

Assignment Bachelor's Thesis

Department: Institute of Building Structures
Student: Šimon Madzik
Supervisor: Ing. Jan Müller, Ph.D.
Academic year: 2023/24
Study programme: B3607 Civil Engineering
Field of study: Building Constructions

The Dean of the Faculty, in accordance with Act No. 111/1998 on universities and the Study and Examination Regulations of the VUT in Brno, assigns you the following topic for your bachelor's thesis:

Guest House in Pasohlávky

Concise characteristic of the task:

Preparation of building documentation for construction purposes for a near-zero energy building, including preliminary studies / blueprint of internal layout with partial focus on positioning of bearing elements from chosen materials. It is to include building site topography and terrain works as a result of building positioning.

Objectives and outputs Bachelor's Thesis:

To design layout and load-bearing structure of the assigned building. To design siting of the building with respect to its surroundings. The extent of the project will comply with ordinance No. 499/2006 Coll. as amended: it will include reports and drawings defined in parts A, B, C and D, throughout the section D.1.1 and D.1.3 and to the partial extent of section D.1.2 of the ordinance, especially: site plans; excavations; foundations; floor plans; roofing; vertical sections; elevations; floor formwork plans or floor structure assemblies; at least five assembly details; documents specified in D.1.1.c), thermal and acoustic assessment of the building and specified structures, including confirmation of compliance with nearly-zero energy requirements. The project will also include following appendices: layout concepts including module scheme of load-bearing structures; concept drawings of heating; ventilation and domestic hot water systems; simplified structural design of foundations and specified load-bearing structures; 3D model of the building. The project might also include other specific parts requested by the supervisor. The project will be structured in compliance with Dean's directive no. 4/2019 as amended. The individual parts of the project will be delivered in A4-sized folders with a title block on the front page and a table of content inside. All parts of the project will be elaborated using word processing and CAD software. All drawings will include a title block. The text part will also include sections h) "Introduction", i) "Text of the work" and j) "Conclusions". The Text of the work will contain technical reports complying with ordinance no. 499/2006 Coll as amended. The reports and assessments in the project will list applied nearly-zero energy building requirements. The electronic version of the project will include a B1-sized poster with key information, schemes and 3D model of the designed building. All sources utilized in the project have to be properly cited in compliance with ČSN ISO 690 (e.g. using www.citace.com tool).

List of recommended literature and documents:

1) Směrnice děkana č. 19/2011 s dodatky a přílohami; (2) Stavební zákon č. 183/2006 Sb. v platném a účinném znění; (3) Vyhláška č. 499/2006 Sb. v platném a účinném znění; (4) Vyhláška č. 268/2009 Sb. v platném a účinném znění; (5) Vyhláška č. 398/2009 Sb.; (6) Platné normy ČSN, EN; (7) Katalogy stavebních materiálů, konstrukčních systémů, stavebních výrobků; (8) Odborná literatura; (9) Vlastní dispoziční řešení budovy, (10) Vlastní architektonický návrh budovy a (11) ČSN ISO 690.

Deadline for submission Bachelor's Thesis is determined by the schedule of the academic year.

In Brno, 30. 11. 2023

L. S.

prof. Ing. Miloslav Novotný, CSc.
Head of department

Ing. Jan Müller, Ph.D.
project supervisor

prof. Ing. Rostislav Drochytka, CSc., MBA, dr. h. c.
Dean

ABSTRACT

The guesthouse is situated on a flat plot on the outskirts of Pasohlávky ashore of reservoir Věstonická nádrž.

The proposed building consists of two above-ground floors. The building is divided into two parts. One part is winter garden connected with restaurant and kitchen, second part is residential part with 2 units on first floor and 9 units on second floor with a total capacity of 26 guest. The residential part is closed for the people visiting only restaurant area for providing more privacy. The guest house has multiple parking places around the building from the front side for visitors or residents. Around the guesthouse is cycling road and nearby waterpark for making residents stay more pleasant.

The roofs are insulated by ISOVER EPS polystyrene and rockwool. The vertical load bearing structure of the house is masonry made of ceramic blocks Porotherm with additional thermal insulation. The horizontal load bearing structure is made of reinforced concrete slabs. The building is constructed on concrete step foundations. The second floor is made from roof trusses on sides and middle part is made from steel frame. The walls on second floor are made from Knauf plaster systems.

KEYWORDS

Guest house, slope roof, ceramic blocks.

ABSTRAKT

Penzion se nachází na rovinatém pozemku na okraji Pasohlávek na břehu Věstonické nádrže.

Navržený objekt sestává ze dvou nadzemních podlaží. Stavba je rozdělena na dvě části. Jedna část je zimní zahrada spojená s restaurací a kuchyní, druhá část je obytná část se 2 jednotkami v prvním patře a 9 jednotkami ve druhém patře s celkovou kapacitou 26 hostů. Obytná část je uzavřena pro osoby navštěvující pouze restaurační část z důvodu většího soukromí. Penzion má několik parkovacích míst kolem budovy z přední strany pro návštěvníky nebo rezidenty. Kolem penzionu vede cyklostezka a nedaleký aquapark pro zpříjemnění pobytu obyvatel.

Střechy jsou izolovány polystyrenem ISOVER EPS a minerální vlnou. Svislá nosná konstrukce domu je zděná z keramických tvárnic Porotherm s dodatečnou tepelnou izolací. Vodorovná nosná konstrukce je tvořena železobetonovými deskami. Stavba je postavena na betonových schodových základech. Druhé patro je po stranách tvořeno vazníky a střední část je tvořena ocelovým skeletem. Stěny ve druhém patře jsou provedeny z omítkových systémů Knauf.

KLÍČOVÁ SLOVA

Penzion, šikmá střecha, keramické tvárnice .

BIBLIOGRAPHIC CITATION

MADZIK, Šimon. *Penzion Pasohlávky*. Brno, 2024. Bakalářská práce. Vysoké učení technické v Brně, Fakulta stavební, Ústav pozemního stavitelství. Vedoucí práce Jan Müller.

DECLARATION OF AUTHORSHIP OF THE FINAL THESIS

I, Šimon Madzik, affirm that this Bachelor's Thesis titled "Guesthouse in Pasohlávky" is my original work, resulting from my independent research. I have properly cited all quoted or paraphrased material and included references for all sources.

Brno, 20. 05. 2024

Šimon Madzik
author

Acknowledgement

I want to extend my sincere gratitude to my supervisor, Ing. Jan Müller, Ph.D., for his expertise, patience, and invaluable insights. His guidance and constructive feedback have greatly contributed to the quality of this work. Thank you.

I am also deeply thankful to my family for their support and to all my friends for believing in me.

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1. INTRODUCTION

The aim of this thesis is to design a guest house in Pásohlávky that can accommodate 26 residents. The primary goal is to develop a sustainable and energy-efficient building that adheres to the highest standards of health and safety, thermal protection, structural stability, and user comfort.

The thesis aims to achieve the following specific goals:

1. **Separate Entrances:** Design four separate entrances, two for the bigger apartments in first ground floor, one for the entrance to stairs which leads to second ground floor, and one for entering to restaurant ensuring privacy and convenience for residents and visitors.
2. **Energy Efficiency:** Utilize design strategies and technologies that support nearly zero energy consumption, including external wall insulation, energy-efficient systems, and renewable energy sources, to create a sustainable and eco-friendly living space.
3. **Two-Floor Layout:** Design a two-floor house that optimizes functional spaces, ensuring efficient use of available area while providing living space for the residents and space for restaurant purposes.
4. **Slope Roof:** Incorporate a slope roof that enhances thermal insulation, manages rainwater, and creates an unusual shape for the building with built in windows which suits as dormers.
5. **Parking Spaces:** Provide a parking for multiple cars dedicated to the residents and adequate parking spaces for visitors, ensuring convenience and accessibility.
6. **Staircase Hall:** Design a prominent staircase hall with a prefabricated staircase as a central feature of the house, creating a bridge between sleeping quarters and outdoor spaces.
7. **Compliance with Building Regulations:** Ensure that the design adheres to all relevant health and safety regulations, including noise protection, fire safety, energy-saving measures, and structural requirements. This compliance guarantees a safe and comfortable environment for both living and working, meeting all legal standards and

providing peace of mind for residents and staff.

8. Building Physics: Consider building physics principles to optimize thermal comfort, acoustics, and indoor air quality, ensuring a healthy and pleasant living and working environment for the occupants.

By achieving these goals, this thesis aims to deliver a comprehensive design solution for a guest house that integrates sustainable practices, a functional layout, aesthetic appeal, and full compliance with all necessary health, safety, and energy efficiency standards.



BRNO UNIVERSITY OF TECHNOLOGY

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FACULTY OF CIVIL ENGINEERING

FAKULTA STAVEBNÍ

INSTITUTE OF BUILDING STRUCTURES

ÚSTAV POZEMNÍHO STAVITELSTVÍ

GUESTHOUSE IN PASOHLÁVKY

RODINNÝ DŮM, BRNO

A. Accompanying report

BACHELOR'S THESIS

BAKALÁŘSKÁ PRÁCE

AUTHOR

AUTOR PRÁCE

Šimon Madzik

SUPERVISOR

VEDOUCÍ PRÁCE

Ing. Jan Müller, Ph.D.

BRNO 2024

A. Accompanying report

A.1. General information

A.1.1 General information about the construction

a) Name:

Guesthouse in Pasohlávky

b) Place:

Location: Pasohlávky, Brno-Venkov

Cadastral Area and plot No.: 3163/596

A.1.2 Information about the investor

a) Name, surname and place of permanent residence:

-

A.1.3 Information about the project engineer

a) Head engineer: Šimon Madzik, Kolejní 2612 00 Brno-Královo Pole,
Czechia

A.2. Division of construction into objects and technical and technological equipment

SO-01 GUESTHOUSE

SO-02 WINTER GARDEN

SO-03 PARKING SPACES

SO-04 PARKING SPACE FOR BARRIERLESS ACCESS

SO-05 SEWAGE CONNECTION

SO-06 GAS CONNECTION

SO-07 WATER SUPPLY CONNECTION

SO-08 FENCING

SO-09 RETENTION TANK WITH OVERFLOW

SO-10 PAVED SURFACES

SO-11 ELECTRICAL SUPPLY CONNECTION

SO-12 CAR DRIVEWAY

SO-13 GRAVEL DRAINAGE STRIP

A.3. List of input materials

- Geographical and altimetric survey of the land
- Territorial planning documents
- Documents from utility network administrators
- Information from the land registry
- Engineering-geological survey
- Investor requirements



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B. Summary technical report

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BRNO 2024

B. Summary technical report

B.1. Description of the construction site

a) Characteristics of the area and the building plot, built-up area and undeveloped area, compliance of the proposed building with the character of the area, current use and built-up area:

The planned object of the guesthouse is located on a plot in Brno-Venkov with access to the building object from unnamed street.

It has a flat terrain. Its altitude ranges from about 375 m above sea level. The surface is covered with grass. The surrounding land is intended for relax and rest in way of cycling routes and waterpark. There are existing communication, sewage, water supply and electricity utility lines.

b) Data on compliance with a zoning decision or regulatory plan or a public law contract replacing a zoning decision or zoning consent:

The construction is in accordance with the valid zoning decision

c) Data on compliance with spatial planning documentation, in the case of building modifications requiring a change in the use of the building:

The design and functional use of the proposed building comply with the binding conditions set forth by the valid spatial planning documentation of the municipality of Brno. According to the city's spatial plan, it is situated in a designated buildable development area for housing. These areas are intended primarily for housing. The plan further specifies spatial arrangement conditions, allowing structures with one floor above ground. These buildings can include residential or other types of usable floors. At the same time, Decree No. 501/2006 Coll. on general requirements for land use.

d) Information on issued decisions on permitting exemptions from general land use requirements:

No exception was issued in at stage of the documentation.

e) Information on whether and in which parts of the documentation the conditions of the binding opinions of the authorities concerned are taken into account:

All conditions issued by the relevant administrative authorities have been met and incorporated into the project documentation and will be further observed and taken into account during construction. The written statements of the concerned authorities are part of the project documentation.

f) List and conclusions of surveys and analyzes carried out - geological survey, hydrogeological survey, building historical survey, etc.:

No survey has been carried out yet, only experience from previous construction is taken into account.

g) Protection of territory according to other legal regulations:

There is no protective safety zone at the site of the planned construction. At the same time, the area under consideration is not located in a specially protected area, a heritage-protected area, a floodplain or otherwise protected area. For these reasons, the protection of the territory according to other legal regulations was not addressed.

h) Position relative to floodplain, mined area, etc.:

There is no border of the flood plain in the vicinity of the plot. There is therefore a high probability that the area under consideration will not be flooded, and it is therefore not necessary to propose any anti-flood measures.

The proposed construction site is not close to the mined area and there is no need to propose possible measures.

i) Impact of construction on surrounding buildings and land, protection of the environment, impact of construction on runoff conditions in the area:

The proposed family house will not disturb the surrounding development and will not have a negative effect on it. The surroundings of the building must be protected

against common negative influences during construction. The construction will not fundamentally change the runoff conditions.

j) Requirements for sanitation, demolition, felling of trees:

The plot is clear. There are no shrubs or trees on the property that should be removed.

k) requirements for maximum temporary and permanent occupations of the agricultural land fund or land intended to fulfill the function of the forest:

Excavation of this topsoil will be carried out and it will be stored on the builder's property and subsequently spread back on the property during the final landscaping improvements.

l) Territorial technical conditions – especially the possibility of connection to the existing transport and technical infrastructure, the possibility of barrier-free access to the proposed building:

The proposed building will be connected by new connections to the sewage system, water supply, electricity connection. Access to the construction site is provided by local roads as shown in the site plan.

m) Permanent and temporal links of the construction, conditioning, induced, related investments:

At the time of the processing of the project documentation, no investments are known.

n) List of plots of land according to the real estate cadaster, on which the construction is being carried out:

3163/596

o) List of plots according to the real estate cadaster, on which a protective or safety zone will be created:

Safety zones are not created on other plots or roads.

B.2. General description of the building

- a) New construction or alteration of a completed construction; in the case of a building change, data on their current state, the conclusions of a construction-technical or construction-historical survey and the results of a static assessment of the load-bearing structures:**

The submitted project documentation deals with the design of a new construction of a guesthouse. The plan also includes connections to transport and technical infrastructure.

- b) Purpose of use of the building:**

The purpose of the building is permanent short-term housing for a approximately 26 residents.

- c) Permanent or temporary construction:**

The guesthouse is a permanent construction.

- d) Information on issued decisions on permitting exemptions from technical requirements for buildings and technical requirements ensuring barrier-free use of the building:**

The building is designed in accordance with Decree No. 268/2009 Coll. on technical requirements for buildings. No exceptions were allowed. Pursuant to Decree No. 398/2009 Coll. on the general technical requirements ensuring barrier-free use of buildings, it was necessary to apply the requirements for barrier-free use of the building on the project.

- e) Information on whether and in which parts of the documentation the conditions of the binding opinions of the authorities concerned are taken into account:**

All binding opinions of the relevant authorities are observed and taken into account in the project documentation and will continue to be observed during the

construction itself. The written declarations of the concerned authorities are part of the project documentation.

f) Building protection according to other legal regulations:

This is a building does not require any additional protection according to other legal regulations

g) Proposed building parameters – built-up area, built-up area, useful area, number of functional units and their sizes, etc.:

- parcel area: 4839 m²
- built area: 420 m²
- area of paved surfaces: 200 m²
- Number of functional units: 10
- Number of users: 26

h) Basic balance of the building – needs and consumption of media and materials, rainwater management, total amount and types of waste and emissions produced, energy efficiency class of buildings, etc.:

Water demand:

No. of people: 40 people (Guesthouse - housing 125 l/person)

Average daily need $40 \times 125 = 5000$ l

Annual water requirement $5000 \times 1.4 = 7000$ m³/year

Energy label

The evaluated building of the guesthouse falls into class A - Satisfactory

Rainwater management:

The location of the rain inlets at the house is according to the roof solution in the construction project. The drainpipe of rainwater from the house will be fed into a plastic accumulation tank with an overflow into the infiltration box. Collected rainwater will be used for watering the garden.

i) Basic assumptions of construction (time data on construction implementation, breakdown into stages):

Estimated start of construction: June 2024

Estimated construction completion: 24 months from the start of construction.

Breakdown into stages: 1st stage: Earthwork and foundations

2nd stage: First floor construction

3rd stage: Second floor construction

4th stage: landscaping and fencing

5th stage: Finishing work

j) Approximate construction costs:

Estimate according to built-up space and price indicators:

Approx. 85 430 160 CZK



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D. Technical report

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Ing. Jan Müller, Ph.D.

BRNO 2024

D. Technical report

Identification data:

Name:	Guesthouse in Pasohlávky
Location:	Pasohlávky, Brno-Venkov
Cadastral Area and plot No.:	3163/596
Investor:	-
Project engineer:	Šimon Madzik
Date:	May 2024
Level:	Documentation for construction management

D.1. Architectural and construction solutions

a) Purpose of the object

The detached building will be used for permanent short-term housing of 26 people. Its layout is designed in a such a way to include a restaurant with kitchen. The house is designed to provide its users with maximum comfort, taking into account the financial possibilities of the investor.

b) Layout solution

The layout solution is primarily based on the size and orientation of the building plot. The building is placed in the right upper corner of the plot with sufficient space in front of the house to accommodate parking spaces for residents and visitors.

The building has 2 floors. The first floor has two apartments and stairway hall leading to second floor, separate entrance to restaurant and to toilets. It has also kitchen which is connected to restaurant.

The second floor has a corridor which branches into 8 separate units.

c) Barrier-free use of the building:

The building is subjected to Decree No. 398/2009 Coll. on general technical requirements ensuring barrier-free use of buildings. The main door is leveled with the exterior pavement to ensure accessibility to the visitors.

d) Architectural material solution:

The building has the shape of regular rectangle shapes. The highest point of the attic is at +6,776m above the 1st floor level. The surface of the facade is made of white silicon-based plaster. Openings in the perimeter wall are fitted with aluminum windows and entrance doors. The surface color of aluminum elements will be in the gray shade. Terrain and garden improvements consist mainly of building paved areas, especially for parking spaces.

D.2. Building construction solutions

a) Construction solutions

The main vertical load bearing structure is made of ceramic blocks Porotherm 25 Eko Dry fix 250mm thick. Partitions are made of the ceramic blocks but in 115mm thickness. The ceiling construction is from reinforced concrete slab, thickness 200 mm. The windows and doors are from aluminum frames fitted with triple glazing.

b) Description of the designed structural system

Masonry wall construction system.

c) Designed materials and main structural elements

Earthworks

Before starting earthworks, it is necessary to mark out the existing underground networks. There is no groundwater level in the vicinity of the excavations that could negatively affect the earthworks. First, topsoil with a thickness of 200-300 mm is removed. The topsoil will be stored in a landfill that is part of the property. Measurement of the position and height of the building will be ensured, and then excavations will be carried out using a machine. Before concreting the foundation strips, the excavations are prepared and cleaned.

Foundations

The solution is realized with two step foundation made of plain concrete C16/20 and concrete formwork. Before concreting the foundations, a FeZn grounding strip with outlets for connecting the lightning conductor will be placed on the foundation joint. Penetrations will be left in the foundations in accordance with the requirements. Hollow blocks will be laid on the foundation strips, which will be filled with C20/25 concrete with horizontal and vertical reinforcement. After the soil has been compacted in the space between the foundation strips, a base concrete slab of C20/25 thick concrete is created with reinforced mesh.

Waterproofing of the substructure

The waterproofing of the substructure will be made of modified S-type asphalt strips with a glass fabric insert. These will be melted and welded with a hot flame and their minimum overlap is 100 mm. The concrete base will be waterproofed with asphalt strips, and the surface will be penetrated with an asphalt penetrating coating prior to their application. Vertical edge waterproofing will be made from 1 layer of asphalt strip, and the surface will also be covered with a penetrating asphalt coating before

its application. The vertical waterproofing must be extended at least 300 mm above ground level.

Vertical load bearing structures and partitions:

The vertical load-bearing perimeter structures are designed as ceramic blocks with dimensions of 248 x 240 x 248 mm built on cement mortar for thin-layer foam Dryfix. On the exterior side of the perimeter structure, a contact insulation system will be made of Isover Eps Greywall plus boards, thickness 180 mm. The internal load-bearing masonry consists of ceramic masonry km Porotherm 11.5 with dimensions 497 x 240 x 115 mm on foam Dryfix. The internal load-bearing masonry consists of ceramic blocks Porotherm 25 Eko 248 x 240 x 248 mm on a foam Dryfix.

Lintels

The translations are from the same ceramic material profiles below the ceiling structure. The lintels above the internal openings are made from prefabricated Porotherm lintels. The kitchen lintel is made from monolithic reinforced concrete.

Ceiling construction:

The ceiling structure above the 1st floor is made of reinforced concrete slab, thickness 200 mm. The ceiling structure will be strengthened with a reinforcement ring beam poured with concrete C20/25 consistency S3.

Stair construction:

The staircase is a prefabricated type.

Slope roof

The building has a slope roof, with a classic order of layers. Its supporting structure consists of wooden and steel frame. This is provided with a coating and then a vapor barrier with an insert made of glass fabric is fused to it. This is followed by a layer of slope wedges at the corners and then keys of TI mechanism is used to ensure a 12% slope, and then a layer of thermal insulation from EPS INTENSE is placed on top of it, with the thickness of 200mm. This is followed by a waterproofing layer, thickness 4 mm each. The individual strips are welded to each other with hot air, and then the joints are provided with a sealing grout. The waterproofing film is anchored both mechanically, but also by melting.

Openings

The windows are made of aluminum frames, glazed with triple insulating glass. The entrance to the terrace is secured by a sliding opening window. The entrance door to the building is designed as an aluminum door. The interior

doors are wooden, fitted into panel frames.

Interior finish

The surface of the masonry walls and ceilings is provided with a lime-gypsum plaster of thickness 10 mm. The surface of the walls and front walls is plastered and sanded. Subsequently, all surfaces are provided with penetration and silicate coating in two layers.

Floors

The leveling layer is cement screed. In the 1st floor, the floor is composed of EPS rigifloor thermal insulation in two layers - 2 x 50 mm. In the 2nd floor, instead of thermal insulation, acoustic insulation is used, mainly dampening the impact sound the thickness is 40 mm. All floors are separated from vertical constructions by expansion tape thickness 10 mm. The tread layer consists of either ceramic tiles or Laminate flooring. A skirting board is used in the corners of the rooms. A threshold is added to transitions from laminate to ceramic tiles.

Carpentry and metalsmith elements

Mainly carpentry is winter garden which is separate object to the building.

Flashing elements

The building mainly consists of aluminum parapets flashing and roof parapet flashing. For detailed specifications.

Paved areas

It is divided into walking areas and parking areas. The both cases they are made of concrete pavement with a thickness of 60 mm with a sufficient gap in between to insure drainage.

d) Construction technical solution:

Heating

The building will be heated using heat exchangers in the form of plate radiators, and in the bathrooms, pipe radiators. The heat source will be a category C gas condensing boiler with an integrated hot water tank.

Ventilation

The exchange of indoor polluted air in the building with outdoor air will be ensured by natural ventilation, and ventilation unit. The ventilation function depends on the human factor, i.e. on the users of the building. Micro-ventilation cannot be considered ventilation.

Due to the tightness of the windows, it is impossible to count on infiltration, i.e. the spontaneous entry of outside air into the building through the joints and leaks of windows and doors due to the difference in pressures outside and inside the building.

Water heating

The preparation of hot water will be provided by a category C gas condensing boiler with an integrated hot water tank. The boiler is intended for heating the heating system and heating water in the integrated indirect heating tank.

e) Safety during use of the building, health protection and working environment:

The basic requirement for safety when using the building is focused on the creation of conditions that prevent people inside or near the building from harming their

health, especially due to slips, falls, impacts, burns, electric shocks, explosions, etc. At the same time, they will be subject to regular technical inspections and revisions carried out by qualified workers of the given issue. It also includes a solution to the fire safety of the building and compliance with fire protection tasks in accordance with Act No. 133/1985 Coll. Act of the Czech National Council on Fire Protection, as amended. The overall solution of the building will be designed and implemented with regard to safety during its use.

f) Building physics

The building is designed to meet the requirements in terms of building physics. Building physics is dealt with in a separate part of this project documentation in Appendix No. 6.

g) Fire safety solution principles:

The building is designed to meet fire protection requirements.

The fire safety solution is part of this project documentation in Appendix No. 5.

h) Verification of the quality of materials used and construction:

Only such materials will be used that are listed in the project documentation and agreed by the main designer. At the same time, all materials must have a valid certified declaration of properties. The overall quality of the construction will be regularly checked in the agreed terms by the designer, the investor's technical supervision and the builder. All work related to the construction of the building in question can only be performed by qualified and trained workers in the field in question, which will be the subject of their expertise.

i) Description of non-traditional technological procedures and special requirements for the construction and quality of the designed products:

During construction, the technological procedures proposed by the designer will be followed, especially the proposed details like in the case of window installation and installation of roof inlet.

j) Determination of the required inspections of covered constructions and possible inspection measurements and tests, if they are beyond the scope of the mandatory tests established by the relevant regulations and standards:

Inspections beyond the range of mandatory inspections are not required.

In Brno, May 2022 Šimon Madzik

2. CONCLUSION

This thesis focuses on the design and integration of a guesthouse with a restaurant, kitchen, and winter garden in Pasohlávky, emphasizing key aspects such as zero energy building, layout, parking spaces, and compliance with health, safety requirements, and building regulations. By exploring and implementing these elements, the thesis offers a comprehensive design solution that promotes sustainable living, optimal functionality, and a comfortable environment for both residents and the medical practice.

Through the process of researching, analyzing, and designing this project, I have developed a deep understanding of the various proposals and considerations involved in creating a harmonious space while maintaining efficiency. This work has allowed me to explore innovative design strategies and energy-efficient solutions.

Ultimately, this thesis has not only expanded my knowledge and expertise in architecture and sustainable design but has also provided me with a solid foundation to contribute to the development of residential and healthcare spaces that prioritize energy efficiency, user comfort, and adherence to regulatory standards.

LIST OF SOURCES USED

The valid legislation, i.e., decrees and standards, were used to process the assessment of the project.

- Act No. 183/2006 Coll. on spatial planning and building regulations (Building Act)
- Act No. 406/2000 Coll. on energy management (amended by Act No. 3/2020 Coll.)
- Decree No. 499/2006 Coll. on documentation of buildings (amended by Decree No. 62/2013 Coll., No. 405/2017 Coll.)
- Decree No. 268/2009 Coll. on technical requirements for buildings (amended by Decree No. 20/2012 Coll., No. 323/2017 Coll.)

- Decree No. 78/2013 Coll. on the energy efficiency of buildings (amended by Decree No. 230/2015 Coll.)
- Government Regulation No. 272/2011 Coll. on health protection against the adverse effects of noise and vibrations, as amended
- ČSN 73 0540-1:2005 Thermal protection of buildings - Part 1: Terminology
- ČSN 73 0540-2:2011 + Z1:2012 Thermal protection of buildings - Part 2: Requirements
- ČSN 73 0540-3:2005 Thermal protection of buildings - Part 3: Design values of quantities
- ČSN 73 0540-4:2005 Thermal protection of buildings - Part 4: Calculation methods
- ČSN EN ISO 10077-1:2019 Thermal behavior of windows, doors, and shutters - Calculation of the heat transfer coefficient - Part 1: General
- ČSN EN ISO 10077-2:2019 Thermal behavior of windows, doors, and shutters - Calculation of the heat transfer coefficient - Part 2: Calculation method for frames
- ČSN 73 0532:2010 Acoustics - Noise protection in buildings and related acoustic properties of building products - Requirements
- ČSN EN ISO 717-1:2013 Acoustics - Evaluation of sound insulation of building structures and in buildings - Part 1: Air sound insulation
- ČSN EN ISO 717-2:2013 Acoustics - Evaluation of sound insulation of building structures and in buildings - Part 2: Impact sound insulation
- ČSN EN ISO 12354-1:2018 Building acoustics - Calculation of the acoustic properties of buildings from the properties of building elements - Part 1: Air sound insulation between rooms
- ČSN EN ISO 12354-2:2018 Building acoustics - Calculation of the acoustic properties of buildings from the properties of building elements - Part 2: Impact sound insulation between rooms
- ČSN EN ISO 12354-6:2004 Building acoustics - Calculation of the acoustic properties of buildings from the properties of building elements - Part 6: Sound absorption in closed spaces

- ČSN 73 0525:1998 Acoustics - Design in the field of spatial acoustics - General principles
- ČSN EN 17037:2019 Daylighting of buildings
- ČSN 73 0580-1:2007 Daylighting of buildings - Part 1: Basic requirements as amended Z3:2019
- ČSN 73 0580-2:2007 Daylighting of buildings - Part 2: Daylighting of residential buildings, as amended Z1:2019

- Law and other regulation:
 - Law No. 320/2015 CL., about the FRC in the Czech Republic
 - Law No. 133/1985 CL, fire protection law in amendments
 - Regulation No. 23/2008 CL, technical requirements of fire safety of buildings in amendment No. 268/2011 CL., about technical conditions of fire safety of buildings
 - Regulation about fire prevention
 - Regulation No. 246/2001 CL, determines requirements fire safety and performance of state fire supervision - regulation about fire prevention (about the determination of the conditions of fire safety and the performance of state fire supervision)
 - Reg. No. 268/2009 CL., about technical requirements of constructions
 - Reg. 499/2006 CL about building documentation - fire safety solution of building

 - Standards CSN:
 - ČSN 73 0810 - FPB -General requirements
 - ČSN 73 0802 - FPB - Non-industrial buildings
 - ČSN 73 0818 - FPB - Person surface rate in buildings
 - ČSN 73 0835 - FPB - Buildings for sanitary matters and social care

- ČSN 73 0872 - FPB - Protection of buildings to extension of fire by air distributing equipment (standard for ventilation)
- ČSN 73 0873 - FPB - Equipment for fire-water supply
- ČSN 73 0821, ed. 21 - FPB - Fire resistance of engineering structures
- ČSN 73 4200 - Chimneys - General requirements
- ČSN 73 4201 - Chimneys and flues
- ČSN 06 1008 - Fire safety of thermal equipment
- ČSN 01 3495 - Construction drawings in fire safety of buildings
- Other sources
 - Zoufal and coll.: Values of structure's fire resistance according to the EC
 - technical data sheets
 - Lectures from last years.
- Internet sources

[Porotherm | výrobce pro hrubou stavbu |](#)

[TZB-info - Stavebnictví. Úspory energií. Technická zařízení budov.](#)

[ISOVER - Jistota v izolacích | Isover](#)

[Fasády, omítky, stěrky, zateplení, podlahy, hydroizolace | Cz.Weber](#)

[Schiedel - vedoucí firma v oboru komínových systémů › Schiedel Česká republika](#)

[LASSELSBERGER, s.r.o. | RAKO ceramic wall and floor tiles](#)

[Systems for drainage of flat roofs | TOPWET](#)

[Optigruen: Green roofs and water management](#)

[OKNA.EU - Plastová, hliníková a dřevěná okna](#)

[Prefa.cz - ...we are where you build.](#)

[Home \(quick-step.co.uk\)](http://quick-step.co.uk)

[Stavebniny DEK](#)

[ČÚZK - Úvod \(cuzk.cz\)](http://cuzk.cz)

[Home - Compacfoam - Der moderne Werkstoff aus sortenreinem EPS](#)

3. LIST OF ABBREVIATIONS AND SYMBOLS USED

approx.	Approximately
cm	Centimeter
Coll.	Collocation
ČSN	Czech technical standard
ČSN EN	Adopted European standard
EPS	Expanded polystyrene
ETICS	External Thermal Insulation Composite System
FC	Fire compartment
FGL	Final ground level
IGL	Initial ground level
km	Kilometer
m	Meter
max	Maximal
min	Minimal
mm	Millimeter
No.	Number
pcs	Pieces

PE	Polyethylene
RC	Reinforced concrete
S-JTSK	System of a unified cadastral trigonometric network
th.	Thickness
GCV	main gas closing valve
EK	electrical box
WM	water meter shaft
DS	drainage shaft
RT	retention tank
RB	rainwater infiltration box

5. List of Annexes

FOLDER NO.1 - PREPARATORY AND STUDY WORKS

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FOLDER NO.2 - C SITUATION DRAWINGS

C.1 CADASTRAL SITUATION DRAWING	1:1000	2xA4
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FOLDER NO.3 - D.1.1 ARCHITECTURAL-STRUCTURAL SOLUTION

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FOLDER NO.4 - D.1.2 BUILDING CONSTRUCTION SOLUTION

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D.1.2.12 LIST OF DOORS		3xA4
D.1.2.13 LIST OF WINDOWS		3xA4
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FOLDER NO.5 - D.1.3 FIRE SAFETY SOLUTION

D.1.3.01 FIRE SAFETY REPORT		
D.1.3.02 SITUATION PLAN	1:200	4xA4
D.1.3.03 FIRST FLOOR PLAN	1:50	8xA4

D.1.3.04 SECOND FLOOR PLAN

1:50

8xA4

FOLDER NO.6 - BUILDING PHYSICS

6.01 - BUILDING PHYSICS REPORT

6.02 - A1 ENERGY SAVING AND HEAT PROTECTION ASSESSMENT

6.03 - A2 ACOUSTICS AND VIBRATION ASSESMENT

6.04 - A3 DAYLIGHTING AND SUN EXPOSURE ASSESSMENT