AMENDMENTS

TO THE

BUILDING CODE

FOR THE

CITY AND COUNTY OF DENVER

2004

BY AUTHORITY

ORDINANCE NO. 363
SERIES OF 2004

COUNCIL BILL NO. 345
COMMITTEE OF REFERENCE:
PUBLIC WORKS

A BILL

For an ordinance repealing Ordinance 263, Series of 1999 which adopted and amended certain model codes and enacted the Building Code of the City and County of Denver, repealing Ordinance 98, Series of 1996 which adopted and amended the Uniform Fire Code and enacting Article II of Chapter 10 of the Denver Revised Municipal code and enacting certain International Codes with additions and modifications, together to be known as the Building and Fire Code of the City and County of Denver.

BE IT ENACTED BY THE COUNCIL OF THE CITY AND COUNTY OF DENVER:

Section 1. That Ordinance No. 263, Series of 1999 as periodically amended is hereby repealed in its entirety, including all amendments.

Section 2. That Ordinance No. 98, Series of 1996 as periodically amended is hereby repealed in its entirety, including all amendments.

Section 3. That Article II (Building and Fire Code), Chapter 10 of the Denver Revised Municipal Code is added to read and be read as follows.

ARTICLE II BUILDING AND FIRE CODE

Sec. 10-16. The International Building Code ("IBC"), International Energy Conservation Code ("IECC"), the International Fire Code ("IFC"), the International Fuel Gas Code ("IFGC"), the International Mechanical Code ("IMC"), the International Plumbing Code ("IPC"), and the International Residential Code ("IRC"), all series of 2003 and all amendments thereto and The Administration of the Denver Building Code, all as filed May 21, 2004 in City Clerk File Number 04-421 are hereby adopted collectively as the Denver Building and Fire Code.

Sec. 10-17 The Uniform Plumbing Code, Series of 2003 may continue to be used as an alternate code until July 1, 2005, to the extent that it does not conflict with the IBC, IECC, IFC, IMC, and the IRC.

Sec. 10-18 The Uniform Mechanical Code, Series of 2003 may continue to be used as an alternate code until July 1, 2005, to the extent that it does not conflict with the IBC, IECC, IFC, IPC, and the IRC.

Sec. 10-19 The current National Electrical Code, as currently adopted by the State of Colorado or as is from time to time modified, re-enacted or re-adopted by the State of Colorado is hereby

adopted as the electrical code of the City and County of Denver.

PASSED BY THE COUNCIL June 1 2004

_____ - PRESIDENT

APPROVED _____ - MAYOR JUNE 2, 2004

ATTEST: _____ - CLERK AND RECORDER,
EX-OFFICIO CLERK OF THE
CITY AND COUNTY OF DENVER

NOTICE PUBLISHED IN THE DAILY JOURNAL MAY 28, 2004 JUNE 4, 2004

PREPARED BY: KERRY A. BUCKEY, ASSISTANT CITY ATTORNEY 5/17/2004

REVIEWED BY: _____ Asst - CITY ATTORNEY 23 May 2004

SPONSORED BY COUNCIL MEMBER(S) _____

BY AUTHORITY

ORDINANCE NO. 717

SERIES OF 2005

COUNCIL BILL NO. 698

COMMITTEE OF REFERENCE:

PUBLIC WORKS

A BILL

For an ordinance, amending the Building and Fire Code of the City and County of Denver

BE IT ENACTED BY THE COUNCIL OF THE CITY AND COUNTY OF DENVER:

Section 1. That the title of section 102, of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 102 Organization of Building Permitting and Inspection Services

Section 2. That section 102.1 of the Administration section of the Denver Building and Fire Code is hereby repealed and re-enacted to read and be read as follows.

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

Section 3. That section 123.1.3 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows.

Section 123.1.3. Building Contractor Class C (Residential Contractor ICC Classification)**.** To erect, add to, alter or repair one and two family dwellings, U Occupancy buildings and attached single unit dwellings (townhouses). The demolition of any one and two-dwelling unit building or U Occupancy building or structure is permitted. All work shall be performed under the supervision of the holder of Class A, B or C Construction Supervisor Certificate.

Section 4. That section 123.1.4 of the Administration section of the Denver Building and Fire Code is hereby amended to delete the following:

Section 123.1.4. Radon mitigation. Work to be performed under the supervision of the certificate holder. No alteration is permitted to the existing heating and ventilating system. All duct installation must comply with the DBC (Denver Building Code) and IMC (International Mechanical Code).

Section 5. That section 130 of the Administration section of the Denver Building and Fire Code is hereby amended to delete the following subsection 130.2:

Section 130.2 Temporary Certificate. The Agency may issue a temporary Certificate when the applicant has previously exhibited his skills to the satisfaction of the Agency and the applicant's

qualifications are acceptable. The Agency shall determine the period of validity of the temporary Certificate.

Section 6. That section 130.5 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 130.5 Examinations. All applicants for a Certificate shall have a written examination except for those who apply for a Construction D Supervisor Certificate, in which case they shall be examined for experience and training by a standard procedure established by the Agency. If an applicant who has successfully passed the examination given by the Agency fails to procure this Certificate within 180 days after notification, the Certificate shall be declared to be null and void and a new application and fee shall be filed.

Section 7. That section 135.1 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 135.1 Renewal and Expiration. Certificates shall be renewed every 3 years and expire on the date specified on the Certificate. No work shall commence or continue after the date of expiration.

Section 8. That section 136.1 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 136.1 General. The Agency shall have the authority to renew a Certificate, provided that the renewal is accomplished within the limits set forth herein.

1. The Certificate may be reissued without a new application, provided that such reissuance is accomplished within one year after the Certificate has expired.
2. If the Certificate holder reapplies within 3 years of the date of expiration, a new Certificate examination shall not be required.
3. If the Certificate holder applies more than 3 years after expiration, a new Certificate examination shall be required.

Section 9. That section 137.1 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 137.1 General. All Certificate holders shall be responsible to insure that the work performed by the licensee is in accordance with the requirements of this Code, without limitation, and to:

1. Have in possession at all times a Certificate.
2. Present a Certificate when requested by the Agency.

3. Faithfully construct without departure from or disregard of approved drawings and specifications.
4. Obey any order issued under authority of this Code.
5. Pay any fee assessed under the authority of this Code.
6. Observe the safety requirements of this Code.
7. Actively supervise and oversee all work performed by or for the licensee by whom he is employed.
8. Be responsible for all permits being issued prior to the beginning of work.
9. Maintain a current local mailing address and accept all mail so addressed.
10. Out of state Certificate holders shall maintain a current local mailing address on file with Contractor licensing and accept all mail so addressed for the duration of the job.
11 Notify the Agency within 3 days whenever he leaves the employ of licensee.
12. Provide minimum safety measures and equipment to protect workmen and the public.
13. Faithfully construct, without departure from drawings and specifications filed and approved by the Agency and permit issued for same, unless changes are approved by the Agency.
14. Complete all work authorized by the permit issued under the authority of the Agency, unless the cause of incomplete work is determined by the Agency to be not the fault of the Certificate holder.
15. Obtain inspection services where required by the Agency.

Section 10. That section 150.2.1 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 150.2.1 Mechanical. No Permit Required For:

All general repairs and replacements of like units unless the work involves disconnection and reconnection of any of the following:

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

No mechanical permit shall be required for bath fan installation in existing one and two family dwellings and townhouses, however electrical and construction permits shall be required.

Section 11. That section 150.2.2 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 150.2.2 Electrical. No Permit Required For:

1. All general replacements of existing electrical appliances and/or apparatus with like units.
2. General repairs that do not involve altering or changing the electrical system.
3. Reconnection of furnaces and air conditioning units in one and two family dwellings and townhouses.
4. No permit shall be required from Building Permitting and Inspection Services for non-required fire alarm systems in one and two family dwellings and townhouses, however, permits for non-required fire alarm systems in one and two family dwellings and townhouses shall be issued and inspected by the fire department.

Exceptions:

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

Section 12. That subsection 2 of section 151.2 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 151.2, subsection 2. The permitee demonstrates that he or she is one of the following before the permit is issued:

A. A contractor that is licensed under Chapter 1 of this Code;
B. An owner applying for a permit under Subsection 151.2.3; or
C. An owner or owner's agent applying for permits under Subsection 151.2.4.

Section 13. That subsection 6 of section 157.5 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 157.5, subsection 6. Gypsum Board or Lath and Plaster Inspection. To be conducted after all gypsum board or lath, interior and exterior, is in place but before gypsum board joints and fasteners are taped and finished or before plastering is applied.

Exception:

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

Section 14. That item D of section 157.9 of the Administration section of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 157.9 item D. The annual inspection fee for vertical transportation units shall be as specified in Table No. 157.9.

Section 15. That section 1009.12.1 of the Denver Amendments to the 2003 International Building Code (hereinafter IBC), adopted as part of the Denver Building and Fire Code is hereby amended to delete the exception thereto.

Section 16. That section 1009.13 of the Denver Amendments to the 2003 International Building Code (hereinafter IBC), adopted as part of the Denver Building and Fire Code is hereby enacted and added to read and be read as follows:

Section 1009.13 Roof hatches. All required interior stairways that extend to the top floor in any building four or more stories in height shall have, at the highest point of the stair shaft, an approved hatch openable to the exterior not less than 16 square feet (1.5 m^2) in area and having a minimum dimension of 2 feet (6.10 mm).

Exception: A roof hatch need not be provided on pressurized enclosures or on stairways that extend to the roof with an opening onto that roof.

Section 17. That section 1013.3.1 of the Denver Amendments to the 2003 International Building Code (hereinafter IBC), adopted as part of the Denver Building and Fire Code is hereby enacted and added to read and be read as follows:

Section 1013.3.1 Common path of travel for tenant finish alterations in existing office buildings.

When a tenant finish alteration in an existing office building can not comply with the provisions of 2003 IBC Section 1013.3 Common path of travel, the designer of record may apply the exiting criteria of 1997 UBC Sections 1003 and 1004 of the 1999 Denver Building Code through the Admin. Sections 103.3 Modification under Special Circumstances and Section 105.1 Additions, Alterations or Repairs.

Section 18. That Exception 3 is added to section 1019.1.8.1 (Enclosure exit.) of the Denver Amendments to the IBC, adopted as part of the Denver Building and Fire Code is hereby added to read and be read as follows:

Section 1019.1.8.1. Exception 3. A smoke proof enclosure or pressurized stairway shall be permitted to egress through areas on the level of discharge as permitted by Section 1023.

Section 19. That section 1025.1. (General) of the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 1025.1 General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue in Group R as applicable in Section 101.2 and Group I-1 occupancies. Basements and sleeping rooms below the fourth story above grade plane

shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such opening shall open directly into a public way, or to a yard or court that opens to a public way.

Section 20. That section 1704.1.1. (Building permit requirement.) of the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 1704.1.1 Building permit requirement. The permit applicant shall submit a statement of special inspections prepared by the registered design professional in responsible charge as a condition for permit issuance. This statement shall include a complete list of materials and work requiring special inspections by this section, and the inspections to be performed. The owner shall submit, for the building official's review, a list of the individuals, agencies or firms intended to be retained for conducting such inspections.

Section 21. That section 1805.2.1. (Frost Protection) of the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 1805.2.1 Frost Protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods. The frost line for the City and County of Denver shall be 36 inches (915 mm) below the finished grade.

1. Extending below the frost line of the locality.
2. Constructing in accordance with ASCE-32.
3. Erecting on solid rock.
4. Grade beams supported by footings, piers, piles or other foundations where the following conditions are present:
   A. Strength and stability requirements are satisfied: and
   B. The grade beam is constructed over a permanent void space: and
   C. In soils containing silt or fine sand, the highest expected water table is at least 5 feet below the exterior finished grade, or
   D. In expansive soils, the soil on each side of the grade beam is either permanently enclosed, covered or protected from moisture penetration and irrigation, or paved with a material that prevents the penetration of water into the soil and is sloped to drain away from the grade beam.

Exception: Free-standing buildings meeting all of the first three of the following conditions or the fourth condition shall not be required to be protected:

1. Classified in Importance Category I (see Table 1604.5)
2. Area of 400 square feet (37 m^2) or less;
3. Eave height of 10 feet (3048 mm) or less; and
4. Single detached group U buildings of less than 1,000 square feet and not of mixed-occupancy.

Footings shall not bear on frozen soil unless such frozen condition is of a permanent character.

Section 22. That section 3306.1 (Protection required) of the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 3306.1 Protection required. Pedestrians shall be protected during construction, remodeling or demolition activities as required by this chapter and Table 3306.1. Signs shall be provided to direct pedestrian traffic. Fences or barriers shall be provided where a building or structure is under construction, is partially or totally demolished, or there is an open excavation 30" in depth or greater, or a hazardous condition exists. Opening in fences or barriers shall be protected by doors or gates that are normally kept closed.

Section 23. That section 3306.5 (Barriers) of the IBC, adopted as part of the Denver Building and Fire Code is hereby amended by adding two exception to read and be read as follows:

Section 3306.5 Exceptions:

1. When approved by the Building Official, the height may be reduced to six feet.
2. When approved by the Building Official, adequate chain link fencing may be utilized as a barrier.

Section 24. That section 3307 (Protection of adjoining property) of the Denver Amendments to the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

SECTION 3307

PROTECTION OF ADJOINING PROPERTY

3307.1 Protection required. Adjoining public and private property shall be protected from damage during construction , remodeling, demolition, and building relocation work. Protection must be provided for footings, foundations party walls, chimneys, skylights and roofs. Provisions shall be made to control water runoff and erosion during construction, demolition or relocations activities. The person making or causing any excavation, demolition or relocation to be made shall provide written notice to the owners of adjoining buildings and property, by certified mail with a return receipt, advising them that the excavation is to be made and that the adjoining buildings should be protected. Said notification shall be deliverd not less than 10 days prior to the scheduled starting date of the excavation, demolition and/or relocation.

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

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

Section 25. That section 3410.2 (Applicability) of the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 3410.2 Applicability. Structures and buildings existing prior to the adoption of 1990 Denver Building Code (October 1990), in which there is work involving additions, alterations or changes of occupancy shall be made to conform to the requirements of this section or any one of the following, in accordance with Administrative Section 105.1:

1. The requirements of this section or the provisions of Sections 3403 through 3407.
2. The requirements of 1997 Uniform Code for Building Conservation
3. The requirements of 2003 International Existing Building Code.

Exception: For the design and analysis of structural systems and elements, all buildings and structures designed under building codes in force subsequent to September 1976, in which there is work involving additions, alterations, or changes of occupancy, shall be made to conform to the requirements of 2003 International Existing Building Code.

The provisions in Sections 3410.2.1 through 3410.2.5 shall apply to existing occupancies that shall continue to be, or are proposed to be, in Groups A, B, E, F, M, R, S, and U. These provisions shall not apply to buildings with occupancies in Groups H or I.

Section 26. That Section 3410.4.1 of the Denver Amendments to the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section 3410.4.1 Structural Analysis. The owner shall have a structural analysis of the existing building made to determine adequacy of structural systems for the proposed alteration, addition or change of occupancy. The existing building shall be capable of supporting the minimum load requirements of Chapter 16. For seismic loads, FEMA 273, FEMA 310, or FEMA 356 may be used

in lieu of Chapter 16 requirements.

Section 27. That the first sentence of Section L106.1.7 (Exit stairway access) of Appendix L of the Denver Amendments to the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section L106.1.7 Exit stairway access. Direct access to at least two exit stair enclosures from the secured elevator lobby shall be provided or a dedicated corridor shall be provided to maintain free access to at least two exits.

Section 28. That Section N108.1 (Fire Sprinkler system) of Appendix N of the Denver Amendments to the IBC, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section N108.1 Fire Sprinkler System. Terminal/concourse buildings shall be fully sprinklered in accordance with NFPA 13, Standard for Installation of Sprinkler System. Design criteria for terminal buildings shall be in accordance with ordinary Hazard Group 2 for retail and service areas per 2002 NFPA 415 for office and passenger areas.

Section 29. That section R403.1.4.1. (Frost Protection) of the 2003 International Residential Code, adopted as part of the Denver Building and Fire Code is hereby amended to read and be read as follows:

Section R403.1.4.1 Frost Protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extending below the frost line specified in Table R301.2(1);
2. Constructing in accordance with Section R403.3;
3. Constructing in accordance with ASCE-32-01; and
4. Erected on solid rock.

Exceptions:

1. Freestanding accessory structures with an area of 1000 square feet or less and an eave height of 10 feet or less shall not be required to be protected.
2. Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

Footings shall not bear on frozen soil unless such frozen condition is of a permanent character.

COMMITTEE APPROVAL DATE: September 14, 2005.

MAYOR-COUNCIL DATE: September 20, 2005.

PASSED BY THE COUNCIL October 3 2005

- PRESIDENT

APPROVED: _____ - MAYOR 10/4 2005

ATTEST: _____ - CLERK AND RECORDER,
EX-OFFICIO CLERK OF THE
CITY AND COUNTY OF DENVER

NOTICE PUBLISHED IN THE DAILY JOURNAL Sept. 30, 2005; Oct. 7, 2005

PREPARED BY: Kerry A. Buckey, Assistant City Attorney 8/15/2005

Pursuant to section 13-12, D.R.M.C., this proposed ordinance has been reviewed by the office of the City Attorney. We find no irregularity as to form, and have no legal objection to the proposed ordinance. The proposed ordinance is not submitted to the City Council for approval pursuant to § 3.2.6 of the Charter.

Cole Finegan, City Attorney

BY: _____, Asst City Attorney

DATE: 21 Sep 05

ACKNOWLEDGEMENT

The process to review the series of International Codes, as developed by the International Code Council (ICC), was in response to concerns expressed on behalf of the construction and development industries, businesses, design professional associations, educational institutions, local governments, affordable housing and most of all the citizens of Denver. It became apparent that the City and County of Denver needed to adopt a national series of building codes that were universal on the local, state and national level. The 2003 Series of International Codes are becoming the national standard of the country.

As a result, the Building Code Revision Committee (BCRC) reviewed and recommended the adoption of the 2003 Series of I Codes and accompanying National Electrical Code regulated by the National Fire Protection Association and the State of Colorado Electrical Board.

The Amendments presented in this document are considered necessary to make these codes effective for the construction and development conditions within the City and County of Denver. They include changes to the International Building Code, International Residential Code, International Mechanical Code, International Fuel and Gas Code, International Energy Conservation Code and the International Plumbing Code. The International Fire Code was reviewed by the Fire Code Review Committee. The International Electrical Code, International Zoning Code and International Property Maintenance Codes have not been adopted.

We wish to thank the members of Denver's City Council, the Mayor's Office, City Attorney's Office, Fire Department, Building and Construction Services of the Community Planning and Development, the Building Code Revision Committee and its subcommittees and the organizations they represented. The time, dedication and professionalism devoted by all involved to develop this document were invaluable. In particular, we also wish to thank Sarah Kendall of the Mayor's Office for her assistance and guidance.

Peter Park, Manager
Community Planning and Development

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An expression of sincere thanks is extended to all those who have contributed so much of their time and effort for the safety and welfare of the people who live, work and visit Denver.

John W. Hickenlooper, Mayor

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2004 DENVER AMENDMENTS

TO THE

2003 INTERNATIONAL CODES

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THE END

ADMINISTRATION

OF THE

2004 DENVER BUILDING CODE

CHAPTER 1
ADMINISTRATION

SECTION 101
PURPOSE AND SCOPE

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

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

101.3 Scope. The provisions of this Code shall apply to and govern the following:

101.3.1 New Buildings, Structures and Utilities. The Code shall regulate the construction, addition, alteration, repair, occupancy, use and maintenance of any building, structure or utility hereafter erected within the City, except as set forth in subsection 101.3.3 below.

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

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

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

Refer to Section 150.1.1 for additional exempt work.

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

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

101.3.5.1 Effective date. The effective date of the new Code shall be 4 months after the date of the adopting ordinance to the International Building Code, International Fuel Gas Code, International Energy Conservation Code, International Plumbing Code, International Residential Code and the International Mechanical Code; including amendments.

The latest edition of the UPC maybe used until July 1, 2005 when requested by the owner.

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

101.3.5.2 Continued use of the 1999 Denver Building Code. The option of the use of the 1999 Denver Building Code or the new Code shall be allowed for any projects that will be submitted to the Agency after the adopting ordinance and before the effective date of this Code.

Major projects in the design stage during the drafting of the new Code that will be submitted to the Agency after the effective date of this Code may be reviewed under the 1999 Denver Building Code. Provided that the owner or the owner's agent submits a letter of commitment to the Agency stating:

i. Election to proceed under the 1999 Denver Building Code or this Code;

ii. Address of the construction project;

iii. Description, number of stories, floor area, occupancy, etc., of the building;

iv. Date of beginning design drawings;

v. Date of submitting construction drawings to the Agency.

vi. That the construction of the project will start within 6 months and be completed within 24 months of the effective date of this Code if the option is to use the 1999 Denver Building Code.

A letter of commitment must be submitted by the effective date of this Code.

101.3.5.3 Type approved. "Type approved" structures approved by the Agency prior to the effective date of the new Code are valid for permitting until 6 months after the effective date of the new Code.

SECTION 102
ORGANIZATION OF BUILDING AND CONSTRUCTION SERVICES

102.1 General. The Building and Construction Services Agency (hereinafter "Agency") is established as an agency under the Manager of Community Planning and Development. See Chapter 2 for definition.

102.2 Building Official. The Manager of Community Planning and Development shall appoint the Building Official. The Building Official is hereby authorized and directed to interpret and enforce all provisions of this Code.

102.3 Employees. In accordance with prescribed procedures, the Building Official shall authorize or appoint engineers, technicians, inspectors or other employees to perform duties and exercise powers delegated to him by this Code.

102.4 Authorization and Identification. Each employee of the Agency shall be provided with an identification card bearing information required by the Building Official. This card shall be carried by the person identified, and shall be displayed when necessary to identify the person properly to perform official duties.

SECTION 103
GENERAL POWERS AND DUTIES OF THE AGENCY

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

103.2 Interpretations, Rules and Regulations. The Building Official shall have the full power to render interpretations of this Code and to adopt and enforce Rules and Regulations supplemental to this Code, as he may deem necessary in order to clarify the application of Code provisions. Such interpretations and Rules and

Regulations shall be in conformity with the intent and purpose of this Code. Rules and Regulations shall be adopted and recorded in accordance with the provisions of the Revised Municipal Code. The Board of Appeals (see Section 112) may review any appeal of an Agency interpretation subject to Section 113 Appeals.

103.3 Modifications Under Special Circumstances. Whenever there are practical difficulties involved in carrying out the provisions of this Code, the Building Official may grant modifications for individual cases, provided he shall first notify the owner of the building, structure or utility and then find that a special individual reason makes the strict letter of the code impractical and that the modification is in conformity with the intent and purpose of this Code and that such modification does not lessen any fire protection requirements or any degree of structural integrity. The details of any action granting modifications shall be sent to the owner and entered in the permit files of the Agency.

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

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

103.6 Right of Entry. Whenever an authorized representative of the Agency has reasonable cause to believe that there exists in any building or upon any premises any condition or Code violation which makes such building or premises an eminent hazard, the representative of the Agency may enter such building or premises and take such action as is necessary to abate such hazard.

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

A. The Agency's representative has presented to the occupant of an occupied building or premises proper credentials and been refused entry.

B. The Agency's representative has made a reasonable effort to locate the owner or other persons having charge or control of an unoccupied premises and has been unable to locate such person or has been refused entry by such person.

103.7 Orders. Whenever work is or has been performed contrary to the provisions of this Code, or whenever conditions exist which are in violation of this Code or any of the several codes or ordinances enforced or administered by this Agency, the Agency may:

A. Order any work stopped until authorized by the Agency to proceed. The owner, once notified of the order, shall not allow any further work upon the subject property until authorized by the Agency.

B. Order the work being performed or that has been performed to be completed or corrected so that the resulting work is in accordance with the requirements of this Code or other codes or ordinances enforced or administered by the Agency.

C. Order the use or occupancy of a building, structure or equipment discontinued and the structure, or portion thereof, vacated by notice served on any person causing such use to be continued. Such person shall discontinue the use within the time prescribed by the Building Official.

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

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

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

The Board of Appeals may review any appeal of an Agency order subject to Section 121.

SECTION 104
SERVICE

Service of any order may be by personal service, as specified in the Colorado Rules of Civil Procedure, or by certified mail, return receipt requested, and service shall be deemed complete upon delivery.

SECTION 105
APPLICATION TO EXISTING BUILDINGS

105.1 Additions, Alterations or Repairs. Additions, alterations or repairs may be made to any building or structure without requiring the existing building or structure to comply with all the requirements of this Code, provided that the addition, alteration or repair conforms to that required for a new building or structure, except as otherwise provided for in this Code. The Building Official shall use the 1997 edition of the Uniform Code for Building

Conservation and Guidelines, and the 2003 International Existing Building Code, as a guide for granting modifications to the Code for such additions, alterations or repairs.

105.2 When Additions, Alterations or Repairs are Not Allowed. Additions, alterations or repairs shall not be made to an existing building or structure which will cause the existing building or structure to be in violation of any of the provisions of this Code, unless otherwise provided for in this Code. Any addition, alteration or repair shall not cause an existing building or structure to become unsafe.

105.3 Materials. Non-structural alterations and repairs may be made with the same materials as the existing building or structure, provided they do not adversely effect any structural member, nor the fire-resistive rating of any part of the building or structure.

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

105.4 Existing Occupancy.

1. Buildings in existence at the time of the adoption of the Code may have their existing use or occupancy continued, if such use or occupancy was legal at the time of the adoption of this Code, provided that such continued use is not dangerous to life.

2, Any change in the use or occupancy of any existing building or structure shall comply with the provisions of the Code.

105.5 Maintenance. All buildings, structures or utilities, both existing and new, and all parts thereof, shall be maintained in a safe and sanitary condition. All devices, utilities or safeguards which are required by this Code, or which were required under any previous Code or Ordinance, shall be maintained in good working condition. The owner or legally responsible person shall maintain such buildings, structures or utilities. To determine compliance with this subsection, the Agency may cause any building, structure or utility to be reinspected.

105.6 Moved and Temporary Buildings or Structures. Buildings or structures moved into the City shall comply with the provisions of this Code for new buildings or structures. Temporary structures, such as reviewing stands, and other miscellaneous structures, sheds, canopies or fences used in conjunction with special events or construction work may be erected by special permit from the Agency for a limited period of time as specified in Section 162. Temporary buildings or structures need not comply with the type of construction or fire-resistive requirements except where specifically required by this Code. Tents shall be permitted as specified

in the Fire Code. Temporary buildings or structures shall be completely removed upon the expiration of the time limit stated on the permit.

105.7 Rehabilitation of Older Buildings. Chapter 61 of this Code may be applied to rehabilitation of older buildings.

SECTION 106
UNSAFE BUILDINGS OR STRUCTURES

106.1 General. Structures, buildings or equipment that are or hereafter become unsafe, insanitary or deficient because of inadequate means of egress facilities, or which constitute a fire hazard, or otherwise dangerous to human life or public welfare due to damage, vandalism, dilapidation or abandonment, or that involve illegal or improper occupancy, or inadequate maintenance or use inferior materials shall be deemed unsafe.

106.1.1 Additional Conditions. In addition, if any of the following conditions occur, the building or structure shall be deemed unsafe.

1. Those buildings or structures in which a wall or other vertical structural member lists, leans or buckles to such an extent that a plumb line passing through the center of gravity falls outside of the middle third of the base.

2. Those buildings or structures that show damage or deterioration to:

   A. Any structural or load-bearing member to the extent that the member does not have sufficient strength to resist all applicable loads specified in Chapter 16.

   B. Nonbearing exterior walls or enclosures to such an extent that they will not resist the wind pressure or lateral forces specified in Chapter 16.

   C. Any exposed exterior member to the extent that the member provides inadequate protection from the elements to the occupants of the building or structure.

3. Those buildings or structures in which the loads upon the walls, floors, roofs or any other necessary structural member exceed the maximum design limits specified in Chapter 16.

4. Those buildings or structures having floors or areas with inadequate egress.

5. Those building or structures having parts attached in such a manner that they may fall and cause injury to the public or property.

Uncompleted buildings or structures when the permit has been canceled.

7. Open pits, open wells and open excavations of all types when such are determined to be hazardous by the Agency.

8. Trenches or ditches not properly shored or cribbed.

9. Vacant buildings which are not secure and to which entry may be made through opened or unlocked doors, windows or other openings.

10.Those buildings or structures which are uninhabitable, including but not limited to buildings or structures, with any one of the following conditions:

   A. Where building envelope damage or deterioration has caused the interior of the structure to be open to the elements.

   B. Where vandalism or deterioration has caused the plumbing system, electrical system or heating system to be no longer functional.

C. Where vandalism or deterioration has caused the internal floor structure or stairways to be incapable of supporting the weight of normal occupancy.

11. Any dilapidated building of whatever kind which is unused by the owner, or uninhabited because of deterioration or decay, which condition constitutes a fire hazard or subjects adjoining property to danger of damage by deterioration of structural building elements, storm effect, soil erosion or rodent infestation, or which becomes a place frequented by trespassers and transients seeking a temporary hideout or shelter.

SECTION 107
UNSAFE UTILITY

107.1 General. An unsafe utility is one which constitutes a fire hazard or a hazard to life, health, property or public welfare by reason of use, construction, installation, obsolescence, damage, deterioration, quality of materials, abandonment or inadequate maintenance. However, without limitation of the foregoing, any utility in which any one or more of the following conditions exists shall constitute an unsafe utility:

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

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

107.3 Elevators and Similar Conveyances. Elevators, escalators, dumbwaiters, moving walks or similar conveyances or apparatus which have any of the following defects:

1. Hoisting, counterweight or governor ropes or cables with frayed or broken strands.

2. Operation in a hoistway used to store material other than elevator equipment. This shall also apply to elevator machine rooms, machinery spaces and pits where materials other than elevator equipment are maintained or stored.
3. Operation in a hoistway that is in danger as a result of dust or other highly combustible material on the mechanism or in the hoistway, penthouse or pit.
4. Brake mechanism not functioning properly or safely.
5. Those not safety tested in accordance with the requirements of this Code, or where required safety devices have been disconnected or discontinued.
6. Those safety or operational devices provided in the elevator cab which are not functioning properly or safely.
7. Where hoistway entrance protection does not meet the requirements of this Code.

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

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

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

1. Inadequate ventilation.
2. Inadequate venting of pressure relief valves.
3. Unauthorized fuel-fired equipment located in the same room designated for the refrigeration equipment.
4. Improperly installed cooling towers by reason of location, type, fan, water condition, controls, roof or floor overload.
5. Faulty controls.

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

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

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

3. Inadequate piping not supplying sufficient water to the various appliances.
4. Clogged sewers or drains.
5. Inadequate or missing trap seals.
6. Inadequate venting.

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

8. Trenches or ditches not properly shored or cribbed.

SECTION 108
NOTICE AND ABATEMENT OF UNSAFE BUILDINGS, STRUCTURES OR UTILITIES

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

108.2 Unsafe Building or Structure. In the case of an unsafe building or structure, the Agency may order such building or structure, or any buildings or structures placed in jeopardy by the unsafe building or structure, vacated immediately. The unsafe buildings or structures shall be posted in accordance with the provisions of Section 108.7.

108.3 Unsafe Utility.

1. In the case of an unsafe utility, the Agency shall affix an approved warning tag on the unit declared to be unsafe. The Agency shall order the unsafe utility disconnected or its use discontinued until the nuisance created thereby is abated. In addition, the Agency may order any building, structure or utility which is placed in jeopardy by the unsafe utility to be vacated and/or disconnected, and these shall not be reoccupied or reconnected until declared safe by the Agency.

2. It shall be unlawful for anyone to mark any unsafe utility, as herein defined, with any type markings or tags declaring them to be unsafe, except as authorized by the Agency.

108.4 Demolition or Securing by the City. If the owner and/or occupant of an unsafe building, structure or utility fails to perform the repairs, rehabilitation, securing or removal required by an order within the time specified in the order or any extension of time to comply with said order, the City may, as set forth in Section 108.5, cause the demolition or securing of the unsafe building or structure.

108.5 Emergency Demolition or Securing. In the event an emergency should occur wherein the continued use or existence of a building, structure or utility may constitute an immediate hazard to life, health, property or public welfare, the Agency may order and/or cause the building, structure or utility to be demolished, removed, disconnected, secured or barricaded at once by any means available to the Agency. When feasible, the Agency shall attempt to give notice, by any means, to the owner of the building, structure or utility prior to taking any action. Cost and expense of demolition, removal, securing or barricading, if borne by the City, shall be recovered as provided for in Section 108.

108.6 Emergency Barricades. If any building, structure or utility is declared a hazard to life or safety of persons using a public way, the public way shall be provided with barricades to prevent public use. The barricades shall be erected on order from the Agency. Recovery of cost and expense, if borne by the City, shall be made as provided for in Section 108.9.

108.7 Posting of Signs. When necessary to protect life, property, health and public welfare, the Agency may post signs which shall prohibit entry into an unsafe building or structure. However, with permission of the Agency, it shall be lawful to enter the unsafe building or structure for the purpose of effecting any required repairs, rehabilitation or demolition; or by members of the Fire Department. The signs shall be provided and attached to the building or structure by the Agency and shall read, in addition to other information, "UNSAFE DO NOT ENTER". See Section 111 for Prohibitions and Violations.

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

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

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

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

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

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

108.9 City's Lien. In the event the owner fails to pay the costs as set forth in the notice sent under Section 108.8.5 within 15 days of such notice, the amount shall constitute a lien against the real property upon which the building or structure was or is situated. The Agency shall thereafter pay the cost and expense of demolition, removal, securing and/or barricading, from any appropriation made available for that purpose, and shall certify a statement thereof to the Manager of Revenue, who shall assess and charge the same against the property involved and collect the same due, together with interest at the rate established by the law for delinquent real property taxes

1. The lien created thereby shall be superior and prior to other liens, regardless of date, except liens for general and specific taxes.

2. For purposes of this Code, cost and expense shall include the demolition, removal, securing, barricading and administrative costs incurred therewith.

108.10 Right to Appeal. The Board of Appeals may review an Agency decision under Section 108 upon appeal pursuant to Section 113.

SECTION 109
USED MATERIALS

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

SECTION 110
ALTERNATE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION AND EQUIPMENT

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

110.2 Application and Fee. An application for approval of an alternate material, design and/or method of construction or equipment shall be filed with the Agency. Information shall be that required by the Agency and this Code. Applications for alternate materials shall be accompanied by a fee of $200.00, payable to the Manager of Revenue, City and County of Denver, and shall be paid in the office of the Agency. No fee shall be

required for alternate design and/or method of construction or equipment processed in conjunction with plan review fees applicable in accordance with Table No. 152.1 “Fee Schedule Building Permit Fees”.

110.3 Review and Renewal. Each approved material, method or equipment shall be subject to a review and renewal of the approval every 3 years. The fee for each review and renewal shall be $75.00.

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

110.5 Requirements and Tests.

1. When a construction material, assembly, fixture, device, utility or other article different from that provided for in this Code is proposed for use, the plans, specifications, details, test data, samples and literature shall be furnished to the Agency for review.

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

110.6 Approved Testing Laboratories. At the discretion of the Agency, new methods and materials may be acceptable if tested by a recognized testing laboratory or agency. The testing laboratory or agency must be one approved by the Agency and it shall provide listing, labeling and follow-up inspection services. A copy of the Agency approval report or the test report shall be submitted to the Agency for approval.

110.7 Right to Appeal. The Board of Appeals may review an Agency decision upon appeal, subject to Section 113.

SECTION 111
PROHIBITIONS, VIOLATIONS, PENALTIES AND REMEDIES

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

1. **Alternate Methods, Materials or Equipment.** It shall be unlawful for anyone to use any method, material or equipment as an alternate to the methods, materials or equipment permitted by this Code without first obtaining approval in the manner herein provided.
2. **Licensing, Certificate and Registration.** It shall be unlawful for any person to perform any work on any building or utility without first obtaining a license, certificate or registration in accordance with the requirements of this Code, except that the owner of a building, where authorized under Section 150 of this Code, who obtains a permit for the work being performed, need not be licensed, certified or registered.
3. **Licensing, Certificate and Registration Holder Responsibility.** It shall be unlawful for any license, certificate or registration holder to violate any of the responsibilities enumerated in Chapter 1 of this Code.

4. **Permits.** It shall be unlawful for any person to perform or cause to perform any work on any building, structure or utility without first obtaining a permit for such work from the Agency in accordance with Sections 150 through 165 of this Code.

5. **Certificate of Occupancy.** It shall be unlawful for anyone to occupy a new building or structure or change the occupancy of any building or structure without first having obtained a Certificate of Occupancy from the Agency as required by the provisions of this Code. A Certificate of Occupancy will not be required for remodeling or additions, unless there is a change of occupancy.

6. **Unsafe Building, Structure or Utility.** It shall be unlawful for any person to maintain or permit to be maintained any building, structure or utility which is unsafe as defined in this Code. These provisions shall apply to buildings, structures or utilities that are new, existing, under construction, altered or demolished.

7. **Enter, Occupy or Inhabit an Unsafe Building or Structure.** It shall be unlawful to enter, occupy or inhabit any unsafe building or structure posted in accordance with the provisions of Section 108.7.

8. **Removal of Danger Sign(s).** It shall be unlawful to remove or deface a sign required by Section 108.7, without specific approval from the Agency.

9. **False Information.** It shall be unlawful to furnish the Agency any false information in any application for a license, certificate or permit required by this Code or during the course of an investigation conducted by the Agency to enforce this Code.

10. **Operate or Maintain Unsafe Utility.** It shall be unlawful for any person to operate or maintain an unsafe utility or reconnect the power or fuel supply to any utility declared by the Agency as being unsafe, and to which a City red tag has been attached as provided for in Section 108.3.1 of this Code. The owner and occupant of any building or structure containing an unsafe utility to which a City red tag has been attached, who has notice that the utility has been declared unsafe and so tagged by the Agency, shall not permit said utility to be operated and shall take whatever steps are necessary to insure that the utility is not operated.

    Exception: A properly Licensed Contractor with a permit may remove a City red tag for purposes of repair of the equipment. However, in the case of elevators, it shall be unlawful to allow any person to occupy the elevator except a licensed contractor and his employees during said repairs. Permission shall be obtained from the Agency prior to removal of the City red tag.

11. **Removal of City Warning or City Danger Tag.** It shall be unlawful for any person to remove a City red tag attached to any utility as provided for in Section 108.3.1 of the Code.

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

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

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

111.4 Remedies. In the event any building, structure or utility is erected, constructed, reconstructed, altered, repaired, converted, demolished, moved, maintained or used in violation of this Code, the City or any proper

person may institute an appropriate action or proceedings to prevent the unlawful erection, construction, reconstruction, alteration, repair, conversion, maintenance or occupancy, and to restrain, correct or abate such violation, or to prevent the occupancy of said building, structure or land. The imposition of any penalty thereunder shall not preclude the City or any proper person from instituting any appropriate action or proceeding to require compliance with the provisions of this Code, and with administrative orders and determination made thereunder.

SECTION 112
BOARD OF APPEALS

112.1 Creation. There is hereby created a Board of Appeals (the "Board"), which shall consist of 5 members and 3 alternates appointed by the Mayor. The Board shall be comprised of the following persons:

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

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

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

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

112.4 Terms. As of the effective date of this Ordinance, the members of the Board of Appeals as constituted under the Amendments to the Building Code for the City and County of Denver, as adopted by Ordnance number 263, Series of 1999 shall continue to serve for the unexpired portion of their terms. The Mayor shall appoint Board members and alternates as necessary to fill expiring terms and such terms shall be for 3 calendar years. No member of the Board shall serve more than 3 consecutive full terms or a total of more than 9 consecutive calendar years. Any vacancy that occurs in the Board shall be filled by the Mayor for the unexpired term of that Board member. Board members may be removed only for cause upon written charges.

112.5 Procedures – Meetings – Quorum.

1. **Regular Meetings.** Regular meetings shall be held once each month, or as often as may be required by the Agency. At the first regular meeting of each calendar year, the Board shall elect a Chairman and a Vice-Chairman. The Chairman of the Board shall require that all members of the Board be polled during voting at the meeting. Three members of the Board shall constitute a quorum.
2. **Special Meetings.** Special meetings may be held at the call of the Chairman and at such times as the Board shall determine. The Board, the Agency or an appellant may request a special meeting. Any special meeting held at the request of an appellant shall be paid for by the appellant in the amount of $150.00. Three members of the Board shall constitute a quorum at special meetings.
3. **Business Meetings.** Business meetings of the Board may be called by the Chairman of the Board.

4. **Public Notice.** Public notice shall be given of all meetings and all meetings shall be open to the public except executive sessions or business meetings.

5. **Notice.** Due notice of all meetings shall be given by the Secretary to all parties in interest, including the Agency. The Agency shall be permitted to intervene, for and on behalf of the City, in all public meetings.

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

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

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

112.6 Powers and Duties of the Board.

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

2. Powers. Subject to the limitations enumerated herein, the Board shall have and may exercise the following powers:

A. Administrative Review. To hear and decide appeals where it is alleged there is error in any order, requirement, decision or determination made by the Agency in the enforcement of this Code.

B. Variances. To hear, grant or deny requests for a variance from the terms of the Code or from an order or decision of the Agency upon finding that the following conditions exist:

i. That the applicant properly applied for a variance under Section 113.

ii. That, owing to Exceptional and extraordinary circumstances, there are practical difficulties or unnecessary hardship involved in carrying out the strict letter of the Code.

iii. That the variance will not weaken the general purposes of the Code.

iv. That the variance will be in harmony with the spirit and purposes of the Code.

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

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

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

C. Alternate Methods and Materials. To hear and decide appeals from the Agency denial of an application for alternate materials and methods of construction and equipment under Section 110 herein, after the applicant has obtained an approval or certified test results from an approved testing agency. All relevant information and documentation shall be submitted to the Board prior to the hearing. The decision of the Agency shall not be overturned unless the Board shall find that the following conditions exist:

i. That the applicant properly applied under the terms of Section 110.

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

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

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

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

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

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

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

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

3. Additional Powers. The Board shall have and exercise the powers hereinafter set forth in connection with Chapter 10 of the Revised Municipal Code. In the exercise of its powers, the Board may reverse or affirm, wholly or partly, or may modify the order, requirement, decision or determination as ought to be made, and, to that end, shall have all the powers of the officer or department from whom the appeal is taken. Notwithstanding the above and any other part of this Section 112, the Board shall not have these powers with respect to Articles I, IV, V, and VIII of Chapter 10.

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

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

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

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

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

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

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

4. **Decision of the Board.** In the exercise of the powers described above, the Board may reverse or affirm, wholly or in part, or may modify the order, requirements, decision or determination appealed from; may impose conditions or requirements as deemed necessary; and may make such order, decision or determination as ought to be made and has the right to hold cases in abeyance until proper information needed by the Board is supplied. Decisions shall be filed with the Agency as a matter of public record.

112.7 Procedure and Notice. Upon written receipt of a request for a variance, notice of the request shall be sent to the Fire Department, the City Attorney and the owner of the real estate affected by the request for a variance. No variance shall be granted until 15 days after the required notifications are mailed.

112.8 Limitations of Powers.

1. The Board shall issue a written decision, based on evidence presented at the public meeting, setting forth the necessary findings of fact and the final decision of the Board. A copy of this decision shall be mailed by the Secretary to all interested parties who received notice under subsection 112.7, including the Agency. The Board may order that a copy of the decision be recorded in the office of the Denver Clerk and Recorder.

2. The concurring vote of 3 members of the Board, or a majority of those present and voting, whichever is greater, shall be necessary to decide any matter upon which the Board is required to pass under this section of this Code.

3. The Board of Appeals shall have no authority to review administrative decisions or grant variances to the provisions of Chapters 1 of this Code except where specifically provided by the following Sections: Section 103.6 Orders; Section 108 Notice and Abatement of Unsafe Buildings, Structures or Utilities; Section 110 Alternate Materials and Methods of Construction and Equipment; Section 122.3 Application and Fee; Section 160 Certificate of Occupancy; and Section 162 Permits for Temporary Building.

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

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

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

112.9 Compensation. Each member of the Board shall receive $70.00 per meeting attended regardless of number or type of cases heard.

SECTION 113
APPEALS

113.1 Method of Application Fee. Prior to action by the Board, an application shall be filed with the Agency on a form providing the necessary information required by the Board. An appeal shall not be considered unless filed with the Agency at least 15 days prior to the meeting. Upon filing the application, a fee of $70.00 shall be paid to the City. All checks shall be made payable to the Manager of Revenue, and shall be paid in the office of the Agency. This fee is not refundable.

113.2 Grievance. Any person or city agency aggrieved by a decision of the Agency; any person or city agency claiming practical difficulties or unnecessary hardships in complying with the strict letter of the Code or Chapter 10 of the Revised Municipal Code; or where it is alleged there is error in any order, requirement, decision or determination made by the Agency, may, within 30 days of the date of notice of such decision or order, appeal the decision or order of the Agency by filing an application with the Board.

Exception: Appeals of notices issued under Section 108.8, where such notice is personally served or delivered by overnight mail, shall be made within 10 days of the delivery of such notice or the refusal to accept such notice.

113.3 Unsafe Condition. Whenever the owner or legally responsible person of an alleged unsafe building, structure or utility or other condition does not agree with the order from the Agency as to the correction to be made, he shall have the right to appeal to the Board within 30 days from the date of said order. In his appeal, he shall state how he proposes to make the building, structure, utility or other condition safe and, if required by the Board, he shall submit detailed engineering analysis or recommendations, accompanied by plans and specifications prepared by a Colorado licensed Architect or Colorado registered Professional Engineer, as prescribed in this Building Code. The Board may require substantiating data concerning the removal or other remedial steps to be taken to render the building, structure, utility or other condition safe.

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

SECTION 114
APPEALS FROM DECISIONS OF THE BOARD

114.1 Procedure. Any person aggrieved by the City, or any officer, Agency or division of the City may have a decision of the Board reviewed in the manner provided by the Colorado Rules of Civil Procedure. The Board shall not be required to return the original papers acted upon by it, but shall return copies thereof. The returned copies shall concisely set forth other pertinent facts and material to the decision appealed from and shall be verified.

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

114.3 Transcript Costs. Whenever a transcript is demanded by the person taking the appeal, or when a transcript is furnished by the Board pursuant to court order, the cost of preparing the transcript of proceedings shall be borne by the appellant, in the amount of at least $200.00.

SECTION 115
VALIDITY OF BUILDING CODE

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

SECTION 116
LIABILITY

The Building Official, or his authorized employee or representative charged with the enforcement of this Code, acting in good faith and without malice in the discharge of his duties, shall not thereby render himself personally

liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of his duties. Any suit brought against the Building Official or employee because of such act or omission performed by him in the enforcement of any provision of the Codes or the Charter, or other pertinent laws or ordinances implemented through the enforcement of this Code or enforced by the Agency, shall be defended in accordance with Section 108 of Chapter 24, Article 10, C.R.S.

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

SECTIONS 117 through 119 are reserved.

SECTION 120
LICENSING, CERTIFICATION, REGISTRATION

This Chapter provides for the licensing of all persons, the certification of supervisory personnel, registration and other types of certifications.

SECTION 121
AUTHORITY

121.1 Licenses. The Agency is vested with the authority to establish licensing procedures, to qualify applicants for licenses and to issue, revoke, renew and suspend licenses.

121.2 Certificates. The Agency is vested with the authority to establish certification procedures, prequalify applicants and issue, revoke, renew and suspend certificates.

SECTION 122
LICENSES OR REGISTRATION

122.1 Definitions.

1. A license is authority granted by the City to a person, agency or political entity to perform the work authorized by the license.

2. A registration is authority granted by the City to an electrical contractor registered by the State of Colorado to perform the work authorized by said registration.

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

Exceptions:

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

2. Work performed by owners of one and two family dwelling unit buildings, townhouses and U Occupancies when work is performed under a permit authorized by Section 151.2.3.

3. Upon prior approval by the Agency, a licensed Building Contractor Class A, B or C, and homeowner, when constructing one- or two-dwelling unit buildings may have unlicensed subcontractors working under the licensed contractor's or homeowner's building permit. This does not apply to Utility or Roofing Contractor.

122.3 Application and Fee. Every applicant for a license shall fill out a form provided by the Agency and shall pay an application fee of $15.00 at the time of filing. This fee shall not be refundable and shall not apply to the license fee. The name of the certified supervisor shall appear on the license application. The applicant shall be notified of the action taken on the license application by the Agency. If the license is approved, the applicant shall procure this license within 90 days after notification. Failure of the applicant to procure the license shall require the filing of a new application with fee. If the application for license is disapproved by the Agency, the applicant may appeal to the Board of Appeals in the manner provided for in this Building Code.

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

1. Individual. If the licensee is an individual, he also may qualify as the Supervisor for that license, after examination.

2. Not Required. Electrical registration shall not require a certified supervisor.

SECTION 123
CLASSIFICATION OF LICENSES AND REGISTRATION

123.1 General. There shall be various classes of licenses and an electrical registration and the holder thereof shall be authorized to perform the following:

1. Building Contractor Class A (General Contractor ICC Classification). To erect, add to, alter, demolish or repair any building or structure. All work shall be performed under the supervision of the holder of a Class A Construction Supervisor Certificate.

2. Building Contractor Class B (Building Contractor ICC Classification)**.** To erect, add to, alter or repair any building or structure of the following construction types:

A. Types I or II limited in height to less than a high rise and in area to that allowed for a Type III building.

B. Type III, IV or V buildings.

The demolition of any one and two-dwelling unit buildings or one-story building or structure is permitted. The contractor may install nonbearing partitions or do interior finish work in any type of building or structure. All

work shall be performed under the supervision of the holder of Class A or B Construction Supervisor Certificate.

3. Building Contractor Class C (Residential Contractor ICC Classification)**.** To erect, add to, alter or repair one and two family dwellings U Occupancy buildings or tenant improvements in townhouses. The demolition of any one and two-dwelling unit building or U Occupancy building or structure is permitted. All work shall be performed under the supervision of the holder of Class A, B or C Construction Supervisor Certificate.

4. Building Specialty Contractor Class D. To perform building construction work which is covered by the Code, but is not assigned to any other license listed in this section. All work shall be performed under the supervision of the holder of the particular Class D Supervisor's Certificate. Those building construction activities shall be approved separately and shall include but not be limited to the following:

Antennas. Antennas attached to buildings or freestanding. This includes antenna towers. Not allowed to alter any structural members of a building.

Building insulation.

Concrete and foundations. Combined excavating, shoring, piles, caissons and drilled shafts and cast-in-place concrete.

Concrete reinforcing steel placers. Placement of reinforcing bars, pre- or post-tensioning steel, bar supports and welded wire fabric for reinforced concrete construction.

Curtain walls. Installation of curtain walls and storefronts.

Custom size replacement windows. Work limited to townhouses, one and two family dwelling unit buildings not requiring any structural alterations.

Fence structures.

Fire doors.

Fireproofing. Application of fireproofing materials.

Gutters and downspouts.

Inside tap and backflow preventor. Installation of inside tap and backflow preventor in single family and duplex residences only.

Lathing, plastering and dry wall. Installation of all lathing, plastering and dry wall including the installation of nonbearing partitions, stucco or exterior texturing of buildings or structures and suspended ceiling systems.

Masonry. Laying and forming all types of masonry.

Material handling equipment.

Open deck. Including supporting foundation and attachment to buildings. Does not allow construction of shade devices or roof structures. Work to be done only on one and two family dwellings.

Outdoor stage erection: Erection of outdoor stages, mobile stages, platforms or reviewing stands.

Overhead doors.

Pneumatic tubes.

Power-operated door installers.

Pre-cast concrete building units. The erection of precast concrete structural units.

Prefabricated patios, carports, canopies and awnings.

Racks for high piled storage.

Radon mitigation. Work to be performed under the supervision of the certificate holder. No alteration is permitted to the existing heating and ventilating system. All duct installation must comply with the DBC (Denver Building Code) and IMC (International Mechanical Code).

Raised access floor.

Retaining walls.

Roof covering and waterproofing. Installation of roof coverings, including valleys, gutters, downspouts and waterproofing.

Scaffold erection.

Security bars, grills and grates.

Siding.

Structural metals. The fabrication and erection of structural metal members for all buildings or structures.

Swimming pools. Installation of swimming pools required by this Code.

Temporary prefabricated mobile buildings. Setting up temporary buildings.

Tenant finish. Interior nonbearing and nonstructural work only. Four (4) years of field experience as a supervisor or general contractor in commercial tenant finish work.

Tile, marble, sandstone, granite, terrazzo, chemical broadcast and troweled floor finish systems. Install and remove from existing construction.

Trash chute. Factory assembled with all joints welded and installed in accordance with manufacturer's installation instructions and approved by Agency.

Wood Framing. The fabrication and erection of wood framing for all types of buildings.

5. Access Control System Contractor. Access Control System Contractor to install, add to, alter or repair control units, electric door hardware, wiring and raceways electrically interconnected to control and regulate ingress and egress. Voltages shall not exceed 48 volts or the system shall be power limited as defined by the National Electric Code. Complete conduit or raceway systems shall not be installed by the holder of this license. All work shall be performed under the supervision of the holder of an Access Control Supervisor's Certificate. A certified supervisor shall be present at all work sites at all times that work is being performed.

6. Boilermaker Contractor. To install, assemble or repair steam and hot water boilers, all pressure and nonpressure vessels, precipitators, breeching, metal stacks, plates and casings. All work shall be performed under the supervision of the holder of a Boilermaker Supervisor Certificate.

7. Demolition Contractor Class A. To demolish any building, structure, utility or portion thereof. All work shall be performed under the supervision of the holder of a Class A Demolition Supervisor Certificate.

8. Demolition Contractor Class B. To demolish any building not more than 30 feet in height. All work shall be performed under the supervision of the holder of a Class A or B Demolition Supervisor Certificate.

9. Electrical Registration. Performs all work authorized by the Registration issued by the State of Colorado.

10. Electrical Signal Contractor. To install, add to, alter or repair electrical wiring and equipment for fire alarm, fire detection, emergency voice communication systems, electrical signaling and control wiring. Voltages shall not exceed 48 volts or the system shall be power limited as defined by the National Electrical

Code. The holder of this license shall not install complete conduit or raceway systems. All work shall be performed under the supervision of the holder of an Electrical Signal Supervisor Certificate.

11. Elevator Contractor. To install, add to, alter or repair elevators, escalators, moving sidewalks, moving ramps, dumbwaiters, stage lifts, manlifts and amusement devices which employ ropes, cables, pulleys or platforms. In addition, this license shall include electrical work from the elevator controls to elevator equipment. This work does not include termination to any fire alarm system. All work shall be performed under the supervision of the holder of an Elevator Supervisor Certificate.

12. Fire Protection Contractor Class A. To install, add to, alter or repair fire-extinguishing systems of all types. All work shall be performed under the supervision of the holder of a Class A Fire Protection Supervisor Certificate.

13. Fire Protection Contractor Class B. To install, add to, alter or repair automatic fire sprinkler and standpipe systems of all types. All work shall be performed under the supervision of the holder of a Class A or Fire Protection Supervisor Certificate.

14. Fire Protection Contractor Class C. To install, add to, alter or repair approved nonwater, factory engineered extinguishing systems. All work shall be performed under the supervision of the holder of a Class A or C Fire Protection Supervisor Certificate.

15. Gas Service Contractor. To install, add to, alter or repair the following equipment, which utilizes gas or liquid fuel:

A. Gas and liquid fuel piping.

B. Gas and liquid fuel controls.

C. Commercial cooking equipment.

D. After burners.

E. Ranges.

F. Dryers.

G. Conversion burners.

H. Venting of domestic water heaters, dryers and incinerators.

I. Water heaters not exceeding 100 MBtu input.

J. Low voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway.

All work shall be performed under the supervision of the holder of a Gas Service Supervisor Certificate or a Heating and Ventilating Class A Supervisor Certificate

16. Heating and Ventilating Contractor Class A. To install, add to, alter or repair warm air heating, venting, ventilation, evaporative cooling, exhaust systems and their appurtenances, ductwork, dust collection systems, domestic and commercial range hoods, water heaters not exceeding 100 Mbtu input, gas piping; burners, controls and venting, trash and laundry chutes; exterior sheet metal, duct insulation, low voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway and maximum of 10 tons of refrigeration when it is utilized for comfort cooling and the refrigerating system is self-contained. This refrigeration shall not include systems with precharged lines or separate air-cooled condenser or chilled water systems. All work shall be performed under the supervision of the holder of a Class A Heating and Ventilating Supervisor Certificate.

17. Heating and Ventilating Contractor Class B. To install, add to, alter or repair, in one or two-family dwellings, townhomes or U Occupancies only, warm air heating systems and their appurtenances, ductwork, ventilation, evaporative cooling, duct insulation, exterior sheet metal, gas piping; burners, venting and controls, water heaters not exceeding 100 Mbtu input and low voltage wiring which does not exceed 48

volts and is not enclosed in a conduit or raceway. All work shall be performed under the supervision of the holder of a Class A or B Heating and Ventilating Supervisor Certificate.

18. Hot Water Contractor. To install, add to, alter or repair, in one or two-family dwellings, townhomes or Group U Occupancy only, hot water heating systems and their appurtenances, solar water heating, water heaters, gas piping and controls, pipe insulation and low voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway. All work shall be performed under the supervision of the holder of a Steam and Hot Water or Hot Water Supervisor Certificate.

19. Moving Contractor. Moving of all types of buildings or structures. All work shall be performed under the supervision of the holder of a Moving Supervisor Certificate.

20. Plumbing Contractor Class A. To install, add to, alter or repair sanitary plumbing, potable water supply piping and appliances connected thereto, storm sewer, gas piping, water heaters, gas ranges, domestic gas incinerators, swimming pool and spa piping, solar plumbing utilized for potable water, and all medical gas and vacuum systems in health care facilities. All work shall be performed under the supervision of the holder of a State of Colorado Master Plumbers License.

21. Plumbing Contractor Class B. To install, add to, alter or repair, in one or two-family dwellings, townhomes, and Group U Occupancies only, sanitary plumbing, potable water supply piping and appliances connected thereto, storm sewer, gas piping, water heaters not exceeding 100 Mbtu input, gas ranges, domestic gas incinerators and gas dryers, swimming pool and spa piping. All work shall be performed under the supervision of the holder of a State of Colorado Master Plumbers License.

22. Refrigeration Contractor Class A. To install, add to, alter or repair refrigeration systems and appurtenant cooling towers, pipe insulation and low voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway. A permit or license is not required for the installation of self-contained window type air conditioners. All work shall be performed under the supervision of a Class A Refrigeration Supervisor Certificate.

23. Refrigeration Contractor Class B. To install, add to, alter or repair, in Group one and two family dwellings, townhouses and Group U Occupancies, refrigeration systems consisting of self-contained refrigeration systems of 5 tons or less, the installation of precharged systems utilizing Group 1 Refrigerants and gas-fired absorption chillers. All work shall be performed under the supervision of the holder of a Class A or B Refrigeration Supervisor Certificate.

24. Sign Contractor. To, install, erect or maintain all types of signs unless exempt by Section 150. All work shall be performed under the supervision of the holder of a Sign Supervisor Certificate.

25. Steam and Hot Water Contractor. To install, add to, alter or repair steam and hot water heating systems, solar water heating; process piping and related appurtenances; piping used for the transmission of chemicals, gases, air and other products; all items regulated by the Mechanical and Plumbing Code for boilers, pressure vessels, steam and water heating systems and process piping; low-static gas-fired unit heaters; industrial ovens; burners; controls; piping and controls utilizing gas, liquid or solid fuel; water heaters; pipe insulation and low-voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway. All work shall be performed under the supervision of the holder of a Steam and Hot Water Supervisor Certificate.

26. Water Service Contractor. To install or repair service lines and appurtenances from the corporation cock on the main up to and including:

A. The first valve downstream of the meter, for an inside meter setting; or

B. The first valve inside the structure, for an outside meter setting.

This license shall not permit the installation of the water meter. All work shall be performed by or under the supervision of the holder of a Water Service Supervisor Certificate or a State of Colorado Master Plumbers License.

SECTION 124
LICENSE FEES

124.1 Annual Fees Required. An annual license fee of $75.00 shall be paid to the Agency.

124.2 License Fee Refund. License fees shall not be refundable.

SECTION 125
LICENSE RENEWAL

All licenses are subject to annual renewal.

SECTION 126
REISSUANCE OF LICENSE

The Agency shall have the authority to reissue a license without the filing of a new application, provided that the reissuance is accomplished within one year after the license has expired.

SECTION 127
LICENSEE AND REGISTRANT RESPONSIBILITY

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

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

12. To provide all vehicles used in the operation of the business with the identification in letters a minimum of 2 inches in height and a color contrasting to the background. The identification shall include the following information:

    A. Name of company.

    B. Business address.

    C. Business telephone.

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

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

127.2 Registrant Responsibility. Registered electrical contractors shall comply with all provisions of Section 127.1 above and in addition shall comply with all provisions of the Colorado State Electrical Board.

127.3 Demolition and moving liability insurance. Any person, firm or corporation demolishing or moving any building, structure or utility shall provide insurance to cover bodily injury and property damage to the public or public property. A copy of the certificate of liability insurance shall be provided to the Agency. This insurance shall contain a noncancellation clause and be valid at all times during demolition or moving operations.

Exception: Homeowners for the demolition of Group R3 or U Occupancies when approved by the Agency.

127.3.1 Insurance amounts. The minimum amount of insurance to be provided shall be as follows:

CONTRACTOR INSURANCE COVERAGE

Class A Wrecking	$500,000.00
Class B Wrecking	$300,000.00
House Moving	$300,000.00

Additional insurance coverage may be required by the Office of Risk Management for contractors utilizing explosives in their demolition operations.

SECTION 128
LICENSE AND REGISTRATION CHANGES

128.1 Change of Name. The change of name by a licensee or registrant shall be reported to the Agency within 15 days after making the change, on a form provided by the Agency. A $15.00 application fee shall be required.

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

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

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

SECTION 129

SUSPENSION OR REVOCATION OF LICENSE

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

1. Fails to comply with any of the licensee responsibilities as outlined in this Code.
2. Conspires with any person to permit a license to be used by another person.
3. Acts in any capacity with persons to evade the provisions of this Code.
4. Willfully violates or disregards any of the provisions of this Code.
5. Intentionally fails to perform in accordance with any written contract to perform work, which is regulated by this Code.
6. Creates, as a result of work performed, an unsafe condition as defined in Chapter 1 of this Code.
7. Intentionally or fraudulently misrepresents the condition of any structure or utility, or the requirements of this Building Code.
8. Repeatedly violates the provisions of this Code or repeatedly fails to obey orders in a timely fashion.

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

1. **Notification.** The Agency shall send written notice to the license holder, by certified mail or by personal service, identifying the acts of omission and indicating that the license will be suspended or revoked. The written notice shall advise the license holder that a "Request for Hearing" may be initiated as outlined in item 2.

2. **Request for Hearing**. Upon receipt of the notice, the License holder may request a hearing to show cause why the License should not be suspended or revoked. This request shall be in writing to the Building Official within 7 days after receipt of the notice.

3. **Time of Hearing**. If a hearing is requested by the License holder, the Manager shall notify the License holder of the time, date and place of the hearing. Suspension or revocation of the license shall be stayed until after the hearing. In the event the License holder fails to appear, the license may be suspended by the Manager.

4. **Attendance**. The License holder, the Agency and other interested parties may be in attendance at the hearing. Upon completion of the hearing, the Manager shall take all evidence available as a result of the Agency's investigation and all evidence presented at the hearing under advisement, and shall give written notice of the findings and ruling to the License holder by certified mail or personal service.

5. **Suspension or Revocation**. Unless the license is being suspended or revoked under the emergency provisions of Section 129.3, the suspension or revocation shall take effect:

   A. Seven (7) days after receipt by the Licensee of the notification unless a hearing is requested.

   B. Upon the return by the U.S. Postal Service of the notification as undeliverable or refused at the address maintained by the licensee with the Agency.

   C. If a hearing has been requested by the licensee which resulted in the affirming of the Building Official's decision to suspend or revoke the licensee's license, upon receipt by the Agency of the Manager's decision.

129.3 Emergency Suspension or Revocation. If the Building Official finds that cause exists for emergency suspension or revocation of a license and that continued work under the license could be hazardous to life or property, he may enter an order for the immediate suspension or revocation of the license, pending further investigation. The licensee may, within 7 days of receiving notice of the suspension, request a hearing before

the Manager and such hearing shall be granted within 24 hours. The suspension or revocation is not stayed while the hearing is pending.

129.4 Time of Suspension or Revocation. Time of suspension may be up to one year. Time of revocation may be from one year to five years.

129.5 Delegation of Authority. The Manager may appoint a hearing officer to conduct the hearing. Final decision shall be rendered by the Manager.

129.6 Right to Appeal. Any final decision by the Manager may be reviewed in the manner provided by the Colorado Rules of Civil Procedure. See Section 114.

SECTION 130
CERTIFICATES

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

130.2 Temporary Certificate. The Agency may issue a temporary Certificate when the applicant has previously exhibited his skills to the satisfaction of the Agency and the applicant's qualifications are acceptable. The Agency shall determine the period of validity of the temporary Certificate.

130.3 Reciprocal Certificate. The Agency may issue a certificate when the applicant has passed an examination equivalent, as determined by the Agency, to the examination given by the Agency for a Supervisor Certificate of Qualification and the applicant has submitted for Agency approval a completed BID application with supporting documents and required fees.

130.4 Certificate Application. Every applicant for a Certificate shall be required to complete a form provided by the Agency and to pay an application fee of $15.00 at the time of the filing. The fee shall not be refundable and shall not apply to the Certificate fee. The payment of the fee shall entitle the applicant to one examination only. If the applicant is re-examined for any reason, a new application and fee shall be required.

130.5 Examinations. All applicants for a Certificate shall have a written examination except for those who apply for a Construction D Supervisor Certificate, in which case they shall be examined for experience and training by a standard procedure established by the Agency. If an applicant who has successfully passed the examination given by the Agency fails to procure this Certificate within 90 days after notification, the Certificate shall be declared to be null and void and a new application and fee shall be filed. When an applicant has failed to pass the examination, the Agency shall notify him in writing.

130.6 Certified Supervisors.

1. Every supervisor required for a particular license shall be examined by the Agency, and if qualified, shall be issued a Supervisor Certificate of Qualification. The Certificate holder shall be entitled to perform and supervise the work in the particular skill for which he is qualified and certified. This Certificate is personal to that holder and shall not be construed to be a license.

2. The Certificate holder shall actively supervise the workmen of the licensee by whom he is employed in accordance with Section 122.4.

130.7 Certified Journeymen and Operators.

1. Every Journeyman and Operator required by this Code shall be examined by the Agency and, if qualified, shall be issued a Journeyman or Operator Certificate of Qualification. The Certificate holder shall be entitled to perform and supervise the work in the particular skill for which he is qualified and certified. This certificate is personal to that holder and shall not be construed to be a license.

2. The Certificate holder shall actively supervise the workmen of the licensee by whom he is employed in accordance with Section 132.

SECTION 131
CLASSIFICATION OF SUPERVISOR CERTIFICATE OF QUALIFICATION

A Supervisor Certificate for the particular work to be performed shall permit the holder to be a Supervisor under the licenses listed in Table No. 131.

TABLE NO. 131 CLASSIFICATION OF SUPERVISOR	
Contractor License	**Supervisor Certificate Required**
Building Class A	Construction Class A
Building Class B	Construction Class A or B
Building Class C	Construction Class A, B or C
Building Class D	Construction Class D
Access Control System	Access Control System
Boilermaker	Boilermaker
Demolition Class A	Demolition Class A
Demolition Class B	Demolition Class B
Electrical Registration	NOT REQUIRED
Electrical Signal	Electrical Signal
Elevator	Elevator
Fire Protection Class A	Fire Protection Class A
Fire Protection Class B	Fire Protection Class A or B
Fire Protection Class C	Fire Protection Class A or C
Gas Service	Gas Service or Heating and Ventilating Class A or B
Heating & Ventilating Class A	Heating & Ventilating Class A
Heating & Ventilating Class B	Heating & Ventilating Class A or B
Hot Water	Hot Water or Steam and Hot Water
Moving	Moving
Plumbing Class A	State of Colorado Master Plumber's License
Plumbing Class A	State of Colorado Master Plumber's License
Refrigeration Class A	Refrigeration Class A
Refrigeration Class B	Refrigeration Class A or B
Sign	Sign
Steam and Hot Water	Steam and Hot Water
Water Service	Water Service or State of Colorado Master Plumber's License

SECTION 132
CLASSIFICATION OF JOURNEYMAN AND OPERATOR CERTIFICATE OF QUALIFICATION

132.1 General. Unless otherwise provided for in this Section or in this Building Code, all journeymen and operators required to be certified shall perform that work permitted under the provisions of licenses for a

particular type of work. The work permitted by the certification shall be performed in the employ of the licensee as hereinafter set forth.

132.2 Journeyman Certificate of Qualification. A Journeyman Certificate of Qualification shall be required in the following trades and shall entitle the individual to work only in the trade for which he is certified under a Certified Supervisor:

1. **Journeyman Boilermaker Certificate.** Permits the installation and erection of steam and hot water boilers, pressure vessels, precipitators, incinerators, breeching, chimneys, plate and casings. The holder of this Certificate may perform this work only in the employ of a Boilermaker Contractor.
2. **Journeyman Electrical Signal Certificate.** Permits the installation of electrical wiring and equipment for fire alarm, fire detection, emergency voice communication system, and electrical signaling and control wiring. Voltages shall not exceed 48 volts or the system shall be power limited as defined in the National Electrical Code. Complete conduit or raceway systems shall not be installed by the holder of this Certificate. The holder of this Certificate shall perform this work only in the employ of an Electrical Signal Contractor.
3. **Journeyman Gas Service Certificate.** Permits the installation of the following equipment utilizing gas or liquid fuel:

    A. Gas and liquid fuel piping. The low-voltage wiring permitted by this Certificate shall apply to gas or liquid fuel-fired appliances only. The holder of this Certificate may perform this work only when in the employ of a Gas Service Contractor or a Heating and Ventilating Contractor Class A or B.

    B. Gas and liquid fuel controls.

    C. Commercial cooking equipment.

    D. Afterburners.

    E. Ranges.

    F. Dryers.

    G. Conversion burners.

    H. Venting of domestic water heaters, dryers and incinerators.

    I. Water heaters not exceeding 100 Btu input.

    J. Low-voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway.

4. **Journeyman Heating and Ventilating Certificate.** Permits the installation of warm air heating, ductwork, ventilation and evaporative cooling, exterior sheet metal, water heaters not exceeding 100 Mbtu input, gas piping, burners, venting and controls, exhaust systems and appurtenances thereof, and low-voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway. The holder of this Certificate may perform this work only in the employ of a Heating and Ventilating Contractor Class A or B.
5. **Journeyman Refrigeration Certificate.** Permits the installation of refrigeration systems and appurtenant cooling towers, pipe insulation and low-voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway. The holder of this Certificate may perform this work only in the employ of a Refrigeration Contractor Class A or B.
6. **Journeyman Steam Fitter Certificate**. Permits the installation of steam and hot water heating systems; solar water heating; process and industrial piping and related appurtenances; piping used for the transmission of chemicals, gases, air, milk and other products transmitted through piping; and all items regulated by the Mechanical and Plumbing Code for boilers, pressure vessels, steam and water heating systems and process piping; low-static gas-fired unit heaters; industrial ovens; burners, piping and controls

utilizing gas; low-voltage wiring which does not exceed 48 volts and is not enclosed in a conduit or raceway; commercial cooking equipment; commercial incinerators; and afterburners. The holder of this Certificate may perform this work only in the employ of a Steam and Hot Water Contractor or a Hot Water Contractor.

7. **Journeyman Water Service Certificate.** Permits the installation of the initial water service from the main tap through the stop box and meter pit and continuing to and through the wall of the building and capped at that point. This Certificate shall not permit the installation of the water meter. The holder of this Certificate may perform this work only in the employ of a Water Service Contractor or a Plumbing Contractor Class A or B.

132.3 Stationary Engineer and Operator Certificates. It shall be unlawful to operate any of the following equipment without the personal attendance of a properly Certified Stationary Engineer or a properly Certified Operator:

1. Any steam boiler and appurtenances thereto, steam pumps, steam turbines, and steam engines where the steam pressure is in excess of 15 psi working pressure and where the equipment produces a total of 10 boiler horsepower or more at Denver altitude.

2. Water heating systems when the water temperature exceeds 250 degrees F. in the system.

3. Refrigeration systems having manual or semiautomatic control with charges of 1500 lbs. or more of Safety Group A1 or B1 refrigerants as outlined in the Mechanical Code.

4. Built-up grouping of multiple refrigeration units where the refrigeration system charge is 1500 lbs. or more of Safety Group A1 or B1 refrigerants as outlined in the Mechanical Code.

5. Refrigeration systems utilizing refrigerant other than Safety Group A1 or B1 as defined in the Mechanical Code and which contains a charge of 200 lbs. or more. NOTE: As used in this Section, "semiautomatic" shall mean plants or systems which are provided with automatic safety controls by manual load proportioning controls requiring other than seasonal adjustments.

Exception: Personal attendance shall not be required for refrigeration units, which are categorized in items 3 and 4 that:

1. Have fully automatic safety controls which will shut down the unit when any one of the following conditions are detected:

   A. Excessive pressure in condenser.

   B. Excessive amperage draw.

   C. Improper voltage balance.

   D. Minimum temperature protection in evaporator.

2. Are located in a mechanical room that is in compliance with IMC Chapter 11.

3. Have immediate auto-dial notification to an approved constantly attended location.

4. Have annual testing and calibration of all operating and safety controls as required by the manufacturers' specifications. Records shall be maintained and available for inspection by this Agency and the Fire Department.

5. Have refrigerant vapor detectors that have local audible or visible alarm located inside and outside of the refrigeration equipment room.

6. Have all safety controls that have individual manual reset to be reset only by a Certified Stationary Engineer, Refrigeration Operator or Refrigeration Journeyman/Supervisor. The control limits shall be as required by the manufacturers specifications for the specific refrigeration unit.

132.4 Stationary Engineer Certificate. Permits the holder to take charge of and operate all steam boilers and appurtenances hereto, steam pumps, steam turbines, steam engines and mechanical refrigeration systems.

132.5 Boiler Operator Certificate, Class A. Permits the holder to take charge of and operate all steam boilers and appurtenances, steam pumps, steam turbines and steam engines.

132.6 Boiler Operator Certificate, Class B. Permits the holder to take charge of and operate all steam boilers and appurtenances, steam pumps, steam turbines and steam engines containing a steam pressure between 15 and 100 psi and where the equipment produces a total of between 10 and 100 horsepower at Denver altitude.

132.7 Refrigeration Operator Certificate. Permits the holder to take charge of and operate mechanical refrigeration systems.

132.8 Hoist Operator Certificate. It shall be unlawful to operate a construction hoist powered by steam, electricity or other power when such hoist serves buildings or structures under construction or demolition exceeding 25 feet in height unless said hoist is operated by a properly Certified Hoist Operator. This Section shall not be construed to include elevators as regulated and defined in this Code.

Exception: Single drum material hoists not more than 25 feet in height and not carrying personnel do not require a Hoist Operator Certificate Holder.

SECTION 133
APPRENTICES AND TRAINEES

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

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

133.3 Definition.

1. An "apprentice" shall mean any person who has entered into an apprentice agreement which provides for participation in a program of training through employment and education in related and supplementary subjects.

2. A "trainee" shall mean any person working at the trade under the direct supervision of a certified Journeyman or Supervisor.

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

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

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

SECTION 134
CERTIFICATE FEES

134.1 Fees. Certificates of Qualification fees shall be paid every 3 years to the Agency in the amount as follows:

Supervisor Certificate	$50.00
Journeyman Certificate	$25.00
Engineer Certificate	$25.00
Operator Certificate	$25.00

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

134.2 Certificate Fee Refund. Certificate fees are not refundable.

SECTION 135
CERTIFICATE RENEWAL

135.1 Renewal and Expiration. Certificates shall be renewed every 3 years and expire on the date specified on the Certificate. No work shall commence or continue after the date of expiration. A Renewal Examination will be required. The renewal examination shall be a written test on recent revisions to this Code, will be included with the renewal notices and must be answered and returned with the renewal application and the fee.

SECTION 136
REISSUANCE

136.1 General. The Agency shall have the authority to renew a Certificate, provided that the renewal is accomplished within the limits set forth herein.

1. The Certificate may be reissued without a new application, provided that such reissuance is accomplished within one year after the Certificate has expired. A Renewal Examination will be required.

2. If the Certificate holder reapplies within 3 years of the date of expiration, a new Certificate examination shall not be required but a Renewal Examination shall be required.

3. If the Certificate holder applies more than 3 years after expiration, a new Certificate examination shall be required.

SECTION 137
CERTIFICATE HOLDER RESPONSIBILITY

137.1 General. All Certificate holders shall be responsible to insure that the work performed by the licensee is in accordance with the requirements of this Code, without limitation, and to:

1. Have in possession at all times a Certificate.
2. Present a Certificate when requested by the Agency.
3. Faithfully construct without departure from or disregard of approved drawings and specifications.
4. Obey any order issued under authority of this Code.
5. Pay any fee assessed under the authority of this Code.
6. Observe the safety requirements of this Code.
7. Actively supervise and oversee all work performed by or for the licensee by whom he is employed.

8. Be responsible for all permits being issued prior to the beginning of work.

9. Maintain a current local mailing address and accept all mail so addressed.

10. Notify the Agency within 3 days whenever he leaves the employ of licensee.

11. Provide minimum safety measures and equipment to protect workmen and the public.

12. Faithfully construct, without departure from drawings and specifications filed and approved by the Agency and permit issued for same, unless changes are approved by the Agency.

13. Complete all work authorized by the permit issued under the authority of the Agency, unless the cause of incomplete work is determined by the Agency to be not the fault of the Certificate holder.

14. Obtain inspection services where required by the Agency.

SECTION 138
SUSPENSION OR REVOCATION OF CERTIFICATE

138.1 Authority. The Building Official may suspend or revoke a Certificate for any one or more of the following acts or omissions:

1. Incompetence.

2. Misuse of the Certificate.

3. Failure to comply with any of the Certificate holder responsibilities outlined in Section 137.

4. Knowingly conspire with a person to permit a license to be used by another person.

5. Act as agent, partner, associate or in any capacity with persons to evade the provisions of this Code.

6. Intentionally or fraudulently misrepresent the condition of any structure or utility or the requirements of this Code.

7. Create, as a result of work performed, an unsafe condition as defined in Chapter 1 of this Code.

8. Intentionally or fraudulently misrepresent the condition of any structure or utility or the requirements of this Code.

9. Repeatedly or willfully violate the provisions of this Code or repeatedly fail to obey orders in a timely fashion.

138.2 Procedures. When a Certificate holder commits any acts or omissions enumerated above and the Building Official deems that the Certificate shall be suspended or revoked, the action shall be as follows:

1. **Notification**. The Agency shall send written notice to the certificate holder, by certified mail or by personal service, identifying the acts of omission and indicating that the certificate will be suspended or revoked. The written notice shall advise the certificate holder that a "Request for Hearing" may be initiated as outlined in item 2.

2. **Request for Hearing.** Upon receipt of the notice, the Certificate holder may request a hearing to show cause why a certificate should not be suspended or revoked. This request shall be in writing to the Manager within 7 days after receipt of the notice.

3. **Time of Hearing.** If a hearing is requested by the Certificate holder, the Manager shall notify the Certificate holder of the time, date and place of the hearing. Suspension or revocation of the certificate shall be stayed until after the hearing. In the event the Certificate holder fails to appear, the Certificate may be suspended by the Manager.

4. **Attendance.** The Certificate holder, the Agency and other interested parties may be in attendance at the hearing. Upon completion of the hearing, the Manager shall take all evidence available as a result of the Agency's investigation and all evidence presented at the hearing under advisement, and shall give written notice of the findings and ruling to the Certificate holder by certified mail or personal service.

5. **Suspension or Revocation**. Unless the certificate is being suspended or revoked under the emergency provisions of Section 138.3, the suspension or revocation shall take effect:

   A. Seven days after receipt by the certificate holder of the notification unless a hearing is requested.

   B. Upon the return by the US Postal Service of the notification as undeliverable or refused at the address maintained by the certificate holder with the Agency.

   C. If a hearing has been requested by the certificate holder which resulted in the affirming of the Building Official's decision to suspend or revoke the certificate holder's certificate, upon receipt by the Agency of the Manager's decision.

138.3 Emergency Suspension or Revocation. If the Building Official finds that cause exists for the emergency suspension or revocation of a certificate and that continued work under the certificate could be hazardous to life or property, the Manager may enter an order for the immediate suspension of the certificate, pending further investigation. The certificate holder may, within 7 days of receiving notice of the suspension or revocation, request a hearing before the Manager and such hearing shall be granted within 24 hours. The suspension or revocation is not stayed while the hearing is pending.

138.4 Time of Suspension or Revocation. Time of suspension may be up to one year. Time of revocation may be from one year to five years.

138.5 Delegation of Authority. The Manager may appoint a Hearing Officer to conduct the hearing. The final decision shall be rendered by the Manager.

138.6 Right to Appeal. Any final decision by the Manager may be reviewed in the manner provided by the Colorado Rules of Civil Procedure. See Section 114.

SECTION 139
EXAMINATION STANDARDS AND REVIEW

139.1 Examination Standards. The Agency shall develop standards for the examination of applicants for Certificates. The standards shall be consistent with the purpose of this Code, which is to provide for the public health, safety and welfare to the extent that those persons examined are to be found qualified in terms of their skills, Building Code knowledge, practical experience and knowledge of pertinent laws to perform the construction work for which they may be certified.

1. The Agency shall examine applicants in the following areas:

   A. Applicable areas of the Code.

   B. Technical knowledge.

   C. Skills.

2. The Agency shall establish minimum standards for education and experience of the applicants.

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

139.3 Annual Review. The Standards shall be reviewed annually or more frequently if necessary to maintain the standards current with changes in the Code and building construction practices.

Sections 140 through 149 are reserved.

SECTION 150
PERMITS, PLANS, INSPECTIONS, CERTIFICATE OF OCCUPANCY

150.1 Permits required. No person, business, corporation, agency or public, private or governmental institution shall erect, construct, enlarge, remodel, alter, repair, move, improve, remove, convert, demolish or change the occupancy of any building, structure or utility, or perform any other work regulated by this Code, or cause the same to be performed, in the City, without first having obtained a permit from the Agency for the specific work to be performed. This permit shall be displayed or available on the job site at all times.

150.1.1 Pedestrian protection. The erection of covered walkway and railings for the protection of pedestrians around a construction, demolition or moving site.

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

1. One-story detached accessory buildings or structures used as tool and storage sheds, playhouses and similar uses, provided that the projected roof area does not exceed 200 square feet and a maximum height of 8 feet.
2. Fences of any type not over 4 feet high. Posthole-dug fences up to 8 feet high, such as chain link, cedar pine, redwood and wrought iron.
3. Oil derricks.
4. Movable cases, counters and partitions not over 5 feet 9 inches high.
5. Retaining walls which are not over 3 feet high measured from the lowest grade to the top of the wall, unless supporting a surcharge or impounding Class I, II or III-A liquids.
6. Water tanks supported directly upon grade where the capacity does not exceed 5,000 gallons and the ratio of height to diameter or width does not exceed 2 to 1.
7. Sidewalks and driveways less than 30 inches above grade and not over any basement or story below and are not part of an accessible route. Uncovered decks less than 30 inches above grade and accessory to one and two family dwellings and townhomes.
8. Painting, papering, tiling, floor coverings, countertops, carpeting, cabinets, curtains, drapes and similar decoration items except those items regulated by Chapter 8, IBC.
9. Temporary motion picture, television and theater stage sets or scenery.
10. Window awnings supported by an exterior wall of one and two family dwellings and townhomes and Group U Occupancies when projecting not more than 54 inches over privately owned property.
11. Prefabricated swimming pools accessory to one and two family dwellings and U Occupancies in which the pool walls are entirely above the adjacent grade and when utilities are provided.
12. Public utility: Construction, repair or maintenance of public utility equipment and facilities used in the distribution of their utility. This exemption includes buildings whose primary function is to house utility distribution or signal control equipment and not intended for human occupancy. RTD: Traction power substations, signal/communication relay stations and houses and associated conduit and wiring

for the operation of the light rail lines, the installation of the light rail tracks and associated passenger platforms on RTD right-of-way.

13. State and federal governments, their agencies or subdivisions, or contractors constructing improvements for said state and federal governments, their agencies or subdivisions, when constructing improvements to be used for and maintained entirely and strictly for the operation of said governments.
14. Replacement of glass not in hazardous locations (see IBC Section 2406.2).
15. Site development work including grading, water detention/retention ponds and soil erosion control. The Wastewater Division will require permits for this type of work.
16. Denver Public Schools (D.P.S.): Construction, remodeling or repair of any plumbing or electrical system, except for fire and burglar alarm and detection systems, in any portion of a building in which instruction is or will be given by any D.P.S. school as long as such work is permitted and inspected by the State Examining Board of Plumbers or the State Electrical Board.
17. All plumbing fixture replacement or repair.
18. Tents, 200 sq. ft. or less and freestanding canopies 400 sq. ft. or less, open on 3 or more sides.
19. Membrane structures, including tents and canopies of any size, erected for a period of less than 180 days.
20. Nonilluminated signs of the following types:
    A. Cloth signs mounted directly on a wall.
    B. Wall signs not exceeding 200 sq. ft. in area.
    C. Ground signs not exceeding 150 sq. ft. in area, or not exceeding 6 feet in height to the top of the sign.
    D. Arcade signs not exceeding 25 sq. ft. in area on each side.
21. Replacement of awning fabrics.
22. Replacement of windows with no structural alterations and no change in size of opening in one and two family dwellings and townhomes. When structure is a designated structure for preservation or is located in a district for preservation pursuant to Chapter 30, Denver Revised Municipal Code, a building permit and approval from the Landmark Preservation Commission shall be required.
23. Floor covering, replacing kitchen cabinets.

150.2.1 Mechanical. No Permit Required For:

All general repairs and replacements of like units unless the work involves disconnection and reconnection of either:

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

150.2.2 Electrical. No Permit Required For:

All general replacements of existing electrical appliances and/or apparatus with like units, or general repairs that do not involve altering or changing the electrical system.

Exceptions:

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

150.2.3 Plumbing. No Permit Required For:

1. Single-family homes, duplexes, townhouses – general repairs that do not alter existing systems, including replacement of like units such as bathroom/kitchen sinks, garbage disposals and water closets.
2. Commercial buildings – replacement of sinks, garbage disposals and water closets with like units; faucet and trap replacement or repair. Permit required for all other plumbing work in commercial buildings.

SECTION 151
PERMITS

151.1 Application.

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

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

2. The contractor's signature is not required on the permit application when the construction documents are submitted to the Agency for review.

151.2 Issuance of Permits. The Agency shall issue permits to perform the work shown on submitted documents and as specified on the permit when the following conditions are met:

1. All phases of the project conform to the requirements of this Code, Department of Public Works, Zoning Administration, Public Health Inspection Division and Fire Department; and

2. The permit form is signed by one of the following before the permit is issued:

A. A contractor that is licensed under Chapter 1 of this Code;

B. An authorized representative of the license holder;

C. An owner applying for a permit under Subsection 151.2.3; or

D. An owner or owner's agent applying for permits under Subsection 151.2.4.

3. When the applicant is a natural person who owns and occupies a single-family dwelling, a duplex, a Group U Occupancy or a dwelling unit in a townhouse building, or who desires to construct a one or two-family dwelling or Group U Occupancy, a homeowner’s permit may be issued provided that:

Any work done under a homeowner's permit, including demolition of a dwelling or Group U occupancy structure, shall be done by the owner personally unless otherwise approved by the Agency

Exception:

A permit shall not be issued to the owner of a townhome unit for structural alteration.

B. The applicant for a permit to perform electrical, heating, cooling or plumbing work shall hold an appropriate Certificate of Qualification or shall pass an examination appropriate to

the work to be performed and shall personally perform the work, unless approved by the Agency.

C. A permit for minor work involving the volunteer services of persons working through a recognized volunteer organization, or of other qualified individuals, may be issued to the applicant of a single-family dwelling, duplex or miscellaneous building. A request for permit shall be in writing and shall be issued only when approved by the Building Official.

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

5. Any work to the exterior or common elements of a townhouse or condominium apartment building must be approved by the Homeowner's Association and the permit issued to a licensed contractor.

6. The applicant is an owner or owner's agent to establish a new certificate of occupancy when no construction work is to be done.

7. Payment of the Systems Development Fee established by the Gateway Regional Metropolitan District and imposed on all land within such District.

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

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

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

Exception: Permits for improper address issued to the same contractor may be transferred. A processing fee of $25.00 per permit will be charged. Requests for transferable permits must be made within 30 days of issuance of the original permit.

151.3.1 Cancellation of the permit by contractor. The contractor may cancel the permit by notifying the Building Inspection Division. The owner shall appoint a new contractor to complete the work and provide a written statement regarding the change of contractor. The new contractor shall obtain a new permit for the work to be completed. An administrative fee of $100 will be charged. Additional administration, plan review and inspection fees may be charged to recover the cost incurred by the Agency.

151.3.2 Replacement of Contractor Set. A set of Agency approved, stamped drawings are required to be posted at the job site. If Contractor Set is misplaced the following are required to obtain a copy of the Agency's stamped Record Set of drawings:

1. A release from the architect / engineer of record

2. A copy of the original permit

3. An administrative fee of $50 will be charged

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

151.4 Validity. The issuance of a permit or the approval of drawings and specifications shall not be construed to be a permit for, nor an approval of, any violation or deviation from the provisions of this Code or other ordinances, laws, rules or regulations. The Agency shall take any action it deems necessary to ensure that all work performed meets all requirements of this Code.

151.5 Suspension-Cancellation-New Permits.

1. The Agency may cancel a permit when:

A. Work is not commenced within 60 days from the date of issuance unless this time is extended by the Agency.

B. Work is suspended or abandoned for a period of 60 days after work is commenced unless this time is extended by the Agency.

C. No request for inspection has been made for a period of 60 days unless this time is extended by the Agency.

2. A demolition or moving permit may be canceled by the Agency when:

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

Work is suspended or abandoned for a period of 10 days after work is commenced unless otherwise approved by the Agency.

3. A new permit may be issued to replace an expired permit, provided that no changes have been made in the original drawings and specifications for the work, when:

A. The holder of a canceled permit demonstrates that the suspension or abandonment of work was occasioned by circumstances beyond his control and that it would be an injustice to require a new fee; or

B. Payment of a fee equal to ½ the current permit fee, provided that the application is made within one year after cancellation.

4. The Agency may suspend or cancel any permit or may stop the work for any of the following reasons:

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

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

C. Whenever the continuance of any work becomes dangerous to life or property.

151.6 Notice. Notice of the suspension or cancellation for reasons stated in Subsection 151.5 shall be in writing and shall be served upon the holder of the permit, the owner or the person in charge of the work. If the original notice is not served on the owner, a copy of the notice shall be sent to the owner. It shall be unlawful to proceed with any work once the notice is served.

SECTION 152
PERMIT FEES

152.1 Permit Fees. The fee for each permit shall be as set forth in Table No. 152.1. The determination of value or valuation under any of the provisions of this Code shall be made by the Building Official. The value to be used in computing the building permit and building plan review fees shall be the total value of all construction work for which the permit is issued, as well as all finish work, roofing, electrical, plumbing, heating, air conditioning, elevators, fire-extinguishing systems and any other permanent equipment. Permit fees provide for the customary inspections only.

In order to encourage energy conservation, water conservation and reduction of air pollution, the Building Official is authorized to waive or reduce the permit fees for the installation of equipment or appliances which meet the standards for achieving conservation of energy or water or which may reduce air pollution. Such waivers shall be in writing and shall be for a specific period of time.

When the “valuation” is in question, the Building Official shall use the latest “Building Valuation Data” table as published in the ICC “Building Safety” publication.

TABLE NO. 152.1
FEE SCHEDULE - BUILDING PERMIT FEES

VALUATION OF WORK	PERMIT FEE	PLAN REVIEW % [1]
$1.00 to $500.00	$20.00	0%
$501.00 to $2,000.00	$35.00	0%
$2,001.00 to $25,000.00	$35.00 for the first $2,000.00 plus $8.00 for each additional $1,000.00 or fraction thereof, to and including $25,000.00	50%
$25,001.00 to $50,000.00	$220.00 for the first $25,000.00 plus $8.00 for each additional $1,000.00 or fraction thereof, to and including $50,000.00	50%
$50,001.00 to $100,000.00	$420.00 for the first $50,000.00 plus $7.00 for each additional $1,000.00 or fraction thereof, to and including $100,000.00	50%
$100,001.00 to $500,000.00	$770.00 for the first $100,000 plus $5.60 for each additional $1,000.00 or fraction thereof, to and including $500,000.00	50%
$500,001.00 to $1,000,000.00	$3,010.00 for the first $500,000.00 plus $4.75 for each additional $1,000.00 or fraction thereof to and including $1,000,000.00	50%
$1,000,001.00 and over	$5,385.00 for the first $1,000,000.00 plus $3.65 for each additional $1,000.00 or fraction thereof.	50%

[1] Walk-through and type approved plans will be charged at the rate of 10%, with a minimum of $50.00 per approved plans.

OTHER FEES		
Building Moving	Per Each Address	$100.00/hour
1. Inspections outside of normal business hours (minimum charge of 2 hours).		$100.00/hour
2. Reinspection fees assessed under provisions of Section 157.7 (minimum charge 1 hour)		$ 75.00/hour
3. Inspections required by the Agency for which no fee is specifically indicated.		$ 50.00/hour
4. Additional plan review fee for review of modifications to approved plans		$ 75.00/hour

[2] The Agency may charge the hourly cost incurred by the inspection or plan review if greater than the hourly rate above.

152.2 Plan Review Fees. When submittal documents are required by Section 153.1, a plan review fee shall be paid at the time of submitting the submittal documents for plan review. Said plan review fee shall be the percentage of the building permit fee as shown in Table No. 152.1. Where plans are essentially incomplete and not in accordance with Sections 153, 154 or 155 or changes are made which require additional plan review, an additional fee shall be charged at the rate shown in Table No. 152.1. The plan review fees specified in this Section are separate fees from the permit fees specified in Section 152.1 and are in addition to the permit fees

152.3 Type Approval. When construction documents have been approved for a typical structure and duplicate structures are to be constructed on the same site by the same contractor, a plan review fee shall be paid at the rate of 10% of permit fee in Table No. 152.1. See footnote 1 in Table No. 152.1.

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

152.5 Allowed Inspections. Permit fees provide for the customary inspections only.

152.6 Late Fees. When work for which a permit is required by this Code is started without a permit, the permit fees stated in Table No. 152.1 shall be doubled with a minimum of $50, based on the work performed without a permit. The payment of this late fee shall not relieve any person from fully complying with the requirements of this Code in the execution of the work or from other penalties for performing work without a permit.

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

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

152.8 Additional Fees. A supplementary permit shall be obtained for any additional valuation not included in the original permit. The fee shall be the difference between the fee paid and the fee that would have been required had the original permit included the entire valuation.

152.9 Additional Plan Review Fees for Rejected Drawings. When drawings are rejected, an additional fee shall be charged in accordance with Table No. 152.1. When submittal documents are incomplete or changed so as to require additional plan review or when the project involves deferred submittal items as defined in Section 154.1.3.A, an additional plan review fee shall be charged at the same rate shown in Table No. 152.1.

152.10 Refunds. No refund will be granted for any permit fee paid to the Agency.

> **Exception:** Fees for duplicate or out-of-City permits may be refunded. A processing fee of $25.00 per permit will be charged and that amount will be deducted from the refund. Request for refund must be made in writing within 60 days of the date of the permit.

152.11 Investigation for Work Without a Permit. Whenever any work for which a permit is required by this Code has been commenced without first obtaining a permit, a special investigation shall be made before a permit may be issued for the work.

152.12 Investigation Fee. An investigation fee shall be collected when work has begun without a permit. The investigation fee shall be equal to the amount of the permit fee required by this Code. The minimum

investigation fee shall be the same as the minimum fee set forth in Table No. 152.1. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this Code nor from any penalty or fees prescribed by law.

SECTION 153
DRAWINGS AND SPECIFICATIONS

153.1 General. Drawings and specifications shall be required for review and approval by the Agency prior to the issuance of a permit, except as set forth in Subsection 153.6.

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

1. Drawings including the information required in Section 155.

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

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

153.3 Approval. Drawings and specifications complying with the provisions of this Code and approved by the Agency shall bear the Agency stamp of approval. When corrections are required, the Agency may require that the drawings and specifications be revised and resubmitted for approval prior to the issuance of a permit.

153.4 Distribution. One set of approved drawings and specifications shall be returned to the Applicant and shall be kept on the job site until project is completed. One set of approved drawings and specifications shall remain in the office of the Agency.

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

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

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

SECTION 154
PREPARATION OF DRAWINGS AND SPECIFICATIONS

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

1. **Architect and/or engineer required.** Construction documents for all buildings, structures, additions, alterations or repairs shall bear the seal and signature of the design professional responsible for each design phase except as provided in Subsection 7.

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

2. **Seal.** The authorized seal, either the crimp type imprint or a rubber stamp facsimile with an original signature and date of signature through the seal, shall be placed on:

A. Each sheet of reproductions of original drawings produced by or under the direct supervision of the design professional.

B. The cover, title page and table of contents of specifications.

C. Each sheet of subsequent issues of revisions, addenda clarifications or other modifications.

D. Title page of details bound in book form.

E. Title or signature page of all engineering reports.

3. **Architect or engineer of record.** When it is required that documents be prepared by an architect or engineer, the Agency may require the owner to engage and designate on the building permit application an architect or engineer who shall act as the architect or engineer of record. If the circumstances require, the owner may designate a substitute architect or engineer of record who shall perform all of the duties required of the original architect or engineer of record. The Agency shall be notified in writing by the owner if the architect or engineer of record is changed or is unable to continue to perform the duties. The architect or engineer of record shall be responsible for reviewing and coordinating all submittal documents prepared by others, including deferred submittal items, for compatibility with the design of the building.

A. Deferred Submittals. For the purposes of this Section, deferred submittals are defined as those portions of the design which are not submitted at the time of the application and which are to be submitted to the Agency within a specified period. Deferral of any submittal items shall have prior approval of the Building Official. The architect or engineer of record shall list the deferred submittals on the plans and shall submit the deferred submittal documents for review by the Agency. Submittal documents for deferred submittal items shall be submitted to the architect or engineer of record who shall review them and forward them to the Agency with a notation indicating that the deferred submittal documents have been reviewed and that they have been found to be in general conformance with the design of the buildings. The deferred submittal items shall not be installed until their design and submittal documents have been approved by the Agency.

B. Inspection and Observation Program. When special inspection is required by Section 1701, the architect or engineer of record shall prepare an inspection program which shall be submitted in the Agency for approval prior to issuance of the building permit. The inspection program shall designate the portions of the work that require special inspection and the name or names of the individuals or firms who are to perform the special inspections, and indicate the duties of the special inspectors. The special inspector shall be employed by the owner, the engineer or architect of record, or an agent of the owner, but not the contractor or any other person responsible for the work. When structural observation is required by Section 158.2, the inspection program shall name the individuals or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur. The inspection program shall include samples of inspection reports and provide time limits for submission of reports.

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

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

6. **Reproducible Drawings**. The design professional's seal and signature shall not be placed on reproducible drawings that are used for multiple copies or on reproducible drawings that are transferred away from the design professional's possession and supervision. Electronic seal may be used as regulated by the Department of Regulatory Agencies of the State of Colorado.

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

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

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

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

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

E. If after review of the drawings and specifications, the Agency determines that the proposed building or structure is inadequately designed, the Agency may require that the drawings and specifications bear the seal of an architect and engineer who will be responsible for the design phases of the building or structure.

SECTION 155
INFORMATION REQUIRED FOR PREPARATION OF DRAWINGS

155.1 Information Required. Drawings and specifications shall be complete and of sufficient clarity to indicate the entire work proposed and to show in detail that the building, structure or utility conforms to the provisions this Building Code and relevant laws, ordinances, rules and regulations. Each set of drawings and specifications shall contain at least the following: Architectural, Structural, Mechanical, Electrical Drawings, Specifications and Analysis:

1. The exact address, legal description and location of the work performed.

2. The name and address of the owner.

3. Name and address of the person or firm responsible for the preparation of the drawings and specifications. The seal and signature of the architect and or engineer responsible for the preparation of the drawings and specifications when required by Section 154.

4. A plot plan showing the location of the proposed construction and the location of every adjacent existing building on the property, roads, walks, utilities and other site improvements, all property lines, streets, alleys, easements and other public areas. A plot plan is not required for interior alterations and repairs. The proposed construction shall not project beyond property lines except as provided for in Chapter 32.

5. A completed "Building Profile Form." The form shall be provided by the Agency.

6. Two complete sets of construction documents showing the construction of architectural, structural, mechanical and electrical arrangements.

7. One copy of specifications or notes that clearly describe the type, quality and finish of materials and the method of assembly, erection and installation of equipment to be installed with proper reference to accepted standards.

8. Architectural drawings and specifications as follows:

   A. Plans showing the arrangement of each floor, elevations, sections and details to show the construction of all architectural features, including the location and type of fire-rated construction.

   B. The gross area in square feet of (1) buildings or portions of buildings in which new construction or remodeling work is intended; and (2) different occupancy groups.

   C. A complete Code Analysis, including the building occupancy groups, the type of construction, and a comparison of actual floor areas and number of stories to those allowed under the provisions of this Code on the front sheet of drawings.

9. Structural drawings, specifications and analysis as follows:

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

   B. Foundation, floor and roof plans indicating (1) location of concentrated loads and varying live loads; (2) roof areas used to impound water; and (3) pressurized shafts required for Chapter 9.

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

   D. Foundation design criteria shall be submitted when requested by the Agency for all new construction in accordance with a soils investigation report signed and sealed by an engineer responsible for the preparation of the report.

10. Mechanical drawings, specifications and analysis as follows:

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

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

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

    D. Plans and details showing (1) the location of impounded water; and (2) shafts used for pressurization as required by Chapter 9.

11. Electrical drawings, specifications and analysis as follows:

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

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

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

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

12. A field survey under Section 156 shall be required for all additions and new construction.

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

155.2 Additional Information When Requested.

1. Reports from an independent testing agency, which substantiates requirements of this Code regarding structural or fire-resistive requirements.

2. Engineering design calculations.

3. Other information deemed necessary to determine compliance with the requirements of this Code.

SECTION 156
FIELD SURVEYS

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

1. Scale drawing of the boundaries of the land parcel with all dimensions to establish those boundaries.

2. All recorded and apparent rights-of-way and easements.

3. Improvements locations shall be shown in scale with a minimum of 2 dimensions to the nearest property line to locate all improvements.

156.2 Access for Agency. The contractor or property owner shall provide unobstructed access for the Agency to the required corner stakes or markers.

SECTION 157
INSPECTIONS

157.1 General. All work for which a permit is required shall be subject to inspection by the Agency and all such work shall remain accessible and exposed for inspection until approved by the Agency. In addition, certain types of construction shall have continuous inspection as specified in Section 158. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this Code or of other City ordinances. Inspections presuming to give authority to violate or cancel the provisions of this Code or of other ordinances shall not be valid. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection. Neither the Agency nor the City shall be liable for expense entailed in the removal or replacement of any material required to allow inspection. A survey of the lot may be required by the Agency to verify that the structure is located in accordance with the approved plans.

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

157.3 Inspection Requests. It shall be the duty of the person doing the work authorized by a permit to notify the Agency when such work is ready for inspection. The Agency may require that every request for inspection be filed at least one working day before such inspection is desired and such request may be in writing or by telephone. It shall be the duty of the person requesting any inspections required by this Code to provide access to and means for inspection of such work. It shall be the duty of the Agency to conduct the inspections in a timely manner.

157.4 Approval Required. Approval by the Agency shall be required at progressive stages of the construction of the building or structure and the installation of the mechanical, plumbing and electrical systems. The Agency shall make the requested inspections and shall either approve that the completed portion of the construction is

satisfactory or shall notify the permit holder or his agent that the same fails to comply with this Code. Any portion which does not comply shall be corrected and such work shall not be covered or concealed until approved by the Agency.

There shall be a final inspection and approval of all completed construction before the building, structure or portion thereof shall be ready for occupancy and use.

157.5 Required Inspections. The following inspections shall be required and shall be made by the Agency after proper notification. Other inspections may be required. See Sections 157.6 and 158.

1. **Foundation Inspection.**

   A. Footings. Inspections shall be conducted prior to pouring concrete. The footing excavation form work and any reinforcing steel must be in place. Any clay soil pipe encountered must be replaced with schedule 40 PVC, ABS/DWV or cast iron pipe by a licensed plumber, under a separate permit. All such work shall be approved by the Agency prior to the footing inspection.

   B. Walls. Concrete walls shall have the form work and reinforcing steel inspected prior to the concrete placement. Approved treated wood walls shall be inspected as required by AF & PA Technical Report 7-87.

   C. Waterproofing/Dampproofing Inspection. To be conducted after the waterproofing/dampproofing system or materials are completely in place and exposed for inspection.

   D. Exterior wall insulation and drain tile when required.

2. **Concrete slab or under-floor inspection**. To be made after all in-slab or under-floor building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.

3. **Frame Inspection**. To be conducted on the completed frame construction with all fire blocking and bracing in place. All framing must be exposed to view. Roof and wall sheathing or panel must be complete with windows in place. All rough installations or electrical, plumbing and mechanical systems shall have prior approval by the Agency.

4. **Insulation Inspection.** To be conducted after the installation of the insulation is completed.

5. **Air Infiltration Barrier Inspection**. To be conducted after the air infiltration barrier system is in place and complete.

6. **Gypsum Board or Lath and Plaster Inspection**. To be conducted after all gypsum board or lath, interior and exterior, is in place but before gypsum board joints and fasteners are taped and finished or before plastering is applied.

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

157.6 Other Inspections. The engineer or architect responsible for the structural design work shall include in the construction documents the following:

1. Special inspections required by Section 158.

2. Other structural inspections required by the engineer or architect in responsible charge of the structural design work.

In addition to the inspections specified, the Building Official may make or require other inspections of any construction work to ascertain compliance with the provisions of this Code and other laws which are enforced by the Agency. Other inspections, outside of business hours, requested by the owner,

design professional or contractor shall be requested no later than 12 noon of the day the inspection is needed. See Table No. 152.1 for fees.

157.7 Reinspections. A reinspection fee may be assessed for each inspection or reinspection when the inspected work is not complete or when corrections called for have not been made. This Subsection is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply with the requirements of this Code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection. Reinspection fees may be assessed for failure to properly post the permit card on the work site, for failure to have approved plans readily available to the inspector, for failure to provide access on the date for which inspection is requested, or for deviating from plans requiring the approval of the Agency. To obtain a reinspection, the applicant shall file an application therefore in writing upon a form furnished for that purpose and pay the reinspection fee of a minimum of one hour in accordance with Table No. 152.1. Where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

157.8 Boilers, Incinerators, Crematories and Pressure Vessel Annual Inspection. Boilers, pressure vessels, crematories, pool heaters, incinerators of all types and water heaters located in all Occupancies, except one- and two-unit dwellings, townhouses and miscellaneous buildings, shall be inspected by the Agency at least once each year.

A. If, after inspection by the Agency, the equipment is found to be in safe condition, the Agency shall issue a certificate of inspection stating that the equipment may be operated. The certificate shall be posted in a conspicuous place in the boiler room only, mounted in a tamper-proof frame.

B. Owner to Provide Facilities. Every person owning or having in his possession or control the equipment enumerated herein shall provide, at his expense, proper arrangements and facilities for the required inspections.

C. Annual Inspection Fees. The annual inspection fee for boilers, pressure vessels, incinerators and crematories shall be as specified in Table No. 157.8.

Exception: Listed storage-type direct-fired water heaters of less than 200,000 Btu/h input do not need a yearly inspection.

TABLE NO. 157.8
PERIODICAL INSPECTION FEES
BOILERS, PRESSURE VESSELS, INCINERATORS AND CREMATORIES

BOILERS – STEEL	
HORSEPOWER [1]	FEE
0 to 50	$50.00
51 to 100	70.00
101 to 250	90.00
251 to 500	110.00
501 to 1000	130.00
1000 and over-	150.00
STEAM BOILERS – CAST IRON **15 PSI OR LESS IN PRESSURE**	
SQUARE FEET OF RADIATION	FEE

TABLE NO. 157.8 PERIODICAL INSPECTION FEES BOILERS, PRESSURE VESSELS, INCINERATORS AND CREMATORIES	
0 to 1,400	$40.00
1,401 to 5,000	50.00
5,001 to 10,000	60.00
10,001 to 25,000	70.00
25,001 and over	80.00
BOILERS – HOT WATER	
SQUARE FEET OF RADIATION	FEE
0 to 1,400	$40.00
1,401 to 5,000	$50.00
5,001 to 10,000	$60.00
10,001 to 25,000	$70.00
25,001 and over	$80.00
WATER HEATERS	
BTU/HR INPUT [2]	FEE
200,000 to 1,673,750	$40.00
1,673,751 and over	$50.00
MISCELLANEOUS EQUIPMENT	
	FEE
Pool Heaters All Sizes	$40.00
Unfired Pressure Vessels	$40.00
Incinerators and Crematories	$40.00

Inspections outside of normal business hours shall be charged per Table No. 152.1 "Other Fees Item 1" in addition to the fees of Table No. 157.8.

[1] For purposes of determining fees for electric boilers, one boiler horsepower is equivalent to 10 kilowatts.

[2] For electric water heaters divide kilowatt rating by 0.000293 to obtain BTU/HR equivalent.

157.9 Vertical and Horizontal Transportation Annual Inspection. The following units shall be inspected by the Agency and City-Licensed Elevator Contractors: passenger or passenger service elevators, combination passenger and freight elevators, freight and freight service elevators, escalators, moving walks, dumbwaiters, sidewalk elevators, stage lifts, orchestra lifts and manlifts.

~~A.~~ Required Inspections. The owner, agent or lessee shall, at his expense, cause the elevator to be thoroughly inspected by an Elevator Contractor licensed by the City.

B. Certificate of Inspection. If, after inspection by the Agency, the equipment is found to be in safe condition, the Agency shall issue a certificate of inspection stating that the equipment is ready for use and indicating the maximum load permitted. Certificates of inspection shall be maintained in the building for which they are issued, by the owner, agent or lessee in a manner easily accessible for checking by the Agency or other interested persons. Valid elevator certificates of inspection shall be mounted in a tamper-proof frame in the elevator for which

they were issued or a metal plaque indicating where the certificate of inspection is located within the building may be mounted in the car in lieu of the current certificate of inspection.

C. Equipment Tag. The owner or operating agent shall cause the equipment to be tagged with an appropriate metal tag so as to indicate the contractor's name, date, type of test and work performed. Multiple test dates shall be prohibited.

D. Annual Inspection Fee. The semiannual inspection fee for vertical transportation units shall be as specified in Table No. 157.9.

E. Inspections required by ASME A17.1 to be performed every six (6) months shall be changed to ANNUAL (12 month) inspections.

TABLE NO. 157.9
ANNUAL INSPECTION FEES
(VERTICAL TRANSPORTATION)

TYPE OF INSPECTION	FEE
Elevators	$150.00 (each Unit)
For each additional landing over 3	10.00
Escalators *	300.00 (each Unit)
Moving Walks**	300.00 (each Unit)
Dumbwaiters	150.00 (each Unit)
Stage Lifts	150.00 (each Unit)
Orchestra Lifts	150.00 (each Unit)
Man Lifts	150.00 (each Unit)
Platform Lifts	150.00 (each Unit)

* This shall mean each unit, floor to floor, in either direction.

** This shall mean each unit, in either direction.

Inspections outside of normal business hours shall be charged per Table No. 152.1 in addition to the fees of Table No. 157.9.

SECTION 158
SPECIAL INSPECTIONS

158.1 See Section 1704, IBC – Special Inspections

158.2 Structural Observation. When required by the Agency, the owner shall employ an engineer to make visits to the site to observe general compliance with the approved structural plans specifications and change orders. The engineer shall submit a final report in writing to the Agency stating that site visits have been made and that any deficiencies noted have been corrected. Reference IBC Section 1709.

SECTION 159
FINAL INSPECTION APPROVAL/CERTIFICATE OF COMPLIANCE

A final inspection approval card will be issued by the Agency upon the completion and approval of the work covered by the permit. A certificate of compliance will be issued by the Agency, when a Certificate of

Occupancy is not required, upon the request of the General Building Contractor when the inspection card issued by the Agency is returned indicating that all final inspections by the Agency have been made. There shall be a processing fee of $5.00 for each certificate issued.

SECTION 160
CERTIFICATE OF OCCUPANCY

160.1 Required. All new buildings or structures except miscellaneous buildings or structures shall not be used or occupied until a Certificate of Occupancy is issued by the Agency. No building or portion thereof shall be used or occupied for an occupancy other than the one designated on the certificate until a new Certificate of Occupancy is issued by the Agency.

160.2 Requirements Prior to Issuance. A Certificate of Occupancy shall be issued to the owner after approval by the Agency and the following:

1. Construction Engineers Division, Wastewater Management and Zoning Administration.

2. Public Health Inspection Division and the Fire Department when specifically requested by either department in writing at the time of application.

3. Public Health Inspection Division, Fire Department and the Department of Public Works showing compliance with all provisions of this Building Code applicable to buildings or structures located in a Special Construction Zone designated pursuant to Article 647 of the Revised Municipal Code.

160.3 Issuance of Certificate. When all the conditions of this Chapter have been fulfilled, the Agency shall issue a Certificate of Occupancy indicating:

1. The use and occupancy for which the certificate is issued.

2. Approval by the Agency.

160.4 Duplicate Certificate of Occupancy. Upon payment of $5.00 to the Agency, a duplicate Certificate of Occupancy may be secured by the owner, architect, engineer, contractor, permit holder or tenant.

160.5 Temporary Certificate of Occupancy. The Agency may issue a temporary Certificate of Occupancy to the owner where unusual construction difficulties have delayed the completion of the construction work covered by the Building Permit. The certificate may be issued provided that no substantial hazard will result from the occupancy and subject to the following items being provided to the Agency:

1. A written request by the owner or the owner's agent, itemizing the uncompleted work and justifying the T.C.O. This list shall not waive, reduce or diminish any Code requirements required by the Building Permit.

2. The process fee shall be $200.00 unless approved by the Building Official.

3. Approval from the following City Agencies:

    A. Construction Engineering Division.

    B. Wastewater Management Division.

    C. Public Health Inspection Division.

    D. Fire Department.

    E. Zoning Department.

This temporary Certificate of Occupancy may be granted for a period up to 12 months. The temporary Certificate of Occupancy may be extended with the approval of the Building Official. After the expiration date

of the temporary Certificate of Occupancy, the building or structure shall require a permanent Certificate of Occupancy in accordance with other provisions of this Chapter.

Additional inspections required for the T.C.O. shall be charged as indicated in Table No. 152.1 and shall be paid before the permanent Certificate of Occupancy is issued.

160.6 Change of Use or Occupancy. Changes in the character or occupancy of all buildings or structures shall not be made except as specified in Chapter 34, IBC. A new Certificate of Occupancy is required for all such changes.

160.7 Cancellation of Certificate of Occupancy. A Certificate of Occupancy may be canceled when:

1. The owner has failed to comply with the requirements of the Agency after appropriate notice and reasonable time to correct.

2. The continued occupancy of the structure is dangerous to the public health, safety or welfare.

160.8 Violation. It shall be a violation of this Code to occupy a building or structure prior to obtaining a Certificate of Occupancy when required.

160.9 Right to Appeal. The Board of Appeals may review any appeal of the Agency's suspension or denial of Certificate of Occupancy under Section 113. One extension of a temporary Certificate of Occupancy may be sought from the Board of Appeals subject to Section 113.

SECTION 161
ADDRESS

161.1 On Job Site. The construction permit holder shall post, at the front of the job site in a conspicuous place, a sign indicating the following:

1. The address number and street, avenue, court, parkway or other, as assigned by the Office of the City Engineer.

2. The name of the firm, address, business phone number and emergency phone number of the permit holder.

3. The building permit number.

161.2 Permanent Address. The owner or occupant of every building shall display the permanent address of each building in a permanent visible location with numbers made of durable materials and of a size to be visible and legible from the street fronting the property

SECTION 162
PERMITS FOR TEMPORARY BUILDINGS

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

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

162.2 Right of Appeal. An extension of a permit for a temporary building may be sought from the Board of Appeals subject to Section 113.

162.3 Fee. A building permit fee shall be established by Table No. 152.1 for the valuation of the temporary building installation which shall consist of (1) the rental cost or the prorated cost of the temporary buildings based on a ten-year life, for the period of the permit, and (2) the cost of the installation and removal of the temporary building.

SECTION 163
FOUNDATION PERMITS

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

1. The total valuation of the project, excluding utilities, exceeds $200,000 or as approved by the Agency.

2. Drawings of the proposed superstructure containing sufficient detail relating to the design of the foundation or substructure are submitted to the Agency. Complete calculations shall be submitted to validate the design of footings, caissons and all other substructure elements.

3. Approvals required by the appropriate City agencies are obtained prior to issuance of the permit.

4. For purposes of the Section, the term "Project" shall mean one building only with a valuation in conformance with subsection 152.1.

163.2 Fee. The plan review fee and the permit fee charged at the time of issuance of the foundation permit shall be based on the total valuation of the construction for both the substructure and the superstructure, plus an additional 25%. See Table No. 152.1.

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

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

163.5 Not Applicable. Foundation permits are not applicable to phased construction.

SECTION 164
PHASED CONSTRUCTION PERMITS

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

1. The minimum total valuation of the building, structure or utility is more than $1,000,000.

2. Prior to the submitting the first phase of the project the applicant submits a Phased Construction Proposal (the "Proposal") to the Agency outlining the program for the phased construction. The Proposal must provide a title for, and describe the content of each of the submittal packages. Content includes declaring the building systems to be submitted for review and valuation for the same. The proposal should contain an estimated submittal date for each of the phases.

The approval of appropriate City agencies has been obtained prior to issuing such phased permit.

4. The valuation of the portion of the work, including utilities, is restated on each phased application.

5. Drawings for each phase shall, on each sheet, include the title chosen in the Proposal and the term "Phased Construction".

164.2 Fees. Plan review fees and permit fees shall be assessed at 150% the amount of those specified in Table No. 152.1. A permit issued under this Section shall not be construed as approval for any portion of the structure not covered by the permit.

SECTION 165
TABLES AND FEES

165.1 Permit Fees. The fee specified in Table No. 152.1 shall be assessed for all permits except as otherwise provided for in this Chapter.

165.2 Other Fees. Annual and semiannual fees shall be as specified in Table No. 157.8 and Table No. 157.9. Inspections outside of normal business hours shall be charged in accordance with Table No. 152.1.

CHAPTER 2
DEFINITIONS AND ABBREVIATIONS

SECTION 201
GENERAL

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

SECTION 202
DEFINITIONS

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

ADEQUATE. Determined to be acceptable to the Agency.

ADMINISTRATIVE AUTHORITY. The Building Official.

BOARD. The Board of Appeals.

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

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

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

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

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

HOTEL. A building or portion thereof used for the living and/or sleeping accommodation of guests and which will be licensed by the City as a hotel.

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

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

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

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

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

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

VALUE OR VALUATION. The building replacement value for permit purposes including labor, profit, overhead, materials, base building equipment and appliances. The determination of value or valuation shall be made or directed to be made by the Department.

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

WRECKING. See Demolition.

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AMENDMENTS TO THE 2003 EDITION OF THE INTERNATIONAL BUILDING CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

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

Section 101.4.1 Electrical is amended by deleting this section in its entirety.

Section 101.4.5 Property Maintenance is amended by deleting this section it its entirety.

Sections 103 through 115 are amended by deleting these sections in their entirety. The Administration of the Denver Building Code shall govern.

CHAPTER 2
DEFINITIONS AND ABBREVIATIONS

SECTION 201
GENERAL

Section 201 is amended by replacing Section 201.4 in its entirety with the following:

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

SECTION 202
DEFINITIONS

Section 202 is amended by adding the following definitions shall be added:

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

ADEQUATE. Determined to be acceptable to the Agency.

ADMINISTRATIVE AUTHORITY. The Building Official.

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

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

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

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

ARCHITECT. An architect licensed by the State of Colorado.

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

BOARD. The Board of Appeals.

CHILD CARE CENTER. A facility which provides a comprehensive care service for the child when the parent or guardian is employed or otherwise engaged and unavailable to care for the child. The facility is

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

Child Care Centers shall not include:

1. Child Care Homes.

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

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

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

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

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

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

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

1. *Prompt.* Evacuation capability equivalent to the capability of the general population to evacuate a facility. Evacuation drill time shall be 3 minutes or less.

2. *Slow.* Evacuation capability of a group to move to a point of safety in a timely manner, with some of the residents requiring assistance from the staff. Evacuation drill time shall be over 3 minutes, but not in excess of 13 minutes.

3. *Impractical.* A group that, even with staff assistance, cannot reliably move to a point of safety in a timely manner. Evacuation drill time is more than 13 minutes.

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

GRAPHIC ANNUNCIATION. Graphic Annunciation is an annunciation method where each floor plan is provided and shows building details with each initiating device/zone identified.

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

HOTEL. A building or portion thereof used for the living and/or sleeping accommodation of guests and which will be licensed by the City as a hotel.

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

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

Exceptions

1. If the access road is further than 30 ft. to any exterior wall of the building, the lowest level of Fire Department vehicle access shall be measured from the lowest elevation of any required Fire Department access road located no more than 50 ft. from any exterior wall of the building.

2. If any topography, waterway, non-negotiable grades or other similar conditions exist that preclude required Fire Department vehicular access, the Fire code official is authorized to require additional fire protection systems as required by Chapter 9.

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

MONITORING SYSTEM. An approved system of supervised circuits employing a connection between signaling devices at the protected premises and devices at the protected premises and signal receiving equipment at the fire alarm headquarters or other location approved by the Fire Department. Class I and Class II central stations shall be as defined in Revised Municipal Code Section 22.62 of the City and County of Denver.

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

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

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

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

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

PREFABRICATED CONSTRUCTION. See Section DBCA 3110.

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

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

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

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

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

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

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

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

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

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

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

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

WRECKING. See Demolition.

CHAPTER 3
USE AND OCCUPANCY CLASSIFICATION

SECTION 302
CLASSIFICATION

Section 302.1.1 is amended by adding to Table 302.1.1.

ROOM OR AREA [a]	SEPARATION
Emergency Power Equipment Room Enclosures for: The main emergency equipment disconnect switches or panel boards. The Automatic transfer switches.	1 hour - Also see NEC

a. Fuel-fired equipment rooms shall be separated from refrigerant equipment machinery rooms and from air handling equipment rooms by a one-hour fire-resistance-rated fire barrier. There shall be no direct access to any room containing fuel-fired equipment from a refrigeration equipment machinery room or from an air handling equipment room.

Section 302.1.1.2 is added as follows:

302.1.1.2 Separation of equipment rooms. Fuel-fired equipment rooms shall be separated from refrigerant equipment machinery rooms and from air handling equipment rooms by a one-hour fire-resistance-rated fire barrier. There shall be no direct access to any room containing fuel-fired equipment from a refrigeration equipment machinery room or from an air handling equipment room.

Section 302.3.2 Separated uses, is amended by adding the following after the last sentence before the Exception:

The area of the building shall be such that the sum of the ratios of the actual area for each separate occupancy divided by the allowable area of each occupancy shall not exceed 2 for 2 story buildings and 3 for buildings over two stories.

SECTION 305
EDUCATIONAL GROUP E

Sections 305.3 and 305.4 are added:

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

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

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

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

Exceptions:

1. Basements as allowed per Section 305.4.
2. Any floor level with an exterior door leading directly to the outside where the floor level is within:
3. Two feet vertically of directly surrounding grade shall be allowed for children 2 ½ years or younger.
4. Five feet vertically of directly surrounding grade shall be allowed for children more than 2 ½ and less than 5 years of age.
5. Eight feet vertically of directly surrounding grade shall be allowed for children over 5 years of age and ambulatory adults.
6. Egress from the floor level to grade may be by stairs or ramps.
7. A floor level occupied for day care activities shall have 2 exits. Two exits may include one exit directly to grade or as provided in item #3 above with a second exit as an interior stair or ramp. Egress through a window shall not be accepted as an exit.
8. There shall be no dead-end corridors.
9. Gas-fired heating appliances must comply with Section 808 of the International Mechanical Code.
10. Existing partitions, walls and ceilings may be approved if the existing surface is of a fire-resistive material consisting of lath and plaster or gypsum board of at least ½ inch thickness.
11. Section 907.2.3 shall apply to all conversions. Residential type multiple single-station smoke detectors may be installed with field inspector approval. System type smoke detectors will require drawings signed and sealed by an electrical engineer.
12. Requirements of other City and State agencies must be complied with. When a conflict occurs between regulations of different agencies, the most restrictive will govern.

Section 305.4 Special Provisions. Rooms in E and Group I Division 4 Child Care Facility Occupancies used for day-care, pre-kindergarten, kindergarten or first grade pupils shall not be located above or below the first story.

Exceptions:

1. Basements or stories having floor levels located within 4 feet (1219 mm), measured vertically, from adjacent ground level at the level of exit discharge, provided the basement or story has exterior exit doors at that level.
2. In buildings equipped with an automatic sprinkler system throughout, rooms used for kindergarten or for day-care purposes may be located on the second story, provided there are at least two exterior exit doors for the exclusive use of such occupants.
3. Child care facility may be located above the first story in buildings of Type I-A construction and in Types I-B, II-A and III-A, subject to the limitation of Section 503, 504 and 506 when:

   3.1 Child care facility with children under the age of seven or containing more than 25 children per story shall not be located above the fourth floor; and

   3.2 The entire story in which the day-care facility is located is equipped with an approved manual fire alarm and smoke-detection system.

   3.3 Actuation of an initiating device shall sound an audible/visual alarm throughout the entire story. When a building fire alarm system is required by other provisions of this code or the Fire Code for the City and County of Denver, the alarm system shall be connected to the building alarm

system. An approved alarm signal shall sound at an approved location in the day-care occupancy to indicate a fire alarm or sprinkler flow condition in other portions of the building.

3.3 The child-care facility shall be separated from other occupancies by fire and smoke barriers having a fire-resistive rating of not less than one hour, with door openings protected by smoke- and draft-control assemblies having a fire-protection rating of not less than 60 minutes. The damper shall close upon detection of smoke by an approved smoke detector located within the duct, or upon the activation of the fire alarm system (including any flow alarm); and

3.4 Child-care facility shall form compartments separated by smoke barriers when the occupant load is 50 or more. Each compartment shall have not less than two exits or exit-access doors, one of which is permitted to pass through the adjoining compartment; and

3.5 The building is equipped with an automatic sprinkler system throughout.

SECTION 308
INSTITUTIONAL GROUP I

Sections 308.5.3 and 308.5.4 are added:

Section 308.5.3 Conversion of Existing Buildings to Small Day Care Centers. See Section 305.3.

Section 308.5.4 Special Provisions. See Section 305.4.

SECTION 310
RESIDENTIAL GROUP R

SECTIONS 310.3 AND 310.4 ARE ADDED:

310.3 Special Provisions for Operable Windows. Openings of operable windows, that are more than 30 inches above grade, floor or roof surface, shall not be less than 21 inches above the floor of the room that has the window.

EXCEPTION:

1. Windows which when opened do not allow a 4-inch sphere to pass through the opening or which are normally closed but may be opened for cleaning or maintenance.

2. Open areas of the window that are protected by bars, grilles, grates or similar devices, other than insect screens, through which a 4-inch sphere will not pass.

3. Escape or rescue windows covered with bars, grilles, grates or similar devices that comply with Section 1009.4 and the spacing between bars will not allow a 4-inch sphere to pass through.

310.4 Special Provisions for Residential Personal Care Facility. A Personal Care Facility may occupy Group I-1, Group R-3, or Group R-4 occupancies with the following provisions:

1. Type of Occupancies.

   A. Group R-3 Home Occupancy: less than 3 occupants.

   B. Group R-3 Personal Care Facility: from 3-5 occupants.

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

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

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

2. Plans and permit shall indicate the maximum occupant load and for Personal Care Facilities indicate the evacuation capability classification.

3. Plans for the renovation of an existing building or the construction of a new building shall bear the seal and signature to the Architect or Engineer responsible for the design phases of the building. See Section 153.

4. Personal Care Facility Provider shall:

A. Develop a Facility Personal Care Plan, which specifically establishes the services to be provided to the residents (forms provided by the Agency).

B. Establish an Evacuation Capability by using the "Facility and Resident Characteristics for Establishing Evacuation Capability" chart. The actual evacuation capability will be verified by the Fire Department after the building is occupied.

Section 312.2 is added:

SECTION 312
UTILITY AND MISCELLANEOUS GROUP U

312.2 Fences and Retaining Walls.

312.2.1 General. This Section shall apply to all fences or walls in excess of 4 feet in height, all retaining walls in excess of 3 feet in height, combination fences and retaining walls in excess of 4 feet in height, and all fences, walls and retaining walls specifically provided for in this Section. For exempted work refer to Section 150.1.2, item #2.

When the Agency determines that the installation, removal or repair of a fence shall be for the public welfare and safety, the Agency may order any action deemed necessary notwithstanding the provisions of this Section.

312.2.2 Design. All fences, walls and retaining walls shall be designed in accordance with the following:

1. Retaining walls shall be designed and drainage provided so as to resist all lateral pressure to which they may be subjected.

2. Fences shall be designed to resist any wind load to which they may be subjected.

312.2.3 Prohibition. The following prohibitions shall apply to all fences, walls or retaining walls, regardless of height:

1. The use of barbed wire or any other sharp-pointed material as a fencing material or on top of fences or retaining walls is prohibited except when specifically approved by the Agency.

2. The use of electrically charged fences or on top of fences or retaining walls is prohibited except when specifically approved by the Agency.

312.2.4 Review and Approval. Fences, walls or retaining walls to be installed on corners or locations which may create a traffic hazard or be in violation of other City ordinances shall be subject to review by the appropriate City agency. No fence, wall or retaining wall shall be installed or maintained if disapproved by any City agency.

312.2.5 Repair or Removal. The Agency may order any fence, wall or retaining wall it declares to be dilapidated or hazardous to be repaired or removed.

CHAPTER 4

SPECIAL DETAILED REQUIRMENTS BASED ON USE AND OCCUPANCY

SECTION 402
COVERED MALL BUILDINGS

Section [F] 402.8.1 is amended by adding the following sentence:

Location of standpipes shall be within 10 feet of the exit openings referenced in Section 905.

Section 402.12 is amended by replacing it in its entirety with the following:

402.12 Standby and Emergency Power. Covered mall buildings exceeding 50,000 square feet (4,645.2m) shall be provided with standby and emergency power systems which are capable of operating the emergency voice/alarm communication system, the smoke control system for 4 adjacent zones per 909.4.1, the fire pump and one elevator.

Section [F] 402.13 is amended by replacing it in its entirety with the following:

[F] 402.13 Emergency voice/alarm communication system: Emergency voice/alarm communication system shall be provided in accordance with the Fire Code for the City and County of Denver.

Section [F] 402.16 is added:

[F] 402.16 Fire Command Center. A Fire Command Center for fire department operations shall be provided. The location and accessibility of this room shall be approved by the fire department. The room size, the fire-resistive construction of the room and the components within the room shall be provided in accordance with section 911.2.

SECTION 403
HIGH-RISE BUILDINGS

Section 403.1, Applicability, Exception 2 is amended by replacing it in its entirety with the following:

2. Single use open parking garages (as defined in Section 406.3.5.1) in accordance with Section 406.3

Section [F] 403.2, Automatic sprinkler system, Exception 1 is amended by replacing it in its entirety with the following:

1. Single use open parking garages (as defined in Section 406.3.5.1) in accordance with Section 406.3

Section [F] 403.3.1 Type of construction is deleted in its entirety.

Section 403.5 Automatic fire detection is amended by replacing reference to “Section 907.2.12.1” with “Section 907.2.12.2”.

Section [F] 403.6 Emergency voice/alarm communication systems is amended by replacing reference to “Section 907.2.12.2” with “Section 907.2.12.3.”

Section [F] 403.7 is amended by replacing it in its entirety with the following:

[F] 403.7 Fire department communications system. A fire department communication system shall be provided in accordance with Section 907.2.12.4.

Section 403.9 Elevators is amended by adding Section 403.9.1.

403.9.1 Elevator lobbies. Passenger elevators on all floors shall open into elevator lobbies with an area of at least 1% of the gross floor area of that story. Elevator lobbies shall be separated from the remainder of the building, including corridors and other exits, by walls extending from the floor to the underside of the fire-resistive floor or roof above. Openings through such walls shall be protected as required for fire rated corridors, refer to Section 1016. These lobbies shall also meet the requirements of areas of refuge in accordance with Section 1007.6. Elevator lobbies, serving Group R-1 or R-2 Occupancies, shall comply with the special High Rise smoke control provisions.

Exceptions:

1. The street floor level elevator lobby in an office building
2. Corridors in High Rise office buildings may lead through an enclosed elevator lobby where the lobby serves as a refuge area.
3. Elevators opening into single use open parking garages
4. Elevators opening into open parking garages where sufficient openings are provided in exterior walls such that mechanical ventilation would not be required.
5. Elevator lobbies located within the atrium space complying with the provisions of Section 404.
6. Freight elevators shall open into elevator lobbies, which may be of any size. The walls surrounding these lobbies need not be fire-resistive partitions nor smoke barriers. The freight elevator shaft shall be pressurized per Section 909.3.1.2.2.

Section [F] 403.10.1 is amended by replacing it in its entirety with the following:

[F] 403.10.1. Fuel Supply. An on-premises fuel supply, sufficient for not less than 8 hours full-demand operation of the system, shall be provided.

Section 403.12 Is deleted in its entirity and locking of stairway doors are addressed by Appendix L Access Control Systems.

Section 403.13 Smokeproof exit enclosures is deleted in its entirety.

Section 405.1 is amended by the addition of Exception 6.

6: High Rise buildings shall comply with Section 403.

SECTION 404
ATRIUMS

Section 404.1.1 Shall be amended by adding the following exceptions to the Atrium definition:

Exceptions:

1. Floor openings meeting requirements of Section 707.2, Exceptions 2, 7, 8 or 9.
2. Floor openings meeting requirements of Section 1019.1, Exception 8 or 9.

SECTION 405
UNDERGROUND BUILDINGS

Section 405.4.3 Elevators is amended by replacing reference to “Section 907.10” in the last sentence with “Section 909.5.3.”

Section 405.5 is amended by adding the following:

Section 405.5 Smoke control system. The provisions of Denver Amendments Section 909 herein shall apply to any basement component of high-rise buildings. The provisions of International Building Code Section 909 shall apply in all other underground buildings.

SECTION 406
MOTOR-VEHICLE-RELATED OCCUPANCIES

Section 406.2.10 is added:

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

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

SECTION 407
GROUP I-2

Section [F] 407.2.1 Spaces of unlimited area, paragraph no. 2 and paragraph no. 3, are amended by replacing references to "Section 907" with "Section 907" of the Denver Fire Code.

Section [F] 407.2.3 Mental health treatment areas, paragraph no. 4 is amended by replacing reference to "Section 907.2" with "Section 907.2" of the Denver Fire Code.

Section [F] 407.6 Automatic fire detection is amended by replacing reference to "Section 907" with "Section 907.2.6" of the Denver Fire Code.

SECTION 411
SPECIAL AMUSEMENT BUILDINGS

Section [F] 411.3 Automatic fire detection is amended by replacing reference to "Section 907" with "Section 907.2 of the Amendments to the Denver Fire Code."

Section [F] 411.5 Alarm is amended by replacing reference to "Section 907" with "Section 907.2.11 of the Denver Fire Code."

Section [F] 411.6 Emergency voice/alarm communications system is amended by replacing references to "Section 907.2.11 and 907.2.12.2" with "Section 907.2.11.3 of the Denver Fire Code."

Section [F] 411.7 Exit marking is amended by replacing reference to "Section 907.2.11.2" in the last sentence with "the Amendments to the Denver Fire Code."

SECTION 413
COMBUSTIBLE STORAGE

Section 413 is amended by deleting the word "COMBUSTIBLE" from the title as follows:

Section 413.1 General is amended by adding the following sentence:

For new and existing buildings, also refer to the Fire Code for the City and County of Denver.

Section 413.2 is amended by deleting the word "combustible" from the first sentence.

Section [F] 415.9.8 Manual fire alarm system is amended by replacing reference to "Section 907" in the last sentence with "Section 907.2.5" of the Amendments to the Denver Fire Code.

CHAPTER 5
GENERAL BUILDING HEIGHTS AND AREAS

SECTION 503
GENERAL HEIGHT AND AREA LIMITATIONS

Section 503.1.5 is added:

503.1.5 View Protection Ordinances. Mountain view and central business district view protection ordinances contained in the revised Municipal Code shall be enforced by the Agency and shall require the following:

1. A written statement by the owner that the proposed building is within a view protection district.
2. A certification by a registered design professional, with the appropriate calculations, that the proposed building does not exceed the allowable height within the view protection district.

SECTION 506
AREA MODIFICATIONS

Section 506.3 Automatic sprinkler system increase is amended by replacing the last sentence with the following:

Where a building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, and height and/or story increases are taken in accordance with Section 504.2, the area limitation in Table 503 is permitted to be increased as follows:

1. 100 percent (Is = 100 percent) where height and story increases are taken in accordance with Section 504.2.
2. 100 percent (Is = 100 percent) where story increase is taken in accordance with Section 504.2.
3. 100 percent (Is = 100 percent) where height increase is taken in accordance with Section 504.2.
4. 200 percent (Is = 200 percent) for multistory buildings except as noted above.
5. 300 percent (Is = 300 percent) for single story buildings.

Section 506.4 Area Determination is amended by deleting Exception 2.

SECTION 507
UNLIMITED AREA BUILDINGS

Section 507.1 is amended by adding the following Exception:

Exception: Buildings of Type V A, Type V B and Type III B construction.

Section 507.10 is added:

507.10 Existing Buildings. Any building constructed prior to March 26, 1994 and meeting the requirements of one of the categories below, is allowed to retain its existing area, provided the existing area does not exceed the allowable area of the code under which it was last certified for occupancy, including all applicable Modifications Under Special Circumstances and retrofit ordinances. Alterations and repairs are permitted provided no area is added to the existing building footprint. Additions are prohibited unless the building, including the addition, meets all the requirements of the currently adopted Building Code.

TABLE 507.10

Existing Building Unlimited Area Additions

Category	Occupancy Group	Maximum No. of Stories	Type of Construction	Auto Sprinkler Throughout	Minimum Open Space*
1	B, F, M, S	1	ALL	YES	20’
2	F2, S-2	1	II, III-A	NR	40’

NOTE: NR = NOT REQUIRED

* = ENTIRELY SURROUNDED AND ADJOINED BY PUBLIC WAYS OR YARDS NOT LESS THAN DISTANCE INDICATED. ADDITIONAL OPEN SPACE MAY BE REQUIRED FOR FIRE DEPARTMENT ACCESS, SEE *FIRE CODE.*

CHAPTER 7
FIRE-RESISTANCE-RATED CONSTRUCITON

SECTION 704
EXTERIOR WALLS

Section 704.2 Projections is amended by replacing it in its entirety with the following:

704.2 Projections. Cornices, eave overhangs, cantilevered or wall hung non-exit balconies, cantilevered roof overhangs, and similar architectural appendages extending beyond the exterior walls shall conform to the requirements of this section. Exterior egress balconies and exterior exit stairways shall also comply with Sections 1013.5 and 1022.1. The fire separation distance from exterior edges of projections shall not be less than four feet (1220 mm). The aggregate length for balconies and similar projections shall not exceed 50 percent of the building perimeter on each floor.

> **Exception:** Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.

704.2.1 Materials. Combustible projections are only permitted in Type III, IV and V construction. Non-combustible projections shall be permitted in any Type of construction.

704.2.2 Fire-resistance rating. Where the fire separation distances from exterior edges of projections are less than 6 feet (18288 mm), combustible or noncombustible projections shall be of a minimum of 1-hour fire-resistance-rated construction.

Where the fire separation distances from exterior edges of non-combustible projection are 6 feet (18288 mm) or more, noncombustible projections shall not be required to have a fire-resistance-rating.

Combustible projections in Type III-A, IV and V-A construction shall be one-hour fire-resistance rated or Type IV construction.

> **Exception:** Balconies and similar appendages in Type III-A, IV and V-A construction may be permitted to be of Type V-B construction where sprinkler protection is extended to these areas.

704.2.3 Membrane penetrations. Membrane penetration of the bottom fire-resistive membrane of projections is prohibited where projections are required to be of fire-resistance-rated construction.

> **Exception:** Openings in the bottom membrane of fire-resistance rated projections where the fire separation distance exceeds 6 feet shall be limited to those required for attic ventilation.

Section 704.8.1 Automatic sprinkler system is amended by adding the following sentence to the end of the paragraph.

Section 704.8.1 is applicable to openings with or without windows, duct and air transfer openings.

Section 704.12 is amended by replacing the Exception in its entirety with the following:

> **Exception:** Where opening protection is provided by ceiling sprinkler heads spaced at 6 ft. on center and placed between 6 to 12 inches from the wall, area of exterior openings described in Table 704.8 may not exceed 50% where the fire separation distance is greater than 5 and is less than 15 ft. Buildings shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The sprinkler system shall be designed to distribute at least 3 gpm per linear foot of wall opening. The sprinkler system serving the floor shall be designed to provide adequate water supply to either a hydraulically calculated remote floor area in accordance with NFPA 13 or to all of the exposure protection heads on any one level of the building, whichever demand is greater.

Section 704.14 Ducts and air transfer openings is amended by adding Exception 2.

Exception:

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

SECTION 707
SHAFT ENCLOSURES

Section 707.2 Exception 2, item 2.1 is amended by replacing the last sentence in its entirety with the following:

For escalator openings this application is limited to openings that do not connect more than four stories for other than Group B and M occupancies. For stairway openings this application is limited to openings that do not connect more than three stories for buildings without smoke control capabilities. For buildings with smoke control capabilities this application is limited to openings that do not connect more than four stories. The smoke control capability shall consist of exhausting the fire floor, pressurizing all floors above and below the fire floor and pressurizing the building exit stair enclosures and elevator shafts per Section 909. In addition, smoke detectors shall be located adjacent to the floor side of the opening and the smoke control system for the openings shall be subject to field testing.

Section 707.4 is amended by adding the following Exception:

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

Section 707.5 is amended by adding the following Exception:

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

Section 707.14.1 is amended by adding the following sentence:

Elevator lobbies in high rise buildings shall comply with Section 403.9.1 of the Denver Building Code Amendments.

Section 707.14.1. Exception 4 is amended by deleting it in its entirety.

SECTION 708
FIRE PARTITIONS

Section 708.3 is amended by deleting Exception 2.

Section 708.4 is amended by adding Exception 7.

Exception:

7. The supporting construction of the dwelling unit floor-ceiling assemblies need not be fire rated where provisions of Table 601 note ‘d’ are applied, except where the supporting elements are separating dwelling units.

SECTION 711
HORIZONTAL ASSEMBLIES

Section 711.4 is amended by adding the following Exception:

Exception: Where provisions of Section 704.5 are applied.

SECTION 715
OPENING PROTECTIVES

Section 715.3.7.2 is amended by adding the following Exception:

Exception: Fusible links are not allowed in an automatic-closing assembly. In circumstances where smoke detectors are not suited to environmental conditions heat detectors shall be installed.

SECTION 717
CONCEALED SPACES

Section 717.3.2 is amended by deleting Exceptions 1 and 2.

Section 717.3.3 is amended by replacing the Exception in its entirety with the following:

Exception: Where an approved automatic sprinkler system is installed within the concealed spaces, the area between the draft stops may be 3,000 square feet.

Section 717.4.2 is amended by deleting Exception 2 and by replacing Exception 4 in its entirety with the following:

Exception 4: Where approved automatic sprinkler systems are installed within concealed roof spaces, the area between the draft stops may be 9000 square feet and the greatest horizontal dimension may be 100 feet.

Section 717.4.3 is amended by replacing the Exception in its entirety with the following:

Exception: Where approved automatic sprinkler systems are installed within concealed roof spaces, the area between the draft stops may be 9000 square feet and the greatest horizontal dimension may be 100 feet.

CHAPTER 9
FIRE PROTECTION SYSTEMS

SECTION [F]903
AUTOMATIC SPRINKLER SYSTEMS

Amend Section [F]903.2.8.1 by adding Items #4 and #5 as follows:

4. Repair garages with spray booth and/or mixing area greater 16 square feet requires an automatic fire sprinkler system in the booth and the building. The automatic sprinkler system shall comply with Section 903.3.1.1.

5. An automatic sprinkler system in accordance with Section 903.3.1.1 shall be installed in any repair garage using open flame or welding of any type where repair garage that exceeds 3,000 square feet.

Replace Section [F]903.2.8.2 with the following:

[F]903.2.8.2 Bulk storage of tires. Buildings and structures where the area for the storage of tires exceeds 500 square feet in area and 5 feet in height shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.1.1.

Delete Section [F]903.3.5.1. in its entirety

Delete Section [F]903.3.5.1.1 in its entirety

Delete Section [F]903.3.5.1.2 in its entirety

Replace Section [F]903.3.7 with the following:

[F]903.3.7 Fire Department connections. Fire Department Fire Prevention personnel prior to installation shall approve the location of fire department connections. Minimum pipe size and number of inlets shall be per Table 903.3.7. An approved exterior audible and visual alarm device (24 VDC supervised) shall be connected to every fire sprinkler system. The main waterflow detection device shall activate this device. The devices shall be located on the exterior of the building at least 10 feet above grade and within 25 feet of and visible from the fire department connection. An approved audible/visual sprinkler flow alarm to alert the occupants shall be provided in the interior of the building in a normally occupied location.

TABLE [F]903.3.7 FIRE DEPARTMENT CONNECTION

No FIRE PUMP	Minimum 2-2½" inlets with 3 or 4-inch piping. Under no circumstances shall the FDC pipe size diameter be less than the diameter of the system riser or 4 inches, whichever is larger.	
Fire Pump Capacity	**Number of Inlets**	**Pipe Size (Diameter)**
750 gpm or less	2-2½"	4"
1000 gpm	4-2½ "	6"
1250 gpm or greater	6-2½"	8"

SECTION [F]905
STANDPIPE SYSTEMS

Replace Section [F]905.1 with the following:

[F]905.1 General. Standpipe systems shall be provided in new buildings and structures in accordance with this section. Fire hose threads used in conjuction with standpipe systems shall be approved and shall be compatible with Denver Fire Department hose threads – 2 ½-inch hose thread is national standard; 1 ½-inch hose thread is a special 11 ½ threads per inch. The location of fire department hose connections shall be approved by the fire code official. In buildings used for high-piled storage, fire protection shall be in accordance with Chapters 9 and 23.

Amend Items #2 and #3 in Section [F]905.3.1 by replacing "manual" with "automatic dry"

Amend Section [F]905.4 Item #1 with the following:

1. Standpipes shall comply with the requirements of this section, NFPA 14 and the Fire Code. There shall be a Class I standpipe outlet connection at every floor-level landing of every required stairway all levels and below grade and on each side of the wall adjacent to the exit opening of a horizontal exit. Outlets at stairways shall be located in a public corridor within 10 feet of the opening of the stairway, on all floor levels, or as approved by the Fire Department. Each outlet shall consist of a 2 ½-inch hose valve with cap and chain and a 1 ½-inch hose valve outlet with cap and chain. Outlets shall be at least 3 feet and not more than 6 feet above finished floor. The valves shall have no les than 3 inches clearance around control valve and outlet cabinet shall not impede attachment of hose.

   Exception: In fully sprinklered buildings, the 1 ½-inch hose outlet may be omitted

Amend Section [F]905.8 by deleting Exception.

SECTION [F]907 – FIRE ALARM AND DETECTION SYSTEMS, is deleted in its entirety and replaced by the following: (amendment to 2003 IFC)

SECTION [F]907
FIRE ALARM AND DETECTION SYSTEMS

[F]907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components.

[F]907.1.1 Construction Documents. Construction documents for fire alarm systems shall be submitted for permit application as a deferred submittal per IBCA Section 154. Document review and approval is required prior to issuance of a permit for system installation. Two sets of scaled, engineered installation shop drawings shall be submitted. Documents shall be of sufficient clarity and detail to fully describe the scope of work. Handwritten notes and comments on reproduced drawings are not acceptable. Documents shall include, but are not limited to, the following:

1. Completed permit application with exact address, location of work, name and address of responsible design agency and original seal and signature of the design professional.
2. Building occupancy classification and occupant load for each occupancy classification.
3. Manufacturers' specification sheets for all equipment and devices.
4. Code reference used as a basis of design, including any Administrative Modifications or Board of Appeals decisions.
5. Identification of system as code-required, non-required code-compliant or user-defined.
6. Voice message content and language(s) for voice evacuation systems.
7. Complete written narrative sequence of operation including:
   a) Elevator recall
   b) Smoke control
   c) HVAC system operation
   d) Alarm conditions

e) Trouble and supervisory conditions
f) Emergency voice/alarm communication system
g) Two-way firefighter's voice communication system
h) Special systems, e.g., pre-action, kitchen hoods, laundry and trash chutes, computer rooms, etc.

8. Identification of air-handling units with airflow exceeding 2,000 cfm and 15,000cfm.
9. Identification of air-handling units used for smoke control.
10. Voltage-drop calculations using either the device-by-device method or where the entire load is lumped at the end of the circuit. The calculations shall use the listed current draw at 18 volts for new systems. The voltage on a circuit shall not drop below 16 volts at the last appliance. The "R" values used for conductors shall be per NFPA 70 (NEC) for uncoated copper conductors. Voltage-drop calculations for additional devices on existing system shall be done in the same manner with the same values, as the original calculations for the system.
11. Battery calculations for control panels and power supplies.
12. Scale drawings of each area where work on the fire alarm is to be performed, including north arrow, building address and local street intersections. The drawings shall show location of all equipment and devices, including existing devices and end-of-line resistors, room identification by number and function (as applicable), attic and ceiling details for areas with automatic detection.
13. Mounting heights of wall mounted devices.
14. Symbol list with quantities of each device. Symbols shall comply with NFPA 170, Standard for Fire Safety Symbols.
15. Power supply connection details.
16. System single line riser showing all devices.
17. A separate single line drawing of the pre-amps, amplifiers, interconnect wiring and methods used to provide survivability of the voice communication system "A" and "B" circuits per NFPA 72.
18. Wire color code.
19. Interconnection wiring.
20. Central station designation.
21. Full-scale drawings of annunciators, zone maps and firefighter's control panels.
22. Reflected ceiling plan, where full smoke detection is provided.

Exception: A permit may be issued for fire alarm "conduit only rough-in" without approved plans. A "conduit only rough-in" permit may be issued to a contractor with either an Electrical or Electrical Signal contractor's license. This permit shall not authorize installation of any system wiring or devices. The "conduit only rough-in" permit applies to device backboxes and conduit stubs only. Compete conduit system installation may be included under the "conduit only rough-in" where the installation is permitted and accomplished by a contractor with a valid Electrical license. The contractor shall be responsible for any changes required by the City plan review.

[F]907.1.2 Equipment. Systems and their components shall be listed and approved for the purpose for which they are installed. Only fire alarm control panels approved for use by the fire department shall be installed. Installation locations of all control panels and annunciators are subject to field approval by the fire department. Keys for all equipment required to be accessible to the fire department shall be maintained in an approved location.

[F]907.1.3 Use of area separation walls to define separate buildings. For the purpose of this Section, area separation walls shall not define separate buildings.

[F]907.1.4 Central Station Connection. All fire alarm systems required by this code, the Fire Code or by special agreement shall be monitored by an approved Class I central station (as defined in the Denver Municipal Code) licensed by the City and County of Denver. Multiple central station connections from one building are not permitted. Alternatively, fire department radio boxes shall be installed at locations approved by the Fire Department. These boxes shall typically be installed at locations of high-hazard, high occupancy that require immediacy of response due to limitations in the occupants' capabilities for self- preservation.

Under no circumstances shall a radio box be removed from a protected premises without written approval of the Fire Department.

[F]907.1.5 Problematic systems. Fire alarm and detection systems that generate four (4) or more unintentional false alarms, as determined by the Fire Department, per month for three (3) consecutive months, shall be immediately repaired or replaced as necessary. A permit must be obtained for all work.

[F]907.1.6 Systems out of service. Systems undergoing maintenance or modification shall not have any portion of the system out of service for more than ten (10) hours. During maintenance or modification, all manual pull stations and notification appliances shall remain operational. Fire watch must be provided to all areas of the building where maintenance or modification will place any portion of the system out of service. Tenant-finish operations shall be in accordance with policy.

[F]907.2 Where required. Required fire alarm and Automatic fire detection systems shall comply with NFPA 72. An approved manual or manual and automatic fire alarm system shall be provided in accordance with this section. Automatic fire detectors shall be smoke detectors. Where smoke detectors are not suitable for the environment such as; laundry rooms, toilet rooms, kitchens, boiler rooms, unusable space under floor areas, attached garages, attics and rooms of similar use, heat detectors shall be used. Where heat detectors are substituted for smoke detectors and the room is protected by an approved automatic fire sprinkler system, the heat detectors are not required.

[F]907.2.1 Group A. Group A Occupancies having an occupant load of 300 or more shall be provided with a manual fire alarm system in accordance with Section 907.2.1.

Exception: Group A Occupancy portions of Group E Occupancies shall be provided with a manual fire alarm and automatic detection system as required for the Group E Occupancy.

[F]907.2.1.1 Group A occupancies with an occupant load of 1,000 or more shall be provided with a Fire Command Center. The Fire Command Center shall be a minimum of 24sf, of 1-hr rated construction and have a minimum three feet (1m) clearance from the front of the control equipment. The Fire Command Center shall be located in an area approved by the Fire Department.

[F]907.2.1.2 Activation of the fire alarm in Group A Occupancies with an occupant load of 1,000 or more shall immediately initiate an approved prerecorded message announcement using an approved emergency voice/alarm communication system in accordance with 907.2.12.3 as applicable. In very high noise areas, such as theaters, night clubs and dance halls, the system shall be designed to reduce or eliminate the background noise upon alarm initiation.

[F]907.2.1.3 Emergency Power. Emergency voice/alarm communication system shall be provided with an approved emergency power source.

[F]907.2.2 Group B. A manual fire alarm system shall be provided in all Group B occupancies five or more stories above grade.

[F]907.2.3 Group E. Group E Occupancies having an occupant load of 50 or more shall be provided with an approved manual fire alarm and automatic detection system throughout the occupancy. See also Section 907.2.1, Exception.

Exceptions:

1. If less than 50 occupants, the system is not required to be monitored by a central station.
2. If 20 or less occupants, 120v AC single- or multiple-station residential smoke detectors with battery back-up, wired to an un-switched source shall be provided in sleeping areas and paths of egress. A manual fire alarm system is not required.
3. In mixed occupancies where the E occupancy is accessory to the A occupancy, a manual fire alarm system is not required in the A occupancy except as identified in 907.2.1. Any exit paths for the E occupancy through the A occupancy shall be provided with automatic fire detection.

4. Manual fire alarm boxes are not required throughout the building where all the following apply:
   a) Interior corridors are protected by smoke detectors.
   b) System central station monitoring is provided.
   c) Manual boxes are provided in locations supervised by staff.
5. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

[F]907.2.4 Group F. A manual fire alarm system shall be installed in Group F occupancies that are two or more stories in height and have an occupant load of 500 or more above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required if the building is equipped throughout with an approved fire sprinkler system which activates notification appliances throughout the building. At least one manual fire alarm box shall be installed at an approved location(s).

[F]907.2.5 Group H. A manual fire alarm system shall be installed in group H-5 occupancies as required in Chapter 18 of the Fire Code and in occupancies used for the manufacture of organic coatings as required in Chapter 15 of the Fire Code. An automatic fire detection system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 37, 39 and 40 respectively, of the Fire Code. See also IBC Section 908.

[F]907.2.5.1 Emergency alarms. Where emergency alarms are required by the Fire Code and a fire alarm or sprinkler alarm system is provided, emergency alarm devices and appliances shall be connected to the fire alarm or sprinkler alarm system and transmit an alarm signal to the monitoring station, where provided. The emergency alarm devices serving this area shall be distinctly annunciated as a separate zone at the building annunciator panel and provide local alarm to notify occupants. Where emergency alarms are required and a fire alarm system is not provided, manual alarm initiating devices shall be installed outside each door to the area and local audible/visual appliances shall be provided to notify occupants in accordance with Chapter 27.

[F]907.2.6 Group I. A manual fire alarm and automatic detection system shall be installed in Group I occupancies. When actuated, alarm-initiating devices shall activate an alarm signal that is audible throughout the building.

Exceptions:

1. Manual fire alarm boxes in patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.3.1.1.1 are not exceeded.
2. Visual alarm-signaling devices are allowed to substitute for audible devices in patient use areas.
3. A pre-signal system may be installed if approved by the fire department. 24-hour personnel supervision is required at approved locations. Chimes may be installed in lieu of audible notification appliances.
4. Automatic fire detectors are not required in sprinklered areas less than 24sf.
5. **Patient room system smoke detectors.** Actuation of patient room system detectors shall cause a visual display on the corridor side of the room in which the detector is located and shall cause an audible and visual alarm at the respective nurses' station. Actuation of patient room smoke detectors shall not activate the building visual and audible fire alarm appliances.

[F]907.2.6.1 Group I-2. Corridors in nursing homes (both intermediate care and skilled nursing facilities), detoxificaton facilities and spaces open to the corridors shall be equipped with an automatic fire detection system.

Exception: Group I-2 occupancies with more than five, but less than ten occupants may be provided throughout with 120vac single- or multiple-station residential smoke detectors with battery back-up, wired to an un-switched source. A manual fire alarm system is not required.

[F]907.2.6.2 Group I-3. occupancies shall be equipped with a manual fire alarm and automatic detection system installed for alerting staff.

[F]907.2.6.2.1 System initiation. Actuation of an automatic fire-extinguishing system, a manual fire alarm box or a fire detector shall initiate an approved fire alarm signal that automatically notifies staff. Pre-signal systems shall not be used.

[F]907.2.6.2.2 Manual fire alarm boxes. Manual fire alarm boxes need not be located in accordance with Section 907.3.1.1.1 when they are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted. Manual fire alarm boxes are allowed to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

[F]907.2.6.2.3 Smoke detectors. An approved automatic smoke-detection system shall be installed throughout residential housing areas, including sleeping areas and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Exceptions:

1. Other approved smoke-detection arrangements providing equivalent protection, including, but not limited to, placing detectors in exhaust ducts from cells or behind protective guards listed for the purpose, are allowed when necessary to prevent damage or tampering.
2. Sleeping units in Use Condition 2 and 3.
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an approved automatic sprinkler system.

[F]907.2.6.2.4 Zoning and annunciation. Alarm, supervisory and trouble signals shall be annunciated at the annunciation panel and respective signals to be transmitted to the central station. Such signals shall indicate the zone of origin. Separate zones shall be provided for individual fire protection systems, buildings, building levels, cell complexes and sections of floors compartmented by smoke-stop partitions. See 907.3.2.

[F]907.2.6.2.5 Monitoring. The fire alarm system shall be monitored by an approved central, proprietary or remote station service or by transmission of a local alarm which will give audible and visual signals at an approved constantly attended location.

[F]907.2.7 Group M. A manual fire alarms system shall be installed in Group M occupancies other than covered mall buildings complying with Section 402, having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge. Notification appliances shall be installed throughout the building.

Exception: Manual fire alarm boxes are not required if the building is equipped throughout with an automatic sprinkler system and the alarm notification appliances will activate upon sprinkler flow.

[F]907.2.7.1 Occupant notification. During times that the building is occupied, in lieu of the automatic activation of alarm notification appliances, the manual fire alarm system shall be allowed to activate an alarm signal at a constantly attended location from which evacuation instructions shall

be initiated over an emergency voice/alarm communication system installed in accordance with 907.2.14.2. The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided the manual fire alarm takes precedence over any other use. The emergency/voice alarm communication system shall be accessible to the fire department.

[F]907.2.8 Group R-1. A manual fire alarm and automatic detection system shall be installed in Group R-1 Occupancies as required in sections 907.2.8.1 through 907.8.4. Also see Section 907.2.14 for additional requirements.

[F]907.2.8.1 Manual Fire Alarm Systems. A manual fire alarm system shall be installed in Group R-1 Occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not over two stories when all individual guest rooms and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one-hour fire partitions and each individual guestroom has an exit directly to a public way, exit court or yard.
2. A manual fire alarm system is not required in buildings fully protected by an approved, monitored automatic fire sprinkler system having notification appliances, located throughout, activated upon water flow. At least one manual fire alarm box shall be provided at an approved location(s).

[F]907.2.8.2 Automatic fire alarm system. An automatic fire alarm system shall be provided in all common areas and interior corridors serving as a required means of egress for ten or more occupants.

[F]907.2.8.3 Smoke alarms. Smoke alarms shall be provided as required in Section 907.2.10. Such devices shall not be connected to the fire alarm system unless for annunciation only.

[F]907.2.8.4 Visible notification appliances. Guestrooms for persons with hearing impairments shall be provided with visible notification appliances activated by the in-room smoke detector. Additional visible notification appliances shall be provided which shall be activated by the building fire alarm system. Common or separate appliances for this purpose are permitted.

[F]907.2.9 Group R-2. A monitored manual fire alarm system shall be provided in Group R-2 Occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge.
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit or;
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions: Applicable to items 1, 2 and 3 above:

1. A manual fire alarm system is not required in buildings not over two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. A manual fire alarm system is not required in buildings fully protected by an approved, monitored automatic fire sprinkler system installed in accordance with Section 903.1.1 or 903.1.2, having notification appliances, located throughout, activated upon water flow. At least one manual fire alarm box shall be provided at an approved location(s).

3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected throughout by an approved automatic sprinkler system installed in accordance with Section 903.1.1 or 903.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1022.6 Exception 4.

[F]907.2.10 Single- and multiple-station smoke alarms in occupancy groups R-1, R-2, R-3 and R-4. Listed single- or multiple- station smoke alarms shall be installed in accordance with the provisions of this code and the household fire –warning equipment provisions of NFPA 72.

[F]907.2.10.1 Where required. Single- and multiple-station smoke alarms shall be installed in the locations described in Sections 907.2.10.1.1 through 907.2.10.1.3.

[F]907.2.10.1.1 Group R-1. Single- or multiple- station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas
2. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
3. In each story within the sleeping unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split-levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

[F]907.2.10.1.2 Groups R-2, R-3, R-4. Single- or multiple-station smoke alarms shall be installed and maintained in groups R-2, R-3, R-4, regardless of the occupant load at all the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.
3. In each story within a dwelling unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split-levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

[F]907.2.10.1.2.1.Visible notification appliances. Guestrooms for persons with hearing impairments shall be provided with visible notification appliances activated by the in-room smoke detector. Additional visible notification appliances shall be provided which shall be activated by the building fire alarm system. Common or separate appliances for this purpose are permitted.

[F]907.2.10.2 Power source. In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection. Branch circuits for smoke alarms shall be provided with a listed “lock on” device.

Exception: Smoke alarms are not required to be equipped with battery backup in Group R-1 where they are connected to an emergency electrical system.

[F]907.2.10.3 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in Group R-2, R-3 or R-4, or within an individual dwelling unit or sleeping unit in Group R-1, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

[F]907.2.10.4 Acceptance testing. When the installation of the alarm devices is complete, each detector and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the household fire warning equipment provisions of NFPA 72.

[F]907.2.11 Special amusement buildings. An approved automatic smoke detection system shall be provided in special amusement buildings in accordance with this section.

Exception: In areas where ambient conditions will cause a smoke-detection system to alarm, an approved alternative type of automatic detector shall be installed.

[F]907.2.11.1 Alarm. Activation of any single smoke detector, the automatic sprinkler system or any other automatic fire detection device shall immediately sound an alarm at the building and at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.11.2.

[F]907.2.11.2 System response. The activation of two or more smoke detectors, a single smoke detector with alarm verification, the automatic sprinkler system or other approved fire detection device shall automatically:

1. Cause the illumination of the means of egress with light of not less than 1 foot-candle (11 lx) at the walking surface level.
2. Stop any conflicting or confusing sounds and visual distractions; and;
3. Activate an approved directional exit marking that will become apparent in an emergency. Such system response shall also include activation of a prerecorded message, clearly audible throughout the special amusement building, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound which is distinctive from other sounds used during normal operation. The wiring to the auxiliary devices and equipment used to accomplish the above fire safety functions shall be monitored for integrity in accordance with NFPA 72.

[F]907.2.11.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is also allowed to serve as a public address system, shall be installed in accordance with 907.2.12.3. and be audible throughout the entire special amusement building. A Fire Command Center shall be provided. The Fire Command Center shall be a minimum 24sf, of 1-hr rated construction and have a minimum three feet (1m) clearance from the front of the control equipment. The Fire Command Center shall be located in an area approved by the Fire Department.

[F]907.2.12 High-rise buildings. Buildings having floors used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, shall be provided with an automatic fire alarm and detection system, emergency voice/alarm communication system, a fire department communication system and a smoke control system in accordance with Sections 907.2.12.2, 907.2.12.3,907.2.12.4 and 909. A Fire Command Center shall be provided in accordance with 907.2.12.1.

Exception: Buildings identified in IBC Section 403.1 Exception.

[F]907.2.12.1 Fire Command Center Construction. The FCC shall be contained in a room separated from the remainder of the building by 1-hour fire/smoke resistive construction. The room shall be used for no other purpose unless that use is approved by the Fire Department. No piping, ducts or equipment foreign to the required operations shall be permitted to enter, pass through or be

installed within the room. The room shall be ventilated and equipped with a smoke detection system and shall be sprinklered with a high temperature head. The FCC shall be located on the ground floor with a door that opens directly into the main lobby at a point in the lobby accessible directly from the exterior. The door to the FCC shall not be located on a dead-end corridor. The room shall be a minimum of 96 square feet (9m2) with a minimum dimension of 8 feet (2438 mm). A layout of the FCC and all features contained therein shall be submitted for approval prior to installation. The FCC shall be provided with an approved emergency power source.

[F]907.2.12.1.1 Equipment. The FCC shall contain the following:

1. The emergency voice/alarm communication system unit.
2. The fire department communications unit.
3. Fire detection and alarm system annunciator unit.
4. Annunciator visually indicating the location of the elevators and whether they are operational (elevator recall and supervisory panel).
5. The fire-fighters' smoke control panel (FSCP) per Section 909.
6. Controls for unlocking stairway and refuge area doors simultaneously. (per ICBA___)
7. Emergency generator panel per 907.2.12.7.
8. A telephone for fire department use with controlled access to the public telephone system.
9. Fire pump remote status panel per 907.2.12.8
10. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment, fire department access, interior generator and interior utility shut-off locations.
11. Site plan with North arrow, local street intersections, fire hydrants, fire department connection location, building entry points, exterior generator locations and exterior utility shut-off locations.
12. Work table 3'x5'.
13. Public address system, where specifically required by other sections of this code.

[F]907.2.12.2 Automatic fire detection. Smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system and shall place into operation all equipment necessary to prevent the re-circulation of smoke in accordance with Section 909. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment, or similar room which is not provided with sprinkler protection, elevator machine rooms and in all elevator lobbies.

2. In the main return air and exhaust air plenum of each air-handling system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94m3/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet. Duct type smoke detectors, shall cause a supervisory signal, not an alarm signal at the building annunciator panel. Detectors shall be listed for the air velocity in which they are installed.

3. Smoke detectors shall be installed in the outlet of fans used for pressurization of stairways, hoistways and refuge areas. Activation of these smoke detectors shall cause a supervisory signal, not an alarm signal at the building annunciator panel. Detectors shall be listed for the air velocity in which they are installed.

4. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum on an air-handling system. In Group R-1 and R-2 occupancies a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4m3/s) and serving not more than 10 air inlet openings. These detectors are not required where full corridor or full floor area detection is provided.

5. For Group R-1, R-2 and R-4 Occupancies, in all interior corridors serving as a means of egress for an occupant load of 10 or more.
6. For occupancies other than R-1, R-2 and R-4, not less than one foot but no more than three feet on the occupied side of each door that enters an area of evacuation assistance, elevator lobby and exit stairway which does not directly exit from an area of evacuation assistance.
7. At unenclosed openings extending vertically through floors, detectors shall be provided at each level at the perimeter of the opening, no closer than 4 feet and no further than 8 feet from the edge of the opening. Detectors at the highest level shall be installed to provide coverage 30 feet beyond the perimeter of the projected opening. (For atriums as defined by this code, see 907.2.16.)
8. Vertical openings for non-required stairwells/escalators in Group B and M occupancies. Smoke detectors shall be installed adjacent to the floor side of each opening where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and a smoke management system is provided in accordance with Section 909.
9. At the top of stairwells and in elevator hoistways as required for recall and shunt trip operation. These devices shall initiate an alarm condition and illuminate the respective indicator at the graphic annunciator. They shall not initiate occupant notification nor the smoke control sequence.

[F]907.2.12.3 Emergency voice/alarm communication system. Emergency voice/alarm communications systems shall be connected to a UL 864 listed fire alarm system. Components shall be listed under UL product category code designation UOXX or UUMW. The operation of any manual fire alarm box, automatic fire detector or water-flow device shall automatically sound an alert tone followed by voice instructions giving appropriate information and direction on a general and selective basis to the following terminal areas on the fire floor and the floors immediately above and below the fire floor and the level at which the Fire Command Center (FCC) is located:

1. Elevators (selective activation from the Fire Command Center only)
2. Each floor or level excluding mezzanines
3. Exit stairways (selective activation from the Fire Command Center only),
4. Assembly rooms of 1,000 occupants or more.

Exceptions:

1. In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.
2. In Group A occupancies with an occupant load of 1,000 or more, special amusement buildings only general notification is required.

[F]907.2.12.3.1 Manual override. A manual override for emergency voice communication shall be provided for all paging zones.

[F]907.2.12.3.2 Live voice messages. The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages to all areas indicated in 907.2.12.3.

[F]907.2.12.3.3 System design. Design of this communication system shall be such that the speakers on any one floor shall be connected to an alternate cable system so that damage or loss of any one speaker, cable, amplifier or pre-amplifier will not cause the failure of more than one-half of the communications systems of a given floor or zone. Speakers shall be installed so that each alternate speaker is connected to a different riser. The vertical communications systems cable shall be routed in a minimum of two risers separated by a distance at least 1/3 the diagonal

of the floor plate. If the risers cannot meet this separation, one riser shall be installed in a 2-hr rated enclosure separated from the other riser by a distance at least 20% of the diagonal measurement. Communication risers shall be installed in metallic conduit in accordance with the National Electrical Code (NEC).The horizontal communications systems cable shall be routed to provide a minimum separation of four (4) feet.

[F]907.2.12.3.3.1 Each exit stairway and elevator cab shall be provided with a dedicated communication circuit.

[F]907.2.12.3.3.2 In very high noise areas, such as theaters, nightclubs and dance halls, the system shall be designed to reduce or eliminate the background noise upon alarm initiation.

[F]907.2.12.4 Fire department communication system. Two-way telephone communications service shall be connected to a UL 864 listed fire alarm system. Design of the fire department communication system shall be one, or a combination, of the following:

1. Hardwired components consisting of plug-in phone jacks, permanent handsets, amplifiers and cable system for selective and "all-call' operation. Components shall be listed under UL product category code designation UOXX.
2. Radio communications using the "Department of Safety Radio Communications System" in accordance with 907.2.12.4.2 and DBCA Policy 32-B0xx

[F]907.2.12.4.1 Hardwired systems. An approved two-way, fire department communication system shall be provided for fire department use. It shall operate between the FCC and; elevators, elevator lobbies, emergency and standby power rooms, standpipe hose connection locations, the building engineer's office, mechanical rooms, elevator equipment rooms, fire pump rooms, areas of refuge, entries into required exit stairways and rooms containing the main electrical service disconnecting means. Design of this communication system shall be such that the jacks on any one floor shall be connected to an alternate cable system so that damage or loss of any one jack, cable, amplifier or pre-amplifier will not cause the failure of more than one-half of the communications systems of a given floor or zone. Jacks shall be installed so that each alternate floor is connected to a different riser. The vertical communications systems cable shall be routed in a minimum of two risers separated by a distance at least 1/3 the diagonal of the floor plate. If the risers cannot meet this separation, one riser shall be installed in a 2-hr rated enclosure separated from the other riser by a distance at least 20% of the diagonal measurement. Communication risers shall be installed in metallic conduit in accordance with the National Electrical Code (NEC). The horizontal communications systems cable shall be routed to provide a minimum separation of four (4) feet.

Fire Department communication system jacks shall be designed to prevent feedback by being arranged in such a manner that when a handset is plugged in, it will disconnect any voice communication system speaker in the immediate area. Wiring supervision to this speaker is not required to be maintained during this use.

A firefighter's telephone handset shall be permanently mounted in the building engineer's office, each mechanical room with fans used for smoke control, emergency or standby power room, each fire pump room, the rooms containing the main electrical service disconnecting means and each elevator equipment room. Each permanently mounted handset shall initiate a signal from the handset to the FCC. A minimum of six spare handsets shall be provided in an approved cabinet located in the FCC.

Each circuit on the two-way fire department communication system shall have a separate control switch on the fire alarm control panel.

[F]907.2.12.4.2 Radio systems. It is the responsibility of the building owner to ensure that the public safety radio communications system functions within all areas of the facility including enclosed parking garages. Those areas that shield radio communications shall be remedied through the use of currently acceptable technology, i.e. bi-directional amplifiers with radiating ("leaky coax") cable or a discrete distributed antenna system in accordance with DBCA Policy 32-B0xx. Areas that typically need to be evaluated for poor communications are; below grade rooms, parking garages, elevators and areas surrounded by metal and/or concrete.

Radio communications systems shall operate on the frequencies designated by the Fire Department and designed such that in addition to all areas of the facility described in section 907.2.12.3, stair enclosures, penthouses, basements and enclosed parking structures shall also be transparent to communication signals. Those areas that attenuate the available signal below an acceptable level shall be remedied by providing a radio repeater system as described in DBCA Policy 32-B0xx. Coverage shall be overlapping such that loss of any one amplifier or cable shall not result in complete loss of communication to any floor or zone. Amplifiers shall be powered by a dedicated uninterruptible power source (UPS) with a minimum backup time of eight (8) hours with all amplifiers at rated output. The UPS input circuit shall be a dedicated circuit and connected to the emergency/standby generator, where provided. The circuit shall be provided with a listed "lock on" device.

Acceptance of the completed communication system shall be based upon an on-site survey performed by fire department technical personnel. System integrity shall be maintained through implementation of a "Radio Frequency Control Plan" as described in DBCA Policy 32-B0xx. System tests witnessed by a fire department representative shall be conducted in accordance with DBCA Policy 32-B0xx. Documentation of test results shall be maintained on-site with a copy provided to the Fire Prevention and Investigation Division.

[F]907.2.12.5 Annunciation. Point-lit graphic annunciation shall be provided in accordance with 907.4.8.5.

[F]907.2.12.6 Elevator Recall and Shunt trip. All elevators shall be provided with Phase I and Phase II emergency recall per ANSI/ASME A17.1 and Section 3007. Any fire-alarm initiating device shall return to the primary level, nonstop, all elevators serving that alarm zone except for the smoke detector in the elevator lobby at the primary level which shall return the elevators to an alternate level. Both the primary and alternate levels shall be approved by the Fire Department. Elevators without a landing at grade level shall be returned to the landing that is closest to grade level or other approved level. The elevator doors shall remain open for one minute then close. Elevators shall remain at the level where they returned until being manually overridden by the operator key switch required by ANSI/ASME 17.1 or the elevator control panel in the FCC.

Elevator shunt trip shall be provided for all elevators in accordance with ANSI/ASME A17.1. Recall and shunt trip detectors shall be located in accordance with NFPA 72. These detectors shall be connected to the building fire alarm system. Control circuits to shut down elevator power shall be monitored for presence of operating voltage. Loss of voltage to the control circuit for the disconnecting means shall cause a supervisory signal to be indicated at the fire alarm panel and required remote annunciators.

[F]907.2.12.6.1 Elevator recall control and supervisory system. In buildings without a building fire alarm system, system smoke detectors and a dedicated fire alarm system control unit shall be provided that is designated as an "elevator recall control and supervisory panel". The system shall be designed and installed in accordance with NFPA 72 and ANSI/ASME A17.1. Control circuits to shut down elevator power shall be monitored for presence of operating voltage. Loss of voltage to the control circuit for the disconnecting means shall cause a supervisory signal to be indicated at the control unit and required remote annunciators.

[F]907.2.12.6.2 Elevator recall control and supervisory panel.

1. Identify each elevator cab numerically and the floors it serves. Identify corresponding cab number in elevator cab at permanent handset.
2. Indication of which elevator(s) are on emergency power.
3. Placard at elevator status/control panel stating how many elevators can operate under emergency power simultaneously.
4. Elevator car position indicator.
5. Key switches as required for selective activation of cars, if all are not provided with emergency power for simultaneous operation.

[F]907.2.12.7 Emergency Generator Panel

1. 1. Operating status (on-off) and malfunction indication panel as required by NFPA 110
2. Indication of transfer switch position (normal-emergency)
3. Indication that generator is in automatic mode
4. Main fuel oil storage tank fuel level gauge
5. If pumping is required from a main fuel tank to a diesel engine a duplex pumping system shall be provided. Emergency fuel flow controls are required in the FCC.
6. Fuel tanks shall be located at or below grade level. See Fire Code.

[F]907.2.12.8 Fire Pump Panel

1. Remote operating status indication panel as required by NFPA 20.
2. Motor/engine running/on or off
3. If pumping is required from main fuel tank to diesel fire pump, a duplex pumping system shall be provided. Emergency fuel flow controls are required in Operations Center.
4. Fuel level indicator for fire pump fuel tank.
5. Fuel tanks shall be located at or below grade level. See Fire Code.

[F]907.2.13 Atriums connecting more than two stories. A fire detection system shall be installed in occupancies with an atrium that connects more than two stories. The system shall be activated in accordance with this section. All smoke detectors shall be accessible for maintenance and testing.

1. Area type smoke detectors, spaced in accordance with NFPA 72, shall be installed at the atrium ceiling where the ceiling is 30 feet or less from the floor of the atrium. If the ceiling is greater than 30 feet from the atrium floor, beam type detectors shall be installed. A detection system with alarm verification may be installed. The initial device in alarm shall initiate a supervisory condition at the fire alarm panel.
2. On the underside of projections into the atrium, spaced in accordance with NFPA 72.
3. Around the perimeter of the atrium opening on all floors open to the atrium. The detectors shall be spaced not more than 30 feet (9144mm) on center and shall be located within 15 feet (4572mm) of the atrium opening.
4. In high-rise buildings, where any part of the floor is open to an atrium, smoke detectors shall be located throughout the floor not included in the atrium area for every 2500sf of occupied floor space. No smoke detector shall serve more than one smoke zone.

[F]907.2.13.1 Annunciation. Point-lit graphic annunciation shall be provided per 907.4.8.5.

[F]907.2.14 High-piled combustible storage uses. Where required by Chapter 23 of the fire code, high-piled combustible storage areas shall be provided with an automatic fire-detection system.

[F]907.2.15 Special egress-control devices. When special egress-control devices are installed on exit doors, an automatic smoke-detection system shall be installed throughout the area in which the devices are located. Activation of any building alarm shall automatically unlock doors in accordance with IBC Chapter 10.

[F]907.2.16 Aerosol storage uses. When required by Chapter 28 of the Fire Code, aerosol storage rooms and general-purpose warehouses containing aerosols shall be provided with an approved manual fire alarm system.

[F]907.2.17 Lumber, plywood and veneer mills. Lumber, plywood and veneer mills shall be provided with a manual fire alarm system.

[F]907.2.18 Underground buildings with smoke exhaust system. Where a smoke exhaust system is installed in an underground building in accordance with this code, automatic fire detectors shall be provided in accordance with this section.

[F]907.2.18.1 Smoke detectors. A minimum of one smoke detector listed for the intended purpose shall be installed in the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m3/s) and serving not more than 10 air inlet openings.

[F]907.2.18.2 Alarm required. Activation of the smoke exhaust system shall activate an audible alarm at a constantly attended location where provided, or a local alarm to notify occupants.

[F]907.2.18.3 Annunciation. Point-lit graphic annunciation shall be provided per 907.4.8.5.

[F]907.2.19 Underground buildings. Where the lowest level of a structure is more than 60 feet (18 288 mm) below the lowest level of exit discharge, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.2.12.3.

[F]907.2.19.1 Public address system. Where a fire alarm system is not required by Section 907.2, a public address system shall be provided that shall be capable of transmitting voice communications to the highest level of exit discharge serving the underground portions of the structure and all levels below.

[F]907.2.20 Covered mall buildings. Covered mall buildings exceeding 50,000 square feet (4645 m2) in total floor area shall be provided with a Fire Command Center. An emergency voice/alarm communication system per section 907.2.12.3 shall be provided. A smoke control system shall be provided per Section 909. The Fire Command Center shall be a minimum of 24sf, of 1-hr rated construction and have a minimum three feet (1m) clearance from the front of the control equipment. The Fire Command Center shall be located in an area approved by the Fire Department.

[F]907.2.20.1 Annunciation. Zone-lit or point-lit graphic annunciation shall be provided per 907.4.8.4 or 907.4.8.5.

[F]907.2.21 Residential aircraft hangars. A minimum of one listed smoke alarm shall be installed within a residential aircraft hangar as defined in Section 412.3.1 and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm that will be audible in all sleeping areas of the dwelling.

[F]907.2.22 Airport traffic control towers. An automatic fire detection system shall be provided in airport traffic control towers. See Section 430.5.5.

[F]907.2.23 Battery rooms. An approved automatic smoke detection system shall be installed in areas containing stationary and valve –regulated lead-acid battery systems having a liquid capacity of more than 50 gallons (189.3L). The detection system shall be monitored by an approved central, proprietary or remote station service where a fire alarm system is provided. In buildings without a fire alarm system, a local alarm shall sound an audible and visual signal at a constantly attended location or immediately outside the battery room. See also Sections 608 and 609 of the Fire Code.

907.2.24 Smoke-control systems. An approved automatic smoke-detection system shall be provided when required by Section 909 for activation of the smoke-control system.

907.2.25 Passenger terminal and concourse buildings. See Section 430.8.5.

[F]907.3 RESERVED

[F]907.4 General system design and installation requirements. Fire alarm systems, automatic fire detectors, emergency voice/alarm communication systems and notification devices shall be designed, installed and maintained in accordance with NFPA 72. Installation system wiring shall also be in accordance with NFPA 70 (NEC).

[F]907.4.1 Equipment. System assemblies and components shall be listed and approved for the purpose for which they are intended. All components shall be compatible with the system in which installed.

[F]907.4.1.1 Manual fire alarm boxes. Manual fire alarm boxes shall be installed in accordance with Sections 907.4.1.1.1 through 907.4.1.1.5.

[F]907.4.1.1.1 Location. Manual fire alarm boxes shall be located not more than 5 feet (1524mm) from the entrance to each exit. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet (60 960mm).

[F]907.4.1.1.2 Height. The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067mm) and a maximum of 48 inches (1219mm), measured vertically, from the floor level to the activating handle or lever of the box.

[F]907.4.1.1.3 Color. Manual fire alarm boxes shall be red in color.

[F]907.4.1.1.4 Signs. Where fire alarm systems are not monitored by a supervising station, an approved permanent sign that reads: LOCAL ALARM ONLY, PULL AND CALL 911 shall be installed adjacent to each manual fire alarm box. Where additional digits are required to access the public telephone system, signage shall reflect the additional digits required.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

[F]907.4.1.1.5 Protective covers. The building official or fire department is authorized to require the installation of listed manual fire alarm box protective covers to prevent malicious false alarms or provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal shall not be installed unless approved by the fire department.

[F]907.4.1.2 Control units, annunciator panels and access keys. All fire alarm control panel and annunciators shall be approved by the fire department. Locations are subject to field approval. Access keys to locked fire alarm equipment shall be maintained in an approved location. Fire alarm system reset and silence functions of the fire alarm control unit shall not be restricted by the need for a key or special numeric code to access these functions. Access to the reset and silence operator interface shall be secured behind a locked door. System zone and device disable functions shall not be accessible without a technician-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 a fire watch.

Exception: In existing buildings undergoing a panel replacement, remote annunciators with silence and reset functions may be provided when approved by the Department. These units shall not be equipped with "enable/disable" switches and shall be contained behind a transparent, lockable cover.

[F]907.4.1.2.1 Power supply. The fire alarm control panel shall be fed from a dedicated 120v ac branch circuit. The branch circuit overcurrent protection shall be equipped with a "lock-on" device. The primary and secondary power supplies for the fire alarm system shall be provided in accordance with NFPA 72.

[F]907.4.1.3 Wiring. Fire alarm system and communications wiring shall comply with provisions of NFPA 72 and NFPA 70 (NEC) Article 760 requirements for fire alarm and communications systems. Wiring color code shall be consistent throughout the entire system and permanently posted inside the fire alarm control panel. Separate colors shall be used for each type of initiating circuit, indicating circuit and control circuit. Color-coding shall be by continuous colored insulation or by application of 6-inch long colored heat-shrink tubing at the end of each conductor at all splices, taps and terminations.

[F]907.4.1.4 Activation. Where an alarm notification system is required by another section of this code, it shall be activated by:

1. The automatic fire detection system.
2. Sprinkler water flow devices.
3. Manual fire alarm boxes.

Exceptions:

1. Single-station detectors in dwelling units, rooms used for sleeping purposes in hotel and lodging houses, and patient sleeping rooms in hospitals and nursing homes.
2. Duct detectors shall initiate a supervisory signal only. See 907.11.
3. Occupant notification is not required upon activation of detectors at the top of stairwells and in elevator hoistways.

[F]907.4.2 Alarm notification. Audible and visual alarm notification shall be provided to alert occupants of the area having a fire alarm system as well as in the means of egress serving the occupancy. The fire alarm control panel shall incorporate an audible-alarm silencing switch that shall not cancel the visual alarm until the system is manually reset. Alarms shall be provided per 907.4.2.1 and 907.4.2.2, and as required by other sections of this code.

[F]907.4.2.1 Audible alarms. Fire alarm notification appliances shall sound a distinctive sound that is not to be used for any other purpose. The audible signal shall be the standard fire alarm evacuation signal as described in ANSI S3.41. Audible alarm signals shall be audible above the ambient sound conditions in accordance with NFPA 72. The audible alarm shall provide a sound pressure level of 15decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupied space within the building. The minimum sound pressure levels shall be: 70 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms and 60 dBA in other occupancies. The maximum sound pressure level for audible alarm notification appliances shall be 120 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 105 dBA, visual alarm notification appliances shall be provided in accordance with NFPA 72.

In theaters, nightclubs, dance halls and similar areas, means shall be provided to reduce or eliminate background noise upon activation of the fire alarm system. The fire alarm system shall produce a sound level at least 15dBA above the reduced average ambient sound level or 5dBA above the maximum sound level having a duration of at least 60 seconds whichever is greater. The reduced sound level shall not require audible notification to exceed 115dBA.

Exception: This audible notification is not required for systems using prerecorded or live voice message announcement.

[F]907.4.2.2 Visual alarms. Visible notification shall be provided in toilet rooms accessible to the handicapped, in corridors, public and common areas and in areas of assembly. Visual alarms shall be installed in accordance with NFPA 72.

Exceptions:

1. Visual alarm signals in patient and inmate areas of Group I Occupancy may be provided per 907.2.6.
2. Visual notification appliances shall not be installed in stairwells
3. In existing buildings with only audible alarms, visual alarms are not required to be added during the course of any tenant finish or fire alarm system modification work. If a building owner desires to install visual alarms, the number and location shall be at the owner's discretion. A separate circuit between the fire alarm control panel and the visual appliances is not required. This exception does not apply if the building is undergoing a change in use or visual alarms are required to correct an exiting deficiency as described in Section 10.

[F]907.4.2.3 Presignal systems shall not be installed.

Exception: Group I occupancies per 907.2.6 Exception 3.

[F]907.4.3 Connection to other systems. A fire alarm system shall not be used for any other purpose other than fire warning.

[F]907.4.4 Monitoring Integrity. Conductors and connections which interconnect equipment, devices and appliances, shall be monitored for integrity, as set forth in NFPA 72 .

[F]907.4.5 Survivability. Fire alarm system survivability shall be provided in accordance with NFPA 72.

Exception: Notification appliance circuits shall not be run in stairwells except for the specific devices located in the stair enclosure.

[F]907.4.6 Automatic telephone dialing devices. Automatic telephone dialing devices used for the transmission an emergency alarm from a protected premises or central station shall not be connected to any fire department telephone number.

[F]907.4.7 Remote indicating lights. A remote indicating light shall be installed for detector(s) within each room with an entry door. The indicating light shall be located above the door, on the exit corridor side. This shall include each door leading through adjoining or intervening rooms from an exit corridor to that room (progressive type). Remote indicating lights shall be installed on the ceiling directly below detectors located above ceilings. Remote indicating lights for duct detectors shall be installed in an accessible area directly below or adjacent to the detector. Remote indicating lights shall remain lit until the fire alarm system is reset. Remote indicating lights may be deleted where a point-lit graphic annunciator is provided.

[F]907.4.8 Annunciator panels. Annunciator panels shall be; point-lit graphic, zone-lit graphic or a directory point display type. Upon initiation of an alarm, supervisory or trouble condition the panel shall record the status and "lock-in" until the fire alarm system is reset with a dedicated reset switch located at the main fire alarm control panel. Annunciation lights shall be Red for Alarm and Yellow for Trouble and Supervisory Signals. Each signal type shall be distinctly identified.

[F]907.4.8.1 Annunciation. All fire alarm systems shall be divided into alarm zones. When two or more alarm zones are provided, visible annunciation shall be provided at an approved location. Alarm zones shall comply with 907.4.8.2 unless otherwise approved by the fire department. Annunciator panels shall comply with 907.4.8.

[F]907.4.8.2 Annunciation zones. Each building level shall be annunciated separately as follows:

1. All manual devices.
2. All automatic devices. No single zone shall exceed 22,500 square feet. No detection zone shall exceed 300 feet in length in any direction.
3. Where standpipes are required per ICC section 905, at each fire sprinkler water flow detection device. Sprinkler zones shall comply with NFPA 13.
4. Separate visual indication shall be provided for:
    a. Main fire sprinkler flow.
    b. Each special extinguishing system.
    c. Each non-required system.
    d. Each special detection system.
    e. Each stairway (where detection is provided).
    f. Each elevator hoistway.
    g. System trouble.
    h. Sprinkler control valves (supervisory only). Maximum 20 devices per zone.
    i. Duct detectors (supervisory only). Maximum 20 devices per zone.

[F]907.4.8.3 Directory annunciator. A directory annunciator shall be provided as required. Location shall be field approved. The annunciator shall be provided with individual alarm and trouble indications per 907.4.8.2 for each zone. Indicators shall be of sufficient size and intensity to be visible in normal lighting. Building plans shall be permanently mounted adjacent to directory type annunciator panels. Plans shall be of durable construction, easily readable in normal lighting, have a smooth plastic surface and shall clearly indicate the building outline and boundary of each zone and have a "you are here" with North orientation arrow. The plans shall clearly indicate the building address, stairwells, elevator shafts, emergency generator location, fire pump location, fire sprinkler valves, standpipe hose outlets, electrical service equipment and each initiating device. One plan may be used for typical levels. Plans shall also include; adjacent street intersections, local fire hydrant locations and the location of the fire department connection. Each zone on the annunciator shall be permanently labeled to indicate the location and to identify the type of initiating device.

[F]907.4.8.4 Zone-lit graphic annunciator. Upon approval by the fire department, a zone-lit graphic annunciator may be provided in lieu of the directory annunciator. The annunciator shall incorporate a building plan including all the features of the plans required in 907.4.8.3, with the addition of relevant indicating lights located within the appropriate zone representing the initiating devices within that zone. The annunciator shall be provided with a momentary push-button "Lamp Test". Zoning shall comply with 907.4.8.2. Location shall be field approved.

[F]907.4.8.5 Point-lit graphic annunciator. A graphic annunciator shall be provided as required. Location shall be field approved. The annunciator shall consist of building plans per 907.4.8.3 with the addition of discrete indication for each alarm initiating device. The annunciator shall be provided with a momentary push-button "Lamp Test". Separate indications for "Trouble" and "Supervisory" conditions shall be provided.

[F]907.4.8.5.1 Where required. A point-lit graphic annunciator is required in high-rise buildings, buildings with an atrium and underground buildings with a smoke exhaust system.

[F]907.4.9 Systems Status. When required by the fire department, fire alarm supervisory and trouble signals shall be reported to an approved central, proprietary or remote supervising station or at the protected premise at a constantly attended location in accordance with the requirements of NFPA 72.

[F]907.5 Acceptance test. Upon completion of the installation, a witnessed test of the entire system shall be made in the presence of fire department personnel. All functions of the system shall be tested. Testing shall be accomplished in accordance with NFPA 72.

[F]907.6 Record of completion. A record of completion in accordance with NFPA 72 verifying that the system has been installed in accordance with the approved plans and specifications shall be provided to the owner and the Denver Fire Prevention and Investigation Division.

[F]907.7 Instructions. Operating, testing and maintenance instructions and record drawings ("as builts") and equipment specifications shall be provided and maintained at the building engineer's or managers's office, fire command center or other approved location.

[F]907.8 Inspection, testing and maintenance. The maintenance and testing schedules and procedures for fire alarm and detection systems shall be in accordance with NFPA 72. Records of inspections, tests and maintenance shall be provided to Denver Fire Prevention and Investigation Division. Report format shall comply with FPB Policy xxxx.

[F]907.9 Non-required full or partial systems. Only approved fire alarm control panels are allowed. 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 or Class II central station. Multiple central station connections from one building are not permitted. Non-required full or partial fire alarm or fire detection systems are required to comply with NFPA 72. Annunciation shall be provided in accordance with Section 907.4.8. Annunciator and control panels for non-required or partial systems shall have permanent signage indicating "Non-required System" or "Partial System". Partial fire alarm and/or fire detection systems installed in a building having a required fire alarm system shall be annunciated separately on the building fire alarm annunciator panel.

[F]907.9.1 General system design and installation requirements. Shop drawings must be submitted for approval. Documents shall be stamped and signed by a Colorado registered engineer, unless the building is one story, without basements and less than 5,000sf. The following minimum criteria apply:

1. Provide one audible/visual alarm per floor.
2. Strobes need not remain flashing when audibles are silenced.
3. Provide one initiating device zone per floor.

4. Manual pull stations are optional.
5. Remote indicating lights are optional.
6. Duct detectors in existing HVAC systems are not required to be connected to the fire alarm system. Additional duct detectors will not be required.
7. Battery backup will be required for the FACP. Electrical connection shall be to a dedicated circuit.
8. Partial or non-required systems shall be maintained operational or shall be removed. System removal shall be approved by the Fire Department.
9. Non-required systems installed in adjacent tenat spaces are not required to be interconnected.
10. Non-required systems installed in a building with a required fire alarm system shall have the non-required system connected to the required fire alarm control panel. Each non-required system shall annunciate as a separate zone at the required fire alarm control panel. Multiple fire alarm control panels are not allowed where a required system is installed.

[F]907.10 Fire Safety Functions. Fire safety functions are intended to increase the level of life-safety for occupants or to control the spread of the harmful effects of fire. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control panel where a fire alarm system is required by Section 907.2. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or a visible and audible supervisory signal at a constantly attended location where provided. In buildings not required to be equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

[F]907.11 Elevator Recall and Shutdown. Elevator recall and shunt trip shall be provided for all elevators in accordance with ANSI/ASME A17.1. Detectors shall be located in accordance with NFPA 72. In buildings with a fire alarm system, these detectors shall be connected to the building fire alarm system. In buildings without a fire alarm system, system smoke detectors and a dedicated fire alarm system control unit shall be provided that is designated as an "elevator recall control and supervisory panel". The system shall be designed and installed in accordance with NFPA 72 and ANSI/ASME A17.1. Control circuits to shut down elevator power shall be monitored for presence of operating voltage. Loss of voltage to the control circuit for the disconnecting means shall cause a supervisory signal to be indicated at the control unit and required remote annunciators.

Exception: Elevators in high-rise buildings shall comply with 907.2.12.6.

[F]907.12 Duct smoke detectors. Duct smoke detectors shall be connected to the building's fire alarm control panel when a fire alarm system is provided and when activated shall initiate supervisory signal to the monitoring station. Duct smoke detectors shall not be used as a substitute for required open-area detection. Spot-type smoke detectors may be used for return air system connection to vertical risers serving two or more stories. Detectors shall be placed no more than 12" horizontally and no higher than 4" below the top of the duct opening and positioned to ensure maximum exposure to the airstream entering the duct. Detectors shall be listed for the maximum anticipated airflow. Detectors concealed above the ceiling shall be provided with a remote indicating light mounted on the ceiling directly below the device.

Exception: In occupancies not required to be equipped with a fire alarm system, actuation of a duct smoke detector shall activate a visible and audible signal at an approved location. Duct smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

[F]907.13 Access. Access shall be provided to each detector for periodic inspection, testing and maintenance.

[F]907.14 Fire-extinguishing systems. Automatic fire-extinguishing systems shall be connected to the building fire alarm system where a fire alarm system is required by another section of this code or is otherwise installed.

Section [F]909 – SMOKE CONTROL SYSTEMS, is deleted in its entirety and replaced by the following. (amendment to 2003 IFC)

SECTION [F]909
SMOKE CONTROL

[F]909.1 Scope and Purpose. This design method of smoke control has been developed over 20 years within the City of Denver and uses the rational approach for the design, installation and performance verification of smoke control systems and applies to mechanical smoke control systems. The purpose of this Section is to establish minimum requirements for the design and installation of smoke control systems which are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of content or for assistance in fire suppression or overhaul activities. Nothing within these requirements is intended to apply when smoke control is not otherwise required by this Code. Smoke control systems are not a substitute for sprinkler protection.

[F]909.2. Where required. Smoke control systems are required for high-rise buildings, airport buildings, covered mall***s*** including anchor buildings, atriums, any other special occupancy and large assembly area as determined by the Building and Fire Departments.

[F]909.3 General design requirements. Smoke control systems shall comply with the requirements of this section.

[F]909.3.1 Minimum pressure difference. The minimum pressure difference across a smoke barrier shall be 0.05-inch water gauge (0.0124 kPa).

[F]909.3.2 Maximum pressure difference. The maximum pressure difference across a smoke barrier shall be determined by the required door-opening or door-closing forces.

[F]909.3.3 Activation. Smoke control systems shall be automatically activated by automatic detection devices, water flow, manual pull station and manual operation from the Fire Command Center (FCC). Activation by any alarm initiating device shall be as described herein.

[F]909.3.4 Detection and control systems. Smoke control systems shall be controlled by a U.L. 864 listed fire alarm system meeting the requirements of NFPA 72. The fire alarm system shall also be listed for smoke control use under UL product category guide designation UUKL. Upon an alarm, the fire alarm system shall take direct control of all smoke control components such as fans, dampers, pressure control and status indication from any temperature control or building automation systems. Hard-wired interlock is acceptable. The fire alarm system shall provide automatic and manual override control and status. Terminal air distribution units may remain under their own normal building automation control. Safety devices for protection against injury and equipment damage shall not be overridden during smoke control operation or from the FCC (e.g. excessive fan vibration, high fan discharge and suction pressure and power supply overloads. Freezestats shall be overridden to allow for 100% outside air supply to system. For manual system operation see Section 911.3.4.

[F]909.3.5 System response time. Smoke control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. The total response time for individual smoke control systems to achieve their desired operating mode shall not exceed the following time periods:

Fan operating at desired state – 75seconds.

Damper position travel – 60seconds.

[F]909.3.6 Smoke barrier construction and opening protection shall comply with IBC Section 709.

[F]909.3.7 Emergency Power. Equipment and controls necessary for proper operation of a smoke control system required by this code shall be provided with an approved emergency power source.

[F]909.4 Smoke Control Systems for Atriums. Buildings with atriums shall be provided with a smoke control system as specified by this Section. The atrium volume shall include all spaces not separated from the atrium by the provisions of IBC Section 404.5.

[F]909.4.1 Design Criteria. A mechanically operated air-handling system shall be installed that will exhaust smoke either entering or developed within the atrium. The smoke control system may be dedicated to the atrium or integrated with other air-handling systems. Outside air intakes shall be less than 50 feet above grade.

Exception: In atriums with lowest floor level greater than 50 feet above grade, the outside air intakes may be within 10 feet of this *floor*

[F]909.4.1.2 Exhaust openings shall be located in the ceiling or in a smoke trap area immediately adjacent to the ceiling of the atrium. The lowest level of the exhaust openings shall be above the top of the highest portion of the door openings into the atrium.

[F]909.4.1.3 Mechanically operated pressurization and exhaust systems shall be provided in new atriums constructed in existing buildings as approved by the Building and Fire Departments.

[F]909.4.2 Atriums within high rise buildings shall comply with both the requirements for the atrium and for the high rise portion of this Code.

[F]909.4.2.1 Floors partially open to the atrium in high-rise buildings. Activation of a smoke detector located in the area separated from the atrium shall initiate floor exhaust, general building pressurization and pressurization of stairways and hoistways.

[F]909.4.3 Atriums 55 feet or less in height with a volume of 600,000 cubic feet or less. The system shall exhaust a minimum of 6 air changes per hour. Gravity supply or fan powered supply shall be provided within 10 feet of the lowest level of the atrium and be sized for 75% of the exhaust. A maximum velocity of 800 feet per minute shall be maintained across the net free area of the supply air openings.

[F]909.4.4 Atriums 55 feet or less in height with a volume in excess of 600,000 cubic feet. The system shall exhaust a minimum of four air changes per hour. Gravity supply or fan powered supply shall be provided within 10 feet of the lowest level of the atrium and be sized for 75% of the exhaust. A maximum velocity of 800 feet per minute shall be maintained across the net free area of the supply air openings

[F]909.4.5 Atriums in excess of 55 feet in height. The system shall exhaust a minimum of four air changes per hour. A minimum of 50% of the volume of supply air shall be sized and introduced via gravity supply or fan powered inlets within 10 feet of the lowest level of the atrium. The total volume of supply air shall be 75% of the required volume of exhaust air.

[F]909.4.6 Activation. Activation of two smoke detectors in the atrium shall initiate the atrium exhaust sequence. In high-rise buildings; spaces separated from the atrium, elevator hoistways, elevator lobbies/corridors and stairways shall be pressurized.

[F]909.5 Smoke Control Systems for High Rise Buildings. High-rise buildings shall be provided with a mechanical smoke control system in accordance with this section.

[F]909.5.1 Door opening force. Stairwell and refuge area door opening force shall not exceed 30 pounds applied horizontally at the latch side of the door on the door-opening device under any operating condition.

[F]909.5.2 Stairway Pressurization. All interior enclosed exit stairways shall be mechanically pressurized with outside air, upon activation of a manual or automatic alarm-initiating device or fire sprinkler water flow. A minimum positive pressure of 0.05" w.c. across any closed stairway door with general building pressurization systems off and all stairway doors closed shall be maintained. Each interior enclosed exit

stairway shall have a separate dedicated pressurization system. Supply air for the stairway shall be obtained from outside air intakes mounted so that they will not be contaminated by products of combustion, with a minimum of 50% of the air drawn from intakes located not more than 50 feet above grade. Stairway pressurization systems shall not have fire or smoke dampers. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the FCC graphic panel and illuminate a yellow lamp adjacent to the fan status indicator on the firefighters smoke control panel. The capability to manually override the operation of each fan shall be provided to Fire Department personnel in the FCC. Fans shall not shut off until manually overridden by Fire Department personnel or until the fire alarm system is reset. Each pressurization system from the outside air intake to the stairway enclosure penetration shall be enclosed in a 2-hour fire-resistive enclosure. The air volume introduced into the stairway shall be as follows: 15 floors or less, at least 1,000 cfm per floor; 16 floors or more, at least 15,000 cfm, plus 200 cfm per floor level in excess of 15 floors with 1" w.c. static pressure minimum at duct penetration into hoistway. Static pressure control and variable frequency drive shall be provided for fan speed control.

[F]909.5.3 Elevator Hoistway Pressurization. Elevator hoistways shall be mechanically pressurized with outside air, upon activation of any manual or automatic alarm-initiating device or fire sprinkler water flow. A minimum positive pressure of 0.05" w.c. across any closed elevator hoistway door measured with general building pressurization systems off, and all transfer air openings from the elevator hoistway to the elevator lobby/refuge area closed, must be maintained. Each elevator hoistway shall have a separate dedicated pressurization system. The supply air for each hoistway shall be obtained from outside air intakes mounted so they will not be contaminated by products of combustion, with a minimum of 50% of the air drawn from intakes located not more than 50 feet above grade. Elevator hoistway pressurization system supply air ductwork shall not have fire or smoke dampers. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the FCC graphic panel and illuminate a yellow lamp adjacent to the fan status indicator on the firefighters smoke control panel. Fans shall not shut off until manually overridden by Fire Department personnel or until the fire alarm system is reset. Each pressurization system from outside air intake to the hoistway penetration shall be enclosed in a 2-hour fire-resistive enclosure. Elevator hoistway pressurization systems shall be sized for a minimum of 15,000 CFM per bank (shaft) of elevators, plus 300 CFM per door opening per floor, with 1" w.c. static pressure minimum at duct penetration into hoistway. Static pressure control or variable frequency drive shall be provided for fan speed control.

[F]909.5.3.1 Smoke venting of pressurized elevator hoistways to the exterior of the building shall not be required. If provided, vent operation shall comply with Section 3004.1.1.

[F]909.5.3.2 Hoistway pressurization shall not interfere with the opening and closing of elevator doors.

[F]909.5.4 Elevator Machine Rooms. Elevator machine rooms shall not be pressurized from outside but rather indirectly from the elevator hoistway pressurization system through the cable slots.

[F]909.5.5 Elevator Lobbies/Refuge Areas pressurization. Elevators on all floors shall open into elevator lobbies as required by the IBC. Elevator lobbies shall be designated as Refuge Areas per IBC. Pressurization of elevator lobbies/refuge areas shall be provided by either of the following methods.

1. Supply air for elevator lobbies/refuge areas shall be obtained from outside air intakes mounted so that they will not be contaminated by products of combustion, with a minimum of 50% of the air drawn from intakes located not more than 50 feet above grade. Elevator lobby/refuge area supply air ductwork for pressurization systems shall not have fire or smoke dampers. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the FCC graphic panel and illuminate a yellow lamp adjacent to the fan status indicator on the firefighters smoke control panel. Fan shall not shut off until manually overridden by Fire Department personnel or fire alarm system is reset. Each pressurization system from outside air intake to the riser or shaft penetration shall be enclosed in a 2-hour fire-resistive enclosure.

2. Elevator lobby/refuge areas may be pressurized using the elevator hoistway pressurization system by transferring air to the elevator lobby/refuge area with the use of transfer openings. Penetration of the elevator shaft wall shall be protected with fire/smoke dampers listed under UL Standards 555 and 555S. Upon opening of the transfer air openings from the elevator hoistway to the elevator lobby/refuge area, the elevator hoistway shall not be required to maintain 0.05 inch of water column (w.c.) positive pressure differential relative to adjacent elevator lobby/corridor/refuge area.

[F]909.5.6 Pressurization of Elevator Lobbies/Refuge areas for Group A, B, E and M Occupancies. All elevator lobbies/refuge areas shall be pressurized, upon activation of any manual or automatic alarm-initiating device or floor sprinkler water flow, to maintain a minimum positive pressure of 0.05 inch of water column (w.c.) with respect to adjacent occupied spaces. Measurements shall be taken with elevator doors closed, stairway, hoistway and elevator lobby/refuge area pressurization systems in operation and general building pressurization systems off. The maximum pressure shall not create an opening force on any elevator lobby door greater than 30 pounds applied at the latch side of the door on the door-opening device under any operating condition. Pressure shall not interfere with the opening and closing of elevator doors.

Exception: Grade level elevator lobbies/corridors.

[F]909.5.7 Pressurization and Exhaust of Elevator Lobbies/Corridors/Refuge Areas for Group R1, R2 and I1 Occupancies. Exhaust and pressurization systems shall be provided for elevator lobbies and corridors serving Group R1, R2 and I1 occupancies. Elevator lobbies need not be separated from corridors.

[F]909.5.7.1 Elevator lobbies/corridors/refuge areas serving Group R1, R2 and I1 Occupancies shall be exhausted to outside when a fire is detected within the elevator lobby/corridor/refuge area by smoke detectors within the elevator lobbies/corridors. Activation of the linen and rubbish chute sprinkler zone water flow and fire sprinkler water flow or guest room smoke detection within the floor shall not activate lobbies/corridors exhaust systems. Exhaust systems shall be designed and sized to exhaust a minimum of 60 air changes per hour from the lobby/corridor/refuge areas in alarm and provide a negative pressure of 0.05" w.c. relative to elevator shafts, adjacent occupied areas, and floors above and below the floor in alarm. The exhaust system shall be sized for one floor and assuming supply air is available.

[F]909.5.7.2 Elevator lobbies/corridors/refuge areas serving Group R1, R2 and I1 Occupancies shall be pressurized, when activated, to maintain a minimum positive pressure of 0.05 inch of water column (w.c.) with respect to the floor in alarm (fire floor), with elevator doors closed and with stairway, hoistway and elevator lobby/refuge area pressurization and exhaust systems in operation. Air volume introduced into the unaffected lobbies/corridors/refuge shall be designed to provide a minimum outside supply air of 6 air changes per hour to all floors above and below the typical fire floor. The maximum pressure shall not create an opening force on any elevator lobby door greater than 30 pounds applied at the latch side of the door on the door-opening device under any operating condition. Pressure shall not interfere with the opening and closing of elevator doors.

Exception: Grade level elevator lobbies/corridors shall not be required to be pressurized at 6 air changes per hour or exhausted at 60 air changes per hour, when there is a clear exit path with no stairs or other obstructions for people with special needs to exit the building, and where grade-lev Clark, David M. - Fire Prevention and Investigation Divisionel residential units have direct access to outside for egress as defined in current building codes. When required, exhaust and pressurization shall be provided based on exhaust or supply rates established on a typical lobby/corridor floor other than the grade level floor. The general building HVAC serving the grade level may be used for pressurization and/or exhaust.

[F]909.5.8 General Building Pressurization and Exhaust for All Occupancies. A general building pressurization and exhaust system shall be provided which, when activated, will shut off all supply air to the fire floor (or smoke zone) and shall maintain a minimum negative pressure of 0.05"

water column on the fire floor (or smoke zone) with respect to adjacent non-alarm floors/smoke zones with general building pressurization in operation; and shall exhaust air from the fire floor/smoke zone to the outside. Return air from all other floors shall be shut off.

Exceptions:

1. General building pressurization systems are not required in Group R1, R2 and I1 Occupancies other than lobby/corridor pressurization.
2. General building pressurization systems are not required in mechanical/electrical rooms such as boiler rooms, chiller rooms, fan rooms, electrical rooms, and other typical utility rooms.

[F]909.5.8.1 The general pressurization and exhaust system(s) shall consist of mechanically operated air-handling system(s) which will restrict the smoke to the general area of fire origin and provide a safe means of occupant egress from the affected fire floor.

[F]909.5.8.2 Supply air to all non-fire floors for general pressurization shall be provided from the outside by a mechanically operated air-handling system. A dedicated or general building HVAC system may be used to pressurize and exhaust individual floors or smoke zones provided the system is designed in such a manner that it is dedicated during alarm mode to serve each floor or smoke zone through smoke dampers in the duct distribution system or is dedicated in normal operation to a single smoke zone or floor. The outside air intakes shall be open 100% and located so that they will not be contaminated by products of combustion and smoke recirculation will not occur.

[F]909.5.8.3 The exhaust system(s) for each floor/smoke zone shall be sized for:

1. Areas greater than 10,000 square feet, a minimum of 10 air changes per hour or 20,000cfm, whichever is greater. The volume shall be determined from the area of the floor/smoke zone to the ceiling/roof up to a maximum height of 12 feet above finished floor.
2. Areas less than 10,000 square feet, a minimum of 10 air changes per hour. The volume shall be determined based on full floor height including plenum area above ceiling.
3. Use and allow for 1% damper leakage for outside, return and exhaust systems.
4. The exhaust system shall be sized assuming supply air is available.

[F]909.5.8.4 Each floor area shall be a compartment**,** smoke control zone not to exceed 52,000 square feet on a single floor. Except for openings into atriums, pedestrian bridges between two buildings or non-required stair enclosures between floors, and open escalators between multiple floors as allowed by building codes, smoke control zones shall be separated from each other by a wall that shall extend from the floor to the underside of the floor or roof above.

1. Draft stops shall be required between smoke zones without wall separation to prevent migration of smoke throughout the building and shall be approved by the Building and Fire Departments.
2. A smoke control zone in alarm shall actuate all the adjacent zone smoke control equipment to pressurize those adjacent zones with outside air only while the smoke control zone in alarm goes into exhaust. Where smoke control zones have wall separations, a minimum positive pressure of 0.05 inch of water column (w.c.) shall be maintained in the adjacent non-fire zones with respect to the smoke control zones in alarm.

3. Sprinkler zones shall coincide with smoke zones.

4. For smoke zones without wall separations, it must be demonstrated that products of combustion will be contained within the zone of origin. Any failure to restrict products of combustion to the floor or area of origin will be considered as not complying with the requirements for the smoke control system.

[F]909.5.9 Parking Garages within High Rise Structures. Elevator lobbies on all floors designated as refuge areas within an enclosed parking structure shall have a separate dedicated pressurization system or shall be pressurized using the elevator hoistway pressurization system by transferring air to the elevator lobby/refuge area with the use of transfer openings. Penetrations of the elevator shaft wall shall be protected with fire/smoke dampers listed under UL Standards 555 and 555S. Exhaust systems are not required in this area if direct access without stairs or obstructions is available for people with special needs to exit from the elevator lobby/refuge area into the enclosed parking level or directly to a public way.

[F]909.5.9.1 Open parking garages shall not require a general building smoke control system. Elevator lobbies that are enclosed and serve an open parking garage are not required to be pressurized or exhausted if direct access without stairs or obstructions is available for people with special needs to exit from the elevator lobby to the open parking garage level or directly to a public way.

[F]909.5.9.2 Enclosed garages. Exhaust fans associated with an enclosed parking structure shall be capable of manual operation from the FCC. Exhaust fans do not require a redundant source of power and this shall be indicated at the FCC "not on emergency power". The fan discharge shall be located so that it will not contaminate other life safety system air intakes and smoke recirculation will not occur.

[F]909.5.10 Activation of Stairway and Elevator Hoistway pressurization. Activation of Stairway and Elevator Hoistway pressurization shall be automatic by:

1. Activation of any smoke or heat detector or water flow device.

   Exception: Main water flow, heat or smoke detectors located in stairwells or hoistways and waterflow in building service chutes or elevator hoistways.

2. Activation of any manual fire alarm box.

3. Manual operation from the FCC.

[F]909.5.11 Activation of Elevator Lobby/Refuge Area Smoke Control.

[F]909.5.11.1 Group A, B, E and M Occupancies. Pressurization of Elevator lobby/refuge areas on all floors shall be activated by:

Any smoke or heat detector or water flow device

Exception: Main water flow, heat or smoke detectors located in stairwells or hoistways and water flow in building service chutes or elevator hoistways.

Manual operation from the FCC.

4. Activation of a smoke detector within an elevator lobby/refuge area shall close the supply air dampers to the elevator lobby/refuge area in alarm and activate the general building pressurization system. The occupied area adjacent to the refuge area shall also be pressurized.

905.11.2 Group R1, R2 and I1 Occupancies. Activation of a smoke or heat detector in an elevator lobby/corridor/refuge area shall:

1. Activate the elevator lobby/corridor/refuge exhaust system, open the exhaust damper(s) on the fire floor and close the air supply to the elevator lobby/corridor/refuge area in alarm.

2. Activate the pressurization systems for the elevator lobbies/corridors/refuge areas on all non-fire floors and close exhaust dampers on all floors above and below the fire floor.

[F]909.5.12 General Building Pressurization and Exhaust. A smoke control zone shall be automatically activated by:

1. Respective sprinkler zone activation. (No individual sprinkler zone shall serve more than one smoke zone.)
2. Activation of any smoke or heat detector within the zone.

   Exception: Main water flow, heat or smoke detectors located in stairwells or hoistways.
3. Manual operation from the FCC.
4. A smoke detector in the main return air duct(s) of air-handling systems serving an individual smoke zone or floor, with no individual detector serving more than one smoke zone.
5. Smoke detector in the elevator lobby/refuge area per 907.5.11.1.4.
6. A smoke detector within 3' of each stair door and refuge area door on the corridor side.
7. A smoke detector on each side of each opening between smoke zones separated by a draft stop.

[F]909.5.13 Retrofit of smoke control systems in existing high-rise buildings. Smoke control systems shall be maintained in operational condition as required by the code under which the system was installed. System upgrades shall generally comply with the requirements of section 909.5. as approved. Construction drawings and system sequence of operation shall be submitted for approval. The upgraded system shall be considered the new requirement and documented as approved by the building and fire departments. Future work shall not be allowed to adversely affect the performance of the system.

[F]909.6 Smoke Control Systems for Covered Mall Buildings.. A mechanically operated air-handling system shall be installed in covered mall buildings which will restrict the smoke to the general area of fire origin and maintain the exiting system in a condition that is safe for exiting. The system shall be designed so that exhausted smoke cannot contaminate the outside air intake of any system.

[F]909.6.1 Activation. The smoke control system shall activate by any alarm initiated from the smoke detection or sprinkler system, inclusive. The smoke control system shall also be manually operable from the FCC. The smoke control system shall be functional anytime the building is occupied and during those hours when the building air conditioning systems are not operating. All smoke control equipment for both tenant space and the covered mall building shall be in place and operational before any portion of the covered mall building is occupied. The level of protection of the fire detection system for unoccupied tenant space shall be subject to the approval of the Department and the Fire Department.

[F]909.6.1.1 Tenant Space and Anchor stores.

1. The spaces shall be compartmentalized into smoke control zones not to exceed 52,000 square feet on a single floor. Except for openings between the covered mall area and tenant spaces, smoke control zones shall be separated from each other by wall construction having a fire-resistance rating per IBC Section 402.7.2 and 402.7.3. The walls shall extend from the floor to the underside of the floor or roof above.
2. The tenant smoke control exhaust system shall exhaust a minimum of 6 air changes per hour or 20,000 cfm from each smoke control zone, whichever is greater.

3. Smoke detection shall be provided as follows:

    i. On the tenant side at each opening into the mall and at each exit from the tenant space. For openings larger than 30 lineal feet, an additional detector shall be provided for each 30 lineal feet or fraction thereof.

    ii. Electrical equipment rooms.

    iii. Detector zones may not exceed 22,500 square feet and no detector zone shall serve more than one smoke control zone.

    iv. Detectors in individual tenant spaces shall be spaced not to exceed 2,500 sf per detector.

4. A strobe-type remote annunciator shall be located in the mall above each tenant entry and shall annunciate those detectors within that space. Concealed detectors shall also be annunciated immediately outside the concealed space.

5. A detector in a tenant area smoke control zone shall activate the smoke control equipment to supply air to the covered mall area with 100% outside air while the affected tenant smoke control zone goes into exhaust. All other tenant smoke control zones shall remain in normal operation.

[F]909.6.1.2 Covered Mall Area.

1. The smoke control equipment for the covered mall areas shall be separate from that serving tenant spaces. The tenant ventilation/smoke control system shall not be used to pressurize the covered mall.

2. The covered mall area system shall have a smoke detector located in the supply air system after the air filters, which will stop the supply fan and provide a supervisory alarm signal. In addition, a smoke detector shall be provided in the return or exhaust air stream to activate the fire alarm system.

3. The covered mall area smoke removal system shall provide at least 6 air changes per hour and shall be located to preclude accumulation of smoke in any area of the covered mall. The covered mall area smoke removal system shall be automatically activated from the fire alarm system upon detection of smoke within the covered mall or activation of fire sprinkler system water flow within the covered mall area. If multiple smoke control zones for the mall area are provided either by zone area requirements of this Section or by system design, then only the smoke removal system for the zone in alarm shall be activated. Adjacent covered mall zones shall supply 100% outside air and adjoining tenant spaces shall go into normal operation if operation of those systems will not contribute to the spread of smoke.

[F]909.7 Testing of Smoke Control Systems. Before the Fire Department accepts the smoke control systems and prior to initial occupancy, the smoke control systems shall be tested in their presence to confirm that the systems operate in compliance with this Section.

[F]909.7.1 Acceptance Testing Prior to Building Occupancy. The requirements of acceptance testing defined hereinafter shall be the minimum requirements. All acceptance tests shall be witnessed by a fire department representative.

1. The design professional engineer shall furnish a testing procedure to the Fire Department in advance of the acceptance tests being performed. The procedure shall define how compliance with the Code will be demonstrated. The procedure shall also identify what instrumentation, including artificial smoke generating equipment, will be used during the testing.

2. Prior to witnessed acceptance testing of the smoke control systems, the design professional engineer shall confirm and advise the Fire Department in writing that the entire smoke control system has

been installed, air balanced and tested in accordance with its design, plans, specifications and this Code. The designer shall also certify that fans are provided with 1.5x the number of belts required for the design load. A minimum of two belts are required for fans providing smoke control. Fan motors shall have a marked service factor (S.F.) of 1.15.

3. The following shall be notified so that they may witness the acceptance testing:

   A. Design Professional Engineer-of-Record

   B. Building Contractor

   C. Owner's Representative

   D. Fire Department

   E. Building Department

4. Unless otherwise approved by the Fire Department, sufficient smoke shall be generated to produce at least the volume of the smoke zone being tested within 5 minutes. All smoke-generating devices shall be supplied by the owner or his representative and shall meet with the approval of the Department and the Fire Department.

5. After the system is activated, smoke shall not continue to migrate to other smoke zones of the building.

[F]909.7.1.1 Testing requirements: Tests shall be performed in full automatic mode with the building operating under both normal power and emergency power. Test equipment shall be the responsibility of the design professional and shall include; manometer (calibrated within last 12 months), spring scale and other equipment as necessary to adequately measure and record system performance. Communications shall be provided between the test locations and the FCC.

A. For a building that is not a high rise, multiple tests on more than one floor or smoke zone shall be required to demonstrate proper operation.

B. For high rise buildings, tests shall be conducted at a minimum of 5 locations.

   C. A floor in the lower third, a floor in the middle third and a floor in the upper third of the building.

   D. With a floor in alarm, an additional automatic alarm shall be initiated on a floor immediately above or below the initial floor in alarm. All floors in alarm shall go to exhaust mode.

   E. With a floor in alarm, a manual pull station on another floor shall be activated. Smoke control operation shall not be affected.

C. For atriums, more than one test may be required depending upon the atrium configuration, its relationship to adjacent spaces and if the atrium is located in a high-rise.

D. Activation of one smoke detector in each smoke control zone on each floor being tested.

E. Activation of at least one sprinkler flow switch.

F. Activation of at least one manual pull station.

G. 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 R1, R2 and I1 Occupancies and between atriums and areas immediately adjacent to

atriums where atriums are part of a high rise building. Door pull force into stair enclosures or refuge areas shall not exceed 30 lbs. under any conditions.

H. 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 FCC.

I. 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.

[F]909.7.2 Annual Tests. Annual tests shall be performed in accordance with 909.7.2.1 and 907.2.2, 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.

[F]909.7.2.1 Equipment Operating Tests. The following equipment operating tests shall be conducted annually on the smoke control system components:

1. Verify the proper 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 FCC.

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. Verity that the manual override switches function properly for smoke control dampers and fans.

4. Items l, 2 and 3 above can be performed by qualified service technicians who are familiar with the proper operation of the smoke control systems and equipment. Otherwise, the above testing shall be performed directly supervised by a professional engineer qualified in the design and testing of smoke control systems. Direct supervision shall require the presence of the engineer at the building while the equipment operating tests are taking place. If service technicians perform the equipment operating tests, the engineer responsible for either conducting the smoke control system tests shall review the test procedures used and results obtained by the service technicians. A statement summarizing this review shall be included in the test report described in section 909.7.2.3 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 FCC 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 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 test.

[F]909.7.2.2 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 by a professional engineer qualified in the testing of such smoke control systems.

1. Activate the smoke control systems manually for tests used to confirm minimum pressure differentials defined in this Section with the general building pressurization systems off.

2. Activate the smoke control systems automatically through the fire alarm system for tests used to confirm proper sequencing of the system components, actual relative pressure differentials between areas in alarm and adjacent areas, and actual door opening forces with the general building pressurization systems operating.

3. For high rise buildings, conduct smoke control tests, observations and measurements of all aspects of the smoke control system at a minimum of 3 locations: a floor in the lower third, a floor in the middle third and a floor in the upper third of the building. Smoke control tests in subsequent years shall be conducted on previously untested floors, as may be practical so that all floors ultimately are tested.

4. For all other buildings, conduct smoke control tests, observations and measurements of all aspects of the smoke control system at a minimum number of locations to demonstrate proper performance as approved by the Fire Department. Each test shall attempt to involve as many different fan systems as practical. Smoke control tests in subsequent years shall be conducted on previously untested locations, as may be practical so that all locations ultimately are tested over a three year period.

5. Tests of the smoke control system shall be conducted by activation of at least one smoke detector in each smoke control zone on each floor being tested. One test of at least one of the smoke control zones shall include activation of one sprinkler flow switch. In addition, the smoke control tests shall include activation of at least one manual fire alarm box.

6. 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 R1, R2 or I1 Occupancies, and between atriums and areas immediately adjacent to atriums where atriums are part of high rise buildings.

7. 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 FCC.

8. 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.

[F]909.7.3 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 FCC. 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 FCC 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.

[F]909.8 Equipment. Equipment such as, but not limited to, fans ducts, automatic dampers and balance dampers, shall be suitable for their intended use, suitable for the probable exposure temperatures that the rational analysis indicated, and as approved by the building official.

[F]909.8 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they could be exposed under smoke control-operating conditions but not less than 1.5 times the maximum design pressure. Ducts shall be constructed and supported in accordance with the Mechanical Code. Ducts shall be supported directly from fire-resistive structural elements of the building by substantial noncombustible supports. Ducts that are part of a smoke control system shall be traversed using generally accepted practices to determine actual air quantities.

EXCEPTION: Flexible connections for the purpose of vibration isolation complying with the Mechanical Code may be used if constructed of approved fire-resistive materials.

[F]909.8.2 Equipment inlets and outlets. Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard. Inlets and outlets shall be read using generally accepted practices to determine air quantities.

[F]909.8.3 Automatic dampers. Automatic dampers installed within the smoke control system shall be listed and conform to the requirements of approved recognized standards. Smoke dampers shall be supplied by emergency power systems when such power systems are required by other sections of this Code.

[F]909.8.4 Fans. In addition to other requirements, belt-driven fan shall have 1.5 times the number of belts required for the design duty with the minimum of 2 belts. Fans shall be selected for stable performance based upon the design intent of their smoke control function. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the requirements of IBC Chapter 16. Motors driving fans shall not be operated beyond their nameplate horsepower (kilowatts), as determined from measurement of actual current draw. Motors driving fans shall have a minimum service factor (S.F.) of 1.15. Fans shall be examined for correct rotation. Measurements of voltage, amperage, revolutions per minute and belt tension shall be made. Static pressure readings shall be taken at suction and discharge.

[F]909.8.5 Detection devices. Smoke or fire detectors that are a part of a smoke control system shall be listed for the environment installed. Detectors installed in air streams shall be listed for the worst-case velocity. When applicable, testing shall include verification of airflow in both minimum and maximum conditions.

[F]909.8.6 Smoke Barriers. Measurements using inclined manometers or other approved gauges shall be made of the pressure differences across smoke barriers to confirm system performance. Such measurements shall be conducted for each possible smoke control condition.

[F]909.8.7 Controls. Each smoke zone equipped with an automatic-initiation device, shall be put into operation by the actuation of one such device. Each additional device within the zone shall be verified to cause the same sequence without requiring the operation of fan motors in order to prevent damage. Control sequences shall be verified throughout the system, including verification of override from the firefighter's control panel and simulation of standby power conditions.

[F]909.9 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved emergency source complying with NFPA 70 (National Electrical Code). The emergency power source and its transfer switches shall be in a separate room from the normal power transformers and switchgear and shall be enclosed in a room of not less than 1-hour fire resistance construction ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full emergency power shall be automatic and within 10 seconds of failure of the primary power.

[F]909.9.1 Power sources and power surges. Elements of the smoke management system relying on volatile memories or the like shall be supplied with uninterruptible power sources of sufficient duration to span a 15-minute primary power interruption. Elements of the smoke management system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

[F]909.10 Wiring. In addition to meeting requirements of NFPA 70, all wiring, regardless of voltage, shall be fully enclosed with continuous raceways in; mechanical, electrical rooms and vertical risers.

[F]909.11 Detection and control systems. Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment. Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation.

[F]909.12 Marking and identification. The detection and control systems shall be clearly marked at all devices, junctions, accesses and terminations.

[F]909.13 Control diagrams. Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with building management and in the FCC in an approved format and manner.

[F]909.14 Fire-Fighters Smoke Control Panel (FSCP). Smoke control systems shall be controlled by a U.L. 864 listed fire alarm system meeting the requirements of NFPA 72. The fire alarm system shall also be listed for smoke control use under UL product category guide designation UUKL. Upon an alarm, the fire alarm system shall take direct control of all smoke control components such as fans, dampers, pressure control and status indication from any temperature control or building automation systems. Hard-wired interlock is acceptable. The fire alarm system shall provide automatic and manual override control and status. Terminal air distribution units may remain under their own normal building automation control.

An FSCP, shall be provided for manual or override of automatic control of mechanical smoke control systems.] This panel shall graphically depict the individual smoke control system fan and damper controls, their relative location within the building, stairwells, hoistways, building pressurization and exhaust airflow, refuge area pressurization and all other smoke control zones that apply. This panel shall clearly show the building

arrangement and smoke control system zones served by the systems. The graphic panel shall be oriented to the building and include a North reference compass point. A combination of vertical (section) and/or horizontal (plan) graphic arrangement may be necessary. The operating control and status indicators on FSCP shall have a maximum height from the floor of 6 feet 6 inches and a minimum of 2 feet, 0 inches, and may require more than one section to accommodate height limitations. Layout, labeling and location of the FSCP shall be reviewed and approved by Fire Department prior to fabrication. The following features shall be incorporated and color-coded as follows:

1. General building layout (black lines on white background
2. Exhaust systems – RED
3. Pressurization systems – GREEN
4. Garage supply and exhaust systems shall be energized manually to purge smoke (Auto - On only). System need not be connected to emergency power.

The status of smoke control equipment shall be indicated by LED lamps and appropriate legends. Fans, major ducts and dampers within the building that are components of the smoke control system shall be clearly identified as to purpose (e.g. STAIR PRESSURIZATION FAN) on the FSCP. Lettering shall be 16 point Helvetica bold, Equipment Identification ([e.g.] SPF-1) shall be 12 point Helvetica Bold.

[F]909.14.1 LED status indicators. Shall be provided for each [component of the] smoke control system as follows:

1. Fans operating, dampers open, power on – GREEN
2. Fans off, dampers closed – BLUE
3. Fans, dampers and other operating equipment in a fault status – YELLOW
4. with pulsating LED.
5. Duct detectors as required per section 910.3.1.1 and 910.3.1.4 shall be identified with a YELLOW LED.
6. Provide lamp test with momentary contact push button(s) to illuminate all LED's simultaneously.
7. All status LED's shall be active all the time..
8. Control switches are active only during alarm condition except through a secured and supervised bypass method approved by the Department.

[F]909.14.2 Control Action and Priorities. The FSCP control actions shall be as follows:

1. ON-OFF, OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the FSCP, no automated or manual control from any other control point within the building shall contradict the control action, except from motor control electrical protection at the local motor controller and disconnects. Where automatic means is provided to interrupt normal non-emergency equipment operation to safeguard the building or equipment (i.e., freezestats, duct smoke detectors, high temperature cutouts, temperature-actuated linkage and similar devices), such means shall be bypassed while the system is in smoke control mode.

   EXCEPTION: Starter overloads and short circuit protection, power disconnects required by the Electrical Code, excessive fan vibration switches and excessive fan pressure switch.

2. Only the AUTO position of each 3-position FSCP switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL non-emergency, building control position. When a FSCP switch is in the AUTO position, the actual status of the device (on-off, open-closed) shall be indicated as described above. If the 3-position switch is moved from the AUTO position and then returned to the AUTO position, the equipment shall be returned to automatic operation.

3. Wiring between FSCP and FACP shall be supervised for integrity.

[F]909.14.3 Response Time. Smoke control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. The total response time for individual smoke control systems to achieve their desired operating mode shall not exceed the following time periods:

Fan operating at desired state –75seconds.

Damper position travel – 60 seconds.

[F]909.14.4 Testing. Devices, equipment, components and sequences shall be individually tested. These tests in addition to those required by other provisions of the Building Code shall consist of determination of function, sequence and where applicable, capacity of their installed condition. The requirements of DBCA Section 910.5 shall apply.

[F]909.15 Emergency Graphics and Signs._ Graphics and signs required by this Policy shall be of durable construction, easily readable in normal light and have a smooth plastic surface. Diagrammatic building floor plans shall be permanently mounted, unobstructed, on an interior wall of the FCC. One drawing may be used for all typical levels. Plans shall depict the following:

Location of general building features. A legend shall be provided listing the levels on which general building features are located:

Stair towers (identified by building directional location, ie East Stair, North Stair)
Elevators (numerically identified)
Elevator machine room(s)
Emergency generator
Fire pump(s)
All fire sprinkler and standpipe valves
Mechanical area(s)
[Rooms with other standby power sources, eg UPS rooms, fuel cells, etc.]
Main electrical area(s)
Fuel tank(s)

Site plan with major intersection, building outline, FDC location, North arrow, local fire hydrants and information as described below:

Location of building service control(s):
Electrical
Gas
Water Supply (domestic), all valves, building entry location
Water supply (fire), all valves, building entry location
Ammonia, Freon, chlorine, etc.
Utility property line valves

Location of features on individual levels. One drawing may be used for all typical levels.

[F]909.16 Equipment Specifications and Manuals. Operational and maintenance manuals for all life safety equipment shall be provided to the building engineering staff and made available to Fire Department personnel.

SECTION [F]910
SMOKE AND HEAT VENTS

Replace Exception in Section [F]910.2.1 with the following:

Exception: Group S-1 aircraft repair hangar or aircraft hangar shall conform to NFPA 409.

Replace Section [F]910.2.3 with the following:

[F]910.2.3 High-piled storage. Buildings and portions thereof containing high-piled stock or rack storage in any occupancy group shall comply with requirements of Chapter 23.

Replace Table [F]910.3 with the following:

TABLE [F]910.3 – REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTING

COMMODITY CLASS	DESIGNATED STORAGE HEIGHT (ft)	VENT AREA-TO-FLOOR AREA RATIO	MAXIMUM SPACING OF VENT CENTERS (ft)	MAXIMUM DISTANCE TO VENTS (ft)	MINIMUM CURTAIN DEPTH (ft) [b]	MAXIMUM AREA FORMED BY DRAFT CURTAINS (SQ. FT) [b]
I – IV [a]	≤20	1:100	100	60	6	10,000
	>20≤ 40	1:75	100	55	6	8000
High Hazard [a] and Plastics	≤20	1:50	100	NR	6	6000
	> 20 ≤ 30	1:40	90	NR	6	6000

a. When areas of buildings or portions are equipped with early suppression-fast response (ESFR) ventings shall be installed per section 910.3.5.

b.When required per section 903.3.1.

Delete Section [F]910.3.1.1. Gravity vents.

Replace Section [F]910.3.4 Exception with the following:

Exception: Curtain boards would not be required in areas where ESFR sprinklers are provided except for the following two conditions:

1. If there is a separate sprinkler system in the building that uses control mode sprinklers and does not use ESFR sprinkler heads, then a curtain board "Draft Curtain" shall be provided between the sprinkler systems.

2. If a greater than 12 inch sudden vertical difference in roof elevations, such as a high bay and low bay section, then curtain boards "Draft Curtains" should be provided at the point of roof elevation change if the high bay section is protected with ESFR sprinklers.

3. When draft curtains are required, they shall be located centered between sprinklers or sprinkler branch lines. If they are not centered, provide additional sprinklers such that sprinklers on either side of the draft curtain are no farther from the curtain than one-half the allowable maximum sprinkler spacing for the building height. If suppression mode sprinklers protect the areas on both sides of the draft curtain, there is no need to maintain a clear aisle beneath the draft curtain.

4. Extend the draft curtain at least 2 ft (0.61 m) below the ceiling. Ensure the draft curtain is noncombustible and fits tightly against the underside of the roof. (Openings created by ribs in metal roof deck are not a concern, but openings created by channels between Z-purlins or other structural members should be filled.)

Solid beams, girders or other structural features which meet the above criteria are equivalent to draft curtains.

Add new Section [F]910.3.5 as follows:

[F]910.3.5 Buildings equipped with approved early suppression fast response (ESFR) sprinkler system.

1. Roof vent area to floor area ratio of 1:600 for all types of commodities
2. A remote manual switch from fire department control panel shall activate each vent. This control panel shall be located in an approved location and clearly identified. The face of the panel shall be

graphic depicting the location of each vent. Each remote manual switch shall be mounted adjacent to the respective vent depicted on the panel.

3. Electrical power to the smoke removal vents shall be provided from a separate and dedicated distribution panel board tapped ahead of the main sevice disconnect. This panel board shall be identified as electrical disconnect for emergency ventilation. Wiring and smoke-removal fan units shall be thermally protected in a manner that will provide continued operation for not less than 15 minutes while exposed to a temperature of 1,000°F.
4. Curtain boards would not be required in areas where ESFR sprinklers are installed with the exceptions in 910.3.4 Exception
5. Smoke and heat vents shall have the capability of being opened by an approved manual operation.

Amend Section [F]910.4 by adding the following exceptions:

Exception: Buildings equipped with approved early suppression fast response (ESFR) sprinkler system.

1. A =Area of roof vents provided in square feet accordance to a roof vent area to floor area ratio of 1:600.
2. On combination comfort air-handling and smoke- removal systems, and on independent comfort air-handling systems, fans shall be controlled to shut down in accordance with the automatic shutoff requirements of the Mechanical Code or by activation of automatic extinguishing or detection systems. Coordinate the location of sprinklers and the design of powered heating, ventilation and air conditioning for buildings protected by suppression mode sprinklers so that the air velocity at sprinklers does not exceed 5 ft/sec (1.52 m/sec).
   •Examples of powered ventilation include exhaust fans, air conditioning / refrigeration supply and return vents, and grated return air inlets to roof-mounted mechanical equipment penthouses.
   •Examples of natural ventilation include turbine vents, vent stacks, and ridge vents.
3. Each smoke-removal fan shall be manually activated by a remote automatic switch from fire department control panel. Fire department control panel shall be located in an approved location and clearly identified.
4. Electrical power to the smoke removal system shall be provided from a separate and dedicated distribution panel board tapped ahead of the main service disconnect. This panel board shall be identified as electrical disconnect for emergency ventilation. Wiring and smoke-removal fan units shall be thermally protected in a manner that will provide continued operation for not less than 15 minutes while exposed to a temperature of 1,000^{o}F.
5. The individual capacity of a fan shall not exceed 30,000 cubic feet per minute.

CHAPTER 10
MEANS OF EGRESS

SECTION 1002
DEFINITIONS

Section 1002.1 is amended by replacing the definition of PUBLIC WAY in its entirety with the following:

PUBLIC WAY. Any street, alley, or similar parcel of land essentially unobstructed from the ground to the sky that is deeded, dedicated, or other wise permanently appropriated to the public for public use and having a clear width of not less than 10 feet (3048 mm).

SECTION 1004
OCCUPANT LOAD

Table 1004.1.2 is amended for Airport terminal/concourse to read:

OCCUPANCY	FLOOR AREA IN SQ. FT. PER OCCUPANT
Airport terminal/concourse	
Concourse Hold Rooms Open Areas	100 gross
Seating Areas	30 gross
Passenger Circulation Space includes ticket area, check-in and baggage claim area	15 or fixed seat count
Baggage handling	300 gross

SECTION 1005
EGRESS WIDTH

Table 1005.1 Egress width per occupant served is amended as follows:

In the occupancy row “Occupancies other than those listed below”, the stairway width and the other egress component factors in buildings with sprinkler systems are changed from 0.2 to 0.25 and from 0.15 to 0.175 respectively. “Hazardous: H-1; H-2, H-3, and H-4” egress component factors are changed from .2 to .3 for buildings with sprinkler systems. Add footnotes b and c to table.

TABLE 1005.1
EGRESS WIDTH PER OCCUPANT SERVED

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM[a]	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.25[b]	0.175[c]
Hazardous: H-1, H-2, H-3, and H-4	0.7	0.4	0.3	0.3
Institutional: I-2	N/A	N/A	0.3	0.2

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1 or 903.1.2.

b. For assembly occupancies with occupant load greater than 400 egress component factors shall be 0.3

c. For assembly occupancies with occupant load greater than 400 egress component factors shall be 0.2

SECTION 1008
DOORS GATES AND TURNSTILES

Section 1008.1.3.4 is deleted in its entirity and access-controlled egress doors are addressed by Appendix L Access Control Systems.

Section 1008.1.8.6 is deleted in its entirity and delayed egress locks are addressed by Appendix L Access Control Systems.

Section 1008.1.8.7 is deleted in its entirity and stairway doors are addressed by Appendix L Access Control Systems.

SECTION 1009
STAIRWAYS AND HANDRAILS

Section 1009.5.1 is amended by deleting and replacing the exception as follows:

Exception: In Group F, H and S occupancies, other than areas of parking structures accessible to the public, openings in treads and landings shall not be prohibited provided a sphere with a diameter of 1/2 inch (13 mm) diameter cannot pass throught the opening. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

Section 1009.12.1 Roof access is amended by deleting the Exception.

SECTION 1011
EXIT SIGNS

Section 1011.2 is replaced in its entirety with the following:

1011.2 Illumination. Exit signs shall be internally illuminated to a minimum of 5.0 foot-candle. If incandescent lamps or bulbs are used, there shall be a minimum of two lamps or bulbs. External and self-luminous exit signs are not allowed.

Section 1011.4 is amended by adding the following subsections:

1011.4.1 Graphics. Exit signs shall have the word "EXIT" on the sign in block letters not less than 6 inches (15.2 cm) high with the principal strokes of letters not less than ¾ inch (1.9 cm) wide. The word "EXIT" shall have letters of a width not less than 2 inches (5 cm) except the letter "I," and the minimum spacing between letters shall be not less than 3/8 inch (1 cm). Signs larger than the minimum established in this paragraph shall have letter widths, strokes, and spacing in proportion to their height. If an arrow is provided as part of the exit sign, the construction shall be such that the arrow direction cannot be readily changed. Lettering, arrows, and other symbols on exit signs shall be one of the following:

1. White luminous letters on green luminous field.
2. Green luminous letters on white luminous filed.
3. White light emitting diode letters on green field.
4. Green light emitting diode letters on white field.

1011.4.2 Power Source. Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

Section 1011.5 is deleted in its entirety

SECTION 1013
EXIT ACCESS

Section 1013.3 Common path of egress travel is amended by adding Exception 4:

4. The length of common path of egress travel in an R-2 occupancy shall not be more than 110 feet, provided the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

SECTION 1014
EXIT ACCESS AND EXIT ACCESS DOORWAYS

Section 1014.2.1 is amended by adding Exception 3:

3. In buildings constructed prior to March 26, 1994 two existing stairways within the same enclosure but completely separated from each other by rated construction in conformance with the requirements of the building code under which the building was last certified for occupancy, including Modifications Under Special Circumstances and applicable retrofit ordinances, shall be considered two separate exits, provided:

   3.1 This scissor stair is currently recognized as two separate exits.

   3.2 This scissor stair has been used continuously as two separate exits since the building was last certified for occupancy.

   3.3 The number of existing exits shall not be reduced.

SECTION 1016
CORRIDORS

Section 1016.1, Exception 4 is replaced in its entirety with the following:

4. Corridor walls and ceilings need not be of fire-resistive construction within single-tenant office spaces.

Section 1016.1 is amended by adding Exception No. 5.

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

SECTION 1019
VERTICAL EXIT ENCLOSURES

Section 1019.1.5 Exception is amended by adding the following sentence:

Fuel fired appliances may be located under stairways serving and contained within a single residential unit in Group R2 and R3 occupancies when the stairs are protected by one layer of 5/8" Type X Gypsum board attached directly to the underside of the stairs. Reference amendments to IFGC 303.3.

Section 1019.1.8 is amended to by deleting and replacing with the following:

1019.1.8 Smokeproof enclosures. In buildings required to comply with Section 403 or 405, each of the exits of a buildng that serves stories where the floor surface is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) shall be a pressurized stair way in accordance with Sections 909.5 and 909.20.

CHAPTER 11
ACCESSIBILITY

SECTION 1101
GENERAL

Section 1101.1 Scope is amended by adding the following sentence:

In addition to the requirements of this chapter, the provisions of the Colorado Revised Statute 9-5 shall be enforced. CRS 9-5 is reproduced in Appendix M of this code for reference.

SECTION 1107
DWELLING UNITS AND SLEEPING UNITS

Section 1107.2.1 is added to amend American National Standard ICC/ANSI 117.1-1998 Section 1002.11.5.3 Height.

1107.2.1 Toilet height for Type A Dwelling Unit. The top of the toilet seat shall be a minimum of 17 inches and 19 inches maximum above the floor or ground.

Section 1107.6.2.1 is amended by replacing the first paragraph and adding categories "for sale" and "for rent" Type A Units:

1107.6.2.1.1 Type A units. Type A "For Sale" units in occupancies in Group R-2 containing more than 20 dwelling units, at least 2 percent, but not less than one, of the units shall be Type A units. Type A "for rent" dwelling units or sleeping units in Group R-2 occupancies shall be in accordance with Table 1107.6.2.1.

TABLE NO. 1107.6.2.1
REQUIRED TYPE A FOR RENT DWELLING UNITS

Total Number of Dwelling Units on Site	Required Number of Type A Dwelling Units
0 – 10	None
11 – 20	1
21 – 40	2
41 – 60	3
61 – 80	4
81 – 100	5
For every 20 units or fractional part thereof, over 100	1 additional

CHAPTER 14
EXTERIOR WALLS

SECTION 1406
COMBUSTIBLE MATERIALS ON THE EXTERIOR SIDE OF EXTERIOR WALLS

Section 1406.3 Balconies and similar projections. is deleted in its entirety. See amended Section 704.2 Projections.

CHAPTER 15
ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

SECTION 1503
WEATHER PROTECTION

Section 1503.2.2 is added.

1503.2.2 Flashing for Single-ply roof systems. All flashing installations for single-ply roofing systems shall be installed per manufacturer's latest recommendations and details for the system.

Section 1503.2.3 is added

1503.2.3 Mechanical equipment on roof. Mechanical equipment placed, replaced and reset on roofing shall be supported on curbs or legs, which shall be flashed to the roofing and made watertight.

Section 1503.4.4 is added.

1503.4.4 Drain installation for single-ply system. Drains for single-ply roof systems shall be installed per the latest manufacturer's details and recommendations.

Section 1503.6 is added.

1503.6 Vertical Projections. All projections through the roof surface shall be properly flashed to prevent moisture entry.

1. Pipe penetrations shall be completed with a standard roof jack, flashed per manufacturer-recommended details or field flashed. Pitch pans are prohibited.

2. Only one pipe penetration through each flashing.

Mechanical penetrations may penetrate through properly sized flashing extending 8 inches above the finished roofing deck with a storm collar.

Section 1507.2.9.2 Valleys is amended by adding item 4.

4. Metal liners shall not be installed in closed valleys.

SECTION 1507
REQUIREMENTS FOR ROOF COVERINGS

Section 1507.3.10 is added.

1507.3.10 Inspection of tile roofs. Mid-roof inspections shall be made to inspect the battens and flashing. No more than 30% of the roofing shall be completed when requesting the inspection.

Section 1507.6.2 is amended by replacing it in its entirety with the following:

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

Section 1507.10.3 is added.

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

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

2. The metal shall be turned a minimum of ½ inch into a drain sump and plied with 2 plies of Type 15 felt.
3. A 2-component drain system. The membrane flashing shall be polyvinylchloride sheet measuring 22 inches in its overall length, and factory-attached to the underside of the strainer flange. The membrane flashing shall be applied on top of the completed felt, shall extend a minimum of 7 inches from the outside diameter of the drain throat, shall be set into hot asphalt or roofing cement, and plied in with 2 plies of Type 15 felt.

Section 1507.10.4 is added.

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

1. All flashing surfaces shall be primed.
2. All flashing shall extend at least 8 inches, but not more than 12 inches, up all vertical surfaces and at least 4 inches out onto the roof.
3. The top edges of the flashing shall be fastened at 3-inch intervals and sealed with plastic cement. End laps shall be at least 3 inches long, nailed vertically and covered with 4 inches of felt embedded in plastic cement.
4. The top edges of all felts and roofing shall be given a coating of approved plastic cement upon completion of the nailing requirements.
5. All vertical walls and projections shall be counterflashed with a 2-piece metal system installed watertight.
6. Nailer strips shall be provided on vertical walls, drips in edge and curbs which will not accept conventional nailing.

Section 1507.10.5 is added.

1507.10.5 Stucco. Stucco on walls extending above the roof shall terminate 9 inches above the finished roofing of a flat roof and 1 ½ inch above shingle, shake and tile roofs.

Section 1507.10.6 is added:

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

SECTION 1510
REROOFING

Section 1510.7 is added.

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

1. The existing roof deck is structurally sound.
2. The roof drains and roof drainage are sufficient to prevent the ponding of water.
3. The existing roofing is secured to the existing roof deck.
4. The existing insulation is not wet.
5. The fire-retardant requirements are maintained.

All rocks shall be removed; loose rock shall be power broomed and a minimum ½ thick recovery board shall be installed prior to the installation of the new roof covering.

CHAPTER 16
STRUCTURAL DESIGN

SECTION 1607
LIVE LOADS

TABLE 1607.1 shall be used in its entirety except as amended below:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
11. Dining rooms and restaurants [i]	100	-

NOTES TO TABLE 1607.1 shall be used in its entirety except as amended below:

a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of Table 1607.1 or the following concentrated loads:

(1) for garages restricted to vehicles accommodating not more than nine passengers, 3000 pounds acting on an area of 4.5 in. by 4.5 in.:

(2) for mechanical parking structures without slab or deck, which are used for storing passenger vehicles only, 2250 pounds per wheel.

Garage loadings shall not include an impact factor for floors or roofs.

Ramp loadings shall be the same as floors.

Garage roofs used for passenger vehicles or trucks and bus parking shall be designed for a non-reducible live load of 55 psf., which includes snow and snow removal equipment. Garage roofs that provide access for fire trucks shall be designed for the required fire truck loads.

i. Kitchens (other than residential) shall be designed for the same live load as the occupancy served. Use the weight of actual equipment or stored materials when greater.

1607.9.2 Alternate floor live load reduction. Shall be used in its entirety except as amended below:

4. For structural members supporting more than 150 square feet in garages used for the storage of passenger vehicles, the reduced live load shall not be less than 30 pounds per square foot.

1607.14 Fire Truck Loading. Where fire department access requires travel over or loading of a structure by fire department vehicles, the structure shall be analyzed for the three load cases indicated below. Structural members shall be designed for the most severe case. The fire vehicle geometry is shown in Figure 1607.14.

Basic Load Case

The front axle load shall be 21,130 pounds (10,565 pounds per tire) with a tire contact area of 12 in. x 13 in. The load on each rear axle shall be 25,700 pounds (12,850 pounds per tire) with a tire contact area of 14 in.

x 16 in. Impact and longitudinal forces imparted by the vehicle loads shall be in accordance with the latest edition of AASHTO standards.

Static Load Case A

A load of 43,200 pounds on one outrigger. The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.14.

Static Load Case B

A load of 28,600 pounds on each of two adjacent outriggers (total load is 57,200 pounds). The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.14.

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

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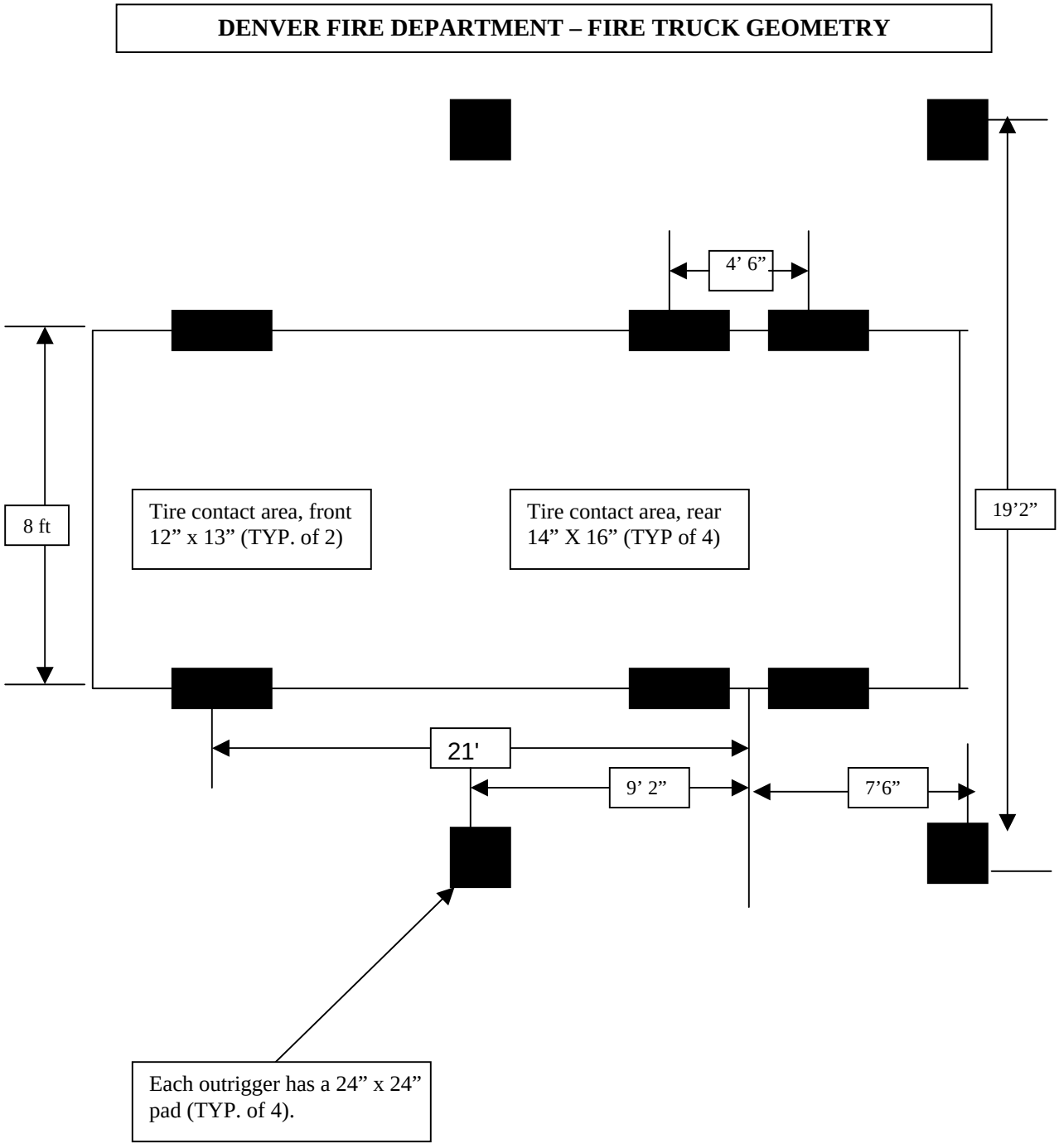

FIGURE 1607.14

SECTION 1608
SNOW LOADS

Section 1608 Snow Loads shall be used in its entirety except as amended below:

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

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

B. Neglecting drifting and unbalanced loadings, a uniformly applied roof snow load shall be:

a. 30 pounds per square foot for all structures in the occupancy Categories III and IV of Table 1604.5.

b. 25 pounds per square foot for all other structures.

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

1608.3 Flat roof snow loads.

1608.3.3 Snow load importance factor. The value for the snow load importance factor, I_s, in Table 1604.5 shall be amended as follows and used in lieu of the I factors listed in Table 7.4 of ASCE 7:

Category III.....1.2

Category IV.....1.4

1608.3.4 Rain-on-snow surcharge load need not be considered.

Section 1608 Snow Loads shall be amended by the addition of 1608.10 below:

1608.10 Additional Criteria. Snow loads are not to be considered as reducible live loads.

SECTION 1609
WIND LOADS

Section 1609 Wind Loads shall be used in its entirety except as amended below:

1609.1.1.2 Reduction for air density. In calculating velocity pressures using Eq. 6-15 in ASCE 7, the numerical constant, 0.00256, may be reduced to account for air density. Any reduction shall comply with ASCE 7, Section C6.5.10, but in no case shall the reduction in the numerical constant exceed fifteen percent. No reduction is to be applied to 1609.6, "Simplified provisions for low-rise buildings."

1609.3 Basic wind speed. The basic wind speed, to be used in the provisions of ASCE 7, shall be 90 miles per hour (V3s, three second gust) for all areas in the City and County of Denver located east of a line defined as the centerline of Sheridan Blvd. For areas located west of the centerline of Sheridan Blvd., the basic wind speed shall be 100 miles per hour (V3s, three second gust). The centerline of Sheridan Blvd. is assumed to be projected to the north and south boundaries of the City and County of Denver.

SECTION 1615
EARTHQUAKE LOADS-SITE GROUND MOTION

Section 1615 Earthquake Loads – Site Ground Motion shall be used in its entirety except as amended below:

1615.1.1 Site class definition. The site shall be classified as one of the site classes defined in Table 1615.1.1. Where the soil shear wave velocity, v_s, is not known, site class shall be determined, as permitted in Table 1615.1.1, from standard penetration resistance, N, or from soil undrained shear strength, s_u, calculated per Section 1615.1.5. Where site specific data are not available to a depth of 100 feet (30,480 mm), appropriate soil properties are permitted to be estimated by the registered design professional preparing the soils report based on known geologic conditions. Any assignment of site class NOT based on soil shear wave velocity, measured for the top 100 feet of the soil profile, shall comply with the following limitations:

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

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

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

SECTION 1616
EARTHQUAKE LOADS-CRITERIA SELECTION

Section 1616 Earthquake Loads – Criteria Selection shall be used in its entirety except as amended below:

Section 1616.3.2 Seismic Design Category, Minimum. All buildings and structures in the City and County of Denver shall satisfy the requirements of seismic design category B, as a minimum.

CHAPTER 17
STRUCTURAL TESTS AND SPECIAL INSPECTIONS

SECTION 1704
SPECIAL INSPECTIONS

Section 1704 Special Inspections shall be used in its entirety except as amended below.

Section 1704.1.1 Building Permit Requirements. The permit applicant shall submit a statement of special inspections prepared by the registered design professional in responsible charge in accordance with Section 106.1 as a condition for permit issuance. This statement shall include a complete list of materials and work requiring special inspections by this section, and the inspections to be performed. The owner shall submit, for the building official's review, a list of the individuals, agencies or firms intended to be retained for conducting such inspections.

CHAPTER 18
SOILS AND FOUNDATIONS

SECTION 1805
FOOTINGS AND FOUNDATIONS

Section 1805 shall be used in its entirety except as amended below:

Section 1805.2.1 Frost Protection. *Add the following sentence:* The frost line for the City and County of Denver is to be 36 inches (915 mm) below the finished grade.

Section 1805.4.1 Design. *Delete the following sentence*: The minimum width of footings shall be 12 inches (305 mm).

Section 1805.5 Foundation Walls. *Shall read as follows:* Concrete and masonry foundation walls shall be designed in accordance with Chapter 19 or 21. Foundation walls that are laterally supported at the top and bottom and within the parameters of Tables 1805.5(1) through 1805.5(4), are permitted to be designed and constructed in accordance with Sections 1805.5.1 through 1805.5.5 except that the maximum bar spacing shall not exceed 24 inches (610 mm).

Section 1805.5.3 Alternative foundation wall reinforcement. *Shall read as follows:* In lieu of the reinforcement provisions in Table 1805.5(2), 1805.5(3), or 1805.5(4), alternative reinforcing bar sizes and spacings having an equivalent cross-sectional area of reinforcement per linear foot (mm) of wall is permitted to be used, provided the spacing of reinforcement does not exceed 24 inches (610 mm) and reinforcing bar sizes do not exceed No. 11.

CHAPTER 27
ELECTRICAL

SECTION 2700
GENERAL - DENVER

Sections 2700.1 and 2700.2 are added.

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

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

CHAPTER 29
PLUMBING SYSTEMS

[P] SECTION 2902
MINUMUM PLUMBING FACILITIES

Section 2902.1 is amended by replacing it in its entirety with the following:

2902.1 Minimum number of fixtures. Plumbing fixtures shall be provided for the type of occupancy and in the minimum number shown in Table 2902.1. Type of occupancies not shown in Table 2902.1 shall be considered individually by the Code Official. The number of occupants shall be determined by the International Building Code, Table 1004.1.2. Occupancy classification shall be determined in accordance with the International Building Code.

Table 2902.1 Footnote "e" is amended by replacing it in its entirety with the following:

e. For each dwelling unit, in buildings with one or two dwelling units, one (1) capped automatic washer standpipe in a space large enough to accept laundry equipment. For each dwelling or apartment unit, in buildings with three or more units, one laundry tray and one automatic washer for the first ten units; in excess of ten units, one automatic washer for each additional fifteen unit; this equipment shall be accessible to all units. Kitchen sinks with garbage disposers; one for each unit.

Section 2902.2, Exception #4 is amended by replacing it in its entirety with the following:

4. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is 100 or less.

Section 2902.6 is amended by adding the following sentence:

Public access to toilet rooms shall be via a clear and unobstructed pathway not infringing on stock rooms, storage rooms or private areas such as offices.

Sections 2902.7, 2902.8, 2902.9, 2902.10 and 2902.11 are added:

2902.7 Access. There shall be no access through a toilet room to any portion of a building. Access to toilet rooms shall not be through food preparation areas, except for toilet room facilities provided exclusively for the use of employees in the food preparation area.

2902.8 Toilet room accessories. A minimum of one hand-drying facility shall be provided in each toilet room where lavatories are provided.

2902.9 Location of service sinks. Except for Group R occupancies, service sinks are required on each floor where toilet facilities are required. Service sinks shall not be installed in toilet rooms.

2902.10 Restaurants. A restaurant is defined as a business which sells food to be consumed on the premises.

1. The number of occupants for a drive-in restaurant or drive-in theater shall be considered as equal to twice the number parking stalls.
2. Employee toilet facilities are not to be included in the above restaurant requirements.
3. Walk-up restaurants with no access inside the building by customers:
    a. If 17 or less outside seats, one uni-sex toilet room is required, for employees only.
    b. If 18 or more outside seats, both male and female toilet rooms are required for both public and employees.

4. Restaurants with 225 sq.ft. or less inside customer area and 17 or less outside seats.
    a. A minimum of one uni-sex toilet room shall be provided.
5. Both male and female toilet rooms are required for the following restaurants:
    a. Restaurants with 225 sq.ft. or less inside customer area and 18 or more outside seats. Occupancy load shall be based on the total of the inside and outside customer loads.
    b. Restaurants with 226 sq.ft. or more inside customer area and which may include outside seating of less than 50% of the inside occupant load. Occupancy load may be based on inside customer area only.
    c. Restaurants with 226 sq.ft. or more inside customer area and which may include outside seating greater than 50% of the inside occupant load. Occupancy load shall be based on the total of the inside and outside customer loads.

2902.11 Minimum drinking fountains per floor. There shall be a minimum of one (1) drinking fountain per occupied floor in schools, theaters, auditoriums, dormitories, offices or public buildings.

CHAPTER 30
ELEVATORS AND CONVEYING SYSTEMS

SECTION 3001
GENERAL

Section 3001.2 is amended by replacing it in its entirety with the following:

3001.2 Standards. Unless provided for in other portions of this Building Code, the following standards shall apply:

Safety Code for Elevators, Dumbwaiters, Moving Walks and Escalators – ASME A17.1-1996 including supplements A 17.1a 1977 and A 17.1b 1998.

Exception: ASME A17.1 2002 may be used when approved by the Building Official.

Inspectors Manuals

ASME A17.2.1-1996	**Electric Elevators**
ASME A17-2.2-1997	**Hydraulic Elevators**
ASME A17.2.3-1998	**Escalators and Moving Walks**
ASME A10.4-1990	**Personnel Hoists**
ASME A17.3-1996	**Existing Elevators and Escalators**
ASME A90.1-1997	**Belt Manlifts**
ICC A117.1-1998	**Accessible & Useable Buildings**
ASCE 24-1998	**Construction in flood hazard areas as established in Section 1612.3**

SECTION 3002
HOISTWAY ENCLOSURES

Section 3002.3 is amended by adding the following sentence to the end of the paragraph:

All required exit stairs and area of refuges shall be graphically located on a sign adjacent to the elevator call buttons. Design shall meet ICC/ANSI A 117.1.

[F] SECTION 3003
EMERGENCY OPERATIONS

Section 3003.1.3.1 is added:

Section 3003.1.3.1 Two or more elevators in High Rise building: Sufficient emergency power shall be provided to operate enough elevators serving the fire floor to evacuate the occupants of the required refuge area on the fire floor to a minimum of two floors above or below the fire floor with a maximum of two elevator trips. Occupant load of refuge area based on three square feet per occupant.

A minimum of two elevators supplied with emergency power shall serve the fire floor refuge area at any time. In addition, emergency power shall be provided to operate an elevator that serves all other floors.

SECTION 3004
HOISTWAY VENTING

Section 3004.1 is amended by adding the following exceptions 3 and 4 as follows:

Exceptions:

3. Hoistways in high rise buildings shall comply with the high rise provision
4. Residential elevators need not be vented.

Section 3004.1.1 is added.

Section 3004.1.1 Vent operation. All hoistway vents shall be closed motorized vents (electrically) and shall open automatically by activation of the elevator hoistway smoke detector and/or a power failure.

On activation of the hoistway vent smoke detector, the elevator(s) shall be placed in the fire recall mode.

The hoistway vent smoke detector shall be connected to the building smoke detection system when building detection is provided.

A manual override shall be provided by a keyed switch adjacent to the elevator emergency controls. The switch shall be labeled "hoistway vent" and shall indicate an open and closed position.

The hoistway vents shall return to the closed position by resetting the vent smoke detector and placing the "hoistway vent" switch in the closed position.

Exception: Permanent open vents may be used in the following hoistways:

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

Section 3005.1 is amended by deleting "conveyors" from the general requirements.

Section 3005.3, Section 3005.3.1 and Section 3005.3.2 are amended by replacing them in their entirety with the following:

Section 3005.3 Conveyors. Conveyors and conveying systems shall not be regulated by this Code. Conveyors and related equipment penetrating fire rated assemblies shall comply with the provisions of Chapter 7.

Section 3007 is added.

3007 Elevator Recall for high rise buildings with pressurized hoistways.. In addition to the requirements of A17.1 Fire-Fighters' service, elevator operation within high-rise buildings with pressurized hoistways shall be as follows:

The elevator doors shall automatically open when the car reaches the approved level. After a period of one minute, elevators shall automatically close their doors. The doors shall be responsive by pressing the designated return floor call button in the elevator lobby or by pressing the door open button in the interior of the elevator cab. Elevators shall remain at that level until manual overrides by the key operated switch required by ASME 17.1.

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

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

Once the car is placed on Phase II, the fire department has control of the elevator; it shall operate per ANSI A17.1 rule 2113.C, Normal Phase II Operation.

Section 3008 is added.

3008 Elevator, Escalator and Moving Sidewalk Accident Reporting

3008.1 Definitions. For the purposes of this section, "accident" means a malfunction of an escalator, or moving sidewalk that results in an injury to a person or persons or that results in damage to the affected equipment, other than merely cosmetic damage. For the purposes of this section, "injury" means an injury to a person that results in treatment by a doctor or other medical professional.

3008.2 Time to Report. Any accident involving an elevator, escalator or moving sidewalk that results in injury shall be reported to the Agency within 24 hours after the accident by the owner or managing agent of the property in or on which said equipment is located. Any accident that does not involve injury shall be reported to the Agency within 48 hours. A written report by the owner or agent shall be filed with the Agency within 72 hours.

3008.3 After Accident Operation. When an escalator or moving sidewalk accident causes an injury, the equipment shall not be operated until such operation is approved by the Agency. A representative of the Agency shall make an on-site visit to examine the equipment within 24 hours of the initial report of the accident to the Agency.

3008.4 Removal. No portion of equipment involved in an accident that is reportable under Section 3008.2 shall be removed from the premises until approval for such removal has been granted by the Agency.

CHAPTER 31
SPECIAL CONSTRUCTION

SECTION 3105
AWNINGS AND CANOPIES

Section 3105.5 is added:

3105.5 Canopy special provisions.

1. A canopy may be entirely supported by the building to which it is attached.
2. Separation between different types of construction shall not be required.
3. Canopies shall comply with Fire Department access requirements. The minimum height of canopies at locations not requiring Fire Department access shall be 8 feet.
4. Canopies in the public right-of-way shall comply with Section 3202.
5. Canopies shall not obstruct required exits.
6. For the purposes of this code, a porte-cochere may be considered a canopy.

Section 3110 is added:nbction 3110

MANUFACTURED OR FACTORY-BUILT STRUCTURES

3110.1 Definitions.

A. **Manufactured or Factory-built Structures** shall mean factory-assembled structures which are completely finished to include all utilities and are transported to a site of permanent installation. This shall include mobile homes, factory-built housing and nonresidential structures as defined by state and federal regulations.

B. **Federal Act** shall mean the National Manufactured Home Construction and Safety Standards Act of 1974, 42 USCA, Sections 5401 to 5426, and the rules and regulations promulgated thereunder.

C. **Colorado Housing Act** shall mean the Colorado Housing Act of 1980 as amended, Title 24, Article 32, Part 7 of the Colorado Revised Statutes.

3110.2 Factory approval of manufactured structures.

A. Housing manufactured in or out of state under the Federal Act are inspected and approved by a HUD-authorized Product Primary Inspection Agency (IPIA). The manufacturer shall permanently attach a HUD label (seal) to the exterior of the home on the tail light end of each transportable section. Each manufactured home shall bear a data compliance sheet (plate) permanently affixed to the interior of the home near the electrical panel in a visible location. The data compliance sheet (plate) shall show structural zone and snow and wind loads for which the home has been designed, thus determining whether the home does or does not meet the Colorado requirements of the Federal Act.

B. Manufactured structures not constructed to the Federal Act shall be constructed in compliance with the Colorado Housing Act or the Colorado Factory Build Nonresidential Structures Act. The Colorado Division of Housing shall be the inspection agency and shall require a permanent

Colorado approval label (seal) with a factory-built (FB) certification number attached to each unit.

C. Other factory-built structures are not allowed. Prefabricated systems for residential or nonresidential use shall comply with the other sections of this Chapter. For example:

i. Stressed skin panels assembled at the site for roof, floor and walls.

ii. Shell type units.

3110.3 Permits required. The installation of factory-built structures shall comply with all provisions of the Building Code except the plans for the MHU are not required when either of the following items are provided to the Department:

A. A data compliance sheet for HUD-approved manufactured housing units.

B. A copy of the Colorado approval label (seal) with a legible factory-built certification number.

3110.4 Seal. A Colorado Division of Housing approval label (seal) must be permanently affixed to each factory-built structure.

3110.5 Inspection and Notice. The Federal Act and the Colorado Housing Act preempt the Building Code in relation to factory-built structures; therefore the Department does not inspect them. However, the Department shall inspect the foundation, installation of utilities and installation of the factory-built structures to the foundation.

A. The following notices shall be given to all persons applying for any permit relating to manufactured homes and factory-built structures from any agency of the City:

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

ii. ”It shall be the obligation of the permit applicant to forward this notice to the owner of the manufactured home or factory built structure.”

B. The notice set forth in Subsection 1 above shall be permanently installed in a visible location by the permit applicant adjacent to the date plate required by the Federal Act or in the furnace closet on factory-built structures.

CHAPTER 32
ENCROACHMENTS INTO THE PUBLIC RIGHT-OF-WAY

SECTION 3202
ENCROACHMENTS

Section 3202.2 is deleted in its entirety and replaced with the following:

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

Section 3202.3 is reserved.

Section 3202.4 Temporary encroachments is amended to replace the first sentence with the following:

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

CHAPTER 33
SAFEGAURDS DURING CONSTRUCTION

Section 3303 is amended by replacing it in its entirety with the following:

SECTION 3301
GENERAL

Section 3301.1 shall be deleted and replaced with the following:

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

Section 3301.3 shall be added:

3301.1 Demolition and moving standard. Unless provided for in other portions of this Building Code, the following additional standard shall utilized in relation to the work coverd in this chapter, American National Standard Institute publication, "Demolition Safety Requirements A10.6-1990".

SECTION 3302
CONSTRUCTION SAFEGAURDS

Section 3302.2 shall be amended by the addition of the following sentence.

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

Section 3302.2.1 shall be added:

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

Section 3302.2.2 shall be added:

3302.2.2 Cleaning Brick. The cleaning of brick or lumber at the job site shall be performed only by employees of the demolition contractor.

SECTION 3303
DEMOLITION

Section 3303.1.1 shall be added:

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

1. type of construction

2. method of demolition
3. a structural survey made to determine the condition of the structure
4. determination of the possibility of unplanned collapse of any portion of the building or structure
5. street, sidewalk or other public way closures
6. method of protecting the public
7. pertinent data and analysis pertaining to adjacent structures

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

Section 3303.1.2 shall be added:

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

Section 3303.1.3 shall be added:

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

Section 3303.4 shall be deleted and replaced by the following:

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

Section 3303.6 shall be amended by adding the following sentence:

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

Section 3303.6.1 shall be added:

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

Section 3303.6.2 shall be added:

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

Section 3303.7 shall be added:

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

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

SECTION 3306
PROTECTION OF PEDESTRIANS

Section 3306.1.1 shall be added:

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

SECTION 3307
PROTECTION OF ADJOINING PROPERTY

Section 3307.1 shall be deleted and replaced with the following:

3307.1 Protection required. Adjoining public and private property shall be protected from damage during construction , remodeling, demolition, and building relocation work. Protection must be provided for footings, foundations party walls, chimneys, skylights and roofs. Provisions shall be made to control water runoof and erosion dureing construction, demolition or relocations activities. The person making or causing and excavation, demolition or relocation to be made shall provide written notice to the owners of adjoining buildings and property, by certified mail with a return receipt, advising them that the excavation is to be made and that the adjoining buildings should be protected. Said motification shall be deliverd not less than 10 days prior to the scheduled starting date of the excavation, demolition and/or relocation.

Section 3307.2 shall be added:

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

Section 3307.3 shall be added:

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

SECTION 3308
TEMPORARY USE OF STREETS, ALLEYS AND PUBLIC PROPERTY

Section 3308.3 shall be added:

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

SECTION 3309
FIRE EXTINGUISHERS

Section 3309.1 shall be deleted and replaced with the following:

[F] 3309.1 General. All structures under construction, alteration, demolition or relocation shall comply with the provisions of the Fire Code for the City and County of Denver and shall be provided with not less than one approved portable fire extinguisher in accordance with Section 906 and sized for not less than ordinary hazard as follows:

1. At each stair way on all floor levels where combustible materisl ahave accumulated.
2. In every storage and construciton shed.
3. Additional portable fire extinguishers shall be provided where special hazards exist, such as the storage and use of flammable and combustible liquids and when and where cutting torches are utilized.

SECTION 3310
EXITS

Section 3310 shall be amended by adding the following sentence:

Only those stairways, passageways and ladders designated as means of access to the structure or building shall be used. Other access ways shall be closed at all times.

[F] SECTION 3311
STANDPIPES

Section 3311.1 shall be amended by adding the following sentence:

Standpipes in buildings, structures or utilities under construction, demolition or relocation shall comply with the provisions of the Fire Code for the City and County of Denver.

[F] SECTION 3312
AUTOMATIC SPRINKLER SYSTEM

Section 3312.1 shall be deleted and replaced with the following:

3312.1 Completion before occupancy. In buildings where an automatic sprinkler system is required by this code, it shall be unlawful to occupy any portion of a building or structure until the automatic sprinkler system installation has been tested and approved in accordance with the provisions of the Fire Code for the City and County of Denver.

Section 3312.2 shall be amended by the addition of the following sentence:

Operation of valves and automatic sprinkler systems in buildings, structures or utilities shall comply with the provisions of the Fire Code for the City and County of Denver.

Section 3313 shall be added:

SECTION 3313
MOVING AND RELOCATION OF STRUCTURES

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

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

3313.3 Moving on the public way. During actual moving operations on the public way a minimum of one individual shall be stationed at the top of the structure being moved to determine that there is no interference with trees, wires, traffic signals, signs or other obstructions.

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

3313.5 Vacated lot. Reference section 3303.4 above.

CHAPTER 34
EXISTING STRUCTURES

[EB] SECTION 3401
GENERAL

SECTION 3401
GENERAL

Section 3401.1 is replaced in its entirety with the following:

3401.1 Scope. The provisions of this chapter and Section 1026 of the Fire Code shall control the alteration, repair, addition and change of occupancy of existing structures.

Exception: Existing bleachers, grandstands and folding and telescopic seating shall comply with ICC 300-02.

The phrases “change of occupancy” and “change of use” are interchangeable.

[EB] SECTION 3403
ADDITIONS, ALTERATIONS OR REPAIRS

Section 3403.4 is amended by adding the following paragraph:

Stairways constructed prior to the adoption of the 2004 Denver Building Code using the provision of prior Denver Building Codes allowing " A flight of stairs shall not have a vertical rise greater than 13 feet (3963 mm) between floor levels or landings." May continue to utilize this provision and shall not be required to meet present code for the rise between floor levels or landings.

Section 3404.3 is replaced in its entirety with the following:

3404.3. The fire escape shall be designed to support a live load of 100 pounds per square foot (4788 Pa) and shall be constructed of noncombustible materials.

[EB] SECTION 3406
CHANGE OF OCCUPANCY

Section 3406.3 is amended by adding the following paragraph:

Stairways constructed prior to the adoption of the 2004 Denver Building Code using the provision of prior Denver Building Codes allowing " A flight of stairs shall not have a vertical rise greater than 13 feet (3963 mm) between floor levels or landings." may continue to utilize this provision and shall not be required to meet present code for the rise between floor levels or landings.

Chapter 61 is added:

CHAPTER 61
BUILDING CODE APPEALS

SECTION 6101
GENERAL

6101.1 Scope. This Chapter applies to the rehabilitation of all existing buildings, structures and utilities of any occupancy classification, except Group H Occupancy, which is at least 30 years old. This Chapter shall supersede all the requirements of this Code that are in conflict with the provisions of this Chapter, except the requirements of Chapter 1 relating to unsafe buildings, structures or utilities.

6101.2 Intent. The intent of this Chapter of the Code is to allow for cost-effective and efficient renovation of existing buildings that are at least 30 years old which may not meet the strict letter of present building and fire codes, but that still meet basic life-safety standards.

6101.3 Declaration. It is hereby declared, as a matter of public policy, that the rehabilitation, preservation and restoration of older buildings, located within the City and County of Denver, are a public necessity and are required in the interest of the general welfare of the people. Special consideration shall be given to buildings that are structures for preservation or contributing structures in Districts for Preservation.

6101.4 Exception for the rehabilitation of existing buildings. Buildings, structures and utilities conforming with Section 6101.1 of this Code may be granted an Exception from the requirements of this Code, concerning the repair, rehabilitation or change of use or occupancy of such building, structure or utility. No Exception shall be granted unless the following conditions exist:

A. The building, structure or utility is at least 30 years old; and

B. The building, structure or utility is structurally sound and the proposed repair, rehabilitation or change of use or occupancy will substantially improve the use, safety and welfare of the occupants. The Committee or Building Official, in making this decision, may request an engineer's or architect's report to determine the condition of the building, structure or utility.

SECTION 6102
COMMITTEE

6102.1 Creation. There is hereby created the Committee composed of 9 members who shall be appointed by the Mayor for terms of 2 years. The terms shall be staggered to allow for continuity. The Board members may petition to be considered for additional terms.

6102.2 Composition. The Committee membership shall consist of at least one representative of the following fields:

1. Architect with broad based experience in the field of architecture.
2. Contractor possessing a Building Contractor Class A or Class B license for the City and County of Denver.
3. Fire Protection engineer or degreed code consultant.
4. Preservationist, a person with expertise in historic preservation of buildings and structures.
5. Person with expertise in real estate, real estate development or real estate financing.

6. Person with expertise in accessible design or construction to represent the Commission of People with Disabilities of the City and County of Denver.

6102.2.1 Registered Professional Engineer. A registered professional engineer, with expertise in lateral stability of structures and expertise in unreinforced masonry buildings, shall be appointed to the committee to advise the committee on those subjects. This engineer shall be a non-voting member unless appointed as a voting member by the Mayor.

6102.2.2 City representation. The Building Official of this Agency and the Chief of the Fire Prevention and Investigation Division or their designees shall be ex officio members of the Committee, but shall have no voting power. A liaison to the Mayor's Office shall be established.

6102.3 Removal. The Mayor may remove any member of the Committee for cause, or when recommended by the chair. Cause may include, but is not limited to, absence from more than 3 meetings in a row.

6102.4 Vacancy. The Mayor may fill any vacancy for the remaining time of the term.

SECTION 6103
COMMITTEE ACTIVITIES

6103.1 Support. The Agency shall provide the Committee with a coordinator and secretary. The coordinator may be, but need not be, the Building Official of the Building Department or his designee.

6103.2 Meetings. There shall be at least one meeting per month unless there is no work for the Committee to conduct. A simple majority of the Committee shall be necessary to conduct business. Guidelines shall be established to govern the activities of the Committee. The Committee may hold meetings to inspect the physical condition of subject buildings. All meetings of the Committee shall be open to the public. At the meeting the Committee and the applicant are encouraged to discuss the application, the requested variances and possible options and changes to the application in order to meet necessary health and safety requirements in a manner that is acceptable to all parties.

6103.3 Compliance. The Committee shall make a recommendation as to any variances requested by the applicant and forward it to the Building Official. The Building Official shall grant the recommended variances within 2 weeks after receipt of the Committee's recommendation unless the Building Official determines, by clear and convincing evidence, that the variance would cause imminent peril to life or property. Such a determination must be made in writing and forwarded to the applicant and the Committee. The Chief of the Fire Prevention and Investigation Division shall provide written comments concerning the variance to the Building Official. The Building Official shall consider any such comments when making such determination and make them part of the record. Failure to comply with present codes shall not, in and of itself, constitute clear and convincing evidence of imminent peril to life or property.

Policy Recommendations: The Board may recommend policies to the Building Official for his review and approval.

6103.5 Compensation. Each member of the Committee, except those that are city employees, shall be all volunteer and are not compensated.

SECTION 6104
APPLICATION AND FEE

6104.1 Application form. Prior to any action by the Committee, an application for a variance shall be filed with the Department on a form approved by the Committee.

6104.2 Application fee. A nonrefundable fee of $150.00 shall accompany the application. Checks shall be made payable to the Manager of Revenue.

SECTION 6105
APPLICATION REVIEW PROCEDURE

6105.1 Submittal of Application. Application for a variance shall be submitted to the Building Official of the Agency by the last Wednesday of each month. The Agency shall review the application with the applicant before the first Wednesday of the next month. If the issues for a variance cannot be resolved by the first Wednesday of the month, the application shall be directed to the Rehabilitation Committee for its review and recommendation at their next meeting.

6105.1 Stay of enforcement. The application for a variance shall stay enforcement of any outstanding order or denial unless the Building Official certifies that a stay of the order or denial would cause imminent peril to life or property.

SECTION 6106
DECISION OF THE COMMITTEE

6106.1 Acceptance. The decision on the application for variance shall be sent to the applicant and to the committee. Decisions shall be filed with the Clerk & Recorder as a matter of public record.

6106.2 Denial by Committee. A denial of a variance by the Building Official based on a Committee recommendation for denial may be appealed to the Board of Appeals under Section 113.

6106.3 Denial by the Building Official. A denial of a variance by the Building Official contrary to the recommendation of the Committee because of clear and convincing evidence that the variance would cause imminent peril to life and property may be appealed to the Manager of Community Planning and Development. Upon an appeal, the Manager of Community Planning & Development shall decide whether the Building Official has clear and convincing evidence of imminent peril to life or property with which to deny the variance. If the Manger of Community Planning & Development determines that the Building Official has met the burden of proof, the Building Official's denial of the variance shall be upheld.

6106.4 Denial by Chief of Fire Prevention. A denial of a variance by the Chief of Fire Prevention and Investigation Division, contrary to the recommendation of the Committee, may be appealed to the Manager of Safety.

6106.5 Period of variance. Variance approved for the rehabilitation of existing buildings, structures and utilities pursuant to this Chapter, based on the original application, shall be valid for a period of 2 years from the date of approval, after which period the variance shall lapse and become void unless a building permit has been issued within said period and is not thereafter cancelled.

APPENDICES

APPENDIX ADOPTION STATUS

IBC APPENDICES
STATUS OF APPENDICES ON ADOPTION

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

APPENDIX	TITLE	STATUS
A	EMPLOYEE QUALIFICATIONS	DELETE
B	BOARD OF APPEALS	DELETE
C	GROUP U – AGRICULTURAL BUILDINGS	DELETE
D	FIRE DISTRICTS	DELETE
E	SUPPLEMENTARY ACCESSIBILITY REQUIREMENTS	ADOPT/AS GUIDELINE
F	RODENT PROOFING	ADOPT
G	FLOOD RESISTANT CONSTRUCTION	DELETE
H	SIGNS	ADOPT AS AMENDED
I	PATIO COVERS	ADOPT AS AMENDED
J	GRADING	ADOPT AS GUIDELINE
K	CONSTRUCTION IN DESIGNATED SPECIAL CONSTRUCTION ZONES	ADDED
L	ACCESS CONTROL	ADDED
M	COLORADO TITLE 9 ARTICLE 5 – STANDARDS FOR ACCESSIBILE HOUSING	ADDED
N	CONSTRUCTION OF AIRPORT BUILDINGS AND STRUCTURES	ADDED

APPENDIX H
SIGNS

SECTION H101
GENERAL

Section H101.1 General is amended by adding the following sentence:

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

Section H101.2 Signs exempt from permits is amended by adding the following to exemption no's. 2 and 4:

2. Temporary signs announcing the sale or rent of property. The Zoning Sign Code Section 59-537 (a)(7) allows these signs to be erected without a permit with the following limitations**:** 1 sign per property; not more than 5 square feet in area per face; not more than 6 feet above grade; shall not be illuminated or animated.

4. Projecting signs not exceeding 2.5 square feet (0.23 m^2). The Zoning Sign Code Sections 59-537(c)(3) 7. & Section 59-554(d) allows projecting signs only in the B-5, B-7 & B-8-A Zone Districts. They must be reviewed and approved by the Planning Office.

SECTION H102
DEFINITIONS

Section H102.1 General is amended by adding the following:

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

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

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

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

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

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

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

SIGN. Reference Zoning Sign Code Section 59-2 (269) Sign: A sign is any object or device or part thereof situated outdoors or indoors which is used to advertise or identify an object, person, institution, organization,

business, product, service, event or location by any means including words, letters, figures, designs, symbols, fixtures, colors, motion illumination or projected images. Signs do not include the following:

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

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

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

BILLBOARD. See Outdoor General Advertising Device.

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

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

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

APPENDIX I
PATIO COVERS

SECTION I104
STRUCTURAL PROVISIONS

Appendix I Section I104.2 is amended by replacing it in its entirety with the following:

I104.2 Footings. A patio cover may be supported on a concrete slab on grade without footings, provided that the slab is not less than 4 inches thick with thickened edges 12 inches below grade, and further provided that the columns do not support live and dead loads in excess of 2,000 pounds per column.

APPENDIX K
CONSTRUCTION IN DESIGNATED SPECIAL CONSTRUCTION ZONES

SECTION K101
GENERAL

K101 Scope. All construction, alteration, repairs, demolition or moving in areas designated under Article VII, Chapter 10 of the Revised Municipal Code as Special Construction Zones shall conform to the provisions of this Chapter.

SECTION K102
GENERAL PROVISIONS

K102.1 Permits. No permits for construction, alteration, repairs, demolition or moving in a designated Special Construction Zone shall be issued without being in compliance with all recommendations contained in the engineer's report if required by Section 155.

K102.2 Engineer's reports. If the applicant is required to prepare an engineer's report pursuant to Section 155, the Department may require such additional information and recommendations as it deems necessary and may require such additional measures as are necessary to minimize potential hazards during construction and control hazards from the completed structure.

K102.3 Inspections. All construction and excavation sites shall be subject to inspection by the Department, Fire Department and the Department of Health and Hospitals, and results of tests or monitoring required by this Chapter shall be available at the site for inspection.

K102.4 Work stoppage. In the event of a material violation with the requirements of this Chapter, the Department may stop all construction activity until it is satisfied that the violation has been corrected.

SECTION K103
HAZARDOUS GASES GENERATED BY LANDFILLS

K103.1 New construction. Except as provided in Section 153.6 of this Building Code, all new buildings, structures and utilities to be constructed in a Special Construction Zone, which is so designated because of the presence of hazardous gases generated by landfills, shall be designed by an engineer registered in the state of Colorado to control and protect against accumulation of over 1.0% by volume of flammable gas in the building, structure or utility. The following precautions shall be taken during and after construction activity:

1. A flammable gas indicator shall be utilized at all times during trenching, excavating, drilling or when working within 10 feet of an open excavation.
2. When trenching, excavating or drilling deeper than 2 feet into the soil or fill, or in the presence of detectable concentrations of 1.0% by volume of flammable gas, the operating equipment shall be provided with spark proof exhausts.
3. A dry chemical fire extinguisher, approved by the Fire Department, shall be provided on all equipment used in the landfill.
4. Personnel within or near an open trench or drill hole deeper than 2 feet into the soil or fill shall be fully clothed, wear shoes with nonmetallic soles and wear a hard hat and safety goggles or glasses.

5. Exhaust blowers shall be used in instances where trenches may show a build-up of flammable gas of 1.0% by volume or less than 19.5% by volume of oxygen.
6. Smoking and/or an open flame shall not be permitted in any area within 100 feet of the excavation.
7. Personnel shall be kept upwind of any open trench unless the trench and the downwind atmosphere are continuously monitored.
8. Before personnel are permitted to enter an open trench, the trench shall be monitored for flammable gas and at least a 19.5%-by-volume oxygen sufficiency. When in the excavation, each work party shall be working no more than 5 feet from a continuously operating flammable gas and oxygen monitor.
9. The applicant shall employ an inspector whose duty it shall be to effect continuous compliance with the foregoing precautions. The inspector shall be a qualified person approved by the Department or shall be an engineer registered with the state of Colorado or a person in the employ of, or subject to, the direct supervision and control of such an engineer. Said inspector shall submit a written report of his inspection to the applicant and to the Department at 10-day intervals during active construction stating that all new construction is in compliance with these regulations, and that all testing and monitoring has been and is being done as required by the Code.
10. After construction is completed, hazardous gas monitoring devices approved by the Fire Department shall be installed in the completed building or structure in such number and in such places within the building or structure as may be required by the Fire Department.

K103.2 Alteration or repair of existing building, structures or utilities. Except as provided in Section 153.6 and K 103.3, no alterations or repairs to any existing building, structure or utility shall be made unless the following precautions are taken:

1. Within 5 days prior to applying for a permit under Chapter 1 of the Building Code to alter or repair an existing building, structure or utility, the work site shall be tested for the presence of flammable gas by an engineer registered in the state of Colorado.
2. The applicant shall be exempt from all other requirements of this Section K103.2 if:
    A. Test results show that there is less than 2.0% of the Lower Explosive Limit (L.E.L.) of hazardous gas, then the permit for the work shall be issued; and
    B. Upon completion of the work, the applicant shall install hazardous gas monitoring devices approved by the Fire Department in such number and in such places within the building or structure as may be required by the Fire Department.
3. If the test results show that there is 2% or more of the Lower Explosive Limit (L.E.L.) of hazardous gas, then the applicant shall take all of the precautions pursuant to Section K 103.1 as if the construction were new construction.

K103.3 Exemption. Whether or not he is an applicant for a permit, the owner of real property within a Special Construction Zone may apply to the Building Department for a certificate of exemption from the provisions of Article 647 of the Revised Municipal Code and Section K 103 of the Building Code. To obtain such exemption, said owner shall have his property tested by an engineer registered in the state of Colorado and tests shall meet the following requirements:

1. A test for the presence of flammable gas shall be performed at a time when there is frost on his property to a depth of at least 6 inches in the soil, again at a time when there is no frost in the soil, and again within 5 days of the date when an exemption certificate is applied for.

2. The test holes shall be placed along each major boundary line of the real property for which the exemption is sought in such number and at such locations as the engineer deems proper.

3. If the test results show that there is less than 2.0% of the lower explosive limit (L.E.L.) of flammable gas, and if such test results are satisfactory to the Department, then the Department shall issue a certificate stating that the real property described in the certificate is exempt from the provisions of Article 647 of the Revised Municipal Code and Section K 103 of the Building Code.

4. As a condition of receiving an exemption certificate from the Department, the owner shall acquire and install in all existing and future buildings and structures devices approved by the Fire Department to monitor for the presence of hazardous gas in such number and in such places within the building or structure as may be required by the Fire Department.

5. Upon a finding that flammable gas is present in amounts greater than 2% of the lower explosive limit on any property where an exemption certificate has been issued, the Department shall revoke the exemption certificate. Further, upon a finding that the monitoring devices on any property for which an exemption certificate has been issued are inoperative, the Department may suspend or revoke the exemption certificate.

APPENDIX L
ACCESS CONTROL

SECTION L101
INTRODUCTION

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

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

L101.2 Purpose and intent. The purpose of this appendix is to combine all of the various DBC requirements and previous policy requirements for access control systems into one document. The appendix is intended to provide consistency in the design, review, installation and inspection of access control systems and components by providing standards and guidelines for these systems. It is anticipated that redundant design efforts and administrative modification requests can be avoided by providing safe alternative solutions to some commonly reoccurring security applications where the use of access control systems would create conflicts with other requirements of the DBC. Although the appendix contains specific solutions for a number of common applications it is not intended to limit the use of this policy to only those situations. This appendix can be used to help devise appropriate solutions to other unique situations that require the use of access control systems that may also be incompatible with requirements of the DBC. The provisions of the DBC in Section 103.3 relating to modifications under special circumstances can be used when other solutions provide an equivalent alternative to the provisions of the DBC. The standards and guidelines of this appendix are designed to assist in the development of specialized access control systems that are necessary to respond to unique security needs.

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

Policy P-25 Securing of Stair Doors Into Exit Enclosures – Dated 09/04/19990

Policy P-26 Securing of Elevator Lobbies - Dated 02/05/1993

Policy P-47 Interim Policy – Electric Door Hardware Applications for Exit Doors - Dated 09/21/1992

Policy 32-B068 Access Control – Dated 04/18/1995

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

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

- Section 403.12 Stairway door operation.
- Section 1008.1.3.4 Access-controlled egress doors.
- Section 1008.1.8.6 Delayed egress locks.
- Section 1008.1.8.7 Stairway doors.

SECTION L102
DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ELECTRICAL CONTRACTOR. Colorado State licensed electrical contractor.

ELECTRICAL SIGNAL CONTRACTOR. A contractor licensed to install, add to, alter or repair electrical wiring and equipment for fire alarm, fire detection, emergency voice communication systems, electrical signaling and control wiring. Voltages shall not exceed 48 volts or the system shall be power-limited as defined by the NEC. Complete conduit or raceway systems shall not be installed by the holder of this license. All work shall be performed under the supervision of the holder of an Electrical Signal Supervisor Certificate.

ELECTRICALLY MODIFIED LOCKSET. A standard builder's hardware lockset that has been modified to operate electrically without compromising mechanical free egress.

ELECTRICALLY OPERATED EXIT DEVICE. An exit device that has been modified to operate electrically without compromising mechanical free egress.

FAIL-SAFE LOCK. A lock that unlocks automatically upon loss of power.

FAIL-SECURE LOCK. A lock that remains locked during loss of power.

FIRE ASSEMBLY. An assembly of fire doors, fire windows or fire damper, including all required hardware, anchorage, frames and sills.

FIRE DETECTION SYSTEM. A building that is fully smoke detectored, or smoke detection where required by the DBC Section 1807, Smoke Control in High Rise Buildings.

FPB. Fire Prevention and Investigation Division, of the Denver Fire Department.

LABEL. Fire doors shall have a label or other identification showing the fire protection rating. Such label shall be approved and shall be permanently affixed. The label shall be applied at the factory where fabrication and assembly are performed. Inspection shall be made by an approved inspection agency during fabrication and assembly.

LISTED and LISTING. Terms referring to equipment and materials which are shown in a list published by an approved testing agency, qualified and equipped for experimental testing and maintaining an adequate periodic inspection of current productions and whose listing states that the equipment complies with recognized safety standards.

MAGNETIC LOCK. Lock that relies on magnetic power to lock the door. Typically mating a door mounted door-plate to a frame mounted lock housing.

MAGNETIC LOCK RELEASE. A switch to release a magnetic lock that is mounted in a CPD-approved exit device.

MANUAL UNLOCKING SWITCH. A permanently wired, manually operated, raised, push-type switch with integrated time delay which immediately and directly unlocks a door.

MECHANICAL FREE EGRESS. Door hardware that mechanically unlocks and unlatches the door, from the inside (egress side) with a single motion without the use of a key, card or any special knowledge or effort.

MOTION DETECTOR. A device that is listed by an approved testing laboratory as a request to exit sensor under UL294, "Access Control System Unit" (i.e., UL ALVY) or other appropriate category.

NEC. National Electric Code.

POWER TRANSFER. Hinge, pivot or door cord that provides that routing for the wire to pass from the frame into the door.

SHEAR-TYPE MAGNETIC LOCK. A magnetic lock that relies on a shear pin, post, concave/convex machining or other similar projections to enhance the latching strength of the lock.

SECTION L103
DEFINITIONS

L103.1 General Requirements. All access control system applications shall comply with all of the requirements contained in Section L301.1 unless other specific provisions of Appendix L modify these requirements.

L103.1.1 Mechanical free egress. All doors shall have mechanical free egress at all times unless otherwise approved by CPD.

L103.1.2 Fire-rated doors. Required fired-rated doors shall remain latched at all times that the door is in a closed position.

L103.1.3 Modifying doors and door frames. Re-machining fire-rated doors or frames may void the fire label. Re-machining shall comply with the manufacturer's specified procedures.

L103.1.4 Key lock boxes. Provision for ingress by way of an approved key box (e.g., "Knox Box") for entry by emergency personnel should be provided and shall be located in a FPB-approved location.

L103.1.5 Fail safe wiring. When electric locks are held locked by the application of electric power, the wiring between the power supply and lock shall be installed in a "fail-safe" arrangement. All portions of the circuit shall be configured in a way that parallel conductors in a common cable or raceway shall have conductors of opposite polarity in the same cable or raceway. This arrangement assures that the lock releases if wires break or if parallel conductors are shorted.

L103.1.6 Access control system power. Access control system power supplies shall comply with all of the following requirements:

1. All power supplies shall be listed assemblies.
2. "Plug-in" Class II power supplies along with their serving outlets shall be enclosed in a protective cabinet.
3. All power supplies other than "plug-in" Class II power supplies shall be hardwired to primary power.

4. When the manufacturer's nameplate primary power requirement exceeds 180 volt-amps, the power supply shall be served by a dedicated branch circuit. If power requirement is less than 180 VA, then an existing power outlet may be converted to a junction box serving the power supply.

L103.1.7 Hardware Requirements. All access control system applications shall utilize hardware that complies with all of the requirements contained in Section L301.1.7 unless specifically excepted by other provisions of Appendix L.

L103.1.7.1 Listing. All access control system units shall be listed for their intended use by an approved agency, such as UL or ETL, or as otherwise approved by CPD.

L103.1.7.2 Electrical compatibility. All components of the operating system shall be matched electrically in all ratings (i.e. voltage and current).

L103.1.7.3 Electric strikes. Doors or frames may be equipped with electric strikes that do not affect mechanical free egress. Electric strikes used on fire-rated doors shall be fail-secure and shall bear the appropriate fire listing.

L103.1.7.4 Electrified locksets. Approved and listed electrically modified locksets (mortise, cylindrical or unit type) that do not affect mechanical free egress are permitted.

L103.1.7.5 Electrically operated panic hardware. Approved and listed electrically operated panic hardware (rim, mortise, and concealed or vertical rod type) is permitted. The exit device shall bear appropriate fire rating when used on fire-rated doors.

L103.1.7.6 Electric bolts. Electric bolts, either flush or surface mounted, shall not be installed, altered or repaired.

L103.1.7.7 Shear-type magnetic locks. Shear-type magnetic locks shall not be installed, altered or repaired.

L103.1.8 Non-binding hardware. Hardware shall be non-binding in design and function.

SECTION L104
ACCESS CONTROL SYSTEMS WITH MAGNETIC LOCKS

L104.1. Access control systems with magnetic locks. Doors in all occupancies except H occupancies are permitted to be equipped with magnetic locks that prevent mechanical free egress when the magnetic locking system complies with all of the provisions of Section L104.1. Magnetic locks that are part of a delayed egress system shall comply with the provisions of Section L105.1. Magnetic locks that are used to secure a elevator lobby shall comply with all of the requirements of Section L106.1.

L104.1.1 Fire alarm interface. Activation of the building fire alarm system, automatic sprinkler system or fire detection system, if provided, shall directly unlock the doors, and the doors shall remain unlocked until the system has been reset.

L104.1.2 Loss of power. All doors secured by magnetic locks shall unlock upon the loss of normal building power. On doors with panic hardware, the loss of normal building power shall directly unlock the door.

Exception: On doors not requiring panic hardware, emergency power sources (battery, generator, etc.) may be used to power the locks provided the door unlocks upon failure of the emergency source.

L104.1.3 Magnetic lock power transfer. Power transfer from the door to the frame shall be listed and approved.

L104.1.4 Other locking devices. When magnetic locks are installed on a door, no other locking device shall be used on the door.

L104.1.5 Door release hardware. The door shall unlock from the egress side using a combination of any two of the following means:

1. **Door mounted release device.** May be either of the following:
   a) Panic hardware release. Panic hardware may be used to unlock a magnetic lock, provided it is equipped with an internally mounted switch. Operation of the panic device shall simultaneously directly unlock the magnetic lock and allow the door to open with one motion. The switch shall have a proven operable life, as part of the exit device, equal to the listing requirements for the device (typically 250,000 cycles).
   b) Contact sense exit device release. This device shall directly unlock the magnetic lock.
2. **Manual unlocking device.** A manual, press to operate button may be used to unlock a magnetic lock when all the following conditions are met:
   a) Be located in compliance with the requirements of DBC 1106.3 (Accessible Design and Standards, Controls and Hardware).
   b) Be located within five feet of either edge of the egress side of the door opening.
   c) The operable portion of the device shall have a minimum dimension of one inch (1").
   d) Be clearly identified by a sign that reads "EXIT" (or similar language) in minimum ¼" high letters on a contrasting background.
   e) Directly unlock the magnetic lock.
   f) Remain unlocked for a minimum of 30 seconds.
3. **Motion detector release.** The detector shall be arranged to detect an occupant approaching the doors from the egress side within a six-foot radius of the centerline of the door opening (refer to Figure 104.1 for coverage patterns) and upon detection, shall directly unlock the magnetic lock and shall keep it unlocked for a minimum of 5 seconds.. Loss of operating power to the detector shall directly unlock the magnetic lock.

COVERAGE PATTERNS

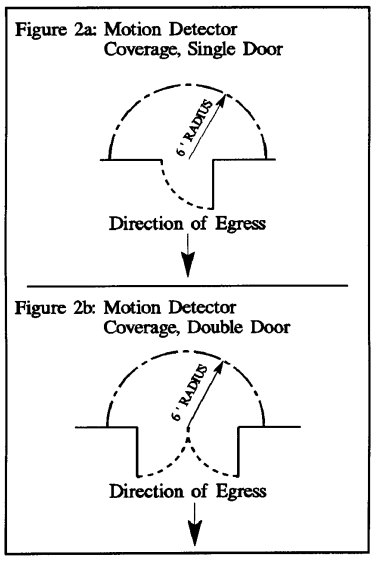

FIGURE 104.1

SECTION L105
DELAYED EGRESS SYSTEMS

L105.1 Delayed egress systems. The doors in a means of egress in any occupancy except Group A, E and H occupancies are permitted to be equipped with delayed egress locks when the delayed egress system complies with all of the requirements of L105.1.

L105.1.1 Fire protection systems. Delayed egress systems can be installed in buildings containing occupancies allowed by Section L501.1 when all of the following requirements are met in the building:

1. The building shall be protected by an approved fire alarm system that includes manual fire alarm pull stations.
2. The building shall be equipped with at least one of the following systems:
   a) The building shall be protected throughout with an approved fire sprinkler system.
   b) The building shall be protected throughout by an approved fire detection system.
3. The door shall directly unlock upon activation of the fire alarm system and remain unlocked until the system has been reset.

L105.1.2 Number of delayed egress systems along egress path. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.

L105.1.3 Loss of power. Loss of normal building power shall directly unlock the door.

> **Exception:** On doors not requiring panic hardware, emergency power sources (battery, generator, etc.) may be used to power the lock, provided the door unlocks upon failure of the emergency source.

L105.1.4 Fire command center switch. The lock shall be connected to an on/off toggle switch in the building's Fire Command Center, or other approved location, which can simultaneously unlock all delayed egress doors. The switch shall be in a location approved by the FPB and shall be clearly labeled as to its function and the "ON" and "OFF" positions.

L105.1.5 Release Device. The door shall unlatch upon the initiation of an irreversible process, which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67N) is applied for not more than 3 seconds to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only at the door.

> **Exception:** Where approved, the delay to latch release time may be extended to not more than 30 seconds.

L105.1.6 Signage. A sign shall be provided on the door located above and within 12 inches of the release device reading: PUSH UNTIL ALARM SOUNDS, DOOR CAN BE OPENED IN 15 (30) SECONDS

L105.1.7 Lighting. The area at the door shall be illuminated per IBC Section 1006 (Means of Egress Illumination).

L105.1.8 Listed Assembly. The components of the delayed egress lock (lock, release device, electronics, etc.) shall be listed as a complete assembly as a delayed egress system. Individual, listed components may not be field assembled to build a delayed egress locking system.

SECTION L106
SECURING AN ELEVATOR LOBBY WITH AN ACCESS CONTROL SYSTEM

L106.1 Secured elevator lobby. When all of the provisions of Section L106.1have been satisfied, elevator lobbies may be secured to prevent access from the elevator lobby into a tenant space.

L106.1.1 Use of secured elevator lobbies. Secured elevator lobbies are intended to provide a transitional area where building occupants can await the arrival of an elevator car or depart from an elevator car. It is not intended to be an area where building occupants can work. A secured elevator lobby cannot contain other spaces that are considered normally occupied such as restrooms, reception areas or waiting areas.

L106.1.2 Exit path blockage. Securing of the lobby cannot result in the blockage of exit paths from normally occupied areas. A secured lobby cannot interrupt the exit path circulation.

L106.1.3 Dead-end corridors. Securing of the lobby cannot result in dead- end exit corridors with lengths that exceed the provisions of IBC Sections 1016.

L106.1.4 Restroom facility access. Securing of the lobby cannot result in elimination of access to required restroom facilities from normally occupied areas. Each individual tenant shall have access at all times to required toilet facilities.

L106.1.5 Electric load-center access. Securing of the lobby cannot eliminate the access required by the NEC to electrical overload protection or disconnect equipment. Each tenant shall have the access required by the NEC.

L106.1.6 Delayed egress. Delayed egress hardware is permitted under this section.

L106.1.7 Exit stairway access. Direct access to at least one exit stair enclosure from the secured elevator lobby shall be provided or a dedicated corridor shall be provided to maintain free access to at least one exit.

Exception: When free access to at least two exits is not maintained, the elevator lobby may be secured provided all of the following conditions are met:

1. Fire System Requirements. The building shall be equipped with either a fire alarm system and be fully detectored or be fully sprinkled and have manual fire pull stations installed throughout the building or be equipped with the life safety features prescribed under DBC Section 403.
2. Electric Locks. All doors connecting the secured lobby with normally occupied areas or with corridors leading to the exit stair enclosure can only be secured with a fail safe electric lock and the lock shall unlock when the fire alarm is activated or upon loss of normal building power. The electric lock cannot be connected to an emergency power source which would keep the lock engaged when normal building power is lost.
3. Emergency Communications. One of the following emergency communication devices shall be provided in the lobby:
    a) A manual fire alarm box shall be installed in a clearly visible location within the elevator lobby and mounted at a height to comply with the requirements of DBC Section 1106.3 (Accessible Design and Standards, Controls and Hardware). The location shall be subject to approval by the FPB. A manual fire alarm box installed under these requirements shall transmit to a Class I Central Station.
    b) An emergency telephone or other approved communication device shall be installed in the elevator lobby, and mounted in compliance with the requirements of DBC 1106.3 (Accessible Design and Standards, Controls and Hardware). The location shall be approved by the FPB. The system/device shall transmit to a commercial monitoring service or continuously staffed monitoring service within the building as approved by CPD and the FPB. Upon activation, the communications device shall automatically transmit a location identification message to the monitoring service. A sign shall be provided at the communication device that states that this is an emergency phone and lists the building address and the floor number of the elevator lobby.

4. Lighting Requirements. The elevator lobby shall be illuminated per IBC Section 1006 (Means of Egress Illumination).

5. Compatibility With Accessibility Requirements. All doors into the elevator lobby area from normally occupied areas shall have hardware compatible with the requirements of DBC Section 1106.3 and 1106.10 on each side of the door.

6. Areas of Evacuation Assistance (Refuge Areas). When an elevator lobby is used as an Area of Evacuation Assistance, all of the following additional, conditions shall be met:

   a) Electric Lock Requirements. Electric locks shall be designed so that when they are released, the door will remain latched. The lock shall also be connected to an on/off toggle switch in the building's Fire Command Center, or other approved location, which can simultaneously unlock all refuge area doors. The switch shall be clearly labeled as to its function and the "ON" and "OFF" positions.

   b) Door and Door Hardware Requirements. All doors opening into elevator lobby refuge areas shall be 20-minute fire-protection rated assemblies as required by DBC Section 403.9.1. All hardware necessary to maintain the fire rating of the door shall be listed and approved fire door hardware. All hardware installed on the rated door and frame assembly shall be compatible with the manner in which the door was manufactured and shall not reduce the fire rating of the assembly. Field or other modification of rated doors and frames is prohibited unless approved in writing by the agency which labeled the fire-rated assembly.

   c) Securing Doors Leading Into the Elevator Lobby. Doors leading into the lobby refuge area from normally occupied areas shall be openable from the normally occupied side without the use of a key or special knowledge or effort.

   d) Compatibility With Accessibility Requirements. All doors into the elevator lobby refuge area from normally occupied areas shall have hardware compatible with the requirements of DBC Section 1008.1.8 on each side of the door.

   e) Refuge Area Subdivision. A refuge area, which includes the elevator lobby and the corridors that connect the lobby to the exit stair enclosures, shall remain as one open area without restriction of movement within the refuge area.

SECTION L107
SECURING EXIT ENCLOSURE (STAIR TOWER) DOORS

L107.1 Securing exit enclosure doors. Doors opening into exit enclosures can be secured under certain conditions provided all of the applicable requirements of Section L107.1 are satisfied.

L107.1.1 Exit enclosure door general hardware requirements. All doors into exit enclosure shall have hardware that complies with the provisions of Section L107.1.1

L107.1.1.1 Fire rating and latching requirements of door hardware. All doors into exit enclosures shall be fire-rated assemblies, as required by Section 1019. In order to maintain the fire rating of the door assembly, all hardware installed on enclosure doors shall meet the following criteria:

1. Latching Requirements. The door shall remain latched at all times that the door is in a closed position as required by Section 715.3.7. Electric locks or strikes that unlatch the door upon activation of the fire alarm system or loss of power are unacceptable.

2. All hardware shall be listed for use on fire-rated door assemblies. The hardware shall be listed for an hourly rating equal to or greater than the rating of the door assembly. Any field or

other modification of rated doors and frames is prohibited unless approved in writing by that agency that labels the door and frame assembly. Doors that are modified to accommodate hardware without the approval of the labeling agency are not approved and shall be replaced with properly labeled doors manufactured to accommodate the hardware.

L701.1.1.2 Door hardware requirements to provide accessibility. All new hardware on doors into exit enclosures shall be compatible with the requirements of DBC Sections 1106.3 and 1106.10. All hardware that was installed after August 1, 1983, shall comply with DBC Sections 1106.3 and 1106.10.

L107.1.2 Requirements for access control. All doors into exit enclosures shall be capable of being opened from both sides without the use of a key or special knowledge or effort unless otherwise permitted by the provisions of Section L701.1.

L107.1.3 Exit enclosure doors at the exit discharge level. Doors providing the path of egress out of the enclosure at the discharge level cannot be locked from the exit enclosure side at any time.

Exception: Magnetic locks and Delayed Egress Locks are permitted when used in accordance with this appendix.

Exterior exit enclosure doors at the exit discharge level can be locked to prevent access into the exit enclosure from the exterior side. Interior exit enclosure doors at the exit discharge level that are not intended for exit discharge from the exit enclosure shall comply with all of the provisions of Section L701.1.4.

L107.1.4 Access doors into exit enclosures at levels other than the exit discharge level. Doors that are a part of the path of egress into exit enclosures cannot be locked to prevent or restrict access into the exit enclosure at any time. Doors shall be operable without the use of a key or any special knowledge or effort. The door shall be capable of being opened with one operation only. The following types of locking devices are prohibited on the exit side of doors into enclosures:

1. **Key operated mechanical locks**. Mechanical locks requiring a key, combination or other special knowledge to open the door.
2. **Combination of mechanical and electrical locks.** Combinations of mechanical door hardware and/or electric locks which require more than one operation to open the door.
3. **Electric locks.** Electric locking devices which are unlocked by use of a key, card reader, key pad, pressure sensitive mat, push button switch or other similar method.
4. **Electric strikes.** Fail-safe electric strikes are prohibited on doors into exit enclosures. The latch point on these doors must be maintained and a fail-safe electric strike does not maintain the latch point when power is lost to the strike. Fail-secure electric strikes that are not listed for use on a fire rated door assembly are also prohibited on doors into exit enclosures. Except as allowed by Section L107.1.3.2.2.
5. **After hours locks.** Locking devices that are activated after normal business hours or during other timed periods and restrict access into the exit enclosure.

Exceptions:

1. **Magnetic locks and Delayed Egress** Locks are permitted when used in accordance with this appendix.
2. **Parking Garage.** In a parking garage that is not intended for use by the general public (or in other garages, when approved by CPD & FPB), doors used in a means of egress that also serve lobbies, corridors or common areas shall be secured provided all of the following conditions are met:

a) Parking Garage, Lobby, Corridor, Common Area Use. The parking garage, lobby, corridor or common area that is accessed by the door may not be accessible to the general public.

b) Fire System Requirements. The building shall be equipped with a fire alarm system with manual fire pull stations and notification appliances installed throughout the building. Manual pull stations and notification appliances shall be provided adjacent to each secured, parking garage door. If the building is provided with an automatic sprinkler system or a fire detection system then activation of either of these systems or the fire alarm system shall unlock the doors and the doors shall remain unlocked until the system has been reset.

c) Electric Lock Requirements. The electric lock must be fail-safe and unlock upon fire alarm activation or loss of normal building power. The lock may not be connected to an emergency power source that would keep the lock energized when normal building power is lost.

d) Signage. A sign shall be provided on the garage side of each door to be locked that reads: DOOR IS LOCKED, UNLOCKS UPON FIRE ALARM. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.

e) Lighting. The area at the door shall be illuminated per UBC IBC Section 1006 (Means of Egress Illumination).

L107.1.5 Doors that provide access out of exit enclosures at non-discharge levels. If the locking system complies with all of the specific provisions of Section L701.1.5 and the general provisions of Section 701.1 then the doors that provide access out of exit enclosures on levels that are not intended for exit discharge may be secured from the exit enclosure side.

L107.1.5.1 High Rise Buildings. In a high rise building, if all of the provisions of Section L701.1.5.1 are satisfied then the enclosure doors can be locked to prevent access out of enclosure on all levels except the exit discharge levels.

L107.1.5.1.1 New Door Locks Which Prevent Access Out of Exit Enclosures. All new lock installations in high rise buildings, which prevent access out of an exit enclosure, shall satisfy the following requirements:

1. Electric Locks. All new locks shall be electrically modified locksets which shall simultaneously unlock, but not unlatch, upon a fire alarm or a power loss or activation of an on/off toggle switch in the building's Fire Command Center, or other approved location, which can simultaneously unlock all stairway doors. The switch shall be clearly labeled as to its function and the "ON" and "OFF" positions. The electrically modified lockset shall be wired to all three of these monitor/power/control points. Each of these three conditions shall unlock but not unlatch the stairway doors. These locks shall not be connected to an emergency power source that would keep the door locked upon loss of normal building power.

2. Mechanical Locks. Conventional keyed, combination or other mechanical locks are not allowed in new lock installations

3. Fifth Floor Rule. Where doors are locked for more than five consecutive floors, a telephone or other approved two-way communication system shall be provided. The travel distance between each phone or communication system shall not exceed five floors as required by DBC Section 1003.3.1.12.

4. Phone/Communications System. An emergency telephone or other approved communication device shall be installed in the stair landing, and mounted at a height to

comply with the requirements of DBC 1106.3. The location shall be approved by the CPD. The system/device shall transmit to a commercial monitoring service or continuously staffed monitoring service within the building as approved by CPD. Upon activation, the communications device shall automatically transmit a location identification message to the monitoring service.

5. Signage. All locked doors shall have the applicable sign required by Section 1004.13.4(a) or (c). Stairway identification signs as required by Section 1006.16 of the Denver Building Code are required on all doors. All signs shall comply with the requirements of DBC Sections 1103.2.4.2 and 1106.16. Signage shall be provided as follows:

   a) All doors that are locked for more than 5 consecutive floors shall have a sign that reads: **THIS DOOR IS LOCKED. EMERGENCY PHONES ARE LOCATED ON FLOORS ___ AND ___.**

   b) All doors that are locked for 5 consecutive floors or less shall have a sign that reads: **THIS DOOR IS LOCKED. FOR THE NEXT OPEN GO DOWN TO FLOOR ___ OR UP TO FLOOR ___.**

   c) All emergency phones in exit enclosures shall have a sign that reads: **EMERGENCY PHONE.** The sign shall also provide the address of the building and describe the floor and stair location of the phone.

L107.1.5.1.2 Existing Door Locks Which Prevent Access Out of Exit Enclosures. Existing locking systems in high-rise buildings that prevent access out of exit enclosures shall satisfy all of the following criteria in order to remain in service:

1. Existing Lock Definition. An existing lock is a lock that was legally installed with a building permit prior to September 21, 1990, the effective date of Policy P-25 "Securing of Stair Doors into Exit Enclosures". The lock shall also comply with all of the requirements of the building code in effect at the time it was installed.

2. Master Keys. Locks must be key operable. Four sets of master keys to operate the locks shall be available for Fire Department use in a location approved by the FPB.

3. Fifth Floor Rule. Doors shall not be locked for more than five consecutive floors with keyed mechanical locks. Where keyed locks are in place for more than five consecutive floors, at least one shall be replaced by an electric lock such that the keyed locks do not occur for more than five consecutive levels. The electric locks shall comply with all high rise building requirements as required by Section L107.1.5.1.1.

4. Existing Mechanical Combination Locks. Existing mechanical combination locks shall be removed and replaced with complying electric locks.

5. Existing Electric Locks. Existing electric locks on the enclosure side may remain in service if they comply with all of the requirements listed in Section L107.1.

L107.1.5.2 Non-High Rise Buildings. In non-high rise buildings, if all of the provisions of Section 107.1.5.2 are satisfied then the enclosure doors can be locked to prevent access out of the enclosure on all levels except the discharge levels or other levels required to have access from the enclosure by the provisions of Section L107.1.5.2.2.

L107.1.5.2.1 Non-high rise buildings less than five stories. Doors into exit enclosures can be locked with any type of mechanical lock or listed electrical lock from the enclosure side to prevent access out of the enclosure if all of the following conditions are satisfied:

a. The locking hardware does not prevent mechanical free egress into the enclosure at exit doors.

b. The door is not a part of the egress path from the enclosure at a discharge level.

c. The door locking hardware complies with all of the requirements of Section L107.1.1.1.

d. If listed electric strikes are used as part of the locking system the strike shall be a fail-secure strike.

The provisions of this section can be applied to locking applications in both new and existing buildings.

L107.1.5.2.2 Non-high rise buildings greater than four stories. Exit enclosure doors can be locked to prevent access out of the enclosure in non-high rise buildings more than four stories in height if the locking system complies with all of the general provisions of Section L107.1 and the specific provisions for high rise buildings in Section L107.1.5.1.

SECTION L108
CONTRACTOR LICENSING REQUIREMENTS FOR ACCESS CONTROL SYSTEMS

L108.1 Contractor licensing requirements for access control system work. A licensed access control contractor is required to obtain the permit necessary to install access control systems and components, including but not limited to, delayed egress systems, telephone entry systems, electric door strikes, magnetic locking hardware, electrified locksets, electrically operated panic hardware, card readers, controllers and other access control equipment. The access control contractor may perform all of the work related to the installation of the access control system except for the work restricted by the provisions of Section L108.1.2. The restricted work shall be performed by a contractor that is licensed to perform the work.

L108.1.1 Access control system contractor license. The access control system contractor license is authorized and classified by the provisions of Section 123.1 (Refer to license type number 5). All of the applicable requirements of Section 122 shall be satisfied in order to obtain the access control system contractor license. The access control contractor may perform all work directly related to the access control system except as limited by this section. The following types of related work can be performed by the access control contractor:

1. The installation of all access control system components including but not limited control panels, magnetic locking hardware, electrified locksets, electric strikes, electrically operated panic hardware, card readers and power supplies that are not hardwired to the buildings electrical power distribution system can be performed. The work necessary to connect the access control system to a hard-wired power supply is allowed to be performed.
2. The installation of all associated interconnecting wiring between access control system components necessary for operation of the system except electrical circuits that are powered with more than 48-Volt-AC/DC can be performed.
3. The installation of raceways and conduits that only contain wiring for the interconnection of the various access control components can be performed.
4. The modification of doors and door frames required to install the various access control components can be performed if the modification does not void the listing and labeling of a fire rated door and/or door frame. The work necessary for the replacement of existing doors and/or doorframes in existing openings is also allowed to be performed.

An electrical contractor or an electrical signal contractor cannot perform the work that requires an access control system contractor unless allowed by other provisions of this appendix. The modification of doors

and door frames can be performed by a properly licensed building contractor (Class A or B) or by one of the Class D building specialty contractors licensed to install or perform work on doors.

Section L108.1.2 Requirements for work not performed by access control systems contractor. Work related to the installation of the access control system that cannot be performed by the access control system contractor shall be performed by a contractor that is licensed by the classification provisions of Section 123.1 to perform the work. The following types of work related to the installation of access control systems cannot be performed by the access control contractor and shall be performed by an appropriately licensed contractor as required by Section L108.1.2:

1. The wiring and modifications necessary to connect the access control systems to the fire alarm system. This work shall be performed by an electrical signal contractor (Section 123.1, #10) or an electrical registration contractor (Section 123.1, #9).
2. The wiring and modifications necessary to connect the access control system to elevator control system. This work shall be performed by a licensed elevator contractor (Section 123.1, #11).
3. Any work on electrical circuits that are powered by more than 48 Volt-AC/DC including the hard-wiring of power supplies for the access control system to the buildings power system. This work shall be performed by an electrical registration contractor (Section 123.1, #9).
4. The installation of conduits or raceways that are intended to contain wiring for any of the following types of circuits is not allowed:
    a) Circuits that carry more than 48 Volts AC/DC. This work shall be performed by an electrical registration contractor (Section 123.1, #9).
    b) Circuits that are a part of the buildings fire alarm system. This work shall be performed by an electrical signal contractor (Section 123.1, #10) or an electrical registration contractor (Section 123.1, #9).
    c) Circuits that are a part of an elevator control system. This work shall be performed by an elevator contractor (Section 123.1, #11).
5. The construction of new walls and the installation of new doors and/or door frames in new openings. This work shall be performed by a Class A building contractor (Section 123.1, #1), Class B building contractor (Section 123.1, #2) or by one of the Class D building specialty contractors (Section 123.1, #4) licensed to perform the work.
6. The work necessary to modify fire rated doors and door frames that is required to be performed by the doors manufacture or other approved door fabrication shop approved by the agency that provides the listing for the door and door frames..

SECTION L109
ACCESS CONTROL SYSTEM PERMIT REQUIREMENTS

Section L109.1 Access control system permit. In order perform work on an access control system an access control permit shall be obtained prior to the start of work on the system. All of the provisions of Section L109.1 shall be satisfied prior to the issuance of an access control system permit.

L109.1.1 Purpose and background. A specific permit application form was developed for the installation of access control systems. This application form was designated as a Type 3B Permit. The 3B Permit allows the installation of access control systems and electric door locks in existing buildings, additions and new buildings. The 3B Permit application is intended to provide a unique permit for access control system work and to simplify the permitting process for access control systems. Previously, multiple permit applications had to be submitted for the installation of access control systems. The 3B permit allows all of the following

types of permits and their corresponding access control system related work to be combined into one application (all permit types may not be required for each access control system application):

Type 1C Permit – Work performed for the installation of doors or approved modifications to doors and doorjambs.

Type 3A Permit – Work performed for the interconnection of the access control system with the fire alarm and fire detection system.

Type 3 Permit – Work performed for the installation of the access control system or component that require circuits that carry more than 48 Volts AC/DC.

L109.1.2 Work requiring an access control permit. An access control system permit is required when a new access control system or electric locking systems are being installed or an existing system or electric lock is being modified in any new or existing building. An access control permit is also required when the access control system is installed outside of a building and anyone of the following conditions occurs:

1. The exterior access control system limits or affects the occupants of the building in their ability to reach the public right-of way or a required safe dispersal area as required by Section 1023.6.
2. The exterior access control system limits or restricts the use of the accessible route into the building.
3. The exterior access control system is interfaced and connected with a buildings fire alarm system.
4. The exterior access control system is interfaced and connected to a building's elevator system.

L109.1.3 Scope of work covered by a Type 3B permit. As indicated in Section L109.1.1 the Type 3B permit is intended to allow all of the work to be performed, on a single permit, that is directly related to the access control system and that must be completed by the following licensed contractors as required by Section L108.1.1 and Section 108.1.2:

1. Access Control System Contractor
2. Electrical Signal Contractor
3. Electrical Registration Contractor
4. Building Contractor Class A or B
5. Building Specialty Contractor Class D (related to the installation of new door and door frames and the approved modification of fire rated and labeled door and door frames)

Although the name and license number of the elevator contractor is required to be provided on the Type 3B permit, the work related to the elevator system is not covered by the Type 3B permit. A separate Type 6 elevator permit shall be obtained by a licensed elevator contractor in conjunction with the Type 3B permit when the access control system interfaces with the elevator system.

L109.1.4 Issuance of a Type 3B permit. A Type 3B permit can only be issued to a properly licensed access control system contractor.

> **Exception:** The Type 3B permit can be issued to a properly registered electrical registration contractor if the access control system does not require any of the following types of work or create any of the following conditions to occur:
>
> 1. Limits or restricts mechanical free egress.
> 2. Requires work to install or modify fire rated door and/or door frames.
> 3. Requires work to replace doors and/or door frames.

CPD will provide a permit inspection record card to the contractor upon issuance of the permit. The Type #3B permit contractor is responsible for obtaining the required signatures on this card for all work requiring inspection and approval by CPD.

L109.1.5 Type 3B permit application requirements. All of the submittal requirements of Section L109.1.5 shall be satisfied prior to acceptance of the Type 3B permit application by CPD.

L109.1.5.1 Application procedures. The applicant for the Type 3B permit shall be the contractor that will be performing the access control work or their authorized representative. The applicant is responsible for completing the permit application on the form provided by CPD. A complete description of work is to be provided with the application. The names and license numbers of the other contractors that will be performing work under the Type 3B permit shall be provided on the permit application. If the access control system interfaces and connects with the building's elevator system the name and license number of the elevator contractor shall be provided on the permit application for the Type 3B permit.

The permit application along with all the other submittal items required by Section L109.1.5 shall be presented for acceptance in the manner and at the location established by CPD.

L109.1.5.2 Plan submittal requirements. Two sets of drawings showing the entire scope of the work to be performed shall be submitted with the Type 3B permit application.

L109.1.5.2.1 Responsible designer. The drawings shall be prepared under the direction and control of one of the following:

1. A licensed access control system contractor. The contractor shall indicate their review and acceptance of responsibility for the systems design by providing an original signature and the date of signature along with their contractor license number on each drawing sheet.
2. A licensed access control system supervisor. The supervisor shall indicate their review and acceptance of responsibility for the systems design by providing an original signature and the date of signature along with their contractor license number on each drawing sheet.
3. A Colorado licensed design professional. The design professional shall indicate that they are the person responsible for the design of the system by placing their State of Colorado design professional seal on each drawing. The seal shall original or computer generated and be signed with an original signature and the date of signature shall be indicated.

The name, mailing address and phone number of the person accepting responsibility for the drawings and system design shall be indicated on the plans submitted with the permit application.

L109.1.5.2.2 Drawing content. The plans being submitted shall provide all of the following information:

1. The address of the building shall be included on the drawings along with a description of the location of the work.
2. The plans shall clearly indicate all doors that have mechanical free egress. If mechanical free egress is not being provided, as allowed by the provisions of this appendix, the plans shall clearly indicate the doors that do not provide mechanical free egress.
3. Floor plans, drawn to scale, showing the device locations and door swings in plan view(s). The location of all equipment involved shall be shown on the plan view(s).

The floor plans shall provide sufficient information so that the affect of the access control system on the exiting scheme from the floor can be fully evaluated.

4. A door and hardware schedule that specifies the type and size of each door and the hardware type and function being provided on each door.
5. A narrative shall be provided that describes in detail the sequence of operations for the system.
6. When the installation of the system requires the penetration of fire rated assemblies, details and/or specifications shall be provided that indicate how the fire rating of the assembly will be maintained at the penetration in accordance with Chapter 7 of the DBC.
7. A one-line diagram of the system design shall be provided. The diagram shall include the source of power, battery backup if provided, and interconnection with burglar alarm or fire alarm or elevator control systems if provided. All devices in the design shall be shown on the one-line diagram. When the source of power is provided by a plug-in power supply such device shall be clearly noted on the diagram.
8. Point-to-point wiring details of all connections, including all interconnections to other building systems shall be shown. Other building systems include but are not limited to the power distribution system, the fire alarm system and the elevator control system.
9. Manufacturer's specification sheets for all devices that are part of the scope of work shall be provided. Specification information shall include the approved testing agency's file number for each device. One complete set of specification sheets should be attached to each set of plans.

Section L113.1 provides sample access control drawings that can be used as examples of how to present the required information on the submittal drawings.

L109.1.5.3 Other submittal requirements. When fire rated door and or door frames are shop modified to accommodate the access control system installation, documentation shall be submitted with the permit application that indicates the modifications performed and the name of the shop that performed the modifications to the door or door frame. All modifications to fire rated door and door frame assemblies shall be performed by a shop that is approved by the listing and labeling agency as an approved fabricator.

L109.1.5.4 Valuation of work. The applicant shall provide a statement for the valuation of the work to be performed under the access control system permit. The valuation of work shall be provided on a form provided by CPD. The valuation of work shall include the contractor's profit, cost of materials, labor and overhead.

L109.1.5.5 Plan review fee. Once the Type 3B permit application is reviewed and determined to be complete the applicant shall be required to pay the plan review fee required by Section 152.2 of the DBC.

L109.1.6 Plans review. Upon payment of the plans review fee the Type 3B permit application will be placed in the tracking system for the plans review process. The applicant will be given an application tracking number. Once the plans review has been performed the applicant will be notified if the application is approved or denied. If the application is denied the applicant will be provided with a written list of comments that describe the reasons for the denial of the application. Upon resolution of the plans review comments the application will be approved. The permit will be issued upon payment of the building permit fee and any additional plan review fee or other fee required by Section 152 of the DBC.

SECTION L110
ACCESS CONTROL SYSTEM PERMIT INSPECTION PROCESS

L110.1 Access control system permit inspection process. All access control system work shall be inspected and accepted by CPD prior to starting the operation of the system. All of the requirements of Section 110.1 shall be satisfied prior to the final acceptance of the access control system work by CPD inspections.

L110.1.1 Required inspections. The access control system contractor shall be responsible for requesting and obtaining a CPD inspector's approval on all required inspections. A separate rough-in inspection and a separate final inspection shall be performed for all of the following work:

1. Access control system work.
2. High voltage electrical work.
3. Fire alarm system work.
4. Elevator system work.

The final inspection for the access control system will not be performed until the final inspection has been approved for all of the other related work. The access control system shall be ready for inspection prior to requesting the final access control system inspection.

L110.1.2 CPD inspector responsibility. The following CPD inspectors shall be responsible for performing the rough-in and final inspections on the access control system work:

1. A CPD electrical inspector shall perform all of the inspections required for high voltage electrical work.
2. A CPD electrical inspector shall perform all of the inspections required for fire alarm system work.
3. A CPD elevator inspector shall perform all inspections required for the elevator system work.
4. A CPD public safety inspector shall perform the inspections on all of the work being performed under the Type 3B permit that is not inspected by another CPD inspection group.

L110.1.2.1 Inspection related duties. It will be the responsibility of the CPD public safety inspector to perform the following inspection related duties:

1. Verify that labeling has been provided on all modified fire-rated doors and frames.
2. Performing testing of the access control system. If testing is required to be performed by an electrical or elevator inspector, the public safety inspector shall coordinate with the other inspectors to assure that the overall systems functions as designed.
3. Coordinate with the FPB when Fire Department related issues occur during the installation of the access control system.
4. Assure that the inspections record card has been signed and approved by all of the inspection groups that have been required to inspect work on the access control system being installed.
5. Final the Type 3B permit once they complete the final inspection process.

SECTION L111
ACCESS CONTROL SYSTEM TESTING AND MAINTENANCE

L111.1 Access Control System Testing. This appendix does not require mandatory access control system testing. However, it is strongly recommended that the building owner implement a periodic testing program to assure that the system and its component parts continue to operate as designed. It is further recommended that a

licensed and qualified access control system contractor be retained to test and perform maintenance on the system at a maximum interval of twelve (12) months.

L111.2 Access Control System Maintenance. All access control systems shall be maintained to remain in compliance with this appendix and the specific operational requirements of the system that was originally permitted. Failure to maintain the system in compliance with the requirements of this appendix and the original ly approved system design requirements and conditions shall be cause to require the operation of the system to be suspended or removed. When the access control system interfaces with the buildings fire alarm and/or elevator control systems and these systems are not maintained in a fully operational condition, the operation of the access control system maybe required to be suspended until these related systems are fully operational.

SECTION L112
ACCESS CONTROL SYSTEM LISTING REQUIREMENTS AND STANDARDS

L112.1 Access control system listing requirements and standards. All access control systems and components shall be listed by a CPD approved testing and listing agency for the purpose for which that they are intended to be used. When the access control system prevents mechanical free egress the system shall be tested and approved under the following standard unless otherwise approved:

Underwriters Laboratories Inc. Standard for Safety (UL 294), Fifth Addition, for Access Control System Units, dated January 29, 1999.

When a system is tested and listed, the substitution of other components or the addition of other components other than those included in the tested system shall be prohibited. All systems shall be installed and used in accordance with their listing.

SECTION L113
ACCESS CONTROL – SAMPLE DRAWINGS

L113.1 Sample drawings. The sample drawings included in this section are intended to provide general guidance and assistance in the preparation of submittal drawings that are required to be submitted by Section 109.1 with the 3B Permit application. All of the information shown on these sample drawings shall be incorporated into the drawings that are to be used to construct the system. Additional information may be required to be shown on the drawings being submitted when unusual conditions occur or when unique systems are being installed. The following sample drawings are included:

DRAWING AC1 – TITLE SHEET – Figure 113.1 (a)
DRAWING AC2 – SEQUENCE OF OPERATION – Figure 113.1 (b)
DRAWING AC3 – FLOOR PLAN AND DOOR SCHEDULE – Figure 113.1 (c)
DRAWING AC4 – POINT-TO-POINT DIAGRAM – Figure 113.1 (d)
DRAWING AC5 – ONE LINE DIAGRAM – Figure 113.1 (e)
DRAWING AC6 – ELEVATION VIEW OF DOORS – Figure 113.1 (f)

FIGURE 113.1 (A) - DRAWING AC1 – TITLE SHEET

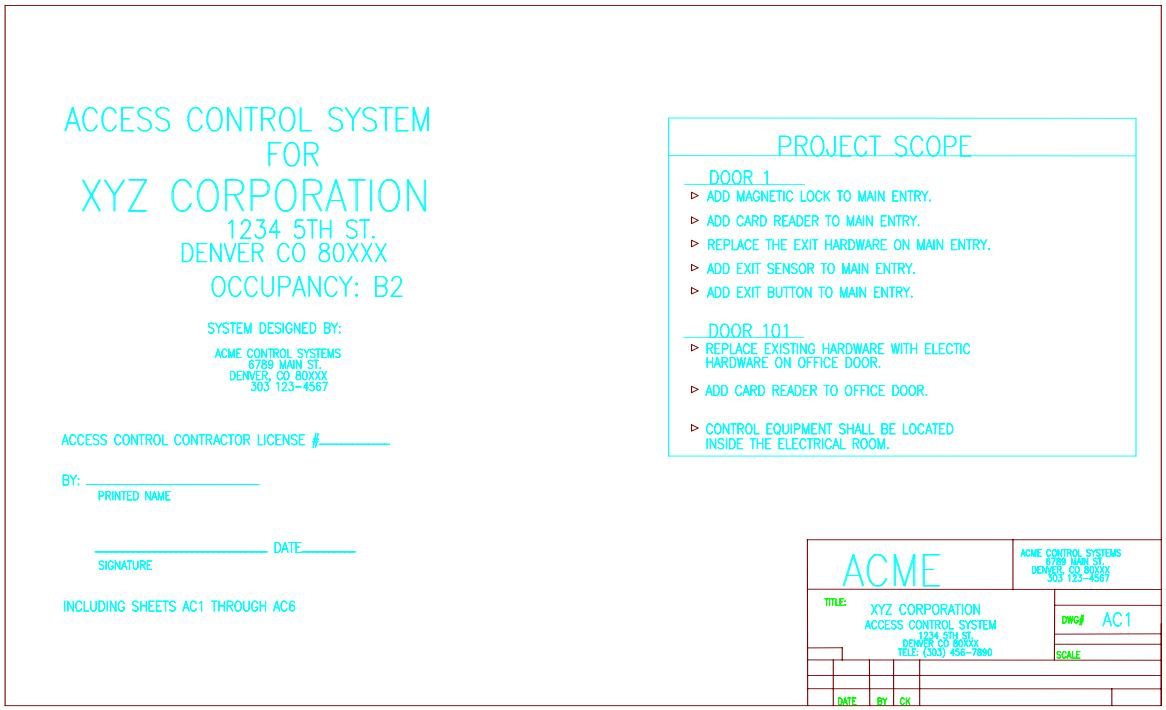

FIGURE 113.1 (A)

FIGURE 113.1 (B) - DRAWING AC2 – SEQUENCE OF OPERATION

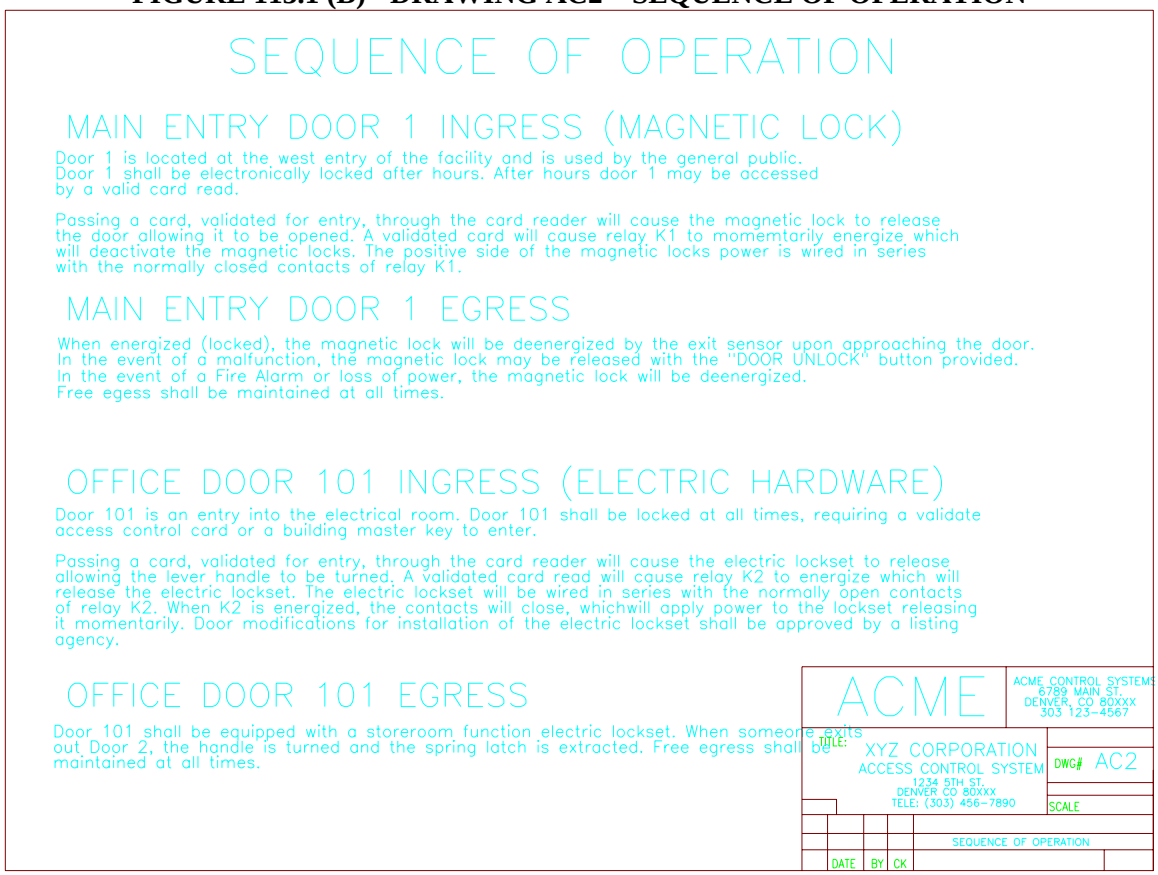

FIGURE 113.1 (B)

FIGURE 113.1 (C) - DRAWING AC3 – FLOOR PLAN AND DOOR SCHEDULE

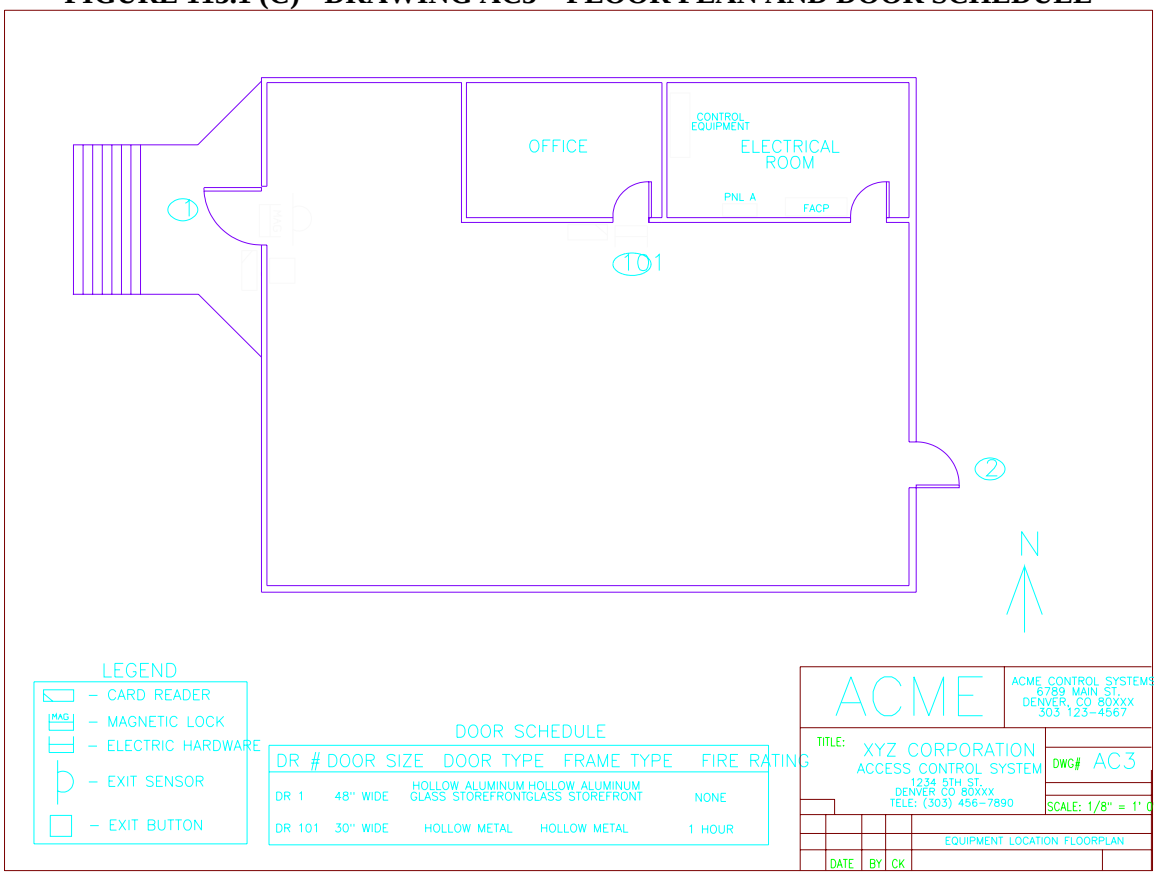

FIGURE 113.1 (C)

FIGURE 113.1 (D) - DRAWING AC4 – POINT-TO-POINT DIAGRAM

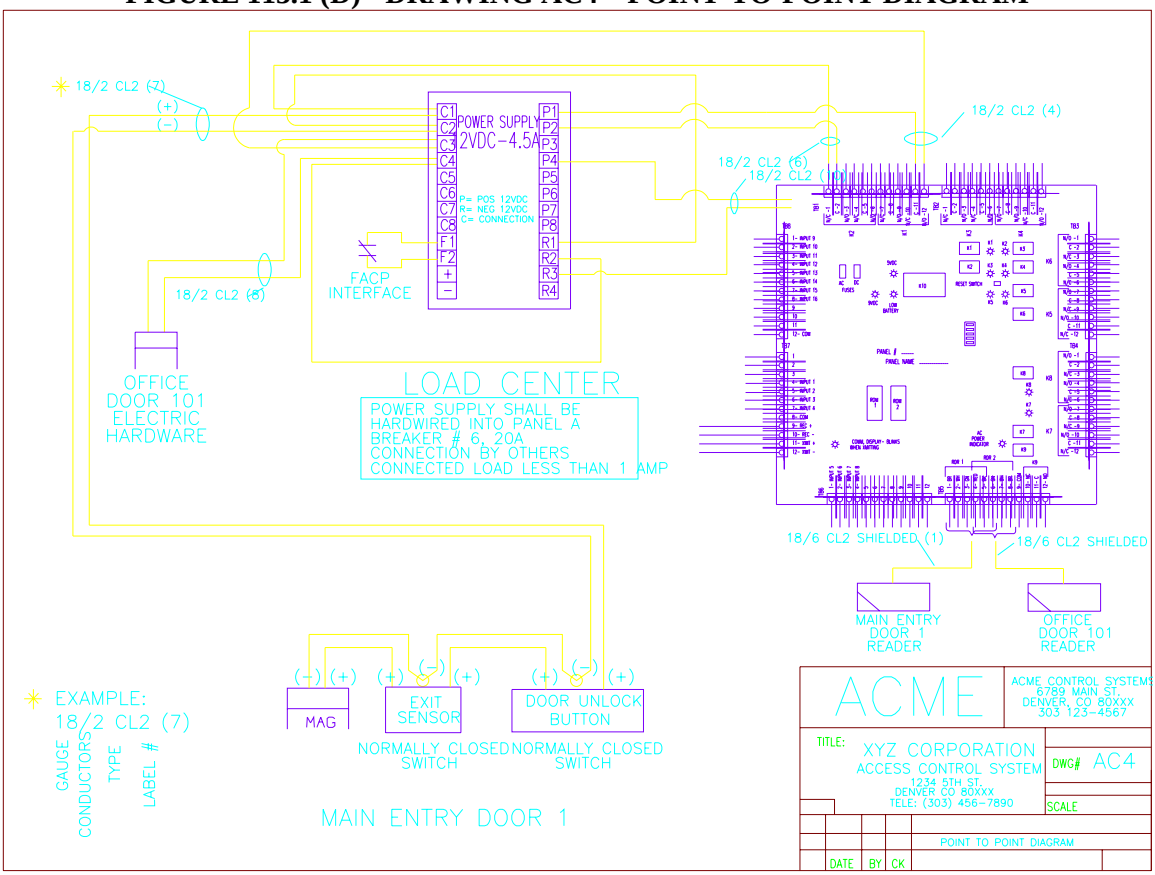

FIGURE 113.1 (D)

FIGURE 113.1 (E) - DRAWING AC5 – ONE LINE DIAGRAM

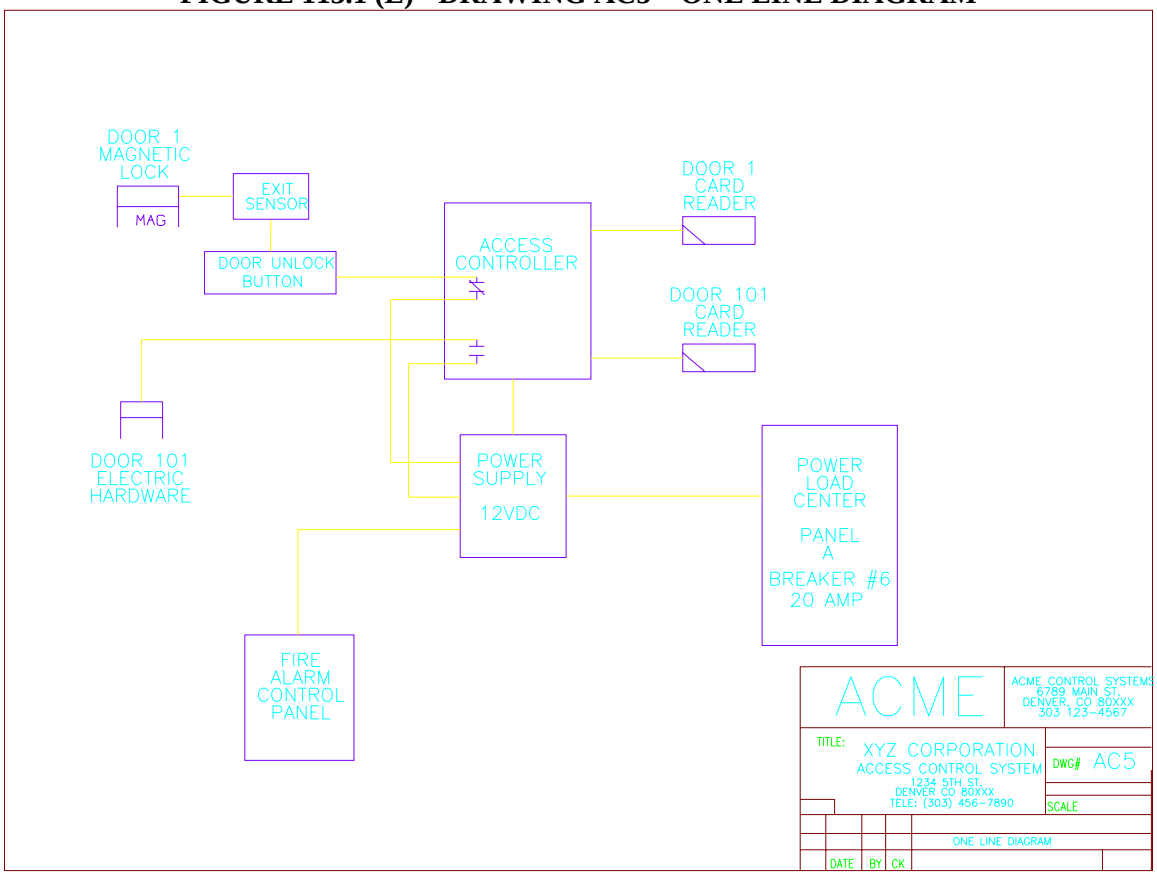

FIGURE 113.1 (E)

FIGURE 113.1 (F) - DRAWING AC6 – ELEVATION VIEW OF DOORS

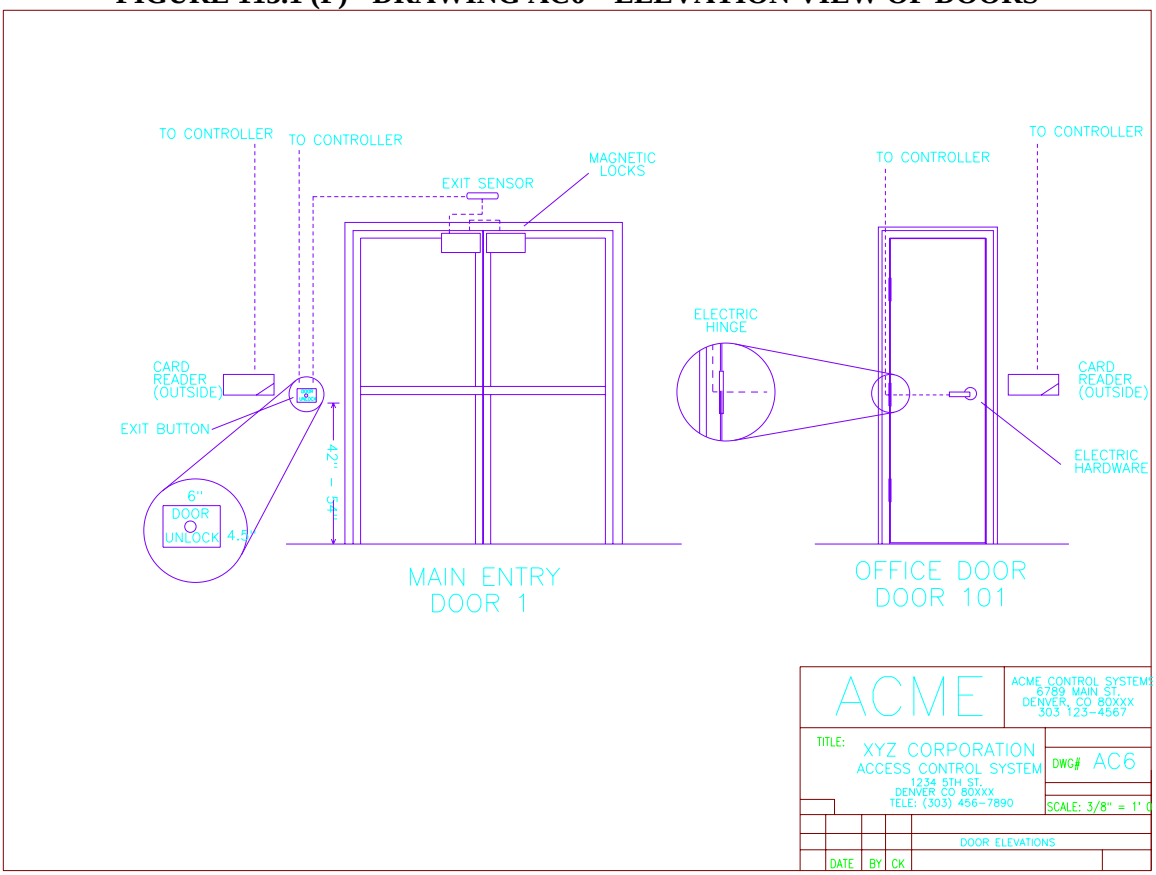

FIGURE 113.1 (F)

APPENDIX M

COLORADO TITLE 9 ARTICLE 5 - STANDARDS FOR ACCESSIBILE HOUSING

Colorado Statute Title 9, Article 5 is reproduced in this appendix for reference.

COLORADO STATUTE TITLE 9
SAFETY INDUSTRIAL AND COMMERCIAL BUILDINGS AND EQUIPMENT.
ARTICLE 5 STANDARDS FOR ACCESSIBLE HOUSING.

9-5-101.1
DEFINITIONS.

As used in this article, unless the context otherwise requires.

5. "Accessibility point" means a unit of value exchanged for different levels of accessible dwelling types to satisfy the requirements for dwelling accessibility contained in this article.

6. "Accessible route" means an interior or exterior circulation path that complies with the provisions contained in "ANSI A117.1-1998".

7. "ANSI A117.1-1998" means the 1998 version of the "American National Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People", promulgated by the American National Standards Institute.

8. "Detached residence" means a one- or two-family residence that is separated from adjacent dwellings by an unobstructed physical space. A one- or two-family residence that is separated from an adjacent dwelling by a physical space of less than three feet shall not be considered a detached residence.

9. "Ground story level" means the lowest story in a dwelling unit containing habitable rooms or areas with an accessible entrance located on an accessible route that contains living, sleeping, cooking, bathing and toilet facilities. For the purposes of this article, a basement shall not be considered the ground story level if the finished basement floor is located more than four feet below the exterior finished grade determined at any point along the exposed periphery of the dwelling unit.

10. "Project" means the total number of parcels and buildings in a development planned or constructed by the same developer, builder, or entity on one site or contiguous sites, and also includes all parcels and structures that are parts of the same planned development application or agreement. The separation of contiguous individual buildings, units, lots, tracts or parcels of land by a property line or by a public or private road shall not create a separate project.

11. "Property" means the site, parcels of land, plats, lots, tracts, individual dwelling units, existing and proposed structures and the built environment.

12. "Residential dwelling unit" means any portion of a building that contains living facilities, including a room or rooms in a facility that have shared cooking, bathing, toilet or laundry facilities such as dormitories, shelters, assisted living facilities and boarding homes. "Residential dwelling unit" also means facilities that include provisions for sleeping, cooking, bathing and toilet facilities for one or more persons and are used for extended stays, such as time-shares and extended-stay motels. "Residential dwelling unit" does not mean a guest room in a motel or hotel.

13. "Technically infeasible" in reference to a proposed alteration to a building or facility, means that the proposed alteration is not implemented because:

14. An existing structural condition or conditions make such alteration labor- or cost-prohibitive.

15. The building or facility is in strict compliance with minimum accessibility requirements for new construction and, due to existing physical or site constraints, such alteration would negatively impact such compliance.

16. "Type A dwelling unit" means a dwelling unit designed in accordance with the provisions of ANSI A117.1-1998, section 1002.

17. "Type A multistory dwelling unit" means a multiple story dwelling unit with a ground story level designed in accordance with the provisions of ANSI A117.1-1998, section 1002, and, if provided, accessible laundry facilities on the ground story level.

18. "Type B dwelling unit" means a dwelling unit with a ground floor level designed in accordance with the provisions of ANSI A117.1-1998, section 1003.

19. "Type B multistory dwelling unit" means a multiple-story dwelling unit with a ground story level that is designed in accordance with the provisions of ANSI A117.1-1998, section 1003, and, if provided, accessible laundry facilities on the ground story level.

20. "Type B visitable ground floor" means a multiple-story dwelling unit with an accessible entrance and toilet facility designed in accordance with the provisions of ANSI A117.1-1998, section 1003.

21. "Undue hardship" means a substantial and unusual hardship that is the direct result of unique physical site conditions such as topography or geology, or that is the direct result of other unique or special conditions encountered on a property, but that are not typically encountered in the jurisdiction in which such property is located. Constraints, complications or difficulties that may arise by complying with these statutory standards for accessibility but that do not constitute an undue hardship shall not serve to justify the granting of an Exception or variance.

9-5-102.
DISABILITIES COVERED – PURPOSE.

22. This article is intended to provide accessibility standards for residential projects designed to serve persons with nonambulatory disabilities, semiambulatory disabilities, sight disabilities, hearing disabilities, disabilities of incoordination and aging.

23. Design criteria. Design criteria shall comply with the 1998 version of the "American National Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People", promulgated by the American National Standard Institute, commonly cited as "ANSI A117.1-1998".

9-5-103.
APPLICABILITY OF STANDARDS – ENFORCEMENT.

1. The standards and specifications set forth in this article shall apply to all buildings and facilities used for housing that are constructed in whole or in part by the use of state, county or municipal funds or the funds of any political subdivision of the state or that are constructed with private funds. All such buildings and facilities to be constructed from plans on which architectural drawings are started after July 1, 1975, from any one of these funds or any combination thereof shall conform to each of the standards and specifications prescribed in this article. The governmental unit responsible for the enforcement of this article shall grant Exceptions to or modify any particular standard or specification when it is determined that it is impractical and would create an undue hardship. Any such Exception or modification of the provisions of this article shall be made in writing as a matter of public record. These standards and specifications shall be adhered to in those buildings and facilities that are constructed or proposed on or after April 29, 2003. This article shall apply to permanent buildings.
2. The jurisdiction with responsibility for enforcement of this article pursuant to section 9-5-104 shall designate a board of appeals to hear and resolve appeals of orders, decisions or determinations made by the enforcing agency regarding the application and interpretation of this article.
3. Any building or facility that would have been subject to the provisions of this article but was under construction prior to July 1, 1976, shall comply with the following:

    a. If the walls or defining boundaries of an element or space are altered, then the altered element or space shall comply with the applicable provisions of section 9-5-105, unless such alteration is technically infeasible. If full compliance with this article is technically infeasible, compliance shall be implemented up to the point of technical infeasibility. No alteration shall be undertaken that negatively impacts accessibility of a building or facility pursuant to ANSI A117.1-1998. This paragraph (a.) shall not be construed to require the moving of any existing walls not otherwise planned to be moved.

    b. Any additions to a building or facility shall be treated as new construction for the purposes of enforcement of this article.

4. The general assembly finds and declares that the standards and specifications set forth in this article are of statewide concern. Nothing in this article shall prohibit any municipality or other governmental subdivision from making and enforcing standards and specifications that are more stringent, and thus provide greater accessibility, than those set forth in this article.

9-5-104.
RESPONSIBILITY FOR ENFORCING STANDARDS.

1. The responsibility for enforcement of this article is as follows:

    a. For factory-built housing as defined in section 24-32-703 (3), C.R.S., the division of housing created in section 24-32-704, C.R.S.;

    b. In a political subdivision that does not have a local building code, the division of housing created in section 24-32-704, C.R.S.;

    c. For all other housing or in a political subdivision that has adopted a building code, by the building department, or it’s equivalent, of the political subdivision having jurisdiction.

9-5-105.
EXEMPTIONS FOR CERTAIN PRIVATELY FUNDED PROJECTS.

4. Accessible dwelling units shall be provided as required in this article; except that this article does not apply to privately funded projects for the construction of a detached residence or residences or to other types or residential property containing less than seven residential units.

For the purpose of determining the number of accessibility points required pursuant to subsection (2) of this section, the accessible dwelling unit types shall have the following point values:

Accessible dwelling unit type:	Accessibility point value per dwelling unit:
Type A dwelling unit	6
Type A multistory dwelling unit	5
Type B dwelling unit	4
Type B multistory dwelling unit	3
Type B visitable ground floor	1

5. Residential projects.

(a) A project shall be assigned accessibility points based on the number of units contained within the project as follows:

Units	Points	Units	Points	Units	Points
0-6	0	56-71	30	129-142	60
7-14	6	72-85	36	143-157	66
15-28	12	86-99	42	158-171	72
29-42	18	100-114	48	172-185	78
43-57	24	115-128	54	186-199	84
				200 or more	+6 points for each 14 or fraction thereof.

(b) A project shall include enough accessible dwelling units to achieve at least the specified number of accessibility points required pursuant to paragraph (a) of this subsection (2.). A project may use any combination of accessible dwelling unit types to comply with the section.

9-5-105. IMPLEMENTATION PLAN.

The builder of any project regulated by this article shall create an implementation plan that guarantees the timely and evenly phased delivery of the required number of accessible units. Such plan shall clearly specify the number and type of units required and the order in which they are to be completed. Such implementation plan shall be subject to approval by the entity with enforcement authority in such project's jurisdiction. The implementation plan shall not be approved if more than thirty percent of the project is intended to be completed without providing a portion of accessible units required by section 9-5-105; except that, if an undue hardship can be demonstrated, or other guarantees provided are deemed sufficient, the jurisdiction having responsibility for enforcement may grant Exceptions to this requirement. The implementation plan shall be approved by the governmental unit responsible for enforcement before a building permit is issued.

APPENDIX N
CONSTRUCTION OF AIRPORT BUILDINGS AND STRUCTURES

SECTION N101
GENERAL

N101.1 General. The provisions of this Chapter apply to the special problems that are encountered in the construction and fire protection of airport buildings and related structures. Due to the exposure of these structures by normal airport operations and the large number of people who may occupy some of the buildings, special requirements are required to assure public safety and welfare.

N101.2 Federal Agencies. The facilities, buildings, structures or portions thereof owned, occupied and managed by an agency of the federal government may not be subject to the provisions of this Code.

SECTION N102
DEFINITIONS

AIRCRAFT LOADING WALKWAY – An elevated device through which passengers move between a point in a passenger terminal building and an aircraft. Included in this category are walkways that may be essentially fixed and permanently placed, and walkways (jetways) that are essentially mobile in nature and fold, telescope or pivot from a fixed point at the airport terminal building or at a fixed walkway.

AIRPORT RAMP – Any outdoor area, including aprons and hard-stands, on which aircraft may be positioned, sorted, serviced or maintained, irrespective of the nature of the surface of the area.

CONCOURSE – A fully enclosed portion of the terminal building used for passenger handling and aircraft flight service functions with provisions for parking aircraft on one or more sides.

FREIGHT TERMINAL BUILDING (Air Cargo Buildings) – A structure used for the processing and/or storage of incoming or outgoing freight and other necessary functions in connection with air freight operations.

PASSENGER TERMINAL BUILDING – A structure used for air passenger enplaning or deplaning, including ticket sales, flight information, baggage handling and other necessary functions in connection with air transport operations. Passenger terminal buildings shall include any concourse or satellite buildings used for passenger handling or aircraft flight service functions. Passenger walkways, aircraft loading walkways and "mobile lounges" are excluded.

PASSENGER WALKWAY – A fully enclosed grade or ramp level walkway that is used for the enplaning or deplaning of passengers.

SATELLITE PASSENGER TERMINAL BUILDING – A structure which may be adjacent to but separated from the main passenger terminal building, accessible aboveground or thorough subway passages, and used to provide flight service operations (i.e., passenger check-in, waiting rooms, floor service, enplaning or deplaning).

SECTION N103
TYPE OF CONSTRUCTION

N103.1 Passenger terminal buildings. Passenger terminal buildings shall be Type I or II as required for the areas allowed by Section 503. Section 507 "Unlimited Area" shall not apply to Passenger Terminal Buildings.

EXCEPTION: The concourse or part of the concourse of a passenger terminal building may be enclosed by unprotected, noncombustible construction (i.e., walls and roof) provided the following conditions exist:

1. There is no occupied level above the concourse level or part of the concourse level being considered.
2. The maximum height of the building is less than 55 feet. This height does not include ramp or Federal Aviation Agency control towers.
3. The passenger terminal building is sprinklered.

The structures for elevated interior walkways, people movers or interconnecting crossovers within this area of unprotected, noncombustible construction shall have the same fire rating as the base building.

N103.2 Freight terminal buildings. Freight terminal buildings shall be of noncombustible construction.

N103.3 Aircraft Loading Walkways (Jetways). Movable jetways and fixed walkways shall meet the requirements of NAPA 417 (Aircraft Loading Walkways). No hazardous storage or operations such as fuel supply lines, fuel storage tanks, vehicular storage or fueling may occur under or near the aircraft loading walkway.

Exit doors between walkways and the passenger terminal shall swing into the passenger terminal. Doors held open shall have automatic closing devices. All other doors shall have self-closing devices and be equipped with panic hardware on the aircraft side.

Sprinkler protection is not required in the interior or exterior of movable or fixed walkways.

N103.4 Passenger Walkways on Grade Level. Construction shall be at least one-hour noncombustible construction.

Doors and windows shall be ¾-hour fire-rated assemblies. Glazing area of windows shall not exceed 25% of the wall area. All gate doors shall swing outward and have a self-closing device.

Entrance doors between walkways and the passenger terminal shall swing into the passenger terminal and be equipped with panic hardware on the walkway side.

N103.5 Other structures. All other buildings or structures may be of any type of construction allowed for the occupancy group by this Code.

SECTION N104
OCCUPANCY

N104.1 Occupancy Group. The primary occupancy of the passenger terminal shall be a Group M Occupancy with the special provisions specified in this Chapter. Every building or portion thereof shall be classified by the use or the character of its occupancy according to the provisions of Chapters 3 and 4.

N104.2 Limitation of Occupancy. Any occupancy considered “extra-hazardous” (as defined in NFPA 13, Standard for the Installation of Sprinkler Systems) shall be prohibited in an airport terminal building.

N104.3 Occupant Load Factors and Occupancy Groups.

TABLE N104.3
OCCUPANT LOAD FACTORS AND OCCUPANCY GROUPS

USE	OCCUPANCY GROUP	OCCUPANT LOAD FACTOR Sq. Ft/Occupant
1. Hold Rooms		
a. Open Areas	**M**	30
b. Seating Areas	**M**	15 or fixed seat count
2. Passenger Circulation Space includes ticket area, check-in and baggage claim area	**M**	100
3. Office	**B**	See Table 1003.2.2.2
4. Retail	**M**	See Table 1003.2.2.2
5. Drinking and Dining Establishments		
a. Occupant Load less than 50	**B**	See Table 1003.2.2.2
b. Occupant Load greater than 50		
Stand up service without Seating		
Sit down service	**A2**	See Table 1003.2.2.2
6. Baggage Storage/Handling		
a. Areas with vehicular access	**S1**	
b. Areas without vehicular access	**S1**	300 gross
7. Transit Stations		As required by NFPA 130

SECTION N105
MEANS OF EGRESS

N105.1 Building Means of Egress. Building means of egress shall comply with Chapter 10, unless specifically provided for in this Chapter.

N105.2 Emergency Exits. If emergency exits discharge directly onto an airport ramp or service area, the doors shall be clearly marked “Emergency Exit Only” in letters at least 2 inches high with contrasting colors in addition to exit signs as required by Section 1003.2.10 or as approved by the Department and the Fire Department.

N105.3 Delay Panic Hardware. All emergency exits from a passenger terminal building that discharge onto an airport ramp or service area shall be equipped with delay panic hardware. The locking device shall release without unlatching when activated by 2 alarm devices or by a loss of electrical power.

N105.4 Numbering. Emergency exit doors shall be numbered on both sides, 3 inches high minimum on the inside and 5 inches high minimum on the outside with contrasting colors.

N105.5 Control Tower. There shall be 2 exits from any control tower floor which exceeds 1,500 sq. ft. in area or where 2 or more adjacent floors have an occupant load of more than 15. Scissor stairs are allowed with the following provisions:

1. That the wall between the 2 separate stairs shall be 2-hour fire-rated minimum and with no penetrations allowed.

2. Both stairs shall be mechanically pressurized on alarm to maintain a minimum positive pressure of 0.15-inch water column relative to atmospheric pressure with all doors closed. Activation of the mechanical equipment shall be through the Fire Alarm System which shall be provided per Code:
    A. Provide a smoke detector in front of each stair door on the corridor ceiling of each floor.
    B. Provide a smoke detector on the ceiling adjacent to the elevator lobby.
    C. For air conditioning systems or pressure air supply serving more than one story, provide a smoke detector in the return air duct or plenum on each floor. The activation of any detector shall cause the return air to exhaust completely from the building without any recirculation through the building.
3. Power for the mechanical equipment and the fire alarm system smoke control shall be provided through the required emergency power section of the building electrical supply.
4. Stair shafts shall be provided with emergency lighting from the emergency power supply described in paragraph 3. In addition, battery backup supply shall be provided for these fixtures.

N105.6 Exterior Doors. Exterior doors shall include doors opening onto roadways on grade or elevated which provide public access/egress to passenger terminals, provided that:

1. The roadways have sidewalks, width based on occupant load, that lead to a dispersal area at grade.
2. Covered roadways are sprinklered and have at least one side open.

N105.7 Security Grilles and Doors. See Section 402.11.

SECTION N106
AIRPORT RAMP DRAINAGE

N106.1 Scope. The requirements specified herein provide standards for the design of the water drainage system of an aircraft fueling ramp to control the flow of fuel which may be spilled on a ramp and to minimize the resultant possible danger therefrom. Such a drainage system is intended to limit spread of the fuel spill to aircraft loading walkways, terminal structures or passenger loading walkways that might result in liquid or vapors reaching a source of ignition or in the accumulation of dangerous or toxic vapors.

N106.2 Definitions. "Aircraft Fueling Ramp" is defined as any outdoor area at an airport, including aprons and hand stands, on which aircraft are normally fueled or defueled.

N106.3 Aircraft Fueling Ramp Slope and Drain Design. Aircraft fueling ramps shall slope away from terminal buildings, passenger loading walkways, aircraft hangars and other structures (excluding aircraft loading walkways), with a minimum grade of 1% (1:100) for the first 50 feet (15.2 m). Beyond this distance, the slope to drainage inlets may be reduced to a minimum of 0.5% (1:200). Drainage inlets, where provided, shall be a minimum of 50 feet (15.2 m) from such structures.

Proximity of ramp drainage inlets and fueling hydrants to aircraft loading walkways shall not be restricted.

N106.4 Vapor Penetration Protection. Below-grade areas or blind spaces in airport terminal buildings shall be protected against flammable fuel or vapor penetration or shall be mechanically ventilated to provide at least 4 complete air changes per hour.

SECTION N107
AIRPORT SMOKE CONTROL AND DETECTION

N107.1 General. The smoke control systems shall be connected to the smoke detection and/or the automatic sprinkler systems, and shall automatically operate when either system is actuated. The smoke control system shall also be capable of manual operation from the Fire Command Center. During those hours when the building air conditioning systems are not operating, the smoke detection system shall activate the smoke control system. All smoke control equipment for both tenant space and terminal buildings shall be in place and operational before any part of the passenger terminal buildings is occupied. The level of protection of the fire detection system for unoccupied tenant space shall be subject to the approval of the Department and Fire Department. For any space or corridor which exceeds 20 feet in length connected to an atrium or passenger terminal area which has separate smoke control zones, provide supply air to the space or corridor at the farthest location from the point of connection to the atrium or passenger terminal area.

EXCEPTIONS:

1. Ramp service and nonpublic ramp level tenant areas of concourse buildings need not be provided with a smoke control system.
2. Unenclosed bag handling tenant areas of concourse or terminal buildings need not be provided with a smoke control system.

N107.2 When required. A mechanically operated air-handling system shall be installed in the main passenger terminal building which will restrict the smoke to the general area of fire origin and maintain the exiting system in a condition that is safe for exiting. The system shall be designed so that exhausted smoke cannot contaminate the outside air intake of any system.

N107.3 High Rise Buildings. See Section 403.

N107.4 Atriums. See Section 404.

N107.5 Passenger terminal buildings.

1. The smoke control equipment for the main passenger terminal building may be separate from that serving tenant spaces.
2. The passenger terminal buildings systems shall have a product of combustion detector located in the supply air system after the air filters which will stop the supply fan upon detection. In addition, a product of combustion detector shall be provided in the return or the exhaust air stream to activate the smoke control system.
3. The passenger terminal buildings' public circulation area smoke removal systems shall provide at least 4 air changes per hour, and shall be located to preclude accumulation of smoke in any part of the public circulation areas zoned not to exceed 52,000 square feet on a single floor and must coincide with required fire sprinkler zones. Within that sprinkler zone there may be one or more air moving systems but no single smoke control zone shall be larger than the sprinkler zone. The smoke removal system shall also be capable of manual operation from the F.D. Operations Center.
4. The tenant space shall be part of a smoke control zone, not to exceed 52,000 square feet on a single floor. Tenant spaces that are within 2 adjacent smoke control zones may be connected to either of the adjacent smoke control systems.
5. The smoke control exhaust system for tenant spaces shall be sized to provide a minimum of 4 air changes per hour or 20,000 cfm from each smoke control zone, whichever is greater.
6. For tenant spaces adjoining the concourse or terminal exceeding 7,500 square feet, a separate smoke control zone shall be provided.

N107.6 Smoke Detection. Smoke detection shall be provided as follows:

1. There shall be an average of one detector per 2,500 square feet for areas with roof/ceilings over 25 feet above an occupied floor.

EXCEPTION: Thermal detectors or cross-zone beam detectors may be used in lieu of smoke detectors where approved by the Department and Fire Department.

2. Detector zones may not exceed 20,000 square feet and no detector zone shall serve more than one smoke control zone.
3. A detector in a smoke control zone shall actuate all the adjacent zone smoke control equipment to pressurize those adjacent zones with 100% outside air while the affected smoke control zone goes into exhaust. All other smoke control zones shall remain in normal operation.

N107.7 Specific Requirements. The mechanically operated supply and return exhaust systems servicing smoke control zones shall be arranged to exhaust at the indicated rates when activated by the smoke detection and/or sprinkler systems; all adjoining areas or smoke control zones shall be arranged to supply 100% outside air to prevent smoke migration to the unaffected areas.

In addition to other smoke zone area requirements, passenger holding areas shall be treated as tenant spaces if separate systems are used; otherwise, they shall be treated as part of the concourse/passenger terminal public circulation space and horizontal smoke control zones shall be limited to 52,000 square feet maximum.

N107.8 Control Tower. Smoke control in the control tower shall be as follows:

1. Exhaust the occupied level where the fire alarm is activated at 6 air changes per hour.
2. Maintain normal HVAC operations on all other adjacent occupied levels.
3. Provide stairway pressurization and other requirements per Code.

N107.9 Acceptance Testing. See amended Section 910.5.

SECTION N108
AIRPORT LIFE SAFETY SYSTEMS

N108.1 Fire Sprinkler System. Terminal/concourse buildings shall be fully sprinklered in accordance with NFPA 13, Standard for Installation of Sprinkler Systems. Design criteria for terminal buildings shall be in accordance with ordinary Hazard Group 2 for retail and service areas and light hazard for office and passenger areas.

N108.1.1 Other locations. Other locations for sprinklers shall include:

1. Sprinklers shall be installed at 6-foot on center each side of draft stops required at the interface of a main terminal building and a concourse building.
2. Kiosks or similar structures that are covered or have roofs and are located within the passenger terminal building or the concourse shall be protected by an approved automatic fire suppression system.

   EXCEPTION: No automatic fire suppression system is required if the kiosk is:

   1. Noncombustible construction and less than 4 feet wide in any dimension; or
   2. Portable vendor carts with a maximum size of 4 feet x 8 feet spaced at more than 10 feet between carts.

N108.2 Standpipe Systems. All terminal structures and control towers shall have standpipes in compliance with this Code.

N108.3 Manual Pull Stations. Manual pull station zones must be provided at the required exits and shall be annunciated separately. There shall be 200 feet maximum between pull stations.

N108.4 Fire Detection Systems. Detectors shall be located in all nonpublic areas that are not sprinklered and shall be annunciated separately. A remote status indicating light shall be located in the terminal or concourse building above each entry of an enclosed tenant area greater than 2,500 square feet as approved by the

Department and Fire Department. Concealed detectors shall also be annunciated immediately outside the concealed space.

Smoke detectors shall be installed in all occupied levels for smoke control as required by 430.8.

Area smoke detectors shall be cross-zoned or addressable type with verifiable function.

N108.5 Emergency Communication Systems. Both one-way and 2-way systems shall be installed in all passenger terminal buildings in public areas at required exits, Building Engineering Office, Airport Operations Office, each mechanical room, emergency generator room, fire pump room, main switch gear rooms and each elevator cab which serves 4 or more stories as allowed by the Fire Department; telephone jack locations shall be approved by the Fire Department.

N108.6 Fire Command Center. The F.C.C. shall be provided in a space in each building as required by other Sections of this Code and approved by the Department and the Fire Department.

N108.7 Fire Extinguishers. Hand fire extinguishers shall be provided throughout an airport terminal building in accordance with the requirements outlined by the Fire Code for the City and County of Denver.

N108.8 Security Systems. Security systems shall be separate from fire alarm systems.

> **EXCEPTION:** Delay panic hardware systems as required in Section 430.5.3 may be part of the fire alarm system.

N108.9 Zones. Zones for smoke control, sprinklers, detectors, etc., shall be coordinated to have the same zones or multiples thereof, not to exceed the maximum area required by other provisions of this Code.

N108.10 Interface Openings. An interface shall exist between a passenger terminal concourse and connecting concourses, hotel or office occupancy. Where occupancy separations are not required, openings may be provided at the interface with the following conditions:

1. The size of the opening shall be limited to provide effective smoke control which will restrict the migration of smoke across the interface. See Section 430.8.8.
2. A noncombustible draft curtain shall be provided at the interface.
3. Automatic fire sprinklers shall be located on both sides of the draft curtain, spaced at 6 feet on center.

N108.11 Main Passenger Terminal Building Elevators and Stairs. Pressurized stairs, elevators and exit passageways are required unless otherwise approved by the Department and Fire Department.

> **EXCEPTION:** Elevators and enclosed stairways from the transitway station.

Elevator refuge areas are not required at the transitway station and on levels having adequate exterior doors per Section N105.6.

SECTION N109
AIRPORT MECHANICAL

N109.1 General. Mechanical requirements shall comply with applicable sections of this Code and referenced National Standards.

> **EXCEPTION:** Air exhaust openings for air conditioning or ventilating equipment, serving ramp level tenant spaces, shall be permitted where the ramp surrounds the building. Such openings shall be located a minimum of 7 feet above the ramp.

SECTION N110
AIRPORT ELECTRICAL

N110.1 General. Design, installation and materials shall conform to the requirement of NFPA 70, National Electrical Code and this Code.

Exceptions:

1. Runways, taxiways, ramps and all electrical systems required for their operations which are under FAA jurisdiction.
2. Airplane parking light conduit runs and junction boxes which are fed from building power systems and may be within 1-inch minimum of ramp surface covered with FAA approved sealer.

All electrical materials and equipment shall be of a type tested and listed by an approved laboratory, shall bear its label, and shall be approved for the purpose for which the materials and equipment are to be used.

N110.2 Grounding. See the National Electrical Code.

N110.3 Emergency Power. Emergency power systems, emergency generator and/or battery backup shall provide power to the following equipment:

1. Mechanical equipment for smoke control.
2. Emergency egress and exit lighting.
3. Emergency elevator power.
4. Fire alarm and detection systems.
5. Fire pump/jockey pump.
6. Emergency communication systems.
7. Delay panic hardware.

N110.4 Exit signs. Exit signs with illuminated letters at least 6 inches in height shall be provided at each required exit doorway and elsewhere as required to clearly indicate the direction of egress. The letters shall be white on a green field and illuminated. Battery-operated exit signs with a minimum of 1½ hours of 100% output can be connected to a reliable power source.

N110.4.1 Exit illumination. Exit illumination shall be connected to an emergency power system. Exit ways shall be illuminated to an intensity of one foot-candle at floor level during all times. Battery-operated exit illumination with a minimum of 1½ hours of 100% output can be connected to a reliable normal power source.

N110.5 Raceways. All wiring for power, lighting, signal, control, computer communications and telephone shall be installed in raceways. Cable tray systems shall be allowed for electrical systems not exceeding 50 volts between any conductors. Installation shall comply with the National Electrical Code.

N110.6 Hazardous Areas – Class 1, Division II.

1. Hazardous wiring methods shall apply within a 15-foot radius of fuel connection (fuel pit or aircraft). All measurements are referenced from the surface of ramp and the 18-inch vertical measurement shall not apply.

2. Electrical room access off of the apron area is acceptable unless within 15 feet of fueling connections. Electrical equipment within 15 feet of a fuel connection shall comply with National Electrical Code Class 1, Division II methods.

SECTION N111
SUBSURFACE TUNNELS

N111.1 General. All subsurface tunnels shall comply with the provisions of this section;

N111.2 Sprinklers. Utility Tunnels (Ordinary Group I) and Train tunnel Service Tunnels (Ordinary Group II) shall be sprinklered throughout the transit way and shall be sprinklered at the transit stations as approved by the Department and Fire Department.

N111.3 Smoke Removal System. A smoke removal system shall be provided.

N111.4 Life Safety System. All life safety systems shall be on an emergency generator.

N111.5 Exits. A walkway with a minimum 74-inch width (2 exit path widths of 22 inches each plus 12 inches wall clearance and an 18-inch platform edge clearance) shall be provided within all people-mover transit tunnels.

Exit doors into adjacent protected tunnels shall be provided at a maximum spacing of 200 feet and shall be monitored by the airport operations center.

Exception: The walkway width and exit door spacing may be modified based upon an exit study submitted by the Design Professional and approved by the Department and Fire Department.

N111.6 Separation. A minimum 2-hour separation shall be provided between tunnels.

N111.7 Transit Station Separation. The transitway shall be separated from the transit station by a minimum two-hour fire-resistance-rated noncombustible walls with 1½-hour fire-protection-rated doors. Windows within these walls shall be approved 1 ½-hour fire-protection-rated windows.

Exception. Fire-protection-rated window openings of ¾-hour may be used when the window assembly is protected with approved directional sprinkler heads 6’0” o.c. both sides of glass.

N111.8 Transit Systems Construction Guide. Fixed Guideway Transit Systems NFPA 130 shall be used as a construction guide unless specifically covered by this Code.

N111.9 Transitway Tunnel. The transitway tunnel shall be used exclusively for the movement of passengers between stations.

SECTION N112
LIQUID FUEL LINES

N112.1 Liquid Fuel Lines Penetrating Buildings or Structures. Liquid fuel lines that pass through or over any building or structure shall be double-walled and monitored for leakage. Liquid fuel lines that pass through buildings shall have control valves at the outside of the building penetration and shall be automatically closed upon detection of a break or leak.

SECTION N113
STANDARDS

N113.1 General. Unless provided for in other portions of this Building Code, the following Standards shall apply:

ORGANIZATION	TITLE OF PUBLICATION
NFPA	Aircraft Fueling Ramp Drainage, Pamphlet 415-1997
	Construction and Protection of Airport Terminal Buildings, Pamphlet 416-1987
	Construction and Protection of Aircraft Loading Walkways, Pamphlet 417-1985
	Fixed Guideway Transit Systems, Pamphlet 130-1988
	Standard on Aircraft Hangers, Pamphlet 409 – 1995

AMENDMENTS TO THE 2003 EDITION OF THE INTERNATIONAL FIRE CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINSTRATION

SECTION 101
GENERAL

Sections 101.1, 101.2 and 101.3 are replaced with the following:

101.1 Title. The title of this code is and may be cited and referred to as the Fire Code, the Denver Fire Code, or the Fire Code of the City and County of Denver. It may be referred to herein as "this code" or "the code," in both upper and lower case. The terms "Denver" and "City" are understood to mean the City and County of Denver.

101.2 Scope. This code establishes regulations affecting or relating to structures, processes, premises, and safeguards including, but not limited to:

1. inspection of permanent and temporary buildings, processes, equipment, systems, and other fire- and safety-related situations;
2. investigation of fires, explosions, hazardous materials incidents, and other related emergency events;
3. recovery of City costs related to the mitigation of hazardous materials incidents;
4. storage, use, processing, handling, and transportation of hazardous materials;
5. storage, use, processing, handling, and transportation of flammable and combustible gases, liquids, and solids;
6. interior finish, decorations, furnishings, and other combustibles that contribute to fire spread, fire load, and smoke production in all occupancies;
7. hazards from interior fires in trash, excessive storage of combustibles, production of chemical material, and other materials that pose an exposure hazard to adjacent property in all occupancies including single family residences;
8. hazards from outside fires in vegetation, trash, storage, vehicles, combustible and flammable materials, building debris, and other materials;
9. regulation and control including assignment of standby personnel, of special events including, but not limited to, assemblage of people, exhibits, trade shows, amusement parks, haunted houses, outdoor events, livestock events, large sporting events, and other similar special temporary and permanent occupancies;
10. existing occupancies and conditions,
11. maintenance and testing of all fire- and life-safety systems;
12. access and water supply requirements for fire department operations;
13. review of design plans and construction documents including drawings, calculations and specifications for the design and construction of new buildings, and alterations, additions and repairs of existing buildings;
14. review of design plans and construction documents including drawings, calculations and specifications for the installation, alteration, addition and repair of life- and fire-safety systems, equipment, features, components, devices and apparatus including but not limited to fire protection systems, fire department access, water supply, flammable and combustible materials, hazardous materials, commercial processes.

15. fire- and life-safety education of fire brigades, employees, responsible parties, and the general public including the review and approval of emergency procedures for all occupancies and evaluation of fire drills;
16. Control of emergency operations and scenes.
17. Conditions affecting firefighter safety.

The provisions of this code shall supplement any and all laws relating to fire- and life-safety and shall apply equally to all of the following without restriction: persons, firms, corporations, the government of the United States of America, the government of the State of Colorado, the government of the City and County of Denver, and all agencies, subdivisions, and departments thereof. The provisions of this Code shall apply to existing conditions as well as to conditions arising after the adoption of the Code.

101.2.1 Appendices. Provisions in the appendices shall apply.

101.3 Intent. The purpose of this code is to establish the minimum requirements, consistent with nationally recognized good practice, for providing a reasonable level of occupant and pedestrian fire- and life-safety and property protection from the hazards of fire, explosion, production, use, and handling of dangerous and hazardous materials, substances, and devices, or dangerous conditions in new and existing buildings, structures, and premises, and to provide safety to firefighters and emergency responders during emergency operations.

SECTION 102
APPLICABILITY

Sections 102.6 and 102.7 are replaced with the following:

102.6 Referenced codes and standards. Additional details regarding processes, methods, specifications, equipment testing and maintenance, or other pertinent criteria contained in these standards and codes listed in Chapter 45 of this Code shall be considered a part of this Code.

102.7 Subjects not regulated by this code. Where no applicable codes, standards, or requirements are set forth in this Code or contained within other laws, codes, regulations, ordinances, or bylaws adopted by the City and County of Denver Fire Department, compliance with the applicable codes and standards of the National Fire Protection Association (NFPA) or other nationally recognized and approved standards shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the City and County of Denver Fire Department's responsibility.

SECTION 103
DEPARTMENT OF FIRE PREVENTION

Section 103.1 and 103.3 are replaced with the following:

103.1 General. The Fire Prevention and Investigation Division is established within the Fire Department of the City and County of Denver's Department of Safety under the direction of the Division Chief of Fire Prevention and Fire Investigation. This position is and may be referred to as the "Fire Code Official," "Fire Official," and "Fire Marshal," in both upper and lower case. This code shall be administrated and enforced by the Manager of the Department of Safety: "Manager". "Chief" shall refer to the Chief of the Fire Department.

103.1.1 Rules and Regulations. The Manager of Safety shall have the full power to adopt, in reference to this Code, any rules, restrictions, or measures that may, by said manager, be advisable.

103.3 Deputies. In accordance with the prescribed procedures of the City and County of Denver's Department of Safety and with the concurrence of the Chief, the Fire Code Official shall have the authority to appoint a Deputy Fire Code Official, Chief Fire Protection Engineer, Fire Protection Engineers, other related

technical officers, fire inspectors, fire investigators, and employees. Their duties shall be those outlined by the Fire Code Official.

SECTION 104
GENERAL AUTHORITY AND RESPONSIBILITIES

Replace Section 104.1 as follows:

104.1.1 Division Authority. The Fire Prevention and Investigation Division is authorized to inspect land, buildings, structures, utilities, installations, equipment, devices, illegal processes, and materials for fire, explosion, and other emergency hazards and to investigate and ascertain the causes of fires, explosions, releases of hazardous materials, false alarms, any unsafe conditions that relate to the protection of the public and/or property and other emergencies. The Division shall have the authority to investigate fire protection and other life safety systems that are disabled or not functioning. The Division shall also have the authority on behalf of the Department of Safety to control the use, location, and transportation of flammable or combustible liquids or acids (in a chemical or physical state) or hazardous materials; the issuance of permits; the issuance of notices, orders, or Denver County Court summonses for the correction or immediate abatement of hazardous situations; the enforcement of this code and other laws, ordinances, rules, and regulations, which are within the perspective of this Code and standards set forth in Chapter 45

Replace Section 104.3 as follows:

104.3 Right of entry. Whenever it is necessary to make an inspection to enforce the provisions of this code, or whenever the fire code official has reasonable cause to believe there exists in a building or upon any premises, any vehicle, or any vessel, any conditions or violations of this code that make the premises, vehicle, or vessel unsafe, dangerous, or hazardous, the fire code official shall have the authority to enter the building, vehicle, or vessel to conduct an inspection and, if necessary, an investigation, taking photographs of unsafe, dangerous, or hazardous conditions or for investigative or fire investigation purposes or the pursuance of any other emergency, or to perform the duties upon the Fire Code Official by this code. If such building, premises, or vehicle is occupied, the Fire Code Official shall present credentials to the occupant and request entry. If such building, premises, or vehicle is unoccupied, the fire code official shall first make a reasonable effort to locate the owner or other person having charge or control of the building or premises and request entry. If entry is refused, the fire code official has recourse to every remedy provided by law to secure entry.

104.3.2 Interference with Enforcement. Persons shall not interfere or cause conditions that would interfere with the fire code official carrying out any duties or functions prescribed by this code.

Add new Section 104.3.3 as follows:

104.3.3 Power to protect property. The fire code official shall have power to cause the removal of any property when necessary to preserve such property from fire, explosion, or other emergency; to prevent the spreading of fire; or to protect adjoining property. No person shall be entitled to remove any property in the possession of the fire code official saved from any fire until proof of ownership thereof is furnished.

Replace Sections 104.4.1 and 104.6.3 as follows:

104.4.1 Impersonation. Persons shall not use a badge, uniform, or other credentials to impersonate a Fire code official.

104.6.3 The Fire Department shall keep a record of all fires, explosions, and other emergencies occurring within its jurisdiction and of facts concerning the same, including reports, photographs, videos, and statistics as to the extent of such fires and the damage or injury caused thereby, together with other information as required by the Fire code official

104.6.3.1 Fire loss information. It shall be the responsibility of any person suffering a fire, explosion, or building collapse within the City and County of Denver to report the incident

and to provide the Division in writing with the dollar value of the resulting loss. If insured, the person may provide the name and address of the insurance company, in which case the insurance company shall supply the final loss figures to the Division.

Replace Section 104.7.2.1 as follows:

104.7.2.1 Final Determination. The fire code official shall make the final determination as to whether the provisions of this code have been met.

Amend second sentence of Section 104.7.2 Technical assistance to read as follows:

The opinion and report shall be prepared by a professional engineer licensed by the state of Colorado and acceptable to the fire code official. The opinion and report shall analyze the fire safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to recommend necessary changes.

Add Section 104.8.1 as follows:

104.8.1 Application for Modification. The fire code official is authorized to modify any of the provisions of this code upon application in writing by the owner where there are practical difficulties in carrying out the provisions of the Code, provided the intent of the code shall be complied with, public safety secured, and substantial justice done.

104.8.2 Compliance with code. Buildings with equivalency, alternative, or modification approved by the building code official or fire code official shall be considered conforming to the code.

Add Sections 104.9.1 and 104.9.2 as follows:

104.9.1 Fire protection features. Each application for an alternate fire protection feature shall be filed with the fire code official and shall be accomplished by such evidence, letters, statements, test results, or other supporting information as required to justify the request. The fire code official shall keep a record of actions on such applications, and a signed copy of the Fire code official's decision shall be provided for the applicant.

104.9.2 Building Code. Whenever the alternate material or method involves matters regulated by the Fire Code and Building Code, approvals are also subject to approval of the building code official.

Replace Section 104.10 as follows:

104.10 Fire investigations. The Division is authorized to investigate without delay the cause, origin, and circumstances of each and every fire or explosion or intent to commit such an act occurring within the City and County of Denver involving the loss of life or injury to a person or destruction or damage to property and, if it appears to the fire investigators that such fire or explosion is of suspicious origin, the investigators are authorized to take immediate charge of all physical evidence relating to the intent or cause of the fire and are authorized to pursue the investigation to its conclusion.

104.10.1 Release of hazardous materials. The fire code official is authorized to investigate the cause, origin, and circumstances of unauthorized releases of hazardous materials. The fire code official is authorized to recover from the responsible party(s) all costs incurred by the City for mitigation, rendering the release harmless to people or property, and cleanup.

Add Sections as follows:

104.10.2 Authorization of Denver Police Department. The Denver Police Department is authorized to assist the Fire Department in any investigation when requested to do so by the Manager of Safety, the Fire Chief, or the fire code official.

104.10.3 Limiting access. The Fire Department shall have the authority to limit access to buildings, property, vehicles, vessels, or other similar conveyances by any vehicle, vessel, or person during an investigation.

104.10.4 Interference with enforcement. Persons shall not interfere, nor cause conditions that would interfere with, the Fire Investigator carrying out any duties or functions, including arrest of suspects, prescribed by this Code.

104.11.1.1 Scene barrier. The incident commander in charge of an emergency scene shall have the authority to establish barriers to control access in the vicinity of such emergency and to place, or cause to be placed, ropes, guards, barricades, or other obstructions across any public or private street or alley, to delineate an emergency scene barrier(s). No person, except as authorized by the incident commander in charge of the emergency, shall be permitted to cross barriers established in accordance with Sections 104.11.1 and 104.11.1.1

Add new subsection 104.11.4 as follows:

104.11.4 Emergency power to demolish buildings. When a fire is in progress, the fire code official, or the officer in charge of the fire, may order any building that is in close proximity to such fire to be torn down, blown up, or otherwise disposed of for the purpose of checking the conflagration.

SECTION 105
PERMITS

Replace Section 105.1 as follows:

105.1 General. The Fire code official shall be authorized to establish and issue permits, certificates, notices, approvals, or orders pertaining to fire and hazard control and fire and explosion hazards wherever indicated by this Code. A permit issued under the provisions of this Code shall continue until revoked or for such a period of time designated therein at the time of issuance. Such permit shall not be transferable, and any change in use, occupancy, operation, or ownership shall require a new permit. Permits for activities requiring evidence of financial responsibility by the jurisdiction shall not be issued unless proof of required financial responsibility is furnished. Any attempt to misrepresent or otherwise deliberately or knowingly design; install; service; maintain; operate; sell; represent for sale; falsify records, reports, or applications; or act in any related activity in violation of the requirements prescribed by this Code shall be a violation of this Code. Such violations shall be cause for immediate suspension or revocation of any related licenses, certificates, or permits issued by the Fire code official. In addition, any such violation shall be subject to any other criminal or civil penalties as available by the laws of this jurisdiction. An inspection is required prior to the issuance of a permit. Any person who engages in any business, operation, or occupation, or uses any premises, after the permit issued therefore has been suspended or revoked pursuant to the provisions of this Code, and before such suspended permit has been reinstated or a new permit has been issued, shall be in violation of this Code.

Add new subsection 105.1.4 as follows:

105.1.4 Other required permits. The requirements for permits from other City agencies shall not waive the requirement for permits required by this Code. Where a permit is required by other City agencies, such permit shall be obtained prior to or simultaneous with the issuance of a permit required by this Code.

Replace Section 105.6.1 with the following:

105.6.1 Aerosol products. An operational permit is required to manufacture, store or handle an aggregate quantity of Level 1, Level 2 or Level 3 aerosol products in excess of 300 pounds (136 kg) net weight.

Section 105.6.9 is amended by adding the following sentence and Table:

The minimum quantities of compressed gas requiring permit shall be as set forth in Table 105.6.9.

TABLE 105.6.9

PERMIT AMOUNTS FOR COMPRESSED GASES

Type of Gas	Amount (cubic feet at NTP)
Corrosive	200
Flammable (except cryogenic fluids and Liquefied petroleum gases)	200
Highly toxic	Any Amount
Inert and simple asphyxiant	6000
Oxidizing (including oxygen)	504
Pyrophoric	Any Amount
Radioactive	Any Amount
Toxic	Any Amount
Unstable (Reactive)	Any Amount

Section 105.6.17, Items 2 and 3 are replaced with the following:

105.6.17 Flammable and combustible liquids. An operational permit is required:

2. To store, handle or use Class IA liquids in excess of 30 gallons (114 L) in a building or in excess of 60 gallons (228.6 L) outside of a building, except that a permit is not required for the following:

   2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the code official, would cause an unsafe condition.

   2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures when such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.

3. To store, handle or use Class IB, IC, II or IIIA liquids in excess of 60 gallons (228.6 L) in a building or in excess of 120 gallons (457.1 L) outside a building, except for fuel oil used in connection with oil-burning equipment.

The following Item # 11 is added:

11. A site plan shall be submitted showing the following: distances from all buildings, property lines, utility poles, power lines, railroad tracks, etc. A Hazardous Materials Inventory Statement (HMIS) may be required upon request.

Table 105.6.21 is replaced with the following:

TABLE 105.6.21 AMEND
PERMIT AMOUNTS FOR HAZARDOUS MATERIALS

TYPE OF MATERIAL	AMOUNT
Combustible liquids	See Section 105.6.17
Corrosive materials	
Gases	See Section 105.6.9
Liquids	55 gallons
Solids	550 pounds
Explosive materials	See Section 105.6.9
Flammable materials	
Gases	See Section 105.6.9
Liquids	See Section 105.6.17
Solids	100 pounds

TYPE OF MATERIAL	AMOUNT
Highly toxic materials	
Gases	See Section 105.6.9
Liquids	Any Amount
Solids	Any Amount
Irritants	
Liquids	55 gallons
Solids	550 pounds
Other Health Hazards	
Liquids	55 gallons
Solids	550 pounds
Oxidizing materials	
Gases	See Section 105.6.9
Liquids	
Class 4	Any Amount
Class 3	1 gallon
Class 2	10 gallons
Class 1	55 gallons
Solids	
Class 4	Any Amount
Class 3	10 pounds
Class 2	100 pounds
Class 1	500 pounds
Organic peroxides	
Liquids	
Class I	Any Amount
Class II	Any Amount
Class III	1 gallon
Class IV	2 gallons
Class V	No Permit Required
Solids	
Class I	Any Amount
Class II	Any Amount
Class III	10 pounds
Class 1V	20 pounds
Class V	No Permit Required
Pyrophoric materials	
Gases	See Section 105.6.9
Liquids	Any Amount
Solids	Any Amount
Radioactive materials	
Not sealed	1 microcurie
Sealed	1 millicurie
Sensitizers	
Liquids	55 gallons
Solids	550 pounds
Toxic materials	
Gases	See Section 105.6.9
Liquids	Any Amount
Solids	Any Amount
Unstable (reactive) materials	

TYPE OF MATERIAL	AMOUNT
Liquids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	1 gallon
Class 1	10 gallons
Solids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	10 pounds
Class 1	100 pounds
Water-reactive materials	
Liquids	
Class 3	Any Amount
Class 2	5 gallons
Class 1	10 gallons
Solids	
Class 3	Any Amount
Class 2	50 pounds
Class 1	100 pounds

Section 105.6 is replaced with the following:

105.6 Required operational permits. The fire code official is authorized to issue operational permits for the following:

Operational Permits – issued by the Fire Code Official
Abandoned Buildings
Aerosol Products – store or handle more than 300 lbs.
Air Compressor – for building smoke management and fire protection systems – certificate of fitness in accordance with A.S.M.E. Code
Aircraft Hangar – per bay or sq. footage - NFPA 409
Aircraft Refueling Vehicles – each
Amusement Buildings
Asbestos Removal – per building
Asphalt Kettles (other than roofing operations)
Automobile Wrecking Yard
Battery Charging - on or off vehicle
Battery System having an electrolyte capacity in excess of 10 gallons.
Battery System – install or operate systems of more than 50 gallon capacity
Blank Cartridges – to sell, store and use
Bonfires / Rubbish Fires

Operational Permits – issued by the Fire Code Official
Bowling Pin Alley Refinishing
Building Emergency Communication System
Building Fire Alarm System
Building Fire Protection System
Building Fire Standpipe System
Burning in Public Places – Open Burning
Candles and Open Flames in Assembly Areas – one time $25; annual permit $125
Canopies – having an area in excess of 300 square feet but less than 500 square feet
Canopies – having an area in excess of 500 square feet
Carnivals and Fairs - for event only; event coordinator responsible for permit – single event $50 plus $12.50 for each additional item; annual permit $350; vendors responsible for individual permits for booths
Cellular/Wireless Telephone Signal Repeater Sites
Cellulose Nitrate Film – store, handle, use, display – 25 lbs. or less
Cellulose Nitrate – store, handle, use display – more the 25 lbs.
Certification – Construction Fire Safety Officer (Includes point-of-contact relative to permits)
Chemical Tanks/Cryogenic Towers – install / modify
Chemical Tanks/Cryogenic Towers – remove / abandon
Chili Roaster – Tent/canopy > 200 sq. ft. < 400 sq. ft.
Chili Roaster – Tent/canopy > 400 sq. ft.
Chili Roaster – Roaster and LPG (300 lb. maximum)
Combustible Fiber – store / handle - more than 100 cubic feet
Combustible Material Storage – more than 2,500 cubic feet
Commercial Rubbish – handling operation
Compressed Gas (not LPG) – store, handle, use
Compressed Natural Gas (CNG) – install, modify, remove
Covered Mall Buildings
Cryogen – store, use, handle
Demolition by Explosives
Dry Cleaning Plants (Over 10 gal. Flammable/combustible liquid)

Operational Permits – issued by the Fire Code Official
Dust-producing Operations (excluding woodworking)
Emergency Generator / Fire Pump- Fuel Tank System (per tank) (integral day tank, remote day tank and main tank)
Equipment Testing – Fire Alarm Systems (smoke detector, horn/strobe, etc.) – Annual permit (does not include overtime costs)
Equipment Testing – Fire Protection Systems (sprinkler head, flow switch, etc.) – Annual permit (does not include overtime costs)
Equipment Testing – Smoke Management Systems – Annual permit (does not include overtime costs)
Equipment Testing – Standpipe Systems – Annual permit (does not include overtime costs)
Exhibits and Trade Shows
Explosive / Blasting Agents
Failure to Obtain a Permit
File Search – Fire Prevention / Hazardous Material – Amendment packet -
File Search – Fire Investigation – Video -$30
Fire Alarm Signal Delay Equipment - annual
Fire Department Fire Alarm Radio Transmitter (Wireless Denver Fire Department Radio Box)
Fire Hydrants and Valves
Fire Protection System Maintenance – certificate issued to qualified person for maintenance
Fire Pumps and Related Equipment
Fire Watch
Fireworks / Pyrotechnics
Flammable or Combustible Liquids – store, use, handle
Flammable/Combustible fuel tanker vehicles
Floor Cleaning (Using 3A combustible liquids) – One address, one location, one time
Floor Cleaning (Using 3A combustible liquids) – Multiple locations/same building
Floor Cleaning (Using 3A combustible liquids) – Annual, multiple sites
Floor Finishing – exceeding 350 sq. ft. using Class I or Class II liquids
Fruit Ripening
Fumigation / Thermal Insecticide Fogging
Garages – motor vehicle repair (not including compressed gas, combustible/flammable

Operational Permits – issued by the Fire Code Official
liquids, hot work)
Halogenated Agent Systems / Extinguishers
Halogenated Hydrocarbons – over 50 gallons
Hazardous Materials – store, use, handle
Hazardous Materials Inventory Statement Plan Review - Small
Hazardous Materials Inventory Statement Plan Review – Large
Hazardous Production Materials (for Haz Mat fees, see Table)
Hazardous Waste Generator (no exceptions)
Hazardous Waste Generator Contingency Plan Review
Heliports and Helistops
High-Piled Storage
Holiday Decorations in Public Assembly Occupancies
Hot Work Operations – including welding and cutting (per site)
Hypergolic Materials – any amount
Industrial Trucks – each – per NFPA Pamphlet 505
Insecticides/Pesticides/Fumigants – to apply, sell and manufacture
Interim Permit
Interior Fire Alarm System Maintenance – certificate issued to qualified person for maintenance
Laboratories – to store and use hazardous and flammable substances
Limited Fueling (per vehicle)
Liquefied Chlorine – to store, use, sell and transport
Liquid- or Gas-fueled Vehicles or Equipment in Assembly Buildings
LPG – annual filling or exchange (amount of gas calculated and assessed separately) Tank or cage
LPG – install, modify, remove any container or system
LPG – operate / maintain any container or system
LPG – limited operations / construction sites
LPG – roofing operation
Liquid or Gas-fueled Vehicles or Equipment in Assembly Buildings (per vehicle)
Lubricating Oils – to transport, store, sell or use – over 100 gallons
Lumber Yards
Mall, Covered

Operational Permits – issued by the Fire Code Official
Magnesium – store, use, handle
Matches – bulk storage
Medical Gas Systems (per system)
Motor Fuel Storage Systems, Certification to install, test, alter, repair or remove equipment
Motorcycle Vehicle Repair Shops
Nitrous Oxide-piped Systems
Occupant Load Increase (10% maximum – single date)
Open Flame
Open Flames and Torches
Open Flame on Aircraft Fuel Servicing Ramp (Annual Permit)
Organic Coating – manufacture of more than one gallon per day
Ovens, Industrial Baking or Drying
Ozone generator – per system
Pallet Storage – Indoor (over 3,000 sq. ft.)
Pallet Storage – Outdoor (over 3,000 sq. ft.)
Parade Floats – each (ground and airborne)
Places of Assembly -- 150 – 299 people
Places of Assembly – 300 – 2,500 people
Places of Assembly – more than 2,500 people
Plan Review – Development plan review (assessed in ½ hour increments)
Plan Review – Pre-plan submittal consultation (assessed in ½ hour increments)
Plan Review – Hazardous Materials
Plan Review – Overtime plan reviews (assessed in ½ hour increments)
Plan Review – Subsequent plan submittals (third and subsequent submittals)
Plastic Foam Products (flammable) – storage over 1,000 pounds
Powder Coating – see Spray Booth, Spraying and Dipping
Pressure Vessels
Private Fire Hydrants
Pyrophoric Materials – any amount
Pyrotechnic Event - After-hours Inspections
Pyrotechnic Event - Fog Machine

Operational Permits – issued by the Fire Code Official
Pyrotechnic Event - Indoor/Outdoor Pyro Show
Pyrotechnic Event - Propane Effects
Pyrotechnic Event - Pyro Inspector during show (paid by promoter as after-hours inspection)
Pyrotechnists – certificate of fitness
Pyroxylin Plastics
Radioactive Material – store, use, handle
Refrigeration Equipment – cold storage
Reviewing Stands/ Grandstands
Salvage Yard (not including compressed gases, flammable and combustible liquids, hot work, spray painting)
Service Station – full service / self service (fuel calculated and assessed separately)
Service Stations – fleet / private service (accompanied w/HMIS for new and remodeled only) (fuel calculated and assessed separately)
Special Conditional Permit
Special Events – Places of Assembly – Any hazardous material or process at temporary events
Special Events – Places of Assembly – Refueling operations at temporary events in assembly occupancies
Special Events – Places of Assembly – Store, use, handle compressed gases at temporary event
Special Events – Places of Assembly – Store, use, handle flammable or combustible liquids at temporary event
Special Events within Existing Facilities
Special Event - Submittal less than fourteen (14) days prior to event
Special Event (outdoor) with six (6) or more fuel-fired cooking/heating units
Special Extinguishing System
Special Fire Alarm System
Special Spray Application Projects—Interior of Structure—Flammable or Combustible Finishes
Spray Booth/Powder Coating – installation, including fire protection system
Spraying – One time, one location
Spraying – At various locations – Annual
Spraying and Dipping/Powder Coating (per booth)

Operational Permits – issued by the Fire Code Official
Spraying of Water-Based Finishes
Storage Containers – Temporary (less than 180 days)
Storage Containers – Permanent (180 days or more)
Storage of Scrap Tires and Tire By-products
Storage Tank, Flammable/Combustible – Dispensing System – install, repair, alter, upgrade (per tank)
Storage Tank, Flammable/Combustible – remove/abandon in place (annual fee) (per tank)
Stored Electrical Energy Emergency/Standby Power Systems
Sulphur/Sulphur Chloride – to store, sell or use
Supervising Station/Central Station -- to receive fire alarm signals from a protected property
Supervising Station/Central Station Personnel – to carry out the responsibilities of a central station operator
Tanks, Change of Content
Temporary Fire Standpipe
Temporary Generator (Fuel calculated and assessed separately)
Temporary Heating Appliance – Electric, Natural Gas or LPG, plus amount of LPG use
Temporary Membrane Structures (tents and canopies) – exceeding 200 but less than 400 square feet
Tents or air-supported structures having an area in excess of 150 square feet but less than 700 square feet
Tents or air-supported structures having an area in excess of 700 square feet
Tire Recapping
Tire Storage – more than 250 cubic feet
Trailer, Permanent (for human occupancy) - 180 days or more
Trailer, Temporary (for human occupancy) – less than 180 days
Training Fees – Building Evacuation Exercise – high-rise building
Training Fees - Building Evacuation Exercise – non-high-rise building
Training Fees – Building Management Emergency Procedures Certification Training (per person)
Training Fees – Fire Extinguisher training - 2 hours (does not include extinguisher) – limit 5 persons
Training Fees – Floor Warden – limit 5 persons
Training Fees – Hazardous Material Closure Plan

Operational Permits – issued by the Fire Code Official
Training Fees – Hazardous Materials Inventory Statement Training (2 hours) – limit 5 persons
Training Fees – Hazardous Material Release Mitigation Training (2 hours) – limit 10 persons
Training Fees – Hazardous Waste Generator Contingency Plan (2 hours) – limit 5 persons
Training Fees – Safety and Evacuation Training (2 hours) – limit 10 persons
Underground Hazardous Material Storage Tanks
Underground Spaces – Inspection and certification of underground space
Varnishes – more than 100 gallons
Waste Material Handling Plant
Waste Receptacles – Capacity greater than twenty (20) cubic feet
Waxes – Store, sell or use – more than 400 pounds
Wood Products – in excess of 200 cubic feet
Wooden Packing Boxes, Cases and Barrels (empty) – storage of more than 2,000 cubic feet
Woodworking Operations

105.8 Fees. The Manager of Safety is authorized to adopt a permit fee schedule necessary to cover administrative costs of inspections and record-keeping under this code. Fees adopted pursuant to Ordinance 98, Series of 1996 shall remain in effect until and unless changed bythe Manager of Safety under the provisions of this code.

SECTON 106
INSPECTIONS

Add Sections as follows:

106.2.1 Dangerous or hazardous conditions or material. The fire code official shall have the authority to order any person(s) to remove or remedy such dangerous or hazardous condition or material as set forth in this code Any person(s) failing to comply with such order shall be in violation of this code.

106.2.2 Right of entry. The fire code official shall be authorized to inspect any building or premises for dangerous or hazardous conditions or materials as set forth in this code. Before entering, the fire code official shall obtain the consent of the occupant thereof or obtain a court warrant authorizing entry for the purpose of inspection except in those instances where an emergency exists.

106.2.3 Emergency. As used in 106.2.2, “emergency” means circumstances that the fire code official knows, or has reason to believe, exist and can constitute immediate danger to life and property.

106.2.4 Authorized Personnel. Uniformed fire inspectors, fire investigators, and fire protection engineers shall be authorized to enter and inspect buildings, structures, vessels, vehicles, and premises as herein set forth. They shall be identified by credentials issued by the Department of Safety.

106.2.4.1 Impersonation. Persons shall not use a badge, uniform, or other credentials to impersonate the fire code official.

106.2.5 Hazardous Conditions. Where conditions exist and are deemed hazardous to life and property by the fire code official, the fire code official shall have the authority to summarily abate such hazardous conditions that are in violation of this code.

106.2.6 Plans and Specification. The fire code official shall have the authority to require plans and specifications to ensure compliance with applicable codes and standards. The plans and specifications shall bear the stamp of a professional engineer.

106.2.7 Inspection of construction and installation. The fire code official shall be notified by the person performing the work when the installation is ready for a required inspection or for fire protection or other life safety systems acceptance tests.

106.2.7.1 Work in violation. When any construction or installation work is being performed in violation of the plans and specifications approved by the fire code official, a written notice shall be issued to the responsible party to stop work on that portion of the work that is in violation. The notice shall state the nature of the violation, and no work shall be continued on that portion until the violation has been corrected.

106.2.8 Stop work or evacuation. The fire code official shall have the authority to order an operation or use stopped and the immediate evacuation of any occupied building, area of a building, or other property when such building, area of a building, or other property has hazardous conditions that present imminent danger.

106.2.8.1 Non-complying work. Whenever any work is being done contrary to provisions of this code, the fire code official is hereby authorized to order such work stopped. Such work should immediately stop until authorized by the fire code official to proceed.

106.2.9 Standby personnel. When, in the opinion of the fire code official, it is essential for public safety in a tent, canopy or membrane structure used as a place of assembly or any other use where people congregate, or any building, premises or property where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, or when potentially hazardous conditions exist, or an occupant load varies due to large crowd movement from one building to another building or one area of a building to another area of the building, or there is a reduction in a life safety feature, or there is an impairment to a fire protection feature, the owner, agency or lessee shall employ and compensate through approved Department of Safety channels at a rate established by the Manger of Safety one or more firefighters of the City and County of Denver, as required by the fire code official. Such firefighter(s) shall be subject to the fire code official's orders at all times when so employed and shall be in uniform and remain on duty during the times such places are open to the public or when such activity is being conducted or, in the case of residential occupancies, whenever occupied.

106.2.9.1 Owner's responsibility. The owner, agent, or lessee shall employ standby fire personnel in an adequate number determined by the fire code official based on the potential hazard or reduction in a fire protection system or other life safety feature as described in Section 106.2.9, as required and approved, to be on duty. Such standby fire personnel or fire watch personnel shall be subject to the fire code official's orders at all times and shall be identifiable and remain actively on duty during the times such places are open to the public, when such activity is being conducted, or in residential buildings, whenever occupied.

106.4. Fees. The Manager of Safety is authorized to adopt an inspection fee schedule necessary to cover administrative costs of inspections and record-keeping under this code.

SECTION 108

BOARD OF APPEALS

Section 108.1 is deleted and replaced as follows:

108.1 Board of appeals established. In order to hear and decide appeals of orders, decisions, or determinations made by the Fire code official relative to the application and interpretation of this Code, the Manager of Safety can hear the appeal alone or appoint a board of appeals consisting of members who are qualified by experience and training to make decisions pertinent to hazards of fire, explosions, hazardous conditions, flammable and combustible liquids and gases, the use, storage and production of hazardous materials, or fire protection and other life safety systems and features.

108.1.1 Application. Prior to any action by the Manager of Safety, an application in writing shall be filed in the office of the Manager within thirty (30) days after receiving the order, decision, or determination made by the fire code official on a form provided by the Manager providing the necessary information required. A copy of such application shall be furnished to the fire code official by the applicant. A fee of $100, in the form a check made payable to the Denver Manager of Revenue, must accompany the application.

108.1.2 Meetings and records. The Manager of Safety/Board of Appeals shall keep records of its proceedings showing the vote of each member on every question and the final decision.

108.1.3 Appeal from decision of the Manager of Safety. Any person aggrieved by a decision of the Manager of Safety may have judicial review of such decision as provided by law. A petition for review shall be filed in the court having jurisdiction within thirty (30) days after receiving the decision of the Manager of Safety.

SECTION 109
VIOLATIONS

Section 109.2.2.1 through 1009.2.2.4 are added:

109.2.2.1 Failure to comply. It shall be unlawful to violate any provisions of this code, or to fail to carry out an order made pursuant to this code or violate any condition attached to a permit, approval, or certificate, or to erect, install, alter, repair or do work in violation of approved construction documents, or without the appropriate license, permit or directive of the fire official. Violations shall be punishable as prescribed in Section 1-13(a) of the Denver Revised Municipal Code.

109.2.2.2 Time limits. Failure to comply with the time limits of an abatement notice or after a corrective order or notice of violation is issued by the fire code official shall result in each day that such violation continues being regarded as a new and separate violation and a new and separate offense.

109.2.2.3 Not owner-occupied. If the building or other premises is not owner occupied, under lease or otherwise, and the order or notice of violation requires additions or changes in the building or premises that would immediately become real estate and be the property of the owner of the building or premises, such orders or notices shall be complied with by the owner.

109.2.2.4 Citation. The fire code official is authorized to issue a citation to persons operating or maintaining an occupancy, premises, vessel, vehicle or other property subject to this code who allow a hazard to exist or fail to take immediate action to abate a hazard on such occupancy, premises, vessel, vehicle, or other property when ordered or notified to do so.

Section 109.3 is replaced with the following:

109.3 Violation penalties. See Section 109.2.2.1 Failure to comply.

SECTION 110
UNSAFE BUILDINGS

Section 110.1.1 is deleted and replaced as follows:

110.1.1 Unsafe conditions. Structures or existing equipment that are or hereafter become unsafe or deficient because of inadequate means of egress, or which constitute a fire hazard such as storage of explosives, excessive amounts of combustible or flammable materials, manufacture of controlled substances, unstable material, hazardous materials, etc., or are otherwise dangerous to human life or to the public welfare, or which involve illegal or improper occupancy or inadequate maintenance, shall be deemed an unsafe condition. A vacant structure that is not secured against unauthorized entry shall be deemed unsafe. A structure, including residences, that constitutes a fire hazard and an exposure hazard in the event of fire or explosion shall be deemed unsafe.

110.1.2.1 Unsafe heating or electrical equipment and structural hazards. When the fire code official deems any chimney, smokestack, stove, oven, incinerator, furnace, or other heating device, electrical fixture, or any appurtenance thereto, or anything regulated under a nationally recognized standard in or upon any building, structure, or premises not specifically mentioned in this code, to be unsafe or defective so as to create a hazard, the fire code official is authorized to serve upon the owner or the person having control of the property a written notice to remove or repair or alter as necessary. The fire code official is authorized to affix a condemnation tag prohibiting the use thereof, or until such repairs or alterations are made.

Sections 112 through 115 are added:

SECTION 112
LICENSES

112.1 General. A license is authority granted to the person to whom it is issued to perform the work authorized by the license.

112.2 Licenses required. Licenses shall be required for all fire protection ftters to install, add to, alter, repair, or perform all types of testing and maintenance and inspections on all types of automatic fire sprinkler and standpipe systems. Each and every fitter/technician must be licensed to install, add to, perform all testing and maintenance and inspections on, and repair factory engineered fire-extinguishing systems. Licenses are required for fire alarm technicians to install, add to, perform all testing and maintenance and inspections on, alter or repair electrical wiring and equipment for fire alarm, fire detection, emergency voice communication systems, electrical signaling and central wiring, emergency radio enhancement systems, and smoke control system control wiring. Licenses shall be required for all supervising station/central alarm station service agencies/firms (any facility that receives fire alarm signals from protected properties at which personnel are in attendance at all times to respond to these signals). Licenses are required for all supervising station/central alarm station personnel who perform the duty responsibilities of an operator (who responds to fire alarm signals).

112.3 Application and fee. Every applicant for a license shall fill out a form provided by the Denver Fire Department Fire Prevention and Investigation Division and shall pay the established application fee at the time of filing. This fee shall not be refundable and shall not apply to the established license fee.

112.4 Licenses. Effective March 1, 2005 the Denver Fire Department Fire Prevention and Investigation Division shall have the authority to establish licensing procedures, to qualify applicants for licenses, and to issue, revoke, renew, and suspend licenses.

112.5 License fees. The annual license fee applicable to those enumerated shall be paid to the Denver Fire Department Fire Prevention and Investigation Division in accordance with the fee schedule established by the Manager of Safety. License fees shall not be refundable.

112.6 License renewal. All licenses shall be renewed annually. Any work performed thirty (30) days after expiration of a license shall constitute a violation of this Code.

SECTION 113
PUBLIC FIRE EDUCATION

113.1 General. The fire code official shall have the authority to develop and implement a public fire safety education program as deemed necessary for the general welfare with respect to the fire hazards within the jurisdiction.

113.2 Educational programs and messages. The fire code official shall have the authority to ensure that duly authorized public fire safety education programs or public fire safety messages are disseminated to the general public.

SECTION 114
EMERGENCY PLANS AND PROCEDURES

114.1 General. Where required, emergency plans, staff training, and emergency evacuation drills are required for all occupancies.

114.2 Plan requirements. Emergency plans and emergency evacuation drills shall be developed in accordance with the Denver Fire Department Fire Prevention and Investigation Division's guidelines, NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs*, and Chapter 4, Emergency Planning and Preparedness, of this code.

114.3 Review. Emergency plans shall be submitted to the Division for review.

114.4 Maintenance. Emergency plans shall be reviewed and updated annually. Revised plans shall be submitted for review and updates shall be provided whenever changes are made in the occupancy or physical arrangement of the building or fire protection systems or features. The owner shall provide floor plans to the Denver Fire Department Fire Prevention and Investigation Division in a manner approved by the fire code official.

SECTION 115
FIRE ALARM MONITORING

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

115.2 Central Alarm Station/Supervising Station. These facilities, licensed by the Denver Fire Department, monitor remote fire alarm signaling systems where personnel licensed by the Denver Fire Department are in attendance at all times to take such action as required for the notification of the Denver Fire Department.

115.3 Permits. Permits shall be obtained for central alarm station/supervising stations and the operators who take such action as required for notification of the Denver Fire Department.

115.4 Definitions.

CENTRAL ALARM STATION/ SUPERVISING STATION. A facility that receives fire alarm signals and at which personnel are in attendance at all times to respond to these signals. A supervising station that is listed for central station service.

CLASS I FIRE ALARM MONITORING. The monitoring of a fire alarm that is required by Denver's Building and Fire Codes.

CLASS II FIRE ALARM MONITORING. The monitoring of a fire alarm system that is not required by Denver's Building and Fire Codes.

OPERATOR. A competent person employed by a central alarm station and licensed by the Denver Fire Department to take such action as required for notification of the Denver Fire Department.

RUNNER. A qualified person who responds to the location where a reported fire alarm system has been activated for the purpose of silencing, restoring, or confirming that the system is restored to a normal condition.

115.5 License Required.

115.5.1 Central alarm station/supervising station. No person or public agency shall monitor fire alarm systems in the City and County of Denver without first obtaining a license to operate a Class I or Class II central alarm station/supervising station.

115.5.2 Operator. No person shall be employed as an operator in a central alarm station/supervising station that monitors fire alarm systems in the City and County of Denver unless licensed as an apprentice operator or operator by the Denver Fire Department.

115.5.2.1 Class I Operator. A Class I Operator license shall authorize the holder to act as an operator in any central alarm station/supervising station.

115.5.2.2 Class II Operator. A Class II Operator license shall authorize the holder to act as an operator in any Class II central alarm station/supervising station.

115.5.2.3 Apprentice Operator. An Apprentice Operator license shall authorize the licensee to act as an operator only under the constant supervision of a licensed operator.

115.6 Runner service. The central alarm station/supervising station shall provide runner service to all Class I alarms. Maximum response time from receipt of alarm to arrival of runner service shall not exceed 45 minutes.

CHAPTER 2
DEFINITIONS

SECTION 202
GENERAL DEFINITIONS

Add the following to definitions:

CARCINOGEN. A substance that causes the development of cancerous growths in living tissue. A chemical is considered to be a carcinogen if:

1. It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen, or
2. It is listed as a carcinogen or potential carcinogen in the latest edition of the Annual Report on Carcinogens published by the National Toxicology Program, or
3. It is regulated by OSHA as a carcinogen.

EMERGENCY shall mean one or more of the following:

1. Fire, regardless of size or type
2. Explosion
3. Building, structure, or utility failure
4. Rescue operations involving humans or animals; including people trapped in elevators due to power failure or mechanical malfunctions
5. Failure of or damage to fire protection or life safety systems
6. Exposure to a hazard(s)
7. Panic
8. Hazardous material leak or spill
9. Overcrowding of any building or premises
10. Any other hazard or situation involving or endangering life or property.

OTHER HEALTH HAZARD MATERIAL. A hazardous material which affects target organs of the body, including but not limited to, those materials which produce liver damage, kidney damage, damage to the nervous system, act on the blood to decrease hemoglobin function, deprive the body tissue of oxygen, or affect reproductive capabilities, including mutations (chromosomal damage) or teratogens (effects on fetuses).

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

RELEASE/UNAUTHORIZED DISCHARGE. Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discharging of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant).

SENSITIZER. A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

CHAPTER 3
GENERAL PRECAUTIONS AGAINST FIRE

SECTION 301
GENERAL

Section 301.2 is deleted and replaced with the following:

301.2 Permits. Permits shall be required as set forth in Section 105.6 for the activities or uses regulated by Sections 303, 304, 306, 307, 308, 309, 311, 313, 314, and 315.

SECTION 304
COMBUSTIBLE WASTE MATERIAL

Sections 304.1.2.1, 304.2.1 and 304.2.2 are added:

304.1.2.1 Cut vegetation. Cut or uncut weeds, grass, vines, and other vegetation shall be removed when determined by the fire code official to be a fire hazard.

304.2.1 Required storage conditions. Combustible rubbish kept or accumulated within or adjacent to buildings or structures shall be in containers complying with this code, or in rooms or vaults constructed of non-combustible materials.

304.2.2 Residential occupancies. Storage, accumulation, use and handling of combustible waste, newspapers, magazines, etc. in excess of 10 cubic feet total, stored outside of non-combustible vaults or rooms is prohibited.

Replace Section 304.3.3 as follows:

304.3.3 Capacity exceeding 30 cubic feet. Dumpsters and containers with an individual capacity of 30 cubic feet or more shall not be stored in buildings or placed within 5 feet of combustible walls, openings or combustible roof eave lines.

Exceptions:

1. Dumpsters or containers in areas protected by an approved automatic sprinkler system complying with Chapter 9.
2. Storage in a structure shall not be prohibited where the structure is of Type I or Type IIA construction located not less than 10 feet form other buildings and used exclusively for dumpster or container storage.

Add the following new sections:

304.3.4 Nonmetallic containers. Nonmetallic rubbish containers exceeding 40 gallons capacity shall be manufactured of materials having a peak rate of heat release not exceeding 300 KN/m^2 when tested in accordance with nationally recognized standards. Such containers shall be permanently labeled indicating capacity and peak rate of heat release.

304.3.5 Removal. Combustible rubbish stored in containers outside of noncombustible vaults or rooms shall be removed from buildings at least once each working day.

304.3.6 Commercial rubbish-handling operations. Occupancies exclusively performing commercial rubbish handling or recycling shall maintain rubbish or product to be processed or recycled as follows:

1. In approved vaults
2. In covered metal or metal-lined receptacles or bins, or
3. Completely baled and stacked in an orderly manner in an approved location.

SECTION 307
OPEN BURNING AND RECREATIONAL FIRES

Add the following new sections:

307.5 Fuel-fired appliances. For other than one- and two-family dwellings, no hibachi, gas-fired grills, charcoal grill, or other similar devices used for cooking, heating, or any other purpose, shall be used or kindled on any balcony or under any overhanging portion or within 10 feet of any structure. Listed electric ranges, grills, or similar electrical apparatus shall be permitted.

307.6 Prohibition. The fire code official shall have the authority to prohibit any or all open fires when atmospheric conditions or local circumstances make such fires hazardous. When the fire code official declares a dry season, that official shall have the authority to establish special regulations on the use of any form of fire or smoking material. The fire code official shall be authorized ot require any fire to be immediately discontinued if the fire is determined ot constitute a hazardous condition.

SECTION 309
POWERED INDUSTRIAL TRUCKS

Replace Section 309.1 as follows:

309.1 General. Powered industrial trucks shall be operated and maintained in accordance with this section. Operational permits are required in accordance with section 105.

Replace Section 309.2 as follows:

309.2 Battery chargers. Battery chargers shall be of an approved type. Combustible storage shall be kept a minimum of 3 feet (915 mm) from battery chargers. Battery charging shall not be conducted in areas accessible to the public.

Add the following subsections:

309.2.1 Battery-charging operations. Battery-charging operations shall be located in areas designated for such purpose. Areas shall be kept free of extraneous combustible materials. Where on-board chargers are used, charging shall be accomplished at locations designated for such purpose.

309.2.2 Smoking prohibited. Smoking shall be prohibited in battery charging areas. "No Smoking" signs shall be provided in the charging area in accordance with Section 310.3

309.2.3 Battery charging areas. Battery charging shall be conducted in an area protected by an approved automatic sprinkler system when the aggregate electrolyte capacity is 50 gallons or more. All battery-charging rooms or areas shall be protected by fire sprinklers.

309.2.4 Battery charging area construction. Battery charging areas shall be constructed in accordance with International Building Code Chapter 7. One-hour fire resistive construction shall be required where the aggregate electrolyte capacity is 100 gallons or more.

309.2.5 Spills. An approved method shall be provided capable of neutralizing a spill from the largest battery to a ph between 7.0 and 9.0.

309.2.6 Each rack or tray of batteries shall be provided with a liquid-tight 4-inch minimum spill control barrier which extends at least one-inch beyond the battery rack in all directions.

Replace Section 309.3 as follows:

309.3 Ventilation. Ventilation shall be provided in an approved manner in battery-charging areas to prevent a dangerous accumulation of flammable gases. Continuous ventilation shall be provided at a rate of not less than 1cu-ft/min/sf of designated battery-charging area. Ventilation systems shall be interlocked with charging equipment to ensure continuous operation during charging.

309.4 Fire extinguishers. Battery-charging areas shall be provided with a fire extinguisher complying with Section 906 having a minimum 4-A:20-B:C rating within 20 feet (6096 mm) of the battery charger.

309.5 Refueling. Powered industrial trucks using liquid fuel or LP-gas shall be refueled outside of buildings or in areas specifically approved for that purpose and in accordance with Chapter 34 or 38.

309.6 Repairs. Repairs to fuel systems, electrical systems and repairs utilizing open flame or welding shall be done in approved locations outside of buildings or in areas specifically approved for that purpose.

SECTION 310
SMOKING

Replace Section 310.2 as follows:

310.2 Prohibited areas. Smoking shall be prohibited where conditions are such as to make smoking a hazard, and in spaces where flammable or combustible materials are stored or handled. Smoking is prohibited in facilities owned or leased by the City and County of Denver.

SECTION 315
MISCELLANEOUS COMBUSTIBLE MATERIALS STORAGE

Add the following new section:

315.3.3 Residential occupancies. Storage, accumulation, use and handling of combustible waste, newspapers, magazines, etc. in excess of 10 cubic feet total, stored outside of non-combustible vaults or rooms is prohibited.

CHAPTER 4
EMERGENCY PLANNING AND PREPAREDNESS

SECTION 401
GENERAL

Add the following new Sections:

401.3.4 Reporting of fires and other emergencies. The person discovering any unwanted fire, regardless of magnitude, shall immediately notify the Fire Department.

401.3.5 Evidence of fire. The owner, manager, occupant, or any person in control of such building or premises, vehicle, vessel, or property, upon discovery of an unwanted fire or evidence of there having been an unwanted fire even though it has apparently been extinguished, shall immediately notify the Fire Department of the existence of such fire, circumstances of same, and the location thereof. Evidence of the fire shall not be disturbed, thus preserving such evidence to allow the Fire Department to conduct an investigation.

401.3.6 Other emergencies. The owner, manager, occupant, or any person in control of such building, or premises, vehicle, vessel, or property, upon discovery of an unauthorized discharge of hazardous materials or other emergency, shall immediately notify the Fire Department

401.6 False alarm. No person shall deliberately or maliciously report a fire or unauthorized discharge of hazardous materials when in fact that person knows that no fire or discharge exist.

401.7 Misleading information. It shall be a violation of this code for any person to willfully make any false, fraudulent, misleading, or unfounded report or statement or to willfully misrepresent any fact with the intention of misleading any Fire Department personnel or that interferes with the operation of the Fire Department.

SECTION 403
PUBLIC ASEMBLAGES AND EVENTS

Replace Section 403.1.2 as follows:

403.1.2 Contents. The public safety plan, where required by Section 403.1.1, shall address items such as emergency vehicle ingress and egress, water supply system, fire hydrant locations, fire protection, emergency procedures and employee training, public assembly areas, and the directing of both attendees and vehicles, including parking of vehicles, presence of fuel-fired equipment, vendor and food concession distribution, emergency vehicle access to all areas of the building or premises, and the need for the presence of police and fire personnel.

403.1.2.1 Review of safety plan. Public safety plans shall be submitted to the fire code official for review.

SECTION 404
FIRE SAFETY AND EVACUATION PLANS

Replace Section 404.2 as follows:

404.2. Occupant load. Where required, an approved fire safety and evacuation plan shall be prepared and maintained for all occupancies and buildings with an occupant load greater than ten (10) persons.

Exception: U occupancies.

Replace Section 404.3 as follows:

404.3 Contents. Fire safety and evacuation plan contents shall be in accordance with Sections 404.3.1, 404.3.2, and Denver Fire Department policy on Emergency Procedures and Emergency Evacuation.

Add Item #8 to Section 404.3.1 as follows:

8. Locations of persons requiring assistance to evacuate and an established procedure for conducting that evacuation

Add Item #9 to Section 404.3.2 as follows:

9. A description of the building's life safety systems.

SECTION 405

EMERGENCY EVACUATION DRILLS

Replace Section 405.2 as follows:

405.2 Frequency. Required emergency evacuation drills shall be held at the intervals specified in table 405.2. or more frequently as deemed necessary by the fire code official to familiarize all occupants with the drill procedure.

TABLE 405.2
FIRE AND EVACUATION DRILL
FREQUENCY OF PARTICIPATION

Group A	Quarterly	Employees
Group B	Annually	All occupants
Group E	Monthly[a]	All occupants
Group F	Semiannually on each shift	Employees
Group H	Semiannually on each shift	Employees
Group I	Quarterly on each shift	Employees
Group M	Semiannually on each shift	Employees
Group R	Quarterly on each shift	Employees
Group S	Semiannually on each shift	Employees

Replace Section 405.10 as follows:

405.10 Extent of Evacuation. Fire and evacuation drills shall include the complete evacuation from the building of all persons required to participate. It shall be a violation of this code to refuse to participate or to interfere with the Fire Department personnel conducting a fire and evacuation drill.

SECTION 408
USE AND OCCUPANCY-RELATED REQUIREMENTS

Add the following new subsections:

408.2.2.1 Emergency announcement. The required fire alarm system shall sound an audible alarm in a constantly attended area within the building when occupied for purposes of initiating emergency action. The announcement shall be made via an approved voice communication or public address system, provided with an emergency power source, that is audible above the ambient noise level of the assembly occupancy. Occupant notification shall be by means of visible signals and voice announcements, either live or prerecorded, initiated by the person in the constantly attended location.

408.2.2.2 High noise areas. In very high noise areas such as theaters, dance halls, nightclubs, machine shops, etc., the fire alarm system shall reduce or eliminate the background noise system so the fire alarm system may be heard.

CHAPTER 5
FIRE SERVICE FEATURES

SECTION 502
DEFINITIONS

Section 502.1 is amended by adding the following definition:

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. If the access road is farther than 30 feet to any exterior wall of the building, the lowest level of Fire Department vehicle access shall be measured from the lowest elevation of any required Fire Department access road located no more than 50 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.

SECTION 503
FIRE APPARATUS ACCESS ROADS

Section 503.1.1 Exception #1 amended by replacing as follows:

1. Where a building is equipped throughout with an approved automatic sprinkler system installed in accordance with Sections 903.1.1, 903.3.1.2 or 903.3.1.3 the 150 feet dimension may be increased to 250 feet. Access into interior courtyards shall be provided from two remote locations and access points shall be comprised of breezeways not less than 6 feet wide and having a height not less than the first story of the building. Location shall be approved by fire code official.

Section 503.2.1.1 is added:

503.2.1.1 Fire apparatus access roads shall have an unobstructed width per Table 503.2.1.1-A.

TABLE 503.2.1.1-A

Type of Right of Way	Minimum Clear Width
Private or public streets serving single-family detached buildings or townhomes with alleys	16 feet
Private or public streets serving single-family detached buildings or townhomes, without alleys but with driveways that reach the street	20 feet
Private or public streets serving single-family detached buildings or townhomes,without alleys OR driveways that reach the street	25 feet
Multi-family buildings, two stories or less, 15 units maximum per building; buildings with interior corridor(s) and a fire standpipe system complying with City ordinance	18 feet

Multi-family buildings, three or more stories, 16 or more units	25 feet
Non-residential	25 feet
Cul de sac	90 feet in diameter
Hammerhead turnaround	20 feet wide by 90 feet long
Turning radius	25 feet inside, 50 feet outside

Security gates shall comply with Section 503.6. The fire apparatus access road shall have an unobstructed vertical clearance on not less than 13 feet 6 inches.

Section 503.2.3 is deleted and replaced as follows:

503.2.3 Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities. Permanent fire access surfaces shall be asphalt or concrete capable of supporting imposed loads of fire apparatus. Grasscrete or similar products are not allowed except at treelawns of 8 feet and less in width. Temporary fire access surfaces during construction may consist of a gravel road base or asphalt or other approved surface. See 2003 IBC Chapter 16 for fire department apparatus loading.

Section 503.2.4 is deleted and replaced as follows:

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall be 25 feet inside radius and 50 feet outside radius.

Replace Section 503.2.7 as follows:

503.2.7 Grade. The grade of the fire apparatus access road shall not exceed 5%.

Add Sections 503.5.2 and 503.5.3 as follows:

503.5.2 Width. Secured gates and barricades shall be a minimum of 3 feet wide.

503.5.3 Approved means of securing. Secured gates and barricades shall be openable by one of the following means:

1. Key box containing keys to gain necessary access, installed in an approved location. (See section 506.1)
2. An approved lock. (See section 506.1.1)
3. A chain of ¼ inch maximum non-case hardened steel.
4. Approved means of securing by fire code official.

Add Sections 503.6.1 and 503.6.2 as follows:

503.6.1 Width. Security gates across a fire apparatus access road shall be a minimum 16 feet wide.

503.6.2 Approved means of emergency operation. Security gates across a fire apparatus access road shall be openable by one of the following means:

1. Key box containing keys to gain necessary access, installed in an approved location. (See section 506.1)
2. An approved lock. (See section 506.1.1)
3. A chain of ¼ inch maximum non-case hardened steel.

4. Approved emergency operation by fire code official.

SECTION 504
ACCESS TO BUILDING OPENINGS AND ROOFS

Replace Section 504.1 as follows:

504.1 Required access. Exterior doors and openings required by this code or the International Building Code shall be maintained readily accessible for emergency access by the fire department. An approved access walkway (5 feet minimum width) leading from fire apparatus access roads to exterior openings shall be provided.

Exception: A lesser width may be provided when approved by the fire code official.

SECTION 508
FIRE PROTECTION WATER SUPPLIES

Replace Section 508.3 as follows:

508.3 Fire flow. Fire flow requirements shall be as determined in Appendix B. Each new or existing fire hydrant shall be capable of providing not less than 1500 GPM at 20 PSI residual pressure.

Replace Section 508.5.1 as follows:

508.5.1 Where required. Fire hydrants shall be located in accordance with Appendix C.

Replace Section 508.5.3 as follows:

508.5.3 Private fire service mains and water tanks. Private fire service mains are not permitted except for existing systems previously approved by the fire department.

Replace Section 508.5.5 as follows:

508.5.5 Clear space around hydrants. A five-foot clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.

SECTION 509
FIRE COMMAND CENTER

Replace Section 509 in its entirety and retitle section as FIRE COMMAND CENTER GRAPHICS.

For Fire Command Center requirements see IBCA Section 911.

Replace Section 509.1, Item #12 as follows:

509.1 Features

12. Emergency graphics and signs. Graphics and signs required by this Section shall be of durable construction, easily readable in normal room or corridor light, and have a smooth plastic surface.

A. Diagrammatic building floor plans shall be permanently mounted, unobstructed, on an interior wall of the operation center. One drawing may be used for all typical levels. Plans shall depict the following:

Location of general building features. A brief legend shall be provided listing the levelson which general building features are located.

Stairtowers (identified by building directional location).

Elevators (numerically identified).

Elevator machine room(s).

Emergency generator.

Fire pump(s).

All fire sprinkler and standpipe valves.

Mechanical area(s).

Main electrical area(s).

Fuel tank(s).

Location of building services control(s).

Electricity.

Gas.

Water supply (domestic), all valves, building entry location.

Water supply (fire), all valves,building entry location.

Ammonia, freon, chlorine, etc.

Utility property line valves.

Location of features on individual levels. One drawing may be used for all typical levels.

Elevator(s).

Stairwell doors.

Refuge area(s).

Fire sprinkler sectional valve(s).

Vertical shaft(s).

Concealed detector(s) (duct, electrical closet, ammonia, etc.)

A sign of 6 inches by 6 inches minimum size shall be mounted within each standpipe valve cabinet at each level of the building. This sign shall graphically depict the locations of sprinkler sectional valve(s), duct detector(s) and electrical closet(s) on that level.

A sign of 6 inches by 6 inches minimum size reading “Use stairs in case of fire unless otherwise instructed” and graphically depicting exiting scheme shall be installed at each elevator call button in each refuge area.

SECTION 510
FIRE DEPARTMENT ACCESS TO EQUIPMENT

Amend Section 510.1 by adding the following:

Access to fire pumps in new buildings constructed after adoption of the 2003 IFC shall be directly from the outside. Fire pumps may be located in basements with direct access to the outside having travel distance from grade level to the pump room not exceeding 15 feet. Where stairways are used to access the pump room, stairway width shall not be less than 36 inches.

CHAPTER 6
BUILDING SERVICES AND SYSTEMS

SECTION 602
DEFINITIONS

Replace the following definition in Section 602.1:

BATTERY, LEAD ACID. A group of electrochemical cells interconnected to supply a nominal voltage of DC power to a suitably connected electrical load. The number of cells connected in series determines the nominal voltage rating of the battery. The size of the cells determines the discharge capacity of the entire battery. This includes batteries that are sealed, valve-regulated and/or those containing immobilized electrolytes.

SECTION 603
FUEL-FIRED APPLIANCES

Replace Sections 603.4 and 603.4.1 with the following:

603.4 Portable unvented heaters. Portable unvented fuel-fired heating equipment are prohibited within the City and County of Denver.

Add the following to Section 603.5, Heating appliances:

603.5.1 Guard against contact. Freestanding solid fuel appliances must comply with manufacturer's recommendations.

Add the following to Section 603.8, Incinerators:

603.8.1 Residential incinerators. Residential incinerators are prohibited within the City and County of Denver

SECTION 604
EMERGENCY AND STANDBY POWER SYSTEMS

Add the following to Section 604.1:

604.1 Installation. For new installations refer to 2003 IMC and IFGC and other nationally recognized standards.

SECTION 608
STATIONARY LEAD-ACID BATERY SYSTEMS

Replace Section 604.1 as follows:

608.4 Spill Control and neutralization. An approved method and materials for the control and neutralization of a spill of electrolyte shall be provided.

Add Section 608.4.1 as follows:

608.4.1 Spill control. Each rack of batteries or groups of racks shall be provided with a liquid-tight 4-inch (101.6mm) minimum spill-control barrier which extends at least 1-inch (25.4 mm) beyond the battery rack in all directions.

Add Section 608.4.2 as follows:

608.4.2 Neutralization. An approved method to neutralize spilled electrolyte shall be provided. The method shall be capable of neutralizing a spill from the largest lead-acid battery to a pH between 7.0 and 9.0.

Add Section 608.9 as follows:

608.9 Sprinkler systems. All areas where stationary lead-acid battery systems are located shall be equipped with an automatic sprinklered system as required per Chapter 9 or when the buildings is equipped with an automatic sprinkler system.

SECTION 609
VALVE-REGULATED LEAD-ACID (VRLA) BATTERY SYSTEMS

Replace Section 609.5 as follows:

609.5 Spill control and neutralization. An approved method and materials for the control and neutralization of a spill of electrolyte shall be provided.

Add Section 609.5.1 as follows:

609.5.1 Spill control. Each rack of batteries or groups of racks shallbe provided with a liquid-tight 4-inch (101.6mm) minimum spill-control barrier which extends at least 1-inch (25.4 mm) beyond the battery rack in all directions.

Add Section 609.5.2 as follows:

609.5.2 Neutralization. An approved method to neutralize spilled electrolyte shall be provided. The method and materials shall be capable of controlling and neutralizing a release of 3 percent of the volume of the largest VRLA cell or block in the room to a pH between 7.0 and 9.0.

Add Section 609.11 as follows:

609.11 Sprinkler systems. All areas where stationary lead-acid battery VRLA systems are located shall be equipped with an automatic sprinklered system as required per Chapter 9 or when the buildings is equipped with an automatic sprinkler system.

SECTION 609
VALVE-REGULATED LEAD-ACID (VRLA) BATTERY SYSTEMS

CHAPTER 7
FIRE-RESISTANCE-RATED CONSTRUCTION

SECTION 704
FLOOR OPENING AND SHAFTS

Section 704.1 is replaced in its entirety with the following:

704.1 Enclosure. Interior vertical shafts, including but not limited to stairways, elevator hoistways, service and utility shafts, shall be enclosed with fire-resistance rated assemblies as specified in Table 704.1. Laundry and refuse chutes shall also comply with NFPA 82.

The fire-resistance rating of the shaft enclosures shall not be less than the fire-resistance rating of the floor assembly penetrated, or the fire-resistance rating required for shaft enclosures in the building and fire codes, including applicable Modifications Under Special Circumstances and retrofit ordinances, under which the building or structure in which they are located was last certified for occupancy. The extent and fire-resistance rating of shaft enclosures need not exceed that required for new construction, provided the Construction Type of the building meets or exceeds the Construction Type requirements for new construction. The enclosure of all new floor openings shall conform with IBC Section 707.2.

When required to be protected, openings into shaft enclosures shall be maintained self-closing or automatic-closing by smoke detection. In circumstances where smoke detectors are not suited to environmental conditions, heat detectors shall be installed.

Fusible links are allowed to remain on existing automatic-closing devices that were permitted to have fusible links in the building and fire codes, including Modifications Under Special Circumstances and applicable retrofit ordinances, under which the building or structure in which they are located was last certified for occupancy. Fusible link ratings shall not exceed 135 °F.

TABLE 704.1
VERTICAL OPENING PROTECTION REQUIRED

OCCUPANCY CLASSIFICATION	CONDITIONS[a]	PROTECTION REQUIRED
All	Mezzanines open to the floor below	No
Group I	Vertical openings connecting 2 or more stories	Yes
Other than Group I	Vertical openings connecting 3 or more stories	Yes
Group B	Stairway openings in a sprinklered building protected by a draft curtain and closely-spaced sprinklers in accordance with NFPA 13, connecting 4 or less stories	No
Groups B, F, M and S	Escalator openings in a sprinklered building protected by a draft curtain and closely-spaced sprinklers in accordance with NFPA 13	No
Group R-3		No

a. Basements are considered stories.

CHAPTER 8
INTERIOR FINISH, DECORATIVE MATERIALS AND FURNISHINGS

SECTION 804
DECORATIVE VEGETATION

Replace Section 804.1.1 as follows:

804.1.1 Restricted occupancies. Natural cut trees shall be permitted, by occupancy, in accordance with Table 804.1.1.

TABLE 804.1.1
Provisions for natural cut trees and similar vegetation by occupancy

Occupancy	Not Permitted	Permitted with Automatic Sprinkler Systems	Permitted without Automatic Sprinkler Systems	Balled Tree Permitted
Ambulatory health care (B)				X
Apartment buildings (R-2)		Within unit	Within unit	
Assembly (A)	X			
Board and care (R-4)	X			
Business (B)		X		X
Day care (I-4)		X		X
Detention and correctional (I-3)	X			
Dormitories (R-2)	X			
Educational (E)	X			
Health care (I-1 and I-2)				X
Hotels (R-1)	X			
Industrial (F)		X	X	X
Lodging and rooming (R-1)		X	X	X
Mercantile (M)		X		X
One and two family (R-3)		X	X	X
Storage (S)		X	X	X

Add the following new Section 804.5:

804.5 Natural combustible vegetation. In addition to natural cut trees, similar natural combustible vegetation shall be permitted, by occupancy, in accordance with Table 804.1.1. In any occupancy, limited quantities of combustible vegetation shall be permitted where the fire code official determines that adequate safeguards are provided based on the quantity and nature of the combustible vegetation.

CHAPTER 9
FIRE PROTECTION SYSTEMS

SECTION 903
AUTOMATIC SPRINKLER SYSTEMS

Amend Section 903.2.8.1 by adding Items #4 and #5 as follows:

4. Repair garages with spray booth and/or mixing area greater 16 square feet requires an automatic fire sprinkler system in the booth and the building. The automatic sprinkler system shall comply with Section 903.3.1.1.

5. An automatic sprinkler system in accordance with Section 903.3.1.1 shall be installed in any repair garage using open flame or welding of any type where repair garage that exceeds 3,000 square feet.

Replace Section 903.2.8.2 with the following:

903.2.8.2 Bulk storage of tires. Buildings and structures where the area for the storage of tires exceeds 500 square feet in area and 5 feet in height shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.1.1.

Delete Section 903.3.5.1. in its entirety

Delete Section 903.3.5.1.1 in its entirety

Delete Section 903.3.5.1.2 in its entirety

Replace Section 903.3.7 with the following:

903.3.7 Fire Department connections. Fire Department Fire Prevention personnel prior to installation shall approve the location of fire department connections. Minimum pipe size and number of inlets shall be per Table 903.3.7. An approved exterior audible and visual alarm device (24 VDC supervised) shall be connected to every fire sprinkler system. The main waterflow detection device shall activate this device. The devices shall be located on the exterior of the building at least 10 feet above grade and within 25 feet of and visible from the fire department connection. An approved audible/visual sprinkler flow alarm to alert the occupants shall be provided in the interior of the building in a normally occupied location.

TABLE 903.3.7 FIRE DEPARTMENT CONNECTION

No FIRE PUMP	Minimum 2-2½" inlets with 3 or 4-inch piping. Under no circumstances shall the FDC pipe size diameter be less than the diameter of the system riser or 4 inches, whichever is larger.	
Fire Pump Capacity	**Number of Inlets**	**Pipe Size (Diameter)**
750 gpm or less	2-2½"	4"
1000 gpm	4-2½ "	6"
1250 gpm or greater	6-2½"	8"

SECTION 905
STANDPIPE SYSTEMS

Replace Section 905.1 with the following:

905.1 General. Standpipe systems shall be provided in new buildings and structures in accordance with this section. Fire hose threads used in conjuction with standpipe systems shall be approved and shall be compatible with Denver Fire Department hose threads – 2 ½-inch hose thread is national standard; 1 ½-inch hose thread is a special 11 ½ threads per inch. The location of fire department hose connections shall be approved by the fire code official. In buildings used for high-piled storage, fire protection shall be in accordance with Chapters 9 and 23.

Amend Items #2 and #3 in Section 905.3.1 by replacing "manual" with "automatic dry"

Amend Section 905.4 Item #1 with the following:

2. Standpipes shall comply with the requirements of this section, NFPA 14 and the Fire Code. There shall be a Class I standpipe outlet connection at every floor-level landing of every required stairway all levels and below grade and on each side of the wall adjacent to the exit opening of a horizontal exit. Outlets at stairways shall be located in a public corridor within 10 feet of the opening of the stairway, on all floor levels, or as approved by the Fire Department. Each outlet shall consist of a 2 ½-inch hose valve with cap and chain and a 1 ½-inch hose valve outlet with cap and chain. Outlets shall be at least 3 feet and not more than 6 feet above finished floor. The valves shall have no les than 3 inches clearance around control valve and outlet cabinet shall not impede attachment of hose.

   Exception: In fully sprinklered buildings, the 1 ½-inch hose outlet may be omitted

Amend Section 905.8 by deleting Exception.

SECTION 906
PORTABLE FIRE EXTINGUISHERS

Amend Section 906.1 by deleting Exception to Item #1.

SECTION 907
FIRE ALARM AND DETECTION SYSTEMS

Section 907 is deleted in its entirety and replaced by the following (amendment to 2003 IBC):

907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components.

907.1.1 Construction Documents. Construction documents for fire alarm systems shall be submitted for permit application as a deferred submittal per IBCA Section 154. Document review and approval is required prior to issuance of a permit for system installation. Two sets of scaled, engineered installation shop drawings shall be submitted. Documents shall be of sufficient clarity and detail to fully describe the scope of work. Handwritten notes and comments on reproduced drawings are not acceptable. Documents shall include, but are not limited to, the following:

1. Completed permit application with exact address, location of work, name and address of responsible design agency and original seal and signature of the design professional.
2. Building occupancy classification and occupant load for each occupancy classification.
3. Manufacturers' specification sheets for all equipment and devices.
4. Code reference used as a basis of design, including any Administrative Modifications or Board of Appeals decisions.
5. Identification of system as code-required, non-required code-compliant or user-defined.

6. Voice message content and language(s) for voice evacuation systems.
7. Complete written narrative sequence of operation including:
    a. Elevator recall
    b. Smoke control
    c. HVAC system operation
    d. Alarm conditions
    e. Trouble and supervisory conditions
    f. Emergency voice/alarm communication system
    g. Two-way firefighter's voice communication system
    h. Special systems, e.g., pre-action, kitchen hoods, laundry and trash chutes, computer rooms, etc.
8. Identification of air-handling units with airflow exceeding 2,000 cfm and 15,000cfm.
9. Identification of air-handling units used for smoke control.
10. Voltage-drop calculations using either the device-by-device method or where the entire load is lumped at the end of the circuit. The calculations shall use the listed current draw at 18 volts for new systems. The voltage on a circuit shall not drop below 16 volts at the last appliance. The "R" values used for conductors shall be per NFPA 70 (NEC) for uncoated copper conductors. Voltage-drop calculations for additional devices on existing system shall be done in the same manner with the same values, as the original calculations for the system.
11. Battery calculations for control panels and power supplies.
12. Scale drawings of each area where work on the fire alarm is to be performed, including north arrow, building address and local street intersections. The drawings shall show location of all equipment and devices, including existing devices and end-of-line resistors, room identification by number and function (as applicable), attic and ceiling details for areas with automatic detection.
13. Mounting heights of wall mounted devices.
14. Symbol list with quantities of each device. Symbols shall comply with NFPA 170, *Standard for Fire Safety Symbols.*
15. Power supply connection details.
16. System single line riser showing all devices.
17. A separate single line drawing of the pre-amps, amplifiers, interconnect wiring and methods used to provide survivability of the voice communication system "A" and "B" circuits per NFPA 72.
18. Wire color code.
19. Interconnection wiring.
20. Central station designation.
21. Full-scale drawings of annunciators, zone maps and firefighter's control panels.
22. Reflected ceiling plan, where full smoke detection is provided.

Exception: A permit may be issued for fire alarm "conduit only rough-in" without approved plans. A "conduit only rough-in" permit may be issued to a contractor with either an Electrical or Electrical Signal contractor's license. This permit shall not authorize installation of any system wiring or devices. The "conduit only rough-in" permit applies to device backboxes and conduit stubs only. Compete conduit system installation may be included under the "conduit only rough-in" where the installation is permitted and accomplished by a contractor with a valid Electrical license. The contractor shall be responsible for any changes required by the City plan review.

907.1.2 Equipment. Systems and their components shall be listed and approved for the purpose for which they are installed. Only fire alarm control panels approved for use by the fire department shall be installed. Installation locations of all control panels and annunciators are subject to field approval by the fire department. Keys for all equipment required to be accessible to the fire department shall be maintained in an approved location.

907.1.2.1 Connections to other systems. A fire alarm system shall not be used for any purpose other than fire warning or as specifically approved (e.g. pool alarm, access control release per IBCA, emergency alarms per 907.2.5.1).

907.1.3 Use of area separation walls to define separate buildings. For the purpose of this Section, area separation walls shall not define separate buildings.

907.1.4 Central Station Connection. All fire alarm systems required by this code, the Fire Code or by special agreement shall be monitored by an approved Class I central station (as defined in the Denver Municipal Code) licensed by the City and County of Denver. Multiple central station connections from one building are not permitted. Alternatively, fire department radio boxes shall be installed at locations approved by the Fire Department. These boxes shall typically be installed at locations of high-hazard, high occupancy that require immediacy of response due to limitations in the occupants' capabilities for self- preservation. Under no circumstances shall a radio box be removed from a protected premises without written approval of the Fire Department.

907.1.5 Problematic systems. Fire alarm and detection systems that generate four (4) or more unintentional alarms, as determined by the Fire Department, per month for three (3) consecutive months, shall be immediately repaired or replaced as necessary. A permit must be obtained for all work.

907.1.6 Systems out of service. Systems undergoing maintenance or modification shall not have any portion of the system out of service for more than ten (10) hours. During maintenance or modification, all manual pull stations and notification appliances shall remain operational. Fire watch must be provided to all areas of the building where maintenance or modification will place any portion of the system out of service. Tenant-finish operations shall be in accordance with IBCA Polilcy 32-B0097.

907.2 Where required. Required fire alarm and Automatic fire detection systems shall comply with NFPA 72. An approved manual or manual and automatic fire alarm system shall be provided in accordance with this section. Automatic fire detectors shall be smoke detectors. Where smoke detectors are not suitable for the environment such as; laundry rooms, toilet rooms, kitchens, boiler rooms, unusable space under floor areas, attached garages, attics and rooms of similar use, heat detectors shall be used. Where heat detectors are substituted for smoke detectors and the room is protected by an approved automatic fire sprinkler system, the heat detectors are not required.

907.2.1 Group A. Group A Occupancies having an occupant load of 300 or more shall be provided with a manual fire alarm system in accordance with Section 907.2.1.

Exception: Group A Occupancy portions of Group E Occupancies shall be provided with a manual fire alarm and automatic detection system as required for the Group E Occupancy.

907.2.1.1 Group A occupancies with an occupant load of 1,000 or more shall be provided with a Fire Command Center. The Fire Command Center shall be a minimum of 24sf, of 1-hr rated

construction and have a minimum three feet (1m) clearance from the front of the control equipment. The Fire Command Center shall be located in an area approved by the Fire Department.

907.2.1.2 Activation of the fire alarm in Group A Occupancies with an occupant load of 1,000 or more shall immediately initiate an approved prerecorded message announcement using an approved emergency voice/alarm communication system in accordance with 907.2.12.3 as applicable. In very high noise areas, such as theaters, night clubs and dance halls, the system shall be designed to reduce or eliminate the background noise upon alarm initiation.

907.2.1.3 Emergency Power. Emergency voice/alarm communication system shall be provided with an approved emergency power source.

907.2.2 Group B. A manual fire alarm system shall be provided in all Group B occupancies five or more stories above grade.

907.2.3 Group E. Group E Occupancies having an occupant load of 50 or more shall be provided with an approved manual fire alarm and automatic detection system throughout the occupancy. See also Section 907.2.1, Exception.

Exceptions:

1. If less than 50 occupants, the system is not required to be monitored by a central station.
2. If 20 or less occupants, 120v AC single- or multiple-station residential smoke detectors with battery back-up, wired to an un-switched source shall be provided in sleeping areas and paths of egress. A manual fire alarm system is not required.
3. In mixed occupancies where the E occupancy is accessory to the A occupancy, a manual fire alarm system is not required in the A occupancy except as identified in 907.2.1. Any exit paths for the E occupancy through the A occupancy shall be provided with automatic fire detection.
4. Manual fire alarm boxes are not required throughout the building where all the following apply:
    a. Interior corridors are protected by smoke detectors.
    b. System central station monitoring is provided.
    c. Manual boxes are provided in locations supervised by staff.
5. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

907.2.4 Group F. A manual fire alarm system shall be installed in Group F occupancies that are two or more stories in height and have an occupant load of 500 or more above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required if the building is equipped throughout with an approved fire sprinkler system which activates notification appliances throughout the building. At least one manual fire alarm box shall be installed at an approved location(s).

907.2.5 Group H. A manual fire alarm system shall be installed in group H-5 occupancies as required in Chapter 18 of the Fire Code and in occupancies used for the manufacture of organic coatings as required in Chapter 15 of the Fire Code. An automatic fire detection system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 37, 39 and 40 respectively, of the Fire Code. See also IBC Section 908.

907.2.5.1 Emergency alarms. Where emergency alarms are required by the Fire Code and a fire alarm or sprinkler alarm system is provided, emergency alarm devices and appliances shall be connected to the fire alarm or sprinkler alarm system and transmit an alarm signal to the monitoring station, where provided. The emergency alarm devices serving this area shall be distinctly annunciated as a separate zone at the building annunciator panel and provide local alarm to notify occupants. Where emergency alarms are required and a fire alarm system is not provided, manual alarm initiating devices shall be installed outside each door to the area and local audible/visual appliances shall be provided to notify occupants in accordance with Chapter 27.

907.2.6 Group I. A manual fire alarm and automatic detection system shall be installed in Group I occupancies. When actuated, alarm-initiating devices shall activate an alarm signal that is audible throughout the building.

Exceptions:

1. Manual fire alarm boxes in patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.3.1.1.1 are not exceeded.
2. Visual alarm-signaling devices are allowed to substitute for audible devices in patient use areas.
3. A pre-signal system may be installed if approved by the fire department. 24-hour personnel supervision is required at approved locations. Chimes may be installed in lieu of audible notification appliances.
4. Automatic fire detectors are not required in sprinklered areas less than 24 s.f.

Patient room system smoke detectors. Actuation of patient room system detectors shall cause a visual display on the corridor side of the room in which the detector is located and shall cause an audible and visual alarm at the respective nurses' station. Actuation of patient room smoke detectors shall not activate the building visual and audible fire alarm appliances.

907.2.6.1 Group I-2 Corridors in nursing homes (both intermediate care and skilled nursing facilities), detoxificaton facilities and spaces open to the corridors shall be equipped with an automatic fire detection system.

Exception: Group I-2 occupancies with more than five, but less than ten occupants may be provided throughout with 120vac single- or multiple-station residential smoke detectors with battery back-up, wired to an un-switched source. A manual fire alarm system is not required.

907.2.6.2 Group I-3 occupancies shall be equipped with a manual fire alarm and automatic detection system installed for alerting staff.

907.2.6.2.1 System initiation. Actuation of an automatic fire-extinguishing system, a manual fire alarm box or a fire detector shall initiate an approved fire alarm signal that automatically notifies staff. Pre-signal systems shall not be used.

907.2.6.2.2 Manual fire alarm boxes. Manual fire alarm boxes need not be located in accordance with Section 907.3.1.1.1 when they are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted. Manual fire alarm boxes are allowed to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

907.2.6.2.3 Smoke detectors. An approved automatic smoke-detection system shall be installed throughout residential housing areas, including sleeping areas and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Exceptions:

1. Other approved smoke-detection arrangements providing equivalent protection, including, but not limited to, placing detectors in exhaust ducts from cells or behind protective guards listed for the purpose, are allowed when necessary to prevent damage or tampering.
2. Sleeping units in Use Condition 2 and 3.
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an approved automatic sprinkler system.

907.2.6.2.4 Zoning and annunciation. Alarm, supervisory and trouble signals shall be annunciated at the annunciation panel and respective signals to be transmitted to the central station. Such signals shall indicate the zone of origin. Separate zones shall be provided for individual fire protection systems, buildings, building levels, cell complexes and sections of floors compartmented by smoke-stop partitions.

907.2.6.2.5 Monitoring. The fire alarm system shall be monitored by an approved central, proprietary or remote station service or by transmission of a local alarm which will give audible and visual signals at an approved constantly attended location.

907.2.7 Group M. A manual fire alarms system shall be installed in Group M occupancies other than covered mall buildings complying with IBC Section 402, having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge. Notification appliances shall be installed throughout the building.

Exception: Manual fire alarm boxes are not required if the building is equipped throughout with an automatic sprinkler system and the alarm notification appliances will activate upon sprinkler flow.

907.2.7.1 Occupant notification. During times that the building is occupied, in lieu of the automatic activation of alarm notification appliances, the manual fire alarm system shall be allowed to activate an alarm signal at a constantly attended location from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with 907.2.12.3. The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided the manual fire alarm takes precedence over any other use. The emergency/voice alarm communication system shall be accessible to the fire department.

907.2.8 Group R-1. A manual fire alarm and automatic detection system shall be installed in Group R-1 Occupancies as required in sections 907.2.8.1 through 907.8.4. Also see Section 907.2.12 for additional requirements.

907.2.8.1 Manual Fire Alarm Systems. A manual fire alarm system shall be installed in Group R-1 Occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not over two stories when all individual guest rooms and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one-hour fire partitions and each individual guestroom has an exit directly to a public way, exit court or yard.
2. A manual fire alarm system is not required in buildings fully protected by an approved, monitored automatic fire sprinkler system having notification appliances, located throughout, activated upon water flow. At least one manual fire alarm box shall be provided at an approved location(s).

907.2.8.2 Automatic fire alarm system. An automatic fire alarm system shall be provided in all common areas and interior corridors serving as a required means of egress for ten or more occupants.

907.2.8.3 Smoke alarms. Smoke alarms shall be provided as required in Section 907.2.10. Such devices shall not be connected to the fire alarm system unless for supervision only.

907.2.8.4 Visible notification appliances. Guestrooms for persons with hearing impairments shall be provided with visible notification appliances activated by the in-room smoke detector. Additional visible notification appliances shall be provided which shall be activated by the building fire alarm system. Common or separate appliances for this purpose are permitted.

907.2.9 Group R-2. A monitored manual fire alarm system shall be provided in Group R-2 Occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge.
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit or;
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions: Applicable to items 1, 2 and 3 above:

1. A manual fire alarm system is not required in buildings not over two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least one-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. A manual fire alarm system is not required in buildings fully protected by an approved, monitored automatic fire sprinkler system installed in accordance with Section 903.1.1 or 903.1.2, having notification appliances, located throughout, activated upon water flow. At least one manual fire alarm box shall be provided at an approved location(s).
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected throughout by an approved automatic sprinkler system installed in accordance with Section 903.1.1 or 903.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with IFC Section 1022.6 Exception 4.

907.2.9.1 Visible notification appliances. Dwelling units and guestrooms for persons with hearing impairments shall be provided with visible notification appliances activated by the in-room smoke detector. Additional visible notification appliances shall be provided which shall be activated by the building fire alarm system. Common or separate appliances for this purpose are permitted.

907.2.10 Single- and multiple-station smoke alarms in occupancy groups R-1, R-2, R-3 and R-4. Listed single- or multiple-station smoke alarms shall be installed in accordance with the provisions of this code and the household fire–warning equipment provisions of NFPA 72.

907.2.10.1 Where required. Single- and multiple-station smoke alarms shall be installed in the locations described in Sections 907.2.10.1.1 through 907.2.10.1.3.

907.2.10.1.1 Group R-1. Single- or multiple- station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas
2. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.

3. In each story within the sleeping unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split-levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.10.1.2 Groups R-2, R-3, R-4. Single- or multiple-station smoke alarms shall be installed and maintained in groups R-2, R-3, R-4, regardless of the occupant load at all the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.
3. In each story within a dwelling unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split-levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.10.1.2.1 Visible notification appliances. Guestrooms for persons with hearing impairments shall be provided with visible notification appliances activated by the in-room smoke detector. Additional visible notification appliances shall be provided which shall be activated by the building fire alarm system. Common or separate appliances for this purpose are permitted.

907.2.10.2 Power source. In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection. Branch circuits for smoke alarms shall be provided with a listed "lock on" device.

Exception: Smoke alarms are not required to be equipped with battery backup in Group R-1 where they are connected to an emergency electrical system.

907.2.10.3 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in Group R-2, R-3 or R-4, or within an individual dwelling unit or sleeping unit in Group R-1, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

907.2.10.4 Acceptance testing. When the installation of the alarm devices is complete, each detector and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the household fire warning equipment provisions of NFPA 72.

907.2.11 Special amusement buildings. An approved automatic smoke detection system shall be provided in special amusement buildings in accordance with this section.

Exception: In areas where ambient conditions will cause a smoke-detection system to alarm, an approved alternative type of automatic detector shall be installed.

907.2.11.1 Alarm. Activation of any single smoke detector, the automatic sprinkler system or any other automatic fire detection device shall immediately sound an alarm at the building and at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.11.2.

907.2.11.2 System response. The activation of two or more smoke detectors, a single smoke detector with alarm verification, the automatic sprinkler system or other approved fire detection device shall automatically:

1. Cause the illumination of the means of egress with light of not less than 1 foot-candle (11 lx) at the walking surface level.
2. Stop any conflicting or confusing sounds and visual distractions; and;
3. Activate an approved directional exit marking that will become apparent in an emergency. Such system response shall also include activation of a prerecorded message, clearly audible throughout the special amusement building, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound which is distinctive from other sounds used during normal operation. The wiring to the auxiliary devices and equipment used to accomplish the above fire safety functions shall be monitored for integrity in accordance with NFPA 72.

907.2.11.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is also allowed to serve as a public address system, shall be installed in accordance with 907.2.12.3. and be audible throughout the entire special amusement building. A Fire Command Center shall be provided. The Fire Command Center shall be a minimum 24sf, of 1-hr rated construction and have a minimum three feet (1m) clearance from the front of the control equipment. The Fire Command Center shall be located in an area approved by the Fire Department.

907.2.12 High-rise buildings. Buildings having floors used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, shall be provided with an automatic fire alarm and detection system, emergency voice/alarm communication system, a fire department communication system and a smoke control system in accordance with Sections 907.2.12.2, 907.2.12.3,907.2.12.4 and 909. A Fire Command Center shall be provided in accordance with 907.2.12.1.

Exception: Buildings identified in IBC Section 403.1 Exception.

907.2.12.1 Fire command center construction. The FCC shall be contained in a room separated from the remainder of the building by 1-hour fire/smoke resistive construction. The room shall be used for no other purpose unless that use is approved by the Fire Department. No piping, ducts or equipment foreign to the required operations shall be permitted to enter, pass through or be installed within the room. The room shall be ventilated and equipped with a smoke detection system and shall be sprinklered with a high temperature head. The FCC shall be located on the ground floor with a door that opens directly into the main lobby at a point in the lobby accessible directly from the exterior. The door to the FCC shall not be located on a dead-end corridor. The room shall be a minimum of 96 square feet (9m2) with a minimum dimension of 8 feet (2438 mm). A layout of the FCC and all features contained therein shall be submitted for approval prior to installation. The FCC shall be provided with an approved emergency power source.

907.2.12.1.1 Equipment. The FCC shall contain the following:

1. The emergency voice/alarm communication system unit.
2. The fire department communications unit.
3. Fire detection and alarm system annunciator unit.
4. Annunciator visually indicating the location of the elevators and whether they are operational (elevator recall and supervisory panel).
5. The fire-fighters' smoke control panel (FSCP) per Section 909.
6. Manual controls for unlocking stairway and refuge area doors simultaneously per section 907.2.15
7. Emergency generator panel per 907.2.12.7.

8. A telephone for fire department use with controlled access to the public telephone system.
9. Fire pump remote status panel per 907.2.12.8
10. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment, fire department access, interior generator and interior utility shut-off locations.
11. Site plan with North arrow, local street intersections, fire hydrants, fire department connection location, building entry points, exterior generator locations and exterior utility shut-off locations.
12. Work table 3'x5'.
13. Public address system, where specifically required by other sections of this code.

907.2.12.2 Automatic fire detection. Smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by *this section* shall operate the emergency voice/alarm communication system and shall place into operation all equipment necessary to prevent the re-circulation of smoke in accordance with Section 909. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room, elevator machine rooms and in all elevator lobbies.
2. In the main return air and exhaust air plenum of each air-handling system having a capacity greater than 2,000 cubic feet per minute (cfm) ($0.94m^3/s$). Such detectors shall be located in a serviceable area downstream of the last duct inlet. Duct type smoke detectors, shall cause a supervisory signal, not an alarm signal at the building annunciator panel. Detectors shall be listed for the air velocity in which they are installed.
3. Smoke detectors shall be installed in the outlet of fans used for pressurization of stairways, hoistways and refuge areas. Activation of these smoke detectors shall cause a supervisory signal, not an alarm signal at the building annunciator panel. Detectors shall be listed for the air velocity in which they are installed.
4. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum on an air-handling system. In Group R-1 and R-2 occupancies a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm ($2.4m_3/s$) and serving not more than 10 air inlet openings. These detectors are not required at return openings located in a corridor that is protected by full corridor or full floor area detection.

5 For Group R-1, R-2 and R-4 Occupancies, in all interior corridors serving as a means of egress for an occupant load of 10 or more.

6. For occupancies other than R-1, R-2 and R-4, not less than one foot but no more than three feet on the occupied side of each door that enters an area of evacuation assistance, elevator lobby and exit stairway which does not directly exit from an area of evacuation assistance.
7. At unenclosed openings extending vertically through floors, detectors shall be provided at each level at the perimeter of the opening, no closer than 4 feet and no further than 8 feet from the edge of the opening. Detectors at the highest level shall be installed to

provide coverage 30 feet beyond the perimeter of the projected opening. (For atriums as defined by this code, see 907.2.13.)

8. Vertical openings for non-required stairwells/escalators in Group B and M occupancies. Smoke detectors shall be installed adjacent to the floor side of each opening where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and a smoke management system is provided in accordance with Section 909.

9. At the top of stairwells and in elevator hoistways. These devices shall initiate an alarm condition and illuminate the respective indicator at the graphic annunciator. They shall not initiate occupant notification nor the smoke control sequence.

907.2.12.3 Emergency voice/alarm communication system. Emergency voice/alarm communications systems shall be connected to a UL 864 listed fire alarm system. Components shall be listed under UL product category code designation UOXX or UUMW. The operation of any manual fire alarm box, automatic fire detector or water-flow device shall automatically sound an alert tone followed by voice instructions giving appropriate information and direction on a general and selective basis to the following terminal areas on the fire floor and the floors immediately above and below the fire floor and the level at which the Fire Command Center (FCC) is located:

1. Elevators (selective activation from the Fire Command Center only)
2. Each floor or level excluding mezzanines
3. Exit stairways (selective activation from the Fire Command Center only),
4. Assembly rooms of 1,000 occupants or more.

Exceptions:

1. In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.
2. In Group A occupancies with an occupant load of 1,000 or more, special amusement buildings only general notification is required.

907.2.12.3.1 Manual override. A manual override for emergency voice communication shall be provided for all paging zones.

907.2.12.3.2 Live voice messages. The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages to all areas indicated in 907.2.12.3.

907.2.12.3.3 System design. Design of this communication system shall be such that the speakers on any one floor shall be connected to an alternate cable system so that damage or loss of any one speaker, cable, amplifier or pre-amplifier will not cause the failure of more than one-half of the communications systems of a given floor or zone. Speakers shall be installed so that each alternate speaker is connected to a different riser. The vertical communications systems cable shall be routed in a minimum of two risers separated by a distance at least 1/3 the diagonal of the floor plate. If the risers cannot meet this separation, one riser shall be installed in a 2-hr rated enclosure separated from the other riser by a distance at least 20% of the diagonal measurement. Communication risers shall be installed in metallic conduit in accordance with the National Electrical Code (NEC).The horizontal communications systems cable shall be routed to provide a minimum separation of four (4) feet.

907.2.12.3.3.1 Each exit stairway and elevator cab shall be provided with a dedicated communication circuit.

907.2.12.3.3.2 In very high noise areas, such as theaters, nightclubs and dance halls, the system shall be designed to reduce or eliminate the background noise upon alarm initiation.

907.2.12.4 Fire department communication system. Communications service shall be as follows:

1. Hardwired components consisting of plug-in phone jacks, permanent handsets, amplifiers and cable system for selective and "all-call' operation. Components shall be listed under UL product category code designation UOXX.

2. Radio communications using the "Department of Safety Radio Communications System" in accordance with 907.2.12.4.2 and Fire Department policy.

907.2.12.4.1 Hardwired systems. An approved two-way, fire department communication system shall be provided for fire department use. It shall operate between the FCC and; elevators, elevator lobbies, emergency and standby power rooms, standpipe hose connection locations, the building engineer's office, mechanical rooms, elevator equipment rooms, fire pump rooms, areas of refuge, entries into required exit stairways and rooms containing the main electrical service disconnecting means. Design of this communication system shall be such that the jacks on any one floor shall be connected to an alternate cable system so that damage or loss of any one jack, cable, amplifier or pre-amplifier will not cause the failure of more than one-half of the communications systems of a given floor or zone. Jacks shall be installed so that each alternate floor is connected to a different riser. The vertical communications systems cable shall be routed in a minimum of two risers separated by a distance at least 1/3 the diagonal of the floor plate. If the risers cannot meet this separation, one riser shall be installed in a 2-hr rated enclosure separated from the other riser by a distance at least 20% of the diagonal measurement. Communication risers shall be installed in metallic conduit in accordance with the National Electrical Code (NEC). The horizontal communications systems cable shall be routed to provide a minimum separation of four (4) feet.

a) Fire Department communication system jacks shall be designed to prevent feedback by being arranged in such a manner that when a handset is plugged in, it will disconnect any voice communication system speaker in the immediate area. Wiring supervision to this speaker is not required to be maintained during this use. A minimum of six spare handsets shall be provided in an approved cabinet located in the FCC.

b) A firefighter's telephone handset shall be permanently mounted in the building engineer's office, each mechanical room with fans used for smoke control, emergency or standby power room, each fire pump room, the rooms containing the main electrical service disconnecting means and each elevator equipment room. Each permanently mounted handset shall initiate a signal from the handset to the FCC.

c) Each circuit on the two-way fire department communication system shall have a separate control switch on the fire alarm control panel.

907.2.12.4.2 Radio systems. It is the responsibility of the building owner to ensure that the public safety radio communications system functions within all areas of the facility including enclosed parking garages. Those areas that shield radio communications shall be remedied through the use of currently acceptable technology, i.e. bi-directional amplifiers with radiating ("leaky coax") cable or a discrete distributed antenna system. Areas that typically need to be evaluated for poor communications are; below grade rooms, parking garages, elevators and areas surrounded by metal and/or concrete.

a) Radio communications systems shall operate on the frequencies designated by the Fire Department and designed such that in addition to all areas of the facility described in section 907.2.12.3, stair enclosures, penthouses, basements and enclosed parking structures shall also be transparent to communication signals. Those areas that attenuate the available signal below an acceptable level shall be remedied by providing a radio repeater system. Coverage shall be

overlapping such that loss of any one amplifier or cable shall not result in complete loss of communication to any floor or zone. Amplifiers shall be powered by a dedicated uninterruptible power source (UPS) with a minimum backup time of eight (8) hours with all amplifiers at rated output. The UPS input circuit shall be a dedicated circuit and connected to the emergency/standby generator, where provided. The circuit shall be provided with a listed "lock on" device.

b) Acceptance of the completed communication system shall be based upon an on-site survey performed by fire department technical personnel. System integrity shall be maintained through implementation of a "Radio Frequency Control Plan" as described in Fire Department policy. System tests witnessed by a fire department representative shall be conducted. Documentation of test results shall be maintained on-site with a copy provided to the Fire Prevention and Investigation Division.

c) A firefighter's telephone handset shall be permanently mounted in the building engineer's office, each mechanical room with fans used for smoke control, emergency or standby power room, each fire pump room, the rooms containing the main electrical service disconnecting means and each elevator equipment room. Each permanently mounted handset shall initiate a signal from the handset to the FCC.

907.2.12.5 Annunciation. Point-lit graphic annunciation shall be provided in accordance with 907.4.8.5.

907.2.12.6 Elevator Recall and Shunt trip. All elevators shall be provided with Phase I and Phase II emergency recall per ANSI/ASME A17.1 and IBCA Section 3007. Smoke detectors located in elevator lobbies, hoistways and machine rooms shall return to the primary level, nonstop, all elevators served by that alarm zone, except for the smoke detector in the elevator lobby at the primary level which shall return the elevators to an alternate level. Both the primary and alternate levels shall be approved by the Fire Department. Elevators without a landing at grade level shall be returned to the landing that is closest to grade level or other approved level. Elevators shall remain at the level where they returned until being manually overridden by the operator key switch required by ANSI/ASME 17.1 or the elevator control panel in the FCC.

907.2.12.6.1 Elevator Status/Control panel.

1. Identify each elevator cab numerically and the floors it serves. Identify corresponding cab number in elevator cab at permanent handset.
2. Indication of which elevator(s) are on emergency power.
3. Placard at elevator status/control panel stating how many elevators can operate under emergency power simultaneously.
4. Elevator car position indicator.
5. Key switches as required for selective activation of cars, if all are not provided with emergency power for simultaneous operation.

907.2.12.7 Emergency Generator Panel

1. Operating status (on-off) and malfunction indication panel as required by NFPA 110.
2. Indication of transfer switch position (normal-emergency)
3. Indication that generator is in automatic mode
4. Main fuel oil storage tank fuel level gauge
5. If pumping is required from a main fuel tank to a diesel engine a duplex pumping system shall be provided. Emergency fuel flow controls are required in the FCC.

6. Fuel tanks shall be located at or below grade level. See Fire Code.

907.2.12.8 Fire Pump Panel

1. Remote operating status indication panel as required by NFPA 20.
2. Motor/engine running/on or off. Pump running indication shall be transmitted to the fire alarm control panel as a supervisory signal and distinctly annunciated.
3. If pumping is required from main fuel tank to diesel fire pump, a duplex pumping system shall be provided. Emergency fuel flow controls are required in Operations Center.
4. Fuel level indicator for fire pump fuel tank.
5. Fuel tanks shall be located at or below grade level. See Fire Code.

907.2.13 Atriums connecting more than two stories. A fire detection system shall be installed in occupancies with an atrium that connects more than two stories. The system shall be activated in accordance with this section. All smoke detectors shall be accessible for maintenance and testing.

1. Area type smoke detectors, spaced in accordance with NFPA 72, shall be installed at the atrium ceiling where the ceiling is 30 feet or less from the floor of the atrium. If the ceiling is greater than 30 feet from the atrium floor, beam type detectors shall be installed. A detection system with alarm verification may be installed. The initial device in alarm shall initiate a supervisory condition at the fire alarm panel.
2. On the underside of projections into the atrium, spaced in accordance with NFPA 72.
3. Around the perimeter of the atrium opening on all floors open to the atrium. The detectors shall be spaced not more than 30 feet (9144mm) on center and shall be located within 15 feet (4572mm) of the atrium opening.
4. In high-rise buildings, where any part of the floor is open to an atrium, smoke detectors shall be located throughout the floor not included in the atrium area for every 2500sf of occupied floor space. No smoke detector shall serve more than one smoke zone.

907.2.14 High-piled combustible storage uses. Where required by Chapter 23 of the fire code, high-piled combustible storage areas shall be provided with an automatic fire-detection system.

907.2.15 Special egress-control devices. When special egress-control devices are installed on exit doors, an automatic smoke-detection system shall be installed throughout the area in which the devices are located. Activation of any building alarm shall automatically unlock doors in accordance with IBCA Appendix L. A manual means of unlocking doors shall also be provided at an approved location.

907.2.16 Aerosol storage uses. When required by Chapter 28 of the Fire Code, aerosol storage rooms and general-purpose warehouses containing aerosols shall be provided with an approved manual fire alarm system.

907.2.17 Lumber, plywood and veneer mills. Lumber, plywood and veneer mills shall be provided with a manual fire alarm system.

907.2.18 Underground buildings with smoke exhaust system. Where a smoke exhaust system is installed in an underground building in accordance with this code, automatic fire detectors shall be provided in accordance with this section.

907.2.18.1 Smoke detectors. A minimum of one smoke detector listed for the intended purpose shall be installed in the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.

2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m3/s) and serving not more than 10 air inlet openings.

907.2.18.2 Alarm required. Activation of the smoke exhaust system shall activate an audible alarm at a constantly attended location where provided, or a local alarm to notify occupants.

907.2.18.3 Annunciation. Point-lit graphic annunciation shall be provided per 907.4.8.5.

907.2.19 Underground buildings. Where the lowest level of a structure is more than 60 feet (18 288 mm) below the lowest level of exit discharge, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.2.12.3.

907.2.19.1 Public address system. Where a fire alarm system is not required by Section 907.2, a public address system shall be provided that shall be capable of transmitting voice communications to the highest level of exit discharge serving the underground portions of the structure and all levels below.

907.2.20 Covered mall buildings. Covered mall buildings exceeding 50,000 square feet (4645 m^2) in total floor area shall be provided with a Fire Command Center. An emergency voice/alarm communication system per section 907.2.12.3 shall be provided. A smoke control system shall be provided per Section 909. The Fire Command Center shall be a minimum of 24sf, of 1-hr rated construction and have a minimum three feet (1m) clearance from the front of the control equipment**.** The Fire Command Center shall be located in an area approved by the Fire Department.

907.2.20.1 Annunciation. Zone-lit or point-lit graphic annunciation shall be provided per 907.4.8.4 or 907.4.8.5.

907.2.21 Residential aircraft hangars. A minimum of one listed smoke alarm shall be installed within a residential aircraft hangar as defined in Section 412.3.1 and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm that will be audible in all sleeping areas of the dwelling.

907.2.22 Airport traffic control towers. An automatic fire detection system shall be provided in airport traffic control towers. See Section 430.5.5.

907.2.23 Battery rooms. An approved automatic smoke detection system shall be installed in areas containing stationary and valve –regulated lead-acid battery systems having a liquid capacity of more than 50 gallons (189.3L). The detection system shall be monitored by an approved central, proprietary or remote station service where a fire alarm system is provided. In buildings without a fire alarm system, a local alarm shall sound an audible and visual signal at a constantly attended location or immediately outside the battery room. See also Sections 608 and 609 of the Fire Code.

907.2.24 Smoke-control systems. An approved automatic smoke-detection system shall be provided when required by Section 909 for activation of the smoke-control system.

907.2.25 Passenger terminal and concourse buildings. See Section 430.8.5.

907.3 RESERVED

907.4 General system design and installation requirements. Fire alarm systems, automatic fire detectors, emergency voice/alarm communication systems and notification devices shall be designed, installed and

maintained in accordance with NFPA 72. Installation system wiring shall also be in accordance with NFPA 70 (NEC).

907.4.1 Equipment. System assemblies and components shall be listed and approved for the purpose for which they are intended. All components shall be compatible with the system in which installed.

907.4.1.1 Manual fire alarm boxes. Manual fire alarm boxes shall be installed in accordance with Sections 907.4.1.1.1 through 907.4.1.1.5.

907.4.1.1.1 Location. Manual fire alarm boxes shall be located not more than 5 feet (1524mm) from the entrance to each exit. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet (60 960mm).

907.4.1.1.2 Height. The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067mm) and a maximum of 48 inches (1219mm), measured vertically, from the floor level to the activating handle or lever of the box.

907.4.1.1.3 Color. Manual fire alarm boxes shall be red in color.

907.4.1.1.4 Signs. Where fire alarm systems are not monitored by a supervising station, an approved permanent sign that reads: LOCAL ALARM ONLY, PULL AND CALL 911 shall be installed adjacent to each manual fire alarm box. Where additional digits are required to access the public telephone system, signage shall reflect the additional digits required.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

907.4.1.1.5 Protective covers. The building official or fire department is authorized to require the installation of listed manual fire alarm box protective covers to prevent malicious false alarms or provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal shall not be installed unless approved by the fire department.

907.4.1.2 Control units, annunciator panels and access keys. All fire alarm control panel and annunciators shall be approved by the fire department. Locations are subject to field approval. *A*ccess keys to locked fire alarm equipment shall be maintained in an approved location. Fire alarm system reset and silence functions of the fire alarm control unit shall not be restricted by the need for a key or special numeric code to access these functions. Access to the reset and silence operator interface shall be secured behind a locked door. 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 a fire watch.

Exception: In existing buildings undergoing a panel replacement, remote annunciators with silence and reset functions may be provided when approved by the Department. These units shall not be equipped with “enable/disable” switches and shall be contained behind a transparent, lockable cover.

907.4.1.2.1 Power supply. The fire alarm control panel shall be fed from a dedicated 120v ac branch circuit. The branch circuit overcurrent protection shall be equipped with a “lock-on” device. The primary and secondary power supplies for the fire alarm system shall be provided in accordance with NFPA 72.

907.4.1.3 Wiring. Fire alarm system and communications wiring shall comply with provisions of NFPA 72 and NFPA 70 (NEC) Article 760 requirements for fire alarm and communications systems. Wiring color code shall be consistent throughout the entire system and permanently posted inside the fire alarm control panel. Separate colors shall be used for each type of initiating circuit, indicating circuit and control circuit. Color-coding shall be by continuous colored insulation or by application of 6-inch long colored heat-shrink tubing at the end of each conductor at all splices, taps and terminations.

907.4.1.4 Activation. Where an alarm notification system is required by another section of this code, it shall be activated by:

1. The automatic fire detection system.
2. Sprinkler water flow devices.
3. Manual fire alarm boxes.

Exceptions:

1. Single-station detectors in dwelling units, rooms used for sleeping purposes in hotel and lodging houses, and patient sleeping rooms in hospitals and nursing homes.
2. Duct detectors shall initiate a supervisory signal only. See 907.11.
3. Occupant notification is not required upon activation of detectors at the top of stairwells and in elevator hoistways.

907.4.2 Alarm notification. Audible and visual alarm notification shall be provided to alert occupants of the area having a fire alarm system as well as in the means of egress serving the occupancy. The fire alarm control panel shall incorporate an audible-alarm silencing switch that shall not cancel the visual alarm until the system is manually reset. Alarms shall be provided per 907.4.2.1 and 907.4.2.2, and as required by other sections of this code.

907.4.2.1 Audible alarms. Fire alarm notification appliances shall sound a distinctive sound that is not to be used for any other purpose. The audible signal shall be the standard fire alarm evacuation signal as described in ANSI S3.41. Audible alarm signals shall be audible above the ambient sound conditions in accordance with NFPA 72. The audible alarm shall provide a sound pressure level of 15decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupied space within the building. The minimum sound pressure levels shall be: 70 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms and 60 dBA in other occupancies. The maximum sound pressure level for audible alarm notification appliances shall be 120 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 105 dBA, visual alarm notification appliances shall be provided in accordance with NFPA 72.

In theaters, nightclubs, dance halls and similar areas, means shall be provided to reduce or eliminate background noise upon activation of the fire alarm system. The fire alarm system shall produce a sound level at least 15dBA above the reduced average ambient sound level or 5dBA above the maximum sound level having a duration of at least 60 seconds whichever is greater. The reduced sound level shall not require audible notification to exceed 115dBA.

Exception: This audible notification is not required for systems using prerecorded or live voice message announcement.

907.4.2.2 Visual alarms. Visible notification shall be provided in toilet rooms accessible to the handicapped, in corridors, public and common areas and in areas of assembly. Visual alarms shall be installed in accordance with NFPA 72.

Exceptions:

1. Visual alarm signals in patient and inmate areas of Group I Occupancy may be provided per 907.2.6.
2. Visual notification appliances shall not be installed in stairwells
3. In existing buildings with only audible alarms, visual alarms are not required to be added during the course of any tenant finish or fire alarm system modification work. If a building owner desires to install visual alarms, the number and location shall be at the owner's discretion. A separate circuit between the fire alarm control panel and the visual appliances is not required. This exception does not apply if the building is undergoing a change in use or visual alarms are required to correct an exiting deficiency as described in Section 10.

907.4.2.3 Presignal systems shall not be installed.

Exception: Group I occupancies per 907.2.6 Exception 3.

907.4.3 Monitoring Integrity. Conductors and connections which interconnect equipment, devices and appliances, shall be monitored for integrity, as set forth in NFPA 72 .

907.4.4 Survivability. Fire alarm system survivability shall be provided in accordance with NFPA 72.

Exception: Notification appliance circuits shall not be run in stairwells except for the specific devices located in the stair enclosure.

907.4.5 Automatic telephone dialing devices. Automatic telephone dialing devices used for the transmission an emergency alarm from a protected premises or central station shall not be connected to any fire department telephone number.

907.4.6 Remote indicating lights. A remote indicating light shall be installed for detector(s) within each room with an entry door. The indicating light shall be located above the door, on the exit corridor side. This shall include each door leading through adjoining or intervening rooms from an exit corridor to that room (progressive type). Remote indicating lights shall be installed on the ceiling directly below detectors located above ceilings. Remote indicating lights for duct detectors shall be installed in an accessible area directly below or adjacent to the detector. Remote indicating lights shall remain lit until the fire alarm system is reset. Remote indicating lights may be deleted where a point-lit graphic annunciator is provided.

907.4.7 Annunciator panels. Annunciator panels shall be; point-lit graphic, zone-lit graphic or a directory point display type. Upon initiation of an alarm, supervisory or trouble condition the panel shall record the status and "lock-in" until the fire alarm system is reset with a dedicated reset switch located at the main fire alarm control panel. Annunciation lights shall be Red for Alarm and Yellow for Trouble and Supervisory Signals. Each signal type shall be distinctly identified.

907.4.7.1 Annunciation. All fire alarm systems shall be divided into alarm zones. When two or more alarm zones are provided, visible annunciation shall be provided at an approved location. Alarm zones shall comply with 907.4.7.2 unless otherwise approved by the fire department. Annunciator panels shall comply with 907.4.7.

907.4.7.2 Annunciation zones. Each building level shall be annunciated separately as follows:

1. All manual devices.
2. All automatic devices. No single zone shall exceed 22,500 square feet. No detection zone shall exceed 300 feet in length in any direction.
3. Where standpipes are required per IBC section 905, at each fire sprinkler water flow detection device. Sprinkler zones shall comply with NFPA 13.
4. Separate visual indication shall be provided for:

5. Main fire sprinkler flow.
6. Each special extinguishing system.
7. Each non-required system.
8. Each special detection system.
9. Each stairway (where detection is provided).
10. Each elevator hoistway.
11. System trouble.
12. Sprinkler control valves (supervisory only). Maximum 20 devices per zone.
13. Duct detectors (supervisory only). Maximum 20 devices per zone.

907.4.7.3 Directory annunciator. A directory annunciator shall be provided as required. Location shall be field approved. The annunciator shall be provided with individual alarm and trouble indications per 907.4.7.2 for each zone. Indicators shall be of sufficient size and intensity to be visible in normal lighting. Building plans shall be permanently mounted adjacent to directory type annunciator panels. Plans shall be of durable construction, easily readable in normal lighting, have a smooth plastic surface and shall clearly indicate the building outline and boundary of each zone and have a "you are here" with North orientation arrow. The plans shall clearly indicate the building address, stairwells, elevator shafts, emergency generator and other alternate power source location(s), fuel tank locations, fire pump location, fire sprinkler valves, standpipe hose outlets, electrical service equipment, and each initiating device. One plan may be used for typical levels. Plans shall also include; adjacent street intersections, local fire hydrant locations, utility shut-offs for; gas and water supply and the location of the fire department connection. Each zone on the annunciator shall be permanently labeled to indicate the location and to identify the type of initiating device.

907.4.7.4 Zone-lit graphic annunciator. Upon approval by the fire department, a zone-lit graphic annunciator may be provided in lieu of the directory annunciator. The annunciator shall incorporate a building plan including all the features of the plans required in 907.4.7.3, with the addition of relevant indicating lights located within the appropriate zone representing the initiating devices within that zone. The annunciator shall be provided with a momentary push-button "Lamp Test". Zoning shall comply with 907.4.7.2. Location shall be field approved.

907.4.7.5 Point-lit graphic annunciator. A graphic annunciator shall be provided as required. Location shall be field approved. The annunciator shall consist of building plans per 907.4.7.3 with the addition of discrete indication for each alarm initiating device. The annunciator shall be provided with a momentary push-button "Lamp Test". Separate indications for "Trouble" and "Supervisory" conditions shall be provided.

907.4.7.5.1 Where required. A point-lit graphic annunciator is required in high-rise buildings, buildings with an atrium and underground buildings with a smoke exhaust system.

907.4.8 Systems Status. When required by the fire department, fire alarm supervisory and trouble signals shall be reported to an approved central, proprietary or remote supervising station or at the protected premise at a constantly attended location in accordance with the requirements of NFPA 72.

907.5 Acceptance test. Upon completion of the installation, a witnessed test of the entire system shall be made in the presence of fire department personnel. All functions of the system shall be tested. Testing shall be accomplished in accordance with NFPA 72.

907.6 Record of completion. A record of completion in accordance with NFPA 72 verifying that the system has been installed in accordance with the approved plans and specifications shall be provided to the owner and the Denver Fire Prevention and Investigation Division.

907.7 Instructions. Operating, testing and maintenance instructions and record drawings ("as builts") and equipment specifications shall be provided and maintained at the building engineer's or managers's office, fire command center or other approved location.

907.8 Inspection, testing and maintenance. The maintenance and testing schedules and procedures for fire alarm and detection systems shall be in accordance with NFPA 72. Records of inspections, tests and maintenance shall be provided to Denver Fire Prevention and Investigation Division. Report format shall be approved by the Fire Prevention and Investigation Division.

907.9 Non-required full or partial systems. Only approved fire alarm control panels are allowed. 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 or Class II central station. Multiple central station connections from one building are not permitted. Non-required full or partial fire alarm or fire detection systems are required to comply with NFPA 72. Annunciation shall be provided in accordance with Section 907.4.8. Annunciator and control panels for non-required or partial systems shall have permanent signage indicating "Non-required System" or "Partial System". Partial fire alarm and/or fire detection systems installed in a building having a required fire alarm system shall be annunciated separately on the building fire alarm annunciator panel.

907.9.1 General system design and installation requirements. Shop drawings must be submitted for approval. Documents shall be stamped and signed by a Colorado registered engineer, unless the building is one story, without basements and less than 5,000sf. The following minimum criteria apply:

1. Provide one audible/visual alarm per floor.
2. Strobes need not remain flashing when audibles are silenced.
3. Provide one initiating device zone per floor.
4. Manual pull stations are optional.
5. Remote indicating lights are optional.
6. Duct detectors in existing HVAC systems are not required to be connected to the fire alarm system. Additional duct detectors will not be required.
7. Battery backup will be required for the FACP. Electrical connection shall be to a dedicated circuit.
8. Partial or non-required systems shall be maintained operational or shall be removed. System removal shall be approved by the Fire Department.
9. Non-required systems installed in adjacent tenant spaces are not required to be interconnected.
10. Non-required systems installed in a building with a required fire alarm system shall have the non-required system connected to the required fire alarm control panel. Each non-required system shall annunciate as a separate zone at the required fire alarm control panel. Multiple fire alarm control panels are not allowed where a required system is installed.

907.10 Fire safety functions are intended to increase the level of life-safety for occupants or to control the spread of the harmful effects of fire. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control panel where a fire alarm system is

required by Section 907.2. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or a visible and audible supervisory signal at a constantly attended location where provided. In buildings not required to be equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

907.11 Elevator Recall and Shutdown. Elevator recall and shunt trip shall be provided for all elevators in accordance with ANSI/ASME A17.1. Detectors shall be located in accordance with NFPA 72. In buildings with a fire alarm system, these detectors shall be connected to the building fire alarm system. In buildings without a fire alarm system, system smoke detectors and a dedicated fire alarm system control unit shall be provided that is designated as an "elevator recall control and supervisory panel". The system shall be designed and installed in accordance with NFPA 72 and ANSI/ASME A17.1

Exception: Elevators in high-rise buildings shall comply with 907.2.12.6.

907.12 Duct smoke detectors. Duct smoke detectors shall be connected to the building's fire alarm control panel when a fire alarm system is provided and when activated shall initiate supervisory signal to the monitoring station. Duct smoke detectors shall not be used as a substitute for required open-area detection. Spot-type smoke detectors may be used for return air system connection to vertical risers serving two or more stories per NFPA 72. Detectors shall be listed for the maximum anticipated airflow velocity. Detectors concealed above the ceiling shall be provided with a remote indicating light mounted on the ceiling directly below the device.

Exception: In occupancies not required to be equipped with a fire alarm system, actuation of a duct smoke detector shall activate a visible and audible signal at an approved location. Duct smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

907.13 Access. Access shall be provided to each detector for periodic inspection, testing and maintenance.

907.14 Fire-extinguishing systems. Automatic fire-extinguishing systems shall be connected to the building fire alarm system where a fire alarm system is required by another section of this code or is otherwise installed.

SECTION 909 - SMOKE CONTROL

Delete Section 909 Smoke Control Systems in its entierty and replace with the following:

909.1 Scope and Purpose. This design method of smoke control has been developed over 20 years within the City of Denver and uses the rational approach for the design, installation and performance verification of smoke control systems and applies to mechanical smoke control systems. The purpose of this Section is to establish minimum requirements for the design and installation of smoke control systems which are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of content or for assistance in fire suppression or overhaul activities. Nothing within these requirements is intended to apply when smoke control is not otherwise required by this Code. Smoke control systems are not a substitute for sprinkler protection.

909.2. Where required. Smoke control systems are required for high-rise buildings, airport buildings, covered malls including anchor buildings, atriums, any other special occupancy and large assembly area as determined by the Building and Fire Departments.

909.3 General design requirements. Smoke control systems shall comply with the requirements of this section.

909.3.1 Minimum pressure difference. The minimum pressure difference across a smoke barrier shall be 0.05-inch water gauge (0.0124 kPa).

909.3.2 Maximum pressure difference. The maximum pressure difference across a smoke barrier shall be determined by the required door-opening or door-closing forces.

909.3.3 Activation. Smoke control systems shall be automatically activated by automatic detection devices, water flow, manual pull station and manual operation from the Fire Command Center (FCC). Activation by any alarm initiating device shall be as described herein.

909.3.4 Detection and control systems. Smoke control systems shall be controlled by a U.L. 864 listed fire alarm system meeting the requirements of NFPA 72. The fire alarm system shall also be listed for smoke control use under UL product category guide designation UUKL. Upon an alarm, the fire alarm system shall take direct control of all smoke control components such as fans, dampers, pressure control and status indication from any temperature control or building automation systems. Hard-wired interlock is acceptable. The fire alarm system shall provide automatic and manual override control and status. Terminal air distribution units may remain under their own normal building automation control. Safety devices for protection against injury and equipment damage shall not be overridden during smoke control operation or from the FCC (e.g. excessive fan vibration, high fan discharge and suction pressure and power supply overloads. Freezestats shall be overridden to allow for 100% outside air supply to system. For manual system operation see Section 909.16.2.

909.3.5 System response time. Smoke control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. The total response time for individual smoke control systems to achieve their desired operating mode shall not exceed the following time periods:

Fan operating at desired state – 75seconds.

Damper position travel – 60seconds.

909.3.6 Smoke barrier. Smoke barrier construction and opening protection shall comply with IBC Section 709.

909.3.7 Emergency Power. Equipment and controls necessary for proper operation of a smoke control system required by this code shall be provided with an approved emergency power source.

909.4 Smoke Control Systems for Atriums. Buildings with atriums shall be provided with a smoke control system as specified by this Section. The atrium volume shall include all spaces not separated from the atrium by the provisions of IBC Section 404.5.

909.4.1 Design Criteria. A mechanically operated air-handling system shall be installed that will exhaust smoke either entering or developed within the atrium. The smoke control system may be dedicated to the atrium or integrated with other air-handling systems. Outside air intakes shall be less than 50 feet above grade.

Exception: In atriums with lowest floor level greater than 50 feet above grade, the outside air intakes may be within 10 feet of this *floor*

909.4.1.2 Exhaust openings shall be located in the ceiling or in a smoke trap area immediately adjacent to the ceiling of the atrium. The lowest level of the exhaust openings shall be above the top of the highest portion of the door openings into the atrium.

909.4.1.3 Mechanically operated pressurization and exhaust systems shall be provided in new atriums constructed in existing buildings as approved by the Building and Fire Departments.

909.4.2 Atriums within high rise buildings shall comply with both the requirements for the atrium and for the high rise portion of this Code.

909.4.2.1 Floors partially open to the atrium in high-rise buildings. Activation of a smoke detector located in the area separated from the atrium shall initiate floor exhaust, general building pressurization and pressurization of stairways and hoistways.

909.4.3 Atriums 55 feet or less in height with a volume of 600,000 cubic feet or less. The system shall exhaust a minimum of 6 air changes per hour. Gravity supply or fan powered supply shall be provided within 10 feet of the lowest level of the atrium and be sized for 75% of the exhaust. A maximum velocity of 800 feet per minute shall be maintained across the net free area of the supply air openings.

909.4.4 Atriums 55 feet or less in height with a volume in excess of 600,000 cubic feet. The system shall exhaust a minimum of four air changes per hour. Gravity supply or fan powered supply shall be provided within 10 feet of the lowest level of the atrium and be sized for 75% of the exhaust. A maximum velocity of 800 feet per minute shall be maintained across the net free area of the supply air openings

909.4.5 Atriums in excess of 55 feet in height. The system shall exhaust a minimum of four air changes per hour. A minimum of 50% of the volume of supply air shall be sized and introduced via gravity supply or fan powered inlets within 10 feet of the lowest level of the atrium. The total volume of supply air shall be 75% of the required volume of exhaust air.

909.4.6 Activation. Activation of two smoke detectors in the atrium shall initiate the atrium exhaust sequence. In high-rise buildings; spaces separated from the atrium, elevator hoistways, elevator lobbies/corridors and stairways shall be pressurized.

909.5 Smoke control systems for high rise buildings. High-rise buildings shall be provided with a mechanical smoke control system in accordance with this section.

909.5.1 Door opening force. Stairwell and refuge area door opening force shall not exceed 30 pounds applied horizontally at the latch side of the door on the door-opening device under any operating condition.

909.5.2 Stairway pressurization. All interior enclosed exit stairways shall be mechanically pressurized with outside air, upon activation of a manual or automatic alarm-initiating device or fire sprinkler water flow. A minimum positive pressure of 0.05" w.c. across any closed stairway door with general building pressurization systems off and all stairway doors closed shall be maintained. Each interior enclosed exit stairway shall have a separate dedicated pressurization system. Supply air for the stairway shall be obtained from outside air intakes mounted so that they will not be contaminated by products of combustion, with a minimum of 50% of the air drawn from intakes located not more than 50 feet above grade. Stairway pressurization systems shall not have fire or smoke dampers. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the FCC graphic panel and illuminate a yellow lamp adjacent to the fan status indicator on the firefighters smoke control panel. The capability to manually override the operation of each fan shall be provided to Fire Department personnel in the FCC. Fans shall not shut off until manually overridden by Fire Department personnel or until the fire alarm system is reset. Each pressurization system from the outside air intake to the stairway enclosure penetration shall be enclosed in a 2-hour fire-resistive enclosure when within the confines of the building. The air volume introduced into the stairway shall be as follows: 15 floors or less, at least 1,000 cfm per floor; 16 floors or more, at least 15,000 cfm, plus 200 cfm per floor level in excess of 15 floors with 1" w.c. static pressure minimum at duct penetration into the stairway. Static pressure control and variable frequency drive shall be provided for fan speed control.

909.5.3 Elevator hoistway pressurization. Elevator hoistways shall be mechanically pressurized with outside air, upon activation of any manual or automatic alarm-initiating device or fire sprinkler water flow. A minimum positive pressure of 0.05" w.c. across any closed elevator hoistway door measured with general building pressurization systems off, and all transfer air openings from the elevator hoistway to the elevator lobby/refuge area closed during testing, must be maintained. Each elevator hoistway shall have a separate

dedicated pressurization system. The supply air for each hoistway shall be obtained from outside air intakes mounted so they will not be contaminated by products of combustion, with a minimum of 50% of the air drawn from intakes located not more than 50 feet above grade. Elevator hoistway pressurization system supply air ductwork shall not have fire or smoke dampers. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the FCC graphic panel and illuminate a yellow lamp adjacent to the fan status indicator on the firefighters smoke control panel. Fans shall not shut off until manually overridden by Fire Department personnel or until the fire alarm system is reset. Each pressurization system from outside air intake to the hoistway penetration shall be enclosed in a 2-hour fire-resistive enclosure when within the confines of the building. Elevator hoistway pressurization systems shall be sized for a minimum of 15,000 CFM per bank (shaft) of elevators, plus 300 CFM per door opening per floor, with 1" w.c. static pressure minimum at duct penetration into hoistway. Static pressure control or variable frequency drive shall be provided for fan speed control.

909.5.3.1 Smoke venting of pressurized elevator hoistways to the exterior of the building shall not be required. If provided, vent operation shall comply with Section 3004.1.1.

909.5.3.2 Hoistway pressurization shall not interfere with the opening and closing of elevator doors.

909.5.4 Elevator machine rooms. Elevator machine rooms shall not be pressurized from outside but rather indirectly from the elevator hoistway pressurization system through the cable slots.

909.5.5 Elevator lobbies/Refuge areas pressurization. Elevators on all floors shall open into elevator lobbies as required by the IBC. Elevator lobbies shall be designated as Refuge Areas per IBC. Pressurization of elevator lobbies/refuge areas shall be provided by either of the following methods.

1. Supply air for elevator lobbies/refuge areas shall be obtained from outside air intakes mounted so that they will not be contaminated by products of combustion, with a minimum of 50% of the air drawn from intakes located not more than 50 feet above grade. Elevator lobby/refuge area supply air ductwork for pressurization systems shall not have fire or smoke dampers. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the FCC graphic panel and illuminate a yellow lamp adjacent to the fan status indicator on the firefighters smoke control panel. Fan shall not shut off until manually overridden by Fire Department personnel or fire alarm system is reset. Each pressurization system from outside air intake to the riser or shaft penetration shall be enclosed in a 2-hour fire-resistive enclosure.
2. Elevator lobby/refuge areas may be pressurized using the elevator hoistway pressurization system by transferring air to the elevator lobby/refuge area with the use of transfer openings. Penetration of the elevator shaft wall shall be protected with fire/smoke dampers listed under UL Standards 555 and 555S. Upon opening of the transfer air openings from the elevator hoistway to the elevator lobby/refuge area, the elevator hoistway shall not be required to maintain 0.05 inch of water column (w.c.) positive pressure differential relative to adjacent elevator lobby/corridor/refuge area.

909.5.6 Pressurization of elevator lobbies/Refuge areas for Group A, B, E and M Occupancies. All elevator lobbies/refuge areas shall be pressurized, upon activation of any manual or automatic alarm-initiating device or floor sprinkler water flow, to maintain a minimum positive pressure of 0.05 inch of water column (w.c.) with respect to adjacent occupied spaces. Measurements shall be taken with elevator doors closed, stairway, hoistway and elevator lobby/refuge area pressurization systems in operation and general building pressurization systems off. The maximum pressure shall not create an opening force on any elevator lobby door greater than 30 pounds applied at the latch side of the door on the door-opening device under any operating condition. Pressure shall not interfere with the opening and closing of elevator doors.

Exception: Grade level elevator lobbies/corridors.

909.5.7 Pressurization and exhaust of elevator lobbies/corridors/refuge areas for Group R1, R2 and I1 Occupancies. Exhaust and pressurization systems shall be provided for elevator lobbies and corridors serving Group R1, R2 and I1 occupancies. Elevator lobbies need not be separated from corridors.

909.5.7.1 Elevator lobbies/corridors/refuge areas serving Group R1, R2 and I1 Occupancies shall be exhausted to outside when a fire is detected within the elevator lobby/corridor/refuge area. Smoke detectors within the elevator lobby/corridor/refuge area and floor water flow devices shall be capable of activating the exhaust system. Activation of the linen and rubbish chute sprinkler zone water flow or guest room smoke detection within the floor shall not activate lobbies/corridors exhaust systems. Exhaust systems shall be designed and sized to exhaust a minimum of 60 air changes per hour from the lobby/corridor/refuge areas in alarm and provide a negative pressure of 0.05" w.c. relative to elevator shafts, adjacent occupied areas, and floors above and below the floor in alarm. The exhaust system shall be sized for one floor and assuming supply air is available.

909.5.7.2 Elevator lobbies/corridors/refuge areas serving Group R1, R2 and I1 Occupancies shall be pressurized, when activated, to maintain a minimum positive pressure of 0.05 inch of water column (w.c.) with respect to the floor in alarm (fire floor), with elevator doors closed and with stairway, hoistway and elevator lobby/refuge area pressurization and exhaust systems in operation. Air volume introduced into the unaffected lobbies/corridors/refuge shall be designed to provide a minimum outside supply air of 6 air changes per hour to all floors above and below the typical fire floor. The maximum pressure shall not create an opening force on any elevator refuge area door greater than 30 pounds applied at the latch side of the door on the door-opening device under any operating condition. Pressure shall not interfere with the opening and closing of elevator doors.

Exception: Grade level elevator lobbies/corridors shall not be required to be pressurized at 6 air changes per hour or exhausted at 60 air changes per hour, when there is a clear exit path with no stairs or other obstructions for people with special needs to exit the building, and where grade-level residential units have direct access to outside for egress as defined in current building codes. When required, exhaust and pressurization shall be provided based on exhaust or supply rates established on a typical lobby/corridor floor other than the grade level floor. The general building HVAC serving the grade level may be used for pressurization and/or exhaust.

909.5.8 General building pressurization and exhaust for all occupancies. A general building pressurization and exhaust system shall be provided which, when activated, will shut off all supply air to the fire floor (or smoke zone) and shall maintain a minimum negative pressure of 0.05" water column on the fire floor (or smoke zone) with respect to adjacent non-alarm floors/smoke zones with general building pressurization in operation; and shall exhaust air from the fire floor/smoke zone to the outside. Return air from all other floors shall be shut off.

Exceptions:

1. General building pressurization systems are not required in Group R1, R2 and I1 Occupancies other than lobby/corridor pressurization.

2. General building pressurization systems are not required in mechanical/electrical rooms such as boiler rooms, chiller rooms, fan rooms, electrical rooms, and other typical utility rooms.

909.5.8.1 The general pressurization and exhaust system(s) shall consist of mechanically operated air-handling system(s) which will restrict the smoke to the general area of fire origin and provide a safe means of occupant egress from the affected fire floor.

909.5.8.2 Supply air to all non-fire floors for general pressurization shall be provided from the outside by a mechanically operated air-handling system. A dedicated or general building HVAC system may be used to pressurize and exhaust individual floors or smoke zones provided the system is designed in such a manner that it is dedicated during alarm mode to serve each floor or smoke zone through smoke dampers in the duct distribution system or is dedicated in normal operation to a single smoke zone or floor. The outside air intakes shall be open 100% and located so that they will not be contaminated by products of combustion and smoke re-circulation will not occur.

909.5.8.3 The exhaust system(s) for each floor/smoke zone shall be sized for:

1. Areas greater than 10,000 square feet, a minimum of 10 air changes per hour or 20,000cfm, whichever is greater. The volume shall be determined from the area of the floor/smoke zone to the ceiling/roof up to a maximum height of 12 feet above finished floor.
2. Areas less than 10,000 square feet, a minimum of 10 air changes per hour. The volume shall be determined based on full floor height including plenum area above ceiling.
3. Use and allow for 1% damper leakage for outside, return and exhaust systems.
4. The exhaust system shall be sized assuming supply air is available.

909.5.8.4 Each floor area shall be a compartment**,** smoke control zone not to exceed 52,000 square feet on a single floor. Except for openings into atriums, pedestrian bridges between two buildings or non-required stair enclosures between floors, and open escalators between multiple floors as allowed by building codes, smoke control zones shall be separated from each other by a wall that shall extend from the floor to the underside of the floor or roof above.

1. Draft stops shall be required between smoke zones without wall separation to prevent migration of smoke throughout the building and shall be approved by the Building and Fire Departments.
2. A smoke control zone in alarm shall actuate all the adjacent zone smoke control equipment to pressurize those adjacent zones with outside air only while the smoke control zone in alarm goes into exhaust. Where smoke control zones have wall separations, a minimum positive pressure of 0.05 inch of water column (w.c.) shall be maintained in the adjacent non-fire zones with respect to the smoke control zones in alarm.
3. Sprinkler zones shall coincide with smoke zones.
4. For smoke zones without wall separations, it must be demonstrated that products of combustion will be contained within the zone of origin. Any failure to restrict products of combustion to the floor or area of origin will be considered as not complying with the requirements for the smoke control system.

909.5.9 Parking garages within high rise structures. Elevator lobbies on all floors designated as refuge areas within an enclosed parking structure shall have a separate dedicated pressurization system or shall be pressurized using the elevator hoistway pressurization system by transferring air to the elevator lobby/refuge area with the use of transfer openings. Penetrations of the elevator shaft wall shall be protected with fire/smoke dampers listed under UL Standards 555 and 555S. Exhaust systems are not required in this area if direct access without stairs or obstructions is available for people with special needs to exit from the elevator lobby/refuge area into the enclosed parking level or directly to a public way.

909.5.9.1 Open parking garages shall not require a general building smoke control system. Elevator lobbies that are enclosed and serve an open parking garage are not required to be pressurized or exhausted if direct access without stairs or obstructions is available for people with special needs to exit from the elevator lobby to the open parking garage level or directly to a public way.

909.5.9.2 Enclosed garages. Exhaust fans associated with an enclosed parking structure shall be capable of manual operation from the FCC. Exhaust fans do not require a redundant source of power and this shall be indicated at the FCC “not on emergency power”. The fan discharge shall be located so that it will not contaminate other life safety system air intakes and smoke re-circulation will not occur.

909.5.10 Activiation of pressurization. Activation of Stairway and Elevator Hoistway pressurization shall be automatic by:

1. Activation of any smoke or heat detector or water flow device.

2. Exception: Main water flow, heat or smoke detectors located in stairwells or hoistways and waterflow in building service chutes or elevator hoistways.
3. Activation of any manual fire alarm box.
4. Manual operation from the FCC.

909.5.11 Activation of elevator Lobby/Refuge Area Smoke Control.

909.5.11.1 Group A, B, E and M Occupancies. Pressurization of Elevator lobby/refuge areas on all floors shall be activated by:

Any smoke or heat detector or water flow device.

Exception: Main water flow, heat or smoke detectors located in stairwells or hoistways and waterflow in building service chutes or elevator hoistways.

Manual operation from the FCC.

Activation of a smoke detector within an elevator lobby/refuge area shall close the supply air dampers to the elevator lobby/refuge area in alarm and activate the general building pressurization system. The occupied area adjacent to the refuge area shall also be pressurized.

909.5.11.2 Group R1, R2 and I1 Occupancies. Smoke or heat detectors located in the elevator lobby/corridor/refuge area and floor water flow devices shall activate the smoke control system as follows:

Activate the elevator lobby/corridor/refuge exhaust system, open the exhaust damper(s) on the fire floor and close the air supply to the elevator lobby/corridor/refuge area in alarm.

Activate the pressurization systems for the elevator lobbies/corridors/refuge areas on all non-fire floors and close exhaust dampers on all floors above and below the fire floor.

909.5.12 General Building Pressurization and Exhaust. A smoke control zone shall be automatically activated by:

1. Respective sprinkler zone activation. (No individual sprinkler zone shall serve more than one smoke zone.)
2. Activation of any smoke or heat detector within the zone.

   Exception: Main water flow, heat or smoke detectors located in stairwells or hoistways.
3. Manual operation from the FCC.
4. A smoke detector in the main return air duct(s) of air-handling systems serving an individual smoke zone or floor, with no individual detector serving more than one smoke zone.
5. Smoke detector in the elevator lobby/refuge area per 907.5.11.1.4.
6. A smoke detector within 3’ of each stair door and refuge area door on the corridor side.
7. A smoke detector on each side of each opening between smoke zones separated by a draft stop.
8. Smoke detector(s) within a smoke zone as required to activate respective smoke zones.

909.6 Smoke control systems for covered mall buildings.. A mechanically operated air-handling system shall be installed in covered mall buildings which will restrict the smoke to the general area of fire origin and maintain the exiting system in a condition that is safe for exiting. The system shall be designed so that exhausted smoke cannot contaminate the outside air intake of any system.

909.6.1 Activation. The smoke control system shall activate by any alarm initiated from the smoke detection or sprinkler system, inclusive. The smoke control system shall also be manually operable from the

FCC. The smoke control system shall be functional anytime the building is occupied and during those hours when the building air conditioning systems are not operating. All smoke control equipment for both tenant space and the covered mall building shall be in place and operational before any portion of the covered mall building is occupied. The level of protection of the fire detection system for unoccupied tenant space shall be subject to the approval of the Department and the Fire Department.

909.6.1.1 Tenant space and anchor stores.

1. The spaces shall be compartmentalized into smoke control zones not to exceed 52,000 square feet on a single floor. Except for openings between the covered mall area and tenant spaces, smoke control zones shall be separated from each other by wall construction having a fire-resistance rating per IBC Section 402.7.2 and 402.7.3. The walls shall extend from the floor to the underside of the floor or roof above.
2. The tenant smoke control exhaust system shall exhaust a minimum of 6 air changes per hour or 20,000 cfm from each smoke control zone, whichever is greater.
3. Smoke detection shall be provided as follows:
    a) On the tenant side at each opening into the mall and at each exit from the tenant space. For openings larger than 30 lineal feet, an additional detector shall be provided for each 30 lineal feet or fraction thereof.
    b) Electrical equipment rooms.
    c) Detector zones may not exceed 22,500 square feet and no detector zone shall serve more than one smoke control zone.
    d) D. Detectors in individual tenant spaces shall be spaced not to exceed 2,500 sf per detector.
4. A strobe-type remote annunciator shall be located in the mall above each tenant entry and shall annunciate those detectors within that space. Concealed detectors shall also be annunciated immediately outside the concealed space.
5. A detector in a tenant area smoke control zone shall activate the smoke control equipment to supply air to the covered mall area with 100% outside air while the affected tenant smoke control zone goes into exhaust. All other tenant smoke control zones shall remain in normal operation.

909.6.1.2 Covered Mall Area.

1. The smoke control equipment for the covered mall areas shall be separate from that serving tenant spaces. The tenant ventilation/smoke control system shall not be used to pressurize the covered mall.

2. The covered mall area system shall have a smoke detector located in the supply air system after the air filters, which will stop the supply fan and provide a supervisory alarm signal. In addition, a smoke detector shall be provided in the return or exhaust air stream to activate the fire alarm system.

3. The covered mall area smoke removal system shall provide at least 6 air changes per hour and shall be located to preclude accumulation of smoke in any area of the covered mall. The covered mall area smoke removal system shall be automatically activated from the fire alarm system upon detection of smoke within the covered mall or activation of fire sprinkler system water flow within the covered mall area. If multiple smoke control zones for the mall area are provided either by zone area requirements of this Section or by system design, then only the smoke removal system for the zone in alarm shall be activated. Adjacent covered mall zones shall supply 100% outside air and

adjoining tenant spaces shall go into normal operation if operation of those systems will not contribute to the spread of smoke.

909.7 Smoke control for large assembly areas. Assembly's areas or similar areas were the occupant load is 300 or greater as calculated per 2003 IBC section 1004 and smoke control is required per section 909.4 (atriums) and 909.5 (high-rises)

909.7.1 Smoke control systems. A mechanically operated air-handling system shall be installed in large assembly buildings which will restrict the smoke to the general area of fire origin and maintain the exiting system in a condition that is safe for exiting. The system shall be designed so that exhausted smoke cannot contaminate the outside air intake of any system.

909.7.2 Activation. The smoke control system shall activate automatically by any alarm initiated from a smoke detector, heat detector, sprinkler waterflow alarm or air sampling-type smoke detection where allowed per Section 909.7.2.1(3). The smoke control system shall also be manually operable from the FCC.

909.7.2.1 Large assembly areas and adjacent areas.

1. The spaces shall be compartmentalized into smoke control zones. Large assembly areas shall be separated from other adjacent areas, or smoke control zones by the use of wall construction having a 1-hour fire-resistance rating. The walls shall extend from the floor to the underside of the floor or roof above.
2. The smoke control exhaust system shall exhaust a minimum of 6 air changes per hour or 20,000 cfm from each smoke control zone, whichever is greater.
3. Smoke detection shall be provided as follows:
   A. Electrical equipment rooms.
   B. Detector zones may not exceed 22,500 square feet and no detector zone shall serve more than one smoke control zone.
   C. Where ceiling heights are 25 ft or greater air sampling-type smoke detection or approved beam detection shall be provided in lieu of ceiling spot smoke detection.
4. A strobe-type remote annunciator shall be located outside entries to the large assembly areas. Concealed detectors shall also be annunciated immediately outside the concealed space.
5. A alarm activation within a smoke control zone shall activate the following:
   A. Smoke control exhaust system in the alarmed smoke zone.
   B. Closed all supply air to the alarmed smoke zone.
   C. Provide 100% outside supply air to adjacent areas.
   D. All adjacent areas systems shall remain in normal operation.
   E. Fire alarm activation per section 907.

909.7.2.2 Large assembly area.

1. The smoke control equipment for the large assembly areas shall be a dedicated system.

   Exception: Other smoke control exhaust system as required from Section 909.4 or 909.5 may be used for large assembly smoke control system when exhaust system is design for smoke removal rate per Section 909.7.2.1 (2) plus ½ exhaust requirement from Section 909.4 or 909.5.

2. The large assembly area system shall have a smoke detector located in the supply air system after the air filters, which will stop the supply fan and provide a supervisory alarm signal.

3. Other fire alarm system requirements shall be per section 907. Annunciation shall be point-lit graphic per Section 907.4.7.5.

909.8 Testing of smoke control systems. Before the Fire Department accepts the smoke control systems and prior to initial occupancy, the smoke control systems shall be tested in their presence to confirm that the systems operate in compliance with this Section.

909.8.1 Acceptance testing prior to building occupancy. The requirements of acceptance testing defined hereinafter shall be the minimum requirements. All acceptance tests shall be witnessed by a fire department representative.

1. The design professional engineer shall furnish a testing procedure to the Fire Department 72hrs in advance of the acceptance tests being performed. The procedure shall define how compliance with the Code will be demonstrated. The procedure shall also identify what instrumentation, including artificial smoke generating equipment, will be used during the testing.

2. Prior to witnessed acceptance testing of the smoke control systems, the design professional engineer shall confirm and advise the Fire Department in writing that the entire smoke control system has been installed, air balanced and tested in accordance with its design, plans, specifications and this Code. The designer shall also certify that fans are provided with 1.5x the number of belts required for the design load. A minimum of two belts are required for fans providing smoke control. Fan motors shall have a marked service factor (S.F.) of 1.15.

3. The following shall be notified so that they may witness the acceptance testing:

   A. Design Professional Engineer-of-Record

   B. Building Contractor

   C. Owner's Representative

   D. Fire Department

   E. Building Department

4. Unless otherwise approved by the Fire Department, sufficient smoke shall be generated to produce at least the volume of the smoke zone being tested within 5 minutes. All smoke-generating devices shall be supplied by the owner or his representative and shall meet with the approval of the Department and the Fire Department.

5. After the system is activated, smoke shall not continue to migrate to other smoke zones of the building.

   909.8.1.1 Testing requirements: Tests shall be performed in full automatic mode with the building operating under both normal power and emergency power. Test equipment shall be the responsibility of the design professional and shall include; manometer (calibrated within last 12 months), spring scale and other equipment as necessary to adequately measure and record system performance. Communications shall be provided between the test locations and the FCC.

   A. For a building that is not a high rise, multiple tests on more than one floor or smoke zone shall be required to demonstrate proper operation.

   B. For high rise buildings, tests shall be conducted at a minimum of 5 locations.

      1. A floor in the lower third, a floor in the middle third and a floor in the upper third of the building.

2. With a floor in alarm, an additional automatic alarm shall be initiated on a floor immediately above or below the initial floor in alarm. All floors in alarm shall go to exhaust mode.

3. With a floor in alarm, a manual pull station on another floor shall be activated. Smoke control operation shall not be affected.

C. For atriums, more than one test may be required depending upon the atrium configuration, its relationship to adjacent spaces and if the atrium is located in a high-rise.

D. Activation of one smoke detector in each smoke control zone on each floor being tested.

E. Activation of at least one sprinkler flow switch.

F. Activation of at least one manual pull station.

G. 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 R1, R2 and I1 Occupancies and between atriums and areas immediately adjacent to atriums where atriums are part of a high rise building. Door pull force into stair enclosures or refuge areas shall not exceed 30 lbs. under any conditions.

H. 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 FCC.

I. 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.

909.8.2 Annual tests. Annual tests shall be performed in accordance with 909.8.2.1 and 909.8.2.2, 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.

909.8.2.1 Equipment operating tests. The following equipment operating tests shall be conducted annually on the smoke control system components:

1. Verify the proper 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 FCC.

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 can be performed by qualified service technicians who are familiar with the proper operation of the smoke control systems and equipment. Otherwise, the above testing shall be performed directly supervised by a professional engineer qualified in the design and testing of smoke control systems. Direct supervision shall require the presence of the engineer at the building while the equipment operating tests are taking place. If service technicians perform the equipment operating tests, the engineer responsible

for either conducting the smoke control system tests shall review the test procedures used and results obtained by the service technicians. A statement summarizing this review shall be included in the test report described in section 909.8.2.3 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 FCC 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 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 test.

909.8.2.2 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 by a professional engineer qualified in the testing of such smoke control systems.

1. Activate the smoke control systems manually for tests used to confirm minimum pressure differentials defined in this Section with the general building pressurization systems off.

2. Activate the smoke control systems automatically through the fire alarm system for tests used to confirm proper sequencing of the system components, actual relative pressure differentials between areas in alarm and adjacent areas, and actual door opening forces with the general building pressurization systems operating.

3. For high rise buildings, conduct smoke control tests, observations and measurements of all aspects of the smoke control system at a minimum of 3 locations: a floor in the lower third, a floor in the middle third and a floor in the upper third of the building. Smoke control tests in subsequent years shall be conducted on previously untested floors, as may be practical so that all floors ultimately are tested.

4. For all other buildings, conduct smoke control tests, observations and measurements of all aspects of the smoke control system at a minimum number of locations to demonstrate proper performance as approved by the Fire Department. Each test shall attempt to involve as many different fan systems as practical. Smoke control tests in subsequent years shall be conducted on previously untested locations, as may be practical so that all locations ultimately are tested over a three year period.

5. Tests of the smoke control system shall be conducted by activation of at least one smoke detector in each smoke control zone on each floor being tested. One test of at least one of the smoke control zones shall include activation of one sprinkler flow switch. In addition, the smoke control tests shall include activation of at least one manual fire alarm box.

6. 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 R1, R2 or I1 Occupancies, and between atriums and areas immediately adjacent to atriums where atriums are part of high rise buildings.

7. 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 FCC.

8. 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.

909.8.3 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 FCC. 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 FCC 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.

909.9 Equipment. Equipment such as, but not limited to, fans ducts, automatic dampers and balance dampers, shall be suitable for their intended use, suitable for the probable exposure temperatures that the rational analysis indicated, and as approved by the building official.

909.10 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they could be exposed under smoke control-operating conditions but not less than 1.5 times the maximum design pressure. Ducts shall be constructed and supported in accordance with the Mechanical Code. Ducts shall be supported directly from fire-resistive structural elements of the building by substantial noncombustible supports. Ducts that are part of a smoke control system shall be traversed using generally accepted practices to determine actual air quantities.

EXCEPTION: Flexible connections for the purpose of vibration isolation complying with the Mechanical Code may be used if constructed of approved fire-resistive materials.

909.10.2 Equipment inlets and outlets. Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard. Inlets and outlets shall be read using generally accepted practices to determine air quantities.

909.10.3 Automatic dampers. Automatic dampers installed within the smoke control system shall be listed and conform to the requirements of approved recognized standards. Smoke dampers shall be supplied by emergency power systems when such power systems are required by other sections of this Code.

909.10.4 Fans. In addition to other requirements, belt-driven fan shall have 1.5 times the number of belts required for the design duty with the minimum of 2 belts. Fans shall be selected for stable performance based upon the design intent of their smoke control function. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the requirements of IBC Chapter 16. Motors driving fans shall not be operated beyond their nameplate horsepower (kilowatts), as determined from measurement of actual current draw. Motors driving fans shall have a minimum service factor (S.F.) of 1.15. Fans shall be examined for correct rotation. Measurements of voltage, amperage, revolutions per minute and belt tension shall be made. Static pressure readings shall be taken at suction and discharge.

909.10.5 Detection devices. Smoke or fire detectors that are a part of a smoke control system shall be listed for the environment installed. Detectors installed in air streams shall be listed for the worst-case velocity. When applicable, testing shall include verification of airflow in both minimum and maximum conditions.

909.10.6 Smoke Barriers. Measurements using inclined manometers or other approved gauges shall be made of the pressure differences across smoke barriers to confirm system performance. Such measurements shall be conducted for each possible smoke control condition.

909.10.7 Controls. Each smoke zone equipped with an automatic-initiation device, shall be put into operation by the actuation of one such device. Each additional device within the zone shall be verified to cause the same sequence without requiring the operation of fan motors in order to prevent damage. Control sequences shall be verified throughout the system, including verification of override from the firefighter's control panel and simulation of standby power conditions.

909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved emergency source complying with NFPA 70 (National Electrical Code). The emergency power source and its transfer switches shall be in a separate room from the normal power transformers and switchgear and shall be enclosed in a room of not less than 1-hour fire resistance construction ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full emergency power shall be automatic and within 10 seconds of failure of the primary power.

909.11.1 Power sources and power surges. Elements of the smoke management system relying on volatile memories or the like shall be supplied with uninterruptible power sources of sufficient duration to span a 15-minute primary power interruption. Elements of the smoke management system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

909.12 Wiring. In addition to meeting requirements of NFPA 70, all wiring, regardless of voltage, shall be fully enclosed with continuous raceways in; mechanical, electrical rooms, elevator equipment rooms and vertical risers. Wiring shall not be painted.

909.13 Detection and control systems. Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment. Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation.

909.14 Marking and identification. The detection and control systems shall be clearly marked at all devices, junctions, accesses and terminations.

909.15 Control diagrams. Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with building management and in the FCC in an approved format and manner.

909.16 Fire-Fighters Smoke Control Panel (FSCP). Smoke control systems shall be controlled by a U.L. 864 listed fire alarm system meeting the requirements of NFPA 72. The fire alarm system shall also be listed for smoke control use under UL product category guide designation UUKL. Upon an alarm, the fire alarm system shall take direct control of all smoke control components such as fans, dampers, pressure control and status indication from any temperature control or building automation systems. Hard-wired interlock is acceptable. The fire alarm system shall provide automatic and manual override control and status. Terminal air distribution units may remain under their own normal building automation control.

An FSCP, shall be provided for manual or override of automatic control of mechanical smoke control systems.] This panel shall graphically depict the individual smoke control system fan and damper controls, their relative location within the building, stairwells, hoistways, building pressurization and exhaust airflow, refuge area pressurization and all other smoke control zones that apply. This panel shall clearly show the building arrangement and smoke control system zones served by the systems. The graphic panel shall be oriented to the building and include a North reference compass point. A combination of vertical (section) and/or horizontal (plan) graphic arrangement may be necessary. The operating control and status indicators on FSCP shall have a maximum height from the floor of 6 feet 6 inches and a minimum of 2 feet, 0 inches, and may require more than one section to accommodate height limitations. Layout, labeling and location of the FSCP shall be reviewed and approved by Fire Department prior to fabrication. The following features shall be incorporated and color-coded as follows:

1. General building layout (black lines on white background
2. Exhaust systems – RED
3. Pressurization systems – GREEN
4. Garage supply and exhaust systems shall be energized manually to purge smoke (Auto - On only). System need not be connected to emergency power.

The status of smoke control equipment shall be indicated by LED lamps and appropriate legends. Fans, major ducts and dampers within the building that are components of the smoke control system~~s~~ shall be clearly identified as to purpose (e.g. STAIR PRESSURIZATION FAN) on the FSCP. Lettering shall be 16 point Helvetica bold, Equipment Identification (e.g. SPF-1) shall be 12 point Helvetica Bold.

909.16.1 LED status indicators. Shall be provided for each component of the smoke control system as follows:

1. Fans operating, dampers open, power on – GREEN
2. Fans off, ~~or~~ dampers closed – YELLOW
3. Fans, outside air supply and exhaust dampers and other operating equipment in a fault status – YELLOW.
4. Duct detectors as required per section 910.3.1.1 and 910.3.1.4 shall be identified with a YELLOW LED.
5. Provide lamp test with momentary contact push button(s) to illuminate all LED's simultaneously.
6. All status LED's shall be active all the time..
7. Control switches are active only during alarm condition except through a secured and supervised bypass method approved by the Department.

909.16.2 Control Action and Priorities. The FSCP shall incorporate 3-position switches for control actions of fans and dampers (except main outside air supply, return and exhaust dampers) as follows:

1. ON-OFF, OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the FSCP, no automated or manual control from any other control point within the building shall contradict the control action, except from motor control electrical protection at the local motor controller and disconnects. Where automatic means is provided to interrupt normal non-emergency equipment operation to safeguard the building or equipment (i.e., freezestats, duct smoke detectors, high temperature cutouts, temperature-actuated linkage and similar devices), such means shall be bypassed while the system is in smoke control mode.

   Exception: Starter overloads and short circuit protection, power disconnects required by the Electrical Code, excessive fan vibration switches and excessive fan pressure switch.

2. Only the AUTO position of each 3-position FSCP switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL non-emergency, building control position. When a FSCP switch is in the AUTO position, the actual status of the device (on-off, open-closed) shall be indicated as described above.

3. Wiring between FSCP and FACP shall be supervised for integrity.

909.16.3 Response Time. Smoke control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. The total response time for individual smoke control systems to achieve their desired operating mode shall not exceed the following time periods:

Fan operating at desired state –75seconds.

Damper position travel – 60 seconds.

909.16.4 Testing. Devices, equipment, components and sequences shall be individually tested. These tests in addition to those required by other provisions of the Building Code shall consist of determination of function, sequence and where applicable, capacity of their installed condition. The requirements of IBCA Section 910.5 shall apply.

909.17 Equipment Specifications and Manuals. Operational and maintenance manuals for all life safety equipment shall be provided to the building engineering staff and made available to Fire Department personnel.

909.18 RESERVED

909.19 RESERVED

909.20 Smokeproof enclosures. Where required by Section 403.13 and 405.8.2, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an enclosed interior exit stairway that conforms to Section 1019.1 and the requirements of this section. Where access to the roof is required by the Fire Code, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required. Mechanical smoke control shall be provided per section 909.5.

909.20.1 Access. Access to the stair shall be byway of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall not be less than the required width of the corridor leading to the vestibule but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than a 2-hour fire-resistance-rated fire barrier without openings other than the required means of egress doors. The vestibule shall be separated from the stairway by not less than a 2-hour fire-resistance-rated fire barrier. The open exterior balcony shall be constructed in accordance with the fire-resistance-rating requirements for floor construction.

909.20.2.1 Door closers. Doors in a smokeproof enclosure shall be self-closing or shall be automatic-closing by actuation of a smoke detector installed at thefloor-side entrance to the smokeproof enclosure in accordance with Section 715.4.7. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the smokeproof enclosure at all levels. Smoke detectors shall be installed in accordance with Section 907.10.

SECTION 910
SMOKE AND HEAT VENTS

Replace Exception in Section 910.2.1 with the following:

Exception: Group S-1 aircraft repair hangar or aircraft hangar shall conform to NFPA 409.

Replace Section 910.2.3 with the following:

910.2.3 High-piled storage. Buildings and portions thereof containing high-piled stock or rack storage in any occupancy group shall comply with requirements of Chapter 23.

Replace Table 910.3 with the following:

TABLE 910.3 – REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTING

COMMODITY CLASS	DESIGNATED STORAGE HEIGHT (ft)	VENT AREA-TO-FLOOR AREA RATIO	MAXIMUM SPACING OF VENT CENTERS (ft)	MAXIMUM DISTANCE TO VENTS (ft)	MINIMUM CURTAIN DEPTH (ft) [b]	MAXIMUM AREA FORMED BY DRAFT CURTAINS (SQ. FT) [b]
I – IV [a]	≤20	1:100	100	60	6	10,000
	>20≤ 40	1:75	100	55	6	8000
High Hazard [a] and Plastics	≤20	1:50	100	NR	6	6000
	> 20 ≤ 30	1:40	90	NR	6	6000

a. When areas of buildings or portions are equipped with early suppression-fast response (ESFR) ventings shall be installed per section 910.3.5.

b.When required per section 903.3.1.

Delete Section 910.3.1.1. Gravity vents.

Replace Section 910.3.4 Exception with the following:

Exception: Curtain boards would not be required in areas where ESFR sprinklers are provided except for the following two conditions:

1. If there is a separate sprinkler system in the building that uses control mode sprinklers and does not use ESFR sprinkler heads, then a curtain board “Draft Curtain” shall be provided between the sprinkler systems.

2. If a greater than 12 inch sudden vertical difference in roof elevations, such as a high bay and low bay section, then curtain boards “Draft Curtains” should be provided at the point of roof elevation change if the high bay section is protected with ESFR sprinklers.

3. When draft curtains are required, they shall be located centered between sprinklers or sprinkler branch lines. If they are not centered, provide additional sprinklers such that sprinklers on either side of the draft curtain are no farther from the curtain than one-half the allowable maximum sprinkler spacing for the building height. If suppression mode sprinklers protect the areas on both sides of the draft curtain, there is no need to maintain a clear aisle beneath the draft curtain.

4. Extend the draft curtain at least 2 ft (0.61 m) below the ceiling. Ensure the draft curtain is noncombustible and fits tightly against the underside of the roof. (Openings created by ribs in metal roof deck are not a concern, but openings created by channels between Z-purlins or other structural members should be filled.)

Solid beams, girders or other structural features which meet the above criteria are equivalent to draft curtains.

Add new Section 910.3.5 as follows:

910.3.5 Buildings equipped with approved early suppression fast response (ESFR) sprinkler system.

6. Roof vent area to floor area ratio of 1:600 for all types of commodities
7. A remote manual switch from fire department control panel shall activate each vent. This control panel shall be located in an approved location and clearly identified. The face of the panel shall be graphic depicting the location of each vent. Each remote manual switch shall be mounted adjacent to the respective vent depicted on the panel.
8. Electrical power to the smoke removal vents shall be provided from a separate and dedicated distribution panel board tapped ahead of the main sevice disconnect. This panel board shall be identified as electrical disconnect for emergency ventilation. Wiring and smoke-removal fan units shall be thermally protected in a manner that will provide continued operation for not less than 15 minutes while exposed to a temperature of 1,000°F.
9. Curtain boards would not be required in areas where ESFR sprinklers are installed with the exceptions in 910.3.4 Exception
10. Smoke and heat vents shall have the capability of being opened by an approved manual operation.

Amend Section 910.4 by adding the following exceptions:

Exception: Buildings equipped with approved early suppression fast response (ESFR) sprinkler system.

6. A =Area of roof vents provided in square feet accordance to a roof vent area to floor area ratio of 1:600.
7. On combination comfort air-handling and smoke- removal systems, and on independent comfort air-handling systems, fans shall be controlled to shut down in accordance with the automatic shutoff requirements of the Mechanical Code or by activation of automatic extinguishing or detection systems. Coordinate the location of sprinklers and the design of powered heating, ventilation and air conditioning for buildings protected by suppression mode sprinklers so that the air velocity at sprinklers does not exceed 5 ft/sec (1.52 m/sec).
   •Examples of powered ventilation include exhaust fans, air conditioning / refrigeration supply and return vents, and grated return air inlets to roof-mounted mechanical equipment penthouses.
   •Examples of natural ventilation include turbine vents, vent stacks, and ridge vents.

8. Each smoke-removal fan shall be manually activated by a remote automatic switch from fire department control panel. Fire department control panel shall be located in an approved location and clearly identified.

9. Electrical power to the smoke removal system shall be provided from a separate and dedicated distribution panel board tapped ahead of the main service disconnect. This panel board shall be identified as electrical disconnect for emergency ventilation. Wiring and smoke-removal fan units shall be thermally protected in a manner that will provide continued operation for not less than 15 minutes while exposed to a temperature of 1,000°F.
10. The individual capacity of a fan shall not exceed 30,000 cubic feet per minute.

SECTION 912
FIRE DEPARTMENT CONNECTIONS

Replace Section 912.1 with the following:

912.1 Installation. Fire department connections shall be required for all fire sprinkler and standpipe systems. Fire department connections shall be installed in accordance with the NFPA standard applicable to the system design.

CHAPTER 10
MEANS OF EGRESS

SECTION 1002
DEFINITIONS

Section 1002.1 is amended by replacing the definition of PUBLIC WAY in its entirety with the following:

PUBLIC WAY. Any street, alley, or similar parcel of land essentially unobstructed from the ground to the sky that is deeded, dedicated, or other wise permanently appropriated to the public for public use and having a clear width of not less than 10 feet (3048 mm).

SECTION 1004
OCCUPANT LOAD

Table 1004.1.2 is amended for Airport terminal/concourse to read:

OCCUPANCY	FLOOR AREA IN SQ. FT. PER OCCUPANT
Airport terminal/concourse	
Concourse Hold Rooms Open Areas	100 gross
Seating Areas	30 gross
Passenger Circulation Space includes ticket area, check-in and baggage claim area	15 or fixed seat count
Baggage handling	300 gross

SECTION 1005
EGRESS WIDTH

Table 1005.1 Egress width per occupant served is amended as follows:

In the occupancy row “Occupancies other than those listed below”, the stairway width and the other egress component factors in buildings with sprinkler systems are changed from 0.2 to 0.25 and from 0.15 to 0.175 respectively. “Hazardous: H-1; H-2, H-3, and H-4” egress component factors are changed from .2 to .3 for buildings with sprinkler systems. Add footnotes b and c to table.

TABLE 1005.1
EGRESS WIDTH PER OCCUPANT SERVED

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM[a]	
	Stairways (inches per occupant)	**Other egress components (inches per occupant)**	**Stairways (inches per occupant)**	**Other egress components (inches per occupant)**
Occupancies other than those listed below	0.3	0.2	0.25[b]	0.175[c]
Hazardous: H-1, H-2, H-3, and H-4	0.7	0.4	0.3	0.3
Institutional: I-2	N/A	N/A	0.3	0.2

a Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1 or 903.1.2.

b For assembly occupancies with occupant load greater than 400 egress component factors shall be 0.3

c For assembly occupancies with occupant load greater than 400 egress component factors shall be 0.2

SECTION 1008
DOORS GATES AND TURNSTILES

Section 1008.1.3.4 is deleted in its entirity and access-controlled egress doors are addressed by Appendix L Access Control Systems.

Section 1008.1.8.6 is deleted in its entirity and delayed egress locks are addressed by Appendix L Access Control Systems.

Section 1008.1.8.7 is deleted in its entirity and stairway doors are addressed by Appendix L Access Control Systems.

SECTION 1009
STAIRWAYS AND HANDRAILS

Section 1009.5.1 is amended by deleting and replacing the exception as follows:

Exception: In Group F, H and S occupancies, other than areas of parking structures accessible to the public, openings in treads and landings shall not be prohibited provided a sphere with a diameter of 1/2 inch (13 mm) diameter cannot pass throught the opening. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

Section 1009.12.1 Roof access is amended by deleting the Exception.

SECTION 1011
EXIT SIGNS

Section 1011.2 is replaced in its entirety with the following:

1011.2 Illumination. Exit signs shall be internally illuminated to a minimum of 5.0 foot-candle. If incandescent lamps or bulbs are used, there shall be a minimum of two lamps or bulbs. External and self-luminous exit signs are not allowed.

Section 1011.4 is amended by adding the following subsections:

1011.4.1 Graphics. Exit signs shall have the word "EXIT" on the sign in block letters not less than 6 inches (15.2 cm) high with the principal strokes of letters not less than ¾ inch (1.9 cm) wide. The word "EXIT" shall have letters of a width not less than 2 inches (5 cm) except the letter "I," and the minimum spacing between letters shall be not less than 3/8 inch (1 cm). Signs larger than the minimum established in this paragraph shall have letter widths, strokes, and spacing in proportion to their height. If an arrow is provided as part of the exit sign, the construction shall be such that the arrow direction cannot be readily changed. Lettering, arrows, and other symbols on exit signs shall be one of the following:

5. White luminous letters on green luminous field.
6. Green luminous letters on white luminous filed.
7. White light emitting diode letters on green field.
8. Green light emitting diode letters on white field.

1011.4.2 Power Source. Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

Section 1011.5 is deleted in its entirety

SECTION 1013
EXIT ACCESS

Section 1013.3 Common path of egress travel is amended by adding Exception 4:

4. The length of common path of egress travel in an R-2 occupancy shall not be more than 110 feet, provided the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

SECTION 1014
EXIT ACCESS AND EXIT ACCESS DOORWAYS

Section 1014.2.1 is amended by adding Exception 3:

3. In buildings constructed prior to March 26, 1994 two existing stairways within the same enclosure but completely separated from each other by rated construction in conformance with the requirements of the building code under which the building was last certified for occupancy, including Modifications Under Special Circumstances and applicable retrofit ordinances, shall be considered two separate exits, provided:

   3.1 This scissor stair is currently recognized as two separate exits.

   3.2 This scissor stair has been used continuously as two separate exits since the building was last certified for occupancy.

   3.3 The number of existing exits shall not be reduced.

SECTION 1016
CORRIDORS

Section 1016.1, Exception 4 is replaced in its entirety with the following:

4. Corridor walls and ceilings need not be of fire-resistive construction within single-tenant office spaces.

Section 1016.1 is amended by adding Exception No. 5.

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

SECTION 1019
VERTICAL EXIT ENCLOSURES

Section 1019.1.5 Exception is amended by adding the following sentence:

Fuel fired appliances may be located under stairways serving and contained within a single residential unit in Group R2 and R3 occupancies when the stairs are protected by one layer of 5/8" Type X Gypsum board attached directly to the underside of the stairs. Reference amendments to IFGC 303.3.

Section 1019.1.8 is amended to by deleting and replacing with the following:

1019.1.8 Smokeproof enclosures. In buildings required to comply with Section 403 or 405, each of the exits of a buildng that serves stories where the floor surface is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) shall be a pressurized stair way in accordance with Sections 909.5 and 909.20.

SECTION 1026

MEANS OF EGRESS FOR EXISTING BUILDINGS

Section 1026.16 Fire escape staris shall read:

1026.16 Fire escape stairs. Fire escape stairs shall comply with Sections 1026.16.1 through 1026.16.7 and Section 3404 of the Building Code.

Section 1026.16.3 is replaced in its entirety with the following:

1026.16.3 Dimensions. Fire escape stairs shall meet the minimum width, riser height and tread depth as specified in Section 3404.4 of the Building Code.

Exception: Other stairs approved by the fire code official.

CHAPTER 11
AVIATION FACILITIES

SECTION 1107
HELISTOPS AND HELIPORTS

Amend Section 1107.1 by adding the following:

Compliance with NFPA 418 is required for items not specifically addressed herein. Heliports are allowed only at airports.

Add new Section 1107.9 as follows:

1107.9 Helistops on roofs. In addition to other applicable portions of this Code, helistops located on roofs shall comply with the following:

1. Smoking is prohibited on the roof operating area during landing and takeoff operations.
2. Persons, other than helistop personnel, shall be restricted to designated protected or fenced waiting areas during landing and take-off operations.
3. Loose material such as gravel is prohibited.
4. Openings in the roof shall not be permitted in the immediate landing area.
5. Major repair and maintenance operations are not permitted on the helistop except in cases of emergency, and only with prior notification to the department.
6. Communication facilities shall be provided from the helistop to the department and building personnel for emergency notification.
7. Helistop personnel shall be trained in the use of communication and fire extinguishing equipment.
8. The storage of flammable liquids or highly combustible materials on the roof is prohibited.
9. An exterior (weatherproof) manual pull station shall be provided by each exit and shall be connected to the building alarm system.
10. At least 100 feet of approved 1-1/2 inch hose equipped with an approved fog nozzle and a 2-1/2 inch male NST reduced to a 1-1/2 inch male, Denver thread shall be provided in a weatherproof cabinet adjacent to the roof standpipe.

CHAPTER 12
DRY CLEANING

SECTION 1203
CLASSIFICATIONS

1203.1 Solvent classification. Item #5 is replaced with the following:

5. Class IV solvents are liquids classified as nonflammable. Perchlorethylene (tetrachlorethylene) is included as a Class IV solvent and requires HMIS reporting.

SECTION 1204
GENERAL REQUIREMENTS

Section 1204.2.1 and 1204.2.2 and 1204.2.3 are replaced with the following:

1204.2.1 Ventilation. Ventilation shall be provided in accordance with Section 502 of the International Mechanical Code and DOL 29 CFR Part 1910.1000, where applicable. Mechanical ventilation is needed in the cleaning room to carry fumes safely outdoors. The exhaust system requires an exhaust capacity of one cubit foot per minute (cfm) for every square foot of floor area. (See Mechanical Code Chapters 4 and 5.) The system serves no other areas in the plant. (See Mechanical Code Section 510.4.) Ventilation system shall be in accordance with NFPA 90A, *Air Conditioning and Ventilation Systems,* and NFPA 91, *Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Non-combustible Particulate Solids*. (See Section 1205.2.3)

1204.2.2 Heating. In Type II dry cleaning plants, heating shall be by indirect means using steam, hot water, or hot oil only. Steam and hot water pipes, radiators, or convectors used for heating or drying purposes shall provide at least one inch clearance from all woodwork and shall be protected by metal screens arranged so as to prevent combustible materials from being in contact with such pipes, radiators, or convectors. (See Mechanical Code.)

1204.2.3 Electrical wiring and equipment: Electrical wiring and equipment in dry cleaning rooms or other locations subject to flammable vapors shall be installed in accordance with NFPA 70, *National Electrical Code.*

SECTION 1205
OPERATING REQUIREMENTS

Add new subsection 1205.2.4:

1205.2.4 Smoking prohibited: Smoking in plants employing Class II or III systems, except in smoking rooms so designated, shall be strictly prohibited and **"NO SMOKING"** signs shall be posted.

CHAPTER 13
COMBUSTIBLE DUST-PRODUCING OPERATIONS

SECTION 1304
EXPLOSION PROTECTION

Amend Table 1304.1 – EXPLOSTION PROTECTION STANDARDS as follows:

Change ICC *Electrical Code* to NFPA 70, *National Electrical Code* as the standard for Electrical Installations.

CHAPTER 14
FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

SECTION 1401
GENERAL

Add the following new subsection:

1401.3 Permit required. Permits shall be required as set forth in Section 105.6 for temporary heating, LPG roofing operations, asbestos operations, hot works, open burning, explosives, fire watch, and waste receptacles larger than 20 cubic feet capacity.

SECTION 1403
TEMPORARY HEATING EQUIPMENT

Add the following new subsection:

1403.7 Permits. Permits shall be required as set forth in Section 105.6.

SECTION 1404
PRECAUTIONS AGAINST FIRE

Add the following new subsection:

1404.5.1 Permits. Permits shall be required as set forth in Section 105.6.

SECTION 1405
FLAMMABLE AND COMBUSTIBLE LIQUIDS

Add the following new subsections:

1405.1.1 Permits. Permits shall be required as set forth in Section 105.6.

1405.2.1 Permits. Permits shall be required as set forth in Section 105.6.

SECTION 1406
FLAMMABLE GASES

Section 1406.1 is replaced with the following:

1406.1 Storage and handling. The storage, use and handling of flammable gases shall comply with Chapter 35. For natural gases, see IFGC, International Fuel Gas Code.

Add the following new subsection:

1406.1.1 Permits. Permits shall be required as set forth in Section 105.6.

SECTION 1407
EXPLOSIVE MATERIALS

Add the following new subsection:

1407.1.1 Permits. Permits shall be required as set forth in Section 105.6.

SECTION 1411
MEANS OF EGRESS

Amend by adding to end of Section 1411.1 the following:

1411.1 When a building is constructed utilizing slipforms one stairway shall follow no more than two floors below the slipform.

SECTION 1413
STANDPIPES

Section 1413.1 is replaced with the following:

1413.1 Where required. Buildings four or more stories in height shall be provided with not less than one standpipe for use during construciton. Such standpipes shall be installed when the progress of construction is not more than 30 feet in height above the lowest level of fire department vehicle access or where the floor level of the lowest story is located more than 30 feet below the highest level of fire department vehicle access. Such standpipes shall be extended as construction progresses to within one floor of the hightest point of construction having secured decking or flooring. When slipforms are used in construction of the core of a building, one standpipe shall follow two levels below the slipform. One fire department connection (not less than 2 ½ x 2 ½ x 4) shall be provided for buildings less than 200 feet in height. Two fire department connections (not less than 2 ½ x 2 ½ x 6) shall be provided for buildings exceeding 200 feet in height. The fire department connection(s) shall be provided at a location visible from the public way, accessible to fire apparatus and approved by Fire Prevention personnel. Refer to IFC Chapter 9.

Amend by adding at end of Section 1413.3 the following:

On each floor there shall be provided a 2 ½ inch (63.5 mm) valve outlet for Fire Department use.

SECTION 1417
SAFEGUARDING ROOFING OPERATIONS

Add the following subsection:

1417.1.1 Permits. Permits shall be required as set forth in Section 105.6.

Add the following new section:

SECTION 1418
ASBESTOS OPERATIONS

1418.1 General. Operations involving asbestos or asbestos-containing materials in buildings and other structures regulated by this code shall be in accordance with Section 1418.

1418.1.1 Permits. Permits shall be required as set forth in Section 105.6.

1418.2 Notification. The Fire code official shall be notified 24 hours prior to the commencement and closure of asbestos operations. The permit applicant shall notify the building official when asbestos abatement involves the removal of materials which were used as a feature of the building's fire resistance.

1418.3 Signs. Approved signs shall be posted at the entrance, exit, decontamination areas and waste-disposal areas for asbestos operations. The signs shall state asbestos abatement operations are in progress in the area, asbestos is a suspected carcinogen and proper respiratory protection is required. Signs shall have a reflective surface and lettering shall be a minimum of two inches (51 mm) in height.

CHAPTER 15
FLAMMABLE FINISHES

SECTION 1501
GENERAL

Section 1501 is amended by addition of the following:

1501.1 Scope. Compliance with the International Fuel Gas Code (IFGC) and International Mechanical Code (IMC) is required for operations referenced in this chapter. This chapter shall apply to locations or areas where any of the following activities are conducted:

Replace Section 1501.1 #4 as follows:

4. Floor surfacing or finishing operations involving flammable finishes shall comply with Denver Fire Department policy, *Requirements for Special Spray Application Projects, Inside of Building, Using Flammable or Combustible Finishes.*

Amend Section 1501.1 by adding the following Exceptions:

Exceptions:

1. The use of small portable spray equipment or aerosol products not used repeatedly at the same location.
2. Spraying outdoors.
3. Spraying non combustible materials (water based). See Denver Fire Department policy.

Add the following Section 1501.3:

1501.3 Storage and use of flammable and combustible liquids. Storage and use of flammable and combustible liquids shall be in accordance with Chapter 34 and Denver Fire Department policy.

SECTION 1502
DEFINITIONS

Add the following definition:

LOWER FLAMMABILITY LIMIT (LFL). The minimum concentration of vapor in air at which propagation of flame will occur in the presence of an ignition source. LFL is sometimes referred to as LEL or lower explosive limit.

SECTION 1504
SPRAY FINISHING

Add the following to Section 1504.2:

Spraying equipment shall be electrically interlocked with exhaust ventilation.

Add the following to Section 1504.2.5 Exception #2:

2.5 The installation is approved by the Fire Department

Replace Section 1504.7.2.1 #3 as follows:

3. Have the ventilating system maintain a concentration 25 percent below the lower flammable limit (LFL) within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.

SECTION 1505
DIPPING OPERATIONS

Replace Section 1505.2 as follows:

1505.2: **Ventilation of vapor areas.** Mechanical ventilation shall be provided to maintain airborne concentrations below 25 percent the lower flammability limit (LFL). Required ventilation systems shall be arranged such that the failure of any ventilating fan shall automatically stop the dipping conveyor system.

SECTION 1507
POWDER COATING

Replace Section 1507.8 as follows:

1507.8 Fire Protection. Areas used for power coating shall be protected by an approved automatic fire-extinguishing system complying with Section 903.2.4. and applicable Denver Fire Department policies.

SECTION 1510
FLOOR SURFACING AND FINISHING OPERATIONS

Replace Section 1510.1 as follows:

1510.1 Scope. Floor surfacing and finishing operations using Class I or Class II liquids shall comply with Sections 1510.2 through 1510.5. Finishing Operations Involving Flammable Finishes, and Denver Fire Department Policy, *"Requirements for Special Spray Application Projects, Inside of Building, Using Flammable or Combustible Finishes."*

CHAPTER 16
FRUIT AND CROP RIPENING

SECTION 1603
ETHYLENE GAS

Add the following subsection:

1603.3 Container Construction. Containers storing ethylene shall be in accordance with Section 3003.1.

Add the following subsections:

1603.4 Storage. Containers other than those connected for use shall be stored outside of ripening process buildings or in a special building.

Exception: Storage of not more than two portable containers complying with Section 3003.1 and approved for transportation is allowed in ripening process buildings.

1603.5 Piping. Piping containing ethylene shall be constructed of iron. Flexible connectors and hose, when used, shall be of an approved type. Tubing shall be of brass or copper with not less than 0.049-inch (1.2 mm) wall thickness.

SECTION 1607
WARNING SIGNS

Replace Section 1607.1 as follows:

1607.1 When required. Approved warning signs (including NFPA 704 placard guidelines) indicating the danger involved and necessary precautions; shall be posted on all doors and entrances to the premises, rooms, and areas conducting the fruit and crop ripening process.

CHAPTER 17
FUMIGATION AND THERMAL INSECTICIDAL FOGGING

SECTION 1701
GENERAL

Replace Section 1701.2 with the following:

1701.2 Permits. No person shall engage in the actual operation of fumigation or thermal insecticidal fogging without first obtaining a permit. No fumigation room, vault, or chamber using toxic or flammable fumigant shall be used or maintained without first obtaining a permit. Permits shall be required as set forth in Section 105.6.

Add the following new subsection:

1701.3 License. No person shall conduct fumigation or insecticidal operations without first obtaining a license from the City and County of Denver Department of Excise and Licenses as required by the Revised Municipal Code.

SECTION 1703
FIRE SAFETY REQUIREMENTS

Add the following subsections:

1703.1.1 Usage warning signs. Where fumigants and thermal insecticidal fogging products are used, approved warning signs bearing the "skull and crossbones" emblem with the warning "DANGER! POISON GAS! KEEP OUT!" AND notices pertaining to the type of chemicals being used shall be posted. The notices pertaining to the type of chemicals for fumigation and thermal insecticidal fogging shall be printed in red ink on a white background. Letters in the headlines shall be at least 2 inches (51 mm) in height and shall state the date and time of the operation, the name and address of the person, the name of the operator in charge, and a warning stating that the occupied premises shall be vacated at least 1 hour before the operation begins and shall not be reentered until the danger signs have been removed by the proper authorities.

1703.1.2 Storage warning signs. Where fumigants and thermal insecticidal fogging products are stored NFPA 704 placard guidelines shall be followed.

Replace Section 1703.3.1 with the following:

1703.3.1 Warning signs. Approved warning signs indicating the danger, type of chemical involved and necessary precautions shall be posted on all doors and entrances to the premises, rooms and areas containing chemicals for fumigation and thermal insecticidal fogging. Approived warning signs indicating the danger, type of chemical involved and necessary precaustions shall be posted on all doors and entrances to the premises and upon all gangplanks andladders from the deck, pier or land to the ship. Such notices shall be printed in red ink on a white background. Letters in the headlines shall be at least 2 inches (51 mm) in height and shall state the date and time of the operation, the name and address of the person, the name of the operator in charge, and a warning stating that the occupied premises shall be vacated at least 1 hour before the operation begins and shall not be reentered until the danger signs have been removed by the proper authorities.

CHAPTER 19
LUMBER YARDS AND WOODWORKING FACILITIES

SECTION 1903
GENERAL REQUIREMENTS

Replace Section 1903.5.3 with the following:

1903.5.3 Smoking. Smoking is prohibited in lumberyards and woodworking facilities, except in designated areas. Owner or occupant shall post approved "No Smoking" signs complying with section 310. The fire code official is authorized to designate specific locations where smoking is allowed.

SECTION 1904
FIRE PROTECTION

Replace Section 1904.2 with the following:

1904.2 Portable fire extinguishers and standpipes. Portable fire extinguishers or standpipes supplied from an approved water system shall be provided within 50 feet (15240 mm) of travel distance to any machine producing shavings or sawdust. Extinguishers shall be provided in accordance with Section 906 for extra-high hazards.

SECTION1909
EXTERIOR STORAGE OF FINISHED LUMBER PRODUCTS

Replace Section 1909.5 with the following:

1909.5 Fire protection. An approved hydrant and portable fire-extinguishing equipment suitable for the fire hazard involved shall be provided for open storage yards. Hydrant systems shall be installed in accordance with NFPA 24. Portable fire extinguishers complying with Section 906 shall be located so that the travel distance to the nearest unit does not exceed 75 feet (22860mm). Portable fire extinguishers located in open storage yards shall be protected from weather and shall be maintained per NFPA 10. Portable fire extinguishers complying with Section 906 and with a minimum rating of 4-A:40-B:C shall be provided on all vehicles operating in a lumber storage yard.

CHAPTER 20
MANUFACTURE OFORGANIC COATINGS

SECTION 2001
GENERAL

Add the following language to the end of Section 2001.1:

Manufacture of organic coatings shall comply with NFPA 35.

SECTION 2003
GENERAL PRECAUTIONS

Add the following subsection:

2003.12 Organic coating processes. Enclosed structures involving organic coating processes in which Class I liquids are processed or handled shall be ventilated at a rate of not less than 1 cfm/ft^2 [0.00508 $m^3/(s \cdot m^2)$] of solid floor area. Ventilation shall be accomplished by exhaust fans that intake at floor levels and discharge to a safe location outside the structure. Noncontaminated intake air shall be introduced in such a manner that all portions of solid floor areas are provided with continuous uniformly distributed air movement.

CHAPTER 21
INDUSTRIAL OVENS

SECTION 2103
LOCATION

Add the following to the end of Section 2103.1:

See NFPA 86, *Standard for Ovens and Furnaces.*

Add the following new subsections:

2103.5 Location. Ovens, oven heaters and related equipment shall be located with due regard to the possibility of fire resulting form overheating or from the escape of fuel gas or fuel oil and the possibility of damage to the building and injury to persons resulting form explosion.

1. Ovens shall be located at or above grade, or if in basements, at least 50% of the wall are of the room in which the oven is located shall be above grade.

2. Ovens shall be so located as to be readily accessible for inspection and maintenance and with adequate clearances to permit the proper functioning of explosion vents.

2103.6 Relief (explosion) vents. Ovens which may contain flammable air-gas mixtures shall be equipped with relief vents for freely relieving internal explosion pressures.

2103.7 Ductwork. All ductwork shall be constructed of approved non-combustible material. Ducts shall be made tight throughout and shall have no openings other than those required for the proper operation and maintenance of the system. Ducts passing through combustible walls, ceilings, floors or roofs shall provide adequate insulation and clearances to prevent surface temperatures from exceeding 160 degrees F. Exhaust ducts shall not discharge within 10 feet of doors, windows or other air intakes in a manner that will permit re-entry of vapors into the building.

CHAPTER 22
MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

SECTION 2201
GENERAL

Delete the following section:

2201.4 Indoor motor fuel-dispensing facilities.

SECTION 2204
DISPENSING OPERATIONS

Section 2204.3 is replaced as follows:

2204.3. Unattended public self-service motor fuel-dispensing facilities are prohibited.

SECTION 2205
OPERATIONAL REQUIREMENTS

Replace Section 2205.6 with the following:

2205.6 Warning signs. Warning signs shall be conspicuously posted within sight of each dispenser in the fuel-dispensing area. Warning signs shall have letters of not less than three (3) inches (76 mm) in height on a background of contrasting color (but avoiding contrasts that are invisible to colorblind people) with the following or approved equivalent wording:

WARNING

NO SMOKING

Stop Engine While Fueling

Shut Off Electricity

Do Not Use Cell Phone During Fueling

Remain at Nozzle—Do Not Re-enter Vehicle During Fueling

SECTION 2206
FLAMMABLE AND COMBUSTIBLE LIQUID MOTOR FUEL-DISPENSING FACILITIES

Delete the following section:

2206.2.2 Above ground tanks located inside buildings.

Add the following Item #5 to Section 2206.2.3:

5. Above grade tanks shall be a listed UL 2085 tank or tank shall be enclosed per Section 2206.2.6.

SECTION 2211
REPAIR GARAGES

Amend sentence in Section 2211.2.2 to read as follows:

Tanks **or containers** storing Class IIIB liquids in repair garages are allowed to be located at, below or above grade, provided that adequate drainage or containment is provided.

Add the following new section:

2211.4.4 Fire Protection Systems. Buildings equipped with an automatic sprinkler system, the pits and below-grade work areas shall be installed with separately zoned approved sprinkler system. Pits and below grade work areas shall be equipped with flammable vapor monitoring alarm. Alarm initiation shall be local only.

CHAPTER 23
HIGH-PILED COMBUSTIBLE STORAGE

SECTION 2301
GENERAL

Amend 2301.3 Construction Documents by adding Item #15 as follows:

15. Submit Hazardous Material Inventory Statement (HMIS).

SECTION 2306
GENERAL FIRE PROTECTION AND LIFE SAFETY FEATURES

Amend Table 2306.2 by deleting Footnote J and the following rows:

Detlete: Option 2 under column heading "Size of High-piled Storage Area"for both Commodity Classes "I-IV" and "High hazard."

Delete: Footnote J

Replace Section 2306.7 with the following:

2306.7 Smoke and heat removal. Where smoke and heat removal is required by Table 2306.2, smoke heat vents shall be provided in accordance with Table 910.3. Where draft curtains are required by Section 903.3.1.1, they shall be provided in accordance with Section 910.3.4.

Add the following new Section 2306.8.1 as follows:

2306.8.1 Small Hose. Provide 1 ½" small hose connections in areas containing high-piled or high rack storage. Small hose connections shall be located in high-piled areas and at every other exterior door with hose reach not exceeding 130 feet in line of travel from the connection. Installation and design of small hose connections shall be in accordance with Section 903.3.1.1. All piping supplying small hose connections areas shall be no less than 1 ½" in diameter. Small hose connections shall be supplied from an adjacent sprinkler zone or a separate standpipe system. Outside hydrants may not be substituted for small hose connections. Submittal and placement of small hose connections is subject to tenant rack layout. Fire protection system shop drawings shall be submitted for review and approval prior to installation of these systems.

Exception: In buildings protected by an approved early suppression fast response (ESFR) sprinkler system provide one small hose connection inside the building adjacent to exterior access doors and within the high-piled areas with the hose reach not exceeding 200 feet.

Add the following new Section 2311 Existing Buildings as follows:

SECTION 2311
EXISTING BUILDINGS

2311.1 Scope-Existing buildings constructed prior to October 1990. This section is applicable to high-piled or rack storage in existing buildings as follows:

1. Any modification to the existing commodities stored in an existing tenant space where storage height is increased or classification of the commodities is placed in a higher category per IFC 2303.

2. New tenant spaces in existing buildings.
3. Existing tenant spaces with new tenants.
4. In buildings that were built and occupied by a tenant with high-piled combustible stock prior to the adoption of the Uniform Codes on October 1, 1990; as long as that tenant remains in operation, it will be up to the Fire Department inspection to identify any unsafe conditions per section 110.

2311.2 Storage of Class I commodity – as defined by NFPA 13.

2311.2.1 Automatic sprinklers. Where an automatic sprinkler system is required by Table 2306.2, an approved automatic sprinkler system shall be provided in accordance with section 903.3.

Exception: Existing automatic sprinkler system will be accepted, provided it is certified by a licensed Colorado professional engineer or a NICET Level III certified individual to provide a protection level equal to at least 70% design density of section 903.3.

2311.2.2 Building access. Building access from fire apparatus access roads in accordance with section 503 shall be provided within 200 feet of all portions of the exterior walls of a building used for high-piled storage.

2311.2.2.1 Access doors. Fire department access doors shall be provided in accordance with Section 2306.6.1. Access doors shall be accessible without the use of a ladder. Roll-up doors shall not be used unless approved.

2311.2.3 Small hose stations. Small hose valves and stations shall be provided with approved 1-1/2 - inch (38.1 mm) hose valves at approved locations per Section 2306.8.1.

2311.2.4 Aisles. Shall be accordance with Section 2306.9 or Section 903.3.1, the most restrictive shall govern.

2311.2.5 Portable fire extinguishers. Shall be accordance with Section 2306.10

2311.3 Storage of Class II and III commodity as defined by NFPA 13.

2311.3.1 Automatic sprinklers. Where an automatic sprinkler system is required by Table 2306.2, an approved automatic sprinkler system shall be provided in accordance with Section 903.3.1.

Exception: Existing automatic sprinkler system will be accepted, provided it is certified by a licensed Colorado professional engineer or a NICET Level III certified individual to provide a protection level equal to at least 70% design density of section 903.3.

2311.3.2 Building Access. Building access from fire apparatus access roads in accordance with section 503 shall be provided within 200 feet of all portions of the exterior walls of a building used for high-piled storage.

2311.3.2.1 Access doors. Fire department access doors shall be provided in accordance with Section 2306.6.1. Access doors shall be accessible without the use of a ladder. Roll-up doors shall not be used unless approved.

2311.3.3 Smoke and Heat Removal. Smoke and heat vents shall be provided in accordance with Section 2306.7 with a vent area to floor area ratio of 1:200. Draft curtains shall not be required when separation between high-piled storage and non high-piled storage is in accordance with Section 2306.3 and not required per section 903.3.

Exceptions:

1. When the installation of smoke and heat vents is determined by the fire code official to be impractical, mechanical smoke- removal systems are allowed to be provided in accordance with Section 910.4.

2. Frozen food storage classified as a Class II commodity is not required to be provided with smoke and heat vents or mechanical smoke removal when protected by an automatic sprinkler system.

3. Existing roof openings such as skylights may be used as smoke vents when approved by the Fire code official.

2311.3.4 Small hose stations. Small hose valves and stations shall be provided with approved 1-1/2-inch (38.1 mm) hose valves provided at approved locations per section 2306.8.1.

2311.3.5 Aisles. Shall be accordance with Section 2306.9 or Section 903.3.1, the most restrictive shall govern.

2311.3.6 Portable fire extinguishers. Shall be accordance with Section 2306.10.

2311.4 Storage of Class IV, high-hazards and plastics commodities - as defined by NFPA 13.

2311.4.1 Automatic sprinklers. Where an automatic sprinkler system is required by Table 2306.2, an approved automatic sprinkler system shall be provided in accordance with Section 903.3.

2311.4.2 Building Access. Building access from fire apparatus access roads in accordance with section 503 shall be provided within 100 feet of all portions of the exterior walls of building used for high-piled storage.

2311.4.2.1 Access doors. Fire department access doors shall be provided in accordance with Section 2306.6.1. Access doors shall be accessible without the use of a ladder. Roll-up doors shall not be used unless approved.

2311.4.3 Smoke and Heat Removal. Smoke and heat vents shall be provided in accordance with Section 2306.7 with vent area to floor area ratio accordance with Table 910.3.

Exception: When the installation of smoke and heat vents is determined by the fire code official to be impractical, mechanical smoke-removal systems are allowed to be provided in accordance with Section 910.4.

2311.4.4 Small hose stations. Small hose valves and stations shall be provided with approved 1-1/2-inch (38.1 mm) hose valves shall be provided at approved locations per section 2306.8.1.

2311.4.5 Aisles. Shall be accordance with Section 2306.9 or Section 903.3.,1 the most restrictive shall govern.

2311.4.6 Portable fire extinguishers. Shall be in accordance with Section 2306.10

2311.5 Storage rack installation A building permit shall be required for all rack system installations.

- Drawings must be submitted to the Denver Fire Department for review prior to the issuance of a permit, showing:
  a. Scaled plans.
  b. The rack arrangement in the warehouse area with sufficient detail to allow an exiting analysis per IBC Chapter 10.
  c. A typical section view showing the height of the racks.
  d. Completed Hazards Material Inventory Statement (HMIS) and height of all commonidies.
- Indicate the location of any required smoke and heat vents and draft curtains in relation to the rack locations.

- Structural analysis per 2003 International Building Code Chapter 16 will be required on the **new** rack systems. Installation and application shall be in accordance with the rack manufacturer's recommendations.

  Exception: Existing rack systems that are being relocated to a new tenant space.

2311.6 Solid-piled and shelf storage. Shall be accordance with Section 2307

CHAPTER 24
TENTS, CANOPIES AND OTHER MEMBRANE STRUCTURES

SECTION 2403
TEMPORARY TENTS, CANOPIES AND MEMBRANE STRUCTURES

Replace Section 2403.2 as follows:

2403.2 Approval required. Tents and membrane structures having an area in excess of 200 square feet and canopies in excess of 300 square feet shall not be erected, operated, or maintained for any purpose without first obtaining a permit and approval from the fire code official.

Exception: Tents used exclusively for recreational camping purposes.

SECTION 2404
TEMPORARY AND PERMANENT TENTS, CANOPIES AND MEMBRANE STRUCTURES

Replace Section 2404.20 as follows:

2404.20 Standby personnel. When, in the opinion of the fire code official, it is essential for public safety in a tent, canopy, or membrane structure used as a place of assembly or any other use where people congregate, or any building premise or property where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest, or activity, or when potentially hazardous conditions exist, or an occupant load varies due to large crowd movement from one building to another building or one area of a building to another area of the building, or there is a reduction in a life safety feature, or there is an impairment to a fire protection feature, the owner, agency, or lessee shall employ and compensate through Department of Safety channels, at a rate established by the Manager of Safety, one or more firefighters of the City and County of Denver, as required by the Fire Code Official. Such firefighter(s) shall be subject to the Fire Code Official's orders at all times when so employed and shall be in uniform and remain on duty during the times such places are open to the public or when such activity is being conducted or, in the case of residential occupancies, whenever occupied.

CHAPTER 25
TIRE REBUILDING AND TIRE STORAGE

SECTION 2501
GENERAL

Replace Section 2501.1 with the following:

2501.1 Scope. Tire rebuilding plants, tire storage and tire by-product facilities shall comply with this chapter, other applicable requirements of this code and NFPA 13. Tire storage in buildings shall also comply with Chapter 23.

SECTION 2508
FIRE PROTECTION

Add new section as follows:

2508.3 Automatic sprinkler systems. Automatic sprinkler systems shall be installed in accordance with Section 903.2.8.2.

CHAPTER 26
WELDING AND OTHER HOT WORK

SECTION 2601
GENERAL

Section 2601.2 is replaced with the following:

2601.2 Permits. All welding and hot work shall comply with applicable Denver Fire Department policies, including hot works, fire watch, LPG, roofing and compressed gas. Permits shall be required as set forth in Section 105.6.

SECTION 2604
FIRE SAFETY REQUIREMENTS

Add new Section 2604.1.10 as follows:

2604.1.10 Prohibited areas: Hot work shall not be conducted in rooms or areas where flammable liquids or vapors, lint, dust, or combustible storage is at risk of ignition from sparks or hot metal from the hot work in other locations as determined by the Fire code official.

SECTION 2605
GAS WELDING AND CUTTING

Add the following to end of Section 2605.2:

Ordinary rope slings or electromagnets shall not be used.

SECTION 2608
ACETYLENE GENERATORS

Section 2608.1 is amended as follows:

2608.1 Use of acetylene generators. The use of acetylene generators shall comply with this section and NFPA 51 and 51A.

CHAPTER 27
HAZARDOUS MATERIALS—GENERAL PROVISIONS

SECTION 2701
GENERAL

Replace Section 2701.3 with the following:

2701.3 Performance-based design alternative. When approved by the fire code official, building and facilities where hazardous materials are stored, used or handled shall be permitted to comply with this section as an alternative to compliance with the other requirements set forth in this chapter and Chapters 28 through 45. Written approval shall be obtained from the fire code official prior to submitting a performance-based design.

Amend Item #5 of Section 2701.5.2 as follows:

5. Chemical Abstract Service (CAS) identification number required. United Nations (UN) and North America (NA) identification numbers may be provided as additional information.

SECTION 2702
DEFINITIONS

Add the following definitions to Section 2702.1:

CARCINOGEN. A substance that causes the development of cancerous growths in living tissue. A chemical is considered to be a carcinogen if:

1. It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen, or
2. It is listed as a carcinogen or potential carcinogen in the latest edition of the Annual Report on Carcinogens published by the National Toxicology Program, or
3. It is regulated by OSHA as a carcinogen.

OTHER HEALTH HAZARD MATERIAL. A hazardous material which affects target organs of the body, including but not limited to, those materials which produce liver damage, kidney damage, damage to the nervous system, act on the blood to decrease hemoglobin function, deprive the body tissue of oxygen, or affect reproductive capabilities, including mutations (chromosomal damage) or teratogens (effects on fetuses).

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

RELEASE/UNAUTHORIZED DISCHARGE. Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discharging of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant).

SENSITIZER. A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

SECTION 2703
GENERAL REQUIREMENTS

Amend Section 2703.4 as follows:

2703.4 Material Safety Data Sheets. Material Safety Data Sheets (MSDS) shall be readily available on the premises (*hard copy shall always be required*) for hazardous materials regulated by this chapter. Material Safety Data Sheets shall be located at the main entrance or a location approved by the fire department (AHJ). When a hazardous substance is developed in a laboratory, available information shall be documented and maintained at a fire department (AHJ) approved location.

Add the following new Section 2703.5.2 as follows:

2703.5.2 Confined spaces. Tanks that contain materials that would not contain enough oxygen to support life shall have a confined space sign at the entrance to the tank.

SECTION 2704
STORAGE

Amend Table 2704.2.2 as follows:

TABLE 2704.2.2
REQUIRED SECONDARY CONTAINMENT-
HAZARDOUS MATERIAL SOLIDS AND LIQUIDS STORAGE

MATERIAL	INDOOR STORAGE		OUTDOOR STORAGE	
	Solids	Liquids	Solids	Liquids
2. Health-hazard materials				
Carcinogens	Not Required	Not Required	Not Required	Required
Corrosives	Not Required	Required	Not Required	Required
Highly toxics	Required	Required	Required	Required
Irritants	Not Required	Not Required	Not Required	Required
Other health hazards	Not Required	Not Required	Not Required	Required
Radioactive	Required	Not Applicable	Not Applicable	Not Applicable
Sensitizers	Not Required	Not Required	Not Required	Required
Toxics	Required	Required	Required	Required

Replace Section 2704.9 with the following:

2704.9 Emergency alarm. An approved manual emergency alarm system shall be provided in buildings, rooms or areas used for storage of hazardous materials. Emergency alarm-initiating devices shall be installed outside of each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials. The Denver Fire Department, based on the specific hazards associated with materials being stored shall determine the type of alarm. The emergency alarm for hazardous materials shall be connected to the fire alarm system and shall be annunciated as a separate zone(s) as per section 907.2.5.1, of the Fire Code. System components (equipment) shall be listed for the worst-case weather and temperature ranges to which the equipment will be exposed.

Replace Section 2704.10 with the following:

2704.10 Supervision. Emergency alarm, detection and automatic fire-extinguishing systems required by Section 2704 shall be supervised by an approved class 1 central station service.

Replace Section 2704.12 with the following:

2704.12 Noncombustible floor. Except for surfacing, floors, walkways, ramps, structures for walkways and ramps of storage areas shall be of noncombustible construction.

SECTION 2705
USE, DISPENSING AND HANDLING

Replace Section 2705.1.2 with the following:

2705.1.2 Noncombustible floor. Except for surfacing, floors, walkways, ramps, structures for walkways and ramps of areas where liquid or solid hazardous materials are dispensed or used in open systems shall be of noncombustible, liquid-tight construction.

Replace Section 2705.2.1.1 with the following:

2705.2.1.1 Ventilation. Where gases, liquids or solids having a hazard ranking of 3 or 4 in accordance with NFPA 704 are dispensed or used, mechanical exhaust ventilation shall be provided to capture fumes, mists or vapors at the point of generation. Use as a reference for capture velocity the American Association of Industrial Hygienists (AAICH) handbook, Volume 25.

Exception: Gases, liquids or solids which can be demonstrated not to create harmful fumes, mists or vapors.

CHAPTER 30
COMPRESSED GASES

SECTION 3001
GENERAL

Amend by adding to the end of Section 3001.1 the following:

Compliance with applicable Denver Fire Department policies is required.

CHAPTER 33
EXPLOSIVES AND FIREWORKS

SECTION 3301
GENERAL

Amend Section 3301.1 by deleting exceptions.

Amend Section 3301.1.3 by deleting exceptions.

Replace Section 3301.4 with the following:

Section 3301.4 Qualifications. Persons in charge of magazines, blasting, fireworks display, or pyrotechnic special effect operations shall obtain the appropriate State of Colorado or City and County of Denver license. For pyrotechnic special effect operations, the license is that required for an outdoor display operator. Persons in charge of magazines, blasting, fireworks display, or pyrotechnic special effect operations shall not be under the influence of alcohol or drugs which impair sensory or motor skills, shall be at least 21 years of age, and shall demonstrate knowledge of all safety precautions related to the storage, handling, or use of explosive, explosive material, or fireworks.

Add the following new Section 3301.9:

3301.9 Standby personnel qualifications. Persons in charge of magazines, blasting, fireworks display, or pyrotechnic special effect operations shall obtain the appropriate State of Colorado or City and County of Denver license. For pyrotechnic special effect operations, the license is that required for an Outdoor Display operator. Persons in charge of magazines, blasting, fireworks display, or pyrotechnic special effect operations shall not be under the influence of alcohol or drugs which impair sensory or motor skills, shall be at least 21 years of age, and shall demonstrate knowledge of all safety precautions related to the storage, handling, or use of explosive, explosive material, or fireworks.

Replace Section 3301.2.4 with the following:

3301.2.4 Financial responsibility. Before a permit is issued, as required by section 3301.2, the applicant shall file with the Fire Prevention and Investigation Division a surety bond in the principal sum of $2,000,000 or a public liability insurance policy for the same amount, for the purpose of the payment of all damages to persons or property which arise from, or are cause by, the conduct of any act authorized by the permit upon which any judicial judgement results. The fire code official is authorized to specify a greater or lesser amount when, in his or her opinion, conditions at the location of use indicate a greater or lesser amount is required. Government entities shall be exempt from this bond requirement.

CHAPTER 34
FLAMMABLE AND COMBUSTIBLE LIQUIDS

SECTION 3401
GENERAL

Delete Item #1 of Section 3401.2 Nonapplicability.

Replace Item #2 of Section 3401.2 with the following:

2. Medicines, foodstuffs and cosmetics containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, in retail sales or storage uses when packaged in individual containers not exceeding 5 liters.

Replace Section 3401.4 with the following:

3401.4 Permits. Denver Fire Department policy on service stations shall apply to the storage, use, dispensing, mixing and handling of flammable and combustible liquids.

Add new Section 3401.4.1 as follows:

3401.4.1 Application. Plans shall be submitted with each application for a permit to store more than 30 gallons (18 925 L) of liquids outside of buildings in drums or tanks. The plans shall indicate the method of storage quantities to be stored, distances from buildings and property lines, access ways, fire-protection facilities, and provisions for spill control, drainage control and secondary containment.

SECTION 3402
DEFINITIONS

Add the following definition to Section 3402.1:

FLOATING ROOF TANK. A tank which incorporates either:

1. A pontoon or double-deck metal floating roof in an open-top tank, or
2. A fixed metal roof with ventilation at the top and roof eaves and containing a metal floating roof or cover meeting the following requirements:

   2.1 A pontoon or double-deck metal floating roof, or

   2.2 A metal floating cover supported by liquid-tight metal pontoons or floats which provide sufficient buoyancy to prevent sinking of the cover when one half of the pontoons or floats is punctured. An internal metal floating pan, roof or cover which does not meet the requirements of Item 2, or one which uses plastic foam, except for seals, for flotation, even if capsulated in metal or fiberglass, shall be treated as a fixed roof tank.

SECTION 3404
STORAGE

Delete Section 3404.3.8.5

SECTION 3406

SPECIAL OPERATIONS

Amend Section 3406.2.5 to read as follows:

3406.2.5 Type of tank. Tanks shall be provided with top openings only. Dispensing by use of gravity is prohibited.

Delete Section 3406.2.5.2 in its entirety and replace with the following:

3406.2.5.2 Tanks for gravity discharge. Dispensing by use of gravity is prohibited.

CHAPTER 35
FLAMMABLE GASES

SECTION 3501
GENERAL

Replace Section 3501.2 with the following:

3501.2 Permits. Permits shall be required as set forth in Section 105.6 and applicable Denver Fire Department policies.

CHAPTER 36
FLAMMABLE SOLIDS

SECTION 3602
DEFINITIONS

Add the following to the end of definition of FLAMMABLE SOLID:

Flammable solids include finely divided solid materials which, when dispersed in air as a cloud, could be ignited and cause an explosion.

CHAPTER 37
HIGHLY TOXIC AND TOXIC MATERIALS

SECTION 3703
HIGHLY TOXIC AND TOXIC SOLIDS AND LIQUIDS

Replace Section 3703.1.2 with the following:

3703.1.2 Quantities exceeding the maximum allowable quantity per control area. The indoor storage or use of highly toxic and toxic solids or liquids in amounts exceeding the maximum allowable quantity per control area set forth in Table 2703.1.1(2) shall be in accordance with Sections 3701 through 3703.1.5 and Chapter 27.

CHAPTER 38
LIQUEFIED PETROLEUM GASES

SECTION 3801
GENERAL

Add the following to the end of Section 3801.1:

and Denver Fire Department policy on the use and storae of LPG.

Replace Section 3801.2 with the following:

3801.2 Permits. Permits shall be required as set forth in Section 105.6 and 105.7 and applicable Denver Fire Department policies.

SECTION 3803
INSTALLATION OF EQUIPMENT

Add the following to the end of Section 3803.2.1.2:

and Denver Fire Department policy on temporary heating.

Add new Section 3803.2.1.2.1 as follows:

3803.2.1.2.1 LP-gas roofing operations. LP-gas used or stored at roofing sites shall comply with Denver Fire Department policy.

Add the following to the end of Section 3803.2.1.7:

Such containers shall not exceed a water capacity of 2.5 pounds (1 kg).

Add the following to the end of Section 3803.3:

Not allowed for permanent use if within 300 feet of a natural gas source.

SECTION 3809
STORAGE OF PORTABLE LP-GAS CONTAINERS AWAITING USE OR RESALE

Replace Section 3809.6 with the following:

3809.6 Storage on roofs. LP-gas storage on roofs is not permitted. See Denver Fire Department policy.

CHAPTER 42
PYROXYLIN (CELLULOSE NITRATE) PLASTICS

SECTION 4204
STORAGE AND HANDLING

Add the following new subsection:

4201.3.1 Automatic sprinkler system protection. Provide one approved automatic sprinkler head to each 125 cubic feet (3.5 cubic meter) of toal vault space.

CHAPTER 45
REFERENCED STANDARDS

Replace the specific NFPA Standards listed in Chapter 45 with the following:

NFPA	National Fire Protection Association Battery March Park Quincy, MA 02269 NFPA Codes and Standards—2002 Edition Volumes 1 through 15

Addition: Reference the following standard:

National Chlorine Institute	Chlorine Manual 5th printing—1986

Addition: Reference the following standard:

Institute of Makers of Explosives	Institute of Makers of Explosives 1575 I Street N.W. Suite #550 Washington, D.C. 20005

Addition: Reference the following standards:

Pamphlet 1	Construction Guide for Storage Magazines
Pamphlet 3	Suggested Code Regulations
Pamphlet 17	Safety in the Transportation, Storage, Handling and Use of Explosives
Pamphlet 20	Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Electric Blasting Caps
Pamphlet 21	Destruction of Commercial Explosives
Pamphlet 22 (b)IME	Standard for the Safe Transportation of Class C Detonators (Blasting Caps) in a Vehicle with Certain Other Explosives (March 1979)

APPENDIX B
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

SECTION B105
FIREFLOW REQUIREMENTS FOR BUILDINGS

Replace B105.2 with the following:

B 105.2 Buildings other than one- and two-family dwellings. The minimum fire flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in table B105.1.

Exception: A reduction in required fire flow of up to 50 percent, as approved, is allowed when the building is protected throughout with an automatic fire sprinkler system installed in accordance with NFPA 13 *Standard for the Installation of Sprinkler Systems.* Where buildings protected throughout by fire sprinklers are also of Type I or II construction and are a light-hazard occupancy as defined by NFPA 13, the reduction may be up to 75 percent. The resulting fire flow shall not be less than 1,500 gallons per minute (5,678 L/min) for the prescribed duration as specified in table B 105.1. Any existing hydrant shall flow no less than 1,500 gpm (gallons per minute), with a minimum residual pressure of 20 psi (pounds per square inch).

Amend Table B105.1 by deleting Footnote a.

APPENDIX C

FIRE HYDRANT LOCATIONS AND DISTRIBUTION

Add new Section C106 as follows:

C106.1 Water main size. Water mains supplying fire hydrants, fire protection systems, and building fire flows, shall be sized to provide for the required building fire flows in addition to the fire flow requirements for required fire hydrants.

AMENDMENTS TO THE 2003 EDITION OF THE INTERNATIONAL RESIDENTIAL CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINSTRATION

SECTION R101
TITLE, SCOPE AND PURPOSE

Section R101.1 is amended by deletion and replacement with the following

R101.1 Title. These provisions shall be known as the Residential Code for One- and Two-Family Dwellings of the City and County of Denver, and shall be cited as such and will be referred to herein as "this code".

Sections R103 through R114 are amended by deleting those sections in their entirety. The Administrative provisions of the Denver Building Code shall govern.

CHAPTER 3
BUILDING PLANNING

SECTION R301
DESIGN CRITERIA

Table R301.2(1) is amended as follows:

TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

GROUND SNOW LOAD	WIND SPEED (MPH)	SEISMIC DESIGN CATEGORY	SUBJECT TO DAMAGE FROM				WINTER DESIGN TEMP	ICE SHIELD UNDER-LAYMENT REQUIRED	FLOOD HAZARDS	AIR FREEZING INDEX	MEAN ANNUAL TEMP
			Weathering	Frost line depth	Termite	Decay					
25	90/100	B	Severe	36	Slight/Mod	None/ Slight	1°	No	1978	712	40-45

SECTION R305
CEILING HEIGHT

Section R305.1 Exception 2 is amended by adding the following to the last sentence.

Ceiling height in unfinished basements built prior to October 1990 shall be a minimum ceiling height of 6' 8" with a minimum clearance of 6' 0" to any ceiling projection caused by beams, ducts or pipes. If unusual circumstances are present, ceiling heights lower than 6' 8" are subject to the approval of the Building Official.

SECTION R309
GARAGES AND CARPORTS

Section R309.1 is amended by adding the following to the last sentence:

All doors must be equipped with approved self closing devices.

Section R309.2 is amended by replacing the first and last sentence with the following:

The garage shall be separated from the residence and its attic area by not less than 5/8" gypsum board applied to the garage side.

Where the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than 5/8 inch gypsum board or equivalent.

SECTION R310
EMERGENCY ESCAPE AND RESCUE OPENINGS

Section R310.1.1 Minimum opening area is amended by deleting the Exception.

Section R310.1.4 is amended by deleting and replacing with the following:

Section R310.1.4 Operation constraints. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools, special knowledge or effort.

Section R310.4 is amended by deleting and replacing with the following:

R310.4 Bars, grills, covers and screens. Bars grills, covers, screens or similar devices are permitted to be placed over emergency escape and rescue openings, bulkhead enclosures, or window wells that serve such openings, provided the minimum net clear opening size complies with Section R310.1.1 to R310.1.3 and such devices shall be releasable or removable from the inside without the use of a key, tool, special knowledge or force greater than that which is required for normal operations of the escapee and rescue opening."

Section R310.4.1 is added.

R310.4.1 Special provisions for operable windows. Openings of operable windows shall not be less than 21 inches above the floor of the room that has the window, when the sill is located 30 inches above the exterior grade, adjacent exterior floor or balcony floor, or located adjacent to a roof surface.

Exception:

1. Windows that when opened do not allow a 4 inch sphere to pass through the opening or which are normally enclosed but may be opened for cleaning as maintenance.
2. Open areas of the window that are protected by bars, grills, grates, or similar devices other than insect screens, through which a 4 inch sphere will not pass.
3. Escape or rescue windows covered with bars, grills, grates or similar devices that comply with Section R310.1.1 to R310.1.3 and the spacing between bars will not allow a 4 inch sphere to pass through.

SECTION R317
DWELLING UNIT SEPARATION

Section R317.1 is amended by adding the following sentence:

Where a property line exists between units, separation walls shall comply with the requirements of R317.2.

[B] SECTION R322
ACCESSIBILITY

Section R322.1 is amended by adding the following sentence:

In addition to the requirements of this section, the provisions of the Colorado Revised Statute 9-5 shall be applicable. CRS 9-5 is reproduced in Appendix M of the Denver Amendments to the IBC.

CHAPTER 4
FOUNDATIONS

SECTION R401
GENERAL

Section R401.1 is amended by adding the following sentence:

Wastewater Management Division of Public Works regulates the requirements for excavation, grading and earthwork construction, including fills and embankments.

Section R401.4 is amended by deleting in its entirity and replacing with the following:

R401.4 Soil tests. The classification of the soil at each building site shall be determined when required by the Building Official. The Building Official may require that this determination be made by an engineer or architect licensed by the state to practice as such.

R401.4.1 Investigation. The classification shall be based on observation and any necessary tests of the materials disclosed by borings or excavations made in appropriate locations. Additional studies may be necessary to evaluate soil strength, the effect of moisture variation on soil bearing capacity, compressibility, liquefaction, and expansiveness.

R401.4.2 Reports. The soil classification and design bearing capacity shall be shown on the plans, unless the foundation conforms to Table R403.1. The Building Official may require submission of a written report of the investigation, which shall include, but need not be limited to, the following information:

1. A plot showing the location of the test borings and/or excavations.
2. Description and classifications of the materials encountered.
3. Elevation of the water table, if encountered.
4. Recommendations for foundation type and design criteria, including bearing capacity, provisions to mitigate the effects of expansive soils, provisions to mitigate the effects of liquefaction and soil strength, and the effects of adjacent loads.
5. Expected total and differential settlement.

SECTION R404
FOUNDATION WALLS

Section R404.1 is amended by replacing with the following:

R404.1 Concrete and masonry foundation walls. Concrete and masonry foundation walls shall be selected and constructed in accordance with the provisions of this section or in accordance with ACI 318, NCMA TR68-A or ACI 530/ASCE5/TMS 402 or other approved structural standards.

Section R404.1.6 Height above finished grade is amended in its entirety by the following:

R404.1.6 Height above finished grade. Concrete and masonry foundation walls shall extend above the finished grade adjacent to the foundation at all points a minimum of 6 inches (152 mm) where masonry veneer is used and minimum of 6 inches (152 mm) elsewhere.

SECTION R405
FOUNDATION DRAINAGE

Section R405.1 is amended in its replacing the Exception by the following:

Exception: A drainage system is not required if it is determined by the soils engineer, or design architect or engineer if a soils test is not done, that the foundation is installed on well-drained ground or sand-gravel mixture soils according to the Unified Soil Classification System, Group I Soils, as detailed in Table R405.1.

CHAPTER 7
WALL COVERING

SECTION R703
EXTERIOR COVERING

Section R703.2 is amended by deleting Exception #3 and #4.

CHAPTER 9
ROOF ASSEMBLIES

SECTION R903
WEATHER PROTECTION

Section R903.2.2 is added.

R903.2.2 Flashing for Single-ply roof systems. All flashing installations for single-ply roofing systems shall be installed per manufacturer's latest recommendations and details for the system.

Section R903.2.3 is added.

R903.2.3 Flashing for interior roof drains. Flashing for interior roof drains shall be one of the following:

1. A minimum of 2 x 2 feet, 4-pound lead sheet or lead-copper coated sheet, set on completed felts in flashing cement.
2. The metal shall be turned a minimum of ½ inch into a drain sump and plied with 2 plies of Type 15 felt.
3. A 2-component drain system. The membrane flashing shall be polyvinylchloride sheet measuring 22 inches in its overall length, and factory-attached to the underside of the strainer flange. The membrane flashing shall be applied on top of the completed felt, shall extend a minimum of 7 inches from the outside diameter of the drain throat, shall be set into hot asphalt or roofing cement, and plied in with 2 plies of Type 15 felt.
4. Drain details for single-ply systems shall be installed per manufacturer'

Section R903.2.4 is added.

R903.2.5.1 Equipment on roof. Equipment placed, replaced or reset over roofing shall be supported by curbs or legs, which shall be flashed to the roofing and made watertight.

Section R903.4.2 is added.

R903.4.2 Drain installation for single-ply system. Drains for single-ply roof systems shall be installed per the latest manufacturer's details and recommendations.

Section R903.4.3 is added.

R903.4.3 Vertical Projections. All projections through the roof surface shall be properly flashed to prevent moisture entry.

1. Pipe penetrations shall be completed with a standard roof jack or manufacturer-recommended pipe penetration details.
2. Pitch pans are prohibited. Only one pipe through each flashing.
3. Mechanical penetrations may penetrate through properly sized flashing extending 8 inches above the finished roofing with a storm collar.

SECTION R905
REQUIREMENTS FOR ROOF COVERINGS

Section R905.3.9 is added.

R905.3.9 Inspection of tile roofs. Mid-roof inspections shall be made to inspect the battens and flashing. No more than 30% of the roofing shall be completed when requesting the inspection.

Section R905.5.2 is deleted and replaced by the following:

R905.5.2 Deck Slope. Mineral surfaced rolled roofing (90 lbs.) shall not be applied on roof slopes below two units vertical in twelve units horizontal.

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

Section R905.9.4 is added.

R905.9.4 Flashing – new built-up roof covering. Flashing shall be installed on all vertical walls and curbs in accordance with the manufacturer's specifications and:

1. All old wall flashing shall be removed prior to installation of new flashing.
2. All flashing shall extend at least 8 inches, but not more than 12 inches, up all vertical surfaces and at least 4 inches out onto the roof.
3. The top edges of the flashing shall be fastened at 3-inch intervals and sealed with plastic cement.
4. End laps shall be at least 3 inches long, nailed vertically and covered with 4 inches of felt embedded in plastic cement.
5. All vertical walls and projections shall be counterflashed with a 2-piece metal system installed watertight.
6. Nailer strips shall be provided on vertical walls, drips in edge and curbs which will not accept conventional nailing.

CHAPTER 11
ENERGY EFFICIENCY

SECTION N1101
GENERAL

Section N1101.2.1 is amended by adding the following items:

3. The results from using a RESNET HERS (Residential Energy Services Network Home Energy Rating System) with a pass rating of "83"can be utilized to show compliance. A city agreement form must be signed by the applicant committing to the terms of the rating procedure with the building permit application. A $75 fee reduction in the building permit fee is available to builders who utilize this program.

4. The results from a code compliant software can be utilized to show compliance. "REScheck™" - Residential Energy Code Compliance Software is one program currently being accepted. This program developed by the Department of Energy can be downloaded for free at http://www.energycodes.gov/compliance_tools.stm.

Section N1101.2.2 Townhouses is amended by adding the following items:

3. The results from using a RESNET HERS (Residential Energy Services Network Home Energy Rating System) with a pass rating of "83"can be utilized to show compliance. A city agreement form must be signed by the applicant committing to the terms of the rating procedure with the building permit application. A $75 fee reduction in the building permit fee is available to builders who utilize this program.

4. The results from a code compliant software can be utilized to show compliance. "REScheck™" - Residential Energy Code Compliance Software is one program currently being accepted. This program developed by the Department of Energy can be downloaded for free at http://www.energycodes.gov/compliance_tools.stm.

Section N1102.1.10 is amended by deleting and replacing with the following:

N1102.1.10 Air leakage. Protection against air infiltration shall be provided to include the sealing of air leaks through and around windows, doors and penetrations. Buildings shall be built with the following provisions:

1. All electrical outlets and switches on exterior walls and on interior walls which connect with an insulated ceiling or attic shall have foam gaskets installed behind the outlet and switch cover. Recessed lights within insulated ceilings shall be air-tight and IC-rated.

2. Box sills and sill plates shall be sealed at the top of the foundation wall with one of the following:

    a. Closed -cell foam backer rod or gasket, minimum ¼" thick; or

    b. Foam caulk for gaps over ¼" wide and polyurethane caulk for smaller gaps. Fiberglass sill sealers are not permitted.

3. Provide one of the following air infiltration barrier systems:

    a. Seal penetrations in the building envelope with foam sealant and appropriate caulking. Foam sealant and caulking must meet ASTME-814 for fire-stopping characteristics only when sealing penetrations in a fire-rated assembly. Areas to be sealed with foam sealant include the spaces between rough openings and window and door frames; wiring and plumbing penetrations through exterior walls, openings into garage ceiling and wall systems; openings between the house and crawlspaces; and around all accessible penetrations of the ceiling vents, ducts, plumbing lines, electrical cables and light fixtures. Openings around chimney stacks shall be blocked with noncombustible material and sealed with high temperature caulk. Bottom plates

can be sealed to the floor decking with adhesive caulk during framing or a bead of caulking or foam may be applied after walls are in place. Weather-strip the framework around attic hatches and secure hatches and secure the door tightly against the weather-stripping with latches.

b. Wrap the exterior of the house with an infiltration barrier film (water vapor permeability rating of at least 5). It must be continuous from the foundation to the top plate and must be taped with a seal around all penetrations such as windows, doors and utility penetrations.

c. The building can be wrapped with foam sheathing and covered with a flexible stucco-like coating.

d. Use either blow-in blanket or spray cellulose insulation in wall cavities.

e. Install a continuous interior air barrier that relies on sealed drywall (also referred to as the Airtight Drywall Approach -- ADA). Drywall is sealed with air-sealing gasketing or caulk (between deck, rim and top plate).

f. Install interior insulated sheathing with joints taped. The sheathing should be sealed, with either foam or construction-grade tape, all around the base and around all rough openings. Reflective bubble-pack insulation can also be used if it is taped at the seams.

g. Install a foam-core building system in which the wall and ceiling panels are sealed or adhered to each other with compatible caulking or foam material. Where only the walls are made of foam-core material, vertical penetrations from the occupied space into the attic must be sealed as described in Step a.

CHAPTER 15
ENERGY EFFICIENCY

SECTION M1506
MECHANICAL VENTILATION

Section M1506 is amended by adding M1506.4.

M1506.4 Makeup air. Commercial or domestic ranges installed in a dwelling unit which require greater than 450 CFM exhaust for operation per the manufacturers recommendations shall be provided with an interlocked source of makeup air equivalent to the required exhaust volume.

CHAPTER 17
COMBUSTION AIR

SECTION M1702
ALL AIR FROM INSIDE THE BUILDING

Section M1702 is deleted.

SECTION M1703
ALL AIR FROM OUTDOORS

Section M1703.1 Combustion air ducts is amended by adding the following:

Combustion outside air openings must terminate a minimum of 18 inches above grade or 12 inches above roof surfaces within 10 feet of the opening.

Exceptions:

1. In unconfined spaces, a single combustion duct from the outside to within 3 inches of the Firebox having a total free area of 1 square inch per 5,000 BTU of input rating.
2. Compliance with Section 703 is not required for an installation when it has been professionally designed to ensure an adequate supply of combustion air.

In confined spaces where all air is taken from outdoors for an appliance with a minimum of 1 square inch on all sides and back and 6 inches on the front, one opening shall be permitted which terminates within the upper 12 inches of the enclosure and is sized at 1 square inch per 3000 BTU/hr.

Section 1703.4 Under-floor combustion air is deleted.

CHAPTER 21
HYDRONIC PIPING

SECTION M2101
HYDRONIC PIPING SYSTEMS INSTALLATION

Section M2101.1 is amended by adding the following sentence at the end of the paragraph:

Galvanized piping and fittings are not suitable for hydronic systems.

CHAPTER 26
GENERAL PLUMBING REQUIREMENTS

SECTION P2602
INDIVIDUAL WATER SUPPLY AND SEWAGE DISPOSAL

Section P2602 is amended by adding:

P2602.3 Existing buildings. Plumbing in existing buildings may have their use continued, if such use was legal at the time of enforcement of the Plumbing Code in force at the time of Sec. P201.2 construction and such use is not detrimental to the health or safety requirements of current occupancy or use.

Any change in the use or occupancy of any existing building or structure shall comply with the provisions of the 2000 IPC. Any deviations may be approved by the Administrative Authority if they are determined to not be detrimental to health or safety requirements.

SECTION P2604
TRENCHING AND BACKFILLING

Section P2604.6 Trench safety is amended by adding:

P2604.6 Trench safety. All excavations shall follow guidelines as required by OSHA and/or the Administrative Authority. The most restrictive rules shall apply. "Failure to Pass" notices will be issued if unsafe trenches are found at the time of inspection and will require remedy of the issues in question and re-notification to the proper Administrative Authority that the work is ready for re-inspection. Re-inspection fees will be charged on all excavations found unsafe at the time of the inspection.

CHAPTER 27
PLUMBING FIXTURES

SECTION P2717
DISHWASHING MACHINES

Section P2717.2 is amended by deleting the last sentence and adding:

No domestic dishwashing machine shall be directly connected to a drainage system without the use of an approved dishwasher airgap fitting on the discharge side of the dishwashing machine. Listed airgaps shall be installed with the flood level (FL) marking at or above the flood level of the sink or drainboard, whichever is higher, or separately trapped with the airbreak located on the standpipe.

Section P2717.3 Sink, dishwasher and food grinder is amended by deleting the last sentence and adding:

No domestic dishwashing machine shall be directly connected to a drainage system or food waste disposer without the use of an approved dishwasher airgap fitting on the discharge side of the dishwashing machine. Listed airgaps shall be installed with the flood level (FL) marking at or above the flood level of the sink or drainboard, whichever is higher, or separately trapped with the airbreak located on the standpipe.

IRC APPENDICES
STATUS OF APPENDICES ON ADOPTION

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

APPENDIX	TITLE - SUBJECT	STATUS
A	Sizing and Capacity of Gas Piping (1FGS)	Informative
B	Sizing of Venting Systems Serving Appliances (IFGS)	Informative
C	Exit Terminals of Mechanical Draft and Direct-Vent Ventilating Systems (IFGS)	Informative
D	Recommended Procedures for Safety Inspection of an Existing Appliance Installation (IFGS)	Informative
E	Manufactured Housing Used as Dwellings (IBC)	Amended
F	Radon Control Methods	Amended
G	Swimming Pools, Spas and Hot Tubs	Amended
H	Patio Covers	Adopted
I	Private Sewage Disposal	Deleted
J	Existing Buildings and Structures	Deleted
K	Sound Transmission	Adopted
L	IRC Electrical Provisions / NEC Cross Reference	Cross Reference

APPENDIX E
MANUFACTURED HOUSING USED AS DWELLINGS

SECTION AE101
SCOPE

Appendix E is amended in its entirety.

Manufactured housing used as dwellings shall comply with Section 3110 IBC Amendment.

AMENDMENTS TO THE 2003 EDITION OF THE INTERNATIONAL MECHANICAL CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINISTRATION

SECTION 103
DEPARTMENT OF MECHANICAL INSPECTION

Section 103 is deleted in its entirety.

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

Section 104 is deleted in its entirety.

SECTION 105
APPROVAL

Section 105 is deleted in its entirety.

SECTION 106
PERMITS

Section 106 is deleted in its entirety.

SECTION 108
VIOLATIONS

Section 108 is deleted in its entirety.

SECTION 109
MEANS OF APPEAL

Section 109 is deleted in its entirety.

CHAPTER 3
GENERAL REGULATIONS

SECTION 303
EQUIPMENT AND APPLIANCE LOCATION

Section 303.3 is amended by adding item 6:

6. Fuel fired appliances may not be located under stairways.

CHAPTER 4
VENTILATION

SECTION 401
GENERAL

Section 401.5.2 is amended by deleting in its entirety.

CHAPTER 5
EXHAUST SYSTEMS

SECTION 501
GENERAL

Section 501.2 is amended by adding the following after the first paragraph:

Exhaust ducts that terminate on roofs shall be a minimum of 12" above any roof surface within 3 feet.

SECTION 506
COMMERCIAL KITCHEN HOOD VENTILATION SYSTEM DUCTS AND EXHAUST EQUIPMENT

Section 506.3.10 The first sentence is amended as follows:

A Grease duct serving a Type I hood shall be installed in an enclosure from the point where the duct penetrates a fire-rated wall, floor or ceiling assembly.

SECTION 507
COMMERCIAL KITCHEN HOODS

Section 507.2 is amended by adding the following after the first paragraph:

Domestic type kitchen ranges installed in other than individual dwelling units of R Occupancies shall require a Type I hood to be installed unless otherwise approved by the Building Official.

Commercial or domestic ranges installed in the individual dwelling units of R Occupancies and Fire Stations which require greater than 450 CFM exhaust for operation per the manufacturers recommendations shall be provided with an interlocked source of makeup air equivalent to the required exhaust volume.

Section 507.2.1 is amended by adding the following after the first paragraph:

Domestic type kitchen ranges installed in other than individual dwelling units of R occupancies shall require a Type I hood to be installed.

> **Exception:** Type I hood is not required when the domestic range is located in a community room of a residential complex and is used for less than 8 hours per week for noncommercial cooking. Type II hood and fire suppression is required.

Commercial or domestic ranges, installed in individual dwelling units of R occupancies and fire stations, and which require greater than 450cfm exhaust for operation per manufacturers recommendations, shall be provided with an interlock source of makeup air equivalent to the required exhaust volume.

Section 507.2.2 is amended by adding the following Exception:

> **Exceptions:**

3. Dishwashers that are low temperature and not steam producing.

CHAPTER 6
DUCT SYSTEMS

SECTION 601
GENERAL

Section 601.2 is amended by adding the following to Exception 1.

Any transfer-air penetrations through walls separating the corridor from the spaces listed above, should they be made through rated walls, must be protected by combination fire/smoke assemblies.

SECTION 603
DUCT CONSTRUCTION AND INSTALLATION

Section 603.6 is amended by adding the following:

Section 603.6.5 Factory-made air ducts. Approved Class 0 and 1 factory-made air ducts may be installed in any occupancy covered by this Code. Factory made flexible air ducts shall be used only to connect diffusers and grilles to a main duct and shall be limited to a maximum of 16 inches in diameter and 10 feet in length.

Approved high-pressure semi-rigid metal flexible ducts may be used to connect variable volume boxes to main ducts and shall be limited to a maximum of 16 inches in diameter and 10 feet in length.

Exception: Flexible air ducts connected to the outlets of evaporative coolers shall be limited to 20 inches in diameter and 10 feet in length.

SECTION 606
SMOKE DETECTION SYSTEMS CONTROL

Section 606.2 is amended by adding the following:

Exceptions:

2. Automatic shut-off is not required for evaporative coolers or units that supply untempered 100%outside air.

Section 606.2.1 is amended by adding the following Exceptions:

Exceptions:

2. Smoke detectors are not required for Group R, Division 3, and Group U occupancies.
3. Smoke detectors are not required when approved smoke-control systems exist or are required by Denver amendments. This provision would apply to fan coil units, heat pumps, fan-powered boxes or similar systems.
4. Where smoke detector shutoff would create an increased hazard, for example where air handling equipment supplies portions of Group H occupancies, such air handling equipment shall have smoke detection with remote indicator and alarm, and manual shutoff capability at a location as approved by the Fire Prevention and Investigation Division.

CHAPTER 7
COMBUSTION AIR

SECTION 702
INSIDE AIR

Section 702 Inside air is deleted in its entirety.

SECTION 703
OUTDOOR AIR

Section 703.1 is amended by adding the following:

For appliances located in unconfined area where roll-up doors are located, infiltration may be used for combustion air.

Section 703.1.1 is amended by adding the following:

Exceptions:

1. In unconfined spaces, a single combustion duct from the outside to within 3 inches of the Firebox having a total free area of 1 square inch per 5,000 BTU of input rating.
2. Compliance with Section 703 is not required for an installation when it has been professionally designed to ensure an adequate supply of combustion air.

Section 703.1.5 has been added:

Section 703.1.5 Combustion air ducts for residential occupancies. In confined spaces where all air is taken from outdoors for an appliance with a minimum of 1 square inch on all sides and back and 6 inches on the front, one opening shall be permitted which terminates within the upper 12 inches of the enclosure and is sized at 1 square inch per 3000 BTU/hr.

In confined spaces where all air is taken from outdoors for an appliance with a minimum of 1 square inch on all sides and back and 6 inches on the front, one opening shall be permitted which terminates within the upper 12 inches of the enclosure and is sized at 1 square inch per 3000 BTU/hr.

SECTION 704
COMBINED USE OF INSIDE AND OUTSIDE AIR (CONDITION 1)

Section 704 is deleted in its entirety.

SECTION 705
COMBINED USE OF INSIDE AND OUTSIDE AIR (CONDITION 2)

Section 705 is deleted in its entirety.

SECTION 708
COMBUSTION AIR DUCTS

Section 708.1 is amended by adding the following:

9. Combustion outside air openings must terminate a minimum of 18 inches above grade or 12 inches above roof surfaces within 10 feet.

CHAPTER 8
CHIMNEYS AND VENTS

SECTION 804
DIRECT-VENT, INTEGRAL VENT AND MECHANICAL DRAFT SYSTEMS

Section 804.1 Direct-vent terminations is amended as follows:

See Section 503.8 Venting System Terminal Location of the International Fuel Gas Code as amended.

CHAPTER 10
REFRIGERATION

SECTION 1004
BOILERS

Section 1004.4 is amended by adding the following sentences:

The approved base supporting Boilers shall extend not less than 3 inches above the supporting floor. Exterior mounting shall not be located closer that 5 feet to any property line.

CHAPTER 11
REFRIGERATION

SECTION 1101
GENERAL

Section 1101.10 is added:

Section 1101 Storage of refrigerant. Storage of Refrigerant and refrigerant oils must be in accordance with the provisions of the current Fire Code and the IBC.

CHAPTER 12
HYDRONIC PIPING

SECTION 1202
MATERIAL

Section 1202.3 amended by adding the following at the end of the paragraph:

Galvanized piping and fittings are not suitable for hydronic systems.

IMC APPENDICES
STATUS OF APPENDICES ON ADOPTION

Appendix A and B are deleted.

Appendix C is added.

APPENDIX C
BUILDING SERVICES AND PROCESS PIPING SYSTEMS

SECTION C101
BUILDING SERVICES PIPING

Section C101.1 National Standards and Technical Documents. The following standards shall be used for Building Services Piping Systems in the City and County of Denver. These will be recognized for use in this jurisdiction. The list is not limited to these specific standards.

ASME B31.9-1996 BUILDING SERVICES PIPING.

ASME B31.5-2001 REFRIGERATION PIPING AND HEAT TRANSFER COMPONENTS.

ASME B31.1-2001 POWER PIPING.

SECTION C102
PROCESS PIPING

Section C102.1 Process Piping System Standards Piping systems used for Process Piping Systems in the City and County of Denver shall use the following standards. These standards will be recognized for use in this jurisdiction. The list is not limited to these specific standards.

ASME B31.4-2002 PIPELINE TRANSPORTATION SYSTEMS FOR LIQUID HYDROCARBONS AND OTHER LIQUIDS.

ASME B31.3-2003 PROCESS PIPING.

ASME B31.8-2000 GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS.

AMERICAN PETROLEUM INSTITUTE technical documents for the Petroleum Industries.

AMENDMENTS TO THE 2003 EDITION OF THE INTERNATIONAL PLUMBING CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

Amend Section 101.1 Title. by inserting City and County of Denver for the name of the jurisdiction.

SECTION 103
DEPARTMENT OF PLUMBING INSPECTION

Section 103 is deleted in its entirety.

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

Section 104 is deleted in its entirety.

SECTION 105
APPROVAL

Section 105 is deleted in its entirety.

SECTION 106
PERMITS

Section 106 is deleted in its entirety.

SECTION 108
VIOLATIONS

Section 108 is deleted in its entirety.

SECTION 109
MEANS OF APPEAL

Section 109 is deleted in its entirety.

CHAPTER 3
GENERAL REGULATIONS

SECTION 301
GENERAL

Section 301 is amended by adding sections:

301.8 Existing buildings. Plumbing in existing buildings may have their use continued, if such use was legal at the time of enforcement of the Plumbing Code in force at the time of construction and such use is not detrimental to the health or safety requirements of current occupancy or use.

Any change in the use or occupancy of any existing building or structure shall comply with the provisions of the 2003 IPC. Any deviations may be approved by the Adminstrative Authority if they are determined to not be detrimental to health or safety requirements.

SECTION 306
TRENCHING, EXCAVATION AND BACKFILL

Section 306 is amended by adding section:

306.2.4 Trench safety. All excavations shall follow guidelines as required by OSHA and/or the Administrative Authority. The most restrictive rules shall apply. "Failure to Pass" notices will be issued if unsafe trenches are found at time of inspection and will require remedy of the issues in question and renotification to the proper Admistrative Authority that the work is ready for re-inspection. Re-inspection fees will be charged on all excavations found unsafe at time of inspection.

SECTION 307
STRUCTURAL SAFETY

Section 307.5 is amended to read:

307.5 Trench location. Tenches excavated parallel to footings of building structures shall not extend below the 45-degree bearing plane of the footing or wall unless authorized by the Administrative Authority. Where re-routing is necessary, the person(s) and/or Contractor responsible for obtaining the permit shall be required to submit drawings for approval.

CHAPTER 4
FIXTURE, FAUCETS AND FIXTURE FITTINGS

SECTION 401
GENERAL

Section 401.3.1 is added.

401.3.1 Rain sensing. An approved rain sensing system shall be installed on all new automatic lawn sprinkler systems. Said rain sensing system shall be capable of turning the lawn sprinkler system off in the event adequate rain has fallen.

Section 401.3.2 is added.

401.3.2 Metering. Each individual dwelling unit shall be metered in such a way that all water used by said dwelling unit can be recorded and billed. The maintenance and repair of said meters shall be the responsibility of the owner of the metered property.

SECTION 403
MINIMUM PLUMBING FACILITIES

Table 403.1 is amended replacing footnote "e" to read:

e. For each dwelling unit, in buildings with one or two dwelling units, one (1) capped automatic washer standpipe in a space large enough to accept laundry equipment. For each dwelling or apartment unit, in buildings with three or more units, one laundry tray and one automatic washer for the first ten units; in excess of ten units, one automatic washer for each additional fifteen units; this equipment shall be accessible to all units. Kitchen sinks with garbage disposers; one for each unit.

Section 403.2, Exception #4 is amended as follows:

Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is 100 or less.

Section 403.6 is amended by adding the following sentence:

Public access to toilet rooms shall be via a clear and unobstructed pathway not infringing on stock rooms, storage rooms or private areas such as offices.

Section 403.6.3 is added:

403.6.3 Restaurants. A restaurant is defined as a business which sells food to be consumed on the premises.

1. 1. The number of occupants for a drive-in restaurant of drive-in theater shall be considered as equal to twice the number parking stalls.
2. Employee toilet facilities are not to be included in the above restaurant requirements.
3. Walk-up restaurants with no access inside the building by customers.
    (a) If 17 or less outside seats, one uni-sex toilet room is required, for employees only.
    (b) If 18 or more outside seats, both male and female toilet rooms are required for both public and employees.
4. Restaurants with 225 sq.ft. or less inside customer area and 17 or less outside seats.

(a) A minimum of one uni-sex toilet room shall be provided.

5. Both male and female toilet rooms are required for the following restaurant types:

   (a) Restaurants with 225 sq.ft. or less inside customer area and 18 or more outside seats. Occupancy load shall be based on the total of the inside and outside customer loads.

   (b) Restaurants with 226 sq.ft. or more inside customer area and which may include outside seating of less than 50% of the inside occupant load. Occupancy load may be based on inside customer area only.

   (c) (c) Restaurants with 226 sq.ft. or more inside customer area and which may include outside seating greater than 50% of the inside occupant load. Occupancy load shall be based on the total of the inside and outside customer loads.

Section 403.8 Access is added.

403.8 Access. There shall be no access through a toilet room to any portion of a building. Access to toilet rooms shall not be through food preparation areas, except for toilet room facilities provided exclusively for the use of employees in the food preparation area.

SECTION 410
DRINKING FOUNTAINS

Section 410.3 is added to read:

410.3 Minimum per floor. There shall be a minimum of one (1) drinking fountain per occupied floor in schools, theaters, auditoriums, dormitories, offices or public buildings.

SECTION 412
FLOOR AND TRENCH DRAINS

Section 413.2 is amended to read:

413.2 Domestic food waste grinder outlets: Domestic food waste outlets may be 1 1/2" but shall be connected to a drain of at least 2" in diameter.

Section 413.3 is amended by adding:

413.3.1: **Discharge into grease interceptor.** All food waste disposals in commercial kitchens shall be connected to and discharge into the grease interceptor.

Exception: Vegetable preparation area disposal may discharge to either sanitary or grease waste system.

SECTION 416
LAVATORIES

Section 416 is amended by adding the following section:

416.5 Lavatory equivalents. Twenty-four (24) linear inches (610 mm) of wash sink or eighteen (18) inches (457 mm) of circular basin, when provided with water outlets for each space, shall be considered equivalent to one (1) lavatory**.**

CHAPTER 5
WATER SUPPLY AND DISTRIBUTION

SECTION 504
SAFETY DEVICES

Section 504.6.1 is deleted and replace to read as follows:

504.6.1 Discharge. The relief valve shall discharge full size to a safe place of disposal such as the floor or and indirect waste receptor. The discharge pipe shall not have any trapped sections and shall have a vissible air gap or air gap fitting located in the same room as the water heater. The outlet end of the discharge pipe shall not be threaded and such dicharge pipe shall not have a valve or tee installed. Relief valve piping shall be piped independent of other equipment drains or relief valve discharge piping to the disposal point. Such pipe shall be installed in a manner tha does not cause personal injury to occupants in the immediate area or strucural damage to the building.

Relief valves located insidea building shall be provided with a drain not smaller that the relief valve outlet, of galvanized steel, hard drawn copper piping and fittings, CPVC, PB or listed relief valve drain tube with fittings which will not reduce the internal boure of the pipe or tubing (straight lengths as opposed to coils) and shall be piped and turned down into a sump or into a plumbing fixture with an air gap as an indired waste. Such drains may terminate at other approved locations but shall not be run outside of the building. No part of such drain pipe shall be trapped. A maximum of three (3) elbows are allowed in the dicharge pipin. Whenever a drain pan is used as a receptacle for receiving the discharge from a relief valve, the draing pipe from the drain pan shall be a minimum pipe size equal to appliance relief valve outlet..

CHAPTER 6
WATER SUPPLY AND DISTRIBUTION

SECTION 603
WATER SERVICE

Section 603.1 is amended to read:

603.1 Size of water service pipe. The water service pipe shall be sized to supply water to the structure in the quantities and at the pressures required in this code. The minimum diameter of water service pipes shall be ¾ inch (19 mm). The service line shall remain the same size from tap through meter, then may be increased in size thereafter.

SECTION 605
MATERIALS, JOINTS AND CONNECTIONS

Sections 605.19, 605.19.1, 605.19.2 and 605.19.3 are deleted in their entirety.

Tables 605.3 and 605.4 are amended by deleting reference to Polybutylene (PB) plastic pipe and tubing.

SECTION 608
PROTECTION OF POTABLE WATER SUPPLY

Section 608.1 is amended by adding:

608.1.1 Backflow devices. Backflow devices installed in water service lines shall be inspected and maintained per Denver Water/State of Colorado Clean Water Act, and the **Colorado Cross-Connection Control Manual**, most recent edition, as published by the Colorado Department of Public Health and Environment Water Quality Control Division.

Section 608.7 is amended by deleting and replacing with the following:

608.7 Stop-and-waste valves prohibited. Combination stop and waste valves may be installed underground if an approved means of removing wastewater (such as gravel bedding 1foot deep 1 foot below valve) from the seep hole is provided.

Section 608.15.2 is amended by adding:

608.15.2.1 Waste Discharge. The waste discharge from a reduced pressure device shall be discharged to an approved location. If this discharge is by means of a pump, the pump shall be sized to handle the maximum discharge of the device.

CHAPTER 7
SANITARY DRAINAGE

SECTION 703
BUILDING SEWER

Section 703 is amended by adding the following section:

703.6 Slope of building sewer piping. Building sewers shall be installed at uniform grade or slope. The minimum grade of building sewers shall be in accordance with Denver Waste Water Management Standards.

SECTION 708
CLEANOUTS

Section 708.3.3 is deleted and replaced with the following:

708.3.3 Changes of direction. Cleanouts shall be installed at each change of direction of the building drain or horizontal waste or soil lines greater than 135 degrees (2.36 rad.). Where more than one change of direction occurs in a run of piping, only one cleanout shall be required for each 40 feet (12 192 mm) of developed length of the drainage piping.

Section 708.3.5 is deleted and replaced with the following:

708.3.5 Building drain and building sewer junction. There shall be a cleanout at the junction of the building sewer. An approved two-way cleanout shall be used and brought up to finished grade. Minimum size shall be 4" or as approved by Denver Waste Water Management

SECTION 712
SUMPS AND EJECTORS

Section 712.3.1 is deleted and replaced with the following:

712.3.1 Sump pump. The sump pump capacity and head shall be appropriate to anticipated use requirements. In public use occupancies, dual (duplex) sump pumps shall be required and shall be arranged to function independently in case of mechanical failure. All sump or receiving tanks that require dual pumps shall be alarmed to provide visual and/or audible notification of failure.

Exceptions:

1. When it is readily apparent or can be demonstrated that the sump will very rarely operate and/or that little or no damage will be incurred if failure does occur.
2. Sump pumps installed for the purpose of condensate removal from A/C systems.
3. Single use graywater fixture.

Section 712.4 is deleted and replaced with the following:

712.4 Sewage pumps and sewage ejectors. A sewage pump or sewage ejector shall automatically discharge the contents of the sump to the building drainage system. In public use occupancies, dual (duplex) sewage ejectors shall be required and shall be arranged to function independently in case of mechanical failure. All dual ejectors shall be alarmed to provide visual and/or audible notification of failure.

Exception: A single ejector pump may be used in commercial application when it is used for a single use kitchen sink and/or dishwasher and/or disposer.

CHAPTER 8
INDIRECT/SPECIAL WASTE

SECTION 803
SPECIAL WASTES

Section 803.4 is added.

803.4 Cooling water. Domestic water used for cooling purposes shall be consumed or recycled and shall not be wasted to storm drain, sanitary drain, above-ground drainage or below-ground drainage unless specifically approved by Denver Water.

Exception: Diesel driven fire pump.

SECTION 805
FOOD WASTE

Section 805.1 is added.

805.1 Food waste disposers: An approved food waste disposer shall be required whenever food is to be prepared either commercially or in area containing a refrigerator, sink and stove.

Exception: A food waste disposer may be deleted for the following facilities: (1) All food is prepared off site and/or is prepackaged. (2) All food is served with disposable plates or trays and utensils.

CHAPTER 9
VENTS

SECTION 904
VENT TERMINALS

Section 904.1 is deleted and replaced with the following:

904.1 Roof extension. All open vent pipes that extend through a roof shall be terminated at least 12 inches (305 mm) above the roof, except that where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least 7 feet (2134 mm) above the roof.

Section 904.6 is deleted.

SECTION 905
VENT CONNECTIONS AND GRADES

Section 905.4 is amended by deleting the exception and replacing with the following:

Exception: If structural conditions do not allow the vent to be taken off vertically, the vent shall be run horizontally to the nearest wall. All fittings shall be drainage type. A cleanout shall be installed in the vent line.

CHAPTER 10
TRAPS, INTERCEPTORS AND SEPARATORS

SECTION 1003
INTERCEPTORS AND SEPARATORS

Section 1003.2 is deleted and replaced with the following:

1003.2 Approval. The size, type and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturer's instructions and the requirements of this section based on the anticipated conditions of use. Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator. Prior to installation of any interceptor or separator and their associated piping, plans shall be submitted to Waste Water Management for approval.

Section 1005 is added.

SECTION 1005
ABANDONED INTERCEPTORS

1005.1 Abandoned food/oil grease interceptors and sand/oil interceptors. All food/oil/grease interceptors and sand/oil interceptors that are to be abandoned or by-passed, shall have all piping removed, the structure capped or plugged and the lid broken so as to make it unusable. It shall be pumped clean and filled with granular material to satisfy Denver Wastewater Management standards.

CHAPTER 11
STORM DRAINAGE

SECTION 1101
GENERAL

Section 1101.1 is deleted and replaced with the following:

1101.1 Scope. The provisions of this chapter shall govern the materials, design, construction and installation of storm drainage. That portion of the storm drainage system from the building to the public storm sewer shall be as required by Denver Waste Water Management.

SECTION 1106
SIZE OF CONDUCTORS, LEADERS AND STORM DRAINS

Section 1106.1 is deleted and replaced with the following:

1106.1 General. The size of the vertical conductors and leaders, building storm sewers and any horizontal branches of such drains shall be based on 3" (7.6 mm) per hour.

IPC APPENDICES
STATUS OF APPENDICES ON ADOPTION

The following Appendixes are adopted:

Appendix E Sizing of Water Piping System

Appendix F Structural Safety

AMENDMENTS TO THE 2003 EDITION OF THE INTERNATIONAL FUEL & GAS CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINISTRATION

SECTION 101 (IFGC)
GENERAL

Amend Section 101.1 Title. by inserting City and County of Denver for the name of the jurisdiction.

SECTION 103 (IFGC)
DEPARTMENT OF INSPECTION

Section 103 is deleted in its entirety.

SECTION 104 (IFGC)
DUTIES AND POWERS OF THE CODE OFFICIAL

Section 104 is deleted in its entirety.

SECTION 105 (IFGC)
APPROVAL

Section 105 is deleted in its entirety.

SECTION 106 (IFGC)
PERMITS

Section 106 is deleted in its entirety.

SECTION 108 (IFGC)
VIOLATIONS

Section 108 is deleted in its entirety.

SECTION 109 (IFGC)
MEANS OF APPEAL

Section 109 is deleted in its entirety.

CHAPTER 1
ADMINISTRATION

SECTION 202 (IFGC)
GENERAL DEFINITIONS

APPLIANCE, UNVENTED. is amended by adding the following sentence:

Installation of unvented appliances is prohibited in Denver.

LOG LIGHTER. is amended by adding the following sentence:

Installation of log lighters is prohibited in Denver.

ROOM HEATER, UNVENTED. is amended by adding the following sentence:

Installation of unvented room heaters is prohibited in Denver.

UNLISTED BOILER. is amended by adding the following sentence:

Installation of unlisted boilers is prohibited in Denver.

UNVENTED ROOM HEATER. is amended by adding the following sentence:

Installation of unvented room heaters is prohibited in Denver.

WALL HEATER, UNVENTED TYPE. is amended by adding the following sentence:

Installation of unvented wall heaters is prohibited in Denver.

CHAPTER 3
GENERAL REGULATIONS

SECTION 303 (IFGC)
APPLIANCE LOCATION

Section 303.3 is amended by adding the following item 6 to the prohibited locations:

6. Spaces under stairways

Section 303.3 is amended by deleting Exception 2, 3, 4 and adding Exception 6.:

6. Fuel fired appliances may be located under stairways serving and contained within a single residential unit in Group R2 and R-3 occupancies when the stairs are protected by one layer of 5/8" Type X Gypsum board attached directly to the underside of the stairs. Reference amendments to IBC 1019.5.

SECTION 303.3.1 is added:

303.3.1 Prohibited Configurations. A fuel-fired furnace shall not be installed on the discharge side of a refrigerant coil unless the furnace is specifically listed for such configuration. A furnace shall not be installed on the discharge side of an evaporative cooler unless the furnace heat exchanger is of approved corrosion-resistant material.

SECTION 304 (IFGC)
COMBUSTION, VENTILATION AND DILUTION AIR

Section 304.1 General is amended by adding the following Exception:

Exception #2: For appliances located in unconfined areas where roll-up overhead doors are located, infiltration may be used for combustion air.

Section 304.5 Indoor combustion air is deleted in its entirety.

Section 304.7 Combustion indoor and outdoor air is deleted in its entirety.

Section 304.11 Combustion air ducts is amended by adding the following paragraph:

Combustion air intake openings located on the exterior of a building shall have the lowest side of such openings located not less than 18” (458 mm) vertically from the adjoining grade level.

SECTION 306 (IFGC)
ACCESS AND SERVICE SPACE

Section 306.5 is amended as by deleting and replaceing the first paragraph as follows:

[M] 306.5 Appliances on roofs or elevated structures. Where appliances requiring access are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the appliance’s level service space. Buildings having an eave height of 20 feet (6096 mm) or more, or of 2 or more stories in height, where equipment is located on the roof, shall have permanent inside means of access. Such access shall

not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33% slope).

Section 306.7 is added:

306.7 Clearance from grade. Equipment and appliances installed at grade level shall be supported on a level concrete slab or other approved material extending a minimum of 3”(76 mm) above adjoining grade or shall be suspended a minimum of 6” (152 mm) above adjoining grade.

Section 306.8 is added:

306.8 Separation of Equipment Rooms. Fuel-fired equipment rooms shall be separated from refrigerant equipment machinery rooms and from air handling equipment rooms by a one-hour fire-resistance-rated fire barrier. There shall be no direct access to any room containing fuel-fired equipment from a refrigeration equipment machinery room or from an air handling equipment room.

CHAPTER 4
GAS PIPING INSTALLATIONS

SECTION 402 (IFGC)
PIPE SIZING

Section 402.3 is amended to read:

402.3 Sizing. Gas piping shall be sized in accordance with on of the following:

1. Pipe sizing tables or sizing equations in accordance with Table 402.3.
2. The sizing tables included in a listed piping system's manufacturer's installations instructions, adjusted for altitued.

Table 402.3 is Added:

TABLE 402.3

FUEL LINE SIZING TABLE
CAPACITIES FOR 6.0 INCHES W.C. FUEL LINE SYSTEMS
STEEL PIPE 0.5 INCHES W.C. PRESSURE DROP
PIPING CAPACITY TABLE FOR 0.67 SPECIFIC GRAVITY GAS
MAXIMUM CAPACITY OF STEEL PIPE IN CFH

PIPE LENGTH FEET	NOMINAL PIPE SIZES - INCHES								
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
	ACTUAL I.D. - INCHES								
	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	4.026
10	164	344	649	1332	1996	3845	6128	10833	22097
20	113	236	446	915	1372	2642	4212	7446	15187
30	90	190	358	735	1101	2122	3382	5979	12196
40	77	162	306	629	943	1816	2894	5117	10438
50	68	144	271	557	835	1609	2565	4535	9251
60	62	130	246	505	757	1458	2324	4109	8382
70	57	120	226	465	696	1341	2138	3780	7711
80	53	111	210	432	648	1248	1989	3517	7174
90	50	104	197	405	608	1171	1866	3300	6731
100	47	99	186	383	574	1106	1763	3117	6358
110	45	94	177	364	545	1050	1674	2960	6038
120	42	89	169	347	520	1002	1597	2824	5761
130	41	86	162	332	498	959	1530	2704	5517
140	39	82	155	319	478	922	1469	2598	5300
150	38	79	149	307	461	888	1416	2503	5106
160	36	76	144	297	445	857	1367	2417	4930
170	35	74	140	287	431	830	1323	2339	4771
180	34	72	135	278	417	805	1283	2268	4626
190	33	70	131	270	405	781	1246	2202	4493
200	32	68	128	263	394	760	1211	2142	4370
250	28	60	113	233	349	673	1074	1898	3873
300	26	54	103	211	317	610	973	1720	3509
350	24	50	94	194	291	561	895	1582	3228
400	22	46	88	181	271	522	832	1472	3003
450	21	43	82	169	254	490	781	1381	2818
500	19	41	78	160	240	463	738	1305	2661
550	18	39	74	152	228	439	701	1239	2528
600	17	37	70	145	217	419	668	1182	2411
650	17	36	67	139	208	401	640	1132	2309
700	16	34	65	133	200	386	615	1087	2218
750	15	33	62	128	193	371	592	1048	2137
800	15	32	60	124	186	359	572	1012	2064
850	14	31	58	120	180	347	554	979	1997
900	14	30	56	116	174	337	537	949	1939
950	14	29	55	113	169	327	521	922	1881
1000	13	28	53	110	165	318	507	896	1829

Section 402.4 is deleted in its entirity.

SECTION 403 (IFGC)
PIPING MATERIALS

Section 403.1 is deleted and replaced with the following:

403.1 General. Materials used for piping systems shall comply with the requirments of this chapter or shall be approved by the Building Official. Pipe used for the installation, extension, alteration or repair of gas piping shall be malleable black iron pipe or standard weight black steel pipe. Other piping and tubing may be used only when specifically approved by the Building Official. When special circumstances dictate, internally tinned copper pipe or tubing may be used. Polyethylene pipe meeting may be used in exterior buried piping systems. The use of PVC, galvanized steel, yellow brass or cast iron for any gas piping is prohibited.

Section 403.5.4 is deleted and replaced with the following:

403.5.4 Corrugated stainless steel tubing and fittings. Corrugated stainless steel tubing (CSST) may be permitted providing that it is a part of a system listed by an approved agency. CSST shall be tested and listed in compliance with the construction, installation and performance requirements of ANSI LC 1/CSA 6.26 and the following:

CSST must be installed in accordance with its listing only by individuals certified or otherwise qualified by participation in a CSST manufacturer's training program.

Installations must be tested in accordance with the ANSI LC 1/CSA 6.26 and manufacturer's instructions. A second similar pressure test is required when any building construction that might affect the piping system is complete.

Comply with the manufacturer's recommendations for sizing and for interface of CSST with black iron pipe and copper tube gas piping systems. Use of another manufacturer's products in conjunction with those of the selected manufacturer's system is prohibited.

CSST is prohibited for use as an appliance connector whenever appliances are free to be moved for maintenance or cleaning.

When piping movement is restricted, concealed CSST must be protected against damage with strike plates provided by the manufacturer.

Comply with applicable UL classification requirements and diagrams for through penetration fire stop installations.

SECTION 404 (IFGC)
PIPING SYSTEM INSTALLATION

Section 404.1 Prohibited locations is amended by adding the following paragraphs:

The installation of piping shall not be permitted in the shaft, pit or penthouse of elevators.

> **Exception:** Piping necessary for the installation of heating equipment for penthouses shall be permitted in penthouses.

Gas meters shall not be located in or under any building unless the meter is located in its own dedicated, adequately ventilated vault.

Section 404.3 is deleted and replaced with the following:

404.3 Piping in concealed locations. Welded or threaded gas piping may be installed in concealed spaces, provided that bushings, unions, valves, couplings, lugged or capped openings, are not concealed, gas piping is not imbedded in concrete or masonry, and access is provided to all threaded joints. Threaded joints behind drywall are considered accessible. All exposed gas piping shall be adequately protected where the piping is subject to physical damage from an exterior source.

Section 404.4 is deleted and replaced with the following:

404.4 Inlet location. The gas piping inlet shall be located adjacent to the approved meter location, whenever a building has a gas meter. Gas pipe entry into the building shall be above grade unless the entry is into an approved ventilated gas meter vault. Gas piping that passes through the outer foundation or basement wall of a building, shall be encased in a protective pipe sleeve. The anular space between the gas piping and the sleeve shall be sealed.

Section 404.6 is deleted and replaced with the following:

404.6 Piping below floors or grade. Gas piping shall not be installed in or on the ground under any building or structure, or within the solid floors of any building or structure. Gas piping shall not be installed under any

concrete or asphalt slab that butts up against a building unless the pipe is sleeved and the sleeve is vented to the atmosphere to dissipate any gas leaks. Exposed gas piping shall be installed a minimum of 6 inches above grade or structure.

Section 404.7 is deleted and replaced with the following:

404.7 Above-ground outdoor piping and rooftop piping. All above-ground piping installed outdoors shall be elevated not less than 6 inches (152 mm) above ground, and piping installed across roof surfaces, shall be elevated not less than 6" (152 mm) above the roof surface. Piping installed above ground outdoors, and piping installed across the surface of roofs shall be securely supported on metal stands at a maximum of 10 feet on center, and located where it will be protected from physical damage. Where passing through an outside wall, piping shall be encased in a protective pipe sleeve and shall be protected against corrosion by coating or wrapping with an inert material. The annular space between the piping, or encasing material, and the sleeve shall be sealed.

Section 404.11 Piping underground beneath buildings is deleted in its entirety.

SECTION 406 (IFGC)
INSPECTION, TESTING AND PURGING

Section 406.1 is amended by adding the following paragraph:

The code official shall make such inspections as are deemed advisable to ensure that the work has been performed in accordance with the intent of this chapter. Records of all tests performed on piping systems shall be available for examination by the code official whenever the code official is not present at the time of testing.

Section 406.4.1 is deleted and replaced with the following:

406.4.1 Test pressure. The test pressure to be used shall be no less than 10 psig (69 kPa gauge), irrespective of design pressure. For welded piping, and for piping carrying gas at pressures exceeding 14 inches water column (3.5 kPa gauge) pressure, the test pressure shall be no less than 60 psig (414 kPa gauge). Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe.

SECTION 409 (IFGC)
SHUTOFF VALVES

Section 409.5.1 Shutoff valve in fireplace is deleted in its entirety.

SECTION 410 (IFGC)
FLOW CONTROLS

Section 410.1 Pressure regulators is amended by adding the following paragraph:

Each regulator shall vent to the outside either separately or through a common vent stack of adequate size as determined by the design engineer and approved by the Building Official. A common vent, which has cross-sectional area equal to the sum of the cross-sectional areas of the individual vents is acceptable.

SECTION 411 (IFGC)
APPLIANCE CONNECTIONS

Section 411.1 Connecting appliances is amended by adding item 7:

7. Aluminum alloy connectors are approved for installation only when supplied by the manufacturer for use with their appliance.

CHAPTER 5
CHIMNEYS AND VENTS

SECTION 501 (IFGC)
GENERAL

Section 501.8 is amended by deleting items 8 and 10.

SECTION 503 (IFGC)
VENTING OF EQUIPMENT

Section 503.2.2. Well-ventilated spaces. is deleted in its entirety.

Section 503.5.6.1 is amended by adding the following sentence to the Exception:

Such continued use is permitted only if chimney is structurally sound and unobstructed per requirements of Section 503.5.6.

Section 503.6.10 Gas vents serving equipment on more than one floor is amended by adding the following sentence:

Gas vents cannot serve equipment on more than one floor level where the floors are required to be fire-rated.

Section 503.7.2 is deleted and replaced with the following:

503.7.2 Cold climate. Uninsulated single-wall metal pipe shall not be used outdoors for venting gas utilization equipment.

Section 503.10.2.2 is amended by deleting the Exception.

SECTION 504 (IFGC)
SIZING OF CATEGORY I APPLIANCE VENTING SYSTEMS

Section 504.2.9 is amended by deleting item 5.

SECTION 505 (IFGC)
DIRECT VENT, INTEGRAL VENT, MECHANICAL VENT AND VENTILATION/EXHAUST HOOD VENTING

Section 505 Direct-Vent, Integral Vent, Mechanical Vent and Ventilation/Exhaust Hood Venting is amended by adding Section 505.1.2.

505.1.2 Residential cooking appliances vented by exhaust hoods. Where residential cooking appliances are gas-fired, a fan powered kitchen exhaust hood shall be installed and must be vented to the outside.

CHAPTER 6
SPECIFIC APPLIANCES

SECTION 602 (IFGC)
DECORATIVE APPLIANCES FOR INSTALLATION IN FIREPLACES

SECTION 602 Decorative Appliances for Installation in Fireplaces is amended in its entirety and replaced by the following:

602.1 General Requirements. In addition to the general regulations specified in Chapter 3, gas logs installed in fireplaces shall comply with the requirements specified for heating equipment and heating appliances in this Code.

602.2 New Gas Log Fireplaces. Installations shall comply with the manufacturer's recommendations and listing. An approved direct vented, enclosed gas log fireplace may be installed in bedrooms, bathrooms and toilet rooms in accordance with their listing.

602.3 Existing Fireplace Conversion. A gas-fired decorative log set may be installed in an existing solid fuel-burning fireplace subject to the following limitations:

1. Construction shall be in accordance with ANSI Standard Z21.60 and all equipment shall be listed.
2. Input rating shall not exceed 90,000 Btu/h nor be less than 11,000 Btu/h. Orifices shall be fixed and sized for Denver Altitude.
3. A safety pilot is required. The safety pilot shall be protected from mechanical damage and shall not be covered by sand or granules.
4. A thermostatic control valve is not permitted.
5. The use of a flexible gas connector is not permitted unless the connector is manufacturer-supplied as part of the unit.
6. Masonry fireplaces shall comply with Chapter 21 of the *International Building Code*. Factory built fireplaces shall be approved for installation of gas logs and provided with means for installing gas piping.
7. The chimney serving a masonry fireplace shall comply with Chapter 21 of the *International Building Code*, or for existing chimneys, as approved by the building official.
8. The chimney damper shall either be removed, or an opening or openings shall be cut in the damper; or a permanent, nonremovable clamp with a breakaway bolt fastener shall be installed on the damper. Openings shall be of the minimum area prescribed in Section 601.6, or the manufacturer's instructions, whichever is greater.
9. Permanent combustion air openings, communicating with directly with outside air, shall be provided in the firebox or in the area directly communicating with the room in which the fireplace is located. Openings shall be sized in accordance with Chapter 3.
10. Glass doors and a fireplace screen shall be required on the fireplace when a gas log appliance is installed.
11. The gas log appliance shall be provided with a permanent label with lettering ¼ in height stating "NO SOLID FUEL SHALL BE USED IN THIS FIREPLACE". This label must be visible after installation.
12. Manufacturer's instructions: Complete instructions shall be attached to each unit.

602.4 New Fireplaces. In addition to the above limitations, neither new masonry fireplaces nor new pre-fabricated metal fireplaces will be allowed to be installed in any building regardless of occupancy, unless an approved gas log set is permanently affixed in the firebox to establish the fireplace as a gas-burning fireplace. "Permanently affixed" is defined as follows:

1. Gas burners must be affixed to the gas log set metal pan as recommended by the manufacturer's specifications.
2. The metal pan must be permanently affixed to the firebox floor using high temperature adhesive over the entire pan surface. Adhesive should be visible around edge of pan.

602.5 Wood-burning appliances. Installation of new factory-built wood-burning appliances is restricted to certified wood stoves as approved by the Environmental Protection Agency. Appliances must be listed by an approved testing lab. If a wood-burning appliance is not on the EPA approved list, it cannot be installed unless it is converted to a gas log fireplace in accordance with the requirements of Chapter 6.

602.6 Gas Log chimney sizing. Chimney size shall be in accordance with the following Table:

TABLE 6-A
CHIMNEY SIZING FOR GAS LOGS
MINIMUM FREE AREA REQUIRED WITHIN THE CHIMNEY AND AT THE DAMPER OPENING. (SQ. IN.)

Chimney Height, Feet	13	20	29	39	51	64
	Appliance Input Rating, Btu Per hour					
6	14,000	23,200	34,000	46,400	62,400	80,000
8	15,200	25,200	37,000	50,400	68,000	86,000
10	16,800	27,600	40,400	55,800	74,400	96,400
15	18,200	30,200	44,600	62,400	84,000	108,800
20	20,200	32,600	50,400	68,400	94,000	122,200
30	21,600	36,600	58,200	78,800	106,800	138,800

SECTION 603 (IFGC)
LOG LIGHTERS

SECTION 603 LOG LIGHTERS is deleted in its entirety.

SECTION 604 (IFGC)
VENTED GAS FIREPLACES (DECORATIVE APPLIANCES)

SECTION 604 VENTED GAS FIREPLACES (DECORATIVE APPLIANCES) is deleted in its entirety.

SECTION 605 (IFGC)
VENTED GAS FIREPLACE HEATERS

SECTION 605 VENTED GAS FIREPLACE HEATERS is deleted and replaced with the following:

605.1 General. Vented gas fireplace heaters shall be installed in accordance with the manufacturer's installation instructions, shall be tested in accordance with ANSI Z21.88 and shall be designed and equipped as specified in the applicable portions of Section 602.

SECTION 609 (IFGC)
FLOOR FURNACES

SECTION 609 FLOOR FURNACES is deleted in its entirety.

SECTION 611 (IFGC)
NONRECIRCULATING DIRECT-FIRED INDUSTRIAL AIR HEATERS

Section 611.2 is amended by adding the following paragraph:

Nonrecirculating direct-fired industrial air heaters may be installed only in Group F, H, M, S, and U Occupancies, and in commercial kitchens as makeup air for range hood exhaust systems. Such equipment may only be used in conjunction with powered exhaust systems to prevent any accumulation of products of combustion.

SECTION 612 (IFGC)
NONRECIRCULATING DIRECT-FIRED INDUSTRIAL AIR HEATERS

Section 612.3 is amended by adding the following paragraph:

Recirculating direct-fired industrial heaters may be installed only in Group F, H, M, S, and U Occupancies. All areas served by recirculating direct-fired industrial heaters must be protected by the installation of CO sensors spaced per manufacturer's recommendations. Whenever automatic carbon monoxide sensing devices exceed the NAAQS of 9 ppm for an 8 hour average or 35 ppm for a 1 hour average, the CO sensors shall activate an increase in the exhaust air volume in order to reduce CO concentration back below those prescribed levels.

SECTION 621 (IFGC)
UNVENTED ROOM HEATERS

SECTION 621 UNVENTED ROOM HEATERS is deleted.

SECTION 623 (IFGC)
COOKING APPLIANCES

Section 623.2 is amended by adding the following Exception:

Exception: Commercial cooking appliances may be installed within dwelling units if provide with exhaust systems and make-up air provisions as noted in Section 507.2 of the *International Mechanical Code Amendments.*

SECTION 624 (IFGC)
WATER HEATERS

SECTION 624 WATER HEATERS is amended by adding the following section:

624.3 Prohibited locations. See Section 303.3 for prohibited locations.

SECTION 631 (IFGC)
BOILERS

SECTION 631 BOILERS is amended by adding the following under the title:

For additional boiler code requirements, see the *International Mechanical Code,* and associated amendments.

SECTION 631 BOILERS is amended by adding Section 631.4 and 631.5.

631.4 Boiler rooms and enclosures. Boiler rooms and enclosures and access thereto shall comply with Chapter 3 of this Code and the Building Code. In addition, the following prohibitions shall apply:

1. The storage of materials of any kind shall not be permitted in boiler rooms.
2. The installation of compressors shall not be permitted in boiler rooms.
3. The installation of gaseous chlorinators or chlorine piping in boiler rooms or rooms where fuel-fired equipment is located is prohibited.
4. The installation of any device that would create a pressure less than atmospheric in a boiler room containing gas, oil or solid fuel-fired equipment is prohibited.

   Exception: Equipment designed, listed and approved with power burners or induced draft fans.
5. Fuel-fired equipment with atmospheric burners shall not be installed in the same room with equipment having power burners or induced draft fans.

   Exception: Engineered systems specifically approved by the Building Official.
6. Refrigeration equipment, forced air or gravity furnaces or air handlers shall not be located in or access made through boiler rooms.

   Exception: Group R-3 occupancies and individual living units of R-1 Occupancies.
7. Incinerators or access to incinerators shall not be located in boiler rooms.
8. Crawl spaces or attics shall not be used for boiler locations.
9. Installation of sinks in boiler rooms is prohibited.

   Exception: Floor sinks may be installed.

631.5 Permit required. It shall be unlawful to install, alter or repair any boiler or pressure vessel without first obtaining a permit to do so from the Building official. All repairs or alterations shall be completed in accordance with the National Board Inspection Code (NBIC). All repairs or alterations of a welded nature to ASME-coded boilers or pressure vessels must be performed by a company in possession of a National Board "R" Symbol Stamp or an ASME Code Symbol Stamp. Repairs or alterations shall be performed in accordance with procedures outlined in the National Board Inspection Code. In addition, the scope of the work must be within the capability of the company as outlined in the company's quality control manual. Assembly of code boilers requiring field welding must be performed by an organization in possession of a valid and appropriate ASME Code Symbol Stamp.

SECTION 634 (IFGC)
CHIMNEY DAMPER OPENING AREA

SECTION 634 CHIMNEY DAMPER OPENING AREA is deleted in its entirety.

AMENDMENTS TO THE 2003 EDITION OF THE INTERNATIONAL ENERGY CONSERVATION CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

Section 101.1 Title is deleted and replaced with the following:

101.1 Title. These regulations shall be known as the Energy Code of the City and County of Denver, and shall be cited as such. It is referred to herein as "this code".

CHAPTER 3
DESIGN CONDITIONS

SECTION 302
THERMAL DESIGN PARAMETERS

Table 302.1 Exterior design conditions is amended.

TABLE 302.1
EXTERIOR DESIGN CONDITIONS

CONDITION	VALUE
Winter , Design Dry-bulb (°F)	+1°F
Summer , Design Dry-bulb (°F)	91°F
Summer , Design Wet-bulb (°F)	59°F
Degree days heating	6020
Degree Days Cooling	567
Climate zone	13B

CHAPTER 4

RESIDENTIAL BUILDING DESIGN BY SYSTEMS ANALYSIS AND DESIGN OF BUILDING UTILIZING RENEWABLE ENERGY SOURCES

SECTION 402
SYSTEMS ANALYSIS

Section 402.2 Energy analysis is amended by adding the following:

The results from using a RESNET HERS (Residential Energy Services Network Home Energy Rating System) with a pass rating of “83”can be utilized to show compliance. A city agreement form must be signed by the applicant committing to the terms of the rating procedure with the building permit application. A $75 fee reduction in the building permit fee is available to builders who utilize this program.

CHAPTER 5

RESIDENTIAL BUILDING DESIGN BY COMPONENT PERFORMANCE APPROACH

SECTION 501
GENERAL

Section 501.1 Scope is amended by adding the following:

The results from a code compliant software can be utilized to show compliance. "REScheck™" - Residential Energy Code Compliance Software is one program currently being accepted. This program developed by the Department of Energy can be downloaded for free at http://www.energycodes.gov/compliance_tools.stm.

SECTION 502
BUILDING ENVELOPE REQUIREMENTS

Section 502.1.4.2 is deleted in its entirety and replaced with the following:

502.1.4.2 Caulking and sealants. Protection against air infiltration shall be provided to include the sealing of air leaks through and around windows, doors and penetrations. Buildings shall be built with the following provisions:

1. All electrical outlets and switches on exterior walls and on interior walls which connect with an insulated ceiling or attic shall have foam gaskets installed behind the outlet and switch cover. Recessed lights within insulated ceilings shall be air-tight and IC-rated.
2. Box sills and sill plates shall be sealed at the top of the foundation wall with one of the following
    a. Closed-cell foam backer rod or gasket, minimum ¼" thick; or
    b. Foam caulk for gaps over ¼" wide and polyurethane caulk for smaller gaps. Fiberglass sill sealers are not permitted.
3. Provide one of the following air infiltration barrier systems:
        a. Seal penetrations in the building envelope with foam sealant and appropriate caulking. Foam sealant and caulking must meet ASTME-814 for fire-stopping characteristics only when sealing penetrations in a fire-rated assembly. Areas to be sealed with foam sealant include the spaces between rough openings and window and door frames; wiring and plumbing penetrations through exterior walls, openings into garage ceiling and wall systems; openings between the house and crawlspaces; and around all accessible penetrations of the ceiling vents, ducts, plumbing lines, electrical cables and light fixtures. Openings around chimney stacks shall be blocked with noncombustible material and sealed with high temperature caulk. Bottom plates can be sealed to the floor decking with adhesive caulk during framing or a bead of caulking or foam may be applied after walls are in place. Weather-strip the framework around attic hatches and secure hatches and secure the door tightly against the weather-stripping with latches.
        b. Wrap the exterior of the house with an infiltration barrier film (water vapor permeability rating of at least 5). It must be continuous from the foundation to the top plate and must be taped with a seal around all penetrations such as windows, doors and utility penetrations.

c. The building can be wrapped with foam sheathing and covered with a flexible stucco-like coating.

d. Use either blow-in blanket or spray cellulose insulation in wall cavities.

e. Install a continuous interior air barrier that relies on sealed drywall (also referred to as the Airtight Drywall Approach -- ADA). Drywall is sealed with air-sealing gasketing or caulk (between deck, rim and top plate).

f. Install interior insulated sheathing with joints taped. The sheathing should be sealed, with either foam or construction-grade tape, all around the base and around all rough openings. Reflective bubble-pack insulation can also be used if it is taped at the seams.

g. Install a foam-core building system in which the wall and ceiling panels are sealed or adhered to each other with compatible caulking or foam material. Where only the walls are made of foam-core material, vertical penetrations from the occupied space into the attic must be sealed as described in Step a.

SECTION 504
SERVICE WATER HEATING

Section 504.3.2 Pool covers. is deleted in its entirety.

CHAPTER 6

SIMPLIFIED PRESCRIPTIVE REQUIREMENTS FOR DETACHED ONE- AND TWO-FAMILY DWELLINGS AND GROUP R-2, R-4 OR TOWNHOUSE RESIDENTAIL BUILDNGS

SECTION 602
BUILDING ENVELOPE

Section 602.1.10 is deleted and replaced by Section 502.1.4.2.

CHAPTER 8
DESIGN BY ACCEPTABLE PRATICE FOR COMMERCIAL BUILDINGS

SECTION 801
GENERAL

Section 801.1 Scope is amended by adding the following:

The results from a code compliant software can be utilized to show compliance. "COMcheck™" - Commercial Energy Code Compliance Software is one program currently being accepted. This program developed by the Department of Energy can be downloaded for free at http://www.energycodes.gov/compliance_tools.stm.

THE END