Air System Sizing Summary for Rest - Floor 1 Zone 1

Project Name: Project 113 — 11/09/2024
Prepared by: Engineer's Team — 11:49AM

Air System Information

Air System Name	**Rest - Floor 1 Zone 1**		Number of zones	**1**
Equipment Class	**SPLT AHU**		Floor Area	**1829.8** ft²
Air System Type	**SZCAV**		Location	**London - Kew, United Kingdom**

Sizing Calculation Information

Calculation Months	**Jan to Dec**		Zone CFM Sizing	**Sum of space airflow rates**
Sizing Data	**Calculated**		Space CFM Sizing	**Individual peak space loads**

Central Cooling Coil Sizing Data

Total coil load	**6.7**	Tons	Load occurs at	**Aug 1600**	
Total coil load	**80.9**	MBH	OA DB / WB	**82.4 / 68.0**	°F
Sensible coil load	**67.3**	MBH	Entering DB / WB	**76.6 / 63.8**	°F
Coil CFM at Aug 1600	**3045**	CFM	Leaving DB / WB	**56.1 / 54.7**	°F
Max block CFM	**3045**	CFM	Coil ADP	**53.3**	°F
Sum of peak zone CFM	**3045**	CFM	Bypass Factor	**0.120**	
Sensible heat ratio	**0.832**		Resulting RH	**50**	%
CFM/Ton	**451.4**		Design supply temp.	**55.0**	°F
ft²/Ton	**271.3**		Zone T-stat Check	**1 of 1**	OK
BTU/(hr·ft²)	**44.2**		Max zone temperature deviation	**0.0**	°F
Water flow @ 10.0 °F rise	**N/A**				

Central Heating Coil Sizing Data

Max coil load	**64.8**	MBH	Load occurs at	**Des Htg**	
Coil CFM at Des Htg	**3045**	CFM	BTU/(hr·ft²)	**35.4**	
Max coil CFM	**3045**	CFM	Ent. DB / Lvg DB	**65.4 / 85.2**	°F
Water flow @ 20.0 °F drop	**N/A**				

Supply Fan Sizing Data

Actual max CFM	**3045**	CFM	Fan motor BHP	**1.67**	BHP
Standard CFM	**3043**	CFM	Fan motor kW	**1.32**	kW
Actual max CFM/ft²	**1.66**	CFM/ft²	Fan static	**2.00**	in wg

Outdoor Ventilation Air Data

Design airflow CFM	**549**	CFM	CFM/person	**10.98**	CFM/person
CFM/ft²	**0.30**	CFM/ft²			

Zone Sizing Summary for Rest - Floor 1 Zone 1

Project Name: Project 113 — 11/09/2024
Prepared by: Engineer's Team — 11:49AM

Air System Information

Air System Name ..... **Rest - Floor 1 Zone 1**
Equipment Class ..... **SPLT AHU**
Air System Type ..... **SZCAV**

Number of zones **1**
Floor Area ..... **1829.8** ft²
Location ..... **London - Kew, United Kingdom**

Sizing Calculation Information

Calculation Months ..... **Jan to Dec**
Sizing Data ..... **Calculated**

Zone CFM Sizing ..... **Sum of space airflow rates**
Space CFM Sizing ..... **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
Zone 1	3045	3045	1.66	0.0	-	0.0	-	0

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft²)
Zone 1	64.0	Jul 1900	56.9	1829.8

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft²)	Space CFM/ft²
Zone 1							
Bar Kitchen	1	33.3	Aug 1600	1541	26.2	1047.1	1.47
Brew KIT	1	5.5	Jun 2100	255	3.1	92.9	2.74
Dining Space	1	12.0	Jun 1900	554	10.0	273.0	2.03
fwc1	1	1.1	Jul 2200	52	1.3	20.1	2.57
fwc2	1	1.0	Jul 2100	47	1.1	18.6	2.53
fwc3	1	1.1	Jul 2100	50	1.3	20.6	2.43
fwc4	1	1.4	Jul 2100	65	1.7	36.4	1.78
KEG Store	1	1.9	Jul 2100	87	2.6	69.3	1.26
Mwc	1	2.5	Jul 2100	118	2.4	66.6	1.77
staff	1	2.2	Jul 2100	101	2.2	50.9	1.99
staff bath	1	1.1	Jul 2100	49	1.2	18.0	2.74
Wash up	1	2.7	Jun 2000	125	3.9	116.3	1.08

Ventilation Sizing Summary for Rest - Floor 1 Zone 1

1. Summary

Ventilation Sizing Method ..... **Sum of Space OA Airflows**
Design Ventilation Airflow Rate ..... **549** CFM

2. Space Ventilation Analysis

Zone Name / Space Name	Mult.	Floor Area (ft²)	Maximum Occupants	Maximum Supply Air (CFM)	Required Outdoor Air (CFM/person)	Required Outdoor Air (CFM/ft²)	Required Outdoor Air (CFM)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (CFM)
Zone 1									
Bar Kitchen	1	1047.1	20.0	1541.4	7.50	0.18	0.0	0.0	338.5
Brew KIT	1	92.9	1.0	254.5	5.00	0.06	0.0	0.0	10.6
Dining Space	1	273.0	15.0	553.7	7.50	0.18	0.0	0.0	161.6
fwc1	1	20.1	1.0	51.7	0.00	0.00	0.0	0.0	0.0
fwc2	1	18.6	1.0	47.1	0.00	0.00	0.0	0.0	0.0
fwc3	1	20.6	1.0	50.0	0.00	0.00	0.0	0.0	0.0
fwc4	1	36.4	1.0	65.0	0.00	0.00	0.0	0.0	0.0
KEG Store	1	69.3	1.0	87.1	5.00	0.12	0.0	0.0	13.3
Mwc	1	66.6	3.0	117.8	0.00	0.00	0.0	0.0	0.0
staff	1	50.9	3.0	101.4	5.00	0.06	0.0	0.0	18.1
staff bath	1	18.0	1.0	49.4	0.00	0.00	0.0	0.0	0.0
Wash up	1	116.3	2.0	125.3	0.00	0.06	0.0	0.0	7.0
Totals (incl. Space Multipliers)				**3044.6**					**549.0**

Air System Design Load Summary for Rest - Floor 1 Zone 1

Project Name: Project 113 11/09/2024
Prepared by: Engineer's Team 11:49AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1600 COOLING OA DB / WB 82.4 °F / 68.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	245 ft²	11952	-	245 ft²	-	-
Wall Transmission	3859 ft²	4068	-	3859 ft²	15889	-
Roof Transmission	1830 ft²	7932	-	1830 ft²	24509	-
Window Transmission	245 ft²	716	-	245 ft²	6522	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	733 ft²	1092	-	733 ft²	9944	-
Floor Transmission	1762 ft²	0	-	1762 ft²	0	-
Partitions	3367 ft²	0	-	3367 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1555 W	4745	-	0	0	-
Task Lighting	1456 W	4657	-	0	0	-
Electric Equipment	1941 W	6386	-	0	0	-
People	50	11108	9760	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	720	930	-	0	0
Safety Factor	15% / 5%	8007	535	0%	0	0
>> Total Zone Loads	-	**61384**	**11225**	-	**56864**	**0**
Zone Conditioning	-	60918	11225	-	56111	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	3045 CFM	0	-	3045 CFM	0	-
Ventilation Load	549 CFM	1904	2375	549 CFM	13231	0
Supply Fan Load	3045 CFM	4514	-	3045 CFM	-4514	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	**67335**	**13599**	-	**64828**	**0**
Central Cooling Coil	-	67335	13604	-	0	0
Central Heating Coil	-	0	-	-	64828	-
>> Total Conditioning	-	**67335**	**13604**	-	**64828**	**0**
Key:	**Positive values are clg loads Negative values are htg loads**			**Positive values are htg loads Negative values are clg loads**		

Zone Design Load Summary for Rest - Floor 1 Zone 1

Project Name: Project 113 11/09/2024
Prepared by: Engineer's Team 11:49AM

Zone 1	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1900 COOLING OA DB / WB 79.5 °F / 67.1 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F		
	OCCUPIED T-STAT 75.0 °F			OCCUPIED T-STAT 70.0 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	245 ft²	8365	-	245 ft²	-	-
Wall Transmission	3859 ft²	5297	-	3859 ft²	15889	-
Roof Transmission	1830 ft²	12716	-	1830 ft²	24509	-
Window Transmission	245 ft²	495	-	245 ft²	6522	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	733 ft²	755	-	733 ft²	9944	-
Floor Transmission	1762 ft²	0	-	1762 ft²	0	-
Partitions	3367 ft²	0	-	3367 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1555 W	4849	-	0	0	-
Task Lighting	1456 W	4715	-	0	0	-
Electric Equipment	1941 W	6429	-	0	0	-
People	50	11317	9760	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	720	930	-	0	0
Safety Factor	15% / 5%	8349	535	0%	0	0
>> Total Zone Loads	**-**	**64007**	**11225**	**-**	**56864**	**0**

TABLE 1.1.A. Component Loads For Space "Bar Kitchen" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1600 COOLING OA DB / WB 82.4 °F / 68.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	165 ft²	10766	-	165 ft²	-	-
Wall Transmission	890 ft²	866	-	890 ft²	3666	-
Roof Transmission	1047 ft²	4538	-	1047 ft²	14023	-
Window Transmission	165 ft²	483	-	165 ft²	4396	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	303 ft²	452	-	303 ft²	4114	-
Floor Transmission	1047 ft²	0	-	1047 ft²	0	-
Partitions	642 ft²	0	-	642 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	890 W	2475	-	0	0	-
Task Lighting	890 W	2725	-	0	0	-
Electric Equipment	838 W	2622	-	0	0	-
People	20	3768	4100	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	240	310	-	0	0
Safety Factor	15% / 5%	4340	221	0%	0	0
>> Total Zone Loads	**-**	**33275**	**4631**	**-**	**26199**	**0**

TABLE 1.1.B. Envelope Loads For Space "Bar Kitchen" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	383	0.091	-	118	-	1576
DOOR	184	0.300	-	275	-	2500
S EXPOSURE						
WALL	393	0.091	-	609	-	1617
WINDOW 1	119	0.588	0.811	347	7732	3157
WINDOW 2	47	0.588	0.811	136	3033	1239
DOOR	84	0.300	-	125	-	1139
E EXPOSURE						
WALL	40	0.091	-	63	-	165
DOOR	35	0.300	-	52	-	475
W EXPOSURE						
WALL	75	0.091	-	76	-	309
H EXPOSURE						
ROOF	1047	0.296	-	4538	-	14023

TABLE 1.2.A. Component Loads For Space "Brew KIT" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 2100 COOLING OA DB / WB 75.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	391 ft²	644	-	391 ft²	1609	-
Roof Transmission	93 ft²	671	-	93 ft²	1248	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	1	-	18 ft²	237	-
Floor Transmission	92 ft²	0	-	92 ft²	0	-
Partitions	205 ft²	0	-	205 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	79 W	269	-	0	0	-
Task Lighting	79 W	269	-	0	0	-
Electric Equipment	700 W	2388	-	0	0	-
People	1	295	455	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	240	310	-	0	0
Safety Factor	15% / 5%	717	38	0%	0	0
>> Total Zone Loads	**-**	**5494**	**803**	**-**	**3094**	**0**

TABLE 1.2.B. Envelope Loads For Space "Brew KIT" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	68	0.091	-	51	-	281
S EXPOSURE						
WALL	68	0.091	-	116	-	281
E EXPOSURE						
WALL	118	0.091	-	237	-	487
DOOR	18	0.300	-	1	-	237
W EXPOSURE						
WALL	136	0.091	-	240	-	559
H EXPOSURE						
ROOF	93	0.296	-	671	-	1248

TABLE 1.3.A. Component Loads For Space "Dining Space" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1900 COOLING OA DB / WB 78.5 °F / 67.1 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	Details	(BTU/hr)	(BTU/hr)	Details	(BTU/hr)	(BTU/hr)
Window & Skylight Solar Loads	80 ft²	2015	-	80 ft²	-	-
Wall Transmission	368 ft²	493	-	368 ft²	1514	-
Roof Transmission	273 ft²	1961	-	273 ft²	3656	-
Window Transmission	80 ft²	114	-	80 ft²	2126	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	196 ft²	143	-	196 ft²	2658	-
Floor Transmission	273 ft²	0	-	273 ft²	0	-
Partitions	143 ft²	0	-	143 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	232 W	792	-	0	0	-
Task Lighting	232 W	792	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	15	3675	3075	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	240	310	-	0	0
Safety Factor	15% / 5%	1559	169	0%	0	0
>> Total Zone Loads	-	11954	3554	-	9954	0

TABLE 1.3.B. Envelope Loads For Space "Dining Space" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	116	0.091	-	77	-	478
WINDOW 1	80	0.588	0.811	114	2015	2126
S EXPOSURE						
WALL	51	0.091	-	78	-	209
DOOR	123	0.300	-	89	-	1661
E EXPOSURE						
WALL	89	0.091	-	178	-	366
DOOR	56	0.300	-	41	-	759
W EXPOSURE						
WALL	112	0.091	-	160	-	460
DOOR	18	0.300	-	13	-	237
H EXPOSURE						
ROOF	273	0.296	-	1961	-	3656

TABLE 1.4.A. Component Loads For Space "fwc1" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2200 COOLING OA DB / WB 74.5 °F / 65.5 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	181 ft²	319	-	181 ft²	744	-
Roof Transmission	20 ft²	134	-	20 ft²	269	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	1	-	18 ft²	237	-
Floor Transmission	20 ft²	0	-	20 ft²	0	-
Partitions	170 ft²	0	-	170 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	17 W	58	-	0	0	-
Task Lighting	17 W	58	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	1	230	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	146	6	0%	0	0
>> Total Zone Loads	**-**	**1117**	**126**	**-**	**1251**	**0**

TABLE 1.4.B. Envelope Loads For Space "fwc1" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	28	0.091	-	22	-	117
S EXPOSURE						
WALL	28	0.091	-	55	-	117
E EXPOSURE						
WALL	53	0.091	-	106	-	219
DOOR	18	0.300	-	1	-	237
W EXPOSURE						
WALL	71	0.091	-	137	-	292
H EXPOSURE						
ROOF	20	0.296	-	134	-	269

TABLE 1.5.A. Component Loads For Space "fwc2" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2100 COOLING OA DB / WB 76.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	158 ft²	241	-	158 ft²	649	-
Roof Transmission	19 ft²	129	-	19 ft²	249	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	6	-	18 ft²	237	-
Floor Transmission	19 ft²	0	-	19 ft²	0	-
Partitions	88 ft²	0	-	88 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	16 W	54	-	0	0	-
Task Lighting	16 W	54	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	1	230	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	133	6	0%	0	0
>> Total Zone Loads	**-**	**1017**	**126**	**-**	**1135**	**0**

TABLE 1.5.B. Envelope Loads For Space "fwc2" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	51	0.091	-	37	-	209
S EXPOSURE						
WALL	51	0.091	-	96	-	209
E EXPOSURE						
WALL	37	0.091	-	74	-	151
W EXPOSURE						
WALL	19	0.091	-	34	-	79
DOOR	18	0.300	-	6	-	237
H EXPOSURE						
ROOF	19	0.296	-	129	-	249

TABLE 1.6.A. Component Loads For Space "fwc3" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2100 COOLING OA DB / WB 76.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	188 ft²	269	-	188 ft²	772	-
Roof Transmission	21 ft²	143	-	21 ft²	276	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	6	-	18 ft²	237	-
Floor Transmission	19 ft²	0	-	19 ft²	0	-
Partitions	178 ft²	0	-	178 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	18 W	60	-	0	0	-
Task Lighting	18 W	60	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	1	230	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	141	6	0%	0	0
>> Total Zone Loads	**-**	**1080**	**126**	**-**	**1285**	**0**

TABLE 1.6.B. Envelope Loads For Space "fwc3" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	75	0.091	-	54	-	309
S EXPOSURE						
WALL	75	0.091	-	142	-	309
E EXPOSURE						
WALL	28	0.091	-	55	-	113
W EXPOSURE						
WALL	10	0.091	-	18	-	41
DOOR	18	0.300	-	6	-	237
H EXPOSURE						
ROOF	21	0.296	-	143	-	276

TABLE 1.7.A. Component Loads For Space "fwc4" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2100 COOLING OA DB / WB 76.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	227 ft²	348	-	227 ft²	936	-
Roof Transmission	36 ft²	253	-	36 ft²	487	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	6	-	18 ft²	237	-
Floor Transmission	19 ft²	0	-	19 ft²	0	-
Partitions	194 ft²	0	-	194 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	31 W	106	-	0	0	-
Task Lighting	31 W	106	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	1	230	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	183	6	0%	0	0
>> Total Zone Loads	**-**	**1402**	**126**	**-**	**1661**	**0**

TABLE 1.7.B. Envelope Loads For Space "fwc4" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	72	0.091	-	52	-	295
S EXPOSURE						
WALL	72	0.091	-	136	-	295
E EXPOSURE						
WALL	51	0.091	-	102	-	209
W EXPOSURE						
WALL	33	0.091	-	59	-	137
DOOR	18	0.300	-	6	-	237
H EXPOSURE						
ROOF	36	0.296	-	253	-	487

TABLE 1.8.A. Component Loads For Space "KEG Store" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2100 COOLING OA DB / WB 76.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	343 ft²	505	-	343 ft²	1410	-
Roof Transmission	69 ft²	482	-	69 ft²	928	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	6	-	18 ft²	237	-
Floor Transmission	69 ft²	0	-	69 ft²	0	-
Partitions	360 ft²	0	-	360 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	59 W	201	-	0	0	-
Task Lighting	59 W	201	-	0	0	-
Electric Equipment	3 W	10	-	0	0	-
People	1	230	120	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	245	6	0%	0	0
>> Total Zone Loads	**-**	**1881**	**126**	**-**	**2576**	**0**

TABLE 1.8.B. Envelope Loads For Space "KEG Store" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	124	0.091	-	90	-	511
S EXPOSURE						
WALL	124	0.091	-	236	-	511
E EXPOSURE						
WALL	56	0.091	-	112	-	230
W EXPOSURE						
WALL	38	0.091	-	68	-	158
DOOR	18	0.300	-	6	-	237
H EXPOSURE						
ROOF	69	0.296	-	482	-	928

TABLE 1.9.A. Component Loads For Space "Mwc" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2100 COOLING OA DB / WB 76.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	309 ft²	495	-	309 ft²	1274	-
Roof Transmission	67 ft²	464	-	67 ft²	892	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	6	-	18 ft²	237	-
Floor Transmission	19 ft²	0	-	19 ft²	0	-
Partitions	243 ft²	0	-	243 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	57 W	193	-	0	0	-
Task Lighting	57 W	193	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	3	690	360	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	332	18	0%	0	0
>> Total Zone Loads	**-**	**2543**	**378**	**-**	**2403**	**0**

TABLE 1.9.B. Envelope Loads For Space "Mwc" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	79	0.091	-	57	-	326
S EXPOSURE						
WALL	79	0.091	-	150	-	326
E EXPOSURE						
WALL	84	0.091	-	169	-	347
W EXPOSURE						
WALL	67	0.091	-	118	-	275
DOOR	18	0.300	-	6	-	237
H EXPOSURE						
ROOF	67	0.296	-	464	-	892

TABLE 1.10.A. Component Loads For Space "staff" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2100 COOLING OA DB / WB 76.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	260 ft²	382	-	260 ft²	1071	-
Roof Transmission	51 ft²	354	-	51 ft²	682	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	35 ft²	12	-	35 ft²	475	-
Floor Transmission	51 ft²	0	-	51 ft²	0	-
Partitions	202 ft²	0	-	202 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	43 W	148	-	0	0	-
Task Lighting	43 W	148	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	3	690	360	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	286	18	0%	0	0
>> Total Zone Loads	**-**	**2189**	**378**	**-**	**2227**	**0**

TABLE 1.10.B. Envelope Loads For Space "staff" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	93	0.091	-	67	-	381
S EXPOSURE						
WALL	75	0.091	-	142	-	309
DOOR	18	0.300	-	6	-	237
E EXPOSURE						
WALL	38	0.091	-	75	-	154
DOOR	18	0.300	-	6	-	237
W EXPOSURE						
WALL	55	0.091	-	98	-	226
H EXPOSURE						
ROOF	51	0.296	-	354	-	682

TABLE 1.11.A. Component Loads For Space "staff bath" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 2100 COOLING OA DB / WB 76.0 °F / 66.0 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	**Details**	**(BTU/hr)**	**(BTU/hr)**	**Details**	**(BTU/hr)**	**(BTU/hr)**
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	164 ft²	241	-	164 ft²	676	-
Roof Transmission	18 ft²	125	-	18 ft²	241	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	18 ft²	6	-	18 ft²	237	-
Floor Transmission	18 ft²	0	-	18 ft²	0	-
Partitions	680 ft²	0	-	680 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	15 W	52	-	0	0	-
Task Lighting	15 W	52	-	0	0	-
Electric Equipment	50 W	171	-	0	0	-
People	1	280	270	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	139	14	0%	0	0
>> Total Zone Loads	**-**	**1066**	**284**	**-**	**1154**	**0**

TABLE 1.11.B. Envelope Loads For Space "staff bath" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	62	0.091	-	44	-	254
S EXPOSURE						
WALL	62	0.091	-	117	-	254
E EXPOSURE						
WALL	29	0.091	-	58	-	120
W EXPOSURE						
WALL	12	0.091	-	21	-	48
DOOR	18	0.300	-	6	-	237
H EXPOSURE						
ROOF	18	0.296	-	125	-	241

TABLE 1.12.A. Component Loads For Space "Wash up" In Zone "Zone 1"						
	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 2000 COOLING OA DB / WB 76.8 °F / 66.5 °F OCCUPIED T-STAT 75.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 24.8 °F / 20.8 °F OCCUPIED T-STAT 70.0 °F		
		Sensible	Latent		Sensible	Latent
SPACE LOADS	Details	(BTU/hr)	(BTU/hr)	Details	(BTU/hr)	(BTU/hr)
Window & Skylight Solar Loads	0 ft²	0	-	0 ft²	-	-
Wall Transmission	381 ft²	584	-	381 ft²	1569	-
Roof Transmission	116 ft²	848	-	116 ft²	1557	-
Window Transmission	0 ft²	0	-	0 ft²	0	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	59 ft²	23	-	59 ft²	799	-
Floor Transmission	116 ft²	0	-	116 ft²	0	-
Partitions	263 ft²	0	-	263 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	99 W	337	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	2	560	540	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	15% / 5%	353	27	0%	0	0
>> Total Zone Loads	-	2706	567	-	3926	0

TABLE 1.12.B. Envelope Loads For Space "Wash up" In Zone "Zone 1"						
				COOLING	COOLING	HEATING
	Area	U-Value	Shade	TRANS	SOLAR	TRANS
	(ft²)	(BTU/(hr·ft²·°F))	Coeff.	(BTU/hr)	(BTU/hr)	(BTU/hr)
N EXPOSURE						
WALL	88	0.091	-	62	-	364
S EXPOSURE						
WALL	47	0.091	-	77	-	193
DOOR	41	0.300	-	16	-	561
E EXPOSURE						
WALL	132	0.091	-	264	-	542
W EXPOSURE						
WALL	114	0.091	-	182	-	470
DOOR	18	0.300	-	7	-	237
H EXPOSURE						
ROOF	116	0.296	-	848	-	1557

August DESIGN COOLING DAY, 1600

TABLE 1: SYSTEM DATA

Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	82.4	0.01135	549	400	1904	2375
Ventilation Reclaim	Outlet	79.2	0.01044	549	400	1904	2369
Vent - Return Mixing	Outlet	76.6	0.00969	3045	1232	-	-
Central Cooling Coil	Outlet	56.1	0.00875	3045	1232	67335	13604
Central Heating Coil	Outlet	56.1	0.00875	3045	1232	0	-
Supply Fan	Outlet	57.4	0.00875	3045	1232	4514	-
Cold Supply Duct	Outlet	57.4	0.00875	3045	1232	-	-
Zone Air	-	76.0	0.00953	3045	1415	60918	11225
Return Plenum	Outlet	76.0	0.00953	3045	1415	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4743.8 BTU/(hr-CFM)
Site Altitude = 16.4 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	61384	Cooling	60918	76.0	3045	1415	0	0

WINTER DESIGN HEATING

TABLE 1: SYSTEM DATA

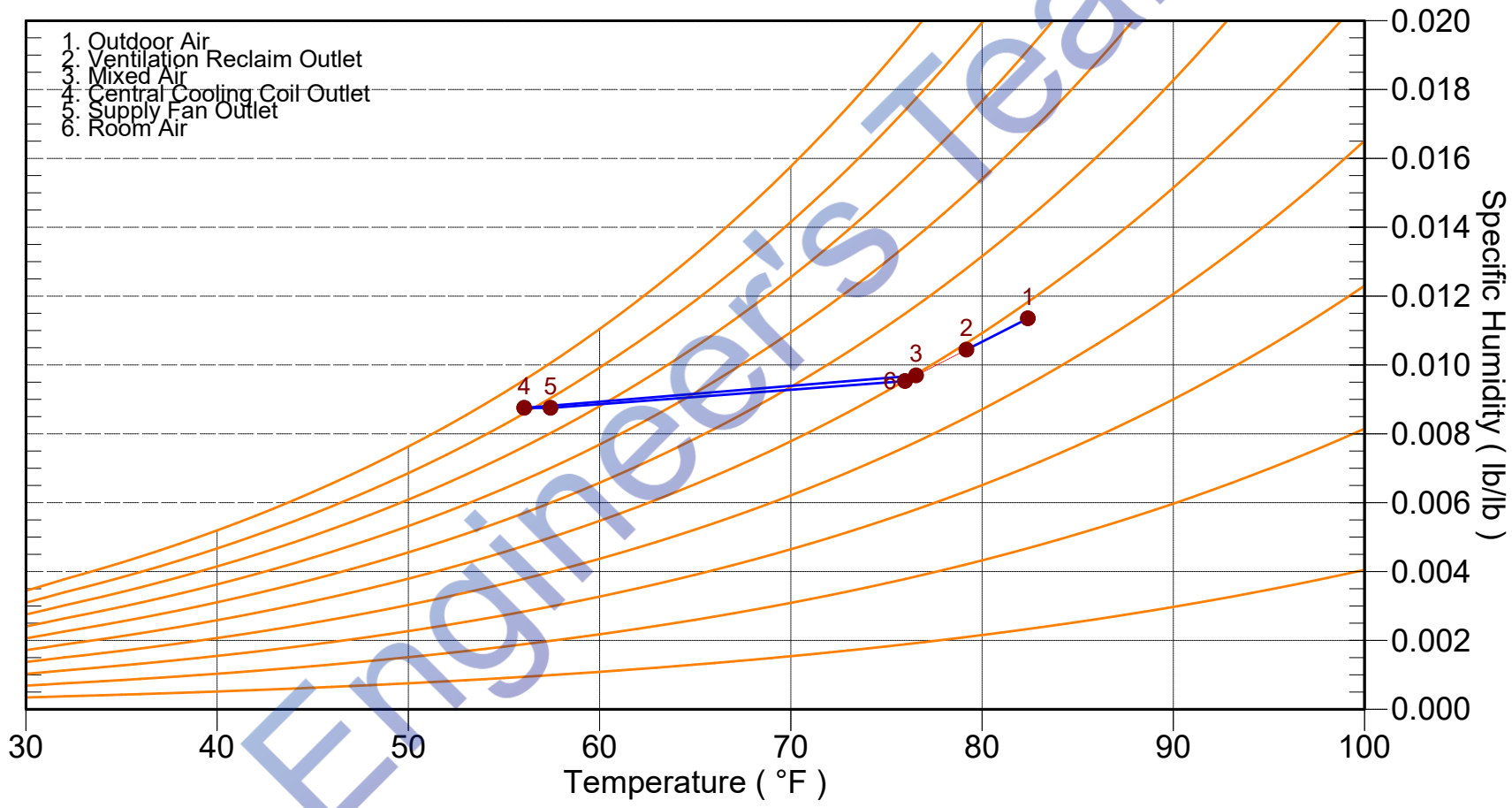
Component	Location	Dry-Bulb Temp (°F)	Specific Humidity (lb/lb)	Airflow (CFM)	CO2 Level (ppm)	Sensible Heat (BTU/hr)	Latent Heat (BTU/hr)
Ventilation Air	Inlet	24.8	0.00134	549	400	-13231	0
Ventilation Reclaim	Outlet	47.1	0.00134	549	400	-13231	0
Vent - Return Mixing	Outlet	65.4	0.00134	3045	445	-	-
Central Cooling Coil	Outlet	65.4	0.00134	3045	445	0	0
Central Heating Coil	Outlet	85.2	0.00134	3045	445	64828	-
Supply Fan	Outlet	86.5	0.00134	3045	445	4514	-
Cold Supply Duct	Outlet	86.5	0.00134	3045	445	-	-
Zone Air	-	69.5	0.00134	3045	455	-56111	0
Return Plenum	Outlet	69.5	0.00134	3045	455	0	-

Air Density x Heat Capacity x Conversion Factor: At sea level = 1.080; At site altitude = 1.079 BTU/(hr-CFM-F)
Air Density x Heat of Vaporization x Conversion Factor: At sea level = 4746.6; At site altitude = 4743.8 BTU/(hr-CFM)
Site Altitude = 16.4 ft

TABLE 2: ZONE DATA

Zone Name	Zone Sensible Load (BTU/hr)	T-stat Mode	Zone Cond (BTU/hr)	Zone Temp (°F)	Zone Airflow (CFM)	CO2 Level (ppm)	Terminal Heating Coil (BTU/hr)	Zone Heating Unit (BTU/hr)
Zone 1	-56864	Heating	-56111	69.5	3045	455	0	0

Location: London - Kew, United Kingdom
Altitude: 16.4 ft.
Data for: August DESIGN COOLING DAY, 1600



Location: London - Kew, United Kingdom
Altitude: 16.4 ft.
Data for: WINTER DESIGN HEATING