

**AN ASSESSMENT OF THE DIFFERENCES IN VERTICAL SOUND TRANSMISSION
 BETWEEN
 A CONVENTIONAL SOUND SYSTEM
 AND
 A JBN CEILING ARRAY SOUND SYSTEM**

16 March 2009

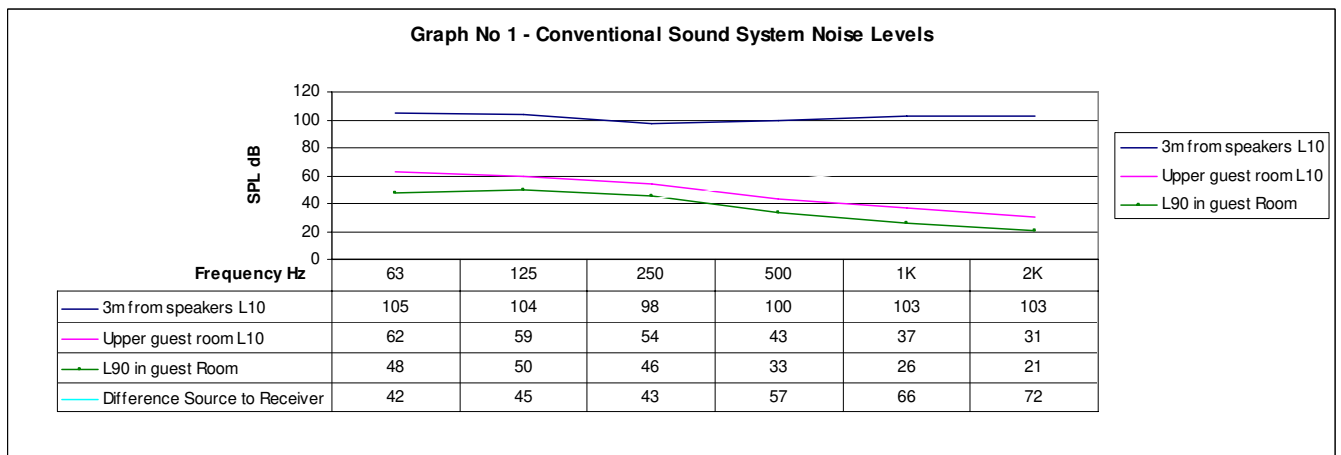
This study is the outcome of field tests conducted by Palmer Acoustics before and after the installation of a JBN sound ceiling into the ceiling of the Irish Pub, P.J. O'Brien's (PJ), in Cairns. PJ.'s had experienced problems with vertical noise transmission into backpacker accommodation located directly above the dance floor area. Our assessment of this matter was in two parts;

1. Prior to the installation of the JBN ceiling and
2. After the installation of the JBN ceiling.

The following outcomes were recorded.

1. Prior to Installation of JBN Sound Ceiling

Palmer Acoustics were initially commissioned to determine the allowable noise levels to meet Queensland Liquor Licensing Division requirements (octave band noise levels from amplified entertainment 63 to 2000 Hz are not to exceed 8 dB above the octave band background level). Our tests showed the following levels of noise in the dance floor (3m from the speakers) and in the upper level guest room (see Graph No 1 below).



This test established a noise limit for the dance floor of 103 dB(C) at 3m from the sound system speakers.

This level of music was found to be inadequate for many patrons and hence after investigating many options a decision by P. J. O'Brien's was made to install a JBN sound ceiling.

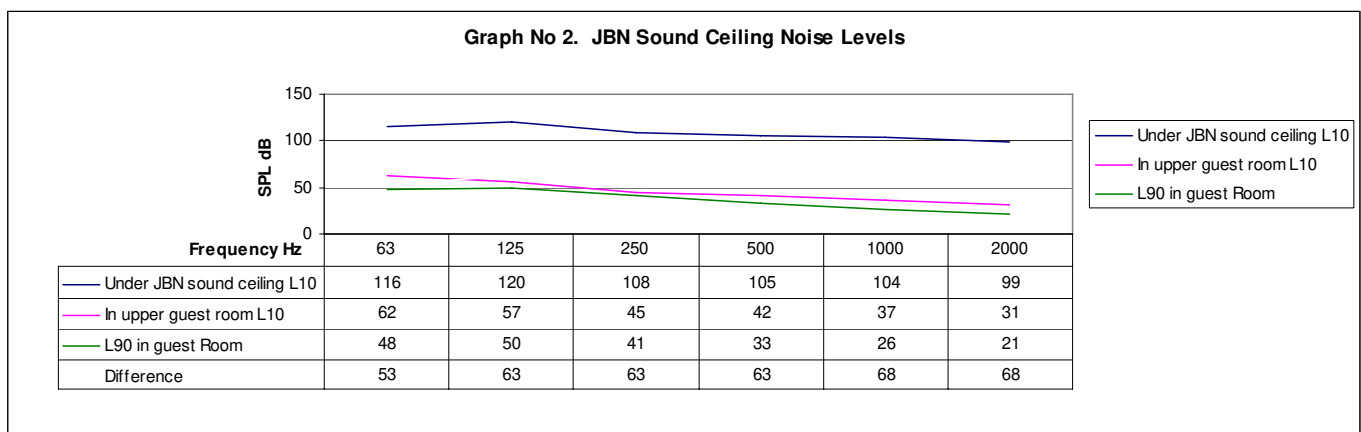
The ceiling above the dance floor area consisted of 1x layer of 10mm plasterboard, a cavity and 2x layers 16mm fyrecheck plasterboard suspended from a 200mm concrete slab.

2. After the installation of the JBN Sound Ceiling

Palmer Acoustic was called back to re-assess the allowable level of entertainment noise after the installation of a JBN sound ceiling. The JBN ceiling was as follows:

- 2x layers of 12mm plasterboard screwed directly onto the existing 2x layers of 16mm fyrecheck plasterboard, Green Glue was used to join the two layers of 12mm plasterboard (re Ultrafonic Brisbane).
- Timber purlins were located on the 2 layers of plasterboard, decoupled from the structure by neoprene isolation hangers.
- A "Rondo" suspended ceiling grid, Type H was installed, to suit the size of the JBN sound ceiling grid;
- 1x layer of R3 Sound screen (CSR) fibreglass blanket above the sound ceiling
- JBN installed 51x USA111 – JBN Sound ceiling tiles (459 speakers), Amplifiers – 2x QSC PLX 3602 and Rane Digital Processor Type RPM2.

With the sound system operating noise levels were again measured on the dance floor and in the upper level guest room with the sound system running and then turned off (see Graph No 2 below).



These tests resulted in an allowable noise level on the dance floor of 113 dB(C), ie an increase in allowable amplified entertainment of 10 dB over the original installed conventional sound system.

CONCLUSIONS

Our tests showed that the JBN sound ceiling when installed with specified treatments above the ceiling resulting in a 10 dB decrease in overall noise levels in the occupied areas directly above the dance floor. This was a significant gain for P. J. O'Brien's in that it allowed 10 dB higher noise levels on the dance floor. In the low frequency octave bands the following additional level of acoustic isolation were recorded from the installation of the JBN system (see Data Set No 1 below)

Data Set No 1. Additional levels of allowable entertainment noise achieved though the use of the JBN sound ceiling.

Frequency HZ	63	125	250	500
Difference JBN of Conventional system	11	18	20	7

The gains were mainly in the low frequencies (63 to 500 hz) which also corresponds with the frequencies where floor structures will normally transmit high levels of entertainment noise.

This result is not an isolated outcome for our office as we have found the same 10 dB vertical attenuation advantage when carrying out a similar test on another JBN sound ceiling installed in a Tavern in SE Queensland.

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