

## Table 2 - Construction Time of the Step Pyramid

by Rudolf Volz

Up No.	The Up Number represents the specific level of the total pyramid counted from the bottom to the top (1 - 210).
Down No.	The Down Number represents the specific level of the step pyramid counted backwards from the bottom to the top (209 - 1). Up_No. = 210 – Down_No.
Blocks	Number of blocks of the corresponding level of the step pyramid. This is equal to the square of the Down No. Blocks = (Down No.) <sup>2</sup>
Accum. blocks	Accumulated blocks up to the corresponding level.
Volume %	Percentage of blocks up to the corresponding level with respect to the total step pyramid. It is determined by the accumulated blocks divided by the total number of blocks in the step pyramid. Volume% = 100 * Accumulated_blocks / 3,065,985
Max. rate	The maximal rate represents the number of produced and installed blocks per day for 3 months during the Nile flood. There were about 20,000 workers available during this time.
Min. rate	The minimal rate represents the number of installed blocks per day during the other 9 months of the year. There were about 10,000 workers available during this time.
Average rate	Average of the installation rate over the year. Average_Rate = (3 Maximal_rate + 9 Minimal_rate) / 12
Constr. days	Construction days needed for the corresponding level of the step pyramid without casing. This is equal to the number of blocks divided by the average rate. Construction_days = Blocks / Average_rate
Constr. years	Accumulated construction days up to the corresponding level. Each year consisted of 300 working days. The rest were Saint days. Construction_years = Construction_days / 300
Accum. years	The construction years are the accumulated years up to the corresponding level.

Up No.	Down No.	Blocks	Accum. blocks	Volume %	Max. rate	Min. rate	Average rate	Constr. days	Constr. years	Accum. years
1	209	43,681	43,681	1.43	1,523	761	952	45.9	0,153	0.15
2	208	43,264	86,945	2.84	1,499	750	937	46.2	0,154	0.31
3	207	42,849	129,794	4.23	1,481	741	926	46.3	0,154	0.46
4	206	42,436	172,230	5.62	1,460	730	912	46.5	0,155	0.62
5	205	42,025	214,255	6.99	1,438	719	899	46.8	0,156	0.77
6	204	41,616	255,871	8.35	1,417	708	885	47.0	0,157	0.93
7	203	41,209	297,080	9.69	1,397	698	873	47.2	0,157	1.09
8	202	40,804	337,884	11.02	1,377	689	861	47.4	0,158	1.24
9	201	40,401	378,285	12.34	1,359	680	849	47.6	0,159	1.40
10	200	40,000	418,285	13.65	1,343	671	839	47.7	0,159	1.56

Table 2 - Construction Time of the Step Pyramid / 2

Up No.	Down No.	Blocks	Accum. blocks	Volume %	Max. rate	Min. rate	Average rate	Constr. days	Constr. years	Accum. years
11	199	39,601	457,886	14.94	1,327	663	829	47.8	0,159	1.72
12	198	39,204	497,090	16.22	1,310	655	819	47.9	0,160	1.88
13	197	38,809	535,899	17.48	1,292	646	808	48.0	0,160	2.04
14	196	38,416	574,315	18.74	1,276	638	798	48.2	0,161	2.20
15	195	38,025	612,340	19.98	1,262	631	789	48.2	0,161	2.36
16	194	37,636	649,976	21.21	1,249	625	781	48.2	0,161	2.52
17	193	37,249	687,225	22.42	1,242	621	776	48.0	0,160	2.68
18	192	36,864	724,089	23.62	1,231	616	770	47.9	0,160	2.84
19	191	36,481	760,570	24.81	1,219	609	762	47.9	0,160	3.00
20	190	36,100	796,670	25.99	1,204	602	753	48.0	0,160	3.16
21	189	35,721	832,391	27.16	1,188	594	743	48.1	0,160	3.32
22	188	35,344	867,735	28.31	1,172	586	732	48.3	0,161	3.48
23	187	34,969	902,704	29.45	1,156	578	722	48.4	0,161	3.64
24	186	34,596	937,300	30.58	1,141	571	713	48.5	0,162	3.81
25	185	34,225	971,525	31.70	1,127	563	704	48.6	0,162	3.97
26	184	33,856	1,005,381	32.80	1,114	557	696	48.6	0,162	4.13
27	183	33,489	1,038,870	33.89	1,103	552	690	48.6	0,162	4.29
28	182	33,124	1,071,994	34.98	1,094	547	684	48.4	0,161	4.45
29	181	32,761	1,104,755	36.04	1,084	542	677	48.4	0,161	4.61
30	180	32,400	1,137,155	37.10	1,075	537	672	48.2	0,161	4.78
31	179	32,041	1,169,196	38.15	1,064	532	665	48.2	0,161	4.94
32	178	31,684	1,200,880	39.18	1,055	527	659	48.1	0,160	5.10
33	177	31,329	1,232,209	40.20	1,040	520	650	48.2	0,161	5.26
34	176	30,976	1,263,185	41.21	1,031	516	645	48.1	0,160	5.42
35	175	30,625	1,293,810	42.21	1,022	511	639	47.9	0,160	5.58
36	174	30,276	1,324,086	43.20	1,012	506	632	47.9	0,160	5.74
37	173	29,929	1,354,015	44.18	1,003	501	627	47.8	0,159	5.90
38	172	29,584	1,383,599	45.14	992	496	620	47.7	0,159	6.05
39	171	29,241	1,412,840	46.10	983	491	614	47.6	0,159	6.21
40	170	28,900	1,441,740	47.04	972	486	608	47.6	0,159	6.37
41	169	28,561	1,470,301	47.97	967	483	604	47.3	0,158	6.53
42	168	28,224	1,498,525	48.89	961	481	601	47.0	0,157	6.69
43	(50%)	27,889	1,526,414	49.80	956	478	597	46.7	0,156	6.84
44	166	27,556	1,553,970	50.70	949	474	593	46.5	0,155	7.00
45	165	27,225	1,581,195	51.59	940	470	587	46.4	0,155	7.15
46	164	26,896	1,608,091	52.47	931	465	582	46.2	0,154	7.31
47	163	26,569	1,634,660	53.33	922	461	576	46.1	0,154	7.46
48	162	26,244	1,660,904	54.19	913	456	570	46.0	0,153	7.61
49	161	25,921	1,686,825	55.04	904	452	565	45.9	0,153	7.77
50	160	25,600	1,712,425	55.87	896	448	560	45.7	0,152	7.92
51	159	25,281	1,737,706	56.70	889	445	556	45.5	0,152	8.07
52	158	24,964	1,762,670	57.51	882	441	551	45.3	0,151	8.22
53	157	24,649	1,787,319	58.31	873	437	546	45.2	0,151	8.37
54	156	24,336	1,811,655	59.11	868	434	542	44.9	0,150	8.52
55	155	24,025	1,835,680	59.89	860	430	538	44.7	0,149	8.67
56	154	23,716	1,859,396	60.67	855	428	534	44.4	0,148	8.82
57	153	23,409	1,882,805	61.43	848	424	530	44.2	0,147	8.96
58	152	23,104	1,905,909	62.18	842	421	527	43.9	0,146	9.11
59	151	22,801	1,928,710	62.93	835	418	522	43.7	0,146	9.26
60	150	22,500	1,951,210	63.66	828	414	518	43.5	0,145	9.40

Table 2 - Construction Time of the Step Pyramid / 3

Up No.	Down No.	Blocks	Accum. blocks	Volume %	Max. rate	Min. rate	Average rate	Constr. days	Constr. years	Accum. years
61	149	22,201	1,973,411	64.39	821	410	513	43.3	0,144	9.55
62	148	21,904	1,995,315	65.10	814	407	509	43.1	0,144	9.69
63	147	21,609	2,016,924	65.81	808	404	505	42.8	0,143	9.83
64	(10 yrs)	21,316	2,038,240	66.50	801	401	501	42.6	0,142	9.97
65	145	21,025	2,059,265	67.19	794	397	496	42.4	0,141	10.11
66	144	20,736	2,080,001	67.86	787	393	492	42.2	0,141	10.26
67	143	20,449	2,100,450	68.53	781	391	488	41.9	0,140	10.40
68	142	20,164	2,120,614	69.19	776	388	485	41.6	0,139	10.53
69	141	19,881	2,140,495	69.84	770	385	482	41.3	0,138	10.67
70	140	19,600	2,160,095	70.48	765	383	478	41.0	0,137	10.81
71	139	19,321	2,179,416	71.11	760	380	475	40.7	0,136	10.94
72	138	19,044	2,198,460	71.73	756	378	473	40.3	0,134	11.08
73	137	18,769	2,217,229	72.34	751	375	469	40.0	0,133	11.21
74	136	18,496	2,235,725	72.94	745	373	466	39.7	0,132	11.34
75	135	18,225	2,253,950	73.54	740	370	462	39.4	0,131	11.48
76	134	17,956	2,271,906	74.12	734	367	459	39.1	0,130	11.61
77	133	17,689	2,289,595	74.70	729	365	456	38.8	0,129	11.74
78	132	17,424	2,307,019	75.27	725	363	453	38.4	0,128	11.86
79	131	17,161	2,324,180	75.83	722	361	451	38.0	0,127	11.99
80	130	16,900	2,341,080	76.38	716	358	448	37.7	0,126	12.12
81	129	16,641	2,357,721	76.92	711	356	444	37.4	0,125	12.24
82	128	16,384	2,374,105	77.46	706	353	441	37.2	0,124	12.36
83	127	16,129	2,390,234	77.99	700	350	438	36.9	0,123	12.49
84	126	15,876	2,406,110	78.50	695	347	434	36.6	0,122	12.61
85	125	15,625	2,421,735	79.01	689	345	431	36.3	0,121	12.73
86	124	15,376	2,437,111	79.51	686	343	429	35.9	0,120	12.85
87	123	15,129	2,452,240	80.01	682	341	426	35.5	0,118	12.97
88	122	14,884	2,467,124	80.49	679	339	424	35.1	0,117	13.08
89	121	14,641	2,481,765	80.97	675	338	422	34.7	0,116	13.20
90	120	14,400	2,496,165	81.44	670	335	419	34.4	0,115	13.32
91	119	14,161	2,510,326	81.90	666	333	416	34.0	0,113	13.43
92	118	13,924	2,524,250	82.36	661	330	413	33.7	0,112	13.54
93	117	13,689	2,537,939	82.80	657	329	411	33.3	0,111	13.65
94	116	13,456	2,551,395	83.24	653	327	408	33.0	0,110	13.76
95	115	13,225	2,564,620	83.67	650	325	406	32.6	0,109	13.87
96	114	12,996	2,577,616	84.10	644	322	403	32.3	0,108	13.98
97	113	12,769	2,590,385	84.52	641	320	401	31.9	0,106	14.08
98	112	12,544	2,602,929	84.92	637	319	398	31.5	0,105	14.19
99	111	12,321	2,615,250	85.33	634	317	396	31.1	0,104	14.29
100	110	12,100	2,627,350	85.72	630	315	394	30.7	0,102	14.40
101	109	11,881	2,639,231	86.11	626	313	392	30.3	0,101	14.50
102	108	11,664	2,650,895	86.49	621	311	388	30.1	0,100	14.60
103	107	11,449	2,662,344	86.86	616	308	385	29.8	0,099	14.70
104	106	11,236	2,673,580	87.23	612	306	383	29.4	0,098	14.79
105	(Median)	11,025	2,684,605	87.59	610	305	381	28.9	0,096	14.89
106	104	10,816	2,695,421	87.94	608	304	380	28.4	0,095	14.99
107	103	10,609	2,706,030	88.29	607	303	379	28.0	0,093	15.08
108	102	10,404	2,716,434	88.63	603	302	377	27.6	0,092	15.17
109	101	10,201	2,726,635	88.96	599	300	375	27.2	0,091	15.26
110	100	10,000	2,736,635	89.29	596	298	372	26.9	0,090	15.35

Table 2 - Construction Time of the Step Pyramid / 4

Up No.	Down No.	Blocks	Accum. blocks	Volume %	Max. rate	Min. rate	Average rate	Constr. days	Constr. years	Accum. years
111	99	9,801	2,746,436	89.61	592	296	370	26.5	0,088	15.44
112	(90%)	9,604	2,756,040	89.92	589	294	368	26.1	0,087	15.53
113	97	9,409	2,765,449	90.23	585	293	366	25.7	0,086	15.61
114	96	9,216	2,774,665	90.53	581	291	363	25.4	0,085	15.70
115	95	9,025	2,783,690	90.82	580	290	362	24.9	0,083	15.78
116	94	8,836	2,792,526	91.11	576	286	359	24.6	0,082	15.86
117	93	8,649	2,801,175	91.39	540	284	348	24.9	0,083	15.94
118	92	8,464	2,809,639	91.67	540	283	347	24.4	0,081	16.03
119	91	8,281	2,817,920	91.94	540	282	347	23.9	0,080	16.11
120	90	8,100	2,826,020	92.20	540	280	345	23.5	0,078	16.18
121	89	7,921	2,833,941	92.46	540	279	344	23.0	0,077	16.26
122	88	7,744	2,841,685	92.71	540	278	344	22.5	0,075	16.34
123	87	7,569	2,849,254	92.96	540	276	342	22.1	0,074	16.41
124	86	7,396	2,856,650	93.20	540	275	341	21.7	0,072	16.48
125	85	7,225	2,863,875	93.44	540	273	340	21.3	0,071	16.55
126	84	7,056	2,870,931	93.67	540	272	339	20.8	0,069	16.62
127	83	6,889	2,877,820	93.89	540	271	338	20.4	0,068	16.69
128	82	6,724	2,884,544	94.11	396	270	302	22.3	0,074	16.76
129	81	6,561	2,891,105	94.33	394	269	300	21.8	0,073	16.84
130	80	6,400	2,897,505	94.54	392	268	299	21.4	0,071	16.91
131	79	6,241	2,903,746	94.74	391	267	298	20.9	0,070	16.98
132	78	6,084	2,909,830	94.94	389	266	297	20.5	0,068	17.05
133	77	5,929	2,915,759	95.13	387	262	293	20.2	0,067	17.11
134	76	5,776	2,921,535	95.32	385	261	292	19.8	0,066	17.18
135	75	5,625	2,927,160	95.50	383	260	291	19.3	0,064	17.24
136	74	5,476	2,932,636	95.68	382	259	290	18.9	0,063	17.31
137	73	5,329	2,937,965	95.86	380	258	288	18.5	0,062	17.37
138	72	5,184	2,943,149	96.02	378	257	287	18.0	0,060	17.43
139	71	5,041	2,948,190	96.19	380	257	288	17.5	0,058	17.49
140	70	4,900	2,953,090	96.35	376	256	286	17.1	0,057	17.54
141	69	4,761	2,957,851	96.50	374	252	283	16.8	0,056	17.60
142	68	4,624	2,962,475	96.66	373	250	281	16.5	0,055	17.66
143	67	4,489	2,966,964	96.80	371	250	280	16.0	0,053	17.71
144	66	4,356	2,971,320	96.94	369	249	279	15.6	0,052	17.76
145	65	4,225	2,975,545	97.08	367	248	278	15.2	0,051	17.81
146	64	4,096	2,979,641	97.22	365	246	276	14.8	0,049	17.86
147	63	3,969	2,983,610	97.35	364	245	275	14.5	0,048	17.91
148	62	3,844	2,987,454	97.47	362	244	273	14.1	0,047	17.96
149	61	3,721	2,991,175	97.59	360	243	272	13.7	0,046	18.00
150	60	3,600	2,994,775	97.71	358	242	271	13.3	0,044	18.05
151	59	3,481	2,998,256	97.82	356	241	270	12.9	0,043	18.09
152	58	3,364	3,001,620	97.93	355	240	269	12.5	0,042	18.13
153	57	3,249	3,004,869	98.04	353	238	267	12.2	0,041	18.17
154	56	3,136	3,008,005	98.14	351	237	266	11.8	0,039	18.21
155	55	3,025	3,011,030	98.24	349	235	264	11.5	0,038	18.25
156	54	2,916	3,013,946	98.33	347	233	262	11.1	0,037	18.29
157	53	2,809	3,016,755	98.43	346	231	260	10.8	0,036	18.32
158	52	2,704	3,019,459	98.51	344	229	258	10.5	0,035	18.36
159	51	2,601	3,022,060	98.60	342	228	257	10.1	0,034	18.39
160	50	2,500	3,024,560	98.68	340	227	255	9.8	0,033	18.42

