

Sound Transmission between 118 State Street (Cielo) & 114 State Street

It is important to understand that this issue is not the how loud the music is played within Cielo, but rather how loud the transmitted music is within the residential space(s) at the neighboring 114 State Street address.

The literature provides acceptable noise levels for a variety of applications. An excellent reference is Fundamentals of Noise Control Engineering by Albert Thumann and Richard Miller:

Table 3.3 Acceptable NC Levels for Various Activities

SLEEPING, RESTING AND RELAXING

Suburban & Rural: Homes, apartments, hotels, hospitals, etc.	NC-20 to NC-25
Urban: Homes, apartments, hotels, hospitals, etc.	NC-25 to NC-30

Since music is played within Cielo during evening hours, the entry pertaining to sleeping, resting and relaxing has been quoted, as it is the most stringent. With the site being in downtown Madison, WI, the default value would be the NC-25 to NC-30 range. However, the values given in this reference assume noise in general, most commonly steady state noises, such as mechanical system noises. Steady state noises are not perceived with the same level of irritation as intelligible sources such as speech or music, and with music, low frequency rhythmic percussion. On this basis, the NC-20 to NC-25 range should be used, providing extra consideration for the residential space(s).

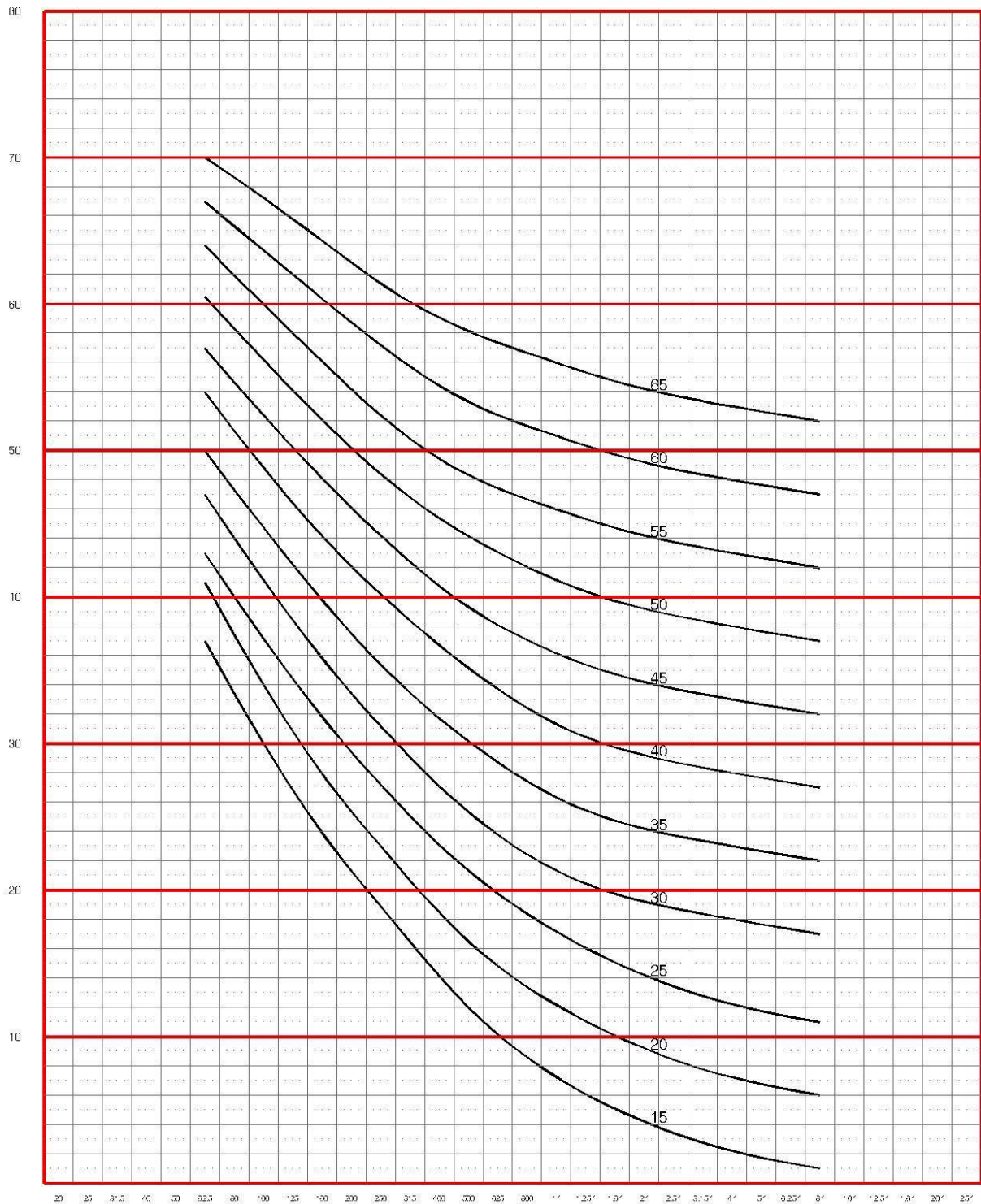
NC (Noise Criteria) values are not the same as SPL (Sound Pressure Level) values, although both use the same unit of measure, the dB (decibel). SPL values are taken with a single measurement with a sound level meter. Most commonly, the values are weighted to give less credit to low frequency content, with what is known as A-Scale weighting.

In contrast, NC measurements require taking 8 separate SPL measurements, one for each of 8 separate octaves; with center frequencies of 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, and 8 kHz. A time window is determined for these measurements, as each one must be over a duration sufficient to capture a representative sample of the noise being measured. A time window of 10 seconds is typical.

The measured SPL for each octave is then plotted on an industry standard graph with frequency in Hz on the lateral axis, and amplitude in dB on the vertical axis. The graph includes a family of NC curves in 5 dB increments. (A sample follows.) By definition, wherever a data point exceeds the highest NC curve beneath it, the value of the next NC curve is taken as the measured NC value. All NC measurements, therefore, are a multiple of 5 dB.

Sample NC Graph:

PROJECT ID: _____ DATE: _____



The next step should be to determine what the NC value(s) in the residential space(s) actually is(are), to determine whether the complaint(s) from the residential space(s) is(are) legitimate or not. If found to be legitimate, meaning that the measured NC value(s) exceed NC-25, Cielo will be able to determine what corrective actions may be required to increase the transmission loss of the barrier separating them from the residential space(s) to a degree sufficient to achieve the NC-25 value.

In order to make the NC measurement(s), access will be required to the subject space(s), meaning cooperation by the occupant(s). Approximately one half hour would be required per space, and the resident(s) would have to be present.