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FACULTY OF CIVIL ENGINEERING
DEPARTMENT OF BUILDING STRUCTURES



**TECHNICAL REPORT – BUILDING
SERVICES PART
RESIDENTIAL BUILDING**

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NAME OF PROJECT RESIDENTIAL BUILDING IN PRAGUE

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1. GENERAL INFORMATION

Residential building in Letnany in Prague is designed. The building is located in the outer border area of Prague in a newly developed residential area. The residential building is designed economically and utilizing modern ways of design and construction. The project emphasizes on good quality. The project utilized orthogonal architecture to blend in with the surrounding. Czech and Euro codes were used during design.

2. BASIC INFORMATION

The residential building has 1 underground floor and 5 upper ground floors. The size of the building is different in underground level and in upper floors. Underground level is 47,0 m long and 20,6 m. Height above the ground is 17.05 m. Height under the ground is 2,02 m. Total height is 19,07 m. The underground floor is equipped with a garage, technical room, washingmaschine room, drying room, rooms for storages. 16 parking spaces are located outside the building. Drive in to the building is from south. There are 10 apartments first level, 11 apartments in second till fourth level and 6 floor in fifth floor. Apartment is of different dispositions from 1+kc to 4+kc. The building consists of 49 apartment units in total. All the apartments are properly lighted. Underground level is bigger than upper floor, there is jump in the slab in the structural system of underground level to achieve the difference in section of first level terraces and apartments. Another recess of building shape is in the fifth level when the fifth level is smaller than others. The roof areas of fourth floor is used as terraces for fifth floor apartments. Building is also equipped with balconies. Entrance to the garage is from the level of outside street. There is no ramp. Underground level floor is in the same height as surrounding street level. Entrance to the building is from the intermediate level of staircase. It is one staircase wing downstairs to the garage and one staircase wing up to the apartment areas. In the entrance area there is common residential building equipmmt such as cleaning room and staller room. Underground floor is used mainly for parking, there is also storage areas and technical room. The building is not designed specifivaly for use of disabled people. Disabled people will be in the building not permanently, only occasionally.

2.1. SOFTWARE

-AutoCAD 2015

-MS Office

-Teplo

2.2. CODES

Water:

CSN 736660

CSN 736005

Drainage:

CSN 756114

CSN 756760

3. STRUCTURAL SYSTEM

Structural system of the building is combined reinforced concrete structure. Skeleton system is used in the underground level, upper floors load bearing elements are created from load bearing reinforced concrete walls. The building is founded on the combination of foundation slab of thickness of 250 mm and piles of diameter 600 mm and 900 mm.

4. WATER SUPPLY

4.1. WATER SOURCE

Water source is the public water supply.

4.2. WATER SUPPLY CONNECTION

Water is supplied to the north side of the limit of the land. Supply pipes are from steel DN50. Main water meter assembly is located in the shaft outside the object. Shaft is located 2 m from the façade of the object. It is circular shaft with diameter 1200 mm.

4.3. INNER PIPING

Cold water piping is from plastic pipelines PPR. Pipelines are going to be put under the ceiling of underground floor. Connection to the each apartments are going to be directed through installation shafts. Drainage fitting valve is located before every vertical piping. Piping in the apartments is done in the walls. There is a water meter and valve in located in every apartment. Cold water piping is connected to the boiler in the technical room in the underground. Hot water will be heated in the boiler in the technical room located in the underground. Heated water will be directed next to the cold water under the ceiling in the underground floor and through vertical shafts to each apartment. There will be as well water meter and valve. Not used hot water will go back in the circulated piping to the hot water reservoir. Circulated piping will be always between piping of hot and cold water. Water will be pumped by pump located directly before hot water reservoir.

4.4. HOT WATER PREPARATION

Hot water preparation will be solved as central system for the whole building located in the technical room in the ground floor. Technical room will be equipped with the gas boiler and hot water reservoir.

4.5. MATERIALS

Inner piping will be from plastic PPP. Water supply connection, part of the piping from water supply connection to main water meter assembly and fire water piping will be from steel piping. All the water piping will be thermally insulated.

5. DRAINAGE

5.1. MAIN DRAINAGE CONNECTION

Building is connected to the drainage network, it has separated rain water drainage from common drainage. Drainage is located -2.45 m under the pavement. Drainage piping is from concrete and is DN200

5.2. DRAINAGE ELEMENTS

Connection

It connects main drainage network with inner drainage. It is located in the revision shaft. Connecting piping is bedded in the sand gravel rigol, 1.4 m below ground in the angle of 21%.

Revision shaft

Revision shaft is located inside the object. Cleaning element is placed in this shaft. The distance between cleaning shafts in the object is 17,5 m. Other revision shafts are located outside the building due to the limit of 20 m per revision shaft.

Inner drainage

Inner drainage drains all water from all fittings and ends outside the building into main drainage network.

Underground drainage

Piping is equipped with security box in the place of going through foundation. Piping is directed under the floor of underground floor and has angle 2%. It is DN100 and DN125.

Vertical drainage

Every apartment has its vertical drainage located in the installation shaft. Cleaning elements are located in every floor, 1m above floor level. Connection from vertical to horizontal drainage is done by two 45° elements. All the vertical drainage has ventilation piping exiting to the roof.

Rain drainage

Building has a flat roof of area 360 m². Rain water is drained by two inner piping by PVC DN 100. It is directed underground next to drainage and goes to the rain drainage network.

6. HEATING

6.1. HEATING SOURCE

There is a system of gas boiler with hot water reservoir located in the technical room on the underground level. Boiler has estimated power 80 kW.

6.2. TECHNICAL ROOM

Technical room is located in the underground level. It is equipped with boiler, hot water reservoir, expansion vessel, watermeter assembly, chimney, main watermeters.

6.3. PIPING

All the piping needed for heating the object is from copper. There are several vertical piping. All the water piping for hot water is from PPR.

6.4. HEATING DEVICES

In all the apartments this type of heating devices is installed.

7. VENTILATION

Garage ventilation

PEW ventilation

Apartment ventilation

8. LIGHTING

All the living areas are properly lighted according to relevant codes. There is a light shaft located in the surrounding of PEW to allow daylight in this area.

9. ELECTRICITY

All the electricity in the building is properly designed according to relevant codes. There is a electricity box located in the communication area of every floor. Spatial importance was given to the electrical connection for forced ventilation in the PEW in the case of fire, ventilation of garage and EFS signaling in the corridor.

10. LIST OF DRAWINGS

1. Drainage and water supply - Plan View of the underground floor
2. Drainage and water supply - Plan View of the ground floor
3. Ventilation - Plan View of the underground floor
4. Ventilation - Plan View of the ground floor
5. Heating - Plan View of the underground floor
6. Heating - Plan View of the ground floor