AMENDMENTS TO THE

1991 UNIFORM CODES OF THE

INTERNATIONAL CONFERENCE OF

BUILDING OFFICIALS (ICBO)

FOR THE

CITY AND COUNTY OF DENVER

1993
ACKNOWLEDGEMENT

The City and County of Denver has accepted the Uniform Codes, as developed by the International Conference of Building Officials as the basic building code. In order to provide a building code for the maintenance of existing buildings and the construction of new buildings, the Mayor has established the Building Code Revision Committee to review and propose amendments to the Uniform Codes to make them effective for the construction and development conditions within the City and County of Denver. This committee represents various segments of the building and development industry. The different perspectives and interests presented during this code review process has helped to provide an effective building code which will maintain minimum standards for the health, safety, and welfare of the people who live, work, or visit in Denver.

We wish to thank the members of the City Council, Public Works Department, City Attorney’s Office, Fire Department, Central Services, Commission on the Disabled, Building Inspection Division, the Building Code Revision Committee and the many BCRC subcommittees who represented various segments of the construction and development industry. They have all devoted their time, dedication and professionalism to develop this document.

Michael D. Musgrave, Acting Manager of the Department of Public Works

Douglas W. Franssen, Deputy Manager of the Department of Public Works

Dan Muse, City Attorney

Greg Romberg, Director, Office of Regulatory Reform

Carol Woolsey, Director of Central Services

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Structural Engineers

Mechanical Engineers

Commission for People with Disabilities

Fire Protection Engineers

Director, Building Department

Chief, Fire Prevention Bureau

Assistant City Attorney

Building Department

Secretary

Code Preparation Secretary

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, or visit Denver.

Wellington E. Webb
Mayor
**BCRC SUB-COMMITTEES**

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**Labor**

- Electrical Engineer
- Fire Prevention Bureau
- Sprinkler Contractor
- Supplier
- Building Owners Mgmt. Assn.
- B.I.D., Engineer
- B.I.D., Inspector

**Electrical Contractor**

- Apartment Owners Association
- Consultant Engineer
- Labor
- Fire Prevention Bureau
- HVAC Supplier
- Fire Prevention Bureau
- Public Service Company
- B.I.D., Engineer
- B.I.D., Inspector

**Mechanical**

- Mechanical Engineer
- BOMA
- Labor
- Mechanical Contractor
- HVAC Supplier
- Fire Prevention Bureau
- Public Service Company
- B.I.D., Engineer
- B.I.D., Inspector

**Fire Prevention Bureau**

- Building Owners Mgmt. Assn.
- B.I.D., Engineer
- B.I.D., Inspector
- Public Service Company
- B.I.D., Engineer
- B.I.D., Inspector

**Public Service Company**

- B.I.D., Engineer
- B.I.D., Inspector

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- B.I.D., Inspector

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The effective date of the adopting Ordinance No. 961 Series of 1993, Council Bill No. 972 is November 26, 1993.

The effective date of the Denver Building Code shall be as follows:

1. Divisions 1 through 4 shall be effective March 26, 1994.
2. Division 5 shall be effective November 26, 1993.

See amended U.B.C. Section 102(e), Transition Rules.

Vertical lines in the margin indicate that chapters, sections, lines, words, numbers, etc., have been added or revised from the 1991 editions of the related Uniform Codes or the 1993 edition of the National Electrical Code.

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FOR THE

CITY AND COUNTY OF DENVER

1993

The Building Code of the City and County of Denver enacted by Ordinance No. 961 - Series of 1993, Council Bill No. 972, which has adopted the Uniform Codes, Standards and Appendixes as set forth below, is hereby amended in the following particulars.

Division 1 - Amendments to 1991 Uniform Building Code and Appendix
Division 2 - Amendments to 1991 Uniform Mechanical Code and Appendix
Division 3 - Amendments to 1991 Uniform Plumbing Code and Appendix
Division 4 - Amendments to 1991 Uniform Building Code Standards
Division 5 - Amendments to 1993 National Electrical Code
BY AUTHORITY

ORDINANCE NO. 961 SERIES OF 1993
COUNCIL BILL NO. 972 COMMITTEE OF REFERENCE:

PUBLIC WORKS

A BILL

FOR AN ORDINANCE REPEALING ORDINANCE NOS. 144 AND 180, SERIES OF 1990 WHICH ADOPTED AND AMENDED CERTAIN UNIFORM CODES AND ENACTING NEW UNIFORM CODES AS THE BUILDING CODE FOR THE CITY AND COUNTY OF DENVER.

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

Section 1. That Ordinance Nos. 144 and 180, Series of 1990 as periodically amended be and the same are hereby repealed.


Section 3. That the Denver Building Code enacted by section 2 of this ordinance be and the same is hereby amended and supplemented by "Amendments to the 1991 Uniform Codes of the International Conference of Building Officials (ICBO) for the City and County of Denver", 1993 edition, which is attached hereto and incorporated herein.

Section 4. That attached hereto and incorporated herein are the 1991 Uniform Code for the Abatement of Dangerous Buildings and the 1991 Uniform Code for Building Conservation, and their respective appendices. Where they are applicable, these Codes shall be standards to be applied, where not in conflict with the Building Code, by the Building Inspection Division in exercising discretion in the interpretation, administration, and enforcement of the Building Code.
Code, by the Director in granting of modifications under Section 104(c) of the Building Code, by the Chapter 61 Committee in exercising its authority under Chapter 61 the Building Code, and by the Board of Appeals in exercising its authority under Section 120(f).

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DIVISION 1

AMENDMENTS

TO THE

1991 EDITION OF THE UNIFORM BUILDING CODE

AND

APPENDIX
DENVER AMENDMENTS TO THE UNIFORM BUILDING CODE
BY PARTS, CHAPTERS AND SECTIONS

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CHAPTER 1
ADMINISTRATIVE AND BOARD OF APPEALS

TITLE

Sec. 100. The title of this Ordinance shall be, and this Ordinance shall be cited and referred to as, the BUILDING CODE OF THE CITY AND COUNTY OF DENVER.

PURPOSE

Sec. 101. The purpose of this Building 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, and certain equipment specifically regulated herein.

SCOPE

Sec. 102. The provisions of this Building Code shall apply to and govern the following:

(a) New Buildings, Structures and Utilities. This Code shall regulate the construction, addition, alteration, repair, demolition, removal, moving, occupancy, use and maintenance of any building, structure or utility hereafter erected within the City, except as set forth in subsection (c) below.

(b) Existing Buildings, Structures or Utilities. This 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.

(c) Buildings, Structures and Utilities not Regulated by this Code. This Code shall not regulate work performed:

1. On work located primarily in the public way unless specifically provided for by this Code.

2. On 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.

(d) Most Restrictive. Where in any specific case the requirements of different sections of this Building 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 Building Code and any other legally adopted city ordinance, the most restrictive shall govern.
Sec. 102

(e) **Transition Rules.** This Building Code and implementation of all its provisions and policies shall become effective as follows:

1. The effective date of the new Building Code shall be as follows:
   A. Divisions 1 through 4 shall be effective four months after the effective date of the adopting ordinance.
   B. Division 5 shall be effective on the effective date of the adopting ordinance.

2. Any projects that will be submitted to the Building Department after the date of the adopting ordinance and before the effective date of this code shall have the option of using the present Denver Building Code or the new Denver Code, provided that the owner or the owner’s agent submits a letter of commitment to the Building Department stating:
   A. Election to proceed under the new or old building code;
   B. Address of the construction project;
   C. Description, number of stories, floor area, occupancy, etc. of the building (i.e., code analysis);
   D. Date of beginning design drawings; and
   E. Date of submitting construction drawings to Building Inspection Division.

3. Major projects on the board during the drafting of this Building Code, that will be submitted to Building Inspection Division after the effective date of this Building Code, shall have the option to use the present Denver Building Code, provided that the owner or the owner’s agent submits a letter of commitment with the same items required in paragraph 2, and provided that the construction of the project will start within 6 months after the Building Code effective date and be completed within 2 years after the Building Code effective date.

4. All letters of commitment must be submitted by the first day of the fourth month after the date of the adopting ordinance.

5. Division 5 - 1993 National Electrical Code with amendments, shall be effective on the date of adoption of the Ordinance and shall be used with either option outlined in item 2 or 3 of this Section.

**ORGANIZATION OF THE BUILDING INSPECTION DIVISION**

Sec. 103.

(a) **General.** The Building Inspection Division is established as an agency under the Manager of Public Works. See Chapter 4 for definition.
Sec. 103

(b) Director. The Department shall be administered by a Director. The Director is hereby authorized and directed to enforce all the provisions of this Code. Wherever this Building Code makes reference to the "Building Official," it shall mean the Director.

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

(d) Authorization and Identification. Each employee of the Department shall be provided with an identification card bearing information required by the Director. This card shall be carried by the person identified, and shall be displayed when necessary to identify the person properly to perform official duties.

GENERAL POWERS AND DUTIES OF THE BUILDING DEPARTMENT

Sec. 104.

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

(b) Interpretations, Rules and Regulations. The Director 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 may review any appeal of a Department interpretation subject to Section 121.

(c) Modifications Under Special Circumstances. Whenever there are practical difficulties involved in carrying out the provisions of this Code, the Director 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 Department.

(d) Authority to Inspect. The Department shall have the authority to inspect or cause to be inspected all buildings,
structures or utilities for compliance with this Building Code.

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

(f) Right of Entry. Whenever it is necessary to make inspections, investigations or surveys to enforce any of the provisions of this Code, or whenever an authorized representative of the Department has reasonable cause to believe that there exists in any building or upon any premises any condition or Code violation which makes such building or premises unsafe, dangerous or hazardous, the Department may enter such building or premises at all reasonable times to inspect the same or to perform any duty imposed upon the Department by this Code. If such building or premises are occupied, the Department shall first present proper credentials and request entry. If such building or premises are unoccupied, he shall first make a reasonable effort to locate the owner or other persons having charge or control of the premises and request entry. If such entry is refused, the Building Official shall have recourse to every remedy provided by law to secure entry.

(g) Orders.

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

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

   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 Building Code or other codes or ordinances enforced or administered by the Department.

   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.

2. Any such order shall be by written notice served on the owner of the property upon which work was or is being performed.
Sec. 104

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.

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

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

5. The Board of Appeal may review any appeal of a Department order subject to Section 121.

SERVICE

Sec. 105. Service of any order may be by personal service, as specified in the Colorado Rules of Civil Procedure, or by registered or certified mail, return receipt requested, and service shall be deemed complete upon delivery.

APPLICATION TO EXISTING BUILDINGS

Sec. 106.

(a) 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 Director shall use the 1991 edition of the Uniform Code for Building Conservation, and Guidelines as a guide for granting modifications to the Code for such additions, alterations or repairs.

(b) 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.

(c) Materials. Alterations or repairs to an existing building or structure which are nonstructural and do not adversely affect any structural member or any part of the building or structure having required fire resistance may be made with the same materials as of the existing building or structure.

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

(d) Existing Occupancy.

1. Buildings in existence at the time of the adoption of this Building Code may have their existing use or occupancy
continued, if such use or occupancy was legal at the time of the adoption of this Building 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 Chapters 3 and 5 of this Building Code.

(e) **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 Building 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 Department may cause any building, structure or utility to be reinspected.

(f) **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, tents 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 Department for a limited period of time as specified in Chapter 3. 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 Chapter 17. Temporary buildings or structures shall be completely removed upon the expiration of the time limit stated on the permit.

(g) **Historic Buildings.** See Chapter 61 of this Code.

**UNSAFE BUILDINGS OR STRUCTURES**

Sec. 107. An unsafe building or structure is one which constitutes a fire hazard or a hazard to life, health, property or public welfare by reason of use, construction, damage, vandalism, quality of materials, inadequate maintenance, dilapidation or abandonment, including but not limited to any building or structure in which any one or more of the following conditions exists:

(a) 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.

(b) Those buildings or structures that show damage or deterioration to:

1. 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 23.
2. Nonbearing exterior walls or enclosures to such an extent that they will not resist the wind pressure or lateral forces specified in Chapter 23.

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

(c) 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 23.

(d) Those buildings or structures having floors or areas with inadequate egress.

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

(f) Uncompleted buildings or structures when the permit has been cancelled.

(g) Open pits, open wells and open excavations of all types when such are determined to be hazardous by the Department.

(h) Trenches or ditches not properly shored or cribbed. See Chapter 29.

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

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

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

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

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

(k) 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.
UNSAFE UTILITY

Sec. 108. 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:

(a) **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 Department.
   18. Appliances not provided with required safety controls.

(b) **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 room, 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 Building 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 Building Code.

(c) **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.

(d) **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.
(e) **Plumbing Systems.** Plumbing systems or devices which have any of the following defects:

1. When the supply water does not meet the standards of potability as required by the Colorado State Department of Public Health and the City Department of Health and Hospitals.

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

3. Where inadequate piping does not supply sufficient water to the various appliances.

4. Clogged sewers or drains.

5. Where a trap seal is not provided or is inadequate.

6. Inadequate venting.

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

8. Trenches or ditches not properly shored or cribbed.

**NOTICE AND ABATEMENT OF UNSAFE BUILDINGS, STRUCTURES OR UTILITIES**

Section 109 is amended by adding:

Sec. 109.

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

(b) **Unsafe Building or Structure.** In the case of an unsafe building or structure, the Department 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 109(g).

(c) **Unsafe Utility.**

1. In the case of an unsafe utility, the Department shall affix an approved warning tag on the unit declared to be unsafe. The Department shall order the unsafe utility disconnected or its use discontinued until the nuisance created thereby is abated. In addition, the Department 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 Department.
Sec. 109

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 Department.

(d) 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 subsection (h), cause the demolition or securing of the unsafe building or structure.

(e) 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 Department may order and/or cause the building, structure or utility to be demolished, removed, disconnected or secured at once by any means available to the Department. When feasible, the Department 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 and/or removal or securing, if borne by the City, shall be recovered as provided for in Section 109(h).

(f) 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 Department. Recovery of cost and expense, if borne by the City, shall be made as provided for in Section 109(h).

(g) Posting of Signs. When necessary to protect life, property, health and public welfare, the Department may post signs which shall prohibit entry into an unsafe building or structure. However, with permission of the Department, 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 Department and shall read, in addition to other information, "DANGER KEEP OUT." See Section 112 for Prohibitions and Violations.

(h) 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 Department:

1. May obtain competitive bids for the securing or demolition of the building or structure.
Sec. 109

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.

(i) City's Lien. In the event the owner fails to pay the costs as set forth in the notice sent under subsection 109(h)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 Department 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 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 Building Code, cost and expense shall include the demolition, removal, securing, barricading and administrative costs incurred therewith.

USED MATERIALS

Sec. 110. Used materials may be used in the construction of any building, structure or utility only with prior approval of the Department.

ALTERNATE MATERIALS AND METHODS OF CONSTRUCTION AND EQUIPMENT.

Sec. 111.

(a) General. The provisions of this Building Code shall not prevent the use of alternate methods, materials or equipment that
meet the standards of strength, safety, sanitation and fire resistance required to be met in any building, structure or utility to which this Building Code applies, provided that the alternate has been approved by the Department.

(b) Application and Fee. An application for approval of an alternate material, method or equipment shall be filed with the Department upon a Departmental form. Information shall be that required by the Department and this Building Code. The application 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 Department.

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

(d) Department Decision. The Department 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 Department 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 Building Code.

(e) Requirements and Tests.

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

2. In order that claims for alternate materials, methods or equipment may be substantiated, the Department may require tests to be made at the expense of the applicant by an approved laboratory or agency. Test methods shall be as set forth by the Standards which are part of this Building Code, or by a test method established for a particular product by a nationally recognized agency. If there are no appropriate test methods or Standards set forth in this Building Code, the manufacturer or fabricator may present testing methods and their results for evaluation.

(f) Approved Testing Laboratories. At the discretion of the Department, 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 Department 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 Department for approval.
(g) Right to Appeal. The Board of Appeals may review a Department decision upon appeal, subject to Section 121.

PROHIBITIONS, VIOLATIONS, PENALTIES AND REMEDIES

Sec. 112.

(a) Prohibitions. It shall be unlawful for anyone to do or cause to be done any act or allow a condition to exist that violates or is contrary to the provisions of this Building Code, any other code, ordinance or rule and regulation promulgated thereunder which is enforced and administered by the Department, 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 Building 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 Chapter 2 of this Building Code, except that the owner of a building, where authorized under Chapter 3 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 2 of this Building 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 Department in accordance with Chapter 3 of this Building 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 Department as required by the provisions of this Building Code. A Certificate of Occupancy will not be required for remodeling or additions, unless there is a change of occupancy. See Chapters 3 and 5.

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 Building Code. It shall also be unlawful to remove or deface any City red tag attached to a utility. These provisions shall apply to buildings, structures or utilities which 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 109(g).

8. **Removal of Danger Sign(s).** It shall be unlawful to remove or deface a sign required by Section 109(g), without specific approval from the Department.

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

10. **Vacant and Inadequately Maintained or Boarded up Buildings or Structures.** It shall be unlawful for any person to maintain or permit to be maintained for a period longer than 6 months any building or structure in any residential zoned district which is vacant and inadequately maintained or which is boarded up, and which does not show evidence of current construction or remodeling activity.

11. **Vacant and Inadequately Maintained Buildings or Structures Located within 1,000 feet of a Residential Zoned District.** It shall be unlawful for any person to maintain or permit to be maintained for a period longer than 6 months any building or structure which is vacant and inadequately maintained, and which does not show evidence of current construction or remodeling activity, and which is:

   A. Within 1,000 feet of a residential zoned district and is located in an I-0 zone district.

   B. Within 1,000 feet of a residential zoned district and is located in a business zone district.

**EXCEPTION:** B-5, B-7 and B-8 zone districts.

12. **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 Department as being unsafe, and to which a City red tag has been attached as provided for in Section 109(c)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 Department, 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 Department prior to removal of the City red tag.

13. 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 109(c)(1) of this Building Code.

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

(b) Violation. Wherever, by the provisions of this Building Code, any act is prohibited, or wherever 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 Building Code shall constitute a violation. Each day on which a violation exists shall constitute a separate offense and a separate violation.

(c) Penalties. Whenever, in any Section of this Building Code, or any Section of a Rule or Regulation promulgated hereunder, 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 a sum of not more than $999.00, and/or imprisoned not to exceed 180 days, or both so fined and imprisoned. 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 Building Code.

(d) 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 Building 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 hereunder shall not preclude the City or any proper person from instituting any appropriate action or proceeding to require compliance with the provisions of this Building Code, and with administrative orders and determination made hereunder.

SECTIONS 113 THROUGH 119 HAVE BEEN PURPOSELY OMITTED.

BOARD OF APPEALS

Sec. 120.

(a) Creation. There is hereby created a Board of Appeals (the
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"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 and shall fill a temporary vacancy for a citizen member. In the absence of any member of the Board, the alternates shall be authorized to fill such temporary vacancy, regardless of the resulting composition of the Board, with the full power and compensation accorded the regular member. A permanent vacancy shall be filled in accordance with subsection (d) below. Alternates may appear at all meetings but shall not vote unless they are filling a temporary vacancy.

(b) Secretary. There shall be a Secretary of the Board, furnished by the Department. 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 to come before the Board prior to the meeting of the Board.

(c) Fire Department Representative. The Chief of the Fire Prevention Bureau, 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.

(d) Terms. As of the effective date of this Ordinance, the Mayor shall appoint the initial Board members in accordance with subsection (a) above. The initial terms of these members shall be as follows: Citizen 1 - 1 year; Citizen 2 - 2 years; Architect - 2 years; Contractor - 3 years; Engineer - 3 years; Engineer Alternate - 2 years; Architect Alternate - 3 years; Citizen Alternate - 2 years. Following these initial terms, subsequent terms of all Board members and alternates 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 which 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.

(e) **Procedures - Meetings - Quorum.**

1. **Regular Meetings.** Regular meetings shall be held once
each month, or as often as may be required by the Department. 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 Department 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 Department. The
Department 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 Building Code.

7. **Department/Interested Party.** At any public meeting a
representative of the Department 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.
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(f) **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 Department in the enforcement of the Building 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 Department upon finding that the following conditions exist:

      (i) The applicant properly applied for a variance under Section 121.

      (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 Department's denial of an application for alternate materials and methods of construction and equipment under Section 111 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 Department 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 111;

(ii) That the proposed design is satisfactory and that the alternate is, for the purpose intended, the equivalent of that prescribed in the Building Code;

(iii) That the proposed alternate will not weaken the general purposes of the Building Code;

(iv) That the proposed alternate will be in harmony with the spirit and purposes of the Building 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 Department 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. 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 Department as a matter of public record.

(g) Procedure and Notice. Upon written receipt of a request for a variance, notice of the request shall be sent to the Fire Department, the Health Department, the City Attorney, the owner of the real estate affected by the request for a variance, and those neighborhood organizations listed and described in Sec. 41-19 of
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the Revised Municipal Code. No variance shall be granted until 15 days after the required notifications are mailed.

(h) 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 (g), including the Department. 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 shall be necessary to decide any matter upon which the Board is required to pass under this Building Code.

3. The Board of Appeals shall have no authority to review administrative decisions or grant variances to the provisions of Chapters 1, 2 or 3 of this Code except where specifically provided by the following Sections: Section 104(b) Interpretations, Rules and Regulations; Section 104(c) Modifications; Section 104(f) Orders; Section 111 Alternate Materials and Methods of Construction; Section 202(c) Application and Fee; Section 209 Suspension or Revocation of License; Section 218 Suspension or Revocation of Certificate; Section 310 Certificate of Occupancy; and Section 312 Permits for a Temporary Building.

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

(i) Compensation. Each member of the Board shall receive $35.00 per meeting attended regardless of number or type of cases heard.

APPEALS

Sec. 121.

(a) Method of Application Fee. Prior to an action by the Board, an application shall be filed with the Department on a form providing the necessary information required by the Board. An appeal shall not be considered unless filed with the Department at least 15 days prior to the meeting. Upon filing the application, a fee of $35.00 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 Department. This fee is not refundable.

(b) Hardship or Error. Any person, firm, corporation or city agency aggrieved by a decision of the Department in the enforcement of this Building Code; any person, firm or corporation who feels that there are practical difficulties or unnecessary
hardships involved in carrying out the strict letter of this Building Code; or where it is alleged there is error in any order, requirement, decision or determination made by the Department, may, within 30 days of the date of notice of such decision or order, appeal the decision or order of the Department by filing an application with the Board.

(c) **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 Department 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.

(d) **Hazard.** In any matter in which an order or notice relating to an unsafe building or structure is appealed, the Department 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.

**APPEALS FROM DECISIONS OF THE BOARD**

Sec. 122.

(a) **Procedure.** Any person aggrieved by the City, or any officer, department 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 facts pertinent and material to the decision appealed from and shall be verified.

(b) **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.

(c) **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.
VALIDITY OF BUILDING CODE

Sec. 123. If any Section, subsection, sentence, clause or phrase of this Building Code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this Building Code.

LIABILITY

Sec. 124. The Director, 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 Director 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 Department, shall be defended in accordance with A10.8 of the Charter and 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 Department 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.
CHAPTER 2 is amended in its entirety:

CHAPTER 2
LICENSING, CERTIFICATION, REGISTRATION, BOARDS OF STANDARDS

GENERAL
Sec. 200. This Chapter provides for the licensing of all persons, the certification of supervisory personnel, registration, other types of certifications, and Boards of Standards.

AUTHORITY
Sec. 201.
(a) Licenses. The Department is vested with the authority to establish licensing procedures, to qualify applicants for licenses and to issue, revoke, renew and suspend licenses.
(b) Certificates. The Department is vested with the authority to establish certification procedures, prequalify applicants, and issue, revoke, renew and suspend certificates.

LICENSES OR REGISTRATION
Sec. 202.
(a) 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.
(b) Licenses or Registration Required. Licenses shall be required for all types of work described in this Chapter. Plumbing contractors shall be licensed by the Department and shall have a master plumber license issued by the State of Colorado as the licensee or in the full time employ of the contractor. Electrical contractors registered by the State of Colorado shall also register with the Department. 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 Group R-3 and M Occupancies when work is performed under a permit authorized by Chapter 3.

(c) Application and Fee. Every applicant for a license shall fill out a form provided by the Department 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 Department. 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 Department, the applicant may appeal to the Board of Appeals in the manner provided for in this Building Code.

(d) 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 Department within 3 working days after the termination. Failure of the licensee to notify the Department 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 Department notified.

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

2. Not Required. The following licenses and registrations shall not require a certified supervisor:
   A. Electrical Registration.
   B. Building Contractor Class E.
   C. Sign Contractor Class B.
   D. Lawn Sprinkler Contractor.
CLASSIFICATION OF LICENSES AND REGISTRATION

Sec. 203.

(a) 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. To erect, add to, alter or repair any building or structure. The demolition of a building or structure is permitted when the licensee establishes that he will erect a new building or addition on the same site. All work shall be performed under the supervision of the holder of a Class A Construction Supervisor Certificate.

2. Building Contractor Class B. 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 R-3 Occupancy or one-story building or structure is permitted when the licensee establishes that he will erect a new building or addition on the same site. 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 a Class A or B Construction Supervisor Certificate.

3. Building Contractor Class C. To erect, add to, alter or repair any Group R-3 or M Occupancy building. The Contractor may install nonbearing partitions or do finish work within any type of building or structure and also erect prefabricated patio covers, carports, canopies and awnings less than 1000 square feet area for a building of any occupancy classification. The demolition of any one-story Group R-3 or M Occupancy building or structure is permitted when the licensee establishes that he will erect a new building or addition on the same site. All work shall be performed under the supervision of the holder of a Class A, B or C Construction Supervisor Certificate.

4. Building Contractor Class D. To perform work listed under any one of the crafts listed below. All work enumerated in this subsection shall be performed under the supervision of the holder of the particular Class D Construction Supervisor Certificate.
   A. D-1 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.
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B. D-2 Roof Covering and Waterproofing. Installation of roof coverings including valleys, gutters, downspouts and waterproofing.

C. D-3 Masonry. Laying and forming all types of masonry.

D. D-4 Curtain Walls. Installation of curtain walls and storefronts.

E. D-5 Excavating, Shoring, Piles, Caissons and Drilled Shafts. All types of excavating work, shoring and the installation of caissons and drilled shaft foundations.

F. D-6 Wood Framing. The fabrication and erection of wood framing for all types of buildings.

G. D-7 Swimming Pools. Installation of swimming pools required by this Code.

H. D-8 Structural Metals. The fabrication and erection of structural metal members for all buildings or structures.

I. D-9 Pre-Cast Concrete Building Units. The erection of precast concrete structural units.

J. D-10 Dry Wall. Installation of all dry wall including the installation of nonbearing partitions and suspended ceiling systems.


M. D-13 Cast-in-Place Concrete. The forming and construction of all cast-in-place concrete including the placement of reinforcing steel, bar supports and welded wire fabric for reinforced concrete construction.

5. Building Contractor Class E. To perform the work involving the installation, altering or repair of the following:

E-1. Garage door installers
Gutters and downspouts
Siding
Prefabricated patio covers, carports, canopies and awnings less than 1000 square feet area.
Storm window and door installers
Security bars, grills and grates

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Glass and glazing installations for all occupancies and the installation of custom sized replacement windows for townhouses and dwellings which do not require any structural alterations.

E-2. Building insulation
   Acoustical treatment

E-3. Sandblasting and cleaning
   Damp proofing

E-4. Fences
   Scaffold erection

E-5. Power operated door installers
E-6. Tents - Fabric covered structures
E-7. Tile and marble
E-8. Fireplace inserts
E-9. Raised access floor
E-10. Electric Locksmith - (Low voltage 24 volts or less AC/DC) - Installation of electric door strikes and magnetic door locks which may be connected to card access devices, closed circuit TV, TV and VCR, buzzers, bells, gate and door controls or similar security devices.

6. Construction Management Firm. To administer and coordinate those trades and contracts directly engaged in the construction of buildings, structures and utilities. The holder of this license shall conform to all the provisions of this Building Code and Chapter except that this licensee shall not be permitted to obtain permits in accordance with Chapter 3. This license shall require a Construction Certificate holder who shall be certified in the Class of Construction being performed and be in the employ of the construction management firm. See Table 2-B.

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. 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.

10. 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 fire sprinklers not to exceed 10 heads. All work shall be performed under the supervision of the holder of a State of Colorado Master Plumbers License.

11. Plumbing Contractor Class B. To install, add to, alter or repair, in Group R-3 and M 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.

12. 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.

13. Hot Water Contractor. To install, add to, alter or repair, in Group R-3 or M 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.

14. 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.
15. **Heating and Ventilating Contractor Class B.** To install, add to, alter or repair, in Group R-3 or M 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.

16. **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.

17. **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.

18. **Refrigeration Contractor Class B.** To install, add to, alter or repair, in Group R-2, R-3 and M Occupancies only, 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.

19. **Sign Contractor Class A.** To fabricate, install, erect or maintain all types of signs. All work shall be performed under the
supervision of the holder of a Class A Sign Supervisor Certificate.

20. **Sign Contractor Class B.** To install, erect or maintain the following types of non-illuminated signs:
   A. Cloth signs mounted directly on a wall.
   B. Wall signs not exceeding 200 square feet in area.
   C. Ground signs not exceeding 150 square feet in area.
   D. Arcade signs not exceeding 25 square feet in area per side.

   A certified supervisor shall not be required for this license.

21. **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.

22. **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.

23. **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 B Fire Protection Supervisor Certificate.

24. **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.

25. **Lawn Sprinkler Contractor.** To install, add to, alter or repair underground lawn sprinkler systems except for the connection to the water service line. A certified supervisor shall not be required for this license.

26. **Electrical Signal Contractor.** To install, add to, alter or repair electrical wiring and equipment for fire alarm, fire detection, emergency voice communication systems, electrical signalling and control wiring. Voltages shall not exceed 48 volts or the system shall be power limited as defined by the National Electrical 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 Electrical Signal Supervisor Certificate.
27. **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.

28. **Water Service Contractor.** To install service lines and appurtenances, on new installations only, 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.

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

**LICENSE FEES**

Sec. 204.

(a) **Annual Fees Required.** The annual license fee shall be paid to the Department in accordance with Table 2-A.

(b) **License Fee Refund.** License fees shall not be refundable.

**LICENSE RENEWAL**

Sec. 205. All licenses are subject to annual renewal.

**REISSUANCE OF LICENSE**

Sec. 206. The Department 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.

**LICENSEE AND REGISTRANT RESPONSIBILITY**

Sec. 207.

(a) **Licensee Responsibility.** Licensees shall be responsible for performing all work in conformity with the provisions of this Building Code, including, but not limited to the following items:

   1. To report in writing to the Department, 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 Department.

4. To employ a full time qualified supervisor certified in accordance with the requirements of this Building Code.

5. To employ qualified journeymen certified in accordance with the requirements of this Building 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 Department and permit issued for same, unless changes are approved by the Department.

8. To complete all work authorized by the permit issued under the authority of this Building Code, unless acceptable cause is indicated to the Department.

9. To obtain inspection services where required by this Building Code.

10. To pay any fee assessed under authority of this Building Code.

11. To obey all orders or notices issued under the authority of this Building Code.

12. To provide all vehicles used in the operation of the business with 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 Department a current mailing address. Any Order, Notice, Summons and Complaint or other Departmental communication, whether delivered by personal service or by certified, registered or first class mail sent to that address, shall constitute service.

(b) Registrant Responsibility. Registered electrical contractors shall comply with all provisions of Section 207(a) above and in addition shall comply with all provisions of the Colorado State Electrical Board.

LICENSE AND REGISTRATION CHANGES
Sec. 208.
(a) Change of Name. The change of name by a licensee or
registrant shall be reported to the Department within 15 days after making the change, on a form provided by the Department. A $15.00 application fee shall be required.

(b) **Change of Address.** A change of address of a licensee or registrant shall be reported to the Department within 15 days after making the change.

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

(d) **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.

**SUSPENSION OR REVOCATION OF LICENSE**

Sec. 209.

(a) **Authority.** The Director 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 Building 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 Building Code.

4. Willfully violates or disregards any of the provisions of this Building Code.

5. Intentionally fails to perform in accordance with any written contract to perform work which is regulated by this Building Code.

6. Creates, as a result of work performed, an unsafe condition as defined in Chapter 1 of this Building 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.

(b) **Procedure.** When any of the acts or omissions enumerated herein are committed by a license holder and the Director deems that the license shall be suspended or revoked, the action shall be as follows:

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

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

3. Time of Hearing. If a hearing is requested by the Certificate holder, the Manager of Public works 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 Director.

4. Attendance. The Certificate holder, the Department and other interested parties may be in attendance at the hearing. Upon completion of the hearing, the Manager of Public Works shall take all evidence available as a result of the Department'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 license is being suspended or revoked under the emergency provisions of Section 209(c), 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. The return by the U.S. Postal Service of the notification as undeliverable or refused at the address maintained by the licensee with the Building Inspection Division.

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

(c) Emergency Suspension or Revocation. If the Director 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 of Public Works and such hearing shall be granted within 24 hours. The suspension or revocation is not stayed while the hearing is pending.
Sec. 209

(d) **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.

(e) **Delegation of Authority.** The Manager of Public Works may appoint a hearing officer to conduct the hearing. Final decision shall be rendered by the Manager of Public Works.

(f) **Right to Appeal.** Any final decision by the Manager of Public Works may be reviewed in the manner provided by the Colorado Rules of Civil Procedure. See Section 122.

CERTIFICATES


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

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

(c) **Certificate Application.** Every applicant for a Certificate shall be required to complete a form provided by the Department 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 reexamined for any reason, a new application and fee shall be required.

(d) **Successful Applicants.** If an applicant who has successfully passed the examination given by the Department 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.

(e) **Failure to Pass Examination.** When an applicant has failed to pass the examination, he shall be notified in writing by the Department.

(f) **Certified Supervisors.**

1. Every supervisor required for a particular license shall be examined by the Department, 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 202(d).

CLASSIFICATION OF SUPERVISOR CERTIFICATE OF QUALIFICATION

Sec. 211. A Supervisor Certificate for the particular work to be performed shall permit the holder to be a Supervisor under the licenses listed in Table 2-B.

CLASSIFICATION OF JOURNEYMAN AND OPERATOR CERTIFICATE OF QUALIFICATION

Sec. 212.

(a) 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.

(b) 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 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 after burners. 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.

2. 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.

3. Journeyman Gas Service Certificate. Permits the installation of the following equipment utilizing gas or liquid fuel:
Sec. 212

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.

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.

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 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.

7. Journeyman Electrical Signal Certificate. Permits the installation of electrical wiring and equipment for fire alarm, fire detection, emergency voice communication system, and electrical signalling 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.

8. **Journeyman Drainlayer Certificate.** Permits the installation of sanitary, storm sewer and sewer connections. This work shall commence at the pipe located 2 feet outside the buildings and continue to the main sewer and shall include digging and backfilling of ditches. The holder of this Certificate may perform this work only in the employ of a Plumbing Contractor Class A or B.

(c) **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. Composite grouping of refrigeration machines where machines are 25 tons in capacity and parallel to a common refrigerant piping system. The total charge in the entire system shall determine the capacity of the system.

4. Refrigeration systems utilizing Group 2 or 3 refrigerants as defined in the Mechanical Code and which contains a charge of 200 lbs. or more.

5. Refrigeration systems having manual or semi-automatic control with charges of 1500 lbs. or more of Group 1 refrigerants as outlined in the Mechanical Code.

6. Refrigeration systems with fully automatic controls with charges of 1500 lbs. or more of Group 1 refrigerants.

   NOTE: As used in this Section, semi-automatic shall mean plants or systems which are provided with automatic safety controls by manual load proportioning controls requiring other than seasonal adjustments.

(d) **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.

(e) **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.
(f) **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.

(g) **Refrigeration Operator Certificate.** Permits the holder to take charge of and operate mechanical refrigeration systems.

(h) **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 regulated and as defined in this Building 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.

**APPRENTICES AND TRAINEES**

Sec. 213.

(a) **General.** This Section shall govern the requirements for apprentices and trainees and shall be limited to the crafts listed in this Chapter where a Journeyman Certificate holder is required.

(b) **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.

(c) **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.

(d) **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.

(e) **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
Sec. 213

employed shall not exceed one apprentice or trainee to one Journeyman or Master Electrician.

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

CERTIFICATE FEES

Sec. 214.

(a) Annual Fees. Annual Certificates of Qualification fees shall be paid the Department as follows:

- Supervisor Certificate ....................... $25.00
- Journeyman Certificate ....................... $10.00
- Engineer Certificate .......................... $10.00
- Operator Certificate .......................... $10.00

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

(b) Certificate Fee Refund. Certificate fees are not refundable.

CERTIFICATE RENEWAL

Sec. 215. Certificates shall be renewed annually and expire on the date specified on the Certificate. No work shall commence or continue after the date of expiration.

REISSUANCE

Sec. 216.

(a) General. The Department 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, reexamination shall not be required.

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

CERTIFICATE HOLDER RESPONSIBILITY

Sec. 217.

(a) General. All Certificate holders shall be responsible to insure that the work performed by the licensee is in accordance with the requirements of this Building Code, without limitation, and to:
Sec. 217

1. Have in possession at all times a Certificate.
2. Present a Certificate when requested by the Department.
3. Faithfully construct without departure from or disregard of approved drawings and specifications.
4. Obey any order issued under authority of this Building Code.
5. Pay any fee assessed under the authority of this Building Code.
6. Observe the safety requirements of this Building 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 Department 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 Department and permit issued for same, unless changes are approved by the Department.
13. Complete all work authorized by the permit issued under the authority of the Department, unless the cause of incomplete work is determined by the Department to be not the fault of the Certificate holder.
14. Obtain inspection services where required by the Department.

SUSPENSION OR REVOCATION OF CERTIFICATE

Sec. 218.

(a) Authority. The Director may suspend or revoke a Certificate for any one or more of the following acts or omissions:

1. Incompetence.
3. Violation of any of the provisions of this Building Code.
4. Failure to comply with any of the Certificate holder responsibilities outlined in Section 217.
5. Knowingly conspire with a person to permit a license to be used by another person.
Sec. 218

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

7. Willfully violate or disregard any of the provisions of this Building Code.

8. Intentionally fail to perform in accordance with any written contract to conduct work which is regulated by this Building Code.

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

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

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

(b) Procedures. When a Certificate holder commits any acts or omissions enumerated above and the Director deems that the Certificate shall be suspended or revoked, the action shall be as follows:

1. Notification. The Department shall send written notice to the certificate holder, by certified mail or by personal service, identifying the acts of omission and indicating the intent to suspend or revoke the certificate. The written notice shall advise the certificate holder that a "Request for hearing" may be initiated as outlined in item 2.

2. Request 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 of Public Works within 7 days after receipt of the notice.

3. Time of Hearing. If a hearing is requested by the Certificate holder, the Manager of Public Works 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 Director.

4. Attendance. The Certificate holder, the Department and other interested parties may be in attendance at the hearing. Upon completion of the hearing, the Manager of Public Works shall take all evidence available as a result of the Department'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 219(c), the suspension or revocation shall take effect:
Sec. 218

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

B. The return by the U.S. Postal Service of the notification as undeliverable or refused at the address maintained by the certificate holder with the Building Inspection Division.

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

(c) **Emergency Suspension or Revocation.** If the Director 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, he 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 of Public Works and such hearing shall be granted within 24 hours. The suspension or revocation is not stayed while the hearing is pending.

(d) **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.

(e) **Delegation of Authority.** The Manager of Public Works may appoint a Hearing Officer to conduct the hearing. The final decision shall be rendered by the Manager of Public Works.

(f) **Right to Appeal.** Any final decision by the Manager of Public Works may be reviewed in the manner provided by the Colorado Rules of Civil Procedure. See Section 122.

**BOARDS OF STANDARDS**

Sec. 219.

(a) **Creation of Boards of Standards.** There are hereby created and established Boards of Standards which shall have the duties, powers and functions prescribed by this Section.

(b) **Members.** The members of the Boards shall be appointed by the Mayor to serve a period of 2 calendar years and may be reappointed for an additional 2 years; but no member shall serve more than 4 consecutive years.

(c) **Procedures and Bylaws.** The Boards of Standards are authorized to make rules of procedure and adopt bylaws necessary for the transaction of business consistent with this Building Code. Each Board shall elect its own Chairman at the first meeting of each calendar year and that person shall be Chairman.
Sec. 219

for the entire year. A simple majority shall constitute a quorum. Each member shall receive $25.00 for attendance per meeting.

(d) **Examination Standards.** The Board of Standards shall develop standards for the examination of applicants for Certificates and shall submit the standards to the Department for approval. The standards shall be consistent with the purpose of this Building Code, which is the protection of the public health, safety and welfare of the people of the City to the extent that those persons recommended to be certified under this Building Code are qualified in terms of their skills, knowledge, practical experience and knowledge of pertinent law to perform the work for which they may be certified.

1. The Examination Section of the Department shall examine applicants in the following areas:
   A. Applicable portions of the Building Code.
   B. Technical knowledge.
   C. Skills.

2. The Boards shall furnish the Examination Section of the Department with suggested test material which reflects the examination standards.

3. The Department shall establish minimum standards for education and experience of applicants.

(e) **Annual Review.** The standards shall be reviewed annually, or more frequently if necessary, to maintain the standards current with changes in the Building Code and building practices.

(f) **Members.** The qualifications for members of the respective Boards shall be as follows:

1. **Building Board.**
   A. Construction Class A Certificate Holder.
   B. Construction Class B Certificate Holder.
   C. Construction Class C Certificate Holder.
   D. Professional Engineer registered in the State of Colorado.
   E. Architect licensed in the State of Colorado.
   F. Sign Class A Certificate Holder.
   G. Demolition Class A Certificate Holder.

   This Board shall develop standards for the examination of applicants for the following Certificates: Construction Class A, B, C, D and Moving; Demolition Class A and B; Sign Class A.

2. **Heating, Ventilating and Gas Service Board.**
   A. Heating and Ventilating Class A Certificate Holder.
Sec. 219

B. Gas Service Certificate Holder.
C. Professional Engineer registered in the State of Colorado.

This Board shall develop standards for the examination of applicants for the following Certificates: Heating and Ventilating Class A, B; Gas Service; Journeyman Gas Service; Journeyman Heating and Ventilating.

3. Mechanical Board.
A. Steam and Hot Water Certificate Holder.
B. Journeyman Steamfitter Certificate Holder.
C. Stationary Engineer Class A Certificate Holder.
D. Professional Engineer registered in the State of Colorado.
E. Refrigeration Class A Certificate Holder.
G. Boilermaker Certificate Holder.
H. Journeyman Boilermaker Certificate Holder.
I. Journeyman Refrigeration Certificate Holder.
J. Water Service Certificate Holder.
K. Journeyman Drainlayer Certificate Holder.

This Board shall develop standards for the examination of applicants for the following Certificates: Refrigeration Class A, B; Stationary Engineer; Boiler Operator Class A, B; Refrigeration Operator; Steam and Hot Water; Hot Water; Fire Protection Class A, B, C; Boilermaker; Water Service; Journeyman Steamfitter; Journeyman Refrigeration; Journeyman Water Service; Journeyman Boilermaker; Journeyman Drainlayer.

4. Electrical Board.
A. Hoist Operator
B. Professional Engineer registered in the State of Colorado.
C. Electrical Signal Certificate Holder.
D. Elevator Certificate Holder.

This Board shall develop standards for the examination of applicants for the following certificates: Hoist Operator; Elevator; Electrical Signal; Journeyman Electrical Signal.

Sec. 220. Has been purposely omitted.
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CHAPTER 3

PERMITS, PLANS, INSPECTIONS, CERTIFICATE OF OCCUPANCY

PERMITS REQUIRED

Sec. 300.

(a) General. 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 Building Code, or cause the same to be performed, in the City and County of Denver, without first having obtained a permit from the Department for the specific work to be performed. This permit shall be displayed or available on the job site at all times.

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 and Zoning Administration 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 150 square feet and a maximum height of 8 feet.
2. Fences not over 4 feet high.
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. See Section 1107.
6. Water tanks supported directly upon grade where the capacity does not exceed 5000 gallons and the ratio of height to diameter or width does not exceed two to one.
7. Platforms, walks and driveways not more than 30 inches above grade and not over any basement or story below.
8. Painting, wall papering, cabinets, curtains, drapes and similar decoration items except those items regulated by Chapter 42.
Sec. 300

9. Temporary motion picture, television and theater stage sets or scenery.

10. Window awnings supported by an exterior wall of Group R-3 and M Occupancies when projecting not more than 54 inches over privately owned property.

11. Prefabricated swimming pools accessory to a Group R-3 and M Occupancy in which the pool walls are entirely above the adjacent grade and when utilities are provided.

12. A permit shall not be required of a public utility for the construction, repair, or maintenance of their 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.

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.

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.

PERMITS

Sec. 301.

(a) Application.

1. The owner or the owner’s agent shall apply for a permit on forms furnished by the Department.

The applicant should exercise care in completing the necessary information, especially addresses, as permits are non-transferable, unless the address change is approved by the Address Section of the Design Engineering Division of the Department.

EXCEPTION: The Department may correct minor errors in the address if the change can be made on all copies of the permit and initialed by the inspector.
Sec. 301

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

(b) Issuance of Permits.

1. The Department shall issue permits to perform the work shown on submitted documents and as specified on the permit when the following conditions are met:

A. All phases of the project conform to the requirements of this Building Code, Department of Public Works, Zoning Administration, Department of Health and Hospitals, and Fire Department; and

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

   (i) A contractor that is licensed under Chapter Two of this code;

   (ii) An authorized representative of the license holder;

   (iii) An owner applying for a permit under Subsection 301(b)1C or

   (iv) An owner or owner’s agent applying for permits under Subsection 301(b)1D.

C. When the applicant is a person who owns a single family dwelling, a duplex, a Group M Occupancy or a dwelling unit in a townhouse building, or who owns property and wishes to construct a single family dwelling or Group M Occupancy which is an accessory to an owner-occupied single unit dwelling or owner-occupied half of a duplex, a permit will be issued provided that:

   (i) Any work done under a homeowner’s permit including demolition of a dwelling or Group M.1 structure shall be done by the owner personally unless otherwise approved by the Department.

   (ii) 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.

   (iii) Any electrical, plumbing, mechanical or structural work that is done on a homeowner’s permit shall be restricted to work in an owner-occupied single family dwelling, the owner-occupied unit of a duplex or Group M occupancy. When the applicant does
electrical work, he must intend to occupy the unit for at least 12 months after the completion of the permitted work and shall submit a written statement to the Department before an electrical permit will be issued.

(iv) 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, duplex, or miscellaneous building. A request for permit shall be in writing and shall be issued only when approved by the Director.

EXCEPTIONS:

a. A permit shall not be issued to the owner of a townhouse dwelling unit for structural or utility work.

b. Only one permit to construct a single family or duplex building shall be issued to any person under Subsection 301(a)3 in any 12-month period.

D. When the applicant is the owner or owner's agent of a Group R Division 1 building for the purpose of installing battery-operated smoke detectors.

E. 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.

F. The applicant is an owner or owner's agent to establish a new certificate of occupancy when no construction work is to be done, covered by a 1-C building permit.

(c) **Nontransferable.** Permits shall not be transferable.

**EXCEPTION:** Permits for improper address issued to same contractor may be transferred. A processing fee of $15.00 per permit will be charged. Requests for transferable permits must be made within 30 days of issuance of the original permit.

(d) **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 Building Code or other ordinances, laws, rules or regulations. The Department shall take any action it deems necessary to ensure that all work performed meets all requirements of this Building Code.

(e) **Suspension-Cancellation-New Permits.**
1. A permit may be cancelled by the Department when:
   A. Work is not commenced within 60 days from the date of issuance unless this time is extended by the Department.
   B. Work is suspended or abandoned for a period of 60 days after work is commenced unless this time is extended by the Department.
   C. No request for inspection has been made for a period of 60 days unless this time is extended by the Department.

2. A demolition or moving permit may be cancelled by the Department when:
   A. Work is not commenced within 30 days after the date of issuance.
   B. Work is suspended or abandoned for a period of 10 days after work is commenced unless otherwise approved by the Department.

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 cancelled 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 \( \frac{1}{2} \) the current permit fee, provided that the application is made within one year after cancellation.

4. The Department 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 Building Code or any City ordinance which the Department 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, Health and Hospitals, and the Fire Department.
   C. Whenever the continuance of any work becomes dangerous to life or property.

(f) Notice. Notice of the suspension or cancellation for reasons stated in subsection (c) 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.
Sec. 302

PERMIT FEES

Sec. 302.

(a) Permit Fees. The fee for each permit shall be as set forth in Table No. 3-A. 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 director 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, water or which may reduce air pollution. Such waivers shall be in writing and shall be for a specific period of time.

(b) Plan Review Fees. The plan review fee shall be 40% of the building permit fee shown in Table No. 3-A and shall be paid at the time of submitting plans and specifications for review. The plan review fees specified in this subsection are included in and not in addition to the permit fees specified in subsection 302(a). Where plans are incomplete or changed so as to require additional plan review, an additional plan review fee shall be charged at the rate shown in Table No. 3-A.

(c) Type Approval. When construction documents have been approved for a typical structure and duplicate structures are to be constructed by the same contractor, 80% of the original permit fees will be required for the building permits of duplicate or typical buildings.

(d) 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. No application shall be extended more than once. 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.

(e) Allowed Inspections. Permit fees provide for the customary inspections only.

(f) Late Fees. When work for which a permit is required by this Building Code is started without a permit, the permit fees
stated in Table No. 3-A shall be doubled. The payment of this
double fee shall not relieve any person from fully complying with
the requirements of this Building 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 Department, 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.

**EXCEPTION:** For items of work performed on an
emergency basis, as determined by the Department, 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.

(g) **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.

(h) **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.

(i) **Additional Permit Fees for Rejected Drawings.** When
drawings are rejected, an additional fee shall be charged in
accordance with Table No. 3-A.

(j) **Modified Drawings.** When a reviewed set of drawings is
modified or substantially changed so as to require rechecking by
the Department, an additional fee shall be charged in accordance
with Table No. 3-A.

(k) **Refunds.** No refund will be granted for any permit fee paid
to the Department.

**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.

**DRAWINGS AND SPECIFICATIONS**

**Sec. 303.**

(a) **General.** Drawings and specifications shall be required for
review and approval by the Department prior to the issuance of a
permit, except as set forth in subsection (f).

(b) **New Construction, Additions, Alterations or Repairs.**
Application for a permit shall be accompanied by the following:
Sec. 303

1. Drawings including the information required in Section 305.

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 Department of Health and Hospitals and the Fire Department shall approve all reports required by this subsection before any permit is issued.

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

   (c) Approval. Drawings and specifications complying with the provisions of this Building Code and approved by the Department shall bear the Department stamp of approval on the first page thereof. When corrections are required, the Department may require that the drawings and specifications be revised and resubmitted for approval prior to the issuance of a permit.

   (d) Distribution. One set of approved drawings and specifications shall be returned to the applicant to be maintained at the job site. One set of approved drawings and specifications shall remain in the office of the Department.

   (e) Disposal. Upon completion of the work and the final inspections by the Department, the Department's 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 90 days from the date of application.

   (f) 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 Department 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.

   (g) Utility Companies. With the approval of the Department, the design of buildings, structures or utilities for the authorized Public Utilities may vary from these Building Code requirements.
Sec. 304. PREPARATION OF DRAWINGS AND SPECIFICATIONS

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

(a) 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 (f).

(b) Seal. The authorized seal, either the crimp type imprint or a rubber stamp facsimile with an original signature, shall be placed on:

1. Reproductions of all original drawings produced by or under the direct supervision of the design professional.
2. The cover, title page and table of contents of specifications.
3. Subsequent issues of revisions, addenda clarifications or other modifications.

(c) 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.

(d) 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.

(e) 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.

(f) 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:

1. Single family, duplex or miscellaneous buildings.
2. Group R-1 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.
Sec. 304

3. 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.

4. Nonstructural alterations, including alterations to utilities, approved by the Department, 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.

5. If after review of the drawings and specifications, the Department determines that the proposed building or structure is inadequately designed, the Department 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.

INFORMATION REQUIRED FOR PREPARATION OF DRAWINGS

Sec. 305. 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 of this Building Code and relevant laws, ordinances, rules and regulations. Each set of drawings and specifications shall contain at least the following:

(a) 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 304.

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 45.

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

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 Chapter 5 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 Sections 1807 and 1907.
   C. Elevations, sections and details showing all structural requirements.
   D. Foundation design criteria shall be submitted when requested by the Department 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 Sections 1807 and 1907.
11. Electrical drawings, specifications and analysis as follows:

A. Complete electrical drawing, including a single-line power distribution diagram showing sizes of service, feeder conductors and overcurrent protection and panel ratings.

B. Electrical diagrams for fire protection systems as required in Chapters 38 and 53.

C. Two complete sets of drawings for fire alarm and fire detection systems shall be submitted prior to installation. Each drawing shall bear the seal and signature of the engineer responsible for the design of the system.

D. Drawings of all new or replacement services of 400 amperes or more. Drawings shall indicate all information, including calculated loads. Each drawing shall bear the seal and signature of the engineer responsible for the design of the system when required by the Department.

12. A field survey under Section 306 shall be required for all additions and new construction.

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

(b) Additional Information When Requested.

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

2. Engineering design calculations.

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

FIELD SURVEYS

Sec. 306.

(a) General. Prior to the issuance of a permit, a field survey shall be conducted by a land surveyor registered by the State of Colorado establishing the following:

1. Location of property corners and placement of corner stakes or markers.

2. Lines and locations of all existing buildings on the property.

3. Building site boundaries.

4. Items 1 through 3 shall be shown on a surveyor’s certificate and shall be drawn to scale.

(b) Access for Department. The contractor or property owner shall provide unobstructed access for the Department to the required corner stakes or markers.
INSPECTIONS

Sec. 307.

(a) General. All work for which a permit is required shall be subject to inspection by the Department and all such work shall remain accessible and exposed for inspection until approved by the Department. In addition, certain types of construction shall have continuous inspection as specified in Section 308. 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 Denver 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 Department 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 Department to verify that the structure is located in accordance with the approved plans.

(b) 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 Department 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 Department.

(c) Inspection Requests. It shall be the duty of the person doing the work authorized by a permit to notify the Department when such work is ready for inspection. The Department 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.

(d) Approval Required. Approval by the Department 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 Department 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 Department.

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.
Sec. 307

(e) **Required Inspections.** The following inspections shall be required and shall be made by the Department after proper notification. Other inspections may be required. See Section 307(f) and 308.

1. **Foundation Inspection.**
   a. **Footings.** Inspections shall be conducted prior to pouring concrete. The footing excavation, formwork 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 Department prior to the footing inspection.

   b. **Walls.** Concrete walls shall have the formwork and reinforcing steel inspected prior to the concrete placement. Approved treated wood walls shall be inspected as required by UBC Standard No. 29-3.

   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 Department.

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. See Appendix Section 5301 amended.

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.
(f) 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 308.

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 Department.

Other inspections 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 3A for fees.

(g) 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 Department. To obtain a reinspection, the applicant shall file an application therefor 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. 3-A. Where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

(h) Inspections.

1. 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 Department at least once each year.

   A. If, after inspection by the Department, the equipment is found to be in safe condition, the Department shall issue a certificate 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. 3-B.

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

2. **Vertical and Horizontal Transportation Semi-Annual Inspection.** The following units shall be inspected by the Department and City Licensed Elevator Contractors as indicated in this subsection: passenger or passenger service elevators, combination passenger and freight elevators, freight and freight service elevators, escalators, dumbwaiters, sidewalk elevators, stage lifts, orchestra lifts, manlifts and moving sidewalks.

A. **Required Inspections.** The owner, agent or lessee shall, at his expense, cause the elevator to be thoroughly checked by an Elevator Contractor licensed by the City. This inspection shall include the requirements of Chapter 51. The car safety device shall be tested without load at the lowest possible speed each year; and full load at the rated car speed every 2 years for winding machines and every 5 years for traction machines. The overspeed governor actuating the safety device shall be checked for calibration every 3 years.

B. **Certificate.** If, after inspection by the Department, the equipment is found to be in safe condition, the Department shall issue a certificate stating that the equipment is ready for use and indicating the maximum load permitted. Certificates 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 Department or other interested persons. Valid elevator certificates shall be mounted in a tamper-proof frame in the elevator for which they were issued or a metal plaque indicating where the certificate 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 tag so as to indicate the contractor’s name, date, type of test and work were performed.

D. **Semiannual Inspection Fee.** The semiannual inspection fee for vertical transportation units shall be as specified in Table No. 3-C.
Sec. 308

SPECIAL INSPECTIONS

Sec. 308.

(a) General. In addition to the inspections required by Section 307, the owner, engineer or architect of record, acting as the owner's agent, shall employ one or more special inspectors to conduct inspections during construction on the following types of work:

1. **Concrete**: During the taking of test specimens and placing of reinforced concrete and pneumatically placed concrete.
   
   **EXCEPTIONS:**
   
   A. Concrete for foundations conforming to minimum requirements of Table No 29-A or for one and two unit dwellings and miscellaneous buildings, provided that the Department finds that a special hazard does not exist.
   
   B. For foundation concrete when the structural design is based on a $f_c$ no greater than 2500 psi.
   
   C. Nonstructural slabs on grade, including prestressed slabs on grade when effective prestress in concrete is less than 150 psi.
   
   D. Site work concrete full-supported on earth and concrete where no special hazard exists.

2. **Bolts Installed In Concrete**: During installation of bolts and placing of concrete around such bolts when stress increases permitted by Footnote No. 5 of Table No. 26-F are utilized.

3. **Ductile Moment-Resisting Concrete Frame**: As required by subsection 2625(1) of this Code.

4. **Reinforcing Steel And Prestressing Steel**:
   
   A. During all stressing and grouting of prestressed concrete.
   
   B. During placing of reinforcing steel, tendons and prestressing steel for all concrete required to have special inspection by Item No. 1.

   **EXCEPTION**: The special inspector need not be present during entire reinforcing steel and prestressing steel-placing operations, provided that he has inspected for conformance with the approved plans, prior to the closing of forms or the delivery of concrete to the job site.

5. **Welding**:
   
   A. Ductile moment-resisting steel frames. As required by subsection 2722(f) of this Code.
   
   B. All structural welding, including welding of reinforcing steel.
EXCEPTION:

(i ) When welding is done in an approved fabricator's shop.

(ii ) When approved by the Building Official, single-pass fillet welds when stressed to less than 50% of allowable stresses and floor and roof deck welding and welded studs when used for structural diaphragm or composite systems may be periodically inspected in accordance with subsection 306(e) of this Code. For periodic inspection, the inspector shall check qualifications of welders at the start of work and then make final inspection of all welds for compliance prior to completion of welding.

6. High-Strength Bolting: During all bolt installations and tightening operations.

EXCEPTION:

A. The special inspector need not be present during installation and tightening operation, provided that he:

(i ) Has inspected the surfaces and bolt type for conformance to plans and specifications prior to start of bolting; and

(ii ) Will, upon completion of all bolting, verify the minimum specified bolt tension for 10% of the bolts for each connection with a minimum of two bolts per connection.

B. Inspection prior to or during installation will not be required in bearing-type connections when threads are not required by design to be excluded from the shear plane.

7. Structural Masonry: During preparation of masonry wall prisms, sampling and placing of all masonry units, placement of reinforcement, inspection of grout space, immediately prior to dosing of cleanouts, and during all grouting operations.

EXCEPTION:

A. Special inspection need not be provided when design stresses have been adjusted to permit noncontinuous inspection.

B. For hollow-unit masonry when the $f'_m$ is no more than 1500 psi for concrete units or 2600 psi for clay units, special inspection for placing of units may be performed on a periodic basis in accordance with subsection 306(e).

8. Reinforced Gypsum Concrete: When cast-in-place Class B gypsum concrete is being mixed and placed.
Sec. 308

9. **Insulating Concrete Fill**: During the application of insulating concrete fill when used as part of a structural system.

   **EXCEPTION**: The special inspections may be limited to an initial inspection to check the deck surface and placement of reinforcing. The special inspector shall supervise the preparation of compression test specimens during this initial inspection.

10. **Spray-Applied Fireproofing**: As required by UBC Standard No. 43-8.

11. **Piling, Drilled Piers and Caissons**: During driving and testing of piles and construction of cast-in-place drilled piles or caissons. See Items Nos. 1 and 4 for concrete and reinforcing steel inspection.

12. **Shotcrete**: During the taking of test specimens and placing of all shotcrete and as required by subsections 2621 (j) and (k).

   **EXCEPTION**: Shotcrete work fully supported on earth, minor repairs and when, in opinion of the Department, no special hazard exists.

13. **Special Grading, Excavation and Filling**: During earthwork excavations, grading and filling operations inspection to satisfy requirements of Chapter 29 and Chapter 70 (Appendix) of this Code.

14. **Special Cases**: Work which, in the opinion of the Department, involves unusual hazards or conditions.

   (b) **Special Inspector**. The special inspector shall be a qualified person who shall demonstrate his competence, to the satisfaction of the Department, for inspection of the particular type of construction or operation requiring special inspection.

   (c) **Duties and Responsibilities of the Special Inspector**.

   1. The special inspector shall observe the work assigned for conformance with the approved design drawings and specifications.

   2. The special inspector shall furnish inspection reports to the Department, the engineer or architect of record, and other designated persons. All discrepancies shall be brought to the immediate attention of the contractor for correction; then, if uncorrected, to the proper design authority and the Department.

   3. The special inspector shall submit a final signed report stating whether the work requiring special inspection was, to the best of his knowledge, in conformance with the approved plans and specifications and the applicable workmanship provision of this Code.
(d) **Waiver of Special Inspection.** The Department may waive the requirement for the employment of a special inspector if the construction is minor in nature.

(e) **Periodic Special Inspection.** Some inspections may be made on a periodic basis and satisfy the requirements of continuous inspection, provided that this periodic scheduled inspection is performed as outlined in the project plans and specifications and approved by the Department.

(f) **Structural Observation.** When required by the Department, 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 statement in writing to the Department stating that site visits have been made and that any deficiencies noted have been corrected. He shall also submit a final report as required in subsection 308(c)3.

(g) **Approved Fabricators.** Special inspections required by this Section and elsewhere in this Code shall not be required where the work is done on the premises of a fabricator registered and approved by the Department to perform such work without special inspection. The Certificate of Registration shall be subject to revocation by the Department if it is found that any work done pursuant to the approval is in violation of this Code. The approved fabricator shall submit a Certificate of Compliance that the work was performed in accordance with the approved plans and specifications to the Department and to the engineer or architect of record. The approved fabricator's qualifications shall be contingent on compliance with the following:

1. The fabricator has developed and submitted a detailed fabrication procedural manual reflecting key quality control procedures which will provide a basis for inspection control of workmanship and the fabricator plant.

2. Verification of the fabricator's quality control capabilities, plant and personnel as outlined in the fabrication procedural manual shall be by an approved inspection or quality control agency.

3. Periodic plant inspections shall be conducted by an approved inspection or quality control agency to monitor the effectiveness of the quality control program.

4. It shall be the responsibility of the inspection or quality control agency to notify the approving authority in writing of any change to the procedural manual. Any fabricator approval may be revoked for just cause. Reapproval of the fabricator shall be contingent on compliance with quality control procedures during the past year.
CERTIFICATE OF COMPLIANCE

Sec. 309. A Certificate of Compliance will be issued by the Department, when a certificate of occupancy is not required, upon the request of the General Building Contractor when the inspection card issued by the Department is returned indicating that all final inspections by the Department have been made. There shall be a processing fee of $5.00 for each certificate issued.

CERTIFICATE OF OCCUPANCY

Sec. 310.

(a) 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 Department. 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 Department.

(b) Requirements Prior to Issuance. A Certificate of Occupancy shall be issued to the owner after approval by the Department and the following:

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

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

3. Department of Health and Hospitals, 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.

(c) Issuance of Certificate. When all the conditions of this Chapter have been fulfilled, the Department, in conjunction with Zoning Administration, shall issue a Certificate of Occupancy indicating:

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

2. Approval by the Department and Zoning Administration.

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

(e) Temporary Certificate of Occupancy. The Department may issue a temporary Certificate of Occupancy to the owner where unusual construction difficulties have delayed the completion of the
Sec. 310

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 Department:

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 Building Code requirements required by the Building Permit.

2. Payment of the following processing fees:
   A. Zoning Administration $10.00
   B. Building Department $30.00

3. Approval from the following City Agencies:
   A. Construction Engineering Division
   B. Wastewater Management Division
   C. Department of Health and Hospitals
   D. Fire Department
   E. Zoning Department.

This temporary Certificate of Occupancy shall be valid for a period of 6 months. Upon written request by the owner, showing reasonable cause, the Department may grant an extension of the T.C.O. for an additional 6 months. The fee for this extension shall be $50.00. The request for an extension of a Temporary Certificate of Occupancy shall be filed at least 30 days prior to the expiration of the certificate. 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 3A and shall be paid before the permanent Certificate of Occupancy is issued.

(f) Change of Occupancy. Changes in the character or occupancy of all buildings or structures shall not be made except as specified in Chapters 5 and 31 of this Building Code. A new Certificate of Occupancy is required for all such changes.

(g) Cancellation of Certificate of Occupancy. A Certificate of Occupancy may be cancelled when:

1. The owner has failed to comply with the requirements of the Department of Public Works.

2. The continued occupancy of the structure is dangerous to the public health, safety or welfare.
Sec. 310

(h) **Violation.** It shall be a violation of this Building Code to occupy a building or structure prior to obtaining a Certificate of Occupancy when required.

(i) **Right to Appeal.** The Board of Appeals may review any appeal of the Department's suspension or denial of Certificate of Occupancy under Section 121. One extension of a temporary Certificate of Occupancy may be sought from the Board of Appeals subject to Section 121.

**ADDRESS**

Sec. 311.

(a) **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 permit holder.
3. The building permit number.

(b) **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.

**PERMITS FOR TEMPORARY BUILDINGS**

Sec. 312.

(a) A permit for a temporary building may be issued by the Department if the applicant can substantiate a definite need for the temporary building. The permit shall not exceed 6 months duration. However, after the expiration date of the permit, if the applicant can demonstrate that there have been no complaints or hazards as a result of this temporary occupancy, the Department may issue a renewal of the permit for one additional 6 month period. 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 and 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 permit.

(b) **Right of Appeal.** One 6-month extension of a permit for a temporary building may be sought from the Board of Appeals subject to Section 121.
FOUNDATION PERMITS

Sec. 313.

(a) 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 Department.
2. Drawings of the proposed superstructure containing sufficient detail relating to the design of the foundation or substructure are submitted to the Department. 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 this Section, the term "Project" shall mean one building only with a valuation in conformance with Subsection 312(a).

(b) 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. 3-A.

(c) Deviations. Any deviation from the approved 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 Department.

(d) 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 Building 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.

(e) Not Applicable. Foundation permits are not applicable to phased construction.

PHASED CONSTRUCTION PERMITS

Sec. 314.

(a) 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. The approval of appropriate City agencies has been obtained prior to application for the initial permit.
3. The valuation of the portion of the work, including utilities, is stated on each application.
4. Drawings shall show on each sheet the note "Phased Construction" with a brief description of the phase covered by the permit.

(b) **Fees.** Plan review fees and permit fees shall be assessed at 150% the amount of those specified in Table No. 3-A. A permit issued under this Section shall not be construed as approval for any portion of the structure not covered by the permit.

**TABLES AND FEES**

Sec. 315.

(a) **Permit Fees.** The fee specified in Table No. 3-A shall be assessed for all permits except as otherwise provided for in this Chapter.

(b) **Other Fees.** Annual and semi-annual fees shall be as specified in Table No. 3-B and No. 3-C. Inspections outside of normal business hours shall be charged in accordance with Table No. 3-A.
Sec. 315
TABLE NO. 3-A

FEE SCHEDULE
BUIIDING PERMIT FEES
VALUATION OF WORK

$1.00 - $500.00
$501.00 - $2 000.00
$2,001.00 - $50,000.00

$50,001.00 - $100,000.00

$100,001.00 - $600,000.00

Over $500,001.00

PERMIT FEE

$15.00
$20.00
$8.00 per $1,000 in Valuation
for fraction thereof of Total
Valuation.
$50.00 plus $7.00 per $1,000
in Valuation for fraction
thereof of Total Valuation.
$150.00 plus $6.00 per $1,000
in Valuation for fraction
thereof of Total Valuation.
$650.00 plus $5.00 per $1,000
in Valuation for fraction
thereof of Total Valuation.

BUIIDING MOVING PERMIT FEES
Per Each Address

APPUCATIONFEE

NONE
Sl0.00
$20.00

$30.00

$40.00

$50.00

$100.00

OTHERFEES
1. Inspections outside of normal business hours . .. $50.00 per hour1
(minimum charge - two hours)
2. Reinspection fees assessed under provisions of
Section 307{g) . . . . . . . . . . . . . . . . . . .. $35.00 per hour l
(minimum charge - one hour)
3. Inspections required by the Department for which no fee is specifically
indicated ...................... $35.00 per hour 1
(minimum charge- one-half hour)
4. Additional plan review required by changes, additions or revisions to
approved plans . . . . . . . . . . . . . . . . . . . $50.00 per hour 1
(minimum charge - one-half hour)
a. Incomplete plans or resubmittals. Section 302(b)
b. Rejected plans. Section 302(i)
c. Modified plans. Section 302G)
1 Or the total hourly cost to the jurisdiction, whichever is the greatest.
This cost shall include supervision, overhead, equipment, hourly wages
and fringe benefits of the employees involved.

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## TABLE NO. 3-B
### PERIODICAL INSPECTION FEES
#### BOILERS, PRESSURE VESSELS, INCINERATORS AND CREMATORIES

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**STEAM BOILERS - CAST IRON**
15 PSI OR LESS IN PRESSURE

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**BOILERS - HOT WATER**

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**WATER HEATERS**

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<td>25.00</td>
</tr>
</tbody>
</table>

**MISCELLANEOUS EQUIPMENT**

<table>
<thead>
<tr>
<th>FEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool Heaters All Sizes</td>
</tr>
<tr>
<td>Unfired Pressure Vessels</td>
</tr>
<tr>
<td>Incinera tors and Crematories</td>
</tr>
</tbody>
</table>

Saturday, Sunday and Holiday Inspection Fees shall be double the fees indicated in Table 3-B.

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.

## TABLE NO. 3-C
### PERIODICAL INSPECTION FEES
#### (VERTICAL TRANSPORTATION)

<table>
<thead>
<tr>
<th>TYPE OF INSPECTION</th>
<th>FEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevators</td>
<td>$37.00 (each unit)</td>
</tr>
<tr>
<td>For each additional landing over 3</td>
<td>$1.00</td>
</tr>
<tr>
<td>Escalators*</td>
<td>$37.00 (each unit)</td>
</tr>
<tr>
<td>Dumbwaiters</td>
<td>$37.00 (each unit)</td>
</tr>
<tr>
<td>Stage Lifts</td>
<td>$37.00 (each unit)</td>
</tr>
<tr>
<td>Orchestra Lifts</td>
<td>$37.00 (each unit)</td>
</tr>
<tr>
<td>Man Lifts</td>
<td>$37.00 (each unit)</td>
</tr>
</tbody>
</table>

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

Saturday, Sunday and Holiday Inspection Fees shall be double the fees indicated in Table 3-C.
Section 401 is amended:

GENERAL

Sec. 401. 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. The text of this Code shall control captions, titles, maps, figures and diagrams. The word "shall" is mandatory and not permissive; the word "may" is permissive and not mandatory. Words used in the singular shall include plural, the words used in the plural shall include singular. Words used in the present tense shall include the future tense, and words used in the future tense shall include the present tense. Words used in the masculine gender shall include the feminine, and words used in the feminine gender shall include the masculine. Other terms and abbreviations used only with specialized application are defined in the Chapter in which they are used.

Sec. 402-427 Definitions are amended, and where conflicts occur these definitions shall govern:

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.

ACCESSORY USE, MINOR. A secondary occupancy or use closely associated with the principal use.

ADEQUATE. Determined to be acceptable to the Department.

ADMINISTRATIVE AUTHORITY. The Director.

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.

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.

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 4 or fewer clients, over the age of 16 years.
AISLE. A free, unobstructed passageway in a building for public ingress and egress to and from seats or other similar use areas leading to a lobby, foyer, corridor or exit.

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.

AREAWAY. An excavated space outside the wall of a building used for access, lighting or ventilation.

ASSISTED CARE FACILITIES. See Personal Care Facilities.

BOARD. The Board of Appeals.

BUILDING. A structure, including utilities, enclosed with a roof and within exterior walls built and designed for the housing, shelter, enclosure and support of individuals, animals or property of any kind.

BUILDING OFFICIAL. The officer charged with the administration and enforcement of this code. See Director.

BUILDING, TEMPORARY. A building not intended for permanent use.

CARPORT. A covered shelter for private or pleasure type motor vehicles that is open on 2 or more sides.

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 stated educational purposes. The term includes facilities commonly known as a "day care center", "day nurseries", "nursery school", "kindergarten", "preschools", "play groups", "school age programs", centers for developmentally disabled children", "day treatment centers", "extended day programs", and "summer playground programs".

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 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.

**CITY.** The City and County of Denver.

**CLINIC.** A building or portion thereof that contains offices for the diagnosis and treatment of outpatients requiring health services excluding facilities for overnight accommodation of patients.

**COMBUSTIBLE MATERIAL.** Material that will ignite and burn when subjected to fire under ordinary conditions. See noncombustible.

**CONGREGATE RESIDENCE.** Any building or portion thereof which contains facilities for living, sleeping and sanitation, as required by this code, and may include facilities for eating and cooking, for occupancy by other than a family. A congregate residence may be a shelter, convent, monastery, dormitory, fraternity, sorority house, or group housing that provides personal care services, but does not include jails, hospitals, nursing homes, hotels or lodging houses.

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

**CRAWL SPACE.** A space located under the first floor of a building that provides a clear height of less than 5 feet.

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

**DEPARTMENT.** The Building Inspection Division of the Department of Public Works of the City and County of Denver.

**DESIGN PROFESSIONAL.** The Architect or Engineer of record responsible for the production of construction documents.

**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 occurs.
DIRECTOR. The officer charged with the administration and enforcement of this Building Code.

EARA. Elevator Area of Rescue Assistance.

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

EVACUATION CAPABILITY. Evacuation capability is 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.

FLAME-SPREAD. The propagation of flame over a surface.

FLOOR. The structural system which supports the applied loads within a building and may divide the building into stories.

FLOOR LEVEL. Shall be the top surface of the floor system.

FLOOR SPACE. The volume of space developed between the exterior wall or building line and

(1) Adjacent floor levels or

(2) The floor level and the top of the adjacent roof system.

GARAGE, REPAIR. A building or portion thereof used for the repair of internal combustion engines; motor vehicle transmission, differentials, frames or bodies where any part is removed for repairs rendering the vehicle inoperative; repairs requiring welding or brazing; stripping of inoperative motor vehicles; painting; or any other work not permitted in a storage garage.
GARAGE, STORAGE. A building, other than a private, repair or open parking garage, used exclusively for the housing of motor vehicles.

HABITABLE SPACE (ROOM) is space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space, and similar areas, are not considered habitable space. Basements within single dwelling units shall be considered habitable space.

HIGH RISE BUILDING. Any building having floors used for human occupancy more than 75 feet above the lowest level of Fire Department vehicle access.

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. Independent living is 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.

LANDING. A continuation of the floor of a building giving access to stairs, ramps or an escalator, and any level space between stair runs.

MACHINE ROOM. A room used for the housing of elevator, heating, refrigeration or air handling equipment.

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 Department as beyond the scope of maintenance.

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

NURSERY. A place where parents may temporarily leave children with trained attendants.

NURSING HOME. A facility that is operated in connection with a hospital or where nursing care and medical services are prescribed by or performed under the general direction of 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 or equipment.

**PARTITION, PERMANENT.** Permanent partitions are those walls within a building which are required to provide protection of specific areas such as machine and equipment rooms, service areas, etc. Permanent partitions may be bearing or nonbearing walls.

**PARTITION, TEMPORARY.** Temporary partitions are those walls or portions of walls which are used to divide a floor space into rooms or spaces. Corridor and occupancy separations are special types of temporary partitions which must comply with specific fire-resistive construction requirements. Temporary partitions shall be nonbearing walls only and shall include fixed partitions, folding, portable or movable partitions and demising walls within the same occupancy.

**PENTHOUSE.** An enclosed structure built on or above the roof of a building and used for the housing of machinery or equipment, and not used for habitation.

**PERSONAL CARE.** "Personal care" means 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.** A Personal Care Facility shall mean a facility where personal care of a resident, who does not require chronic or convalescent, medical or nursing care, is provided.

**PORCH.** A roofed structure providing shelter at the entrance of a building or an open or enclosed room at the outside of a building.

**PREFABRICATED ASSEMBLY.** See Chapter 50.

**PROSCENIUM.** A vertical plane or separation between an assembly area and a stage or enclosed platform.
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.

REFUGE AREA. A specified area within a building constructed and mechanically ventilated to protect the occupants from fire and/or smoke. See area of rescue assistance, Chapter 31.

REHABILITATION CENTER. A center for the rehabilitation of handicapped persons.

RESTAURANT. A restaurant shall mean any place which is kept or maintained for the purpose of preparing and/or serving food for sale and consumption, but does not include food processing establishments or retail food stores. For the purposes of this Building Code, the provisions for restaurants shall pertain to those permanent facilities within buildings or structures only.

RETAIL FOOD STORE. Any establishment or portion of a building where food or food products are offered to the consumer for off-premise consumption.

ROOF, OPEN FRAME. A roof with all supporting members exposed on the underside and without a ceiling.

ROOF STRUCTURE. A structure above or on the roof of a building including cooling towers, tanks, heating and cooling equipment, spires, towers or any other projection above the roof, not used for habitation.

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

SCHOOL, VOCATIONAL. An institution which provides instruction or education for a trade, art, voice, music, modeling or similar endeavors.

SMOKE CONTROL SYSTEM. An engineered mechanical and electrical system designed to control the development and movement of smoke as a product of combustion.

STAIRWAY. 2 or more risers.

STRUCTURE. An assembly of materials forming a construction for a specific use including among others,
building, 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.

**TOWNHOUSE.** A specific type of arrangement for attached dwelling units which may be arranged as cluster homes, row houses or attached dwelling units for 3 or more units. See special provisions for Group R, Division 2 Occupancies.

**TREAD.** The horizontal portion of a step, including nosing.

**UNDERGROUND.** Embedded by completely burying pipe, cable, etc., in earth.

**UNSAFE BUILDING, STRUCTURE OR UTILITY.** See Chapter 1.

**USE.** The purpose for which a building is occupied.

**USEABLE SPACE.** Space that may be used. This definition does not apply when a 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 ventilating 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.
VEHICULAR SERVICE FACILITIES.

1. Fueling Station - A building and/or lot with pumps and tanks the purpose of which is the dispensing of motor vehicle fuel.

2. Vehicular Service (when more than one service is in the same space, the most restrictive will govern).
   A. Minor repairs or maintenance exchange of parts and maintenance which requires no open flame, welding or use of Class I, II, or III A liquids (i.e. radio, tires, upholstery, car wash, windows, lubrication service without pits).
   B. Major repairs or maintenance (i.e. repair garages, paint and/or body shops, transmission, mufflers and tune-up shops. See the Fire Code requirements for vehicular service with pits).

VERTICAL OPENING. An opening extending vertically through 1 or more floors of a building.

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

WRECKING. See Demolition.
Sec. 503

Sec. 503(a) Exception 5, Subsection A is amended by adding the sentence:

"All buildings of less than 100 square feet for attendant or cashier only may have one exit."

Sec. 504(b) is amended to add an Exception to the first paragraph:

EXCEPTION: In fully sprinklered buildings a sprinkler system designed as follows may be substituted for the required three-quarter-hour fire resistive protection in Table 5A or code sections 504, 709, 1803, 1903, 2003, 2103, and 2203. The glass shall be protected by a sprinkler system equipped with listed quick-response sprinklers. The sprinkler system shall completely wet the entire surface of the glass wall when actuated. The sprinkler shall be located within 18 inches of the opening and be spaced a maximum distance of six feet apart. The sprinkler system shall completely wet the entire surface of the glass or provide a spray that protects the building opening. Sprinklers shall be closed heads and may be taken off the sprinkler system piping serving that floor. The system shall be designed to distribute at least 3 gpm per lineal 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 greatest.

Sec. 506(b) is amended:

(b) Unlimited Area 1. New Buildings. The area of any one- or two-story building of Group B and Group H, Division 5 Occupancies shall not be limited if the building is provided with an approved automatic sprinkler system throughout as specified in Chapter 38, and entirely surrounded and adjoined by public ways or yards not less than 60 feet in width.

The area of a Group B, Division 4 Occupancy in a one-story Type II, Type III One-hour or Type IV building shall not be limited if the building is entirely surrounded and adjoined by public ways or yards not less than 60 feet in width.

2. Existing Buildings. The area of any building constructed prior to the effective date of this Code shall not be limited, provided it meets the requirements of one of the following categories:
### Sec. 506

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>Occupancy</th>
<th>No. of Stories</th>
<th>Construction</th>
<th>Type Of</th>
<th>Sprinkler Throughout</th>
<th>Minimum Space</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>B, H-5</td>
<td>1</td>
<td>ALL</td>
<td>YES</td>
<td>20'</td>
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<td>2</td>
<td>B</td>
<td>2</td>
<td>ALL</td>
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<td>H-5</td>
<td>TABLE 5-D</td>
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<td>3</td>
<td>B ***</td>
<td>1</td>
<td>II</td>
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<td></td>
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<td>III 1 HR.</td>
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<td>4</td>
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<td>1</td>
<td>IV</td>
<td>NR</td>
<td>60'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

1. NR NOT REQUIRED
2. 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.
3. SEE SECTION 507
4. RESTRICTED TO THE USES ALLOWED UNDER B-4 AND THE FOLLOWING:

Manufacturing plants, factories, or workshops utilizing noncombustible, non-explosive or not highly combustible materials and sales rooms incidental to their operation. A building storing non-explosive materials, noncombustible or not highly combustible materials and sales rooms incidental to their operation. Automobile parking garages.
Sec. 509

Sec. 509(h) is amended:

(h) Pedestrian Walkways Over Public Streets. Pedestrian walkways over public streets shall be subject to the requirements of Chapter 45.

Sec. 510(c) is added.

(c) Plumbing Fixtures. For plumbing fixture requirements see Section 910 and Appendix C of the Uniform Plumbing Code.

Table No. 5-A is amended for Group M and R Occupancies.

1. Group M: Revise Group M2 "Description of Occupancy" as follows;

2. Fences over 4 feet high, tanks, towers, and other miscellaneous structures.

2. Group R: Add Group R2 "Description of Occupancy" as follows:

2. Townhouses, row houses and attached dwelling units containing 3 or more units.

The requirements for "Fire Resistance of Exterior Walls" and "Openings in Exterior Walls" are the same as for Group R3.

Table 5-B is amended to add "footnote #5"

5. "Group R, Division 3 occupancy shall not be mixed with any other occupancy except Group M occupancies."
Sec. 605 is amended:

LIGHT, VENTILATION AND SANITATION

Sec. 605. All enclosed portions of Group A Occupancies customarily used by human beings and all dressing rooms shall be provided with natural light by means of exterior glazed openings with an area not less than one-tenth of the total floor area or shall be provided with artificial light. A mechanically operated ventilating system shall be provided which complies with ASHRAE Standard 62-1989 Ventilation for Acceptable Indoor Air Quality. If the velocity of the air at the register exceeds 10 feet per second, the register shall be placed more than 8 feet above the floor.

Toilet rooms shall be provided with a fully openable exterior window at least 3 square feet in area; or a vertical duct not less than 100 square inches in area for the first toilet facility, with 50 additional square inches for each additional facility; or a mechanically operated exhaust system capable of providing a complete change of air every 15 minutes. Such systems shall be connected directly to the outside, and the point of discharge shall be at least 3 feet from any openable window.

For plumbing fixture requirements, see Sections 510 and 511.
Section 705 is amended:

LIGHT, VENTILATION AND SANITATION

Sec. 705. In Group B Occupancy buildings, all enclosed portions customarily occupied by human beings, other than rooms and areas for which requirements are specified elsewhere in this Section, shall be provided with natural light by means of exterior glazed openings with an area equal to one-tenth of the total floor area of such portions or shall be provided with artificial light. A mechanically operated ventilating system shall be provided which complies with ASHRAE Standard 62-1989 Ventilation for Acceptable Indoor Air Quality.

In all buildings or portions thereof where Class I, II or III-A liquids are used, exhaust ventilation shall be provided sufficient to produce 6 air changes per hour. Such exhaust ventilation shall be taken from a point at or near the floor level.

In all parking garages, other than open parking garages as defined in Section 709(b), used for storing or handling of automobiles operating under their own power and on all loading platforms in bus terminals, ventilation shall be provided capable of exhausting a minimum of 1.5 cfm per square foot of gross floor area. The building official may approve an alternate ventilation system designed to exhaust a minimum of 14,000 cfm for each operating vehicle. Such system shall be based upon the anticipated instantaneous movement rate of vehicles but not less than 2.5% (or one vehicle) of the garage capacity. Listed automatic CO sensing devices may be used to modulate the ventilation system to maintain a maximum average concentration of CO of 50 ppm during any 8-hour period, with a maximum concentration not greater than 200 ppm. Connecting offices, waiting rooms, ticket booths, etc., shall be supplied with conditioned air, from a source other than the garage, under positive pressure.

EXCEPTION: In gasoline service stations without lubrication pits, storage garages and aircraft hangars, the building official may authorize the omission of such ventilating equipment where, in his opinion, the building is supplied with unobstructed openings to the outer air sufficient to provide the necessary ventilation.

Every building or portion thereof where persons are employed shall be provided with at least one water closet. Such toilet facilities shall be located either in such building or conveniently in a building adjacent thereto on the same property within 300 feet travel distance.

Toilet rooms shall be provided with a fully openable exterior window at least 3 square feet in area; or a vertical duct not less
Sec. 705

than 100 square inches in area for the first toilet facility, with 50 additional square inches for each additional facility; or a mechanically operated exhaust system capable of providing a complete change of air every 15 minutes. Such systems shall be connected directly to the outside, and the point of discharge shall be at least 3 feet from any openable window.

For other plumbing fixture requirements, see Sections 510 and 511.

Sec. 706 is amended by adding Exceptions 2 and 3:

Exits shall be enclosed as specified in Chapter 33.

Elevator shafts, vent shafts and other vertical openings shall be enclosed, and the enclosure shall be as specified in Section 1706.

EXCEPTIONS:

1. In Group B, Division 4 Occupancies, exits shall be enclosed as specified in Chapter 33, but other vertical openings need not be enclosed.

2. In buildings of Group B Division 1 Occupancies, vehicular ramps in enclosed parking structures and storage garages:
   A. Less than 4 stories/levels in height need not be enclosed.
   B. 4 or more stories/levels in height, basement and underground parking structures need not be enclosed, provided that:
      (i) An approved automatic fire sprinkler system is installed throughout the parking structure, or
      (ii) An approved automatic supervised fire detection system is installed throughout the parking structure using heat detectors, and
      (iii) Manual controls are installed for the operation of a mechanical smoke exhaust system which are located as approved by the Department and Fire Department.

   EXCEPTION: When natural ventilation is provided as required for open parking garages, a mechanical smoke exhaust system is not required.

3. In buildings of Group H, Division 4 Occupancies, vehicular ramps in repair garages:
   A. Less than 3 stories/levels in height need not be enclosed.
Sec. 706

B. Three or more stories/levels in height need not be enclosed provided that an approved sprinkler system is installed throughout.

Sec. 708 third paragraph is amended:

Devices generating a glow or flame capable of igniting gasoline vapor shall not be installed or used within 66 inches of the floor in any room in which Class I flammable liquids or gas are used or stored.
Section 801, Division 3 is amended.

Sec. 801, Division 3. Any building or portion thereof used for adult care or child care purposes for periods of less than twenty-four hours a day.

EXCEPTION: Adult Care Homes and Child Care Homes.

Section 802(c) is amended:

Sec. 802. (c) Special Provisions. Rooms in Divisions 1 and 2 Occupancies used for pre-kindergarten, kindergarten, first- or second-grade pupils, and Division 3 Occupancies shall not be located above or below the first story.

EXCEPTIONS:

1. Basements or stories having floor levels located within 4 feet, measured vertically, from adjacent ground level at the point of exit, provided the basement or story has exits directly to the exterior at that level.

2. In buildings equipped with an automatic sprinkler system throughout, rooms used for kindergarten, first- and second-grade children or for day-care purposes may be located on the second story, provided there are at least two exits directly to the exterior for the exclusive use of such occupants.

3. Division 3 Occupancies may be located above the first story in buildings in Type I or Type II fire-resistive construction and equipped with an automatic sprinkler system throughout when:

   A. Division 3 Occupancies with children under the age of seven or containing more than 12 children per story shall not be located above the fourth floor; and

   B. The entire story in which the day-care facility is located is equipped with an approved manual fire alarm and smoke-detection system. Actuation of an initiating device shall sound an audible alarm throughout the entire story. When a building fire alarm system is required by other provisions of this code or the Fire Code, the alarm system shall be connected to the building alarm system.

   An approved alarm signal at an approved location in the day-care occupancy shall indicate when a fire alarm or sprinkler flow-initiating device on other stories is actuated.

   C. The day-care facility, if more than 1,000 square feet in area, is divided into at least two compartments of approximately the same size by a smoke barrier with door openings protected by smoke- and draft-control assemblies having a fire protection rating of not less than 20 minutes. Smoke barriers shall be constructed as required for a 1-hour fire-resistive rating. In addition to the requirements of Section
503, occupancy separations between the Division 3 and other occupancies shall be constructed as smoke barriers. Door openings in the smoke barrier shall be tight fitting with gaskets installed as required by Section 3305, and shall be automatic closing by actuation of the automatic sprinklers, fire alarm or smoke-detection system. Duct and other heating, ventilating and air-conditioning openings shall be equipped with a minimum Class 1, 250°F, smoke damper as defined and tested in accordance with UBC Standard NO. 43-12. 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; and

D. Each compartment formed by the smoke barrier has not less than two exits, one of which is permitted to pass through the adjoining compartment; and

E. At least one exit from the Division 3 Occupancy shall be into a separate exiting system as defined in Section 3318.

Section 802(e) is added:

Sec. 802(e) Conversion of Existing Buildings to Small Care Centers. An existing building may be converted to a small care center without complying with all the requirements for a change of use under Section 502, provided the following provisions are met:

1. Drawings and specifications need not bear the seal of an architect or engineer. However, if after review of the drawings and specifications, the Department 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.

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

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

EXCEPTIONS:

A. Basements as allowed per Section 802(c).

B. Any floor level with an exterior door leading directly to the outside where the floor level is within.

   (i) Two feet vertically of directly surrounding grade shall be allowed for children 2½ years or younger.

   (ii) Five feet vertically of directly surrounding grade shall be allowed for children than 2½ and less than 5 years of age.

   (iii) Eight feet vertically of directly surrounding grade shall be allowed for children over 5 years of age.
and ambulatory adults.

Egress from the floor level to grade may be by stairs or ramps.

4. A floor level occupied for day care activities shall have two exits. Two exits may include one exit directly to grade or as provided in item #3 above with a second exit as an interior stair or ramp. Egress through a window shall not be accepted as an exit.

5. There shall be no dead end corridors.

6. Gas-fired heating appliances must comply with the Uniform Mechanical Code, with Denver amendments.

7. Existing partitions, walls and ceilings may be approved if the existing surface is of a fire-resistive material consisting of lath and plaster or gypsum board of at least ½ inch thickness.

8. Section 3853(b), Exception 2 shall apply to all conversions. Residential type multiple single station smoke detectors may be installed with field inspector approval. System type smoke detectors will require drawings signed and sealed by an electrical engineer.

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

Section 805 is amended:

LIGHT, VENTILATION AND SANITATION

Sec. 805. All portions of Group E Occupancies shall be provided with light and ventilation, either natural or artificial, as specified in Section 605.

For plumbing fixture requirements, see Sections 510 and 511.
Section 905(a) is amended:

(a) **General Ventilation.** In Group H Occupancy buildings, all enclosed portions customarily occupied by human beings, other than rooms and areas for which requirements are specified elsewhere in this Section, shall be provided with natural light by means of exterior glazed openings with an area equal to one-tenth of the total floor area of such portions or shall be provided with artificial light. A mechanically operated ventilating system shall be provided which complies with ASHRAE Standard 62-1989 Ventilation for Acceptable Indoor Air Quality.

Section 905(d) is amended:

(d) **Sanitation.** Every building or portion thereof where persons are employed shall have at least one water closet. Such toilet facilities shall be located in such building or conveniently in a building adjacent thereto on the same property within 300 feet travel distance.

Toilet rooms shall be provided with a fully openable exterior window at least 3 square feet in area; or a vertical duct not less than 100 square inches in area for the first water closet, with 50 additional square inches for each additional fixture; or a mechanically operated exhaust system capable of providing a complete change of air every 15 minutes. Such systems shall be connected directly to the outside, and the point of discharge shall be at least 5 feet from any openable window.

For other plumbing fixture requirements, see Sections 510 and 511.

Section 908 is amended to revise the third paragraph to read as follows:

In Division 4 occupancies, appliances or devices which generate a spark, flame, or glow capable of igniting gasoline vapors shall be installed with the pilots and burner at least 66 inches above the floor. Electrical equipment shall be installed in accordance with National Electrical Code.

Section 912 is amended:

**HELIPORTS**

Sec. 912. Heliports shall not be erected on buildings. See the Denver Zoning Code for approved locations.
Section 1005 is amended:

LIGHT, VENTILATION AND SANITATION

Sec. 1005. All portions of Group I Occupancies customarily used by human beings shall be provided with natural light by means of exterior glazed openings with an area equal to 1/10 of the total floor area or shall be provided with artificial light. A mechanically operated ventilation system shall be provided as specified in Section 605. For other requirements on water closets, see Section 510.
Sec. 1101

Section 1101 is amended.

GROUP M OCCUPANCIES DEFINED

Sec. 1101. Group M Occupancies shall be:

Division 1. Private garages, carports, sheds and agricultural buildings. For occupancy separations, see Table No. 5-B.

EXCEPTION: Where applicable for agricultural buildings, see Appendix Chapter 11.

Division 2. Fences over 4 feet high, tanks, towers and other miscellaneous structures. Occupancy separations are not required for Division 2.

Section 1107 is added:

FENCES AND RETAINING WALLS

Sec. 1107.

(a) General.

1. 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 installed on corners or locations specifically provided for in this Section.

2. When the Department determines that the installation, removal or repair of a fence shall be for the public welfare and safety, the Department may order any action deemed necessary notwithstanding the provisions of this Section.

(b) 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.

(c) Prohibitions. 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 Department.

2. The use of electrically charged fences or on top of fences or retaining walls is prohibited except when specifically
Sec. 1107

approved by the Department.

(d) **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 of by any City agency.

(e) **Repair or Removal.** The Department may order any fence, wall or retaining wall it declares to be dilapidated or hazardous to be repaired or removed.
Section 1201 is amended by adding Division 2:

**Division 2.** Townhouses, row houses and attached dwelling units containing 3 or more units.

Congregate residences (each accommodating 10 persons or less).

Section 1202 is amended by adding subsections (c), (d), (e), and (f):

**CONSTRUCTION, HEIGHT AND ALLOWABLE AREA**

(c) **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 and 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 1204 and the spacing between bars will not allow a 4-inch sphere to pass through.

(d) **Special Provisions for Residential Group Living Facilities.** Residential Group Living Facilities may occupy Group R Division 1, 2 or 3 occupancies with the following provisions:

1. Minimum Requirements.
   - A. Small congregate residences: 10 or less occupants, see Table 12A.
   - B. Large congregate residences: more than 10 occupants, see Table 12B.
2. Plans and permit shall indicate the maximum occupant load and for Personal Care Facilities indicate the evacuation capability classification.
3. Plans for the renovation of an existing building or the construction of a new building shall bear the seal and signature of the Architect or Engineer responsible for the design phases of the building.
4. Personal Care Facilities
   - A. Develop a Facility Personal Care plan which specifically establishes the services to be provided to the
residents (forms provided by the Department).

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.

(e) **Special Provisions for Group R, Division 2 Occupancy.**

1. Group R, Division 2 Occupancy shall consist of 3 or more attached dwelling units, not more than 3 stories in height, with each unit having independent access to the exterior of the building in the ground story. For purposes of this Section, if living quarters are located in a basement, the basement shall be considered a story.

2. Each dwelling unit shall be provided with separate sewage, water supply, heating, electric and plumbing systems, together with all other housing utilities and equipment.

3. Each dwelling unit shall be separated by a two-hour fire-resistive wall extending from the foundation to the highest point of the building, to the underside of the roof sheathing or decking, and to the exterior walls. Voids or openings shall not be permitted. Utilities, including plumbing, electrical, heating, air conditioning and telephone, shall not be permitted in the two-hour fire-resistive separation wall.

4. Electrical, heating, plumbing and general construction provisions including exiting shall conform to all the requirements of Group R, Division 3 Occupancy.

5. The second story or basement of any Group R, Division 2 Occupancy shall not be utilized to house another family.

6. Where a conflict exists between this Section and other Sections of this Building Code, this Section shall apply.

7. Group R, Division 2 Occupancy shall not be mixed with any occupancy except Group M Occupancies, in which case a one-hour occupancy separation wall is required.

8. Roof coverings shall comply with the roof classes of Group R, Division 1 Occupancy.

(f) **Special Provisions for Group R, Division 3 Occupancy.**

1. Group R, Division 3 Occupancy shall not be mixed with any other occupancy except Group M Occupancies.

**Sec. 1204** is amended by adding a new paragraph:

Areaways for escape or rescue windows located below grade shall be provided with areaways which provide enclosing walls extending 4 inches above grade and 4 inches below the bottom of the window. The bottom of the areaway shall provide a masonry,
Sec. 1204
concrete or gravel floor. The inside dimensions of the areaway shall be at least 4 feet in length, 30 inches in width and not more than 4 feet in depth. The areaway shall extend the full length of the window when the window is longer than 4 feet.

EXCEPTION: The maximum depth may be increased to 5½ feet with an approved permanent noncombustible ladder within the area.

Section 1205(d) is amended:
(d) Sanitation. Every building shall have at least one water closet.
For other plumbing fixture requirements, see Sections 510 and 511.
TABLE 12-A
Minimum Requirements for Small Personal Care Congregate Residences (10 or less occupants) in addition to All Requirements for One - and Two-Unit Group R Division 3 Dwellings.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>EVACUATION CAPABILITY OF RESIDENTS</th>
<th>Prompt and Slow</th>
<th>Impractical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exiting</td>
<td>2 Remote on each habitable floor</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>Vertical Openings (Includes stairways)</td>
<td>Minimum 20-minute fire resistive. Doors separating floors shall be 1-3/8 inches thick, solid core construction with self-closing device</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>Protection of Hazardous Areas</td>
<td>Fuel-fired equipment rooms shall be enclosed with 5/8 inch type X gypsum board on the ceiling and in each side of the walls. Doors shall be solid core construction, 1-3/8 inches thick, with self-closing device. Fire Dampers need not be installed in air ducts passing through the wall, floors or ceilings. Adequate outside combustion and relief air ducts are required for the fuel-fired equipment room.</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>Interior Finish</td>
<td>Class III in all areas.</td>
<td>Class I in enclosed exitways. Class II in other exitways. Class III in rooms or areas</td>
<td></td>
</tr>
<tr>
<td>Fire Alarms and Smoke Detection</td>
<td>Approved residential single type station interconnected smoke detectors wired to a 115-volt AC unswitched electric power source. Detectors shall be located in sleeping rooms, at a point centrally located in the corridor giving access to each sleeping room, general living areas and basements.</td>
<td>A complete fire alarm system and complete fire detection system shall be required and maintained in accordance with Section 3851. Detectors shall be located in sleeping rooms, at a point centrally located in the corridor giving access to sleeping rooms, general living areas basements, and attics.</td>
<td></td>
</tr>
<tr>
<td>Separation of Sleeping Rooms</td>
<td>All doors from sleeping rooms to corridors shall be solid core construction, and be a minimum of 1-3/8 inches thick. Walls and ceilings shall be covered with a minimum of 1/2 inch plaster or gypsum board.</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>Disabled Access</td>
<td>Chapter 31</td>
<td>Chapter 31</td>
<td></td>
</tr>
</tbody>
</table>

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**TABLE 12-B**

Minimum Requirements for Large Personal Care Congregate Residences (more than 10 occupants) in addition to All Requirements for Group R Division 1 Occupancy.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>EVACUATION CAPABILITY OF RESIDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extending</td>
<td>Prompt and Slow</td>
</tr>
<tr>
<td>exiting</td>
<td>2 Remote on every floor, including floors below the level of exit discharge and occupied for public purposes.</td>
</tr>
<tr>
<td>Vertical Openings (Includes stairways)</td>
<td>Every stairway, elevator shaft, and other vertical opening shall be enclosed or protected with a minimum 1 hour fire resistive construction. Stairway doors shall have self-closing devices.</td>
</tr>
<tr>
<td>Protection of Hazardous Areas</td>
<td>Fuel-fired equipment rooms shall be enclosed with 5/8 inch type X gypsum board on the ceiling and in each side of the walls. Doors shall be solid core construction, 1-3/8 inches thick, with self-closing device. Fire Dampers need not be installed in air ducts passing through the wall, floors or ceilings. Adequate outside combustion and relief air ducts are required for the fuel-fired equipment room.</td>
</tr>
<tr>
<td>Interior Finish</td>
<td>Class I in enclosed exitways. Class II in other exitways. Class III in rooms or areas.</td>
</tr>
<tr>
<td>Fire Alarms and Smoke Detection</td>
<td>A complete fire alarm system and complete fire detection system shall be required and maintained in accordance with Section 3851. Detectors shall be located in sleeping rooms, at a point centrally located in the corridor giving access to each sleeping room, general living areas basements. The system need not be connected to a central station.</td>
</tr>
<tr>
<td>Separation of Sleeping Rooms</td>
<td>Walls separating corridors and sleeping rooms shall be of 1-hour fire resistive construction. Doors from sleeping rooms to corridors shall be solid core construction, and be a minimum of 1-3/4 inches thick.</td>
</tr>
<tr>
<td>Sprinkler System</td>
<td>An automatic sprinkler system shall be installed when building is three or more stories in height or has an occupant load of 20 or more.</td>
</tr>
<tr>
<td>Disabled Access</td>
<td>Chapter 31</td>
</tr>
</tbody>
</table>

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Section 1705(d) is amended:

(d) Walls Fronting on Streets or Yards. Regardless of fire-resistive requirements for exterior walls, certain elements of the walls fronting on streets or yards having a width of 40 feet may be constructed as follows:

1. Bulkheads below show windows, show-window frames, aprons and showcases may be of combustible materials, provided that the height of such construction does not exceed 15 feet above the lowest point of Fire Department access.

2. Wood veneer of boards not less than 1 inch nominal thickness or exterior-type panels not less than 3/8 inch nominal thickness may be applied to walls, provided that the veneer does not exceed 15 feet above lowest point of Fire Department access and further provided that such veneer shall be placed either directly against noncombustible surfaces or furred out from such surfaces not to exceed 1-5/8 inches with all concealed spaces fire-stopped in accordance Section 2516(f). Where boards, panels and furring as described above comply with Section 407 as fire-retardant treated wood suitable for exterior exposure, the height above the lowest point of Fire Department access may be increased to 35 feet.

Section 1708(d) is amended:

(d) Dampproofing Foundation Walls.

1. Concrete foundation walls enclosing a basement or crawl space below finished grade shall be dampproofed outside by the application of dampproofing material.

2. Masonry units used in foundation walls below finished grade shall have the soil contact surfaces plastered with at least ¼ inch cement plaster before the application of dampproofing.

Section 1712 second paragraph is amended by adding Exception 4:

EXCEPTIONS:

4. The top of guardrails around roof-mounted appliances shall be at least 36 inches unless 6 feet is maintained between the appliance and the roof edge or other hazard.

Section 1714 (d) through (h) are added:

(d) R-Factor Requirements. Insulation installed in existing Group R-2 and R-3 Occupancies shall provide a minimum R Factor of 11 for walls and 19 for ceilings. New construction shall comply with the requirements of UBC Appendix 53 amended.

(e) Identification Tag. Each application of insulating material shall be identified by an appropriate tag or card permanently
Sec. 1714

affixed in a conspicuous place near the insulated areas. The tag or card shall be on a form approved by the Department and shall include, without limitation, the following information:

1. The manufacturer's name, address and trade name of material used.
2. The contractor's name and address.
3. Type of insulation (batt, blanket, loose, etc.).
4. Density, depth (inches), number of bags if loose fill, weight of each bag.
5. R-Factor (wall and ceiling).
6. Laboratory approval number indicating conformance with ASTM C-739 requirements. Also label listing and follow-up service indication, flame spread and smoke.
7. Date of installation.
8. Signature of applicator certifying that these requirements have been complied with.

(f) Prohibitions. Insulation shall be prohibited in the following locations:

1. Insulation shall not be placed closer than 3 inches horizontally to transformers, recessed lighting. See National Electrical Code.
2. Insulation shall not be placed within 1 inch of Type B heating equipment vents, and 6 inches from any other of heating vents or flues.
3. Insulation shall not be placed within 24 inches of attic-type furnaces unless of noncombustible material.
4. Insulation shall not be placed over soffit, roof or foundation vents.
5. Loose-type insulation shall not be placed over attic access doors. The access doors shall be insulated with batts or blanket insulation and securely fastened to the access door.
6. Insulation shall not be permitted in air plenums unless approved by the Department.
7. Foam plastics shall not be left exposed.

(g) Combustible Insulation Bag Identification. In addition to the markings on each bag desired by the manufacturer, markings shall be provided in compliance with ASTM C-739, Section 12, and shall also include the following:

1. CAUTION (in enlarged letters). Do not cover recessed light fixtures and attic vents. Loose fill insulation shall be no closer than one inch to any Type B furnace or water heater vent pipe, bathroom vents or kitchen vents. Loose fill insulation shall not be
Sec. 1714

placed closer than 24 inches of an attic-type (horizontal) furnace or air handling equipment, or within 6 inches of any chimney.

2. Manufacturer’s name, address, city and state including the zip code.

3. Average minimum weight in pounds.

4. The label of an approved independent testing laboratory listing compliance with CSPC Cellulose Insulation Standards HH-1-515 C or D.

(h) Roof Insulation. Insulation to be installed in roofs shall conform to the manufacturer’s instructions and shall be approved by the Department. When a Class A, B or C roof is required, the insulation shall not deter from its classification.

Section 1716(b) is amended:

(b) Smoke-Control System for Atriums. See Section 5702.

Section 1716(k) is added:

(k) Floor Area. When calculating the floor area for a refuge area as required by Section 1807 or for occupant load, the area of the atrium at each floor, except its base, may be subtracted from the gross floor area.

Section 1716(l) is added:

(l) Smoke Detection. The atrium shall be fully detectored per NFPA 72E (see Chapter 38). Smoke detectors shall be placed on the occupied side of any door opening into the atrium. Where a level is open to the atrium as in subsection (c) Exception 1 above, that level or portion of that level open to the atrium shall be fully detectored.

Section 1716(m) is added:

(m) Annunciation.

1. Other Than High-Rise Buildings. Other than high-rise buildings shall have a main annunciator panel in accordance with Chapter 38. The manual control for the atrium smoke control systems shall be located at a location approved by the Department and the Fire Department.

2. High-Rise. High-rise buildings shall have an Operations Center in accordance with Section 1807. In addition, the following are required:

A. Smoke detectors in the atrium shall be on a separate zone per floor.

B. Manual controls and status indicators for the atrium smoke control system shall be provided.
Section 1716(n) is added:

(n) Testing of Fire Alarm, Detection and Emergency Communications Systems:

1. Acceptance Testing: Before the fire alarm detection and emergency communications systems (if required by the code) are accepted by the Department and the Fire Department and prior to initial occupancy, they shall be tested in their presence to confirm that the systems operate in compliance with this section.

2. Subsequent Testing: The fire alarm, detection and emergency communications systems shall be tested in accordance with Section 3853(f)7 at the intervals stated.

Section 1718 is added:

TRANSMISSION OF CITY MICROWAVE SIGNALS

Sec. 1718. No construction permits or Certificates of Occupancy shall be issued for any building or structure exceeding 60 feet in height which interferes or may interfere with the transmission or reception of City microwave communication signals unless the owner of such building or structure provides for installation of equipment to retransmit or redirect the signal as necessary to eliminate any interference. Such equipment shall be approved by and installed at the direction of the affected City agency. A service agreement must also be approved by the City or agency whose transmission is affected by the proposed building or structure prior to the issuance of any permit or Certificate of Occupancy. Such agreement shall include provisions for easements and access for maintenance, electricity for operation and provision for the replacement of equipment.

Section 1719 is added:

EMERGENCY POWER EQUIPMENT ROOM ENCLOSURES

Sec. 1719. Emergency power equipment rooms shall be provided with a one-hour fire-resistive occupancy separation. Doors shall be one-hour rated with self-closing devices. See National Electrical Code.

Section 1720 is added:

VEHICLE EXIT FACILITIES

Sec. 1720. Where ramps are provided for vehicle exiting from buildings or from private drives onto public right of ways, the ramps shall be sloped at 0.5% min. to 2.0% max. for a distance at least 20 feet inside of the building or property line. Vertical curves shall be used at all grade breaks.
Section 1721 is added:

CEILING HEIGHTS

Sec. 1721. Ceilings shall have a clear height of not less than 7 feet measured to the lowest projection from the ceiling.

EXCEPTION: Group R Occupancies.

Section 1722 is added:

CONSTRUCTION IN A FLOOD PLAIN

Sec. 1722.

(a) Construction. All new buildings and additions to existing buildings hereafter erected in a flood plain shall comply with the requirements for location and elevation contained in Chapter 56, Article V of the Denver Revised Municipal Code.

(b) Design. New buildings, substantial improvements and additions of nonresidential structures may be located below the level of the 100-year flood elevation, provided that the structure and utilities are designed by a professional engineer in conformance with the provisions of the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and Related Regulations.

(c) Water Supply and Sanitary Sewer System. New or replacement water supply and sanitary sewer systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into the flood waters.

(d) One-Hundred-Year Flood. A flood that has the frequency of occurrence of once every 100 years as determined from an analysis of floods on a particular watercourse and other watercourses in the same general region. It has approximately a 1% chance of occurring in a given year.

Section 1723 is added:

VIEW PROTECTION ORDINANCES

Sec. 1723. Mountain view and central business district view protection ordinances contained in the Revised Municipal Code shall be enforced by the Department 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 an Engineer, with appropriate calculations, that the proposed building does not exceed the allowable height within the view protection district.
Section 1724 is added:

SIGNS AND SIGN STRUCTURES

Sec. 1724. The Uniform Sign Code, 1991 Edition, shall regulate all signs and sign structures not located within a building.

EXCEPTION: The Denver Zoning Code shall regulate all signs and sign structures relative to type, size, location, and projection.
Section 1807 is amended:


(a) General. Every building having a passenger elevator and having floors used for human occupancy more than 75 feet above the lowest level of Fire Department vehicle access and housing Groups A, B, E, I and Group R, Division 1 Occupancies shall conform to the requirements of this Section:

1. All new high-rise buildings shall conform to the requirements of this Section.

2. Existing high-rise buildings whose occupancy is being changed shall conform to the requirements of this Section.

3. Smoke barriers and smoke dampers shall be required as follows:

   A. Required fire-rated assemblies that separate areas to be pressurized or exhausted as part of a smoke control system shall be considered smoke barriers.

   B. Smoke dampers shall be required only at the point where ducts pass through required smoke barriers and at connections between outside air and building exhaust air. The smoke dampers shall be installed before the first duct inlet or outlet and in no case more than 2 feet from the barrier.

   C. Smoke dampers shall meet the standards of UL 555S Class II with a minimum temperature classification of 250°F and shall be listed by an approved testing laboratory.

(b) Elevator Area of Rescue Assistance (EARA).

1. A EARA to allow for elevator evacuation shall be provided at the elevator entrances of each story served by a passenger elevator. Each EARA shall have an area of at least 1% of the gross floor area of that story.

   EXCEPTION: Stories opening directly to grade or having ramps to grade.

2. The EARA shall be enclosed by one-hour fire-resistive construction, extending from the floor to the underside of the floor above. The exception noted in Section 3305 allowing deletion of one-hour corridor construction for fully sprinklered buildings does not apply to this requirement.

   A. Openings into EARA shall be protected by 3/4-hour-rated self-closing fire assemblies in accordance with Section 4306.

   B. Locks or latches shall be in accordance with Section 3303(c) except that doors from occupied areas into the EARA and into stairways shall have lever-type door handles or panic
Sec. 1807

devices. Devices that act to hold any door from an occupied area into the EARA in an open position are not permitted.

EXCEPTION: Automatic closing devices which close refuge area doors throughout the building upon activation of the fire alarm system or the fire detection system are permitted.

C. Door-closing devices and pressurization systems shall be designed so that opening of doors to the EARA can be accomplished with a force of not more than 30 pounds applied at the latch side of the door on the door opening device.

3. Each EARA shall exit directly to required exit stairways.

EXCEPTION: In office buildings only, either stairway pressurization or full smoke detection may be substituted for direct access to required exit stairways if such a substitution is made to the entire building and complies with Section 1807(c)7. (This substitution does not delete the required EARA.)

4. Finish materials in EARA, atriums and corridors connecting stairways with EARA shall be of a minimum Class II Flame Spread Classification. See Tables Nos. 42-A and 42-B.

5. Carpeting may be installed on the floors of EARA, atriums and corridors but shall not cover up the walls for more than 8 inches. See Appendix IV, A, Uniform Fire Code.

(c) Smoke-Control Systems for High-Rise Buildings. See Section 5703.

(d) Detection. In addition to any other requirements of this Code, approved smoke detectors shall be provided in the following locations:

1. Downstream from air filters and in each fan system supplying air during alarm activation. The detector shall stop the fan when products of combustion are detected. A system shall be designed so that smoke will not recirculate through the building when the fan has stopped.

2. Not less than one foot and not more than 3 feet from the door on the occupied side of each door entering a EARA.

EXCEPTION:

1. In apartment buildings and where permitted by the Department and the Fire Department, a supervised rate of rise detector located per subsection (d)2 above and a single station smoke detector conforming to the requirements of Section 3810 shall be installed in lieu of the supervised smoke detector required above. The supervised rate-of-rise detector shall actuate all systems in the same manner as the smoke
detector required in subsection (d)2. The single station smoke detector shall be wired to a 115-volt AC unswitched electric power source. When additional supervised smoke detectors are required by this Code, a supervised smoke detector or a supervised rate-of-rise detector with a single station smoke detector as specified above shall be provided. When more than one single station smoke detector is installed within a unit, they shall be interconnected so that activation of any one single station detector shall cause all to sound an alarm. (See Sections 3810 and 3816.)

3. Not less than one foot and not more than 3 feet outside of each door into an exit stairway which is not directly exiting from a EARA.

4. EARA in accordance with NFPA 72E.

5. At openings extending vertically through floors which are not required to be enclosed. Detectors shall be located on each level in locations approved by the Department.

6. Return air openings at each floor.

(e) Elevators.

1. All passenger elevators serving a floor shall open into a EARA. Elevators used exclusively for service must open into a EARA if they occupy a common hoistway with passenger elevators.

2. Any fire-alarm-initiating device shall return to grade level, nonstop, all elevators serving that alarm zone. Elevators without a landing at grade level shall be returned to the landing closest to grade level or other approved level and the elevator doors shall automatically open. After a period of one minute, the elevator doors shall automatically close. The doors shall be reopenable by pressing either the designated return floor landing(s) 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 manually overridden by the key operator switch required by ANSI A17.1, Section 211.3a-1. See Chapter 55.

(f) Fire Department Operations Center Equipment. A Fire Department Operations Center (F.D. Operations Center) shall be provided in a space approved by the Department and the Fire Department. The F.D. Operations Center shall be contained in a room separated from the remainder of the building by 2-hour fire resistive construction. The room shall be used for no other purpose unless that use is approved by the Department and 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 equipped with a smoke detection system and shall not be sprinklered. The
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F.D. Operations Center shall be located on the ground floor with the door opening directly into the main lobby at a point in the lobby accessible directly from the exterior. The door to the F.D. Operations Center shall not be located on a dead-end corridor. The F.D. Operations Center shall contain the following:

1. A smoke control system status/control panel, utilizing graphics outlining the building and placing individual smoke control system fan and damper controls relative to location within building. The smoke control system status/control panel may be combined with the fire alarm annunciator panel. The panel shall have a maximum height from the floor of 6 feet 6 inches and may be in more than one section to accommodate height limitations. The following features shall be incorporated:

   A. Individual manual override switches for orientation of all system components utilized for smoke control, such as fans and/or dampers for pressurization and exhaust. Provide an individual switch, one per zone or level for exhaust components and individual switch for orientation of 100% outdoor air dampers.

   B. Manual override switches shall be 3-function type, such as "Open-Auto-Close" for dampers or "On-Auto-Off" for fans. Manual positions shall override all automatic modes including automatic smoke detector shutdown.

   C. Independent positive indication (e.g. damper end switches for dampers and duct pressure switches for fans) of orientation of each system component provided with manual override per subsection above such as damper indication shall be for full closed and full opened and fan indication shall be for "Run". Control signals cannot be used for indication purposes.

   D. In R-1 occupancies, provide controls and indication for each EARA supply and exhaust dampers. Controls shall consist of an "exhaust-automatic-pressurize" selector switch to control the dampers when the EARA pressurization system is operating. In the automatic position, the dampers shall be controlled by the smoke detectors within the EARA. The indication required shall indicate whether the dampers are in pressurization or exhaust position.

   E. A push-to-test switch shall be provided for all lights on control board.

2. Communications System. A communications system shall be provided and shall function as follows:

   A. A one-way voice communication (PA) system designed to be clearly heard by all occupants of the building and operated from the F.D. Operations Center. The detection system fire alarm system and sprinkler system may activate the
one-way voice communication system. It shall provide one-way communication on a selective general basis to the following locations:

(i) Each floor including tenant areas, guest rooms, dwelling units, public corridors, elevator lobbies and restrooms.
(ii) Exit stairways.
(iii) Elevator cabs.

B. Provide one-way communication on an individual and all-call basis to each level.

C. Stairwell and elevator speakers shall be separate zones, controlled manually from the F.D. Operations Center.

3. Two-Way (Firefighters') Telephone Communication System, with the following features:

A. A firefighters' telephone jack shall be at every manual fire alarm box and elevator lobby. The firefighters' telephone communication system shall have "In Use" indication, by zone, at the F.D. Operations Center master panel, and switching provisions at the master panel to allow the selecting of any zone. Zones shall be by level plus separate zones for each of following:

   Building Engineer Office
   Each Mechanical Room
   Emergency Generator Room
   Fire Room
   Electrical Room
   Each Elevator Bank
   Elevator Equipment Room.

B. The firefighters' telephone communication system shall be designed to serve as backup to the PA voice communication system.

C. Firefighters' telephone jacks shall be designed to prevent feedback by being arranged in such a manner that when a handset is inserted, it will disconnect any speaker in the immediate area while maintaining full supervision on the speaker circuit.

D. A permanently mounted firefighters' telephone handset shall be located at the building engineer's office, each mechanical room, emergency generator room, fire pump room, main electrical areas, each elevator cab and each elevator equipment room. These units shall initiate a signal from the F.D. Operations Center to the individual handset.
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and from the individual handset to the F.D. Operations Center.

4. The communications system shall be continuously electrically supervised. Design of the communications systems shall be such that the speakers and telephone jacks on any one floor or in any one area shall be connected to an alternate cable system so that damage or loss of any one speaker, telephone jack, cable, amplifier or pre-amplifier will not cause the failure of more than 1/2 of the communications systems of a given floor or area. The communications cable system shall be routed in a minimum of 2 separate vertical risers remotely located from each other.

5. If main electrical disconnects are located higher than 75 feet from grade, remote tripping switches shall be located within the F.D. Operations Center.

6. Fire Pump Panel with the following features:
   A. Operating status indication (motor on or off).
   B. If pumping is required from a main fuel tank to a diesel fire pump, a duplex pumping system shall be provided. Emergency fuel flow controls are required in the F.D. Operations Center.
   C. Fuel level indicator for fire pump fuel tank is provided.
   D. Fire pump start control.

7. Fire Alarm Annunciation with the following features:
   A. Automatic fire sprinkler system zoned and annunciated per level with main water flow indication.
   B. Manual fire alarm boxes zoned and annunciated per level.
   C. Fire detection (duct and space) system zoned per level.

   EXCEPTION: With all concealed detectors (i.e., duct, electrical closet,) provided with remote indicating pilot lights mounted directly below the detector or directly outside door (i.e., electrical closures,) for annunciation purposes, all initiating devices may be combined and annunciated as one zone per level. Remote indicating lamps may be mounted on a graphic plate at an alternate approved location.

   D. In Group R, Division 1 Occupancy, every detected space shall be annunciated individually. Annunciation shall be at the main F.D. Operations Center annunciator panel by individual detected space or individual level with a remote annunciator annunciating each detected space at each level at approved location. Main water flow annunciation shall be at...
the main annunciator panel. Individual level water flow shall be annunciated in the same manner as detectored space. With individual level remote annunciators, water flow, detection and manual fire alarm boxes may be annunciated as one zone per level.

E. The annunciator shall be graphic, detailing building and placing annunciation indication relative to building level. The fire alarm annunciator panel may be combined with the smoke control system status/control panel. The following are items to be included on graphic panel (See graphic panel Table No. 18-A):

(i ) Fire alarm zoned annunciation.
(ii ) Lamp test switch.
(iii) Power on and trouble indications.
(iv) Fire alarm power source indicator (e.g., normal or standby - generator or battery).
(v) Smoke control/pressurization status and control switches.
(vi) Garage exhaust system control switch.
(vii) Fire pump running status.
(viii) Emergency generator running status.
(ix) Special extinguishing systems.
(x) Fire mode indication with switch "on/auto". Fire mode means that the General Building Pressurization System Dampers are as follows: O.A. - Open 100%, R.A. - Closed 100%, E.A. - Open 100%
(xi) Minimum height of letters shall be 3/16 inch.

The panel shall be graphic to clearly indicate a detailed layout of the building geography.

A combination of vertical (section) and horizontal (plan) graphic arrangements may be necessary. Primary ingress and egress routes, including stairs (indicating those which open to the roof) and elevator shafts shall be shown. The graphic panel shall be oriented to the building and include a compass point.

Identification and location of major building features and functions shall be indicated, (e.g. EARA, stairwells, elevator shafts, fire pump room, emergency generator room, electrical rooms, mechanical rooms, atriums, F.D. Operations Center and special extinguishing equipment), and other features as required by the Department and the Fire Department. If the panel has colored graphics, the graphics shall be colored coded as follows:
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White - general building layout (black lines on white background)
Yellow - exhaust air systems
Orange - supply air systems
Green - pressurization air systems

Indicator lights (status) shall be color coded as follows:
Red - Alarm conditions
Amber - Trouble or supervisory
Green - Power on, fans operating, or dampers open
White - Fans off, or dampers closed

Lamps shall be clearly visible and easily distinguishable between lighted and unlighted modes when operating. Full-size shop drawings (indicate color coding, if any) of the graphic annunciator shall be submitted to the Department and the Fire Department prior to the issuance of a Fire Alarm Permit.


A. A color graphics system consisting of a personal computer with a high resolution CRT having a touch sensitive screen may be used as an alternative to hard-wired graphic annunciator and control panels. The touch screen computer shall include the manual control of all smoke control functions including:

(i) Exhaust Air System
(ii) Supply Air System
(iii) Pressurization Air System
(iv) Alarm Indications
(v) Damper and Fan Status Controls
(vi) Audible and Visual Alarm Controls

B. A color graphic computerized system without the touch sensitive screen operations is not acceptable.

C. The graphics shall be color coded the same as the graphic annunciator of Denver Building Code 1807(g)3E.

D. The color graphics, sequence of operations, and touch screen controls shall be approved by the Department and the Fire Department prior to issuance of the permit.

E. Sufficient emergency power, in accordance with NFPA 72, must be provided to assure operations under a brown-out or power outage condition.

F. Automatic fire detection in individual level refuge areas shall be zoned and annunciated individually and separate from occupied area.
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G. Special extinguishing systems shall be annunciated separately (hood extinguishing system, halon, or similar systems).

9. Elevator Control/Status Panel with the following features:

A. Identify each elevator cab numerically and the floors it serves. Locate corresponding cab number in elevator cab at permanent handset.

B. Indication of which elevators are on emergency power.

C. Placard at elevator status/control panel stating how many elevators can operate under emergency power simultaneously.

D. Elevator car position indicator.

10. Emergency 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 (Table No. 18-A) shall be permanently mounted, unobstructed, on an interior wall of the F.D. Operations Center. One drawing may be used for all typical levels. Plans shall depict the following:

   Location of general building features,

   A brief legend listing the levels on which general building features are located:

   Stairtowers (identified by building directional location)
   Elevators (numerically identified)
   Elevator machine rooms
   Emergency generator
   Fire pumps
   Fire sprinkler and standpipe valves
   Mechanical areas
   Main electrical areas
   Fuel tanks
   Locations of building services controls
   Electricity
   Gas
   Water supply (domestic), all valves and building entry location
   Water supply (fire), all valves and building entry location
   Ammonia, Freon, chlorine
   Utility property line valves
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Location of features on individual levels. One drawing may be used for all typical levels:
- Elevators
- Stairwell doors
- Elevator areas of rescue assistance (EARA)
- Fire sprinkler sectional valves
- Vertical shafts
- HVAC supply and return ducts (main each level)
- Concealed detectors (duct, electrical closet, ammonia, etc.), and,

Portions of buildings where partitions may be relocated from time to time. (This information may be in notebook form.)

B. 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. (Table No. 18-A.)

C. 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 (Table No. 18-A) shall be installed at each elevator call button in each refuge area.

(g) Emergency Generation. (See Electrical Code.)

1. 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 2 floors above or below the fire floor with a maximum of 2 elevator trips (assume one person per 3 square feet of required refuge area). A minimum of 2 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, to operate air handling equipment for pressurization and exhaust systems as required, and to operate other emergency system as required by this Code.

   EXCEPTION: Where an elevator transfer floor is provided, only elevators in one bank providing access to the ground floor are considered to be serving that floor.

2. Emergency switchboards, panel boards, transfer switches and conductors supplying this equipment shall be separated from main service equipment by a one-hour fire-rated wall.

3. Provide sufficient on site fuel supply for 8 hours continuous operation under full load.
4. The emergency generation system shall be operated not less than once a month for not less than 30 minutes at a minimum of 30% of full load. An accurate log shall be maintained on the premises indicating the person or agency conducting test, dates tested and length of test. Any defect, modification or repair shall be recorded in the log. Logs shall be made available to the Fire Department.

5. The emergency generation system shall provide power for, but not limited to the following:
   A. Fire alarm and detection systems.
   B. Exit and emergency lighting.
   C. Fire pumps.
   D. Mechanical ventilation as required by Chapter 18.
   E. Emergency elevators.
   F. Communications systems.

(h) Testing of Fire Alarm, Detection and Emergency Communications Systems:

1. Acceptance Testing: Before the fire alarm, detection and emergency communications systems are accepted by the Department and the Fire Department and prior to initial occupancy, they shall be tested in their presence to confirm that the systems operate in compliance with this Section.

2. Subsequent Testing. The fire alarm, detection and emergency communications systems shall be tested in accordance with Section 3853(f)7 at the intervals stated.

Section 1807 is amended by adding Subsection (i).

(i) Emergency Air Rescue Replenishment System. An approved emergency air replenishment system shall provide an adequate pressurized fresh air supply through a permanent piping system for the replenishment of self-contained breathing apparatus carried by fire suppression rescue and other emergency personnel in the performance of their duties. The design, specification, location and testing of this system shall be in accordance with the requirements and specifications in the Denver Building Code, UBC Appendix 18.
TABLE NO. 18-A
EXAMPLES OF EMERGENCY GRAPHICS
(Reduced in size)

Elevator Call Button Sign:

USE STAIRS IN CASE OF FIRE UNLESS OTHERWISE INSTRUCTED
Section 2303(g) is added:

(g) Fire Truck Loading. When parking structures are designed to accommodate fire trucks, the beams and slab shall be designed for a concentrated load of 31,000 pounds bearing on an area with dimensions of 20 inches by 32 inches. The condition of concentrated or equivalent uniform live load (as given in Table No. 23-A) producing the greater stresses shall govern the design.

Section 2304(d) is amended:

(d) Partitions Loads. Floors in office buildings and other buildings where partition locations are subject to change shall be designed to support a uniformly distributed dead load equal to 1/10th the weight of one lineal foot of partition with a minimum of 10 pounds per square foot in addition to all other loads. Access floor systems may be designed to support a uniformly distributed dead load equal to 10 pounds per square foot in addition to all other loads.

Section 2305(d) is deleted and replaced with the following:

(d) Snow Loads. Snow loads full or unbalanced shall be considered in place of loads set forth in Table No. 23C, where such loading will result in larger members or connections. The load reduction provisions of Section 2306 shall not be used to reduce snow loads. Rain on snow need not be considered. Roofs shall be designed for snow loads in compliance with the procedures specified in either Appendix 23, Division 1, or in American Society of Civil Engineers, ASCE7-88. The two procedures may not be mixed. The ground snow load for such procedures shall be 25 pounds per square foot. The importance factor I shall be:

1.4 for all structures in occupancy categories 1 or 2 according to Table A-23-T

1.0 for all other structures

In addition, roofs shall be designed for not less than the following uniformly applied snow load:

30 pounds per square foot for all structures in occupancy categories 1 or 2 according to Table A-23-T.

25 pounds per square foot for all other structures

Section 2311 is amended:

General. Every building or structure and every portion thereof shall be designed and constructed to resist the wind effects determined in accordance with the requirements of this Section. Wind shall be assumed to come from any horizontal direction. No reduction in wind pressure shall be taken for the shielding effect of
adjacent structures. Structures sensitive to dynamic effects, such as buildings with a height-width ratio greater than 5, structures sensitive to wind-excited oscillations, such as vortex shedding or icing, and buildings over 400 feet in height shall be, and any structure may be, designed in accordance with ANSI A58.1

Section 2314 is amended:

Basic Wind Speed. The following parameters shall be used for Denver, Colorado:

1. Basic wind speed = 85 miles per hour.
2. qs = 19 psf
3. Exposure B, unless flat and generally open terrain extends uniformly ½ mile or more from the site in any full quadrant, in which case Exposure C shall be used.
<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DESCRIPTION</th>
<th>UNIFORM LOAD</th>
<th>CONCENTRATED LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Access floor system</td>
<td>Office use</td>
<td>50</td>
<td>2000(^2)</td>
</tr>
<tr>
<td></td>
<td>Computer use</td>
<td>100</td>
<td>2000(^2)</td>
</tr>
<tr>
<td>2. Armories</td>
<td></td>
<td>150</td>
<td>0</td>
</tr>
<tr>
<td>3. Assembly areas(^3) and auditoriums and balconies therewith</td>
<td>Fixed seating areas</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Movable seating and other areas</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Stage areas and enclosed platforms</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>4. Cornices, marquees and residential balconies</td>
<td></td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>5. Exit facilities(^4)</td>
<td>General storage and/or repair</td>
<td>100</td>
<td>6</td>
</tr>
<tr>
<td>6. Garages(^9)</td>
<td>Private or pleasure-type motor vehicle storage</td>
<td>50</td>
<td>6</td>
</tr>
<tr>
<td>7. Hospitals</td>
<td>Wards and rooms</td>
<td>40</td>
<td>1000(^2)</td>
</tr>
<tr>
<td></td>
<td>Operating and X-ray Rooms</td>
<td>60</td>
<td>1500(^2)</td>
</tr>
<tr>
<td>8. Libraries</td>
<td>Reading rooms</td>
<td>60</td>
<td>1000(^2)</td>
</tr>
<tr>
<td></td>
<td>Stack rooms</td>
<td>125</td>
<td>1500(^2)</td>
</tr>
<tr>
<td>9. Manufacturing</td>
<td>Light</td>
<td>75</td>
<td>2000(^2)</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>125</td>
<td>3000(^2)</td>
</tr>
<tr>
<td>10. Offices</td>
<td></td>
<td>50</td>
<td>2000(^2)</td>
</tr>
<tr>
<td>11. Printing Plants</td>
<td>Press rooms</td>
<td>150</td>
<td>2500(^2)</td>
</tr>
<tr>
<td></td>
<td>Composing and linotype rooms</td>
<td>100</td>
<td>2000(^2)</td>
</tr>
<tr>
<td>12. Residential(^7)</td>
<td>Lounge, recreational areas and exterior balconies</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>13. Rest rooms(^8)</td>
<td></td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>14. Reviewing stands, grandstands and bleachers, folding and telescoping seating</td>
<td></td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>15. Roof deck</td>
<td>Same as area served or for the type of occupancy accommodated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Schools</td>
<td>Classrooms</td>
<td>40(^{10})</td>
<td>1000(^2)</td>
</tr>
<tr>
<td>17. Sidewalks and driveways</td>
<td>Public access</td>
<td>250</td>
<td>6</td>
</tr>
<tr>
<td>18. Storage</td>
<td>Light</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Heavy</td>
<td>250</td>
<td>0</td>
</tr>
</tbody>
</table>
## Table 23-A

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DESCRIPTION</th>
<th>UNIFORM LOAD</th>
<th>CONCENTRATED LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Stores</td>
<td>Retail</td>
<td>75</td>
<td>2000&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Wholesale</td>
<td>100</td>
<td>3000&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>20. Kitchens</td>
<td>Other than residential</td>
<td>100&lt;sup&gt;11&lt;/sup&gt;</td>
<td>0</td>
</tr>
<tr>
<td>21. Penal Institutions</td>
<td>Cell blocks</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>22. Racquet ball &amp; Tennis</td>
<td>Courts</td>
<td>60</td>
<td>0</td>
</tr>
</tbody>
</table>

1. See Section 2306 for live load reductions.
2. See Section 2304(c), first paragraph, for area of load application.
3. Assembly areas include such occupancies as dance halls, drill rooms, gymnasiums, playgrounds, plazas, terraces, lounges, other recreational areas and similar occupancies which are generally accessible to the public.
4. Exit facilities shall include such uses as corridors serving an occupant load of 10 or more persons, exterior exit balconies, stairways, fire escapes and similar uses.
5. Individual stair treads shall be designed to support a 300-pound concentrated load placed in a position which would cause maximum stress. Stair stringers may be designed for the uniform load set forth in the table.
6. See Section 2304(c), second paragraph, for concentrated loads.
7. Residential occupancies include private dwellings, apartments and hotel guest rooms.
8. Rest room loads shall be not less than the load for the occupancy with which they are associated, but need not exceed 50 pounds per square foot.
9. Garage loadings shall not include an impact factor for floors or roofs. Ramp loadings shall be the same as for floors. Garage roofs 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 live loads required. Contact the Fire Department for specifications.
10. School class and lecture rooms in excess of 1200 square feet in area without fixed seats shall be designed for a uniform live load of 75 pounds per square foot.
11. Use weight of actual equipment when greater.
Table 23-B

Table No. 23-B is amended by adding category 14 and footnote 13:

<table>
<thead>
<tr>
<th>14. Mechanical Equipment Rooms</th>
<th>Aisle Areas</th>
<th>75</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equipment Areas</td>
<td>Actual Loads</td>
</tr>
</tbody>
</table>

13. Minimum uniform liveload = 125 psf
Section 2401(d) is added:

(d) **Acceptable Alternate.** Design and construction of masonry structures in conformance with the American Concrete Institute and American Society of Civil Engineers standards ACI-ASCE 530 "Building Code Requirements for Masonry Structures" and ACI-ASCE 530.1 "Specifications for Masonry Structures". The material and testing standards referenced therein are acceptable alternates to this Chapter.
Section 2501(g) is added:

(g) **Acceptable Alternate.** Design and construction of wood structures in accordance with the following standards are an acceptable alternate to the corresponding portions of this chapter:


3. Glued-laminated and heavy timber construction in accordance with the standards of the American Institute of Timber Construction.

Use of the materials and test standards specifically referred by these cited standards is also acceptable. Sections 2513 through 2517 are not replaceable by these cited standards and shall be satisfied in all cases, except that the ASTM, ANSI, AITC, NFPA or Department of Commerce standards for materials or tests may be substituted for the UBC standard where the equivalent standard is listed in Chapter 60.

Section 2516(c)(6) is amended:

6. **Crawl Space Ventilation.** The crawl space between the bottom of floor joists and the ground under the building shall be provided with ventilation openings through foundation walls or exterior walls to ensure ventilation of the crawl space area. The openings shall be covered with a corrosion-resistant wire mesh not greater than ½ inch nor less than ¼ inch in any dimension. The minimum total area of ventilating openings shall be proportioned on the basis of ½ square foot for each 25 lineal feet of exterior wall. Openings shall be located on opposite sides of the building, and as near to the corner as practicable.

**EXCEPTION:** Mechanical ventilation or other systems approved by the Department.

Minimum clearance between any obstruction and the ground within a crawl space shall be at least 18 inches. Access to a crawl space shall be at least 18 by 24 inches. See the Mechanical Code for equipment access requirements.

Section 2516(i) is amended:

(i) **Structural Roof Sheathing.** Structural roof sheathing shall be designed in accordance with the general provisions of this Code and the special provisions in this subsection. Structural roof sheathing shall be designed to support all loads specified in this Code and shall be capable of supporting concentrated loads of not less than 300 pounds without failure. The concentrated load
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shall be applied by a loaded disc, 3 inches or smaller in diameter. Structural roof sheathing shall meet the following requirement:

Deflection under uniform design live and dead load limited to 1/180 of the span between supporting rafters or beams and 1/240 under live load only.

Roof sheathing shall conform to the provisions of Table Nos. 25-R-1 and 25-R-2 or 25-S-1, 25-S-2 or Table 25-S-3 with the exception that the minimum thickness of plywood or particle board roof sheathing shall be:

1. 15/32-inch plywood; or
2. 7/16-inch nonveneer APA Rated Sheathing (oriented strand board panels, structural particle board panels, composite panels or wafer board panels).

Plywood roof sheathing shall be bonded by intermediate or exterior glue. Plywood roof sheathing exposed on the underside shall be bonded with exterior glue.

Section 2517(h) is amended:

7. Blocking. Roof rafters and ceiling joists shall be supported laterally to prevent rotation and lateral displacement when required by Section 2506(h). Roof trusses shall be supported at points of bearing to prevent lateral displacement and if necessary, rotation.
Section 2601 is amended:

SCOPE

Sec. 2601. The design of structures in concrete of cast-in-place or precast construction, plain, reinforced or prestressed, shall conform to the rules and principles specified in this Chapter. Design and construction of concrete structures in conformance with American Concrete Institute Standards ACI 318, "Building Code Requirements for Reinforced Concrete" and ACI 318.1 "Building Code Requirements for Structural Plain Concrete," 1983 editions (revised 1986). The material and testing standards referenced therein are acceptable alternates to this Chapter, except that Sections 2618(j)2, 2621, 2624 and 2627 apply in all cases.
Section 2701(c) is added:

(c) **Acceptable Alternate.** Design and construction of steel structures in accordance with the following standards is an acceptable alternate to this Chapter:

1. **Structural Steel:** "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" or "Load and Resistance Factor Specification for Structural Steel Buildings," both of the American Institute of Steel Construction.

2. **Cold-Formed Structural Steel:** "Specification for the Design of Cold-Formed Structural Steel Members" or "Specification for the Design of Cold-Formed Stainless Steel Structural Members," both of the American Iron and Steel Institute.


Use of the materials and test standards specifically referenced by these cited standards is also acceptable.
Section 2801(e) is added:

(e) **Acceptable Alternate.** Design and construction of aluminum structures in accordance with the "Specifications for Aluminum Structures" of the Aluminum Association. The materials and testing standards referenced therein are acceptable alternates to this Chapter.
Table No. 29-A is amended:

**TABLE NO. 29-A**

**FOUNDATIONS FOR STUD BEARING WALLS**

**MINIMUM REQUIREMENTS**

<table>
<thead>
<tr>
<th>NUMBER OF FLOORS SUPPORTED BY THE FOUNDATION</th>
<th>THICKNESS OF FOUNDATION WALL (INCHES)</th>
<th>UNIT CONCRETE</th>
<th>UNIT MASONRY</th>
<th>WIDTH OF FOOTING (INCHES)</th>
<th>THICKNESS OF FOOTING (INCHES)</th>
<th>DEPTH BELOW UNDISTURBED GROUND SURFACE (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>6</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>8</td>
<td>15</td>
<td>7</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>10</td>
<td>18</td>
<td>8</td>
<td>36</td>
<td>36</td>
</tr>
</tbody>
</table>

1. Where unusual or frost conditions are found, footings and foundations shall be as required in Section 2907(a).
2. The ground under the floor may be excavated to the elevation of the top of the footing.
3. Foundations may support a roof in addition to the stipulated number of floors. Foundations supporting roofs only shall be as required for supporting one floor.
4. Exterior foundations, footings and grade beams of permanent structures except when founded on rock.
5. See 2907(a) for Group M Occupancies.
6. Does not apply in the case of expansive soils.

Section 2901(a) is amended:

Sec. 2901.

(a) General. This chapter sets forth requirements for excavation and fills for any building or structure and for foundations and retaining structures.

See Wastewater Management Division for requirements governing excavation, grading and earthwork construction, including fills and embankments.

All foundations shall be designed in accordance with accepted engineering practice by an engineer or as approved by the Department.

Section 2903(b) is amended:

(b) Protection of Adjoining Property. The requirements for protection of adjacent property and depth to which protection is
required shall be as defined by prevailing Colorado law. Before commencing the excavation, the person making or causing the excavation to be made shall notify in writing the owners of adjoining buildings not less than 10 days before such excavation is to begin that the excavation will be made and the adjoining buildings should be protected. The owners of the adjoining properties shall be given access to the excavation for the purpose of protecting such adjoining buildings.

Section 2907(a) is amended:

(a) General. Footings and foundations shall be constructed of masonry, concrete or treated wood in conformance with UBC Standard No. 29-3. Footings of concrete and masonry shall be of solid material. Foundations supporting wood shall extend at least 6 inches above the adjacent finish grade. Exterior foundations, footings and grade beams of permanent structures, shall be placed not less than 3 feet below the finished grade.

EXCEPTIONS:
1. Foundations, footings, or grade beams bearing on non-expansive rock.
2. 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 five (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.
3. The following may be placed on a minimum 4-inch reinforced concrete slab, with thickened edges. The bottom of the thickened edges shall extend at least 12 inches below the final exterior finished grade.
   A. Single Group M, Division I buildings of less than 1,000 square feet and not a mixed occupancy.
   B. Single occupancy buildings, other than Group R, of less than 400 square without a basement and of only one story.
Chapter 31 is amended in its entirety:

CHAPTER 31
ACCESSIBILITY REQUIREMENTS FOR
PERSONS WITH DISABILITIES

NOTICE: The City and County of Denver is not responsible for the enforcement of the Federal American Disabilities Act (ADA) 1990 Title: 3 "Non Discrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities: Final Rule or the HUD Fair Housing Act of 1988."

Your building plans will be reviewed and inspected for compliance to the Denver Building Code and will not be reviewed or inspected for compliance to the requirements of the ADA, or the HUD Fair Housing Act; therefore, it is the sole responsibility of the developer or building owner to have their plans or facilities evaluated to comply to the applicable requirements. Any modifications to a building will require a building permit.

GENERAL REQUIREMENTS
Sec. 3101.

(a) Scope. In addition to other requirements of this Building Code, all Occupancies shall be accessible to persons with disabilities in the manner provided in this Chapter.

EXCEPTION: Group R Division 2 Occupancies (attached housing) where all sleeping facilities are on the second floor, Group R Division 3 Occupancies, (other than congregate residences) and M Occupancies accessory to R-3 Occupancies (other than congregate residences).

(b) Design, Installation and Materials. Design, installation and materials used in all structures shall comply with this Building Code and the requirements of ANSI A117.1-1980, except when modified by this Chapter. Where a conflict exists between this Chapter and the standards indicated herein, the requirements of this Chapter shall govern. ANSI A117.1-1986 illustrations are acceptable substitutes for the corresponding illustrations herein.

(c) Site Development. For parking, passenger loading zone, walks, curb, ramp and other site development requirements, refer to the Denver Zoning Ordinance and the Planned Unit Development/Planned Building Group Rules and Regulations.

(d) Exceptions. The Building Department may grant exceptions to or modify any particular standard or specification when it is determined that it is impractical and would create an unusual hardship or would unreasonably complicate the construction, alteration or repair in question. Any such exemption
or modification of the provisions of this Chapter shall be made in writing as a matter of public record.

(e) **Reference and Numbering.** The numbering system used in this Chapter references ANSI A117.1-1980. See Section 3104. For purposes of this Building Code, numbers referencing the ANSI standard are preceded by an "A" and enclosed in parentheses. (ex. (A3.1)). All other numbers are consistent with the Building Code. Any Section or portions of a Section deviating from ANSI A117.1-1980 are in italics. Sections or portions of Sections indicated as "Reserved" are omitted from this Code. Parts 1 and 2 of ANSI A117.1-1980 are not a part of this Code. The following material except otherwise noted in this Chapter is reproduced with permission from American National Standard Specifications for Making Buildings and Facilities Accessible to and Useable by Physically Handicapped People, ANSI A117.1-1980; copyright 1980 by the American National Standards Institute. Copies of this standard may be purchased from the American National Standards Institute at 1430 Broadway, New York, New York 10018.

**MISCELLANEOUS INSTRUCTIONS AND DEFINITIONS**

Sec. 3102.

(a) **(A3.1) Graphic Conventions.** Graphic conventions used in the illustration are shown in Table No. 31-A. Dimensions that are not marked "minimum" or "maximum" are absolute, unless otherwise indicated in the text or captions.

(b) **(A3.2) Dimensional Tolerance.** All dimensions are subject to conventional building industry tolerances for field conditions.

(c) **(A3.3) Notes.** The text of this standard does not contain notes or footnotes. Additional information, explanations and advisory materials are located in the Appendix of ANSI A117.1-1980. Paragraphs marked with an asterisk have related, nonmandatory material in the ANSI Appendix. In the Appendix, the corresponding paragraph numbers are preceded by an A. Numbering used in this text conforms to ANSI A117.1-1980.

(d) **(A3.4) General Terminology.**

**COMPLY WITH.** Meet one or more specifications of this standard.

**IF, IF..THEN.** Denotes a specification that applies only when the conditions described are present.

**MAY.** Denotes an option or alternative.

**SHALL.** Denotes a mandatory specification or requirement.
(e) (A3.5) Definitions. The following terms shall, for the purpose of this Chapter, have the meaning indicated in this Section.

ACCESS AISLE. An accessible pedestrian space between elements such as parking spaces, seating and desks that provides clearances appropriate for use of the elements.

ACCESSIBLE. Describes a site, building, facility or portion thereof that complies with this standard and that can be approached, entered and used by physically disabled people.

ACCESSIBLE ELEMENT. Part of an accessible route or accessible functional space; an item specified by this standard (for example, controls and the like).

ACCESSIBLE ROUTE. A continuous unobstructed path connecting all accessible elements and spaces in a building or facility that can be negotiated by a severely disabled person using a wheelchair and that is also safe for and usable by people with other disabilities. Interior accessible routes may include corridors, floors, ramps, elevators, lifts and clear floor space at fixtures. Exterior accessible routes may include parking access aisles, curb ramps, walks, ramps and lifts.

ADAPTABILITY. The ability of certain building elements, such as kitchen counters, sinks and grab bars, to be added to, raised, lowered or otherwise altered so as to accommodate the needs of either the disabled or nondisabled, or to accommodate the needs of persons with different types or degrees of disability.

AREA OF RESCUE ASSISTANCE. An area, which has direct access to an exit, where people who are unable to use stairs may remain temporarily in safety to await further instructions or assistance during emergency evacuation.

ASSEMBLY AREA. A room or space accommodating 50 or more individuals for religious, recreational, educational, political, social or amusement purposes or for the consumption of food and drink, including all connected rooms or spaces with a common means of egress and ingress. Such areas as conference rooms would have to be accessible in accordance with other parts of this standard but would not have to meet all of the criteria associated with assembly areas.

AUTOMATIC DOOR. A door equipped with a power-operated mechanism and controls that open and close the door automatically upon receipt of a momentary actuating signal. The switch that begins the automatic cycle may be a photoelectric device, floor mat or manual switch mounted on or near the door itself. (See power-assisted door.)

CHILDREN. People below the age of 12 years (that is, elementary school age and younger).
CIRCULATION PATH. An exterior or interior way of passage from one place to another for pedestrians, including, but not limited to, walks, hallways, courtyards, stairways and stair landings.

CLEAR. Unobstructed.

CLEAR FLOOR SPACE. The minimum unobstructed floor or ground space required to accommodate a single, stationary wheelchair and occupant.

CLOSED CIRCUIT TELEPHONE. A telephone with dedicated line(s) such as a house phone, courtesy phone or phone that must be used to gain entrance to a facility.

COMMON USE. Refers to those interior and exterior rooms, spaces or elements that are made available for the use of a restricted group of people (for example, residents of an apartment building, the occupants of an office building or the guests of such residents or occupants).

COVERAGE. The extent or range of accessibility that a particular administrative authority adopts and requires.

CROSS SLOPE. The slope of a pedestrian way that is perpendicular to the direction of travel. (See running slope.)

CURB RAMP. A short ramp cutting through a curb or built up to it.

DETECTABLE. Perceptible by one or more of the senses.

DISABILITY. A limitation or loss of use of a physical, mental or sensory body part or function.

EGRESS, MEANS OF. A continuous and unobstructed way of exit travel from any point in a building or facility to a public way. A means of egress comprises vertical and horizontal travel and may include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, horizontal exits, courts and yards. An accessible means of egress is one that complies with these guidelines and does not include stairs, steps, or escalators. Areas of rescue assistance or evacuation elevators may be included as part of accessible means of egress.

ELEMENT. An architectural or mechanical component of a building, facility, space, or site, e.g., telephone, curb ramp, door, drinking fountain seating, or water closet.

ENTRANCES. An access point to a building or portion of a building or facility used for the purpose of entering. An entrance includes the approach walk, the vertical access leading to the entrance platform, the entrance platform itself, vestibules if provided, the entry door(s) or gates(s), and the hardware of the entry door(s) or gate(s).
EMERGENCY. Facilities resulting from or anticipating unforeseen combinations of circumstances. (Ex., storm shelters, bomb shelters and comparable refuges.)

EVACUATION ELEVATOR. An elevator within a pressurized shaft and serving floors that have pressurized elevator lobbies.

FACILITY. All or any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property located on a site.

FUNCTIONAL SPACES. The rooms and spaces in a building or facility that house the major activities for which the building or facility is intended.

GROUND FLOOR. Any occupiable floor less than one story above or below grade with direct access to grade. A building or facility always has at least one ground floor and may have more than one ground floor as where a split level entrances has been provided or where a building is built into a hillside.

HOUSING. A building, facility or portion thereof, excluding inpatient health care facilities, that contains one or more dwelling units or sleeping accommodations. Housing may include, but is not limited to, one- and two-family dwellings, apartments, group homes, hotels, motels, dormitories and mobile homes.

MARKED CROSSING. A crosswalk or other identified path intended for pedestrian use in crossing a vehicular way.

OCCUPIABLE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes, or in which occupants are engaged at labor, and which is equipped with means of egress, light, and ventilation.

OPERABLE PART. A part of a piece of equipment or appliance used to insert or withdraw objects, or to activate, deactivate or adjust the equipment or appliance. (Ex., coin slot, pushbutton, handle).

POWER-ASSISTED DOOR. A door with a mechanism that helps to open the door, or relieve the opening resistance of a door, upon the activation of a switch or a continuous force applied to the door itself. If the switch or door is released, such doors immediately begin to close or close completely within 3 to 30 seconds. (See automatic doors.)

PRINCIPAL ENTRANCE. An entrance intended to be used by the residents or users to enter or leave a building or facility. This may include, but is not limited to, the main entrance.
PUBLIC USE. Describes interior and exterior rooms or spaces that are made available to the general public. Public use may be provided at a building or facility that is privately or publicly owned.

RAMP. A walking surface in an accessible space that has a running slope greater than 1:20.

REASONABLE NUMBER. Reasonable number shall mean 10% of the number provided.

RUNNING SLOPE. The slope of a pedestrian way that is parallel to the direction of travel. (See cross slope.)

SERVICE ENTRANCE. An entrance intended primarily for delivery or service.

SIGNAGE. Verbal, symbolic and pictorial information.

SITE. A parcel of land bounded by a property line or a designated portion of a public right-of-way.

SITE IMPROVEMENTS. Landscaping, paving for pedestrian and vehicular ways, outdoor lighting, recreational facilities and the like, added to a site.

SLEEPING ACCOMMODATIONS. Rooms in which people sleep, for example, dormitory and hotel or motel guest rooms.

SPACE. A definable area, e.g., room, toilet room, hall, assembly area, entrance, storage room, alcove, courtyard, or lobby.

TACTILE. Describes an object that can be perceived using the sense of touch.

TACTILE WARNING. A standardized surface texture applied to or built into walking surface or other elements to warn visually text telephone impaired people of hazards in the path of travel.

TEMPORARY. Applies to facilities that are not of permanent construction but are extensively used or essential for public use for a given (short) period of time, for example, temporary classrooms or classroom buildings at schools and colleges, or facilities around a major construction site to make passage accessible, usable and safe. Structures directly associated with the actual processes of major construction, such as porta-potties, scaffolding, bridging, trailers and the like, are not included.

VEHICULAR WAY. A route intended for vehicular traffic, such as a street, driveway or parking lot.

WALK. An exterior pathway with a prepared surface intended for pedestrian use, including general pedestrian areas such as plazas and courts.
Sec. 3102

WALKING AID. A device used by a person who has difficulty walking. (Ex., a cane, crutch, walker or brace.)

ACCESSIBLE ELEMENTS AND SPACES

Sec. 3103.

(a) (A4.1) Minimum Requirements.

1. (A4.1.1) Accessible Sites and Exterior Facilities. An accessible site shall meet the following minimum requirements.

   A. Reserved.
   B. Reserved.
   C. Reserved.
   D. Reserved.
   E. Reserved.
   F. Stairs connecting levels that are not connected by an elevator shall comply with subsection (i) below.
   G. All passenger elevators shall comply with subsection (j) below.
   H. All doors or gates to accessible spaces and elements and along accessible routes shall comply with subsection (m) below.
   I. If drinking fountains are provided, they shall comply with subsection (o) below.
   J. If toilet rooms are provided, they shall comply with subsection (v) below. If bathing facilities are provided, a reasonable number, but always at least one, of the bathrooms shall comply with subsection (w) below. If toilet and bathing facilities are provided for both sexes, a reasonable number, but always at least one, of toilet rooms and bathrooms, bathing facilities, or shower rooms complying with subsections (v) and (w) shall be provided for each sex:
   K. Tactile warnings shall be provided at hazardous conditions as specified in subsection (cc) below.
   L. All signs shall comply with subsection (dd) below.
   M. Reserved.
   N. Reserved.
   O. If places of assembly are provided, they shall comply with subsection (gg) below.
   P. Ramped access shall be provided to temporary buildings that are used for public related activities.

2. (A4.1.2) Accessible Buildings. Accessible buildings and facilities shall meet the following minimum requirements:
Sec. 3103

A. At least one accessible route complying with subsection (c) below shall connect accessible building or facility entrances with all accessible spaces and elements within the building or facility.

B. All objects that overhang circulation paths shall comply with subsection (d) below.

C. Ground and floor surfaces along accessible route and in accessible rooms and spaces shall comply with subsection (e) below.

D. Stairs connecting levels that are not connected by an elevator shall comply with subsection (i) below. This requirement is not mandatory within dwelling units.

E. One passenger elevator complying with subsection (j) shall serve each occupied level including mezzanines, in multi-story buildings. If more than one elevator is provided each full passenger elevator shall comply with subsection (j)

EXCEPTIONS:

1. Elevators are not required in (1) residential building three stories or less in height and (2) other buildings or facilities that are less than 3 stories in height or less than 3,000 sq. ft. per story unless the building is a shopping center, a shopping mall or professional office of a health care provider.

2. Service levels such as elevator penthouses mechanical rooms, equipment catwalk, etc.

3. Accessible ramps complying with subsection (h).

F. Reserved.

G. All doors to accessible spaces along accessible routes shall comply with subsection (m) below.

H. An accessible building or facility shall have at least one accessible principal entrance that complies with subsection (n) below.

I. If drinking fountains are provided, they shall comply with subsection (o) below.

J. If toilet rooms are provided, they shall comply with subsection (v) below. If bathing facilities are provided, a reasonable number, but always at least one, of the bathrooms shall comply with subsection (w) below. If toilet and bathing facilities are provided for both sexes, a reasonable number, but always at least one, of toilet rooms and bathrooms, bathing facilities or shower rooms complying with subsections (v) and (w) shall be provided for each sex.

K. If storage facilities such as cabinets, shelves, closets and drawers are provided in accessible spaces, a reasonable
number, but at least one, shall comply with subsection (y) below.

L. Controls and operating mechanisms in accessible spaces, along accessible routes, or as parts of accessible elements (for example, light switches and dispenser controls) shall comply with subsection (aa) below.

M. If emergency warning systems are provided, they shall comply with subsection (bb) below.

N. Tactile warnings shall be provided at hazardous conditions as specified in subsection (cc) below.

O. If signs are provided, they shall comply with subsection (dd) below.

P. Reserved.

Q. If seating, tables or work surfaces are provided in accessible spaces, a reasonable number, but always at least one, of seating spaces, tables or work surfaces shall comply with subsection (ff) below.

R. If places of assembly are provided, they shall comply with subsection (gg) below.

3. (A4.1.3) Accessible Housing. Accessible housing shall comply with the minimum requirements in subsection (a)1 and subsection (a)2. It shall also meet the requirements of subsection (hh) below.

4. Identification of Existing Inaccessible Elements and Spaces. Identification of existing inaccessible elements and spaces shall meet the following minimum requirements:

A. All signage shall comply with subsection (dd).

B. Signage shall be installed along an accessible route to clearly indicate the conditions of inaccessibility at specific points (i.e.):

( i) Entrances to buildings that do not have accessible exits or areas of rescue assistance.

( ii) Main floor elevator lobbies, when the elevators serve other floors that do not have accessible facilities, exits or areas of rescue assistance.

See UBC Chapter 31 amended, Figure 41 for examples.

(b) (A4.2) Space Allowances and Reach Ranges.

1. (A4.2.1*) Wheelchair Passage Width. The minimum clear width for single wheelchair passage shall be 32 inches (815mm) at a point and 36 inches (915mm) continuously (see Fig. 1).
2. (A4.2.2) Width for Wheelchair Passing. The minimum width for two wheelchairs to pass is 60 inches (1525mm) (see Fig. 2).

3. (A4.2.3*) Wheelchair Turning Space. The space required for a wheelchair to make a 180° turn is a clear space of 60 inches (1525mm) diameter (see Fig. 3(a)) or a T-space (see Fig. 3(b)).

4. (A4.2.4*) Clear Floor or Ground Space for Wheelchairs.

5. (A4.2.4.1) Size and Approach. The minimum clear floor or ground space required to accommodate a single stationary wheelchair and occupant is 30 inches by 48 inches (760mm by 1220mm) (see Fig. 4(a)). The minimum clear floor or ground space for wheelchairs may be positioned for forward or parallel approach to an object (see Fig. 4(b) and (c)). Clear floor or ground space for wheelchairs may be part of the knee space required under some objects.

6. (A4.2.4.2) Relationship of Maneuvering Clearances to Wheelchair Spaces. One full unobstructed side of the clear floor or ground space for a wheelchair shall adjoin or overlap an accessible route or adjoin another wheelchair clear floor space. If a clear floor space is located in an alcove or otherwise confined on all or part of 3 sides, additional maneuvering clearances shall be provided as shown in Fig. 4(d) and (e).

7. (A4.2.4.3) Surfaces of Wheelchair Spaces. Clear floor or ground spaces for wheelchairs shall comply with subsection (e) below.

8. (A4.2.5) Forward Reach. If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 inches (1220 mm) (see Fig. 5(a)). The minimum low forward reach is 15 in (380 mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in Fig. 5(b).

9. (A4.2.6) Side Reach. If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 inches (1370mm) and the low side reach shall be no less than 9 inches (230mm) above the floor (Fig. 6(a) and (b)). If the side reach is over an obstruction, the reach and clearances shall be as shown in Fig. 6(c).

(c) (A4.3) Accessible Route.

1. (A4.3.1*) General. All halls, corridors, aisles and other spaces that are part of an accessible route shall comply with this subsection (c).

2. (A4.3.2) Location.

A. Reserved.
B. Reserved.

C. At least one route shall connect accessible building or facility entrances with all accessible spaces and elements and with all accessible dwelling units within the building or facility.

D. An accessible route shall connect at least one accessible entrance of each accessible dwelling unit with those exterior and interior spaces and facilities that serve the accessible dwelling unit.

3. (A4.3.3) Width. The minimum clear width of an accessible route shall be 36 inches (915 mm) except at doors (see subsection (m)5 and 6). If a person in a wheelchair must make a turn around an obstruction, the minimum clear width of the accessible route shall be as shown in Fig. 7.

4. (A4.3.4) Passing Space. If an accessible route has less than 60 inches (1525 mm) clear width, then passing spaces at least 60 inches by 60 inches (1525 mm by 1525 mm) shall be located at reasonable intervals not to exceed 200 feet (61 m). A T-intersection of 2 corridors or walks is an acceptable passing place.

5. (A4.3.5) Head Room. Accessible routes shall comply with subsection (d)2 below.

6. (A4.3.6) Surface Texture. The surface of an accessible route shall comply with subsection (e) below.

7. (A4.3.7) Slope. An accessible route with a running slope greater than 1:20 is a ramp and shall comply with subsection (h) below. Nowhere shall the cross slope of an accessible route exceed 1:50.

8. (A4.3.8) Changes in Level. Changes in level along an accessible route shall comply with subsection (e)2 below. If an accessible route has changes in level greater than ½ inch (13 mm), then a curb ramp, ramp elevator or elevator or platform lift approved by the Department shall be provided that complies with subsections (g), (h), (j) or (k), respectively. Stairs steps or escalators shall not be part of an accessible route.

9. (A4.3.9) Doors. Doors along an accessible route shall comply with subsection (m) below.

10. (A4.3.10) Egress. In buildings or portions of buildings required to be accessible, accessible means of egress shall be provided in the same number as required for exits by Chapter 33. When an exit required by Chapter 33 is not accessible, an area for rescue assistance shall be provided.

Areas for rescue assistance shall comply with the requirements of this code and shall adjoin an accessible route of travel.
**EXCEPTION:** An area of rescue assistance shall not be required with any one of the following conditions:

1. Buildings other than high rise buildings, with an automatic sprinkler system throughout.
2. An exit is provided through a horizontal exit complying with Section 3308.
3. Existing buildings that are altered without a change of occupancy.

11. **Areas of Rescue Assistance.**
   
   A. **(A4.3.11.1) Location and Construction.** An area of rescue assistance shall be one of the following:
   
   (i) A portion of a stairway landing within a pressurized enclosure complying with Section 1807 (b) Stairway pressurization.

   (ii) A portion of an exterior exit balcony located immediately adjacent to an exit stairway when the exterior balcony complies with Section 3305. Openings to the interior of the building located within 20 feet of the area for rescue assistance shall be protected with fire assemblies having a three-fourths hour fire protection rating.

   (iii) A portion of a one-hour fire-resistive corridor, complying with Section 3305 (g) and (h), located immediately adjacent to an exit enclosure.

   (iv) A vestibule located immediately adjacent to an exit enclosure and constructed to the same fire-resistive standards as required by Section 3305 (g) and (h).

   (v) A portion of a stairway landing for an exterior stair.

   (vi) When approved by the building official, an area or a room which is separated from other portions of the building by a smoke barrier. Smoke barriers shall have a fire-resistant rating of not less than one hour and shall completely enclose the area or room. Doors in the smoke barrier shall be tight-fitting smoke- and draft-control assemblies having a fire-protection rating of not less than 20 minutes and shall be self-closing or automatic closing. The area or room shall be provided with an exit directly to an exit enclosure. Where the room or area exits into an exit enclosure which is required to be of more than one-hour fire-resistive construction, the room or area shall have the same fire-resistive construction, including the same opening protection, as required for the adjacent exit enclosure.
(vii) An elevator lobby complying with Section 1807 (b).

B. (A4.3.11.2) Size and Number. The size of each area of rescue assistance shall provide at least two accessible spaces, each space being not less than 30" x 48". See Table 31-D for additional maneuvering clearances. The area of rescue assistance shall not encroach on any required exit width.

The total number of such 30 inch by 48 inch (760 mm by 1220 mm) spaces per story shall be not less than one for every 200 persons of calculated occupant load served by the area of rescue assistance.

EXCEPTION: The department may reduce the minimum number of 30-inch by 48-inch (760 mm by 1220 mm) spaces to one for each area of rescue assistance on floors where the occupant load is less than 200.

C. (A4.3.11.3) Stairway Width. Each stairway adjacent to an area of rescue assistance shall have a minimum clear width of 48 inches between handrails.

D. (A4.3.11.4) Two-way Communication. A method of two-way communication, with both visible and audible signals, shall be provided between each area of rescue assistance and the primary entry. The fire department or department may approve a location other than the primary entry.

E. (A4.3.11.5) Identification. Each area of rescue assistance shall be identified by a sign which states "AREA OF RESCUE ASSISTANCE" and displays the international symbol of accessibility. The sign shall be illuminated when exit sign illumination required. Signage shall also be installed at all inaccessible exits to clearly indicate the direction to areas of rescue assistance. In each area of rescue assistance, instructions on the use of the area under emergency conditions shall be posted adjoining the two-way communication system.

(d) (A4.4) Protruding Objects.

1. (A4.4.1*) General. Objects projecting from walls with their leading edges between 27 inches and 80 inches (685 mm and 2030 mm) above the finished floor shall protrude no more than 4 inches (100 mm) into halls, corridors, passageways or aisles (see Fig. 8(a)). Objects mounted with their leading edges at or below 27 inches (685 mm) above the finished floor may protrude any amount (see Fig. 8(a) and (b)). Free-standing objects mounted on posts or pylons may overhang 12 inches (305 mm) maximum from 27 inches to 80 inches (685 mm to 2030 mm) above the ground or finished floor (see Fig. 8(c) and (d)).
Protruding objects shall not reduce the clear width of an accessible route or maneuvering space (see Fig. 8(e)).

2. (A4.4.2) Head Room. Halls, corridors, passageways, aisles or other circulation spaces shall have 80 inches (2030 mm) minimum clear head room (see Fig. 8(a)).

(e) (A4.5) Ground and Floor Surfaces.

1. (A4.5.1*) General. Ground and floor surfaces along accessible routes and in accessible rooms and spaces, including floors, walks, ramps, stairs and curb ramps, shall be stable, firm and relatively non-slip under all weather conditions and shall comply with this subsection (e).

2. (A4.5.2) Changes in Level. Changes in level up to ¼ inch (6 mm) may be vertical and without edge treatment. Changes in level between ¼ and ½ inches (6 mm and 13 mm) shall be leveled with a slope no greater than 1:2. Changes in level greater than ½ inch (13 mm) shall be accomplished by means of a ramp that complies with (h).

3. (A4.5.3*) Carpet. If carpet or carpet tile is used on a ground or floor surface, it shall be securely attached, have a firm cushion, pad or backing or no cushion or pad, and have a level loop, textured loop, level cut pile or level cut/uncut pile texture. The maximum pile height shall be ½ inch (13 mm). Exposed edges of carpet should be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with subsection (e)2.

4. (A4.5.4) Gratings. If gratings are located in walking surfaces, they shall have spaces no greater than ½ inch (13 mm) wide in one direction. If gratings have elongated openings, they shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

(f) (A4.6) Reserved.

(g) (A4.7) Reserved.

(h) (A4.8) Ramps.

1. (A4.8.1*) General. Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with this subsection (h).

2. (A4.8.2*) Slope and Rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp shall be 1:12. The maximum rise for any ramp run shall be 30 inches (760 mm).

EXCEPTION: For existing conditions where there are physical restraints to a ramp with a maximum slope of 1:12 than a maximum slope of 1:8 may be used.
3. **(A4.8.3) Clear Width.** The minimum clear width of a ramp shall be 36 inches (915mm).

4. **(A4.8.4) Landings.** Ramps shall have level landings at the bottom and top of each run. Landings shall have the following features:

   A. The landing shall be at least as wide as the widest ramp run leading to it.
   
   B. The landing shall be a minimum of 60 inches (1525 mm) clear.
   
   C. If ramps change in direction at a landing, a minimum level run from each ramp of 60 inches (1525 mm) shall be provided not less than the width of the ramp.
   
   D. If a doorway is located at a landing, then the area in front of the doorway shall comply with subsection (m)6 below.

5. **(A4.8.5*) Handrails.** If a ramp has a rise greater than 6 inches (250 mm) or a horizontal projection greater than 72 inches (1830 mm), it shall have handrails on both sides; if less than a 6-inch rise, one handrail is required per Section 3307(e). Handrails shall comply with subsection (z)2 below and shall have the following features:

   A. Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback or dogleg ramps shall always be continuous.
   
   B. If handrails are not continuous, they shall extend at least 12 inches (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface.
   
   C. The clear space between the handrail and the wall shall be 1 ½ inches (38mm).
   
   D. Gripping surfaces shall be uninterrupted by other construction elements or obstructions.
   
   E. Handrail heights shall comply with Chapter 33.
   
   F. Ends of handrails shall be either rounded or returned smoothly to floor, wall, or post.
   
   G. Handrails shall not rotate within their fittings.

6. **(A4.8.6) Cross Slope and Surfaces.** The cross slope of ramp surfaces shall be no greater than 1:50. Ramp surfaces shall comply with subsection (e) above.

7. **(A4.8.7) Edge Protection.** Ramps and landings with drop-offs shall have curbs, walls, railings or projecting surfaces that prevent people from slipping off the ramp. Curbs shall be a minimum of 2 inches (50mm) high (see Fig. 9).
8. **(A4.8.8) Outdoor Conditions.** Outdoor ramps and their approaches shall be designed so that water will not accumulate on walking surfaces.

   (i) **(A4.9) Stairs.**

   1. **(A4.9.1) Minimum Number.** Stairs connecting levels not connected by an elevator shall comply with this subsection (i). These specifications are not mandatory for stairs within dwelling units.

   2. **(A4.9.2) Treads and Risers.** On any given flight of stairs, all steps shall have uniform riser heights and uniform tread widths. Stair treads shall be no less than 11 in (280 mm) wide, measured from riser to riser (see Fig. 18(a)). Open risers are not permitted.

   3. **(A4.9.3) Nosings.** The undersides of nosings shall not be abrupt. The radius of curvature at the leading edge of the tread shall be no greater than ½ inch (13mm). The riser shall be sloped or the underside of the nosing shall have an angle not less than 60° from the horizontal.

      Nosings shall project no more than 1½ inches (38mm) (See Fig. 10).

   4. **(A4.9.4) Handrails.** Stairways shall have handrails at both sides of all stairs. Handrails shall comply with subsection (z) below and shall have the following features:

      A. Handrails shall be continuous along both sides of stairs. The inside handrail on switchback of dogleg stairs shall always be continuous (see Fig. 11(a) and (b)).

      B. If handrails are not continuous, they shall extend at least 12 inches (305mm) beyond the top riser and at least 12 inches (305mm) plus the width of one tread beyond the bottom riser. At the top, the extension shall be parallel with the floor or ground surface. At the bottom, the handrail shall continue to slope for a distance of the width of one tread from the bottom riser; the remainder of the extension shall be horizontal (see Fig. 11(c) and (d)). Handrail extensions shall comply with subsection (d) above.

      C. The clear space between the handrail and the wall shall be 1½ inches (38mm).

      D. Gripping surfaces shall be uninterrupted by other construction elements or obstructions.

   5. **(A4.9.5) Reserved.**

   6. **(A4.9.6) Outdoor Conditions.** Outdoor stairs and their approaches shall be designed so that water will not accumulate on walking surfaces.
(j) Elevators.

1. General. Accessible elevators shall be on an accessible route and shall comply with 4.10 and with the ASME A17.1-1990, Safety Code for Elevators and Escalators. Freight elevators shall not be considered as meeting the requirements of this section unless the only elevators provided are used as combination passenger and freight elevators for the public and employees.

2. Automatic Operations. Elevator operation shall be automatic. Each car shall be equipped with a self-leveling feature that will automatically bring the car to floor landings within a tolerance of ½ inch (13mm) under rated loading to zero loading conditions. This self-leveling feature shall be automatic and independent of the operating device and shall correct for overtravel and undertravel.

3. Hall Call Buttons. Call buttons in elevator lobbies and halls shall be centered at 42 inches (1065mm) above the floor. Such call buttons shall have visual signals to indicate when each call is registered and when each call is answered. Call buttons shall be a minimum of ¾ inches (19mm) in the smallest dimensions. The button designating the up direction shall be on top (see Fig. 12).

4. Hall Lanterns. A visible and audible signal shall be provided at each hoistway entrance to indicate which car is answering a call. Audible signals shall sound once for the up direction and twice for the down direction, or shall have verbal annunciators that say "up" or "down". Visible signals shall have the following features:

   A. Hall lantern fixtures shall be mounted so that their centerline is at least 72 inches (1830mm) above the lobby floor.
   B. Visual elements shall be at least 2½ inches (64mm) in the smallest dimension.
   C. Signals shall be visible from the vicinity of the hall call button.

In-car lanterns located in cars, visible from the vicinity of hall call buttons and conforming to the above requirements, shall be acceptable. (see Fig. 12).

5. Raised Characters on Hoistway Entrances. All elevator hoistway entrances shall have raised floor designations provided on both jambs. The centerline of the characters shall be 60 inches (1525mm) from the floor. Such characters shall be 2 inches (50mm) high and shall comply with subsection (dd) below. Permanently applied plates are acceptable if they are permanently fixed to the jambs. (see Fig. 12).
6. **(A4.10.6) Door Protective and Reopening Device.** Elevator doors shall open and close automatically. They shall be provided with a reopening device that will stop and reopen a car door and hoistway door automatically if the door becomes obstructed by an object or person. The device shall be capable of completing these operations without requiring contact for an obstruction passing through the opening at heights of 5 inches and 29 inches (125mm and 735mm) from the floor (see Fig. 12). Door reopening devices shall remain effective for at least 20 seconds. After such an interval, doors may close in accordance with the requirements of ANSI A17.1. See Chapter 51.

7. **(A4.10.7*) Door and Signal Timing for Hall Calls.** The minimum acceptable time from notifications that a car is answering a call until the doors of that car start to close shall be calculated from the following equation: where \( T \) = total time in seconds and \( D \) = distance (in feet or millimeters) from a point in the lobby or corridor 60 inches (1525mm) directly in front of the farthest call button controlling that car to the centerline of its hoistway door (see Fig. 13). For cars with in-car lanterns, \( T \) begins when the lantern is visible from the vicinity of hall call buttons and an audible signal is sounded.

8. **(A4.10.8) Door Delay for Car Calls.** The minimum time for elevator doors to remain fully open in response to a car call shall be 3 seconds.

9. **(A4.10.9) Floor Plan of Elevator Cars.** The floor area of elevator cars shall provide space for wheelchair users to enter the car, maneuver within reach of controls, and exit from the car. Acceptable door opening and inside dimensions shall be as shown in Fig. 14. The clearance between the car platform sill and the edge of any hoistway landing shall be no greater than 1¼ inches (32mm).

10. **(A4.10.10) Floor Surfaces.** Floor coverings shall comply with subsection (e) above.

11. **(A4.10.11) Illumination Levels.** The level of illumination at the car controls, platform and car threshold and landing sill shall be at least 5 footcandles (53.8 lux).

12. **(A4.10.12*) Car Controls.** Elevator control panels shall have the following features:

   A. **Buttons.** All control buttons shall be at least ¾ inch (19mm) in their smallest dimension. They may be raised or flush.

   B. **Tactile and Visual Control Indicators.** All control buttons shall be designated by raised standard alphabet characters for letters, Arabic characters for numerals or standard symbols as shown in Fig. 15(a) and as required in
ANSI A17.1. See Chapter 55. Raised characters and symbols shall comply with subsection (dd) below. The call button for the main entry floor shall be designated by a raised star at the left of the floor designation (see Fig. 15(a)). All raised designations for control buttons shall be placed immediately to the left of the button to which they apply. Applied plates, permanently attached, are an acceptable means to provide raised control designations. Floor buttons shall be provided with visual indicators to show when each call is registered. The visual indicators shall be extinguished when each call is answered.

C. Height. All floor buttons shall be no higher than 54 inches (1370 mm) above the floor for side approach and 48" for front approach. Emergency controls, including the emergency alarm and emergency stop, shall be grouped at the bottom of the panel and shall have their centerlines no less than 35 inches (890mm) above the floor (see Fig. 15(a) and (b)).

D. Location. Controls shall be located on a front wall if cars have center opening doors, and at the side wall or at the front wall next to the door if cars have side opening doors (see Fig. 15(c) and (d)).

13. (A4.10.13*) Car Position Indicators. In elevator cars, a visual car position indicator shall be provided above the car control panel or over the door to show the position of the elevator in the hoistway. As the car passes or stops at a floor served by the elevators, the corresponding numeral shall illuminate and an audible signal shall sound. Numerals shall be a minimum of ½ inch (13mm) high. The audible signal shall be no less than 20 decibels with a frequency no higher than 1500 Hz. An automatic verbal announcement of the floor number at which a car stops or which a car passes may be substituted for an audible signal.

14. (A4.10.14*) Emergency Communications. If provided, emergency 2-way communication systems between the elevator and a point outside the hoistway shall comply with ANSI A17.1. See Chapter 55. The highest operable part of a 2-way communication system shall be a maximum of 54 inches (1370mm) from the floor of the car. It shall be identified by raised symbol and lettering complying with subsection (dd) below and located adjacent to the device. If the system uses a handset, then the length of the cord from the panel to the handset shall be at least 20 inches (735mm).

15. Evacuation Plans. All elevators will have an emergency evacuation plan posted at the elevator call buttons indicating the location of handicapped refuge areas. Stairwells which have
wheelchair refuge areas shall have signage to indicate the refuge area.

(k) (A4.11) Reserved.

(l) (A4.12) Reserved.

(m) (A4.13) Doors.

1. (A4.13.1) General. All doors to accessible spaces and elements and along accessible routes shall comply with the requirements of this subsection (m).

2. (A4.13.2) Revolving Doors and Turnstiles. Revolving doors or turnstiles shall not be the only means of passage at an accessible entrance or along an accessible route.

3. (A4.13.3) Gates. Gates, including ticket gates, shall meet all applicable specifications of this subsection (m).

4. (A4.13.4) Double-Leaf Doorways. If doorways have two door leaves, then at least one leaf shall meet the specifications in subsections (m)5 and (m)6. That leaf shall be an active leaf.

5. (A4.13.5) Clear Width. Doorways shall have a minimum clear opening of 32 inches (315mm) with the door open 90° measured between the face of the door and the stop (see Fig. 16(a), (b), (c) and (d)), except that 32 inches (815mm) nominal doors with offset hinges may be installed in dwelling units. Openings more than 24 inches (610mm) in depth shall comply with subsections (b)1 and (c)3 above (see Fig. 16(e)).

6. (A4.13.6) Maneuvering Clearances at Doors. Except in dwelling units, minimum maneuvering clearances for doors that are not automatic shall be as shown in Fig. 17. The floor or ground area within the required clearances shall be level and clear. Entry doors to acute care hospital bedrooms for inpatients shall be exempt from the requirement for space at the latch side of the door (see dimension "x" in Fig. 17) if the door is at least 44 inches (1120mm) wide.

7. (A4.13.7) Two Doors in Series. The minimum space between two hinged or pivoted doors in series shall be 48 inches (1220mm) plus the width of any door swinging into the space. Doors in series shall swing either in the same direction or away from the space between the doors (see Fig. 18). This requirement may be reduced to 60 inches (1525mm) between the doors when there is a 24-inch (610mm) offset on the latch side of the door.

8. (A4.13.8*) Thresholds at Doorways. Thresholds at doorways shall not exceed ¾ inch (19mm) in height for exterior sliding doors or ¼ inch (13mm) for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be leveled with a slope no greater than 1:2 (see subsection (e)2).
9. **(A4.13.9*) Door Hardware.** Handles, pulls, latches, locks and other operating devices on accessible doors in corridors and public areas shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching or twisting of the wrist to operate. Lever-type mechanisms with a return, push-type mechanisms and U-shaped handles are acceptable designs. When sliding doors are fully open, operating hardware shall be exposed and usable from both sides. In dwelling units, only doors at accessible entrances to the unit itself will be made adaptable for the handicapped. Doors to hazardous areas shall have hardware complying with subsection (cc)3 below.

10. **(A4.13.10*) Door Closers.** If a door has a closer, then the sweep period of the closer shall be adjusted so that from an open position of 70° the door will take at least 3 seconds to move to a point 3 inches (75mm) from the latch, measured to the leading edge of the door.

11. **(A4.13.11*) Door Opening Force.** The maximum force for pushing or pulling open a door shall be as follows:

   A. Fire rate doors have minimum opening force required to maintain the latching operations.

   B. Doors that are part of a pressurized system shall not exceed a maximum opening force as required to maintain the design pressure.

   C. (1) exterior hinged doors: 8.5 lbf (37.8N)

      (2) interior hinged doors: 5 lbf (22.2N)

      (3) sliding or folding doors: 5 lbf (22.2N)

   These forces do not apply to the force required to retract latch bolts or disengage other devices that may hold the door in a closed position.

12. **(A4.13.12*) Automatic Doors and Power-Assisted Doors.** If an automatic door is used, then it shall comply with American National Standard for Power Operated Doors, ANSI A156.10-1985. Slowly opening, low-powered, automatic doors shall be considered a type of custom design installation as described in paragraph 1.1.1 of ANSI A156.10-1984. Such doors shall not open to back check faster than 3 seconds and shall require no more than 15 lbf (66.6N) to stop door movement. If a power-assisted door is used, its door-opening force shall comply with subsection (m)11 above and its closing shall conform to the requirements in Section 10 of ANSI A156.10-1984.

   (n) **(A4.14) Entrances.**

   1. **(A4.14.1) Minimum Number.** The principal entrance to a building or facility shall be part of an accessible route and shall comply with subsection (c) above. They shall also be connected
by an accessible route to all accessible spaces or elements within the building or facility.

2. (A4.14.2) Service Entrances. A service entrance shall not be the sole accessible entrance unless it is the only entrance to a building or facility (for example, in a factory or garage).

(c) (A4.15) Drinking Fountains and Water Coolers.

1. (A4.15.1) Minimum Number. Minimum accessible plumbing facilities to be provided may vary with occupant load and use, but in no case shall be less than the number specified in Table No. 64-A.

2. (A4.15.2) Spout Height. In new construction spouts shall be no higher than 36 inches (915mm), measured from the floor or ground surfaces to the spout outlet (see Fig. 19(a)). In renovation construction, drinking cups may be provided when spout height adjustment is not practicable.

3. (A4.15.3) Spout Location. The spouts of drinking fountains and water coolers shall direct the water flow in a trajectory that is parallel or nearly parallel to the front of the unit. The spout shall provide a flow of water at least 4 inches (100mm) high so as to allow the insertion of a cup or glass under the flow of water.

4. (A4.15.4) Controls. Controls shall comply with subsection (aa)4 below.

5. (A4.15.5) Clearances.

   A. Wall and post mounted cantilevered units shall have a clear knee space between the bottom of the apron and the floor ground at least 27 inches (685mm) high, 30 inches (760mm) wide and 17 inches to 19 inches (430mm to 485mm) deep (see Fig. 19(a) and (b)). Such units shall also have a minimum clear floor space 30 inches by 48 inches (760mm by 1220mm) to allow a person in a wheelchair to approach the unit facing forward.

   B. Free-standing or built-in units not having a clear space under them shall have a clear floor space at least 30 inches by 48 inches (760mm by 1220mm) that allows a person in a wheelchair to make a parallel approach to the unit (see Fig. 19(c) and (d)). This clear floor space shall comply with subsection (b)4 above.

(p) (A4.16) Water Closets.

1. (A4.16.1) General. Accessible water closets shall comply with (p). For water closets in adaptable dwelling units, see subsection (hh)7 below.

2. (A4.16.2) Clear Floor Space. Clear floor space for water closets not in stalls shall comply with Fig. 20. Clear floor space
may be arranged to allow either a left-handed or right-handed approach.

3. **(A4.16.3*) Height.** The height of water closets shall be 17 inches to 19 inches (430mm to 485mm) measured to the top of the toilet seat (see Fig. 21).

4. **(A4.16.4*) Grab Bars.** Grab bars for water closets not located in stalls shall comply with Fig. 21 and with subsection (z) below.

5. **(A4.16.5*) Flush Controls.** Flush controls shall be hand operated and shall comply with subsection (aa)4 below. Controls for flush valves shall be mounted on the wide side of toilet areas no more than 44 inches (1120mm) above the floor.

6. **(A4.16.6) Dispensers.** Toilet paper dispensers shall be installed within reach, as shown in Fig. 21(b).

(q) **(A4.17) Toilet Stalls.**

1. **(A4.17.1) Location.** Accessible toilet stalls shall be on an accessible route and shall meet the requirements of this subsection (q). Clearance for entry into the stall shall conform to Fig. 17.

2. **(A4.17.2) Water Closets.** Water closets in stalls shall comply with subsection (p) above.

3. **(A4.17.3) Size and Arrangement.** The size and arrangement of toilet stalls shall comply with Fig. 22(a) in new construction. The size and arrangement of toilet stalls shall comply with either Fig. 22(a) or (b) in renovation or remodel construction. The width dimension of the toilet stall shown in Fig 22(b) shall be the absolute dimension of 36 inches (915mm). Toilet stalls with a minimum depth of 56 inches (1420mm) (See Fig. 22(a)) or 66 inches (1675mm) (see Fig. 22(b)) shall have wall-mounted water closets. If the depth of toilet stalls is increased at least 3 inches (75mm), a floor-mounted water closet may be used. Arrangements shown for stalls may be reversed to allow either a left- or right-hand approach.

4. **(A4.17.4) Toe Clearances.** In standard stalls, the front partition and at least one side partition shall provide a toe clearance of at least 9 inches (230mm) above the floor. If the depth of the stall is greater than 60 inches (1525mm), then the toe clearance is not required.

5. **(A4.17.5*) Doors.** Toilet stall doors shall comply with subsection (m) above.

6. **(A4.17.6) Grab Bars.** Grab bars complying with the length and positioning shown in Fig 22(a), (b), (c) and (d) shall be provided. Grab bars may be mounted by any desired method as long as they have a gripping surface at the locations shown and
do not obstruct the required floor area. Grab bars shall comply with subsection (z) below.

(r) **(A4.18) Urinals.**

1. *(A4.18.1) General.* Accessible urinals shall comply with this subsection (r). When only one urinal is provided, the urinal does not have to meet the provisions of subsection (r) when an accessible water closet is located in the same room.

2. *(A4.18.2) Height.* Urinals shall have an elongated rim of at least 14 inches and mounted at a maximum of 17 inches (430mm) above the floor.

3. *(A4.18.3) Clear Floor Space.* A clear floor space 30 inches by 48 inches (760mm by 1220mm) shall be provided in front of urinals to allow forward approach. This clear space shall adjoin or overlap an accessible route and shall comply with subsection (b)4 above.

4. *(A4.18.4) Flush Controls.* Flush controls shall be hand-operated, shall comply with subsection (aa)4 below and shall be mounted no more than 44 inches (1120mm) above the floor.

(s) **(A4.19) Lavatories and Mirrors.**

1. *(A4.19.1) General.* The requirements of this subsection (s) shall apply to lavatory fixtures, vanities and built-in lavatories.

2. *(A4.19.2) Height and Clearances.* Lavatories shall be mounted with a clearance of at least 29 inches (735mm) from the floor to the bottom of the apron. Knee and toe clearance shall comply with Fig. 23.

3. *(A4.19.3) Clear Floor Space.* A clear floor space 30 inches by 48 inches (760mm by 1220mm) complying with subsection (b)4 above shall be provided in front of a lavatory to allow a forward approach. Such clear floor space shall adjoin or overlap an accessible route and shall extend a maximum of 19 inches (485mm) underneath the lavatory (see Fig. 24).

4. *(A4.19.4) Exposed Pipes and Surfaces.* Hot water and drain pipes under lavatories shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under lavatories.

5. *(A4.19.5) Faucets.* Faucets shall comply with subsection (aa)4 below. Lever-operated, push-type and electronically controlled mechanisms are examples of acceptable designs. Self-closing valves are allowed if the faucet remains open for at least 10 seconds.

6. *(A4.19.6*) **Mirrors.* Mirrors shall be mounted with the bottom edge no higher than 40 inches (1015mm) from the floor (see Fig. 23).
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(f) (A4.20) Bathtubs.

1. (A4.20.1) General. Accessible bathtubs shall comply with this subsection (f). For bathtubs in adaptable dwelling units, see subsection (hh)9 below.

2. (A4.20.2) Floor Space. Clear floor space in front of bathtubs shall be as shown in Fig. 25.

3. (A4.20.3) Seat. An in-tub seat or a seat at the head end of the tub shall be provided as shown in Fig. 25 and 26. The structural strength of seats and their attachments shall comply with subsection (z)3 below. Seats shall be mounted securely and shall not slip during use.

4. (A4.20.4) Grab Bars. Grab bars complying with subsection (z) below shall be provided as shown in Fig. 25 and 26.

5. (A4.20.5) Controls. Faucets and other controls complying with (aa)4 shall be located as shown in Fig. 26.

6. (A4.20.6) Shower Unit. A shower spray unit with a hose at least 60 inches (1525mm) long that can be used as a fixed shower head or as a hand-held shower shall be provided.

7. (A4.20.7) Bathtub Endosures. If provided, enclosures for bathtubs shall not obstruct controls or transfer from wheelchairs onto bathtub seats or into tubs. Enclosures on bathtubs shall not have tracks mounted on their runs.

(u) (A4.21) Shower Stalls.

1. (A4.21.1*) General. Accessible shower stalls shall comply with (u). For shower stalls in adaptable dwelling units, see subsection (hh)10 below.

2. (A4.21.2) Size and Clearances. Shower stall size and clear floor space shall comply with Fig. 27(a) or (b). The shower stall in Fig. 27(a) shall be 36 inches by 36 inches (915mm). The shower stall in Fig. 27(b) shall fit into the space required for a bathtub.

3. (A4.21.3) Seat. A seat shall be provided in a shower stall 36 inches by 36 inches (915mm by 915mm) and shall be as shown in Fig. 28. The seat shall be mounted 17 inches to 19 inches (430mm to 485mm) from the bathroom floor and shall extend the full depth of the stall. The seat shall be on the wall opposite the controls. The structural strength of seats and their attachments shall comply with subsection (z)3 below.

4. (A4.21.4) Grab Bars. Grab bars complying with subsection (z) below shall be provided as shown in Fig. 29.

5. (A4.21.5) Controls. Faucets and other controls complying with subsection (aa)4 below shall be located as shown in Fig. 29. In shower stalls 36 inches by 36 inches (915mm by
915mm), all controls, faucets and the shower unit shall be mounted on the side wall opposite the seat.

6. (A4.21.6) Shower Unit. A shower spray unit with a hose at least 60 inches (1525mm) long that can be used as a fixed shower head or as a hand-held shower shall be provided.

7. (A4.21.7) Curbs. If provided, curbs in shower stalls 36 inches by 36 inches (915mm by 915mm) shall be no higher than 4 inches (100mm). Shower stalls that are 30 inches by 60 inches (760mm by 1525mm) shall not have curbs.

8. (A4.21.8) Shower Enclosures. If provided, enclosures for shower stalls shall not obstruct controls or obstruct transfer from wheelchairs onto shower seats.

(v) (A4.22) Toilet Rooms.

1. (A4.22.1) Minimum Number. Minimum accessible plumbing facilities to be provided may vary with occupant load and use, but in no case shall be less than the number specified in Table No. 64-A.

2. (A4.22.2) Doors. All doors to accessible toilet rooms shall comply with subsection (m) above. Doors shall not swing into the clear floor space required for any fixture.

3. (A4.22.3) Clear Floor Space. The accessible fixtures and controls required in subsections (v)4, (v)5, (v)6 and (v)7 shall be on an accessible route. An unobstructed turning space complying with subsection (b)3 shall be provided within an accessible toilet room. The clear floor spaces at fixtures and controls, the accessible route and the turning space may overlap.

4. (A4.22.4) Water Closets. If toilet stalls are provided, then a reasonable number, but always at least one, shall comply with subsection (q) above, and its water closet shall comply with subsection (p) above. If water closets are not in stalls, then a reasonable number, but always at least one, of water closets shall comply with subsection (p) above.

5. (A4.22.5) Urinals. If urinals are provided, a reasonable number, but always at least one, shall comply with subsection (r) above.

6. (A4.22.6) Lavatories and Mirrors. If lavatories and mirrors are provided, a reasonable number, but always at least one of each, shall comply with subsection (s) above.

7. (A4.22.7) Controls and Dispensers. If controls, dispensers, receptacles or other equipment is provided, at least one of each shall be on an accessible route and shall comply with subsection (aa) below.

(w) (A4.23) Bathrooms, Bathing Facilities and Shower Rooms.
1. **(A4.23.1) Minimum Number.** Minimum accessible plumbing facilities to be provided may vary with occupant load and use, but in no case shall be less than the number specified in Table No. 64-A.

2. **(A4.23.2) Doors.** Doors to accessible bathrooms shall comply with subsection (m) above. Doors shall not swing into the floor space required for any fixture.

3. **(A4.23.3) Clear Floor Space.** The accessible fixtures and controls required in subsections (w)4, (w)5, (w)6, (w)7, (w)8 and (w)9 shall be on an accessible route. An unobstructed turning space complying with subsection (b)3 above shall be provided within an accessible bathroom. The clear floor spaces at fixtures and controls, the accessible route and the turning space may overlap.

4. **(A4.23.4) Water Closets.** If toilet stalls are provided, then a reasonable number, but always at least one, shall comply with subsection (q) above, and its water closet shall comply with subsection (p) above. If water closets are not in stalls, then a reasonable number, but always at least one, shall comply with subsection (p) above.

5. **(A4.23.5) Urinals.** If urinals are provided, then a reasonable number, but always at least one, shall comply with subsection (r) above.

6. **(A4.23.6) Lavatories and Mirrors.** If lavatories and mirrors are provided, then a reasonable number, but always at least one of each, shall comply with subsection (s) above.

7. **(A4.23.7) Controls and Dispensers.** If controls, dispensers, receptacles or other equipment is provided, at least one of each shall be on an accessible route and shall comply with subsection (aa) below.

8. **(A4.23.8) Bathing and Shower Facilities.** If tubs or showers are provided, then at least one accessible tub that complies with subsection (t) above or at least one accessible shower that complies with subsection (u) above shall be provided.

9. **(A4.23.9*) Medicine Cabinets.** If medicine cabinets are provided, at least one shall be located with a usable shelf no higher than 44 inches (1120mm) above the floor space. The floor space shall comply with subsection (b)4 above.

10. **(x) (A4.24) Sinks.**

1. **(A4.24.1) General.** If accessible sinks are provided, they shall comply with this subsection (x). Sinks in kitchens of accessible dwelling units shall comply with subsection (hh)18 below.

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2. **(A4.24.2) Height.** Sinks shall be mounted with the center or rim no higher than 34 inches (865mm) from the floor.

3. **(A4.24.3) Knee Clearance.** Knee clearance that is 27 inches (685mm) high, 30 inches (760mm) wide and 19 inches (485mm) deep shall be provided underneath sinks.

4. **(A4.24.4) Depth.** Each sink shall be a maximum of 6½ inches (165mm) deep.

5. **(A4.24.5) Clear Floor Space.** A clear floor space at least 30 inches by 48 inches (760mm by 1220mm) complying with subsection (b)4 above shall be provided in front of a sink to allow forward approach. The clear floor space shall be on an accessible route and shall extend a maximum of 19 inches (485mm) underneath the sink (see Fig. 24).

6. **(A4.24.6) Exposed Pipes and Surfaces.** Hot water and drain pipes under sinks shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under sinks.

7. **(A4.24.7) Faucets.** Faucets shall comply with subsection (aa)4 below. Lever-operated, push-type, touch-type, or electronically controlled mechanisms are acceptable designs.

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(y) **(A4.25) Storage.**

1. **(A4.25.1) General.** If provided, accessible storage facilities such as cabinets, shelves, closets and drawers shall comply with this subsection (y).

2. **(A4.25.2) Clear Floor Space.** A clear floor space at least 30 inches by 48 inches (760mm by 1220mm) complying with subsection (b)4 above that allows either a forward or parallel approach by a person using a wheelchair shall be provided at accessible storage facilities.

3. **(A4.25.3) Height.** Accessible storage spaces shall be within at least one of the reach ranges specified in subsection (b)5 above and subsection (b)6 above. Clothes rods shall be a maximum of 54 inches (1370mm) from the floor (see Fig. 30).

4. **(A4.25.4) Hardware.** Hardware for accessible storage facilities shall comply with subsection (aa)4 below. Touch latches and U-shaped pulls are acceptable.

(z) **(A4.26) Handrails, Grab Bars and Tub and Shower Seats.**

1. **(A4.26.1*) General.** All handrails, grab bars and tub and shower seats shall comply with this subsection (z).

2. **(A4.26.2*) Size and Spacing of Grab Bars and Handrails.** The diameter or width of the gripping surface of a handrail or grab bar shall be 1¼ to 1½ inches (32mm to 38mm) or the shape shall provide an equivalent gripping surface. If handrails or grab bars are mounted adjacent to a wall, the space
between the wall and the handrail or grab bar shall be 1½ inches (38mm) (see Fig. 31(a), (b) and (c)). Handrails may be located in a recess if the recess is a maximum of 3 inches (75mm) deep and extends at least 18 inches (455mm) above the top of the rail (See Fig. 31(d)).

3. **(A4.26.3) Structural Strength.** The structural strength of grab bars, tub and shower seats, fasteners and mounting devices shall meet the following specifications:

   A. Bending stress in a grab bar or seat induced by the maximum bending moment from the application of 250 lbf (1112N) shall be less than the allowable stress for the material of the grab bar or seat.

   B. Shear stress induced in a grab bar or seat by the application of 250 lbf (1112N) shall be less than the allowable shear stress for the material of the grab bars or seat. If the connection between the grab bar or seat and its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses shall be totaled for the combined shear stress, which shall not exceed the allowable shear stress.

   C. Shear force induced in a fastener or mounting device from the application of 250 lbf (1112N) shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.

   D. Tensile force induced in a fastener by a direct tension force of 250 lbf (1112N) plus the maximum moment from the application of 250 lbf (1112N) shall be less than the allowable withdrawal load between the fastener and the supporting structure.

   E. Grab bars shall not rotate within their fittings.

4. **(A4.26.4) Eliminating Hazards.** A handrail or grab bar and any wall or other surface adjacent to it shall be free of any sharp or abrasive elements. Edges shall have a minimum radius of 1/8 inch (3.2mm).

   (aa) **(A4.27) Controls and Operating Mechanisms.**

   1. **(A4.27.1) General.** Controls and operating mechanisms in accessible spaces, along accessible routes, or as part of accessible elements (for example, light switches, dispenser controls) shall comply with this subsection (aa).

   2. **(A4.27.2) Clear Floor Space.** Clear floor space complying with subsection (b)4 above that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles and other operable equipment.
3. **(A4.27.3) Height.** The highest operable part of all controls, dispensers, receptacles and other operable equipment shall be placed within at least one of the reach ranges specified in subsections (b)5 and (b)6 above. Except where the use of special equipment dictates otherwise, electrical and communications system receptacles on walls shall be mounted no less than 15 inches (380mm) above the floor.

4. **(A4.27.4) Operation.** Controls and operating mechanisms, except in Group H-3 occupancies, shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2N).

   (bb) **(A4.28) Alarms.**

   1. **(A4.28.1) General.** If emergency warning systems are provided, they shall include both audible alarms complying with this subsection (bb)2 and visual alarms complying with this subsection (bb)3. In facilities with sleeping accommodations, the sleeping accommodations shall have an auxiliary visual alarm system complying with this subsection (bb)4.

   2. **(A4.28.2) Audible Alarms.** Audible alarms shall comply with the requirements of Chapter 38.

   3. **(A4.28.3) Visual Alarms.** Visual alarms shall be provided in all areas required to be accessible. Visual alarms shall conform to the requirements of Chapter 38.

   4. **(A4.28.4) Auxiliary Alarms.** Accessible sleeping accommodations shall have a visual alarm connected to the building fire alarm system conforming to the requirements of Chapter 38.

   (cc) **(A4.29) Tactile Warnings.**

   1. **(A4.29.1) Reserved.**

   2. **(A4.29.2) Reserved.**

   3. **(A4.29.3*) Tactile Warnings on Doors to Hazardous Areas.** Doors that lead to areas that might prove dangerous to a blind person (for example, doors to loading platforms, boiler rooms, stages and the like) shall be made identifiable to the touch by a textured surface on the door handle, knob, pull or other operating hardware. This textured surface may be made by knurling or roughening or by a material applied to the contact surface. Such textured surfaces shall not be provided for emergency exit doors or any doors other than those to hazardous areas.

   4. **(A4.29.4) Reserved.**

   5. **(A4.29.5) Reserved.**
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6. (A4.29.6) Reserved.
7. (A4.29.7) Reserved.

(dd) (A4.30) Signage.

1. (A4.30.1*) General. All signage that provides emergency information or general circulation directions shall comply with subsections (dd)2, (dd)3 and (dd)5. Tactile signage shall also comply with subsection (dd)4.

2. (A4.30.2) Character Proportion. Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.

3. (A4.30.3*) Color Contrast. Characters and symbols shall contrast with their background - either light characters on a dark background or dark characters on a light background.

4. (A4.30.4*) Raised Characters or Symbols. Letters and numbers on signs shall be raised 1/32 inch (0.8mm) minimum and shall be sans serif characters. Raised characters or symbols shall be at least 5/8 inch (16mm) high, but no higher than 2 inches (50mm). Characters or symbols shall have a stroke width of at least ¼ inch (6mm). Symbols or pictographs on signs shall be raised or 1/32 inch (0.8mm) minimum.

5. (A4.30.5) Symbols or Accessibility. When accessible facilities are identified, then the international symbol of accessibility shall be used. The symbol shall be displayed as shown in Fig. 32.

(ee) (A4.31) Reserved.

(ff) (A4.32) Seating, Tables and Work Surfaces.

1. (A4.32.1) Minimum Number. If fixed or built-in seating, tables or work surfaces are provided in accessible spaces, a reasonable number, but always at least one, of seating spaces, tables or work surfaces shall comply with this subsection (ff).

2. (A4.32.2) Seating. If seating spaces for people in wheelchairs are provided at tables, counters or work surfaces, clear floor spaces complying with subsection (b)4 above shall be provided. Such clear floor space shall not overlap knee space by more than 19 inches (485mm) (see Fig. 33).

3. (A4.32.3) Knee Clearances. If seating for people in wheelchairs is provided at tables, counters and work surfaces, knee spaces at least 27 inches (685mm) high, 30 inches (760mm) wide and 19 inches (485mm) deep shall be provided (see Fig. 33).

4. (A4.32.4*) Height of Work Surfaces. The tops of tables and work surfaces shall be from 28 inches to 34 inches (710mm to 865mm) from the floor or ground.

(gg) (A4.33) Assembly Areas.
1. **(A4.33.1) Minimum Number.** If assembly areas are provided, accessible viewing positions shall comply with this subsection (gg) and the following table:

<table>
<thead>
<tr>
<th>Capacity of Assembly(3)</th>
<th>Number of Viewing Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 25</td>
<td>1</td>
</tr>
<tr>
<td>26 to 50</td>
<td>2</td>
</tr>
<tr>
<td>51 to 75</td>
<td>3</td>
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<tr>
<td>76 to 100</td>
<td>4</td>
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<tr>
<td>401 to 500</td>
<td>9</td>
</tr>
<tr>
<td>501 to 1000</td>
<td>(1)</td>
</tr>
<tr>
<td>Over 1000</td>
<td>(2)</td>
</tr>
</tbody>
</table>

(1) 2 percent of total
(2) 20 plus 1 for each 100 over 1000.

Assembly areas with audio-amplification systems shall have a listening system complying with subsections (gg)6 and (gg)7 to assist a reasonable number of people, but no fewer than two, with severe hearing loss in the appreciation of audio presentations.

(3) When there are multiple assembly areas in one facility (e.g. multiple theaters), accessible seating shall be provided in every assembly area proportional to the capacity of assembly.

2. **(A4.33.2*) Size of Wheelchair Locations.** Each wheelchair location shall provide minimum clear ground or floor spaces as shown in Fig. 34 and shall accommodate 2 people in wheelchairs.

3. **(A4.33.3*) Placement of Wheelchair Locations.** Wheelchair areas shall be an integral part of any fixed seating plan and shall be dispersed throughout the seating area. They shall adjoin an accessible route that also serves as a means of egress in case of emergency and shall be located to provide lines of sight comparable to those for all viewing areas.

4. **(A4.33.4) Surfaces.** The ground or floor at wheelchair locations shall be level and comply with subsection (e) above.

5. **(A4.33.5) Access to Performing Areas.** An accessible route shall connect wheelchair seating locations with performing areas, including stages, arena floors, dressing rooms, locker rooms and other spaces used by performers.
6. *(A4.33.6*) Placement of Listening Systems. If the listening system provided serves individual fixed seats, then such seats shall be located within a 50-foot (15m) viewing distance of the stage or playing area and shall have a complete view of the stage or playing area.

7. *(A4.33.7*) Types of Listening Systems. Audio loops and radio frequency systems are 2 acceptable types of listening systems.

*(hh) (A4.34) Dwelling Units.*

1. *(A4.34.1) General.* In Group R Division 1 and 2, Occupancies consisting of 8 or more units, one unit of the first 8 units and one unit for each 7 units thereafter shall comply with the requirements of Section 6402(hh) for accessible housing.

**EXCEPTION:** Group R-2 Occupancies where all sleeping facilities are on the second floor.

2. *(A4.34.2*) Minimum Requirements. An accessible dwelling unit shall be on an accessible route. An accessible dwelling unit shall have the following accessible elements and spaces as a minimum:

   A. Common spaces and facilities serving individual accessible dwelling units (for example, entry walks, trash disposal facilities and mail boxes) shall comply with subsections (b) through (gg).

   B. Accessible spaces shall have maneuvering space complying with subsections (b)2 and (b)3 and surfaces complying with subsection (e).

   C. At least one accessible route complying with subsection (c) shall connect the accessible entrances with all accessible spaces and elements within dwelling units.

   D. Reserved.

   E. Reserved.

   F. Doors to and in accessible spaces that are intended for passage shall comply with subsection (m).

   G. A reasonable number, but always at least one, of accessible entrances to the dwelling unit shall comply with subsection (n).

   H. Storage in accessible spaces in dwelling units, including cabinets, shelves, closets and drawers shall comply with subsection (y).

   I. All controls in accessible spaces except in R-2 occupancies shall comply with subsection (aa). Those portions of heating, ventilating and air-conditioning equipment requiring regular, periodic maintenance and adjustment by the
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resident of a dwelling shall be accessible to people in wheelchairs. If air distribution registers must be placed in or close to ceilings for proper air circulation, this specification shall not apply to the registers.

J. If emergency alarms are provided, a reasonable number, but always at least one, of alarm connections complying with subsection (bb)4 shall be provided in the dwelling unit.

K. Reserved.

L. A reasonable number, but always at least one, of full bathrooms shall comply with (hh)5. A full bathroom shall include a water closet, a lavatory and a bathtub or a shower.

M. The kitchen shall comply with subsection (hh)23.

N. If laundry facilities are provided, they shall comply with subsection (hh)24.

O. The following spaces shall be accessible and shall be on an accessible route:

(i) The living area, including kitchen.
(ii) The dining area.
(iii) The sleeping area, or the bedroom in one-bedroom dwelling units, or one bedroom in dwelling units with 2 or more bedrooms.
(iv) Balconies, carports and garages, if provided with the dwelling unit. Grade level entry while not required is preferred and can be achieved with wood earth separation in conformance with Chapter 25 of this Code through construction of a foundation wall with a reverse ledge designed to provide bearing for wood framing with concrete at least 3 inches (78mm) in thickness separating the wood from the earth.

3. (A4.34.3) Adaptability. Consumer information required by subsection (hh)4 shall be provided with each filing for a building permit for apartment and townhouse buildings. The specifications of subsections (hh)5 and (hh)13 as modified by this Chapter are based on the concept of adaptability.

4. (A4.34.4) Consumer Information. To ensure that the existence of adaptable features will be known to the owner or occupant of a dwelling, the following consumer information shall be provided in each accessible dwelling unit for rent or sale:

A. Reserved.
B. Reserved.
C. Reserved.
D. Reserved.
E. Notification that the dwelling unit has been designed in accordance with American National Standard Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People, ANSI A117.1-1980.

In addition, the renters and buyers of accessible dwelling units shall be provided with the following information:

(i) Reserved.
(ii) Reserved.
(iii) Reserved.
(iv) Reserved.
(v) Reserved.

5. (A4.34.5*) Adaptable Bathrooms. Adaptable bathrooms shall be on an accessible route and shall comply with the requirements of subsections (hh)5 - 12.

6. (A4.34.5.1) Doors. Doors may swing into the clear floor space required for any fixture, but shall not encroach into the required clear space when opened 90° or more.

7. (A4.34.5.2) Water Closets.
   A. Clear floor space at the water closet shall be as shown in Fig. 35(a). The water closet may be located with the clear area at either the right or left side of the toilet.
   B. The height of the water closet shall be at least 15 inches (380mm) measured to the top of the toilet seat.
   C. Structural reinforcement or other provisions that will allow installation of grab bars shall be provided in the locations shown in Fig. 35(b). If provided, grab bars shall be installed as shown in Fig. 21 and shall comply with subsection (z).
   D. The toilet paper dispenser shall be installed within reach as shown in Fig. 35(b).

8. (A4.34.5.3) Lavatory, Mirrors and Medicine Cabinets.
   A. The lavatory and mirrors shall comply with subsection (s).
   B. If a cabinet is provided under the lavatory, then it shall be removable to provide the clearances specified in subsection (s)2.
   C. If a medicine cabinet is provided above the lavatory, then the bottom of the medicine cabinet shall be located with a usable shelf no higher than 44 inches (1120mm) above the floor.

9. (A4.34.5.4) Bathtubs. If a bathtub is provided, then it shall have the following features:
A. Floor Space. Clear floor space at bathtubs shall be as shown in Fig. 25.

B. Reserved.

C. Grab Bars. Structural reinforcement or other provisions that will allow installation of grab bars shall be provided in the locations shown in Fig. 36. If provided, grab bars shall be installed as shown in Fig. 26 and shall comply with subsection (z).

D. Controls. Faucets and other controls shall be located as shown in Fig. 26 and shall comply with subsection (aa)4.

E. Shower Unit. A shower spray unit with a hose at least 60 inches (1525mm) long that can be used as a fixed shower head or as a hand-held shower shall be provided. In Group R-1 and R-2 Occupancies if only a tub is provided, it must comply with this requirement; if both a tub and a shower are provided, one must comply with this requirement.

10. (A4.34.5.5) Showers. If a shower is provided, it shall have the following features:

A. Size and Clearances. Shower stall size and clear floor space shall comply with either Fig. 27(a) or (b). The shower stall in Fig. 27(a) shall be 36 inches by 36 inches (915mm by 915mm). The shower stall in Fig. 27(b) will fit into the same space as a standard 60 inches (1525mm) long bathtub.

B. Seat. A seat shall be provided in the shower stall in Fig. 27(a) as shown in Fig. 28. The seat shall be 17 inches to 19 inches (430mm to 485mm) high measured from the bathroom floor and shall extend the full depth of the stall. The seat shall be on the wall opposite the controls. The structural strength of seats and their attachments shall comply with (z)3. Seats shall be mounted securely and shall not slip during use.

C. Grab Bars. Structural reinforcement or other provisions that will allow installation of grab bars shall be provided in the locations shown in Fig. 37. If provided, grab bars shall be installed as shown in Fig. 29 and shall comply with subsection (z).

D. Controls. Faucets and other controls shall be located as shown in Fig. 29 and shall comply with subsection (aa)4. In the shower stall in Fig. 27(a), all controls, faucets and the shower unit shall be mounted on the side wall opposite the seat.

E. Shower Unit. A shower spray unit with a hose at least 60 inches (1525mm) long that can be used as a fixed
shower head or as a hand-held shower shall be provided. In Group R-1 and R-2 Occupancies if only a shower is provided, it must comply with this requirement; if both a tub and a shower are provided, one must comply with this requirement.

11. (A4.34.5.6) Bathtub and Shower Enclosures. Enclosures for bathtubs or shower stalls shall not obstruct controls or transfer from wheelchairs onto shower or bathtub seats. Enclosures on bathtubs shall not have tracks mounted on their rims.

12. (A4.34.5.7) Clear Floor Space. Clear floor space at fixtures may overlap.

13. (A4.34.6) Adaptable Kitchens. Kitchens and their components shall be on an accessible route and shall comply with the requirements of subsections (hh)13 - 22.

14. (A4.34.6.1*) Clearance. Clearances between all opposing base cabinets, counter tops, appliances or walls shall be 40 inches (1015mm) minimum, except in U-shaped kitchens, where such clearance shall be 60 inches (1525mm) minimum.

15. (A4.34.6.2) Clear Floor Space. A clear floor space at least 30 inches by 48 inches (760mm by 1220mm) complying with subsection (b)5 that allows either a forward or a parallel approach by a person in a wheelchair shall be provided at all appliances in the kitchen, including the range or cooktop, oven refrigerator/freezer, dishwasher and trash compactor. Laundry equipment located in the kitchen shall comply with subsection (hh)24.

16. (A4.34.6.3) Controls. All controls in kitchen shall comply with subsection (aa).

17. (A4.34.6.4) Work Surfaces. At least one 30-inch (760mm) section of counter shall provide a work surface that complies with the following: (See Fig. 38)

   A. The counter shall be adjustable or replaceable as a unit.

   B. Base cabinets, if provided, shall be removable under the full 30 inches (760mm) minimum frontage of the counter. The finished floor shall extend under the counter to the wall.

   C. Counter thickness and supporting structure shall be 2 inches (50mm) maximum over the required clear area.

   D. A clear floor space 30 inches by 48 inches (760mm by 1220mm) shall allow a forward approach to the counter. Nineteen inches (485mm) maximum of the clear floor space may extend underneath the counter. The knee space shall have a minimum clear width of 30 inches (760mm) and a
minimum clear depth of 19 inches (485mm). This may be accomplished by the use of a removable front panel.

E. There shall be no sharp or abrasive surfaces under such counters.

18. (A4.34.6.5*) Sink. The sink and surrounding counter shall comply with the following requirements (see Fig. 39):

A. The total width of the sink and counter area shall be 30 inches (760mm) minimum. Initial installation may include standard base-cabinetry and a 36-inch (915mm) high countertop.

B. Rough-in plumbing shall be located to accept connections of supply and drain pipes for sinks mounted at the height of 28 inches (710mm).

C. The depth of a sink bowl shall be no greater than 6½ inches (165mm).

D. Faucets shall comply with subsection (aa)4. Lever-operated or push-type mechanisms are 2 acceptable designs.

E. Base cabinets, if provided, shall be removable under the full 30 inches (760mm) minimum frontage of the sink and surrounding counter. The finished flooring shall extend under the counter to the wall.

F. Upon adaptation, counter thickness and supporting structure shall be 2 inches (50mm) maximum over the required clear space.

G. A clear floor space 30 inches by 48 inches (760mm by 1220mm) shall allow forward approach to the sink. Nineteen inches (485mm) maximum of the clear floor space may extend underneath the sink. The knee space shall have a minimum clear width of 30 inches (760mm) and a clear depth of 19 inches (485mm).

H. There shall be no sharp or abrasive surfaces under sinks. Hot water and drain pipes under sinks shall be insulated or otherwise covered.

I. If garbage disposal units are provided, at least one sink bowl shall be accessible per paragraph (3).

19. (A4.34.6.6*) Ranges and Cooktops. Ranges and cooktops shall comply with subsections (hh)15 and (hh)16. If ovens or cooktops have knee spaces underneath, then they shall be insulated or otherwise protected on the exposed contact surfaces to prevent burns, abrasions or electrical shock. The clear floor space may overlap the knee space, if provided, by 19 inches (485mm) maximum. The location of controls for ranges and cooktops shall not require reaching across burners.
20. (A4.34.6.7*) Ovens. Ovens shall be of the self-cleaning type and be located adjacent to an adjustable height counter with knee space below (see Fig. 40). For side-opening ovens, the door latch side shall be next to the open counter space, and there shall be a pull-out shelf under the oven extending the full width of the oven and pulling out not less than 20 inches (255mm) when fully extended. Ovens shall have controls on front panels. They may be located on either side of the door.

21. (A4.34.6.8*) Refrigerators/Freezers. Refrigerators and freezers shall comply with this subsection (hh)21. Refrigerators shall be:

A. Of the vertical side-by-side refrigerator/freezer type; or

B. Of the over-and-under type and meet the following requirements:

   (i) Have at least 50% of the freezer space below 54 inches (1370mm) above the floor.

   (ii) Have 100% of the refrigerator space and controls below 54 inches (1370mm). Freezers with less than 100% of the storage volume within the limits specified in subsections (b)5 or (b)6 shall be the self-defrosting type.

22. (A4.34.6.9) Dishwashers. Dishwashers shall comply with subsections (hh)15 and (hh)16. Dishwashers shall have all rack space accessible from the front of the machine for loading and unloading dishes.

23. (A4.34.6.10*) Kitchen Storage. Cabinets, drawers and shelf storage areas shall be adaptable to comply with subsection (y) and shall have the following features:

A. Maximum height shall be 48 inches (1220mm) for at least one shelf of one cabinet or storage shelf (see Fig. 38).

B. Door pulls or handles for wall cabinets shall be mounted as close to the top of cabinet doors as possible.

24. (A4.34.7) Laundry Facilities. If laundry equipment is provided within individual accessible dwelling units, or if separate laundry facilities serve one or more accessible dwelling units, then they shall meet the requirements of subsections (hh)25 through (hh)27.

25. (A4.34.7.1) Location. Laundry facilities and laundry equipment shall be on an accessible route.

26. (A4.34.7.2) Washing Machines and Clothes Dryers. Washing machines and clothes dryers in common use laundry rooms shall be front loading.
27. (A4.34.7.3) Controls. Laundry equipment shall comply with subsection (aa).

STANDARDS

Sec. 3104. Unless provided for in other Sections of this Building Code, the following Standards shall apply.

ORGANIZATION | TITLE OF PUBLICATION
--- | ---
ANSI | Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People. ANSI A117.1-1986

Pedestrian Doors, Power Operated. ANSI A 156.10-1979

LEGEND

ORGANIZATION

ANSI | American National Standards Institute, Inc.
1430 Broadway
New York, NY 10018
### TABLE 31-A

**FIXTURES REQUIRED TO BE ACCESSIBLE TO THE DISABLED PERSON**

<table>
<thead>
<tr>
<th>WATER CLOSETS</th>
<th>MALE URINALS</th>
<th>LAVATORIES</th>
<th>DRINKING FOUNTAINS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
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<td>15 W.C.</td>
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<td>every 10</td>
<td>1st</td>
<td>1st</td>
<td>every 8</td>
</tr>
<tr>
<td>W.C.</td>
<td></td>
<td></td>
<td>W.C.</td>
</tr>
<tr>
<td>thereafter</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SECTION 3105

SECTION 3105. TABLES AND ILLUSTRATIONS.

TABLE 31-B
GRAPHIC CONVENTIONS

Graphic Conventions

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 760</td>
<td>Typical dimension line showing U.S. customary units (in inches) above the line and S.I. units (in millimeters) below</td>
</tr>
<tr>
<td>9 120</td>
<td>Dimensions for short distances indicated on extended line</td>
</tr>
<tr>
<td>9 30 120 760</td>
<td>Dimension line showing alternate dimensions required</td>
</tr>
<tr>
<td>max</td>
<td>Maximum</td>
</tr>
<tr>
<td>min</td>
<td>Minimum</td>
</tr>
<tr>
<td></td>
<td>Boundary of clear floor area</td>
</tr>
<tr>
<td></td>
<td>Centerline</td>
</tr>
</tbody>
</table>

TABLE 31-C
ALLOWABLE RAMP DIMENSIONS

Allowable Ramp Dimensions for Construction in Existing Sites, Buildings and Facilities

<table>
<thead>
<tr>
<th>Slope*</th>
<th>Maximum Rise</th>
<th>Minimum Run</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in</td>
<td>mm</td>
</tr>
<tr>
<td>Steeper than 1:12 but no steeper than 1:8</td>
<td>30</td>
<td>750</td>
</tr>
</tbody>
</table>

*A slope steeper than 1:8 not allowed.
TABLE 31-D
FIGURES
(Note: All numbers in parentheses refer to the ANSI A117.1 - 1986 Standard.)

Fig. 1
Minimum Clear Width for Single Wheelchair

Fig. 2
Minimum Clear Width for Two Wheelchairs

(a)
60-in (1525-mm) Diameter Space

Fig. (3)
Wheelchair Turning Space

(b)
T-Shaped Space for 180° Turns
TABLE 31-D (Continued)

Fig. (4)
Minimum Clear Floor Space for Wheelchairs

(a) Clear Floor Space

(b) Forward Approach

(c) Parallel Approach

(d) Clear Floor Space in Alcoves

(e) Additional Maneuvering Clearances for Alcoves

NOTE: If \( x > 24 \text{ in (610 mm)} \), then an additional maneuvering clearance of 6 in (150 mm) shall be provided as shown.

NOTE: If \( x > 15 \text{ in (380 mm)} \), then an additional maneuvering clearance of 12 in (305 mm) shall be provided as shown.
### TABLE 31-D (Continued)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>1220</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
- When \( x \) shall be \(<25\text{ in (635 mm)}\), \( x \) shall be \(\geq x\).
- When \( x \) is 20 to 25 in (510 to 635 mm), then \( y \) shall be 48 in (1220 mm) maximum.
- When \( x \) is 20 to 25 in (510 to 635 mm), then \( y \) shall be 40 in (1020 mm) maximum.

### (b)
**Maximum Forward Reach over an Obstruction**

**Fig. (5)**

**Forward Reach**
TABLE 31-D (Continued)

(a) Clear Floor Space
Parallel Approach

(b) High and Low
Side Reach Limits

(c) Maximum Side Reach
over Obstruction

Fig. (6)
Side Reach
NOTE: Dimensions shown apply when x < 48 in (1220 mm).

(b) Turns around an Obstruction

Fig. (7)

Width of Accessible Route
TABLE 31-D (Continued)

(a) Walking Parallel to a Wall

(b) Walking Perpendicular to a Wall

Fig. (8)
Protruding Objects
TABLE 31-D (Continued)

(c) Free-Standing Overhanging Objects

this overhang can be greater than 12 (305) because no one can approach the object from this direction

(d) Objects Mounted on Posts or Pylons

(e) Example of Protection around Wall-Mounted Objects and Measurements of Clear Widths

Fig. (8)
Protruding Objects (Continued)
TABLE 31-D (Continued)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Elevation Diagram" /></td>
<td><img src="image2" alt="Section Diagram" /></td>
</tr>
<tr>
<td><img src="image3" alt="Elevation Diagram" /></td>
<td><img src="image4" alt="Section Diagram" /></td>
</tr>
<tr>
<td><img src="image5" alt="Elevation Diagram" /></td>
<td><img src="image6" alt="Section Diagram" /></td>
</tr>
<tr>
<td><img src="image7" alt="Elevation Diagram" /></td>
<td><img src="image8" alt="Section Diagram" /></td>
</tr>
</tbody>
</table>

Fig. 9 (17)
Examples of Edge Protection and Handrail Extensions
TABLE 31-D (Continued)

(a) Flush Riser

(b) Angled Nosing

(c) Rounded Nosing

Fig. 10 (18)
Usable Tread Width and Examples of Acceptable Nosings

Fig. 11 (19)
Stair Handrails
TABLE 31-D (Continued)

(c) Extension at Bottom of Run

(d) Extension at Top of Run

Fig. 11 (19)
Stair Handrails (continued)

NOTE: The automatic door reopening device is activated if an object passes through either line A or line B. Line A and line B represent the vertical locations of the door reopening device not requiring contact.

Fig. 12 (20)
Hoistway and Elevator Entrances
NOTE: Elevator cars with a minimum width less than that above but no less than 54 in (1370 mm) are allowed for elevators with capacities of less than 2000 lb. A center opening door application may necessitate increasing the 68-in (1730-mm) dimension.
TABLE 31-D (Continued)

<table>
<thead>
<tr>
<th>Numeral height</th>
<th>3/4</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>control diameter</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>7</th>
<th>8</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>X</strong></td>
<td></td>
</tr>
<tr>
<td>main entry floor</td>
<td>door closed</td>
<td>door open</td>
<td>emergency alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>emergency stop</td>
</tr>
</tbody>
</table>

octagon symbol shall be factual, but the X is not

Panel Detail

Control Height

(c) Alternate Locations of Panel with Center Opening Door

(d) Alternate Locations of Panel with Side Opening Door

Fig. 15 (23)
Car Controls
TABLE 31-D (Continued)

<table>
<thead>
<tr>
<th>Detail</th>
<th>32 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Detail</td>
<td>32 min</td>
</tr>
<tr>
<td>(b) Hinged Door</td>
<td>32 min</td>
</tr>
<tr>
<td>(c) Sliding Door</td>
<td>32 min</td>
</tr>
<tr>
<td>(d) Folding Door</td>
<td>32 min</td>
</tr>
</tbody>
</table>

Fig. 16 (24)
Clear Doorway Width and Depth

Maximum Doorway Depth
TABLE 31-D (Continued)

(a) Front Approaches - Swinging Doors

NOTE: \( x = 12 \text{ in} (306 \text{ mm}) \) if door has both a closer and latch.

(b) Hinge Side Approaches - Swinging Doors

NOTE: \( X = 36 \text{ in} (915 \text{ mm}) \) minimum if \( Y = 60 \text{ in} (1525 \text{ mm}) \); \( X = 42 \text{ in} (1065 \text{ mm}) \) minimum if \( Y = 54 \text{ in} (1370 \text{ mm}) \).

(c) Latch Side Approach - Swinging Doors

NOTE: \( Y = 48 \text{ in} (1220 \text{ mm}) \) minimum if door has closer.

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

Fig. 17 (25)
Maneuvering Clearances at Doors
TABLE 31-D (Continued)

(d) Front Approach - Sliding Doors

(e) Slide Side Approach - Sliding Doors

(f) Latch Side Approach - Sliding Doors

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

Fig. 17 (25)
Maneuvering Clearances at Doors (Continued)

Fig. 18 (26)
Two Hinged Doors in Series
### TABLE 31-D (Continued)

#### (a) Spout Height and Knee Clearance

- Height: 48 min
- Clear Floor Space: 17-19
- Knee Clearance: 760

#### (b) Clear Floor Space

- Spout Height: 48 min
- Clear Floor Space: 17-19
- Knee Clearance: 760

#### (c) Free-Standing Fountain or Cooler

- Spout Height: 48 min
- Clear Floor Space: 760

#### (d) Built-In Fountain or Cooler

- Spout Height: 48 min
- Clear Floor Space: 760

---

**Fig. 19 (27)**

Drinking Fountains and Water Coolers
TABLE 31-D (Continued)

Fig. 20 (28)
Clear Floor Space at Water Closets

Fig. 21 (29)
Grab Bars at Water Closets
TABLE 31-D (Continued)

(a) Standard Stall

(b) Alternative Stall

Fig. 22 (30)
Toilet Stalls
TABLE 31-D (Continued)

Smallest Acceptable Toilet Room Sizes
Alternate Design
Fig. 22 (30)
Toilet Stalls (Continued)
TABLE 31-D (Continued)

(c) Rear Wall of Standard Stall

(d) Side Walls

Smallest Acceptable Toilet Room Sizes
Alternate Design

Fig. 22 (30)
Toilet Stalls (Continued)
TABLE 31-D (Continued)

<table>
<thead>
<tr>
<th>6 max</th>
<th>toe clearance</th>
<th>knee clearance</th>
<th>8 min</th>
<th>205</th>
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</thead>
</table>

Fig. 23 (31)
Lavatory Clearances

Fig. 24 (32)
Clear Floor Space at Lavatories
TABLE 31-D (Continued)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td>Shower controls</td>
</tr>
<tr>
<td>▼</td>
<td>Shower head</td>
</tr>
<tr>
<td>△</td>
<td>Drain</td>
</tr>
</tbody>
</table>

(a) With Seat in Tub

(b) With Seat at Head of Tub

Fig. 25 (33)
Clear Floor Space at Bathtubs
TABLE 31-D (Continued)

(a) With Seat in Tub

(b) With Seat at Head of Tub

Fig. 26 (34)
Grab Bars at Bathtubs
TABLE 31-D (Continued)

(a) 36-in by 36-in (915-mm by 915-mm) Stall

(b) 30-in by 60-in (760-mm by 1525-mm) Stall

Fig. 27 (35)
Shower Size and Clearances

Fig. 28 (36)
Shower Seat Design
TABLE 31-D (Continued)

(a) 36-in by 36-in (915-mm by 915-mm) Stall

(b) 30-in by 60-in (760-mm by 1525-mm) Stall

Fig. 29 (37)
Grab Bars at Shower Stalls
TABLE 31-D (Continued)

Fig. 30 (38)
Storage Shelves and Closets

Fig. 31 (39)
Size and Spacing of Handrails and Grab Bars
Size and Spacing of Handrails and Grab Bars (Continued)
TABLE 31-D (Continued)

(a) Proportions

(b) Display Conditions

Fig. 32 (43)
International Symbol of Accessibility
TABLE 31-D (Continued)

(a) Forward or Rear Access

(b) Side Access

Fig. 34 (46)
Space Requirements for Wheelchair Seating Spaces in Series
TABLE 31-D (Continued)

(a) Clear Floor Space for Adaptable Bathrooms

(b) Reinforced Areas for Installation of Grab Bars

Fig. 35 (47)
Water Closets in Adaptable Bathrooms
TABLE 31-D (Continued)

(a) With Seat in Tub

(b) With Seat at Head of Tub

NOTE: The hatched areas are reinforced to receive grab bars.

Fig. 36 (48)
Location of Grab Bars and Controls of Adaptable Bathtubs
### TABLE 31-D (Continued)

<table>
<thead>
<tr>
<th>Section 3105</th>
</tr>
</thead>
</table>

#### (a)

<table>
<thead>
<tr>
<th>36-in by 36-in (915-mm by 915-mm) Stall</th>
</tr>
</thead>
</table>

#### (b)

<table>
<thead>
<tr>
<th>30-in by 60-in (750-mm by 1525-mm) Stall</th>
</tr>
</thead>
</table>

**NOTE:** The hatched areas are reinforced to receive grab bars.

**Fig. 37 (49)**

Location of Grab Bars and Controls of Adaptable Showers
TABLE 31-D (Continued)

(a)
Before Removal of Cabinets and Base

(b)
Cabinets and Base Removed and Height Alternatives

Fig. 38 (50)
Counter Work Surface
TABLE 31-D (Continued)

(a) Before Removal of Cabinets and Base

Fig. 39 (51)
Kitchen Sink

(b) Cabinets and Base Removed and Height Alternatives

Fig. 40 (52)
Ovens without Self-Cleaning Feature

SYMBOL KEY:
1. Countertop or wall-mounted oven.
2. Pull-out board preferred with side-opening door.
3. Clear open space.
4. Bottom-hinged door.
SECTION 3105

Fig. 41
Sample Signs For Buildings With Limited Access
Section 3201

Section 3201 (b) is amended:

I. UBC Standard No. 32-13, Modified Bitumen, Thermoplastic and Thermoset membranes shall apply to all roofing membrane in this category installed after January 1, 1994. In the interim period materials with both Underwriters Laboratory and Factory Mutual listings for installation will be acceptable without compliance to the UBC standard.

Section 3205 (c) is amended by deleting:

"Where determined necessary by the building official due to atmospheric or climatic conditions." The rest of the section is to remain.

Section 3207 is amended:

ROOF DRAINAGE

Sec. 3207.

(a) General. Roof systems shall be sloped a minimum of ¼ inch in 12 inches for drainage. (See Section 2305(f).) All roofs shall be provided with drains or gutters and downspouts sufficient to drain the roof.

EXCEPTION: Enclosed or open balconies.

(b) Roof Drains. Except when roofs are sloped to drain to the roof perimeter, interior drains shall be installed and shall be sized to convey the water to the storm drainage system. See the Plumbing Code.

(c) Flashing. 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 two 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 two plies of Type 15 felt.

4. Drain details for single-ply systems shall be installed per the manufacturer's currently published details for the specific single-ply system.

(d) Overflow Drains, Scuppers, and Downspouts.
Where roof drains are required, overflow drains (1 per roof drain) shall be installed with the inlet flow line located 2" above the low point of the roof. In lieu of overflow drains, overflow scuppers having 3 times the capacity of the roof drains shall be installed in adjacent parapet walls. The scupper drain inlet flow line shall be 2" above the low point of the adjacent roof and have a minimum opening height of 2". No overflow drains or scuppers are required if the maximum water depth cannot exceed 2".

EXCEPTION: If greater water detention is required, overflow drains and scuppers may extend beyond 2" height provided that roof loading calculations are submitted and approved by the Department. See Chapter 23.

Overflow drains shall be connected to leader piping after the first 90° offset serving a roof drain or shall be taken independently down through the building and discharged on grade or into storm sewer. When overflow drains and roof drains are combined into single piping system, all connection to that system must be offset 90° from the vertical prior to connection.

(e) Concealed Piping. Roof drains and overflow drains when concealed within the construction of the building shall be installed in accordance with the Plumbing Code.

(f) Discharge Water. Water shall not be discharged from any conductor pipes onto any sidewalk, but shall be conducted underneath the walk to the gutter or street.

(g) Gutters and Downspouts.
   1. Gutters shall be installed so that the line of the slope of the roof intersects the inside face of the gutter. Gutters shall slope to drain.
   2. Hangers shall be the same material as the gutters and installed level with the gutter.
   3. Maximum spacing of hangers shall be as follows:
      - Stainless steel gutter: 60 inches on centers.
      - Galvanized steel gutters: 36 inches on centers.
      - Copper, aluminum, or zinc-copper alloy gutters: 24 inches on centers.
   4. Gutters shall be anchored to the roof deck.
   5. All joints within the gutter trough shall be soldered or riveted and sealed with an approved sealant.
   6. Gutter backs shall extend beneath roof covering a minimum of one inch, or be provided with a drip edge one inch beneath the roof covering and extending down a minimum of 2 inches into the gutter trough.

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Sec. 3207

7. Downspouts shall be anchored to the building by supporting straps not more than 8 feet on centers and be of the same material as the gutter.

8. Downspouts shall be installed at the rate of one 2" x 3" per 750 square feet of roof surface drained. All other sizes are to be installed based on the 100 year storm for Denver and the Uniform Plumbing Code.

9. All roof drains shall discharge away from any building or structure. Where it is necessary, concrete blocks at least 12 inches in width and 36 inches in length or permanently attached or hinged metal downspout extensions, 36 inches long, shall be used.

Section 3208(b)3 is amended:

3. Asphalt Shingles. Asphalt shingles shall be fastened according to manufacturer's instructions and Table No. 32-B-1. All asphalt shingle systems shall be sealed to the starter course with a compatible shingle cement or a manufacturer recommended starter strip. The shingle cement must attach all parts of each individual shingle with a minimum of three six inch long cement strips. Adjacent shingles shall butt to each other and not overlap in any fashion unless called for by the manufacturer.

Section 3208(b)10 is amended:

10. Wood Shakes. Shakes shall comply with UBC Standard No. 32-8 and shall be installed in accordance with Table No. 32-B-2. Ridge shakes shall alternate the overlap joint between wood pieces across the entire length and be fastened to the roof with fasteners of sufficient length to penetrate ¾ inch into the roof sheathing. All ridge shakes shall have a six inch wide number 30 felt underlayment over the field shake.

Section 3208(c)1A is amended by adding to the second paragraph:

Asphalt shingles shall be sealed with a compatible cement along all metal valleys except when excluded by the manufacturer. All metal valleys are required to be open 4 inches at the top expanding 1/8 inch per foot of valley length to the bottom.

Section 3209 is added:

FLASHING

Sec. 3209.

(a) 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. A minimum of one ply of finishing felt shall be used, but shall not be less than the manufacturer's flashing recommendations.

   EXCEPTION: For Group R-3 and M Occupancies, the flashing shall be equivalent to the type of roofing being installed.

3. 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.

4. The top edges of the flashing shall be fastened at 3-inch intervals and sealed with plastic cement.

5. End laps shall be at least 3 inches long, nailed vertically and covered with 4 inches of felt embedded in plastic cement.

6. The entire base of the flashing shall be covered with a coating of the applicable surfacing materials in accordance with the manufacturer's specifications.

7. The top edges of all felts and roofing shall be given a coating of approved plastic cement upon completion of the nailing requirements.

8. On smooth-surfaced roofs, the bottom edge of the flashing extending out onto the roof shall be covered with a 4-inch strip of manufacturers recommended felt.

9. All vertical walls and projections shall be counterflashed with a 2-piece metal system installed watertight.

10. Nailer strips shall be provided on vertical walls, drips in edge and curbs which will not accept conventional nailing.

    (b) Flashing - New Single-Ply Roof Coverings.

1. All flashing details for new single-ply roofing systems shall be installed per the manufacturer's currently published details for that system.

2. Installation of special flashing details may be approved by the manufacturer for unusual site conditions if covered by a manufacturer issued warranty.

    (c) **Vertical Surfaces.** Flashing shall be provided wherever vertical surfaces meet a roof, and shall be constructed as follows:

1. On new construction, when the roofs are of slate, wood or asphalt shingles, a metal base flashing and metal counterflashing of at least 26-gauge galvanized sheet metal. Similar corrosion-resistant metal of equal thickness could be substituted for either the base or counter flashing material.

2. Base flashing of the step type shall be installed between each course of material.
3. Under clay or concrete shingles, a metal base flashing and counterflashing shall be installed on all roofs.

4. Where the new roof is installed over an existing composition shingle roof, all pipes and vertical projections shall be flashed with plastic cement.

5. A saddle or cricket shall be installed on the upper side of all projections 30 inches or more in width on all sloping roofs.

A. All saddles or crickets on the upper side of all projections shall be covered with galvanized metal, with soldered joints, or asphalt rolled roofing at least 18 inches wide and equivalent to the type of roofing being applied, nailed over the saddles or crickets and sealed with plastic cement.

B. Areas where saddles and crickets are not required on the upper side of projections shall be flashed with galvanized metal with a minimum width of 18 inches or asphalt-rolled roofing 18 inches wide, equivalent to the type of roofing being applied, and shall be nailed and sealed with plastic cement.

(d) **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 may be used on all penetrations when the material within the pitch pan is composed of expansive cement grout to one inch below the top edge of a pitch pan. The top one inch must be filled with a manufacturer recommended pourable sealer placed in a "crowned" condition of ½ inch above pitch pan edge. Alternates to this would be to provide 26 gauge sheet metal or manufacturer's material cap over the pitch pans.

3. Mechanical penetrations may penetrate through properly sized flashing extending twelve inches above the roof deck with a permanent drip collar around the pipe.

**Section 3210** is added:

**EQUIPMENT ON ROOFS**

Sec. 3210.

(a) **Mechanical Equipment.** Mechanical equipment placed, replaced or reset over roofing shall be supported by curbs or legs which shall be flashed to the roofing and made watertight. Mechanical equipment shall include, by way of example and not limitation, heating, cooling refrigeration, ventilating fans, blowers and similar type equipment.

(b) **Flat Roofs.** On roofs having a pitch of less than 2 inches rise in a 12 inch run, mechanical equipment shall be supported on
Sec. 3210

a platform, that shall be sheathed solid, with intermediate supports if necessary, and covered in a watertight manner with a minimum 40 pound coated felt and metal of at least 26 gauge. All seams and miter corners of the metal on the platform shall be riveted and soldered so as to be watertight. The platform shall be a minimum of 9 inches above the finished roof, or the units may be set on legs when the following is adhered to:

1. Units and ductwork in which at any point one horizontal dimension of the equipment on a roof is less than 4 feet shall have a clearance of at least 18 inches from the bottom of the unit or ductwork to the finished roof.

2. Units and ductwork in which at any point one horizontal dimension of the equipment on a roof is more than 4 feet but less than 8 feet shall have a clearance of at least 36 inches from the bottom of the unit or ductwork to the finished roof.

3. Units and ductwork in which at any point one horizontal dimension of the equipment on a roof is in excess of 8 feet shall have a clearance of at least 48 inches from the bottom of the unit or ductwork to the finished roof.

(c) Sloped Roofs. On roofs having a pitch of more than a 2-inch rise in a 12-inch run, mechanical equipment may be set on legs which provide a minimum of 11 inches clearance between the equipment frame and the finished roof.

(d) Piping and Conduits. Except where they vertically penetrate the roof, all piping or conduits shall protrude a minimum of 12 inches above the surface of the finished roof and shall be supported on metal stands installed in pitch pans no more than 10 feet between stands.

(e) Structures. Supports for signs, mansard roofs and other miscellaneous structures shall be installed in pitch pans with a minimum of 12 inches clear distance above the finished roof to the structure.

Section 3211 is added:

STAPLES

Sec. 3211. Staples shall be permitted on new installations only.
Section 3301(b) The following definitions are added:

**EXTERIOR STAIRWAY.** A stairway that is open on two adjacent sides, except for required structural columns and open-type handrails and guardrails. The adjoining open areas shall be either yards, courts or public ways; the other two sides may be enclosed by the exterior walls of the building.

**INTERIOR STAIRWAY.** Any stairway not meeting the definition of an exterior stairway. BC

**MAGNETIC LOCK.** A lock that relies totally on electromagnetic power to mate the door plate to the lock housing and is listed by an approved testing laboratory. Shear-type magnetic locks must be listed as non-binding.

**MANUAL UNLOCKING SWITCH.** A permanently wired, manually operated, raised, push-type switch, with integral time delay, which immediately and directly unlocks a door for an approved period of time.

**MOTION DETECTOR.** A device which is listed by an approved testing laboratory as a request to exit sensor under UL 294 "Access Control System Units (i.e., UL: ACVY) or other approved category.

**SCISSOR STAIRS.** Two stairways constructed within the same enclosure but completely separated from each other by appropriate fire rated construction. Scissor stairs constructed after the adoption of this code are prohibited from consideration as two separate exits.

Section 3303(a) is amended by adding Exception 7 to the fourth paragraph.

**EXCEPTION 7:** Elevator lobbies may be secured when approved by the Department.

Section 3303(c) is amended by adding exceptions 2 and 3:

**EXCEPTION 2:** Tenant Space Requirements in Existing Buildings. Group B, Division 2, Office Occupancies in buildings constructed prior to the effective date of this Code shall meet the following minimum exit requirements:

If a tenant space is altered to require additional exits, or a tenant space with two exits is altered to increase the occupant load by 15 or more; at least two exits shall be separated by a minimum of 25 feet. This 25 ft. minimum straight line separation shall be maintained for required egress paths within the tenant space whenever those egress paths accommodate an occupant load of 30 or more.
If the exit separation cannot be provided, either option (1) or (2) below can be used:

Option (1) The space shall be divided into compartments or areas serving an occupant load of less than 30. Each compartment is to be provided with a separate and direct exit to a multi-tenant corridor. The wall dividing the compartment shall be constructed as a floor to ceiling wall. If there are openings in the wall they shall be of fixed glazed panels installed in tight fitting frames or automatic closing doors activated by smoke detectors as set forth in Fire Code Standard No. 14-1.

Option (2) The tenant space shall be protected with a fire detection system in the following manner.

A. Smoke detectors shall be located within 5 feet of the tenant side of each exit door to a multi-tenant exit corridor; and

B. Smoke detectors shall be located in all enclosed storage, copy, supply or similar accessory rooms; and

C. Smoke detectors shall be located in the exit corridor within the tenant space; and

D. Smoke detectors shall be located in any room or open area in excess of 900 square feet; and

E. Audible and visual alarm devices shall be located within the detected tenant space. Visual and audible alarms may be on the same circuit. Buildings with existing audible alarms in the corridor shall only be required to locate a visual alarm on the tenant side of each tenant space exit door.

F. All detectors shall be connected to the fire alarm control panel and an annunciator at an approved Fire Department location. The fire alarm control panel shall be monitored by an approved Central Station.
Sec. 3303

G. Remote indicating lights shall be provided in detected areas as required by Chapter 38.

H. In areas where detection is required to be installed under this section, installation shall be in accordance with NFPA 72.

EXCEPTION 3: Multi-Tenant Corridor Requirements in Existing Buildings. Group B, Division 2, Office Occupancies in buildings constructed prior to the effective date of this Code shall have required egress paths through the multi-tenant corridor separated by a minimum of 25 feet along a direct line of travel within the corridor. The required separation shall be maintained to an exterior exit door, horizontal exit, exit passageway or an enclosed stairway.

If a tenant space is altered to require additional exits, or a tenant space with multiple exits is altered to increase the occupant load by 15 or more, and the 25 ft minimum separation is not maintained through the multi-tenant corridor; or the cumulative occupant load of tenant spaces with only one exit on a dead end corridor is increased, then the multi-tenant corridor shall be provided with a fire detection system installed with the following minimum requirements:

A. Multi-tenant corridors shall be smoke detected; and

B. Smoke detectors shall be located within 5 feet of the tenant side of each exit door to the multi-tenant corridor; and

C. Smoke detectors shall be installed in all accessory rooms opening onto the multi-tenant corridor such as electrical, mechanical, mail, or special equipment areas; and

D. Unless the building is fully sprinklered, rate of rise detectors shall be installed in all rest rooms and janitors closets equipped with sinks, which have doors opening into multi-tenant corridors; and

E. Audible and visual alarm devices shall be installed within each altered tenant space. Visual and audible alarms may be on separate circuits. Buildings with existing audible alarms in the corridor shall only be required to locate a visual alarm on the tenant side of each tenant space exit door.

F. All detectors shall be connected to an alarm control panel and an annunciator at an approved Fire Department location. The system shall be monitored by an approved Central Station.
G. Remote indicating lights shall be provided in detected areas as required by Chapter 38.

H. In areas where detection is required, installation shall be in accordance with NFPA 72.

Section 3304(b) is amended:

(b) Swing & Opening Force. Exit doors shall be of the pivoted or side-hinged swinging type. Exit doors shall swing in the direction of exit travel when serving any hazardous area or when serving an occupant load of 50 or more. The door shall swing to full-open position when an opening force not to exceed 30 pounds is applied to the latch side. For other door opening forces, See Chapter 31 and 57. See Section 4507 for doors swinging over public property.

Section 3304(c) is amended by adding Exception 3 to the first paragraph.

Exception 3: Building and tenant space entrances in Occupancy Groups A, B, E, H and R-Division 1 (excluding hotels) are permitted to be equipped with an access control system in accordance with the provisions below, subject to the limitation that Occupancy Groups A, B, E and H shall not be secured from the egress side by the access control system during periods in which the building is open to the general public.

An approved Magnetic Lock may be used in conjunction with an approved Motion Detector, under the following conditions:

A. Activation of any automatic fire alarm, detection or extinguishing system, if provided, will directly unlock the doors, and the doors will remain unlocked until the system has been reset.

B. Loss of building power and/or loss of power to the motion detector and/or that part of the access control system which locks the door, shall directly unlock the door.

C. Operation of the motion detector shall cause the interruption of power to the lock, independent of the access control system electronics, upon an occupant approaching the door from the inside within a six foot radius from the centerline of the egress side of the door opening (See Figure 33-1a. and 33-1b: Motion Detector Coverage).

D. An approved manual unlocking switch will be provided as an emergency door release. Activation of the manual unlocking switch shall result in the direct interruption of power to the lock, independent of the access control system electronics, and conform to the following conditions:
Sec. 3304

(i) Be located within two feet of either edge of the egress side of the door opening, in the same plane as the door;

(ii) Be located between 42 inches and 54 inches above the finished floor;

(iii) Provide for a minimum of a 30 second unlock time;

(iv) Be a minimum of 1 inch in diameter and red in color;

(v) Include the following signage: "UNLOCK DOOR" (See Figure 33-2: "Unlock Door" Signage). The sign shall be in letters not less than 1 inch high on a contrasting background. Sign background will also contrast with the manual unlocking switch. The manual unlocking switch shall be integral to the sign.

Section 3304(e) is amended:

(e) Special Egress-Control Devices. When approved by the building official, exit doors in Group B Division 2 and Group I Occupancies may be equipped with approved listed special egress-control devices of the time-delay type, provided the building is protected throughout by an approved automatic sprinkler system or an approved automatic smoke-detection system. Such devices shall conform to all of the following: (remainder of subsection to remain)

Section 3304(j) is amended:

(j) Landing at Doors. Landings shall have a width of not less than the width required by Section 3306(g) or the width of the door, whichever is greater. Doors in fully open position shall not reduce a required dimension by more than 7 inches when a landing serves an occupant load of 50 or more. Doors in any position shall not reduce the landing dimension to less than ½ its required width. Doors shall not swing into the wheelchair space required by Section 3306(g), Exception 2, and the door shall not obstruct access to the wheelchair space. Landings shall have a length measured in the direction of travel of not less than 44 inches.

EXCEPTION: In Group R, Division 2 and 3, and M Occupancies and within individual units of Group R, Division I Occupancies, such length need not exceed 36 inches.

Section 3304(m) is added:

(m) Security Doors in Stairway Enclosures. Exit doors in high-rise stairway enclosures shall comply with the other requirements.
of this Code and the following if building/floor security requires that these exit doors are to be locked:

1. All stairway doors which are required to be locked shall be locked from the stairway side only.

2. All stairway doors which are locked shall have the capability of being unlocked simultaneously upon alarm or power failure or from a manual control at the fire department response point. The system shall be designed so that if deactivated under emergency conditions as herein noted, the mechanical latching system shall still be functional.

3. A telephone or other 2-way communications system connected to an approved emergency service which operates continuously shall be provided at not more than every fifth floor when doors are locked for more than 5 consecutive floors.

4. Signage shall be provided:
   A. On all locked doors for more than 5 consecutive floors "This door is locked - Emergency Phones are located at floors ___ and ___.
   B. At all phones "Emergency Phone".
   C. On all locked doors for 5 consecutive floors or less. "This door is locked. The next open door is down to Floor ___ or up to Floor ____.
   D. Stairway identification - signage shall be provided as required by the Fire Code.

Section 3305(e) is amended by adding an Exception:

EXCEPTION: Dead end corridors in existing buildings of Group B, Division 2, Office Occupancies constructed prior to the effective date of this Code shall meet the following minimum dead end corridor requirements whenever new interior construction takes place.

1. The length of dead end corridors within an individual tenant space shall not exceed 50 feet.

2. The length of dead end corridors, in a building equipped with an automatic fire extinguishing system throughout, may be 50 feet in multi-tenant corridors and 75 feet for corridors within an individual tenant space.

Section 3305(g) Exception is amended:

EXCEPTION: 5. Corridor walls and ceilings need not be of fire-resistive construction within single-tenant office spaces.

Section 3305(g) Exception 8 is added:

EXCEPTION: 8. Corridor walls and ceilings need not be of fire resistive construction when serving a conference or
Sec. 3305 assembly room having an occupant load of less than 100 located within an individual tenant space.

Section 3305(g) Exception 9 is added:

EXCEPTION: 9. For Group B Division 2 and Group A Division 3 Occupancies, when the entire building is provided with an automatic fire extinguishing system throughout. See Section 1807 for corridors in high-rise buildings.

Section 3306(g) is amended:

(g) Landings. Every landing shall have a dimension measured in the direction of travel not less than the width of the stairway. Such dimension need not exceed 44 inches when the stair has a straight run. There shall not be more than 13 feet vertically between landings. For landings with adjoining doors, see Section 3304(j). For areas of rescue assistance, see Chapter 31.

EXCEPTION: Stairs serving an unoccupied roof are exempt from these provisions.

Section 3306(l) amend the exception to the third paragraph to read as follows:

EXCEPTION: The hatch need not be provided on pressurized stair enclosures as required in Section 1807 or on stairways that extend to the roof with an opening onto that roof.

Section 3309(a) is amended:

Sec. 3309

(a) General. Every interior stairway, ramp or escalator shall be enclosed as specified in this Section.

EXCEPTIONS:

1. In other than Groups H and I Occupancies, an enclosure need not be provided for a stairway, ramp or escalator serving only one adjacent floor and not connected with corridors or stairways serving other floors. For escalators serving Group B Occupancies, see Section 706. Escalators in other Occupancies, except Groups H and I, may be installed as required in Section 706.

2. Stairs in Group R, Division 2 and 3 Occupancies and stairs within individual dwelling units in Group R, Division 1 Occupancies need not be enclosed.

3. Stairs in open parking garages, as defined in Section 709, need not be enclosed.
B. Alternate 2. Corridors in all areas shall be fully sprinklered. Annunciation shall be by individual level. Each residential unit shall have a sprinkler head in the foyer of the room within 3 feet of the door opening onto the corridor. Each residential unit shall also have a single station detector wired to a 115-volt AC unswitched electric power source.

EXCEPTION: In lieu of individual level waterflow annunciation, supervised smoke detectors shall be provided in front of stairwell doors on the corridor side and at entrances to elevator lobbies or in front of elevator. Main riser waterflow indication will be required.

C. Alternate 3. All areas shall be provided with a supervised fire detection system installed per Section 3809(c), (d), (e), (f), (g) and (h), except an emergency generator will not be required. Doors opening into public corridors shall be provided with automatic closers per Section 4306(f).

EXCEPTION 2: In lieu of a sprinkler system, assembly service and retail areas and equipment rooms shall be provided with a fire detection system per Section 3809. Assembly areas with ceiling heights in excess of 16 feet shall have a specially engineered system.

EXCEPTION 3: In lieu of a sprinkler system, kitchens may be equipped with fixed temperature heat detection in addition to requirements of Section 3812.

2. Standpipe systems shall be required as follows:

A. All buildings shall have a standpipe system complying with the requirements of this Chapter.

EXCEPTION 1: In buildings with an existing standpipe, a separate sprinkler riser, sized per NFPA 13 and interconnected with the standpipe system at the base of the riser, may be installed to serve the sprinkler system.

EXCEPTION 2: Where the building is fully or partially sprinklered, the combination standpipe or sprinkler riser shall operate the sprinklers on any floor properly as per NFPA 13 without Fire Department pumping into the system to increase the pressure. In addition, the standpipe shall have adequate capacity to supply two 1 ½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.
EXCEPTION 3: Where the building is fully detectored, the standpipe shall supply two 1½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

B. A Fire Department connection shall be provided as required in this Chapter.

C. 1½-inch hose connections shall be provided on each floor.

D. Provide a main riser waterflow indication/annunciation.

3. Communications systems shall be required as follows:
   A. A one-way voice communication (PA) system conforming to the requirements of this Code shall be provided.
      EXCEPTION 1: Phone jacks will be required only at stairway entrances adjacent to manual fire alarm boxes.
      EXCEPTION 2: Phone jacks at stairway entrances may be on one zone per stairway.

4. The F.D. Operations Center shall be located on the first floor (ground) level at a location approved by the Department and the Fire Department. The F.D. Operations Center shall consist of the main fire alarm panel and/or annunciator panel, controls for the voice communications systems, controls for the firefighters’ communication system and a graphic diagram of the building by floor (typical floors may use a single graphic).

   (c) Requirements for Retail and Office Occupancies in Buildings over 75 feet (High-Rise) in Height.

   1. A fire sprinkler system conforming to the requirements of this Chapter shall be installed throughout the building.
      EXCEPTION 1: In buildings utilizing a central structural concrete or masonry core, the areas outside the core shall be provided with a fire sprinkler system conforming to the requirements of this Chapter; areas within the core may be provided with supervised fire detection system installed per Section 3809 in lieu of the fire sprinkler system.
      EXCEPTION 2: In lieu of a full sprinkler system, all areas shall be provided with a supervised fire detection system installed per Section 3809.
      EXCEPTION 3: A sprinkler system shall be provided in the corridor with smoke detectors provided outside each door into an exit stairway and on the occupied (tenant) side of each door opening into the corridor. The above detectors shall be located not less than 1 foot nor more than 3 feet from the
protected door. Detectors shall also be installed in mechanical, electrical and telephone equipment rooms and in all janitor closets and storage closets opening into the corridor. Detectors not located in the corridor shall have a remote indicating light above the door in the corridor or be annunciated on a panel at an approved location.

**EXCEPTION 4:** Where the building has at least 2 means of exiting from each floor complying with the requirements of Chapter 33 and has a fire standpipe system complying with the requirements of Section 3817(c)2.A. Exception 3, a fire detection system shall be installed as follows: detectors shall be provided in the corridor outside each door into an exit stairway and on the occupied (tenant) side of each door opening into the corridor. The above detectors shall be located not less than one foot nor more than 3 feet from the protected door. Detectors shall also be provided in the corridor connecting the exit stairways; in all elevator lobbies; in mechanical, electrical and telephone equipment rooms; and in all janitor and storage closets opening into the corridor. Where there is no enclosed corridor (open floor plan), detectors shall be located as above at each stairway entrance, in all elevator lobbies, equipment rooms, janitor closets and closets intended to be entered (walk-in) and used for storage of combustible materials and with a minimum of 4 additional detectors provided for the rest of the floor area. Detectors installed in enclosed areas such as equipment rooms and closets shall have a remote indicating light over the door in the corridor, or outside the room, or be annunciated on a panel at an approved location.

2. Standpipe systems shall be required as follows:

   A. All buildings shall have a standpipe system complying with the requirements of this Chapter 1.

   **EXCEPTION 1:** In buildings with an existing standpipe, a separate sprinkler riser, sized per NFPA 13 and interconnected with the standpipe system at the base of the riser, may be installed to serve the sprinkler system.

   **EXCEPTION 2:** Where the building is fully or partially sprinklered, the combination standpipe or sprinkler riser shall operate the sprinklers on any floor properly as per NFPA 13 without the Fire Department pumping into the system to increase the pressure. In addition, the standpipe shall have adequate capacity to supply two 1½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the
Appendix Sec. 210

Fire Department pumping into the system.

**EXCEPTION 3:** Where the building is fully or partially detected, the standpipe system shall supply two 1½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

B. A Fire Department connection shall be provided as required in this Chapter.

C. 1½-inch hose connections shall be provided on each floor.

D. Main riser water flow indication/annunciation shall be provided.

E. When the existing standpipe cannot meet the above criteria, a new standpipe system sized per Section 3806 shall be required.

**EXCEPTION 1:** Connection to City main water supply and the installation of a fire pump is not required.

**EXCEPTION 2:** The system shall be supervised by air pressure or by water (as approved by the Denver Water Board).

**EXCEPTION 3:** New standpipe risers may be installed in stairwells, provided that the exitway is not obstructed. Outlets shall be located per Section 3806.

3. A communication system shall be required as follows for existing retail and office high-rise occupancies.

A. A one-way communication shall be provided. The system shall be provided with a minimum of 2 one-way communication zones. Design of the communication system shall be such that half the speakers on each floor are connected to one zone and half connected to the other zone, so that damage or loss of any one speaker, cable, amplifier, preamplifier or any other single component will not cause the failure of more than ½ of the communications system on each floor. The cable system shall be routed in a minimum of 2 vertical risers remotely located from each other. Speakers connected to each system shall be evenly distributed on each floor with adjacent speakers connected to opposite zones.

**EXCEPTION 1:** Speakers will not be required in stairways but shall be audible in these areas.

**EXCEPTION 2:** Speakers will not be required in elevators.
B. A 2-way (firefighters') telephone communication system shall be provided conforming to the requirements of this Code.

**EXCEPTION 1:** Phone jacks will be required only at stairway entrances adjacent to manual fire alarm boxes.

**EXCEPTION 2:** Phone jacks at stairway entrances may be one zone per stairway.

4. The F.D. Operations Center shall be located on the first floor (ground) level at a location approved by the Department and the Fire Department. The F.D. Operations Center shall consist of the main fire alarm panel and/or annunciator panel, controls for the voice communications systems, controls for the firefighters' communication and a graphic diagram of the building by floor (typical floors may use a single graphic).
Appendix Sec. 1801

Appendix Chapter 18 is added:

CHAPTER 18

EMERGENCY AIR RESCUE REPLENISHMENT SYSTEM

Sec. 1801.

(a) Scope. This specification covers the requirements for the construction and installation of an emergency air rescue replenishment system which will allow firefighters to refill their breathing apparatus at stations in the elevated locations of buildings which may be remote from the fire department ground level portable high pressure air-resupply system. This system is permanently installed in high-rise buildings hereafter constructed or in retrofit installations as required by this code. This appendix establishes the basic requirements for the design, location, installation, testing and maintenance of this system.

(b) Pressure Rating. The emergency air system shall be constructed of materials tested and certified for an operating pressure of 5,000 pounds per square inch at 70°F.

(c) Locations. The emergency system is a series of remote filling stations connected by high pressure piping to a single ground level filling and connection station. Only one system shall be required in each high-rise building. The location of the filling station shall be shown on the floor layout diagram within each valve cabinet.

1. The ground level filling and connection station shall include a shutoff valve, pressure gauge and quick couple high pressure connection in a lockable weatherproof enclosure located within 10 feet of the fire department connection at a height between 1 foot 6 inches and 3 feet 6 inches above the ground or a location approved by the fire department.

2. The remote filling station shall be located on alternating floors beginning at the third floor and terminating no more than two floors from the highest portion of the building. The filling station shall include a shutoff valve, pressure gauge quick couple high pressure connection, pressure bleed valve and an isolation valve installed in the fire department standpipe cabinet or separate lockable enclosure. When located in a separate enclosure, the top of the enclosure shall not be located more than five feet above the finished floor. The isolation valve will be installed so that when it is closed, all filling stations above the valve will seal out the remainder of the system. The remote filling stations and enclosure may be located in the stairwell and shall not extend more than 4 inches into the required exit width.
(d) **Required Clean Materials of Construction.** All materials and components used in the construction of the emergency air rescue system shall meet the requirements of ANSI B31 and ASME Section 8. High quality commercial components shall be used. All materials used in unaccessible areas shall be corrosion resistant steel.

The internal surfaces of all components must be free of contamination, especially hydrocarbons, and the air contained within the system shall meet grade D breathing requirements.

Fittings and piping shall be joined by welding or the use of commercial high pressure pipe fittings. Where compression type fittings are used the ferrules shall be properly selected to match the type of pipe being joined. Fittings may only be used in areas that are accessible. All welded connections shall be socked welding conforming to ANSI Section IX. Fittings shall be installed by trained personnel in conformance with the manufacturer’s recommended instructions.

The high pressure piping shall be adequately supported and protected from abrasion. Pipe bends shall be avoided, where necessary, they shall be made by using a commercial pipe bender with sufficient radius and support to prevent collapse.

All piping shall be sized to minimize flow losses and maximize flow rate at 4500 psig.

(e) **Testing and Maintenance.**

1. **Testing.** The entire emergency air rescue system shall be subject to a pneumatic pressure test of one and one-half the maximum working pressure with oil-free, dry air or nitrogen. This test pressure shall be maintained until each connection has been examined for leakage by means of soapy water or other equally effective means of leak detection safe for use with grade D breathing air. After completing the testing, the system shall be subject to a 24-hour standing air pressure test at one and one-half the maximum working pressure.

2. **Maintenance.** The emergency air rescue system shall maintain a minimum residual air pressure of 150 psig to minimize the contamination and moisture build-up. This system shall be maintained as a fire and life safety system and operational at all times.

(f) **Labeling and Graphics.** The emergency air rescue system shall be readily identifiable by appropriate labeling reading “High Pressure Rescue Air System”. Labeling shall be permanently attached at intervals of not more than 20 feet and at each remote filling station. A graphic representation shall be required in the fire command center or to indicate the location of the emergency air rescue system and the ground and remote filling stations.
Appendix Section 3210 is amended by adding a third paragraph:

Reroofing of existing roof surfaces which have a slope of less than ¼" per foot may be allowed provided ponding does not occur. Ponding is considered to occur when water remains on the roof for 72 hours under temperature conditions which average at least 70° Fahrenheit for the evaluation period. Ponding must be corrected if water remains after the evaluation period. The Department may approve alternate materials and methods of construction submitted for cases of ponding water that cannot be corrected by the provisions of this Section.

Appendix Section 3211 is amended by adding Subsection (d):

(d) Patching. Permanent repairs, when completed, shall incorporate material into the repair that must be compatible with the existing roofing product. Compatibility shall be determined by manufacturer's written specifications for reroof installation over the existing roof.

Appendix 3212 is amended by adding Subsection (g):

Sec. 3212.

(g) Hip and Ridge. All original hip and ridge shingles or shakes shall be removed prior to installing a new roof covering.

Appendix Section 3215 is amended by adding a new paragraph:

All reroofing that leaves the existing membrane in place shall have original flashings on walls and curbs removed except as allowed by the new material manufacturer. Published manufacturers' details showing the original flashings covered must be submitted at time of permit approval.
Appendix Sec. 4201

Appendix Chapter 42 is added:

CHAPTER 42
FLAMMABLE FLOOR COVERINGS
INTERIOR FLOOR FINISH

GENERAL

Sec. 4201. This appendix regulates exposed floor surfaces of buildings, including coverings that are applied over a previously finished floor.

EXCEPTION: Interior floor finish materials of a traditional type, such as wood, vinyl, linoleum, terrazzo and other resilient floor-covering materials.

Floor coverings shall meet the classification prescribed for the various occupancy groups listed in Table IV-A when tested in accordance with the requirements of Section 4202.

TESTING AND CLASSIFICATION OF MATERIALS

Sec. 4202.

(a) Testing. Critical radiant flux values of interior floor finishes shall be established by tests conducted in accordance with procedures specified within Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source, National Fire Protection Association Standard 253-1978 conducted by an approved testing agency.

(b) Classification. Interior floor finish materials which are to be installed in an exit enclosure, passageway or corridor shall be tested and classified on the basis of tests conducted in accordance with subsection (a) as follows:

Class 1 Interior Floor Finish. Materials having a minimum critical radiant flux of 0.45 watt per square centimeter.

Class 2 Interior Floor Finish. Materials having a minimum critical radiant flux of 0.22 watt per square centimeter.

MAXIMUM ALLOWABLE CRITICAL RADIANT FLUX

Sec. 4203.

(a) General. Interior floor finish materials shall meet the classification prescribed for the various occupancy groups listed in Table IV-A when tested in accordance with the requirements of Section 4202.

EXCEPTION: When an approved automatic sprinkler system is installed, Class 2 materials may be used in any area where Class 1 materials are required and the materials need not be classified in areas where Class 2 materials are permitted.
Appendix Sec. 4203

(b) **Test Report Availability.** All interior floor finish materials required by this Section to meet critical radiant flux limits in accordance with Section 4202 shall be tested by an approved laboratory. A copy of the test report identifying and representing the style to be installed shall be provided to the Department upon request. The test report shall identify the interior floor finish by manufacturer (or supplier) and style name and shall be representative of the current construction of the material to be installed.

(c) **Identification.** The interior floor finish material shall be identified by a hang tag or other suitable method as to manufacturer (or supplier) and style and shall indicate the classification of the material based upon the limits specified within Section 4202.
# TABLE IV-A
INTERIOR FLOOR FINISH REQUIREMENTS

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\(^1\) Combustible floor finish not permitted for stairs in Types I and II construction nor other types of construction exceeding three stories in height.

\(^2\) Combustible floor finish not permitted in rooms occupied by inmates or patients whose personal liberties are restrained.
Appendix Sec. 4601

Appendix Chapter 46 is added:

CHAPTER 46

DEMOLITION AND MOVING

GENERAL

Sec. 4601.

(a) Scope. In addition to the other requirements of this Building Code, the Revised Municipal Code and the Fire Code, this Chapter shall govern the demolition and moving of buildings, structures and utilities. Any device or equipment such as scaffolds, ladders, derricks, hoists or similar equipment used in connection with demolition or moving shall be constructed, installed, maintained and operated in accordance with the requirements governing the construction, installation, maintenance and operation of such device or equipment as specified in other portions of this Building Code.

(b) Loads. Structures, floors, temporary support, scaffold, sidewalk barricade or bridge or any part thereof or any device or equipment shall not be loaded in excess of the safe carrying capacity.

(c) Danger Signs. Every demolition project shall be provided with danger signs posted around the property. See Chapter 1 for the posting of Danger Signs.

(d) Cleaning Brick. The cleaning of brick or lumber at the job site shall be performed only by employees of the demolition contractor.

(e) Dust. All dust resulting from demolition operations shall be settled with water and approved by the Department.

(f) 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.

(g) Rubbish and Waste. 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.

(h) Sale of Material on Job Site. The sale of any material on a demolition or moving site is hereby prohibited, except as approved by the Department. See Chapter 1 for violations.
(i) **Sanitary Facilities.** Toilet facilities shall be provided on each demolition or moving site in accordance with the requirements of Appendix C. Uniform Plumbing Code amended.

(j) **Extinguishers.** When cutting torches are required on any demolition or moving project, approved type extinguishers shall be provided. The approval and number required shall be set forth by the Fire Department. See the Uniform Fire Code.

(k) **Liability Insurance.** Prior to the issuance of a permit by the Department, 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 Department. 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 M Occupancies when approved by the Department.

1. **Insurance.** 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.

2. **Other Permittee.** Whenever any other permittee, except a homeowner, performs demolition work, he shall be required to show proof of insurance in the same amounts as indicated herein.

(l) **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.

(m) **Permit.** A permit shall be required for the erection of all covered walkways and railings. See Chapter 3.

(n) **Protection of Utilities.** Materials or equipment used in, or required for, demolition or moving operations shall not be placed or stored so as to obstruct free and convenient approach to any
fire hydrant, fire or police alarm box, utility box, catch basins or manhole, or so as to interfere with the free flow of water in any street or alley gutter. Every street lamp, utility box, fire or police alarm box, fire hydrant, catch basin and manhole that might be damaged by any work being performed or by the placement or storage of any materials or equipment shall be protected adequately against such damage. This protection shall be maintained only as long as the actual work may require and shall be completely removed as soon as the work status permits.

PREPARATORY OPERATIONS

Sec. 4602.

(a) Survey and Notification. Prior to the start of demolition operations, the owner of the property to be demolished shall:

1. Have a structural survey made to determine the condition of the structure, and to determine the possibility of unplanned collapse of any portion of the building or structure, and

2. Notify in writing by registered mail with a return receipt, the owners of the adjoining buildings not less than 60 days before the demolition is to begin that their buildings should be surveyed and protected if necessary.

If the building to be demolished shares a common wall with an adjacent the owner of the building to be demolished shall provide an Engineer’s report stating the effect the removal of the building will have on the structural ability of the adjacent buildings. Should the Engineer’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 Department, buildings 4 or more stories in height shall require an engineer’s report to be filed with the Department prior to a demolition permit being issued. This report shall contain information as to type of construction, method of demolition, street, sidewalk or other public way closures, method of protecting the public, and pertinent data pertaining to adjacent structures. The Department may request an engineer’s report for other demolition operations when deemed necessary.

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.

(b) Damage by Fire, Flood, or Other. 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.

(c) Utility Shut Off. All electric, gas, water, steam, sewer and other service lines shall be shut off, capped or otherwise controlled
outside the building line prior to beginning demolition work.

(d) **Relocation of Utilities.** Any power, water or other utilities required to be maintained during demolition shall be temporarily relocated and protected.

(e) **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.

(f) **Glass Hazard.** Hazards from the fragmentation of glass shall be removed.

(g) **Wall Opening Hazard.** Wall openings shall be protected to a height of approximately 42 inches above the floor.

(h) **Exterior Wall-Floor Demolition.** The demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into storage space before commencing the removal of exterior walls and floors in the story next below.

**STAIRS, PASSAGEWAYS AND LADDERS**

Sec. 4603.

(a) **Access.** Only those stairways, passageways and ladders designated as means of access to the structure of a building shall be used. Other access ways shall be closed at all times.

(b) **Maintenance.** All stairs, passageways, ladders and incidental equipment thereto shall be periodically inspected and maintained in a clean, safe condition.

(c) **Stairwells.** In a multistory building when a stairwell is being used as access, the stairwell shall be properly illuminated by either natural or artificial means and completely and substantially covered over at a point not less than 2 floors below the floor on which the work is being performed. Access to the floor where the work is in progress shall be through a properly lighted, protected and separate passageway.

(d) **Doorways.** All access doorways or thoroughfares to the property shall be kept barricaded, except during the actual passage of men or equipment.
Appendix Sec. 4603

CHUTES

Sec. 4604.

(a) Prohibition. Materials shall not be dropped to any point lying outside the exterior walls of the structure unless the area is protected. Where the distance from the property line or sidewalk is equal to or greater than the height of the demolition work, materials may be dropped by gravity to the ground, provided that the dust control is maintained.

(b) Enclosure. All material chutes or sections thereof which are at an angle of 45° or more from the horizontal shall be entirely enclosed, except for openings equipped with closures at each floor level for the insertion of materials. The opening shall not exceed 48 inches in height measured along the wall of the chute. At all stories below the top floor, openings shall be kept closed when not in use.

(c) Gate. A substantial gate shall be installed in each chute at or near the discharge end. When chutes are used, a competent employee shall be assigned to control the operation of the gate and the backing and loading of trucks. When operations are not in progress, the area surrounding the discharge end of the chute shall be securely closed off.

(d) Guardrail. Any chute opening used to dump debris shall be protected by a substantial guardrail, approximately 42 inches above the floor or other surface on which the men stand to dump material. Any space between the chute and the edge of the openings in the floors through which it passes shall be solidly covered over.

(e) Toeboard or Bumper. Where the material is dumped from motorized equipment or wheelbarrows, a securely attached toeboard or bumper not less than 4 inches thick and 6 inches high shall be provided at each chute opening.

REMOVAL OF WALLS, MASONRY SECTIONS AND CHIMNEYS

Sec. 4605.

(a) Floor Loads. Masonry walls or sections of masonry shall not be permitted to fall upon floors of the building in such masses as to exceed the safe carrying capacities of the floors.

(b) Free-Standing Walls. No wall section which is more than one story in height shall be permitted to stand alone without lateral bracing. All walls shall be left in a stable condition at the end of each shift.

(c) Cutting Load-Supporting Members. Structural or load-supporting members on any floor shall not be cut or removed until all stories above such floor have been demolished and removed.
This provision shall not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment.

(d) **Skeleton-Type Buildings.** In buildings of steel or concrete frame construction, the framing may be left in place during the demolition of the masonry. Where this is performed, all beams, girders and similar structural supports shall be cleared of all loose material as the masonry demolition progresses downward.

(e) **Walls Serving as Support.** Walls that serve as retaining walls to support earth or adjoining structures shall not be demolished until the earth has been properly braced or adjoining structures have been properly supported.

(f) **Walls Serving as Retainers.** Walls which are to serve as retaining walls against which debris will be piled shall not be used unless they are capable of supporting the imposed loads.

### CATCH PLATFORMS

Sec. 4606.

(a) **General.** During the demolition of the exterior walls of a structure originally more than 70 feet high, catch platforms shall be erected along the exterior faces of these walls.

**EXCEPTION:** Catch platforms shall not be required when the engineer’s report specified in Section 4602 specifically deletes this requirement.

(b) **Height.** The catch platforms shall be constructed and maintained not more than 3 stories below the story from which the exterior walls are being removed. Catch platforms shall not be considered necessary when the demolition has progressed to within 3 stories of ground level.

(c) **Width.** Catch platforms shall be at least 5 feet in width, measured in a horizontal direction from the face of the structure, and shall consist of outriggers and planks. Planks shall be laid tight together and without openings between such planks and the wall.

(d) **Material.** Catch platforms may be constructed of material other than wood, provided that such material is of equal strength and does not otherwise lessen the security against falling material.

(e) **Loading.** Catch platforms shall be capable of sustaining a live load of at least 125 pounds per square foot.

(f) **Incline.** The catch platforms shall be inclined so that the outer edge is at least 6 inches higher than the inner edge.

(g) **Supports and Outriggers.** Supports shall consist of outriggers of ample strength, secured against turning, and spaced not more than 20 feet apart. Each outrigger shall have ample
support against the building or in window openings and shall be properly secured.

(h) **Enclosure.** The outer edge of each catch platform shall be provided with a substantial enclosure constructed at an angle of approximately 45° with the horizontal and having its outer edge at least 48 inches from the platform measured along the slope of the enclosure.

1. The enclosure shall consist of galvanized wire mesh made of at least No. 16 U.S. gauge wire and 1 ½ inch mesh. The enclosure shall be secured to supports placed not more than 10 feet apart.

2. There shall be no openings between the platform and the enclosure.

3. Supports for the enclosure shall be at least 2 inches by 6 inches in section with the greater dimension at right angles to the enclosure.

**STORAGE**

Sec. 4607. The storage of waste material and debris on any floor shall not endanger the structural stability of the building.

**MACHINE DEMOLITION**

Sec. 4608. Machine demolition shall be subject to approval by the Department.

**USE OF EXPLOSIVES**

Sec. 4609. Contractors utilizing explosives in their demolition operation shall be specifically approved by the Director. For storage and transportation of explosives, see the Fire Code.

**MOVING**

Sec. 4610.

(a) **Compliance.** 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 Department prior to moving. See Chapter 3.

(b) **Other Requirements.** During actual moving operations on the public way, one or more men shall be stationed on the roof of the structure being moved to determine that there is no interference with trees, wires, traffic signals, signs or other obstructions.

(c) **Utilities Disconnect.** See Section 4602.

(d) **Filling Holes and Clearing of Site.** See Section 4611.

(e) **Approvals.** Prior to the issuance of a permit by the Depart-
Appendix Sec. 4609

ment and the subsequent moving of any building, structure or utility, approval shall be obtained from the Traffic Engineer.

(f) Storage of Moved Buildings. Buildings, structures or utilities shall not be stored on any property for more than 72 hours, unless approved by the Department.

AFTER REMOVAL

Sec. 4611. Upon completion of the removal of a building, structure or utility, either by demolition or moving, 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 Department. 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.

STANDARDS

Sec. 4612. Unless provided for in other portions of this Building Code, the following Standards shall apply:

<table>
<thead>
<tr>
<th>ORGANIZATION</th>
<th>TITLE OF PUBLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>American National Standards</td>
<td>Demolition Safety Requirements</td>
</tr>
<tr>
<td>Institute</td>
<td>A10.6-1969</td>
</tr>
<tr>
<td>1430 Broadway</td>
<td></td>
</tr>
<tr>
<td>New York, NY 10018</td>
<td></td>
</tr>
</tbody>
</table>
Appendix Chapter 49 Section 4901 is amended by deleting the last sentence in the first paragraph and adding:

Openings may be enclosed with panels of insect screening, plastic or single pane glass which are readily removable (i.e., panels which can be placed or removed without inserting or removing screws, bolts, or other connectors which would require the use of tools or special knowledge). The plastic or glass shall not be more than 0.125 inch in thickness and may be transparent or translucent.

Appendix Section 4902 is amended:

DESIGN LOADS FOR PATIO COVERS

Sec. 4902. Patio covers shall be designed to sustain, within the stress limits of this Code, all dead loads plus a minimum vertical snow load of 30 psf, nonreducible. Such covers shall be designed to resist the minimum horizontal wind loads set forth in this Code, except that where less than 12 feet high the horizontal wind load shall be as indicated in Table 49-A. In addition, they shall be designed to support a minimum wind uplift equal to the horizontal wind load acting upward normal to the roof surface, except that for structures not more than 10 feet above grade the uplift may be three-fourths of the horizontal wind load. When enclosed with insect screening, glass, or plastic panels, wind loads shall be applied to the structure, assuming it is fully enclosed.

Section 4904 is amended:

Sec. 4904. 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 Chapter 51 Section 5110 is deleted:

Section 5111 is amended:

STANDARDS

Sec. 5111. Unless provided for in other portions of this Building Code, the following standards shall apply:

Practice for the Inspection of Elevators - Inspectors Manual A17.2-1985
Safety Requirements for Personnel Hoists A10.4-1985
Safety Standards for Manlifts ANSI-ASME A90.1-1985
Safety Requirements for Powered Platforms for Exterior Building Maintenance A120.1-1970
Base Mounted Drum Hoists B30.7-1977
Lifting Devices B30.7b ANSI-ASME

Legend Organization
ANSI American National Standards Institute
1430 Broadway
New York, NY 10018

Section 5113(c) is amended by changing the inspection period to five (5) years in ANSI Rule 1005.1: Inspection and Test Periods.

Section 5113(e) is amended:

(e) Inspection Reports. After each required inspection, a full and correct safety test report by the elevator contractor performing the test shall be filed with the Building Official.
Appendix Sec. 5301

Appendix Chapter 53 is amended:

Chapter 53

ENERGY CONSERVATION IN NEW BUILDING CONSTRUCTION

GENERAL

Sec. 5301.

(a) Purpose. The purpose of this appendix is to regulate the design and construction of the exterior envelopes and selection of heating, ventilating and air conditioning, service water heating, electrical distribution and illuminating systems and equipment required for the purpose of effective conservation of energy within a building or structure governed by this Code.

(b) Model Energy Code Adopted. In order to comply with the purpose of this appendix, buildings shall be designed to comply with the requirements of the Model Energy Code promulgated jointly by the International Conference of Building Officials (ICBO); the Southern Building Code Congress International, Inc. (SBCCI); the Building Officials and Code Administrators International, Inc. (BOCA); and the National Conference of States on Building Codes and Standards, Inc. (NCSBCS); dated 1992.

EXCEPTION: Residential buildings that are (1) detached one-and two-dwelling units, and (2) multi-dwelling units not exceeding 3 stories above grade.

The following "Thermal Design Parameters" are established for Section 302.1:

<table>
<thead>
<tr>
<th>Winter Design Dry - Bulb</th>
<th>1 °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer Design Dry - Bulb</td>
<td>91 °F</td>
</tr>
<tr>
<td>Design Wet - Bulb</td>
<td>59 °F</td>
</tr>
<tr>
<td>Degree Days Heating</td>
<td>6000 +</td>
</tr>
<tr>
<td>Degrees North Latitude</td>
<td>40°</td>
</tr>
</tbody>
</table>

(c) Residential Building Energy Conservation Code. New residential construction, including additions for (1) detached one-and two dwelling units, and (2) multi-dwelling units not exceeding 3 stories above grade shall comply with prescriptive or Performance procedure as follows:

1. Prescriptive Procedure:

   A. Temperature Control. Electric or gas fired heating systems shall be thermostatically controlled. Programmable thermostats may be used which can be set for high and low temperatures during selected time periods.

   B. Water Conservation. See Uniform Plumbing Code amended Section 901(b) - Conservation for the flow rate of...
shower heads, lavatory, kitchen, and service faucets.

C. Air Infiltration. 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:

( i) 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.

( ii) 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 \( \frac{1}{4} \)" thick or

b. Foam caulk for gaps over \( \frac{1}{4} \)" wide and polyurethane caulk for smaller gaps.

Fiberglass sill sealers are not permitted.

(iii) 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 ASTM E-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, light fixtures. Openings around chimney stacks shall be blocked with non-combustible 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. Weatherstrip the framework around attic hatches and secure hatches and secure the door tightly against the weatherstripping 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 place 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 c.

**EXCEPTION:** The air infiltration performance procedure may be used instead of the prescriptive air infiltration procedure. See item 2c of this subsection.

D. **Insulation.** The following minimum R values shall be provided by the insulating material only.

( i) Roof/Ceilings: R-30

**EXCEPTION:** Roof panels of foam-core construction with an R-value of 26.1 (not including air films, cladding materials or reflective barriers).

( ii) Walls: R-15. The wall system shall include any combination of cavity insulation and rated insulating foam sheathing to achieve the stated minimum R value. Sprayed or blown-in insulation with a depth of 3.5 inches shall be considered R-13. Assume R-3.7 per inch for any other depth of product.
EXCEPTION:

1. Plywood, for purposes of sway bracing, may be substituted for the foam board sheathing over an area not to exceed 20% of the total wall area. Door and window areas will be included for the purpose of calculating the total wall area. When the use of plywood sheets for sway bracing would exceed 20% of the total wall area, it will be necessary to provide other means of lateral support, such as steel straps or let-in braces, so that in no case is more than 20% of the total wall area reduced to less than the required minimum R value when replacing the insulated foam sheathing with plywood.

2. Wall panels of foam core construction with an R-value of 13.3 minimum (not including air films, cladding materials or reflective barriers).

(iii) Basement walls: R-5. Provide either exterior or interior insulation as follows:

a. Exterior insulation shall be installed a maximum of 8" from the top of foundation or finished grade, whichever provides the least amount of exposure, to a minimum of 24" below grade against basement walls.

b. Interior insulation shall be installed from the sill plate to the top of basement slab.

(iv) Floor insulation above crawlspace: R-19. See amended UBC Section 2516(c)6 for crawl space ventilation. Crawlspace foundation walls are not required to be insulated.

(v) Frost wall insulation (for heated areas only) shall be installed as follows:

a. Exterior. See paragraph D(iii), basement walls above or

b. Interior. The insulation shall extend downward from the top or bottom of the slab vertically for a minimum distance of 24" on the face of the frost wall or horizontally beneath the slab from the face of the wall for a minimum total distance of 24".

E. System Efficiency. Equipment related to heating efficiency.
(i) When a gas heating system is installed, it shall have an AFUE (efficiency) rating of 78% or greater.

(ii) High efficiency water heaters shall be installed with the following minimum energy factors:

<table>
<thead>
<tr>
<th>Tank Size</th>
<th>Gas</th>
<th>Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Gal</td>
<td>0.62</td>
<td>0.91</td>
</tr>
<tr>
<td>40 Gal</td>
<td>0.61</td>
<td>0.90</td>
</tr>
<tr>
<td>50 Gal</td>
<td>0.60</td>
<td>0.88</td>
</tr>
</tbody>
</table>

F. **Windows.** Double-pane windows shall be installed as a minimum. Existing single pane with storm windows may be used for existing buildings. Metal framed multi-paned windows must have thermal break design.

G. **Wall Openings.** Maximum area of wall openings shall not exceed 20% of total exterior wall area.

H. **Duct Insulation.** Ducts within unconditioned spaces shall be covered with a minimum insulation of R-4.

2. **Performance Procedure.** Provide all of the following:

A. Provide items A, B, E, F and H of the Prescriptive procedure.

B. Provide calculations to provide the required thermal performance of the building. Calculations shall be based on the State of Colorado, Residential Building Energy Conservation Standards Handbook, August 1990, Alternative I, II or III with the following exceptions:

   (i) The maximum "U" Values for various building components shall be:

<table>
<thead>
<tr>
<th>Component</th>
<th>U Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walls</td>
<td>.15</td>
</tr>
<tr>
<td>Roof</td>
<td>.04</td>
</tr>
<tr>
<td>Floors</td>
<td>.05</td>
</tr>
<tr>
<td>Basement or Frost Wall</td>
<td>.2</td>
</tr>
</tbody>
</table>

   (ii) All references to the ASHRAE Fundamentals Handbook shall be for the 1985 edition.

C. **Air Infiltration.** Protection against air infiltration shall be verified by a blower door test, which shall certify that the building has a leakage ratio (LR) between LR-2 and LR-4. (Leakage ratio is a measurement system established by the Colorado Thermal Insulation Association Standard - 1985.) Builders of buildings with type-approved plans may submit blower door test results for one of every five homes built according to each plan.
Appendix Sec. 5301

EXCEPTION: Leakage factors below LR-2 may be accepted if an upgraded ventilation system has been installed to maintain fresh air requirements as required by the Mechanical Code. (At a minimum, an upgraded ventilation system must include an exhaust fan with a humidistat controller device which turns on the fan whenever indoor humidity rises above pre-set level.)
Appendix Sec. 6301

Appendix Chapter 63 is added:

CHAPTER 63
CONSTRUCTION IN DESIGNATED SPECIAL CONSTRUCTION ZONES

SCOPE

Sec. 6301. 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.

GENERAL PROVISIONS

Sec. 6302.
(a) 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 303.

(b) Engineer's Reports. If the applicant is required to prepare an engineer's report pursuant to Section 303, 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.

(c) 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.

(d) 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.

HAZARDOUS GASES GENERATED BY LANDFILLS

Sec. 6303.
(a) New Construction. Except as provided in Sections 303(f) and 6303(c) 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.

(b) Alteration or Repair of Existing Building, Structures or Utilities. Except as provided in Sections 303(f) and 6303(c), 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 3 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 6303 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 6303(a) as if the construction were new construction.

(c) 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 6303 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 6303 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.
UMC
DIV. 2
DIVISION 2

AMENDMENTS

TO THE

1991 EDITION OF THE UNIFORM MECHANICAL CODE

AND

APPENDIX
DENVER AMENDMENTS TO THE UNIFORM MECHANICAL CODE
BY PARTS, CHAPTERS AND SECTIONS

The following Chapters and Sections have been amended by the Denver Amendments to the UMC.

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<th>Sections Amended</th>
</tr>
</thead>
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Sec. 503

Part I - Administrative, which includes Chapters 1, 2 and 3 of the Uniform Mechanical Code (UMC), is deleted. The administrative provisions of UBC, Chapters 1, 2 and 3 as amended by Denver, shall govern.

Section 503(c) is amended:

(c) Gas-Burning Appliances. Appliances designed to burn gas shall be rigidly connected to the gas-supply outlet in an approved manner and with approved materials.

EXCEPTION: An approved listed semirigid or flexible metal connector may be used to connect commercial and domestic cooking appliances, gas clothes dryers, gas appliances subject to expansive soil conditions when approved by the Department, and other specialized appliances as approved by the Department, provided that:

1. The connector shall not exceed 3 feet in length, except range and clothes dryer connectors which may not exceed 6 feet.
2. An approved shutoff valve is used between the gas-supply outlet and such connector.
3. Connectors shall not be concealed within or run through any wall, floor, or partition.
4. Connectors shall have a nominal diameter not less than that of the inlet connection to the appliance as provided by the manufacturer of the appliance and shall be of such size as to provide the total demand of the connected appliance load based on Table No. 5-D-1 or 5-D-2.

Section 505 is amended by adding the following paragraph.

ACCESS

Sec. 505. Boiler and furnace rooms shall be separated from refrigeration equipment machinery rooms and from air handling equipment rooms by a fire separation wall of at least one-hour fire-resistive construction. There shall be no access doors to a boiler or furnace room from a refrigeration equipment machinery room or from an air handling equipment room.

Section 506 Exception is amended:

EXCEPTION: The listed shut off devices shall not be required on range or cooking tops, gas lights, open-burner manually operated appliances permitted by this Code or the Department, listed appliances not requiring such devices, or specific industrial appliances as approved by the Department.

UMC - 1
Section 508 is amended:

LOCATION

Sec. 508. Appliances installed in garages, warehouses, or other areas where they may be subjected to mechanical damage shall be suitably guarded against such damage by being installed behind protective barriers or by being elevated or located out of the normal path of vehicles.

Equipment located in a garage and which generates a glow, spark, or flame capable of igniting flammable vapors shall be installed with the pilots and burners or heating elements at least 66 inches above the floor level or 96 inches when the area is subjected to vehicle traffic.

Where such appliances installed within a garage are enclosed in a separate, approved compartment having access only from outside of the garage, such appliances may be installed at floor level, provided that the required combustion air is taken from and discharged to the exterior of the garage.

Heating equipment located in rooms where cellulose nitrate plastic is stored or processed shall comply with the Fire Code.

Fuel-fired appliances or equipment shall not be installed under a stairway.

Solid-fuel fireplaces may be used and installed in bedrooms.

Section 607 is amended:

AREA OF COMBUSTION AIR OPENINGS.

Sec. 607.

(a) General. For combustion air, the provisions of this Section shall apply above other provisions of this Chapter, except as noted. All combustion air shall be taken from the outside or from spaces connecting with the outside, such as crawl spaces and attics, unless otherwise permitted by the Building Official.

(b) Appliances Located in Unconfined Spaces. Combustion air openings having a total free area of at least 1 square inch per 5,000 Btu/h of total input rating of all appliances shall be provided. Ducts admitting outdoor air may be connected to the cool air return of the heating system and shall comply with Section 604.

   EXCEPTION: For Group R-3 Occupancies and for individual units of Group R-1 Occupancies, combustion air opening(s) of at least 1 square inch per 10,000 Btu/h of total input rating shall be provided.

(c) Appliances Located in Confined Spaces. Provide 2 openings as required in Section 602. Each opening shall have a
free area of at least 1 square inch per 4000 Btu/h of the total input rating of all appliances in the enclosure. If horizontal ducts are used, each opening shall have a free area of at least 1 square inch per 2000 Btu/h of total input rating of all appliances in the enclosure.

**EXCEPTION:** In R-3 Occupancies and in individual living units of R-1 Occupancies, each opening shall have a free area of at least 1 square inch per 5000 Btu/h of total input rating.

**d) Designed Installations.** With prior approval of the building official, compliance with the requirements of subsections (b) and (c) above will not be required for an installation that has been professionally designed to ensure an adequate supply of combustion and ventilation air.

> TABLE NO. 6-A IS DELETED IN ITS ENTIRETY

**Section 706(a) is amended:**

(a) **Source.** A warm air furnace shall be provided with return air, outside air or both. Heating systems regulated by this Code shall be arranged to mechanically introduce a continuous supply of outside air into the building to comply with ASHRAE 62-1989

**EXCEPTION:** In R-2 and R-3 Occupancies and in individual living units of R-1 Occupancies, the use of operable windows to provide required ventilation shall be allowed.

**Section 710(i) is added:**

(i) Guardrails of at least 3 feet in height shall be provided wherever an appliance is located within 6 feet of the edge of the roof.

**EXCEPTIONS:** 1. Guardrails are not required if a minimum height parapet of 3 feet is installed.

**Section 802 is amended:**

**GENERAL**

> **Sec. 802.** Every vented decorative appliance, vented wall furnace, unit heater and room heater shall be of a type listed for vented use and shall be connected to a vent complying with Chapter 9, except as provided for in Section 807.

Every vented decorative appliance, vented wall furnace, unit heater and room heater shall be provided with combustion air complying with Chapter 6.

> A vented decorative appliance, vented wall furnace, unit heater or room heater shall not be located in any of the following places:

1. Surgical operating room.
Sec. 802

2. Hazardous location.
3. Group H, Division 1, 2 or 3 Occupancies.
4. Any room or space where an open flame is prohibited.
5. In Group H, Division 4 Occupancies, devices generating a spark or glow capable of igniting gasoline vapors shall not be installed or used within 8 feet of the floor.
6. In any Group H, Division 5 Occupancies, and Group B, Division 3 Occupancies, unless the appliance is located at least 8 feet above the floor.

Overhead heaters installed in aircraft storage or servicing areas of Group B, Division 3 Occupancies shall be at least 10 feet above the upper surface of wings or engine enclosures of the tallest aircraft which may be housed in the hangar. Overhead heaters shall be at least 8 feet above the floor of shops, offices and other sections of hangars communicating with aircraft storage or working areas.

Vented decorative appliances, vented wall furnaces, unit heaters and room heaters shall be installed so as to minimize the probability of damage from an external source.

Section 803 is amended:

VENTED DECORATIVE APPLIANCES AND GAS LOGS.

Sec. 803.

(a) General. In addition to the general requirements specified in Section 802, every vented decorative appliance shall comply with the requirements specified for heating equipment and heating appliances of this Code. Vented decorative appliances and gas logs may be installed in bedrooms.

(b) Gas Log. A gas-fired decorative log set may be installed in a fireplace suitable for burning solid fuel subject to the following limitations. Installation shall comply with the manufacturer's listing and instructions.

1. Construction shall be in accordance with Los Angeles Standard RGA 2-72 or ANSI Standard Z21.60, and equipment shall be listed.

2. Input rating shall not exceed 90,000 Btu/h nor be less than 11,000 Btu/hr. 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. Thermostatic control valve is not permitted.

5. The use of a flexible gas connector is not permitted.
6. Masonry fireplaces shall comply with Chapter 37. Factory-built fireplaces shall be approved for installation of gas logs and provided with a means for installing the gas piping.

7. The chimney serving a masonry fireplace shall comply with Chapter 37 or for existing chimneys, as approved by the Department. Factory built fireplaces shall be equipped with a listed chimney. Chimney size shall comply with Table 8-A.

8. The chimney damper shall either be removed or an opening or openings shall be cut in the camper; or a permanent, nonremovable clamp with a breakaway bolt fastener shall be installed on the damper; all to provide the minimum amount of opening prescribed in Table 8A or the manufacturer's instructions, whichever is more stringent.

9. Permanent combustion air openings, communicating directly with outside air, shall be provided in the fireplace or in an area directly communicating with the room in which the fireplace is located. Openings shall be sized in accordance with Chapter 6.

10. 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 ¾ inches 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 packaged with each set.

**TABLE 8-A is added:**

**TABLE 8-A**

**CHIMNEY SIZING FOR GAS LOGS**

Minimum free area required within the chimney and at the damper opening.

<table>
<thead>
<tr>
<th>Chimney Height, Foot</th>
<th>13</th>
<th>20</th>
<th>29</th>
<th>39</th>
<th>51</th>
<th>64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appliance Input Rating, Btu Per Hour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>14,000</td>
<td>23,200</td>
<td>34,000</td>
<td>46,400</td>
<td>62,400</td>
<td>80,000</td>
</tr>
<tr>
<td>8</td>
<td>15,200</td>
<td>25,200</td>
<td>37,000</td>
<td>50,400</td>
<td>68,000</td>
<td>86,000</td>
</tr>
<tr>
<td>10</td>
<td>16,600</td>
<td>27,500</td>
<td>40,400</td>
<td>55,600</td>
<td>74,400</td>
<td>96,400</td>
</tr>
<tr>
<td>15</td>
<td>18,200</td>
<td>30,200</td>
<td>44,600</td>
<td>62,400</td>
<td>84,000</td>
<td>108,800</td>
</tr>
<tr>
<td>20</td>
<td>20,200</td>
<td>32,600</td>
<td>50,400</td>
<td>68,400</td>
<td>94,000</td>
<td>122,200</td>
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<tr>
<td>30</td>
<td>21,600</td>
<td>36,600</td>
<td>55,200</td>
<td>76,800</td>
<td>105,800</td>
<td>138,500</td>
</tr>
</tbody>
</table>

UMC - 5
Section 804 is amended:

FLOOR FURNACES

Sec. 804. Floor furnaces shall not be installed, repaired, replaced or used.

Section 806(a) is amended:

(a) Suspended-Type Unit Heaters.

1. Approved unit heaters may be installed in garages, enclosed loading docks and other similar occupancies. When heaters are installed in public repair or storage garages, they shall be suspended from the roof or ceiling so that there is at least 8 feet from the floor to the bottom of the unit. In spaces where vehicular equipment in excess of 6 feet in height is present, a minimum of 2 feet clearance shall be provided between the bottom of the unit heater and the top of the vehicle.

2. Unit heaters installed in private garages shall be installed with a clearance of at least 66 inches measured from the floor to the bottom of the unit.

3. Unit heaters shall be installed with clearances from combustible material of not less than 18 inches at the sides, 12 inches at the bottom, 6 inches above the top, and 18 inches beyond the front and rear of the heater except as provided in subsections (c) and (d) below.

Section 806(b)3 is added:

3. Floor-mounted-type unit heaters shall not be installed in repair garages, storage garages or any other areas where Class I flammable liquids are used or stored.

Section 1002(a) is amended:

Sec. 1002.

(a) General. Supply air, return air and outside air for heating, cooling, or evaporative cooling system shall be conducted through duct systems constructed of metal as set forth in Tables Nos. 10-A, 10-B, and 10-C; metal ducts complying with UMC Standard No. 10-2 with prior approval; or factory-made air ducts complying with UMC Standard No. 10-1. Ducts, plenums and fittings may be constructed of asbestos cement, concrete, clay or ceramics when installed in the ground or in a concrete slab, provided the joints are tightly sealed.

Corridors shall not be used to convey air to or from rooms if the corridor is required to be of fire-resistive construction by Section 3305 of the Building Code.

EXCEPTION: The transfer of air from such corridors into toilet facilities of all but R Occupancies is permitted,
providing that the corridor wall penetrations are protected with fire dampers.

Concealed building spaces or independent construction within buildings may be used as ducts or plenums.

Venting systems from fuel fired appliances shall not extend into or through ducts or plenums.

When gypsum products are exposed in ducts or plenums, the air temperature shall be restricted to a range from 50°F to 125°F, and moisture content shall be controlled so that the material is not adversely affected. Gypsum products shall not be exposed in ducts serving evaporative coolers.

Gypsum board products shall not be used as a duct, except that a fire-rated shaft extending through a multi-level building and constructed of an approved fire-rated gypsum board assembly may be used as a central return air duct.

Section 1004(b) is amended:

(b) Factory-Made Air Ducts. Approved Class O and Class 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 grills 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 6 feet in length.

Section 1004(e) is added:

(e) Installation References. In addition to the specific requirements outlined in this Section, duct installation shall comply with American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) and Sheet Metal and Air Conditioning Contractors National Association (SMACNA) standards.

Section 1006(d) Exception #3 is added:

EXCEPTION 3: Fire dampers and combination fire/smoke dampers located in a smoke exhaust path shall be equipped with 212 degree fusible links.

Section 1104 is amended:

Sec. 1104.

(a) Environmental air ducts not regulated by other provisions of this code shall comply with this section. Ducts shall be substantially airtight and shall comply with the provisions of Chapter 10. Exhaust ducts shall terminate outside the building and shall be equipped with back-draft dampers. Environmental air
ducts which have an alternate function as a part of an approved
smoke-control system do not require design as Class I product-
conveying ducts.

(b) Ducts used for domestic kitchen range ventilation and
domestic clothes dryers shall be of metal and shall have smooth
interior surfaces. Commercial dryer exhaust ducts shall be
installed in accordance with their listing. For additional
requirements for domestic dryer exhaust systems, see Section
1903.

EXCEPTION: Approved flexible duct connectors not more
than 6 feet in length may be used in connection with
domestic dryer exhausts. Flexible duct connectors shall
not be concealed within construction.

(c) Bathroom and laundry room exhaust ducts may be of
gypsum wallboard subject to the limitations of Section 1002(a).

(d) Exhaust ducts that terminate on horizontal or flat roofs shall
terminate a minimum of 12" above the roof's surface and be
equipped with ¼" bivro screen.

(e) Domestic gas-fired kitchen ranges used in residential
occupancies shall be provided with a domestic type range hood
ducted to the outside of the building.

Section 1105(a) is amended by revising the last sentence of the
first paragraph to read:

Sec. 1105 (a).

Exhaust ducts under positive pressure shall not extend into or
through ducts and plenums unless contained within an airtight
enclosure.
Section 1503 is amended:

**GROUP 1**

<table>
<thead>
<tr>
<th>Compound</th>
<th>Formula</th>
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<tbody>
<tr>
<td>Carbon Dioxide (R 744)</td>
<td>CO₂</td>
</tr>
<tr>
<td>Dichlorodifluoromethane (R 12)</td>
<td>CCl₂F₂</td>
</tr>
<tr>
<td>Dichlorodifluoromethane, 73.8 degrees and Ethylidene Fluoride, 26.2%</td>
<td>CCl₂F₂, CH₃CHF₂</td>
</tr>
<tr>
<td>Dichloromethane (R 30) (Methylene Chloride)</td>
<td>CH₂Cl₂</td>
</tr>
<tr>
<td>Dichloromonofluoromethane (R 21)</td>
<td>CHClF₂</td>
</tr>
<tr>
<td>Dichlorotetrafluoroethane (R 114)</td>
<td>C₂Cl₂F₂</td>
</tr>
<tr>
<td>Monochlorodifluoromethane (R 22)</td>
<td>CHClF₂</td>
</tr>
<tr>
<td>Trichloromonofluoromethane (R 11)</td>
<td>CCl₃F</td>
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<tr>
<td>Trichlorotetrafluoroethane (R 113)</td>
<td>C₂Cl₃F₃</td>
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**GROUP 2 (TOXIC)**

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<tbody>
<tr>
<td>Ammonia</td>
<td>NH₃</td>
</tr>
<tr>
<td>Dichloroethylene</td>
<td>C₂H₂Cl₂</td>
</tr>
<tr>
<td>Ethylchloride</td>
<td>C₂H₅Cl</td>
</tr>
<tr>
<td>Methylchloride</td>
<td>CH₃Cl</td>
</tr>
<tr>
<td>Methylformate</td>
<td>HCOOCH₃</td>
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<tr>
<td>Sulphur Dioxide</td>
<td>SO₂</td>
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**GROUP 3 (FLAMMABLES)**

<table>
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<tr>
<th>Compound</th>
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<tbody>
<tr>
<td>Butane</td>
<td>C₄H₁₀</td>
</tr>
<tr>
<td>Ethane</td>
<td>C₂H₆</td>
</tr>
<tr>
<td>Ethylene</td>
<td>C₂H₄</td>
</tr>
<tr>
<td>ISO Butane</td>
<td>(CH₃)₂CH</td>
</tr>
<tr>
<td>Propane</td>
<td>C₃H₈</td>
</tr>
</tbody>
</table>
Section 1504(a) is amended:

(a) **Supports.** Supports for compressors and condensing units shall be designed to safely carry the equipment. Supports from buildings or parts of buildings that are of noncombustible construction shall be noncombustible.

A compressor or portion of a condensing unit supported from the ground shall rest on a concrete or other approved base extending not less than 3 inches above the adjoining ground level and shall not be located closer than 5 feet to any property line.

Section 1504(b) is amended:

(b) **Access.** An unobstructed access opening and passageway not less than 24 inches in the least dimension shall be provided and maintained to the compressor, unless otherwise specified by this Code.

Roof-mounted mechanical refrigeration equipment shall not be placed closer than 6 feet to the edge of a roof unless protected with a guard rail or parapet wall at least 3 feet high. Access to refrigeration rooms shall not be through a boiler or furnace room.

Section 1504(g) is added:

(g) **Domestic Water.** Domestic water used for cooling purposes shall be consumed or recycled and shall not be wasted to storm sewer, sanitary sewer, above-ground drainage or below-ground drainage unless specifically approved by the Department.

Section 1506 is amended:

**GROUP 2 AND GROUP 3 REFRIGERANTS**

Sec. 1506.

(a) The use of any Group 2 (toxic) or Group 3 (flammable) refrigerants, other than ammonia as specified herein, is prohibited from use in a refrigerating system.

(b) Ammonia may be used as a refrigerant in mechanical refrigeration systems in conformance with ASHRAE 15-1992 subject to the following restrictions:

1. Direct ammonia refrigeration systems shall not be used as an air-cooling or air-conditioning system for human comfort.

2. A mechanical refrigerating system or unit refrigerating system shall not be located within a building unless all the ammonia-containing portions of the system are enclosed in a refrigeration machinery room.

3. When ammonia refrigeration systems are installed outside of a building, the system shall be located at least 20 feet
from an exit door, window, or ventilating air inlet in a building or surrounding buildings.

4. The pressure relief valve discharge for indoor systems shall discharge to the atmosphere through the roof of the building. Alternate discharge locations may be into a tank of water as prescribed in ASHRAE 15-1992 or locations as approved by the Denver Building Official.

5. Ammonia may be used as a refrigerant in systems for ice making, cold storage, or manufacturing or processing of food or drink where the occupant load served by the system does not exceed one person per 100 square feet of floor area. (Refer to Table 33-A, UBC).

6. All packaged refrigeration units shall bear the seal of a nationally recognized testing agency approved by the Department.

Section 1601 first paragraph is amended:

Sec. 1601. Refrigerants stored in a refrigeration machinery room shall be stored in appropriately labeled, approved containers and shall not exceed the amount contained in the largest refrigeration machine installed in the machinery room.

Section 1904(a) is amended:

Sec. 1904.

(a) General. Direct gas-fired makeup air heaters may only be installed in Group B, Divisions 1, 3, and 4, Group H Occupancies, and other occupancies when approved by the Department.

Section 2002(c) is amended by adding the following paragraph:

Cleanout openings shall be located at the sides of horizontal sections of ductwork in such a manner to prevent dripping of residue. Spacing of openings shall not exceed 20 feet.

Section 2002(d) is amended:

(d) Duct Enclosure. A grease duct serving a Type I hood shall be installed in an enclosure from the point where the duct first penetrates a fire-rated wall, floor or ceiling assembly. Enclosure shall be continuous until the duct exits the building. A duct may only penetrate exterior walls at locations where unprotected openings are permitted by the Code. Enclosures shall be constructed in accordance with the Code procedures for shaft enclosures. Duct enclosures shall be of at least one-hour fire-resistive construction in all buildings and shall be of 2-hour fire-resistive construction in Types I and II fire-resistive buildings. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the exterior through weather-protected openings. The enclosure shall be separated from the duct by at
least 3 and not more than 12 inches and shall serve a single grease exhaust duct system.

**Section 2003(b)** last paragraph is added:

Joints and seams shall be made with a continuous liquid-tight weld or braze.

**EXCEPTION:** Hoods of listed grease extractors or listed automatic damper and hood assemblies evaluated under the same conditions of fire severity as the hood of listed grease extractors shall be considered as complying with this requirement.

**Section 2003(g)4** is amended:

4. Type I hoods where the cooking equipment includes low-temperature appliances such as medium-to-low temperature ranges, roasters, roasting ovens, pastry ovens, pizza ovens, and equipment approved for use under Type II hood.

<table>
<thead>
<tr>
<th>Number of Exposed Sides</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (island or central hood)</td>
<td>( Q = 75A )</td>
</tr>
<tr>
<td>3 or less</td>
<td>( Q = 50A )</td>
</tr>
<tr>
<td>Alternate formula</td>
<td>( Q = 50PD )</td>
</tr>
</tbody>
</table>

**EXCEPTION:** Listed grease extractors are to be installed in accordance with the terms of their listing and the manufacturer's installation instructions.

Domestic type kitchen ranges installed in other than the individual dwelling units of R Occupancies shall require a Type I hood to be installed unless otherwise approved by the building official.
Appendix Sec. 2105 is amended:

PERMIT REQUIRED

Sec. 2105. 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 latest revision of 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.

Appendix B Section 2106(f) is added:

(f) Prohibitions. The following prohibitions shall apply to installation and location of equipment:

1. The storage of materials of any kind shall not be permitted in boiler rooms.
2. The installation or use of gaseous chlorinators or chlorine piping in boiler rooms or rooms where fuel-fired equipment is located is prohibited.
3. The installation of any device that will create a pressure less than atmospheric in the 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.
4. 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 the penthouses.
5. The use of internal float-type low-water cutoff as a primary control is prohibited.
6. 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 Department.
7. Single wall exchangers are prohibited where process water and potable water are interfaced. See the Plumbing Code.

8. Incinerators or access to incinerators shall not be located in boiler rooms.

9. The use of sealants introduced into boilers and piping systems is prohibited.

10. The plugging of boiler tubes is prohibited.

11. Water heaters shall not be used for space heater purposes unless those water heaters meet ANSI Z21.10.1 or ANSI Z21.10.3 for water heaters used in dual purpose applications.

12. Galvanized pipe shall not be used on steam, space heating or process piping systems.

Appendix B Section 2108 is amended:

SAFETY OR RELIEF VALVE DISCHARGE

Sec. 2108. The discharge from relief valves shall be piped to within 18 inches of the floor or to an open receptacle, and when the operating temperature is in excess of 212°F., shall be equipped with a splash shield or centrifugal separator. When the discharge from safety valves would result in a hazardous discharge of steam inside the boiler room, such discharge shall be discharged to the outside atmosphere at a safe location. When condensate can accumulate at the relief valve, a drip-pan ell is required. No valve of any description shall be placed between the safety or relief valve and the boiler, nor on the discharge pipe between the safety valve and the atmosphere. The cross-sectional area of the discharge pipe shall be not less than the full area of the valve outlet, or of the total of the areas of the valve outlets, discharging thereto. It shall be as short and straight as possible and arranged as to avoid undue stresses on the valve or valves.

Appendix B Section 2110 is amended:

GAS PRESSURE REGULATORS

Sec. 2110. An approved gas pressure regulator shall be installed on gas-fired boilers where the gas supply pressure is higher than that at which the main burner is designed to operate. A separate approved gas-pressure regulator shall be installed to regulate the gas pressure to the pilot or pilots. The vent for these regulators should be vented to: (1) a standing pilot; (2) the outside atmosphere; or (3) an approved vent limiting device. A separate regulator shall not be required for the pilot or pilots on manufacturer-assembled boiler-burner units which have been approved by the Building Official and on gas-fired boilers in Group R Occupancies of less than 6 units and in Group M Occupancies.
Appendix B Section 2113 is amended:

**AUTOMATIC BOILERS AND PRESSURE VESSELS**

**Sec. 2113.** Automatic boilers shall be equipped with controls and limit devices as set forth in Table No. 21-C. Automatic boilers shall also be equipped with the following gauges, when applicable: oil temperature, oil suction pressure, high and low gas pressure, stack temperature and windbox pressure.

Unless otherwise approved by the Department in special circumstances, automatic boilers and pressure vessels shall conform to the standards of the ASME Boiler and Pressure Vessel Code.

The Building Official may approve solid fuel-fired boilers that meet the safety requirements for automatic gas- or oil-fired boilers.

Appendix B Section 2115 is amended:

**Sec. 2115.** Boiler rooms and enclosures and access thereto shall comply with Chapter 7 of this code and the Building Code. The installation of sinks in boiler rooms is prohibited.

Appendix B Section 2116 is amended:

**MOUNTING**

**Sec. 2116.** A boiler or water heater shall rest on a concrete or other approved base extending not less than 3 inches above the supporting ground or floor level. Exterior mounting shall not be located closer than 5 feet to any property line.

Appendix B Section 2123 is amended:

**INSPECTION AND TESTING**

**Sec. 2123.**

(a) **Testing and Inspection Responsibility.** The testing of boilers and pressure vessels shall be performed by the permit holder. In addition to the inspections required in Chapter 3 of the Building Code, the inspection of boilers and pressure vessels shall be performed by the Department.

(b) **Owners to Provide Facilities.** Every person owning or having possession or control of any such equipment subject to inspection shall provide, at his own expense, proper arrangements and facilities for attaching the instruments of inspection. Immediately before the time set for such inspection, every such person shall remove all scale, dirt, soot and sediment in, beneath and around the equipment. When directed by the Department, a hydrostatic test shall be performed by a licensed steam and hot water heat contractor or boiler maker contractor in accordance with the provisions of the National Board Inspection Code (NBIC),
Appendix Sec. 2123

and witnessed by the Department. The hydrostatic test pressure need be no greater than the set pressure of the safety valve having the lowest setting and shall not exceed 1½ times the maximum allowable working pressure of the boiler. When hydrostatic pressure test is deemed necessary by the Department, an internal examination shall be performed prior to the hydrostatic pressure test.

(c) Equipment Tests. When leaks occur that prevent a successful test, the Department shall make a second test upon receiving notice that all leaks have been repaired. If, upon making a second test, such equipment is still defective, the owner or user thereof shall pay an additional inspection fee as provided in Chapter 3 of the Building Code for each subsequent test. The Department shall not issue a certificate until fully satisfied that the equipment is safe.

(d) Piping Systems. Piping systems shall be pressure tested to a minimum of 1½ times working pressure or 100 psig whichever is greater.

(e) Inspection Fees. See Chapter 3 of the Building Code.

Appendix B Section 2124, Exception is amended:

EXCEPTION: The operation only of steam heating boilers, low-pressure hot-water-heating boilers, hot-water-supply boilers and pressure vessels in Group R Occupancies of one or two dwelling units and in Group M Occupancies.

Appendix B Section 2125. Maintenance Inspection is deleted.

Appendix B Section 2127 is amended:

Delete all references to asbestos cement piping.

Appendix B Section 2127 paragraph 1 is amended:

1. Those portions of piping systems in which the pressure exceeds 160 psig or the temperature exceeds 250°F shall comply with the ASME Boiler and Pressure Vessel Code, ASME/ANSI B31.1 Power Piping, and with the requirements of paragraph 2 below.

Appendix B Section 2128 is added:

USED EQUIPMENT

Sec. 2128.

(a) General. This Section shall not be construed to prevent the use or reinstallation of a boiler or pressure vessel, provided that it conforms to the requirements of this Chapter governing new or existing installations.

(b) Working Pressure. The maximum allowable working pres-
sure of a boiler or pressure vessel carrying the ASME Code symbol shall be determined by the applicable sections of the ASME Code under which it was constructed and stamped.

(c) **Non-Standard Working Pressure.** The maximum allowable working pressure of a boiler or pressure vessel which does not carry the ASME Code symbol shall be computed in accordance with the Inspection Code of the National Board of Boiler and Pressure Vessel Inspectors.

(d) **Used Equipment.** Before a used boiler or pressure vessel may be installed, an inspection shall be made by a Denver licensed steam and hot water heating or boilermaker contractor.

**EXCEPTION:** For equipment to be installed in one- and two-unit dwellings, the boiler may be inspected by a hot water heating contractor.

(e) Used boilers and pressure vessels shall be hydrostatically tested in accordance with requirements outlined in the National Board Inspection Code (NBIC). The hydrostatic test shall be witnessed by a member of the Department. Test results and written certification of the boiler condition shall be submitted by the licensed contractor to the Department and approved prior to installation.

(f) **Reinstallation.** Where a stationary boiler or pressure vessel is moved and reinstalled, the fittings and appurtenances shall comply with the requirements for new installations.

Appendix B Section 2129 is added:

**CENTRAL UTILITY STEAM**

Sec. 2129.

(a) **General.** Steam piping from any central utility heating system entering into an individual building shall be provided with a steam shutoff valve of the same size as the supply pipe to the building and shall be installed near the entrance of the pipe to the building. Connections to the steam supply of building piping shall be made on the building or load side of the valve.

(b) **Reducing Valve Required.**

1. Where the steam pressure supplied from such systems is of greater pressure than the design pressure of the heating equipment or other equipment used in the building, an approved reducing valve shall be installed to regulate the steam pressure to this equipment.

2. A bypass line installed around the pressure reducing valve shall be at least ½ the size of the reducing valve and shall be controlled by a globe-type stop valve.
3. On the downstream side or low pressure side of the reducing valve, a steam gauge and low pressure relief or safety valve shall be installed and set at maximum pressure at which the low pressure heating system is designed to be operated.

(c) **Return Condensate.** The return condensate from a building heated by a central steam supply may be discharged either into a return condensate system or wasted into a sewer drain connection or approved leaching well. Condensate discharging into a sanitary sewer system shall be sufficiently cooled so that the temperature of the discharge water is not in excess of 180°F. The discharge cannot be directly connected to any sanitary sewer system. The discharge shall be to an open floor drain, special drain connection or approved receptor. If the floor drain or drain connection to the sewer is above the level of the return piping so that it cannot flow by gravity, an automatic sump pump shall be installed so that the condensate can be discharged and pumped from the sump to the sewer drain.

Appendix B Section 2130 is added:

**STANDARDS**

**Sec. 2130.** Unless otherwise provided for in the Building Code, the following Standards shall apply:

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<th>ORGANIZATION</th>
<th>TITLE OF PUBLICATION</th>
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<td>AISI</td>
<td>American Iron and Steel Institute C-140 Flow Chart and Sizing Tables.</td>
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<td>ANSI</td>
<td>Pipe Threads (Except Dryseal), 82.1-1968.</td>
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<td>Petroleum Refinery Piping, B31.3-1980</td>
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<td></td>
<td>Refrigeration Piping, B31.5-1983</td>
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<td>ASHRAE</td>
<td>1984 Systems</td>
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<td>1985 Handbook of Fundamentals</td>
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<td>1982 Applications</td>
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<td>1983 Equipment Volume</td>
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<tr>
<td></td>
<td>Heating Boilers, Section IV, 1989.</td>
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<tr>
<td></td>
<td>Recommended Rules for Care and Operation of Heating Boilers, Section VI, 1989.</td>
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</table>
Recommended Rules for Care of Power Boilers, Section VII, 1989.
Pressure Vessels, Section VIII, 1989.
Welding and Brazing Qualifications - Section IX 1989

ASTM Surface Burning Characteristics of Building Materials, E84-77.


LEGEND

AISI American Iron and Steel Institute
1000 16th Street N.W.
Washington, D.C. 20036

ANSI American National Standards Institute
1430 Broadway
New York, NY 10018

API American Petroleum Institute
1801 K Street N.W.
Washington, D.C. 20006

ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
1791 Tullie Cir. N.E.
Atlanta, GA 30329

ASME American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017

ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

NBBI National Board of Boiler and Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, OH 43229

Appendix B Table No. 21-C, footnote #8 is amended to:
change the number of units in which the boiler controls may be tested without system drainage in Group R Occupancies from "less than 6" to one or two dwelling units.
Appendix B Section 2211(d) is amended:

(d) Inlet Location. The gas piping inlet shall be located adjacent to the approved meter location. Gas pipe entry into the building shall be above grade.

Appendix B Section 2211(f) is amended:

(f) Meter Location. Gas meters shall not be located under a show window or under interior stairways or in engine, boiler, heater, or electric meter rooms. Where not prohibited by other regulations, gas meters may be located in the open under exterior stairways. Gas meters shall not be located in or under any building unless the meter is located in its own dedicated vault that is adequately ventilated.

Appendix B Section 2212 first paragraph is amended:

MATERIAL FOR GAS PIPING

Sec. 2212. Pipe used for the installation, extension, alteration or repair of gas piping shall be malleable black iron pipe or, when special circumstances dictate, internally tinned copper pipe or tubing. Polyethylene pipe meeting the standards of ASTM D2513-86A may be used in exterior buried piping systems. The use of PVC or cast iron for any gas piping is prohibited.

Appendix B Section 2213(b) is amended:

(b) Location. Gas piping shall not be installed in or on the ground under any building or structure, and exposed gas piping shall be kept at least 6 inches above grade 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. Welded or threaded gas piping may be installed in concealed spaces provided that bushings, unions, valves, plugged 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.

Appendix B Section 2214 is amended:

APPLIANCE CONNECTORS

Sec. 2214. Appliance connections shall be installed in accordance with Section 503(c) of the Uniform Mechanical Code.

Appendix B Section 2219(a) is amended:

(a) General. Where the maximum demand does not exceed 250 cubic feet per hour and the maximum length of piping
between the meter and the most distant outlet is not over 250 feet, the size of each section and each outlet of any system of gas piping shall be determined by means of Table No. 22-D. Other systems within the range of Table No. 22-D may be sized from that table or by the methods set forth in subsection (b) below. Table No. 22-J, representing Denver's condition of altitude and .67 specific gravity gas, may be used to size gas piping systems.

Section 2220(c) is amended:

Sec. 2220.

(c) Pressure Regulators. Approved regulators shall be installed on medium- and high-pressure gas piping systems in approved locations, and shall be accessible for servicing. 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 Department.

EXCEPTION: Pounds-to-inches water-column regulators equipped with limiting orifices capable of releasing not more than 5 cubic feet of gas per hour when regulators have been approved by the Department. These regulators shall:

1. Be connected to the same piping material used to pipe the structure.

2. Have an approved gas valve in the supply line upstream of the pounds-to-inches water-column regulator.

3. Be accessible.

4. Have the upstream pressure identified. Such identification shall be a metal tag permanently attached to the regulator and state: Warning ½ to 5 pounds natural gas pressure. DO NOT REMOVE.

5. Be installed in a location that communicates with a ventilated area.

An approved gas valve shall be installed immediately preceding each regulator. Regulators that may be subjected to mechanical damage shall be substantially protected to the satisfaction of the Department.

Appendix C Reference Standards is amended to include the following Standards.

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<tr>
<td>NFPA 90A</td>
<td>Installation of Air Conditioning and Ventilating Systems - 1989</td>
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<td>NFPA 211</td>
<td>Chimneys, Fireplaces, Vents, and Solid Burning Appliances - 1989</td>
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### Appendix C

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<th>NFPA 33</th>
<th>Spray Application Using Flammable &amp; Combustible Liquids - 1985</th>
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<td>NFPA 37</td>
<td>Stationary Combustion Engines &amp; Gas Turbines - 1990</td>
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<td>Health Care Facilities - 1990</td>
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<td>Incinerators, Waste and Liner Handling Systems &amp; Equipment - 1990</td>
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<td>NFPA 91</td>
<td>Blower and Exhaust Systems - 1990</td>
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</table>
Appendix B Table No. 22-J is added:

### TABLE 22-J

**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

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UPC
DIV. 3
DIVISION 3

AMENDMENTS

TO THE

1991 EDITION OF THE UNIFORM PLUMBING CODE

AND

APPENDIX
DENVER AMENDMENTS TO THE UNIFORM PLUMBING CODE BY
PARTS, CHAPTERS AND SECTIONS

The following Chapters and Sections have been amended by the Denver Amendments to the UPC.

**Part I - Administration**

**Part II - Installation Requirements**

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Sec. 102

> Part I Administration, of the Uniform Plumbing Code ("UPC") is deleted. The administrative provisions of UBC Chapters 1, 2 and 3 as amended by Denver shall govern.

Part II Installation Requirements.

Section 102(l) is added:

(i) Area Drain - A drain installed to collect surface or rainwater from an open area.

Section 103(r) is added:

(r) Branch Interval - A length of waste stack not less than 8 feet in length or height, within which horizontal branches are connected to the stack.

Section 104(b) Cesspool is deleted.

Section 104(e) is amended:

(e) Combination Waste and Vent System - A specially designed system of waste piping embodying the horizontal wet venting of one or more sinks, lavatories, drinking fountains or floor drains by means of a common waste and vent pipe, adequately sized to provide free movement of air above the flow line of the drain.

Section 104(n) and (o) are added:

(n) Control Valves - the valves controlling distribution of water from the sprinkler supply line to sprinkler distribution pipes. The valves may be installed singly or in manifold.

(o) CPVC - Chlorinated Polyvinyl Chloride.

Section 105(h), (l), (j) and (k) are added:

(h) Dead End - A branch leading from a waste, vent, building drain or building sewer which is terminated at a developed length of 2 feet or more by means of a cap, plug or other closed fitting.

(i) Downspout - A water conductor that does not connect to a disposal system. (Also see Leader.)

(j) Dwelling - Any building or portion thereof which contains not more than 2 dwelling units.

(k) Dwelling Unit - Any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and sanitation for not more than one family.

Section 107(l) and (m) are added:

(l) Floor Drain - An opening in the floor used to drain water from floors into the plumbing system.
Sec. 107

(m) **Floor Sink** - A receptor in the floor used for the waste discharged from indirect drain piping.

Section 108(b) is amended:

(b) **Grease Interceptor** - See Interceptor.

Section 108(c) **Grease Trap** is deleted.

Section 110(a) is amended:

(a) **Indirect Waste Pipe** - A pipe that does not connect directly with the drainage system but conveys liquid wastes by discharging, through an air break or air gap, into a plumbing fixture or receptacle that is directly connected to the drainage system.

Section 110(f) is added:

(f) **Irrigation Control Valves** - The valves controlling distribution of water from the sprinkler supply line to sprinkler distribution pipes. The valves may be installed singly or in a manifold.

Section 113(h) is added:

(h) **Leader** - A water conductor from the roof to the building storm drain.

Section 114(f) is added:

(f) **Municipal Water System** - The system by which water is supplied to the City and its inhabitants.

Section 117(s) is added:

(s) **Pressure Lines** - A water line designed or intended to contain water under continuous pressure.

Section 119(g) is added:

(g) **Roof Drain** - A drain or receptacle installed to receive water collecting on the surface of a roof and to discharge it to a leader or downspout.

Section 120(r), (s), (t), (u), (v) and (w) are added:

(r) **Sanitary Sewer** - A pipe that carries sewage exclusive of storm, surface and groundwater.

(s) **Service Line** - Pipes conveying water from the water main to the building.

(t) **Sewage Ejector** - A nonclogging type pump designed for conducting sewage collected from sanitary plumbing fixtures in the building.

(u) **Sprinkler Distribution Pipe** - A water line not under continuous pressure conveying water from the control valves to the sprinkler heads.
Sec. 120

(v) Subsoil Drain - A drain or pipe that receives only subsurface water and conveys it to a place of disposal.

(w) Sump Pump - A pump that handles only clear waste or storm water.

Section 124(j) and (k) are added:

(j) Water Storage Facility - A reservoir, cistern, storage tank, water supply tank or similar facility utilized to store water in a water supply system.

(k) Weir - The level at which water leaves the outlet of a trap.

Section 201(a) is amended:

(a) Unless otherwise provided for in this Code, all materials, fixtures, or devices used or entering into the construction of plumbing and drainage systems, or parts thereof, shall conform to approved applicable standards, or to other equivalent standards acceptable to the Administrative Authority, and shall be free from defects.

Section 203(a) is amended:

(a) Underground Drainage. Copper tube for underground drainage and vent piping shall have a weight of not less than that of type L copper drainage tube.

Section 203(d) is amended:

(d) Water Piping. Copper tube for water piping shall have a weight of not less than type L.

EXCEPTION: Type M copper tubing may be used for water piping when piping is above ground in or on a building.

Section 207(c) is amended:

(c) Cleanout. Cleanouts shall be designed to be gas and water tight.

Section 208(a) is amended:

(a) Screwed fittings. Screwed fittings shall be ABS, cast iron, copper, copper alloy, malleable iron, PVC, CPVC, polypropylene, steel or other approved materials. Threads shall be tapped out of solid metal or molded in solid ABS, PVC, CPVC or polypropylene.

Section 303(c) is amended:

(c) Wastewater Management Division. Uniform Plumbing Code provisions for wastewater quality control facilities, inside and/or outside of any structure, shall be administered and enforced by the Wastewater Management Division (WMD). These facilities include and are not limited to pretreatment devices such as grease, sand and oil interceptors, acid neutralization tanks, silver recovery units; swimming pool discharge; area drains;
control manholes; flow equalization facilities; flow meters; and inspection chambers. Construction of all storm and sanitary sewers, facilities and service connections from a point 2 feet outside the structure to the point of connection at the public sewer system is within the purview of the WMD and thus must be approved by the WMD and meet all applicable WMD standards.

References:
1. Rules and Regulations Governing Sewage Charges and Fees and Management of Wastewater, Wastewater Management Division.
4. Directives, Procedures and Standards, Wastewater Management Division.

Section 310(h) is added:
(h) **Dead Ends.** In the installation or removal of any part of a drainage system, dead ends shall be avoided except where necessary to make a cleanout accessible.

Section 401(a)(4) is added:
4. No vitrified clay tile shall be installed under or within 2 feet of any building or structure.

Section 504(a) is amended:

**SIZE OF VENTS**

Sec. 504.
(a) The size of vents shall be determined from its length and the total number of fixtures connected thereto, as set forth in Table 4-3 of this Code. In addition, the drainage piping of each building and each connection to a public sewer or a private sewage disposal system shall be vented by means of one or more vents, one of which must be 3" or larger, the aggregate cross-sectional area of which shall not be less than that of the largest required building sewer, as determined from Table 4-3.

Section 606 is added:

**FOOD WASTE DISPOSERS**

Sec. 606. An approved food waste disposer shall be required whenever food is to be prepared either commercially or in a kitchen area consisting of a refrigerator, sink, and stove.
Section 608(d) is amended:

Sec. 608.

(d) 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 stand pipe.

Section 609 is amended:

COOLING WATER

Sec. 609. Domestic water used for cooling purposes shall be consumed or recycled and shall not be wasted to storm sewer, sanitary sewer, above-ground drainage or below ground drainage unless specifically approved by the Department.

EXCEPTION: Diesel-drive fire pump.

Section 610 is amended:

DRINKING FOUNTAINS.

Sec. 610. Drinking fountains shall not be installed with indirect wastes.

Section 612(h) is amended:

(h) Minor Installations. The provisions in this Section, relative to materials and methods of construction, may not apply to minor installations such as small photographic or X-ray dark rooms or small research or control laboratories where minor amounts of adequately diluted chemicals are discharged as approved by Wastewater Management Division.

Section 613 is amended to have a new title and amend subsection (a) and (b):

HORIZONTAL AND VERTICAL WET VENTING

Sec. 613.

(a) Vertical Wet Venting.

1. Wet venting is limited to vertical drainage piping receiving the discharge from the trap arm of one (1) and two (2) fixture unit fixtures that also serves as a vent for not to exceed four (4) fixtures. All wet vented fixtures shall be on the same floor level; provided, further, that fixtures with a continuous vent discharging into a wet vent shall be on the same floor level as the wet vented fixtures.
2. The vertical piping between any two (2) consecutive inlet levels shall be considered a wet vented section. Each wet vented section shall be a minimum of one (1) pipe size larger than the required minimum waste pipe size of the upper fixture or shall be one (1) pipe size larger than the required minimum pipe size for the sum of the fixture units served by such wet vented section, whichever is larger, but in no case less than two (2) inches (50.8 mm).

3. Common vent sizing shall be the sum of the fixture units served but in no case smaller than the minimum vent pipe size required for any fixture served, or by Section 504.

(b) Horizontal Wet Venting.
Single bathroom groups, a single bathroom group of fixtures may be installed with the drain from an individually vented lavatory or lavatories serving as a wet vent for a bathtub, shower compartment, or floor drain and for a water closet provided the requirements listed below are met:

1. Not more than four fixture units drain into a minimum 2 inch diameter wet vent. Kitchen sinks, dishwashers, or automatic dishwasher connections are not permitted.

2. The horizontal branch drain connects to the stack at the same level as the water closet drain; or it may connect to the upper half of the horizontal portion of the water closet bend at an angle not greater than 45 degrees from the direction of flow.
3. Trap arm sizes and lengths shall conform to Tables 4-1, 4-3, and 7-1.

Section 708 is amended by adding illustration:

Illustration - minimum requirements for oil or sand interceptor.

SAND/OIL INTERCEPTOR
Minimum capacity of oil & sand interceptors shall be 6 cubic feet plus 1 C.F. for each vehicle washed during a 24 hour period. Maximum depth permitted is 12" below grade.

For concrete or hard surface, extend top ring & install iron ring & cover.

Location depends on fire regulations and other considerations. If gas tight cover is provided, interceptor may be installed inside of structure.

Section 712 is amended:

Sec. 712. Grease Interceptor For Commercial Kitchens. When grease interceptors are required, the sizing criteria shall comply with that contained in Appendix H.

EXCEPTION: Alternative sizing as approved by Wastewater Management Division.
Section 713 is amended:

FOOD AND WASTE DISPOSAL REQUIREMENTS

Sec. 713. All food waste disposals in commercial kitchens shall be connected to and discharge into a grease interceptor. 

EXCEPTION: Vegetable preparation area disposal.

Section 802(h) Asbestos Cement Sewer Pipe Joints is deleted.

Section 804(g) is added:

(g) Expansion and Contraction. For plastic sanitary drainage and vent systems, restraint and expansion fittings shall be used at each branch interval or each vertical 25 feet, whichever is less, to accommodate movement due to contraction and expansion.

Section 901 is amended:

MATERIALS - CONSERVATION - GENERAL REPLACEMENTS

Sec. 901.

(a) Quality of Fixtures. Plumbing fixtures shall be constructed of dense, durable, nonabsorbent materials and shall have smooth, impervious surfaces, free from unnecessary concealed fouling surfaces. Except as permitted elsewhere in this Code, all fixtures shall conform in quality and design to nationally recognized applicable standards or to other approved standards acceptable to the Department. All porcelain enamel surfaces on plumbing fixtures shall be acid resistant. Water closet bowls for public use shall be elongated bowls equipped with open-front seats. Water closet seats shall be of smooth nonabsorbent material and shall be properly sized for the water closet bowl type. (For the convenience of users of this Denver Code, a list of generally accepted plumbing fixture standards is included in Table A at the end of Chapter 2 of this Code.)

Section 901(b) is added:

(b) Conservation in New Commercial, Industrial and Public Use Construction. All plumbing fixtures in new commercial, industrial and public use construction shall meet the following requirements for water use.

1. All water closets shall be designed to use a maximum of 1.6 gallons per flush. All closets shall be listed with an approved listing agency.

   EXCEPTION: Where flushometer valves are used, up to 3.5 gallons per flush is approved.

2. Shower heads for the purpose of bathing and washing shall have a maximum flow rate of 2.5 gallons per minute at 80 psig.
3. All lavatories shall be equipped with faucets that either deliver a maximum flow of 0.5 gallons per minute at 60 psig; that are equipped with metering valves that close automatically after delivering a maximum of .25 gallon; or that are controlled by an infrared or other device so that they operate only upon demand with a maximum flow rate of 0.5 gallons per minute at 60 psig, except required handicapped facilities may be equipped with faucets designed for handicapped.

4. Allowance of Standard Fixtures. The Department may allow the use of a standard fixture when, in its opinion, conformance would cause a health hazard or unusual hardship, would not accomplish the intent of this Section, or would require a greater quantity of water to be used to properly operate the fixture.

EXCEPTIONS: Hazardous waste handling facilities and health care facilities shall be exempted from the requirements of this section, except for their restroom facilities used exclusively by visitors.

Section 901(c) is added:

(c) Conservation in New Residential Construction. All plumbing fixtures in new residential construction shall meet the following requirements for water use:

1. All water closets shall be designed to use a maximum of 1.6 gallons per flush. All closets shall be listed with an approved listing agency.

   EXCEPTION: Where flushometer valves are used, up to 3.5 gallons per flush is approved.

2. Shower heads for the purpose of bathing and washing shall have a maximum flow rate of 2.5 gallons per minute at 80 psig.

3. Kitchen and service faucets shall have a maximum flow of 2.2 gallons per minute at 60 psig. Residential hose bibs shall be exempted.

4. Lavatory faucets shall have a maximum flow of 2.2 gallons per minute at 60 psig.

5. Allowance of Standard Fixtures. The Department may allow the use of a standard fixture when, in its opinion, conformance would cause a health hazard or unusual hardship, would not accomplish the intent of this section, or would require a greater quantity of water to be used to properly operate the fixture.

Section 901(d) is added:

Sec. 901.

(d) Definitions.

1. Commercial, industrial and public construction, as used
in Sections 901(b) and 901(c) of this Chapter, means all restrooms and bathrooms in commercial, industrial and public establishments, including but not limited to restaurants, bars, night clubs, public buildings, comfort stations, schools, gymnasiums, factories, offices and athletic clubs.

2. Residential construction, as used in Sections 901(b) and 901(c) of this Chapter, means all single-family residences and any accessory guest houses, multi-family dwellings, row houses, apartments, condominiums, townhouses, hotels, and motels.

3. New construction, as used in Sections 901(b) and 901(c) of this Chapter, shall not include redecoration, renovations or additions to existing structures.

4. Water closet, as used in Sections 901(b) and 901(c) of this Chapter, means any fixture consisting of a water-flushed bowl, with a seat, used for the disposal of human wastes.

5. Urinal, as used in this Chapter, means any fixture consisting of a water-flushed bowl used for the disposal of human urine.

Section 908(a) is amended:

Sec. 908.

(a) Automatic Flushing Tanks. The use of Automatic Flushing Tanks which flush more than one urinal at a time shall be prohibited.

Section 908(c) is added:

Sec. 908.

(c) All urinals shall be designed to use a maximum of one (1) gallon per flush. No urinal shall be installed which use a timing device to flush periodically irrespective of demand.

Section 910 is amended:

PLUMBING FIXTURES REQUIRED

Sec. 910. Each building shall be provided with the minimum sanitary facilities for various occupancies as listed in Appendix C of this Code. Each plumbing fixture shall be equipped with hot and cold running water as necessary for its normal operation.

(a) Location of Toilet Facilities. Facilities shall be installed in a location convenient to occupied areas served by them and not more than 300 feet and one floor removed from any portion of the occupied area.

(b) Restroom. Separate toilet room facilities shall be provided for males and females, unless otherwise allowed in this Code. Toilet room facilities shall be completely enclosed or screened to
ensure privacy. A toilet room utilized by both sexes shall be identified as a "Restroom".

(c) 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.

(d) Toilet Room Accessories. A minimum of one hand-drying facility shall be provided in each toilet room where lavatories are provided.

(e) 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.

(f) Urinals for Women. Women's urinals may be installed only under the following conditions:

1. Urinals may be installed as auxiliary fixtures and shall not be considered as substitutes for required water closets. The required minimum number of water closets shall be provided in all cases.

2. Urinals shall be in enclosed compartments with doors for privacy.

(g) Coin-Operated Toilets. Toilet facilities for public use and provided with coin-operated or other external locking devices shall be provided only in addition to the toilet room facilities required by this Code.

(h) Occupancy/Ratio of Sexes. To determine the number of occupants in a building or portion thereof, see Table No. 33-A of the Uniform Building Code. In buildings occupied by both sexes, the ratio of male to female facilities shall be established on the basis of 50% male and 50% female occupants, except when the building or portions thereof are designed and intended for an imbalanced division of the sexes. For imbalanced situations, the number of fixtures for each sex shall be installed on the basis of the actual or intended ratio of male to female occupants of the building or portion thereof.

Section 913 is added:

SINKS

Sec. 913.

(a) Waste Outlets. Sinks shall be provided with waste lines at least 1 1/2 inches in diameter. Waste outlets shall have open strainers or stoppers.
(b) **Commercial Sinks.**

1. All commercial sinks, such as bar sinks and dishwashing sinks, used in food preparation areas shall be installed so that any drainage backup is relieved through a floor drain placed next to the fixture.

2. Sinks used in the direct preparation of foods, such as salad sinks and frozen food sinks where food is prepared, stored or thawed, shall be connected indirectly to a floor sink located as near as possible to the food preparation sink.

(c) **Waste Lines.** All kitchen-type sinks with a garbage disposal and dishwasher installed in residential or commercial lunch rooms shall have a minimum of a 2-inch waste line.

**Section 1003** is amended:

1. Delete table "Backflow Assemblies, Devices and Methods," page 84.

2. Add table "Backflow Preventer Applications."

**Section 1003(b) is amended:**

Sec. 1003.

(b) The premise owner or responsible person shall have the backflow preventer assembly tested by a certified backflow tester at the time of installation, repair, or relocation.

**Section 1003(m) is amended:**

(m) **Lawn Sprinkling Systems.**

1. In addition to the other requirements of the Uniform Plumbing Code, this Section shall govern the design, construction and installation of lawn sprinkler systems connected to the potable water supply.

2. Lawn Sprinkler Systems shall include apparatus and equipment affixed permanently to the property in the lawn, ground, flower beds or fence, connected to the potable water supply, and normally used for the purpose of irrigation. Connection to the water supply includes connections to the hose bibs and permanent connections to the water supply line.

3. Design and installation of sprinkler systems shall, under calm wind conditions, prevent spray of water onto sidewalks, streets or other public ways.

4. Pipes shall be sloped to drain. Drain valves shall drain into a sump or gravel pocket.

5. Cross connections shall not be made between the potable water supply and any other source of water.

6. Connection to the potable water supply may be made either at the service line or at the water distribution line. In either
case, the connection shall be made at least 5 feet downstream from the water meter. Provisions shall be made to protect the sprinkler supply line from freezing.

7. An approved back-flow preventer shall be installed in all lawn sprinkler systems. The back-flow preventer, unless of the reduced pressure type, shall be installed at least 6 inches above the highest sprinkler head.

8. In addition to meeting the requirements specified in Appendix A, tubing under pressure to the irrigation control valves shall be capable of withstanding a minimum of 125 psi.

9. All pipe and fittings downstream of the irrigation control valves and backflow devices shall be capable of withstanding a continuous working pressure of 80 psi.

10. Each pipe fitting, sprinkler head, valve or device used in a lawn sprinkler system shall have the manufacturer’s name and type or classification indelibly marked on it. Each length of pipe shall be so marked continuously along its length.

11. The following standards shall apply:

Organization:
American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

Title of Publication:
Poly (Vinyl Chloride) Plastic Pipe Schedules, D-1785, 1974
Poly (Vinyl Chloride) Plastic Pipe, Specs. for, D-2241, 1974
Polyethylene Plastic Pipe, Specs. for, D-2239-1974
Polyethylene Plastic Tubing, Specs. for, D-2737-1974

Section 1007(e) is amended:

Sec. 1007.
(e) Relief valves located inside a building shall be provided with a drain, not smaller than the relief valve outlet, of galvanized steel, hard drawn copper pipe and fittings, CPVC or PB with fittings which will not reduce the internal bore 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 as an indirect waste. Such drains may terminate at other approved locations. No part of such drain pipe shall be trapped and the terminal end of the drain pipe shall not be threaded. A maximum of three (3) elbows is allowed in the discharge piping.

Whenever a drain pan is used as a receptacle for receiving the discharge from a relief valve, the drain pipe from the drain pan
shall be at least two (2) pipe sizes larger than the relief valve outlet.

Section 1101(d) is amended:

(d) Public Sewer. The public sewer shall not be considered available when it is more than 300 feet from the nearest point of the property line or the building to be served is more than 1000 feet from such public sewer.

Section 1105 is amended:

SIZE OF BUILDING SEWERS

Sec. 1105. The minimum size of any building sewer shall be determined on the basis of the total number of fixture units drained by such sewer, in accordance with Table 11-2. In no case shall the building sewer size be less than 4 inches inside diameter.

Section 1307 is amended:

ENCLOSURES AND COMBUSTION AIR

Sec. 1307. All fuel-fired water heaters shall be provided with combustion air in accordance with Chapter 6 of the Uniform Mechanical Code.

Section 1309 is amended by adding a new paragraph:

PROHIBITED LOCATIONS

Water heaters shall not be located in any area where the water heater and connected piping is subject to freezing.

Section 608(d) Illustration
## BACKFLOW PREVENTER APPLICATIONS

<table>
<thead>
<tr>
<th>TYPE OF CONNECTION</th>
<th>DEGREES OF HAZARD</th>
<th>TYPES OF PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severe</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Direct Water Connections subject to pressure -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Pumps, tanks and lines handling:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Sewage and lethal substances</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Toxic substances¹</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Non-toxic substances²</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>B. Water connection to steam and Steam Boiler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Boiler or steam connection to toxic substances¹</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Boiler or steam connection to non-toxic substances² (boiler blow-off through approved gap)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>C. Hot water heating boilers, generators or pressure vessels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Connection to toxic substance¹</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Connection to non-toxic substances²</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>D. Fire Sprinkler Line</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- X: Requirement indicated
- (): Optional indication

Notes:
1. Toxic substances include substances that are hazardous to human health.
2. Non-toxic substances include substances that are not hazardous to human health.
### BACKFLOW PREVENTER APPLICATIONS (Continued)

<table>
<thead>
<tr>
<th>TYPE OF CONNECTION</th>
<th>DEGREES OF HAZARD</th>
<th>TYPES OF PROTECTION</th>
<th>All Others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severe</td>
<td>Moderate</td>
<td>Minor</td>
</tr>
<tr>
<td>II. Direct or Indirect Water Connections not subject to pressure:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Low inlet to receptacles containing toxic substances¹</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>B. Low inlet to receptacles containing non-toxic substances²</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>C. Lawn sprinkler systems (chemical injection prohibited)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>D. Coils or jackets used as heat exchangers in compressors, degreasers or other equipment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. In Sewer Lines</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2. In toxic substances¹</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. In non-toxic substances²</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Flush valve toilets &amp; urinals</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Toilet and urinal tanks</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>G. Valved outlets or fixtures with hose attachments which may constitute a cross-connection:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Toxic substances¹</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Non-toxic substances²</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

¹ Toxic substances include substances that are harmful or deadly to human beings or animals, or that cause injury or damage to property.

² Non-toxic substances include substances that are not harmful or deadly to human beings or animals, and that do not cause injury or damage to property.
### BACKFLOW PREVENTER APPLICATIONS (Continued)

<table>
<thead>
<tr>
<th>TYPE OF CONNECTION</th>
<th>DEGREES OF HAZARD</th>
<th>TYPES OF PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Severe</td>
<td>Reduced Pressure Backflow Preventer Assembly</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Pressure Vacuum Breaker Assembly</td>
</tr>
<tr>
<td></td>
<td>Minor</td>
<td>Atmospheric Vacuum Breaker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check Valve (Spring Loaded) Assembly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All Others</td>
</tr>
<tr>
<td>H. Water connected into domestic water tanks</td>
<td>X</td>
<td>Each Case Treated Separately</td>
</tr>
<tr>
<td>I. Plumbing drainage lines</td>
<td>X</td>
<td>X X X X</td>
</tr>
<tr>
<td>J. Reclaimed or recycled water</td>
<td>X</td>
<td>X X X X</td>
</tr>
</tbody>
</table>

1. **TOXIC SUBSTANCE:** Any substance (liquid, solid, or gaseous) which, when introduced into the water supply system, creates or may create a danger to the health and well being of the consumer.

2. **NON-TOXIC SUBSTANCE:** Any substance or a non-poisonous nature that is potable or edible and that may create a moderate or minor hazard to the domestic water system.

**EXAMPLES:**
1. Connections of food processing lines such as syrups, lard, beer, etc.
2. Connections to steam and steam boilers where the steam does not come in contact with poisonous materials.
3. Steam clean-up connection in food plants, apartment house boilers, or pressing boilers, where toxic compounds are not used.
4. Connections to enclosed circulating systems, such as radiant heating systems and refrigerated water systems, where toxic compounds are not used.

3. **DEVICES ARE REQUIRED TO BE TESTED**

4. **MINIMUM DOUBLE CHECK VALVE.**
### APPENDIX C
### MINIMUM PLUMBING FACILITIES

Each building shall be provided with sanitary facilities, for use by both the public and employees, including provision for the physically handicapped (See Section 910, Plumbing Fixtures Required). For Handicapped requirements the design, installation and materials used in all structures shall comply with this Plumbing Code and Chapter 31 amended.

#### FIXTURES PER NUMBER OF OCCUPANTS

<table>
<thead>
<tr>
<th>Type of Building Occupancy</th>
<th>Water Closets</th>
<th>Male Urinals</th>
<th>Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>0:1-9</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>1:1-15</td>
<td>1:1-12</td>
<td>1:10-60</td>
<td>1 per 40</td>
<td>1 per 40</td>
</tr>
<tr>
<td></td>
<td>2:16-35</td>
<td>2:13-24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:30-55</td>
<td>3:25-39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:40-55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assembly Places - Theatres, Auditoriums, Convention Halls, Arenas, Field Houses, Assembly Halls, Stadiums, and similar occupancies - for permanent employee use.</td>
<td>For Additional Occupants</td>
<td>For Additional Males</td>
<td>1 per 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>1 per 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:1-100</td>
<td>3:1-50</td>
<td>1:1-100</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>2:101-200</td>
<td>5:61-100</td>
<td>2:101-200</td>
<td>1 per 40</td>
<td>1 per 40</td>
</tr>
<tr>
<td></td>
<td>3:201-400</td>
<td>8:101-200</td>
<td>3:201-400</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11:201-400</td>
<td></td>
<td>4:401-600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants</td>
<td>For Additional Males</td>
<td>1 per 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>1 per 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 per 125</td>
<td></td>
<td>1 per 300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 per 500</td>
<td></td>
<td>1 per 500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 per 160\textsuperscript{12} Min. .1 per Floor
## APPENDIX C
### MINIMUM PLUMBING FACILITIES

#### FIXTURES PER NUMBER OF OCCUPANTS

<table>
<thead>
<tr>
<th>Type of Building Occupancy</th>
<th>Water Closets</th>
<th>Male Urinals (8,10,18)</th>
<th>Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains (8,13)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dormitories</strong> (9-10) - School or Labor</td>
<td>Male</td>
<td>Female</td>
<td>1 per 10</td>
<td>1 per 8</td>
<td>1 per 25</td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants</td>
<td>1 per 25</td>
<td>1 per 60</td>
<td>1 per 50</td>
<td>1 per 20</td>
</tr>
<tr>
<td><strong>Dormitories</strong> (9-10) - For Staff Use</td>
<td>Male</td>
<td>Female</td>
<td>1:1-15</td>
<td>1:1-12</td>
<td>0:1-10</td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants</td>
<td>1:1-60</td>
<td>1:11-60</td>
<td>1:11-60</td>
<td>1:11-60</td>
</tr>
<tr>
<td><strong>Dwellings</strong> (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Dwelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Dwelling or Apartment House (16)</td>
<td>1 per dwelling unit</td>
<td>1 per dwelling unit or apartment unit</td>
<td>1 per dwelling unit</td>
<td>1 per dwelling unit or apartment unit</td>
<td>1 per dwelling unit</td>
</tr>
</tbody>
</table>

---

1. Males over 160
2. 1 per 160
3. For male, add 1 additional bathtub per 30. Over 150 occupants, add 1 fixture per 20
4. Min. 1 per Floor
5. 1 per 150
## APPENDIX C

### MINIMUM PLUMBING FACILITIES

<table>
<thead>
<tr>
<th>Type of Building Occupancy</th>
<th>Water Closets</th>
<th>Male Urinals</th>
<th>Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiting Room</td>
<td>1 per room for each sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For employee use</td>
<td>Male 1:1-12</td>
<td>Male 1:1-15</td>
<td>Male 0:1-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female 1:1-12</td>
<td>Female 1:1-15</td>
<td>Female 1:1-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants 1 per 40</td>
<td>For Additional Males 1 per 50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Room</td>
<td>1 per room</td>
<td></td>
<td>1 per room for each sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward Room</td>
<td>1 per 4 beds</td>
<td></td>
<td>Male 1:1-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female 1:1-30</td>
<td></td>
<td>Female 1:1-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warehouses</td>
<td></td>
<td></td>
<td>1 per 10 patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:101-200</td>
<td>Female 2:31-75</td>
<td>Female 2:31-90</td>
<td>Female 2:31-60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:201-300</td>
<td>3:76-150</td>
<td>3:91-200</td>
<td>3:61-200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Additional Occupants</td>
<td>1 per 160</td>
<td>1 per 160</td>
<td>1 per 160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 per 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Includes drinking fountains at the rate of one per 150 occupants, or one per floor, whichever is greater.
## APPENDIX C
### MINIMUM PLUMBING FACILITIES

**FIXTURES PER NUMBER OF OCCUPANTS**

<table>
<thead>
<tr>
<th>Type of Building Occupancy²</th>
<th>Water Closets¹³</th>
<th>Male Urinals¹⁰,¹²</th>
<th>Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains¹³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshops, Foundries, Parking Structures with attendants and similar occupancies</td>
<td>Male 1:1-30 Female 1:1-10</td>
<td>1:1-10</td>
<td>1 per 10 up to 100 occupants</td>
<td>1 shower for each 15 persons exposed to excessive heat or to skin contamination with poisonous, infectious, or irritating material.</td>
<td>1 per 150¹² Min. 1 per Floor</td>
</tr>
<tr>
<td></td>
<td>2:31-60 2:11-25</td>
<td>2:11-60</td>
<td>3:61-120 4:121-180</td>
<td>1 per 15 over 100 occupants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:91-120 4:51-75</td>
<td>4:121-180</td>
<td>5:181-240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5:121-150 5:76-100</td>
<td>For Additional Occupants</td>
<td>For Additional Males</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 per 60 1 per 30</td>
<td>1 per 60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional other than Hospitals or Penal Institutions (on each occupied floor)</td>
<td>Male 1 per 10</td>
<td>Female 0:1-10 1:1-50</td>
<td>Male 1 per 10</td>
<td></td>
<td>1 per 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Female For additional Males 1 per 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional other than Hospitals or Penal Institutions (on occupied floor for employee use)</td>
<td>Male 1:1-15 1:1-12</td>
<td>Female 0:1-9 1:10-50</td>
<td>Male 1 per 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:16-35 2:13-24</td>
<td></td>
<td>Female 1 per 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:36-55 3:25-39</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:40-55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants</td>
<td>For Additional Males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 per 40</td>
<td>1 per 50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motels or Hotels</td>
<td>1 per Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# APPENDIX C

## MINIMUM PLUMBING FACILITIES

### FIXTURES PER NUMBER OF OCCUPANTS

<table>
<thead>
<tr>
<th>Type of Building Occupancy</th>
<th>Water Closets(^\text{18})</th>
<th>Male Urinals(^\text{8, 10, 18})</th>
<th>Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains(^\text{8, 13})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Office or Public Buildings(^\text{16}) for Public Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 per 150(^\text{12}) Min. 1 per Floor</td>
</tr>
<tr>
<td>Male</td>
<td>1:1-100</td>
<td>1:1-100</td>
<td>1:1-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3:1-60</td>
<td>2:101-200</td>
<td>2:101-200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:101-200</td>
<td>4:51-100</td>
<td>3:201-400</td>
<td>3:201-400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:201-400</td>
<td>5:101-200</td>
<td>4:401-600</td>
<td>4:401-600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:101-400</td>
<td>11:201-400</td>
<td>For Additional Occupants</td>
<td>For Additional Males</td>
<td>For Additional Occupants</td>
<td></td>
</tr>
<tr>
<td>1 per 500</td>
<td>1 per 300</td>
<td>1 per 800</td>
<td>1 per 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Office or Public Buildings(^\text{16}) for Employee Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 per 150(^\text{12}) Min. 1 per Floor</td>
</tr>
<tr>
<td>Male</td>
<td>1:1-15</td>
<td>0:1-10</td>
<td>0:1-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1:1-12</td>
<td>1:11-50</td>
<td>1:11-50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:16-25</td>
<td>2:13-24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:36-55</td>
<td>3:25-39</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:40-55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Additional Occupants</td>
<td>1 per 40</td>
<td>1 per 60</td>
<td>1 per 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Penal Institutions for Employee Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 per 150(^\text{12}) Min. 1 per Floor</td>
</tr>
<tr>
<td>Male</td>
<td>1:1-15</td>
<td>0:1-9</td>
<td>0:1-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1:1-12</td>
<td>1:10-50</td>
<td>1:10-50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:16-25</td>
<td>2:13-24</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3:36-55</td>
<td>3:25-39</td>
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<td></td>
</tr>
<tr>
<td>4:40-55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Additional Occupants</td>
<td>1 per 40</td>
<td>1 per 60</td>
<td>1 per 60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX C

### MINIMUM PLUMBING FACILITIES

**FIXTURES PER NUMBER OF OCCUPANTS**

<table>
<thead>
<tr>
<th>Type of Building Occupancy</th>
<th>Water Closets¹⁸</th>
<th>Male Urinals⁵,¹⁰,¹³</th>
<th>Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains⁸,¹³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Penal Institutions for Prisoner Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell</td>
<td>1 per cell</td>
<td>1 per exercise room</td>
<td>1 per cell</td>
<td>1 per cell block floor</td>
<td>1 per cell block floor</td>
</tr>
<tr>
<td>Exercise Room</td>
<td>1 per exercise room</td>
<td>1 per exercise room</td>
<td>1 per exercise room</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Restaurants and establishments which serve alcoholic beverages¹¹</strong></td>
<td>Male Female 1:1-50 1:1-20</td>
<td>1:1-60</td>
<td>Male Female 1:1-60 1:1-20</td>
<td>1 per 150¹² Min. 1 per Floor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:76-115 5:116-165</td>
<td>4:211-300</td>
<td>4:221-350</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants 1 per 200</td>
<td>For Additional Males 1 per 100</td>
<td>For Additional Occupants 1 per 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Restaurants and establishments which serve no alcoholic beverages¹¹</strong></td>
<td>Male Female 1:1-50 1:1-40</td>
<td>1:1-150</td>
<td>Male Female 1:1-50 1:1-40</td>
<td></td>
<td>Min. 1 per Floor</td>
</tr>
<tr>
<td></td>
<td>2:51-150 2:41-90</td>
<td>2:61-130</td>
<td>2:51-120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:151-230</td>
<td>4:211-300</td>
<td>4:221-350</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants 1 per 200</td>
<td>For Additional Males 1 per 100</td>
<td>For Additional Occupants 1 per 400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX C
### MINIMUM PLUMBING FACILITIES

**FIXTURES PER NUMBER OF OCCUPANTS**

<table>
<thead>
<tr>
<th>Type of Building Occupancy²</th>
<th>Water Closets¹⁶</th>
<th>Male Urinals⁵,¹⁰,¹⁸</th>
<th>Male Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains⁴,¹³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Retail Stores - for public use</strong> <em>(Use same table for employees)</em></td>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
<td>1 per 576 Min. 1 per Floor</td>
</tr>
<tr>
<td>1:1-200</td>
<td>1:1-76</td>
<td>0:1-100</td>
<td>1:1-150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Additional Occupants</td>
<td>For Additional Males</td>
<td>For Additional Occupants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 per 400</td>
<td>1 per 300</td>
<td>1 per 500</td>
<td>1 per 400</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For student use - Nursery</td>
<td>Male Female</td>
<td>Male Female</td>
<td>1:1-25</td>
<td>1 per 150¹²</td>
<td>Min. 1 per Floor</td>
</tr>
<tr>
<td>1:1-20</td>
<td>1:1-20</td>
<td>2:26-50</td>
<td>For Additional Occupants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:21-50</td>
<td>2:21-50</td>
<td></td>
<td>1 per 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Additional Occupants</td>
<td>For Additional Occupants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 per 60</td>
<td>1 per 60</td>
<td>1 per 60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Child Care Center</strong></td>
<td>1 per 15</td>
<td>1 per 15</td>
<td>1 per 15</td>
<td>1 per 150¹²</td>
<td>Min. 1 per Floor</td>
</tr>
<tr>
<td><strong>Elementary</strong></td>
<td>Male Female</td>
<td>Male Female</td>
<td>1 per 30</td>
<td>1 per 35</td>
<td>1 per 150¹² Min. 1 per Floor</td>
</tr>
<tr>
<td>1 per 30</td>
<td>1 per 25</td>
<td>1 per 50</td>
<td>1 per 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Secondary</strong></td>
<td>Male Female</td>
<td>Male Female</td>
<td>1 per 30</td>
<td>1 per 40</td>
<td>1 per 150¹² Min. 1 per Floor</td>
</tr>
<tr>
<td>1 per 40</td>
<td>1 per 30</td>
<td>1 per 30</td>
<td>1 per 40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# APPENDIX C

## MINIMUM PLUMBING FACILITIES

### FIXTURES PER NUMBER OF OCCUPANTS

<table>
<thead>
<tr>
<th>Type of Building Occupancy²</th>
<th>Water Closets¹⁸</th>
<th>Male Urinals⁶,¹⁰,¹⁸</th>
<th>Lavatories</th>
<th>Bath tubs or Showers</th>
<th>Drinking Fountains⁴,¹⁸</th>
</tr>
</thead>
<tbody>
<tr>
<td>Others (Colleges, universities, adult centers, etc.)</td>
<td>Male 1 per 40</td>
<td>Female 1 per 30</td>
<td>1 per 30</td>
<td>Male 1 per 40</td>
<td>Female (14)</td>
</tr>
<tr>
<td>Schools - For Staff use (All schools)</td>
<td>Male 1:1-15</td>
<td>Female 1:1-12</td>
<td>0:1-9</td>
<td>Male 1:10-50</td>
<td>Female 1 per 40</td>
</tr>
<tr>
<td></td>
<td>2:16-35</td>
<td>2:13-24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:38-55</td>
<td>3:25-39</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>4:40-55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For Additional Occupants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 per 40</td>
<td>1 per 40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worship Places - Educational and activities unit</td>
<td>Male 1 per 150</td>
<td>Female 1 per 75</td>
<td>1 per 125</td>
<td>1 per 2 Water Closets</td>
<td>1 per 150¹² Min. 1 per Floor</td>
</tr>
<tr>
<td>Worship Places - Principal Assembly Place</td>
<td>Male 1 per 150</td>
<td>Female 1 per 75</td>
<td>1 per 125</td>
<td>1 per 2 Water Closets</td>
<td>1 per 150¹² Min. 1 per Floor</td>
</tr>
</tbody>
</table>

1. The figures shown are based upon one (1) fixture being the minimum required for the number of persons indicated or any fraction thereof.
2. Building categories not shown on this table shall be considered separately by the Administrative Authority.
3. Drinking Fountains or service sinks shall not be installed in toilet rooms.
APPENDIX C

MINIMUM PLUMBING FACILITIES¹

4. Laundry and kitchen. 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 (3) or more dwelling or apartment units, one (1) laundry tray and one (1) automatic washer for the first ten units; in excess of ten units, one (1) automatic washer for each additional 15 dwelling or apartment units; this equipment shall be accessible to all units. Kitchen sinks with garbage disposals; one (1) for each dwelling or apartment unit.

5. For each urinal added in excess of the minimum required one water closet may be deducted. The number of water closets shall not be less than two-thirds (2/3) of the minimum requirements.


7. Where there is exposure to skin contamination with poisonous, infections, or irritating materials, provide one (1) lavatory for each five (5) persons.

8. Twenty-four (24) lineal inches (609.67 mm) of wash sink or eighteen (18) inches (457.2 mm) of circular basin, when provided with water outlets for such space, shall be considered equivalent to one (1) lavatory.

9. Laundry trays, one (1) for each fifty (50) persons. Slop sinks, one (1) for each hundred (100) persons.

10. General. In applying this schedule of facilities, consideration must be given to the accessibility of the fixtures. Conformity purely on a numerical basis may not result in an installation suited to the need of the individual establishment. For example, schools should be provided with toilet facilities on each floor having classrooms.
    a. Surrounding materials. Wall and floor space to a point two (2) feet (0.6m) in front of urinal tip and four (4) feet (1.2m) above the floor, and at least two (2) feet (0.6m) to each side of the urinal shall be lined with non-absorbent material.
    b. Trough urinals are prohibited.

11. A restaurant is defined as a business which sells food to be consumed on the premises.
    a. The number of occupants for a drive-in restaurant or drive-in theatre shall be considered as equal to twice the number of parking stalls.
    b. Employee toilet facilities are not to be included in the above restaurant requirements. Hand washing facilities must be available in the kitchen for employees.
APPENDIX C
MINIMUM PLUMBING FACILITIES¹

c. Walk-up restaurants with no access inside of building by customers.
   (1) If less than 17 outside seats, one toilet room is required, for employees only.
   (2) If more than 16 outside seats, both male and female toilet rooms are required, for public and employees per Appendix C.

d. Restaurants with less than 225 sq. ft. inside customer area and less than 17 outside seats.
   (1) A minimum of one toilet room shall be provided for public and employees.

e. Restaurants with less than 225 sq. ft. inside customer area and more than 16 outside seats.
   (1) Both male and female toilet rooms are required, for public and employees per Appendix C.

f. Restaurants with more than 224 sq. ft. inside customer area and which may include outside seating of less than 50% of inside occupant load. Occupancy load may be based on inside customer area only.
   (1) Both male and female toilet rooms are required for public and employees per Appendix C.

g. Restaurants with more than 225 sq. ft. inside customer area and with outside seating greater than 50% of inside occupant load. Occupant load must include entire inside and outside occupant loads.
   (1) Both male and female toilet rooms are required for public and employees per Appendix C.

12. Where food is consumed indoors, water stations may be substituted for drinking fountains. Offices, or similar public buildings for use by more than six (6) persons shall have one (1) drinking fountain for the first one hundred fifty (150) persons and (1) additional fountain for each three hundred (300) persons thereafter.

13. There shall be a minimum of one (1) drinking fountain per occupied floor in schools, theatres, auditoriums, dormitories, offices or public buildings.

14. Provide one shower for each 5 students of a gym or swimming class.

15. A single restroom may be provided for both sexes, and both service sinks and drinking fountains may be eliminated for the following:
   (1) Retail occupancies of 3,000 sq. ft. or less.
   (2) Offices, medical and dental clinics of 1000 sq. ft. or less.
APPENDIX C

MINIMUM PLUMBING FACILITIES

16. Separate toilet facilities for each sex shall be located adjacent to all swimming pools used by the public, except Group R Occupancies of 3 stories or less.
17. Toilet with bed pan flushing equipment.
18. For temporary construction facilities, one (1) water closet and one (1) urinal shall be provided for each 30 workers of each sex (Urinals not required for women). Fixtures may be conventional type water closet and urinals or of the chemical "storage" type.
Appendix D

Appendix D, Part C, Paragraph D3.1 is amended:

D3.1 Sizing of Rainwater Piping. Vertical rainwater piping shall be sized in accordance with Table D-1. Table D-1 is based upon maximum inches (mm) of rainfall per hour falling upon a given roof area in square feet (m). Three inches per hour is the selected rate for Denver.

Appendix D, Part C, Paragraph D3.6 is added:

D3.6 Controlled Flow Storm Water System.

(a) The roof drainage system may be sized on the equivalent or adjusted maximum projected roof areas which result from controlled flow and storage of storm water on the roof, provided that approved flow control devices are incorporated into a finished roof.

(b) A control device shall be installed to limit the rate of discharge water in gallons per minute not to exceed the rate permitted in Tables D-1 through D-3.

(c) See Uniform Building Code for roof construction.

(d) Control of runoff from flat roofs may be controlled by devices. Height of stones or other granular material above waterproofed surface shall be protected by secured metallic strainers.

(e) At least 2 drains shall be installed in roof areas 10,000 square feet or less and at least 4 drains in roof areas over 10,000 square feet.
DIVISION 4

AMENDMENTS

TO THE

1991 EDITION OF THE UNIFORM BUILDING CODE STANDARDS
DENVER AMENDMENTS TO THE
UNIFORM BUILDING CODE STANDARDS

The following have been amended by the Denver Amendments to the 1991 Uniform Building Code Standards.

  Uniform Building Standard No. 70-1
  Section 7010 Appendix
  7016 Alternate Standard
Section 70.106 is added to Uniform Building Code Standard No. 70-1:

**ALTERNATE STANDARD**

Sec. 70.106. ASTM D-698-78 (Standard Proctor) may be used as an alternate to the standards listed.
DIVISION 5

AMENDMENTS

TO THE

1993 EDITION OF THE NATIONAL ELECTRICAL CODE
DENVER AMENDMENTS TO THE NATIONAL ELECTRICAL CODE
BY PARTS, ARTICLES AND SECTIONS

The following Articles have been added by the Denver Amendments to
the National Electrical Code.

Chapter 10. Amendments to Electrical Design, Installation and Materials.
ART. 1001. General Requirements .................................. NEC-1
1002. Service ............................................................ 2
1003. Grounding....................................................... 2
1004. Temporary Installations................................. 3
1005. Types of Wiring .............................................. 4
1006. Wiring Methods ............................................. 4
1007. Appliances...................................................... 5
1008. Mechanical Equipment................................. 6
1009. Emergency Systems.......................................... 6
1010. Signs and Outline Lighting.............................. 9
1011. Standards....................................................... 9
Chapter 10 is added:

CHAPTER 10
AMENDMENTS TO ELECTRICAL DESIGN, INSTALLATION AND MATERIALS

GENERAL REQUIREMENTS

Article 1001.

(a) Scope. In addition to the other requirements of this Code, the provisions of this Chapter shall apply to all electrical installations, electrical systems and their components.

(b) Design, Installation and Materials. Design, installation and materials shall conform to the requirements of this Chapter, and the National Electrical Code NFPA 70. (See Standards). The abbreviation NEC shall mean, the National Electrical Code.

EXCEPTION: Where a conflict exists between this Chapter and the Standards indicated herein, the requirements of this Chapter shall govern.

(c) Approval. All electrical materials and equipment required or permitted by this Chapter shall be accepted only if tested and listed by a testing agency recognized by the Department.

(d) Weather Protection. Electrical equipment, raceways and/or conductors susceptible to weather damage shall not be installed inside or outside of any building, structure or utility until adequate protection for the equipment and/or conductors has been provided.

(e) Release. The public utility company shall not provide electrical service to a building, structure or utility until electrical inspection has been completed and the building, structure or utility has been released for electrical service by the Department.

EXCEPTION: Electrical meters for temporary heat and construction purposes may be released by the Department.

This Section covers meters set at permanent site for one- and two-unit dwellings only. Construction heat meters will be released under the following conditions:

1. Electrical rough-in inspection shall be completed.
2. Not more than two 120-volt receptacles provided with ground fault circuit interrupter protection shall be connected.
3. Furnace or boiler circuit, including electric furnaces or boilers, shall be completed.
4. Inspection shall be required. If inspection can be completed at the same time as rough-in inspection, no fee will be required. Additional inspection shall require a reinspection fee.
5. No occupancy of the building shall be permitted until all final inspections are completed.

(f) Testing. Electrical systems shall be energized for final inspection or inspection for occupancy.

SERVICE

Article 1002.

(a) General. See Article 230 NEC.

(b) Service Drop. The method of attachment of electrical service to any building, structure or utility shall be designated by the public utility company and shall comply with the requirements of Article 230-24 (a) and (b) NEC. If the roof is accessible by a permanent ladder, stairs, or doorway, a minimum 8-foot clearance over the roof shall be maintained.

(c) Service Masts. Where a mast is required to maintain the required height, the mast shall be at least 2-inch galvanized rigid conduit or intermediate metal conduit. All masts over 48 inches in height shall be guyed.

EXCEPTION: For remodeling work only and where it is physically impractical to use 2-inch rigid steel conduit for a service mast, 1¼-inch rigid galvanized steel conduit may be permitted, provided that the mast is properly guyed at the point of attachment of the service wires.

(d) Disconnecting Means. Service entrance switches or any service distribution equipment, including branch circuit panelboards, shall not be installed within a bathroom, toilet room, clothes closet, storage closet, bedroom, furnace room, boiler room, mechanical room, or over or under stairways.

EXCEPTION:
1. Branch circuit panelboards or control centers serving a furnace, boiler or associated mechanical equipment may be installed in furnace, boiler and mechanical rooms.
2. Furnace or boiler rooms in a townhouse or one- and two-unit dwellings.

(e) The sum of the ratings of the circuit breakers or fuses shall not be permitted to exceed the ampacity of the service conductors, except in accordance with NEC 240-3(b).

GROUNDINGS

Article 1003.

(a) Grounding Electrode. See Article 250 NEC.
1. Gas piping systems shall not be permitted as a grounding electrode.
2. Rod electrodes of iron or steel shall be protected by a conductive coating other than galvanizing or painting.

3. Pipe or conduit electrodes shall not be permitted.

4. Water lines serving exclusively as fire protection piping shall not be permitted as a grounding electrode.

(b) **Grounding Connections.** Grounding conductors shall not be secured to any plumbing fixture or fitting.

(c) **Temporary Service Grounding.** A driven ground rod at the service equipment will be acceptable. When building steel is in place, the temporary service ground shall have an additional connection to this steel even if the temporary service was installed prior to the steel being erected.

**EXCEPTION:** Group R-2 and R-3 Occupancies.

(d) **Transformer Case Grounding.** The transformer neutral and case must be grounded. The size of the grounding conductors and point of grounding must be specified.

(e) **The Emergency Disconnecting.** The emergency disconnecting means shall be grounded by a separate equipment grounding conductor sized per NEC Table 250-94.

**TEMPORARY INSTALLATIONS**

**Article 1004.**

(a) **Electrical Service.** Electrical service and wiring installed for temporary purposes shall comply with all applicable requirements of this Chapter and NEC Article 305. Location and construction of the temporary service drop/lateral support for both overhead and underground supply shall comply with the above and public utility company requirements.

(b) **One- and Two-Unit Dwellings.** One temporary service shall serve not more than three (3) consecutive sites for construction purposes.

(c) **Location.** Temporary construction meters shall be located on the same side of the alley, street or driveway as the construction for which the meter is required.

(d) **Outside Wiring.** Outside temporary electrical wiring, other than extension cords, shall be installed at a minimum height of 8 feet above ground level. Extension cords rated for hard usage as listed in NEC may be laid upon the ground provided that the cords are removed at the end of each working day.

(e) **Underground.** Temporary conductors installed underground shall be of a type approved for the purpose and use, such as UF and USE. Minimum burial depth shall be 12 inches. Routes of buried conductors shall be plainly marked with flags or stakes to prevent accidental excavation.
TYPES OF WIRING

Article 1005. Nonmetallic Sheathed Cable as defined in Article 336 NEC and Service-Entrance Cable as defined in Article 338 NEC shall not be permitted to be installed.

EXCEPTION: Nonmetallic-Sheathed Cable and Service-Entrance Cable may be installed in the following occupancies and uses:

(a) Apartment buildings of three (3) stories or less. See Section 1009(c) for emergency systems.
(b) Townhouse buildings.
(c) One- and two-unit dwellings.
(d) Temporary buildings.
(e) Trailers and mobile units.
(f) Portable buildings.
(g) Temporary wiring.

WIRING METHODS

Article 1006.

(a) Connection of Cable Assemblies. Cable assemblies connected to panelboards, junction boxes, outlet boxes and other enclosures shall enter the enclosure through a separate opening for each cable and shall be secured to the enclosure by means of an approved fitting, clamp or connector.

EXCEPTION: Exterior panelboard. Cables shall enter an exterior panelboard through a nipple extending completely through the outer wall structure into the hollow space within the wall. The nipple shall be secured to the panelboard by locknut or connector, and insulated bushings shall be provided at each end of the nipple into the panelboard.

(b) Box Supports. Outlet boxes shall not be supported by nails alone unless boxes are specifically designed and approved for the purpose.

(c) Raceway.

1. Raceway installed directly in or on the earth, or in concrete which is placed in or on the earth, shall be one of the following types:

   A. Rigid nonmetallic conduit.

   B. Rigid steel or intermediate metal conduit covered with:

      (i) An approved factory-applied polyvinyl chloride (PVC) or bituminous-base tape. Field-applied tape is not acceptable.

      (ii) An approved bonded PVC coating.
(iii) An approved coat of bituminous-base paint. An approved "Special" coating. (e.g., double galvanizing, etc.).

2. Raceway installed in concrete not in contact with the earth may be electrical metallic tubing in addition to the types listed above.

3. Aluminum conduit shall not be installed in or on the earth or embedded in concrete.

4. Electrical non-metallic tubing may be installed in concrete in addition to the types listed above and shall comply with Article 331, NEC.

(d) Roof Penetrations. Conduits penetrating a roof shall be installed in roof jacks to preserve the integrity of the roof.

(e) Conduits on Roofs. When conduits are installed on roofs, they shall be a minimum of 12 inches above the finished roof and shall be supported on metal stands installed in pitch pans with no more than 10 feet between stands.

(f) Conductors in Ducts and Plenums. See the Mechanical Code and Articles 300 and 645 NEC.

(g) Duct Attachment or Support. Support or attachment of conduit or fixtures from ducts is prohibited.

(h) Clearances. See the Mechanical Code for clearances from bonnets, ducts and plenums.

(i) Townhouse Buildings. Electrical, telephone and signalling wiring and equipment shall not be permitted in 2-hour fire-resistive walls between dwelling units. Electrical installations shall conform to the requirements for one- and two-unit dwellings. See Chapter 12.

(j) Type AC and MC Cable. An approved tool shall be used to cut the armor on type AC and MC cable. Metal cutting saws or pliers are not permitted.

APPLIANCES

Article 1007.

(a) Electric Cooking Units. Each wall-mounted oven or counter-mounted cooking unit not grouped to form a single appliance shall be connected to a separate individual circuit.

(b) Electric Fences. Electric fences are prohibited. See the Building Code.

(c) Electric Water Heaters. Electric water heaters shall not be installed in unheated crawl spaces or attic areas. See the Mechanical Code.
MECHANICAL EQUIPMENT

Article 1008.

(a) General. See the Uniform Mechanical Code for refrigeration equipment.

(b) Furnaces, Unit Heaters and Boilers. All motors for furnaces, heaters and boilers, either new installations or replacements, shall have a separate overcurrent device that shall open the circuit when the motor current exceeds 125% of the full load rated amperage. A thermal protector integral with the motor is not acceptable as the overcurrent device for motors on furnaces, unit heaters, or boilers. Each motor shall be provided with a disconnecting means located on or adjacent to the unit. All motors for new furnace and boiler installations shall be on a separate circuit. All motors for furnace and boiler replacement shall be on separate circuits, unless approved by the Department.

EXCEPTION: In townhouses and one- and two-unit dwellings, lighting fixtures and receptacles required by Article 1008(c)1 may be installed on the furnace or boiler circuit.

(c) General Lighting and Power Requirements. In all rooms containing mechanical equipment, adequate lighting and receptacle outlets shall be provided for servicing the equipment. In addition, when equipment is installed in attics, crawl spaces or on roofs, the following shall be required:

1. Attics and crawl spaces. A lighting fixture shall be installed at the access opening and a lighting fixture and receptacle shall be installed on the service side of the equipment. Fixtures shall be switched at the access opening.

2. Roofs. A duplex receptacle shall be installed within 25 feet of the equipment.

EMERGENCY SYSTEMS

Article 1009.

(a) Scope. Emergency systems shall comply with Article 700 NEC and shall include all required electrical wiring and equipment that is essential to life safety.

1. Exit illumination and exit signs shall be provided as required in Chapter 33 of the Building Code.

2. Fire alarm and detection systems.

A. Systems shall be installed as required by Chapter 38 of the Building Code.

B. Wiring for fire alarm and fire detection shall be separate and distinct from all other wiring and raceway systems.
C. All systems shall be electrically supervised in accordance with NFPA 72 and Chapter 38 of the Building Code.

3. Sprinkler alarm systems shall be installed on fire sprinkler systems as required by Chapter 38 of the Building Code. Fire sprinkler systems with a Central Station connection must be powered from the building emergency power source.


5. Elevators.
   A. When required by Chapter 51 of the Building Code, elevators shall be powered from the emergency power source of the building. See Chapter 18 of the Building Code.
   B. The ventilation fan and lighting in each elevator cab shall be energized by a separate circuit connected to the emergency power source of the building.


7. Communications Systems. The voice alarm and/or communication system for Fire Department use shall conform to the requirements of Chapters 18 and 38 of the Building Code.

(b) Emergency Power Source. All emergency circuits shall be energized from one or more of the following emergency power sources of the building. See Chapters 18, 33, and 38 of the Building Code.

1. Generator driven by a diesel powered prime mover.

2. There shall be a normal source of power plus an emergency source of power for emergency loads in accordance with Article 700-12 NEC. Emergency sources may be any of the options indicated in paragraphs (a) through (e) of 700-12. Unit equipment for emergency lighting may be utilized in accordance with paragraph 700-12(f). When emergency lighting is installed as required, the additional requirements of Sections 3313 and 3314 shall apply. See Chapter 33 of the Building Code.

(c) Wiring Methods. Wiring for emergency systems, except for fire alarm cables, shall be installed in any of the following methods:

1. Approved metal raceways.
2. Type MI cable or type MC cable.
3. Type AC cable with a full-size insulated grounding conductor.
4. Rigid PVC conduit encased in at least two inches of concrete. The PVC conduit shall not exit the concrete encasement.

(d) **Fire Alarm Cable.** Approved cables may be installed for listed fire protective signalling circuits provided that they comply with Article 760 NEC and the following requirements.

1. Cables shall have 300 volt minimum insulation rating and a temperature of 105° Celsius.
2. Conductors. See Article 760 NEC.
3. Cables shall not penetrate walls, floors or ceilings required to be fire-rated unless enclosed in a metal raceway. Cable passed through a floor or located on a sidewall within 7 feet of the floor shall be installed in a metal raceway. See Article 300 NEC.
4. Cables shall be installed and supported as required for nonmetallic-sheathed cable and shall be protected from mechanical injury.
5. Cables shall be spliced only in equipment enclosures or junction boxes, and junction box covers shall be marked "Fire Alarm" or painted red in color.

(e) **Group I Occupancies.**

1. In all Group I Occupancies, a standby emergency power source shall be installed. This source shall be a diesel-driven generator having a capacity and rating for the emergency operation of the following equipment.
   A. Heating equipment.
   B. Emergency illumination.
   C. Fire alarm and detection system.
   D. Sprinkler alarm systems.
   E. Elevators as required by Chapter 51 of the Building Code.
2. The requirements of Article 517 NEC shall apply to all health care facilities.

(f) **Reference.** See Chapters 18, 33, and 38 of the Building Code for other required standby (emergency) power equipment.

(g) **Testing Standby Power Source.** Tests shall be performed on generator or battery standby power sources as follows:

1. Group I Occupancies shall be tested on a weekly schedule.
2. All other occupancies shall be tested on a monthly schedule.
Sec. 1009

3. Tests of generator systems shall be conducted in accordance with the requirements of Chapter 18 of the Building Code.

SIGNS AND OUTLINE LIGHTING

Article 1010.

(a) Disconnect. The disconnecting means shall comply with Article 600-2 NEC.

(b) Signs. All signs and outdoor lighting shall be wired to comply with Article 600 NEC and shall provide an approved testing laboratory label of approval on each sign prior to installation on any building or structure. All new signs and outline lighting shall be inspected by the Department prior to connection to any electrical power source. Temporary connections shall not be permitted. See Chapter 3 of the Building Code.

(c) Indoor Portable Signs and Retail Sales Carts. Indoor portable signs and retail sales carts shall comply with Article 600 NEC and Sections (a) and (b) above. Such signs and carts shall be supplied by a 3-wire grounded cord protected by a ground fault circuit interrupter.

STANDARDS

Article 1011. Unless provided for elsewhere in this Building Code, the following Standards shall apply:

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VIEW PROTECTION ORDINANCES: UBC 1724

VIOLATION OF CODE: UBC 112(b)

WALKWAYS, PEDESTRIAN: UBC 509(h)

WALL
Defined: UBC 402
Foundation Walls, Dampproofing: UBC 1707(d)
Fronting on Streets or Yards: UBC 1705(d)
Penetration, Fire-Resistive Standards: UBC 4304(e)

WASTE
Chemicals: UPC 612(h)
Disposals, Food: UPC 713
Fountains, Drinking: UPC 610
Water, Cooling: UPC 609

WASTEWATER MANAGEMENT: UPC 303(c)
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