

# Heat Loss Report

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## Project Details

TBD File: Training - Design Sizing.tbd  
Building Name: Training  
Date: Friday, 20 August, 2021

## Heat Loss Breakdown for Zone: B1\_Circulation 1

Floor Area (m<sup>2</sup>): 35.74  
Volume (m<sup>3</sup>): 103.65  
Design External Dry Bulb Temperature (°C): -4.00  
Design Zone Dry Bulb Temperature (°C): 16.00  
Infiltration (ach): 0.15  
Ventilation (ach): 1.05  
Emitter Type: Forced warm air heaters  
Radiant Proportion: 0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Door-frame	0.93	41.22
Door-pane	5.28	235.37
External Wall	55.72	304.22
Ground Floor	38.11	40.12
Internal Floor/Internal Ceiling	36.14	-155.57
Internal Wall	43.07	-222.38

Total Heat Loss Through Fabric (W): 242.98  
Infiltration Loss (W): 105.78  
Ventilation Loss (W): 740.43  
Air Movement Loss (W): 0.00  
Size Fraction: 1.00  
Total Heat Loss for Zone, Including Size Fractions, (W): 1089.18  
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m<sup>2</sup>): 30.47  
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m<sup>3</sup>): 10.51

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Circulation 2

Floor Area (m <sup>2</sup> ):	25.35
Volume (m <sup>3</sup> ):	73.51
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	16.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Door-frame	0.31	14.23
Door-pane	1.76	81.35
External Wall	5.98	33.89
Ground Floor	25.99	33.26
Internal Floor/Internal Ceiling	25.53	5.61
Internal Wall	56.95	-177.79

Total Heat Loss Through Fabric (W):	-9.45
Infiltration Loss (W):	75.01
Ventilation Loss (W):	525.08
Air Movement Loss (W):	-3.88
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	586.77
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	23.15
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	7.98

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Circulation 3

Floor Area (m <sup>2</sup> ):	12.90
Volume (m <sup>3</sup> ):	79.34
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	16.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Ground Floor	13.14	17.13
Internal Wall	75.44	-201.42
Roof	10.89	46.29
Rooflight-frame	0.22	11.40
Rooflight-pane	2.03	80.05

Total Heat Loss Through Fabric (W):	-46.55
Infiltration Loss (W):	80.96
Ventilation Loss (W):	566.74
Air Movement Loss (W):	12.02
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	613.18
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	47.53
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	7.73

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Circulation 4

Floor Area (m <sup>2</sup> ):	76.31
Volume (m <sup>3</sup> ):	221.29
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	16.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Exposed Floor	44.29	197.03
External Wall	18.48	103.99
Internal Floor/Internal Ceiling	32.00	-0.24
Internal Wall	150.44	-693.25
Roof	77.91	328.52

Total Heat Loss Through Fabric (W):	-63.94
Infiltration Loss (W):	225.82
Ventilation Loss (W):	1580.76
Air Movement Loss (W):	-8.13
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1734.50
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	22.73
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	7.84

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 1

Floor Area (m <sup>2</sup> ):	36.90
Volume (m <sup>3</sup> ):	107.02
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	32.83	203.22
Ground Floor	38.18	59.11
Internal Floor/Internal Ceiling	36.90	22.55
Lower Window-frame	0.76	38.78
Lower Window-pane	3.24	79.86
Upper Window -open-frame	0.48	24.49
Upper Window -open-pane	0.72	17.74

Total Heat Loss Through Fabric (W):	445.75
Infiltration Loss (W):	131.05
Ventilation Loss (W):	917.35
Air Movement Loss (W):	-17.13
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1476.98
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	40.02
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.80

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 2

Floor Area (m <sup>2</sup> ):	38.73
Volume (m <sup>3</sup> ):	112.30
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	16.84	105.08
Ground Floor	39.50	63.14
Internal Floor/Internal Ceiling	38.73	10.48
Internal Wall	17.82	91.78
Lower Window-frame	0.38	19.52
Lower Window-pane	1.62	40.21
Upper Window -open-frame	0.24	12.33
Upper Window -open-pane	0.36	8.93

Total Heat Loss Through Fabric (W):	351.47
Infiltration Loss (W):	137.52
Ventilation Loss (W):	962.67
Air Movement Loss (W):	6.25
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1457.94
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	37.65
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	12.98

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 3

Floor Area (m <sup>2</sup> ):	15.93
Volume (m <sup>3</sup> ):	46.19
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	5.55	34.41
Ground Floor	16.20	25.27
Internal Floor/Internal Ceiling	15.93	9.69
Lower Window-frame	0.38	19.41
Lower Window-pane	1.62	39.99
Upper Window -open-frame	0.24	12.26
Upper Window -open-pane	0.36	8.88

Total Heat Loss Through Fabric (W):	149.91
Infiltration Loss (W):	56.56
Ventilation Loss (W):	395.90
Air Movement Loss (W):	-3.69
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	598.64
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	37.59
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	12.96

# Heat Loss Report

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## Heat Loss Breakdown for Zone: B1\_Office 4

Floor Area (m <sup>2</sup> ):	16.71
Volume (m <sup>3</sup> ):	48.47
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Ground Floor	16.76	27.28
Internal Floor/Internal Ceiling	16.71	6.24
Internal Wall	7.69	40.29

Total Heat Loss Through Fabric (W):	73.82
Infiltration Loss (W):	59.35
Ventilation Loss (W):	415.46
Air Movement Loss (W):	26.19
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	574.82
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	34.39
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	11.86



# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 5

Floor Area (m <sup>2</sup> ):	36.36
Volume (m <sup>3</sup> ):	105.45
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	32.56	201.48
Ground Floor	37.63	58.23
Internal Floor/Internal Ceiling	36.36	22.27
Lower Window-frame	0.76	38.78
Lower Window-pane	3.24	79.84
Upper Window -open-frame	0.48	24.49
Upper Window -open-pane	0.72	17.74

Total Heat Loss Through Fabric (W):	442.83
Infiltration Loss (W):	129.13
Ventilation Loss (W):	903.94
Air Movement Loss (W):	-17.44
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1458.49
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	40.11
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.83

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 6

Floor Area (m <sup>2</sup> ):	38.16
Volume (m <sup>3</sup> ):	110.66
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	16.84	105.06
Ground Floor	38.93	62.20
Internal Floor/Internal Ceiling	38.16	10.39
Internal Wall	17.56	90.31
Lower Window-frame	0.38	19.52
Lower Window-pane	1.62	40.21
Upper Window -open-frame	0.24	12.33
Upper Window -open-pane	0.36	8.93

Total Heat Loss Through Fabric (W):	348.95
Infiltration Loss (W):	135.51
Ventilation Loss (W):	948.60
Air Movement Loss (W):	5.91
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1438.96
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	37.71
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.00

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 7

Floor Area (m <sup>2</sup> ):	90.65
Volume (m <sup>3</sup> ):	262.88
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	57.42	358.87
Ground Floor	93.24	150.12
Internal Floor/Internal Ceiling	90.85	49.98
Internal Wall	61.56	154.44
Lower Window-frame	1.14	58.67
Lower Window-pane	4.86	120.86
Upper Window -open-frame	0.72	37.05
Upper Window -open-pane	1.08	26.84

Total Heat Loss Through Fabric (W):	956.83
Infiltration Loss (W):	321.91
Ventilation Loss (W):	2253.36
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	3532.10
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	38.97
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.44

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 8

Floor Area (m <sup>2</sup> ):	52.22
Volume (m <sup>3</sup> ):	151.44
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	21.61	135.81
Ground Floor	53.52	88.04
Internal Floor/Internal Ceiling	52.22	26.45
Internal Wall	60.93	127.89
Lower Window-frame	0.76	39.29
Lower Window-pane	3.24	80.97
Upper Window -open-frame	0.48	24.81
Upper Window -open-pane	0.72	17.98

Total Heat Loss Through Fabric (W):	541.24
Infiltration Loss (W):	185.45
Ventilation Loss (W):	1298.17
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	2024.86
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	38.77
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.37

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 9

Floor Area (m <sup>2</sup> ):	36.90
Volume (m <sup>3</sup> ):	107.02
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	32.83	202.74
Internal Floor/Internal Ceiling	36.90	-22.57
Lower Window-frame	0.76	38.70
Lower Window-pane	3.24	79.69
Roof	38.18	174.99
Upper Window -open-frame	0.48	24.44
Upper Window -open-pane	0.72	17.70

Total Heat Loss Through Fabric (W):	515.70
Infiltration Loss (W):	131.05
Ventilation Loss (W):	917.35
Air Movement Loss (W):	-29.66
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1534.42
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	41.58
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	14.34

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 10

Floor Area (m <sup>2</sup> ):	38.73
Volume (m <sup>3</sup> ):	112.30
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	16.84	105.59
Internal Floor/Internal Ceiling	38.73	-10.48
Internal Wall	17.76	-46.83
Lower Window-frame	0.38	19.60
Lower Window-pane	1.62	40.39
Roof	39.50	183.64
Upper Window -open-frame	0.24	12.38
Upper Window -open-pane	0.36	8.97

Total Heat Loss Through Fabric (W):	313.26
Infiltration Loss (W):	137.52
Ventilation Loss (W):	962.67
Air Movement Loss (W):	28.03
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1441.48
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	37.22
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	12.84

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## Heat Loss Breakdown for Zone: B1\_Office 11

Floor Area (m <sup>2</sup> ):	15.93
Volume (m <sup>3</sup> ):	46.19
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	5.55	34.31
Internal Floor/Internal Ceiling	15.93	-9.69
Lower Window-frame	0.38	19.37
Lower Window-pane	1.62	39.88
Roof	16.20	74.32
Upper Window -open-frame	0.24	12.23
Upper Window -open-pane	0.36	8.86

Total Heat Loss Through Fabric (W):	179.26
Infiltration Loss (W):	56.56
Ventilation Loss (W):	395.90
Air Movement Loss (W):	-9.11
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	622.57
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	39.09
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.48

# Heat Loss Report

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## Heat Loss Breakdown for Zone: B1\_Office 12

Floor Area (m <sup>2</sup> ):	16.71
Volume (m <sup>3</sup> ):	48.47
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Internal Floor/Internal Ceiling	16.71	-6.25
Internal Wall	7.58	29.53
Roof	16.76	77.95

Total Heat Loss Through Fabric (W):	101.23
Infiltration Loss (W):	59.35
Ventilation Loss (W):	415.46
Air Movement Loss (W):	13.20
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	589.23
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	35.26
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	12.16



# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 13

Floor Area (m <sup>2</sup> ):	36.36
Volume (m <sup>3</sup> ):	105.45
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	32.56	201.00
Internal Floor/Internal Ceiling	36.36	-22.28
Lower Window-frame	0.76	38.70
Lower Window-pane	3.24	79.67
Roof	37.63	172.45
Upper Window -open-frame	0.48	24.44
Upper Window -open-pane	0.72	17.70

Total Heat Loss Through Fabric (W):	511.68
Infiltration Loss (W):	129.13
Ventilation Loss (W):	903.94
Air Movement Loss (W):	-29.66
Size Fraction:	1.00
<b>Total Heat Loss for Zone, Including Size Fractions, (W):</b>	<b>1515.16</b>
<b>Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m<sup>2</sup>):</b>	<b>41.67</b>
<b>Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m<sup>3</sup>):</b>	<b>14.37</b>

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## Heat Loss Breakdown for Zone: B1\_Office 14

Floor Area (m <sup>2</sup> ):	38.16
Volume (m <sup>3</sup> ):	110.66
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	16.84	105.58
Internal Floor/Internal Ceiling	38.16	-10.40
Internal Wall	17.50	-46.09
Lower Window-frame	0.38	19.60
Lower Window-pane	1.62	40.38
Roof	38.93	180.98
Upper Window -open-frame	0.24	12.38
Upper Window -open-pane	0.36	8.97

Total Heat Loss Through Fabric (W):	311.40
Infiltration Loss (W):	135.51
Ventilation Loss (W):	948.60
Air Movement Loss (W):	27.28
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1422.85
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	37.29
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	12.86

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 15

Floor Area (m <sup>2</sup> ):	37.04
Volume (m <sup>3</sup> ):	107.41
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	13.85	86.03
Internal Floor/Internal Ceiling	36.84	14.91
Internal Wall	53.02	118.41
Lower Window-frame	0.76	38.91
Lower Window-pane	3.24	80.16
Roof	38.02	175.26
Upper Window -open-frame	0.48	24.57
Upper Window -open-pane	0.72	17.80

Total Heat Loss Through Fabric (W):	556.06
Infiltration Loss (W):	131.53
Ventilation Loss (W):	920.70
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1608.29
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	43.42
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	14.97

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## Heat Loss Breakdown for Zone: B1\_Office 16

Floor Area (m <sup>2</sup> ):	52.22
Volume (m <sup>3</sup> ):	151.44
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	21.61	135.39
Internal Floor/Internal Ceiling	52.22	-26.46
Internal Wall	60.30	97.99
Lower Window-frame	0.76	39.19
Lower Window-pane	3.24	80.75
Roof	53.52	248.66
Upper Window -open-frame	0.48	24.75
Upper Window -open-pane	0.72	17.93

Total Heat Loss Through Fabric (W):	618.19
Infiltration Loss (W):	185.45
Ventilation Loss (W):	1298.17
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	2101.82
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	40.25
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.88

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Office 17

Floor Area (m <sup>2</sup> ):	91.05
Volume (m <sup>3</sup> ):	264.04
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	38.17	237.90
Internal Floor/Internal Ceiling	90.85	-50.00
Internal Wall	79.05	218.16
Lower Window-frame	1.14	58.52
Lower Window-pane	4.86	120.55
Roof	93.11	430.48
Upper Window -open-frame	0.72	36.96
Upper Window -open-pane	1.08	26.77

Total Heat Loss Through Fabric (W):	1079.34
Infiltration Loss (W):	323.34
Ventilation Loss (W):	2263.38
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	3666.07
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	40.26
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	13.88

# Heat Loss Report

## Heat Loss Breakdown for Zone: B1\_Reception 1

Floor Area (m <sup>2</sup> ):	36.64
Volume (m <sup>3</sup> ):	106.26
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	20.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Forced warm air heaters
Radiant Proportion:	0.00

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Curtain wall-frame	1.77	86.21
Curtain wall-pane	33.31	787.84
External Wall	2.60	15.25
Ground Floor	37.99	51.85
Internal Floor/Internal Ceiling	36.84	-14.92
Internal Wall	35.16	0.22

Total Heat Loss Through Fabric (W):	926.45
Infiltration Loss (W):	130.12
Ventilation Loss (W):	910.83
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	1967.40
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	53.70
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	18.52

# Heat Loss Report

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## Heat Loss Breakdown for Zone: B1\_Toilet 1

Floor Area (m <sup>2</sup> ):	15.10
Volume (m <sup>3</sup> ):	43.79
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	18.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Vertical and panel heaters
Radiant Proportion:	0.67

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	7.73	51.46
Internal Floor/Internal Ceiling	14.94	75.70
Internal Wall	42.86	210.72
Roof	15.64	77.23

Total Heat Loss Through Fabric (W):	415.11
Infiltration Loss (W):	49.16
Ventilation Loss (W):	344.11
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	808.38
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	53.53
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	18.46

# Heat Loss Report

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## Heat Loss Breakdown for Zone: B1\_Toilet 2

Floor Area (m <sup>2</sup> ):	14.88
Volume (m <sup>3</sup> ):	43.15
Design External Dry Bulb Temperature (°C):	-4.00
Design Zone Dry Bulb Temperature (°C):	18.00
Infiltration (ach):	0.15
Ventilation (ach):	1.05
Emitter Type:	Vertical and panel heaters
Radiant Proportion:	0.67

### Zone Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
External Wall	7.73	51.45
Internal Floor/Internal Ceiling	14.73	74.48
Internal Wall	42.34	208.00
Roof	15.42	76.10

Total Heat Loss Through Fabric (W):	410.03
Infiltration Loss (W):	48.44
Ventilation Loss (W):	339.05
Air Movement Loss (W):	0.00
Size Fraction:	1.00
Total Heat Loss for Zone, Including Size Fractions, (W):	797.51
Total Heat Loss for Zone Per Unit Area, Including Size Fractions, (W/m <sup>2</sup> ):	53.60
Total Heat Loss for Zone Per Unit Volume, Including Size Fractions, (W/m <sup>3</sup> ):	18.48



# Heat Loss Report

## Heat Loss Summary for Building as a Whole

Heated Building Floor Area (m<sup>2</sup>): 905.68  
 Heated Building Volume (m<sup>3</sup>): 2668.39

### Building Heat Loss Breakdown by Building Element

Building Element Name	Total Surface Area (m <sup>2</sup> )	Heat Loss by Conduction (W)
Curtain wall-frame	1.77	86.21
Curtain wall-pane	33.31	787.84
Door-frame	1.24	55.45
Door-pane	7.04	316.72
Exposed Floor	44.29	197.03
External Wall	460.15	2812.75
Ground Floor	449.18	675.75
Internal Floor/Internal Ceiling	848.74	-0.11
Internal Wall	847.04	0.00
Lower Window-frame	9.88	506.56
Lower Window-pane	42.12	1043.40
Roof	491.72	2246.87
Rooflight-frame	0.22	11.40
Rooflight-pane	2.03	80.05
Upper Window -open-frame	6.24	319.89
Upper Window -open-pane	9.36	231.74

Total Heat Loss Through Fabric (W): 9371.56  
 Infiltration Loss (W): 3161.23  
 Ventilation Loss (W): 22128.64  
 Air Movement Loss (W): 0.20  
 Total Building Heat Loss, Including Size Fractions, (W): 34661.59  
 Total Building Heat Loss Per Unit Area, Including Size Fractions, (W/m<sup>2</sup>): 38.27  
 Total Building Heat Loss Per Unit Volume, Including Size Fractions, (W/m<sup>3</sup>): 12.99

# Heat Loss Report

## Zone by Zone Breakdown Table

Zone	Fabric Heat Loss (W)	Infiltration Loss (W)	Ventilation Loss (W)	Air Movement Loss (W)	Size Fraction	Radiant Proportion	Total Heat Loss (W)
B1_Circulation 1	242.98	105.78	740.43	0.00	1.00	0.00	1089.18
B1_Circulation 2	-9.45	75.01	525.08	-3.88	1.00	0.00	586.77
B1_Circulation 3	-46.55	80.96	566.74	12.02	1.00	0.00	613.18
B1_Circulation 4	-63.94	225.82	1580.76	-8.13	1.00	0.00	1734.50
B1_Office 1	445.75	131.05	917.35	-17.13	1.00	0.00	1476.98
B1_Office 2	351.47	137.52	962.67	6.25	1.00	0.00	1457.94
B1_Office 3	149.91	56.56	395.90	-3.69	1.00	0.00	598.64
B1_Office 4	73.82	59.35	415.46	26.19	1.00	0.00	574.82
B1_Office 5	442.83	129.13	903.94	-17.44	1.00	0.00	1458.49
B1_Office 6	348.95	135.51	948.60	5.91	1.00	0.00	1438.96
B1_Office 7	956.83	321.91	2253.36	0.00	1.00	0.00	3532.10
B1_Office 8	541.24	185.45	1298.17	0.00	1.00	0.00	2024.86
B1_Office 9	515.70	131.05	917.35	-29.66	1.00	0.00	1534.42
B1_Office 10	313.26	137.52	962.67	28.03	1.00	0.00	1441.48
B1_Office 11	179.26	56.56	395.90	-9.11	1.00	0.00	622.57
B1_Office 12	101.23	59.35	415.46	13.20	1.00	0.00	589.23
B1_Office 13	511.68	129.13	903.94	-29.66	1.00	0.00	1515.16
B1_Office 14	311.40	135.51	948.60	27.28	1.00	0.00	1422.85
B1_Office 15	556.06	131.53	920.70	0.00	1.00	0.00	1608.29
B1_Office 16	618.19	185.45	1298.17	0.00	1.00	0.00	2101.82
B1_Office 17	1079.34	323.34	2263.38	0.00	1.00	0.00	3666.07
B1_Reception 1	926.45	130.12	910.83	0.00	1.00	0.00	1967.40
B1_Toilet 1	415.11	49.16	344.11	0.00	1.00	0.67	808.38
B1_Toilet 2	410.03	48.44	339.05	0.00	1.00	0.67	797.51