

THE LEVEL OF NOISE POLLUTION IN UNIVERSITY CAMPUSES ADMINISTERED BY THE UNIVERSITY OF 1 DECEMBER 1918 IN ALBA IULIA

Elena MARICA

University of 1 December 1918 in Alba Iulia
e-mail: elenamarica93@yahoo.com

ABSTRACT

Sound pollution is becoming a major problem because of multiplying sources of noise. In this study, I will present the results of the noise measurements carried out in the four campuses of the 1 Decembrie 1918 University in Alba Iulia. Initially the noise level was measured at several points in the university campuses and the main sources of noise were identified. Finally, solutions have been sought to mitigate noise so that noise levels remain below the maximum allowable limits in order to create normal learning and resting conditions for students staying in these campuses.

KEYWORDS: noise pollution, noise level measurement

1. Introduction

Noise is derived from the Latin word "nausea" implying 'unwanted sound' or 'sound that is loud, unpleasant or unexpected' [1].

Sound pollution is a component of environmental pollution. Noise sources divide into 2 categories of natural noise sources and artificial sources of noise generated by people's activities.

Sound pollution is a threat to quality of life. It is more severe and widespread than before and will continue to grow in intensity due to population growth, industry development and road, air and rail traffic, thus becoming a major issue in all major cities in the world [2].

According to the World Health Organization, seven major effects of noise pollution were identified: Hearing Impairment, Interference with Spoken Communication, Sleep Disturbances, Cardiovascular Disturbances, Disturbances in Mental Health, Negative Social Behavior and Annoyance Reactions [3].

2. Materials and methods

We have measured the level of noise pollution in the four student dormitories administered by 1 Decembrie 1918 University in Alba Iulia.

For this project, we used a portable 2250 acoustic analyzer, Brüel & Kjær. This portable analyzer is the most widely used tool for noise

measurements. It has several advantages compared to other measuring instruments: it is efficient, easy to handle, has a large memory, the data is saved on the inter card and can be transferred to the computer, it simultaneously measures several parameters like: LAF – the instantaneous 'A' frequency-weighted and 'F' time-weighted sound pressure level; LAFmax – the maximum 'A' frequency-weighted and 'F' time-weighted sound pressure level detected during a measurement; LAeq – the 'A' frequency-weighted equivalent continuous sound pressure level, that is, the average level representing the same energy as the measured fluctuating levels.

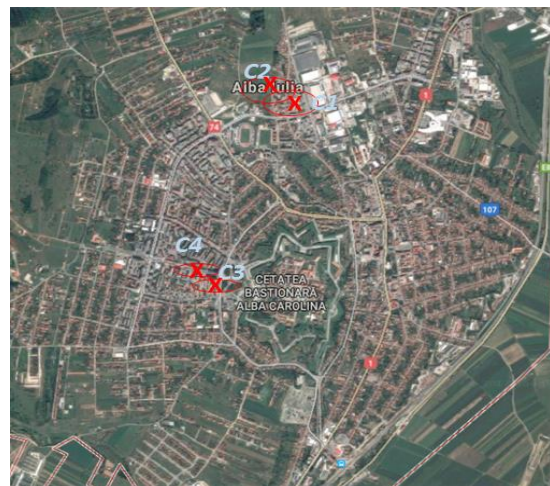


Fig. 1. Campuses location

Student hostels 1 and 2 are located on Vasile Alecsandri Street, and the 3 and 4 Suden Rooms are located on Vasile Goldiș Street. As can be seen in Figure 1, Campuses are numbered from C1 to C4.

I made noise measurements at two different times of the day, in the morning (between 08:30 - 10:00) and in the evening (between 20:00 and 22:00). Measurement time was 5 minutes, and this operation was repeated 2 times for greater accuracy of the results, then the average of the 2 results. The sonometer was seated at a height of 1.20 m.

3. Results and discussions

In the following Tables, the results of the values recorded during the measurements in the four campuses are presented.

In Figure 2 it can be seen the difference between the maximum admissible value and the noise level recorded on campus1.

Noise is produced by sources inside the campus, but also outside the campus. The main sources of noise inside the campus are: doors, parties, and secondary sources are: washing machine, students' dialogues, home appliances, audio devices. The main source of noise outside the campus is traffic, followed by various industrial activities taking place around campuses.

It can be seen from the tables that the noise level at one time exceeds the value of 50 dB, i.e. the maximum allowable limit. There are solutions to lessen the noise level so that the noise remains below the maximum allowable value over the longest period of time.

Table 1. Values recorded in campus 1

The selected point	Lecture hall		1st floor hallway		Outside the campus	
	M	E	M	E	M	E
LAeq	49.8	59.6	69.8	72.4	63.5	60.7
LAFmax	67.5	78.9	82.1	93.0	86.2	83.0
LAF90.0	40.6	45.2	50.1	56.0	48.7	47.4
Maximum admissible value	50	50	50	50	50	50

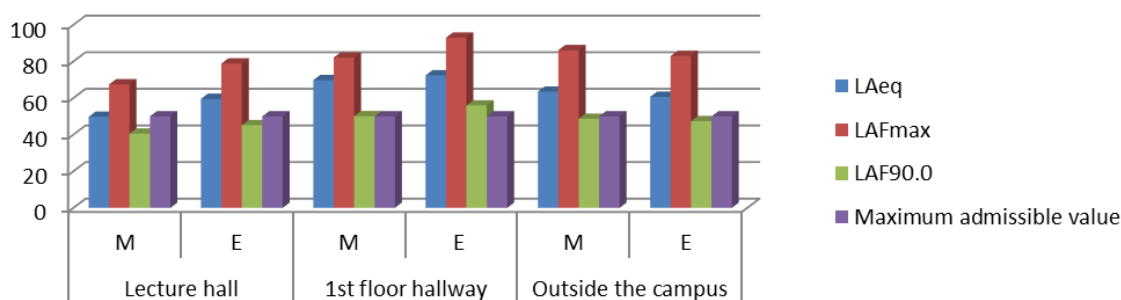


Fig. 2. Values recorded in campus 1

Table 2. Values recorded in campus 2

The selected point	Lecture hall		1st floor hallway		Kitchen		Outside the campus	
	M	E	M	E	M	E	M	E
LAeq	43.8	44.5	62.8	62.2	48.6	49.7	63.5	61.2
LAFmax	57.2	57.9	82.5	83.9	61.0	61.3	83.72	83.0
LAF90.0	39.9	40.1	45.8	46.6	45.9	46.8	45.7	46.8
Maximum admissible value	50	50	50	50	50	50	50	50

Table 3. Values recorded in campus 3

The selected point	Lecture hall		1st floor hallway		Kitchen		Outside the campus	
	M	E	M	E	M	E	M	E
L_{Aeq}	46.6	37.0	43.5	46.5	48.6	47.5	54.3	52.8
L_{AFmax}	67.2	52.6	60.9	60.6	72	71.8	65.6	70.3
L_{AF90.0}	34.3	30.2	36.8	41.6	40.0	42.2	47.1	45.0
Maximum admissible value	50	50	50	50	50	50	50	50

Table 4. Values recorded in campus 4

The selected point	Lecture hall		1st floor hallway		Kitchen		Outside the campus	
	M	E	M	E	M	E	M	E
L_{Aeq}	45.1	45.3	51.1	54.7	62.4	63.8	54.8	53.4
L_{AFmax}	60.2	71.2	74.0	80.2	82.1	81.5	66.3	61.9
L_{AF90.0}	34.1	33.1	40.3	43.9	46.9	49.2	44.0	44.9
Maximum admissible value	50	50	50	50	50	50	50	50

To reduce the noise on campuses, the following are proposed: weather-strips - to reduce the noise produced by the doors; regulation - to reduce the noise made by students; sound absorbing panels - to reduce noise on the propagation path., tree fences- to reduce the noise from outside the campus.

4. Conclusions

From the above we can conclude that in the 4 campus the noise level of 50 dB is overcome due to both external and internal sources.

The highest value recorded as a result of noise measurements was obtained in campus 1. The maximum admissible value by 43 dB was exceeded, the recorded value being 93 dB. The lowest value was obtained on campus 3. The sonometer recorded a value of 30.2 dB.

If we rank the campuses according to the recorded noise level, we will get the following ranking: campus 1 (the noisiest campus), campus 2, campus 4 and campus 3 (the least noisy campus).

By intervening with methods to combat noise pollution, the level of noise identified in student dormitories can be significantly diminished so that students are offered optimal study and rest conditions.

References

- [1]. Narendra Singh, Davar S. C., *Noise Pollution-Sources, Effects and Control*, J. Hum. Ecol., 162, p. 181-187, 2004.
- [2]. Lisa Goines, Louis Hagler, *Noise Pollution: A Modern Plague*, Southern Medical Journal, vol. 100, p. 287-294, 2007.
- [3]. Berglund B., Lindvall T., *Community Noise*, Archives of the Center/or Sensory Research, 2:1-195. This document is an updated version of the document published by the World Health Organization in 1995.