

SCA Walls » Acoustics

Construction And Acoustics

This is a memo sent from SCA Walls to all Dealers and Customers

Over the course of several years and a multitude of projects with various conditions, we thought it would be good to make list of “things to watch for” to help with the overall privacy and acoustics of wall projects. Many times we get caught in the numbers game of STC rating. The STC rating is a lab generated controlled environment that maximizes the rating on the whole wall. The rating is for sound-blocking capability as measured in sound level lost at specific frequencies. Remember that walls are only part of the entire acoustical envelope that provides privacy for the end users.

Ceilings

- The generic or typical mineral fiber ceiling tile you see is not a great acoustical barrier by itself. Check the ceiling tile CAC/CSTC rating. Typical tiles are rated around 35, which makes them audibly less private than our walls. Add a layer of any kind of insulation or sound batting material to bring the rating of a standard mineral fiber tile up to the equivalent of our wall.
- For new ceilings or replacement tiles, we recommend a composite fiberglass and mineral fiber ceiling tile that offers a CAC of 40 - 44.
- Make sure the “border” cut tiles are tight in the grid and there are not any gaps which would allow sound to pass through.
- Above the ceiling, in the plenum, check to see if there is an echo chamber effect that will carry sound. Wide-open plenums with metal decks and open joist construction will not help. When these conditions exist, install acoustic curtains from the deck (with enough material to drape over the grid) at intervals to break up the sound paths. See details below.

Lighting and Air Ducts:

- We have found this to be the worst of acoustic leaks. Check to see if the return air is handled in the open plenum area above the ceiling. It is common to find open grills or slots in the perimeter of light fixtures to assist in this air flow process. Left alone, these will destroy privacy.
- The solution is to add acoustic “boots” that make the air flow bend around and go through a sound absorbing lined duct in a 45-90 degree configuration that faces away from the area needing additional privacy. These boots can be made from a multitude of acoustic board materials and are fairly common. See detail 2 on page 3 for an example.
- Watch for slotted air diffusers at the perimeter of the building as well as all the air vents to insure they are not creating an open path through the plenum and over the walls. Even ducted return systems need to be checked that they are acoustically treated (lined) with sound absorbing material so that they do not become unwanted “communication tubes” over the walls.

Building Interface Details:

- Traditional construction details in the facility in which movable walls are being installed can have additional detrimental effects on the privacy of the space. The drywalls, whether a furred out column, a perimeter wall under a glazing sill or a demising to the deck wall, need to be flat and plumb as possible. Look carefully for bed mud build-up at the floor, mid-point and ceiling levels. These will look like a gap or bowing in our Wall Starts and potentially create open paths in the center of the bow. Those open paths ruin privacy.
- The finish should be consistent so that the Wall Start connector and the foam tape sound/light seal will do their job well.
- A bead of an acoustical sealant or caulk may be necessary to fill those uneven surfaces at our wall start. This detail is still removable and can clean up neatly upon relocation of the wall. Make sure our Certified Installers give you a certified installation.

Design:

- The design of the walls can also have an effect on the privacy afforded in a space.
- Make layouts “cookie cutter similar” rather than “mirrored”. The mirrored style almost always puts 2 doors side by side. Most doors are kept open a majority of the time and therefore, those two spaces will be sharing sound. Back to back speakerphones will also cause people speaking loudly towards the person next door in a

mirrored configuration.

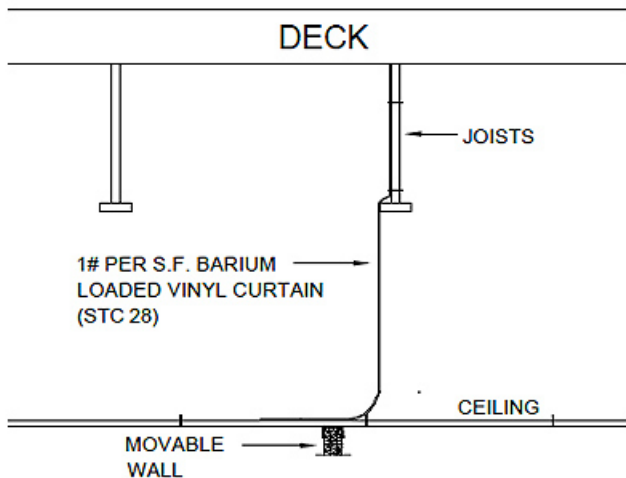
- If you need to add glass, try to minimize the amount of glass in the walls as they are 5 – 10 points less acoustic than our walls. Specify laminated glass when possible, the film layer in the middle provide an additional sound barrier.
- If you need Wallstrips to support systems furniture components, use Wallstrip closures or better yet use the Wall Strip Covers that completely cover the Wallstrip and the connection joints around the Wallstrip.
- If you use base electrical, be sure to specify some kind of additional batting or sound barrier material in the base cavity. We have had great success with 1 pound per square foot barium loaded vinyl as an acoustic curtain in the base cavity (also works well in the ceiling plenum as discussed earlier, detail 1, page 3).
- If panels with electrical boxes in the panel assembly are needed, try to avoid back to back configurations that make us cut holes in both sides of a panel to prevent any possible open paths.
- Sliding doors do not have as good an acoustic seal as our swing doors and frames. Our swing doors and frame have a nice soft vinyl bulb seal to block sound paths.
- If needed, specify acoustic drop seals on the doors that fill the gap between the bottom of the door and the floor. They can be specified concealed, machined into the bottom edge on new door product or as surface applied units like a Pemko Model 430_RL. The latter is less expensive and can be retrofitted on existing doors.

Ambient Noise:

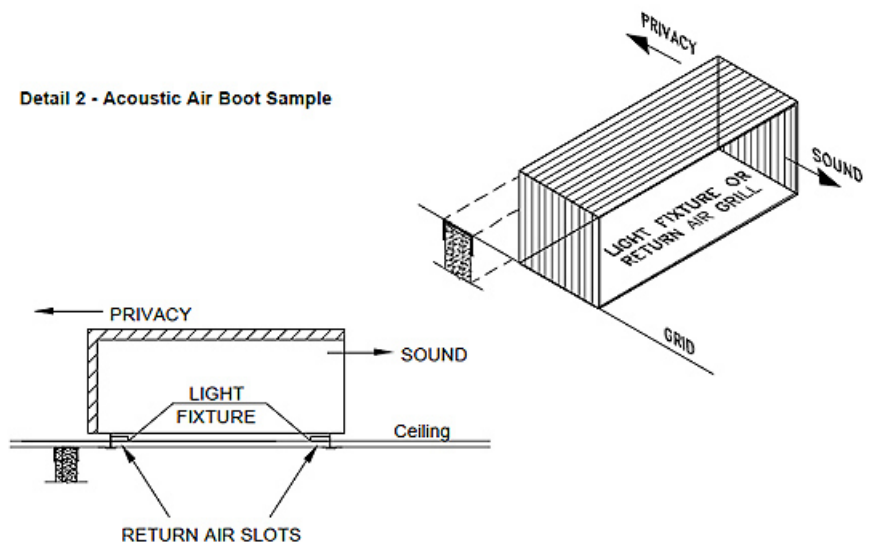
- A carpeted space is better than hard surface floors. Again echoing sound travels further.
- Office equipment and air conditioning sound helps with background noise.
- Sound masking provides an “acoustic covering” that is a consistent, vocal-focused noise that can significantly improve privacy in the interior space. Please review our Quiet Technology Masking solution and related information.
- Masking may provide the greatest amount of privacy at the lowest overall cost in both open plan and office type configurations.

We hope these few comments can be used in your real-world situations to help provide acoustically private offices that you and your customer

Detail 1 - Acoustic Curtain in Plenum Area



Detail 2 - Acoustic Air Boot Sample



Acoustics Discussion

This is a memo sent from SCA Walls to all Dealers and Customers

Here is basic information regarding a request for information on a comparison of the acoustic properties of drywall and M-Wall.

There are several numeric methods to “compare” acoustical properties of products. Below are the two most common measurements.

1. NRC or Noise Reduction Coefficient basically measures the ability of a material (or assembly) to absorb acoustic energy.
2. STC or Sound Transmission Class basically measures the ability of a material (or assembly) to block sound from passing through that material (or assembly).

Both of these measurements are broad based over a fairly full spectrum of acoustical frequencies (low to high pitches). Both are measured through calculations of reduction of the acoustic energy in as measured in decibels of STL or Sound Transmission Loss.

There are other types of reference/test numbers are more specialized looking at particular “speech” frequencies or specific real world arrangements for sound reduction of one form or another. One common reference is AI or Articulation Index, which refers to the intelligibility of speech within those test conditions. For more information on AI and new HIPAA regulations, review our information on the Quiet Technology masking system.

NRC is rated from 0.0 to 1.0 with 0.0 being the worst (reflecting all sound energy) and 1.0 being best (absorbing all sound energy). The NRC of basic painted drywall is extremely low (probably 0.0 to 0.05) and has not been tested, due to the fact that drywalls are typically floor to ceiling (or to the deck) to provide full enclosure. Typically the STC rating would be more applicable to full height walls. Wall coverings typically do not add NRC capability to drywall unless they are a specialized thick absorbing material, like 3/16” thick Acousticord (carpet for the wall). There are also several systems of a fabric over a frame with absorbing insulation behind that can be applied to the surface of a drywall in the field. These solutions have an effective NRC of 0.20 on the wall carpet and from 0.60 up to 0.95 on the various stretch-fabric-over-acoustic-material wall covers.

- Our current M-Wall acoustic surface option is a 3/4” layer of 1.6 pound density fiberglass behind the fabric. Our test and resultant calculations gave us a 0.75 NRC rating.
 - A high NRC rating on a ceiling high partition can only help in the acoustical privacy of an office space by reducing the sound energy before it begins to travel to annoy someone nearby. In addition to the partition, the entire envelope is critical to provide “privacy”.
 - Carpets are going to give you a 0.20 to 0.25 rating, mineral fiber ceiling boards a range of 0.50 to 0.70, fiberglass based ceiling tiles are typically in the 0.80 to 0.95 NRC range.
- STC ratings are measured from 0 to 70+ with 0 being the worst (no sound transmission loss) to numbers in the 60’s or 70’s being best. Sound studios and special location require STC in the 60’s range and up. STC is the sound energy loss measured against a standard curve established, which ranks barriers for sound reduction into the receiving (next door) space.
- Commercial drywall construction of 2 ½” or 3 5/8” metal studs with 5/8” gypsum faces will achieve a 35 to 39 STC, while adding sound batting will increase that range from 38 to 42.
 - Our first set of STC tests yielded a range of ratings from 33 for double tackable or acoustical to 41 for our double hard surface panel type. We are doing more testing and will see what results we get with a combination hard surface one side and acoustical surface on the other.
 - Regarding the consideration of the entire envelope of the space in question, mineral fiber ceilings are rated in the 35 to 39 STC ranges while fiberglass based tiles are so low that they are not published unless they are tested with a foil barrier backing behind them. The foil backed fiberglass tiles are rated in the 20 to 29 range.
 - All of the above information is also impacted greatly by the HVAC system and how many paths it may create for sound to travel over or through the walls.
 - Glass in a partition can effect the overall perception also. Tempered ¼” glass is rated at about 31 STC

while laminated ¼" glass (1/8" with safety film interior and another 1/8" sheet) is rated around 35 STC.

- Doors and the frame opening affect the sound ratings as well, downward of course. All our door frames are a jamb type with a bead stop as standard detail; this provides a much better seal around the door than any sliding or pivot hinged door could offer.

Well, we hope all this information helps everyone as they design and select products for their interior space. Hopefully they can achieve the flexibility of the interiors we have been talking to them about while maintaining the privacy they desire.