

## Disability Accessibility

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**Question: An architect recently asked our firm to bid on a fire alarm installation for a large government-subsidized apartment complex in a major northeastern city. The bidding criteria include an item which states that we must meet the disability accessibility requirements of the local building code. What fire alarm system implications should we expect for such an item in this project?**

*Answer:* The major concerns that fire alarm systems must address with respect to accessibility for disabled persons as codified in the model building codes generally concerns three basic items: the ease of operation of manual fire alarm boxes; the accessibility of the location of manual fire alarm boxes; and the notification of persons with hearing impairments that the fire alarm system has operated into an alarm condition.

The model building codes rely heavily on ICC/ANSI A117.1, *Standard on Accessible and Usable Buildings*, to provide the accessibility requirements. This document correlates very well with the requirements of the *Americans with Disabilities Act (ADA)* and the *Americans with Disabilities Act Accessibility Guidelines (ADAAG)* and offers equivalent facilitation in a wide range of accessibility issues.

The model building codes also contain specific philosophies regarding the accessibility of fire alarm systems which you will need to address in your bid. You should purchase a copy of the model code that forms the basis for your local code. You should purchase a copy of the actual

adopted building code for every jurisdiction in which you intend to perform work. You will also need a copy of the latest edition of NFPA 72, *National Fire Alarm Code*. Each of the model building codes refers to the requirements in NFPA 72.

You may address the operability of manual fire alarm boxes by choosing a product where the manufacturer has specified that the device complies with ADA and ADAAG. Such manual fire alarm boxes require an operating force no greater than 5 foot pounds of force. This complies with an ADAAG requirement, which states the following:

**4.27.4 Operation.** Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

In similar fashion, you may address the accessibility of manual fire alarm boxes by following the mounting height requirements contained in NFPA 72-2002, *National Fire Alarm Code*, section 5.12.4, which states the following:

**5.12.4** The operable part of each manual fire alarm box shall be not less than 1.1 m (3 1/2 ft) and not more than 1.37 m (4 1/2 ft) above floor level.

This mounting height meets the associated requirements of ADAAG, which state the following:

**4.27.3\* Height.** The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.

**EXCEPTION:** *These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.*

**4.2.5\* Forward Reach.** If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 in (1220 mm) (see Fig. 5(a)). The minimum low forward reach is 15 in (380 mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in Fig. 5(b).

**4.2.6\* Side Reach.** If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 in (1370 mm) and the low side reach shall be no less than 9 in. (230 mm) above the floor (Fig. 6(a) and (b)). If the side reach is over an obstruction, the reach and clearances shall be as shown in Fig 6(c).

By maintaining sufficient clear space around each manual fire alarm box, you will permit an individual in a wheelchair to approach the device from a side reach position. If you have maintained the mounting heights in accordance with NFPA 72-2002, *National Fire Alarm Code*—between 42 inches and 54 inches—you will satisfy the requirements of ADAAG, as well.

The last issue you must address focuses on the need to make the fire alarm system's notification of a fire alarm condition accessible to persons with hearing impairments. Once again, NFPA 72-2002, *National Fire Alarm Code*, provides adequate assistance in section 7.5, "Visible Characteristics—Public Mode." You will find this section offering details regarding the dimensions of coverage, mounting heights, output specifications, and other matters relating to the use of visible fire alarm notification appliances. By choosing visible appliances listed by Underwriters Laboratories Inc. under ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired*, and by installing them in accordance with NFPA 72-2002, you will meet the requirements of ADA and ADAAG as equivalent facilitation, and also satisfy the requirements of ICC/ANSI A117.1.

The more difficult aspect of your particular project will come when you choose how many apartments to equip for hearing impaired notification. In some cases, the philosophy of several of the model building codes requires you to provide wiring to actuate visible notification appliances in

every apartment. This would mean that you would need to provide adequate capacity in the fire alarm system control unit, or accessory notification appliance power supplies, to power the maximum number of visible notification appliances that eventually might exist. In other cases, the building codes will give you an equivalent number of apartments based on the total number of apartments that must have visible appliances.

You will also need to address equivalency for visible notification by the single or multiple station smoke alarms, installed in accordance with Chapter 11 of NFPA 72-2002.

ICC/ANSI A117.1 permits the use of common visible notification appliances by both the apartment single or multiple station smoke alarms and the building fire alarm system.

Finding UL listed hardware to permit such a common usage may offer you a significant challenge. Likely, you will still need to provide separate visible notification appliances for the single or multiple station smoke alarms and the building fire alarm system in each apartment so equipped.

In order to base your bid on a fully proper fire alarm system design, you may wish to consider using the services of a licensed professional fire protection engineer whose engineering practice includes the design of fire alarm systems for such applications as the one you intend to bid. The FPE will provide you with a fully code-compliant design and also give you the means to provide documentation and justification for the design elements that make your particular bid completely compliant, yet cost effective.

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