



# Shaft Requirements

## *Building Division Interpretations and Policy*

<b>Index Number:</b>	IBC-2020-002
<b>Issue Date:</b>	03/03/2020
<b>Code:</b>	2018 IBC & IMC
<b>Section:</b>	IBC Chapter 7, IMC Chapters 5, 6, 7, & 11

### General Shaft Code Requirements

**Shaft Construction:** Shaft enclosures shall be constructed as *fire barriers*. IBC 713.2. Building elements supporting the shaft walls are subject to the fire-resistant rating provisions of IBC 707.5.1 (COB interpretation shaft wall spreader beam protection requirements).

**Penetrations:** Penetrations in a shaft enclosure shall be protected in accordance with IBC 714 as required for *fire barriers*. Structural elements, such as beams or joists, where protected in accordance with IBC 714 shall be permitted to penetrate the shaft enclosure. IBC 713.8.

**Prohibited Penetrations and Openings:** Penetrations and openings other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures. Membrane penetrations on the outside of shaft enclosures shall be permitted. IBC 713.7.1, 713.8.1.

**Duct and Air Transfer Openings:** Penetrations of a shaft enclosure by ducts and air transfer openings shall comply with IBC 713.10, 717, IMC state amendment 504.10, IMC 607.5.2 and 607.5.5.

**Two-Story Openings in other than Groups I-2 and I-3:** A shaft enclosure is not required for floor openings that do not connect more than two stories and complies with all six items in IBC 712.1.9. Note: An elevator hoistway serving not more than two stories is not considered “concealed within the construction” per item 3.

**Parking Garages:** Elevators and duct systems that only serve open and enclosed parking garages are not required to be enclosed in a shaft. IBC 712.1.10.2, 712.1.10.3.

**Horizontal Shaft Assemblies:** Vertical shaft assemblies differ from horizontal shaft assemblies. See details in applicable listed gypsum assemblies.

### Reference Table for Shaft Type

Type of Shaft	Requirements (including what items can and cannot be combined in a shaft)	Code Section(s)
Grease Duct	Shaft enclosures that include grease ducts can only be used for the grease duct. The shaft enclosure must begin where a grease duct penetrates a ceiling, wall or any concealed space and shall continue to termination.	IMC 506.3.11, IMC 506.3.11.1

Type of Shaft	Requirements (including what items can and cannot be combined in a shaft)	Code Section(s)
Hazardous Exhaust	Hazardous exhaust systems shall not share common shafts with other duct systems unless they meet additional requirements. Hazardous exhaust shafts must start at the penetration of a fire-resistance rated assembly and continue to the outlet terminal. Shaft construction must meet the fire-resistance rating of the highest fire-resistance rated assembly penetrated.	IMC 510.5, IMC 510.7.3
Refrigerant Piping	Refrigerant piping cannot be located within an elevator, dumbwaiter or other shafts containing moving objects or a shaft that has one or more openings into a fire resistance-rated exit access corridor, interior exit stairway, ramp or exit passageway.	IMC 1107.2
Smoke Control Ventilation System	Equipment, control wiring, power wiring and ductwork shall be separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire-resistance rated construction. (See Bellevue Fire Department Smoke Control Guidelines for additional wiring requirements.)	IBC 909.20.6.1, Bellevue Fire Department Smoke Control Guidelines
Utility	Utility shafts can combine plumbing, mechanical, electrical and FARS systems that pass through at least one floor provided they are not restricted by other sections of the code.	IBC 713.8, IBC 713.7.1, IBC 713.8.1

## Interpretations and Clarifications

**Rated access openings for grease duct cleanouts** in a shaft shall not be considered as penetrations that would require additional protection at the bottom of the shaft. Where a grease duct penetrates the shaft enclosure at the bottom, the shaft shall be sealed around the duct at the point of penetration. IBC 713.11, IMC 506.3.11.1.

**Waste and linen chutes/shafts** shall discharge into a room separated by *fire barriers* not less than the rating of the chute/shaft. The protected openings are required to have the same rating as the chute/shaft. IBC 713.13.4.

Although IBC 713.11 Item 3 allows for a **fire damper to be used as a method of protection** at the bottom of a shaft, this code section alone does NOT exempt the requirement for a smoke damper in this location. See the IBC Commentary for more info.

Gypsum shafts/ducts are only permitted in other than I-2 occupancies for **stairwell and elevator pressurization**, and return air not incorporating air handling systems utilizing evaporative coolers. IMC state amendment 603.5.1.

Required rated protection of **building emergency life safety fuel and electrical systems** are not required to be in a shaft, therefore their fire-resistance rating is not required to change when they pass through a higher hourly rated separation. Listed fire wraps meeting required standards (UL 1489 fuel piping, ASTM

E1725 electrical cable) can be used with listed and approved firestops. Other methods of protection allowed: electrical wiring encased in at least two inches of concrete per NFPA 70, or located within a gypsum shaft constructed per IBC 713.2.

A listed and labeled **fire wrap** can be substituted for a rated gypsum shaft except in stair shafts, exit passageways and for transformer room ventilation. The fire wrap is required to meet the applicable standard and be installed per the listed assembly which includes the required duct support:

- Grease duct fire wrap is required to be listed using ASTM E2336. IMC 506.3.11.2.
- Ventilation duct-rated fire wrap assemblies are required to be listed UL HNLJ assemblies or use ISO standard 6944 for the rated fire wrap.
- A listed firestop assembly meeting ASTM E814 or UL 1479 is required at all locations where a fire wrapped duct penetrates a rated assembly.

### Protection Requirements Where Ducts Penetrate Floor/Ceiling Assemblies

IBC 717.6.1, 717.6.3, IMC 717.6.3

Number of floors	Rated floor/ceiling assemblies for I-2 and I-3 occupancies	Rated floor/ceiling assemblies for OTHER occupancies	Non-rated floor/ceiling assemblies
Single floor	Shaft Required	Fire damper or shaft required*	Fill annular space with approved non-combustible material
Two floors	Shaft Required	Shaft required*	Fire damper or shaft required*#
Three floors or more	Shaft Required	Shaft required*	Shaft required*#

\* Exception for ducting contained within one dwelling or sleeping unit. IBC 717.6.1.

# In floor assemblies composed of noncombustible materials, a shaft shall not be required where the duct connects not more than three stories.

*This document is intended to provide guidance in applying certain regulations and is for informational use only. It is not a substitute for the construction codes or other city codes. This handout is intended for use to prepare for an inspection. This is only a general list and is not intended to address all possible conditions.*

Signature Gregg Schrader Date: 03/12/2020  
 Gregory H. Schrader, PE, SE, Building Official

Attachments:  Supersedes: