

2021 Virginia Construction Code

CHAPTER 7 FIRE AND SMOKE PROTECTION FEATURES

SECTION 712 VERTICAL OPENINGS

712.1 General.

Each vertical opening shall comply in accordance with one of the protection methods in [Sections 712.1.1 through 712.1.16](#).

712.1.1 Shaft enclosures.

Vertical openings contained entirely within a *shaft enclosure* complying with [Section 713](#) shall be permitted.

712.1.2 Individual dwelling unit.

Unconcealed vertical openings totally within an individual residential *dwelling unit* and connecting *four stories* or less shall be permitted.

712.1.3 Escalator openings.

Where a building is equipped throughout with an *automatic sprinkler system* in accordance with [Section 903.3.1.1](#), vertical openings for escalators shall be permitted where protected in accordance with [Section 712.1.3.1](#) or [712.1.3.2](#).

712.1.3.1 Opening size.

Protection by a draft curtain and closely spaced sprinklers in accordance with [NFPA 13](#) shall be permitted where the area of the vertical opening between *stories* does not exceed twice the horizontal projected area of the escalator. In other than Groups B and M, this application is limited to openings that do not connect more than four *stories*.

712.1.3.2 Automatic shutters.

Protection of the vertical opening by approved shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with [Section 907.3.1](#) and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.

712.1.4 Penetrations.

Penetrations, concealed and unconcealed, shall be permitted where protected in accordance with [Section 714](#).

712.1.5 Joints.

Joints shall be permitted where complying with [Section 712.1.5.1](#) or [712.1.5.2](#), as applicable.

712.1.5.1 Joints in or between horizontal assemblies.

Joints made in or between *horizontal assemblies* shall comply with [Section 715](#). The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be permitted where protected in accordance with [Section 715.4](#).

712.1.5.2 Joints in or between nonfire-resistance-rated floor assemblies.

Joints in or between floor assemblies without a required *fire-resistance rating* shall be permitted where they comply with one of the following:

1. The *joint* shall be concealed within the cavity of a wall.
2. The *joint* shall be located above a ceiling.
3. The *joint* shall be sealed, treated or covered with an *approved* material or system to resist the free passage of flame and the products of combustion.

Exception: *Joints* meeting one of the exceptions specified in [Section 715.3](#).

712.1.6 Ducts and air transfer openings.

Penetrations by ducts and air transfer openings shall be protected in accordance with [Section 717](#). Grease ducts shall be protected in accordance with the [International Mechanical Code](#).

712.1.7 Atriums.

Atriums complying with [Section 404](#) that connect two or more *stories* in Group I-2 or I-3 occupancies or three or more *stories* in other occupancies shall be permitted.

Exceptions:

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1. *Atriums* shall not be permitted within Group H occupancies.
2. Balconies or stories within Groups A-1, A-4 and A-5 and *mezzanines* that comply with [Section 505](#) shall not be considered a story as it applies to this section

712.1.8 Masonry chimney.

Approved vertical openings for masonry chimneys shall be permitted where the *annular space* is fireblocked at each floor level in accordance with [Section 718.2.5](#).

712.1.9 Two-story openings.

In other than Groups I-2 and I-3, a vertical opening that is not used as one of the applications specified in this section shall be permitted if the opening complies with all of the following items:

1. Does not connect more than two *stories*.
2. Does not penetrate a *horizontal assembly* that separates *fire areas* or *smoke barriers* that separate *smoke compartments*.
3. Is not concealed within the construction of a wall or a floor/ceiling assembly.
4. Is not open to a *corridor* in Group I and R occupancies.
5. Is not open to a *corridor* on nonsprinklered floors.
6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required *shaft enclosures*.

712.1.10 Parking garages.

Vertical openings in parking garages for automobile ramps, elevators and duct systems shall comply with [Section 712.1.10.1](#), [712.1.10.2](#) or [712.1.10.3](#), as applicable.

712.1.10.1 Automobile ramps.

Vertical openings for automobile ramps in parking garages shall be permitted where constructed in accordance with [Sections 406.5](#) and [406.6](#).

712.1.10.2 Elevators.

Vertical openings for elevator hoistways in parking garages that serve only the parking garage, and complying with [Sections 406.5](#) and [406.6](#), respectively, shall be permitted.

712.1.10.3 Duct systems.

Vertical openings for mechanical exhaust or supply duct systems in parking garages complying with [Sections 406.5](#) and [406.6](#), respectively, shall be permitted to be unenclosed where such duct system is contained within and serves only the parking garage.

712.1.11 Mezzanine.

Vertical openings between a *mezzanine* complying with [Section 505](#) and the floor below shall be permitted.

712.1.12 Exit access stairways and ramps.

Vertical openings containing *exit access stairways* or *ramps* in accordance with [Section 1019](#) shall be permitted.

712.1.13 Openings.

Vertical openings for floor fire doors and access doors shall be permitted where protected by [Section 712.1.13.1](#) or [712.1.13.2](#).

712.1.13.1 Horizontal fire door assemblies.

Horizontal *fire door* assemblies used to protect openings in fire-resistance-rated *horizontal assemblies* shall be tested in accordance with [NFPA 288](#), and shall achieve a *fire-resistance rating* not less than the assembly being penetrated. Horizontal *fire door* assemblies shall be labeled by an *approved agency*. The *label* shall be permanently affixed and shall specify the manufacturer, the test standard and the *fire-resistance rating*.

712.1.13.2 Access doors.

Access doors shall be permitted in ceilings of fire-resistance-rated floor/ceiling and roof/ceiling assemblies, provided that such doors are tested in accordance with [ASTM E119](#) or [UL 263](#) as *horizontal assemblies* and labeled by an *approved agency* for such purpose.

712.1.14 Group I-3.

In Group I-3 occupancies, vertical openings shall be permitted in accordance with [Section 408.5](#).

712.1.15 Skylights.

Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated *roof assembly* is maintained. Unprotected *skylights* shall not be permitted in *roof assemblies* required to be fire-resistance rated in accordance with [Section 705.8.6](#). The

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supporting construction shall be protected to afford the required *fire-resistance rating* of the *horizontal assembly* supported.

712.1.16 Openings otherwise permitted.

Vertical openings shall be permitted where allowed by other sections of this code.