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Evaluating the Regulation of Alerting Systems to Facilitate the Evacuation of the Deaf in Australia

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Evaluating the Regulation of Alerting Systems to Facilitate the Evacuation of the Deaf in Australia

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Abstract

The current building regulations in Australia may be in need of review to provide effective alerting systems for emergency egress of the deaf in buildings. Through research, interviews, and focus groups, we reviewed the Australian building regulations, determined that they are in need of change regarding alerting systems and egress for the deaf, and formulated recommendations on procedures to change them. Our project sponsor, the Victorian Deaf Society, and other organisations can use these recommendations to generate justified cases for presentation to various Australian building regulatory appeals boards.

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List of Acronyms

AAD……...……...Australian Association of the Deaf
ABCB……...……...Australian Building Codes Board
ADA…..……...…….Americans with Disabilities Act
AFAC……..….Australasian Fire Authorities Council
AFDO……...…….Australian Federation of Disability Organisations
BAB……...……Building Appeals Board
BAC……..……Building Advisory Council
BAPC…….....Building Access Policy Committtee
BCA……..Building Code of Australia
BCC……..……Building Control Commission
BRAC……...…….Building Regulation Advisory Committee
CAPD.……...……...Central Auditory Processing Disorder
CODA……...…….Children of Deaf Adults
DDA……...……...Disability Discrimination Act
DHS……..…….....Department of Human Services
FETA……..Fire Extinguishing Trades Association
FPAA……..…….…….Fire Protection Association Australia
HIA……...…….Housing Industry Association
HREOC……Human Rights and Equal Opportunities Commission
IQP……...…….…Interactive Qualifying Project
NBCC……...…….National Building Code of Canada
RMIT……..……...…Royal Melbourne Institute of Technology
TDD……...…...Telecommunication Device for the Deaf
TFS……...…..Tasmanian Fire Service
TTY……...……Telephone Typewriter
UK……..……...United Kingdom
USFA……...…...United States Fire Administration
WPI……..……..Worcester Polytechnic Institute

Executive Summary

Among the numerous physical, social, and economic limitations the disabled may face in society, safety is one issue that warrants frequent examination to create improvements. The deaf have specific safety concerns in buildings compared to the hearing community. Addressing these concerns could achieve a higher level of safety during emergencies requiring alert and possible egress, such as evacuation during a fire. The goals of this project were to:

- Review how the Australian building regulations accommodate the deaf and determine if and why the regulations on alerting systems for the deaf should change; and
- Formulate recommendations and justifications for how to change these regulations, and if deemed appropriate, to suggest improvements to the regulation of alerting systems to facilitate the evacuation of the deaf in buildings.

These recommendations were intended for use by the Victorian Deaf Society, other deaf advocacy and service provision organisations, and various fire safety and building safety groups as a reference document. This document was intended to provide information and guidelines on how to present cases to various Australian boards specialising in building regulations if these organisations choose to take action.

Our methodology was designed with three main objectives:

- To understand the common issues and needs associated with alerting systems and egress for the deaf by gaining insight into the opinions of various stakeholders;
- To discover and compare the regulations on alerting systems for the deaf in other countries with Australia's regulations, as well as find statistical and anecdotal evidence of egress and alerting issues throughout the world; and
- To determine the procedures for proposing changes to Australia's building regulatory documents.

Once all data collection was complete, we qualitatively analysed our results along with previous research about the building regulations to formulate conclusions as to whether changes are necessary and the strategies for generating them.

In order to satisfy our first objective of gathering stakeholder opinions, we sought the views of the deaf community as well as those of advocates and service providers from organisations including the Victorian Deaf Society, Deaf Children Australia, Deafness Forum, and the Victorian Council of the Deaf. We solicited opinions regarding the safety of the deaf in buildings and whether these target groups felt changes are necessary. The deaf, advocates and service providers also contributed input regarding awareness of existing deaf alerting

technologies, as well as what changes to current building regulations on alerting systems that might improve their safety in case of an emergency. We also gained insight into varying opinions of representatives of building and property organisations, policy makers, and board committees. These organisations provided their viewpoints on how changes would affect the building industry and the community as a whole.

Our second objective focused on comparing the building regulations of Australia to those of Canada, the United Kingdom, and the United States to determine what regulations these countries currently have to ensure the safety of the deaf in situations requiring alert and evacuation. We found anecdotal evidence of deaf people not being alerted during emergencies or situations requiring building evacuation. This information helped illustrate the level of risk associated with the absence of alerting systems for the deaf.

To achieve our third objective of attaining a working understanding of the building regulations of Australia and how to propose changes to them, we interviewed various stakeholders involved in building regulations who aided in our analysis of the building regulatory system in Australia. From their insight we understood the relevant details and sections of the building regulations with respect to alert and egress of the deaf and the procedures available to change them.

Our results gathered from the various methods were analysed according to the following categories:

- Factual research about building regulations of other countries, statistical information about the deaf community, and anecdotal evidence of the deaf involved in emergencies with no effective alerting systems;
- Positions and opinions of various stakeholder groups on alerting systems and evacuation for the deaf; and
- Possible strategies for generating change in the Australian building regulatory documents.

After conducting research in online publications, we analysed and compared the building regulations of Australia, Canada, the United Kingdom, and the United States to evaluate Australia's position with respect to other countries on providing for the deaf regarding alerting systems in buildings. Some notable findings were that the United States requires a flashing light alarm for every audible alarm in public buildings, and that the United Kingdom will fund alerting systems within the workplace or public living accommodations of a deaf person on a case by case basis if the deaf individual petitions for it. Our results implied that,

while other countries provide for the deaf in their building regulatory documents specifically with respect to alerting systems for the deaf, Australia does not. We also found anecdotal evidence suggesting that audible alarms are ineffective for the deaf, and that alerting failures have led to emergencies, injuries, and deaths of deaf people around the world. We drew on these incidents to conclude that the deaf have a high level of risk with respect to being alerted during an emergency.

We gathered information from stakeholder groups regarding their positions on alerting systems and evacuation for the deaf. We then analysed their responses and categorised them into two groups based on similar opinions and viewpoints on this issue. From this classification we observed trends that showed how the perspectives of different groups vary. While the deaf and their advocates believe the deaf community is at an increased risk because the building regulations do not comply with the Disability Discrimination Act, the representatives of building and policy organisations act in the interest of their respective areas such as providing for the building industry's needs and creating an acceptable cost-benefit balance for the community.

Our final analyses led to the conclusion that better protection for the deaf during evacuation situations in Australia is justified. Anecdotal evidence of deaths and injuries of the deaf community due to ineffective alerting shows the need for effective regulations for the deaf. Other countries' documents provide for the safety of the deaf in emergency alerting and egress situations; our findings prove that the current Australian building regulatory documents do not act in accordance with each other to effectively provide for the safety of the deaf.

Research into Australia's current building regulatory documents has led us to recommend the following specific changes to the documents:

- The Victorian Deaf Society and other advocacy and service provision organisations should appeal to the Building Access Policy Committee to amend the Access to Premises Standard to provide requirements regarding egress issues of the deaf.
- Specific regulations for alerting and egress systems for the deaf in buildings must be appropriate for the environment of the building.

This approach will provide for the major concerns for the safety of the deaf while ensuring that buildings are not required to install irrelevant systems for their type of environment. The Table below lists our recommendations on specific systems for each type of building.

Building Type	Recommended Requirements
Sleep (Monitored Facility)	• Personal Information System • Flashing Lights • Vibration System (deaf residents only)
Sleep (Unmonitored Personal Home of the Deaf)	• Government Funding
Large Business	• Personal Information System • Flashing Lights • Pager System • Either Telephone Emergency Warning System OR Computer Emergency Warning System
Small Business	• Personal Information System • Flashing Lights
Facilities or Companies Catered to the Deaf	• Emergency Light Colour Coding System

We concluded that there are a number of strategies that could be followed to generate changes in the building regulations including:

- public education,
- lobbying under the Disability Discrimination Act,
- lobbying at the state level, and
- lobbying to the national appeals boards.

We recommend that a consortium of local and national advocacy and service provision organisations appeal to the Australian Building Codes Board and its committees, which oversee the Building Code of Australia and regulate the building environment on a national level. This strategy has the potential to create changes that will affect the largest population of the deaf community throughout Australia.

Chapter 1. Introduction

People with disabilities face many challenges and it is a matter of public concern to accommodate and empower them. The problems encountered by the disabled are typically due to a lack of resources and awareness, and contribute to their ongoing social struggle to gain equal opportunity. Only through the provision of resources and recognition of rights through funding and advocacy will the disabled community be able to experience equality in society.

Among the numerous physical, social, and economic limitations the disabled may face in society, safety is one issue that warrants frequent examination to create a more secure environment. In particular, the deaf have specific safety concerns in buildings because they are less likely than a hearing person to be alerted during any type of emergency. A delayed recognition of an alert can hinder the quick evacuation necessary in emergency situations such as fires, bomb threats, and natural disasters. Addressing these concerns could achieve a higher level of safety for the deaf during emergencies requiring alert and egress from buildings.

The specific problem we investigated considered whether the current building regulations in Australia are sufficient for providing effective alerting systems for emergency egress of the deaf. The two most relevant regulatory documents that provide for the safety of the disabled in Australia's buildings are the Building Code of Australia (BCA), which sets forth national laws, and the Disability Discrimination Act (DDA) that establishes standards for the equality of the disabled. The Disability Discrimination Act intends to ensure the equality of the disabled in society, yet the Building Code of Australia does not contain requirements to provide for the deaf with regards to their safety in buildings. This lack of provision for the deaf is a major safety concern in case of emergencies in buildings. Convincing arguments presented to various Australian building regulatory boards could help implement changes; however, these boards are approached by many special interest organisations, mostly of the physically disabled nature. Deaf advocates believe the deaf community is a silent minority within the handicapped population, and think they are largely ignored regarding their specific needs.

The first goal of this project was to review the Australian building regulatory documents to determine if and why the regulations on alerting systems for the deaf should change. If appropriate, our second goal was to formulate recommendations of what changes should be made to the regulations and how to bring about these changes. In order to achieve these goals we developed three main objectives: (1) to research and compare the

regulations on alerting systems for the deaf in Australia, Canada, the United Kingdom, and the United States, as well as find statistical information on Australia's deaf population and anecdotal evidence of tragedies due to alerting and egress issues in various countries; (2) to understand the common issues and needs associated with alerting systems and egress for the deaf by gaining insight into the opinions of stakeholders; and (3) to determine the procedures for proposing changes to Australia's building regulatory documents. Once all data collection was complete, we qualitatively analysed our results along with our research about the building regulations to formulate conclusions regarding whether changes are necessary and the strategies for generating them. These recommendations were intended for use by the Victorian Deaf Society, other deaf advocacy and service provision organisations, and various fire safety and building safety groups as a reference document to provide information and guidelines on how to present cases to various Australian building regulatory boards. It is our hope that the recommendations provided in this report can help bring about changes to the Australian building regulatory documents to increase the level of safety of the deaf community in buildings throughout the nation.

Chapter 2. Background Information

This chapter presents an overview of the causes and classifications of hearing loss, the incidence of deafness in Australia, and an explanation of advocacy and service provision organisations for the deaf. The safety concerns of the deaf specifically regarding alerting systems and the current technologies to accommodate for hearing losses are explained. An overview of the current building regulatory documents of Canada, the United Kingdom, and the United States is presented. Lastly, the Building Code of Australia, Standards Australia, the Building Act of Victoria, the Building Regulations of Victoria, the Disability Discrimination Act, and their impact on alerting systems for the deaf are described.

2.1 Causes, Classifications, and Incidence of Hearing Losses

This section discusses the three main types of hearing losses and several causes of them, along with the various levels of hearing impairments and their differences. The incidence and types of deafness in Australia are described, along with the organisations that support the deaf community in Australia.

2.1.1 Types and Causes of Hearing Impairments

There are three main ways to possess a hearing loss. Congenital deafness, which is when one is born with the impairment, is caused by hereditary disorder, genetic mutation, or prenatal exposure to certain diseases. Adventitious deafness is acquired at some point during one's lifetime due to exposure to noise, trauma, various diseases, or certain chemicals. Lastly, age-related hearing loss, called presbycusis, occurs when the higher frequencies used to discern various speech sounds are lost. This damage causes certain sounds and words to sound similar, but the overall ability to hear remains (Berke, 2005).

Three classifications of hearing loss exist. Conductive hearing loss occurs in the outer or middle sections of the ear, usually when the standard path for sound to reach the inner ear is obstructed. Some causes are blocked ear canals, fluid-filled middle ears, punctured eardrums, and either genetic deformities or trauma-induced problems associated with the ossicles, which are small connecting bones (Baloh, 1998). The blockage or injuries to the small bones or eardrum causes lesions, which impair hearing. Conductive hearing loss can be compensated for by the use of loud speech, but the absence of background noise is ineffective. This type usually affects only one ear and does not target any specific sound frequencies (Baloh, 1998). Medical treatment or surgery is typically available to correct these issues and restore hearing (Dobie, 2001).

Sensorineural hearing loss results from an injury to the cochlea or the vestibulocochlear nerve, which is the sensory nerve responsible for hearing. Inner ear infections caused by ototoxic drugs and diseases such as bacterial meningitis, measles, mumps, and mononucleosis are main causes (Baloh, 1998). Noise damage, trauma, viruses, and aging can also lead to this type of hearing loss (American Speech-Language-Hearing Association, 2005). Sensorineural hearing loss impairs the ability to evaluate the different frequencies of sound, causing an individual to have difficulty separating speech from background noise. A quiet background can improve this type of hearing loss. This impairment usually affects both ears and directly influences how well certain sound frequencies are heard (Baloh, 1998). Due to the severity and complexity of diseases associated with sensorineural hearing loss, treatment is not usually effective for these ailments (Dobie, 2001).

Central hearing loss results from wounds to the nerves and fibres in the inner ear; it is typically initiated by a central auditory processing disorder (CAPD), which occurs when the auditory functional units of the brain are adversely affected. Causes of this type of hearing loss include injuries, traumas, diseases, tumours, and hereditary factors (American Speech-Language-Hearing Association, 2005). Loud speech is not necessary to aid in listening, although a quiet background is helpful. Central hearing loss can affect both ears, but it does not target specific frequencies of sound (Baloh, 1998).

2.1.2 Classification of Hearing Losses

Three definitions are used to further clarify hearing loss. A *permanent hearing impairment* causes the ear to function at a level outside of the normal range; the level outside of the normal range is when a person is unable to hear sounds outside of 0-15 decibels. A *permanent hearing handicap* is when a hearing impairment causes a disadvantage significant enough to disrupt a person's ability to complete daily activities. Lastly, a *permanent disability* causes an individual to be unable to remain employed at full wages (The American Academy of Otolaryngology – Head and Neck Surgery, 1988).

The range of hearing loss extends from normal hearing to profound deafness and is typically classified into seven levels. These different levels of hearing loss are distinguished by the amount of decibels that cannot be heard outside of the normal hearing range. These levels are calculated from an average of the hearing loss at the frequencies of 500 Hertz, 1000 Hertz, and 2000 Hertz in the healthier ear (American Speech-Language-Hearing Association, 2005). To further explain each degree of hearing loss, information from the American Speech-Language-Hearing Association (2005) and the Deafness Forum of Australia's "Submission to Standing Committee on Ageing

Inquiry into long-term strategies to address the ageing of the Australian population over the next 40 years" (2002) was compiled into Table 1.

Table 1: Degrees of Hearing Loss (American Speech-Language-Hearing Association, 2005 and the Deafness Forum of Australia's "Considerations when there is hearing loss", 2002)

Degree of Hearing Loss	Equivalent Decibel Loss	Effects	Hearing Assistance Possibilities
Normal Hearing	0-15 dB	No effects in good listening environment	Good acoustic environment and amplification system
Slight to Minimal Hearing Loss	16-25 dB	Negligible problem hearing speech	Good acoustic environment and amplification system
Mild Hearing Loss	26-40 dB	Slight difficulty hearing speech; difficulty understanding in a noisy environment	Good acoustic environment and amplification system
Moderate Hearing Loss	41-55 dB	Increased difficulty hearing and understanding speech; unable to follow conversations in large open areas	Good acoustic environment with amplification system; Induction loop or other assistive listening system (i.e. infrared or radio frequency system); hearing aids
Moderate to Severe Hearing Loss	56-70 dB	Significant difficulty communicating under all conditions; needs visual clues (lip-reading or sign language)	Good acoustic environment with amplification system; Induction loop or other assistive listening systems (i.e. infrared or radio frequency system); hearing aids; clear speech, supplementary sign language
Severe Hearing Loss	71-90 dB	Unable to hearing normal speech, depends on visual clues (lip-reading or sign language); term "deaf" begins to be used	Good acoustic environment and amplification; induction loop or other assistive listening systems (i.e. infrared or radio frequency system); may require signing, deaf oral interpreter, or visual communication in noisy situations; hearing aids assist with some speech and environmental sounds
Profound Hearing Loss	91 dB +	Considered deaf; may hear some loud sounds; does not rely on hearing as primary channel for communication	Depends on a visual communication mode (i.e. lip-reading, sign language, or a combination); requires signing, deaf oral interpreting, and/or visual text system; hearing aids help with environmental and warning sounds and the rhythm of speech; cochlear implants an option

Although, these seven different levels illustrate the different ranges of hearing loss, three definitions are used to indicate a hearing impairment. In an attempt to limit confusion and promote a general understanding of hearing impairments, The Australian Association of the Deaf (2002) defined the following terms:

- **Deaf** (capital D) describes people who prefer to communicate via Auslan, the Australian sign language, and identify as members of the signing Deaf community. Also referred to as being "culturally Deaf," members of this group were likely born Deaf or became Deaf while very young.
- **Hard of hearing** describes those who acquired a hearing loss as an older child or adult. They normally communicate through speech, lip-reading, and possibly hearing aids.
- **deaf** (lowercase d) is a broad term that describes the physical state of not hearing. This term encompasses both Deaf and hard of hearing.

2.1.3 Demographics of the Deaf in Australia

In 1998, the Centre for Population Studies in Epidemiology of the Department of Human Services in Australia conducted a study of the deaf population in Australia. They used a representative population sample of South Australia aged 15 years and older and asked all participants to answer a question regarding their hearing ability. One response meant the interviewee had no level of hearing loss while the remaining three replies were varying levels of hearing loss. Rather than relying on the participants' self-reported declarations of impairment, the researchers audiologically tested any individual claiming a hearing impairment to ensure precise measurements. The results of this study found that 22% of Australians aged 15 years and older have some level of hearing impairment (Wilson, 1999).

According to the 2001 Census, the population of Australia was 18,972,350. Of these people, 15,038,339 people were 15 years of age or older. Taking into account that 22% of Australia's population is Deaf or hard of hearing, Australia has approximately 4.2 million citizens that are age 15 or older and have some level of hearing impairment (Australian Bureau of Statistics, 2001).

Deaf individuals can either be born deaf or acquire a hearing impairment during their lifetime. However, research has shown that hearing impairments are more prevalent at ages 65 and older. Paul Mitchell from the University of Sydney's Department of Ophthalmology: Public Health & Community Medicine, reported age versus the incidence of hearing loss for people in Australia to be as illustrated in Figure 1 (Mitchell, 2002).

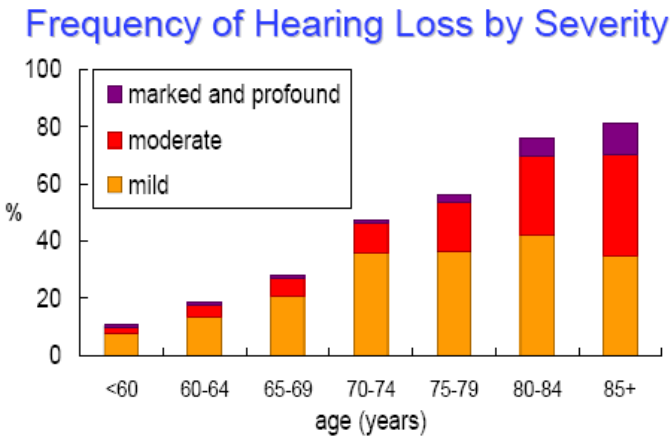

Figure 1: Frequency of Hearing Loss by Severity (Mitchell, 2002)

In March of 2005, the Australasian Fire Authorities Council (AFAC) composed a document intended to develop a greater understanding of the nature of residential fire fatalities, to identify a range of potential risk treatments, and to accurately assess some of the risk treatments. The research investigated fire fatalities in residential fires in Australia and New Zealand and identified the following groups as having an elevated risk of fire fatalities:

1. people aged 65 years and older;
2. children aged between 0-4 years; and
3. adults affected by alcohol consumption

(Unpublished Draft AFAC Report, 2005).

According to this AFAC report, people who are 65 years or older are at a higher risk for residential fires because "older people may be hearing impaired and not hear an alarm." This statement is supported by the fact that 27% of the fire deaths in Australia are in the age group of 65 years and older. According to this report, the absence of smoke alarms or inability to become alerted in a fire emergency can increase the possibility of fatality in a fire by 60%. (Unpublished Draft AFAC Report, 2005)

Between 1997 and 2003, Victoria experienced 95 fatal residential fires that resulted in 99 deaths. Intentionally lit fires and those resulting from incidences such as murder or arson were not included in this study. Time of death was only recorded for 66 of the 99 deaths, but of these 66 deaths, 70% of them occurred during the sleeping hours between 8:00 p.m. and 8:00 a.m. The presence of a fire alarm was recorded in 72 of the 99 cases, but of the 72 cases, 53% of the residences were noted as having a fire alarm while 47% did not have a properly functional alarm. Of the 38 cases where a fire alarm was present, 82% of

the fire alarms were functioning at the time of incident. (Unpublished Draft AFAC Report, 2005)

2.1.4 Organisations that Service and Support the Deaf Community in Australia

Australia has both national and state organisations focused on supporting the deaf community. These organisations provide legal and lifestyle services to the deaf and also offer ways for deaf individuals to connect with other deaf people through various groups and activities.

Australia's national deaf advocacy organisation is the Australian Association of the Deaf (AAD). The goal of the AAD is to promote the betterment of the lives of the deaf community by using its national contacts to achieve results concerning the rights of the deaf. Areas of service provided by the AAD include telephone companies, educational agencies, rehabilitative services, and employment bureaus (Australian Association of the Deaf Inc "Advocacy", 2003). The AAD and similar national organisations participate actively in promoting legislation to ensure that members of the deaf community have rights equal to those without disabilities.

Each Australian state has one service provision organisation to address the lifestyle needs of the deaf, such as our sponsoring organisation, the Victorian Deaf Society in Victoria, Australia. Each state's representing service provider, listed in Appendix B**,** strives to provide the deaf community with improvements in their daily activities, such as communication and social interaction. These service providers are all non-profit organisations and receive money through governmental grants as well as private contributions, fundraising, and various fees charged for services provided. Interpreting services, community education/outreach, employment services, living skills support, and aged care are just a few examples of the many areas in which state organisations are involved. These organisations also provide various activities such as sports opportunities and social/support groups, which can be found through searching their websites or visiting their headquarters. Examples include: CODA—Children of Deaf Adults (CODA International, 2004), a group that strives to help children cope with their unique family environment; Deaf Sports Australia, which provides social experience through sporting events; and Deaf Children Australia, which allows deaf children to learn how to live a productive and happy life with their hearing impairment (Victorian Deaf Society "Links", 2005).

2.2 Safety Concerns of the Deaf and Alerting Systems for the Deaf

The deaf face challenges in their everyday lives, including specific challenges regarding their safety and ability to communicate in public buildings. This section explains certain safety concerns of the deaf, possible solutions, and the current available alerting systems for the deaf.

The Deafness Forum of Australia compiled a list of concerns faced by the deaf in an article titled "Submission to Standing Committee" (2002). One concern cited was the inability to hear important news stories and public announcements, and another concern was the possibility of not being alerted to emergency situations such as fires or burglaries (Deafness Forum of Australia "Submission to Standing Committee", 2002).

A possible solution for the inability to hear announcements is captioning on televisions and monitors. Captioning on televisions allows deaf individuals to remain up to date on important news stories, while scrolling monitors in buildings can inform the deaf of public announcements regarding both recreational and safety-related topics (Deafness Forum of Australia "Assistive Devices," 2004). These types of visual signage can inform the deaf of current events and announcements, while also having the ability to warn the deaf in case of an emergency.

Alerting systems are preventative emergency technologies that have saved thousands of lives by alerting individuals to evacuate buildings in emergency situations (Brian, 2000). Their effectiveness is a result of the early warnings they provide to both conscious and sleeping individuals who may otherwise become overwhelmed by smoke and other toxic gases in emergencies such as fires (United States Fire Administration, 2004). These systems utilise the person's hearing, visual, and tactile senses individually or they can be combined to offer more alerting techniques. The audible alarm is the most commonly used alerting system in Australia because the Building Code of Australia requires that all buildings have an audible alarm (Building Code of Australia, 2005). However, conventional audible alarms are not effective in alerting the Deaf and hard of hearing, thus generating a need for the creation of visual alarms with strobe or flashing lights (Brooks Australia, 2002). A third type of alerting system relies on a person's tactile sense because it has a vibrating device connected to the alerting system that is triggered when an emergency occurs. Some alerting systems are hardwired to the overall system, others run only on batteries, and some equipment is a combination of both options. Since electricity is normally lost or shut off during a fire, a common comprehensive choice is the combination of hardwiring and a rechargeable backup battery (Michael Craythorn, personal communication, 21 March 2005).

Specialised alerting systems for the deaf can utilise numerous signals and respond to various incidents. Transmitters are available that can be programmed to indicate the various types of emergency alarms, as well as telephones, door bells, baby cry alarms, alarm clocks, and when doors or windows open or close. Notification of these events can be provided by a variety of devices including flashing lights, vibrating mechanisms under the pillow, bed shakers, and vibrating watches or pager (Word of Mouth, 2005).

A standard 9-volt battery powered, stand-alone smoke detector costs approximately $10 - $30 depending on the different style (One Stop Shop Catalogue, 2005). The cost of specialised alerting systems is significantly higher. Specialised alerting systems for the deaf that must be wired to the standard fire alarms usually costs over $200 (Michael Craythorn, personal communication, 21 March 2005). Some examples of this type of equipment can be found in Appendix C.

2.3 Building Regulatory Documents of Canada, the United Kingdom and the United States for Comparison

Most countries have a number of documents that work together for the building environment. *Building regulatory documents* refer to the appropriate building codes, regulations, and discrimination acts within each country. Building regulatory documents are the requirements set to ensure that appropriate standards are met in the design and construction of a building. They provide for the safety, accessibility, and comfort of the general public within these structures. These documents are particularly important to the disabled because they require that buildings are better suited to the needs of the disabled.

To become familiar with building regulations and to fully understand the strength of the Australian building regulatory documents regarding the disabled, we investigated the building regulations of other countries. The building regulations in these countries will serve as points of comparison to what building regulations Australia has in place. This section describes the building regulatory documents of Canada, the United Kingdom, and the United States and how they accommodate the disabled, specifically the deaf.

2.3.1 How Canada Accommodates the Deaf in Buildings

The Canada Human Rights Act intends to provide equal opportunity throughout Canada. The Act prevents discrimination based on: race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, family status, disability, or conviction for an offence for which a pardon has been granted (Department of Justice Canada, 2004).

The Canadian building codes are outlined in six model documents that delineate the minimum requirement called for by the federal government. These documents include the National Building Code of Canada (NBCC), the National Fire Code of Canada, the National Plumbing Code, the National Farm Building Code, the National Housing Code, and the Model National Energy Code. These codes are adopted and enforced by most provinces or territories and can be altered to suit local needs (National Research Council Canada, 2005).

Section 3.2.4.18 of the National Building Code of Canada, *Alert and Alarm Signals*, states that "in a building or portion thereof intended for use primarily by persons with hearing impairment, visual signal devices shall be installed in addition to audible signal devices." Section 3.2.20, *Visual Signals*, then specifies that these visual alarms are required to be installed so that "the signal from at least one device is visible throughout the floor area or portion thereof in which they are installed." In order to do so, the NBCC specifies that in rooms where a door is visible, the visual alarms should be located above the exit door, and if the door cannot be seen, the visual alarm should be located where the occupants are normally in attendance. Copies of Sections 3.2.4.18 to 3.2.4.20 of the 1995 National Building Code of Canada with related Appendix notes were obtained from personal communication with the technical advisor of the National Research Council (Claire Fréchette, personal communication, 3 April 2005). The complete version of sections 3.2.4.18 to 3.2.4.20 can be found in Appendix D.

2.3.2 How the United Kingdom Accommodates the Deaf in Buildings

The United Kingdom's Disability Discrimination Act seeks to make it unlawful to discriminate against a disabled person with respect to the provision of goods, facilities and services or management of premises, and employment (Disability Discrimination Act – United Kingdom, 1995). The United Kingdom's Building Regulations 2000 specifies the building regulations within England and Wales. This document exists to ensure "the health and safety of people in and around all types of buildings…and it provides for energy conservation, and access to these buildings" (Office of the Deputy Prime Minister, 2004). The buildings included in the UK Building Regulations 2000 are domestic, commercial, and industrial buildings (Office of the Deputy Prime Minister, 2004). The UK Building Regulations require that employers are responsible "towards safeguarding their employees in case of fire" (Office of the Deputy Prime Minister, 1997).

It is the duty of the "responsible person" to ensure that the building complies with the UK Building Regulations. This person usually owns the premises or business; one example would be a landlord. The Regulatory Reform Order requires the responsible person to "provide all measures to ensure the safety of all people he or she is responsible for" (Fire

Extinguishing Trades Association, 2004). The responsible person must "provide and maintain clear means of escape, signs, notices, emergency lighting, fire detection & alarm, and extinguishers" (FETA, 2004). Please refer to Appendix E for a more detailed description of the duties of the responsible person.

Under the Disability Discrimination Act – UK, additional aids or services may be provided on a case-by-case basis to ensure equality. For the safety, equality and well-being of the deaf community, some options of services that may be provided upon request under the Disability Discrimination Act – UK include:

- communication support, such as providing qualified BSL [British Sign Language]/English interpreters (face-to-face or via videophone), lip-speakers, note-takers or speech-to-text reporters;
- equipment, such as an induction loop or infrared system, text-phone, telephone with an amplifier or an inductive coupler, videophone or a fire alarm with flashing lights;
- making your printed and online information accessible by writing in plain English; and
- making sure that videotapes, DVDs or video clips on their website are subtitled, signed or both.

(Royal National Institute for the Deaf, 2004)

The Disability Discrimination (Employment) Regulations 1996 provide for the disabled in their workplace. This document ensures equal wages, treatment, contract work, and building regulations to accommodate for the safety of the disabled (Her Majesty's Stationery Office, 2000). In a focus group conducted with the deaf staff at the Victorian Deaf Society, Nishma Shah, a fully deaf case manager who moved from England to Australia last year, stated that if a deaf person moves into or works in a public building in the United Kingdom, the responsible person is accountable for ensuring the deaf person's safety. To provide for the deaf individual's safety, the responsible person must install flashing lights on the floor the deaf person occupies and provide that person with a pager outfitted with the specialised alerting system if he or she leaves the floor. For these provisions to occur, the deaf employee must petition the responsible person for an alerting system and the responsible person is required to assess the building to provide a system in accordance with the Building Regulations at no additional cost to the deaf employee (Nishma Shah, personal communication, 6 April 2005).

2.3.3 How the United States Accommodates the Deaf in Buildings

The United States Congress signed into law the Americans with Disabilities Act (ADA) on July 26, 1990 under President George H.W. Bush's administration. During the signing, President Bush stated, "with today's signing of the landmark Americans with Disabilities Act, every man, woman and child with a disability can now pass through once closed doors into a bright new era of equality, independence and freedom" (Evan Terry Associates, 1992).

The Americans with Disabilities Act strives to prevent inequality for those with disabilities. It sets forth a "clear and comprehensive prohibition of discrimination on the basis of disability" (Evan Terry Associates, 1992), and clearly states many guidelines to accommodate the deaf community. The ADA clarifies that if audible alarms are installed throughout a building, there must be an equal number of visual alarms. Appendix F illustrates the requirements regarding the safety of the deaf under the ADA (Code of Federal Regulation, 1994).

Other areas of the ADA specific to the deaf community include signage and telephones. As seen in Figure 2, the international Telecommunication Device for the Deaf (TDD) Symbol and Symbol for Hearing Loss are included in the act. Specifically, the Act calls for assistive listening devices, text telephones, and hearing aid compatible telephones to accommodate the deaf community in public buildings.

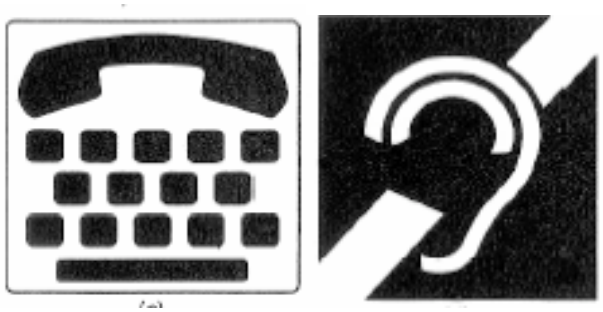

Figure 2: International TDD Symbol (left) and Symbol for Hearing Loss (right) (Code of Federal Regulation, 1994)

2.4 Australian Building Regulatory Documents and Legal Rights for the Disabled

The building regulatory documents of Australia were explored to understand how the Australian building regulations accommodate the deaf. In this section, a brief overview of the Building Code of Australia, Standards Australia, the Building Act of Victoria, the

Building Regulations of Victoria, and the Disability Discrimination Act is provided. Finally, the relationships between the documents are analysed.

2.4.1 Building Code of Australia

The Building Code of Australia (BCA) is a nationwide set of building standards. The first copy of the BCA was created in 1996 to impose acceptable building standards with regards to "structural sufficiency, safety, health and amenity for the benefit of the community" (Housing Industry Association, 1997). Regulated by the Australian Building Codes Board (ABCB), the BCA is intended to provide for the safety of all Australians in buildings. The ABCB is a committee consisting of representatives from six states, two territories, one commonwealth government official, and 2-4 non-government individuals. Overall, the ABCB was formed to "achieve nationally consistent performance-based building regulatory systems that was efficient, cost effective and met community, industry and national needs" (Australian Building Codes Board, 2004).

The BCA was adopted by the Commonwealth and most states and territories in July of 1997, and is updated on a yearly cycle to ensure that the document is always up to date (Australian Building Codes Board, 2004). The codes are organised into sections including *Structure*, *Fire Resistance*, *Access and Egress*, *Services and Equipment*, *Maintenance* and a number of other specific areas important to the safety of buildings (BCA, 2005). The section on *Access and Egress* concentrates on the disabled, and is therefore specifically important to this project.

Section D of the BCA, *Access for People with Disabilities*, outlines the requirements for accessibility to different classes of buildings. A table describing the different building classes is found in Appendix G. One example is that the BCA requires Classes 5, 6, 7, and 8 to provide accessibility to the entrance floor and all other floors using a ramp, step ramp, or lift (BCA, 2005). The codes then provide specific details on how to make the aforementioned required areas accessible. For example, the document explains how passenger lifts must comply *if* passenger lifts are required in the building.

Section D3.7: *Hearing Augmentation* is included within the *Access for People with Disabilities* section of the BCA. Within *required accessible* buildings, there are four areas where hearing augmentation systems must be provided. These include any conference room with a floor area of $100m^2$, any judicial room, any auditorium in a Class 9b building, and any ticket offices or teller booths (BCA, 2005). The BCA also states that all accessible facilities must be clearly identified with international symbols of access. Finally, sections can be found throughout the BCA accommodating for the

disabled in areas including stairways, pedestrian ramps, and sanitary facilities (BCA, 2005).

2.4.2 Standards Australia

Standards Australia is a private company that creates standards in a variety of areas such as business, building, community, policy, design and development. Since the company is private, its standards are *recommendations* and not legal codes. Along with the BCA, Standards Australia sets regulations to improve the environment of buildings even though this matter is not its area of concentration; its primary focus is "to enhance Australia's economic efficiency, international competitiveness and the community's expectations for a safe and sustainable environment" (Standards Australia, 2005). The structure of Standards Australia includes five divisions; one division is the Building and Utilities division, which is responsible for the standards within the categories of structures, fire protection, and safety, among others (Standards Australia, 2005).

In 2004, Standards Australia released a document titled "Australian Standard: Sound Systems for Emergency Purposes." A committee including a number of prominent companies and organisations prepared this document. The committee consisted of representatives from 14 groups, including the Australasian Fire Authorities Council, the Australian Building Codes Board, Deafness Forum of Australia, and Fire Protection Association Australia (FPAA). This document provides general requirements, system technical requirements, installation requirements, and system operation instructions for the sound systems used for emergency purposes. Although this document clearly specifies safety precautions for the general public, no sections are included requiring specific safety accommodations for the Deaf and hard of hearing (Standards Australia, 2004).

2.4.3 Victorian State Building Regulatory Documents

At the Victorian level, the two documents that work along with the Building Code of Australia to regulate the built environment are the Building Act of 1993 and the Building Regulations of 1994. The main difference between these two documents is that the Building Act provides the framework to regulate buildings, while the Regulations specifically define the requirements necessary within the buildings (Building Commission "Victoria's Building Legislation System", 2005). The Building Act includes sections such as building permits, inspection of building work, occupancy permits, and plumbing regulations (Building Act of Victoria, 1993). The Regulations were derived from the Building Act and contain specific requirements under categories such as Architectural Features, Window Shutters, and Windows and Balconies (Building Regulations of Victoria, 1994).

The documents are both regulated by four committees: the Building Advisory Committee, the Building Regulations Advisory Committee, the Building Practitioners Board, and the Building Appeals Board. All four committees, established alongside the Building Commission of Victoria, are responsible for regulating the Victorian building environment for the best of the Victorian community (Building Commission, 2005).

2.4.4 Disability Discrimination Act

Australia's disability policy is similar to the Americans with Disabilities Act regarding accommodation, goods, services, and facilities. The Disability Discrimination Act of 1992 (DDA) is a set of guidelines created to ensure the equality of the disabled.

In the Disability Discrimination Act, the *Access to Premises* section states "it is unlawful for a person to discriminate against another person on the ground of the other person's disability or a disability of any of that other person's associates" (Disability Discrimination Act, 1992). Later in this section, the Act clarifies the law's intent with specific provisions. Part 2 of the *Access to Premises* section of the DDA states:

1. *This section does not render it unlawful to discriminate against a person on the ground of the person's disability in relation to the provision of access to premises if:*
    a. *the premises are so designed or constructed as to be inaccessible to a person with a disability; and*
    b. *any alteration to the premises to provide such access would impose unjustifiable hardship on the person who would have to provide that.*

(Commonwealth Consolidated Acts, 2005)

The continuation of Section 23 of the Disability Discrimination Act can be found in Appendix H. The DDA is not a set of codes or standards, so in order for the Act to be enforced, other regulations must be changed to comply with the DDA.

2.4.5 Relationships between the BCA, Standards Australia, and DDA

All the building regulatory documents of Australia are related so that together, they can provide for the well-being of the entire community in buildings. The relationships between the documents can be seen in Figure 3. As illustrated in Figure 3 the only time the standards are laws is when the BCA refers to them. The BCA is enforceable as a series of laws, and many BCA requirements are stated by referring to Standards Australia. When the Standards change, they remain enforceable requirements since they are part of

the laws through reference by the BCA. Similarly, when the BCA changes, the Building Regulations and the Building Act change. Victorian building legislation requires that all buildings comply with the Building Regulations, the Building Act, and the Building Code of Australia.

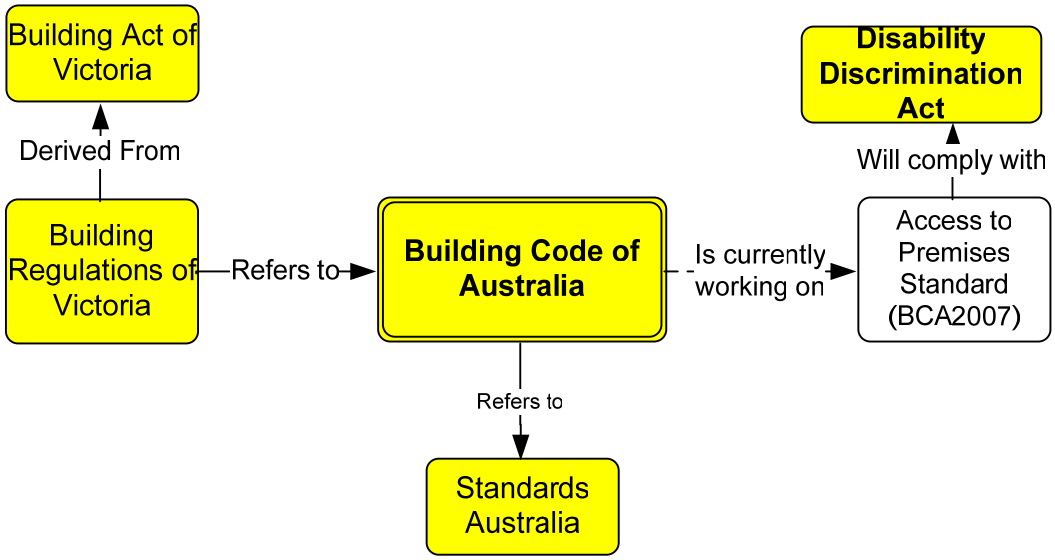

Figure 3: Relationship between the Australian Building Regulatory Documents:

The BCA is intended to act in accordance with the DDA. The DDA states requirements for the disabled, but it does not list any actual regulations in buildings. Ideally, the documents should be in agreement with each other, however, there are many discrepancies between the three documents. The Australian Building Codes Board clearly summarises the main discrepancies between the BCA and DDA in the following list:

- *The DDA contains intent and objectives but not the technical details of how to provide access for people with a disability;*
- *The current technical requirements of the BCA are not considered to meet the intent and objectives of the DDA; and*
- *The existence of two legislative requirements in relation to access for people with a disability to buildings, being the BCA and DDA, clearly gives rise to potential inconsistencies.*

(Australian Building Codes Board, 2004)

The Australian Building Codes Board recognises that disagreements between the documents exist. According to the ABCB, "the intent and objectives of the DDA have not been supported by detailed technical requirements, so there is no clear way to ensure

that a building complies with the DDA" (ABCB, 2004). Currently, the Australian Building Codes Board is working to make the two documents correspond; the *Access to Premises* standard is currently being reviewed by the Planning Minister and is expected to be in the Building Code of Australia by 2007 (Peter Nassau, personal communication on April 11, 2005).

Chapter 3. Methodology

This chapter describes the methods we used to gather and interpret data. These techniques included research, interviews, focus groups, and qualitative analysis. Methods to obtain information regarding alerting and evacuating the deaf during emergency situations are discussed, including building regulations, statistical and anecdotal evidence, and the perspectives of stakeholder groups. The procedures for how changes occur to the building regulations are described. Finally, our methods for analysing the building regulations, statistical and anecdotal evidence, the viewpoints of different stakeholder groups, and potential strategies to generate change are explained.

3.1 Issues with Alerting and Egress of the Deaf

This section discusses the methods used to understand the building regulations of Australia, Canada, the United Kingdom, and the United States, and how they provide for the deaf. The techniques for gathering statistical evidence of deafness in Australia and anecdotal evidence regarding alerting and evacuating the deaf during emergency situations are explained. The procedures for gathering the perspectives of the deaf community; advocacy, service provision, and support organisations; building and property organisations; and building regulatory board committees are also discussed.

3.1.1 Building Regulations of Australia, Canada, the United Kingdom, and the United States

To gain a better understanding of how each country's documents regulate buildings and provide for the deaf, we researched the various building regulatory documents in Australia. Several documents in Australia work together to ensure safe and comfortable buildings. The Building Code of Australia, Standards Australia, and the Disability Discrimination Act provide for the community at the federal level, while the Building Regulations and the Building Act regulate the Victorian state building environment. We obtained the contents of these documents through electronic access at the Metropolitan Fire Brigade's library, the documents' official websites, and published versions. We examined the documents and available published reviews on their policies to discover how the documents work together to provide for the deaf in buildings and how their building regulatory committees collaborate. To further understand the regulating system, we interviewed individuals on committees associated with the Australian Building Codes Board and Standards Australia.

To understand how Australia's regulations compare to those of other countries, we researched the building regulatory documents in Canada, the United Kingdom, and the United States. We examined the Americans with Disabilities Act for the United States'

policy, and we researched the Building Regulations and the Disability Discrimination Act, and the Disability Discrimination (Employment) Act of the UK to gain the United Kingdom's policies. We also examined the documents in Canada, which include the National Building Code of Canada, the National Fire Code of Canada, the Standards Council Canada, and the Canadian Human Rights Act. We obtained these documents through official websites and contacts from each respective country.

We analysed and compared each country's building regulatory documents regarding alerting systems and evacuation systems for the deaf in buildings to discover similarities and differences in their policies. We also examined the documents to find discrepancies between the regulations for the deaf community versus those for the hearing community and differences between how each country provides for the deaf.

3.1.2 Statistical and Anecdotal Evidence of Deafness and Problems Being Alerted in Emergencies

To understand the extent of deafness in Australia, we consulted a study done in 1998 by the Centre for Population Studies in Epidemiology. We examined the prevalence of different levels of hearing impairments to gain a better understanding of the composition of the deaf population affected by the lack of alerting systems.

In order to understand the personal impact of alerting systems on deaf individuals, we looked for anecdotal examples of the deaf having problems being alerted or evacuating buildings in emergency situations. We researched electronic articles available on the Internet for documented news stories, and also asked interviewees and focus group participants to relate personal experiences related to this problem. Gathering these stories through interviews and focus groups allowed us to hear the information from the source and ask follow-up questions about the effects of each situation.

3.1.3 Views of Stakeholder Groups

To understand the different viewpoints on changing building regulatory documents to accommodate alerting and evacuating the deaf in buildings, we sought the opinions and knowledge of this subject from various stakeholders. These stakeholder groups included (1) the deaf community, (2) advocacy, service provision, and support organisations, (3) building and property organisations, and (4) building regulatory board committees. We held interviews with representatives from organisations in each category, and also conducted focus groups with representatives of the deaf community, and advocacy, service provision, and support organisations.

To gain insight into the opinions of the deaf community, we spoke with deaf individuals because they know firsthand what challenges and concerns they face daily in public buildings. To obtain their in-depth thoughts about alerting systems and the lack of regulations requiring them, we conducted interviews and focus groups with employees of the Victorian Deaf Society. See Appendix I for a description of the etiquette for communicating with deaf individuals. The areas we hoped to gain information on included anecdotal evidence of situations they or others have experienced, the awareness and opinions of the deaf community regarding the current deaf alerting systems and evacuation procedures, and suggested changes that might improve being alerted and evacuating during emergencies. Refer to Appendix J for a general protocol of interviews with deaf individuals, and Appendix K for the focus group protocol with the deaf community.

To gain more insight into the challenges the deaf community faces, we obtained information from advocacy, service provision, and support organisations. These organisations continuously interact with the deaf, and are therefore aware of the deaf community's concerns and issues in a variety of lifestyle areas. We conducted interviews with representatives from Deaf Children Australia, Deafness Forum, the Victorian Council of the Deaf, and the Victorian Deaf Society, asking about the deaf community's concerns on being alerted and evacuating during emergencies, anecdotal evidence of situations where deaf individuals have not been alerted, the awareness of the deaf community regarding current alerting systems for the deaf, and suggestions for potential changes to improve the alerting and evacuation of the deaf. Appendix L displays the general protocol we followed when we interviewed representatives from groups supporting the deaf community; we tailored each protocol to the specific interviewee and the organisation they represented.

To understand the building industry's perspective, we obtained the views of building and property organisations. Since the building regulations impact these companies, we hoped the building and property organisations could provide knowledge and opinions regarding changing the regulations to include alerting and evacuation systems for the deaf. We interviewed representatives from the Building Commission, Jones Lang LaSalle, the Master Builders Association, and the Property Council of Australia. The information we hoped to gather was the effect of changes to the building regulations on their organisations, their position on changes to the building regulatory documents, and possible arguments hindering changes regarding alerting systems for the deaf. Refer to Appendix M for the general interview protocol for representatives from building and property organisations; we customised each procedure to the interviewee and represented organisation.

To gain a better understanding of the operation of the Australian building regulations and their regulatory committees, we conducted research and interviews. These stakeholders are significantly involved in the regulation process, and therefore could provide knowledge and insight into the process, current situation, and potential changes. We interviewed representatives from the Standards Australia Committee, and the Building Codes Committee and the Building Access Policy Committee of the Australian Building Codes Board. We hoped to gain information on the different committees' positions on changes to include alerting systems for the deaf, past or current work that is relevant to alerting systems for the deaf, obstacles that might delay change, and the feasibility and potential for change. We also sought information regarding the purposes and responsibilities of each significant committee within the national, state, and disability divisions. Refer to Appendix N for the general protocol followed during interviewees with representatives of building regulatory boards; we made each protocol specific to the interviewee and represented board.

3.2 Analysing Data to Generate Recommendations

Using qualitative data analysis, we drew conclusions regarding whether changes to the Australian building regulatory documents should occur, what these suggested changes should be, and what strategies might be needed to generate changes. In order to develop conclusions on the first two objectives, we compared the building regulatory documents of Australia, Canada, the United Kingdom, and the United States, analysed statistical and anecdotal evidence, and compared the viewpoints of stakeholder groups. To formulate strategies with the ability to produce changes, we analysed the different possible processes to create change.

3.2.1 Comparison of the Building Regulations of Australia, Canada, the United Kingdom, and the United States

By researching and comparing the regulatory documents of Australia, Canada, the United Kingdom, and the United States, we gained an understanding of how each country's regulations provide for the deaf, and identified the similarities and differences between the regulatory documents of each country. To generate conclusions from this knowledge, we analysed how the Building Code of Australia and Standards Australia provide for the deaf in relation to the Disability Discrimination Act. Analysing the relationship between the Australian building regulatory documents allowed us to better understand how the documents provide for the deaf. We also comparatively analysed how Australia accommodates for the deaf in relation to Canada, the United Kingdom, and the United States. The analysis of discrepancies between the Australian documents and the

comparison to other countries helped us determine if the Australian regulations should be changed.

3.2.2 Analysis of Statistical and Anecdotal Evidence to Understand the Impact of Alerting Systems on the Deaf

Statistical evidence on the incidence of deafness in Australia and the frequency of different levels of hearing impairment in Australia was analysed to generate conclusions on the impact of the lack of deaf alerting systems. This analysis allowed us to understand how many people are affected by the lack of alerting systems for the deaf and what type of hearing impairments they have. Analysis of the anecdotal evidence collected from interviews, focus groups, and published sources aided in our understanding of what problems or potential problems have occurred when the proper alerting system was not present. Analysing the cases that resulted in death or injuries also gave us evidence to determine if the lack of proper alerting systems can result in tragic consequences. These two analyses gave us an understanding of the scope of this problem and provided evidence regarding if changes to the building regulations to implement alerting systems for the deaf were warranted.

3.2.3 Comparison of Stakeholders' Views to Illustrate Trends

We qualitatively analysed the information gained from each stakeholder group to discover how their viewpoints compared and contrasted. From this analysis, we classified the stakeholders according to similar thoughts and opinions regarding alerting systems for the deaf. We then analysed each group to better understand the specific trends illustrated by their viewpoints. From this investigation, we gained an understanding of the different perspectives regarding alerting systems for the deaf and what stakeholders share similar opinions.

3.2.4 Creation of Strategies to Generate Change

To identify possible strategies for change, we analysed the history of each Australian building regulatory document, how each is regulated, and the processes necessary to amend each. We interpreted this information, which we gathered through research and interviews, to determine various procedures that have the potential to change building regulatory documents. Further analysis into these pathways allowed us to determine effective and feasible strategies for changing the building regulatory documents. From these interpretations, we formulated recommendations of potential pathways to facilitate changes to the different policies regarding alerting systems for the deaf.

Chapter 4. Results and Analysis

This chapter presents the findings from inquires into other countries' building regulations, evidence regarding the importance of alerting and evacuating the deaf, stakeholders' views on alerting systems and evacuation of the deaf, and the relationship between Australia's building regulatory documents and processes. These results provide an understanding of the current building regulations, statistics on the incidence of deafness, anecdotal evidence of egress difficulties and fatalities due to alerting problems, and input from various stakeholder groups. The analysis of this evidence leads to the recommendation of changes to the current regulatory documents and strategies to implement them by presenting the changes to the appropriate regulatory boards.

4.1 Comparison of Building Regulations, Statistical Evidence of Deafness, and Anecdotal Evidence of Alerting Problems

The following section explains and compares pertinent aspects of the building regulations of Australia, Canada, the United Kingdom, and the United States. The regulations of each country are explained and analysed to reveal the safety accommodations provided for the deaf. We also present statistical information about Australia's deaf population, and describe anecdotal evidence of difficulty alerting the deaf in emergencies.

4.1.1 Comparison of the Building Regulations of Australia, Canada, the United Kingdom, and the United States

The countries selected for comparison of building regulations with those of Australia were Canada, the United Kingdom, and the United States. These countries were chosen because they are industrialised nations, similar to Australia in culture, and their building regulatory documents were accessible and written in English. This section analyses the differences between the building regulations of each country pertaining to building egress of the deaf in emergencies. A more detailed description of each country's building regulations can be found in Section 2.3 of the background chapter.

- **Australia**
    - The Disability Discrimination Act, *Access to Premises* section states "it is unlawful for a person to discriminate against another person on the ground of the other person's disability or a disability of any of that other person's associates" (Disability Discrimination Act, 1992). The Building Code of Australia (BCA) mandates that public and private buildings have an audible smoke alarm in every room. There is no regulation regarding alerting systems for the deaf.

- **Canada**
    - The Canadian Human Rights Act requires that all individuals be treated as equal members of society and not be discriminated based on: race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, family status, disability, or conviction for an offence for which a pardon has been granted (Department of Justice Canada, 2004).
    - Canadian building codes are adopted and enforced by most provinces or territories and can be altered by local governments to suit regional needs (National Research Council Canada, 2005). The codes require that any building intended for use by the deaf or hearing impaired must provide visual alarms with audible alarms. It also requires that the visual signal must be visible throughout the entire floor (Claire Fréchette, personal communication, 3 April 2005).
- **United Kingdom**
    - The United Kingdom's Disability Discrimination Act seeks to make it unlawful to discriminate against a disabled person with respect to the provision of goods, facilities and services or management of premises, and employment (DDA-UK, 1995). The Disability Discrimination (Employment) Regulations 1996 provides for the disabled in their workplace. It ensures equal wages, treatments, contract work, and building regulations to accommodate their safety (Her Majesty's Stationery Office, 2000).
    - Building Regulations 2000 specifies the building regulations within England and Wales. This document exists to ensure "the health and safety of people in and around all types of buildings…and it provides for energy conservation, and access to these buildings." It is required by the UK Building Regulations that the responsible person, or employer, is responsible for "safeguarding their employees in case of fire" (Office of the Deputy Prime Minister, 1997). The buildings included in the Building Regulations 2000 are domestic, commercial, and industrial buildings (Office of the Deputy Prime Minister, 2004).
- **United States**
    - The Americans with Disabilities Act strives to prevent inequality for those with disabilities. It sets forth a "clear and comprehensive prohibition of discrimination on the basis of disability" (Evan Terry Associates, 1992), and clearly states many guidelines to accommodate the deaf community. The ADA clarifies that if audible alarms are

> installed throughout a building, there must be an equal number of visual alarms. The Act calls for assistive listening devices, text telephones, and hearing aid compatible telephones to accommodate the deaf community in public buildings.

The results of a comparative analysis show that Australia's regulations lack provisions for the safety of the deaf, and that other countries' regulations serve as evidence that options exist to better accommodate the safety of the deaf in buildings. Although the regulations of Canada and the United Kingdom are vague about details, they *do* include some provisions for the deaf that have the potential to become more specific requirements to accommodate for the deaf. Our research shows that the United States has the most comprehensive regulations for alerting systems to ensure the safety of the deaf in buildings.

The ADA has a similar purpose to Australia's Disability Discrimination Act but the ADA is more comprehensive in that it includes both the *rights* of the disabled and the *technical requirements* necessary in public buildings to provide acceptable, equal environments for people of all disabilities. Not only does the ADA provide explicit details of how to provide satisfactory levels of access and egress, it also has enforcement requirements to penalise any people responsible for buildings that are not in complete compliance with the Act. If the Act is violated, the "Department [of Justice] may obtain civil penalties of up to $55,000 for the first violation and $110,000 for any subsequent violation" (U.S. Department of Justice, 2004). On the contrary, Australia's Disability Discrimination Act has minimal regulation violation consequences. Current consolations vary from an apology to payment of damages (Human Rights and Equal Opportunity Commission, 2004); the DDA's style of enforcement may indicate areas for improvement of the alerting and egress conditions for the deaf in Australia's buildings.

4.1.2 Incidences of the Deaf Requiring Emergency Egress

From our research, focus groups, and interviews, we discovered several situations in which deaf people have experienced problems being alerted in buildings during emergencies. Although these are only some examples, they illustrate the types of egress problems experienced by the deaf community. In analysing these stories, we observed that many of these incidents could have been avoided if alerting systems to accommodate the deaf were in place. This section illustrates consequences that deaf individuals can encounter if no appropriate early warning systems are present in buildings to alert them of an emergency situation.

- In October of 2003 in Tasmania, a deaf man died when his house caught on fire. He was unable to hear his audible fire alarm sounding or his neighbours knocking on the windows. The Tasmanian Fire Service regional fire investigator said, "It was very unfortunate the man could not hear it [the alarm]," while the TFS community education consultant stated that a specialised alerting system "might have helped" since flashing lights are effective enough to awaken sleeping individuals. In closing, the TFS regional fire investigator declared, "The Tasmania Fire Service would advise anyone with hearing problems to examine the alternative alarms on the market" (*The Mercury*, 2003).
- In January of 2005 in Dallas, Texas, two deaf parents could not hear the fire alarm sounding, and awoke when the fire was already engulfing their home. The father and his 6-year-old and 7-year-old sons were able to jump to safety out of a second floor window; however, his wife, 3-year-old child, and 10-month-old child died (Stiles, 2005).
- At a Russian boarding school for deaf children in April of 2003, a fire killed 28 children between 6 and 14 years of age and seriously injured 17 others while rescuers attempted to individually awaken the students who could not hear the audible alarms (The Associated Press, 2003).

Incidences of alerting problems for the deaf during both drills and emergency situations can also occur.

- Janice Knuckey, a deaf teacher who works at Deaf Children Australia in Melbourne, Victoria, was teaching a classroom of deaf children when an announcement advised all building occupants to leave the building. Although this situation was only a drill, the deaf teacher and her class were left in the building because they could not hear the announcement over the PA system (Janice Knuckey, personal communication, 24 March 2005).
- In an article written by the United States Fire Administration (USFA), Federal Emergency Management Agency, several deaf participants of a focus group recounted experiences when a fire erupted in their building. The individuals each reported having no knowledge of the situation until a firefighter arrived to awaken and evacuate them (USFA, 1999). This focus group estimated that the time from the first alarm to when the occupants were evacuated ranged from 30 to 60 minutes. None of the respondents had strobe lights or vibrating pillows installed in their residences (USFA, 1999).

- An article printed in the *Toronto Star* described the reaction of a deaf Canadian teacher who was standing on the beach during the tsunami in December of 2004. Although buildings set off audible alarms to warn the inhabitants to evacuate and move inland, the deaf teacher could not hear the sounding alarms or shouted warnings. Due to his inability to be alerted, he did not realise the danger of the situation until it was too late and was dragged out by the currents. He stated he was lucky to have survived, but other deaf people may not have been so lucky (Heath-Rawlings, 2005).

These stories illustrate types of incidents that can occur when there are no appropriate alerting systems for the deaf. Bernd Bartl, a professor at RMIT consulted for information on strategies to amend the building regulations, argued that individual stories in the media are powerful and vital to spark human interest on alerting systems for the deaf. He believes that increasing public awareness on this matter is an effective tool when attempting to generate changes to the building regulations (Bernd Bartl, personal communication, 23 March 2005).

4.2 Stakeholders' Views on Alerting Systems and Egress of the Deaf

Using interviews and focus groups, we gathered information from stakeholder groups regarding their positions on alerting systems and evacuation for the deaf in buildings. The initial stakeholder groups were classified as the deaf community; advocacy, service provision, and support organisations for the deaf; building and property organisations; and building regulatory board committees. The results from their responses allowed us to separate the stakeholder groups into two categories based on similar opinions and viewpoints. The first group can be generalised as members of and professionals in the deaf community, and it is composed of the deaf, and advocacy, service provision, and support organisations. The second group is the building environment, the safety, and the building regulations communities. This category contains building and property organisations, safety organisations, and regulatory board committees. Each represented organisation is described in Appendix O. Contact information for each representative who contributed information can be found in Appendix P.

4.2.1 Members of and Professionals in the Deaf Community

Deaf individuals and representatives of advocacy, service provision, and support organisations shared their viewpoints on the current building regulations and available deaf alerting systems for emergency situations. The contributors included:

- Deaf employees from the Victorian Deaf Society;

- Bernd Bartl – a professor of science, engineering and technology at the Royal Melbourne Institute of Technology (RMIT) and an experienced advocate for the Disability Support and Housing Alliance;
- Janice Knuckey – a policy worker and teacher from Deaf Children Australia; and
- Rachel Miers – the manager of the Victorian Council of the Deaf (VCOD).

All participants in the focus group were profoundly deaf employees of the Victorian Deaf Society, and the interviewees were comprised of both deaf and hearing individuals. This stakeholder group's concerns, experiences, knowledge, and opinions regarding safety were revealed through a focus group and interviews with representatives from each organisation. The information they provided allowed us to gain an understanding of their viewpoints and illustrated trends that represent their position.

Members of the group expressed concerns regarding the deaf being alerted and evacuated during emergency situations in buildings, including communication and sign placement. The representatives of the hearing community acknowledged that a lack of provision for alerting the deaf was a problem, while the deaf representatives from Deaf Children Australia, VCOD, and the Victorian Deaf Society voiced their personal concerns when in public buildings. Example concerns included how they would be alerted to an emergency when they were in isolated areas such as a toilet or an underground car park; a fear of being in lifts during an emergency because communicating with people outside the lift would be impossible; and being uncomfortable in hotels because the hotels do not provide any advice on being alerted or safely exiting the building during an emergency. Many public buildings have announcements to provide information; however, the general consensus was that monitors with scrolling written announcements would be more helpful. The group thought that since most public buildings only had exit signs, evacuating was a problem since communication of specific instructions would be difficult. All contributors agreed that they felt concerned regarding how well the deaf would be alerted and evacuated during an emergency situation.

The participants believed that access to information about alerting equipment for the deaf is important; however, the response from the focus group suggested that the general deaf community is not knowledgeable about this equipment and does not own it. Reasons given for this lack of knowledge and equipment included relying on hearing family members, minimal advertising of these products, having landlords who do not provide them with the equipment, and being unable to afford the systems. Examples of how deaf individuals became aware of these products were through schools, presentations, and

festivals for the deaf community. Although all focus group participants were aware of these types of alerting systems, only three out of seven people owned them. These alerting systems included one with a flashing light triggered by the phone, one with a flashing light for fire alarms that had never been tested, and one with a flashing light system that responds to the phone, doorbell, baby cries, and the fire alarm.

Contributors to the interviews and focus group thought the current building regulatory documents do not provide for the deaf in buildings with regards to alerting and evacuating. Some views expressed on Australia's disability laws by representatives of support organisations were that the laws are not strong because they have only been recently achieved; that Australia is far behind countries such as the United States with respect to these laws; and that the lack of accommodation for the deaf is a "national disgrace." The members of the focus group agreed they were not provided for, and said they felt ignored by the government. Reasons given for the lack of accommodation were cost and unawareness of both the problem and possible solutions.

Support for changes to the building regulations to include specialised alerting systems was expressed; however, the focus group participants and interviewees were unsure of exactly what those changes should be. The reactions of participants were mixed when they were introduced to the alerting methods of sounds, flashing lights, and vibrating devices. The focus group thought that the audible alarm might be beneficial to a person who was not fully deaf, although visual alerts would still be a better option since sounds might confuse people who had hearing impairments. Although most participants found the flashing lights aesthetically unappealing, some thought they would be helpful in situations requiring warning and evacuation if they were situated in the correct part of a room. Recommendations for the lights included placing them near exit signs so the deaf would know to leave the building, linking them to the overhead room lights, and using coloured lights because they might be more noticeable. The vibrating system and flashing light system also caused a mixed reaction, since the general consensus was that the effectiveness of an alert depends on what method an individual would respond to best. However, some members said they set their mobile to vibrate and use it as an alarm clock, which suggests that a vibrating device would achieve similar results. Overall, many people felt the lights were important in buildings and daytime situations, while vibrating devices might be more useful in hotels and other housing accommodations.

From the variety of opinions and suggestions, we noticed several trends. Contributors believed the current regulations are inadequate for alerting the deaf during emergency situations and changes are necessary to improve alerting, communication, and sign placement. The representatives of the deaf community and support groups thought cost

and unawareness of the problem and available alerting equipment for the deaf are two reasons why the Australian laws do not provide for the deaf in cases of emergency building egress. Although special alerting systems could be beneficial, the deaf individuals had mixed feelings on the current audible, visual, and tactile options.

4.2.2 The Building Environment, Safety, and Building Regulations Communities

Interviews with representatives from the building environment, safety, and building regulations communities provided viewpoints from each of these perspectives. The *building environment community* consists of building and property organisations, which focus on the interests of the building industry. These organisations were represented by:

- Peter Bartucca – a property manager from Jones Lang LaSalle;
- Frank Martinez – a property manager from Jones Lang LaSalle;
- Peter Nassau – the Director of Building Quality for the Building Commission in Victoria and a representative on the ABCB Building Codes Committee;
- Paul Waterhouse – the National Policy Manager of the Property Council of Australia and a representative of the ABCB Building Access Policy Committee; and
- Geoff Woolcock – the Managing Director of the Master Builders Association Building Services.

The *safety community* includes organisations that focus on the safety and well-being of the entire population. Representatives in this category consisted of:

- Joanne Fulton – the individual in charge of the Department of Human Services (DHS) housing units in the Eastern Region;
- Tass Georges – a building surveyor, inspector, and engineer from the Metropolitan Fire Brigade (MFB);
- Bob Hetherington – a station officer and regulation enforcer from the MFB;
- Ivan Peterson – an Access and Integration Planner from the Banyule City Council and the chair of the Standards Australia Committee;
- Hank Van Ravenstein – the manager of Asset Compliance in the Capital Management Branch of DHS; and
- Norm Winn – an evacuation consultant from Fire & Safety Consultants

The *building regulations community* consists of members of building regulatory board committees that are involved in creating and amending the building regulatory documents. Representatives from this category included:

- Brian Ashe – the Project Manager in Fire, Research, and Engineering for the Australian Building Codes Board (ABCB);
- Matthew McDonald – a Project Officer in the Technical/Development Division of the ABCB and a representative of the ABCB Building Access Policy Committee;
- Peter Nassau – the Director of Building Quality for the Building Commission in Victoria and a representative of the ABCB Building Codes Committee;
- Ivan Peterson – an Access and Integration Planner from the Banyule City Council and the chair of the Standards Australia Committee; and
- Paul Waterhouse – the National Policy Manager of the Property Council of Australia and a representative of the ABCB Building Access Policy Committee

Information from these individuals provided us with a better understanding of their organisations' positions on changes to the building regulations to include deaf alerting systems, the effect of changes to the building regulations on their organisations, and insight into why these changes have not occurred. Representatives from these organisations also gave us information on how the regulations are created and amended, and what the different regulatory boards are currently doing to address the issue of alerting systems and egress of the deaf.

Changes to building regulatory documents affect building owners more than property managers and other building organisations because the building owners would have to bear the cost of installing deaf alerting systems. The building organisations must comply with the Buildings Code of Australia, so the main effect of changes to the regulatory documents is that the employees involved in implementing the building regulations must learn the new codes to accurately build and manage properties. The consequences of not following the building regulations can lead to legal problems and damaged reputations, but these implications apply to all the regulations and are not specific to those involving alerting systems for the deaf. Therefore, the cost of implementing changes to the building regulations concerns building owners more than building and property organisations.

The representatives from these three stakeholder communities suggested cost, feasibility, and the small deaf population as reasons why changes have not previously occurred. They thought the cost of implementing alerting systems for the deaf in all buildings might be higher than the benefit of doing so due to the low population of deaf individuals. The

property managers from Jones Lang LaSalle said alerting systems might be more important in buildings where many deaf people will visit, such as the Victorian Deaf Society, causing the need for deaf alerting systems to be unique to each building. Interviewees also believed most of the regulations focus more on the majority instead of the minority, and the deaf community is in the minority. Therefore, they thought that outfitting all buildings with equipment for the deaf is difficult to support when compared to the cost.

Representatives from the different committees associated with the Australian Building Codes Board supplied information regarding how the building regulations are developed and changed, and what the regulatory boards are currently doing to address the issue regarding alerting systems for the deaf. These representatives said that the Building Access Policy Committee is currently working on a project to align the Building Code of Australia with the Disability Discrimination Act. This document, which will better accommodate the disabled and their access to buildings, is called the *Access to Premises* Standard and is planned for release by BCA 2007. Although this document focuses only on access to buildings, it is a step towards better accommodation for the disabled; once the issue of access is resolved, egress can become a primary focus.

The interviewees from the building regulatory board committees acknowledged that changes would be beneficial to improve alerting and evacuating the deaf during emergencies. Their position is to ensure that the cost of changes is accurately analysed so it does not outweigh the benefits. This group does not oppose the idea of changes to include alerting systems for the deaf in buildings; however, their focus is to make sure the cost and feasibility of implementing the changes do not adversely affect the businesses in the building industry.

4.3 Strategies to Generate Changes to the Building Regulations

There are a number of strategies that could be implemented to generate change in the building regulations. Pathways can be taken at the national or state level, and also through the Disability Discrimination Act. It can be seen through the relationships between the building regulatory documents that change is possible at each of the levels. As seen in Figure 4, each level presents a number of organisations to appeal to that could potentially generate changes to the regulations. In this section, the various committees and organisations to appeal to are explored.

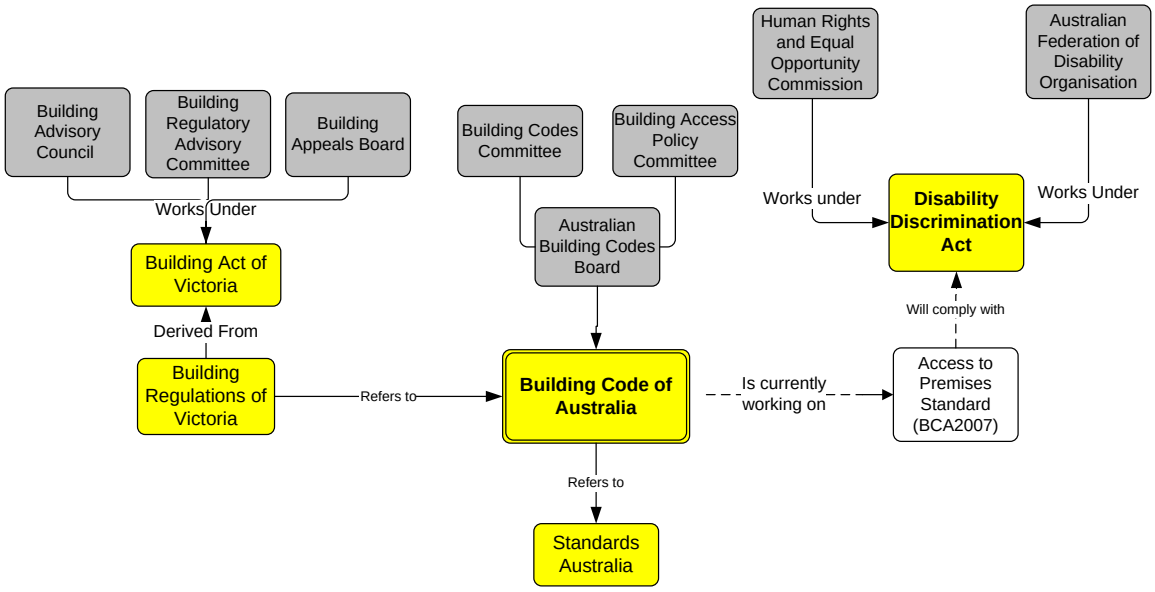

Figure 4: Relationships between the building regulatory documents and their committees

4.3.1 Disability Organisations and Pathways to Generate Change

The **Human Rights and Equal Opportunities Commission (HREOC)** is responsible for reviewing cases of possible discrimination. Under the Disability Discrimination Act, a service provision organisation reserves the right to present an *action plan* to the HREOC to report discrimination (DDA, 1992). Under the DDA, an action plan requires a legal advisor who is capable of presenting where the Act was violated, how a person was discriminated against, and how to go about resolving the issue. A copy of the Provision of Action Plans can be found in Appendix Q. This appeal process can be used to better accommodate a deaf individual if discriminated against in a place of work, or in specific other buildings. Advising the deaf community to appeal to the HREOC would be an initial step to better educate them on discriminatory issues in buildings, and have the potential to educate the public if the media covers specific cases. Although this method will not change any building regulations, it will increase the deaf community's and the public's awareness of the existence of alerting systems which could, in turn, potentially increase the amount of support for changes.

Matthew McDonald, a member of the ABCB Building Access Policy Committee that is currently working on a project to align the Disability Discrimination Act with the Building Code of Australia, suggests that a powerful pathway to generate better accommodation is to approach the **Australian Federation of Disability Organisations (AFDO).** This organisation represents disabled awareness organisations in Australia and has contacts that could potentially create better awareness of disability issues throughout society. Its purpose is to be a voice of the interests of people with disabilities in

Australia. The AFDO "has been established as the primary national voice to government that fully represents the interests of all people with disabilities across Australia" (Australian Federation of Disability Organisation, 2005).

4.3.2 State Committees and Pathways to Change the Building Regulations

At the Victorian level, there are three primary committees that oversee the Building Control System, which are the **Building Regulation Advisory Committee,** the **Building Advisory Council,** and the **Building Appeals Board**. Each committee works with the **Building Commission** to provide for the best of the community and the building environment. If appealing to these committees, it is necessary to provide a strong argument that changes will benefit the entire community and not just a small distinct population.

The **Building Regulation Advisory Committee (BRAC)** is a state-wide committee that advises the building regulation *drafts* in Victoria for the betterment of the community. The two Victorian documents are the Building Act of Victoria and the Building Regulations of Victoria. The BRAC is comprised of representatives from organisations including, but not limited to, the Country Fire Authority, the Melbourne City Council, the Institute of Engineers Australia, the Master Builders Association of Victoria, and the Victorian Property Council of Australia (Building Commission "What you need to know about the BRAC", 2005). The main purposes of the BRAC are to review proposed standards, ensure enforceability and workability, and to strive for the best community outcomes (Building Commission "What you need to know about the BRAC", 2005).

The **Building Advisory Council (BAC)** presents advice to the minister on the administration of the Building Act of Victoria and the Building Regulations of Victoria. The Building Advisory Council is comprised of representatives from organisations including, but not limited to, the Australian Institute of Building Surveyors, the Property Council of Australia, the Housing Industry Association, the Royal Australian Institute of Architects, and the Master Builders Association. The primary focus of this council is to oversee the impact of the building regulatory system and its effects on the building industry for the betterment of all (Building Commission "What you need to know about the BAC", 2005).

The **Building Appeals Board (BAB)** was prepared under the Building Act of Victoria to service the interests of the entire community with regard to safety and amenity seeking "the best possible building outcomes for the building industry and the community as a

whole" (Building Commission "Victoria's Building Legislation System", 2005). Specifically important to people with disabilities, the BAB can consider provisions with regards to access and decide if a provision is being followed on a case-by-case basis. For example, if building owners cannot afford to install ramps due to cost, they may appeal to this board and possibly receive a waiver. Furthermore, disabled people can appeal to the board to report a case where a ramp may not comply with the regulations.

4.3.3 National Committees and Pathways to Change the Building Regulations

At the national level, the primary board that oversees the Building Code of Australia is the **Australian Building Codes Board (ABCB).** The ABCB is appointed by state ministers and "is responsible for the oversight and direction of the regulatory reform program, policy development and direction, priorities and budget and financial control" (ABCB, 2004). Currently, the board is focusing on two major areas of interest: access and sustainability. A strategy to improve the safety of the deaf is to appeal directly to the Australian Building Codes Board.

Currently, the board is aware of the discrepancies between the Disability Discrimination Act and the BCA, which are detailed in Section 2.4.4 of the background chapter. **The ABCB Building Access Policy Committee (BAPC)** is a committee under the ABCB that is currently working to address inconsistencies between the documents. The main purpose of the BAPC is to "help industry, regulators and service providers achieve equitable, cost effective access to buildings, and to the facilities and services available in buildings, for people with disabilities" (ABCB, 2005).

Finally, the **ABCB Building Codes Committee (BCC)** is the ABCB's technical advisory body. "It has responsibility for providing technical advice on reforming, maintaining and upgrading the technical content of Australia's building codes and standards" (ABCB, 2005). This committee is knowledgeable about the technical aspects of the codes, and therefore would be especially important to appeal to with regard to alerting systems for the deaf.

Chapter 5. Conclusions and Recommendations

This chapter presents our conclusions and recommendations regarding emergency egress of the deaf from buildings in Australia. Evidence has led us to conclude that changes to the current building regulations are warranted. Our recommendations for changes to the current Australian building regulatory documents are described. Various options regarding pathways to cause change are also described, and finally, recommendations for future work are presented.

5.1 Conclusions Regarding Emergency Egress of the Deaf

Based on our research, we conclude that the current Australian building regulatory documents do not adequately provide for the safety of the deaf in buildings, and that requirements for alerting systems should be changed to better provide for the evacuation of the deaf during emergency situations. Although Australia's Disability Discrimination Act calls for the equality of the disabled, the Building Code of Australia lacks provisions for the safety and evacuation of the deaf. Representatives from the deaf community; advocacy, service provision, and support organisations; building and property organisations; and regulatory board committees acknowledged concern for the safety of the deaf in buildings. Our results provided evidence of fire related deaths and injuries due to inadequate alerting systems for the deaf. From results generated by a comparison of building regulatory documents, we conclude that Australia's building regulations regarding the deaf are not consistent with the regulations found in other comparable countries. The building regulations of Canada, the United Kingdom, and the United States each have some provisions regarding alerting and safe egress of the deaf in public and/or private buildings.

5.2 Recommended Changes to the Australian Building Regulatory Documents

This section presents our recommended changes to the Australian building regulatory documents. Specifically, we describe how the discrepancies between the Building Code of Australia and the Disability Discrimination Act have led us to recommend that greater consideration of egress issues for the deaf in building regulations be taken when developing regulatory documents. Specific changes to the Australian building regulatory documents are then suggested.

5.2.1 Greater Consideration into Egress Issues of the Deaf in Building Regulations

Although the Australian Building Codes Board (ABCB) developed the *Access to Premises* Standard to eliminate the discrepancies among the Building Code of Australia, Standards Australia, and the Disability Discrimination Act, **we recommend that the Building Access Policy Committee takes greater consideration into the egress issues of the deaf to amend the *Access to Premises* Standard to include requirements for egress.** Our research has shown that although the board intends for better building *access* for the disabled, *egress* is still a largely ignored issue that should be addressed.

Figure 5 depicts the relationships between the Australian building regulatory documents and the DDA. Our study revealed a number of areas of the Australian building regulations where the deaf are not accommodated for, and a lack of consistency among the documents. For example, although the BCA and Standards Australia are intended to act in accordance with the DDA, the DDA states requirements for the disabled that are not fulfilled by any actual regulations for buildings in the BCA or in the Standards Australia that are referred to by the BCA. Unfortunately, there are many discrepancies between the three documents similar to the previous example. The Australian Building Codes Board (ABCB) has clearly summarised the main discrepancies between the BCA and DDA in the following list:

- *The DDA contains intent and objectives but not the technical details of how to provide access for people with a disability;*
- *The current technical requirements of the BCA are not considered to meet the intent and objectives of the DDA; and*
- *The existence of two legislative requirements in relation to access for people with a disability to buildings, being the BCA and DDA, clearly gives rise to potential inconsistencies.*

(Australian Building Codes Board, 2004)

In order to address these inconsistencies, the Australian Building Codes Board must explore the egress issue as part of their efforts to create compliance between the BCA and the DDA. Although the *Access to Premises* is a step forward for the disabled, the full intent of the DDA will not be achieved until the egress safety of the disabled is provided within buildings.

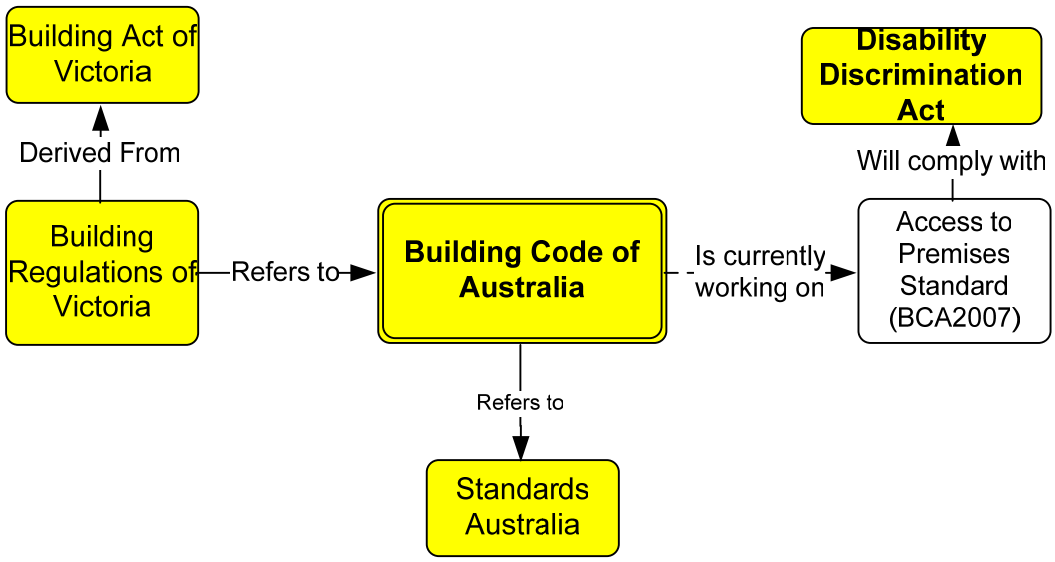

Figure 5: Relationship between the Australian Building Regulatory Documents

5.2.2 Requiring Specific Regulations According to the Building Type

Our findings suggest that it is necessary to distinguish between different building environments before making specific recommendations regarding alerting systems for emergency egress. **We recommend enacting specialised regulations on alerting systems for emergency egress of the deaf according to the type of building.** Each category of building requires different considerations to provide for the safety of the deaf. We define five categories of building environments as follows:

- **Sleep (Monitored Facility) -** Any environment where staff members are employed to oversee the safety of residents, including aged care facilities, facilities that house disabled individuals, and hotels.
- **Sleep (Unmonitored Personal Home of the Deaf) -** Any environment where deaf individuals are responsible for their own safety, such as their personal homes, but not other homes they might visit.
- **Large business -** Any business setting where there may be a large number of employees, and also a number of visitors that will be coming in and out of the facility.
- **Small business -** Any smaller business setting that may not have many visiting clients, and may not have an emergency panel to accommodate new technology.
- **Facilities or companies intended for use by the deaf** - Any environment where the deaf community is a primary focus. Includes deaf schools, service provision organisations, and any other organisations that normally host deaf events.

Within each of these environments, there are a number of options to better accommodate the deaf:

- **Personal Information System:** This system requires a number of hearing people to be responsible to inform a deaf employee in case of an emergency. More than one person is typically needed to ensure readiness at all times. This system would be implemented in a manner that is determined by each establishment.
- **Government Funding:** Similar to the requirement under the United Kingdom's Disability Discrimination Act, this option would require the government to provide funding to profoundly deaf residents who request assistance for evacuation and alerting systems for their home.
- **Flashing Lights**: A visual alerting system coinciding with the audible alarm system, so that when the audible alarm system is alerted by an emergency, the flashing lights will also activate.
- **Emergency Light Colour Coding System**: A system with different light colours to signify different emergency situations. *Orange* should identify an *alert* and *red* should designate *evacuate.*
- **Vibration System**: A tactile alerting system that is wired to an audible alerting system. It is usually placed under a pillow in sleeping situations and will vibrate to alert an individual when the audible alerting system is activated.
- **Pager System**: A system in which pagers are connected to the building's emergency alerting system. Pagers will vibrate or light up when the building's audible alerting system is activated.
- **Telephone Emergency Warning System**: A visual system connected to the building's emergency alerting system. When the building's audible alerting system is activated, a signal on the base of a telephone will light up as visual alert.
- **Computer Emergency Warning System**: A visual system connected to the building's emergency alerting system. A signal on the computer screen flashes as a visual alert when the building's audible alarm system is activated.

Table 2 presents a summary of which solutions we recommend for each respective environment. The BCA categorises buildings into 9 different classes, therefore, this table lists the possible class numbers that each building type would fall under.

Building Type	Recommended Requirements
Sleep (Monitored Facility) (Class: 1b, 3, 9a, 9c)	Personal Information System Flashing Lights Vibration System (deaf residents only)
leep (Unmonitored Personal Home of the Deaf) (Class: 1a)	Government Funding
Large Business (Class: 5, 9a)	Personal Information System Flashing Lights Pager System Either Telephone Emergency Warning tem OR Computer Emergency Warning System
Small Business (Class: 5)	Personal Information System Flashing Lights
Facilities or Companies Catered to the Deaf (Class: 9a, 9c)	Emergency Light Colour Coding System

Table 2: Recommended Requirements According to Building Type

These recommendations would provide protection for the deaf in emergency situations and would better accommodate the overall community. This approach will provide for the major concerns for the safety of the deaf while ensuring that buildings are not required to install irrelevant systems for their type of environment. Both public and private buildings should be examined to determine the specific *Building Type* to ensure equality in all aspects of the community. To further increase protection of the deaf, the recommended safety equipment should be regulated by an Australian Standard to provide requirements on the technical aspects, such as how they should be monitored, and what the procedures are if the battery fails or the wiring is damaged.

5.3 Recommendations for Generating Changes

This section explores the various options available to generate changes to Australia's building regulatory documents to provide alerting systems to facilitate egress of the deaf in emergencies. We recommend education to initially promote awareness of available alerting systems for the deaf and the challenges the deaf face being alerted. Once increased awareness is achieved, we recommend organisations and individuals lobby for changes to Australia's national building regulatory documents, state building regulatory documents, and the Disability Discrimination Act.

5.3.1 Promoting Awareness through Public Education

We recommend that the Victorian Deaf Society educate the public to increase awareness of the available alerting systems for the deaf and the challenges the deaf face being alerted during emergencies. Due to a lack of knowledge among the general public regarding alerting systems, safety, and the deaf community, education should be a primary step. We recommend that the Victorian Deaf Society focus on increasing awareness within the city of Melbourne and the state of Victoria of the various safety concerns for the deaf in building. We recommend the Victorian Deaf Society also inform the fire safety community of these issues to create more awareness of specific concerns regarding the safety aspect of building regulations. The fire safety community can then spread this information to their clients to continue educating the public. We also recommend submitting newspaper articles or seeking media coverage of events related to the deaf community to increase awareness in the following areas:

- Major safety concerns in buildings
- Deaf population statistics and the deaf culture in general
- Available safety technology and alerting systems for the deaf

This step will help educate and inform the public of compelling information including deaths and injuries of deaf people in emergencies where they were not alerted and the measures other countries have taken to provide for the deaf. The goal would be to better inform the public on these issues, which is intended to increase advocacy for the deaf and provide a stronger voice to fight for the safety needs of the deaf community.

5.3.2 Appealing to Building Regulatory Boards

From our research, we conclude that the most effective pathway for generating changes in Australia's building regulatory documents is to appeal to the national building regulatory boards. The decisions of the national building regulatory boards affect the entire country; therefore, appealing to the national boards would be the most comprehensive and realistic approach to change. **To generate changes to Australia's building regulatory documents at the national level to provide alerting systems to facilitate egress, we recommend the Victorian Deaf Society gather a consortium of advocacy, service provision, and support organisations throughout the nation and appeal the recommendations outlined in Section 5.2.2 to:**

- **The Australian Building Codes Board**
- **The ABCB Building Codes Committee**
- **The ABCB Building Access Policy Committee**

The Australian Building Codes Board is the primary board that oversees the Building Code of Australia. Within the ABCB, The Building Access Policy Committee and the Building Codes Committee work for the overall goal of the ABCB. When a change is lobbied to the ABCB, this board will review the issues and appoint the appropriate committee to explore them. Currently, the Building Access Policy Committee is working to align the DDA with the BCA and the Building Codes Committee provides technical advice on the content of the amendments. We recommend lobbying to any or all of these committees to increase the likelihood that the ABCB will decide that changes are necessary. When appealing to these boards, we recommend presenting a case that includes any present safety concerns, possible benefits of change, evidence that change is necessary, and an awareness of the impact of cost on changing the regulations.

As possible alternative options, we have identified two other pathways that can be taken to pursue change. **We conclude if the Victorian Deaf Society, similar organisations, and individuals appeal to the appropriate committees that regulate the state or disability documents, they have the potential to create change to better provide for the deaf.** The committees at the state level are the Building Advisory Council, the Building Regulatory Advisory Committee, and the Building Appeals Board. The committees regulating disability policies are the Human Rights and Equal Opportunity Commission and the Australian Federation of Disability Organisation. All the respective committees and their Australian building regulatory documents are depicted in Figure 6.

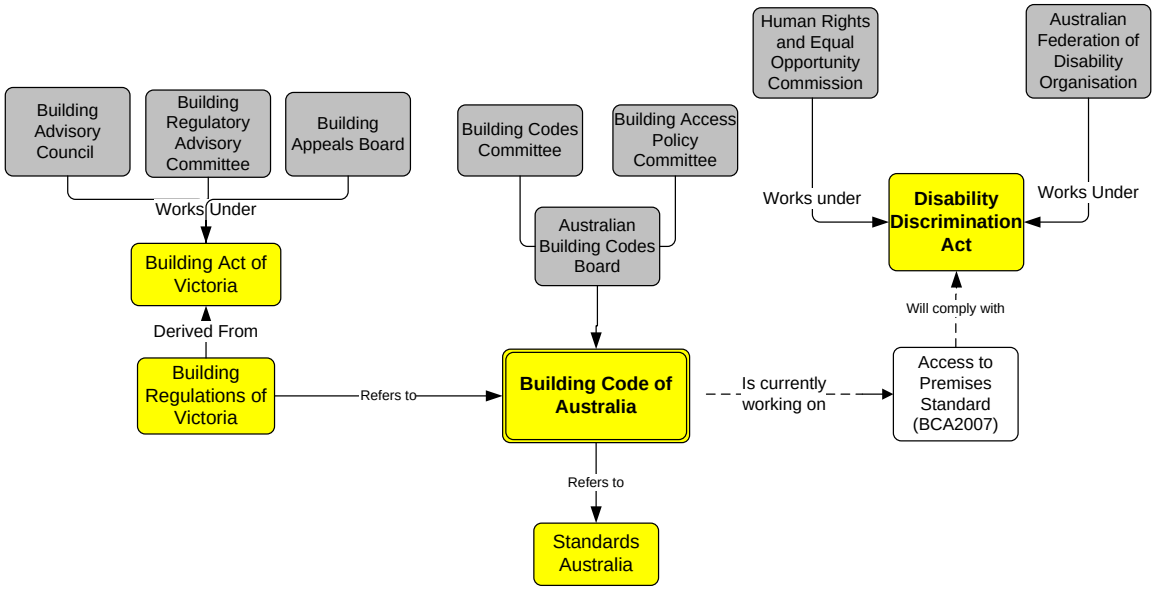

Figure 6: Respective Committees Under Australian Building Regulations

We recommend that a consortium of local advocacy, service provision, and support organisations appeal at the state level when pursuing changes to Australia's building regulatory documents to better alert the deaf in emergency situations requiring egress. Appealing at the state level will increase awareness and potentially generate changes to Australia's building regulatory documents. This consortium should consist of various representatives from advocacy, service provision, and support organisations such as the Victorian Deaf Society, the Australian Association of the Deaf, Deafness Forum, and the Victorian Council of the Deaf. Lobbying with a consortium will benefit the cause by creating a larger network of support and possibly more diverse perspectives from different organisations. At the Victorian state level, we suggest appealing to:

- The Building Advisory Council
- The Building Regulatory Advisory Board
- The Building Appeals Board

We recommend the Victorian Deaf Society advise the deaf community to appeal under the Disability Discrimination Act to generate changes when a discrimination case has occurred to a particular deaf individual in a specific building, such as a workplace. We suggest appealing to:

- The Human Rights and Equal Opportunity Commission
- The Australian Federation of Disability Organisations

This process will not change building regulations, but it will prevent discriminatory cases within solitary buildings. This pathway will also be a form of lobbying to educate people about the rights of the deaf. We recommend this pathway on an individual basis to create better accommodations one building at a time.

5.4 Recommendations for Future Work

Our research into the alerting systems and evacuation needs of the deaf has revealed other areas that warrant research. Below we identify various topics that could lead to more evidence regarding changes to the regulations, and could perhaps lead to more comprehensive accommodations for the deaf. We recommend the Victorian Deaf Society and similar organisations research further into the following areas:

(1) The types of strobe lights available with regards to frequency, colour, and style. Research and responses from the deaf community have raised questions as to whether different wavelengths or colours of light would be more effective for

alerting the deaf. Due to the possibility of a more effective visual alerting system, we recommend further tests and research occur regarding strobe frequencies and colours. Also, because medical research has shown strobe lights can initiate seizures in epileptic patients, we suggest more research into the effects of visual alerting systems.

(2) The current regulatory documents focused on access, and any upcoming regulations that are intended to better accommodate the deaf. Research has shown that the Building Access Policy Committee of the Australian Building Codes Boards developed the *Access to Premises* Standard to address access to buildings. An assessment of how well this document accommodates the deaf regarding access could reveal possible areas to revise and improve, and initiate similar policies that focus on egress of the deaf.

(3) The building regulatory documents of other countries, specifically those that were unavailable for comparison because they are not written in English. The comparison of Australia, Canada, the United Kingdom, and the United States helped identify how Australia provided for the deaf with regards to similar developed nations; however, we recommend more extensive research is performed in this area.

(4) Regulatory Impact Statements (Cost Benefit Analyses) and the financial concerns of changing the Australian building regulatory documents to provide alerting systems for the deaf. When representatives from organisations associated with buildings and the building industry were questioned about the effect of implementing changes to increase the safety of the deaf, many alluded to the need for a Regulatory Impact Statement to evaluate the costs and benefits of changes to building regulations. Research has shown that the overall benefit for the community is one of the main viewpoints supporting change. Benefits must take into account the political, social, and economical effects of a change. Therefore, although the economic level illustrates a high cost, the benefit to society can be argued at the political and social levels. We recommend more research be done regarding the different components affecting cost benefit analyses.

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Appendix A: Sponsor Description

The Victorian Deaf Society aims to improve the quality of life for the Deaf and hard of hearing throughout the state of Victoria. Its mission to do so encompasses three main goals. The company works to break down communication barriers and improve access to services. Second, they strive to increase the status and participation of deaf people in society. Lastly, as specialists, they provide support and community services. With these three main mission statements, The Victorian Deaf Society aspires for a world in which the deaf and those with normal hearing can communicate and function effortlessly as a society.

In order for The Victorian Deaf Society to accomplish their mission, buildings need modifications and improvements to better accommodate the deaf society in their everyday activities. This area includes their safety, communication, and comfort. Therefore, our project aim is to review current building standards and to formulate recommendations for improving them.

The Victorian Deaf Society is a non-profit organisation that consists of five main divisions. Hear Service is a section designated to helping families and friends of the deaf with any questions or concerns they may have by providing programs and information about hearing concerns. Community Support addresses the issues the deaf community faces everyday and provides support in available areas. This division is broken up into four main subsets that include Case Management, Independent Living Skills, Shared Supported Accommodation, and Clubs and Groups. Housing and Aged Care aids the deaf in finding suitable living accommodations, allowing them to receive help without feeling dependent on others. Regional Services maintains equal services for all areas in both urban and rural Victoria. Information Resources provides information and resources for the Deaf and hard of hearing community. Since our project incorporates all general areas of life for the deaf community, each of these divisions is relevant to this project.

The Victorian Deaf Society has numerous resources that can help alleviate the current issues involving the deaf. Their monetary resources could help fund the education of the Australian public to the challenges facing deaf people, manufacture necessary special equipment, and implement new equipment and standards. The Victorian Deaf Society has the financial support of both private and corporate communities. It receives approximately 35% of its operating costs from state and federal governments, and gets the other 65% of operational funding through fundraising and service fees. They also receives tax deductible donations from the public.

There are many people and projects which are focused on the same goals and mission, and will therefore provide additional assistance. The Community Housing Project provides a 24 hour accommodation support program for deaf people with multiple disabilities. Client Interpreting Services allows deaf people to utilise counselling and crisis support. The Victorian Deaf Society interpreters are available for deaf family members at funerals and other personal occasions. Various client services provide assistance throughout Victoria including counselling, case management, crisis intervention, emergency support, and duty work. Independent Living Skills offers training to deaf people with multiple disabilities.

The Victorian Deaf Society accomplishes its mission within the Australian state of Victoria. Each state in the country, including the island of Tasmania, has its own advocacy group that tends to the needs of its state's deaf community. After exploring their websites, it is evident that they are all trying to promote similar lifestyle improvements for the deaf societies in their respective states. This specified strategy is wise because it allows for a more concentrated focus on individual needs, rather than having one national society for the deaf that would possibly be too overwhelming.

Appendix B: Deaf and Hard of Hearing Advocacy Organisations

The following list contains the Australian advocacy organisations used in this project to gather information about services offered to the deaf community. For a complete list of all the deaf organisations in Australia please go to http://www.vicdeaf.com.au and click on the Links tab.

Australian Association of the Deaf – http://www.aad.org.au
Deafness Association of the Northern Territory - http://www.aceinfo.net.au/Resources/ADD_FOLDER/ADD_listings/ADDdeafassocnt.html
Deaf Children Australia - http://deafchildrenaustralia.org.au
Deafness Forum of Australia - http://www.deafnessforum.org.au
Deaf Society of New South Wales - http://www.deafsocietynsw.org.au
Queensland Deaf Society - http://www.qds.org.au
Southern Australian Deaf Society - http://www.sadeaf.org.au
Tasmanian Deaf Society Inc. - http://www.tasdeaf.org.au
The Western Australian Deaf Society Inc. - http://www.wadeaf.org.au
Victorian Council of the Deaf - http://www.vcod.com.au
Victorian Deaf Society - http://www.vicdeaf.com.au

Appendix C: Specialised Alerting Systems for the Deaf

The following is a table illustrating three examples of specialised alerting equipment for the deaf. These three alerting systems were utilised during our focus groups.

Name	Description	Picture
Genesis Strobe Light	Small, compact UL 1971/ULC-S526 variable strobe, and ADA compliant. Intended for use in large facilities with fire panels.	
Vibralarm	Contains a Xenon strobe light (one second interval) and a vibrating pad. The pad is intended for placement under the pillow for waking up a deaf person. Contains a rechargeable battery, interconnected smoke alarm, test switch, and battery indicator.	
Visalert Strobe Light	Strobe light with 4.2 Joule of intensity. Contains a rechargeable battery backup, a test switch, and a low battery indicator. Intended for use with a standard household smoke detector.	

Appendix D: National Building Code of Canada

The following excerpt from the National Building Code of Canada was received through a personal communication on 3 April 005 with Claire Fréchette, P. Eng, Technical Advisor of the Canadian Codes Centre.

Copy of Articles 3.2.4.18. to 3.2.4.20 of the 1995 National Building Code of Canada with related Appendix notes

3.2.4.18. Alert and Alarm Signals

1) In a 2 stage fire alarm system described in Sentence 3.2.4.4.(2), the same audible signal devices are permitted to be used to sound the *alert signals* and the *alarm signals.*
2) If audible signal devices with voice reproduction capabilities are intended for paging and similar voice message use, other than during a fire emergency, they shall be installed so that *alert signals* and *alarm signals* take priority over all other signals.
3) Audible signal devices forming part of a fire alarm or voice communication system shall not be used for playing music or background noise.
4) In a *building* or portion thereof intended for use primarily by persons with hearing impairment, visual signal devices shall be installed in addition to audible signal devices.

3.2.4.19. Audibility of Alarm Systems

(See Appendix A.)
1) Audible signal devices forming part of a fire alarm system shall be installed in a *building* so that *alert signals* and *alarm signals* are clearly audible throughout the *floor area* in which they are installed. (See Appendix A.)
2) The temporal pattern of an *alarm signal* shall conform to the temporal pattern defined in Clause 4.2 of International Standard ISO 8201, "Acoustics – Audible emergency evacuation signal." (See Appendix A.)
3) The signals from *smoke alarms* and the patterns of *alert signals* shall be sufficiently different from the signals or patterns of *alarm signals* that there is no possibility of confusion.
4) The fire *alarm signal* sound pressure level shall be not more than 110 dBA in any normally occupied area. (See Appendix A.)
5) The sound pressure level in a sleeping room from a fire alarm audible signal device shall be not less than 75 dBA in a *building* of *residential occupancy* when any intervening doors between the device and the sleeping room are closed. (See Appendix A.)
6) The sound pressure level from a fire alarm audible signal device in a *floor area* used for *occupancies* other than *residential occupancies* shall be not less than 10 dBA above the ambient noise level, but with a minimum value not less than 65 dBA.
7) Fire alarm audible signal devices shall be supplemented by visual signal devices in any *floor area* in which
a) the ambient noise level is more than 87 dBA, or
b) the occupants of the *floor area*
i) use ear protective devices,
ii) are located within an audiometric booth, or
iii) are located within sound insulating enclosures.
8) Sentence (7) shall also apply in an *assembly occupancy* in which music and other sounds associated with performances could exceed 100 dBA.
9) An audible signal device located within a *dwelling unit* shall incorporate a means that enables the device to be silenced for a period of not more than 10 min, after which the device shall restore to normal operation. (See Appendix A.)
10) An audible signal device located within a *dwelling unit* or a *suite* of *residential occupancy* shall be connected to the fire alarm system in a manner that disconnection of, or damage to, that device will not interfere with the ability of devices in other *dwelling units*, *public corridors*, or *suites* to sound an alarm.
11) Audible signal devices referred to in Sentence (10) are not required to have individual electrical supervision.
12) Audible signal devices shall be installed in a *service space* referred to in Sentence 3.2.1.1.(7) and shall be connected to the fire alarm system.

3.2.4.20. Visual Signals

1) Visual signal devices required by Sentences 3.2.4.18.(4) and 3.2.4.19.(7) and (8) shall be installed so that the signal from at least one device is visible throughout the *floor area* or portion thereof in which they are installed. (See Appendix A.)

2) In addition to the requirements for fire alarm and detection systems in this Subsection, visual signals from *smoke detectors* required in sleeping rooms of Group B *occupancy* shall be provided so that staff serving those rooms can easily identify the room or location of fire alarm initiation. (See Appendix A.)

APPENDIX NOTES

A-3.2.4.19. Acoustic Measurement and Terminology. The following notes on acoustic measurement and terminology are intended to assist in the application of the requirements for audibility of fire alarm system sounding devices.

The background or ambient measurement should be a spatial averaged A-weighted equivalent sound level measured for 60 s. This can be obtained using an integrating sound level meter with the integration time set to 60 s. During the measurement period the meter should be slowly moved about so as to sample the space uniformly but coming no closer than 0.5 m from any solid wall, floor or ceiling. Alternatively, measurements can be made at 3 or more positions throughout the space and an energy average calculated.

The measurement of the alarm level depends on the type of alarm signal. If the signal is a continuous signal from a bell or siren, the spatial averaged A-weighted equivalent sound level should be obtained. The integration time should be long enough to obtain a reasonable spatial average of the space, but not less than 10 s.

If the alarm has a temporal pattern, then the A-weighted sound level should be measured using the 'fast' time constant during the 'on' part of the cycle. In this situation it is not appropriate to use an integrating sound level meter. Since the duty cycle of the alarm is only 37.5% at best, that type of meter would give a reading that is 4 or more decibels lower than the level while the alarm is 'on.' A number of measurements should be made about the space in question and the average value used to obtain a good spatial representation. Strictly speaking, the energy average of the measurements should be used; however, the frequency spectrum associated with most alarms is of a type that should give little variation about the space. If the measured levels don't vary by more than 2 to 3 dB, then an arithmetic average rather than an energy average can be used.

Effect of Furnishings

The final inspection of a fire alarm system is seldom made when the building is furnished and ready for occupancy. This results in measured levels which may be several decibels higher than will be found in the occupied building. The importance of this difference depends on the situation.

If the building is complete except for furnishings, so that the sources of ambient noise are present, then the amount by which the alarm signal exceeds the ambient level will not change appreciably with the introduction of furnishings. In this case both levels will be reduced by about the same amount.

If the primary source of ambient noise will be office equipment and workers, as would be expected in an open plan office, then measurements made prior to occupancy may differ substantially from those made afterwards. This may be true for both the absolute sound levels and the difference between the alarm level and the ambient.

A problem arises in trying to estimate what the absolute sound levels will be after the building is occupied. In general, if the measurement is made in a totally bare room then the level will be about 3 dB higher than if the room were carpeted, assuming a reasonable carpet with an underlay. In most cases this will account for most of the absorption in the room and no further correction will be necessary. Adding heavy drapes and absorptive furnishings to a carpeted room can reduce the sound level by a further 2 to 3 dB. Commercial buildings are more problematic. For example, if an open plan office is measured before any office screens are installed, there could be a substantial difference in the before and after levels, depending on the distance to the nearest alarm device.

Glossary of Acoustical Terms

Audible: A signal is usually considered to be clearly audible if the A-weighted sound level exceeds the level of ambient noise by 15 dB or more.

Awakening threshold: The level of sound that will awaken a sleeping subject 50% of the time.

A-weighted: A frequency weighting network which emphasises the middle frequency components similar to the response of the human ear. The A-weighted sound level correlates well with subjective assessment of the disturbing effects of sounds. The quantity is expressed in dBA.

Masked threshold: The level of sound at which a signal is just audible in ambient noise.
Sound level: A sound pressure level obtained using a signal to which a standard frequency-weighting has been applied.
Sound pressure: A fluctuating pressure superimposed on the static pressure by the presence of sound. The unqualified term means the root-mean-square sound pressure. In air, the static pressure is barometric pressure.
Sound pressure level: Ten times the common logarithm of the ratio of the square of the sound pressure under consideration to the square of the standard reference pressure of 20 mPa. The quantity obtained is expressed in decibels.

A-3.2.4.19.(1) Alert and Alarm Signals. Alert signals are part of a 2 stage fire alarm system. The intent of the first, alert, stage is to notify persons in authority of a potential threat to building occupants. If a continuously staffed location is available, the alert signal can be restricted to that location.

A-3.2.4.19.(2) Alarm Signal Temporal Pattern. The temporal pattern of an alarm signal relates to the time during which the signal is produced and the intervals between the individual signal pulses. The international standard ISO 8201, "Acoustics – Audible emergency evacuation signal," includes a pattern that is becoming widely used in different countries and it is appropriate for this pattern to be adopted in Canada. The temporal pattern can be produced on most signalling devices. Most existing alarm systems can be modified, and this pattern could be phased in when the systems require modification. The characteristic of the pattern is a 3-pulse phase followed by an off phase. The 3 pulses each consist of an on phase lasting for 0.5 ± 0.05 s followed by an off phase lasting for 0.5 ± 0.05 s sounded for 3 successive on periods and then followed by an off phase lasting for 1.5 ± 0.15 s. Figure A-3.2.4.19.(2).A. indicates the pattern that is intended.

On
Off
One cycle
a b a b a c a
Phase a: signal is on for 0.5 ± 0.05 s
Phase b: signal is off for 0.5 ± 0.05 s
Phase c: signal is off for 1.5 ± 0.15 s
Total cycle to last 4.0 ± 0.40 s
EC01204A

Figure A-3.2.4.19.(2).A.
Temporal pattern for fire alarm signal

Although the diagram shows a square wave form, the wave can have other shapes that produce a similar effect. If single stroke bells are to be used, the temporal pattern can be produced by having the bell struck three times at a rate of one stroke per second followed by an interval of 2 s of silence. Figure A-.2.4.19.(2).B. shows the pattern that results.

On
Off
0 2 4 6 8 10 Time, s
EC01205A

Figure A-3.2.4.19.(2).B.
Temporal pattern imposed on a single stroke bell or chime

Note to Figure A-3.2.4.19.(2).B.:
(1) The on phase represents the time that the striker mechanism is actuated. The sound produced by the bell or chime will continue at a level that decreases until the striker mechanism is re-actuated.

A-3.2.4.19.(4) Sound Pressure Level. For the purposes of this requirement, an audible signalling device should not produce a sound pressure level more than 110 dBA when measured at a distance of 3 m.

A-3.2.4.19.(5) Residential Sound Level. In a building in which corridors or hallways serve more than one suite or dwelling unit, there will be situations in which an audible signal device cannot be placed in the corridor or hallway to alert persons sleeping in suites and dwelling units, because the sound level in the vicinity of the device would exceed that permitted by Sentence 3.2.4.19.(4). In these situations it will be necessary to supplement the building fire alarm system with an audible signal device in the suite or dwelling unit. These devices could be piezoelectric devices similar to the sounding units in many smoke alarms, subject to the device emitting the appropriate temporal pattern required by Sentence 3.2.4.19.(2).

A-3.2.4.19.(9) Disconnect Device for Dwelling Units. In order to minimise the annoyance caused by false and unwanted alarms, the disconnect will permit a person to silence the local audible device within the dwelling unit. At that time the person would be aware of sounds from devices in common spaces and could plan appropriate action. The disconnect will reduce the possibility of tampering with the audible devices.

A-3.2.4.20.(1) Visual Alarm Pattern. CAN/ULC S526-M, "Visual Signal Appliances for Fire Alarm Systems," published by Underwriters' Laboratories of Canada, applies to visual signaling units. This document is referenced by the most recent standard for the installation of fire alarm systems and would automatically apply. Current Canadian technology does not integrate visual and audible alarms to have the same temporal pattern. Visual and audible alarms should have as close a temporal pattern as possible but without interference beats that might have a deleterious effect on some persons. Visual signalling devices with the same temporal pattern as required for audible devices are available from some sources and they should become available in Canada. Not all units that comply with the ULC standard will have sufficient power to adequately cover large areas; care will have to be taken to specify units with adequate power when large spaces are being designed.

A-3.2.4.20.(2) Visual Signal. If staff located in each zone or compartment can see each sleeping room door, visual signals could be located above each door. If staff cannot see every door, it is intended that the visual signals be provided at the location where the staff are normally in attendance.

Appendix E: United Kingdom Fire Safety Concern Items

The following excerpt from the Regulatory Reform Order of the United Kingdom is an explanation of the required duties of the "responsible person" in a building (i.e. the building owner).

1. Escape Routes and exits

Escape routes must be established and always available, doors must open in the direction of escape, no sliding or revolving doors, adequate in size and provided with emergency lighting and signs [14 (1) & (2)].

2. Signs and notices

Appropriate signs and notices must be provided:

• Giving appropriate instruction to employee's [Schedule 1 Part 3 (h)] including Fire Action Notices [15 (1) (a) & 15 (2) (a)]

• Indicating the position of extinguishers [13 (1) (b)]

• Indicating emergency routes and exits. [14 (2) (g)]

3. Fire Detection and Alarm

An appropriate fire detection and alarm system must be provided [13 (1) (a), 4. (1) (e) and 15 (2) (a) & (b)]. The type and extent of the fire alarm would be subject to the requirements of the Risk Assessment.

4. Emergency Lighting

Escape routes must be provided with emergency lighting [14 (2) (h)].

5. Compartments and doors

You must take measures to reduce the risk of the spread of fire. This can be taken as ensuring all fire resisting walls and doors are kept in good order, walls are not breached and fire doors have appropriate seals and closing devices. [4.(1) (a)]

Appendix F: Americans with Disabilities Act Requirements

The Americans with Disabilities Act of 1990 outlines the requirements in building regulations in order to ensure the safety of the disabled. Some significant sections of this document include Alarm Systems, Signage, and Telephones. Each of the sections included below specifically impact the deaf community and their safety.

4.28 Alarms.

4.28.1 General. Alarm systems required to be accessible by 4.1 shall comply with 4.28. At a minimum, visual signal appliances shall be provided in buildings and facilities in each of the following areas: restrooms and any other general usage areas (e.g., meeting rooms), hallways, lobbies, and any other area for common use.

4.28.2* Audible Alarms. If provided, audible emergency alarms shall produce a sound that exceeds the prevailing equivalent sound level in the room or space by at least 15 dbA or exceeds any maximum sound level with a duration of 60 seconds by 5 dbA, whichever is louder. Sound levels for alarm signals shall not exceed 120 dbA.

4.28.3* Visual Alarms. Visual alarm signal appliances shall be integrated into the building or facility alarm system. If single station audible alarms are provided then single station visual alarm signals shall be provided.

Visual alarm signals shall have the following minimum photometric and location features:

(1) The lamp shall be a xenon strobe type or equivalent.
(2) The color shall be clear or nominal white (i.e., unfiltered or clear filtered white light).
(3) The maximum pulse duration shall be two-tenths of one second (0.2 sec) with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10 percent of maximum signal.
(4) The intensity shall be a minimum of 75 candela.
(5) The flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz.
(6) The appliance shall be placed 80 in (2030 mm) above the highest floor level within the space or 6 in (152 mm) below the ceiling, whichever is lower.
(7) In general, no place in any room or space required to have a visual signal appliance shall be more than 50 ft (15 m) from the signal (in the horizontal plane). In large rooms and spaces exceeding 100 ft (30 m) across, without obstructions 6 ft (2 m) above the finish floor, such as auditoriums, devices may be placed around the perimeter, spaced a maximum 100 ft (30 m) apart, in lieu of suspending appliances from the ceiling.
(8) No place in common corridors or hallways in which visual alarm signaling appliances are required shall be more than 50 ft (15 m) from the signal.

4.28.4* Auxiliary Alarms. Units and sleeping accommodations shall have a visual alarm connected to the building emergency alarm system or shall have a standard 110-volt
electrical receptacle into which such an alarm can be connected and a means by which a signal from the building emergency alarm system can trigger such an auxiliary alarm.
When visual alarms are in place the signal shall be visible in all areas of the unit or room. Instructions for use of the auxiliary alarm or receptacle shall be provided.

4.30 Signage.
4.30.1* General. Signage required to be accessible by 4.1 shall comply with the applicable provisions of 4.30.

4.30.7* Symbols of Accessibility.
(1) Facilities and elements required to be identified as accessible by 4.1 shall use the international symbol of accessibility. The symbol shall be displayed as shown in Fig. 43 (a) and (b).
(2) Volume Control Telephones. Telephones required to have a volume control by 4.1.3(17)(b) shall be identified by a sign containing a depiction of a telephone handset with radiating sound waves.
(3) Text Telephones. Text telephones required by 4.1.3(17)(c) shall be identified by the international TDD symbol (Fig 43(c)). In addition, if a facility has a public text telephone, directional signage indicating the location of the nearest text telephone shall be placed adjacent to all banks of telephones which do not contain a text telephone. Such directional signage shall include the international TDD symbol. If a facility has no banks of telephones, the directional signage shall be provided at the entrance (e.g., in a building directory).
(4) Assistive Listening Systems. In assembly areas where permanently installed assistive listening systems are required by 4.1.3(19)(b) the availability of such systems shall be identified with signage that includes the international symbol of access for hearing loss (Fig 43(d)).
4.30.8* Illumination Levels. (Reserved).

4.31 Telephones.

4.31.5 Hearing Aid Compatible and Volume Control Telephones Required by 4.1.
(1) Telephones shall be hearing aid compatible.
(2) Volume controls, capable of a minimum of 12 dbA and a maximum of 18 dbA above normal, shall be provided in accordance with 4.1.3. If an automatic reset is provided then 18 dbA may be exceeded.

4.31.9* Text Telephones Required by 4.1.

(1) Text telephones used with a pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. If an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the text telephone and the telephone receiver.

(2) Pay telephones designed to accommodate a portable text telephone shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a text telephone and shall have 6 in (152 mm) minimum vertical clearance in the area where the text telephone is to be placed.

(3) Equivalent facilitation may be provided. For example, a portable text telephone may be made available in a hotel at the registration desk if it is available on a 24-hour basis for use with nearby public pay telephones. In this instance, at least one pay telephone shall comply with paragraph 2 of this section. In addition, if an acoustic coupler is used, the telephone handset cord shall be sufficiently long so as to allow connection of the text telephone and the telephone receiver. Directional signage shall be provided and shall comply with 4.3.

Appendix G: Definition of Building Class Numbers

The following is a section of the Building Code if Australia that defines the different classes of buildings. In the Building Code of Australia, there are unique building regulatory requirements for each class of building.

A3.1 Principles of classification

The classification of a building or part of a building is determined by the purpose for which it is designed, constructed or adapted to be used.

A3.2 Classifications

Buildings are classified as follows:

Class 1 amended by BCA 2005

Class 1:
one or more buildings which in association constitute—

(a) **Class 1a** —a single dwelling being—

(i) a detached house; or

(ii) one of a group of two or more attached dwellings, each being a building, separated by a *fire-resisting* wall, including a row house, terrace house, town house or villa unit; or

(b) **Class 1b** —a boarding house, guest house, hostel or the like-

(i) with a total area of all floors not exceeding 300 m^2 measured over the enclosing walls of the Class 1b; and

(ii) in which not more than 12 persons would ordinarily be resident,

which is not located above or below another dwelling or another Class of building other than a *private garage*.

Class 2:
a building containing 2 or more sole-occupancy units each being a separate dwelling.

Class 3 amended by Amdt No. 11

Class 3:
a residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons, including—

(a) a boarding-house, guest house, hostel, lodging-house or backpackers accommodation; or

(b) a residential part of a hotel or motel; or

(c) a residential part of a *school*; or

(d) accommodation for the aged, children or people with disabilities; or

(e) a residential part of a *health-care building* which accommodates members of staff; or

(f) a residential part of a *detention centre*.

Class 4:
a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.

Class 5:
an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.

Class 6:
a shop or other building for the sale of goods by retail or the supply of services direct to the public, including—

(a) an eating room, cafe, restaurant, milk or soft-drink bar; or

(b) a dining room, bar, shop or kiosk part of a hotel or motel; or

(c) a hairdresser’s or barber’s shop, public laundry, or undertaker’s establishment; or

(d) market or sale room, showroom, or *service station*.

Class 7 amended by Amdt No. 11

Class 7:
a building which is—

(a) **Class 7a** —a *carpark*; or

(b) **Class 7b** —for storage, or display of goods or produce for sale by wholesale.

Class 8:
a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

Class 9 amended by BCA 2004

Class 9:
a building of a public nature—

(a) **Class 9a** —a *health-care building*; including those parts of the building set aside as a laboratory; or

(b) **Class 9b** —an *assembly building*, including a trade workshop, laboratory or the like in a primary or secondary *school*, but excluding any other parts of the building that are of another Class; or

(c) **Class 9c** — an *aged care building*.

Class 10:
a non-habitable building or structure—

(a) **Class 10a** —a non-habitable building being a *private garage*, carport, shed, or the like; or

(b) **Class 10b** —a structure being a fence, mast, antenna, retaining or free-standing wall, *swimming pool*, or the like.

Appendix H: The Australian Disability Discrimination Act of 1992

The Australian Disability Act of 1992 provides regulations to allow the Australians with disabilities to have equal opportunity. Its main focus is to address the physical and attitudinal barriers that prevent people with disabilities from leading successful lives and help them become more involved in the community. Hopefully, these laws will not only help the disabled, but the Australian community as a whole (Disability Discrimination Act, 1992).

Section 11: Unjustifiable hardship

For the purposes of this Act, in determining what constitutes unjustifiable hardship, all relevant circumstances of the particular case are to be taken into account including:

1. the nature of the benefit or detriment likely to accrue or be suffered by any persons concerned; and

2. the effect of the disability of a person concerned; and

3. the financial circumstances and the estimated amount of expenditure required to be made by the person claiming unjustifiable hardship; and

4. in the case of the provision of services, or the making available of facilities—an action plan given to the Commission under section 64.

Section 23: Access to premises

1. It is unlawful for a person to discriminate against another person on the ground of the other person's disability or a disability of any of that other person's associates:

    a. by refusing to allow the other person access to, or the use of, any premises that the public or a section of the public is entitled or allowed to enter or use (whether for payment or not); or

    b. in the terms or conditions on which the first-mentioned person is prepared to allow the other person access to, or the use of, any such premises; or

    c. in relation to the provision of means of access to such premises; or

    d. by refusing to allow the other person the use of any facilities in such premises that the public or a section of the public is entitled or allowed to use (whether for payment or not); or

e. in the terms or conditions on which the first-mentioned person is prepared to allow the other person the use of any such facilities; or

f. by requiring the other person to leave such premises or cease to use such facilities.

2. This section does not render it unlawful to discriminate against a person on the ground of the person's disability in relation to the provision of access to premises if:

a. the premises are so designed or constructed as to be inaccessible to a person with a disability; and

b. any alteration to the premises to provide such access would impose unjustifiable hardship on the person who would have to provide that

Section 24: Goods, services and facilities

1. It is unlawful for a person who, whether for payment or not, provides goods or services, or makes facilities available, to discriminate against another person on the ground of the other person's disability or a disability of any of that other person's associates:

a. by refusing to provide the other person with those goods or services or to make those facilities available to the other person; or

b. in the terms or conditions on which the first-mentioned person provides the other person with those goods or services or makes those facilities available to the other person; or

c. in the manner in which the first-mentioned person provides the other person with those goods or services or makes those facilities available to the other person.

2. This section does not render it unlawful to discriminate against a person on the ground of the person's disability if the provision of the goods or services, or making facilities available, would impose unjustifiable hardship on the person who provides the goods or services or makes the facilities available.

Section 25: Accommodations

1. It is unlawful for a person, whether as principal or agent, to discriminate against another person on the ground of the other person's disability or a disability of any of that other person's associates:

a. by refusing the other person's application for accommodation; or

b. in the terms or conditions on which the accommodation is offered to the other person; or

c. by deferring the other person's application for accommodation or according to the other person a lower order of precedence in any list of applicants for that accommodation.

2. It is unlawful for a person, whether as principal or agent, to discriminate against another person on the ground of the other person's disability or a disability of any of the other person's associates:

a. by denying the other person access, or limiting the other person's access, to any benefit associated with accommodation occupied by the other person; or

b. by evicting the other person from accommodation occupied by the other person; or

c. by subjecting the other person to any other detriment in relation to accommodation occupied by the other person; or

d. by refusing to permit the other person to make reasonable alterations to accommodation occupied by that person if:

(i) that person has undertaken to restore the accommodation to its condition before alteration on leaving the accommodation; and
(ii) in all the circumstances it is likely that the person will perform the undertaking; and
(iii) in all the circumstances, the action required to restore the accommodation to its condition before alteration is reasonably practicable; and
(iv) the alteration does not involve alteration of the premises of any other occupier; and
(v) the alteration is at that other person's own expense.

3. This section does not apply to or in respect of:

a. the provision of accommodation in premises if:

(i) the person who provides or proposes to provide the accommodation or a near relative of that person resides, and intends to continue to reside on those premises; and
(ii) the accommodation provided in those premises is for no more than 3 persons other than a person referred to in subparagraph (a)(i) or near relatives of such a person; or

b. the accommodation is provided by a charitable or other voluntary body solely for persons who have a particular disability and the person discriminated against does not have that particular disability; or

c. the provision of accommodation in premises where special services or facilities would be required by the person with a disability and the provision of such special services or facilities would impose unjustifiable hardship on the person providing or proposing to provide the accommodation whether as principal or agent.

Appendix I: Etiquette for Deaf Interaction during Interviews and Focus Groups

Due to the communication barrier between ourselves and the deaf, we conducted interviews with the deaf via Auslan interpreters. This allowed each interviewee to respond in their language of Auslan, and it was our hope that by creating a comfortable environment for the interviewee, they could respond to our questions with honest and substantial answers. To facilitate this, we used a semi-standardised technique which consisted of a structured interview protocol whose wording varied in complexity depending on the level of English the interviewee could understand. This flexibility allowed for ease of understanding and made it easier for the translator if translation was required. The original list of questions was amended as necessary, and the interviewer was allowed to answer or clarify questions (Berg, 2004). We hoped this method created a more conversational atmosphere instead of a straightforward question and answer session. Standard etiquette of conversations with the Deaf and hard of hearing were followed, focusing on eye contact and full attention given to the interviewee, not the interpreter. This created a comfortable setting that allowed responses to be more personal and in-depth, while also generating substantial information.

Appendix J: Interview Protocol: Deaf and Hard of Hearing

The following is an interview protocol used to interview a Deaf or hard of hearing person. Along with this protocol, we made sure to observe the proper etiquette for communicating with a deaf individual (as explained in Appendix H).

Date:
Time:
Location:
Interviewers:

Introductions

- Group members
- Project description
    - We will review the Australian building regulations to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on what these changes should be and how these regulations can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.
- Interviewee introduces self

Questions

What are some of your main concerns for your safety in buildings?

What are some of your concerns with the alerting systems and evacuation systems (or lack there of) in place to accommodate you?

- Do you have any ideas for improvement in the alerting systems (captioning, signs, lights, vibrating, fire wardens, different tones on alarms, etc)?
- Where is the best location for signs, alarms, etc.?

Have you been in an emergency situation where you were not alerted?

- What were the results/consequences?
- Do you know of any other stories with similar situations?

How knowledgeable do you feel you and the deaf community are with respect to safety equipment available to alert you in case of an emergency?

- If you are, then how did you learn?

- If not, why do you think this is?

What types of alarms are you familiar with?

How familiar are you with these types of alarms (audible, visual, tactile)?

- Do you have these in your home/work?
- If YES, have they ever gone off and how well did they alert you?
- If NO, why don't you have them?

Are there any levels/frequency sound that you are able to hear?

Do you think audible alarms would be an effective alert technique for your level of hearing?

Do you think strobe lights would be effective in alerting you in case of an emergency?

- Different colours?

Do you think a vibrating alarm would be effective?

- Sleeping scenario (under pillow)
- Awake scenario (pager system)

We've heard that some common arguments against the implementation of alerting systems for the deaf in buildings. Some examples of these are that it costs too much to outfit an entire building to accommodate a small percentage of the population, and that the public is generally apathetic or unaware of the safety challenges the deaf face. What are your thoughts?

Appendix K: Focus Group Protocol: Deaf and Hard of Hearing

The following includes an explanation of the procedure followed to conduct a focus group with the deaf, and the question protocol used.

Since these focus groups were conducted by hearing people, we had an Australian sign language (Auslan) interpreter present to translate the questions by the moderator and the responses by the deaf participants. We also ensured the room was set up properly to accommodate for the comfort needs of the deaf by having appropriate space for each person to stand where the rest of the group would be able to see the sign language being used.

Part 1:

We began these focus groups by requesting discussion of any areas in which they felt were important with regards to the safety of the deaf in buildings. The prompts and ideas used for these focus groups were partially formed due to feedback received from advocates and service providers about the experiences of their clients. Rather than hearing stories second-hand, these focus groups were an effective way of hearing anecdotal situations straight from the source and thus allowed us to ask follow-up questions about how these situation affected their lives personally.

When all deaf focus groups were complete we made sure to note any general points of agreement or similar stories in order to use as feedback for our final analysis.

Part 2:

Once we had discussed safety in buildings, we then switched topics to discuss alerting systems for the deaf. It has been suggested by numerous deaf interviewees such as Simon Andersson that deaf people may not even know that such alerting systems are a viable option to increase their safety in buildings. We first asked the focus group participants if they knew of any existing technology and if they had any of this currently in their homes. Once we established their base knowledge of the technology, we demonstrated each piece of equipment to show them how they worked. Unlike in the advocates and service providers' focus group, we explored another important area with this equipment- whether the deaf were able to sense from the equipment that there was an emergency hypothetically happening. Once the deaf were aware of the equipment and how well or poorly it gained their attention, we started a discussion about whether or not this technology would be a beneficial addition to the current building requirements to ensure the deaf's safety in buildings in case of an emergency.

Focus Group Protocol

Date:

Time:

Location:

Interviewers:

Introductions

- Group members
- Project description
    - We will review the Australian building regulations to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on what these changes should be and how these regulations can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.
- Participants introduce themselves

Part 1- General Questions:

What are some of your main concerns for your safety in buildings?

What are some of your concerns with the alerting systems and evacuation systems (or lack there of) in place to accommodate you?

- Do you have any ideas for improvement in the alerting systems (captioning, signs, lights, vibrating, fire wardens, different tones on alarms, etc)?
- Where is the best location for signs, alarms, etc?

What do you think about signage in public buildings?

Have you, or anyone you know, been in an emergency situation where you were not alerted?

How knowledgeable do you feel you and the deaf community are with respect to safety equipment available to alert you in case of an emergency?

- If you are, then how did you learn?
- If not, why don't deaf community know about this technology?

Part 2- Equipment Demonstration:

What types of alarms are you familiar with?

How familiar are you with these alarms?

Do you have these in your home/work?

- If yes, have they ever gone off and how well did they alert you?
- If no, why don't you have them?

Next, we demonstrated some of the available deaf alerting system technology in hopes of hearing the participants' opinions on them.

Audible Alarms: Showed fire panel with 8 different tones that vary in pitch and sound pattern

Do you think this would be an effective alert technique for you?

Visual Alarms: Showed "Visalert" which is easily wired to a standard fire alarm and has a built in rechargeable battery in case of loss of electricity; and "Genesis Strobe" which can be sound, strobe or both… is used as part of a commercial fire system to alert people of emergencies

Do you think these lights would be effective in alerting you in case of an emergency?

Combination Alarm System (strobe, sound and vibralert):Three alert system mainly used in homes; strobe/sound piece mounted right next to bed and vibrating device under pillow

Do you think that this combination device would be effective in waking you at night?

We've heard that some common arguments against the implementation of alerting systems for the deaf in buildings. Some examples of these are that it costs too much to outfit an entire building to accommodate a small percentage of the population, and that the public is generally apathetic or unaware of the safety challenges the deaf face. What are your thoughts?

Appendix L: Interview Protocol: Advocates and Service Providers

The following is a protocol used to conduct interviews with advocates, services providers, and representatives from deaf supporting organisations. As some interviewees were deaf, we used the proper deaf communication etiquette explained in Appendix H.

Date:
Time:
Location:
Interviewers:

Introductions

- Group members
- Project description
    - We will review the Australian building regulations to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on what these changes should be and how these regulations can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.
- Interviewee introduces self

General Questions

What are some of your main concerns for the safety of the deaf in buildings?

What are some of your concerns with the alerting systems and evacuation systems (or lack there of) for the deaf?

- Do you have any ideas for improvement in the alerting systems (captioning, signs, lights, vibrating, fire wardens, different tones on alarms, etc)?
- Where is the best location for signs, alarms, etc?

Do you know of any experiences your clients have faced where alerting them during an emergency was a problem?

Are the deaf people you work with knowledgeable about the safety equipment available to alert them?

(if deaf) Do you have any in your home?

Have you ever faced an emergency during the workday?

Equipment Demonstration

We demonstrated some of the available deaf alerting system technology in hopes of hearing the participants' opinions on them.

Audible Alarms: Showed fire panel with 8 different tones that vary in pitch and sound pattern

Is it common for deaf people with milder hearing loss to be able to hear different frequencies of sounds?

Do you think this would be an effective alerting technique for the deaf?

Visual Alarms: Showed "Visalert" which is easily wired to a standard fire alarm and has a built in rechargeable battery in case of loss of electricity; and "Genesis Strobe" which can be sound, strobe or both… is used as part of a commercial fire system to alert people of emergencies

Do you think these lights would be effective in alerting the deaf?

Combination Alarm System (strobe, sound and vibralert):Three alert system mainly used in homes; strobe/sound piece mounted right next to bed and vibrating device under pillow

Do you think that this combination device would be effective in waking the deaf?

We've heard that some common arguments against the implementation of alerting systems for the deaf in buildings. Some examples of these are that it costs too much to outfit an entire building to accommodate a small percentage of the population, and that the public is generally apathetic or unaware of the safety challenges the deaf face. What are your thoughts?

Appendix M: Interview Protocol: Building and Property Organisations

The following is an interview protocol used to interview members of building and property organisations such as property owners, building managers, and representatives of builders' rights.

Date:
Time:
Location:
Interviewers:

Introductions

- Group members
- Project description
    - We will review the Australian building regulations to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on what these changes should be and how these regulations can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.
- Interviewee introduces self

General Questions

Could you describe the type of properties you own/manage?

Are you familiar with the technology available for alerting the deaf?

As a property owner/manager, how do you feel about the changes to the codes to accommodate the deaf?

Have you ever provided these special alerting systems and if so, how much did it cost?

- If no, would you be willing to incorporate flashing alerting systems into your buildings if a deaf person occupied it?

We've heard that some common arguments against the implementation of alerting systems for the deaf in buildings. Some examples of these are that it

costs too much to outfit an entire building to accommodate a small percentage of the population, and that the public is generally apathetic or unaware of the safety challenges the deaf face. What are your thoughts?

Appendix N: Interview Protocol: Policy Makers and Board Committees

The following is the interview generalised interview protocol used when preparing more specific, targeted protocols for policy makers and board committee members.

Date:
Time:
Location:
Interviewers:

Introductions

- Group members
- Project description
    - We will review the Australian building regulations to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on what these changes should be and how these regulations can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.
- Interviewee introduces self

General Questions

You are a member of the _____, could you tell us about:

- **The role of the board/regulation/organisation**
- **Your role on the board/regulation/organisation**

What is the process that happens when the regulations are in need of change?

How does the board decide if changes are needed?

How do you (or the board) feel about implementing changes to accommodate the deaf?
Feasibility?

What is the possibility of providing/requiring special alerting systems/flashing lights?

What is the process for making changes to the codes?

- **What is the most effective pathway?**

How much does cost come into play?

What are some of the arguments against the implementation of these types of changes?

Appendix O: Description of Organisations

The following tables summarises the purposes of the large stakeholder organisations approached to gather opinions and views regarding their positions on changes in the building regulations to accommodate the deaf.

Table 3: Members of and Professionals in the Deaf Community and their Descriptions

Members of and Professionals in the Deaf Community	Description
Banyule City Council	Provides numerous services to its community.
Deaf Children Australia	Provides information, advocacy, support services and educational resources that respond to the needs of deaf children and their families.
Department of Human Service	Its purpose is to enhance and protect the health and well-being of all citizens by emphasising minority groups and those most in need.
Disability Support and Housing Alliance	Assists the disabled in respect to housing and related issues.
Metropolitan Fire Brigade	Community safety organisation committed to working in partnership with other organisations to achieve safer cities.
Victorian Council of the Deaf	A non-profit, consumer-driven organisation led and controlled by Deaf Victorians to provide a voice for Deaf Victorians by lobbying, advocating and sharing information to ensure that full access is achieved.

Table 4: The Building Environment, Safety, and Building Regulations Communities and their Descriptions

The Building Environment, Safety, and Building Regulations Communities	Description
Australian Building Codes Board	Primary board that oversees the Building Code of Australia
Building Commission	Works with the Building Advisory Council, Building Appeals Board, Building Practitioners Board and the Building Regulations Advisory Committee to provide leadership and regulate quality in the building industry.
Jones Lang LaSalle	An organisation that helps property owners manage their properties.
Master Builders Association	Australian building and construction industry association that promotes the viewpoints and interests of the building and construction industry.
Metropolitan Fire Brigade	A community safety organisation committed to working in partnership with other organisations to achieve safer cities.
Fire & Safety Consultants	Consult building owners on improving building fire safety and evacuation systems.
Property Council of Australia	Organisation responsible for lobbying policy issues that affect commercial property owners and managers

Appendix P: Contact List

The people and organisations listed in this contact list are organised into four groups. These groups include members of and professionals in the deaf community, the building environment community, the safety community, and the building regulations community. Under each of the five main groups there exists organisations and contact persons within each organisation.

Members of and Professionals in the Deaf Community

- **Deaf employees from the Victorian Deaf Society**
  - Simon Anderson
  - Niaz Burhanuddin
  - Elaina Chapman
  - Selwyn Hoffmann
  - Tammy Jong
  - Natasha Jumelet
  - David Peters
  - Nishma Shah

- **Bernd Bartl**
  RMIT - Royal Melbourne Institute of Technology
  Phone: (03) 9376 7955
  Email: bernd.Bartl@ems.rmit.edu.au

- **Janice Knuckey**
  Deaf Children Australia
  Email: jknuckey@deafchildren.org.au

- **Rachel Miers**
  Manager at VCOD
  Email: info@vcod.com.au

The Building Environment Community

- **Peter Bartucca**
  Associate
  Engineering Facilities Management
  Phone: +61 (03) 9672 6575
  Email: peter.bartucca@ap.jll.com

- **Frank Martinez**
  Manager
  Management Service
  Phone: +61 (03) 9672 6618
  Email: frank.martinez@ap.jll.com

- **Peter Nassau**
  Director
  Building Quality
  Phone: +61 (03) 9285 6446
  Email: pnassau@buildingcommission.com.au

- **Paul Waterhouse**
  National Policy Manager
  Property Council of Australia
  Phone: (02) 9033 1956
  Email: PWaterhouse@nat.propertyoz.com.au

- **Geoff Woolcock**
  Managing Director
  Phone: (03) 9411 4573
  Email: gwoolcock@mbav.com.au

The Safety Community

- **Joanne Fulton**
  DHS, Eastern Region
  Phone: (03) 9843 6256
  Email: Joanne.fulton@dhs.vic.gov.au

- **Tass Georgas**
  Building Surveyor
  Metropolitan Fire Brigade
  Phone: (03) 9420 3919
  Email: ageorgas@mfbb.vic.gov.au

- **Bob Hetherington**
  Station Officer

Essential Services
Phone: (03) 9420 3876
Email: bhetherington@mfbb.vic.gov.au

- **Ivan Peterson**
  Access and Integration Planner
  Banyule City Council
  Chair of the Standards Australia Committee
  Phone: (03) 9457 9915
  TTY: (03) 9432 7211
  Email: Ivan.Peterson@banyule.vic.gov.au

- **Hank Van Ravenstein**
  Manager, Asset Compliance
  Capital Management Branch
  Financial & Corporate Services
  Phone: (03) 9616 2046
  Email: hank.vanravenstein@dhs.vic.gov.au

- **Norm Winn**
  Norm Winn & Associates Pty Ltd
  Evacuation engineer
  Phone: +61 (03) 9873 3060
  Email: normwinn@austarmetro.com.au

The Building Regulations Community

- **Brian Ashe**
  Project Manager – Fire, Research, and Engineering for the ABCB
  Phone: +61 (02) 6213 7132
  Email: brian.ashe@abcb.gov.au

- **Matthew McDonald**
  Project Manager
  Australian Building Codes Board
  Phone: +61 (02) 6213 7289
  Email: matthew.mcdonald@abcb.gov.au

- **Peter Nassau**
  Director
  Building Quality
  Phone: +61 (03) 9285 6446
  Email: pnassau@buildingcommission.com.au

- **Ivan Peterson**
  Access and Integration Planner
  Banyule City Council
  Chair of the Standards Australia Committee
  Phone: (03) 9457 9915
  TTY: (03) 9432 7211
  Email: Ivan.Peterson@banyule.vic.gov.au

- **Paul Waterhouse**
  National Policy Manager
  Property Council of Australia
  Phone: (02) 9033 1956
  Email: PWaterhouse@nat.propertyoz.com.au

Appendix Q: Provisions of Action Plans

The following is the section from the Disability Discrimination Act outlining the procedure for creating an action plan to approach the Human Rights Equal Opportunity Commission (HREOC) regarding an alleged act of discrimination.

The action plan of a service provider must include provisions relating to:

(a) the devising of policies and programs to achieve the objects of this Act; and

(b) the communication of these policies and programs to persons within the service provider; and

(c) the review of practices within the service provider with a view to the identification of any discriminatory practices; and

(d) the setting of goals and targets where these may reasonably be determined against which the success of the plan in achieving the objects of the Act may be assessed; and

(e) the means, other than those referred to in paragraph (d), of evaluating the policies and programs referred to in paragraph (a); and

(f) the appointment of persons within the service provider to implement the provisions referred to in paragraphs (a) to (e) (inclusive).

Appendix R: Interview and Focus Group Transcripts

Simon Andersson Interview

Special Projects Coordinator
TTY: 03 9473 1163
Mobile: 04 1148 9093
Email: sandersson@vicdeaf.com.au

Date: 17 March 2005
Interpreter: Cheryl
Main interviewer: Nicole
Other interviewers: Heather, Laurie ,Vinnie

Business environment
I have worked for various deaf organisations. I lived in England for 7 years working with areas dealing with mental health and also worked on the video phone.
I came back to Australia and worked with DHS, which is an advisory council in Victoria looking into disabilities in Australia.

There are a lot of big major happenings dealing with buildings. The access issues are not good, there are lots of steps and stairs. When I went to the US, I had no idea about ramps and why they were everywhere. The US is way ahead in terms of access because of the Disability Act. We are way behind in Australia and have a long way to catch up.

Currently, I am a special projects officer to get funding for Vicdeaf projects.

I emailed my work colleague to get a hard copy of the briefing I wrote, but the presentation attached to the email gives a rough idea.

Kate Colvin is the best person to contact first. She's a policy officer at VCOSS, which is a service organisation and does a lot of lobbying, etc.
www.vcoss.org.au
Her and I first met to talk about transport. The accessibility for public transport is very bad here…for wheelchairs and even strollers. I have two small children, 1 and 3, and it's tough to lift the stroller into the trams.

DDA deals with standards – which means it states what is required to put in place to follow it. Accessibility to public transport needs to happen by 2032, looking far into the future.
Kate focuses on disability in transport and accessibility to buildings.

Human rights and equal opportunity commission is a good place to contact, especially with the shortness of time to get things moving.

Is this all there is in building codes for deaf? Where else could we look?

I think that's probably it, but I'm puzzled because I don't think it was passed in legislation yet.

The BCA (1996) stated that the front entrance must be accessible for persons in wheelchairs.

BCA and DDA. Want building standards and DDA to match…so if you follow the standards, you are following the DDA.
This is still being discussed at government level. The printout may just be a proposed version.

Deafness Forum – contact Brian Rope – he has done work in this area.

This issue is not a high profile issue.
One major issue was smoke alarms. In Tasmania, a deaf person died because the beeping fire alarm didn't help at all. There was a lot of lobbying there to get visual and vibrating alarms put in.

The DHS have the report from Tasmania, but they haven't used it yet.

Access into homes is hopeless. The deaf have to consider alarms, phones, doorbells, lights, vibrating things, etc when buying a home. They must renovate and modify homes each time.

Is the new draft of building codes coming out in April?
There is a big controversy at the moment. The Property Council of Australia rejected the idea because it costs too much, so the government is trying to change things.

2 or 3 story buildings also a big issue for accessibility.
Big fuss happening right now

So we won't know until it comes out?
Correct

The main focus is people who have a physical disability, not blind, deaf, etc.

COST is a major issue.
Access for the deaf means money must be expended. It costs too much to modify buildings.
There's a lot of politics involved to change regulations. I see your project to not only research possible ideas, but also the politics. Political will is not here, even though changes are necessary.

So you think we should look a lot into the politics side?
Yes, Kate and Bernd are both great people to talk to about that. Bernd is very technical, but is very knowledgeable. Kate might be easier to contact first though.

The Building Commissions – very helpful – has an expert working group called the Access to the Built Environment Work Group (ABEWG). Will email it to us

Also learn about building regulations in Victoria….how things are changed, amended…look at the processes to do so.

Brian Ashe and Matthew McDonald Interview

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Project Manager – Fire, Research, and Engineering for the ABCB
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Mobile: 04 1998 1857
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Matthew McDonald
Project Manager
Australian Building Codes Board
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Email: matthew.mcdonald@abcb.gov.au

Date: 15 April 2005
Interviewer: Nicole

****Introductions**

****Project Description**

> ***We will review the Australian building codes to decide if the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.***

Mathew: working on a project ABCB trying to align national code with DDA (bulding access policy committee)
Tech. requires align with the DDA level of access that we require.

<u>Two areas that currently have no solutions</u>

1. Emergency egress
2. Way findings for blind and vision impaired

not aware if technology was available @ res cost –high level of benefit

Brian: research is looking into

DDA federal government/comm. Has no technical general state regulations. Public access in buildings must allow people w/ disabilities to enter

BCA has tech requirement for hearing augment DDA 92 & BCA 98
Last 10 years it has been recognised

BCA tells what to do when to do it – office building so many toilets
Standards tell how- technical detail

Now – committee – government and building regulation analyse what we currently have – something further is needed– for example there was never access into swimming pools
Document meets intent /objective of DDA

Revised building codes – transfer technical detail for public comment,
In revised docs: car park, tactile ground surfaces for blind, access gen. (how wide , how toilets)

Regulation impact statement cost/benefit
Determined $26 billion cost over 3 years, but benefit is only $13 billion
Need to refine and reduce cost of small buildings
Building Access policy committee met about this yesterday with the ministers

Doesn't consider wayfinding or emergency egress
-wayfinding issue not universally
-Brian is working on developing solution, doesn't automatically apply to old builings

ABCB has board that determines priority access and energy efficiency.
BAPC: DDA Standards project

3 representatives of people with disabilities: Australia Federal Disability Organisation
Recommend taking it through Australia Federal Disability Organisation

It would be very beneficial if you could recognise cost

Cost and benefit and social impacts, a good place: office of regulation will review/endorse proposal that we put through checklist that reviews the Net Benefit

Holly Ault and Anna Gauthier Interview

Date: 22 February 2005
Interviewer: Heather and Nicole
Other interviewers: Laurie and Vinnie

Holly Questions:
Can you tell us about your education and past experiences leading you into this field?

We see that your field includes biomechanics, rehabilitation engineering. Also, we found on your website that you enjoy advising IQP's including rehabilitation and design of assistive devices for the disabled. Obviously, you are very educated in this field, thus this is why it was suggested that we contact you. Could you please elaborate on your knowledge of disability awareness?

How familiar are you with the hearing impaired community? Australian hearing impaired community?

Now that you have reviewed our problem statement, are there any aspects that you think you could elaborate on with your experience in disability awareness?
Things that we have mentioned that you know more about?
Things that we may have missed that you thought of?

Which issue of the four do you think is most relevant?
Cost, prejudice\nonacceptance, ignorance, government liabilities

Specifically, how knowledgeable are you about Vicdeaf and the company goals? Is there anything that you know about the company from visiting it, or talking with John Patton that we may not know from research, or email correspondence?

Anna Questions:

- **How long have you worked with deaf and hearing impaired children?**
- **What age groups do you teach?**
- **Have you ever worked with or communicated with deaf or hearing impaired adults?**
- **If so, have they ever expressed any concerns regarding their safety in public buildings, acceptance by society, or the public's understanding of their disability?**
- **What have you found are the toughest challenges associated with working with the hearing impaired?**
- **Do you feel the current building standards ensure their safety to the same extent as those of normal hearing?**
- **Did you have to undergo any special training in order to work with the hearing impaired?**
    - **If so, was any of it directly related to safety?**

- **Do you feel the hearing impaired children would be easily alerted to an emergency if a person of normal hearing was not in the room to ensure it?**
- **Do the deaf and hard of hearing children seem comfortable and safe in public buildings?**
    - **If not, how do they appear? And can you make any assumptions as to why they might feel this way?**

BEGINNING CASUAL CONVERSATION
Anna: 47 different genes for deafness… scarlet fever, meningitis, German measles, etc.
VicDeaf good organisation
Holly: Let me tell you about Anna…Masters in deaf ed. Schools in Newton.. learning center for deaf children in Newton…. 10 years working with deaf children…. Close friend growing up was deaf

BACKGROUND (HOLLY SPEAKING)
*Assistive technology started in 1988 during post doc
*Became involved with a project to design a canoe for disabled people with mass hospital school sponsor
*Coincidence, prof hoffman was doing a project there too and he was designing a rowing machine.. when she returned to WPI, they got together and decided to work with the mass hos school and use as a vehicle for designing assistive tech… started MQPs in the field
*Member of RESNA rehabilitative (engineering) society of North America
*Annual conferences taught her knowledge about assistive technology
*on sabbatical 8 yrs ago spent 6 months at mass hosp, then 4 months at children's learning about robotics for rehab

DISABILITY AWARENESS
*Class here on rehab design, include awareness issues in there
*Do a Camp Reach day on disability awareness
*Do an ecotarium day about DA… GEMS, Strive.. etc

HEARING IMPAIRED
*not much knowledge about hearing impaired, brought Anna

THOUGHTS ON OUR PROBLEM STATEMENT
Holly: Equipment is important to look into
Holly: Look into the British to have another backup… may be most advanced
Anna: Denmark has a lot of access and law set up for deaf people… Danish sign is a national language, huge Deaf/Blind population in Copenhagen
Holly: May be able to read some Danish, other people on campus fluent
Prof Peterson in EE
Tom Thompson in Intl Studies Office
Anna: 2 intl conferences by deaf people… "Deaf Way" lots published that could be helpful that was presented at the conferences

BACKGROUND (ANNA SPEAKING)

*Learing Center for Deaf Children in Framingham
*Masters… and certificate from northeastern in deaf studies
*Working on interpreter liscence
*Mainly teaching and some consulting the integration of a student into a public high school
*Taught ASL to hearing students

HOW SHE BECAME INTERESTED

*Took 3 week course in sign language, following fall a club was contacted by a woman wth a deaf daughter who wanted expanded social activities, looking for anyone with signing experience to help them integrate
*tough beginning, 10 yrs old with minimal experience
*learned a lot from her, anna was one year older but were good friends thru school
*friend's friend lived with her family so learned from her
*always wanted to teach but didn't know what aspect to try…. Learned about friend's educational programs during her life… at 16 had 2nd grade reading level which was shockingly terrible so that was an eye opener
*Was a meeting for bad reading level, they said she has "deaf syndrome and wouldn't be able to learn to read" which made Anna hit the roof and go into deaf education
*mother who doesn't sign at all spent summer with deaf girl brought her up 2 reading levels so there much have been something bad in the school system
Holly: Don't label disabled people when working with them… they can start to believe it over time… have positive attitude and don't necessarily take for granted about what other people say about disabled people's limitations
Holly: Key is to think about the person when speaking to them… in US don't use the word impaired, but in legislation, has to do with different levels that need a broad name… people won't call themselves it though… impairment has specific definition.. basically the loss of a physical function… disability is not being able to perform a function… handicapped is when you are restricted from being able to perform in a part of society in some way, more social rather than function or physical
Anna: Human element on other side of labels. People won't say they have these unless they've been drilled for years to think that. Be VERY careful with these words when speaking to them. Use hard of hearing… Aussie very progressive in dealing with disabilities. (Denmark is #1) In US, deaf ppl all their life and use sign language as primary communication call themselves deaf. HI tends to be ppl who lose hearing later in life bc had function forever and then lost their primary mode of communication. Hard of hearing very sticky bc has very heavy cultural weight. HOH by science has some use of sound and hearing aids can help… to deaf people, someone who identifies with hearing culture and identifies with hearing culture… uses English. A true deaf person using HOH is an insult saying "you're with them and not part of us." Disccuss these terms with John ASAP there to see what is appropriate for documents and personal/social use…. Be open about it and ask…. Could also be an individual preference.

AGES GROUPS TAUGHT

*middle school some but mostly high school
*have adult deaf friends/collegues

THEIR CONCERNS ABOUT PUBLIC SAFETY

*most horrific experience of a student, going into a restroom and having a fire drill and coming out to no one there, fire alarm with no light… A lot of places don't REALLY follow ADA and have lights, etc.
Holly: Higgins was renovated and has things wrong… same with CC
Holly: Downstairs in lobby and in food court there is a stairwell you can walk underneath at any height but a blind person could walk right into the stairs

FLASHING LIGHTS
*school bell system is attached to lights
*lights really are useful except for special cases but a good general measure to use
*would make a lot more sense to hook up to ALL lights… would attract more attention so that is useful
Holly: strobe will reflect all walls to alert more people
*Deaf will notice these things, late deaf people might not be as prone to notice
Holly: If you want to fix the problem, interview people and don't be afraid to ask why

CHALLENGES WORKING WITH THE DEAF
*she is a minority in her building which is different
*getting everyone to look at the teacher at the same time just like in normal schools
*has to get visual attention, table banging, touching.. they are NOT QUIET PEOPLE
*deaf people are not aware of bathroom noises so be careful
*deaf people will look at you to get their info so be used to it, same with noises

BUILDING CODES
*NOT good for deaf people
*needs enforcement for this stuff to happen… codes are okay but they aren't enforced
Holly: The awareness of people in building industries…. Architect designed poorly and inspector let it pass….Disabled don't really advocate for themselves, and sometimes people won't advocate for them so nothing gets done… need more knowledge of the law by people responsible
*Sound announcements… flight safety had NO access for deaf people
*Need fire safety diagrams with written easy to follow language instructions (English is a second language) of what to do and where important items are (life jackets on boat etc) graphics are your best bet… Emergency lights don't really show where the door is to get out… had a student who was deaf and the lights went out and had mobility issues so this was very scary and couldn't get out
*Maybe use scrolling screen with simple language… use deaf consultant to write these sentences b/c its English as a second language

SPECIAL TRAINING FOR HOH WORK
*working in school for deaf had to learn CPR and fire drills and whatnot
*married to firefighter

CHILDREN COMFORTABLE OR KNOW WHAT TO DO
*in Newton girl knew to leave the building.. but what if she was younger?
*have intuition, might not know whole story but you know something is wrong and will act on it
*in deaf school, the light switches outside restroom so if something is wrong, someone will flicker the lights to alert you
*fire safety stuff in the bathroom helpful

*strong sense of community as deaf person in deaf community… it's like a culture community group of its own
*look out for each other and know what needs to be told to what people
*hearing people don't think to tell deaf people so they know that and take care of each other
*best resources are the people that know what they need… the deaf population

MULTIPLE CHOICE
Anna: ignorance covers all of them
Holly: ignorance… cost can be retrofit but if its done right the first time then it shouldn't cost more really

PERSONALLY THINK PUBLIC IS AWARE?
Anna: people aren't aware
Holly: general public not aware with disability period. Not a lot of awareness and some people have had experience with one type will make more tolerable to others.. tend to look at the person, not the disability
Anna: younger people more effected… adults didn't have mainstream so they don't have as much experience, smaller schools might not have as much experience.. what you've been exposed to. Positive experiences are more influential than negative so you have to be careful of people who have had bad experiences b/c that might cause the prejudice

OTHER PEOPLE THAT COULD HELP?
*MCDHH- not organised, but do screening and help a little.
*Deaf Inc- in greater Boston area, pick their brains to get info, volunteers always there to answer questions… try face to face as much as possible… to see if there's anyone who would talk to us about building codes… been to aussie, from aussie

CONTACT INFO
Anna Gauthier
Call to make look at email: 508-561-0328 annagauthier222@hotmail.com

OTHER STUFF
*Extreme Makeover!!!
*Harris Communications harriscom(m).com has technology catalogs to look through
*huge push in midwest to make visual warning systems for tornados
*ask Rob about any emergency weather stuff?
*weather.com pager alerts about weather
*BSL… sign system in Aussie is different
*2 handed finger spelling (can find online?)
*might want to know your name but don't expect spelled conversation
*Be patient if you get phone calls with TTY
*Interpreter… make sure you look at and talk to the person, NOT the interpreter
*give deaf people time… lag time with interpretation
*deaf speech… letters s,t,f don't register in some people… lower voice might be better… might be better for just one on one talking rather than 4 people
*questionnaire… make up then send it to someone at VicDeaf to approve wording for deaf people that is easy to understand in English

*visual sign questionnaire CD rom
*sit with someone who's native language is Auslan and talk to them about written questionnaire.. signing and writing don't match up with syntax
*contact John about finding meetings to interrupt to do questionnaires
*add something tactfully about written answers and we won't judge
*hard time with multiple choice… open ended "tell me about a time when…" narrative
* ask John about interpreter availability

Bernd Bartl Interview

RMIT - Royal Melbourne Institute of Technology
Phone: 03 9376 7955
Email: bernd.Bartl@ems.rmit.edu.au

Date: 23 March 2005
Time: 1pm
Interviewers: Nicole and Vinnie

****Introductions**
****Explanation of project**
****Could you tell us about some of your background in building codes?**

- **For the disabled?**

Information to gather

1. **Could you explain the scope of the Building Codes of Australia (BCA)**
    - **Are there any regulations on alerting systems and evacuation systems currently in place?**
    - **Could you give us some insight on the difference in these alerting and evacuation systems in place for private homes and public buildings?**
2. **Could you explain the purposes and the differences between the BCA, DDA, and Standards Australia?**
3. **What is the difference between the words regulations/codes/standards?**
4. **How would we go about making suggestions to improve alerting and evacuations systems for the deaf and hard of hearing?**
    - **What are some of the political process underlying the changes?**
    - **What is the best way to make a compelling and effective argument that could lead to changes?**
    - **What is the likeliness of changes like this occurring?**
5. **Why is the improvement in the codes taking so long to improve the safety of the deaf in buildings?**
    - **Has no one tried before?**
    - **Is it because making amendments is a difficult process?**
6. **Who would VicDeaf contact to approach to begin the process of making changes?**
    - **ABCB?**
7. **Could you tell us about the presentation you just attended and how it may be of insight to our project?**

1. It deals with all structural matters: Main focus, structure/matter & Safety and amenity
Some element of sustainability relation to access “appallingly inadequate”
Building 25 m or more “effective height” must have emergency lifts (8 stories)

Public/commercial buildings under revision, Federal government seems reluctant to make all federal (2/3 stories not worth it)
The disabled should be treated like a human being

Emphasis on fire safety and fire evacuation
Disabilities (mobility) arguably "useless"
Lifts can not be used in case of fire…what to do???

Fire in Victoria Kew cottages, 9 people burned alive
Supported res. Accommodation. Doors locked so disabled couldn't get out at night,
One person on duty

Backpackers fire in Queensland

Definitely in codes but not adequate due to poor egress- under review. Still bad for disabled

Alerting systems: DDA access to premises standard
www.abcb.gov.au
Does have some stuff on emergency signage

- Differences between Standards Australia, DDA, and BCA

Building act says parliament can make regulation
BCA amended once a year
Part 1- 80% people using mobility
2- 90% people
3- children
4- vision imp.

Class 1-10, 1&2 resident buildings, 3 public/ commercial, schools, shops

Standards Australia is a PRIVATE company
BCA-ABCB representatives from 6 states, 2 territories, 1 commonwealth/fed, 2-4 non government reps
Every state must sign agreement
Standards Australia- political process
SA- reasonable standards
Practice serious negotiation between SA&ABCB

1. Difference between regulations/codes/standard

Regulations- act of parliament (building act) formal/vote
Regulatory impact statement- public consultation
Government develops regulations- cost benefit analysis
Benefit$, cost$
ABCB access- regulatory Impact statement about DDA access to premises standard

Idea- standard under DDA
Identical to amend to BCA
Australia fed government only has const power to legislate- because human rights act
Fed government can legislate
Builders don't look at human rights

If someone doesn't comply with DDA, Equal rights commissions yet it's a cumbersome process

BCA if build surveyor con not approve drawings, no occupancy comm.
Disabled won't have to complain
Any state/government
Some states don't apply/additional stuff

Just because there is a standard- doesn't mean you have to comply
1428 large part
6/7 yrs increase
Referred to BCA law

Standard/law
DDA section commonwealth. Government can make state
ed/accommodation/transport/access
Initially didn't have premises
Fed government can not make standard on press????

Stand DDA is law, Australian Stand is voluntary
Regulation says code applies
Act says regulation is a law

2. How to make changes

Link in chain (picture)
No-rest voluntary

Parliament can make building regulations
As a builder- you want BCA and relevant Australian standards

Change to Australian standard to be incorporated into building code

If issue is important enough- if things aren't moving nationally- state building regs
If one state takes lead, others will follow
Speeds up process on national legislation.

Yrs Australian standard
ABCB 4/5/8 years
Tedious

Quick way is state government: Building regulation

Alternative- state equal opportunity act
Victorian doesn't allow government make standards because relates to human rights

3rd track---BC long time
Build regulation-ask them
LOCAL government-Yarra/ Melbourne /Brisbane
Planning policy/schemes

Victoria not the same- planning minister must sign off
Pushing local council

1. educating people
    a. local government staff
    b. newspaper
2. puts a lot of pressure on state government
    a. what are you doing…3/79
    b. 3 is better than 0

Wont allow local but we will do something at state levels

Arguments- individual stories are powerful!
Vital in media-human interest
Hard headed economist- how much its going to cost/benefit

Site research
Evidence from monitoring brain patterns that same pain sent- feeling left out and a needle
People being included, loved, cared- their well being will improve
Quantify? Pain severe-suicide? Real limitation

$ servant of people not people servant of money
Not be an all end all

Important to have some idea of cost
Lot of apt buildings have intercom systems
Only geared towards hearing people
Panel/text/light signal
Per unit not too much
Standard unit only $50--- only $5 more

Mandatory- current voice only req.
Additional cost should come down once its in every unit

Regulating
Making universal cutting out special orders
EXAMPLES
Metric/feet
Metric sized doors used to cost more
Now it's the other way
Once it's standard it becomes the cheapest

Taxis in Britain
Until yr 2000 cost additional 2000 pound
London- all new taxis with wheel chairs accessibility additional cost 0

Its all about what people are used to

Contact:
Ivan Peterson

Peter Bartucca Interview

Associate
Engineering Facilities Management
Phone: +61 3 9672 6575
Fax: +61 3 9670 6318
Email: peter.bartucca@ap.jll.com

Date: 7 April 2005
Location: Jones Lang LaSalle (Level 21 600 Bourke Street)
Interviewers: Heather and Vinnie

- Peter Bartucca
  - Engineering department
  - Has team of 8 (4/5 engineers, 4/5 operations)
  - In charge of day to day basis
    - Including fire alarms, EWISS, and evacuation

- Fire indicator panel determines if there's a fire
- EWISS panel is separate
  - Automated – cascade system

- 65-95 decibel system
- Maybe should be different lights
  - Example – red is evacuate, orange is warning

- VicDeaf is unique because deaf people are there a lot

- Manages a shopping center
  - Have travelators (flat escalators)
  - Spent $400,000-500,000 because someone complained
  - Owner installed disabled lift
  - Needed DDA consultant – GET INFORMATION TO TALK TO THEM

- Unique to situation
- Maybe tenants responsibility

- Talk to evacuation contractors – First 5 minutes, Timevac
- Disabled consultant – may be disabled athlete

- Consultant comes through to organise evacuation training, etc.
  - Have floor wardens (Fire wardens)
  - Must have an evacuation plan
  - 2 fire wardens – look out for EVERYONE during evacuation

- Drills in their buildings (ask VicDeaf)
  - They attend these drills

    - Evacuation companies run the drills
- For false alarms – must pay firemen $1800 per vehicle they send

- Code deals with majority not minority

- Building across the street – 60,000 square meters

- BCA changed significantly in the last few years
    - Before – was "thou shalt…."
    - Now – performance based. If there's a fire, might have sprinklers.
    - Changed from proactive to reactive
    - Pure design consultants – Umow Lai and Association in South Yarra
        - Dominic Lai
        - Design boards and committees
        - More appropriateness vs. required

- WorkSafe Victoria – State government
- Occupational Health and Safety Act
- Consideration given to people to who can't hear at the time – because of loud machinery, etc

- Has only seen flashing lights:
    - At VicDeaf
    - Retail shopping center that was connected to a sewer pit
    - Usually seen with alarms, security alarms
    - Computer rooms because of vesder (very early smoke detector alarm) – fires put out by toxic gases
    - High noise areas where fork lifts operate

- Building surveyor – issues permits
    - Design guide
    - Joe Babbelaco

- Changing the building code for new construction there's no drama, it is retrofitting older buildings where the problem arises

- Can take us to see evacuate control rooms if we want to

Brooks Australia Visit

- **Eric Buckler**
  Regional Manager for Victoria and Tasmania
  Mobile: 0414 507 783
  Email: salesvic@brooks.com.au

- **Michael Craythorn**
  Project Services in Victoria
  Mobile: 0423 796 381
  Email: projects.vic@brooks.com.au

Date: 22 March 2005
Location: 1/3 Molan St. Ringwood

Visalert

- Strobe only, 240v
- Doesn't sense smoke on its own, needs to be linked to smoke detector
- Works with HUSH smoke detector (may only work with some)
- Has its own battery back up (lasts 4-5 hours)
- $250/300

Firemen always turn power off when arrive at a fire
HUSH smoke alarm – detects and sounds
PSA, Chubs, Pixle - other companies

Other Strobes have no back up battery. $60. 4 kend strobe frequency??

Vibalarm - set

- Strobe-wall, vibrating disk (vibrapad) under pillow
- Battery back up but also plugs in, connects to smoke alarm
- Strobe penetrates eyelids
- $335
- 240 volts also 9 volts

Small smoke detector

- 24 volt dc
- Compatible with commercial system, goes on the smoke detector system in building
- Not really used in normal house
- Can use 1 or both – sound and strobe

Blue Strobe

- Same strobe on visilet
- Also works on 24 volts

Photoelectric- optical-

- Use in bedrooms

- “See what we see”
- More expensive but required in sleeping area
- Sense slow burning fires.
- Used in commercial

Ionisation
- Fast fueling fires
- “Smell what we smell”
- Use in passage ways, corridors, kitchen,

Heat detector
- Use only in kitchen/laundry/bathroom
- Senses heat rise

Residential – class 1B, 2, and some 3

Can have more than 1 visalarm hooked up

Brooks trained DHS staff to check if main light is on before bed `

Aussie runs on AC
All panels have 24-volt DC power supply

Conventional systems
Commercial systems
Smoke detectors
Connect genesis sounders and genesis strobes
Can replace sounds with sounder/strobes – same voltage
Go right with the systems or evacuation speakers

Battery backup in panel - supposed to last 24 hours with power off

Smoke detector sends signal to panel then goes to strobe/sounders
- Panels have 24 v power supply, same as sounders/strobes

Photoelectric/optical BEST one out there, most used

Heat alarms – types A, B, C, D – go off at different temperatures
- Type A bathroom
- C roof space
- B fixed temp
- D fixed temp

Can have more detectors than sounders in building.

DHS Property Visit (1)

- **Joanne Fulton**
  DHS, Eastern Region
  Phone: 03 9843 6256

Date: 30 March 2005
Location of DHS Property: 36 Finlayson Street, Doncaster
Interviewers: Heather and Vinnie

- **Staff Member:** Kim Fulton
- **Length of Employment:** 18 years in this type of work, but 9 years in these types of houses.
- **Shift – (Day/Night/Both):** Day and afternoon shifts
- **How many staff members work in this house?** 5 staff members total. 2 are working at each time, but there is only 1 person for the sleepover shift (from 9pm – 7am).
- **How many residents?** 5 residents
- **How many deaf people are present in this housing unit?** Only 1 deaf resident
- **Are any residents on medication**? None
- **What type of medication? N/A**
- **Does medication use interfere with the types of alerting system used (e.g. epilepsy)?**
- **Joanne**: Yes, there have been incidences in drug rehabilitation cases, so it could happen.
- **Has the staff been trained to use the alert equipment for the Deaf and hard of hearing?** Yes
- **If yes, how?**
  - **Check to make sure the system is functioning?** Yes, it is checked every week to make sure the light is functioning.
  - **Able to test the system when necessary?** No, the fire department checks it when they come to test the system once a month
  - **Other training?** Just to make sure everyone is out of the building. We hold house supervisor training, and the Melbourne Fire Brigade has site-specific training and refresher training. The disability division covers training.
  - **Have the deaf residents been educated about the different alert systems?** Somewhat
  - **Check to make sure the system is functioning?** No
  - **Test the system?** No
  - **What the alarms means?** Yes, that there is an emergency and to get out of the house
  - **What to do when an alarm goes off?** Yes, same as above

- **How many times per year are the alerting systems set off for drills?** Never **** However, drills in which alarms are not set off do occur to evacuate residents. The residents are told there is a fire in a certain room and to evacuate.

- **Do these occur during the day or at night?** Both day and night

- **For day:**
- **Do the deaf residents respond to the alarms?** N/A
- **Sound:**
- **Light:**
- **Vibrating:**

- **How do the deaf residents react to the alarms?** N/A
- **Sound:**
- **Light:**
- **Vibrating:**
- **Do they know what is happening?** N/A

- **Do they know how to evacuate themselves or must they wait for assistance?** Yes usually, but it depends on their disability (mental, physical, drug related, etc). When simulate fire, the fire wardens make sure they are out of the house.

- **For night:**
- **Do the alert systems wake up the deaf residents?** N/A
- **Sound:**
- **Light:**
- **Vibrating:**

- **How do they react to the alarms?** N/A
- **Sound:**
- **Light:**
- **Vibrating:**
- **Do they know what is happening?** N/A

- **Do they know how to evacuate themselves or must they wait for assistance?** Same as previous answer in Day section

- **Has a real emergency situation ever arisen during your employment or that you are aware of?** No

- **Were the deaf residents alerted?** N/A

- **Did they evacuate in a timely manner?** N/A

Other Notes:
-In 1997 at the Kew cottages, a client created a fire and there were 9 deaths in the housing units (none were deaf). So now they are in the process of getting sprinklers.
-Most DHS housing units are not outfitted with sprinklers

Eric:
-This panel is an older panel and will be replaced soon.
-If the sprinkler is tampered with, there will be a sound alarm and a light on the panel
-The sprinklers heat up, glass pops, water flows, sets off alarm
-Sprinkler and smoke alarms release door locks so they can just be pushed open

-In August 2002, decided that if less than 10% of the residents need assistance, the building needs sprinklers
-Only in supported residential services
-Depends on the department

Joanne: It's all about early warning

Hank: The sprinklers stop the fire from getting out of control, so it doesn't get to the flashover point. Fast response sprinklers. The sprinklers are separate from smoke detectors.

-The house was bought in 1998, and this system was put in place in 1999

-People don't want sprinklers because they have to spend the money to maintain them.
-"Operational readiness" – to see what works for each person
-Hearing Impaired resident knows how to react to an emergency – will grab a backpack or phone.
-It varies from resident to resident (and disability to disability) on how well they can get out

DHS Property Visit (2) with Vibralarms

- **Joanne Fulton**
  DHS, Eastern Region
  Phone: 03 9843 6256

Date: 8 April 2005
Time: 10:30am
Location: 16 Meadow Crescent, Mount Waverley
Interviewer: Vinnie

Interviewees:
Simone Turnbull: has been the house manager at the property since January of 2004
Joanne Fulton: DHS representative
Paul Stanley: Specialised Fire Services representative

Property Description:
The building is a one floor building with a kitchen, dining room, bathroom, six bedrooms, and a small backyard. Because the residents and the some of the staff are deaf, the building is equipped with several visual alerting systems. Every bedroom has a flashing light and vibrating pad, however due to residents chewing the cords and pulling the power cord, the flashing lights are hidden behind the bed and the lights can't be seen. The vibrating pads are not being used because they have not found an effective way to keep the pads under the resident's pillow. The doorbell is wired to a light in the kitchen area and to a vibrating watch the staff members are required to wear (they do not wear it). The watch will also vibrate when the phone rings. The death of a deaf man in Tasmania was what made these changes occur.

The building has an evacuation system designed by The First Five Minutes and the staff is required to attend DHS evacuation training and procedure training once a year. The building is also equipped with a fire panel and automatic opening doors.

Shift – (Day/Night/Both):
There are five staff members, one is fully deaf and two are hard of hearing. Two staff members are usually working during the day and one during the night. The five staff members switch off the shifts they work on.

Day shifts are from 9am-5pm and night shifts are from 5pm-9am

How many residents?
Five residents with multiple disabilities live in this house. The residents are deaf, blind, and dumb or some combination of the three. Two of them have cerebral palsy.

How many deaf people are present in this housing unit?
There are three staff members, one fully deaf and two hard of hearing. All the residents have some kind of hearing impairment.

Are any residents on medication? Yes

Has the staff been trained to use the alert equipment for the Deaf and hard of hearing?
The staff has been trained to use the alerting equipment and to make sure they are working. If there is a problem with the equipment they are directed to contact DHS.

Have the deaf residents been educated about the different alert systems?
No, Simone stated that all of the lights and vibrating systems are in place, but they don't really know what it is for. Because of their intellectual disability, the best way to alert the residents is by personally leading them out of the building

How many times per year are the alerting systems set off for drills?
Never, they only go off when there is an actual emergency. The drills conducted in this facility are by setting up situations and going through the motion without the alarm sounding.

The alerting systems are tested every month when the building is empty.

Do these occur during the day or at night? Both day and night

Do they know how to evacuate themselves or must they wait for assistance?
Some can recognise what is happening, but they need assistance to evacuate the building.

Has a real emergency situation ever arisen during your employment or that you are aware of?
No

Who funds the specialised alerting systems?
Through DHS, the government funds all the changes. Paul and Joanne stated that there is no cost barrier when it comes to the safety of their residents

Conclusions

Paul stated that the reason for the intermittent flashing white light is because it is intended to target the optic never. It will penetrate the eyelids and trigger a response by the deaf person. Colored lights are not used because they do not trigger a response by the optic nerve. One concern with these lights is epilepsy, which can occur when the optic never is triggered.

Because there is no regulation on where to place both the lights and the vibrapad, they are placed in wrong places and become useless.

The challenge with alerting the residents in this building is due to the multiple disabilities. If the person was simply deaf, the alerting systems would be effective. Because of the safety issues with chewing cords, strangling themselves, and disconnecting it from the power source, the systems become ineffective. Even with these obstacles, the DHS provides as much assistance as they can.

The responses from Joanne and Paul are that even though the codes do not require flashing lights, if the occupant in the building raises a concern, they will satisfy that person’s need.

Focus Group with the deaf

Location: Victorian Deaf Society
Date: 6 April 2005
Time: 1 PM
Location: The Victorian Deaf Society

Moderators: Laurie (Moderator), Heather, Nicole, Vinnie, Kirri Dangerfield (Interpreter)
Deaf Attendees: Elaina Chapman, Selwyn Hoffmann, Tammy Jong, Niaz Burhanuddin, David Peters, Nishma Shah, Natasha Jumelet

Introductions

- Ourselves
- Attendees

Elaina Chapman – Born hearing and became fully deaf about 10 years ago. Works on level 4 as a case manager.
Selwyn Hoffmann – Deaf, failed hearing test. Works on 4th level in the same support group as Natasha.
Tammy Jong – Born fully deaf. Works in finance area.
Niaz Burhanuddin – Fully Deaf. Works on 4th floor in IT area, in and out of office.
David Peters – Deaf. Works on level 3 as an outreach officer, goes out into the community.
Nishma Shah – Fully deaf. Works on level 4 as a case manager, and also works outside the office with clients
Natasha Jumelet – Fully deaf, can't hear a thing. Relies on her eyes. Works in Independent living skills area on 4th floor.

Project Description

We will review the Australian building codes to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.

Our results will include two sections;

- *The first section will include suggestions on improvements to the codes themselves.*
- *The second section will include suggestions on how to approach making changes to the building codes.*

Part 1: Discussion Topics

****What are some of your main concerns for your safety in buildings?**

Selwyn – I'm not comfortable with hotels. When I go to book a room, there's no advice on how to get out of the building in case of an emergency or fire. They have alarms, but I can't hear them. The hotels are not meeting my needs. I'm satisfied with museums but not hotels.
Nishma – I'm a case manager, so I'm mostly out. I'm scared of lifts, I could get stuck in one. The receptionists don't know I'm deaf. When I go to hospitals with clients, I can't hear the names get called. It would be better if they had a screen. What if there was a fire?
Elaina – Like in underground carpark, if there is a fire in upper levels, how would I know? In ours, there are security cameras and the doors open, but there's no actual warning system.
Niaz – Another example is at a public train. When I'm waiting, they have spoken announcements to say the train is late. I would rather they had a screen.
Elaina – I feel stupid when following people, and I don't know what's going on.
David – In the old VicDeaf building, there were lights that were red and yellow. If there was a fire, the lights go off, same with the doorbell. Then we moved and there were no lights, it was difficult. They organised a vibrating pager system, so I could feel in my pocket when something was happening. In my area, there was one hearing person responsible for the whole area to tell everyone of any news.

*****What are some of your concerns with the alerting systems and evacuation systems (or lack there of) in place to accommodate you?***

David – None really, I have not been anywhere where something has happened. Most deaf do know about alerts. When they see everyone leaving, they follow them. But I feel I know everything second, so I'm not equal.

- **Do you have any ideas for improvement in the alerting systems (captioning, signs, lights, vibrating, fire wardens, different tones on alarms, etc)?**
- **Where is the best location for signs, alarms, etc**

Selwyn – Do you know about the sign on the 4th level by door on the left hand side. It says "stop". Go have look at it and see what you think of it.
Nishma - It's a very visual drawing of how to get out. It's a good explanation of what you need to do.

What about signs in public buildings?

Selwyn – They usually only say where the exit is
David – The problem with public buildings is if I'm in there, I won't be looking around for posters on emergencies. I only really follow people.
Elaina – Most people just follow hearing people
David – What if I'm up on 20th floor in the toilet. I will be reading paper and not paying attention. If there's a fire, I won't know and people won't know I'm in there.

Have you been in an emergency situation where you were not alerted?

Nishma – Here in this building, nothing really happens. In another organisation, I was in the toilet, saw a flash of light, and thought there was an emergency. I was embarrassed. There is one light that's a tiny light, but I work on a computer, so I don't notice. Need something brighter or a color to be noticed.
Selwyn – 10 to 15 years ago, a house had a smoke alarm, but it doesn't suit deaf people. One night, there was a fire. The smoke alarm went off, but it didn't do any good, the smoke came into their room, they inhaled it and they died. A Deaf organisation called AAD talks about how we need special alarms for smoke alarms. We have a very poor standard here because there are a lot of systems that don't suit the deaf.
Elaina – Before, the deaf people weren't allowed to go on boats to go on holiday because if something happened, they wouldn't know what was gong on. They suggested leaving our doors open so they could come and get us if something happened, but that is an invasion of privacy.
Selwyn – At home, we have flashing lights. But there should be ones for the door and telephone with different flashes. Slow flash for door, fast flash for telephone, and very fast for emergency
Elaina – In homes, I have a visual system, but I have to pay for it because the government won't. There is no support to have these additions in homes.

How knowledgeable do you feel you and the deaf community are with respect to safety equipment available to alert you in case of an emergency?

General consensus – not very knowledgeable

If you are, then how did you learn?

Tammy – I learned from a talk that I was involved in. I went to a deaf school. In the accommodations there, there were lights all over the place there so you could chat, but that was more during school hours. At night the lights were off.
Natasha – I'm from New Zealand, so I went to school there. I wore hearing aids. When I got them, someone asked me about flashing lights and I didn't know anything about them, so I started learning about the equipment. I left school, but later on I always knew I could go back and buy that equipment
Selwyn – I found out where to get flashing lights from Word of Mouth Technology. There was a deaf festival, and there was a store there from WOM. They had equipment for doors, baby crying, etc. WOM is the only place I know that sells that equipment. Here, there's not a lot of information about flashing lights
Niaz – I think there is information linked with hearing services
David – In our old building, there was lots of info
Niaz – I think we need information. The Internet has some information
Elaina – I learned from visiting deaf families at their homes, but I think technology is getting better
Selwyn – I used to live in Balarat and built my own house. I had to look at building standards, but there was nothing about providing special support for the deaf. There was nothing within the standard framework about what to add to a home. There was

only information about the needed smoke/fire alarms, and there's a fine of about $200 if you don't do it

If not, why don't deaf community know about technology?

Nishma – It depends. If the deaf live in the country, no advertising goes out there. If they grow up in hearing family, they don't know about. If deaf parents, they might know
Tammy – most deaf in hearing families don't need it, but when they move out on their own, they have to learn about it
Nishma – they rely on their hearing family. When they move out, they realise things they do need. I'm from England, and in England they provide everything for free - flashing lights, etc. All equipment, you get for free. Here you have to pay for everything, it's not fair. The government should be providing this. English government provides free equipment.

Part 2: Demonstration of Alerting Systems

What types of alarms are you familiar with? (The three most common alarms are…)

David – Yes, I have heard of some. I know about the American ones. There's a special kit for the deaf. There is wheelchair access in showers, motels for deaf with flashing lights on doors and alarms, TTY services, and alarms suited for waking up the deaf

Natasha – Most people don't know about them, they just have sound alarms
Elaina – Most clients don't have lights in their homes because landlords don't provide for them
David – Most deaf who own their own houses would have their own systems, but probably not those in rental homes.
Elaina – Most clients can't afford to put systems in because it's very expensive, over $1000. They can't afford it; I think it's discriminatory. Sometimes if they complain, the landlords will put it in
Elaina – In hospitals, when a deaf mother has a baby, there are no alarms to tell the mother when the baby is crying. This is another huge problem that we have

Who does have special alerting systems in their homes?

Elaina – has a phone one
Selwyn - has one, but has never tried it
David - Has ones for the phone, door, baby crying, and emergencies that all work. The first three are on the same light system, and the fire alarm is separate to that.

Next, we would like to demonstrate some of the available deaf alerting system technology and hear your opinions on them.

Explain the alarms we have and the procedure we will use to get their feedback.

Audible Alarms

Fire Panel: has 8 different tones that vary in pitch and sound pattern

****Are there any levels of sound that you are able to hear?** *All were fully deaf*

*****Do you think this would be an effective alert technique for you?***

David - if someone is losing their hearing, that might be beneficial, but not if they are fully deaf
Natasha – If they are hearing impaired, it might help, but visual might be better
Tammy – for hearing impaired it could help, but those of us who are fully deaf, it doesn't help
Natasha – for the hearing impaired, it could confuse them about what noise is. They could think it was a lawnmower or something, and might not know it's for an emergency
Selwyn – for the hearing impaired, they have hearing aids. But they take them when they go to bed, so they can't hear. I agree with Natasha, it is better for everyone to have flashing lights. Noises and sounds are for hearing people. I don't really think sounds are especially useful for hearing impaired.
Elaina – Some people don't accept they are deaf, so they might want sounds also

Visual Alarms

Visalert: easily wired to a standard fire alarm and has a built in rechargeable battery in case of loss of electricity

Genesis strobe: can be sound, strobe or both… is used as part of a commercial fire system to alert people of emergencies (NOT a detector)

*****Do you think these lights would be effective in alerting you in case of an emergency?***

Visalert:
General Response: *everyone showed disapproval and dislike of the flashing light.*
Elaina – that looks like it would give me a fit. It is not good for those with epilepsy, I feel like I'm in a disco
Elaina – It's an ugly machine, not very pleasing on the eyes
Selwyn – maybe it would be better if it was linked to the actual lights
Tammy – It's a good idea, but we need to have one in each room. What if I'm in a different room?
Natasha – It would be better to have a robot to tell me there's a fire instead of flashing lights. We could have robots to follow us wherever we go

Genesis strobe:
General Response: *everyone showed disapproval and dislike of the flashing light.*
Nishma – Red, orange, or yellow lights would be better. Can't really see it, looks like a camera flash
Selwyn – I think maybe link that light to an exit light or near an exit light, this would encourage people to get out of the building. If they saw it somewhere, they would all turn and look there instead of leaving.
Natasha – People with ushers (eyesight deteriorates with deafness, like tunnel vision) have minimal sight. They couldn't see lights, so it's better to have pagers

Selwyn – I agree with Natasha, people with ushers have limited sight. So to have flashing light near the exit is good

EI Professional Alerting System (strobe, sound and vibralert)
Three alert system mainly used in homes; strobe/sound piece mounted right next to bed and vibrating device under pillow

Do you think that this combination device would be effective in waking you at night?

Natasha – I think that's a good idea.
David – In public buildings, it's good to have lights. Vibrating disks are not useful.
Most - said they thought it would wake them up
Nishma – I would sleep through lights, but the vibrator would wake me up. If there was a fire and the water went off, that would wake me up. I would wake up because everything is wet.
David – It's important to have lights and what Selwyn said, it is important to have them near exit signs
Nishma – just having one could be sufficient
Elaina – depends on person, whatever you wake up to
David – in public building, it is good to have lights. In motels and whatnot, it is good to have vibrating things

****We've heard that some common arguments against the implementation of alerting systems for the deaf in buildings. Some examples of these are:**

- **It costs too much to outfit an entire building to accommodate a small percentage of the population, and**
- **The public is generally apathetic or unaware of the safety challenges the deaf face**
- **Any thoughts?**

David – with a group like VCOD, there is support for us. People in wheelchairs have full access to things, but there's not enough going on for us to have a loud voice. Wheelchairs have a loud voice, so the government listens to them.
Nishma – in England, if you work in area, the area has to pay for equipment. Government provides it in the home
David – who started this? English deaf association
Nishma – AAD does promote this for public buildings, but it is very expensive
Elaina – in America, they have a kit. Maybe if rent equipment until you don't need it anymore, it would make it cheaper
Tammy – in a Sydney restaurant that I went to with a deaf friend, they had a special light to say when you are ready to order. It's in Bondi beach, I forgot the name but I will ask. Another restaurant, when you give an order, the number shows up on a screen so you know the meal is ready
Selwyn – I have an interesting story. Some deaf people went overseas to Thailand for holiday. On last day, flying home, they went to a hotel. They explained about a balloon with a string that went to the doorway. The balloon went in the bed near the feet. When you pull the string, it moved the balloon and woke them up.

Natasha – on another topic, 6 years ago I went to Richmond. I was in the library reading about Richmond history. There was a story about a deaf man. He tied a string to his toe that went to the door. People would pull on the string when they came to visit.
Selwyn – Here's another story about 2 deaf/blind people when asked how they wake up in the morning. Before they go to bed, they drink a glass of water at the same time each night. So when they need the toilet, they wake up.

Selwyn – I have dogs, so they wake me up.
Elaina – My body clock wakes me up at 4 or 5 am every day
Natasha – I set mobile to vibrate and have it on me, so it wakes me up
Niaz – I set my mobile to vibrate or my wife wakes me up

Networking:

Is there anyone else you know who could help us with our project?

Selwyn – I believe that we need signs about how to evacuate a building in case of a fire or emergency or bomb threat. Read that and be done with it. Not with too much information, because there's no point to that. In an emergency, the lights need to be 1 color (red or yellow or orange), just pick 1 color. If it passes in law that we need lights, it would be good. For the vibrating one, you need to be careful with that. If it is linked to the phone, it should follow the pattern of the phone ring. But for an emergency, it should be continuous.
Tammy – what happens during a power outage?
Niaz – they have a battery backup

Selwyn – maybe some people can't see the lights good enough during day?

David – In Melbourne, there is the building code committee. You should talk to them
Nishma – I think they need to change all the building codes for deaf and deaf/blind people so they can all have access.
Elaina – Talk to all deaf organisations like the Deaf schools and Monengton center
Selwyn – The deaf blind association
David – VOCD, AAD - ask what they're doing about building codes with deaf people.
Selwyn – I don't think they're doing a lot about it at all
Nishma – they should do stuff, maybe you could be leader
Selwyn – VCOD is only for the state. AAD is federal and Australia wide

Focus Group with Parents of Deaf

Participants:

(1) Tamara Trinder
Employment Case Manager, Deaf Children Australia
ttrinder@deafchildren.org.au
(2) Greg Frost
Family & community worker, Deaf Children Australia
gfrost@deafchildren.org.au

Date: 14 April 2005
Time: 1pm
Location: 597 St. Kilda Road, Deaf Children Australia

Interviewers: Nicole and Vinnie

Protocol

****Introductions**

****Project Description**

We will review the Australian building codes to decide if the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.

**** How old are your children and what are their level of hearing impairment?**

10 months with a severe hearing loss (mom is deaf)
12 year old who lost hearing at 4 ½ profound deaf and 10 year old born profound deaf

*****What are some of your main concerns for your children when they are in a building?***

I am lucky because I work in a deaf organisation. Hearing organisations usually have nothing like fire alarms in place. I've worked in kitchens before, no alarms. Same in school, there was nothing, but that was 15 years ago.
My oldest is in high school and has nothing and the other is in primary school which has a similar system has here.
Deaf children Australia has a 2-color alarm system where the orange means warning but don't panic and red means evacuate. The computers also will come up with notices in emergencies, but the only problem with that is your not always looking at the computer.
(2) My children are integrated in mainstream schools so their classmates tell them.
Most of the buildings near us are single story so it's not a big deal of evacuation

****What are some of the things you would like to see in buildings to ensure the security of your children?**

Do you have any ideas for improvement in the alerting systems (captioning, signs, lights, vibrating, fire wardens, different tones on alarms, etc)

(1) Captioning would be nice. In my experience in employment areas deaf clients re lucky because they have me to sign. Most people aren't aware of the deaf people in an organisation. All deaf people should receive benefits- small %age get access. More publicity is needs to create awareness. Funding is available, but people just don't know who to ask.

(2) It should be made mandatory. Major sporting events, never captioned. I'm not sure if they have anything. There are 100thousand people there at one time, how do we get them all out? It does concern me when we get separated in crowds too.

Where is the best location for signs, alarms, etc

in reality we don't automatically look around for alarms. Hearing people rely on PA systems. When you're panicking you don't really have time to look around. Hearing people get additional info with PA announcements but we get nothing.

Floor plan-I check all those for my own safety but now that you've mentioned it I've never mentioned anything to my kids about them. What if they're by themselves, they'll need a map

(1) I just don't take notice. I was explained all the signs when I was new here, but I haven't thought about them since. In reality people aren't going to remember.

What types of alarms do you have in your home?

(1) Before my daughter was born we had to request a baby cry alarm from DHS. It was quite difficult, they wouldn't have provided it but I found a social worker help me find where to get the money. I shouldn't have to fight. There is a lack of understanding/awareness in that area. They would only help us with the cry alarm, not fire or doorbell. I think they should provide all of them. What if the hospital was ringing? I wouldn't know. I shouldn't have to have my mum stay with me for the first 6-8 weeks but I do, it's not fair. Any they they want you to pay for all the sutff for yourself, I cant afford it.

(2) Very expensive. Its about 3 ½ grand for the whole system. I have deaf friends who have everything, they're pretty well off so its ok. We only have a light on our phone TTY. A regular on is $5 but the one with the strobe is $60, a lot higher. You've got to be in that room to see it anyways; it's a hassle.

(1) You have to think about installation costs too. Itrs really expensive for first time mother and fathers. The cry alarm is the priority.

(2) If I was building a house I would do it, but its when you have to retrofit that it gets too expensive.

Is the school your child attends well equipped to alert your children in case of an emergency?

Nothing at child care

Most children have mobiles but they can't have them in school. They have to be kept in the locker. I requested letting my child carry hers so it can be on vibrate and they can SMS her if something happened. They just pushed that idea to the side.

(1) I've used pagers with some clients and they're quite good. One client is a housekeeper and works in a lot of high-rise buildings so she carries the pager with her when working.

Do you feel your children are educated to the alerting systems?
(2) Anything that moves, she would notice. They know what an exit sign is but they usually just take directions from everyone else. The kids they go to school with are deaf aware because they've gone to school together all along.

Have there been any instances where because there wasn't an appropriate alerting system, your child was in danger?
Do you know of anyone who has been in this type of situation
What were the results/consequences

(1) Not really about just lack of resources and not knowing what's available.
(2) No, there have been a few times where we got separated and an audible alarm would be a waste. My friend keeps reminding me about how he was sitting in traffic for a long time because the radio said the road was blocked off. He didn't know to go another way.
(1) Very annoying and frustrating. Same thing about the freeway. I also had a friend who was in a shopping center and her deaf kid got lost. They wanted to call the name over the PA, that wouldn't help! People had to look for her physically, not the best way.

Have any of you been part of an effort to improve the safety of your children in buildings?
What were the results
(1) At the end of the day its all about money
(2) Government subsidies for TTY, so its only about $10. there's got to be a way to subsidies the strobe lights. Doorbells should have lights as an option.

Common arguments against the implementation of alerting systems for the deaf have included:
It costs too much to equip an entire building for such a small population
What are your thoughts
(1) Very offensive when you think about it. It might e a minor thing to them, but we pay the same taxes and do the same stuff as everyone else
(2) I know some old folks who got $15gr then another $8 grand for wheel chair ramps and stuff like that. Why can't they do that for deaf people? One area is important but deaf people aren't the same? Just because they're regular looking people….

Part 2
The most common alerting systems for the deaf include:
Flashing lights
Vibrating pads
Pager systems

Audible Alarms
Brooks Fire Panel (Tones 1-8)

Standard household fire alarm

Visual Alarms

BrooksVisalert
Genesis strobe (battery operated)
EI Professional (attaches to vibrator)

Tactile Alarm

Vibrating Pillow

(1)No I don't like that; it's just like being in a nightclub. It would be better if it were a normal light flashing. My first reaction is that I just don't like it. With the vibrating system, we've had the same thing sin some disabled homes, but it's hooked up to the regular lights. I wake up by a portable shake awake alarm. Cant you just wire the equipment, there must be some sort of manager that automatically goes off in every room.

(2) I have a friend who wired the lights up to a regular smoke alarm; highly illegal, but he could do it for $20. Whys it so expensive to buy? I think id need to realise this flashing light is on…I've seen a watch because I check out this stuff all the time, and it has 4 alarms on it for different warnings.

****How effective do you think these alarms would be in alerting your children?**
****Would you pay the extra money for these alarms?**
****What do you think is the most effective method?**

Tass Georgas Interview

Building Surveyor
Metropolitan Fire Brigade
Phone: 03 9420 3919

Date: 15 April 2005
Interviewer: Heather and Laurie

****Introductions**
****Project Description**

We will review the Australian building codes to decide if the regulations on alerting systems for the deaf are in need of changes. We will then make recommendations if the codes are in need of changes to improve alerting systems to facilitate the evacuation of the deaf in buildings.

- **What exactly do you do/what your job entails?**
- **Are you aware of how the codes accommodate the disabled?**
  - **How do you usually approach disability accommodation?**
- **How do disability alterations affect the rights of builders?**
- **The building surveyors?**
- **Do you think adding alerting systems would be a significant change?**
  - **Somewhat pricey?**
  - **Difficult/time consuming?**
- **As you know, our project is to review the building codes for the deaf (There is nothing in the codes for the deaf)**
  - **How would you/builders feel if there is change?**
  - **Would you be for change or would you oppose it?**

  - Surveyor/inspector/engineer
  - Surveyors issue permits
  - Been a surveyor since 1998, and started as an inspector 8 years before that
- Bob Hetherington
  - Enforcer
  - Station officer
  - Tass gives him technical advice
- Surveyors in terms of Australian Institute of Surveyors - lobby group to influence what goes into BCA, Building Regulations of Victoria, and Building Act of Victoria
- MFB in BRAC (Regulations) – all brigades together as AFAC and have a say in what goes in Standards Australia
- 1428.5 – not referred by BCA until later in the year
  - When amended yearly, sometimes included in BCA
  - Could be 2 years, ABCB could say no, which is very common – "too hard to basket"
  - Master Builders Association and Property Council will fight cost…more than inflation (1-2%)

    - Put in slowly by components
- Hardwired fire alarms are about $150-200
- After 1997 all houses had to be retrofitted (had 2 years to do so)
    - Buildings that were sold had 30 days – Class 1A,1B, 3
    - Did not affect apartments (Class 2)
- Cost would be a deterrent…they can have all the committees they want…if saw trend, would try to make changes…need massive loss of life or influence for other people
- Strobes to link to alarms - $400-500
- Smoke/strobe - $200-310
- Calibrated lights (strobe)
- Flashing lights (non-epilepsy)
- There have been cases when alert was delayed – usually resulted in injury, not death
- Regulations are very influenced by lobby groups
- Lobby Groups
    - Building Commission – person nominated by minister
        - There are official groups…then people who lobby them
    - Morris Walker Consultants – disability building consultants
        - Member of building appears board – spend time assessing buildings for people with disabilities
- Equal Opportunity Commission – work with DDA (Federal)
    - Deaf go there…
    - "A good hearing", "make a lot of noise"
    - Then publicise to get public outrage so the state and ABCB notice and realise the need for change
- Uniform Building Regulations in Victoria 1974 had nothing
- 1983 when Regulations came in were amended and started to change (probably a lawsuit or something)
- 1990 – got rid of technical requirements to make BCA
- Lawsuits are getting bigger
- Risk management is getting much better
- EOC (DDA) – need 100% proof of discrimination
- Lawsuit – only needs 51%
- In VIC, the height of a balcony rail was a little low…a guy was pushed over while at a party – was wheelchair bound
    - So now, people MUST have the right height
- State level with MFB because has person on the BRAC
- VIC Institute of Technology says kids can't hear fire alarms
- Eye and Ear Hospital – talk to their engineer or maintenance manager
- Easier to change the Regulations than an act of Parliament

Janice Knuckey Interview

Deaf Children Australia
Email: jknuckey@deafchildren.org.au

Date: 24 March 2005
Location: VicDeaf
Interviewees: Heather, Laurie, Nicole, Vinnie

- Janice Knuckey
    - Deaf Children Australia
    - Does policy work for the families of deaf children
        - Children are 5-18 years old
    - Advocacy and support – nation
        - Services, educational support, etc
    - Offices in Melbourne and Brisbane
    - Partnership with Queensland
    - DCA is over 100 years old
    - Janice has been doing policy and information work for almost 3 years
    - Also a teacher for the deaf in technical education
    - Facility for deaf students
    - Provide statewide advice and information for families
- Should involve DCA and VCOD
- The 3 groups could create policy
- Suggested focus group with parents of deaf children

- Information to what is available
- Disability laws are not strong
- Only recently achieved or not achieved at all
- Just got access to DVDs with captions last year
- People need to know – why?
    - They haven't thought about what would happen

- Suggested we visit schools
- Interview teachers
- Go to the college of the deaf (St. Kilda Road)
- Go to both private and government schools
    - Methodist Ladies College – private school
        - 2000 girls, 20 deaf kids
    - Mt. ???
        - Coordinator is deaf
    - Baxter Secondary College

- Schools are all designed for hearing kids
- Issues with safety with integrated settings
- In schools – things are haphazard

- Signs are important to facilitate evacuation

- Her experience as a teacher
    - Drill happened – announced emergency drill
    - Everyone went outside
    - Her and her kids were still inside working
    - Nothing changed
        - Because of money – had no money to put in flashing lights

- Two instances of deaths in fire
    - Tasmania
    - Another one??
        - Maybe VCOD could help – Grant Roberts was previous manager

- NMIT – center of excellence for deaf studies
- 2 employment services – DeafWorks
    - Look and assist deaf and blind people

Frank Martinez Interview

Manager
Management Service
Phone: +61 3 9672 6618
Fax: +61 3 9670 6318
Email: frank.martinez@ap.jll.com

Date: 7 April 2005
Location: Jones Lang LaSalle (Level 21 600 Bourke Street)
Interviewees: Heather and Vinnie

Protocol
****Introductions**

****Project Description**

We will review the Australian building codes to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.

Our results will include two sections;

- ***The first section will include suggestions on how to approach making changes to the building codes.***
- ***The second section will include suggestions on improvements to the codes themselves.***

****John Paton informed us that you own several buildings.**
Could you describe the type of properties you own?

****Are you familiar with the technology available for alerting the deaf?**
Flashing lights
Vibrating pads
Pager systems

****As a property owner, how do you feel about the changes to accommodate the deaf?**
Have you ever provided these special alerting systems and if so, how much did is cost?
If NO, would you be willing to incorporate flashing alerting systems into your buildings if a deaf person occupied it?

****Common arguments against the implementation of alerting systems for the deaf have include;**

It costs too much to equip an entire building for such a small population
What is your position on this issue
What other arguments do property owners have against the implementation of such systems for the deaf?

- Frank Martinez
  - Property Manager
  - Manages industrial and commercial buildings
  - Based in Victoria
  - Group manages over 200-220 buildings
  - He manages 8 (about 40 tenants in each building)
  - Has worked since 1988 – 17 years
  - Started in residential, then sales, then property manager (about 10 years)

- Focus more on the BCA
- Standard Australia is more about the equipment
- Industrial buildings have more regulations

- Make sure the buildings are maintained with the codes
- If the codes are changed – they find out – they update the buildings
- Buildings have 12 months to comply
- Fines/prison if don't comply
  - Both managers (if they miss a change) and the company (if they don't make the change)
- 80-90% of property owners agree with changes and make them

- Knows there's products out there for the deaf
- Knows about flashing lights

- Right now – disabled access and toilets are necessary for NEW buildings

- Don't have a problem with changes, but thinks it's more important for buildings that a lot of deaf people would be visiting

- Cost/Benefit
  - Cost vs. the percentage of deaf people entering the building
  - Cost can't be justified

- Smart developer might implement to be prepared
- VicDeaf building
  - Cost $50,000 to update the building
  - $8,000-$10,000 per floor to update

New codes are not an issue for new buildings

Rachel Miers Interview

Manager at VCOD
Email: info@vcod.com.au

Date: 11 April 2005
Location: The Victorian Deaf Society

****Was supposed to be a focus group but only Rachel came****

Introductions

- **Ourselves**
- **Attendees**
    - **Who they are**
    - **Where they work and how their organisation deals with the deaf**

First of all, my name is Rachel Miers, I work at the Victorian Council of the Deaf (VCOD) and have only been there for 6 weeks, and everything there is very new. I worked previously in Canberra so I can answer with that experience.

Project Description

We will review the Australian building codes to decide if and why the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.

Our results will include two sections:

- *The first section will include suggestions on improvements to the codes themselves.*
- *The second section will include suggestions on how to approach making changes to the building codes.*

Part 1: Discussion Topics

****What are some of your main concerns for the safety of the deaf in buildings?**

> I am new to Melbourne so I am not used to the working conditions here. In my past experience there have been no flashing lights because they are very rare in public buildings. I have a pager at VCOD which is a baby alarm type thing programmed for smoke detectors and doorbells. The way the pager responds indicates which alert it is.
>
> Last year, for 7 months, 3 different alarm types were available but no one was taking the technology seriously. They would practice the lights flashing on the pager sometimes, but it would be better if it was a light in the ceiling that was more visual.

During the Deafalymics, they talked about the pager type of alarm and they thought that these pagers weren't sufficient enough.

When at Galladet University in the US, standards said there had to be flashing lights in all public buildings which was great; it was the best system I've ever had contact with. In the dorms there were lights and all building had mobiles. They also had fire alarms with strobe lights with special patterns to know when to evacuate because a specific emergency evacuation pattern would go off.

****Were these lights colored?**

Nope, they were plain white lights although it would be nice to have other colours.

****What are some of your concerns with the alerting systems and evacuation systems (or lack there of) for the deaf?**

- Do you have any ideas for improvement in the alerting systems (captioning, signs, lights, vibrating, fire wardens, different tones on alarms, etc)
- Where is the best location for signs, alarms, etc

Good question, I would at least like to see the whole world on the same standard as in the US with the required flashing lights. Even just talking with some people, everyone seems to take the American ideas, although that may not be the way to go. Things need to be compatible so you can't just take them from another country, they need to fit in and work with the technology of your country.

Next to the wall and near the door is a good location for the flashing lights.

****Do you know of any experiences your clients have faced where alerting them during an emergency was a problem?**

In my own experience, someone always told me there was an emergency because there were no flashing lights for me to see. They told me it was too much money for flashing light equipment for just one person. Also, there is one death in Tasmania which was very sad and it's the only one I've heard of. I plan on doing a survey on these types of experiences.

****Are the deaf people you work with knowledgeable about the safety equipment available to alert them?**

I don't think a lot of people are aware but deaf people just say if it's put in front of them they'll do it but additional costs for lights becomes too expensive.

****Do you have any in your home?**

We are renting an apartment, so we have nothing like that… maybe when we buy a home we'll get them. In America they would have flashing lights in a rented place… here there should be a code saying all places must have it. At

the moment in our rented house we have one ceiling lamp and it's even worse when my mother visits because she keeps telling me about this noise that was going on all the time and we realised it was a flat battery in the smoke detector and we never replaced it b/c we couldn't hear it. This alarm certainly wouldn't be able to warn us in an emergency if I don't even know the battery has gone flat.

When at Galladet, I had my first experience of knowing about the equipment. My husband says they've always had it so he took for granted that I would already know *husband is from FL*

****Have you ever faced an emergency during the workday?**

There are 2 times. The first was when I was in a car accident before SMS was available and had no way of contacting anyone and got taken to hospital. My parents were visiting at my home and were waiting for me to arrive after work… I spent all day in the hospital without a way to contact them and when I got home at about 5 I had to tell them there was no way for me to contact them. Now that SMS is available we have a good way to let people know about an emergency.
There was a bushfire in Canberra two or three years ago that was just terrible and SMS wouldn't work because there was so much being sent in the city that the whole network collapsed. We had no information about what was going on, and just saw black smoke and didn't know what to do or where to go or if they should evacuate. Eventually we went to my mother's home and later wrote a letter to the AAD saying they should have a way to contact deaf people by SMS in an emergency. Her family is deaf so they could all die in a bushfire in that situation without any good way to communicate.

One deaf family's house totally burned and they lost everything. 3 other deaf people had families in their houses but right across the fence-line were other people whose house was lost in fire.

Part 2: Demonstration of Alerting Systems

Next, we would like to demonstrate some of the available deaf alerting system technology and hear your opinions on them.

Explain the alarms we have and the procedure we will use to get their feedback.

Audible Alarms
Fire Panel: has 8 different tones that vary in pitch and sound pattern

****Is it common for deaf people with milder hearing loss to be able to hear different frequencies of sounds?**

****Do you think this would be an effective alert technique for the deaf?**

Visual Alarms

<u>Visalert</u>: easily wired to a standard fire alarm and has a built in rechargeable battery in case of loss of electricity

Genesis strobe: can be sound, strobe or both… is used as part of a commercial fire system to alert people of emergencies (NOT a detector)

****Do you think these lights would be effective in alerting the deaf?**

Yes I think the strobes would be good (about both of them). I guess it is an indivudal choice to buy the vibrating device, for me I think I wouldn't need it because the strobe would be enough to wake me up.

These flashing lights absolutely must be incorporated into the building codes.

EI Professional Alerting System (strobe, sound and vibralert)
Three alert system mainly used in homes; strobe/sound piece mounted right next to bed and vibrating device under pillow

Do you think that this combination device would be effective in waking the deaf?

****We've heard that some common arguments against the implementation of alerting systems for the deaf in buildings. Some examples of these are:**

It costs too much to outfit an entire building to accommodate a small percentage of the population, and

The public is generally apathetic or unaware of the safety challenges the deaf face

- **Any thoughts?**

I certainly think they are expensive and that's a big problem. Personally I don't think that should prevent it. In an office, that should be building's responsibility to make sure all employees are safe and can work effectively in their environment.

I think most people aren't aware of the these problems, obviously if you tell people it will raise their awareness… most people will be like oh thanks for telling me, and then people will bill you anyways for the service.

It depends on how long people work for a business, with new technology, people get new jobs often so owners might not want to put new equipment in their building for fear of them leaving within 2 years to get another job or go on maternity leave.

A flashing light in a room will alert the people in that room… maybe the lights should be red for fire so that people will understand that red is only for a specific alert such as a fire emergency.

Networking:

****Any other recommendations?**

> As for alarms in houses, I don't think it's fair for the deaf to have to pay for that additional expense. Regular alarms are $30 for hearing people, why should deaf people pay the extra costs b/c it's so expensive to have the types we need.
>
> AAD would be good to talk to and Deafness Forum, they work together at times and are working to develop standards of equality for deaf people.

When working at VCOD, I did research for previous manager Grant Roberts. He had a number of discussions with deaf people and VCOD was going to lobby the government about smoke alarms… it hasn't gotten very far, and I'm not sure about why we did the amount of research we did if it wasn't used in the lobbying, it could be helpful to you *she will send to us*

Peter Nassau Interview

Director
Building Quality
Phone: +61 3 9285 6446
Fax: +61 3 9285 6410
Email: pnassau@buildingcommission.com.au

Date: 11 April 2005
Location: Building Commission
Level 21 2 Lonsdale Street
Interviewers: Heather and Nicole

- **Introductions**
- **Project**
  - *We will review the Australian building codes to decide if the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.*
- **You are a member of the ABCB, could you tell us about:**
  - **The role of the board**
  - **Your role on the board**
- **What is the process that happens when the codes are in need of change?**
- **How does the board decide if changes are needed?**
- **How do you (or the board) feel about implementing changes to accommodate the deaf?**
  - **Feasibility?**
- **What is the possibility of providing/requiring special alerting systems/flashing lights?**
- **Cost?**
- **Other Arguments?**
- **Who is the opposition?**

- Policy Rooftop Committee – sets directions
  - Each state and territory has a Building Control Leader who sits on the committee (1 million per year. VIC – 300,000)
  - Tarney arnel represented on board????
  - State/territory leaders, local government representatives and 3 industry representatives
  - Commonwealth government is represented also (about 1 million per year)
- Australian Building Codes Board formed in 1994 by the inter-government agreement (voluntary)
  - Inter-government provides funding for ABCB- (proportional by state)
  - It achieved its initial main goal of forming the BCA (uniformly nationally accepted).

    - Staff of 30-40 people – mostly in Canberra

- Peter Nassau
    - Technical Manager in his office
        - Reports to ABCB – Building Codes Committee (BCC)

- Once a year, BCA is amended – 1 May
- Also involved in building control related topics
- Accessibility and sustainability are big topics being discussed right now

- DDA – said they must provide access, but doesn't say how

    - Nobody understands what was intended by the DDA
    - Made life difficult, too broad of terminology
    - "Access unless justifiable hardship"
    - Legislation is "reactive approach" – requires people to complain after building is built if it doesn't comply
    - Human Rights and Equality Opportunity Commission (HREOC)
    - Property never sure if they'd complied or not, few landmark cases

- Work toward Premise Standard – legislation made under BCA
    - Requirements that meet provisions of DDA
    - Even if complied with PS – still not safe from complaints, although they still feel comfortable because they complied with the PS
    - Once PS is set, include those provisions into BCA
        - Comply with that to get both building and occupancy permits
- BCA is more understood accessible document to building industry- MUST comply with BCA
- Close to getting agreement between Property Council (building owners) and disability groups (2 ends of spectrum)
- COST – main argument
    - Most are concerned on refurbishing existing buildings
- Premise Standards – go through federal attorney generals department and federal parliament to become law
    - Hopefully make BCA 2007

- Building Access Policy Committee – disability groups
    - Make recommendations to ABCB – meetings on 26 May
- Regulatory Impact Statement – cost/benefit
    - Figures said cost nationally for new provisions was 30 billion and benefits were 16 billion
        - ½ doesn't look good on paper
- Upgrade BCA to meet the requirements of DDA
- Building Access Policy Committee – meeting 13 and 14 April 2005
    - Moshe Gilovitz – person going from Building Commissions Office

- 85-95% of room space/auditoriums/grandstands (such as MCG) needs hearing augmentation WHERE there is amplification system required
    - FM technology and receivers based on the number of seats

    - Electronic signs capable of providing PA system announcements
    - Lifts – visual information on what floor it is
    - Signs- Arial/clear font

- BCA – mostly to get into buildings
    - Now – go further to "not die in a fire"
    - Want to research and see how other countries handle it
    - Should lifts be able to be used in fire to get our quickly and safely? Different ways to get people out? –Fireproof box?
- No one is saying that they don't care but…
- Property Owners – want to get the most benefit out of their areas with the least cost "fair enough"

But disability groups argue accessibility will enhance their business because can sell/service more people.

Ivan Peterson Interview

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Date: 14 April 2005
Interviewers: Heather and Laurie

Intros
Project Description

Wayfinding

Only need two words…. Very badly, very poorly. National disgrace. BCA requires in all class 3-9 (public buildings.. not public transport itself, maybe the transport complex, not platform) no PA announcements, don't have to comply with BCA… BCA has limited application. What it requires, where there is inbuilt PA system there will also eb an augmented hearing device (induction loop) … will satisfy requirements. That's the ONLY reference to the needs of the deaf in the legislation for the buildings. If there is an audible emergency warning system, there is still NO requirement for that to be in any other format for the deaf. ONLY rooms with PA systems have to have hearing augmentation technology. As a council we are working towards making our services accessible to our city and our people. Some councils will do it, but some stll won't even thugh they should.

> Code 1428…currently set of 4 standards… main about access (1428.1) 1428.2 "enhanced access" being put into main standard, part 3 for children centers (height of handrails for kids), part 4 for vision impairments, I am chair of that aussie standards committee. Those standards will be expanded to 10 parts… 1428.5 will set standards for access to the deaf, will be a wonderful thing. All organisations can take hold of that and use as instruction book for accommodation. Until it is called up in the BCA, it is only a recommendation. Planning Laws- in VIC they cover things like the whole community, how many types of houses should be in a space, road looks, footpaths.. etc. Says very little about access for anything… groups like us are lobbying to make access a planning law… councils would then be able to enforce on developers.
> 1428 We will lobby for the planning laws to say access should be along with 1428. BCA does good for most groups except the deaf.

Wayfinding is mostly for vision impaired. Access to premises started in 2001 and is now about to go to parliament for consideration and hopeful voting into codes. Is also a disgrace bc it doesn't help vision or hearing impaired. This standard should address those isses…. They say it's too difficult at this stage and more research needs to be done before it is considered. Research group established to look into wayfinding

internationally. There is no universal wayfinding system that exists today. Most reliable is to give tactile info like Braille, arrows, etc. None need batteries, and wont break down.

Any studies done for deaf?
No, nothing as part of the standards regimes.

1428.5, when will be coming out?
The best thing would be to go through the Australian Foundation of the Deaf who are represented on that part 5 working group. Or, ask for info from Standards Australia… email request and I can give you contact for the Standards Australia.

Feasibility of them happening?
Going to take time… AS 1428.5 has great potential, excellent documents, seen drafts. It definitely would work. Trick will be to get it called up in BCA so it will become Law. Also, the access to premises standard. Go thru the Building Access Policy Committee of the ABCB. Disagreement between AS and BCA but will work together when it comes to proposed standards. ABCB has an AS rep on the committee when making decisions. Planning laws, has to go thru planning minister and state govt planning authorities to get there… MORE DIFFICULT than getting into BCA. About 18 months-2 years to get the law into the builders heads, then have army of people to enforce the law.

Arguments
One major issue… property council of Aussie who rep builder owners and developers. For example, the new access to premises standards has increased the toilets area a foot on each side and that's one of the reasons, PC and others will say that in a large builder that will amount to losses of 10% of total floor space of every floor that they can let and get income from. Hugely powerful bc they have money and the advocates for the disabled don't.
Adelaide replaced old fleet of buses with new ones that the buses lower and lean so the wheel chair can get on. Bought 33, they cost about $750,000. Because the buses were accessible, everyone got on and off faster. Every person was spending one minute less at EVERY stop, to save 40-50 minutes every run. Only needed 29 buses so they save a LOT when buying buses… that changed the ideas of the people fighting the change. Need to produce counterarguements that these cost issues are not accurate. Access to premises standard the PC said w/ new standard theyd have to put in new ramps for every new building. DON'T build building up, build it at ground level and you won't have to spend money on a ramp.

Can you discredit flashing lights?
Customer friendly shopping center so more people would come. For example in UK there is a large shopping center. Cost could go done once its required bc then mass production starts.

Other Countries with good disability laws?
Canada, US, UK and Aussie. In US have the US access board who writes the standard and it become law. Aussie and UK are complaints based which is very different. Many eople with disabilities don't really want to do it b/c they're tired of the business of living. Deaf people aren't stong enough lobby groups. Don't bother b/c not much to

do in the built environment other than safety. Talk to DDA and complain to get things done. Every complaint has been successful so they should. If you spend $10 in achieving access at the design point… when you're at construction it could go to $100, retrofit $1000. Standard and code only enforcable on new premises, change of purpose, or significant renovations.
In Banyule, a house is changed to a health therapy building… they have to bring up to BCA standard. Retrofit enforced by complaining to comply with DDA.

Banyule city council
Manage the upgrading of council facilities…. Footpaths, building services, access to buildings, etc. Will only work together in an advisory committee to trade ideas. Have power to enforce codes in the 3 areas, no other power. State govt, building commission, PC, disability sector all have representation in the BCA. There should be someone representing blind, deaf, mentally challenges.

Nishma Shah Interview

Date: 7 April 2005
Interviewer: Vinnie

Explain that we are researching other countries to gain a more global perspective of where Australia stands compared to them.

****Yesterday you mentioned that the government paid for a deaf person to make their home safe. How does this work?**

- **What equipment did they pay for?**
- **What procedure did you have to go through to get their help?**

The United Kingdom's social service provides for the private care of a deaf person. Deaf people can ask the social service for equipment such as flashing fire alarms, doorbells, and phones for their homes at no cost. The procedure to receive this service includes an application to the social service and a verification of their need.

****Another point you made was that your employer was responsible for providing the appropriate alerting system where you worked. Could you explain a little bit more on how this works?**

- **Does the government help the employer provide this**
- **Is the alerting system only required for your work area**
- **What did you have to do**

I am a fully deaf case manager and I moved from England to Australia last year. If a deaf person moves into or works in a public building, the responsible person is accountable for ensuring the deaf person's safety. That requirement included installing flashing lights on the floor they occupy and to provide the deaf with a pager if they leave the floor outfitted with the specialised alerting system. For this to occur the deaf employee must petition the responsible person for an alerting system and the employer or responsible person is required to assess the building to provide a system in accordance with the Building Regulations at no additional cost to the deaf employee.

Hank Van Ravenstein Interview

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Date: 23 March 2005
Location: Department of Human Services
Interviewers: Heather and Laurie

- Hank
  - Has worked 2 years in the Departing of Housing
  - Started in capitol management in November

- Building Act in Victoria – provides for health, safety, and amenity
- Building Regulations – head of power to the BCA
- BCA –
  - Referees Board
  - Power to override anything
  - Nursing home wanted to delete access to disabled people
    - Granted it to the regulations, but not to the DDA
    - Won't be provided with any money
    - Complaint and there will be action
  - New South Wales
    - Disability Discrimination Commissioner said they had to comply
- DDA – commonwealth
- Disability Service Act – says can't discriminate
- Department (DHS?) has written to them

- Fire engineering guidelines – currently
  - Smoke detectors, emergency lights
  - Only have those with sound
  - Discuss it with Brooks
  - Testing it now
  - Most fire related devices are sound based

- His DHS facilities are putting stuff in
  - Capital Management Branch
    - 77,000 properties
    - Disability ones – over 1,000 properties in VIC – DHS provides for (owns) them
    - Also have mental health and hospital facilities
  - Staff

        - Need evacuation training to know to go to deaf people's rooms automatically in an emergency
        - Staff are trained to check fire alarms
        - Panel itself checks
        - Staff don't last that long because it's a very draining job
    - Facilities also have sprinklers
        - Necessary if they can't evacuate or perform daily activities by themselves
        - New policy? - only if they "may need assistance"
        - Fire panel in facilities keeps track of alerts and emergencies
    - Have no jurisdiction if they rent or buy their home
    - Only have an effect if court orders DHS to look after a private home or of they live in their facilities

- Regulators – don't see it as justifiable to put in all private homes
- No manager requirement
- Testing is done in DHS properties every month.
- Need general public involved… lights are not so much a cost issue; it is more just the public not caring.

- Queensland tragedy
- Buildings change – cost

- Feels it's not a cost issue, relies more on the public's feelings
- Bureau of Statistics – can get deaf/disabled numbers

- Regulation – variation to Australian codes
    - Lobbying government
- Manufacturers – should change cost to make the prices of non-flashing and flashing alarms the same
- Disabled is only small percentage – not vocal – need more lobbying

- Private homes – class 1 and 2
- Public buildings – classes 3-9 (4 is 2)

- Commercial buildings – sounding alarms and fire wardens
- Student accommodation buildings – no warden

- Contact MFB and CFA to find out deaths in fires

- Cascading system
    - In high rise buildings they shouldn't have to empty the whole building
    - Get firemen up and people down from only the floors necessary for evacuation
- If over-regulate – just as bad, people stop paying attention… Also, once regulations are made it's hard to undo them if they don't do what you expected.

- Facilities tour

    - Institutionalised people
    - High rise – disabled but normal mentally
        - Starting to be sprinkler protected
    - Deaf – usually in 3-4 story buildings
    - Can take pictures but not of outside of building for privacy protection of tenants

- Building surveyors are the principal certification authority then are building certifiers, and building inspectors go out and look at actual properties
    - They work to achieve health, safety, and amenity

- In Victoria
    - Building Act – parliament
        - Regulations – easiest to change – through minister.
            - BCA (12 month)
                - Australian Standards – more recent
        - Australian Standards
- Can propose in BCA or Regulations
    - Regulatory Impact Statement
        - What effect the change has on the community
        - Public can comment
        - Decision is made

Paul Waterhouse Interview

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National Policy Manager of Property Council of Australia
Member of Australian Building Codes Board Building Access Policy Committee

Date: 18 April 2004
Interviewer: Heather

Describe Project

- *We are reviewing the Australian building codes to decide if the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.*

You are the National Policy Manager of the Property Council of Australia, can you tell me what your job is?

Are you aware that there is concern for alerting the deaf in emergency situations?

What is the Property Council's view on this issue?

Do you feel change is necessary to improve the safety of the deaf?

What is the impact on properties and buildings if the codes changed?

What is the cost?

Other reasons that do not support a change?

What is the feasibility of changing the building codes to include alerting systems for the deaf?

You are also a member of the Australian Building Codes Board Building Access Policy Committee, could you tell me about:

- **The role of the board**
- **Your role on the board**

We have heard there is a draft Standard that would become 1428.5, and is focused on the deaf and hearing impaired.

- **Do you know much about this draft?**

Could you tell me about it – what provisions it contains, where it is in respect to becoming a standard?

- Lobbyist, responsible for policy issues that affect commercial property owners
- Planning building regulations, disability access for everyone
- Considering what needs to be changed to go into the BCA, all aspects of building codes
- 1428.5 Standards Australia, you should look at
- Property Council does not oppose changes to the building regulations to better accommodate the deaf, just want to make sure its properly costed and has correct benefits- distinguishing between what's necessary and what's ideal
- Their purpose is to look out for the properties and building industry
- They do acknowledge that changes would benefit the deaf in how they are alerted and evacuated in emergencies
- There is a potential for change, until something is recommended, can't put cost on it
- There is a study being done to find better ways of improving egress
- Regulations aren't always the best solution, allow market forces to come up with solutions, that way its easier for regulators to make laws for it.
- Working together with the deaf advocates and lobby groups to find the best way to accommodate the best
- The deaf lobby groups want a high level of accommodation, but the Property Council wants a lower one
- So, the two groups are opposed in the amount of protection they feel is necessary or feasible for the deaf
- Cost is a major issue, how much it would cost the building industry to make changes, it's a big target for government regulators
- Working to find the best cost/benefit decision for the entire community
- DDA says you can't discriminate, but does not mention equipment. Changes need to specify what has to be done NOT on a complaint basis.
- Contact Ivan Donaldson on ABCB (executive director in change of process, runs the department)

Norm Winn Interview

Norm Winn & Associates Pty Ltd
Evacuation engineer
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Date: 20 April 2005
Location: FPA
Interviewers: Nicole and Vinnie

****Introductions**

I own my own evacuation planning company and have been in the fire industry for over 44 years, 30 of those years has been at the executive level. I have extensive experience in developing evacuation systems for the deaf. I am also a life member of Fire Protection Association Australia. I have recently worked in the fire industry and have presented to 10,000 fire chiefs on emergency response.

****Project Description**

> ***We will review the Australian building codes to decide if the regulations on alerting systems for the deaf should be changed. We will then make recommendations and justifications on how these codes can be changed to improve alerting systems to facilitate the evacuation of the deaf in buildings.***

****About the regulation documents.**

Rrefer to AS3745 to develop emergency procedures. Implementation of change to the building codes can be done through the Building Codes of Australia, but is better to go through ABCB. The Occumpational Health and Safety Act also says the employer must provide for the deaf's safety and they are accountable if the safety provisions are not addressed.

**** What are the main dangers facing the deaf during an emergency evacuation?**

- **How did you address these issues**
- **Were there special devices used**

Buildings have to be looked at differently. They have to be divided into sleep monitored, sleep unmonitored, industrial, small office, large office, and private homes.

In an industrial buildings where a fork lift operator may be isolated and not see flashing lights and loud noise, flashing computer screens on the fork lift helps to alert the operator of an emergency. Industrial facilities should have thick insulated cables so it can function during a fire. The use of revolving lights and red and orange lights have also been used.

In large office buildings, evacuation of the entire building should not occur. In Australia, it can be done by 2 levels above and 1 level below the floor of the fire. Progressively evacuate the entire building. Handicapped person is surrounded by people so it is a little easier to alert them. The use of buddy system is effective (3 people assigned to warn the deaf person in case of an emergency because 60% of the time people are not where they are supposed to be in the event of an emergency). Other alerting systems include strobe lights, flashing computer screens, and flashing telephones.

Small offices usually utilise the buddy system because of the less comprehensive systems. Deaf individuals should carry a pad to be able to communicate.

Deaf facilities usually have strobe lights to alert the deaf occupants.

Sleeping accommodations for the deaf usually we've worked with to place sprinkler systems in the bedrooms, smoke detectors, and vibrating beds. In monitored sleeping the buddy system is used and in unmonitored sleeping, the vibrating pillows are used.

The deaf have not had major issues because their living mates helps them to get around and be aware of the situations

****What buildings did you work on that required an evacuation plan for the deaf?**

- **Were they public or private buildings and what are the differences in evacuation**
- **Was the evacuation plan for the deaf a request or suggested by the company**

****Would you like to see changes in the Australian building codes to increase the safety of the deaf in buildings?**

Yes, we need to identify the greatest risk and find a way to address this issue. There is no particular way of alerting someone, but there needs to be something in place. Australia has a small population and therefore they have less resources

**** Some common arguments against the implementation of specific alerting systems for the deaf have been:**

- **It costs too much to outfit an entire building to accommodate such a small percentage of the population**
- **What are your thoughts on this**
- **Do evacuation systems for the deaf increase the cost for the service**

If changes are made during the construction of the building and not by modifying it after construction, the cost difference is not significant. The greatest expense are the cables to wire the systems, not the alerting systems themselves.

****Do you have any data specifying appropriate evacuation times?**

- **Any evidence to show the deaf take longer to recognise danger and evacuate**

A resent job we completed for a twelve story building used an effective nine minute evacuation time. However, it varies from building to building.

Geoff Woolcock Interview

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Date: 7 April 2005
Interviewer: Nicole
Main interviewer: Laurie

**Introductions

**Project Description

> *We will review the Australian building codes to decide if the regulations on alerting systems for the deaf are in need of changes. We will then make recommendations if the codes are in need of changes to improve alerting systems to facilitate the evacuation of the deaf in buildings.*

- What exactly do you do/what your job entails?
    - Entire organisation/rights of builders

Manager of building services dept which is a commercial unit that generates income by providing building permits and free advice to members as well as interpretation of codes and regulation. They also represent industry on building commission committees.

- Are you aware of how the codes accommodate the disabled?
    - How do you usually approach disability accommodation?

Principle is the BCA that they follow….. D3: Access to Buildings, within are requirements for Braille, hearing systems for hearing aids in public buildings… further into other parts of the code are things with fire services like warning systems. There are provisions in the codes there to alert people that may be visually or orally impaired such as strobes and other systems. Basically, provisions exist but to a very limited degree.

- How do disability alterations affect the rights of builders?

When altering a building you don't always have to tend to disabled. More than 50% of a change to a building requires a full upgrade, but minor changes don't necessarily mean people have to alter all parts. For example, if a main entrance changed, then it has to be changed to fit current regulations, but other parts of building not being changed don't have to be up to regulations.

- Do you think adding alerting systems would be a significant change?

    - Somewhat pricey?
    - Difficult/time consuming?

It's currently discretionary… therefore it's up to the building owner to see if people in building need it, if not asked for they won't do it. If it was obvious that people in building needed it, they may provide on their own (loud factory… may need flashing lights)

Price: Builder is one of last in line to come on board to building planning. The owner and planner puts together the package and THEN the builder gets the design when it's done and ready to be approved therefore builders wouldn't have a care. If a builder was doing a special job that made them do design of constructs as well as building, they would have to cut out everything unnecessary to fit a set price. Contracts when builder gets project, they will hand full control to the builder and the design team becomes subservient to the builder and the builder can change things to the price fit. Because of this, things could potentially get cut out, this is not the norm, mainly major government jobs. Visual or hearing aids in building regulated wouldn't be able to be cut out in the situation if they were mandatory.

- When the codes change, how does it effect the builders?

Changes bother everyone because they constantly have to learn the new requirements which are an ongoing irritation. Change often adds costs to housing, but it often has a good reason. For example, energy efficiency is good but it costs more to the initial building which makes it hard to learn to comply with rules and price limits.

- As you know, our project is to review the building codes for the deaf (There is nothing in the codes for the deaf)
    - How would you/builders feel if there is change?
    - Would you be for change or would you oppose it?

Generally they would want the things to stay the same. Everything changed goes through RIS process (Regulatory Impact Statement) which evaluates the cost and benefit to the public… cost of system is X dollars, who will gain and what will be value of gain? If cost is high and benefit is low, probably won't get support from the building community.