VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ
BRNO UNIVERSITY OF TECHNOLOGY

FAKULTA STAVEBNÍ
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FACULTY OF CIVIL ENGINEERING
INSTITUTE OF BUILDING STRUCTURES

FOLDER No.7 Other calculations

Calculation of foundations

BAKALÁŘSKÁ PRÁCE
BACHELOR ´S THESIS

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a) LOADING OF THE MOST LOADED PERIPHERAL WALL

HORIZONTAL CONSTRUCTIONS	TH. (m)	MASS (Kn.m-3)	LW (m)	SUM (Kn/m)
FOUNDATION SLAB				
UNDER THE 1NP	0,15	25	3,37	12,64
FOUNDATIONS				
(ESTIMATION)	0,8	23	0,6	11,04
CEILINGS				
SLAB ABOVE 1NP	0,25	25	3,37	21,06
SUSPENDED CEILING ABOVE 2NP				
KNAUF D 11 GYPSUM-BOARDS CEILIN(	0,04	7,5	5	1,50
ISOVER TOPSIL	0,3	0,6	5	0,90
FLOOR COMPOSITIONS				
FLOOR AT THE 1NP a				
FLOATING LAMINATE FLOOR PARADO	0,007	3,9	3,37	0,09
AFE 20 ANHYDRITE SCREED SAKRET	0,04	20	3,37	2,70
Isover EPS 100S	0,15	0,25	3,37	0,13
ELASTOBIT GG 40	0,004	12,25	3,37	0,17
FLOOR AT THE 1NP b				
CERAMIC TILES RAKO STONE	0,008	22	0	0,00
GLUE FOR CERAMIC TILES C1T SAKRE'	0,005	4,5	0	0,00
AFE 20 ANHYDRITE SCREED SAKRET	0,04	20	0	0,00
Isover EPS 100S	0,15	0,25	0	0,00
ELASTOBIT GG 40	0,004	12,25	0	0,00
FLOOR ABOVE THE 1NP				
FLOATING LAMINATE FLOOR PARADO	0,007	3,9	3,37	0,09
AFE 20 ANHYDRITE SCREED SAKRET	0,04	20	3,37	2,70
Isover EPS 100S	0,05	0,25	3,37	0,04
ROOF STRUCTURE				
WOODEN TRUSS	-	-	-	2
LATHS				0,2
ELASTOBIT GG 40	0,004	12,25	7	0,343
METAL SHEETS CORUS				0,35
OSB	0,025	1	7	0,175
PERIMETER WALLS				
HELUZ FAMILY 25	5,7	7,5	0,25	10,69
ISOVER TOPSIL	5,7	0,6	0,16	0,55
WOODEN FRAME	0,04	6	0,05	0,01
WOODEN FASADE	5,5	6	0,015	0,50
SUM OF PERMANENT LOADS:			∑ gk=	67,86
			gd=γ gk	
			gd=1,35*gk	91,61
VARIABLE LOAD				

	LW	qk [KN.m⁻²]	(Kn/m)
IMPOSED LOAD 1.NP	3,37	1,5	5,06
IMPOSED LOAD 2.NP	3,37	1,5	5,06

SNOW LOAD

SNOW CATEGORY I. (VYSOKÁ NAD LABEM) Sk= 0,7

S = μ1 * Ce * Ct * Sk= 0,8 *1,0 * 1,0 * 0,7 = 0,56

	7	0,56	3,92

SUM OF VARIABLE LOADS: ∑ qk= 14,03

qd=γ qk

qd=1,5*gk 21,05

SUM OF ALL LOADING fd **fd=** 112,66

SUBSOIL CONDITIONS:

ACCORDING TO THE TABLE FOR LOAD BEARING CAPACITY OF ROC (ČSN 72 1001)

R4, ROCK WITH LOW STIFNESS

SYMBOL: R4 LOAD BEARING CAPACITY: Rdt= 400 kPa

MATERIAL FOR FOUNDATIONS:

CONCRETE C20/25

fck= 20 Mpa

PROPOSAL OF EFFECTIVE AREA:

b=fd/(1*Rdt)

b=124,44 /(1*400)

b=0,311 m **DESIGNED WIDTH OF FOUNDATION b= 400 mm**

a=(b-d)/2

a=(400-250)/2

a=75 mm

h= a. tanα PLAIN CONCRETE tan α= 1,5

h=75. 1,5

h= 112,5 mm MINIMAL HEIGHT OF FOUNDATION h= 500 mm

DESIGNED HEIGHT OF FOUNDATION h= 900 mm due to unfreezing depth

b) LOADING OF THE MOST LOADED INTERNAL WALL

HORIZONTAL CONSTRUCTIONS	**TH. (m)**	**MASS (Kn.m-3)**	**LW (m)**	**SUM (Kn/m)**
FOUNDATION SLAB				
UNDER THE 1NP	0,15	25	5,21	19,54
FOUNDATIONS				
(ESTIMATION)	0,8	23	0,6	11,04
CEILINGS				
SLAB ABOVE 1NP	0,25	25	5,21	32,56

FLOOR COMPOSITIONS

FLOOR AT THE 1NP a

FLOATING LAMINATE FLOOR PARADO	0,007	3,9	0	0,00
AFE 20 ANHYDRITE SCREED SAKRET	0,04	20	0	0,00
Isover EPS 100S	0,15	0,25	0	0,00
ELASTOBIT GG 40	0,004	12,25	0	0,00
FLOOR AT THE 1NP b				
CERAMIC TILES RAKO STONE	0,008	22	5,21	0,92
GLUE FOR CERAMIC TILES C1T SAKRE	0,005	4,5	5,21	0,12
AFE 20 ANHYDRITE SCREED SAKRET	0,04	20	5,21	4,17
Isover EPS 100S	0,15	0,25	5,21	0,20
ELASTOBIT GG 40	0,004	12,25	5,21	0,26
FLOOR ABOVE THE 1NP				
FLOATING LAMINATE FLOOR PARADO	0,007	3,9	5,21	0,14
AFE 20 ANHYDRITE SCREED SAKRET	0,04	20	5,21	4,17
Isover EPS 100S	0,05	0,25	5,21	0,07
INTERNAL WALLS				
HELUZ FAMILY 30	2,75	7,5	0,25	5,16

SUM OF PERMANENT LOADS: ∑ gk= 78,32

gd=γ gk

gd=1,35*gk 105,74

VARIABLE LOAD

	LW	**qk [KN.m⁻²]**	**(Kn/m)**
IMPOSED LOAD 1.NP	5,21	1,5	7,82
IMPOSED LOAD 2.NP	5,21	1,5	7,82

SUM OF VARIABLE LOADS: ∑ qk= 15,63

qd=γ qk

qd=1,5*gk 23,45

SUM OF ALL LOADING fd **fd=** 129,18

SUBSOIL CONDITIONS:

ACCORDING TO THE TABLE FOR LOAD BEARING CAPACITY OF ROC (ČSN 72 1001)

R4, ROCK WITH LOW STIFNESS

SYMBOL: R4 LOAD BEARING CAPACITY: Rdt= 400 kPa

MATERIAL FOR FOUNDATIONS:

CONCRETE C20/25

fck= 20 Mpa

PROPOSAL OF EFFECTIVE AREA:

b=fd/(1*Rdt)

b=124,44 /(1*400)

b=0,311 m **DESIGNED WIDTH OF FOUNDATION b= 400 mm**

a=(b-d)/2

a=(400-250)/2

a=75 mm

h= a. tanα PLAIN CONCRETE tan α= 1,5

h=75. 1,5

h= 112,5 mm MINIMAL HEIGHT OF FOUNDATION h= 500 mm

DESIGNED HEIGHT OF FOUNDATION h= 900 mn due to unfreezing depth