

Table 5.18(c) Banded weather data: Cardiff

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
May											
1	10.35	0	0	0	0	0	0	0	0	0	0
2	10.22	0	0	0	0	0	0	0	0	0	0
3	10.38	0	0	0	0	0	0	0	0	0	0
4	10.82	0	0	0	0	0	0	0	0	0	0
5	11.51	21	33	71	38	162	57	158	56	62	36
6	12.40	75	75	60	65	226	99	260	106	142	82
7	13.44	152	119	10	84	237	132	325	151	223	129
8	14.55	227	164	0	97	189	152	328	182	275	171
9	15.66	294	207	0	124	110	163	285	203	293	205
10	16.69	347	245	0	146	16	165	209	211	280	228
11	17.57	380	273	0	162	0	162	110	205	236	236
12	18.23	392	283	0	168	0	168	0	168	167	226
13	18.65	380	273	0	162	0	162	0	162	80	198
14	18.78	347	245	0	146	0	146	0	146	0	146
15	18.62	295	207	0	124	0	124	0	124	0	124
16	18.18	228	164	0	98	0	98	0	98	0	98
17	17.49	152	119	10	84	0	70	0	70	0	70
18	16.59	76	75	60	65	0	42	0	42	0	42
19	15.55	21	33	71	38	0	17	0	17	0	17
20	14.44	0	0	0	0	0	0	0	0	0	0
21	13.34	0	0	0	0	0	0	0	0	0	0
22	12.31	0	0	0	0	0	0	0	0	0	0
23	11.43	0	0	0	0	0	0	0	0	0	0
24	10.76	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	10.35	0	0	0	0	0	0	0	0	0	14.72
2	10.22	0	0	0	0	0	0	0	0	0	28.87
3	10.38	0	0	0	0	0	0	0	0	0	42.09
4	10.82	0	0	0	0	0	0	0	0	0	54.35
5	11.51	0	17	0	17	0	17	0	17	6.85	65.87
6	12.40	0	42	0	42	0	42	0	42	15.71	77.02
7	13.44	0	70	0	70	0	70	0	70	24.99	88.32
8	14.55	61	124	0	97	0	97	0	97	34.31	100.47
9	15.66	130	168	0	124	0	124	0	124	43.23	114.47
10	16.69	186	206	0	146	0	146	0	146	51.08	131.73
11	17.57	223	233	80	198	0	162	0	162	56.77	153.71
12	18.23	236	243	167	226	0	184	0	168	58.93	180.00
13	18.65	223	233	236	236	110	205	0	162	56.79	206.30
14	18.78	186	206	279	228	209	211	16	165	51.1	228.30
15	18.62	129	168	293	205	285	203	110	163	43.27	245.57
16	18.18	60	124	274	171	328	183	189	152	34.36	259.58
17	17.49	0	70	223	129	325	151	237	132	25.05	271.74
18	16.59	0	42	142	82	261	107	227	100	15.79	283.05
19	15.55	0	17	62	36	159	56	163	57	6.94	294.20
20	14.44	0	0	0	0	0	0	0	0	0	305.72
21	13.34	0	0	0	0	0	0	0	0	0	317.98
22	12.31	0	0	0	0	0	0	0	0	0	331.19
23	11.43	0	0	0	0	0	0	0	0	0	345.31
24	10.76	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.52; Diffac = 0.96; Maximum dry-bulb = 21.50 °C; Minimum dry-bulb = 10.22 °C; Adaptive comfort range = 21.5–25.5 °C

Table continues

Table 5.18(c) Banded weather data: Cardiff — *continued*

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
June											
1	13.34	0	0	0	0	0	0	0	0	0	0
2	13.11	0	0	0	0	0	0	0	0	0	0
3	13.05	0	0	0	0	0	0	0	0	0	0
4	13.16	0	6	7	6	11	9	9	8	1	2
5	13.42	11	43	30	37	64	44	61	43	22	35
6	13.82	34	82	27	64	89	77	99	79	51	69
7	14.34	61	124	8	91	89	107	117	113	77	105
8	14.94	87	167	0	85	71	134	116	144	94	139
9	15.57	111	209	0	106	43	157	100	170	99	170
10	16.20	129	246	0	125	10	176	73	190	94	195
11	16.78	141	274	0	139	0	139	39	202	79	211
12	17.27	145	285	0	144	0	144	0	144	54	213
13	17.64	141	274	0	139	0	139	0	139	24	198
14	17.87	129	246	0	125	0	125	0	125	0	125
15	17.93	111	209	0	106	0	106	0	106	0	106
16	17.83	87	167	0	85	0	85	0	85	0	85
17	17.56	61	124	8	91	0	63	0	63	0	63
18	17.16	34	82	27	64	0	41	0	41	0	41
19	16.64	11	43	30	37	0	21	0	21	0	21
20	16.04	0	6	7	6	0	3	0	3	0	3
21	15.41	0	0	0	0	0	0	0	0	0	0
22	14.78	0	0	0	0	0	0	0	0	0	0
23	14.20	0	0	0	0	0	0	0	0	0	0
24	13.71	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	13.34	0	0	0	0	0	0	0	0	0	14.17
2	13.11	0	0	0	0	0	0	0	0	0	27.83
3	13.05	0	0	0	0	0	0	0	0	0	40.67
4	13.16	0	3	0	3	0	3	0	3	1.41	52.64
5	13.42	0	21	0	21	0	21	0	21	9.36	63.92
6	13.82	0	41	0	41	0	41	0	41	18.11	74.87
7	14.34	0	63	0	63	0	63	0	63	27.32	85.96
8	14.94	16	122	0	85	0	85	0	85	36.66	97.91
9	15.57	40	157	0	106	0	106	0	106	45.69	111.75
10	16.20	60	187	0	125	0	125	0	125	53.76	129.10
11	16.78	72	210	24	198	0	139	0	139	59.74	151.89
12	17.27	77	218	54	213	0	144	0	144	62.04	180.00
13	17.64	72	210	79	211	39	202	0	139	59.74	208.11
14	17.87	60	187	94	195	73	190	10	176	53.76	230.90
15	17.93	40	157	99	170	100	170	43	157	45.69	248.25
16	17.83	16	122	94	139	116	144	71	134	36.66	262.09
17	17.56	0	63	77	105	117	113	89	107	27.32	274.04
18	17.16	0	41	51	69	99	79	89	77	18.11	285.13
19	16.64	0	21	22	35	61	43	64	44	9.36	296.08
20	16.04	0	3	1	2	9	8	11	9	1.41	307.36
21	15.41	0	0	0	0	0	0	0	0	0	319.33
22	14.78	0	0	0	0	0	0	0	0	0	332.17
23	14.20	0	0	0	0	0	0	0	0	0	345.83
24	13.71	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.18; Diffac = 0.91; Maximum dry-bulb = 17.93 °C; Minimum dry-bulb = 13.05 °C; Adaptive comfort range = 21.8–25.8 °C

Table continues

Table 5.18(c) Banded weather data: Cardiff — *continued*

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
July											
1	14.52	0	0	0	0	0	0	0	0	0	0
2	13.54	0	0	0	0	0	0	0	0	0	0
3	12.92	0	0	0	0	0	0	0	0	0	0
4	12.70	0	0	0	0	0	0	0	0	0	0
5	12.90	25	32	87	41	200	64	196	63	77	39
6	13.50	91	74	73	67	278	110	321	119	175	88
7	14.47	186	119	10	82	292	143	403	167	278	140
8	15.73	280	164	0	103	233	160	407	199	343	184
9	17.21	363	207	0	131	135	166	355	216	366	219
10	18.79	428	245	0	155	18	161	260	219	349	241
11	20.38	470	273	0	171	0	171	137	207	295	246
12	21.86	484	283	0	178	0	178	0	178	210	231
13	23.13	470	273	0	171	0	171	0	171	101	198
14	24.11	428	245	0	155	0	155	0	155	0	155
15	24.74	363	207	0	131	0	131	0	131	0	131
16	24.95	280	164	0	103	0	103	0	103	0	103
17	24.75	185	119	10	82	0	73	0	73	0	73
18	24.15	90	74	72	66	0	43	0	43	0	43
19	23.18	24	31	86	40	0	17	0	17	0	17
20	21.92	0	0	0	0	0	0	0	0	0	0
21	20.45	0	0	0	0	0	0	0	0	0	0
22	18.86	0	0	0	0	0	0	0	0	0	0
23	17.27	0	0	0	0	0	0	0	0	0	0
24	15.79	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	14.52	0	0	0	0	0	0	0	0	0	14.76
2	13.54	0	0	0	0	0	0	0	0	0	28.94
3	12.92	0	0	0	0	0	0	0	0	0	42.20
4	12.70	0	0	0	0	0	0	0	0	0	54.50
5	12.90	0	17	0	17	0	17	0	17	6.63	66.04
6	13.50	0	43	0	43	0	43	0	43	15.49	77.22
7	14.47	0	73	0	73	0	73	0	73	24.75	88.55
8	15.73	77	126	0	103	0	103	0	103	34.06	100.73
9	17.21	163	172	0	131	0	131	0	131	42.95	114.76
10	18.79	234	213	0	155	0	155	0	155	50.76	132.01
11	20.38	280	242	101	198	0	171	0	171	56.41	153.91
12	21.86	297	253	210	231	0	178	0	178	58.53	180.00
13	23.13	281	242	295	246	137	207	0	171	56.39	206.08
14	24.11	234	213	350	241	260	219	18	161	50.73	227.96
15	24.74	164	172	367	219	355	216	135	166	42.91	245.20
16	24.95	78	125	343	184	407	198	233	160	34.01	259.21
17	24.75	0	73	278	140	403	166	292	143	24.69	271.39
18	24.15	0	43	175	88	320	118	277	109	15.41	282.71
19	23.18	0	17	77	38	195	63	199	64	6.53	293.88
20	21.92	0	0	0	0	0	0	0	0	0	305.43
21	20.45	0	0	0	0	0	0	0	0	0	317.73
22	18.86	0	0	0	0	0	0	0	0	0	331.00
23	17.27	0	0	0	0	0	0	0	0	0	345.20
24	15.79	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.64; Diffac = 0.96; Maximum dry-bulb = 24.95 °C; Minimum dry-bulb = 12.7 °C; Adaptive comfort range = 23.2–27.2 °C

Table continues

Table 5.18(c) Banded weather data: Cardiff — *continued*

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
August											
1	16.72	0	0	0	0	0	0	0	0	0	0
2	16.31	0	0	0	0	0	0	0	0	0	0
3	16.10	0	0	0	0	0	0	0	0	0	0
4	16.09	0	0	0	0	0	0	0	0	0	0
5	16.28	0	0	0	0	0	0	0	0	0	0
6	16.67	21	46	17	36	110	57	138	64	86	52
7	17.22	70	95	0	50	140	99	217	116	166	105
8	17.90	128	144	0	79	116	126	239	156	222	151
9	18.66	180	190	0	105	59	143	215	181	245	189
10	19.45	220	229	0	126	0	126	159	194	238	214
11	20.22	246	256	0	141	0	141	85	193	207	224
12	20.91	255	265	0	147	0	147	0	147	154	217
13	21.48	246	255	0	141	0	141	0	141	87	193
14	21.88	220	228	0	126	0	126	0	126	13	157
15	22.10	179	190	0	104	0	104	0	104	0	104
16	22.11	127	144	0	78	0	78	0	78	0	78
17	21.91	69	95	0	50	0	50	0	50	0	50
18	21.53	20	45	16	36	0	23	0	23	0	23
19	20.98	0	0	0	0	0	0	0	0	0	0
20	20.30	0	0	0	0	0	0	0	0	0	0
21	19.54	0	0	0	0	0	0	0	0	0	0
22	18.75	0	0	0	0	0	0	0	0	0	0
23	17.98	0	0	0	0	0	0	0	0	0	0
24	17.29	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb /°C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	16.72	0	0	0	0	0	0	0	0	0	16.45
2	16.31	0	0	0	0	0	0	0	0	0	32.06
3	16.10	0	0	0	0	0	0	0	0	0	46.38
4	16.09	0	0	0	0	0	0	0	0	0	59.42
5	16.28	0	0	0	0	0	0	0	0	0	71.50
6	16.67	0	23	0	23	0	23	0	23	8.54	83.11
7	17.22	18	70	0	50	0	50	0	50	17.87	94.83
8	17.90	75	116	0	79	0	79	0	79	27.03	107.33
9	18.66	131	161	0	105	0	105	0	105	35.53	121.44
10	19.45	178	198	13	157	0	126	0	126	42.71	138.07
11	20.22	208	224	87	193	0	141	0	141	47.68	157.82
12	20.91	218	234	154	217	0	177	0	147	49.47	180.00
13	21.48	208	224	207	224	85	193	0	141	47.65	202.17
14	21.88	178	198	238	214	159	194	0	126	42.66	221.90
15	22.10	132	161	245	188	215	181	59	143	35.46	238.50
16	22.11	75	116	222	151	239	155	116	126	26.94	252.59
17	21.91	19	70	166	104	216	116	140	98	17.76	265.07
18	21.53	0	23	86	51	138	63	109	57	8.41	276.78
19	20.98	0	0	0	0	0	0	0	0	0	288.38
20	20.30	0	0	0	0	0	0	0	0	0	300.46
21	19.54	0	0	0	0	0	0	0	0	0	313.50
22	18.75	0	0	0	0	0	0	0	0	0	327.83
23	17.98	0	0	0	0	0	0	0	0	0	343.48
24	17.29	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.39; Diffac = 1.07; Maximum dry-bulb = 22.13 °C; Minimum dry-bulb = 16.07 °C; Adaptive comfort range = 22.9–26.9 °C

Table continues

Table 5.18(c) Banded weather data: Cardiff — *continued*

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²									
		Horizontal		N		NE		E		SE	
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse
September											
1	14.94	0	0	0	0	0	0	0	0	0	0
2	14.51	0	0	0	0	0	0	0	0	0	0
3	14.28	0	0	0	0	0	0	0	0	0	0
4	14.28	0	0	0	0	0	0	0	0	0	0
5	14.51	0	0	0	0	0	0	0	0	0	0
6	14.94	0	1	0	0	2	1	3	1	2	1
7	15.56	36	48	0	25	119	59	213	79	182	73
8	16.32	109	93	0	53	117	89	300	129	307	130
9	17.16	184	133	0	79	46	100	294	155	370	172
10	18.04	244	167	0	100	0	100	225	162	375	196
11	18.88	283	189	0	114	0	114	121	153	335	202
12	19.64	296	197	0	119	0	119	0	119	262	190
13	20.26	282	189	0	114	0	114	0	114	164	162
14	20.69	244	166	0	100	0	100	0	100	56	123
15	20.92	183	133	0	79	0	79	0	79	0	79
16	20.92	108	92	0	53	0	53	0	53	0	53
17	20.69	35	47	0	25	0	25	0	25	0	25
18	20.26	0	0	0	0	0	0	0	0	0	0
19	19.64	0	0	0	0	0	0	0	0	0	0
20	18.88	0	0	0	0	0	0	0	0	0	0
21	18.04	0	0	0	0	0	0	0	0	0	0
22	17.16	0	0	0	0	0	0	0	0	0	0
23	16.32	0	0	0	0	0	0	0	0	0	0
24	15.56	0	0	0	0	0	0	0	0	0	0

Hour	Dry-bulb / °C	Incident solar irradiation / W·m ⁻²								Altitude	Azimuth
		S		SW		W		NW			
		Direct	Diffuse	Direct	Diffuse	Direct	Diffuse	Direct	Diffuse		
1	14.94	0	0	0	0	0	0	0	0	0	18.87
2	14.51	0	0	0	0	0	0	0	0	0	36.36
3	14.28	0	0	0	0	0	0	0	0	0	51.88
4	14.28	0	0	0	0	0	0	0	0	0	65.61
5	14.51	0	0	0	0	0	0	0	0	0	78.07
6	14.94	0	0	0	0	0	0	0	0	0.12	89.91
7	15.56	44	43	0	25	0	25	0	25	9.4	101.75
8	16.32	135	93	0	53	0	53	0	53	18.27	114.22
9	17.16	229	141	0	79	0	79	0	79	26.26	127.95
10	18.04	305	180	56	124	0	100	0	100	32.78	143.51
11	18.88	353	206	164	163	0	114	0	114	37.12	161.06
12	19.64	370	215	262	190	0	130	0	119	38.65	180.00
13	20.26	353	206	335	202	121	153	0	114	37.09	198.93
14	20.69	305	180	375	196	225	162	0	100	32.72	216.46
15	20.92	229	140	370	171	293	155	45	100	26.18	231.99
16	20.92	135	92	307	130	299	128	116	88	18.16	245.71
17	20.69	44	43	181	72	212	79	118	58	9.27	258.15
18	20.26	0	0	0	0	0	0	0	0	0	269.97
19	19.64	0	0	0	0	0	0	0	0	0	281.79
20	18.88	0	0	0	0	0	0	0	0	0	294.24
21	18.04	0	0	0	0	0	0	0	0	0	307.96
22	17.16	0	0	0	0	0	0	0	0	0	323.50
23	16.32	0	0	0	0	0	0	0	0	0	341.04
24	15.56	0	0	0	0	0	0	0	0	0	360.00

Dirfac = 0.59; Diffac = 1.02; Maximum dry-bulb = 20.95 °C; Minimum dry-bulb = 14.25 °C; Adaptive comfort range = 22.7–26.7 °C