7-1– 12

504.5.1, 701.1.2 (NEW), 703.2.1.1 (New), 703.2.1.2 (New), 703.5.3.1 (New), 703.5.3.2 (New), 703.6.3.1 (New), 703.6.3.2 (New), 705.3

Proposed Change as Submitted

Proponent: Sharon Toji, Access Communication, representing self

Add the following new section

Add the following new section

701.1.2 Contrast and Light Reflectance Value. The contrast of surfaces shall be determined in accordance with Equation 7-1.

Contrast = [(B1-B2)/B1] x 100 percent **Equation 7-1**

Where

B1 = light reflectance value (LRV) of the lighter surface,
B2 = light reflectance value (LRV) of the darker surface.

Light Reflectance Value (LRV) shall be determined in accordance with British Standard BS 8493:2008 + A1: 2010 "Light reflectance value (LRV) of a surface. Method of Test."

Revise as follows

703.2.1 General. Visual characters shall comply with the following:

(Balance of section is not changed)

703.2.1.1 Nonglare Finish. Gloss on the finish of characters and their background shall not exceed 19 as measured on a 45-degree gloss meter.

703.2.1.2 Contrast. The Light Reflectance Value (LRV) of characters and their background shall contrast 70 percent minimum as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

703.5.3 Finish and Contrast. Pictograms and their fields shall have a nonglare finish. Pictograms shall contrast with their fields, with either light pictograms on a dark field, or dark pictograms on a light field.

703.5.3.1 Nonglare Finish. Gloss on the finish of pictograms and their fields shall not exceed 19 as measured on a 45-degree gloss meter.

703.5.3.2 Contrast. The Light Reflectance Value (LRV) of pictograms and their fields shall contrast 70 percent minimum as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

703.6.2 Finish and Contrast. Symbols of accessibility and their backgrounds shall have non-glare finish. Symbols of accessibility shall contrast with their backgrounds with either a light symbol on a dark background or a dark symbol on a light background.

703.6.3.1 Nonglare Finish. Gloss on the finish of symbols of accessibility and their backgrounds shall not exceed 19 as measured on a 45-degree gloss meter.

703.6.3.2 Contrast. The Light Reflectance Value (LRV) of symbols of accessibility and their backgrounds shall contrast 70 percent minimum, as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

705.3 Contrast. Detectable warning surfaces shall contrast visually with adjacent surfaces, either light-on-dark or dark-on-light.

The Light Reflectance Value (LRV) of the surfaces shall contrast 70 percent minimum, as determined in accordance with Equation 7-1r. The lighter surface shall have a LRV of not less than 45.

504.5.1 Visual Contrast. The leading 2 inches (51 mm) of the tread shall have visual contrast of dark-on-light or light-on-dark from the remainder of the tread.

The Light Reflectance Value (LRV) of the 2-inch stripe and tread shall contrast 70 percent minimum, as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

Reason: Glare: Glare is a very important issue to many people with vision impairments. It is a particular problem to older people, who are often developing cataracts, and who form a very large group of persons with age related vision impairments, in addition to others with vision impairments developed at a much younger age. Glare on sign surfaces makes them virtually unreadable in many cases. Because brushed metals are such a popular architectural material, and there is no measurable standard for glare or gloss, they are used frequently for signs. Unfortunately, such surfaces are almost never non-glare according to the standard previously given in the ADAAG Appendix.

The original ADAAG did have an appendix item that gave a measurement for what is called, technically, in paints, “eggshell” finish, which was one of the suggested terms for non-glare finishes. That finish is measured with a gloss meter, and measures between 9 and 19.

The ANSI Sign Committee, working on the 1998 changes, decided to abandon the term “eggshell” because it is also the name of a color, and usually applies only to paint finishes. It had been confusing to some graphic designers. However, the maximum amount of allowed gloss, 19, is an appropriate limit for gloss or glare for all sign finishes that must be accessible. Manufacturers of various materials and finishes can easily supply the gloss meter reading of their materials, and these readings tend to be made by manufacturers, because they are required for many architectural purposes. Therefore, architects, designers and fabricators can obtain the gloss reading for materials they are specifying, and submit them with their plans.

I am therefore proposing that ANSI add a measurable standard for glare or gloss to standards that have to do with sign surfaces. Because I am proposing a maximum amount of glare, and not tying it to “eggshell” paint, I have omitted the lower number, because I do not believe it is relevant to many sign surfaces, including some non-glare paint finishes.

Contrast: During the last ANSI cycle, a subcommittee composed of individuals, some of whom were acknowledged vision or color experts, worked for a substantial period of time on a specific measurement proposal for contrast. This is a contentious topic, because many designers understandably worry that they will be denied the opportunity to choose from a large array of colors. However, the ANSI A117.1 standard as it now reads, as well as the ADA Standard for Accessible Design, make it very clear that “color,” (known more scientifically as “hue,”) is not the issue when we are dealing with vision impairment. The reason that only “dark” and “light” are to be considered is that many people with an entire range of vision impairments do not see color, or see only limited colors. Even those individuals that we speak of as “red-green color blind” — perhaps as many as 10 percent of the male population — become visually impaired when they are confronted with black or green contrasted with red or brown, or many shades of those colors in between. These colors appear to them as barely contrasting shades of gray. Older people also often find various colors more difficult to discern as their vision deteriorates. For anyone with impaired color vision — and that is a large percentage of people who are defined as legally blind, and therefore disabled — colors with similar “darkness” or “lightness,” often make signs unreadable.

The contrast standard introduced in the last cycle suffered from the fact that we did not have a recognizable method of measurement that was effective for various material finishes. This was a major objection on the part of the SEGD and ISA. They were concerned about being able to use wood finishes, for instance, since the measurement standard was very limited as to surface type. However, that has now changed, and I think it provides us with the scientific support we need to reintroduce a measurable standard for contrast with a way to measure it uniformly.

The British Standards Institute has done the work we need, and has developed a standard for the measurement of the Light Reflective Values (LRVs) of a variety of architectural finishes. This standard is actually used by another ANSI Committee’s standards, and is available in the ANSI Standards Store, so it is part of an accepted ANSI standard. The standard was developed to use for all kinds of architectural elements where contrast is an issue.

In the United Kingdom, there was been much more research on the needs of vision impaired individuals for dark/light contrast in the environment, than has taken place in this country. An important study called the “Rainbow Project” determined that many architectural elements, such as door handles, and doors on buses and trains, needed to contrast with their surrounding materials.

Just as we proposed in the last cycle, the British Standards uses Light Reflectance Value, or LRV, as the standard of measurement. They turned the 70 percent standard that is normally used, into a requirement for a difference in LRV numbers of 30. I have attached a paper written by an industry member about the standard, and its development.

However, just as with the 70 percent formula, there is an unfortunate flaw caused by the fact that the distances between the points on the scale of 100, used for LRV measurements, are not equal. The “visual” difference between a finish with an LRV of 4 and one of 8 is quite noticeable, whereas the difference between a finish with an LRV of 90 and 94 is barely noticeable. Therefore, if

you use the formula and compare two dark finishes, they will show a large percentage of difference, whereas two lighter colors, even though far apart numerically, will fail the percentage test.

Nevertheless, there appears to be general agreement that the LRV is the proper measurement to use if one is comparing darkness and lightness of various surface colors, since it is independent of hue. It remains only to determine a reasonable minimum that will allow the use of a reasonable choice of colors, and still meet the needs of a large group of people who have impaired, though usable vision. Seventy percent minimum contrast appears to be well established, and already is used in some building codes in the United States, including for detectable warning surfaces and the Cleaner Air Symbol, in California.

Our committee agreed with the conclusion drawn by the individuals who prepared a study on contrast in detectable warning surfaces prepared for the Access Board, and cited in the last cycle's attempt, that the formula included in the original ADAAG Appendix, and some building codes, could only be used successfully if a minimum LRV was established for the lighter of the two numbers. A scientist working at NIST on the light and dark comparison of colored electrical wires for aircraft came to the same conclusion. Accordingly, after much studying of color graphs and formulas, the contrast committee determined on a minimum number of 45.

The contention of the color specialist who spoke on behalf of the SEGD and ISA against the proposed standard during one of the final meetings of the last cycle, that the standard is meaningless without a reference to hue, goes against the entire intent of the accessibility standards not only in the United States, but also other countries that adopt contrast standards for the built environment, and accept the LRV as the standard unit of measurement.

A bright red and white sign was circulated as a sample of a sign that would fail the percentage formula the committee proposed. This was understandably disturbing to committee members. However, it appeared that assessment was actually based on a completely different measurement standard, one that included hue, which would produce different numbers. During the recess, the sign was checked with a Spectrometer that measures LRV and the reading showed a contrast, using the formula, significantly greater than 70 percent. The vote was called before this could be demonstrated to the Committee. Color is admittedly a complicated issue, and it is indeed difficult, particularly among people with adequate color vision, to separate the concept of hue out from the other attributes that make up what we refer to collectively as "color." I am attaching a document that gives a clear explanation of color terminology.

In preparation for resubmitting a measurable standard for contrast, I went to a single swatch book of just one popular paint manufacturer, Dunn Edwards, and sorted all the colors by LRV. I am attaching the list. I then counted the number of swatches that measure the most extreme, or minimum (darkest) "light" color, LRV 45, and found there were 10 of them. I found that, in order to get a minimum percentage of 70, I needed to choose a dark color with an LRV of 13. There were actually 199 swatches that ranged from 4 (black) up to various shades that measured 13. That means that using the least possible contrast range, and only matching colors in this one swatch book, the designer has 1990 different colors or shades of hues with which to work. It is difficult to imagine the designer who could not be creative within that range. Of course, as lighter colors with higher LRVs are used, different choices are available. If you choose DE "white," which has an LRV of 93, you can use all the shades with an LRV of 27 or less for the darker color. Note that there are decimals for the LRV measurements, so using the exact numbers, not rounded, may give you slightly different choices.

Unfortunately, I did not have a budget to purchase the actual British Standard, but am attaching the abstract. It should be readily available through ANSI. I believe the abstract along with the discussion in the attached document about the standard makes it clear that it is the appropriate one.

I urge the ANSI A117.1 Committee to give us another opportunity to pass a measurable standard. Code officials do not feel secure in checking contrast and glare, because they have no definition at all of what these terms mean. In some cases, we see signs with "dark" that is only a shade or two darker than "light."

Contrast may possibly be the issue that affects the largest group of persons with a variety of vision disabilities. Admittedly, we do not yet have a scientific instrument that would be affordable and convenient for every inspector to carry onto a site. However, there are many elements of construction that are important, such as certification of hidden welds or the composition of concretes and adhesives, that are certified by the designer and required to be stated for plan checkers. There is no way for inspectors to check them on site, even though they are vital to the building structure. There is no reason why the measurements for gloss (glare) and dark/light contrast — items with no structural importance — cannot be listed in the specifications and plans by designers. Then, if there appear to be signs during the actual site check that have too much glare or insufficient contrast, swatches of the materials used can be requested and checked to be sure that they have been provided in compliance with those specifications and plans. I have no doubt that it is only a matter of time before a device can be invented that will measure those attributes on site.

I plan to submit additional materials to support the standard as I am able to gather them. Several people, such as a professor I met who does research on light, have recently expressed interest in the topic. It may even be possible to get some focus groups together of individuals with impaired color vision, who can look at some of the combinations from specific distances to determine if they are visible. Attachments will be provided as separate pdf documents.

703.2.1.1(New)-TOJI.doc

Committee Action

Approved

Committee Reason: The Committee has considered the issues surrounding signage for many years. This proposal provides a measurable standard based on the cited British standard. The Committee debated again the importance that contrast of the sign itself, the amount of light available and the role of glare of the surface. While sign materials fade over time and the contrast can be lost, that was judged to be an issue of maintaining a building (facility) in compliance and not a definitive concern for the Standard at new construction/installation. The Committee discussed whether the provision results in a measureable standard. It considered the concern that some measurement devices are costly and that many sign providers are smaller businesses with few employees - making the requirement of costly equipment problematic. The Committee concluded that better standards helped all, regardless the size of the providers or enforcement organizations.

BALLOT COMMENTS

7-1.1

Commenter: Todd Andersen
Ballot: Negative with comment:

Comment: We are buying a pig in a poke. We heard from the signage industry that these required meters are expensive, we heard from the regulators that they would rely on representations made to them by licensed professionals, and we heard from everybody that post construction changes to lamps, wall colors etc may change readings. I imagine this is what litigators will come to call a target rich environment.

7-1.2

Commenter: David S. Collins, Representing AIA
Ballot: Negative with comment:

Comment: The wording “Gloss on” should be deleted from Nonglare. Whatever the finish, the gloss meter will measure it. This language implies that only finishes that have a gloss must be measured. Glare can be caused by various finishes, not only glossy ones. If the finish is flat, but a glass covering placed over it does it become gloss on the finish? The language should be clear.

7-1.3

Commenter: Ann Makowski, Representing SEGD
Ballot: Negative with comment:

Comment: We would like to divide the question and consider the proposed changes related to contrast and glare separately as additional research is needed on both subjects.

The proponent made a math error claiming that in one paint book, they found 10 color swatches with an LRV of 45 (darkest of the light end) and 199 color swatches with an LRV of 13 or less (the dark end). They then state that that these swatches give the designer "1990 different colors" to work with. The correct statement would be that the designer has 209 colors (10 light colors + 199 dark colors) that can be paired in 1990 combinations (10 light colors x 199 dark colors).

Other reasons to divide the question and address contrast separately include:

- Differences in LRV contrast readings under different lighting conditions either in a controlled environment (e.g., a manufacturing facility or a testing body facility) and what will actually be present in the field under which the products will be used
- Even with the required contrast level, restricted light color LRV, and a defined formula for calculating contrast, there are still results that would not be recommended for good visual contrasts, such as a yellow on white example.
- The unavailability of LRV values on all coatings and material substrates, which could curtail the use of such elements within a program that would otherwise still achieve the contrasts levels but that would not have the ability to be formally tested to meet a "required" contrast level
- The prevalence of multi-colored signs that address various functional reasons such as color coding (e.g., trying to make all adjacent colors on NYC subway signs or on a multi-color orientation map contrast at 70% will be almost impossible)

7-1.4

Commenter: Kim Paarlberg, Representing ICC
Ballot: Negative with comment:

Comment: The British standard BS 8493:2008 was not provided to the committee. It should be verified that this standard is an open consensus standard and written in enforceable language. If this is approved, the standard needs to be added to Section 105. Not having seen the standard, I am not clear on how this contrast and light reflective value can be determined consistently in the field or be identified as compliant by manufactures. Is this due able with standard signage available on the market. Without this information I believe this proposal should be disapproved.

7-1.5

Commenter: Teresa Cox, Representing ISA
Ballot: Negative with comment:

Comment: We would like to divide the question and consider the proposed changes related to contrast and glare separately. Additional research is needed on both subjects. The proponent also made a mistake in the terminology when recommending a 45

degree measurement for gloss. The LRV is measured with a spectrophotometer at a 45 degree angle, but that is not a function of gloss. While there is a 45 degree measurement for gloss, it is rarely used and not recommended in the paint and coating industry. It is most commonly used in ceramics and textiles. The correct measurement should be 60 degree gloss meter, as referenced by the proponent in 7-8-12, who stated, "An eggshell finish (11 to 19 degree gloss on 60 degree glossimeter) shall be used".

Much of the evidence cited by the proponent was anecdotal in nature, rather than evidence-based. Many references were given regarding the "contrast committee", but this group's research and findings were not made available to the ANSI A117.1 Committee members. There is no record of such a committee in the minutes of previous meetings, nor are the members of this contrast committee listed.

We ask the committee to separate the different issues of contrast and gloss, wait for empirical data & research on the two issues to be presented at the July meeting, and the proponent to make the correction for gloss measurement at 60 degrees.

Committee Review of Comments and Action – July 2013

Approval with Modifications based on Comments.

Committee Reason: The committee considered value of setting light reflectance value (LRV) as the measure by which contrast is measured and whether the British standard - BSI 8493 was an adequate standard. The committee discussed the availability and cost of the evaluation devices. The discussions revealed that the standard may not be useful for all surface materials. The original proposal was amended to address the limitation of the standard.

Modification:

Revise as follows:

105.2.13 Light reflectance value (LRV) of a surface. Method of Test. BS 8493:2008 + A1: 2010 (British Standards Institution, 389 Chiswick High Road, London W4 4AL, United Kingdon).

701.1.2 ~~Contrast and~~ Light Reflectance Value. The light reflectance value (LRV) ~~contrast~~ of surfaces shall be determined in accordance ~~with Equation 7-1~~ with BS 8493 for the following surface types:

1. Opaque paint coatings and paint systems, including those that cause extreme angular dependences of reflected light and those that have a surface texture of less than 2 mm;

2. Opaque coverings including those that cause extreme angular dependences of reflected light, and those that have an unyielding texture of less than 2 mm;

3. Opaque coverings with a yielding pile, e.g. carpet;

4. Opaque materials, including those that cause extreme angular dependences of reflected light, and those that have a texture of less than 2 mm, e.g. finished metals;

5. Opaque materials coated with non-opaque coatings or coverings, e.g. timber door coated with a woodstain, including those that cause extreme angular dependences of reflected light, and those that have a texture of less than 2 mm;

6. Multi-colored surfaces;

701.1.2.1 Other Surfaces. Other surfaces shall comply with Section 703.1.3.1.

701.1.3 Contrast Value. The contrast between the LRVs of adjacent surfaces required by Sections 703.2.1.2, 703.5.3.2, 703.6.3.2, 705.3, and 504.5.1 shall be determined by Equation 7-1,

Contrast = [(B1-B2)/B1] x 100 percent **Equation 7-1**

Where

B1 = light reflectance value (LRV) of the lighter surface,
B2 = light reflectance value (LRV) of the darker surface.

701.1.3.1 Other Surfaces. Surfaces not within the scope of BS 8493 shall provide contrast between adjacent surfaces that are either light on dark or dark on light.

703.2.1.1 Nonglare Finish. The glare from coverings, ~~Gloss on~~ the finish of characters and their background shall not exceed 19 as measured on a ~~45~~ 60-degree gloss meter.

703.2.1.2 Contrast. The Light Reflectance Value (LRV) of characters and their background shall contrast 70 percent minimum as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

703.5.3 Finish and Contrast. Pictograms and their fields shall have a nonglare finish. Pictograms shall contrast with their fields, with either light pictograms on a dark field, or dark pictograms on a light field.

703.5.3.1 Nonglare Finish. The glare from coverings and ~~Gloss on~~ the finish of pictograms and their fields shall not exceed 19 as measured on a ~~45~~ 60-degree gloss meter.

703.5.3.2 Contrast. The Light Reflectance Value (LRV) of pictograms and their fields shall contrast 70 percent minimum as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

703.6.2 Finish and Contrast. Symbols of accessibility and their backgrounds shall have non-glare finish. Symbols of accessibility shall contrast with their backgrounds with either a light symbol on a dark background or a dark symbol on a light background.

703.6.3.1 Nonglare Finish. The glare from coverings and ~~Gloss on~~ the finish of symbols of accessibility and their backgrounds shall not exceed 19 as measured on a ~~45~~ 60-degree gloss meter.

703.6.3.2 Contrast. The Light Reflectance Value (LRV) of symbols of accessibility and their backgrounds shall contrast 70 percent minimum, as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

705.3 Contrast. Detectable warning surfaces shall contrast visually with adjacent surfaces, either light-on-dark or dark-on-light.

The Light Reflectance Value (LRV) of the surfaces shall contrast 70 percent minimum, as determined in accordance with Equation 7-1r. The lighter surface shall have a LRV of not less than 45.

504.5.1 Visual Contrast. The leading 2 inches (51 mm) of the tread shall have visual contrast of dark-on-light or light-on-dark from the remainder of the tread.

The Light Reflectance Value (LRV) of the 2-inch stripe and tread shall contrast 70 percent minimum, as determined in accordance with Equation 7-1. The lighter surface shall have a LRV of not less than 45.

Ballot Comments on July 2013 Committee Action Report

HLAA – Sharon Toji –
Affirmative with Comment Ballot:

Comment: (
Proposed revision is only to 701.1.2. Everything else remains as voted on in July.)

105.2.13 Light reflectance value (LRV) of a surface. Method of Test. BS 8493:2008 + A1: 2010 (British Standards Institution, 389 Chiswick High Road, London W4 4AL, United Kingdom).

701.1.2 Light Reflectance Value. The light reflectance value (LRV) of ~~surfaces~~ "ordinary" and specified surface types shall be determined in accordance with Section 1: Scope of BS 8493 ~~for the following surface types~~.

~~1. Opaque paint coatings and paint systems, including those that cause extreme angular dependences of reflected light and those that have a surface texture of less than 2 mm;~~
~~2. Opaque coverings including those that cause extreme angular dependences of reflected light, and those that have an unyielding texture of less than 2 mm;~~
~~3. Opaque coverings with a yielding pile, e.g. carpet;~~
~~4. Opaque materials, including those that cause extreme angular dependences of reflected light, and those that have a texture of less than 2 mm, e.g. finished metals;~~
~~5. Opaque materials coated with non-opaque coatings or coverings, e.g. timber door coated with a woodstain, including those that cause extreme angular dependences of reflected light, and those that have a texture of less than 2 mm;~~
~~6. Multi-colored surfaces;~~

701.1.2.1 Surfaces not suitable for the method of test. The following surface types shall comply with 701.1.3.1.

1. Thermochromic;
2. Photochromic;
3. Retroreflective;
4. Fluorescent;
5. Phosphorescent;
6. Surfaces involving electrical power for light emission;
7. Self-luminous
8. Free-standing non-opaque materials such as glass and clear plastic for curved surfaces.

(remaining sections are unchanged)

Reason: The listing of materials that can be tested was actually shortened and thereby made to sound very restrictive. It is actually just the opposite. The types of materials even include such extremes as those that "cause extreme angular dependences of reflected light and those that have a surface texture of less than 2 mm. Those are not by any means the only materials that can be tested. Indeed, there is a very large category, "ordinary materials," that was omitted from the list of applicable materials.

"1 Scope The method of test is applicable to:

- opaque paint coatings and paint systems, including those that cause extreme angular dependences of reflected light and those that have a surface texture of <2 mm;
- opaque coverings including those that cause extreme angular dependences of reflected light, and those that have an unyielding texture of <2 mm;
- opaque coverings with a yielding pile, e.g. carpet;
- opaque materials, including those that cause extreme angular dependences of reflected light, and those that have a texture of <2 mm, e.g. finished metals;
- opaque materials coated with non-opaque coatings or coverings, e.g. timber door coated with a woodstain, including those that cause extreme angular dependences of reflected light, and those that have a texture of <2 mm
;- multi-coloured surfaces;
- **ordinary materials."**

"Ordinary materials" are defined in the Standard thus:

> **3.3 ordinary materials:** material which is neither retroreflecting nor fluorescent nor phosphorescent nor involves electrical power for light emission nor is self-luminous

Therefore, the limitations are actually of the materials that are not appropriate for testing, and they are listed and then repeated as materials that are not considered "ordinary" materials.

As far as curved glass and plastic surfaces go, most so-called "curved" sign profiles start out as flat sign surfaces. The usual method is to apply graphics to a flat piece of material that is thin enough to bend. This material is then inserted into a curved frame or extrusion, which forces the flat sign surface into a curved shape.

I checked with Professor Geoffrey Cook, the co-author of the Rainbow Project, and very involved with this issue in the UK, and he informed me that if you measure a material while it is flat, and then force it into a curve frame or extrusion, it is not a "free-standing" curved material, and the flat LRV measurement applies.

Another important consideration is opaque materials covered by non-opaque materials.

To understand this, you need to look at the definition of "non-opacity" in the Standard. These are "specimens that are detected by the observer as light-permeable." Therefore, if you paint, foil or otherwise coat or cover the second surface of a piece of clear plastic or glass with an opaque coat or covering, it is not, according to the definition in the Standard, "non-opaque."

If you apply non-translucent vinyl cut out characters, as an example, to a clear glass panel or window, you cannot measure the LRV of the glass surface according to this method of test. But, if you place a rectangle of non-translucent colored vinyl behind the vinyl characters, so that the observer does see any light through the area, you could measure the LRV of both colors, as long as the surface is not curved.

In regard to opaque materials covered with a non-opaque covering, the Standard says the following:

> " For opaque materials coated or covered with non-opaque coatings or coverings the LRV values are valid where the specimen is fully representative of the materials and the coating or covering."

This would comport with Professor Cook's message to me that measuring the LRV of such a sign would not present any difficulty. Mr. Mark Rose of MK Design in the UK, states that he uses Rowmark Ultramatte for many of his tactile signs. Ultramatte is a material comprised of a matte clear layer of acrylic with an opaque colored foil applied to the second surface.

Another issue was whether or not this method of test was used for signs. I am assured by Professor Cook of Reading University, and by Mr. Mark Rose of MK Design that the Standard is used for signs. Mr. Rose serves as a consultant to the Royal National Institute of Blind People (RNIB) in the UK and was very involved in the writing of their materials on accessible signs. He uses the method of testing in his own company. As a matter of fact, Mr. Rose sent me a government document showing that the recommendation is for the characters and background of signs to have a 70-point difference in LRV values from each other. This is far more stringent than we are recommending for our minimum contrast.

My point in bringing up these items is to reassure the Committee that LRV testing can be carried out on a great variety of sign materials, including many that are used commonly in the United States. The major exception I can think of, other than illuminated signs, is the materials used for photoluminescent signs and markings. Most of the other materials that are excluded from testing are not commonly used for architectural signs covered by the accessibility standards.

There should, in other words, be very few kinds of sign materials that cannot come under the Standard of Measurement. If you read the Standard carefully, and check on the types of materials that cannot be tested, you see that the Standard is actually very permissive, and is more restrictive in what cannot be tested. The Committee's most recent version, with the omission of "ordinary materials," infers that it is the other way around. That is misleading.

ISA – Teresa Cox –
Negative Ballot:

Comment/reason: As mentioned during the ANSI committee meetings in July, we are strongly supportive of any changes to the ADA guidelines when the proposals are backed by empirical evidence and research. The proponent cites the British standard for contrast extensively and with much supporting documentation, however almost none of the documentation pertains to signage, but rather stairway striping, doors, carpets, and walls. In fact, the British Standard for signage does *not* have any hard requirements for contrast. It reads as follows:

> **9.2.3.2 Visual contrast**
> For signs other than safety signs (for which there are prescribed colours), letters, symbols and pictograms should contrast visually with the signboard. Signboards should contrast visually with their backgrounds (see **9.1.1** and Annex B).
>
> *NOTE 1 A difference in LRV of 70 points between the letters, symbols or pictograms and the signboard, and between the signboard and the background, ensures good visual contrast.*
> *NOTE 2 Light coloured text and symbols or pictograms on a dark background are preferred.*

All of the supporting documentation supplied by the proponent pertains to architectural elements other than signage.

Despite extensive research, we could find no “best practices” to show that the proposed visual contrast rule has been tested and deemed effective (even in the UK). In reaching out to Australia and Canada, they also are interested in working together to develop evidence-based research on contrast. In Canada, each provincial jurisdiction works independently to draft legislation, with the Accessibility for Ontarians with Disabilities Act (AODA) being furthest along. Working in tandem with these groups, who are dealing with very similar arguments and contradictions, would ensure the development of a truly effective standard.

Aries Arditi, PhD and Principal Scientist at Visibility Metrics, and formerly a Senior Fellow in Vision Science and Vice President for Vision Science at Lighthouse International, had the following observations:

> “The Rainbow Project report was very nicely done and very comprehensible for non-vision scientists, and I'm sure it's been useful for educating people on the committee. The report notably did not recommend particular values for light reflectance, luminance, contrast, or illumination for any of the principles it espoused, very likely for reasons quite similar to what I will say below for signage. Also, it's important to recognize that the renditions of the figures in the report and in the example signs that Sharon Toji shared (70% Contrast_LRV_10-90.pdf) are completely uncalibrated -- so one cannot rely on their appearance conclusively. As I'm sure you already appreciate, contrast alone cannot determine recognizability/readability of signs. Perhaps the best demonstration of this is to consider a very high contrast black and white sign. In sufficiently dim illumination, of course, no one will be able to read the sign. The contrast has not changed -- but the readability has been reduced to below the threshold for perception. Which is to say in another way, that readability depends not only on contrast, but also on luminance of the sign (generally luminance of the lighter color).
>
> Indeed, character size also interacts with luminance and contrast, so that a moderately illuminated sign (whose light color is of moderate luminance) whose characters are of insufficient size to read (at a fixed viewing distance), may be made readable by ANY of increasing the illumination, increasing the contrast, or increasing the character size.
>
> There are more variables that interact as well, including gloss (specularity), font There are more variables that interact as well, including gloss (specularity), font, expectation, and hue, in some cases of congenital and acquired color vision deficiencies. Put simply, minimum contrast value, or even contrast and LRV of the lighter color do not determine readability for anyone (normally sighted or low vision) because they ignore luminance of the sign.

The committee’s discussions have focused on specifying contrast (with the somewhat arbitrary value of 70%) by comparing light reflectance values (LRV) of the background and characters. This does not take in to account all the other variables that impact readability. In addition, LRV would not be appropriate at all for many types of signs, including emissive display signs (i.e. backlit signs), signs with clear covers, multi-colored surfaces, phosphorescent safety signs or signs with curved faces. “

Many of the accessible signs in use in the US today are made from clear material with color applied to the second surface (subsurface). According to Dr. Geoff Cook and Mark Rose, the BS8493 test method is not suitable for multi-layered materials as the measurement equipment needs to accurately assess the difference between the light sent to the measurement surface and that reflected from the measurement surface. A layer of clear material between the meter and colored measurement surface would allow light to escape after reflection and render the measurement invalid.

In Great Britain, there is a certain amount of general research that has been undertaken on contrast but there is little specific research relating to signage. The contrast standards that are used for signage, are ” best practice” rather than compulsory Why should the A117 Committee adopt a foreign standard for contrast on signage that has not been deemed appropriate for adoption in that foreign country? Instead we ask that a taskforce be created to gather existing research on contrast in signage, to collaboratively work with other countries (such as the UK, Australia, and Canada), and to recommend any modifications after this data has been collected and analyzed.

RESNA – Edward Steinfeld
Negative: Ballot:

Comment/reason: Research was not presented to demonstrate that this is a serious issue. Before adopting extensive standards, it would be good to know whether it is or not. Further, the standards are based on testing a sample. This is not equivalent to field conditions. Following the standard will not necessarily lead to signage that is usable for people with visual impairments, or anyone else for that matter. In field conditions, lighting levels, type of light source, the presence of disabling glare in the visual field, and the angle of incidence of the light sources can have a greater effect on readability than surface characteristics. Further, in daylight, the conditions vary significantly within short periods of time. While this may be enforceable based on laboratory testing, it is highly doubtful that this rule will actually contribute to improved usability.

SEGD – Ann Makowksi –
Negative Ballot:

Comment/reason: SEGD supports changes to the ADA guidelines when proposals are backed by empirical evidence and research. While the proponent cites the British standard for contrast with much supporting documentation, almost none of the documentation pertains to signage but rather to architectural elements other than signage. In fact, the British Standard for signage does *not* have any hard requirements for contrast.

Despite extensive research, we could find no "best practices" to show that the proposed visual contrast rule has been tested and deemed effective (even in the UK). In Great Britain, there is a certain amount of general research that has been undertaken on contrast but there is little specific research relating to signage. The contrast standards that are used for signage are "best practices" rather than compulsory. Why adopt a foreign standard for contrast on signage that has not been deemed appropriate for adoption in that country? Rather, we ask that a taskforce be created to gather existing research on contrast in signage, to collaboratively work with other countries (such as the UK, Australia, and Canada), and to recommend any modifications after this data has been collected and analyzed. Working in tandem with other groups who are dealing with very similar arguments and contradictions would ensure the development of a truly effective standard.

In addition, many of the accessible signs in use in the US today are made from clear material with color applied to the second surface (subsurface). According to Dr. Geoff Cook and Mark Rose, the BS8493 test method is not suitable for multi-layered materials, as the measurement equipment needs to accurately assess the difference between the light sent to the measurement surface and that reflected from the measurement surface. A layer of clear material between the meter and colored measurement surface would allow light to escape after reflection and render the measurement invalid.

ATBCB – Marsha Mazz
Negative Ballot:

Comment/reason: All the comments on this action are persuasive. It appears we were too hasty in approving this proposal. Before we approve a reference standard, we need to be certain that it adequately addresses a legitimate concern. Of particular concern is Dr. Aries Arditit's observation that "Many of the accessible signs in use in the US today are made from clear material with color applied to the second surface (subsurface). According to Dr. Geoff Cook and Mark Rose, the BS8493 test method is not suitable for multi-layered materials as the measurement equipment needs to accurately assess the difference between the light sent to the measurement surface and that reflected from the measurement surface. A layer of clear material between the meter and colored measurement surface would allow light to escape after reflection and render the measurement invalid." Several commenters indicated that research is underway in other countries. Perhaps we should await those studies prior to establishing a standard that is potentially flawed.

7-2– 12
702.1

Proposed Change as Submitted

Proponent: Kim Paarlberg, International Code Council

Revise as follows:

702.1 General. Accessible audible and visible alarms and notification appliances that are part of a building fire alarm system shall be installed in accordance with NFPA 72 listed in Section 105.2.2, be powered by a commercial light and power source, be permanently connected to the wiring of the premises electric system, and be permanently installed.

EXCEPTION: Audible and visible notification appliances provided within dwelling or sleeping units shall comply with Section 1006.2 through 1006.4.4.

1006 Units with Accessible Communication Features.

1006.1 General. Units required to have accessible communication features shall comply with Section 1006.

1006.2 Unit Smoke Detection. Where provided, unit smoke detection shall include audible notification complying with NFPA 72 listed in Section 105.2.2.

1006.3 Building Fire Alarm System. Where a building fire alarm system is provided, the system wiring shall be extended to a point within the unit in the vicinity of the unit smoke detection system.

1006.4 Visible Notification Appliances. Visible notification appliances, where provided within the unit as part of the unit smoke detection system or the building fire alarm system, shall comply with Section 1006.4.

1006.4.1 Appliances. Visible notification appliances shall comply with Section 702.

1006.4.2 Activation. All visible notification appliances provided within the unit for smoke detection notification shall be activated upon smoke detection. All visible notification appliances provided within the unit for building fire alarm notification shall be activated upon activation of the building fire alarm in the portion of the building containing the unit.

1006.4.3 Interconnection. The same visible notification appliances shall be permitted to provide notification of unit smoke detection and building fire alarm activation.

1006.4.4 Prohibited Use. Visible notification appliances used to indicate unit smoke detection or building fire alarm activation shall not be used for any other purpose within the unit.

Reason: There continues to be the mis-interpretation that all apartments are required to have full blown visible alarms within every dwelling unit. The intent of this proposal is to indicate to the alarm designer that within some dwelling or sleeping units, the smoke detectors can also serve as part of the building alarm system. If there are specific sections of NFPA 72 that can be referenced, that information should also be included.

702.1(NEW)-PAARLBERG.doc

Committee Action

Approved

Committee Reason: The proposal provides better reference to the residential standards. It should eliminate people inadvertently using the commercial provisions for residential facilities.

7-6– 12
Table 703.2.4, Table 703.7.4

Proposed Change as Submitted

Proponent: Kim Paarlberg, International Code Council

Revise as follows:

TABLE 703.2.4—VISUAL CHARACTER HEIGHT

Height above Floor to Baseline of Character [1]	Horizontal Viewing Distance [2]	Minimum Character Height
40 inches (1015 mm) to less than or equal to 70 inches (1780 mm)	Less than 6 feet (1830 mm)	$^5/_8$ inch (16 mm)
	6 feet (1830 mm) and greater	$^5/_8$ inch (16 mm), plus $^1/_8$ inch (3.2 mm) per foot (305 mm) of viewing distance above 6 feet (1830 mm)
Greater than 70 inches (1780 mm) to less than or equal to 120 inches (3050 mm)	Less than 15 feet (4570 mm)	2 inches (51 mm)
	15 feet (4570 mm) and greater	2 inches (51 mm), plus $^1/_8$ inch (3.2 mm) per foot (305 mm) of viewing distance above 15 feet (4570 mm)
Greater than 120 inches (3050 mm)	Less than 21 feet (6400 mm)	3 inches (75 mm)
	21 feet (6400 mm) and greater	3 inches (75 mm), plus $^1/_8$ inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6400 mm)

1. The vertical height is measured from the floor of the viewing position to the baseline of the highest line of characters.
2. The horizontal viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign or where applicable, as stated in the exception to Section 703.2.4.

TABLE 703.7.4—LOW RESOLUTION VMS CHARACTER HEIGHT

Height above Floor to Baseline of	Horizontal Viewing Distance [2]	Minimum Character Height
40 inches (1015 mm) to less than or equal to 70 inches (1780 mm)	Less than 10 feet (3050 mm)	2 inches (51 mm)
	10 feet (3050 mm) and greater	2 inches (51 mm), plus 1/5 inch (5.1 mm) per foot (305 mm) of viewing distance above 10 feet (3050 mm)
Greater than 70 inches (1780 mm) to less than or equal to 120 inches (3050 mm)	Less than 15 feet (4570 mm)	3 inches (75 mm)
	15 feet (4570 mm) and greater	3 inches (75 mm), plus 1/5 inch (5.1 mm) per foot (305 mm) of viewing distance above 15 feet (4570 mm)
Greater than 120 inches (3050 mm)	Less than 20 feet (6095 mm)	4 inches (100 mm)
	20 feet (6095 mm) and greater	4 inches (100 mm), plus 1/5 inch (5.1 mm) per foot (305 mm) of viewing distance above 20 feet

1. The vertical height is measured from the floor of the viewing position to the baseline of the highest line of characters.
2. The horizontal viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign or where applicable, as stated in the exception to Section 703.7.4.

Reason: The quantity of change proposals submitted by International Code Council is reflective of three elements of our work: 1. ICC is the Secretariat for the Standard and some changes reflect inconsistencies or improvements suggested by staff; 2. ICC develops and publishes a Commentary on the standard and writing the commentary illuminates issues of the text and figures; and 3. ICC provides an interpretation service for the standard which results in the observation of provisions the users find most confusing.

(Table 703.2.4) This proposal will clarify how the provisions are to be applied. Primarily the major revision needed is shown in footnote 1 of the table. If the committee desired, this footnote could be removed and the heading of the first column could be revised to read "Height above floor to baseline of characters on the highest line". Section 703.2.9 states that the minimum 40 inch height is "measured to the baseline of the character." That is acceptable since it is a minimum height requirement. That text does not however explain whether the ranges in the table (40 to 70, 70 to 120, or >120) is for the highest, lowest, average or each individual line of text. Therefore footnote 1 will clarify how the measurement is to be made and completes the information that is needed to comply with Section 703.2.9 which indicates "Heights shall comply with Table 703.2.4, based on the size of the characters on the sign". (Section 703.2.9 measures the minimum height to the lowest line of characters while Table 703.2.4 is measuring to the highest line of information when determining the minimum character heights.)

The second footnote is not as important since Section 703.2.4 clearly describes how the horizontal distance is to be measured. However, if footnote 1 is added to address the vertical distance then footnote 2 should be included for the clarity.

See corresponding change that has been submitted for Table 703.7.4.

The following figure from the A117.1 commentary will help explain the intent of the change. It should also be noted that the commentary explaining Table 703.2.4 indicates the vertical height measurement to be used for determining the character height is taken "to the baseline of the highest line of the characters."

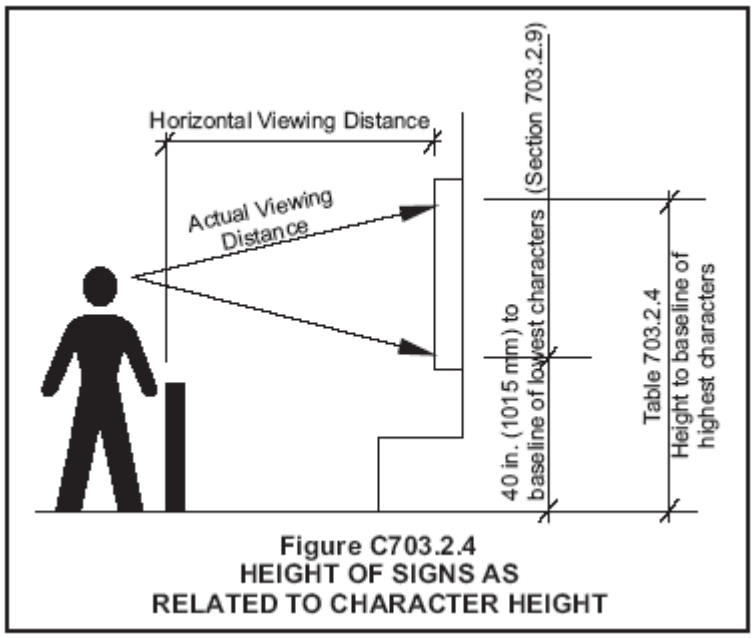

Figure C703.2.4
HEIGHT OF SIGNS AS RELATED TO CHARACTER HEIGHT

(Table 703.7.4) This proposal will clarify how the provisions are to be applied. Primarily the major revision needed is shown in footnote 1 of the table. If the committee desired, this footnote could be removed and the heading of the first column could be revised to read "Height above floor to baseline of characters on the highest line". Section 703.7.9 states that the minimum 40 inch height is "measured to the baseline of the character." That is acceptable since it is a minimum height requirement. That text does not however explain whether the ranges in the table (40 to 70, 70 to 120, or >120) is for the highest, lowest, average or each individual line of text. Therefore footnote 1 will clarify how the measurement is to be made and completes the information that is needed to comply with Section 703.7.9 which indicates "Heights of low resolution variable message signs characters shall comply with Table 703.7.4, based on the size of the characters on the sign". (Section 703.7.9 measures the minimum height to the lowest line of characters while Table 703.2.4 is measuring to the highest line of information when determining the minimum character heights.)

The second footnote is not as important since Section 703.7.4 clearly describes how the horizontal distance is to be measured. However, if footnote 1 is added to address the vertical distance then footnote 2 should be included for the clarity.

See corresponding change that has been submitted for Table 703.2.4.

The following figure from the A117.1 commentary will help explain the intent of the change. It should also be noted that the commentary explaining Table 703.2.4 indicates the vertical height measurement to be used for determining the character height is taken "to the baseline of the highest line of the characters."

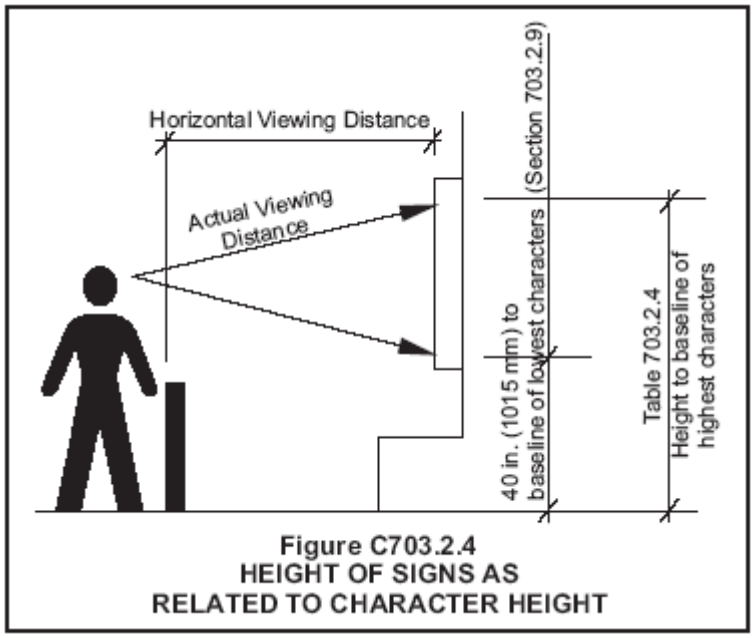

Figure C703.2.4
HEIGHT OF SIGNS AS
RELATED TO CHARACTER HEIGHT

703.2.4(TABLE)-PAARLBERG.doc

Committee Action

Approved

Committee Reason: The Committee concluded that the proposal fills a gap currently in the standard. The Committee asked the proponent to revisit the language to see if it its clarity could be improved.

7-14– 12
704.2

Proposed Change as Submitted

Proponent: Kim Paarlberg, International Code Council

Revise as follows:

704 Telephones.

704.1 General. Accessible public telephones shall comply with Section 704.

704.2 Wheelchair Accessible Telephones. Wheelchair accessible public telephones shall comply with Section 704.2.

EXCEPTION: Drive up only public telephones are not required to be provided with a clear floor space complying ~~to comply~~ with Section 704.2.1.

704.2.1 Clear Floor Space. A clear floor space complying with Section 305 shall be provided. The clear floor space shall not be obstructed by bases, enclosures, or seats.

704.2.1.1 Parallel Approach. Where a parallel approach is provided, the distance from the edge of the telephone enclosure to the face of the telephone shall be 10 inches (255 mm) maximum.

704.2.1.2 Forward Approach. Where a forward approach is provided, the distance from the front edge of a counter within the enclosure to the face of the telephone shall be 20 inches (510 mm) maximum.

Reason: The quantity of change proposals submitted by International Code Council is reflective of three elements of our work: 1. ICC is the Secretariat for the Standard and some changes reflect inconsistencies or improvements suggested by staff; 2. ICC develops and publishes a Commentary on the standard and writing the commentary illuminates issues of the text and figures; and 3. ICC provides an interpretation service for the standard which results in the observation of provisions the users find most confusing.

This proposal is really being submitted to allow the committee a chance to discuss what items from this section should appropriately be exempted and which items should still be required for a public telephone. For example should the hearing-aid compatibility, volume-control, or cord length be exempted simply because the phone is a drive up phone or would those features also be appropriate for a drive-up public telephone?

As currently written, the exception in Section 704.2 would exempt a drive-up telephone from all of the requirements of Section 704.2. While it seems as if only Sections 704.2.1, and perhaps the height aspects of Sections 704.2.2, 704.2.3, and 704.5 should be exempt from compliance.

The A117.1 standard does currently match the federal 2010 ADA Standards for Accessible Design. Therefore, the committee may decide matching the federal requirements makes sense even though it would exempt a drive-up telephone from all of the provisions including hearing-aid compatibility and volume-control.

As currently written the exception would only remove the clear floor space provisions of Section 704.2.1 even though I personally feel that certain other aspects should be exempted or modified. Specifically I believe the height aspects are inappropriate for a drive-up telephone. Unfortunately as this section of the standard is currently written, it tries to address both mobility (wheelchair) and hearing aspects in a single section and therefore where the mobility provisions are deemed to be inappropriate, the hearing assistance items are also lost. One possible solution may be to modify Section 704 to address telephones in general in one section and then as a separate subsection address “wheelchair accessible telephones” and the clear floor space and reach range items that are appropriate for those users. Another solution would be to add a new subsection to address drive-up telephones and the features that are appropriate for them.

704.2-PAARLBERG.doc

Committee Action

Approved

Committee Reason: The proposal provides clarifying text. It will improve compliance with the Standard.

7-15– 12

704.2.5, 704.7

Proposed Change as Submitted

Proponent: Ed Roether, representing the ADA/A117 Harmonization Task Group

Revise as follows:

~~**704.2.5 Hearing-Aid Compatibility**. Telephones shall be hearing aid compatible~~**.**

~~**704.7 Protruding Objects. Telephones, enclosures, and related equipment shall comply with Section 307.**~~

Reason: The ADA/A117 Harmonization Task Group (HTG) was created as a task group of the A117.1 Committee to compare the 2010 ADA with the 2009 A117.1 Standard. The HTG has recommend a series of changes through a set of change proposals. The HTG is recommending changes, for the most part, address where the ADA was viewed as more stringent than the A117. Where the A117 contained provisions not addressed in the ADA, these were not considered a conflict needing action to amend the A117. In addition there are a number of places where the ADA and A117.1 are different as a result of specific actions, by the A117.1 Committee during the development of the 2009 edition, to remain or create a difference where, in the judgment of the committee the ADA was deficient.

Reason for 704.2.5: ADA does not have this text found in the A117.1 Standard. Federal law now requires such capability for all phones. There is no longer a need for the standard to state the requirement.

Reason for 704.7: The text is not found in ADA. It is simply a reminder that these things need to be treated as protruding objects. In a way the text is redundant.

704.2.5-ROETHER.doc

Committee Action

Approved

Committee Reason: The federal standards do not require this compatibility. The constant improvement in hearing aid and telephone technology makes this an unnecessary requirement.

7-16– 12
704.8(NEW), 704.8.1 (NEW), 704.8.2 (NEW)

Proposed Change as Submitted

Proponent: Hansel Bauman, Architect, representing National Association of the Deaf

Add new text as follows:

704.8 Visual Relay Service. Where accessible public telephones are required, provide a minimum of one Visual Relay Service interface.

704.8.1 Equipment. Each Visual Relay Service interface shall accommodate one user with seating, a visual monitor, control device, lighting to illuminate sign language privacy enclosure with a muted color back drop for clear visual communication.

704.8.2 Booth Accessibility. Each booth shall be fully accessible in compliance with all applicable dimensions as stipulated in Sections 304, 305, 306, 308 and 309.

Reason: Submitted reasons statement addressed another proposal.

704.8-BAUMAN.doc

Committee Action

Disapproved

Committee Reason: There was considerable committee discussion on this proposal. There is an explosion of equipment and changing technology surrounding this topic. Sharon Toji encouraged the committee to establish a task force to address these issues. Part of this proposal is scoping which would need to be proposed for the *International Building Code* or other scoping document. The proposal seems to be trying to address a person who is both hard of hearing and using a wheelchair. Historically the Standard hasn't addressed multiple disabilities. Such may be a next step for the standard. This current proposal needs further study and refinement.

BALLOT COMMENTS

7-16.1
Commenter: Gene Boecker, Representing NATO
Ballot: Affirmative with comment:

Comment: I am in agreement with the committee but want to stress that a task force needs to be created to study this item for the next edition.

7-16.2
Commenter: Gina Hilberry, Representing UCP
Ballot: Affirmative with comment:

Comment: Would like confirmation that a task force will be formed to address this and other similar issues.

7-16.3

Commenter: Hansel Bauman, Representing NAD
Ballot: Negative with comment:

Comment: The intent of this proposal is to provide equal communication access for deaf people using sign language that is the same as that provided to hearing individuals. The proponent should be given an opportunity to resubmit the proposal with revisions to address committee concerns.

7-16.4

Comment rescinded.

7-16.5

Commenter: Sharon Toji, Representing HLAA
Ballot: Negative with comment:

Comment: Although I agree this proposal is not usable "as is," I hope that a reasonable substitute that will allow the use of video phones and video relay systems to be placed in locations with necessary public phones can be offered prior to the July meeting. The TTY is seldom used now, and we need to make a first attempt to substitute more recent technology in the standard.

PROPONENT COMMENT

7-16.6

Commenter: Hansel Bauman, Representing NAD

Revise the proposal as follows:

704.8 Visual Relay Service. ~~Where accessible public telephones are required, provide a minimum of one Visual Relay Service interface.~~ Telephones intended for public use shall be accompanied with a minimum of one Visual Relay Service interface.

704.8.1 Equipment. Each Visual Relay Service interface shall accommodate one user with seating, a visual monitor, control device, lighting to illuminate sign language privacy enclosure with a muted color back drop for clear visual communication.

704.8.2 Booth Accessibility. Each booth shall be fully accessible in compliance

Reason: The proponent disagrees with the Committee's action on this proposal as it limits fair access to communication. The proposed Standard does not intent to provide scoping but rather to provide Visual Relay Service as an expanded communication option for when telephones are provided. Revised text is provided here to address the Committee's comments. Additionally it is the intent of this Standard to meet the needs of individuals with multiple disabilities—a comprehensive approach in keeping with current Universal Design trends.

Committee Review of Comments and Action – July 2013

Approval with Modifications based on Comments.

Committee Reason: The revised proposal eliminates any scoping provisions and simply provides a framework for design of such spaces. Scoping would have to be done by adopting jurisdictions. The committee concurred that the concept needs to be seriously considered for the next standard. The committee wants to be able to further revise the proposal during the cycle.

Revise the proposal as follows:

704.8 Visual Relay Service Booth. ~~Where accessible public telephones are required, provide a minimum of one Visual Relay Service interface.~~

~~704.8.1 Equipment.~~ Each public Visual Relay Service Booth ~~interface~~ shall be accessible and accommodate one user with seating, a visual monitor, control device, diffuse lighting with a minimum lighting level of 20 foot candles ~~source illuminate sign language~~ , and a privacy enclosure with a flat, non-textured surface and finish color in contrast with the full range of human skin tones ~~with a muted color back drop for~~ to provide a background for clear visual communication.

~~**704.8.2 Booth Accessibility.** Each booth shall be fully accessible in compliance with all applicable dimensions as stipulated in Sections 304, 305, 306, 308 and 309.~~

Ballot Comments on July 2013 Committee Action Report

ICC – Kim Paarlberg
Negative Ballot:

Comment/reason: While I understand the need for the visual relay system, I have concerns with the requirements. If this is for a person seated, how do you make it also fit a person in a wheelchair and have appropriate distance from the seat to the screen? Is a house phone in a hotel or a pager phone in an airport a phone 'intended for public use'?

7-18– 12
705.5.4

Proposed Change as Submitted

Proponent: Ed Roether, representing the ADA/A117 Harmonization Task Group

Revise as follows:

705.5.4 Alignment. Truncated domes shall be aligned in a square or radial grid pattern.

Reason: The ADA/A117 Harmonization Task Group (HTG) was created as a task group of the A117.1 Committee to compare the 2010 ADA with the 2009 A117.1 Standard. The HTG has recommend a series of changes through a set of change proposals. The HTG is recommending changes, for the most part, address where the ADA was viewed as more stringent than the A117. Where the A117 contained provisions not addressed in the ADA, these were not considered a conflict needing action to amend the A117. In addition there are a number of places where the ADA and A117.1 are different as a result of specific actions, by the A117.1 Committee during the development of the 2009 edition, to remain or create a difference where, in the judgment of the committee the ADA was deficient.

Reason for 705.5.4: The published draft of the ADA standards applicable to rights of way has included the text to allow a radial pattern of the truncated domes.

705.5.4 ROETHER.doc

Committee Action

Approved

Committee Reason: The proposal is consistent with the proposed ADA rule regarding transportation facilities. If the rule changes by its publication, the Committee can address it at that time.

7-19– 12
706.1, 706.3 (New)

Proposed Change as Submitted

Proponent: Sharon Toji, Access Communications, representing Hearing Loss Association of America

Revise as follows:

706.1 General. Accessible assistive listening systems ~~in assembly areas~~, where provided, shall comply with Section 706.

706.3 Inductive Loop Systems. Where inductive loop systems are provided, they shall comply with the following international standard: IEC-60118-4.

(Note: Where existing standards in ANSI A117, 706.4, 5 or 6 conflict or do not comply with the IEC Standard for Inductive Loop Systems, an exception shall be added as follows:)

Exception: Inductive loop systems, where provided, shall comply with 706.3.

Reason: 1. Revision to 706.1: Since accessibility codes in some states require assistive listening systems in occupancies other than assembly areas, the standard should apply to all such systems, in whatever type of occupancy they are installed.

2. Revision to 706.3: Although there are several types of assistive listening systems, and no particular system is required by the ADA Design Standards, the Induction Loop (or T-Coil) System can be used automatically by anyone who has a hearing aid fitted with the technology. We understand that 50 percent or more of the hearing aids sold in the United States have this technology. Also, people who have cochlear implants can use the T-Coil technology. Therefore, so that the many facilities that choose to install an Induction Loop System will install one that will perform satisfactorily for the most users, we recommend that the international performance standard for such systems, the IEC-60118.4, as revised in 2007, be added to the ANSI Standard. This standard is widely adopted internationally, and is recognized by quality manufacturers of these systems, sold both in the United States and abroad. One of the values of the IEC Standard, is that it is applicable to any size room and system.

3. ANSI already adopts this standard for use in AS 60118.4-2007: “Hearing aids – Magnetic field strength in audio-frequency induction loops for hearing aids operating with an induction pickup coil.”

4. IEC, the International Electrochemical Commission, is a nonprofit organization that develops and publishes standards concerning electrical technologies.

Here is the Abstract for the IEC Standard, as it appears on the ANSI Standards Store site, where it may be purchased:
Electroacoustics - Hearing aids - Part 4: Induction loop systems for hearing aid purposes - Magnetic field strength
"Applies to audio-frequency induct ion loop systems producing an alternating magnetic field at audio frequencies and intended to provide an input signal for hearing aids operating with an induct ion pick-up coil . The standard specifies requirements for the field strength in audio-frequency induct ion loops for hearing aid purposes, which will give adequate signal -to-noise ratio without overloading the hearing aid. The standard also specifies the minimum frequency response requirements for acceptable intelligiblity. Methods for measuring the magnetic field strength are specified, and information is given on appropriate measuring equipment (see Annex B), information that should be provided to the operator and users of the system (see Annex C), and other important considerations. "

The following is from a document prepared by a British manufacturer of induction loop systems describing the revised IEC Standard.

New Requirements for Audio Induction Loops in 2007

A major revision of the Audio Induction Loop performance standard means better hearing assistance systems for the hearing impaired. It also changes the way that loop systems are specified, designed, commissioned and maintained.

Providing hearing assistance is a vital way for many organizations to help their customers and staff. With over 10% of the population suffering significant hearing loss, the benefit of hearing assistance systems can be very significant for both the provider and for those who suffer from hearing loss.

However, simply installing a system is not sufficient; a hearing assistance system such as an Audio Induction Loop must provide a genuine benefit to the hearing aid user. A poorly designed or installed hearing assistance system is unlikely to meet legislative requirements as the provider is not giving assistance to the hearing impaired. Standards can provide performance benchmarks that will ensure that systems provide a genuine benefit.

The international standard for audio induction loop systems — IEC60118-4 — sets out requirements and test methods for any loop system. As hearing assistance is increasingly mandated by equal access legislation around the world, IEC60118-4 has become the reference for all loop systems, often appearing in specifications and tenders or directly in hearing assistance legislation.

IEC60118-4 has been revised and republished in 2007. The revised standard is more complex but also sets a clearer performance standard for loops. There are four main requirements:

Field Strength: Sets the output level for the system, ensuring sufficient signal is delivered to the hearing aid to provide enough volume but no distortion.

Test:

• Capable of 400mA/m RMS with 1kHz sine
• Variation ≤ +/-3dB over the required volume of use

Frequency: Sets the requirement for flat frequency response to give good speech intelligibility, the most critical requirement for loop system and the most frequently failed.

Test: Field strength variation ≤ +/-3dB from 100Hz to 5kHz over the required volume of use (reference to the level at 1KHz)

Background Noise: Sets a requirement for a maximum acceptable level of background noise. Suppression of background noise is essential to give the intelligibility required by the hearing impaired.

Test: • A-weighted background noise to be <32dB relative to the signal (400mA/m RMS)
• Ideally <47dB where possible.

Subjective Test: To ensure the system provides an undistorted clear signal to hearing aid users using the actual system sources (microphones etc.)

Test:

• Ideally hearing aid users will validate the system performance
• If not, someone from the service provider must assess the system with suitable receiving equipment.

Here is a document about the new standard submitted by company in the United States

Basic Review of lEe 60118-4 as Revised

The original lEe 60118-4 document was written to establish a standard for the installation of AFIL systems defining required signal levels and installation standards. The required signal strength was chosen to be high enough to produce an acceptable signal to noise ratio over background magnetic noise and yet not so high as to cause overloading of the hearing aid.

In many countries throughout Europe AFILS systems were thought to be required by law. The bad part – many venues installed what was felt to be the minimum system required and much was left up to interpretation. One manufacturer stated that at first they sold only their smallest induction loop drivers and felt many venues had installed marginal systems. In reality some studies indicated that fewer the 50% of the systems in Europe worked properly and often the users were not satisfied with the benefits of AFIL systems. Many of the revisions were meant to better define terms and clarify procedures like commissioning a new system. The desire was to have systems installed where any user could walk into any hearing loop system, sit anywhere and receive a good signal.

Basic points of the revised specification

1. Defines two different types of AFIL systems: large loop or small loop and gives different parameters for each. The small loop is a counter loop, tv loop or cushion loop. In this document we will be dealing with the large loop side of this document.
2. The 0 dB level has now been defined as a 400mA/meter as created by a 1KHz sine wave signal.
3. The useful magnetic field volume now defines the height dimension in detail (the perpendicular distance between the hearing aid pick up coil and the plane of the loop.
4. Suitability of the site is now defined by three items: the magnetic background noise level, the influence of materials in the structure and the presence of other induction loop systems in the area.
5. Background noise levels should be read using an A weighted meter with a.125 sec averaging of the RMSvalue. In a perfect environment the signal tonoise ratio should be 47dB. In other words a noise level reading -47dBA or lower is preferred, however if the actual signal to noise ratio is less than 32dB - it should be analyzed to determine if it is comprised of any undesirable tones and this information shall be reported.
6. The test signals were defined in more detail especially the pink noise signal, which is used often. Sinusoidal signals of 100Hz, 1KHz and 5KHz were defined as the three minimum test frequencies for testing amplifier characteristics and system response.
7. Induction loop system measurements should be taken under conditions deemed to be normal use including other powered sources such slighting. Once the system has been commissioned it recommends that multiple users evaluate the system as a final test.
8. Typical values for the maximum field strengths (peak)(400mA/m) produced by a test signal will vary depending upon the test signal and whether the amplifier uses peak detecting AGe. For a 1KHz sine it would be 400mA/m or OdB, for pink noise it would be 200mAjm or -6dB and for male simulated speech 225mA/m or -5dB. Readings should be taken over at least 60s and the maximum indication read.
9. Commissioning the system requires that the signal levels shall be within ±3dB of the level as indicated in #8 and performed at 100Hz, 1KHz and 5KHz throughout the useful magnetic field volume.
10. Pink noise should be bandwidth limited in a manner similar to speech.
11. Information which should be provided to the hearing aid user and system operators include: signage, instructions on how to use the system, a plan showing the useful magnetic field volume, name and position of the person responsible for proper operation, documented field strength levels, how to monitor the AFIL level and operation, any special audio microphones or other equipment required for proper operation.
12. Appendix E gives a very good overview of induction loop system theory. One major point is the need for a constant loop plane and to keep the loop plane distance from the listening plane consistent and generally in the range of .12 to .16 times the loop width. Also the worst location for the loop plane is at ear height and going up and over doorways should be avoided. It was noted that loops have both resistance and inductance - therefore the amplifier should have sufficient voltage to drive the required current through the loop - especially at the higher frequencies.

We are also sending a letter of support from Listen Technologies, a United States Company that supplies Assistive Listening Systems in the United
States.

Don't miss a single sound. Listen

June 28, 2012

TO WHOM IT MAY CONCERN:

Listen Technologies Corporation is a leading supplier of assistive listening systems in North America. As such we support the Hearing Loss Association of America (HLAA) efforts in establishing guidelines and recommendations for induction loops.

We believe that the current version of the IEC-60118-4 standard is the best choice as a referenced standard for the following reasons:

- The product standards included in the IEC-60118-4 standard are comprehensive and have been vetted over many years of use in Europe.
- They are clear and concise and provide a performance standard that applies non-discriminatorily to either large or small venues.
- Induction Loops products are inexpensive enough to be used in facilities such as colleges or movie theaters and houses of worship.
- Induction Loop products are readily available around the world.

Best regards,

LISTEN TECHNOLOGIES CORPORATION

Keldon A. Paxman
VP-Operations.

Listen Technologies Corporation • 14912 Heritagecrest Way • Bluffdale • Utah 84065-4818
T 801.233.8992 • T 800.330.0891 North America • F 801.233.8995 fax

SWBR

SWBR Architects

ROCHESTER NY
387 East Main Street
Rochester NY 14604
Voice 585.232.6300
SYRACUSE NY
209 South Franklin Street
Syracuse NY 13202
Voice 315.422.5325
www.swbr.com

June 29, 2012

SWBR Architects
387 East Main Street
Rochester, NY 14604

To: To Whom It May Concern:

Re: ANSI 117.1, Section 706 Assistive Listening Systems

I am a practicing Architect with SWBR Architects & Engineering, P.C., which is one of the top 250 Architectural firms (Architectural Record, June 2012), directly responsible for the design of Induction Loop Systems for variety of public, educational, and private projects.

I wear (2) behind the ear digital hearing aids that include T-Coil Programs. I am currently the Board President of the Hearing Loss Association of America Rochester Chapter, and have presented workshops on Induction Loop Systems based on IEC-60118-4.

I prepare Induction Loop Design and Specification Documents for small and large areas based on IEC-60118-4 (IEC) and endorse the following proposed adoption of IEC-60118-4 standards:

1. Conformance with the IEC is beneficial because conformance provides a constant field strength level to everyone (within a +/- 3dB level), within the Induction Loop Space.
2. IEC establishes 0 dB as a standard basis, (defined as 400mA/meter created by a 1 kHz sine wave signal), allowing a standard metric and development of measuring equipment.
3. IEC provides performance and commissioning requirements for small or large Induction Loop installations with parameters for each, ensuring that operators have the ability to provide and maintain proper system operation.
4. IEC defines "useful magnetic field volume" level and height dimension beneficial for hearing aid or headphone with pick up T-Coil users.
5. IEC defines (pre-design) area suitability requirements: magnetic background noise level, structure material influence and presence of other induction loops.

Respectfully submitted,

Donald W. Baraffe, AIA, CCS
Architect / Specification Writer

DWB:jmd

PERFECT BALANCE

Committee Action

Disapproved

Committee Reason: The Committee was concerned that this was promoting a technology that has not a proven track record and may be promoting equipment of a single company. There is already an acknowledged standard for this, how would this proposal compare to it. The proposed exception seems unnecessary.

BALLOT COMMENTS

7-19.1

Commenter: Kim Paarlberg, Representing ICC
Ballot: Affirmative with comment:

Comment: The referenced standard, IEC 60118-4 was not provided for the committee. Is the standard developed using a consensus process and written in enforceable language. Are there systems available that can meet this standard?

Revise as follows:

7-19.2

Commenter: Hansel Bauman, Representing NAD
Ballot: Negative with comment:

Comment: The intent of this proposal improves upon existing standards. The proponent should be given an opportunity to re submit the proposal with revisions that address the committee's concerns.

7-19.3

Commenter: Gina Hilberry, Representing UCP
Ballot: Negative with comment:

Comment: The committee's actions relate to 706.3. 706.1 has merit.

7-19.4

Commenter: Melanie Hughes, Representing AERBVI
Ballot: Negative with comment:

Comment: For complex but valid reasons explained by the proponent in an email.

7-19.5

Comment rescinded

7-19.6

Commenter: Cheryl D. Kent, Representing HUD
Ballot: Negative with comment:

Comment: I am voting negative based on the information provided in an email from Sharon Toji, as follows:

For all who have not yet sent in their ballot. I am hoping to get a reconsideration of the item on ALS. (7-19– 12). I found that items that I submitted that were necessary if you wanted to understand the exception, were left out when it was printed, and I unfortunately got very flustered and couldn't figure out myself why it didn't make sense.

Also, I was very shocked when I saw the "reasons" why it was so soundly defeated. This technology (hearing or induction loop) is the oldest of all the technologies for wireless assistive listening, far from being "unproven." Also, although I did include a letter from a well respected company that installs the loop systems, as well as from an architect who is hard of hearing, is an expert in the systems, and consults on them and specifies them, this is hardly anything to do with the equipment manufactured by any one company.

I have finally been able to get many more responses from experts in this field, and the whole point is that induction loop systems, of all the systems listed by the Access Board in their commentary, require very specific installation testing if they are to be

useful. That is why the IEC standard was written. I know that many people on the committee are in favor of objective testing standards, and the current ADA/ANSI standard is a "one size fits all" standard for the equipment itself, and does not require testing of the installation. The IEC Standard is specific to induction (hearing) loop systems, and what I am getting from the experts is that it is vital to ending up with a very usable system.

It is possible to purchase components that would comply with ADA/ANSI standards and have a "do-it-yourself" installation by someone who had the proper contractor's license, but did not understand how to test it, and the system would be inferior and would work poorly. That is what I understand, and what was happening in Europe and why they worked on, and passed the standard. The best professional companies here do, I believe, use the standard and they all say that, but it is possible to go a route that does not provide that kind of installation, and it's undoubtedly less expensive.

By the way, small, portable testing kits are available, so this is something that an inspector could probably learn to test.
I would like to be able to present this in more detail, and I think that this time, I will have technical experts to explain things and back it up. Therefore, I am requesting that those who have not yet sent in their ballot will consider putting in a negative ballot on this item.

Sharon Toji

7-19.7

Commenter: R. Duane Wilson, Representing ASTC
Ballot: Negative with comment:

Comment: Having specified these systems in the past, I never had a good way to know they were working satisfactorily. The European standard provides that test.

7-19.8

Commenter: Sharon Toji, Representing HLAA
Ballot: Negative with comment:

Comment: At the July meeting, I believe I will be able to present convincing reasons for the acceptance of this proposal, including a modified “exception” if that is appropriate. The reasons given for the negative vote by the committee are not reasonable, since this is very tried and true technology (inductive loop systems), and is no way confined to one or two manufacturers. These standards are promoted by many experts, consultants, manufacturers, and installers as vital for the needed end result of inductive loop systems that are effective for their users. They add standards for the testing of the systems AFTER installation, which are not in the current standard, which is a “one size fits all” standard for every type of system.

Proponent Comment

7-19.9

Commenter: Sharon Toji, Representing HLAA

Reason: Here are items I would like to submit in support of my negative ballot on the committee action on my item 7-19-12 having to do with the adoption of international standards for installation of Hearing Loop (Induction Loops) types of assistive listening systems. Please distribute this material as per your regular procedure. These letters were all received by me via email.

I would also like to add the following remarks myself:
In support of the adoption of the IEC Standard for Hearing Loop Installation, when that is the system chosen assistive listening system:

I have now been able to speak much more extensively with a number of experts on assistive listening systems. The major flaw in our current standard, in regard to the Hearing Loop, is that the standard relates equally to all kinds of approved systems, and does not take into account the necessity for strict and regulated testing of Loop installations. The installation is the deciding factor in most cases between an excellent outcome for the user of the Loop system, and a substandard one. That was the experience in Europe, where substandard installations gave Loop systems a bad reputation. With the development of the IEC Standard, which includes testing protocol for the installation, Loop systems have become widespread, and very popular.

A major reason for the popularity of the Loop system is that those with hearing aids and cochlear implants with a T-Coil do not have to wear headphones. And yet, someone who does not have a hearing aid, or a T-Coil can get the advantage of the system by using headphones. It is really a universal system, and a system that provides the least effort on the part of the user who does not need to ask for, or use, cumbersome special equipment. In addition, since the sound comes through the individuals own hearing aid or implant, it is a remarkably clear sound, and does not vary from location to location, when it is correctly installed.

My only concern earlier was that ANSI was not adopting something that would conflict directly with the current standard. That is the reason why I was suggesting, that if anything in the IEC Standard did conflict with the current "one size fits all" standards for assistive listening systems, that we adopt an exception to that part of the standard specifically for Loop systems. I will be submitting a slightly rewritten (amended) standard under the advisement of the technical experts involved with the HLAA to be sure that the standard we adopt is clear, and not in conflict with ADA Standards, but supplements them, to the advantage of those with hearing loss.

Sharon Toji

ITEM 1

Dear Sharon,

Thanks so much for writing, and thank you, especially, for your volunteer leadership on behalf of HLAA and all Americans with hearing loss.

Your recommendation—to let the international consensus standard for hearing loops be our national standard—is not just prudent, it is important, and I am very eager to support your effort to propose this to the ANSI committee. As you can see here, the nonprofit informational website that advocates hearing aid compatible assistive listening (via hearing loops) *strongly* encourages that installations meet the standard for strength and evenness of coverage. This is in response to reports of inferior installations, sometimes done by well-intentioned people and sometimes by less-than-scrupulous installers who get jobs by placing low bids and then doing slapdash, inferior installations and pocketing the profit.

Mandating the international standard would help level the playing field for would-be installers, and would also incentivize installers to become trained to do such installations. As HLAA executive director Brenda Battat surely has indicated to you, she and others associated with the HLAA/American Academy of Audiology "Get in the Hearing Loop" joint initiative strongly support respecting people with hearing loss via a mandate for installations that serve their needs.

To help your fellow ANSI committee members appreciate what effective hearing aid compatible assistive listening means to those of us with hearing loss, see here for one example (from this week) and here for a synopsis of accelerating progress in our efforts to transform the way America provides listening assistance to people with hearing loss. (I will also attach a couple items that provide further information, including my remarks to hearing industry leader Oticon, this past Thursday, on accepting an award that salutes our grassroots effort to make American assistive listening hearing aid compatible.)

FYI (to assure you and others that I have no financial interest in any hearing-related product or service) I have just been appointed by HHS Secretary Janet Sebelius as Brenda Battat's replacement (representing Americans with hearing loss) on the National Deafness and Other Communication Disorders Advisory Council (which advises NIDCD on its priorities and grantmaking).

Please feel free to forward this to your fellow ANSI committee members, with my gratitude for their efforts to define national standards that make America accessible to all, including to those of us in the biggest sensory-challenged group—the 36 million Americans with the invisible disability of hearing loss.

Cordially,
David Myers

STAFF NOTE: Ms. Toji's supporting documentation can be viewed under the Agendas tab; July 15-19, 2013; Supporting Documentation at the following link: http://www.iccsafe.org/cs/standards/A117/Pages/default.aspx

---

Committee Review of Comments and Action – July 2013

Approval with Modifications based on Comments.

Committee Reason: Based on the information provided regarding the technology and the international standard which the devices must comply, the committee approved referencing induction loop systems as another alternative for compliance with the assistive listening requirements.

Modification:

Revise as follows:

105.2.12 Hearing aids – Magnetic field strength in audio-frequency induction loops for hearing aids operating with an induction pickup coil IEC 60118.4-2007 (International Electrotechnical Commission, 3 rue de Varenbe, PO Box 131, 1211 Geneva 20, Switzerland.)

706.1 General. Where installed, ~~A~~assistive listening systems ~~required in assembly areas~~ shall comply with 706.

706.3 ~~Inductive~~ Induction Loop Systems. Where ~~inductive~~ induction hearing loop systems are provided, they shall comply with IEC-60118-4.

~~Exception: Inductive loop systems, where provided, shall comply with 706.3.~~

(*Existing sections will be renumbered)*

7-20– 12
706.2

Proposed Change as Submitted

Proponent: Kim Paarlberg, International Code Council

Revise as follows:

706.2 Receiver Jacks. Receivers required for use with an assistive listening system shall include a $^{1}/_{8}$ inch (3.2 mm) standard ~~mono~~ monaural (monophonic) jack.

Reason: The quantity of change proposals submitted by International Code Council is reflective of three elements of our work: 1. ICC is the Secretariat for the Standard and some changes reflect inconsistencies or improvements suggested by staff; 2. ICC develops and publishes a Commentary on the standard and writing the commentary illuminates issues of the text and figures; and 3. ICC provides an interpretation service for the standard which results in the observation of provisions the users find most confusing.

The purpose of this proposal is to provide better guidance than the current "mono" wording. Without the additional clarification a user cannot determine if the term mono is intended to imply a single plug jack as compared to a plug with two prongs which is common on airplanes, or if the intent is to imply that you could not have a stereo (stereophonic) jack plug for the assistive listening device.

The intent of the requirement for receiver jacks is to ensure compatibility with standard headphones or earbuds. With the increased popularity and ownership of headphones and earbuds, the existing requirement can create a bit of confusion and difference in sound quality for an assistive listening system (ALS). While the intent of the provision is to ensure that users can plug in their own headphones to the system, the fact that the standard specifies a "mono" jack will result in the users hearing the sound differently than what is typically being heard through the remainder of the audio system. Monaural or monophonic sound (mono) is created by an amplifier transmitting a single signal where as a stereophonic (stereo) sound is produced by transmitting two independent signals through two separate channels. Stereo systems are the most common today and are best used to replicate the sensation of hearing an orchestra or band performance since the independent signals allow for different sounds or instruments in the right and left channels reproducing the sound of individual instruments or performers being located in different areas of the auditorium. The mono system tends to work best for speeches or panel discussions and will produce the exact same sound level in each speaker of the headphone since it is receiving a single signal channel. While a mono system may not produce the depth or location sensation that stereo can provide, it remains the standard for various communication systems including assistive listening devices.

I have kept this proposal consistent with what I believe is the current intent (that it is referencing a monophonic connector versus a single plug connection). If the committee desires to expand the options the proposal could be revised by deleting the current word "mono" or replacing it with "audio". Such a revision would allow a venue to determine whether a monophonic or stereophonic assistive listening system would be used. While that may make the assistive listening system more consistent with the general sound system, it may reduce the overall effectiveness of the ALS, which as mentioned previously is typically done in monophonic since it works best for the spoken word and for people that have differences in hearing on their left or right side.

I would suggest that the committee stick with the monaural or monophonic wording at this point and not change to accepting mono or stereo unless additional information is available or one of the committee members has the expertise to address the differences/benefits between the two systems for an assistive listening system.

Simply as a side note, the standard single plug connector in the audio industry is known as a 3.5 mm connection as opposed to the 1/8 inch or 3.2 mm size that is shown in the standard. People will know what you are talking about if you use the standard's dimensions but it does not match exactly with the terminology in the audio industry.

706.2-PAARLBERG.doc

Committee Action

Approved

Committee Reason: The change provides improved language for the Standard.

7-21– 12
Table 707.6.1

Proposed Change as Submitted

Proponent: Kim Paarlberg, International Code Council

Revise as follows:

TABLE 707.6.1—RAISED SYMBOLS

Key Function	Description of Raised Symbol	Raised Symbol
Enter or Proceed:	CIRCLE	○
Clear or Correct:	LEFT ARROW	←or <
Cancel:	"X"	X
Add Value:	PLUS SIGN	+
Decreased Value:	MINUS SIGN	-

Reason: The quantity of change proposals submitted by International Code Council is reflective of three elements of our work: 1. ICC is the Secretariat for the Standard and some changes reflect inconsistencies or improvements suggested by staff; 2. ICC develops and publishes a Commentary on the standard and writing the commentary illuminates issues of the text and figures; and 3. ICC provides an interpretation service for the standard which results in the observation of provisions the users find most confusing.

This is a clarification that was requested based upon an interpretation request that I received. On the whole this seems to have been a fairly isolated incident but if this revision can help clarify the requirement in the future I am willing to suggest it.

Compare the 2010 ADA Standard to the A117 for the "left arrow". The A117 provides a specific symbol while the federal requirement simply states "raised left arrow".

The A117 shows ⬅
Other sources and books show <

Is either one acceptable? Are they really both requiring separate/unique symbols that are not permitted/accepted by the other standard?

I did some checking and noticed that the table with the symbols just came into the A117 standard in the 2003 edition. So there is not a lengthy history of this item. I have not dug back into the code change enough to know if Table 707.6.1 was submitted with the proposal or if it was simply added during the process or by an editorial revision as if it was a figure.

It may be easiest to add the text from Section 707.6.3.2 of the federal requirements and then simply rely on the graphic as we do any other figure in the standard - that it is there for informational purposes and is not considered part of the standard (Section 104.3).

For informational purposes, the text from the ADA standard is as follows:

> **707.6.3.2 Tactile Symbols.** Function key surfaces shall have tactile symbols as follows: Enter or Proceed key: raised circle; Clear or Correct key: raised left arrow; Cancel key: raised letter ex; Add Value key: raised plus sign; Decrease Value key: raised minus sign.

However, if the committee elects to use the ADA text, I would suggest on the cancel key showing the text as raised letter "X" instead of "ex"

707.6.1(TABLE)-PAARLBERG.doc

Committee Action

Approved

Committee Reason: The change allows for options for compliance, and an option that seems most popular in current installations.

7-23– 12

703.3.8

Proposed Change as Submitted

Proponent: Ann Makowski, representing Society for Environmental Graphic Design (SEGD)

Revise as follows:

703.3.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Spacing between individual raised characters shall be ~~1/8 inch (3.2 mm)~~ 15 percent minimum and 35 percent maximum of the character height measured at the top surface of the raised character. ~~minimum measured at the top surface of the characters, 1/16 inch (1 .6 mm) minimum measured at the base of the characters, and four times the raised character stroke width maximum.~~ Characters shall be separated from raised borders and decorative elements 3/8 inch (9.5 mm) minimum.

Reason: The proposed changes to the language of this section are provided in order to allow for a proportionate minimum and maximum raised character spacing to be achieved as opposed to a measurement based requirement that will be difficult to administer, produce and confirm. The language proposed to be removed regarding variations of measurement in spacing of characters from the top or base is proposed to eliminate confusion and provide a single measurement point at the tope surface of a raised character, which is where it is read.

Uniform dimensionally based spacing between character pairs is not recommended for use at is perceived to impair legibility of words. Proper spacing between characters varies based on the shape of the specific character, for example there should be more space between "AC" than "CO". Character spacing is understood by the graphics design profession to be most effective and legible when created in proportion to character height.

It is understood that the objective of creating minimum and maximum character spacing of raised characters is to enhance the ability for raised characters to serve their tactile reading function and creating standards to achieve the maximum effectiveness of this purpose is supported. However, in the majority of applications a raised character is also acting in function as a visual character and the effectiveness of this purpose should not be sacrificed. It is proposed that the necessary restrictions on spacing be maintained but in a measurement protocol that will allow for proper proportional spacing to ensure both tactile and visual function is most effectively achieved.

703.3.8-MAKOWSKI.doc

Committee Action

Disapproved

Committee Reason: The Committee felt that additional research was needed. There was concern that the 15% would be difficult and time consuming to accomplish. Of further concern is equal spacing isn't required and could be visually confusing.

BALLOT COMMENTS

7-23.1

Commenter: Gene Boecker, Representing NATO
Ballot: Affirmative with comment:

Comment: The proposal has merit and should be researched. Kerning is the concern of spacing between adjacent letters and is a part of every font layout. It relies on proportional spacing for better reading. The 15-30 percent is reasonable. In fact, for certain types of fonts, a zero (0) spacing would be preferred. If you compare the spacing between the letters "A" and "W" when used next to one another as in "AWFUL," the space between them is actually a negative number for some fonts. Whether the specific range should be 15-30 should be the focus. Arbitrarily relying on a particular dimension as is done in the existing standard will not improve readability.

7-23.2

Commenter: Teresa Cox, Representing ISA
Ballot: Negative with comment:

Comment: The proposal will be modified and resubmitted to address the Committee's concerns.

7-23.3

Commenter: Edward Steinfeld, Representing RESNA
Ballot: Negative with comment:

Comment: This was a good proposal that came from a knowledgeable proponent. The current requirements are far too restrictive and lead to poor legibility for all as demonstrated in the presentation. Moreover, they were developed with little research also, demonstrated by the fact that they violate principles of good graphic design. So, the argument for disapproval is not valid.

Committee Review of Comments and Action – July 2013

Approval with Modifications based on comments.

Committee Reason: The proponents are seeking flexibility of spacing of raised letters, but appear to assume the measurements provided in the standard are absolutes and not minimum's as stated. The committee felt it was essential that the location of the measurement be maintained in the language for consistency of application. All parties agreed that more research was needed on this topic, and the proposal was approved so that further action can be taken this cycle.

Modification.

Replace the proposal as follows:

703.3.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Spacing between individual raised characters shall be 15% or 1/8 inch (3.2 mm) minimum, whichever is greater, and 35% maximum of the character height measured at the top of the surface of the characters, 1/16 inch (1.6 mm) minimum measured at the base of the characters, ~~and four times the raised character stroke width maximum.~~ Characters shall be separated from raised borders and decorative elements 3/8 inch (9.5 mm) minimum.

Ballot Comments on July 2013 Committee Action Report

ACB – Chris Bell
Negative Ballot:

Comment/reason For the reasons cited by Ed Steinfeld.

HLAA – Sharon Toji
Negative Ballot:

Revise as follows:

703.3.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Spacing between individual raised characters shall be 1/8 inch (3.2 mm) of the character height measured at the top surface of the raised character, and four times the base character stroke width maximum. Characters shall be separated from raised borders and decorative elements 3/8-inch (9.5 mm) minimum.