

Casavant Frères

Acoustics and Frame Wall Construction

The following information is provided as a guideline for the construction of wall and ceiling surfaces relative to the installation of a pipe organ. The total mass of wall and ceiling surfaces is important for bass energy reflection and/or for stopping sound travel through the walls and ceilings of expressive enclosures. Ratings for single layers of 5/8" thickness of different types of gypsum board are given below. The goal is to achieve a minimum level of 5 pounds per square foot (psf).

Imperial Gypsum Base (Blue board)

5/8"	Regular	2.3 psf
5/8"	Firecode	2.3 psf
5/8"	Firecode C	2.5 psf

Sheetrock (Gypsum Board)

5/8"	Regular	2.2 psf
5/8"	Firecode C	2.6 psf

These figures show that two layers of Firecode C material provide the desired mass. There is also a material called "Shaft Wall", which is manufactured in a thickness of 1 inch, however contractors generally are not very fond of using it due to the added weight of individual sheets plus the fact that the individual sheets are smaller than the standard 4' x 8' dimension.

Contractors sometimes do not understand the reasoning behind an organ builder's request to use two layers of 5/8-inch thickness drywall for walls and ceilings, especially with regard to the recommendation that the two layers be glued and screwed securely together. Most assume that the adhesive is applied randomly or only at the stud lines for the purpose of attaching the second layer to the first. However the primary purpose is to bond both layers securely together in order to achieve a single sturdy mass.

The adhesive and methods of attaching two layers of drywall together can vary, however the method of applying drywall mud with a notched trowel over the entire first layer surface is considered by some acousticians to be superior to the use of construction adhesive applied randomly. Keeping in mind that the goal is to bond both layers as securely as possible into one mass should be the guide for the choice of materials and methods for accomplishing this goal.

The recommended finish for the exterior layer is called "Level 5 finish", and consists of a slurry of drywall mud on the entire surface that is troweled to provide a final smooth "plaster-like" finish, which is superior to the porous paper surface with which drywall is manufactured. The walls should be painted with two coats of paint after the drywall finish has cured.

The minimum framing method for walls and ceilings should have studs placed a minimum of sixteen inches on centers with horizontal blocking at four-foot intervals. Stud spacing of twelve inches on centers is preferable where possible and considered the ideal method for frame wall construction.

Where both sides of walls are reflective surfaces for organ sounds it is important that each side of the wall be finished with this double layer construction method. In the construction of expressive chambers, staggered non-common studs are considered ideal if space permits. Expression chamber walls and ceilings should have insulation bats between the studs especially where the studs are common for both wall surfaces.

Okon-transparent glossy sealant is recommended for sealing porous masonry construction.

© Casavant Frères