

## BAB V

### KESIMPULAN

Berdasarkan data yang diperoleh, hasil perhitungan trafik serta referensi yang mendukung dalam analisa optimasi *occupancy* BTS CDMA Cilangkap Jakarta Timur maka dapat ditarik kesimpulan sebagai berikut:

1. Setelah data trafik dianalisa, BTS CDMA Cilangkap Jakarta Timur memiliki persentase *Answer Seizure Ratio* (%ASR) dan *occupancy* diluar standar karena terjadinya peningkatan jumlah panggilan (*call attempt*) yang lebih besar dari *call maximum* yang telah ditentukan.
2. Dengan membuat persentase kepadatan saluran (% *Occupancy*) sesuai dengan standarisasi yang telah ditentukan, diperlukan penambahan kanal elemen sebesar 12 kanal elemen, dan nilai persentase ASR menjadi optimal.
3. Cara penambahan kanal elemen adalah dengan menambahkan *Channel Element Module* (CEM) sebanyak 1 slot yang berisi 32 kanal elemen.
4. Dalam impiementasinya BTS Cilangkap diperlukan penambahan 32 kanal elemen 1 (CEM) lagi sehingga total kanal elemen yang terpasang menjadi 96 kanal elemen.

## DAFTAR PUSTAKA

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2. Qualcomm, "CDMA120-cdmaOne and CDMA2000 Concept and Terminology", Qualcomm Incorporated, San Diego U.S.A,2004.
3. Iversen, Villy B, "Teletraffic Engineering and Network Planning", Technical University of Denmark,2004.
4. Juhana, Tutun, "ET3042 Rekayasa Trafik", institut Teknologi Bandung,1998.
5. Santoso, Gatot, " Sistem Selular CDMA", Graha Ilmu, Yogyakarta, 2004.
6. Nortel Networks, "CDMA Metro Cell Base Transceiver Station (BTS):Overview", <http://products.nortel.com/> .

**LAMPIRAN A**

STANDARISASI DAN PERENCANAAN AWAL BTS SEKTOR ALPHA  
CILANGKAP JAKARTA TIMUR

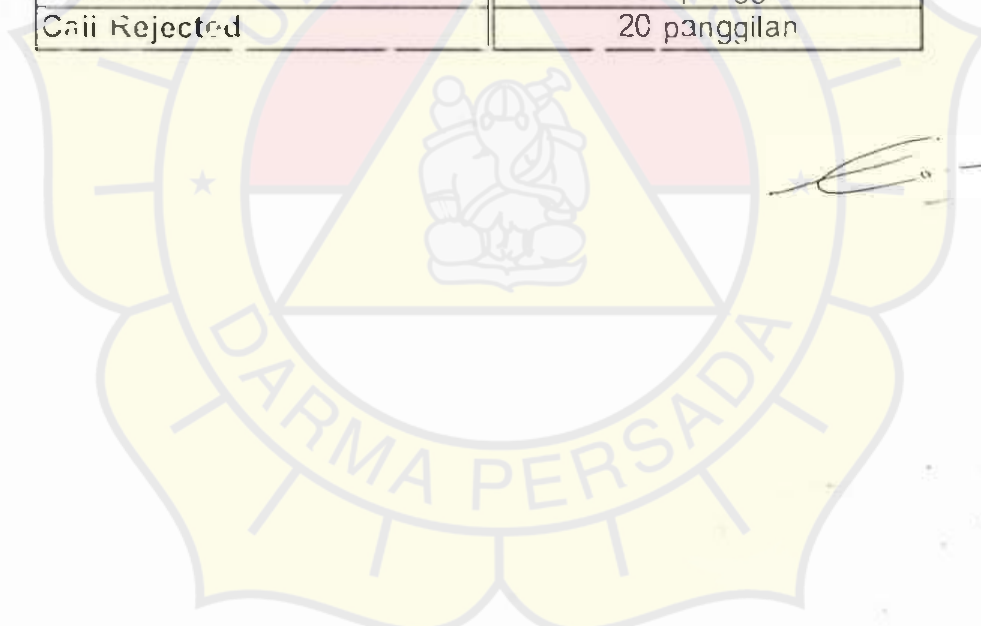


# STANDARISASI DAN PERENCANAAN

## BTS CDMA SEKTOR ALPHA

### CILANGKAP JAKARTA TIMUR

Kode BTS/Sektor	1085X
Lokasi	Cilangkap
Jumlah kanal elemen	64 kanal elemen
GOS	1%
Occupancy	70%
CSR	94%
Traffic Offered	50,6 Erlang
Traffic Rejected	0,506 Erlang
Traffic Carried	50,094 Erlang
Call Max.	1984 panggilan
Call Rejected	20 panggilan



**LAMPIRAN B**

DATA TRAFIK BULAN OKTOBER 2007  
BTS SEKTOR ALPHA CILANGKAP JAKARTA TIMUR



Date	Time	Cid	KEY	IncAtt	AnsInc	OutAtt	AnsOut	Use:Inc	UserOut	User	CSR	OCC
5/10/2006	00:00-01:00	1085X	64	14	14	28	24	0.41	0.58	0.98	90,4762	1.53
6/10/2006	01:00-02:00	1085X	64	18	14	14	14	0.24	0.34	0.57	87,5000	0.89
6/10/2006	02:00-03:00	1085X	64	16	14	18	16	0.28	0.44	0.72	88,2353	1.12
6/10/2006	03:00-04:00	1085X	64	54	52	98	98	1.42	2.85	4.27	98,6842	6.68
6/10/2006	04:00-05:00	1085X	64	9	96	266	250	2.39	6.08	8.47	95,0549	13.23
6/10/2006	05:00-06:00	1085X	64	180	178	376	356	4.71	10.43	15.13	96,0432	23.64
6/10/2006	06:00-07:00	1085X	64	284	278	588	530	6.56	14.31	20.86	96,1009	32.60
6/10/2006	07:00-08:00	1085X	64	394	382	714	698	7.85	17.85	25.70	97,4729	40.15
6/10/2006	08:00-09:00	1085X	64	274	266	560	514	6.80	14.27	21.06	97,1223	32.91
6/10/2006	09:00-10:00	1085X	64	270	264	698	680	6.40	16.81	23.21	97,5207	36.27
6/10/2006	10:00-11:00	1085X	64	214	210	470	456	5.79	14.01	19.80	97,3684	30.94
6/10/2006	11:00-12:00	1085X	64	358	348	572	562	8.95	17.23	26.18	97,8495	40.91
6/10/2006	12:00-13:00	1085X	64	308	302	790	756	7.37	19.33	26.70	96,3570	41.72
6/10/2006	13:00-14:00	1085X	64	282	274	668	638	7.14	17.47	24.61	96,0000	38.45
6/10/2006	14:00-15:00	1085X	64	318	306	674	648	7.34	20.03	27.37	96,1694	42.76
6/10/2006	15:00-16:00	1085X	64	432	344	916	882	8.85	25.63	34.48	90,9496	53.87
6/10/2006	16:00-17:00	1085X	64	444	390	1020	960	9.03	26.29	35.32	92,2131	55.18
6/10/2006	17:00-18:00	1085X	64	412	386	1338	1114	10.50	24.98	45.48	87,4286	71.06
6/10/2006	18:00-19:00	1085X	64	622	542	1526	1354	12.94	36.89	49.82	88,2682	77.85
6/10/2006	19:00-20:00	1085X	64	578	502	1536	1416	11.57	41.14	52.71	90,7285	82.36
6/10/2006	20:00-21:00	1085X	64	514	448	1408	1354	12.12	41.40	53.52	93,7565	83.63
6/10/2006	21:00-22:00	1085X	64	286	224	1128	1114	6.12	32.35	38.47	94,6252	60.11
6/10/2006	22:00-23:00	1085X	64	210	204	528	514	5.18	15.88	21.06	97,2900	32.90
6/10/2006	23:00-24:00	1085X	64	60	60	218	212	1.47	6.13	7.60	97,8417	11.88
13/10/2006	00:00-01:00	1085X	64	44	42	122	116	1.17	3.55	4.72	95,1807	7.37
13/10/2006	01:00-02:00	1085X	64	50	46	70	68	1.42	2.09	3.51	95,0000	5.49
13/10/2006	02:00-03:00	1085X	64	16	16	92	88	0.41	1.82	2.23	96,2963	3.48
13/10/2006	03:00-04:00	1085X	64	12	12	26	26	0.26	0.61	0.87	100,0000	1.36
13/10/2006	04:00-05:00	1085X	64	10	8	34	32	0.22	0.66	0.88	90,9091	1.37
13/10/2006	05:00-06:00	1085X	64	170	160	252	230	4.15	5.48	9.64	92,4171	15.06
13/10/2006	06:00-07:00	1085X	64	352	340	912	844	8.19	23.05	21.24	93,6709	48.82
13/10/2006	07:00-08:00	1085X	64	404	380	1258	1210	6.61	24.76	41.57	95,6679	64.64
13/10/2006	08:00-09:00	1085X	64	462	450	1262	1220	8.95	37.69	46.64	96,7877	72.87
13/10/2006	09:00-10:00	1085X	64	514	474	1342	1248	12.98	38.34	51.32	92,102	80.19
13/10/2006	10:00-11:00	1085X	64	494	480	1220	1164	13.23	37.59	50.82	95,1160	79.41
13/10/2006	11:00-12:00	1085X	64	442	380	1056	1000	9.36	30.91	40.27	92,128	62.92
13/10/2006	12:00-13:00	1085X	64	566	538	1424	1316	13.84	38.48	52.32	92,7928	81.75
13/10/2006	13:00-14:00	1085X	64	782	680	1150	1080	18.86	30.59	49.45	91,0973	77.27

13/10/2006	14:00-15:00	1085X	64	576	554	1070	1006	16,09	27,55	43,64	94,7752	68,19
13/10/2006	15:00-16:00	1 85X	64	500	480	1098	1040	13,23	22,71	38,94	95,1189	60,85
13/10/2006	16:00-17:00	1 85X	64	410	380	1282	1286	8,41	32,60	39,01	96,0993	60,95
13/10/2006	17:00-18:00	1 85X	64	652	588	1586	14,6	14,02	32,01	52,02	92,6720	81,29
13/10/2006	18:00-19:00	1 85X	64	474	430	1376	12,0	10,65	32,45	46,10	89,1892	72,03
13/10/2006	19:00-20:00	085X	64	548	474	1474	13,90	10,81	32,65	54,47	92,1860	85,11
13/10/2006	20:00-21:00	1 85	64	468	450	1393	12,02	10,36	35,55	49,91	88,6266	77,99
13/10/2006	21:00-22:00	1 85X	64	286	242	968	792	7,44	22,99	32,43	82,4561	50,67
13/10/2006	22:00-23:00	1 85X	64	160	136	356	350	3,95	30,88	13,83	94,1860	21,61
13/10/2006	23:00-24:00	1 85X	64	42	42	116	110	1,22	1,73	3,95	96,2025	6,17
20/10/2006	00:00-01:00	085X	64	12	12	96	92	0,35	5,83	3,18	96,2963	4,96
20/10/2006	01:00-02:00	1085X	64	28	28	66	64	0,65	2,53	2,18	97,8723	3,40
20/10/2006	02:00-03:00	085X	64	54	54	80	78	1,28	2,61	2,88	98,5075	4,51
20/10/2006	03:00-04:00	1085X	64	28	38	90	84	0,81	1,06	2,87	95,3125	4,49
20/10/2006	04:00-05:00	1085X	64	80	78	266	254	2,21	1,39	8,66	98,8095	13,54
20/10/2006	05:00-06:00	085X	64	210	200	441	418	5,18	2,97	15,16	94,4954	23,68
20/10/2006	06:00-07:00	1085X	64	356	340	724	704	9,80	2,97	24,38	96,6667	38,09
20/10/2006	07:00-08:00	085X	64	400	384	836	822	6,76	3,6	27,09	95,9547	42,32
20/10/2006	08:00-09:00	1085X	64	428	316	1034	592	8,36	3,53	39,59	97,3064	64,86
20/10/2006	09:00-10:00	1085X	64	496	466	948	922	1,3	9,53	34,85	90,4294	50,45
20/10/2006	10:00-11:00	1 85X	64	358	344	952	912	2,76	1,41	38,93	95,8779	6,84
20/10/2006	11:00-12:00	1 85	64	452	334	1196	1142	9,49	2,4	36,69	95,8788	57,33
20/10/2006	12:00-13:00	085X	64	622	538	1213	1156	1,33	0,63	47,67	95,1739	74,48
20/10/2006	13:00-14:00	1085X	64	368	352	836	816	2,09	2,25	31,89	92,0100	49,84
20/10/2006	14:00-15:00	1085X	64	362	354	872	832	2,09	2,25	32,80	97,5964	51,25
20/10/2006	15:00-16:00	1085X	64	386	366	828	782	5,06	2,09	27,37	94,8329	42,77
20/10/2006	16:00-17:00	1085X	64	326	306	884	828	9,08	2,09	30,20	93,5537	47,19
20/10/2006	17:00-18:00	1085X	64	446	406	1042	996	9,97	4,5	37,43	94,2204	58,49
20/10/2006	18:00-19:00	1 85X	64	636	528	1250	1216	9,09	3,21	40,22	90,6542	62,84
20/10/2006	19:00-20:00	085X	64	786	672	1748	1566	12,60	2,36	52,59	88,3189	82,18
20/10/2006	20:00-21:00	1 85X	64	456	340	1254	1154	9,31	2,36	46,55	85,3714	72,73
20/10/2006	21:00-22:00	1085X	64	396	366	754	712	10,70	2,58	33,65	93,7391	52,58
20/10/2006	22:00-23:00	1085X	64	56	54	246	242	1,32	3,83	8,39	98,0132	13,12
20/10/2006	23:00-24:00	1085X	64	38	36	88	88	0,92	1,435	3,36	98,4127	5,25
27/10/2006	00:00-01:00	1085X	64	18	18	40	40	0,43	5,07	1,46	100,0000	2,28
27/10/2006	01:00-02:00	1085X	34	22	22	54	52	0,49	1,43	1,92	97,3584	3,00
27/10/2006	02:00-03:00	1085X	64	26	26	44	44	0,77	7,48	1,83	100,0000	2,85
27/10/2006	03:00-04:00	1085X	64	54	50	120	124	1,19	1,03	4,57	96,6667	7,14
27/10/2006	04:00-05:00	1085X	64	132	128	170	160	2,40	8,99	5,67	95,3642	8,85
									17,23			
									2,95			
									7,07			

27/10/2006	05:00-06:00	1085X	64	132	128	260	258	332	6.15	9.47	96.5000	14.80
27/10/2006	06:00-07:00	1085X	64	292	286	546	526	829	15.24	23.52	96.8974	36.76
27/10/2006	07:00-08:00	1085X	64	366	356	762	728	889	21.43	30.32	96.0993	47.38
27/10/2006	08:00-09:00	1085X	64	376	368	834	798	739	19.93	26.32	96.3636	41.13
27/10/2006	09:00-10:00	1085X	64	398	380	1044	928	750	23.02	30.52	90.7074	47.69
27/10/2006	10:00-11:00	1085X	64	422	396	1208	1056	791	25.21	33.12	89.0798	51.75
27/10/2006	11:00-12:00	1085X	64	392	356	1290	1154	916	35.67	44.82	89.7741	70.03
27/10/2006	12:00-13:00	1085X	64	362	358	1084	990	862	29.77	37.40	93.2227	58.43
27/10/2006	13:00-14:00	1085X	64	342	330	558	544	819	16.63	24.82	97.1111	38.78
27/10/2006	14:00-15:00	1085X	64	354	342	704	664	793	21.16	29.09	95.0851	45.46
27/10/2006	15:00-16:00	1085X	64	368	354	888	860	805	27.85	35.91	96.6561	56.10
27/10/2006	16:00-17:00	1085X	64	284	272	978	882	608	28.08	34.16	91.4422	53.37
27/10/2006	17:00-18:00	1085X	64	354	348	1398	1146	830	33.30	41.59	85.2740	64.99
27/10/2006	18:00-19:00	1085X	64	420	366	1422	1212	630	35.92	42.22	85.6678	65.97
27/10/2006	19:00-20:00	1085X	64	774	606	1480	1354	1194	40.96	52.90	86.9565	82.66
27/10/2006	20:00-21:00	1085X	64	580	512	1009	978	1576	30.88	46.64	93.8287	72.88
27/10/2006	21:00-22:00	1085X	64	356	288	776	632	842	20.35	28.77	81.2721	44.96
27/10/2006	22:00-23:00	1085X	64	136	114	328	266	273	8.17	10.90	81.8966	17.03
27/10/2006	23:00-24:00	1085X	64	24	24	174	168	0.49	4.99	5.48	96.9697	8.56



*Handwritten signature or initials.*

**LAMPIRAN C**

DATA TRAFIK BULAN NOVEMBER 2007  
BTS SEKTOR ALPHA CII ANGKAP JAKARTA TIMUR



Date	Time	Cid	KEY	IncAtt	AnsInc	OutAtt	AnsOut	UserInc	UserOut	User	CSR	OCC
3/11/2006	00:00-01:00	1085X	64	6	6	20	20	0.14	0.51	0.65	100,0000	1,02
3/11/2006	01:00-02:00	1085X	64	26	26	30	30	0.76	1.01	1.77	10,0000	2,77
3/11/2006	02:00-03:00	1085X	64	10	10	20	20	0.24	0.55	0.79	100,0000	1,24
3/11/2006	03:00-04:00	1085X	64	64	64	134	128	1.63	3.33	5.57	96,9697	8,70
3/11/2006	04:00-05:00	1085X	64	120	112	350	338	2.57	10.37	12.84	95,7447	20,07
3/11/2006	05:00-06:00	1085X	64	204	198	488	472	4.40	13.24	17.64	96,8208	27,56
3/11/2006	06:00-07:00	1085X	64	342	336	796	772	7.73	18.51	28.24	97,3638	44,13
3/11/2006	07:00-08:00	1085X	64	464	442	968	940	8.43	22.33	29.97	96,5084	46,82
3/11/2006	08:00-09:00	1085X	64	416	404	928	906	8.12	24.62	32.94	97,4702	51,47
3/11/2006	09:00-10:00	1085X	64	512	494	938	916	13.52	26.62	40.15	97,2414	62,74
3/11/2006	10:00-11:00	1085X	64	392	378	700	656	9.36	18.30	27.66	94,6886	43,21
3/11/2006	11:00-12:00	1085X	64	414	398	708	690	8.94	20.05	28.99	96,9697	45,30
3/11/2006	12:00-13:00	1085X	64	482	474	900	876	11.25	22.44	33.69	97,8292	52,63
3/11/2006	13:00-14:00	1085X	64	360	354	894	810	9.11	22.59	31.70	92,8230	49,53
3/11/2006	14:00-15:00	1085X	64	432	420	884	774	9.26	19.80	29.06	90,7295	45,41
3/11/2006	15:00-16:00	1085X	64	530	516	554	928	11.61	28.37	39.98	97,3046	62,48
3/11/2006	16:00-17:00	1085X	64	442	430	844	796	9.95	23.58	33.53	95,3344	52,39
3/11/2006	17:00-18:00	1085X	64	408	376	1424	1312	8.96	33.84	42.80	92,1397	66,87
3/11/2006	18:00-19:00	1085X	64	434	416	1284	1172	11.43	34.11	45.55	92,4331	1,16
3/11/2006	19:00-20:00	1085X	64	324	314	1672	1464	9.08	44.76	53.84	89,0782	6,413
3/11/2006	20:00-21:00	1085X	64	358	310	1188	944	8.23	29.77	38.00	81,1125	59,38
3/11/2006	21:00-22:00	1085X	64	124	124	296	288	3.42	6.90	12.32	98,0952	19,25
3/11/2006	22:00-23:00	1085X	64	70	68	138	130	1.98	3.58	5.56	95,1923	8,69
3/11/2006	23:00-24:00	1085X	64	20	20	48	44	0.47	1.21	1.69	94,1176	2,64
10/11/2006	00:00-01:00	1085X	64	14	12	20	18	0.28	0.46	0.73	88,2353	1,15
10/11/2006	01:00-02:00	1085X	64	18	16	24	24	0.41	0.70	1.11	95,2381	0,74
10/11/2006	02:00-03:00	1085X	64	2	2	24	24	0.05	0.53	0.58	100,0900	0,90
10/11/2006	03:00-04:00	1085X	64	62	60	160	152	1.46	3.78	5.24	95,4955	8,19
10/11/2006	04:00-05:00	1085X	64	90	90	234	218	1.85	6.01	7.86	95,0617	12,29
10/11/2006	05:00-06:00	1085X	64	154	148	436	418	3.66	12.07	15.73	95,9322	24,58
10/11/2006	06:00-07:00	1085X	64	204	202	504	474	3.60	13.14	16.74	95,4802	26,16
10/11/2006	07:00-08:00	1085X	64	306	300	610	600	5.05	15.43	20.48	98,2533	32,00
10/11/2006	08:00-09:00	1085X	64	264	254	752	732	5.10	19.19	24.29	97,0472	37,96
10/11/2006	09:00-10:00	1085X	64	20	280	578	552	6.22	17.70	23.92	95,8525	37,37
10/11/2006	10:00-11:00	1085X	64	20	262	405	398	7.11	12.23	19.34	97,6331	30,22
10/11/2006	11:00-12:00	1085X	64	296	280	580	552	6.60	17.33	25.93	94,9772	40,51
10/11/2006	12:00-13:00	1085X	64	320	302	566	542	9.98	15.75	25.73	95,2596	40,21
10/11/2006	13:00-14:00	1085X	64	290	284	536	510	8.98	14.90	23.89	96,1259	37,33

10/11/2006	14:00-15:00	1055X	64	278	276	608	530	8.62	17.14	25.76	97.7427	40.25
10/11/2006	15:00-16:00	1085X	64	308	302	684	564	10.00	20.52	30.53	97.3790	47.70
10/11/2006	16:00-17:00	1085X	64	378	348	85	036	10.69	23.89	34.58	93.1274	54.03
10/11/2006	17:00-18:00	1085X	64	380	370	732	1294	11.00	33.62	44.62	96.8254	69.72
10/11/2006	18:00-19:00	1085X	64	330	314	115	122	9.49	36.70	46.19	95.9456	62.17
10/11/2006	19:00-20:00	1085X	64	464	452	1280	188	13.89	38.26	52.15	88.6488	61.49
10/11/2006	20:00-21:00	1085X	64	24	230	1360	068	7.64	34.30	41.95	91.8686	65.54
10/11/2006	21:00-22:00	1085X	64	26	256	113	126	7.91	1.06	20.97	96.6009	32.77
10/11/2006	22:00-23:00	1085X	54	120	100	138	154	2.47	4.76	7.23	91.3661	11.30
10/11/2006	23:00-24:00	1085X	64	52	52	66	34	1.25	1.76	3.01	98.053	4.70
17/11/2006	20:00-01:00	1085X	64	50	48	72	50	1.25	2.02	3.28	96.3213	5.12
17/11/2006	01:00-02:00	1085X	64	26	26	64	54	0.63	1.55	2.18	88.8883	3.40
17/11/2006	02:00-03:00	1085X	64	26	26	62	50	0.44	1.64	2.08	97.7273	3.25
17/11/2006	03:00-04:00	1085X	54	82	80	216	256	1.66	5.19	6.85	95.9732	10.70
17/11/2006	04:00-05:00	1085X	64	216	204	362	324	3.55	9.70	13.25	96.5398	20.70
17/11/2006	05:00-06:00	1085X	64	306	294	722	728	7.07	21.76	28.83	97.4708	45.04
17/11/2006	06:00-07:00	1085X	64	516	498	996	928	11.47	23.75	35.22	96.2963	55.03
17/11/2006	07:00-08:00	1085X	64	676	658	1252	1224	14.7	30.31	44.48	97.6111	69.50
17/11/2006	08:00-09:00	1085X	64	800	788	1474	1426	16.16	34.30	51.25	97.8012	80.08
17/11/2006	09:00-10:00	1085X	64	778	752	1562	1508	13.3	30.56	43.69	96.5912	88.26
17/11/2006	10:00-11:00	1085X	64	652	620	1104	1072	11.7	29.32	40.40	96.354	88.12
17/11/2006	11:00-12:00	1085X	64	620	574	1252	074	10.81	34.15	44.95	93.3761	73.24
17/11/2006	12:00-13:00	1085X	64	618	550	1514	116	11.85	35.97	47.81	91.7748	70.71
17/11/2006	13:00-14:00	1085X	64	568	428	1430	138	9.85	37.87	47.72	89.3694	74.57
17/11/2006	14:00-15:00	1085X	64	598	470	380	258	10.06	31.68	41.74	88.3721	65.23
17/11/2006	15:00-16:00	1085X	64	602	528	1572	1472	11.42	36.03	47.5	91.563	74.14
17/11/2006	16:00-17:00	1085X	64	574	510	1510	366	11.86	40.29	52.5	90.490	81.49
17/11/2006	17:00-18:00	1085X	64	598	412	1528	1474	10.12	41.37	51.19	86.3994	84.45
17/11/2006	18:00-19:00	1085X	64	626	578	1566	1426	9.5	39.07	49.42	91.4534	70.59
17/11/2006	19:00-20:00	1085X	64	598	292	1608	1566	7.17	45.50	52.07	84.268	82.30
17/11/2006	20:00-21:00	1085X	64	478	416	958	82	11.40	27.57	38.66	98.2268	62.88
17/11/2006	21:00-22:00	1085X	64	144	140	216	214	3.82	5.65	9.07	95.0834	1.80
17/11/2006	22:00-23:00	1085X	64	98	92	114	110	2.28	3.06	5.34	95.3833	4.34
17/11/2006	23:00-24:00	1085X	64	48	44	134	132	1.36	4.08	5.44	96.2030	8.50
24/11/2006	00:00-01:00	1085X	64	32	28	26	26	0.49	0.68	1.17	93.1034	1.82
24/11/2006	01:00-02:00	1085X	64	8	8	54	52	0.25	1.73	1.97	96.7742	3.08
24/11/2006	02:00-03:00	1085X	64	8	8	18	18	0.20	0.59	0.79	100.0000	1.24
24/11/2006	03:00-04:00	1085X	64	58	56	160	148	1.25	4.28	5.53	94.4444	8.63
24/11/2006	04:00-05:00	1085X	64	108	106	356	342	3.10	9.37	12.47	96.5517	19.49

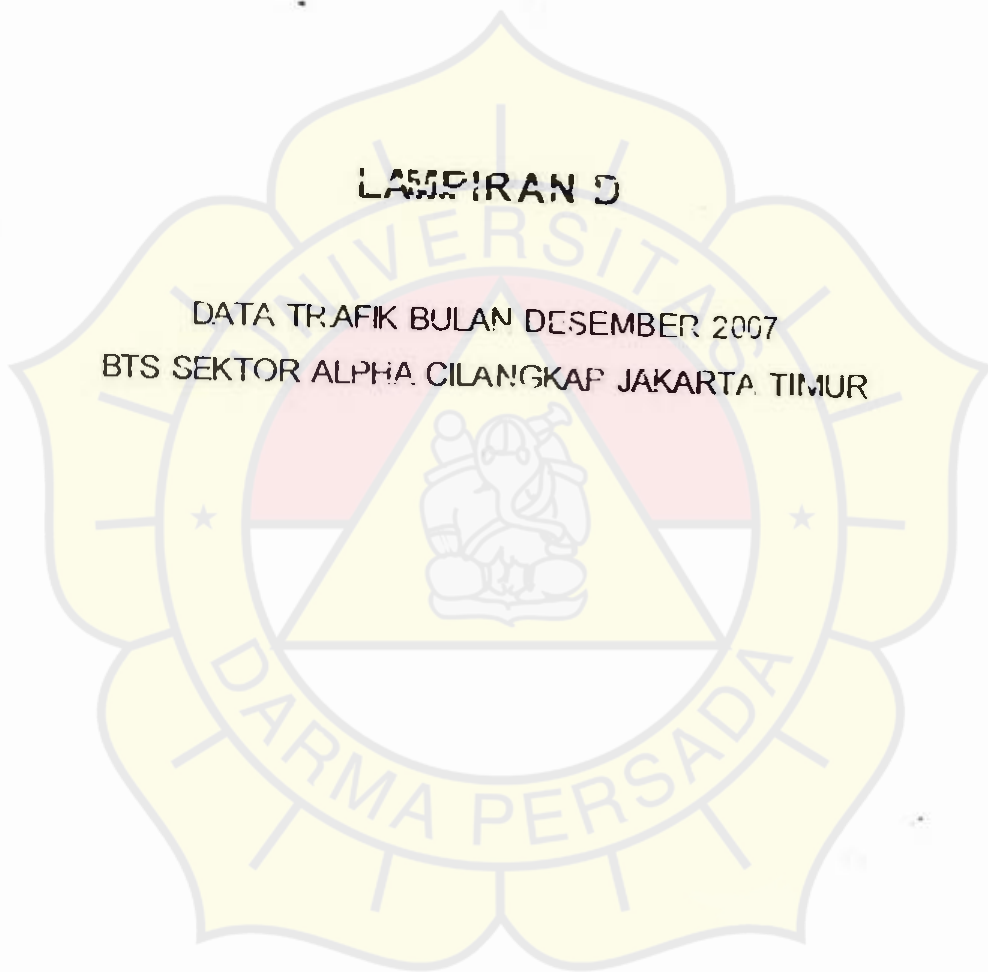
24/1/2006	05:00-06:00	1085X	64	196	192	498	472	5,00	11,26	16,26	95,6772	25,41
24/1/2006	06:00-07:00	1085X	64	310	296	644	610	8,13	17,63	25,76	94,9686	40,25
24/1/2006	07:00-08:00	1085X	64	372	354	788	744	8,81	22,02	30,83	94,6552	48,16
24/1/2006	08:00-09:00	1085X	64	412	404	1118	1058	9,31	32,50	41,81	95,5556	65,33
24/1/2006	09:00-10:00	1085X	64	446	398	966	936	8,81	27,20	36,02	94,4759	56,28
24/1/2006	10:00-11:00	1085X	64	324	318	722	688	9,18	21,61	30,79	96,1759	48,11
24/1/2006	11:00-12:00	1085X	64	472	458	842	822	9,43	23,78	33,22	97,4125	51,90
24/1/2006	12:00-13:00	1085X	64	422	410	862	830	9,01	24,10	33,11	96,5732	51,73
24/1/2006	13:00-14:00	1085X	64	416	412	900	850	10,54	25,14	35,68	96,6565	55,75
24/1/2006	14:00-15:00	1085X	64	424	416	860	822	11,39	25,34	36,73	96,4174	57,39
24/1/2006	15:00-16:00	1085X	64	486	472	842	818	11,27	25,13	36,40	97,1386	56,88
24/1/2006	16:00-17:00	1085X	64	462	446	1062	1020	12,37	29,51	41,88	96,1942	65,44
24/1/2006	17:00-18:00	1085X	64	414	388	1350	1242	9,95	36,73	46,68	92,4036	72,94
24/1/2006	18:00-19:00	1085X	64	352	336	1388	1178	9,76	37,52	47,29	37,0115	73,88
24/1/2006	19:00-20:00	1085X	64	376	336	1454	1298	10,34	42,18	52,51	89,2896	82,05
24/1/2006	20:00-21:00	1085X	64	338	314	912	880	8,66	27,80	36,46	95,5200	56,96
24/1/2006	21:00-22:00	1085X	64	192	174	376	178	5,02	5,62	10,64	61,9718	16,63
24/1/2006	22:00-23:00	1085X	64	156	132	323	266	3,86	7,78	11,63	82,2314	18,18
24/1/2006	23:00-24:00	1085X	64	110	98	340	324	2,53	9,18	11,71	93,7778	18,29

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LAMPIRAN D

DATA TRAFIK BULAN DESEMBER 2007  
BTS SEKTOR ALPHA CILANGKAP JAKARTA TIMUR



Date	Time	C-d	KEY	IneAt	AnsInc	OutAtt	AnsOut	UserInc	UserOut	User	CSR	OCC
1/12/2006	00:00-01:00	1085X	64	95	82	176	156	2.11	4.59	6.70	87.5000	10.46
1/12/2006	01:00-02:00	1085X	64	154	148	262	246	3.68	7.32	11.00	94.7115	17.19
1/12/2006	02:00-03:00	1085X	64	44	42	194	190	0.83	5.87	6.70	97.4790	10.47
1/12/2006	03:00-04:00	1085X	64	24	24	48	46	0.57	1.41	1.99	97.2222	3.10
1/12/2006	04:00-05:00	1085X	64	12	12	116	110	0.31	3.20	3.50	95.3125	5.47
1/12/2006	05:00-06:00	1085X	64	20	20	168	164	0.44	3.97	4.41	97.8723	6.89
1/12/2006	06:00-07:00	1085X	64	86	82	238	228	1.95	5.07	7.02	95.6790	10.96
1/12/2006	07:00-08:00	1085X	64	176	174	478	444	3.93	14.69	18.62	94.4954	29.09
1/12/2006	08:00-09:00	1085X	64	254	250	690	624	5.61	18.27	23.88	92.5847	37.31
1/12/2006	09:00-10:00	1085X	64	266	222	958	936	6.09	27.23	33.32	94.6078	52.07
1/12/2006	10:00-11:00	1085X	64	296	278	1026	990	8.59	24.07	32.66	95.9153	51.03
1/12/2006	11:00-12:00	1085X	64	388	344	1208	1198	8.88	35.09	43.97	96.6165	68.70
1/12/2006	12:00-13:00	1085X	64	406	376	1384	1360	8.98	29.28	38.26	85.0279	59.78
1/12/2006	13:00-14:00	1085X	64	514	492	1456	1420	10.62	33.91	44.52	94.0102	69.57
1/12/2006	14:00-15:00	1085X	64	402	384	1368	1286	8.50	35.55	44.05	94.3503	68.83
1/12/2006	15:00-16:00	1085X	64	388	374	1288	1158	9.32	33.28	42.60	91.4081	66.56
1/12/2006	16:00-17:00	1085X	64	370	352	1508	1420	8.40	41.32	49.72	94.3557	77.69
1/12/2006	17:00-18:00	1085X	64	384	366	1736	1554	8.51	41.24	49.75	90.5660	77.74
1/12/2006	18:00-19:00	1085X	64	422	396	1666	1504	7.88	40.92	48.80	90.9962	76.26
1/12/2006	19:00-20:00	1085X	64	536	484	1715	1556	9.47	42.61	52.09	90.5861	81.39
1/12/2006	20:00-21:00	1085X	64	388	358	1802	1668	8.03	42.60	50.63	92.5114	79.11
1/12/2006	21:00-22:00	1085X	64	350	306	1574	1486	6.77	41.69	48.46	93.1393	75.72
1/12/2006	22:00-23:00	1085X	64	310	294	1370	1272	6.34	36.96	43.30	93.2143	67.66
1/12/2006	23:00-24:00	1085X	64	264	244	994	936	4.59	27.03	31.62	93.7997	49.41
8/12/2006	00:00-01:00	1085X	64	250	240	606	526	5.74	15.00	20.74	89.4860	32.41
8/12/2006	01:00-02:00	1085X	64	82	80	240	226	1.76	6.59	8.35	95.0311	13.04
8/12/2006	02:00-03:00	1085X	64	28	28	90	86	0.74	2.39	3.13	96.6102	4.88
8/12/2006	03:00-04:00	1085X	64	14	14	34	34	0.38	1.04	1.43	100.0000	2.23
8/12/2006	04:00-05:00	1085X	64	4	4	50	44	0.09	1.12	1.21	88.8889	1.89
8/12/2006	05:00-06:00	1085X	64	28	26	58	56	0.44	1.72	2.16	95.3488	3.38
8/12/2006	06:00-07:00	1085X	64	110	110	234	218	2.29	6.51	8.80	95.3488	13.75
8/12/2006	07:00-08:00	1085X	64	188	182	422	410	3.20	11.20	14.40	97.0492	22.50
8/12/2006	08:00-09:00	1085X	64	260	252	680	652	5.44	20.49	25.92	96.1702	40.51
8/12/2006	09:00-10:00	1085X	64	310	284	872	834	7.33	24.37	31.70	94.5854	49.53
8/12/2006	10:00-11:00	1085X	64	346	328	960	898	8.99	27.91	36.90	93.3029	57.65

8/12/2006	11:00-12:00	1085X	64	364	354	1062	978	910	29.36	38.46	93,4081	60.09
8/12/2006	12:00-13:00	1085X	64	374	350	1102	1044	7.73	31.89	39.62	94,4444	61.91
8/12/2006	13:00-14:00	1085X	64	390	358	1246	1176	9.80	37.93	47.74	93,7653	74.59
8/12/2006	14:00-15:00	1085X	64	344	310	1218	1134	7.35	36.92	44.27	92,4456	69.18
8/12/2006	15:00-16:00	1085X	64	366	322	1176	1106	9.95	35.80	45.75	92,6070	71.49
8/12/2006	16:00-17:00	1085X	64	436	400	1154	1084	10.63	31.70	42.33	93,3333	66.14
8/12/2006	17:00-18:00	1085X	64	428	416	1098	1004	12.36	32.52	44.88	93,0537	70.12
8/12/2006	18:00-19:00	1085X	64	326	332	1332	1182	9.03	38.08	47.11	91,3148	73.61
8/12/2006	19:00-20:00	1085X	64	428	408	574	1444	10.41	41.70	52.11	92,5075	81.42
8/12/2006	20:00-21:00	1085X	64	342	286	666	1530	6.85	42.67	49.52	90,4382	77.37
8/12/2006	21:00-22:00	1085X	64	226	202	1390	1256	4.75	37.17	41.91	90,2228	65.49
8/12/2006	22:00-23:00	1085X	64	168	154	022	986	4.19	30.47	34.66	95,7983	54.16
8/12/2006	23:00-24:00	1085X	64	130	122	230	214	3.14	5.83	8.97	93,3333	14.01
15/12/2006	00:00-01:00	1085X	64	42	40	182	156	0.95	4.48	5.42	87,5000	8.48
15/12/2006	01:00-02:00	1085X	64	26	22	144	42	0.45	1.18	1.63	91,4286	2.54
15/12/2006	02:00-03:00	1085X	64	20	20	36	36	0.51	0.88	1.39	100,0000	2.17
15/12/2006	03:00-04:00	1085X	64	10	10	12	12	0.24	0.32	0.56	100,0000	0.87
15/12/2006	04:00-05:00	1085X	64	16	16	28	26	0.43	0.79	1.22	95,4545	1.91
15/12/2006	05:00-06:00	1085X	64	34	30	106	100	0.66	2.49	3.16	92,8571	4.93
15/12/2006	06:00-07:00	1085X	64	110	106	243	230	2.53	5.63	8.16	94,3820	12.75
15/12/2006	07:00-08:00	1085X	64	124	118	343	320	3.25	9.88	13.14	94,3966	20.53
15/12/2006	08:00-09:00	1085X	64	240	236	658	644	5.23	16.74	21.97	97,9955	34.32
15/12/2006	09:00-10:00	1085X	64	308	296	836	800	8.09	21.06	29.15	95,8042	45.54
15/12/2006	10:00-11:00	1085X	64	392	380	008	986	8.40	29.17	37.58	97,5714	58.11
15/12/2006	11:00-12:00	1085X	64	406	396	896	863	9.50	24.14	33.63	96,9325	52.55
15/12/2006	12:00-13:00	1085X	64	340	310	820	792	8.52	20.32	28.83	95,0000	45.05
15/12/2006	13:00-14:00	1085X	64	376	355	930	892	9.61	20.25	35.86	95,5590	56.03
15/12/2006	14:00-15:00	1085X	64	296	268	780	748	7.48	22.11	29.58	94,4238	46.23
15/12/2006	15:00-16:00	1085X	64	424	408	1036	982	10.87	27.55	38.42	95,8621	60.04
15/12/2006	16:00-17:00	1085X	64	230	222	554	518	6.73	3.75	19.48	94,3878	30.43
15/12/2006	17:00-18:00	1085X	64	408	396	986	954	6.37	26.05	35.43	93,9742	55.36
15/12/2006	18:00-19:00	1085X	64	508	444	1084	958	10.66	30.25	40.93	88,0653	63.95
15/12/2006	19:00-20:00	1085X	64	578	514	1446	1222	11.37	40.66	51.98	90,7115	81.23
15/12/2006	20:00-21:00	1085X	64	226	204	950	858	5.93	6.10	32.08	90,3061	50.13
15/12/2006	21:00-22:00	1085X	64	168	156	674	638	3.96	9.61	23.56	94,2993	36.82
15/12/2006	22:00-23:00	1085X	64	106	102	203	200	2.45	5.01	8.51	96,1783	13.29

15/12/2006	23:00-24:00	1085X	64	42	38	124	118	0.93	3.22	4.15	35,9759	6.49
22/12/2006	07:00-01:00	1085X	64	16	14	24	22	0.36	0.65	1.01	90,0000	1.58
22/12/2006	01:00-02:00	1085X	64	18	18	26	26	0.56	0.79	1.35	100,0000	2.11
22/12/2006	02:00-03:00	1085X	64	10	10	23	28	0.29	0.72	1.01	100,0000	1.58
22/12/2006	03:00-04:00	1085X	64	34	30	63	65	0.89	1.88	2.76	96,0784	4.32
22/12/2006	04:00-05:00	1085X	64	70	64	138	134	1.81	3.89	5.70	95,1923	8.91
22/12/2006	05:00-06:00	1085X	64	108	106	226	218	2.35	6.70	9.04	97,0060	14.13
22/12/2006	06:00-07:00	1085X	64	226	222	344	342	5.79	10.45	16.24	98,9474	25.37
22/12/2006	07:00-08:00	1085X	64	292	286	554	528	6.91	16.93	23.83	96,2175	37.24
22/12/2006	08:00-09:00	1085X	64	252	244	484	472	7.48	14.39	21.87	97,2926	34.17
22/12/2006	09:00-10:00	1085X	64	300	290	630	596	7.85	19.23	27.07	95,2688	42.30
22/12/2006	10:00-11:00	1085X	64	294	292	452	460	8.04	12.70	20.75	96,9072	32.42
22/12/2006	11:00-12:00	1085X	64	294	284	554	540	6.42	13.05	22.47	97,1698	35.11
22/12/2006	12:00-13:00	1085X	64	324	322	792	770	10.66	20.33	30.99	97,9495	48.43
22/12/2006	13:00-14:00	1085X	64	312	304	766	744	3.86	20.88	29.74	97,2171	46.47
22/12/2006	14:00-15:00	1085X	64	328	316	788	764	9.87	23.61	33.49	96,7742	52.32
22/12/2006	15:00-16:00	1085X	64	182	176	428	406	5.83	13.85	19.68	95,4098	30.76
22/12/2006	16:00-17:00	1085X	64	284	276	762	724	7.26	27.14	34.40	95,6023	53.75
22/12/2006	17:00-18:00	1085X	64	508	482	922	880	11.51	27.20	38.70	94,9791	60.47
22/12/2006	18:00-19:00	1085X	64	620	568	820	788	17.55	26.20	43.75	94,1667	68.36
22/12/2006	19:00-20:00	1085X	64	556	504	1368	1234	14.64	37.91	52.55	90,3326	82.11
22/12/2006	20:00-21:00	1085X	64	430	376	886	638	11.64	34.58	46.22	92,2492	72.21
22/12/2006	21:00-22:00	1085X	64	258	246	560	524	6.71	24.23	30.95	94,1320	48.35
22/12/2006	22:00-23:00	1085X	64	198	184	382	368	6.04	17.31	23.35	96,8421	36.48
22/12/2006	23:00-24:00	1085X	64	34	34	144	142	0.83	5.84	6.67	98,8764	10.43
29/12/2006	00:00-01:00	1085X	64	58	56	60	52	1.37	2.38	3.75	91,5254	5.85
29/12/2006	01:00-02:00	1085X	64	12	12	44	42	0.35	2.39	2.74	96,4286	4.29
29/12/2006	02:00-03:00	1085X	64	44	44	92	88	0.91	4.83	5.74	97,0588	8.97
29/12/2006	03:00-04:00	1085X	64	118	114	258	244	4.74	17.27	16.01	95,2128	25.02
29/12/2006	04:00-05:00	1085X	64	170	164	382	366	4.74	15.08	19.82	96,0145	30.97
29/12/2006	05:00-06:00	1085X	64	314	296	534	512	7.68	15.23	22.91	95,2830	35.80
29/12/2006	06:00-07:00	1085X	64	388	360	844	820	10.43	23.76	34.19	95,7792	53.43
29/12/2006	07:00-08:00	1085X	64	422	402	880	848	7.57	27.52	35.09	96,0061	54.83
29/12/2006	08:00-09:00	1085X	64	492	472	946	898	9.43	26.15	35.58	95,2712	55.59
29/12/2006	09:00-10:00	1085X	64	466	470	862	828	10.90	23.24	34.15	97,7410	53.36
29/12/2006	10:00-11:00	1085X	64	626	582	978	956	12.56	27.96	40.52	95,8853	63.31

29/12/2006	11:00-12:00	1085X	64	524	518	1128	1074	12,81	28,36	41,17	95,7882	64,32
29/12/2006	12:00-13:00	1085X	64	446	418	1156	1114	9,67	31,11	40,79	95,6305	63,73
29/12/2006	13:00-14:00	1085X	64	524	504	1128	1040	11,71	24,84	36,54	93,4625	57,10
29/12/2006	14:00-15:00	1085X	64	432	406	1263	1216	9,93	26,21	38,14	95,4118	59,60
29/12/2006	15:00-16:00	1085X	64	476	450	1304	266	10,79	30,36	41,16	96,4045	64,32
29/12/2006	16:00-17:00	1085X	64	614	582	1222	1110	15,01	27,63	42,64	92,4837	66,63
29/12/2006	17:00-18:00	1085X	64	644	554	1278	122	13,70	29,38	43,08	92,2997	67,31
29/12/2006	18:00-19:00	1085X	64	462	428	1372	1240	9,95	36,04	45,99	90,9487	71,85
29/12/2006	19:00-20:00	1085X	64	406	336	1690	1522	7,19	44,59	51,78	88,6450	8,91
29/12/2006	20:00-21:00	1085X	64	114	434	776	744	9,29	21,75	31,05	95,7724	48,51
29/12/2006	21:00-22:00	1085X	64	36	108	306	292	2,95	3,97	11,92	95,2381	18,63
29/12/2006	22:00-23:00	1085X	64	12	32	121	114	0,62	2,72	3,34	91,2500	5,22
29/12/2006	23:00-24:00	1085X	64	12	12	36	34	0,32	0,99	1,31	95,8333	2,04



*[Handwritten signature]*

LAMPIRAN E

SPEKTRUM  
SPESIFIKASI BTS CDMA  
CILANGKAP JAKARTA TIMUR





## CDMA METRO CELL BASE TRANSCIVER STATION (BTS)

- Features & Benefits
- Technical Specifications
- Product Literature
- Brochures
- News
- Related Products
- Upgrade & Solutions
- Country Availability

- Productivity
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### OVERVIEW

The Nortel CDMA Metro Cell BTS enables a cost effective network growth with a "pay as you grow" strategy, as it supports CDMA2000 1X, 1xEV, IS-95, and 800-1900MHz all in a single BTS. The BTS provides operators with a seamless evolution path from existing IS-95 networks to CDMA2000 1X and 1xEV-DO via a card upgrade, enabling evolution by leveraging the investments in existing networks, which is critical to today's wireless operators.

### KEY FEATURES

- Evolution with Investment: Protection and cost effective network growth
- Leading Flexibility and Scalability
- Best in class capacity and performance

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Product Details

### CDMA METRO CELL BASE TRANSCEIVER STATION (BTS)

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Product Information

#### FEATURES & BENEFITS

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Product Literature

The CDMA Metro Cell BTS offers:

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Brochures

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Tools

- **Evolution with Investment Protection and cost effective network growth** - A single Metro Cell can support CDMA2000 1X, 1xEV, IS-95 and 800/1900 MHz and evolution from IS-95 to CDMA2000 1X is available today via a simple card upgrade. Operators can preserve existing investments in their network while incrementally growing their network to add capacity as required through a clear, smooth evolution path. Nortel Multi-Carrier Flexible Radio Module (MFRM) provides an operator with the capability to increase capacity in the network through an upgrade, enabling optimized utilization of existing spectrum and improving spectral efficiencies. MFRM also provides extended coverage option to the operators for rural and highway deployments.

CONTACT

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Services & Solutions

Country Availability

- **Leading Flexibility and Scalability** - offers a variety of configurations for indoor or outdoor operation providing operators with a modular design for simple, cost effective expansion and growth. For metropolitan markets, the Metro Cell BTS can be configured as a high-capacity, multi-carrier base station with the ability to increase capacity remotely using software. For rural markets the Metro Cell can be configured as a high power, high coverage cell site to enable cost-effective coverage of wide areas. The Fiber Optic Microcell (FOM) provides operators with an easy and economical solution to extend coverage into challenging locations such as campuses, in-building areas and "hotspots". Using a fiber connection, the Fiber Optic Microcell can be remotely deployed from Metro Cell or Minicell Digital Enclosure to improve coverage for either 800 MHz or 1900 MHz traffic.

CONTACT

CONTACT

- **Best in class capacity and performance** - With an industry-leading capacity, the CDMA Metro Cell BTS offers superior voice quality with best in class RF performance coupled with integrated echo cancellation. Metro Cell is capable of providing extended coverage option for rural and highway deployments with a software upgrade on the MFRM radio module within the existing frame.

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## CDMA METRO CELL BASE TRANSCEIVER STATION (BTS)

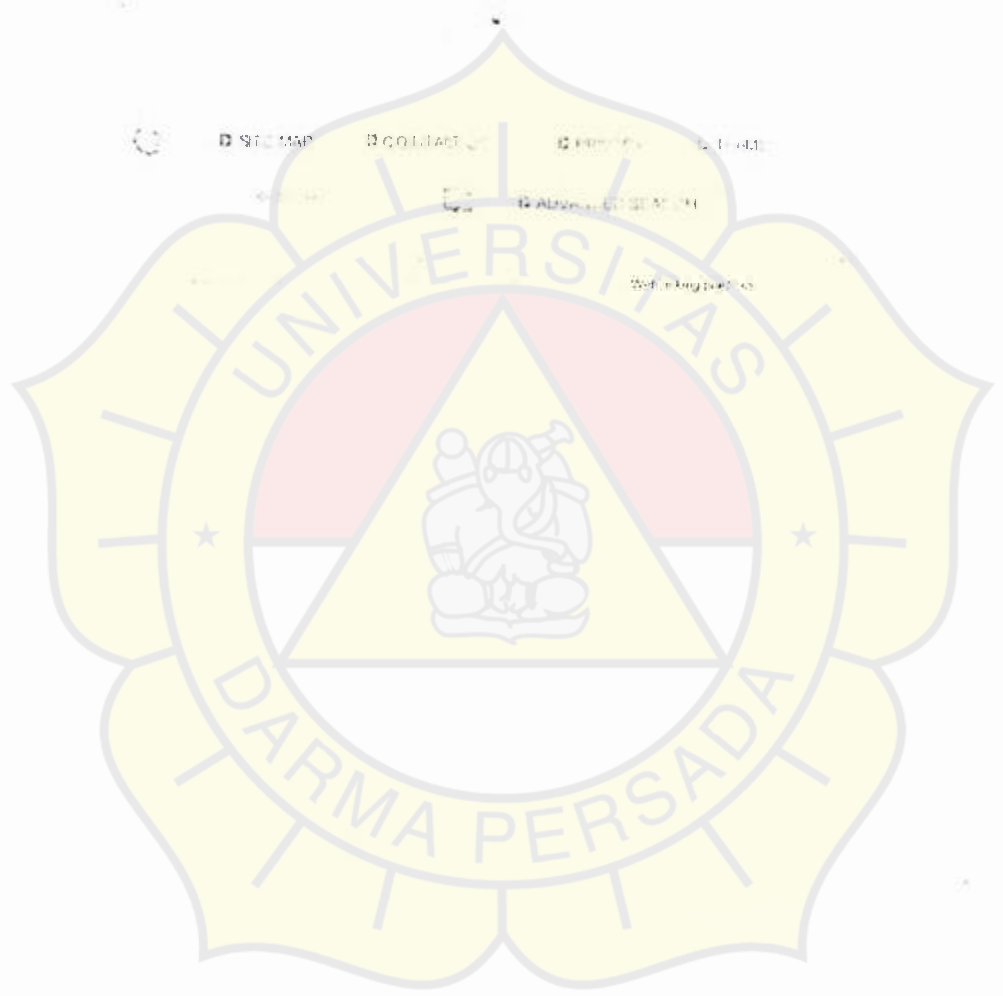
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### TECHNICAL SPECIFICATIONS

- 800MHz and 1900MHz dual-band capable
- 32- and 64- Channel Element card options
- Fiber connectivity
- Support of up to 768 channel elements

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## BAKRIE TELECOM GROWS FIXED WIRELESS INDOONESIAN NETWORK WITH NORTEL SOLUTIONS

### EXPANSION TO DOUBLE CAPACITY TO MEET ACCELERATING SUBSCRIBER GROWTH

MAY 18, 2006

JAKARTA, Indonesia - PT Bakrie Telecom, one of Indonesia's leading providers of fixed wireless voice and data services, is significantly boosting the capacity and transmission capabilities of its wireless network with new radio access, switching and optical solutions from Nortel. [NYSE/TSX: NTI]

The increased capacity of the CDMA2000 1X network, serving Greater Jakarta and 15 cities in West Java and Banten province, will position Bakrie to meet escalating subscriber demand for the voice and fixed wireless broadband Internet, data and fax services it provides via its 'Esia' brand.

"We are currently experiencing 55% growth within one quarter in 2006 and expect to grow this base to approximately 1.35 million subscribers during 2006 more than double last year's total," said AG Rao, Chief Technical Officer, PT Bakrie Telecom. "Esia is known as a market 'mover and shaker' in Indonesia, and we look to Nortel to support our continuing growth with highly secure and reliable world-class technology that keeps pace with the changing needs of the Indonesian market."

"Nortel is strongly committed to supporting Bakrie Telecom's evolution and delivering the solutions that enable it to bring substantial added value and communications innovation to its residential and business customers," said James Demers, vice president, ASEAN, Nortel. "We have a highly successful and long-standing relationship with Bakrie, having built its original CDMA network in 2002 and implemented a major upgrade in 2005."

The Nortel solution for Bakrie Telecom consists of new CDMA Metro Cell Base Transceiver Stations (BTS) to enable cost-effective network growth and seamless, investment-protecting evolution, via a card upgrade to Nortel's third generation (3G) 1xEV-DO CDMA infrastructure. At the network core, Bakrie is deploying Nortel's flexible DMS-MTX Switching Platform to enable subscribers to

#### RELATED LINKS

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[CDMA 2000 1xEV-DO](#)

[DMS-MTX Circuit Switching Platform](#)

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LAMPIRAN F

TABEL ERLANG-B



Erlang B Traffic Table in Erlangs

Trunks	0.001	0.002	0.003	0.005	0.01	0.02	0.03	0.04	0.05	0.06
1	0,00100	0,00200	0,00301	0,00503	0,01010	0,02041	0,03093	0,04167	0,05263	0,06383
2	0,04576	0,06534	0,08064	0,10540	0,15259	0,22347	0,28155	0,33333	0,38132	0,42678
3	0,19384	0,24872	0,28851	0,34900	0,45549	0,60221	0,71513	0,81202	0,89940	0,98048
4	0,43927	0,53503	0,60209	0,70120	0,86942	1,09226	1,25891	1,39944	1,52462	1,63971
5	0,76211	0,89986	0,99446	1,13204	1,36079	1,65714	1,87521	2,05733	2,21847	2,36586
6	1,14591	1,32520	1,44681	1,62183	1,90903	2,27588	2,54306	2,76487	2,96032	3,13853
7	1,57860	1,79844	1,94626	2,15747	2,50094	2,93541	3,24965	3,50949	3,73782	3,94559
8	2,05133	2,31055	2,48373	2,72990	3,12756	3,62705	3,98655	4,28297	4,54296	4,77924
9	2,55749	2,85491	3,05265	3,33259	3,78254	4,34473	4,74788	5,07964	5,37024	5,63411
10	3,09204	3,42652	3,64804	3,96066	4,46118	5,03400	5,52942	5,89541	6,21571	6,50636
11	3,65106	4,02152	4,26610	4,61041	5,15992	5,84153	6,32796	6,72721	7,07640	7,39314
12	4,23140	4,63684	4,90382	5,27090	5,87599	6,61472	7,14104	7,57269	7,95005	8,29227
13	4,83053	5,27001	5,55880	5,96379	6,60717	7,40151	7,96673	8,43001	8,83490	9,20203
14	5,44637	5,91903	6,22905	6,66320	7,35168	8,20027	8,80347	9,29768	9,72951	10,12105
15	6,07718	6,58221	6,91295	7,37554	8,10804	9,00962	9,64999	10,17448	10,63272	11,04822
16	6,72150	7,25815	7,60913	8,09951	8,87503	9,82845	10,50522	11,05940	11,54359	11,98263
17	7,37809	7,94566	8,31643	8,83398	9,65160	10,65581	11,36827	11,95162	12,46130	12,92351
18	8,04567	8,64372	8,93386	9,57802	10,43688	11,49088	12,23841	12,85043	13,38519	13,87021
19	8,72393	9,31444	9,76056	10,33030	11,23010	12,33299	13,11498	13,75520	14,31468	14,82218
20	9,41145	10,06805	10,49579	11,09162	12,03061	13,18154	13,99742	14,66543	15,24925	15,77894
21	10,10773	10,79297	11,23039	11,85984	12,83784	14,03600	14,89526	15,58066	16,18851	16,74010
22	10,81214	11,52532	11,98930	12,63493	13,65127	14,89592	15,77808	16,50048	17,13204	17,70528
23	11,52412	12,26486	12,74649	13,41639	14,47045	15,78090	16,67549	17,42455	18,07955	18,67417
24	12,24317	13,01103	13,51001	14,20380	15,29500	16,63057	17,57717	18,35255	19,03071	19,64650
25	12,96389	13,76338	14,27946	14,99677	16,12456	17,50464	18,48281	19,28422	19,98528	20,62201
26	13,70077	14,52156	15,05447	15,79494	16,95880	18,38279	19,39217	20,21930	20,94302	21,60049
27	14,43854	15,28521	15,83471	16,59802	17,79744	19,26476	20,30501	21,15756	21,90372	22,58173
28	15,18184	16,05402	16,61938	17,40570	18,64022	20,15037	21,22109	22,09883	22,86719	23,56557
29	15,93037	16,82770	17,40969	18,21774	19,48691	21,03937	22,14024	23,04291	23,83328	24,55182
30	16,68386	17,60601	18,20391	19,03389	20,33729	21,93156	23,06228	23,98963	24,80180	25,54036
31	17,44204	18,38869	19,00231	19,85396	21,19115	22,82679	23,98705	24,93885	25,77265	26,53105
32	18,20470	19,17553	19,80468	20,67771	22,04833	23,72438	24,91439	25,89042	26,74566	27,52377
33	18,97162	19,96633	20,61081	21,50499	22,90866	24,62570	25,84418	26,84423	27,72075	28,51841
34	19,74259	20,76091	21,42053	22,33563	23,77197	25,52909	26,77629	27,80015	28,69779	29,51485
35	20,51743	21,55908	22,23369	23,16945	24,63812	26,43404	27,71051	28,75809	29,67667	30,51302
36	21,29598	22,36069	23,05011	24,00637	25,50702	27,34314	28,64701	29,71796	30,65732	31,51281
37	22,07807	23,16561	23,85968	24,84612	26,37850	28,25357	29,58543	30,67964	31,63965	32,51418
38	22,86355	23,97366	24,69224	25,68872	27,25246	29,16615	30,52575	31,64305	32,62359	33,51700
39	23,65231	24,78475	25,51768	26,53399	28,12880	30,08076	31,46790	32,60814	33,60905	34,52125
40	24,44419	25,59873	26,34589	27,38181	29,00743	30,99734	32,41181	33,57480	34,59596	35,52684
41	25,23909	26,41551	27,17674	28,23212	29,88823	31,91578	33,35738	34,54299	35,58426	36,53372
42	26,03666	27,23407	28,01014	29,08479	30,77116	32,83604	34,30455	35,51263	36,57389	37,54182
43	26,83745	28,05702	28,84900	29,93974	31,65609	33,75802	35,25327	36,48366	37,56481	38,55111
44	27,64071	28,88156	29,69422	30,79688	32,54298	34,68165	36,20347	37,45605	38,55695	39,56154
45	28,44658	29,70848	30,52471	31,65615	33,43173	35,60689	37,15509	38,42971	39,55028	40,57305
46	29,25494	30,53774	31,36741	32,51746	34,32230	36,53367	38,10808	39,40461	40,54473	41,58557
47	30,06573	31,36924	32,21224	33,38075	35,21460	37,46194	39,06233	40,38070	41,54030	42,59915
48	30,87897	32,20291	33,05913	34,24595	36,10859	38,39164	40,01796	41,35796	42,53689	43,61364
49	31,69427	33,03867	33,90798	35,11294	37,00420	39,32273	40,97475	42,33632	43,53448	44,62908
50	32,51184	33,87643	34,75879	35,98176	37,90139	40,25515	41,93275	43,31572	44,53304	45,64540
51	33,33158	34,71619	35,61143	36,85230	38,80010	41,18884	42,89188	44,29619	45,53255	46,66259
52	34,15335	35,55782	36,46588	37,72451	39,70029	42,12382	43,85211	45,27761	46,53301	47,68064
53	34,97712	36,40132	37,32210	38,59833	40,60189	43,06000	44,81340	46,26004	47,53427	48,69948
54	35,80284	37,24663	38,18001	39,47373	41,50491	43,99733	45,77573	47,24333	48,53640	49,71907
55	36,63045	38,09363	39,03955	40,35064	42,40922	44,93578	46,73908	48,22757	49,53940	50,73940
56	37,45988	38,94235	39,90071	41,22906	43,31438	45,87536	47,70339	49,21269	50,54313	51,76052
57	38,29110	39,79272	40,76342	42,10886	44,22175	46,81600	48,66863	50,19868	51,54767	52,78228
58	39,12406	40,64467	41,62762	42,99010	45,12988	47,75770	49,63480	51,18545	52,55296	53,80475
59	39,95869	41,49819	42,49332	43,87270	46,03920	48,70039	50,60187	52,17301	53,55892	54,82785
60	40,79497	42,35318	43,35043	44,75661	46,94970	49,64410	51,56980	53,16133	54,56563	55,85160
61	41,63287	43,20968	44,22895	45,64183	47,86128	50,59872	52,53854	54,15043	55,57296	56,87601
62	42,47230	44,06763	45,09882	46,52829	48,77403	51,53423	53,50809	55,14026	56,58103	57,90094
63	43,31325	44,92698	45,97005	47,41598	49,68778	52,48066	54,47343	55,13079	57,58063	58,92651
64	44,15567	45,78753	46,84250	48,30484	50,60263	53,42901	55,44055	57,12198	58,59897	59,95267
65	44,99952	46,64966	47,71624	49,19486	51,51845	54,37620	56,42146	58,11388	59,60886	60,97931
66	45,84433	47,51300	48,59120	50,08603	52,43529	55,32517	57,39403	59,10644	60,61933	62,00562
67	46,68915	48,37755	49,46743	50,97832	53,35309	56,27499	58,36734	60,09956	61,63039	63,03425
68	47,53951	49,24338	50,34472	51,87168	54,27184	57,22562	59,34134	61,09339	62,64194	64,06248

Trunks	0.001	0.002	0.003	0.005	0.01	0.02	0.03	0.04	0.05	0.06
69	48,38885	50,11041	51,22321	52,76611	55,19149	58,17700	60,31601	62,08777	63,65415	65,09124
70	49,23948	50,97864	52,10283	53,66148	56,11207	59,12909	61,29136	63,08272	64,66680	66,12044
71	50,09132	51,84801	52,98352	54,55794	57,03351	60,08199	62,26729	64,07829	65,67999	67,15013
72	50,94439	52,71848	53,86525	55,45538	57,95580	61,03554	63,24393	65,07439	66,69371	68,18023
73	51,79871	53,59013	54,74802	56,35376	58,87888	61,98984	64,22111	66,07100	67,70787	69,21078
74	52,65415	54,46277	55,63186	57,25304	59,80287	62,94481	65,19887	67,06818	68,72253	70,24180
75	53,51082	55,33651	56,51668	58,15326	60,72761	63,90041	66,17728	68,06585	69,73768	71,27327
76	54,36853	56,21124	57,40244	59,05439	61,65313	64,85671	67,15626	69,06406	70,75326	72,30512
77	55,22740	57,08708	58,28918	59,95640	62,57943	65,81363	68,13573	70,06276	71,76926	73,33735
78	56,08731	57,96386	59,17688	60,85928	63,50648	66,77116	69,11582	71,06192	72,78569	74,35997
79	56,94832	58,84162	60,06552	61,76301	64,43428	67,72928	70,09640	72,06158	73,80261	75,40299
80	57,81040	59,72027	60,95501	62,66758	65,36274	68,68809	71,07746	73,06171	74,81991	76,43635
81	58,67339	60,59995	61,84533	63,57290	66,29194	69,64742	72,05909	74,06228	75,83758	77,47013
82	59,53750	61,48049	62,73664	64,47904	67,22187	70,60736	73,04122	75,06327	76,85572	78,50428
83	60,40248	62,36196	63,62868	65,38600	68,15247	71,56777	74,02379	76,06464	77,87420	79,53875
84	61,26849	63,24429	64,52162	66,29371	69,08365	72,52860	75,00688	77,06656	78,89303	80,57355
85	62,13544	64,12747	65,41538	67,20216	70,01559	73,49041	75,99045	78,06881	79,91225	81,60864
86	63,00333	65,01149	66,30989	68,11129	70,94806	74,45252	76,97443	79,07149	80,93186	82,64411
87	63,87208	65,89638	67,20522	69,02118	71,88123	75,41507	77,95892	80,07456	81,95184	83,67993
88	64,74170	66,78204	68,10131	69,93185	72,81495	76,37825	78,94379	81,07796	82,97211	84,76504
89	65,61227	67,66858	68,99818	70,84315	73,74934	77,34185	79,92915	82,08180	83,99272	85,75239
90	66,48364	68,55585	69,89575	71,75510	74,68433	78,30595	80,91486	83,08604	85,01371	86,78916
91	67,35590	69,44394	70,79413	72,66771	75,61986	79,27053	81,90105	84,09002	86,03502	87,82021
92	68,22900	70,33278	71,69316	73,58102	76,55596	80,23560	82,88757	85,09559	87,05658	88,85345
93	69,10286	71,22233	72,59288	74,49505	77,49265	81,20112	83,87455	86,10089	88,07059	89,90102
94	69,97759	72,11268	73,49330	75,40956	78,42981	82,16703	84,86195	87,10054	89,10079	90,93639
95	70,85313	73,00368	74,39447	76,32485	79,36763	83,13347	85,84963	88,11239	90,12332	91,97698
96	71,72942	73,89537	75,29622	77,24062	80,30589	84,10030	86,83781	89,11880	91,14615	93,01529
97	72,60638	74,78787	76,19869	78,15705	81,24472	85,06764	87,82623	90,12539	92,16922	94,05395
98	73,48416	75,68103	77,10181	79,07410	82,18398	86,03529	88,81521	91,13227	93,19269	95,09292
99	74,36268	76,57480	78,00554	79,99173	83,12381	87,00346	89,80438	92,13961	94,21634	96,13199
100	75,24199	77,46930	78,90992	80,90997	84,06415	87,97197	90,79390	93,14718	95,24031	97,17150
101	76,12194	78,36440	79,81430	81,82869	85,00497	88,94089	91,78390	94,15513	96,26457	98,21102
102	77,00267	79,26022	80,72041	82,74801	85,94631	89,91020	92,77397	95,16324	97,28908	99,25092
103	77,88402	80,15663	81,62662	83,66781	86,88803	90,87989	93,76466	96,17165	98,31382	100,29093
104	78,76503	81,05367	82,53347	84,58822	87,83024	91,85009	94,75553	97,18053	99,33894	101,33131
105	79,64877	81,95129	83,44081	85,50912	88,77289	92,82058	95,74675	98,18946	100,36421	102,37194
106	80,53217	82,84955	84,34871	86,43064	89,71600	93,79132	96,73828	99,19800	101,38961	103,41261
107	81,41630	83,74840	85,25721	87,35256	90,65973	94,76248	97,73009	100,20852	102,41551	104,45372
108	82,30100	84,64789	86,16627	88,27497	91,60363	95,73421	98,72235	101,21838	103,44146	105,49501
109	83,18634	85,54788	87,07585	89,19795	92,54807	96,70609	99,71483	102,22835	104,46765	106,53627
110	84,07225	86,44844	87,98591	90,12139	93,49301	97,67827	100,70769	103,23882	105,49405	107,57787
111	84,95881	87,34961	88,89656	91,04548	94,43822	98,65034	101,70071	104,24934	106,52034	108,61979
112	85,84608	88,25137	89,80788	91,96974	95,38387	99,62386	102,69405	105,26030	107,54778	109,66179
113	86,73380	89,15361	90,71944	92,89479	96,33012	100,59698	103,68769	106,27146	108,57484	110,70406
114	87,62225	90,05652	91,63164	93,82015	97,27654	101,57071	104,68160	107,28280	109,60221	111,74637
115	88,51112	90,95989	92,54444	94,74600	98,22350	102,54460	105,67575	108,29451	110,62966	112,78911
116	89,40070	91,86358	93,45758	95,67210	99,17076	103,51882	106,67012	109,30634	111,65759	113,83184
117	90,29079	92,76808	94,37126	96,59884	100,11830	104,49334	107,66489	110,31848	112,68554	114,87474
118	91,18156	93,67283	95,28544	97,52598	101,06651	105,46815	108,65985	111,33070	113,71371	115,91802
119	92,07277	94,57834	96,20007	98,45370	102,01493	106,44343	109,65512	112,34341	114,74207	116,96120
120	92,96436	95,48412	97,11514	99,38152	102,96352	107,41871	110,65052	113,35613	115,77061	118,00472
121	93,85677	96,39060	98,03059	100,31010	103,91271	108,39464	111,64646	114,36908	116,79929	119,04856
122	94,74972	97,29752	98,94664	101,23893	104,86225	109,37051	112,64246	115,38223	117,82833	120,09224
123	95,64296	98,20483	99,86325	102,16823	105,81210	110,34659	113,63848	116,39578	118,85748	121,13642
124	96,53691	99,11275	100,78016	103,09773	106,76223	111,32359	114,63498	117,40926	119,88671	122,18040
125	97,43130	100,02100	101,69756	104,02787	107,71286	112,30028	115,53170	118,42310	120,91625	123,22465
126	98,32611	100,92980	102,61521	104,95838	108,66373	113,27751	116,62861	119,43706	121,94606	124,26929
127	99,22154	101,83887	103,53353	105,88925	109,61480	114,25502	117,62594	120,45134	122,97590	125,31394
128	100,11731	102,74866	104,45203	106,82043	110,56653	115,23254	118,62341	121,46594	124,00574	126,35870
129	101,01389	103,65866	105,37115	107,75191	111,51817	116,21055	119,62102	122,48034	125,03604	127,40376
130	101,91075	104,56908	106,29064	108,66390	112,47043	117,18877	120,61873	123,49526	126,06631	128,44892
131	102,80787	105,48015	107,21045	109,61038	113,42304	118,16718	121,61678	124,51019	127,09702	129,49420
132	103,70571	106,39159	108,13057	110,54907	114,37572	119,14601	122,61515	125,52536	128,12765	130,53961
133	104,60399	107,30337	109,05121	111,48220	115,32396	120,12499	123,61356	126,54074	129,15844	131,58511
134	105,50259	108,21545	109,97235	112,41549	116,28223	121,10300	124,61223	127,55633	130,18902	132,63070
135	106,40203	109,12810	110,89372	113,34942	117,23601	122,08355	125,61120	128,57210	131,22066	133,67662
136	107,30148	110,04125	111,81554	114,28347	118,19003	123,06336	126,61039	129,58804	132,25207	134,72259
137	108,20151	110,95464	112,73780	115,21786	119,14426	124,04323	127,60981	130,60413	133,29356	135,78009
138	109,10212	111,86850	113,66046	116,15283	120,09894	125,02341	128,60918	131,62035	134,31513	136,84488

Trunks	0.001	0.002	0.003	0.005	0.01	0.02	0.03	0.04	0.05	0.06
139	110.00300	112.78280	114.58324	117.08784	121.05380	126.00388	129.60900	132.63695	135.34702	137.86117
140	110.90441	113.69753	115.50665	118.02340	122.00907	126.98462	130.60873	133.65339	136.37896	138.90772
141	111.80604	114.61239	116.43040	118.95920	122.96447	127.96534	131.60888	134.67018	137.41091	139.95424
142	112.70841	115.52789	117.35419	119.89524	123.92025	128.94629	132.60918	135.68704	138.44315	141.00099
143	113.61096	116.44375	118.27854	120.83177	124.87611	129.92773	133.60960	136.70423	139.47565	142.04796
144	114.51393	117.35966	119.20345	121.76848	125.83232	130.90938	134.61040	137.72145	140.50813	143.09486
145	115.41730	118.27616	120.12832	122.70564	126.78913	131.89093	135.61129	138.73897	141.54086	144.14196
146	116.32133	119.19322	121.05370	123.64294	127.74568	132.87293	136.61226	139.75650	142.57353	145.18923
147	117.22544	120.11027	121.97957	124.58066	128.70281	133.85507	137.61329	140.77430	143.60642	146.23666
148	118.13016	121.02784	122.90562	125.51876	129.66020	134.83735	138.61464	141.79207	144.63951	147.28426
149	119.03520	121.94592	123.83212	126.45695	130.61784	135.82003	139.61631	142.81009	145.67279	148.33172
150	119.94052	122.86420	124.75877	127.39549	131.57573	136.80282	140.61799	143.82834	146.70596	149.37930
151	120.84611	123.78294	125.68582	128.33436	132.53354	137.78569	141.61996	144.84653	147.73930	150.42729
152	121.75224	124.70185	126.61327	129.27355	133.49213	138.76891	142.62191	145.86492	148.77308	151.47511
153	122.65888	125.62119	127.54081	130.21304	134.45052	139.75220	143.62412	146.88351	149.80671	152.52330
154	123.56573	126.54064	128.46899	131.15281	135.40928	140.73581	144.62658	147.90228	150.84048	153.57130
155	124.47305	127.46078	129.39722	132.09285	136.36838	141.71975	145.62898	148.92122	151.87436	154.61966
156	125.38054	128.38100	130.32576	133.03314	137.32763	142.70359	146.53190	149.94032	152.90834	155.66779
157	126.28847	129.30158	131.25461	133.97395	138.28729	143.68763	147.63473	150.95927	153.94273	156.71627
158	127.19683	130.22249	132.18375	134.91469	139.24705	144.67216	148.63777	151.97835	154.97690	157.76509
159	128.10529	131.14373	133.11346	135.85592	140.20691	145.65664	149.64098	152.99817	156.01144	158.81364
160	129.01443	132.06528	134.04312	136.79733	141.16714	146.64108	150.64407	154.01779	157.04575	159.86252
161	129.92365	132.98742	134.97332	137.73891	142.12775	147.62307	151.64763	155.03721	158.08041	160.91110
162	130.83352	133.90952	135.90375	138.68095	143.08839	148.61098	152.65131	156.05703	159.11511	161.95029
163	131.74342	134.83186	136.83437	139.62313	144.04907	149.59542	153.65519	157.07724	160.15016	163.00925
164	132.65395	135.75479	137.76519	140.56542	145.01007	150.58170	154.65886	158.09721	161.18401	164.05851
165	133.56447	136.67792	138.69648	141.50813	145.97138	151.56728	155.66295	159.11724	162.21959	165.10768
166	134.47558	137.60126	139.62794	142.45092	146.93299	152.55300	156.66715	160.13752	163.25538	166.15709
167	135.38697	138.52510	140.55985	143.39411	147.89490	153.53868	157.67177	161.15805	164.29045	167.20639
168	136.29861	139.44880	141.49189	144.33767	148.85676	154.52493	158.67616	162.17850	165.32581	168.25592
169	137.21048	140.37330	142.42404	145.28128	149.81888	155.51112	159.68061	163.19930	166.36147	169.30566
170	138.12257	141.29762	143.35660	146.22523	150.78126	156.49777	160.68545	164.22009	167.39709	170.35526
171	139.03518	142.22271	144.28657	147.16953	151.74388	157.48423	161.69035	165.24089	168.43266	171.40507
172	139.94831	143.14759	145.22260	148.11383	152.70639	158.47031	162.69561	166.26200	169.46849	172.45507
173	140.86129	144.07323	146.15601	149.05844	153.66946	159.45781	163.70058	167.28308	170.50426	173.50491
174	141.77475	144.99862	147.08978	150.00335	154.63272	160.44491	164.70590	168.30443	171.54028	174.55492
175	142.68868	145.92474	148.02358	150.94955	155.59585	161.43210	165.71124	169.32580	172.57655	175.60510
176	143.60274	146.85091	148.95772	151.89369	156.55949	162.41036	166.71950	170.34709	173.61272	176.65540
177	144.51724	147.77745	149.89218	152.83944	157.52331	163.40701	167.72256	171.36899	174.64912	177.70560
178	145.43184	148.70402	150.82662	153.78510	158.48728	164.39438	168.72854	172.39048	175.68540	178.75590
179	146.34686	149.63093	151.76171	154.73100	159.45141	165.38213	169.73450	173.41222	176.72191	179.80634
180	147.26194	150.55819	152.69674	155.67713	160.41567	166.37026	170.74041	174.43422	177.75827	180.85692
181	148.17777	151.48576	153.63206	156.62382	161.38096	167.35841	171.74662	175.45612	178.79484	181.90763
182	149.09363	152.41365	154.56764	157.57038	162.34456	168.34656	172.75273	176.47825	179.83161	182.95846
183	150.00951	153.34149	155.50347	158.51713	163.30951	169.33507	173.75921	177.50062	180.86856	184.00904
184	150.92609	154.26997	156.43955	159.46441	164.27456	170.32357	174.76592	178.52287	181.90517	185.06010
185	151.84268	155.19837	157.37586	160.41152	165.23969	171.31205	175.77255	179.54532	182.94248	186.11089
186	152.75959	156.12704	158.31240	161.35914	166.20525	172.30086	176.77943	180.56763	183.97960	187.16177
187	153.67662	157.05631	159.24914	162.30691	167.17052	173.28998	177.78621	181.59050	185.01653	188.21314
188	154.59436	157.98547	160.18608	163.25483	168.13555	174.27906	178.79324	182.61303	186.05398	189.26420
189	155.51184	158.91486	161.12321	164.20287	169.10227	175.26808	179.80050	183.63356	187.09121	190.31533
190	156.42997	159.84483	162.06088	165.15103	170.06839	176.25739	180.80764	184.65864	188.12895	191.36654
191	157.34837	160.77464	162.99835	166.09967	171.03452	177.24699	181.81500	185.68153	189.16646	192.41822
192	158.26666	161.70502	163.93634	167.04840	172.00104	178.23651	182.82239	186.70496	190.20374	193.46955
193	159.18557	162.63521	164.87447	167.99722	172.96756	179.22630	183.82981	187.72818	191.24150	194.52094
194	160.10436	163.56595	165.81274	168.94649	173.93443	180.21636	184.83780	188.75119	192.27901	195.57273
195	161.02374	164.49685	166.75113	169.89583	174.90130	181.20631	185.84561	189.77471	193.31700	196.62425
196	161.94333	165.42790	167.69001	170.84522	175.86814	182.19651	186.85325	190.79801	194.35473	197.67617
197	162.86314	166.35947	168.62898	171.79466	176.83531	183.18659	187.86144	191.82182	195.39293	198.72771
198	163.78313	167.29079	169.56805	172.74489	177.80282	184.17659	188.86943	192.84539	196.43084	199.77968
199	164.70331	168.22262	170.50758	173.69477	178.77027	185.16761	189.87722	193.86870	197.46922	200.83188
200	165.62405	169.15455	171.44680	174.64504	179.73804	186.15357	190.88554	194.89250	198.50731	201.88389
01	166.54456	170.08696	172.38604	175.59533	180.70574	187.14897	191.89441	195.91680	199.54585	202.93548
02	167.46561	171.01947	173.32656	176.54599	181.67374	188.14016	192.90305	196.94083	200.58408	203.98749
03	168.38680	171.95206	174.26669	177.49665	182.64184	189.13118	193.91145	197.96457	201.62276	205.03922
04	169.30851	172.88472	175.20725	178.44767	183.61004	190.12200	194.92037	198.98879	202.66111	206.09191
05	170.22995	173.81782	176.14783	179.39905	184.57891	191.11341	195.92904	200.01349	203.69912	207.14432
06	171.15188	174.75137	177.08842	180.35039	185.54766	192.10460	196.93744	201.03789	204.73835	208.19713
07	172.07432	175.68456	178.02940	181.30168	186.51628	193.09637	197.94715	202.06192	205.77645	209.24930
08	172.99644	176.61858	178.97078	182.25331	187.48477	194.08792	198.95578	203.08652	206.81577	210.30138

209	173,91905	177,55221	179,91174	183,20547	188,45391	195,07924	199,96492	204,11073	207,85472	211,35454
210	174,84212	178,48626	180,85347	184,15735	189,42289	196,07111	200,97456	205,13540	208,89330	212,40722
211	175,76485	179,42071	181,79517	185,10915	190,39252	197,06273	201,98390	206,16053	209,93230	213,45942
212	176,68843	180,35515	182,73722	186,06165	191,36198	198,05491	202,99293	207,18531	210,97172	214,51199
213	177,61166	181,28998	183,67943	187,01406	192,33125	199,04682	204,00244	208,20973	212,01074	215,56496
214	178,53572	182,22478	184,62178	187,96716	193,30116	200,03927	205,01245	209,23458	213,04937	216,61741
215	179,45940	183,16016	185,56405	188,92015	194,27087	201,03145	206,02212	210,25989	214,08921	217,67114
216	180,38349	184,09529	186,50624	189,87300	195,24120	202,02415	207,03227	211,28481	215,72865	218,72344
217	181,30800	185,03119	187,44916	190,82572	196,21131	203,01657	208,04208	212,31016	216,16766	219,77703
218	182,23250	185,96620	188,39199	191,77911	197,18204	204,00951	209,05153	213,33512	217,20707	220,83007
219	183,15740	186,90196	189,33554	192,73318	198,15171	205,00214	210,06227	214,36050	218,24687	221,88257
220	184,08207	187,83848	190,27897	193,68626	199,12281	205,99529	211,07182	215,38631	219,28623	222,93635
221	185,00733	188,77491	191,22228	194,63999	200,09367	206,98812	212,08266	216,41171	220,32598	223,98958
222	185,93254	189,71124	192,16629	195,59439	201,06428	207,98146	213,09312	217,43753	221,36528	225,04223
223	186,85854	190,64746	193,11017	196,54861	202,03548	208,97445	214,10319	218,46291	222,40495	226,09617
224	187,78448	191,58441	194,05389	197,50262	203,00641	209,96796	215,11371	219,48871	223,44501	227,14953
225	188,71036	192,52124	194,99831	198,45729	203,97706	210,96110	216,12468	220,51406	224,48459	228,20230
226	189,63700	193,45879	195,94256	199,41174	204,94828	211,95475	217,13523	221,53981	225,52454	229,25636
227	190,56270	194,39620	196,88663	200,36596	205,92008	212,94802	218,14537	222,56597	226,56487	230,30982
228	191,49003	195,33346	197,83138	201,32082	206,89158	213,94178	219,15681	223,59167	227,60470	231,36363
229	192,41638	196,27143	199,77681	202,27632	207,86364	214,93603	220,16781	224,61776	228,64490	232,41682
230	193,34349	197,20922	199,72116	203,23156	208,83539	215,92939	221,17838	225,64425	229,68546	233,47035
231	194,27047	198,14684	200,66706	204,18656	209,80682	216,92335	222,18937	226,67025	230,72551	234,52421
232	195,19820	199,09516	201,61186	205,14217	210,77968	217,91817	223,20079	227,69664	231,76591	235,57840
233	196,12578	200,02328	202,55732	206,09751	211,75132	218,91169	224,21175	228,72253	232,80579	236,63196
234	197,05322	200,96209	203,50343	207,05342	212,62127	219,90657	225,22313	229,74881	233,84602	237,68584
235	197,98139	201,90058	204,44930	208,00912	213,59622	220,90102	226,23492	230,77546	234,88650	238,74005
236	198,90939	202,83996	205,39492	208,96539	214,66859	221,89504	227,24624	231,80160	235,92753	239,79360
237	199,83811	203,77901	206,34118	209,92135	215,64149	222,88952	228,25797	232,82901	236,96791	240,84746
238	200,76665	204,71782	207,28717	210,87791	216,61401	223,88446	229,26920	233,85499	238,00876	241,90165
239	201,69500	205,65730	208,23380	211,83415	217,58706	224,87894	230,28084	234,88225	239,04891	242,95615
240	202,62400	206,59744	209,18015	212,79099	218,55972	225,87387	231,29288	235,90897	240,08940	244,00996
241	203,55290	207,53641	210,12712	213,74748	219,53290	226,86833	232,30440	236,93513	241,13022	245,06409
242	204,48245	208,47695	211,07379	214,70456	220,50660	227,86416	233,31633	237,96257	242,17138	246,11853
243	205,41177	209,41722	212,02108	215,66129	221,47989	228,85859	234,32865	238,98946	243,21186	247,17225
244	206,34086	210,35720	212,96806	216,61860	222,45370	229,85438	235,34043	240,01577	244,25369	248,22730
245	207,27063	211,29689	213,91564	217,57648	223,42703	230,84968	236,35261	241,04337	245,29379	249,28164
246	208,20109	212,23816	214,86290	218,53305	224,40096	231,84447	237,36517	242,07038	246,33525	250,33628
247	209,13130	213,17617	215,81077	219,49112	225,37440	232,83969	238,37718	243,09775	247,37600	251,39018
248	210,06123	214,11977	216,75829	220,44881	226,34834	233,83534	239,38957	244,12453	248,41706	252,44438
249	210,99184	215,06009	217,70640	221,40610	227,32278	234,83142	240,40235	245,15164	249,45845	253,49887
250	211,92217	216,00103	218,65511	222,36395	228,29676	235,82697	241,41455	246,17910	250,50015	254,55365
251	212,85316	216,94259	219,60250	223,32234	229,27027	236,82294	242,42712	247,20691	251,54112	255,60873
252	213,78385	217,88381	220,55143	224,28033	230,24522	237,81837	243,43911	248,23409	252,58241	256,66304
253	214,71520	218,82561	221,49398	225,23885	231,21969	238,81421	244,45243	249,26161	253,62400	257,71764
254	215,64624	219,76711	222,44815	226,19695	232,19368	239,81046	245,46515	250,28947	254,66483	258,77253
255	216,57792	220,70918	223,39688	227,15558	233,16911	240,80615	246,47824	251,31669	255,70704	259,82770
256	217,50928	221,65186	224,34619	228,11475	234,14307	241,80225	247,49072	252,34424	256,74849	260,88208
257	218,44127	222,59317	225,29500	229,07347	235,11847	242,79875	248,50356	253,37211	257,79023	261,93674
258	219,37333	223,53606	226,24456	230,03173	236,09336	243,79565	249,51676	254,40032	258,83120	262,99167
259	220,30522	224,47856	227,19260	230,99150	237,06972	244,79197	250,52933	255,42786	259,87246	264,04689
260	221,23714	225,42065	228,14320	231,95080	238,04356	245,78869	251,54324	256,45573	260,91510	265,10238
261	222,16970	226,36431	229,09236	232,90962	239,01885	246,78481	252,55651	257,48391	261,95696	266,15705
262	223,10288	227,30657	230,04206	233,86896	239,99459	247,78131	253,56913	258,51142	262,99800	267,21199
263	224,03568	228,24940	230,99232	234,82881	240,96980	248,77821	254,58311	259,53924	264,04044	268,26719
264	224,96809	229,19279	231,94212	235,78816	241,94545	249,77449	255,59642	260,56737	265,08206	269,32267
265	225,90112	230,13677	232,89247	236,74802	242,92054	250,77216	256,60907	261,59581	266,12396	270,37730
266	226,83475	231,07928	233,84233	237,70736	243,89308	251,76921	257,62307	262,62457	267,16615	271,43331
267	227,76798	232,02337	234,79274	238,66822	244,87205	252,76562	258,63639	263,65262	268,20751	272,48847
268	228,70181	232,96700	235,74368	239,62754	245,84847	253,76240	259,65005	264,68098	269,25027	273,54389
269	229,63521	233,91119	236,69412	240,58837	246,82431	254,75955	260,66404	265,70861	270,29218	274,59844
270	230,56921	234,85491	237,64509	241,54867	247,80058	255,75708	261,67734	266,73758	271,33438	275,65437
271	231,50277	235,79917	238,59556	242,50842	248,77625	256,75499	262,69097	267,76581	272,37571	276,70943
272	232,43692	236,74295	239,54654	243,46970	249,75339	257,75223	263,70493	268,79434	273,41845	277,76474
273	233,37166	237,68831	240,49804	244,43041	250,72992	258,74983	264,71921	269,82317	274,46032	278,82030
274	234,30593	238,63213	241,44022	245,39057	251,70583	259,74676	265,73278	270,85125	275,50246	279,87611
275	235,24094	239,57753	242,40050	246,35124	252,68252	260,74440	266,74711	271,88007	276,54487	280,93102
276	236,17518	240,52242	243,35145	247,31229	253,65891	261,74274	267,76087	272,90934	277,58755	281,98733
277	237,11014	241,46679	244,30290	248,27337	254,63608	262,73959	268,77540	273,93724	278,63050	283,04273
278	238,04461	242,41162	245,25406	249,23480	255,61261	263,73300	269,78919	274,96448	279,67256	284,09938

Trunks	0.001	0.002	0.003	0.005	0.01	0.02	0.03	0.04	0.05	0.06
279	238,97964	243,35711	246,20730	250,19630	256,58956	264,73571	270,80435	275,99495	280,71485	285,15426
280	239,91524	244,30199	247,15919	251,15822	257,56691	265,73372	271,81877	277,02370	281,75742	286,20922
281	240,85033	245,24739	248,11051	252,11953	258,54360	266,73208	272,83243	278,05273	282,80025	287,26559
282	241,78598	246,19330	249,06339	253,08130	259,52070	267,72971	273,84747	279,08204	283,84216	288,32102
283	242,72218	247,13974	250,01568	254,04244	260,49821	268,72769	274,86174	280,11056	284,88550	289,37669
284	243,65786	248,08453	250,96847	255,00404	261,47611	269,72601	275,87632	281,14043	285,92792	290,43259
285	244,59409	249,03090	251,92065	255,96608	262,45334	270,72467	276,89120	282,16950	286,97058	291,48872
286	245,52977	249,97670	252,87332	256,92858	263,43096	271,72258	277,90530	283,19885	288,01350	292,54509
287	246,46600	250,92301	253,82646	257,89043	264,40898	272,72083	278,91969	284,22737	289,05667	293,60049
288	247,40277	251,86981	254,77899	258,85272	265,38629	273,71942	279,93439	285,25726	290,09888	294,65612
289	248,33898	252,81602	255,73199	259,81546	266,36400	274,71834	280,94938	286,23633	291,14255	295,71198
290	249,27572	253,76272	256,68547	260,77753	267,34209	275,71650	281,96466	287,31565	292,18526	296,76806
291	250,21189	254,70881	257,63830	261,74004	268,32057	276,71498	282,97914	288,34525	293,22820	297,82436
292	251,14970	255,65650	258,59161	262,70298	269,29833	277,71378	283,99390	289,37400	294,27139	298,88090
293	252,08580	256,60357	259,54537	263,66524	270,27647	278,71292	285,00896	290,40413	295,31360	299,93643
294	253,02355	257,55001	260,49849	264,62905	271,25499	279,71238	286,02430	291,43340	296,35727	300,99341
295	253,96070	258,49692	261,45205	265,59104	272,23277	280,71105	287,03994	292,46293	297,39995	302,04938
296	254,89836	259,44432	262,40608	266,54548	273,21092	281,71004	288,05473	293,49272	298,44286	303,10557
297	255,83541	260,39220	263,35943	267,51742	274,18945	282,70934	289,06988	294,52164	299,48601	304,16198
298	256,77411	261,33942	264,31437	268,48067	275,16835	283,70784	290,08517	295,55194	300,52939	305,21736
299	257,71105	262,28712	265,26863	269,44155	276,14818	284,70664	291,10081	296,58137	301,57301	306,27420
300	258,64964	263,23528	266,22219	270,40730	277,12498	285,70576	292,11553	297,61105	302,61560	307,33000
301	259,58750	264,18278	267,17520	271,37181	278,10384	286,70519	293,13130	298,60407	303,65969	308,38727
302	260,52604	265,13073	268,13064	272,33443	279,08307	287,70493	294,14713	299,67115	304,70274	309,44349
303	261,46533	266,07916	269,08553	273,29862	280,06671	288,70383	295,16274	300,70043	305,74602	310,49993
304	262,40218	267,02680	270,03970	274,26205	281,04147	289,70295	296,17746	301,72995	306,78952	311,55657
305	263,34092	267,97507	270,99547	275,22590	282,02064	290,70371	297,19361	302,76088	307,83325	312,61214
306	264,28021	268,92372	271,94935	276,19014	282,99896	291,70353	298,20887	303,79089	308,87593	313,66920
307	265,21882	269,87165	272,90403	277,15479	283,97886	292,70343	299,22440	304,81997	309,92011	314,72518
308	266,15792	270,82121	273,85957	278,11868	284,95792	293,70173	300,24020	305,85047	310,96322	315,78266
309	267,09633	271,77074	274,81473	279,08295	285,93733	294,70246	301,25626	306,88003	312,00656	316,83904
310	268,03640	272,71814	275,77032	280,04763	286,91710	295,70230	302,27259	307,91101	313,05011	317,89563
311	268,97576	273,66788	276,72515	281,01151	287,89602	296,70127	303,28800	308,94105	314,09338	318,95242
312	269,91444	274,61687	277,68040	281,97578	288,87648	297,70171	304,30367	309,97133	315,13786	320,00810
313	270,85478	275,56511	278,63608	282,94045	289,85610	298,70125	305,31959	311,00184	316,18207	321,06529
314	271,79439	276,51498	279,59217	283,90550	290,83605	299,70228	306,33578	312,03139	317,22518	322,12268
315	272,73328	277,46409	280,54748	284,87094	291,81516	300,70241	307,35223	313,06237	318,26849	323,17895
316	273,57384	278,41364	281,50320	285,83556	292,79380	301,70162	308,35773	314,09238	319,31534	324,23541



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### PENDIDIKAN

1. SD Perguruan Rakyat 4-5, Tahun 1990
2. SMP 51 Jakarta, Tahun 1993
3. SMA 71 Jakarta, Tahun 1996
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Andry Zulfikar