

## รายการอ้างอิง

### ภาษาไทย

- จัญดา บุญเกียรติ. การลดการถ่ายเทความร้อนเข้าสู่อาคารทางหลังคา. วิทยานิพนธ์ปริญญา  
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- โชติวิทย์ พงษ์เสริมผล. การปรับปรุงหลังคาอาคารเพื่อลดภาระการทำความเย็น : กรณีศึกษา  
อาคารของจุฬาลงกรณ์มหาวิทยาลัย. วิทยานิพนธ์ปริญญามหาบัณฑิต ภาควิชาสถาปัตยกรรม  
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- ธนิต จินดาวนิก. พลังงานกับการออกแบบสถาปัตยกรรม. เอกสารประกอบการสอน.  
คณะสถาปัตยกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย.
- วิชัย อธิธิวิกุล. อิทธิพลของสภาพแวดล้อมทางธรรมชาติที่มีผลต่ออุณหภูมิบริเวณอาคาร.  
วิทยานิพนธ์ปริญญามหาบัณฑิต ภาควิชาสถาปัตยกรรมศาสตร์ บัณฑิตวิทยาลัย จุฬาลงกรณ์  
มหาวิทยาลัย, 2537.
- สุนทร บุญญาธิการ และ ธนิต จินดาวนิก. การวิเคราะห์ความน่าสบายและสภาพแวดล้อมที่  
เกี่ยวข้องกับสถาปัตยกรรมไทย. รายงานการวิจัยทุนรัชดาภิเษกสมโภช.  
จุฬาลงกรณ์มหาวิทยาลัย, 2536.
- สุนทร บุญญาธิการ. หัวใจหลักในการออกแบบสถาปัตยกรรมเพื่อประหยัดพลังงาน.  
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- สุนทร บุญญาธิการ. อาคารอนุรักษ์พลังงานเฉลิมพระเกียรติ การวิจัยประยุกต์เพื่อการออกแบบ  
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- เอนก อีร์วิวัฒน์ชัย. การทำความเย็นอาคารโดยใช้ผิวสัมผัสดิน. วิทยานิพนธ์ปริญญามหาบัณฑิต  
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ภาคผนวก

ข้อมูลที่ได้จากการเก็บข้อมูล

Date	Time	dry bulb	dry bulb in	dry bulb 0 ft	dry bulb air	glass 0 ft	glass 0 ft in	glass 0 ft R	glass 0 ft air	glass in	glass air	in dbn air	slat. in	slat. 0 ft	slat. air	slat. in	slat. out	small tree l
18/3/99	6:06:30 AM	25.859	28.204	27.801	24.853	28.572	30	29.2	26.677	27.288	25.801	25.62	29.279	29.005	26.236	28.518	27.056	28.069
18/3/99	6:36:30 AM	25.844	28.204	27.81	24.847	28.445	30.103	29.299	26.697	27.294	25.793	25.68	29.232	28.854	26.123	28.43	26.844	27.983
18/3/99	7:06:30 AM	26.012	28.104	27.719	24.759	28.392	30.004	29.218	26.667	27.349	25.851	25.946	29.337	28.819	26.222	28.446	26.928	27.945
18/3/99	7:36:30 AM	26.65	28.1	27.754	24.748	27.92	29.932	29.199	26.656	27.293	25.83	26.403	29.287	28.321	26.197	28.457	27.311	27.941
18/3/99	8:06:30 AM	27.366	28.065	27.724	24.732	27.628	30.025	29.237	26.783	27.349	25.918	27.269	29.265	27.997	26.194	28.4	28.307	27.885
18/3/99	8:36:30 AM	28.172	28.096	27.748	24.751	27.729	29.991	29.161	26.895	27.27	25.907	28.086	29.221	28.035	26.258	28.427	30.538	27.963
18/3/99	9:06:30 AM	29.027	28.04	27.727	24.809	27.893	30.02	29.312	27.214	27.358	26.118	29.02	29.236	28.202	26.34	28.392	33.138	27.86
18/3/99	9:36:30 AM	29.423	27.926	27.697	24.87	28.182	30.017	29.223	27.351	27.215	26.203	29.394	29.095	28.363	26.431	28.434	34.288	27.849
18/3/99	10:06:30 AM	30.161	27.98	27.738	24.99	28.031	30.02	29.258	27.484	27.15	26.234	30.14	28.992	28.287	26.496	28.443	38.202	27.929
18/3/99	10:36:30 AM	30.565	27.897	27.676	25.01	27.488	30.037	29.211	28.034	27.229	26.405	30.316	29.087	27.706	26.925	28.441	40.886	27.847
18/3/99	11:06:30 AM	31.736	27.904	27.68	25.109	27.94	29.988	29.184	28.578	27.188	26.557	31.713	29.059	28.165	27.308	28.459	42.143	27.927
18/3/99	11:36:30 AM	32.508	27.972	27.674	25.165	27.978	29.948	29.184	29.191	27.209	26.607	32.472	29.103	28.234	27.869	28.485	44.007	27.975
18/3/99	12:06:30 PM	33.128	27.97	27.643	25.215	27.429	30.011	29.237	29.497	27.215	27.822	33.096	28.986	27.65	28.279	28.369	43.906	27.886
18/3/99	12:36:30 PM	33.861	28.078	27.653	25.237	27.362	30.01	29.167	30.079	27.2	28.003	33.603	29.023	27.619	28.28	28.489	44.236	27.97
18/3/99	1:06:30 PM	34.602	28.015	27.635	25.24	27.661	29.945	29.126	30.667	27.205	27.563	34.542	29.04	27.896	28.322	28.491	44.481	28.024
18/3/99	1:36:30 PM	34.889	27.992	27.641	25.252	28.116	30.001	29.125	30.984	27.192	27.528	34.429	29.012	28.319	28.414	28.536	45.242	28.019
18/3/99	2:06:30 PM	35.483	28.04	27.679	25.286	28.24	30.023	29.176	30.907	27.197	27.306	35.23	29.033	28.291	28.233	28.506	45.439	28.071
18/3/99	2:36:30 PM	35.735	28.113	27.685	25.22	28.105	29.984	29.165	30.682	27.231	26.981	35.449	29.039	28.225	28.035	28.429	45.305	28.123
18/3/99	3:06:30 PM	35.709	28.089	27.656	25.086	27.922	29.988	29.165	30.324	27.344	26.755	35.66	29.114	28.099	27.868	28.465	44.923	28.154
18/3/99	3:36:30 PM	34.735	28.109	27.674	24.999	27.985	30.075	29.145	29.768	27.253	26.602	34.61	29.124	28.036	27.636	28.638	44.709	28.173
18/3/99	4:06:30 PM	34.353	28.148	27.67	24.962	27.754	30.122	29.163	29.221	27.279	26.767	34.317	29.163	27.793	27.528	28.691	43.918	28.157
18/3/99	4:36:30 PM	34.195	28.234	27.686	24.958	28.102	30.061	29.15	28.841	27.269	26.813	34.089	29.152	28.243	27.399	28.745	43.456	28.174
18/3/99	5:06:30 PM	33.32	28.319	27.708	24.968	27.993	30.109	29.23	28.543	27.305	26.834	33.288	29.08	28.184	27.313	28.721	41.736	28.17
18/3/99	5:36:30 PM	33.766	28.462	27.689	24.951	27.827	30.07	29.162	28.282	27.426	26.77	33.467	29.342	28.049	27.29	28.722	39.92	28.239
18/3/99	6:06:30 PM	32.113	28.492	27.7	24.968	27.716	30.215	29.172	28.223	27.488	26.607	32.108	29.443	27.979	27.224	28.826	37.866	28.217
18/3/99	6:36:30 PM	31.239	28.51	27.727	25.001	28.635	30.259	29.234	28.069	27.517	26.714	31.108	29.427	28.818	27.062	28.841	36.276	28.185

Date	Time	dry bulb	dry bulb in	dry bulb 0.00	dry bulb an	wet 0.00	wet 0.00 in	wet 0.00 0.00	wet 0.00 an	wet in	wet an	in-foot an	shrub in	shrub 0.00	shrub an	slab in	slab an	small tree in
18/3/99	7:06:30 PM	30.457	28.501	27.738	25.034	28.865	30.21	29.196	27.908	27.524	26.641	30.352	29.47	29.032	27.072	28.917	35.197	28.214
18/3/99	7:36:30 PM	29.536	28.498	27.76	25.053	28.96	30.192	29.169	27.786	27.524	26.561	29.373	29.502	28.998	26.998	28.921	34.389	28.254
18/3/99	8:06:30 PM	29.326	28.492	27.79	25.085	28.974	30.276	29.22	27.658	27.54	26.503	29.326	29.469	29.021	26.881	28.868	33.719	28.172
18/3/99	8:36:30 PM	29.052	28.502	27.799	25.066	29.069	30.189	29.196	27.514	27.534	26.45	29.031	29.526	29.111	26.912	28.896	33.174	28.158
18/3/99	9:06:30 PM	28.734	28.491	27.833	25.035	28.966	30.224	29.18	27.384	27.524	26.343	28.65	29.525	29.04	26.852	28.876	32.708	28.175
18/3/99	9:36:30 PM	28.622	28.479	27.815	25.045	28.807	30.246	29.183	27.402	27.512	26.346	28.424	29.465	28.915	26.767	28.879	32.16	28.153
18/3/99	10:06:30 PM	28.345	28.471	27.843	25.027	28.971	30.289	29.261	27.418	27.512	26.34	28.264	29.456	29.007	26.723	28.832	31.704	28.078
18/3/99	10:36:30 PM	28.158	28.387	27.808	24.979	28.653	30.155	29.14	27.266	27.451	26.228	28.147	29.49	28.78	26.715	28.924	31.45	28.207
18/3/99	11:06:30 PM	27.982	28.42	27.822	25.029	28.184	30.256	29.193	27.348	27.481	26.298	27.613	29.468	28.388	26.724	28.919	30.98	28.126
18/3/99	11:36:30 PM	27.799	28.467	27.874	25.045	27.98	30.187	29.17	27.288	27.437	26.186	27.511	29.429	28.156	26.7	28.926	30.695	28.121
19/3/99	12:06:30 AM	27.314	28.438	27.857	25.049	28.303	30.17	29.215	27.249	27.453	26.172	27.308	29.428	28.447	26.617	28.818	30.293	28.099
19/3/99	12:36:30 AM	26.621	28.398	27.847	25.053	28.056	30.242	29.268	27.252	27.521	26.175	26.386	29.494	28.377	26.625	28.764	29.933	28.075
19/3/99	1:06:30 AM	26.243	28.363	27.834	25.003	28.074	30.183	29.213	27.174	27.483	26.059	26.194	29.504	28.309	26.563	28.789	29.542	28.153
19/3/99	1:36:30 AM	26.34	28.399	27.875	25.002	27.956	30.163	29.204	27.112	27.441	25.94	26.201	29.457	28.293	26.492	28.774	29.285	28.14
19/3/99	2:06:30 AM	26.189	28.341	27.854	24.973	27.69	30.223	29.262	27.129	27.491	25.968	26.166	29.451	28.005	26.416	28.699	28.87	28.038
19/3/99	2:36:30 AM	25.842	28.256	27.824	24.923	27.895	30.203	29.331	27.114	27.519	26.035	25.743	29.46	28.235	26.384	28.631	28.452	27.939
19/3/99	3:06:30 AM	26.061	28.295	27.856	24.914	27.647	30.231	29.299	27.051	27.449	25.888	26.038	29.395	27.954	26.3	28.651	28.246	28.026
19/3/99	3:36:30 AM	26.082	28.249	27.824	24.863	27.451	30.166	29.253	26.976	27.44	25.871	26.015	29.414	27.767	26.31	28.69	28.085	28.007
19/3/99	4:06:30 AM	26.183	28.25	27.876	24.874	27.575	30.173	29.261	26.944	27.378	25.798	26.087	29.343	27.876	26.217	28.677	27.947	27.997
19/3/99	4:36:30 AM	26.151	28.197	27.851	24.835	27.79	30.174	29.293	26.911	27.405	25.822	26.057	29.361	28.125	26.21	28.638	27.706	27.963
19/3/99	5:06:30 AM	26.009	28.138	27.835	24.844	28.216	30.207	29.33	26.913	27.409	25.823	25.985	29.311	28.579	26.13	28.591	27.422	27.869
19/3/99	5:36:30 AM	26.129	28.077	27.79	24.764	28.607	30.133	29.284	26.851	27.414	25.848	26.04	29.359	28.908	26.187	28.593	27.459	27.868
19/3/99	6:06:30 AM	25.999	28.094	27.824	24.793	28.225	30.203	29.334	26.83	27.382	25.786	25.869	29.251	28.583	26.08	28.527	27.278	27.866
19/3/99	6:36:30 AM	25.981	28.098	27.821	24.763	28.257	30.141	29.329	26.754	27.374	25.741	25.732	29.26	28.515	26.125	28.516	27.11	27.872
19/3/99	7:06:30 AM	26.267	28.092	27.82	24.733	27.902	30.081	29.266	26.687	27.294	25.678	26.195	29.233	28.27	26.099	28.544	27.22	27.969
19/3/99	7:36:30 AM	26.893	28.046	27.797	24.715	27.824	30.056	29.274	26.781	27.278	25.746	26.852	29.191	28.183	26.103	28.494	27.651	27.917

Date	Time	small tree a	standard	tree di in	tree di 0.0	tree di sur	tree in	tree 0.00	tree sur	wet bulb	wet soil 0.2	wet soil 0.4	wet soil in	wet soil 0.6	wet soil sur	Dir. E (ft/hr/sq ft)	Wind speed
18/3/99	6:06:30 AM	25.72	27.107	27.954	28.862	26.391	27.652	27.521	25.971	18.618	24.132	24.351	27.826	24.216	24.837	12.457	39.36
18/3/99	6:36:30 AM	25.588	27.195	27.997	28.954	26.417	27.699	27.674	25.954	18.59	24.029	24.344	27.75	24.155	24.711	68.108	59.04
18/3/99	7:06:30 AM	25.448	27.278	27.872	28.755	26.451	27.672	27.565	25.996	18.71	23.842	24.45	27.862	24.274	24.802	108.696	98.4
18/3/99	7:36:30 AM	25.557	27.949	27.877	28.804	26.662	27.611	27.513	25.94	19.311	23.557	24.404	27.833	24.252	24.791	189.22	255.84
18/3/99	8:06:30 AM	25.505	28.745	27.856	28.77	27.365	27.67	27.632	26.059	19.747	23.28	24.433	27.823	24.268	24.734	221.137	157.44
18/3/99	8:36:30 AM	25.719	29.555	27.9	28.84	27.789	27.609	27.521	26.062	20.105	23.274	24.362	27.796	24.222	24.84	308.683	236.16
18/3/99	9:06:30 AM	25.667	30.345	27.8	28.726	28.833	27.618	27.439	26.231	20.671	23.479	24.398	27.829	24.244	24.909	384.893	216.48
18/3/99	9:36:30 AM	25.793	30.845	27.874	28.751	28.801	27.657	27.611	26.458	20.899	23.628	24.447	27.693	24.293	24.928	554.043	295.2
18/3/99	10:06:30 AM	26.048	31.608	27.9	28.908	31.521	27.639	27.613	26.536	21.143	23.627	24.358	27.634	24.179	24.969	605.866	413.28
18/3/99	10:36:30 AM	25.957	32.446	27.847	28.753	33.939	27.675	27.571	26.779	21.277	23.114	24.454	27.705	24.285	25.083	703.265	610.08
18/3/99	11:06:30 AM	26.073	33.283	27.846	28.783	31.393	27.689	27.573	28.056	20.641	23.415	24.418	27.681	24.269	25.145	730.052	688.8
18/3/99	11:36:30 AM	26.188	33.982	27.805	28.789	30.309	27.692	27.477	28.678	20.984	23.511	24.374	27.777	24.268	25.215	778.008	728.16
18/3/99	12:06:30 PM	25.819	34.773	27.845	28.727	29.636	27.79	27.61	28.438	20.279	22.996	24.46	27.722	24.267	25.148	792.969	551.04
18/3/99	12:36:30 PM	25.939	35.395	27.844	28.774	29.331	27.781	27.509	27.847	21.066	22.983	24.403	27.744	24.24	25.151	825.822	688.8
18/3/99	1:06:30 PM	26.052	36.075	27.816	28.722	29.18	27.815	27.385	27.831	20.691	23.285	24.411	27.79	24.314	25.15	840.539	649.44
18/3/99	1:36:30 PM	26.135	36.51	27.816	28.751	28.987	27.837	27.452	27.633	20.788	23.678	24.423	27.717	24.32	25.073	828.855	885.6
18/3/99	2:06:30 PM	26.009	37.181	27.848	28.852	28.8	27.86	27.643	27.231	19.917	23.734	24.341	27.737	24.211	24.923	826.738	590.4
18/3/99	2:36:30 PM	25.689	37.336	27.847	28.842	28.601	27.95	27.6	26.862	19.472	23.632	24.341	27.829	24.219	24.766	729.421	826.56
18/3/99	3:06:30 PM	25.278	37.428	27.816	28.747	28.864	28.014	27.501	26.475	19.612	23.501	24.426	27.924	24.293	24.661	710.043	905.28
18/3/99	3:36:30 PM	25.316	36.364	27.824	28.769	30.773	28.015	27.501	26.386	20.597	23.445	24.399	27.814	24.299	24.522	510.089	452.64
18/3/99	4:06:30 PM	25.665	36.015	27.865	28.788	31.013	27.96	27.49	26.553	21.127	23.271	24.298	27.795	24.189	24.391	369.28	413.28
18/3/99	4:36:30 PM	25.929	35.831	27.869	28.809	30.959	27.985	27.557	26.896	21.383	23.652	24.614	27.829	24.459	25.039	176.681	236.16
18/3/99	5:06:30 PM	25.983	35.143	27.892	28.855	30.416	28.074	27.715	27.101	21.67	23.583	24.53	27.826	24.315	24.765	120.217	118.08
18/3/99	5:36:30 PM	26.119	35.748	27.872	28.788	29.61	28.076	27.605	27.166	22.03	23.51	24.503	27.98	24.35	24.698	84.799	98.4
18/3/99	6:06:30 PM	26.14	33.742	27.927	28.75	29.159	28.02	27.638	27.147	22.214	23.326	24.404	27.988	24.296	24.536	10.462	118.08
18/3/99	6:36:30 PM	26.086	32.877	27.982	28.818	28.678	28.159	28.003	27.214	22.125	24.18	24.517	28.007	24.314	24.58	0	98.4

Date	Time	Small tree su	standard	tree dl in	tree dl 0.6	tree dl su	tree in	tree 0.60	tree su	wet bulb	wet soil 0.2	wet soil 0.4	wet soil in	wet soil 0.6	wet soil su	Dir: 1 (0.1m/sq ft)	Wind speed
18/3/99	7:06:30 PM	26.144	32.014	27.968	28.825	28.257	28.036	27.86	27.029	21.896	24.16	24.423	28.055	24.286	24.692	0	157.44
18/3/99	7:36:30 PM	26.124	31.092	27.959	28.832	28.002	28.046	27.933	26.944	21.749	24.407	24.44	28.069	24.296	24.721	0	39.36
18/3/99	8:06:30 PM	26.053	30.825	27.993	28.84	27.821	28.065	28.057	26.891	21.616	24.39	24.473	28.048	24.308	24.722	0	59.04
18/3/99	8:36:30 PM	26.004	30.48	27.992	28.786	27.612	28.017	27.915	26.782	21.497	24.503	24.464	28.113	24.362	24.815	0	78.72
18/3/99	9:06:30 PM	25.911	30.108	28.009	28.8	27.549	27.952	27.871	26.56	21.431	24.379	24.425	28.111	24.342	24.777	0	39.36
18/3/99	9:36:30 PM	25.817	30.098	28.022	28.845	27.588	27.983	27.982	26.552	21.837	24.224	24.462	28.067	24.339	24.704	0	39.36
18/3/99	10:06:30 PM	25.805	29.791	28.047	28.836	27.642	28.002	28.104	26.533	22.003	24.239	24.445	28.042	24.323	24.692	0	19.68
18/3/99	10:36:30 PM	25.964	29.734	28.101	28.957	27.686	27.962	28.194	26.514	22.073	24.102	24.474	28.004	24.336	24.715	0	59.04
18/3/99	11:06:30 PM	25.858	29.459	28.009	28.871	27.56	27.885	28.008	26.5	22.074	23.715	24.434	28.032	24.323	24.819	0	39.39
18/3/99	11:36:30 PM	25.916	29.144	28.018	28.853	27.441	27.824	27.917	26.413	21.999	23.568	24.376	28.064	24.339	24.929	0	78.72
19/3/99	12:06:30 AM	25.852	28.697	28.067	28.86	27.481	27.975	28.116	26.536	22.117	23.7	24.499	28.073	24.414	24.918	0	39.36
19/3/99	12:36:30 AM	25.75	27.99	28.039	28.836	27.367	27.927	28.023	26.448	21.884	23.66	24.438	28.069	24.35	24.906	0	19.68
19/3/99	1:06:30 AM	25.796	27.649	28.04	28.881	27.183	27.903	28.075	26.415	21.674	23.524	24.45	28.029	24.341	24.893	0	19.68
19/3/99	1:36:30 AM	25.747	27.613	28.056	28.857	27.003	27.823	27.905	26.231	21.606	23.502	24.358	28.056	24.329	24.929	0	39.36
19/3/99	2:06:30 AM	25.615	27.512	27.998	28.855	26.97	27.845	27.994	26.262	21.623	23.293	24.415	28.001	24.337	24.851	0	59.04
19/3/99	2:36:30 AM	25.426	27.229	27.986	28.824	26.882	27.89	28.144	26.311	21.636	23.513	24.496	27.989	24.348	24.805	0	39.36
19/3/99	3:06:30 AM	25.519	27.399	28.011	28.875	26.826	27.832	32.827	26.161	21.647	23.311	24.419	27.969	24.304	24.781	0	19.68
19/3/99	3:36:30 AM	25.432	27.341	28.01	28.802	26.791	27.798	48.974	26.141	21.672	23.071	24.429	28.004	24.328	24.82	0	39.36
19/3/99	4:06:30 AM	25.504	27.498	28.035	28.893	26.775	27.757	52.781	26.048	21.672	23.066	24.366	27.929	24.271	24.798	0	39.36
19/3/99	4:36:30 AM	25.397	27.475	28.012	28.849	26.726	27.776	53.265	26.067	21.738	23.486	24.413	27.928	24.284	24.775	0	59.04
19/3/99	5:06:30 AM	25.317	27.406	28.047	28.876	26.657	27.792	53.754	26.071	21.777	23.773	24.425	27.891	24.267	24.719	0	39.36
19/3/99	5:36:30 AM	25.237	27.435	27.941	28.794	26.601	27.766	54.54	26.059	21.901	23.957	24.474	27.93	24.327	24.745	1.547	19.68
19/3/99	6:06:30 AM	25.301	27.379	28.009	28.915	26.597	27.735	53.891	26.028	21.803	23.785	24.416	27.832	24.223	24.657	47.549	59.04
19/3/99	6:36:30 AM	25.23	27.247	27.949	28.815	26.508	27.718	53.966	26	21.829	23.698	24.441	27.912	24.297	24.736	92.697	118.08
19/3/99	7:06:30 AM	25.353	27.557	27.986	28.892	26.556	27.669	53.543	25.874	21.794	23.484	24.368	27.863	24.211	24.691	183.439	157.44
19/3/99	7:36:30 AM	25.319	28.22	27.94	28.886	26.897	27.702	53.34	25.935	22.049	23.421	24.387	27.832	24.229	24.686	355.602	236.16

Date	Time	dry bulb	dry soil in	dry soil 0.6	dry soil air	glass 0.6	glass dl in	glass dl 0.6	glass dl air	glass in	glass air	in clear air	shrub in	shrub 0.6	shrub air	slab in	slab soil	small tree 1
19/3/99	8:06:30 AM	27.764	27.989	27.787	24.722	27.542	30.077	29.307	26.9	27.233	25.84	27.696	28.995	27.885	26.122	28.476	28.887	27.886
19/3/99	8:36:30 AM	28.522	27.943	27.758	24.733	27.536	30.05	29.226	26.878	27.181	25.867	28.452	29.009	27.93	26.182	28.515	31.168	27.949
19/3/99	9:06:30 AM	29.443	27.91	27.757	24.777	28.007	30.125	29.266	27.125	27.229	26.012	29.435	29.029	28.31	26.334	28.539	33.8	27.899
19/3/99	9:36:30 AM	30.071	27.932	27.751	24.842	28.028	30.143	29.269	27.346	27.177	26.153	29.942	28.946	28.312	26.439	28.555	36.129	27.876
19/3/99	10:06:30 AM	30.253	27.924	27.749	24.964	28.086	30.186	29.316	27.54	27.151	26.294	30.154	28.849	28.339	26.535	28.517	38.668	27.773
19/3/99	10:36:30 AM	30.938	27.933	27.731	25.008	28.289	30.151	29.257	28.063	27.161	26.321	30.91	28.919	28.471	27.034	28.582	41.737	27.835
19/3/99	11:06:30 AM	31.804	27.944	27.714	25.098	28.082	30.188	29.304	28.802	27.173	26.746	31.787	28.879	28.358	27.494	28.58	43.351	27.818
19/3/99	11:36:30 AM	32.52	27.954	27.722	25.179	28.182	30.215	29.309	29.428	27.16	26.851	32.459	28.911	28.406	28.111	28.609	43.058	27.858
19/3/99	12:06:30 PM	32.998	27.929	27.691	25.247	27.606	30.158	29.254	29.665	27.198	28.074	32.879	28.972	27.858	28.704	28.674	43.295	27.894
19/3/99	12:36:30 PM	34.211	27.972	27.733	25.326	27.121	30.207	29.263	29.927	27.167	28.703	34.209	28.942	27.32	28.737	28.647	43.254	27.975
19/3/99	1:06:30 PM	34.933	27.952	27.705	25.373	27.671	30.155	29.198	30.144	27.192	28.205	34.756	29.001	27.796	28.788	28.71	43.774	28.01
19/3/99	1:36:30 PM	34.224	27.983	27.728	25.464	28.164	30.169	29.208	30.588	27.193	28.24	34.193	28.945	28.337	28.933	28.666	44.666	28.008
19/3/99	2:06:30 PM	34.032	27.978	27.713	26.073	28.29	30.142	29.195	30.667	27.163	28.691	34.016	28.964	28.595	29.592	28.718	43.847	28.004
19/3/99	2:36:30 PM	33.459	27.995	27.714	26.285	17.581	30.165	29.182	30.322	27.176	28.855	34.404	28.953	28.552	29.525	28.766	43.01	28.06
19/3/99	3:06:30 PM	33.287	27.988	27.716	26.247	17.299	30.203	29.168	30.272	27.187	28.937	33.246	29.008	28.182	29.458	28.776	42.073	28.044
19/3/99	3:36:30 PM	33.598	27.998	27.715	26.177	27.582	30.177	29.182	29.924	27.129	28.681	33.622	28.981	28.418	29.354	28.826	41.565	28.097
19/3/99	4:06:30 PM	33.973	27.976	27.676	26.129	27.342	30.217	29.166	29.59	27.216	28.594	33.71	29.048	28.115	29.311	28.891	39.977	28.071
19/3/99	4:36:30 PM	33.623	28.031	27.696	26.108	26.956	30.221	29.152	29.226	27.202	28.488	33.619	29.059	28.127	29.218	28.918	38.855	28.11
19/3/99	5:06:30 PM	33.724	28.015	27.688	26.073	25.67	30.266	29.217	28.784	27.201	28.383	33.519	29.017	28.017	29.094	28.861	34.713	27.912
19/3/99	5:36:30 PM	33.367	28.045	27.675	25.988	26.549	30.244	29.176	28.305	27.212	28.162	33.325	29.076	27.875	28.998	28.894	33.118	27.9
19/3/99	6:06:30 PM	31.577	28.155	27.704	25.898	26.772	30.231	29.192	27.847	27.286	27.883	31.506	29.192	27.753	28.721	28.899	32.126	27.941



Date	Time	small tree ev	standard	tree ill in	tree ill 0.0	tree ill sun	tree ill	tree 0.00	tree sun	wet soil	wet soil 0.0	wet soil 0.0	wet soil in	wet soil 0.0	wet soil sun	Water (liters/sq ft)	Wind speed
19/3/99	8:06:30 AM	25.339	29.173	27.939	28.856	27.701	27.715	52.398	26.066	22.358	23.098	24.392	27.749	24.196	24.658	407.69	551.04
19/3/99	8:36:30 AM	25.493	30.014	27.966	28.914	27.99	27.74	52.775	26.167	22.645	23.07	24.431	27.688	24.228	24.709	536.537	570.72
19/3/99	9:06:30 AM	25.49	30.84	27.935	28.835	29.012	27.731	53.705	26.252	23.063	23.404	24.42	27.741	24.237	24.828	616.593	629.76
19/3/99	9:36:30 AM	25.657	31.521	27.957	28.845	29.228	27.68	53.849	26.443	23.366	23.441	24.412	27.677	24.212	24.905	572.606	236.16
19/3/99	10:06:30 AM	25.758	31.8	27.995	28.884	31.814	27.717	54.005	26.663	23.4	23.453	24.42	27.604	24.163	24.941	695.041	236.16
19/3/99	10:36:30 AM	25.894	32.464	27.942	28.836	34.584	27.681	54.204	26.791	23.457	23.693	24.394	27.657	24.211	25.089	759.384	236.16
19/3/99	11:06:30 AM	25.888	33.399	27.977	28.841	33.014	27.771	54.197	28.825	23.643	23.599	24.419	27.635	24.207	25.095	601.938	767.52
19/3/99	11:36:30 AM	26.034	34.046	27.973	28.873	30.415	27.766	53.977	29.597	23.944	23.554	24.41	27.635	24.2	25.157	657.161	728.16
19/3/99	12:06:30 PM	26.172	34.64	27.949	28.843	29.252	27.785	52.748	29.335	23.867	23.153	24.405	27.678	24.237	25.255	795.819	236.16
19/3/99	12:36:30 PM	26.373	35.808	28.003	28.904	28.726	27.804	51.65	28.98	24.276	22.728	24.318	27.683	24.128	25.254	738.906	728.16
19/3/99	1:06:30 PM	26.507	36.404	27.996	28.901	28.361	27.853	52.547	29.094	24.721	23.137	24.367	27.704	24.186	25.349	634.893	492
19/3/99	1:36:30 PM	26.757	35.784	28.007	28.868	28.287	27.859	53.792	28.997	24.35	23.551	24.339	27.691	24.154	25.404	525.546	452.64
19/3/99	2:06:30 PM	27.038	35.527	27.976	28.879	28.442	27.848	54.452	29.026	24.245	23.741	24.736	27.696	24.451	25.916	499.674	314.88
19/3/99	2:36:30 PM	27.539	34.939	27.953	28.889	28.398	27.875	54.29	28.898	24.134	23.594	24.736	27.693	24.448	25.91	455.809	236.16
19/3/99	3:06:30 PM	27.457	34.799	27.96	28.849	28.561	27.882	53.475	28.96	24.22	23.422	24.631	27.734	24.373	25.845	373.168	157.44
19/3/99	3:36:30 PM	27.463	35.183	27.982	28.865	29.171	27.909	53.94	28.893	24.333	23.554	24.546	27.745	24.324	25.718	234.205	118.08
19/3/99	4:06:30 PM	27.404	35.598	27.973	28.804	29.481	27.939	53.611	28.95	24.456	23.315	24.556	27.812	24.364	25.711	129.315	118.08
19/3/99	4:36:30 PM	27.539	35.205	27.983	28.864	29.255	27.897	52.76	28.871	24.318	23.273	24.488	27.827	24.318	25.673	63.508	118.08
19/3/99	5:06:30 PM	27.383	36.01	28.037	28.847	27.436	27.94	53.138	28.826	24.181	23.218	24.496	27.796	24.286	25.529	36.72	39.36
19/3/99	5:36:30 PM	27.276	35.861	27.996	28.814	30.903	27.889	52.939	28.655	24.454	23.106	24.482	27.818	24.315	25.43	16.284	157.44
19/3/99	6:06:30 PM	27.321	33.126	28.018	28.853	30.31	27.919	52.677	28.407	23.049	23.049	24.433	27.9	24.25	25.176	10.462	118.08



### ประวัติผู้เขียน

นายศุภกิจ ยิ้มสรวล เกิดวันที่ 23 กรกฎาคม พ.ศ. 2516 ที่กรุงเทพมหานคร สำเร็จ  
การศึกษาปริญญาตรีสถาปัตยกรรมศาสตรบัณฑิต สาขาสถาปัตยกรรม คณะสถาปัตยกรรมศาสตร์  
มหาวิทยาลัยรังสิต ในปีการศึกษา 2538-2539

ประวัติการทำงาน ปี 2539-2541 สถาปนิกฝ่ายบริหารและควบคุมการก่อสร้าง  
บริษัท อรุณชัยเสรี คอนซัลติ้ง เอนจิเนียส์ จำกัด

ปัจจุบัน กำลังศึกษาในระดับปริญญาสถาปัตยกรรมศาสตรมหาบัณฑิต สาขาเทคโนโลยีอาคาร  
ภาควิชาสถาปัตยกรรมศาสตร์ คณะสถาปัตยกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย