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CONSIDERATIONS REGARDING STREET WORKS IN CLUJ-NAPOCA MUNICIPALITY

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Abstract: *This paper presents a case study, in terms of replacing a gas pipe on a street in the city of Cluj-Napoca. In the paper to make a comprehensive study, the street works, taking place in a given preset location. The paper is occasional and unfold is due to gas leaks, which have been found as a result of maintenance verification. Through this work is watch to be establish, how they are respected the particulars given by the standards on sound pollution in urban agglomeration.*
Key words: *street work, sound pollution, urban agglomeration*

1. INTRODUCTION

Noise pollution (soundtrack) is an important component of environmental pollution and harmful nature and by its presence in all the compartments of modern life. Noise pollution constitutes a major problem for all developed countries or developing countries [1], [2]. Noise pollution means the aggression continues, driven by different noises produced by cars, machinery, household appliances, industrial or in the premises or outside proffesionals.

Taking into account all the aspects presented above, in the paper to make a comprehensive study, the street works, in a given preset location. The paper is occasional and unfold is due to gas leaks, which have been found as a result of maintenance verification. Through this work, is watch to be establish, how they are respected the particulars given by the standards on sound pollution in urban agglomeration [3].

2. IDENTIFICATION OF NOISE SOURCES

For carrying out the works of intervention at a gas pipe on a strreet from Cluj-Napoca municipality, was used an excavator (fig. 1), which is equipped with a pneumatic hammer (fig. 2).

Fig. 1. Excavator with the pneumatic hammer

Fig. 2. Pneumatic hammer device

2.1. Sound Pressure Indications

Sound pressure marking is provided both on the excavator and the pneumatic hammer, they

are shown in figures 3 and 4. All together, there are provisions for a mark of CE given by the manufacturer, which is rendered in the next figure (fig. 5).

Fig. 3. Sound pressure marking of excavator

Fig. 4. Sound pressure marking of pneumatic hammer

Fig. 5. CE marking on the excavator

2.2. Measurements Location

The measurements were performed in the city of Cluj-Napoca, Islazului Street, due to interventions by the excavation for the purpose of replacement of a gas pipeline, which has been broken.

2.3. Measurements Device

The measuring device has been established as soundmeter, named NL32, produced by the Japanese company RION. It was set to record a continuous acoustic pressure level, type "A". Graphical representation was made with the specialized system NL-PB1.

3. MEASUREMENTS. REPRESENTATIONS. ANALYSIS OF NOISE CAUSED BY MACHINERY.

The measurements were carried outside. Have been conducted three sets of measurements for excavator: in front, behind it and in right. As it has done and for the pneumatic hammer. The duration of each measurement was 10 seconds.

Measurements were made at the height of 1.50 m above ground (at the level of the human ear) about 2-3 m of equipment. The machine in time have ongoing action to excavation; and the number of measurements made in every place there were six in number. Values recorded refer to the following indicators:

- Sound pressure level (L_p);
- Equivalent sound pressure level (Lp_E);
- Maximum sound pressure level (Lp_{max});
- Minimum sound pressure level (Lp_{min});
- Percentage sound pressure level (L_N)- Lp05,Lp10, Lp50, Lp90, Lp95;
- Equivalent “C” continuu sound pressure level (Lc_{eq});

3.1. Measurements of noise levels produced by the excavator

The results of the measures undertaken are centalizate in table 1.

The representation of each noise levels are given in the representations noted with 6, for Lp, 7 for LpE, 8 for Lpmax, and 9 for Lpmin, given by the excavator.

Table 1.

Measurements noise levels produced by the excavator [dB]

Place the measurement	Number of the measurement	Day	Time	Lp	LpE	Lpmax	Lpmin	Lp05,	Lp10,	Lp50,	Lp90,	Lp95	LCeq
in front of the excavator	1	19.04.2016	14:55:32	94.0	104	95,4	93,3	95,3	95,3	93,6	93,4	93,4	92,3
	2	19.04.2016	14:55:42	93.6	103.6	93.9	93.3	93.8	93.7	93.5	93.4	93.3	92.0
	3	19.04.2016	14:55:52	93,9	103,9	94	93,6	93,9	93,9	93,8	93,7	93,7	92,3
	4	19.04.2016	14:56:02	93,9	103,9	94,1	93,6	94	93,9	93,8	93,7	93,7	92,3
	5	19.04.2016	14:56:12	93,4	103,4	93,9	93,2	93,8	93,7	93,3	93,3	93,3	91,8
	6	19.04.2016	14:56:22	93,2	103,2	93,5	93	93,4	93,4	93,2	93	93	91,7
sideways to the right excavator	7	19.04.2016	14:56:53	93,2	103,2	93,6	92,9	93,3	93,3	93,1	93	93	91,7
	8	19.04.2016	14:57:03	93,5	103,5	93,8	93,3	93,7	93,7	93,5	93,4	93,3	92
	9	19.04.2016	14:57:13	93,4	103,4	93,7	93,2	93,6	93,5	93,3	93,2	93,2	91,9
	10	19.04.2016	14:57:23	93,5	103,5	93,8	93,2	93,8	93,7	93,5	93,3	93,3	92
	11	19.04.2016	14:57:33	93,2	103,2	93,3	92,9	93,3	93,2	93,1	93	93	91,6
	12	19.04.2016	14:57:43	93,1	103,1	93,3	92,7	93,2	93,2	93,1	92,8	92,7	91,5
behind the excavator	13	19.04.2016	14:57:58	93,2	103,2	93,4	93	93,3	93,3	93,2	93	93	91,6
	14	19.04.2016	14:58:08	93,3	103,3	93,4	92,9	93,4	93,3	93,2	93,1	93	91,7
	15	19.04.2016	14:58:18	93,3	103,3	93,5	93,1	93,4	93,4	93,3	93,2	93,2	91,8
	16	19.04.2016	14:58:28	93,2	103,2	93,3	92,9	93,2	93,2	93,2	93,1	93	91,6
	17	19.04.2016	14:58:38	93,1	103,1	93,2	92,9	93,1	93,1	93	93	93	91,5
	18	19.04.2016	14:58:48	93,5	99,5	93,9	92,9	93,8	93,8	93	93	93	92

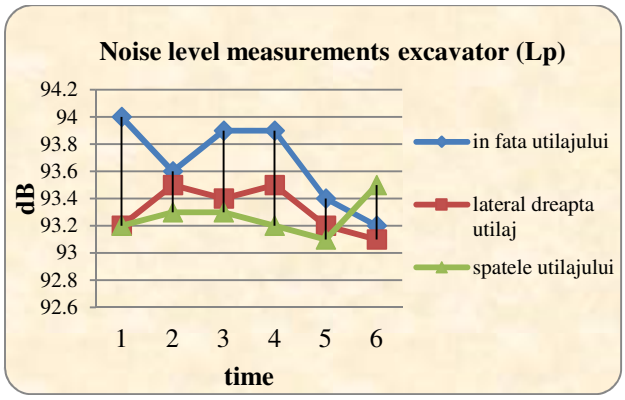

Fig. 6. Noise level measurement excavator for Lp

In the figure 6 can be observe that the noise level in the front (blue color) of the excavator is greater than the values recorded for the right side (red color), and behind the excavator (green color).

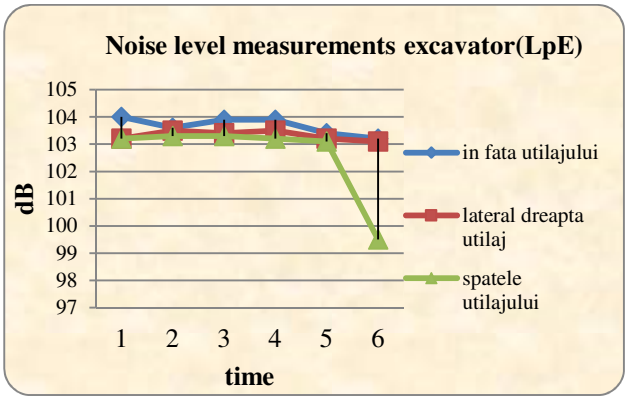

Fig. 7. Noise level measurement excavator for LpE

In the figure 7 all the measurements for the noise levels are situated above the indicated

values of 102 dB (A) for the all the positions of the human operator with the measurement device.

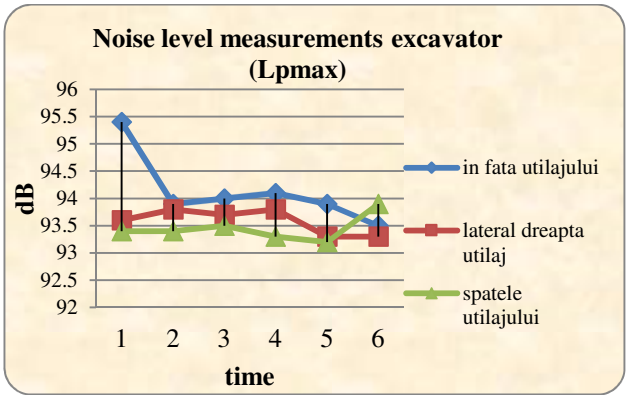

Fig. 8. Noise level measurement excavator for Lpmax

In the figure 8 all the measurements for the noise levels are situated above the indicated values of 102 dB (A) for the all the positions of the human operator with the measurement device. The value of noise in front of excavator (blue color) has and 95.5 dB, that it is a very great value for the working day in the urban agglomeration.

In the figure 9 all the measurements for the noise levels are situated above the indicated

values of 102 dB (A) for the all the positions of the human operator with the measurement device.

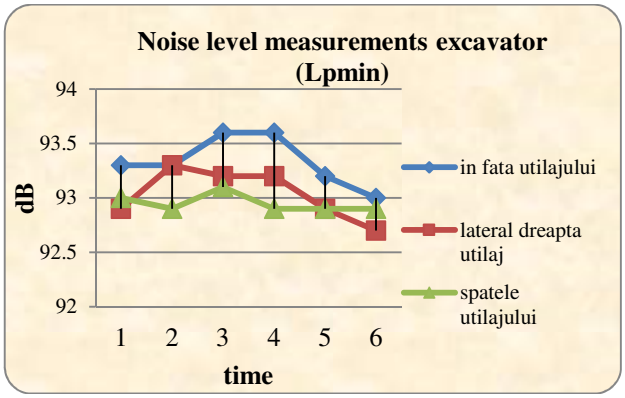

Fig. 9.

Fig. 9. Noise level measurement excavator for Lpmax

3.2. Measurements of noise levels produced by the pneumatic hammer

The results of the measures undertaken are centalizate in table 2.

The representation of each noise levels are given in the representations noted with 10, for Lp, 11 for LpE, 12 for Lpmax, and 13 for Lpmin, given by the excavator.

Table 2.

Measurements noise levels produced by the excavator [dB]

Place the measurement	Number of the measurement	Day	Time	Lp	LpE	Lpmax	Lpmin	Lp05,	Lp10,	Lp50,	Lp90,	Lp95	LCeq
in front of the pneumatic hammer	1	19.04.2016	15:25:24	109,5	107,9	109,5	107,8	108,7	108,5	108,6	109,1	108,4	107,8
	2	19.04.2016	15:25:34	109,1	108,2	109,1	107,5	108,8	108,7	108,5	108,4	108,3	107
	3	19.04.2016	15:25:44	109,2	108,1	109,2	107,5	108,9	108,8	108,8	108,7	108,7	107,5
	4	19.04.2016	15:25:54	109,2	108,2	109,2	107,5	109	108,9	108,8	107,5	108,9	108,8
	5	19.04.2016	15:26:04	109,5	108,5	109,5	107,9	108,8	108,7	107,9	108,9	108,8	108,8
	6	19.04.2016	15:26:14	109,6	108,6	109,6	108	108,4	108	108,5	108,2	108,3	108,5
sideways to the right pneumatic hammer	7	19.04.2016	15:27:37	108,9	107,8	108,9	107,8	108,3	108,3	108,2	108,3	108,3	108,5
	8	19.04.2016	15:27:47	108,7	108,2	109,1	107,9	108,7	109,1	108,4	108,3	108,5	107,9
	9	19.04.2016	15:27:57	108,6	107,9	108,9	107,5	108,6	108,5	108,6	108,9	108,8	107,5
	10	19.04.2016	15:28:07	108,7	107,8	108,7	107,8	108,3	108,7	108,3	108,5	107,9	107,8
	11	19.04.2016	15:28:17	108,5	108,5	108,5	107,8	108,2	108,2	108,3	108,5	107,9	107,8
	12	19.04.2016	15:28:27	108,4	108,5	108,5	107,8	108,2	108,3	108,5	107,9	107,8	107,8

behind the pneumatic hammer	13	19.04.2016	15:29:01	108,1	107,8	108,9	107,5	108,3	108,3	108,7	108,9	108,8	107,5
	14	19.04.2016	15:29:11	108	107,9	108,6	107,8	108,4	108,3	108,3	108,5	108,6	107,8
	15	19.04.2016	15:29:21	108	107,8	109,1	107,8	108,4	108,4	107,8	108,7	109,1	108,7
	16	19.04.2016	15:29:31	108	107,9	108,9	107,8	108,3	108,5	107,9	107,8	108,9	108,5
	17	19.04.2016	15:29:41	108,1	107,8	108,9	107,5	108,1	108,1	108,5	108,9	108,8	107,5
	18	19.04.2016	15:29:51	108,2	107,6	108,3	107,2	108,3	108,2	107,5	108	107,8	107,2

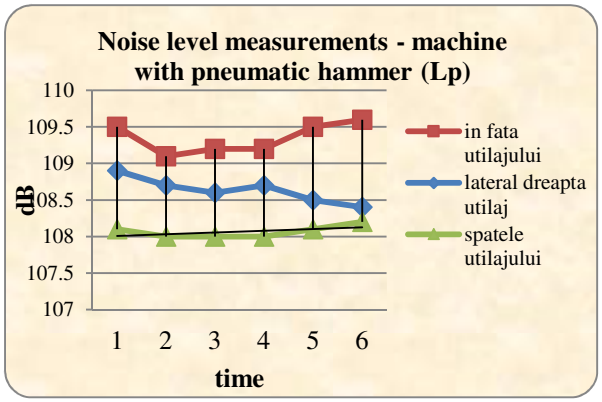

Fig. 10. Noise level measurements - machine with pneumatic hammer (Lp)

In the figure 10 can be observe that the noise level in the front (blue color) of the excavator is greater than the values recorded for the right side (red color), and behind the excavator (green color).

All the measurements for the noise levels are situated under the indicated values of 110 dB (A) for the all the positions of the human operator with the measurement device.

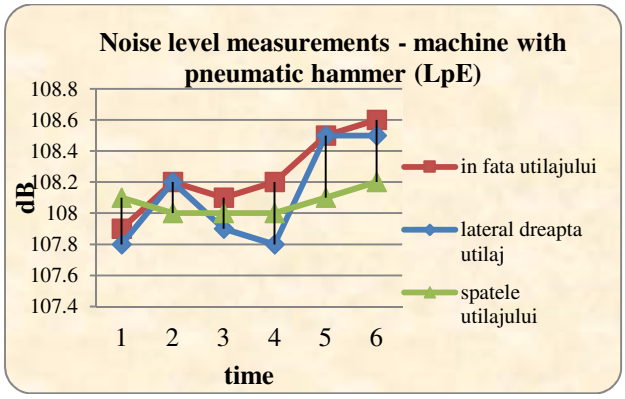

Fig. 10. Noise level measurements - machine with pneumatic hammer (Lp)

All the measurements (fig. 11) for the noise levels are situated under the indicated values of 110 dB (A) for the all the positions of the human operator with the measurement device.

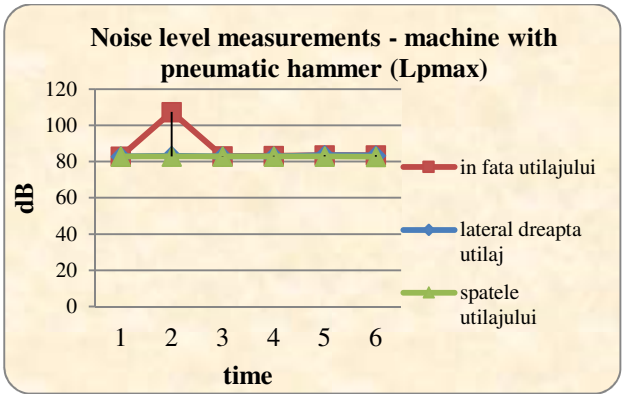

Fig. 12. Noise level measurements - machine with pneumatic hammer (Lpmax)

All the measurements (fig. 12) for the noise levels are situated under the indicated values of 110 dB (A) for the all the positions of the human operator with the measurement device.

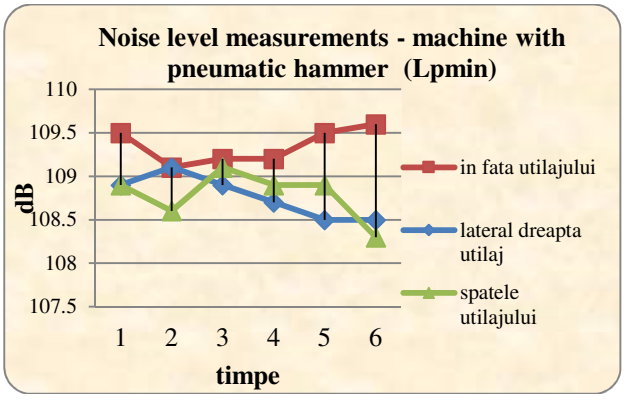

Fig. 13. Noise level measurements - machine with pneumatic hammer (Lpmin)

All the measurements (fig. 13) for the noise levels are situated under the indicated values of 110 dB (A) for the all the positions of the human operator with the measurement device.

4. CONCLUSIONS

Measurements of noise made on a machine working in the urban area, for occasional intervention, due to a leaking gas pipe type, it is noticed that:

- machine has two working devices:
  - with the escavator;
  - with the pneumatic hammer.
- The sound level is exceeded (102 dB) for the machine equipped with the escavator in three positions for measurement and is greater in front of machine;
- Utilajul prevazut cu ciocan pneumatic in timpul functionarii, nu depaseste valoarea prescrisa de 110 dB (A).

5. BIBLIOGRAPHY

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Consideraţii asupra lucrărilor stradale în municipiul Cluj-Napoca

Rezumat: *Lucrarea prezintă un studiu de caz, în ceea ce priveşte inlocuirea unei ţevi de gaz, pe o stradă din municipiul Cluj-Napoa. In lucrare se face un studiu complex, asupra lucrarilor stradale, ce se desfasoara intr-o locaţie bine stabilită. Lucrarea este ocazională şi se desfăşoară datorită unor scurgeri de gaze, ce s-a constatat în urma verificărilor de mentenanţă. Prin această lucrare se urmăreşte să se stabilească modul în care se respectă indicaţiile date de standardele in vigoare privind poluarea sonoră în aglomerările urbane.*

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