

HANDICAPPED USE OF ELEVATORS

by Clarence C. Fox

ABSTRACT

Elevators have been allowed to be installed in the buildings as a means of access for handicapped persons. There have not been any code requirements set forth to recognize the use of elevators as means of egress for any persons. The model building code organizations are reviewing proposals which would incorporate the use of elevators on Phase II Firefighters' Service for evacuating the handicapped in a fire emergency. The design, construction, maintenance, operating procedures, and fire fighting procedures must be addressed to accomplish this in a safe manner.

INTRODUCTION

This paper will present issues concerning passenger elevators, wheelchair lifting devices, and stair climber devices which are used by handicapped persons. Elevator codes should be revised to recognize the use of elevators for evacuation of handicapped persons during a fire. Several building codes require accessibility for the handicapped, either by elevators, ramps, or other types of lifting devices. However, none of the codes address the required means of egress for handicapped people.

The ANSI A117.1-1986 Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People addresses the issue of accessibility but does not address the issue of egress, concerning elevating devices. The ASME/ANSI A17.1-1987 Safety Code for Elevators and Escalators (including A17.1a-1988 and A17.1b-1989) does not address accessibility or egress, except for elevators that are provided with

firefighters' service features. Firefighters' service features are required on elevators with a travel of 25 ft or more that are installed in accordance with the A17.1 elevator code.

PROPOSED CODE CHANGES

Pressurization

When Phase II of Firefighters' Service is required on the elevator, the hoistway and machine room should be required to be pressurized and prohibit venting of the hoistways. The pressurization would help prevent smoke and gases from accumulating in the hoistway and therefore be less hazardous to the occupants of the elevators. An emergency power supply should also be required for all elevators; and the power supply, both the normal and the emergency power, should be installed within a two hour fire rated enclosure.

Standby Power

A stand-by power system, conforming to Section 2707.0 of the BOCA National building Code should also be provided. The system could be programmed to automatically select an individual elevator car instead of being required to have sufficient power for all of the elevators in the building.

Elevators Used for Evacuation

Rule 4.10 of the ANSI A117.1 code should be adopted by the A17 committee to be used by handicapped persons during a fire. When the

elevator is operating on Phase II operation, the hall calls must be registered in the car so that the person operating the elevator on Phase II will know that there is a person desiring to use the elevator at that particular floor. Each elevator lobby should also be required to be enclosed in a one hour fire resistant structure which would be a refuge area for the handicapped persons waiting for the elevator. The fire department would have to assign someone to operate the elevator to pick up the handicapped persons.

Load Weighing Devices

Load weighing devices should be required on the elevator to allow the elevator to bypass all calls from the hallway when the predetermined weight limit has been reached or to be manually bypassed by the operator. This would allow the elevators to operate more efficiently and go directly to the floor of egress in an automatic mode.

Firefighters' Service

Smoke detectors should be required to be installed at each landing except the main egress landing from the building at which the fire department normally arrives when answering a fire call. The smoke detectors when activated at each floor would require the elevator to return to the main egress floor so that the person in charge of fighting the fire could determine if it was safe to use the elevators. The hoistways should also be required to be more smoke proof than the codes presently require so that the elevators can be used during the first few minutes of a fire to evacuate not only handicapped but all persons in the building.

Buildings of more than 75 ft in height do not have any way for persons to be safely evacuated from them. Most fire department aerial ladder trucks can reach a workable height of approximately 75 ft from ground level and can be used to rescue persons from the building. The egress floor should be sprinkled and alternate floor recall should not be permitted.

Egress

Accessibility to buildings is required by ANSI A117.1, Michigan Elevator Laws and Rules, and other local codes, but means of egress are not addressed for elevators. The BOCA building code,

Section 814.7, requires auxiliary passenger elevators when horizontal exits are provided on floors located 12 or more stories above the level of exit discharge; also BOCA Section 602 requires elevators for buildings with a height of more than 75 ft from ground level. This section, 602 also requires access to the elevator through horizontal egress to be provided with a two hour fire rated enclosure. The A17.1 code should be amended to all of the provisions of the high rise BOCA building code. The elevators for high rise buildings should be required to have a minimum speed of 500 fpm and a capacity of 5000 lb and be provided with automatic power operated doors. Section 807.6 of the BOCA building code should be amended since this section prohibits the use of elevators for egress. The National Fire Protection Association 101, Section 7-4, Code for Safety to Life from Fire in Buildings and Structures, also prohibits use of elevators for egress.

Sprinklers

A17.1 requires sprinklers in the machine room or hoistway be provided with a means which will automatically disconnect the power supply before water is applied. This provision could result in an elevator being stranded in a hoistway with persons in the car. This provision should be removed from the A17.1 code or sprinklers should be prohibited from being installed in machine rooms or hoistways. An alternative to fire extinguishing system such as carbon dioxide or halon gas. There are some negative reasons for allowing this type of fire protection also. Therefore a study should be made of what type of fire suppression should be allowed in elevator machine rooms and hoistways.

Wheelchair Lifts

Wheelchair elevating devices are permitted to be installed in buildings for accessibility handicappers. Wheelchair lifts should be required to be enclosed in at least a one hour fire rated enclosure; and due to the slow speed of these lifts which is generally 8 to 10 fpm and have manually operated doors, the travel distance of the wheelchair lifts should be limited to 6 ft. This is based on the travel distance permitted in the BOCA codes. For instance, a wheelchair lift that is traveling at a rate of 8 fpm would require 45 sec to travel a 6 ft distance. In a fire this might be too slow of a speed. Wheelchair elevating devices also be required to have constant pressure operating

ices instead of the key operated devices that are required ANSI A17.1.

Stair climber types of lifts should not be allowed to be installed on stairways since they do not check the required means of egress. It does not matter whether the stairway is a required means of egress or an auxiliary stairway, during a fire or other emergency situation persons in the building will use these stairways anyway and this could contribute to the pile up of persons on the stairway.

Fire Rating

Buildings that are more than 10 stories in height from the ground level should be required to have an elevator which is installed with a 4 hr rated hoistway so that it can be used for evacuation of all persons in the building. At the present time the elevator industry does not manufacture a passenger hoistway door or entrance with more than a one and one half hour rating on it. The hoistway doors for a 4 hr rated hoistway would be required to have a 3 hr rating.

Elevator Controls and Fire Alarms

The elevator control system should be connected into the building alarm system in such a manner that when a fire alarm signal is registered at the main fire control panel, the elevators will not respond to any hallway calls in the up direction and will be dispatched to the top floor to respond to hallway calls in the down direction.

Emergency Power

All elevator and emergency power systems should be required to be tested on a quarterly basis

and would require a test of the complete system to ensure that it does function properly. Past experiences have shown that there has been a lack of proper testing procedures and when the systems have been called upon to function during a fire they have frequently malfunctioned. Therefore, it must be stressed that the test should be conducted quarterly by competent persons and a record kept of the inspections.

Codes

All code requirements for elevators should be adopted by the A17.1 elevator code and the local building codes should reference A17.1. This would help to reduce the confusion that now exists between elevator codes, fire codes, building codes, and handicapped codes.

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