

FIRE RESEARCH PROJECT DESCRIPTION

Cultural Buildings – Fire Protection for People with Activity Limitations

1. Introduction

The project “Considerate Accessibility” was carried out in collaboration with the Association of the Neurologically Disabled (NHR), the Federation for Disabled Persons (DHR), the Swedish branch of the European Institute for Design and Disability (EIDD), and the Royal Institute of Technology (KTH). It has been reviewed as a book of ideas containing examples which show that consideration for historical features and values in buildings can be combined with accessibility and usability for people with activity limitations. The book is intended to function as a common frame of reference for all those who participate in the planning, construction, renewal and management of buildings. It is designed to supplement – but not replace – the specialized literature commonly used by the various professions involved. The assumption is made that practitioners have the required knowledge base, and that the process which leads to the final result will enable work of a professional nature to be carried out.

Clear examples are used as an illustration of principles and general requirements. They also serve as a source of inspiration when solutions specifically suited to each particular object are to be designed. The examples chosen are all public buildings and building environments.

The NHR, DHR, EIDD and KTH would like to go further with a project on fire safety and evacuation for people with activity limitations in buildings of cultural and historical value. Financial support for this project has been requested from the Swedish State Inheritance Fund. Similar projects are being commenced in Ireland, Belgium and Italy.

2. Two Objectives of the Research Project in Sweden

- a. The first objective is to demonstrate how fire safety can be achieved for people with activity limitations. To some extent, the same material described in the “Considerate Accessibility” project will be used as a basis for analysis and the criteria which are to be elaborated within the project as a whole. The material will be supplemented with other examples when needed. In “Considerate Accessibility”, there are good examples of older buildings, most of which have cultural and historical value, that are accessible to people with activity limitations. The question is whether conditions are as ideal when it comes to evacuation in the case of fire.

In general, attention is rarely paid to the safety of people with activity limitations in the case of evacuation due to fire - neither when buildings are newly constructed nor in existing buildings. Occasionally, a builder may however place certain demands so that the recommendations in the Swedish Accessibility Manual called "Bygg ikapp handikapp" are followed.

In existing buildings considered worthy of preservation, there can be considerable problems when it comes to creating the possibility of safe emergency evacuation. For example, doorways can be too narrow, and the widening of doorways may not be allowed for reasons of preserving the original architectural integrity of the building.

There are two separate collections of rules operating at different levels: the BBR*, which is applied both to the construction of new buildings and to renovation work on existing buildings, and the Rescue Services Act, which is applied to buildings which are not to be changed or renovated. It is on the basis of this Act that fire inspections are carried out. The Act is available from the Swedish Rescue Services Agency, and will be amended in the near future with the stipulation that fire and rescue services will be able to demand a full description of the fire precautions in all public buildings.

With the aid of standard design rules or calculations, evacuation from a building can be deemed to be satisfactory. In standard rules, permitted evacuation distances and doorway widths are stipulated. When using calculations, which is also called a performance-based approach to fire protection, the estimated time for a building to be filled with smoke and toxic gases from a fire is compared with the estimated evacuation time. When estimating smoke development, attention is paid to the height of ceilings - something which is not done when dealing only with standard dimensions. Performance-based design can be especially useful in buildings worthy of preservation where, for example, the dimensions of doorways can only be increased with difficulty. However, it can often be shown with calculations that the possibilities for evacuation are satisfactory.

The following is a description of some fire protection issues which will be dealt with in the research project, and will be included as components in a performance based approach:

- The use of evacuation lifts from floors above the ground floor is expensive and provides only a limited amount of protection for the disabled, since a lift can only accommodate a small number of people;

- Certain requirements are placed on doorway openings to stairwells for the purposes of fire and smoke resistance. Fixed thresholds often get in the way of people in wheelchairs. They can be replaced with a smoke sealing system installed within the door leaf itself which is automatically lowered into place when the door is closed, or a rubber neoprene seal fixed to the underside of the door. Thresholds may also be dispensed with if stairwells are positively pressurized relative to other areas of the building in order to prevent smoke ingress;
- Fire alarms are often required in public premises, but it can be difficult to place these in such a way that they are noticed by the disabled;
- The number of people present is often crucial, if evacuation is to be efficient. Therefore, the number of people often needs to be limited;
- Door opening devices are often not easy for people to operate, and it is difficult to open doors to facilitate evacuation;
- Computer software which supplies instructions, rather like that used in aeroplanes, might be useful in some premises.

- b. The second objective of the research project is to co-operate with the countries already mentioned within the framework of the 'European Fire Research Project'.

This European project, initiated under the auspices of the European Concept for Accessibility Network (EuCAN), is entitled "European Fire Research Project – Protection of 'People with Activity Limitations' from Fire in Buildings". The objective of the project is to be able to identify important aspects which will aid the protection of people with activity limitations and to form a network within Europe. Another objective is to develop common concepts in several languages. The project is in effect concerned with four national projects which will be carried on at the same time and will be in continuous contact with each other in the form of seminars, workshops, etc. The task for the Swedish project will be to work with evacuation in buildings of cultural and historical value.

3. Results

This project will result in a publication of richly illustrated, discursive and informative book, as was the case with the project "Considerate Accessibility".

The book of ideas and the material, which will be collected as the work is carried out, are to be used for adaptations and the evaluation of criteria for the evacuation of people with activity limitations. These criteria will be elaborated within the European project "Protection of 'People with Activity Limitations' from Fire in Buildings".

During the course of the project, project leaders in the other countries will be invited to contribute to seminars and similar events both inside and outside Sweden. This will help to raise awareness of, and interest in, this problem area. Co-operation with other European countries within the framework of "The European Fire Research Project" will also be fostered.

The project is expected to continue until the end of 2003.

4. Project Organization

The project is in the form of a collaboration between the same organizations and institutions, as was previously the case with "Considerate Accessibility"; in other words, the NHR, DHR, EIDD and KTH. The NHR will administer the project.

The project is planned to be carried out under the leadership of the architect Elena Siré, with the participation of the same reference group involved with "Considerate Accessibility". The Swedish Rescue Services Agency will also be included in the reference group. Staffan Bengtson, from Brandskyddslaget, will also participate as an expert in fire protection and emergency evacuation.

5. Special Expertise in the Project

In order to throw light on human behaviour during evacuation, a behavioural scientist will be connected with the project. Dr. Lena Kecklund, Ph.D., who was commissioned by the Swedish Board of Accident Investigation to assist in their analysis of the fire in Göteborg where 63 young people died, is interested and prepared to contribute her views on the subject. She will write a special section on psychological aspects of evacuation behaviour.

The main participant from Brandskyddslaget will be Staffan Bengtson. With his help, the main body of text will be written, a literature search will be carried out, and a number of study visits will be arranged.