

Foundation loading and design - internal column

Floor loading

Permanent load	d [m]	[kN/m ³]	[kN/m ²]
Ceramic tiles	0,011	20	0,220
Distribution layer	0,050	24	1,200
Thermal insulation	0,040	3,4	0,136
Load bearing layer	0,250	24	6,000
Plaster	0,010	20	0,200
Total			7,756
With partitions (+10%)		g_k	8,532
		A [m ²]	[kN]
Force in area		20,625	175,964
Imposed load		A [m ²]	[kN/m ²]
Corridor		5,25	3,000
Room		13,419	1,500
Average		q_k	1,922
		A [m ²]	[kN]
Force in area		18,669	35,878
COMBINATION			[kN]
$\gamma_G = 1,35; \gamma_Q = 1,5$			291,369

Roof loading

Permanent load	d [m]	[kN/m ³]	[kN/m ²]
Substrate	0,226	16	3,616
Thermal insulation	0,300	0,3	0,090
Load bearing layer	0,250	24	6,000
Plaster	0,010	20	0,200
Total		g_k	9,906
		A [m ²]	[kN]
Force in area		20,625	204,311
Imposed load			[kN/m ²]
Utility load			3,000
Snow (II. area)			1,000
Total		q_k	4,000
		A [m ²]	[kN]
Force in area		20,625	82,500
COMBINATION			[kN]
$\gamma_G = 1,35; \gamma_Q = 1,5$			399,570

Other permanent load

COLUMN L=11,77 m	V [m ³]	[kN/m ³]	[kN]
0,4x0,3	1,4124	24	45,762

INTERNAL WALL	d [m]	l [m]	h [m]	[kN/m ³]	[kN] ($\gamma_G = 1,35$)
Blocks	0,25	7,425	9,87	9,8	179,548
Plaster	0,01	15,5	9,87	20	30,597
Total					283,695

Calculation

Total force	1311,765 kN
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Foundation loading and design - perimeter column

Floor loading

Permanent load	d [m]	[kN/m ³]	[kN/m ²]
Ceramic tiles	0,011	20	0,220
Distribution layer	0,050	24	1,200
Thermal insulation	0,040	3,4	0,136
Load bearing layer	0,250	24	6,000
Plaster	0,010	20	0,200
Total			7,756
With partitions (+10%)		g_k	8,532
	$A [m^2]$		[kN]
Force in area	16,725		142,691
Imposed load		[kN/m ²]	
Total		q_k	1,500
	$A [m^2]$		[kN]
Force in area	13,883		20,824
COMBINATION		[kN]	
$\gamma_G = 1,35; \gamma_Q = 1,5$			223,868

Roof loading

Permanent load	d [m]	[kN/m ³]	[kN/m ²]
Substrate	0,226	16	3,616
Thermal insulation	0,500	0,3	0,150
Load bearing layer	0,250	24	6,000
Plaster	0,010	20	0,200
Total		g_k	9,966
	$A [m^2]$		[kN]
Force in area	16,725		166,681
Imposed load		[kN/m ²]	
Utility load			3,000
Snow (ll. area)			1,000
Total		q_k	4,000
	$A [m^2]$		[kN]
Force in area	14,625		58,500
COMBINATION		[kN]	
$\gamma_G = 1,35; \gamma_Q = 1,5$			312,770

Other permanent load

COLUMN L=11,77 m	V [m ³]	[kN/m ³]	[kN]
0,4x0,4	1,8832	24	61,016

FACADE	A [m ²]	[kN/m ²]	[kN]
Permanent load	37,5	0,191	9,669

ATTIC	V [m ³]	[kN/m ³]	[kN]
Permanent load	0,5625	24	18,225

EXT. AND INT. WALL	d [m]	l [m]	h [m]	[kN/m ³]	[kN] ($\gamma_G = 1,35$)
Blocks	0,25	7,375	9,87	9,8	178,339
Plaster	0,01	10,6	9,87	20	20,924
Total					269,005

Calculation

Total force	1118,422 kN
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Floor loading

Roof loading

Balcony loading

Other permanent load

EXT. AND INT. WALL	d [m]	l [m]	h [m]	[kN/m ³]	[kN] ($\gamma_G = 1,35$)
Concrete	0,2	5	9,87	24	236,880
Plaster	0,01	10	9,87	20	19,740
Blocks	0,25	2,625	9,87	9,8	63,476
Total					432,130

Calculation

Total force	1405,840 kN
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Foundation loading and design - concrete wall - stairwell

Place in halls, where are no floor slabs, only roof slab supported by concrete wall.

Roof loading

Permanent load	d [m]	[kN/m ³]	[kN/m ²]
Substrate	0,226	16	3,616
Thermal insulation	0,500	0,3	0,150
Load bearing layer	0,250	24	6,000
Plaster	0,010	20	0,200
Total	g _k		9,966
	A [m ²]		[kN]
Force in area	16,725		166,681
Imposed load	[kN/m ²]		
Utility load	3,000		
Snow (II. area)	1,000		
Total	q _k		4,000
	A [m ²]		[kN]
Force in area	16,725		66,900
COMBINATION	[kN]		
γ _G = 1,35; γ _Q = 1,5	325,370		

Other permanent load

EXT. AND INT. WALL	d [m]	l [m]	h [m]	[kN/m ³]	[kN] (γ _G = 1,35)
Concrete	0,2	5	10,52	24	252,480
Plaster	0,01	5	10,15	20	10,150
Total					354,551

ATTIC	V [m ³]	[kN/m ³]	[kN]
Permanent load	0,5625	24	18,225

Calculation

Total force	698,145	kN
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Foundation loading and design - elevator shaft

Place with the smaller elevator.

Floor loading

Permanent load	d [m]	[kN/m ³]	[kN/m ²]
Ceramic tiles	0,011	20	0,220
Distribution layer	0,050	24	1,200
Thermal insulation	0,040	3,4	0,136
Load bearing layer	0,250	24	6,000
Plaster	0,010	20	0,200
Total			7,756
With partitions (+10%)		g_k	8,532
	A [m ²]		[kN]
Force in area	5,642		48,135
Imposed load		[kN/m ²]	
Total		q_k	3,000
	A [m ²]		[kN]
Force in area	13,472		40,416
COMBINATION		[kN]	
$\gamma_G = 1,35; \gamma_Q = 1,5$			125,607

Roof loading

Permanent load	d [m]	[kN/m ³]	[kN/m ²]
Substrate	0,226	16	3,616
Thermal insulation	0,500	0,3	0,150
Load bearing layer	0,250	24	6,000
Plaster	0,010	20	0,200
Total		g_k	9,966
	A [m ²]		[kN]
Force in area	27,150		270,577
Imposed load		[kN/m ²]	
Utility load			3,000
Snow (II. area)			1,000
Total		q_k	4,000
	A [m ²]		[kN]
Force in area	23,920		95,680
COMBINATION		[kN]	
$\gamma_G = 1,35; \gamma_Q = 1,5$			508,799

Other permanent load

SHAFT (approx.)	d [m]	l [m]	h [m]	[kN/m ³]	[kN] ($\gamma_G = 1,35$)
Concrete	0,2	6,7	11,27	24	362,443
Plaster	0,01	7,6	11,27	20	17,130
Elevator		1,5*675 + 500 kg			15,125
Total					527,549

STAIRCASE (approx.)	t [m]	l [m]	w [m]	[kN/m ³]	[kN] ($\gamma_G = 1,35$)
Concrete	0,2	2,61	3	24	37,584
Plaster	0,01	5,22	3	20	3,132
Total					54,967

Calculation

Total force	1397,495	kN
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