3) Flyover passing over the railway and road and requiring an interchange

   Jl. Manggadua and Jl. Kepu Selatan

4) Flyover which creates a hazard for another road and thus requires the construction of a detour.

   Jl. Jend Suprapto

5) Underground required

   Jl. Angkasa

   For the foregoing, see the flyover drawings in Figs. 5.4.2.2 (1) through (9).

(5) Traffic management during construction

   The following flyovers will have the construction work carried out on one side first then the other side for management of traffic.

   (2) Jl. Gunung Sahari; (6) Jl. Garuda; (8) Jl. Jend. Suprapto; and (13) Jl. Pramuka

   This is shown in Fig. 5.4.2.3 (1), and the part shown by dotted line will be constructed, while traffic continues to flow on the other level which is the part shown as a solid line. When the flyover of one side is completed and put into service, the other side will be constructed.

   The following flyovers have a side road provided on each side to detour the vehicles as shown in Fig. 5.4.2.3 (2), while construction is being carried out.

1) Jl. Manggadua and Jl. Kepu Selatan

   On account of the interchange, it would be difficult to split the work.
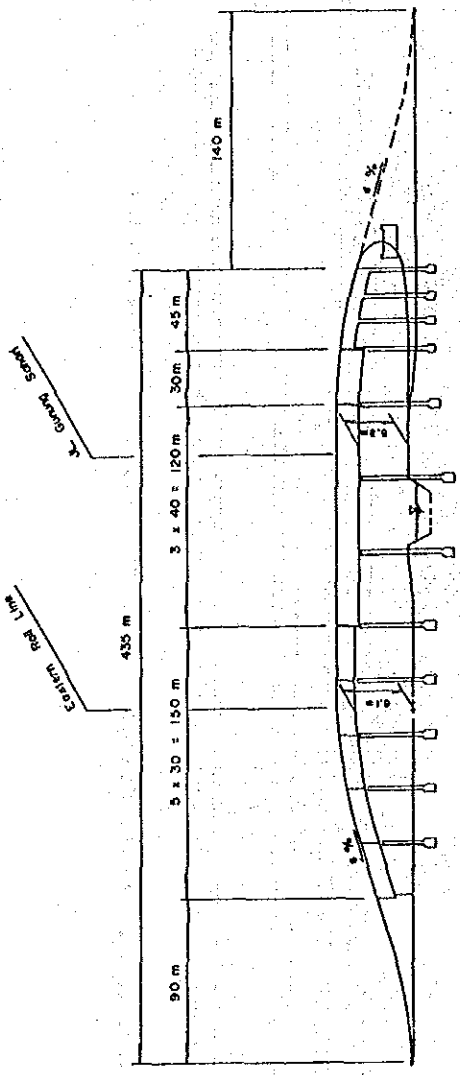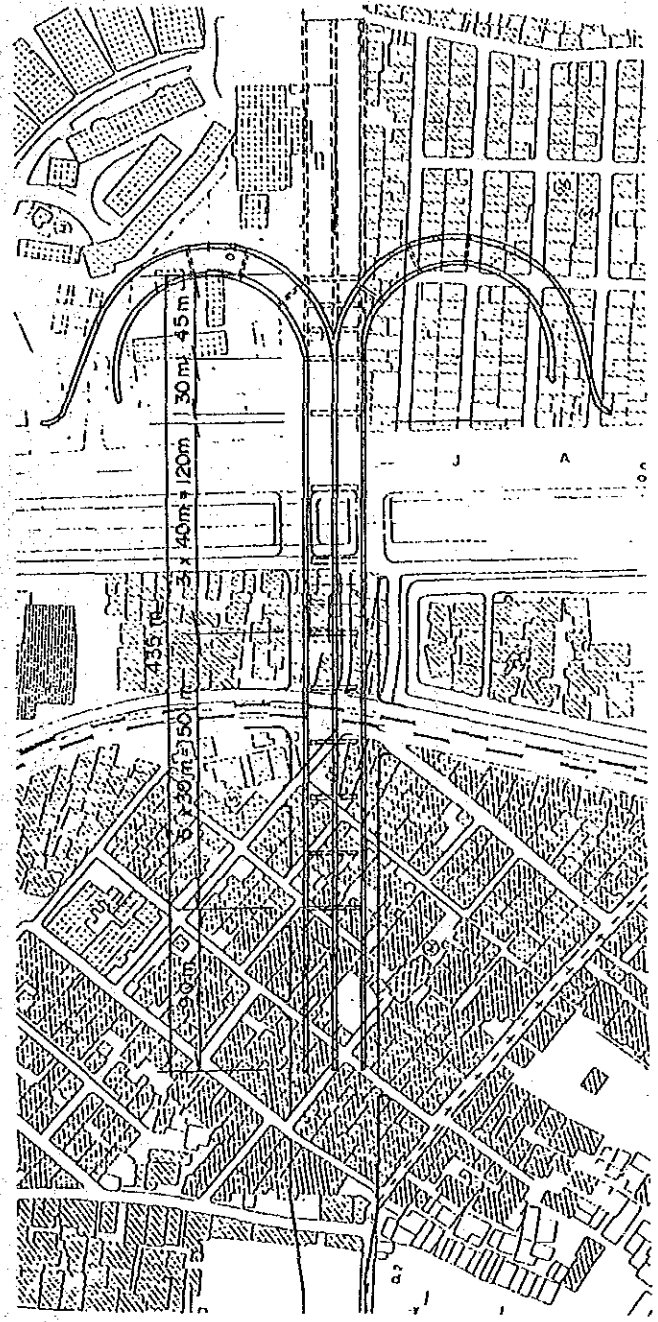
Fig. 5.4.2.2 Conceptual Design for Flyover (1) Jl. Manggadua
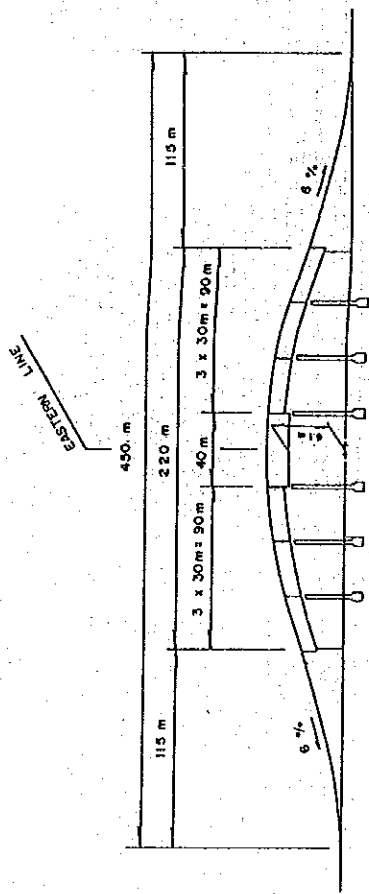
J. GUNUNG SAHARI
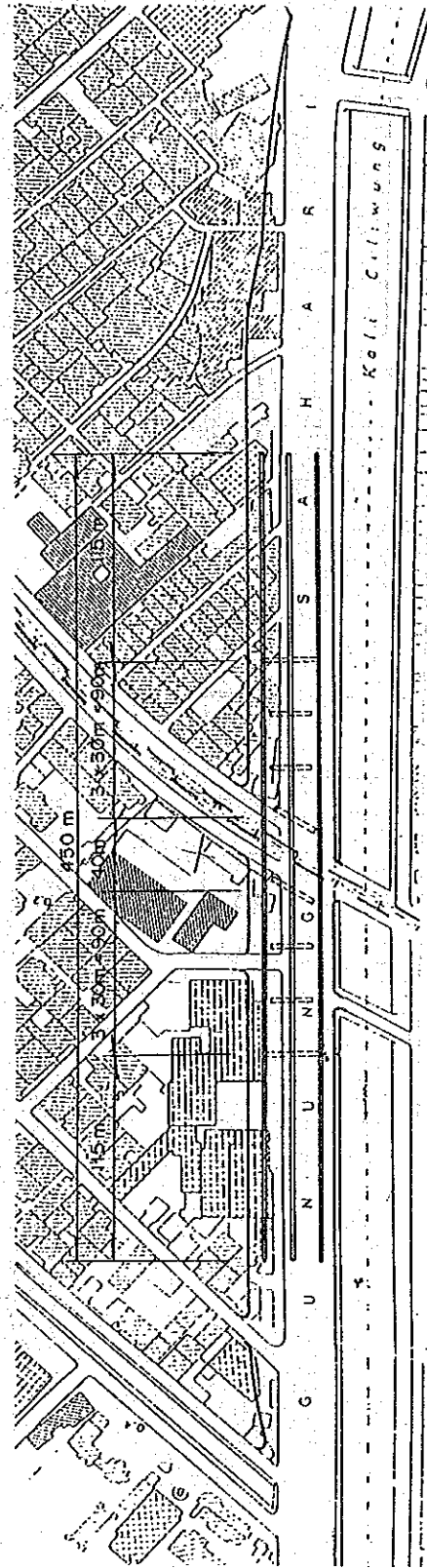
Fig. 5.4.2.2 Conceptual Design for Flyover (2) Jl. Gunung Sahari

EASTERN LINE

115 m | 230 m | 115 m

450 m

6%

3 x 30m = 90m   40m   3 x 30 m = 90m

6%

JL. INDUSTRI

400m   3 x 30m, 90m, 90m   3 x 30m, 90m

Gunung Sahari

10201
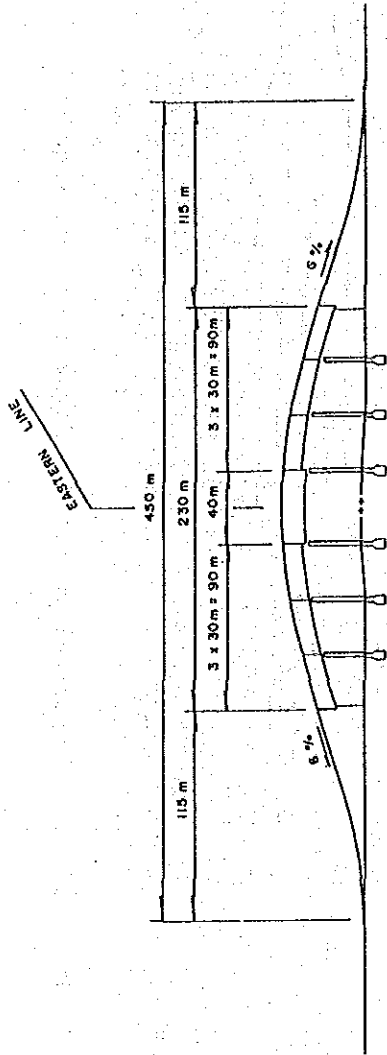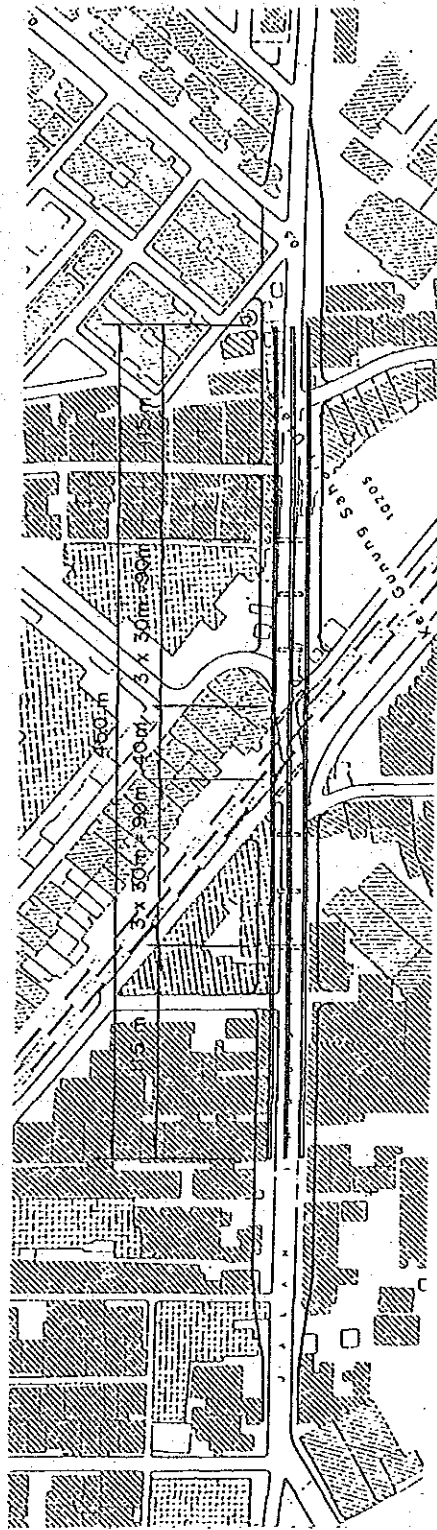
Fig. 5.4.2.2 Conceptual Design for Flyover (3) Jl. Industry
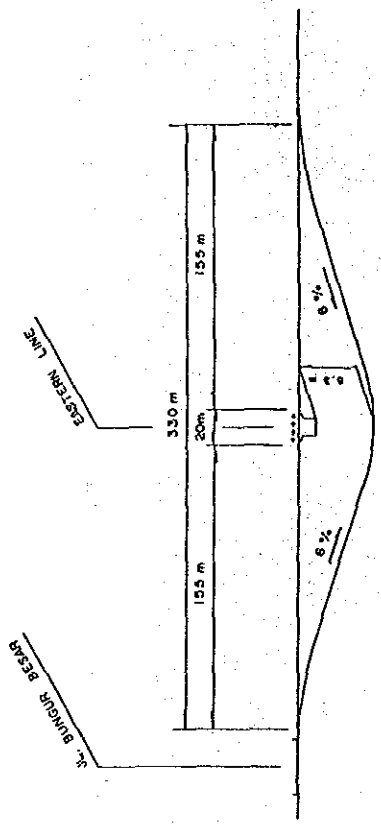
JL. ANGKASA
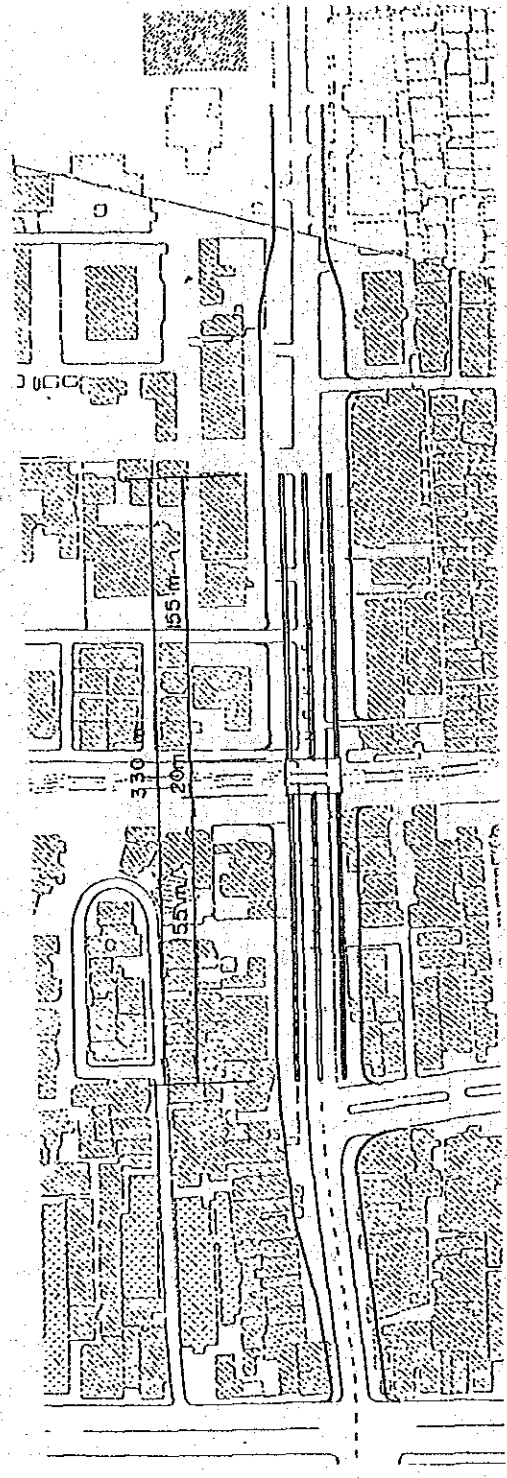
Fig. 5.4.2.2 Conceptual Design for Flyover (4) Jl. Angkasa
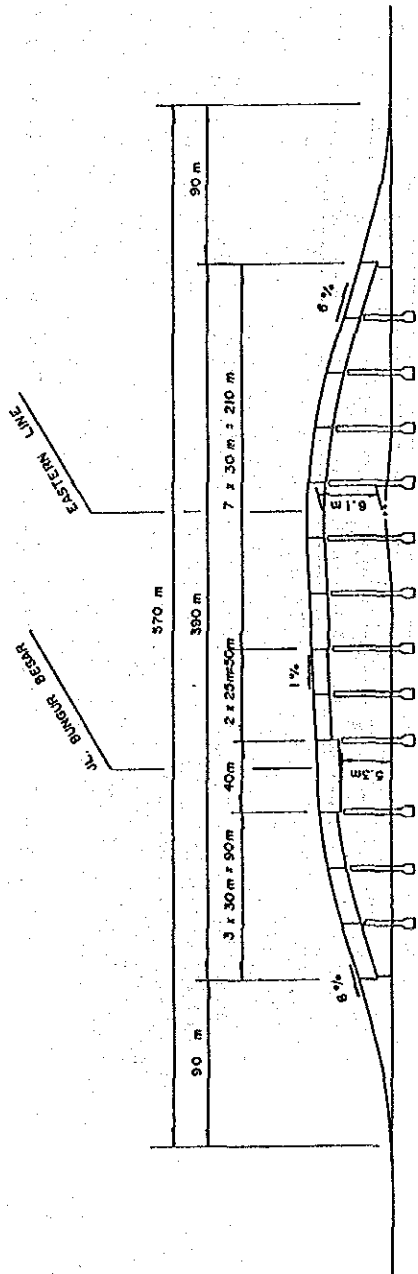
JL. GARUDA
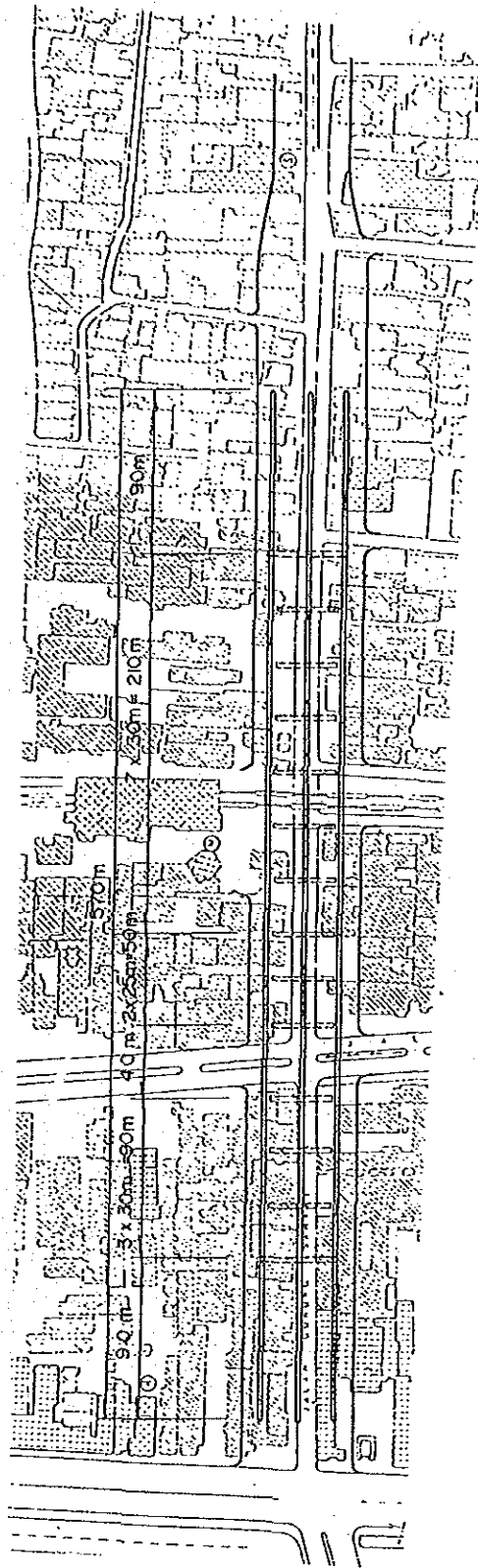
Fig. 5.4.2.2 Conceptual Design for Flyover (5) Jl. Garuda

Fig. 5.4.2.2 Conceptual Design for Flyover (6) Jl. Kepu Selatan

EASTERN LINE

474 m

102 m | 270 m | 102 m

2 x 30 m = 60 m | 3 x 50 m = 150 m | 2 x 30 m = 60 m

6 % | 6,1 m | 6 %
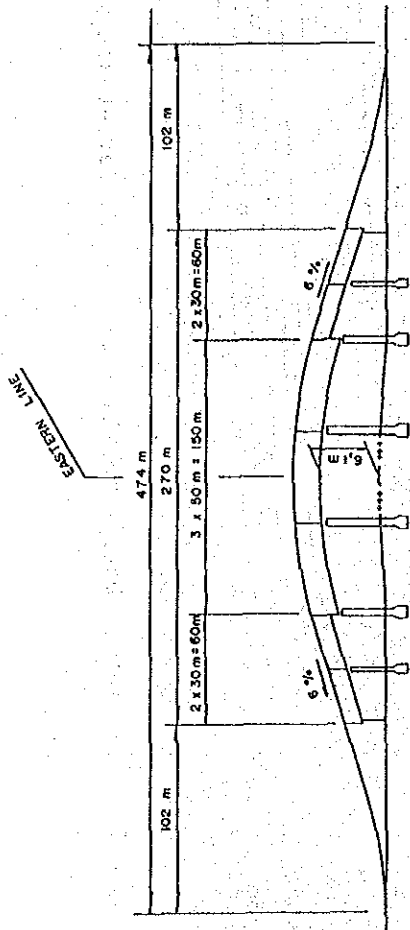
JL. LETJEN. SUPRAPTO
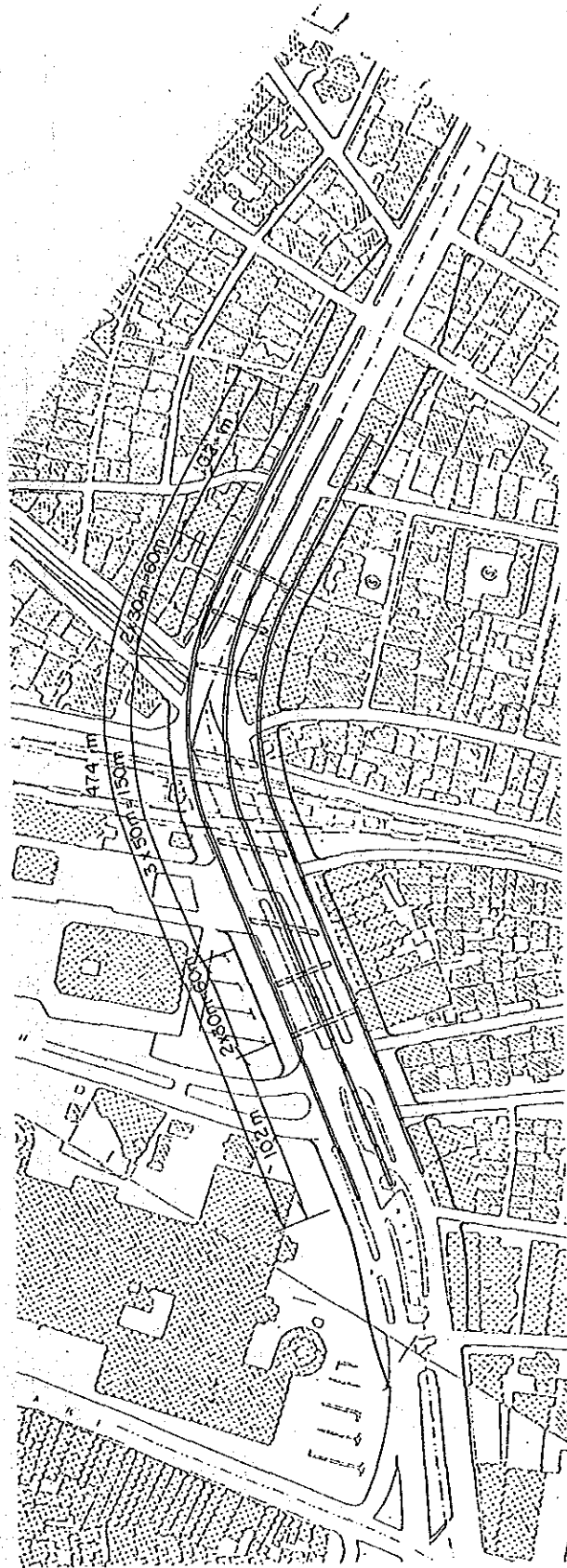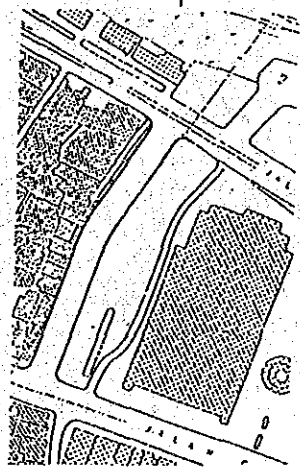
5.4.2.2 Conceptual Design for Flyover (7) Jl. Let. Jend. Suprapto
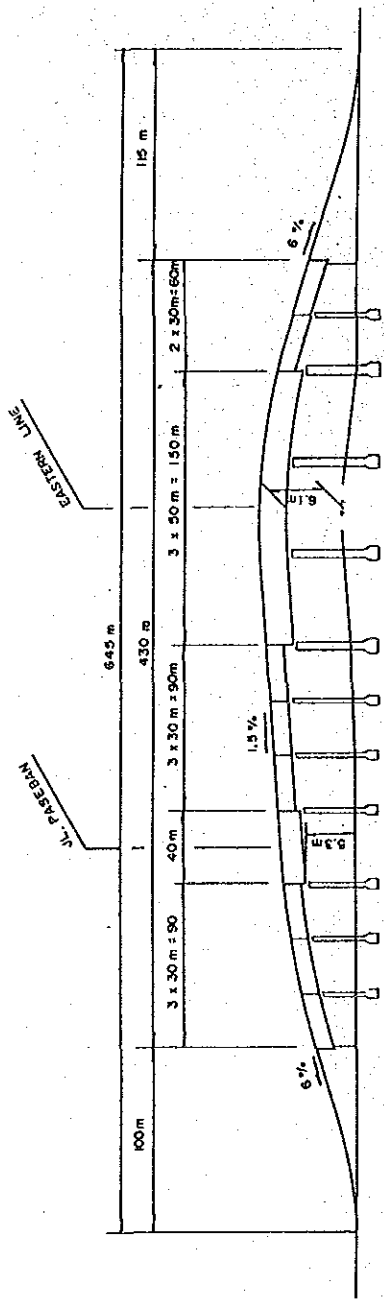
JL. PERCETAKAN NEGARA
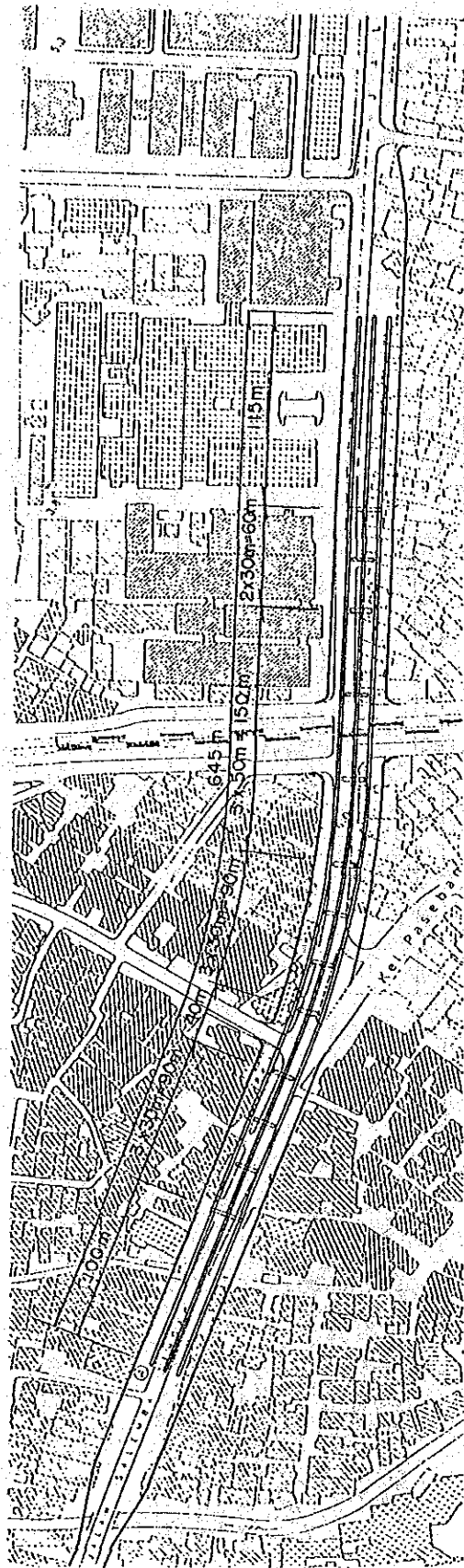
Fig. 5.4.2.2 Conceptual Design for Flyover (8) Jl. Percetakan Negara
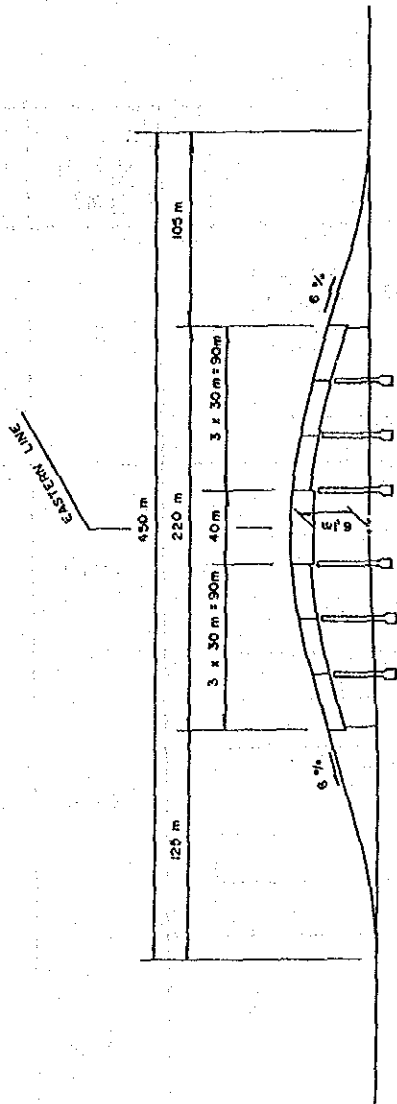
JL. PRAMUKA
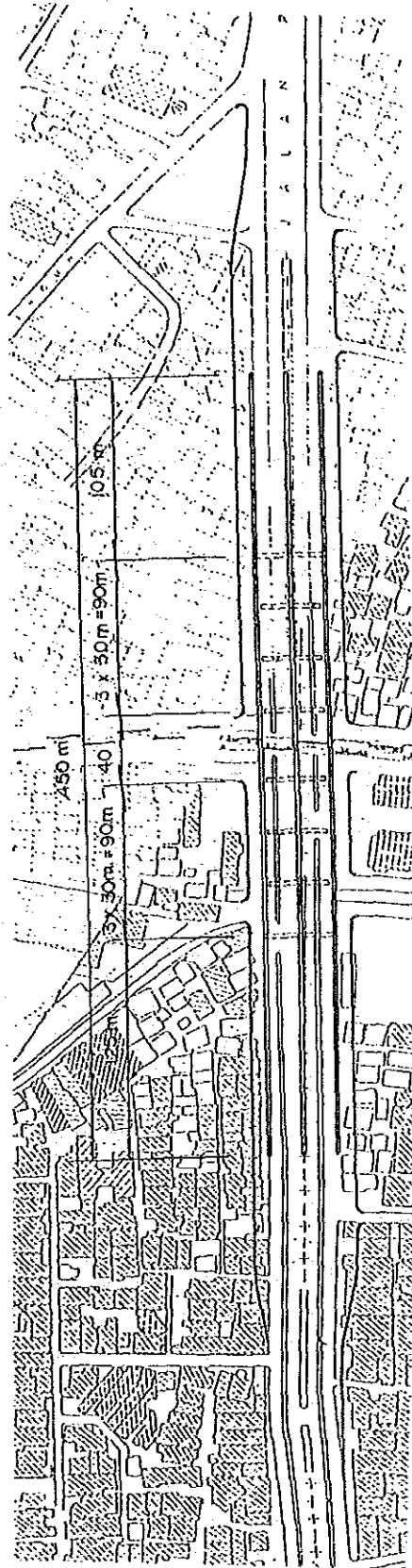
Fig. 5.4.2.2 Conceptual Design for Flyover (9) Jl. Pramuka

Road Name	Section (m)	Detour Width (m)	Detour Length (m)
②JL. Gunung Sahari		25	690
⑥JL. Garuda		28.5	720
⑧JL. LETJEN. Suprapto		30.5	710
⑬JL. Pramuka		28.5	690

Fig. 5.4.2.3 Detour Width and Length during Construction (1)
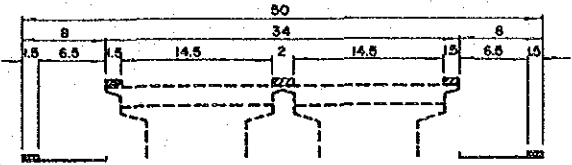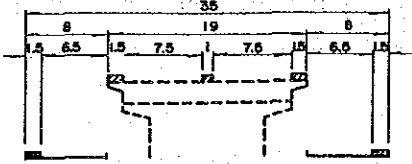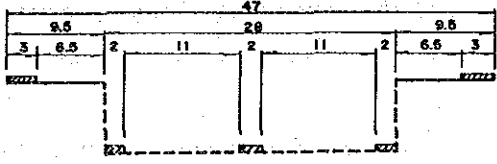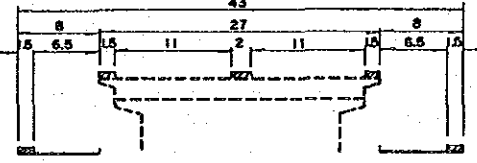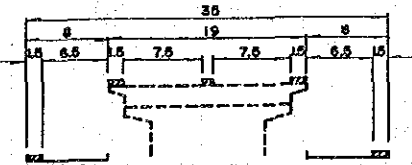
Road Name	Section (m)	Detour Width (m)		Detour Length (m)
① JL. Manggadua		left 8	right 8	440
		16		
③ JL. Industri		left 8	right 8	690
		16		
④ JL. Angkasa		left 9.5	right 9.5	570
		19		
⑦ JL. Kepu Selatan		left 8	right 8	360
		16		
⑪ JL. Percetakan Negara		left 8	right 8	890
		16		

Fig. 5.4.2.3 Detour Width and Length during Construction (2)

2) Jl. Angkasa

On account of the underground construction, it would be difficult to split the work.

3) Jl. Industri and Jl. Percetakan Negara

As the construction work is of small scale, it would be disadvantageous to split the work.

5-4-3 Track Elevation

(1) Basic plan

1) For the elevated track section, the following two alternatives will be examined with reference to the traffic volumes along the crossing roads.

Alternative 1   Kota - Gangsentiong

Alternative 2   Kota - Jatinegara

In Alternative 1, of the crossing roads between Gangsentiong and Jatinegara, Jl. Percetakan Negara and Jl. Pramuka will be of flyover.

The volumes of crossing traffic reduced by these Alternatives are shown in Table 5.4.3.1.

Table 5.4.3.1   Volumes of Crossing Traffic Reduced by these Alternatives

	Track Elevation		Flyover		Total	
	No. of roads	Traffic Volumes (2005) 1,000 vehicles (PCU)	No. of roads	Traffic Volumes (2005) 1,000 vehicles (PCU)	No. of roads	Traffic Volumes (2005) 1,000 vehicles (PCU)
Alternative 1	9	863	2	297	11	1,160
Alternative 2	15	1,246			15	1,246

2) Plan conditions

The standards shown in Table 5.4.3.2 were used in planning the horizontal and vertical alignment of the line. The construction gauge of PJKA is shown in Fig. 5.4.3.1.

Table 5.4.3.2 Railway Standards for Track Elevation Project

Item		Standard
Radius of Curve	Main Track Turnout Curve behind Flog Along Platform Side Track	600m (300m) 320m (240m) 600m (500m)
Maximum Gradient	Main Track along Platform Main Track between Stations	2.5 ‰ (3.5‰) 10 ‰ (14‰ , 25‰)
Track Center Distance	Outside of Station Inside of Station	4.0m 4.0m
Track	Type of Rail Sleeper Turnout Gauge Ballast Thickness , Min. under Sleeper Maximum Design Speed Maximum Cant	R 54 or UIC 54 Continious PC Sleeper Welded 12 # (10 #) 1,067mm 250mm 100 km/h 110mm
Minimum Width of Sub-ballast (embankment) or between Parapets (viaduct)		9.5m
Platform	Distance from Platform to Track Center Width of Iland Platform Width of Side Platform Height of Platform above Top of Rail Length of Platform	1.6m 8.0m 6.0m 0.95m , 0.80m 270m
Transition	Type Curve Length = L1 , L2 ,or L3 whichever is the longest transition curve , length , meters	Cubic Parabola L1 = 0.8 C L2 = 0.01 C V L3 = 0.009 Cd V C = Cant (mm) Cd = C ballance - C actual (mm) V = Max. Train Speed (km/h)
Vertical Curve Radius		4,000 m in the case where radius of horizontal curve R < 800m 3,000 m in the case R > 800m

Note : Inside of ( ) is applicable to an unavoidable case.

Fig. 5.4.3.1   Construction gauge
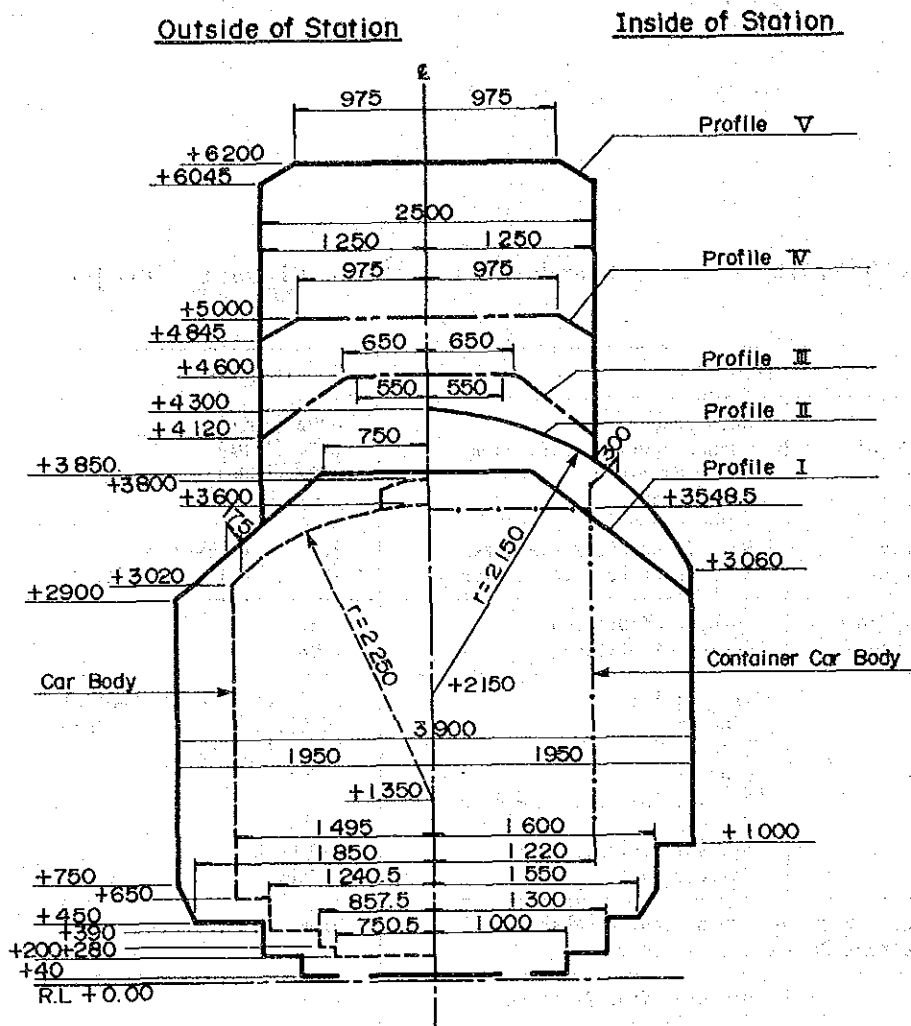
Profile   I   :   Minimum profile for a bridge with a speed restriction of 60 km/hour.

Profile   II :   Minimum profile for a tunnel and viaduct with speed restrictions of 60 km/hour.   Regarding bridges, there is no speed restriction.

Profile   III :   Minimum profile for new viaducts and new construction, excluding tunnels and bridges.

Profile   IV :   Normal profile for an electric railcar.

Profile   V   :   Normal profile for new viaducts.

3) Alignment

a) Horizontal alignment of the line

The horizontal alignment was planned for the eastern side of the Eastern Line along the existing line so that double-track operation can be continued during construction and in consideration of the following matters.

a. Use of land reserved for railway

There is land not yet used from about 1 km 400 m to about 2 km 100 m.

The section between Rajawali St. and Kemayoran St. is presently of four tracks, but the two tracks on the eastern side are barely used for freight-train operation. By shifting the freight-train operation to the Eastern Line, the land for the two eastern tracks becomes usable.

In the eastern part of the compound of Pasar Senen St. there is land usable for track elevation.

b. Development of the city is distinguished on the western side of Eastern Line, and when the acquisition of necessary land, effects of hazardous objects and ease of work are considered, the eastern side is advantageous.

c. With completion of track elevation, surplus land is produced on the western side of the Eastern Line and central areas of the city, so it is possible to use this land effectively.

d. The track layout was planned as below.

- Rajawali St.

In consideration of the branching toward Tanjung Priok and future increase of the tracks, an island type track layout of one platform and two tracks is taken.

- Pasar Senen St.

    In consideration of the departure and arrival of long distance
    trains, refuge for priority trains and handling of parcels, an
    island type layout of three platforms and five tracks is taken.

- Other stations

    In consideration of the number of passengers riding in and out
    and the frequency of train operations, a separate type layout of
    two platforms and two tracks is taken.

    A diagram of the horizontal alignment of the line is shown in
    Fig. 5.4.3.2, and that of the track layout shown in Fig. 5.4.3.3,
    respectively, for Alternatives 1 and 2.

b) Vertical alignment

The vertical alignment was determined in consideration of clearance
beneath the railway girder over the respective crossing roads,
girder height, avoidance of the competition of horizontal and
vertical curves and train riding comfortability.

Jl. Manggadua is located close to New Kampung Bandan St., and it is
difficult to put an elevated bridge over the road. Thus, flyover
of the road was taken. The grade at the starting point was set at
12‰ in order to clear Jl. Gunung Sahari. For Jl. Garuda, Jl.
Jend Suprapto and Jl. Pramuka, the bridges would be of a long span,
and so they were designed to cross the respective roads in two
spans with a pier constructed on the central median strip and thus
prevent the bridge from becoming too long.

Crossing roads and required formation level heights are shown in
Table 5.4.3.3.
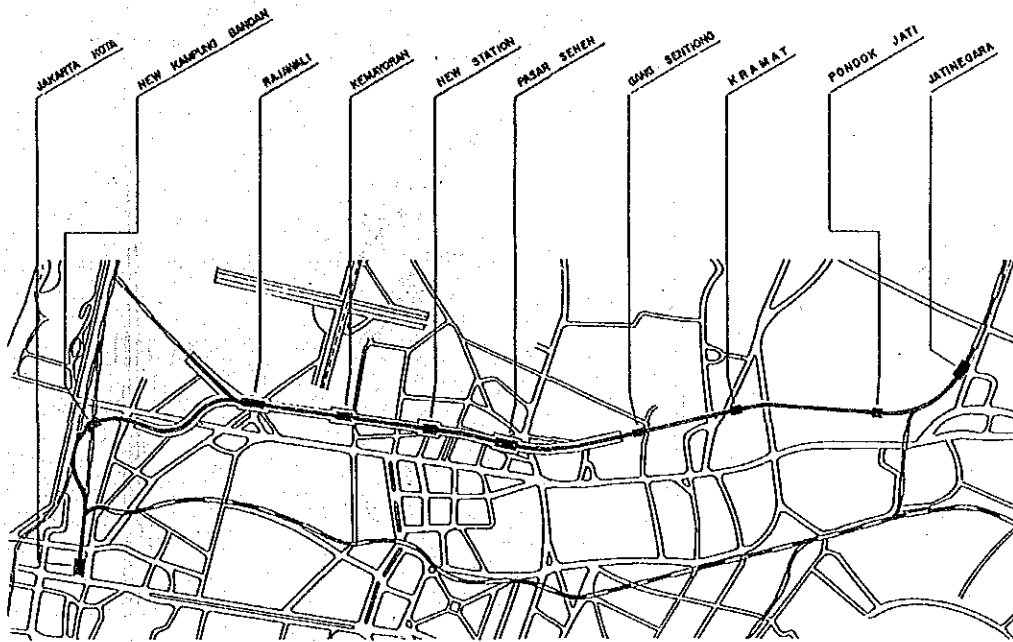
ALTERNATIVE 1
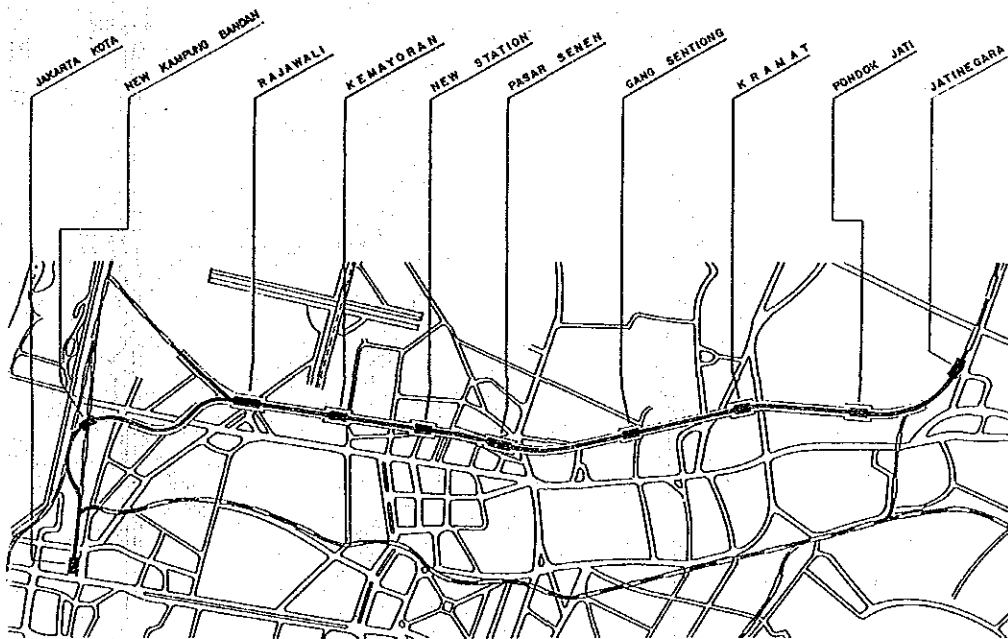
ALTERNATIVE 2

Fig. 5.4.3.2 Horizontal Alignment of the Track Elevation

ALTERNATIVE 1
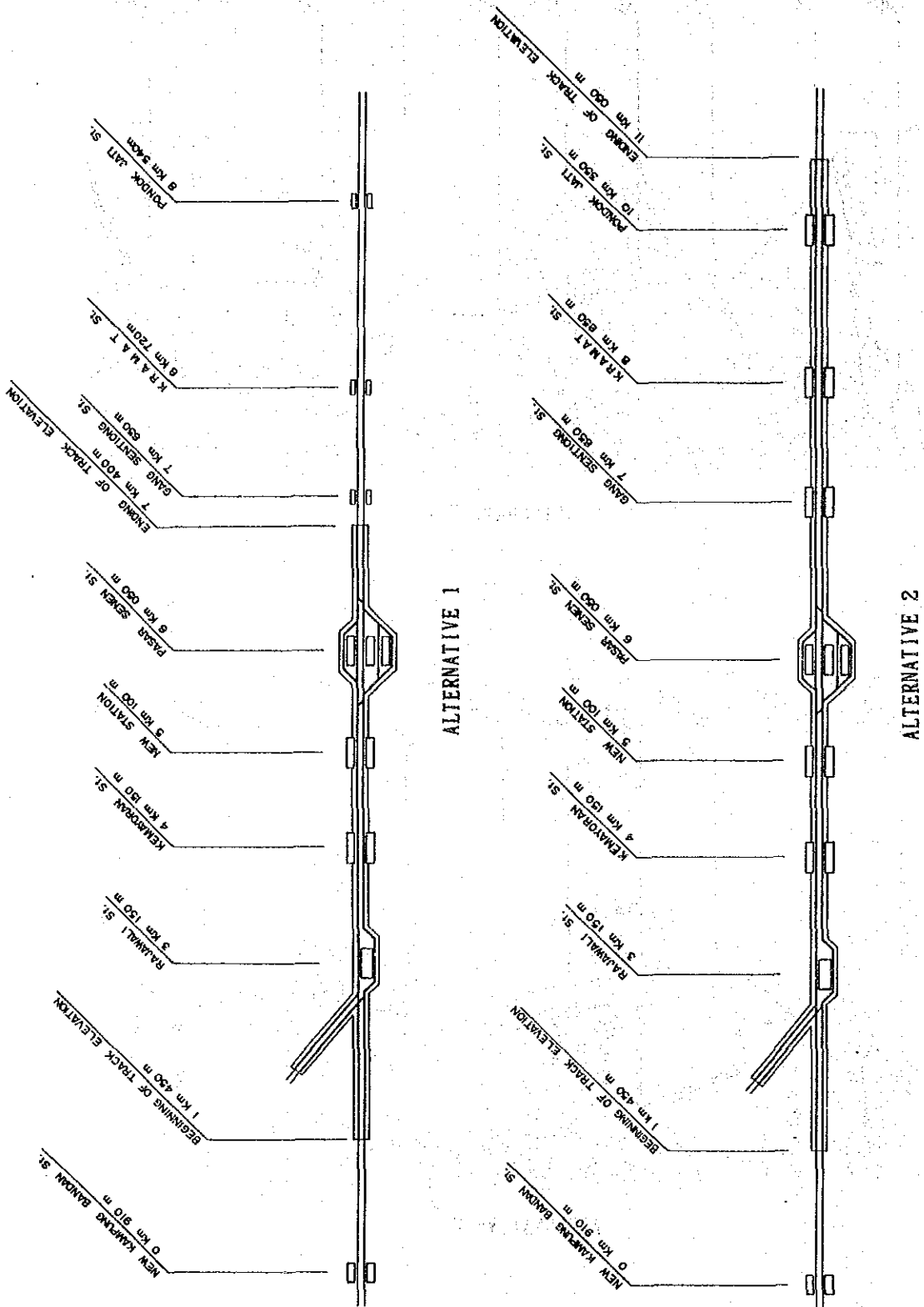
ALTERNATIVE 2

Fig. 5.4.3.3 Track layouts of the Track Elevation
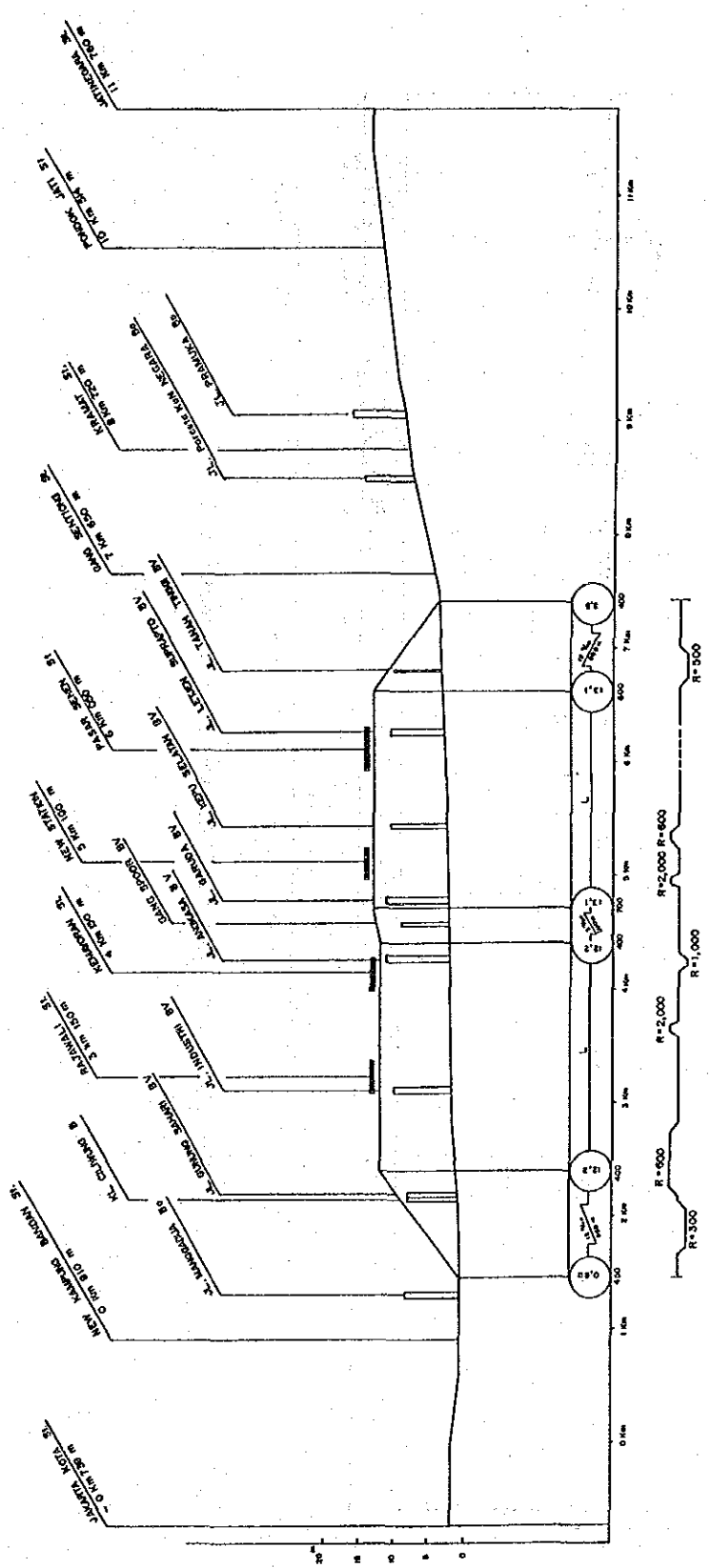
Fig. 5.4.3.4 Vertical Alignment Alternative 1
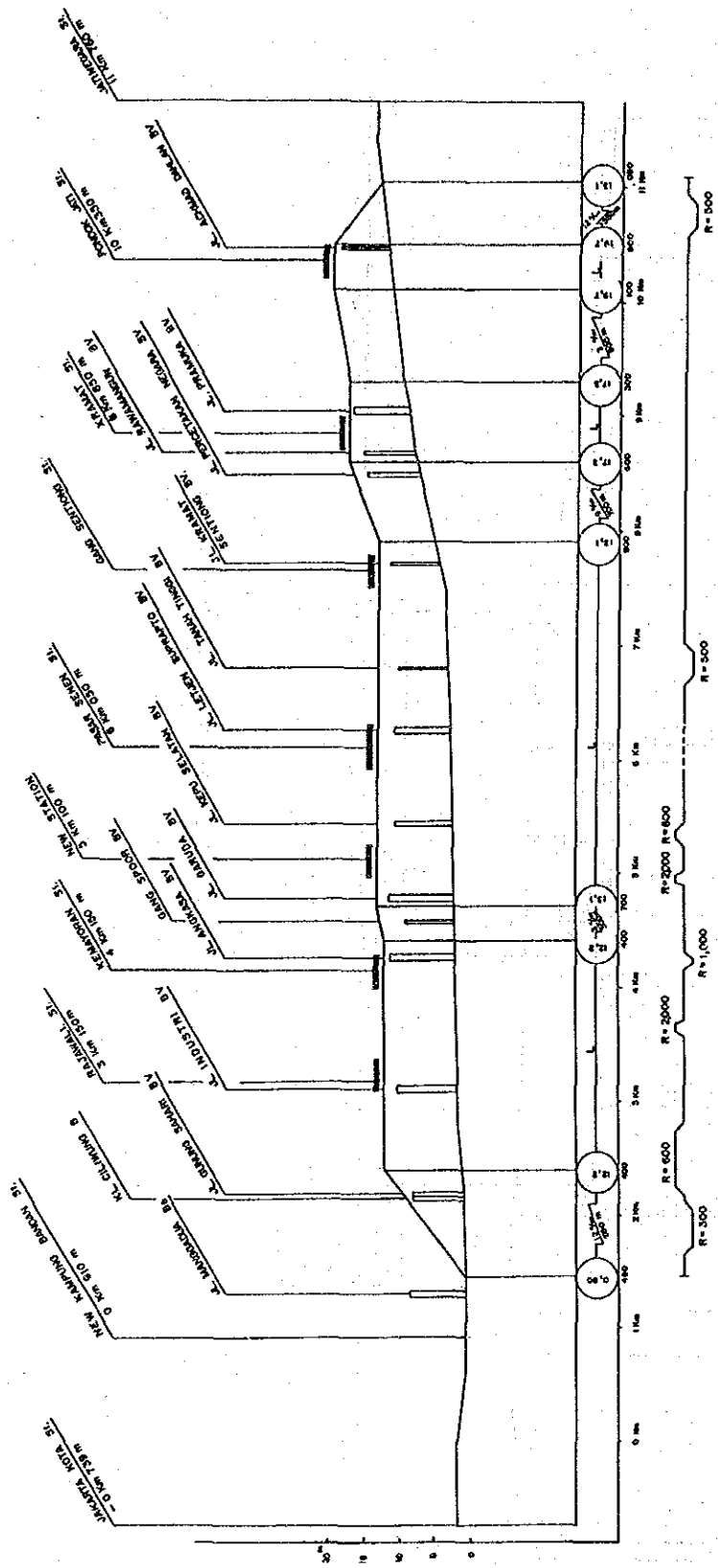
Fig. 5.4.3.5 Vertical Alignment Alternative 2

Table 5.4.3.3 Required Formation Level

| Distance | Name of Road | Bridge | | Required |
		Span	Kind of Girden	Formation Level
2 km 185 m	2. Jl. Gunung Sahari	40 m x 2	PC-Through	8.5
3 km 110 m	3. Jl. Industri	30 m x 1	PC	10.8
4 km 255 m	4. Jl. Angkasa	35 m x 1	PC-Box	11.6
4 km 570 m	5. Gang Spoor	15 m x 1	RC	9.4
4 km 780 m	6. Jl. Garuda	30 m x 2	PC	11.7
5 km 445 m	7. Jl. Kepu Selatan	35 m x 1	PC-Box	10.8
6 km 250 m	8. Jl. LETJEN Saprapto	30 m x 2	PC	10.9
6 km 890 m	9. Jl. Tanah Tinggi	15 m x 1	RC	10.3
7 km 710 m	10. Jl. Kramat Sentiong	20 m x 1	RC	11.8
8 km 485 m	11. Jl. Percetakan Negara	25 m x 1	PC	14.7
8 km 675 m	12. Jl. Rawanangun	20 m x 1	RC	15.4
9 km 045 m	13. Jl. Pramuka	30 m x 2	PC	16.9
10 km 475 m	14. Jl. Achmad Dahlan	15 m x 1	RC	19.1

(2) Structure

The structures at the general section and at stations were designed
in reinforced concrete in consideration of utilization of space under
the elevated track and prevention of noise. For the girders of the
bridges over the road, those of 20 m or less were designed in
reinforced concrete, and those of 20 m or more in PC girder.

For the type of elevated structure at the general sections, the same
girder type elevated bridge as that used in the track elevation now
underway on the Central Line was employed, and a standard span of
15 m was considered. Outline cross section of the girder type
elevated bridge and the structure at stations are shown in Figs.
5.4.3.6 and 5.4.3.7. The Track Structure is consisted of R54
Continuous-welded rail and PC Sleepers.
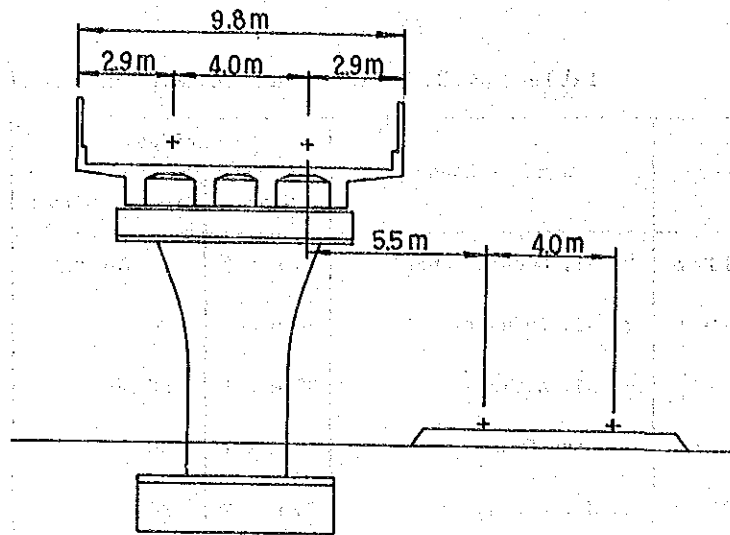
Fig. 5.4.3.6 Girder type elevated bridge

(3) Station facilities plan

1) General

In planning the station facilities, the scale was determined with reference to the number of passengers in 2005 in the development level (Ry2-BC01) employed in the Master Plan.

2) Platform

For the platform, a high bed platform would be employed for smoothing and thus reducing the time spent by passengers getting on and off and then securing the punctuality of trains. The platform height would preferably be of the same level with the floor of the car. But, in order to remove the steps in the existing cars, the cars would have to be greatly modified, and so the steps would be left as they are, and the platform height was determined accordingly. Planned sections of the platform are shown in Fig. 5.4.3.8 and 5.4.3.9. The platform height was set at 0.8 m for Rajawali St. and Pasar Senen St. in consideration of the stop of medium- and long-distance trains and 0.95 m for the other stations. Separation of the platform from the center of the track was set, from the construction gauge, at 1.6 m. The platform width was set at 8 m for the island type platform (Rajawali St. and Pasar Senen St.) and 6 m for the separate type platforms (other stations) in consideration of the number of
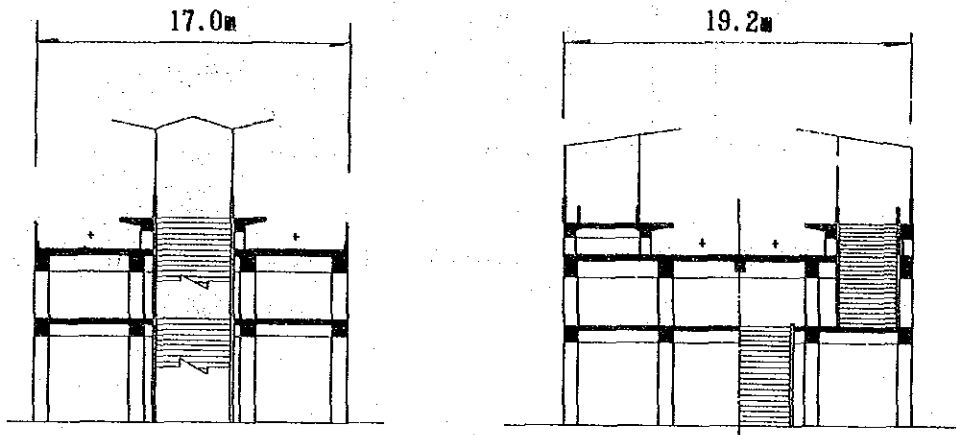
RAJAWALI

KEMAYORAN

New Station

GANG SENTIONG

KRAMAT

PONDOK JATI
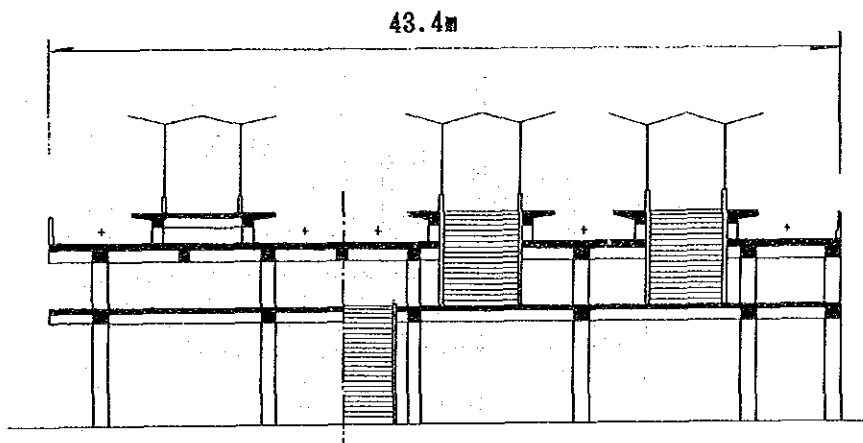
PASAR SENEN

Fig. 5.4.3.7 Cross Section for the Stations
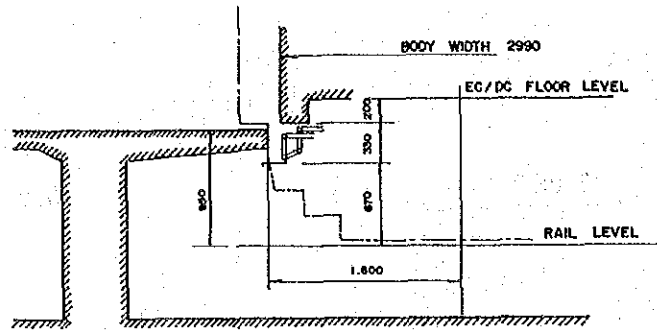
Fig. 5.4.3.8 Planned Section of Platform for Commuter Train
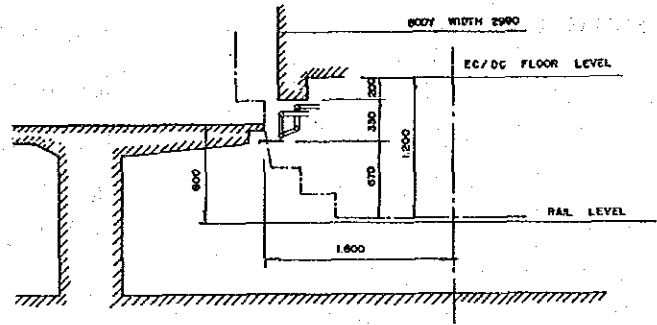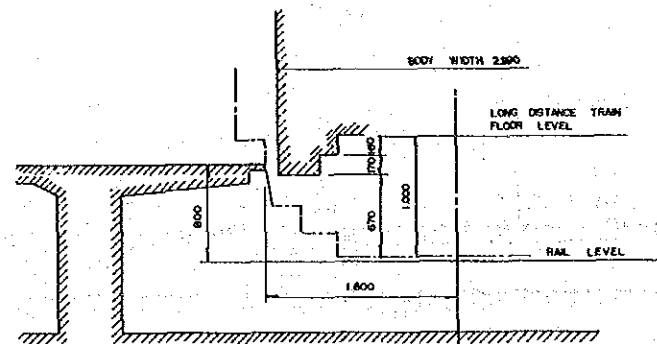
Fig. 5.4.3.9 Planned Section of Platform for Commuter Train and Long Distance Train

passengers and the width of the stairs. The platform extension was set at 270 m to conform to the 12-car composition trains.

3) Platform shed

For passenger services, a platform shed over the whole length of the platform was considered for Pasar Senen St. and 60% of the platform length for the other stations.

4) Main station building

As a point of contact of the railway transportation facilities and passengers, the main station building is required to allow a smooth and comfortable flow of passengers and, at the same time, ensure that the booking and other office work of the station are carried precisely out.

As for the facilities of the main station building:

o Flow facilities — Concourse, passage, etc.
o Passenger facilities — Booking, wicket, fare adjustment, etc.
o Service facilities — Waiting room, toilet, etc.
o Office facilities — Stationmaster's room, office, restroom, etc.

are considered, but layout of these facilities focuses on the smooth flow of the passengers.

The scale of the facilities of the main station building was determined by the number of the passengers and in consideration of the following.

o Pasar Senen St. is intended for departure and arrival of medium- and long-distance trains and handling of parcels.
o Pasar Senen St. has the facilities of the main station building used in two layers.

The scale of the facilities of the respective stations is planned as below.

o Pasar Senen St.   3,500 m^2
o Kemayoran St.   2,200 m^2
o Other stations   1,500 m^2

In Figs. 5.4.3.10 through 5.4.3.11 are shown the layout plans of the stations under elevated track.
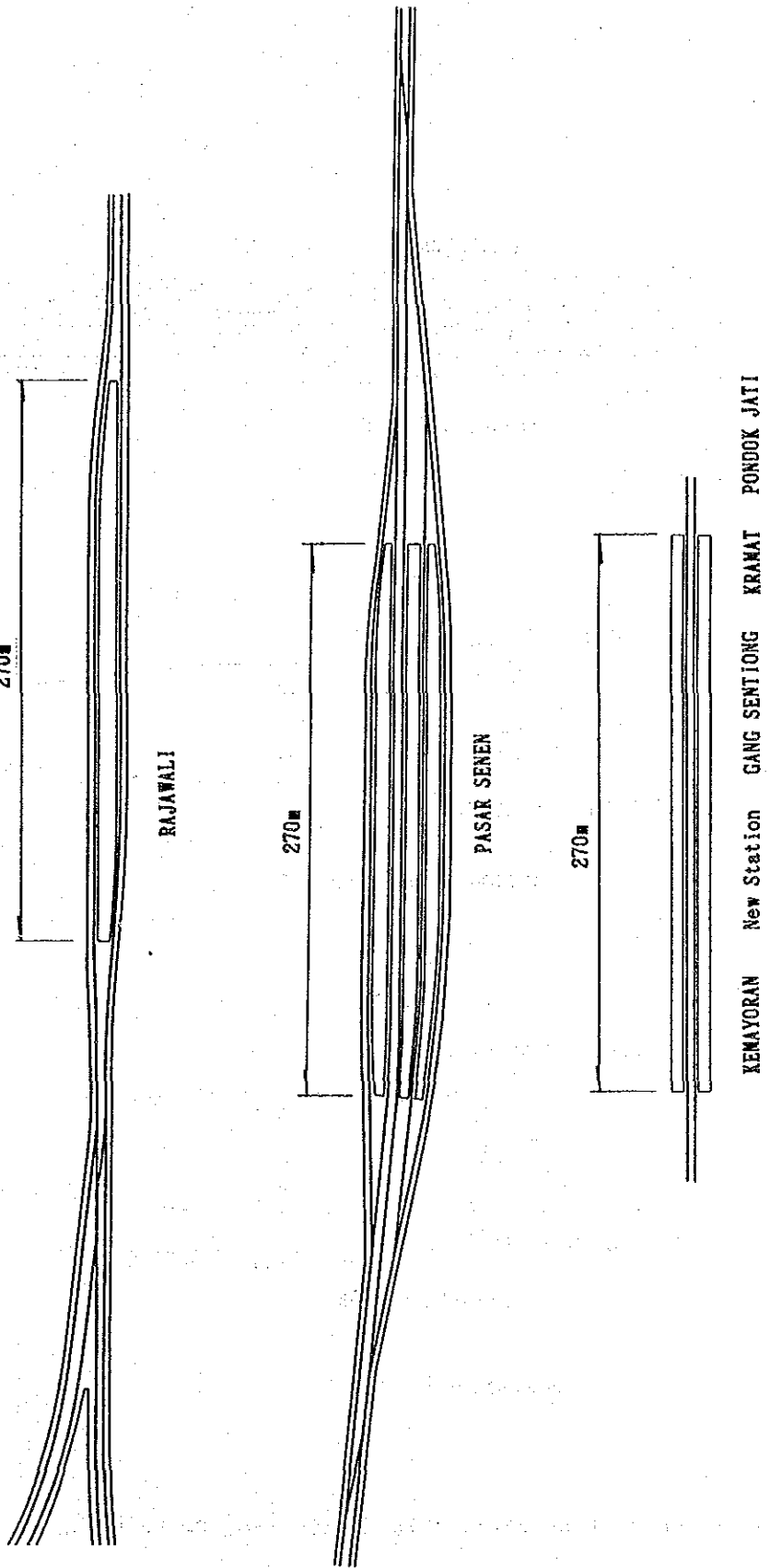
Fig. 5.4.3.10   Track Layout Plan of Station Yard

270m

RAJAWALI

270m

PASAR SENEN

270m

KEMAYORAN   New Station   GANG SENTIONG   KRAMAT   PONDOK JATI

PLATFORM

Third Level Plan

PASSENGER FLOW

PASSENGER SERVICE

Second Level Plan

STATION SERVICE

STATION OFFICE   BAGGAGE OFFICE

PASSENGER FLOW

Ground Level Plan
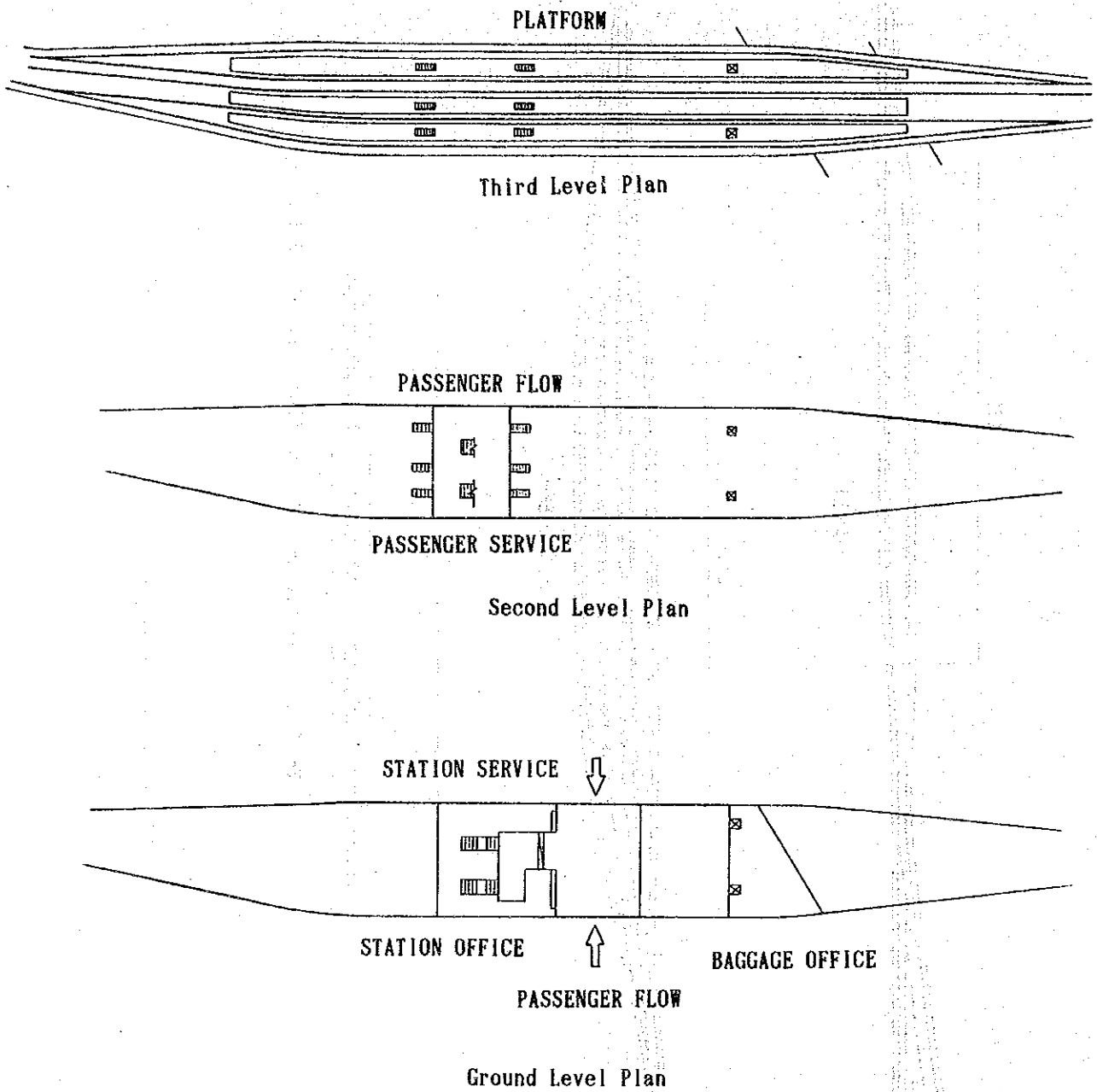
Fig. 5.4.3.11   Concept on Station Facilities for Pasar Senen

(4) Electrification

1) Electrical facilities

The electrical facilities will consist of a temporary overhead contact-wire system while grade separation is being carried out, and an overhead contact-wire system and high-tension distribution line for automatic signalling for the future elevated track. When this project starts, the electrical facilities for the Eastern Line should be able to have trains operating at 6 minute intervals.

These facilities will consist of a simple catenary type overhead contact-wire system with a feeder wire and a high-tension distribution line for automatic signalling. In addition a sectioning post will be installed near Kemayoran Station.

The location of power substations, the feeding system network, and the distribution line network are as shown in Fig. 5.4.3.12 and Fig. 5.4.3.13.
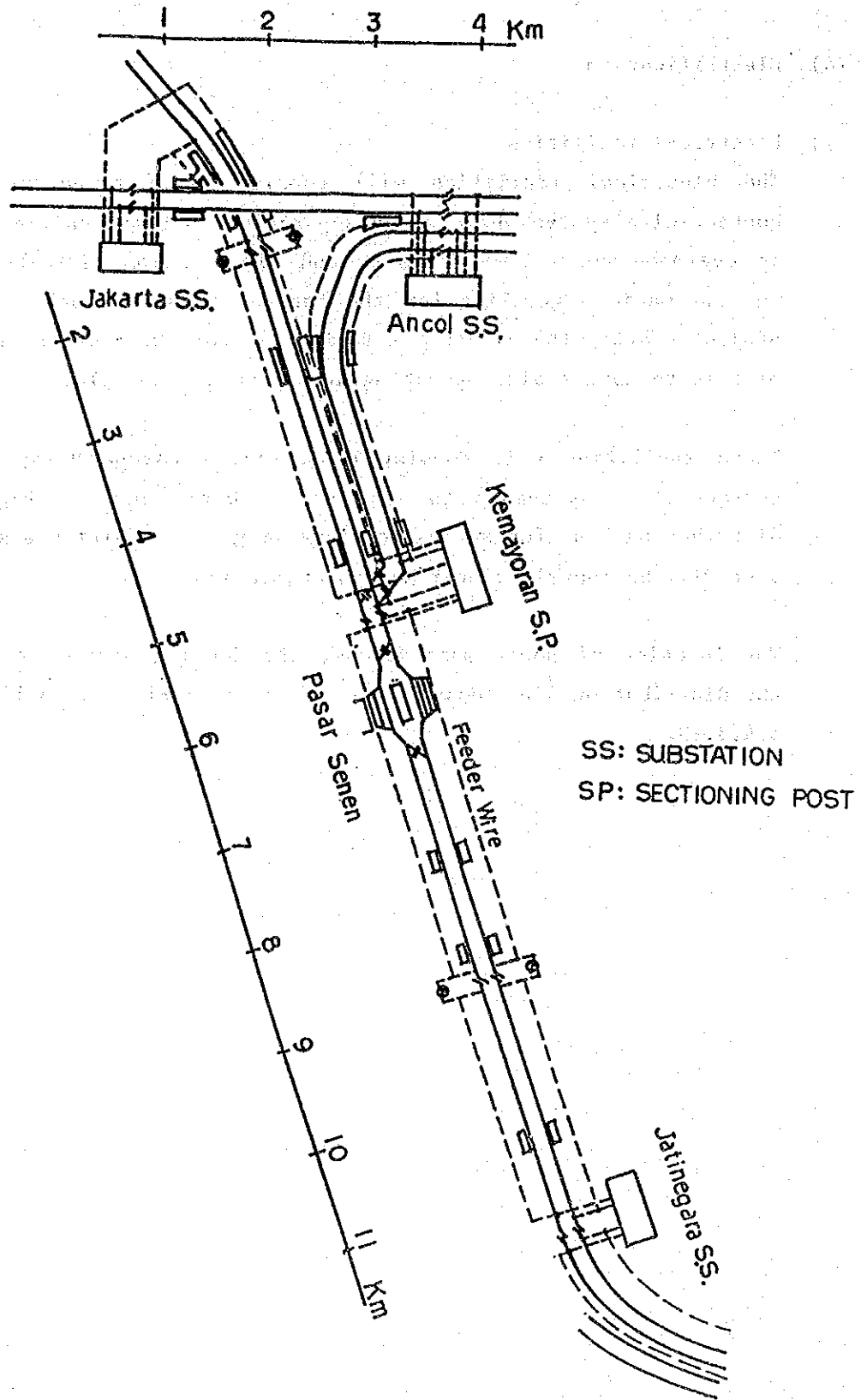
Fig. 5.4.3.12   Power Substation and Feeding System Network (1993)

KAMPUNGBANDAN
S.T.

JAKARTA KOTA
S.T.

Jakarta SS.

KEMAYORAN
S.T.

PASAR SENEN
S.T.

Jatinegara SS.

JATINEGARA
S.T.
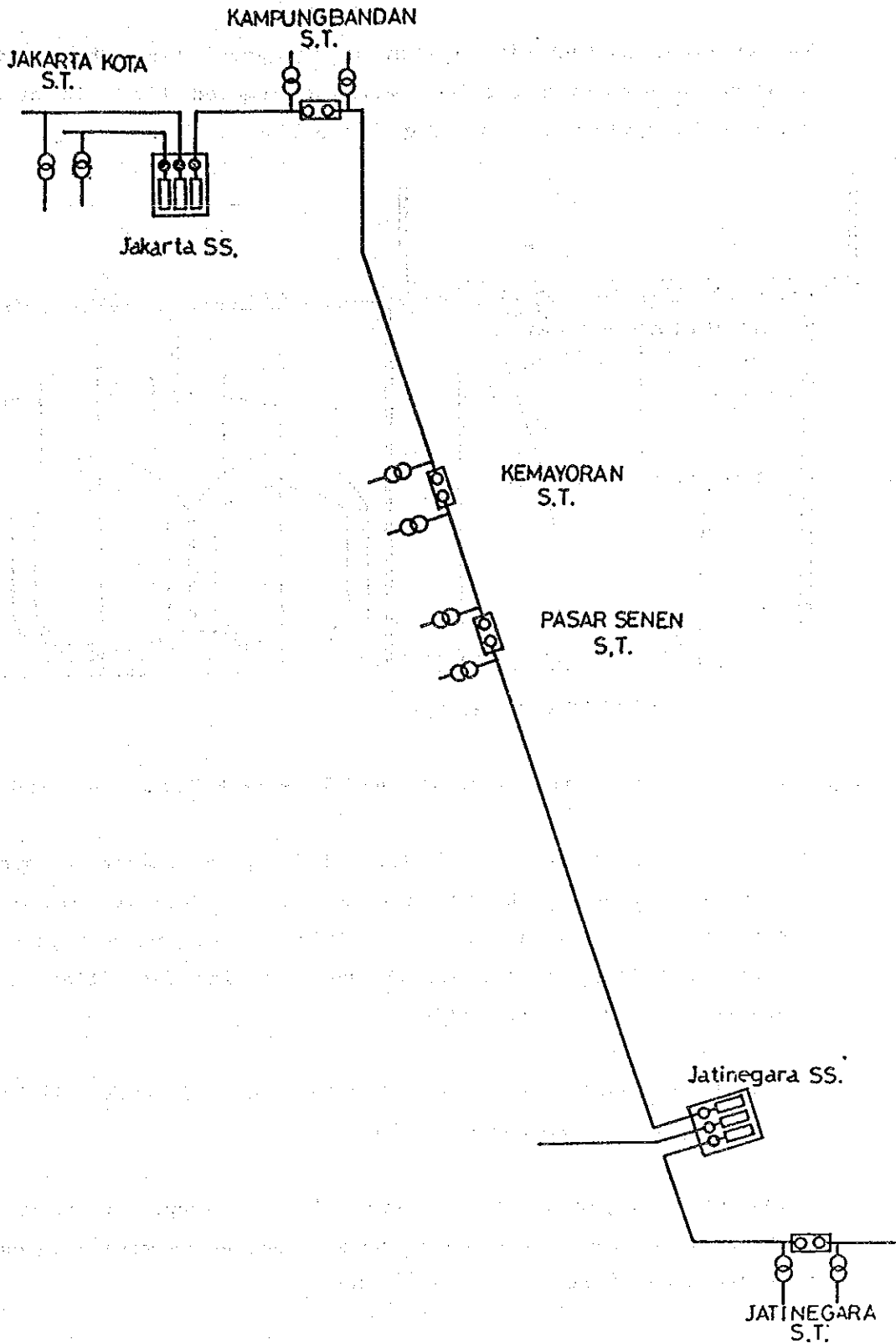
Fig. 5.4.3.13 Hight Tension Distribution Line Network (1993)

The overhead contact-wire system of the Ancol Line, from Rajawali Station to Kamayoran Station, will be removed first in order to construct the viaduct. (see Fig. 5.4.3.14)
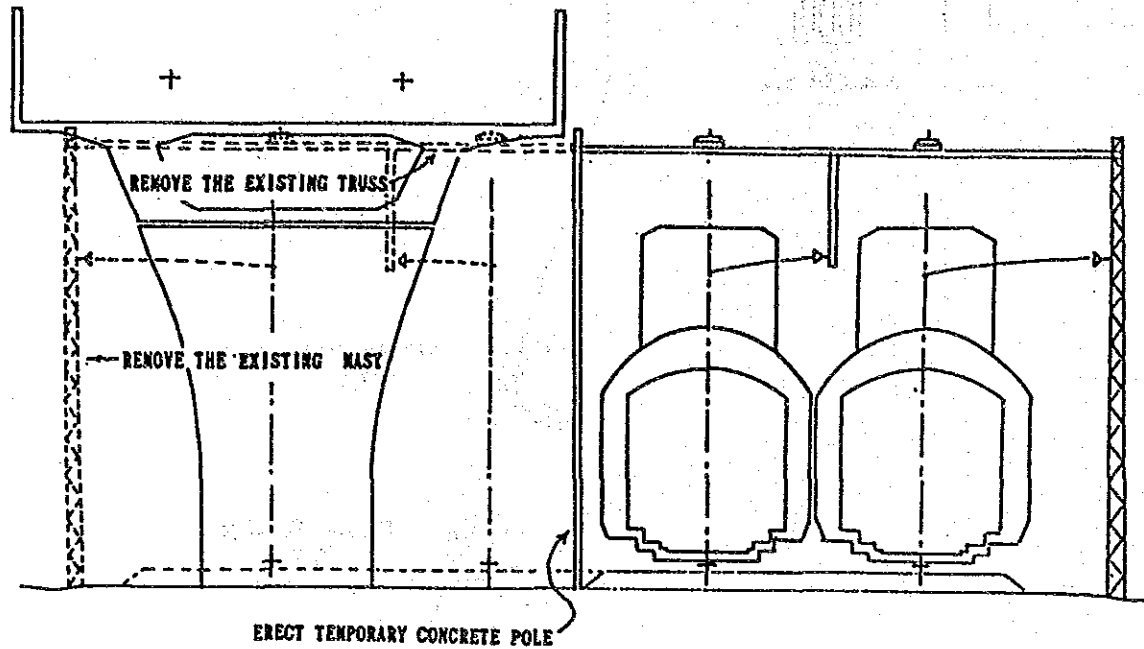
Fig. 5.4.3.14 Abolish the Existing Ancol Line (2 k 800 m ~ 4 k 900 m)

During the construction of the viaduct, a temporary overhead contact-wire system will be provided in the Rajawali Station and Pasar Senen Station areas. In addition, a temporary high-tension distribution line for signalling and lightning facilities will be installed in Pasar Senen Station.

The overhead contact-wire system for the elevated track will be same as that of the elevated Central Line.

Below is a simple catenary system that is supported by a rigid cantilever mounted on a concrete pole. The feeder wire an grounding wire are mounted on the concrete poles.

LEGEND:
① CONCRETE POLE
② GROUNDING WIRE
③ FEEDER WIRE
④ RIGID CANTILEVER
⑤ SUSPENSION INSULATOR
⑥ MESSENGER WIRE
⑦ STEM INSULATOR
⑧ CONTACT WIRE
⑨ STEADING EQUIPMENT
⑩ CABLE DUCT
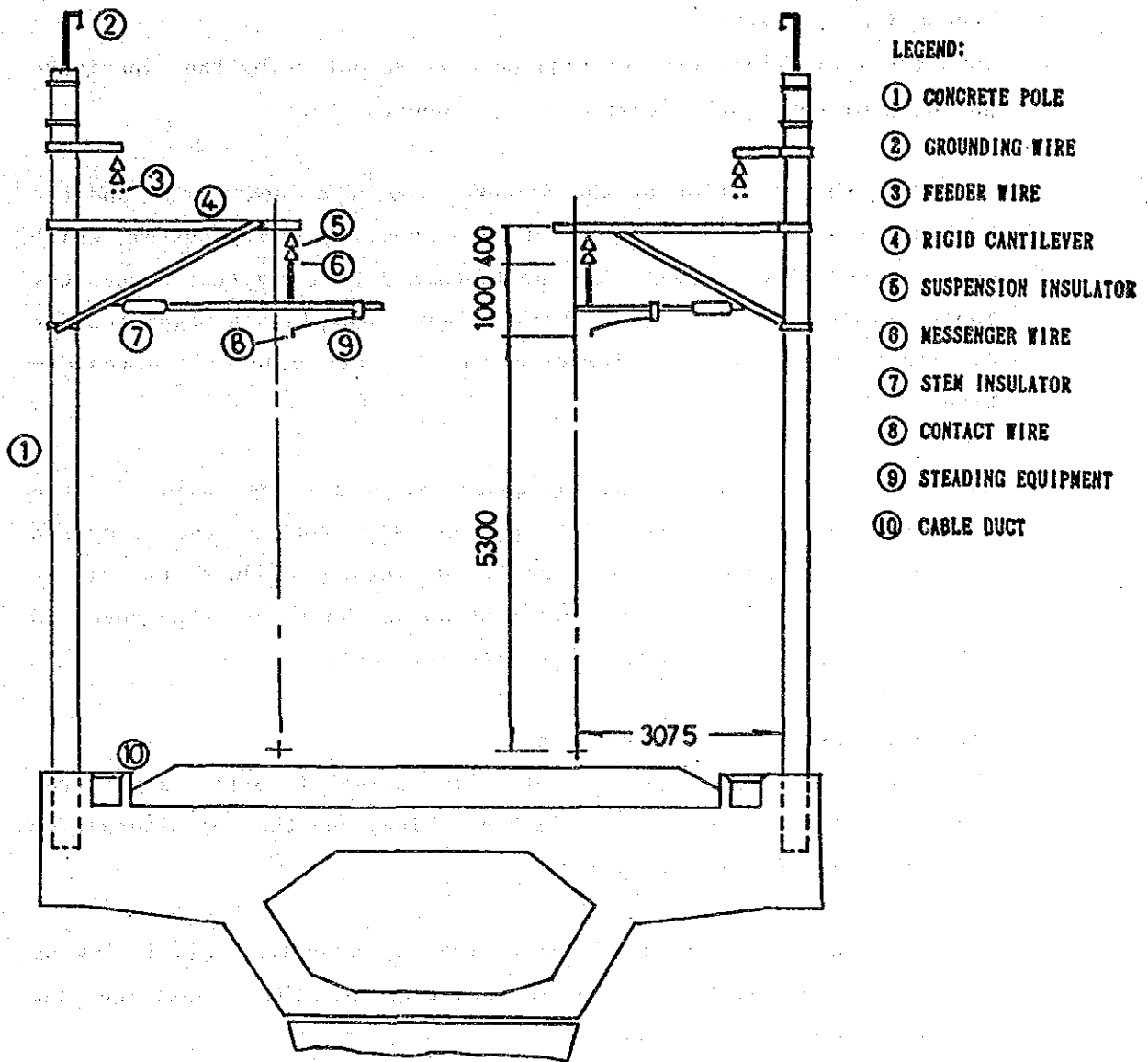
Fig. 5.4.3.15 Standard Supporting Structure

The electrical facilities of stations, will be totally renovated. The main facilities consist of lighting power sources and lighting equipment, and secondary facilities of announcement equipment, electric clocks, electric information boads, and lightening for station frontage.

2) Precautions for work

This track elevation project will be carried out using the experience gained from the track elevation of the Central Line.

Regarding the elevation of the Eastern Line, the feeder wire and the high-tension distribution line for automatic signalling system, which must be installed by 1993, must be installed in a way that causes the least hindrance to future work. For example, a high-tension distribution line will be installed on the west side of the Eastern Line.

As, it is necessary that adequate attention be paid to the construction execution method to prevent any trouble, the Kemayoran sectioning post should come under the future viaduct and it is desirable to acquire land in anticipation of the future changeover to substation upon there being a capacity increase.

(5) Signalling and Telecommunications

The track elevation section of Alternative I will range from 1 km 450 m to 7 km 400 m on the Eastern Line, and that of Alternative II from 1 km 450 m to 11 km 050 m.

In accordance with the track elevation construction, the following idea is recommended for the construction of the signalling and telecommunication equipment.

a) The signalling and telecommunication equipment will be newly constructed on the track elevation sections.

b) The temporary signalling and telecommunication equipment will be partly constructed at the stations of Pasar Senen and Rajawali.

c) The existing signalling and telecommunication equipment to be replaced by the track elevation is to be removed a after completion of the track elevation.

1) Signalling

The basic design of the signalling equipment on the Eastern Line is recommended to be consistent with that of the other lines under tender procedure, such as the Central Line, Bekasi Line and Bogor Line. Therefore, the signalling equipment is to be based on the following.

a) Interlocking device

Electronic interlocking devices with stand-by equipment are to be newly constructed at the station of Pasar Senen and Rajawali.

b) Blocking device

Automatic block signal systems are to be newly constructed in:

Alternative I :   1 km 450 m – 7 km 400 m, or

Alternative II: 1 km 450 m – 11 km 050 m.

Counter flow operation is not to be adapted. The general outline of automatic block signal location is shown in Fig. 5.4.3.16.

c) Track circuit

Track circuits with commercial frequency (50Hz) are to be newly constructed in;

Alternative I :   1 km 450 m – 7 km 400 m, or

Alternative II: 1 km 450 m – 11 km 050 m.

d) Electrical points are to be newly constructed at the stations of Pasar Senen and Rajawali.

e) Level crossing device

The existing level crossing devices are to be removed at;

9 level crossings in case of Alternative I, or

15 level crossings in case of Alternative II.
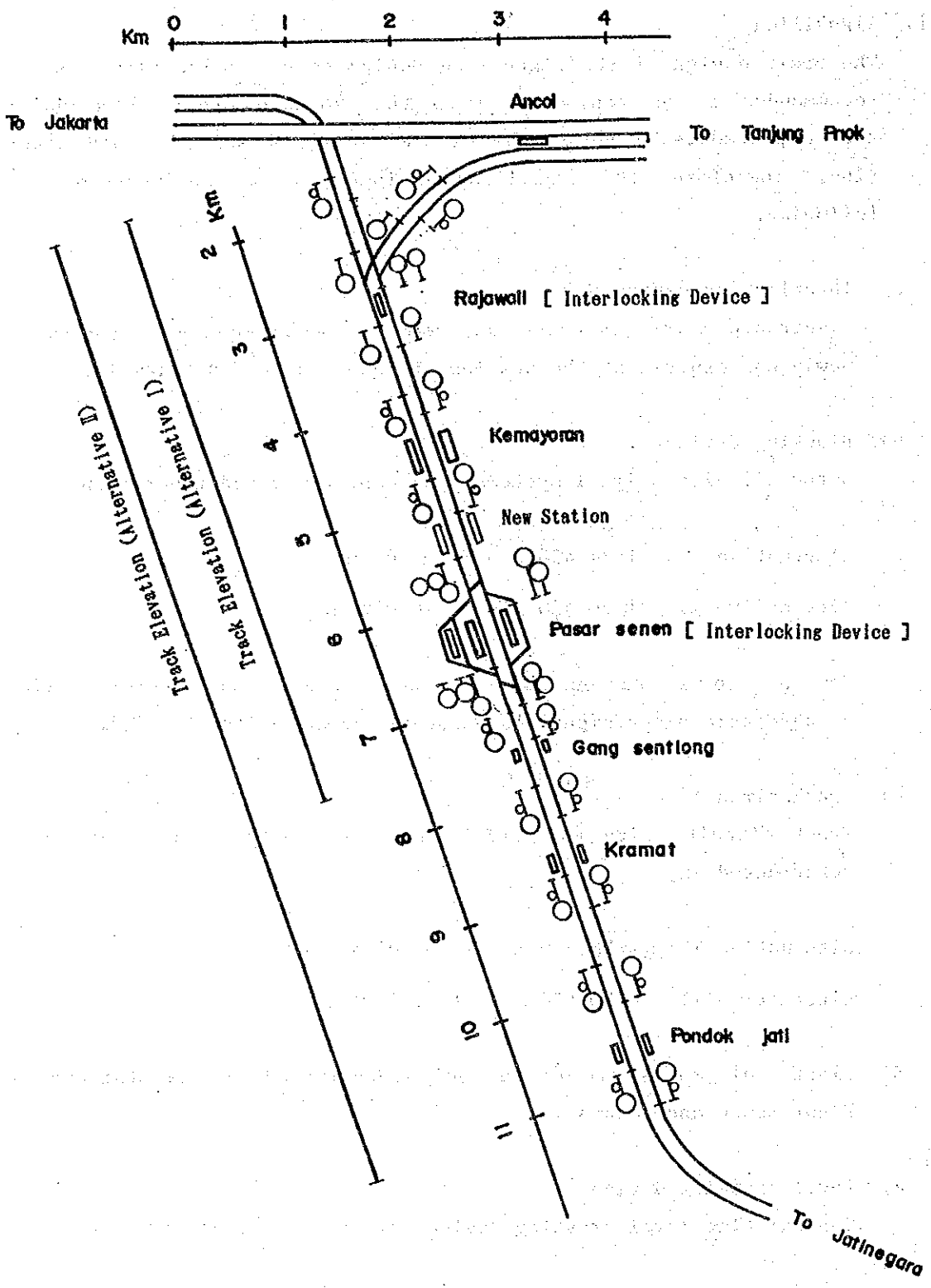
Fig. 5.4.3.16 Block Signal Location on the Eastern Line

2) Telecommunications

  a) Overhead cable

    Overhead cable of 80 pairs is to be newly constructed.

  b) Talk back system

    . New construction at Pasar Senen

  c) Utility radio system

    . Transference at the stations of Pasar Senen and Kemayoran.

  d). New construction of dispatching local equipment at the stations of
    Pasar Senen and Rajawali.

(6) Plans for use of the space beneath the elevated track

1) Basic concept

  The space created beneath the elevated track is very valuable and so
  it should be used as effectively as is practicable.

  The space could be for the following facilities.

  a) Station facilities

  b) Commercial facilities

  c) Freight transpont facilities (warehouse, truck yard, etc.)

  d) Car parking facilities

  e) Community facilities (park, etc.)

  f) Open space

From the view point of city planning, it is desirable to allocate as much space as is practicable for the city park, other community facilities and for open space. However, space should also be allocated for profitable commercial facilities with consideration for the accumulation of commercial and other operational activities in the adjacent area.

2) Plans for use of the space under the elevated track
    The elevated track structures would extend for:

About 6.0 km in the case of Alternative 1 (Kota - Gangsentiong); or

About 9.6 km in the case of Alternative 2 (Kota - Jatinegara), and

the usable area produced under the elevated track would be about 80,000 m^2 or 116,000 m^2 respectively.

For Pasar Senen, two layers are planned on certain section.

The station facilities were planned to have an area capable of handling future numbers of passengers and the commercial facilities were planned to be large enough to accomodate the accumulation of commerce in the vicinity of the station.

For warehouse and parking space, the areas under the track between stations will be used, and the size was determined taking in consideration the adjacent commercial and freight distribution areas as well as the development of the vicinity and access to road.

Table 5.4.3.4 Utilization Planning under Track Elevation Structure

Alternative 1. (Kota - Gangsentiong)

unit: m^2

	Total square meter	Station Facilities	Commercial Facilities	Warehouse	Car park
- Rajawali	17,770			1,000	700
Rajawali St.	3,700	1,500	1,500		
Rajawali - Kemayoran	7,200			700	700
Kemayoran St.	4,470	2,200	2,000		
Kemayoran - New Station	6,480			700	1,000
New Station	5,380	1,500	1,500		
New Station - Pasar Senen	5,230			400	800
Pasar Senen St.	22,400	3,500	9,000		
Pasar Senen - Gangsentiong	8,350			1,000	1,000
Total	80,200	8,700	14,000	3,800	4,200

Table 5.4.3.5 Utilization Planning under Track Elevation Structure

Alternative 2. (Kota - Jatinegara)

unit: m^2

	Total square meter	Station Facilities	Commercial Facilities	Warehouse	Car park
- Rajawali	17,770			1,000	700
Rajawali St.	3,700	1,500	1,500		
Rajawali - Kemayoran	7,200			700	700
Kemayoran St.	4,470	2,200	2,000		
Kemayoran - New Station	6,480			700	1,000
New Station	5,380	1,500	1,500		
New Station - Pasar Senen	5,230			400	800
Pasar Senen St.	22,400	3,500	9,000		
Pasar Senen - Gangsentiong	11,290			1,000	1,000
Gang sentiong St.	5,380	1,500	500		
Gang sentions - Kramat	8,820				800
Kramat St.	5,090	1,500	500		
Kramat - Pondok Jati	11,460				1,000
Pondok Jati St.	5,380	1,500	500		
Pondok Jati - Jatinegara	2,550				250
Total	116,490	13,200	15,500	3,800	6,250

5-4-4 Implementation Program

(1) Implementation agencies

Grade separation, via either elevation or tunnelling, should be implemented based on sufficient consultations with the city authorities concerned, since the work will be closely related to city and land use planning. PJKA should carry out this work since it should be done without suspending daily train operation.

Table 5.4.4.1 Implementation Agencies for Projects

Project	Construction	Operation	Maintenance
Subway	PJKA	PJKA	PJKA
Track elevation	PJKA	PJKA	PJKA
Flyover	DKI	DKI	DKI

Construction of elevated railway facilities will be undertaken by PJKA, and PJKA will operate and maintain the spaces under the newly elevated tracks, excluding city parks and other spaces for public use.

(2) Scale and schedule of investment

1) Preconditions for estimating construction costs
The Preconditions for estimating of construction costs are as follows:

a) Construction costs

- Construction costs are calculated at 1989 prices and do not take into account possible price rises after that date;

- Construction costs take into account expenses for labor, materials, machinery and related items;

- Imported machinery and materials are tax-exempt;

- Construction costs are divided between domestic and foreign capital;

- Unit costs of labor and materials are estimated based on the actual records in Indonesia and Japan.

b) The costs of purchasing land and compensation for houses are based on the documents of DKI Jakarta.

c) The cost of detailed design and supervision service were assumed to be 5% of construction cost.

d) A physical contigency is equal to 10% of the total cost of construction and purchasing land/compensation was assumed.

e) Calculations are at the foreign exchange rate of ¥1 = Rp13.4.

2) Scale of investment

The results of estimation of the investment cost are shown in Tables 5.4.4.2 to 5.4.4.4.

3) Shedule of investment

The shedule of investment is as shown in Tables 5.4.4.5 and 5.4.4.6. The grade separation should take about five years and flyover construction three.

Table 5.4.4.2   Investment Cost for Flyover

(Flyover)

Investment Item	Unit	Quantity	Investment Sum. (Million Rp)		
			Foreign	Local	Total
1. Civil Work			81,208	79,013	160,221
Excavation	m³	97,400	4,351	1,450	5,801
Bridge	m²	78,500	71,522	72,126	143,648
Pavement	m²	236,000	3,690	2,564	6,254
Miscellaneous	1		1,645	2,873	4,518
2. Land Purchase	m²	95,400		42,064	42,064
3. Detailed Design			7,210	801	8,011
4. Supervisory Service			14,099	1,922	16,021
5. Contingency			10,252	12,380	22,632
Total			112,769	136,180	248,949

(Railway)

Investment Item	Unit	Quantity	Investment Sum. (Million Rp)		
			Foreign	Local	Total
1. Civil	m²	48,200	3,868	2,611	6,479
2. Track	m²	10,080	5,336	2,484	7,820
3. Station Building	m²	5,900	5,163	3,450	8,613
4. Electrification		1	1,148	750	1,898
Subtotal			15,515	9,295	24,810
5. Land Purchase	m²	20,700		2,681	2,681
6. Detailed Design			1,116	124	1,240
7. Supervisory Service			2,183	298	2,481
8. Contingency			1,881	1,240	3,121
Total			20,695	13,638	34,333

Grand total 283,282 Million Rp

Table 5.4.4.3   Investment Cost for Track Elevation   (Alternative 1)
(Railway)

Investment Item	Unit	Quantity	Investment Sum. (Million Rp)		
			Foreign	Local	Total
1. Civil	m	6,900	123,645	60,275	183,920
2. Track	m	6,900	19,036	4,748	23,784
3. Station Building	m²	8,700	15,434	18,072	33,506
4. Machinery		1	2,822	1,976	4,798
5. Electricity		1	4,998	7,449	12,447
6. Electrification	m	6,900	6,947	1,360	8,307
7. Signaling	m	6,900	5,970	2,000	7,970
8. Telecommunication	m	6,900	1,256	771	2,027
Subtotal			180,108	96,651	276,759
9. Land Purchase	m²	18,500		9,755	9,755
10. Detailed Design			12,454	1,384	13,838
11. Supervisory Service			24,355	3,321	27,676
12. Contingency			21,691	11,110	32,801
Total			238,608	122,221	360,829

(Flyover)

Investment Item	Unit	Quantity	Investment Sum. (Million Rp)		
			Foreign	Local	Total
1. Civil Work			29,318	29,884	59,202
Excavation	m³	25,000	118	115	233
Bridge	m²	31,200	27,313	27,895	55,208
Pavement	m²	84,600	1,307	898	2,205
Miscellaneous	1		580	976	1,556
2. Land Purchase	m²	35,100		11,275	11,275
3. Detailed Design			2,664	296	2,960
4. Supervisory Service			5,210	710	5,920
5. Contingency			3,719	4,216	7,935
Total			40,911	46,381	87,292

Grand total   448,121 Million Rp

Table 5.4.4.4 Investment Cost for Track Elevation (Alternative 2)
(Railway)

Investment Item	Unit	Quantity	Investment Sum. (Million Rp)		
			Foreign	Local	Total
1. Civil	m	10,600	190,888	92,301	283,189
2. Track	m	10,600	26,295	6,753	33,048
3. Station Building	m²	13,200	26,418	31,187	57,605
4. Machinery		1	4,676	3,187	7,863
5. Electricity		1	7,748	11,986	19,644
6. Electrification	m	10,600	8,877	1,670	10,547
7. Signaling	m	10,600	8,723	3,017	11,740
8. Telecommunication	m	10,600	1,827	1,155	2,982
Subtotal			275,452	151,166	426,618
9. Land Purchase	m²	63,100		23,892	23,892
10. Detailed Design			19,198	2,133	21,331
11. Supervisory Service			37,542	5,119	42,661
12. Contingency			33,219	18,231	51,450
Total			365,411	200,541	565,952

(Flyover)

Investment Item	Unit	Quantity	Investment Sum. (Million Rp)		
			Foreign	Local	Total
1. Civil Work			12,421	12,330	24,751
Excavation	m²	11,000	54	53	107
Bridge	m²	13,800	11,792	11,718	23,510
Pavement	m²	26,000	371	233	604
Miscellaneous	1		204	326	530
2. Land Purchase	m²	12,300		4,235	4,235
3. Detailed Design			1,114	124	1,238
4. Supervisory Service			2,178	297	2,475
5. Contingency			1,574	1,699	3,270
Total			17,284	18,685	35,969

Grand total 601,921 Million Rp

Table 5.4.4.5 Construction Time Schedule for Flyover

Work Item	1993	1994	1995	1996	1997	Note
Detailed Design						② JL.GUNUNG SAHARI
Land Purchase						⑥ JL.GARUDA
Excavation						⑧ JL.LETJEN.SUPRAPTO
Bridge						⑩ JL.PRAMUKA
Pavement						
Miscellaneous						
Detailed Design						① JL.MANGGADUA
Land Purchase						③ JL.INDUSTRI
Excavation						④ JL.ANGKASA
Bridge						⑦ JL.KEPU SELATAN
Pavement						⑪ JL.PERCETAKAN NEGARA
Miscellaneous						

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Table 5.4.4.6 Construction Time Schedule for Track Elevation

Work Item	1991	1992	1993	1994	1995	1996	1997
Detailed Design							
Land Purchase							
Temporary track							
Elevated Track Structure							
Building							
Track							
Electric							

CHAPTER 6 ECONOMIC AND FINANCIAL ANALYSIS

CHAPTER 6 Economic and Financial Analysis

6-1 General

6-1-1 Economic Analysis

(1) Objective

The objective of economic analysis is to evaluate a viability of a proposed project from a view point of national economy. Therefore, the analysis differs from a financial analysis which evaluates the viability from a view point of a private enterprise.

(2) Methodology and evaluation criteria

The methodology of the analysis used in this study is what is called "with - without" analysis. It analyses a viability of a project by comparing economic costs and economic benefits of "with" project situation with "without" project situation.

Evaluation criteria used in this study are economic internal rate of return (EIRR), benefit cost ratio (B/C) and net present value (NPV).

The EIRR is a discount rate which makes a total amount of net benefit in present value to be zero. The EIRR satisfies the following equation.

$$\sum_{i=1}^{n} \frac{(\text{Amount of Net Benefit in i-th year})}{(1 + EIRR)^i} = 0$$

The benefit cost ratio is a ratio of a total benefit against a total cost of a project. The benefit and cost are discounted by a social discount rate of the country.

The NPV is a value of a total net benefit of a project. The value is calculated by summing up annual net benefit which is discounted by the social discount rate.

The EIRR and the B/C indicates an efficiency of a project, while the NPV shows an amount of net benefit of the project. If a scale of a project is large enough, the NPV has a tendency to become big, even if its EIRR is low. On the contrary, if a scale of a project is small, the NPV may be small, even if its EIRR is high.

(3) Preconditions

1) Project life

Twenty years after the completion of a project

2) Pricing date

Prices of April 1989

3) Foreign exchange rate

1 US dollar = 1758 Indonesian Rupiah

6-1-2 Financial Analysis

(1) Purpose and method of analysis

In Indonesia investment funds for railway equipment and rolling stock all come from the government. PJKA operates under these conditions.

As PJKA's present legal status is Perjan, all its operational losses are subsidized by the government.

As a change in PJKA's legal status is currently under study, however, PJKA is expected to at least arrive at a balance in its income and expenditure, although it may not be thought necessary to pursue profit.

In the case where the project is significant from the national economic standpoint of the Indonesian policy (economic analysis shows it to be feasible), but the return on the project can not be expected, a subsidy is essential to permanent management and maintenance, which causes fall of service quality and imposes greater burden on the public finance.

In this light, the primary objectives of this financial analysis are to examine the following corollaries to PJKA' the executing entity of this project.

1) an examination of profitability as per FIRR calculations;
2) given the profitability, the source of capital necessary to execute the project;
3) whether a government subsidy is necessary or not.

(2) Preconditions

Project life and pricing date, as well as the foreign exchange rate, are assumed as they are under the economic analysis.

6-2 Feeder Service and Station Facilities Improvement for Three Stations

6-2-1 Economic Analysis

(1) Economic Cost

1) Initial Investment cost

The economic initial investment cost of the "Feeder Service and Station Facilities Improvement" Project (Table 6.2.1.1) is derived from financial construction costs which is shown in Table 6.2.1.2 through the procedure described in Chapter 5 of Volume I.

Table 6.2.1.3 summarizes a construction program and the initial investment cost excluding initial rolling stock cost which is an additional cost to cope with the increased demand by the improvement in 1995.

2) Additional investment cost

Two kinds of additional investment were considered. They are an
additional investment on rolling stocks and station facilities.

The cost for the station facilities and rolling stocks are
summarized in Table 6.2.1.4 and 6.2.1.5 respectively.

3) Reinvestment

The cost for reinvestment should be appropriated when useful life of
asset expires within the project life. However, the project life of
this study is defined as 20 years after the completion and the
minimum life of the asset is not less than 20 years, no reinvestment
is considered.

Table 6.2.1.1 Economic Investment Cost of Feeder Service
and Station Improvement

(Million Rupiah)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	Subtotal	2000/1	2001/2	2002/3	2003/4	Subtotal	Total
Bus Bay											
Foreign Portion	0	0	354	355	710	0	0	0	0	0	710
Labour Cost	0	0	260	260	520	0	0	0	0	0	520
Others	0	0	87	89	176	0	0	0	0	0	176
Pedestrian Cross											
Foreign Portion	0	0	87	87	174	0	0	0	0	0	174
Labour Cost	0	0	1	2	3	0	0	0	0	0	3
Others	0	0	1	0	1	0	0	0	0	0	1
Bus Platform											
Foreign Portion	0	0	14	13	27	0	0	0	0	0	27
Labour Cost	0	0	1	1	2	0	0	0	0	0	2
Others	0	0	1	0	1	0	0	0	0	0	1
Traffic Signal											
Foreign Portion	0	0	12	12	24	0	0	0	0	0	24
Labour Cost	0	0	6	6	12	0	0	0	0	0	12
Others	0	0	2	2	4	0	0	0	0	0	4
Pedestrian Bridge											
Foreign Portion	0	0	3355	3355	6710	0	0	982	982	1965	8674
Labour Cost	0	0	1764	1764	3528	0	0	67	67	134	3662
Others	0	0	1553	1554	3107	0	0	318	318	637	3744
Over Track Station											
Foreign Portion	0	0	1037	1037	2075	0	0	596	597	1194	3268
Labour Cost	0	0	3941	3941	7882	0	0	3941	3941	7882	15764
Others	0	0	2424	2424	4848	0	0	2424	2424	4848	9696
Station Building											
Foreign Portion	0	0	486	486	972	0	0	486	486	972	1944
Labour Cost	0	0	1031	1031	2062	0	0	1031	1031	2062	4124
Others	0	0	95	94	189	0	0	103	103	206	307
Station Front Plaza											
Foreign Portion	0	0	19	19	38	0	0	0	0	0	38
Labour Cost	0	0	40	40	80	0	0	0	0	0	80
Others	0	0	3411	3410	6821	0	0	238	237	476	7297
Station Bridge											
Foreign Portion	0	0	2591	2591	5182	0	0	190	191	381	5563
Labour Cost	0	0	32	31	63	0	0	0	0	0	64
Others	0	0	788	788	1576	0	0	47	47	94	1670
Pedestrian Mole											
Foreign Portion	0	0	1445	1444	2889	0	0	997	997	1992	4881
Labour Cost	0	0	880	888	1777	0	0	613	613	1225	3002
Others	0	0	178	178	356	0	0	122	122	245	601
Station Platform											
Foreign Portion	0	0	378	378	756	0	0	261	261	522	1278
Labour Cost	0	0	0	0	0	0	0	235	235	470	470
Others	0	0	0	0	0	0	0	2	2	3	3
Land Acquisition and Compensation											
Foreign Portion	0	0	0	0	0	0	0	30	30	60	60
Labour Cost	0	0	0	0	0	0	0	3581	3581	7163	7163
Others	0	0	0	0	0	0	0	2171	2171	4342	4342
Foreign Portion	0	0	0	0	0	0	0	452	452	904	904
Labour Cost	0	5105	0	0	5105	0	0	958	958	1917	1917
Others	0	5105	0	0	5105	0	1693	0	0	1693	6798
Local Portion	0	5105	0	0	5105	0	1693	0	0	1693	6798
Subtotal											
Foreign Portion	0	5105	12682	12680	30468	0	1693	9776	9772	21240	51708
Labour Cost	0	0	8029	8028	16057	0	0	5488	5488	10977	26994
Others	0	5105	3376	3375	11857	0	1693	1382	1380	7542	19398
Contingency											
Foreign Portion	0	0	1902	1901	3804	0	0	1467	1465	2932	6736
Labour Cost	0	0	1204	1204	2408	0	0	821	820	1641	4049
Others	0	0	506	506	1013	0	0	207	207	414	797
D/D and E/S											
Foreign Portion	390	652	781	781	2604	302	504	439	438	877	1890
Labour Cost	240	402	482	482	1606	164	274	504	504	2014	4618
Others	150	250	299	299	998	138	230	328	328	1094	2700
Local Portion								296	296	920	1918
Total											
Foreign Portion	390	5757	15366	15363	36876	302	2197	11847	11841	26186	63062
Labour Cost	240	402	9715	9714	20071	162	274	6618	6616	13672	33743
Labour Cost	240	250	1768	1767	3935	138	230	1865	1863	4092	8031
Others	150	5105	3883	3882	12870	0	1693	3564	3362	8418	21288

Table 6.2.1.2 Financial Investment Cost of Feeder Service
and Station Improvement

(Million Rupiah)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	Subtotal	2000/1	2001/2	2002/3	2003/4	Subtotal	Total
Bus Bay											
Foreign Portion	0	0	363	364	727	0	0	0	0	0	727
Local Portion Labour Cost	0	0	260	260	520	0	0	0	0	0	520
Local Portion Others	0	0	95	95	191	0	0	0	0	0	191
Pedestrian Cross											
Foreign Portion	0	0	1	2	3	0	0	0	0	0	3
Local Portion Labour Cost											
Local Portion Others	0	0	1	1	2	0	0	0	0	0	2
Bus Platform											
Foreign Portion	0	0	15	14	29	0	0	0	0	0	29
Local Portion Labour Cost											
Local Portion Others	0	0	1	1	2	0	0	0	0	0	2
Traffic Signal											
Foreign Portion	0	0	13	13	26	0	0	0	0	0	26
Local Portion Labour Cost											
Local Portion Others	0	0	6	6	12	0	0	0	0	0	12
Pedestrian Bridge											
Foreign Portion	0	0	4	4	8	0	0	0	0	0	8
Local Portion Labour Cost	0	0	3458	3459	6917	0	1042	1042	1042	2084	2001
Local Portion Others	0	0	1764	1764	3528	0	67	67	67	134	3662
Over Track Station											
Foreign Portion	0	0	553	554	1107	0	318	319	318	637	1744
Local Portion Labour Cost	0	0	1141	1141	2282	0	656	656	657	1313	3595
Local Portion Others	0	0	4044	4044	8088	0	4044	4044	4044	8088	16176
Station Building											
Foreign Portion	0	0	2424	2424	4848	0	2424	2424	2424	4848	9696
Local Portion Labour Cost	0	0	486	486	972	0	486	486	486	972	1944
Local Portion Others	0	0	1134	1134	2268	0	1134	1134	1134	2268	4536
Station Front Plaza											
Foreign Portion	0	0	158	157	315	0	0	0	0	0	315
Local Portion Labour Cost	0	0	95	94	189	0	0	0	0	0	189
Local Portion Others	0	0	19	19	38	0	0	0	0	0	38
Station Bridge											
Foreign Portion	0	0	44	44	88	0	0	0	0	0	88
Local Portion Labour Cost	0	0	3490	3489	6979	0	242	243	242	485	7464
Local Portion Others	0	0	2591	2591	5182	0	191	190	191	381	5563
Pedestrian Mole											
Foreign Portion	0	0	32	31	63	0	0	0	0	0	64
Local Portion Labour Cost	0	0	867	867	1734	0	51	52	51	103	1837
Local Portion Others	0	0	1483	1482	2965	0	1021	1023	1021	2044	5009
Station Platform											
Foreign Portion	0	0	889	888	1777	0	612	613	612	1225	3002
Local Portion Labour Cost	0	0	178	178	356	0	122	123	122	245	601
Local Portion Others	0	0	416	416	832	0	287	287	287	574	1406
Land Aquisition and Compensation											
Foreign Portion	0	0	0	0	0	0	38	38	38	76	79
Local Portion Labour Cost	0	0	0	0	0	0	4	4	3	3	3
Local Portion Others	0	0	33	33	66	0	33	33	33	66	66
Foreign Portion	0	0	3490	3489	6979	0	3678	3678	3677	7355	7355
Local Portion Labour Cost	0	0	2591	2591	5182	0	2171	2171	2171	4342	4342
Local Portion Others	0	5616	0	0	0	1862	452	452	452	904	2904
Foreign Portion	0	0	0	0	5616	0	1054	1055	1054	2109	2109
Local Portion Labour Cost	0	5616	0	0	0	1862	0	0	0	1862	7478
Local Portion Others	0	5616	0	0	5616	1862	0	0	0	1862	7478
Subtotal											
Foreign Portion	0	5616	13020	13018	31654	0	1862	10068	10064	21994	53648
Local Portion Labour Cost	0	0	8029	8028	16057	0	0	5469	5468	10937	26994
Local Portion Others	0	5616	3714	3713	13043	0	1862	3217	3216	8295	21338
Contingency											
Foreign Portion	0	0	1953	1952	3905	0	0	1511	1509	3020	6925
Local Portion Labour Cost	0	0	1204	1204	2408	0	0	821	820	1641	4049
Local Portion Others	0	0	557	557	1114	0	504	483	482	414	797
D/D and E/S											
Foreign Portion	390	652	781	781	2604	302	504	604	604	2014	2079
Local Portion Labour Cost	240	402	482	482	1606	164	274	328	328	1094	4618
Local Portion Others	150	250	299	299	998	138	230	276	276	920	1918
Total											
Foreign Portion	390	6268	15754	15751	38163	302	2366	12183	12177	27028	65191
Local Portion Labour Cost	240	402	9715	9714	20071	164	274	6618	6618	13672	33743
Local Portion Others	150	250	1768	1767	3955	138	230	1865	1863	4096	8031
	5616	5616	4271	4270	14157	1862	1862	3700	3698	9260	23417

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Table 6.2.1.3 Economic Investment Cost of Feeder Service
and Station Facilities Improvement

(Rp.000000)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	Total
Bus Bay	0	0	354	355	710
Pedestrian Cross	0	0	3	3	6
Bus Platform	0	0	14	13	27
Traffic Signal	0	0	6	6	12
Pedestrian Bridge	0	0	3354	3355	6710
Over Track Station	0	0	3941	3941	7882
Station Building	0	0	154	153	307
Station Front Plaza	0	0	3411	3410	6821
Station Bridge	0	0	1445	1444	2889
Pedestrian Mall	0	0	0	0	0
Station Platform	0	0	0	0	0
Land Acquisition and Compensation	0	5105	0	0	5105
D/D, S/S and Contingency	390	652	2683	2682	6408
Total	390	5757	15366	15363	36876

Table 6.2.1.4 Economic Additional Investment Cost of Feeder Service
and Station Facilities Improvement

(Rp.000000)

Investment Item \ Year	2000/1	2001/2	2002/3	2003/4	Total
Bus Bay	0	0	0	0	0
Pedestrian Cross	0	0	0	0	0
Bus Platform	0	0	0	0	0
Traffic Signal	0	0	0	0	0
Pedestrian Bridge	0	0	982	982	1965
Over Track Station	0	0	3941	3941	7882
Station Building	0	0	0	0	0
Station Front Plaza	0	0	238	237	476
Station Bridge	0	0	997	995	1992
Pedestrian Mall	0	0	35	35	70
Station Platform	0	0	3582	3581	7163
Land Acquisition and Compensation	0	1693	0	0	1693
D/D, S/S and Contingency	302	504	2071	2069	4946
Total	302	2197	11847	11841	26186

Table 6.2.1.5 Additional Investment of Rolling Stocks

(Rp. 000000)

Year	Number	Amount
1995	8	14944
1998	4	7472
2001	4	7472
2003	4	7472
2005	4	7472
2008	4	7472
2011	4	7472
2013	4	7472
Total	36	67248

4) Residual value

The 20 year period of project life is defined only for the project evaluation. The assets invested for the improvement remain even after the period. The remaining value of the assets is appropriated as residual value at the last year of the project life.

Table 6.2.1.6 shows the useful life and the residual value by asset.

Table 6.2.1.6 Useful Life and Residual Value

(Years, Rp. 000000)

	Useful Life	Residual Value
Bus Bay	30	237
Pedestrian Cross	30	2
Bus Platform	30	9
Traffic Signal	20	0
Pedestrian Bridge	35	4223
Over Track Station	35	8783
Station Building	35	132
Station Front Plaza	30	2575
Station Bridge	35	2604
Pedestrian Mall	30	44
Station Platform	30	4537
Rolling Stock	25	35567
Land Acquisition	-	6077
Total	-	64790

(2) Economic benefit

1) Maintenance and operation cost difference

a) Railway operation, feeder service and station facilities

Maintenance cost of the project was estimated using the same method described in Chapter 5 of Volume I. The maintenance rates by investment item are shown in Table 6.2.1.7. This table includes operating cost of the project except railway operation.

Table 6.2.1.7 Maintenance Rate by Investment Item

	Maintenance Rate
Bus Bay	0.0051
Pedestrian Cross	0.0041
Bus Platform	0.0051
Traffic Signal	0.0150
Pedestrian Bridge	0.0027
Over Track Station	0.0067
Station Building	0.0067
Station Front Plaza	0.0041
Station Bridge	0.0027
Pedestrian Mall	0.0041
Station Platform	0.0041
Rolling Stock	0.0137

Railway operation cost increase for the increased passenger is summarized in Table 6.2.1.8.

Table 6.2.1.8 Operation Cost Increase
(Rp. 000000)

	1995	2005
Personnel		
Driver	1.3	9.2
Conductor	1.4	8.5
Station	19.2	134.7
Workshop	10.6	31.9
Depot	8.0	24.0
Electricity	37.7	179.5

b) Road vehicles

The difference of road vehicle operating cost is appropriated as benefit by this project if the cost of "with" case is less than that of "without" case.

The cost components consist of vehicles, tires, fuels, engine oil, wage, interest, insurance and overhead. The methodology of estimation is same as described in Chapter 5 of Volume I. The cost for 1995 target year was derived from an interpolation.

2) Time saving benefit

Time saving benefit caused by this project was calculated from the difference of the passenger hours by mode between "with" and "without" cases.

In addition to the time saving of passengers, time savings of freight transportation by trucks were appropriated as same as option "b" evaluation.

The time saving benefit by mode in target years are shown in Table 6.2.1.9.

Table 6.2.1.9 Annual Time Saving Benefit

(Rp. 000000)

Mode	1995	2005
Railway	2143.2	6068.7
Bus	4344.2	11107.1
Sedan	3574.7	8287.9
Motorcycle	868.9	2343.0
Truck	3.1	10.9

Time value estimates by mode were estimated by interpolation.

(3) Result of analysis

Table 6.2.1.10 shows the result of the economic analysis. The EIRR of the project is very high. It reached to 30%. The B/C, which was calculated according to the test discount rate of 15%, indicates 2.39. The net present value by this project was Rp. 114736 million.

The result shows a superiority in efficiency of the project. The reason why this project has such a high EIRR seems to that the cost of the project was relatively small and the effect was big.

A sensitivity test was also carried out. The result is shown in Table 6.2.1.11. The EIRR of the most pessimistic case was 29.19%. The viability of this project can be said very preferable from an economic point of view.

Table 6.2.1.11 Sensitivity Test Results

Case	EIRR(%)	B/C	NPV
Base Case	34.78	2.39	114736
Benefit 10% down	31.76	2.15	95033
Cost 10% up	32.04	2.18	106506
Benefit 10 down & Cost 10% up	29.19	1.96	86804

Note:NPV(Rp.000000)

Table 6.2.1.10 Economic Analysis of Feeder Service and Station Facilities Improvement

EIRR (%)	34.77527		B/C	2.39		NPV	114736
(Million Rupiah)			Benefit:	1.00		Cost :	1.00

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Cost	390	5757	15366	15363	14944	0	0	7472	0	302	9669	11847
Initial Investment	390	5757	15366	15363								
Additional Investment					14944			7472		302	9669	11847
Residual Value												
Benefit	0	0	0	0	17224	19155	21086	22902	24834	26765	28581	30512
Time Saving	0	0	0	0	11027	12722	14418	16113	17808	19503	21198	22893
Public Mode User					6487	7556	8625	9694	10763	11832	12900	13969
Private Mode User					4540	5166	5792	6419	7045	7671	8297	8923
Cost Saving	0	0	0	0	6197	6433	6669	6790	7026	7262	7383	7619
Railway & Feeder					-399	-424	-450	-590	-615	-640	-780	-805
Maintenance					-343	-343	-343	-457	-457	-457	-572	-572
Operation					-56	-82	-107	-132	-157	-183	-208	-233
Road Vehicle					6596	6857	7118	7380	7641	7902	8163	8425
Net Benefit	-390	-5757	-15366	-15363	2280	19155	21086	15430	24834	26463	18912	18665

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cost	19313	0	7472	0	0	7472	0	0	7472	0	7472	-64790
Initial Investment												
Additional Investment	19313		7472			7472			7472		7472	0
Residual Value												-64790
Benefit	32328	34259	35981	37912	39843	41659	43590	45521	47338	49269	51085	53016
Time Saving	24588	26283	27978	29673	31368	33063	34758	36453	38148	39843	41538	43233
Public Mode User	15038	16107	17176	18245	19313	20382	21451	22520	23589	24658	25727	26795
Private Mode User	9550	10176	10802	11428	12055	12681	13307	13933	14559	15186	15812	16438
Cost Saving	7740	7977	8003	8239	8475	8596	8832	9068	9189	9425	9547	9783
Railway & Feeder	-946	-971	-1206	-1251	-1256	-1396	-1422	-1447	-1587	-1612	-1752	-1778
Maintenance	-687	-687	-897	-897	-897	-1012	-1012	-1012	-1127	-1127	-1241	-1241
Operation	-258	-284	-309	-334	-360	-385	-410	-435	-461	-486	-511	-536
Road Vehicle	8686	8947	9209	9470	9731	9992	10254	10515	10776	11038	11299	11560
Net Benefit	13015	34259	28509	37912	39843	34187	43590	45521	39866	49269	43613	117806

6-2-2 Financial Analysis

(1) Items composing cash flow statement

1) Operating revenue

The operating revenue means in this analysis the increased passenger revenue accompanying improvements in the feeder service and station facilities. Passenger revenue is calculated from passenger fare rates, and the volume of passengers (passenger-km) derived from an estimation of transportation demand. At Rp 13.4/passenger-km, the rate is the same used in Volume I.

2) Operating expenses

Operating expenses can be divided into working cost and depreciation. Working cost is the total of maintenance cost, personnel cost and energy cost for the feeder service and station facilities.

Depreciation, meanwhile, because a certain loss in the value of equipment is set off against the purchase of new equipment, and so some portion of the amount spent on equipment is included in expenses, it is normally a cost included in simple accounting procedures and does not produce a cash outflow. For a calculation of depreciation, the useful life indicated in Table 6.2.2.1 is applied.

3) Operating profit and net profit

Operating profit is operating revenue less operating expense. Net profit is operating profit less expense and plus revenue accrued through other than business activities. This analysis, however, takes, net profit to be operating profit less the sum PJKA pays the government as interest on total assets. (Note 1)

Interest on total assets is calculated in this analysis as 3% of the amount of fixed assets after expenses for amortization of price reductions is deducted from the figure.

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(Note 1)   According to Article 13 of the Joint Decree of the
Minister of Finance and the Minister of Communications
issued on 30th March 1979, as a general rule, PJKA pays to
the government as interest 3% of its fixed assets. This
joint decree can be considered to be still in effect. In
the PJKA's statement of profits and losses is the item
Bunga atas modal Pasal 4 IBW (Interest on capital Article
4 IBW), the interest it pays to the government. Since
PJKA has always shown red figures, however, the source of
the funds PJKA has paid to the government as interest has
been again a government subsidy, and so the interest has
essentially not been paid.

Table 6.2.2.1   Useful Life and Residual Value

	Useful Life (Years)	Residual Value (Million Rp)
Bus Bay	30	242
Pedestrian Cross	30	2
Bus Platform	30	10
Traffic Signal	20	0
Pedestrian Bridge	35	4364
Parking Area	50	299
Over Track Station	35	8897
Station Building	35	135
Station Front Plaza	30	2326
Station Bridge	35	2643
Station Platform	30	4536
Pedestrian Mall	30	47
Rolling Stock	25	38257
Land Acquisition	—	6685
Total	—	68442

(2) Investment and finance program

1) Investment schedule and amount

We will apply the investment schedule used in the economic
analysis. However prices are all based on financial expenses with
taxes telescoped (market prices).

Investment by year of financial expense is as shown in Table 6.2.2.2.

Additional investment cost and reinvestment cost, as well as
residual value, are taken as they are in the economic analysis.
However, prices are the base of financial costs, and the residual
value of assets by type is as shown in Table 6.2.2.1.

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Table 6.2.2.2 Financial Investment Cost of Feeder Service and Station Improvement

(Million Rp)

Investment items	1991	1992	1993	1994	1995	2000	2001	2002	2003	Total
Feeder facilities										
Bus bay			364	362						726
Foreign portion			234	233						467
Local portion			130	129						259
Pedestrian cross			3	3						6
Foreign portion			1	2						3
Local portion			2	1						3
Bus platform			29							29
Foreign portion			2							2
Local portion			27							27
Traffic signals			6	6						12
Foreign portion			4	4						8
Local portion			2	2						4
Pedestrian bridge			3458	3459				1042	1042	9001
Foreign portion			1764	1764				67	67	3662
Local portion			1694	1695				975	975	5339
Parking area								243	242	485
Foreign portion								190	191	381
Local portion								53	51	104
Pedestrian mall								38	38	76
Foreign portion								4	3	7
Local portion								34	35	69
Land purchase		2212					1862			4074
Foreign portion										
Local portion		2212					1862			4074
D/D and E/S	115	191	229	229		39	66	80	80	1029
Foreign portion	61	100	120	120		7	13	16	16	453
Local portion	54	91	109	109		32	53	64	64	576
Contingency			573	571				199	198	1541
Foreign portion			301	300				40	39	680
Local portion			272	271				159	159	861
Sub total	115	2403	4662	4630		39	1928	1602	1600	16979
Foreign portion	61	100	2426	2423		7	13	317	316	5663
Local portion	54	2303	2236	2207		32	1915	1285	1284	11316
Station facilities										
Overtrack station			4044	4044				4044	4044	16176
Foreign portion			2424	2424				2424	2424	9696
Local portion			1620	1620				1620	1620	6480
Station building			158	157						315
Foreign portion			95	94						189
Local portion			63	63						126
Station front plaza			3490	3489						6979
Foreign portion			2591	2591						5182
Local portion			899	898						1797
Station bridge			1483	1482				1023	1021	5009
Foreign portion			889	888				613	612	3002
Local portion			594	594				410	409	2007
Station platform								3678	3677	7355
Foreign portion								2171	2171	4342
Local portion								1507	1506	3013
Rolling stocks					14944					14944
Foreign portion					14792					14792
Local portion					152					152
Land purchase		3404								3404
Foreign portion										
Local portion		3404								3404
D/D and E/S	274	460	553	553		261	438	525	525	3589
Foreign portion	180	301	362	362		155	261	313	313	2247
Local portion	94	159	191	191		106	177	212	212	1342
Contingency			1382	1379				1312	1311	5384
Foreign portion			904	903				781	781	3369
Local portion			478	476				531	530	2015
Sub total	274	3864	11110	11104	14944	261	438	10582	10578	63155
Foreign portion	180	301	7265	7262	14792	155	261	6302	6301	42819
Local portion	94	3563	3845	3842	152	106	177	4280	4277	20336
Total	389	6267	15772	15734	14944	300	2366	12184	12178	80134
Foreign portion	241	401	9691	9685	14792	162	274	6619	6617	48482
Local portion	148	5866	6081	6049	152	138	2092	5565	5561	31652

2) Finance program

The financial soundness of the project depends largely on how funds are to be obtained but we assume the finance program shown in Table 6.2.2.3.

Table 6.2.2.3 Finance Program

	Foreign currency portion	Local currency portion	Reference
Case-1	Government-to-Gov't borrowing 2.5% p.a. 30 years, including 10 years grace period	Government budget	Table 6.2.2.10
Case-2	Same as above	(50%) Government budget ------------------------------ (50%) Domestic Rp borrowing 13.5% p.a. 10 years, including 4 years grace period	Table 6.2.2.11
Case-3	Official overseas borrowing (IBRD) 7.65% p.a. 15 years, including 3 years grace period	Government budget	Table 6.2.2.12

Notes: The terms of repayment are assumed as follows:

(1) Government budget=No need to repay

(2) Borrowing=Annual equal installments

(3) Results of analysis

1) Profitability of the project

The project's FIRR, calculated on the basis of the cash flow derived from the premises described above, is -2.92%.
(For details, refer to Table 6.2.2.4)

Table 6.2.4 Financial Analysis of Feeder Service and Station Facilities Improvement

(All Cost Share on Railway Side: 100%)

(Million Rupiah)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OPERATING PROFIT	0	0	0	0	500	-46	5	-46	-294	-243	-295	-591	-998	-1552	-1604
OPERATING REVENUE	0	0	0	0	1683	1765	1846	1928	2009	2091	2172	2254	2335	2417	2498
OPERATING EXPENSE	0	0	0	0	1183	1811	1841	1974	2303	2334	2467	2845	3333	3969	4102
WORKING COST															
MAINTENANCE COST	0	0	0	0	401	432	462	595	626	656	799	868	1050	1081	1214
FEEDER	0	0	0	0	320	320	320	423	423	423	525	574	725	725	828
STATION FACILITIES	0	0	0	0	23	23	23	23	23	23	23	27	31	31	31
PERSONNEL COST	0	0	0	0	298	298	298	400	400	400	502	547	695	695	797
ELECTRICITY COST	0	0	0	0	43	60	76	92	109	125	141	158	174	190	206
FUEL COST	0	0	0	0	38	52	66	80	94	109	123	137	151	165	180
DEPRECIATION	0	0	0	0	781	1379	1379	1379	1678	1678	1678	1977	2283	2888	2888
INTEREST ON TOTAL ASSETS	0	0	0	0	1206	1165	1123	1306	1256	1205	1379	1622	2080	1993	2130
NET PROFIT	0	0	0	0	-706	-1211	-1118	-1353	-1550	-1449	-1674	-2213	-3078	-3545	-3734
INVESTMENT	389	6267	15772	15734	14944	0	0	7472	0	300	9838	12184	19650	0	7472
FEEDER	115	2403	4662	4630	0	0	0	0	0	39	1928	1602	1600	0	0
STATION FACILITIES	274	3864	11110	11104	14944	0	0	7472	0	261	7910	10582	18050	0	7472
SALVAGE VALUE															
INT. DURING CONST.	5	14	199	446											
FINANCE PROGRAM															
FINANCE TOTAL															
BORROWING	394	6281	15971	16180	14944	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	394	6674	22645	38825	53769	53769	53769	53769	53769	53769	53769	53769	53769	53769	53769
INTEREST	5	14	199	446	887	887	887	887	887	887	887	887	887	887	887
FINANCE IN FOREIGN CCY															
BORROWING	246	415	9890	10131	14792	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	246	660	10550	20681	35473	35473	35473	35473	35473	35473	35473	35473	35473	35473	35473
INTEREST	5	14	199	446	887	887	887	887	887	887	887	887	887	887	887
FINANCE IN LOCAL CCY															
BORROWING	148	5866	6081	6049	152	0	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	148	6014	12095	18144	18296	18296	18296	18296	18296	18296	18296	18296	18296	18296	18296
INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	0	0	0	0	395	446	497	-7027	497	248	-9342	-11686	-19252	449	-7074
CUM. NET CASHFLOW	0	0	0	0	395	840	1337	-5689	-5193	-4945	-14287	-25973	-45224	-44775	-51849
CASH IN	394	6281	15971	16180	16226	1333	1384	1332	1383	1434	1383	1385	1285	1336	1285
CASH OUT	394	6281	15971	16180	15831	887	887	8359	887	1187	10725	13071	20537	887	8359
CASHFLOW FOR FIRR	-389	-6267	-15772	-15734	-13662	1333	1384	-6140	1383	1134	-8455	-10799	-18365	1336	-6187
FIRR %	-2.92%														

Table 6.2.2.4 (Continued)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	-1851	-1900	-1852	-2099	-2048	-2100	-2348	-2399	-2647
OPERATING REVENUE	2580	2661	2743	2824	2906	2988	3069	3151	3232
OPERATING EXPENSE	4431	4462	4595	4924	4954	5087	5417	5549	5879
WORKING COST	1244	1274	1407	1438	1468	1601	1632	1764	1795
MAINTENANCE COST	828	828	930	930	930	1032	1032	1135	1135
FEEDER	31	31	31	31	31	31	31	31	31
STATION FACILITIES	797	797	899	899	899	1002	1002	1104	1104
PERSONNEL COST	223	239	255	272	288	304	321	337	353
ELECTRICITY COST	194	208	222	256	250	265	279	293	307
FUEL COST	0	0	0	0	0	0	0	0	0
DEPRECIATION	3187	3187	3187	3486	3486	3486	3785	3785	4034
INTEREST ON TOTAL ASSETS	2035	1939	2069	1963	1859	1978	1865	1975	2053
NET PROFIT	-3886	-3740	-3919	-4063	-3907	-4078	-4212	-4374	-4700
INVESTMENT	0	0	7472	0	0	7472	0	7472	-68442
FEEDER	0	0	7472	0	0	7472	0	7472	0
STATION FACILITIES	0	0	0	0	0	0	0	0	0
-SALVAGE VALUE									68442
INT. DURING CONST									
FINANCE PROGRAM									
FINANCE TOTAL									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	1774	1774	1774	1774	1774	1774	1774	1774	1774
LOAN BALANCE	51996	50222	48448	46675	44901	43127	41354	39580	37806
INTEREST	842	798	754	709	665	621	576	532	488
FINANCE IN FOREIGN CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	1774	1774	1774	1774	1774	1774	1774	1774	1774
LOAN BALANCE	33700	31926	30152	28379	26605	24831	23058	21284	19510
INTEREST	842	798	754	709	665	621	576	532	498
FINANCE IN LOCAL CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0
LOAN BALANCE	18296	18296	18296	18296	18296	18296	18296	18296	18296
INTEREST	0	0	0	0	0	0	0	0	0
NET CASHFLOW	-1290	-1185	-8664	-1097	-1001	-8480	-913	-8392	67617
CUM. NET CASHFLOW	-53129	-54314	-62978	-64075	-65076	-73556	-74469	-82860	-15243
CASH IN	1336	1387	1336	1387	1438	1386	1437	1386	1437
CASH OUT	2616	2572	9999	2483	2439	9866	2350	9778	-66180
CASHFLOW FOR FIRR	1336	1387	-6136	1387	1438	-6086	1437	-6086	69879
FIRR %									

For PJKA, this means that the project is not financially feasible.

In order to make the project feasible from the railway's point of view, we have calculated FIRR under the hypothetical scenario of cost-sharing. The results are as shown in Table 6.2.2.5.

Table 6.2.2.5 Change of FIRR According to Cost Sharing on Railway Side

	Investment Cost		Maintenance Cost		Operation Cost		FIRR (%)
	Feeder	Station	Feeder	Station	Feeder	Station	
Cost Sharing on Railway Side (%)	100	100	100	100	100	100	-2.92
	50	100	50	100	50	100	-2.82
	20	100	20	100	20	100	-2.76
	90	90	90	100	90	100	-2.68
	50	50	50	100	50	100	-0.71
	20	20	20	100	20	100	6.32

The project becomes financially feasible (with a positive FIRR) for the railway under the condition that the railway's share of capital investment and of operational and maintenence cost of the feeder section are reduced to 20%. (Refer to Table 6.2.2.6)

However, the debt of the commercial base may make management unfeasible under this FIRR (6.32%), and it would then be necessary to obtain loans at as low interest as possible and, above all, government grants which need not be repaid

In Japanese projects similar to this one which contribute to the harmonization of urban road and rail transport, the city and railway, in responce to the several benefits deriving from the project, conclude an agreement to share the costs. (Refer to Volume I, page A-20, Cost Sharing of the Railway Facilities Related to Urban Facilities (In the case of Japan).)

As shown by the economic analysis, much can be expected from the implementation of the project, and so from the point of view of the Indonesian economy, it would certainly not be odd to seek cost-sharing by the government or the city so that the railway (PJKA) would be able to excute the project and maintain its operation. As for the concrete help to the railway from within Indonesia, it will be necessary to discuss the matter thoroughly with the relevant personalities in Indonesia.

Table 6.2.2.6 Financial Analysis of Feeder Service and Station Facilities Improvement
(All investment and fedder's working Cost share on railway side: 20%)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OPERATING PROFIT															
OPERATING REVENUE	0	0	0	0	1683	1765	1846	1928	2009	2091	2172	2254	2335	2417	2498
OPERATING EXPENSE	0	0	0	0	540	690	720	853	945	974	1106	1242	1482	1634	1767
WORKING COST	0	0	0	0	540	690	720	853	945	974	1106	1242	1482	1634	1767
MAINTENANCE COST	0	0	0	0	393	414	444	577	608	638	771	847	1026	1056	1189
FEEDER	0	0	0	0	302	302	302	405	405	405	507	553	701	701	803
STATION FACILITIES	0	0	0	0	5	5	5	5	5	5	5	5	6	6	6
PERSONNEL COST	0	0	0	0	298	298	298	400	400	400	502	547	695	695	797
ELECTRICITY COST	0	0	0	0	43	60	76	92	109	125	141	158	174	190	206
FUEL COST	0	0	0	0	38	52	66	80	92	109	123	137	151	165	180
DEPRECIATION	0	0	0	0	156	276	276	276	336	336	336	395	457	572	578
INTEREST ON TOTAL ASSETS	0	0	0	0	241	233	225	261	251	241	276	324	416	399	426
NET PROFIT	0	0	0	0	902	842	901	814	815	876	790	687	437	384	306
INVESTMENT	78	1253	3154	3147	2989	0	0	1494	0	60	1968	2437	3930	0	1494
FEEDER	23	481	932	926	0	0	0	0	0	8	386	320	320	0	0
STATION FACILITIES	55	773	2222	2221	2989	0	0	1494	0	52	1582	2116	3610	0	1494
-SALVAGE VALUE															
INT. DURING CONST.	1	3	40	89											
FINANCE PROGRAM															
FINANCE TOTAL															
BORROWING	79	1256	3194	3236	2989	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	79	1335	4529	7765	10754	10754	10754	10754	10754	10754	10754	10754	10754	10754	10754
INTEREST	1	3	40	89	177	177	177	177	177	177	177	177	177	177	177
FINANCE IN FOREIGN CCY															
BORROWING	49	83	1978	2026	2958	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	49	132	2110	4136	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095
INTEREST	1	3	40	89	177	177	177	177	177	177	177	177	177	177	177
FINANCE IN LOCAL CCY															
BORROWING	30	1173	1216	1210	30	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	30	1203	2419	3629	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	0	0	0	0	1122	1173	1224	-321	1224	1215	-744	-1208	-2798	1183	-362
CUM. NET CASHFLOW	0	0	0	0	1122	2296	3520	3199	4423	5638	4895	3687	889	2072	1710
CASH IN	79	1256	3194	3236	4288	1351	1402	1350	1402	1453	1401	1407	1310	1361	1309
CASH OUT	79	1256	3194	3236	3166	177	177	1672	177	237	2145	2614	4107	177	1672
CASHFLOW FOR FIRR	-78	-1253	-3154	-3147	-1689	1351	1402	-144	1402	1393	-566	-1030	-2620	1361	-185

FIRR % 6.32%

Table 6.2.6 (Continued)

(Million Rupiah)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	723	774	723	714	765	714	705	654	645
OPERATING REVENUE	2580	2661	2743	2824	2906	2988	3069	3151	3232
OPERATING EXPENSE	1857	1887	2020	2111	2141	2274	2364	2497	2587
WORKING COST									
MAINTENANCE COST	1219	1250	1383	1413	1444	1577	1607	1740	1770
FEEDER	803	803	905	905	905	1008	1008	1110	1110
STATION FACILITIES	6	6	6	6	6	6	6	6	6
PERSONNEL COST	797	797	899	899	899	1002	1002	1104	1104
ELECTRICITY COST	223	239	255	272	288	304	321	337	353
FUEL COST	194	208	222	236	250	285	279	293	307
	0	0	0	0	0	0	0	0	0
DEPRECIATION	637	637	637	697	697	697	757	757	817
INTEREST ON TOTAL ASSETS	407	388	414	393	372	396	373	395	411
NET PROFIT	316	386	309	321	393	318	332	259	234
INVESTMENT									
FEEDER	0	0	1494	0	0	1494	0	1494	-13688
STATION FACILITIES	0	0	1494	0	0	1494	0	1494	0
-SALVAGE VALUE									13688
INT. DURING CONST.									
FINANCE PROGRAM									
FINANCE TOTAL									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	10399	10044	9690	9335	8980	8625	8271	7916	7561
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN FOREIGN CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	6740	6395	6030	5676	5321	4966	4612	4257	3902
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN LOCAL CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0
LOAN BALANCE	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0
NET CASHFLOW	837	897	-640	915	974	-562	992	-545	14698
CUM. NET CASHFLOW	2547	3444	2804	3719	4693	4131	5123	4578	19276
CASH IN	1360	1411	1360	1411	1462	1411	1462	1411	1462
CASH OUT	523	514	2000	497	488	1973	470	1956	-13236
CASHFLOW FOR FIRR	1360	1411	-134	1411	1462	-84	1462	-84	15150
FIRR %									

2) Analysis of cash flow

The circumstances of the case analyzed in this section and the Sensitivity Analysis of the following section are that the railway, with a positive FIRR, undertakes 20% of the capital investment and of maintenance and operation of the feeder.

a) Net cash flow

Net cash flow is the difference between cash inflow and cash outflow. The items which comprise these are the following:
  *Cash inflow
   Operating profit, Depreciation, Borrowing
  *Cash outflow
   Investment, Repayment, Interest payments
  *Net cash flow = (Cash inflow) - (Cash outflow)

When net cash flow is negative, whether the negative portion is drawn from the capital on hand, or, when this is insufficient, the government engages in cost-sharing as a last resort.

In the case where the net cash flow of this project is negative, the financial assistance from the government necessary to make up for this is shown in Table 6.2.2.7. In order to estimate the financial assistance necessary to the execution of this project, we have calculated the surplus cash to be produced by this project as what would be retained of the insufficient cash which the project forces on PJKA. Realistically, because PJKA has been for many years in operational deficit, there is a fear that the surplus cash resulting from this project will be lost.

b) Analysis of net cash flow

Table 6.2.2.8 shows the net cash flows as per cases based on the capital finance program hypothesized in (2) 2). Careful examination of the above net cash flow reveals the capital finance program case 1 or case 2 to be desirable.

Table 6.2.2.7   Government Subsidy Necessary for Net Cash Flow Shortage

(Million Rp)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL
Case-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Case-2	—	—	—	—	—	—	—	—	2925	—	—	—	—	—	—	—	—	—	—	—	2925
Case-3	—	—	—	—	—	—	—	1398	3565	—	571	—	—	—	—	—	—	—	—	—	5534

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Table 6.2.2.8   Net Cash Flow According to Cases

(Million Rp)

Cases	Items	1991-1998	1999-2006	2007-2014	Total
Common to all cases	Operating revenue	7222	18356	23573	49151
	Operating expenses	2803	11005	17881	31689
	Operating profit	4419	7351	5692	17462
	Depreciation	984	3653	5695	10332
	Net profit	3459	4611	2552	10622
	Investment	12115	9889	4483	26487
Case-1	Net cash flow	3199	-653	3041	5587
	DSCR [Note 1]	4.65	0.63	1.78	1.84
	Ratio [Note 2]	44%	-4%	13%	11%
Case-2	Net cash flow	1956	-4042	3041	955
	DSCR [Note 1]	1.53	0.22	1.78	1.03
	Ratio [Note 2]	27%	-22%	13%	2%
Case-3	Net cash flow	1651	-6627	4165	-811
	DSCR [Note 1]	1.46	0.14	2.52	0.91
	Ratio [Note 2]	23%	-36%	18%	-2%

[Note 1] : DSCR=Debt service coverage ratio
    =Operating profit+Depreciation-Additional investment/Debt service

[Note 2] : Ratio=Net cash flow/Operating revenue X 100

Case 1 and case 2 present no debt-repayment problems because 1) accumulated net cash flow will be positive totalling the whole life of the project; 2) the net cash flow/operating revenue ratio will not make it necessary to raise passenger fares and 3) debt service coverage ratio (DSCR) is greater than 1.0.

Case 3 presents problems with regard to the avobe points. It would present debt-repayment problems because 1) accumulated net cash flow would be negative; 2) the net cash flow/operating revenue ratio would make it necessary to raise 2% passenger fares; and 3) DSCR is below 1.0.

3) Sensitivity analysis

Table 6.2.2.9 gives the result of a sensitivity analysis of operating revenue and of the amount of investment. It can be seen from the result that a change in the amount of investment would have somewhat less effect on the FIRR than would a change in operating revenue.

Table 6.2.2.9   Results of Sensitivity Analysis

	F I R R (%)	R e f e r e n c e
1) B a s e C a s e	6 . 3 2	Table 6. 2. 2. 6
2) R e v e n u e 1 0 % d o w n	4 . 2 9	Table 6. 2. 2. 13
3) I n v e s t m e n t 1 0 % u p	4 . 7 3	Table 6. 2. 2. 14
4) 2) + 3)	2 . 8 7	Table 6. 2. 2. 15

Table 6.2.2.10   Financial Analysis of Feeder Service and Station Facilities Improvement

(Case-1)

(Million Rupiah)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OPERATING PROFIT	0	0	0	0	1143	1075	1126	1075	1066	1117	1066	1011	853	783	732
OPERATING REVENUE	0	0	0	0	1683	1765	1846	1928	2009	2091	2172	2254	2335	2417	2498
OPERATING EXPENSE	0	0	0	0	540	690	720	853	943	974	1106	1242	1482	1634	1767
WORKING COST					383	414	444	577	608	638	771	847	1026	1056	1189
MAINTENANCE COST					302	302	302	405	405	405	507	553	701	701	803
FEEDER					5	5	5	5	5	5	5	5	6	6	6
STATION FACILITIES					298	298	298	400	400	400	502	547	695	695	797
PERSONNEL COST					43	60	76	92	109	125	141	159	174	190	206
ELECTRICITY COST					38	52	66	80	94	109	123	137	151	165	180
FUEL COST					0	0	0	0	0	0	0	0	0	0	0
DEPRECIATION					156	276	276	276	336	336	336	395	457	578	578
INTEREST ON TOTAL ASSETS					241	233	225	261	251	241	276	324	416	399	426
NET PROFIT					902	842	901	814	815	878	790	687	437	384	306
INVESTMENT	78	1253	3154	3147	2989	0	0	1494	0	60	1968	2437	3930	0	1494
FEEDER	23	481	932	926	0	0	0	0	0	8	386	320	320	0	0
STATION FACILITIES	55	773	2222	2221	2989	0	0	1494	0	52	1582	2116	3610	0	1494
-SALVAGE VALUE															
INT. DURING CONST.	1	3	40	89											
FINANCE PROGRAM															
FINANCE TOTAL															
BORROWING	79	1256	3194	3236	2989	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	79	1335	4529	7765	10754	10754	10754	10754	10754	10754	10754	10754	10754	10754	10754
INTEREST	1	3	40	89	177	177	177	177	177	177	177	177	177	177	177
FINANCE IN FOREIGN CCY															
BORROWING	49	83	1978	2026	2958	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	49	132	2110	4136	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095
INTEREST	1	3	40	89	177	177	177	177	177	177	177	177	177	177	177
FINANCE IN LOCAL CCY															
BORROWING	30	1173	1216	1210	30	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	30	1203	2419	3629	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	0	0	0	0	1122	1173	1224	-321	1224	1215	-744	-1208	-2798	1183	-362
CUM. NET CASHFLOW	0	0	0	0	1122	2296	3520	3199	4423	5638	4895	3687	889	2072	1710
CASH IN	79	1256	3194	3236	4288	1351	1402	1350	1402	1453	1401	1407	1310	1361	1309
CASH OUT	79	1256	3194	3236	3166	177	177	1672	177	237	2145	2614	4107	177	1672
CASHFLOW FOR FIRR	-78	-1253	-3154	-3147	-1689	1351	1402	-144	1402	1393	-566	-1030	-2620	1361	-185

FIRR %   6.32%

Table 6.2.2.10 (Continued)

(Million Rupiah)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	723	774	723	714	765	714	705	654	645
OPERATING REVENUE	2580	2661	2743	2824	2906	2988	3069	3151	3232
OPERATING EXPENSE	1857	1887	2020	2111	2141	2274	2364	2497	2587
WORKING COST	1219	1250	1383	1413	1444	1577	1607	1740	1770
MAINTENANCE COST	803	803	905	905	905	1008	1008	1110	1110
FEEDER	6	6	6	6	6	6	6	6	6
STATION FACILITIES	797	797	899	899	899	1002	1002	1104	1104
PERSONNEL COST	223	239	255	272	288	304	321	337	355
ELECTRICITY COST	194	208	222	236	250	265	279	293	307
FUEL COST	0	0	0	0	0	0	0	0	0
DEPRECIATION	637	637	637	697	697	697	757	757	817
INTEREST ON TOTAL ASSETS	407	388	414	393	372	396	373	395	411
NET PROFIT	316	386	309	321	393	318	332	259	234
INVESTMENT	0	0	1494	0	0	1494	0	1494	-13688
FEEDER	0	0	0	0	0	0	0	0	0
STATION FACILITIES	0	0	1494	0	0	1494	0	1494	0
-SALVAGE VALUE									13688
INT. DURING CONST.									
FINANCE PROGRAM									
FINANCE TOTAL									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	10399	10044	9690	9335	8980	8625	8271	7916	7561
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN FOREIGN CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	6740	6385	6030	5676	5321	4966	4612	4257	3902
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN LOCAL CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0
LOAN BALANCE	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0
NET CASHFLOW	837	897	-640	915	974	-562	992	-545	14698
CUM. NET CASHFLOW	2547	3444	2804	3719	4693	4131	5123	4578	19276
CASH IN	1360	1411	1360	1411	1462	1411	1462	1411	1462
CASH OUT	523	514	2000	497	488	1973	470	1956	-13236
CASHFLOW FOR FIRR	1360	1411	-134	1411	1462	-84	1462	-84	15150
FIRR %									

Table 6.2.2.11 Financial Analysis of Feeder Service and Station Facilities Improvement

(Case-2)

(Million Rupiah)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OPERATING PROFIT	0	0	0	0	1143	1075	1126	1075	1066	1117	1066	1011	853	783	732
OPERATING REVENUE	0	0	0	0	1683	1765	1846	1928	2009	2091	2172	2254	2335	2417	2498
OPERATING EXPENSE	0	0	0	0	540	690	720	853	943	974	1106	1242	1482	1634	1767
WORKING COST	0	0	0	0	383	414	444	577	608	638	771	847	1026	1056	1189
MAINTENANCE COST	0	0	0	0	302	302	302	405	405	405	507	553	701	701	803
FEEDER	0	0	0	0	5	5	5	5	5	5	5	5	6	6	6
STATION FACILITIES	0	0	0	0	298	298	298	400	400	400	502	547	695	695	797
PERSONNEL COST	0	0	0	0	43	60	76	92	109	125	141	158	174	190	206
ELECTRICITY COST	0	0	0	0	38	52	66	80	94	109	123	137	151	165	180
FUEL COST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	156	276	276	276	336	336	336	395	457	578	573
INTEREST ON TOTAL ASSETS	0	0	0	0	241	233	225	261	251	241	276	324	416	399	426
NET PROFIT	0	0	0	0	902	842	901	814	815	876	790	687	437	384	306
INVESTMENT	78	1253	3154	3147	2989	0	0	1494	0	60	1968	2437	3930	0	1494
FEEDER	23	481	932	926	0	0	0	0	0	8	386	320	320	0	0
STATION FACILITIES	55	773	2222	2221	2989	0	0	1494	0	52	1582	2116	3610	0	1494
-SALVAGE VALUE				344											
INT. DURING CONST.	2	66	193												
FINANCE PROGRAM / FINANCE TOTAL															
BORROWING	80	1319	3347	3491	2989	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	384	384	384	384	384	384
LOAN BALANCE	80	1399	4746	8238	11226	11226	11226	11226	11226	10843	10459	10075	9692	9308	8924
INTEREST	2	66	193	344	488	488	488	488	488	436	385	333	281	229	177
FINANCE IN FOREIGN CCY															
BORROWING	49	83	1978	2026	2958	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	49	132	2110	4136	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095
INTEREST	1	3	40	89	177	177	177	177	177	177	177	177	177	177	177
FINANCE IN LOCAL CCY															
BORROWING	31	1236	1369	1465	30	0	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0	384	384	384	384	384	384
LOAN BALANCE	51	1267	2636	4101	4132	4132	4132	4132	4132	3748	3564	2931	2597	2213	1830
INTEREST	2	63	153	255	311	311	311	311	311	259	207	155	104	52	0
NET CASHFLOW	0	0	0	0	812	663	914	-632	913	573	-1335	-1747	-3285	748	-746
CUM. NET CASHFLOW	0	0	0	0	812	1674	2588	1956	2869	3442	2107	360	-2925	-2177	-2923
CASH IN	80	1319	3347	3491	4288	1351	1402	1350	1402	1453	1401	1407	1310	1361	1309
CASH OUT	80	1319	3347	3491	3477	488	488	1983	480	880	2756	3153	4595	613	2055
CASHFLOW FOR FIRR	-78	-1253	-3154	-3147	-1689	1351	1402	-144	1402	1393	-566	-1030	-2620	1361	-185
FIRR %	6.32%														

Table 6.2.2.11 (Continued)

(Million Rupiah)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	723	774	723	714	765	714	705	654	645
OPERATING REVENUE	2580	2661	2743	2824	2906	2988	3069	3151	3232
OPERATING EXPENSE	1857	1887	2020	2111	2141	2274	2364	2497	2587
WORKING COST	1219	1250	1383	1413	1444	1577	1607	1740	1770
MAINTENANCE COST	803	803	905	905	905	1008	1008	1110	1110
FEEDER	6	6	6	6	6	6	6	6	6
STATION FACILITIES	797	797	899	899	899	1002	1002	1104	1104
PERSONNEL COST	223	239	255	272	288	304	321	337	353
ELECTRICITY COST	194	208	222	236	250	265	279	293	307
FUEL COST	0	0	0	0	0	0	0	0	0
DEPRECIATION	637	637	637	697	697	697	757	757	817
INTEREST ON TOTAL ASSETS	407	388	414	393	372	396	373	395	411
NET PROFIT	316	386	309	321	393	316	332	259	234
INVESTMENT	0	0	1494	0	0	1494	0	1494	-13688
FEEDER	0	0	0	0	0	0	0	0	0
STATION FACILITIES	0	0	1494	0	0	1494	0	1494	0
-SALVAGE VALUE									13688
INT. DURING CONST.									
FINANCE PROGRAM									
FINANCE TOTAL									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	8570	8215	7860	7505	7151	6796	6441	6086	5732
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN FOREIGN CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	6740	6385	6030	5676	5321	4966	4612	4257	3902
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN LOCAL CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0
LOAN BALANCE	1830	1830	1830	1830	1830	1830	1830	1830	1830
INTEREST	0	0	0	0	0	0	0	0	0
NET CASHFLOW	837	897	-640	915	974	-562	992	-545	-14698
CUM. NET CASHFLOW	-2086	-1189	-1829	-914	60	-502	490	-55	14643
CASH IN	1360	1411	1360	1411	1462	1411	1462	1411	1462
CASH OUT	523	514	2000	497	488	1973	470	1956	-13236
CASHFLOW FOR FIRR	1360	1411	-134	1411	1462	-84	1462	-84	15150
FIRR %									

Table 6.2.2.12   Financial Analysis of Feeder Service and Station Facilities Improvement

(Case-3)

(Million Rupiah)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
OPERATING PROFIT	0	0	0	0	1143	1075	1126	1075	1066	1117	1066	1011	853	783
OPERATING REVENUE	0	0	0	0	1683	1765	1846	1928	2009	2091	2172	2254	2335	2417
OPERATING EXPENSE	0	0	0	0	540	690	720	853	943	974	1106	1242	1482	1634
WORKING COST														
MAINTENANCE COST														
FEEDER	0	0	0	0	383	414	444	577	608	638	771	847	1026	1056
STATION FACILITIES	0	0	0	0	302	302	302	405	405	405	507	553	701	701
PERSONNEL COST	0	0	0	0	5	5	5	5	5	5	5	5	6	6
ELECTRICITY COST	0	0	0	0	298	298	298	400	400	400	502	547	695	695
FUEL COST	0	0	0	0	43	60	76	92	109	125	158	158	174	190
	0	0	0	0	38	52	66	80	94	109	141	137	151	165
DEPRECIATION	0	0	0	0	156	276	276	276	336	336	336	395	457	578
INTEREST ON TOTAL ASSETS	0	0	0	0	241	233	225	261	251	241	276	324	416	399
NET PROFIT	0	0	0	0	902	842	901	814	815	876	790	687	437	384
INVESTMENT														
FEEDER	78	1253	3154	3147	2989	0	0	1494	0	60	1968	2437	3930	0
STATION FACILITIES	23	481	932	926	0	0	0	0	0	8	366	320	320	0
	55	773	2222	2221	2989	0	0	1494	0	52	1582	2116	3610	0
-SALVAGE VALUE														
INT. DURING CONST.	3	9	123	281										
FINANCE PROGRAM														
FINANCE TOTAL														
BORROWING	81	1262	3278	3428	2989	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	81	1343	4620	8048	11037	11037	11037	11037	10422	9807	9192	8578	7963	7348
INTEREST	3	9	123	281	564	564	564	564	517	470	423	376	329	282
FINANCE IN FOREIGN CCY														
BORROWING	51	89	2062	2218	2958	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	615	615	615	615	615
LOAN BALANCE	51	140	2201	4419	7378	7378	7378	7378	6763	6148	5533	4918	4304	3689
INTEREST	3	9	123	281	564	564	564	564	517	470	423	376	329	282
FINANCE IN LOCAL CCY														
BORROWING	30	1173	1216	1210	30	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	30	1203	2419	3629	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	0	0	0	0	735	786	837	-708	269	307	-1604	-2021	-3564	464
CUM. NET CASHFLOW	0	0	0	0	735	1522	2359	1651	1920	2228	623	-1398	-4963	-4499
CASH IN	81	1262	3278	3428	4288	1351	1402	1350	1402	1453	1401	1407	1310	1361
CASH OUT	81	1262	3278	3428	3553	564	564	2059	1132	1145	3006	3428	4874	897
CASHFLOW FOR FIRR	-78	-1253	-3154	-3147	-1699	1351	1402	-144	1402	1393	-566	-1030	-2620	1361
FIRR %	6.32%													

Table 6.2.2.12 (Continued)

(Million Rupiah)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	732	723	774	723	714	765	714	705	654	645
OPERATING REVENUE	2498	2580	2661	2743	2824	2906	2988	3069	3151	3232
OPERATING EXPENSE	1767	1857	1887	2020	2111	2141	2274	2364	2497	2587
WORKING COST	1189	1219	1250	1383	1413	1444	1577	1607	1740	1770
MAINTENANCE COST	803	803	803	905	905	905	1008	1008	1110	1110
FEEDER	6	6	6	6	6	6	6	6	6	6
STATION FACILITIES	797	797	797	899	899	899	1002	1002	1104	1104
PERSONNEL COST	206	223	239	255	272	288	304	321	337	353
ELECTRICITY COST	180	194	208	222	236	250	265	279	293	307
FUEL COST	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	578	637	637	637	697	697	697	757	757	817
INTEREST ON TOTAL ASSETS	426	407	388	414	393	372	396	373	395	411
NET PROFIT	306	316	386	309	321	393	318	332	259	234
INVESTMENT										
FEEDER	1494	0	0	1494	0	0	1494	0	1494	-13688
STATION FACILITIES	1494	0	0	1494	0	0	1494	0	1494	0
SALVAGE VALUE										13688
INT. DURING CONST.										
FINANCE PROGRAM										
FINANCE TOTAL										
BORROWING	0	0	0	0	0	0	0	0	0	0
REPAYMENT	615	615	615	615	615	615	0	0	0	0
LOAN BALANCE	6733	6118	5504	4889	4274	3659	3659	3659	3659	3659
INTEREST	235	188	141	94	47	0	0	0	0	0
FINANCE IN FOREIGN CCY										
BORROWING	0	0	0	0	0	0	0	0	0	0
REPAYMENT	615	615	615	615	615	615	0	0	0	0
LOAN BALANCE	3074	2459	1844	1230	615	0	0	0	0	0
INTEREST	235	188	141	94	47	0	0	0	0	0
FINANCE IN LOCAL CCY										
BORROWING	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	-1035	557	656	-943	749	847	-84	1462	-84	15150
CUM. NET CASHFLOW	-5534	-4977	-4321	-5164	-4415	-3567	-3651	-2189	-2273	12877
CASH IN	1309	1360	1411	1360	1411	1462	1411	1462	1411	1462
CASH OUT	2344	803	756	2203	662	615	1494	0	1494	-13688
CASHFLOW FOR FIRR	-185	1360	1411	-134	1411	1462	-84	1462	-84	15150
FIRR %										

Table 6.2.2.13   Financial Analysis of Feeder Service and Station Facilities Improvement

(Revenue 10% down)

(Million Rupiah)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OPERATING PROFIT	0	0	0	0	975	899	941	882	865	908	849	786	619	541	482
OPERATING REVENUE	0	0	0	0	1515	1588	1661	1735	1808	1882	1955	2028	2102	2175	2248
OPERATING EXPENSE	0	0	0	0	540	690	720	853	943	974	1106	1242	1482	1634	1767
WORKING COST	0	0	0	0	383	414	444	577	608	638	771	847	1026	1056	1189
MAINTENANCE COST	0	0	0	0	302	302	302	405	405	405	507	553	701	701	803
FEEDER	0	0	0	0	5	5	5	5	5	5	5	5	6	6	6
STATION FACILITIES	0	0	0	0	298	298	298	400	400	400	502	547	695	695	797
PERSONNEL COST	0	0	0	0	43	60	76	92	109	125	141	158	174	190	206
ELECTRICITY COST	0	0	0	0	38	52	66	80	94	109	123	137	151	165	180
FUEL COST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	156	276	276	276	336	336	336	395	457	578	578
INTEREST ON TOTAL ASSETS	0	0	0	0	241	233	225	261	251	241	276	324	416	399	426
NET PROFIT	0	0	0	0	734	666	717	621	614	667	573	462	204	143	56
INVESTMENT	78	1253	3154	3147	2989	0	0	1494	0	60	1968	2437	3930	0	1494
FEEDER	23	481	932	926	0	0	0	0	0	8	386	320	320	0	0
STATION FACILITIES	55	773	2222	2221	2989	0	0	1494	0	52	1582	2116	3610	0	1494
-SALVAGE VALUE															
INT. DURING CONST.	1	3	40	89											
FINANCE PROGRAM															
FINANCE TOTAL															
BORROWING	78	1256	3194	3236	2989	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	79	1335	4529	7765	10754	10754	10754	10754	10754	10754	10754	10754	10754	10754	10754
INTEREST	1	3	40	89	177	177	177	177	177	177	177	177	177	177	177
FINANCE IN FOREIGN CCY															
BORROWING	49	83	1978	2026	2953	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	49	132	2110	4136	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095	7095
INTEREST	1	3	40	89	177	177	177	177	177	177	177	177	177	177	177
FINANCE IN LOCAL CCY															
BORROWING	30	1173	1216	1210	30	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	30	1203	2419	3629	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	0	0	0	0	954	997	1040	-514	1023	1006	-961	-1433	-3031	942	-612
CUM. NET CASHFLOW	0	0	0	0	954	1951	2991	2477	3500	4506	3545	2112	-919	23	-590
CASH IN	79	1256	3194	3236	4120	1174	1217	1158	1201	1244	1184	1181	1076	1119	1059
CASH OUT	79	1256	3194	3236	3166	177	177	1672	177	237	2145	2614	4107	177	1672
CASHFLOW FOR FIRR	-78	-1253	-3154	-3147	-1957	1174	1217	-337	1201	1184	-784	-1256	-2954	1119	-435
FIRR %	4.29%														

Table 6.2.2.13 (Continued)

(Million Rupiah)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	465	508	448	431	474	415	398	339	322
OPERATING REVENUE	2322	2395	2469	2542	2615	2689	2762	2836	2909
OPERATING EXPENSE	1857	1887	2020	2111	2141	2274	2364	2497	2587
WORKING COST	1219	1250	1383	1413	1444	1577	1607	1740	1770
MAINTENANCE COST	803	803	905	905	905	1008	1008	1110	1110
FEEDER	6	6	6	6	6	6	6	6	6
STATION FACILITIES	797	797	899	899	899	1002	1002	1104	1104
PERSONNEL COST	223	239	255	272	288	304	321	337	353
ELECTRICITY COST	194	208	222	236	250	265	279	293	307
FUEL COST	0	0	0	0	0	0	0	0	0
DEPRECIATION	637	637	637	697	697	697	757	757	817
INTEREST ON TOTAL ASSETS	407	388	414	393	372	396	373	395	411
NET PROFIT	58	120	35	39	103	19	25	-56	-89
INVESTMENT	0	0	1494	0	0	1494	0	1494	-13688
FEEDER	0	0	0	0	0	0	0	0	0
STATION FACILITIES	0	0	1494	0	0	1494	0	1494	0
-SALVAGE VALUE									13688
INT. DURING CONST.									
FINANCE PROGRAM									
FINANCE TOTAL									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	10399	10044	9690	9335	8980	8625	8271	7916	7561
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN FOREIGN CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	355	355	355	355	355	355	355	355	355
LOAN BALANCE	6740	6385	6030	5676	5321	4966	4612	4257	3902
INTEREST	168	160	151	142	133	124	115	106	98
FINANCE IN LOCAL CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0
LOAN BALANCE	3659	3659	3659	3659	3659	3659	3659	3659	3659
INTEREST	0	0	0	0	0	0	0	0	0
NET CASHFLOW	579	631	-914	632	684	-861	685	-860	14375
CUM. NET CASHFLOW	-11	620	-294	338	1022	161	846	-14	14361
CASH IN	1102	1145	1086	1129	1172	1112	1155	1096	1138
CASH OUT	523	514	2000	497	488	1973	470	1956	-13236
CASHFLOW FOR FIRR	1102	1145	-409	1129	1172	-382	1155	-399	14827
FIRR %									

Table 6.2.2.14 Financial Analysis of Feeder Service and Station Facilities Improvement

(Investment 10% up)

(Million Rupiah)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OPERATING PROFIT	0	0	0	0	1098	1017	1068	1007	992	1043	981	916	737	655	594
OPERATING REVENUE	0	0	0	0	1683	1765	1846	1928	2009	2091	2172	2254	2335	2417	2498
OPERATING EXPENSE	0	0	0	0	585	747	778	921	1017	1048	1191	1337	1598	1762	1905
WORKING COST	0	0	0	0	414	444	474	618	648	679	822	902	1096	1126	1269
MAINTENANCE COST	0	0	0	0	332	332	332	445	445	445	558	608	771	771	883
FEEDER	0	0	0	0	5	5	5	5	5	5	5	6	7	7	7
STATION FACILITIES	0	0	0	0	327	327	327	440	440	440	553	602	764	764	877
PERSONNEL COST	0	0	0	0	43	60	76	92	109	125	141	158	174	190	205
ELECTRICITY COST	0	0	0	0	38	52	66	80	94	109	123	137	151	165	180
FUEL COST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	172	303	303	303	369	369	369	435	502	635	635
INTEREST ON TOTAL ASSETS	0	0	0	0	265	256	247	287	276	265	303	357	458	438	469
NET PROFIT	0	0	0	0	832	761	821	719	716	778	678	560	280	217	125
INVESTMENT	86	1379	3470	3461	3288	0	0	1644	0	66	2164	2680	4323	0	1644
FEEDER	25	529	1026	1019	0	0	0	0	0	9	424	352	352	0	0
STATION FACILITIES	60	850	2444	2443	3288	0	0	1644	0	57	1740	2328	3971	0	1644
-SALVAGE VALUE															
INT. DURING CONST.	1	3	44	98											
FINANCE PROGRAM															
FINANCE TOTAL															
BORROWING	87	1382	3514	3560	3288	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	87	1463	4982	8542	11829	11829	11829	11829	11829	11829	11829	11829	11829	11829	11829
INTEREST	1	3	44	98	195	195	195	195	195	195	195	195	195	195	195
FINANCE IN FOREIGN CCY															
BORROWING	54	91	2176	2229	3254	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	54	145	2321	4550	7804	7804	7804	7804	7804	7804	7804	7804	7804	7804	7804
INTEREST	1	3	44	98	195	195	195	195	195	195	195	195	195	195	195
FINANCE IN LOCAL CCY															
BORROWING	33	1291	1338	1531	33	0	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	33	1323	2661	3992	4025	4025	4025	4025	4025	4025	4025	4025	4025	4025	4025
INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	0	0	0	0	1074	1125	1176	-529	1166	1151	-1009	-1524	-3279	1095	-610
CUM. NET CASHFLOW	0	0	0	0	1074	2200	3376	2847	4013	5164	4155	2631	-647	448	-162
CASH IN	87	1382	3514	3560	4557	1321	1372	1310	1361	1412	1351	1351	1239	1291	1229
CASH OUT	87	1382	3514	3560	3483	195	195	1639	195	261	2359	2876	4518	195	1839
CASHFLOW FOR FIRR	-86	-1379	-3470	-3461	-2018	1321	1372	-334	1361	1346	-814	-1329	-3084	1291	-415
FIRR %	4.73%														

Table 6.2.2.14 (Continued)

(Million Rupiah)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	579	630	568	554	605	543	528	467	452
OPERATING REVENUE	2580	2661	2743	2824	2906	2988	3069	3151	3232
OPERATING EXPENSE	2001	2031	2175	2271	2301	2444	2541	2684	2780
WORKING COST	1300	1330	1473	1504	1554	1677	1708	1851	1881
MAINTENANCE COST	883	883	996	996	996	1109	1109	1221	1221
FEEDER	7	7	7	7	7	7	7	7	7
STATION FACILITIES	877	877	989	989	989	1102	1102	1214	1214
PERSONNEL COST	223	239	255	272	288	304	321	337	353
ELECTRICITY COST	194	208	222	236	250	265	279	293	307
FUEL COST	0	0	0	0	0	0	0	0	0
DEPRECIATION	701	701	701	767	767	767	833	833	898
INTEREST ON TOTAL ASSETS	448	427	455	432	409	435	410	435	452
NET PROFIT	131	203	113	122	196	108	118	32	1
INVESTMENT	0	0	1644	0	0	1644	0	1644	-15057
FEEDER	0	0	0	0	0	0	0	0	0
STATION FACILITIES	0	0	1644	0	0	1644	0	1644	0
-SALVAGE VALUE									15057
INT. DURING CONST.									
FINANCE PROGRAM									
FINANCE TOTAL									
BORROWING	390	390	390	390	390	390	390	390	390
REPAYMENT	11439	11049	10659	10268	9878	9488	9098	8708	8317
LOAN BALANCE INTEREST	185	176	166	156	146	137	127	117	107
FINANCE IN FOREIGN CCY									
BORROWING	390	390	390	390	390	390	390	390	390
REPAYMENT	7414	7024	6634	6243	5853	5463	5073	4682	4292
LOAN BALANCE INTEREST	185	176	166	156	146	137	127	117	107
FINANCE IN LOCAL CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYENT	4025	4025	4025	4025	4025	4025	4025	4025	4025
LOAN BALANCE INTEREST	0	0	0	0	0	0	0	0	0
NET CASHFLOW	704	765	-930	774	835	-861	944	-851	15910
CUM. NET CASHFLOW	543	1308	378	1152	1987	1127	1971	1119	17030
CASH IN	1280	1331	1270	1321	1372	1310	1361	1300	1351
CASH OUT	576	566	2200	546	537	2171	517	2151	-14560
	1280	1331	-374	1321	1372	-534	1361	-344	16408

Table 6.2.2.15　Financial Analysis of Feeder Service and Station Facilities Improvement

(Revenue 10% down / Investment 10% up)

(Million Rupiah)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
OPERATING PROFIT	0	0	0	0	929	841	884	814	791	834	764	691	504	413	344
OPERATING REVENUE	0	0	0	0	1515	1588	1661	1735	1808	1892	1955	2028	2102	2175	2248
OPERATING EXPENSE	0	0	0	0	585	747	778	921	1017	1048	1191	1337	1598	1762	1905
WORKING COST	0	0	0	0	414	444	474	618	648	679	822	902	1096	1126	1269
MAINTENANCE COST	0	0	0	0	332	332	332	445	445	445	558	608	771	771	883
FEEDER	0	0	0	0	5	5	5	5	5	5	5	6	7	7	7
STATION FACILITIES	0	0	0	0	327	327	327	440	440	440	553	602	764	764	877
PERSONNEL COST	0	0	0	0	43	60	76	92	109	125	141	158	174	190	206
ELECTRICITY COST	0	0	0	0	38	52	66	80	94	109	123	137	151	165	180
FUEL COST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	172	303	303	303	369	369	369	435	502	635	635
INTEREST ON TOTAL ASSETS	0	0	0	0	265	256	247	287	276	265	303	357	458	438	469
NET PROFIT	0	0	0	0	664	585	637	527	515	569	461	334	46	-25	-125
INVESTMENT	86	1379	3470	3461	3288	0	0	1644	0	66	2164	2680	4323	0	1644
FEEDER	25	529	1026	1019	0	0	0	0	0	9	424	352	352	0	0
STATION FACILITIES	60	850	2444	2443	3288	0	0	1644	0	57	1740	2328	3971	0	1644
-SALVAGE VALUE				93											
INT. DURING CONST	1	3	44	98											
FINANCE PROGRAM															
FINANCE TOTAL															
BORROWING	87	1382	3514	3560	3288	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	87	1468	4982	8542	11829	11829	11829	11829	11829	11829	11829	11829	11829	11829	11829
INTEREST	1	3	44	98	195	195	195	195	195	195	195	195	195	195	195
FINANCE IN FOREIGN CCY															
BORROWING	54	91	2176	2229	3254	0	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	54	145	2321	4550	7804	7804	7804	7804	7804	7804	7804	7804	7804	7804	7804
INTEREST	1	3	44	98	195	195	195	195	195	195	195	195	195	195	195
FINANCE IN LOCAL CCY															
BORROWING	33	1291	1339	1331	33	0	0	0	0	0	0	0	0	0	0
REPAYPENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BALANCE	33	1323	2661	3992	4025	4025	4025	4025	4025	4025	4025	4025	4025	4025	4025
INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET CASHFLOW	0	0	0	0	906	949	992	-722	965	942	-1226	-1750	-3512	854	-860
CUM. NET CASHFLOW	0	0	0	0	906	1855	2847	2125	3090	4032	2806	1057	-2456	-1602	-2462
CASH IN	87	1382	3514	3560	4389	1144	1187	1117	1160	1203	1133	1126	1006	1049	979
CASH OUT	87	1382	3514	3560	3483	195	195	1839	195	261	2359	2876	4518	195	1839
CASHFLOW FOR FIRR	-86	-1379	-3470	-3461	-2187	1144	1187	-527	1160	1137	-1031	-1555	-3317	1049	-665

FIRR %　2.87%

Table 6.2.2.15 (Continued)

(Million Rupiah)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
OPERATING PROFIT	321	364	294	271	314	244	222	152	129
OPERATING REVENUE	2322	2395	2469	2542	2615	2689	2762	2836	2909
OPERATING EXPENSE	2001	2031	2175	2271	2301	2444	2541	2684	2780
WORKING COST	1300	1330	1473	1504	1534	1677	1708	1851	1881
MAINTENANCE COST	833	883	996	996	996	1109	1109	1221	1221
FEEDER	7	7	7	7	7	7	7	7	7
STATION FACILITIES	877	877	989	989	989	1102	1102	1214	1214
PERSONNEL COST	223	239	255	272	288	304	321	337	353
ELECTRICITY COST	194	208	222	236	250	265	279	293	307
FUEL COST	0	0	0	0	0	0	0	0	0
DEPRECIATION	701	701	701	767	767	767	833	833	898
INTEREST ON TOTAL ASSETS	448	427	455	432	409	435	410	435	452
NET PROFIT	-127	-63	-161	-161	-95	-191	-189	-283	-323
INVESTMENT	0	0	1644	0	0	1644	0	1644	-15057
FEEDER	0	0	0	0	0	0	0	0	0
STATION FACILITIES	0	0	1644	0	0	1644	0	1644	
SALVAGE VALUE									15057
INT. DURING CONST.									
FINANCE PROGRAM									
FINANCE TOTAL									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	390	390	390	390	390	390	390	390	390
LOAN BALANCE	11439	11049	10659	10268	9878	9488	9098	8708	8317
INTEREST	185	176	166	156	146	137	127	117	107
FINANCE IN FOREIGN CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	390	390	390	390	390	390	390	390	390
LOAN BALANCE	7414	7024	6634	6243	5853	5463	5073	4682	4292
INTEREST	185	176	166	156	146	137	127	117	107
FINANCE IN LOCAL CCY									
BORROWING	0	0	0	0	0	0	0	0	0
REPAYMENT	0	0	0	0	0	0	0	0	0
LOAN BALANCE	4025	4025	4025	4025	4025	4025	4025	4025	4025
INTEREST	0	0	0	0	0	0	0	0	0
NET CASHFLOW	447	499	-1205	492	545	-1159	537	-1167	15587
CUM. NET CASHFLOW	-2015	-1516	-2721	-2229	-1684	-2843	-2306	-3473	12114
CASH IN	1022	1065	995	1033	1081	1011	1054	985	1027
CASH OUT	576	566	2200	546	537	2171	517	2151	-14560
CASHFLOW FOR FIRR	1022	1065	-649	1038	1081	-632	1054	-659	16085
FIRR %									

6-3 Eastern Line Grade Separation Project

6-3-1 Economic Analysis

(1) Alternatives

Three alternatives were prepared to evaluate the viability of the project as described in chapter 1. The first and the second alternative are track elevation of the Eastern line between Jakarta Kota and Gang Sentiong, and between Jakarta Kota and Jatinegara respectively. The third alternative is a case of construction of flyovers over the line at major railway level crossings. The relationships between the alternatives and "without" case are summarized in Table 6.3.1.1.

Table 6.3.1.1 Alternatives

Name of Road at Railway Level Crossings	without	Alternatives 1) Track Elevation 1	Track Elevation 2	Flyover
1. Jl. Manggadua	N	F	F	F 2)
2. Jl. Gunung Sahari	N	E	E	F
3. Jl. Industri	N	E	E	F
4. Jl. Angkasa	N	E	E	F
5. Gang Spoor	N	E	E	N
6. Jl. Garuda	N	E	E	F
7. Jl. Kepu Selatan	N	E	E	F
8. Jl. Jend. Suprapto	N	E	E	F
9. Jl. Tanah Tinggi	N	E	E	N
10. Jl. Kramat Sentiong	N	N	E	N
11. Jl. Percetakan Negara	N	F	E	F
12. Jl. Salemba Tengah	N	N	E	N
13. Jl. Pramuka	N	F	E	F
14. Jl. Tegaran	N	N	E	N
15. Jl. Achmad Dahlan	N	N	E	N

Note: 1)

Track Elevation 1: The Eastern line is elevated between Jakarta Kota and Gang Sentiong.

Track Elevation 2: The Eastern line is elevated between Jakarta Kota and Jatinegara.

Flyover: The Eastern line is not elevated, flyovers are constructed along the line.

2)   N: No improvement

F: Flyover construction   E: Track Elevation

(2) Economic cost

1) Initial investment cost

The economic initial investment costs (Table 6.3.1.2 - 6.3.1.7) of
the project were derived from financial construction costs described
in chapter 5 of this report by alternative case and by investment
item through the same methodology given in chapter 5 of Volume I.

Costs of rolling stocks were not appropriated, since the railway
passengers were not thought to increase by the execution of the
project. The level of service of railway was thought to remain
unchanged.

2) Additional investment cost

Any additional investment costs were not appropriated for the
project, since there is not a necessity to increase railway
facilities compared with the "without" case.

3) Reinvestment

The reinvestment cost was not appropriated, because the project life
is not less than any useful lives of the invested railway or flyover
assets.

Table 6.3.1.2 Economic Investment Cost of Track Elevation 1
              -- Track Elevation --   (Rp. 000000)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	Total
Civil Engineering	0	0	12993	53973	54025	59093	0	180084
Station Building	0	0	0	0	0	19413	12943	32356
Track	0	0	3100	0	3099	6914	10369	23482
Signals	0	0	419	0	421	2855	4271	7965
Telecommunucations	0	0	102	0	103	698	1122	2024
Electric Power Facilities	0	0	258	0	294	2120	9315	11987
Catenary	0	0	1579	0	1125	0	5580	8283
Machinery	0	0	0	0	0	934	3738	4672
Land Acquisition and Compensation	0	0	8868	0	0	0	0	8868
D/D, S/S and Contingency	6089	9132	4797	11460	12534	19563	10062	73636
Total	6089	9132	32115	65433	71599	111589	57399	353357

Table 6.3.1.3 Economic Investment Cost of Track Elevation 1
                -- Flyover --   (Rp. 000000)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	Total
Civil Engineering	0	0	0	0	11045	23559	22696	57300
Land Acquisition and Compensation	0	0	0	0	10250	0	0	10250
D/D, S/S and Contingency	0	0	1303	1954	3384	5033	4849	16522
Total	0	0	1303	1954	24679	28592	27545	84073

Table 6.3.1.4 Economic Investment Cost of Track Elevation 2
                -- Track Elevation --   (Rp. 000000)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	Total
Civil Engineering	0	0	19910	83143	83195	91067	0	277315
Station Building	0	0	0	0	0	33372	22248	55620
Track	0	0	3100	0	3099	10568	15852	32618
Signals	0	0	418	0	420	4363	6531	11732
Telecommunications	0	0	102	0	103	1065	1708	2977
Electric Power Facilities	0	0	258	0	294	3414	14938	18903
Catenary	0	0	1579	0	1126	0	7812	10516
Machinery	0	0	0	0	0	1531	6129	7660
Land Acquisition and Compensation	0	0	21720	0	0	0	0	21720
D/D, S/S and Contingency	9385	14079	7550	17654	18726	30909	15994	114297
Total	9385	14079	54636	100797	106961	176291	91211	553360

Table 6.3.1.5 Economic Investment Cost of Track Elevation 2
                -- Flyover --   (Rp. 000000)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	Total
Civil Engineering	0	0	0	0	4554	9586	9826	23966
Land Acquisition and Compensation	0	0	0	0	3850	0	0	3850
D/D, S/S and Contingency	0	0	546	816	1358	2048	2099	6866
Total	0	0	546	816	9761	11634	11925	34682

Table 6.3.1.6 Economic Investment Cost of Flyover
            -- Station Improvement --   (Rp. 000000)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	Total
Civil Engineering	0	0	0	0	1893	2526	1893	6311
Station Building	0	0	0	0	2519	3355	2519	8393
Track	0	0	0	0	2300	3063	2300	7662
Signals	0	0	0	0	0	0	0	0
Telecommunications	0	0	0	0	0	0	0	0
Electric Power Facilities	0	0	0	0	0	0	0	0
Catenary	0	0	0	0	556	739	556	1850
Machinery	0	0	0	0	0	0	0	0
Land Acquisition and Compensation	0	0	0	0	2437	0	0	2437
D/D, S/S and Contingency	0	0	545	818	1789	2061	1545	6758
Total	0	0	545	818	11493	11744	8812	33412

Table 6.3.1.7 Economic Investment Cost of Flyover
            -- Flyover --   (Rp. 000000)

Investment Item \ Year	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	Total
Civil Engineering	0	0	0	0	30002	64144	61047	155193
Land Acquisition and Compensation	0	0	0	0	38240	0	0	38240
D/D, S/S and Contingency	0	0	3524	5288	10230	13699	13037	45779
Total	0	0	3524	5288	78473	77843	74084	239212