

## **Review of PhD thesis**

**Candidate's name: mgr. Barbara Mateuszów**

**Thesis title: Wpływ wysokiego budynku na drgania podłoża w jego otoczeniu**

I was invited to prepare a review on the above-mentioned PhD thesis of mgr. Barbara Mateuszów by letter of the Dean Prof. dr hab. L. Marynowski dated March 24, 2020.

Main topic of the thesis is detailed study of evoked frequencies of selected buildings and in their surroundings. The submitted thesis contains a total of 125 pages including 14 tables and 53 pictures.

Submitted PhD thesis was divided into obvious main parts, i.e. introduction, literature search, definition of main and partial aims of the thesis, definition of used methods and instrumentation, experimental field measurements, and discussion of obtained results. Literature search is extensive material that documents very good orientation of candidate in the given problem, i.e. site effect and related topics. Selected aims of the thesis are current topics that are under attention of seismologists and civil engineers.

Measured data represent good material for detailed interpretation. Used interpretation methods and methodologies (HVSr, HHSr) are suitable selected and obtained results are realistic. Analysis of data and discussion of results of individual localities represent good base for following study, e.g. numerical modelling. Conclusions in the individual locations (chapter 10) summarize results of seismic data analysis; common conclusions are presented in chapter 11. Generalization of obtained results is presented in chapter 12.

Notes/remarks:

The literature search is partly confusing because some parts (probably from different sources) are unnecessarily repeated. Conversely, some parts are condensed too much and do not include "all essential".

The chapter describing the parameters of the used apparatus is too brief.

The use of mean values and absolute errors is not appropriate in some places because it does not represent the desired result (e.g. pages 66 or 92).

Figures 37 and 38 do not have a good resolution, the conclusions are not detectable. Curves are not described in the spectra ratio figures.

In the thesis based on experimental measurements, I expect a large set of measured data and intermediate results (wave patterns, spectra) or at least examples. This is very missing in the thesis, which does not allow for example to assess the quality of records or calculations, it does not enable to study used interpretation and measurement methods.

Confrontation of peaks in spectral ratios and local geology (only from the description of rock type) can lead to completely misleading results. Physical parameters of quasi-homogeneous rock blocks in the surroundings of the measured points allow for better interpretation.

Only minor errors are in the thesis.

Questions to candidate:

What would be the appropriate measurement methodology for locations where the spectral peaks, representing the response of the rock mass and the building, are close to each other in order to interpret this?

“Novelty” of the thesis is confrontation of the HVSR and HHSR ratios. What is better solution for evaluation of resonant frequency of building?

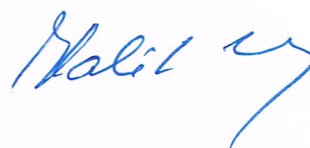
Results of seismic interpretation have significant uncertainty in the weather condition. How will be possible to decrease this uncertainty, e.g. the mean value of the wind force is certainly not a representative value?

Summary

The thesis demonstrates knowledge of literature relevant to the field to which it belongs. This PhD thesis is sufficient, all aims and studied topics are described in details with many references and foundations, and it document good knowledge of the candidate in given topic. My recommendation for future research: Numerical modelling.

**I am satisfied that mgr. Barbara Mateuszów met all needs according to the Polish law and regulations. I recommend mgr. Barbara Mateuszów for obtaining PhD degree.**

Ostrava, April 15, 2020



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