

THESIS SUPERVISOR FORM



1. Identification of the student:

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| Student: | Jacopo Scacco |
| Thesis: | Nonlinear numerical evaluation of the bearing capacity and the structure stability of the St. Jacob Church from the Group of Churches |
| 1 st Institution: | University of Minho |
| 2 nd Institution: | Czech Technical University in Prague, Czech Republic |
| Academic year: | 2015/2016 |

2. Identification of the supervisor:

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| Name: | Pavel Kuklík |
| Institution: | CTU in Prague, Faculty of Civil Engineering, Department of Mechanics |
| Position: | Professor, Deputy Chair |

3. General comments

I have been in contact with Mr. Jacopo Scacco since April 2018, it was the date when he actually started his thesis work on “Nonlinear numerical evaluation of the bearing capacity and the structure stability of the St. Jacob Church from the Group of Churches”. The master thesis consists of several parts. In the beginning is briefly described the history of the region and the Broumov group of churches. Then was introduced the St. Jacob Church and its current state. The study was started off by summary of findings from preliminary historical, geotechnical background studies. The main part is focused on the numerical analysis using ATENA 2D finite element (FEM) software, ATENA-Gid FEM software, Geo5 geotechnical FEM software and DIANA 3D FEM software. The software has been used to assess the safety of the church walls with regards to damages it currently faces. Couple calculations were carried out. The first set of models aim to assess the bearing capacity of the enclosure wall, which is the main structural element in the church. He calculated the sufficient bearing capacity for the potential vertical load even with significant unexpected overload, respectively.

The second set of models involve modelling the structure with the subsoil underneath it. The deterioration of both structural components and subsoil were taken into consideration in analysis of the bearing capacity of the structure, estimation of geotechnical parameters and soil-structure interaction modelling. Mr. Jacopo Scacco proposed the repair regime to control the presence of moisture surrounding the church proximity. He suggested different scenarios to explain potential causes of damages. Furthermore, there is proposal on additional tests and monitoring to obtain a more accurate mechanical properties of the wall's constituting materials is elaborated.

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Mr. Jacopo Scacco has proven very good ability to collect, analyze and classify a large amount of diverse information. She carried out the master thesis without significant intervention from me. For me it was the fruitful cooperation on partial solving of the Czech culture heritage preservation and saving.

In general, I can state that Mr. Scacco in his thesis work successfully coped with all tasks assigned to him. I regard Mr. Jacopo Scacco as a diligent and hardworking young professional who is capable to solve advanced tasks related to analysis of monuments and historical constructions. Therefore, I recommend his admission to the state exam and to process the defending act of his thesis.

4. Grade: A (excellent)

Use the following scale

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| A (excellent) | B (very good) | C (good) | D (satisfactory) | E (sufficient) | F (fail) |
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CTU in Prague, Prague

July 17, 2018

The Supervisor, Pavel Kuklík

(type name of the supervisor)