

OPPONENT'S REPORT ON THE DIPLOMA PROJECT

AUTHOR OF THE DIPLOMA PROJECT: BC. ELIŠKA UHERÍKOVÁ

OPPONENT OF THE DIPLOMA PROJECT: ING. KAREL STRUHALA

This diploma project named “Penzion pro seniory” contains (parts of the) design documentation of a home for the elderly in Vratimov, Czech Republic. The documentation is prepared at the level of “design documentation for building realisation”. The project contains 7 folders, including technical report and drawings, fire safety report and drawings, calculations of thermal properties, etc.

According to the project specifications the author designed a 3 storey building without basement. Capacity of the building is 42 patients. The designed building is located near the centre of Vratimov (a small municipality south of Ostrava, Czech Republic).

DESIGN OF THE BUILDING'S LAYOUT AND OPERATING CONDITIONS

The author put effort to design of functional building. However, there are some inconsistencies and oversights in the design. Some of them are mentioned below:

- 1) The author designed rather high number of parking spaces. But she overlooked several important facts in their design. The roads on the building plot itself are rather narrow. Drivers would have problems with parking their cars. There's no place for easy turning of a car (e.g. an ambulance) there. Part of the parking spaces is designed on a building plot nearby. An apartment building stands in that place now. Its demolition is not mentioned in the project.
- 2) Why is the main corridor in all storeys so wide (4.5 m)? Also, why are the rooms x15a and x15b (halls in all storeys) so large? What is their purpose?
- 3) There is only 1 door leading from the kitchen to the corridor and the dining area. Both the meals and dirty dishes would have to be moved through this door. In my opinion this solution is “undersized”. There's no space for leaving the dirty dishes – e.g. an alcove for a tray or a window with wide parapet between the kitchen and the corridor.
- 4) There's rather large terrace on the first floor. Part of it is designed as green, with vegetation. Part is covered by ceramic tiles on adjustable pedestals. The rest is covered by gravel. Why is the green part so small (approx. 34 out of 123 m²)? Is it (in its designed form) justifiable? Couldn't the area covered by gravel be covered by vegetation layer instead?
- 5) The author designed stairs 200 mm high in the whole building. This significantly exceeds requirements of valid Czech standards and ordinances.
- 6) According to chapter B.2.2.2. the investor required that the main corridors should be insulated by sunlight. Only the corridor in the first floor has windows and those are facing North-East.

ARCHITECTURE, DESIGN OF THE STRUCTURES AND EQUIPMENT

The structural and architectural design represents the knowledge the author gained during her studies. Overall the design is suitable for the intended purpose. However I found several errors, inconsistencies and oversights that would significantly influence the completed building. Some of them are mentioned below. They are sorted by the drawing/report where they were found:

0) General comments

- Technical report mentions that the building “... brings a little taste of west Amsterdam culture of variation of colours and different window shape and position repetition”. Does the design comply with local zoning plan and regulatory plan in Vratimov?
- Chapter B.2.6.1 of the Summary Technical Report mentions that “...the building energy comes from co-generation unit based on stilling engine on electricity”. Chapter B.2.7 of this report, as well as chapter A.5 of the Accompanying Report says, that “Building main source is gas and electricity. The technological equipment is gas kettle and heater of domestic water”. Which of these statements is correct? If the later, than the building is missing a chimney.
- Why is the building divided into so many fire compartments?
- Downspouts are missing in all floor plan drawings.
- I couldn't find location of ventilation exhaust drawn in 0100-C2-06 Detail 6 – Ventilation Chimney in One Layer Flat Roof. Is it the element designated “c” in the plan of the terrace in top right corner of drawing 0201-C2-07 Terrace? What's its purpose?

1) 0100-C1-02 Situation plan

- The paper size is too small. Part of the building plot is missing on the drawing. Most of the nearby building plot where the parking spaces will be built is missing too.
- The drawing is insufficiently dimensioned. The distance between the designed building and the existing building is not clear. As well as dimensions of the roads, pavements, etc. The vertical alignment of the building is unclear, because height dimensions and/or sections are missing in the drawing.
- The floor level of the ground floor is set to the same height as the level of the surrounding terrain. Is this solution possible according to valid Czech standards?
- The size and shape of the building is different than the shape drawn in drawing 0200-C2-01.
- Are the water measuring shaft (Shaft S2) and sewage control shaft (Shaft S1) placed according to the valid Czech standards?
- A rain water disposal system (sewage, soakaway well, etc.) is missing.
- Are there no public data lines in the vicinity? How will the building be connected to the telephone or data networks?

2) 0100-C2-01 Foundations, 0201-C2-03 Detail 03 - Foundation

- Part of the height dimensions in the foundation plan is probably incorrect (based on partial sections in the drawing): For example “OT = 278,21” and “MT = 283,00” in one

of the corners. This would mean that the original terrain was approx. 4 m under the foundation base!

- Insulation against ground water is not drawn in the drawing *0100-C2-01* or in section drawings (*0202-C2-01*, *0202-C2-02*). Its design in the drawing *0201-C2-03* is insufficient in my opinion.

3) 0200-C2-01 Ground Floor Plan

- Part of the facade around the main entrance is insulated by a layer of EPS. The rest of the building is not. Why?
- Toilet bowls are in the opposite corner to the installation shafts. Where will lead the horizontal sewage pipe? Is there sufficient space in the floor?
- Shower drains are not drawn.
- Wall heating system is drawn insufficiently in the floor plans. It is described only in the section drawings.
- Room 111 is designated “Cloakroom” in this drawing. According to the Fire Safety Report and accompanying drawings it is fire compartment “N1.13-II Ventilation Engine Room”. According to the technical reports the building is ventilated naturally.

4) 0200-C2-02 First Floor Plan, 0201-C2-07 Terrace

- The meaning of letter “h” in room 217 is unclear.
- The terrace is not dimensioned in the drawing *0200-C2-02*. At least basic dimensions should have been included there. Height of the parapet wall / railing is not included in the drawings. Sloping of the layers is unclear from both drawings.
- It is unclear where the rainwater drains lead. They are positioned just above the recessed main entrance area.
- It seems that the blocks (not described) dividing the green roof from the ceramic tiles would hamper flow of the rain water. It will accumulate under the tiles. Reinforced concrete floor structure would have to be designed to withstand this additional load.
- Waterproofing layer (SBS modified bituminous sheets) is needlessly exposed at the bottom of the wall. Metal flashing covers it only partially. This would increase possibility of malfunction of the designed assembly, as well as decrease the aesthetics of the terrace.

5) 0300-C-01 Ceiling – Ground Floor, 0300-C-02 Ceiling – First Floor, 0300-C-03 Ceiling – second floor plan

- What is maximum ratio between width and length of two-way reinforced concrete slab? In the project this ratio is up to 5.7:1.
- Installation shafts are insufficiently described – their position in relation to the surrounding structures is not dimensioned.
- There are unsolved thermal bridges created by the stairs’ landings in the envelope walls.

6) 0700-C2-01 Roof Structure, 0700-C2-02 Roof Structure – Surface, 0201-C2-02 Detail 02 Roof Valley

- Drawing 0700-C2-01 is incomplete. It does not include downspouts and elements creating the “roof valley”, drawn and described in drawings 0201-C2-02 and 0700-C2-02. Doubled timber truss girders in place of gable walls (according to partial section A-A') are not drawn in the plan in 0700-C2-01.
- Chimneys, ventilation exhausts, snow guards, etc. are not drawn in the plans. Access to the roof is missing.

7) 0202-C2-01 Section A-A', 0202-C2-02 Section B-B'

- In some parts there's a thermal bridge at the connection of the roof and envelope wall.
- Ceilings of the elevator shafts are insufficiently described. Thermal insulation is missing in these ceilings. It is unclear if the structure complies with the acoustic and fire safety requirements.

PROCESSING QUALITY

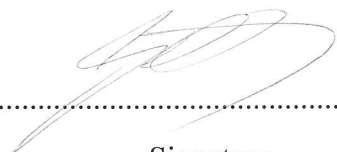
The quality of work is fluctuating through the whole project. There are deviations from the ČSN 013420 standard in the drawings. Thicknesses of the lines are not respected - e.g. roof ridges are not drawn using very thick line in 0700-C2-01. Line types are not respected – e.g. dashed line instead of dot-and-dashed line is used in drawing of doors without a threshold. Structures and materials are not drawn correctly – e.g. missing waterproofing in drawings of sections and foundations. There are inconsistencies in used hatching - e.g. hatching in 0100-C-01 *Cadastral Situation Plan*, where there are different hatches in legend and in the actual drawing above it. Dimensioning and descriptions are also incomplete in some drawings – e.g. 0100-C1-02 *Situation plan* mentioned above.

FINAL ASSESSMENT

Scope of the presented diploma project meets the assignment. Overall the quality of the project is average. However, there are a lot of inconsistencies and omissions in the project. Author of the project demonstrated very good knowledge in the field of civil engineering, which she unfortunately wasn't always able to implement correctly.

Grade according to ECTS: *D/2,5*

Done in Brno on 25th January


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Signature

Klasifikační stupnice

Klas. stupeň ECTS	A	B	C	D	E	F
Číselná klasifikace	1	1,5	2	2,5	3	4