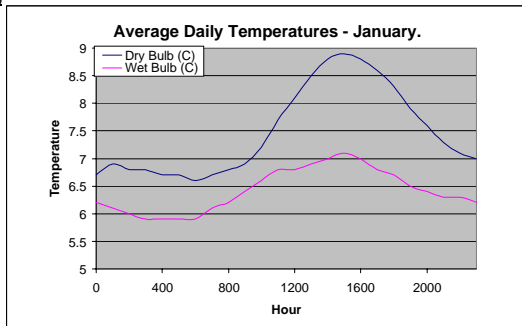


Hour	Dry Bulb (C)	Wet Bulb (C)
0	6.7	6.2
100	6.9	6.1
200	6.8	6
300	6.8	5.9
400	6.7	5.9
500	6.7	5.9
600	6.6	5.9
700	6.7	6.1
800	6.8	6.2
900	6.9	6.4
1000	7.2	6.6
1100	7.7	6.8
1200	8.1	6.8
1300	8.5	6.9
1400	8.8	7
1500	8.9	7.1
1600	8.8	7
1700	8.6	6.8
1800	8.3	6.7
1900	7.9	6.5
2000	7.6	6.4
2100	7.3	6.3
2200	7.1	6.3
2300	7	6.2



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
100	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.062		100.157 kW
200	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
300	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
400	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
500	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
600	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
700	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
800	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
900	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
1000	53.0 kW R	39.0 C	53.0 kW R	28.4 kW	1.87	0.0 kW R	0.0 kW	0		£2.499	100.157 kW
1100	54.0 kW R	39.0 C	54.0 kW R	28.9 kW	1.87	0.0 kW R	0.0 kW	0		£2.543	100.157 kW
1200	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0		£2.587	100.157 kW
1300	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0		£2.684	100.157 kW
1400	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0		£2.684	100.157 kW
1500	58.0 kW R	39.0 C	58.0 kW R	31.1 kW	1.86	0.0 kW R	0.0 kW	0		£2.736	100.157 kW
1600	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0		£2.684	100.157 kW
1700	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0		£2.684	100.157 kW
1800	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.640	100.157 kW
1900	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0		£2.587	100.157 kW
2000	54.0 kW R	39.0 C	54.0 kW R	28.9 kW	1.87	0.0 kW R	0.0 kW	0		£2.543	100.157 kW
2100	53.0 kW R	39.0 C	53.0 kW R	28.4 kW	1.87	0.0 kW R	0.0 kW	0		£2.499	100.157 kW
2200	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
2300	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
TOTAL				686.1 kW			0.0 kW		£8.36	£41.11	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£259.15	£1,274.38	£1,533.53

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£190.84	£964.51	£1,155.35

RETROFIT COST SAVING

£378.18

EFFICIENCY INCREASE (%)

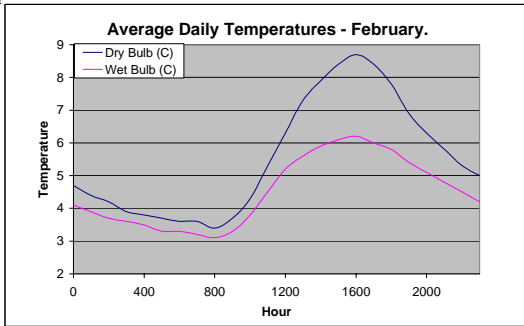
33.3

CHANGE IN KW HOURS FOR MONTH (kW/H)

5310.3

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETRO II CHILLER 1 DUTY (kW Ref)	RETRO II CHILLER 1 ABS (Kw)	RETRO II CHILLER 1 COP	RETRO II CHILLER 2 DUTY (kW Ref)	RETRO II CHILLER 2 ABS (kW)	RETRO II CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	51.0 kW R	27.7 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£0.768		118.376 kW
100	52.0 kW R	27.9 C	52.0 kW R	20.6 kW	2.52	0.0 kW R	0.0 kW	0	£0.787		118.107 kW
200	51.0 kW R	27.8 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£0.768		118.241 kW
300	51.0 kW R	27.8 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£0.768		118.241 kW
400	51.0 kW R	27.7 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£0.768		118.376 kW
500	51.0 kW R	27.7 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£0.768		118.376 kW
600	51.0 kW R	27.6 C	51.0 kW R	20.0 kW	2.55	0.0 kW R	0.0 kW	0	£0.764		118.511 kW
700	51.0 kW R	27.7 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£0.768		118.376 kW
800	51.0 kW R	27.8 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0		£1.769	118.241 kW
900	52.0 kW R	27.9 C	52.0 kW R	20.6 kW	2.52	0.0 kW R	0.0 kW	0		£1.813	118.107 kW
1000	53.0 kW R	28.2 C	53.0 kW R	21.1 kW	2.51	0.0 kW R	0.0 kW	0		£1.857	117.703 kW
1100	54.0 kW R	28.7 C	54.0 kW R	21.8 kW	2.48	0.0 kW R	0.0 kW	0		£1.918	117.030 kW
1200	55.0 kW R	29.1 C	55.0 kW R	22.4 kW	2.46	0.0 kW R	0.0 kW	0		£1.971	116.491 kW
1300	57.0 kW R	29.5 C	57.0 kW R	23.4 kW	2.44	0.0 kW R	0.0 kW	0		£2.059	115.952 kW
1400	57.0 kW R	29.8 C	57.0 kW R	23.6 kW	2.42	0.0 kW R	0.0 kW	0		£2.077	115.548 kW
1500	58.0 kW R	29.9 C	58.0 kW R	24.1 kW	2.41	0.0 kW R	0.0 kW	0		£2.121	115.414 kW
1600	57.0 kW R	29.8 C	57.0 kW R	23.6 kW	2.42	0.0 kW R	0.0 kW	0		£2.077	115.548 kW
1700	57.0 kW R	29.6 C	57.0 kW R	23.5 kW	2.43	0.0 kW R	0.0 kW	0		£2.068	115.818 kW
1800	56.0 kW R	29.3 C	56.0 kW R	22.9 kW	2.45	0.0 kW R	0.0 kW	0		£2.015	116.222 kW
1900	55.0 kW R	28.9 C	55.0 kW R	22.3 kW	2.47	0.0 kW R	0.0 kW	0		£1.962	116.760 kW
2000	54.0 kW R	28.6 C	54.0 kW R	21.7 kW	2.49	0.0 kW R	0.0 kW	0		£1.909	117.164 kW
2100	53.0 kW R	28.3 C	53.0 kW R	21.2 kW	2.5	0.0 kW R	0.0 kW	0		£1.865	117.568 kW
2200	52.0 kW R	28.1 C	52.0 kW R	20.7 kW	2.51	0.0 kW R	0.0 kW	0		£1.821	117.837 kW
2300	52.0 kW R	28.0 C	52.0 kW R	20.6 kW	2.52	0.0 kW R	0.0 kW	0		£1.813	117.972 kW
TOTAL				514.8			0.0 kW		£6.16	£31.11	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	4.7	4.1
100	4.4	3.9
200	4.2	3.7
300	3.9	3.6
400	3.8	3.5
500	3.7	3.3
600	3.6	3.3
700	3.6	3.2
800	3.4	3.1
900	3.7	3.3
1000	4.3	3.8
1100	5.3	4.5
1200	6.3	5.2
1300	7.3	5.6
1400	7.9	5.9
1500	8.4	6.1
1600	8.7	6.2
1700	8.4	6
1800	7.8	5.8
1900	6.9	5.4
2000	6.3	5.1
2100	5.8	4.8
2200	5.3	4.5
2300	5	4.2



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	45.0 kW R	39.0 C	45.0 kW R	24.1 kW	1.87	0.0 kW R	0.0 kW	0	£0.920		100.157 kW
100	44.0 kW R	39.0 C	44.0 kW R	23.6 kW	1.86	0.0 kW R	0.0 kW	0	£0.901		100.157 kW
200	44.0 kW R	39.0 C	44.0 kW R	23.6 kW	1.86	0.0 kW R	0.0 kW	0	£0.901		100.157 kW
300	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.878		100.157 kW
400	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
500	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
600	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
700	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
800	41.0 kW R	39.0 C	41.0 kW R	22.0 kW	1.86	0.0 kW R	0.0 kW	0		£1.936	100.157 kW
900	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0		£1.980	100.157 kW
1000	44.0 kW R	39.0 C	44.0 kW R	23.6 kW	1.86	0.0 kW R	0.0 kW	0		£2.077	100.157 kW
1100	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.217	100.157 kW
1200	50.0 kW R	39.0 C	50.0 kW R	26.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.358	100.157 kW
1300	53.0 kW R	39.0 C	53.0 kW R	28.4 kW	1.87	0.0 kW R	0.0 kW	0		£2.499	100.157 kW
1400	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0		£2.587	100.157 kW
1500	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.640	100.157 kW
1600	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0		£2.684	100.157 kW
1700	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.640	100.157 kW
1800	54.0 kW R	39.0 C	54.0 kW R	28.9 kW	1.87	0.0 kW R	0.0 kW	0		£2.543	100.157 kW
1900	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
2000	50.0 kW R	39.0 C	50.0 kW R	26.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.358	100.157 kW
2100	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.261	100.157 kW
2200	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.217	100.157 kW
2300	46.0 kW R	39.0 C	46.0 kW R	24.6 kW	1.87	0.0 kW R	0.0 kW	0		£2.165	100.157 kW
TOTAL				611.7 kW			0.0 kW		£7.04	£37.81	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£218.19	£1,165.81	£1,384.01

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£153.43	£856.49	£1,009.93

RETROFIT COST SAVING

£374.08

EFFICIENCY INCREASE (%)

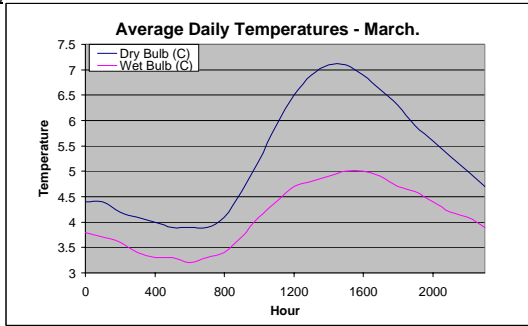
37.9

CHANGE IN kW HOURS FOR MONTH (kW/H)

5211.1

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	45.0 kW R	26.0 C	45.0 kW R	17.0 kW	2.65	0.0 kW R	0.0 kW	0	£0.649		120.665 kW
100	44.0 kW R	26.0 C	44.0 kW R	16.6 kW	2.65	0.0 kW R	0.0 kW	0	£0.634		120.665 kW
200	44.0 kW R	26.0 C	44.0 kW R	16.6 kW	2.65	0.0 kW R	0.0 kW	0	£0.634		120.665 kW
300	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0	£0.619		120.665 kW
400	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
500	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
600	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
700	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
800	41.0 kW R	26.0 C	41.0 kW R	15.5 kW	2.64	0.0 kW R	0.0 kW	0		£1.364	120.665 kW
900	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0		£1.390	120.665 kW
1000	44.0 kW R	26.0 C	44.0 kW R	16.6 kW	2.65	0.0 kW R	0.0 kW	0		£1.461	120.665 kW
1100	47.0 kW R	26.3 C	47.0 kW R	17.9 kW	2.63	0.0 kW R	0.0 kW	0		£1.575	120.261 kW
1200	50.0 kW R	27.3 C	50.0 kW R	19.5 kW	2.56	0.0 kW R	0.0 kW	0		£1.716	118.915 kW
1300	53.0 kW R	28.3 C	53.0 kW R	21.2 kW	2.5	0.0 kW R	0.0 kW	0		£1.865	117.568 kW
1400	55.0 kW R	28.9 C	55.0 kW R	22.3 kW	2.47	0.0 kW R	0.0 kW	0		£1.962	116.750 kW
1500	56.0 kW R	29.4 C	56.0 kW R	23.0 kW	2.43	0.0 kW R	0.0 kW	0		£2.024	116.087 kW
1600	57.0 kW R	29.7 C	57.0 kW R	23.6 kW	2.42	0.0 kW R	0.0 kW	0		£2.077	115.683 kW
1700	56.0 kW R	29.4 C	56.0 kW R	23.0 kW	2.43	0.0 kW R	0.0 kW	0		£2.024	116.087 kW
1800	54.0 kW R	28.8 C	54.0 kW R	21.8 kW	2.48	0.0 kW R	0.0 kW	0		£1.918	116.895 kW
1900	52.0 kW R	27.9 C	52.0 kW R	20.6 kW	2.52	0.0 kW R	0.0 kW	0		£1.813	118.107 kW
2000	50.0 kW R	27.3 C	50.0 kW R	19.5 kW	2.56	0.0 kW R	0.0 kW	0		£1.716	118.915 kW
2100	48.0 kW R	26.8 C	48.0 kW R	18.5 kW	2.59	0.0 kW R	0.0 kW	0		£1.628	119.588 kW
2200	47.0 kW R	26.3 C	47.0 kW R	17.9 kW	2.63	0.0 kW R	0.0 kW	0		£1.575	120.261 kW
2300	46.0 kW R	26.0 C	46.0 kW R	17.3 kW	2.66	0.0 kW R	0.0 kW	0		£1.522	120.665 kW
TOTAL				443.6			0.0 kW		£4.95	£27.63	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	4.4	3.8
100	4.4	3.7
200	4.2	3.6
300	4.1	3.4
400	4	3.3
500	3.9	3.3
600	3.9	3.2
700	3.9	3.3
800	4.1	3.4
900	4.6	3.7
1000	5.2	4.1
1100	5.9	4.4
1200	6.5	4.7
1300	6.9	4.8
1400	7.1	4.9
1500	7.1	5
1600	6.9	5
1700	6.6	4.9
1800	6.3	4.7
1900	5.9	4.6
2000	5.6	4.4
2100	5.3	4.2
2200	5	4.1
2300	4.7	3.9



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	44.0 kW R	39.0 C	44.0 kW R	23.8 kW	1.86	0.0 kW R	0.0 kW	0	£0.901		100.157 kW
100	44.0 kW R	39.0 C	44.0 kW R	23.6 kW	1.86	0.0 kW R	0.0 kW	0	£0.901		100.157 kW
200	44.0 kW R	39.0 C	44.0 kW R	23.6 kW	1.86	0.0 kW R	0.0 kW	0	£0.901		100.157 kW
300	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.878		100.157 kW
400	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.878		100.157 kW
500	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.878		100.157 kW
600	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.878		100.157 kW
700	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.878		100.157 kW
800	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.024	100.157 kW
900	45.0 kW R	39.0 C	45.0 kW R	24.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.121	100.157 kW
1000	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.217	100.157 kW
1100	49.0 kW R	39.0 C	49.0 kW R	26.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.305	100.157 kW
1200	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
1300	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
1400	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
1500	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
1600	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.446	100.157 kW
1700	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
1800	50.0 kW R	39.0 C	50.0 kW R	26.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.358	100.157 kW
1900	49.0 kW R	39.0 C	49.0 kW R	26.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.305	100.157 kW
2000	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.251	100.157 kW
2100	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.217	100.157 kW
2200	46.0 kW R	39.0 C	46.0 kW R	24.6 kW	1.87	0.0 kW R	0.0 kW	0		£2.165	100.157 kW
2300	45.0 kW R	39.0 C	45.0 kW R	24.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.121	100.157 kW
TOTAL				602.7 kW			0.0 kW		£7.10	£36.68	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£219.97	£1,137.17	£1,357.14

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£154.85	£822.40	£977.25

RETROFIT COST SAVING

£379.89

EFFICIENCY INCREASE (%)

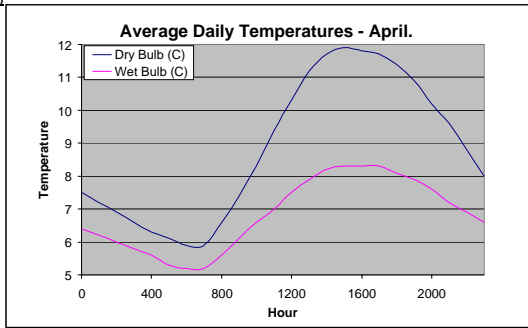
39.4

CHANGE IN KW HOURS FOR MONTH (KW/H)

5282.4

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	44.0 kW R	26.0 C	44.0 kW R	16.8 kW	2.65	0.0 kW R	0.0 kW	0	£0.634		120.665 kW
100	44.0 kW R	26.0 C	44.0 kW R	16.6 kW	2.65	0.0 kW R	0.0 kW	0	£0.634		120.665 kW
200	44.0 kW R	26.0 C	44.0 kW R	16.6 kW	2.65	0.0 kW R	0.0 kW	0	£0.634		120.665 kW
300	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0	£0.619		120.665 kW
400	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0	£0.619		120.665 kW
500	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0	£0.619		120.665 kW
600	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0	£0.619		120.665 kW
700	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0	£0.619		120.665 kW
800	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0		£1.425	120.665 kW
900	45.0 kW R	26.0 C	45.0 kW R	17.0 kW	2.65	0.0 kW R	0.0 kW	0		£1.496	120.665 kW
1000	47.0 kW R	26.2 C	47.0 kW R	17.8 kW	2.64	0.0 kW R	0.0 kW	0		£1.566	120.396 kW
1100	49.0 kW R	26.9 C	49.0 kW R	18.9 kW	2.59	0.0 kW R	0.0 kW	0		£1.663	119.453 kW
1200	51.0 kW R	27.5 C	51.0 kW R	20.0 kW	2.55	0.0 kW R	0.0 kW	0		£1.760	118.645 kW
1300	52.0 kW R	27.9 C	52.0 kW R	20.6 kW	2.52	0.0 kW R	0.0 kW	0		£1.813	118.107 kW
1400	52.0 kW R	28.1 C	52.0 kW R	20.7 kW	2.51	0.0 kW R	0.0 kW	0		£1.821	117.837 kW
1500	52.0 kW R	28.1 C	52.0 kW R	20.7 kW	2.51	0.0 kW R	0.0 kW	0		£1.821	117.837 kW
1600	52.0 kW R	27.9 C	52.0 kW R	20.6 kW	2.52	0.0 kW R	0.0 kW	0		£1.813	118.107 kW
1700	51.0 kW R	27.6 C	51.0 kW R	20.0 kW	2.55	0.0 kW R	0.0 kW	0		£1.760	118.511 kW
1800	50.0 kW R	27.3 C	50.0 kW R	19.5 kW	2.56	0.0 kW R	0.0 kW	0		£1.716	118.915 kW
1900	49.0 kW R	26.9 C	49.0 kW R	18.9 kW	2.59	0.0 kW R	0.0 kW	0		£1.663	119.453 kW
2000	48.0 kW R	26.6 C	48.0 kW R	18.4 kW	2.61	0.0 kW R	0.0 kW	0		£1.619	119.857 kW
2100	47.0 kW R	26.3 C	47.0 kW R	17.9 kW	2.63	0.0 kW R	0.0 kW	0		£1.575	120.261 kW
2200	46.0 kW R	26.0 C	46.0 kW R	17.3 kW	2.66	0.0 kW R	0.0 kW	0		£1.522	120.665 kW
2300	45.0 kW R	26.0 C	45.0 kW R	17.0 kW	2.65	0.0 kW R	0.0 kW	0		£1.496	120.665 kW
TOTAL				432.3			0.0 kW		£5.00	£26.53	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	7.5	6.4
100	7.2	6.2
200	6.9	6
300	6.6	5.8
400	6.3	5.6
500	6.1	5.3
600	5.9	5.2
700	5.9	5.2
800	6.6	5.6
900	7.4	6.1
1000	8.3	6.6
1100	9.4	7
1200	10.3	7.5
1300	11.2	7.9
1400	11.7	8.2
1500	11.9	8.3
1600	11.8	8.3
1700	11.7	8.3
1800	11.4	8.1
1900	10.9	7.9
2000	10.2	7.6
2100	9.6	7.2
2200	8.8	6.9
2300	8	6.6



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	54.0 kW R	39.0 C	54.0 kW R	28.9 kW	1.87	0.0 kW R	0.0 kW	0	£1.104		100.157 kW
100	53.0 kW R	39.0 C	53.0 kW R	28.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.085		100.157 kW
200	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.062		100.157 kW
300	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.043		100.157 kW
400	50.0 kW R	39.0 C	50.0 kW R	26.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.023		100.157 kW
500	49.0 kW R	39.0 C	49.0 kW R	26.2 kW	1.87	0.0 kW R	0.0 kW	0	£1.001		100.157 kW
600	49.0 kW R	39.0 C	49.0 kW R	26.2 kW	1.87	0.0 kW R	0.0 kW	0	£1.001		100.157 kW
700	49.0 kW R	39.0 C	49.0 kW R	26.2 kW	1.87	0.0 kW R	0.0 kW	0	£1.001		100.157 kW
800	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
900	53.0 kW R	39.0 C	53.0 kW R	28.4 kW	1.87	0.0 kW R	0.0 kW	0		£2.499	100.157 kW
1000	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.640	100.157 kW
1100	59.0 kW R	39.0 C	59.0 kW R	31.6 kW	1.87	0.0 kW R	0.0 kW	0		£2.780	100.157 kW
1200	62.0 kW R	39.0 C	62.0 kW R	33.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.921	100.157 kW
1300	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.062	100.157 kW
1400	66.0 kW R	39.0 C	66.0 kW R	35.3 kW	1.87	0.0 kW R	0.0 kW	0		£3.106	100.157 kW
1500	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.159	100.157 kW
1600	66.0 kW R	39.0 C	66.0 kW R	35.3 kW	1.87	0.0 kW R	0.0 kW	0		£3.106	100.157 kW
1700	66.0 kW R	39.0 C	66.0 kW R	35.3 kW	1.87	0.0 kW R	0.0 kW	0		£3.106	100.157 kW
1800	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.062	100.157 kW
1900	64.0 kW R	39.0 C	64.0 kW R	34.3 kW	1.87	0.0 kW R	0.0 kW	0		£3.018	100.157 kW
2000	62.0 kW R	39.0 C	62.0 kW R	33.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.921	100.157 kW
2100	60.0 kW R	39.0 C	60.0 kW R	32.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.824	100.157 kW
2200	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0		£2.684	100.157 kW
2300	55.0 kW R	39.0 C	55.0 kW R	29.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.587	100.157 kW
TOTAL				739.2 kW			0.0 kW		£8.32	£46.88	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£257.85	£1,422.22	£1,680.07

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£189.07	£1,137.17	£1,326.24

RETROFIT COST SAVING

£353.83

EFFICIENCY INCREASE (%)

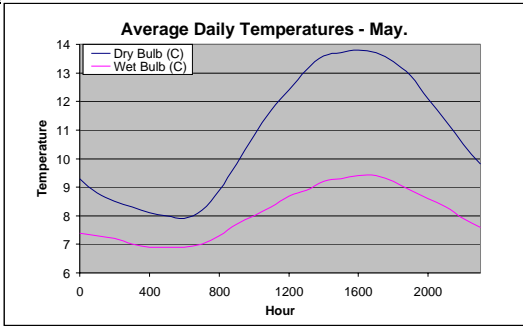
28.2

CHANGE IN KW HOURS FOR MONTH (KW/H)

5040.6

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	54.0 kW R	28.5 C	54.0 kW R	21.7 kW	2.49	0.0 kW R	0.0 kW	0	£0.828		117.299 kW
100	53.0 kW R	28.2 C	53.0 kW R	21.1 kW	2.51	0.0 kW R	0.0 kW	0	£0.806		117.703 kW
200	52.0 kW R	27.9 C	52.0 kW R	20.6 kW	2.52	0.0 kW R	0.0 kW	0	£0.787		118.107 kW
300	51.0 kW R	27.6 C	51.0 kW R	20.0 kW	2.55	0.0 kW R	0.0 kW	0	£0.764		118.511 kW
400	50.0 kW R	27.3 C	50.0 kW R	19.5 kW	2.56	0.0 kW R	0.0 kW	0	£0.745		118.915 kW
500	49.0 kW R	27.1 C	49.0 kW R	19.0 kW	2.58	0.0 kW R	0.0 kW	0	£0.726		119.319 kW
600	49.0 kW R	26.9 C	49.0 kW R	18.9 kW	2.59	0.0 kW R	0.0 kW	0	£0.722		119.453 kW
700	49.0 kW R	26.9 C	49.0 kW R	18.9 kW	2.59	0.0 kW R	0.0 kW	0	£0.722		119.453 kW
800	51.0 kW R	27.6 C	51.0 kW R	20.0 kW	2.55	0.0 kW R	0.0 kW	0		£1.760	118.511 kW
900	53.0 kW R	28.4 C	53.0 kW R	21.2 kW	2.5	0.0 kW R	0.0 kW	0		£1.865	117.433 kW
1000	56.0 kW R	29.3 C	56.0 kW R	22.9 kW	2.45	0.0 kW R	0.0 kW	0		£2.015	116.222 kW
1100	59.0 kW R	30.4 C	59.0 kW R	24.8 kW	2.38	0.0 kW R	0.0 kW	0		£2.182	114.741 kW
1200	62.0 kW R	31.3 C	62.0 kW R	26.7 kW	2.32	0.0 kW R	0.0 kW	0		£2.349	113.529 kW
1300	65.0 kW R	32.2 C	65.0 kW R	28.6 kW	2.27	0.0 kW R	0.0 kW	0		£2.517	112.317 kW
1400	66.0 kW R	32.7 C	66.0 kW R	29.4 kW	2.24	0.0 kW R	0.0 kW	0		£2.587	111.844 kW
1500	67.0 kW R	32.9 C	67.0 kW R	30.0 kW	2.23	0.0 kW R	0.0 kW	0		£2.640	111.375 kW
1600	66.0 kW R	32.8 C	66.0 kW R	29.4 kW	2.24	0.0 kW R	0.0 kW	0		£2.587	111.509 kW
1700	66.0 kW R	32.7 C	66.0 kW R	29.4 kW	2.24	0.0 kW R	0.0 kW	0		£2.587	111.644 kW
1800	65.0 kW R	32.4 C	65.0 kW R	28.7 kW	2.26	0.0 kW R	0.0 kW	0		£2.525	112.048 kW
1900	64.0 kW R	31.9 C	64.0 kW R	27.9 kW	2.29	0.0 kW R	0.0 kW	0		£2.455	112.721 kW
2000	62.0 kW R	31.2 C	62.0 kW R	26.6 kW	2.33	0.0 kW R	0.0 kW	0		£2.341	113.664 kW
2100	60.0 kW R	30.6 C	60.0 kW R	25.4 kW	2.36	0.0 kW R	0.0 kW	0		£2.235	114.471 kW
2200	57.0 kW R	29.8 C	57.0 kW R	23.6 kW	2.42	0.0 kW R	0.0 kW	0		£2.077	115.548 kW
2300	55.0 kW R	29.0 C	55.0 kW R	22.3 kW	2.47	0.0 kW R	0.0 kW	0		£1.962	116.626 kW
TOTAL				576.6			0.0 kW		£6.10	£36.68	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	9.3	7.4
100	8.8	7.3
200	8.5	7.2
300	8.3	7
400	8.1	6.9
500	8	6.9
600	7.9	6.9
700	8.2	7
800	8.9	7.3
900	9.8	7.7
1000	10.8	8
1100	11.7	8.3
1200	12.4	8.7
1300	13.1	8.9
1400	13.6	9.2
1500	13.7	9.3
1600	13.8	9.4
1700	13.7	9.4
1800	13.4	9.2
1900	12.9	8.9
2000	12.1	8.6
2100	11.3	8.3
2200	10.5	7.9
2300	9.8	7.6



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	59.0 kW R	39.0 C	59.0 kW R	31.6 kW	1.87	0.0 kW R	0.0 kW	0	£1.207		100.157 kW
100	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0	£1.165		100.157 kW
200	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0	£1.165		100.157 kW
300	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0	£1.146		100.157 kW
400	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.123		100.157 kW
500	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.123		100.157 kW
600	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.123		100.157 kW
700	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0	£1.146		100.157 kW
800	58.0 kW R	39.0 C	58.0 kW R	31.1 kW	1.86	0.0 kW R	0.0 kW	0		£2.736	100.157 kW
900	60.0 kW R	39.0 C	60.0 kW R	32.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.824	100.157 kW
1000	63.0 kW R	39.0 C	63.0 kW R	33.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.965	100.157 kW
1100	66.0 kW R	39.0 C	66.0 kW R	35.3 kW	1.87	0.0 kW R	0.0 kW	0		£3.106	100.157 kW
1200	68.0 kW R	39.0 C	68.0 kW R	36.4 kW	1.87	0.0 kW R	0.0 kW	0		£3.203	100.157 kW
1300	70.0 kW R	39.0 C	70.0 kW R	37.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.300	100.157 kW
1400	72.0 kW R	39.0 C	72.0 kW R	38.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.388	100.157 kW
1500	72.0 kW R	39.0 C	72.0 kW R	38.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.388	100.157 kW
1600	72.0 kW R	39.0 C	72.0 kW R	38.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.388	100.157 kW
1700	72.0 kW R	39.0 C	72.0 kW R	38.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.388	100.157 kW
1800	71.0 kW R	39.0 C	71.0 kW R	38.0 kW	1.87	0.0 kW R	0.0 kW	0		£3.344	100.157 kW
1900	70.0 kW R	39.0 C	70.0 kW R	37.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.300	100.157 kW
2000	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.159	100.157 kW
2100	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.062	100.157 kW
2200	63.0 kW R	39.0 C	63.0 kW R	33.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.965	100.157 kW
2300	60.0 kW R	39.0 C	60.0 kW R	32.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.824	100.157 kW
TOTAL				812.9 kW			0.0 kW		£9.20	£50.34	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£285.08	£1,560.51	£1,845.59

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£218.43	£1,310.93	£1,529.36

RETROFIT COST SAVING

£316.24

EFFICIENCY INCREASE (%)

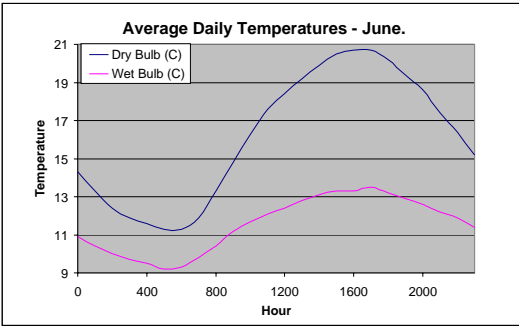
22.2

CHANGE IN kW HOURS FOR MONTH (kW/H)

4581.8

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETROFIT CHILLER 1 DUTY (kW Ref)	RETROFIT CHILLER 1 ABS (kW)	RETROFIT CHILLER 1 COP	RETROFIT CHILLER 2 DUTY (kW Ref)	RETROFIT CHILLER 2 ABS (kW)	RETROFIT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETROFIT CHILLER MAX DUTY (kW Ref)
0	59.0 kW R	30.3 C	59.0 kW R	24.7 kW	2.39	0.0 kW R	0.0 kW	0	£0.943		114.875 kW
100	57.0 kW R	29.8 C	57.0 kW R	23.6 kW	2.42	0.0 kW R	0.0 kW	0	£0.901		115.548 kW
200	57.0 kW R	29.5 C	57.0 kW R	23.4 kW	2.44	0.0 kW R	0.0 kW	0	£0.894		115.952 kW
300	56.0 kW R	29.3 C	56.0 kW R	22.9 kW	2.45	0.0 kW R	0.0 kW	0	£0.875		116.222 kW
400	55.0 kW R	29.1 C	55.0 kW R	22.4 kW	2.46	0.0 kW R	0.0 kW	0	£0.855		116.491 kW
500	55.0 kW R	29.0 C	55.0 kW R	22.3 kW	2.47	0.0 kW R	0.0 kW	0	£0.852		116.626 kW
600	55.0 kW R	28.9 C	55.0 kW R	22.3 kW	2.47	0.0 kW R	0.0 kW	0	£0.852		116.760 kW
700	56.0 kW R	29.2 C	56.0 kW R	22.9 kW	2.45	0.0 kW R	0.0 kW	0	£0.875		116.356 kW
800	58.0 kW R	29.9 C	58.0 kW R	24.1 kW	2.41	0.0 kW R	0.0 kW	0		£2.121	115.414 kW
900	60.0 kW R	30.8 C	60.0 kW R	25.5 kW	2.35	0.0 kW R	0.0 kW	0		£2.244	114.202 kW
1000	63.0 kW R	31.8 C	63.0 kW R	27.4 kW	2.3	0.0 kW R	0.0 kW	0		£2.411	112.856 kW
1100	66.0 kW R	32.7 C	66.0 kW R	29.4 kW	2.24	0.0 kW R	0.0 kW	0		£2.587	111.644 kW
1200	68.0 kW R	33.4 C	68.0 kW R	30.8 kW	2.21	0.0 kW R	0.0 kW	0		£2.710	110.701 kW
1300	70.0 kW R	34.1 C	70.0 kW R	32.2 kW	2.17	0.0 kW R	0.0 kW	0		£2.833	109.759 kW
1400	72.0 kW R	34.6 C	72.0 kW R	33.6 kW	2.14	0.0 kW R	0.0 kW	0		£2.956	109.086 kW
1500	72.0 kW R	34.7 C	72.0 kW R	33.7 kW	2.14	0.0 kW R	0.0 kW	0		£2.965	108.951 kW
1600	72.0 kW R	34.8 C	72.0 kW R	33.7 kW	2.14	0.0 kW R	0.0 kW	0		£2.965	108.816 kW
1700	72.0 kW R	34.7 C	72.0 kW R	33.7 kW	2.14	0.0 kW R	0.0 kW	0		£2.965	108.951 kW
1800	71.0 kW R	34.4 C	71.0 kW R	33.0 kW	2.15	0.0 kW R	0.0 kW	0		£2.904	109.355 kW
1900	70.0 kW R	33.9 C	70.0 kW R	32.1 kW	2.18	0.0 kW R	0.0 kW	0		£2.824	110.028 kW
2000	67.0 kW R	33.1 C	67.0 kW R	30.1 kW	2.23	0.0 kW R	0.0 kW	0		£2.648	111.105 kW
2100	65.0 kW R	32.3 C	65.0 kW R	28.6 kW	2.27	0.0 kW R	0.0 kW	0		£2.517	112.182 kW
2200	63.0 kW R	31.5 C	63.0 kW R	27.2 kW	2.32	0.0 kW R	0.0 kW	0		£2.393	113.260 kW
2300	60.0 kW R	30.8 C	60.0 kW R	25.5 kW	2.35	0.0 kW R	0.0 kW	0		£2.244	114.202 kW
TOTAL				665.1			0.0 kW		£7.05	£42.29	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	14.3	10.9
100	13.3	10.4
200	12.4	10
300	11.9	9.7
400	11.6	9.5
500	11.3	9.2
600	11.3	9.3
700	11.9	9.6
800	13.3	10.4
900	14.8	11.2
1000	16.3	11.7
1100	17.6	12.1
1200	18.4	12.4
1300	19.2	12.8
1400	19.9	13.1
1500	20.5	13.3
1600	20.7	13.3
1700	20.7	13.5
1800	20.2	13.2
1900	19.4	12.9
2000	18.6	12.6
2100	17.4	12.2
2200	16.4	11.9
2300	15.2	11.4



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	ABS (kW)	C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	ABS (kW)	COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	74.0 kW R	39.0 C	74.0 kW R	39.6 kW	1.87	0.0 kW R	0.0 kW	0	£1.512		100.157 kW
100	71.0 kW R	39.0 C	71.0 kW R	38.0 kW	1.87	0.0 kW R	0.0 kW	0	£1.451		100.157 kW
200	68.0 kW R	39.0 C	68.0 kW R	36.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.390		100.157 kW
300	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0	£1.371		100.157 kW
400	66.0 kW R	39.0 C	66.0 kW R	35.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.348		100.157 kW
500	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.329		100.157 kW
600	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.329		100.157 kW
700	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0	£1.371		100.157 kW
800	71.0 kW R	39.0 C	71.0 kW R	38.0 kW	1.87	0.0 kW R	0.0 kW	0		£3.344	100.157 kW
900	75.0 kW R	39.0 C	75.0 kW R	40.2 kW	1.87	0.0 kW R	0.0 kW	0		£3.537	100.157 kW
1000	80.0 kW R	39.0 C	80.0 kW R	42.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.766	100.157 kW
1100	84.0 kW R	39.0 C	84.0 kW R	45.0 kW	1.87	0.0 kW R	0.0 kW	0		£3.960	100.157 kW
1200	86.0 kW R	39.4 C	86.0 kW R	46.5 kW	1.85	0.0 kW R	0.0 kW	0		£4.092	99.634 kW
1300	89.0 kW R	40.2 C	89.0 kW R	49.1 kW	1.81	0.0 kW R	0.0 kW	0		£4.320	98.588 kW
1400	91.0 kW R	40.9 C	91.0 kW R	51.1 kW	1.78	0.0 kW R	0.0 kW	0		£4.496	97.673 kW
1500	93.0 kW R	41.5 C	93.0 kW R	53.0 kW	1.75	0.0 kW R	0.0 kW	0		£4.663	96.889 kW
1600	93.0 kW R	41.7 C	93.0 kW R	53.2 kW	1.75	0.0 kW R	0.0 kW	0		£4.681	96.827 kW
1700	93.0 kW R	41.7 C	93.0 kW R	53.2 kW	1.75	0.0 kW R	0.0 kW	0		£4.681	96.827 kW
1800	92.0 kW R	41.2 C	92.0 kW R	52.0 kW	1.77	0.0 kW R	0.0 kW	0		£4.575	97.281 kW
1900	89.0 kW R	40.4 C	89.0 kW R	49.3 kW	1.81	0.0 kW R	0.0 kW	0		£4.338	98.327 kW
2000	87.0 kW R	39.6 C	87.0 kW R	47.3 kW	1.84	0.0 kW R	0.0 kW	0		£4.162	99.373 kW
2100	83.0 kW R	39.0 C	83.0 kW R	44.4 kW	1.87	0.0 kW R	0.0 kW	0		£3.907	100.157 kW
2200	80.0 kW R	39.0 C	80.0 kW R	42.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.766	100.157 kW
2300	77.0 kW R	39.0 C	77.0 kW R	41.2 kW	1.87	0.0 kW R	0.0 kW	0		£3.625	100.157 kW
TOTAL				1,039.8 kW			0.0 kW		£11.10	£85.91	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£344.16	£2,043.31	£2,387.47

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£290.41	£1,945.93	£2,236.34

RETROFIT COST SAVING

£151.13

EFFICIENCY INCREASE (%)

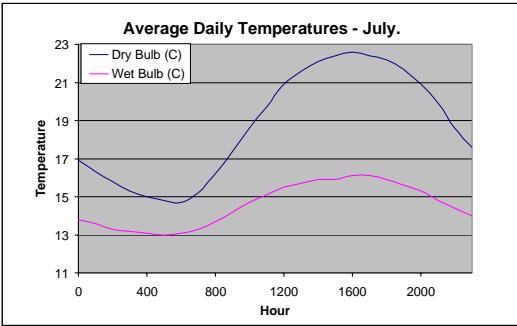
8.5

CHANGE IN KW HOURS FOR MONTH (kW/H)

2514.1

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETROFIT CHILLER 1 DUTY (kW Ref)	RETROFIT CHILLER 1 ABS (kW)	RETROFIT CHILLER 1 COP	RETROFIT CHILLER 2 DUTY (kW Ref)	RETROFIT CHILLER 2 ABS (kW)	RETROFIT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETROFIT CHILLER MAX DUTY (kW Ref)
0	74.0 kW R	35.3 C	74.0 kW R	35.1 kW	2.11	0.0 kW R	0.0 kW	0	£1.340		108.143 kW
100	71.0 kW R	34.3 C	71.0 kW R	32.9 kW	2.16	0.0 kW R	0.0 kW	0	£1.256		109.490 kW
200	68.0 kW R	33.4 C	68.0 kW R	30.8 kW	2.21	0.0 kW R	0.0 kW	0	£1.176		110.701 kW
300	67.0 kW R	32.9 C	67.0 kW R	30.0 kW	2.23	0.0 kW R	0.0 kW	0	£1.146		111.375 kW
400	66.0 kW R	32.6 C	66.0 kW R	29.3 kW	2.25	0.0 kW R	0.0 kW	0	£1.119		111.779 kW
500	65.0 kW R	32.3 C	65.0 kW R	28.6 kW	2.27	0.0 kW R	0.0 kW	0	£1.092		112.182 kW
600	65.0 kW R	32.3 C	65.0 kW R	28.6 kW	2.27	0.0 kW R	0.0 kW	0	£1.092		112.182 kW
700	67.0 kW R	32.9 C	67.0 kW R	30.0 kW	2.23	0.0 kW R	0.0 kW	0	£1.146		111.375 kW
800	71.0 kW R	34.3 C	71.0 kW R	32.9 kW	2.16	0.0 kW R	0.0 kW	0		£2.895	109.490 kW
900	75.0 kW R	35.8 C	75.0 kW R	36.0 kW	2.08	0.0 kW R	0.0 kW	0		£3.168	107.470 kW
1000	80.0 kW R	37.3 C	80.0 kW R	39.9 kW	2	0.0 kW R	0.0 kW	0		£3.511	105.450 kW
1100	84.0 kW R	38.6 C	84.0 kW R	43.2 kW	1.94	0.0 kW R	0.0 kW	0		£3.801	103.700 kW
1200	86.0 kW R	39.4 C	86.0 kW R	45.1 kW	1.91	0.0 kW R	0.0 kW	0		£3.968	102.623 kW
1300	89.0 kW R	40.2 C	89.0 kW R	47.7 kW	1.87	0.0 kW R	0.0 kW	0		£4.197	101.546 kW
1400	91.0 kW R	40.9 C	91.0 kW R	49.6 kW	1.83	0.0 kW R	0.0 kW	0		£4.364	100.603 kW
1500	93.0 kW R	41.5 C	93.0 kW R	51.4 kW	1.81	0.0 kW R	0.0 kW	0		£4.523	99.796 kW
1600	93.0 kW R	41.7 C	93.0 kW R	51.7 kW	1.8	0.0 kW R	0.0 kW	0		£4.549	99.526 kW
1700	93.0 kW R	41.7 C	93.0 kW R	51.7 kW	1.8	0.0 kW R	0.0 kW	0		£4.549	99.526 kW
1800	92.0 kW R	41.2 C	92.0 kW R	50.5 kW	1.82	0.0 kW R	0.0 kW	0		£4.443	100.199 kW
1900	89.0 kW R	40.4 C	89.0 kW R	47.9 kW	1.86	0.0 kW R	0.0 kW	0		£4.215	101.277 kW
2000	87.0 kW R	39.6 C	87.0 kW R	45.9 kW	1.9	0.0 kW R	0.0 kW	0		£4.039	102.354 kW
2100	83.0 kW R	38.4 C	83.0 kW R	42.5 kW	1.95	0.0 kW R	0.0 kW	0		£3.740	103.969 kW
2200	80.0 kW R	37.4 C	80.0 kW R	40.0 kW	2	0.0 kW R	0.0 kW	0		£3.520	105.316 kW
2300	77.0 kW R	36.2 C	77.0 kW R	37.4 kW	2.06	0.0 kW R	0.0 kW	0		£3.291	106.932 kW
TOTAL				958.7			0.0 kW		£9.37	£62.77	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	16.9	13.8
100	16.3	13.6
200	15.8	13.3
300	15.3	13.2
400	15	13.1
500	14.8	13
600	14.7	13.1
700	15.2	13.3
800	16.2	13.7
900	17.4	14.2
1000	18.6	14.7
1100	19.7	15.1
1200	20.9	15.5
1300	21.6	15.7
1400	22.1	15.9
1500	22.4	15.9
1600	22.6	16.1
1700	22.4	16.1
1800	22.2	15.9
1900	21.7	15.6
2000	20.9	15.3
2100	19.9	14.8
2200	18.6	14.4
2300	17.6	14



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	82.0 kW R	39.0 C	82.0 kW R	43.9 kW	1.87	0.0 kW R	0.0 kW	0	£1.677		100.157 kW
100	80.0 kW R	39.0 C	80.0 kW R	42.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.635		100.157 kW
200	78.0 kW R	39.0 C	78.0 kW R	41.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.596		100.157 kW
300	77.0 kW R	39.0 C	77.0 kW R	41.2 kW	1.87	0.0 kW R	0.0 kW	0	£1.573		100.157 kW
400	76.0 kW R	39.0 C	76.0 kW R	40.7 kW	1.87	0.0 kW R	0.0 kW	0	£1.554		100.157 kW
500	75.0 kW R	39.0 C	75.0 kW R	40.2 kW	1.87	0.0 kW R	0.0 kW	0	£1.535		100.157 kW
600	75.0 kW R	39.0 C	75.0 kW R	40.2 kW	1.87	0.0 kW R	0.0 kW	0	£1.535		100.157 kW
700	77.0 kW R	39.0 C	77.0 kW R	41.2 kW	1.87	0.0 kW R	0.0 kW	0	£1.573		100.157 kW
800	80.0 kW R	39.0 C	80.0 kW R	42.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.766	100.157 kW
900	83.0 kW R	39.0 C	83.0 kW R	44.4 kW	1.87	0.0 kW R	0.0 kW	0		£3.907	100.157 kW
1000	87.0 kW R	39.6 C	87.0 kW R	47.3 kW	1.84	0.0 kW R	0.0 kW	0		£4.162	99.373 kW
1100	90.0 kW R	40.7 C	90.0 kW R	50.3 kW	1.79	0.0 kW R	0.0 kW	0		£4.426	97.935 kW
1200	94.0 kW R	41.9 C	94.0 kW R	54.1 kW	1.74	0.0 kW R	0.0 kW	0		£4.760	96.366 kW
1300	96.0 kW R	42.6 C	95.5 kW R	55.9 kW	1.71	0.5 kW R	0.3 kW	1.66		£4.945	95.451 kW
1400	97.0 kW R	43.1 C	94.8 kW R	56.2 kW	1.69	2.2 kW R	1.3 kW	1.69		£5.059	94.797 kW
1500	98.0 kW R	43.4 C	94.4 kW R	56.4 kW	1.67	3.6 kW R	2.1 kW	1.71		£5.147	94.405 kW
1600	99.0 kW R	43.6 C	94.1 kW R	56.5 kW	1.67	4.9 kW R	2.9 kW	1.69		£5.227	94.144 kW
1700	98.0 kW R	43.4 C	94.4 kW R	56.4 kW	1.67	3.6 kW R	2.1 kW	1.71		£5.147	94.405 kW
1800	98.0 kW R	43.2 C	94.7 kW R	56.3 kW	1.68	3.3 kW R	2.0 kW	1.65		£5.130	94.667 kW
1900	96.0 kW R	42.7 C	95.3 kW R	55.9 kW	1.7	0.7 kW R	0.4 kW	1.75		£4.954	95.320 kW
2000	94.0 kW R	41.9 C	94.0 kW R	54.1 kW	1.74	0.0 kW R	0.0 kW	0		£4.760	96.366 kW
2100	91.0 kW R	40.9 C	91.0 kW R	51.1 kW	1.78	0.0 kW R	0.0 kW	0		£4.496	97.673 kW
2200	87.0 kW R	39.6 C	87.0 kW R	47.3 kW	1.84	0.0 kW R	0.0 kW	0		£4.162	99.373 kW
2300	84.0 kW R	39.0 C	84.0 kW R	45.0 kW	1.87	0.0 kW R	0.0 kW	0		£3.960	100.157 kW
TOTAL				1,162.0 kW			11.1 kW		£12.68	£74.01	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£393.05	£2,294.26	£2,687.31

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£358.96	£2,216.25	£2,575.20

RETROFIT COST SAVING

£112.11

EFFICIENCY INCREASE (%)

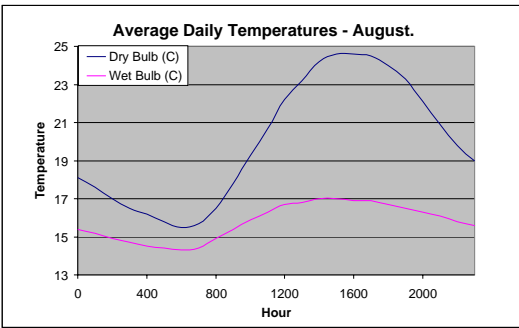
5.1

CHANGE IN kW HOURS FOR MONTH (kW/H)

1779.4

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	82.0 kW R	37.9 C	82.0 kW R	41.5 kW	1.98	0.0 kW R	0.0 kW	0	£1.585		104.643 kW
100	80.0 kW R	37.3 C	80.0 kW R	39.9 kW	2	0.0 kW R	0.0 kW	0	£1.524		105.450 kW
200	78.0 kW R	36.8 C	78.0 kW R	38.4 kW	2.03	0.0 kW R	0.0 kW	0	£1.466		106.124 kW
300	77.0 kW R	36.3 C	77.0 kW R	37.4 kW	2.06	0.0 kW R	0.0 kW	0	£1.428		106.797 kW
400	76.0 kW R	36.0 C	76.0 kW R	36.7 kW	2.07	0.0 kW R	0.0 kW	0	£1.402		107.201 kW
500	75.0 kW R	35.8 C	75.0 kW R	36.0 kW	2.08	0.0 kW R	0.0 kW	0	£1.375		107.470 kW
600	75.0 kW R	35.7 C	75.0 kW R	35.9 kW	2.09	0.0 kW R	0.0 kW	0	£1.371		107.605 kW
700	77.0 kW R	36.2 C	77.0 kW R	37.4 kW	2.06	0.0 kW R	0.0 kW	0	£1.428		106.932 kW
800	80.0 kW R	37.2 C	80.0 kW R	39.8 kW	2.01	0.0 kW R	0.0 kW	0		£3.502	105.585 kW
900	83.0 kW R	38.4 C	83.0 kW R	42.5 kW	1.95	0.0 kW R	0.0 kW	0		£3.740	103.969 kW
1000	87.0 kW R	39.6 C	87.0 kW R	45.9 kW	1.9	0.0 kW R	0.0 kW	0		£4.039	102.354 kW
1100	90.0 kW R	40.7 C	90.0 kW R	48.8 kW	1.84	0.0 kW R	0.0 kW	0		£4.294	100.873 kW
1200	94.0 kW R	41.9 C	94.0 kW R	52.5 kW	1.79	0.0 kW R	0.0 kW	0		£4.619	99.257 kW
1300	96.0 kW R	42.6 C	96.0 kW R	54.6 kW	1.76	0.0 kW R	0.0 kW	0		£4.804	98.315 kW
1400	97.0 kW R	43.1 C	97.0 kW R	55.8 kW	1.74	0.0 kW R	0.0 kW	0		£4.910	97.641 kW
1500	98.0 kW R	43.4 C	97.2 kW R	56.4 kW	1.72	0.8 kW R	0.2 kW	3.98		£4.980	97.237 kW
1600	99.0 kW R	43.6 C	97.0 kW R	56.5 kW	1.72	2.0 kW R	0.6 kW	3.33		£5.024	96.968 kW
1700	98.0 kW R	43.4 C	97.2 kW R	56.4 kW	1.72	0.8 kW R	0.2 kW	3.98		£4.980	97.237 kW
1800	98.0 kW R	43.2 C	97.5 kW R	56.2 kW	1.73	0.5 kW R	0.2 kW	2.49		£4.963	97.507 kW
1900	96.0 kW R	42.7 C	96.0 kW R	54.7 kW	1.75	0.0 kW R	0.0 kW	0		£4.813	98.180 kW
2000	94.0 kW R	41.9 C	94.0 kW R	52.5 kW	1.79	0.0 kW R	0.0 kW	0		£4.619	99.257 kW
2100	91.0 kW R	40.9 C	91.0 kW R	49.6 kW	1.83	0.0 kW R	0.0 kW	0		£4.364	100.603 kW
2200	87.0 kW R	39.6 C	87.0 kW R	45.9 kW	1.9	0.0 kW R	0.0 kW	0		£4.039	102.354 kW
2300	84.0 kW R	38.6 C	84.0 kW R	43.2 kW	1.94	0.0 kW R	0.0 kW	0		£3.801	103.700 kW
TOTAL				1114.5			1.2 kW		£11.58	£71.49	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	18.1	15.4
100	17.6	15.2
200	17	14.9
300	16.5	14.7
400	16.2	14.5
500	15.8	14.4
600	15.5	14.3
700	15.7	14.4
800	16.5	14.9
900	17.8	15.4
1000	19.3	15.9
1100	20.7	16.3
1200	22.2	16.7
1300	23.2	16.8
1400	24.2	17
1500	24.6	17
1600	24.6	16.9
1700	24.5	16.9
1800	24	16.7
1900	23.3	16.5
2000	22.1	16.3
2100	20.9	16.1
2200	19.8	15.8
2300	19	15.6



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	85.0 kW R	39.1 C	85.0 kW R	45.6 kW	1.86	0.0 kW R	0.0 kW	0	£1.741		100.026 kW
100	84.0 kW R	39.0 C	84.0 kW R	45.0 kW	1.87	0.0 kW R	0.0 kW	0	£1.719		100.157 kW
200	82.0 kW R	39.0 C	82.0 kW R	43.9 kW	1.87	0.0 kW R	0.0 kW	0	£1.677		100.157 kW
300	81.0 kW R	39.0 C	81.0 kW R	43.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.657		100.157 kW
400	80.0 kW R	39.0 C	80.0 kW R	42.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.635		100.157 kW
500	78.0 kW R	39.0 C	78.0 kW R	41.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.596		100.157 kW
600	78.0 kW R	39.0 C	78.0 kW R	41.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.596		100.157 kW
700	78.0 kW R	39.0 C	78.0 kW R	41.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.596		100.157 kW
800	81.0 kW R	39.0 C	81.0 kW R	43.4 kW	1.87	0.0 kW R	0.0 kW	0		£3.819	100.157 kW
900	84.0 kW R	39.0 C	84.0 kW R	45.0 kW	1.87	0.0 kW R	0.0 kW	0		£3.960	100.157 kW
1000	89.0 kW R	40.3 C	89.0 kW R	49.2 kW	1.81	0.0 kW R	0.0 kW	0		£4.329	98.456 kW
1100	93.0 kW R	41.7 C	93.0 kW R	53.2 kW	1.75	0.0 kW R	0.0 kW	0		£4.681	96.627 kW
1200	98.0 kW R	43.2 C	94.7 kW R	56.3 kW	1.68	3.3 kW R	2.0 kW	1.65		£5.130	94.667 kW
1300	101.0 kW R	44.2 C	93.4 kW R	56.9 kW	1.64	7.8 kW R	4.6 kW	1.65		£5.411	93.359 kW
1400	104.0 kW R	45.2 C	92.1 kW R	57.5 kW	1.6	11.9 kW R	7.4 kW	1.61		£5.711	92.052 kW
1500	105.0 kW R	45.6 C	91.5 kW R	57.7 kW	1.59	13.5 kW R	8.5 kW	1.59		£5.825	91.529 kW
1600	105.0 kW R	45.6 C	91.5 kW R	57.7 kW	1.59	13.5 kW R	8.5 kW	1.59		£5.825	91.529 kW
1700	105.0 kW R	45.5 C	91.7 kW R	57.7 kW	1.59	13.3 kW R	8.4 kW	1.58		£5.816	91.660 kW
1800	103.0 kW R	45.0 C	92.3 kW R	57.4 kW	1.61	10.7 kW R	6.7 kW	1.6		£5.640	92.314 kW
1900	101.0 kW R	44.3 C	93.2 kW R	56.9 kW	1.64	7.8 kW R	4.8 kW	1.62		£5.429	93.229 kW
2000	97.0 kW R	43.1 C	94.8 kW R	56.2 kW	1.69	2.2 kW R	1.3 kW	1.69		£5.059	94.787 kW
2100	94.0 kW R	41.9 C	94.0 kW R	54.1 kW	1.74	0.0 kW R	0.0 kW	0		£4.760	96.366 kW
2200	90.0 kW R	40.8 C	90.0 kW R	50.4 kW	1.79	0.0 kW R	0.0 kW	0		£4.435	97.804 kW
2300	88.0 kW R	40.0 C	88.0 kW R	48.3 kW	1.82	0.0 kW R	0.0 kW	0		£4.250	98.850 kW
TOTAL				1,204.0 kW			52.2 kW		£13.22	£80.08	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£409.74	£2,482.47	£2,892.21

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£383.94	£2,366.82	£2,750.75

RETROFIT COST SAVING

RETROFIT COST SAVING	£141.46
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EFFICIENCY INCREASE (%)

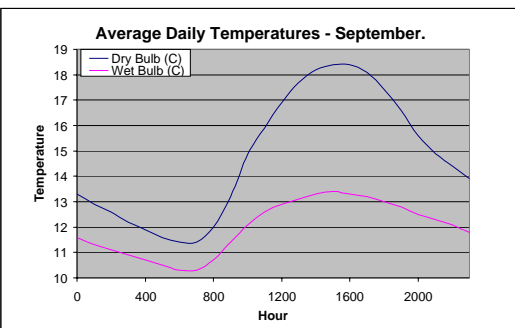
EFFICIENCY INCREASE (%)	5.4
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CHANGE IN KW HOURS FOR MONTH (kWh)

CHANGE IN KW HOURS FOR MONTH (kWh)	1990.2
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Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETROFIT CHILLER 1 DUTY (kW Ref)	RETROFIT CHILLER 1 ABS (kW)	RETROFIT CHILLER 1 COP	RETROFIT CHILLER 2 DUTY (kW Ref)	RETROFIT CHILLER 2 ABS (kW)	RETROFIT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETROFIT CHILLER MAX DUTY (kW Ref)
0	85.0 kW R	39.1 C	85.0 kW R	44.3 kW	1.92	0.0 kW R	0.0 kW	0	£1.692		103.027 kW
100	84.0 kW R	38.6 C	84.0 kW R	43.2 kW	1.94	0.0 kW R	0.0 kW	0	£1.650		103.700 kW
200	82.0 kW R	38.0 C	82.0 kW R	41.6 kW	1.97	0.0 kW R	0.0 kW	0	£1.589		104.508 kW
300	81.0 kW R	37.5 C	81.0 kW R	40.6 kW	2	0.0 kW R	0.0 kW	0	£1.551		105.181 kW
400	80.0 kW R	37.2 C	80.0 kW R	39.8 kW	2.01	0.0 kW R	0.0 kW	0	£1.520		105.585 kW
500	78.0 kW R	36.8 C	78.0 kW R	38.4 kW	2.03	0.0 kW R	0.0 kW	0	£1.466		106.124 kW
600	78.0 kW R	36.5 C	78.0 kW R	38.1 kW	2.05	0.0 kW R	0.0 kW	0	£1.455		106.528 kW
700	78.0 kW R	36.7 C	78.0 kW R	38.3 kW	2.04	0.0 kW R	0.0 kW	0	£1.463		106.258 kW
800	81.0 kW R	37.5 C	81.0 kW R	40.6 kW	2	0.0 kW R	0.0 kW	0		£3.572	105.181 kW
900	84.0 kW R	38.8 C	84.0 kW R	43.4 kW	1.94	0.0 kW R	0.0 kW	0		£3.819	103.431 kW
1000	89.0 kW R	40.3 C	89.0 kW R	47.8 kW	1.86	0.0 kW R	0.0 kW	0		£4.206	101.411 kW
1100	93.0 kW R	41.7 C	93.0 kW R	51.7 kW	1.8	0.0 kW R	0.0 kW	0		£4.549	99.526 kW
1200	98.0 kW R	43.2 C	97.5 kW R	56.2 kW	1.73	0.5 kW R	0.2 kW	2.49		£4.963	97.507 kW
1300	101.0 kW R	44.2 C	96.2 kW R	56.9 kW	1.69	4.8 kW R	1.6 kW	3		£5.147	96.160 kW
1400	104.0 kW R	45.2 C	94.8 kW R	57.5 kW	1.65	9.2 kW R	3.4 kW	2.71		£5.359	94.814 kW
1500	105.0 kW R	45.6 C	94.3 kW R	57.8 kW	1.63	10.7 kW R	4.1 kW	2.61		£5.447	94.275 kW
1600	105.0 kW R	45.6 C	94.3 kW R	57.8 kW	1.63	10.7 kW R	4.1 kW	2.61		£5.447	94.275 kW
1700	105.0 kW R	45.5 C	94.4 kW R	57.7 kW	1.64	10.6 kW R	4.0 kW	2.65		£5.429	94.410 kW
1800	103.0 kW R	45.0 C	95.1 kW R	57.4 kW	1.66	7.9 kW R	2.8 kW	2.82		£5.297	95.083 kW
1900	101.0 kW R	44.3 C	96.0 kW R	56.9 kW	1.69	5.0 kW R	1.7 kW	2.94		£5.156	96.026 kW
2000	97.0 kW R	43.1 C	97.0 kW R	55.8 kW	1.74	0.0 kW R	0.0 kW	0		£4.910	97.641 kW
2100	94.0 kW R	41.9 C	94.0 kW R	52.5 kW	1.79	0.0 kW R	0.0 kW	0		£4.619	99.257 kW
2200	90.0 kW R	40.8 C	90.0 kW R	48.9 kW	1.84	0.0 kW R	0.0 kW	0		£4.303	100.738 kW
2300	88.0 kW R	40.0 C	88.0 kW R	46.9 kW	1.88	0.0 kW R	0.0 kW	0		£4.127	101.815 kW
TOTAL				1170.1			21.9 kW		£12.39	£76.35	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	13.3	11.6
100	12.9	11.3
200	12.6	11.1
300	12.2	10.9
400	11.9	10.7
500	11.6	10.5
600	11.4	10.3
700	11.4	10.3
800	12	10.7
900	13.2	11.4
1000	14.9	12.1
1100	15.9	12.6
1200	16.9	12.9
1300	17.7	13.1
1400	18.2	13.3
1500	18.4	13.4
1600	18.4	13.3
1700	18.1	13.2
1800	17.4	13
1900	16.6	12.8
2000	15.6	12.5
2100	14.9	12.3
2200	14.4	12.1
2300	13.9	11.8



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Ts&tC)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	71.0 kW R	39.0 C	71.0 kW R	38.0 kW	1.87	0.0 kW R	0.0 kW	0	£1.451		100.157 kW
100	70.0 kW R	39.0 C	70.0 kW R	37.5 kW	1.87	0.0 kW R	0.0 kW	0	£1.432		100.157 kW
200	69.0 kW R	39.0 C	69.0 kW R	36.9 kW	1.87	0.0 kW R	0.0 kW	0	£1.409		100.157 kW
300	68.0 kW R	39.0 C	68.0 kW R	36.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.390		100.157 kW
400	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0	£1.371		100.157 kW
500	66.0 kW R	39.0 C	66.0 kW R	35.3 kW	1.87	0.0 kW R	0.0 kW	0	£1.348		100.157 kW
600	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.329		100.157 kW
700	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0	£1.329		100.157 kW
800	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.159	100.157 kW
900	71.0 kW R	39.0 C	71.0 kW R	38.0 kW	1.87	0.0 kW R	0.0 kW	0		£3.344	100.157 kW
1000	76.0 kW R	39.0 C	76.0 kW R	40.7 kW	1.87	0.0 kW R	0.0 kW	0		£3.581	100.157 kW
1100	79.0 kW R	39.0 C	79.0 kW R	42.3 kW	1.87	0.0 kW R	0.0 kW	0		£3.722	100.157 kW
1200	82.0 kW R	39.0 C	82.0 kW R	43.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.863	100.157 kW
1300	84.0 kW R	39.0 C	84.0 kW R	45.0 kW	1.87	0.0 kW R	0.0 kW	0		£3.960	100.157 kW
1400	86.0 kW R	39.2 C	86.0 kW R	46.3 kW	1.86	0.0 kW R	0.0 kW	0		£4.074	99.895 kW
1500	86.0 kW R	39.4 C	86.0 kW R	46.5 kW	1.85	0.0 kW R	0.0 kW	0		£4.092	99.634 kW
1600	86.0 kW R	39.4 C	86.0 kW R	46.5 kW	1.85	0.0 kW R	0.0 kW	0		£4.092	99.634 kW
1700	85.0 kW R	39.1 C	85.0 kW R	45.6 kW	1.86	0.0 kW R	0.0 kW	0		£4.012	100.026 kW
1800	83.0 kW R	39.0 C	83.0 kW R	44.4 kW	1.87	0.0 kW R	0.0 kW	0		£3.907	100.157 kW
1900	81.0 kW R	39.0 C	81.0 kW R	43.4 kW	1.87	0.0 kW R	0.0 kW	0		£3.819	100.157 kW
2000	78.0 kW R	39.0 C	78.0 kW R	41.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.678	100.157 kW
2100	76.0 kW R	39.0 C	76.0 kW R	40.7 kW	1.87	0.0 kW R	0.0 kW	0		£3.581	100.157 kW
2200	74.0 kW R	39.0 C	74.0 kW R	39.6 kW	1.87	0.0 kW R	0.0 kW	0		£3.484	100.157 kW
2300	73.0 kW R	39.0 C	73.0 kW R	39.1 kW	1.87	0.0 kW R	0.0 kW	0		£3.440	100.157 kW
TOTAL				969.3 kW		0.0 kW			£11.06	£59.81	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£342.85	£1,854.01	£2,196.87

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£288.51	£1,718.72	£2,007.23

RETROFIT COST SAVING

£189.63

EFFICIENCY INCREASE (%)

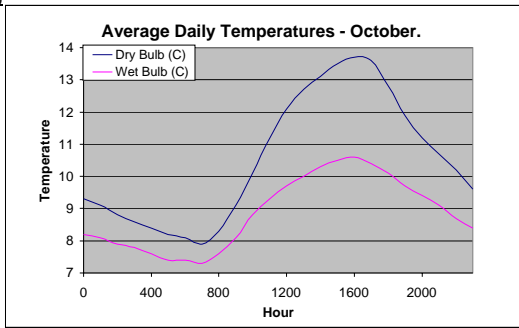
10.9

CHANGE IN KW HOURS FOR MONTH (kW/H)

2960.5

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (Ts&tC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	71.0 kW R	34.3 C	71.0 kW R	32.9 kW	2.16	0.0 kW R	0.0 kW	0	£1.256		108.490 kW
100	70.0 kW R	33.9 C	70.0 kW R	32.1 kW	2.18	0.0 kW R	0.0 kW	0	£1.226		108.028 kW
200	69.0 kW R	33.6 C	69.0 kW R	31.4 kW	2.2	0.0 kW R	0.0 kW	0	£1.199		110.432 kW
300	68.0 kW R	33.2 C	68.0 kW R	30.6 kW	2.22	0.0 kW R	0.0 kW	0	£1.169		110.971 kW
400	67.0 kW R	32.9 C	67.0 kW R	30.0 kW	2.23	0.0 kW R	0.0 kW	0	£1.146		111.375 kW
500	66.0 kW R	32.6 C	66.0 kW R	29.3 kW	2.25	0.0 kW R	0.0 kW	0	£1.119		111.779 kW
600	65.0 kW R	32.4 C	65.0 kW R	28.7 kW	2.26	0.0 kW R	0.0 kW	0	£1.096		112.048 kW
700	65.0 kW R	32.4 C	65.0 kW R	28.7 kW	2.26	0.0 kW R	0.0 kW	0	£1.096		112.048 kW
800	67.0 kW R	33.0 C	67.0 kW R	30.0 kW	2.23	0.0 kW R	0.0 kW	0		£2.640	111.240 kW
900	71.0 kW R	34.2 C	71.0 kW R	32.8 kW	2.16	0.0 kW R	0.0 kW	0		£2.886	109.624 kW
1000	76.0 kW R	35.9 C	76.0 kW R	36.6 kW	2.08	0.0 kW R	0.0 kW	0		£3.220	107.335 kW
1100	79.0 kW R	36.9 C	79.0 kW R	39.0 kW	2.03	0.0 kW R	0.0 kW	0		£3.432	105.989 kW
1200	82.0 kW R	37.9 C	82.0 kW R	41.5 kW	1.98	0.0 kW R	0.0 kW	0		£3.652	104.643 kW
1300	84.0 kW R	38.7 C	84.0 kW R	43.3 kW	1.94	0.0 kW R	0.0 kW	0		£3.810	103.565 kW
1400	86.0 kW R	39.2 C	86.0 kW R	44.9 kW	1.92	0.0 kW R	0.0 kW	0		£3.951	102.892 kW
1500	86.0 kW R	39.4 C	86.0 kW R	45.1 kW	1.91	0.0 kW R	0.0 kW	0		£3.968	102.623 kW
1600	86.0 kW R	39.4 C	86.0 kW R	45.1 kW	1.91	0.0 kW R	0.0 kW	0		£3.968	102.623 kW
1700	85.0 kW R	39.1 C	85.0 kW R	44.3 kW	1.92	0.0 kW R	0.0 kW	0		£3.898	103.027 kW
1800	83.0 kW R	38.4 C	83.0 kW R	42.5 kW	1.95	0.0 kW R	0.0 kW	0		£3.740	103.969 kW
1900	81.0 kW R	37.6 C	81.0 kW R	40.7 kW	1.99	0.0 kW R	0.0 kW	0		£3.581	105.047 kW
2000	78.0 kW R	36.6 C	78.0 kW R	38.2 kW	2.04	0.0 kW R	0.0 kW	0		£3.361	106.393 kW
2100	76.0 kW R	35.9 C	76.0 kW R	36.6 kW	2.08	0.0 kW R	0.0 kW	0		£3.220	107.335 kW
2200	74.0 kW R	35.4 C	74.0 kW R	35.2 kW	2.1	0.0 kW R	0.0 kW	0		£3.097	108.009 kW
2300	73.0 kW R	34.9 C	73.0 kW R	34.3 kW	2.13	0.0 kW R	0.0 kW	0		£3.018	108.682 kW
TOTAL				873.8		0.0 kW			£9.31	£55.44	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	9.3	8.2
100	9.1	8.1
200	8.8	7.9
300	8.6	7.8
400	8.4	7.6
500	8.2	7.4
600	8.1	7.4
700	7.9	7.3
800	8.3	7.5
900	9.1	8.1
1000	10.1	8.8
1100	11.2	9.3
1200	12.1	9.7
1300	12.7	10
1400	13.1	10.3
1500	13.5	10.5
1600	13.7	10.6
1700	13.6	10.4
1800	12.8	10.1
1900	11.9	9.7
2000	11.2	9.4
2100	10.7	9.1
2200	10.2	8.7
2300	9.6	8.4



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 C.O.P	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	59.0 kW R	39.0 C	59.0 kW R	31.6 kW	1.87	0.0 kW R	0.0 kW	0	£1.207		100.157 kW
100	58.0 kW R	39.0 C	58.0 kW R	31.1 kW	1.86	0.0 kW R	0.0 kW	0	£1.168		100.157 kW
200	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0	£1.165		100.157 kW
300	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0	£1.165		100.157 kW
400	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0	£1.146		100.157 kW
500	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0	£1.146		100.157 kW
600	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.123		100.157 kW
700	55.0 kW R	39.0 C	55.0 kW R	29.4 kW	1.87	0.0 kW R	0.0 kW	0	£1.123		100.157 kW
800	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.640	100.157 kW
900	58.0 kW R	39.0 C	58.0 kW R	31.1 kW	1.86	0.0 kW R	0.0 kW	0		£2.736	100.157 kW
1000	61.0 kW R	39.0 C	61.0 kW R	32.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.877	100.157 kW
1100	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.062	100.157 kW
1200	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.159	100.157 kW
1300	69.0 kW R	39.0 C	69.0 kW R	36.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.247	100.157 kW
1400	70.0 kW R	39.0 C	70.0 kW R	37.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.300	100.157 kW
1500	72.0 kW R	39.0 C	72.0 kW R	38.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.388	100.157 kW
1600	72.0 kW R	39.0 C	72.0 kW R	38.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.388	100.157 kW
1700	72.0 kW R	39.0 C	72.0 kW R	38.5 kW	1.87	0.0 kW R	0.0 kW	0		£3.388	100.157 kW
1800	69.0 kW R	39.0 C	69.0 kW R	36.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.247	100.157 kW
1900	67.0 kW R	39.0 C	67.0 kW R	35.9 kW	1.87	0.0 kW R	0.0 kW	0		£3.159	100.157 kW
2000	65.0 kW R	39.0 C	65.0 kW R	34.8 kW	1.87	0.0 kW R	0.0 kW	0		£3.062	100.157 kW
2100	63.0 kW R	39.0 C	63.0 kW R	33.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.965	100.157 kW
2200	62.0 kW R	39.0 C	62.0 kW R	33.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.921	100.157 kW
2300	60.0 kW R	39.0 C	60.0 kW R	32.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.824	100.157 kW
TOTAL				803.5 kW			0.0 kW		£9.26	£49.36	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£287.09	£1,530.23	£1,817.33

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£220.91	£1,271.10	£1,492.02

RETROFIT COST SAVING

£325.31

EFFICIENCY INCREASE (%)

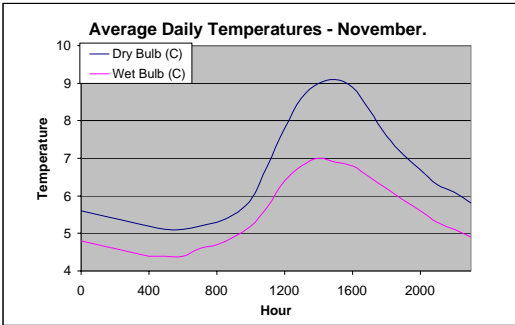
23.1

CHANGE IN kW HOURS FOR MONTH (kW/H)

4677.9

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND. TMP (tsatC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	59.0 kW R	30.3 C	59.0 kW R	24.7 kW	2.39	0.0 kW R	0.0 kW	0	£0.943		114.875 kW
100	58.0 kW R	30.1 C	58.0 kW R	24.2 kW	2.4	0.0 kW R	0.0 kW	0	£0.924		115.145 kW
200	57.0 kW R	29.8 C	57.0 kW R	23.6 kW	2.42	0.0 kW R	0.0 kW	0	£0.901		115.548 kW
300	57.0 kW R	29.6 C	57.0 kW R	23.5 kW	2.43	0.0 kW R	0.0 kW	0	£0.897		115.818 kW
400	56.0 kW R	29.4 C	56.0 kW R	23.0 kW	2.43	0.0 kW R	0.0 kW	0	£0.878		116.087 kW
500	56.0 kW R	29.2 C	56.0 kW R	22.9 kW	2.45	0.0 kW R	0.0 kW	0	£0.875		116.356 kW
600	55.0 kW R	29.1 C	55.0 kW R	22.4 kW	2.46	0.0 kW R	0.0 kW	0	£0.855		116.491 kW
700	55.0 kW R	28.9 C	55.0 kW R	22.3 kW	2.47	0.0 kW R	0.0 kW	0	£0.852		116.760 kW
800	56.0 kW R	29.3 C	56.0 kW R	22.9 kW	2.45	0.0 kW R	0.0 kW	0		£2.015	116.222 kW
900	58.0 kW R	30.1 C	58.0 kW R	24.2 kW	2.4	0.0 kW R	0.0 kW	0		£2.129	115.145 kW
1000	61.0 kW R	31.1 C	61.0 kW R	26.1 kW	2.34	0.0 kW R	0.0 kW	0		£2.297	113.798 kW
1100	65.0 kW R	32.2 C	65.0 kW R	28.6 kW	2.27	0.0 kW R	0.0 kW	0		£2.517	112.317 kW
1200	67.0 kW R	33.1 C	67.0 kW R	30.1 kW	2.23	0.0 kW R	0.0 kW	0		£2.648	111.105 kW
1300	69.0 kW R	33.7 C	69.0 kW R	31.5 kW	2.19	0.0 kW R	0.0 kW	0		£2.772	110.286 kW
1400	70.0 kW R	34.1 C	70.0 kW R	32.2 kW	2.17	0.0 kW R	0.0 kW	0		£2.833	109.759 kW
1500	72.0 kW R	34.5 C	72.0 kW R	33.5 kW	2.15	0.0 kW R	0.0 kW	0		£2.948	109.220 kW
1600	72.0 kW R	34.7 C	72.0 kW R	33.7 kW	2.14	0.0 kW R	0.0 kW	0		£2.965	108.951 kW
1700	72.0 kW R	34.6 C	72.0 kW R	33.6 kW	2.14	0.0 kW R	0.0 kW	0		£2.956	109.086 kW
1800	69.0 kW R	33.8 C	69.0 kW R	31.6 kW	2.18	0.0 kW R	0.0 kW	0		£2.780	110.163 kW
1900	67.0 kW R	32.9 C	67.0 kW R	30.0 kW	2.23	0.0 kW R	0.0 kW	0		£2.640	111.375 kW
2000	65.0 kW R	32.2 C	65.0 kW R	28.6 kW	2.27	0.0 kW R	0.0 kW	0		£2.517	112.317 kW
2100	63.0 kW R	31.7 C	63.0 kW R	27.4 kW	2.3	0.0 kW R	0.0 kW	0		£2.411	112.990 kW
2200	62.0 kW R	31.2 C	62.0 kW R	26.6 kW	2.33	0.0 kW R	0.0 kW	0		£2.341	113.664 kW
2300	60.0 kW R	30.6 C	60.0 kW R	25.4 kW	2.36	0.0 kW R	0.0 kW	0		£2.235	114.471 kW
TOTAL				652.6			0.0 kW		£7.13	£41.00	

Hour	Dry Bulb (C)	Wet Bulb (C)
0	5.6	4.8
100	5.5	4.7
200	5.4	4.6
300	5.3	4.5
400	5.2	4.4
500	5.1	4.4
600	5.1	4.4
700	5.2	4.6
800	5.3	4.7
900	5.5	4.9
1000	5.9	5.2
1100	6.8	5.7
1200	7.8	6.4
1300	8.6	6.8
1400	9	7
1500	9.1	6.9
1600	8.9	6.8
1700	8.3	6.5
1800	7.6	6.2
1900	7.1	5.9
2000	6.7	5.6
2100	6.3	5.3
2200	6.1	5.1
2300	5.8	4.9



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT	COST DAY RATE
0	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0	£0.981	
100	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0	£0.981	
200	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0	£0.962	
300	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0	£0.962	
400	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0	£0.962	
500	46.0 kW R	39.0 C	46.0 kW R	24.6 kW	1.87	0.0 kW R	0.0 kW	0	£0.939	
600	46.0 kW R	39.0 C	46.0 kW R	24.6 kW	1.87	0.0 kW R	0.0 kW	0	£0.939	
700	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0	£0.962	
800	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0	£0.962	
900	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0	£2.217	
1000	49.0 kW R	39.0 C	49.0 kW R	26.2 kW	1.87	0.0 kW R	0.0 kW	0	£2.261	
1100	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£2.305	
1200	54.0 kW R	39.0 C	54.0 kW R	28.9 kW	1.87	0.0 kW R	0.0 kW	0	£2.402	
1300	57.0 kW R	39.0 C	57.0 kW R	30.5 kW	1.87	0.0 kW R	0.0 kW	0	£2.543	
1400	58.0 kW R	39.0 C	58.0 kW R	31.1 kW	1.86	0.0 kW R	0.0 kW	0	£2.684	
1500	58.0 kW R	39.0 C	58.0 kW R	31.1 kW	1.86	0.0 kW R	0.0 kW	0	£2.736	
1600	58.0 kW R	39.0 C	58.0 kW R	31.1 kW	1.86	0.0 kW R	0.0 kW	0	£2.736	
1700	56.0 kW R	39.0 C	56.0 kW R	30.0 kW	1.87	0.0 kW R	0.0 kW	0	£2.640	
1800	54.0 kW R	39.0 C	54.0 kW R	28.9 kW	1.87	0.0 kW R	0.0 kW	0	£2.543	
1900	52.0 kW R	39.0 C	52.0 kW R	27.8 kW	1.87	0.0 kW R	0.0 kW	0	£2.446	
2000	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0	£2.402	
2100	50.0 kW R	39.0 C	50.0 kW R	26.8 kW	1.87	0.0 kW R	0.0 kW	0	£2.358	
2200	49.0 kW R	39.0 C	49.0 kW R	26.2 kW	1.87	0.0 kW R	0.0 kW	0	£2.305	
2300	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0	£2.261	
TOTAL				651.2 kW			0.0 kW		£7.69	£39.58

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£238.44	£1,226.91	£1,465.35

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£169.18	£914.87	£1,084.05

RETROFIT COST SAVING

£381.31

EFFICIENCY INCREASE (%)

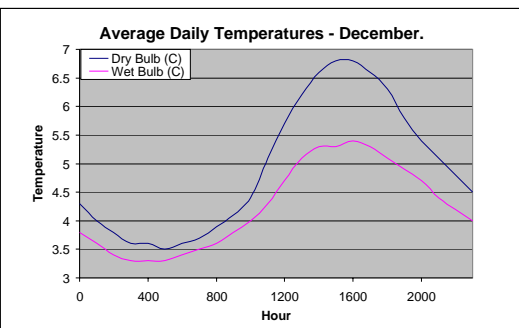
36.1

CHANGE IN kW HOURS FOR MONTH (kW/H)

5359.9

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT	COST DAY RATE
0	48.0 kW R	26.6 C	48.0 kW R	18.4 kW	2.61	0.0 kW R	0.0 kW	0	£0.703	
100	48.0 kW R	26.5 C	48.0 kW R	18.3 kW	2.62	0.0 kW R	0.0 kW	0	£0.699	
200	47.0 kW R	26.4 C	47.0 kW R	17.9 kW	2.63	0.0 kW R	0.0 kW	0	£0.684	
300	47.0 kW R	26.3 C	47.0 kW R	17.9 kW	2.63	0.0 kW R	0.0 kW	0	£0.684	
400	47.0 kW R	26.2 C	47.0 kW R	17.8 kW	2.64	0.0 kW R	0.0 kW	0	£0.680	
500	46.0 kW R	26.1 C	46.0 kW R	17.4 kW	2.64	0.0 kW R	0.0 kW	0	£0.665	
600	46.0 kW R	26.1 C	46.0 kW R	17.4 kW	2.64	0.0 kW R	0.0 kW	0	£0.665	
700	47.0 kW R	26.2 C	47.0 kW R	17.8 kW	2.64	0.0 kW R	0.0 kW	0	£0.680	
800	47.0 kW R	26.3 C	47.0 kW R	17.9 kW	2.63	0.0 kW R	0.0 kW	0	£1.575	
900	48.0 kW R	26.5 C	48.0 kW R	18.3 kW	2.62	0.0 kW R	0.0 kW	0	£1.610	
1000	49.0 kW R	26.9 C	49.0 kW R	18.9 kW	2.59	0.0 kW R	0.0 kW	0	£1.663	
1100	51.0 kW R	27.8 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£1.769	
1200	54.0 kW R	28.8 C	54.0 kW R	21.8 kW	2.48	0.0 kW R	0.0 kW	0	£1.918	
1300	57.0 kW R	29.6 C	57.0 kW R	23.5 kW	2.43	0.0 kW R	0.0 kW	0	£2.068	
1400	58.0 kW R	30.0 C	58.0 kW R	24.2 kW	2.4	0.0 kW R	0.0 kW	0	£2.129	
1500	58.0 kW R	30.1 C	58.0 kW R	24.2 kW	2.4	0.0 kW R	0.0 kW	0	£2.129	
1600	58.0 kW R	29.9 C	58.0 kW R	24.1 kW	2.41	0.0 kW R	0.0 kW	0	£2.121	
1700	56.0 kW R	29.3 C	56.0 kW R	22.9 kW	2.45	0.0 kW R	0.0 kW	0	£2.015	
1800	54.0 kW R	28.6 C	54.0 kW R	21.7 kW	2.49	0.0 kW R	0.0 kW	0	£1.909	
1900	52.0 kW R	28.1 C	52.0 kW R	20.7 kW	2.51	0.0 kW R	0.0 kW	0	£1.821	
2000	51.0 kW R	27.7 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0	£1.769	
2100	50.0 kW R	27.3 C	50.0 kW R	19.5 kW	2.56	0.0 kW R	0.0 kW	0	£1.716	
2200	49.0 kW R	27.1 C	49.0 kW R	19.0 kW	2.58	0.0 kW R	0.0 kW	0	£1.672	
2300	48.0 kW R	26.8 C	48.0 kW R	18.5 kW	2.59	0.0 kW R	0.0 kW	0	£1.628	
TOTAL				478.3			0.0 kW		£5.46	£29.51

Hour	Dry Bulb (C)	Wet Bulb (C)
0	4.3	3.8
100	4	3.6
200	3.8	3.4
300	3.6	3.3
400	3.6	3.3
500	3.5	3.3
600	3.6	3.4
700	3.7	3.5
800	3.9	3.6
900	4.1	3.8
1000	4.4	4
1100	5.1	4.3
1200	5.7	4.7
1300	6.2	5.1
1400	6.6	5.3
1500	6.8	5.3
1600	6.8	5.4
1700	6.6	5.3
1800	6.3	5.1
1900	5.8	4.9
2000	5.4	4.7
2100	5.1	4.4
2200	4.8	4.2
2300	4.5	4



Hour	Predicted Cooling Load (kW Ref)	STD COND TMP (Tsat C)	STD IT CHILLER 1 DUTY (kW Ref)	STD IT CHILLER 1 ABS (kW)	STD IT CHILLER 1 C.O.P	STD IT CHILLER 2 DUTY (kW Ref)	STD IT CHILLER 2 ABS (kW)	STD IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	STD IT CHILLER MAX DUTY (kW Ref)
0	44.0 kW R	39.0 C	44.0 kW R	23.6 kW	1.86	0.0 kW R	0.0 kW	0	£0.901		100.157 kW
100	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.878		100.157 kW
200	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
300	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
400	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
500	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
600	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
700	42.0 kW R	39.0 C	42.0 kW R	22.5 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
800	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0	£0.859		100.157 kW
900	43.0 kW R	39.0 C	43.0 kW R	23.0 kW	1.87	0.0 kW R	0.0 kW	0		£2.024	100.157 kW
1000	44.0 kW R	39.0 C	44.0 kW R	23.6 kW	1.86	0.0 kW R	0.0 kW	0		£2.077	100.157 kW
1100	46.0 kW R	39.0 C	46.0 kW R	24.6 kW	1.87	0.0 kW R	0.0 kW	0		£2.165	100.157 kW
1200	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.261	100.157 kW
1300	50.0 kW R	39.0 C	50.0 kW R	26.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.358	100.157 kW
1400	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
1500	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
1600	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
1700	51.0 kW R	39.0 C	51.0 kW R	27.3 kW	1.87	0.0 kW R	0.0 kW	0		£2.402	100.157 kW
1800	50.0 kW R	39.0 C	50.0 kW R	26.8 kW	1.87	0.0 kW R	0.0 kW	0		£2.358	100.157 kW
1900	48.0 kW R	39.0 C	48.0 kW R	25.7 kW	1.87	0.0 kW R	0.0 kW	0		£2.261	100.157 kW
2000	47.0 kW R	39.0 C	47.0 kW R	25.2 kW	1.87	0.0 kW R	0.0 kW	0		£2.217	100.157 kW
2100	46.0 kW R	39.0 C	46.0 kW R	24.6 kW	1.87	0.0 kW R	0.0 kW	0		£2.165	100.157 kW
2200	45.0 kW R	39.0 C	45.0 kW R	24.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.121	100.157 kW
2300	45.0 kW R	39.0 C	45.0 kW R	24.1 kW	1.87	0.0 kW R	0.0 kW	0		£2.121	100.157 kW
TOTAL				588.0 kW			0.0 kW		£6.94	£35.76	

ESTIMATED MONTHLY RUNNING COSTS STANDARD IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£214.99	£1,108.53	£1,323.53

ESTIMATED RUNNING COSTS RETROFITTED IT CHILLERS

RUNNING COST NIGHT	RUNNING COST DAY	TOTAL COST
£151.06	£795.67	£946.73

RETROFIT COST SAVING

£376.80

EFFICIENCY INCREASE (%)

40.2

CHANGE IN KW HOURS FOR MONTH (kW/H)

5229.7

Hour	Predicted Cooling Load (kW Ref)	RETROFIT COND TMP (TsatC)	RETRO IT CHILLER 1 DUTY (kW Ref)	RETRO IT CHILLER 1 ABS (kW)	RETRO IT CHILLER 1 COP	RETRO IT CHILLER 2 DUTY (kW Ref)	RETRO IT CHILLER 2 ABS (kW)	RETRO IT CHILLER 2 COP	COST NIGHT RATE	COST DAY RATE	RETRO IT CHILLER MAX DUTY (kW Ref)
0	44.0 kW R	26.0 C	44.0 kW R	16.8 kW	2.65	0.0 kW R	0.0 kW	0	£0.634		120.665 kW
100	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0	£0.619		120.665 kW
200	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
300	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
400	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
500	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
600	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
700	42.0 kW R	26.0 C	42.0 kW R	15.8 kW	2.66	0.0 kW R	0.0 kW	0	£0.603		120.665 kW
800	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0		£1.425	120.665 kW
900	43.0 kW R	26.0 C	43.0 kW R	16.2 kW	2.65	0.0 kW R	0.0 kW	0		£1.425	120.665 kW
1000	44.0 kW R	26.0 C	44.0 kW R	16.6 kW	2.65	0.0 kW R	0.0 kW	0		£1.461	120.665 kW
1100	46.0 kW R	26.1 C	46.0 kW R	17.4 kW	2.64	0.0 kW R	0.0 kW	0		£1.531	120.530 kW
1200	48.0 kW R	26.7 C	48.0 kW R	18.4 kW	2.61	0.0 kW R	0.0 kW	0		£1.619	119.722 kW
1300	50.0 kW R	27.2 C	50.0 kW R	19.4 kW	2.58	0.0 kW R	0.0 kW	0		£1.707	119.049 kW
1400	51.0 kW R	27.6 C	51.0 kW R	20.0 kW	2.55	0.0 kW R	0.0 kW	0		£1.760	118.511 kW
1500	51.0 kW R	27.8 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0		£1.769	118.241 kW
1600	51.0 kW R	27.8 C	51.0 kW R	20.1 kW	2.54	0.0 kW R	0.0 kW	0		£1.769	118.241 kW
1700	51.0 kW R	27.6 C	51.0 kW R	20.0 kW	2.55	0.0 kW R	0.0 kW	0		£1.760	118.511 kW
1800	50.0 kW R	27.3 C	50.0 kW R	19.5 kW	2.56	0.0 kW R	0.0 kW	0		£1.716	118.915 kW
1900	48.0 kW R	26.8 C	48.0 kW R	18.5 kW	2.59	0.0 kW R	0.0 kW	0		£1.628	119.588 kW
2000	47.0 kW R	26.4 C	47.0 kW R	17.9 kW	2.63	0.0 kW R	0.0 kW	0		£1.575	120.126 kW
2100	46.0 kW R	26.1 C	46.0 kW R	17.4 kW	2.64	0.0 kW R	0.0 kW	0		£1.531	120.530 kW
2200	45.0 kW R	26.0 C	45.0 kW R	17.0 kW	2.65	0.0 kW R	0.0 kW	0		£1.496	120.665 kW
2300	45.0 kW R	26.0 C	45.0 kW R	17.0 kW	2.65	0.0 kW R	0.0 kW	0		£1.496	120.665 kW
TOTAL				419.3			0.0 kW		£4.87	£25.67	

VARIABLES AND TOTALISER

VARIABLE	VALUE
Min DB Scale (DegC)	3
Max DB Scale (DegC)	32
DB Range (DegC)	29
Min Room Load (kW)	40
Max Deliverable Duty (kW Ref)	230
Fixed Duty Ratio	3
EEV CAPACITY FACTOR (%)	1.03
Min Std Cond Temp (Tsat)	39
Min Retro Cond Temp (Tsat)	26
kW Hour Cost (Summer Night Rate)	0.0361
kW Hour Cost (Summer Day Rate)	0.0557
kW Hour Cost (Winter Night Rate)	0.03819
kW Hour Cost (Winter Day Rate)	0.08799
EDITABLE DATA	

YORK J63 COMPRESSOR DATA

COND TMP (Tsat)	CAP STEP	REF DUTY (kW)	AB POWER (kW)	C.O.P
26.6	33	38.4	17.8	2.16
	67	76.8	30.7	2.5
	100	116.3	44.5	2.61
32.2	33	36	19.4	1.86
	67	71.9	33.5	2.15
	100	109	48.6	2.24
37.7	33	33.7	20.9	1.61
	67	67.4	36.1	1.87
	100	102.1	52.3	1.95
40.5	33	32.4	21.6	1.5
	67	64.7	37.3	1.73
	100	98.1	54	1.82
43.3	33	31.3	22.2	1.41
	67	62.5	38.2	1.64
	100	94.7	55.4	1.71
48.8	33	28.8	23.1	1.25
	66	57.6	39.9	1.44
	100	87.3	57.8	1.51
54.4	33	26.2	23.1	1.13
	66	52.5	39.9	1.32
	100	79.5	57.8	1.38
60	33	23.9	23.1	1.03
	66	47.9	39.9	1.2
	100	72.5	57.8	1.25

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
RUNNING COST SAVING	£378.18	£374.08	£379.89	£353.83	£316.24	£151.13	£112.11	£141.46	£189.63	£325.31	£381.31	£376.80
% INCREASE IN EFFICIENCY	33.3	37.9	39.4	28.2	22.2	8.5	5.1	5.4	10.9	23.1	36.1	40.2
Monthly kW/Hours Saved	5310.3	5211.1	5282.4	5040.6	4581.8	2514.1	1779.4	1990.2	2960.5	4677.9	5359.9	5229.7

TOTAL COST SAVINGS: £3,479.95