Standard for Road Tunnels, Bridges and Other Limited Access Highways
TIA Log No. 1083
Reference: 12.1.2 and A.12.1.2
Comment Closing Date: February 13, 2013
Submitter: William Connell, PB Americas, Inc.

Proposed language to the 2011 edition.

1. Revise 12.1.2 and 12.1.2*(1) to read as follows:

12.1.2*
Emergency circuits installed in a road tunnel and ancillary areas shall remain functional for a period of not less than 1 hour, for the anticipated fire condition, by meeting one of the following methods:

(1)* - A Fire-resistive cables shall be listed for 2 hours in accordance with ANSI/UL/2196 or other equivalent internationally recognized standards to 950°C (1742°F) when approved by the AHJ—tested by an approved testing laboratory in a totally enclosed furnace using the ASTM E 119 time-temperature curve.
   (a) The cables shall demonstrate functionality for no less than 2 hours as described in the ANSI/UL 2196 test standard
   (b) Testing shall be performed in the type and configuration of raceway in which they are intended to be installed
   (c) Provide documentation to include a full description of the actual test procedure conducted and a list of acceptable components to be used for installation certifying compliance with the test procedure

12.1.2(2) text remains unchanged.

Proposed language to the proposed 2014 edition.

1. Revise 12.1.2 and 12.1.2(1) – (4) to read as follows:

12.1.2*
Emergency circuits installed in a road tunnel and ancillary areas shall remain functional for a period of not less than 1 hour, for the anticipated fire condition, by meeting one of the following methods:

(1)* - A Fire-resistive cables listed for 2 hours in accordance with ANSI/UL/2196 or other equivalent internationally recognized standards to 950°C (1742°F) when approved by the AHJ—tested by an approved testing laboratory in a totally enclosed furnace using the ASTM E 119 time-temperature curve.
   (a) The cables shall demonstrate functionality for no less than 2 hours as described in the ANSI/UL 2196 test standard
   (b) Testing shall be performed in the type and configuration of raceway in which they are intended to be installed
   (c) Provide documentation to include a full description of the actual test procedure conducted and a list of acceptable components to be used for installation certifying compliance with the test procedure

(2) Circuits embedded in concrete or protected by a 2-hour fire barrier system in accordance with UL 1724. The insulation for cables or conductors shall be thermoset and shall be suitable to maintain functionality at the temperature within the embedded conduit or fire barrier system.
(3) Routing external to the roadway
(4) Diversity in system routing as approved (such as separate redundant or multiple circuits separated by a 1-hour fire barrier) so that a single fire or emergency event will not lead to a failure of the system.

2. Revise A.12.1.2 and A.12.1.2(1) for both the 2011 and proposed 2014 editions to read as follows:

A.12.1.2 The actual duration required for the circuits to be operative will depend upon the duration required for the circuits to be operative for the emergency evacuation and rescue phase—and, in some circumstances, incident management and structural protection. Factors such as the length of the tunnel, evacuation pathways, the use of fixed water-based fire suppression systems, and the proximity of emergency services may influence this period of time.
A.12.1.2 (1) When selecting a fire-resistive cable, it is important to know how it will be installed and if it was tested as a complete system, including splices. Cables that are exposed (not embedded in concrete) should be protected using either a metallic raceway or an armor/sheath (see 12.3.1). There are two basic configurations of fire-resistive cables:

1. Armored cables, such as Type MI or Type MC, are installed without raceways.
2. Cables installed in a raceway, such as Type RHW-2, Type TC, or Type CM, are tested as a complete system.

Regardless of the fire test standard used to evaluate fire-resistive cables installed in a raceway, it is important to consider that the cables are only one part of the system. Other components of the system include but are not limited to the type of raceway, the size of raceway, raceway support, raceway couplings, boxes, conduit bodies, splices where used, vertical supports, grounds, and pulling lubricants. Each cable type should be tested to demonstrate compatibility. Recent fire testing has demonstrated that hot-dipped galvanized coatings on the interior surface of raceways can cause premature failure of copper fire-resistive cable systems. Only the specific types of raceways tested should be acceptable for installation. Each cable type intended to be installed in a raceway should be tested in both a horizontal and a vertical configuration to demonstrate circuit integrity.

Submitter’s Substantiation: This correction addresses the recent action of UL pertaining to their UL 2196, Standard for Safety for Test for Fire Resistive Cables, 2012. Specifically, as of September 12, 2012, UL has withdrawn all cable certifications (listings) to this test standard. NFPA 502 currently allows the use of 2-hour fire-resistive cable listed in accordance with UL 2196, Standard for Safety for Test for Fire Resistive Cables, 2012. Because NFPA 502 had relied upon the UL listing for compliance, this UL action has changed the standard.

Emergency Nature: The 2011 edition of the document contains listing requirements that are no longer available for 2-hour fire-resistive cables for emergency circuits. The proposed revision provides prescriptive requirements for obtaining the equivalent fire resistance without obtaining UL certification (listing). Several tunnel projects currently in the design and construction phase are being burdened by this UL action and are seeking the direction of this Technical Committee.

Anyone may submit a comment by the closing date indicated above. To submit a comment, please identify the number of the TIA and forward to the Secretary, Standards Council, 1 Battymarch Park, Quincy, MA 02169-7471.