Blank 2

Project Information
Reference
Date 14 September 2018

Construction Type
Element : Suspended ground floor - 0 Spec generator copies
Internal surface emissivity : High External surface emissivity : High

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Pitch (º)	Bridge details Air gaps (Level, Delta U")
Inside surface	-	-	0.170		
Floor deck Particleboard (600 mg/m³)	22.0	-	0.157		
Beltermo Ultra	40.0	0.042	0.950		L:0 0.000W/m²K
Ampatex Sinco	-	-	-		
SteicoFlex	150.0	0.036	4.150		9.000% Softwood (150.0mm) L:0 0.000W/m²K
Ampatex Aero	-	-	-		
Airspace, heat flow downwards, 300 mm thick	300.0	-	0.230		
Deck underside surface resistance			0.170		
Total thickness	**512.0mm**				

Ground Floor Details

Floor type	: Suspended floor		
Calculation method	: EN ISO 13370:2007		
Perimeter	: 42.00 m	Area	: 104.00 m²
P/A	: 0.404	Characteristic dimension, B'	: 4.952
Thermal conductivity of ground:	: 1.500 W/mK	Width of walls, w:	: 0.300 m
Height of floor above ground, h:	: 0.225 m	U-value of sub-floor walls, Uw:	: 1.700 W/m²K
Average wind speed, V:	: 5.000 m/s	Wind shielding factor, fw:	: 0.050
Ventilation opening area, E:	: 0.0015 m²/m	Subfloor ground resistance, Rs	: 0.170 m²K/W
Resistance of insulation on ground, Rg	: 0.000 m²K/W	External surface resistance, Rse	: 0.040 m²K/W
Deck resistance	: 0.157m²K/W		
Description	: Particleboard (600 mg/m³)		
Edge insulation position	: None		

U-value = 0.16W/m²K

U-value, Combined Method : 0.158W/m²K (upper/lower limit 5.320 / 5.041m²K/W, dUf 0.0000, dUg 0.0000, dUp0.0000, dUr0.0000, dUrc1 0.0000, dUrc2 0.0000)

Correction factors
Air gaps, Delta Ug = 0.000W/m²K

(Based on the combined method for determining U-values of structures containing repeating thermal bridges)

Detailed U-value Calculation Results

Calculation of U-value for floor deck (Uf)

Construction includes 1 bridged layer

Non-bridged layers

Inside surface	0.170 m²K/W
Floor deck Particleboard (600 mg/m³)	0.157 m²K/W
Beltermo Ultra	0.950 m²K/W
Airspace, heat flow downwards, 300 mm thick	0.230 m²K/W
Deck underside surface resistance	0.170 m²K/W
Resistance of non-bridged layers, R_{NB} =	1.677 m²K/W

Bridged layer

SteicoFlex (L1) bridged by Softwood (B1)

Path 1 - SteicoFlex
Path 2 - Softwood

Resistance and fraction of heat flow paths

$R_{P1} = R_{NB} + R_{L1} = 1.677 + 4.150 = 5.827$ m²K/W $F_{P1} = 91.000\%$
$R_{P2} = R_{NB} + R_{L2} = 1.677 + 1.154 = 2.831$ m²K/W $F_{P2} = 9.000\%$

Upper resistance limit

$R_{upper} = 1 / ((F_{P1}/R_{P1}) + (F_{P2}/R_{P2}))$
$R_{upper} = 1 / ((0.910/5.827) + (0.090/2.831)) = 5.320$m²K/W

Lower resistance limit

$R_{lower} = R_{NB} + 1 / ((F_{L1}/R_{L1}) + (F_{B1}/R_{B1}))$
$R_{lower} = 1.677 + 1 / ((0.910/4.150) + (0.090/1.154)) = 5.041$m²K/W

Total resistance of suspended ground floor

$R_F = (R_{upper} + R_{lower}) / 2 = (5.320 + 5.041) / 2 = 5.18$ m²K/W
$U_f = 0.193$ m²K/W

Calculation of U-value for ground (Ug)

Equivalent thickness of ground, dg = 0.300 + 1.500(0.170 + 0.000 + 0.040) = 0.615m

Ug = ((2 x 1.500) / ((Pi x 4.952) + 0.615)) x ln(((Pi x 4.952) / 0.615) + 1) = 0.606

Calculation of U-value for sub-floor void (Ux)

Ux = (2 x (0.225 x 1.700 / 4.952)) + (1450 x (0.002 x 5.000 x 0.050 / 4.952)) = 0.264

Floor U-value, U:

1 / U = (1 / 0.193) + (1 / (0.606 + 0.264)) = 6.329
U = 0.158 W/m²K

Correction for air gaps, Delta Ug = 0.0000W/m²K

(Delta Uf + Delta Ug + Delta Up + Delta Ur) is less than 3% of (1 / Rt) so U = (1 / Rt) + (Delta Ur) + (Delta Urc) = 0.16 W/m²K

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Thermal Mass Details

	Thickness assessed (actual) (mm)	Density (kg/m³)	Specific heat capacity (J/kgK)	Heat capacity (kJ/m²K)
Floor deck Particleboard (600 mg/m³)	22.0 (22.0)	0.0	0.0	0.0
Beltermo Ultra	0.0 (40.0)	180.0	2100.0	0.0
Ampatex Sinco	0.0 (-)	280.0	850.0	0.0
SteicoFlex	0.0 (150.0)	0.0	0.0	0.0
Ampatex Aero	0.0 (-)	300.0	850.0	0.0
Airspace, heat flow downwards, 300 mm thick	0.0 (300.0)	1.2	1008.0	0.0
Total				0.0
kappa value				0.0000

Limiting condition: insulation

Admittance : 0.81 W/m²K Decrement : 0.00 factor Decrement delay : 0.00 hours