RESEARCH REPORT

Housing Design Needs of Deaf People

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HOUSING DESIGN NEEDS OF DEAF PEOPLE

NOTE: **DISPONIBLE AUSSI EN FRANÇAIS SOUS LE TITRE:**

Les besoins des sourds en matière de conception de logements

Housing Design Needs of Deaf People

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A Project Report Prepared for Canada Mortgage and Housing Corporation by The Canadian Association of the Deaf

The Canadian Association of the Deaf is the National consumer advocacy organisation of Deaf Canadians. Its mandate is to protect and promote the rights, needs and concerns of Deaf Canadians.

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Report Content

Introduction

This report examines the literature and other resources and documents and summarizes the current level of information on the housing design needs of Deaf persons, and includes an annotated bibliography on this topic. The information examined is summarized to isolate significant factors of concern. Recommendations are made for further courses of action or areas in need of more investigation.

In preparing this report the literature in regards to the Deaf and that in regards to barrier free design was searched. The legislation regarding barrier free design was consulted. Resources on the Internet were searched under the topics of "deaf" and barrier free design" and related topics and likely looking "hits" were "surfed". People and associations who would be likely to have information were contacted.*

Deaf people, for the most part, live in homes designed for the general population. Adaptations are made to meet their unique needs. Homes that are designed specifically with the needs of the Deaf in mind are not common.

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* These included Deaf officials involved in enforcing the ADA, lawyers with the National Association of the Deaf in the USA, the Gallaudet University's National Information Center on Deafness, Michael Fields, a Deaf architect at the Gallaudet construction department, and a board member of the World Federation of the Deaf (the WFD office was being moved so staff were not available).

Review of Resources

BARRIER FREE DESIGN LITERATURE

There is considerable material available on barrier free designs for people with disabilities. Very little of this material includes anything about the design needs of people who are Deaf. If the needs of the Deaf are mentioned at all it is usually superficial, often only noting the need for visual fire/smoke alarms. Examples of these resources in the Bibliography include: Canadian building codes, CMHC publications and texts such as those of Branson & Swinson.

There seems to be an almost total lack of awareness of the fact that accommodations that might be essential or useful for people with a certain disability might pose a barrier for people with different disabilities. Thus, an intercom entry system is mentioned several times as an useful accommodation for people with mobility or other disabilities without any acknowledgment that such a system is a barrier to the Deaf.

LEGISLATION

There is now also considerable legislation regarding architectural barriers for people with disabilities. According to Hewett & Walt at p.1 (see Bibliography)

> "Canada's building construction community has, over many years, developed a system of laws, regulations, codes, standards and specifications. The many elements of this system are related, sometimes in complex ways.

> Despite its importance, however, its effect on building requirements is only partly understood by some members of the building industry."

The inclusion of barrier free design features in this complex system is fairly recent and the main focus is on people with mobility disabilities and very little attention is paid to the Deaf. Legislation usually incorporates features that are already well established and accepted and rarely include innovative or unusual features. The most common and usually only requirements in regards to the Deaf are that visual smoke/fire alarms be installed in certain situations and that some provision, usually only a shelf, be made for TTYs

The legislation is subject to frequent revision so the specific citations in the bibliography may not be the latest and current applicable ones. Examples of legislation in the Bibliography include the various Building Codes and the Americans With Disabilities Act.

DEAF LITERATURE

There is an extensive literature in regards to the Deaf, their language, culture, education, etc. The vast majority of this literature makes no mention of house design needs of the Deaf. When this issue is considered it is generally in relation to the legislation regarding architectural barriers.

There have been a number of Deaf architects who appear to have been quite successful and have even designed buildings

specifically for the Deaf, but no information was found as to what design features for the Deaf these architects incorporated in their buildings (see Van Cleve in Bibliography). Michael Fields, AIA, a Deaf architect at Gallaudet's construction department is possibly the only Deaf architect currently working on designing buildings for the Deaf and he confirms that the literature does not go beyond the superficial material identified in this report.

Examples in the Bibliography include Van Cleve and DuBow, et.al.

THE INTERNET

In regards to information on housing design needs of the Deaf the information on the Internet/ World Wide Web differs little from that in the print media - sites related to deafness pay scant if any attention to architectural barriers or housing needs while sites related to architectural barriers pay scant if any attention to the Deaf. The information on the WWW, of course, changes almost daily so that by the time this report is finalized relevant new information may have been posted. Web sites disappear, move and appear so often that it is not worthwhile to cite specific locations

Design Features

The information that is available on the housing design needs of Deaf people is very superficial. The following discussion, accordingly is not limited to the material that was found in the literature but also includes personal observations of the author.

Alerting Devices

Auditory alerting devices are a common feature in most homes and include doorbells, fire/smoke alarms, phone rings, appliance timers, intercoms, etc. These are, of course, of no use to Deaf people. There are now numerous devices on the market that will change auditory signals to visual signals. The setup can vary from a simple one that detects one auditory signal and flashes a single light to a setup that detects a variety of auditory signals and sends out a variety of distinguishable visual signals.

With the proper equipment and proper placement virtually all auditory signals can be changed to visual signals. The ringing or chiming of doorbells, the ringing of phones, etc., are readily changed to visual signals. Detailed consideration should be given as to what auditory signals should be changed to visual signals. Should bathroom and kitchen exhaust fans, for example, have visual indicators because Deaf people often seem to leave these running unaware? What about the

microwave or oven timing signals? What about a signal to indicate tap water is running (many Deaf people can probably tell stories about flooded floors, or worse, when a tap was left running)? What sounds should not be changed to visual signals - dripping taps, ticking clocks, branches scratching on windows, creaking floors?

Auditory signals can also be converted to tactile signals for when visual signals would not be appropriate. Thus a Deaf-Blind person would wear a vibrating pager instead of using a flashing light. These tactile systems would also be appropriate for a sighted Deaf person in certain circumstances, e.g. in brightly lighted areas where flashing lights might go unnoticed.

Information as to these devices is readily available in the general literature on deafness, both in print and on the WWW and can also be obtained from local suppliers. Unfortunately most of the literature and other resources focuses either on the marketing of the devices or on explaining in rather simple terms the need for these adaptations to people who can hear.

There is a dearth of resources that give details that would allow the Deaf to design custom systems to meet their individual needs. Detailed information is needed on the various auditory signals that should be converted to visual signals, on the placement of visual signals, etc..

SMOKE/FIRE ALARMS

There is legislation in both Canada (e.g. BC Building Code 3.2.4.20) and the USA requiring visual smoke/fire alarm systems in certain circumstances. Several smoke/fire alarm

systems are available in the USA. These systems are only starting to become available in Canada and according to a supplier only one system - a personal pager system which most Deaf would probably hesitate to use - is currently certified.

The writer knows of very few Deaf people in Canada who have a visual fire/smoke alarm system installed in their homes. Many, especially those living in newer homes, do have the auditory alarms that are required by building codes or local bylaws. This is an obvious area that needs priority attention. Detailed consideration should be given to what would be sufficient. Simply replacing the fire/smoke alarms that are required for the non-Deaf with a visible alarm would in most cases not be sufficient. For example, these alarms are commonly located in hallways and replacing them with a visible alarm would be of little use to a Deaf person sleeping in a bedroom behind a closed door. Visible alarms are also much more costly than are audible only alarms so some attention should be given to the economics involved especially since Deaf people suffer from economic discrimination and have much less money available than do their hearing peers.

GARAGES

Prominent Deaf leaders in both Canada and the USA have died from carbon monoxide poisoning when cars in attached garages have been left running. This has led to recommendations from some that attached garages be avoided in housing for the Deaf. Possibly Deaf people,

unable to hear the sound of a car engine running, are at more risk than hearing people, but there is no data to verify this.. This recommendation does not seem to be in general dissemination, however, as the author has Deaf friends who custom built a house recently with an attached garage!

ENTRANCES

Doorbells or even simply knocks on the door serve to alert hearing people that there is someone at the door. For Deaf people the ringing of the doorbell can be made to flash a light or send some other alternate signal. Unfortunately light and these other alternate signals do not travel in the same way as sound does. While a single bell in the house may be sufficient to alert a hearing person wherever the person might be in the house, the Deaf person would have to be somewhere where the visual signal could be seen directly.

Bells or chimes that have different sounds for back and front entrances are common. For the Deaf the more common systems do not differentiate like this. Information should be made available more widely on how such differentiation can be done for the Deaf.

In multi unit buildings there are often intercom entry/security systems and even single unit houses now often have such features. Only a few of the literature resources found have recognized this as a barrier for the Deaf. No satisfactory adaptation of these systems has been identified. Video monitoring of entry places is also available, but these usually are not set up so that two way communication is allowed and are thus of limited use.

Windows at entry places, either in the door itself or in a

nearby wall, would allow Deaf people to identify callers and communicate with them visually before allowing entry. Peepholes in doors are a poor substitute as they, like video monitoring systems, would only allow visual identification without any communication.

MISCELLANEOUS

A common and often the only site for phone installations in residences is on the wall of the kitchen. This does not meet the needs of a Deaf phone user. Most Deaf use TTYs and would need a place to put the TTY as well as to sit down while using it. This requirement is now recognized in most of the legislation and codes that regulate public buildings but such legislation often does not apply to private residences. With increased use of fax, answering machines, and other technology by hearing people this installation site on the kitchen wall would also appear to be less and less satisfactory for them.

Deaf people often use the on/off flick of lights to get the attention of another Deaf person - the visual equivalent of a shout. Appropriate placement of switches, especially three way switches in and outside various rooms should be considered.

Adequate lighting and appropriate placement is probably more important for Deaf than for hearing people. Light must be bright enough to allow easy visibility of signs (or lips for those who speechread!). Lights in the wrong place would tend to blind a Deaf person so placement must be

appropriate. This has been recognized as a factor in a few of the literature sources but there has been no discussion as to the appropriate brightness or placement.

It has been suggested that wooden floors that conduct vibrations be used instead of "deadening" concrete floors. Thought should go into this, as most Deaf people would probably not appreciate being awakened in the middle of the night by vibrations conducted that way!

Open architecture with good sight lines would seem to be preferable for Deaf people. Stairs with open architecture instead of walls and kitchen cabinets that do not block sight lines are examples. Consideration must be given to appropriate placement of work stations such as kitchen sinks and food preparation areas so that Deaf people can still monitor their environment when busy at such stations. Mirrors might be used to adapt work stations that do not have the appropriate sight lines.

Recommendations

During the development of this report several problems became apparent and the following recommendations are accordingly made:

Smoke/fire alarms are universally recognized as a required feature of new construction and also as a priority addition to existing buildings of all kinds. It is well recognized that audible alarms are of little, if any, use to the Deaf. Legislation is in place requiring visible alarms. Very few Deaf people in Canada, however, have visible alarms installed in their residences. Part of the problem is that the alarms are not widely available and when they are available they are costly.

> **It is recommended that on a very high priority basis, fire safety professionals and members and professionals of the Deaf community meet to devise a strategy to increase the use of effective visible alarms by the Deaf.**

There is very little information available on the housing design needs of the Deaf. The information that is available is superficial and of little use in designing houses. Professionals in the building and architectural community have worked with people with various disabilities to come up with design features that are appropriate for them - e.g. Barker, et.al in Bibliography. This has not happened with the Deaf community. It is time it did.

Deaf people need to be surveyed in a scientific fashion to

determine their needs and desires. The information that is available now is very subjective and superficial. There are professional people with appropriate backgrounds (e.g. Michael Fields, the Deaf architect in the USA) who should be consulted on how to do this. Perhaps the Canadian Association of the Deaf and the National Association of the Deaf in the USA and the CMHC and HUD, the government departments in the two countries, could work together to make this happen.

It is recommended that professionals in the building community and members and professionals of the Deaf community develop and disseminate information on the housing design needs of the Deaf.

Canada's complex system of legislation of building construction has been developed without any meaningful input from the Deaf and as a result the legislation covers only the most basic elements and the impact on the Deaf of efforts to remove barriers for people with other disabilities is often overlooked. The complex system of legislation is not well understood by the Deaf and people who do understand the legislation do not understand the Deaf. A start at remedying this might be to have someone who understand the legislation give a presentation at the next National Festival of the Deaf after which a Deaf person might make a reciprocal presentation to an appropriate building legislation body.

It is recommended that the CAD and the appropriate legislative body devise a strategy to increase the understanding of the Deaf of the complex system of building construction legislation with the goal of having the Deaf participate in revising such legislation to better reflect their needs.

Annotated Bibliography

Barker, Peter; Barrick, Jon & Wilson, Rod. (1995) ***Building Sight: A handbook of building and interior design solutions to include the needs of visually impaired people.*** **Royal National Institute for the Blind, England.**

Absolutely no mention of Deaf. It is included here as a model of what could be done. Professionals in the building and architectural community worked with professionals and community members in the blind community to develop this handbook.

Bates, L.W. ***The deaf and partially hearing*** **in Bayes, Kenneth and Franklin, Sandra (1971). Designing for the handicapped. London, England. George Godwin Ltd. p.51-56.**

A discussion of design principles for schools and other buildings for the deaf. Most of discussion is general information on deafness. Very little, if any, of the information would be useful in designing houses.

Branson, Gary D. & Swinson, Hilary W. (1991) ***The Complete Guide to Barrier-Free Housing: Convenient Living for the Elderly and the Physically Handicapped.*** **Betterway Publications Inc.**

Typical of the many publications that promises more than they deliver as the only mention of Deaf in its 176 pages in relation to visible smoke/fire alarms.

Brown, Bernard P. (1993) ***HOUSING FOR THE DEAF?*** **Connecticut Assoc. Of the Deaf Newsletter. April, May, June.**

A Deaf president of a design/remodeling company outlines some structural needs of Deaf homeowners. Although it is only about 400 words, this is the most extensive listing of design needs of the Deaf to be found. Some of the "needs" are debatable (e.g. vibration carrying wood floors instead of "deadening" cement floors - i.e. vibrations in bed rooms that would waken a sleeping Deaf person would hardly be welcome). Other "needs" are insufficiently explained (e.g. three way light switches inside and outside bathrooms, which a Deaf person would know to be for signaling purposes - i.e. a visual form of a knock on the door - but which would probably be totally incomprehensible to a hearing person).

Canada Mortgage and Housing Corporation (1996). ***Housing for Persons with Disabilities.***

The most recent CMHC publication on this topic. Like its predecessors below, this one pays scant attention to the Deaf. Visible fire alarms get their usual mention as does a shelf near the telephone for a TTY. This latest publication does finally recognize that accommodations for people with a certain disability can cause problems for people who have a different disability - mostly in regard to the visually impaired. Also finally recognized here is that intercom systems pose a problem for the Deaf but one wonders at the practicality of the suggested remedy - "closed-circuit television."

Canada Mortgage and Housing Corporation. (1992). ***Housing Choices for Canadians with Disabilities.***

Includes an account of the Rotary Cheshire apartments for Deaf-Blind adults which consists of 16 one-bedroom apartments with mention (but no real description) of some design features.

Canadian Mortgage and Housing Corporation. (1991). A Modification Checklist: Accessibility Using RRAP for Disabled Persons.

A single Deaf related feature is illustrated and mentioned as follows:

> 57. Sound and sight fire alarms can provide additional security and may be installed. Fire safety needs should be discussed thoroughly with your local fire department and your RRAP inspector.

Other features that are mentioned or recommended as being modifications that remove barriers for people with other disabilities actually increase the barriers for the Deaf, e.g. under "security" it is suggested that

> 55. An intercom system might be the answer in an apartment.

Canadian Hearing Society. (1992) ***Recommendations To Make Public Places Accessible To Deaf And Hard Of Hearing People.***

A four page publication in the Access 2000 program of this Ontario (not Canadian as the name misimplies) service society Includes, in general terms, some housing design related recommendations such as TTY, good signage, smoke and fire alarms, and good lighting.

DuBow, Sy; Greer, Sarah & Strauss, Karen Peltz. 1992. *Legal Rights: the guide for deaf and hard of hearing people: featuring the Americans with Disabilities Act!* National Center for Law and Deafness. 4th ed.

The USA guide as to the legal rights of the Deaf in that country. Includes a five page chapter on "Architectural Barriers" which mainly discusses the various legislation such as Section 502 and 504 of the Rehabilitation Act of 1973, the Architectural and Transportation Barriers Compliance Board and the Architectural Barriers Act of 1968. It notes that standards for accessibility are set by the American National Standards Institute but that for the Deaf these standards are inadequate. Mentions only a few specific design barriers.

Goldsmith, Selwyn. *Designing for the Disabled.* (1976). RIBA Publications Ltd. London, England. 3rd ed.

Another of the books that promises more than it delivers as the 525 page, 478 diagram book gives only token attention to the Deaf. For example, in the "electrical services" part it states on p 213 "For deaf people a high level of illumination is needed for lip reading."

Hewett, Robert A., and Walt, Gordon L. (1992) *Canada's Framework for the Regulation and Design of Buildings.* National Research Council of Canada.

A good, general and simple description of the complex system of laws, regulations, codes, standards and specifications that have evolved over the many years. Recommended starting place for anyone trying to get involved in this area.

Latimer, Hugh; Birdsey, Tom & Mann, Charles. (1994). "Sound Design: Creating space for hearing-impaired people meets ADA requirements, as well as improves buildings for the hearing community." *American School & University.* V.66 (May '94). P.58-60.

A general description of some of the design principles taken into consideration for the Gallaudet University "project" - probably meaning the conference centre.

Lebovich, William L. (1993) *Design for Dignity: Accessible Environments for People with Disabilities.* John Wiley & Sons. N.Y.

includes a short chapter on Gallaudet University with the focus on communication devices including alerting devices. Includes a statement but no real elaboration on the use of these devices in homes.

Peloquin, Albert A. (1994) *Barrier-free Residential Design.* McGraw-Hill.

Contains a copy of ADA Accessibility Guidelines but other than that does not mention Deaf at all in its 237 pages.

Van Cleve, John V. (ed.). (1987) *Gallaudet Encyclopedia of Deaf People and Deafness.* New York: McGraw-Hill..

A 3 volume, fairly comprehensive encyclopedia, which mentions housing design for the Deaf only in relation to the USA's Architectural Barriers Act which it summarizes at p 32,Vol. 1, as:

Federal buildings or federally funded facilities subject to the act must at least meet these specifications. For example, there must be visual warning signals in rooms where deaf individuals may work or reside alone. For assembly areas without amplification

systems and for spaces used primarily as meeting and conference rooms, a permanently installed or portable listening system must be provided. If public telephones are provided, at least one telephone must be equipped with a volume control.

Includes portraits of Deaf architects, Olaf Hanson and Thomas Scott Marr who appear to have been quite successful and designed several buildings for the Deaf, but do not seem to have published anything in connection to the housing design needs of the Deaf.

Wylde, Margaret; Barron-Robbins, Adrian & Clark, Sam. (1994). Building for a Lifetime: The Design and Construction of Fully Accessible Homes. . The Taunton Press.

Another book whose title claims more than it delivers. Very little and very general discussion of the Deaf or their design needs in the books 295 pages. On p. 25, it does, however, make a point that appears not to be made elsewhere, as follows:

> People monitor their environments through hearing (a knock at the door, footsteps on the porch, the furnace kicking on). The placement of walls, doors and windows needs to be assessed in terms of their impact on sound monitoring within the house. Efforts should be made to supplement the need to hear with the ability to see. For example, a window placed next to an exterior door allows the occupant to see people approaching.

LEGISLATION, CODES, STANDARDS

CANADA

Alberta Building Code 1990

There may be a 1995 version, but the 1990 version is the latest one that was available to the author. Very similar and only incremental different from the other Codes of which the B.C. Code is widely mentioned as being the model. Subsection 3.7.3.14.(5) is, however, something not found in other codes as follows:

Where public telephones are provided in entrance foyers of buildings classified as Group A, Group B Division 1, hospitals in Group B Division 2, police stations in Group D, or Group E, or in lobbies of hotels and motels, at least one telephone shall be provided with a built-in telecommunication device for the deaf (TDD).

Barrier-Free Design Guide. Building Standards Branch of Alberta Labour. (Undated). A guide respecting the minimum building requirements for disabled persons in the Alberta Building Code 1985.

The only relevant reference in this earlier version of the ABC was 3.2.4.13.(4) which stated "In a building or portion thereof intended for use primarily by persons with hearing impairments, visual signal appliances shall be installed in addition to audible signal appliances."

British Columbia Building Code 1992. Building Standards Branch, Ministry of Municipal Affairs, Recreation and housing.

and

The Building Access Handbook: Building Requirements for Persons with Disabilities from the British Columbia Building Code 1992 including Illustrations and Commentary. 1995.

Expands on section 3.7, Building Requirements for Persons with Disabilities, of the B.C. Building Code with commentary

3.2.4.20.(1) requires that a visual warning system be installed in certain buildings having sleeping accommodations and goes into considerable detail as to placement, intensity, etc.

3.7.3.16.(1) requires that in locations where more than one telephone is installed there be a shelf provided for TDDs. Canadian Housing Code, 1990

CSA Standard CAN/CSA-B651-95, Barrier Free Design. Canadian Standards Association. 1995

Modeled after the B.C. Building Access Handbook and only incrementally different from it. Mentions visual alarms and TTY shelf and suggests that an actual TTY be considered for public areas.

Manitoba Building Code 1976

Another Code that is modeled on the B.C. one and is little different from it.

Saskatchewan, Accessibility Standards Guidelines, Adopted by the Saskatchewan Human Rights Commission, April 13, 1988.

Adopts the NBC, 1985 edition and the Uniform Building and Accessibility Standards Act and Regulations as guidelines. Contains the usual requirements such as a shelf for TTY and visible fire alarm system.

USA

Americans with Disabilities Act, Public Law 101-336. 104 STAT. 328.

The ADA Accessibility Guidelines, Appendix B, contains detailed (e.g. flash rate, brightness, numbers) specifications for text telephones (TTY), visible alarms, etc. Similar to but more detailed than the Canadian building codes. There are also provisions for certification of local building codes that comply with the ADA.

Architectural Barriers Act, Public Law 90-480

See Annotations for DuBow and VanCleve above.

Fair Housing Amendments Act of 1988. Public Law 100-430. 102 STAT. 1619.

See Annotations for DuBow and VanCleve above.

Rehabilitation Act of 1973. Public Law 93-112. 87 STAT. 355.

See Annotations for DuBow and VanCleve above.