



# **TECHNICAL BULLETIN**

## **PERMIT AND RESOURCE MANAGEMENT DEPARTMENT**

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E-2X

### ***Arc Fault Circuit Interrupter (AFCI) Requirements***

#### **INTRODUCTION**

As of November 1, 2002, Sonoma County adopted the 2001 California Electrical Code that requires "all branch circuits that supply 125-volt, single phase, 15 and 20-amp receptacle outlets installed in **dwelling unit bedrooms** shall be protected by an arc-fault circuit interrupter(s)." (Article 210 - 12 b)

This requirement shall be applied as follows:

1. New construction
2. Alterations and additions to existing dwelling units where the scope of the work creates new bedroom space.
3. Alterations and additions which substantially alter the existing bedroom(s) such that rewiring can be easily accomplished.
4. Rewiring a dwelling to meet current code.

#### **TECHNICAL DETAILS**

For the AFCI device to function properly and provide the level of required safety, the following installation guidelines shall be followed:

1. The bedroom branch circuit(s) shall be run separately from all other branch circuits. The raceways or cable assemblies shall not terminate into any junction box, other than the panel board, where other circuit conductors are located.
2. The bedroom branch circuit conductors shall be permanently identified at their point of entry into the panel board.
3. The AFCI breaker shall be a listed and approved device installed in an approved panel board in accordance with its listing.
4. Other outlets within the dwelling unit may be connected to the AFCI protected branch circuit; however, the same wiring methods as required above for bedrooms shall be used.

## INSPECTION

At the close-in or rough electrical inspection, the Building Inspector will verify the location and wiring methods used for the bedroom branch circuit conductors. It is necessary to trace each circuit to its termination point within each bedroom. After insuring that each bedroom branch circuit is isolated from other circuit conductors and that each bedroom receptacle will be AFCI protected, a notation will be made on the job card and file copy of the permit stating such.

At the final inspection, if electrical power is provided, the Building Inspector will test the function of the AFCI device utilizing the test button incorporated into it and the AS1000 Arc Fault Circuit Breaker Tester. The panel board should be visually checked to insure that the bedroom branch circuit's neutral conductor (the grey or white wire) is hooked directly to the AFCI device and not connected in any way to the neutral buss in the panel.

### **Voluntary AFCI Additions to Panel/Subpanel Change-outs Where Access to Interior of Structure is Prohibited or Unavailable**

For main service and/or change-outs where the bedroom branch circuit conductors cannot be visually inspected, the person doing the work shall have a suitable continuity checker or ohm meter available on site. After removing the neutral conductor connecting the AFCI device to the neutral buss, the inspector shall verify that an *open circuit condition* exists between the bedroom branch circuits and the neutral conductor and the neutral buss bar. If an *open circuit condition* cannot be achieved at the panel, the bedroom branch circuit conductors must be traced back to where they share a common neutral conductor with some other branch circuit and then isolated. If the bedroom branch circuit is part of a multi-wire branch circuit, an approved AFCI device which protects both circuits may be installed.

Although AFCI's are not required for panel change-outs, they should be encouraged.

## GLOSSARY

1. Open circuit condition refers to **no** continuity between circuit conductors.

## REFERENCES

2001 California Electrical Code, Article 210-12  
Sonoma County Residential Construction Handbook, Section 17  
E210.12  
1996 Uniform Administrative Code Provisions for the NEC, Sec 102.2

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