

No calculator and no literature allowed.

Write on each answer sheet: your surname, first name and student number.

*Please use the same question numbered list for your answers, i.e., 1.1, 1.2, 1.3, etc.*

**Question 01**

(15p)

The reinforced concrete tower to the left was constructed using slipform construction method.

- 1.1) Describe the principle of the used slipform construction method.
- 1.2) Describe shortly the typical work phases of the slipform construction method. Support your answer with illustrations.
- 1.3) What are the advantages and disadvantage of the slipform construction method?



**Question 02**

(15p)

Precast hollow-core slab elements:

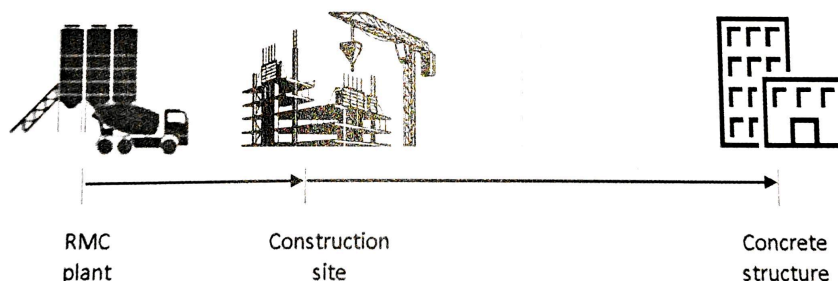
- 2.1) What kind of concrete mix is used (slump and compressive strength) and why?
- 2.2) Explain the casting process for precast hollow-core elements and producing of the bathroom slabs that are parts of the hollow core slabs.
- 2.3) Compare advantages and disadvantages of hollow-core slag with cast-in-situ slab in apartment building.



**Question 03**

(15p)

Your task is to plan a quality control procedure for concrete before concreting, during concreting and after construction.



- 3.1) What are the tests you plan for the **ready-mix concrete (RMC) plant** and what are the main factors affecting the test results?
- 3.2) What are the tests you could plan for the **construction site** and what are the factors affecting the test results?
- 3.3) What are the tests you could plan for the **concrete structure** and what are the factors affecting the test results? In which cases the concrete structure should be tested?

**Question 04**

(15p)

- 4.1) What are the mechanical compaction methods of concrete? Give example(s) for the use of each method. Explain the problems caused by a wrong compaction procedure.
- 4.2) Describe the shotcrete wet mix process (support your answer with an illustration).
- 4.3) What are the (i) basic principles, (ii) applications, (iii) advantages and (iv) disadvantage of self-compacting concrete?