1. Identification of the student

Student: Laird Robert Grayson
Thesis: Renovation of the Former Stables of the CBN in Plasy
1st Institution:
2nd Institution: Czech Technical University in Prague
Academic year: 2023/2024

2. Identification of the reviewer

Name: Radek Zigler
Institution: Czech Technical University in Prague, Faculty of Civil Engineering, Department of Architectural Engineering
Position: Lecturer

3. Fulfillment of thesis goals

 Comments: The submitted thesis focuses on paper analysis of structural damages and concerns related to any general renovation or rehabilitation of the former stables of the CBN in Plasy. It provides suggestions for the repair of those damages, as well as examine the main structure systems of the structure subject to the loading from a more specific design proposal. It also identifies several concerns including issues of salinity in the walls, moisture infiltration, and structural strength deficiencies in the truss system that should be addressed in the renovation. Replaster and soil improvements have been suggested to address the concerns of salinity and water infiltration as well as some new drainage details. New tensile resistance upgrades have also been proposed for the truss system to increase capacity.

Overall the submitted thesis completely fulfils the set goals.
4. Academic/scientific/technical quality

![Image of the reviewer's form]

- **Excellent** ☒ above aver. □ average □ below aver. □ weak □

Comments: The technical level of the submitted thesis is very good. The proposed solutions demonstrate that the author can apply the knowledge gained by study. Main ideas are solid, well documented and well thought out. However, there are some issues that could have been better processed. Namely it is the estimation of materials’ mechanical properties based, among others, on foreign literature review. The construction materials in historic buildings are usually very specific depending on the location of the structure a therefore use of foreign sources could be misleading, even if it seems that we are talking about the same material – in this case clay bricks and lime mortar. Also, the author omitted the main code of standards used in Czech Republic for the assessment of existing structures (CSN ISO 13822), which provides very precise guidelines for estimating the material properties and takes into account the existing conditions of the material, moisture impact etc.

The numerical analyses performed are very helpful and provide an interesting insight into the structural behavior of the assessed structure. There are some minor issues (i.e. the above mentioned estimation of material properties, not very clear definition of supports in the vault model – the stiffening role of the truss system was or wasn’t considered, the results’ evaluation should also consider the material heterogeneity while analyzing the tensile stresses etc.), but these in no way reduce the quality of the work performed.

Despite this the presented thesis is of high quality and very well written.

5. Formal arrangement of the thesis and level of language

- **Excellent** □ above aver. ☒ average □ below aver. □ weak □

From formal point of view, the thesis level can be assessed as very good. Some minor mistakes and typing errors, as well as some mistakes in terminology do not reduce the overall quality of presented thesis. The citation ethics has not been breached and all the sources are correctly cited.
6. Further comments

Overall, the presented thesis is well written and in accordance with the assignment. Nevertheless, I have some remarks and comments that could be discussed during the defense:

- It is not clear, whether the building has any kind of heritage protection or not. This information is very important as it potentially sets firm boundaries and may limit the acceptable solutions for the renovation.

- As the main sources of salts in the material the water and soil are suggested. However, the construction material itself could be, and in many cases is, the main source of salts. In such cases some desalinization methods can be used to decrease the salt levels. What types of methods can we use?

- The author states that the observed cracks in the structure are passive (not moving). How can we distinguish between an active and passive crack?

- While describing the renovation measures on the historic truss structure, the author does not mention any preventive treatment against insects and fungi. Wouldn’t it be appropriate to use some? If so, what would the author recommend?

- The analysis of the floor crack mechanism suggests a settlement of foundation to be the main cause of the damage. Although possible, this would probably result in damage of other structures, namely the load bearing and partitioning walls and also the vault intradoses. As these are not present (at least not described in the thesis), what other cause for such a damage could be possible?

- The analysis of the wall crack suggest that it is due to some issues of the timber structure above this wall. This seems rather odd and needs some explanation. More probable cause would be the wall’s supporting structure (vault), as the crack’s cause usually lies perpendicularly to the crack.

7. Grade: __A (excellent)________________

Use the following scale

<table>
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<tr>
<th>A (excellent)</th>
<th>B (very good)</th>
<th>C (good)</th>
<th>D (satisfactory)</th>
<th>E (sufficient)</th>
<th>F (fail)</th>
</tr>
</thead>
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Prague, July 20th, 2024

The Reviewer