Job Description: Design & Specification for
Installation of a GSHP

Client: Mick Copnall
West Lock House
Borough Edge Road
Boroughbridge
YO51 9NH

16-09-21

Mick Copnall
West Lock House
Borough Edge Road
Boroughbridge
YO51 9NH

Job Description: Quotation / Specification for: ASHP, GSHP

Dear Mick,

Thank you for the interest shown regarding renewable energy, and in particular Ground and Air source heat pumps.

I have prepared for you the following heat loss calculations, energy calculations running costs and installation costs, for both a GSHP & ASHP.
Although the calculations seem time consuming and, in some cases, complicated, they are necessary to be able to design a heat pump installation correctly, and also help you, the client, to be able to understand the design.

In this instance the heat loss on the building, is 14.47Kw (15.1Kw Inc Hot water), this was calculated using the "U"Values as shown on the drawings provided, and shown on the building information sheet .

The total area to be heated is 280.65Sqm, therefore given that the heat loss is 14.47Kw, divided by the Sqm = 51.57 Watts per m. Heat loss.

To qualify for the RHI scheme your heating system must have a minimum (Seasonal performance factor) SPF of 2.5, this is calculated using the worst performing room (please see attached "Fact Sheet") highlighted in dark blue is the worst performing room which is the "Lobby" at 105.36 W/ms, .

The SCOP @ 50 deg flow temp according to the MSC manufacturers declared data is 4.1 for the S1155-12Kw GSHP and 3.53 for the ASHP's

Nibe have launched a new product called "Uplink", all new Nibe heat pumps come complete with the Uplink software in built within the unit, without an additional cost, all that is required is a Cat5 cable from your router to the unit.

Ground source Heat pump:

As a 3-phase supply is nor currently available, the largest single phase GSHP is 12kw, in this type of installation we install multiple Heat pumps in series, The Heat pump's we recommend are the new Nibe S1155-12Kw & 6Kw Smart inverter Heat pump, this is the latest model, this type of Heat pump adjusts its output automatically to suit both the external temperature and the heat load, obviously making the system much more efficient, the system requires an active bore hole depth of 269m, i.e 3No 90m holes which at 1m below the surface will run horizontally, terminating at a 3 port manifold chamber sunk into the ground, from the other side of the manifold chamber we would connect to the plant room.

We would also require a 300Ltr Buffer tank and a 300Ltr Megacoil hot water cylinder, all to be installed within the plant room area.

Our quotation does not include any excavation works, but we would advise and work with whoever carries out the work.

Air Source Heat pump:

Using an ASHP we would recommend a F2040-16Kw. The outdoor units obviously are installed outside, but as above the 200Ltr Buffer tank and a 300Ltr Megacoil hot water cylinder, all to be installed within the plant room.

Note:

You will require planning permission for the F2040-16Kw as it is a twin fan unit, planning is noise related to neighbouring property

System:

We have included separate costs for a Wet UFH system to the entire ground floor using a clip rail system, using 2No manifolds, each incorporating blending valves and circulating pumps, with each area controlled individually using smart Heatmiser room thermostats, which can be operated via a smart phone or tablet.

I Have also included within our pack a radiator schedule, which shows the required outputs, and suggested radiator sizes for the system.

I have included pipework, insulation, and a central smart Heatmiser room thermostat.

As Nibe VIP approved installers and partners, we are able to provide a seven-year manufacturer's warranty on all Nibe products, parts and labour, instead of the standard 2 years, assuming the system is serviced annually. The cost of the service is £150 Inc vat

ENERGY CALCULATION

SUMMARY

Together, we have gone through the building conditions in order to select and size the most efficient heat pump solution based on your circumstances. The calculations are based on both facts and assumptions which means that small deviations from the final installation can occur.

Please give me a call if you have further questions or visit our website to find out more about the heat pump solutions.

Best regards
The Installer

CUSTOMER

Mike Copnall

West Lock House

BUILDING PERFORMANCE		
Energy need for heating	37234	kWh/year
- of which is hotwater	5110	kWh/year
Heat demand	15.1	kW

AFTER HEATPUMP INSTALLED		
Energy to purchase -Electricity	8749	kWh/year

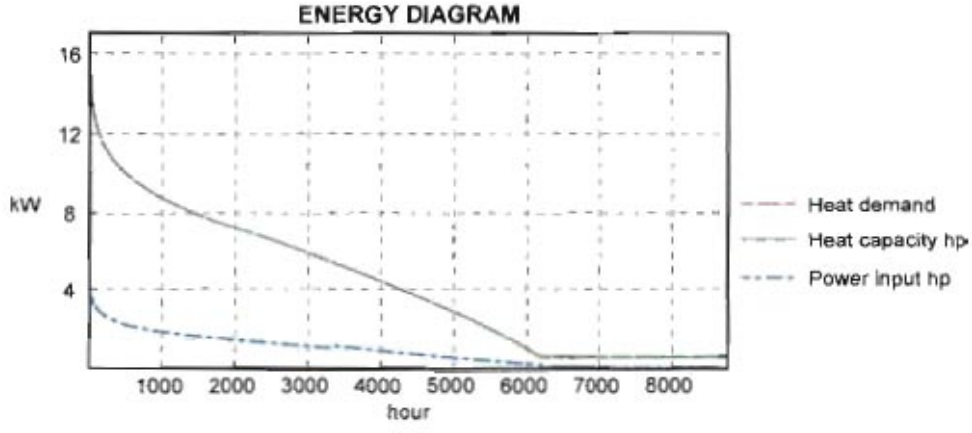
SAVINGS		
Energy Savings	**28485**	**kWh/year**
CO2 Savings	2640	kg/year

CLIMATE CONDITIONS		
Annual mean outdoor temperature	9.8	°C
Design outdoor temperature	-3.0	°C

BUILDING CONDITIONS		
Room temperature	21.0	°C
Space heating turns off	15.0	°C
Flow temperature at DOT	40	°C
Return temperature at DOT	30	°C

ENERGY PERFORMANCE WITH		
-NIBE F1155-12	**1**	**pcs**
-NIBE F1155-6	**1**	**pcs**
Energy delivered hp	37234	kWh/year
Energy supplied hp	7895	kWh/year
Supplementary energy, total (<50kWh)	0	kWh/year
Energy for heating circulation pump	854	kWh/year
Energy coverage	100	%
Annual heating factor, net	4.7	
Annual heating factor, total	4.3	
Fixed or floating condensing	Floating	
Heat capacity hp at DOT	15.1	kW
Power input hp at DOT	3.7	kW
Recommended supplementary power	0.0	kW
Power coverage	100	%

ENERGY DIAGRAM



ROCK COLLECTOR		
Active borehole depth	269	m
Specific energy extraction	110	kWh/m
Specific power extraction	17	W/m
Lambda rock	2.2	W/mK
Incoming mean brine temperature	1.5	°C

2No Nibe S1155-12Kw + 6Kw GSHP	
Total heating load inc Hot water	15.1Kw
Total heating Load	14.47Kw
Gross energy consumption	8749Kwh/yr
Total energy demand	37,234Kwh/yr
Temperature star rating (According to heat emitter guide)	3*
Likely SCOP (as per declared MCS data)	4.17
COP Rating	4.7
Recommended Heat pump: Nibe	S1155 12+6Kw
Degree of Energy coverage	100%
Degree of Power coverage	100%
Saving on heat pump	28,485Kwh/yr
Hot water storage	300Ltrs
Buffer tank required	300Ltrs
Active Bore hole depth	269m
Warranty on Nibe equipment as VIP installer	7Yr

Heat pump and ancillary equipment
Heat meter & generation meters
3 port Manifold, headering pipework, insulation, Glycol
Plant room Cu pipework, fittings, valves, pumps & insulation
Electrical materials
Labour to install chamber, fill test & commission
Plant room labour
Electrical Labour
Commissioning
Nett Total £
Total nett material cost £
+ Vat @ 20% £
Total nett Labour cost £
+ vat @ 5% £
Total Inc Vat £
Drilling costs direct with Welltherm (269m) Subject to site visit
UFH to the GF; to include 2No manifolds, pumps & blemders, Wiring centres, smart heatmiser thermostats, and all associated electrical works.
1st floor radiator system, using stelrad compact radiators, each having TRV's and a smart central heatmiser room thermostat, inc all associated plumbing and electrical works
Excavations are not included in the above quotation

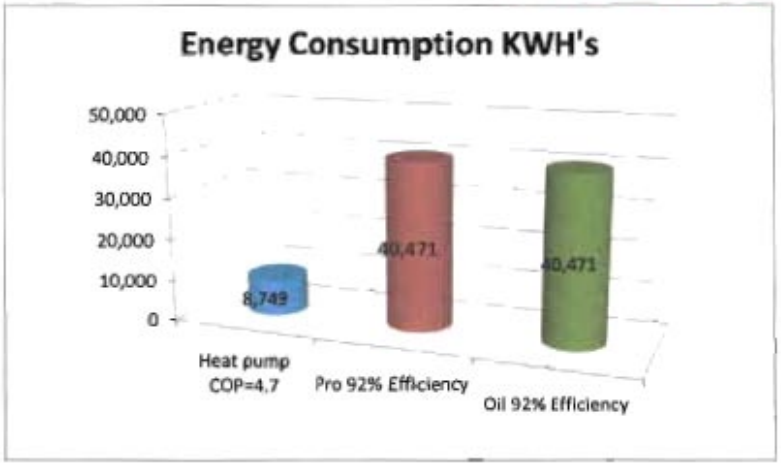
Running costs and carbon saving for Mike Copnall Using a Nibe S1155-12Kw + 6Kw GSHP

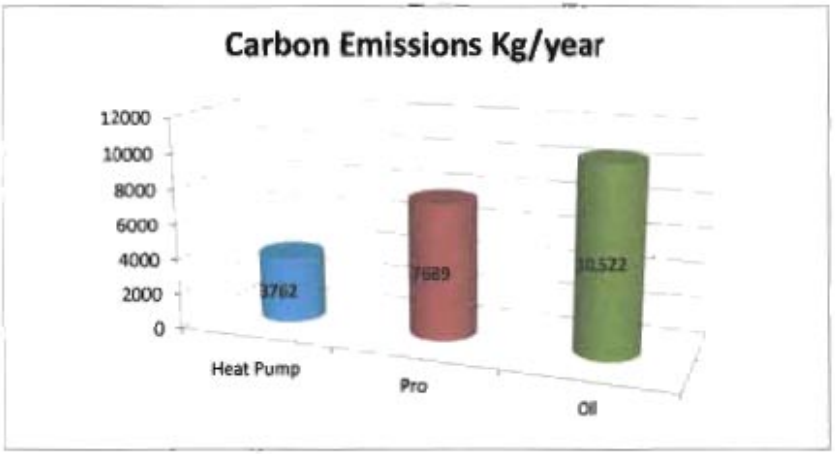
Energy demand from property is 37,234 KWH heating & Hot water

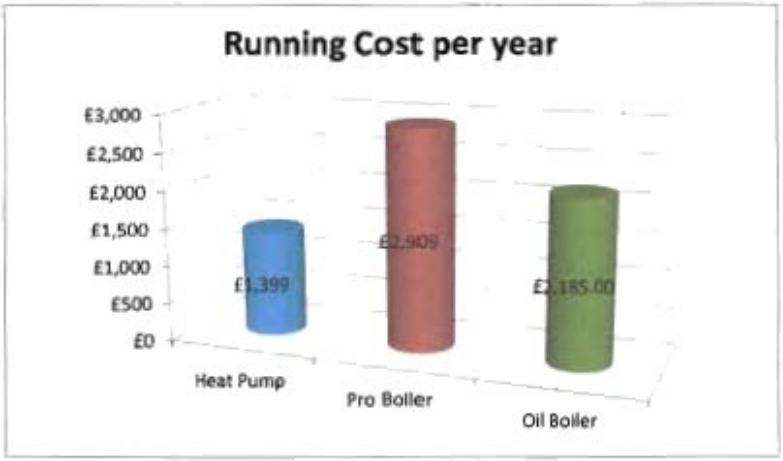
Energy Consumption	Heat pump COP=4.7	Pro 92% Efficiency	Oil 92% Efficiency
KWH	8,749	40,471	40,471

Running Cost per year	Heat Pump	Pro Boiler	Oil Boiler
Elec = 16.0p per KWH	£1,399		
Pro =7.19p per KWH		£2,909	
Oil = 5.4p per KWH			£2,185.00

Carbon Emissions Kg/KWH	Heat Pump	Pro	Oil
Elec = 0.43 Kg/KWH	3762		
Pro = 0.19 Kg/KWH		7689	
Oil = 0.26 Kg/KWH			10,522







Disclaimer: The performance of Microgeneration heat pump systems is impossible to predict with certainty due to the variability of the climate and its subsequent affect on both heat supply and demand. This estimate is based upon the best available information but is given as aguidance only and should not be considered as aguarantee.

ENERGY CALCULATION

SUMMARY

Together, we have gone through the building conditions in order to select and size the most efficient heat pump solution based on your circumstances. The calculations are based on both facts and assumptions which means that small deviations from the final installation can occur.

Please give me a call if you have further questions or visit our website to find out more about the heat pump solutions.

Best regards
The Installer

CUSTOMER

Mike Copnall

West Lock House

BUILDING PERFORMANCE

Energy need for heating	37234	kWh/year
- of which is hotwater	5110	kWh/year
Heat demand	15.1	kW

AFTER HEATPUMP INSTALLED

Energy to purchase -Electricity	8425	kWh/year

SAVINGS

Energy Savings	**28808**	**kWh/year**
CO2 Savings	2615	kg/year

CLIMATE CONDITIONS

Annual mean outdoor temperature	9.8	°C
Design outdoor temperature	-3.0	°C

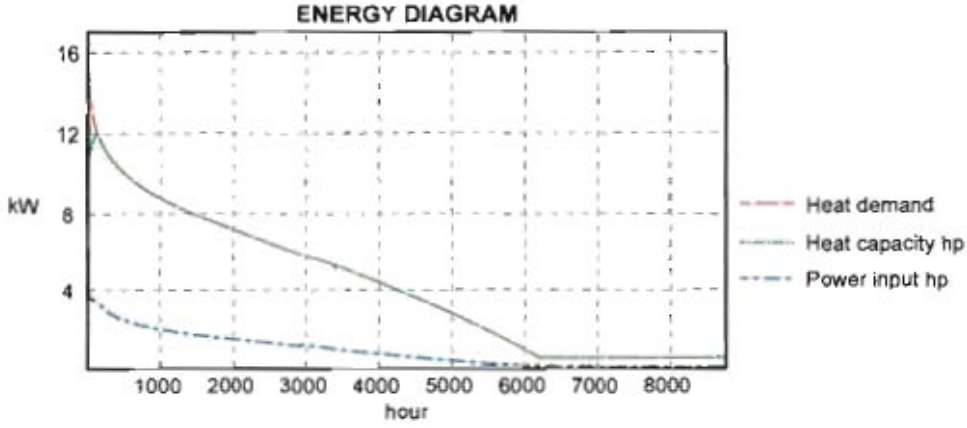
BUILDING CONDITIONS

Room temperature	21.0	°C
Space heating turns off	15.0	°C
Flow temperature at DOT	40	°C
Return temperature at DOT	30	°C

ENERGY PERFORMANCE WITH -NIBE F2040-16

Energy delivered hp	37090	kWh/year
Energy supplied hp	8036	kWh/year
Supplementary energy, total	144	kWh/year
Energy for heating circulation pump	246	kWh/year
Energy coverage	100	%
Annual heating factor, net	4.6	
Annual heating factor, total	4.4	
Fixed or floating condensing	Floating	
Heat capacity hp at DOT	15.1	kW
Power input hp at DOT	5.2	kW
Recommended supplementary power	0.0	kW
Power coverage	100	%

ENERGY DIAGRAM



Nibe F2040-16Kw ASHP	
Total heating load inc Hot water	15.1Kw
Total heating Load	14.47Kw
Gross energy consumption	8425 Kwh/yr
Total energy demand	37,234Kwh/yr
Temperature star rating (According to heat emitter guide)	3*
Likely SCOP (as per declared MCS data)	3.53
COP Rating	4.6
Recommended Heat pump: Nibe	F2040-16Kw
Degree of Energy coverage	100%
Degree of Power coverage	100%
Saving on heat pump	28,808Kwh/yr
Hot water storage	300Ltrs
Buffer tank required	300Ltrs
Warranty on Nibe equipment as VIP installer	7Yr

Heat pump and ancillary equipment	
Heat meter & generation meters	
Plant room Cu pipework, fittings, valves, pumps & insulation	
Electrical materials	
Plant room labour	
Electrical Labour	
Commissioning	
	Nett Total £
	Total nett material cost £
	+ Vat @ 20% £
	Total nett Labour cost £
	+ vat @ 5% £
	Total Inc Vat £
UFH to the GF; to include 2No manifolds, pumps & blenders, Wiring centres, smart heatmiser thermostats, and all associated electrical works.	
1st floor radiator system, using stelrad compact radiators, each having TRV's and a smart central heatmiser room thermostat, inc all associated plumbing and electrical works	
Excavations,floor insulation & screed are not included in the above quotation	

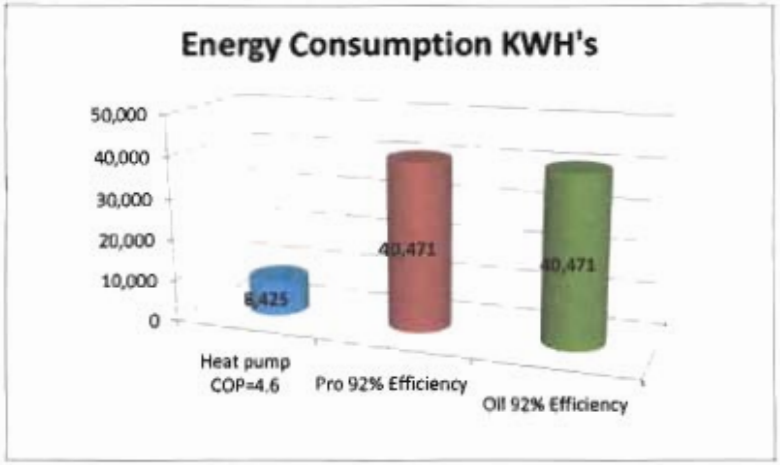
Running costs and carbon saving for Mike Copnall Using a Nibe F2040-16Kw ASHP

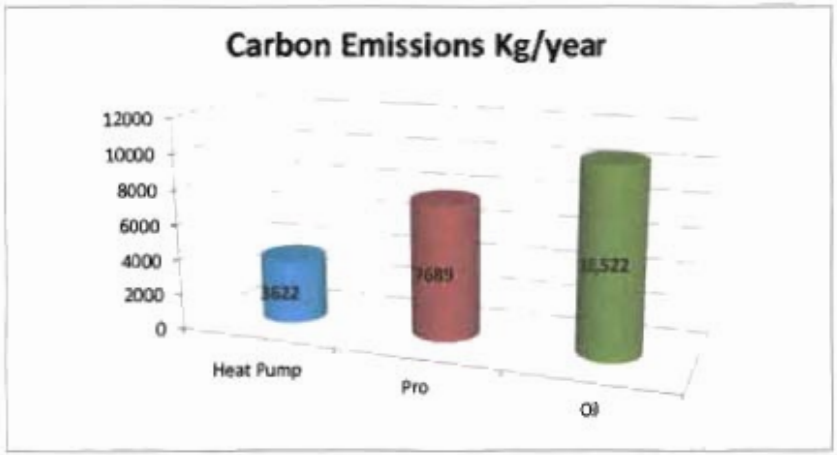
Energy demand from property is 37,234 KWH heating & Hot water

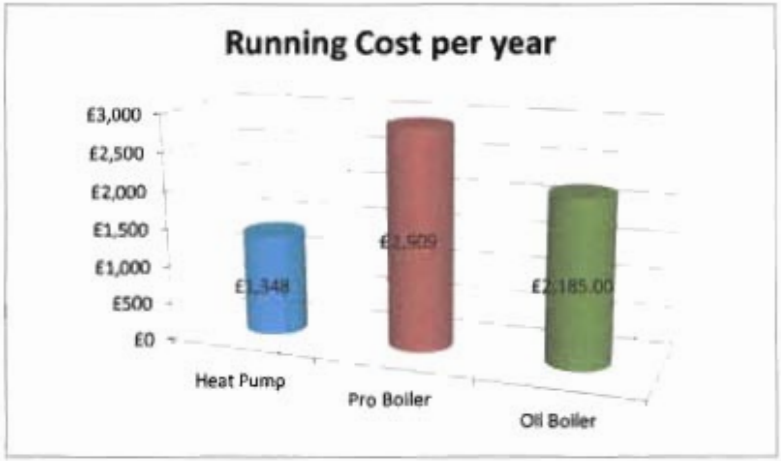
Energy Consumption	Heat pump COP=4.6	Pro 92% Efficiency	Oil 92% Efficiency
KWH	8,425	40,471	40,471

Running Cost per year	Heat Pump	Pro Boiler	Oil Boiler
Elec = 16.0p per KWH	£1,348		
Pro =7.19p per KWH		£2,909	
Oil = 5.4p per KWH			£2,185.00

Carbon Emissions Kg/KWH	Heat Pump	Pro	Oil
Elec = 0.43 Kg/KWH	3622		
Pro = 0.19 Kg/KWH		7689	
Oil = 0.26 Kg/KWH			10,522







Disclaimer: The performance of Microgeneration heat pump systems is impossible to predict with certainty due to the variability of the climate and its subsequent affect on both heat supply and demand. This estimate is based upon the best available information but is given as aguidance only and should not be considered as aguarantee.

RHI predicted payments using the formula published by DECC.

Mike Copnall – West Lock House, Boroughbridge

The payment is going to be deemed by using the Energy demand for the installation, my calculations which I'm sure you will appreciate are and have to be accurate to comply with the MCS guidelines; my calculations show the energy demand of from the property in Kwh/yr, this is to be less the Kwh/yr required to produce the energy demand.

In my opinion, the silly part of this is that the energy demand is not going to be deemed by my calculations, which are calculated to the Current MCS standards, it is to be deemed by an EPC, you would like to think the EPC demand would be the same as our calculated demand, we don't believe it will be.

EPC's have generic type calculation and are not as accurate as a calculated energy demand.

The tariff for GSHP from the 1st April 2021 is to increase to 21.29p, but the RHI is now capped for GSHP at a Max of 30,000Kwhr/yr, and 10.89p for ASHP and is capped at 20,000Kwhr/yr

predicted Calculation: **GSHP**

Your Energy demand = 37,234 Kwh/yr,
Max you can claim for= 30,000Kwhr/yr
SCOP @ 50deg flow temp according to MCS manufacturers data 4.17
Heat demand= 30,000 x (1-1/4.1)
1 /4.1= 0.24 x 30,000 = 7,200
30,000- 7,200 = 22,800 x 21.29p = £4,854 per annum x 7yrs = **£33,978 index linked**

predicted Calculation: **ASHP**

Your Energy demand = 37,234Kwh/yr,
Max you can claim for = 20,000 Kwhr/yr
SCOP @ 50deg flow temp according to MCS manufacturers data 3.53
Heat demand= 20,000 x (1-1/3.32)
1 /3.53= 0.28 x 20,000 = 5,600
20,000- 5,600 = 14,400 x 10.92p = £1,572 per annum x 7yrs = **£11,007 index linked**

Disclaimer:
Please note the above figures are nat exact, and should only be used as a guidance, the exact figure will not be known until an EPC or Sap Assessment has been performed and cannot be performed until the installation is complete.

Room	Temp	Heat loss	Oversize Factor	Star Rating	Kw Output Required	Recommendations to radiator sizes working with Heat pump
Boot Room	18	0.455	2.4	3*		UFH@150mm centres
W.C 1	18	0.304	2.4	3*		UFH@150mm centres
Lounge	21	2.002	2.4	3*		UFH@150mm centres
Living	21	2.081	2.4	3*		UFH@150mm centres
Kitchen	21	1.352	2.4	3*		UFH@150mm centres
Utility Room	18	0.236	2.4	3*		UFH@150mm centres
Dining Room	21	1.056	2.4	3*		UFH@150mm centres
Study	21	0.644	2.4	3*		UFH@150mm centres
W.C 2	18	0.23	2.4	3*		UFH@150mm centres
Lobby	18	0.236	2.4	3*		UFH@150mm centres
Entrance Hall	18	0.981	2.4	3*		UFH@150mm centres
Bedroom 1	18	0.511	2.4	3*	1.22	2No 700x600K1
Bed 1 Ensuite	22	0.391	2.4	3*	0.93	1800x600 white T/r
Bathroom	22	0.71	2.4	3*	1.70	1200x600 White T/r 700x600K2
Shower room	22	0.229	2.4	3*	0.54	1200x600White T/r
Bedroom 2	18	0.283	2.4	3*	0.67	800x600K1
Bedroom 3	18	0.363	2.4	3*	0.87	900x600K1
Bedroom 4	18	0.396	2.4	3*	0.95	1000x600K1
Bed 4 W.C.	18	0.148	2.4	3*	0.35	400x600K1
Landing	18	0.417	2.4	3*	1.00	1100x600K1
Master Bed	18	0.746	2.4	3*	1.79	2No 1000x600K1
Master Ensuite	22	0.395	2.4	3*	0.94	1800x600 White T/r
Landing 2	18	0.306	2.4	3*	0.73	800x600K1

Room	Temperature	Heat loss	Square Meter	W/sm Room performance	Linear Meter UFH
Boot Room	18	0.455	8.93	50.95	
W.C 1	18	0.304	4.04	75.25	
Lounge	21	2.002	24.99	80.11	
Living	21	2.081	39.69	52.43	
Kitchen	21	1.352	21.96	61.57	
Utility Room	18	0.236	5.54	42.60	
Dining Room	21	1.056	20.62	51.21	
Study	21	0.644	10.46	61.57	
W.C 2	18	0.23	3	76.67	
Lobby	18	0.236	2.24	105.36	
Entrance Hall	18	0.981	18.84	52.07	
Bedroom 1	18	0.511	15.24	33.53	
Bed 1 Ensuite	22	0.391	4.17	93.76	
Bathroom	22	0.71	8.55	83.04	
Shower room	22	0.229	2.7	84.81	
Bedroom 2	18	0.283	9.12	31.03	
Bedroom 3	18	0.363	12.71	28.56	
Bedroom 4	18	0.396	11.9	33.28	
Bed 4 W.C.	18	0.148	1.94	76.29	
Landing	18	0.417	9.96	41.87	
Master Bed	18	0.746	32.78	22.76	
Master Ensuite	22	0.395	5.03	78.53	
Landing 2	18	0.306	6.24	49.04	
		14.47Kw	280.65Sqm		
		51.57W/ms			

Building information for heat loss calcs: Mike Copnall, West Bank House, Borough Edge Rd, Bouroughbridge, YO51 9NH

Room	Temp	Length	Width	height	Air ch	Floor Type	Ceiling Type	Wall Type	Outside wall L	Party wall L	Party W type	Window L&W	Type	Door Type	Door L&W
Boot Room	18	3.5	2.55	2.12	1.5	0.15	0.31	0.28	6.0			2.4x2.2	1.1		
W.C 1	18	2.45	1.65	2.12	3.0	0.15	0.31	0.28	5.7			----------	------		
Lounge	21	4.9	5.1	3.24a	1.5	0.15	0.20	0.28	10.0			5.1x2.3 5.1x2.3	1.1		
Living	21	4.9	8.1	2.4	1.5	0.15	0.31	0.24	9.8			7.9x2.3	1.1		
Kitchen	21	6.1	3.6	2.4	2.0	0.15	0.31	0.24	8.05			2.4x1.0 1.8x1.0	1.6		
Utility Room	18	2.7	2.05	2.4	2.0	0.15	0.31	0.24	-------			----------	------		
Dining Room	21	6.65	3.1	2.4	1.5	0.15	0.31	0.24	10.85			1.1x1.3 1.1x1.3	1.6		
Study	21	2.25	4.65	2.4	1.5	0.15	0.31	0.24	9.15			1.0x1.4 1.0x1.4	1.6		
W.C 2	18	1.5	2.0	2.4	3.0	0.15	0.31	0.24	1.8			0.6x1.0	1.6		
Lobby	18	1.4	1.6	2.4	2.0	0.15	0.22	0.24	3.0			0.6x1.0 1.1x2.2	1.6		
Entrance Hall	18	4.71a	4.0	2.4	2.0	0.15	0.31	0.24	4.0			1.0x2.2 1.1x1.4	1.6		
Bedroom 1	18	2.54a	6.0	2.5	1.0	0.32	0.22	0.24	9.65			2.25x1.0	1.6		
Bed 1 Ensuite	22	2.45	1.7	2.5	3.0	0.32	0.22	0.24	5.85			0.75x1.0	1.6		
Bathroom	22	2.63a	3.25	2.5	3.0	0.32	0.22	0.24	6.05			1.1x1.3	1.6		
Shower room	22	1.0	2.7	2.5	3.0	0.32	0.22	0.24	3.25			----------	------		
Bedroom 2	18	2.78a	3.28	2.5	1.0	0.32	0.22	0.24	3.8			1.1x1.3	1.6		
Bedroom 3	18	4.1	3.1	2.5	1.0	0.32	0.22	0.24	4.1			1.1x1.3	1.6		

Building information for heat loss calcs: Mike Copnall, West Bank House, Borough Edge Rd, Bouroughbridge, YO51 9NH

Room	Temp	Length	Width	height	Air ch	Floor Type	Ceiling Type	Wall Type	Outside wall L	Party wall L	Party W type	Window L&W	Type	Door Type	Door L&W
Bedroom 4	18	2.22	5.36	2.5	1.0	0.32	0.22	0.24	9.05			1.0x1.0	1.6		
Bed 4 W.C.	18	1.62	1.2	2.5	3.0	0.32	0.22	0.24	1.9			0.6x0.9	1.6		
Landing	18	1.62a	6.15	2.5	2.0	0.26	0.20	0.28	2.4			----------	-----		
Master Bed	18	4.82a	6.8	2.21a	1.0	0.26	0.20	0.28	6.3			2.4x1.0	1.1		
Master Ensuite	22	1.48a	3.4	2.15a	3.0	0.26	0.20	0.28	5.3			1.2x1.0	1.1		
Landing	18	2.4	2.6	2.81a	2.0	0.26	0.20	0.28	2.4			----------	-----		

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	18	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	21	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Boot Room	1.5	3.5	2.55	2.12	28.38	0.33	21	197	519
	0	0	0	2.12	0.00	0.33	21	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		3.5	2.55		8.93	0.15	21	28	74
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		6		2.12	12.72				
WINDOW GLAZING			2.4	2.2	5.28	1.1	21	122	322
WINDOW GLAZING			0	0	0.00	2.1	21	0	0
WINDOW GLAZING			0	0	0.00	2.1	21	0	0
DOOR			0	0	0.00	1.4	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				7.44	0.28	21	44	115
CEILING or ROOF (gross area)		3.5	2.55		8.93	0.31	2	6	153
CEILING or ROOF (gross area)		0	0		0.00	0	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are				8.93	0	21	0	0
INTERNAL WALL 1		0		2.12	0.00	1.72	-4	0	0
INTERNAL WALL 2		0		2.12	0.00	1.72	-4	0	0
PARTY WALL		0		2.12	0.00	1.76	8	0	
OTHER				2.12	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								396	1183
EXPOSED LOCATION	Yes	If YES, add 10%		15	% to DESIGN HEAT LOSS			59	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS								455	

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	18	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3 No of air								
Design Temp Diff	21 changes								
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
W.C 1	3	2.45	1.65	2.12	25.71	0.33	21	178	470
	0	0	0	2.12	0.00	0.33	21	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		2.45	1.65		4.04	0.15	21	13	34
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		5.7		2.12	12.08				
WINDOW GLAZING			0	0	0.00	1.1	21	0	0
WINDOW GLAZING			0	0	0.00	2.1	21	0	0
WINDOW GLAZING			0	0	0.00	2.1	21	0	0
DOOR			0	0	0.00	1.4	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				12.08	0.28	21	71	187
CEILING or ROOF (gross area)		2.45	1.65		4.04	0.31	2	3	69
CEILING or ROOF (gross area)		0	0		0.00	0	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are				4.04	0	21	0	0
INTERNAL WALL 1		0		2.12	0.00	1.72	-4	0	0
INTERNAL WALL 2		0		2.12	0.00	1.72	-4	0	0
PARTY WALL		0		2.12	0.00	1.76	8	0	
OTHER				2.12	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								264	760
EXPOSED LOCATION	Yes If YES, add 10%			15 % to DESIGN HEAT LOSS				40	
HIGH CEILING	No If YES, add			% to DESIGN HEAT LOSS				0	
INTERMITTENT HEAT	Yes If YES, add 15%			0 % to DESIGN HEAT LOSS				0	
TOTAL ROOM HEAT LOSS								304	

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	21	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	24	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Lounge	1.5	4.9	5.1	3.24	121.45	0.33	24	962	2219
	0	0	0	3.24	0.00	0.33	24	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		4.9	5.1		24.99	0.15	24	90	208
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		10		3.24	32.40				
WINDOW GLAZING			5.1	2.3	11.73	1.1	24	310	714
WINDOW GLAZING			5.1	2.3	11.73	1.1	24	310	714
WINDOW GLAZING			0	0	0.00	2.1	24	0	0
DOOR			0	0	0.00	1.4	24	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				8.94	0.28	24	60	139
CEILING or ROOF (gross area)		4.9	5.1		24.99	0.2	2	10	277
CEILING or ROOF (gross area)		0	0		0.00	0	24	0	0
ROOF GLAZING			0	0	0.00	1.4	24	0	0
ROOF GLAZING			0	0	0.00	1.4	24	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are				24.99	0	24	0	0
INTERNAL WALL 1		0		3.24	0.00	1.72	-4	0	0
INTERNAL WALL 2		0		3.24	0.00	1.72	-4	0	0
PARTY WALL		0		3.24	0.00	1.76	11	0	
OTHER				3.24	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								1741	4271
EXPOSED LOCATION	Yes	If YES, add 10%		15	% to DESIGN HEAT LOSS			261	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS								2002	

Downstairs

ROOM / LOCATION	Downstairs					JOB	Mike Copnall			
Design Room Temp	21		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	24	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Living		1.5	4.9	8.1	2.4	142.88	0.33	24	1132	2611
		0	0	0	2.4	0.00	0.33	24	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			4.9	8.1		39.69	0.15	24	143	330
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			9.8		2.4	23.52				
WINDOW GLAZING				7.9	2.3	18.17	1.1	24	480	1107
WINDOW GLAZING				0	0	0.00	1.1	24	0	0
WINDOW GLAZING				0	0	0.00	2.1	24	0	0
DOOR				0	0	0.00	1.4	24	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					5.35	0.24	24	31	71
CEILING or ROOF (gross area)			4.9	8.1		39.69	0.31	2	25	681
CEILING or ROOF (gross area)			0	0		0.00	0	24	0	0
ROOF GLAZING				0	0	0.00	1.4	24	0	0
ROOF GLAZING				0	0	0.00	1.4	24	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					39.69	0	24	0	0
INTERNAL WALL 1			0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2			0		2.4	0.00	1.72	-4	0	0
PARTY WALL			0		2.4	0.00	1.76	11	0	
OTHER					2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									1810	4799
EXPOSED LOCATION	Yes	If YES, add 10%			15	% to DESIGN HEAT LOSS			271	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS									2081	

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	21	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	24	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Kitchen	2	6.1	3.6	2.4	105.41	0.33	24	835	1926
	0	0	0	2.4	0.00	0.33	24	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		6.1	3.6		21.96	0.15	24	79	182
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		8.05		2.4	19.32				
WINDOW GLAZING			2.4	1	2.40	1.6	24	92	213
WINDOW GLAZING			1.8	1	1.80	1.6	24	69	159
WINDOW GLAZING			0	0	0.00	2.1	24	0	0
DOOR			0	0	0.00	1.4	24	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				15.12	0.24	24	87	201
CEILING or ROOF (gross area)		6.1	3.6		21.96	0.31	2	14	377
CEILING or ROOF (gross area)		0	0		0.00	0	24	0	0
ROOF GLAZING			0	0	0.00	1.4	24	0	0
ROOF GLAZING			0	0	0.00	1.4	24	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are				21.96	0	24	0	0
INTERNAL WALL 1		0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2		0		2.4	0.00	1.72	-4	0	0
PARTY WALL		0		2.4	0.00	1.76	11	0	
OTHER				2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								1176	3058
EXPOSED LOCATION	Yes	If YES, add 10%		15	% to DESIGN HEAT LOSS			176	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS								1352	

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	18	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	21	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Utility Room	2	2.7	2.05	2.4	26.57	0.33	21	184	485
	0	0	0	2.4	0.00	0.33	21	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		2.7	2.05		5.54	0.15	21	17	46
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		0		2.4	0.00				
WINDOW GLAZING			0	0	0.00	1.6	21	0	0
WINDOW GLAZING			0	0	0.00	1.6	21	0	0
WINDOW GLAZING			0	0	0.00	2.1	21	0	0
DOOR			0	0	0.00	1.4	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				0.00	0.24	21	0	0
CEILING or ROOF (gross area)		2.7	2.05		5.54	0.31	2	3	95
CEILING or ROOF (gross area)		0	0		0.00	0	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof area				5.54	0	21	0	0
INTERNAL WALL 1		0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2		0		2.4	0.00	1.72	-4	0	0
PARTY WALL		0		2.4	0.00	1.76	8	0	
OTHER				2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								205	626
EXPOSED LOCATION	Yes	If YES, add 10%		15	% to DESIGN HEAT LOSS			31	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS								236	

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	21	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	24	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Dining Room	1.5	6.65	3.1	2.4	74.21	0.33	24	588	1356
	0	0	0	2.4	0.00	0.33	24	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		6.65	3.1		20.62	0.15	24	74	171
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		10.85		2.4	26.04				
WINDOW GLAZING			1.1	1.3	1.43	1.6	24	55	127
WINDOW GLAZING			1.1	1.3	1.43	1.6	24	55	127
WINDOW GLAZING			0	0	0.00	2.1	24	0	0
DOOR			0	0	0.00	1.4	24	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				23.18	0.24	24	134	308
CEILING or ROOF (gross area)		6.65	3.1		20.62	0.31	2	13	354
CEILING or ROOF (gross area)		0	0		0.00	0	24	0	0
ROOF GLAZING			0	0	0.00	1.4	24	0	0
ROOF GLAZING			0	0	0.00	1.4	24	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are				20.62	0	24	0	0
INTERNAL WALL 1		0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2		0		2.4	0.00	1.72	-4	0	0
PARTY WALL		0		2.4	0.00	1.76	11	0	
OTHER				2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								918	2442
EXPOSED LOCATION	Yes	If YES, add 10%		15	% to DESIGN HEAT LOSS			138	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS								1056	

Downstairs

ROOM / LOCATION	Downstairs					JOB	Mike Copnall			
Design Room Temp	21		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	24	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Study		1.5	2.25	4.65	2.4	37.67	0.33	24	298	688
		0	0	0	2.4	0.00	0.33	24	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			2.25	4.65		10.46	0.15	24	38	87
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			9.15		2.4	21.96				
WINDOW GLAZING				1	1.4	1.40	1.6	24	54	124
WINDOW GLAZING				1	1.4	1.40	1.6	24	54	124
WINDOW GLAZING				0	0	0.00	2.1	24	0	0
DOOR				0	0	0.00	1.4	24	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					19.16	0.24	24	110	255
CEILING or ROOF (gross area)			2.25	4.65		10.46	0.31	2	6	180
CEILING or ROOF (gross area)			0	0		0.00	0	24	0	0
ROOF GLAZING				0	0	0.00	1.4	24	0	0
ROOF GLAZING				0	0	0.00	1.4	24	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					10.46	0	24	0	0
INTERNAL WALL 1			0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2			0		2.4	0.00	1.72	-4	0	0
PARTY WALL			0		2.4	0.00	1.76	11	0	
OTHER					2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									560	1457
EXPOSED LOCATION	Yes	If YES, add 10%			15	% to DESIGN HEAT LOSS			84	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS									644	

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	18		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	21	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
W.C 2		3	1.5	2	2.4	21.60	0.33	21	150	395
		0	0	0	2.4	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			1.5	2		3.00	0.15	21	9	25
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			1.8		2.4	4.32				
WINDOW GLAZING				0.6	1	0.60	1.6	21	20	53
WINDOW GLAZING				0	0	0.00	1.6	21	0	0
WINDOW GLAZING				0	0	0.00	2.1	21	0	0
DOOR				0	0	0.00	1.4	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					3.72	0.24	21	19	49
CEILING or ROOF (gross area)			1.5	2		3.00	0.31	2	2	51
CEILING or ROOF (gross area)			0	0		0.00	0	21	0	0
ROOF GLAZING				0	0	0.00	1.4	21	0	0
ROOF GLAZING				0	0	0.00	1.4	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof area					3.00	0	21	0	0
INTERNAL WALL 1			0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2			0		2.4	0.00	1.72	-4	0	0
PARTY WALL			0		2.4	0.00	1.76	8	0	
OTHER					2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									200	574
EXPOSED LOCATION	Yes	If YES, add 10%			15	% to DESIGN HEAT LOSS			30	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS									230	

Downstairs

ROOM / LOCATION	Downstairs					JOB	Mike Copnall			
Design Room Temp	18		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	21	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Lobby		2	1.4	1.6	2.4	10.75	0.33	21	75	196
		0	0	0	2.4	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			1.4	1.6		2.24	0.15	21	7	19
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			3		2.4	7.20				
WINDOW GLAZING				0.6	1	0.60	1.6	21	20	53
WINDOW GLAZING				1.1	2.2	2.42	1.6	21	81	214
WINDOW GLAZING				0	0	0.00	2.1	21	0	0
DOOR				0	0	0.00	1.4	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					4.18	0.24	21	21	56
CEILING or ROOF (gross area)			1.4	1.6		2.24	0.22	2	1	27
CEILING or ROOF (gross area)			0	0		0.00	0	21	0	0
ROOF GLAZING				0	0	0.00	1.4	21	0	0
ROOF GLAZING				0	0	0.00	1.4	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					2.24	0	21	0	0
INTERNAL WALL 1			0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2			0		2.4	0.00	1.72	-4	0	0
PARTY WALL			0		2.4	0.00	1.76	8	0	
OTHER					2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									205	565
EXPOSED LOCATION	Yes	If YES, add 10%			15	% to DESIGN HEAT LOSS			31	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS									236	

Downstairs

ROOM / LOCATION	Downstairs				JOB	Mike Copnall			
Design Room Temp	18	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	21	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Entrance Hall	2	4.71	4	2.4	90.43	0.33	21	627	1652
	0	0	0	2.4	0.00	0.33	21	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		4.71	4		18.84	0.15	21	59	156
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		4		2.4	9.60				
WINDOW GLAZING			1	2.2	2.20	1.6	21	74	195
WINDOW GLAZING			1.1	1.4	1.54	1.6	21	52	136
WINDOW GLAZING			0	0	0.00	2.1	21	0	0
DOOR			0	0	0.00	1.4	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				5.86	0.24	21	30	78
CEILING or ROOF (gross area)		4.71	4		18.84	0.31	2	12	323
CEILING or ROOF (gross area)		0	0		0.00	0	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
ROOF GLAZING			0	0	0.00	1.4	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof area				18.84	0	21	0	0
INTERNAL WALL 1		0		2.4	0.00	1.72	-4	0	0
INTERNAL WALL 2		0		2.4	0.00	1.72	-4	0	0
PARTY WALL		0		2.4	0.00	1.76	8	0	
OTHER				2.4	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								853	2541
EXPOSED LOCATION	Yes	If YES, add 10%		15	% to DESIGN HEAT LOSS			128	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	% to DESIGN HEAT LOSS			0	
TOTAL ROOM HEAT LOSS								981	

Upstairs

ROOM	Upstairs					JOB	Mike Copnall			
Design Room Temp	18		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	21	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Bedroom 1		1	2.54	6	2.5	38.10	0.33	21	264	696
		0	0	0	2.5	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			2.54	6		15.24	0.32	-2	-10	270
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			9.65		2.5	24.13				
WINDOW GLAZING				2.25	1	2.25	1.6	21	76	199
WINDOW GLAZING						0.00	4.2	21	0	0
DOOR						0.00	4.2	21	0	0
DOOR						0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					21.88	0.24	21	110	291
CEILING or ROOF (gross area)			2.54	6		15.24				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	21	0	0
ROOF GLAZING				0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof area					15.24	0.22	21	70	186
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	8	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									511	1642
EXPOSED LOCATION	Yes	If YES, add 10%			0	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									511	

Upstairs

ROOM	Upstairs					JOB	Mike Copnall			
Design Room Temp	22		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	25	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Bedroom 1 Ensuite		3	2.45	1.7	2.5	31.24	0.33	25	258	571
		0	0	0	2.5	0.00	0.33	25	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			2.45	1.7		4.17	0.32	-2	-3	74
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			5.85		2.5	14.63				
WINDOW GLAZING				0.75	1	0.75	1.6	25	30	66
WINDOW GLAZING						0.00	4.2	25	0	0
DOOR						0.00	4.2	25	0	0
DOOR						0.00	3	25	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					13.88	0.24	25	83	184
CEILING or ROOF (gross area)			2.45	1.7		4.17				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	25	0	0
ROOF GLAZING				0	0	0.00	5.2	25	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					4.17	0.22	25	23	51
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	12	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									391	946
EXPOSED LOCATION	Yes	If YES, add 10%			u	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0		0			0	
TOTAL ROOM HEAT LOSS									391	

Upstairs

ROOM	Upstairs				JOB	Mike Copnall			
Design Room Temp	22	Degree Days		2307	Amount	Air	Design	Power	Energy
Outside Design Temp	-3	No of air			air heated	change	Temp	Heat Loss	Heat Loss
Design Temp Diff	25	changes			per hour	factor	Difference		
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Bathroom		3	2.63	3.25	2.5	64.11	0.33	25	529	1171
		0	0	0	2.5	0.00	0.33	25	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			2.63	3.25		8.55	0.32	-2	-5	151
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			6.05		2.5	15.13				
WINDOW GLAZING				1.1	1.3	1.43	1.6	25	57	127
WINDOW GLAZING						0.00	4.2	25	0	0
DOOR						0.00	4.2	25	0	0
DOOR						0.00	3	25	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					13.70	0.24	25	82	182
CEILING or ROOF (gross area)			2.63	3.25		8.55				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	25	0	0
ROOF GLAZING				0	0	0.00	5.2	25	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof area					8.55	0.22	25	47	104
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	12	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									710	1736
EXPOSED LOCATION	Yes	If YES, add 10%			0	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									710	

Upstairs

ROOM	Upstairs				JOB	Mike Copnall			
Design Room Temp	22		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	25	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Shower Room		3	1	2.7	2.5	20.25	0.33	25	167	370
		0	0	0	2.5	0.00	0.33	25	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			1	2.7		2.70	0.32	-2	-2	48
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			3.25		2.5	8.13				
WINDOW GLAZING				0	0	0.00	1.6	25	0	0
WINDOW GLAZING						0.00	4.2	25	0	0
DOOR						0.00	4.2	25	0	0
DOOR						0.00	3	25	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					8.13	0.24	25	49	108
CEILING or ROOF (gross area)			1	2.7		2.70				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	25	0	0
ROOF GLAZING				0	0	0.00	5.2	25	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					2.70	0.22	25	15	33
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	12	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									229	559
EXPOSED LOCATION	Yes	If YES, add 10%			0	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									229	

Upstairs

ROOM	Upstairs				JOB	Mike Copnall			
Design Room Temp	18		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	21	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Bedroom 2		1	2.78	3.28	2.5	22.80	0.33	21	158	417
		0	0	0	2.5	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			2.78	3.28		9.12	0.32	-2	-6	162
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			3.8		2.5	9.50				
WINDOW GLAZING				1.1	1.3	1.43	1.6	21	48	127
WINDOW GLAZING						0.00	4.2	21	0	0
DOOR						0.00	4.2	21	0	0
DOOR						0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					8.07	0.24	21	41	107
CEILING or ROOF (gross area)			2.78	3.28		9.12				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	21	0	0
ROOF GLAZING				0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					9.12	0.22	21	42	111
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	8	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									283	923
EXPOSED LOCATION	Yes	If YES, add 10%			0	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									283	

Upstairs

ROOM	Upstairs					JOB	Mike Copnall			
Design Room Temp	18		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	21	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Bedroom 3		1	4.1	3.1	2.5	31.78	0.33	21	220	581
		0	0	0	2.5	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			4.1	3.1		12.71	0.32	-2	-8	225
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			4.1		2.5	10.25				
WINDOW GLAZING				1.1	1.3	1.43	1.6	21	48	127
WINDOW GLAZING						0.00	4.2	21	0	0
DOOR						0.00	4.2	21	0	0
DOOR						0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					8.82	0.24	21	44	117
CEILING or ROOF (gross area)			4.1	3.1		12.71				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	21	0	0
ROOF GLAZING				0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof area					12.71	0.22	21	59	155
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	8	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									363	1204
EXPOSED LOCATION	Yes	If YES, add 10%			u	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									363	

Upstairs

ROOM	Upstairs				JOB	Mike Copnall			
Design Room Temp	18	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	21	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Bedroom 4	1	2.22	5.36	2.5	29.75	0.33	21	206	544
	0	0	0	2.5	0.00	0.33	21	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		2.22	5.36		11.90	0.32	-2	-8	211
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		9.05		2.5	22.63				
WINDOW GLAZING			1	1	1.00	1.6	21	34	89
WINDOW GLAZING					0.00	4.2	21	0	0
DOOR					0.00	4.2	21	0	0
DOOR					0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				21.63	0.24	21	109	287
CEILING or ROOF (gross area)		2.22	5.36		11.90				
CEILING or ROOF (gross area)		0	0		0.00				
ROOF GLAZING			0	0	0.00	5.2	21	0	0
ROOF GLAZING			0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are				11.90	0.22	21	55	145
INTERNAL WALL 1		0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2		0		2.5	0.00	1.72	0	0	0
PARTY WALL		0		2.5	0.00	1.76	8	0	0
OTHER				2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								396	1275
EXPOSED LOCATION	Yes	If YES, add 10%			0	% to DESIGN HEAT LOSS		0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS		0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0		0	
TOTAL ROOM HEAT LOSS								396	

Upstairs

ROOM	Upstairs				JOB	Mike Copnall			
Design Room Temp	18		Degree Days	2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	21	changes							
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Bedroom 4 W.C		3	1.62	1.2	2.5	14.58	0.33	21	101	266
		0	0	0	2.5	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			1.62	1.2		1.94	0.32	-2	-1	34
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			1.9		2.5	4.75				
WINDOW GLAZING				0.6	0.9	0.54	1.6	21	18	48
WINDOW GLAZING						0.00	4.2	21	0	0
DOOR						0.00	4.2	21	0	0
DOOR						0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					4.21	0.24	21	21	56
CEILING or ROOF (gross area)			1.62	1.2		1.94				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	21	0	0
ROOF GLAZING				0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					1.94	0.22	21	9	24
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	8	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									148	428
EXPOSED LOCATION	Yes	If YES, add 10%			u	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									148	

Upstairs

ROOM	Upstairs					JOB	Mike Copnall			
Design Room Temp	18		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	21	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Landing		2	1.62	6.15	2.5	49.82	0.33	21	345	910
		0	0	0	2.5	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			1.62	6.15		9.96	0.26	-2	-5	143
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			2.4		2.5	6.00				
WINDOW GLAZING				0	0	0.00	1.6	21	0	0
WINDOW GLAZING						0.00	4.2	21	0	0
DOOR						0.00	4.2	21	0	0
DOOR						0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					6.00	0.28	21	35	93
CEILING or ROOF (gross area)			1.62	6.15		9.96				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	21	0	0
ROOF GLAZING				0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof area					9.96	0.2	21	42	110
INTERNAL WALL 1			0		2.5	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.5	0.00	1.72	0	0	0
PARTY WALL			0		2.5	0.00	1.76	8	0	0
OTHER					2.5	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									417	1257
EXPOSED LOCATION	Yes	If YES, add 10%			0	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									417	

Upstairs

ROOM	Upstairs				JOB	Mike Copnall			
Design Room Temp	18	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	21	changes							
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Master Bed		1	4.82	6.8	2.21	72.43	0.33	21	502	1323
		0	0	0	2.21	0.00	0.33	21	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			4.82	6.8		32.78	0.26	-2	-17	472
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			6.3		2.21	13.92				
WINDOW GLAZING				2.4	1	2.40	1.1	21	55	146
WINDOW GLAZING						0.00	4.2	21	0	0
DOOR						0.00	4.2	21	0	0
DOOR						0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					11.52	0.28	21	68	179
CEILING or ROOF (gross area)			4.82	6.8		32.78				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	21	0	0
ROOF GLAZING				0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					32.78	0.2	21	138	363
INTERNAL WALL 1			0		2.21	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.21	0.00	1.72	0	0	0
PARTY WALL			0		2.21	0.00	1.76	8	0	0
OTHER					2.21	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									746	2483
EXPOSED LOCATION	Yes	If YES, add 10%		0	% to DESIGN HEAT LOSS				0	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS				0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	0				0	
TOTAL ROOM HEAT LOSS									746	

Upstairs

ROOM	Upstairs					JOB	Mike Copnall			
Design Room Temp	22		Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air								
Design Temp Diff	25	changes								
VENTILATION HEAT LOSS		per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Master Ensuite		3	1.48	3.4	2.15	32.46	0.33	25	268	593
		0	0	0	2.15	0.00	0.33	25	0	0
FABRIC HEAT LOSS						Area m2	U-Value			
FLOOR			1.48	3.4		5.03	0.26	-2	-3	72
FLOOR			0	0		0.00	0	0	0	0
EXT WALL (gross area)			5.3		2.15	11.40				
WINDOW GLAZING				1.2	1	1.20	1.1	25	33	73
WINDOW GLAZING						0.00	4.2	25	0	0
DOOR						0.00	4.2	25	0	0
DOOR						0.00	3	25	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area					10.20	0.28	25	71	158
CEILING or ROOF (gross area)			1.48	3.4		5.03				
CEILING or ROOF (gross area)			0	0		0.00				
ROOF GLAZING				0	0	0.00	5.2	25	0	0
ROOF GLAZING				0	0	0.00	5.2	25	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are					5.03	0.2	25	25	56
INTERNAL WALL 1			0		2.15	0.00	1.72	0	0	0
INTERNAL WALL 2			0		2.15	0.00	1.72	0	0	0
PARTY WALL			0		2.15	0.00	1.76	12	0	0
OTHER					2.15	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)									395	952
EXPOSED LOCATION	Yes	If YES, add 10%			0	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add				% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%			0	0			0	
TOTAL ROOM HEAT LOSS									395	

Upstairs

ROOM	Upstairs				JOB	Mike Copnall			
Design Room Temp	18	Degree Days		2307	Amount air heated per hour	Air change factor	Design Temp Difference	Power Heat Loss	Energy Heat Loss
Outside Design Temp	-3	No of air							
Design Temp Diff	21	changes							
VENTILATION HEAT LOSS	per hour	Length m	Width m	Height m	m3/hour	W/m3K	°C	Watts	kWh
Landing 2	2	2.4	2.6	2.81	35.07	0.33	21	243	641
	0	0	0	2.81	0.00	0.33	21	0	0
FABRIC HEAT LOSS					Area m2	U-Value			
FLOOR		2.4	2.6		6.24	0.26	-2	-3	90
FLOOR		0	0		0.00	0	0	0	0
EXT WALL (gross area)		2.4		2.81	6.74				
WINDOW GLAZING			0	0	0.00	1.1	21	0	0
WINDOW GLAZING					0.00	4.2	21	0	0
DOOR					0.00	4.2	21	0	0
DOOR					0.00	3	21	0	0
EXT WALL (net area)	Subtract glazing & door from gross ext wall area				6.74	0.28	21	40	105
CEILING or ROOF (gross area)		2.4	2.6		6.24				
CEILING or ROOF (gross area)		0	0		0.00				
ROOF GLAZING			0	0	0.00	5.2	21	0	0
ROOF GLAZING			0	0	0.00	5.2	21	0	0
CEILING or ROOF (net area)	Subtract roof glazing from gross roof are				6.24	0.2	21	26	69
INTERNAL WALL 1		0		2.81	0.00	1.72	0	0	0
INTERNAL WALL 2		0		2.81	0.00	1.72	0	0	0
PARTY WALL		0		2.81	0.00	1.76	8	0	0
OTHER				2.81	0.00	0	0	0	0
DESIGN HEAT LOSS FOR ROOM (Sum of Watts for all elements)								306	904
EXPOSED LOCATION	Yes	If YES, add 10%		0	% to DESIGN HEAT LOSS			0	
HIGH CEILING	No	If YES, add			% to DESIGN HEAT LOSS			0	
INTERMITTENT HEAT	Yes	If YES, add 15%		0	0			0	
TOTAL ROOM HEAT LOSS								306	