Section 3.6. Service Facilities

3.6.1. General

3.6.1.1. Scope

1) The provisions of this Section apply to *horizontal service spaces*, *vertical service spaces*, *attic or roof spaces*, ducts, crawl spaces, shaft spaces, *service rooms*, and mechanical penthouses, and facilities contained therein.

3.6.1.2. Electrical Wiring and Equipment

1) The installation of electrical wiring and electrical equipment shall conform to the requirements of the Electrical Safety Regulation.

3.6.1.3. Lightning Protection Systems

1) A lightning protection system, when provided, shall conform to the requirements of CAN/CSA-B72-M, "Installation Code for Lightning Protection Systems."

3.6.1.4. Storage Use Prohibition

1) *Service spaces* shall not be designed to facilitate subsequent use as storage space.

3.6.1.5. Appliances Installed outside a Building

1) A fuel-fired *appliance* installed on the roof of a *building* or in another location outside the *building* shall be installed not less than

a) 1.2 m from a property line, measured horizontally, and

b) 3 m from an adjacent wall of the same *building* if that wall contains any opening within 3 *storeys* above and 5 m horizontally from the *appliance*, unless every opening within these limits is protected by

i) a *closure* having a *fire-protection rating* not less than 45 min determined in accordance with Article 3.1.8.4., or

ii) a wired glass assembly permitted for use in a vertical *fire separation* and described in D-2.3.15. in Appendix D.

3.6.2. Service Rooms

3.6.2.1. Fire Separations around Service Rooms

1) Except as permitted by Sentences (2), (8), (9) and (10), fuel-fired *appliances* shall be installed in *service rooms* separated from the remainder of the *building* by *fire separations* having a *fire-resistance rating* not less than 1 h.

2) Except as required by Sentence (3), a fuel-fired *appliance* that serves only one room or *suite* is not required to be installed in a *service room* separated from the remainder of the *building*.

3) A solid-fuel-burning *appliance* shall not be located in a *repair garage*, a *storage garage*, or any other location where it could be exposed to flammable vapours or gases, unless

a) it is enclosed in a *service room* that is separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h,

b) it is supplied with combustion air directly from outside the *building*, and

c) the heat that it generates is supplied indirectly to the space served by means of ducts or piping.

4) A *service room* containing an incinerator shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 2 h.

5) Equipment that uses a liquid having a *flash point* below 93.3°C shall be installed in a *service room* separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.

6) Electrical equipment that is required to be located in a *service room* according to the Electrical Safety Regulation shall be installed in a *service room* separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.

7) Except as permitted by Sentence (8), in a *storey* that is not *sprinklered* throughout, a *service room* that contains service equipment other than that addressed by Sentences (1) to (6) shall be separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.

8) Where a *service room* contains a limited quantity of service equipment, and the service equipment neither constitutes a fire hazard nor is essential to the operation of fire safety systems in the *building*, the requirements for a *fire separation* shall not apply.

9) A *fire separation* is not required between a fireplace and the space it serves.

10) A *fire separation* is not required between a roof-top *appliance* and the *building* it serves.

3.6.2.2. Service Rooms under Exits

1) A *service room* containing service equipment subject to possible explosion, such as *boilers* operating in excess of 100 kPa (gauge) and some types of refrigerating machinery and transformers, shall not be located directly under a required *exit*.

3.6.2.3. Service Equipment

1) A *service room* containing space heating, space cooling and service water heating *appliances* is permitted to contain other service equipment such as electrical service equipment.

3.6.2.4. Incinerator Rooms

1) A *service room* containing an incinerator shall not contain other fuel-fired *appliances*.

3.6.2.5. Combustible Refuse Storage

1) Except as required by Sentence 3.6.3.3.(9), a room for the storage of *combustible* refuse shall be

a) separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 1 h, and

b) *sprinklered*.

(See Note A-3.6.2.5.(1).)

3.6.2.6. Door Swing for Service Rooms

1) A swing-type door from a *service room* containing a *boiler* or incinerator shall swing outward from the room, except that the door shall swing inward if the door opens onto a corridor or any room used for an *assembly occupancy*. (See also Sentence 3.4.4.4.(7).)

3.6.2.7. Electrical Equipment Vaults

1) An electrical equipment vault required by the Electrical Safety Regulation shall conform to Sentences (2) to (9).

2) An electrical equipment vault referred to in Sentence (1) shall be separated from the remainder of the *building* by a *fire separation* of *solid masonry* or concrete construction having a *fire-resistance rating* not less than

a) 3 h if the vault is not protected by an automatic fire extinguishing system, or

b) 2 h if the vault is protected by an automatic fire extinguishing system.

3) If a *building* is *sprinklered* throughout, an electrical equipment vault referred to in Sentence (1) need not be *sprinklered* provided

a) the vault is designed for no purpose other than to contain the electrical equipment, and

b) the vault contains a *smoke detector* which will actuate the *building* fire alarm system in the event of a fire in the vault.

4) Only pipes or ducts necessary for fire protection or the proper operation of the electrical installation shall penetrate the *fire separation* referred to in Sentence (2).

5) Explosion-relief devices and vents or other protective measures conforming to Sentence 3.3.1.20.(3) shall be provided for an electrical equipment vault referred to in Sentence (1) that contains dielectric-liquid-filled electrical equipment. (See Note A-3.6.2.7.(5).)

6) An electrical equipment vault referred to in Sentence (1) shall be provided with a ventilation system designed in conformance with Part 6 to prevent the ambient temperature in the vault from exceeding 40°C.

7) The ventilation system required by Sentence (6) shall be separate from the system for the remainder of the *building* and shall be designed so that it is automatically shut off in the event of a fire in the vault.

8) The floor of an electrical equipment vault referred to in Sentence (1) shall be liquid tight and surrounded by liquid tight walls and sills of sufficient height to confine within the vault all of the liquid from the largest item of electrical equipment, but to a height of not less than 100 mm.

9) Electrical equipment vaults shall be secured against unauthorized entry.

3.6.2.8. Emergency Power Installations

1) Where a generator intended to supply emergency power for lighting, fire safety and life safety systems is located in a *building*, except where such *building* is used solely for the purpose of housing the generator and its ancillary equipment, it shall be located in a room that

a) is separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 2 h, and

b) contains only the generating set and equipment related to the emergency power supply system.

3.6.3. Vertical Service Spaces and Service Facilities

3.6.3.1. Fire Separations for Vertical Service Spaces

1) Except as provided in Articles 3.6.3.3. and 3.6.3.5. and Section 3.5., a *vertical service space* shall be separated from all other portions of each adjacent *storey* by a *fire separation* having a *fire-resistance rating* conforming to Table 3.6.3.1. for the *fire-resistance rating* required by Subsection 3.2.2. for

a) the floor assembly above the *storey*, or

b) the floor assembly below the *storey*, if there is no floor assembly above.

(See Note A-3.6.3.1.(1).)

Table 3.6.3.1.
Fire Separations for Vertical Service Spaces
Forming Part of Sentence 3.6.3.1.(1)

***Fire-Resistance Rating* of *Fire Separation* Required for Floor Assembly**	**Minimum *Fire-Resistance Rating* of *Vertical Service Space***
less than 45 min	–
45 min	45 min
1 h	45 min
1.5 h	1 h
2 h or more	1 h

2) A *vertical service space* that does not extend through the roof of a *building* shall be enclosed at the top with construction having a *fire-resistance rating* not less than that required for the *vertical service space* walls.

3) A *vertical service space* that does not extend to the bottom of a *building* shall be enclosed at the lowest level with construction having a *fire-resistance rating* not less than that required for the *vertical service space* walls.

4) A vent from a *vertical service space* not extending to the roof shall be enclosed within the *building* with construction having a *fire-resistance rating* not less than that required for the *vertical service space* walls.

5) Only openings that are necessary for the use of the *vertical service space* shall be permitted through a *vertical service space* enclosure.

3.6.3.2. Foamed Plastic Protection

1) Foamed plastic insulation in a *vertical service space* shall be protected in conformance with Article 3.1.5.14.

3.6.3.3. Linen and Refuse Chutes

1) A linen chute or refuse chute shall

a) be impervious to moisture,

b) have a smooth internal surface,

c) be corrosion-resistant,

d) be constructed of *noncombustible* material, and

e) be located in a shaft in which there are no services other than *noncombustible* drain, waste and vent piping or *noncombustible* water piping.

2) A shaft containing a linen chute or refuse chute shall have a *fire-resistance rating* conforming to Sentence 3.6.3.1.(1), but not less than

a) 1 h if the chute outlet for the discharge room is protected by an automatic, self-latching *closure* held open by a fusible link, or

b) 2 h if no *closure* is provided at the chute outlet into the discharge room.

3) An interior linen chute or refuse chute shall extend not less than 1 m above the roof and shall be vented above the roof with a vent which

a) has an unobstructed area not less than the cross-sectional area of the chute, and

b) is equipped with a cover that will open automatically, or that can be opened manually, in the event of a fire in the chute.

4) Intake openings for a linen chute or a refuse chute shall

a) have an area not more than 60% of the cross-sectional area of the chute, and

b) be fitted with *closures* designed to close automatically and latch after use.

5) Intake openings for a linen chute or a refuse chute shall be located in rooms or compartments that

a) have no dimension less than 750 mm,

b) are separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 45 min,

c) are designed for no other purpose, and

d) do not open directly into an *exit*.

6) Sprinklers shall be installed at the top of each linen chute or refuse chute, at alternate floor levels and in the room or bin into which the chute discharges.

7) The room into which a linen chute discharges shall be separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 1 h.

8) A refuse chute shall be equipped at the top with spray equipment for washing-down purposes.

9) A refuse chute shall discharge only into a room or bin separated from the remainder of the *building* by a *fire separation* with a *fire-resistance rating* not less than 2 h.

10) The room or bin into which a refuse chute discharges shall be of sufficient size to contain the refuse between normal intervals of emptying, be impervious to moisture and be equipped with a water connection and floor drain for washing-down purposes.

11) A room into which a refuse chute discharges shall contain no service equipment that is not related to refuse handling and disposal.

3.6.3.4. Exhaust Duct Negative Pressure

1) If a *vertical service space* contains an *exhaust duct* that serves more than one *fire compartment*,

a) the duct shall have a fan located at or near the exhaust outlet to ensure that the duct is under negative pressure, and

b) the individual *fire compartments* shall not have individual fans that exhaust directly into the duct in the *vertical service space*.

3.6.3.5. Grease Duct Enclosures

(See Note A-3.6.3.5.)

1) Except as provided in Sentence (2), *fire separations* enclosing grease ducts for commercial cooking operations shall conform to NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."

2) The *fire-resistance rating* of field-applied and factory-built grease duct enclosure assemblies shall be determined in conformance with CAN/ULC-S144, "Fire Resistance Test – Grease Duct Assemblies."

3.6.4. Horizontal Service Spaces and Service Facilities

3.6.4.1. Scope

1) This Subsection applies to *horizontal service spaces* and service facilities, including ceiling spaces, duct spaces, crawl spaces and *attic or roof spaces*.

3.6.4.2. Fire Separations for Horizontal Service Spaces

1) Except as provided in Article 3.6.3.5., a *horizontal service space* that penetrates a required vertical *fire separation* shall be separated from the remainder of the *building* it serves in conformance with Sentence (2).

2) If a *horizontal service space* or other concealed space is located above a required vertical *fire separation* other than a vertical shaft, this space need not be divided at the *fire separation* as required by Article 3.1.8.3. provided the construction between this space and the space below is a *fire separation* with a *fire-resistance rating* equivalent to that required for the vertical *fire separation*, except that the *fire-resistance rating* is permitted to be not less than 30 min if the vertical *fire separation* is not required to have a *fire-resistance rating* more than 45 min. (See Note A-3.6.4.2.(2).)

3.6.4.3. Plenum Requirements

1) A concealed space used as a *plenum* within a floor assembly or within a roof assembly need not conform to Sentence 3.1.5.18.(1) and Article 3.6.5.1., provided

a) all materials within the concealed space have a *flame-spread rating* not more than 25 and a smoke developed classification not more than 50, except for
   i) tubing for pneumatic controls,
   ii) optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes that are used for the transmission of voice, sound or data and conform to Sentences 3.1.4.3.(2) and 3.1.5.21.(2) (FT6 Rating), and
   iii) totally enclosed non-metallic raceways with an FT6 rating, when tested in accordance with Clause 3.1.5.23.(1)(a), in *buildings* required to be of *noncombustible construction*, and
   iv) **Deleted.**
b) the supports for the ceiling membrane are of *noncombustible* material having a melting point not below 760°C.

2) If a concealed space referred to in Sentence (1) is used as a return-air *plenum* and incorporates a ceiling membrane that forms part of the required *fire-resistance rating* of the assembly, every opening through the membrane shall be protected by a *fire stop flap* that

a) stops the flow of air into the concealed space in the event of a fire,
b) is supported in a manner that will maintain the integrity of the ceiling membrane for the duration of time required to provide the required *fire-resistance rating*,
c) conforms to CAN/ULC-S112.2, "Fire Test of Ceiling Firestop Flap Assemblies," and
d) activates at a temperature approximately 30°C above the normal maximum temperature that occurs in the return-air *plenum*, whether the air duct system is operating or shut down.

3) Notwithstanding Sentence (1), all optical fibre cables and electrical wires and cables installed in a concealed space used as a plenum shall:

a) have a flame spread of no more than 1.5 m, a smoke density of not more than 0.5 at peak optical density and a smoke density not more than 0.15 at average optical density when tested in conformance with the Horizontal Flame and Smoke Test referenced in Clause 4.11.6. of CAN/CSA C22.2 No. 0.3, "Test Methods for Electrical Wires and Cables" (FT6 Rating),
b) be located in totally enclosed noncombustible raceways (See Note A-3.1.4.3.(1)(b)(i).), or
c) be located in totally enclosed nonmetallic raceway conforming to Article 3.1.5.23.

4) Notwithstanding Clause (3)(a), minor components of wiring systems such as communication conductors no more than 9 m in length, including the drop down to floor level, that exhibit a vertical char of no more than 1.5 m when tested in conformance with the Vertical Flame Test - Cables in Cable trough in Clause 4.11.4. of the CAN/CSA C22.2 No. 0.3, "Test Methods for Electrical Wires and Cables" (FT4 Rating), may be installed in a concealed space used as a plenum.

3.6.4.4. Attic or Roof Space Access

1) An *attic or roof space* more than 600 mm high shall be provided with access from the floor immediately below by a hatchway not less than 550 mm by 900 mm or by a stairway.

3.6.4.5. Horizontal Service Space Access

1) A *horizontal service space*, consisting of ceiling and duct spaces, which is more than 1 200 mm high and 600 mm wide shall have inspection doors not less than 300 mm in both horizontal and vertical dimensions placed so that the entire interior of the duct or space can be viewed.

3.6.4.6. Crawl Space Access

1) A crawl space shall have at least one access opening not less than 550 mm by 900 mm.

3.6.5. Air Duct and Plenum Systems

3.6.5.1. Duct Materials

1) Except as permitted by Sentences (2) to (5) and Article 3.6.4.3., all ducts, duct connectors, associated fittings and *plenums* used in air duct systems shall be constructed of steel, aluminum alloy, copper, clay, asbestos-cement or other *noncombustible* material.

2) Except as permitted by Sentence (3), ducts, associated fittings and *plenums* are permitted to contain *combustible* material provided they

a) conform to the appropriate requirements for Class 1 duct materials in CAN/ULC-S110, "Test for Air Ducts,"

b) conform to Article 3.1.5.18. in a *building* required to be of *noncombustible construction*,

c) conform to Subsection 3.1.9.,

d) are used only in horizontal runs in a *building* required to be of *noncombustible construction*,

e) are not used in vertical runs serving more than 2 *storeys* in a *building* permitted to be of *combustible construction*, and

f) are not used in air duct systems in which the air temperature could be more than 120°C.

3) *Combustible* ducts which are part of a duct system conveying only ventilation air and are contained entirely within a *dwelling unit* need not comply with the requirements of Sentences (1) and (2).

4) Duct sealants shall have a *flame-spread rating* not more than 25 and a smoke developed classification not more than 50.

5) Duct connectors that contain *combustible* materials and that are used between ducts and air outlet units shall

a) conform to the appropriate requirements for Class 1 air duct materials in CAN/ULC-S110, "Test for Air Ducts,"

b) be not more than 4 m long,

c) be used only in horizontal runs, and

d) not penetrate a required *fire separation*.

3.6.5.2. Vibration Isolation Connectors

1) Except as permitted by Sentence (2), vibration isolation connectors in air duct systems shall be *noncombustible*.

2) *Combustible* fabric vibration isolation connectors are permitted provided they

a) are not more than 250 mm long,

b) comply with the flame-resistance requirements of CAN/ULC-S109, "Flame Tests of Flame-Resistant Fabrics and Films," and

c) are not used in a location where they are exposed to heated air or radiation from heat sources that could cause the exposed surface temperature to be more than 120°C.

3.6.5.3. Tape

1) Tape used to seal joints in air ducts, *plenums* and other parts of air duct systems shall meet the flame-resistance requirements for fabric in CAN/ULC-S109, "Flame Tests of Flame-Resistant Fabrics and Films."

3.6.5.4. Coverings, Linings, Adhesives and Insulation

1) Coverings, linings and associated adhesives and insulation for air ducts, *plenums* and other parts of air duct systems that would have an exposed surface temperature more than 120°C when exposed to heated air or radiation from heat sources shall be of *noncombustible* material.

2) Except as permitted by Sentence (3), *combustible* coverings and linings, including associated adhesives and insulation, shall have

a) a *flame-spread rating* not more than 25 on any exposed surface or any surface that would be exposed by cutting through the material in any direction, and

b) a smoke developed classification not more than 50.

3) The outer covering of ducts, *plenums* and other parts of air duct systems used within an assembly of *combustible construction* is permitted to have

a) an exposed surface *flame-spread rating* not more than 75, and

b) a smoke developed classification not more than 50.

4) *Combustible* coverings and linings referred to in Sentences (2) and (3) shall not flame, glow, smoulder or smoke when tested in accordance with the method of test in ASTM C 411, "Hot-Surface Performance of High-Temperature Thermal Insulation," at the maximum temperature to which the coverings and linings are to be exposed in service.

5) Except as permitted by Sentence (6), foamed plastic insulation shall not be used as part of an air duct system or for insulating an air duct.

6) Foamed plastic insulation is permitted to be installed in a ceiling space that is used as a return air *plenum* provided the foamed plastic insulation is protected from exposure to the *plenum* in accordance with Article 3.1.5.14.

7) *Combustible* coverings and linings of ducts, including associated adhesives and insulation, shall be interrupted where the duct penetrates a *fire separation* and at the immediate area of operation of heat sources in a duct system, including electric resistance heaters or fuel-burning heaters or *furnaces*.

3.6.5.5. Insulation and Coverings

1) Insulation and coverings on pipes in which the temperature of the fluid exceeds 120°C shall

a) be made of *noncombustible* material, or

b) not flame, glow, smoulder or smoke when tested in accordance with ASTM C 411, "Hot-Surface Performance of High-Temperature Thermal Insulation," at the maximum temperature to which the insulation or covering is to be exposed in service.

2) Except as permitted by Sentence (5), where *combustible* insulation is used on piping in a *horizontal service space* or a *vertical service space*, the insulation and coverings on that piping shall have a *flame-spread rating*, on any exposed surface and on any surface that would be exposed by cutting through the material in any direction,

a) not more than 25 in a *building* required to be of *noncombustible construction*, or

b) not more than 75 in a *building* permitted to be of *combustible construction*.

3) Except as permitted by Sentence (5), insulation and coverings on piping located in rooms and spaces other than the *service spaces* described in Sentence (2) shall have a *flame-spread rating* not more than that required for the interior finish of the ceiling of the room or space.

4) Except as permitted by Sentence (5), *combustible* insulation and covering used on piping in a *building* within the scope of Subsection 3.2.6. shall have a smoke developed classification not more than 100.

5) No *flame-spread rating* or smoke developed classification limits are required for *combustible* insulation and coverings used on piping located within a

a) concealed space in a wall,

b) floor slab, or

c) *noncombustible* enclosure.

3.6.5.6. Clearance of Ducts and Plenums

1) The clearance of *furnace plenums* from *combustible* material shall conform to the requirements of the appropriate standards referenced in Sentence 6.2.1.5.(1).

2) If the *plenum* clearance required in accordance with Sentence (1) is not more than 75 mm, the clearance between a *supply duct* and *combustible* material shall be not less than

a) the required *plenum* clearance within a horizontal distance of 450 mm from the *plenum*, and

b) 12 mm at a horizontal distance of 450 mm or more from the *plenum*, except that this clearance is permitted to be reduced to zero beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.

(See Note A-3.6.5.6.(2).)

3) If the *plenum* clearance required in accordance with Sentence (1) is more than 75 mm but not more than 150 mm, a) the clearance between a *supply duct* and *combustible* material shall be not less than

a) the required *plenum* clearance within a horizontal distance of 1 800 mm from the *plenum*, and

b) 12 mm at a horizontal distance of 1 800 mm or more from the *plenum*, except that this distance is permitted to be reduced to zero beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.

(See Note A-3.6.5.6.(3).)

4) If the *plenum* clearance required in accordance with Sentence (1) is more than 150 mm, the clearance between a *supply duct* and *combustible* material shall be not less than

a) the required *plenum* clearance within a horizontal distance of 1 000 mm from the *plenum*,

b) 150 mm within a horizontal distance between 1 000 mm and 1 800 mm from the *plenum*, and

c) 25 mm at a horizontal distance of 1 800 mm or more from the *plenum*, except that this distance is permitted to be reduced to 8 mm beyond a bend or offset in the duct sufficiently large to shield the remainder of the *supply duct* from direct radiation from the *furnace* heat exchanger.

(See Note A-3.6.5.6.(4).)

5) If a register is installed in a floor directly over a pipeless *furnace*, a double-walled register box with not less than 100 mm between walls, or a register box with the warm-air passage completely surrounded by the cold-air passage, shall be permitted instead of the clearances listed in Sentences (2), (3) and (4).

3.6.5.7. Supply, Return, Intake and Exhaust-Air Openings

1) *Combustible* grilles, diffusers and other devices for supply, return, and exhaust-air openings in rooms shall conform to the *flame-spread rating* and smoke developed classification requirements for the interior finish of the surface on which they are installed.

3.6.5.8. Return-Air System

1) Except as required by Sentences (2) and (3), *return ducts* shall be constructed of material having a *flame-spread rating* not more than 150.

2) If any part of a *return duct* will be exposed to radiation from the *furnace* heat exchanger or other radiating part within the *furnace*, that part of a *return duct* directly above or within 600 mm of the outside *furnace* casing shall be *noncombustible*.

3) *Return ducts* serving solid-fuel-burning *furnaces* shall be constructed of *noncombustible* material.

4) *Combustible return ducts* shall be lined with *noncombustible* material

a) below floor registers,

b) at the bottom of vertical ducts, and

c) under *furnaces* having a bottom return.

3.6.5.9. Location of Exhaust Vents in a Building Containing not more than Two Principal Dwelling Units

1) Exhaust vents serving heating and air conditioning equipment and similar appliances, other than direct vented fireplaces, shall be directed

a) vertically through the roof of a *building*, with the discharge located at least 1.5 m away from any property line, or

b) horizontally through an exterior wall which faces a *street*, with the discharge located at least 3 m away from any property line.