

# SBEM Specification Information

Scottish Building Regulations Section 6 Guidance

Carbon Dioxide Emissions, U-Values, Air Permeability, and HVAC

Project name

## Unit 1 Site B

Date: Wed Jan 14 11:14:35 2009

### Administrative information

#### Building details

Address: Unit 1, Site B, Kintore Business Park, Carnhi

#### Certification tool

Calculation engine: SBEM

Calculation engine version: v3.2.b

Interface to calculation engine: DDB PartL

Interface to calculation engine version: v24.21

Compliance check version: v3.2.b

#### Occupier details

Name: Kintore Service Sites Ltd

Telephone number: 01467 632670

Address: Blaeriach, Clovenstone, Kintore, Information no

#### Agent details

Name: Jon Ponting

Telephone number: 08458 386 387

Address: Energist House, Kemble Enterprise Park-, Kemble

### 1- Predicted CO2 emission from proposed building

1.1	Calculated CO2 emission rate from notional building	51.9 KgCO2/m2.annum
1.2	Improvement factor	0.15
1.3	LZC benchmark	0.1
1.4	Target CO2 Emission Rate (TER)	39.6 KgCO2/m2.annum
1.5	Building CO2 Emission Rate (BER)	34.4 KgCO2/m2.annum
1.6	Are emissions from building less than or equal to the target?	BER =< TER YES

### 2- The performance of the building fabric and the building services systems

2.1 How do the U-values compare with Section 6 guidance?

The building follows guidance in Scottish Building Regulations

Element	U <sub>a</sub> -Limit	U <sub>a</sub> -Calc	U <sub>i</sub> -Limit	U <sub>i</sub> -Calc	Surface where this maximum value occurs*
Wall	0.3***	0.22	0.7	0.22	1.1 Wall 1
Floor	0.25	0.15	0.7	0.15	G1 Exposed Floor 1
Roof	0.25	0.22	0.35	0.22	G8 Exposed Roof 2
Windows**, roof windows, and rooflights	2.2	1.8	3.3	1.8	G1 Rooflight 1
Personnel doors	2.2	2.2	3.3	2.2	G1 Wall 2 (Personnel Door)
Vehicle access & similar large doors	1.5	1.5	1.5	1.5	G1 Wall 7 (Vehicle Access Door)

U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m2K)]  
U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m2K)]  
U<sub>i</sub>-Limit = Limiting individual element U-values [W/(m2K)]  
U<sub>i</sub>-Calc = Calculated individual element U-values [W/(m2K)]

\* There might be more than one surface exceeding the limiting standards.  
\*\* Display windows and similar glazing are not required to meet the standard given in this table.  
\*\*\* 0.35 for modular and portable buildings.

2.2 Air permeability

Air Permeability	This building's value
m3/(h.m2) at 50 Pa	10

### 2.3 Are all building services standards acceptable?

#### 2.3a-1 HVAC 2

HVAC system standard is acceptable

Efficiency check	Limiting heat source seasonal efficiency	This building
Heat source efficiency	0.84	0.96
0.84 is the overall limiting efficiency for a single or a multiple boiler system. For a multiple boiler system the limiting efficiency for any individual boiler is 0.80.		

#### 2.3a-2 HVAC 1

HVAC system standard is acceptable

Efficiency check	Limiting heat source seasonal efficiency	This building
Heat source efficiency	0.84	0.96
0.84 is the overall limiting efficiency for a single or a multiple boiler system. For a multiple boiler system the limiting efficiency for any individual boiler is 0.80.		

#### 2.3b-1 Default DHW

HWS standard is acceptable

Efficiency check	Limiting HWS heat source seasonal efficiency	This building
HWS heat source efficiency	Limiting heat source efficiency not specified	1

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

	Actual	Notional
Area (m2)	1178	1178
External area (m2)	3294	3294
Weather	GLA	GLA
Infiltration	10	10
W/K	953.14	1732.58
W/m2K	0.29	0.53
Alpha	27.64	4.26

## Building Use

### % area Building Type

Office
Primary school
Secondary school
Further education universities
Primary health care buildings
Nursing residential homes and hostels
Hospital
Hotel
Restaurant/public house
Sports centre/leisure centre
Sports ground arena
Retail
Warehouse and storage
Theatres/cinemas/music halls and auditoria
Social clubs
Community/day centre
Libraries/museums/galleries
Prisons
Emergency services
Crown and county courts
Airport terminals
Bus station/train station/seaport terminal
<b>100 Workshops/maintenance depot</b>
Telephone exchanges
Industrial process building
Launderette
Dwelling
Retail warehouses
Miscellaneous 24hr activities

## HVAC Systems Performance

System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat kWh/m2	Cool kWh/m2	Aux kWh/m2	Heat SSEE	Cool SSEER	Heat G SEFF	Cool G SEER
[ST] Central heating using water: floor heating, [HS] LTHW boiler, [FT] Oil									
Actual	189.7	38.1	58.4	0	2.6	0.9	0	0.96	0
Notional	254.1	99.3	96.7	0	1.7	0.73	0	----	----
[ST] Central heating using water: floor heating, [HS] LTHW boiler, [FT] Oil									
Actual	357.6	161.8	110.1	0	3.6	0.9	0	0.96	0
Notional	497.9	195.2	188	0	2.1	0.73	0	----	----

## SBEM Data Reflection Report - Actual building

Wed Jan 14 11:14:12 2009

Project Details	Parameter Value	Comments / Warnings
Name of the project:	"Unit 1 Site B"	
Building type:	Workshops/maintenance depot	
Building address:	"Unit 1"	
	: "Site B"	
	: "Kintore Business Park"	
	: ""	
City:	"Carnhill"	
Postcode:	"AB51 0YQ"	
Location description:	""	
Building type:	Workshops/maintenance depot	
Weather (location):	GLA	
Rating with improvements [kgCO2/m2]:		
Building area [m2]:	1177.546	
Electric power factor:	>0.95	
Correction for lighting systems due to voltage reduction management scheme:	0	
Building (clockwise) rotation [degrees]:	0	
Notional Building fuel:	OIL	
CO2 Emission Factor for District Heating [kgCO2/kWh]:	0.293	

Occupier Details	Parameter Value	Comments / Warnings
Name:	"Kintore Service Sites Ltd"	
Telephone number:	"01467 632670"	
Address:	"Blaeriach, Clovenstone"	
City:	"Kintore"	
Postcode:	"Information not provided by the user"	

Qualified/Accredited Person / Agent Details	Parameter Value	Comments / Warnings
Name:	"Jon Ponting"	
Telephone number:	"08458 386 387"	
Address:	"Energist House, Kemble Enterprise Park-"	
City:	"Kemble"	
Postcode:	"GL7 6BQ"	
Registration/Membership number:	"000148"	
Accreditation scheme / Protocol organisation:	"Stroma"	
Qualifications:	NOS3	
Employer/Trading name:	"Energist Testing UK"	
Employer/Trading address:	"Kemble Enterprise Park, GL7 6BQ"	
Insurance company:	""	
Insurance policy number:	""	
Insurance policy start date:	""	
Insurance policy end date:	""	
Insurance policy cover limit [£]:	""	

<b>SBEM Information</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
Calculation engine (version):	v3.2.b	
Interface to SBEM:	"DDB PartL"	
Interface to SBEM (version):	"v24.21"	

<b>Object Summary</b>	<b>Total Number in Project</b>	<b>Total Related Area [m2]</b>	<b>Comments / Warnings</b>
Envelope/Door Constructions:	11	N/A	
Window/Rooflight Constructions:	2	N/A	
HW Systems:	1	N/A	
SE Systems:	0	0	
PV Systems:	0	0	
Wind Generators:	0	N/A	
CHP Generators:	0	N/A	
HVAC Systems:	2	N/A	
Zones:	9	1177.6	
Envelopes:	90	4807.2	
Doors:	6	110.9	
Windows/Rooflights:	20	86.1	
Additional Thermal Bridges:	0	N/A	

>	<b>1/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	Name:	Containing construction	
.	U-value [W/m2K]:	0.1	
.	Cm [kJ/m2K]:	51	
.	Contains metal cladding:	NO	

>	<b>2/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	Name:	EXPWALL 1	
.	U-value [W/m2K]:	0.22	
.	Cm [kJ/m2K]:	15.0984	
.	Contains metal cladding:	NO	

>	<b>3/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	Name:	EXPROOF 1	
.	U-value [W/m2K]:	0.22	
.	Cm [kJ/m2K]:	12.8075	
.	Contains metal cladding:	NO	

>	<b>4/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	Name:	INTFLOOR 1	
.	U-value [W/m2K]:	1.682	
.	Cm [kJ/m2K]:	30.24	
.	Contains metal cladding:	NO	

>	<b>5/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	Name:	PARTITION 1	
.	U-value [W/m2K]:	0.607	
.	Cm [kJ/m2K]:	20.376	
.	Contains metal cladding:	NO	

>	<b>6/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	Name:	EXPWALL 2	

	U-value [W/m2K]:	0.22	
	Cm [kJ/m2K]:	11.9456	
	Contains metal cladding:	YES	
>	<b>7/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	DOOR 1	
	U-value [W/m2K]:	2.2	
	Cm [kJ/m2K]:	9.75	
	Contains metal cladding:	NO	
>	<b>8/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	DOOR 2	
	U-value [W/m2K]:	1.5	
	Cm [kJ/m2K]:	9.75	
	Contains metal cladding:	NO	
>	<b>9/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	EXPFLOOR 1	
	U-value [W/m2K]:	0.15	
	Cm [kJ/m2K]:	30.24	
	Contains metal cladding:	NO	
>	<b>10/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	EXPWALL 3	
	U-value [W/m2K]:	0.216	
	Cm [kJ/m2K]:	17.47	
	Contains metal cladding:	NO	
>	<b>11/11 Envelope/Door Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	INTCEIL 1	
	U-value [W/m2K]:	2.225	
	Cm [kJ/m2K]:	46.888	
	Contains metal cladding:	NO	
>	<b>1/2 Window/Rooflight Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	RLIGHT 1	
	U-value for vertical inclination [W/m2K]:	1.8	
	Total solar energy transmittance for normal incidence:	0.826	
	Light transmissivity for normal incidence:	0.81	
	Total solar energy transmittance for all angles of incidence:	0.743	
	Light transmissivity for all angles of incidence:	0.729	
>	<b>2/2 Window/Rooflight Construction</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	WINDOW 3	
	U-value for vertical inclination [W/m2K]:	1.8	
	Total solar energy transmittance for normal incidence:	0.679	
	Light transmissivity for normal incidence:	0.66	
	Total solar energy transmittance for all angles of incidence:	0.611	
	Light transmissivity for all angles of incidence:	0.594	
>	<b>1/1 HWS</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	Default DHW	

Generator Type:	Instantaneous hot water only
Fuel type:	Grid Supplied Electricity
Effective heat generating seasonal efficiency:	1
Storage system:	NO

1/2 HVAC System	Parameter Value	Comments / Warnings
<b>General</b>		
Name:	HVAC 2	
Type:	Central heating using water: floor heating	
<b>Heating</b>		
Heat source:	LTHW boiler	
Fuel type:	Oil	
Effective heat generating seasonal efficiency:	0.96	
System also uses CHP:	NO	
<b>Ventilation</b>		
Heat recovery system:	No heat recovery	
Heat recovery efficiency:	0	
<b>System Controls</b>		
Central time control:	YES	
Optimum stop/start control:	NO	
Local time control:	NO	
Local temperature control:	YES	
Weather compensation control:	NO	

1/2 Zone	Parameter Value	Comments / Warnings
<b>General</b>		
Name:	1.1	
Multiplier:	1	
Activity:	Warehouse storage	
Area [m2]:	258.202	
Height [m]:	5.78	
Air permeability at 50pa [m3/hm2]:	10	
<b>HVAC and HWS</b>		
HWS Generator:	<a href="#">"Default DHW"</a>	
Deadleg length [m]:	0	
<b>Ventilation and Exhaust</b>		
Zonal ventilation type:	Natural Supply	
Mechanical exhaust:	NO	
Destratification fans:	NO	
Activity requires high pressure drop air treatment:	NO	
<b>Lighting (General)</b>		
Lighting information:	UNKNOWN	
Lamp type:	I-T05-F-T-H	

Efficient lamps for display lighting: NO

### Lighting (Controls)

Light controls: MANUAL

Automatic daylight zoning: YES

Occupancy sensing: NONE

Time switching for display lighting: NONE

### Global Psi Values [W/mK] for Junctions Involving Metal Cladding

Roof-Wall: 0.6

Wall-Ground floor: 1.15

Wall-Wall (corner): 0.25

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 1.27

Sill below window: 1.27

Jamb at window or door: 1.27

### Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding

Roof-Wall: 0.12

Wall-Ground floor: 0.16

Wall-Wall (corner): 0.09

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 0.3

Sill below window: 0.04

Jamb at window or door: 0.05

>	>	>	1/7 Envelope	Parameter Value	Comments / Warnings
			Name:	1.1 Wall 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 1"</a>	
			Envelope area [m2]:	57.25237	
			Orientation:	North	
>	>	>	2/7 Envelope	Parameter Value	Comments / Warnings
			Name:	1.1 Wall 2	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 1"</a>	
			Envelope area [m2]:	58.2399	
			Orientation:	South	
>	>	>	3/7 Envelope	Parameter Value	Comments / Warnings
			Name:	1.1 Wall 3	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 1"</a>	
			Envelope area [m2]:	125.7381	
			Orientation:	West	
>	>	>	4/7 Envelope	Parameter Value	Comments / Warnings



Name:	1.1 Exposed Roof 1
Multiplier:	1
Type of envelope:	Roof
Flat roof:	NO
Connects space to:	Exterior
Construction:	<a href="#">"EXPROOF 1"</a>
Envelope area [m2]:	129.825
Orientation:	South

> **5/7 Envelope**      **Parameter Value**      **Comments / Warnings**

Name:	1.1 Exposed Roof 2
Multiplier:	1
Type of envelope:	Roof
Flat roof:	NO
Connects space to:	Exterior
Construction:	<a href="#">"EXPROOF 1"</a>
Envelope area [m2]:	132.363
Orientation:	North

> **6/7 Envelope**      **Parameter Value**      **Comments / Warnings**

Name:	1.1 Internal Floor 1
Multiplier:	1
Type of envelope:	Floor or Ceiling
Connects space to:	Conditioned adjoining space
Construction:	<a href="#">"INTFLOOR 1"</a>
Envelope area [m2]:	258.202
Orientation:	Horizontal

> **7/7 Envelope**      **Parameter Value**      **Comments / Warnings**

Name:	1.1 Partition 1
Multiplier:	1
Type of envelope:	Wall
Connects space to:	Conditioned adjoining space
Construction:	<a href="#">"PARTITION 1"</a>
Envelope area [m2]:	125.8034
Orientation:	East

> **2/2 Zone**      **Parameter Value**      **Comments / Warnings**

**General**

Name:	G1
Multiplier:	1
Activity:	Warehouse storage
Area [m2]:	653.858
Height [m]:	8.17
Air permeability at 50pa [m3/hm2]:	10

**HVAC and HWS**

HWS Generator:	<a href="#">"Default DHW"</a>
Deadleg length [m]:	0

**Ventilation and Exhaust**

Zonal ventilation type:	Natural Supply
Mechanical exhaust:	NO

Destratification fans:	NO
Activity requires high pressure drop air treatment:	NO

### Lighting (General)

Lighting information:	UNKNOWN
Lamp type:	I-T05-F-T-H
Efficient lamps for display lighting:	NO

### Lighting (Controls)

Light controls:	MANUAL
Automatic daylight zoning:	YES
Occupancy sensing:	NONE
Time switching for display lighting:	NONE

### Global Psi Values [W/mK] for Junctions Involving Metal Cladding

Roof-Wall:	0.6
Wall-Ground floor:	1.15
Wall-Wall (corner):	0.25
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	1.27
Sill below window:	1.27
Jamb at window or door:	1.27

### Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding

Roof-Wall:	0.12
Wall-Ground floor:	0.16
Wall-Wall (corner):	0.09
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	0.3
Sill below window:	0.04
Jamb at window or door:	0.05

>	>	>	1/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Wall 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 2"</a>	
			Envelope area [m2]:	208.1662	
			Orientation:	North	

>	>	>	2/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Wall 2	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 2"</a>	
			Envelope area [m2]:	6.77236	
			Orientation:	North	

>	>	>	>	1/1 Door	Parameter Value	Comments / Warnings
				Name:	G1 Wall 2 (Personnel Door)	
				Multiplier:	1	
				Type:	Personnel Doors	

Construction: ["DOOR 1"](#)  
Area [m2]: 1.9698

	<b>3/23 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	G1 Wall 4	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 2"</a>	
	Envelope area [m2]:	127.9318	
	Orientation:	East	

	<b>4/23 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	G1 Wall 7	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 2"</a>	
	Envelope area [m2]:	51.58665	
	Orientation:	East	

	<b>1/1 Door</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	G1 Wall 7 (Vehicle Access Door)	
	Multiplier:	1	
	Type:	Vehicle Access Doors	
	Construction:	<a href="#">"DOOR 2"</a>	
	Area [m2]:	34.974	

	<b>5/23 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	G1 Wall 9	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 2"</a>	
	Envelope area [m2]:	124.663	
	Orientation:	South	

	<b>6/23 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	G1 Wall 12	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 2"</a>	
	Envelope area [m2]:	42.42784	
	Orientation:	South	

	<b>1/1 Door</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	G1 Wall 12 (Vehicle Access Door)	
	Multiplier:	1	
	Type:	Vehicle Access Doors	
	Construction:	<a href="#">"DOOR 2"</a>	
	Area [m2]:	34.968	

	<b>7/23 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
	Name:	G1 Wall 15	

Multiplier:	1
Type of envelope:	Wall
Connects space to:	Exterior
Construction:	<a href="#">"EXPWALL 2"</a>
Envelope area [m2]:	7.28
Orientation:	South

>	1/1 Door	Parameter Value	Comments / Warnings
	Name:	G1 Wall 15 (Personnel Door)	
	Multiplier:	1	
	Type:	Personnel Doors	
	Construction:	<a href="#">"DOOR 1"</a>	
	Area [m2]:	2.1	

>	8/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Wall 17	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 2"</a>	
	Envelope area [m2]:	42.43512	
	Orientation:	South	

>	1/1 Door	Parameter Value	Comments / Warnings
	Name:	G1 Wall 17 (Vehicle Access Door)	
	Multiplier:	1	
	Type:	Vehicle Access Doors	
	Construction:	<a href="#">"DOOR 2"</a>	
	Area [m2]:	34.974	

>	9/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Wall 19	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 2"</a>	
	Envelope area [m2]:	3.840408	
	Orientation:	West	

>	10/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Exposed Roof 1	
	Multiplier:	1	
	Type of envelope:	Roof	
	Flat roof:	NO	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPROOF 1"</a>	
	Envelope area [m2]:	297.191	
	Orientation:	South	

>	11/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Exposed Roof 2	
	Multiplier:	1	
	Type of envelope:	Roof	
	Flat roof:	NO	
	Connects space to:	Exterior	

Construction:	"EXPROOF 1"
Envelope area [m2]:	306.998
Orientation:	North

>	>	>	12/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Exposed Floor 1	
			Multiplier:	1	
			Type of envelope:	Floor or Ceiling	
			Connects space to:	Underground	
			U-value for ground floor [W/m2K]:	0.15	
			Construction:	"EXPFLOOR 1"	
			Envelope area [m2]:	653.858	
			Orientation:	Horizontal	

>	>	>	13/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Partition 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Conditioned adjoining space	
			Construction:	"PARTITION 1"	
			Envelope area [m2]:	175.7003	
			Orientation:	West	

>	>	>	14/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Rooflight container 1	
			Multiplier:	1	
			Type of envelope:	Roof	
			Flat roof:	NO	
			Connects space to:	Exterior	
			Construction:	"Containing construction"	
			Envelope area [m2]:	6.01	
			Orientation:	North	

>	>	>	>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
				Name:	G1 Rooflight 1	
				Multiplier:	1	
				Glazing Type:	"RLIGHT 1"	
				U-value for window inclination [W/m2K]:	2	
				Area [m2]:	6.01	
				Ratio between developed and projected area:	1	
				Display window:	NO	
				Shading system:	All other cases	
				Transmission factor:	1	

>	>	>	15/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Rooflight container 2	
			Multiplier:	1	
			Type of envelope:	Roof	
			Flat roof:	NO	
			Connects space to:	Exterior	
			Construction:	"Containing construction"	
			Envelope area [m2]:	6.01	
			Orientation:	North	

>	>	>	>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
---	---	---	---	----------------------	-----------------	---------------------

Name:	G1 Rooflight 2
Multiplier:	1
Glazing Type:	" <a href="#">RLIGHT 1</a> "
U-value for window inclination [W/m2K]:	2
Area [m2]:	6.01
Ratio between developed and projected area:	1
Display window:	NO
Shading system:	All other cases
Transmission factor:	1

>	16/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight container 3	
	Multiplier:	1	
	Type of envelope:	Roof	
	Flat roof:	NO	
	Connects space to:	Exterior	
	Construction:	" <a href="#">Containing construction</a> "	
	Envelope area [m2]:	6.01	
	Orientation:	North	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight 3	
	Multiplier:	1	
	Glazing Type:	" <a href="#">RLIGHT 1</a> "	
	U-value for window inclination [W/m2K]:	2	
	Area [m2]:	6.01	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	1	

>	17/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight container 4	
	Multiplier:	1	
	Type of envelope:	Roof	
	Flat roof:	NO	
	Connects space to:	Exterior	
	Construction:	" <a href="#">Containing construction</a> "	
	Envelope area [m2]:	6.01	
	Orientation:	North	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight 4	
	Multiplier:	1	
	Glazing Type:	" <a href="#">RLIGHT 1</a> "	
	U-value for window inclination [W/m2K]:	2	
	Area [m2]:	6.01	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	1	

>	18/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight container 5	
	Multiplier:	1	

Type of envelope:	Roof
Flat roof:	NO
Connects space to:	Exterior
Construction:	"Containing construction"
Envelope area [m2]:	6.01
Orientation:	North

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight 5	
	Multiplier:	1	
	Glazing Type:	"RLIGHT 1"	
	U-value for window inclination [W/m2K]:	2	
	Area [m2]:	6.01	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	1	

>	19/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight container 6	
	Multiplier:	1	
	Type of envelope:	Roof	
	Flat roof:	NO	
	Connects space to:	Exterior	
	Construction:	"Containing construction"	
	Envelope area [m2]:	6.01	
	Orientation:	South	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight 6	
	Multiplier:	1	
	Glazing Type:	"RLIGHT 1"	
	U-value for window inclination [W/m2K]:	2	
	Area [m2]:	6.01	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	1	

>	20/23 Envelope	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight container 7	
	Multiplier:	1	
	Type of envelope:	Roof	
	Flat roof:	NO	
	Connects space to:	Exterior	
	Construction:	"Containing construction"	
	Envelope area [m2]:	6.01	
	Orientation:	South	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G1 Rooflight 7	
	Multiplier:	1	
	Glazing Type:	"RLIGHT 1"	
	U-value for window inclination [W/m2K]:	2	
	Area [m2]:	6.01	

Ratio between developed and projected area:	1
Display window:	NO
Shading system:	All other cases
Transmission factor:	1

>	>	>	21/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Rooflight container 8	
			Multiplier:	1	
			Type of envelope:	Roof	
			Flat roof:	NO	
			Connects space to:	Exterior	
			Construction:	<a href="#">"Containing construction"</a>	
			Envelope area [m2]:	6.01	
			Orientation:	South	

>	>	>	>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
				Name:	G1 Rooflight 8	
				Multiplier:	1	
				Glazing Type:	<a href="#">"RLIGHT 1"</a>	
				U-value for window inclination [W/m2K]:	2	
				Area [m2]:	6.01	
				Ratio between developed and projected area:	1	
				Display window:	NO	
				Shading system:	All other cases	
				Transmission factor:	1	

>	>	>	22/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Rooflight container 9	
			Multiplier:	1	
			Type of envelope:	Roof	
			Flat roof:	NO	
			Connects space to:	Exterior	
			Construction:	<a href="#">"Containing construction"</a>	
			Envelope area [m2]:	6.01	
			Orientation:	South	

>	>	>	>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
				Name:	G1 Rooflight 9	
				Multiplier:	1	
				Glazing Type:	<a href="#">"RLIGHT 1"</a>	
				U-value for window inclination [W/m2K]:	2	
				Area [m2]:	6.01	
				Ratio between developed and projected area:	1	
				Display window:	NO	
				Shading system:	All other cases	
				Transmission factor:	1	

>	>	>	23/23 Envelope	Parameter Value	Comments / Warnings
			Name:	G1 Rooflight container 10	
			Multiplier:	1	
			Type of envelope:	Roof	
			Flat roof:	NO	
			Connects space to:	Exterior	
			Construction:	<a href="#">"Containing construction"</a>	
			Envelope area [m2]:	6.01	



Orientation: South

1/1 Window/Rooflight	Parameter Value	Comments / Warnings
Name:	G1 Rooflight 10	
Multiplier:	1	
Glazing Type:	"RLIGHT 1"	
U-value for window inclination [W/m2K]:	2	
Area [m2]:	6.01	
Ratio between developed and projected area:	1	
Display window:	NO	
Shading system:	All other cases	
Transmission factor:	1	

2/2 HVAC System	Parameter Value	Comments / Warnings
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**General**

Name:	HVAC 1
Type:	Central heating using water: floor heating

**Heating**

Heat source:	LTHW boiler
Fuel type:	Oil
Effective heat generating seasonal efficiency:	0.96
System also uses CHP:	NO

**Ventilation**

Heat recovery system:	No heat recovery
Heat recovery efficiency:	0

**System Controls**

Central time control:	YES
Optimum stop/start control:	NO
Local time control:	NO
Local temperature control:	YES
Weather compensation control:	NO

1/7 Zone	Parameter Value	Comments / Warnings
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**General**

Name:	G2
Multiplier:	1
Activity:	Toilet
Area [m2]:	29.802
Height [m]:	7.59924
Air permeability at 50pa [m3/hm2]:	10

**HVAC and HWS**

HWS Generator:	"Default DHW"
Deadleg length [m]:	0

**Ventilation and Exhaust**

Zonal ventilation type:	Natural Supply
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		Orientation:	North	
>	>	<b>3/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
		Name:	G2 Exposed Roof 1	
		Multiplier:	1	
		Type of envelope:	Roof	
		Flat roof:	NO	
		Connects space to:	Exterior	
		Construction:	<a href="#">"EXPROOF 1"</a>	
		Envelope area [m2]:	30.222	
		Orientation:	North	
>	>	<b>4/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
		Name:	G2 Exposed Floor 1	
		Multiplier:	1	
		Type of envelope:	Floor or Ceiling	
		Connects space to:	Underground	
		U-value for ground floor [W/m2K]:	0.15	
		Construction:	<a href="#">"EXPFLOOR 1"</a>	
		Envelope area [m2]:	29.802	
		Orientation:	Horizontal	
>	>	<b>5/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
		Name:	G2 Partition 1	
		Multiplier:	1	
		Type of envelope:	Wall	
		Connects space to:	Conditioned adjoining space	
		Construction:	<a href="#">"PARTITION 1"</a>	
		Envelope area [m2]:	51.30379	
		Orientation:	South	
>	>	<b>6/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
		Name:	G2 Partition 2	
		Multiplier:	1	
		Type of envelope:	Wall	
		Connects space to:	Conditioned adjoining space	
		Construction:	<a href="#">"PARTITION 1"</a>	
		Envelope area [m2]:	35.1956	
		Orientation:	East	
>	>	<b>7/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
		Name:	G2 Partition 3	
		Multiplier:	1	
		Type of envelope:	Wall	
		Connects space to:	Conditioned adjoining space	
		Construction:	<a href="#">"PARTITION 1"</a>	
		Envelope area [m2]:	34.87324	
		Orientation:	West	
>	>	<b>2/7 Zone</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
		<b>General</b>		
		Name:	G3	
		Multiplier:	1	

Activity:	Tea making
Area [m2]:	25.546
Height [m]:	7.6
Air permeability at 50pa [m3/hm2]:	10

#### HVAC and HWS

HWS Generator:	"Default DHW"
Deadleg length [m]:	0

#### Ventilation and Exhaust

Zonal ventilation type:	Natural Supply
Mechanical exhaust:	YES
Rate of mechanical exhaust [l/sm2]:	1.22
Specific fan power for mechanical exhaust [W/(l/s)]:	1.5
Scope of extract system:	Extract system serving a single room
Destratification fans:	NO
Activity requires high pressure drop air treatment:	NO

#### Lighting (General)

Lighting information:	UNKNOWN
Lamp type:	C-T05-F-T-H
Efficient lamps for display lighting:	NO

#### Lighting (Controls)

Light controls:	MANUAL
Automatic daylight zoning:	YES
Occupancy sensing:	NONE
Time switching for display lighting:	NONE

#### Global Psi Values [W/mK] for Junctions Involving Metal Cladding

Roof-Wall:	0.6
Wall-Ground floor:	1.15
Wall-Wall (corner):	0.25
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	1.27
Sill below window:	1.27
Jamb at window or door:	1.27

#### Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding

Roof-Wall:	0.12
Wall-Ground floor:	0.16
Wall-Wall (corner):	0.09
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	0.3
Sill below window:	0.04
Jamb at window or door:	0.05

>	1/9 Envelope	Parameter Value	Comments / Warnings
>	Name:	G3 Wall 1	
>	Multiplier:	1	
>	Type of envelope:	Wall	
>	Connects space to:	Exterior	

Construction:	<a href="#">"EXPWALL 3"</a>
Envelope area [m2]:	39.18635
Orientation:	North

>	>	>	<b>2/9 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G3 Wall 2	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	17.24725	
			Orientation:	West	

>	>	>	<b>3/9 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G3 Wall 3	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	8.868077	
			Orientation:	West	

>	>	>	>	<b>1/1 Window/Rooflight</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
				Name:	G3 Window 3	
				Multiplier:	1	
				Glazing Type:	<a href="#">"WINDOW 3"</a>	
				U-value for window inclination [W/m2K]:	1.8	
				Area [m2]:	1.4244	
				Ratio between developed and projected area:	1	
				Display window:	NO	
				Shading system:	All other cases	
				Transmission factor:	0.8	

>	>	>	<b>4/9 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G3 Wall 5	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	9.26299	
			Orientation:	West	

>	>	>	>	<b>1/1 Window/Rooflight</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
				Name:	G3 Window 5	
				Multiplier:	1	
				Glazing Type:	<a href="#">"WINDOW 3"</a>	
				U-value for window inclination [W/m2K]:	1.8	
				Area [m2]:	1.4124	
				Ratio between developed and projected area:	1	
				Display window:	NO	
				Shading system:	All other cases	
				Transmission factor:	0.8	

>	>	>	<b>5/9 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G3 Exposed Roof 1	

Multiplier:	1
Type of envelope:	Roof
Flat roof:	NO
Connects space to:	Exterior
Construction:	"EXPROOF 1"
Envelope area [m2]:	25.906
Orientation:	North

>	6/9 Envelope	Parameter Value	Comments / Warnings
	Name:	G3 Exposed Floor 1	
	Multiplier:	1	
	Type of envelope:	Floor or Ceiling	
	Connects space to:	Underground	
	U-value for ground floor [W/m2K]:	0.15	
	Construction:	"EXPFLOOR 1"	
	Envelope area [m2]:	25.546	
	Orientation:	Horizontal	

>	7/9 Envelope	Parameter Value	Comments / Warnings
	Name:	G3 Partition 1	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	"PARTITION 1"	
	Envelope area [m2]:	43.83863	
	Orientation:	South	

>	8/9 Envelope	Parameter Value	Comments / Warnings
	Name:	G3 Partition 2	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	"PARTITION 1"	
	Envelope area [m2]:	35.31255	
	Orientation:	East	

>	9/9 Envelope	Parameter Value	Comments / Warnings
	Name:	G3 Partition 3	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	"PARTITION 1"	
	Envelope area [m2]:	0.374764	
	Orientation:	North	

>	3/7 Zone	Parameter Value	Comments / Warnings
<b>General</b>			
	Name:	G4	
	Multiplier:	1	
	Activity:	Open plan office	
	Area [m2]:	133.937	
	Height [m]:	8.46	

Air permeability at 50pa [m3/hm2]: 10

### HVAC and HWS

HWS Generator: ["Default DHW"](#)

Deadleg length [m]: 0

### Ventilation and Exhaust

Zonal ventilation type: Natural Supply

Mechanical exhaust: NO

Destratification fans: NO

Activity requires high pressure drop air treatment: NO

### Lighting (General)

Lighting information: UNKNOWN

Lamp type: C-T05-F-T-H

Efficient lamps for display lighting: NO

### Lighting (Controls)

Light controls: MANUAL

Automatic daylight zoning: YES

Occupancy sensing: NONE

Time switching for display lighting: NONE

### Global Psi Values [W/mK] for Junctions Involving Metal Cladding

Roof-Wall: 0.6

Wall-Ground floor: 1.15

Wall-Wall (corner): 0.25

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 1.27

Sill below window: 1.27

Jamb at window or door: 1.27

### Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding

Roof-Wall: 0.12

Wall-Ground floor: 0.16

Wall-Wall (corner): 0.09

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 0.3

Sill below window: 0.04

Jamb at window or door: 0.05

>	>	>	1/12 Envelope	Parameter Value	Comments / Warnings
			Name:	G4 Wall 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	81.86405	
			Orientation:	West	

>	>	>	2/12 Envelope	Parameter Value	Comments / Warnings
			Name:	G4 Wall 2	
			Multiplier:	1	
			Type of envelope:	Wall	

Connects space to:	Exterior
Construction:	<a href="#">"EXPWALL 3"</a>
Envelope area [m2]:	9.735114
Orientation:	West

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G4 Window 2	
	Multiplier:	1	
	Glazing Type:	<a href="#">"WINDOW 3"</a>	
	U-value for window inclination [W/m2K]:	1.8	
	Area [m2]:	1.4004	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	0.8	

>	3/12 Envelope	Parameter Value	Comments / Warnings
	Name:	G4 Wall 4	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 3"</a>	
	Envelope area [m2]:	10.88595	
	Orientation:	West	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G4 Window 4	
	Multiplier:	1	
	Glazing Type:	<a href="#">"WINDOW 3"</a>	
	U-value for window inclination [W/m2K]:	1.8	
	Area [m2]:	1.4784	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	0.8	

>	4/12 Envelope	Parameter Value	Comments / Warnings
	Name:	G4 Wall 6	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 3"</a>	
	Envelope area [m2]:	10.37813	
	Orientation:	West	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G4 Window 6	
	Multiplier:	1	
	Glazing Type:	<a href="#">"WINDOW 3"</a>	
	U-value for window inclination [W/m2K]:	1.8	
	Area [m2]:	1.4004	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	0.8	



>	>	>	<b>5/12 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G4 Wall 8	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Exterior	
.	.	.	Construction:	<a href="#">"EXPWALL 3"</a>	
.	.	.	Envelope area [m2]:	10.0728	
.	.	.	Orientation:	West	

>	>	>	>	<b>1/1 Window/Rooflight</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	.	Name:	G4 Window 8	
.	.	.	.	Multiplier:	1	
.	.	.	.	Glazing Type:	<a href="#">"WINDOW 3"</a>	
.	.	.	.	U-value for window inclination [W/m2K]:	1.8	
.	.	.	.	Area [m2]:	1.4388	
.	.	.	.	Ratio between developed and projected area:	1	
.	.	.	.	Display window:	NO	
.	.	.	.	Shading system:	All other cases	
.	.	.	.	Transmission factor:	0.8	

>	>	>	<b>6/12 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G4 Exposed Roof 1	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Roof	
.	.	.	Flat roof:	NO	
.	.	.	Connects space to:	Exterior	
.	.	.	Construction:	<a href="#">"EXPROOF 1"</a>	
.	.	.	Envelope area [m2]:	58.248	
.	.	.	Orientation:	South	

>	>	>	<b>7/12 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G4 Exposed Roof 2	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Roof	
.	.	.	Flat roof:	NO	
.	.	.	Connects space to:	Exterior	
.	.	.	Construction:	<a href="#">"EXPROOF 1"</a>	
.	.	.	Envelope area [m2]:	74.06	
.	.	.	Orientation:	North	

>	>	>	<b>8/12 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G4 Exposed Floor 1	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Floor or Ceiling	
.	.	.	Connects space to:	Underground	
.	.	.	U-value for ground floor [W/m2K]:	0.15	
.	.	.	Construction:	<a href="#">"EXPFLOOR 1"</a>	
.	.	.	Envelope area [m2]:	133.937	
.	.	.	Orientation:	Horizontal	

>	>	>	<b>9/12 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G4 Internal Ceiling 1	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Floor or Ceiling	

Connects space to:	Conditioned adjoining space
Construction:	<a href="#">"INTCEIL 1"</a>
Envelope area [m2]:	3.46
Orientation:	Horizontal

>	10/12 Envelope	Parameter Value	Comments / Warnings
	Name:	G4 Partition 1	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	<a href="#">"PARTITION 1"</a>	
	Envelope area [m2]:	98.23144	
	Orientation:	South	

>	11/12 Envelope	Parameter Value	Comments / Warnings
	Name:	G4 Partition 3	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	<a href="#">"PARTITION 1"</a>	
	Envelope area [m2]:	122.9225	
	Orientation:	East	

>	12/12 Envelope	Parameter Value	Comments / Warnings
	Name:	G4 Partition 7	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	<a href="#">"PARTITION 1"</a>	
	Envelope area [m2]:	94.96688	
	Orientation:	North	

>	4/7 Zone	Parameter Value	Comments / Warnings
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**General**

Name:	G5
Multiplier:	1
Activity:	Cellular office
Area [m2]:	18.584
Height [m]:	8.74
Air permeability at 50pa [m3/hm2]:	10

**HVAC and HWS**

HWS Generator:	<a href="#">"Default DHW"</a>
Deadleg length [m]:	0

**Ventilation and Exhaust**

Zonal ventilation type:	Natural Supply
Mechanical exhaust:	NO
Destratification fans:	NO
Activity requires high pressure drop air treatment:	NO

**Lighting (General)**

Lighting information:	UNKNOWN
Lamp type:	C-T05-F-T-H

Efficient lamps for display lighting: NO

**Lighting (Controls)**

Light controls: MANUAL

Automatic daylight zoning: YES

Occupancy sensing: NONE

Time switching for display lighting: NONE

**Global Psi Values [W/mK] for Junctions Involving Metal Cladding**

Roof-Wall: 0.6

Wall-Ground floor: 1.15

Wall-Wall (corner): 0.25

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 1.27

Sill below window: 1.27

Jamb at window or door: 1.27

**Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding**

Roof-Wall: 0.12

Wall-Ground floor: 0.16

Wall-Wall (corner): 0.09

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 0.3

Sill below window: 0.04

Jamb at window or door: 0.05

>	>	>	<b>1/6 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G5 Exposed Roof 1	
			Multiplier:	1	
			Type of envelope:	Roof	
			Flat roof:	NO	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPROOF 1"</a>	
			Envelope area [m2]:	18.843	
			Orientation:	South	

>	>	>	<b>2/6 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G5 Exposed Floor 1	
			Multiplier:	1	
			Type of envelope:	Floor or Ceiling	
			Connects space to:	Underground	
			U-value for ground floor [W/m2K]:	0.15	
			Construction:	<a href="#">"EXPFLOOR 1"</a>	
			Envelope area [m2]:	18.584	
			Orientation:	Horizontal	

>	>	>	<b>3/6 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G5 Partition 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Conditioned adjoining space	
			Construction:	<a href="#">"PARTITION 1"</a>	
			Envelope area [m2]:	41.6683	
			Orientation:	North	

>	>	>	4/6 Envelope	Parameter Value	Comments / Warnings
.	.	.	Name:	G5 Partition 2	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Conditioned adjoining space	
.	.	.	Construction:	"PARTITION 1"	
.	.	.	Envelope area [m2]:	35.35604	
.	.	.	Orientation:	East	

>	>	>	5/6 Envelope	Parameter Value	Comments / Warnings
.	.	.	Name:	G5 Partition 3	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Conditioned adjoining space	
.	.	.	Construction:	"PARTITION 1"	
.	.	.	Envelope area [m2]:	38.72644	
.	.	.	Orientation:	South	

>	>	>	6/6 Envelope	Parameter Value	Comments / Warnings
.	.	.	Name:	G5 Partition 4	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Conditioned adjoining space	
.	.	.	Construction:	"PARTITION 1"	
.	.	.	Envelope area [m2]:	35.35604	
.	.	.	Orientation:	West	

>	>	>	5/7 Zone	Parameter Value	Comments / Warnings
.	.	.	<b>General</b>		
.	.	.	Name:	G6	
.	.	.	Multiplier:	1	
.	.	.	Activity:	Cellular office	
.	.	.	Area [m2]:	17.794	
.	.	.	Height [m]:	8.070665	
.	.	.	Air permeability at 50pa [m3/hm2]:	10	
.	.	.	<b>HVAC and HWS</b>		
.	.	.	HWS Generator:	"Default DHW"	
.	.	.	Deadleg length [m]:	0	
.	.	.	<b>Ventilation and Exhaust</b>		
.	.	.	Zonal ventilation type:	Natural Supply	
.	.	.	Mechanical exhaust:	NO	
.	.	.	Destratification fans:	NO	
.	.	.	Activity requires high pressure drop air treatment:	NO	
.	.	.	<b>Lighting (General)</b>		
.	.	.	Lighting information:	UNKNOWN	
.	.	.	Lamp type:	C-T05-F-T-H	
.	.	.	Efficient lamps for display lighting:	NO	
.	.	.	<b>Lighting (Controls)</b>		
.	.	.	Light controls:	MANUAL	

Automatic daylight zoning:	YES
Occupancy sensing:	NONE
Time switching for display lighting:	NONE

**Global Psi Values [W/mK] for Junctions Involving Metal Cladding**

Roof-Wall:	0.6
Wall-Ground floor:	1.15
Wall-Wall (corner):	0.25
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	1.27
Sill below window:	1.27
Jamb at window or door:	1.27

**Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding**

Roof-Wall:	0.12
Wall-Ground floor:	0.16
Wall-Wall (corner):	0.09
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	0.3
Sill below window:	0.04
Jamb at window or door:	0.05

>	>	>	<b>1/6 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G6 Exposed Roof 1	
			Multiplier:	1	
			Type of envelope:	Roof	
			Flat roof:	NO	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPROOF 1"</a>	
			Envelope area [m2]:	18.042	
			Orientation:	South	

>	>	>	<b>2/6 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G6 Exposed Floor 1	
			Multiplier:	1	
			Type of envelope:	Floor or Ceiling	
			Connects space to:	Underground	
			U-value for ground floor [W/m2K]:	0.15	
			Construction:	<a href="#">"EXPFLOOR 1"</a>	
			Envelope area [m2]:	17.794	
			Orientation:	Horizontal	

>	>	>	<b>3/6 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G6 Partition 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Conditioned adjoining space	
			Construction:	<a href="#">"PARTITION 1"</a>	
			Envelope area [m2]:	38.7551	
			Orientation:	North	

>	>	>	<b>4/6 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G6 Partition 2	
			Multiplier:	1	

Type of envelope:	Wall
Connects space to:	Conditioned adjoining space
Construction:	"PARTITION 1"
Envelope area [m2]:	31.1702
Orientation:	East

>	5/6 Envelope	Parameter Value	Comments / Warnings
	Name:	G6 Partition 3	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	"PARTITION 1"	
	Envelope area [m2]:	35.61296	
	Orientation:	South	

>	6/6 Envelope	Parameter Value	Comments / Warnings
	Name:	G6 Partition 4	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Conditioned adjoining space	
	Construction:	"PARTITION 1"	
	Envelope area [m2]:	31.1702	
	Orientation:	West	

>	6/7 Zone	Parameter Value	Comments / Warnings
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**General**

Name:	G7
Multiplier:	1
Activity:	Storage area
Area [m2]:	18.946
Height [m]:	7.504423
Air permeability at 50pa [m3/hm2]:	10

**HVAC and HWS**

HWS Generator:	"Default DHW"
Deadleg length [m]:	0

**Ventilation and Exhaust**

Zonal ventilation type:	Natural Supply
Mechanical exhaust:	NO
Destratification fans:	NO
Activity requires high pressure drop air treatment:	NO

**Lighting (General)**

Lighting information:	UNKNOWN
Lamp type:	C-T05-F-T-H
Efficient lamps for display lighting:	NO

**Lighting (Controls)**

Light controls:	MANUAL
Automatic daylight zoning:	YES
Occupancy sensing:	NONE
Time switching for display lighting:	NONE

**Global Psi Values [W/mK] for Junctions Involving Metal Cladding**

Roof-Wall:	0.6
Wall-Ground floor:	1.15
Wall-Wall (corner):	0.25
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	1.27
Sill below window:	1.27
Jamb at window or door:	1.27

**Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding**

Roof-Wall:	0.12
Wall-Ground floor:	0.16
Wall-Wall (corner):	0.09
Wall-Floor (not ground floor):	0.07
Lintel above window or door:	0.3
Sill below window:	0.04
Jamb at window or door:	0.05

>	>	>	<b>1/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G7 Wall 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	45.2285	
			Orientation:	South	

>	>	>	<b>2/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
			Name:	G7 Wall 2	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	6.619338	
			Orientation:	South	

>	>	>	>	<b>1/1 Door</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
				Name:	G7 Wall 2 (Personnel Door)	
				Multiplier:	1	
				Type:	Personnel Doors	
				Construction:	<a href="#">"DOOR 1"</a>	
				Area [m2]:	1.9089	

>	>	>	>	<b>3/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
				Name:	G7 Exposed Roof 1	
				Multiplier:	1	
				Type of envelope:	Roof	
				Flat roof:	NO	
				Connects space to:	Exterior	
				Construction:	<a href="#">"EXPROOF 1"</a>	
				Envelope area [m2]:	19.211	
				Orientation:	South	

>	>	>	<b>4/7 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
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Name:	G7 Exposed Floor 1
Multiplier:	1
Type of envelope:	Floor or Ceiling
Connects space to:	Underground
U-value for ground floor [W/m2K]:	0.15
Construction:	<a href="#">"EXPFLOOR 1"</a>
Envelope area [m2]:	18.946
Orientation:	Horizontal

>	5/7 Envelope	Parameter Value	Comments / Warnings
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Name:	G7 Partition 1
Multiplier:	1
Type of envelope:	Wall
Connects space to:	Conditioned adjoining space
Construction:	<a href="#">"PARTITION 1"</a>
Envelope area [m2]:	20.60276
Orientation:	East

>	6/7 Envelope	Parameter Value	Comments / Warnings
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Name:	G7 Partition 2
Multiplier:	1
Type of envelope:	Wall
Connects space to:	Conditioned adjoining space
Construction:	<a href="#">"PARTITION 1"</a>
Envelope area [m2]:	20.60962
Orientation:	West

>	7/7 Envelope	Parameter Value	Comments / Warnings
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Name:	G7 Partition 4
Multiplier:	1
Type of envelope:	Wall
Connects space to:	Conditioned adjoining space
Construction:	<a href="#">"PARTITION 1"</a>
Envelope area [m2]:	54.94608
Orientation:	North

>	7/7 Zone	Parameter Value	Comments / Warnings
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**General**

Name:	G8
Multiplier:	1
Activity:	Circulation area (corridors and stairways)
Area [m2]:	20.877
Height [m]:	4.239423
Air permeability at 50pa [m3/hm2]:	10

**HVAC and HWS**

HWS Generator:	<a href="#">"Default DHW"</a>
Deadleg length [m]:	0

**Ventilation and Exhaust**

Zonal ventilation type:	Natural Supply
Mechanical exhaust:	NO
Destratification fans:	NO



Activity requires high pressure drop air treatment: NO

### Lighting (General)

Lighting information: UNKNOWN

Lamp type: C-T05-F-T-H

Efficient lamps for display lighting: NO

### Lighting (Controls)

Light controls: MANUAL

Automatic daylight zoning: YES

Occupancy sensing: NONE

Time switching for display lighting: NONE

### Global Psi Values [W/mK] for Junctions Involving Metal Cladding

Roof-Wall: 0.6

Wall-Ground floor: 1.15

Wall-Wall (corner): 0.25

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 1.27

Sill below window: 1.27

Jamb at window or door: 1.27

### Global Psi Values [W/mK] for Junctions Not Involving Metal Cladding

Roof-Wall: 0.12

Wall-Ground floor: 0.16

Wall-Wall (corner): 0.09

Wall-Floor (not ground floor): 0.07

Lintel above window or door: 0.3

Sill below window: 0.04

Jamb at window or door: 0.05

>	>	>	1/13 Envelope	Parameter Value	Comments / Warnings
			Name:	G8 Wall 1	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	3.3182	
			Orientation:	East	

>	>	>	2/13 Envelope	Parameter Value	Comments / Warnings
			Name:	G8 Wall 3	
			Multiplier:	1	
			Type of envelope:	Wall	
			Connects space to:	Exterior	
			Construction:	<a href="#">"EXPWALL 3"</a>	
			Envelope area [m2]:	4.680951	
			Orientation:	East	

>	>	>	>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
				Name:	G8 Window 3	
				Multiplier:	1	
				Glazing Type:	<a href="#">"WINDOW 3"</a>	

U-value for window inclination [W/m2K]:	1.8
Area [m2]:	3.9307
Ratio between developed and projected area:	1
Display window:	NO
Shading system:	All other cases
Transmission factor:	0.8

>	3/13 Envelope	Parameter Value	Comments / Warnings
	Name:	G8 Wall 4	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 3"</a>	
	Envelope area [m2]:	10.80811	
	Orientation:	South	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G8 Window 4	
	Multiplier:	1	
	Glazing Type:	<a href="#">"WINDOW 3"</a>	
	U-value for window inclination [W/m2K]:	1.8	
	Area [m2]:	8.1052	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	0.8	

>	4/13 Envelope	Parameter Value	Comments / Warnings
	Name:	G8 Wall 5	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 3"</a>	
	Envelope area [m2]:	4.863051	
	Orientation:	West	

>	1/1 Window/Rooflight	Parameter Value	Comments / Warnings
	Name:	G8 Window 5	
	Multiplier:	1	
	Glazing Type:	<a href="#">"WINDOW 3"</a>	
	U-value for window inclination [W/m2K]:	1.8	
	Area [m2]:	3.9537	
	Ratio between developed and projected area:	1	
	Display window:	NO	
	Shading system:	All other cases	
	Transmission factor:	0.8	

>	5/13 Envelope	Parameter Value	Comments / Warnings
	Name:	G8 Wall 6	
	Multiplier:	1	
	Type of envelope:	Wall	
	Connects space to:	Exterior	
	Construction:	<a href="#">"EXPWALL 3"</a>	
	Envelope area [m2]:	10.3917	
	Orientation:	West	

>	>	>	<b>6/13 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G8 Wall 7	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Exterior	
.	.	.	Construction:	<a href="#">"EXPWALL 3"</a>	
.	.	.	Envelope area [m2]:	4.9914	
.	.	.	Orientation:	South	

>	>	>	<b>7/13 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G8 Wall 9	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Exterior	
.	.	.	Construction:	<a href="#">"EXPWALL 3"</a>	
.	.	.	Envelope area [m2]:	5.5319	
.	.	.	Orientation:	West	

>	>	>	>	<b>1/1 Window/Rooflight</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	.	Name:	G8 Window 9	
.	.	.	.	Multiplier:	1	
.	.	.	.	Glazing Type:	<a href="#">"WINDOW 3"</a>	
.	.	.	.	U-value for window inclination [W/m2K]:	1.8	
.	.	.	.	Area [m2]:	1.4124	
.	.	.	.	Ratio between developed and projected area:	1	
.	.	.	.	Display window:	NO	
.	.	.	.	Shading system:	All other cases	
.	.	.	.	Transmission factor:	0.8	

>	>	>	<b>8/13 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G8 Exposed Roof 1	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Roof	
.	.	.	Flat roof:	NO	
.	.	.	Connects space to:	Exterior	
.	.	.	Construction:	<a href="#">"EXPROOF 1"</a>	
.	.	.	Envelope area [m2]:	2.832	
.	.	.	Orientation:	West	

>	>	>	<b>9/13 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G8 Exposed Roof 2	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Roof	
.	.	.	Flat roof:	NO	
.	.	.	Connects space to:	Exterior	
.	.	.	Construction:	<a href="#">"EXPROOF 1"</a>	
.	.	.	Envelope area [m2]:	3.453	
.	.	.	Orientation:	East	

>	>	>	<b>10/13 Envelope</b>	<b>Parameter Value</b>	<b>Comments / Warnings</b>
.	.	.	Name:	G8 Exposed Floor 1	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Floor or Ceiling	
.	.	.	Connects space to:	Underground	

U-value for ground floor [W/m2K]:	0.15
Construction:	<a href="#">"EXPFLOOR 1"</a>
Envelope area [m2]:	20.877
Orientation:	Horizontal

>	>	>	11/13 Envelope	Parameter Value	Comments / Warnings
.	.	.	Name:	G8 Internal Ceiling 1	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Floor or Ceiling	
.	.	.	Connects space to:	Conditioned adjoining space	
.	.	.	Construction:	<a href="#">"INTCEIL 1"</a>	
.	.	.	Envelope area [m2]:	14.988	
.	.	.	Orientation:	Horizontal	

>	>	>	12/13 Envelope	Parameter Value	Comments / Warnings
.	.	.	Name:	G8 Partition 1	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Conditioned adjoining space	
.	.	.	Construction:	<a href="#">"PARTITION 1"</a>	
.	.	.	Envelope area [m2]:	21.6529	
.	.	.	Orientation:	North	

>	>	>	13/13 Envelope	Parameter Value	Comments / Warnings
.	.	.	Name:	G8 Partition 2	
.	.	.	Multiplier:	1	
.	.	.	Type of envelope:	Wall	
.	.	.	Connects space to:	Conditioned adjoining space	
.	.	.	Construction:	<a href="#">"PARTITION 1"</a>	
.	.	.	Envelope area [m2]:	12.6524	
.	.	.	Orientation:	East	

BR Compliance / EPC Generation	Parameter Value	Comments / Warnings
Analysis for building regulations compliance:	Scottish Building Regulations	
Analysis for asset rating:	EPC Scotland	
Building designed and built following Accredited Construction Details (Scotland):	YES	

# SBEM Main Calculation Output Document

Wed Jan 14 11:14:12 2009

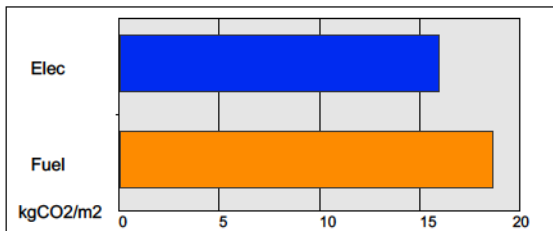
Building name

## Unit 1 Site B

Building type: Workshops/maintenance depot

SBEM is an energy calculation tool for the purpose of assessing and demonstrating compliance with Building Regulations (Part L for England and Wales, Section 6 for Scotland, Part F for Northern Ireland and Part L for Republic of Ireland) and to produce Energy Performance Certificates and Building Energy Ratings. Although the data produced by the tool may be of use in the design process, **SBEM is not intended as a building design tool.**

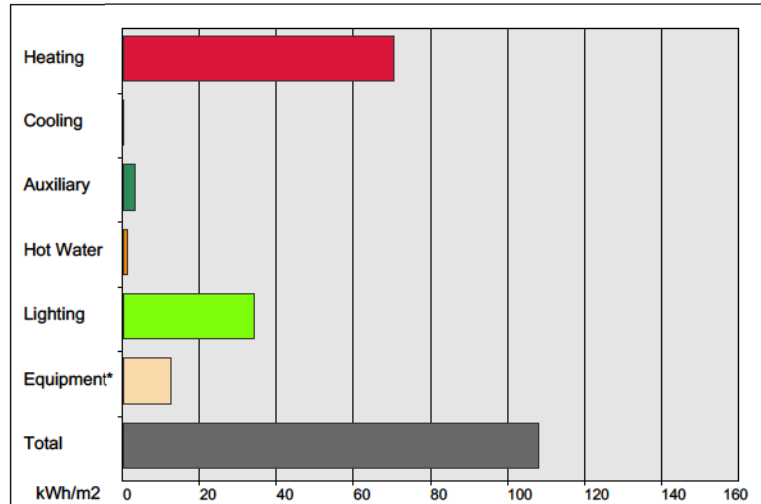
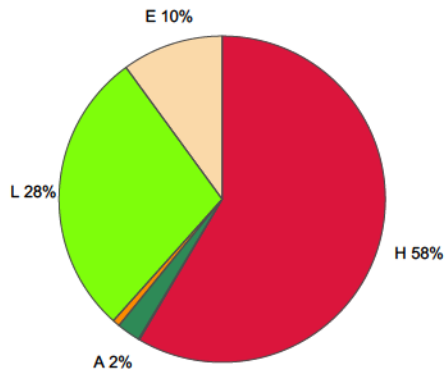
### Building Energy Performance and CO2 emissions



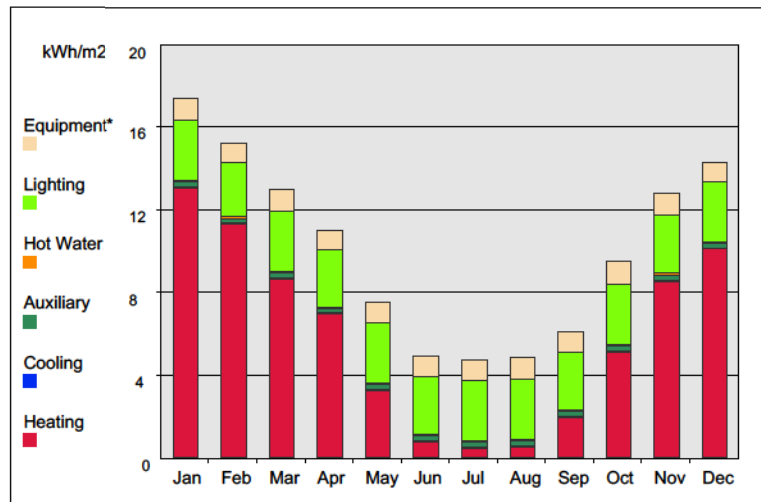
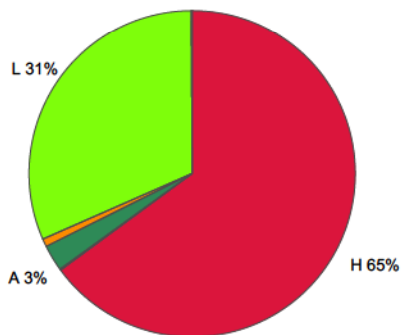
0 kgCO2/m2 displaced by the use of renewable sources.

Building area is 1177.55m2

### Annual Energy Consumption



(Pie chart excluding Equipment end-use)



(\*) Although energy consumption by equipment is shown in the graphs, the CO2 emissions associated with this end-use have not been taken into account when producing the rating.

Energy Performance Certificate	Building Energy Performance		Scotland
	Calculated asset rating using DDB PartL v24.21 [SBEM]	Building type Workshops/maintenance depot	Current rating
	<b>Carbon Neutral</b>	<b>Excellent</b>	
	<b>A</b> (0 to 15)		
	<b>B</b> (16 to 30)		
	<b>C</b> (31 to 45)	<b>C+</b>	
	<b>D</b> (46 to 60)		
	<b>E</b> (61 to 80)		
	<b>F</b> (81 to 100)		
	<b>G</b> (100+)	<b>Very Poor</b>	
<b>Carbon Dioxide Emissions</b> The number refers to the calculated carbon dioxide emissions in terms of kg per m <sup>2</sup> of floor area per year		<b>34</b>	
Approximate current energy use per m <sup>2</sup> of floor area:		<b>108 kWh/m<sup>2</sup></b>	
Main heating fuel: Oil		Building Services: Heating with Nat. Vent.	
Renewable energy source:		Electricity: Grid supplied	
<b>Carbon Dioxide is a greenhouse gas which contributes to climate change. Less Carbon Dioxide emissions from buildings helps the environment.</b>			
<b>Benchmarks</b>			
A building of this type built to building regulations standards current at the date of issue of this certificate would have a rating:		<b>40</b>	<b>C</b>
Where the accompanying recommendations for the cost effective improvement of energy performance are applied, this building would have a rating:		<b>0</b>	<b>??</b>
<b>Recommendations for the cost-effective improvement (lower cost measures) of the energy performance</b>			
1. Some spaces have a significant risk of overheating. Consider solar control measures such as the application of reflective coating or shading devices to windows.		4. Add weather compensation controls to heating system.	
2. Add optimum start/stop to the heating system.		5. Add local time control to heating system.	
3. The default heat generator efficiency is chosen. It is recommended that the heat generator system be investigated to gain an understanding of its efficiency and possible improvements.		6. Consider installing building mounted wind turbine(s).	

Address: Unit 1, Site B, Kintore Business Park, Carnhill, AB51 0YQ  
 Conditioned area (m<sup>2</sup>): 1178  
 Name of protocol organisation: Stroma, [000148]  
 Date of issue of certificate: 14 Jan 2009 (Valid for a period not exceeding 10 years)

This certificate is a requirement of EU Directive 2002/91/EC on the energy performance of buildings.

**NB THIS CERTIFICATE MUST BE AFFIXED TO THE BUILDING AND NOT REMOVED UNLESS REPLACED WITH AN UPDATED VERSION AND FOR PUBLIC BUILDINGS DISPLAYED IN A PROMINENT PLACE**

**Building Address:**

Unit 1  
Site B  
Kintore Business Park  
Carnhill  
AB51 0YQ

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Building Type(s): Workshops/maintenance depot

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<b>ADMINISTRATIVE INFORMATION</b>	
Issue Date:	14 Jan 2009
Valid Until:	13 Jan 2019 (*)
Total Useful Floor Area (m <sup>2</sup> ):	1178
Calculation Tool Used:	DDB PartL v24.21 using calculation engine SBEM v3.2.b

<b>QUALIFIED/ACCREDITED PERSON DETAILS</b>	
Person Name:	Jon Ponting
Employer/Trading Address:	Kemble Enterprise Park, GL7 6BQ
Protocol Organisation:	Stroma
Membership Number:	000148

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## 1. Background

Building (Scotland) Act 2003 and Statutory Instrument 2007 No. 534, *The Building (Scotland) Amendment Regulations 2006*, transposes the requirements of Articles 7.2 and 7.3 of the Energy Performance of Buildings Directive 2002/91/EC.

This Recommendation Report is the Additional advice in clause 6.9.3 of the Scottish Building Standards Non-domestic Technical Handbook which may be provided. Cost effective improvements should be inserted into the Recommendations section of the Energy Performance Certificate.

This section provides general information regarding the building:

Total Useful Floor Area (m <sup>2</sup> ):	1178
Building services:	Heating and Natural Ventilation

## 2. Introduction

This Recommendation Report was produced in line with the Government's approved methodology and is based on calculation tool DDB PartL v24.21 using calculation engine SBEM v3.2.b .

In accordance with Government's current guidance, the Qualified / Accredited Person did undertake a walk around survey of the building prior to producing this Recommendation Report.

### 3. Recommendations

The following sections list recommendations selected by the Qualified / Accredited Person for the improvement of the energy performance of the building. The recommendations are listed under four headings: short payback, medium payback, long payback, and other measures.

#### ***a) Recommendations with a short payback***

This section lists recommendations with a payback of less than 3 years:

<b>Recommendation</b>	<b>Potential impact</b>
Some spaces have a significant risk of overheating. Consider solar control measures such as the application of reflective coating or shading devices to windows.	MEDIUM
Add optimum start/stop to the heating system.	HIGH
The default heat generator efficiency is chosen. It is recommended that the heat generator system be investigated to gain an understanding of its efficiency and possible improvements.	HIGH

#### ***b) Recommendations with a medium payback***

This section lists recommendations with a payback of between 3 and 7 years:

<b>Recommendation</b>	<b>Potential impact</b>
Add weather compensation controls to heating system.	HIGH
Add local time control to heating system.	HIGH

#### ***c) Recommendations with a long payback***

This section lists recommendations with a payback of more than 7 years:

<b>Recommendation</b>	<b>Potential impact</b>
Consider installing building mounted wind turbine(s).	LOW
Consider installing solar water heating.	LOW
Consider installing PV.	LOW

***d) Other recommendations***

This section lists other recommendations selected by the Qualified / Accredited Person, based on an understanding of the building, and / or based on a valid existing energy report.

No recommendations defined by the qualified/accredited person have been identified

## **4. Next steps**

### ***a) Implementing recommendations***

The recommendations are provided as an indication of opportunities that appear to exist to improve the building's energy efficiency.

The calculation tool has automatically produced a set of recommendations, which the Qualified / Accredited Person has reviewed in the light of his / her knowledge of the building and its use. The Qualified / Accredited Person may have comments on the recommendations based on his / her knowledge of the building and its use.

The Qualified / Accredited Person may have inserted additional measures in section 3d (Other Recommendations). He / she may have removed some automatically generated recommendations or added additional recommendations.

These recommendations do not include matters relating to operation and maintenance which cannot be identified from the calculation procedure.

### ***b) Legal disclaimer***

The advice provided in this Recommendation Report is intended to be for information only. Recipients of this Recommendation Report are advised to seek further detailed professional advice before reaching any decision on how to improve the energy performance of the building.

### ***c) Complaints***

Details of the Qualified / Accredited Person and the relevant protocol organisation are on this report and the energy performance certificate. You can get contact details of the protocol organisation from our website at [www.sbsa.gov.uk/european\\_issues/epcprotocols](http://www.sbsa.gov.uk/european_issues/epcprotocols).

## 5. Glossary

### ***a) Payback***

The payback periods are based on data provided by Good Practice Guides and Carbon Trust energy survey reports and are average figures calculated using a simple payback method. It is assumed that the source data is correct and accurate using up to date information.

The figures have been calculated as an average across a range of buildings and may differ from the actual payback period for the building being assessed. Therefore, it is recommended that each suggested measure be further investigated before reaching any decision on how to improve the energy efficiency of the building.

### ***b) Carbon impact***

The High / Medium / Low carbon impact indicators against each recommendation are provided to distinguish, between the suggested recommendations, those that would have most impact on carbon emissions from the building. For automatically generated recommendations, the carbon impact indicators are determined by software, but may have been adjusted by the Qualified / Accredited Person based on his / her knowledge of the building. The impact of other recommendations are determined by the assessor.

### ***c) Valid report***

A valid report is a report that has been:

- Produced within the past 10 years
- For an existing building, produced by a Qualified / Accredited Person who is accredited to produce Recommendation Reports through a Government Approved protocol agreement