Air-Water Transition – Ears Below the Water

There's a large benefit simply to the fact that most customers have their ears below the water when they float. The barrier between air and water is pretty extreme, and if we didn't have fairly well constructed human biology in our ears, this alone would take care of almost all of the soundproofing for a float.

Fortunately (or unfortunately for float tank center owners) our middle ear does an uncanny job at perceiving sound underwater. This means that humans still hear quite surprisingly well underwater.

Still, especially in the higher ranges, the water in the float tank does a wonderful job of cancelling out noise. It's the lower frequencies that, as usual, are more difficult to block.

University of Wisconsin-Madison released a report on this effect. Here is a small exerpt which explains our ability to hear underwater:

Soundproofing

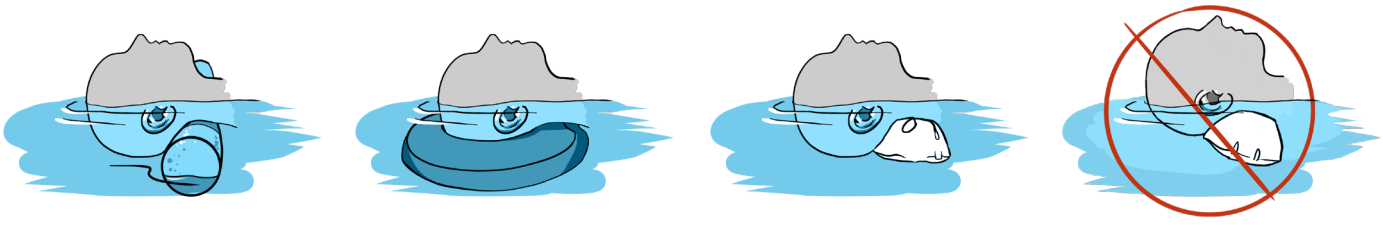
This is just a preview of the Construction Packet.

The full Soundproofing Section is 32 pages.

Neck Pillows

Unfortunately, many neck pillows will raise a floater's ears above the water. There are some out there, like the **Float-Ease,** that are made to provide support while allowing the ears to stay below the surface of the water.

We've ended up working into our walk-through speech that if our customers need the support of standard neck pillows, they might find that the experience is not quite as soundproof as without them.



Earplugs

At Float On, we offer **Mack's Swimmer's Earplugs** for every floater (about one in three people use them). These actually don't do a great job keeping out noise when your ears are below the water (despite their 22 dB Noise Reduction Rating), but they do keep the water out of people's ears, which some people prefer.

Earplugs may actually create a subjectively noisier float, because of the perceived amplification of one's own breathing and heartbeat. Using earplugs or not is really just a matter of personal preference.

For our open pools, we use **Elvex Quattro polymer ear plugs,** which also block out water (although they're more likely to come a little loose and let some water in) and do a better job blocking out sound (25 dB Noise Reduction Rating). They're not as waterproof as the Mack's earplugs, but for an open pool (or if you have sound issues you can't find another way to solve) they're a good option.

General Applications

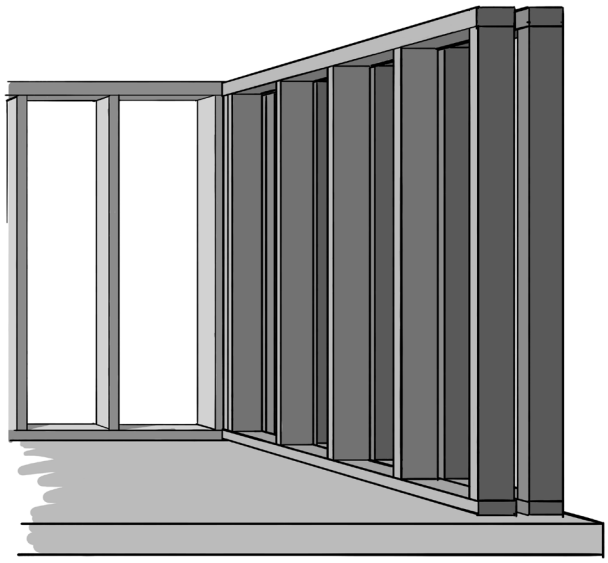
Different Types of Studs

single, staggered, & double – wood & metal

What are Studs?

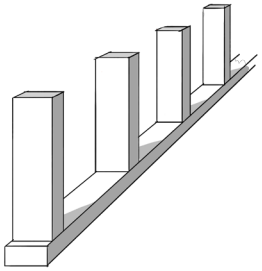
When you build a room, you frame it out of studs. These are usually metal or wood, and they are attached to the floor with baseplates and to the ceiling with top plates. They run vertically up and down, and are typically spaced 16"-24" apart.

Double-stud walls are going to be the most soundproof, and your best bet for a float tank center.



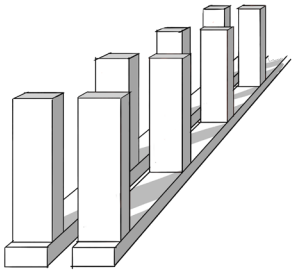
! You should tear out your ceiling (remember the lesson of gutting your space) and put your top plates directly into your joists. You're going to want to extend your drywall all the way to your roof so you don't have a weak point going through your ceilings. As a result, you'll need to tear out large portions of the ceiling no matter what. We recommend tearing out the whole thing.

Single Stud Walls



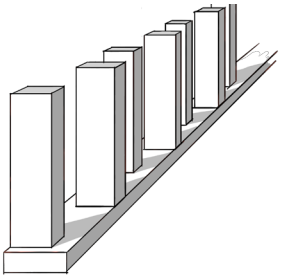
Single stud walls have one baseplate, one top plate, and a single set of studs running vertically between them. **Because they have no air gap in them, these yield the least soundproof walls.** You can combine single stud walls with sound channeling for a more soundproof setup, which we'll discuss later.

Double-Stud Walls



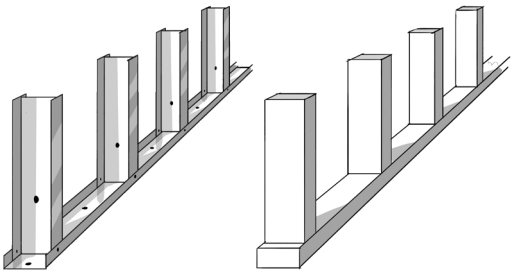
Double-stud walls have separate base plates, separate top plates, and separate studs. You only construct the outer walls on one side of each set of studs, but two walls are separate and never touch. **Because you've created an actual air gap, this has a higher STC rating than either single or staggered stud walls.**

Staggered Stud Walls



Staggered stud walls share a wider base plate and top plate, but the studs are offset, meaning the walls on either side don't touch. **This is more soundproof, with a higher STC rating, than single studs,** but the baseplates and top plates still connect the studs, so there is still a decent amount of vibration conveyed through the system.

Metal vs Wood Studs



Metal studs are more expensive in both materials and installation, but if you aren't doing double-stud walls they're better for soundproofing (with a higher STC rating).

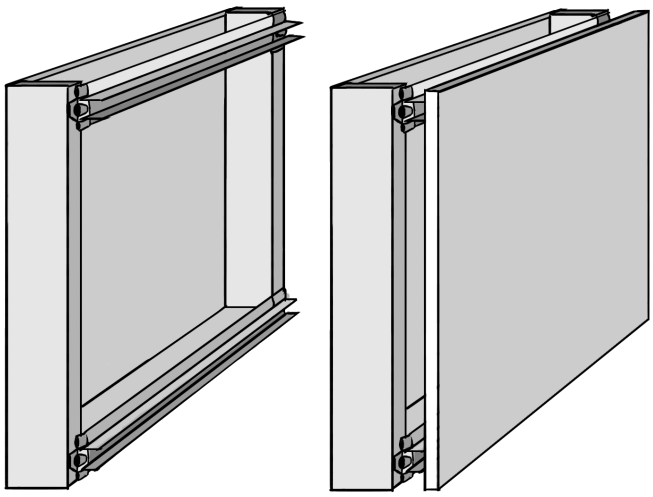
Metal will also hold up for longer, and will flex less (both with the weather, and over longer periods of time).

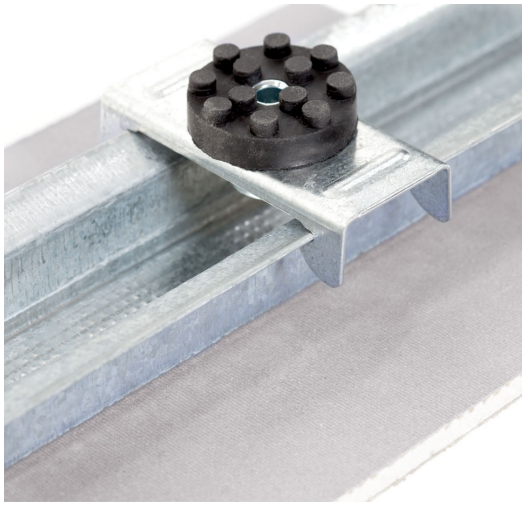
Resilient Sound Clips

Resilient sound clip systems utilize mechanical isolation (and decoupling) to limit vibrations transferring from your drywall to your framing. **If you're using single studs in your float center, it's strongly recommended that you utilize a sound clip system** with furring channels to attach your drywall – this will allow your wall setup to have an air gap, despite only having single studs.

In addition to limiting the contact points between the drywall and the framing, resilient sound clip systems also allow for a certain amount of flex in the building materials. This flex is an important component of the system because it allows the wall to oscillate, and that helps cut down on low frequency noise pollution. Some clips simply create an air gap while other (better) clips utilize a rubber grommet between the clip and the framing to sap even more energy from pesky sound waves.

Properly installing soundproof drywall on a sound clip system is no small feat. Some sound clip setups are rated similarly to double-stud setups, but in practice they often fall short of their potential due to small mistakes in installation. **Be sure that your contractors are experienced in this type of installation if you go this route.**





At Float On, we prefer to use RSIC-1 clips for their rubber grommet (to help isolate the sound) and because they've been used successfully for many years. Your contractors may suggest WhisperClips or V-clips, which we don't recommend due to their inferior soundproofing ability.

Since you need to install grab bars in your float room, you won't be able to use sound clips on the interior of your float rooms. The sound clip system interferes with the ability to install supports to hold up your grab bars. Instead, install sound clips on the outside walls of the rooms, which border your hallways, lobby, and other areas.

Suspended Drywall Ceilings

If you're building a complete room within a room setup, you'll be using a suspended drywall ceiling. In this setup, you basically dangle studs from cables, making an air gap between the joists and your ceiling.

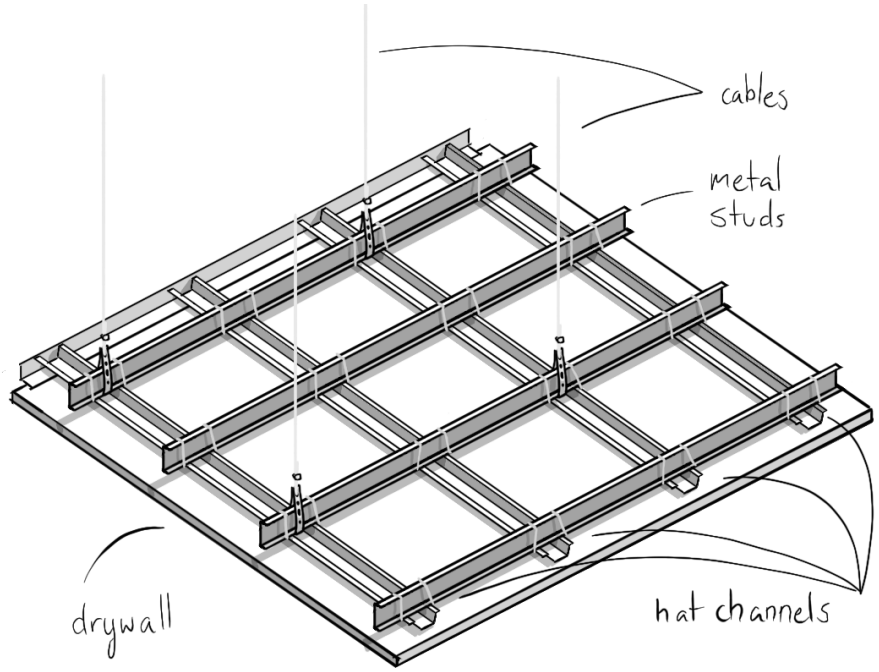
You'll sometimes hear people refer to drop ceilings, which is NOT the same as a suspended drywall ceiling. Drop ceilings are most commonly used to refer to grid ceilings with ceiling panels in them (like you might see in an office). This is not what we'll be using in a float tank center.

In most suspended drywall setups, you'll be attaching lagbolts to the ceiling joists, and hanging down cables which clip to metal studs. Then furring channels go across the studs, and the drywall attaches to the furring channels, creating an air gap for soundproofing between your roof and your ceiling.

Because it's a wet environment, also consider adding a vapor barrier between drywall and your furring.

! Be sure to put insulation above your ceiling, just as you would in your walls, to prevent sound from reverberating inside the cavity.

At Float On, we actually included one more step. We utilized RSC-1 resiliency clips between the studs and furring channels instead of using tie wire.



! You don't want your drop ceiling to fully touch your walls. Leave the drywall hanging about ¼" away from the walls and fill in the gap with sound caulk. You can then put silicone caulking over that to serve as a moisture barrier.

At Float On, we found that in our single story building, we didn't need drop ceilings in our rooms with ordinary float tanks. In the rooms with our open Float Pools, there was no insulating effect of a tank shell, and so drop ceilings proved to be necessary.

Soundproofing Floors

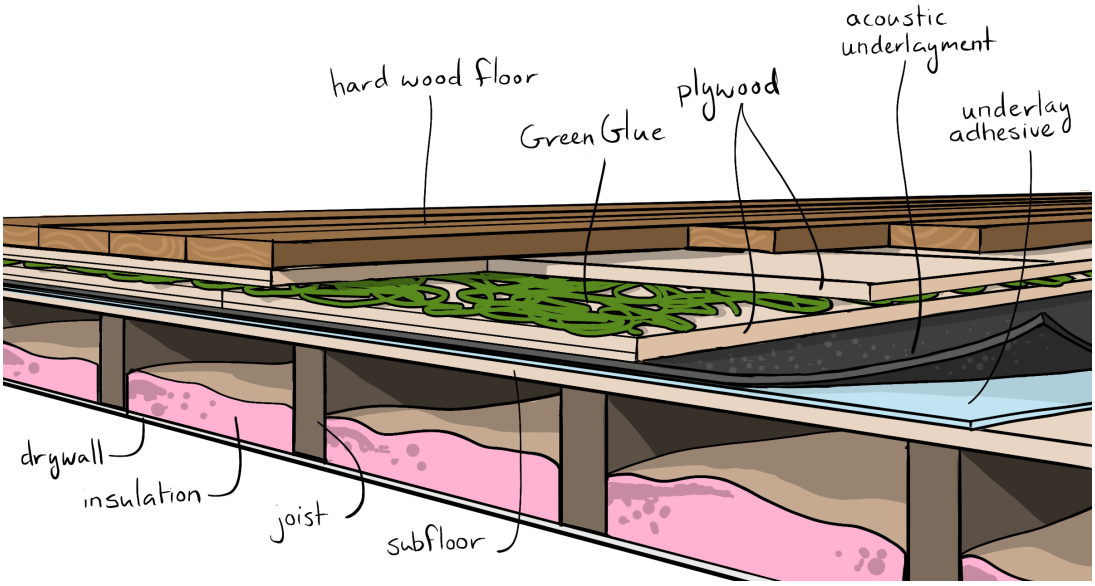
Vibration Isolation Pads

You don't need to protect against sound coming in through your floor as much as need to stop it from getting into your float tanks. Because of this, **vibration isolation pads underneath your tank are one of your best options.** A normal float tank will require 11 vibration isolation pads (each about 3" x 3") to hold it up.

Vibration isolation pads work by forcing the soundwaves through varying densities of material and breaking up the soundwaves through damping. We go into further detail later in this chapter.

Floor Soundproofing Systems

These are usually used to prevent sound from traveling from an upstairs area to a downstairs area. If you're in a multi-story building, soundproofing the entire upper floor would be the kind of measure you would take if sound was coming down from above. Here's is one possible setup as an example:



This is not commonly used in float centers, since your vibration isolation pads serve the same purpose for the float tank (which is the only part of the room that is truly necessary to soundproof).

Raised Floors – false floors

Raised floors (or false floors) are not as commonly used for soundproofing. Mostly they are used for waterproofing in basements and for cable/electrical/plumbing access in office buildings.

They can be built for soundproofing (much like a drop ceiling) but any time we've seen this done it has led to issues. Cost, the weight load cracking tiles, and water resistance issues have all come up. **Be very careful if you decide to go this route.**

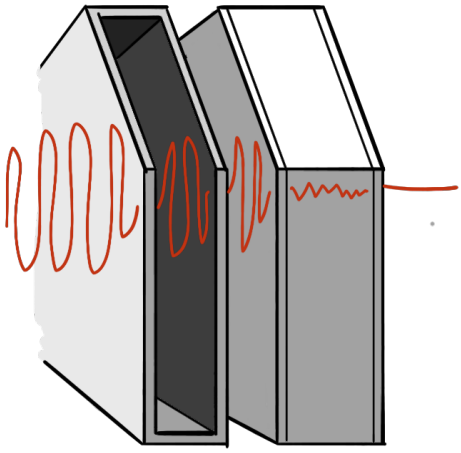
Doorways

Once you've built these expensive, hefty, soundproof walls, you need to make sure that the doorways leading into them aren't a weak spot. This turns out to be it's own unique challenge.

Hollow-Core vs Solid-Core

At its most basic, you want a door that will block far more sound than your typical interior hollow-core door. A solid-core door is the next step up and will add mass, which will help to block sound from getting in.

Also, since the float rooms have to deal with water and salt, exterior solid core doors (as opposed to interior solid core doors) are the way to go.



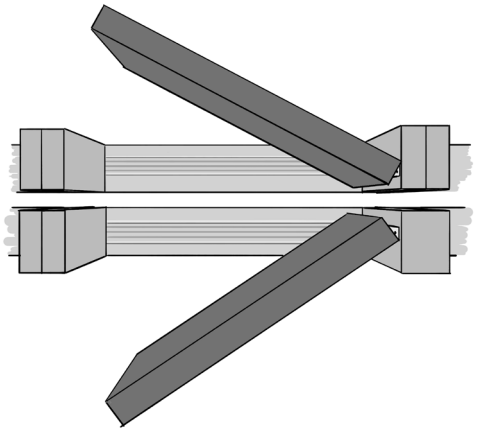
Hollow Door Cross-Section | Solid Door Cross-Section

It's easy to get confused here and think that hollow-core is what you want, since you have an air gap on the inside. However, since the door material is all connected, it's not a 'true' air gap, and is much more akin to a single stud wall. Also, since mass is so important in blocking sound, standard hollow-core doors will let A LOT of noise through.

Double Door System

To create an actual airgap, you could use an air-lock style system of two doors leading into the float rooms.

When you do this, there will be a gap in the casing between the two doors which leads into the gap in the studs. This both ensures that their aren't any rigid connections spanning the gap, and that the air pressure doesn't get crazy when you open or close the doors from either side.

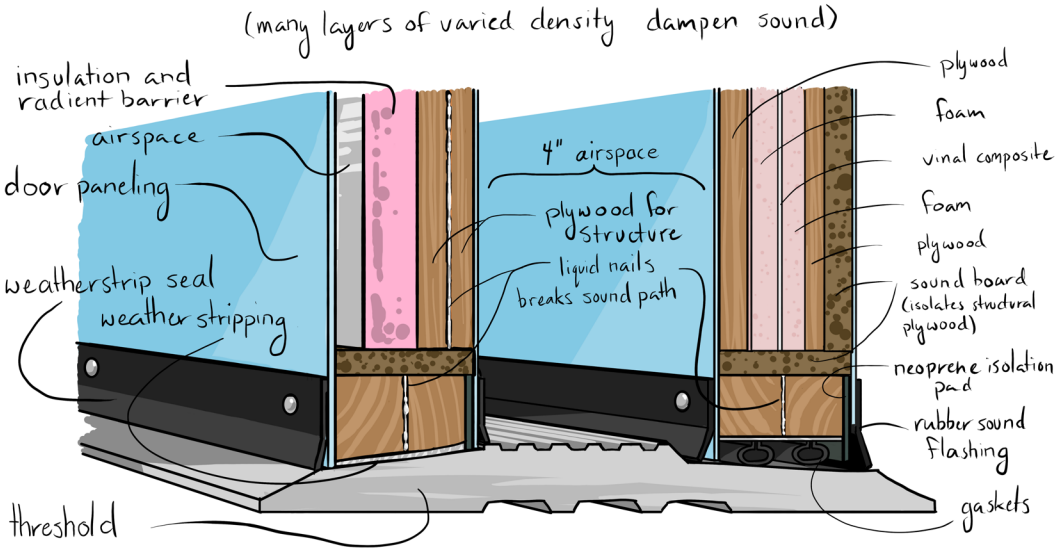


Although this is a common solution for various soundproofing situations, we have yet to see it used in a float center. Often, it goes against ADA code.

Extreme Soundproof Doors

Door soundproofing can get both very complicated and very effective, as you might guess. **STC ratings can go from 35 up to 55 all the way up to 80, but they also come with an increasingly large price tag.** These doors are commonly used for recording studios and laboratory work. They take advantage of all of the soundproofing techniques that we've already discussed, including air gaps and changing densities.

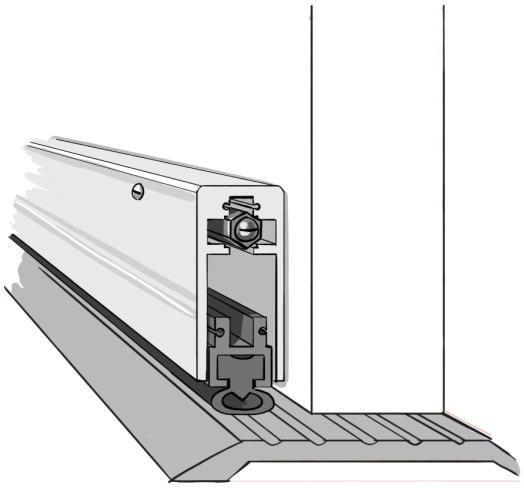
Here is an example of an extreme custom double-door system, designed by **The Art of Woodshop Design.**



Rather than pay $1,500 to $5,000 all the way up to $10,000 for varying intensities of soundproof doors, many float centers rely on secondary doors from their hallway (with the float room entrances) to any other part of the space (like the lobby, the workroom, prep stations, etc).

Protecting the Seams

Once you've chosen your door, you'll need to make sure that the seams around the edges of the door are soundproofed as well. This means that you'll want a saddle / door sweep for the bottom of the door.

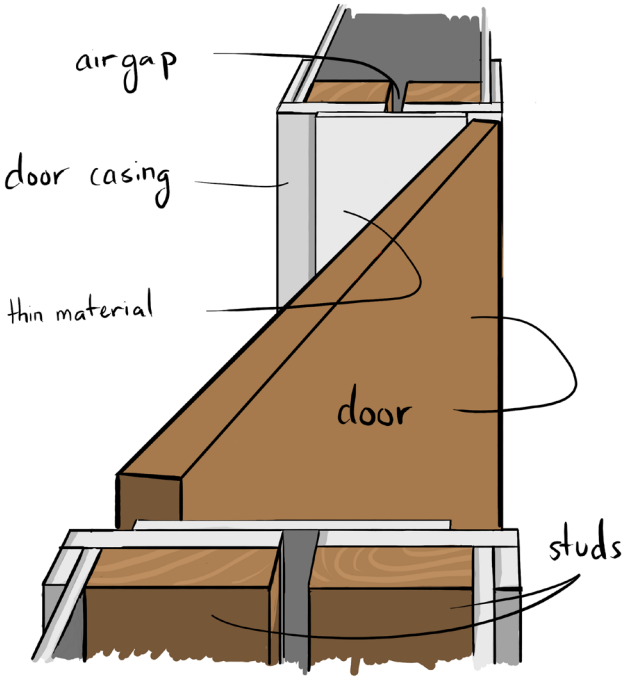


You'll also want stripping, or in cases where you need slightly more extreme soundproofing, a full gasket system around the edges of the door (which serves the same purpose as the under door saddle / sweep).

Avoiding a Short Circuit

If you're using double-stud walls, your doorway is going to be the only spot that breaks your room within a room system. This is because you often have some kind of material (usually the casing of a door) going the full distance from the inside wall to the outside wall. Everywhere else, they don't touch.

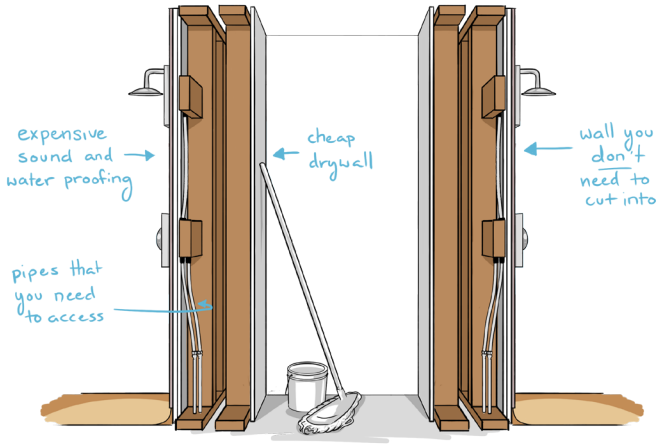
To avoid creating a short-circuit in your sound-proofing, you may want to leave a small gap in your door casing, so the two sets of your studs don't connect. If you do make the casing connect across the studs, be sure to use a very thin material to reduce the amount of sound that gets transferred. You'll also want stripping, or in cases where you need slightly more extreme sound-proofing, a full gasket system around the edges of the door (which serves the same purpose as the under door saddle / sweep).



Creating Your Floor Plan with Soundproofing in Mind

Showers on Adjoining walls

Having the showers back to back in the rooms lessens the noise that can transmit over to the float tank.



This is how we've laid things out at Float On, and we don't get any complaints of shower noise coming in from one room to another.

Be sure to leave the ability to access to the showers from behind to do repairs. An ideal setup, if you have space, is to place small storage closets between your rooms. This will help to block a lot of sound, and also leave access capability for plumbing repairs.