

*Politecnico di Milano*  
*Facoltà di Ingegneria Edile-Architettura*  
*Master of Science in Architectural Engineering*



# RETHINKING SHANGHAI

*Sustainable Intervention on the Suzhou Creek*

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Final Thesis: Rethinking Shanghai

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## 1. Wall Type 1

Table 1: Technological Details of Wall Type 1

Layer	Material	Thickness s (m)	Thermal conductivity $\lambda$ (W/m.k)	Resistance R (m <sup>2</sup> .k/W)	Transmittance u(w/m <sup>2</sup> .k)	$\Delta T \cdot U \cdot R_i$	Ti °C
	inside						23.9
	internal surface			0.13	7.69	0.47	23.43
1	Plaster Board (Knauf)	0.0125	0.19	0.07	15.20	0.24	23.19
2	Vapour Barrier (Dupont Tyvec)	0.0006	0.19	0.00	316.67	0.01	23.18
3	Plaster Board (Knauf)	0.0125	0.19	0.07	15.20	0.24	22.94
4	OSB Board	0.0125	0.13	0.10	10.40	0.35	22.59
5	Soft Insulation Mineral wool 30kg/m <sup>3</sup> (Isover E100-S)	0.06	0.031	1.94	0.52	7.04	15.55
6	Rigid insulation, panel consisting of mineralised spruce wood-wool bound with Portland cement, Weight: 26kg/m <sup>2</sup> (Celenit N)	0.075	0.068	1.10	0.91	4.01	11.54
7	OSB Board	0.0125	0.13	0.10	10.40	0.35	11.19
8	Rigid insulation, Polyurethane Foam coated with embossed Aluminium sheet, density: 38 kg/m <sup>3</sup> (Isotec Parete)	0.08	0.021	3.81	0.26	13.85	-2.65
	external surface			0.04	25.00	0.15	-2.80
	outside						-2.8
	Total	0.2656		7.34	<b>0.14</b>		
	$\Delta T$	26.7					



Table 2: Technological Details of Wall Type 1

Interior		Pi(sat)@23.9°C	2957.30	Pi(50%)	1478.65	<b>Wall Type 1</b>				
Exterior		Pe(sat)@-2.8°C	496.06	Pe(80%)	396.85					
		$\Delta P$ (Pa)	1081.80							
		$\Delta T$ (°C)	26.7							
Layer	Material	Thickness s (m)	Vapour permeability $\delta$ (kg/msPa)	Vapour Resistance $\rho$ (m <sup>2</sup> sPa/kg)	Ti °C	P(sat) Pa	$\Delta P \cdot \rho_i / \rho'$	Pv Pa	$\Delta P \cdot \rho_i / \rho'_{tot}$ vapour barrier	Pv' Pa
	inside				23.90	2957.30				
	internal surface				23.43	2874.36				
1	Plaster Board (Knauf)	0.0125	23	0.0005	23.19	2833.16	6E-12	1478.65	0.00	1478.65
2	Vapour Barrier (Dupont Tyvec)	0.0006	0.002	0.3000	23.18	2831.20			0.00	1478.65
3	Plaster Board (Knauf)	0.0125	23	0.0005	22.94	2790.55	6E-12	1478.65	0.00	1478.65
4	OSB Board	0.0125	1.5	0.0083	22.59	2732.05	8E-11	1478.65	0.00	1478.65
5	Soft Insulation Mineral wool 30kg/m3 (Isover E100-S)	0.06	0.06	1.0000	15.55	1761.54	1E-08	1478.65	0.00	1478.65
6	Rigid insulation, panel consisting of mineralised spruce wood-wool bound with Portland cement, Weight: 26kg/m2 (Celenit N)	0.075	1.46E-12	51369863014	11.54	1356.74	523.45	955.20	523.45	955.20
7	OSB Board	0.0125	1.5	0.0067	11.19	1325.68	7E-11	955.20	0.00	955.20
8	Rigid insulation, Polyurethane Foam coated with embossed Aluminium sheet, density: 38 kg/m3 (Isotec Parete)	0.08	1.46E-12	54794520548	-2.65	501.45	558.35	396.85	558.35	396.85
	external surface				-2.80	496.06				
	outside				-2.80	496.06				
	Total	0.265		106164383563						
	Total with vapour barrier	0.2656		106164383563						



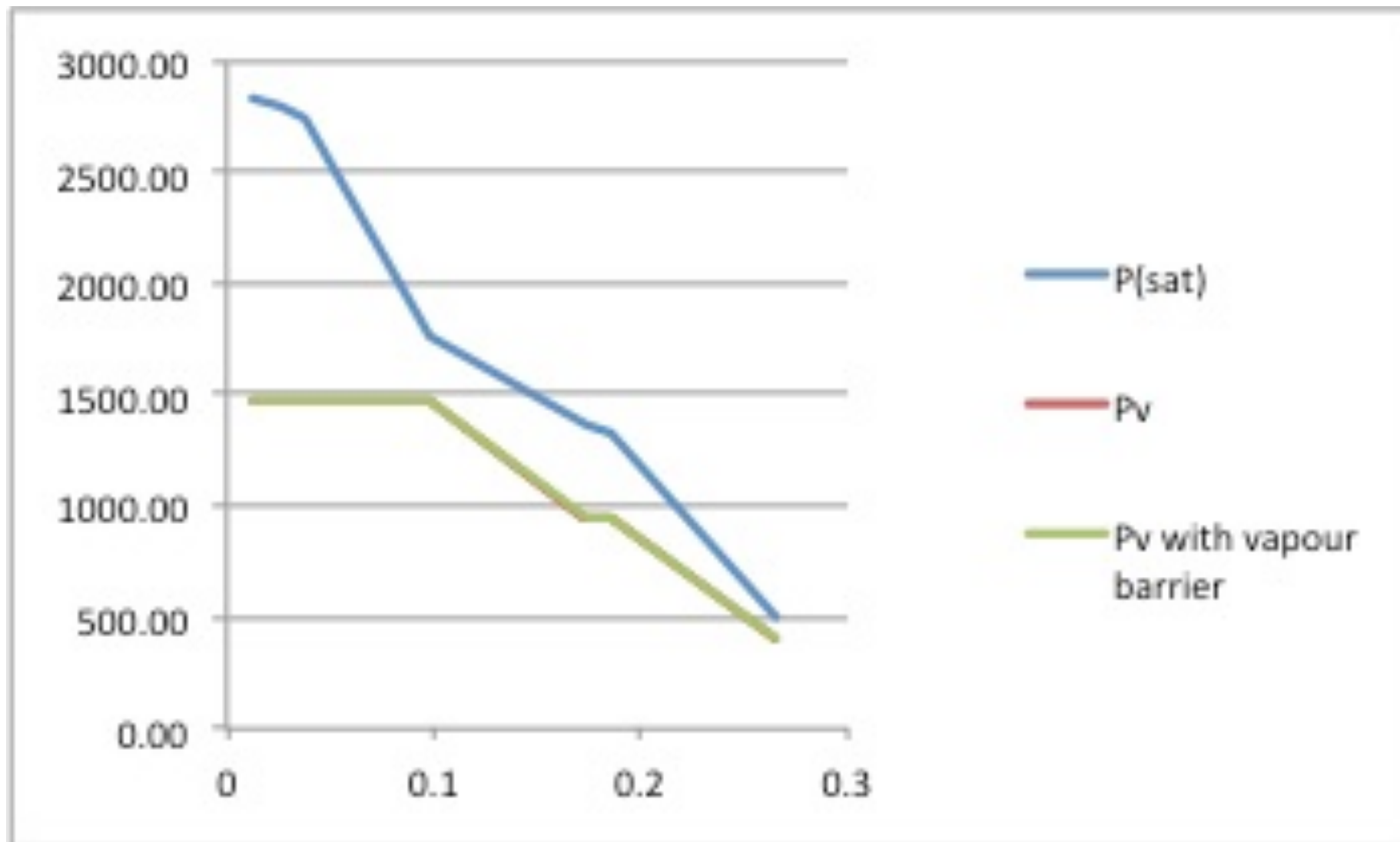


Figure 1: Checking for Condensation for Wall Type 1



## 2. Wall Type 2

Table 3: Technological Details of Wall Type 2

Layer	Material	Thickness s (m)	Thermal conductivity $\lambda$ (W/m.k)	Resistance R (m <sup>2</sup> .k/W)	Transmittance u(w/m <sup>2</sup> .k)	$\Delta T \cdot U \cdot R_i$	Ti °C
	inside						23.9
	internal surface			0.13	7.69	0.45	23.45
1	Ceramic Tile 15*15	0.008	0.02	0.40	2.50	1.40	22.05
2	Ceramic Adhesive	0.002	1.5	0.00	750.00	0.00	22.05
3	Cement Board	0.0125	0.35	0.04	28.00	0.12	21.92
4	Vapour Barrier (Dupont Tyvec)	0.0006	0.19	0.00	316.67	0.01	21.91
5	OSB Board	0.0125	0.13	0.10	10.40	0.34	21.57
6	Soft Insulation Mineral wool 30kg/m3 (Isover E100-S)	0.06	0.031	1.94	0.52	6.75	14.82
7	Rigid insulation, panel consisting of mineralised spruce wood-wool bound with Portland cement, Weight: 26kg/m2 (Celenit N)	0.075	0.068	1.10	0.91	3.85	10.97
8	OSB Board	0.0125	0.13	0.10	10.40	0.34	10.63
9	Rigid insulation, Polyurethane Foam coated with embossed Aluminium sheet, density: 38 kg/m3 (Isotec Parete)	0.08	0.021	3.81	0.26	13.30	-2.66
	external surface			0.04	25.00	0.14	-2.80
	outside						-2.8
	Total	0.2631		7.65	<b>0.13</b>		
	$\Delta T$	26.7					



Table 4: Technological Details of Wall Type 2

Layer	Material	Thickness s (m)	Vapour permeability $\delta$ (kg/msPa)	Vapour Resistance $\rho$ (m <sup>2</sup> sPa/kg)	Ti °C	P(sat) Pa	$\Delta P \cdot \rho_i / \rho_{tot}$	Pv Pa	$\Delta P \cdot \rho_i / \rho'_{tot}$ vapour barrier	Pv' Pa
Interior	Pi(sat)@23.9°C	2957.30	Pi(50%)	1478.65	<b>Wall Type 2</b>					
Exterior	Pe(sat)@-2.8°C	496.06	Pe(80%)	396.85						
$\Delta P$ (Pa)		1081.80								
$\Delta T$ (°C)		26.7								
	inside				23.90	2957.30				
	internal surface				23.45	2877.63				
1	Ceramic Tile 15*15	0.008	20	0.0004	22.05	2644.13	4.07594E-12	1478.65	0.00	1478.65
2	Ceramic Adhesive	0.002	0		22.05	2643.38	0	1478.65	0.00	1478.65
3	Cement Board	0.0125	0.015	0.8333	21.92	2623.36	8.49153E-09	1478.65	0.00	1478.65
4	Vapour Barrier (Dupont Tyvec)	0.0006	0.002	0.3000	21.91				0.00	1478.65
5	OSB Board	0.0125	1.5	0.0083	21.57	2568.40	8.49153E-11	1478.65	0.00	1478.65
6	Soft Insulation Mineral wool 30kg/m3 (Isover E100-S)	0.06	0.06	1.0000	14.82	1680.48	1.01898E-08	1478.65	0.00	1478.65
7	Rigid insulation, panel consisting of mineralised spruce wood-wool bound with Portland cement, Weight: 26kg/m2 (Celenit N)	0.075	1.46E-12	51369863014	10.97	1306.18	523.4507669	955.20	523.45	955.20
8	OSB Board	0.0125	1.5	0.0067	10.63	1277.33	6.82719E-11	955.20	0.00	955.20
9	Rigid insulation, Polyurethane Foam coated with embossed Aluminium sheet, density: 38 kg/m3 (Isotec Parete)	0.08	1.46E-12	54794520548	-2.66	501.24	558.3474847	396.85	558.35	396.85
	external surface				-2.80	496.06				
	outside				-2.80	496.06				
	Total	0.2625		106164383563						
	Total with vapour barrier	0.2631		106164383564						



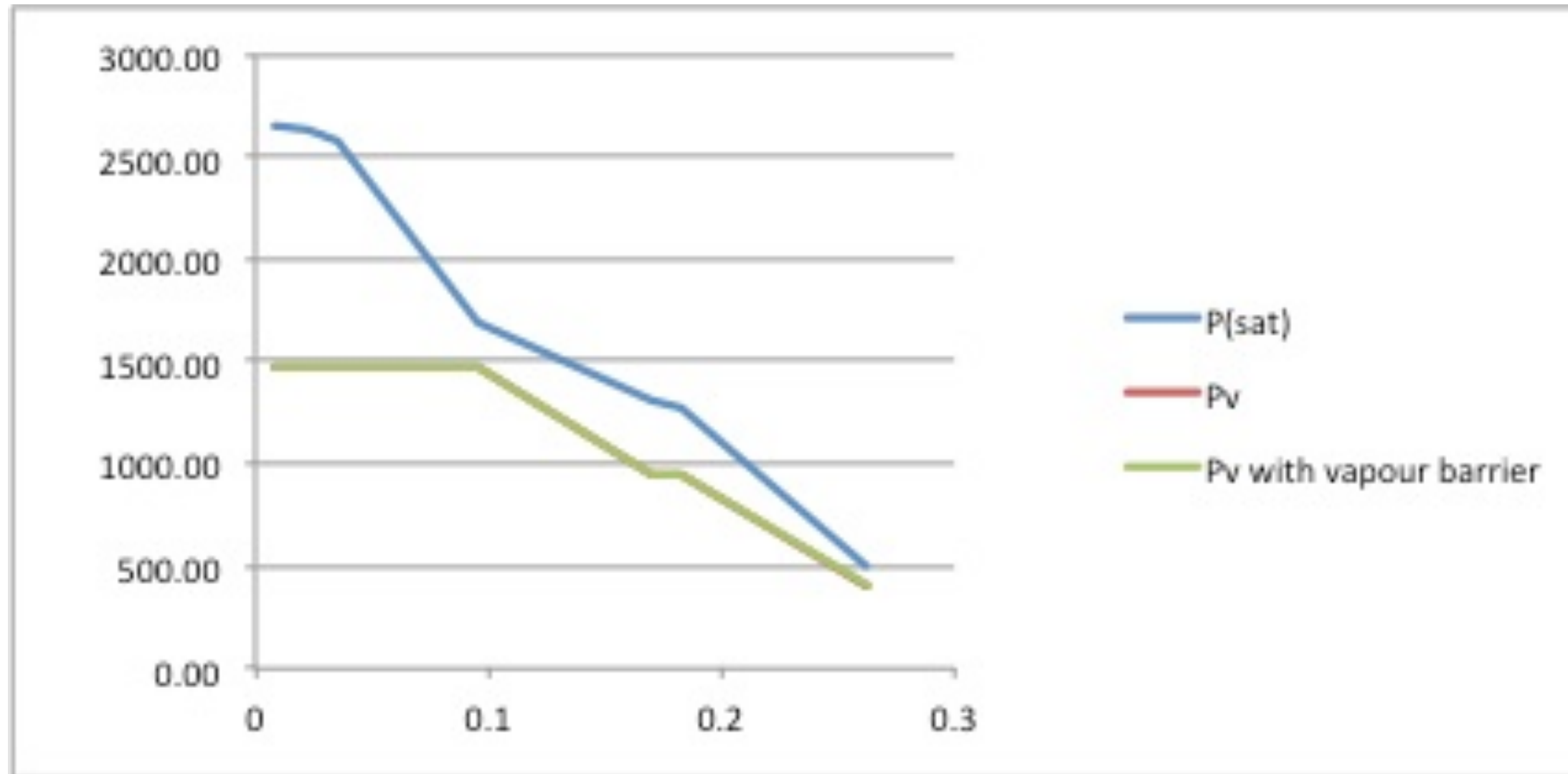


Figure 2: Checking for Condensation for Wall Type 2





### 3. Floor Type 2 (First Floor)

Table 5: Technological Details of Floor Type 2 (First Floor)

Layer	Material	Thickness s (m)	Thermal conductivity $\lambda$ (W/m.k)	Resistance R (m <sup>2</sup> .k/W)	Transmittance u(w/m <sup>2</sup> .k)	$\Delta T \cdot U \cdot R_i$	Ti °C
	inside						23.9
	internal surface			0.13	7.69	0.58	23.32
1	Marble	0.02	2.5	0.01	125.00	0.04	23.28
2	Silicone Caulk adhesive	0.005	1.5	0.00	300.00	0.01	23.27
3	Sand Cement Screed	0.03	0.8	0.04	26.67	0.17	23.10
4	Rigid insulation, panel consisting of mineralised spruce wood-wool bound with Portland cement, Weight: 26kg/m <sup>2</sup> (Celenit N)	0.075	0.068	1.10	0.91	4.94	18.16
5	Light Concrete	0.08	0.4	0.20	5.00	0.90	17.27
6	Polyethilen Sheet	0.002	0.035	0.06	17.50	0.26	17.01
7	Reinforced Concrete 24KN/m <sup>3</sup>	0.15	0.4	0.38	2.67	1.68	15.33
8	Soft Insulation Mineral wool 30kg/m <sup>3</sup> (Isover E100-S)	0.06	0.031	1.94	0.52	8.66	6.67
9	Rigid Insulation EPS 30 KG/m <sup>3</sup> (Isover)	0.06	0.031	1.94	0.52	8.66	-1.99
10	OSB	0.0125	0.18	0.07	14.40	0.31	-2.30
11	Gypsum Board two layers	0.025	0.35	0.07	14.00	0.32	-2.62
	external surface			0.04	25.00	0.18	-2.80
	outside						-2.8
	Total	0.5195		5.97	<b>0.17</b>		
	$\Delta T$	26.7					



Table 6: Technological Details of Floor Type 2 (First Floor)

Layer	Material	Thickness s (m)	Vapour permeability $\delta$ (kg/msPa)	Vapour Resistance $\rho$ (m <sup>2</sup> sPa/kg)	Ti °C	P(sat) Pa	$\Delta P \cdot \rho_i / \rho_{tot}$	Pv Pa	$\Delta P \cdot \rho_i / \rho'_{tot}$ vapour barrier	Pv' Pa
Interior	Pi(sat)@23.9°C	2957.30	Pi(50%)	1478.65	<b>Floor Type 2</b>					
Exterior	Pe(sat)@-2.8°C	496.06	Pe(80%)	396.85						
$\Delta P$ (Pa)		1081.80								
$\Delta T$ (°C)		26.7								
	inside				23.90	2957.30				
	internal surface				23.32	2855.47				
1	Marble	0.02	20	0.0010	23.28	2849.31	1.16994E-11	1478.65	0.00	1478.65
2	Silicone Caulk adhesive	0.005	0		23.27	2846.74	0	1478.65	0.00	1478.65
3	Sand Cement Screed	0.03	2.5	0.0120	23.10	2818.02	1.40393E-10	1478.65	0.00	1478.65
4	Rigid insulation, panel consisting of mineralised spruce wood-wool bound with Portland cement, Weight: 26kg/m <sup>2</sup> (Celenit N)	0.075	1.46E-12	51369863014	18.16	2078.94	600.9990287	877.65	601.00	877.65
5	Light Concrete	0.08	1.95	0.0410	17.27	1964.90	4.79977E-10	877.65	0.00	877.65
6	Polyethilen Sheet	0.002	4.5	0.0004	17.01				0.00	877.65
7	Reinforced Concrete	0.15	1.95	0.0067	15.33	1737.05	7.83863E-11	877.65	0.00	877.65
8	Soft Insulation 30Kg/m <sup>3</sup> (Isover)	0.06	0.06	1.0000	6.67	976.71	1.16994E-08	877.65	0.00	877.65
9	Rigid Insulation EPS 30 KG/m <sup>3</sup> (Isover)	0.06	1.46E-12	41095890411	-1.99	526.73	480.799223	396.85	480.80	396.85
10	OSB	0.0125	1.5	0.0083	-2.30	514.77	9.74954E-11	396.85	0.00	396.85
11	Gypsum Board two layers	0.025	0.05	0.5000	-2.62	502.71	5.84972E-09	396.85	0.00	396.85
	external surface				-2.80	496.06				
	outside				-2.80	496.06				
	Total	0.5175		92465753426						
	Total with vapour barrier	0.5195		92465753426						



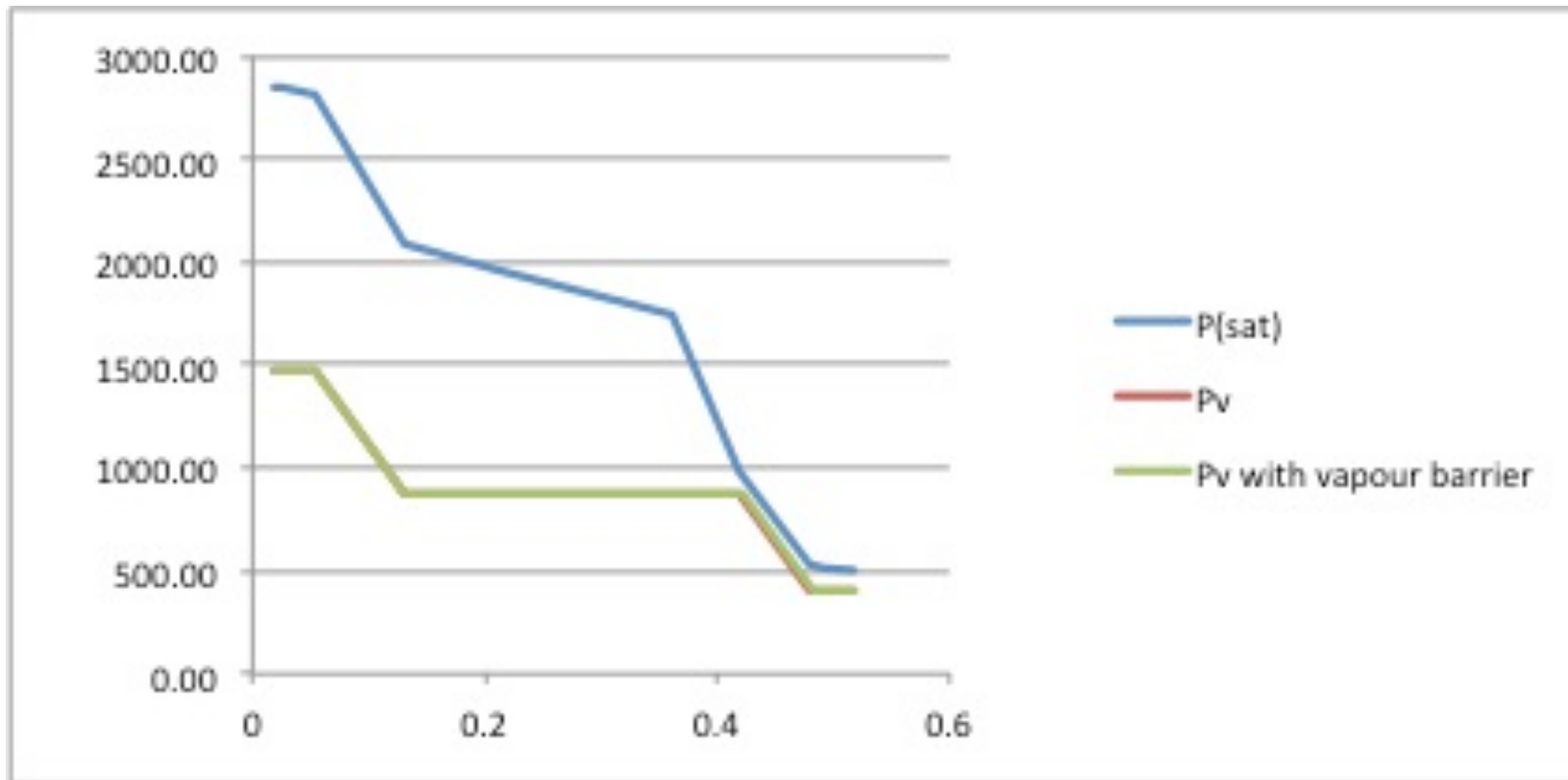


Figure 3: Checking for Condensation for Floor Type 2 (First Floor)



#### 4. Floor Type 5 (Roof)

Table 7: Technological Details of Floor Type 5 (Roof)

Layer	Material	Thickness s (m)	Thermal conductivity $\lambda$ (W/m.k)	Resistance R (m <sup>2</sup> .k/W)	Transmittance u(w/m <sup>2</sup> .k)	$\Delta T \cdot U \cdot R_i$	Ti °C
	inside						23.9
	internal surface			0.13	7.69	0.48	23.42
1	Plaster Board (Knauf)	0.0125	0.16	0.08	12.80	0.29	23.14
2	Plaster Board (Knauf)	0.0125	0.16	0.08	12.80	0.29	22.85
3	Air Gap	0.1	0.15	0.67	1.50	2.44	20.41
4	OSB	0.0125	0.13	0.10	10.40	0.35	20.06
5	Rigid Insulation EPS 30 KG/m3 (Isover)	0.06	0.031	1.94	0.52	7.09	12.97
6	Soft Insulation Mineral wool 30kg/m3 (Isover E100-S)	0.06	0.031	1.94	0.52	7.09	5.88
7	Reinforced Concrete	0.15	0.4	0.38	2.67	1.37	4.50
8	Polyethilen Sheet	0.002	0.035	0.06	17.50	0.21	4.29
9	Light Concrete	0.08	0.4	0.20	5.00	0.73	3.56
10	Rigid Insulation EPS 30 KG/m3 (Isover)	0.03	0.031	0.97	1.03	3.55	0.01
11	Waterproof Roll Insulation (Dupont Tyvek)	0.002	0.33	0.01	165.00	0.02	-0.01
12	Protective Covering Membrane (bauder) 1380 kg/m3	0.004	0.018	0.22	4.50	0.81	-0.82
13	Reservoir Board	0.075	0.15	0.50	2.00	1.83	-2.65
	external surface			0.04	25.00	0.15	-2.80
	outside						-2.8
	Total	0.6005		7.29	<b>0.14</b>		
	$\Delta T$	26.7					



Table 8: Technological Details of Floor Type 5 (Roof)

Layer	Material	Thickness s (m)	Vapour permeability $\delta$ (kg/msPa)	Vapour Resistance $\rho$ (m <sup>2</sup> sPa/kg)	Ti °C	P(sat) Pa	$\Delta P \cdot \rho_i / \rho_{tot}$	Pv Pa	$\Delta P \cdot \rho_i / \rho'_{tot}$ vapour barrier	Pv' Pa
Interior	Pi(sat)@23.9°C	2957.30	Pi(50%)	1478.65	<b>Floor Type 5</b>					
Exterior	Pe(sat)@-2.8°C	496.06	Pe(80%)	396.85						
$\Delta P$ (Pa)		1081.80								
$\Delta T$ (°C)		26.7								
inside					23.90	2957.30				
internal surface					23.42	2873.72				
1	Plaster Board	0.0125	23	0.0005	23.14	2824.49	9.53759E-12	1478.65	0.00	1478.65
2	Plaster Board	0.0125	23	0.0005	22.85	2776.00	9.53759E-12	1478.65	0.00	1478.65
3	Air Gap	0.1	193	0.0005	20.41	2390.91	9.09284E-12	1478.65	0.00	1478.65
4	OSB	0.0125	1.5	0.0083	20.06	2339.42	1.46243E-10	1478.65	0.00	1478.65
5	Rigid Insulation EPS 30 KG/m3 (Isover)	0.06	1.46E-12	41095890411	12.97	1489.91	721.1988344	757.45	650.81	827.84
6	Soft Insulation Mineral wool 30kg/m3 (Isover E100-S)	0.06	0.06	1.0000	5.88	924.49	1.75492E-08	757.45	0.00	827.84
7	Reinforced Concrete	0.15	1.95	0.0769	4.50	840.16	1.34994E-09	757.45	0.00	827.84
8	Polyethilen Sheet	0.002	3E-13	6666666667	4.29				105.58	722.26
9	Light Concrete	0.08	1.95	0.0410	3.56	786.33	7.19966E-10	757.45	0.00	722.26
10	Rigid Insulation EPS 30 KG/m3 (Isover)	0.03	1.46E-12	20547945205	0.01	610.06	360.5994172	396.85	325.41	396.85
11	Waterproof Roll Insulation (Tyvek)	0.002	0		-0.01				0.00	396.85
12	Protective Covering Membrane (bauder) 1380 kg/m3	0.004	0.0025	1.6000	-0.82	573.98	2.80787E-08	396.85	0.00	396.85
13	Reservoir Board	0.075	193	0.0004	-2.65	501.50	6.81963E-12	396.85	0.00	396.85
external surface					-2.80	496.06				
outside					-2.80	496.06				
Total		0.5985		61643835619						
Total with vapour barrier		0.6005		68310502286						



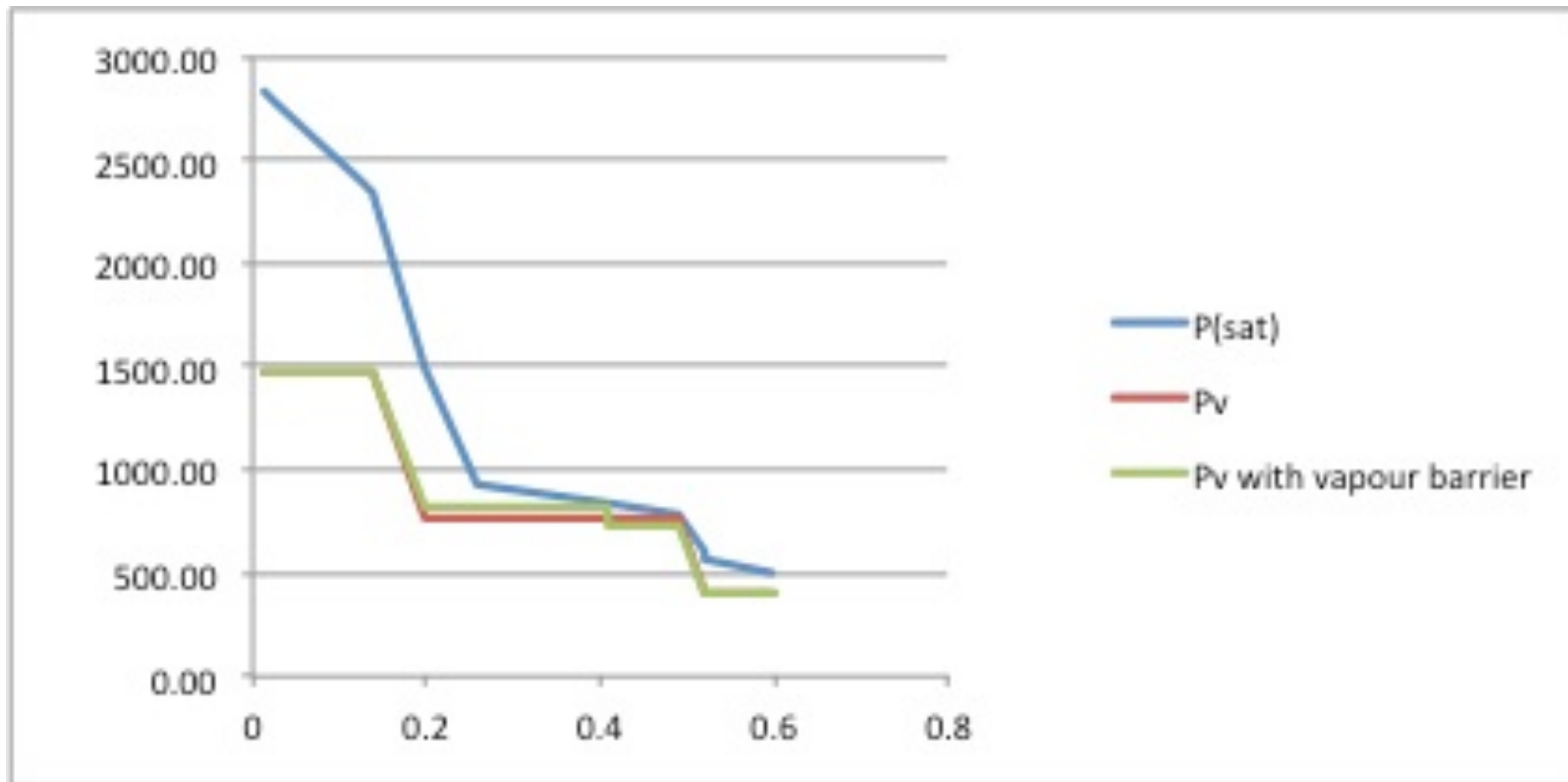
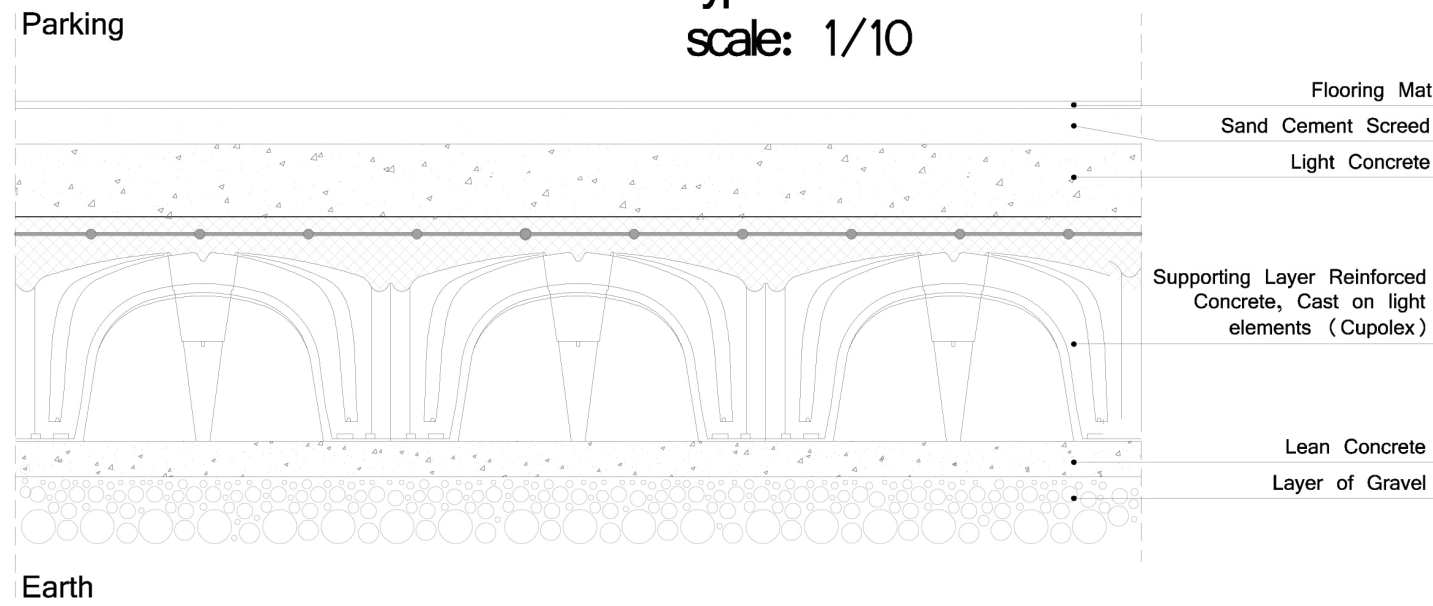


Figure 4: Checking for Condensation for Floor Type 5 (Roof)

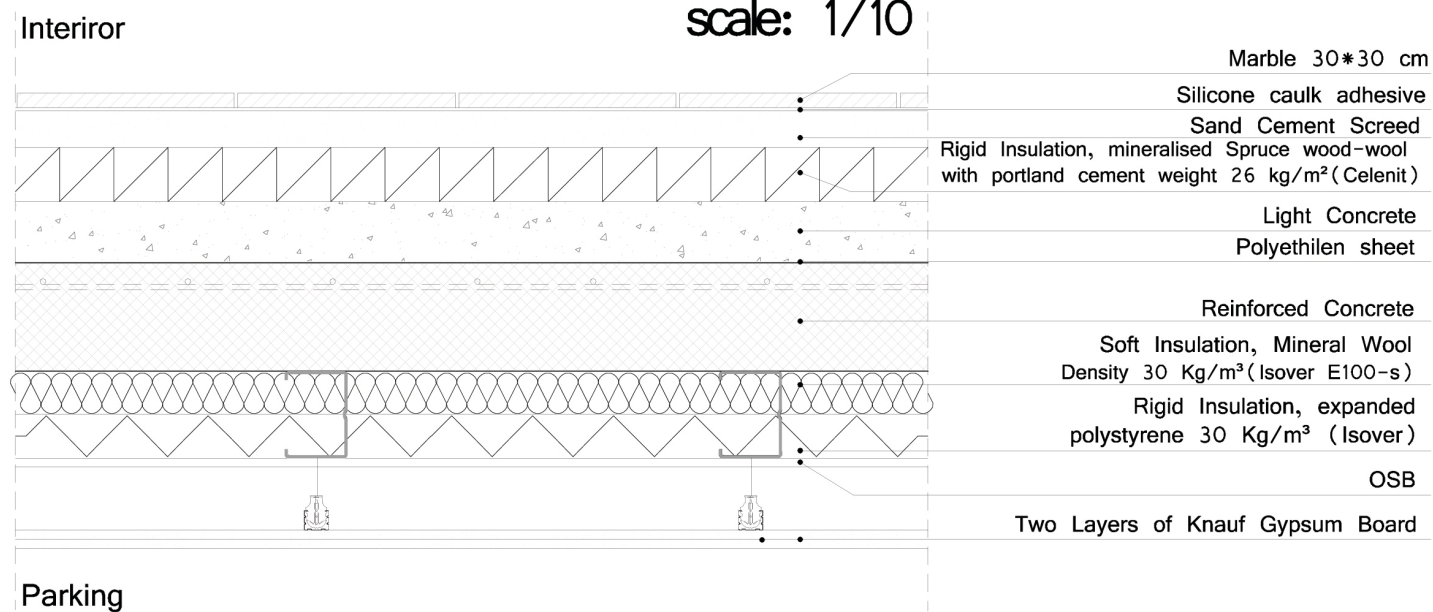


### Type 1: Vertical Section scale: 1/10



Floor- TYPE 1		
NO.	Layer	Thickness
1	Flooring Mat	10 mm
2	Sand Cement Screed	50 mm
3	Light Concrete	80 mm
4	Supporting Layer reinforced concrete, Cast on light elements (Cupolex)	135 mm
5	Lean Concrete	50 mm
6	Layer of Gravel	

### Type 2: Vertical Section scale: 1/10

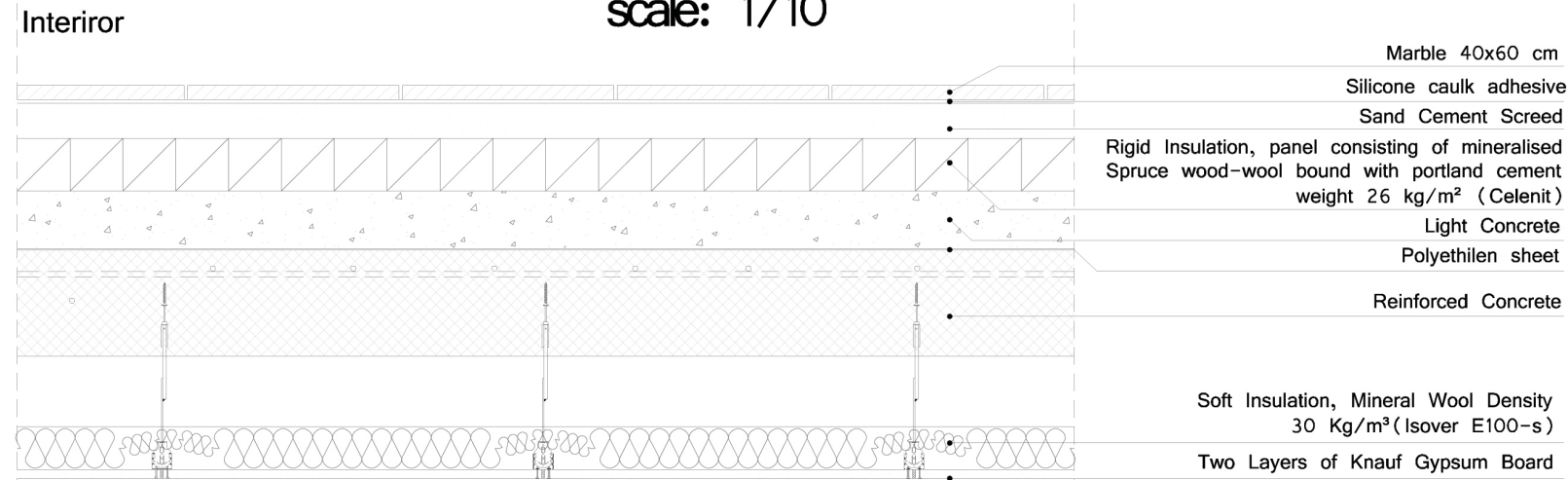


Intermediate floor- TYPE 2		
NO.	Layer	Thickness
1	Marble 30*30 cm	20 mm
2	Silicone caulk adhesive	5 mm
3	Sand Cement Screed	30 mm
4	Rigid Insulation, panel consisting of mineralised Spruce wood-wool bound with portland cement weight 26 kg/m² (Celenit)	75 mm
5	Light Concrete	80 mm
6	Water Plumps	-
7	Polyethilen sheet	2 mm
8	Reinforced Concrete	150 mm
9	Soft Insulation, Mineral Wool Density 30 Kg/m³ (Isover E100-s)	60 mm
10	Rigid Insulation, expanded polystyrene Density 30 Kg/m³ (Isover)	60 mm
11	OSB	12.5 mm
12	Two Layers of Gypsum Board	25 mm

Drawing 1

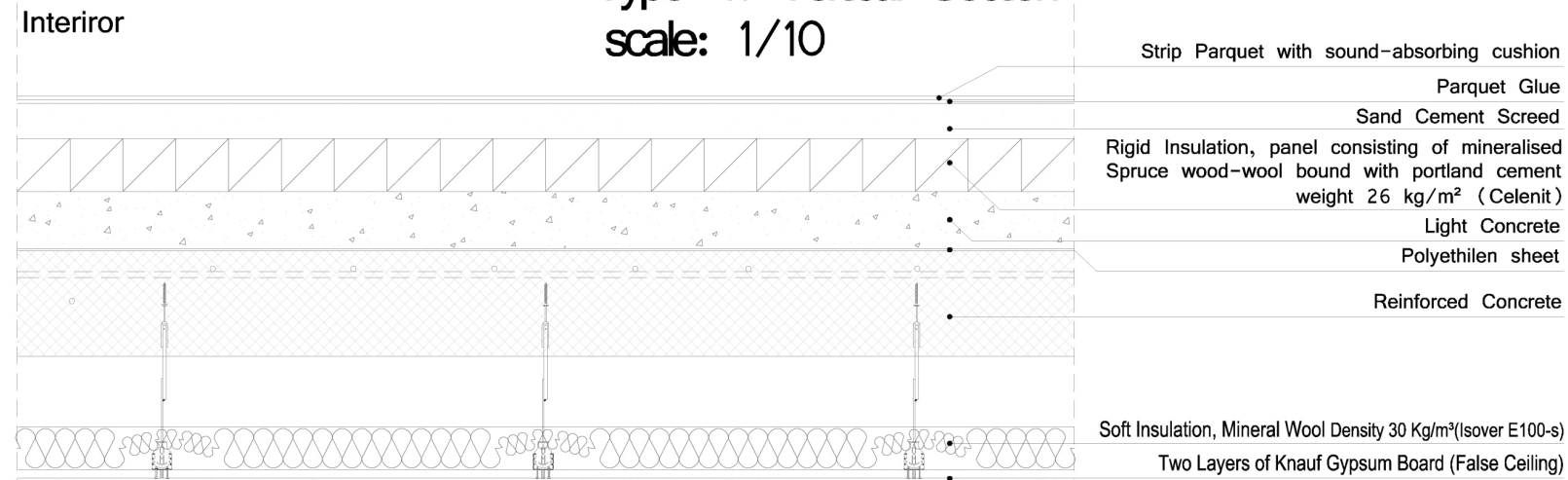


**Type 3: Vertical Section**  
scale: 1/10



Intermediate floor- TYPE C1		
NO.	Layer	Thickness
1	Marble 30*30 cm	20 mm
2	Silicone caulk adhesive	5 mm
3	Sand Cement Screed	30 mm
4	Rigid Insulation, panel consisting of mineralised Spruce wood-wool bound with portland cement weight 26 kg/m² (Celenit)	75 mm
5	Light Concrete	80 mm
6	Water Plumps	-
7	Polyethilen sheet	2 mm
8	Reinforced Concrete	150 mm
9	Soft Insulation, Mineral Wool Density 30 Kg/m³ (Isover E100-s)	60 mm
10	Two Layers of Gypsum Board	25 mm

**Type 4: Vertical Section**  
scale: 1/10



Intermediate floor- TYPE C1		
NO.	Layer	Thickness
1	Strip Parquet with sound-absorbing cushion	5 mm
2	Parquet Glue	5 mm
3	Sand Cement Screed	30 mm
4	Rigid Insulation, panel consisting of mineralised Spruce wood-wool bound with portland cement weight 26 kg/m² (Celenit)	75 mm
5	Light Concrete	80 mm
6	Water Plumps	-
7	Polyethilen sheet	2 mm
8	Reinforced Concrete	150 mm
9	Soft Insulation, Mineral Wool Density 30 Kg/m³ (Isover E100-s)	60 mm
10	Two Layers of Gypsum Board	25 mm

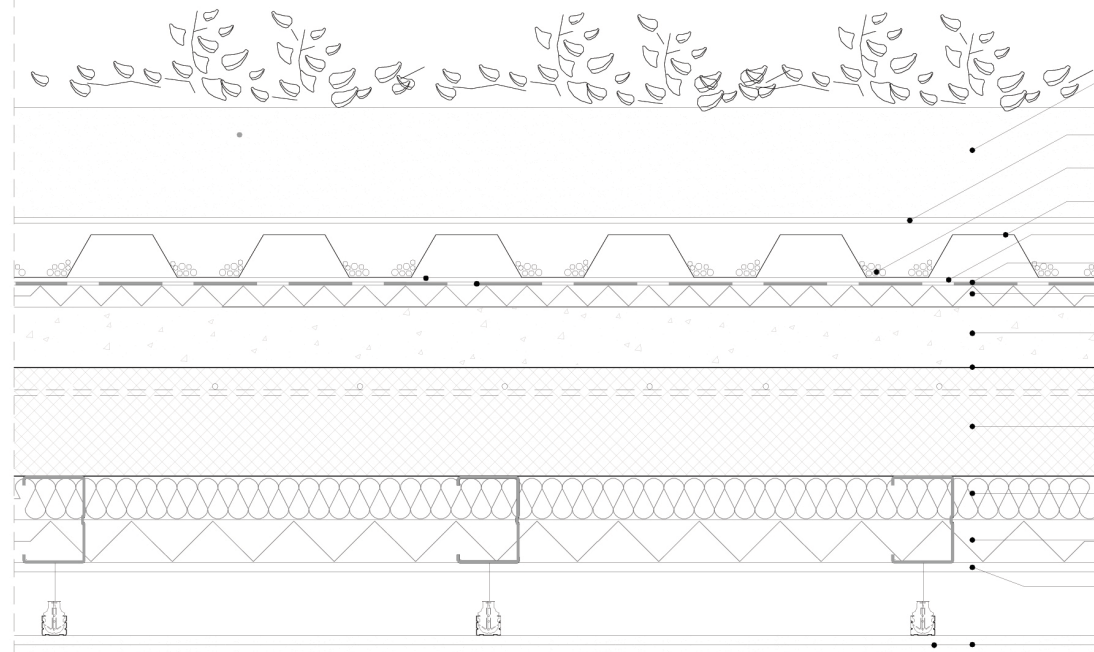
Drawing 2





### Type 5 (Green Roof) : Vertical Section scale: 1/10

Exterior



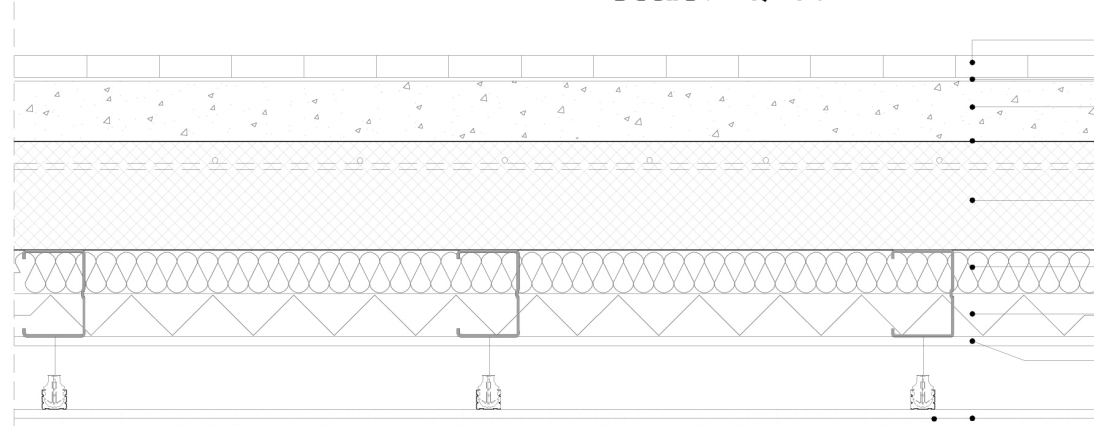
- Intensive Substrate
- Mat Plate (Bauder)
- Intensive substrate drainage (Bauder)
- Reservoir Board
- Protective covering membrane (Bauder)
- Waterproof roll Insulation (Tyvek)
- Rigid Insulation, expanded polystyrene 30 Kg/m<sup>3</sup> (Isover)
- Light Concrete
- Polyethilen sheet
- Reinforced Concrete
- Soft Insulation, Mineral Wool Density 30 Kg/m<sup>3</sup>(Isover E100-s)
- Rigid Insulation, expanded polystyrene 30 Kg/m<sup>3</sup>
- OSB
- Two Layers of Knauf Gypsum Board

Green Roof		
No.	Layer	Thickness
1	Intensive Substrate	150 mm
2	Mat Plate (Bauder)	6 mm
3	Intensive substrate drainage (Bauder)	-
4	Reservoir Board	75 mm
5	Protective covering membrane (Bauder)	4 mm
6	Waterproof roll Insulation (Tyvek)	2 mm
7	Rigid Insulation, expanded polystyrene 30 Kg/m <sup>3</sup> (Isover)	30 mm
8	Light Concrete	80 mm
9	Polyethilen sheet	2 mm
10	Water Plump	-
11	Reinforced Concrete	150 mm
12	Soft Insulation, Mineral Wool Density 30 Kg/m <sup>3</sup> (Isover E100-s)	60 mm
13	Rigid Insulation, expanded polystyrene 30 Kg/m <sup>3</sup>	60 mm
14	OSB	12.5 mm
15	Two Layers of Gypsum Board (False Ceiling)	25 mm

Interior

### Type 6: Vertical Section scale: 1/10

Exterior



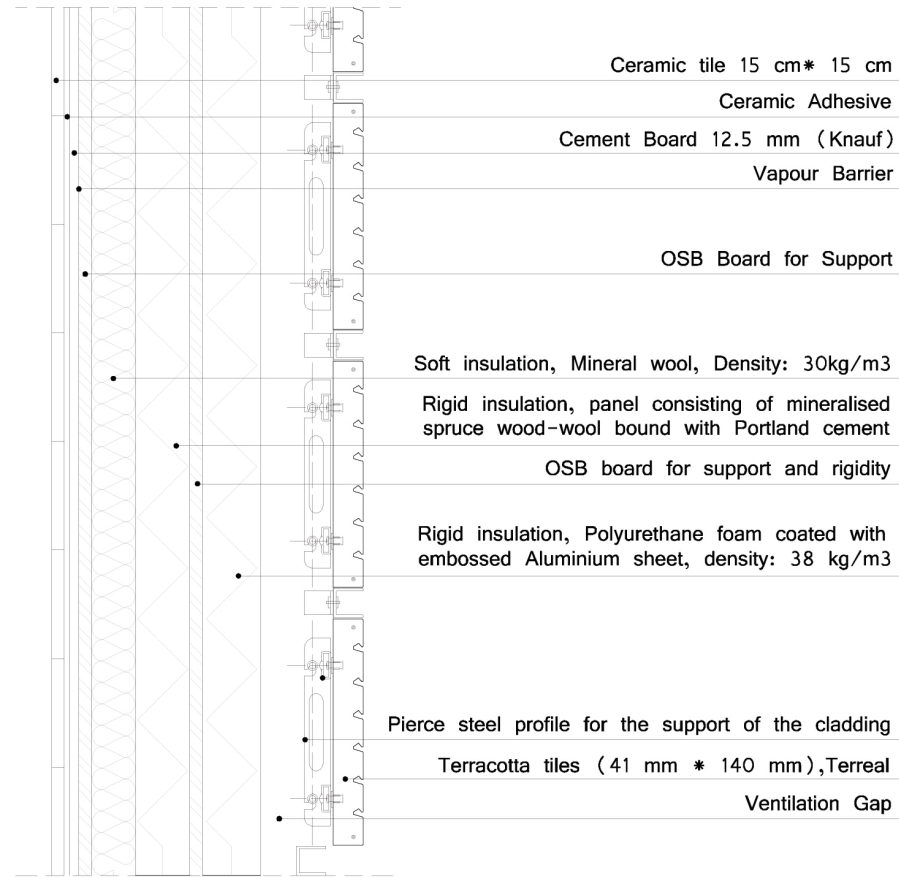
- Spruce wood pavement
- Glue
- Light Concrete
- Polyethilen sheet
- Reinforced Concrete
- Soft Insulation, Mineral Wool Density 30 Kg/m<sup>3</sup>(Isover E100-s)
- Rigid Insulation, expanded polystyrene 30 Kg/m<sup>3</sup>
- OSB
- Two Layers of Knauf Gypsum Board

Intermediate floor- TYPE 2		
NO.	Layer	Thickness
1	Spruce wood pavement	30 mm
2	Glue	5 mm
3	Sand Cement Screed	30 mm
4	Rigid Insulation, panel consisting of mineralised Spruce wood-wool bound with portland cement weight 26 kg/m <sup>2</sup> (Celenit)	75 mm
5	Light Concrete	80 mm
6	Water Plumps	-
7	Polyethilen sheet	2 mm
8	Reinforced Concrete	150 mm
9	Soft Insulation, Mineral Wool Density 30 Kg/m <sup>3</sup> (Isover E100-s)	60 mm
10	Rigid Insulation, expanded polystyrene Density 30 Kg/m <sup>3</sup> (Isover)	60 mm
11	OSB	12.5 mm
12	Two Layers of Gypsum Board	25 mm

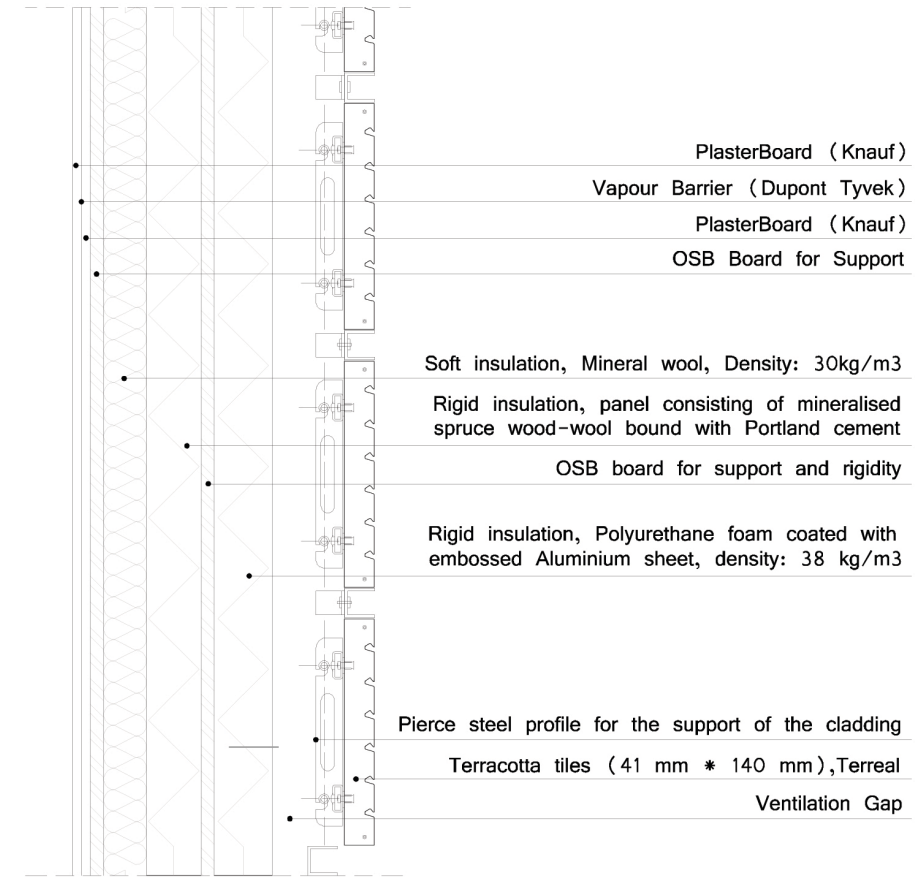
Interior

Drawing 3





Wall Type 2



Wall Type 1

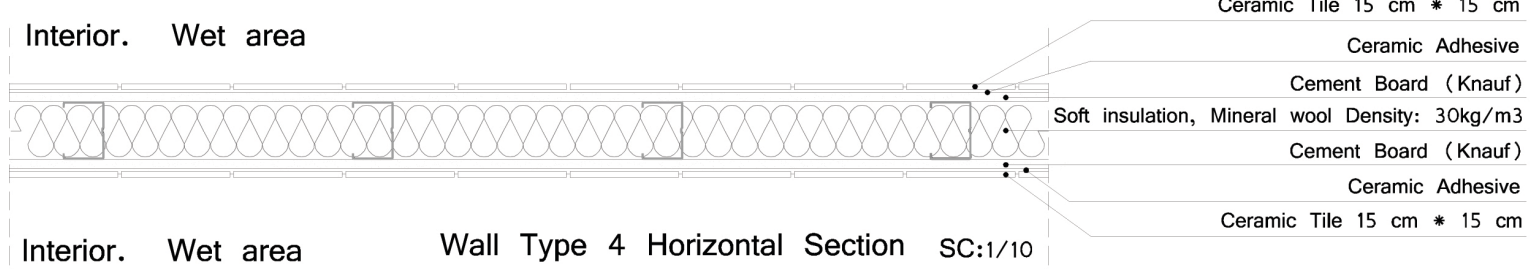
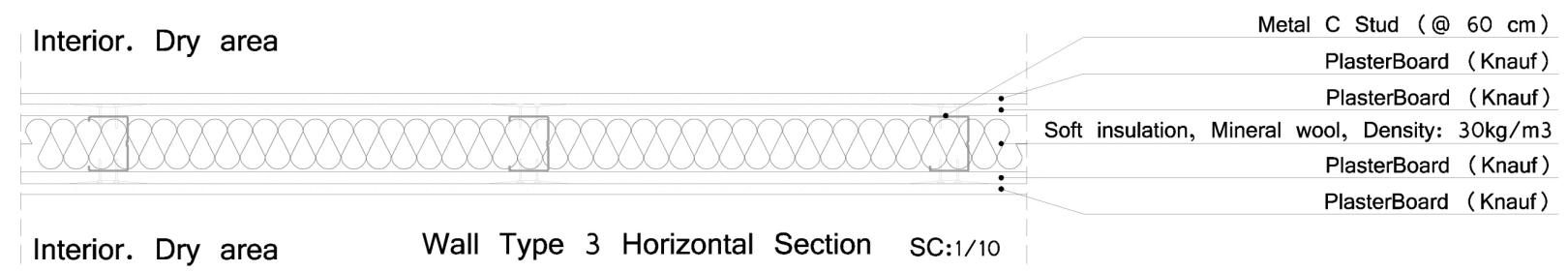
Wall TYPE 2		
Number	Layer	Thickness
1	Ceramic tile 15 cm* 15 cm	20 mm
2	Ceramic Adhesive	5 mm
3	Cement Board 12.5 mm (Knauf)	12.5 mm
4	Soft insulation, Mineral wool, Density: 30kg/m3 (Isover E100-s)	60 mm
5	Rigid Insulation, panel consisting of mineralised Spruce wood-wool bound with portland cement weight 26 kg/m <sup>2</sup> (Celenit)	75 mm
6	OSB Board (support & rigidity)	18 mm
7	"Isotec Parete" Polyurethane Foam coated with embossed Aluminium sheet	80 mm
8	Pierce Steel Profile	
9	Cladding system with Terra Cotta	20 mm
10	Ventilation Gap	

Wall TYPE 1		
Number	Layer	Thickness
1	"Knauf" PlasterBoard with vapor barrier	12.5 mm
2	"Knauf" PlasterBoard	12.5 mm
3	OSB Board (support)	18 mm
4	Soft insulation, Mineral wool, Density: 30kg/m3 (Isover E100-s)	60 mm
5	Rigid Insulation, panel consisting of mineralised Spruce wood-wool bound with portland cement weight 26 kg/m <sup>2</sup> (Celenit)	75 mm
6	OSB Board (support & rigidity)	18 mm
7	"Isotec Parete" Polyurethane Foam coated with embossed Aluminium sheet	80 mm
8	Pierce Steel Profile	
9	Cladding system with Terra Cotta	20 mm
10	Ventilation Gap	

Drawing 4

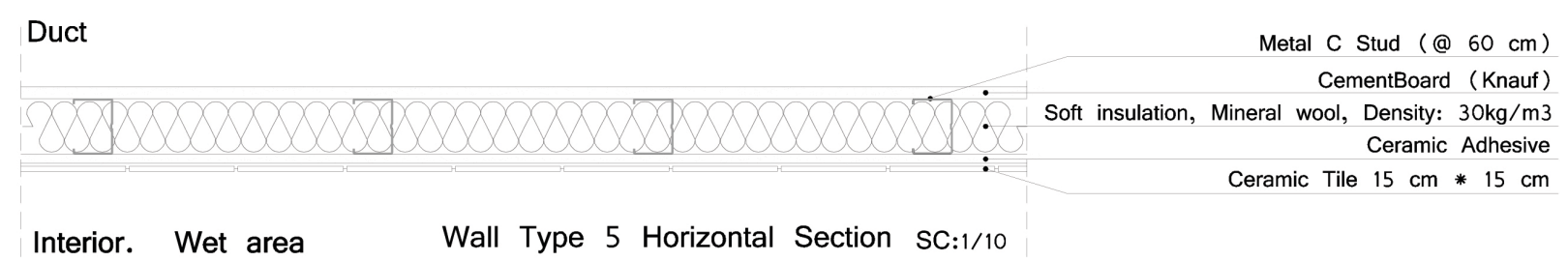


TYPE 3		
No.	Layer	Thickness
1	"Knauf" PlasterBoard	12.5 mm
2	"Knauf" PlasterBoard	12.5 mm
3	Soft insulation, Mineral Wool, Density 30 kg/m <sup>3</sup> (Isover E100-S)	80 mm
4	"Knauf" PlasterBoard	12.5 mm
5	"Knauf" PlasterBoard	12.5 mm
6	Metal C Stud (@60cm)	

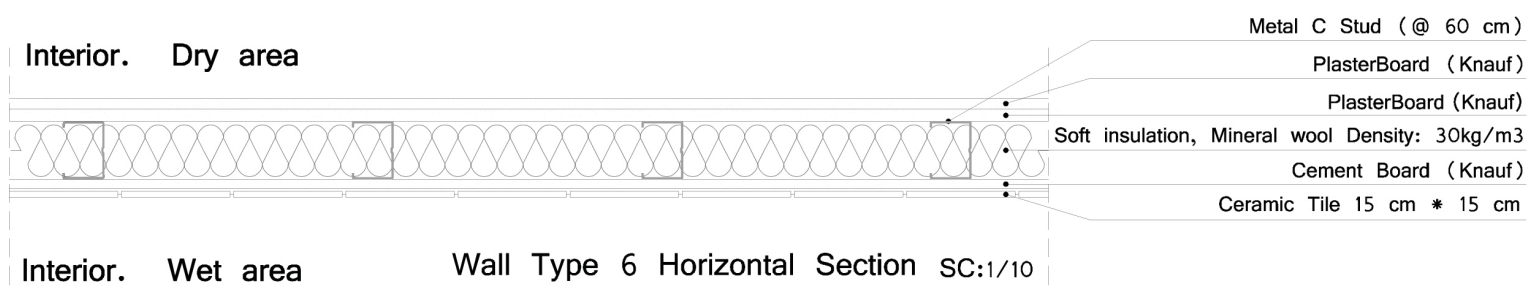


TYPE 4		
No.	Layer	Thickness
1	Ceramic Tile 15*15cm	8 mm
2	Ceramic Adhesive	4 mm
3	"Knauf" CementBoard	12.5 mm
4	Soft insulation, Mineral Wool, Density 30 kg/m <sup>3</sup> (Isover E100-S)	80 mm
5	"Knauf" CementBoard	12.5 mm
6	Ceramic Adhesive	4 mm
7	Ceramic Tile 15*15cm	8 mm
8	Metal C Stud (@40cm)	

TYPE 5		
No.	Layer	Thickness
1	Ceramic Tile 15*15cm	8 mm
2	Ceramic Adhesive	2 mm
3	"Knauf" Cement board	12.5mm
4	Soft insulation, Mineral Wool, Density 30 kg/m <sup>3</sup> (Isover E100-S)	80 mm
5	OSB Board (support)	18mm
6	Metal C Stud (@60cm)	

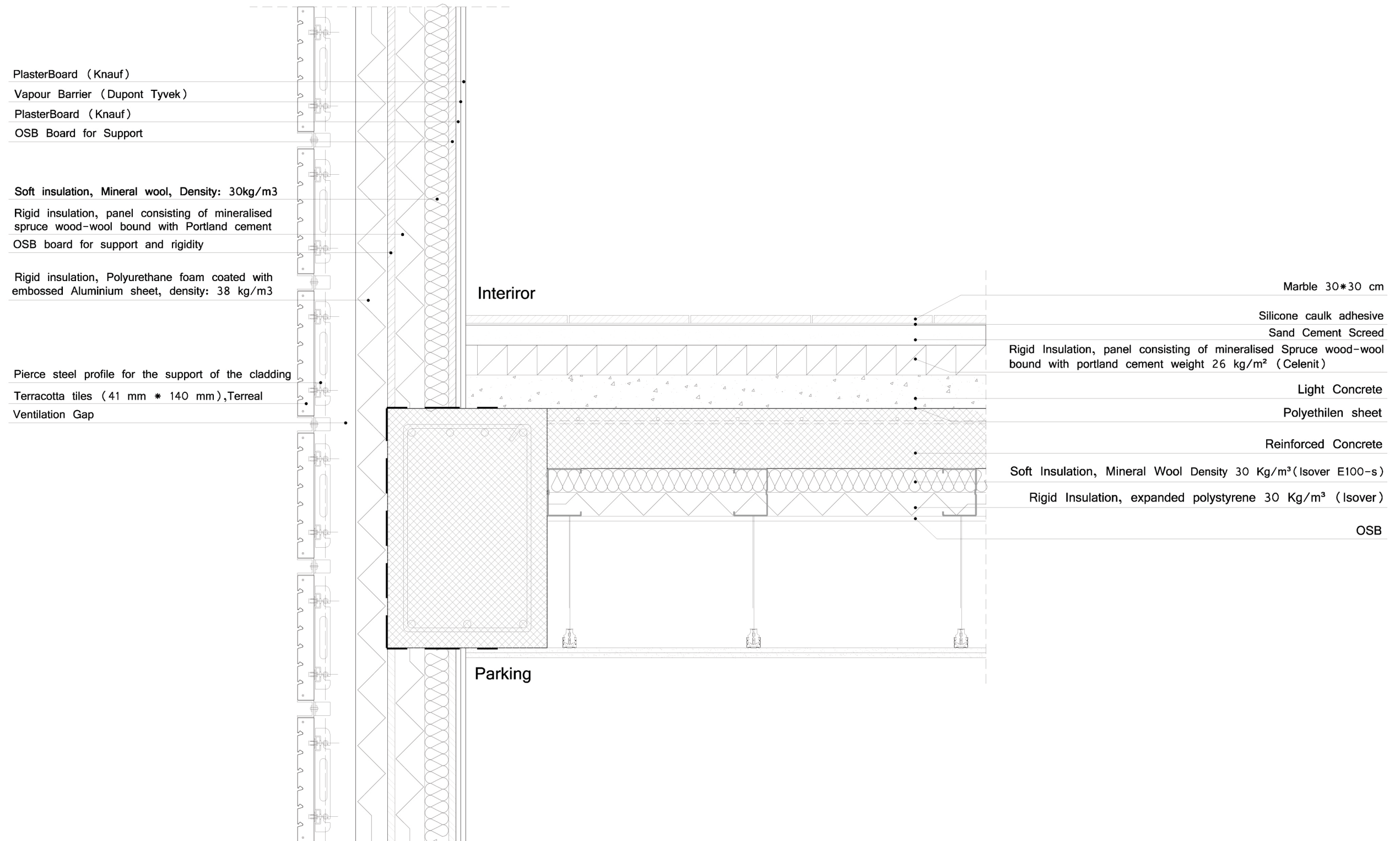


TYPE 6		
No.	Layer	Thickness
1	"Knauf" PlasterBoard	12.5mm
2	"Knauf" PlasterBoard	12.5mm
3	Soft insulation, Mineral Wool, Density 30 kg/m <sup>3</sup> (Isover E100-S)	80 mm
4	"Knauf" CementBoard	12.5mm
5	Ceramic Adhesive	2mm
6	Ceramic Tile 15*15cm	8mm
7	Metal C Stud (@60cm)	



Drawing 5

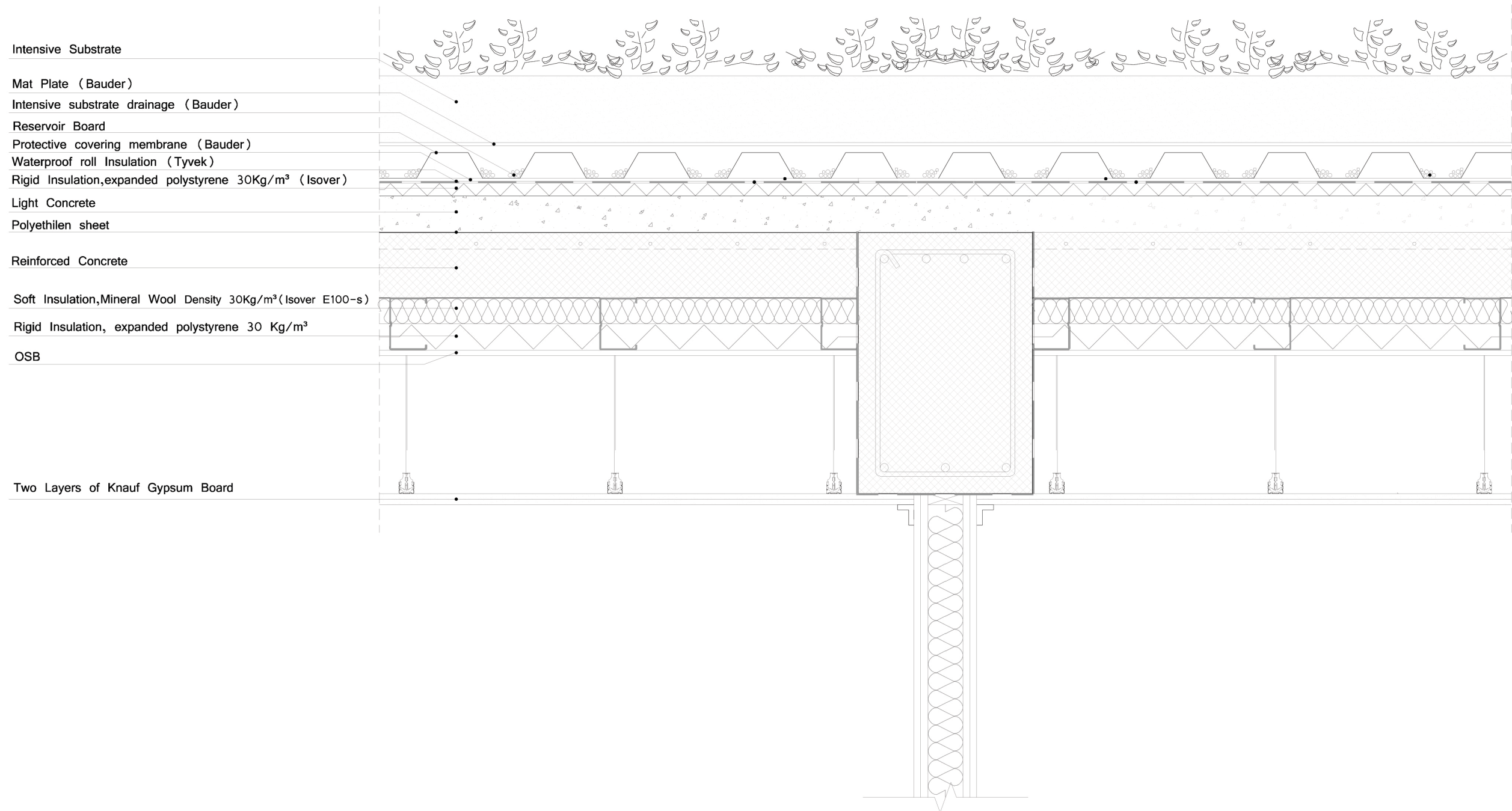




Scale: 1/10

Drawing 6

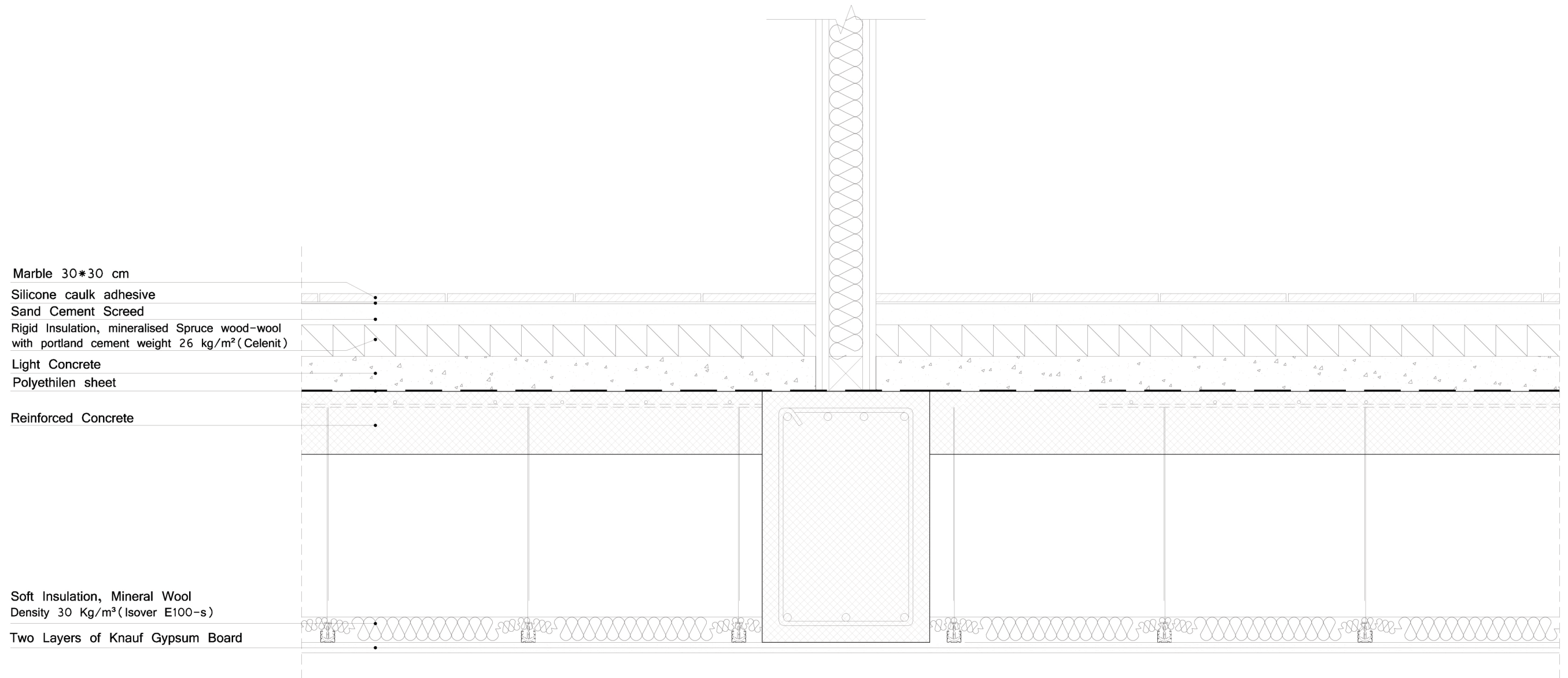




Scale: 1/10

Drawing 7





Drawing 8



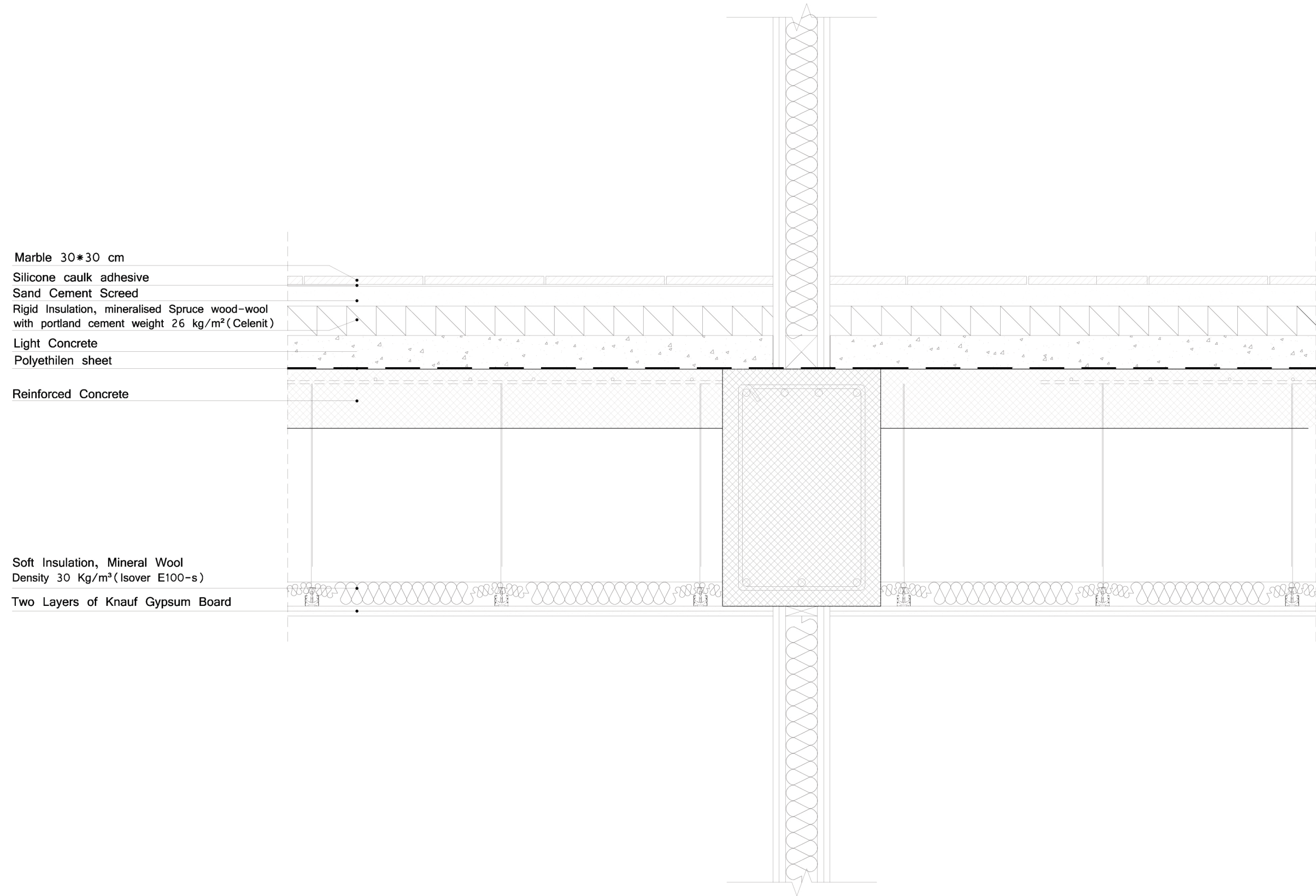
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Suprvisor : Gabriele Masera  
Co-supervisor : Massimo Tadi

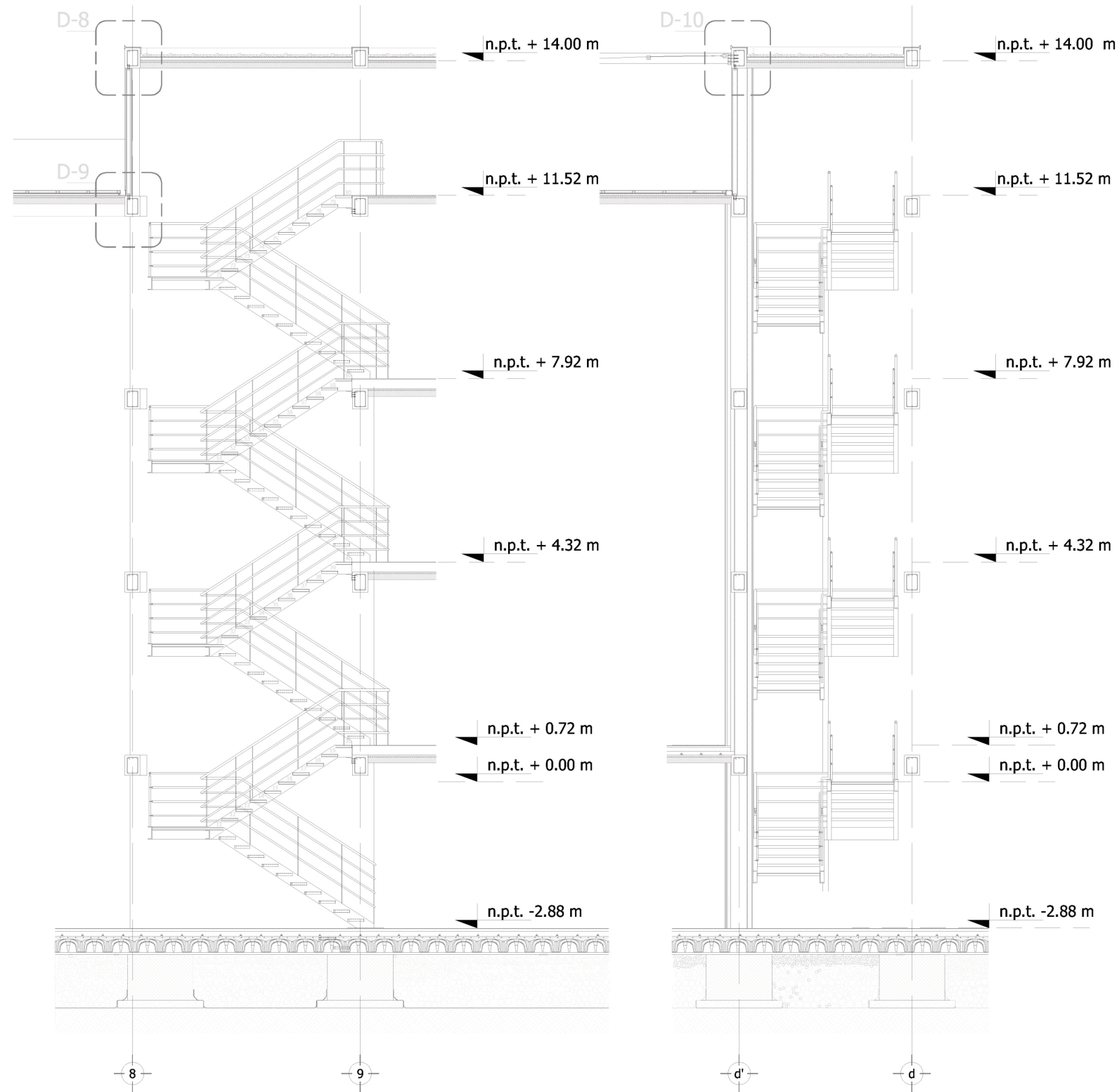
Year 2012-2013

Technological Node



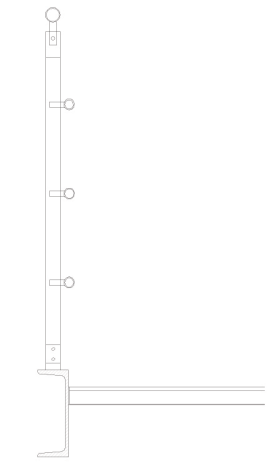
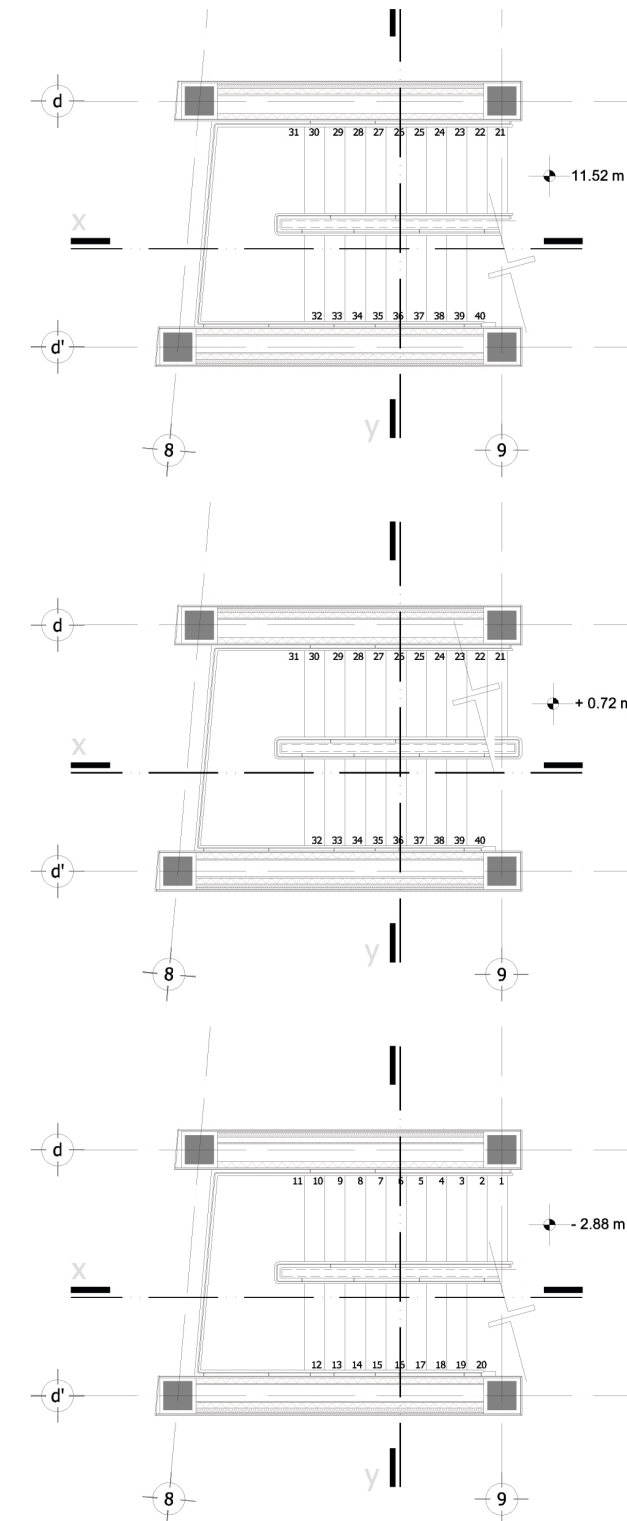
- Marble 30\*30 cm
- Silicone caulk adhesive
- Sand Cement Screed
- Rigid Insulation, mineralised Spruce wood-wool with portland cement weight 26 kg/m<sup>2</sup>(Celenit)
- Light Concrete
- Polyethilen sheet
- Reinforced Concrete
- Soft Insulation, Mineral Wool Density 30 Kg/m<sup>3</sup>(Isover E100-s)
- Two Layers of Knauf Gypsum Board

Drawing 9

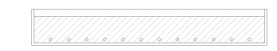


Section X  
Scale : 1/100

Section Y  
Scale : 1/100



Handrail Detail  
Scale : 1/100



Slab Detail  
Scale : 1/100

Drawing 10



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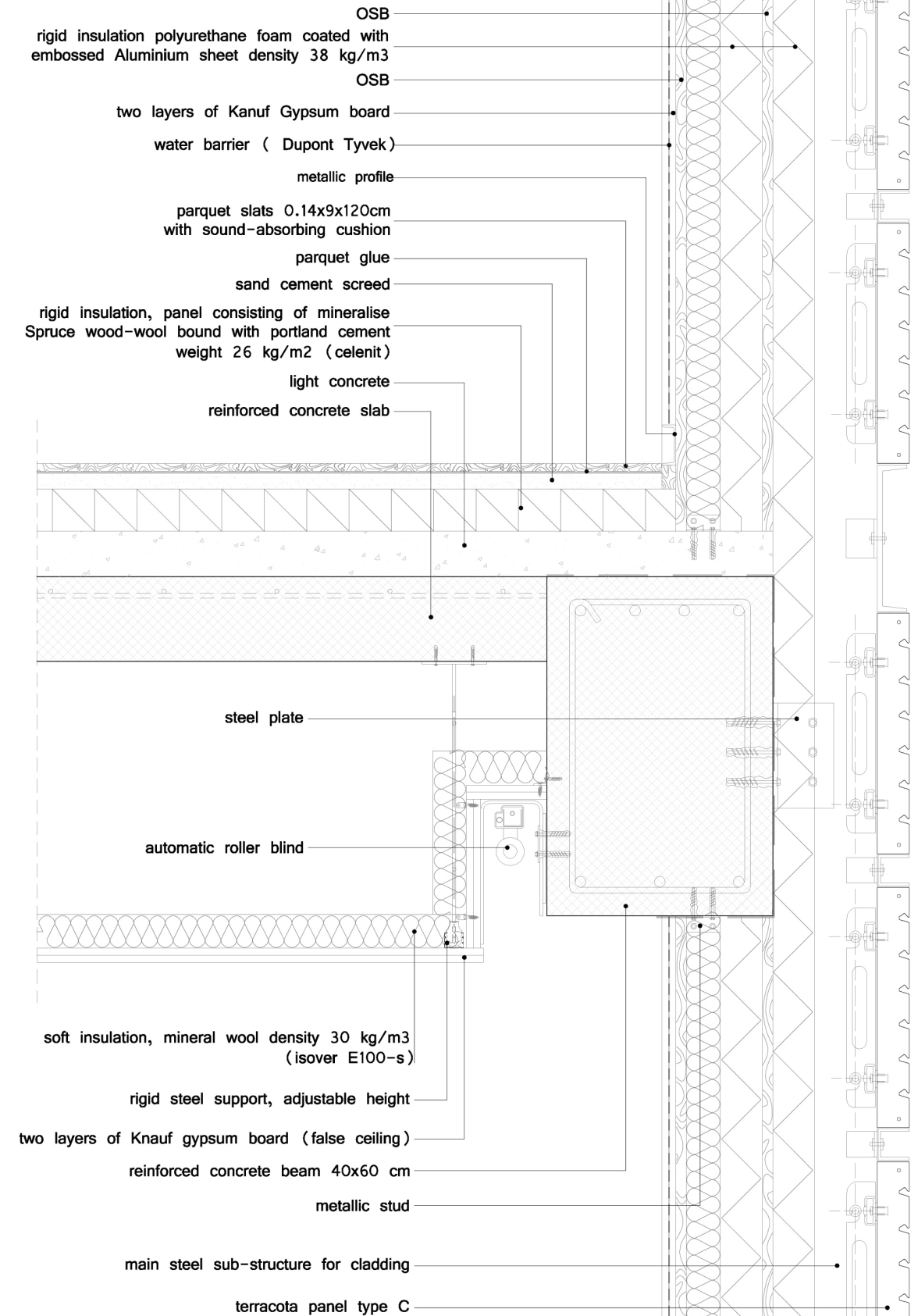
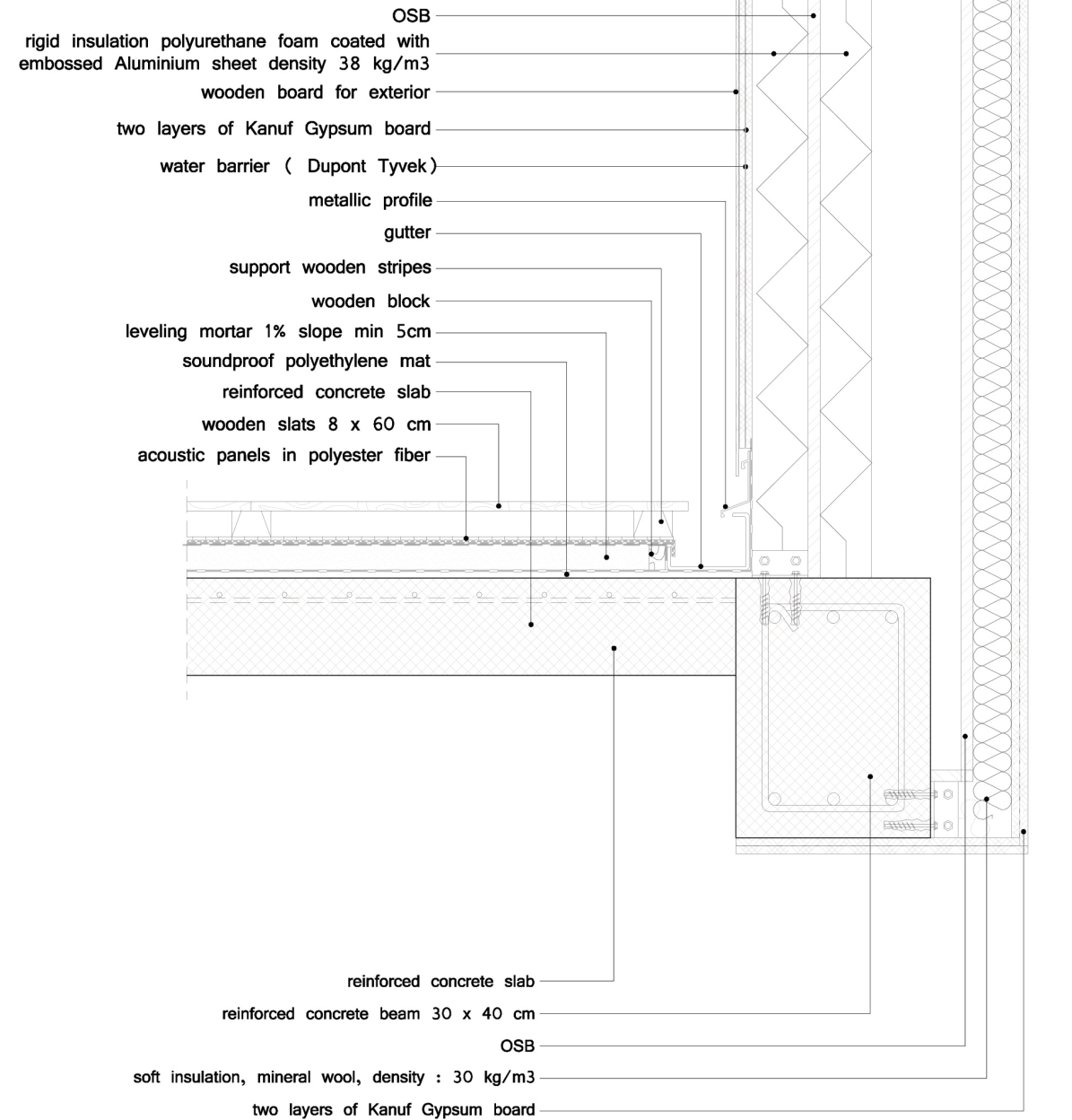
By: S. Kashfolayat, M. Liszt, E. Del Zende  
Supervisor : Gabriele Masera  
Co-supervisor : Massimo Tadi

Year 2012-2013

Stairs Details



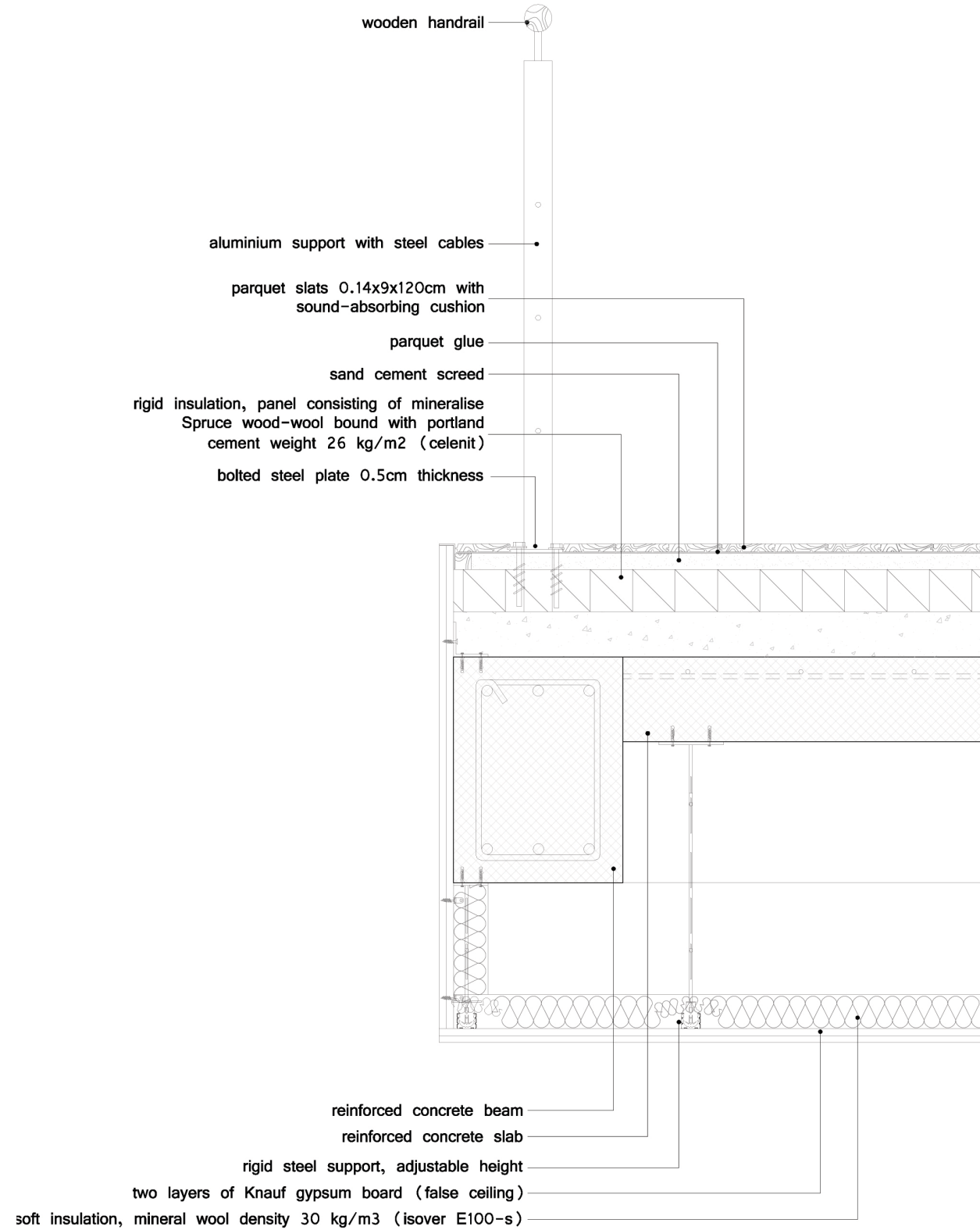
D-9 Scale: 1/10



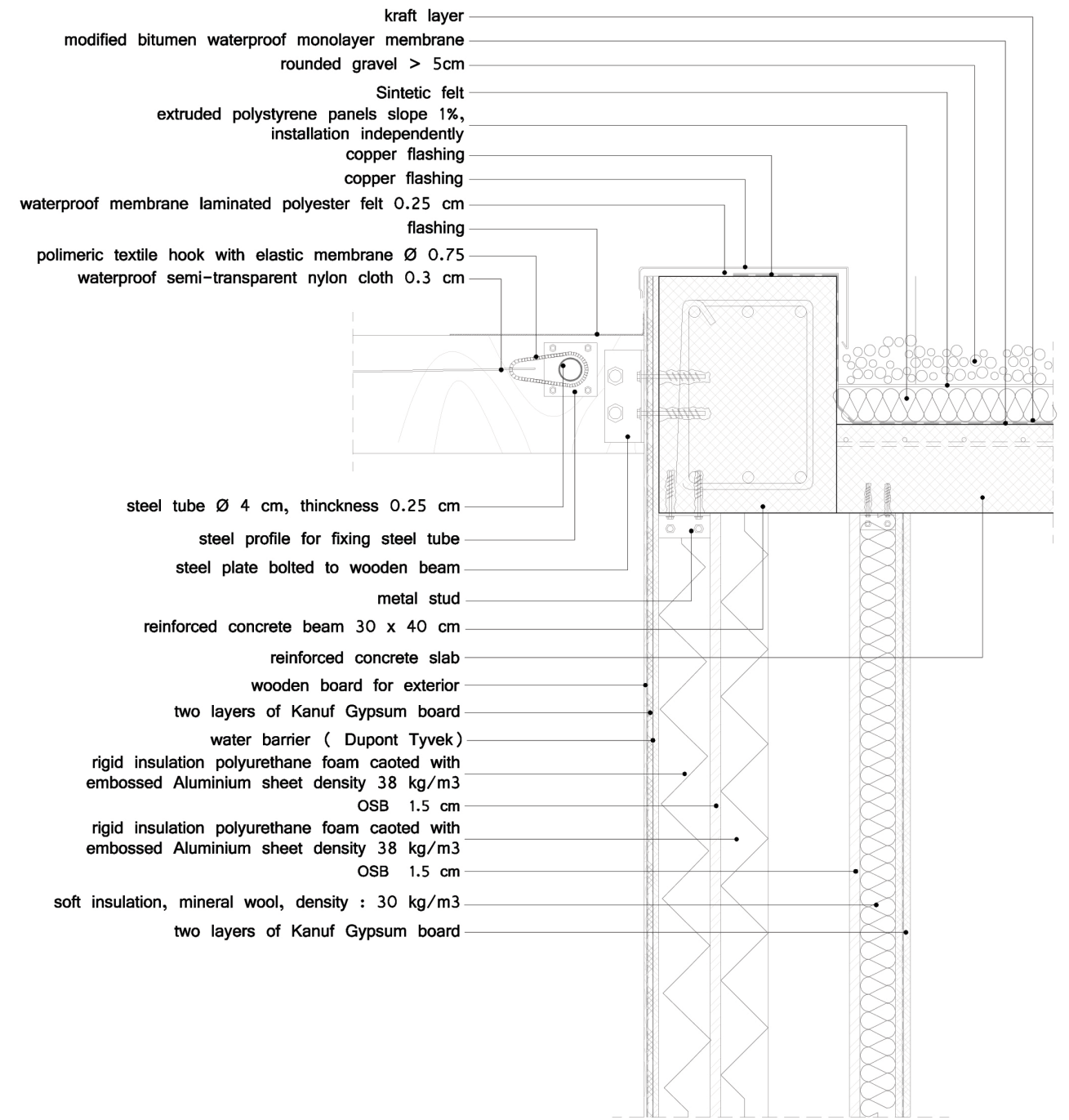
Drawing 11

D-8 Scale: 1/10





D-7 Scale: 1/10



D-10 Scale: 1/10

Drawing 12



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