CHAPTER 7

JUNCTION CIRCUIT AND JUCTION CABLE

T HHIMPHIC

MARIAN ZOUPHIL GRAA THROMD ZOUTDRING.

CHAPTER 7 JUNCTION CIRCUIT AND JUNCTION CABLE

7.1 General Description

In planning the junction cable network among the telephone exchange offices, it will be necessary to comprehend the following matters.

- (a) Exchange office service area and exchange office establishment plan
- (b) Demand by years
- (c) Yearly telephone traffic among the exchange offices and number of circuits
- (d) Tandem plan and numbering plan
- (e) Transmission loss assignment
- (f) Allowable DC resistance
- (g) Service grade
- (h) Classification of cables
- (i) Others

The exchange office establishment plan presented in this chapter is based on the telephone demand as of 1993. The number of junction circuits has been calculated for the object years of 1979, 1983, 1988 and 1993.

The Plan No.1 and the Plan No.2 were prepared on the assumption that the new exchange system will be introduced into the Jakarta multi-exchange area after 1980.

The Plan No.l adopts the five terminating tandems for both the EMD and the new system. The plan No.2 adopts the five terminating tandems for only the EMD, and the one terminating tandem is adopted for the new system.

The transmission loss assigned between EO and EO is 19 dB according to PERUMTEL's Fundamental Plan (1972). However, in consideration of the upgrading of transmission quality in the future and the mutual relation between allowable DC resistance and transmission loss assignment, a transmission loss assignment of 15 dB is applied.

In the discussion held on May 16, 1974 with members of PERUMTEL, it was decided to utilize cables of 0.4 mm conductor from 1983 but in this chapter, cables of 0.4 mm conductor will be applied in sections of large numbers of cables even prior to 1983. Consequently, if required, it will be necessary for PERUMTEL to change the cable of 0.4 mm conductor stated in this chapter to cable of 0.6 mm conductor.

Moreover, as indicated in the Work Flow Chart (refer to Fig. 7.1.(1)), the construction of the junction cable network will naturally influence the internal factors of PERUMTEL as well as such external factors as social environment and city planning.

Therefore, through the feedback of "plan", "do" and "see", PERUMTEL will be required to prepare and continually modify a more superior and practical plan suitable for the changing telephone demand and social environment.

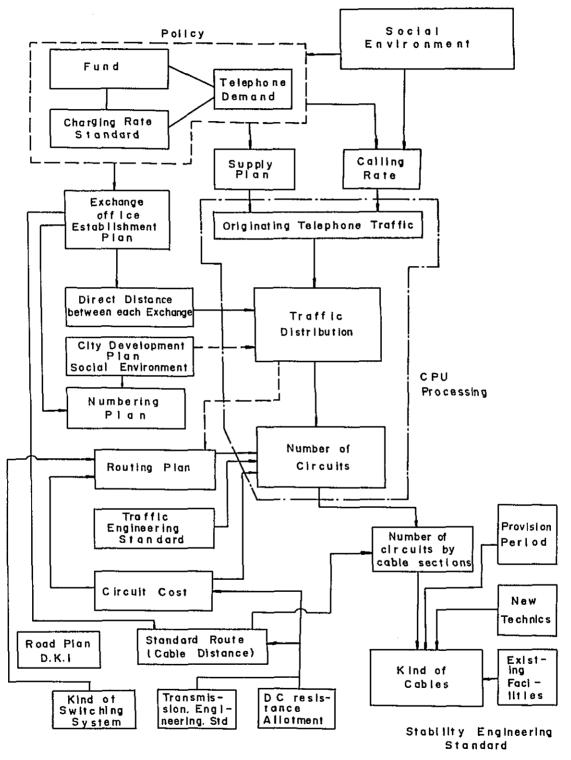


FIG. 7-1-(1) WORK FLOW

7.2 Basic Plan

7.2.1 Telephone Demand and Exchange Office Service Area

As shown in Table 7.2.1.(2) to (3), in regard to the junction circuits for the 1979 year, two kinds were calculated based on the switching expansion plan of PERUMTEL and demand forecasted by JTP. In regard to 1980 and onward, calculation was made based only on the demand forecasted by JTP.

In order to have flexibility to meet the changes in future expansion plans, the junction cable network has been planned for capability in accommodating 100% of the total telephone demand (present subscribers + waiting applicants + potential demand).

As for the service area of an exchange office which has not yet been constructed, the prerequisite is that the subscribers in that area will be accommodated in an adjacent existing exchange office most suitable for the cable network, as shown in Table 7.2.1.(1). Consequently, until the new exchange office building is constructed, the demand of such existing exchange office will include the demand in the service area of the new exchange office. The number of junction circuits has been calculated based on the demand forecasted in this way. Therefore, even if the total demand of the unopened exchange office is accommodated in the adjacent existing exchange office, there will be no problem in the capacity of the junction cables.

Name of Exchange	Commence	ement Year	Temporary Exchange
Name of Exchange	1980-1983	1984-1988	Until Commencement
Kota (C)	о		Kota (B)
Semanggi (B)		0	Semanggi (A)
Kedoya	0		Slipi
Meruya	o		Pal Merah
Penggilingan	0		Rawamangun
Tg. Priok (B)	ο		Tg. Priok (A)
Kebayoran (B)	0		Kebayoran (A)

Table 7.2.1.(1) Commencement Year

TELEPHONE DEMAND AND EXCHANGE SERVICE AREA IN 1979



No.	Exchange Nam e	Telephone Demand	No.	Exchange Name	Telephone Demand	No.	Exchange Name	Telephone Demand
ł	Kota (A)	(9.700) 2.500	13	Pal Merah	(9.700) 3.670	25	Clpete	(6.790) 2.400
2	Kota (B)	(29,100) 26,100	14	Kedoya	—	26	Kalibata	(4.850) 4.550
3	Kota (C)		15	Meruya	—	27	Pasar Minggu	(5.820)
4	Ancol	(5.820) 4.400	16	Cempaka Putih	(14,550) 10,700	28	Jagakarsa	970 (550)
5	Pluit	(7.760) 5.700	17	Rawamangun	(3.880) 4.520	29	Jatinegara (A)	3.880 (3,500)
6	Cenakareng	(5.820) 1.300	18	Pulo Gadung	(3.880) 470	30	Jatinegara (B)	(15.520) 6.100
7	Tegal Alur	(970) 730	19	Penggilingan	—	31	Cawang	(6.790) 2.300
8	Gambir (A)	(19.400) 17.700	20	TanjungPriok (A)	(5.820) 8.300	32	Pasar Rebo	(3.880) 910
9	Gambir (B)	(27,160) 19,200	21	TanjungPriok (B)		33	Klender	(3.880) 700
10	Semanggi (A)	(21.340) (4.950	22	Cilincing	(970) 870	34	Tebet	(12.610) 4.950
11	Semanggi (B)		23	Kebayoran (A)	(18.400) 16.100	35	Gandria	(1.940) 740
12	Slipi	(9.700) 9.080	24	Kebayoran (B)	_			· · · · ·

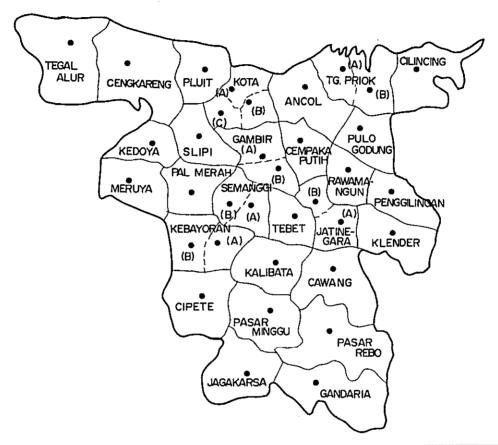
() ; based on Perumtel Supply Plan

TELEPHONE DEMAND AND EXCHANGE SERVICE AREA IN 1983

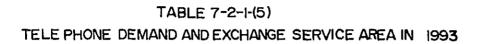


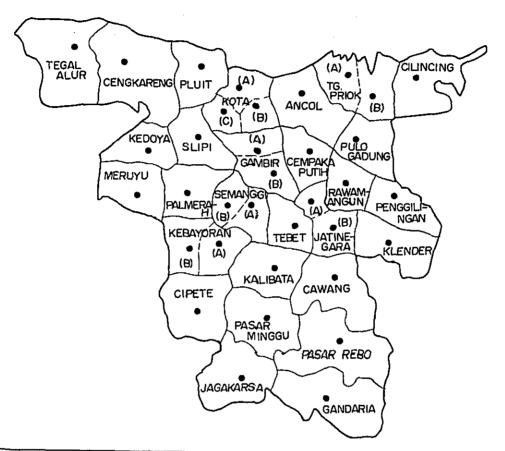
No.	Exchange Name	Telephone Demand	No.	Exchange Name	Telephone Demand	No.	Exchange Na me	Telephone Demand
	Kota (A)	11.000	13	Pal Meroh	5.300	25	Cipete	4. 100
2	Kota (B)	32,600	14	Kedoya	1.080	26	Kallbata	7.500
3	Kota (C)	18.000	15	Meruya	1.600	27	Pasar Minggn	2.750
4	Ancol	7.500	16	Cempaka Purih	15.200	28	Jogakarso	1.050
5	Pluit	8.000	17	Rawamangun	6.500	29	Jatinegara (A)	5. 900
6	Cengkareng	2.550	18	Pulo Gadung	1.000	30	Jatinegara (B)	8.800
7	Togal Alur	1.500	19	Penggilingan	1.150	31	Cawang	4.200
8	Gambir (A)	22.500	20	Tanjung Priok(A)	7.900	32	Pasar Rebo	1.700
9	Gambir (B)	25,500	21	Tanjung Priok(B)	6.500	33	Klender	1.800
10	Semanggi (A)	20.850	22	Cilincing	1.800	34	Tebet	7.900
<u> </u>	Semanggi (B)		23	Kebayoran (A)	15. 400	35	Gandaria	1.550
12	Slipi	13.000	24	Kebayoran (B)	5. 200			

TABLE 7-2-1-(4) TELE PHONE DEMAND AND EXCHANGE SERVICE AREA IN 1988



NO.	ExchangeName	Telephone Demand	NQ	Exchange Name	Telephone Demand	NO.	Exchange Name	Telephone Demand
l	Kota (A)	15.100	13	Pal Merah	11.700	25	Cipete	8.000
2	Kota (B)	33.800	14	Kedoya	3,200	26	Kalibata	14, 700
3	Kota (C)	26.400	15	Meruya	4.300	27	Pasar Minggu	5.600
4	Ancol	14. 500	16	Cempaka Putih	23.700	28	Jagakarsa	2.450
5	Pluit	12.200	17	Rawamangun	12.000	29	Jatinegara (A)	10, 100
6	Cengkareng	6.000	ເອ	Pulo Gadung	2 600	30	Jatinegara (B)	13. 300
7	Tegal Alur	3,800	19	Penggilingan	3.100	31	Cawang	10.000
8	Gambir (A)	31.500	20	Tanjung Priok(A)	16 000	32	Pasar Rebo	4.800
9	Gambir (B)	36.000	21	Tanjung Priok(B)	13.500	33	Klender	6.000
10	Semanggi(A)	22.450	22	Cilincing	4.600	34	Tebet	14. 700
11	Semanggi (B)	9.700	23	Kebayoran (A)	20.200	35	Gandaria	3.850
12	Slipi	21.300	24	Kebayoran (B)	9.300			





NO.	Exchange Name	TelePhone Demond	NO.	ExchangeName	Telephone Demand	NO.	Exchange Name	Telephone Demand
	Kota (A)	20. 900	13	Pal Merah	26.000	25	Cipete	15. 700
2	Kota (B)	57. 100	14	Kedoya	10, 100	26	Kalibata	29 200
3	Kota (C)	39.400	15	Мегиуа	11.800	27	Pasar Minagu	11.400
4	Ancol	28 300	16	Cenpaka Putih	40.200	28	Jagakarsa	5.800
5	Pluít	18.800	(7	Rawamangun	21.900	29	Jatinegara (A)	17. 700
6	Cengkareng	14.600	18	Pulo Gadung	6.900	30	Jatinegara (B)	20.000
7	Tegal Alur	9. 300	19	Penggilingan	8.300	31	Cawang	24.600
8	Gambir (A)	43. 700	20	Tanjung Prick(A)	32.500	32	Pasar Rebo	15. 400
9	Gambir(B)	52.200	21	Tanjung Prick(B)	29.000	33	Klender	20.300
10	Semanggi(A)	36. 100	22	Cilincing	11.700	34	Tebet	27.700
11	Semanggi(B)	1 4.900	23	Kebayoran (A)	26.000	35	Gandaria	9.800
12	Slípi	35 100	24	Kebayoran (B)	15.600			

7.2.2 Telephone Traffic (Calling Rate) and Demand

In the future, the Jakarta multi-exchange office will be divided into the service areas of 35 exchange offices. The originating calling rate of each exchange office will vary according to the telephone demand structure as shown in Table 7.2.2.(1) to (3).

The number of junction circuits has been calculated in accordance with the telephone traffic data set forth in paragraph 3.4. The object years of the telephone traffic are the base years of 1979, 1983, 1988 and 1993.

7.2.3 Transmission Loss Assignment and Allowable DC Resistance

As stated in paragraphs 6.4 and 6.5, the transmission loss assignment allowable DC resistance have been planned with consideration for the existing switching equipment (EMD) and the use of the new switching system with common control to be introduced into Jakarta in the future. Attention is required in regard to the following matters in particular.

(a) Transmission loss between E0 and E0 has been improved from 19 dB

(PERUMTEL's specified value) to 15 dB (JTP's recommended value).

(b) Transmission loss and DC resistance of each exchange office have been set at 1 dB and 20 ohm, respectively.

(c) In connection with the new switching system, with consideration for improvement in the DC resistance limit in the future, the DC resistance limit for direct circuits between E0 and E0 is 3,000 ohm which differs from the 2,4000 ohm of the exsisting EMD system.

7.2.4 Electrical Characteristics of Junction Cable

The maximum value of PERUMTEL's specifications has been used for the DC resistance (Ro) per km, and in regard to other items, the standard values of PERUMTEL's specifications and CCITT have been utilized.

Regarding the loading system, since this will have relation with projects already decided, the inductance of the loading coil was set at 80 mH and the loading spacing 1,500 m upon consultation with PERUMTEL.

Transmission loss per km was calculated in accordance with the following formula described in the CCITT Local Telephone Networks (Chapter V, page 20).

$$= \frac{1}{S_{0}} \left\{ \left(\frac{S \circ R \circ}{2} \left(1 - \frac{2}{3} \left(\frac{W}{W_{0}} \right)^{2} + \frac{R p}{2} \right) \sqrt{\frac{S \circ C \circ}{S \circ L \circ + L p}} + \frac{S \circ G \circ}{2} \sqrt{\frac{S \circ L \circ + L p}{S \circ L \circ}} \right\} \right\}$$

$$= \frac{1}{\sqrt{1 - \left(\frac{W}{W_{0}}\right)^{2}}}$$

$$= \frac{1}{\sqrt{1 - \left(\frac{W}{W_{0}}\right)^{2}}}$$

$$= \frac{R \circ : DC \text{ resistance } (\Omega/km)}{C \circ : Capacitance (nF/km)}$$

$$= Loading \text{ coil spacing } (km)$$

$$= \frac{2}{\sqrt{S \circ L \circ (S \circ L \circ + L p)}}$$

$$= \frac{2}{\sqrt{S \circ L \circ (S \circ L \circ + L p)}}$$

-1014-

TABLE 7-2-2-(1)

TELEPONE TRAFFIC (CALLING RATE) AND DEMAND

unit : Demand=100

Ā	Exchange		Y	ear			Domester
	Name	^(P) 1979	(J) 1979	1983	1988	1993	Remarks
	Kota (A)		85(0.084)	85(0.077)	85 (0066)	85(0.056)	
	4		<u> </u>	26 (,)	66 (,)	124(,)	
0	Kota (B)	29 1 (0.084)	261 (0.084)	176(0.077)	261 (0.066)	26 (0. 056)	D
	<u> </u>			15 ('')	77()	310(,)	Ared
	Kota (C)						Ë
	,			180(0.077)	264(0.066)	394(0.056)	Tandem
	Ancol	58.2(0.055)	44 (0.0.55)	44 (0.050)	44 (0.043)	44(0.036)	Ξ.
	١			31(")	101()	239(,)	Kota
	Pluit	77.6(0.055)	57(0.055)	57 (0.055)	57 (0.043)	57(0.036)	Ŷ
	<i>'</i> i			23(")	65 (,)	131(,)	
	Cengkareng	58.2(0.045)	13(0.045)	13 (0.041)	13 (0.035)	13(0.030)	
	'			12.5(,)	47()	133(4)	
	Tegal Alur	97(0.035)	7.3(0035)	7.3(0032)	7.3(0.027)	7.3(0.023)	
	\$			7.7(,)	307(,)	85.7(,)	
۲	Gambir (A)	194 (0.084)	177(0.084)	177(0.083)	177 (0.081)	17 7(0.080)	
	4			48(,)	138 (,)	260(,)	
	Gambir (B)	2716(0.084)	192(0.084)	192 (0.083)	192 (0.08 1)	1 92(0.080)	
	4			63(")	168(🕠)	330(,)	Da
	Semanggi (A)	213.4(0.050)	149.5(0.050)	149.5(0.053)	149.5(0.056)	149.5(0.060)	Ar.
	4		<u> </u>	59(")	75()	211.5(,)	E
	Semanggi (B)					<u> </u>	Tandem
	y				97 (0.054)	149(0.060)	
	Slipi	97 (0.050)	908(0050)	908(0.045)	90.8(0.039)	908(0.033)	Gambir
	·· · · · · · · · · · · · · · · · · · ·	—		392()	122.2(")	260.2(1)	ß
	Pal Merah	97 (0.045)	36.7(0.045)	367(0.041)	367(0.035)	367(0.030)	
	4			163(•)	80.3()	2233(*)	

(): Calling rate

TABLE 7-2-2-(2)

Ā	Exchange			Year			Bornert
	Name	(P) 1979	^(J) 1979	1983	1988	1993	Remarks
	Kedoya						
	¥			10. ⁸ (0.036)	32. (0.031)	101 (0.027)	
	Meruya						
	4			16 (0.036)	43 (0.031)	18 (0.027)	
0	Cemp, Putih	145.5 (0.055)	107 (0.055)	107 (0.050)	107 (0.043)	107 (0.036)	
	"			45 (")	130 (🍬)	295()	,
	Rawamangun	38 ⁸ (0.045)	45.²(0.045)	45. ² (0.044)	45. ² (0042)	45. ² (0.040)	
	4			19. ⁸ (,)	74. ⁸ (")	173. ⁸ (″)	
	Pulo Gadung	38. ⁸ (0.045)	4.7(0.045)	4.7(0.041)	4.7(0.035)	4.7 (0.030)	Area
	"	······		5. ³ (*)	21.3(″)	64. ³ (")	
	Penggiling an						Tandem
	<u> </u>			11. ⁵ (0.047)	31 (0.050)	83 (0.052)	p
	Tj Priok (A)	58. ² (0.064)	83. (0.064)	79 (0.061)	83 (0.056)	83 (0.052)	ıtih
	#				77 (•)	242 (")	Cempakaputih
	Tj Priok (B)			65 (0.061)	135 (0.056)	220 (0.052)	npa
	"					70 (🧳)	ပ
	Cillncing	9.7 (0.055)	8.7 (0.055)	8.7 (0.050)	8.7(0.042)	8. ⁷ (Q 036)	
	"			9.3(")	37. ³ (["])	108. ³ (,)	
0	Kebayoran (A)	184. (0.050)	161 (0.050)	127 (0.045)	161 (0.039)	161 (0.033)	
			_	27 (")	41 ("	29 (″)	
	Kebayoran (B)						
	"			52 (0.045)	93 (0.039	156 (Q033)	Area
	Cipete	76.° (0.045)	24. (0.045)	24 (0.041)	24 (0.035)	24 (0.030)	Ar
	"			17 (+)	56 (🧳	133. (🔸)	E
	Kalibata	48. ⁵ (0.045)	45.5(0.045)	45. ⁵ (0.041)	45.5 (0.035)	45.5 (0.030)	Tandem
	"			29 ⁵ (″)	1015(//)	246. ⁵ (+)	
	Ps. Minggu	58. ² (0.040)	16 (0.040)	16 (0.036)	16 (0.031)	16 (0.027)	Kebay oran
	"			[] ⁵ (40 (98 (+)	bay
	Jagakarsa	9. ⁷ (0.035)	5. ⁵ (0.035)	5.5 (0.032)	5.5 (0. 027)	5. ⁵ (0.023)	Ke
	"			5 (″)	19. (*)	52.5(-)	

TABLE 7-2-2-(3)

Ā	Exchange						Y	ea	r								
	Name		(P)	1979	(J)	1979	1	98	33			98	38		199)3	Remark
	Jatinegara	(A)			35	(0.055)	35	(C	0.05	0)	35	(C	.043)	35	(0	036)	
	4						24	(*)	66	(<i>"</i>)	142	2(~)	7
0	Jatinegara	(B)	55.²	(0055)	61	(0.055)	61	(0	.05	0)	61	(0	.043)	61	(0	.036)	1
	4		-				27	(*)	72	(~)	139) (")	-
	Cawang		67.9	(0.050)	23	(0.050)	23	(0	.04	8)	23	(0).044)	23	(0.	041)	Area
	4						19	(")	77	(")	223	5 (•)	
	Pasar Rebo		38.8	(0.045)	9.'	(0.045)	9.1	(0	.04	1)	9. 1	(0	035)	9. '	(0	.030)	Tanden
	11		· ·				7. ⁹	(4)	38.5	•(* }	144	9(~)	P
	Klender		38.8	(0.040)	7	(0.040)	7	(0	.03	6)	7	(C	.031)	7	(Q.	0 29)	- E
	4						11	(")	53	(•)	196	(<i>"</i>)	Jatinegara
	Tebet		126.	(0.050)	49	⁵ (0.050)	49.'	5(0	.04	5)	49.	5(C).039)	49	⁵ (O	.035)	da da
	4						29.	۶(")	97.	5 (")	227	5(<i>"</i>)	1
	Gandaria		19.4	(0.050)	7.4	(0.050)	7.4	(0	.04	5)	7.4	(0). 039)	7. 4	(0	.035)	
	"		<u> </u>	_			8. ¹	(•)	31. '	(•)	90.	[₿] (~)	

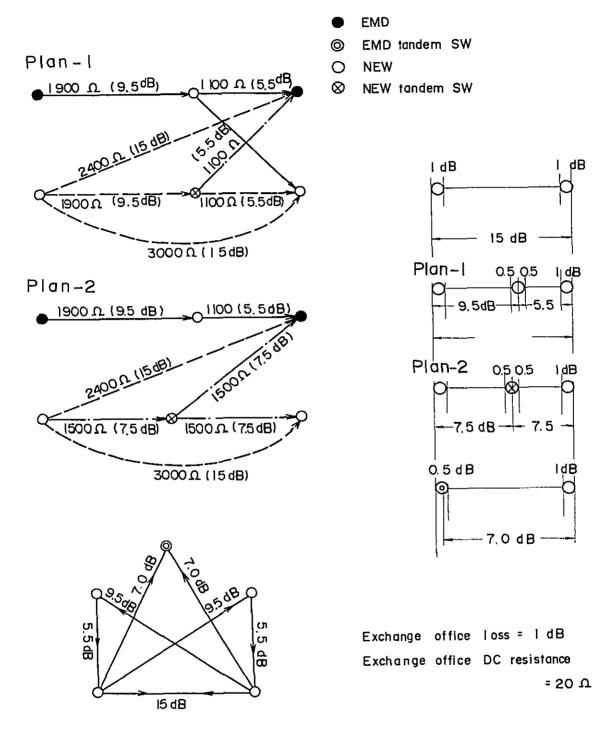


FIG. 7-2-3-(1)

TRANSMISSION LOSS ASSIGNMENT AND DC RESISTANCE ALLOCATION

Con- ductor diameter (mm)	Ro (Ω)	Co (nF)	Lo (mH)	G (ប)	Rp (Ω)	Lp (mH)	Non- loading (dB)	Loading (dB)	Remarks
0.4	300	50	0.7	1	7	80	1.69	1.229	Loading type
0.6	130	n	η	h	n	"	1.11	0.557	80 mH - 1,500 m
0.8	72	"	"	"	6		0.826	0.322	
0.9	58	"	"	17		"	0.742	0.267	
1.0	46	"	"	n	17	"	0.660	0.219	

 Table 7.2.4.(1)
 Electric Characteristics of Junction Cable

7.2.5 Line Distance Limit of Three-Wire System

The distance limit of three-wire system, as shown in Table 7.2.5.(1), is 2.0 km in the case of 0.4 mm conductor.

Table 7.2.5.(1) Distance Limit of 3 Wire System

Conductor diameter	0.4 mm	0.6 mm	0.8 mm	0.9 mm	1.0 mm	Remarks
Distance	2.0 km	4.5 km	4.0 km	4.0 km	3.0 km	DC resistance limit 350Ω single wire

.

Circuit Section	Distance
Kota (B) \rightarrow Kota (A)	1.8 km
Kota (B) \rightarrow Kota (C)	1.7 "
Kota (T) \rightarrow Kota (A)	1.8 "
Kota (T) \rightarrow Kota (C)	1.7 "
Semanggi (A) → Semanggi (B)	2.0 "
Kebayoran (A) → Kebayoran (B)	2.0 "
Kebayoran (T) → Kebayoran (B)	2.0 "
Jatinegara (B) → Jatinegara (A)	2.4 <i>"</i>
Jatinegara (T) → Jatinegara (A)	2.4 <i>"</i>

7.2.6 Line Distance Limit based on Transmission Loss Assignment and Allowable DC Resistance Limit

The line distance limit based on transmission loss assignment and allowable DC resistance is as shown in Table 7.2.6.(1) and as mentioned previously, the switching office loss and DC resistance in each exchange office have been set at 1 dB and 20 ohm, respectively. The asterisk mark (*) denotes those based on DC resistance limit, and no mark denotes those based on transmission loss.

Diameter	R/km	Loss /km	EO → (T)	(Ť) → EO	EO ++ MS	EO ⇔EO (2400Ω)	EO ++ EO (3000Ω)	Toll ++ EO	Remarks
	Ω	dB	km	km	km	km	km	km	
0.4 mm	(305) 300	(1.229) 1.69	*6.13	3.25	*4.82	*7.74	9.70	4.48	
0.6 mm	(135) 130	(0.557) 1.11	*13,85	7.80	10.77	17.48	21.93	9.87	
0,8 mm	(76) 72	(0.322) 0.826	*24.61	12.42	18.63	31.05	28.95	17,08	
0.9 mm	(62) 58	(0.267) 0.742	*29.96	14.98	32.47	38.06	47.74	20.60	
1.0 mm	(50) 46	(0.219) 0.660	*36.53	18.26	27.40	47.20	59.20	25.11	

 Table 7.2.6.(1)
 Distance Limits Based on Transmission Loss

 Assignment and DC Resistance Allocation

* : DC resistance limit

(): Loading circuit

7.2.7 Line Distance Limit of Non-Loading Circuit

Distance limit of non-loading circuit in each circuit section is shown in Table 7.2.7.(1). In the case of the 0.4 mm conductor cable between E0 and T (tandem office), the cable of up to 4.73 km will be non-loading. In the case of the 0.6 mm conductor cable, the cable of 6.13 km to 7.21 km will be non-loading.

Table 7.2.7.(1) Distance Limits of Non-Loading Circuits

Diameter	Resist- ance	Loss	EO → (T)	(T) → EO	EO → MS	EO ↔ EO (2400Ω)	EO ↔ EO (3000Ω)	Toll ↔ EO	Remarks
mm 0.4	Ω/ km 300	dB/km 1.69	km 4.73	km 2.37	km 3.55	km 7.69	km 7.69	km 3.25	
0.6	130	1.11	6.13 ~ 7.21	3.25 ~ 3.00	4.82 ~ 5.41	7.74 ~ 11.71	9.70 ~ 11.71	4.48 ~ 4.95	

7.2.8 Kinds of Cables to be Installed

As shown in paragraph 1.4, nearly all the existing junction cables are 1.0 mm conductor 200 pair cables. It is only recently that large size cables of 0.6 mm conductor 600 pairs were introduced in the junction cable network of Jakarta. However, in line with the development of Jakarta City, a large number of junction circuits have become necessary among the various telephone exchange offices. In order to avoid the increase in civil works also, the introduction of large size cables of small diameter conductors should be considered for Jakarta.

It is necessary that PERUMTEL make an early study regarding the following cables:

- (a) Early use of 0.4 mm conductor 2,400-pair cable.
- (b) Use of large size 0.9 mm conductor cable.
- (c) Introduction of 0.5 mm conductor cable.

In the discussion held on May 16, 1974 between PERUMTEL and the JTP, it was agreed upon that the 0.4 mm conductor cable be used from 1983. However, the number of junction circuits will be large in 1979 in the following cable sections. If 0.6 mm conductor cables were to be used, the installation cost would be become tremendous and uneconomical; therefore it is recommended to PERUMTEL that 0.4 mm cables be installed.

JAKARTA KOTA (A) – JAKARTA KOTA (B)	0.4 mm x 2,400 pairs
CAMBIR (A) – GAMBIR (B)	0.4 mm x 2,400 pairs
CAMBIR (A) – JAKARTA KOTA (B)	0.4 mm x 2,400 pairs

Diameter Size	0.4 mm	0.6 mm	0.8 mm	0.9 mm	1.0 mm	Remarks
100			<u> </u>	0	0	
200		—	0	0	0	
300	_	—	—	0		
400	0	0	0	0		
600	0	0	0	—		
800	0	0	0			
1 200	0	0				
1600	0	_				
1800	0			_		
2400	0	_		_		

 Table 7.2.8.(1)
 Kinds of Cables to be Installed

7.2.9 Standard Cable Route

The standard routes for junction cables are shown in Fig. 7.2.9.(1). In the selection of the standard routes for junction cables, the following points were considered.

- (a) Trunking diagram (five terminating tandem system).
- (b) Selection of routes of the shortest distance.
- (c) Concentration of junction circuits in the cable sections.
- (d) Selection of routes where there is no problem in civil works.

(e) Selection of routes which are in common with junction cables and subscriber cables.

(f) Selection of straight routes wherever possible with few sharp curves or obstruction.

(g) Exclusion of routes where there is the danger of floods, ground depression or cable creep.

(h) Selection of routes in such a manner that the cables to be terminated will not be concentrated to the large exchange offices.

(i) Select routes which will not give rise to problems in construction and maintenance.

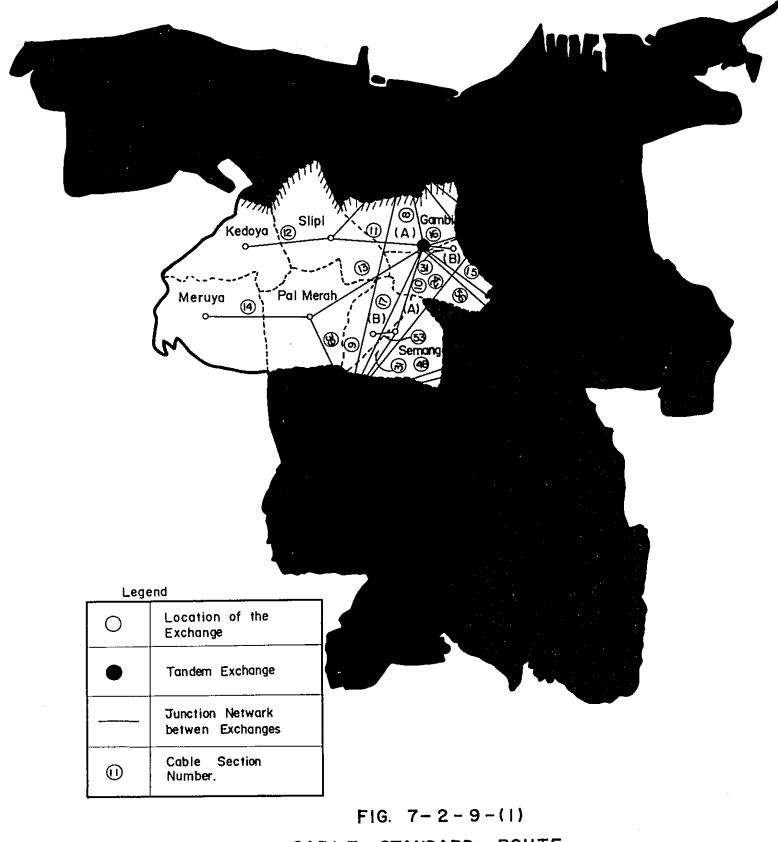
7.3 Trunking Diagram

As mentioned in paragraph 7.2, it must be considered that the existing switching system will continue to be in service for some time to come. Consequently, assumption was made on the composition of the junction cable network shown in Table 7.3.(1).

Furthermore, in determining the tandem plan, the following three plans were prepared.

	Plan — 1	Plan – 2	Plan – 3
EMD System	5 terminating	5 terminating	5 terminating
	tandem	tandem	tandem
NEW System	5 terminating	l terminating	5 originating
	tandem	tandem	tandem
Location of tandem	Kota (B) Gambir (A) Cempaka Putih Kebayoran (A) Jatinegara (B)	Gambir (A)	Kota (B) Gambir (A) Cempaka Putih Kebayoran (A) Jatinegara (B)

Table 7.3.(1) Comparison of Trunking Diagrams





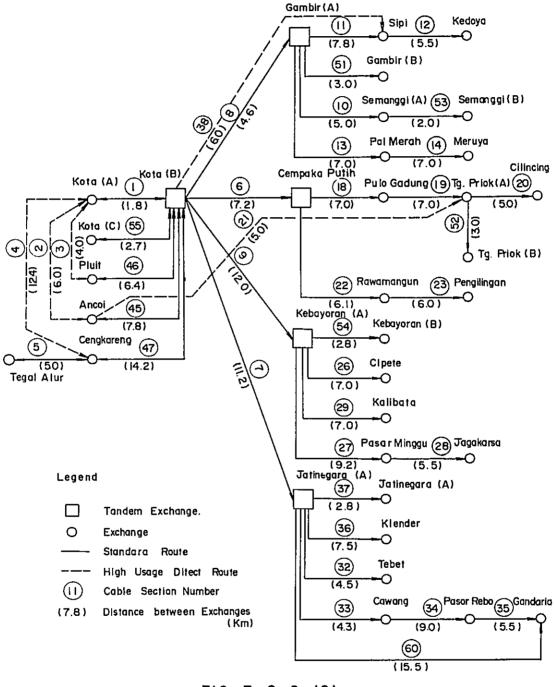


FIG. 7-2-9-(2)

кота - ⁰/g

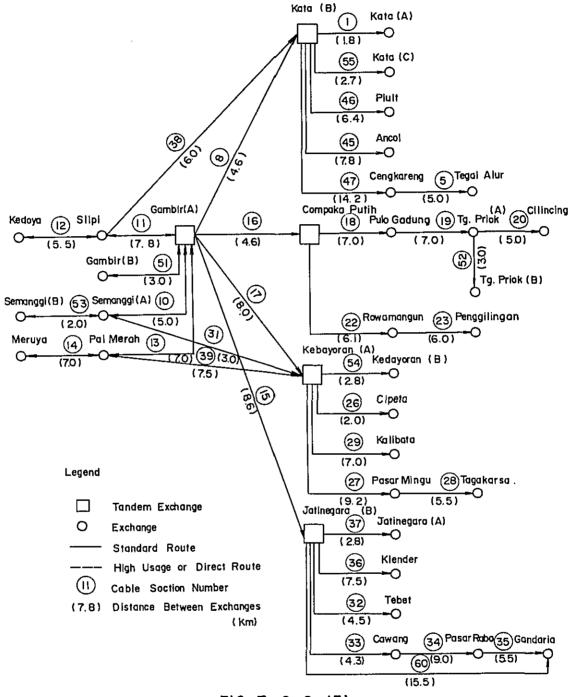


FIG. 7-2-9-(3)

GAMDIR - O/G

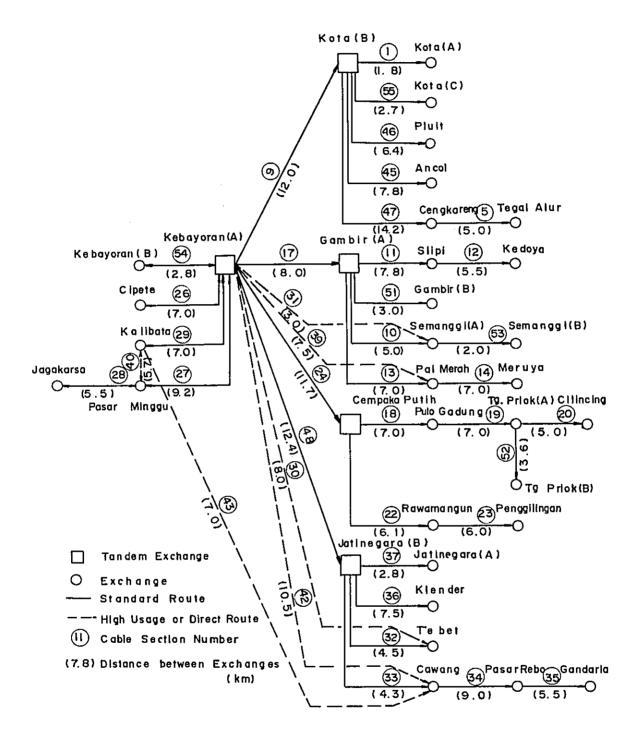


FIG. 7-2-9-(4) KEBAYORN 0/G

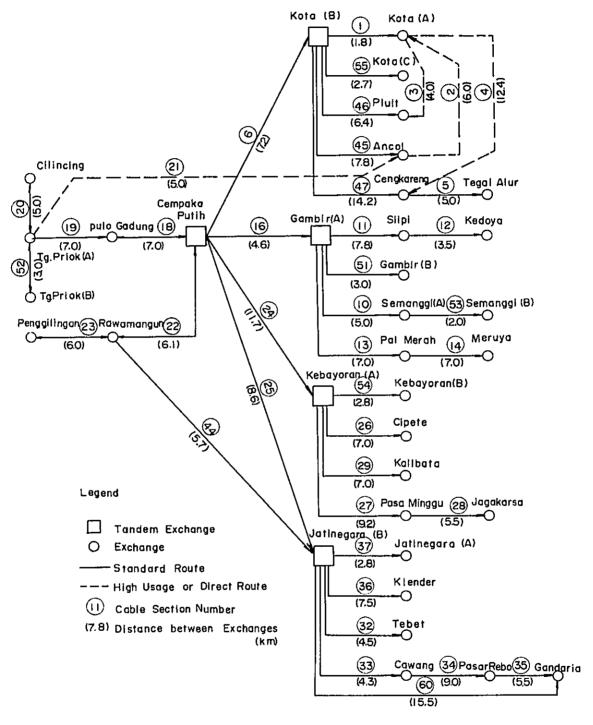


FIG.7-2-9-(5) CEMPAKA PUTIH-0/G

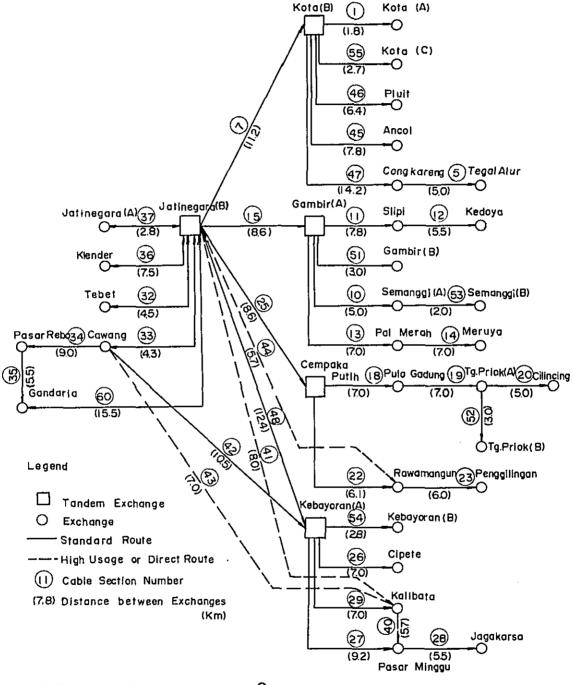


FIG. 7-2-9-(6) JATINEGARA - %

- * The exchange office location of the EMD tandem switching offices in the Plan No.1 and the Plan No.2 is the same.
- * For SLDD and 10X, direct circuits were established between the Toll Office and End Office.

Comparison of the network cost (cables + switching equipment + office building) of these three plans is shown in the table below.

	Plan — 1	Plan — 2	Plan – 3
1983	102	100	105
1988	101	100	104
1993	101	100	103

Table 7.3.(2) Comparison of Junction Cable Network Costs

Index: Plan - 2 --- 100

As can be seen from Table 7.3.(2), the network cost of the Plan No.2 is the lowest, followed in order by the Plan No.1 and the Plan No.3. However, there is hardly any difference in the cost of these plans, and which plan would be most suitable for the composition of the junction cable network cannot be simply be determined solely by cost comparison. Based on the result of a study of the various factors such as switchover from the present system, size of the office building site, road occupancy for civil works, maintenance, etc., it is recommended to adopt the Plan No.1.

7.4 Plan No.1

7.4.1 Junction Circuits

7.4.1.1 Number of Junction Circuits as of 1979, 1983, 1988 and 1993

The number of junction circuits was calculated by use of the computer on the basis of the telephone traffic flow among exchange offices, the tandem plan and the circuit cost.

(a) Object Years

1979, 1983, 1988 and 1993

(b) Classification of Circuit Sections

The number of junction circuits for each circuit section is shown in four combinations of the EMD and new system.

In other words, (EMD - EMD, EMD - NEW, NEW - EMD, NEW - NEW).

(c) Calculation Method

For an alternative routing network with one tandem stage, the determination of the number of the direct junctions and tandem junctions was made by calculation according to the formulas of R.I. Wilkinson, Y. Rapp and the loss formula of A.K. Arlang. (For details, refer to paragraph 6.2,6.)

O EMD NEW		<u></u>	Ta	ble 7.4.1.(1)		T: Term <u>O: Origin</u>	
	Т	EM	D	NE	W	Тс	11
O EMD T EMD T EMD		EO	Т	EO	Т	SLDD	10X
	EO	EO → EO	EO → T	EO → EO	EO → T	EO → SLDD	EO → IOX
EMD	Т	T → EO		T → EO			—
NEW -	EO	EO → EO	EO → T	EO → EO	EO → T	EO → SLDD	EO → 1OX
	Т	T → EO		T → EO	—		
SLI	DD	SLDD → EO		SLDD → EO			
10	x	1OX → EO	_	1OX → EO		_	

7.4.1.2 Number of Junction Circuits in Each Circuit Section

The number of junction circuits in each circuit section in the Plan No.1 is shown in Table 7.4.1.(2). The number of circuits (67,912) as of 1993 will be approximately three times the number of circuits (22,289) as of 1979. Among the circuit sections (EO - EO, EO - T (tandem), TOLL - EO), the circuit section with the highest rate of increase is the direct circuits between EO and EO, and the number of circuits (29,132) as of 1993 will be to about 6.4 times the number of circuits (4,534) as of 1979. The circuit section with the next highest increase rate is the "SLDD", "10X", and the number of circuits (15,466) as of 1993 will be about 5.6 times the number of circuits (23,314) as of 1993 will be about 1.6 times the number of circuits (14,996) as of 1979, this will be due to the introduction of the new

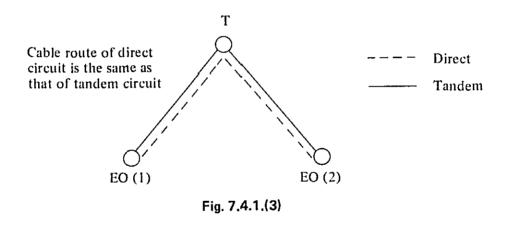
switching system with common control which will make possible alternative routing, and the trend of increase will become very gradual.

Definition of Circuit Section

Circuit section means the section between switching systems. (For example, EO - EO, EO - T (tandem), TOLL - EO.)

7.4.1.3 Number of Junction Circuits and Non-Loading Circuits of Cable Section According to Conductor Diameter

The conductor diameter of each circuit section is determined on the basis of the previously mentioned DC resistance limit or transmission loss assignment. In principle, the same conductor diamter is utilized in one circuit section, as shown in Fig. 7.4.1.(3). However, when the tandem circuit cost [EO (1) \rightarrow T(tandem) + T(tandem) \rightarrow EO (2)] is compared with the direct circuit cost [EO (1) \rightarrow EO (2)], there may be cases where the tandem circuit cost is lower, since the tandem circuit cost permits the use of different conductor diameters. In this case alone, the cable combination of different size conductor diameters in one circuit section will be applied.



Of all the cable sections, the No.5-1 cable section [Gambir (A) – Gambir (B)] will be the largest with a required number of circuits of 11,422 in 1993. The second is the No.8 cable section [Gambir (A) – Jakarta Kota (B)] with 10,708 and the third will be the No.10 cable section [(Gambir (A) – Semanggi (A)] which will require 7,659 circuits. Especially in regard to the Gambir (A) Exchange Office and the Jakarta Kota (B) Exchange Office, since a large number of cables will have to be terminated, it will be necessary to consider direct cable routes to other main exchange offices without passing through these exchange offices

TABLE 7-4-1-(2) NUMBER OF JUNCTION

CIRCUITS BY SYSTEM

PI	an No. I	verside: (\	Circuits w within the	nich are (some e	originating xchange c	and term office are	ingting included	
	Year	1979	191	33	198	38	199	93
Syste		0	0	N	0	N	0	N
Grand F E G G G C C C C C C C C C C C C C	md total	(22,289) 30,927	(26,693) 23,775	(7,513) 8,356	(29,240) 36,373	(18,529) 20,298	(29,022) 35,643	(38,890) 42,464
	EO TI	2,678	2,389	635	2,098	1,017	1,778	1,322
	EO → T₂	3,491	2,726	869	2,614	1,277	2,197	۱,673
	EO T3	1,294	1, 171	474	1,262	,795	1,303	1,172
EO	EO T4	1,053	870	433	803	763	684	1,019
	EO Ts	981	932	457	994	855	1,020	1,205
Sub), total	9,497	8,088	2,868	7,771	4,707	6,982	6,391
0 1 1 Sub.	Ti E0	(1,110) 3,078	(1,943) 3,089	(225) 257	(1,816) 2,990	(402) 473	(1,570) 2,647	(514) 662
	T2 E O	(2,642) 4,037	(2,616) 3,856	(226) 289	(2,676) 3,835	(498) 560	(2,435) 3,353	(762) 886
	T3 - EO	(699) 1,475	(826) 1,569	(117) 164	(1,043) 1,716	(348) 408	(1,196) 1,792	(617) 672
	T4 EO	(327) 1,187	(569) 1,155	(121) 158	(635) 1,149	(274) 336	(646) 1,070	(409) 498
	T5 E O	(721) 1,095	(896) 1,263	(135) 172	(1,058) 1,409	(364) 439	(1,218) 1,511	(574) 659
	b. total	(5,499) 10,872	(6,850) 10,932	(824) 1,040	7,228 11,099	1,886 2,216	(7065) 10,373	(2,876) 3,377
	Total	(14, 996) 20,369	(14,938) 19,020	(3,692) 3,908	(14,999) 18,870	(6,593) 6,923	(14,047) 17,355	(9,267) 9,768
0-EO	SLDD EO	(1,086) 1,236	(1,405) 1,632	(900) 963	1,787) 2,077	(2,552) 2,777	(1,889) 2,225	(6,017) 6,509
SLDI SLDI	IOX EO	(395) 445	(373) 425	(267) 283	(341) 387	(462) 496	(27)) 308	(686) 739
Su	b total	(1,481) 1,681	(1,778) 2,057	(1,167) 1,246	(2,128) 2,464	(3,014) 3,273	(2,160) 2,533	(6,703) 7,248
10X	EO SLDD	(924) 1,049	(1,196) 1,382	(740) 788	(1,495) 1,728	(1,903) 2,054	(1,568) 1,836	(4,155) 4,483
l l	EO 10 X	(354) 394	(341) 381	(255) 270	(318) 357	(441) 459	(262) 296	(618) 663
Su	ib total	(1,278) 1,443	(1,537) 1,763	(995) 1,058	(1,813) 2,085	(2,344) 2,513	(1,830) 2,132	(4,773) 5,146
	Total	(2,759) 3,124	(3,315) 3,820	(2,162) 2,304	(3,941) 4,549	(5,358) 5,786	(3,990) 4,665	(11,476) 12,394
Sub To	E0	(4,534) 7,434	(18,440) 10,935	(1,659) 2,144	(10,300) 12,954	(6,578) 7,589	(10,985) 13,623	(18,147) 20,302
		L	1	L	1	1	1 .	- · · · ·

(): Circuits which are originating and terminating within the same exchange office are excluded lowerside: Circuits which are originating and terminating No.1.

•

as much as possible.

As shown in Table 7.4.1.(4) to (9), the number of circuits in all of the circuit sections as of 1993 will be about 2 to 3 times of those of 1979. In this way, it can be considered that in line with the development of Jakarta City, the number of junction circuits among the required exchange offices will continue to increase.

For this purpose, when laying conduits in consideration of the road construction program, it will be very important to acquire a sufficient number of ductways on the basis of the long-term outside plant circuit network plan.

When considering the number of non-loading circuits, it is clearly seen in Tables 7.4.1.(4) to (9) that the No.51 cable section [Gambir (A) – Gambir (B)] is the largest with 4,955; the second is the No.8 cable section [Jakarta Kota (B) – Gambir (A)] with 4,309; and the third is the No.55 cable section [Jakarta Kota (B) – Jakarta Kota (C)] with 4,284 circuits.

Non-loading circuits remain only in a part of the cables with 0.4 mm and 0.6 mm conductors, and loading coils are inserted in all circuits with cables of 0.8 mm, 0.9 mm and 1.0 mm conductors.

7.4.1.4 Total Number of Junction Circuits and Number of Non-Loading Circuits

As shown in Table 7.4.1.(10), the ratio of loaded circuits to circuits of 0.4 mm conductor as of 1979 is approximately 21% and for 0.6 mm conductor circuits is about 80%. In regard to circuits of other conductor diameters, it will be 100% loaded. Further, the circuit composition ratios according to conductor diameters are 27.4% for 0.4 mm, 48.2% for 0.6 mm, 18.8% for 0.8 mm, 3.6% for 0.9 mm and 2.0% for 1.0 mm conductor cables.

The total number of circuits according to conductor diamter in Table 7.4.1.(10) was calculated on the basis of the DC resistance limit and transmission loss assignment mentioned previously. It is, however, very uneconomical to lay cables of different conductors strictly following the results of such theoretical calculation. Therefore, the actual number of circuits according to conductor diameter would differ from that obtained from the theoretical calculation.

After calculating the required number of circuits according to conductor diameters, the actual conductor diameters were determined from the viewpoint of economy as described in the following paragraph 7.4.2.1.

TABLE 7-4-1-(4)

В NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS IN EACH SECTION

=[ō	(858)	20	(297)	541	2051	364		311	<u>(92</u>)	678	712)	915	(1)	729	4309	8040		1,166	ber)	7,659
Plan – NOI	F) Total	ğ	3,166	<u></u>	ڻ 	<u>S</u>	м М		3			5	6,1		ıllı,	Ð	_		8 1,1	<u>đ</u>	92
n ol		0.1										35 245		35		39 7		1 124		69 1		- 2
	663	Ö				2		1		<u>0</u>				2 3				1221				519 182
	<u> </u>	0.8				3 82	6	3 21		8 103	_	0 229	ন	2]		1 408	3	21311		0 339	<u></u>	
	ŀ	0.6)(26	<u>ਲੇ</u> ਯ	0100	5 323) (85)	0 223		208	6	9 130	0(515	41,334	(1)	1,211	900	<u>8</u>		740	622)	5521
		0.4	2006(1591)(267	289620321134	229(136)(161)	136	197)(120)	120			(39)	39	624) (200)(512)	334			zadojiczalajues	2412			(826)(338)	4937 1,745 5213
		Tota I	200	&	1220	353	(197	290		235	(27)	449	(624	1406		154	Ř	70 7678 41 70 4882		949	1262	4937
		1.0										147				51				16		
	8	0.9										20		20		22		14		44		153
	1988	0.8				53		26		69		171		171		325		96		293		449
	Ī	0.6	297	974	Î	181	(17)	138		199		8	(526)	1036		756	(572)	. 192 192		596	(603)	9443391 449 153
		0.4	2111		611	6 =	126)	126			(27)	27	(98)(526	179			perior	50			629	944
ł		Total		2561 1922	(01 1)(61 1)(621	520	223)(126)	246		80	S S	312	511)	031		8	3461)(2067)(273)	5415 2919 3635	-	272	po3)(659)(603)	3,181
		го 1	<u> </u>	1 01	<u> </u>		<u> </u>					63	3			33	_54	425	. · · · · · · · · · · · · · · · · · · ·	12	ž	2
												2		12		14		64		32		29
	983	œ				45		23		60		35		23		8		654		241		379 129
ĺ	-	0.6 0.	- F	128	57		8			20		52	(16	851 1			ନ୍ଥ			487	କ୍ଷି	
	-	4	E E J CHE	1804 B			(124) ((SO)	20	20)(491)	45 E			89	1952 2703		7	(47 1) (532	5402,33
ŀ		0		12/42) 2563 19	<u>66</u>	- (26) (080)		([24)	46	69			(539) 872 (600	32	22 2036 (1500) (892)	210604	736	8	<u>6</u> 100	
	-) Total		<u>å8</u>		<u></u>	125		2			40112	9.0	4.6		5 4	2 200	078 04 04 04	2	9 2		202
%		9 1.0									7 5	6 4	~	6	20	6		28 1	75 1	28		
Ш	979	0 0			27	9	10	6					_	7		-	8 7					
DIAMETER		o	কিত	() A ()		-			37	25	1 70	1 64	9) 51 140	5 67	9 383	9169	8) 0 348	5 204	4 169	2 13	ଳହ	64
DIA	-	0.6	000 000 000 000 000	((826)(316) (826) 737	37 (37)	(29) 3 (29)	37)	51 (29) 43)			-		(539) 725	<u>8</u> 8	569	289	7(528)	1525(559) 1.525(2315	474	432	00 20 20 20 20 20 20 20 20 20 20 20 20 2	((341)(405) 341 (1,824
		0.4		<u>60</u> 0	(<u>6</u> 6	დს	113	(95 95	601	44	Ξ	00 00					1637 1837	152			<u>4</u> 4	<u>88</u>
E E	Dis- tance	(Km)				09		4.0		12.4		5.0	 	7.2) 11.2		46		012.0		5.0
ğ	Б			(B		_				oreng		Alur		Rutih		8)00		r (A)		Andra A		ggi(A
CONDUCTOR	Cable Section			₹ Kota (B	3	~ Ancol		Pluit	-	Cenglareng	ទីដ	Tegal Alur			-	<u>Jatinegara(B)</u>	-	Sambir (A	~	Kebayonan(A) 12.	7	Semanggi(A)
	ble		Koto (A)	i. 7. T	Kota (A)	(4	0 (A		0 (A)		Cengkareng	ς Ξ	Kota (B)	Ce mpaka	a (B	5	Kota (B)	ن ک	Kota (B)	(Y	nbir(/	ังั่
				<u> </u>			Kota		Kota	<u></u>	Cen				7)Kota (B)		Kot		Kot		Gambir(A)	5
l	00 tic €	2		<u>_)</u>		N)	(୭	(1	シ	(u	シ	6	リ	6)	(@	シ	O	ッ	(<u>೨</u>

(): Number of non-loading circuits

(2)
I
I
7-4
TABLE
T A

NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR

Plan – NO. I	1 988	1.0 Total 0.4 0.6 0.8 0.9 1.0 Total 0.4 0.6 0.8 0.9 1.0 Total	1050		1.818 67 1645 707 72 4 2495 145 2413 790 142 29 3519	(15) (28) (47) (10) (57)	226 28 190 118 72 408 47 417 249 142 855	(1 i6) (1 e6) (1 e6) (224) (1224)	941 223 864 489 79 1655 3701716 661 147 2894	(14) (22) (41) (41)	273 22 164 210 79 475 41 375 357 47 920	(22) (33) (28) (28)	100 1771 33 531 870 216 186 2836 65 2613 605 263 400 4946	(1343) (765) (455) (1720) (1724) (1724)	199 2555 931 3211,158 384 409 4203 371 200 951 767 886 7280	(81) (81) (8) (6) (6)	96 905 40 470 952 151 2613 98 904 355 252 3514	(34) (39) (49) (49)	3002044 45 649 958 436 427 3515 60 2931.71 1 2596 636 6296	(34) (37) (34) (71) (62) (60 (122)	3001877 37 494 B671A26 4273351 6210221A702586 6265766	(44) (66) (15) (81) (121) (47) (168)	
	1983	0.6 0.8 0.9 1.0			1,154 604 39		103 65 39		520 249 43		92 124 43	R	063 439 169 100	95)	791 720 173 199	(6)	1,134 675 9(322 602 783 30	(10	223 561 775 30	(15)	
		.0 Total 0.4 C	2445) (2445)		~	(61)	1 0	(374) 1359 1,773 (116)		(14)	4	91 2604	44 1,106 10	(648)	24 596 672 7	88 933		42 1361 (34)	37	(18)	8	68 182 (29	[[[25]]]
	1979	0.6 0.8 0.9 1	(442) 007 505		916 509			(223) 131	439 47			JB74 639	241	(95) 815 291 100	(/8) 630 318 136	1)191 634 20 8	988 387 14 4	334 768 169 4	811 205	(9) 84 595 169 <i>i</i>	772 205		
(5/6)	Dis-	0.4			7.8		5.5		6 <u>7</u> 07		7.0		8.6	(581) 581	1084 1084		8.0		7.0 (14)	(27) 27	7.0 [1]	(15) (15)	ξ 2
DIAMETER (2/6	Sec tion Cable Section		C (A)	ampo	Stipi	Slipi	Kedova	(3) Gambir (A)	Pal Merah	Pal N	Meruya	رج (Gambir (A)	gora(B)	رچ (Gambir (A)	Cempaka Putih 4.6	Gambir (A)	Kebayoran(A)	Cempaka Putlh	Pulo Gadung	Ъп		Tg. Priok (A)	\$
	S S S S S	N N	(<u>(</u>))	(0)	(r)	(1)	(L))	(4)	C)	(9	(Ž

TABLE 7-4-1-(6) NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR DIAMETER (36)

					3		, r			I			5 2			9	<u></u>						Plan – NO.	g	_[
Sec	action Certion	Dis-			67 0	<u>ه</u>					1 983	ю				2	988					1 993	n	Ì	
ON N		(Km) 0.4	0.4	06	0.8	6.0	1.0	Total	0.4	0 G	0.8	6.0	1.0 T	Total 0.4	4 0	0 9	80,9	01 6	Total	1 0,4	0,6	0,8	60	<u> </u>	Total
6	Tg. Priok (A)	, u		153	8			2	(11)	(12)				(23)	 25	(52			<u></u>	(104)(130)(101)				. <u> </u>	(23)
j)	~ Ancol	ว ต่		231	8			251	21	377	82		4	480 10	100	715 9	94		606	9 243	226	169			638
	Cempaka Putih	<u>u</u>		37	14.0			(49) 559	(68)			 		(91 1)(68)	<u>(</u> 9				9 []	(1 16) (150)					(150)
V	Rawamangun		(54) 54)	413	149			(54) 616	102	664 32	321	9	<u> </u>	1 260	120 021	51 628	8	9	1855	1855 267		1668 1,187	6	-94	3128
(;	Ra	C U							(16)			_		(16)	8				(S)	(33)	(18)				(151)
3)	P enggilingan	5 5							9	52	154	9	2	228	29 13	129 32	_	9	485	55		452648	G		161
(PC	ŭ			158	105	35	8	306			 					6			(9)		(21)				([2])
[)	Ke bayoran(A)			138	77	42	2	264		152	153	63	12 3	380		196 227		99 17	17 539		274	274 355	138	55	792
35	Cempaka Putih	а В		403	202	14		619								(2)			3						Ē
)	Jatinegara(B)	s S		209	110	<u>б</u>		328		308	104	66	4	478	21 4	34 207		95	757	7 38	ဖ	362	173		234
(a)	×	0	(88) 86)	301	383			(98) 782	(72)	(14)		. <u>.</u>		(98)	(83)	(23)			(106)	(83)	(24				(107)
2)	. Cipete	2	49) 49)	108	157	_		314	83	2 19	279			58110	105 3	349390	-		844	t 163	579	529			2
(Ke	ć								<u>4</u>				(44)	3	(4 8)			(48)		(4)			·····	(47)
2	Pasar Minggu								G	143	228	53	96	526	6	7331	17 6	67 151	1 717	15	272	421	119	252	660
(C	Δ.	55	Î	£∽	3	26	67	(18) 142 (8	(21)				(1 (39)	(23)	(27)			(50)	୍ଷି ଚ	3			<u></u>	(62)
2)	Jagakarsa		ဨ်ဖ	<u>5</u> -	ß	20	43		8	73	56	53	36 2	236	23	88 7	76 6	67 5	52 306	62	101	9	119	87	458
62	¥	2	မ္လိုစ္တို	336) 336)	495	321	133	(130) 1345	(26)	(ZE)			=	(125) (107)		(64)			121	(60 1) (61 1) (1 2 1)	60 D)				(528)
)	Kalibata	2	(12) (2) 72 248	(121) 248	372	86	7	(CO)) 861	63	397	378			868	107 7	<u>18 51</u>	0		1335	611 9	1,144	780			2043
(DE	Kebayoran (A)	80		9				91							6				(6)	<u>[0</u>					0)
2	~ Tebet	;		40				40		8			=	54	σ	94			103	3 31	l 68		ļ		8

TABLE 7-4-1-(7) NUMBER OF JUNCTION CIRCUITS AND NON-LOADING

CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR SIZE (4/6)

Plan-NO. 1

r			<u> </u>	-	~	0	<u> </u>	.		5			- 2	<u>m</u>	6	60	3	4	=	10		=
- 9		Total	(44)	681	(210	2460	(202)		0021		(54)		(99)	H 83	(269)	6£1	(207	734	ě	203	6)	231
P la n-NO		0.1							200		140						-					
ā.	56	0.9						774	267		167	2										
	6	0.8				5/6	č	91 G		3	155	~~	020		4 1	D	5	t		55		
		0.6	(76)	233	(22)	1622		670	1 2 1	2	<u>с</u> Г		043	50	(8)		Ľ	- 1		136	ы	81
		0.4	<u> </u>	448	(88)	259	ୟି	298	0	0	(54)	54	(6 6	66	(261)	n l	(176)	533	[34]	34	(59)	59
		Total	4	38.2		I674	(145)	1905	070		(31)	421	(44)	638	215)	6	(113)		(8)	16	(72)	137
		<u>.</u>					ā	5		, ,	L											
ĺ	8	0.9					1	0	100	5		22										
	861	0.8			5	R	00,	430	100	t	6	32		+++	ע ע	55			50		Ļ	C Q
		0.6	(36)	66	[2 0]	660		220	100		ţ	0	, r 1	100	2	-	(22)	83		5	୍ର	27
		0.4	251)	316	(158	187		197	0	<u>•</u>	(31)	ñ	(44	4 4	ເຂເຊ	842	(16)	403	<u>(</u> 8	æ	(45)	45
		Total	ē	20	٦î	1114	109%	6 11	104	ĥ	(24)	287	(12)	346	17 71	907	(33)	306	5	F	(55)	90
		0.1						с П		0		C D										
	8 3	0.9						2	1		ç	20										
	6	0.8				239	-		0	- 1		2	000	277	u N	Ŗ			ų K	2		4
		0.6	(B	ω	1 7	737	100	r F	0			- t	30		0		(15)	34	2	5	(12))	21
		0.4	202	202	1281	138	60	39	ų	D	(24)		(12)		(177)	685	(B 18)	272			34)	34
		Total	167) 1671	(8) 8	307) 866	(84) 718	399)	(54) 488	(29) 483	152			(66) 465	(18) 130	(595) 649	477 525					(94) 740	[2] 2 2 1
		0		-			54	22	54	22					<u> </u>	<u> </u>					133	71
	ი	0.9					4	9 Э	4 }	39		<u></u>									321	86
	19.7	0.8			323	37	412	155	200	63			330	94						-	92	8
		0.6				518		2 18	(29) 88	28) 28)			-	25 25	(14) 59	48 (12)					711	8 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
		4.0	1671	88	234)(234)((66) (18) 66 515	60 66	54) 54)					(52) 52		590						(23) 23	
	Dis-	(Km) 0.4	0)))		4.5		4 10		 ດ	Ľ	0. 0		<u>.</u>		9 19 19		6.0	I	c		2.4
				Samanggi (A)	ara (B)	Tebet	ara (8)	gug	5	Pasar Rebo	Rebo	laria	Jatinegara (B)	der		Jat inegara (A)	B)	s lipi	oran (A)	Paï Merah	0	Deer Mingol
	Sac	Cable	Kebay or an (A)	¥ د ه	Jatlnegara (B)		Jatineg ara (B	Cawang	ŭ		Pasar	Gandaria		Klender	Jatinegara (B)		Kota (B)	`	Ke bayoran (A)		Kalibata	
	8 8	NO.	(6	$ \langle$	2		<u>(</u>	6	5)		9		9		6				3		9

TABLE 7-4-1-(8) NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR SIZE ($^{5}/_{6}$) Plan-NO I

۱	·	5	(9) 13	(34) 226	©00 8 7	(68) 418	86	(305) 162 6	4	358]
Plan - NO. 1	1993	Tota	(6) 243	53	<u>ଅଞ୍</u>	6) 14	(278 3491	162	5 153	ž		
		0.1							0 245			
		<u>.</u> 0		4 <u>3</u>					51			
		0.8	80	49	ۍ ۲	9 	1248.	422	436343	17		
		0.6	(6) 125	(34) 134	92	(26) 186	(278 1928	(3)) 812	436	187		
		0 4	32		() () () () () () () () () () () () () ((42) 226	315	(274) 392				
Ì		Tatal	14 4	(7) 134	(26) 26	(18) 38	(290) 2292	(275) 134 1	911	327		
		0.1							147			
	88	<u>ө</u> .0		37					295			
	198	0.8	65	36			884	32 1	243	157		
		0.6	71	(1) (61)		30	(290) 1251	(40) 683	226	170		
		0.4	ß		(26) 26	(18) 108	157	(235) 337				
	1983	Tota I	001	83		64	(260) 1494	(246) 104 1	586	252		
		1.0							56			
		0.9		23					175			
		0.8	4	2	· · ·		631	266	174	10.8		
		0.6	29	9 9		13	791	(ମ ମୁଧି ସୁଧି	4	14 4		
		0.4				51	72	(193) 271				
		Total					(219) 1020 1194) 164	2400 00200	682 266	637 262		
		1.0 Te		<u> </u>			<u>902</u> .	<u>959v</u>	- 0	14 6		
	~	σ							815 84 4	40		
	679	8					506 382	195 133	206 21 91 8	2 5		
	-	0.6 0.								283 2 134 8		
		4					ດີຕະເບ	(276) 276 558 240 411 240 411	4	13		
		(Mm) 0.4						4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		4		
	Dis	<u>E</u> Y	8.(10.5	2.0	5.7	7.8	6.4	14.2	12.4		
	Sec	tion Cable Section tanco NO. Kun (4) Kallbata Jatinegara(B) 8.0		Kebayoran (A) Cawang	Kalibata Cawang	Jatlnegara (B) Rawamangun	Kota (B) Anĉol	Kota (B) Pľúit	Kota(B) ≁ Cengkareng	Kebayoran (A) Jãiinegara(B)		
	Sec	na N N	4	4 3	(F)	4	45	(9)	(4)	4 B	(64)	2 0

NUMBER OF JUNCTION CIRCUITS AND NON-LOADING TABLE 7-4-1-(9)

CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR SIZE (6/6)

-1		Total	H965)	1422	(410)	3453	(746)	2742	217	483	(4284)	6309	(138)	732					1	-
Plan - NO.	1993	.o To	_ <u>4</u>	-	■30 10 10	<u>አ</u>	<u> </u>	<u>א</u>	8	<u> </u>	<u> </u>	ម័	=			-		 _		
		0.9			8 19 19											+		 		-
		0.8 0	<u></u> ნ				o v	3	366							-		 		
		0.6 0.	വ		21/717				174 36		8	¥.	8	5				 		
			47 50 16	3	83 (5	28	8)(15	517	-		200	9520	0 (4	355 377				 		_
		al 0.4	3391) 4347 (603	2	(195) (358) (52)	754687800	ຣຣຍ ເຣຍສາເເຣຍ	1830 875 1798	112)(188)	4 943	2799)4206(78)	5392 4495 2014	(73)(90)(48)	_		<u> </u>		 		5
		Total	З З	(13391) (4347) (608 809 0 7990 3373		(195 175		<u>6</u>	(188) 11 4		279 539		(73) 477					 _		
		0.1				378 291												 	Ċ	ī.
	988	0.9			1376															-
	<u>6</u> -	60.8	0		344		46		113 265											
		o	2(519	2013241)(28	300 451	404/164)	5731211		- 1	1 1 1		(60) (13)	216						
		0.4	2459)(2872(519)	Ř			404	573	(188)	736	2654) 2799	4292 4021		5 261				 		
	2861	Total	(2459 1055	2622 2622	(1 01) 985				(160	789	2654	4292	(15)	295				 		
		0.1			209 19 7 214														2 2	3
		6.0			197															
		0.8	9						172											
		0.6	532	Ř	(72) (23) 125 240				6	00	2654) 3403 889		129							
		0.4	1260	₿ 	(72)	125			(160)	535	2654	3403	(15)	166					-	
		Total 0.4	621000	4378 300 ZUS									261	255					290	1
		1.0		24												T		 	82	Î
	6791	6.0												•					40	ĺ
		8																	127	Ī
		0.6	in Sol	<u>Şr</u>	 i								149	48		-			41	ĺ
		4	1468(623) 4126/2084										121	10 7 148			-			ſ
	Dis -	(Km) 0.4 0	м 0. 2. 4. 4. 4.	10E	3.0							- -	_	 2.8 2.9		-	!		L	c c
	<u>, 0</u> ł	: 5					`	B)		(B								 		
				ir ((Y)	lok (I	1 (A)) ggi	an(A	oran		(c)	ra (A	Ir (A						
		290	NO. Gamblr (A)		Tg. Priok (A) Tg. Priok (B)		<u> 6</u> 6 u c	Semanggi (B)	IY OF	Kebayoran(B) ^{2. 8}	9	Koña (C	lega	Gañbir (A)					legar	
		Cable					Semanggi (A) Semanggi		Kebayoran(A) Kebayoran((SS Kota (B) Koña (Ja Ja						Jatinegara (B)	
	Sec	ġ Ŷ	٦ ا	\mathbf{i}	(8)		6		B		6		66	57)	8	66	(2

TABLE 7-4-1-(IO) TOTAL NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS

				······	
Year	Diameter	Number of Circuits	Number of Non-Loading Circuits	Loading Circuits Rate	Composition Rate
	0,4	8742	6876	21.3	27,4
	0.6	13405	3145	79.6	48, 2
1070	0.8	6003	0	100.0	18,8
1979	0.9	1149	0	100.0	3.6
	1. 0	649	0	100.0	2.0
	Total	31948	10 021	68.6	100.0
	0.4	15936	10975	31.1	2 9. 2
	0, 6	22646	4059	32.0	41.5
1007	0.8	10608	0	100.0	19.4
1983	0.9	3309	0	100.0	6. 1
	Ι. Ο	2104	0	100.0	3.8
	Total	54603	15034	72.5	100.0
	0, 4	22592	13109	42.0	27.5
	0,6	34438	4961	85.6	4 1.9
1988	0. B	16063	0	100.0	l 9.5
	0.9	5752	0	100.0	7.0
	1.0	3370	0	100.0	4.1
	Total	82215	18070	78.0	100.0
	0.4	31282	19328	38.2	2 4. 8
	0.6	5 3 908	6460	88.0	42.7
10.07	0.8	25045	0	100.0	19.8
1993	0. 9	10209	0	100.0	8.1
	1.0	5861	0	10 0.0	4. 6
	Total	126305	25788	7 9 .6	100.0

Plan-NO.1

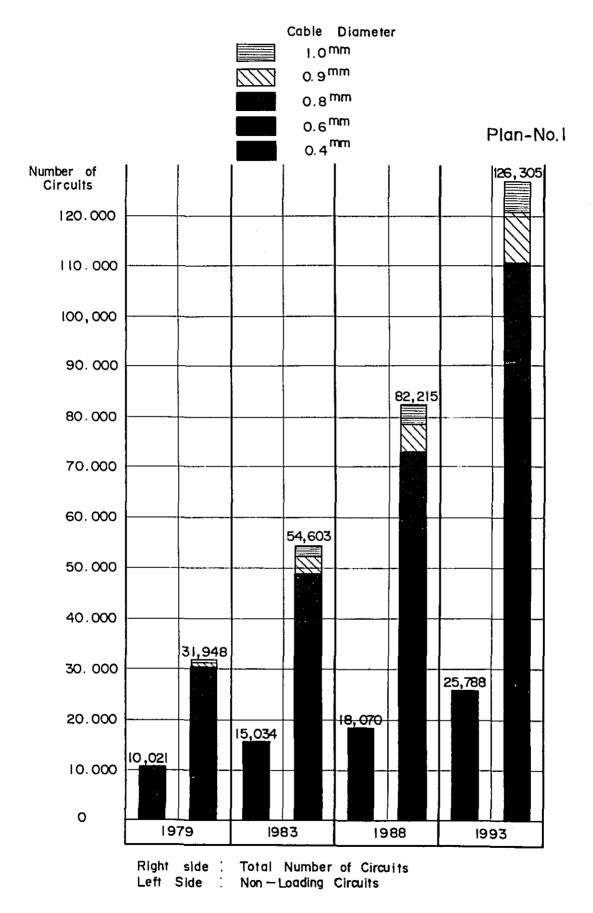


FIG. 7-4-1-(11)

TOTAL NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS

7.4.2. Junction Cable

7.4.2.1 New Cables by Conductor Diameter and Cable Section

Based on the number of circuits of each conductor diameter and circuit sections as described in Tables 7.4.2.(1) to (12), the miscellaneous circuits such as telegraph circuits, telex circuits, leased circuits, etc. will be added and in consideration of the transmission loss and DC resistance limit, the cables to be newly installed will be determined.

In the case of a certain circuit section where almost all the circuits are of small size conductor and only a small number of circuits are of large size conductor, the cables of large size conductor can be replaced with those of economical size conductor which satisfy the limit value of the transmission loss, through application of new technologies, such as improvement of telephone set, or adoption of less severe limit value.

In principle, the pair number of the cable of each conductor diameter shall be the maximum one. However, in case the total number of circuits 15 years hence is less than the maximum number of pairs of the cable, the number of cable pairs which can satisfy the total number of circuits [(telephone circuits + miscellaneous circuits) \times 1.2] will be applied. Futhermore, in calculating the number of circuits after 1993, the decision will be made by an extended provision period of 15 years on the assumption that the circuit increase rate in the five years from 1988 to 1993 will continue in the future.

As one example of a fundamental cable decision, let us look at the cable section No.5 between the Cengkareng Exchange Office and the Tegar Alur Exchange Office. The circuits to be accommodated in this cable section have various DC resistances and transmission losses. Theoretically, it is possibly to lay the cables having various diameter conductors suitable to the respective DC resistances and transmission losses. Actually, however, it is uneconomical to lay the cables of various conductors. Therefore, cables of the maximum diameter conductor will be laid in this cable section in order to satisfy all the conditions. In other words, the 1.0 mm x 200-pair cables will be laid as indicated in Table 7.4.2.(1).

Since this cable, however, cannot accommodate the total number of circuits (414) required by 1983, the 0.8 mm x 400-pair cable will be laid for circuits with conductor diameters of 0.4 mm, 0.6 mm and 0.8 mm. In this case, although the maximum cable size of the 0.8 mm is 800 pairs, it was planned that 400-pair cables be laid so as not to have too many spare pairs of the 0.8 mm conductor cables when the 0.6 mm conductor cables are installed additionally in the future.

Furthermore, in the case of cable section No.6 [Jakarta Kota (B) – Cempaka Putih], although the necessary number of circuits of 0.9 mm conductor cable is 10 circuits, this number is very small and there seems hardly any trend of increase in the future. In such case a restudy will be made on the DC resistance and transmission loss assignment among the exchange offices (EO \rightarrow EO, EO \rightarrow T, T \rightarrow EO, EO \rightarrow TOLL) as to whether or not it would be

possible to use 0.8 mm conductor cable instead of the 0.9 mm conductor cable, but ultimately the decision will be for use of 0.8 mm conductor cable. Of course, the use of twoway repeaters, etc. will be considered but the case may arise where it will be required to provisionally acknowledge a slight excess in allowable transmission loss assignment value.

Fundamentally, in order to avoid the increase in number of cables, 1.0 mm conductor cables are not used between tandem exchanges.

7.4.2.2 Proposed Cable Diagram for New Junction Cables

Based on the junction cables to be newly installed in the various cable sections described in the preceding paragraph 7.4.2.1, the Proposed Cable Diagrams for 1979 and 1993 were prepared. [Refer to Fig. 7.4.2.(13) and Fig. 7.4.2.(14).]

7.4.2.3 Amount of Work According to Number of Cable Pairs

The total cable length by 100-pair conversion of the existing cables up to 1974 was approximately 550 km, but in line with the increase in telephone demand in Jakarta, about 4,400 km of junction cables must be installed by 1979.

In the event the index of the 100-pair conversion cable length as of 1974 was set at 100, it will be 895 as of 1979, 1,165 as of 1983, 1,484 as of 1988 and 2,099 as of 1993.

The ratios of the 100-pair conversion cable lengths of the existing cables as of 1974 were 45.3% for 0.6 mm conductor cables, only 4% for 0.8 mm conductor cables while the balance of 50.7% was 1.0 mm conductor cables.

On the other hand, the ratios of 100-pair conversion cable lengths of 0.4 mm, 0.6 mm, 0.8 mm, 0.9 mm and 1.0 mm conductor cables as of 1993 will be 13.2%, 45.6%, 25.3%, 12.3% and 3.6%, respectively.

Although the installation of about 4,400 km of 100-pair conversion cable length is requested by 1979, the 100-pair conversion cable lengths to be expanded thereafter in the 3rd and 4th Five-Year Plans are 1,500 km and 1,800 km, respectively. During the duration of the 5th Five-Year Plan, 3,400 km of 100-pair conversion cable length will be extended. This is about twice of that of the 4th Five-Year Plan.

In Table 7.4.2.(15), the total cable length under the 2nd Five-Year Plan shows a very high figure.

In order to avoid the increase in the number of cables in the cable routes, this plan considers the laying of cables with the maximum cable size. As shown in 7.4.2.(15), the composition ratio of maximum size cables will be about 87% at 100-pair conversion cable length. As mentioned previously, in order not to hold too many spare pairs over a long period, there may be cases where cables of other than maximum cable size will be laid but this will be 13% at 100-pair conversion cable length. TABLE 7-4-2-(1)

. .

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (1 /12)

												ł								Plan-No.	No. –	
E S	NAME OF	DIS		-	979				6	583				1988 1	38				6 -	663		
° N	EXCHANGE		0.4	0.6	0.8	6'0	0.1	0.4	0.6	0.8	6.0	0.1	4.0	0.6	0.8	0.9	1.0	0.4	0.6	0.8	6.0	1.0
((2410) 2553	(973) 1128				2381	1,58				2537	1,286				2,683 1	1,497			
-)	KOTA (A) ~ KOTA (B)	8.	2400	1,200				2,400	2,400 1,200				2400 1,200	200				2,400	1,200 x 2			
			(83) 97	(38) 49	(21) 36			135	601	60			157	239	02			180	427	60		
$\overline{()}$	KOTA (A) ~	6.0							809		.			ĝ				-	600			
	ANCOL				2002					200					200			I		ន្ត		
			(125) 150	(57) 105	(12) 14			164	131	<u>.</u>		 †	691	182	35			158	295	28		
6	KOTA (A)	4.0			Ę					Ę					40					Ş		
	PLUIT				3					<u>}</u>					B		4		800			
				(58) 144	(33) 49				159	80				220	6				275	135		
(4	KOTA (A)	12.4											!			-						
)	CENGK ARENG				600					600					600					600		
(C ENG KA RENG		(8) 15	(15) 15	(84) 93	<u>8</u> 2	(53) 68	27	69	671	9	123	30	Ξ	226	26	144	52	3	302	47	324
5	\$	D.C					200					So					g			-1		200x2
	TEGAL ALUR									400				<u> </u>	400				4 00	<u><u></u></u>		
1	I J.T.P ESTIMATION	TIMAT	NOT]	1	1	1									1	

LOWER SIDE : BASED ON PERUMTEL SUPPLY PLAN

.

· · ·

TABLE 7-4-2-(2)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION $(^{2}/12)$

		5	FROTOSED CABLES BI CONDOCION DIAMETER AND CABLE		5		ם מ	3		5					Š	į			-	Plan-No.	No. 1	Γ
2 SEC	NAME OF	DIS- TANCE			6761				-	5861				6	1988	ŀ		ŀ	<u>6</u>	£661	-	
ON	EXCHANGE	(Km)	0.4	0.6	0.8	6.0	1.0	0.4	0.6	0.8	6.0	~ 0. _	4	0.6	0.8	0.9	0.	0 4	0,6	0.8	6.0	0.1
				(900) 957	(88) 185	(8) 10		60	1,124	163	9		237	368	226	27		441	1761	280 280	47	[
٢	KOTA (B) 2	7.2		1,200			•	Ť	1200		<u> </u>	!		<u>8</u>				من ا	1200			<u>-</u>
	CEMPAKA PUTIH				6					400					400				7 2 x 2	400 400		
				(38I) 75I	(223) 506	(25) 66	£ º		675	346 346	8	44		866	429	53	67		ł	539	2	94
\bigcirc	KOTA (B) ~	11.2		1,200	600				1,200	600				1,200	ا وو				1200 x 2			
	JATINEGARA (B)					200				P	200					200				<u></u>	200	·
			(2013) 2161	1.7	(269) 460	(37) 94	(24) 29	2577 3,568	3568	863	84	55 3	3853	4798 1	1241	150	92 92	5504 6444 1,731	444		292	164
۲	0 X	4.6		8 [.]	BOO				1200 * 3	800			2400 2400	1200 x 4	800			5400 13	1,200 x 6	800	:	
	GAMBIR (A)		2400		}	§		2400 x 2			400				× 2	ç		x2		ю ×	ş	
				(570) 626	(570) (173) 626 223	(37) 99	(20) 24		643	318	4 22	- 9		787	387	58	51		- 116	447	6	24
٦	× ×	12.0		80	600				1,200	600		······		1,200	600			<u> </u>	130	600		
	KEBAYORAN (A)					200					200					200				<u> </u>	200	
			(450) 531	(2,408 3,695				713	2816	500	170		1,246 4,476		593	g	~	2,303 6981		685	2 4 0	
<u>_</u>	GAMBIR (A) Cemancer (A)	5.0		1,200 x 4				1	1,200 x 4	80	000		2400	200 x 4	800	200		2,400	1200 1, x 4	800	Q	
	JEMARUUI IN			(200) x 3)					QR.							$\frac{1}{2}$	\neg				3	٦

•

TABLE 7-4-2-(3)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (³/12)

																				Plan-No.	No.1	ĺ
D S S NO F	NAME OF	DIS- TANCE			6791		,		_	1983				-	986				Ë	5661		
NO.	EXCHANGE	(Km)	0.4	0.6	0.8	6.0	1.0	0.4	0.6	0.8	6.0	1.0	4.0	0.6	0.8	6.0	0.1	0. 4	0.6	0.8	6.0	0.1
				(209) 1,294	(672) 773			28	1,523	797	51		88	2,171	933	95	S	161	3,185 1,043		188	38
€	GAMBIR (A)	7.8		1200			4															
	≁ SLIPI				800			-	N X	8	400			, x2		400	Τ		x3	ŝ	400	
								25	136	86	51		37	251	156	95		62	550	329	187	
2	SLIPI	5.5				 					005			1		Ę					300	
)	.~ KEDOYA					· · ·					202			1,200		3	.		1,200	600		
((104) 200	(579) 1,422	(62) 173			2	686	395	57		294	l, t 40	645	04		488	2265	873	194	
m	GAMIR (A) ~	7.0		1,200					1200					1,200				1	1,200			
	PAL MERAH				008					008	200		L		800	200				800 400	200	
								<u>8</u>	121	164	57		62	216	277	104		54	495	471	194	Ī
(PAL	2.0						-		600	200	_			600	200				600	200	<u> </u>
	MERUYA																		1,200			
				(I,084) (312) 2474 844	(312) 844		(58)		5041	579	505	132	44	2021	148	285	246	86	3449 2.119		347	528
(GAMBIR (A)	8.6		202		1-	į			_					2		2					
)	~ .IAT INFGARA (R)	_		1,2001	80				× 5	800				1,200	008				82	88		_
				 -		8 8	Π				400	Π				403	П		_	<u> </u>	400	Π

TABLE 7-4-2-(4)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION $(^4/12)$

	2						-										┢			Plan-NO.I	OZ -	_
Name of tarco			6261	979		-		ŀ	-	1983	F		F	- F	1988	F		-	<u> </u>	1993	-	
ange	0.4 0.6	0.4 0.6	0.6	0.8	_	6.0	1.0	0.4	0.6	0.8	6.0	0.	0. 4	0.6	0.8	0.9	0.1	0.4	0.6	0.8	6.0	0.1
(644) (832) (420) (180) 767/ 076 385 132	(644) (832) (420) 7671 076 385	(644) (832) (420) 7671 076 385	(832) (420) 1076 385	(420) 385	<u> </u>		(32) 35	8871	887 1.044	950	228	263 1	2991	7441	529	507 5	<u></u>	228 263 1,299 1,74 4 1,529 507 540 1,8 10 3043 2575 1,012 1,170	20 20 20 20	5751.	01211	021
<u> </u>	.6 1200 ann	<u> </u>	<u> </u>	<u> </u>					50	č				8 8 2 8	800			<u><u><u>q</u></u></u>	87	8		
	8	8	8	8	4	6 0 00			X S	N X X	400 x 2		2400			400 x 3	2	2,400			8 8	
(1304) (51 1)	(51 () 837	(51 () 837	(51 () 837	(51 () 837	12 1	(18) 27	(58) 117		1,497	168		127	531	531,9401	257		6 6	1292388	- 198	1,789		333
(7) Gambir (A) 8.0 [1200 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1,00 1,200 1,200							_	1200 x 2	88		-		1200	80		_!	<u>194</u>	1200	8		
Kebayoran (A) 400					٩ Q					×	400					4 8 0	<u> </u>				§	
· · · · ·	(18) (187 (071) 64 441 (014	(18) (187) (071) (271 64 441 1,014 224	(187) ((071) (271 441 1,014 224	(ID71) (271	224		(49) 56	49	425	795	7951,034	396	59	857	2651	265 896 564	64	2162	791.707 2259 3427	2593		840
(B) Cempaka Puth 7.0 1200 800 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	.0 200 200 200 200	800 × 2	800 × 2	800 × 2 400	4 X		200		1200	800 × 2	5 800 4 00 24	200 ×20		500	800 ×2	400 x5	200 x 3	<u></u>	1,200 800 x2 800 x3	0 M X	64 ×	200 x50
(15)(136()019)(27) 36 1 1 1 786 224	(15) (136)(1)09)(27 36 111 786 22	(15) (136)(0)9)(27 36 111 786 22	(136)(1019)(27 111 786 22	(ID19)(27 786 22	22		(49) 56	24	294	74	74 023	396	49	652	1,1441,882		564	8213	82 1,349 1,940 3,414	9403		826
Pulo Gadung 7.0 1200 800 400 Tg. Priok (A)	.0 800	800	800		4 Q		500		0021	800	400 x3	208 -		1200	800 × 20	400 x 5	200 ×3	<u>8</u>	1200	×30	64 ×	20 X 20
20 12 101	(26) (7) (96) 20 12 101	(7) (96) 12 10 1	(7) (96) 12 10 1		= -	ର ଚ	(18) (18) (18)	58	50	209	22	176	136	83	294	36	300	300	234	420	65	523
Tg. Priok (A) 5.0						1	200					200			-1		ő					2002
Cilincing										80					600		V X X		1,200	600		C X

TABLE 7-4-2-(5)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (5/12)

	<u> </u>
i	۵.

			I I			i					-								Plan	Plan – Na	
	D1S- TANCE		-	979					983				-	988				<u> </u>	£66		T
	(K (K	0.4 4	0.6	0.8	6.0	0. -	0. 4	0.6 (0.8	6.0	0.	0.4	0.6	0.8	0.9	0.1	0.4	0.6	0.8	0.9	0.1
			(305) 202	(27) 27			28	498	108			132	944	124			321 1	1,618	223		
	5.0			84 84					400					400					400		
								200			<u> </u>		1,200					8, ² 80			
		(72) 65	(546) 489	(197) (185			135	876 4	424	œ		224	1387	829	80		352	52021	1,567	8	T
22) CEMPAKA PUTIH	6.1			800					800					0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					8	Τ	
RAWAMANGUN						1		500					1,200 x 2				1,200	x 2	Z X		
							21	69	203	æ		38	021	424	8		73	597	855	ω	
	6.0							-	-	٦								-		-	-
Ž PENGGILINGAN					<u> </u>			<u> </u>	ဝိဒ္ဓ					800					800 * 2		
			(183) 209	(102) 139	(56) 47	<u>0</u> -		201	202	83	9		259	300	131	22		362	467	182	33
	11.7			8				Ť	800					800			L		800		:
KEBAYORAN (A)				-	8					R				•	200				<u> </u>	200	
			(276) 532	(146) 267	(12) 19			407	137	8		28	573	273	125		50	873	478	228	
25 CEMPAKA PUTIH	8.6		1,200					1,200					201		00			2		005	
JATINEGARA (B)					300			L		300			<u>Sy</u>	600	200	-		N 71	00	2	
					-	1	•	-	-			1									1

TABLE 7-4-2-(6)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (6/12)

Ī	Ī					333	2	୧୦	15	200						
히		2					 	<u>,</u>		<u>~</u>	0			200		
Plan-NO.		6.0				5 157		e vu 400 500	3 159		400			4000		
Pla	5661	0.8	698	800		556			153		400	1030		800		
	_	06	764	1200		359		1200	14			1,5 10		સુષ	222	400
		0. 4	215			20			38			157			4	
ŀ		0 10				661	200	3	69	000	}					
		6.0				88			88					800 800 800 800		
	988	0.8	515	800		418		222	8		400	673		808		
	-	0.6	461	500		228			1 16		<u> </u>	88		200	<u>8</u>	400
		0.4	139			2			30			141			2	
		1.0				127		200	48	000	, > 4					
		د 0				02			70				-	000 000 000 000 000 000 000 000 000 00		
	983	0.8	368	800		301		 3	74		400	499		800		
	51	a6 (289 3	200		189			96			524 4		002 002	71	40
		0.4 0	011			8			24		1	123		<u>.</u>		<u> </u>
		0		┝━┖╼╸					(57) 89			(94) 176 ^[]				
		1 6.0							35 (4	(130) (424		0000 0000 0000		
	62	0 8.0	208) 506	800	(800				(3) (14)	$\left \right $		(491) (1) 654 4		8 8 8 9 9 0 9		
	1979	9	(143)(2 398 5	1200 8	8				<u>6</u> 0	- -		(328) (491) 436 654			(53) 12 1	400
		04 0	(65) (4 30 35	<u> </u>					(8) 15	_ _		(95) (32 88 43	2	<u>y</u>		4
	5	(km) O		0	i	<u> </u>	<u>م</u>		<u> </u>	5.5		^{ت ت} ا	0 2			0 0
	Dis-	(kr d	 	~			ರ			ŝ			2			ω
	Ţ	Excharge		Kebayoran(A) ~	ete		Kebayoran (A)	Pasar Minggu		Pasar Minggu	Jagakarsa	1	Kebayoran (A)	, Kalibata		ran (A) t
	Nome of			Kebay 2	Cipete		T	Pasar								Kebayoran (A) Tebet
	Sec	Ś		(2)			6			83)		ලි)		() ()
,			-													

TABLE 7-4-2 (7)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (7/12)

1_	· · · · · ·		<u> </u>		<u>г</u>					0		<u> </u>					ł	~	
ġ	ļ	0.						527		88×		527			88 88	220 224		400 200	N K
Plan - 1		0.9				-		428		400 X2		484		400		220		400	
₽	993	0.8			764	1		1621		800	ş	667		800		205			600
	-	0.6	308	1200	2141	200	N X	331	000			595			200	165			
		0.4	591		342			393				7				71			
ľ		0.						265		8°3 × 20		265		200	x2	139		00	
		6 Ö						247		400				4 <u>6</u>		108		400 200	
	988	08			5 12		800	657 2		8		375 296	2			121		7	
	-	0.6	87	0021	1451	(200		1085 (Ş			292				87			
		0.4 0	417	<u> </u>	249 14			260 15		<u>¥ </u>	_	24 2				4			<u></u>
		0.	4			_		52 2		500	╞	152		8		8		00	
		6.0						145 1		00		176		⁸⁰⁰ 400 200		106		400 200	
	33	0.8			315		800	409		800 400		252		004		1 201		4	
	1983	060	=	002	973 3	1200	œ	587 4		8		197 2				54			
		4	267	<u> </u>	82 9	<u> </u>		183 56	<u> </u>	<u>.</u>		8	+			33			
}		0. 0	й И		≝			(29) 72	ł	0	(29)	72		0		ربم 			
										0 200				v 200					, <u> </u>
	æ	0.9			2		<u> </u>	5) (52) 4 187		800 400	4) (52)		2				ļ		
	I 979	08		10	0) (181) 8 427		8	3)(205) 0 544			7) (84)		Ğ	Š			_		
		06	10-	1200	(88)(680) 309 (,728	1200		(72)(288) 251 790	ļ		(37)	117					_		
		0.4	(156) 221		305			251											
	D js- tonce	(È J		о. Ю		4.5			4				0 6				5,5		
	Name of	Exchange		Kebayoran (A) Semanggi(A)		32) Jatinegara (B)	Tebet		Jatinegara (B)	¢ Cawang	2		Самалд	¢ Daeor Deho			Rebo	Gandaria)
ľ	Sec	Ő		(E)	<u> </u>	3			E)			A)			(F)	

TABLE 7-4-2-(8) LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (8/12)

T

							, I			•										Ъ	Plan-NO. I	
tion ch	N dia N dia N	Dis-		-	679				-	983				51	988					1 993		
Ŋ	aĐ	(km)	0.4	0.6	8 0	60	Ę	04	06	0.8 0	6.0	0	0.4	06	0.8	60	1:0	04	0.6	0.8	60	0'1
-			(15) 69		(33) (124) 1 10 436			4	4	302			58	202	582			87	764106	106		
(9)	Jatinegara (B)	7.5			800					800					800					800 X2		
	Kiender									<u> </u>		[002			<u> </u>		1200			
			(630) 779	(64) 78				904 246	246	4 8		╞╼╴┤	Ξ	282	70			1387	375	83		
3)	Jatinegara (B) Jatinegara(A)	5.		1200					500			N	2400	1200				2400 1200	1200			
								3 59	45				532	01				704	260	S		
(B)	Kota (B) Slipi	6.0							400			<u> </u>	0021	400				1200	400			
									45	<u> </u>	1	1	=	8	29			45	180	44		
B	Kebayoran (A) Pal Merah	7.5							- 	<u>8</u>		l		400	001				400	õ		
-			(18) 3 I		(51) (107) (130) 94 254 424	(51) (107) (130) 94 254 424	(94) 176	45	28	54			59	36	86			78	107	107 120		
@	Kalibata 2. Minggu	5.7			400 (200)	400 200) 200 (300)			<u> </u>	400 400 (200)(300)	300 300	I		<u> </u>	400 (200) 200 (300)	400 300				400 400 200 (200) (300)	00000 30000 30000	

Т

T

TABLE 7-4-2-(9)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (9/12)

			1																립	Plan – NO.	
Sec Name of Dis- 1979	-	-	1979	979		 	ſ	-	983	Ì				1988 1			ŀ	~	1 993	ſ	
Exchange (km) 0.4 0.6 0.8 0.9 1.0	0.4 0.6 0.8 0.9 1.0	0.4 0.6 0.8 0.9 1.0	08 0.9 1.0	0.1 0.0	0.1	 	0.4	0.6	8 0	6.0	0.I	0 4	0.6	0.8	6.0	<u>.</u>	4	06	0.8	60	의
								78	54			=	8	88			42	165	1 14		
41) Kalibata 8.0 Jafinegara (B)	0	· · · · · · · · · · · · · · · · · · ·							400					400			-{	<u> </u>	400		
						1 1		51	କ୍ଷ	30			8	8	6			177	65	2	
42 Kebayoran (A) 10.5 Caiwang	05									400					400		_!			400	
												स्र					6	12	~		[+ [
Ga Kalibata 7.0 Cawang	02				·								400					400			
							67	2				143	6				298	246	80		
(44) Jatinegara (B) 5.7 Rawamangun	5.7 C							8g					8 8 9				· [600			
		(705)(505) 679 668	(705)(505) 679 668	(505) 668 668		4	95	<u>8</u>	833			207	1651	1,167			416 2545 1647	5451	647	·	:
45) K010 (B) K.B (200 800 A ncol		1200 800	1200 800	800				1200	800		<u> </u>		1200	800 x 2			<u> </u>	1200 x2	800 x2		

TABLE 7-4-2-(10)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (IO/I2)

_ _ [-	Π		M	QN					
ò		1.0			323	200 × 200	 				
Plan-NO.I		6.0			678	400 x 2					
	1993	QB	557	600	453	200 600	226	800			
	-	α6	2701	500	536	1200	247				
-		0.4	517	1200 1,200 600							
		0.1			194	200		<u> </u>			
		0.9			389	<u>6</u>					
	1988	0.8	424	600	321	600	207	800			
5	2	a6	902	200	298		224				
		α4	445	1200 1200 600							
		0.1			123	200					
		0.9			231	600 400 200				,	
2	1983	0.8	298	600	230	600	143	8 00			
$\frac{2}{2}$	-	0.6	718	1200 600	061		<u> 061</u>				
		α4	358					_			
5		1.0			(53) 68	200	(<u>)</u> 61				
		0.9			(11) 371	400 200	(53) 169				
	1 979	0.8	(176) 258	600	(68) (1 21) 190 272	600	(107) 280	8			
	1	00	(317) (543)(176) 365 737 258	1200 600	(68) 190		(177)(107) 374 280				
		0.4	(3 I7) 365								
2	Dis- tance	(km)		6.4		14.2		12.4			
	Name of	ge		Kota (B) Pluit		Kota (B) Cengkareng		Kebayoran (A) Jatinegara (B)			
						ž		¥			
	Sec	NO		(4)		(F)		(4)	(64	2)	8

TABLE 7-4-2-(II)

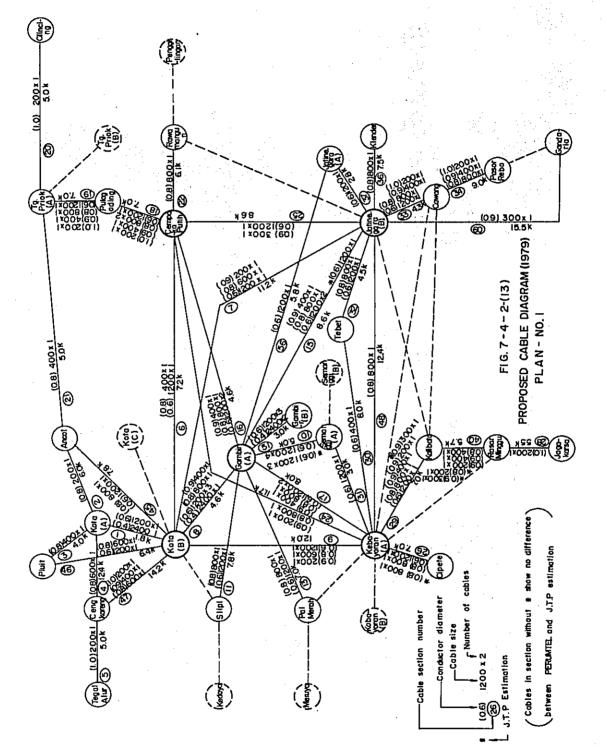
1

.

			•									
10.1	:	1.0			568	400 x3 x3 x3						· · · ·
I2) Plan-NO.		0.9			j98[60 53 53					:	
1/12	£66	0.8	78		946	800	<u>.</u> 6		483	800		
U Z	-	a6	05474452	2400 1200 x5 x4	9071,056	24001200	1,123,2373	2400 1200 x2	244 230		59332658	1200 1200 1200
CTIO		α4	10547	2400 x5	907		1,123	2400	1,244	2,400	5933	2400 x3
SE		0.1			384	200 x2						-
BLE		60			499	400 x2			_			
DCA	1988	0 B	53		595 454	800	61		149 350	: 008 800		
S AN	-	α6	7,356 3270	1200 x3		1200	1,612	1200 x2			1,810	22 22
TER		0.4	7,356	2400 x3	396		756		972	2400	5308 1810	2400 x 3
IAME		1.0			282	x2 x2					,	
R D		0.9			260	800 400				 		
сто	1983	0.8	21		276	800			227	800		
NDL	1 6	0.6	51512689	1200 x3	317				108		44921,173	50
γcΩ		0.4	5,151	2400 x2	165				706	2400	4492	2400 x 2 2 200
S B		0'1										
ABLE		6.0										
D C	679	0.8										
OSE	-	0.6	3912)(1868) 5447/2751	1200 × 3								
ROF		(km) 0.4	3912 5447	2400 x 3 x2	<u> </u>						ļ	_
ц ц	Dis- tonce	E Š		0.0	ļ	0.5		0		5.8		1.7
LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (II/I2)	Name of	Exchange		Gambir (A) Gambir (B)		Tg.Priok (A) Tg.Priok(B)		Semanggi (A) Semanggi (B)		Kebayoran (A) Kebayoran (B)		Kota (B) Kota (C)
	Sec.	0 N		J.		(2)		ß		(A)		(2) (2)

TABLE 7-4-2-(12) LIST OF PROPOSED CABLES BY CONDUCTOR

												т.				· · · ·	 : .		 	
:	, <u>.</u>	[:	ō		:		,				1977) 1977 -	•				80	8 3		
	· ·	Plan – No.		ရ		· · · ·				100 100	-		:		:				300	
		립	1993	8												:			•	
	, * } - *		-	0.6	498	1200			:					÷.,				1		
			:	04 04	469				:					•						
ц		ľ	;	<u>.</u>		· · ·							-				9	2		
JCT0			:	60															300	
NDC			1988	0.8					:						,					
PROPOSED CABLES BY CONDUCTOR			-	0.6	285	1200							-						• •	
S D	FER AND CABLE SECTION (^{12/12)}			0 4	345															
BLE	_ v	Ī		<u>o</u>														99]
20	T10	1	,	6.0															300	
SED	SEC		1983	80									•			:				
SOPC	μE		-	0.6	2	1200														
	CAE	ł		0.4	219														•	
ЧÖ	QN	ſ		0.1													(55)	60		
LIST OF	۶			60												-	(20) (80) (32) (55)	53	8 202	
	ETE		1979	0.8													 (80)	168		
[]-	DIAMET		· ·	06	(142) (196) 148 197	1200											 (50)	22		
4-2	-			04	(142) 148															
~			Dis-	(Km)		58												ļ	0 0	
TABLE 7-4-2-(12)			Name of	8		56 Jatinegara (A)	Gambir (A)											Tatinoogra (D)	Gandaria Gandaria	
			ģ	tion No.		(2)		İ	6				83)		8		(8	



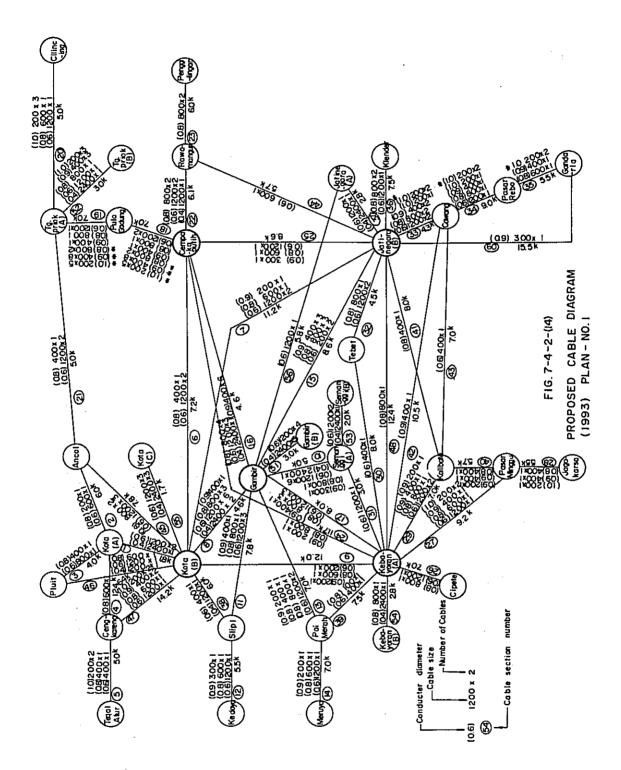


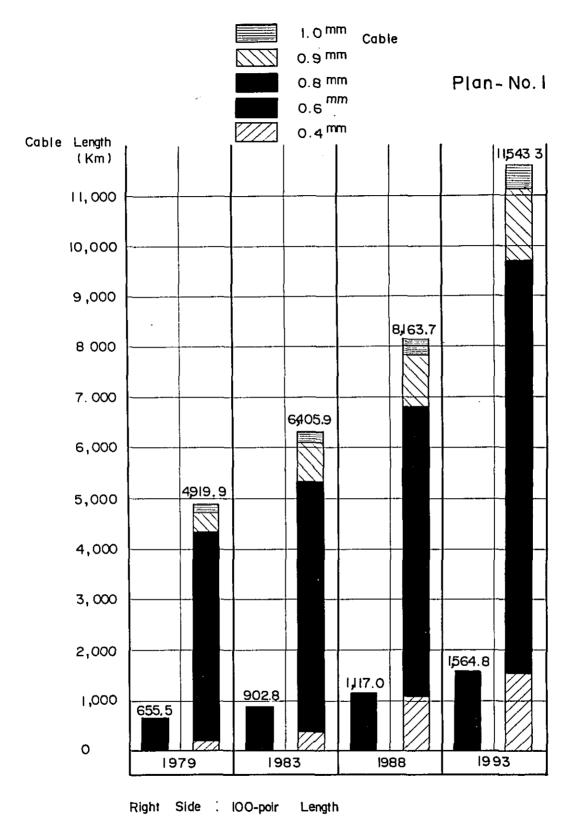
TABLE 7-4-2-(15) TOTAL LENGTH

BY CABLE PAIRS

_													
DI a-	Cable		1979			1983			1988			1993	
	Pairs	Cable Length	100-pair Lengt h	Comp siti on Rat e	Cable Length	100-pair Length			100-pair Length	Compo sítio n Rate	Cable Length	100-pair Length	Compo sition Rate
	2400	12.4	297.6	6. Ö	25.2	604,8	9,4	43.3	1,039.2	12.7	54.3	1,303.2	11.3
0.4	1200	-	-	1	-	1		12.4	148.8	1.8	18.5	222.0	1.9
	Sub Total	12.4	297.6	6. 0	25.2	604.8	9.4	55.7	1,188.0	14,5	72. 8	1,5252	13.2
	1200	203.4	2,440 8	4 9.6	225. 0	2,700.0	42.1	271.9	3262.8	40.0	4 18.7	5,024.4	43.5
	800	_	_		_	_	-	—	-		4.0	32,0	0,3
0.6	600		_	-	11.7	70,2	1.1	11.7	70.2	0.8	11.7	702	0.6
	400	8.0	32,0	0.7	14.0	56, 0	0.9	28.5	114.0	1.4	33, 5	134.0	1.2
	Sub Total	211.4	2 A 72.8	50.3	2507	2 826 .2	44.1	3 12. 1	3,447.0	42.2	467.9	5,260.6	45.6
	800	138.9	1,111.2	22.6	168.3	1,346.4	21.0	196.3	1,570.4	19.2	264.6	2,116.8	18.3
	600	56, 2	337.2	6.9	77.4	464.4	7.2	86, O	5160	63	97.0	582.0	5.0
0.8	400	21.9	87.6	1.8	40.4	161.6	2.5	40. 4	161.6	2.0	47.4	189.6	6. ا
	3 00	-		_	7.5	22.5	0.4	7.5	22.5	0.3	7, 5	22.5	0, 2
	200	6, 0	12.0	0.2	6.0	12.0	0.2	6.0	12.0	0, 1	6.0	1 2.0	0.1
	Sub Total	223.0	1,548.0	31. 5	299.6	2,006. 9	31.3	336. 2	2,282.5	27.9	422.5	2,922.9	25.3
	400	80.0	320.0	6.5	139.4	557.6	8.7	192, 8	771.2	9.4	298.2	1,192.8	10.3
	300	24.1	72.3	1.5	34,6	103.8	1,6	34.6	103.8	1,3	34.6	103.8	0.9
0.9	200	47.6	95.2	1.9	61.6	123.2	2.0	61.6	12 3.2	1.5	61.6	123.6	1.1
	Sub Tota I	151.7	487.5	9.9	235.6	78 4.6	12.3	289, 0	998.2	12.2	394.4	1,420.2	12.3
	200	57.0	114.0	2.3	91.7	183.4	2.9	124.0	248.0	3.0	207.2	414.4	3,6
1.0	Sub Total	5 7.0	114.0	2.3	91.7	18 3.4	2.9	124.0	248.0	3.0	207.2	414.4	3.6
	Total	655.5	4919.9	100.0	902.8	6,405.9	100.0	I,117.0	8,163.7	100.0	1,564.8	11,543.3	100.0

Plan - NO.1 (Ur : T : km)

. .



Left Sida Cable Length

FIG. 7 - 4 - 2 - (16)

TOTAL LENGTH BY CABLE DAIRS (1/2)

7.4.2.4 Situation in Use of Cable Conductors

The ratio of use of cable conductors assumed for each base year is 0.57 for 1979, 0.68 for 1983, 0.75 for 1988 and 0.83 for 1993. The reason why the cable use ratio for 1979 is very low is that a huge amount of installation work will be carried out at one time and cables of the maximum size will be installed in an extended provision period of 15 years. From 1993 and onwards, it is supposed that the average use ratio of about 85% from 1988 to 1993 will continue.

Generally speaking, when the number of circuits in the cable section is very large, the circuit use ratio is high; on the contrary, when the number of circuits is small, the ratio becomes low.

7.4.2.5 Number of Loading Coils of Each Cable Section According to Conductor Diameter

The number of pairs of loading coils, in principle, will be for a standard provision period of 5 years but since a large number of loading coils will be concentrated in the manholes in the half loading spacing from the exchange office, it is desirable that the loading coils having a large number of pairs be used for the junction cables between the tandem exchange offices in the central part of Jakarta wherever possible. Furthermore, in consideration of maintenance, material management and possibility of reducing manufacturing costs through unification of materials, the kinds of loading coils to be applied were determined as in the following.

Capacity of cable	Capacity of loading coil applied to each cable
2400 P	800 P + 800 P + 800 P
1200 P	600 P + 600 P
800 P	800 P or 400 P + 400 P
600 P	600 P or 400 P + 200 P
400 P	400 P or 200 P + 200 P
300 P	300 P
200 P	200 P
100 P	100 P

Table 7.4.2.(21) Capacity and Combinations of Loading Coils to be Applied

* Installation of loading coil will be done twice.

TABLE 7-4-2-(I7)

CIRCUIT UTILIZATION TO CABLES (1/4)

									· · ·			• .	1 A.	<u>,</u>	· · · · ,	i.c.	· .
No. I	993	(3)	0.87	0.90	D.40	0.69	0.75	16.0	0.72	0.96	0.77	0,94	.0.7	0.54	101	0.61	1.09
Plan — No.	ie I	(2)	4,180 4,800	800	1200	600	1200	2529 2800	2,283 3,200	4,135,14,800	500 700	002,01 601,01	4,800	1,128 2,100	3,820 3,800	1,214 2,000	6,529 6,000
		1	4,180	716	481	410	897	2,529	2,283	14,135	8	60ľ0:	4645	1,128	3,820	1,214	6,529
	988	(3)	0.80	0.59	0.97	0.52	0.90	0.67	0.77	0.87	0.63	0.79	0.92	0.36	00.1	0.78	0.98
	6	(2)	3823 4,800	800	400	60	60	1,858 2,800	1,523 2,000	0,134 11,600	58 59	8300	3,292 3,600	1,500	2200	800	3,744 4,800
>		(1)	3823	466	386	311	537	1,858	1,523	10,134	1253	6517	3,292	539	2,183	626	3,744
	983	(3)	0.98	0.38	0.82	0.40	0.69	0.86	0.55	0.74	0.51	(0.89) 0.72	0.67	1.00	0.60	0.45	0.65
-	6 -	(2)	3539 3,600	80	400	60	8	8	1,083 2,000	7,47 9,600	2000	(002 t) 5,900	3600	30	2200	8	3,600
		(1)	3,539	304 B	326	239	414	1,363	1,083	747	1,019	4,199	2,399	298	1,308	360	2337
	979	(3)	(0.94) 1.03	(17.0) 16.0	(0.49) 0.67	10.15) 0.32	(0.84) 1.01	1 0.62) 0.72	(0.32) 0.67	(0.75) 0.89	(0.40) 0.49	(0.79) 0.88	(0.94) 1.03		10.37) 0.90		(0.61) 0.96
>	6	(2)	3,600	200	400	600	200	8	2,000	7,200	800) 972 2,000	(3,600) 4,800	2,000	l	(745) 1.795 2,000		3,600 1,600
		113	6883) 3681	[142] 182	(194) 269	{ 91) (193	[168] 201	(996) 1,152	(636) 1,333 2,000	5,399) 6,388 7,200	(1800) 972	2858) (3600) 4,226 4,800	(1,880) 2,067		(745) 1,795	1	(1,460) 2,400) 3,439 3,600
		OISTANCE (km)	1.8	6.0	4.0	12.4	5.0	7.2	11.2	4.6	12.0	5.0	7.8	5.5	7.0	7.0	8.6
	с С	o N N	Θ	N	٩	•	٩	٢	\bigcirc	8	6	0	⊜	2	(E)	(1	(<u>s</u>)
		CABLE SECTION	кота @~ кота ®	~ ~ ANCOL	* ~ PLUIT	 CENG KARENG 	CENGKARENG ~ TEGAL ALUR	КОТА (1)) ~ СЕМРАКА РUTIH	* ~ JATINEGARA (B)	* ~ GAMBIR @	• ~ KEBAYORAN @	GAMBIR A ~ KEBAYORAN A	* ~ SLIPI	SLIPI ~ KEDOYA	GAMBIR (A) ~ PAL MERAH	PALMERAH ∼ MERUYA	GAMBIR @ ~ JATINEGARA ®

() OF 1979: BASED ON JTP ESTIMATION LOWER SIDE OF 1979: BASED ON PERUMTEL SUPPLY PLAN

- 1066 -

TABLE 7-4-2-(18)

.

CIRCUIT UTILIZATION TO CABLES (2/4)

G	CIRCUIT		UTILIZATION	LION	10	CABLES	ŝ	(6/4)					Plan - NO.	- NO.I
	v v			1979			1 983			1988			266 I	
Cable Section		Distance	Ξ	(2)	(3)	(1)	(2)	(3)	Ξ	(2)	(3)	Ξ	(2)	(3)
Gambir (A) ~ Cempaka Puth	9	4.6	(2108) 2,3953,600	360	(0.59) 0.67	3372 4800	00at	0.71	5619 7600	7,600	0.74	961011,600	,600	0.83
" ~ Kebayoran (A)	Ð	8.0	(1 891) 2654 3,600	3600	(0.53) 0.71	25154400	1400 1	0.58	33494400	4400	0.76	4,639	6400	0.73
Cempaka Putih ~ Pulo Godung	(8)	7.0	(159G 1,799)	596 ,799 3,400	(0.47) 0.53	26994,400	1,400	0.61	46415,400	5,400	0.86	8312	940	0.88
Pulo Gedung ~ Tg. Priok A	6	7.0	(4 90) ,2132600	2600	(0.57) 0.47	2,478,3500	teoo	0.69	4291 5400	5400	0.78	76118200	8200	56.0
Tg. Priok (A) Cilincing	8	5.0	(222) 242	200	(1.11) 1.21	515	800	0.64	849	849 1,000	0.85	1,542 2,400	2,400	0.65
× Ancol	3	5.0	(332) 229	400	(0.83) 0.58	634	634 1,600	0.40	1,200 1,600	1,600	0.75	2,1622,800	2800	0.78
Cempaka Gutih ~ Rawamangun	63	6. I	(815) 739	80	(1.02) 0.93	1,443	443 2000	0.73	2448	2448 3200	0.77	4,1295200	5200	0.75
Rawamangun ~ Penggilingan	23	6. 0	1			30	800	0.38	640	88	0.80	1,533	1,5331,600	96.0
Cempaka:Putih ~ Kabayoran (A)	2 4	11.7	(351) 4061	000	(0.35) 0.4 I	502	502 1,000	0.51	7 12	8 Q	0.72	1,044	000/1440	1.05
″ ~ Jatinegara (B)	63	8.6	(434) 818	434) 818 (500	(0.29) 0.55	625	625 500	0.42	666	999 2,100	0.48	1629	629 2100	0.78
Kabayoran(A) Čipete	92	7. 0	(416) 1,034	416(800) 1,034/2000	(0.52) 0.52	767	7672000	0.39	1,1 152000	500 500	0.56	1,677	6772000	0.84
 Y Pasar Minggu 	6	9.2	I	I		68	800	0.87	945	945 1,200	0.79	1,4252600	2600	0.55
Pasar Minggu ~ Jagakarsa	83	5.5	061 (221)	200	(0.67) 0.95	312	60	0.52	403	600	0.68	604	604 1,000	0.61
Kebayoran(A) ~ Kalibata	වේ	7.0	(82.1') (82.1')	,1 38)2300	(0.49) 0.68	1,1462	1 462600	(0.50) 0.49	1,762	8 8 8 8 8	(0.77) 0.68	2697		(0.77) 0.71
Kebayoran(A) ~ Tebet	3	8.0	(53) 121	64 06	(0.13) 0.30	71	64 0	0.18	136	6 0	0.34	263	6	0.66

TABLE 7-4-2-(19) CIRCUIT UTILIZATION TO CABLES (3/4)

													Plan - NO.	· NO. I
Cable Section	ດ ບ			6	79		861	3		1988	8		661	ß
I	Ö.	Distance	(1)	(2)	(3)	(1)	(2)	(2)	(1)	(2)	3)	Ξ	(2)	(Ð
Kabayoran A Semanggi A	3	3.0	(156) 221	156) 221 200	(0.13) 0.19	278	2781,200	0.24	504	5041,200	0.42	668	1200	0.75
Jatinegara (B) Teber	33	4.5	(949) 2464	(949) 24642000	(0.47) 1.24	1,4702000	000	0.74	22103200	3200	0.69	3247	3247 3200	1.02
Ja tinegara (B) ~ Cawang	3 3	4.3	(646 1,844	646 8442600	(0.25) 0.71	1,4762600	600	0.57	25142800	2800	06.0	4,8505,400	5400	06.0
Cawang ~ Pasar Rebo	34	06	(202) 640	400	(0,14) 0.46	785	7851,400	0.56	1,252	2521.600	0.78	2350	23503000	0.78
Pasar Rebo ∼ Gandaria	35	5.5	I			380	600	0.64	496	600	0.83	885	8851400	0.64
Jatinegara (B) ~Klender	36	7.5	(172) 615	800	(0.22) 0.77	457	800	0.58	842	842 2000	0.43	1957	9572900	0.70
″. ~Jatinegara (A)	37)	2.8	(694) 857 ¹ ,	1200	(0.58) 0.72	1,1981,200	200	0 0. 1	1,4633600	3600	0.41	1,845	1,845,3500	0.51
Kota (B) ~Slipi	8	6.0	1	1		<u></u>	400	1.0.1	642	6421,600	0.4	696	0091696	0.61
Ka bayoran $\underbrace{A}{\sim}$ Pal Meroh	(B)	7.5	1	I		62	00	0.62	121	500	0.25	269	500	0.54
Kalibata ~ Pasar Minggu	(5.7	(400) 979	400(500) 9791,000	(0.80) 0.98	127	(500) [000	(0.25) 0.13	181	(500) 1000	(0.36) 0.19	305	(500) 305 ,000	(0.01) 0.31
″ ~Jatinegara (₿)	Ð	8.0				132	400	0.33	191	400	0.48	321	400	0.81
kabayoran (A) ~ Cawang	(2)	10.5				8	400	0.28	178	400	0.45	299	400	0.75
Kalibata ~Cawang	(9	7.0				!	1		34	400	0.09	247	400	0.62
Jatinegara (B) ~Rawamangun	(F)	5.7				84	600	0.14	183	600	0.31	552	600	26.0
Kota (B) ~ Ancol	(7.8	(1210) 1347	(1210) (347/2000	(0.61) 0.67	000222.61	ood	66.0	30252900	oostz	1.08	4,608	46085200	0.89

TABLE 7-4-2-(20)

Plan-No.1 0.72 0.66 0,76 0.62 0.80 0,76 0.83 0.60 0.92 76,0 0,81 3 £66 I 1666677200100 166667200500 800 ğ 2,46 3,000 000(5)0661 5,077 15,600 4,558 6,200 3,587 4,800 1,957 3,200 202 8,591 10,800 [2] 473 226 967 ()) (0. 75) 0. 75 1.00 0.59 0.54 66.0 0.73 1.02 0.46 0.74 0.40 0.53 6 1988 (4/4) 083151143700 08315144,500 1200 800 3,000 008,01 6730 2328 3,200 2,429 2,400 3200 7,118 9,600 80, 88 [2] 630 1 1,28 1471 6 431 Ξ CABLES (0.68) 0.67 0.33 0.94 0.77 0.65 0.94 0.22 0.42 0.82 0.33 3 286 1 UTILIZATION TO 72,147,106,400 72,147,108,100 1,200 1,800 808 7,861 8,400 300 1,600 3,200 1,200 ğ 5,665 6,000 [2] I 1,374 774 333 041 588 99 Ξ I (0.57) 0.77 (0,43) 1.06 (0.73) 0.76 (0.29) 0.75 (0. 69) 0 . 98 (0.62) 1.29 (0.28) 0.29 (3) 1979 142,202174,000 60,414,78,400 157801 8,198 8,400 1,360 1,800 1200 800 ğ 1200 2 I l I L 385 CIRCUIT 3471 842 Ξ 353 I I I I DI STANCE (km) 6.4 12.4 3.0 Э.О Е 2.0 14.2 2.8 5.8 1.7 15.5 **(4**) 65 8 69 ٩ \$ 4 (9) (J \$ 8 3 3 3 s o N **(** KEBAYORAN (A) ~ JATINEGARA (B) ۲ TG. PRIOK @ ≁ TG. PRIOK ® • \sim ceng kareng ~ KEBAYORAN (L • € SECTION ~ SEMANGGI 0 ~ GANDARIA JATINEGARA (A) ~ G A MBIR ~ PLUIT ~ GAMBIR V KOTA KEBAYORAN (A) JATINEGARA TOTAL SEMANGGI A ◙ ۲ CABLE GAMBIR KOTA KQTA

According to the aforementioned DC resistance limit and transmission loss assignment, it would be effective to insert loading coils in the long distance circuits where 0.8 mm, 0.9 mm and 1.0 mm conductor cables are used. The reason is that it would be more strongly influenced through the transmission loss limit than the DC resistance limit and the insertion of loading coils in the circuits would be more economical than using cables of large conductor diameter.

On the other hand, as shown in Table 7.4.2.(22), in relation to short distance circuits using 0.4 mm and 0.6 mm conductor cables, non-loading circuit sections exist which satisfy both limits of DC resistance and transmission loss.

7.4.2.6 Total Number of Loading Coils

The number of loading coils will be 473 in 1979 and 1,380 in 1993. If these were converted to 100-pair coils, the number of coils will be 2,447 in 1979 and 6,341 in 1993. When small number of pairs of loading coils are numerously installed, this will cause a shortage in installation places which would require modification of the manholes and in order to avoid such cases, the use of coils of large pair numbers is being considered.

As the result, the composition rate of relatively small pair numbers of coils (such as 100 pairs, 200 pairs and 300 pairs) will be about 18% in 1979.

It is natural that the number of loading coils increase in proportion to the telephone demand. On the other hand, the amount of capital investment for loading coils is very small in comparison with that of other required materials such as cables, telephone poles, pipes and telephone sets. Furthermore, since the quantity is small, sufficient preparatory period must be allowed when ordering loading coils. In other words, the ordering of loading coils should be made earlier than purchase orders for cables, etc.

7.4.2.7 Number of Terminating Cables, Number of Loading Coils and MDF Length of Each Exchange

According to Tables 7.4.2.(32) to (35), the largest number of junction circuits will be terminated in the Gambir (A) Exchange Office, and the number of terminated junction cables will reach 70 cables in 1993.

When considering all cables including subscriber cables and toll cables, more than 100 cables will be terminated in the Gambir (A) Exchange Office.

Therefore, a full survey of the number of entrance cables, length of MDF and the capacity of the manholes with loading coils nearest to Gambir (A) Exchange Office, as well as the setting up of a plan, will be very important.

As indicated in Table 7.4.2.(32), the length of the MDF for junction cables at Gambir (A) Exchange Office will be 22.9 m in 1993. Consequently, the MDF for junction cables should be separated from that for subscriber cables.

TABLE 7-4-2-(22)

dinmatar	Candition of	Loss	Specified Value	Value	E0T	Τ + ΕΟ	MSEO	E0E0 (ald)		
	Loadina	Rosistance	R,	Loss,	9.5 dB	5.5 dB	7.5 dB	15.0 dB	15.0dB	7.0 dB
(EU)			/km (L2)	7 km (J2)km(da)	<u>тоое і</u>	0011	1 500 J	2400 J.	J 000 E	2400.N
	Non -	Loss	1	1.69	* 4.73	* 2.37	* 3.55	* 7.69	* 7.69	* 3.25
	loading	Resistance	300	I	6.23	3.57	4.90	7.87	9.87	7.90
	l ondim	Loss	1	1.229	6.51	* 3.25	4.88	10.58	1 0.58	* 4.48
_	5-1000J	Resistance	305	;	* 6.13	3,51	* 4.82	* 7.74	* 9.70	7.77
	Non-	Loss	1	1.11	* · 7.21	* 3.60	* 5.41	17.11 *	* 11.71	* 4.95
	loading	Resistance	130	I	14.38	8.23	11.31	18.15	22.77	I 8. 23
	i ondino	Loss	,	0.557	14.36	* 7.18	* 10.77	23.34	23.34	* 9.87
		Resistonce	135		* 13.85	7.93	1 0.89	× 17.48	* 21.93	17.56
	Non	Loss	1	0.826	9.69	4.84	7.26	15.74	1 5.74	6,66
 8 C	loading	Resstance	72		25.97	14.86	20.42	32.78	41.11	3 2.92
	Loading	Loss	1	0.322	24.84	* 12.42	* 18.63	40.37	40.37	* 17.08
	,	Resistance	76	1	* 24.61	14.08	19.34	* 31.05	* 38.95	31.18
		Loss	1	0.742	10.78	5.39	7.98	17.52	1 7.52	7.41
 ດ ວ	loading	Resistance	58	1	32.24	18.45	25.34	40.69	51.03	40.86
	Loading	Loss	1	0.267	* 29.96	* 14.98	* 22.47	48.69	48.69	* 20.60
		Resistance	62	ļ	30.16	1 7.26	23.71	* 38.06	* 47.74	38.23
	Non-	Loss	1	0.660	12.12	6.06	60.6	19.70	19.70	8.33
	l oading	Resistance	46	1	40.65	23.26	31.96	51.30	64.35	51.52
	ondi no	Loss	1	0.219	* 36.53	* 18.26	* 27.40	59.36	59.36	* 25.11
		Resistance	50	1	37.40	24.40	29.40	* 47.20	* 59.20	47.40

Application Zone of cable conductor diameter (km) F0 473 721 1385 20 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 <th>m) 40km 2653 1 3653 40km 3806 9 L 1.0 L 3805 4774 0.9 L 1.0 L 5920 5920</th>	m) 40km 2653 1 3653 40km 3806 9 L 1.0 L 3805 4774 0.9 L 1.0 L 5920 5920
E0 T (9.5 dB) (1,900m) MS E0 (7.5 dB) (1,500m) T E0 (5.5 dB) (1,100m) E0 E0 (15.0 dB)(2,400m) E0 E0 (15.0 dB)(2,400m)	тоццео (70dB)(2400Л)

.

FIG, 7-4-2- (23)

- 1072 -

NUMBER OF LOADING COILS IN EACH CABLE TABLE 7-4-2-(24)

SECTION BY CONDUCTOR DIAMETER (1/6)

Plan - NO. I

ſ		ł									ſ					ŀ					ſ
Sec		Dis - tance		5	679				198	ю			-	988				5	993		
Ň	Cable Section		0.4 0	0.6 0.	8	0.9 1.0	o	4 0.6	5 O.8	3 0.9	1.0	0.4	0.6	0.8	0.9	0.1	0.4	0.6	0.8 (6.0	0
(Kota (A)	- 19	2400x1/200x1	9×1			248	2400x1 [200x]	R			2400 x	2400x11200x2			(4	24 00x 1200x2	200%2	$\left \right $		·
-)	(B)	8 8	(N. L.) (6x2)	(X2)			(8 × 1	(8 × I) (6×2)	6	ļ		(8×1)	(B x 1) ((8 x 2)		·		(1N1) (8×1) (8×2)	6x2)			
	Kota (A)	┟╾╼┨		X	200×1	$\left - \right $		8 8 9	60x1 200x				× 89	600 x 200 x1			- \$	600x1200x1	1 8		
2	Ancol	0.0		2	(1 × 1)				4 x 1) [[2 x])				(4×1)	4x 1)(2 x 1)			<u> </u>	(4 x 1) (2 x 1)	2x I)		
\Box	Kota (A)			¥	400x {				48×1					400×1		╞╴┨	- ^w	800 x1 400 x1	1×00		Π
m	P luit	4.0		[2	(1× 2)				(× 2)					(X)				(4 xl) (2 x l)	2 x l}	·····	
	Kota (A)			ы С	600x1				600x	-				600 xl				<u>ه</u>	600xl		
4)	Cengkareng	12.4		4	(4 x l)			<u> </u>	(4 × 1)					47 * *	_				(4 x)		
7	Cengkareng	┝╌╍┸	┝╌╀	$\left - \right $	$\left \cdot \right $	200×1	R		400x1		2 00x1			400 × 1		200×I	4	400x1400x1	1×00	2	200%2
<u>م</u>	Tégal Alur	5.0				(2 X I)	=	-	(4x 1)		(2×1)			(1 × 1)		(; x2)	<u> </u>	(4 × 1) (4 × 1)	4 xl)	<u> </u>	(2xl)2
(Kota (B)		N N	200×1400x) Š			8 8	200x1400x				1200x2400 x	48×1	Ì			200 x 2 400 x	š		
୭	Cempaka Putih	7.2	(6	6 x 1) (2 x 1)	(1 ×			(6x l	6x1) (2x1)				(6 x 1)2 (2 x 2	(2x2)	.			(6x2) (6x1) (2x2)	2X2)		
	Kota (B)		12(20×16C	200×1600 ×1 200×1	XI		1200x	KI 600 X	200x1 600 x 1 200x1			1200x1	200x1 600 x1 200x1	2002		7	20026	1200x2 60 0x1 200x1	Š	
5	Jatinegara(B)	1. 2	3	6x23 16	(6 x 1)(2 x 1)	=		16x2	3 (6 x 1	(6x2) (6 x 1) (2 x 1)			(6x2)	6x2)(6 x1)(2 x1)	(× 2)		22	5 x 1) ((6 x 1) (6 x 1) (6 x 1) (2 x 1)	(1 × .)	
6	Kota (B)		ŭ	20 x 5 8 (200×5 800×1 400×)×1		1200X	200x5 800 x I	(400 x		2400x1	1200x5	2400x1 200x5 800x 2 400 x1	1× 8	-01	400-4	200168	24002120046800×3400×1	Ň	
m)	Gambir(A)	4.6	<u>097</u>	(6x2)2 16 x 1) (8 1 N L)2	6x2)2 6 x 1) (8x 1) (4 x 1) N L)2	a		(6x2) (6x2) (1)2	13 13 2 2 2	(6x2)2 (6 x!) (8 x!) (4 x !) (NL)2		(× 8)	(6x2)3 (NL) 2	(6x2)3(8x 1)-2 (4 x 1)	(1×4)		(1 N)(1)	6x2)4(6 N L)2(1	(8 x3)(6x2)4(8x1)2 (4 x1) (N L)(NL)2(4 x1)	4 × I)	
(Kota (B)		Ň	00×16C	200x1600x1 200x1	X		1200x	11 600 x	200x1 600 x1 200x1			1200 xI	200 xI 600 x 1 200x	200×1		53	200 × 1 6	200x1 600x1 200x1	1×0	
ை	Kebayoran(A)	12.0	(6	x 2)(4	(6x 2)(4 x1)(2x1)	2		(6x2	0 (4 xl	6x2) (4 x1) (2 x 1)			(6 x 2	6x2 (4 x 1) (2x1)	(2 X I)		<i>.</i>	5 x 2) (;	6 x2) (4x1) (2x1	2×1)	·····
	Gambir (A)	 	<u>x</u> :	1200x4				128×	4 800	200x4 800x1 300x1		240.0x1	\$×002	240 0x1 200x4 800 x1 300x1	300x1	- 64	9400x11	5005	2400x11200x5 800 x 1 300x	ĕ	
হা	Semanggl (A)	2.0	<u>۽ ٿ</u>	(N L)				(6 ×1) (8 ×1) (N L)	2] (8 x ((5 x1) (8 x 1) (3 x1) (N L)		(I × B)	1 × 1)(6 ×2)3(8 ×	(× 8)	x 1) (3 x 1)	<u>ت</u>	8 x2)	N L)	(8 x2)(6x2)5(8 x1)(3 x1)	(1×1)	
	2400 x1 N umb	mber mber	01	c o i l c abi e	e palrs	ų.						© [≁] Z	(er L) (N L)		- u.	ber of lo poirs lo looding	loading loading ing	g coll ig coll			

	C
25)	
E 7-4-2-(25)	
TABLE 7-	
	Ц С

NUMBER OF LOADING COILS IN EACH CABLE SECTION BY CONDUCTOR DIAMETER (2/6)

Plan-NO. I		01 6.0	400x	ম্র্র মূর্য	300	(3×I)	200X	(2xl)	200xl)	(IXZ	40005	(ht):3	400KG	(4xl)6	₩ ¥ Q Q Q Q Q Q	(2x2)	2000280003 4000820005	(6x2) (8x1)/2 (4x1)9(2x1)5 (6x1) (4x2)	2000/80003 4000920065	(6x2) (8x1)-2(4x1)9(2x1)5	200(3	E(1×2)
Plan	1993	0.8	20003800x1400x1	Ex22 (BxI) (Ex I)	2000 EOOX 300X	(1×1) (1×1)	2004 800X 200x	(1x2) (1x3) (5x1)	2000 600x 200x	(6xI) (^{4xI}) (2xI)	2800X3	(6x222(4x1).2 (4x1).3	24000200380004 40005	(INL) (4x1)2	2004380043 4004	(6×1) (4×1) (2×2)	280003	(8x1)/2 (4x2)	8000	(8xd)-2 (4x2)	poon 600x1	(6x1) (^{4x1}) (2x1
	_	06	2002	ໄດ້ (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	2000	(ExI)	2002	6628	200	(exI)	2002	(6,22)	No co	E 6	ğ	(EX1) (6X1)	Ю Q	(6x2) (6x1)	800	(623)	Xoozi	(exI)
ļ		0 4											8	(Bx I)			10	10		-69-	, V	~
		0	x	6	X		X		×		-S	<u>_</u>	U	<u>0</u>	¥		2000/80002400050003	(6x2) ((8x1) (4x1)5 (2x1)3	2001/800/2 400020003	(4X1)-5(2X3)3	200XI	R SXI) S
	_	09	2004 800 × 1400		3004	(IxE)	200X1800X1200X	(6x2) (4x2) (2x1)	600x1200x) (2xl)	2002 80002 40002	(4×1)2	2400K1/200K2800K2 400K3	(6x2) (8x1) (NL) (4x2) (4x1)3	20042800424004	(JXC)	(2400	() () () ()	2400		X	
	986	0.8	800	(8×1)	8		88	(4×2	8	24) 24	800	(6x22(8x1) (4x1)	(2800) X008	(8K) (4x)	100 80 80 80 80	(9×1) (9×1) (4×2)	X1800	(8×1) (4×2	(1800)	(6x2) (8x1) (4x1)	<u>800</u>	([¥])
		1 0.6	02	(6,2	1002	(ExI)	8	(ex2			8	60		L S	8	2023	002	(6x2	800	(6x2		
		0.4											800	(Bx I)			2	R	9	-01-	R	
		0.1	×		X	~~	×	~)XI		X	(1	-8-	30	X	(G200	(4XI)3(2XI)2	00200	13 [2X[N N N N	(IXI)
		9.0 B	<u>8</u> 84	(Bx I) (2xI)	8 8 8	(xE)	800	1) (2×	600x 200x	(4×1) (2×1)	<u>6</u>	1) (4x	(00 (00)) [4X1)2	840	() (2×1)	(2 400) (4xi	X1400	(4×1)	X	~
	1983	6 08	2004800x1400x	(BX			POOKI BOOKIZOOX	(6x2) (4x1) (2x1)	8	(4×	200K2 800K1 400K	6x2)2(8x1) (4x1)	200028000240002	(6x2) (8x1) (NL) (4x1)	20002 800024000	(6x2) (8x1) (6x1) (4x1)	200X1 800X2 400X3 200X2	(6×1) (8×1) (6×1) (200X1800x1400c3200X2	(6×1) (8×1) (4×1)-3(2×1)2	NO 00 00	(4xl)
		4 0.6	ଞ୍ଚ	(6x2) (6x1)			8	(ex			0 N	200	ğ	U (QX)	002	(6x2) (6x1)	20	(6x	021	(6x		
I		04															¥	0	×	0	x	~
	ŗ	0.1									R	_	×	_	¥		200X1 800X2400X1200X1	(4x1) (2x1)	2004 8004 400x 200x	(B×I) (4×I) (2×I)	ð N	(IXI)
		9 0.9	X	0			X	•			200K2 800k1 400k1	(6x2)2(8x1) (4x1)	20002 8004 400x1	(6x2) (NL) (8x1) (4x1)	200428004400x	(2× 1) (2×1)	240) (4x1	840	I) (4×i		
5	1979	s 0.8	20001 80001	(IX8) (3			20001 80001	(6x2) (4x I)	_		280)2(8x	8) (8x	<u>ଥ</u> ଥ	N N N	800	(6x1) (8x1) (4x1)	8) (B×I		
5		t 0.6	2021	(6x2)			8	ğ	_		8	<u>a</u>	8	(0X2) (NL)	8	(6x2) (6x1)	02	<u>ě</u>	8	(6×1)		
ŀ		0 (۱		<u>_</u>		5		_	_[9		9		m		0		_		
-	Dis - tance	(Km)		7.8	-	<u>0</u>	1	ר הי		7.0		αj		4		αi		~		0 2		0 G
	Cable Section		Gambir (A)	~ slipi	S II pi	~ Kedoya	Gambir (A)	Pal Merah	Pal Meroh	~ Meruya	Gambir (A)		Gambir (A)	Cempaka Putih	Gambir (A)	Kebayoran(A)	Cempaka Putih	Pulo Gadung	Pulo Gadung	Tg. Priok (A)	Tg. Priok (A)	CII inclug
ľ	Sec	N N	(Ð	(٩)	(<u>e</u>)	(4	(2	((9	(Ð		<u>)</u>	(<u>)</u>	(ରୁ)

NUMBER OF LOADING COILS IN EACH CABLE TABLE 7-4-2-(26)

SECTION BY CONDUCTOR DIAMETER (3/6)

Plan-NO. 1

	· · · · ·		[]	1	1		<u> </u>				11		<u> </u>		N	N	-	~	1.1		<u> </u>	
		<u>.</u>													200X	(I×2)	20×	(2×1				
		6 О							200x I	(×2)	300x1	(1×5)			400 x I	(IXZ)	400 xI	(X)	2001	(4 x l) (2 x l)		
-1 (86	0.8	400x I	(4 xl)	80x 2	8x 1) 2	800x2	(8x1) (4x2)	800x1200x1	(4x2) (2x1)	200x1600x1 300x	(4×1)	900×1	4x2)	200 xI 600x1 400 x1 200x2	(6 x1) (6 x 1) (2 x1) (2 x1)2	400x1400x1200x	2x 2)(2 x 1) (2 x 1)	2002 800x1 200x1	(×8)		
	<u>6</u> -	0.6	200/2 400x	(6x2) (6x1)	800	52) Z					200×16	(5×2)	2004 800x	(6x2) (4x2)	200 xl (6 x1) (Ť		8000	(6x2)	400x1	(2x2)
	ŀ	4.0	3		200 x1 1200x2800x2	6 ×1) (6×2) 2 (8×1) 2					3	~										
┢		0.1			<u></u>										0×1	x1)	200 KI	2×1)				
	ŀ	ი	-		-				1×	÷	0x1	E			0x120	(1)	х Х	8	1 Z Z	69		
	88	0 8	Ē	-	× ×	=	-	5	800 x 200x	4x2)(2x1)	K 1300x1	(6 x1) (4 x 1) (3 x1)	=	(2	600x1 400x1200x	6 x 1) (2 x 1) (2 x 1	l-		1 4 00 x 1	1) (2×1)		
	8	Ö	200 x1 400x1	6 x 2) (4 x 1)	200x2 800x1	(1×8)	800x1	(4 x2)	8	(4x	200x1600x) (4 x	1 800 x	6 x l) (4 x 2	0 G	ě,	₩ 8 8	(2 × 1)	200x 800 x	(1×1)		
		0.6	200 X	(6x2	8 8	(6x2) (6x1)					1200x	(6 x)	1×002	(6 x					No.	(6 x 2)	400x1	(2 x 1)
		0.4																				
		0.1													200×1	([X])	200xl	2×1)				
		0.9							00×1	241)	300 %	(I XE)			-81	<u> </u>		<u> </u>	400x1 200x1	(4 x l) (2 x l)		
1	8 8 6	0.8	8×I	(1×t	1×0	8×1)	900x1	(4xl)	800×1 200×1	H x I) [[2 X I]	ñ	<u> </u>	80x1	(4x1)	600 × 1	(6x1)	40 40 40	2×1)		-Cix		
	-	9	200x1400x1	6x1) (4x1)	200x1 800x1	6x 2) (8x1)	ð	<u> </u>	ā	<u>z</u>	200x1	6x1)	200×1 8	6x1) (4	3		4	3	200x1800x1	6 x1) (Bx1)	400x)	([X])
	ŀ	4	<u>.</u> 2	<u> </u>	2	<u> </u>					120	(e	<u>N</u>	_ <u>e</u>		-			<u>ă</u>	<u></u>	4	[2
\vdash		0								·												
									-	<u> </u>		~					200x1	(1×2)		~~		
	ი	0.9							B004 1200x1	x 1) (1 × 1)	300×1	(1×E)						_	<u></u><u></u> <u></u> 2885	[4x] [2x]		
	64.6	0.8	400x1	(4×1)	800x1	(1×8)			BCOR	(4 x 1)			1×008	(4 x l)					200x1800x1	(6 x1) (8x1) (4 x1)		
	- [0.6									1200xI	(1×9)	1200×1	6x I)					80	6 x l J	12004	(2 1)
	F	0.4																				<u> </u>
	Dis- tance-		┠──┴	5.0		6.1		0.0	1	~ -		9. 9.	╞╼╍╀	2.0	l	2 0		ີ ເມີ	┟──┞	2.0	L 	0 m
								9 -				B) 8										
	tion		Ø		Nith	חחפר	Ē	ng af	Putih	a n (7	utih	a ra((A)		(A)	lingg	750	SG	B	n	(Y)	
	Sec		iok	0	ka	ĐE	nGup	111 <u>0</u> 0	ž	yor	<u> </u>	neg	or an	ete	oran	ar N	Ming	ık ar	u D'	bat (ID	e t
	ble		Tg. Priok(A)	Ancol	o d m	* Rawamangnn	M a M	Penggilingan	Ddw	Kebayoran(A)	Cempaka Putih	Jatinegara(B)	bayc	ې د او	bay (Pasar Minggu	ar ar	Jagakarsa	bayo	Kaĩibata	ba yt	Tebet
	Sec tion C able Section		Tg.	_	🔍 Cempaka Putih	-	Rawamangun	_	Cempaka Putih	<u>_</u>			Ke	Cipete	Kebayoran(A)		Pasar Minggu		Kebay oran (A)	Ŧ	Ke ba yoran (A)	
L	101 101	NO.		(v)	_(<u>ଅ</u>)	(<u>เชี</u>)	(<u>8</u>)	. (R)		ଞ୍ଚି		2	(R)		62)	(<u>ନ</u>)

NUMBER OF LOADING COILS IN EACH TABLE 7-4-2-(27)

CABLE SECTION BY CONDUCTOR DIAMETER (4/6)

Dis- tance
(Km) 0.4 0.6 0.8 0.9
3.0 (NL)
1200x 1800x1
4.5 (6x2)(8x1)
1200 AI 800 AI 400 AI 200 A
4.3 (6 x2) (8 x1) (2x1) (2x1)
9.0 (4x1)(2x1)(2
0.0
7.5 (4×1)
2.8 (6 ×1)
6.0
7.5
400x1200x
.7 (4x1) (4x1) (2x1)

		0.1								'					000	2(82			>	Τ	
ÖN -		6.0	I		Ş	(2x2)								<u> </u>	000	N (XX)		[—			
Plan -	I 993	0. B	400X	(2x2)				-	<u> </u>	-	200%	(6x1) [6x1]	ŏ	(EXI)	200x600x1400x200x2	(6x 1) (4x 1) (4x1) 2(24) 2	Ő	(I ×8)			
	-	0.6					ğ	(I×Z)	ğ	2x1) (4x1)	2000	(6x1)	8	(6x2)	8	(Ex I)					
		0 4											ğ	(Ex 1)(Ex2)(Ex1)						1	
		<u>0</u>								_					ŏ	(2x1) (4x1)(2x1)					
	_	0.0			<u>Å</u>	([×2)									ğ	(1×1)				1	
	988	0.8	400×1	(IXZ)							20048002	(BXI)-2	ğ	(exl)	lõ	2×1)	BOOX	(1×8			
	-	0.6					400x1	(NL)	200 000	([XZ])	2004	(ex2)	No Q	(6x2)				<u>~</u>			
		0.4											x009x002lix002	(6x1) (6x2) (6x1)						-	
		0.1											_ <u></u>		No.	2XI)				<u> </u>	
	~	0.9			400xl	2×1)					-				600x1400x1200x1	$\binom{4 \times 1}{(2 \times 1)}$ (4 × 1) (2 × 1)				1	
	1983	0.8	4004	(I×Z)				-			300%	8xI)	SOOXI	(4×I)	<u>800x k</u>	2×1)	BOOXI	a A A A A A A A A A A A A A A A A A A A		†	
		0.6							600×	(2×1)	200x1800x1	6x2)(ZOOXIGOOXI	(6x2) (4x1)			Ű	<u>~</u>		<u>+</u>	
	ĺ	0.4										<u> </u>		<u> </u>							
ĺ		1.0													NOXI	(2×0				<u> </u>	-
		0.9													N N N N N	4 x I)					
	979	0.8									300x	(I×8)	SOOX	4x1)	600x1400x1200x1	(4× I) (4×I) (2×0	800×	Û X B		<u> </u>	_
		0.6									2004 BOOM	(6×1) (8×1)	200x1600x1	(6x2)(4x1)		-		2		† <u> </u>	-
	Ĩ	0.4																			-
	Dis- tance	Ê Ě		8.0		10.5		7.0		5.7		7.8		6.4		14.2		124			٦
	Section tion Cable Section		Kalibata	Jatinegara (B)	Kabayoran (A)	Cowang	Kalibata	Cowang	Jatineaara (B)	Rawamangun	Kota (B)		Kota (B)	Pluit	Kata (B)	Čěngkareng	Kebayoran (A)				
L	0, 1	g	(;	\mathbf{J}	(Ð	(₽)	(3	Ð	G	Ð	(9	(Ð	(9	(8	

NUMBER OF LOADING COILS IN EACH CABLE SECTION CONDUCTOR DIAMETER (5/6) TABLE 7-4-2-(28)

TABLE 7-4-2-(29) NUMBER OF LOADING COILS IN EACH

CABLE SECTION BY CONDUCTOR DIAMETER (6/6)

<u> </u>		0.1	J]		12	5(<u> </u>					T	<u> </u>	 		
Ž	ļ				3200	2 (24	[[<u> </u>			╡	
 		6.0			40 80	(4xl) (202													Ř Ř	(13 xl)
ā	£ 66	0.8			800×1	(1 ¥8			800× (4x2}										
	<u> </u>	0.6	00x4		1×8	6x2) (828	5x2)2			813	5 × 1)	1200x1	(6x2)		1				
		4	400x5j200x4	(N L)3 (6x2)3	N N N	3×1) (2400 x1 1200 x2	(BxI) (6x2)2	2400kl	(8x2)	2400×3 200×3	(B x 2) (6x2)2 (NL)2 (6 x 1)	2						╡	
		1.0 0.1	3	ê2	400x2 200x2 2400x1 200x1 800x1 400x3200x3	[4 x1] (2 x1)2 (8 x0 (6 x2) (8 x 1) (4 x1) 2 (2 x1)3	ų.	<u> </u>	3	(8	24	<u>8</u> 2					+	+		
			_		20	100					_								×	0
	8	Ö			<u>8</u>				[]	<u>ิ</u> ส								\square	ž S	(3 xl)
	8 6	0.8			1200×1 800 x	6 x 2) (8 x I)			800 x ((4 x 2)										
	-	0.6	12003	(6x2)2 (6x1')	200x	(6 x 2)	12000	(6x2) (6x1)			2002	(6 x2) (6 xl)	120051	(E x i)						
		0. 4	2400x3 12003	18 x 3) (6x2)2 18 x 2) (6x2)2 (1 N L) (6x1)					2400x1	(x)	2400×31200+2	(8 x 2) (6x2) (N L)2 (6 x()								
ł		1.0	-à	995		x 1)2			<u>R</u> i		ň.	25				· · ·			-	
ļ		6			800x1 400x 1200x2	x 1) (4 x 1)(2 x 1)2								. <u> </u>						÷
	ю	8 0.			<u>×</u> 40	1) (4	_		׼,							· · · ·			3001	(1×E)
	861	0.8	10	No	8	(B ×			BOCK	(4 X I)	_	_	_	,			<u> </u>			
		9. O	2400/2 1200/3	(8 x 3) 15x2) 2 (8 x 2) (N·L)							24002 [2004]	(8x2) (NL)	1200x1	(6 x 1)						
		0. 4	5400%	(S × 3)					2400x1	(I × 8)	2006	(8×2) (N L)								
		0.										-				1	1			
		o													.		+	-+	3 00x1	3 x 1)
	79	0.8 0.			$\left \right $												+		m	<u></u>
	197		12	N ₂							-		-	=		<u> </u>	<u> </u>			
		0.6	24006120043	(B x 3) (E x 2)2 (B x 2) (N L)		<u> </u>							1200x	(6 x I)				_		
		(m) 0.4	2400 2400	(8×3 (8×2																
	DIs-	(ma)		а. О		3.0		0 V		2.8		I. 7		5.8						<u>ני</u> ני
						(6		=		~			_							
	10140			(B)	(Y	Tg. Priok (B)	(A)	л Semanggi (В)	(A) u	Kebayoran (B)			8 8	م 6 a m b I r (A)					8)	r i a
ĺ	Ű	6 0	× ×	Gambir (B)	iok	Prl)ig gi(มฉนดี		ayor	(B)	0 0	gar	д Е					gara	Gandaria
	4		4 8 8	ς a Ω	Tg. Priok (A)	, ₽	Se man ggi(A)	Ser	s b a v	X 6 b	Kota (B)	Kota (c)	Jatinegara (A)	ל ס ט					it ine	ç G
	Sec Cable Sector	5	0 7	(51) Gambir (B		(52)		5 3)	Ke Ke	(54 Kebayaran (B	¥	E 2	r 7	9		6	705	+	Jatinegara (B)	2
ļ	<u> </u>			ഗ		<u>9</u>		<u>6</u>		ഗ	L (b		<u>6</u>)	6	89	59		G	و)

TABLE 7-4-2-(30) TOTAL NUMBER

OF LOADING COILS

.

				<u>Plan — No. l</u>
Year	Loading Coil Pairs.	Total Cable Length (Km)	Number of Loading Coils (Loaing Inte-) rval 1.5Km	Composition Rate
	100	_		—
	200	104.7	70	4.8
	300	24.1	17	3. 6
1979	400	156.6	105	22.2
	600	309.0	206	43.5
	800	111.7	75	15.9
	Total	706.1	473	100. 0
	100	7.5	5	0.7
	200	251.5	168	24.0
	300	34.6	24	3.4
1988	400	271.6	182	26.0
	600	359.2	24 0	34.2
	800	122.7	82	11.7
	Total	1047.1	701	100.0
	100	7.5	5	0.5
	200	393.2	263	27.0
	300	34.6	24	2.5
1988	400	342.7	229	23.5
	600	522.9	349	35.8
	800	154.9	104	10.7
	Total	1455.9	974	100.0
	100	7.5	5	0.4
	200	527.3	352	25.5
	300	34.6	24	1.7
1993	400	547.8	366	26.5
	600	725.9	484	35.1
	800	223.5	149	10.8
	Tota I	2066.6	1380	100.0

Plan — No. I

Plan - NO. I

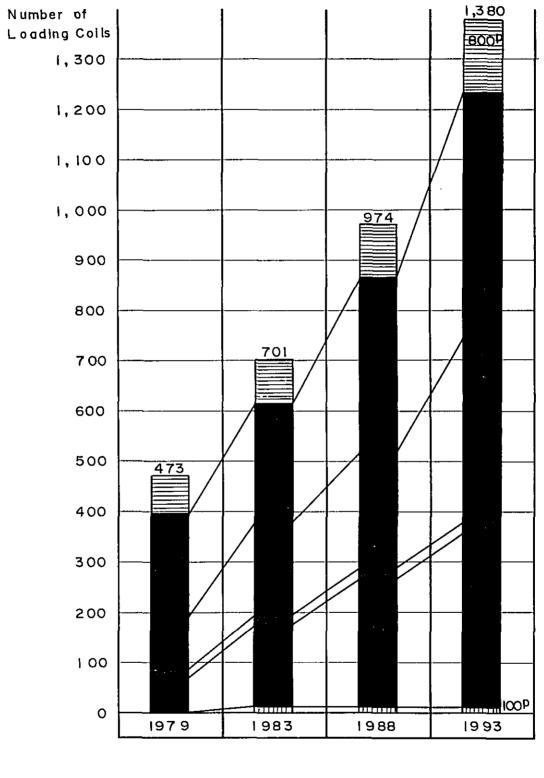


FIG. 7-4-2-(31) TOTAL NUMBER OF LOADING COILS

Moreover, the number of loading coils installed in the manholes nearest to Gambir (A) Exchange Office will become 97 coils. Supposing that even if the entrance cables were divided into four routes, about 25 loading coils will be installed in the same manhole. Therefore, a dispersion of loading coil manholes and entrance cables will be requested.

When PERUMTEL expands the telecommunication facilities, it is recommended that sufficient space be given to the manholes, MDF, etc. based on the long-term expansion plan.

7.5 Plan No. 2

7.5.1 Junction Circuits

7.5.1.1 Number of Junction Circuits as of 1979, 1983, 1988 and 1993

The number of junction circuits was calculated by utilizing the computer on the basis of the telephone traffic flow among the exchange offices, the tandem plan and the circuit cost.

(a) Object Years

1979, 1983, 1988 and 1993

(b) Classification of Circuit Sections

The number of junction circuits for each circuit section is shown in four combinations of the EMD and the new system.

In other words, (EMD \rightarrow EMD, EMD \rightarrow NEW, NEW \rightarrow EMD, NEW \rightarrow NEW).

(c) Calculation Method

For an alternative routing network with one tandem stage, the determination of the number of the direct junctions and tandem junctions was made by calculation according to the formulas of R.I. Wilkinson, Y. Rapp and the loss formula of A. K. Erlang. (The details are described in paragraph 6.2.6.)

7.5.1.2 Number of Junction Circuits in Each Circuit Section

The number of junction circuits in each circuit section in the Plan No. 2 is indicated in Table 7.5.1.(2). The number of circuits (67,669) as of 1993 will be to about three times the number of circuits (22,289) as of 1979. Among the circuit sections (EO - EO, EO - T (tandem), TOLL - EO), the circuit section with the highest rate of increase is the direct circuits between EO and EO, and the number of circuits (29,783) as of 1993 will be to about 6.6 times the number of circuits (4,534) as of 1979. The circuit section with the second highest increase rate is the "SLDD", "10X", and the number of circuits (15,466) as of 1993 will be about 5.6 times the number of circuits (2,759) as of 1979. Furthermore, although the number of tandem circuits (22,420) as of 1993 will be about 1.5 times the number of circuits (14,996) as of 1979, this will be due to the introduction of the new

TABLE 7-4-2-(32)

TOTAL NUMBER OF TERMINATING CABLES, LOADING COILS AND M D F LENGTH FOR JUNCTION CABLE OF EACH EXCHANGE (1/4)

							r.		1	· · · · ·	+	· ·····
- NO. I	MDF	Length for Junction Cable (m)	2.4	15.5	3.3	2.7	i.3	1.5	0. 4	22.9	5.1	ي. -
Plan	s	8	-	<u>0</u>	2	N				5	9	4
	Pairs	۵ĝ	N	35	5	8	4	-		48 21	9	5
	Coil	۳Å	Ń	N		N	-	9	N	5		
		30 [–]								_		-
	Loading	ဆ၀ီဒတ်4ထိတ်ေစတ်	ы	σ		_	-	9	2	မ		
	<u> </u>	<u>°8</u>										
	Total	Number of Loading Coils	თ	60	2	13	9	13	4	97	12	20
		шш О 1		200x2				400x2 200x4	200%2			
	Diameter	тт 6.0		200x2 400x3						200x1 300x1 400x2		300×1
	ĺ	тт 8.0	200x1 400x1 600x1	400x 800x 41		200x1 400x1 800x2	400x1 600x1	400x1 600x2	400x1	400x I 800x I		800x1
	Conductor	шш 0.6	600x 1 800x 1 1200x 2	400x 1 1200x2	500x 3	600x 1200x	800x 1 1200x1	400x 1200x	400x I	1200x30	1200 x 4	6 700X 9
	Ĵ	0.4 Em	2400x1	1200x2 2400x61	2400x3		1200×1			2400x9 (200x30	2400x5 200 x 4	2400x2 200x 9 800x1
	Total	Junction Cable	7,400	51,200	10,800	8,800	4,200	4,800	1,200	76,100	16,800	16,700
		Terminating Circuit	(4,532) 3,433	(20,238) 15,332	(8,705) 6,595	(3,891) 2,948	(2,627) 1,990	(1,657) 1,255	(895) 678	(46,461) 35,198	(15,077) 11,422	(8,138) 6,165
		Telephone Demand	20,900	57,100	39,400	28,300	18,800	1 4,600	9,300	43,700	52,200	36,100
		Name of Exchange	Kota (A)	× (B)	、 (C)	Ancol	Pluit	Cengkareng	Tegal Alur	Gambir (A)	, (B)	Semanggi (A)
	1	<u>Ö</u>	-	N	n	4	ۍ ک	Q	~	ω	σ	0

(): including miscellaneous circuits

TABLE 7-4-2-(33) TOTAL NUMBER OF TERMINATING CABLES, LOADING COILS AND

MDF LENGTH FOR JUNCTION CABLE OF EACH EXCHANGE (2/4)

_[tion این	ت	7	0	0.8	60	9.8	S	1.8	0.6	0
Plan-NO.	MDF	p p p p p p tor Junction 100/200300400600800 cable (m)	-	2.7	2.0	Ö	6 0	6	2.2		0	6.0
ы	s	۵Å	· –	1				7	З		-	4
	Pairs	60° D	4	~	ۍ ۲	-	-	1	5	ß		8
	Coit	<u>-</u> §		2	м	-	-	23	N	6	2	15
		<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>										
	oading	<u>X</u>		2	9		2	ი				4
	Ĕ											
	Total	Number of Loading Coils	ç	- 3	- 5	ĸ	4	57	0 -	11	ŝ	4 1
		шш О.						200x5				200x11
	Diameter	тт 0.9		300x1 400x1	200x2	600x1 300x1	600x1 200x1	200x1 300x1 400x15		800x2 400x2		400x1 600x1 800x4 400x12200x11
		тт 0.8		600x1 300x1 800x1 400x1	1 00x1 400x1 600x1 800x1	600xl	600x1	400x1 600x1 800x0	B00x4	800x2	800x2	
	Conductor	mm 0.6	1200×2	400×1 1200×4	480x1 1200x1	(200×1	1200×1	120040	1,200x2	1,200x3		1200x5
	C or	шт 0.4	2400×1 1×00+2	1200x1				1200 x 1 2400 x 1	1×0021			2400x1
	Total	Junction Cable	4,800	e, 500	6,300	2,100	2,000	32,100	6,800	6,000	1,600	19,600 2400x1 1200x5
		lerminating Circuít	(3,619) 2,742	(4,607) 3,490	(3,222) 2,441	(1,128) 855	(1,214) 920	(I 2,193) 9,237	(3,285) 2,489	(989) 747	(1,533) 1,161	(5,291) 4,008
		Telephone Demand	14.900	35,100	26,000	10,100	11,800	40,200	21,900	6,900	B.300	32,500
		Name of Exchange	Semanggi (B)	Slipi	13 Pal Merah	i 4 Kedoya	Meruya	l 6 Cempaka Putih	l 7 Rawamangun	Pulo Gadung	l 9 Penggilingan	20 Tg. Priok (A)
		Ň		12	<u>ы</u>	4	- 2	9			61	20

		C
TOTAL NUMBER OF TERMINATING CABLES,	CABLE	
TERMINAT	COILS AND MDF LENGTH FOR JUNCTION CABLE	~
Ъ	æ	3/4
NUMBER	IGTH FO	EXCHANGE (3/4)
TAL	Ш Ц	EXCH
ΤO	MDF	OF EACH
-(34)	AND	Ь
7-4-2-	COILS	
TABLE 7-4-2-(34)	LOADING	

Plan - NO. I	Loading Coil Paris M.D.E.	100 200 300 400 800 Cα b 1 e(m)	2.0	0.8	7. 4	1. 1	ю. В	1.8
6	ris	α B B B B B B B B B B B B B B B B B B B	2		сı С	2		I
٩	Pa	eΩρ	5	-	11 15		N	2
	110	- <mark>4</mark> 8	2	1	=	2	N	ñ
	0 D	age						
	adìn	<u>_8</u>	2	4	2	<u> </u>		5
	Ĕ				-	<u> </u>		
	T ota 1	mm Number of O Looding Coils	1	Q	47	4	4	12
		л п п 0.1	200×3	200×3	200x2			
/ # / 0	Dlameter	ш ш б О	400×3		200x3 400x4			400x1 400x3 200x1 1200x2 800x1 400x2
		ш 8 О. 8 Ш	800×1	1200x1 600 x1	100 x1 600 x3 800x8	800x1	1200x1 800x1	400x3 800x1
CHAN	Conductor	тп 0.6	1200×1	1200x1	400x2 1200x9		120 Ox1	400x1 1200x2
ц Х	Cone	. тт 0. 4	2400×1		2400x1	2400x1		
UF EAUN EAUNAGE (3/4/	Total	Junction Cabie	6, 2 00 2400x1 200x1 800x1 400x3 200x3	2, 400	24, 300 2400x1 200x9 600 x3 200x3 200x2	3, 200 2400x1	2, 000	6,000
2		ephone Terminating Junction nand Circult Cable	(4, 55 8) 3, 483	(1, 538) 1, 165	(7,672) 5,812	(1, 975) 1, 496	(1,677) 1,271	(3, 184) 2, 4 2 1
		Telephone Demand	29,000	11, 700	26, 000	15, 600	15, 7 00	29,200
		Name of Exchange	21 Tg. Priok(B)	22 Cilincing	23 Kebayoran(A)	" (B)	25 Cipete	26 Kalibata
		NO.	12	22	23	24	25	26

ן. ני

5

8

2

200x3

400x2200x1 600x1400x3

1200 x1

4,600

(1,201) 910

11, 400

Posar Minggu

27

0.4

4

4

200×1

400x1 400x1

1, 000

(605) 458

800

ຕົ

28 Jagakarsa

<u>.</u>5

2

4

ø

2400x1 1200x2

4,800

(2, 350) 1, 780

700

17,

Jatinegara(A)

29

თ

ώ.

218

11 2 10

52

400 x1 200 x1 600 x3 300 x2 200 x3 800 x9 400 x5

2400×1 600×1

29,000

(8, 930) 6, 765

20,000

(B)

\$

30

TABLE 7-4-2-(35)

TOTAL NUMBER OF TERMINATING CABLES, LOADING COILS AND M DF LENGTH FOR JUNCTION CABLE OF EACH EXCHANGE (4/4)

LENGIT TOR JOIN CABLE OF EACH EACHANGE 1.74.7Plan-NO.1TotalConductorDiameterTotalLoadingPlan-NO.1Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} Junction \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} \overline{mm} <	
International and the second secon	
Inv CHOIR Control Looding Coll Pairs n nm nm nmmeter Number of p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p p	
Introv CHOLE OF EACH EACH EACH ANGE n nm nmmber of P P P n nm nmmber of P P P P n 0.8 0.9 1.0 Number of P P P 1 0.8 0.9 1.0 Coils 10 2 2 1 800x1 400x2 200x1 9 3 3 3 3 3 1 800x1 400x2 200x1 9 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td></td>	
ION CADLE OF EACH EACH EACH EACH ANDER Total Looding Co n nmm nmm Loading no 0.8 0.9 1.0 Number of Coils P 1 0.8 0.9 1.0 P P 1 0.8 0.9 1.0 Coils P P 1 800x1 400x2 200x1 9 3 3 1 800x1 400x2 200x1 9 3 3 1 800x1 400x2 200x1 9 3 3 2 1 800x1 200x2 200x1 2 1 2 800x1 200x2 5 5 1	
Introv CHOLE OF EACH EACH EACH AND n nm nmber of Loading n 0.8 0.9 1.0 Number of P 1 0.8 0.9 1.0 Coils 10 200 2 800x3 400x4 200x1 9 3 3 1 800x1 400x2 200x1 9 3 3 1 800x1 400x2 200x1 9 3 3 2 800x1 400x2 200x1 9 3 3 3	
ION CADLE OF Total Loa n nmm nmmeter Total Loa n 0.8 0.9 1.0 Number of P 1 0.8 0.9 1.0 Coils P 1 800x1 400x2 200x1 9 P 1 800x1 400x2 200x1 9 P 1 800x1 400x2 200x1 9 P 2 800x1 200x2 200x1 9 P 2 800x1 200x2 200x1 9 P	
OLION CABLE OF EACH EX Or Diameter Total nm nmm number of 0.8 0.9 1.0 Number of 1 0.8 0.9 1.0 Coils 2 800x3 400x4 200x1 9 1 800x1 400x2 200x1 9 1 800x1 400x2 200x1 9 2 800x1 400x2 7 7 2 800x1 200x1 20 7	
Introv CADLE Or n 0.8 0.9 1.0 0.8 0.9 1.0 1.0 1 800x3 400x4 200x2 1 800x1 400x2 200x1 2 800x1 400x2 200x1 2 800x1 400x2 200x1 2 800x1 200x2 200x1	
Inclusion CHOLE Inclusion Inductor Inclusion Inductor Inclusion 0.9 Inclin 0.9 Incl	
0.1 ION 0.8 mm 0.8 mm 0	
0.000 400x1 1200x1 1200x1 1200x1 1200x1 1200x2 1200x2 1200x2 1200x1 1200x2 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1 1200x1	
Total Junction Cable 8,400 3,100 2,800 2,800 1,700	
M. U. r Telephone Terminating Demand Circuit 24,600 (1,973) 15,500 (1,622) 15,500 (1,622) 15,500 (1,937) 20,300 (1,937) 20,300 (1,937) 9,800 (1,11) 9,800 842	
Telephone Demand 24,600 15,500 20,300 20,300 20,300 9,800	
Name of Exchange Cawang Pasar Rebo Klendar Tebet Gandaria	
3 3 3 3 3 3 <u>3</u> 3 <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u>	

•

switching system with common control which will make possible alternative routing, and the trend of increase will become very gradual.

Definition of Circuit Section

Circuit section means the section between switching systems. (For example, EO - EO, EO - T (tandem), TOLL - EO.)

			Tab	le 7.5.1.(1)		T: Term O: Origin	inating nating
\square	Т	EM	D	NE	ew	To	มเ
0	\geq	EO	Т	EO	Т	SLDD	10X
EMD	EO	EO → EO	EO → T	EO → EO	EO → T	EO → SLDD	EO → 1OX
	Т	T → EO	_	T → EO	_		—
NEW	EO	EO → EO	EO → T	EO → EO	EO → T	EO → SLDD	EO →1OX
	Т	T → EO	_	T → EO		_	_
SLI		SLDD → EO		SLDD → EO	_	_	
10	x	10X → EO		10X → EO	_	_	—

7.5.1.3 Number of Junction Circuits and Non-Loading Circuits of Cable Section According to Conductor Diameter

The conductor diameter of each circuit section is determined on the basis of the aforementioned DC resistance limit or transmission loss assignment. In principle, the same conductor diameter is used in one circuit section, as shown in Fig. 7.5.1.(3). However, when comparison is made between the tandem circuit cost [EO (1) \rightarrow T(tandem) + T(tandem) \rightarrow EO (2)] and the direct circuit cost [EO(1) \rightarrow EO (2)], they may be cases where the tandem circuit cost is lower, since the tandem circuit cost permits the use of different kinds of conductor diameters. Only in such case, the cable combination of different size conductor diameters in one circuit section will be applied.

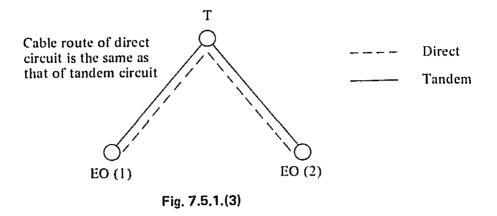
Of all the cable sections, the No. 51 cable section [Gambir (A) – Gambir (B)] will be the largest with a circuit requirement of 11,395 as of 1993. The second will be the No. 8 cable section [Gambir (A) – Jakarta Kota (B)] with 10,600 and the third will be the No. 16 cable section [Gambir (A) – Cempaka Putih] which will require 8,341 circuits. Especially in regard to Gambir (A) Exchange Office and Jakarta Kota (B) Exchange Office, since a large

TABLE 7-5-1-(2)

NUMBER OF JUNCTION CIRCUITS BY SYSTEM

(): CIRCUITS WHICH ARE ORIGINATING AND TERMINATINS WITHIN THE SAME EXCHANGE OFFICE ARE EXCLUDED LOWER SIDE: CIRCUITS MENTIONED ABOVE ARE INCLUDED Plan-No.2

							P10	<u>1n – No. 2</u>
	YEAR	1979	198	13	19	88	195	93
SYSTE		0	0	N	0	N	0	N
GRAND	. TOTAL	(31,696) 42,173	{25,875) 32,461	(8,123) 9,032	(28,235) 39,632	(19,382) 21,101	(27,882) 33,835	(39,787) 43,276
	EO TI	3, 254	2,389		2,098		1,778	
	EO Tz	4,708	2,726		2,614		2, 1 9 7	
۲- ا	E0 T3	1, 589	1.171		1,262		1,303	
- 03	EO — T4	1,528	870	·	803		684	
	EO Ta	2,079	932		994		1.020	
	EO —— MS			(2,049) 2,146		(3,524) 3,609		(4.674) 4,870
SUE	B TOTAL	13,158	8,088	(2,049) 2,146	7,771	(3,524) 3,609	6,982	(4,674) 4,870
	T, EO	11, 463)	(1,778)		(1,607)		(),359)	
		3,566	2,778		2,570		2.202	
	T ₂ — EO	(3.993)	(2,257) 3,371		(2,216) 3,226		(1,924) 2,695	
E D	T3 - E0	(715)	(702) ,352		(881) 1,462		{1,019} 1,514	
Ī	τ ΕΟ	(659) .777	(479) 967	<u></u> -	(511) 874		(506) 748	
-	T5 EO	(1,568) 2,489	(736)		(845) ,116		(950) ,157	
	MS EO			(2,215) 2,396		(3,744) 3,945		(5,006) 5,248
su	B TOTAL	(8,398) 15,019	(5,952) 9,519	(2,215) 2,396	(6,060) 9,248	(3, 74 4) 3, 945	(5,758) 8,316	(5,008) 5,248
то	TAL	(21,556) 28,177	(14,040) 17,607	{4,264} 4,542	(13,831) 17,019	(7, 268) 7, 554	(12,740) 15,298	(9,680) 10,118
ΕQ	SLDD - EO	(1,512) 1,676	{1,405) 1,632	(900) 963	{1,787} 2,077	(2,552) 2,777	(1,889) 2,225	(6,017) 6,509
sLDD 1 0 X	10 X E0	(524) 578	(373) 425	(267) 283	(341) 387	(462) 496	(271) 308	(686) 739
ຣບ	B TOTAL	{2.036) 2,254	(1,778) 2,057	{	2,128 2,464	(3,014) 3,273	(2,160) 2,533	(6,708) 7,248
st.DD	EO SLDD	(1,280) 1,416	(1,196) 1,382	(740) 788	(1,495) 1,728	(1,903) 2,054	(1,568) 1,836	(4,155) 4,483
. 🛱	E0 10 X	(476) 516	{ 341 } 381	(255) 270	(318) 357	(441) 459	(262) 294	(618) 663
SUI	B TOTAL	(1,756) 1,932	(1,537) 1,763	(995) (,058	(1,813) 2,085	(2,344) 2,513	(1,830) 2,130	(4,773) 5,146
тс	DTAL	(3,792) 4,186	(3,315) 3,820	(2,162) 2,304	(3,941) 4,549	(5,358) 5,786	(3,990) 4,663	(11,476) 12,394
E	0 EO	(6,348) 9,810	(8,524) 11,034	(1,697) 2,186	(10, 463) 18,064	(6,756) 7,761	(1,152) 3,874	(18,631) 20,764



number of cables will have to be terminated, the consideration of direct cable routes to other main exchange offices without passing through these exchange offices will be necessary.

As shown in Tables 7.5.1.(4) through (9), the number of circuits in all of the circuit sections as of 1993 will be to approximately 2 to 3 times of those of 1979. In this way, it can be considered that with the progress in city development of Jakarta, the number of junction circuits among the required exchange offices will continue to increase.

Consequently, when laying conduits in consideration of the road construction program, it will be very important to acquire a sufficient number of ductways on the basis of the long-term outside plant circuit network plan.

When considering the number of non-loading circuits, it can clearly be seen in Tables 7.5.1.(4) to (9) that the No. 51 cable section [Gambir (A) – Gambir (B)] is the largest with 5,405, the second is the NO. 8 cable section [Jakarta Kota (B) – Gambir (A)] with 4,277 and the third is the No. 1 cable section [Jakarta Kota (A) – Jakarta Kota (B)] with 1,688 circuits.

Non-loading circuits remain only in a part of the cables with 0.4 mm and 0.6 mm conductors, and loading coils are inserted in all circuits with cables of 0.8 mm, 0.9 mm and 1.0 mm conductors.

7.5.1.4 Total Number of Junction Circuits and Number of Non-Loading Circuits

As shown in Table 7.5.1.(10), the ratio of loaded circuits to circuits of 0.4 mm conductor as of 1979 is approximately 26% and for 0.6 mm circuits is about 82%. Regarding circuits of other conductor diameters, it will 100% loaded.

The circuit composition ratios according to conductor diameters are 24.3% for 0.4 mm, 49.2% for 0.6 mm, 19.5% for 0.8 mm, 4.7% for 0.9 mm and 2.3% for 1.0 mm conductor cables.

(4
1
Ц
۱ ۲
ш
Щ
TAI

Number of Junction circuits and non-loading circuits in each cable section by conductor diameter $(^{1/6})$

Ņ		Total	(88)	3124	306)	558	(205	370		337	(39)	711	ĝ	455	(23)	142	(LLZ	0600		646	02	7375
ON-		1.0 Tc	<u> </u>	M	<u> </u>		<u> </u>		à	_		366	\$			13/1	<u>5</u>		_	5	-=	~
Plan-I		0.9										9		Ю		2		1522		29		8
	993	0.8.0		—		8		2		60		8		89		74		66 452279		79		366 128
		<u> </u>	8	40	Q	344	(85)	622		228 1		30 1	13	963	_ମ୍ବ୍ର	8	8			533	ଷ୍ଡି	
		0.4 0	163	384 12	36)	136 3	20 (1202			(39)	39 1	(191)(413)	418 5				<u> </u>			989) []	7465
		Total C	847)(1463)(222)	2885 884 240	(1234) (136) (170)	365 1	197)(120)	243 1		459	[2]	431	200	062	(14)	696	3242)2592)(685	152 7761 4653 35551		566	(3 C)(988)(0	5161 1746 5135
		- <u>1</u> 10	93	ă	3							83 4	ÿ	ž		15	<u> </u>	5217		5	<u><u> </u></u>	<u>0</u>
		0.9						-				9		ω		2		261 1		4		8
	988	æ				55		28		33		31		61		27				105		389 109
	-	0.6	27	774	(115)	<u>6</u>	(20)	39	-	326 1		84	- 69	764	(1 (1	546 1	63 13	1000		442	ີເວີ	
		0.4	(1505)	1408 1477) (61 1)	611	(126) (26		(1)	121	27	(95)(468)	2317		<u>0</u>	-50	2752			(629)	9533710
		Tota 1 C	937)02	2657 14	993 I)	234	(181)	249		354	ଟ୍ଥ	301	(458)	801 2		563	2843(2049) 193	5600327528921181		547	000	3253
		<u>е</u> О	<u></u>	8	=				<u> </u>			104	2	E	<u></u>	16 5	<u>_0</u>	76 55		6	<u> </u>	8
	~	 6										6 I(6		~		127		17		97
	983	0				48		26		117		6		63		55		8261		27		345
		0 9	- Se	938	23	84	(57)	66		237 1		52	38			385	(8 3	326 8		397 1	8	2271 3
		40.	2 192	1699 9	 [0]	102	(fZ))	124		~	Q	8	20(438)	69 69		m	515) (B	452		3	(471) (536)	540 2
		o I I	2789 (636) (242) 2563 16	(<u> 37</u> (;	100		(124) 147	146	69	20 20	<u>5</u> 3			600	482	3 4636 (1515)(628)	909 9012	736	<u>8</u>	1025 3201 (4	9 <u>0</u> 9
			82	<u>88</u>	=		5					0	ເງິມ	74	7 0	5		8 80	8	ъlle		22
		0.1								·	7 5	6 4	~	6	50	ŋ	712	28 1	75 1	28 1		
	979	0			27	16	<u> </u>	6	3	25	5	64	40	67	383	169	348	204	69	31		
1	-	0.6	3 8	62			50	29) 13)		44			725			1 68	80 3 3	59) SI 5 2		_	<u> </u>	200
(0,)		<u> </u>	(934) (364) 1934 8561	200	200	<u>88</u>	<u>9</u> 9	80 20 20 20 20 20 20 20 20 20 20 20 20 20	Ξ		<u>=</u> =	6)	202	<u>€</u> 0	ũ	Ñ	1637 (628) 1637 2760	25) (5 25) 23	4	4	(402)(623) 4022739	41) 41 18 18
5		(km) 0.4	ପ୍ରିତ୍ରା	1.8 8	6	00	=-	4.0		124	~_]	5.0 (7.2		Ņ	ଜୁଜୁ	16 15		0	<u> <u>5</u>4</u>	5.0 3.
טואואיב ובת						<u> </u>		4						- 1 1 1 1						(A) 12		
	•;•			Kota (B)		5		it		Cengkareng	ę	Tegal Alur		Cempaka Puti		Jatinegara (B)		Gambir (A)		Kebayoran(A) 120	~	Semanggi(A)
	ů	20	ৰি	Kot	g	Ancol	ß	Pluit	Ð	Ceng	karei	Tego	(8)	اقر ق	<u>e</u>	Jatin	ً₿	Gar	(B)	Kebc	oir (A	Sen
			Kota (A)	1	Kota (A)	1	Kota (A)	ſ	Kota (A)	۲	Cengkareng	`	Kota (B)	`	Kota (B)	•	Kota (B)	۲,	Kota (B)	(Gambir (A)	`
	Sec tim Cat la Eastion	2		$\overline{)}$		N)	("	$\overline{)}$	(4		ى		9	\mathbf{b}	6)	6)	σ		0	

() : Number of non-loading circuits.

TABLE 7-5-1-(5)

٠

NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR DIAMETER (2/6)

1,97 1,97 1,31 1,31 1,31 1,31 1,31 1,31 1,31 1,3	9 I,988 I,993	0.9 1.0 Tatal 0.4 0.6 0.8 0.9 1.0 Tatal 0.4 0.6 0.8 0.9 1.0 Tatal 0.4 0.6 0.8 0.9 1.0	1.442 1.246 (246 (248) (248) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) (238) <th(< th=""><th>84 84 26 213</th><th>(116) (116(166) (1163(2556) 88)</th><th>1⁽¹⁶⁷⁾129 646 246 28 (049 223 097 373 41 1734 402 094 523 60 2949</th><th>(41)</th><th>14 92 123 28 257 22 164 227 41 454 41 376 417 60</th><th>(33) (33)</th><th>44 1106 1060 734 171 155 2120 33 161 2 324 275 322 3556 65 259 22 09 391 677 5836</th><th>100 26 1813(586)(295 (881)(692)(454) (1145(910)(681) (1591)</th><th>136 24 (556) 832 827 748 330 266 3003090 (378 411 587 552 5018 481 2304227 (117() 12 8341</th><th>20 88 1933 (9 (8) (8) (8) (8) (8) (18)</th><th>14 44 1433 12261004 128 2358 40 16561571 222 3489 98 2012 2090 399 4599</th><th>42 (</th><th>37</th><th>42 ⁽</th><th>5 37 1,1</th><th>14 68 ^(1 234) (1 55) (1 55) (1 55) (1 55) (1 21)(50)</th><th></th></th(<>	84 84 26 213	(116) (116(166) (1163(2556) 88)	1 ⁽¹⁶⁷⁾ 129 646 246 28 (049 223 097 373 41 1734 402 094 523 60 2949	(41)	14 92 123 28 257 22 164 227 41 454 41 376 417 60	(33) (33)	44 1106 1060 734 171 155 2120 33 161 2 324 275 322 3556 65 259 22 09 391 677 5836	100 26 1813(586)(295 (881)(692)(454) (1145(910)(681) (1591)	136 24 (556) 832 827 748 330 266 3003090 (378 411 587 552 5018 481 2304227 (117() 12 8341	20 88 1933 (9 (8) (8) (8) (8) (8) (18)	14 44 1433 12261004 128 2358 40 16561571 222 3489 98 2012 2090 399 4599	42 (37	42 ⁽	5 37 1,1	14 68 ^(1 234) (1 55) (1 55) (1 55) (1 55) (1 21)(50)	
	626'1	8 0.9	(442) 980 585 (427)			79 439 47			6	821 241	95) 815 291 100 2	78) 630 318 136 2	634 20	14	169	1 205 3	(9) 84 595 169	2 205	9) 9 76 14	_
ble Section Dis- tance mbir (A) 0.4 0.6 Slipi 7.8 (427) 916 Slipi 5.5 (427) 916 Mbir (A) 7.8 (427) 916 Fal Merah 7.0 (79) 439 Meruya 7.0 779 439 1874 Meruya 7.0 799 439 1874 Meruya 7.0 779 439 1874 Meruya 7.0 1874 1874 1874 Unbir (A) 8.6 821 821 191 Keboyoran (B) 8.6 821 191 172 Moti o Gadung 7.0 14 142 1191 1191 Keboyoran (A) 8.0 8.0 988 630 1191 1191 To. Drink (A) 7.0 148 142 1191 1191 1191 To. Redoung 7.0 148 488 334 1191<	Dis-	4.0		5.5	(151)	-		7.0		8.6	(581) 581	(488) 488					(27)	11) 0'2	ດີດີ (

NUMBER OF JUNCTION CIRCUITS AND NON-LOADING TABLE 7-5-1-(6) CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR DIAMETER $(3/_6)$

Plan-N0.2

														ŀ					ľ						Γ
S		-siQ			197	ŋ				ļ	1983					198	8	ŀ		ŀ	-	1993	ŀ	F	
<u>s</u>	Cable Section	(km) 0.4	4.0	0.6	0.8	0.9 1.	1 O T	Tota I	0.4 0	.60	0.8	<u>-</u> റ	0 Total	10.4	0.6	0 [.] 8	6.0	<u>a</u>	Total (0.4	0.6 0	8.0	<u>.</u> ອີ	<u>م</u> 0	Total
	Tg, Priok (A)	()		53	20		_	73 () (10	(13)	- 20		ы М	4) (33)	S) (59)	у М			(32)((132)(125)	25	C		2	257)
<u>n</u>	_			231	20			251	22 3	8			44	8		1			844	2451	8	;		<u></u>	8
	Cempaka Putih		(49) 49)	370	140			519) 559)			305	G	(79)	9)(116)	() ()	607	Ľ			150	7511	Ľ	ى ت	ΞI	(150)
ର)	Rawamanqun	<u>.</u>	(54) 54)	413	149				02		3		1085	2	2	5	>		865	82		2	,	<u>7</u>	4
(Rawamangun	((1 6)	1	48	ŭ	(16)	5) (29)	3102	F 0 F	ŭ		(53)	33	12)	632	<u>ں</u>		(67)
r)	Pengilingan	ı ک ف							16			5	5	ةة 	-	;	>		460		+ 			┋╌┥	=
	Cempaka Putih	1		158	105	35	ω	306		ų I	יי ס ר		6 226		(0)	69	3	<u>ں</u>	(0)		(28)	28	25	<u>ر</u> 2	(28) (28)
8)	Kebayoran(A)		L	138	17	42	~	264					1	,	145		,		250	-				+	R R
	ပီ			403	202	4		619		0		u	202	~	2 (15)		9		<u>ຄ</u>	0		227	4	- 1	(15)
8)	Jafinegara (B)	ດ ນ		209	011	ŋ		328	-		2	,	3	1		2	?		425	5	8 <u>8</u>	i	-+		69
Γ	Kebayoran (A)	(86) 98	(86) 686	301	383			(98) 782	(67)	(14)	000		(18)	11 (83)	3 (23)	435			(106)	(83)	(26)	617		=	600
5	GCipete	2	40) (00	108	157			3 3 4 9 4 9			,		22						806						65
	Kebayoran (A)	0								41,			a (44)		48	205	Å V	000	(48)	ц Т	67	275	313	399	(47)
27	Pasar Mingan	N M							- ?			,	5		_	1)		729				·		62
	Pasar Minggt	L L	(<u>=</u> =	22	ы	26 (67	142) 142	(18)	ព ខ	··· ((10 0	9 (23)	3) (27)	- 4 4			(50)	(59)	(33)		- - -	1020	(62)
ଞ୍ଚ	Jagakarsa	ก ก่	(9) 9	77	23	20	43	形 の の の	18	73	2	ם ה	° 208		ω	'n	מ	271	298	50	201	r			35
	Kebayoran (A)	۲ ۲	(66) 66	(64) 330	495	321	33 [(130) 1345	(23)	(32)	461		15	<u>0</u>	7 (64)	l) 667			N	(G D	601	120		Ŋ	(228)
ଚ	e Kalibata	2	22	(31) 248	372	88	7	861 861	<u>Е</u>	316			8	2					1246	<u>6</u>				8	R
(Kebayoron(A)			_ ი				6					۳ 		ú	·			с в	D	H V				
9 9	Tebet			40			<u> </u>	40		0			, 	-	o				78	36	<u>}</u>			-	79

NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR DIAMETER (4/6) TABLE 7-5-1-(7)

C 014 - 40 0

L		ſ						ſ											$\left \right $		۹	Plan -	g	~	
Sec		-si0		-	979					<u>0</u>	983					986	_				6	5			
0 Z		(km)	0.4	0.6	0.8	0.9	0'1	Total	4,	0.6 0.	в 0	0'1 6	Total	0.4	0.6	0.8	 ອ.໐		Tota 1 0.	0.4 0.6	5 0.B	0.9	1.0	Total	
(F	Kebayoran (A)	30	(<u>67</u>					1167 1167 1167	183)	<u>(</u>			(161)	(240)	(36)			2	(276)(365)	55) (76)	((441)	
)	Semanggi(A)		00					00	83	8			<u>16</u>	273	79				352 4	4 10 262	01			672	
(Jatinegara (B)	43	234	(33)	323			(307) 1866	(128)	(12)			(145)	145) (158) (20)	ଛି)	178)(188	38 1 (22)	ন			(210)	
3)	Tebet		(99) 99	0 0 0 0 0	137			7 84) 7 84)	38	200 3	387		1115	187	800	618			705 2	259 367	7 855			248	
U (F	Jatl	۲ ۲	<u>66</u>	598	412	141	54 (190) 395	(60)	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		2	(60 j)	(145)	E Z	ROA BOA	000) 270	(145)(202)	22		725	554	(202)	
શે	Cawang		<u>8</u> 2		155	39	22	(5 4 8 8 4 8 8 4 9	139	200	=		113	197	3	2			936 2	298	2			3683	
(Cawang			ଷିଞ୍ଚ	200	[4]	54	(29) 483			-		01		(2) (2)				(1)	41				(14)	
5)	Pasar Rebo	40		(6) (6) (6)	63	39	22	(9) 152	9	[49	42 125	5 141	563	8	221	15/	230 274			58 ° °		305 349	554	1730	
("	Pasar Rebo	л Л							(24)	4	77 38	đ	(24)	(131)	u U	88	٩	178	(31)	2 2	201	00	325	(54)	
)	Gandaria	2							24				271	31	2	00				54 12			}	636	
(5	L T	(52) 52	(14) 83	330			(66) 465	(3)	22	212		(131)	(44)	153	716			(44)	(66) 607	799			(66)	
8)	Klender	с <i>7</i>			94			130	31		2		330	44		710			613	66 2	<u>.</u>			1472	
(Jatinegara (B)	а с А	201) 2011	<u>5</u> 8				(595) 649	(166)				(166)	166)(218)				<u> </u>	(2 18)(Z	(226)	2E			(226)	
3)	Jatinegara(A))	64 7 7 7 7	-			-		600	8	<u>.</u>		757	703	135	25		-	863 9	905 1	- 1	_		1138	
()	Kota (B)	ں بو					-		(18)	(18)			(36)	(108)	କ୍ଷି				(1 33)(207)	07) (46)				(දිදුව)	
8)	v Slipi	2							5 49	28			274	88 8	51			-	435 5	530 15	55	٥		691	
(ъ В	ר ק								20			2	6)	(8)				2	(35) (15)	6		•	50	
RP)	Pal Merah	>												თ	38				47	35 118	80			153	
(9	Kallbata	5.7	ଷ୍ଠିଷ୍ପ	25	192	321	133	(<u>7</u>	(34) (21)		00		(55)	(45)	(27)	00			(72) ((59) (33)	3) 26			(92	
Ð_	Pasar Minggu	5	<u>0</u> m	<u>888</u>	8	8	7		(34)		<u></u>		77	45	27	1	·		94	59 8	87			172	

TABLE 7-5-1-(8) NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS

IN EACH CABLE SECTION BY CONDUCTOR DIAMETER (5/6)

NO 2 0

٩ľ	i	= 1	80	ດິດ	<u>N-</u>	20	 	62	N	2		
g		Tota	(6)	(01) (01)	(92) 201	(81) 392	(278) 4103	(3051 1603	72	162		
-		1.0							550 366 1547			
2	ю	6.0		ω								
	5661	0.8	22	18	4		1136	652	961	37		
		0.6	(6) [0]	0° 1⊂	105	(3 I) 175	932	(31) 559	435	125		
		6.4	37		26 02 02 02	(50) 217	278 035	(274) (31) 392 559				
		Total (с О	45	59 50	(20) 82	(290)(278) 2198)(035	(275) 1287	872	155		
		0			·····				183			
	38	6.0		<u>0</u>					338			
ľ	1 988	0.8	22	2			824	466	125	41		
		0.6	м М	25			1217	(40 484	226	114		
		0.4	0-		(29) 29	(20) 82	157	(235) 337				
ĺ	-	Tota l	57	42		34	(260) 14 16	[244] 1039	561	151		
		1.0							104			
	83	0.9		Ξ		<u>.</u>			63			
	8 6	0.8	22	=		<u></u>	588		120	43		
		0.6 (35	20			767	(53) 432	44	08		
		0.4 0				ж 4	910	(191) 2697				
							(219) 1020 (194) 916	76] 290 8402	682 266	37 62		
		O Tota		<u> </u>	s	<u> </u>	<u> 90,00</u>	<u>9097</u>	- 0	4 6 7 2		
		<u> </u>							~ +	80		
	979	0.8 0.9					506 382	95 33	20628 9184	12 2 8 4		
	-									2		
		4 0.6					(219) 514 (194) 534	6 558 6 558 0 41 1	144 51	283 134		
	<u> </u>	(km) 0.4		<u> </u>			6	2761 4 276 240 240	5	4		
	Dis-	E K H	8.0	10.5	7.0	5. 1	7.8	6.4	14. 2	12.4		
	Sec	oble section	Kalib ata Ja tinegara (B)	Kebayoran(A) Cawang	Kalibata Cawong	Jatinegara (B) Rawamangun	Kota (B) Ancol	Kota (B) Píult	Kota (B) Čengkareng	Ke bayoran(A) Jatinegara(B)		
) 	y Q		₩	₹ ₹	4	₹ ₹	(4) ×	₹ ₹	¥ ₩	67	(B)
	ω ,										$ \odot $	<u> </u>

TABLE 7-5-1-(9)

NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS IN EACH CABLE SECTION BY CONDUCTOR DIAMETER (¹/6).

						z	EAC	L L	ABL	ц Ц		IN EACH CABLE SECTION	ם 	BY CUNDUCIUN		2	5	5	E A	UIAMEIER		(9/.)		Plan – No.2	Vo.2	_ [
	SEC- TRON CADIE SACTION	DIS- TANC			6791	თ					1983	ŝ					1 988	m					1993			
P N			0.4	0.6	0.8	0.9	0.	TOTAL	0.4	0.6	0.8	6.0	1.0	TOTAL	0.4	0.6	0.8	0.9	1.0 T	TOTAL (0.4	0.6	0.8	1 6.0	1.0 T	TOTAL
	GAMBIR (A)		4,126	(1,468) (623) 4,26(2084				12091) 6210 ((2247) (289)	(289)				12261 33271 (302)	1255	(302)		 .		(66£) 900fs (629f2		ŝ			শ্র	(5405)
	~GAMBIR (B)	З.О Ю.	2989 2987	(405) A15			- 1 54	(1,660) (4,378 4,012 1,939	4DI2	939	16			5967 5741 2290	5741	2290	~		- 20	8038 8344 3014	- H	014	÷			1395
(TG. PRIOK (A)						1. Tanàn		R 2	(78) (140)				(2181	6	(55)			~	(222) (358 (92)	[358]	(92)			2	(450)
3)	~ TG. PRIOK (B) 3.0	3.0							126	251	43	188	275	883	8	476	131	248 4	468 1	1,623	687	837	526 4	429 8	851 3	3330
	SEMANGGI (A)														(286)	10				(356) (427) (72)	1427	9			2	(499)
<u>B</u>	~ SEMANGGI (B)	2.0													592	592 : 245	4		-	1851	839 1849	849	58		<u>v</u>	2716
	KEBAYORAN (A)								1124					(124)	150					1021	(165)					(165)
5)	~ KEBAYORAN(B) 2.8	12.8							50	49	222			778	689	75	346			011	883	44	466		4	593
6 5	KOTA (B)								2553					12553)(2681)	(2681)				(1	2681312546	2546				<u>N</u>	25461
)	~KOTA (C)	1.7							3352	734				4086 3957 1,037	3957	1,037			4	4994 4459 1404	4591	Ą			- 27	5863
(Y	JATINEGARA (A)		112	149				261							(25)				******	(25)	۶.	(121)				(55)
8)	√GAMBIR (A)	5.8	107	149				255	144	283				427	207	473				680	326	662				988
ঝ										1									,							
(%)																		<u> </u>		· · · · ·						-
(65)																							<u> </u>			
8	٩٢			4	127	40	82	290														·				
)	~ GANDARIA	15.5		15	60	24	41	140					50	50					8	8			_		5	Ē

The total number of circuits according to conductor diameter in Table 7.5.1.(10) was calculated on the basis of the aforementioned DC resistance limit and transmission loss assignment. It is, however, very uneconomical to lay cables of different conductors strictly following the results of such theoretical calculation. Therefore, the actual number of circuits according to conductor diameters would differ from that obtained from the theoretical calculation.

After calculating the required number of circuits according to conductor diameters, the actual conductor diameters were determined from the viewpoint of economy as described in paragraph 7.5.2.1 below.

7,5.2 Junction Cables

7.5.2.1 New Cables by Conductor Diameter and Cable Section

Based on the number of circuits of each conductor diameter and circuit section as stated in Tables 7.5.2.(1) to (12), the miscellaneous circuits such as telegraph circuits, telex circuits, leased circuits, etc. will be added and in consideration of the transmission loss and DC resistance limit, the cables to be newly installed will be determined.

In the case of a certain circuit section where almost all the circuits are of small size conductor and only a small number of circuits are of large size conductor, the cables of large size conductor can be replaced with those of economical size conductor which satisfy the limit of the transmission loss, through application of new technologies, such as improvement of telephone set, or adoption of less severe limit value.

In principle, the pair number of the cable of each conductor diameter shall be the maximum one. However, in case the total number of circuits 15 years hence is less than the maximum number of pairs of that cable, the number of cable pairs which can satisfy the total number of circuits [(telephone circuits + miscellaneous circuits) x 1.2] will be applied. Furthermore, in computing the number of circuits after 1993, assuming that the circuit increase ratio in the five years from 1988 to 1993 will continue in the future, the decision will be made by an extended provision period of 15 years.

As one example of a fundamental cable decision, look at the cable section No. 5 between Cengkareng Exchange Office and Tegar Alur Exchange Office. The circuits to be accommodated in this cable section have various DC resistances and transmission losses. Theoretically, it is possible to lay the cables having various diameter conductors suitable to the respective DC resistances and transmission losses. Actually, however, it is uneconomical to lay the cables of various conductors. Therefore, cables of the maximum diameter conductor will be laid in this cable section in order to satisfy all the conditions. In other words, the 1.0 mm x 200-pair cables will be laid as shown in Table 7.5.2.(1).

Since this cable, however, cannot accommodate the total number of circuits (399)

TABLE 7-5-1-(10) TOTAL NUMBER

OF JUNCTION CIRCUITS AND

NON-LOADING CIRCUITS

				r	lan — No. 2
Year	Diameter	Numberof Circuits	Number of Non-Looding Circuits	Loading Circuits Rate	Composition Rate
	0.4	11095	8207	26.0	24.3
	0.6	22504	4120	81.7	49.2
1979	0.8	8945	0	100.0	(9.5
	0.9	2130	0	100.0	4. 7
	1.0	1051	0	100.0	2, 3
	Total	45725	12327	73.0	100. 0
	0.4	16056	10876	32.3	29.6
	0.6	21586	374	82.7	39.7
1983	0.8	10846	0	100.0	20.0
	0,9	3296	0	0.001	6. J
	1.0	250	0	100.0	4,6
	Total	54285	14617	73.1	100.0
	0.4	22396	13645	39.	27. 4
	0.6	33009	5024	84.8	40.4
1988	0.8	16485	0	100.0	20.2
1900	0.9	5388	0	0.001	6.6
	1.0	4 42 5	0	100.0	5. 4
	Total	81703	18669	77.2	100.0
	0.4	32583	18187	44.2	26.0
	0.6	50253	5814	88.4	40.1
1993	0.8	2 5 2 3 6	0	100.0	20.1
1990	0.9	9232	0	100.0	7. 4
	1.0	7972	0	100.0	6. 4
	Total	125276	24001	80.8	100.0

Plan -No. 2

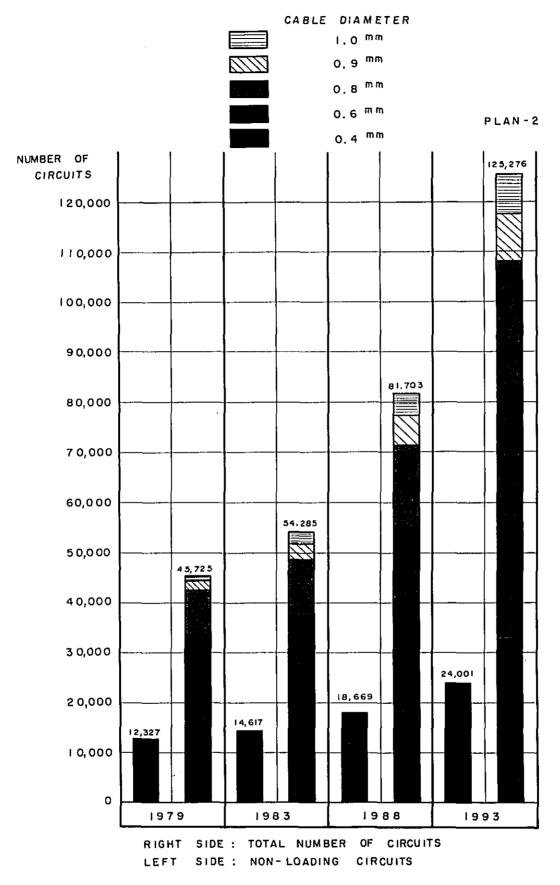


FIG. 7-5-1-(1)

TOTAL NUMBER OF JUNCTION CIRCUITS AND NON-LOADING CIRCUITS

•

required by 1983, the 0.8 mm x 400 pair cable will be laid for circuits with conductor diameters of 0.4 mm, 0.6 mm and 0.8 mm. In this case, although the maximum cable size of the 0.8 mm conductor cable is 800 pairs, it was planned that 400 pair cables be laid so as not to hold too many spare pairs of the 0.8 mm conductor cables when the 0.6 mm conductor cables are installed additionally in the future.

Moreover, in the case of cable section No. 6 [Jakarta Kota (B) – Cempaka Putih], although the required number of circuits of 0.9 mm conductor cable is 10 circuits, this number is very small and there seems to be hardly any trend of increase in the future. In such case a restudy will be made on the DC resistance limit and transmission loss assignment among the exchange offices (EO \rightarrow EO, EO \rightarrow T, T \rightarrow EO, EO \rightarrow TOLL) as to whether or not it would be possible to use the 0.8 mm conductor cable instead of the 0.9 mm conductor cable, but ultimately the decision will be for use of 0.8 mm conductor cable. Of course, the use of two-way repeaters, etc. will be considered but the case may arise where it will be necessary to provisionally acknowledge a slight excess in allowable transmission loss assignment value.

Fundamentally, in order to avoid the increase in number of cables, 1.0 mm cables are not used mutually between tandem exchanges.

7.5.2.2 Proposed Cable Diagram for New Junction Cables

On the basis of the junction cables to be newly installed in the various cable sections as described in the preceding paragraph 7.5.2.1, the Proposed Cable Diagram for 1979 and 1993 were prepared. [Refer to Fig. 7.5.2.(13) and Fig. 7.5.2.(14).]

7.5.2.3 Amount of Work According to Number of Cable Pairs

The total cable length by 100-pair conversion of the existing cables up to 1974 was approximately 550 km, but with the increase in telephone demand in the city of Jakarta, about 4,300 km of junction cables must be installed by 1979.

Should the index of the 100-pair conversion cable length in 1974 be 100, it will be 873 as of 1979, 1,153 as of 1983, 1,494 as of 1988 and 2,069 as of 1993.

The ratios of the 100-pair conversion cable lengths of the existing cables as of 1974 were 45.3% for 0.6 mm conductor diameter cable and only 4% for 0.8 mm cables, while the balance of 50.7% was 1.0 mm conductor cables.

On the other hand, the ratios of 100-pair conversion cable lengths of 0.4 mm, 0.6 mm, 0.8 mm, 0.9 mm and 1.0 mm conductor cables as of 1993 will be 15.3%, 41.2%, 26.3%, 12.6% and 4.6%, respectively.

It is requested that 4,300 km of 100-pair conversion cable length be installed by 1979, but the 100-pair conversion cable lengths to be extended thereafter in the 3rd and 4th Five-Year Plan are 1,500 km and 1,900 km, respectively. And during the period of the 5th

TABLE 7-5-2-(1)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (1/12)

			FRUPUSED CABLES BI WUNUCIUN DIAMEIEK AND CABLE SECTION (סבט	CAC		ō	N N N	200	חא	DIA	MEII	בא א	ND.	CABL	л Ц	ן נג		1217	믭	Plan - No.2	0.2
Sac	SEC- TION NAME OF	DIS- TANCE		-	1979				<u> </u>	£86 1				-	886	•			-	1993		
Q	EXCHANGE	(Km)	0.4	0.6	0.8	0.9	0.1	0.4	0.6	0.8	6.0	1.0	0.4	0.6	0.8	6.0	1.0	0.4	0.6	0.8	6.0	1.0
			2553 2553	24101 (973) 2553 1,128			-	2243 1,265	1,265				1,859	1,950				2487 1,537	637			
Θ	() кота (в) кота (в)	8.	2400 2400	1200				2400	1200 x2				2,400	1,200 x 2				2,400	1,200 x2	.		
		ļ	(83) 97	(38) 49	(21) 36			135	=	64			157	253	12			081	454	ß		
\bigcirc	KOTA (A) 	6.0			200				600	200				600	200		<u>_</u>		000	20 20		
	300 114																					
			(125) 150	(57) 105	(12) 14			164	131	35			167	184	37			159	303	58		
(m)	3 KOTA (A)	4 Ö			400					40 40		<u> </u>			64 Q					<u>8</u>		
	PLUIT																L		800 00		<u></u>	-
				(58) 144	(33) 49				313	155				431	176				301	144		
4	KOTA (A) ~ Congkaréng	12.4			600				-	600					600					600		
			(8) 15	(15) 15	(84) 93	<u>8</u> 0	(53) 68	27	69	157	α0	138	36	Ξ	5	ω	242	52	172	225	80	484
6	S CENGKARENG	5.0					200			6		18 N			- I		200 x2			400		200 x3
	I EGAL ALUR									}	_	<u> </u>			 }		-		400			

TABLE 7-5-2-(2)

- 1103 -

TABLE 7-5-2-(3)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION ($^{3/12}$)

					l J			I			•										Plar	Plan – No.2	.2
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	SEC		DIS- TANCE		-	676				6	83				-	886				-	6 63		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	D N	EXCHANGE	(Km)		0.6							6		4			6.0		4		8		0.1
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$						(672) 773						35				726	51				880	72	39
$ \frac{1}{12} \sum_{\substack{i=1,2,2,2\\ i=1}} \sum_{\substack{i=1,2,2\\ i=1}} \frac{1}{5} \sum_{\substack{i=1,2\\ i=1}} \frac{1}{5} \sum_{i=1,2\\ i=1,2\\ $	\bigcirc	GAMBIR (A) ~ Stipl			1200			<u> </u>					I								800		
$ \ \ \ \ \ \ \ \ \ \ \ \ \ $		36171				008			_	<u> </u>		02					200	Τ		-		200	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $												35					ž				8	72	
KE DOYA <	<u>(</u>	SLIPI	5.5						-			8 8			1.	-	300					300	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		č Kedoya											L		1200			L		2002			_
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $				(104) 200	(579) 1,422	(62) 173						37		•		493	ង				691	80	
PAL MERAH 7.0 800 200 200 x2 800 200 x3 800 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 20		GAMBIR (A) ~	0.7		1,20			1	┤╧										1-				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		PAL MERAH								~		8					200					200	
PAL MERAH 7.0 7.0 7.0 7.0 600 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 2												37		· · · · ·	····	200	55				551	80	
MERUYA MERUYA 6 MBIR (A) 3 1004 (318) 2 784 (318) 1 200 2 784 (318) 1 200 1 200 2 784 517 1 200 2 784 517 2 785 517 2 7		PAL MERAH ∼	7.0					I	-			8		1-			S S				600	200	
GAMBIR (A) I_0044 [318) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (58) (51) (50) (51) (100) (56) 226 205 44 2128 (74) 278 2784 517 C 1200 1200 1200 1200 1200 1200 1200 800 1200 800 1200 800 1200 800 1200 800 1200 800 1200 800 1200 800 1200 800 1200 800 1200 800 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200 1200		MERUYA													-			L	-	500			
GAMBIR (A) 8.6 1200 1,200 x 2 800 1,200 800 0, x 2 800 1,200 800 0, x 3 400 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200 1,200					(1,084) 2,474	(318) 844	<u> </u>	58) 21		400 9			305	4				425			2784	517	894
ky200 400 400 x2 x3 400 x2 x400 x2	<u>(1</u>)	GAMBIR (A) ~	œ.		_				<u> </u>		00		.			80		_1	<u> </u>				
		JATI NEGARA (B)					400			I	4	00×00					or a					6 × 6 4	

TABLE 7-5-2-(4)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION $(^{4}/_{12})$

2			1,468			527			745		200 x 4	745	200	Å7 667	l ĝ	4 × .
n - No		0.9			400 0 8			<mark>8</mark> %	3363		400 × 90	303	400			
Plan	563	0.8	3072 1,475	800		2759		08×	2446	00×	<u> </u>	9961	800 x 3	362	600	
	-	0.6	3042	1200		2663 2759	1200 ×20		1514	2002		1351	1202	237		88
		0,4	(955		2,400	130			80			82	1	300		
		1.0	638			293			560		200 x3	560	200	403	200 200) (
		0.9	969		40× 04			6 4	J B27		400 × 50	1,814	400 × 5	=		
	1 988	0.8	1752	80		2074	800		I 435		201 201	1,229	800 x 2	189	CO3	3
		0.6	6181	1,200 x2		2,186	1,200 x 2		761	1,200		642	1200	85		
		0.4	1,439		2,400	53			60			49		136		
1		0.1	352			169			381		200 x 2	381	200	225 225	200	4
		6.0	436		400 × 20			400	1,082		400 x 3	1201	400 x3	=		
	583	0.8	988	800		1326	800 * 2	1 1	831		Ser Ser	740	800	151	600	}
		0.6	2601	1,200 x2		1,619	1,200 x2	-	382	1200		289	1200	2 Z		
		0.4	6601						49			24		58		
		0.1	(32) 35			(58) 117			(49) 56		200	(49) 56	200	(181) 90	200	
	_	6.0	(180) 132		400 100	(18) 27		400	(271) 224		400	(271) 224	400	(12) 19		
	1 979	0.8	(420) 385	800		(5) 1) 837	800		(170) 1014	ADD 0	75 75	(1019) (271) 786 224	800	(96) 101		
		0.6	(832) 1,076	1,200 x2		(1304) 1573	1,200 x 2		(187) 441	1200		(136) 111	1,200	[2]		
		0.4	(644) 767						(18) 64			(15) 36		ဖ် လို့		
	DIS- TANCE	(Ka)		4. 0			8. 0			0.7			0.7		0. 0.	
	NA ME OF	EXCHANGE		64	СЕМРАКА РUTIH		GA	KEBAYUHAN (A)		CEMPAKA PUTIH ~	PULO GADUNG		PULO GADUNG 76. PRIOK (A)		1-	CILINCING
ĺ	SEC- TION	NO N	(ၜ			E		(۲		(<u>e</u>	(ଛ	

TABLE 7-5-2-(5)

LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (5 /I2)

Plan - No.2 1993	0.6 0.8 0.9 1.0	66			8	-1					~	1					
Plan - 1 993	0.8	66							Т			-1-				~	
P1 1933	┝────	66	0			_		80			33		Q Q Q	6		2002	
	9.6		õ	(400)	1,472	80	*	835		800 x 2	169			300	800		
	Ľ,	1 <mark>,</mark> 694		1,200 x 2	2312		80 1200	560			278			646			1,200
	0.4	324			355		1,200	73						52			
	1.0										7	Τ					
	6.0				8			œ			41		400 00	22		200	
988	0.8	ы	200	(400)	802	8		427		800	16			143 -	G	3	
	0.6	952		1200	1,427		1,200 x 2	135			192			369			
	0.4	132			226			39						29			
	0.1										80	T					
	0.9				8			ω			45		<u>}</u>	22		200	
983	0.8	36	80	(400)	403	80		961		800	93			6 -		222	
	0.6	518		1,200	887	I	1,200	55			154	T		262			
	0.4	29			135			22									
	0.1										(0)						
	0.9										(56) 47		201	(12) 19		8	
679	0.8	271 27	20 20	(4 00)	(197) (721)	800					(102) ((146) 267	2 2		
-	0.6	(305)(27) 202 27			(546) (489						(183) 209			(276) (532	Ť		
	0.4			• •	(72) (65										I		
DIS-	(Km J	'	5.0			 9		1	6.0			1.7			8.6		
							z			N			4 (A)			ģ	8
0 F	EX CHANGE		TG. PRIOK (A)	ΟΓ		РИТ	RAWAMANGUN		GUN	Ž PENGIL INGAN		PUTI	~ КЕВАҮОРА N (A)		PUTI		JAI INEGARA (B)
1	EXCH		PRIO	ANCOL		PAKA ∕	AWAN		AMAN	ENGIL		AKA	ЕВАҮ		AKA		I NE
NAME						22 CEMPAKA PUTIH	æ		(23) RAWAMANGUN	۲۵.		(24) CEMPAKA PUTIH	Σ Σ	:	25 СЕМРАКА РИТІН	2 :	3
SEC.	Ŷ				(8		(3)		(%) (*))		8)	

										01					
ار اہ (6		<u>•</u>			527		200 x3	309 309	20	×2					
CTION (6)		60			4			4					400 3000 (3000		
SECTION (6/12)	566	0.8	815	800	494	800		45		400	1229	800			
	1	0.6	635	1200	361		<u> </u>	142			1297 1229	200	X Z	681	400
ABL		0.4	221		8			39			157			4 8	1
9		0.			293		200 x 2	163)) 					
AN		60			4			6					2000 2000 (3000		
rer	988	0.8	575	800	390	800		45		400	881	800			•••••••
MET	51	0.6	352	1200	229	-		2			623	200	I	89	400
BY CONDUCTOR DIAMETER AND CABLE		0.4	68		<u>N</u>			31			142	1		5 D	
TOR		<u>.</u>			169	<u> </u>	200	6	002	<u> </u>					<u>.</u>
DUC		6.0			39			39	-				4500 8800 8800 8800		
CON	983	0.8	395	800	279	800	L	27		400	609	800			
٦	-	0.6	249	1200	68			97			418	<u>8</u>		4	400
		4.0	0	-	4	-		24			123 4	+-			4
CABLES		0.1		<u></u>				(57) 89	200	<u></u>	(94) 176	!			
		0.9						(27) ((35		<u> </u>			1400 1400 1400 1400		
SED	979	0.8	(208) 506	800				(31) (41			(491) (130) 654 424	800	400		
PROPOSED	51	0.6	(143) (2 398 5					0 0	+-		(328) (4 436 6	(200 B		(53) 121	400
		0.4 0	(65) (I- 130 3					(8) 15 (1	+-	. -	(95) (3 88 4	<u></u>	}	5	4
P	Dis-			 0.7		9.2		= -	5.5						
JST	<u> </u>	<u> </u>							ۍ س	_		~		(<u></u>
TABLE 7-5-2-(6) LIST OF	of	agni	Kehavaran (A)	ete	0 0(0)		Pasar Minggu		י יישראו אוואלאמ	Jagakarsa	(V)	3	p t a	Кећачогар(Д)	
2-((e	Exchange		Cipete	2	\$ 2	Isark					2 2	Kalibata	2.07	Tebet
- 5-	Sec- tion Norme	ш	Koho K		Кећ		4			ř	A a h		¥	Кећа	ц
LE 7	n co tio	No.		50		6			8		(ଟ୍ଥ		(B
TAB															

- 1107 -

7/2)

	:	LIJI VE FROPOSED CABLES	·																PIa	Plan-No 2	Plan-No2
Name of	Dis- tance	p1		197	6			-	8 6	Ω			-	988				ი -	ത		
Exchange	(Km)	0.4	0.6	0.8	0.9	0.1	0.4	0.6	0.8	0.9	0.1	4.0	0.6	0.8	6.0	0.1	0.4	0.6	0.8	6.0	<u>.</u>
Kebayoran (A)		(156) 221					242	=				361	105				542	346			
∼ Semanggi (A)	й. 0.0		1200					500					1200			L	<u> </u>	500			
Jatine aara (B)	<u> </u>	(88) 309	88) (680) (181) 309 1728 427	(181) 427			183	779	511			247	1188	816			342 1805	805 1	1129		T
č Tebet	4.5 Č		1200	800				1200	800				1200	800 × 2				×200	800 x 2		
Jatinegara(B)		(72) 251	(288) (205) 790 544	(205) 544	(52) 187	(29) 72	184	435	515	151	187	260 841	841	803	291	362	394 1925		1372 441	1 1	732
€awang	6.4		82	800	800 400	200		1200	800	800 400	200		1200	800	400	200		1200 x2 800 x2 800	×20 200	400	500
Cawang			(37)	(84) 264	(52) 187	(29) 72	ω	197	188	165	187	24	292	208	304	362	77	613	403 4	461 7	732
Pasar Rebo	9.0			800	400 200	200			800	400	200			8	400	× 20		8	8 8	400	200 x4
Pasar Rebo	l						32	55	102	51	121	4	88	117	45	235	72	165 1	36 3	39 4	429
ر Gandaria	ດ									400	200				84 8	×200			4	400	200 x 3

ιl		> - -										ľ					ł			Plan-No.2	N 9
Se Se	Sec Name of	DIs-			1979				-	983				-	988				1993	3	
No No	Exchange	(Km)	0.4	0.6	0.8	0.9	0.1	0.4	0.6	0.8	0.9	0.1	0.4	0.6	0.8	0.9	1.0	0.4 0.	0.6 0.8	3 0.9	1.0
(Jatineaara (B)		(15) 69	(33)	(124) 436			41	114	282			58	202	550			88 8(802 1055		
ন্দ	6	2.5			800					800					800				8		
	Klender											I		1200				12	1200 X2	~	
	Jatineaara (B)		(630) 779	(630) (64) 779 78				792	172	36			928 179	621	33		<u> </u>	1195 26	262 47		
(H)		ୟ ୯		1200				1	1200			!		1200				N.	1200	-	
	Jatinegara (A)																Ň	2400			
. <u>-</u> .	Kota (B)							325	37				507	68			~	700 205	5 8		
38		6.0												400						-T	
<u>9 </u>	Slipi							<u>.</u>	400	<u>-</u> · · · · · · · · · · · · · · · · · · ·			1200	2			<u>.</u>	1200 400	<u></u>		
	Kebavoran (A)								27				12	51				47 156	9		
(B)		7.5							400			<u> </u>		400	·			40	400		
	Kalibata	ج 7	(18) 31	(51) 94	(107) 254	(130) (94) 424 176	(94) 176	45	28	6 7			60	36	29			11 82	115 35		
a					400 (200)	400 (200) 200				400 400 (200) 200	400 000 000				400 400 (200 200	000 000			400 (200	400 400 (200 200	

- 1109 -

(S													
ଡ଼ି:		0.											
NON NON		6.0			=	400							
BY CONDUCTOR DIAMETER AND CABLE SECTION (9/12)	5993	0.8	29	4 00	24		υ]			20	1200 x 2 800 x 2	
щ	<u> </u>	0.6	134		150		139	400	231	600	2551	× 28	
CABI		0.4	49				122		287		1367		5
Q		0.1											
A A	_	0.9		<u></u>	4	400						<u> </u>	
ETER	1988	0.8	5 5	6 0	4						208 1607 1088	800 × 2	J :
AME	-	0.6	4 4		33			400		600	1607	1200 x2	
2		0.4	4				36 3		601		208		_
cto		1.0						<u>.</u>					
NDN	-	0.9			- 12	400		·					
ပ္ပ	5861	0.8	29	400	20 						227	800	_
ВΥ	_	0.6	47		27					600	1013	1200	
ES		0.4							4 5		8		
OF PROPOSED CABLES		1.0											
D	თ	0.9											
OSE	9791	0.8									(705)(505) 679 668	1200 800	
ROF		9 0				· · · · ·					(705 679	1200	
Ч		6.4				·							
	DIS-	(K K	. <u></u>	О Ю		10.5		۰ <u>۲</u>		5.7		2.8	
L		a		(B)	a a				â	unt			
(6)-	of	Exchange	: •	Jat (negara (B)	pran(, d u d	0	6 u d	gara (Rawamangun	(B)	्न	
\BLE7~5~2-(9) LIST	Name	Excl	Ξ	4) Kallbara Jatíñega) Kebavoran(A)	Cawang) Kalībata	C awa n g	Jatinegara (B)	Rawe	- Kata (B)	Ancol	
E7-	Sec N.	ÖZ	<u>`</u>	ž =	X X	<u>द</u> ्भ	×	<u>r</u>)	۲ ۲	T	×	(f)	$\left \right $
ا آ_ ه	 			<u></u>	<u> </u>	⊻	I`	¥	<u> </u>	T			

- 1110 -

1 (10/1	
SECTION (
R AND CABLE	
AND	
DIAMETER	
CONDUCTOR	
BΥ	
CABLES	
PROPOSED	
ЧОГ	
LIST	
TABLE 7- 5-2-(10)	

[2]																	
SECTION (10/2) PIGN-No2		0.1				100			400 x 2 2003				Τ	1			
ECTION Plan-No 2		0.9				705 207	2		400 × 2								
SEC	993	0.8	861		800×80		203	800		49	Q	(400)		1			
	-	0.6	738	1200		676 676	2		-	165							
CABI		4.0	518						_								
AND CABLE		0.1				070	242		200 X2								
A	~	6.0		•		~~~	ř T	4 00									
CABLES BY CONDUCTOR DIAMETER	8 8 6 8	0.8	616		3	<u> </u>	_	800		55	Sa	600					
AME	-	0,6 0	639	1200		Ş	603			151					•		-
		0.4	445														
CTO		0							8								
ng l		6.0				а и и и и и		400	}								
8	1983	0.8	447		2	<u> </u>		800		57		(400)					
BY	1	0.6	355 571	1200		9				143							
ËS		0.4	355														
ZABL		0.1				(53) 50	3		200	<u>0 0</u>							
	-	0.9				(11)		400	<u>}</u>	(107) (53) 280 169						<u> </u>	
PROPOSED	1979	0.B	(317) (543) (176) 365 737 258	5	8	(68) (121) (111)		808			SON CONTRACTOR	(400)					
P D D D D D D D D D D D D D D D D D D D		0.6) (543 737	1200		(68)	2			(177) 374							
i 1		0.4	(317 365						_								
ST (Dis- tonce	(Km)		6.4			14.2	, F			12.4						
		e							bua	(A)	•	Jatinegara(B)					
0	of	Exchange	(8		÷	;	ট		Cengkareng	oran		inega					
5-2	Name	Exc	Kota (B)	4	Pluit		Kota (B)	~	Cen	Kebavoran (A)		Jati					
ABLE 7- 5-2-(10) LIST OF	Z Sec ton ton	No.	¥	@				Ð		×	(@)			69			ß
ABL	Q∓=			<u> </u>				<u>¥</u> ⁄			J.		L	<u>v</u>	I		<u> </u>

•

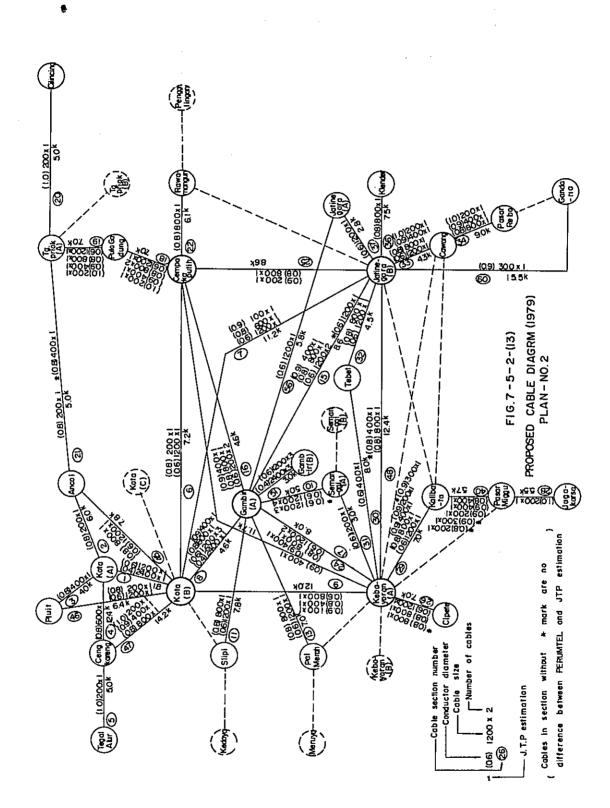
TABLE 7-5-2-(11)

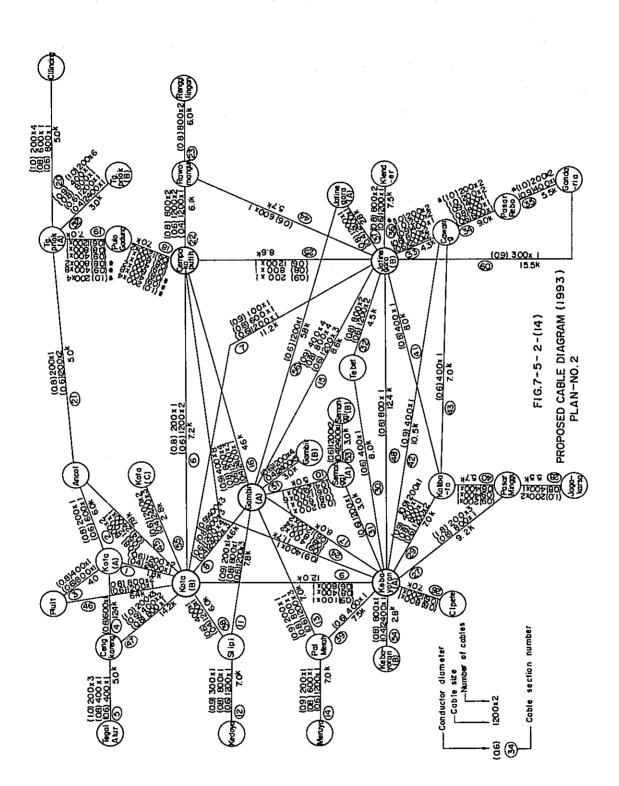
LIST OF PROPOSED CABLES BY CONDUCTOR DIAMETER AND CABLE SECTION (11/12)

	ľ					╞					f										
OF	DIS- TANCEL			6 2 6 1				-	983				-	1988	ŀ	-		-	£66	ŀ	
ANGE		0.4	0.6	0.8	0.9	0.1	0.4 0	0.6 0	0.8	6.0	0.1	0.4	0.6	0.8	6.0	0.1	4	0.6	0.8	6.0	0.1
	<u> </u>	(39121 (1968) 5447 2751	(B68)			 	5296 2560		22			520F 6727	5023	2			1014 3979		49		
(5) GAMBIR IA) 3	0. 0.		Fronzi			č	<u> </u>	120043			C		(200±3				 	prox4			
	<u>`_</u>]				_	<u></u>	167	332	57	249	r B	396	629	173	SE SE	618	201 105		695	567	1124
TG. PRIOK (A)	0.E					-			8	400	<u></u> L 			800	400				800	400	
TG. PRIOK (B)											20062		1200	1		00x4	200x4 2400	λ200	4		200x6
												782	l,644	61			1,108 2,441	2441	37		
53 SEMANGGI (A) E	2.0							·····	<u></u>				2005	Ţ			<u> </u>	<u>300x2</u>			
SEMANGG! (B)													;				2400				
	<u>بــــــــــــــــــــــــــــــــــــ</u>					<u> </u>	670	8	293			016	66	457			1,166	58	616	· ·	
54 KEBAYORAN (A) 2	2.8					<u>N</u>	2400					2400					2400				
KEBAYORAN (B)							I		800					800					800		
					ļ	4	4425	696				5224	1,369				5886 1854	854	·		
KOTA (B)	1.7					<u>N</u>	2,400		n		- 64	23002					2,400 X3				
√ K0TA (C)							 ; ;	1200					200x2					200x5			

•

1983 1988 1993	1.0 0.4 0.6 0.8 0.9	431 874	1200								
1988	0.6 0.8 0.9	625	1200					· · · · · · · · · · · · · · · · · · ·			
1983	0.6 0.8 0.9 1.0 0.4	374 274	1200							99	
	0.9 1.0 0.4 0	190 3								(32) (55) 53 109	┢
6 1 6 1	0.4 0.6 0.8 0	(142) (196) 148 197	1200					-		(20) (80) (32) 55 168 53	
Dis~ tance		(α Ω			<u>`</u>			I		15.5
Name of	Exchange	Jatinegara (A)	~ Gambir (A)								ימי הוחהפווויהר
Sec	No.	(20		62		8 5		(B)		Ċ





Five-Year Plan, the extension of 3,200 km of 100-pair conversion cable lengths is projected. This will be about 1.7 times of the cable length in the 4th Five-Year Plan.

In Table 7.5.2.(15), the total cable length under the 2nd Five-Year Plan shows a very high figure.

This plan considers the laying of cables with the maximum cable size in order to avoid increasing the number of cables in the cable routes. Consequently, the composition ratio of the maximum size cables will be about 89% at 100-pair conversion cable length, as shown in Table 7.5.2.(15). In order not to hold too many spare pairs over a long period as aforementioned, the case will arise where cables of other than maximum cable size will be laid but this will be 13% at 100-pair conversion cable length.

7.5.2.4 Situation in Use of Cable Conductors

The ratio of use of cable conductors assumed for each base year is 0.57 for 1979, 0.66 for 1983, 0.77 for 1988 and 0.83 for 1993. The reason for the low cable use ratio as of 1979 is that a tremendous amount of installation work will be implemented at one time and cables of the maximum size will be installed in an extended provision period of 15 years. The supposition is that from 1993 and onwards, the average use ratio of approximately 85% in the period from 1988 to 1993 will continue.

Generally speaking, in case the number of circuits in the cable section is very large, the circuit use ratio is high while on the contrary, the ratio becomes low when the number of circuits is small.

7.5.2.5 Number of Loading Coils of Each Cable Section According to Conductor Diameter

In principle, the number of pairs of loading coils shall be for a standard provision period of 5 years; however, since large numbers of loading coils will be concentrated in the manhole in the half loading spacing from the exchange office, it is desirable that the loading coils having a large number of pairs be used for the junction cables between the tandem exchange offices in the central part of Jakarta wherever possible. Furthermore, in consideration of maintenance, material management and the possibility of reduction in manufacturing costs through the unification of materials, the kinds of loading coils to be applied were determined as in the following.

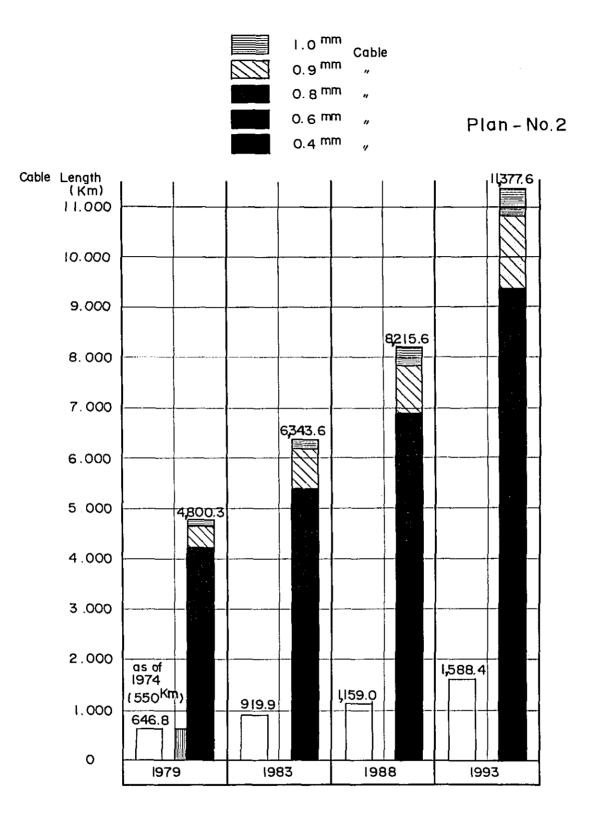
In accordance with the DC resistance limit and transmission loss assignment previously mentioned, it would be effective to insert loading coils in the long distance circuits where 0.8 mm, 0.9 mm and 1.0 mm conductor cables are utilized. The reason is because it would be more strongly influenced through the transmission loss limit than the DC resistance limit, and the insertion of loading coils in the circuits would be more economical than the use of cables of large conductor diameter.

TABLE 7-5-2-(15) TOTAL LENGTH

BY CABLE PAIRS

		r							Plan -		· · · · · · · · · · · · · · · · · · ·	<u>1.Km</u>	
Dia -	Cable	<u> </u>	979			1983			1988			1993	
	Pairs			eition		l 00 Pair Length	i citi on i		100 P air Lengt h	ເປັນກາ		l ©P alr Length	Compo sition Rare
	2400	15.4	369.6	7.7	23. 6	566.4	8, 9	40.8	979. 2	11.9	66.7	1600, 8	14.1
0.4	1200	-	_	-	-	<u> </u>	-	6.0	72. 0	0. 9	12.1	145.2	1.3
	Sub. Tota l	l 54	369.6	7.7	23.6	566.4	8.9	46.8	1051. 2	12.8	78.8	1746.0	15.3
	1200	182.8	2193.6	45.7	212.0	2544.0	40.1	267.4	3208.8	39. 0	351.8	4221.6	37. I
	800	12.0	96.0	2.0	12.0	96. 0	1.5	12.0	96.0	1. 2	35. O	28 0. 0	2.5
0.6	600	_	I	-	11.7	70.2	1.1	11. 7	70.2	0, 9	11.7	70.2	0.6
	400	ao	32.0	0.7	21.5	86.0	1.4	28.5	114. 0	1.4	28.5	114.0	1.0
	Sub Total	202.8	2321.6	48,4	257. 2	2796 2	44.1	319.6	3489. 0	42.5	427.0	4685.8	41.2
	800	156.4	1251.2	26.1	194.6	1556.8	24.6	243.7	1949.6	23. 7	319,3	2554.4	22.5
	600	2 3.6	141.6	2.9	40.6	243.6	3,8	40.6	243.6	3. 0	40.6	243.6	8.1
0.8	400	21.7	86.8	1.8	40. 2	160.8	2.5	40.2	160.8	2.0	40.2	160.8	1.4
	200	182	36.4	0.8	18.2	36.4	0.6	18.2	36.4	0.4	18.2	36.4	0.3
	Sub Total	219. 9	1516.0	31.6	293.6	1997.6	31.5	342.7	2390. 4	29. 1	418.3	2995.2	26,3
	400	91.7	366.8	7.6	151.9	607.6	9.6	193.7	774.8	9.4	312.1	1248.4	11.0
	300	15.5	46.5	1.0	21.0	63.0	1.0	21.0	63.0	0. 7	21.0	63.0	0.6
0.9	200	21.3	42.6	0.9	48.	96.2	1.5	48.1	96.2	1. 2	48.	96.2	0,8
	100	23.2	23.2	0.5	23. 2	23.2	0.4	23. 2	23. 2	0.3	23.2	23.2	0.2
	Sub Total	151.7	479.1	10.0	244. 2	790.0	12.5	286.0	957.2	11.6	404.4	1430,8	12.6
1.0	200	5 7.0	114.0	2,3	96, 7	193.4	3,0	163, 9	327.8	4. 0	259.9	5 19.8	4.6
	Sub Total	57.0	114.0	2. 3	96.7	193.4	3.0	163.9	327.8	4. 0	259, 9	519.8	4.6
	Total	646.B	4800.3	100	915.3	6343.6	100	1159.0	82 5.6	100	1588.4	11377.6	100

Plan-NO.2 (Unit:Km)



Right Side : 100-Pair Length Left Side : Cable Length

FIG. 7 - 5 - 2 - (16)

TOTAL LENGTH BY CABLE PAIRS (2/2)

.

Plan — No. 2

(⁴)

TABLE: 7-5-2-(17) CIRCUIT UTILIZATION TO CABLES

0.48 0.60 0.86 0.68 0.80 0.90 0.66 0.94 1.02 0.85 0.92 0.41 0.75 0.74 (3) 993 15,600 8 0400 8 1300 2300 800 8 0 0 0 0 0 0 0 0 0 4800 800 200 88 <u></u> 2600 460 (2) 1510 13994 7705 4124 1922 Ξ 445 855 9737 4671 3895 £811 737 ĝ ō ¥ 0.80 0. 72 0.54 0. 75 1.02 0.49 0.58 0. 86 0 0.98 0.35 0.68 85 8 0.61 0.97 (3) ö ö 988 5600 4800 2600 80 300 3400 1500 8 400 0246 2000 8000 3400 88 60 88 (2) 4708 919 749 6814 1403 ଅଟ୍ଟ 3809 607 570 3322 524 483 388 60 Ξ (0.63) 0.77 0.70 0.76 0.78 0.56 0.71 0.63 0.43 0.73 0.39 0.83 0.67 046 0.94 0.91 3 1983 (6800) 5600 3400 300 4800 <u></u> 600 1400 0061 8000 1300 2200 800 2800 4000 800 8 (2) 341 723 3508 4295 2417 282 1386 310 330 399 1059 746 2263 468 Ξ { 0.6 | } 0.9 6 (0.71) 0.91 (0.33) 0.71 (0.15) 0.33 (0.71) 0.53 (0.75) 0.89 (0.85) 1.01 (0.37) 0.85 (0.49) 0.63 (0.79) (0.62) 0.75 0.88 0.94 1.04 (0.94) 1.02 (3) 1979 (2858)(3600) 4226 4800 (1460)(2400) 3439 3600 (745) 1795 2000 1536 1900 (1881) 2067 (5399) 6368 7200 (800 1300 972 809 200 <u>6</u> 3600 200 ĝ (2) } (168) 201 (|94) 269 (966) 1152 (161) 193 3681 (142) 182 Ξ I 1,8 K Distance 5.0 7.0 ຕ. ບ 7.0 8.6 ດ ທີ 7.2 11.2 4,6 12.0 7.8 <u>6</u>0 40,4 12,4 C.S. E 9 (\mathbf{v}) • 6 \bigcirc 0 0 9 Ξ **(E) (†**) \bigcirc 6 2 • ~ Cempaka Putih ๔ ๔ Jatinegara 📵 ๔ ∽ Cengkareng Cengkareng ~ Tegal Alur A ~ Jatinegara A Kebayoran Kebayoran ۲ Pal Merah ≁ Meruya ~ Kedoya Section ~ Gambir ≁ Kota ∽ Ancol ~ Slipi ≁ Pluit 1 5 **(**) Cable Pal Merah ๔ • Gambir Gambir Gambir ÷ * Kota 2 * Slipi ٠ Kote

() : based on JTP estimation down side : based on Perumtel Supply Plan

- 1121 -

TABLE 7-5-2-(18) CIRCUIT UTILIZATION TO CABLES (²/4)

)			:						Plan	Plan - No.2
	C.S.			-	979		19	983		5	1988		1 993	5
CABLE SECTION	NO.	DISTANCE (km)	Ξ	(2)	(3)	1	(2)	(3)	Ξ	(2)	(3)	0	(2)	(3)
GAMBIR (Д) ∼ СЕМРАКА Р∪ТІН	(G	4.6	12,108) 2,395	3,600	(0.59) 0.67	3967	4,800	0.83	6,344	8,800	0.72	11,012	12,400	0.89
" ~ KEBAYORAN (A)	Ŀ	8.0	(1,891) 2,554	3,600	(0.53) 0.71	3,14	4,400	0.71	4,606	5,200	0.89	6 079	5,400	0.95
CEMPAKA PUTIH ~ PULO GADUNG	8	7.0	(1,596) 1,799	3,400	(0.47) 0.53	2725	4,400	0.62	4,643	5,400	0.86	8,148	9,200	68.0
PULO GADUNG ~ TG. PRIOK (A)	٩	7.0	11,490) 1,213	2,600	(0.57) 0.34	2505	3,600	07.0	4,294	5,400	0.80	7,447	8000	0.93
TG. PRIOK (A) ~ CILINCING	30	5.0	(222) 242	200	(1.1.1) 1.21	496	8	0:50	824	000,1	0.83	1,576	2,200	0.72
 ANCOL 	S	5.0	(332) 229	209 100	(0.83) 1.15	583	1,400 1,400 1,400	(0.36) 0.42	1,115	400	080	2,084	(12,800) 2,600	(0.74) 0.81
CEMPAKA PUTIH ~ RAWAMANGUN	22	6.1	1 815) 739	800	(1.02) 0.93	I ₄ 33	2000	0.72	2A63	3200	220	4,147	5,200	0.80
RAWAMANGUN ~ PENGGILINGA N	(£3)	6,0	I	I	1	281	88	0.36	609	8	0.77	1,476	1,600	0.93
CEMPAKA PUTIH ~ KEBAYORAN (A)	24)	11.7	(351) 406	004	(0.88) 1.02	ନ୍ନ	Ş.	0.75	331	400	0.83	487	400	1.22
 ↓ ↓ JATINEGARA (B) 	25	8.6	(434) 818	0001	(0.43) 0.82	403	8	0.41	563	8	0.57	1,017	2,200	0.47
KEBAYORAN (A) ~ CIPETE	26	7.0	(4) 6) 800	2,000	(0.52) 1.00	754	2 8001 2 0000	(0.94) 0.73	1066	2000	0.48	1,671	2,000	0.75
* ~ Pasar Minggu	27)	9.2		I		680	000'1	0.68	964	1,200	0.81	1,443	1,400	1.03
PASAR MINGGN ~ JAGAKARSA	2 B	5.5	(133) 190	200	(0.67) 0.95	277	600	0.47	396	600	0.66	576	8	0.72
КЕВАТОРАИ () ~КАLIВАТА	8	7.0	(1,138) 1,778	, 138) (2300) 778 2600	(0.49) 0.69	1,150	2,5001 2,600	(0.50) 0.45	1,646	12,300) 2,600	(0.72) 0.64	2,683	(3,500) 3,800	(0.77) 0.71
KEBAYORAN (A) ~ TEBET	30	8.0	153) 121	400	(0.13) 0.31	44	6 4	0.11	õ	400	0.26	237	8 4	0.60

TABLE 7-5-2-(19)

(0.46) 0.23 0,85 0.46 Plan - No.2 0.86 0.69 0.42 0.57 0.51 0.53 0.67 3 0.74 0.82 0.94 0.83 0.85 593 1,000 400 6,400 1,600 **4** 00 **6**0 1200 4,000 5200 2,800 8 1,945 2,800 3,600 § 80 20 1,504 913 518 5,418 4,864 203 267 3276 2286 841 212 185 82 888 0 0.95 0.16 (0.25) 0.13 0.10 0.18 0.75 0.66 0.36 0.22 0.15 0.73 0.39 0.92 0.41 0.81 3 1 988 (^{3/4}) 1200 88 000 400 2251 2,800 0091 0611 810 2000 ĝ § 2557 2800 1,40 1,200 575 1,600 8 2903 4,000 [2] å 526 466 63 125 б Г 8 Ξ 87 19 CABLES (0.20) 0.1*0* 0.19 0.54 0.08 0.74 0.55 0.83 0.07 0.94 0.57 0.14 0.21 0 0.61 0.91 I 1983 <u>р</u> 600 (500) (500) 253 1,200 473 2000 745 1,400 400 1,472 2,600 800 1,000 1,200 **4**00 400 **4** 8 600 2000 2 I UTILIZATION 102 361 362 437 27 76 57 45 1871 Ξ I (0.14) 0.46 (0.61) 0.67 (0.13) 0.19 (0.47) 1.24 {0.71 (0.58) 0.72 (0.80) 0.98 (0.22) 0.77 6 I I I L I I 979 ŝŝ (949) 2464 2,000 2000 (646) 1844 2500 1200 ន្ម័ 841 3 8 1 1 ł ł 1 ł I CIRCUIT 979 ((172) 615 (121 0) 202) 640 694) 857 (156) 221 Ξ I I 1 I T I 1 DISTANCE (km) 9.0 а.о Е 6.0 6 8.0 5.5 7.5 2.8 7.5 10.5 7.0 7.8 4.5 5.7 5.7 4 10 י ט ט ע ט 3 \$ 42 4 45 **(n)** (**3**2 (ge 8 **(B**) **4 (F)** (R) E (%) ◙ 0 \sim pasar minggn JATINEGARA (B) ~ rawa man gun € ~ PASAR REBO ~ JATINEGARA ~JATINEGARA KEBAYORAN (A) ~ PALMERAH SECTION ~ SEMANGGI ✓ GANDARIA ~ KLENDER KE BAYORAN (A) ~CAWANG ~CAWANG ~ CAWANG © ∽ancol ~ TEBET JATINEGARA B ∽sr IPI ~ JATINEGARA (B) JATINEGARA B KEBAYORAN PASAR REBO KALIBATA CABLE KALIBATA CAWANG KOTA \$ KOTA \$

TABLE 7-5-2-(20) CIRCULT UTILIZATION TO CABLES (4/4)

Plan-NO 2

								3										
0.2		(3)	0. 76	0, 93	(0, 54) 0, 27	1	1	0.90	0. 73	0. 75	0.58	0. 81	1.09				0. 76	(0,83) 0,83
Plan-NO.	2661	(2)	2800	2200	(400) (800)	1		16 800	6000	4800	3200	3600	1200				300	200300
ā.		0	2117	2044	214	1	1	15042	4398	3586	1840	7740	13 05				226	(165453)(199300) 165453 200300
	8	(3)	0.85	0.72	(0.52) 0.26	l	1	0.98	0.67	1.02	0.46	0.92	0.75				0.40	(0.77) 0.76
-	198	[2]	2000	1600	(400) (800)	1	1	10800	3200	2400	3200	7200	12 00				3 00	107641) 140200 107641 141200
		Ξ	1700	1153	206	1	Ι	106 12	2144	2445	146 6	6593	668				119	(107641) 107641
	3	(2)	0.69	0, 53	(0. 50) 0. 25		I	0.73	0. 73		0. 32	06 .0	0.47				0. 22	(0, 6 6) 0, 6 6
	198	(2)	2000	1400	(400) 8 0 0		I	10800	1600	1	3200	6000	1200				300	71733)(107800 71733 108800
		Ξ	1373	742	200			7878	1168	1	102.8	5394	564				66	(55717) 7 1733
	6	(3)	(0. 52) 0. 68	(0. 25) 0. 64	(0, 87) L. 05			(0.54) 0.76	1	1	1		(0.28) 0.29				(0. 62) 1. 29	(0.57) 0.77
	197	(2)	2000	140 0	(400) 800	1	1	0800	1	1	1	1	1200				300	(74300) 78800
		Ξ	(1 036) 1360	(353) 90 I	(347) 842			6780) 8198	Ι				(338) 345				187) 385	42 2 02) (74 3 00) 6 0 4 1 4 7 8 8 00
		Distance	6.4	[4 :2	12.4		1	3.0	3.0	2.0	2.8	1.7	5.8			5	15.5	
	ں ر	NO.	46	4 .7	(8)	69	ß	ହ	52	63	6	8	56	5 7	5 8	69	60	
		Cable Section	Kota 🖲 🖉 Pluit	بر د Cengkareng	Kabayoran (A) ~ Jatinegara (B)	J	1	Gamblr (A) ~ Gambir (B)	Tg. Priok (A) ~ Tg. Priok (B)	Semanggi (A) ~ Semanggi (B)	K®bayoran (A) ~ Kebayoran (B)	Kota B ~ Kota C	Jatinegara (A) ~ Gambir (A)				Jatinegara A ~ Gandaria	Total

Capacity of cable	Capacity of loading coil applied to each cable
2400 P	800 P + 800 P + 800 P
1200 P	600 P + 600 P
800 P	800 P or 400 P + 400 P
600 P	600 P or 400 P + 200 P
400 P	400 P or 200 P + 200 P
300 P	300 P
200 P	200 P
100 P	100 P

 Table 7.5.2.(21)

 Capacity and Combinations of Loading Coils to be Applied

Installation of loading coil will be done twice.

On the other hand, in connection with short distance circuits using 0.4 mm and 0.6 mm cables, as shown in Table 7.5.2.(22), there will be non-loading circuit section existing which satisfies both the limits of DC resistance and transmission loss.

7.5.2.6 Total Number of Loading Coils

The number of loading coils will be 484 as of 1979 and 1,314 as of 1993. Should these figures be converted to 100-pair coils, the number of coils as of 1979 will be 2,413 and 6,326 as of 1993. If small number of pairs of loading coils are numerously installed, a shortage in installation places will occur which would require modification of the manholes; in order to avoid such cases, the composition ratio of small pair number coils (100 pairs, 200 pairs and 300 pairs) as of 1979 will be approximately 23%.

It is natural that the number of loading coils increase in proportion to the telephone demand. On the other hand, the capital investment amount for loading coils is very low in comparison with the amount for other required materials and equipment such as cables, telephone poles, pipes and telephone sets. Moreover, when issuing purchase orders for loading coils, a sufficient advance period must be allowed, since the quantity is small. That is, the ordering of loading coils should be made earlier than the purchase orders for cables, etc.

7.5.2.7 Number of Terminating Cales and Loading Coils and MDF Length for Junction Cables

In accordance with Tables 7.5.2.(32) to (35), the maximum number of junction circuits will be terminated in Gambir (A) Exchange Office, and the number of terminated junction cables will reach 77 cables as of 1993.

When all cables including subscriber cables and toll cables are considered, cables in

\sim
N
2
\sim
1
N
1
വ
1
~
ш
\sim
ш
4
H

Conductor	Condit lon	Loss	Specif ied	d Value	E 0 -T	T - E O	MS EO	E0 + E0	EO - EO	TOLL -EO
(mm)		Rasistance	R , Km(r)	Loss	9.5 dB	5.5dB	7. 5 dB	15.0 dB	15.0 dB	7.0dB
	- u o N	Loss	1	1.69	- - -	* 2.37	* 3.55	* 7.69	* 7.69	* 3. 25
40	Log ding	Resistance	30.0		6.23	3.57	4.90	7.87	9.87	~
r S		Loss		1.229	6.51	* 3.25	4.88	10.58	10.58	* 4 48
	5	Resistance	305		* 6.13	3.51	* 4.82	* 7.74	* 9.70	777
	N on-	Loss		1.11	* 7.21	* 3.60	+ 5.41	* 11.71	* 11.71	+ 4.95
u C	Loading		130		14.38	8. 23	11.31	18, 15	22.77	18, 23
5		Loss		0. 557	14.36	¥ 7.18	* 10. 77	23.34	23.34	* 9.87
		Resistance	135		* 13.85	7.93	10.89	*17.48	* 21.93	17.56
	- u o N	Loss		0.826	9.69	4.84	7.26	15.74	15.74	6.66
8	Loading	Resistance	72		25.97	14.86	20.42	32.78	41. 11	32.92
)	l ondino	L 055		0.322	24.84	* 12.42	* 18.63	40.37	40.37	* 17. 08
-		Resistance	76		* 24.61	14,08	19.34	*31.05	+ 38.95	31.18
	Non-	Loss		0. 742	10.78	5.39	7.98	17.52	17.52	7.41
9 0	L o ading	Resistance	58		32.24	18. 45	25.34	40.69	51. 03	40,86
) j	l odioo	Loss		0. 267	* 29.96	* 14.98	* 22.47	48.69	48.69	+20.60
		Resistance	62		30.16	17, 26	23, 71	* 38.06	* 47.74	38.23
	Non -	Loss		0. 660	12. 12	6.06	9.09	19.70	19.70	8.33
	roading	Resistance	46		40.65	23.26	31.96	51.30	64.35	51.52
) :) oction	Loss		0. 219	* 36.53	* 18.26	+ 27.40	59.36	59.36	+ 25.11
	רטבנווע									

 ${f x}$ Distance limit based on specified value

Application zone of cable conductor diameter (km) 10 km zo km 30 km 40 km	7.21 1385 24.61 29.96 36.53	10 U D'ST 0.9T 1.0 L	7.IB 12.42 14.98 18.26	0.8 L 0.9 L 1.0 L		10.77 18.63 22.47 27.40	0.6 L 0.8 L 1.0 L 1.0 L	O.6NL	7,69 11.71 17,48 31.05 38.06 47.20	0.6NL 0.6L 0.8L 0.9L 1.0L	7.74 0.4L	7.69.9.70 11.71 21.93 47.74 59.20	0.4 0.6 L 0.8 L 0.9 L 1.0 L	9.87 I7.08 20.60 25.11	L 0.8L 0.9L 1.0L	U.B.W.L	- T (9.5dB) (1900 Ω) E0 E0 (7.5dB) (1500 Ω) T0LL E0 (7.0dB) (2400 Δ) E0 E0 (15dB) (2400 Δ)
A pp lica t lokm		0.4 NL 04 06 0.6 L	360 7.18	0.6 L 0.8 L	3.25 0.6NL	82		5.41 0.6NL	11	0.4 NL 0.6 NL	7.74 0.4L		0.4 NL 0.4 0.6 L NL	3.25.448 9.87	0.6 L	1.30 U.BNL	

FIG. 7-5-2-(23)

Table 7-5-2-(24) NUMBER OF LOADING COILS IN EACH CABLE SECTION .BY (1 / $_{6}$)

CONDUCTOR SIZE

Plan — No.2

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	ľ												ľ					Į				,	
	ti Se	Cable	Dis - tance		-	679					1983	_			_	1988					1993		
	No.		(Km)		0.6	08	6.0	0]	04	0.6	08	6.0	0.1		06	0.8	0.9	0.1	04	06	08	60	<u>0</u>
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	(Kntn (Δ)		2400x	1200×1				2400×1	1200x2				2400xl	1200x2				2400×1	20073		+ !	
Koru (A) Zooul Zooul <thzooul< th=""> Zooul Zooul</thzooul<>	$ \rightarrow $			(1×1)	(6x1)				(BxI)	(NL) (NL)				(IXB)	(NL)				(8xl) (6x2) 6x1)			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	(Kota (A)				200 x	_				1×82				600x	200x1				500×1	1× 8		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\overline{\mathbf{N}}$	~Ancol	60			[2x]				[[4x1]]	(2×I)				(4x1)	(2x1)				4x[]	2x11		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	1	Kota (A)				400x	_				48×1					1×00				1×00	1×00		
	3	~ Pluit	4.0			(12×1)	-				(2x I)					(531)	• ; ;			(4×1)	2×1)		Ì
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	1	Kota (A)				800×					600 x t					600 ±		1			NO XI		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	5	Čengkareng	12.4			([2×[])					(4x I) (2x I)					2x }					8 x])		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	1	Centamo						200×I			400x1		SOOK			400 4		20012		11000	500×I		200x3
Kola Kola (B) Izzox/ zoox/ Zoox/ <thzoox <="" th=""> Zoox/ Zoox/</thzoox>	<u> </u>	~ Tegal Alur	5.0					([2×[])			[4 x])		(2xi)	·		(4x1)		(2x1).2		(4 xl) (4×1)	<u> </u>	2×1)-3
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		Kata (B)			1200 x I	200 x				1200x1	200x1				1200x2	200×1			-	200x2	SOOx1,		
	3	aka Putih	て		(ExI)	(2X				(6x1)	(2x1)	·			(6x2) (NL)	(2 x I)			<u> </u>	6 x2) (NL)	(SXI)		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		Kota (B)			1200 ×	600x	1 100			20XI	600x1				1200X	800×1	1 × 00			1 X N N N	600 xl	8	
Koto (B) Room		~ Jatinegara (B)			(6xl)	(6x1)	(1×0)			(6u2)	(6x1)	(×)		•	(6x2)	(ExI)	[14]			(6x2)	(Ex1)	() × ()	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	1	Koto (B)		NO N	1200x4	800×	400x		24004	1200,41	800x2	400x1		2005	2004	BOOK2	00x2		2400,31	200%4	800x34	6X3	
Kota (B) 800xi 400xi 100xi 800xi 400xi 100xi 800xi 400xi 100xi ~ Kebayaran (A) $ _{2,0}$ $ _{4x1}$) $ _{4x1}$) $ _{1x1}$) $ _{8x1}$) $ _{4x1}$) $ _{1x1}$) ~ Kebayaran (A) $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,0}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$ $ _{2,1}$	2	bir (A)	4.6	(Bx I)	(6x2)2 (6x1) (NL)	(8x1)	(4 x 1)			(6x2) 2 (6x1) (NL)	(8x1) [4x]]	(4x1)			(6x2)2 (6x1) NL)	(8xl) (4x2)	(4xl) (2xl)			(NL)	8x()2 4x2)2	4xl)-2 2xl)	
~ Kebayaran (A) I2.0 (8x1) (4x1) (1x1) (8x1) (4x1) (1x1) Gambir (A) I2.0 izcox4 izc0x4 izcx40 izcx4 izcx40	1	Kota (B)			800xl	ş	ž				400x1	1×00			800x1	400xI	1×00		Ξ	800xI -	1 XOO4	00×1	
Gambir (A) Izcox4 Izcox4 Izcox4 6coxi Zooxi Zooxi <thzooxi< th=""> Zooxi Zooxi<td>$\overline{\mathbf{n}}$</td><td>yoran (A)</td><td>120</td><td></td><td>(1×8)</td><td>(4 xl)</td><td>(1×1)</td><td></td><td></td><td>(8×1)</td><td>(1 × F)</td><td>(1×1)</td><td></td><td></td><td>(BxI)</td><td>(4 x l)</td><td>(I X I)</td><td></td><td></td><td>(1×8)</td><td>4x1)</td><td>(1×1)</td><td></td></thzooxi<>	$\overline{\mathbf{n}}$	yoran (A)	120		(1×8)	(4 xl)	(1×1)			(8×1)	(1 × F)	(1×1)			(BxI)	(4 x l)	(I X I)			(1×8)	4x1)	(1×1)	
~ Semanggi (A) 5.0 [6x1] ((x,1) ((x,1)) (6x2) ² (6x1) ((2x1) ((2	7	Gomhir (A)			1200x4					1200x41	600x1	200x1		400xl	200x4	600x1	200x1		2400×11	200x6	11003	1×00	
2400×1 Numbar of londing Coil - 800P loading coil	$\overline{\mathbf{o}}$	~ Semanggi (A)	5.0		(Ex2) ((Ex1) (NL)	A1				(6x1) (6x1) (NL)	(6x1)	(172)		(1×8	(6x2)-3 (6x1)	(Exl)	2×1)		(8x2) (SX2)-5	6x1) (2x()	
		3)		<u>200 Р</u>	imbar Ioadi	ng lo Ig lo	nding I	Coil								2400) 		Numt Ver of	ber of cable	cable pairs	<u>ي</u>		

TABLE 7-5-2-(25)

NUMBER OF LOADING COILS IN EACH CABLE SECTION BY CONDUCTOR SIZE (2/6)

		ľ										ŀ					ľ		립	Plan - NO 2	2	ſ
Sec- tion	Sec- tion Cohle Section	Dis- tonce		_	979	_			-	983				-	988					993		
0N N		(km)	0.4	0.6	0.8	0.9	1.0	0.4	0.6	0.8	0.9	1.0	0.4	0.6	0.8	6.0	0.1	0.4	0.6	0.8	6.0	1.0
(Gambir (A)			1200 x1 800x1	BOOXI				1200/2	200/2 800x1	200x1				BOOK	200x1			ZDOX3 BOOX1	BOOXI	200x1	
Ð	S lipi	7.8		(6x2) (8x1)	(8×1)				(6x2) (6x1)	(1×1)	(IXI)			(6x2)2(8x1)	(1×8)	(2x1)			(Ex2)-3(Bx1)		(2x1)	
(Slipi										300x1			(200x1		1XOOE		-	200x1 800x1	BOOK	300x1	
2	č Kedoya	5.5									(3×I)		-	(ExI)		(J×I)			(ExI) ((BxI)	(3xl)	
(Gambir (A)		_	ZOOXI	BOOXI				(200x1 BOOx1		200x1			1200x2	800x1 200x1	200x1			200x3 800x1		200x1	
<u>e</u>	Pal Merah	7.0		(6x2)	(4 x I)				(6x2)	(1×4)	(1×2)			(6x2) (6x1)	(4x2) ((IXI)		~~	(6x2)-2(4x2) (6x1)		(IXI)	
(Pai Merah									600x1	ZOOKI				600x1	20041		_**	200x1	GOXI	2004	
4)	Мегиуа	7.0								(1×1) ((1×2)				2x1) ((I XZ)			(ExI)	(^{4x})	(IXZ)	
(Gombir (A)		-	200x2	BOOxI	400xl			1200x2 800x1		400x2			200x2 800x3 400x2	80043	400,22		_	200x3 800x4 400x4	800x4	400x4	
9	Jatinegara(B)	8.6	-	(6x2)2(8x1)		(4×1)			(6x2)-2(Bx1)		(4×1)2		-	(6x2)2(8x1)-2(4x1)-2 (4x1)	(8x1)-2((4x1)	4×1).2		-	(6x2)-3(8x1)-3(4x1)-4 (4x1)	(8xl)-3((4xl)	4×1}4	
(Gambir (A)		-	200x2 B00x1	BOOxI	400xt			1200.2	200x2 800x2 400x2	400x2	_6	g4cox1 (200x2 800x3 400x4	8003	400a4		2400×1	1200x3 800x4 400x8	800x4	400x8	
9	Čempaka Purih	4.6		(NL)	(4 x I)	(2xl)			(Ex2)	(8×1) (4×1) ((2x2) (4x1)		(Bx1) ((NL) (NL)	(BxI)-2(4 xI)-3 (4 xI) (2 x2)	(4 x I) 3 (2 x 2)		(IX8)	(6x2)2(8x1)3(4x1)-7 (NL) (4x2) (2x2)	8x1)-3(4x2) ((4 x I)-7 (2 x 2)	
(1		200%2	200x2 800x1	400xl		_	2002	200% B00% 400%	400x1		1	200x2 800x3 400x1	800x3	400xI			200x2 800x4 400x2	BOOM	400x2	
Ð		8.0		(6x2) (6x1)	(8x1)	(4xl)			(6x2) ((6x1) ((6x2) (8x1)-2 (4x1) (6x1)	(4×1)			(6x2)2 (8 x1)3(4 x1)	(1×8)	(4 X I)			(6x2)2(8x1)4(4x1)2	8x I) 4(4x 1) 2	
(Cempaka Putih			200×1	900x2	400x1	200x1 B00x2 400x1 200x1		1200x1	200x1 800x2 400x3 200x2	400x3 2	200%		j200xI	8002	800x2 400x5 200x3	200x3		2002	50033	200K2 800x3 400x9 200x4	20044
P	Pulo Godung	7.0	-	(e x I)	(8 x l) (4 x l)	(4 xl)	(2xI)		(E x I)	(B×I) ((4×I) ((4×1)-3(2×1)-2	2x1):2		(622)	(8x1) ((4x2)	(4×1)5(2×1)3	2xI)-3		(6x2) (6x1)	8x)-2 4x2)	(Bx1)2(4x1)-9/2x1)-4	2x1)-4
(Pulo Gadung				800x1	400xI	800x1 400x1 200x1		ROOZ	1×	800x1 400x3 200x2	200%2	-1	1200x1	8002	8002 400x5 200x3	200x3		200x1 800x3 400x9 200x4	800x3	400 A	200x4
	(P)	0.7		(Ex1)	(B×1)	(4 x I)	(2 X I)		(6 x l)	(1×8	(4×1)-3/2×1)-2	2×1)-2	÷	(6x2) (8x1)-2	(BxI)2(4x1)5(2x1)3	ZXI)3		(6x2) (8×1)3(5(1×2)6(1×6)E(1×8)	2x1)4
	Tg. Prick						200x1			6004		2002			600x1		200%2		BOOXI 600XI	600xI		200%4
٩	Čitincing	5.0					(2 ×I)			(4×I)	<u></u>	2×1):2			(1×1)		2x1)2	. 	(4xl) (4xl)	4x1)		tzxI)4

		0	F	<u> </u>	-				<u> </u>		<u> </u>	Γ			8	N	<u>∎</u> 8	R	1	T	Γ	
		0. 		 					L_			<u> </u>	<u> </u>	ļ	20003	2 20	8000	2 (1) 20			<u> </u>	
6)		0.9							400×I	(1 × 1)	Š	(2 × 1							Š	(4×1) (2×1)		
ETER (³ 6 Plan- NO.2	1993	0.8	lõ	(IXS)	900X2	(8xl) (4x2)	8000	(8×1) (4×2)			1X006	(I X 8)	900kl	(I X8)	8004	(BXI)	Ş	((2×1)	l X	(X8)		
E TEF Plan	-	0.6	200022000	(6x2) (6x1) (6x1)	2002	602)2					200x1800x1200x1	(6x2) (8x1) (2 x1)	200×1900×	(6x2)(8x1)						(6 x 2) (8 x 1) (4 x 1) (NL) (2 x 1)	<u>Š</u>	(2X2)
IAM		0.4	-		200x1200x2800x2	(6 x 1) (6x2)2 (8x1) (4x2)												† <u> </u>				-
с С		0.1				9									200X2	2(J)2	ð	(2×1)		- <u></u>		
сто	ſ	0.9							400X	(1 × 1)	Š.	(1×2			64	<u>a</u>		<u> </u>	Š			
BY CONDUCTOR DIAMETER (36) Plan-N0.2	988	0.8	ğ	2×1)	8 8	(2×t	BOOx	(4×2)	4	2	BOOKZOOK	(B×I) (2×I)	8 8	(I X [BOOx	(1×8)	8 ¥	(2×1)		(6×1)(8×1)(4×1) (2×1)		
С С	5 1	0.6 (ROOMZOOM	6x 2)(2x i	20028004	(6x2)(4x2) (6x1)	0	<u>7</u>			ă	<u>99</u>	2004/800x	(ExI) (BxI)	<u>o</u>	<u></u>	4	8	0 X X X X X X X X X X X X X X X X X X X	8) (I X	1 X O Q	([X])
		0.4	Ø	e)	2	<u>99</u>			L				<u>ā</u>	9				<u> </u>	Ø	<u>9</u>	Â	2
OF LOADING COILS IN EACH CABLE SECTION		1.0 0					-								ZOOXI	(1 × 2)	Š	(Ix				
EC	-	9.							×		×	<u> </u>			8	2	8	8	žž	≈e		
S		0							400XI	(1×t)	g	S (2×							8 8	<u>4 0</u>		
ABLE	983	0.8	8 Q	2xI)	1X008	(4×2)	800XI	(4 × 1)			BOOXIZOOX	(B×1) (2×1)	BOOK	(×8)	800xl	(B×I)	400 <u>x</u>	(1×2)	300 N	(I × I)		
C T	-	0.6	ROOM ROOM	(6x2)(2x1)	20041B00X	(Ex2)(4×2)		<u> </u>			<u> </u>	<u> </u>	2004 8004	(6 x I) (8 x I)		~		<u> </u>	200x1800x1288x	(6×1) (8×1) (4×1) (2×1)	400xl	(1 X 2)
EACI		0.4												<u> </u>					<u> </u>	~	4	¥
IN		1.0															SOX	(2×1)			_	
LS		0.9							400xl	(I × t)	ŏ	(IX)					Q	<u>9</u>	ž			
col	6	0.8	ZOOXI	(1×2)	800xl	(1×1)			4	5	BOOKIZOOK	(Bx I) (2 xI)	ğ	(I ×				 +	0x120	(6×1)(8×1)(4×1) (2×1)		
ING	1979	0.6	X	5	ğ	ব					8	Ø	2008/2002	(6×1) (8×1)					000	x I)(B	400 <u>4</u>	(IXI)
QAO													Ø	9					8	(6	- 3	<u>8</u>
		(km) 0.4										(0)				0						
	Dis- tance	(km		50		60		60	<u> </u>	11.7		8.6		7.0		9.2		5.5		7,0		8.0
NUMBER	Cable Section		Ta. Priok (A)	Ancol	Campaka Putih	Rowamangun	Rawamangun	Penggilingan	Cempakaputih	Kebayoran (A)	Cempaka Putih	25) Vatinegara (B)	Kebayaran (A)	Čipete	Kebayoran (A)	E Pasar Minggu	Pasar Minaau	Jagakarsa	Kebayoran (A)	Kalibata	Kebayoran (A)	Tebet
	fion Sec	NO	($\overline{\mathbf{y}}$	(9	(3	(8	(<u>8</u>	6	9	(\mathbb{P}	(8)	(63	(8)

TABLE 7-5-2-(26)

TABLE 7-5-2-(27) NUMBER OF LOADING COILS IN EACH CABLE

SECTION BY CONDUCTOR SIZE (4/6)

Ē

Plan - NO.2	1993	1.0 0.4 0.6 0.8 0.9 1.0	200x1	(ex1)	1200/2800/22	(6x2)2(8x1)2	1x2 200x2 800x2 400 x1 200x4	12 16 x2/2 (8x1)/2 (2 x2) (2x1)4	0x2 800x1200x1400x1200x4	1)2 (Bx1) (4x2) (2x2) (2x1)4	0x2 40 0x1 200x3	1)2 (4x1) (2x1)3	1200x1 800x2	(6x 2) (8x1) (4x1)	2400x(1200x1	(8 x2) (6 x2)	1200x1400x1	(6 x11(4 x1)	400xl	(2 x 1)	400x1200x1	
	89	6.0			22	- 24	2 00x1 800 x1 400 x1 200x2	6 x2) (3 x 1) (2 x2) (2 x 1)2	80 0x1 400x1 200x2	x2) (2 x2) (2 x))2	4 00x1 200x2	(4 x 1) (2x1)2	<u>z</u>								400x1 400x1	
	198	0.4 0.6 0.8	1200x1	(ex 1)	1200x1,800x2	(6x2)(8x1).2	12 00x1 800	(6 x 2) (3 x	68	4			1200x1 B00x1	(1×8)(1×9)	1200x1	(5x2)	200x 400x1	(6 x l] (4 x l)	400x1	(12 ×1)	40(-
	1983	0.4 0.6 0.8 0.9 1.0	1200x1	(NL)	1200x1 B00x1	(6x2) (8x1)	1200x1 200x1 400x1 200x1	(6 x2) (8 x 1) (2 x 1) (2 x 1)	800x1400x1200x1	(4×1)(2×1)(2×1)	400x1200x1	(4×1)(2×1)	800x1	(B x 1)	120021	(6 x2)	400x1	(4 × 1) (6	400x1	((2x1)	400x1200x1	-
	1979	0.4 0.6 0.8 0.9 1.0	1200x 1	(N L)	1200x1 800x1	(6x2) (8x))	1200x1 800x1 400x1 200x1	(6 x2) (8x 1) (2 x1) (2 x1)	BOOX 400X 200X	(4×1) (2×1) (2×1)			BOOxI	(8 x 1)	1200x1	(6 x 1)				·	400x1 200x	-
	Sec Dis- Tion Coble Socion 1015-	(km)	Kebavaran (A)	(31) Semanggi (A) 3. 0	Jatinegara (B)	(32) ~ Tebet 4.5) Jatinegara (B)	Cawang 4.3	Cawang	34 Pasar Rebo 9.0	Pasar Rebo	S Gañdarla 5,5	Jatinegara (B)	6 Klender 7.5	Jatinegara (B)	Jatineggara(A) 2.8	(B) Kata (B)	Stlpi 6.0	Kebayoran (A)	Pal Merah 7.5	Kalibata	

NUMBER OF LOADING COILS IN EACH TABLE 7-5-2-(28)

CABLE SECTION BY CONDUCTOR SIZE (5/6)

	ļ																Ì		Plan	о́ Ч	2	ſ
		Dis-			979					983				-	886				661	ю 6		
Cable Section			0.4	0.6	0.8	0.9	0.1	0.4 (0.6	0.8	6.0	0.1	0.4	0.6	0.8	6.0	1.0	0.4 (0.6	0.8 (0.9	1.0
ali hata							$\left \right $		4	400x1					400x1				4	400xl		
(4) Ja finegara (B)	(B)	0.0		<u> </u>					~	(1×2)					(IZXI)				(2	2×2)		
(ebayoran (A			\square	\vdash						4	400x1					400xl				4	400xl	
(42) Cawang		Ю.5									([12]					(1x2)					(1×2)	
calibata	-		\square											400x1				4	400x1			
Cawang		0.2		<u> </u>										2 ×1)					2 x2)			
Tatheonro (B)								9	600x1					600×1				9	GOOXI			
	<u>ต</u>								(1×2)				-	(×2)				<u></u>	(2xl) (4xl)			
(oto (B)			व	1200x1 800x1	1×00			21	1200x1800x1	1 X 00 I				200x2 B00x2	B00x2			2400x1 200x2 800x2	00x2 8	200		
45 An Col		8.	(6)	(6x1)(8x1)	(1 × E		-	Ĵ	(6x2) (8x1)	8×1)				6x2) 6x1)	(6x2)(8x 1) (6x1)(4 x 1)			8x2)(6x2)2(8x1))] [[8 xl) 4 x2)		
Coto (B)			15	1200x 800x	- ĕ			2	200x1 800x1	300×1			-	200x 800x1	800%	_		N	200 x1 800x2	8		
P [u] 1	Ψ	4	16	(6x2) (4x1)	(1×1			<u>.</u>	(6x2) (4x2)	4x2)				(6x2) (4x2)	(4 x 2)			1	(6x2) (4x2)	4 x2) 4 x1)		
Kota (B)				ک	20 × I 4	B00 x1 4 00x1 200x1	1×8			800x1 400x1 200x1	00 ×1				300 x 1	800 x 1 40 0x1 200 x2	200x2		ă	8 × 14	800 x 1 4 00 x 2 200x3	00x3
Cengkareng		4.2		3	3× 1) (-	(8x 1) (4x 1) (2x 1)	2 × []			8 x 1) (4 x 1) (2 x 1)	\$ × 1)(2 x I)			8 x I)	8 x l) (4 x l) (2x l) 2	2x1)2		_ <u> </u>	3 × 0	8 x 1) (4 x 1)-2 (2 x1)-3	x) 3
Kebayoran (A)		[]		ă	1 ×008					BOOxt					800x1				ē	BOOK		Τ
Jafínegara(B)	ŝ	12.4		<u> </u>	(1×8)				-	(x)					(×8)					(¥)		
																- <u>-</u>						
			-		+						-										<u> </u>	<u> </u>
			-				\neg															7

TABLE 7-5-2-(29) NUMBER OF LOADING COILS IN EACH

CABLE SECTION BY CONDUCTOR SIZE (6/6)

									. ,				,		<u>_</u>			, ,	
		0.1			200X6	(8x 1) (6x2) (4x1) (4x 1) 2x1)6		÷		. 1							1		
		0.9			ŏ	4x I)												3004	(] ¥ E)
0.2	ю 6	0.8			R S	1×1)			1×08	(4)(3)									
- NO.	61	0.6	0x4	2)3 U	8 X 0	x2) (5	N Š	212	×.	<u> </u>	272	2(2)	1x002	(6 x 2)		. .			
Plan		0.4 0	2400x5 I200x4	(1 N) 5-(1 N)	200x1 800 x1 400x1 200x4 2400x1 1200x1 800x1 400x1	1) (6;	2400x1 1200x2	(Bx1)(6x2)2	3	2	2400/3 200/2	(8 x3) (8 x 1) (8 x 1) (8 x 2)2	R	9)					
a.			₽. Q	LXB)	8		- Second	ŝ	2400x	(8×2)	8	<u>@@</u> Z							
		0.1			00 150	6													
	_	0.9			<u>§</u>	(4×1				_								300x1	(1 x E)
	988	0.8			1× 006	(4 × 1)			800x1	(4 x2)			-						
	-	0.6	5X00	(8 ×3) (8 ×2) (8 ×2) (6 ×1)	8	(6 x 2) (4 x 1) (4 x 1) (2 x 1) 4	2002	(6x2)2			8	5x 2) 5x 1)	IXOOZI	6 x 2)					
		4	2400x41200x3	x3)(6 x2)(6 L)·2	2	<u> </u>		<u> </u>	2400x1	8x I)	24002 2002	(8 x 3) (6 x 2) (N L) (6 x 1)	24						
		o O	4	887 887	22	2	┝─┤		X	8	X	<u>e</u> 5						$\left \cdot \right $	
		9 1.0			B00x1 400x1 200x2	(4 x 1)												×	
	01	o			6 0	(4 ×												300x1	(3 x l)
	8 8	0 8			BOO	[4 x I)			800x	(4 ×1)									
	-	0.6	12003 20043	(B x3)(6x2)2 (B x2)(6x2)2 (N L) (NL)							200x1	(6 x2)	1200x1	(6 x l)					
		0.4	15009	8 x 2) 8 x 2) N L)					2400x	8 xl)	2400x21200x	(Bx2) (NL)							
		0.1	a	222			╞╍╍┝		<u>o</u>	<u> </u>	Ň	50							
		6			-							·						300x1	(1× E)
	6	8 0.																30	Ũ
	197	5 O.8	3	20					_										
		0.6	24005/20043	(8×3) (8×2) (8×2) (NL) (NL)						-			12 00x1	(6 x 1)					
		0.4	2400	(8×3) (8×2) (NL)															
	Dis-	tance (Km)		3.0		0.5 5		2.0		80 ~i		1. 7		5.8 8					15.5
)		-		<u> </u>		B)			-	_				~	
				Gõmbir (B)	B	Tg. Priok (B)	(A)	Semanggi (B)	u (A)	Kebayoran(B)		ີວ	a (A	Gambir (A)				a (B	
	ŭ	5	ir (A	, mbi	riok	Pric	b b u	nang	010/	ó a y c	e)		60 O I	id E				egar	Gândarla
	a ida		Gambir (A)	ς Ω	Tq. Priok (A)	, ⊢ ,	Semanqqi (A)	se,	Kebayoran (A)	Ke	ota	Kořa (C)	Jatinegara (A)	່ອ				Jatinegara (B)	ς Ω Ω
	Sec Cable Certion			(2		8)		(23)		8	×	: (29)		20	E)	(28)	B	ר ה	8
	<u>ن</u>	= 2		<u>47</u>		<u>"</u>	L	цу I		<u>47</u>		<u>uv</u>		<u>ש</u>		U)	U)		۳

TABLE 7-5-2-(30)

TOTAL NUMBER

OF LOADING COILS

Plan-NO. 2

				Plan-NO. 2
Year	Loading Coil Pairs	Total Cable Length (km)	Number of Loading Colls (Loading Interval 1.5 km)	
	100	23.2	16	3.3
	200	138.8	93	19.2
	300	15.5	11	2. 3
1979	400	131.6	88	18.2
	600	263.4	176	36.3
	800	149.7	100	20.7
	Tota I	722.2	484	100.0
	100	23.2	16	2.3
	200	247. 1	165	23.4
	300	21.0	14	2.0
1983	400	251,6	168	23.8
	600	327.4	21 9	31.1
	800	184.3	123	17.4
	l ptoT	1054.6	705	100.0
	100	23.2	16	1.7
	2 00	346.2	231	24.5
	300	21.0	14	1.5
1988	480	341.6	228	24.2
	600	442.8	296	31.5
	800	233. 9	156	16.6
	Tota I	1408.7	94 1	100.0
	100	23.2	16	١.2
	200	458.2	306	23.3
	300	21.0	14	1.1
1993	400	508.4	339	25.8
	600	608.2	406	30.9
	800	348.9	233	7. 7
	Tota l	1967.9	1314	100.0
		- 1134	······································	····· - ···

Plan-NO.2

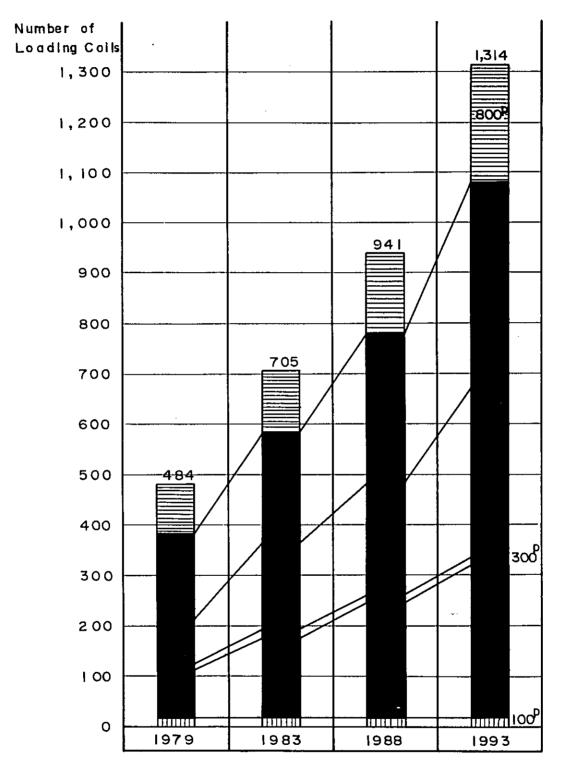


FIG. 7-5-2-(31) TOTAL NUMBER OF LOADING COILS

excess of 100 will be terminated in Gambir (A) Exchange Office.

Therefore, an intensive survey of the number of entrance cables, length of the MDF and the capacity of the manholes with loading coils nearest to Gambir (A) Exchange Office as well as the setting up a plan will be of prime importance.

The length of the MDF for junction cables at Gambir (A) Exchange Office will be 24.2 meters as of 1993, as shown in Table 7.5.2.(32). Therefore, the MDF for junction cables should be separated from that for subscriber cables.

The number of loading coils installed in the manholes nearest to the Gambir (A) Exchange Office, moreover, will become 101 coils. Supposing that even if the entrance cable were divided into four routes, about 25 loading coils will be installed in the same manhole. Therefore, a dispersion of loading coil manholes and entrance cables will be requested.

At the time when PERUMTEL expands the telecommunication facilities, it is recommended that sufficient space be given to the manholes, MDF, etc., based on the long-term expansion plan.

7.6 Comparison Between Plan No. 1 and Plan No. 2

As stated in paragraph 7.3, there is hardly any difference in the Plan No. 1 and the Plan No. 2 in regard to the installation cost. For example, the 100-pair conversion cable length as of 1993 in the Plan No. 1 will be 11,543 km while the Plan No. 2 will be 11,378 km which is only a slight difference. However, the centralization of the tandem switching equipment of the new system in the exchange offices of the Plan No. 2 will bring about problems on the following points.

- (a) Maintenance problem in case the MDF is lengthened.
- (b) Necessity of large-size manholes or telephone-tunnels.
- (c) Service restoration in time of trouble.
- (d) Difference in circuit routes between the EMD system and the new system.
- (e) Difficulty in purchase of sites for exchange office buildings.

For the reasons mentioned above, the Plan No. 1 is considered recommendable, even though the Plan No. 2 has an advantage in that losses which may arise from the separate installation of the new tandem switching equipment can be avoided by the installation of the equipment in one exchange office.

7.7 Conclusion

As can be seen from the proposed junction cable diagrams for the Plan No. 1 and the Plan No. 2, there will be a large increase in the installation of junction cables in the future. Consequently, in regard to the junction network, a full study of not only the outside plant facilities but also the accommodation limit of the inside plant facilities should be made and a systematic plan must be set up.

TABLE 7-5-2-(32)

TOTAL NUMBER OF TERMINATING CABLES LOADING COILS AND MDF LENGTH FOR JUNCTION CABLE OF EACH EXCHANGE (¹/4)

l			MUL		אטי ה	ייטאכ		CABLE	L 2	EACH	LENGIN FUR JUNCION CABLE OF EACH EACHANGE	בו פר		1 741	-	ď	Plan - No. 2
					TOTAL	COA	CONDUCTOR		DIAMETER		TOTAL	LOAL	LOADING COIL PAIRS	COL	PAL		MDF
Z	NO NAW EXC	NAME OF Exchange	TELE PHONE DEMAND	HONE TERMINATING JUNCTION ND CIRCUIT CABLE	JUNCTION CABLE	тт 0.4	ш Ш О.6 Ш	шш 0.8	Ε Ε Ο	тт 1.0	I.O LOADING IC COL	_ <u>~</u> ⊘	 ₽_02	<u>-6</u>		<u>~8</u>	200 200 400 600 800 FOR JUNCTION CABLE
	і кота	(A)	20.900	(4,487) 3,399	7.400	2400 x I	600x1 800x1 200x2	200x1 400x1 600x1			0		ы	ю	ю		2.4
	* 2	(8)	57, 100	(16, 773) 12, 707	48.800	200 x 2400 x 8	400x1 800x1 1200x4	200x1 400x1 800x8 800x8	1 00x2 400x5	200x3	60	2	ۍ س	ñ	24	9	14.8
	ñ	<u>(</u> 2	39,400	(7, 740) 5, 863	9,600	2400x3 1200x2	1200×2	<i>ute t e</i>			B				4	4	5.9
	4 ANCOL	0 L	28,300	(3,890) 2,947	9.800	2#00×1	600x I 1,200x4	200x 2 800x 2			15		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	г		<u>м</u>	3.1
	5 PLUIT	E	18.800	(2,607) 1.973	4.000		800x I 1200x I	400x 800x 2			2		-	4	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1.3
-	6 CENA	CENA KARENG	14.600	(1,627) 1,230	4,200		400x1	400x 600x 800x	400x 2	200×6	1		~	ۍ ۲		-	1.3
	7 TEGA	TEGAL ALUR	9, 300	(941) 711	1,400		400x1	400×1		200x3	S			~			0.6
~	8 GAMBIR	BIR (A)	43,700	{52,698) 40,074	80,40 0	2400 x IO	2400 x 10 1,200 x 29	600x1 800x17	200x3 400x17		101		٥	SC SC	20 49	56	24.2
	* თ	(B)	52,200	(15,041) 11,395	16,800	2,00x5 1,200x4	(200 x4				2				φ	ن	5.1
<u> </u>	IO SEMA	SEMANGGI (A)	36, 100	(8, 160) 6 , 182	16,400	2400x2 1200x9	6×002į	400 x I	200×1		50				-16	m 	5.1
l																	

I 1: INCLUDING MICELLANEOUS CIRCUITS

TABLE 7-5-2-(33)

TOTAL NUMBER OF TERMINATING CABLES LOADING COILS AND

MDF LENGTH FOR JUNCTION CABLE OF EACH EXCHANGE

(²/4) Plan-

															Ъ	Plan-No.2
L_				Totat	U	Conductor	Diameter	eter		Total	Loading Coil	្ត ទ្		Pairs		MDF
No.	Name of Exchange	Talephone Deman d	TermInating Circuit	Junction Cable	0.4 Mm	0.6 0	E B O	ш. 6.0	шо. -	Number of Loading Coits	4 Q	ч 02 202	°.0 10	4.00 00	<u>م 8</u>	P P P P P P P Cable
=	SAMANGGI (B)	14,900	(3,568) 2,702	4,800	2400×1	1,200×2				S				4	_	1.5
12	SLIPI	35,100	(4, 595) 3, 481	8.500	I ×002'I	400 x 200 x 4	800×2	200x1 300x1		<u>8</u>			-	۵۵ 	2	2.7
13	PAL MERAH	26.000	(3,107) 2.354	7,000		400x1 200x4	600x 800x	200x2		13		4	ro 	9		2.2
4	КЕДОҮА	10, 100	(1, 101) 833	2.300		1,200×1	800 x I	300x I		Ń					-	0.8
15	MERUYA	11.800	(1,183) 894	2.000		1,200×1	600x I	200x I		4		~~~	-	-		0.8
91	СЕМРАКА РUTIH	40,200	(9,351) 7,084	32,000	(200x 1 2400x 1	1200 x10 200 x1 800 x10	200×1 800×10	200x 1 400x 18	200x4	ŝ		<u> </u>	5	9	80	8.6
17	RAWAMANGUN	21,900	(3,322) 2.517	7,400	1 ×002'1	600x1	800x4			13				2	2	2.4
80	PULO GADUNG	6,900	(965) 731	6, 000		(200× 3	800x 2	400x2		01				<u>ب</u>		1.8
61	PENGGILINGAN	8,300	(1,476) 1,117	1,600			800x2			£			8		-	0.6
50	20 TG. PRIOK (A)	32,500	(5, 298) 4, 014	18.800 2400x 1	2400x I	800x1 1,200x4	200x 600x 800x 4	400x 10	400x 10 200x 14	39	<u> </u>	15	13	~	4	5.8

TABLE 7-5-2-(34) TOTAL NUMBER OF TERMINATING CABLES, LOADING COILS AND MDF LENGTH FOR JUNCTION CABLE OF EACH EXCHANGE (3/4)

		<u>ہ ۔</u>									[
0.2	Ч	Length for Junc- tion Cable (m)	7 .8	α. 0	6.7		0.8	- 8	1 . 1	0. 4	1.5	9.2
- NO.	Q₩	1 dig Le										<u> </u>
Plan-	rs I	<u> </u>			=	N		-	-		~	12
<u>a</u> .	Pair	<u> </u>	<u>N</u>		on N		2	~~~	2		4	23
	Coi 1	<u> </u>	Ň	ŝ	~	N		<u>м</u> .				~
:		<u>8</u>										-
ł	Loa di ng	တ် 2ထို ဒထို 4ထိုက်ေစာ စတို		4	œ			ں	2	ŕ		<u> </u>
					-				<u> </u>			
		Number Loadin Colis	Ξ	۵	36	4	ю	12	01	Crt	<u>ں</u>	54
		п. о	200x6	200×4	200x3				200×5	200x2		200x4
(3/4)	Diameter	0. 9 ^{mm}	400×1		100 x 1 200 x 1 400 x 5			200x2 400x2	400x2 200x1 800x1 400x1			400x1 100x1 600x1 200x1 800x12 300x1 800x12 400x5
-	r Dia	ш 8.0 О	800xl	600x	400x1 800x9	800x1	BOOxI	400x2 800x1	400x2 800x1	400 x		400x1 600x1 800x12
EXCHANGE	onducto	0. 6 ^m	2400x1 1200x1	80 OxI	400x2 800x1 1/200x6		200×1	400×1 1,200×2			2400x1 1200x2	600 xl 1200xl
	Cor	0.4 ^m	2400 ki		2400xl	2,400×1					2400x1	2,400x1
EACH	_	5	000	2 00	700	200	000	600	200	800	800	8 8
OF E/	Totol	Junction Cable	6,	2,2	2 1, 7	3, 2	2 , 0	5, 6	3, 2	ω	4, 8	30, 2
0		Terminating Circuit	(4, 398) 3, 330	(1, 576) 1,192	(5, 236) 3, 967	(1, 840) 1, 393	(1,671)	(3,175) 2,405	(I,159) 878	(576) 435	(2,644) 2,003	(5, 698) 4, 31 7
	 - - 	Telephone Terminating Demand Circuit	29,000	11,700	26,000	15,600	15,700	29,200	11,400	5, 800	17, 700	20,000
		Name of Exchange	Tg. Priok (B)	Ci lin ci ng	Ke bayo ran(A)	(B)	Cipete	Kalibata	Pasar Minggu	Jagakarsa	Jatìne gara (A)	" (B)
		о Х	5	22	23	24	52	26	27	58	59	30

TABLE 7-5-2-(35)

TOTAL NUMBER OF TERMINATING CABLES, LOADING COILS AND M D F LENGTH FOR JUNCTION CABLE OF EACH EXCHANGE (4/4)

	2~							1	<u></u>	1	T
S MDF	Length for Junction Cable (m)	2.6	0.9	0.9	l.5	0.6					
	₽ 8	ъ	-	-	N						
Pairs	P P P P P	4		2	4						
Ö	<u>г</u> 4	2	ท	1		-	l				
	∎₿					-					
Loading	_a X	Ξ	Ω		N	ñ					
Ľ	<u>a 8</u>										
Total	Number of Loading Coil	20	თ	4	80	S					
	EEO.	200x4	400x2 200x3			200x3					
Diameter	ш 0.9	400/3	400x2			300x1 400x1					
	шт 0.8	BOOX3	BOOXI	BOOX2	BOOX2						
Conductor	тт 0.6	400x1 800x1 1200x2	800x1	1200x1	400x1 200x2					-	
	тт 0.4										
Total	Junction Cable	8,000	3,000	2,800	4,400	1,300					
	Terminating Circuit	(3,444) 2,609	(1,587)	(1,945) 1,472	(3,503) 2,654	(1,067) 807			,		. <u></u>
	Telephone Demand	24,600	15,500	20,300	27,700	9,800					
	Name of Exchange	Cawang	Pasar Rebo	Klender	Tebet	Gandaria					
	ġ	3	32	33	34 45	35					

Attention should be paid to the following points in particular.

- (a) Exchange office establishment plan
- (b) Demand fulfilment plan
- (c) Tandem plan
- (d) MDF and switching capacity
- (e) Acquisition of road occupancy rights for civil works
- (f) Relation between road construction program and PERUMTEL's expansion plan.

As mentioned before, there is hardly any difference in costs between the Plan No. 1 and the Plan No. 2 and which plan would be the most suitable for network composition cannot be determined simply by comparision of costs. Therefore, as the result of the study of other factors such as switchover from the present system (5 terminating tandem \rightarrow one tandem), size of the exchange office building site, road occupancy for civil works, maintenance, etc., the Plan No. 1 is deemed desirable.

It is recommended that: firstly, PERUMTEL should endeavor to plan for improvement of the DC resistance limit due to difficulty in the acquisition of road occupancy rights for cable laying and for the saving of copper.

Secondly, 0.5 mm conductor cables should be used in the future; it is assumed that the use ratio of this cable will be about 22%.

Thirdly, two-way repeaters should be applied in the future.

As mentioned previously, a long-term plan will have to change in accordance with the environment and prevailing conditions. Therefore, in setting up the junction cable plan, it will be necessary to make revisions in compliance with the usable limits of the basic plan prepared by JTP while coping with the changing prerequisite conditions.

a a second de la constante de la

