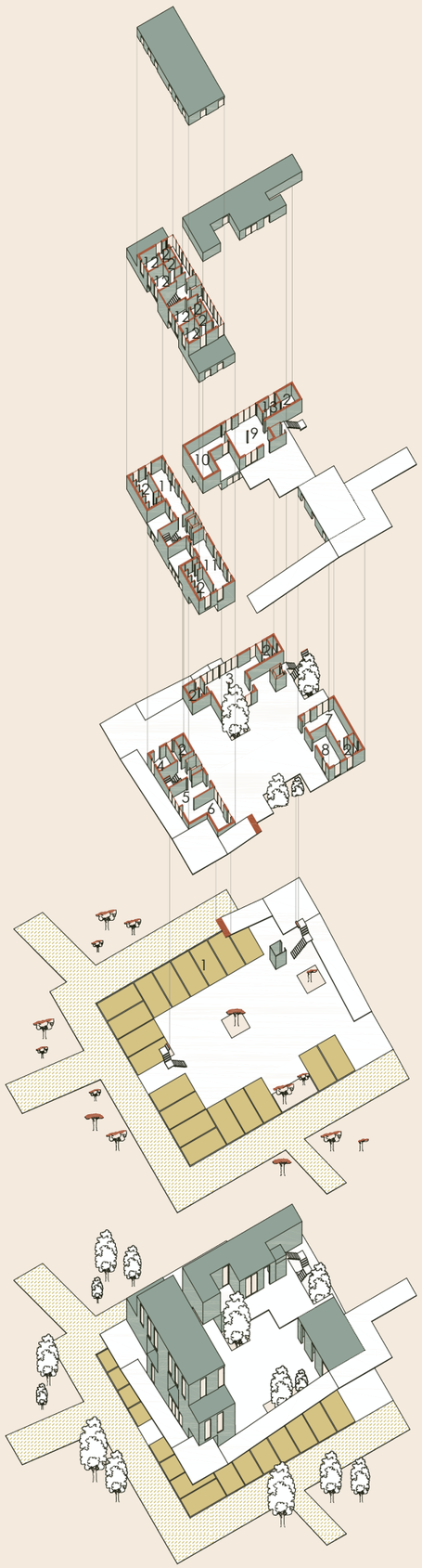
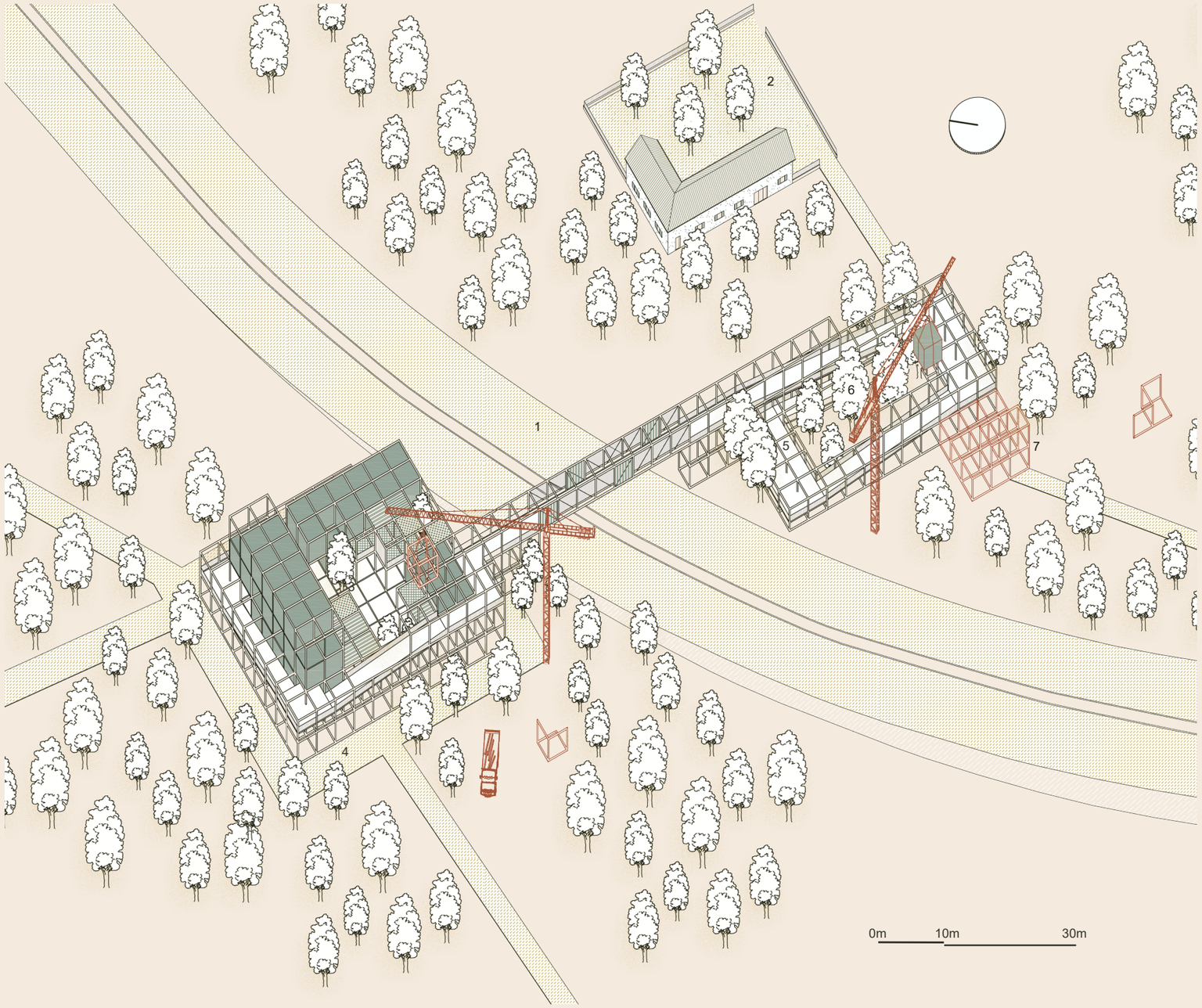


EXPLODED VIEW

1. parking
2. bathrooms
3. coffee bar
4. infirmary
5. reception
6. common room
7. deposit
8. rental space for bikes
9. restaurant
10. kitchen
11. dormitories for ten people
12. double rooms
13. changing room

GENERIC AXONOMETRIC

1. corso Don Luigi Sturzo, Turin, Italy
2. farm with the same orientation
3. semipublic square
4. road for the access to the parking
5. cycle-pedestrian walkway
6. public garden
7. future development of the structural lattice

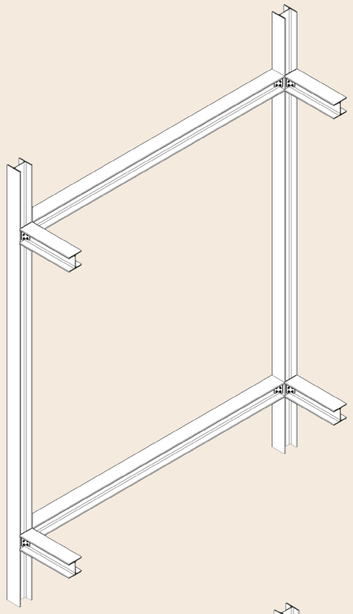


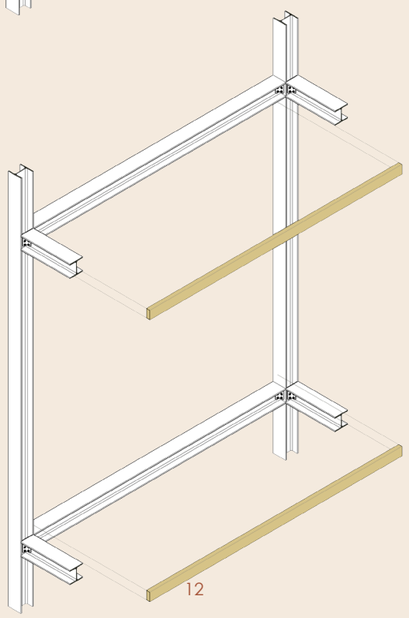
THE STRUCTURE AS CONCEPT

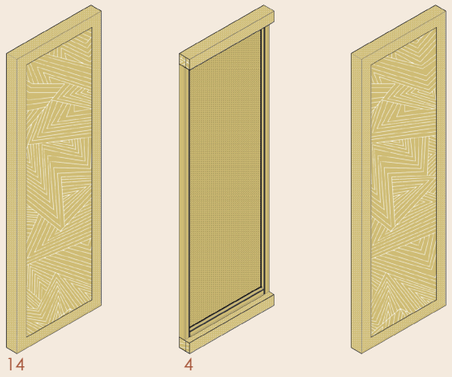
In contemporary society there is more and more a tendency to abandon static architecture; architecture becomes "alive" and it is modeled according to the needs that change quickly in time. The project of the bike hotel, located in *corso don Luigi Sturzo* in Turin, it was born with an attention towards flexibility. A structural lattice, defined by the three-dimensional repetition of a cubic module of HEB beams and pillars, constitutes the skeleton of the structure. A lot of panels with different functions tampon the frame defining the spaces. This modular system was born with the optics of allowing the extension, reduction or modification of the project over time, based on needs. Bolting has been designed for the joining of beams and pillars thus creating reversible dry joints. This system also allows to realize the project for parts, in relation to the funding allocated by the public authority, without altering the general compositional aspect of the intervention.

THE SYSTEM

Corso don Luigi Sturzo separates the Meisino park from the inhabitants of the *borgata Rosa*. To cross this street, currently there are two communication pedestrian crossings at more than 1km away. The project aims to achieve a further crossing of this street through a cycle-pedestrian walkway. Furthermore, the area of intervention, towards the park, is a floodable area, thus it is requires the presence of a *pilotis* plan. The modular cubic structural system aims to create an *unicum* joining different elements: the building, the piloties plan and the footbridge.

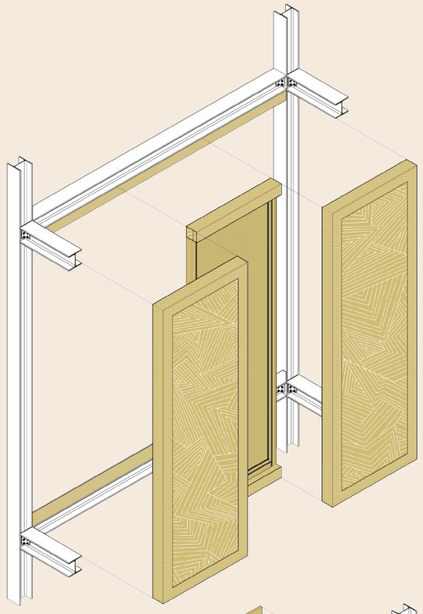


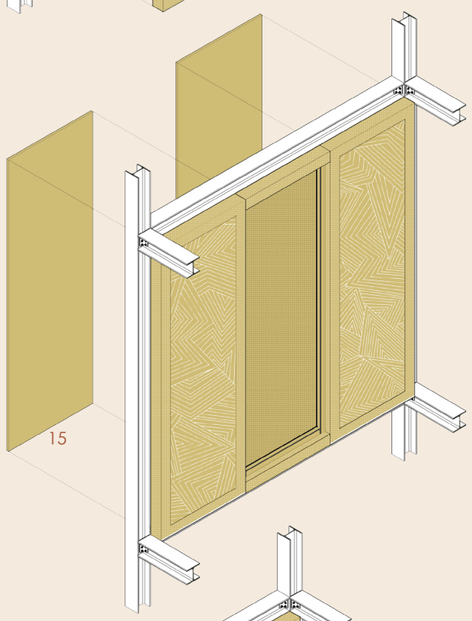


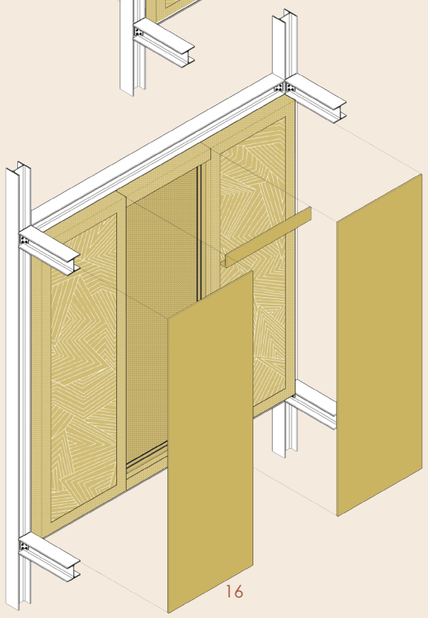


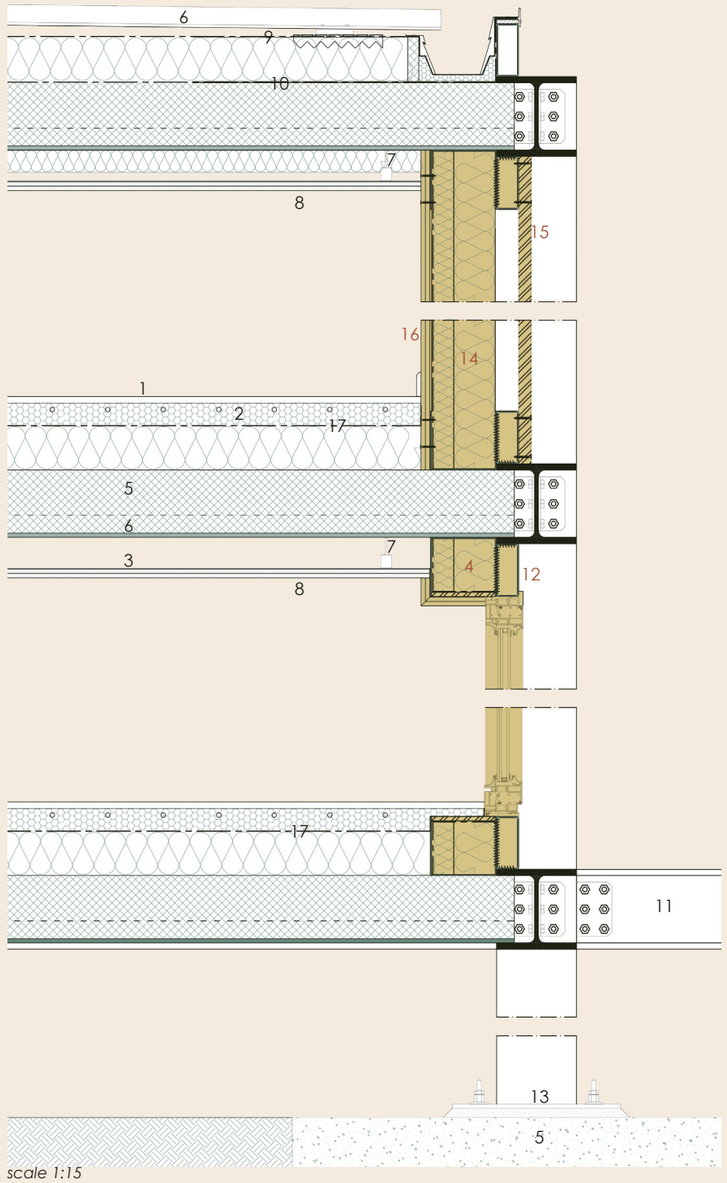
CONSTRUCTION PHASES
AND TECHNICAL SECTION

1. parquet
2. thermal insulation + heating system
3. thermal insulation
4. prefabbricate glass panel (window, thermal insulation, steel profile, vapor barrier, wood elements)
5. reinforced concrete
6. corrugated sheet
7. countertop frame
8. countertop slabs
9. waterproof barrier
10. vapor barrier
11. HE180B
12. carrier profile
13. foundation steel plate
14. prefabbricate insulated panel (vapor barrier, thermal insulation, steel profile)
15. facade wooden strips
16. plasterboard slabs (type 1, type 2)
17. acoustic insulation









scale 1:15

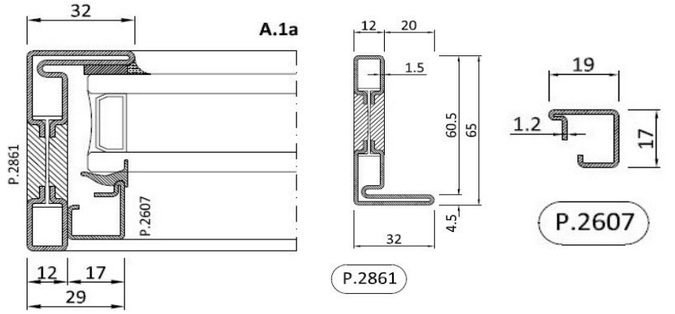
1. ELEMENTS

id	function		material	quantity (-)	volume (m^3/unit)	tot volume (m^3)
4	prefabbricate glass panel	fixed window	float glass (double glass, th. 3+3mm)	1	0,0194	0,0194
			weathering steel (ASTM A242)	1	0,0031	0,0031
		thermal insulation	extruded polystyrene (XPS)	1	0,0410	0,0410
		steel profile	weathering steel (ASTM A242)	1	0,0030	0,0030
		vapor barrier	polyethylene film (PE)	1	0,0001	0,0001
		wood elements	pine wood	1	0,0034	0,0034
12	carrier profile		weathering steel (ASTM A242)	2	0,0035	0,0070
14	prefabbricate insulated panel	vapor barrier	polyethylene film (PE)	2	0,0008	0,0017
		thermal insulation	extruded polystyrene (XPS)	2	0,5970	1,1940
		steel profile	weathering steel (ASTM A242)	2	0,0125	0,0250
15	facade wooden strips		pine wood	2	0,1200	0,2400
16	plasterboard slabs	type 1	gypsum plasterboard	2	0,0854	0,1708
		type 2		1	0,0053	0,0053

2. TECHNICAL SPECIFICATIONS

Window frame

fonte: https://www.seccosistemi.com/it/materiali/acciaio-corten



Profilo / Profile n°	P Kg/m ZN / I - CT	P Kg/m OT	A m²/m	Jx cm⁴	Jy cm⁴	L m
P.2607	0,51	0,55				6,0
P.2861	2,30	2,46	0,21	11,45	1,74	6,0

series	OS265
material	CT=weathering steel
profile	kg/m
P.2861	0,51
P.2607	2,30
	2,81
h (m)	1,11
b (m)	3,28
P (m)	8,78
mass (kg)	24,67
density (kg/m^3)	7900,00
volume (m^3)	0,0031
producer	Secco Sistemi Spa, Preganziol, Treviso, Italia
reseller	Sap Sistemi, Settima, Piacenza, Italia

Vapor barrier

fonte: http://www.riwega.com/Prodotti/Membrane-traspiranti-USB/Barriere-al-vapore/DS-46-PE-retinato.aspx

DS 65 PE

Materiale	PE
Passaggio d'Aria	massa areica 188 (± 10 g/m²)
Dimensioni	Lunghezza rotolo 33 m x 3,0
Valore sd	140 m
Spessore	0,2 mm
Conducibilità termica	0,4 W/mK
Temperatura	-20°/+ 80°C

Materiale	PE
Film	-
Colore	Trasparente / Blu
Larghezza rotolo	3,0 m
Lunghezza rotolo	33 m
Peso rotolo	19 Kg
Classificazione secondo UNI 11470 (IT)	B

CARATTERISTICHE	NORMA	UNITÀ DI MISURA	VALORE
Massa areica	UNI EN 1849-2	g/m²	188 (±10 g/m²)
Strato d'aria equivalente al passaggio di vapore [valore S_d]	UNI EN ISO 12572	m	140
Permeabilità al vapore acqueo [DVA]	UNI EN ISO 12572	g/m² / 24h	ca.0,2
Colonna d'acqua	EN 20811	cm	-
Test pioggia battente	TU Berlin	-	-
Impermeabilità all'acqua	EN 13984 (EN 1928 Metodo A)	-	Superato
Resistenza a trazione MD*	UNI EN 12311-1	N/50mm	175 (±30N/50mm)
Resistenza a trazione CD*	UNI EN 12311-1	N/50mm	160 (±30N/50mm)
Estensione MD*	UNI EN 12311-1	%	500 (±15%)
Estensione CD*	UNI EN 12311-1	%	570 (±15%)
Resistenza a lacerazione chiodo MD*	UNI EN 12310-1	N	130 (±15N)
Resistenza a lacerazione chiodo CD*	UNI EN 12310-1	N	135 (±15N)
Reazione al fuoco	UNI EN 13501-1	Classe	E
Resistenza alla temperatura	-	°C	-20/+80
Durabilità			
Invecchiamento artificiale	EN 1296	-	Passato
Resistenza agli alcali	EN 13984	-	Passato

Densità	UNI EN 1849-1	Kg/m^3	940
Spessore	UNI EN 1849-2	mm	0,20
Coefficiente di resistenza al passaggio di vapore [valore μ]	UNI EN ISO 12572	-	700000
Coefficiente di permeabilità al vapore	-	Kg/m*s*Pa	0,0003 *10^{-12}
Conducibilità termica [λ]	-	W/mK	0,40
Calore specifico	-	J/KgK	1800

*MD= longitudinale; CD= trasversale.
I dati tecnici riportati nella presente scheda sono dati medi riferiti ai campioni di prova. È ammissibile una tolleranza minima del ± 5%.

material	PE
density (kg/m3)	940
thickness (m)	0,0002
producer	Riwega S.r.l., Egna, Potenza, Italia
reseller	Guagnini Srl, Collegno, Torino, Italia

3. GENERAL DATA

material	density (kg/m^3)	source	volume (m^3)	mass (kg)
float glass (double glass, th. 3+3mm)	2500	Hegger at al., Baustoff Atlas, 2005 (28/01/2018)	0,019	48,60
weathering steel (ASTM A242)	7900	https://www.makeitfrom.com/material-properties/ASTM-A242-HSLA-Steel (08/02/2018)	0,038	301,17
extruded polystyrene (XPS)	33	http://www.ales-srl.it/files/Depliant%20ITA.pdf (28/01/2018)	1,235	40,76
polyethylene film (PE)	940	http://www.riwega.com/Prodotti/Membrane-traspiranti-USB/Barriere-al-vapore/DS-46-PE-retinato.aspx (28/01/2018)	0,002	1,71
pine wood	450	Hegger at al., Baustoff Atlas, 2005 (28/01/2018)	0,243	109,53
gypsum plasterboard	850	Hegger at al., Baustoff Atlas, 2005 (28/01/2018)	0,176	149,69

general data	
total mass (kg)	total volume (m^3)
651	1,71

4. ENVIRONMENTAL (MATERIALS)

Material, material specification (data origin (see above))	Ref. unit	Calorific value [MJ]	PEI primary energy non-renew. [MJ]	PEI primary energy renew. [MJ]	GWP global warming [kg CO_2eq]	ODP ozone depletion [kg R11eq]	AP acidification [kg SO_2eq]	EP eutrophication [kg PO_4eq]	POCP summer smog [kg C_2H_4eq]
Float glass*, ρ = 2500 kg/m³	1 kg			14	0.08	0.88	2.83 E-08	0.006408	0.00090
Weathering steel, cold-rolled strip (WT St 37-2), 2 mm	1 kg		26	0.56	2.0	8.30 E-08	0.0057	0.00046	0.00088
Polyethylene (PE-HD)*, film	1 kg	41	75	0.09	1.82	0.000001	0.0050	0.00063	0.0059
Pine, 12% MC* (local), ODD 450 kg/m³	1 m³	8775	609	9512	-792 [1]	0.000009	0.37	0.041	0.31
Gypsum plasterboard* (type A), ρ = 850 kg/m³	1 m³		2655	251	150	0.000027	0.41	0.063	0.052

External wall claddings Layers * for origin of data see "Life cycle assessments", p. 100	PEI primary energy non-renewable [MJ]	PEI primary energy renewable [MJ]	GWP global warming [kg CO_2eq]	ODP ozone depletion [kg R11eq]	AP acidification [kg SO_2eq]	EP eutrophication [kg PO_4eq]	POCP summer smog [kg C_2H_4eq]	Durability [a]
extruded polystyrene (XPS)	405	12	21	0	0.50	0.0049	0.016	
XPS board, λ = 0.040 W/mK, ρ = 20 kg/m³, 120 mm polyvinyl acetate adhesive (PVAC)								

[1] The negative global warming potential of wood is due to the carbon dioxide that is removed from the atmosphere during photosynthesis. This is then released again upon rotting or burning of the wood at the end of its useful life. MC Moisture content ; ODD oven dry density

source Hegger et al., *Baustoff Atlas*, 2005

material	value		PEI non-renew. (MJ)	PEI renew. (MJ)	GWP (kg CO2 eq)	ODP (kg R11 eq)	AP (kg SO2 eq)	EP (kg PO4 eq)	POCP (kg C2H4 eq)	source
float glass (double glass, th. 3+3mm)	1,00	kg	0,00	14,00	0,08	0,88000	0,0000	0,0064	0,0009	Hegger et al., Energie Atlas, 2007 (02/02/2018)
	48,60		0,00	680,40	3,89	42,76800	0,0000	0,3114	0,0437	
weathering steel (ASTM A242)	1,00	kg	26,00	0,56	2,00	0,00000	0,0057	0,0005	0,0009	Hegger et al., Energie Atlas, 2007 (02/02/2018)
	301,17		7830,47	168,66	602,34	0,00002	1,7167	0,1385	0,2650	
extruded polystyrene (XPS)	1,00	m^2	405,00	12,00	21,00	0,00000	0,5000	0,0049	0,0160	Hegger et al., Energie Atlas, 2007 (02/02/2018)
	10,29		4168,13	123,50	216,13	0,00000	5,1458	0,0504	0,1647	
polyethylene film (PE)	1,00	kg	75,00	0,09	1,82	0,00000	0,0050	0,0006	0,0059	Hegger et al., Energie Atlas, 2007 (02/02/2018)
	1,71		127,96	0,15	3,11	0,00000	0,0085	0,0011	0,0101	
pine wood	1,00	m^3	609,00	9512,00	-791,00	0,00001	0,3700	0,0410	0,3100	Hegger et al., Energie Atlas, 2007 (02/02/2018)
	0,24		148,23	2315,22	-192,53	0,00000	0,0901	0,0100	0,0755	
gypsum plasterboard	1,00	m^3	2655,00	251,00	150,00	0,00003	0,4100	0,0630	0,0520	Hegger et al., Energie Atlas, 2007 (02/02/2018)
	0,18		467,55	44,20	26,42	0,00000	0,0722	0,0111	0,0092	

5. ENVIRONMENTAL (TRANSPORT)

Material, material specification	Ref. unit	Calorific value [MJ]	PEI primary energy non-renew.. [MJ]	PEI primary energy renew. [MJ]	GWP global warming [kg CO_2eq]	ODP ozone depletion [kg R11eq]	AP acidification [kg SO_2eq]	EP eutrophication [kg PO_4eq]	POCP summer smog [kg C_2H_4eq]
Transport									
HGV*/22 t perm. tot. load/14.5 t payload/local/85% use	1/t km		1.5	0.00031	0.11	3.87 E-08	0.00099	0.00016	0.00019

source Hegger et al., *Baustoff Atlas*, 2005

material	producer	reseller	HGV SEA	km	kg	PEI non-renew. (MJ)	PEI renew. (MJ)	GWP (kg CO2 eq)	ODP (kg R11 eq)	AP (kg SO2 eq)	EP (kg PO4 eq)	POCP (kg C2H4 eq)	source
float glass (double glass, th. 3+3mm)	Secco Sistemi Spa, Preganziol, Treviso, Italia	Sap Sistemi, Settima, Piacenza, Italia	HGV	454	48,6	1,50	0,00	0,11	0,0000	0,0010	0,0002	0,0002	Hegger et al., Energie Atlas, 2007 (02/02/2018)
						33,10	0,01	2,43	0,00	0,02	0,00	0,00	
weathering steel (ASTM A242)	Secco Sistemi Spa, Preganziol, Treviso, Italia	Sap Sistemi, Settima, Piacenza, Italia	HGV	454	301,2	1,50	0,00	0,11	0,0000	0,0010	0,0002	0,0002	Hegger et al., Energie Atlas, 2007 (02/02/2018)
						205,10	0,04	15,04	0,00	0,14	0,02	0,03	
extruded polystyrene (XPS)	FI-VE Isolanti S.r.l., Ramon di Loria, Treviso, Italia	Guagnini Srl, Collegno, Torino, Italia	HGV	420	40,8	1,50	0,00	0,11	0,0000	0,0010	0,0002	0,0002	Hegger et al., Energie Atlas, 2007 (02/02/2018)
						25,68	0,01	1,88	0,00	0,02	0,00	0,00	
polyethylene film (PE)	Riwega S.r.l., Egna, Potenza, Italia	Guagnini Srl, Collegno, Torino, Italia	HGV	1024	1,7	1,50	0,00	0,11	0,0000	0,0010	0,0002	0,0002	Hegger et al., Energie Atlas, 2007 (02/02/2018)
						2,62	0,00	0,19	0,00	0,00	0,00	0,00	
pine wood	Vidoni, Montegnacco di Cassacco, Udine, Italia	Vidoni, Montegnacco di Cassacco, Udine, Italia	HGV	517	109,5	1,50	0,00	0,11	0,0000	0,0010	0,0002	0,0002	Hegger et al., Energie Atlas, 2007 (02/02/2018)
						84,94	0,02	6,23	0,00	0,06	0,01	0,01	
gypsum plasterboard	Knauf, Gambassi Terme, Firenze, Italia (Knauf, Castellina Marittima, Pisa, Italia)	Finotti Srl, Nichelino, Torino	HGV	418	149,7	1,50	0,00	0,11	0,0000	0,0010	0,0002	0,0002	Hegger et al., Energie Atlas, 2007 (02/02/2018)
						93,85	0,02	6,88	0,00	0,06	0,01	0,01	

6. ENVIRONMENTAL ANALYSIS

volume (m^3)	PEI non-renew. (MJ)	value for m^3	PEI renew. (MJ)	value for m^3	GWP (kg CO2 eq)	value for m^3	ODP (kg R11 eq)	value for m^3	AP (kg SO2 eq)	value for m^3	EP (kg PO4 eq)	value for m^3	POCP (kg C2H4 eq)	value for m^3	material
0,019	33,10	1703	680,41	35000	6,32	325	42,77	2200,0	0,02	1,1	0,31	16,2	0,05	2,5	float glass (double glass, th. 3+3mm)
0,038	8035,56	210780	168,70	4425	617,38	16195	0,00	0,0	1,85	48,6	0,16	4,2	0,29	7,6	weathering steel (ASTM A242)
1,235	4193,80	3396	123,51	100	218,01	177	0,00	0,0	5,16	4,2	0,05	0,0	0,17	0,1	extruded polystyrene (XPS)
0,002	130,58	71944	0,15	85	3,30	1817	0,00	0,0	0,01	5,7	0,00	0,7	0,01	5,7	polyethylene film (PE)
0,243	233,17	958	2315,24	9512	-186,30	-765	0,00	0,0	0,15	0,6	0,02	0,1	0,09	0,4	pine wood
0,176	561,40	3188	44,22	251	33,30	189	0,00	0,0	0,13	0,8	0,02	0,1	0,02	0,1	gypsum plasterboard

environmental analysis

PEI tot non-renew. (MJ)	PEI tot renew. (MJ)	GWP tot (kg CO2 eq)	ODP tot (kg R11 eq)	AP tot (kg SO2 eq)	EP tot (kg PO4 eq)	POCP tot (kg C2H4 eq)
13188	3332	692,00	42,77	7,33	0,57	0,62
problematic material	problematic material	problematic material	problematic material	problematic material	problematic material	problematic material
weathering steel (ASTM A242)	pine wood	weathering steel (ASTM A242)	float glass (double glass, th. 3+3mm)	extruded polystyrene (XPS)	float glass (double glass, th. 3+3mm)	weathering steel (ASTM A242)

legend

- Consumo di energia primaria (PEI), MJ
- Effetto serra (GWP, Global Warming Potential), kg CO_2 eq.
- Riduzione dello strato di ozono (ODP, Ozone Depletion Potential), kg CFC-11 eq.
- Formazione di smog fotochimico (POCP, Photochemical Ozone Creation Potential), kg C_2H_4 eq.
- Acidificazione di suoli e acque (AP, Acidification Potential of land and water), kg SO_2 eq.
- Eutrofizzazione (EP, Eutrophication Potential), kg $(PO_4)^{3-}$ eq.

7. WASTE ANALYSIS

material	source	disposed	composted	recycled	donated /reused	problem?
float glass (double glass, th. 3+3mm)	https://portfoliomanager.zendesk.com (28/01/2018)	x		x	x	
weathering steel (ASTM A242)	http://edilizia-in-un-click.starbuild.it/2017/11/acciaio-corten.html (28/01/2018)	x		x	x	
extruded polystyrene (XPS)	https://www.polimerica.it/articolo.asp?id=18983 (08/02/2018)	x		x		
polyethylene film (PE)	https://www.cascami.it/polietilene.php (28/01/2018)	x		x		
pine wood	https://portfoliomanager.zendesk.com (28/01/2018)	x		x	x	
gypsum plasterboard	https://www.branz.co.nz/cms_display.php?st=1&sn=105&pg=12643 (08/02/2018)	x		x	x	

recycle fraction (%)	source	material
24%	Michael F. Ashby, Materials and the Environment (08/02/2018)	float glass (double glass, th. 3+3mm)
52%	Michael F. Ashby, Materials and the Environment (08/02/2018)	weathering steel (ASTM A242)
3%	Michael F. Ashby, Materials and the Environment (08/02/2018)	extruded polystyrene (XPS)
8%	Michael F. Ashby, Materials and the Environment (08/02/2018)	polyethylene film (PE)
9%	Michael F. Ashby, Materials and the Environment (08/02/2018)	pine wood
-	Michael F. Ashby, Materials and the Environment (08/02/2018)	gypsum plasterboard

waste analysis

recycle fraction		***waste managment possibilities***			
problematic material	mid value	disposed	composted	recycled	donated /reused
extruded polystyrene (XPS)	19%	6	0	6	4

legend: from the best to the worst ←

legend: The fraction recycled is a measure of the proportion of a material in use in products which can economically be recycled.

problematic material	#N/D

8. WATER ANALYSIS

water usage (l/kg)	source	mass (kg)	water usage (l)	material
20	Michael F. Ashby, Materials and the Environment (08/02/2018)	48,60	972	float glass (double glass, th. 3+3mm)
280	Michael F. Ashby, Materials and the Environment (08/02/2018)	301,17	84328	weathering steel (ASTM A242)
210	Michael F. Ashby, Materials and the Environment (08/02/2018)	40,76	8559	extruded polystyrene (XPS)
70	Michael F. Ashby, Materials and the Environment (08/02/2018)	1,71	119	polyethylene film (PE)
625	Michael F. Ashby, Materials and the Environment (08/02/2018)	109,53	68456	pine wood
8	Michael F. Ashby, Materials and the Environment (08/02/2018)	149,69	1197	gypsum plasterboard

water analysis
water usage tot (l)
163632
problematic value
weathering steel (ASTM A242)

9. COST ANALYSIS

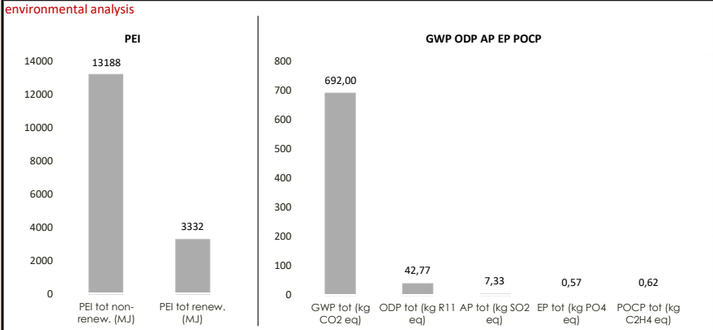
measure unit	quantity	unit price (€/unit)	price (€)	material	source
m^2	3,64	127,92	465,73	float glass (double glass, th. 3+3mm) *	Prezziario regionale, regione Piemonte, 2016 (08/02/2018)
kg	301,17	1,40	421,64	weathering steel (ASTM A242)	Commerciale Bosio, Poirino, Torino, Italia (09/02/2018)
m^2	20,58	8,29	170,64	extruded polystyrene (XPS)	Prezziario regionale, regione Piemonte, 2016 (08/02/2018)
m^2	9,08	0,50	4,54	polyethylene film (PE)	Prezziario regionale, regione Piemonte, 2016 (08/02/2018)
m^3	0,24	487,80	118,73	pine wood	Prezziario regionale, regione Piemonte, 2016 (08/02/2018)
m^2	2,94	8,75	25,68	gypsum plasterboard	Prezziario regionale, regione Piemonte, 2016 (08/02/2018)

cost analysis
total cost (€)
1207
problematic value
float glass (double glass, th. 3+3mm)

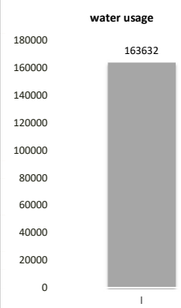
*it is the price of a windows (frame + glass)

10. TOTAL RESULT (WEATHERING STEEL)

environmental analysis



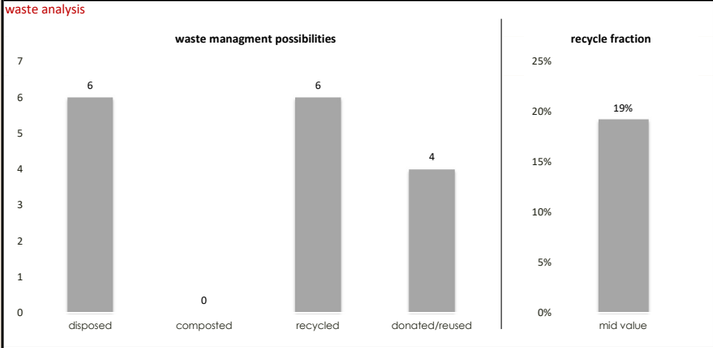
water analysis



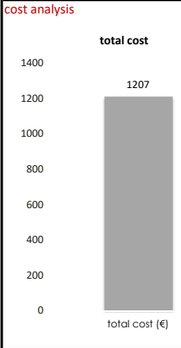
problematic materials

environmental analysis	
PEI non-renew.	weathering steel (ASTM A242)
PEI renew.	pine wood
GWP	weathering steel (ASTM A242)
ODP	float glass (double glass, th. 3+3mm)
AP	extruded polystyrene (XPS)
EP	float glass (double glass, th. 3+3mm)
POCP	weathering steel (ASTM A242)
waste analysis	
recycle fraction	extruded polystyrene (XPS)
waste managment possibilities	#N/D
water analysis	
water usage	weathering steel (ASTM A242)
cost analysis	
cost	float glass (double glass, th. 3+3mm)

waste analysis



cost analysis



general data

total mass (kg)	651
total volume (m^3)	1,71

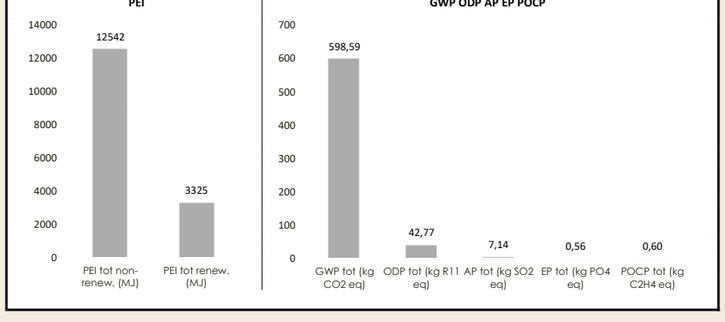
reference: "25 Verde" (Luciano Pia), Torino, Italia

WEATHERING STEEL (ASTM A242 HSLA STEEL)
Elastic Modulus (190 GPa) Fatigue Strength (230 MPa) Shear Strength (310 MPa) Density (7.9 g/cm^3)
source: www.makeitfrom.com

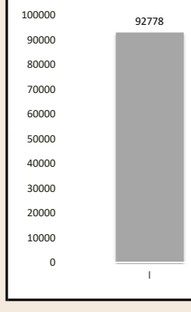
11. TOTAL RESULT (GALVANIZED STEEL)

For the problem of galvanic corrosion, it is necessary to use only one material for all building. Here I have tried to change weathering steel with galvanized steel.

environmental analysis



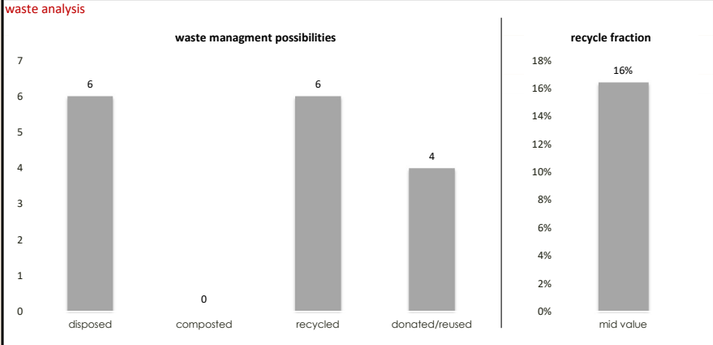
water analysis



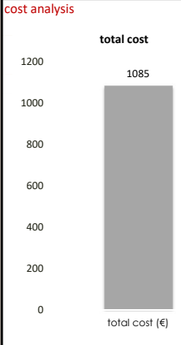
problematic materials

environmental analysis	
PEI non-renew.	galvanized steel
PEI renew.	pine wood
GWP	galvanized steel
ODP	float glass (double glass, th. 3+3mm)
AP	extruded polystyrene (XPS)
EP	float glass (double glass, th. 3+3mm)
POCP	galvanized steel
waste analysis	
recycle fraction	extruded polystyrene (XPS)
waste managment possibilities	#N/D
water analysis	
water usage	pine wood
cost analysis	
cost	float glass (double glass, th. 3+3mm)

waste analysis



cost analysis



general data

total mass (kg)	650
total volume (m^3)	1,71

reference: "MFO Park" (Burckhardt & Partner), Zurich, Switzerland

GALVANIZED STEEL (ASTM A283 CARBON STEEL)
Elastic Modulus (190 GPa) Fatigue Strength (150 to 190 MPa) Shear Strength (240 to 310 MPa) Density (7.8 to 7.9 g/cm^3)
source: www.makeitfrom.com

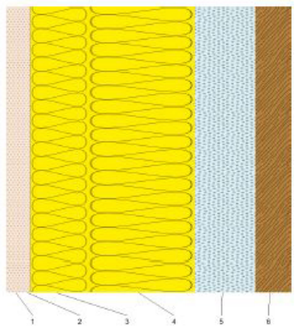
12. GLASER DIAGRAM

SECTION 1
source: http://www.isolparma.info/resistenza_termica.php
place: Torino,Italy climat zone: 3

Descrizione della Struttura e Parametri Termici	
Tipo di struttura	Parete
Spessore (s)	24.6 cm
Massa Superficiale (m)	47 Kg/m^2
Trasmittanza Termica (U)	**0.216 W/m^{2}K**
Resistenza Termica (R)	4.626 m^{2}K/W

Parametri Termici Dinamici	Modulo
Trasmittanza termica periodica (Y_{ie})	0.191 W/m^{2}K
Capacità termica areica interna (K_i)	18.3kJ/m^{2}K
Capacità termica areica esterna (K_e)	57.9kJ/m^{2}K
Fattore di attenuazione (f)	0.883
Sfasamento (φ)	3.81 h
Ammettenza Termica interna (Y_{ii})	1.211 W/m^{2}K
Ammettenza Termica esterna (Y_{ee})	4.103 W/m^{2}K
Massa superficiale esclusi intonaci	47 Kg/m^2

Statigrafia della struttura



Descrizione dello strato	s	ρ	μ	c	λ	R
	[mm]	[Kg/m^3]	[-]	[J/KgK]	[W/mK]	[m^{2}K/W]
Strato liminare interno						0.13
1) Cartongesso in lastre	20.0	900	8	835	0.210	0.10
2) Foglio in P.E. sp. 1.6 mm	0.2	950	50000	2090	0.150	0.00
3) Isolparma ISOPLAN XPS sp. da 30 a 60 mm - polist. estr.	50.0	29	200	1450	0.034	1.47
4) Isolparma ISOROLL XPS sp. da 80 a 120 mm - polist. estr.	93.0	28	200	1450	0.036	2.58
5) Camera non ventilata sp. 50 mm - FTA	53.0	1	1	1000	0.313	0.17
6) Quercia (flusso perpendicolare alle fibre)	30.0	850	60	2385	0.220	0.14
Strato liminare esterno						0.04

Legenda

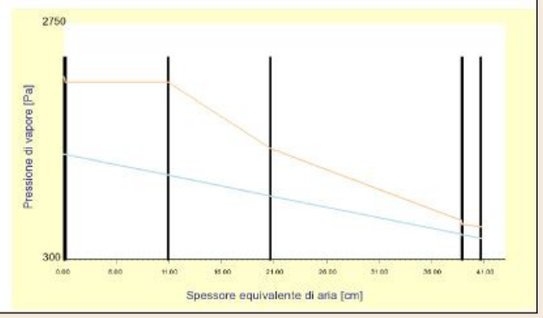
s	spessore dello strato	c	calore specifico del materiale
ρ	massa volumica	λ	conducibilità termica del materiale
μ	fattore di resistenza alla diffusione del vapore	R	resistenza termica degli strati

Mese	Ti (°C)	Pi (Pa)	Te (°C)	Pe (Pa)
Gennaio	20.00	1389.18	0.40	516.00
Febbraio	20.00	1354.44	3.20	606.00
Marzo	20.00	1108.69	8.20	583.00
Aprile	20.00	1129.22	12.70	804.00
Maggio	20.00	1382.02	16.70	1235.00
Giugno	21.10	1702.00	21.10	1702.00
Luglio	23.30	1837.00	23.30	1837.00
Agosto	22.60	1953.00	22.60	1953.00
Settembre	20.00	1557.46	18.80	1504.00
Ottobre	20.00	1509.67	12.60	1180.00
Novembre	20.00	1429.06	6.80	841.00
Dicembre	20.00	1407.90	2.00	606.00

Legenda

Ti	Temperatura interna	Pi	Pressione vapore interna
Te	Temperatura esterna	Pe	Pressione vapore esterna

La struttura non è soggetta a fenomeni di condensa superficiale
La struttura non è soggetta a fenomeni di condensa interstiziale
Mese critico: Gennaio

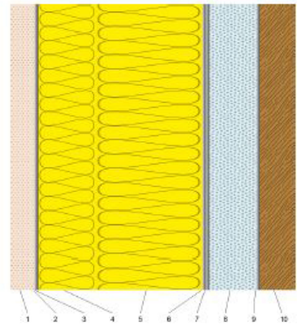


SECTION 2
source: http://www.isolparma.info/resistenza_termica.php
place: Torino,Italy climat zone: 3

Descrizione della Struttura e Parametri Termici	
Tipo di struttura	Parete
Spessore (s)	24.6 cm
Massa Superficiale (m)	132 Kg/m^2
Trasmittanza Termica (U)	**0.218 W/m^{2}K**
Resistenza Termica (R)	4.586 m^{2}K/W

Parametri Termici Dinamici	Modulo
Trasmittanza termica periodica (Y_{ie})	0.146 W/m^{2}K
Capacità termica areica interna (K_i)	27.2kJ/m^{2}K
Capacità termica areica esterna (K_e)	57.1kJ/m^{2}K
Fattore di attenuazione (f)	0.670
Sfasamento (φ)	6.06 h
Ammettenza Termica interna (Y_{ii})	1.846 W/m^{2}K
Ammettenza Termica esterna (Y_{ee})	4.039 W/m^{2}K
Massa superficiale esclusi intonaci	132 Kg/m^2

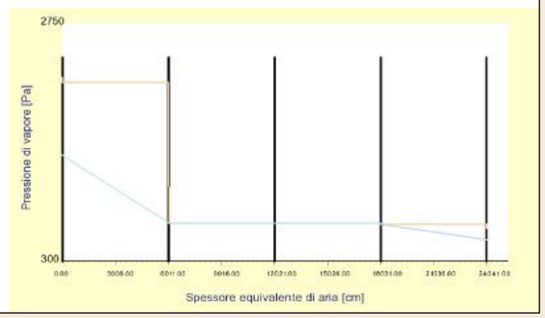
Statigrafia della struttura



Descrizione dello strato	s	ρ	μ	c	λ	R
	[mm]	[Kg/m^3]	[-]	[J/KgK]	[W/mK]	[m^{2}K/W]
Strato liminare interno						0.13
1) Cartongesso in lastre	20.0	900	8	835	0.210	0.10
2) Acciaio	3.0	7800	2000000	460	52.000	0.00
3) Foglio in P.E. sp. 1.6 mm	0.2	950	50000	2090	0.150	0.00
4) Isolparma ISOPLAN XPS sp. da 30 a 60 mm - polist. estr.	50.0	29	200	1450	0.034	1.47
5) Isolparma ISOROLL XPS sp. da 80 a 120 mm - polist. estr.	93.0	28	200	1450	0.036	2.58
6) Acciaio	3.0	7800	2000000	460	52.000	0.00
7) Acciaio	3.0	7800	2000000	460	52.000	0.00
8) Camera debolmente ventilata sp. 10 mm - FTA	41.0	1	1	1000	0.625	0.07
9) Acciaio	3.0	7800	2000000	460	52.000	0.00
10) Pino (flusso perpendicolare alle fibre)	30.0	550	60	2720	0.150	0.20
Strato liminare esterno						0.04

Mese	Ti (°C)	Pi (Pa)	Te (°C)	Pe (Pa)
Gennaio	20.00	1389.18	0.40	516.00
Febbraio	20.00	1354.44	3.20	606.00
Marzo	20.00	1108.69	8.20	583.00
Aprile	20.00	1129.22	12.70	804.00
Maggio	20.00	1382.02	16.70	1235.00
Giugno	21.10	1702.00	21.10	1702.00
Luglio	23.30	1837.00	23.30	1837.00
Agosto	22.60	1953.00	22.60	1953.00
Settembre	20.00	1557.46	18.80	1504.00
Ottobre	20.00	1509.67	12.60	1180.00
Novembre	20.00	1429.06	6.80	841.00
Dicembre	20.00	1407.90	2.00	606.00

La struttura non è soggetta a fenomeni di condensa superficiale
La struttura è soggetta a fenomeni di condensa interstiziale
Mese critico: Gennaio

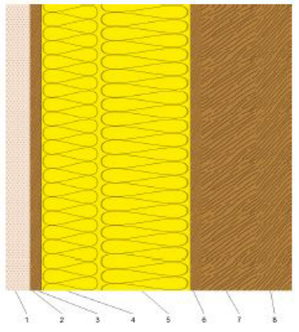


SECTION 2 (WOOD INTRODUCTION)
source: http://www.isolparma.info/resistenza_termica.php
place: Torino,Italy climat zone: 3

Descrizione della Struttura e Parametri Termici	
Tipo di struttura	Parete
Spessore (s)	24.6 cm
Massa Superficiale (m)	75 Kg/m^2
Trasmittanza Termica (U)	**0.220 W/m^{2}K**
Resistenza Termica (R)	4.536 m^{2}K/W

Parametri Termici Dinamici	Modulo
Trasmittanza termica periodica (Y_{ie})	0.075 W/m^{2}K
Capacità termica areica interna (K_i)	29.0kJ/m^{2}K
Capacità termica areica esterna (K_e)	53.4kJ/m^{2}K
Fattore di attenuazione (f)	0.341
Sfasamento (φ)	9.25 h
Ammettenza Termica interna (Y_{ii})	2.039 W/m^{2}K
Ammettenza Termica esterna (Y_{ee})	3.809 W/m^{2}K
Massa superficiale esclusi intonaci	75 Kg/m^2

Statigrafia della struttura



Descrizione dello strato	s	ρ	μ	c	λ	R
	[mm]	[Kg/m^3]	[-]	[J/KgK]	[W/mK]	[m^{2}K/W]
Strato liminare interno						0.13
1) Cartongesso in lastre	20.0	900	8	835	0.210	0.10
2) Pino (flusso parallelo alle fibre)	10.0	550	20	2720	0.220	0.05
3) Foglio in P.E. sp. 1.6 mm	0.2	950	50000	2090	0.150	0.00
4) Isolparma ISOPLAN XPS sp. da 30 a 60 mm - polist. estr.	50.0	29	200	1450	0.034	1.47
5) Isolparma ISOROLL XPS sp. da 80 a 120 mm - polist. estr.	79.0	28	200	1450	0.036	2.19
6) Pino (flusso parallelo alle fibre)	10.0	550	20	2720	0.220	0.05
7) Pino (flusso perpendicolare alle fibre)	47.0	550	60	2720	0.150	0.31
8) Pino (flusso perpendicolare alle fibre)	30.0	550	60	2720	0.150	0.20
Strato liminare esterno						0.04

Mese	Ti (°C)	Pi (Pa)	Te (°C)	Pe (Pa)
Gennaio	20.00	1389.18	0.40	516.00
Febbraio	20.00	1354.44	3.20	606.00
Marzo	20.00	1108.69	8.20	583.00
Aprile	20.00	1129.22	12.70	804.00
Maggio	20.00	1382.02	16.70	1235.00
Giugno	21.10	1702.00	21.10	1702.00
Luglio	23.30	1837.00	23.30	1837.00
Agosto	22.60	1953.00	22.60	1953.00
Settembre	20.00	1557.46	18.80	1504.00
Ottobre	20.00	1509.67	12.60	1180.00
Novembre	20.00	1429.06	6.80	841.00
Dicembre	20.00	1407.90	2.00	606.00

La struttura non è soggetta a fenomeni di condensa superficiale
La struttura non è soggetta a fenomeni di condensa interstiziale
Mese critico: Gennaio