

CODE APPLICATION NOTICE

FILE NO.: 9-907
(Previously part of 9-1001)
EFFECTIVE: 06/19/08

Subject: Voltage Drop and Testing

CODE SECTION: Sections 907.1.1, 907.1.2, 907.17, 2007 California Fire Code (CFC)

907.1.1 Construction documents. Construction documents for fire alarm systems shall be submitted for review and approval prior to system installation. Construction documents shall include, but not be limited to, all of the following:

1. A floor plan which indicates the use of all rooms.
2. Locations of alarm-initiating and notification appliances.
3. Alarm control and trouble signaling equipment.
4. Annunciation.
5. Power connection.
6. Battery calculations.
7. Conductor type and sizes.
8. Voltage drop calculations.
9. Manufacturers, model numbers and listing information for equipment, devices and materials.
10. Details of ceiling height and construction.
11. The interface of fire safety.

907.1.2 Equipment. Systems and their components shall be *California State Fire Marshal* listed and approved for the purpose for which they are installed.

907.17 Acceptance Tests. Upon completion of the installation of the fire alarm system, alarm notification appliances and circuits, alarm-initiating devices and circuits, supervisory-signal initiating devices and circuits, signaling line circuits, primary and secondary power supplies *fire safety function control devices and interfaces, and off site monitoring equipment* shall be tested in accordance to NFPA 72-02.

PURPOSE:

Individual notification appliances are approved and listed by the California State Fire Marshal for a range of operating voltages. However, excessive voltage drops in the notification appliance circuits may cause both audible and visible devices to function outside the required performance parameters of the 2007 CFC.

Low voltage to audible notification devices will cause the device to operate below the minimum decibel levels outlined in Section 907.10.2, 2007 CFC. Low voltage to visible notification devices will cause the device to operate below the minimum flash rate parameters.

INTERPRETATION:

All fire alarm drawings submitted for approval shall include calculations demonstrating that the voltage drop due to line loss of each notification appliance circuit(s) does not exceed the following level:

1. Ten percent (10%) of the nominal Fire Alarm Control Unit operating voltage as shown on the manufacturer's catalog cut sheets and/or listed installation instructions.
- OR
2. The lowest level of notification appliance manufacturer's listed nameplate voltage range, as calculated from the nominal Fire Alarm Control Unit operating voltage.

In addition to the above calculations, as a portion of the field inspection of the fire alarm system installation, the contractor shall demonstrate to the inspector that any or all affected notification appliance circuits as installed meet the above criteria. The test method for such demonstration shall include the following steps:

1. Using a volt-ohm meter set to read the voltage being applied, measure the output voltage of the notification appliance circuit to be tested at the notification circuit power source.
2. Remove from its mounting the end of line notification appliance. All appliance wiring and the end of line devices are to remain intact throughout the test procedure.
3. Activate the fire alarm system to cause the notification appliance circuit to operate.
4. Using a volt-ohm meter, measure the actual voltage being applied to the end of line device during operation of the circuit.
5. Compare the measured voltage to the manufacturer's nameplate voltage. The measured voltage shall not be below the lowest voltage range as printed on the device nameplate. If the output voltage, as measured at the circuit's power source is greater than 24 volts, that difference shall be added to the lowest nameplate voltage of the device and the actual voltage measured at the device shall not be lower than that voltage. Any circuit(s) failing such field tests shall be reevaluated, repaired, and retested prior to acceptance of the system.

| | |
|------------------------|-----------------|
| <u>Original Signed</u> | <u>06/19/08</u> |
| John D. Gillengerten | date |