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NOISE MEASUREMENT OF POOL PUMP ENCLOSURE TO DETERMINE EFFECTIVE NOISE REDUCTION

SOUND BUNKER POOL ENCLOSURES

Koikas Acoustics was requested by Sound Bunker Pty Ltd to measure the noise reduction of two prototype commercial pool pump enclosures. Noise measurements were conducted under controlled testing conditions to determine the noise reduction of the “Burlington” and “Blast Door” enclosure sections. The noise reduction of the pool pump enclosure in a variety of use configurations is presented in this report.

MEASUREMENT METHODOLOGY

Sound level measurements were taken of a noisy swimming pool pump, approximately the same size that would fit the subject pool pump enclosure. Noise level measurements were taken 1 metre from the pump in free field conditions with a Type 1 NTi XL2 sound level meter. The sound measuring instrument had been calibrated by a NATA certified laboratory. Calibration measurements were taken before and after the measurements with a calibrated pistonphone that also carries NATA calibration certification. No system drift was observed for the NTi XL2 instrument.

The meter was configured to measure with the A-frequency weighting and Fast-time weighting response. The measured noise level at 1m was found to be $L_{Aeq, Period}$ **71 dB**. The sound level measurement of the pool pump also included a wave file recording.

Two audio speakers were placed in series to replicate the noise of a standard-sized residential pool pump. The wave file recording was played back through an amplifier to replicate the pool pump noise with and without the subject pool pump enclosure. The spectral levels used to generate sound within the enclosure were modelled from a *Viron P320 Evo Pool Pump*.

MEASUREMENT RESULTS

Measurements were conducted at a distance of 1m from the sound source, on three sides of the Sound Bunker enclosures.

- Position 1: front of the enclosure, facing the “Blast Door”
- Position 2: rear of the enclosure, facing the rear section of the “Burlington”
- Position 3: side of the enclosure

Noise measurements were conducted in different configurations of both sections of the enclosure in place, and with the top hole covered, and uncovered.



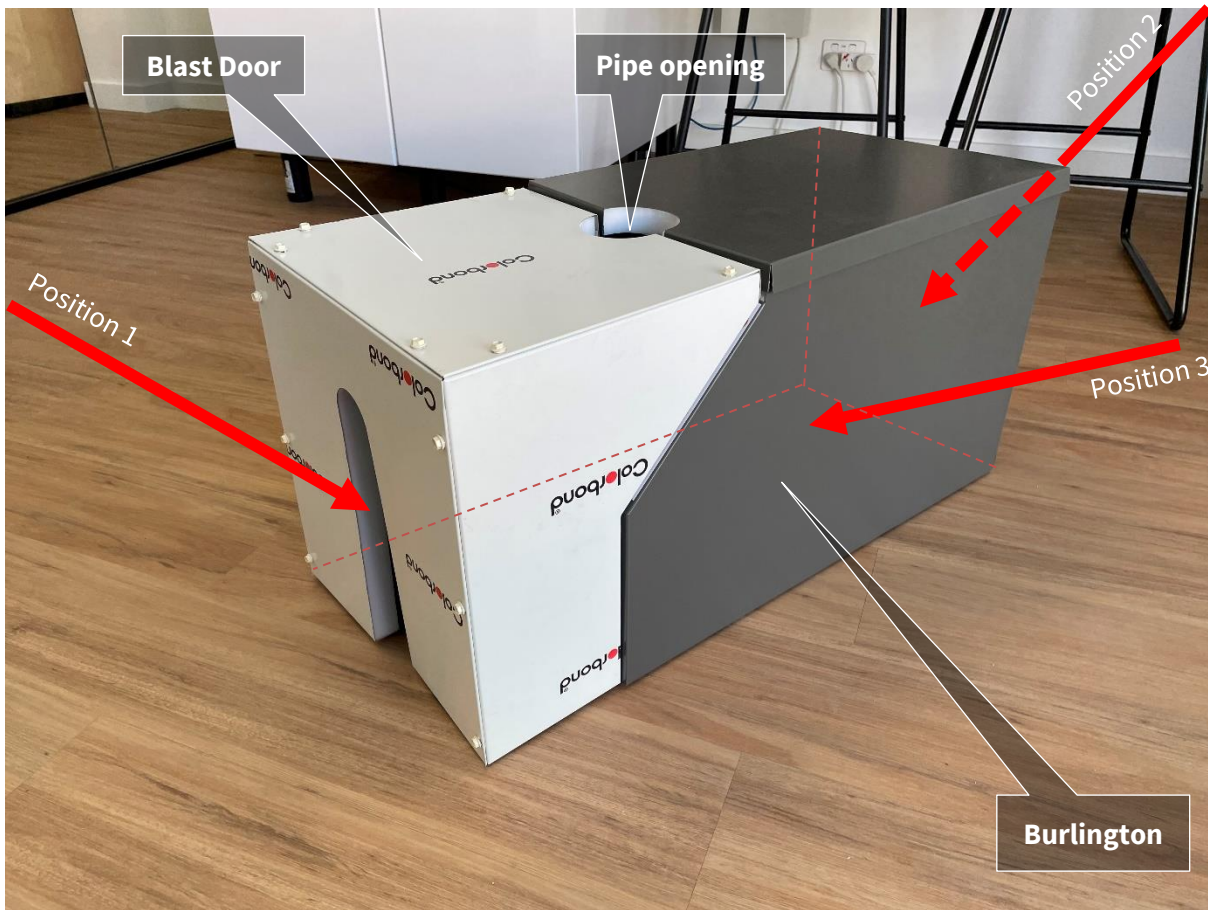


Table 1. Measured noise reduction of Sound Bunker enclosure, LAeq,Period [dB]

| Test No. | Measurement Position | Enclosure Configuration | Pipe opening open/closed | Sound pressure level @1m | Effective Noise reduction (dB) |
|----------|----------------------|-------------------------|--------------------------|--------------------------|--------------------------------|
| 1 | Position 1 (front) | No Enclosure | - | 74 | - |
| 2 | Position 1 (front) | Burlington | - | 70 | 4 |
| 3 | Position 2 (rear) | Burlington | - | 60 | 14 |
| 4 | Position 3 (side) | Burlington | - | 62 | 12 |
| 5 | Position 1 (front) | Burlington & Blast Door | Open | 61 | 13 |
| 6 | Position 2 (rear) | Burlington & Blast Door | Open | 58 | 16 |
| 7 | Position 3 (side) | Burlington & Blast Door | Open | 55 | 19 |
| 8 | Position 1 (front) | Burlington & Blast Door | Closed | 59 | 15 |
| 9 | Position 2 (rear) | Burlington & Blast Door | Closed | 58 | 16 |
| 10 | Position 3 (side) | Burlington & Blast Door | Closed | 54 | 20 |

The acoustical noise reduction provided in this report is indicative of the noise reduction expected for a typical pool pump. The noise reduction may vary depending on the pool pump's spectral sound levels, and the environment in which testing is undertaken.

CONCLUSION

Koikas Acoustics was requested to conduct noise measurements on a prototype pool pump enclosure to determine the noise reduction the pool pump enclosure can provide. Noise level measurements were taken 1 metre away from three positions:

- Front side at 60° from the horizontal
- Rear side at 60° from the horizontal, and
- Side, 60° from the horizontal.

To determine the noise reduction of the pool pump enclosure, sound tests were taken at the above-mentioned positions as follows:

- without the enclosure,
- with the Burlington 'partial' enclosure, and
- both the Burlington and Blast Door enclosures.

The above sound tests were taken twice:

- with the pipe opening left open, and
- with the pipe opening sealed closed.

The results show that when both sections of the enclosure are used and the pipe opening is sealed closed, this produced the greatest noise reduction. This is calculated to be an 18 dB noise reduction when averaged across each measurement direction.

Koikas Acoustics Pty Ltd



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