THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Design methods of flat slabs for punching – European and North American practices**
Author's name:	**Yerlan Koshekbayev**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Civil Engineering (FCE)
Department:	Department of Concrete and Masonry Structures
Thesis reviewer:	doc. Ing. Petr Bílý, Ph.D.
Reviewer's department:	Department of Concrete and Masonry Structures

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment — **ordinarily challenging**

How demanding was the assigned project?

The assignment was ordinarily challenging. The student performed literature review and comparative analysis of two calculation methods.

Fulfilment of assignment — **fulfilled with minor objections**

How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.

The student was asked to perform a review of past failures and provide examples of comparable designs (plural) of flat slabs in EU and North America. Just one example of failure is described and compared in a case study. Even though the provided example is quite detailed, some more examples should have been briefly mentioned.

Methodology — **correct**

Comment on the correctness of the approach and/or the solution methods.

The methodology is correct. The student characterized the flat slabs first, then he summarized the design methods used in EU and North America. He further used the two methods in a case study to compare their results.

Technical level — **C - good.**

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

The overall results of the thesis are reasonable, but some aspects are difficult to verify and/or understand. This mainly concerns sections 6 and 7 and the concept of obtaining the reduction coefficients κ, but this is not the only case. There are arguable statements and unclear values in calculations. See my questions.

Formal and language level, scope of thesis — **C - good.**

Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?

The thesis is understandable in general, but some parts are really hard to comprehend. This is partly due to the English which is far from perfect, but mainly due to the fact that some ideas are not properly explained, as mentioned before. The organization of the thesis is logical, it is relatively well-presented and the extent is sufficient. The student should be careful about the notations used. For example, sometimes he refers to shear stresses as V_{Ed} instead of v_{Ed} (e.g. section 2.2.2.1, but also calculations in section 6). This may lead to confusion with shear forces.

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Selection of sources, citation correctness	**B - very good.**
Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?	
The student used sufficient number of adequate sources. His work is clearly distinguished form earlier work in the field. Some of the bibliographic citations are not complete. In case of the codes, the use of the current versions would be preferred (2004 version of Eurocode 2 and 2008 version of ACI318 was used).	

Additional commentary and evaluation (optional)
Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.
None.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

The thesis has an interesting topic and well set objectives. The student proved that he is able to face a serious technical problem. However, he should present his ideas more clearly so that the reader could understand them. Overall, the thesis is acceptable. Questions (the last two questions are the most important ones):

1. Page 15: Are the headed shear studs really the most popular shear reinforcement in the construction industry? What is their single most important disadvantage?
2. Page 23: What happens if condition (4) is not fulfilled?
3. Page 29: What is the most efficient way to prevent freeze-thaw attack?
4. Page 36: Is the XC1 exposure class sufficient for the studied structure?
5. Page 37: Can you use the displacements from fig. 6.3 to check the serviceability limit state?
6. Page 40: How did you decide that the required reinforcement area in x direction in the upper surface is 2100 mm^2/m? Figure 6.8 shows peak value in support H2 of approximately 2600 mm^2/m. Why and how did you reduce the requirement? Just for comparison: Do you know what reinforcement was used in the real structure?
7. Page 42: Many parameters of the calculation are unclear. Why are column dimensions c_1 and c_2 305 mm instead of 300 mm? How was the shear force V_{Ed} = 434.4 kN obtained? What is a in the calculation of u_1? How did you obtain M_{Ed} for the calculation of β?
8. Page 50: Please explain the process of determining the values of κ coefficients step by step.
9. Page 58: I understand that the value of effective depth in Table 2 was varied as a free parameter. How did you obtain the values of shear reinforcement area A_{sw}? Did you consider any relation between the decrease of effective depth due to degradation and decrease of cross-sectional area of reinforcement?

The grade that I award for the thesis is **C - good.**

Date: **24.1.2022** Signature: Petr Bílý, v.r.