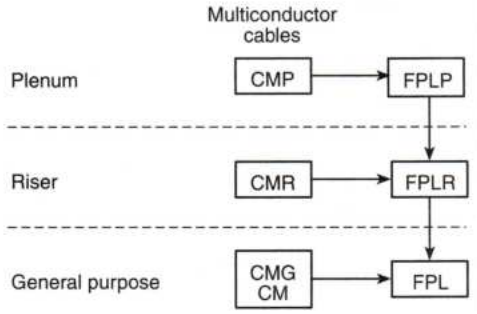
Type CI cable is permitted for applications where survivability of fire alarm circuits is needed during a fire. Such circuits could be essential to communicating evacuation or relocation instructions to building occupants under fire or other emergency conditions. The construction of typical CI cable is illustrated in Exhibit 760.7.

Δ **(A) Fire Alarm Cable Substitutions.** The substitutions for fire alarm cables listed in Table 760.154(A) and illustrated in Figure 760.154(A) shall be permitted. Where substitute cables are installed, the wiring requirements of Article 760, Parts I and III, shall apply.

Informational Note: See 800.179 for information on communications cables (CMP, CMR, CMG, CM).

TABLE 760.154(A) *Cable Substitutions*

Cable Type	Permitted Substitutions
FPLP	CMP
FPLR	CMP, FPLP, CMR
FPL	CMP, FPLP, CMR, FPLR, CMG, CM



Type CM—Communications wires and cables
Type FPL—Power-limited fire alarm cables

A → B Cable A shall be permitted to be used in place of cable B, 26 AWG minimum

FIGURE 760.154(A) *Cable Substitution Hierarchy.*

Part IV. Listing Requirements

Δ **760.176 Listing and Marking of NPLFA Cables.** Non-power-limited fire alarm cables installed as wiring within buildings shall be listed in accordance with 760.176(A) and (B), be listed as resistant to the spread of fire in accordance with 760.176(C) through (F), and be marked in accordance with 760.176(G). Cable used in a wet location shall be listed for use in wet locations or have a moisture-impervious metal sheath. Non-power-limited fire alarm cables shall have a temperature rating of not less than 60°C (140°F). Non-power-limited fire alarm cables shall be permitted to contain optical fibers.

Informational Note: See UL 1425, *Standard for Cables for Non-Power-Limited Fire-Alarm Circuits*, for information on non-power-limited fire alarm cables.

(A) NPLFA Conductor Materials. Conductors shall be 18 AWG or larger solid or stranded copper.

(B) Insulated Conductors. Insulation on conductors shall be rated for the system voltage and not less than 600 V. Insulated conductors 14 AWG and larger shall be one of the types listed in Table 310.4(1) or one that is identified for such use. Insulated conductors 18 AWG and 16 AWG shall be in accordance with 760.49.

Δ **(C) Type NPLFP.** Type NPLFP non-power-limited fire alarm cable for use in other space used for environmental air shall be listed as being suitable for use in other space used for environmental air as described in 300.22(C) and shall also be listed as having adequate fire-resistant and low smoke–producing characteristics.

Informational Note: See NFPA 262, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces*, for one method of defining a cable that is low-smoke producing and fire-resistant if the cable exhibits a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 1.52 m (5 ft) or less when tested.

See also

760.53(B)(2) and its commentary, which discusses other spaces used for environmental air

Δ **(D) Type NPLFR.** Type NPLFR non–power-limited fire alarm riser cable shall be listed as being suitable for use in a vertical run in a shaft or from floor to floor and shall also be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Informational Note: See UL 1666, *Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts*, for one method of defining fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.

Δ **(E) Type NPLF.** Type NPLF non–power-limited fire alarm cable shall be listed as being suitable for general-purpose fire alarm use, with the exception of use in risers, ducts, plenums, and other space used for environmental air, and shall also be listed as being resistant to the spread of fire.

Informational Note: See UL 2556, *Wire and Cable Test Methods*, for one method of defining *resistant to the spread of fire*. One method is to demonstrate that the cables do not spread fire to the top of the tray in the "UL Flame Exposure, Vertical Tray Flame Test." The smoke measurements in the test method are not applicable.

Another method of defining *resistant to the spread of fire* is for the damage (char length) not to exceed 1.5 m (4 ft 11 in.) when performing the FT4 "Vertical Flame Test."