

TABLE 1A: TRADITIONAL MONOLITHIC STRUCTURAL SYSTEM - COST

TRADITIONAL MONOLITHIC STRUCTURAL SYSTEM					
Components	unit	Cost per unit (PLN)	amount	Total cost (PLN)	
Earthworks				1 600.00	
Use of excavator to remove soil. backfill	h	100	16	1600	
Strip footing. depth 120cm				34 834.50	
Sand subbase d=15cm	m ³	35	6.4	224	
Lean concrete d=5cm. B15	m ³	320	2.1	672	
Strip footing. reinforced(d=30cm). B20.	m ³	135	165	22275	
Reinforcement	m ³		165		component
Sealant (Abizol)	m ²	5.1	165	841.5	
XPS polystyrene(d=15)	m ²	62	165	10230	
Bucket foil	m ²	3.2	185	592	
Slab on grade				40 245.20	
Compacted sand d=15cm	m ³	35	23	805	
Lean concrete d=5cm	m ³	320	7.7	2464	
Concrete slab d=15cm. B20	m ²	95	153	14535	
Reinforcement	m ²		153		component
Bitumen waterproofing (Dysperbit)	m ²	2.1	192	403.2	
Floor polystyrene slabs d=20	m ²	25	160	4000	
PE Foil	m ²	1.3	160	208	
Cement screed	m ²	20	160	3200	
Ceramic tiles on mortar	m ²	95	154	14630	
External walls - above-grade				42 498.96	
Interior paint (2 layers)	m ²	0.88	492	432.96	
Lime and cement plaster	m ²	15	246	3690	
Ceramic masonry unit d=30. Portoherm	m ²	101	246	24846	
Styrofoam d=15. mortar w/ mesh. thin plaster (FAST)	m ²	55	246	13530	
External walls - below grade				11 125.40	
Interior paint (2 layers)	m ²	0.88	100	88	
Lime and cement plaster	m ²	15	50	750	
Formwork masonry unit. reinforced d=30. price with steel and B20 concrete	m ²	135	50	6750	
Reinforcement	m ²		50		
Sealant (Abizol)	m ²	5.1	50	255	
Styropian XPS d=15	m ²	62	50	3100	
Bucket foil	m ²	3.2	57	182.4	
Flat roof above the masonry section				12 250.60	
EPDM foil	m ²	34	45	1530	
ESP polystyrene wedges with incline	m ²	23	32	736	
XPS polystyrene	m ²	62	45	2790	
Vapor barrier	m ²	3	35	105	
Reinforced concrete slab d=15	m ²	105	32	3360	
Reinforcement	m ²		32		component
Lime and cement plaster	m ²	15	45	675	
Ceiling paint	m ²	0.88	45	39.6	
Attic wall reinforced concrete	m ²	160	16	2560	

Flashing	m ²	35	13	455	
Deck between stories				30 403.84	
Carpet	m ²	55	143	7865	
Cement screed B15	m ²	25	135	3375	
PE Foil	m ²	3	135	405	
EPS polystyrene floor panels. d=8	m ²	11.8	135	1593	
Reinforced concrete slab d=15. B25	m ²	105	143	15015	
Reinforcement	m ²		143		component
Lime and cement plaster	m ²	15	135	2025	
Ceiling paint	m ²	0.88	143	125.84	
Partition wall				17 949.20	
Wall paint	m ²	0.88	295	259.6	
Lime and cement plaster	m ²	15	295	4425	
Ceramic masonry unit d=11.5. Porotherm	m ²	55	156	8580	
Lime and cement plaster	m ²	15	295	4425	
Wall paint	m ²	0.88	295	259.6	
Load-bearing wall				2 868.27	
Wall paint	m ²	0.88	54.7	48.136	
Lime and cement plaster	m ²	15	54.7	820.5	
Ceramic masonry unit d=25	m ²	78	14.5	1131	
Lime and cement plaster	m ²	15	54.7	820.5	
Wall paint	m ²	0.88	54.7	48.136	
Roof				48 253.04	
Wall paint	m ²	0.88	178	156.64	
Drywall on grid (7.5)	m ²	14	178	2492	
Aluminium grid (75mm)	m ²		178		
Vapor barrier	m ²	3	230	690	
Mineral wool in between grid elements (7.5)	m ²	11	178	1958	
Mineral wool between rafters (16)	m ²	32	230	7360	
Wind barrier	m ²	4	257	1028	
Purlins (40x40)	m	1.5	302	453	
Boarding (spruce. 25mm)	m ³	500	7	3500	
Base asphalt roofing	m ²	9.8	263	2577.4	
Bitumen shingles	m ²	32	263	8416	
Structural timber for use in the roof truss	m ³	820	11	9020	
8 roof windows 94/118	p.	1178	9	10602	
Other windows	m2		42.2836		
			SUM	242 029.01	

Window 395.5x120	p.	4.746	2	9.492	
Window 82x90	p.	0.738	1	0.738	
Window 82x70	p.	0.574	1	0.574	
Window 82x251	p.	2.0582	4	8.2328	
Window 347.2x251	p.	8.71472	1	8.71472	
Window 531x251	p.	13.3281	1	13.3281	
Window 172x70	p.	1.204	1	1.204	
*No parameters for doors			Sum	42.28362	

TABLE 1B: COMPOSITE HOUSE (STRAW BALE) - COST

COMPOSITE HOUSE – STRAW BALE					
Components	unit	Cost per unit (PLN)	amount	Total cost	
Earthworkds				1 600.00	
Use of excavator to remove soil. backfill	h	100	16	1600	
Strip footing. depth 120cm				34 834.50	
Sand subbase d=15cm	m ³	35	6.4	224	
Lean concrete d=5cm. b15	m ³	320	2.1	672	
Strip footing. reinforced (d=30cm). B20.	m ³	135	165	22275	
Reinforcement	m ³		165		component
Sealant (Abizol)	m ²	5.1	165	841.5	
XPS polystyrene d=15	m ²	62	165	10230	
Bucket foil	m ²	3.2	185	592	
Slab on grade				40 245.20	
Compacted sand d=15cm	m ³	35	23	805	
Lean concrete d=5cm	m ³	320	7.7	2464	
Concrete slab d=15cm. B20	m ²	95	153	14535	
Reinforcement	m ²		153		component
Bitumen waterproofing (Dysperbit)	m ²	2.1	192	403.2	
Floor polystyrene slabs d=20	m ²	25	160	4000	
PE Foil	m ²	1.3	160	208	
Cement screed	m ²	20	160	3200	
Ceramic tiles on mortar	m ²	95	154	14630	
External wall - above-grade				12 232.00	
Clay - plaster	m ²	0	145	0	
Straw bale as infill for timber framing	m3	0	45	0	
Timber structure	m ³			0	
Water-resistant plyboard cladding d=15mm	m ²	42	134	5628	
Wind barrier	m ²	4	134	536	
Purlins anc counterpurlins	m ³		0	0	
Wooden siding. spruce d=25mm	m ²	37	164	6068	
External wall - above-grade				0.00	
Clay - plaster	m ²	0	152	0	
Straw bale as infill for timber framing	m3	0	48	0	
Timber framing	m3	0	0	0	
Clay - plaster	m ²	0	164	0	
Deck between stories				17 443.24	
Carpet	m ²	55	143	7865	
Chipboard d=18mm.	m ²	18	143	2574	
EPS floor polystyrene slabs. d=2cm	m ²	4.5	143	643.5	
OSB panels d=18mm	m ²	21	143	3003	
Mineral wool between structural beams d=10cm	m ²	9.5	140	1330	
PE foil	m ²	1.3	143	185.9	
Drywall on grid (5.0)	m2	12	143	1716	
Wall paint	m ²	0.88	143	125.84	
Partition wall				17 949.20	
Wall paint	m ²	0.88	295	259.6	
Drywall on grid (7.5)	m ²	15	295	4425	

Aluminium grid (7.5)	m ²		295		
Mineral wool between structural beams d=10cm	m ²	55	156	8580	
Drywall on grid (7.5)	m ²	15	295	4425	
Wall paint	m ²	0.88	295	259.6	
Flat roof				6513.1	
EPDM foil	m ²	34	55	1870	
Extruded polystyrene 10 cm	m ²	23	45	1035	
Wind barrier	m ²	4	55	220	
OSB panels d=18mm	m ²	21	45	945	
Vapor barrier	m ²	2	45	90	
Mineral wool between structural beams d=16cm	m ²	32	70	2240	
PE foil	m ²	1.3	87	113.1	
Wainscotting	m ²	0	87	0	
aluminium grid (7.5)	m ²		87		
Roof				38 055.04	
Wall paint	m ²	0.88	178	156.64	
Drywall on grid (7.5)	m ²	14	178	2492	
Aluminium grid (7.5)	m ²		178		
Vapor barrier	m ²	3	230	690	
Mineral wool as infill for the structural grid (7.5)	m ²	11	178	1958	
Mineral wool between rafters (16)	m ²	32	230	7360	
Wind barrier	m ²	4	257	1028	
Purlins (40x40)	m	1.5	302	453	
Ful lboarding (spruce. 25mm)	m ³	500	7	3500	
Base asphalt roofing	m ²	9.8	263	2577.4	
Bitumen shingles	m ²	32	263	8416	
8 roof windows 94/118	p.	1178	8	9424	
Other windows	p.		42.28362		
total costs				38 946.00	
Structural timber for use in the roof truss. spruce	m ³	820	11	9 020.00	
Structural timber for timber framing. spruce	m ³	820	45	36900	
Straw bales (triticale)	m ³	22	93	2046	
			SUM	207 818.28	

Window 395.5x120	p.	4.746	2	9.492	
Window 82x90	p.	0.738	1	0.738	
Window 82x70	p.	0.574	1	0.574	
Window 82x251	p.	2.0582	4	8.2328	
Window 347.2x251	p.	8.71472	1	8.71472	
Window 531x251	p.	13.3281	1	13.3281	
Window 172x70	p.	1.204	1	1.204	
*No parameters for doors			Sum	42.28362	

TABLE 2A: TRADITIONAL MONOLITHIC STRUCTURAL SYSTEM – CARBON FOOTPRINT

LP.	Name	Amount	Unit	Area [m ²]	Thickness [m]	Density [kg/m ³]	Amount used [kg/m ²] or [kg/m ³]	EE value [MJ/kg]
2	Sand subbase d=15cm	6.40	m3	42.67	0.150	1650		0.081000
3	Lean concrete d=5cm. B15	2.10	m3	42.00	0.050	1800		0.750000
4	Strip footing. reinforced(d=30cm). B20.	165.00	m3	550.00	0.300	1850		0.700000
5	Reinforcement	165.00	m3				30	35.400000
6	Sealant (Abizol)	165.00	m2		0.005	1000	1.4	51.000000
7	XPS polystyrene(d=15)	165.00	m2		0.150	30		88.600000
8	Bucket foil	185.00	m2				0.450	76.700000
9	Compacted sand d=15cm	23.00	m3	153.33		1650		0.081000
10	Lean concrete d=5cm	7.70	m3	154.00		1800		0.750000
11	Concrete slab d=15cm. B20	153.00	m2		0.150	1850		0.700000
12	Reinforcement	153.00	m2				4	35.400000
13	Bitumen waterproofing (Dysperbit)	192.00	m2				1.5	51.000000
14	Floor polystyrene slabs d=20	160.00	m2		0.200	18		87.400000
15	PE Foil	160.00	m2				0.185	89.300000
16	Cement screed	160.00	m2		0.060	1600		1.330000
17	Ceramic tiles on mortar	154.00	m2		0.020	2000		12.000000
18	Interior paint (2 layers)	492.00	m2		0.002	1370		21.000000
19	Lime and cement plaster	246.00	m2		0.015	1850		1.800000
20	Ceramic masonry unit d=30. Portoherm	246.00	m2		0.300	800		3.000000
21	Styrofoam d=15. mortar w/ mesh. thin plaster (FAST)	246.00	m2		0.150	15		88.600000
22	Interior paint (2 layers)	100.00	m2		0.002	1370		21.000000
23	Lime and cement plaster	50.00	m2		0.015	1850		1.800000
24	Formwork masonry unit. reinforced d=30. price with steel and B20 concrete	50.00	m2		0.300	1100		0.750000
25	Reinforcement	50.00	m2				2	35.400000
26	Sealant (Abizol)	50.00	m2		0.005	1000		51.000000
27	Styropian XPS d=15	50.00	m2		0.150	30		88.600000
28	Bucket foil	57.00	m2				0.450	76.700000
29	EPDM foil	45.00	m2				1.170	91.000000
30	ESP polystyrene wedges with incline	32.00	m2		0.060	18		87.400000
31	XPS polystyrene	45.00	m2		0.100	30		88.600000
32	Vapor barrier	35.00	m2				0.077	89.300000
33	Reinforced concrete slab d=15	32.00	m2		0.150	1850		0.700000
34	Reinforcement	32.00	m2				4	35.400000
35	Lime and cement plaster	45.00	m2		0.015	1850		1.800000
36	Ceiling paint	45.00	m2				0.01169	70.000000
37	Attic wall reinforced concrete	16.00	m2		0.300	2200		0.740000
38	Flashing	13.00	m2		0.005	8100		45.500000
39	Carpet	143.00	m2				1.46	187.000000
40	Cement screed B15	135.00	m2		0.050	1800		0.750000

41	PE Foil	135.00	m2				0.185	89.300000
42	EPS polystyrene floor panels. d=8	135.00	m2		0.080	18		87.400000
43	Reinforced concrete slab d=15. B25	143.00	m2		0.150	2200		0.740000
44	Reinforcement	143.00	m2				4	35.400000
45	Lime and cement plaster	135.00	m2		0.015	1850		1.800000
46	Ceiling paint	143.00	m2				0.01169	70.000000
47	Wall paint	295.00	m2				0.01169	70.000000
48	Lime and cement plaster	295.00	m2		0.015	1850		1.800000
49	Ceramic masonry unit d=11.5. Porotherm	156.00	m2		0.115	800		3.000000
50	Lime and cement plaster	295.00	m2		0.015	1850		1.800000
51	Wall paint	295.00	m2				0.01169	70.000000
52	Wall paint	54.70	m2				0.01169	70.000000
53	Lime and cement plaster	54.70	m2		0.015	1850		1.800000
54	Ceramic masonry unit d=25	14.50	m2		0.250	1100		3.000000
55	Lime and cement plaster	54.70	m2		0.015	1850		1.800000
56	Wall paint	54.70	m2				0.01169	70.000000
57	Wall paint	178	m2				0.01169	70.000000
58	Drywall on grid (7.5)	178	m2		0.015	568		6.750000
59	Aluminium grid (75mm)	178	m2				6.7	155.000000
60	Vapor barrier	230	m2				0.077	89.300000
61	Mineral wool in between grid elements (7.5)	178	m2		0.075	28		16.600000
62	Mineral wool between rafters (16)	230	m2		0.160	28		16.600000
63	Wind barrier	257	m2				0.145	99.200000
64	Purlins (40x40)	302	m	0.0016		550		7.400000
65	Boarding (spruce. 25mm)	7	m3			550		7.400000
66	Base asphalt roofing	263	m2				6	51.000000
67	Bitumen shingles	263	m2				12.5	11.300000
68	Structural timber for use in the roof truss	11	m3			550		7.400000
69	8 roof windows 94/118	9	p.	1.1092				360.000000
70	Other windows	42.2836 2	m2					360.000000

TABLE 2A: TRADITIONAL MONOLITHIC STRUCTURAL SYSTEM – CARBON FOOTPRINT - CONTINUATION

LP.	Name	Embodied energy [MJ]	Description	EC value [kgCO ₂]/kg	Carbon footprint [kgCO ₂]
2	Sand subbase d=15cm	855.3600	ICE V 2.0	0.004800	50.6880
3	Lean concrete d=5cm. B15	2 835.0000	ICE V 2.0	0.100000	378.0000
4	Strip footing. reinforced(d=30cm). B20.	213 675.0000	ICE V 2.0 / 16/20	0.093000	28 388.2500
5	Reinforcement	175 230.0000	ICE V 2.0	-	
6	Sealant (Abizol)	11 781.0000	ICE V 2.0 / General	0.430000	99.3300
7	XPS polystyrene(d=15)	65 785.5000	ICE V 2.0	2.550000	1 893.3750
8	Bucket foil	6 385.2750	ICE V 2.0	1.570000	130.7025
9	Compacted sand d=15cm	3 073.9500	ICE V 2.0	0.004800	182.1600

10	Lean concrete d=5cm	10 395.0000	ICE V 2.0	0.100000	1 386.0000
11	Concrete slab d=15cm. B20	29 720.2500	ICE V 2.0 / 16/20	0.093000	3 948.5475
12	Reinforcement	21 664.8000	ICE V 2.0	-	
13	Bitumen waterproofing (Dysperbit)	14 688.0000	ICE V 2.0	0.380000	109.4400
14	Floor polystyrene slabs d=20	50 342.4000	ICE V 2.0	2.760000	1 589.7600
15	PE Foil	2 643.2800	ICE V 2.0	2.130000	63.0480
16	Cement screed	20 428.8000	ICE V 2.0	0.208000	3 194.8800
17	Ceramic tiles on mortar	73 920.0000	ICE V 2.0	0.740000	4 558.4000
18	Interior paint (2 layers)	10 332.0000	ICE V 2.0 / m2	0.730000	359.1600
19	Lime and cement plaster	12 287.7000	ICE V 2.0	0.120000	819.1800
20	Ceramic masonry unit d=30. Portoherm	177 120.0000	ICE V 2.0	0.230000	13 579.2000
21	Styrofoam d=15. mortar w/ mesh. thin plaster (FAST)	49 040.1000	ICE V 2.0	2.550000	1 411.4250
22	Interior paint (2 layers)	2 100.0000	ICE V 2.0 / m2	0.730000	73.0000
23	Lime and cement plaster	2 497.5000	ICE V 2.0	0.120000	166.5000
24	Formwork masonry unit. reinforced d=30. price with steel and B20 concrete	12 375.0000	ICE V 2.0	0.100000	1 650.0000
25	Reinforcement	3 540.0000	ICE V 2.0	-	
26	Sealant (Abizol)	12 750.0000	ICE V 2.0 / General	0.430000	107.5000
27	XPS polystyrene d=15	19 935.0000	ICE V 2.0	2.550000	573.7500
28	Bucket foil	1 967.3550	ICE V 2.0	1.570000	40.2705
29	EPDM foil	4 791.1500	ICE V 2.0	2.660000	140.0490
30	ESP polystyrene wedges with incline	3 020.5440	ICE V 2.0	2.760000	95.3856
31	XPS polystyrene	11 961.0000	ICE V 2.0	2.550000	344.2500
32	Vapor barrier	240.6635	ICE V 2.0 LDPE	2.130000	5.7404
33	Reinforced concrete slab d=15	6 216.0000	ICE V 2.0 / 16/20	0.093000	825.8400
34	Reinforcement	4 531.2000	ICE V 2.0	-	
35	Lime and cement plaster	2 247.7500	ICE V 2.0	0.120000	149.8500
36	Ceiling paint	36.8235	ICE V 2.0 General	2.420000	1.2730
37	Attic wall reinforced concrete	7 814.4000	ICE V 2.0 / 20/25	0.100000	1 056.0000
38	Flashing	23 955.7500	ICE V 2.0	3.050000	1 605.8250
39	Carpet	39 041.8600	ICE V 2.0	9.800000	2 046.0440
40	Cement screed B15	9 112.5000	ICE V 2.0	0.100000	1 215.0000
41	PE Foil	2 230.2675	ICE V 2.0	2.130000	53.1968
42	EPS polystyrene floor panels. d=8	16 990.5600	ICE V 2.0	2.760000	536.5440
43	Reinforced concrete slab d=15. B25	34 920.6000	ICE V 2.0 / 20/25	0.100000	4 719.0000
44	Reinforcement	20 248.8000	ICE V 2.0	-	
45	Lime and cement plaster	6 743.2500	ICE V 2.0	0.120000	449.5500
46	Ceiling paint	117.0169	ICE V 2.0 General	2.420000	4.0454
47	Wall paint	241.3985	ICE V 2.0 General	2.420000	8.3455
48	Lime and cement plaster	14 735.2500	ICE V 2.0	0.120000	982.3500
49	Ceramic masonry unit d=11.5. Porotherm	43 056.0000	ICE V 2.0	0.230000	3 300.9600
50	Lime and cement plaster	14 735.2500	ICE V 2.0	0.120000	982.3500
51	Wall paint	241.3985	ICE V 2.0 General	2.420000	8.3455
52	Wall paint	44.7610	ICE V 2.0 General	2.420000	1.5475
53	Lime and cement plaster	2 732.2650	ICE V 2.0	0.120000	182.1510

54	Ceramic masonry unit d=25	11 962.5000	ICE V 2.0	0.230000	917.1250
55	Lime and cement plaster	2 732.2650	ICE V 2.0	0.120000	182.1510
56	Wall paint	44.7610	ICE V 2.0 General	2.420000	1.5475
57	Wall paint	145.6574	ICE V 2.0 General	2.420000	5.0356
58	Drywall on grid (7.5)	10 236.7800	ICE V 2.0	0.380000	576.2928
59	Aluminium grid (75mm)	184 853.0000	ICE V 2.0	8.260000	9 850.8760
60	Vapor barrier	1 581.5030	ICE V 2.0 LDPE	2.130000	37.7223
61	Mineral wool in between grid elements (7.5)	6 205.0800	ICE V 2.0	1.200000	448.5600
62	Mineral wool between rafters (16)	17 104.6400	ICE V 2.0	1.200000	1 236.4800
63	Wind barrier	3 696.6880	ICE V 2.0 Polypropylene	2.970000	110.6771
64	Purlins (40x40)	1 966.6240	ICE V 2.0	0.590000	156.7984
65	Boarding (spruce. 25mm)	28 490.0000	ICE V 2.0	0.590000	2 271.5000
66	Base asphalt roofing	80 478.0000	ICE V 2.0	0.380000	599.6400
67	Bitumen shingles	37 148.7500	ICE V 2.0	0.300000	986.2500
68	Structural timber for use in the roof truss	44 770.0000	ICE V 2.0	0.590000	3 569.5000
69	8 roof windows 94/118	3 593.8080	ICE V 1.0	18.000000	179.6904
70	Other windows	15 222.1032	ICE V 1.0	18.000000	761.1052
		1 727 606.8880	MJ		105 357.1603

TABLE 2A: TRADITIONAL MONOLITHIC STRUCTURAL SYSTEM – CARBON FOOTPRINT - CONTINUATION

LP.	Name	Description2	EC value [kgCO ₂ e/kg]	Carbon footprint [kgCO ₂ e]	Description3
2	Sand subbase d=15cm	ICE V 2.0 / General value	0.004384	46.2982	ICE V 3.0
3	Lean concrete d=5cm. B15	ICE V 2.0 / General value	0.097000	366.6600	ICE V 3.0
4	Strip footing. reinforced(d=30cm). B20.	ICE V 2.0 / 16/20	0.104000	31 746.0000	ICE V 3.0
5	Reinforcement		1.990000	9 850.5000	ICE V 3.0 REBAR
6	Sealant (Abizol)	ICE V 2.0 / General	0.326290	75.3730	ICE V 3.0/ PMB
7	XPS polystyrene(d=15)	ICE V 2.0	3.290000	2 442.8250	ICE V 3.0
8	Bucket foil	ICE V 2.0	1.930000	160.6725	ICE V 3.0
9	Compacted sand d=15cm	ICE V 2.0 / General value	0.004384	166.3842	ICE V 3.0
10	Lean concrete d=5cm	ICE V 2.0 / General value	0.097000	1 344.4200	ICE V 3.0
11	Concrete slab d=15cm. B20	ICE V 2.0 / 16/20	0.104000	4 415.5800	ICE V 3.0
12	Reinforcement		1.990000	1 217.8800	ICE V 3.0 REBAR
13	Bitumen waterproofing (Dysperbit)	ICE V 2.0	0.221666	63.8398	ICE V 3.0
14	Floor polystyrene slabs d=20	ICE V 2.0	3.420000	1 969.9200	ICE V 3.0
15	PE Foil	ICE V 2.0	2.600000	76.9600	ICE V 3.0
16	Cement screed	ICE V 2.0	0.200000	3 072.0000	ICE V 3.0
17	Ceramic tiles on mortar	ICE V 2.0	0.780000	4 804.8000	ICE V 3.0
18	Interior paint (2 layers)	ICE V 2.0 / m2	0.870000	1 172.8296	ICE V 3.0
19	Lime and cement plaster	ICE V 2.0	0.130000	887.4450	ICE V 3.0
20	Ceramic masonry unit d=30. Portoherm	ICE V 2.0	0.240000	14 169.6000	ICE V 3.0
21	Styrofoam d=15. mortar w/ mesh. thin plaster (FAST)	ICE V 2.0	3.290000	1 821.0150	ICE V 3.0

22	Interior paint (2 layers)	ICE V 2.0 / m2	0.870000	238.3800	ICE V 3.0
23	Lime and cement plaster	ICE V 2.0	0.130000	180.3750	ICE V 3.0
24	Formwork masonry unit. reinforced d=30. price with steel and B20 concrete	ICE V 2.0	0.103000	1 699.5000	ICE V 3.0
25	Reinforcement		1.990000	199.0000	ICE V 3.0 REBAR
26	Sealant (Abizol)	ICE V 2.0 / General	0.326290	81.5725	ICE V 3.0/ PMB
27	XPS polystyrene d=15	ICE V 2.0	3.290000	740.2500	ICE V 3.0
28	Bucket foil	ICE V 2.0	1.930000	49.5045	ICE V 3.0
29	EPDM foil	ICE V 2.0	2.850000	150.0525	ICE V 3.0
30	ESP polystyrene wedges with incline	ICE V 2.0	3.420000	118.1952	ICE V 3.0
31	XPS polystyrene	ICE V 2.0	3.290000	444.1500	ICE V 3.0
32	Vapor barrier	ICE V 2.0 LDPE	2.600000	7.0070	ICE V 3.0 LDPE
33	Reinforced concrete slab d=15	ICE V 2.0 / 16/20	0.104000	8 880.0000	ICE V 3.0 16/20
34	Reinforcement		1.990000	254.7200	ICE V 3.0 REBAR
35	Lime and cement plaster	ICE V 2.0	0.130000	162.3375	ICE V 3.0
36	Ceiling paint	ICE V 2.0 General	2.910000	1.5308	ICE V 3.0 General
37	Attic wall reinforced concrete	ICE V 2.0 / 20/25	0.112000	1 182.7200	ICE V 3.0 20/25
38	Flashing	ICE V 2.0	2.850000	1 500.5250	ICE V 3.0 Tinplate
39	Carpet	ICE V 2.0	9.800000	2 046.0440	ICE V 3.0
40	Cement screed B15	ICE V 2.0 / General value	0.097000	1 178.5500	ICE V 3.0
41	PE Foil	ICE V 2.0	2.600000	64.9350	ICE V 3.0
42	EPS polystyrene floor panels. d=8	ICE V 2.0	3.420000	664.8480	ICE V 3.0
43	Reinforced concrete slab d=15. B25	ICE V 2.0 / 20/25	0.112000	5 285.2800	ICE V 3.0 20/25
44	Reinforcement		1.990000	1 138.2800	ICE V 3.0 REBAR
45	Lime and cement plaster	ICE V 2.0	0.130000	487.0125	ICE V 3.0
46	Ceiling paint	ICE V 2.0 General	2.910000	4.8646	ICE V 3.0 General
47	Wall paint	ICE V 2.0 General	2.910000	10.0353	ICE V 3.0 General
48	Lime and cement plaster	ICE V 2.0	0.130000	1 064.2125	ICE V 3.0
49	Ceramic masonry unit d=11.5. Porotherm	ICE V 2.0	0.240000	3 444.4800	ICE V 3.0
50	Lime and cement plaster	ICE V 2.0	0.130000	1 064.2125	ICE V 3.0
51	Wall paint	ICE V 2.0 General	2.910000	10.0353	ICE V 3.0 General
52	Wall paint	ICE V 2.0 General	2.910000	1.8608	ICE V 3.0 General
53	Lime and cement plaster	ICE V 2.0	0.130000	197.3303	ICE V 3.0
54	Ceramic masonry unit d=25	ICE V 2.0	0.240000	957.0000	ICE V 3.0
55	Lime and cement plaster	ICE V 2.0	0.130000	197.3303	ICE V 3.0
56	Wall paint	ICE V 2.0 General	2.910000	1.8608	ICE V 3.0 General
57	Wall paint	ICE V 2.0 General	2.910000	6.0552	ICE V 3.0 General
58	Drywall on grid (7.5)	ICE V 2.0	0.390000	591.4584	ICE V 3.0
59	Aluminium grid (75mm)	ICE V 2.0	6.670000	7 954.6420	ICE V 3.0
60	Vapor barrier	ICE V 2.0 LDPE	2.600000	46.0460	ICE V 3.0 LDPE
61	Mineral wool in between grid elements (7.5)	ICE V 2.0	1.280000	478.4640	ICE V 3.0
62	Mineral wool between rafters (16)	ICE V 2.0	1.280000	1 318.9120	ICE V 3.0
63	Wind barrier	ICE V 2.0 Polypropylene	3.430000	127.8190	ICE V 3.0 Polypropylene
64	Purlins (40x40)	ICE V 2.0	-1.550000	- 411.9280	ICE V 3.0

65	Boarding (spruce. 25mm)	ICE V 2.0	-1.550000	-5 967.5000	ICE V 3.0
66	Base asphalt roofing	ICE V 2.0	0.326000	514.4280	ICE V 3.0
67	Bitumen shingles	ICE V 2.0	0.300000	986.2500	ICE V 3.0 CO2
68	Structural timber for use in the roof truss	ICE V 2.0	-1.550000	-9 377.5000	ICE V 3.0
69	8 roof windows 94/118	ICE V 1.0	18.000000	179.6904	ICE V 1.0
70	Other windows	ICE V 1.0	18.000000	761.1052	ICE V 1.0
		kg CO2		110 786.9361	kg CO2e

TABLE 2B: COMPOSITE HOUSE (STRAW BALE) - CARBON FOOTPRINT

LP.	Name	Amount	Unit	Area [m ²]	Thickness [m]	Density [kg/m ³]	Amount used [kg/m ²] or [kg/m ³]	EE value [MJ/kg]
2	Sand subbase d=15cm	6.40	m3	42.67	0.150	1650		0.081000
3	Lean concrete d=5cm. b15	2.10	m3	42.00	0.050	1800		0.750000
4	Strip footing. reinforced (d=30cm). B20.	165.00	m3	550.00	0.300	1850		0.700000
5	Reinforcement	165.00	m3				30	35.400000
6	Sealant (Abizol)	165.00	m2		0.0015	1000	1.4	51.000000
7	XPS polystyrene d=15	165.00	m2		0.150	30		88.600000
8	Bucket foil	185.00	m2				0.450	76.700000
9	Compacted sand d=15cm	23.00	m3	153.33		1650		0.081000
10	Lean concrete d=5cm	7.70	m3	154.00		1800		0.750000
11	Concrete slab d=15cm. B20	153.00	m2		0.150	1850		0.700000
12	Reinforcement	153.00	m2				4	35.400000
13	Bitumen waterproofing (Dysperbit)	192.00	m2				1.5	51.000000
14	Floor polystyrene slabs d=20	160.00	m2		0.200	18		87.400000
15	PE Foil	160.00	m2				0.185	89.300000
16	Cement screed	160.00	m2		0.060	1600		1.330000
17	Ceramic tiles on mortar	154.00	m2		0.020	2000		12.000000
18	Clay - plaster	145.00	m2		0.015	1500		1.800000
19	Straw bale as infill for timber framing	45.00	m3			80		0.890000
20	Timber structure	0.00	m3			550		7.400000
21	Water-resistant plyboard cladding d=15mm	134.00	m2		0.015	540		15.000000
22	Wind barrier	134.00	m2				0.145	99.200000
23	Purlins anc counterpurlins	0.00	m3			550		7.400000
24	Wooden siding. spruce d=25mm	164.00	m2		0.025	550		7.400000
25	Clay - plaster	152.00	m2		0.015	1500		1.800000
26	Straw bale as infill for timber framing	48.00	m3			80		0.890000
27	Timber framing	0.00	m3			550		7.400000
28	Clay - plaster	164.00	m2		0.015	1500		1.800000
29	Carpet	143.00	m2				1.46	187.000000
30	Chipboard d=18mm.	143.00	m2		0.018	300		14.500000
31	EPS floor polystyrene slabs. d=2cm	143.00	m2		0.020	18		87.400000

TABLE 2B: COMPOSITE HOUSE (STRAW BALE) - CARBON FOOTPRINT - CONTINUATION

LP.	Name	Embodied energy [MJ]	Description	EC value [kgCO ₂ /kg]	Carbon footprint[kg CO ₂]	Description2	EC value [kgCO ₂ /kg]
2	Sand subbase d=15cm	855.3600	ICE V 2.0	0.004800	50.6880	ICE V 2.0 / General value	0.004384
3	Lean concrete d=5cm. b15	2 835.0000	ICE V 2.0	0.100000	378.0000	ICE V 2.0 / General value	0.097000
4	Strip footing. reinforced (d=30cm). B20.	213 675.0000	ICE V 2.0 / 16/20	0.093000	28 388.2500	ICE V 2.0 / 16/20	0.104000
5	Reinforcement	175 230.0000	ICE V 2.0	-			1.990000
6	Sealant (Abizol)	11 781.0000	ICE V 2.0 / General	0.430000	99.3300	ICE V 2.0 / General	0.326290
7	XPS polystyrene d=15	65 785.5000	ICE V 2.0	2.550000	1 893.3750	ICE V 2.0	3.290000
8	Bucket foil	6 385.2750	ICE V 2.0	1.570000	130.7025	ICE V 2.0	1.930000
9	Compacted sand d=15cm	3 073.9500	ICE V 2.0	0.004800	182.1600	ICE V 2.0 / General value	0.004384
10	Lean concrete d=5cm	10 395.0000	ICE V 2.0	0.100000	1 386.0000	ICE V 2.0 / General value	0.097000
11	Concrete slab d=15cm. B20	29 720.2500	ICE V 2.0 / 16/20	0.093000	3 948.5475	ICE V 2.0 / 16/20	0.104000
12	Reinforcement	21 664.8000	ICE V 2.0	-			1.990000
13	Bitumen waterproofing (Dysperbit)	14 688.0000	ICE V 2.0	0.380000	109.4400	ICE V 2.0	0.221666
14	Floor polystyrene slabs d=20	50 342.4000	ICE V 2.0	2.760000	1 589.7600	ICE V 2.0	3.420000
15	PE Foil	2 643.2800	ICE V 2.0	2.130000	63.0480	ICE V 2.0	2.600000
16	Cement screed	20 428.8000	ICE V 2.0	0.208000	3 194.8800	ICE V 2.0	0.200000
17	Ceramic tiles on mortar	73 920.0000	ICE V 2.0	0.740000	4 558.4000	ICE V 2.0	0.780000
18	Clay - plaster	5 872.5000	ICE V 2.0 / General	0.120000	391.5000		0.116200
19	Straw bale as infill for timber framing	3 204.0000		0.180000	648.0000		-1.250000
20	Timber structure	-	ICE V 2.0	0.590000	-	ICE V 2.0	-1.550000
21	Water-resistant plyboard cladding d=15mm	16 281.0000	ICE V 2.0 POLYWOOD	1.100000	1 193.9400	ICE V 2.0 POLYWOOD	-1.610000
22	Wind barrier	1 927.4560	ICE V 2.0 Polypropylene	2.970000	57.7071	ICE V 2.0 Polypropylene	3.430000
23	Purlins anc counterpurlins	-	ICE V 2.0	0.590000	-	ICE V 2.0	-1.550000
24	Wooden siding. spruce d=25mm	16 687.0000	ICE V 2.0	0.590000	1 330.4500	ICE V 2.0	-1.550000
25	Clay - plaster	6 156.0000	ICE V 2.0 / General	0.130000	444.6000	CLAYWORKS	0.116200
26	Straw bale as infill for timber framing	3 417.6000		0.180000	691.2000		-1.250000
27	Timber framing	-	ICE V 2.0	0.590000	-	ICE V 2.0	-1.550000
28	Clay - plaster	6 642.0000	ICE V 2.0 / General	0.130000	479.7000	CLAYWORKS	0.116200
29	Carpet	39 041.8600	ICE V 2.0	9.800000	2 046.0440	ICE V 2.0	9.800000
30	Chipboard d=18mm.	11 196.9000	ICE V 2.0	0.860000	664.0920	ICE V 2.0	-1.480000
31	EPS floor polystyrene slabs. d=2cm	4 499.3520	ICE V 2.0	2.760000	142.0848	ICE V 2.0	3.420000
32	OSB panels d=18mm	25 096.5000	ICE V 2.0	0.990000	1 656.3690	ICE V 2.0	-1.500000
33	Mineral wool between structural beamsd=10cm	6 507.2000	ICE V 2.0	1.200000	470.4000	ICE V 2.0	1.280000
34	PE foil	2 362.4315	ICE V 2.0	2.130000	56.3492	ICE V 2.0	2.600000
35	Drywall on grid (5.0)	8 223.9300	ICE V 2.0	0.380000	462.9768	ICE V 2.0	0.390000
36	Wall paint	11.7017	ICE V 2.0 General	2.420000	0.4045	ICE V 2.0 General	2.910000

37	Wall paint	24.1399	ICE V 2.0 General	2.420000	0.8345	ICE V 2.0 General	2.910000
38	Drywall on grid (7.5)	16 965.4500	ICE V 2.0	0.380000	955.0920	ICE V 2.0	0.390000
39	Aluminium grid (7.5)	306 357.5000	ICE V 2.0	8.260000	16 325.8900	ICE V 2.0	6.670000
40	Mineral wool between structural beams d=10cm	7 250.8800	ICE V 2.0	1.200000	524.1600	ICE V 2.0	1.280000
41	Drywall on grid (7.5)	16 965.4500	ICE V 2.0	0.380000	955.0920	ICE V 2.0	0.390000
42	Wall paint	24.1399	ICE V 2.0 General	2.420000	0.8345	ICE V 2.0 General	2.910000
43	EPDM foil	5 855.8500	ICE V 2.0	2.660000	171.1710	ICE V 2.0	2.850000
44	Extruded polystyrene 10 cm	7 079.4000	ICE V 2.0	2.760000	223.5600	ICE V 2.0	3.420000
45	Wind barrier	791.1200	ICE V 2.0 Polypropylene	2.970000	23.6858	ICE V 2.0 Polypropylene	3.430000
46	OSB panels d=18mm	7 897.5000	ICE V 2.0	0.990000	521.2350	ICE V 2.0	-1.500000
47	Vapor barrier	309.4245	ICE V 2.0 LDPE	2.130000	7.3805	ICE V 2.0 LDPE	2.600000
48	Mineral wool between structural beams d=16cm	5 205.7600	ICE V 2.0	1.200000	376.3200	ICE V 2.0	1.280000
49	PE foil	1 437.2835	ICE V 2.0	2.130000	34.2824	ICE V 2.0	2.600000
50	Wainscotting	9 048.0000	ICE V 2.0 Hardwood	0.870000	756.9000	ICE V 2.0 Hardwood	-1.590000
51	aluminium grid (7.5)	90 349.5000	ICE V 2.0	8.260000	4 814.7540	ICE V 2.0	6.670000
52	Wall paint	14.5657	ICE V 2.0 General	2.420000	0.5036	ICE V 2.0 General	2.910000
53	Drywall on grid (7.5)	10 236.7800	ICE V 2.0	0.380000	576.2928	ICE V 2.0	0.390000
54	Aluminium grid(7.5)	184 853.0000	ICE V 2.0	8.260000	9 850.8760	ICE V 2.0	6.670000
55	Vapor barrier	1 581.5030	ICE V 2.0 LDPE	2.130000	37.7223	ICE V 2.0 LDPE	2.600000
56	Mineral wool as infill for the structural grid (7.5)	6 205.0800	ICE V 2.0	1.200000	448.5600	ICE V 2.0	1.280000
57	Mineral wool between rafters (16)	17 104.6400	ICE V 2.0	1.200000	1 236.4800	ICE V 2.0	1.280000
58	Wind barrier	3 696.6880	ICE V 2.0 Polypropylene	2.970000	110.6771	ICE V 2.0 Polypropylene	3.430000
59	Purlins (40x40)	1 966.6240	ICE V 2.0	0.580000	154.1408	ICE V 2.0	-1.550000
60	Ful lboarding (spruce. 25mm)	28 490.0000	ICE V 2.0	0.590000	2 271.5000	ICE V 2.0	-1.550000
61	Base asphalt roofing	80 478.0000	ICE V 2.0	0.380000	599.6400	ICE V 2.0	0.320000
62	Bitumen shingles	37 148.7500	ICE V 2.0	0.300000	986.2500	ICE V 2.0	0.300000
63	8 roof windows 94/118	3 593.8080	ICE V 1.0	18.000000	179.6904	ICE V 1.0	18.000000
64	Other windows	15 222.1032	ICE V 1.0	18.000000	761.1052	ICE V 1.0	18.000000
65	Structural timber for use in the roof truss. spruce	44 770.0000	ICE V 2.0	0.590000	3 569.5000	ICE V 2.0	-1.550000
66	Structural timber for timber framing. spruce	183 150.0000	ICE V 2.0	0.590000	14 602.5000	ICE V 2.0	-1.550000
67	Straw bales (triticale)	6 621.6000		0.180000	1 339.2000		-1.250000
		1 961 245.5858	MJ		119 124.2281	kg CO2	

TABLE 2B: COMPOSITE HOUSE (STRAW BALE) - CARBON FOOTPRINT - CONTINUATION

LP.	Name	Carbon footprint [kgCO ₂ e]	Description2	EC value [kgCO ₂ e/kg]	Carbon footprint [kgCO ₂ e]	Description 3
2	Sand subbase d=15cm	50.6880	ICE V 2.0 / General value	0.004384	46.2982	ICE V 3.0
3	Lean concrete d=5cm. b15	378.0000	ICE V 2.0 / General value	0.097000	366.6600	ICE V 3.0
4	Strip footing. reinforced (d=30cm). B20.	28 388.2500	ICE V 2.0 / 16/20	0.104000	31 746.0000	ICE V 3.0
5	Reinforcement			1.990000	9 850.5000	ICE 3.0 REBAR
6	Sealant (Abizol)	99.3300	ICE V 2.0 / General	0.326290	75.3730	ICE V 3.0/ PMB
7	XPS polystyrene d=15	1 893.3750	ICE V 2.0	3.290000	2 442.8250	ICE V 3.0
8	Bucket foil	130.7025	ICE V 2.0	1.930000	160.6725	ICE V 3.0
9	Compacted sand d=15cm	182.1600	ICE V 2.0 / General value	0.004384	166.3842	ICE V 3.0
10	Lean concrete d=5cm	1 386.0000	ICE V 2.0 / General value	0.097000	1 344.4200	ICE V 3.0
11	Concrete slab d=15cm. B20	3 948.5475	ICE V 2.0 / 16/20	0.104000	4 415.5800	ICE V 3.0
12	Reinforcement			1.990000	1 217.8800	ICE 3.0 REBAR
13	Bitumen waterproofing (Dysperbit)	109.4400	ICE V 2.0	0.221666	63.8398	ICE V 3.0
14	Floor polystyrene slabs d=20	1 589.7600	ICE V 2.0	3.420000	1 969.9200	ICE V 3.0
15	PE Foil	63.0480	ICE V 2.0	2.600000	76.9600	ICE V 3.0
16	Cement screed	3 194.8800	ICE V 2.0	0.200000	3 072.0000	ICE V 3.0
17	Ceramic tiles on mortar	4 558.4000	ICE V 2.0	0.780000	4 804.8000	ICE V 3.0
18	Clay - plaster	391.5000		0.116200	379.1025	CLAYWORKS
19	Straw bale as infill for timber framing	648.0000		-1.250000	-4 500.0000	
20	Timber structure	-	ICE V 2.0	-1.550000	-	ICE V 3.0
21	Water-resistant plyboard cladding d=15mm	1 193.9400	ICE V 2.0 POLYWOOD	-1.610000	-1 747.4940	ICE V 3.0 POLYWOOD
22	Wind barrier	57.7071	ICE V 2.0 Polypropylene	3.430000	66.6449	ICE V 3.0 Polypropylene
23	Purlins anc counterpurlins	-	ICE V 2.0	-1.550000	-	ICE V 3.0
24	Wooden siding. spruce d=25mm	1 330.4500	ICE V 2.0	-1.550000	-3 495.2500	ICE V 3.0
25	Clay - plaster	444.6000	CLAYWORKS	0.116200	397.4040	CLAYWORKS
26	Straw bale as infill for timber framing	691.2000		-1.250000	-4 800.0000	
27	Timber framing	-	ICE V 2.0	-1.550000	-	ICE V 3.0
28	Clay - plaster	479.7000	CLAYWORKS	0.116200	428.7780	CLAYWORKS
29	Carpet	2 046.0440	ICE V 2.0	9.800000	2 046.0440	ICE V 3.0
30	Chipboard d=18mm.	664.0920	ICE V 2.0	-1.480000	-1 142.8560	ICE V 3.0
31	EPS floor polystyrene slabs. d=2cm	142.0848	ICE V 2.0	3.420000	176.0616	ICE V 3.0
32	OSB panels d=18mm	1 656.3690	ICE V 2.0	-1.500000	-2 509.6500	ICE V 3.0
33	Mineral wool between structural beamsd=10cm	470.4000	ICE V 2.0	1.280000	501.7600	ICE V 3.0
34	PE foil	56.3492	ICE V 2.0	2.600000	68.7830	ICE V 3.0
35	Drywall on grid (5.0)	462.9768	ICE V 2.0	0.390000	475.1604	ICE V 3.0
36	Wall paint	0.4045	ICE V 2.0 General	2.910000	0.4865	ICE V 3.0 General
37	Wall paint	0.8345	ICE V 2.0 General	2.910000	1.0035	ICE V 3.0 General

38	Drywall on grid (7.5)	955.0920	ICE V 2.0	0.390000	980.2260	ICE V 3.0
39	Aluminium grid (7.5)	16 325.8900	ICE V 2.0	6.670000	13 183.2550	ICE V 3.0
40	Mineral wool between structural beams d=10cm	524.1600	ICE V 2.0	1.280000	559.1040	ICE V 3.0
41	Drywall on grid (7.5)	955.0920	ICE V 2.0	0.390000	980.2260	ICE V 3.0
42	Wall paint	0.8345	ICE V 2.0 General	2.910000	1.0035	ICE V 3.0 General
43	EPDM foil	171.1710	ICE V 2.0	2.850000	183.3975	ICE V 3.0
44	Extruded polystyrene 10 cm	223.5600	ICE V 2.0	3.420000	277.0200	ICE V 3.0
45	Wind barrier	23.6858	ICE V 2.0 Polypropylene	3.430000	27.3543	ICE V 3.0 Polypropylene
46	OSB panels d=18mm	521.2350	ICE V 2.0	-1.500000	-789.7500	ICE V 3.0
47	Vapor barrier	7.3805	ICE V 2.0 LDPE	2.600000	9.0090	ICE V 3.0 LDPE
48	Mineral wool between structural beams d=16cm	376.3200	ICE V 2.0	1.280000	401.4080	ICE V 3.0
49	PE foil	34.2824	ICE V 2.0	2.600000	41.8470	ICE V 3.0
50	Wainscotting	756.9000	ICE V 2.0 Hardwood	-1.590000	-1 383.3000	ICE V 3.0 Hardwood
51	aluminium grid (7.5)	4 814.7540	ICE V 2.0	6.670000	3 887.9430	ICE V 3.0 Materiał z recyklingu
52	Wall paint	0.5036	ICE V 2.0 General	2.910000	0.6055	ICE V 3.0 General
53	Drywall on grid (7.5)	576.2928	ICE V 2.0	0.390000	591.4584	ICE V 3.0
54	Aluminium grid(7.5)	9 850.8760	ICE V 2.0	6.670000	7 954.6420	ICE V 3.0 Materiał z recyklingu
55	Vapor barrier	37.7223	ICE V 2.0 LDPE	2.600000	46.0460	ICE V 3.0 LDPE
56	Mineral wool as infill for the structural grid (7.5)	448.5600	ICE V 2.0	1.280000	478.4640	ICE V 3.0
57	Mineral wool between rafters (16)	1 236.4800	ICE V 2.0	1.280000	1 318.9120	ICE V 3.0
58	Wind barrier	110.6771	ICE V 2.0 Polypropylene	3.430000	127.8190	ICE V 3.0 Polypropylene
59	Purlins (40x40)	154.1408	ICE V 2.0	-1.550000	- 411.9280	ICE V 3.0
60	Floor boarding (spruce. 25mm)	2 271.5000	ICE V 2.0	-1.550000	-5 967.5000	ICE V 3.0
61	Base asphalt roofing	599.6400	ICE V 2.0	0.320000	504.9600	ICE V 3.0
62	Bitumen shingles	986.2500	ICE V 2.0	0.300000	986.2500	ICE V 3.0
63	8 roof windows 94/118	179.6904	ICE V 1.0	18.000000	179.6904	ICE V 1.0
64	Other windows	761.1052	ICE V 1.0	18.000000	761.1052	ICE V 1.0
65	Structural timber for use in the roof truss. spruce	3 569.5000	ICE V 2.0	-1.550000	-9 377.5000	ICE V 3.0
66	Structural timber for timber framing. spruce	14 602.5000	ICE V 2.0	-1.550000	- 38 362.5000	ICE V 3.0
67	Straw bales (triticale)	1 339.2000		-1.250000	-9 300.0000	
		119 124.2281	kg CO2		16 055.3588	kg CO2e

TABLE 3A: TRADITIONAL MONOLITHIC STRUCTURAL SYSTEM – CONSTRUCTION

Name	m-g	Electrical energy consumption per unit [kWh/h]	Energy consumption [kWh]	Diesel fuel consumption per unit [dm ³ /h]	Diesel fuel consumption [dm ³]	Gasoline consumption per unit [dm ³ /h]	Gasoline consumption [dm ³]	EE [MJ/dm ³]	Embodied energy [MJ]	EC [kgCO ₂ /kWh] [kgCO ₂ /dm ³]	Carbon footprint [kg CO ₂]
truck 75-85 KM	2.28			8.9825	20.4801			35.9912	737.1034	2.667729	54.63536
plaster aggregate	16.69	6.1198	102.139462						367.7021	0.798022	81.50954
bender	17.09	1.2796	21.868364						78.7261	0.798022	17.45144
backhoe loader on a wheeled tractor chassis	4.18			6.0047	25.099646			36.0015	903.6249	2.667729	66.95905
saw	17.16	1.3502	23.169432						83.41	0.798022	18.48972
vehicle-mounted concrete pump	0.1			15.9	1.59			36.0256	57.2807	2.667729	4.24169
portable staplers	0.73	1.1917	0.869941						3.1318	0.798022	0.69423
dump truck 15-20 t	7.79			5.0012	38.959348			35.9966	1402.40	2.667729	103.93298
electric rotary welder 500 A	18.24	13.2001	240.769824						866.7714	0.798022	192.13962
means of transport	31.22			5.0006	156.118732			35.9992	5620.15	2.667729	416.48247
compactor	1.52					1.7894	2.719888	28.9779	78.8166	2.007352	5.45977
mechanical winch, electric powered. 5-10 t	91.48	3.5999	329.318852						1185.55	0.798022	262.80369
vibrator	0.15	2.3333	0.349995						1.26	0.798022	0.2793
tamper, powered by a combustion engine 100m ³ /h	0.87					3	2.61	28.9808	75.6399	2.007352	5.23919
truck crane 5-6 t	3.54			8.9887	31.819998			36.0043	1145.66	2.667729	84.88713
								SUM	12607.22	[MJ]	1315.21 [kgCO ₂]

TABLE 3B: COMPOSITE HOUSE (STRAW BALE) – CONSTRUCTION

Name	m-g	Electrical energy consumption per unit [kWh/h]	Energy consumption [kWh]	Diesel fuel consumption per unit [dm ³ /h]	Diesel fuel consumption [dm ³]	Gasoline consumption per unit [dm ³ /h]	Gasoline consumption [dm ³]	EE [MJ/dm ³]	Embodied energy [MJ]	EC [kgCO ₂ /kWh] [kgCO ₂ /dm ³]	Carbon footprint [kg CO ₂]
truck 75-85 KM	0.39			8.9825	3.503175			35.9912	126.0835	2.667729	9.34552
bender	15.68	1.2799	20.068832						72.2478	0.798022	16.01537
backhoe loader on a wheeled tractor chassis	4.18			6.0047	25.099646			36.0015	903.6249	2.667729	66.95905
saw	18.94	1.3502	25.572788						92.062	0.798022	20.40765
vehicle-mounted concrete pump	2.66			15.9	42.294			36.0256	1523.67	2.667729	112.82893
portable staplers	14.04	1.1917	16.731468						60.2333	0.798022	13.35208

dump truck 15-20 t	0.73			5.0012	3.650876			35.9966	131.4191	2.667729	9.73955
electric rotary welder 500 A	5.91	13.2001	78.012591						280.8453	0.798022	62.25576
means of transport	4.63			5.0006	23.152778			35.9992	833.4815	2.667729	61.76534
compactor	1.52					1.7894	2.719888	28.9779	78.8166	2.007352	5.45977
mechanical winch. electric powered. 5-10 t vibrator	67.5	3.5999	242.99325						874.7757	0.798022	193.91396
tamper. powered by a combustion engine 100m3/h	0.15	2.3333	0.349995						1.26	0.798022	0.2793
truck crane 5-6 t	0.87					3	2.61	28.9808	75.6399	2.007352	5.23919
	1.38			8.9887	12.404406			36.0043	446.612	2.667729	33.09159
								SUM	5 500.77	[MJ]	610.6531

TABLE 4A: TRADITIONAL MONOLITHIC STRUCTURAL SYSTEM – TRANSPORT

Type of machine	Distance [km]	Fuel consumption [dm ³]	Diesel fuel consumption per hour [dm ³ /100km]	Gasoline consumption per hour [dm ³ /h]	EE [MJ/dm ³]	Embodied energy [MJ]	EC [kgCO ₂ /kWh] [kgCO ₂ /dm ³]	Carbon footprint [kg CO ₂]
Truck	15	5.325	35.5	-	35.9912	191.65314	2.667729	14.20565693
Set	30	12	40	-	35.9912	431.8944	2.667729	32.012748
HDS	30	9.222	30.74	-	35.9912	331.9108464	2.667729	24.60179684
						955.4583864		70.82020177

TABLE 4B: COMPOSITE HOUSE (STRAW BALE) – TRANSPORT

Type of machine	Distance [km]	Fuel consumption [dm ³]	Diesel fuel consumption per hour [dm ³ /100km]	Gasoline consumption per hour [dm ³ /h]	EE [MJ/dm ³]	Embodied energy [MJ]	EC [kgCO ₂ /kWh] [kgCO ₂ /dm ³]	Carbon footprint [kg CO ₂]
Truck	15	5.325	35.5	-	35.9912	191.65314	2.667729	14.20565693
Set	30	12	40	-	35.9912	431.8944	2.667729	32.012748
HDS	30	9.222	30.74	-	35.9912	331.9108464	2.667729	24.60179684
						955.4583864		70.82020177

TABLE 5: COMPOSITE HOUSE (STRAW BALE) – EXTERNAL WALL U-VALUE

Item no.	Material	Thickness[m]	Thermal conductivity λ [W/(mK)]	Layer thermal resistance [(m ² K)/W]	Surface resistance R _{si} ; R _{se} [(m ² K)/W]
					0.04
1	Horizontal wooden siding	0.02	0.22	0.091	
2	Air gap	0.02		0.180	
3	Wind barrier	0.001	0.17	0.006	
4	Water-resistant plyboard	0.015	0.13	0.115	

5	Straw bale	0.44	0.086	5.116	
6	Vapor barrier	0.001	0.17	0.006	
7	Plasterboard finish	0.015	0.165	0.091	
					0.13
		Total thermal resistance R_T		5.775246573	[(m²K)/W]
		U partition heat transfer coefficient		0.17315278	[W/(m²K)]

TABLE 6: ANALYSIS OF DIFFERENT TYPES OF INSULATION

Material name	Thermal conductivity λ [W/(mK)]	Density ρ [kg/m ³]	Thermal resistance [(m ² K)/W]	Layer thickness [cm]	EE value [MJ/ kg]	Embodied energy for 1 m ² of partition R=5.00 [(m ² K)/W] [MJ/m ²]	EC value [(kgCO ₂ e)/kg]	Carbon footprint for 1 m ² of partition R=5.00 [(m ² K)/W] [(kg CO ₂)/m ²]
Straw bale	0.086	80.00	5.000	43.00	0.89	30.616000	-1.2500	-43.000000
Earth and straw	0.130	-	5.000	65.00	6.56	4.264000	-108.3300	-70.414500
Hemp panel	0.041	37.50	5.000	20.50	-	-	-0.6240	-4.797000
Hempcreat	0.070	350.00	5.000	35.00	13.62	4.767000	-12.9030	-4.516050
Wood shavings and lime	0.160	-	5.000	80.00	17.90	14.320000	-104.4400	-83.552000
Clay	0.840	850.00	5.000	420.00	-	-	0.1162	414.834000
Sheep wool	0.036	20.00	5.000	17.95	29.00	104.110000	0.5000	1.795000
Glass wool	0.032	21.50	5.000	16.00	28.00	96.320000	1.3500	4.644000
Rock wool	0.036	95.00	5.000	18.00	16.80	287.280000	1.1200	19.152000
Loose rock wool	0.037	60.00	5.000	18.50	16.60	184.260000	-	-
EPS polystyrene	0.031	13.50	5.000	15.50	88.60	185.395500	3.2900	6.884325
XPS polystyrene	0.031	36.00	5.000	15.50	-	-	5.8600	-
PU polyurethane	0.019	30.00	5.000	9.50	102.10	290.985000	4.8400	13.794000
Cellulose	0.039	50.00	5.000	19.50	3.30	32.175000	-	-
Cellulose from recycled paper	0.040	46.00	5.000	20.00	0.45	4.140000	-	-
Cork	0.040	171.00	5.000	20.00	4.00	136.800000	-2.8600	-97.812000
Cellular glass	0.050	165.00	5.000	25.00	27.00	1113.750000	-	-
Loose wood wool	0.038	38.00	5.000	19.00	10.80	77.976000	-	-
Wood wool panels	0.037	110.00	5.000	18.50	20.00	407.000000	0.9800	19.943000
Chipboard	0.100	300.00	5.000	50.00	14.50	2175.000000	-1.4800	-222.000000
Deciduous wood	0.220	800.00	5.000	110.00	10.40	9152.000000	-1.5900	-1399.200000
Coniferous wood	0.160	550.00	5.000	80.00	7.40	3256.000000	-1.5500	-682.000000
VIP	0.006	170.00	5.000	3.00	-	-	11.0800	56.508000
Aerogel	0.017	140.00	5.000	8.50	-	-	4.2000	49.980000