

CZECH TECHNICAL UNIVERSITY IN PRAGUE
FACULTY OF CIVIL ENGINEERING



D.1.3 FIRE PROTECTION SOLUTIONS

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1. Identification data

1.1. Building data

Name of the building:

Community centre – Vodňany

Place of the building:

Zeyerovy sady 963, 389 01 Vodňany, Czech Republic

plots st.1678, 132, st.358, st.1021, 3132, 1762, 689, 3123, 1855/9, st.784/1, 130/3, 130/4, 130/1, 1929

cadastral community Vodňany [784281]

Subject of project documentation:

The subject of the project documentation is the new building of the community centre including the connection to the technical infrastructure.

1.1.1. Data about the developer

ARCHCON atelier, s. r. o.

Národní obrany 826/31

160 00 Praha 6 – Bubeneč

IČ: 28586204

1.1.2. Data about the designer

Bc. Tadeáš Petřík

Dlouhá 971, 330 23 Nýřany

2. General description of the building

The subject of the project documentation is a design of a community centre in a Czech town called Vodňany. It is a building with two floors above ground and one underground floor. The building is square in shape, with

The building is located on plots with parcel number st.1678, 132, st.358, st.1021, 3132, 1762, 689, 3123, 1855/9, st.784/1, 130/3, 130/4, 130/1, 1929. Cadastral community Vodňany [784281].

The building will be connected to the utilities, which are led under the adjacent roads in Zeyerovy Sady and Elektrárenská streets. The construction will not affect any surrounding existing buildings.

3. Urban, architectural and layout design of the building

The subject of the project documentation is a design of a community centre in a Czech town called Vodňany. The building is square in shape, with area of 46,1 x 45,9 m. It has two floors above ground and one underground floor. The height of the building is 9,5 m above $\pm 0,000$ or 9,8 m above ground (modified terrain). Structural floor height is 3,9 m for the underground floor, 4,4 m for the first floor and 4,3 m for the second floor.

The main part of the building is a large black box theatre right in the middle of the layout. Around it, on the first floor, there are public areas such as a foyer, cloakroom, café, playroom, clubrooms, staff facilities and sanitary facilities. On the second floor there is another foyer, an adult's library and children's library, an exhibition space, a cinema room, storage space, technical facilities for the black room theatre, and again staff and sanitary facilities. On the underground floor we can find a rehearsal room, an air-conditioner mechanical room, a boiler room and storerooms. Near the building there is a playground, few parking spaces, and a park that extends on the rest of the property.

4. Technical design of the building

The load-bearing system varies in different parts of the building. In the underground floor, the load-bearing system is designed as monolithic reinforced concrete walls supplemented by reinforced concrete beams and one-way floor slabs. On the above-ground floors, another load-bearing system is used for the black box theatre, where again monolithic reinforced concrete walls are used, now in combination with wooden truss beams. In the rest of the building, the load-bearing system is designed as a combination of wooden wall panels and wooden columns, supplemented by wooden beams and wooden one-way floor slabs.

The foundation structures are designed as a combination of strips and footings made of plain concrete, between which a base plain concrete slab will be made.

The staircases on the underground floor are designed as prefabricated reinforced concrete, half landing or two-quarter landing. The staircases on the above-ground floors are designed as wooden staircases, placed on wooden staircase beams, again half landing or two-quarter landing.

The building has sufficient spatial rigidity due to the large number of load-bearing walls perpendicular to each other in combination with wooden beams and rigid floor slabs.

4.1. Material solution of the building

Load-bearing structures in the underground floor are made as reinforced concrete monolithic, in the black box theatre as reinforced concrete monolithic in combination with wooden elements, and in the rest of the building the load-bearing structures are made of wood. The foundations are made of plain concrete.

Reinforced concrete structures

- concrete C30/37 XC1 (CZ) – CI 0,2 – D_{max} 16 – S3
- concrete C30/37 XC2 (CZ) – CI 0,2 – D_{max} 16 – S3
- steel B 500 B

Foundations

- concrete C25/30 XC2 (CZ) – CI 0,2 – D_{max} 16 – S3

Truss beams

- wood KVH/DUO C24 (S4S)

Wooden structures

- wood KVH C24
- wood CLT C24
- wood SWP + BSH GL32h
- wood BSH GL30

Partitions

- Knauf W111, thickness 100 mm
- Knauf W112, thickness 100 mm
- YTONG Klasik 100, thickness 100 mm

4.2. Vertical load-bearing structures

Monolithic reinforced concrete walls of uniform thickness of 200 mm will be made in the underground floor. In the above-ground floors, the load-bearing walls will be constructed in two ways. In the black box theatre, the walls will again be monolithic reinforced concrete walls of 200 mm thickness, in the rest of the building the walls will be made of NOVATOP SOLID wooden panels of uniform thickness 124 mm, supplemented by load-bearing wooden columns with dimensions 200x200 mm.

4.3. Horizontal load-bearing structures

In the underground floor, the floor slabs are made as one-way, monolithic, from reinforced concrete, designed in a uniform thickness of 250 mm. On this floor there are also monolithic reinforced concrete beams with a width of 200 mm and a height of 500 mm.

There will be openings in the reinforced concrete floor slabs, from which the reinforcement will be summarised outside the opening to the edges of the slab, the edges of the slab at the openings will be further edged with reinforcement.

On the above-ground floors, the floor slabs are designed as one-way wooden slabs NOVATOP ELEMENT, supplemented by wooden beams with a width of 180 mm and a height of 300 mm.

4.4. Vertical communication elements

In the underground floor the staircases will be made as prefabricated, from reinforced concrete, in the above-ground floors staircases will be made out of wood, supported by the staircase wooden beams. All staircase connections to load bearing structures will need to be made in such a way to eliminate the distribution of the impact sound as much as possible. An elevator from VOTO s.r.o. will be used. It is a traction lift without machine room, type III.

4.5. Partitions

There are 3 types of partitions designed in the building. Ytong partitions, 100 mm thick, are designed in the underground floor. In the rest of the building, PBD partitions of Knauf system are designed, namely W111 with a thickness of 100 mm and W112 with a thickness of 100 mm.

For a more detailed description of the individual compositions of each partition, including their minimum airborne sound insulation $R'w$, see annexes D.1.1-13 to D.1.1-17.

4.6. Dropped ceilings

In the whole building, except for the underground floor, there is a PBD dropped ceiling made of the Knauf system. The 15 mm thick Knauf Silentboard boards are anchored to the CD 27/60 load-bearing steel profiles, which are further anchored to the floor slabs using the Nonius anchoring system and steel dowels. The total ceiling height is 500 mm.

4.7. Thermal insulation

The basement walls will be insulated with XPS Isover Styrodur 3000 CS, 200 mm thick. In all areas of the building the insulation will be pulled 300 mm above the landscaped ground to form a plinth.

This thermal insulation will be followed by STEICO Therm 200 mm thick fibreboard on the external walls on the upper floors.

The flat roof above the black box theatre will be insulated with a 270 mm thick layer of Isover EPS 150 thermal insulation.

The flat roof in the rest of the building will include a 200 mm thick layer of XPS Isover Styrodur 3000 CS thermal insulation and a 50-250 mm thick wedge of Isover EPS 150 thermal insulation.

4.8. Windows and doors

The window openings are filled with DAFE PROGRESS ALU EF+ windows with aluminium window frames, triple glazing and integrated blinds. The windows will be finished in a dark grey colour matching the same shade as the plinth plaster and CETRIS LASUR 007 boards.

Several of the entrance doors to the building on the first floor, including one interior door between the vestibule and the foyer behind the main entrance, are designed as glazed in a plastic frame, also with triple glazing and also in a dark grey colour matching the shade of the plinth plaster and the CETRIS LASUR 007 boards. The other entrance door is designed with a solid door panels in frame jambs.

In the interior of the basement floor, the door panels will be solid, in steel jambs. In the interior of the upper floors, the doors will be made with a wooden solid door panels, either in wooden jambs or in frame jambs.

4.9. Installation shafts and partitions

Several installation shafts are designed in the building, their number varies on each floor due to the partial basement of the building. The shafts are designed in different dimensions, these dimensions and the overall layout of the shafts is shown in the structural system drawings and the load-bearing structures layout drawings, see annexes D.1.2-1 to D.1.2-7.

The walls of the installation shafts are made up of 100 mm thick Knauf W111 PBD partitions. In the bathrooms and toilets, the installation PBD partitions are also designed as Knauf W111 100 mm thick, with a 100 mm air gap behind them for all pipework.

4.10. Roof construction

The building is designed with two types of roofs. Above the black box theatre there is a flat, inaccessible (except for maintenance) green roof. It is waterproofed with Fatrafol 810/V PVC-P foil, which is designed so that it can be exposed to direct sunlight and weather conditions. The thermal insulation of this roof consists of Isover EPS 150 with a thickness of 270 mm. The vapour barrier consists of a combination of a top asphalt strip BITAGIT 40 AL+V60 Mineral Radon, t. 4 mm, and a bottom asphalt strip Glastek 30 Sticker Plus KVK, t. 3 mm, the wedge is made of Isover Woodsil mineral wool.

The second type of roof is also a flat inaccessible (except for maintenance) green roof. XPS Isover Styrodur 3000 CS with a thickness of 200 mm is used as thermal insulation, and again PVC-P foil Fatrafol 810/V as waterproofing. The slope is made of Isover EPS 150 thermal insulation 50-250 mm thick.

For a more detailed description of the roof compositions with a complete listing of the individual layers and their thicknesses, including their heat transfer coefficient, see annexes D.1.1-13 to D.1.1-17.

5. Division of the building into fire sections

PÚ/NÚC	NO.	ROOM	AREA [m ²]	P _{v,tab} [kg/m ²]	P _{v,max} [kg/m ²]	* c [-]	P _{v,final} [kg/m ²]	SPB
PÚ	0.02	STORAGE	10,2	45,0	45,0	1,0	45,0	II.

PÚ	0.03	REHEARSAL ROOM	29,5	42,0	45,0	0,7	31,5	II.
	0.04	AIR CONDITIONING ROOM	70,3	WITHOUT (OR LOWER) FIRE RISK				
	0.05	BOILER ROOM	19,5	WITHOUT (OR LOWER) FIRE RISK				
	0.06	WORKSHOP	33,3	42,0				
	0.08	STORAGE	31,6	45,0				

NÚC	0.01	CORRIDOR	30,4	7,5	13,0	0,85	11,1	III.
	0.07	CORRIDOR	26,5	7,5				
	0.09	CORRIDOR	11,7	7,5				
	1.01	VESTIBULE	16,3	7,5				
	1.02	FOYER + STAIRCASE	252,4	13,0				
	1.17	VESTIBULE	50,6	7,5				
	1.22	CORRIDOR	55,2	7,5				
	1.25	CORRIDOR	21,9	7,5				
	1.29	CORRIDOR	68,9	7,5				
	2.01	FOYER	109,7	13,0				
	2.12	CORRIDOR	6,2	7,5				
2.16	CORRIDOR	89,9	7,5					

PÚ	1.03	BLACK BOX THEATRE	601,1	25,0	25,0	0,7	17,5	II.
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PÚ	1.04	CAFÉ	142,5	25,0	45,0 (35,0)	0,75	33,8 (26,3)	IV.
	1.05	STORAGE + CLEANING ROOM	9,2	45,0				
	1.06	WC EMPLOYEES	3,2	WITHOUT (OR LOWER) FIRE RISK				
	1.07	WC WOMEN	3,7	WITHOUT (OR LOWER) FIRE RISK				
	1.08	WC MEN	3,7	WITHOUT (OR LOWER) FIRE RISK				
	1.09	CLOAKROOM	10,2	13,0				
	1.10	WC CHILDREN	6,8	WITHOUT (OR LOWER) FIRE RISK				
	1.11	KITCHEN	6,8	WITHOUT (OR LOWER) FIRE RISK				
	1.12	PLAYROOM	61,8	35,0				
	1.13	BEDROOM	36,0	35,0				
	1.14	TOY STORAGE	2,9	45,0				
	1.15	STORAGE	110,9	45,0				

NÚC	1.16	CORRIDOR	23,1	7,5	7,5	0,75	5,6	II.
	2.04	CORRIDOR	13,8	7,5				
	2.07	CORRIDOR	6,5	7,5				

PÚ	1.18	DRESSING ROOM MEN	29,7	13,0	25,0	0,7	17,5	III.
	1.19	WC MEN	7,0	WITHOUT (OR LOWER) FIRE RISK				
	1.20	DRESSING ROOM WOMEN	29,7	13,0				
	1.21	WC WOMEN	7,1	WITHOUT (OR LOWER) FIRE RISK				
	1.23	CLUBROOM	55,5	25,0				
	1.24	CLUBROOM	59,4	25,0				

PÚ	1.26	CLEANING ROOM	2,6	WITHOUT (OR LOWER) FIRE RISK	13,0	0,7	9,1	II.
	1.27	WC MEN	20,5	WITHOUT (OR LOWER) FIRE RISK				
	1.28	WC WOMEN	22,8	WITHOUT (OR LOWER) FIRE RISK				
	1.30	CLOAKROOM	92,1	13,0				
PÚ	2.02	EXHIBITION SPACE	37,3	45,0	45,0	0,7	31,5	IV.
PÚ	2.03	LIBRARY	264,8	42,0	45,0	0,75	33,8	IV.
	2.05	DEPOSITORY	48,5	45,0	(42,0)	0,75	(31,5)	
PÚ	2.06	DEPOSITORY	18,2	45,0	45,0 (42,0)	0,75	33,8 (31,5)	IV.
	2.08	CHILDREN'S LIBRARY	262,1	42,0				
	2.09	TECHNICAL FACILITIES	52,0	WITHOUT (OR LOWER) FIRE RISK				
	2.10	OFFICE	17,0	42,0				
	2.11	OFFICE + KITCHEN	25,1	42,0				
PÚ	2.13	WC WOMEN	12,2	WITHOUT (OR LOWER) FIRE RISK	25,0	0,7	17,5	III.
	2.14	WC EMPLOYEES	5,0	WITHOUT (OR LOWER) FIRE RISK				
	2.15	WC MEN	11,5	WITHOUT (OR LOWER) FIRE RISK				
	2.17	LECTURE ROOM	83,7	25,0				

6. Evaluation of the designed building structures and fire closures in terms of their fire resistance

The requirements for fire resistance of building structures and fire closures were determined according to the conceptual design of fire resistance based on the relevant standards and on the architectural study of the building.

For the conceptual design procedure, see the first part of the Master's Thesis, specifically *Initial Research and Analysis*.

For the conceptual drawings of fire protection solutions, see drawings *D.1.3-1 to D.1.3-3*.

6.1. Walls and ceilings between fire sections

For the individual compositions of the structures, their requirements and their fulfilment, see annexes *D.1.3-4 to D.1.3-7*.

6.2. Fire closures in walls and ceilings

Not addressed in the conceptual design of fire protection solutions in this Master's Thesis.

6.3. Exterior walls

For the individual compositions of the structures, their requirements and their fulfilment, see annexes *D.1.3-4 to D.1.3-7*.

6.4. Roofs

For the individual compositions of the structures, their requirements and their fulfilment, see annexes *D.1.3-4 to D.1.3-7*.

6.5. Load-bearing structures inside the fire sections that provide stability of the building

For the individual compositions of the structures, their requirements and their fulfilment, see annexes *D.1.3-4 to D.1.3-7*.

6.6. Load-bearing structures outside the building that provide stability of the building

Do not occur.

6.7. Load-bearing structures inside the fire sections that do not provide stability of the building

Do not occur.

6.8. Non load-bearing structures between fire sections

For the individual compositions of the structures, their requirements and their fulfilment, see annexes *D.1.3-4 to D.1.3-7*.

6.9. Non load-bearing structures inside the fire sections

No fire resistance requirements.

6.10. Staircases and elevator shafts inside the fire section that are not part of the CHÚC

Within the conceptual design, the requirements for fire resistance are set out (see drawings *D.1.3-1 to D.1.3-3*), then not further addressed.

6.11. Installation shafts

The installation shafts are formed by the identical walls that are used between the fire compartments.

For the individual compositions of the structures, their requirements and their fulfilment, see annexes *D.1.3-4 to D.1.3-7*.

6.12. Roof sheathing

No fire resistance requirements.

7. Evacuation of persons and determination of types and number of escape routes

From the main assembly area (black box theatre) there are escape routes to 3 directions. In total, there is 1 door to the north, 3 doors to the east, and 3 doors to the west. There are then a total of 7 escape exits from the entire building to the open outdoor space, 3 exits to the north, 2 exits to the west, and 2 exits to the south.

All escape routes are designed as unprotected, "NÚC".

8. Fire protection measures for the whole building

Electronic fire alarms "EPS" will be installed in every room except the sanitary facilities.

Panic bars will be installed on all doors leading from the main assembly area (black box theatre), library, children's library, lecture room, and on all doors in escape routes.

A hydrant should be located within 20 metres of the building, easily accessible to firefighters in the event of a fire.

9. Software used

- AutoCAD 2018 (student version)
- AutoCAD 2023 (student version)
- Microsoft Office 365 (student version)

10. List of references

- ARCHCON Architectural study KD Vodňany [online]
- ARCHCON atelier s.r.o., [cit. 2023-01-08], [<https://www.archcon.cz/projekt/kd-vodnany/>]

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- VÝTAHY VOTO [online], Výtahy VOTO s.r.o., [c. 2023-01-08], [<https://www.vytahy-voto.cz/>]

- TZB-info [online], Topinfo s.r.o., [cit. 2023-01-08], [<https://www.tzb-info.cz/>]

11. List of used standards, laws and decrees

- ČSN 01 3420 Výkresy pozemních staveb – Kreslení výkresů stavební část
- ČSN 73 5305 Administrativní budovy a prostory
- ČSN 73 5245 Kulturní objekty s hledištěm. Podmínky viditelnosti
- ČSN 73 1901 Navrhování střech – Základní ustanovení
- ČSN 73 4130 Schodiště a šikmé rampy – Základní požadavky

- ČSN 01 3495 Výkresy ve Stavebnictví – Výkresy požární bezpečnosti staveb
- ČSN 73 0802 ed. 2 Požární bezpečnost staveb – Nevýrobní objekty
- ČSN 73 0831 ed. 2 Požární bezpečnost staveb – Shromažďovací prostory
- ČSN 73 0818 Požární bezpečnost staveb – Obsazení objektů osobami
- ČSN 73 0821 ed. 2 Požární bezpečnost staveb – Požární odolnost stavebních konstrukcí
- ČSN 73 0810 Požární bezpečnost staveb – Společná ustanovení
- ČSN 73 0833 Požární bezpečnost staveb – Budovy pro bydlení a ubytování

- ČSN EN 1990 Eurokód: Zásady navrhování konstrukcí

- Zákon č. 183/2006 Sb., o územním plánování a stavebním řádu (stavební zákon)
- Zákon č. 201/2012 Sb., o ochraně ovzduší
- Zákon č. 262/2006 Sb., zákoník práce
- Zákon č. 263/2016 Sb., atomový zákon
- Zákon č. 541/2020 Sb., zákon o odpadech
- Zákon č. 100 / 2001 Sb., o posuzování vlivů na životní prostředí a o změně některých souvisejících zákonů (zákon o posuzování vlivů na životní prostředí)
- Zákon č. 185/2001 Sb., o odpadech a o změně některých dalších zákonů
- Zákon č. 258/2000 Sb., o ochraně veřejného zdraví a o změně některých souvisejících zákonů
- Zákon č. 309/2006 Sb., o zajištění dalších podmínek bezpečnosti a ochrany zdraví při práci

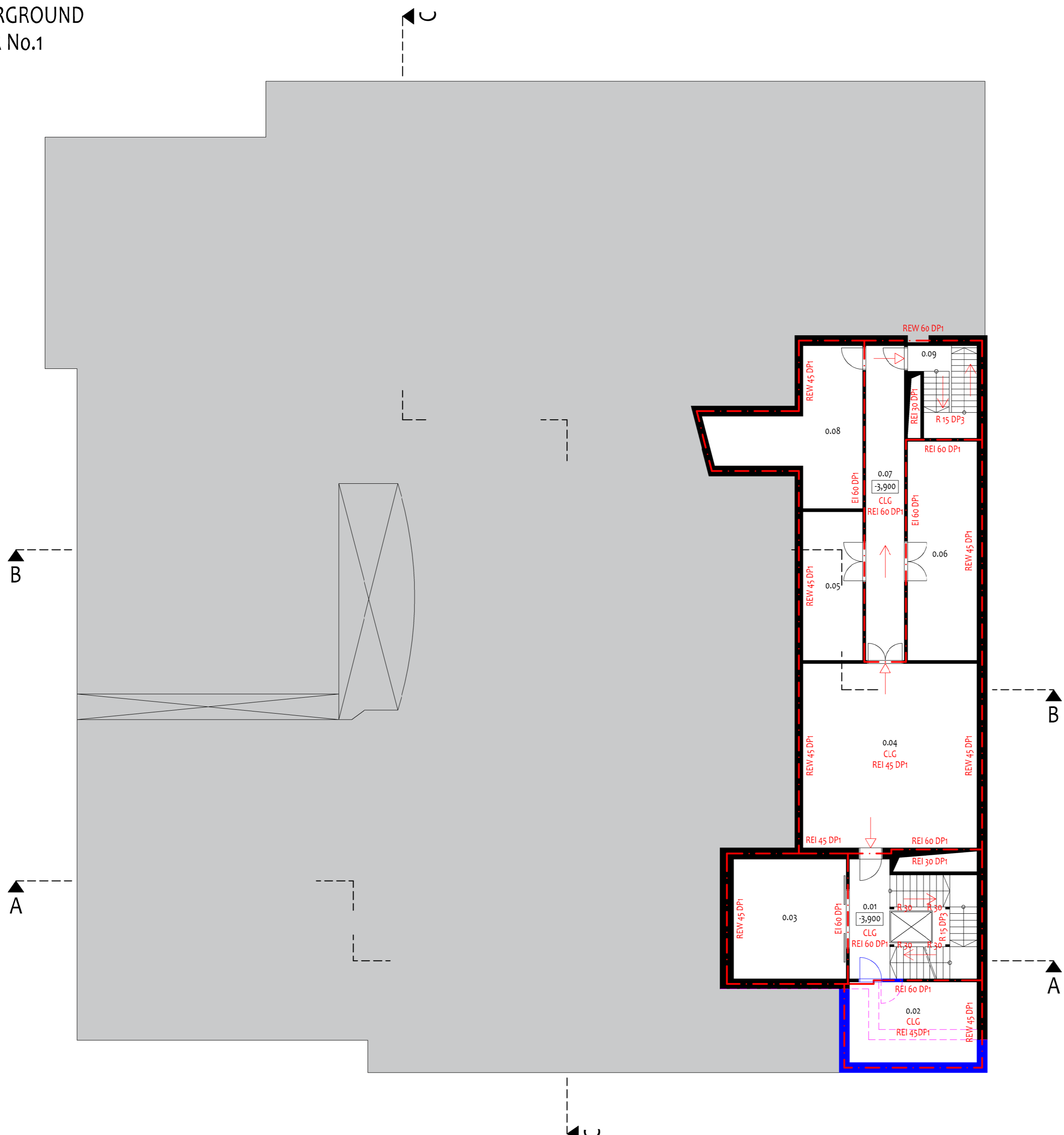
- Nařízení vlády č. 163/2002 Sb., ověření o shodě výrobku
- Nařízení vlády č. 101/2005 Sb., o podrobnějších požadavcích na pracoviště a pracovní prostředí
- Nařízení vlády č. 272/2011 Sb., o ochraně zdraví před nepříznivými účinky hluku a vibrací
- Nařízení vlády č. 361/2007 Sb., kterým se stanoví podmínky ochrany zdraví při práci
- Nařízení vlády č. 591/2006 Sb., o bližších minimálních požadavcích na bezpečnost a ochranu zdraví při práci na staveništích
- Nařízení vlády č. 494/2001 Sb., kterým se stanoví způsob evidence, hlášení a zasílání záznamu o úrazu, vzor záznamu o úrazu a okruh orgánů a institucí, kterým se ohlašuje pracovní úraz a zasílá záznam o úrazu
- Nařízení vlády č. 495/2001 Sb., kterým se stanoví rozsah a bližší podmínky poskytování osobních ochranných pracovních prostředků, mycích, čisticích a dezinfekčních prostředků

- Vyhláška č. 268/2009 Sb., o technických požadavcích na stavby
- Vyhláška č. 499/2001 Sb., o dokumentaci staveb
- Vyhláška č. 78/2013 Sb., o energetické náročnosti budov
- Vyhláška č. 398/2009 Sb., o obecných technických požadavcích zabezpečujících bezbariérové užívání staveb
- Vyhláška č. 23/2008 Sb., o technických podmínkách požární ochrany staveb
- Vyhláška č. 422/2016 Sb., o radiační ochraně a zabezpečení radionuklidového zdroje
- Vyhláška č. 120/2011 Sb., kterou se mění vyhláška Ministerstva zemědělství č. 428/2001 Sb., kterou se provádí zákon č. 274/2001 Sb., o vodovodech a kanalizacích pro veřejnou potřebu a o změně některých zákonů (zákon o vodovodech a kanalizacích), ve znění pozdějších předpisů

In Barcelona 12/2022

Author: Bc. Tadeáš Petřík

UNDERGROUND FLOOR No.1



LEGEND OF THE ELEMENTS:

- FIRE SECTION "PÚ"
- REI 30, ... REQUIRED FIRE RESISTANCE
- CLG REI 45, ... REQUIRED FIRE RESISTANCE (CEILINGS)
- EMERGENCY EXIT SIGN
- DIRECTION OF THE ESCAPE ROUTE
- EMERGENCY EXIT TO THE EXTERIOR
- ZOKT SMOKE AND HEAT EXTRACTION DEVICE
- CHANGES IN LAYOUT OR STRUCTURES FOR FIRE PROTECTION REASONS:
- NEW ELEMENTS
- - - REMOVED ELEMENTS

FIRE RESISTANCE LIMIT STATES:

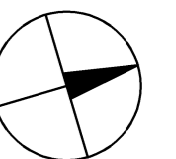
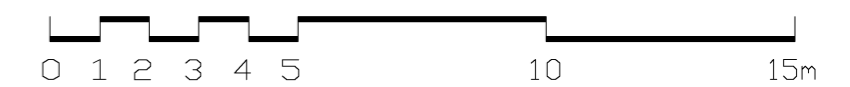
- R** LOAD-BEARING CAPACITY AND STABILITY
- E** INTEGRITY
- I** INSULATING ABILITY
- W** LIMITATION OF HEAT RADIATION


Community centre - Vodňany - UG FL No.1		
NO.	ROOM	AREA [m ²]
0.01	CORRIDOR	30,4
0.02	STORAGE	10,2
0.03	REHEARSAL ROOM	29,5
0.04	UTILITY ROOM	70,3
0.05	STORAGE	19,5
0.06	WORKSHOP	33,3
0.07	CORRIDOR	26,5
0.08	STORAGE	31,6
0.09	CORRIDOR	11,7
TOTAL		263,0

NOTES:

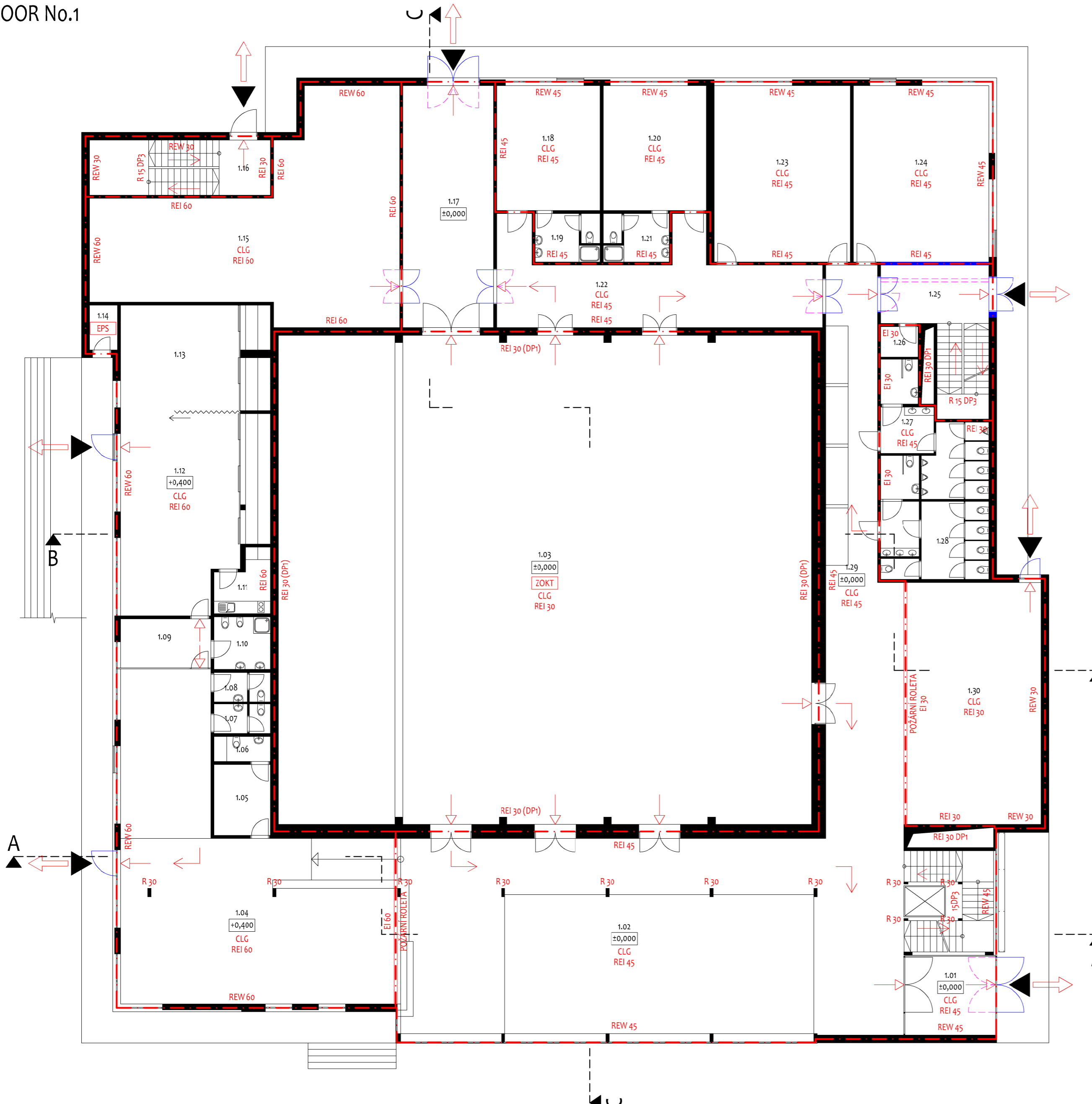
- electronic fire alarms "EPS" will be installed in every room except the sanitary facilities
- panic bars will be installed on all doors leading from the main gathering area (black box theatre), library, children's library, lecture room, and on all doors in escape routes
- fire resistance was only determined for walls, ceilings (floors) and installation shafts, the fire resistance of doors, windows or other building components will be added to the section D.1.3 FIRE PROTECTION SOLUTIONS, if necessary
- all values of fire resistance of the individual structures are only indicative, serving only for basic conceptual design, in no case should they be used for the final design of the fire protection of this building, which would have to be made by an expert who is specialized in the field of fire protection of buildings and would have to be supported by a detailed calculation
- the project documentation can be used only as DSP and in case of any questions it is necessary to contact the responsible designer

±0,000 = 401,5 m.s.l. (B.p.v.)



AUTHOR	Bc. Tadeáš Petřík	CTU Prague Faculty of Civil Engineering	
SUPERVISOR	Ing. Kamil Staněk, Ph.D.		
CONSULTANT	Professor Climent Molins Borrell	FORMAT	4 x A4
TYPE OF THESIS	Master's Thesis	DATE	10/2022
YEAR	2022/2023	LEVEL OF PD	DSP
LOCATION	Czech Republic - Vodňany	SCALE	NO.
BUILDING'S NAME	Community Centre - Vodňany	1:150	D.1.3-1
SUBDIVISION	D.1.3 FIRE PROTECTION SOLUTIONS		
CONTENT	FIRE PROTECTION SOLUTIONS - UG FL No.1		

FLOOR No.1



LEGEND OF THE ELEMENTS:

- FIRE SECTION "PÚ"
- REW 60 DP1, EI 30, ... REQUIRED FIRE RESISTANCE
- CLG REI 45, ... REQUIRED FIRE RESISTANCE (CEILINGS)
- EMERGENCY EXIT SIGN
- DIRECTION OF THE ESCAPE ROUTE
- EMERGENCY EXIT TO THE EXTERIOR
- ZOKT SMOKE AND HEAT EXTRACTION DEVICE
- CHANGES IN LAYOUT OR STRUCTURES FOR FIRE PROTECTION REASONS:
- NEW ELEMENTS
- - - REMOVED ELEMENTS

FIRE RESISTANCE LIMIT STATES:

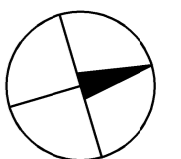
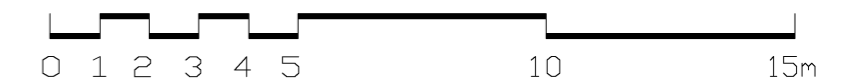
- R LOAD-BEARING CAPACITY AND STABILITY
- E INTEGRITY
- I INSULATING ABILITY
- W LIMITATION OF HEAT RADIATION

Community centre - Vodňany - FL No.1		
NO.	ROOM	AREA [m ²]
1.01	VESTIBULE	16,3
1.02	FOYER + STAIRCASE	252,4
1.03	BLACK BOX THEATRE	601,1
1.04	CAFÉ	142,5
1.05	STORAGE + CLEANING ROOM	9,2
1.06	WC EMPLOYEES	3,2
1.07	WC WOMEN	3,7
1.08	WC MEN	3,7
1.09	CLOAKROOM	10,2
1.10	WC CHILDREN	6,8
1.11	KITCHEN	6,8
1.12	PLAYROOM	61,8
1.13	BEDROOM	36,0
1.14	TOY STORAGE	2,9
1.15	STORAGE	110,9
1.16	CORRIDOR	23,1
1.17	VESTIBULE	50,6
1.18	DRESSING ROOM MEN	29,7
1.19	WC MEN	7,0
1.20	DRESSING ROOM WOMEN	29,7
1.21	WC WOMEN	7,1
1.22	CORRIDOR	55,2
1.23	CLUBROOM	55,5
1.24	CLUBROOM	59,4
1.25	CORRIDOR	21,9
1.26	CLEANING ROOM	2,6
1.27	WC MEN	20,5
1.28	WC WOMEN	22,8
1.29	CORRIDOR	68,9
1.30	CLOAKROOM	92,1
TOTAL		1814,1

NOTES:

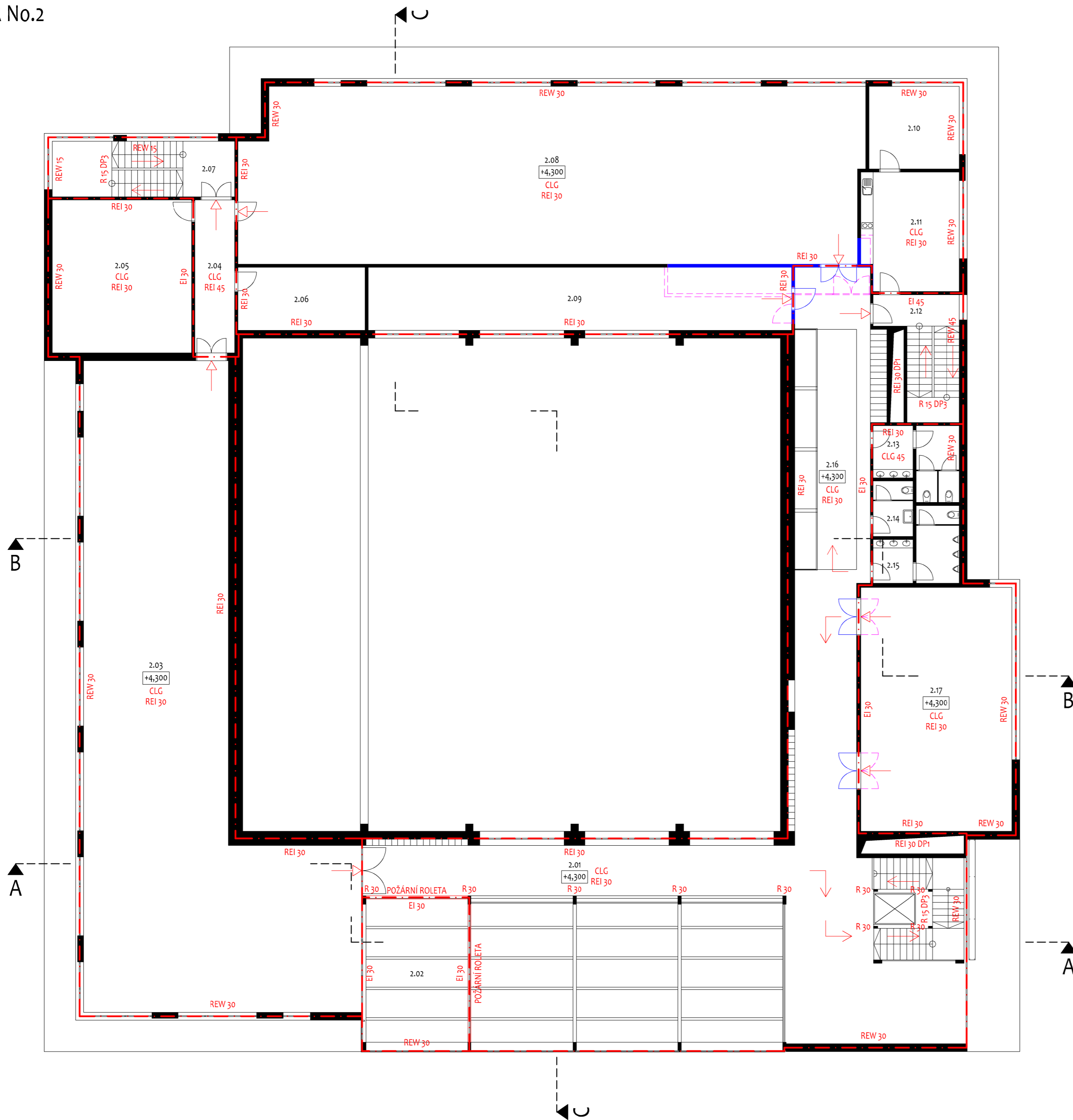
- electronic fire alarms "EPS" will be installed in every room except the sanitary facilities
- panic bars will be installed on all doors leading from the main gathering area (black box theatre), library, children's library, lecture room, and on all doors in escape routes
- fire resistance was only determined for walls, ceilings (floors) and installation shafts, the fire resistance of doors, windows or other building components will be added to the section D.1.3 FIRE PROTECTION SOLUTIONS, if necessary
- all values of fire resistance of the individual structures are only indicative, serving only for basic conceptual design, in no case should they be used for the final design of the fire protection of this building, which would have to be made by an expert who is specialized in the field of fire protection of buildings and would have to be supported by a detailed calculation
- the project documentation can be used only as DSP and in case of any questions it is necessary to contact the responsible designer

±0,000 = 401,5 m.s.l. (B.p.v.)



AUTHOR	Bc. Tadeáš Petřík	CTU Prague Faculty of Civil Engineering	
SUPERVISOR	Ing. Kamil Staněk, Ph.D.		
CONSULTANT	Professor Climent Molins Borrell	FORMAT	4 x A4
TYPE OF THESIS	Master's Thesis	DATE	10/2022
YEAR	2022/2023	LEVEL OF PD	DSP
LOCATION	Czech Republic - Vodňany	SCALE	NO.
BUILDING'S NAME	Community Centre - Vodňany	1:150	D.1.3-2
SUBDIVISION	D.1.3 FIRE PROTECTION SOLUTIONS		
CONTENT	FIRE PROTECTION SOLUTIONS - FL No.1		

FLOOR No.2



- LEGEND OF THE ELEMENTS:**
- FIRE SECTION "PÚ"
 - REW 60 DP1, EI 30, ... REQUIRED FIRE RESISTANCE
 - CLG REI 45, ... REQUIRED FIRE RESISTANCE (CEILINGS)
 - EMERGENCY EXIT SIGN
 - DIRECTION OF THE ESCAPE ROUTE
 - EMERGENCY EXIT TO THE EXTERIOR
 - ZOKT SMOKE AND HEAT EXTRACTION DEVICE
 - CHANGES IN LAYOUT OR STRUCTURES FOR FIRE PROTECTION REASONS:
 - NEW ELEMENTS
 - - - REMOVED ELEMENTS

- FIRE RESISTANCE LIMIT STATES:**
- R LOAD-BEARING CAPACITY AND STABILITY
 - E INTEGRITY
 - I INSULATING ABILITY
 - W LIMITATION OF HEAT RADIATION

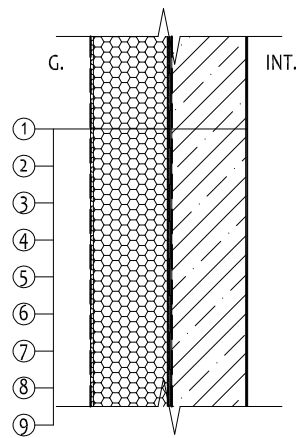
Community centre - Vodňany - FL No.2		
NO.	ROOM	AREA [m ²]
2.01	FOYER	109,7
2.02	EXHIBITION SPACE	37,3
2.03	LIBRARY	264,8
2.04	CORRIDOR	13,8
2.05	DEPOSITORY	48,5
2.06	DEPOSITORY	18,2
2.07	CORRIDOR	6,5
2.08	CHILDREN'S LIBRARY	262,1
2.09	TECHNICAL FACILITIES	52,0
2.10	OFFICE	17,0
2.11	OFFICE + KITCHEN	25,1
2.12	CORRIDOR	6,2
2.13	WC WOMEN	12,2
2.14	WC EMPLOYEES	5,0
2.15	WC MEN	11,5
2.16	CORRIDOR	89,9
2.17	LECTURE ROOM	83,7
	TOTAL	1063,5

1.03	BLACK BOX THEATRE	601,1
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- NOTES:**
- electronic fire alarms "EPS" will be installed in every room except the sanitary facilities
 - panic bars will be installed on all doors leading from the main gathering area (black box theatre), library, children's library, lecture room, and on all doors in escape routes
 - fire resistance was only determined for walls, ceilings (floors) and installation shafts, the fire resistance of doors, windows or other building components will be added to the section D.1.3 FIRE PROTECTION SOLUTIONS, if necessary
 - all values of fire resistance of the individual structures are only indicative, serving only for basic conceptual design, in no case should they be used for the final design of the fire protection of this building, which would have to be made by an expert who is specialized in the field of fire protection of buildings and would have to be supported by a detailed calculation
 - the project documentation can be used only as DSP and in case of any questions it is necessary to contact the responsible designer

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YEAR	2022/2023	LEVEL OF PD	DSP
LOCATION	Czech Republic - Vodňany	SCALE	NO.
BUILDING'S NAME	Community Centre - Vodňany	1:150	D.1.3-3
SUBDIVISION	D.1.3 FIRE PROTECTION SOLUTIONS		
CONTENT	FIRE PROTECTION SOLUTIONS - FL No.2		

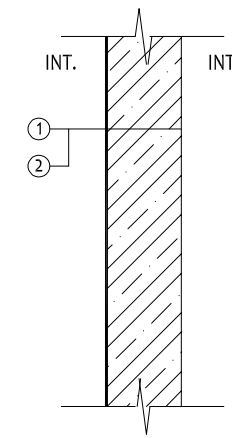


W01 - Exterior load-bearing wall of the heated space adjacent to the ground (underground floor)				
NO.	COMPOSITION INT - GROUND	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	thin-layer gypsum plaster Cemix 136	REW 60	B, C1 - C4	4,0
2	reinforced concrete C30/37, 2500 kg/m ³			
3	asphalt penetration coating			
4	asphalt strip GLASTEK 40 Special Mineral			
5	asphalt strip GLASTEK 40 Special Mineral			
6	frost-resistant and trowel compound Cemix BASIC			
7	XPS Isover STYRODUR 3000 CS			
8	stud membrane DEKDREN G8			
9	separation geotextile FILTEK 300			
SRC.	It can be safely assumed that the reinforced concrete structure will meet the required fire resistance.			

Fire resistance acc. to the manufacturer/calculation and field of application REI / REW - DP1 => FULFILLED

Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

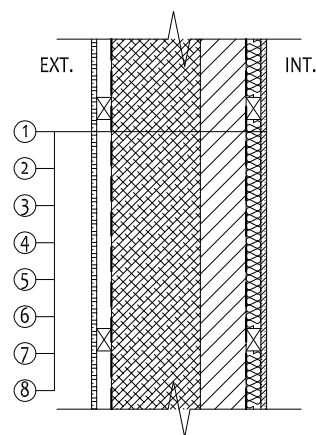


W04 - Interior load-bearing wall without temp. diff. or up to 10 °C max. (black box theatre - inner side)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	reinforced concrete C30/37, 2500 kg/m ³	REI 30 (DP1)	B, C1 - C4	9,0
2	thin-layer gypsum plaster Cemix 136			
SRC.	It can be safely assumed that the reinforced concrete structure will meet the required fire resistance.			

Fire resistance acc. to the manufacturer/calculation and field of application REI / REW - DP1 => FULFILLED

Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.



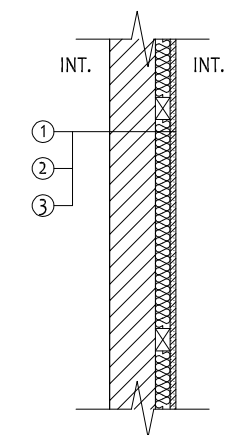
W02 - Exterior load-bearing wall of the heated space (rest of the building)				
NO.	COMPOSITION INT - EXT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	PBD Knauf White	REW 60	B, C1 - C4	4,0
2	MW Isover Woodsil, wooden slatted grate 40/60			
3	PE foil Knauf Insulation Homeseal LDS 100			
4	CLT wooden panel NOVATOP SOLID			
5	fibreboard STEICO Therm			
6	diffusion permeable foil Tyvek Solid			
7	ventilated air gap, spacing wooden slatted grate 40/60 (vertical)			
8	wooden slats (placed horizontally) / CETRIS LASUR 007			
SRC.	NOVATOP SOLID Technical sheet [https://novatop-system.cz/produkt/novatop-solid/]			

Fire resistance acc. to the manufacturer/calculation and field of application REI / REW 60 DP3 => FULFILLED

Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

If better fire resistance is required (e.g. in unprotected escape routes NÚC), PBD Knauf Silentboard can be replaced by Knauf RED Piano or Knauf Fireboard.



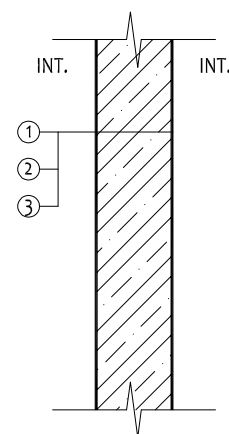
W05 - Interior load-bearing wall without temp. diff. or up to 10 °C max. (black box theatre - outer side)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	PBD Knauf Silentboard	REI 60	B, C1 - C4	4,0
2	MW Knauf Insulation Akustik Board, wooden slatted grate 40/60			
3	CLT wooden panel NOVATOP SOLID			
SRC.	NOVATOP SOLID Technical sheet [https://novatop-system.cz/produkt/novatop-solid/]			

Fire resistance acc. to the manufacturer/calc. and field of application REI / REW 60 DP3 => FULFILLED

Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

If better fire resistance is required (e.g. in unprotected escape routes NÚC), PBD Knauf Silentboard can be replaced by Knauf RED Piano or Knauf Fireboard.



W03 - Interior load-bearing wall without temp. diff. or up to 10 °C max. (underground floor)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	thin-layer gypsum plaster Cemix 136	REI 60 DP1	B, C1 - C4	4,0
2	reinforced concrete C30/37, 2500 kg/m ³			
3	thin-layer gypsum plaster Cemix 136			
SRC.	It can be safely assumed that the reinforced concrete structure will meet the required fire resistance.			

Fire resistance acc. to the manufacturer/calculation and field of application REI / REW - DP1 => FULFILLED

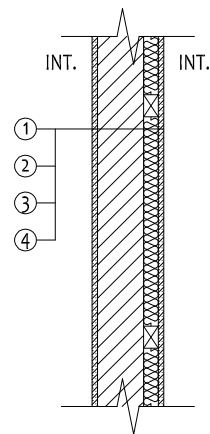
Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

Notes: Within the simplified conceptual design, the maximum fire resistance of structure compositions that aren't supplied by the manufacturer as a whole is determined according to the most similar structures.

For a complete description of the structure compositions, see D.1.1-18 - D.1.1-22

AUTHOR	Bc. Tadeáš Petřík	CTU Prague Faculty of Civil Engineering	
SUPERVISOR	Ing. Kamil Staněk, Ph.D.		
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YEAR	2022/2023	DATE	11/2022
LOCATION	Czech Republic - Vodňany	LEVEL OF PD	DSP
BUILDING'S NAME	Community Centre - Vodňany	SCALE	NO.
SUBDIVISION	D.1.3 FIRE PROTECTION SOLUTIONS	1:20	D.1.3-4
CONTENT	FIRE RESISTANCE OF INDIVIDUAL STRUCTURES		



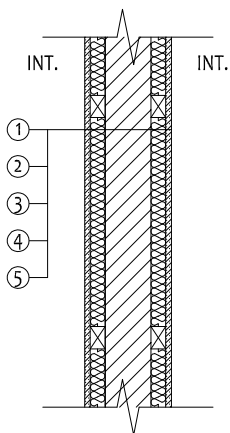
W06 - Interior load-bearing wall without temp. diff. or up to 10 °C max. (installation shafts)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	PBD Knauf Silentboard	REI 30 DP1	B, C1 - C4	4,0
2	MW Knauf Insulation Akustik Board, wooden slatted grate 40/60			
3	CLT wooden panel NOVATOP SOLID			
4	PBD Knauf Silentboard			
SRC.	NOVATOP SOLID Technical sheet [https://novatop-system.cz/produkt/novatop-solid/]			

Fire resistance acc. to the manufacturer/calc. and field of application REI / REW 60 DP3 (+ PBD Knauf DP1) => FULFILLED

Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

If better fire resistance is required (e.g. in unprotected escape routes NÚC), PBD Knauf Silentboard can be replaced by Knauf RED Piano or Knauf Fireboard.



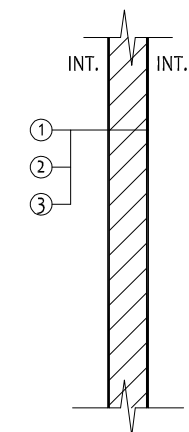
W07 - Interior load-bearing wall without temp. diff. or up to 10 °C max. (rest of the building)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	PBD Knauf Silentboard	REI 60	B, C1 - C4	4,0
2	MW Knauf Insulation Akustik Board, wooden slatted grate 40/60			
3	CLT wooden panel NOVATOP SOLID			
4	MW Knauf Insulation Akustik Board, wooden slatted grate 40/60			
5	PBD Knauf Silentboard			
SRC.	NOVATOP SOLID Technical sheet [https://novatop-system.cz/produkt/novatop-solid/]			

Fire resistance acc. to the manufacturer/calculation and field of application REI / REW 60 DP3 => FULFILLED

Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

If better fire resistance is required (e.g. in unprotected escape routes NÚC), PBD Knauf Silentboard can be replaced by Knauf RED Piano or Knauf Fireboard.

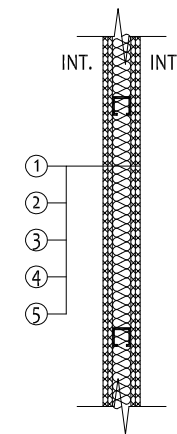


W08 - Partition wall without temp. diff. or up to 10 °C max. (underground floor)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	thin-layer gypsum plaster Cemix 136	EI 60 DP1	B, C1 - C4	4,0
2	aerated concrete blocks YTONG Klasik 100			
3	thin-layer gypsum plaster Cemix 136			
SRC.	YTONG Klasik 100 Product sheet [https://www.xella.cz/cs_CZ/product/ytong-klasik-100/20001004]			

Fire resistance acc. to the manufacturer/calculation and field of application EI 120 DP1 => FULFILLED

Max. permitted height according to the manufacturer/calculation h = - m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.



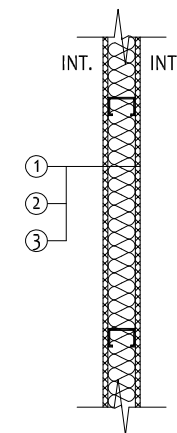
W09 - Partition wall without temp. diff. or up to 10 °C max. (acoustically demanding rooms)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	PBD Knauf Silentboard	EI 45	B, C1 - C4	4,0
2	PBD Knauf Silentboard			
3	steel profile CW50 + MW Knauf Insulation Akustik Board			
4	PBD Knauf Silentboard			
5	PBD Knauf Silentboard			
SRC.	Knauf Fire catalogue [https://www.knauf.cz/dokumenty-ke-stazeni]			

Fire resistance acc. to the manufacturer/calculation and field of application EI 60 / EI 90 => FULFILLED

Max. permitted height according to the manufacturer/calculation h = 5,50 m => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

If better fire resistance is required (e.g. in unprotected escape routes NÚC), the first upper board PBD Knauf Silentboard can be replaced by Knauf RED Piano or Knauf Fireboard.



W10 - Partition wall without temp. diff. or up to 10 °C max. (rest of the building)				
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION	MAX. HT. [m]
1	PBD Knauf Silentboard	EI 45	B, C1 - C4	4,0
2	steel profile CW75 + MW Knauf Insulation Akustik Board			
3	PBD Knauf Silentboard			
SRC.	Knauf Fire catalogue [https://www.knauf.cz/dokumenty-ke-stazeni]			

Fire resistance acc. to the manufacturer/calculation and field of application EI 45 / EI 60 => FULFILLED


Max. permitted height according to the manufacturer/calculation h = 4,0 m => FULFILLED

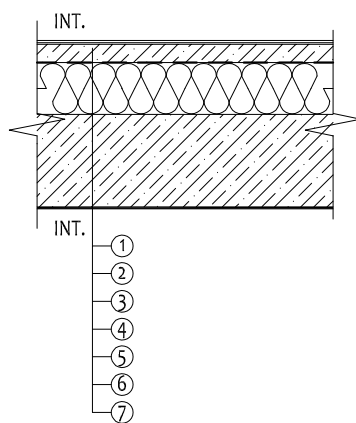
Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

If better fire resistance is required (e.g. in unprotected escape routes NÚC), PBD Knauf Silentboard can be replaced by Knauf RED Piano or Knauf Fireboard.

Notes: Within the simplified conceptual design, the maximum fire resistance of structure compositions that aren't supplied by the manufacturer as a whole is determined according to the most similar structures.

For a complete description of the structure compositions, see D.1.1-18 - D.1.1-22

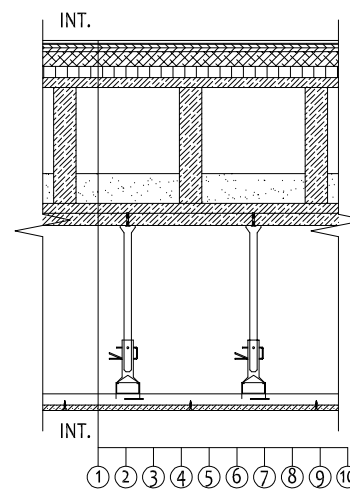
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SUPERVISOR	Ing. Kamil Staněk, Ph.D.		
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TYPE OF THESIS	Master's Thesis	FORMAT	2 x A4
YEAR	2022/2023	DATE	11/2022
LOCATION	Czech Republic - Vodňany	LEVEL OF PD	DSP
BUILDING'S NAME	Community Centre - Vodňany	SCALE	NO.
SUBDIVISION	D.1.3 FIRE PROTECTION SOLUTIONS	1:20	D.1.3-5
CONTENT	FIRE RESISTANCE OF INDIVIDUAL STRUCTURES		



Fo6 - Floor without temperature difference or up to 10 °C max. (ceramic tiles) (above underground floor)			
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	ceramic tiles	REI 60 DP1	B, C1 - C4
2	adhesive for ceramic tiles Cemix 045 FLEX EXTRA		
3	concr. screed, 2300 kg/m ³ + reinf. mesh 150/150/4		
4	separation PE foil DEKSEPAR		
5	PIR panel Puren FAL (rigid foam sheathed in alu.)		
6	reinforced concrete C30/37, 2500 kg/m ³		
7	thin-layer gypsum plaster Cemix 136		
SRC.	It can be safely assumed that the reinforced concrete structure will meet the required fire resistance.		

Fire resistance acc. to the manufacturer/calculation and field of application REI - DP1 => FULFILLED

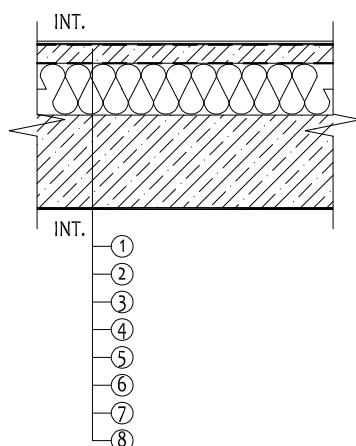
Notes: The field of application is determined by the standard ČSN EN 1991-1-1.



Fo9 - Floor without temperature difference or up to 10 °C max. (laminate)			
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	laminate + dispersion adhesive Den Braven	REI 60	B, C1 - C4
2	Fermacell 2E11 (2x gypsum fibreboard)		
3	fibreboard STEICO Therm		
4	sub-base Fermacell with honeycomb (45 kg/m ²)		
5	three-layer spruce board		
6	wooden grate, limestone grit fill (40 kg/m ²)		
7	three-layer spruce board		
8	three-layer spruce board		
9	air gap, dropped ceiling anchors		
10	steel grid made of CD profiles + PBD boards Knauf		
SRC.	NOVATOP ELEMENT Technical sheet [https://novatop-system.cz/produkt/novatop-element/]		

Fire resistance acc. to the manufacturer/calculation and field of application REI 60 => FULFILLED

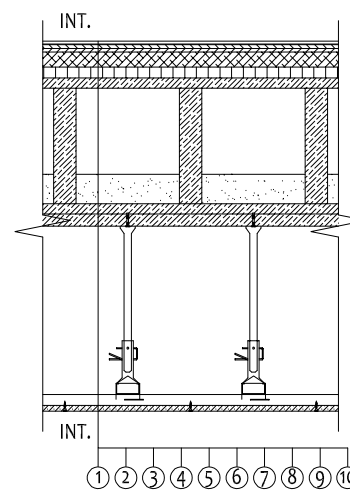
Notes: The field of application is determined by the standard ČSN EN 1991-1-1.



Fo7 - Floor without temperature difference or up to 10 °C max. (ceramic tiles, waterproof) (above underground floor)			
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	ceramic tiles	REI 60 DP1	B, C1 - C4
2	adhesive for ceramic tiles Cemix 045 FLEX EXTRA		
3	one-component waterpr. KOUPELNA Den Braven		
4	concr. screed, 2300 kg/m ³ + reinf. mesh 150/150/4		
5	separation PE foil DEKSEPAR		
6	PIR panel Puren FAL (rigid foam sheathed in alu.)		
7	reinforced concrete C30/37, 2500 kg/m ³		
8	thin-layer gypsum plaster Cemix 136		
SRC.	It can be safely assumed that the reinforced concrete structure will meet the required fire resistance.		

Fire resistance acc. to the manufacturer/calculation and field of application REI - DP1 => FULFILLED

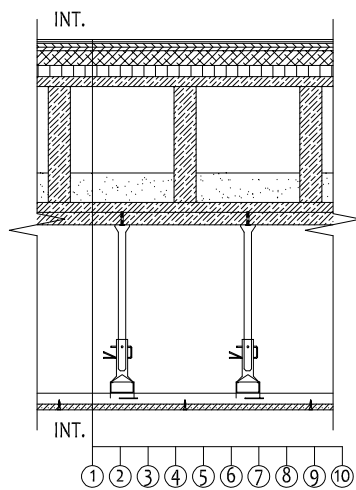
Notes: The field of application is determined by the standard ČSN EN 1991-1-1.



Fo10 - Floor without temperature difference or up to 10 °C max. (ceramic tiles)			
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	ceramic tiles + adhesive Cemix 045 FLEX EXTRA	REI 60	B, C1 - C4
2	Fermacell 2E11 (2x gypsum fibreboard)		
3	fibreboard STEICO Therm		
4	sub-base Fermacell with honeycomb (45 kg/m ²)		
5	three-layer spruce board		
6	wooden grate, limestone grit fill (40 kg/m ²)		
7	three-layer spruce board		
8	three-layer spruce board		
9	air gap, dropped ceiling anchors		
10	steel grid made of CD profiles + PBD boards Knauf		
SRC.	NOVATOP ELEMENT Technical sheet [https://novatop-system.cz/produkt/novatop-element/]		

Fire resistance acc. to the manufacturer/calculation and field of application REI 60 => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.



Fo8 - Floor without temperature difference or up to 10 °C max. (carpet)			
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	carpet + dispersion adhesive Den Braven	REI 60	B, C1 - C4
2	Fermacell 2E11 (2x gypsum fibreboard)		
3	fibreboard STEICO Therm		
4	sub-base Fermacell with honeycomb (45 kg/m ²)		
5	three-layer spruce board		
6	wooden grate, limestone grit fill (40 kg/m ²)		
7	three-layer spruce board		
8	three-layer spruce board		
9	air gap, dropped ceiling anchors		
10	steel grid made of CD profiles + PBD boards Knauf		
SRC.	NOVATOP ELEMENT Technical sheet [https://novatop-system.cz/produkt/novatop-element/]		

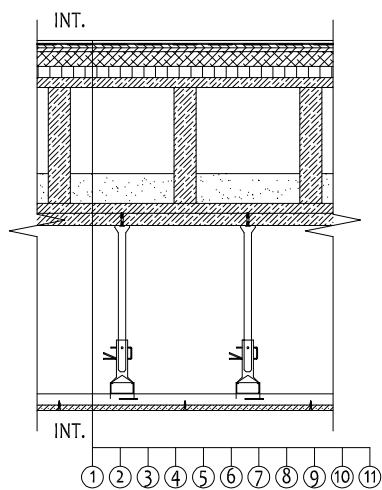
Fire resistance acc. to the manufacturer/calculation and field of application REI 60 => FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

Notes: Within the simplified conceptual design, the maximum fire resistance of structure compositions that aren't supplied by the manufacturer as a whole is determined according to the most similar structures.

For a complete description of the structure compositions, see D.1.1-18 - D.1.1-22

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BUILDING'S NAME	Community Centre - Vodňany	SCALE	NO.
SUBDIVISION	D.1.3 FIRE PROTECTION SOLUTIONS	1:20	D.1.3-6
CONTENT	FIRE RESISTANCE OF INDIVIDUAL STRUCTURES		

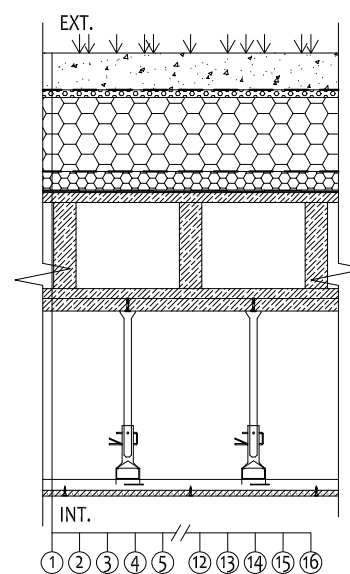


F11 - Floor without temperature difference or up to 10 °C max. (ceramic tiles, waterproof)			
NO.	COMPOSITION INT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	carpet + dispersion adhesive Den Braven	REI 60	B, C1 - C4
2	one-component waterpr. KOUPELNA Den Braven		
3	Fermacell 2E11 (2x gypsum fibreboard)		
4	fibreboard STEICO Therm		
5	sub-base Fermacell with honeycomb (45 kg/m ²)		
6	three-layer spruce board		
7	wooden grate, limestone grit fill (40 kg/m ²)		
8	three-layer spruce board		
9	three-layer spruce board		
10	air gap, dropped ceiling anchors		
11	steel grid made of CD profiles + PBD boards Knauf		
SRC. NOVATOP ELEMENT Technical sheet [https://novatop-system.cz/produkt/novatop-element/]			

Fire resistance acc. to the manufacturer/calculation and field of application REI 60

=> FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

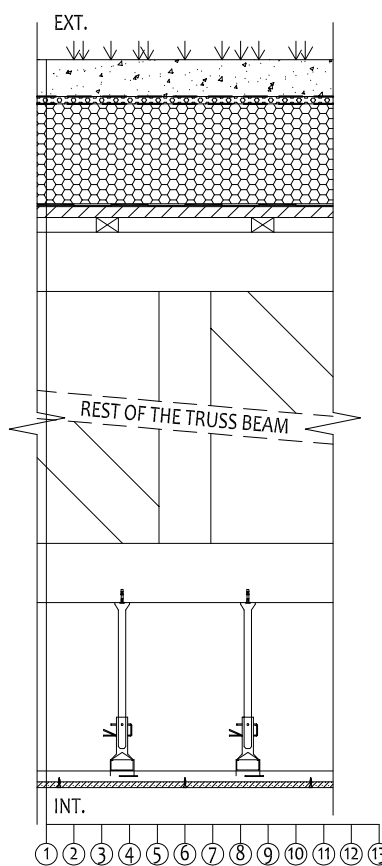


R02 - Roof of the heated space (rest of the building)			
NO.	COMPOSITION EXT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	extensive greenery, roof substrate GREENDEK	REI 60	B, C1 - C4
2	geotextile FILTEK 150		
3	perforated stud membrane DEKDREN T20 GARDEN		
4	XPS Isover STYRODUR 3000 CS		
5	separation geotextile FILTEK 300		
6	PVC-P foil Fatrafol 810/V		
7	separation geotextile FILTEK 300		
8	Isover EPS 150		
9	asphalt strip BITAGIT 40 AL+V60 Mineral Radon (melted)		
10	asphalt strip GLASTEK 30 Sticker Plus KVK (self-adhesive)		
11	three-layer spruce board		
12	wooden grate		
13	three-layer spruce board		
14	three-layer spruce board		
15	air gap, dropped ceiling anchors		
15	steel grid made of CD profiles + PBD boards Knauf		
SRC. NOVATOP ELEMENT Technical sheet [https://novatop-system.cz/produkt/novatop-element/]			

Fire resistance acc. to the manufacturer/calculation and field of application REI 60

=> FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.



R01 - Roof of the heated space (black box theatre)			
NO.	COMPOSITION EXT - INT	MAX. REQUIRED FIRE RESISTANCE	FIELD OF APPLICATION
1	extensive greenery, roof substrate GREENDEK	REI 30	B, C1 - C4
2	geotextile FILTEK 150		
3	perforated stud membrane DEKDREN T20 GARDEN		
4	PVC-P foil Fatrafol 810/V		
5	separation geotextile FILTEK 300		
6	Isover EPS 150		
7	asphalt strip BITAGIT 40 AL+V60 Mineral Radon (melted)		
8	asphalt strip GLASTEK 30 Sticker Plus KVK (self-adhesive)		
9	board EGGER OSB 3		
10	wooden slatted grate 40/60		
11	wooden truss beams		
12	air gap, dropped ceiling anchors		
13	steel grid made of CD profiles + PBD boards Knauf		
SRC. Knauf Fire catalogue [https://www.knauf.cz/dokumenty-ke-stazeni/]			


Fire res. acc. to the manufact./calc. and field of application R (truss beams) + EI30 (Knauf dropped ceiling)

=> FULFILLED

Notes: The field of application is determined by the standard ČSN EN 1991-1-1.

Notes: Within the simplified conceptual design, the maximum fire resistance of structure compositions that aren't supplied by the manufacturer as a whole is determined according to the most similar structures.

For a complete description of the structure compositions, see D.1.1-18 - D.1.1-22

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CONTENT	FIRE RESISTANCE OF INDIVIDUAL STRUCTURES		