

**REVIEWER'S FORM
for thesis evaluation**



1. Identification of the student

Student:	Safa'a Joudeh
Thesis:	Static Assessment of Judith Tower in Prague
1 st Institution:	Universidade do Minho
2 nd Institution:	Czech Technical University in Prague
Academic year:	2022/2023

2. Identification of the reviewer

Name:	Doc. Ing. Eva Burgetová, CSc.
Institution:	Czech Technical University in Prague
Position:	Associate Professor

3. Fulfillment of thesis goals

excellent	x	above aver.	<input type="checkbox"/>	average	<input type="checkbox"/>	below aver.	<input type="checkbox"/>	weak	<input type="checkbox"/>
Comments:									
The goal of this study is to find out the cause and impacts of structural cracks obtained from visual inspections by help computational methods.									
Two different analyses were performed. Primarily, the eigenvalue analysis was adopted to calibrate the building stiffness by comparison of the building's experimental and numerical natural frequencies. Afterwards the values obtained from standards and the dynamic analysis are compared. The obtained results lead to recommendations how to proceed with the similar situations.									
The objectives were met.									

4. Academic/scientific/technical quality

excellent	x	above aver.	<input type="checkbox"/>	average	<input type="checkbox"/>	below aver.	<input type="checkbox"/>	weak	<input type="checkbox"/>
Comments:									
The diploma works is divided into 7 chapters and 3 annexes:									
1-3 Introduction, describing the tower and historical survey,									
4 – Visual inspection and damage survey,									

**REVIEWER'S FORM
for thesis evaluation**



5 – Geometry idealization and material characteristics,

6 – Linear analysis,

7 – Conclusion and recommendations.

Annex A – covers geometry and positions of cracks in great details

Annex B – detailed evaluation and description of the cracks is accomplished with the photographic documentation

Annex C – deals with categorization of stone defects and their causes, detailed description of intervention

Very interesting is the comparison of the FEM results using 2D elements (model M1) and 3D elements (model M2) both in the forming of the model and in the results. The difference between the models is shown in p. 46. The building was modelled in six basic units of the Dlubal software environment. The resulting mesh of the first model (M1) had roughly a quarter of finite elements in comparison with the model M2.

Also of notes is:

- Material characteristic – Tab. 6 - The value ($E=2\text{GPa}$) corresponding with regular stone masonry with good bonding (Lourenco & Gaetani, 2022).
- Boundary conditions - the influence of neighbouring structures and the subsoil has been taken into account by means of elastic supports.

The important results:

The tensile stresses obtained from the FEM model corresponded well to the cracks found in the tower structure. Identification of tensile stress concentration points was the main objective of the work and the results can serve as a starting point for a more accurate nonlinear model.

5. Formal arrangement of the thesis and level of language

excellent above aver. average below aver. weak

Comments:

The thesis is written very clearly with many explanatory pictures. The graphic presentation of the design and results is very clear and gives a perfect overview of the design. Some figure descriptions in the Chapter 3 are Czech and English mix.

**REVIEWER'S FORM
for thesis evaluation**



6. Further comments

The processing of the topic shows a very high level of knowledge and skills of the student.
All goals were achieved and showed very good knowledge of giving problems.

Recommended questions for the presentation and defence:

- Methods of monitoring of crack movement (except SHM)
- Chemical analysis of masonry (reasons, aims)

7. Grade: A (excellent)

Use the following scale

A (excellent)	B (very good)	C (good)	D (satisfactory)	E (sufficient)	F (fail)
---------------	---------------	----------	------------------	----------------	----------

Prague

July 17th, 2023

The Reviewer,

Eva Burgetová