



Following is a history and description of the major issues with the floors of Hawaiki Tower, how and why they transmit sound, why it is more difficult to mitigate the transmission of sound and the pros and cons of changing your flooring.

How come the floors at Hawaiki are so thin?

The Developer of Hawaiki Tower built the floor slabs exceptionally thin in order to maximize the sales volume of the project. By making the floor slabs thinner the Developer was able to build an additional floor plate of sellable area. As a result, we all have to live with these thinner slabs that transmit sound more easily. Our floor slabs are built with steel reinforced post-tension concrete slabs with a nominal thickness of 5 ½". This type of construction transmits sound more easily than other types of hi-rise floor construction. In addition, the primary living areas (the kitchen, living room, and bedrooms) of the vast majority of apartments at Hawaiki do NOT have an acoustic ceiling above. An acoustic ceiling blocks out a lot of noise from the apartment above. An acoustic ceiling is installed in the bathrooms – primarily to conceal plumbing.

What is post-tension construction and why does it increase noise levels?

Building concrete floor slabs with a post tension cable is a technique that allows the slab to be thinner. Concrete increases in strength as it is compressed. Post-tension cables are laid inside the concrete and anchored at various end points. As these end points are tightened, they tighten the cable and compress the concrete horizontally, increasing the strength of the concrete. This is similar to a guitar string being tightened over a guitar top. Vibrating the string (making a noise on the floor) transmits the vibration to the end points which moves the guitar top (floor slab). With a guitar, you can pluck the string anywhere along the string and the sound it produces doesn't change much. This same effect occurs on the floors at Hawaiki. If you drop or slide something on the floor from anywhere in the room, the noise is transmitted to the anchor points and vibrates the entire floor slab. Many occupants claim they hear a noise directly above them and feel certain they know what is causing the noise and where it is coming from. Because of the dynamics of the post-tension floor construction, it is rarely the case that the cause and location of the noise are that easily determined.

What about the apartments that already have replaced their carpet with rigid flooring?

When Hawaiki was opened in 1999, the Developer retained the right to make modifications to apartments. During the next few years as apartments were being sold, the Developer installed wood flooring in many apartments to assist in the sales process. In addition, the Developer permitted new owners to make modifications to their apartments, such as installing wood or stone floors. As far as the Association is concerned, as long as these floors are not damaged or replaced more than 25%, they will be allowed to remain. If they are damaged or repaired more than 25%, they will have to be replaced and brought up to the current sound mitigation standard.

When did Hawaiki begin to learn about the floor issues?

It wasn't until the building began to be more occupied that owners began to complain of the noise coming from above them. It is likely that when the first owners installed wood or stone floors that no one lived beneath them or they were a second-home owner who was rarely here. When these initial owners sold their apartments or someone moved in beneath them, then the Board was made aware of the problem with sound transmitting between apartments through the floors.

What if my neighbor below me complains?

If a resident below complains of excessive noise due to an older existing rigid floor, it is possible that the complainant could bring a civil action to have the sound mitigated, or possibly have the floors removed. To avoid

that from happening, the occupant(s) above can control their behavior (being extra careful not to make noise, install permanent wall-to-wall carpet, area rugs, place padded furniture tips on chairs and other furniture, etc). Controlling behavior does not guarantee the occupants below won't lodge complaints. If the existing rigid flooring does not meet code, the owner below would have a basis for a complaint.

How the noise level is tested and what does it mean?

The main issue in floor/ceiling designs is with the Impact Insulation Class (IIC) requirements. IIC is a measure of how much footfall noise travels through a floor assembly to be heard from below. Usually, this is presented as a single composite number which represents a formulaic curve-fit. The Uniform Building Code (UBC) requires floor assemblies to meet a Field Impact Insulation Class (FIIC) test rating of 45. By using a "tapping machine", metal hammers hit the floor system hundreds of times a minute as the noise is measured in the room below. It measures how floor impact noise travels through the floor to the owner in the unit below.

In most markets, rigid floors (stone or hardwood) are required in quality multifamily units. The problem with rigid floors is that they are severe transmitters of noise. While code requires FIIC 45, in most multifamily dwellings even meeting these numbers has led to myriad complaints from occupants. In recent years, hardwood, marble, quarry stone, ceramic tile and hard vinyl tile floors have gained in popularity over carpet and have come to represent "luxury". From an IIC standpoint, this is unfortunate for the occupants below, as adding carpet to any flooring system absorbs footfall noise, and thus reliably eliminates IIC complaints. A field test rating of 45 is very minimal and it is unlikely that anyone would want to live below an apartment that just met that standard. For every ten points of this rating number, the noise level is reduced by 50% (a rating increase of 10 points from 45 to 55), or the noise level is doubled (reducing the rating 10 points from 55 to 45). This is an exponential progression.

What are the ratings of the floors in Hawaiki?

The floors at Hawaiki have been tested to determine their rating. The ceramic floors in the entryway and kitchen have a rating of FIIC29. The original carpeted area has a rating of FIIC72. The practical difference between these two numbers is that the carpeted areas are approximately 500% quieter than the kitchen and entryway. Hawaiki recognizes that the existing stone floors do not meet code. These original ceramic and marble floors were installed by the Developer, not the Association. The Association is taking the position that since it knows the existing floors (the original tile and marble; and many, if not all of the developer's and owner's existing wood installations) may not meet code or the Association's standards, any replacement or material repair of an existing wood floor that requires more than 25% of the area to be repaired or replaced, the entire floor must be reinstalled to meet Hawaiki's standard.

What do I need to do to change my carpet to hardwood or stone?

The existing policy at Hawaiki Tower is that if anyone wishes to remove their carpet and replace the carpet with rigid flooring of any type, the owner has to install a sound mitigating underlayment beneath the rigid flooring to achieve an FIIC rating of 55. Because the floor slab is relatively thin and transmits sound more easily, the quantity and quality of underlayment has to be thicker and higher quality than typical and installed carefully.

The Association has tested numerous combinations of underlayments and the attached House Rules Exhibit specifies the results of the testing and which areas of the apartment can receive certain assemblies.

In addition, doors may have to be undercut, sliding mirrored closet doors may have to be replaced, cabinets raised and the refrigerator may need to be removed and its enclosures modified to make sure you can get the refrigerator out again for service after the new flooring is installed.

Who insures the carpet or new wood or stone floor?

If an owner changes their carpet to stone or wood, this upgrade changes the nature of the property. Carpet is considered an original as-built component of the building – the same as your walls and cabinets. It is covered by the Association’s master policy. If you replace your carpet with alternative flooring, that new flooring becomes your personal property and is no longer covered by the Association’s insurance. If it is damaged for any reason that the Association’s policy would cover, it will only be covered for the value of carpet.

What happens to the carpet, wood or stone floor in case of flood?

The risk of having water damage to your apartment while living in a hi-rise is high. It is not really a question of if, but when it will happen. If you have carpet, it is a relatively simple task to move furniture out of the way, lift the carpet and insert carpet dryers beneath it, dry the carpet and then reinstall it. This process takes a few days of disrupted living before everything is put back in its place and normal activity resumes.

If you have wood or stone floors and experience a flood, your underlayment will become saturated with water. There is no way to get the water out. The trapped moisture will damage the wood or remain trapped beneath the stone. The only practical way to remove the water before mold begins to grow is to remove the flooring entirely and start over.

What does the Board recommend?

The Board recommends owners to keep their carpeted areas finished with carpet. Many owners have redecorated with carpet and have done a beautiful job. If owners are concerned about dust in the carpet, the cost of a good vacuum cleaner is far less than the cost of rigid flooring.

Owners with allergies that have a real medical need for rigid flooring or owners who are adamant about changing their flooring will simply have to accept the challenges, risks and increased cost that go along with installing rigid flooring in Hawaiki.

The rules and regulations adopted by the Board are to protect all owners of apartments. If someone installs rigid flooring above your apartment you will be very happy that the rules and regulations are as strict as they are.