



## TECHNICAL SERVICES DEPARTMENT

# BULLETIN

No. 101  
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### Wiring Options for Protected Premises Fire Alarm Systems based on NFPA 72 Survivability Requirements

The purpose of this bulletin is to address questions relating to the required rating of cables that are used in Protected Premises Fire Alarm Systems (any fire alarm system located at the protected premises) in accordance with 2010 Edition of NFPA 72, National Fire Alarm and Signaling Code, where the survivability of Emergency Voice/Alarm Communications is required.

The requirement for survivability is covered in Section 24.3.5.4 of NFPA 72. The level of survivability required is dependent on the type of fire alarm system being installed. A higher level of survivability applies to systems used for relocation or partial evacuation of occupants. NFPA 72 section 24.3.5.4.1 states for systems employing relocation or partial evacuation, a Level 2 or Level 3 pathway survivability shall be required. Section 24.3.5.4.2 states that for systems that do not employ relocation or partial evacuation, a Level 0, Level 1, Level 2, or Level 3 pathway survivability shall be required. Lower levels apply to systems that do not employ relocation or partial evacuation.

Section 12.4 defines levels of survivability; Levels 0 – 3. Section 24.4.1.8 covers the requirements for relocation and partial evacuation including both audible and visual notification appliance circuits. The level of survivability is dependent on whether the appliance circuits are for systems within an Evacuation Signaling Zone (ESZ) or for systems outside of the ESZ.

Section 24.4.1.8.4.3 requires that circuits have a pathway survivability of level 2 or 3 until they enter the Evacuation Signaling Zone (ESZ) that they serve. An evacuation signaling zone is defined by NFPA 72 as *a discrete area of a building, bounded by smoke or fire barriers, from which occupants are intended to relocate or evacuate.*

Wiring **within** the ESZ may have a survivability level 0, 1, 2 or 3 except that attack by fire within the ESZ shall not impair the control and operation of notification appliances outside the ESZ. NFPA 72 Section 12.2.4 specifies that all wiring shall be in accordance with NFPA 70 National Electrical Code and specifically Article 770 and 760.

Where attack by fire within the ESZ will impair the control and operation of notification appliances outside the ESZ, Section 24.4.1.8.4.1 and Annex Note A24.4.1.8.4.1 specifies methods for survivability of the system within the ESZ, including pathway survivability levels 2 or 3, and that it is subject to AHJ evaluation.

In the case where the wiring is **outside** of ESZ, all circuits necessary for the operation of notification appliances shall be protected until they enter the evacuation signaling zone (ESZ) that they serve at a pathway survivability level 2 or 3.

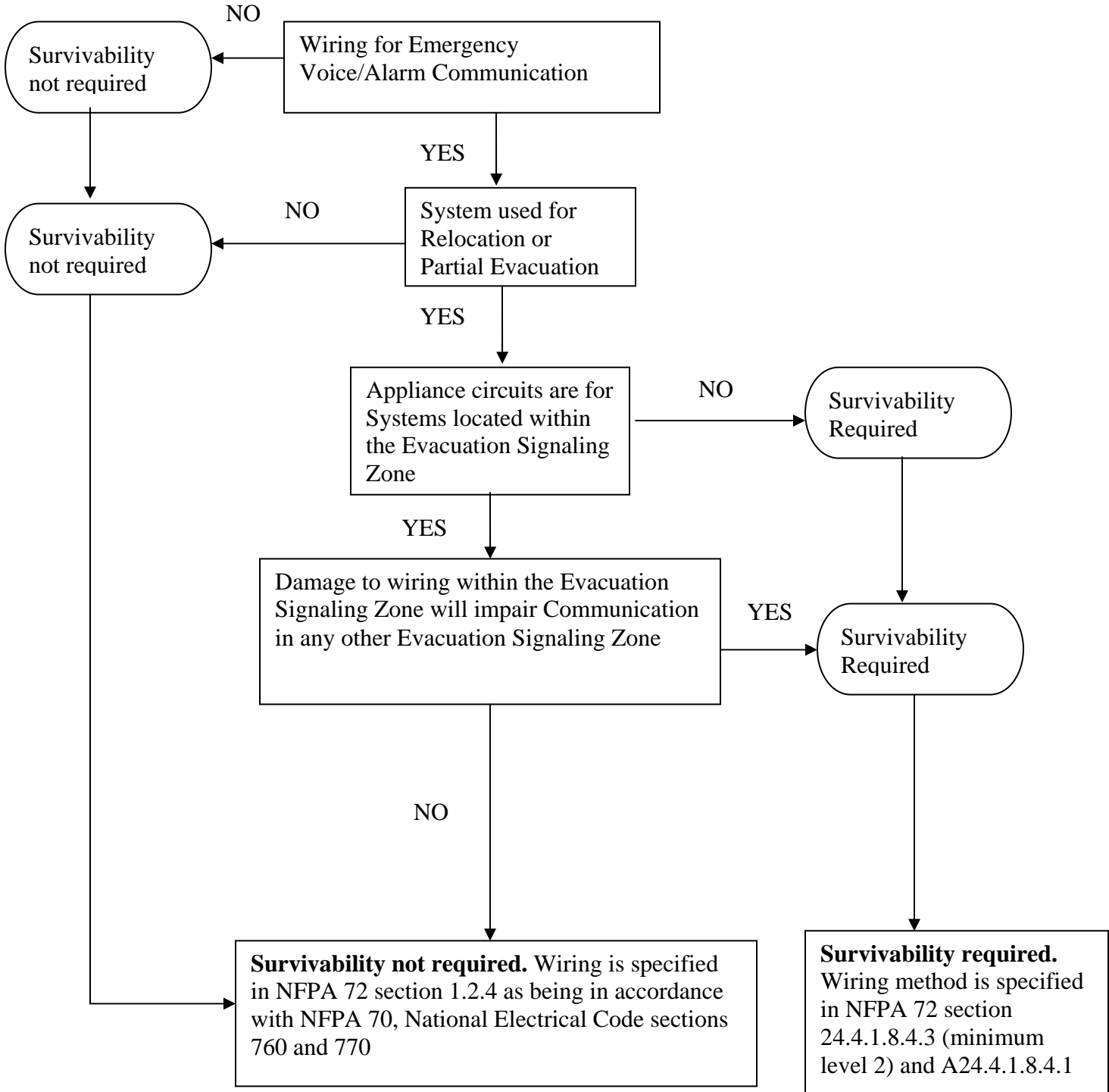
Conclusion: CI rated Cables may be used where pathway survivability level 2 or 3 is required. Where pathway survivability levels 0 and 1 is permitted, CI rated Cables are not required .Wiring in accordance with NFPA 70 National Electrical Code Article 760 may be used. In all cases, the AHJ should be consulted.

### Wiring Options based on Survivability Requirements

<b>Wiring options for outside of ESZ Where minimum level 2 Pathway Survivability is required (12.4.3)</b>	<b>Wiring options within ESZ where minimum level 0 Pathway Survivability is required (12.4.1)</b>	<b>Option within ESZ Where Pathway Survivability May be required (24.4.1.8.4.1)</b>
<p>2-Hr. rated (CI) cable</p> <p style="text-align: center;">Or</p> <p>2-Hr. rated cable System (electrical circuit protective system)</p> <p style="text-align: center;">Or</p> <p>2-Hr. rated enclosure or protected area</p> <p style="text-align: center;">Or</p> <p>AHJ approved alternatives</p> <p>Note: Level 3 pathway survivability may be used in place of Level 2 methods and consists of Level 2 methods in addition to installation in a fully sprinklered building. (12.4.4)</p>	<p>National Electrical Code Article 760.</p> <p>I.e. FPL cable (12.2.4)</p>	<p>Along with pathway survivability level 2 or 3 one or more of the following could be considered acceptable. The AHJ should be consulted. (A24.4.1.8.4.1)</p> <p>Routing notification appliance circuits separately</p> <p>Short circuit fault tolerant signaling line circuits</p>

*Note: Parenthetical references are to NFPA 72-2010*

**FLOW CHART on the NFPA 72 Requirement for Survivability**



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