Hearing Connections
HEARING BETTER

HEARING AUGMENTATION - PERFORMANCE SOLUTIONS

There are two types of hearing augmentation systems
- Hearing Loop Systems
- Receiver Systems (whether Radio/FM or Infrared systems).

Performance Solutions have been proposed as alternatives to providing hearing augmentation.
In part, this has been driven by a concern that Hearing Loop Systems are old technology.
See the separate article on www.hearconnect.com.au/articles about this.

Proposed Performance Solutions have included:
- SoundField systems
- Smartphones
- Captioning (or Subtitles i.e. text of the announcements)

Performance Solutions

A Performance Solution is an alternative way of achieving the Performance Requirement, without using the Deemed to satisfy solution as per D3.7 of the National Construction Codes – NCC (formerly BCA).

The Performance Requirement that must be met is:

> **DP9**
> An Inbuilt communication system for entry, information, entertainment, or for the provision of a service, must be suitable for occupants who are deaf or hearing impaired.

Performance Solutions, to be compliant with the NCC/Access to Premises Standards, must meet DP9, as well as comply with NCC Part A2.

The ABCB (Australian Building Code Board) has gone to great lengths to explain the criteria for a Performance Solution.

NCC 2019 Amendment 1, Part A2 states:

> **A2.2 Performance Solution**
>
> 1. A Performance Solution is achieved by demonstrating —
>
> (a) compliance with all relevant Performance Requirements; or
> (b) the solution is at least equivalent to the Deemed-to -Satisfy Provisions.
>
> 2. A Performance Solution must be shown to comply with the relevant Performance Requirements through one or a combination of the following Assessment Methods:
>
> …
>
> 4. Where a Performance Requirement is proposed to be satisfied by a Performance Solution, the following steps must be undertaken:
>
> (a) Prepare a performance-based design brief in consultation with relevant stakeholders.
>
> (b) Carry out analysis, using one or more of the Assessment Methods listed in (2), as proposed by the performance-based design brief.
>
> (c) Evaluate results from (b) against the acceptance criteria in the performance-based design brief.
>
> (d) Prepare a final report that includes –
>
> i. all Performance Requirements and/or Deemed-to-Satisfy Provisions identified through A2.2 (3) or A2.4(3) as applicable; and
> ii. identification of all Assessment Methods used; and
> iii. details of steps (a) to (c)
> iv. confirmation that the Performance Requirement has been met; and
> v. details of conditions or limitations, if any exist, regarding the Performance Solution.

AS 1428.5 - 2010 states that SoundField systems are “not a replacement” for hearing augmentation systems.

SoundField Systems

SoundField systems are wonderful for the purpose for which they are designed – children with fluctuating hearing loss. This is highlighted in that students in the class room use ALDs in addition to the SoundField system to be able to hear. If SoundField was a hearing augmentation system, the students would not need to connect their own ALD to the SoundField system.

SoundField systems may be used as hearing augmentation systems provided that receivers are supplied in accordance with D3.7.

Not all SoundField systems are capable of having receivers.

- The NCC requires receivers to be provided by the venue, not by the patron.
- Hearing augmentation must provide binaural (both ears) listening for the user.
- Both neckloops and headsets must be provided with each receiver.

Some have argued that receivers do not need to be provided because students can connect their own ALD in schools – they put forward two arguments, both of which are myths.

Myth 1 All students with a hearing impairment have a Personal FM system supplied to them by Hearing Australia, and will therefore bring their own device to school.

Myth 2 SoundField is an alternative (Performance Solution) for all students with hearing loss.

More information on SoundField, as well as on these myths, can be found in a separate article on www.hearconnect.com.au/articles titled *"Hearing Augmentation and SoundField Systems in Classrooms."*

Hearing Connections also supplies SoundField both with and without receivers.

Smartphones

There are systems that can connect to a public Wi-Fi system, allowing a person to use their own smartphone to listen to the proceedings.

- Latency must be less than 40mS for any hearing augmentation system. Latency in public Wi-Fi systems using smartphones is typically 100 to 800mS – which means that the sound is received significantly later than when a person makes the sound – which prevents lipreading, as well as playing havoc with a person's hearing who only has a hearing aid in one ear, or has an open mould. This latency is the combined effect of the Wi-Fi router, the "audio to Wi-Fi adaptor" system, and the smartphone. Even systems advertised as "low latency" and including receivers, have found to have latency over 100mS – in part because of the Wi-Fi routers.

  Hearing Connections has not been able to identify a system that meets this latency requirement, despite the "low latency" statement on some systems.
- Many deaf and hearing impaired users only use their phone for text, not as a listening device.
- Some attachments used by hearing impaired users do not allow streaming from apps.
- Some people can only use their phone for basic yes or no questions due to their limited speech perception, not for conversations. Therefore, they are not set up for using their phone as a hearing augmentation receiver.
- Hearing augmentation must provide binaural (both ears) listening for the user. Mobiles generally only provide monoaural listening, and attachments don't have sufficient volume.
- Cheaper phones often don't provide sufficient volume.
- Many older people don't use smartphones, only push button mobiles like the Telstra Easycall.

NCC requires the venue to provide the receivers, not the patron.

Captions over Smartphones

The question has arisen that as everybody these days have a smartphone, then provide captions over the user's smartphone.

This is not practical, in addition to all the points made above regarding impediments to captions:

a. Not everyone has a smartphone - whether due to unemployment, age pension, low income or other reasons.
b. Many elderly people can't use smartphones for various reasons including physical issues (arthritis, lack of sensitivity in fingers) and cognitive issues.
c. Many who own a smartphone have limited ability to use them – specifically they may be able to dial a number, but are not able to download an app, or find an app, on their phone.

See the following section on captions.

Captioning

On first read of DP9, captioning sounds like a great alternative. The assumption is that putting up a display screen and have pre-recorded text messages that are displayed as audio is announced.

To use Captioning as an alternative to the Deemed to satisfy solutions of the NCC, the following criteria must be met:

1. All Performance Solutions must be developed in line with A2 of the BCA.
2. Captioning is required for 100% reproduction of all speech (including unforeseen/unusual speech/ messages) and sound effects.
3. Captioning must be able to replicate emergency services announcements, which are often not pre-prepared.
4. When captioning is replicating normal speech, it runs at approximately 110 words per minute. This is too fast for many people. The average reading ability of the Australian public is 8 years of age.

   The groups that can't cope with this speed include:

   a. The young of age – our children are the most vulnerable in our society
   b. The elderly – due to memory issues common with age, which generally affects reading before affecting other functions
   c. People with dyslexia – which is variable, where some can read static messages, but not moving messages, and others who can't read at all (and those in between).
   d. People with a Cognitive disability, such as:
      - acquired brain injury (ABI), autism, dementia, developmental disability, down syndrome, intellectual disability, traumatic brain injury (TBI).
      - Attention deficit disorder (ADD), dyscalculia (difficulty with maths) and learning disabilities in general.
   e. Some people who use English as a second language.
5. All hearing impaired people must be able to see the captioning, including:
   a. Short or seated people – in a crowded room or conveyance it is often difficult to see captioning displays
   b. While standing (when all seats are used)
6. People with who are blind or have low vision can't read the captions, including those that may not have their glasses with them.

If captioning was truly adequate, Public Address systems would not be required where captioning is provided. The use of Public Address systems proves that they are still needed, despite alternative technologies.

Captioning is not a Performance Solution for Hearing Augmentation, however it is very worthwhile and necessary adjunct to Hearing Augmentation for those that can use it.

Conclusion:

Captioning and Smartphones are not Performance Solutions, or suitable as alternative to hearing augmentation systems.

SoundField systems can be used as a hearing augmentation system only where receivers are provided in accordance with D3.7 of the NCC.

References

National Construction Codes (previously called Building Code of Australia - BCA); and Disability (Access to Premises - Buildings) Standards 2010

D3.7 — Deemed-to-Satisfy Solution

(b) If a hearing augmentation system required by (a) is—

i. an induction loop, it must be provided to not less than 80% of the floor area of the room or space served by the inbuilt amplification system; or

ii. a system requiring the use of receivers or the like, it must be available to not less than 95% of the floor area of the room or space served by the inbuilt amplification system, and the number of receivers provided must not be less than—...(See NCC for details)

(c) The number of persons accommodated in the room or space served by an inbuilt amplification system must be calculated according to D1.13

PART A2 APPLICATION

A2.0 Compliance
A2.1 Compliance with the Performance Requirements
A2.2 Performance Solution
A2.3 Deemed-to-Satisfy Solutions
A2.4 A combination of solutions

AS 1428.5 – 2010 — ***Communication for people who are deaf or hearing impaired***

Clauses 1.4.24, 4.1 and 4.7 deals with Sound Field systems.

Clause 4.1 states "… SFAS is not a replacement for an ALS."

Clause 4.2 then defines ALS as Hearing Loops, FM and Infrared systems.

FURTHER INFORMATION

If you have any questions, email Andrew Stewart: Managing Director of Hearing Connections at andrew@hearconnect.com.au

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About the Author

Andrew Stewart is qualified in electronics and has been leading research into hearing augmentation systems for over 30 years – including designing, installing, testing and commissioning of Hearing Augmentation Systems. He and his team have conducted their own research of comparison methodologies of installing hearing loop systems and designed and constructed test equipment. He's been involved in installations at Sydney Opera House, First Class Qantas Club Singapore, art galleries, museums, theatres and many others.

Andrew was a key leader in the development of AS 1428.5 - 2010, the authoritative document on Hearing Augmentation in Australia. He is also a life member of Deafness Forum of Australia (the peak body for hearing impaired people in Australia) and continues to represent them, as he has on many committees for over 20 years. Andrew has been hearing impaired all his life, with a progressive loss, and now wears two cochlear implants.

He has 9 other family members who wear hearing aids and/or cochlear implants.

Why choose Hearing Connections

Hearing Connections is built on experience of Andrew Stewart, who:

- Has been **wearing hearing aids** since age 7, and now wears two cochlear implants.
- Knows both sides of the story – the **lived experience,** and the **electronics qualifications.**
- Has been **specialising** in Hearing Augmentation Systems for over 33 years.
- Was **instrumental** in the writing of the definitive Australian Standard **AS 1428.5**.
- Has conducted **research and development** of Hearing Augmentation systems for improved outcomes.
- Has over **33 years of design, installation and commissioning** of Hearing Augmentation systems (loop systems, FM systems, sound field systems and public address systems) for a range of public access buildings, from small halls to significant buildings and venues, including Sydney Opera House and airports.
- **Lectures** in Hearing Augmentation for building professionals.
- Provides **training** in Hearing Augmentation for Access Consultants, Building certifiers and surveyors, and architects.
- Over 20 years of **advocating** for the needs of deaf and hearing impaired people.
- Is a **life member** of Deafness Forum of Australia.
- Has won **numerous awards** for service in advocating for the needs of deaf and hearing impaired people.