

PROTECTION OF RESIDENTIAL BUILDINGS FROM THE NOISE OF THE UNDERGROUND SUBWAY

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Annotatsiya. Ushbu maqola Toshkent shahridagi yer usti metro liniyalarida poyezdlar harakatining shovqinini turar-joy binolariga ta'sir etishi va uni hal etishga qaratilgan.

Kalit so'zlar: shovqin, shovqindan himoya qilish, yer usti metrosi, quvvat, ekran, ko'kalamzorlashtirish.

Аннотация. Данная статья посвящена влиянию шума движения поездов на жилые дома на линиях метрополитена города Ташкента и его решению.

Ключевые слова: шум, шумозащита, метрополитен, мощность, экран, благоустройство.

Abstract. This article focuses on the impact of train traffic noise on residential buildings on the underground metro lines in Tashkent city and its solution.

Key words: noise, noise protection, subway, power, screen, landscaping.

A modern developed city cannot be imagined without transport infrastructure. Increasing comfort for people, while transport plays a key role, has a negative impact on the environment. Especially high-frequency noise disturbs city dwellers. Protecting residents from increased noise is primarily to protect their health. Noise primarily affects the hearing organs, in addition, noise has a negative effect on the central nervous system, causes defects in the respiratory system, disrupts the cardiovascular system and metabolism, contributes to the development of stomach ulcers and hypertension. In this regard, it is urgent to carry out research on the protection of residential buildings from the noise of high metro traffic. The emergence of an underground subway in Tashkent and mass constructions near the underground subway contribute to this.

Noise reduction in elevated subways can be achieved primarily by reducing noise in subway trains. However, with the trends of increasing engine power, increasing running speed, and reducing train spacing, the relative reduction in subway noise is unlikely to result in a significant reduction in subway train noise. In addition to the development of measures to reduce noise sources, there is also the problem of combating the noise emitted by surface metro trains to the population. The solution to this problem should be carried out through the general urban development measures implemented in the design of the master plans of cities, detailed planning of residential areas and development of microdistricts, as well as through the development of special devices that isolate, absorb and protect against noise.

Noise regulation

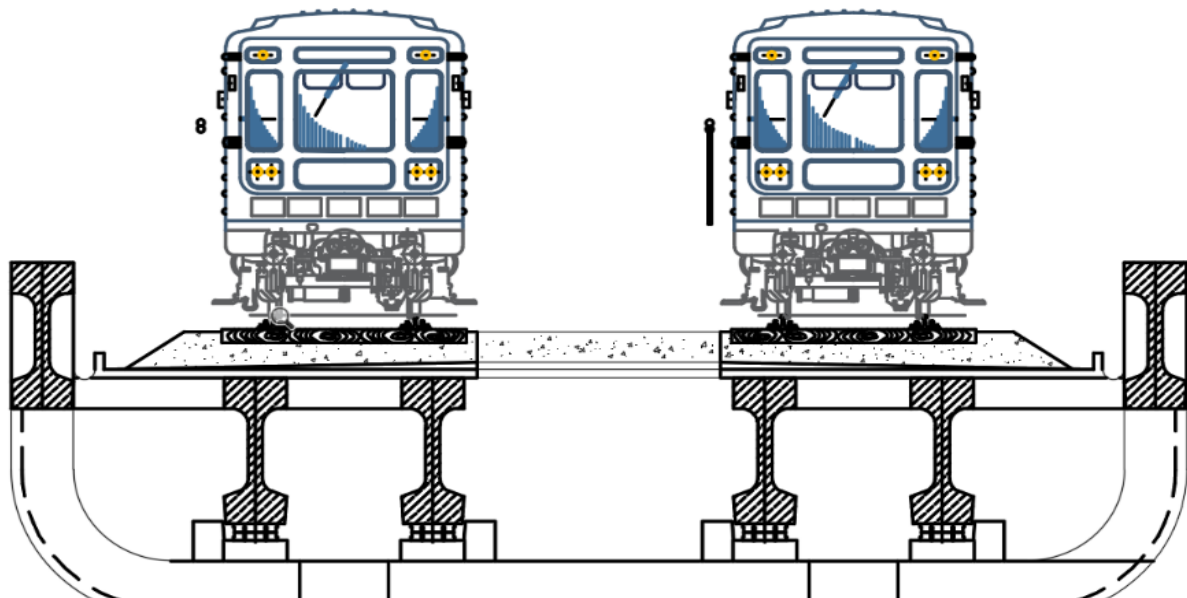
Permissible sound pressure levels, sound levels, equivalent and maximum sound levels in accordance with KMK 2.01.08-19

Research object

A residential building under construction (Yashnobad district, Parkentskaya Street) was chosen as the research object. The building has 12 floors and is located 25 m from the underground metro line, without closed structures. The study was carried out in accordance with QMQ 2.01.08-19 "Noise protection" on the 3rd floor, 1.5 m above the level of the subway line, at a distance of 2 m from the building. Measurements were made during the day in the octave frequency range from 31.5 Hz to 8000 Hz according to the state standard.

Research result

Designation of rooms or areas	Day time, hour	Sound pressure levels (equivalent sound pressure levels) in octave bands with geometric mean frequency (Hz), dB									Maximum sound level LAmax, dBA
		31,5	63	125	250	500	1000	2000	4000	8000	
Areas directly adjacent to residential buildings, holiday homes, nursing homes for the elderly and disabled	7.00-23.00	90	75	66	59	54	50	47	45	44	70



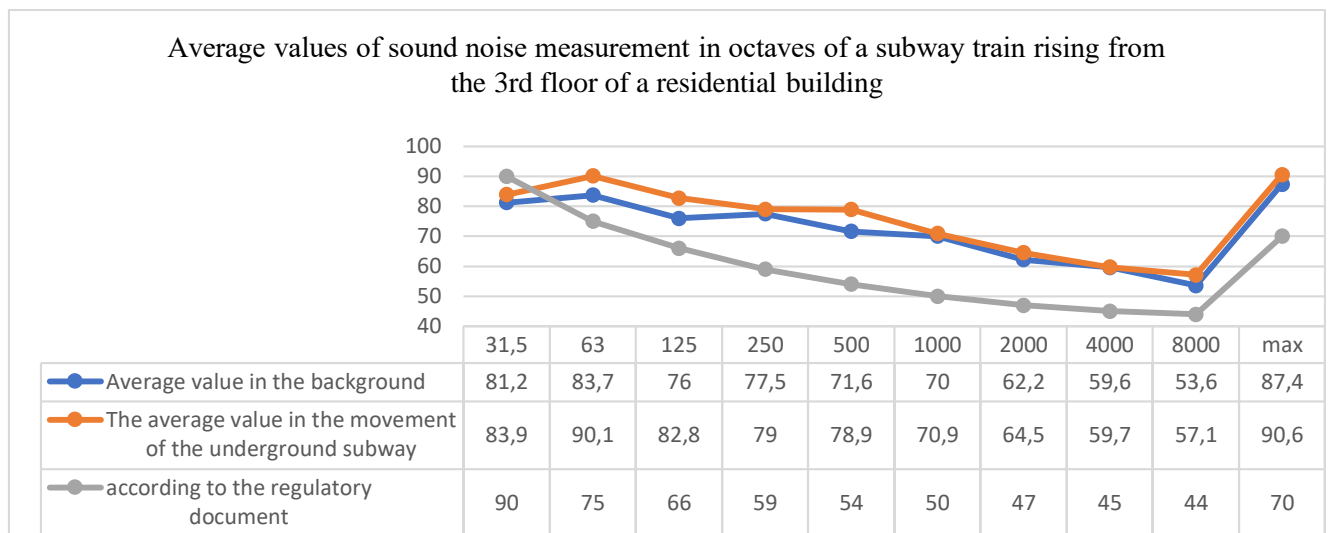


Figure 1. Spectra of frequency characteristics of sound pressure level of noise from underground metro transport

The results of the noise measurement are shown in Figure 2. As can be seen from the figure, the obtained sound pressure levels are 31.5; 63; 125; 250; 500; 1000; 2000; 15.1 above the standard sound pressure level when the underground subway is moving at frequencies of 4000 and 8000; 16.8; 20; 24.9; 20.9; 17.5; 14.7; increases by 13.1 dB. The maximum sound level increases by 20.6 dB. Even the background value of the sound pressure level is 8.7-20 dB higher than the standard values.

Summary

Figure 2. Overground subway canvas cutting

Thus, as a result of the research, in order to reduce the noise affecting the buildings from the movement of the underground subway, it is recommended to use panels made of lightweight concrete, the ribs of which are bent to the bottom, at the border of the train line. I think that it should look like this.

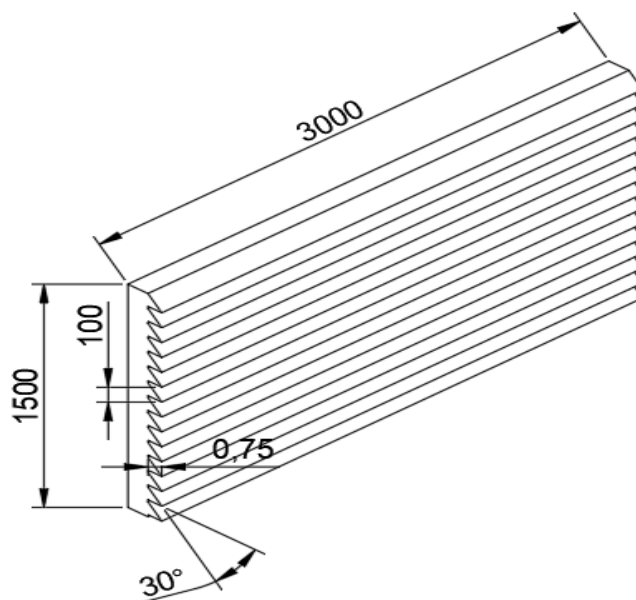


Figure 3. Light concrete panel

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