KMITL ENGINEERING PROJECT DAY 2020

IMSE_Y4_03

Department of Computer Engineering (Music Engineering and Multimedia)

Acoustic Treatment of KMITL Band's Rehearsal Room

Kontorn Leekpai [1], Panut Mayurapuk [2], Somchot Anamnart[3], Hans Amornmettachit[4], Kajornsak Kittmathaveenan[5] , and Phonlasit Thinnakorn na Ayutthaya[6]

Abstract

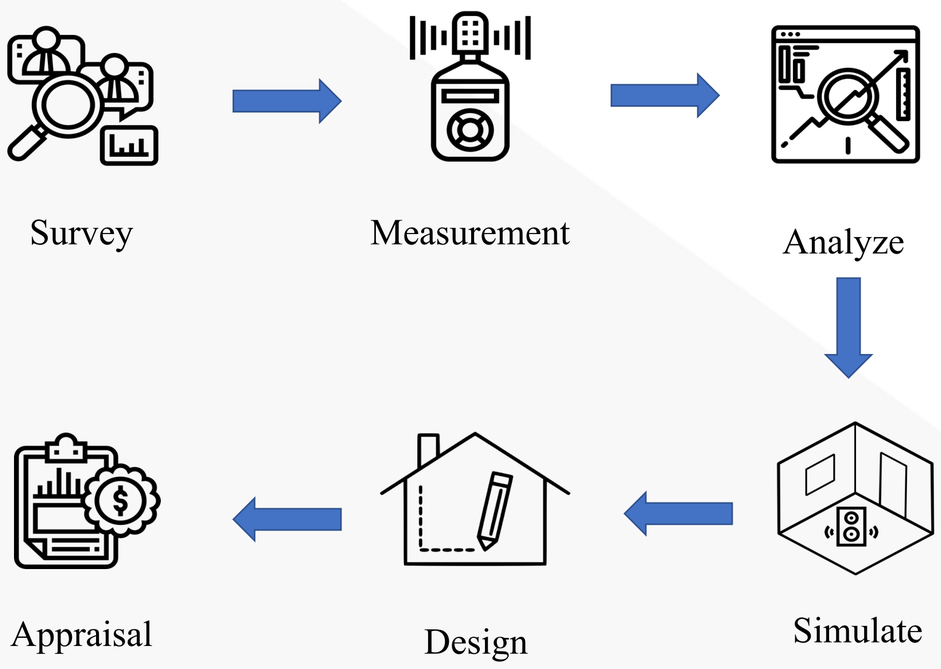
In this project, the aim is to improve the acoustics of the KMITL Band rooms by investigating problems from users and observing the initial observations that the room has a considerable amount of noise problem. And there is still a lot of noise from outside therefore, we measure acoustic value such as RT60, Noise Reduction, Noise Floor in the room were analyzed to find room problems and design, revised the room, and simulate the design results with the simulate program to get the best solution that meets the intended purpose and proposes a room solution design to be a plan to continue in the future.

Introduction

The KMITL Band's room, it's multipurpose room under the grandstand. There is ceiling look like staircase. Walls are cement.

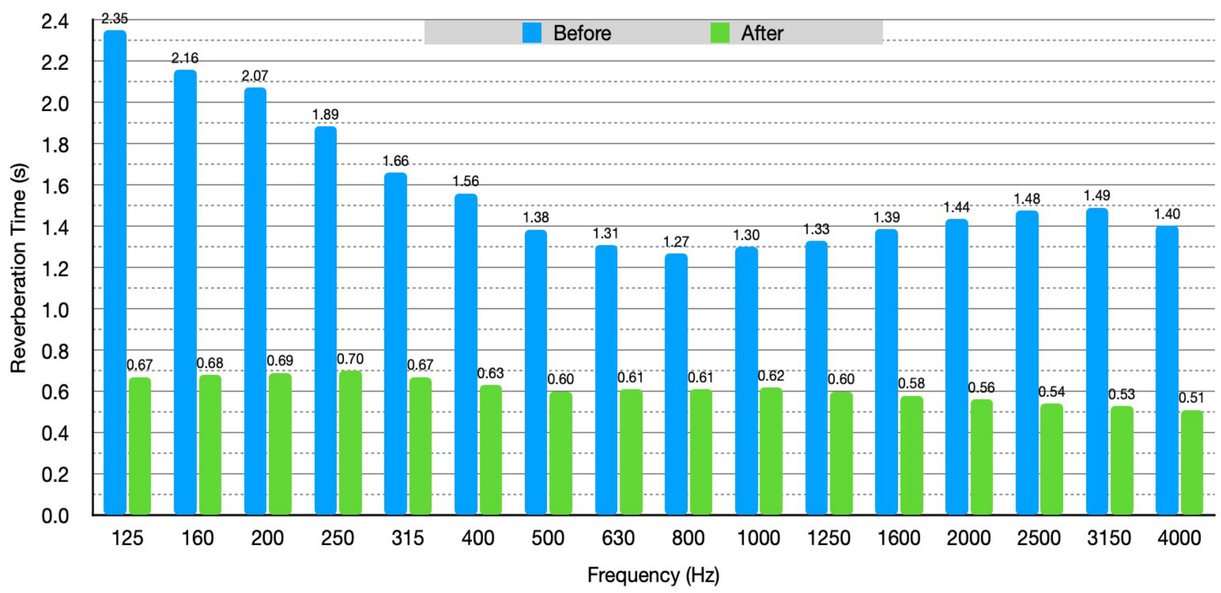
Due to its location near the stadium so too much noise come from outside. There was also a problem with the echo in low frequency. And collected problems from observations and inquiries. So, we must design improvement plans for KMITL Band's room that able to rehearsal room and recording.

Methodology



1. Survey to find the problem of the room initially.
2. Measurement of various acoustic values Noise floor, RT_{60} and Noise Reduction.
3. Analysis of problems from the measured values found that the room have many problems and the worst problem is too much low frequency in range 125-400Hz.
4. Simulate by using Ease program to guess acoustic values after the designing for getting the precision in solving the problem.
5. Design the KMITL Band room and use the materials that have simulated in the program.
6. Estimates the cost of various absorber materials according to designing.

Results



Average RT60 values after designing is 0.58 second that decrease from 1.79 second and all frequency have similar value so RT60 values after design is in good criteria for rehearsal room and recording room.

Conclusion

We have improved the KMITL band room for better usability, which is renovating a new room with various absorber materials installed to get a better rehearsal room according to the purpose of use from the user by designing and correcting the acoustics of the room making it work more efficiently than ever before.

Wherewith designed for problem solving of RT60 values, which a low range that exceeds the standard. The values were obtained, the mean RT60 was 0.58 s and RT60 each frequency is in the range of 0.5-0.7 seconds. Which is considered standard for the rehearsal room and can be record audio, which estimated the price at about 40,000 baht, which is considered inexpensive Therefore, improving KMITL band room to meet the purpose of use of the room.

Resulting in efficiency in use can practice music and hear a clearer sound and can be able to record as a studio

References

NTI Audio. Reverberation Time RT60 Measurement. Retrieved September 7, 2020,from <https://www.ntiaudio.com/en/applications/roombuildingacoustics/reverbera tiontime-rt60- measurement>

Maple Integration. (2562). Sound transmission loss, TL. Retrieved September 12, 2020, from <http://mapleintegration.com/sound_transmission2.php>

Bass trap absorption coefficient and price. Retrieved December 10, 2020, from <https://gikacoustics.eu/product/gik-acoustics-tri-trap>

Acoustic board Cylence Zoftone W050M absorption coefficient and price.Retrieved December 10, 2020, from <https://www.onestockhome.com/th/sound- insulation>

kajornsak.ki@kmitl.ac.th , phonlasit.th@kmitl.ac.th