

L A R G E E V E N T C E N T E R
Accessible Wayfinding and Signage

AN ACTION PLAN



ACCESS COMMUNICATIONS

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Overview

First Impressions of the Interior



We began our experience of the Event Center interior at the Southeast Entrance, where visitors and employees alike have their bags examined, and then pass through a simple scanner.

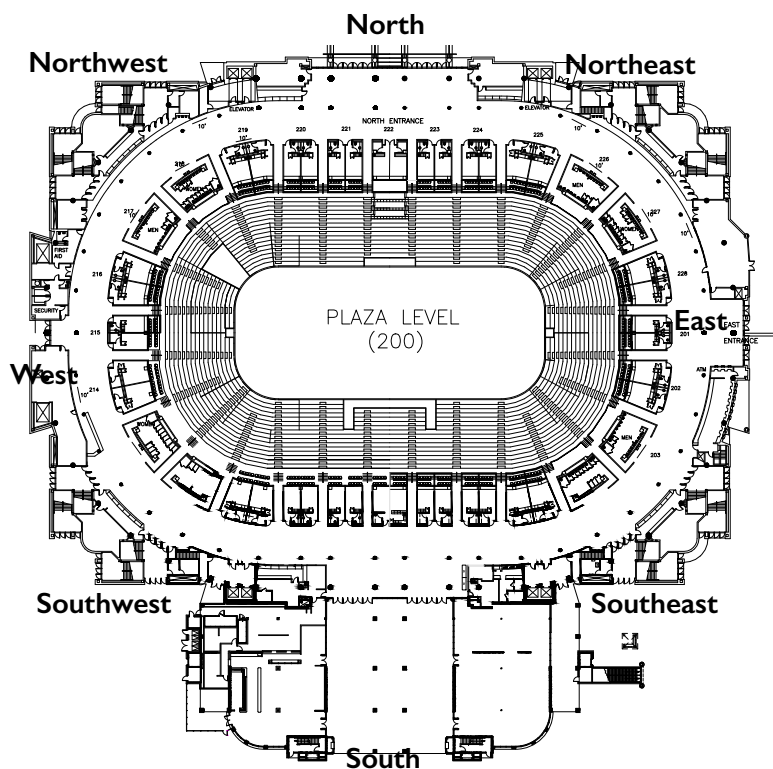
From there, there is really no reliable wayfinding information. Most visitors, during a day when there is no event taking place, would be met. However, it's our job to view the experience through the eyes of someone who might have any one of several disabilities. If there were no one to escort them, how would they find their way? And, during an event, how do they find their seat location?

Life safety signage is another consideration. Many of the signs required by the ADA and Title 24 are missing, and some of the signs that are in place have code errors that make them difficult to read. In addition, the signs don't follow the number one rule of basic code required wayfinding signs: absolute consistency in the designation of floor levels.

We saw signs, floor plans and advertisements referring to one floor by as many as four and five different names or descriptions.



All three of these signs refer to the same level, the ground level that is entered directly from the Plaza.



Central to understanding the layout of the Event Center is the fact that, since it's an oval, it was originally divided into four quadrants, A through D. However, at some point, what function as "corner" designations became more important, so major stairways and controlled entrances are labeled clockwise, NE, SE, SW and NW. Between each of these are central entrances

called East, South, West and North, with South and North being much larger and more prominent.

Consequently, there are a few stairs that may seem to have duplicate designations, except that the larger public stairways all commence with one of the "corner" compass directions (i.e. "Southeast Stair A") rather than just being labeled "Stair A" as is the case with some limited stairways serving employee areas. As a matter of fact, such stairways on the lower levels are usually not labeled in any fashion, and it is only enclosed stairs on levels 6 and higher that have code signs at all.

In some cases this may create a problem for someone with a disability, who might become



easily confused by signs that refer to the same level in different ways on different signs. But just as important, it may create an obstacle for first responders either trying to locate someone — with or without a disability — during an emergency, or attempting to respond to an emergency such as a medical event or a hostage crisis.

Consequently, we believe it is crucial that the standard practice advised by first responders and security personnel be followed and that a single designation system be worked out for the building levels. All evacuation plans, stairwell signs, floor level signs, elevator hoistway and control panel labels should use these designations. In addition, the alarm and key system should use them. Then, it's important that these designations be used on directional and informational signs throughout the facility. There is no problem in also using special names for facilities like lounges, bars, restaurants and luxury suites as long as they are tied to these designations. Seating charts can easily be tied to them as well. The result should be a facility that would be much easier to handle with public announcements in an emergency, and would certainly assist people with all levels of cognitive and communication abilities to quickly find their seats and the amenities they wish to visit during events.

Another impact from a situation where confusion reigns and patrons with and without disabilities are forced to approach staff in order to find their way, is that the current situation, where terrorism is on everyone's mind, may often make staff curt in their responses. Wayfinding signage that is consistent and clear helps everyone, staff and patrons alike. One important thing to remember is, that during emergencies, virtually everyone in the public suffers from temporary cognitive disconnects!

Solutions

So what do we suggest? Normally, floors below grade level are designated “B” for Basement level. As a matter of fact the California State Fire Code, which is the cited reference code for the City of X, requires that below grade floor numbers be designated or the number be preceded with “B” for basement. Floors from ground level up are numbered 1, 2, 3, etc. However that might be too disruptive, since the current floors are tied to the sections which begin with the 200 sections and follow with seat sections 300 and 400. The basement in this case is the “100” level and the new administrative wing even has a mezzanine level that is hidden beneath the exceptionally high ceiling for level 1.

Consequently, we think that the most seamless transfer to a new system would retain level 1 for the basement preceded on all code signs with “B” and begin with level 2 for the ground level. Event Center patrons are used to that. Otherwise, it would be necessary to state that the 200 seat sections are on level 1, 300 on level 2 and 400 on level 3. That might be very disruptive to long time seat holders and box owners.

Here is how we envision the system being used. The basement floor is designated Level B1 on elevator hoist ways, evacuation plans, within enclosed stairwells and on the elevator control panels. As an aid to finding the many rooms downstairs, all room numbers would be three digit numbers beginning with “1.” We do recommend that a numbering scheme be used for these rooms, and the advantage would be that signs with long tactile room names accompanied by braille would be avoided. Those could be visual only, which would be much more helpful to visiting teams and performance groups as well as emergency personnel. The logo signs for The Home Team could be used, as long as the room numbers were usable by people with vision impairments to locate specific rooms and spaces.

On the ground floor entered from the Plaza, or Level 2, all suites are numbered with three digit numbers beginning with 2 and including letter A or B and all seating sections, 200-228. The hoistway signs, elevator control panels, stairwell signs with floor levels and evacuation plans would all refer to the location as “Level 2” or just “2” and any maps or directional signs could indicate what features are available on that level.

The same scheme would be used for Levels 3 and 4. On Level 3, it would be clear that Level 3 is the “Club Level” since that is the name with which most patrons are familiar, although other signs call it “Arena Level” and there are evacuation plans calling it the 2nd Floor. The Press Box level would be Level 5.



The former designators on the elevators of “S,” “M,” “C,” “U” and “P” would be eliminated. At the same time that this correction is made the signs can all be made legally compliant — white on black matte surfaces — with correct fonts and braille.

All stairs would be given designators. Since the compass directions are used so prominently, we think that retaining Northeast-A, B, C and D and the counterparts in sections Southeast, Southwest and Northwest makes the most sense, because that is what most people are familiar with. This scheme can be extended to cover all the additional stairs so that the two stairs that begin on level 5 would be North-A and D. The additional stairs used by employees would be Northeast-E, Southeast-E, Southwest-E and Northwest-E and the stairs in the South section would be South-A and South-D. In a couple of cases, a stair “F” could be designated as well.

It would be possible to label each stair, even given the complexity of the facility, all within the standard for signs required by the building codes. On the following page



is an illustration of a stair code sign using the scheme we have outlined above.

The first sign would be used for one of the main staircases for patrons and the second is for one of the employee staircases linking two floors. We are also showing the code required companion sign which identifies the floor level for people who are blind and using the stair rather than an elevator. The sign is analogous to the hoistway signs and simply states the floor

level along with the five-pointed star that designates the “main” or egress level.

Both these signs are required by code in buildings of four stories or more and the smaller sign is required for all enclosed stairways for any size building. The state code only requires the large sign when the individual stair serves four stories or more, but many larger cities require it for all stairs if there is a wall within the stairwell where the sign can be mounted. Obviously, for instance, you usually would not find a suitable location at a grand staircase but most of the large staircases in the Event Center are enclosed. It would be up to the City of X and building security as to whether the larger signs are required for the stairs serving only two stories.

Once these decisions are made, all the various informational and directional signs that need to be redesigned with compliant type and finishes can reflect the correct

floor levels. Familiar terms such as “Club Level” or “Arena Level” can be associated with the proper level number as well.

Evacuation Plans

One of the important components of the life safety system and one that is impacted by the federal and state standards is evacuation plans. Although they are not specifically required by the ADA or Title 24, once they are provided they must follow the rules for informational and directional signs.

Therein lies a problem. The size chart for informational and directional sign characters requires a minimum size of 5/8 inch. The federal government staff needed to spend some time thinking about scoping for this chart but other than for elevator control panels, they used a one-size-fits all standard so 5/8 inch remains the minimum — even for large floor plans and site maps — as well as evacuation plans. In some states the plans are crowded with information, not all of it vital for emergencies.

The State of California has presumably solved the problem by putting in an exception for the size and height restrictions on evacuation plans. However, there are two things wrong with this picture: One, it reverts all the text requirements to an unrealistic 3/16 inch, not nearly large enough for much of the text. Second, it means that someone can sue under the ADA if they cannot read the sign due to text that is less than 5/8 inch in height.

However, the other requirements for evacuation plans do remain. The plans must still have high contrast and non-glare finishes. Text must be non-decorative and correctly spaced and proportioned.

How do the evacuation plans in the Event Center measure up? The text is non-decorative and fairly easy to read, with good contrast. Although the surface has



some reflective qualities, it isn't highly glossy. However, there are deficiencies. The text is not all large enough to meet federal standards. Sometimes, the green arrows are on a background which has a sort of reddish color so the contrast may not be good for someone who has a color deficiency. One major objection is that some plans do not actually show the path of travel all the way to an exit. The path goes in the direction of an exit but stops, limited by the small size of the plan. For instance in the top plan shown

here, the path of travel disappears into a staircase that has very little contrast with the background. There is no directional arrow or other indication of an exit path. In the other direction, there is no end in sight. The second plan does not even show the two exits closest to the elevator, instead by-passing those to take people out of the entryway and down a crowded corridor to the stairways. By trying to show just a small segment of the facility on each plan, too much might be left to the imagination and during an emergency that could be fatal. People don't think analytically at such times.

The other problem with the existing signs, which we have discussed quite thoroughly above, is the designations they use. The "2nd Floor" signs are on Level 3 or 300, and the "Service Level" signs are in the basement, Level 1 or 100, and of course ignore the fact that the Fire Code requires that a "B" be used for all basement levels.

Because of these issues we recommend a redesign of the evacuation plans. The signs should retain some of the existing colors and materials perhaps, but improve the

readability and the character sizes. They should show the entire path of travel from “You Are Here” to the exit discharge.

Exit Signs

The overhead exit signs for the Event Center are a mishmash of standard electrical signs — some red, some green — and cardboard printed signs in various stages of disrepair. We saw only a very few tactile exit signs, chiefly in the restaurant and the Home Team Store. In California the long-standing rule requiring tactile exit signs, first expressed in a letter from the Department of Justice to the Engraving Journal, was extended to require different wording for different types of exit doors. The Event Center requires most of those. We did not see any exit ramps, but there were exit stairs both up and down, exit routes and of course final exits. The signs for horizontal exits are more difficult, because without knowing the exact type of fire walls present you can’t really tell most horizontal exits from regular exit routes. An exit route sign probably suffices in those cases.



Some of the stairways had multiple signs at the same location. Evidently the first polished brass sign was not effective, so someone put a cardboard printed sign beneath. One effective sign is always better than two or three ineffective ones!

We may need more than one size sign since some locations are very narrow, particularly at the central exits and inside the tunnels leading to the arena seating.

In the meantime, we recommend that the fire department accompany us on a survey of the exits. In some places, our impression is that personnel have added exit signs and the door is perhaps not actually a marked exit. It's important that people not be misled during emergencies. Of course, in any case, all the doors marked with exit signs must also have a tactile exit sign with the proper wording.



Miscellaneous Regulatory and Informational Signs



Scattered throughout the facility, sometimes in public areas, sometimes “back of house,” there are a number of miscellaneous signs directing the public in some way or informing employees of various rules and regulations. These signs must follow the standard rules for visual signs which means non-glare surfaces, high dark to light contrast between the sign background and the text and easy to read non-decorative text, sized appropriately to the reading distance.

The problem with some of the signs is glare. Many of them also violate various rules having to do with text such as spacing or character width.

Although some of the signs do use upper and lower case and are therefore more easily readable, many of them demonstrate the familiar belief that uppercase messages seem more important. Instead, they are just harder to read, and easier to ignore. That this is a fallacy is demonstrated by the 2013 OSHA-ANSI standards (2011 ANSI Z535) for safety sign and tags. OSHA requires that all new signs and sign replacements follow these standards, and the argument for the upper

and lower case messages is that they are more easily readable by a much broader group of people, certainly including those with disabilities.

A few of them might be legally compliant right now, so this group of signs might not have a high priority. At this point, we recommend replacing signs using the 2013 OSHA-ANSI standard design parameters so they would not clutter the environment quite so much. When there are too many signs, and they are not very simple and easy to read, the tendency of most people is just to ignore them. They become part of the background “noise.”

Wayfinding Signs

Some of the most important signs in the Event Center and particularly for the interior, are the ones we would call “wayfinding signs.” Many of them are directional (with arrows) and others are considered “informational” because they give information on where things are in the facility.

These signs do not require raised characters or braille for good reason. There is no set location for them. They might be overhead and thus completely unreachable and otherwise, their location is pretty much unpredictable. Their location is dictated both by what they say and how much space it takes to say it. On the whole, wayfinding signs should have text that is larger than room identification signs,

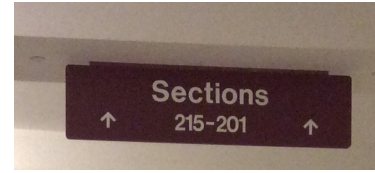


which are to be viewed up close. Furthermore, large text is not very readable by touch. And, just as with the regulatory signs, such signs usually benefit from upper and lowercase text because it may be quite long.

The most carefully planned and installed wayfinding signs in the Event Center are the ones that direct people to their seats or their suites. The “tunnels” that lead from the main

corridors into the seating have overhead signs showing which blocks of seats are on each side of the tunnel.

They also show, on the floors with private suites, which suites are on either side of each tunnel entrance.



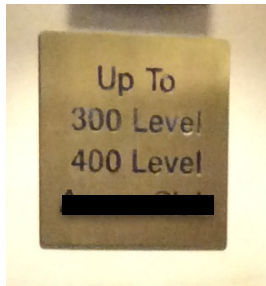
In addition, down the center of the corridors on at least two of the floors plus in one location on the 4th level, there are overhead signs that show which blocks of seats are ahead as you go along the corridor. Those signs may also include information about the location of the restrooms.

The restroom signs deserve a special note. On the whole, these signs are helpful and well situated. The one problem we find with them is the very small set of pictograms. There is plenty of room for larger pictograms and these would be especially helpful to anyone with a language deficit, whether it is because they speak another language or do not read. All those people have cognitive disabilities and studies have shown they benefit from pictograms when they are universally understood, which both the gender pictograms and the wheelchair symbol are.

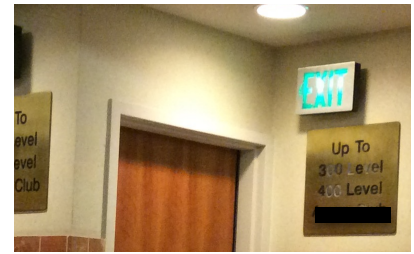


The major problem with the signs located above the tunnel entrances is the material, which is polished brass and the character spacing, which appears to be almost random. Some numbers are spaced correctly and others have numbers so close together that they are very difficult for anyone with a vision impairment to distinguish. And, the polished brass has sometimes become very tarnished so that those numbers are dark and hard to read. The

same goes for the wheelchair symbols which indicate the sections with accessible seating. The most important parts of the sign are the section numbers but those are dwarfed by the word "Section," which could be smaller.



Another group of signs are located at the large stairways used by the public to go from one floor to the other, since only suite holders and persons with disabilities are allowed



to use the elevators. These are also polished brass signs and they

suffer from the same problems as the brass letters installed above the tunnels. Some of them are badly tarnished and others have individual tarnished letters. Although they are quite large and relatively easy to read for that reason, they might not always give useful information, since they sometimes introduce new names for the levels. If you don't know that the "Arena Level" is level 3, for instance, you might think it is a fifth level since it is shown after the direction to level 4.

Miscellaneous Wayfinding Signs



Besides the special groups of wayfinding signs we've discussed above, there are many miscellaneous signs. Some of these signs are



compliant with the rules, some are not,

but they do contribute to clutter since most of them don't follow any particular design plan. There are a number of signs



throughout the facility printed on card stock or even on paper.

There are better ways to accommodate the need for temporary directions that are more apt to follow the ADA and Title 24 standards for accessibility.

One especially interesting sign on paper which uses a pictogram rather than text appears to give some almost useless information. To indicate a stair, the sign shows

an “exit stair up” symbol with a stair railing cutting through. The line almost makes it look as if the sign means “no stair access.” It’s at the top of a stair rather than at the base, so implies that one needs to walk down the stair backwards. But even stranger is the fact that the stair is open and is completely visible so the information is probably not needed at all. If anything needs to be done here, it is to improve the lighting and add required striping to the top and bottom stair. This is the kind of thing that happens when there is no actual sign program but well meaning employees — armed with a computer and printer — try to solve problems that do not exist or solve a problem that actually requires better lighting with a sign.



Restroom Signs



There are virtually no legally compliant restroom signs in the entire Event Center. They range from the least expensive off-the-shelf signs, which rarely have legal California braille spacing, very expensive polished brass signs which are useful only as mirrors and which usually have no companion braille signs at all

and geometric signs on doors that have no contrast with the door and thus do not serve their purpose in providing access to persons with vision impairments.



Consequently, every set of restroom signs in the facility needs to be replaced with signs that contrast with the doors fulfilling the California requirement for geometric

symbol signs, signs with non-glare finishes and wall signs with braille and raised characters that are legal and readable by people who read by touch. Being able to locate a restroom independently is a very basic part of accessibility.

Room Identification Signs



Just as with the restroom signs, there are no legally compliant room identification signs in the entire facility. None of the suite signs are tactile and



they often aren't very readable visually either. The marble backgrounds catch the light and much of the color does not provide contrast with the black lettering.



Rooms that are reserved either exclusively for the Home Team or the rooms up near the Press Box that have facilities for both Home Team broadcast staff and for the visiting team have their own logo signs. Those signs

would need to be supplemented with a tactile room name accompanied by braille or with a tactile and braille room number.



Signs for other rooms that open onto the corridor are sporadic. In some places, modest service spaces such as utility rooms may have expensive polished brass signs that serve as mirrors and in a few other locations, the signs are a light reddish color, also with black lettering that has little contrast.

Consequently, in terms of risk management, there needs to be an entire program of identification signs designed and put in place, since those looking for ADA violations are very conscious of the requirement for braille on signs.



As to the content of the signs, the suite signs are the only signs that follow an obvious plan. Some of the utility rooms on the upper floors are labeled using the original concept of four quadrants and thus there may be two or three rooms with exactly the same designations — a potential security problem during an emergency. On the basement level, there is no identification scheme at all so no efficient way to direct the public, performers, team members or emergency personnel to specific rooms or spaces.



In addition, there are a number of rooms that open off the corridor that have no identification. Contrary to the remarks of the CASp report, the ADA does not require that all rooms be identified. The rule is, that if they are identified,

they must have a tactile sign. The only required identification is for rooms that are designated by a number or name already, designated exit doors and restrooms.

However, it is also true that in this age of heightened awareness of security needs, particularly in a large public venue such as the Event Center, many local government agencies that deal with emergencies of various types are requiring that every room or defined space with a doorway in a facility be identified with a sign. Obviously, since these signs are for the benefit of fast-moving emergency personnel, the ideal is for the signs to represent some sort of logical wayfinding scheme.

There are, of course, reasons why facilities like the Event Center prefer not to identify every space along a public corridor. If certain types of storage facilities are marked, for instance, they could be magnets for vandalism or theft, unless they are carefully locked at all times and available only to authorized personnel. In order to complete a sign plan, the Event Center may want to confer with security services and relevant city agencies and find if it would be preferable to identify every room. In the meantime, we can recommend some sort of logical scheme that would fit into the existing numbering scheme already established for the private suites.

For the basement floor, we highly recommend implementing such a scheme since it is very difficult to find your way around those corridors. At least the main entrance to the various separate areas such as the administrative offices, should be identified with a number. That way, if the decision is made at some point to identify the offices and rooms inside, the scheme already exists to do so in a logical manner.

Exterior Signs



One potential problem has been avoided at the Event Center. All the parking space signs appear to be legal and correct in every respect and the spaces are located correctly as far as we can see, with accessible paths of travel well laid out between them and the entrances. The only question is about the towaway sign, where the address for cars that have been towed is too small. The text on the sign is to be one inch high.

There are additional signs, most of them very readable, although there is no particular design theme that pulls them together visually. Some of them are placed where they are difficult to see and some are too reflective or the text is not correct in terms of character or stroke proportions. If any of the signs need to be



replaced or redone, then would be the time to put a design protocol in place for all exterior signs.

Exterior Building Signs

Some of the entrances into the Event Center are well identified with overhead signs, although most of them are polished brass and therefore may be difficult to read, particularly when artificial light or sunlight is reflecting off the letters. Other entrances, especially the main entrances, do not seem to be as well identified. We would suggest at some point clear, easy to read lettering identifying each entrance and in a couple of cases, some directional signs would be helpful. For instance, there is a sign stating that people can congregate only outside the North Entrance to smoke, but there is no sign there to mark the area and there do not appear to be any special receptacles for cigarettes. If there is no longer a smoking area, the sign should be removed. For someone using a walker or wheelchair, it would be very discouraging to travel around the whole building to get to an exterior smoking area and then not be able to find it. Below is a typical major entry with printed card stock signs located above the doors.



Other signs at the Event Center appear to qualify as promotional or proprietary logo signs. Those signs are not required to comply with ADA or Title 24 standards. A more specific sign plan is presented through a detailed sign schedule, as well as proposed designs for the various sign types needed for a complete and compliant signage system.

Appendix I

General Guidelines and Rules for Accessible Signs

Directional and Informational Signs

There are three classifications of directional signs that are needed to form a complete facility wide system. These are large signs meant to be viewed from moving vehicles, exterior signs to direct pedestrians around the site and interior directional signs for the interior. These signs are often accompanied by informational signs that provide additional information about using the facilities.

Identification Signs

There are two types of identification signs. The first type is the large sign that is attached to a building or is included on a monument sign in front of a facility or outdoor area so that people can identify their major destination from a distance and head in the right direction as they walk from parking or public transportation. It could also be a stand-alone post and panel sign that identifies an exterior area such as a parking lot.

The second type of identification sign identifies a final destination -- almost always a discreet room or space. This type of sign can also identify a floor level, a restroom or a designated exit door. These are the only signs that the ADA or California Building

Code require to have raised text and braille so they can be read by functionally blind individuals. All the other signs mentioned above, including the directional and informational signs, are meant for visual readers only.

Signs indicating accessible features and elements

A third type of sign required for a complete system are signs that direct people from inaccessible to accessible features, elements, and paths of travel. They also identify accessible features when the feature is hidden or obscured or its appearance does not reveal its accessible features.

For instance, when we approach a restroom door, all the features of the restroom are hidden behind the door. If we don't identify it as an accessible restroom, there is no way of knowing, in an older building, whether it is accessible or not. On the other hand, when we approach the lavatory in the restroom and it has a knee space below it, accessible faucets and soap dispenser and the pipes are wrapped, we don't need a sign to tell us that the lavatory is wheelchair accessible.

Scattering wheelchair pictograms on every door (we will call these the "ISA" or "International Symbol of Accessibility" throughout this report), does not make up for barriers that are not addressed in a meaningful way. Such sign clutter merely confuses everyone about the intent of the Americans with Disabilities Act, which is to enable and encourage independent access to public buildings by persons with many different kinds of disabilities, not just wheelchair users.

Some Universal Sign Rules

In order to inform facilities management about the standards that are basic to the correct design of a code compliant and accessible wayfinding plan, we want to introduce something we have long called the "universal sign rules."

The rules break signs down into four basic categories:

One: Signs that identify permanent rooms and spaces of the facility and site

Two: Signs that direct to, or inform about destinations and services of the facility and site

Three: Signs that direct to or inform about accessible features, elements and paths of travel of the facility and site

Four: Signs that are not impacted by laws or codes and do not have to be accessible (such as logos and the names of individuals or companies)

Several of the rules impact the first three categories.

Non-glare Finishes: All Category One, Two and Three signs must have non-glare finishes. The original ADA Accessibility Guidelines had a definition of non-glare that required that the glare as shown on a standard gloss meter could not be higher than 19. This put the sign finish at the same non-glare level as what is called “eggshell” paint. Certain brands of non-glare acrylic that we have checked test at 19 as well.

Why: Many types of vision impairment react strongly to glare. Anyone who is middle-aged and has started to develop incipient cataracts starts to notice the way the glare of street lights affect them at night. White streaks may seem to appear across shiny signs so it is more difficult to read them.

High dark to light contrast: All Category One, Two and Three signs, as well as some other features such as stair striping and detectable warning surfaces must have a high contrast between two adjoining surfaces. The letters and symbols on signs must contrast with their backgrounds.

The misunderstanding of most people is that this is about “color contrast.” Actually, colors have nothing to do with the standards and codes, although of course different colors or hues are easier or more difficult to see. However, we are talking about people who have impaired color vision. They may not be able to tell one color from another if the shade of lightness or darkness is too similar.

Therefore, it is the black and white or gray value of the colors, or “Light Reflectance Values” that are important. There is a formula that allows us to determine if the contrast between two surfaces is a minimum of 70 percent which is the suggested minimum. It works, but does have a problem if we try to compare two darker colors. A good rule of thumb is to use a light color that has a light reflectance value of no less than 45. Then we choose a dark color and apply the formula. If the result is 70 percent or greater contrast we have probably met the minimum requirements.

Almost all paint colors and other commercial pre-colored materials have easily obtainable LRV numbers or “light reflectance values.” One easy way to determine an approximate number is to get a large paint swatch book and check your material next to a matching paint swatch. The index of the paint colors will give you the “LRV” for that color. We now also have access to some portable devices that cost under \$500, and accurately measure the LRV of colors for signs, walls, and even carpet.

Here is the formula to apply:

Subtract the darker color LRV (the smaller number) from the lighter color LRV (the higher number). Then, divide the answer by the LRV of the lighter color. The decimal number you will get will be the same as the contrast percentage.

Example 1: Lighter color is 58. Darker color is 12. Result when you subtract is 46. Divide 46 by 58. The answer is 79 (.793). Therefore, this combination has a contrast of 79 percent, so it exceeds the minimum requirement.

Example 2: Lighter color is 58. Darker color is 20. Result when you subtract is 38. Divide 38 by 58. Result is 65.5 (.655). Therefore, this combination has a contrast of 66 percent, so it does not meet the minimum requirement.

You can ask the designer of your sign system to show the LRV combinations for the signs to make sure you have adequate contrast. Obviously, the higher contrast the better, especially for signs that need to be seen from a distance.

Remember that the great majority of people with vision impairments, even when they are legally blind, are able to use their vision to some extent. If you provide very good contrast for signs and use non-decorative fonts, you are greatly increasing the number of people with disabilities who can use the signs for independent access to the environment.

Another aspect to consider is the very high percentage of the male population with “color blindness.” About 8 percent of the male population has the most common form of color blindness which we generally call “red/green color blindness.” That means they can seldom distinguish greens from browns or any other color with a lot of green or red in its mix, such as blue-green or turquoise and magenta or purple. Many of them also cannot distinguish bright or deep red from black or charcoal gray. Red on black signs in elevators and for safety signs may be virtually invisible to some of these people.

There are, when added to this basic population of 8 percent color blind subjects who do not have other vision impairments, probably from 12 to 15 percent of the population that cannot distinguish various colors one from another. Aging vision is

another source of defective color vision since colors often acquire a yellowish tinge for older people.

Maps of all kinds are especially difficult for people who have some form of color blindness. Two cartographers who have studied the affect of color blindness on map reading have designed a free piece of software called Color Oracle that anyone can install on their computer (www.colororacle.org). If you click on this software while viewing anything colored on your computer, it will show you how it looks to people with three different forms of color blindness. Although it's not meant for people with other forms of vision impairments, it is an aid in determining if something has enough dark/light contrast as well. One of the cartographers informed us by email that he often checks his own design work by copying it in black and white on a copier. If the shades of gray are too close together he assumes the colors he has used do not have adequate contrast. As he informed us, when something like an evacuation map is not readable, the mistake could be fatal.

Readable Typefaces, Sized Appropriately:

The universal signs rules for typefaces are simple: No decorative typefaces, no italics, and no oblique letter styles. Reading of text is easier when "non-decorative" typefaces are used. Therefore, such typefaces should be used very seldom on signs and probably confined to logos and headings of promotional materials in order to enhance certain themes. They should never be used for code compliant signs. Italics and oblique typefaces are also not allowed, because they make both tactile and visual reading more difficult.

To see the proper sizes of type for each type of sign, please read the rules under the different sign types. The universal rule is to always take into account the distance from which the reader needs to first become aware that the sign exists and then how

close it is practical to get before being able to actually read the text visually. Think about obstacles such as trees, shrubbery, sections of buildings and architectural details and where people might be congregated. The universal rule is to always take the entire environment into consideration when deciding on the size type for a specific sign. Never make an arbitrary decision that all signs will be a certain size, no matter what, and then squeeze in the type to fit the sign. Do messaging first, then location, then decide on appropriate sizing of the characters themselves.

Type sizes can also aid messaging when larger type is used for the most important part of the message and subsidiary messages use a slightly smaller type size. For instance, a person's title is not as important as the person's name. On the other hand, the name of a department is usually more important than the names of the people in that department.

Messages That are Clear, Brief, and Consistent

All those involved should decide together on what terminology will be used to name or describe destinations throughout the system. Is it the "Janitor's Closet" or "Custodial?" Is it the "Theatre" or the "Theater?" Does the health department offer "X-Rays" or "Imaging?"

Numbering systems should be well designed by someone who will take the time to think through how people will move logically through different areas of the building. Do not just follow the numbers on the construction blueprints. They have a purpose totally different from public wayfinding. If you need to retain them, then put small inexpensive vinyl numbers higher on the door frames where maintenance and security personnel can see them easily and design a more accessible system for the public. Both functionally blind and sighted people, including first responders to

a hostage situation or a heart attack, will benefit from a well-thought out and highly visible consecutive numbering system.

Identify hallways and corridors by the numbers of offices or other areas that are to be found within. When there are identified rooms within larger rooms, such as offices within the general reading room of a library, use the number of the reading room followed by A, B, etc. That way, anyone coming along the corridor and looking for 101A understands they will find it by going into room 101.

Instead of “Lobby” or “Vestibule,” provide the name of the area the person will be entering. A sighted person can tell right away that they are entering a lobby or vestibule, and a blind person will not get any useful information from such a sign. Always strive to use signs to provide useful information, as briefly and clearly as possible.

There are other rules that are effective for one or the other type of signs. We will cover those under the separate headings later in the report.

Specific Rules for Tactile Identification Signs (Type One Signs)

Uppercase, sans serif typefaces

Tests have shown that people who read characters solely by touch benefit greatly from the shapes of all uppercase, sans serif typefaces. Sans serif typefaces have strokes that end abruptly, rather than with bars or “hooks” at their ends. There are many sans serif typefaces that are attractive and appropriate for various forms of architecture. It is not only not necessary to use Helvetica for all signs but it is actually not the most readable tactile font available. That is because of the confusion it causes between certain letters such as “R” and “A.” Characters are to be raised a minimum of 1/32 inch above the surface of the sign face. (Raising them more than that is not helpful to tactile readers so keep the height at about 1/32 inch.)

Small characters with slender strokes and open shapes

Tactile characters should be fairly small so they can be read quickly by touch much the same way braille is read. The size is to be 5/8 inch minimum and 2 inches maximum. Two inch high characters should be used only on such signs as elevator hoistways and identification signs that need to be read from a substantial distance. The larger the character, the more difficult it may be to read. Characters about 1 inch high are usually quite easy to read and can be read visually by many people within a close distance.

Stroke widths of raised characters are measured at the top of the stroke for touch readers and at the base of the stroke for visual readers if the characters are both tactile and visual. The top of the stroke can not be wider than 15 percent of the character height. Measure across the uppercase character "I." The visual base cannot be wider than 20 percent of the character height. Thus, you can use a font with a 20 percent stroke width and bevel the edges of the tactile character so it comes to a 15 percent width or less at the top surface. Beveled or rounded characters are much easier to read than character with straight sides and sharp edges. There is no minimum width for the top surface in order to accommodate rounded characters which can be produced by thermoforming or molding and are the easiest of all characters for many people to read by touch.

Character widths are a percentage of character height as well. To determine the width, you measure the width of the uppercase "O" of whatever font you are using. The maximum width is 110 percent and the minimum is 60 percent. It is much better to choose a font with the wider widths, particularly if the character is somewhat bold. Condensed characters are very difficult to read, especially by touch.

Spacing Between Characters

Raised characters must have a space of at least 1/8 inch between the top surfaces of adjacent characters, measured at the closest distance. The touch reader must be able to discern each character individually as the fingers pass over the character shapes. For instance, an “A” and an “M” that touch at the base create a “V” between the two characters which is very confusing to the touch reader. This is another reason why serif typestyles are not allowed for raised character signs. There is a special rule when you bevel the characters. If the top of the characters is only 15 percent width and the spacing between characters is 1/8 inch, the space at the base of the characters can be only 1/16th inch. This gives a definite advantage for the provision of beveled characters. The lines of type also have rules as to how close and far apart they can be. The minimum distance is 135 percent of the height of the uppercase character “I.” The maximum is 175 percent.

A “hybrid” type of sign for people who are visually impaired

It became obvious very early after the passage of the ADA that the two different types of blindness were not well served by the sign guidelines for tactile door or room identification signs. Those two general types are those who test as “legally blind” but who use their vision to get around and even to read, and those who have no usable vision, or perhaps are just able to distinguish a little light and shadow and therefore can only read by touch. These are the people we describe as “functionally blind.”

As we have pointed out, touch readers require small, slender stroked characters, all uppercase and all sans serif. Visual readers benefit from larger, bolder characters, upper and lower case and can read serif typefaces. They are obviously also not as limited in the exact placement of the signs.

Consequently, the rules that were finally approved by the Department of Justice in 2010 and that became legally enforceable on March 15, 2012 throughout the United States (the 2010 ADA Standards for Accessible Design or “ADA SAD”) now allow information to be duplicated so that there is one set of text with raised characters and braille and a corresponding set that is visual only and follows the visual rules. The sets of text can be on two different signs or can be on one sign. That means that visual readers can benefit from larger, bolder characters with upper and lower case, while tactile readers can have smaller, beveled raise text that is all uppercase in a sans serif font. Only the visual sign has to have contrast and have a non-glare finish, so the tactile sign can be “invisible” to the sighted reader. This type of sign also opens up many exciting design opportunities, as well as being more accessible.

Installation Rules

Raised character signs need to be placed in a specific location throughout every building and site, and all facilities need to place them pretty much in the same location, regardless of the architecture of the building. Therefore, since people who are blind know how to identify doors and doorways and usually want to know “what is behind the door,” the decision was made to link tactile identification signs to doors and doorways. The only exception is the labels for the buttons on elevator control panels.

So that signs would not be hidden when doors are propped open and sign readers would not be hit in the face by an opening door, the rule is to mount the sign in an 18 inch clear space adjacent to the latch side of the door.

Specific Rules for Visual Type Two Signs and Text on Type Three Signs

Although touch readers appear to need uppercase characters in order to read text easily and quickly, people who read visually seem to benefit more from upper and

lowercase mixtures when they are reading. This is especially true for longer text or text of more than one word. Serif typefaces are often very readable by sight as well and are allowed by the ADA and by California building code (Title 24, Chapters 11A and 11B). Be careful not to confuse decorative typefaces with either serif or sans serif typefaces. There are decorative forms that do have serifs or are without serifs, but are still put into the “decorative” category. It is thought that serif typefaces are less tiring to the vision when a lot of text is being read, especially as the serifs tend to lead the eyes from one character to the next in a smooth manner.

Larger bolder characters for visual readers

Although the minimum character size for visual characters is also 5/8 inch, only a few informational signs or informational text on tactile signs ought to be that small.

Most directional signs should be somewhat larger. Use the new visual size chart as a guide for minimum sizes, but provide minimum sizes only when you are dealing with a lot of text that can be viewed very close. Use the exceptions in the code only when necessary. It is also usually best to use the bolder stroke widths. Remember that most visually disabled readers do have usable vision.

Visual Size Chart

The rules for stroke widths are slightly different for visual characters than for raised characters. The stroke width can be 20 percent of the character height maximum and the minimum can be 10 percent. The character widths are the same -- a maximum of 110 percent of character height and a minimum of 60 percent. Combine wide character widths with bolder strokes whenever possible.

Inter-character and interline spacing

The spacing between characters is allowed to be a little tighter for visual characters than for tactile ones. The average is just 10 percent of character height. Remember

that for tactile characters that are also visual, the spacing can go down to 1/16th inch if the spacing at the top of the character is maintained at 1/8 inch. The spacing between lines is the same as for raised characters.

When text is provided for signs that use the Symbols of Accessibility (Type Three signs), follow the text rules for Type Two visual signs whenever possible. Symbols of Accessibility are not accompanied by raised type or braille. In most cases, those who use wheelchairs or text telephones must have usable vision in order to do so independently. Therefore, there is no point in accompanying them with raised text and braille.

Braille

When raised characters are used to identify a door or a floor level, they must be accompanied by braille. The only other place where braille is required is to accompany the raised symbols on elevator control panels and for the star that designates the egress floor on elevator control panels, hoist way signs and within enclosed stairwells to identify the door leading into the building proper on the egress floor.

The new standards, legally enforceable since March 2012, include some new rules for braille. As in the past, braille must be contracted braille (formerly called Grade 2 Braille). This is a type of braille shorthand, and requires a translation program. That rule has always been in affect throughout the entire United States. However, in the past, California was the only state with rules concerning dot spacing, cell spacing or dot height. There were no federal standards or standards in other states. That is what was meant by “California braille.” Now, there are specifications everywhere in the United States and California specifications are included as one of the two choices. There are also new specifications for the required space between two lines

of braille and for the circumference of the braille dot base. California manufacturers who were using the correct California braille font can continue to do so.

There is also a new rule about capitalization of braille. The new standards prohibit capitalizing every braille word or letter. Capitalization is only used for braille when it adds meaning. For instance, the word “women” does not change its meaning whether it is all lower case, upper and lowercase or all upper case. In braille, it would be all lowercase according to the new standards. However, the acronym “ADA” would be capitalized throughout to show that it is pronounced as three distinct letters standing for the “Americans with Disabilities Act,” whereas the room name “Ada Smith Library” would only have the first letter capitalized, to show it is a proper name.

Pictograms and Symbols of Accessibility

There has been a lot of confusion between these two sections of the ADA standards. Pictograms are a special type of pictographic symbol that conveys meaning through a simplified picture of an object, an animal or plant or a human figure. A simplified symbol of some coins and bills would be a pictographic symbol for money, a bank, ATM or money exchange whereas a dollar sign is a typographic symbol since it does not look anything like a piece of money. By coincidence, all four of the “Symbols of Accessibility” are pictograms. However, the U.S. Access Board chose to treat them differently from other pictograms.

Both pictograms and Symbols of Accessibility must follow the universal sign rules for non-glare surfaces and high dark/light contrast. The implication is that they must be sized appropriately to their viewing distance. However, there is a clear distinction between pictograms that are located at eye level to identify doors and doorways and those that are used as part of informational or directional signs.

The reason is that if a facility like a restroom is identified only by a gender pictogram, for instance, a person who is functionally blind has no way to know that it is a restroom or what gender is served by that restroom. People who are functionally blind do not, on the whole, understand visual symbols and have not learned to read them by touch. Even if they are raised, there is no standard set of such pictograms that could be recognized by everyone.

That is why there is a rule that pictograms that identify doors must be located within a six inch high space or “field” and the corresponding raised message must be placed below the field and accompanied by braille. For instance, a pictogram of two gender figures may designate a staff restroom but the proper text would be either “restroom” or “staff restroom” but not just “staff,” because the “meaning” of the pictogram is that a restroom is behind the door that can be used by either sex. “Staff” could describe a break room, a workroom or a special entry as well as a restroom reserved for staff.

Other pictograms, such as the “no smoking” pictogram, do not identify a door but inform us about how the building may be used so any text is visual only. In addition, the Access Board has made clear in numerous technical assistance reports and in explanatory text in the standards that the ISA (wheelchair pictogram) does not require text, either visual or tactile. It’s useful to remember that people who have no usable vision are not apt to be navigating alone in a wheelchair or with a scooter because of the risk of hitting others or running into walls or posts. Those who have enough vision to operate a wheelchair also usually have enough vision to see a pictogram if it has enough contrast and is sized appropriately.

One Symbol of Accessibility that does require text is the Symbol for Hearing Loss which designates the availability of an assistive listening system. Information needs

to be provided as to how the patron obtains or requests the listening system. TTY symbols sometimes have arrows or other text explaining where they are located. The ISA can benefit from directional arrows when the path of travel reaches a decision point or an elevator or restroom is not immediately visible. It is also helpful to designate the type of accessible facility available. If you need an elevator, you don't want to be directed to a restroom or vice versa. Again, however, visual text and arrows are all that are required.

Summary

This completes our rather lengthy introduction to the details of accessible signs. There are many other details that are part of the codes and standards and best practices as well that make the signs truly usable and readable by readers of all kinds. However, you should be able to get a sense of the kind of knowledge that your sign designer needs and your signage vendor requires, in order to provide you with a truly code compliant as well as a universally accessible wayfinding and room identification system throughout your facility. Following these rules does not usually require much more expense on the part of the signage manufacturer, other than the training they must provide for their designers, fabricators and installers. After their staff is trained, it should become second nature for them to produce signs that will not only reduce the risk of a lawsuit, but will actually help everyone find their way around the site.

