2021 AMENDMENTS TO THE 2018 EDITION OF THE INTERNATIONAL BUILDING CODE
AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

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

[F] Denotes Fire
[DOTI] Department of Transportation and Infrastructure
[EB] Existing Building
[CDH] Colorado Division of Housing
[IFCA] International Fire Code Amendments
[Z] Zoning
[Eh] Revised municipal code, chapter 23 – environmental health
CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

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

Section 101.4.4 Property maintenance is deleted in its entirety.

Section 101.4.8 Electrical is added as follows:

101.4.8 Electrical. All NFPA 70 code references within the 2018 International Building Code shall refer to the National Electrical Code as adopted by the State of Colorado.

Section 102.6 Existing Structures is modified by deleting the reference to the International Property Maintenance Code.

102.6.2 Buildings previously occupied is modified by deleting the reference to the International Property Maintenance Code.

Sections 103 through 116 are deleted in their entirety. The 2019 Administration of the Denver Building Code shall govern.
CHAPTER 2
DEFINITIONS

SECTION 201
GENERAL

Section 201.4 General Terms not defined is amended by replacing it in its entirety as follows:

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

SECTION 202
DEFINITIONS

Section 202 Definitions is amended by adding, modifying or replacing the following definitions:

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

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

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

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

ADEQUATE. Determined to be acceptable to the Agency.

ALCOHOL BEVERAGE (also “Alcoholic Beverage”). A drinkable ethanol mixture intended for human consumption including wine, beer, and beverage spirits.

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

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

ARCHITECT. An architect licensed by the State of Colorado.
AREA OF RESCUE ASSISTANCE. An elevator lobby area separated from adjacent spaces where persons in need of assistance can remain temporarily to await rescue.

ASSISTED CARE FACILITIES. See definition for Personal Care Facilities.

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

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

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

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

DROP-OUT CEILING. A suspended ceiling system with panels that are heat sensitive and fall from their setting when exposed to heat.

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

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

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

ELECTRICAL CONTRACTOR. Colorado State licensed electrical contractor.

ELECTRICAL SIGNAL CONTRACTOR. A contractor licensed to install, add to, alter or repair electrical wiring and equipment for fire alarm, fire detection, emergency voice communication systems, electrical signaling and control wiring. Voltages shall not exceed 48 Volts or the system shall be power-limited as defined by the NEC. All work shall be performed under the supervision of the holder of an Electrical Signal Supervisor Certificate.

ELECTRIC LOCKS – MASTER SWITCH. An electrical switch configured to immediately and simultaneously unlock all connected door locks (typically, but not limited to delayed egress doors, secured elevator lobby doors and stair tower doors). The switch shall be located in the building’s Fire Command Center or other approved location. The switch shall be a two-position, toggle switch labeled “ELECTRIC LOCKS” with its positions labeled “LOCKED” and “UNLOCKED”. When located in a non-secure area, a two-position, key operated switch may be used when a matching key is located in the building’s Key Lock Box.

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

ETHANOL (also “Ethyl Alcohol” or “Grain Alcohol”). A volatile, flammable, colorless, neurotoxic liquid fit for human consumption with structural formula CH-3CH-2OH (abbreviated as C₂H₅OH or C₂H₅O).

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

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

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

FAIL-SAFE LOCK. A lock that unlocks automatically upon loss of power.

FAIL-SECURE LOCK. A lock that remains locked during loss of power.

FIRE DETECTION SYSTEM. A building that is fully smoke-detected, or smoke detection where required by 2018 International Building Code Section 907.2.12.

FPB. Fire Prevention and Investigation Division, of the Denver Fire Department.

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

HOME OCCUPATION. Limited commercial use of a portion of a residential unit as permitted by the Denver Zoning Code.

The definition of “live/work unit” shall be deleted and replaced as follows:

LIVE/WORK UNIT. A dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the resident and does not have approval from the Zoning Administrator as a Home Occupation.

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

Exceptions:

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

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

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

MECHANICAL FREE EGRESS. Door hardware that mechanically unlocks and unlatches the door, from the egress side with a single motion without the use of a key, card or any special knowledge or effort.

NEC. National Electrical Code.

NONAMBULATORY. See 2018 International Building Code definition for “Incapable of Self-Preservation”.

The definition of “Nursing Home” shall be deleted and replaced as follows:

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

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

The definition of “Personal Care Service” shall be deleted and replaced as follows:

**PERSONAL CARE SERVICE.** 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 facility that provides for personal care services. A personal care facility does not provide medical care.

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

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

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

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

**SPIRIT.** An ethanol mixture produced by the distillation of wine, wash, or a previously distilled spirit.

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

**TENANT.** A person or persons occupying a building or portion thereof. The tenant shall have a lease to occupy the specified space from the owner.

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

**UTILITIES.** For the purpose of this Code, utilities shall be defined, without limitation to include the following: Refrigeration systems and their appurtenances; electrical systems and all appurtenances, such as motors, etc.; heating and ventilation systems and appurtenances; elevators, dumbwaiters, escalators and similar conveyances; fire protection systems and apparatus; air conditioning or air treatment systems, including ductwork; exhaust or ventilating systems, including ductwork; plumbing and sanitary systems and all appurtenances; signal and annunciator systems; gas, oil and solid fuel-fired appliances, piping, controls, burners and their appurtenances; evaporative cooling, antennae, wells and equipment; water heaters; gas lights; swimming pool piping; gasoline pumps; and L.P.G. liquid fuel and gasoline tanks and piping.
VALUE OR VALUATION. The building replacement value for permit purposes including labor, profit, overhead, materials, base building equipment and appliances. The determination of value or valuation shall be made or directed to be made by the Agency.

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

WRECK / WRECKING. See Demolition.
CHAPTER 3
USE AND OCCUPANCY CLASSIFICATION

SECTION 302
OCCUPANCY CLASSIFICATION AND USE DESIGNATION

Section 302.1 Occupancy classification is amended by replacing item 8 as follows:

8. Residential (see Section 310): Groups R-1, R-2, R-3, R-4, and R-X

SECTION 306
FACTORY GROUP F

Section 306.2 Moderate-hazard factory industrial, Group F-1, is amended by adding the following:

Greenhouses, buildings, or portions thereof used to cultivate, grow, enrich or otherwise process agricultural plants or products where unique operations, system or hazard may exist that create significant fire and life safety hazards.

SECTION 307
HIGH-HAZARD GROUP H

Section 307.1.1 Uses other than Group H is amended by adding item 15, 20, and replacing 16, 18, and 17 as follows:

15. Battery-charging areas for powered industrial trucks regulated by Section 309 of the International Fire Code.

16. Buildings or portions thereof used for the manufacture, storage, dispensing, and handling of alcohol beverages with 16% or less alcohol by volume and the remainder comprised of water and materials not regulated by this code.

17. Buildings or portions where alcohol beverages are packaged in individual containers that do not exceed 1.3 gallons (5 L) capacity.

Section 307.2 Definitions is amended by adding the following terms:

- Alcohol Beverage
- Bulk Storage
- Ethanol
- Spirit

SECTION 308
INSTITUTIONAL GROUP I

Section 308.5.5 Twelve or fewer children receiving care in a detached one- or two-family dwelling or townhouse is added as follows:

Commented [SM1]: This section added 18 and 19 for alcohol but Denver’s existing is more restrictive so they were kept and replace the new 18 and 19. The current #15 is now #20.

Commented [SM2]: This does not belong in this section. The new definitions are added in Ch 2 already.
308.5.5. Twelve or fewer children receiving care in a detached one- or two-family dwelling or townhouse. Child care provided in a dwelling unit complying with the International Residential Code Section R202 definition of a Family Child Care Home shall be classified as a Group I-4 occupancy or shall comply with the provisions of the International Residential Code.

SECTION 310
RESIDENTIAL GROUP R

Section 310.4.1 is amended by deleting the reference to Section P2904 of the International Residential Code.

Section 310.4.2 Lodging houses is replaced in its entirety as follows:

310.4.2 Lodging houses. Lodging houses (transient or nontransient) with five or fewer guest rooms and 10 or fewer total occupants shall be permitted to be constructed in accordance with the International Residential Code.

Section 310.4.3 Congregate living facilities and boarding houses within a dwelling unit is added as follows:

310.4.3 Congregate living facilities and boarding houses within a dwelling unit. Detached dwelling units used as a congregate living facility or a boarding house (transient or nontransient) with 10 or fewer occupants shall be permitted to be constructed in accordance with the International Residential Code.

Section 310.6 Residential Group R-X is added as follows:

310.6 Residential Group R-X. A residential Group R-X occupancy is a group of two or more detached buildings, each building consisting of a single sleeping unit, where the occupants are primarily permanent in nature. A Group R-X sleeping unit shall not contain cooking facilities. Except as otherwise required by Section 429, residential Group R-X occupancies shall be permitted to be constructed in accordance with the International Residential Code. Group R-X buildings shall not be more than one story above grade plane in height. Basements are prohibited in Group R-X buildings.

A detached community building with cooking facilities and a dining area is required to be provided with a Group R-X occupancy project. Storage for each resident shall be provided within the sleeping unit, the shared community building, or in a separate storage building.

SECTION 312
UTILITY AND MISCELLANEOUS GROUP U

Section 312.2 Fences and retaining walls is added as follows:

312.2 Fences and retaining walls.

312.2.1 General. Section 312.2 shall apply to all fences or walls in excess of 4 feet in height, all retaining walls in excess of 3 feet in height. For exempted work refer to Section 130.3 of the Denver Building Code Administration.

312.2.2 Design. All fences, walls and retaining walls shall be designed in accordance with Section 1807 and 1609 of the International Building Code.
312.24.3 Prohibition. The use of barbed wire or any other sharp-pointed material, devices or features that deliver an electric shock, devices or features that deliver a physical or health hazard on, as or on top of, fences, walls, retaining walls, or similar barriers, regardless of height, is prohibited.

Exception: Barbed wire may be installed where approved by the fire code official and a permit is obtained in accordance with the Denver Building Code Administration.
CHAPTER 4
SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

SECTION 403
HIGH-RISE BUILDINGS

[F] Section 403.3.2 Water supply to required fire pumps is replaced in its entirety as follows:

Section 403.3.2 Water supply serving high-rise buildings. Water supply serving high-rise buildings shall be provided in accordance with Section 507.2 of the International Fire Code.

[F] Section 403.4.1 Smoke detection is replaced in its entirety as follows:

[F] 403.4.1 Smoke detection. Smoke detection shall be provided in accordance with Section 907.2.12.1 of the International Fire Code.

[F] Section 403.4.2 Fire alarm systems is replaced in its entirety as follows:

[F] 403.4.2 Fire alarm systems. A fire alarm system shall be provided in accordance with Section 907.2.12 of the International Fire Code.

[F] Section 403.4.3 Standpipe system is replaced in its entirety as follows:

[F] 403.4.3 Standpipe system. A standpipe system shall be provided in accordance with Section 905 of the International Fire Code.

[F] Section 403.4.4 Emergency voice/alarm communication systems is replaced in its entirety as follows:

[F] 403.4.4 Emergency voice/alarm communication system. An emergency voice/alarm communication system shall be provided in accordance with the Section 907.2.12 of the International Fire Code.

• [F] Section 403.4.5 Emergency responder radio communication coverage is replaced in its entirety as follows:

[F] 403.4.5 Emergency responder radio communication coverage. Emergency responder radio coverage shall be provided in accordance with the Section 916.1 of the International Fire Code.

[F] Section 403.4.6 Fire command is replaced in its entirety as follows:

[F] 403.4.6 Fire command center. A fire command center shall be provided in accordance with Section 506 of the International Fire Code.

Section 403.4.7 Smoke removal is replaced in its entirety as follows:

Section 403.4.7 Smoke control. Smoke control shall be provided in accordance with Section 909 of the International Fire Code.

[F] Section 403.4.8 Standby and emergency power systems and their subsections are replaced in their entirety as follows:

[F] 403.4.8 Emergency power. An emergency power system complying with Section 2702 shall be provided for the emergency power loads specified in Section 403.4.8.3.

[F] 403.4.8.1 Equipment room. If the emergency power system includes a generator set inside a building, the system shall be located in a separate room enclosed with 2-hour fire barriers.
constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. System supervision with manual start and transfer features shall be provided at the fire command center.

**Exception:** In Group I-2, Condition 2, manual start and transfer features for the critical branch of the emergency power are not required to be provided at the fire command center.

[F] **403.4.8.2 Fuel line piping protection.** Fuel lines supplying a generator set inside a building shall be separated from areas of the building other than the room the generator is located in by an approved method or assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the required fire-resistance rating shall be reduced to 1 hour.

[F] **403.4.8.3 Emergency power loads.** The following are classified as emergency power loads:

1. Power and lighting for the fire command center required by Section 403.4.6.
2. Ventilation and automatic fire detection equipment for smokeproof enclosures.
3. Elevators.
4. Where elevators are provided in a high-rise building for accessible means of egress, fire service access or occupant self-evacuation, the standby power system shall also comply with Sections 1009.4, 3007 or 3008, as applicable.
5. Exit signs and means of egress illumination required by Chapter 10.
6. Elevator car lighting.
7. Emergency voice/alarm communication systems.
8. Automatic fire detection systems.
9. Fire alarm systems.
10. Electrically powered fire pumps.
11. Smoke control equipment

[F] **Section 403.5.3 Stairway door operation is replaced as follows:**

[F] **403.5.3 Stairway door operation.** Stairway doors other than the exit discharge doors shall be permitted to be locked from the stairway side when signage is provided in accordance with Section 1023.9.2 of the International Building Code. Stairway doors that are locked from the stairway side shall unlock simultaneously without unlatching upon a fire alarm or loss of power or a signal from the fire command center.

[F] **Section 403.5.76 Accessible means of egress elevator and area of rescue assistance and subordinate sections are added:**

[F] **403.5.76 Accessible means of egress elevator and area of rescue assistance.** An accessible means of egress elevator complying with Section 1009.4 shall be provided in high-rise buildings and shall be accessed directly from an area of rescue assistance. Each area of rescue assistance shall comply with Section 1009.6 and shall be separated from the remainder of the story by a smoke barrier complying with Section 709.
Exceptions:

1. *Areas of rescue assistance* are not required at the elevator in Group S-2 open parking garages; or in Group I-2 or I-3 occupancies.

2. In Group R1, R2, and I1 occupancies, an elevator complying with Section 1009.4 with a fire-resistive corridor providing direct access to the elevator from all dwelling units or sleeping units shall be permitted to serve as a required accessible means of egress.

3. *Areas of rescue assistance* at elevators in enclosed parking garages shall be permitted to be enclosed in accordance with Section 509.4.2.

403.5.26.1 Travel Distance. The maximum travel distance from any accessible space to an accessible means of egress elevator complying with this section shall not exceed the exit access travel distance permitted for the occupancy in accordance with Section 1017.1.

403.5.26.2 Occupant evacuation elevators. Where occupant evacuation elevators are provided in accordance with Section 403.6.2, *areas of rescue assistance* shall be located at these elevators.

403.5.26.3 Area of rescue assistance pressurization. The *area of rescue assistance* at the accessible means of egress elevator shall be pressurized by the transfer of air from the pressurized hoist way through the leakage at the elevator doors.

SECTION 405
UNDERGROUND BUILDINGS

Section 405.8 standby and emergency power is replaced as follows:

405.8 Emergency power. An emergency power system complying with Section 2702 shall be provided for the emergency power loads specified in Section 403.4.8.3

SECTION 406
MOTOR-VEHICLE-RELATED OCCUPANCIES

- [DOTI] 406.4.94 Motor vehicle exiting from parking facilities is added as follows:

[DOTI] 406.4.94 Motor vehicle exiting from parking facilities. Where ramps are provided for motor vehicles to exit from a parking facility or from a private drive onto the public right of way, the ramps shall be sloped at 0.5% minimum to 2% maximum for a distance at least 20 feet inside of the building or property line. Vertical curves shall be used at all grade breaks.

Exception. When alternate slopes are approved by the “Transportation, Engineering and Planning Division” of Department of Transportation and Infrastructure.
SECTION 412
AIRCRAFT RELATED OCCUPANCIES

Section 412.1 General is replaced as follows:

412.1 General. Aircraft-related occupancies shall comply with Sections 412.1 through 412.7, Appendix S, and the International Fire Code.

SECTION 414
HAZARDOUS MATERIALS

Section 414.1.1 Other provisions is replaced as follows, subordinate sections to remain:

[F] 414.1.1 Other provisions. Buildings and structures with an occupancy in Group H shall comply with this section and the applicable provisions of Section 415 and the International Fire Code. A performance-based design alternative may be proposed in accordance with Section 5001.3 of the International Fire Code.

Section 414.2.6 Hazardous material in live/work units and subsections are added, as follows:

414.2.6 Hazardous material in live/work units. Hazardous materials located at a live/work unit shall be in accordance with 414.2.6.1 through 414.2.6.3.

414.2.6.1. Flammable and combustible liquids. The aggregate quantities of flammable and combustible liquids permitted within a single live/work unit shall not exceed 10 gallons. All flammable and combustible liquids shall be stored in liquid storage cabinets in accordance with Section 5704.3.2 of the International Fire Code and the amount in use shall not exceed 1 gallon.

414.2.6.2. Flammable gas. The aggregate amount of flammable gas, including LPG, within each live/work unit shall not exceed one-pound cylinder in use with one-pound cylinder in storage.

414.2.6.3. Outside storage. Flammable and combustible liquids and flammable gases shall not be stored outside and adjacent to a live/work unit.

SECTION 415
GROUPS H-1, H-2, H-3, H-4 AND H-5

Section 415.5 Emergency alarms is replaced as follows, subordinate sections to remain:

[F] 415.5 Emergency alarms. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided as set forth herein and in accordance with Sections 908 and 5004 of the International Fire Code.

SECTION 419
LIVE/WORK UNITS

Section 419.1.1 Limitations is amended by adding item 5:

5. The nonresidential area shall be limited to maximum occupant load of 40 persons, as determined by dividing the floor area under consideration by the occupant-per-unit-area factor assigned to the function of space set forth in Table 1004.1.5.
Section 419.2 Occupancies is amended by adding exception 2 and replacing the section as follows:

419.2 Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the live/work unit when the live/work unit is in compliance with Section 419. Nonresidential uses that would otherwise be classified as either a Group E, F, H, I, or S occupancy shall not be permitted in a live/work unit.

Exception 2: Group F occupancy custom manufacturing establishments primarily engaged in the on-site production of goods by hand-manufacturing shall be permitted in the live/work unit. Production shall involve only the use of hand tools or mechanical equipment not exceeding two (2) horsepower per piece of equipment not to exceed a total of six horsepower, or a single kiln not exceeding eight (8) kilowatts or the equivalent in a gas-fired fixture. Spray-finish operations shall be limited to those allowed by Section 7404.9 of the International Fire Code.

Sections 419.10 Fire-resistance rated construction is added as follows:

419.10 Fire-resistance rated construction. The fire-resistance rating required by Sections 708 and 711.2.4 between units shall be a minimum of 1-hour construction.

SECTION 420
GROUPS I-1, R-1, R-2, R-3 AND R-4

Section 420.112, Group R-2 refuse collection areas (and subsections) are added as follows:

420.112 Group R-2 refuse collection areas. Buildings containing group R-2 occupancies having more than 5 dwelling units shall be provided a refuse collection area in accordance with this section.

Exception: Where curbside pickup is available for each dwelling unit.

420.112.1 Interior refuse collection areas. Where refuse collection areas are provided inside a building, they shall comply with all of the following:

1. An exterior door large enough to remove the largest container in the collection area and opening to access to a public way or to on site vehicular access shall be provided.
2. Floors, walls, and ceilings of the refuse collection area shall be finished in a smooth, cleanable surface.
3. Exhaust ventilation shall be provided at the rate of 1cfm/ft². Exhaust air shall not be recirculated or transferred to any other space.
4. Doors between interior spaces of the building and the refuse collection area shall be weather-stripped.
5. Areas provided chutes shall comply with Section 713.3.
6. A floor drain shall be provided.
7. The area shall be used for no other function other than refuse collection.

420.112.2 Exterior refuse collection areas. Where refuse collection areas are provided outside of a building, siting and screening of the area shall comply with the Denver Zoning Code.

420.112.3 Vehicular access. Where refuse collection pickup requires vehicular access on the building site, such access shall comply with all of the following:
1. Not less than 14 ft. of vertical clearance to any obstructions.
2. Not less than 10 ft. in width.

**Exception:** Where alternative methods can be demonstrated and are approved by the building official.

420.12.4 Minimum size. Refuse collection areas shall be a minimum of 1.5 square feet in area per dwelling unit, but not less than 100 square feet.

**Exception:** Where demonstrated that refuse pickup frequencies or other building features reduce the necessity for the minimum room [collection area] size and is approved by the building official.

420.12.5 Recycling and compost containers. Refuse collection areas shall accommodate refuse separation and containment for waste, recycling, and compost in accordance with all of the following:

1. Recycling containers shall be provided a floor area not less than the floor area provided for waste collection.
2. Compost containers shall be provided a floor area not less than one-half the floor area provided for waste collection.
3. Recycling and compost containers shall be provided occupant access within the collection area equivalent to that of the waste containers.
4. Signage or identified containers shall be provided to clearly identify the material intended for each container or portion of the collection area.
5. Containers shall be of materials and sizes in accordance with Section 304.5 of the International Fire Code.

Add Section 429 Residential Group R-X as follows:

**SECTION 429**

**RESIDENTIAL GROUP R-X**

429.1 General. A Group R-X sleeping unit shall comply with Sections 429.2 through 429.16.

429.2 Individual sleeping unit floor area. The habitable floor area of an individual sleeping unit shall be not less than 70 square feet. The minimum interior dimension of the habitable area of an individual sleeping unit shall not be less than 7 feet. A Group R-X sleeping unit shall be 400 square feet or less in floor area, excluding lofts. Habitable floor areas shall have a ceiling height of not less than 7 feet 6 inches above the finished floor.

429.3 Maximum occupant load. The maximum occupant load within a sleeping unit shall be limited to one person per 50 square feet of habitable floor area.

429.4 Building separation distances. The minimum separation between individual sleeping units is 10 feet. The separation distance between sleeping units and the community building or any storage building shall comply with the provisions of Section 705.3. A sleeping unit and the community building shall not be considered portions of a single building. A sleeping unit and a storage building shall not be considered portions of a single building. To apply the provisions of Section 705.3 the sleeping units shall be considered a Group R-3 occupancy.

**Exception:** Reduced building separation distances shall be considered when exterior walls complying
with the requirements of Section 705 are incorporated into the construction of the sleeping units. For the purpose of applying the provisions of Section 705.3, the imaginary line between two sleeping units shall be centered between the buildings. In no case shall the separation between buildings be reduced to less than 5 feet. The minimum separation distance between roof overhangs is 4 feet.

429.5 Fire apparatus access roads. Approved fire apparatus access roads complying with the requirements of Section 503 of the International Fire Code shall extend to within 150 feet of all portions of any sleeping unit and all portions of the exterior walls of the sleeping units, as measured by a DFD approved route around the exterior of the sleeping units.

To apply the provisions of Table 503.2.1 of the International Fire Code, Minimum Clear Widths for Existing Emergency Fire Apparatus Access Roads, Group R-X occupancies shall be considered single-family detached buildings without alleys or driveways that extend to the road.

The installation of a security gate across a fire apparatus access road must be approved by the fire code official.

429.6 Individual sleeping unit address. Individual sleeping units shall be provided with approved address identification in accordance with Section 502. A permanent weatherproof sitemap identifying the address numbers of the sleeping units shall be provided at the entrance into a campus of sleeping units.

429.7 Sleeping unit exterior stairway illumination. The exterior stairway of a sleeping unit shall be provided with a light source located at the top of the stairway.

429.8 Fire hydrants. All portions of any sleeping unit must be located no more than 600 feet from a fire hydrant. Hydrants must provide a fire-flow as defined in Table 429.8 at a minimum residual pressure of 20 psi.

### TABLE 429.8
**REQUIRED NUMBER OF HYDRANTS AND FIRE-FLOW**

<table>
<thead>
<tr>
<th>Aggregate floor area of buildings (square feet)</th>
<th>Minimum number of hydrants required</th>
<th>Hydrant fire-flow (gpm)</th>
<th>Flow duration (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 3,600</td>
<td>1</td>
<td>1,500</td>
<td>1</td>
</tr>
<tr>
<td>3,601 – 4,800</td>
<td>1</td>
<td>1,750</td>
<td>1</td>
</tr>
<tr>
<td>4,801 – 6,200</td>
<td>2</td>
<td>2,000</td>
<td>2</td>
</tr>
<tr>
<td>6,201 – 7,700</td>
<td>2</td>
<td>2,250</td>
<td>2</td>
</tr>
</tbody>
</table>

429.9 Fire protection. Smoke alarms shall be provided in accordance with Section 907.2.10. To apply the provisions of Section 907.2.10 the Group R-X sleeping units shall be considered a Group R-1 occupancy.

429.10 Accessibility. Where there are four or more sleeping units on a site at least one sleeping unit shall be a Type B unit. Accessibility shall be designed in accordance with Chapter 11. In Group R-X occupancies with 20 or more sleeping units on one site, at least 5 percent but not less than one of the sleeping units shall be a Type B unit.
429.11 Plumbing facilities. The sleeping units shall be provided with minimum plumbing facilities as specified by Chapter 29, for a residential dormitory classification, except that a single bathtub or shower is permitted to serve up to 10 sleeping units and drinking fountains are not required. Where a group of sleeping units includes a Type B unit, toilet and bathing facilities shall comply with Section 1109.2. The path of travel to these facilities shall not exceed 200 feet from any sleeping unit or from the community building.

Only potable water shall be supplied to plumbing fixtures that provide water for drinking, bathing or cooking purposes. A potable water supply system shall be designed, installed and maintained in such a manner to prevent contamination from non-potable liquids, solids or gases being introduced into the potable water supply through cross connections or any other piping connections to the system.

The community building shall provide a water dispenser that is manually controlled by the user for dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture shall be connected to the potable water distribution system of the premises. This definition includes a free-standing apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir.

The community building shall be provided with a kitchen area and every kitchen area shall be provided with a sink.

429.12 Group R-X cooking facilities. Domestic cooking appliances, within a community building accessory to Group R-X sleeping units, for use by the residents shall be in compliance with all of the following:

1. The types of domestic cooking appliances shall be limited to ovens, cooktops, ranges, warmers, coffee makers and microwaves.
2. Domestic cooking appliances shall be limited to approved locations.
3. Cooktops and ranges shall be protected in accordance with Section 904.13.1.1.
4. Cooktops and ranges shall be provided with a domestic cooking hood installed and constructed in accordance with Section 505 of the International Mechanical Code.

429.13 Lofts. Lofts used as sleeping or living space within a Group R-X sleeping unit shall conform to the requirements of Appendix Section AQ104 of the International Residential Code.

429.14 Temporarily placed relocatable sleeping units and associated buildings. Temporarily placed relocatable sleeping units and associated buildings shall comply with the provisions of Section 3103 of the International Building Code.

Exceptions:

1. Where approved by the building official, temporary structures and relocatable buildings may be placed on a site for a period of up to four years without a permanent foundation.
2. Where approved by the building official, Denver Water, and Department of Transportation and Infrastructure, temporary structures and relocatable buildings may be placed on a site for a period of up to 180 days without being connected to a public water supply and without the sanitary drainage from plumbing fixtures being connected to a public sewer. There may be one 180-day extension granted by the building official when required. A formal request must be submitted thirty (30) days prior to the required vacancy. Where a water tank is used to supply potable water to plumbing fixtures, the interior surface of the tank shall be lined or coated to conform to NSF International standard NSF-61. The interior surface of a potable water tank shall not be lined, painted or repaired with any material that changes the taste, odor, color or potability of the water supply when the tank is placed in, or returned to, service.

429.15 Outside storage. Outside storage of combustible materials and hazardous materials, including
aerosols and propane, between adjacent sleeping units is prohibited.

429.16 Existing sleeping units. The legal occupancy of any existing sleeping unit on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, or the International Fire Code, or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.
CHAPTER 5  
GENERAL BUILDING HEIGHTS AND AREAS

SECTION 503  
GENERAL BUILDING HEIGHT AND AREA LIMITATIONS

Section 503.1.4.1 is amended by adding the exception as follows:

Exceptions:

2. Height of fences or guards provided for windbreak or as regulated by other provisions such as for swimming pools and spas is not limited to 48 inches.

SECTION 419

508.5  
LIVE/WORK UNITS

Section 419.508.5.1 Limitations is amended by adding item 5:

5. The nonresidential area shall be limited to maximum occupant load of 49 persons, as determined by dividing the floor area under consideration by the occupant-per-unit-area factor assigned to the function of space set forth in Table 1004.5.

Section 419.508.5.2 Occupancies is amended by adding exception 2 and replacing the section as follows:

419.508.5.2 Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the live/work unit when the live/work unit is in compliance with Section 419.508.5. Nonresidential uses that would otherwise be classified as either a Group E, F, H, I, or S occupancy shall not be permitted in a live/work unit.

Exception 2: Group F occupancy custom manufacturing establishments primarily engaged in the on-site production of goods by hand manufacturing shall be permitted in the live/work unit. Production shall involve only the use of hand tools or mechanical equipment not exceeding two (2) horsepower per piece of equipment not to exceed a total of six horsepower; or a single kiln not exceeding eight (8) kilowatts or the equivalent in a gas-fired fixture. Spray finishing operations shall be limited to those allowed by Section 2404.9 of the International Fire Code.

Section 419.508.5.1012 Fire-resistance-rated construction is added as follows:

419.508.5.1012 Fire-resistance-rated construction. The fire-resistance rating required by Sections 708 and 711.2.4 between units shall be a minimum of 1-hour construction.

SECTION 510  
SPECIAL PROVISIONS

Section 510.2 Horizontal building separation allowance is amended by adding the following sentence to the end of item 1:

The vertical offset shall be constructed as a fire barrier.
CHAPTER 7
FIRE AND SMOKE PROTECTION FEATURES

SECTION 705
EXTERIOR WALLS

Section 705.2 Projections is amended by adding the following sentence to the end of the section:

Balconies inset 4 feet or more shall not be considered projections. Balconies inset up to 4 feet may be considered projections.

Section 705.8.1 Allowable area of openings is replaced as follows and an exception is added as follows:

705.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 705.8 based on fire separation distance of each individual story, as measured from the building face within the height of each individual story that is closest to the line used to determine fire separation distance. The provisions of this section are applicable to the exterior openings with or without windows, duct openings and air transfer openings.

Exceptions

3. Where the fire separation distance is between 5 and 15 feet in buildings protected with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the area of the exterior openings is permitted to be increased to 50% where openings are protected with water curtains designed to distribute 3 gpm per linear foot of wall opening with sprinklers placed at the ceiling 6 to 12 inches from the wall and 6 feet on center; see NFPA 13 “Water Curtains” for design requirements.

SECTION 707
FIRE BARRIERS

Section 707.5 Continuity is amended by adding an exception replacing Exception 3 as follows:

Exceptions:

3. An exit passageway enclosure required by Section 1024.3 that does not extend to the underside of the floor or roof sheathing, slab or deck above shall be enclosed at the top with construction of the same fire-resistance rating as required for the exit passageway.

Section 707.9 Voids at intersections is replaced in its entirety as follows:

707.9 Voids at intersections. The voids created at the intersection of a fire barrier and a non-fire-resistance-rated roof sheathing, slab or deck or a non-fire-resistance-rated exterior wall assembly shall be filled. An approved material or system shall be used to fill the void and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

SECTION 712
VERTICAL OPENINGS

Section 712.1 General is amended by adding the following sentence to the end of the section:

Commented [SM6]: This exception was added to the 2021 IBC and is no longer needed as an amendment

Commented [SM7R6]: Denver staff wanted to keep their exception #3 by replacing the new exception in the IBC.
In a building with a smoke control system, unenclosed vertical openings shall comply with Section 909.3.1 of the International Fire Code.

SECTION 713
SHAFT ENCLOSURES

Section 713.4 Fire resistance rating is amended by adding the following Exception:

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

Section 713.5 Continuity is amended by adding the following Exception:

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

SECTION 714
PENETRATIONS

Section 714.5.1 Through penetrations is amended by adding an exception as follows:

Exceptions:

4. Through penetration of floors or ramps in open and enclosed parking garages where the area above and the area below the penetrations are parking garages.

SECTION 715
FIRE-RESISTANT JOINT SYSTEMS, JOINTS AND VOIDS

Section 715.1.1 Curtain wall assembly Installation is amended by adding an exception as follows:

Exception: Voids at the exterior wall intersection of the floors and ramps in open and enclosed parking garages, where the area above and the area below the voids are parking garages.

Amend Sections 715.4 and 715.5 to add the following exception

715.4 Exterior curtain wall/fire-resistance-rated floor intersections. Voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an approved perimeter fire containment system to prevent the interior spread of fire. Such systems shall provide an F rating for a time period not less than the fire-resistance rating of the floor or floor/ceiling assembly.

Exception: Voids at the exterior wall intersection of the floors and ramps in open and enclosed parking garages, where the area above and the area below the voids are parking garages.

715.5 Exterior curtain wall/nonfire-resistance-rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and nonfire-resistance-rated floor or floor/ceiling assemblies shall be filled with an approved material or system to retard the interior spread of fire and hot gases between stories.
Exception: Voids at the exterior wall intersection of the floors and ramps in open and enclosed parking garages where the area above and the area below the voids are parking garages.

SECTION 717
DUCTS AND AIR TRANSFER OPENINGS

717.5.3 Shaft enclosures is amended by deleting Exception 1.3 and Exception 4, and adding the following sentence:

Ducts penetrating shaft enclosures that are a part of the smoke control system shall conform to Section 909 of the International Fire Code.
SECTION 808
ACOUSTICAL CEILING SYSTEMS

Section 808.1.1.3 Drop-out ceiling panels is added as follows:

808.1.1.3 Drop-out ceiling panels. Drop-out ceiling panels are prohibited.

   Exception: In areas not provided with an automatic sprinkler system, listed drop-out ceiling panels are permitted when installed in accordance with their listing.
CHAPTER 9
FIRE PROTECTION SYSTEMS

Chapter 9 of the International Building Code is amended in accordance with the amendments to Chapter 9 of the International Fire Code, except as follows:

SECTION 901
GENERAL

Section 901 General is retained in its entirety
CHAPTER 10
MEANS OF EGRESS

SECTION 1003
GENERAL MEANS OF EGRESS

Section 1003.7 Elevators, escalators and moving walks is replaced in its entirety as follows:

1003.7 Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress from any other part of the building.

Exceptions:
1. Elevators used as an accessible means of egress in accordance with Section 1009.4.
2. Escalators serving fixed guideway transit system platforms in accordance with NFPA 130.

[B] SECTION 1004
OCCUPANT LOAD

Section 1004.5 Areas without fixed seating is amended by replacing the section and Exception as follows:

1004.5 Areas without fixed seating. The number of occupants shall be computed at the rate of one occupant per unit of area as described in Table 1004.5. For areas without fixed seating, the occupant load shall be not less than that number determined by dividing the floor area under consideration by the occupant load factor assigned to the function of the space as set forth in Table 1004.5. Where an intended function is not listed in Table 1004.5, the building official and fire code official shall establish a function based on a listed function that most nearly resembles the intended function.

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

Table 1004.5 Maximum Floor Area Allowances Per Occupant is amended by adding footnote “b” to “Decks” as follows and adding additional requirements for Group F-1 occupancy for marijuana plant husbandry operations. Also “business areas” is replaced in entirety with the following and footnote c is added as follows:

<table>
<thead>
<tr>
<th>TABLE 1004.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNCTION OF SPACE</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Business areas</td>
</tr>
<tr>
<td>Concentrated business use areas</td>
</tr>
<tr>
<td>Skating rinks, swimming pools</td>
</tr>
<tr>
<td>Rink and pool</td>
</tr>
<tr>
<td>Decks</td>
</tr>
</tbody>
</table>

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| Flowering or vegetative room (F-1 occupancy for marijuana plant husbandry) | 300 net (agricultural use) |
| Work areas (F-1 occupancy for marijuana plant husbandry) | 100 gross |

b. For swimming pools that only serve Group R-2 and R-3 Occupancies, the occupant load factor for the pool deck shall be 30 gross square feet.

c. Use gross area or net area occupant load factor that results in the greatest occupant load.

Section 1004.9.1 Bars, taverns, and similar areas is added as follows:

1004.9.1 Bars, taverns, and similar areas. Every room or space within a bar, tavern, or similar area that is an assembly function with an occupant load of 40 or more shall have the occupant load of the room or space posted in accordance with Section 1004.9.

[F] SECTION 1005
MEANS OF EGRESS SIZING

[F] Section 1005.3.1 Stairways is amended by modifying Exception 1 and adding Exception 4:

Exceptions:

1. For other than Group H and I-2 occupancies, the capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairways by a means of egress capacity factor of 0.25 inch (6.4 mm) per occupant in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Fire Code and an emergency voice/alarm communication system in accordance with Section 907.5.2 of the International Fire Code.

4. The capacity, in inches, of the means of egress stairways serving Group H occupancies shall be calculated by multiplying the occupant load served by such stairways by a means of egress capacity factor of 0.7 inches (17.8 mm) per occupant.

[F] Section 1005.3.2 Other egress components is amended by modifying Exception 1 and adding Exception 4:

Exceptions:

1. For other than Group H and I-2 occupancies, the capacity, in inches, of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.175 inch (4.5 mm) per occupant in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Fire Code and an emergency voice/alarm communication system in accordance with Section 907.5.2.2 of the International Fire Code.

4. The capacity, in inches, of the means of egress components other than stairways serving Group H occupancies shall be calculated by multiplying the occupant load served by such components by a means of egress capacity factor of 0.4 inches (10.2 mm) per occupant.
[B] SECTION 1009
ACCESSIBLE MEANS OF EGRESS

[F] Section 1009.4.1 Standby power is amended by replacing the 2nd sentence with the following:

Emergency or standby power shall be provided in accordance with 606 of the International Fire Code.

Section 1009.5 Platform Lifts is amended by changing the reference from “Chapter 27” to “Section 919.8 of International Fire Code”.

Section 1009.8.1 System requirements is replaced in its entirety as follows:

1009.8.1 System requirements. A two-way communication system shall provide two-way voice communication and visual annunciation between call boxes at locations required by Section 1009.8 of the International Building Code and a master control station. Call boxes provided in addition to those in required locations shall comply with this Section.

The master control station shall be installed in the Fire Command Center (FCC) where provided. In a building where an FCC is not provided, or where multiple master control stations are proposed, locations shall be as approved by the fire code official. In buildings with multiple master control stations, required features and functionality shall be provided simultaneously at all of them. In this configuration, the fire code official shall designate the overriding master control station that supersedes all additional master control stations and assumes any telephone connection established with a monitoring location or 911.

A call from a call box shall be directed to the master control station. When the master control station is not constantly attended, the call shall be redirected automatically within 30 seconds to an approved monitoring location. The call shall be redirected to 911 if the building does not have an approved monitoring location or if no one at the monitoring location is capable of answering the call and taking appropriate action. The call shall not be transmitted to an automated answering system. Two-way voice communication shall be established between the call box and a person at the monitoring location capable of taking appropriate action, or 911. Two-way voice communication shall be discontinued only when monitoring-location personnel or emergency personnel terminate the call.

The two-way communication system shall be connected to a source of standby power capable of providing the required functionality for a minimum of four hours when the normal power supply fails. The two-way communication system shall be monitored for integrity and annunciated in accordance with NFPA 72, 10.18.2.

The following features shall be provided at the call boxes:

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

2. A push button to activate two-way communication shall be provided.

3. An ANSI A117.1-compliant protective cover shall be provided over the face of the call box, including the button. The cover shall be openable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Upon releasing the cover from its closed position, it shall hold itself in the open position so as to provide clear access to activate the button with the same hand. The maximum force required to activate operable parts shall not exceed 5 lbs. (22.2 N). In the open position, the cover shall not encroach on reach ranges required by ANSI A117.1. When the cover is in the open position, the button shall be clearly visible.

4. “EMERGENCY EVACUATION ASSISTANCE” shall be permanently identified on the
5. When the button is pushed, the two-way communication system shall initiate a call for assistance at the master control station. A visual indication shall be provided on or adjacent to the button, and an audible signal shall be provided to acknowledge successful initiation.

6. After the acknowledgement signals are sent, two-way communication shall be established without any intentional delay or required intervention by the person initiating the call. Audible and visual indications shall be provided on the call box to acknowledge two-way voice communication has been established. Visual indication shall be deactivated only when the two-way voice communication is terminated.

The following features shall be provided at the master station(s):

1. Identification of the master control station as the emergency evacuation system master control station;
2. Text operating instruction on the use of the systems;
3. The ability to receive and answer calls from all call boxes in the building served by the master control station;
4. The ability to identify the specific location (story and room) of every call box actively engaged in a call with the master control station;
5. The ability to initiate a call to a call box;
6. The ability to simultaneously put multiple calls on hold without terminating any.

Section 1009.8.2 Directions is replaced in its entirety as follows:

1009.8.2 Directions. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to each call box. Clearly visible ANSI A117.1 compliant signage shall be posted as follows:

1. Text operating instructions on the use of the system shall be posted on or adjacent to the call box;
2. Tactile operating instructions shall be incorporated on or adjacent to the buttons and shall be readily accessible to touch once the cover is in the open position;
3. The written location of the call box shall be posted adjacent to the call box;
4. The statement “PUSH FOR EMERGENCY EVACUATION ASSISTANCE” shall be permanently identified on the call box adjacent to the push buttons;
5. The statement “PERSONS ABLE TO USE THE EXIT STAIRWAY DO SO AS SOON AS POSSIBLE, UNLESS THEY ARE ASSISTING OTHERS” shall be posted on or adjacent to the call box;
6. The statement “AFTER ACTIVATING THE COMMUNICATION SYSTEM, WAIT HERE FOR ASSISTANCE” shall be posted on or adjacent to the call box;
7. Directions to all other means of egress shall be posted near the call box;
8. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance shall be posted on or adjacent to call box within the
stair enclosure.

9. Other information required by the Building or fire code official or the design professional of record.

10. Directions for use shall be as shown in Figure 1009.8.2.

![Figure 1009.8.2](image)

**Section 1009.8.3 Problematic systems is added as follows:**

1009.8.3 Problematic systems. Existing two-way communication systems shall be modified to comply with Section 1009.8.1 of the International Building Code when two (2) or more nuisance calls are placed within a twenty-four (24) hour period, three (3) or more within a thirty (30) day period, or ten (10) or more within a twelve (12) month period. In addition a fine is permitted to be imposed in all cases where the number of nuisance calls exceeds ten (10) within a twelve (12) month period.

The property owner shall be responsible for maintaining the two-way communication systems required by this code to provide, at a minimum, the level of reliability and performance as required when originally permitted. Malfunctioning two-way communication systems shall be immediately repaired or replaced. Legal action is permitted to be imposed for two-way communication systems found to be malfunctioning. Permits shall be obtained in accordance with Section 105 of the International Fire Code for all work on two-way communication systems required by this code.

**SECTION 1010**

**DOORS, GATES AND TURNSTILES**

Section 1010.1.9.12.2 Hardware is replaced in its entirety as follows:

1010.1.9.12.2 Hardware. Door handles, pulls, latches, locks and other operating devices on doors required to be accessible by Chapter 11 shall not require tight grasping, tight pinching or twisting of the wrist to operate. Thumb turn locks are prohibited.

**Commented [SM10]:** This exception was added to 1010.2.4 as #8. (these sections are new numbers in IBC)
Exceptions:

7. Other than egress courts, where occupants must egress from an exterior space through the building for means of egress, exit access doors shall be permitted to be equipped with an approved locking device where installed and operated in accordance with all of the following:

7.1. The maximum occupant load shall be posted where required by Section 1004.9. Such sign shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.

7.2. A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side. (Survivability is not required.)

7.3. The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device. Thumb turn locks are prohibited.

7.4. A clear window or glazed door opening, not less than 5 square feet (0.46 m ) sq. ft. in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.

7.5. A readily visible durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating: THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED. The letters on the sign shall be not less than 1" high on a contrasting background.

7.6. The occupant load of the occupied exterior area shall not exceed 300 in accordance with Section 1004.

Section 1010.1.9.5.2.1 Unlatching is amended by adding Exception 5.

Exceptions:

5. Notwithstanding the last sentence of Section 1010.1.9.12, accessible thumb turn locks are allowed on manually operated sliding doors serving offices with an occupant load of 10 or less. For the purposes of this exception, accessible shall mean a lever with a minimum dimension from the pivot of at least three inches that can be operated with a closed fist by applying no more than 5 pounds of force to the lever.

Section 1010.1.9.13.16 Secured elevator lobby (and subsections) is added as follows:

1010.1.9.13.16 Secured elevator lobby. When all of the provisions of Section 1010.1.9.13.16 have been satisfied, elevator lobbies may be secured to prevent access from the elevator lobby into a tenant space.

1010.1.9.13.16.1 Use of secured elevator lobbies. Secured elevator lobbies are intended to provide a transitional area where building occupants can await the arrival of an elevator car or depart from an elevator car. It is not intended to be an area where building occupants can work. A secured elevator lobby cannot contain other spaces that are considered normally occupied such as restrooms, reception areas or waiting areas.

1010.1.9.13.16.2 Exit path blockage. Securing of the lobby cannot result in the blockage of exit paths from normally occupied areas. A secured lobby cannot interrupt the exit path circulation.

1010.1.9.13.16.3 Dead-end corridors. Securing of the lobby cannot result in dead-end exit corridors with lengths that exceed the provisions of Section 1020.4.

1010.1.9.13.16.4 Restroom facility access. Securing of the lobby cannot result in elimination of

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access to required restroom facilities from normally occupied areas. Each individual tenant shall have access at all times to required toilet facilities.

1010.1.9.13 Electric load-center access. Securing of the lobby cannot eliminate the access required by the NEC to electrical overload protection or disconnect equipment. Each tenant shall have the access required by the NEC.

1010.1.9.13.6 Delayed Egress. Delayed egress is permitted under this section in accordance with 1010.1.9.8.2.13.

1010.1.9.13.7 Exit stairway access. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exception: Access to an exit stairway is not required provided all of the following conditions are met:

1. Fire System Requirements. The building shall be alarmed and/or protected in accordance with one of the items below:
   a. Equipped with a fire alarm system and shall be fully detected.
   b. Fully sprinklered and have manual fire alarm boxes (pull stations) installed throughout the building.
   c. Equipped with the life-safety features prescribed under Section 403.

2. Electric Locks. All doors connecting the secured lobby with normally occupied areas or with corridors leading to the exit stairway may only be secured with a fail-safe electric lock. The lock shall unlock when the fire alarm is activated, upon loss of power or fire flow.

3. Emergency Communications. One of the following emergency communication devices shall be provided in the elevator lobby:
   a. A manual fire alarm box shall be installed in a clearly visible location within the elevator lobby and mounted at a height to comply with the reach range provisions of ICC A117.1 Section 308. The location shall be approved by the FPB. A manual fire alarm box installed under these requirements shall transmit to a Class 1 Central Station.
   b. An emergency telephone or other approved two-way communication device shall be installed in the elevator lobby and mounted in compliance with the reach ranges provisions of ICC A117.1 Section 308. The location shall be approved by the FPB. The system/device shall transmit to a commercial monitoring service or continuously staffed monitoring service within the building as approved by CPD and the FPB. Upon activation, the communications device shall automatically transmit a location identification message to the monitoring service. A sign in compliance with ICC A117.1 shall be provided at the communication device that states that this is an emergency phone and lists the building address and the floor number of the elevator lobby.

4. Lighting Requirements. The elevator lobby shall be illuminated in accordance with Section 1008.

5. Compatibility with Accessibility Requirements. All doors into the elevator lobby area from normally occupied areas shall have accessible hardware compatible with the
requirements of ICC A117.1 Sections 308 and 404.2.6 on each side of the door.

6. **Elevator Lobby Refuge Areas or Elevator Lobby Area of Rescue Assistance.** When an elevator lobby is used as an area of refuge or area of rescue assistance, all of the following conditions shall be met:

   a. **Electric Lock Requirements.** Electric locks shall be designed so that when they are released, the door will remain latched. The lock shall also be connected to the Electric Locks – Master Switch.

   b. **Door and Door Hardware Requirements.** All doors opening into the elevator lobby shall be opening fire-protection assemblies as required by Table 716.1(2) for smoke barriers. All hardware necessary to maintain the fire rating of the door shall be listed and approved fire door hardware. All hardware installed on the rated door and frame assembly shall be compatible with the manner in which the door was manufactured and shall not reduce the fire rating of the assembly. Field or other modification of rated doors and frames is prohibited unless approved in writing by the agency which labeled the fire-rated assembly.

   c. **Securing Doors Leading into the Elevator Lobby.** Doors leading into the lobby from normally occupied areas shall be readily openable from the normally occupied side without the use of a key or special knowledge or effort.

   d. **Refuge Area or Area of Rescue Assistance Subdivision.** A refuge area or area of rescue assistance, which includes the elevator lobby and the corridors that connect the lobby to the exit stairways, shall remain as one open area without restriction of movement within the refuge area or area of rescue assistance.

[B] SECTION 1011 STAIRWAYS

Section 1011.12 Stairway to roof is amended by deleting the Exception.

[B] Section 1011.12.2 Roof access is amended by deleting the Exception.

[B] Section 1011.12.3 Roof hatches is added as follows:

1011.12.3 Roof hatches. All interior stair enclosures that extend to the roof shall have, at the highest point of the enclosure, an approved roof hatch openable to the exterior (also see Section 504.4 of the International Fire Code). The hatch shall be a minimum of 16 square feet (1.5 m²) in area with a minimum dimension of 2 feet (610 mm).

Exceptions:

1. Roof hatches are not required on pressurized stairway enclosures.

2. Enclosures of stairways that extend to the roof in accordance with Sections 1011.12 and 1011.12.2 and provided with a penthouse complying with Section 1510.2.

SECTION 1013
EXIT SIGNS

Section 1013.3 Illumination is replaced in its entirety as follows:
1013.3 Illumination. Exit signs shall be electrically-powered and internally illuminated.

Exceptions:
1. Tactile signs required by Section 1013.4 need not be provided with illumination.
2. Edge-illuminated signs are permitted where listed and labeled in accordance with UL 924.

Section 1013.5 Internally illuminated exit signs is replaced in its entirety as follows:

1013.5 Internally illuminated exit signs. Electrically powered exit signs shall be listed and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer’s instructions and Section 1203 of the International Fire Code. Exit signs shall be illuminated at all times.

Section 1013.5.1 Graphics is added as follows:

1013.5.1 Graphics. Exit signs shall have green lettering on a contrasting field or white lettering on a green field.

Section 1013.6 Externally illuminated exit signs and all subsections are deleted in their entirety.

SECTION 1018
AISLES

Section 1018.5 Aisles in other than assembly spaces and groups B and M is amended by adding Exception 2.

Exceptions:
2. Aisles in high-piled combustible storage areas shall comply with the applicable provisions of Chapter 32 of the International Fire Code.

SECTION 1019
EXIT ACCESS STAIRWAYS AND RAMPS

Section 1019.3 Occupancies other than Groups I-2 and I-3 is amended by replacing item 4 as follows:

4. Exit access stairways and ramps in buildings equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1 of the International Fire Code, where the area of the vertical openings between stories does not exceed twice the horizontal projected area of the stairway or ramp and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. This provision is limited to openings that do not connect more than four stories.

SECTION 1020
CORRIDORS

Section 1020.42 Construction is amended by adding exceptions 6 and 7 as follows:

Exceptions:
6. Corridor walls and ceilings need not be of fire-resistive construction within single-tenant office
spaces.

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

SECTION 1021
EGRESS BALCONIES

Section 1021.4 Location is deleted in its entirety and replaced by the following:

1021.4 Location. Exterior egress balconies shall have a minimum distance of 10 feet (3048 mm) measured at right angles from the exterior edge of the egress balcony to the following:

1. Adjacent lot lines. Where the egress balcony is located adjacent to a public street, alley, or public way, the distance of 10 feet shall be measured to the opposite edge of such public street, alley, or public way.

2. Other buildings or other portions of the same building on the same lot, unless opening limitations and protection are provided as defined below:

a. Openings in exterior walls of adjacent buildings or other portions of the same building on the same lot located less than 3 feet from the exterior egress balcony are not permitted.

b. Openings in exterior walls of adjacent buildings or other portions of the same building on the same lot shall be protected by not less than 45-minute opening protection assemblies when located between 3 feet and 10 feet from the exterior egress balcony. Sprinkler protection shall not be substituted for 45-minute opening protection assemblies.

c. Area of exterior openings in the adjacent buildings or portions of the same building on the same lot shall not exceed the opening area limits specified in Table 705.8 for that portion of the exterior wall adjacent to and at right angle to the exterior egress balcony.

d. Exterior walls of the adjacent building shall have a minimum one-hour fire resistance rating and not less than the fire resistance rating required in Table 602.

SECTION 1023
INTERIOR EXIT STAIRWAYS AND RAMPS

Section 1023.9.2 Door operation identification is added as follows:

1023.9.2 Door operation identification. At locked stairway doors, identification required by Section 1023.9 shall also identify the door operation as follows:

a. All doors that are locked for more than 5 consecutive floors shall have a sign that reads: THIS DOOR IS LOCKED. EMERGENCY PHONES ARE LOCATED ON FLOORS ___ AND ____.

b. All doors that are locked for 5 consecutive floors or less shall have a sign that reads: THIS DOOR IS LOCKED. FOR THE NEXT UNLOCKED DOOR GO DOWN TO FLOOR __ OR UP TO FLOOR __.
Section 1023.9.3 Emergency phone identification is added as follows:

1023.9.3. Emergency phone identification. Emergency phones in exit stairways shall have a sign stating, “Emergency Phone,” the building address and the floor and stair location of the phone. Signage shall be in accordance with Section 1023.9.1 and ICC A117.1 Sections 703 and 704.

Section 1023.112.2 Enclosure access is deleted in its entirety.

SECTION 1025
LUMINOUS EGRESS PATH MARKINGS

Section 1025.1 General is replaced in its entirety as follows:

1025.1 General. Approved luminous egress path markings delineating the exit path shall be provided in high-rise buildings of Group A, B, E, I, M, and R-1 occupancies in accordance with Sections 1025.1 through 1025.5.

Exceptions:

1. Luminous egress path markings shall not be required on the level of exit discharge in lobbies that serve as part of the exit path in accordance with Section 1028.1, Exception 1.

2. Luminous egress path markings shall not be required where illumination level under emergency power is provided in accordance with Section 1008.3.5 and the power supply to the means of egress illumination within interior exit enclosures, interior exit ramps, and exit passageways is powered by all of the following:
   a. Premises’ electrical supply,
   b. Generator electrical supply, and
   c. Emergency storage battery units at each fixture to provide power for duration of not less than 90 minutes.

SECTION 1027
EXTERIOR EXIT STAIRWAYS AND RAMPS

Section 1027.5 Location is replaced in its entirety as follows:

1027.5 Location. Exterior exit stairways and ramps shall have a minimum distance of 10 feet (3048 mm) measured at right angles from the exterior edge of the stairway or ramps, including landings, to:

1. Adjacent lot lines. Where exterior exit stairways and exterior exit ramps are located adjacent to a public street, alley or public way, the distance of 10 feet shall be measured to the opposite edge of such public street, alley or public way.

2. Other buildings or other portions of the same building on the same lot, unless opening limitations and protection are provided as defined below:
   a. Openings in exterior walls of adjacent buildings or other portions of the same building on the same lot located less than 3 feet from the exterior exit stairways or ramps are not permitted.
   b. Openings in exterior walls of adjacent buildings or other portions of the same building on the same lot shall be protected by not less than 45-minute opening protection assemblies when
located between 3 feet and 10 feet from the exterior exit stairway or ramp. Sprinkler protection shall not be considered a substitute to 45-minute opening protection. Exterior walls of the adjacent building shall not be substituted for 45-minute opening protection assemblies.

c. Area of exterior openings in the adjacent buildings or portions of the same building on the same lot shall not exceed the opening area limits specified in Table 705.8 for that portion of the exterior wall adjacent to and at right angles to the exterior exit stairway or ramp.

d. Exterior walls of the adjacent building shall have a minimum one-hour fire resistance rating and not less than the fire resistance rating required in Table 602

Exception: Exterior exit stairways and ramps serving individual dwelling units of Group R-3 shall have a minimum fire separation distance of 5 feet (1525 mm)

[F] SECTION 102930
ASSEMBLY

[F] Section 102930.15 Seat stability is replaced in its entirety as follows:

102930.15 Seat stability. In a building, room or space used for assembly purposes, the seats shall be securely fastened to the floor.

Exceptions:

1. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   a. with 100 or fewer seats, and
   b. with an actual net area per occupant greater than or equal to 7 sq. ft., and
   c. without ramped or tiered floors for seating.

2. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   a. with 100 or fewer seats, and
   b. with an actual net area per occupant greater than or equal to 7 sq. ft., and
   c. with ramped or tiered floors for seating, and
   d. where plans showing seating, tiers and aisles were submitted to, reviewed and permitted by the fire code official.

3. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   a. with more than 100 and fewer than 200 seats, and
   b. with an actual net area per occupant greater than or equal to 7 sq. ft., and
   c. without ramped or tiered floors for seating, and
   d. with seats fastened together in groups of five or more.

4. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   a. with seating at tables, and
   b. with an actual net area per occupant greater than or equal to 15 sq. ft., and
c. without ramped or tiered floors for seating.

5. Groups of seats are not required to be fastened to the floor in places of assembly or portions thereof:
   a. with 14 or fewer seats per group, and
   b. with an actual net area per occupant greater than or equal to 7 sq. ft., and
   c. without ramped or tiered floors for seating, and
   d. groups are separated from other seating by railings, guards, partial height walls or similar barriers.

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

7. Special events permitted in accordance with Section 105.6 of the *International Fire Code*. Loose seats, folding chairs or similar seating facilities that are not fixed to the floor shall be securely fastened together in groups of five or more.

8. All accessible and companion seating as required by currently adopted ICC A117.1 Chapter 8.
CHAPTER 11
ACCESSIBILITY

SECTION 1101
GENERAL

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

Where there are seven or more residential dwelling units in a project, the provisions of Colorado Revised Statutes (C.R.S.) Title 9, Article 5, Standards for Accessible Housing, shall be enforced by this Code. C.R.S. Title 9, Article 5 as amended, is reproduced in Appendix R of this Code for reference.

Section 1101.2 Notice and warning is added as follows:

1101.2 Notice and warning. Although the Code enforces the provisions of Title 9, Article 5, C.R.S., as amended, as set out in Section 1101.1 above, the Code has not been certified or otherwise conformed by the U.S. Government or State of Colorado to the requirements or the Americans with Disabilities Act ("ADA") the Rehabilitation Act, the HUD Fair Housing Act or any other State of Colorado accessibility laws, including but not limited to the Colorado Anti-Discrimination Act ("CADA").

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

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

Any accessibility related modification to a building shall require a building permit.

SECTION 1105
ACCESSIBLE ENTRANCES

Section 1105.1 Public entrances is amended by adding the following Exception sentences to the end of the section and adding Table 1105.1 as follows:

In facilities with the occupancies and building occupant loads indicated in Table 1105.1, public entrances that are required to be accessible shall have one door be either a full power-operated door or a low-energy power-operated door. Where the public entrance includes a vestibule, at least one door into and one door out of the vestibule shall meet the requirements of this section. For the purpose of determining power-operated door requirement above, a tenant space with separate exterior entrance(s) shall be considered a separate facility and building.

Table 1105.1

<table>
<thead>
<tr>
<th>Occupancy</th>
<th>Building occupant load greater than:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1, A-2, A-3, A-4</td>
<td>300</td>
</tr>
</tbody>
</table>
a. In mixed-use facilities, when the total sum of the building occupant load is greater than those listed, the most restrictive building occupant load shall apply.

Exception: For the purpose of determining power-operated door requirements, a tenant space with its own exterior public entrance shall be considered a separate facility and building.

Commented [SM11]: This section added as 11.5.1.1 in 2021 IBC

Commented [SM12R11]: Add exception from 2024 code (proposal E118-21) to keep that last sentence of 1105.1 that wasn’t in 2021.
CHAPTER 15
ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

SECTION 1503
WEATHER PROTECTION

Section 1503.2.2 Mechanical equipment on roof is added as follows:

1503.2.2 Mechanical equipment on roof. Mechanical equipment placed or reset on roofing shall be supported on minimum 8-inch curbs, platforms, or legs bearing on the decking and made watertight. The 8-inch raised height shall be measured from the top of the installed roofing assembly to the top of the curbs, platforms, or legs.

Exception: Individual equipment units with a weight of 400 pounds or less may be supported on 8-inch legs bearing on the roof membrane if vibration isolation bearing pads are provided between the bearing points and the roof and the roof warranty is not affected by the installation of the units on the roof membrane. All methods must be meet manufacturers requirements and recommendations for the application being proposed.

SECTION 1505
FIRE CLASSIFICATION

Section 1505.10 Roof gardens and landscaped roofs is replaced in its entirety as follows:

1505.10 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with Section 1507.15 and shall be installed in accordance with ANSI/SPRI VF-1 and the administrative and design requirements for vegetated roofs in the Department of Community Planning and Development and Department of Public Health and Environment Rules Governing Green Buildings.

SECTION 1507
REQUIREMENTS FOR ROOF COVERINGS

Section 1507.6.2 Deck slope is replaced in its entirety as follows:

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

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

Section 1507.10.3 Flashing for interior roof drains is added as follows:

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

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

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

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

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

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

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

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

Section 1507.10.5 Stucco is added as follows:

1507.10.5 Stucco. Exterior wall finishes such as, but not limited to, stucco and siding on walls extending above the roof shall terminate a minimum of 8 inches above the finished roofing of a flat roof and 2 inches above shingle, shake and tile roofs.

Section 1507.10.6 Drainage testing is added as follows:

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

Section 1507.198 Hot-applied, reinforced rubberized asphalt roofing is added as follows:

1507.198 Hot-applied, reinforced rubberized asphalt roofing. The installation of hot-applied reinforced rubberized asphalt roofing shall comply with the provisions of this section.

1507.198.1 Slope. Hot-applied, reinforced rubberized asphalt roof membranes shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

Exception: Areas of roofs used for occupied roofs, vegetative roofs, roof gardens or other similar purposes, shall not be required to have a design slope provided a permanent electrical conductance breach detection method for testing the membrane is installed in addition to a drainage mat.

1507.198.2 Material standards. Hot-applied, reinforced rubberized asphalt roofing shall be one-part, hot-applied, rubberized asphalt and comply with CAN/CGSB-37.50-M89.

1507.198.3 Protected membrane ballasted low-slope roofs. If installed with a slope of less than one-fourth unit vertical in 12 units horizontal (2-percent slope), hot-applied, reinforced rubberized asphalt roofing shall be installed as a protected membrane roof.

1507.198.4 Foam Plastics. Foam plastic insulation shall comply with Section 2603. Foam plastic insulation used with pavers and pedestals shall be in an approved roof assembly.
SECTION 1511.12
REROOFING

Section 1511.12.6 Reroofing of built-up roofs is added as follows:

1511.12.6 Reroofing of built-up roofs. Pre-roofing inspection shall be made by this Agency for all commercial built-up and single ply systems to verify that the existing roof meets the following conditions:

1. The existing roof deck is structurally sound.
2. The roof drains and roof drainage are sufficient to prevent the ponding of water.
3. The existing roofing is secured to the existing roof deck.
4. The existing insulation is not wet (a 3rd party moisture scan may be required).
5. The fire-retardant classification of the roof shall be maintained.
CHAPTER 16
STRUCTURAL DESIGN

SECTION 1607
LIVE LOADS

Section 1607.7.8 Fire truck and emergency vehicles is replaced in its entirety as follows:

1607.7.8 Fire truck and emergency vehicles. Where a structure or portions of a structure are accessed and loaded by fire department access vehicles and other similar emergency vehicles, the structure shall be designed for whichever of the following loads produces the greater load effects. The Fire Prevention Division shall determine the area around any building or structure for which fire access and, therefore, the provisions of this section are required. All structural decks with loading per this section shall have permanent all-weather load posting signs indicating gross maximum vehicle load, maximum tandem axles load and maximum single axle load. Signs shall be posted in a conspicuous location at each deck entrance and shall be maintained by the owner at all times.

1. The live loading specified in Table 1607.1 Item 29, Sidewalks, vehicular driveways and yards, subject to trucking.
2. The live loading specified in Section 1607.7.1.
3. The three live load cases for each of the two fire department vehicle types indicated below. The fire vehicle nominal live loads and geometries are shown in Figures 1607.7.8 (1) and 1607.7.8 (2).

Platform Truck – Figure 1607.7.8 (1)

Basic Load Case:

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

Static Load Case A:

A load of 52,000 pounds on one outrigger. The contact area of each outrigger is 26 in. x 31 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.7.8 (1).

Static Load Case B:

A load of 30,000 pounds on each of two adjacent outriggers (total load is 60,000 pounds). The contact area of each outrigger is 26 in. x 31 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.7.8 (1).

Ladder Truck – Figure 1607.7.8 (2)

Basic Load Case:

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

Static Load Case A:
A load of 29,000 pounds on one outrigger. The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.2.2 (2).

Static Load Case B:

A load of 20,000 pounds on each of two adjacent outriggers (total load is 40,000 pounds). The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.2.2 (2)
Each outrigger has a 26" x 31" pad (TYP. of 4).

Load Case:
- 52 kips – Case A
- 30 kips – Case B
- Typical Each Side

Load Case:
- 0 kips – Case A
- 30 kips – Case B
- Typical Each Side

Figure 1607.7.2 (1) – Platform Truck
FIGURE 1607.78.2 (2) – LADDER TRUCK

DENVER FIRE DEPARTMENT – FIRE TRUCK GEOMETRY

Tire contact area, front 12" x 13" (TYP. of 2)
Tire contact area, rear 14" X 16" (TYP of 2)

Each outrigger has a 24" x 24" pad (TYP. of 4).

Load Case:
29 kips – Case A
20 kips – Case B
Typical Each Side

Load Case:
0 kips – Case A
20 kips – Case B
Typical Each Side
SECTION 1608  
SNOW LOADS  

Section 1608.1 General is replaced in its entirety as follows:

1608.1 General. Design snow loads shall be determined in accordance with Chapter 7 of ASCE 7, as amended in Section 1608.4 of this code, but the design roof load shall not be less than that determined by Section 1607. In addition, design loads on uncovered parking decks shall include the requirements of Section 1608.5 of this code.

Section 1608.2 Ground snow loads is replaced in its entirety as follows:

1608.2 Ground snow loads. Ground snow load, p, for use with the procedures of ASCE 7 shall be 35 pounds per square foot.

Section 1608.4 Modifications to ASCE 7 is added as follows:

1608.4 Modifications to ASCE 7. The values for the snow load importance factor, Is, in Table 1.5-2 of ASCE 7 shall be amended as follows:

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Is</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>1.20</td>
</tr>
<tr>
<td>IV</td>
<td>1.40</td>
</tr>
</tbody>
</table>

Section 1608.5 Snow load on uncovered parking decks is added as follows:

1608.5 Snow load on uncovered parking decks. Uncovered decks used for parking of passenger vehicles shall be designed for a non-reducible uniformly applied design load of 55 psf. This load includes the combined effects of snow and live loads and need not be combined with other snow loads or other live loads applied to the parking deck.

SECTION 1609  
WIND LOADS  

Section 1609.1.1 Determination of wind loads is replaced as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7. The type of opening protection, and the exposure category for the site is permitted to be determined in accordance with Section 1609 or ASCE 7. The basic design wind speed, V, shall be determined in accordance with Section 1609.3. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Section 1609.3 Basic design wind speed is replaced as follows, subordinate section to remain:

1609.3 Basic design wind speed. The basic design wind speed, V for the determination of the wind loads shall be as follows:

Risk Category II buildings and structures: 115 miles per hour for all areas in the City and County of Denver located east of a line defined as the centerline of Federal Boulevard. For areas located west of the centerline of Federal Boulevard, the wind speed shall be interpolated between the contours as defined in the report titled "Colorado Front Range Gust Map – ASCE 7-10 Compatible dated November 18, 2013, in which the 115 mph contour is located along the centerline of Federal Boulevard, the 125 mph contour is located along the centerline of Sheridan Boulevard, and the 140 mph contour is located along the centerline of Kipling Boulevard."
Risk Category III buildings and structures: 120 miles per hour for all areas in the City and County of Denver located east of a line defined as the centerline of Federal Boulevard. For areas located west of the centerline of Federal Boulevard, the wind speed shall be interpolated between the contours as defined in the report titled “Colorado Front Range Gust Map – ASCE 7-10 Compatible” dated November 18, 2013, in which the 120 mph contour is located along the centerline of Federal Boulevard, the 135 mph contour is located along the centerline of Sheridan Boulevard, and the 150 mph contour is located along the centerline of Kipling Boulevard.

Risk Category IV buildings and structures: 125 miles per hour for all areas in the City and County of Denver located east of a line defined as the centerline of Federal Boulevard. For areas located west of the centerline of Federal Boulevard, the wind speed shall be interpolated between the contours as defined in the report titled “Colorado Front Range Gust Map – ASCE 7-10 Compatible” dated November 18, 2013, in which the 125 mph contour is located along the centerline of Federal Boulevard, the 140 mph contour is located along the centerline of Sheridan Boulevard, and the 155 mph contour is located along the centerline of Kipling Boulevard.

Risk Category I buildings and structures: 105 miles per hour for all areas in the City and County of Denver located east of a line defined as the centerline of Federal Boulevard. For areas located west of the centerline of Federal Boulevard, the wind speed shall be interpolated between the contours as defined in the report titled “Colorado Front Range Gust Map – ASCE 7-10 Compatible” dated November 18, 2013, in which the 105 mph contour is located along the centerline of Federal Boulevard, the 120 mph contour is located along the centerline of Sheridan Boulevard, and the 130 mph contour is located along the centerline of Kipling Boulevard.

The centerlines of Federal Boulevard, Sheridan Boulevard, and Kipling Boulevard are assumed to be projected to the north and south boundaries of the City and County of Denver.

SECTION 1612
FLOOD LOADS

Section 1612.3 Establishment of flood hazard areas is replaced as follows (subordinate sections to remain):

1612.3 Establishment of flood hazard areas. To establish flood hazard areas, the City and County of Denver adopts “regulatory floodplains” which are defined in the Denver Floodplain Ordinance in Section 56-201 of the Denver Revised Municipal Code as “The land subject to inundation by the base flood as delineated by the Special Flood Hazard Area (SFHA), any other floodplain maps that have been adopted by the manager of Department of Transportation and Infrastructure, and areas that have been removed from the SFHA by a FEMA issued Letter of Map Revision Based on Fill (LOMR-F).” Contact the current Floodplain Manager for the City and County of Denver for the latest revisions to the regulatory floodplains. The adopted regulatory floodplains and supporting data are hereby adopted by reference as flood hazard areas and declared to be part of this section.

SECTION 1613
EARTHQUAKE LOADS

Section 1613.2.2 Site class definitions is replaced in its entirety as follows:

1613.2.2 Site class definitions. Based on the site soil properties, the site shall be classified as Site Class A, B, C, D, E, or F in accordance with Chapter 20 of ASCE 7. Any assignment of Site Class NOT based on average shear wave velocity, measured for the top 100 feet of the soil profile, shall comply with the
following limitations:

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

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

   c. Where the soil properties are not known in sufficient detail to determine the site class, Site Class D, subjected to the requirement of Section 1613.2.3, shall be used unless the building official or geotechnical data determines that Site Class E or F soils are present at the site.

Section 1613.2.5.3 Seismic design category, minimum is added as follows:

1613.2.5.3 Seismic design category, minimum. All buildings and structures in the City and County of Denver shall satisfy the requirements of Seismic Design Category B, as a minimum.
CHAPTER 17
SPECIAL INSPECTIONS AND TESTS

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

Section 1704.2 Special inspections and tests is amended by removing reference to Section 105 and replacing with reference to Sections 130 and 131, and by removing reference to Section 110 and replacing with reference to Section 140 of the Denver Building Code.

Section 1704.2.3 Statement of special inspections is amended by removing reference to Section 107.1 and replacing with reference to Section 133.2, item 13 of the Denver Building Code.

Section 1704.6 Structural observations is amended by removing reference to Section 110 and replacing with reference to Section 140 of the Denver Building Code.
CHAPTER 18
SOILS AND FOUNDATIONS

SECTION 1809
SHALLOW FOUNDATIONS

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

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

SECTION 1810
DEEP FOUNDATIONS

Section 1810.3.5.2.2 Uncased is replaced in its entirety as follows:

1810.3.5.2.2 Uncased. Cast-in-place or grouted-in-place deep foundation elements without a permanent casing shall have a specified diameter of not less than 12 inches (305 mm). The element length shall not exceed 30 times the specified diameter.

Exception: The specified diameter of the element is permitted to be less than 12 inches and/or the length of the element is permitted to exceed 30 times the specified diameter, provided that the design and installation of the deep foundations are under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and deep foundations. The registered design professional shall submit a report to the building official stating that the elements were installed in compliance with the approved construction documents.
CHAPTER 24
GLASS AND GLAZING

SECTION 2405
SLOPED GLAZING AND SKYLIGHTS

Section 2405.6 Skylight fall protection is added.

2405.6 Skylight fall protection. In Group F, M, and S occupancies, fall protection shall be provided meeting minimum requirements of Section 2405.6.1 and provisions of Section 1108 items 1, 2 and 3 of the International Fire Code.

2405.6.1 Fall protection construction. Fall protection shall be of such construction and mounting that they are capable of withstanding a load of 400 pounds applied perpendicularly at any one square foot areas on the screen or skylight. Covers shall be secured in place to prevent accidental removal or displacement. Fall protection shall not have openings more than six (6) inches in diameter or of flatwork with openings not more than two (2) inches wide with length unrestricted. Manufacturer or supplier shall submit documentation that the screen(s) or skylight(s) supplied comply with the requirements of this section.

Exception: Skylights constructed on 8-inch minimum or taller curbs, or guards complying with OSHA 29 CFR1926.502. Self-Luminous or Reflective signs shall be provided on guards, Section 1108.1 of the International Fire Code.
CHAPTER 26
PLASTIC

SECTION 2609
LIGHT-TRANSMITTING PLASTIC ROOF PANELS

Section 2609.5 Fall protection is added.

2609.5 Fall protection. Fall protection shall be provided according to Sections 2405.6 and 2405.6.1.

SECTION 2610
LIGHT-TRANSMITTING PLASTIC SKYLIGHT GLAZING

Section 2610.9 Fall protection is added.

2610.9 Fall protection. Fall protection shall be provided according to Sections 2405.6 and 2405.6.1.
CHAPTER 27
ELECTRICAL

SECTION 2701
GENERAL

Section 2701.1 Scope is amended to remove the reference to the *International Property Maintenance Code*.

Section 2701.1.1 Electrical code references is added as follows:

*2701.1 Electrical code references.* All references in this Code to the “NFPA 70” are changed to the “Electrical Code as adopted by the State of Colorado”.

Section 2701.2 Service masts is added as follows:

*2701.2 Service masts.* Where a mast is required to maintain the overhead conductor height required by the *National Electrical Code*, the mast shall be a minimum of 2 inch rigid metal conduit or 2 inch intermediate metal conduit. All masts over 48 inches in height shall be appropriately guyed to counter stresses from the service drop.

SECTION 2702
EMERGENCY AND STANDBY POWER SYSTEMS

[F] Section 2702.2.2 Elevators and platform lifts is replaced in its entirety as follows:

[F] 2702.2.2 Elevators and platform lifts. Emergency or standby power shall be provided for elevators and platform lifts as required in Sections 1009.4, 1009.5, 3003.1, 3007.8 and 3008.8.

[F] Section 2702.2.11 High-rise buildings is replaced in its entirety as follows:

[F] 2702.2.11 High-rise buildings. Emergency power shall be provided in high-rise buildings as required in Sections 403.4.8.
CHAPTER 28
MECHANICAL SYSTEMS

[M] SECTION 2801
GENERAL

Section 2801.1 Scope is amended to remove the reference to the International Property Maintenance Code
CHAPTER 29
PLUMBING SYSTEMS

SECTION 2901
GENERAL

Section 2901.1 Scope is amended to remove the reference to the International Property Maintenance Code.

SECTION 2902
MINIMUM PLUMBING FACILITIES

Section 2902.1.1 Fixture calculations is amended by adding replacing exception 2 as follows:

Exceptions

2. Calculations of fixtures provided in toilet and bathing rooms identified as all-gender shall be permitted to sum fractional numbers for each sex and then round up to the next whole number. Fixtures shall contribute equally to the number of male and female fixtures required. For occupancies where the required number of female fixtures is more than the required number of male fixtures, the additional fixtures are permitted to be provided in all-gender facilities.

Delete exception 3 in its entirety.

Section 2902.1.2 Single-user toilet facility and bathing room fixtures is replaced in its entirety as follows:

[P] 2902.1.2 Toilet and bathing room fixture designation. Toilet and bathing fixtures shall be located in single-user or multi-user toilet and bathing rooms and shall be identified for use by sex or gender in accordance with Section 2902.1.2.1 and Section 2902.1.2.2.

[P] 2902.1.2.1 Single-user toilet and bathing rooms. A single-user toilet and bathing room shall contain not more than one water closet, one bathtub and one shower. Plumbing fixtures provided in single-user toilet and bathing rooms shall contribute toward the total number of required plumbing fixtures as calculated per Section 2902.1.1 Exception 2. Single-user toilet and bathing rooms, including family or assisted-use toilet and bathing rooms shall be identified for use by all genders. Toilet fixtures shall not be in separate compartments.

Exception: In addition to a single water closet, one child-height water closet and one urinal shall be permitted to be located in a single-user toilet or bathing room. Not more than one water closet provided for each single-user toilet or bathing room shall contribute toward the total number of required plumbing fixtures.

[P] 2902.1.2.2 Multi-user toilet and bathing rooms. Multi-user toilet and bathing rooms with not less than two water closet compartments, or one water closet compartment and one urinal, or two bathing fixtures shall be provided as separate male and female facilities. Plumbing fixtures provided in multi-user toilet and bathing rooms shall contribute toward the total number of required plumbing fixtures for the sex to which they are designated.
Exception: Multi-user toilet rooms complying with Section 2902.7 shall be permitted to be identified for use by all genders. Water closets and lavatories provided in multi-user toilet rooms identified for use by all genders shall contribute toward the total number of required plumbing fixtures as calculated per Section 2902.1.1 Exception 2. Where both separate and all-gender facilities are provided, separate independent multi-user male and female facilities shall be provided.

[P] Section 2902.1.3 Lavatory distribution is replaced as follows:

2902.1.3 Lavatory Distribution. Where two or more toilet rooms are provided, the required number of lavatories shall be distributed proportionally to the required number of water closets. The required lavatories shall be permitted to be located within water closet compartments provided not less than the larger of one-half of the required lavatories or two lavatories shall be located outside of the water closet compartments.

[P] Section 2902.2 Separate facilities and its exception is replaced in its entirety as follows:

[P] 2902.2 Minimum number of toilet facilities and bathing rooms. Where plumbing fixtures are required, a minimum of two accessible toilet facilities and two accessible bathing rooms shall be provided. Section 1109.2 Exception 3 to accessible toilet facility and bathing rooms requirements shall not apply to the two accessible toilet facilities and bathing rooms required by this section.

Exceptions: The minimum number of two toilet facilities and two bathing rooms shall not be required for the following:

1. Dwelling units and sleeping units.
2. Structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer shall have not less than one accessible toilet and bathing room.
3. Mercantile occupancies in which the maximum occupant load is 100 or fewer shall have not less than one accessible toilet room.
4. Business occupancies in which the maximum occupant load is 25 or fewer shall have not less than one accessible toilet room.

[P] Section 2902.2.1 Family or assisted-use toilet facilities serving as separate facilities is deleted in its entirety.

[EH] Sections 2902.3.2 “Prohibited toilet room location” shall be amended by adding the following to the last sentence:

Access to toilet rooms shall not be through food preparation areas, food storage areas, or ware washing or utensil storage areas, except for toilet rooms provided exclusively for the use of employees who primarily work in the food preparation area.

[P] Section 2902.3.6 Door locking is replaced in its entirety as follows:

[P] 2902.3.6 Door locking. Door locking of toilet rooms, bathing rooms and toilet compartments shall comply with this section.

[P] 2902.3.6.1 Multi-user toilet and bathing rooms. Where provided, an egress door for the room shall not be lockable from the inside of the room.

[P] 2902.3.6.2 Single-user toilet and bathing rooms. The egress door for the room shall be lockable from the inside of the room for privacy. The privacy lock shall be in accordance with Sections 1010.1.9.1 and 1010.1.9.2.

Exceptions:
1. Privacy locking shall not be required in sleeping units or dwelling units.
2. Where approved in Group I occupancies, toilet room privacy is not required where care recipients or detainees require observation for clinical or security reasons.

[P] 2902.3.6.3 All-gender multi-user toilet rooms toilet compartment doors. Toilet compartment doors in all-gender multi-user toilet rooms shall have a privacy lock that has an indicator which notifies occupants on the exterior side of the door when the door is secured from the inside of the compartment.

[P] Section 2902.4. Signage is replaced as follows (subsection remains unchanged):

[P] 2902.4 Signage. Required public facilities shall be provided with signs that designate the sex or gender as required by Section 2902.4. Signs shall be readily visible and located near the entrance to each toilet facility or bathing room. Signs for accessible toilet and bathing room facilities shall comply with Section 1112.

[EH] Section 2902.7 Location of service sinks is modified by adding the following at the end of the paragraph as follows:

[EH] 2902.9 Location of service sinks. Service sinks are required on each floor where toilet facilities are provided as defined below:
1. In food service facilities and occupancies,
2. In Group R occupancies that have food, drink, or ice for consumption or handling

[P] Section 2902.78 All-gender multi-user toilet rooms and its subsections are added:

[P] 2902.78 All-gender multi-user toilet rooms. Where all-gender multi-user toilet rooms are provided, they shall be in accordance with this Section.

[P] 2902.78.1 Minimum number of fixtures. All-gender multi-user toilet rooms shall contain not less than six toilet compartments and three lavatories.

Exception: Where a single-user toilet room is clustered at a single location with an all-gender multi-user toilet room, the all-gender multi-user toilet room shall be permitted to contain not less than three toilet compartments and two lavatories.

[P] 2902.78.2 Clearance. Toilet rooms shall be provided with a minimum clearance of not less than 60 inches (1 524 mm) between all opposing toilet compartments, walls, and lavatories.

Exception: Circulation areas serving not more than one plumbing fixture.

[P] 2902.78.3 Toilet compartments. Water closets shall each be provided in individual compartments. Compartments shall be permitted to include walls, partitions and doors and shall begin at the floor and extend to the finished ceiling, have no sightlines when the door is in the closed position and have a lockable door in accordance with Section 2902.3.6.3. A urinal shall be permitted only within a water closet compartment; such urinal shall not contribute towards the total number of required plumbing fixtures.

Exceptions:
1. Compartment door undercuts shall be permitted to be not more than 0.5 inches. (13 mm).
2. Air transfer grills at the entrance side of a compartment shall be allowed where they are provided at a height not less than 80 inches (2 133.6 mm).
3. Partial-height toilet compartments are permitted where they begin at a height not more than 4.5 inches (114.3 mm) and extend to a height not less than 96 inches (2 438.4 mm) above the finished floor surface.

Commented [SM16]: Service sink location was brought in as 2902.7 to the 2021 IBC. Moved the Denver requirements here and just added them to what got put in the 2021 IBC.
[EH] Section 2902.89 Toilet room accessories is added as follows:

[EH] 2902.89 Toilet room accessories. A minimum of one hand-drying facility shall be provided in each toilet room where lavatories are provided.

[EH] Section 2902.9 Location of service sinks is added as follows:

[EH] 2902.9 Location of service sinks. Service sinks are required on each floor where toilet facilities are provided as defined below:

1. In eating and amusement occupancies.
2. In food service facilities and occupancies.
3. In Group R occupancies that have food, drink, or ice for consumption or handling.

Section 2902.10 Drive-in facilities is added as follows:

2902.10 Drive-in facilities. In addition to plumbing facilities otherwise required by Section 2902.1, public toilet facilities shall be provided to serve an occupant load equal to twice the number of parking stalls provided at drive-in restaurants and drive-in movie theaters.
CHAPTER 30
ELEVATORS AND CONVEYING SYSTEMS

SECTION 3001
GENERAL

Section 3001.1 Scope is replaced in its entirety as follows:

3001.1 Scope. This chapter and the Denver Fire Code govern the design, construction, installation, alteration and repair of elevators and conveying systems and their components.

Section 3001.3 Referenced Standards is replaced in its entirety as follows:

3001.3 Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, alteration, repair, and maintenance of elevators and conveying systems and their components shall conform to the applicable standard specified in Table 3001.3, and ASCE 24 for construction in flood hazard areas established in Section 1612.3. These standards are referenced as adopted by the State of Colorado and Chapter 80 of the Denver Fire Code or are referenced as adopted by Chapter 35 for standards not adopted by the State of Colorado.

SECTION 3002
HOISTWAY ENCLOSURES

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

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

[F] SECTION 3003
EMERGENCY OPERATIONS

[F] Section 3003 Emergency Operations and all subsections are replaced in their entirety as follows:

Section 3003.1 General. Emergency elevator operations shall comply with Section 606 of the International Fire Code.

[F] SECTION 3006
ELEVATOR LOBBIES AND HOISTWAY OPENING PROTECTION

[F] Section 3006.3 Hoistway opening projection item 4 is replaced in its entirety as follows:

4. The elevator hoistway shall be pressurized in accordance with the design criteria of Section 909.15.2 of the International Fire Code.
SECTION 3007
FIRE SERVICE ACCESS ELEVATOR

Section 3007.6 Fire service access elevator lobby is amended to add the following sentence to the end of the section:

The enclosed fire service access elevator lobby shall have direct access to the building floor plate without passing through an interior exit stairway or ramp.

Section 3007.6.2 Lobby enclosure is replaced in its entirety as follows:

Lobby enclosure. The fire service access elevator lobby shall be enclosed with a smoke barrier having a fire-resistance rating of not less than 1 hour, except that lobby doorways shall comply with Section 3007.6.3. Fire service access elevator lobby shall not be used for storage.

Exceptions:

1. Enclosed fire service access elevator lobbies are not required at the levels of exit discharge.
2. Enclosed fire service access elevator lobbies are not required in open parking garages.
3. Enclosed fire service access elevator lobbies in enclosed parking garages shall be permitted to be enclosed in accordance with Section 509.4.2.

Section 3007.6.3 Lobby doorways is amended by adding an exception as follows:

Exception: 3/4-hour fire door assembly is not required in enclosed parking garages. Such door shall comply with Section 509.4.2.

Section 3007.6.4 Lobby size is amended by adding the following at the end of the paragraph:

An area of rescue assistance shall be permitted to be combined with the fire service access elevator lobby provided the 150 square feet minimum area is increased to accommodate the wheelchair spaces required by Section 1009.6.3.

Section 3007.8 Electrical power is replaced in its entirety as follows:

Electrical power. The following features serving each fire service access elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 emergency power:

1. Elevator equipment.
2. Elevator hoistway lighting.
3. Ventilation and cooling equipment for elevator machine rooms, control rooms, machine spaces and control spaces.
4. Elevator car lighting.

Section 3007.9.1 Access is amended by adding the exception as follows:

Exception: The exit enclosure shall be permitted to have access to an enclosed parking garage through a fire service elevator lobby.
CHAPTER 31
SPECIAL CONSTRUCTION

SECTION 3103
TEMPORARY STRUCTURES AND TEMPORARILY-PLACED RELOCATABLE BUILDINGS

Section 3103 is replaced in its entirety with the following:

3103.1 General. Except for structures associated with an R-X occupancy, the provisions of Sections 3103.1 through 3103.4 shall apply to structures erected for a period of less than 180 days and relocatable buildings placed upon a specific site for a period of less than 180 days, or for a longer timeframe as allowed by the building official after review of a specific proposal. Special event buildings, tents, umbrella structures and other membrane structures erected for a period of less than 180 days shall comply with the International Fire Code. Temporary structures and temporarily-placed relocatable buildings associated with an R-X occupancy may be erected for a period of 2 years, with one 2-year extension only, subject to more strict timeframes in Section 429.13. Temporary structures erected, and relocatable buildings placed on a site for a longer period of time shall comply with applicable sections of this code.

Exception: Where approved by the building official, temporary structures and relocatable buildings may be placed on a site for a period of up to four years without a permanent foundation.

3103.1.1 Conformance. Temporary structures, temporary uses, and relocatable buildings shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

3103.1.2 Permit required. Temporary structures and relocatable buildings that cover an area greater than 120 square feet (11.16 m²), including connecting areas or spaces with a common means of egress or entrance that are used or intended to be used for the gathering together of 10 or more persons; and Group R-X occupancy individual sleeping units shall not be erected, operated or maintained for any purpose without obtaining a permit from the building official.

3103.2 Construction documents. A permit application and construction documents shall be submitted for each installation of a temporary structure or relocatable building. The construction documents shall include a site plan indicating the location of the temporary structure or relocatable building and information delineating the means of egress and the occupant load.

3103.3 Location. Temporary structures and relocatable buildings shall be located in accordance with the requirements of Table 602 based on the fire-resistance rating of the exterior walls for the proposed type of construction.

3103.4 Means of egress. Temporary structures and relocatable buildings shall conform to the means of egress requirements of Chapter 10 and shall have an exit access travel distance of 100 feet (30 480 mm) or less.
SECTION 3105
AWNINGS AND CANOPIES

Section 3105.54 Canopy special provisions is added as follows:

3105.54 Canopy special provisions. Canopies shall comply with all of the following:

A. A canopy may be entirely supported by the building to which it is attached.
B. Separation between different types of construction shall not be required.
C. Canopies shall comply with Fire Department access requirements. The minimum height of canopies at locations not requiring Fire Department access shall be 8 feet.
D. Canopies in the public right-of-way shall comply with Section 3202.
E. Canopies shall not obstruct required exits.
F. For the purposes of this code, a porte-cochere may be considered a canopy.
G. Canopies shall be built of materials consistent with the types permitted for the type of construction of the building.

SECTION 3109
SWIMMING POOLS, SPAS AND HOT TUBS

Section 3109.1 General is amended as follows:

3109.1 General. The design and construction of swimming pools, spas and hot tubs shall comply with Appendix T of this Code.

Section 3114 Manufactured or factory-built structures is added as follows:

[CDH] SECTION 3114
MANUFACTURED OR FACTORY-BUILT STRUCTURES

3114.1 Scope. This section shall regulate the installation, relocation, placement, alteration, repair, and addition of manufactured homes, factory-built housing units, and factory-built non-residential buildings.

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

3114.2 Definitions.

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

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

Data Plate (HUD). Data plates of (HUD) manufactured homes are posted inside the unit affixed in a permanent manner near the main electrical panel or other readily accessible and visible location.

The data plate shall indicate the following minimum design criteria:

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

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

DOH. Colorado Division of Housing. The Division of Housing is the state agency responsible for enforcing the Factory-Built Housing Construction and Factory-Built Nonresidential Construction Statutes, Rules, and Regulations.
Factory-Built Certification Insignia. These insignias certify that the unit is constructed in compliance with applicable codes and regulations adopted by the DOH.

**FACTORY- BUILT AND HUD CERTIFICATION INSIGNIA**

<table>
<thead>
<tr>
<th>Structure Type</th>
<th>Primary Insignia Location and Provided Design Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory-Built Housing Unit</td>
<td>Silver in color, located in the kitchen sink cabinet or inside the vanity cabinet if there is no kitchen sink. The manufacturer shall legibly stamp the unit serial number, date of manufacture, wind design speed, roof design load, and construction codes on the primary insignia.</td>
</tr>
<tr>
<td>Factory-Built Non-residential Structure</td>
<td>Blue in color, located on the exterior hitch end of the unit or in a readily visible location, such as near the electrical panel, prior to units being removed from the plant. The manufacturer shall legibly stamp the unit serial number, date of manufacture, wind design speed, roof design load, fire rating, occupancy, and construction codes on the primary insignia.</td>
</tr>
<tr>
<td>(HUD) Manufactured Home</td>
<td>A red HUD label is located at the tail-light end of each transportable section of the home approximately one foot up from the floor and one foot in from the road side. The label number shall be etched or stamped with a 3 letter designation which identifies the Production Inspection and Primary Inspection Agency (IPIA) for the state in which the home is manufactured. Each label shall also be marked with a 6-digit number which the label supplier will furnish.</td>
</tr>
</tbody>
</table>
**Factory-Built Housing Unit.** Units designed primarily for residential occupancy, either permanent or temporary, which is wholly or in substantial part, made, fabricated, formed or assembled as Closed Construction in a manufacturing facility for installation, or assembly and installation, on permanent or temporary foundations at the building site. Site-built permanent foundations must be built in accordance with the Denver Building Code.

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

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

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

**Foundations, Temporary**

1. Residential foundation systems (temporary set) shall be designed to support the unit in accordance with the manufacturer’s installation instructions or, if manufacturer’s installation instructions are not available, NCSBCS/ ANSI A225.1-1994 shall be used.

2. Factory-built Non-residential structures qualifying as a temporary building in accordance with the Administrative Section of this Code shall have a support layout prepared by a Colorado licensed design professional. The foundation is not required to meet the frost depth requirements of the Denver Building Code.

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

**Manufactured Home, (HUD)** A HUD labeled home.

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

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

**Trailer Home.** A pre-1950’s Trailer coach.

**Factory approval of manufactured structures.** Every Factory-Built Housing Unit and every Factory-Built Nonresidential Structure that is manufactured, sold, offered for sale, or occupied in this state must display a Factory-Built Certification Insignia issued by the DOH certifying that the unit is constructed in compliance with the DOH standards.
Exception: (HUD) Manufactured Homes constructed to the standards of the Federal Act.

31146.3 Permits required. Manufactured or factory-built structures shall comply with the provisions of the Denver Building Code to the extent outlined in Table 3114.3.

Construction documents shall be submitted for review and approval for all manufactured or factory-built structures prior to the issuance of permits.

Plans of the factory-built structure, bearing the stamp of approval of DOH or DOH Authorized Inspection Agency, shall be submitted for use as the City’s Record Set and for use by the City Assessor’s office. Permanent or temporary foundation plans shall be signed and sealed by a Colorado registered engineer for Factory-Built Non-residential Structures. Foundation plans shall be signed and sealed by a Colorado registered engineer for permanently located Factory-Built Housing Units.

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

<table>
<thead>
<tr>
<th>Structure Type</th>
<th>Applicability of Denver Building Code requirements to factory-built structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory-Built Housing Unit</td>
<td>Denver Building Code authority is limited to the design, construction, and inspection of a permanent foundation; and any other site-built construction, except for materials shipped loose by the factory. The Denver Building Code regulates all alteration, repair, and additions to factory-built modular homes.</td>
</tr>
<tr>
<td>Factory-Built Nonresidential Structure</td>
<td>Denver Building Code has authority over the design, construction, and inspection of the structure's temporary or permanent foundation, any other site-built construction, and all on-site interconnection of the factory assembled modules. The Denver Building Code regulates all alteration, repair, and additions to factory-built non-residential structures.</td>
</tr>
<tr>
<td>(HUD) Manufactured Home</td>
<td>HUD labeled homes possessing data plates satisfying the minimum defined design criteria preempt Denver's building code requirements. The Denver Building Code regulates all alteration, repair, and additions to HUD homes after they are initially occupied for residential use.</td>
</tr>
<tr>
<td>Mobile Home</td>
<td>Mobile homes which do not possess State of Colorado certification label must conform to all the provisions of the Denver Building Code. DOH labeled homes are exempt from the provisions of the Denver Building Code but must provide, when required, documented mitigation measures for approval which will enable the structure to withstand Denver's minimum snow loads.</td>
</tr>
<tr>
<td>Open Construction</td>
<td>These structures are regulated by the Denver Building Code unless specifically approved otherwise by DOH.</td>
</tr>
</tbody>
</table>
Trailer Home  Denver Building Code has complete authority over trailer homes.

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

3114.4 Manufactured Home Installation. Every Mobile Home, Manufactured Home, and Factory-Built Housing Unit installed in a temporary or permanent location and designed and commonly used for occupancy by persons for residential purposes, must display a Certificate of Installation Insignia issued by the DOH, certifying that the unit is installed in compliance with the DOH standards. New homes shall be installed in accordance with the Colorado Manufactured Housing Installation Code, i.e., the home manufacturer’s written installation instructions, or State approved alternate standards for used homes when instructions are not available. Application of the certification insignia is evidence that permanent utility service may be established. Permanent insignia application is required prior to the issuance of a Certificate of Occupancy to the home.

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

3114.5 Inspection and notice. Except as noted in Table 3114.3, DOH and the Federal Act preempt the Denver Building Code in relation to factory-built structures. The following statement shall appear on the certificate of occupancy issued to a manufactured or factory-built structures: “In accordance with Federal and Colorado law, this manufactured structure has not been inspected in its entirety by the City and County of Denver and may or may not meet the requirements of the Denver Building Code.”

CHAPTER 32
ENCROACHMENTS INTO THE PUBLIC RIGHT-OF-WAY

[DOTI] SECTION 3202
ENCROACHMENTS

Section 3202.2 Encroachments above grade and below 8 feet in height is replaced in its entirety as follows:

3202.2 Encroachments above grade and below 8 feet in height. All encroachments into the public right of way shall comply with the Denver Revised Municipal Code, Chapter 49, Rules & Regulations of the Department of Transportation and Infrastructure, and all departmental published standards.

Unless otherwise permitted by the Department of Transportation and Infrastructure, the exterior doors of buildings located within the boundary described as - beginning at the intersection of East 14th Avenue and Grant Street, thence north on Grant Street to 21st Street, thence northwest on 21st Street to Blake Street, thence southwest on Blake Street to Cherry Creek, thence southeast on Cherry Creek to West 14th Avenue, thence east on 14th Avenue to the point of beginning - shall not project more than one (1) foot beyond the property line, except that in alleys no projection beyond property line is permitted. The exterior doors of buildings located outside of the above-described described boundary that swing over the property line shall be maintained normally closed.

Section 3202.3 Encroachments 8 feet or more above grade is deleted in its entirety.
Section 3202.4 Temporary encroachments is replaced in its entirety as follows:

3202.4 Temporary encroachments. Where allowed by the local authority having jurisdiction, vestibules and storm enclosures shall not be erected for a period of time exceeding 7 months in any one year and shall not encroach more than 3 feet (914 mm) nor more than one-fourth of the width of the sidewalk beyond the street lot line, unless otherwise permitted by the Department of Transportation and Infrastructure. Temporary entrance awnings shall be erected with a clearance of not less than 7 feet (2134 mm) to the lowest portion of the hood or awning where supported on removable steel or other approved noncombustible support.
CHAPTER 33
SAFEGUARDS DURING CONSTRUCTION

SECTION 3301
GENERAL

Section 3301.1 Scope is replaced in its entirety as follows:

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

Section 3301.3 Demolition and moving standard is added as follows:

Section 3301.3 Demolition and moving standard. Unless provided for in other portions of this Building Code, the following additional standard shall be utilized in relation to the work covered in this chapter, American National Standard Institute publication, “Demolition Safety Requirements A10.6-2006”.

SECTION 3302
CONSTRUCTION SAFEGUARDS

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

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

[EH] Section 3302.2.1 Dust is added as follows:

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

SECTION 3303
DEMOLITION

Section 3303.1.1 Registered design professionals’ reports is added as follows:

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

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

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

Section 3303.1.2 Shoring and bracing of damaged structures is added as follows:

3303.1.2 Shoring and bracing of damaged structures. When persons are required to work within a structure to be demolished which has been damaged by fire, flood, explosion or other cause, the structure shall be braced or shored for safety.

[EH] Section 3303.1.3 Asbestos is added as follows:

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

Section 3303.4 Vacant lot is replaced in its entirety as follows:

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

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

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

Section 3303.6.1 Relocation of utilities is added as follows:

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

Section 3303.6.2 Dangerous utilities is added as follows:

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

Section 3303.8 Machine and explosive demolition is added as follows:

3303.8 Machine and explosives demolition. Machine demolition shall be subject to approval by the
Agency. Contractors utilizing explosives in their demolition operation shall be specifically approved by the building official. For storage and transportation of explosives, see the Fire Code for the City and County of Denver.

SECTION 3306
PROTECTION OF PEDESTRIANS

Section 3306.1.1 Safety watchman is added as follows:

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

SECTION 3307
PROTECTION OF ADJOINING PROPERTY

Section 3307.1 Protection required is replaced in its entirety as follows:

3307.1 Protection required. Adjacent public and private property shall be protected from damage during construction, excavation, remodeling, demolition, and building relocation work. Protection is the responsibility of the person performing the construction, excavation, remodeling, demolition or building relocation work. Protection shall be provided for footings, foundations, party walls, chimneys, skylights, roofs, fences and landscaping. Provisions shall be made to control water runoff and erosion during construction, excavation, remodeling, demolition or relocation activities.

Section 3307.1.1 Notification for buildings regulated by the IRC. The person making or causing an excavation that requires shoring or benching, a demolition requiring a total demolition permit, or relocation shall provide written notice to the owners or homeowner associations of adjoining properties, advising them that the excavation or demolition or relocation is to be made, providing contact information for the person doing the excavation, demolition or relocation and that they shall protect adjacent properties as required by the applicable provisions of Chapter 33 of the International Fire Code. Said notification shall be delivered not less than 10 days prior to the scheduled starting date of the excavation, demolition or relocation.

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

At permit submittal, the applicant shall submit a copy of the notification letter and verification that the adjoining property owners were notified by submitting one of the following:

1. Personal notification forms, showing name and address of property owner notified, and signature of accepting party.

2. USPS certified mail return receipts, showing name and address of property owner notified, and signature of accepting party.

3. When either the signed return receipt or return of the notification is delayed by USPS:
   a. A USPS tracking report indicating notification was sent by certified mail with return receipt, showing the USPS assigned tracking number and date of first attempted delivery.
not less than 21 days prior, and

b. A letter or form, signed by the contractor, with license information, which correlates the
   USPS assigned tracking number to the name and address of the notified property owner,
   and states that personal contact with the property owner has been unsuccessfully attempted.

4. A signed affidavit that lists the name and address of the notified property owners and date of
   notice. All USPS certified mail return receipts shall be maintained on the site at all times for
   random inspection by City and County representatives.

Section 3307.1.2 Notification for all other buildings. The person making or causing an excavation,
   demolition, or relocation shall provide written notice to the owners of adjacent properties,
   advising them that the excavation, demolition, or relocation is to be made, providing contact information for
   the person doing the excavation, demolition or relocation and that they shall protect adjacent properties as
   required by Denver Building and Fire Code Section 3307.1. Said notification shall be delivered not less
   than 10 days prior to the scheduled starting date of the excavation, demolition and/or relocation.

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

At permit submittal, the applicant shall submit a copy of the notification letter and verification that the
adjoining property owners were notified by submitting one of the following:

1. Personal notification forms, showing name and address of property owner notified, and
   signature of accepting party.

2. USPS certified mail return receipts, showing name and address of property owner notified, and
   signature of accepting party.

3. When either the signed return receipt or return of the notification is delayed by USPS:
   a. A USPS tracking report indicating notification was sent by certified mail with return
      receipt, showing the USPS assigned tracking number and date of first attempted delivery
      not less than 21 days prior, and
   b. A letter or form, signed by the contractor, with license information, which correlates the
      USPS assigned tracking number to the name and address of the notified property owner,
      and states that personal contact with the property owner has been unsuccessfully attempted.

4. A signed affidavit that lists the name and address of the notified property owners and date of
   notice. All USPS certified mail return receipts shall be maintained on the site at all times for
   random inspection by City and County representatives.

Section 3307.23 Repair of damage to public property is added as follows:

[DOTI] 3307.23 Repair of damage to public property. As a condition of obtaining a permit to wreck or
move any building, structure or utility, the permittee assumes liability for any damage to public property
occasioned by such moving, demolition or removal operations. The permittee agrees to repair any damage
to public property, including any public sidewalks, occasioned by such moving, demolition or removal
operations. Failure to make such repairs within 30 days shall be grounds for the revocation of the
contractor's license.

Section 3307.34 Work abutting the public way is added as follows:
[DOTI] 3307.34 Work abutting the public way. Prior to the issuance of a permit by the Agency for the construction, demolition or relocation of any building involving excavation extending within one foot of the angle of repose or a slope of one to one under any public sidewalk, street, alley or other public property, the owner of the property or proposed building shall submit to the Manager of the Department of Transportation and Infrastructure an indemnity bond in the amount determined by the Manager in a form approved by the City Attorney.

SECTION 3308
TEMPORARY USE OF STREETS, ALLEYS AND PUBLIC PROPERTY

[DOTI] Section 3308.3 Transportation approval is added as follows:

[DOTI] 3308.3 Transportation approval. Trucks and other equipment used by the contractor shall not interfere with or block either vehicular or pedestrian traffic, except when approved by the Department of Transportation and Infrastructure. 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 DOTI.

Section 3314 Moving and relocation of structures is added as follows:

SECTION 3315
MOVING AND RELOCATION OF STRUCTURES

3315.1 Scope. Buildings, structures or utilities which are moved from one location to another within, to or from the City shall conform to all requirements of this Building Code. These buildings, structures or utilities shall be inspected and approved by the Agency prior to moving.

[DOTI] 3315.2 Transportation approval. Moving of structures on the public way by the contractor shall not interfere with or block either vehicular or pedestrian traffic, except when approved by the Department of Transportation and Infrastructure. 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 DOTI. As required by DOTI the Contractor shall submit to the Manager of DOTI an indemnity bond in the amount determined by the Manager in a form approved by the City Attorney.

[DOTI] 3315.3 Moving on the Public Way. Moving on the public right of way shall follow Department of Transportation and Infrastructure regulations.

3315.4 Storage of moved buildings. Buildings, structures or utilities shall not be stored on any property for more than 72 hours, unless approved by the Agency.

3315.5 Vacated lot. Reference Section 3303.4.
CHAPTER 35
REFERENCED STANDARDS

The following standard is added as follows:

CGSB

Canadian General Standards Board
Portage, III, 6B1
11 Laurier Street
Gatineau QC K1A 1G6
Canada

CGSB-37.50-M89: Asphalt, Rubberized for Roofing and Waterproofing
APPENDICES
APPENDIX ADOPTION STATUS

Appendices are Added, Adopted, Adopted as Amended, or **Deleted Not Adopted** as part of this Code as noted in Appendix Adoption Table 1 of the *International Building Code*. Provisions in Appendices that are **not deleted added, adopted, or adopted as amended** carry the full weight and mandatory enforceability of the Code.

Note: There is no appendix O or Q.

### TABLE 1
INTERNATIONAL BUILDING CODE APPENDIX ADOPTION

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<thead>
<tr>
<th>APPENDIX</th>
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<td>D</td>
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<td>E</td>
<td>Supplementary Accessibility Requirements</td>
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<td>F</td>
<td>Rodent Proofing</td>
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2021 DENVER AMENDMENTS TO THE 2021 INTERNATIONAL BUILDING CODE
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<tr>
<th>R</th>
<th>Colorado Title 9 Article 5 – Standards for Accessible Housing</th>
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<tr>
<td>S</td>
<td>Construction of Airport Buildings and Structures</td>
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<tr>
<td>T</td>
<td>2018-21 International Swimming Pool and Spa Code Section 305, remainder of the 2018-21 International Swimming Pool and Spa Code is deleted.</td>
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<td>U</td>
<td>Tall Wood Buildings</td>
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</table>
Appendix H Signs is added as follows:

APPENDIX H
SIGNS

SECTION H101
GENERAL
Section H101.1.1 Coordination with zoning code is added as follows:

H101.1.1 Coordination with zoning code. The provisions of this appendix, including definitions used herein, are specific to the application of this Code and appurtenant references. The Denver Zoning Code (DZC) contains independent requirements for signs that apply in addition to this Code. If a sign is exempt from a permit in the Building Code, a zoning permit may still be required based on regulations in the DZC. If a sign is exempt from a permit in the DZC, a building permit may still be required based on regulations in this Code. Where there is a conflict between the requirements of this Code and the Denver Zoning Code, the most restrictive criteria shall govern.
Appendix P Construction in designated special construction zones is added as follows:

APPENDIX P

CONSTRUCTION IN DESIGNATED SPECIAL CONSTRUCTION ZONES

SECTION P101
GENERAL

P101.1 Scope. All construction, alteration, repairs, demolition or relocation in areas designated under Article VII, Chapter 10 of the Revised Municipal Code as Special Construction Zones shall conform to the provisions of this Chapter.

SECTION P102
GENERAL PROVISIONS

P102.1 Permits. No permits for construction, alteration, repairs, demolition or relocation in a designated Special Construction Zone shall be issued without being in compliance with all recommendations contained in the engineer's report as required by the Administration Section.

P102.2 Engineers reports. If the applicant is required to prepare an engineer's report pursuant to the Administration Section, the Agency may require such additional information and recommendations as it deems necessary and may require such additional measures as are necessary to minimize potential hazards during construction and control hazards from the completed structure.

P102.3 Inspections. All construction and excavation sites shall be subject to inspection by the Agency, Fire Department and the Environmental Quality section within The Department of Public Health and Environment, and results of tests or monitoring required by this Chapter shall be available at the site for inspection.

P102.4 Work stoppage. In the event of a material violation with the requirements of this Chapter, the Agency may stop all construction activity until it is satisfied that the violation has been corrected.

SECTION P103
HAZARDOUS GASES GENERATED BY LANDFILLS

P103.1 New construction. Except as provided in the Administration Section, all new buildings, structures and utilities to be constructed in a Special Construction Zone, which is so designated because of the presence of hazardous gases generated by landfills, shall be designed by an engineer registered in the state of Colorado to control and protect against accumulation of over 1.0% by volume of flammable gas in the building, structure or utility. The following precautions shall be taken during and after construction activity:

1. A flammable gas indicator shall be utilized at all times during trenching, excavating, drilling or when working within 10 feet of an open excavation.

2. When trenching, excavating or drilling deeper than 2 feet into the soil or fill, or in the presence of detectable concentrations of 1.0% by volume of flammable gas, the operating equipment shall be provided with spark proof exhausts.

3. A dry chemical fire extinguisher, approved by the Fire Department, shall be provided on all equipment used in the landfill.
4. Personnel within or near an open trench or drill hole deeper than 2 feet into the soil or fill shall be fully clothed, wear shoes with nonmetallic soles and wear a hard hat and safety goggles or glasses.

5. Exhaust blowers shall be used in instances where trenches may show a build-up of flammable gas of 1.0% by volume or less than 19.5% by volume of oxygen.

6. Smoking and/or an open flame shall not be permitted in any area within 100 feet of the excavation.

7. Personnel shall be kept upwind of any open trench unless the trench and the downwind atmosphere are continuously monitored.

8. Before personnel are permitted to enter an open trench, the trench shall be monitored for flammable gas and at least a 19.5%-by-volume oxygen sufficiency. When in the excavation, each work party shall be working no more than 5 feet from a continuously operating flammable gas and oxygen monitor.

9. The applicant shall employ an inspector whose duty it shall be to effect continuous compliance with the foregoing precautions. The inspector shall be a qualified person approved by the Agency 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 Agency at 10-day intervals during active construction stating that all new construction is in compliance with these regulations, and that all testing and monitoring has been and is being done as required by the Code.

10. After construction is completed, hazardous gas monitoring devices approved by the Fire Department shall be installed in the completed building or structure in such number and in such places within the building or structure as may be required by the Fire Department.

P103.2 Alteration or repair of existing building, structures or utilities. Except as provided in the Administration Section and P103.3, no alterations or repairs to any existing building, structure or utility shall be made unless the following precautions are taken:

1. Within 5 days prior to applying for a permit under Chapter 1 of the Building Code to alter or repair an existing building, structure or utility, the work site shall be tested for the presence of flammable gas by an engineer registered in the state of Colorado.

2. The applicant shall be exempt from all other requirements of this Section P103.2 if:
   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 P103.1 as if the construction were new construction.

P103.3 Exemption. Whether or not he is an applicant for a permit, the owner of real property within a Special Construction Zone may apply to the Building Agency for a certificate of exemption from the provisions of Article VII, Chapter 10 of the Revised Municipal Code and Section P103 of the Building Code. To obtain such exemption, said owner shall have his property tested by an engineer registered in the state of Colorado and tests shall meet the following requirements:

1. A test for the presence of flammable gas shall be performed at a time when there is frost on his property to a depth of at least 6 inches in the soil, again at a time when there is no frost in the soil, and again
within 5 days of the date when an exemption certificate is applied for.

2. The test holes shall be placed along each major boundary line of the real property for which the exemption is sought in such number and at such locations as the engineer deems proper.

3. If the test results show that there is less than 2.0% of the lower explosive limit (L.E.L.) of flammable gas, and if such test results are satisfactory to the Agency, then the Agency shall issue a certificate stating that the real property described in the certificate is exempt from the provisions of Article 647 of the Revised Municipal Code and Section P103 of the Code.

4. As a condition of receiving an exemption certificate from the Agency, 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 Agency 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 Agency may suspend or revoke the exemption certificate.
Appendix R Colorado Revised Statutes Title 9 Article 5 – Standards for Accessible Housing is added as follows:

APPENDIX R

COLORADO REVISED STATUTES TITLE 9 ARTICLE 5 - STANDARDS FOR ACCESSIBLE HOUSING

SECTION R101
REFERENCE DOCUMENTS

R101.1 Accessibility standard. The ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities standard referenced in this appendix and as described in definition 5.5 of Colorado Revised Statutes 9.5.101 shall mean the 2009 ICC A117.1 standard as referenced in the 2018 editions of the International Building Code and International Residential Code.

SECTION R102
STATE STATUTE AS AMENDED

Colorado Revised Statutes Title 9, Article 5 is reproduced in this appendix for reference. (This language is current through all Laws passed during the 2018 Legislative Session and Ballot Measures Approved in the November 2018 General Election)

9-5-101. Definitions

As used in this article 5, unless the context otherwise requires:

(1) "Accessibility point" means a unit of value exchanged for different levels of accessible dwelling types to satisfy the requirements for dwelling accessibility contained in this article.

(2) "Accessible route" means an interior or exterior circulation path that complies with ICC/ANSI A117.1.

(3) Repealed.

(4) "Detached residence" means a one- or two-family residence that is separated from adjacent dwellings by an unobstructed physical space. A one- or two-family residence that is separated from an adjacent dwelling by a physical space of less than three feet shall not be considered a detached residence.

(5) "Ground story level" means the lowest story in a dwelling unit containing habitable rooms or areas with an accessible entrance located on an accessible route that contains living, sleeping, cooking, bathing, and toilet facilities. For the purposes of this article, a basement shall not be considered the ground story level if the finished basement floor is located more than four feet below the exterior finished grade determined at any point along the exposed periphery of the dwelling unit.

(5.5) "ICC/ANSI A117.1" means the "Accessible and Usable Buildings and Facilities" standard, or any successor standard, promulgated and revised by the International Code Council.

(6) "Project" means the total number of parcels and buildings in a development planned or constructed by the same developer, builder, or entity on one site or contiguous sites, and also includes all parcels and structures that are parts of the same planned development application or agreement. The separation of contiguous individual buildings, units, lots, tracts, or parcels of land by a property line or by a public or private road shall not create a separate project.
(7) "Property" means the site, parcels of land, plats, lots, tracts, individual dwelling units, existing and proposed structures, and the built environment.

(8) "Residential dwelling unit" means any portion of a building that contains living facilities, including a room or rooms in a facility that have shared cooking, bathing, toilet, or laundry facilities such as dormitories, shelters, assisted living facilities, and boarding homes. "Residential dwelling unit" also means facilities that include provisions for sleeping, cooking, bathing, and toilet facilities for one or more persons and are used for extended stays, such as time-shares and extended-stay motels. "Residential dwelling unit" does not mean a guest room in a motel or hotel.

(9) "Technically infeasible", in reference to a proposed alteration to a building or facility, means that the proposed alteration is not implemented because:
   (a) An existing structural condition or conditions make such alteration labor- or cost-prohibitive;
   (b) The building or facility is in strict compliance with minimum accessibility requirements for new construction and, due to existing physical or site constraints, such alteration would negatively impact such compliance.

(10) "Type A dwelling unit" means a dwelling unit designed in accordance with ICC/ANSI A117.1, section 1003, or any successor section within ICC/ANSI A117.1.

(11) "Type A multistory dwelling unit" means a multiple-story dwelling unit with a ground story level designed in accordance with ICC/ANSI A117.1, section 1003, or any successor section within ICC/ANSI A117.1, and, if provided, accessible laundry facilities on the ground story level.

(12) "Type B dwelling unit" means a dwelling unit with a ground floor level designed in accordance with ICC/ANSI A117.1, section 1004, or any successor section within ICC/ANSI A117.1.

(13) "Type B multistory dwelling unit" means a multiple-story dwelling unit with a ground story level that is designed in accordance with ICC/ANSI A117.1, section 1004, or any successor section within ICC/ANSI A117.1, and, if provided, accessible laundry facilities on the ground story level.

(14) "Type B visitable ground floor" means a multiple-story dwelling unit with an accessible entrance and toilet facility designed in accordance with ICC/ANSI A117.1, section 1004, or any successor section within ICC/ANSI A117.1.

(15) "Undue hardship" means a substantial and unusual hardship that is the direct result of unique physical site conditions such as topography or geology, or that is the direct result of other unique or special conditions encountered on a property, but that are not typically encountered in the jurisdiction in which such property is located. Constraints, complications, or difficulties that may arise by complying with these statutory standards for accessibility but that do not constitute an undue hardship shall not serve to justify the granting of an exception or variance.

9-5-102. Disabilities covered - purpose

(1) This article is intended to provide accessibility standards for residential projects designed to serve persons with nonambulatory disabilities, semiambulatory disabilities, sight disabilities, hearing disabilities, disabilities of incoordination, and aging.

(2) Design criteria. Design criteria must comply with ICC/ANSI A117.1.

9-5-103. Applicability of standards - enforcement

(1) The standards and specifications set forth in this article shall apply to all buildings and facilities used for housing that are constructed in whole or in part by the use of state, county, or municipal funds or the funds of
any political subdivision of the state or that are constructed with private funds. All such buildings and facilities to be constructed from plans on which architectural drawings are started after July 1, 1975, from any one of these funds or any combination thereof shall conform to each of the standards and specifications prescribed in this article. The governmental unit responsible for the enforcement of this article shall grant exceptions to or modify any particular standard or specification when it is determined that it is impractical and would create an undue hardship. Any such exception or modification of the provisions of this article shall be made in writing as a matter of public record. These standards and specifications shall be adhered to in those buildings and facilities that are constructed or proposed on or after April 29, 2003. This article shall apply to permanent buildings.

(2) The jurisdiction with responsibility for enforcement of this article pursuant to section 9-5-104 shall designate a board of appeals to hear and resolve appeals of orders, decisions, or determinations made by the enforcing agency regarding the application and interpretation of this article.

(3) Any building or facility that would have been subject to this article but was under construction prior to July 1, 1976, must comply with the following:

(a) If the walls or defining boundaries of an element or space are altered, then the altered element or space shall comply with the applicable provisions of section 9-5-105, unless such alteration is technically infeasible. If full compliance with this article is technically infeasible, compliance shall be implemented up to the point of technical infeasibility. No alteration shall be undertaken that negatively impacts accessibility of a building or facility pursuant to ICC/ANSI A117.1. This subsection (3)(a) shall not be construed to require the moving of any existing walls not otherwise planned to be moved.

(b) Any additions to a building or facility shall be treated as new construction for the purposes of enforcement of this article.

(4) The general assembly finds and declares that the standards and specifications set forth in this article are of statewide concern. Nothing in this article shall prohibit any municipality or other governmental subdivision from making and enforcing standards and specifications that are more stringent, and thus provide greater accessibility, than those set forth in this article.

9-5-104. Responsibility for enforcing standards

(1) The responsibility for enforcement of this article is as follows:

(a) For factory-built residential structures as defined in section 24-32-3302 (10), C.R.S., the division of housing created in section 24-32-704, C.R.S.;

(b) In a political subdivision that does not have a local building code, the division of housing created in section 24-32-704, C.R.S.;

(c) For all other housing or in a political subdivision that has adopted a building code, by the building department, or its equivalent, of the political subdivision having jurisdiction.

9-5-105. Exemptions for certain privately funded projects

(1) Accessible dwelling units shall be provided as required in this article; except that this article does not apply to privately funded projects for the construction of a detached residence or residences or to other types of residential property containing less than seven residential units.

For the purpose of determining the number of accessibility points required pursuant to subsection (2) of this section, the accessible dwelling unit types shall have the following point values:

Type A dwelling unit - 6
Type A multistory dwelling unit - 5
Type B dwelling unit - 4
Type B multistory dwelling unit - 3
Type B visitable ground floor - 1

(2) Residential projects.

(a) A project shall be assigned accessibility points based on the number of units contained within the project as follows:

Number of units within the Accessibility points project and total number of points required:

<table>
<thead>
<tr>
<th>Units</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>0</td>
</tr>
<tr>
<td>7-14</td>
<td>6</td>
</tr>
<tr>
<td>15-28</td>
<td>12</td>
</tr>
<tr>
<td>29-42</td>
<td>18</td>
</tr>
<tr>
<td>43-57</td>
<td>24</td>
</tr>
<tr>
<td>58-71</td>
<td>30</td>
</tr>
<tr>
<td>72-85</td>
<td>36</td>
</tr>
<tr>
<td>86-99</td>
<td>42</td>
</tr>
<tr>
<td>100-114</td>
<td>48</td>
</tr>
<tr>
<td>115-128</td>
<td>54</td>
</tr>
<tr>
<td>129-142</td>
<td>60</td>
</tr>
<tr>
<td>143-157</td>
<td>66</td>
</tr>
<tr>
<td>158-171</td>
<td>72</td>
</tr>
<tr>
<td>172-185</td>
<td>78</td>
</tr>
<tr>
<td>186-199</td>
<td>84</td>
</tr>
<tr>
<td>200+</td>
<td>+6 additional points every 14 units or fraction thereof</td>
</tr>
</tbody>
</table>

(b) A project shall include enough accessible dwelling units to achieve at least the specified number of accessibility points required pursuant to paragraph (a) of this subsection (2). A project may use any combination of accessible dwelling unit types to comply with this section.

9-5-106. Implementation plan

The builder of any project regulated by this article shall create an implementation plan that guarantees the timely and evenly phased delivery of the required number of accessible units. Such plan shall clearly specify the number and type of units required and the order in which they are to be completed. Such implementation plan shall be subject to approval by the entity with enforcement authority in such project's jurisdiction. The implementation plan shall not be approved if more than thirty percent of the project is intended to be completed without providing a portion of accessible units required by section 9-5-105; except that, if an undue hardship can be demonstrated, or other guarantees provided are deemed sufficient, the jurisdiction having responsibility for enforcement may grant exceptions to this requirement. The implementation plan shall be approved by the governmental unit responsible for enforcement before a building permit is issue.
Appendix S Construction of airport buildings and structures is added as follows:

APPENDIX S
AIRPORT STRUCTURES AND SYSTEMS

All Chapters and Sections of 2016 National Fire Protection Association 415 Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways, shall be used in their entirety except as amended below:

CHAPTER 1
ADMINISTRATION

Add new text as follows:

1.4 Permits Required. On Denver International Airport property, permanent or temporary new construction of, and alterations and repairs to, buildings, miscellaneous structures, sites and portions thereof, and changes in the occupancy or function of a space shall be subject to City and County of Denver Development Services and Fire Department construction and operational permit requirements as directed by the Building and Fire Code Officials.

Exception: Facilities, buildings, and structures wholly owned, occupied and maintained by an agency or subdivision of Colorado State or the federal government are subject to the provisions of the International Fire Code and the Denver amendments thereto, per the direction of the fire code official, but are not otherwise subject to the Denver Building Code. Contractors performing work in or on these facilities, buildings, and structures need only be licensed in accordance with the International Fire Code and the Denver amendments thereto, per the direction of the fire code official.

Regional Transportation District (RTD) commuter-rail platforms and all light- and commuter-rail amenities including, but not limited to, canopies, driver relief stations, ramps, stairways, lifts, elevators, and retaining walls that support adjacent private or public rights-of-way shall be subject to City and County of Denver Development Services and Fire Department construction and operational permit requirements as directed by the Building and Fire Code Officials.

Exception: Where located on RTD right-of-way, RTD traction power substations, signal/communication relay stations and associated conduit and wiring for the operation of the light- and commuter-rail lines, rail tracks, retaining walls supporting only rail tracks, and light-rail passenger platforms.

Chapter 3, Definitions, in replaced in its entirety as follows:

CHAPTER 3
DEFINITIONS

Section 3.3 General Definitions.

3.3.1 Aircraft Fueling Ramp. Any outdoor area at an airport, including aprons and hardstands, where aircraft are normally fueled or defueled.

3.3.2 Aircraft Loading Walkway (Passenger Loading Bridge or Passenger Boarding Bridge). An aboveground device through which passengers move between a point in an airport concourse building and an aircraft. Included in this category are walkways that are permanently fixed or essentially mobile in nature and
can fold, telescope, or pivot from a fixed point.

3.3.3 Aircraft Loading Walkway on Grade Level. A fully enclosed walkway supported on grade through which passengers move between a point in an airport concourse building and an aircraft.

3.3.4 Airport Ramp. Any outdoor area, including aprons and hardstands, where aircraft can be positioned, stored, serviced, or maintained, irrespective of the nature of the surface of the area.

3.3.5 Airport Concourse Building (Concourse). A structure used primarily to support air passenger enplaning and deplaning operations. Airport concourse buildings are distinguished from airport terminal buildings in that all occupants have cleared security and accommodations are not provided for nonsecure private or public ground transportation vehicles. Airport concourse buildings have provisions on one or more sides for aircraft boarding and flight service operations such as fueling, deicing, stocking and waste disposal. They can be located adjacent to but separate from airport terminal buildings, accessible via above ground or through subway passages, and include passenger support functions such as flight itinerary modifications, waiting rooms, consumer services, retail, etc. Airport concourse buildings can also house baggage conveyance and transport equipment and functions, offices, moderate-hazard storage, and similar occupancies.

3.3.6 Airport Terminal Building (Terminal). A structure that can accommodate multimodal transportation but used primarily for air passenger support operations. Airport terminal buildings can accommodate all operations provided in airport concourse buildings but are distinguished from concourses in that they can also accommodate occupants that have not been security-screened in addition to nonsecure functions such as private-vehicle and mass transit pick-up / drop-off / parking, passenger check-in, ticket issuance, and baggage check-in / pick-up. In addition, terminals may have provisions for controlled release of deplaned passengers from secure to nonsecure areas such as passenger shuttle train discharge platforms and Customs screening.

3.3.7 Freight Terminal Building (Air Cargo Building). A structure used for the processing and/or storage of incoming or outgoing freight and other necessary functions in connection with air freight operations. Aircraft shall not be housed, stored, loaded or unloaded, undergo service, repairs, or alterations within a freight terminal building. Freight terminal buildings shall comply with the Group S-1 occupancy requirements of International Building Code.

3.3.8 Inline Tenant Spaces. Contiguous rooms or spaces located around the perimeter of common or circulation areas and often leased by the airport (owner) to individuals or groups (tenants) for mercantile, restaurant, concession, service, office, storage or similar occupancies or functions. These are distinguished from kiosks in that they are exposed to common or circulation areas on less than 4 sides. Inline tenant spaces are required to comply with all codes and standards applicable to the overall terminal or concourse in which they’re located. In concourse buildings, inline tenant spaces are usually located along an exterior wall.

3.3.9 Kiosk. Freestanding floor-supported or suspended structure that is not readily relocated and displaces people in public circulation areas of terminals and concourses. Kiosks include booths, stands, counters, carts, vending machines, advertising signboards, information displays, sculptures, exhibition cases, and similar features.

3.3.10 Passenger. A ticketed occupant that has passed through security screening.

3.3.11 Potential Fuel Spill Points. The points on or around the aircraft or airport ramp where fuel can be released. These points include fueling hydrants, fuel servicing vehicles, fuel tank fill connections, fuel vent openings, fuel dump valves, etc.
Chapter 4, Airport Terminal Buildings, is replaced in its entirety as follows:

CHAPTER 4

AIRPORT TERMINAL BUILDINGS

4.1 General

4.1.1 Airport terminal and concourse buildings shall be of Type I or Type II construction as defined in Chapter 6 of the International Building Code.

4.1.1.1 Occupancy. The Occupancy Groups of terminals and concourses and portions thereof shall be assigned in accordance with the provisions of Chapters 3 and 4 of the International Building Code and shall comply with the mixed used and occupancy provisions of Section 508 of the International Building Code. High-hazard Group H occupancies are not permitted in terminals and concourses.

4.1.2 Interior finish materials shall be Class A or Class B in accordance with Chapter 8 of the International Building Code.

4.1.3 Aircraft fueling facilities and ramps shall be designed in accordance with NFPA 407 and Chapter 5 of this standard.

4.1.4 Below grade areas and blind spaces in terminals and concourses shall be protected against flammable fuel and vapor penetration or shall be mechanically ventilated to provide at least four complete air changes per hour. The mechanical ventilation system shall be installed in accordance with the International Mechanical Code and NFPA 91.

4.1.5 Glazing Material – Covered Openings Facing the Ramp.

4.1.5.1 Openings covered with glazing material that have the lowest part of the glazing material not less than 7 ft (2.1 m) above each finished floor level shall not be required to comply with Section 4.1.5.3.

4.1.5.2 Openings covered with glazing material listed for use in a fire barrier and installed in accordance with the listing shall not be required to comply with Section 4.1.5.3.

4.1.5.3 Where potential fuel spill points are located less than 100 ft (30.5 m) horizontally from glazing material–covered openings in terminal and concourse walls facing the airport ramp, they shall be provided with an automatically activated water spray system in accordance with Section 4.1.5.3.1 and 4.1.5.3.2 or an automatically activated, listed fire shutter system in accordance with its listing. (see Annex A4.5.1.5 and Annex C.)

4.1.5.3.1 Where an automatically activated water spray system(s) is provided, it shall be installed in accordance with NFPA 15.

4.1.5.3.2 The system shall be designed to provide a density of at least 0.25 gpm/ft² [10.2 (L/min)/m²] over the exterior surface area of the glazing material.

4.2 Heating, Ventilating and Air-Conditioning

4.2.1 Heating, ventilating, and air conditioning systems shall be installed in accordance with Sections 4.2.2 through 4.2.6 and the applicable portions of the International Mechanical Code and International Fuel Gas Code.

4.2.2 Air supply intake and exhaust openings for air-conditioning or ventilating equipment serving the concourse building, if located on the ramp side, shall be not less than 10 ft (3 m) above the grade level of
the ramp and shall be at least 50 ft (15 m) from any point of flammable vapor release.

4.2.3 Openings to rooms that contain coal-, gas-, or oil-fired equipment or any other open-flame device and that face the ramp side of a concourse shall be above ramp grade and 50 ft (15 m) from any point of flammable vapor release.

4.2.4 Stacks or chimneys from a boiler, heater, or incinerator shall terminate 20 ft (6.1 m) minimum above ramp grade and above the roof of a concourse. Stacks or chimneys from boilers or heaters that use solid fuel or from any incinerator shall be fitted with double screening to control fly ash and sparks. Such stacks or chimneys shall be located so the outlet is 100 ft (30.5 m) minimum horizontally from any aircraft position or point of flammable vapor release.

Exceptions:

1. Natural gas direct vented appliances and direct-vented air handler heaters shall be vented in accordance with Section 503.8 of the International Fuel Gas Code. The vents and combustion air intakes shall not terminate less than 8 feet (2.4 m) above grade.

2. Natural gas radiant heaters serving interior apron levels shall be vented in accordance with Section 503.8 of the International Fuel Gas Code. The vents and combustion air intakes shall not terminate less than 8 feet (2.4 m) above grade.

4.2.5 Incinerators shall conform to the requirements of Chapter 4 of NFPA 82.

4.2.6 Commercial kitchen exhaust hood ventilation systems shall be in accordance with Chapter 6 of the International Fire Code and Chapter 5 of the International Mechanical Code.

4.3 Exits

4.3.1 Airport terminal and concourse building means of egress shall conform to the requirements of the International Building Code.

4.3.2 In addition to the exit signage requirements specified in the International Building Code, doors serving as exits that discharge onto an airport ramp and are provided solely for the purpose of meeting emergency egress requirements from public areas shall be placarded “Emergency Exit Only” in letters minimum of 2 in. (50 mm) high and ½-in. (13 mm) stroke.

4.4 Electrical.

4.4.1 All electrical installations shall be in accordance with NFPA 70.

4.4.2 Ventilation for transformer or electrical service rooms or vaults located on the ramp side of an airport concourse building shall be located in accordance with Section 4.2.2.

4.5 Fire Protection.

4.5.1 Sprinkler Systems

4.5.1.1 Terminals and concourses shall be provided with an automatic sprinkler system installed in accordance with Chapter 9, Section 903 of the International Fire Code as amended and per the following (see Annex A4.5.1.5 of NFPA 415):

1. Passenger areas shall be classified as Ordinary Hazard Group 1 Occupancy.

2. Baggage, package, and mail-handling areas shall be classified as Ordinary Hazard Group 2 Occupancy.

3. Other areas of the airport terminal and concourse buildings shall be classified in accordance
with Chapter 5 of NFPA 13 based on the occupancy and function of the area.

4. Utility tunnel and utility spaces or rooms shall be classified as Ordinary Hazard Group 1 Occupancy.

5. Baggage handling equipment tunnels shall be classified as Ordinary Hazard Group 2 Occupancy.

6. Automatic sprinkler systems in accordance with NFPA 409 shall be provided at aircraft loading positions under concourse canopies and roofed recesses that substantially cover the aircraft.

7. Sprinkler protection for new or modified electrical rooms shall comply with Section 903.3.10 of the International Fire Code.

8. Unless exempted by Section 903.1.1.1 of the International Fire Code, new and modified communication and data rooms shall be provided with automatic sprinkler protection.

4.5.2 Fire Alarm and Communications Systems.

4.5.2.1 Terminals and concourses shall be provided with a fire alarm and communications systems installed in accordance with Sections 4.5.2.1 through Section 4.5.2.7, Chapter 9 of the International Fire Code.

4.5.2.1.1 Smoke detection shall be spaced not to exceed 2,500 ft² (232 m²) per detector with roof/ceilings over 25 ft (7.6 m) above an occupied floor.

4.5.2.1.2 Manual pull station shall be provided at required exits and each zone shall be annunciated individually or by zone as approved. There shall be 200 linear ft (61 m) maximum between pull stations within public areas of terminals and concourses. Location of manual pull stations throughout all other areas shall comply with NFPA 72.

4.5.2.1.3 Smoke detection shall be provided as follows:

1. In each electrical, transformer, telephone equipment or similar room, elevator machine rooms, and in all elevator lobbies.

2. In the outlet of fans used for pressurization of stairways, hoistways and refuge areas. Activation of these smoke detectors shall be annunciated as a supervisory signal in accordance with Section 4.5.2.3 and not as an alarm signal.

3. In elevator hoistways and at the top of pressurized stair enclosures and in elevator hoistways where required by this code. These devices shall initiate an alarm condition and illuminate the respective indicator at the building annunciator panel. This alarm condition shall not initiate occupant notification or the smoke control system.

4. Smoke detectors shall be installed in supply air systems with a design capacity greater than 2,000 cfm (0.9 m³/s), in the supply air duct or plenum downstream of any fan. Activation of these smoke detectors shall be annunciated as a supervisory signal in accordance with Section 4.5.2.3 and not as an alarm signal.

5. In the main return air and exhaust air plenum of each air-handling system having a capacity greater than 2,000 cfm (0.9 m³/s) in accordance with Section 606.2.1 of the International Mechanical Code. Where multiple air-handling systems share common supply or return air ducts or plenums with a combined capacity greater than 2,000 cfm (0.9 m³/s), smoke detectors shall be provided in accordance with Section 606.2.2 of the International Mechanical Code. Detectors shall be listed for the air velocity in which they are installed.
Activation of these smoke detectors shall be annunciated as a supervisory signal in accordance with Section 4.5.2.3 and not as an alarm signal.

**Exception:** Smoke detectors are not required for automatic shut-off of evaporative coolers or units that supply un-tempered 100% outside air.

6. In inline tenant spaces and similar rooms adjoining **terminals and concourses**:

6.1 Smoke detectors shall be installed on the tenant side on inline tenant spaces at each opening into the **terminal or concourse** and at each exist from the tenant space. For openings wider than 30 lineal ft (9.1 m), an additional detector shall be provided for each 30 lineal ft (9.1 m) or fraction thereof.

6.2 Electrical equipment rooms that are equipped with fire sprinklers shall be equipped with a smoke detector(s); rooms without fire sprinkler protection the room shall be equipped with smoke and heat detector(s).

6.3 Manual pull stations shall be required at all kitchen exits.

4.5.2.2 Fire alarm system central station monitoring shall be provided by an approved radio communicator transmitting directly to DFD dispatch in accordance with Section 917 of the International Fire Code.

4.5.2.3 Fire alarm system signal annunciation shall be by a computer-based graphic display. All existing and new airport **terminal and concourse buildings** fire alarm devices shall be integrated into the system. Annunciation of all building fire alarm, trouble and supervisory signals shall be displayed at the computer graphic displays and all fire alarm control units. Local annunciators shall also be provided for pre-action and clean agent extinguishing systems in accordance Section 907 of the International Fire Code.

4.5.2.4 Airport **terminal and concourse buildings** shall be provided with an emergency voice/alarm communication system fully integrated into the complex-wide Emergency Communication System (ECS), incorporating audible, visual and textual notification appliances. In areas accessible to the public, DEN-controlled flight, gate, baggage and multi-use information display systems (FIDS, GIDS, BIDS, and MUFIDS, respectively), and DEN-controlled visual paging monitors shall display ECS messages. Non-DEN-controlled video displays, DEN CATV, and tenant audio systems in public areas shall be shunted upon activation of the emergency communication system.

**Exception:** Non-DEN-controlled video displays exceeding 60” (25.4mm) measured diagonally shall display ECS messages when required by the fire code official.

4.5.2.4.1 The emergency voice alarm evacuation message alert tone shall be a slow whoop or as approved by the fire code official. The evacuation message shall be manually initiated from the FCC.

4.5.2.5 The public areas of airport **terminal and concourse buildings** shall be provided with pre-signal fire alarm notification in accordance with NFPA 72.

4.5.2.6 A firefighter radio communication system shall be provided in accordance with Section 510 of the International Fire Code for an Emergency Responder Radio Enhancement Coverage System (RES)

**Exception:** With prior approval from the fire code official, firefighter radio communication systems are permitted to be integrated into the existing DEN Public Safety Communications Network.

4.5.2.7 Two-way hardwired Fire Department telephone communication system shall also be provided
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4.5.3 Fire Hydrants. Fire hydrants shall be provided on both the ramp and the street sides of terminals and concourses. Such hydrants shall be located so that no portion of the terminal and concourse building is more than 500 ft (152.4 m) from a hydrant.

4.5.4 Standpipe and Hose Systems. Standpipe and hose systems shall be provided for all airport terminal and concourse buildings in excess of two stories [35 ft (10.7 m)] in height or 100 ft (30.5m) in shortest horizontal dimension. Standpipe and hose systems shall be installed in accordance with NFPA 14.

4.5.4.1 Class I standpipe systems shall be provided in buildings protected throughout by an approved automatic sprinkler system. Each 2 1/2 in. (63.5 mm) hose connection shall be equipped with a 2 1/2 in. × 1 1/2 in. (63.5 mm × 38 mm) reducer and cap.

4.5.4.2 Class III standpipe systems shall be provided in nonsprinklered buildings. The exceptions in NFPA 14, for Class III systems shall be applicable to this requirement.

4.5.5 Water Supply. Water supply from public or private sources shall be adequate to supply maximum calculated sprinkler demand plus a minimum of 500 gpm (1893 L/min) for hose streams. The supply shall be available at the rate specified for a period of at least 1 hour.

4.5.5.1 Main sizes shall be hydraulically calculated based on the total domestic and fire protection requirements. Mains shall be not less than 8 in. (203 mm) in diameter except that laterals shall be permitted to be 6 in. (152 mm) in diameter if not over 200 ft (61 m) long.

4.5.5.2 Hydrants shall be readily accessible to fire-fighting vehicles traveling on surfaces adequate for supporting such vehicles.

4.5.5.2.1 Hydrants shall be listed.

4.5.5.2.2 Hydrants shall be located or protected to prevent mechanical or vehicular damage, including taxiing aircraft.

4.5.5.2.3 Hydrants recessed into the ground shall have identifiers in the pavement to assist in their prompt location at night and by personnel who might not be familiar with the location of the hydrants.

4.5.5.3 Water supply systems shall be regularly tested to ensure operation.

4.5.6 Portable Fire Extinguishers. Portable fire extinguishers shall be provided throughout all airport terminal and concourse buildings in accordance with NFPA 10.

Section 4.6 smoke control for airport terminal buildings is added as follows:

SMOKE CONTROL FOR AIRPORT TERMINAL AND CONCOURSE

4.6 Smoke control for airport terminal and concourse. Smoke control systems shall comply with Section 4.6.1 through 4.6.7

4.6.1 Requirements. Terminals and concourses shall be provided with smoke control. Smoke exhaust locations shall be configured in order to prevent accumulation of smoke in any area of the terminals and concourses. Smoke control systems shall be activated in accordance with Section 4.6.6. Where a space or corridor exceeds 20 ft (6.10m) in length and is connected to an atrium or area that has separate smoke control zones, supply air shall be provided to the space or corridor at the farthest location from the point of connection to the atrium or area. Tenant spaces less than 5,000 ft² (465m²) and open to the terminals or concourses shall be incorporated into the terminal or concourse smoke control exhaust operating sequence and shall be separated by an 18-inch
draft curtain with closely spaced sprinklers in accordance with Section 9.3.5 of NFPA 13 and smoke detections in accordance with Section 4.5.2 in the tenant space.

**Exceptions:**

1. Ramp service and nonpublic ramp level tenant areas of airport *concourse* buildings.
2. Unenclosed bag handling tenant areas of the *terminal* and *concourses*.
1. Permanently fixed aircraft loading walkways when separated by one-hour rated assemblies.

**4.6.2 Terminal and concourse design criteria.** The smoke control equipment for *terminals* and *concourses* shall be independent of that serving tenant spaces of 5,000 ft³ (465 m³) or more. The *terminal* and *concourse* smoke removal system shall provide the greater of 4 air changes per hour or 20,000 cfm (9.4 m³/s) from each smoke zone.

**4.6.3 Large tenant spaces and similar room design criteria.** All continuous tenant spaces adjoining the *terminal* and *concourses* which exceed 5,000 ft² (465 m²) shall be a separate smoke control zone per Section 4.6.2. The smoke removal system shall provide a minimum of 4 air changes per hour, with an appropriate source of make-up air. Smoke zones shall be separated by a smoke partition or an 18-inch draft curtain with closely spaced sprinklers installed in accordance with Section 9.3.5 of NFPA 13 and smoke detectors in accordance with Section 4.5.2 in the tenant space.

**4.6.4 Terminal and concourse elevators and stairs.** Exit stair enclosures, elevator hoistways and exit passageways shall be pressurized in accordance with Section 909 of the *International Fire Code*.

**Exception:**

1. As permitted by the building and fire code officials.
2. Elevators and enclosed stairways from the transitway station.
3. Pressurized stairs, elevators and exit passageways shall not be required in existing *terminals* and *concourses* and additions to existing terminal and *concourse* where this system does not presently exist.

**4.6.5 Baggage handling equipment tunnels and automated ground transportation system (AGTS).** The baggage handling equipment and AGTS tunnel smoke control exhaust systems shall be sized to provide a minimum of 4 air changes per hour.

**4.6.6 System initiation.** Terminal and *concourse* smoke exhaust shall be initiated when any automatic device (e.g. suppression water flow or automatic detection), activates within a smoke zone. Manual activation of smoke control equipment shall be provided on all fire command center fire alarm system workstations.

**Exceptions:**

1. Activation of any two (2) automatic detection devices in the same smoke zone shall initiate the smoke control sequence for the following: Terminal Levels 5 and 6 and normally occupied public areas of *Concourse* Level 2. Operation of a manual pull station shall function only as a second verification device to initiate the smoke control sequence for the smoke zone containing the initial automatic device in alarm. A suppression water flow can function as a single automatic activation device.
2. Manual activation from the FCC workstations shall be the only means permitted to
initiate the smoke control exhaust sequence for the terminal atrium, baggage handling equipment tunnels, and AGTS tunnel.

In terminal and concourses, stair and elevator hoistway enclosure vertical pressurization shall be initiated by activation of any single alarm-initiation device.

4.6.7 Adjacent zones. Where multiple smoke exhaust zones for the terminal and concourses are provided, only the smoke exhaust system for the zone in alarm shall be automatically activated. Smoke exhaust systems for adjacent zones shall not automatically activate but may be manually activated.

4.7 Delayed Egress for Airport Terminal and Concourse Buildings

4.7.1 Requirements. Where airport terminal and concourse buildings are provided with delayed egress systems, these systems shall be designed and installed in accordance with this Section and the airport’s Design Standards, Chapter 1 Administration of the International Building Code, Section 1010.1.9.8 of the International Building Code, and policies as approved by the Building and fire code officials.

4.7.2 Delayed egress. Other than in Groups H occupancies, delayed egress locking systems shall be permitted on doors providing access from airport terminal and concourse buildings to the restricted areas of the airport.

4.7.2.1 Delayed egress sequence of operation. The fire alarm system shall interface with all delayed egress systems and unlock these doors based on an approved sequence of operation. All doors shall be capable of being unlocked manually at the FCC fire alarm system workstation.

4.7.2.2 Delayed egress lock power. All delayed egress locks shall release upon loss of power.

4.7.2.3 Delayed egress lock release. The delayed egress locks shall initiate the irreversible unlocking process after the releasing device has been activated for 3 seconds. Once the unlocking process is initiated, the delayed egress lock shall release in 15 seconds.

4.7.2.4 Delayed egress lock relocking. Relocking of the doors shall be permitted through a centralized system after the fire alarm system has been reset.

4.7.2.5 Delayed egress lock signage. All doors provided with delayed egress locks shall have approved signage providing door opening instructions.

4.7.2.6 Delayed egress lock emergency lighting. All new doors provided with delayed egress locks shall be provided with emergency lighting.

4.7.2.7 Delayed egress lock listing. Components for the delayed egress lock shall be listed as a complete assembly.

4.8 Emergency Power

4.8.1 Emergency Power. Airport terminal and concourse buildings shall be provided with an emergency power source. Emergency power shall be provided by dual utility services or other approved means complying with NFPA 70, (NEC) Article 700 and the International Fire Code. Conditions of utility service availability and system power transfer shall be monitored by the fire alarm system.

4.8.2 The following equipment shall be provided with emergency power:

1. Mechanical equipment for smoke control.
2. Egress and exit lighting.
3. Elevator power and all associated elevator equipment.
4. Fire alarm and detection systems.
5. Fire pump/jockey pump.
6. Emergency communication systems.
7. Escalators and all associated escalator equipment
8. Moving walkway and all associated equipment.
10. Two-way Hardwired Fire Department Telephone Communication System

Chapter 5, Aircraft fueling ramp drainage, is replaced in its entirety with the follow:

CHAPTER 5

AIRCRAFT FUELING RAMP DRAINAGE

5.1 Aircraft Fueling Ramp Slope and Drain Design.

5.1.1 Aircraft fueling ramps shall slope away from concourses, aircraft hangars, aircraft loading walkways, or other structures, with a minimum grade of 1 percent (1:100) for the first 50 ft (15 m). Beyond this distance, the ramp slope to drainage inlets shall be permitted to be reduced to a minimum of 0.5 percent (1:200).

5.1.2 Aircraft fueling ramp drainage as specified herein shall be accomplished by the provisions of Section 5.1.1 in conjunction with the following:
   1. The use of drain inlets with connected piping
   2. The use of open-grate trenches

5.1.3 Drainage inlets, where provided, shall be located a minimum of 50 ft (15 m) from structures outlined in 5.1.1.

5.1.4 The drainage system of any aircraft fueling ramp shall be so designed that the fuel or its vapor cannot enter into the drainage system of buildings, areas utilized for automobile parking, public or private streets, or the public side of airport terminal buildings or aircraft hangar structures. In no case shall the design allow fuel to collect on the aircraft fueling ramp or adjacent ground surfaces where it could constitute a fire hazard.

5.1.5 The final separator or interceptor for the entire airport drainage system shall be designed to allow disposal of combustible or flammable liquids into a safety located, approved containment facility.

5.1.6 Grates and drain covers shall be removable to facilitate cleaning and flushing.

5.1.7 If open-grate drainage trenches are used as a collection means, such open trenches, including branches, shall not be over 125 ft (38 m) in length with a minimum interval of 6 ft (1.8 m) between open-trench sections to act as fire stops. Each 125 ft (38 m) section shall be individually drained through underground piping. Open trenches shall not be used where they are in the line of pedestrian or passenger traffic.
5.1.8 Underground piping and components used in drainage systems shall be noncombustible and inert to fuel.

5.2 Drain and Separator Maintenance

5.2.1 Periodic maintenance checks shall be conducted of all ramp drainage systems and interceptors to ensure that they are clear of obstructions and function properly.

5.2.2 Large-volume flushing with water shall be conducted through appropriate drainage elements to purge residual fuel from these drainage elements after any large fuel spill on the aircraft fueling ramp enters the drainage system.

CHAPTER 6

AIRCRAFT LOADING WALKWAYS

Delete Sections 6.1 through 6.2.10 in their entirety and substitute as follows:

6.1 Design Basics

6.1.1 Each aircraft loading walkway installation shall be designed to provide a safe means of egress from the aircraft for a period of 5 minutes under fire exposure conditions equivalent to a free-burning jet fuel spill fire.

6.1.2 Protection of the aircraft loading walkway shall be accomplished by one of the following methods:

1. Construction design meeting the requirements of Sections 6.1 through 6.4

2. Fixed fire protection meeting the requirements of Sections 6.1, 6.2, and 6.5

6.1.3 Aircraft Loading Walkways on Grade Level. Permanently fixed aircraft loading walkways on grade level shall be of Type I or II-A construction as defined in Chapter 6 of the International Building Code. All exterior doors shall have opening protection with a fire protection rating of not less than ¾ hour. Doors shall be self-closing and shall swing outward. Entrance doors between walkways and the airport concourse buildings shall swing into the airport concourse building and be equipped with automatic closure and panic hardware.

6.1.4 Other Aircraft Loading Walkways. Both fixed and moveable aircraft loading walkways shall be constructed in accordance with Section 6.2 and in compliance with FAA Circular AC 150/5220-12C. Structural loading shall comply with Chapter 16 of the International Building Code. All walkways shall be provided with a permanently affixed placard certifying compliance with NFPA 415. Requirements of this amendment Section 6.2.1 through 6.2.3 shall not apply.

6.2 Requirements for All Aircraft Loading Walkways.

6.2.1 Interior finish other than textiles of walls, ceilings, and walkways shall be Class A as defined in Section 803.1.1 of the International Building Code.

6.2.2 Interior textile finish of walls and ceilings in walkways shall be in accordance with Sections 803.5 and 803.6 of the International Building Code.

6.2.3 Interior floor finish in walkways shall be Class I as defined in Section 804 of the International Building Code.

6.2.4 During a ramp fire emergency, walkway interiors shall have a positive air pressure delivered from a
source that shall remain uncontaminated.

6.2.5 Any source of negative air pressure in the aircraft loading walkway shall be automatically shut down in the event of a fire emergency.

6.2.6 Any door in the egress path through the loading walkway to the terminal building shall swing in the direction of egress from the aircraft toward the terminal building and shall be equipped with panic hardware on the aircraft side.

6.2.7 Where loading walkways are provided, the walkway, including the bumpers, curtains, and canopies, shall be seated according to the manufacturer’s instruction and training when ever the walkway is in service.

6.2.8 Cab and Rotunda Slat Curtains.

6.2.8.1 Cab slat curtains and rotunda slat curtains shall meet the requirements of Section 6.4.8 by one of the following methods:

1. Intrinsic structural features
2. Fire-resistant coatings
3. Automatically activated water cooling systems in accordance with Section 6.5.2.
4. Automatically activated fire curtains.
5. Local application of a foam system in accordance with 6.5.3 under the cab and rotunda that is automatically activated and covers an area extending 15 ft (4.6 m) beyond the perimeter of the cab and rotunda. This shall supersede the 10 ft (3 m) criteria of 6.5.3.

6.2.8.2 When the rotunda is located more than 50 ft (15 m) from the fuel fill or fuel vent point of aircraft and the rotunda slit curtain is of noncombustible construction, 6.2.8.1 shall not apply.

6.2.9 Emergency lights shall be installed in all aircraft loading walkways in accordance with the International Building Code.

6.2.10 The minimum obstruction-free width of walking surface shall be 36 in. (914 mm). Changes in elevation between telescoping sections of the loading walkway’s walking surface shall not exceed 1 in 20 slope when the loading walkway is level. Existing loading walkways shall be permitted to be continued in service.

6.2.11 Sprinkler System. Permanently fixed aircraft loading walkways greater than 20 ft (6.10 m) in length or at grade level shall be provided with an automatic sprinkler system in accordance with Section 4.5.1.1(1) of this appendix.

6.2.12 Fire Alarm and Communications System. Permanently fixed aircraft loading walkways greater than 20 ft (6.10 m) in length or at grade level shall be provided with automatic fire alarm visible notification and Emergency Communication System (ECS) audible notification. Each permanently fixed aircraft loading walkway shall be its own notification zone.

2016 NFPA 415 Sections 6.3 through 6.5.3 are incorporated by reference and remain unchanged.

Add Chapter 7 Subsurface Tunnels as follows:
CHAPTER 7

SUBSURFACE TUNNELS

Section 7.1 General. All subsurface tunnels shall comply with the provisions of Sections 7.2 through 7.9.

Section 7.2 Sprinkler System Design Occupancy Classifications. Baggage Handling Equipment Tunnels (Ordinary Hazard Group 2) and Utility Tunnels (Ordinary Hazard Group 1) shall be sprinklered throughout. Train Service Automated Ground Transportation System (AGTS) Tunnels (Ordinary Hazard Group 2) shall be sprinklered at the transit stations as approved by the Building Department and Fire Department.

Section 7.3 Smoke Removal System. A smoke removal system shall be provided per Section 4.6.5.

Section 7.4 Life Safety System. All life safety systems shall be provided with emergency power. Utility and baggage tunnels shall be provided with visible (strobos) and textual visible notification appliances for emergency alarm and ECS integration where applicable. Device locations shall be as approved by the fire code official.

Section 7.5 Exits. A walkway with a minimum 74-inch width (1.9 m) [2 exit path widths of 22 inches (56 cm) each, plus 12 inches (30 cm) wall clearance, and an 18-inch (46 cm) platform edge clearance] shall be provided within all people-mover transit tunnels. Exit doors into adjacent protected tunnels shall be provided at a maximum spacing of 200 ft (61 m) and shall be monitored by the airport operations center.

Exception: The walkway width and exit door spacing may be modified based upon an exit study submitted by the Design Professional and approved by the Building Department and Fire Department.

Section 7.6 Separation. A minimum 2-hour fire-resistance-rated fire barrier in accordance with Section 707 of the International Building Code shall be provided between tunnels.

Section 7.7 Transit Station Separation. The transitway shall be separated from the transit station by minimum two-hour fire-resistance-rated noncombustible walls with 1½-hour fire-resistance-rated doors. Windows within these walls shall be approved 1½-hour fire-resistance-rated windows.

Exception: Fire-resistance-rated window openings of ¾-hour may be used when the window assembly is protected with approved directional sprinkler heads 6'-0" o.c. (1.83 m) both sides of glass.

Section 7.8 Transit Systems Construction Guide. Fixed Guideway Transit Systems NFPA 130 shall be used as a construction guide unless specifically covered by this Code.

Section 7.9 Transitway Tunnel. The transitway tunnel shall be used exclusively for the movement of passengers between stations.

2016 NFPA 415 Annexes A, B, C, D are incorporated by reference and remain unchanged.
APPENDIX T
INTERNATIONAL SWIMMING POOL AND SPA CODE

Section 305 of the 2021 International Swimming Pool and Spa Code is amended as follows:

SECTION 305
BARRIER REQUIREMENTS

305.1 General.

The provisions of this section shall apply to the design of barriers for pools and spas. These design controls are intended to provide protection against the potential drowning and near drowning by restricting access to such pools or spas. These requirements provide an integrated level of protection against potential drowning through the use of physical barriers and warning devices. All portions of the water surface shall be directly visible from any location within the pool barrier.

Exceptions:

1. Spas and hot tubs with a lockable safety cover that complies with ASTM F 1346.
2. Swimming pools with a powered safety cover that complies with ASTM F 1346.

305.1.1 Construction fencing required. The construction sites for in-ground swimming pools and spas shall be provided with construction fencing to surround the site from the time that any excavation occurs up to the time that the permanent barrier is completed. The fencing shall be not less than 4 feet (1219 mm) in height.

305.2 Outdoor swimming pools and spas and indoor swimming pools.

Outdoor pools and spas and indoor swimming pools shall be surrounded by a barrier that complies with Sections 305.2.1 through 305.7.

305.2.1 Barrier height and clearances.

Barrier heights and clearances shall be in accordance with all of the following:

1. The top of the barrier shall be not less than 60 inches (1524 mm) above grade where measured on the side of the barrier that faces away from the pool or spa. Such height shall exist around the entire perimeter of the barrier and for a distance of 3 feet (914 mm) measured horizontally from the outside of the required barrier.

2. The vertical clearance between grade and the bottom of the barrier shall not exceed 2 inches (51 mm) for grade surfaces that are not solid, such as grass or gravel, where measured on the side of the barrier that faces away from the pool or spa.

3. The vertical clearance between a surface below the barrier to a solid surface, such as concrete, and the bottom of the required barrier shall not exceed 4 inches (102 mm) where measured on the side of the required barrier that faces away from the pool or spa.
4. Where the top of the pool or spa structure is above grade, the barrier shall be installed on grade or shall be mounted on top of the pool or spa structure. Where the barrier is mounted on the top of the pool or spa, the vertical clearance between the top of the pool or spa and the bottom of the barrier shall not exceed 4 inches (102 mm).

305.2.2 Openings.

Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.

305.2.3 Solid barrier surfaces.

Solid barriers that do not have openings shall not contain indentations or protrusions that form handholds and footholds, except for normal construction tolerances and tooled masonry joints.

305.2.4 Mesh fence as a barrier.

Mesh fences, other than chain link fences in accordance with Section 305.2.7, shall be installed in accordance with the manufacturer’s instructions and shall comply with the following:

1. The bottom of the mesh fence shall be not more than 1 inch (25 mm) above the deck or installed surface or grade.
2. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not permit the fence to be lifted more than 4 inches (102 mm) from grade or decking.
3. The fence shall be designed and constructed so that it does not allow passage of a 4-inch (102mm) sphere under any mesh panel. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not be more than 4 inches (102 mm) from grade or decking.
4. An attachment device shall attach each barrier section at a height not lower than 45 inches (1143 mm) above grade. Common attachment devices include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring-actuated retaining lever such as a safety gate hook.
5. Where a hinged gate is used with a mesh fence, the gate shall comply with Section 305.3.
6. Patio deck sleeves such as vertical post receptacles that are placed inside the patio surface shall be of a nonconductive material.
7. Mesh fences shall not be installed on top of onground residential pools.

305.2.4.1 Setback for mesh fences. The inside of a mesh fence shall be not closer than 20 inches (508 mm) to the nearest edge of the water of a pool or spa.

305.2.5 Closely spaced horizontal members.

Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the pool or spa side of the fence. Spacing between vertical members shall not exceed 1¼ inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1¼ inches (44 mm) in width.
305.2.6 Widely spaced horizontal members.
Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, the interior width of the cutouts shall not exceed 1¾ inches (44 mm).

305.2.7 Chain link dimensions.
The maximum opening formed by a chain link fence shall be not more than 1¾ inches (44 mm). Where the fence is provided with slats fastened at the top and bottom which reduce the openings, such openings shall be not more than 1¾ inches (44 mm).

305.2.8 Diagonal members.
Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be not more than 1¾ inches (44 mm). The angle of diagonal members shall be not greater than 45 degrees (0.79 rad) from vertical.

305.2.9 Clear zone. Is replaced in its entirety with the following:
There shall be a clear zone of not less than 36 inches (914 mm) between the exterior of the barrier and any permanent structures or equipment such as pumps, filters and heaters that can be used to climb the barrier.

Where equipment, including pool equipment such as pumps, filters and heaters, is on the same lot as a pool or spa and such equipment is located outside of the barrier protecting the pool or spa, such equipment shall be located not less than 36 inches (914 mm) from the outside of the barrier.

305.2.10 Poolside barrier setbacks.
The pool or spa side of the required barrier shall be not less than 20 inches (508 mm) from the water’s edge.

305.3 Gates. Is replaced in its entirety with the following:
Access gates shall comply with the requirements of Sections 305.3.1 through 305.3.3 and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool or spa, shall be self-closing and shall have a self-latching device.

305.3.1 Utility or service gates.
Gates not intended for pedestrian use, such as utility or service gates, shall remain locked when not in use.

305.3.2 Double or multiple gates.
Double gates or multiple gates shall have at least one leaf secured in place and the adjacent leaf shall be secured with a self-latching device. The gate and barrier shall not have openings larger than ¼ inch (12.7 mm) within 18 inches (457 mm) of the latch release mechanism. The self-latching device shall comply with the requirements of Section 305.3.3.

305.3.3 Latches.
Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from grade, the release mechanism shall be located on the pool or spa side of the gate not less than 3 inches (76 mm) below.
the top of the gate, and the gate and barrier shall not have openings greater than ½ inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

305.3 Doors and gates. Doors and gates in barriers shall comply with the requirements of Sections 305.3.1 through 305.3.3 and shall be equipped to accommodate a locking device. Pedestrian access doors and gates shall open outward away from the pool or spa, shall be self-closing and shall have a self-latching device.

305.3.1 Utility or service doors and gates. Doors and gates not intended for pedestrian use, such as utility or service doors and gates, shall remain locked when not in use.

305.3.2 Double or multiple doors and gates. Double doors and gates or multiple doors and gates shall have not fewer than one leaf secured in place and the adjacent leaf shall be secured with a self-latching device.

305.3.3 Latch release. For doors and gates in barriers, the door and gate latch release mechanisms shall be in accordance with the following:

1. Where door and gate latch release mechanisms are accessed from the outside of the barrier and are of the self-locking type, such mechanism shall be located above the finished floor or ground surface in accordance with the following:
   1.1. At public pools and spas, not less than 52 inches (1219 mm) and not greater than 54 inches (1372 mm).
   1.2. At residential pools and spas, not less 54 inches (1372 mm).

2. Where door and gate latch release mechanisms are of the self-locking type such as where the lock is operated by means of a key, an electronic opener or the entry of a combination into an integral combination lock, the lock operation control and the latch release mechanism shall be located above the finished floor or ground surface in accordance with the following:
   2.1. At public pools and spas, not less than 34 inches and not greater than 48 inches (1219 mm).
   2.2. At residential pools and spas, not less than 54 inches (1372 mm).

3. At private pools, where the only latch release mechanism of a self-latching device for a gate is located on the pool and spa side of the barrier, the release mechanism shall be located at a point that is at least 3 inches (76 mm) below the top of the gate.

305.3.4 Barriers adjacent to latch release mechanisms. Where a latch release mechanism is located on the inside of a barrier, openings in the door, gate and barrier within 18 inches (457 mm) of the latch shall not be greater than 1/2 inch (12.7 mm) in any dimension.

305.4 Structure wall as a barrier. Is amended as follows:

Where a wall of a dwelling or structure serves as part of the barrier and where doors, gates or windows provide direct access to the pool or spa through that wall, one of the following shall be required:

1. Operable windows having a sill height of less than 48 inches (1219 mm) above the indoor finished floor, and doors and gates shall have an alarm that produces an audible warning when the window, door or
their screens are opened. The alarm shall be listed and labeled as a water hazard entrance alarm in accordance with UL 2017. In dwellings or structures not required to be Accessible units, Type A units or Type B units, the operable parts of the alarm deactivation switches shall be located 54 inches (1372 mm) or more above the finished floor. In dwellings or structures required to be Accessible units, Type A units or Type B units, the operable parts of the alarm deactivation switches shall be located not greater than 54 inches (1372 mm) and not less than 48 inches (1219 mm) above the finished floor.

2. In dwellings not required to be Accessible units, Type A units or Type B units, the operable parts of the alarm deactivation switches shall be located at not less than 54 inches (1372 mm) above the finished floor.

3. In dwellings that are required to be Accessible units, Type A units or Type B units, the operable parts of the alarm deactivation switches shall be located not greater than 54 inches (1372 mm) and not less than 48 inches (1219 mm) above the finished floor.

4. In structures other than dwellings, the operable parts of the alarm deactivation switches shall be located not greater than 54 inches (1372 mm) and not less than 48 inches (1220 mm) above the finished floor.

25. A safety cover that is listed and labeled in accordance with ASTM F 1346 is installed for the pools and spas.

26. An approved means of protection, such as self-closing doors with self-latching devices, is provided. Such means of protection shall provide a degree of protection that is not less than the protection afforded by Item 1 or 2.

305.5 Onground residential pool structure as a barrier.

An on-ground residential pool wall structure or a barrier mounted on top of an on-ground residential pool wall structure shall serve as a barrier where all of the following conditions are present:

1. Where only the pool wall serves as the barrier, the bottom of the wall is on grade, the top of the wall is not less than 48 inches (1219 mm) above grade for the entire perimeter of the pool, the wall complies with the requirements of Section 305.2 and the pool manufacturer allows the wall to serve as a barrier.

2. Where a barrier is mounted on top of the pool wall, the top of the barrier is not less than 48 inches (1219 mm) above grade for the entire perimeter of the pool, and the wall and the barrier on top of the wall comply with the requirements of Section 305.2.

3. Ladders or steps used as means of access to the pool are capable of being secured, locked or removed to prevent access except where the ladder or steps are surrounded by a barrier that meets the requirements of Section 305.

4. Openings created by the securing, locking or removal of ladders and steps do not allow the passage of a 4-inch (102 mm) diameter sphere.

5. Barriers that are mounted on top of onground residential pool walls are installed in accordance with the pool manufacturer’s instructions.

305.6 Natural barriers.
In the case where the pool or spa area abuts the edge of a lake or other natural body of water, public access is not permitted or allowed along the shoreline, and required barriers extend to and beyond the water’s edge not less than 18 inches (457 mm), a barrier is not required between the natural body of water shoreline and the pool or spa.

305.7 Natural topography.

Natural topography that prevents direct access to the pool or spa area shall include but not be limited to mountains and natural rock formations. A natural barrier approved by the governing body shall be acceptable provided that the degree of protection is not less than the protection afforded by the requirements of Sections 305.2 through 305.5.

305.8 Means of egress. Outdoor public pools provided with barriers shall have means of egress as required by Chapter 10 of the International Building Code.
APPENDIX U
TALL WOOD BUILDINGS

SECTION U101
GENERAL

U101.1 Purpose. The purpose of this appendix is to provide criteria for three new mass timber construction types: Type IV-A, Type IV-B, and Type IV-C. These building types expand the allowable use of mass timber construction to larger areas and greater heights than allowed for Type IV-HT construction.

U101.2 Scope. The provisions in this appendix are in addition to or replace the sections in the 2018 International Building Code where Types IV-A, IV-B, and IV-C construction are used. Where building Types IV-A, IV-B, or IV-C are not used, this appendix does not apply.

SECTION U102
AMENDMENTS TO THE INTERNATIONAL BUILDING CODE

(Under use of this appendix chapter, the following sections shall be modified or added as follows and shall supersede the corresponding sections in the International Building Code or Denver amendments to the International Building Code)

CHAPTER 2
DEFINITIONS

MASS TIMBER. Structural elements of Type IV construction primarily of solid, built-up, panelized or engineered wood products that meet minimum cross section dimensions of Type IV construction.

NONCOMBUSTIBLE PROTECTION (FOR MASS TIMBER). Noncombustible material, in accordance with Section 703.5, designed to increase the fire resistance rating and delay the combustion of mass timber.

CHAPTER 4
SPECIAL DETAILED REQUIREMENTS BASED ON OCCUPANCY AND USE

403.3.2 Water supply to required fire pumps. In all buildings that are more than 420 feet (128 m) in building height, and buildings of Type IV-A and IV-B construction that are more than 120 feet in building height, required fire pumps shall be supplied by connections to not fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

Exception: Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through not fewer than one of the connections.
CHAPTER 5
GENERAL BUILDING HEIGHT AND AREAS

TABLE 504.3
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>TYPE OF CONSTRUCTION</th>
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For SI: 1 foot = 304.8 mm

UL – Unlimited; NS – Buildings not equipped throughout with an automatic sprinkler system; S – Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.2.1.1; S13R – Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.2.1.2; S13D – Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.2.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable heights in the chapter.

b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.

c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.

d. The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.

e. New Group I-I and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-I occupancies Condition 1, see Exception 1 of Section 903.2.6.
New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the International Fire Code.

New Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.

New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

---

**TABLE 504.4**

**ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE**

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>TYPE OF CONSTRUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TYPE I</td>
</tr>
<tr>
<td></td>
<td>A  B</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3. Section 903.3.1.1; S13R = system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.3.

a. See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
b. See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
c. New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
d. The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
e. New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies, Condition 1, see Exception 1 of Section 903.2.6.
f. New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and 1103.5 of the International Existing Building Code.
g. For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
h. New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

<table>
<thead>
<tr>
<th>OCCUPANCY CLASSIFICATION</th>
<th>TYPE I</th>
<th>TYPE II</th>
<th>TYPE III</th>
<th>TYPE IV</th>
<th>TYPE V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A, B</td>
<td>A, B</td>
<td>A, B</td>
<td>A, B</td>
<td>A, B</td>
</tr>
</tbody>
</table>

TABLE 506.2
ALLOWABLE AREA FACTOR (A, = NS, S1, S13R, S13D OR SM, as applicable) IN SQUARE FEET
an automatic sprinkler system installed in accordance with Section 903.3.1.1; SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.2.6 and Section 1103.5 of the International Existing Building Code.

707 or

Required separations shall be fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both, so as to completely separate adjacent occupancies. Mass timber elements serving as fire barriers or horizontal assemblies to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the building with an approved thermal barrier consisting of a minimum of 1/2-inch (12.7 mm) gypsum board or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

508.4.1 Construction. Where Table 508 specifies a fire resistance rated separation, mass timber elements serving as fire barriers or a horizontal assembly in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an approved thermal barrier consisting of a minimum of 1/4-inch (12.7 mm) gypsum board or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

509.4.1 Type IV-B and IV-C Construction. Where Table 509 specifies a fire resistance rated separation, mass timber elements serving as fire barriers or a horizontal assembly in Type IV-B or IV-C construction shall be separated from the interior of the incidental use with an approved thermal barrier consisting of a minimum of 1/4-inch (12.7 mm) gypsum board or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

For SI: 1 square foot = 0.0929 m².

For SI: 1 square foot = 0.0929 m².

UL = Unlimited; NP = Not Permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system; S10 = Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3; S13R = Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1; S1 = Buildings not equipped throughout with an automatic sprinkler system; S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system; S13R = Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1; S13D = Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3;
CHAPTER 6
TYPES OF CONSTRUCTION

602.4 Type IV. Type IV construction is that type of construction in which the building elements are mass timber or noncombustible materials and have fire resistance ratings in accordance with Table 601. Mass timber elements shall meet the fire resistance rating requirements of this section based on either the fire resistance rating of the noncombustible protection, the mass timber, or a combination of both and shall be determined in accordance with Section 703.2 or 703.3. The minimum dimensions and permitted materials for building elements shall comply with the provisions of this section and Section 2304.11. Mass timber elements of Type IV-A, IV-B and IV-C construction shall be protected with noncombustible protection applied directly to the mass timber in accordance with Sections 602.4.1 through 602.4.4. The time assigned to the noncombustible protection shall be determined in accordance with Section 703.8 and comply with Section 722.3.

Cross-laminated timber shall be labeled as conforming to PRG 320-18 as reference in Section 2303.1.4.

Exterior load bearing walls and nonload-bearing walls shall be mass timber construction or shall be of noncombustible construction.

Exception: Exterior load bearing walls and nonload-bearing walls of Type IV-HT Construction in accordance with Section 602.4.4.

The interior building elements, including nonload bearing walls and partitions, shall be of mass timber construction or of noncombustible construction.

Exception: Interior building elements and nonload-bearing walls and partitions of Type IV-HT Construction in accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces but shall comply with Section 718.

In buildings of Type IV-A, B, and C construction with an occupied floor located more than 75 feet above the lowest level of fire department access, up to and including 12 stories or 180 feet above grade plane, mass timber interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 stories or 180 feet above grade plane, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

602.4.1 Type IV-A. Building elements in Type IV-A construction shall be protected in accordance with Sections 602.4.1.1 through 602.4.1.6. The required fire resistance rating of noncombustible elements and protected mass timber elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.1.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering shall be of noncombustible material except water resistant barriers having a peak heat release rate of less than 150 kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².
602.4.1.2 Interior protection. Interior faces of all mass timber elements, including the inside faces of exterior mass timber walls and mass timber roofs, shall be protected with material complying with Section 703.5.

602.4.1.2.1 Protection time. Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(2) shall be permitted to be used for compliance with Section 722.7.1.

602.4.1.3 Floors. The floor assembly shall contain a noncombustible material not less than one inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with 602.4.1.2.

602.4.1.4 Roofs. The interior surfaces of roof assemblies shall be protected in accordance with Section 602.4.1.2. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.1.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the International Mechanical Code and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected in accordance with Sections 602.4.1.2.

602.4.1.6 Shafts. Shafts shall be permitted in accordance with Section 713 and Section 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.

602.4.2 Type IV-B. Building elements in Type IV-B construction shall be protected in accordance with Sections 602.4.2.1 through 602.4.2.6. The required fire resistance rating of noncombustible elements or mass timber elements shall be determined in accordance with Section 703.2 or Section 703.3.

602.4.2.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with non-combustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150 kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354, and having a flame spread index of 25 or less and a smoke developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.2.2 Interior protection. Interior faces of all mass timber elements, including the inside face of exterior mass timber walls and mass timber roofs, shall be protected, as required by this section, with materials complying with Section 703.5.

602.4.2.2.1 Protection time. Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(2) shall be permitted to be used for compliance with Section 722.7.1.

602.4.2.2.2 Protected area. All interior faces of all mass timber elements shall be protected in accordance with Section 602.4.2.1, including the inside face of exterior mass timber wall and mass timber roofs.
Exceptions: Unprotected portions of mass timber ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings, including attached beams, shall be permitted and shall be limited to an area equal to 20% of the floor area in any dwelling unit or fire area, or

2. Unprotected portions of mass timber walls, including attached columns, shall be permitted and shall be limited to an area equal to 40% of the floor area in any dwelling unit or fire area, or

3. Unprotected portions of both walls and ceiling of mass timber, including attached columns and beams, in any dwelling unit or fire area shall be permitted in accordance with Section 602.4.2.2.3.

4. Mass timber columns and beams which are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

602.4.2.2.3 Mixed unprotected areas. In each dwelling unit or fire area, where both portions of ceilings and portions of walls are unprotected, the total allowable unprotected area shall be determined in accordance with Equations 6.1.

\[
\left(\frac{U_{tc}}{A_{tc}}\right) + \left(\frac{U_{tw}}{A_{tw}}\right) \leq 1
\]

(Equation 6.1)

where:

- \(U_{tc}\) = Total unprotected mass timber ceiling areas
- \(U_{ac}\) = Allowable unprotected mass timber ceiling area conforming to Section 602.4.2.2.2, Exception 1
- \(U_{tw}\) = Total unprotected mass timber wall areas
- \(U_{aw}\) = Allowable unprotected mass timber wall area conforming to Section 602.4.2.2.2, Exception 2

602.4.2.2.4 Separation distance between unprotected mass timber elements. In each dwelling unit or fire area, unprotected portions of mass timber walls and ceilings shall be not less than 15 feet from unprotected portions of other walls and ceilings, measured horizontally along the ceiling and from other unprotected portions of walls measure horizontally along the floor.

602.4.2.3 Floors. The floor assembly shall contain a noncombustible material not less than one inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with Section 602.4.1.2.

602.4.2.4 Roofs. The interior surfaces of roof assemblies shall be protected in accordance with Section 602.4.2.2 except, in nonoccupiable spaces, they shall be treated as a concealed space with no portion left unprotected. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.2.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the International Mechanical Code, and shall comply with all

2021 DENVER AMENDMENTS TO THE 2021 INTERNATIONAL BUILDING CODE 114
Combustible construction forming concealed spaces shall be protected in accordance with Section 602.4.1.2.

602.4.2.6 Shafts. Shafts shall be permitted in accordance with Section 713 and Section 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.

602.4.3 Type IV-C. Building elements in Type IV-C construction shall be protected in accordance with Sections 602.4.3.1 through 602.4.3.6. The required fire resistance rating of building elements shall be determined in accordance with Section 703.3 or Section 703.3.

602.4.3.1 Exterior protection. The exterior side of walls of combustible construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering shall be of noncombustible material except water resistant barriers having a peak heat release rate of less than 150 kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.3.2 Interior protection. Mass timber elements are permitted to be unprotected.

602.4.3.3 Floors. Floor finishes in accordance with Section 804 shall be permitted on top of the floor construction.

602.4.3.4 Roofs. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

602.4.3.5 Concealed spaces. Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the International Mechanical Code, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1.

602.4.3.6 Shafts. Shafts shall be permitted in accordance with Section 713 or Section 718. Shafts, elevator hoistways and interior exit stairway enclosures shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1, on both the inside of the shaft and the outside of the shaft.

602.4.4 Type IV-HT. Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated heavy timber or structural composite lumber (SCL) without concealed space. The minimum dimensions for permitted materials, including solid timber, glued-laminated timber, structural composite lumber (SCL) and cross laminated timber (CLT) and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.4.1 or 602.4.4.2 shall be permitted. Interior walls and partitions not less than one hour fire resistance rating or heavy timber conforming with Section 2304.11.2.2 shall be permitted.

602.4.4.1 Fire-retardant-treated wood in exterior walls. Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less.
602.4.4.2 Cross-laminated timber in exterior walls. Cross-laminated timber complying with Section 2303.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one of the following:

1. Fire-retardant-treated wood sheathing complying with Section 2303.2 and not less than 1/2-inch (12 mm) thick; or

2. Gypsum board not less than 7/32-inch (12.7 mm) thick; or

3. A noncombustible material.

602.4.4.3 Exterior structural members. Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.

### TABLE 601

#### FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

<table>
<thead>
<tr>
<th>BUILDING ELEMENT</th>
<th>TYPE I</th>
<th>TYPE II</th>
<th>TYPE III</th>
<th>TYPE IV</th>
<th>TYPE V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Primary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural frame (see Section 202)</td>
<td>3^b</td>
<td>2^a</td>
<td>1^b</td>
<td>0</td>
<td>1^b</td>
</tr>
<tr>
<td>Bearing walls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exterior</td>
<td>3^a</td>
<td>2^a</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Interior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonbearing walls and partitions (Exterior)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nonbearing walls and partitions (Interior)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Floor construction and associated secondary members (see Section 202)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Roof construction and associated secondary members (see Section 202)</td>
<td>1^a</td>
<td>1^b</td>
<td>1^b</td>
<td>1^b</td>
<td>0</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.

### Table 602

Fire-Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance

<table>
<thead>
<tr>
<th>Fire Separation Distance (X) (feet)</th>
<th>Type of Construction</th>
<th>Occupancy Group H</th>
<th>Occupancy Group E-1, M, S-1</th>
<th>Occupancy Group A, B, E, F-1, I, R, S-2, U</th>
</tr>
</thead>
<tbody>
<tr>
<td>X &lt; 5</td>
<td>All</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5 ≤ X &lt; 10</td>
<td>IA, IV-A, IV-B</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10 ≤ X &lt; 30</td>
<td>IA, IB, IV-A, IV-B</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>III, VB</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>X ≥ 30</td>
<td>All</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. See Section 706.1.1 for party walls.
c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
e. For special requirements for Group II occupancies, see Section 415.6.
f. For special requirements for Group S aircraft hangers, see Section 412.3.1.
g. Where Table 708.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.
h. For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.
i. For a Group R-3 building of Type II B or Type V B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.
CHAPTER 7
FIRE AND SMOKE PROTECTION FEATURES

703.8 Determination of noncombustible protection time contribution. The time, in minutes, contributed to the fire resistance rating by the noncombustible protection of mass timber building elements, components, or assemblies, shall be established through a comparison of assemblies tested using procedures set forth in ASTM E119 or UL263. The test assemblies shall be identical in construction, loading, and materials, other than the noncombustible protection. The two test assemblies shall be tested to the same criteria of structural failure.

1. Test Assembly 1 shall be without protection.
2. Test Assembly 2 shall include the representative noncombustible protection. The protection shall be fully defined in terms of configuration details, attachment details, joint sealing details, accessories and all other relevant details.

The noncombustible protection time contribution shall be determined by subtracting the fire resistance time, in minutes, of Test Assembly 1 from the fire resistance time, in minutes, of Test Assembly 2.

703.9 Sealing of adjacent mass timber elements. In buildings of Type IV-A, IV-B, and IV-C construction, sealant or adhesive shall be provided to resist the passage of air in the following locations:

1. At abutting edges and intersections of mass timber building elements required to be fire resistance-rated.
2. At abutting intersections of mass timber building elements and building elements of other materials where both are required to be fire resistance-rated.

Sealants shall meet the requirements of ASTM C920. Adhesives shall meet the requirements of ASTM D3498.

Exception: Sealants or adhesives need not be provided where they are not a required component of a tested fire resistance rated assembly.

718.2.1 Fireblocking materials. Fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool, mineral fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation installed as tested for the specific application.

9. Mass timber complying with Section 2304.11.

722.7 Fire resistance rating of mass timber. The required fire resistance of mass timber elements in Section 602.4 shall be determined in accordance with Section 703.2 or Section 703.3. The fire resistance rating of building elements shall be as required in Tables 601 and 602 and as specified elsewhere in this code. The fire resistance rating of the mass timber elements shall consist of the fire resistance of the unprotected element added to the protection time of the noncombustible protection.

722.7.1 Minimum required protection. Where required by Section 602.4.1 through 602.4.3, noncombustible protection shall be provided for mass timber building elements in accordance with Table 722.7.1(1). The rating, in minutes, contributed by the noncombustible protection of mass timber building elements, components, or assemblies, shall be established in accordance with Section 703.8. The protection contributions indicated in Table 722.7.1(2) shall be deemed to comply with this requirement when installed and fastened in accordance with Section 722.7.2.

<table>
<thead>
<tr>
<th>TABLE 722.7.1(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROTECTION REQUIRED FROM NONCOMBUSTIBLE COVERING MATERIAL</strong></td>
</tr>
<tr>
<td>Required Fire Resistance Rating of Building Element</td>
</tr>
<tr>
<td>per Tables 601 and 602 (hours)</td>
</tr>
<tr>
<td>1/2</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>2 or more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 722.7.1(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROTECTION PROVIDED BY NONCOMBUSTIBLE COVERING MATERIAL</strong></td>
</tr>
<tr>
<td>Noncombustible Protection</td>
</tr>
<tr>
<td>5/8-inch Type X Gypsum Board</td>
</tr>
<tr>
<td>5/8-inch Type X Gypsum Board</td>
</tr>
</tbody>
</table>

722.7.2 Installation of gypsum board noncombustible protection. Gypsum board complying with Table 722.7.1(2) shall be installed in accordance with this section.

722.7.2.1 Interior surfaces. Layers of Type X gypsum board serving as noncombustible protection for interior surfaces of wall and ceiling assemblies determined in accordance with Table 722.7.1(1) shall be installed in accordance with the following:

1. Each layer shall be attached with Type S drywall screws of sufficient length to penetrate the mass timber at least 1-inch when driven flush with the paper surface of the gypsum board.

   Exception: The third layer, where determined necessary by Section 722.7, shall be permitted to be attached with 1-inch #6 Type S drywall screws to furring channels in accordance with ASTM C645.

2. Screws for attaching the base layer shall be 12 inches on center in both directions.
3. Screws for each layer after the base layer shall be 12 inches on center in both directions and offset from the screws of the previous layers by 4 inches in both directions.

4. All panel edges of any layer shall be offset 18 inches from those of the previous layer.

5. All panel edges shall be attached with screws sized and offset as in items 1 through 4 above and place at least 1 inch but not more than 2 inches from the panel edge.

6. All panels installed at wall-to-ceiling intersections shall be installed such that ceiling panels are installed first and the wall panels are installed after the ceiling panel has been installed and is fitted tight to the ceiling panel. Where multiple layers are required, each layer shall repeat this process.

7. All panels installed at a wall-to-wall intersection shall be installed such that the panels covering an exterior wall or a wall with a greater fire resistance rating shall be installed first and the panels covering the other wall shall be fitted tight to the panel covering the first wall. Where multiple layers are required, each layer shall repeat this process.

8. Panel edges of the face layer shall be taped and finished with joint compound. Fastener heads shall be covered with joint compound.

9. Panel edges protecting mass timber elements adjacent to unprotected mass timber elements in accordance with Section 602.4.2.2 shall be covered with 1 1/4 inch metal corner bead and finished with joint compound.

722.7.2.2 Exterior surfaces. Layers of Type X gypsum board serving as noncombustible protection for the outside of the exterior heavy timber walls determined in accordance with Table 722.7(1)(1) shall be fastened 12 inches on center each way and 6 inches on center at all joints or ends. All panel edges shall be attached with fasteners located at least 1 inch but not more than 2 inches from the panel edge. Fasteners shall comply with one of the following:

1. Galvanized nails of minimum 12 gauge with a 7/16 inch head of sufficient length to penetrate the mass timber a minimum of 1 inch.

2. Screws which comply with ASTM C1002 (Type S, Type W, or Type G) of sufficient length to penetrate the mass timber a minimum of 1 inch.

CHAPTER 17
SPECIAL INSPECTIONS AND TESTS
1705.19 Sealing of mass timber. Periodic special inspections of sealants or adhesives shall be conducted where sealant or adhesive required by Section 703.9 is applied to mass timber building elements as designated in the approved construction documents.

1705.5.3 Mass timber construction. Special inspections of Mass Timber elements in Types IV-A, IV-B, and IV-C construction shall be in accordance with Table 1705.5.3.
### TABLE 1705.5.3
**REQUIRED SPECIAL INSPECTION OF MASS TIMBER CONSTRUCTION**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CONTINUOUS SPECIAL INSPECTION</th>
<th>PERIODIC SPECIAL INSPECTION¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inspection of anchorage and connections of mass timber construction to foundation systems.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2. Inspection of erection of mass timber construction</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3. Inspection of connections where installation methods are required to meet design loads</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3.1 Threaded fasteners</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3.1.1 Verify use of proper installation equipment</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.1.2 Verify use of pre-drilled holes where required</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.1.3 Inspect screws, including diameter, length, head type, spacing, installation angle and depth</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.2 Adhesive anchors installed in horizontal or upwardly included orientation to resist sustained tension loads</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.3 Adhesive anchors not defined in 3.2</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3.4 Bolted connections</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Concealed connections</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

¹ Periodic special inspection shall mean minimum 20% inspections of all connection assemblies or as specified by the engineer of record or approved by the building official.

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### CHAPTER 23
**WOOD**

**2304.10.6 Connection fire resistance rating:** Fire resistance ratings for connections in Type IV-A, IV-B, or IV-C construction shall be determined by one of the following:

1. Testing in accordance with Section 703.2 where the connection is part of the fire resistance test.

2. Engineering analysis that demonstrates that the temperature rise at any portion of the connection is limited to an average temperature rise of 250°F (121°C), and a maximum temperature rise of 325°F (163°C), for a time corresponding to the required fire resistance rating of the structural element being connected. For the purposes of this analysis, the connection includes connectors, fasteners, and portions of wood members included in the structural design of the connection.
CHAPTER 31
SPECIAL CONSTRUCTION

3102.3 Type of construction. Noncombustible membrane structures shall be classified as Type II B construction. Noncombustible frame or cable-supported structures covered by an approved membrane in accordance with Section 3102.3.1 shall be classified as Type II B construction. Heavy-timber frame-supported structures covered by an approved membrane in accordance with Section 3102.3.1 shall be classified as Type IV-HT construction. Other membrane structures shall be classified as Type V construction.

Exception: Plastic less than 30 feet (9144 mm) above any floor used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.

3102.6.1.1 Membrane. A membrane meeting the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 710 shall be permitted to be used as the roof or as a skylight on buildings of Type II B, III, IV-HT and V construction, provided that the membrane is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

CHAPTER 35
REFERENCED STANDARDS

APA — APA – Engineered Wood Association
701 South 19th Street
Tacoma WA 98466
US

ANSI/APA PRG 320—18: Standard for Performance-rated Cross-laminated Timber

ASTM — ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US