

I. IDENTIFICATION DATA

Title of thesis:	Creep and Shrinkage Analysis in Reinforced Concrete Structures during Construction of High-rise Buildings
Candidate:	Syrym Sertayev
Type of thesis:	Bachelor thesis
Faculty:	Faculty of Civil Engineering
Department:	Department of Concrete and Masonry Structures
Opponent:	Ing. Štěpán Šonka
Opponent's department:	Department of Concrete and Masonry Structures

II. EVALUATION

Topicality of the thesis theme	Difficult
<p>The main objective of this thesis was to make an assessment of deformation of two high-rise buildings. Buildings are designed to be connected with an expansion joint and the difference between them in vertical displacement had to be unrecognizable, despite the significant difference in construction speed. There was a step-by-step procedure for calculation of the deformations set up. In the end, vertical shortening was compared and possible height correction for each floor were set. The theme of this thesis is considered as more difficult than average.</p>	

Fulfilment of the thesis	Excellent
<p>The objective of the thesis has been fulfilled successfully. The student had very deeply studied all topics mentioned in the thesis, including early-age concrete characteristics, creep and shrinkage contribution to total deformation, construction schedule, loads relevant to construction stages according to heavy weight equipment and so on. Conclusion of the thesis is clear.</p>	

Methods and procedures:	Above average
<p>The workflow is well organized and understandable. Specifically, when the student encountered the limits of the Eurocode, he was able to find a solution and to supplement appropriately his calculations with experimental results from the literature. In addition, a schedule of construction activities during rapid construction is defined in detail, hour by hour. The chapters are chosen and linked appropriately. The general approach is sophisticated.</p>	

Formal layout of the thesis and level of language used:	Excellent
<p>From a technical point of view, the thesis is well written and clear. The text contains only minor grammatical mistakes. The presented figures are readable and they improve the quality of thesis as a whole.</p>	

Citation and references:	Excellent
<p>The references are mentioned in the text and given in detail at the end of the thesis. The sources are presented adequately and in a satisfying amount.</p>	

Other remarks and questions:	
<p>The bachelor thesis is very well written, so I have only two additional questions:</p> <ol style="list-style-type: none"> 1) In the chapter dedicated to shrinkage, the student mentioned that it is necessary to protect the fresh concrete from the sunshine. Is there any case when, even though the structure (for example a slab) is protected from direct sunshine, the enormous drying shrinkage occurs? 2) Why, in the student's opinion, does the compressive strength development in Eurocode 2 start from the first few days of age and not from the very first hours? 	

- 3) During setting the schedule for rapid construction, did the student take into the count the increasing construction difficulty with the increasing height of the structure? For example, more time is needed for transportation of concrete baskets and all other materials from ground level, concrete pumping becomes more difficult, and so on.

III. FINAL ASSESSMENT, REVIEWERS QUESTIONS, GRADING

The reviewer's questions and comments are summarized above.

Grade: A

Date: 18.6.2019

Opponents signature: