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

Proponent: Sharon Toji, Access Communication, representing self

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.

Committee Action: AS AM D

703.2.1.1(New)-TOJI.doc

7-2 – 12
702.1

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.

Committee Action: AS AM D

702.1(NEW)-PAARLBERG.doc

7-3 – 12
702.2 (NEW)

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

Add new text as follows:

702.2 Alarm Location. Visual alarms and notification appliances shall be located where view of the appliances is unobstructed from anywhere in the space served by the appliance. The appliance shall not be located where exposed to high levels of illumination generated by natural or artificial sources.

Reason: This text is added to mitigate situations where high levels of light fall directly upon strobe lights thus reducing their visual impact. And to further direct designers to carefully select visual alarm locations within rooms to ensure the highest degree of visual impact.

Committee Action: AS AM D

702.2 (NEW)-BAUMAN.doc

7-4 – 12
703.2.4

Proponent: Sapna Budev, International Sign Association

Revise as follows:

703.2.4 Character Height <u>for the Primary Message in a sign</u>. The uppercase letter "I" shall be used to determine the allowable height of all characters of a font. The uppercase letter "I" of the font shall have a minimum height complying with Table 703.2.4. <u>In addition, to the maximum extent practicable, secondary or support messages shall comply with 703.2.4.</u>

Reason: Minimum character heights in Table 703.2.4 are not practical for many common signs. Variation is character height helps convey relative importance of different parts of the sign message, and improves communication. The minimum character heights for visual characters do not allow for message hierarchies.

Committee Action: AS AM D

703.2.4-BUDEV.doc

7-5 – 12
703.2.4

Proponent: Francine Wai, Executive Director, Disability & Communication Access Board

Revise as follows:

703.2.4 Character Height. The uppercase letter "I" shall be used to determine the allowable height of all characters of a font. The uppercase letter "I" of the font shall have a minimum height complying with Table 703.2.4. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign.

~~**EXCEPTION:** In assembly seating where the maximum viewing distance is 100 feet (30.5 m) or greater, the height of the uppercase "I" of fonts shall be permitted to be 1 inch (25 mm) for every 30 feet (9145 mm) of viewing distance, provided the character height is 8 inches (205 mm) minimum. Viewing distance shall be measured as the horizontal distance between the character and where someone is expected to view the sign.~~

Reason: The 2010 ADA Standards do not appear to have an exception similar to 703.2.4 in A117.1, for signs located in assembly areas. Signs designed to the exception in 703.2.4 may be found not in compliance with the 2010 ADA Standards. For harmonization with the 2010 ADA Standards, the exception should be deleted.

Committee Action: AS AM D

703.2.4-WAI.doc

7-6 – 12
Table 703.2.4, Table 703.7.4

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."

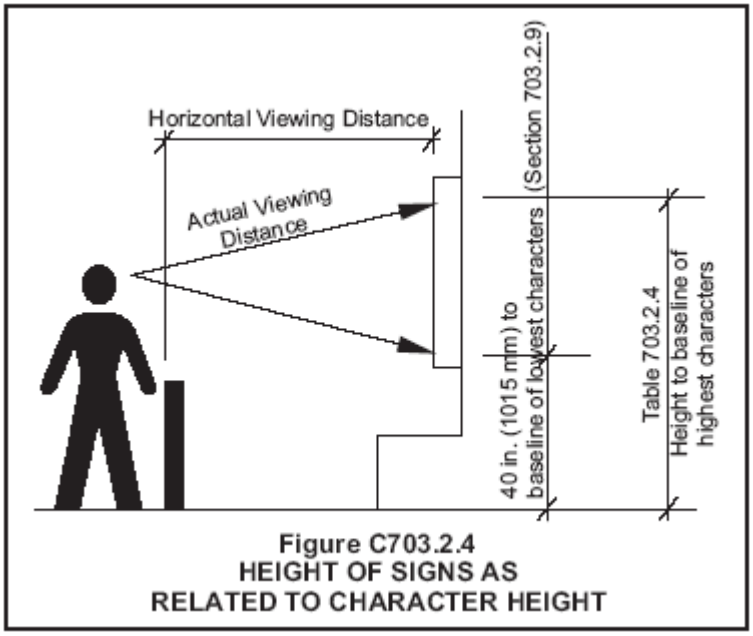


Figure C703.2.4
HEIGHT OF SIGNS AS RELATED TO CHARACTER HEIGHT

(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."

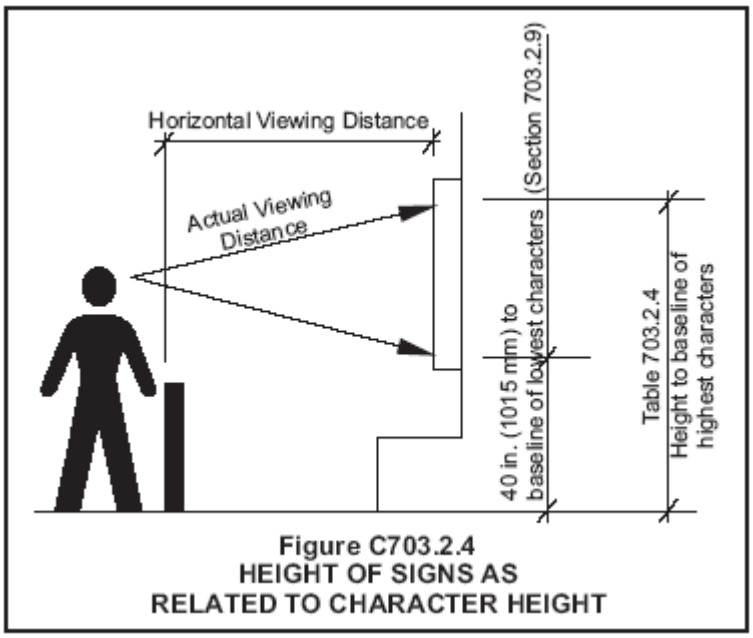


Figure C703.2.4
HEIGHT OF SIGNS AS RELATED TO CHARACTER HEIGHT

Committee Action: AS AM D

703.2.4(TABLE)-PAARLBERG.doc

7-7 – 12
703.2.8

Proponent: Francine Wai, Executive Director, Disability & Communication Access Board

Revise as follows:

703.2.8 Line Spacing. Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of the character height.

> ~~**EXCEPTION:** In assembly seating where the maximum viewing distance is 100 feet (30.5 m) or greater, the spacing between the baselines of separate lines of characters within a message shall be permitted to be 120 percent minimum and 170 percent maximum of the character height~~.

Reason: The 2010 ADA Standards do not appear to have an exception similar to 703.2.8 in A117.1, for signs located in assembly areas. Signs designed to the exception in 703.2.8 may be found not in compliance with the 2010 ADA Standards. For harmonization with the 2010 ADA Standards, the exception should be deleted.

Committee Action: AS AM D

703.2.8-WAI.doc

7-8 – 12
703.2.10

Proponent: Eugene Lozano, Jr, representing California Council of the Blind

Revise as follows:

703.2.10 Finish and Contrast. Characters and their background shall have a non-glare finish. Characters shall have at least a 70 percent contrast with their background, with either light characters on a dark background, or dark characters on a light background.

An eggshell finish (11 to 19 degree gloss on 60 degree glossimeter) shall be used.. Contrast in percent shall be determined by:
Contrast = [(B1-B2/B1)]
°— 100 percent where B1 = light reflectance value (LRV) of the lighter area,
which shall be no less than 45 LRV, and B2 = light reflectance value (LRV) of the darker area.

Reason: The CCB requests that the ANSI A117.1 standards committee consider updating Section 703.2.10 Finish and Contrast. The Council's position is that the current Section 703.2.10 Finish and Contrast is deficient in that it does not address a formula for glare, a measurable standard for contrast nor does it take into consideration differences in color and hue values.

We recommend at a minimum the inclusion of a modified version of the text from the 1992 Americans with Disabilities Act Accessibility Guidelines Appendix A4.30.5 Finish and Contrast be used as a replacement standard for ANSI Section 703.2.10 Finish and Contrast.

The Council has introduced in the proposed text an updated formula provided to us by Sharon Toji, Access Communications, for a measurable standard for contrast.

The Council has received the rationale from Sharon Toji for the use of the formula found in our substitute text which follows:

> "The ANSI Committee has been considering such a standard, and at the previous meetings, the figure that has received approval, either as a part of the standard itself, or as an Appendix item, is 45 LRV for the lighter of the two colors. This number, slightly below the numerical halfway point on the scale between 0 (pure black) and 100 (pure white) makes allowance for the fact that the distance between the LRV points is greater toward the higher end of the scale. It provides a balance between the UK method of merely requiring an interval of 30 points, and the ADAAG formula. If we use the lowest possible LRV for the lighter color, 45, and subtract 30, to contrast it with an LRV of 15, we get close to the required 70 percent at 67 percent. We need to only go a few points higher with the lighter color, or lower with the darker color to achieve 70 percent. At the same time, by requiring a fairly light color, we are ensuring that we will not get a "false positive" for two dark colors. For instance, we can use an LRV of 45 with a darker color measuring LRV 13.5 and achieve a minimum percentage of 70. We can find a lighter color with an LRV of 50, and get the minimum percentage with a darker color with an LRV of 15. This is a conservative standard which will provide hundreds of choices for designers and owners, but also provide better contrast for many persons with vision impairments, including older persons with age related vision impairments, and persons with common color blindness.
>
> Samples with the light LRV of 45 and a 70 percent contrast, and other LRV samples were shown to about 30 persons who are legally blind at national and state conventions in Minneapolis and California. Persons who were legally blind but did read visually had to move close to the sign when the contrast was only 70 percent, but when the lighter of the two colors fell into the lighter end of the spectrum, they were able to distinguish the letters, something that they could not do with contrasts of 70 percent or even more when two dark colors (both in the lower part of the LRV spectrum) were used."

Note that in any application both white and black are never absolute; thus, B1 never equals 100 and B2 is always greater than 0. The greatest readability is usually achieved through the use of light-colored characters or symbols on a dark background.

We suggest that the ANSI A117.1 committee look at contrast formulas that are under development in other countries such as the United Kingdom and Japan.

As far back as the early 1970s, researchers have investigated the question of color combinations and percentage of contrast that are particularly suitable for letters and backgrounds for persons with low vision.

Research indicates that signs are more legible for persons with low vision when characters contrast with their background by at least 70 percent.

One study that supports the at least 70% contrast, "Information Transfer Problems of the Partially Sighted: Recent Results and Project Summary," the Rand Corporation, R-1770-HEW, June 1975, was conducted as part of a broad program on information transfer problems of persons with low vision sponsored by the Rehabilitation Services Administration of the U.S. Department of Health, Education and Welfare. They found:

1. That more than 70 percent of the time persons with low vision prefer to view white symbols on a black background over black symbols on a white background. The reasons for this were (a) that light came to the pathological eye via the information carrying alphanumeric symbols rather than from the matrix in which the symbols were imbedded and (b) that, in general, the alphanumeric symbols occupied a smaller portion of a sign than the matrix in which they were imbedded and hence produced less glare and less light scattering.

2. Through the use of a very sophisticated pseudo color generator that could produce more than 16.7 million two color combinations it was found that persons with low vision preferred very light colored alphanumeric symbols on very dark backgrounds. For example, they felt that they could see very clearly white or yellow characters on a black, dark red, dark brown, dark green, or dark blue background. They found red on blue, blue on red, blue on brown, brown on blue, and green on blue and blue on green to be particularly difficult to distinguish.

In another study "Information Systems for Low Vision Persons" conducted by Peter Muller-Munk Associates, Division of Wilbur Smith and Associates, Consultants: Pennsylvania College of Optometry, American Foundation for the Blind, William R. DeL'aune, Ph.D, and Shelly Marmion Miles, PH.D. November 28, 1986, found:

> Should MGRAD require the following, regarding contrast of characters and background on visual signs: Characters and symbols shall contrast with their background-either light characters on dark background or dark characters on light background. Light characters on dark background are preferred. It is recommended that characters contrast with their background by at least 70%....

Further we refer ANSI committee members to look into additional color contrast research sponsored by the International Lighthouse for the Blind by Aries Arditi, PhD, **Designing for People with Partial Sight and Color Deficiencies** http://www.lighthouse.org/accessibility/design/accessible-print-design/effective-color-contrast and **Investigations of Color Vision in Low Vision** Arlene Gordon Research Institute, http://www.lighthouse.org/research/archived-studies/investigations/ .

In closing, we ask that ours and other's recommendations for updating ANSI Section 703.2.10 Finish and Contrast be given serious consideration.

Committee Action: AS AM D

703.2.10-LOZANO.doc

7-9 – 12
703.3.8

Proponent: Sapna Budev, International Sign Association

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 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.

Reason: Uniform spacing between character pairs is not recommended because it impairs legibility. Correct spacing between characters varies with their shapes, for example there should be more space between AC than CO. Character spacing should be proportional to character height.

Reference to measuring spacing at the base of the characters is deleted because characters are read at their top surface. Additional text is confusing and unnecessary.

Committee Action: AS AM D

703.3.8-BUDEV.doc

7-10 – 12
703.3.11

Proponent: Carroll Lee Pruitt, FAIA, APA, representing Accessibility Professionals Association

Revise as follows:

703.3.11 Location. Where a sign containing raised characters and braille is provided at a door, the sign shall be alongside the door at the latch side. Where a sign containing raised characters and braille is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a sign containing raised characters and braille is provided at double doors with two active leaves, the sign shall be to the right of the right-hand door. The edge of the sign closest to the arc of the door shall be located 9 inches maximum from the edge of the door. . Where there is no wall space on the latch side of a single door, or to the right side of double doors, signs shall be on the nearest adjacent wall. Signs containing raised characters and braille shall be located so that a clear floor area 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the raised characters is provided beyond the arc of any door swing between the closed position and 45 degree open position.

> **EXCEPTION**: Signs containing raised characters and braille shall be permitted on the push side of doors with closers and without hold-open devices.

Reason: Alongside the door is a vague unenforceable term. The current language could allow the sign to be mounted several inches to several feet from the door. This change sets a maximum distance the sign can be mounted from the door's edge. Similar requirements were used in Texas from 1994 to 2012 (1994 Texas Accessibility Standards 4.30.6, Figure 43(e).

Committee Action: AS AM D

703.3.11-PRUITT.doc

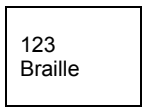
7-11 – 12
703.4.4

Proponent: Sapna Budev, International Sign Association

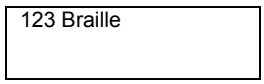
Revise as follows:

703.4.4 Position. Braille shall be below the corresponding text. If text is multi-lined, Braille shall be placed below entire text. Braille shall be separated 3/8-inch (9.5 mm) minimum from any other tactile characters and 3/8-inch (9.5 mm) minimum from raised borders and decorative elements. Braille provided on elevator car controls shall be separated 3/16-inch (4.8 mm) minimum either directly below or adjacent to the corresponding raised characters or symbols. Braille provided on number signs shall be separated 3/8-inch (9.5 mm) minimum either directly below or directly to the right of the corresponding raised characters.

Reason: This proposal is intended to apply only to tactile room number signs. In the standard, Braille is required below the corresponding raised copy for all signs except those that identify elevator car controls.



The result is that the shape of the sign takes on a vertical or portrait format, to allow for proper spacing above the raised number, between the number and the Braille and both and below the tactile portions of the sign. The vertical dimension is furthered increased when the top margin is enlarged to visually balance the area below the raised number with the Braille.



There are many conditions in interior architecture where a horizontal or landscape format is more appropriate. There are situations where permitting a landscape format, allows for a sign that, otherwise, would not fit in the available space above wainscoting, within a side light, or below a decorative object. The A117.1 Committee recognized one of those conditions with the exception for elevator car controls.

Allowing adjacent placement for Braille on room number signs only, permits accessible signage where otherwise, there would be none.

Committee Action: AS AM D

703.4.4-BUDEV.doc

7-12 – 12
703.4.5

Proponent: Sapna Budev, International Sign Association

Revise as follows:

703.4.5 Mounting Height. Braille shall be ~~48~~ 46 inches (~~1220~~ 1168 mm) minimum and ~~60~~ 59 3/8 inches (~~1525~~ 1508 mm) maximum above the floor, measured to the baseline of the Braille cells.

Reason: In 703.4.4, Braille is required to be below the corresponding text. In 703.3.10, the height of raised characters is defined as 48" minimum and 60" maximum above the floor, measured to the baselines of the characters. Revision is recommended so that Braille can be placed below the raised characters. FIG. 703.4.5 requires updating as it conflicts with FIG. 703.3.10.

Committee Action: AS AM D

703.4.5-BUDEV.doc

7-13 – 12
703.6.3.1

Proponent: Sapna Budev, International Sign Association

Revise as follows:

703.6.3.1 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with the basic format of Figure 703.6.3.1.

Reason: Allowing minor stylistic variations in the ISA will not dilute the meaning of the symbol but will project a more progressive and contemporary aesthetic to identify accessible features. This is particularly critical in Colleges and Universities.

Committee Action: AS AM D

703.6.3.1-BUDEV.doc

7-14 – 12
704.2

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.

Committee Action: AS AM D

704.2-PAARLBERG.doc

7-15 – 12
704.2.5, 704.7

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.

Committee Action: AS AM D

704.2.5-ROETHER.doc

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

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: This recommendation is made to provide individuals visiting deaf and hard of hearing people with a means to visually announce their arrival. Such visual doorbells are particularly useful in place of temporary accommodation such as hotels and resorts where housekeeping staff and even emergency providers need to announce their arrival in unplanned situations.

Committee Action: AS AM D

704.8-BAUMAN.doc

7-17 – 12
705.5.2

Proponent: Kim Clawson, Clawson Consultants, representing self

Revise as follows:

705.5.2 Height. Truncated domes shall have a height ~~of 0.2 inch (5.1 mm)~~ between 0.125 inch (3 mm) minimum and 0.375 inch (9 mm) maximum.

Reason: Construction and manufacturing tolerance has been acknowledged in nearly all other areas of accessibility codes and standards, except for this provision. Even the subsection immediately preceding this (705.5.1 Size) acknowledges that need. The current criteria in Section 705.5.2 of mandating a single dimension results in criteria for something that is essentially impossible to build or manufacture, and certainly impossible maintain. It is zero tolerance criteria, making it impossible to achieve compliance.

In addition, un-necessarily tight criteria impose costs on projects without any justifiable return on the expense. The criteria need to be broadened and be based on both the science of manufacturing, and the science of human perception (using a cane in this case).

Dimensions should be based on careful scientific experimentation that strives to accommodate the construction tolerances of the broadest range of materials, including plastics, metals concrete, precast concrete, brick and similar fired clay products, stones, and hardwoods. The requirements should not restrain trade by imposing criteria that restrict certain materials by manufacturing and construction tolerances; rather than proven need.

All research regarding the human perception research utilized to regulate the height, size spacing and configuration of truncated domes should be made readily available on the website for A117.1, for public review and evaluation.

Committee Action: AS AM D

705.5.2-CLAWSON.doc

7-18 – 12
705.5.4

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.

Committee Action: AS AM D

705.5.4 ROETHER.doc

7-19 – 12
706.1, 706.3 (New)

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 +1.801.233.8992 • T 1.800.330.0891 North America • F +1.801.233.8995 fax

SWBR

SWBR Architects

ROCHESTER NY
387 East Main Street
Rochester NY 14604
Voice 585.232.6300
SYRACUSE NY
309 South Franklin Street
Syracuse NY 13202
Voice 315.422.5335
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. Bardille, AIA, CCS
Architect / Specification Writer

DWB:jmd

PERFECT BALANCE

Committee Action: AS AM D

706.1-TOJI.doc

SWBR

SWBR ARCHITECTS

ROCHESTER NY
387 East Main Street
Rochester NY 14604
Voice: 585.232.8300
SYRACUSE NY
309 South Franklin Street
Syracuse NY 13202
Voice: 315.488.5635
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. Bataille, AIA, CCS
Architect / Specification Writer

DWB:jmd

7-20 – 12
706.2

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.

Committee Action: AS AM D

706.2-PAARLBERG.doc

7-21 – 12
Table 707.6.1

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"

Committee Action: AS AM D

707.6.1(TABLE)-PAARLBERG.doc