CHAPTER-11. ROAD NETWORK IMPROVEMENT PROJECTS/PROGRAMS

11-A. ACCESS ROAD FOR TANJUNG PRIOK

11-A-1 Forecast of Future Traffic

388. Traffic volumes were determined at the locations shown on Figure 8-B-4 based on a traffic count survey and origin destination (O/D) survey carried out on 16th and 17th July, 2002 as part of the "Study for Development of the Greater Jakarta Metropolitan Parts." The survey recorded the traffic volumes traveling to and from the Port of Tanjung Priok at each gate and at the major intersections in the proximity of the port.

1) Traffic Distribution Assumptions

389. The results of the O/D survey enabled the traffic counts for each category of vehicle to be assigned to the east, south or west directional flow or to a local container depot in North Jakarta. Ultimately, trucks going into the container depots leave and travel in one of the other three directions. The present distribution of traffic flow is shown on Table 11-A-1.

Table 11-A-1 Distribution of Traffic at Tanjung Priok and Depot Cilincing

From/To	Distribution (%)	
	Cilincing	Tanjung Priok
Jakarta	3.55	5.86
Jakarta Utara	21.43	43.29
East	42.42	20.00
South	19.53	18.28
West	13.07	12.57
Total	**100,00**	**100,00**

390. In the absence, of further data regarding future land development or land use, it is assumed that the directional split shown on Table 11-A-1 will continue to be same for the forecast years.

2) Estimating Traffic Forecasts

391. Each vehicle has a passenger car equivalent, which varies according to the type of vehicle. The PCU Factors, used to convert the total number of each type of vehicle recorded in the traffic count survey to equivalent passenger car units, were derived from the Indonesian Highway Capacity Manual, 1997 and are summarized on Table 11-A-2.

Table 11-A-2 PCU Factors

Vehicle Type	Equivalent pcu
Passenger Car	1
Small Bus	1
Medium and Large Bus	1.5
Pick up	1
Medium Truck	2.3
Heavy Truck	4

392. The average vehicle or traffic growth factors in the study are shown on Table 11-A-3 based on the analysis in Chapter-8.

Table 11-A-3 Traffic Growth Factors (%)

Traffic Generation	Traffic Growth rate (%)	
	2002 to 2012	2012 to 2025
Arterial (exs. Port traffic)	4.03%	4.20%
Port traffic	4.27%	2.00%

393. The traffic growth factors for the arterial road traffic, not generated by the port, were assumed to be the same as those used for the Traffic System Study of Jl. Martadinata-Lodan Raya Corridor carried out in 2001 by the Research Department, University of Indonesia. The traffic growth factors for traffic generated by the port were based on the forecast increase in cargo, shown on Table 11-A-4 and the type of vehicle used for each category of cargo, shown on Table 11-A-5.

Table 11-A-4 Cargo Forecasts for Port of Tanjung Priok

Cargo type	2001	2012	2025	Unit
Container	2,200	4,346	5,321	'000TEU
General Cargo	13,190	16,246	20,389	'000Ton
Bulk	7,244	11,004	20,129	'000Ton
Liquid Bulk	10,094	11,644	14,046	'000Ton
Passenger	1,700	2,482	2,992	'000Pax

Table 11-A-5 Vehicle Types for Various Categories of Cargo

Cargo type¥ Vehicle Type	Pick Up	Medium Truck	Large Truck	Trailer
Container		10%	10%	80%
General & Bag Cargo	50%	25%	25%	
Dry Bulk	20%	17%	63%	
Liquid Bulk	5%	30%	65%	

394. The growth factors were applied to the existing traffic volumes recorded on Tuesday 17th July, which was considered the most representative of conditions at Tanjung Priok, in order to obtain the forecast traffic volumes.

395. The corresponding peak hour volumes were determined by multiplying daily volumes by the ADT factor (K), which represents the ratio between the peak hour flow and daily flow. The results of the traffic count survey were used to determine K for each type of vehicle and to obtain an overall K value, For this study, K=0.1; the highest value obtained during the survey.

396. In the absence of other data which may have an impact, the percentage of traffic which will use new sections of tollway compared to the existing arterial roads is assumed to be the same as the proportional split used on other sections of the Jakarta Outer Ring Road, as shown on Table 11-A-6.

Table 11-A-6 Traffic Using Tollway (%)

Type of Vehicle	2001	2005	2010	2015	2020
Passenger Car	63.25	64.07	64.91	65.68	67.00
Medium & Large Bus	63.25	64.07	64.91	65.68	67.00
Pick up	63.25	64.07	64.91	65.68	67.00
Medium Truck	63.25	64.07	64.91	65.68	67.00
Large Truck	63.25	64.07	64.91	65.68	67.00

Source: Jasa Marga Analysis for JORR, 1998

397. The traffic volumes using the arterial roads and the tollway connections are forecasted as shown in Table 11-A-7.

Table 11-A-7 Traffic Volume Each Direction and Roads (Pcu/day)

				(PCU/day)
Direction	**Road**	**2002**	**2012**	**2025**
From East	Jl .Jampea	29,307	41,815	60,766
	JORR Toll Road	50,887	78,405	123,373
	Total	80,195	120,220	184,138
From West	Jl. Martadinata	76,556	114,766	175,784
From South	Jl. Yos Sudarso	27,210	38,823	56,418
	JIUT Connecter	47,247	72,795	114,546
	Total	74,457	111,619	170,963
Total		231,208	346,604	530,885

3) Lane Capacity

398. The lane capacities for the arterial roads were determined in accordance with IHCM in Chapter-8.

Table 11-A-8 Capacity of Existing Arterial Roads

Description	**Road Conditions**		
	To East	**To West**	**To South**
Lane width (m)	3.5	3.5	3.5
Number of lane in one direction	2	2	3
Base Capacity per lane (Co)	1,650	1,650	1,650
Width adjustment factor (Fcw)	1.0	1.0	1.0
Directional split (Fcsp)	0.94	0.97	1.00
Adjustment factor for side friction (Fcsf)	0.84	0.84	0.872
City size factor (Fcs)	1.04	1.04	1.04
Capacity (pcu/hr/lane) (C)	1,355	1,398	1,496

399. The traffic capacity for new sections of tollway is calculated in a manner similar to the arterial roads and is shown on Table 11-A-9.

Table 11-A-9 Capacity of Tollway

Type of Road		Unit	Comments
4-lane divided	Motorway		
Base Capacity	2,300	Pcu/hr/lane	Flat terrain
FCcw	1.00		3.5 lane width
FCsp	1.00		divided road
Capacity	2,300	pcu/hr/lane	-
Practical capacity	1,840	pcu/hr/lane	80% capacity

Source: IHCM – Motorways

11-A-2 Proposed Improvement of Access Road to Tanjung Priok

400. As a result of the traffic analysis, which is explained in section previous section based on the traffic counting survey data and traffic forecasts of vehicles around the Tanjung Priok port area, the improvement of access to the Tanjung Priok port is studied for the 3 directions to the port, i.e. from West (Jl. Laks. R. E. Martadinata), from East (Jl. Jampea Cilincing), and from South (Jl. Laks. Yos Sudarso and Jl. Sulawesi)

Figure 11-A-1 Road Network and Study on Improvement Access Road

1) From West (Jl. Laks. R.E. Martadinata)

a) Arterial Road

401. The results of the traffic analysis at gates No. 1,3, and 8 on Jl. Laks R.E Martadinata indicates that 3 lanes of traffic are already required along the length of this road. Future widening to 4 lanes in each direction will be required by 2012 and 7 lanes by 2025.

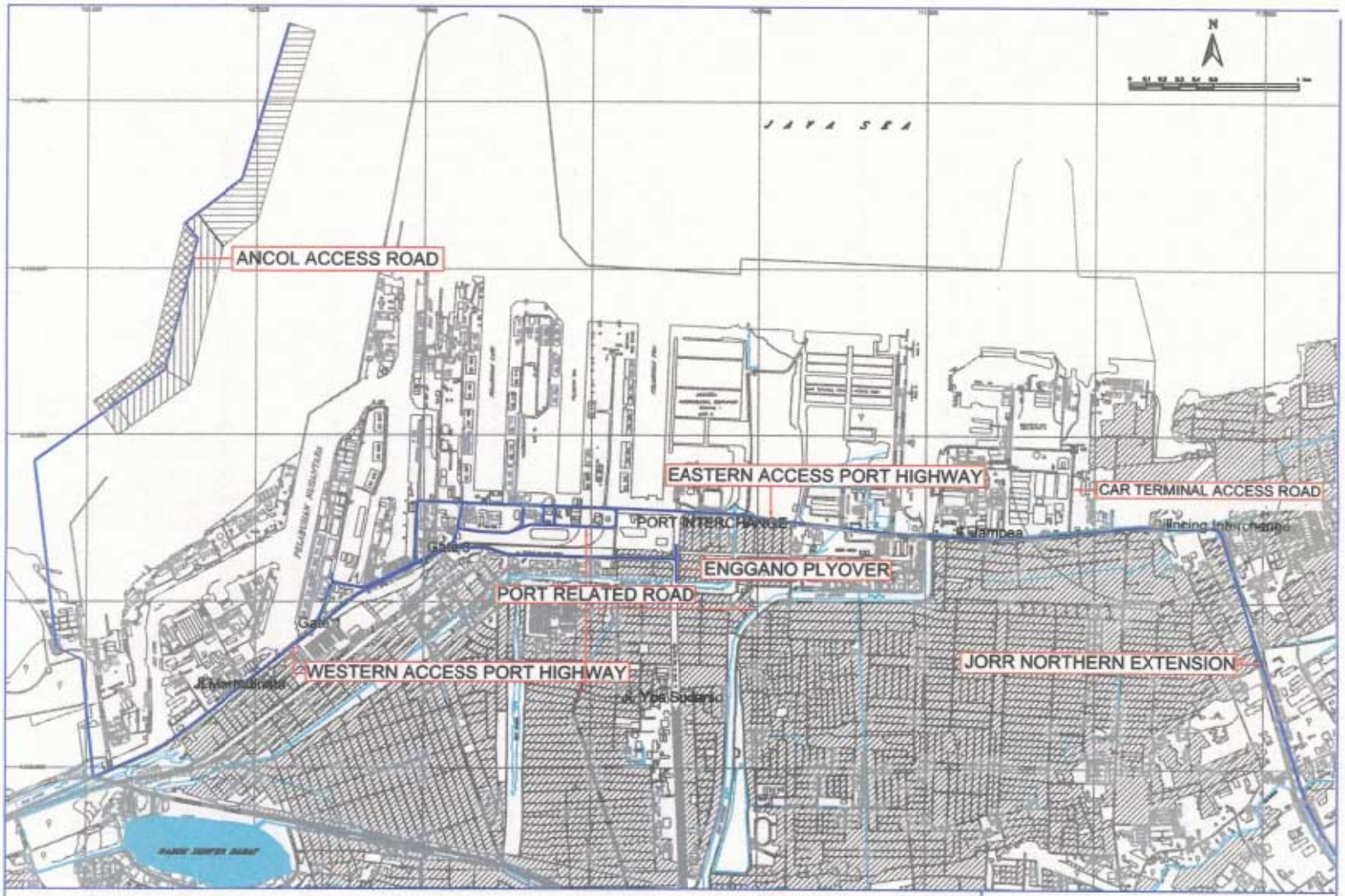
b) Intersection at Port gates

402. The congestion ratio at each of the gate interchange is worked out according to the growth of the traffic and shown in the table below in case of without any improvement of roads. It indicates that the traffic volume of 4 interchanges in 2012 will reach the existing road capacity and the congestion problem at these locations will need to be addressed before 2012. Congestion ratioof access road is shown on Table 11-A-10.

403. The results also indicate that 2 lanes in each direction are adequate for the time being on Jl. Pelabuhan Raya. Until 2012, all intersections require 3 lanes for eastbound and until 2020, 3 lanes are required in both directions

Table 11-A-10 Congestion Ratio of Access Roads around Tanjung Priok

Intersection	Congestion Ratio			
	2002	2012	2020	2025
Gate 1/Re Martadinata	0.73	1.01	1.54	2.05
Gate 3/Re Martadinata	0.83	1.17	1.91	2.38
JICT 2/Pelabuhan Raya	0.74	1.00	1.46	1.76
Gate 8/Re. Martadinata	0.74	1.02	1,61	1.98



THE STUDY FOR DEVELOPMENT OF THE GREATER JAKARTA METROPOLITAN PORTS IN THE REPUBLIC OF INDONESIA

ROAD NETWORK AND STUDY ON IMPROVEMENT ACCESS ROAD

2) From East (Jl. Jampea Cilincing and Cilincing Interchange) as Jakarta Outer Ring Road and Cilincing Interchange

404. The improvement of the access road is proposed for two alternative cases according to the assumptions.

Alternative	Assumption	Proposal of Road Development
Case-1	1. JORR is completely built and retain its current flat tariff system 2. Direct toll way access is provided from JIUT to the port 3. Improvements are made to Jl. Re. Martadinata or a toll way connection is built to improve access from west.	1. A 4-lanes toll way extension would be required in 2005 2. No widening of the toll way is required during the design horizon. 3. The existing arterial roads require immediate widening to 6-lanes (i.e.3-lanes in each direction)
Case-2	1. JORR is completely built and retains its current flat tariff system 2. Direct toll way access is not provided from JICT to the port 3. No improvement to the port access from the west.	1. A 4-lanes toll way extension is required now and 6-lanes will be required by 2008, 2. Further widening of the toll way to 8 lanes would be required by 2018. 3. 4-lanes arterial roads are required now and 6-lanes would be required before 2010

405. These requirements for road development of the case-2 are expensive and difficult to accomplish due to the limited right of way (ROW).

3) From South (Jl. Laks. Yos. Sudarso and Jl. Sulawesi) as JICT Connection and Port Interchange

a) Arterial Road

406. If a toll way connection to JIUT (Jakarta Intra Urban Toll way) is not built, a 6 lane arterial, i.e. 3 lanes in each direction is adequate until 2012, and then 8 lanes are required. Further widening to 10 lanes will be required by 2020.

407. If the toll way connection is built, 6-lane arterial road, i.e. 3 lanes in each direction, is required now and should be adequate until after 2020. 2-lane toll way, i.e. 1 lane in each direction, is adequate until 2012, and then widening to 4 lanes will be required.

b) Jl. Engganno Intersection with Jl. Laks.Yos. Sudarso and Jl. Sulawesi

408. The traffic analysis confirms that the intersection is already extremely congested on weekdays and congested on a Sunday. The grade-separation is warranted immediately at this intersection. This could be achieved by constructing a flyover or an elevated toll way connection to JIUT.

c) Jl. Jampea Intersection

409. The daily and peak hour traffic volumes at the intersection of Jl. Sulawesi with Jl.Jampea are already exceeded the capacity of the road width both for peak hour and full day volume. The left turn lane, therefore, requires immediate expansion to 2 lanes. The congestion ratio of the intersection for the peak hour reaches 1.5 to 1.8, which implies the exceeded lane capacity. The grade-separation is warranted immediately at this intersection. This could be

achieved by constructing a fly-over for right turn movement. The problem at this intersection can be minimized by the long-term solution of constructing elevated toll way connecting to JICT and JORR.

d) Summary of Traffic Lane Requirement

410. The number of lane requirements of the access roads according to the traffic demands of 2005, 2012and 2025 is determined for each segment of road as shown on Table 11-A-11.

Table 11-A-11 Summary of Traffic Lane Requirement at Target Years

Road	Traffic Volume (PCU/day)		Number of Lanes Required		
	2012	2025	pcu/hr/lane	2012	2025
East ; Jl Jampea	41,815	60,766	1,355	4	6
East ; JORR Toll Road	78,405	123,373	2,300	4	6
West ; Jl Martadinata	114,766	175,784	1,398	10	14
South ; Jl. Yos Sudarso	38,823	56,418	1,496	4	4
South ; JIUT Connecter (Toll)	72,795	114,546	2,300	4	6

4) Alternatives and Evaluation of Improvement Access Roads to the Port

411. The traffic analysis substantiates the urgent requirement for improvement of the access road to the Tanjung Priok port and provision of grade-separated structures at major intersection to alleviate existing congestion. Both JORR northern extension and JIUT connector should be constructed as 4-lane toll ways.

412. All the studied existing roads are classified as primary arterial roads and the design classification for these roads is Type II, Class I. The geometric requirements for the new sections of toll way are based on a Type I, Class I Freeway classification.

413. The following countermeasures will be able to satisfy these requirements. The conceptual arrangement of the proposed countermeasures is indicated in Figure 11-A-2.

Figure 11-A-2 Conceptual Arrangement

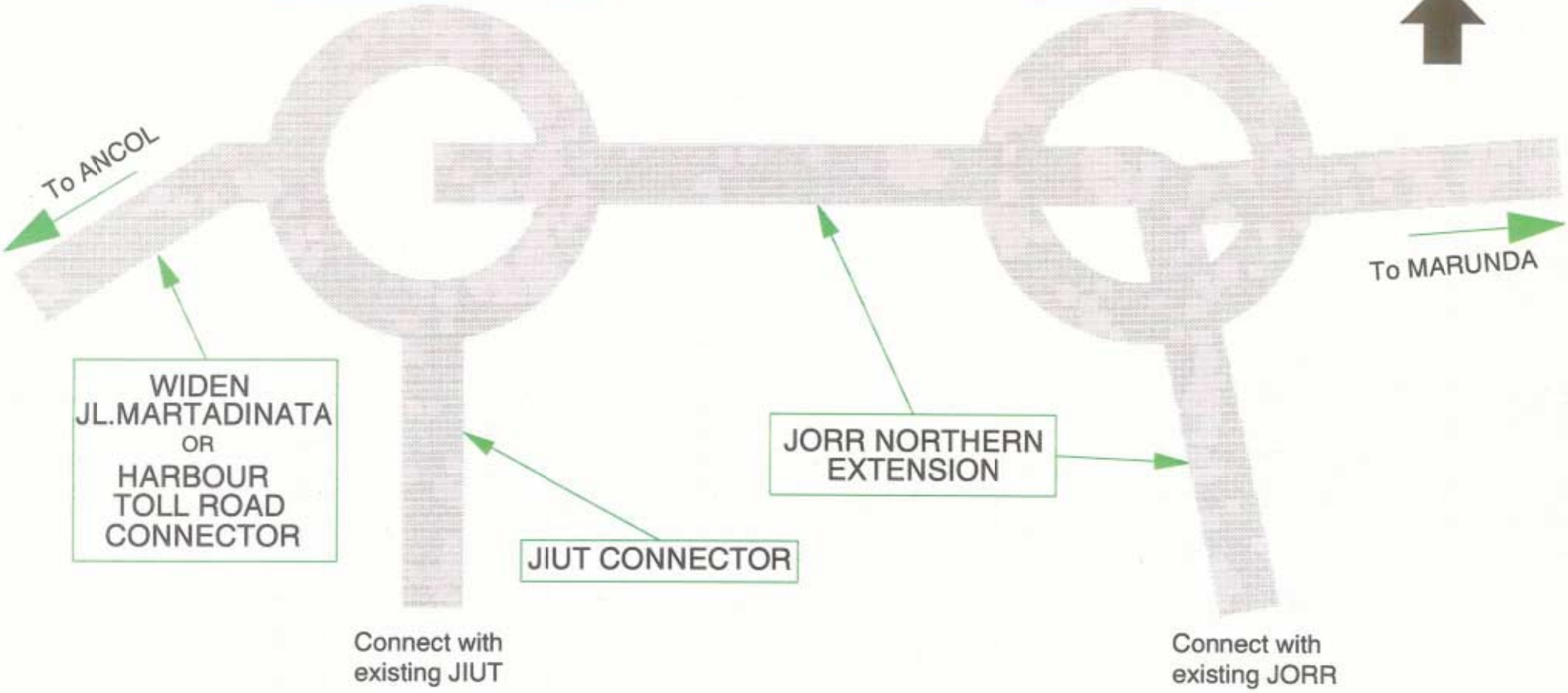
a) Jl. Laks. R.E. Martadinata as Western Access

414. Two alternatives are studied. One is to widen the Jl. Laks. Re. Martadinata, and other are to construct a new-elevated toll way to provide improved access to the port from the west (Referred to the enclosed drawing of Harbor Toll Road Connector).

415. Two options of improving the existing arterial road are studied. One is to widen from 4 lanes to 6 lanes arterial road on each side of the existing road within the existing right of way from the port to where it passes under the Harbor Toll Road and partly local widening as required on the existing road as option A.

416. In the Ancol area there is no room for widening within the existing ROW and extra lanes will have to be provided by constructing the eastbound lanes on the north side of Kali Ancol for the eastbound traffic.

417. The port access road for the future expansion at the Ancol west side will be connected to the eastbound lanes from the Harbor Toll Road through a directional interchange to the Jl. Laks. Re. Martadinata.



THE STUDY FOR DEVELOPMENT OF THE GREATER JAKARTA METROPOLETAN PORTS IN THE REPUBLIC OF INDONESIA

CONCEPTUAL ARRANGEMENT

-

418. This plan provides desirable solution considering the following adverse impacts:

- Encourage more traffic onto JORR, under the flat tariff system
- Minimize an additional traffic volume at the Tomang Interchange on JIUT, which is already extremely congested.
- Minimize the undesirable mix of heavy truck and airport traffic on the toll way to Sukarno-Hatta International Airport.

419. The other option (option B) is to widen the existing arterial road up to gate 1 of the port, then the existing roads inside the port are widened with one way traffic flow to use port related vehicles through the port and local traffic through the existing arterial road. The road inside the port will plan to connect the elevated port interchange road from the gate 9.

420. The concept plan of each option is shown in Figure 11-A-3 and Figure 11-A-4.

421. The comparison of two options for JIUT interchange is described in the Table 11-A-12. Option B of Figure 11-6 is recommended.

b) Jakarta Intra Urban Toll way (JIUT) connector to the Jakarta International Container Terminal (JICT) 1 as Southern Access

422. A new section of elevated toll way (Referred to as JIUT Connector) provide direct access from the south, between JIUT and the port. This improvement will embrace a Port Interchange to provide direct connection between the toll way construction and the port.

423. Two options of the JIUT connection are studied as parts of the port interchange and the comparison of advantage and disadvantages as parts of port interchange are shown in the Table 11-13 and the concept plan of both cases are shown in Figure 11-A-5 and Figure 11-A-6. Option B of Figure 11-6 is proposed.

424. Five options for the port interchange plans are studied. All options provide improved access to the port for traffic approaching from west, south and east. The comparison of advantage and disadvantage of each option is shown in the Table 11-A-13. The concept plan of each option is shown in Figure 11-A-7 to Figure 11-11.

425. Option C of Figure 11-A-9 show the alignment of port interchange with on-off ramp in case the presently separate container gates of JICT 1 and Koja Terminal are operated separated for each gate terminal and not JIUT connector road is constructed.

426. Option D of Figure 11-A-10 shows the long-term plan of the alignment of port interchange and JIUT connector road is directly connected and container gate is integrated in to one at the open space available between JICT 1 and Koja terminal. Since the direct access to the port from JORR northern extension, JIUT Connector and improved access from Jl. Laks. RE. Martadinata can be made.

427. The Figure 11-A-11 is prepared in case the present two separate container gates are remained as it is in future. No direct connection between these roads and with the Toll way from JIUT is provided considering the following criteria relating to alignment and geometric layout.

- Direct access to the port from the east by dedicated toll way, JORR Northern Extension.
- Direct access to the port from the south by dedicated toll way, JIUT Connector also eliminates congestion problems at arterial intersection.
- No direct connection between JIUT Connector and JORR Northern Extension. In case these two roads are connected, it would encourage more traffic on to the section of JIUT between Tanjung Priok I/C and Cawang I/C, which is already reaching full capacity of the existing lanes of the toll way and would cause additional congestion and delays in most of days.

c) Jakarta Outer Ring Road (JORR) North Extension as Eastern Access

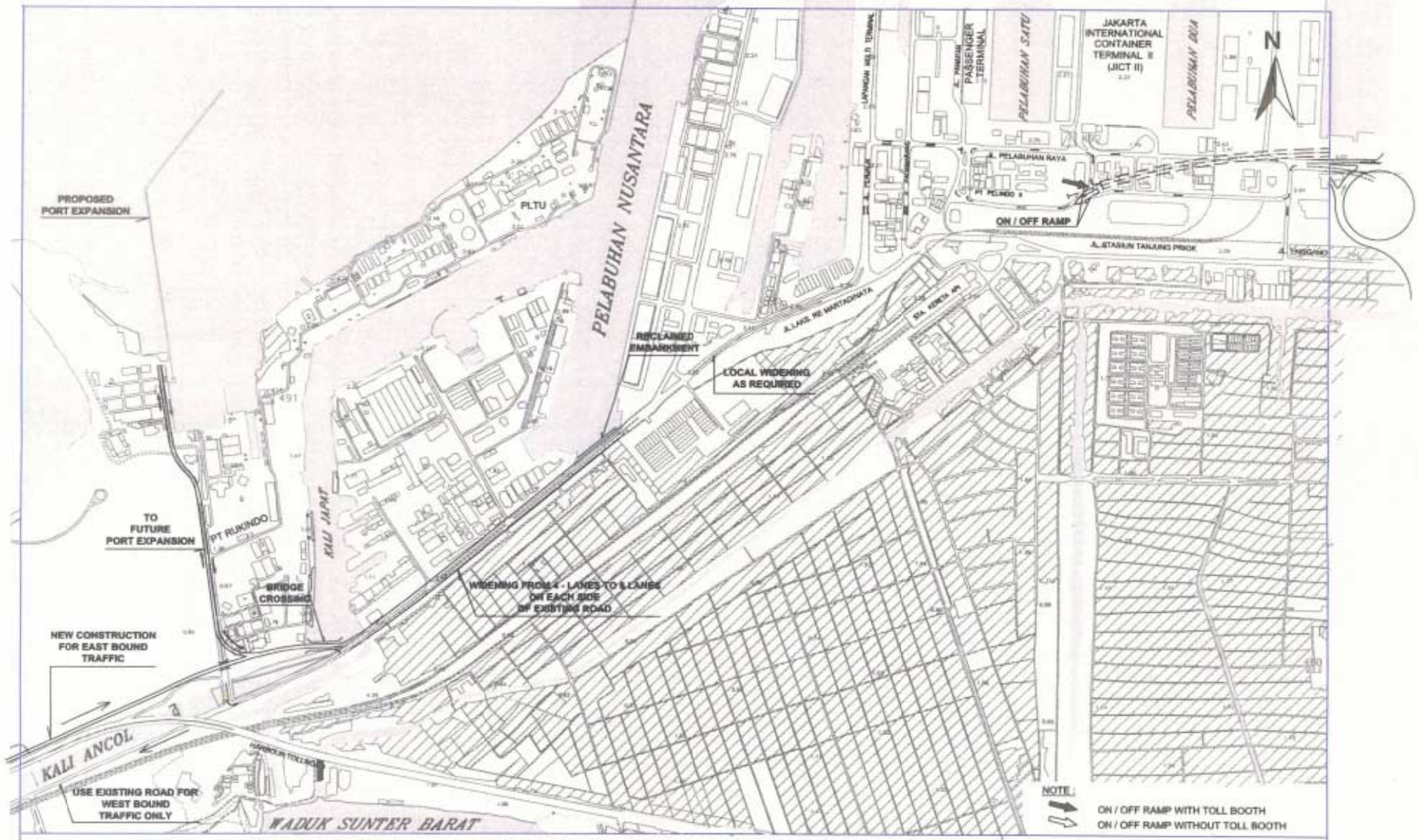
428. Both the JORR northern extension and the JIUT connector should be constructed as 4-lane toll way. A new section of elevated and at-grade toll way (Referred to JORR North Extension) to provide direct access from the east, between JORR and the port.

429. This improvement will embrace a Cilincing Interchange to provide direct access to/from the port and Marunda via JORR North Extension, for heavy container trucks.

430. The ROW for Jl. Jampea is only 30 m wide and there is insufficient space to accommodate an at-grade toll way in addition to the existing arterial road.

431. JORR North Extension is planned for 7 km in length and generally followed the alignment of JL. Jampea and Jl. Cakung. Due to the limited narrow ROW, it will be built as an elevated structure along Jl. Jampea.

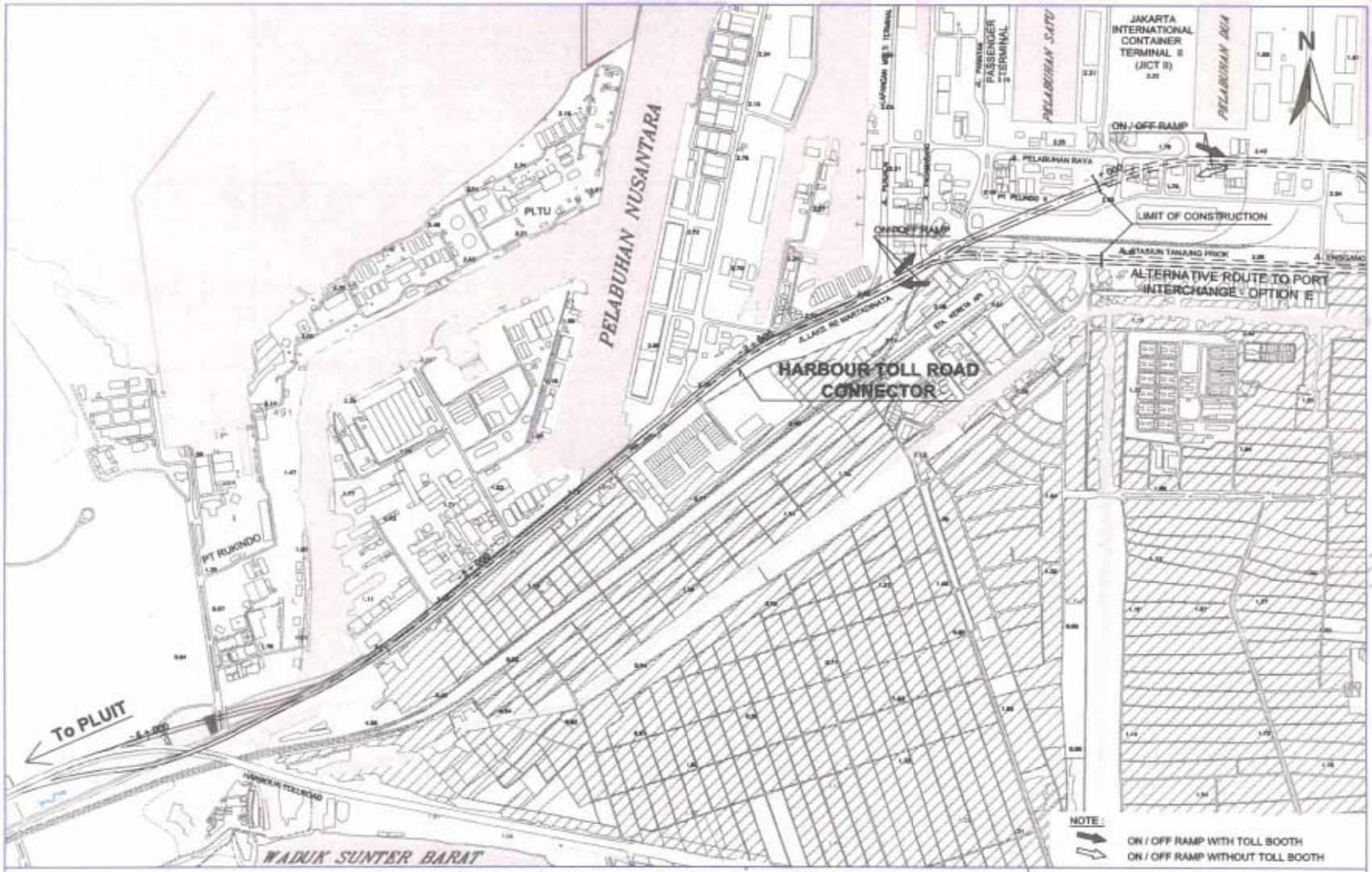
432. In Jl Cakung, the ROW is wider and toll way can be accommodated at- grade within the existing median. A fly-over will be required to provide grade separation with Jl. Tugu Raya and the Cakung River. The concept plan is shown in Figure 11-A-12 and Figure 11-A-13 as parts of the Cilincing Interchange plan.



PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

WESTERN ACCESS - OPTION A

(WIDENING OF JL. LAKS. RE.MARTADINATA)

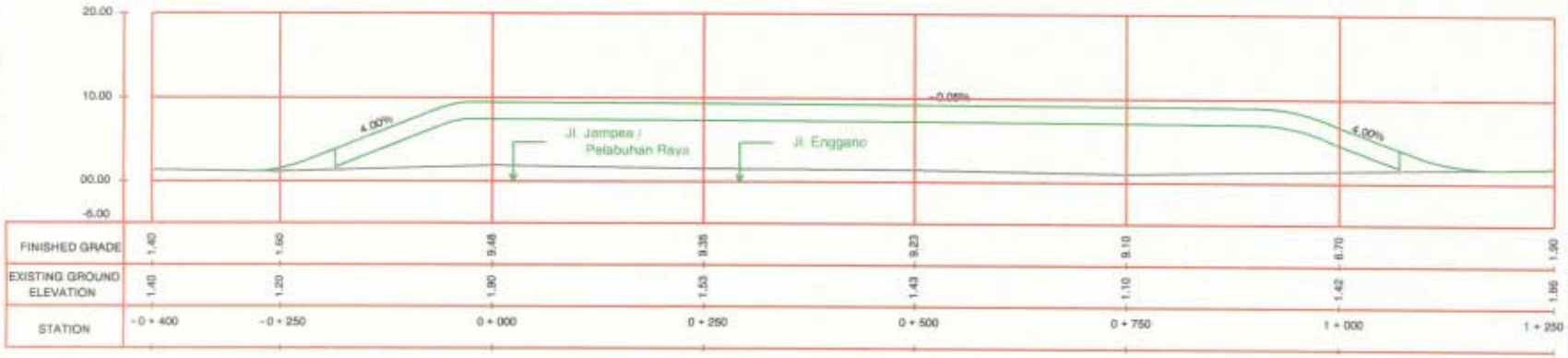


PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

WESTERN ACCESS - OPTION B

(HARBOUR TOLLROAD CONNECTOR)

SCALE 1 : 10,000

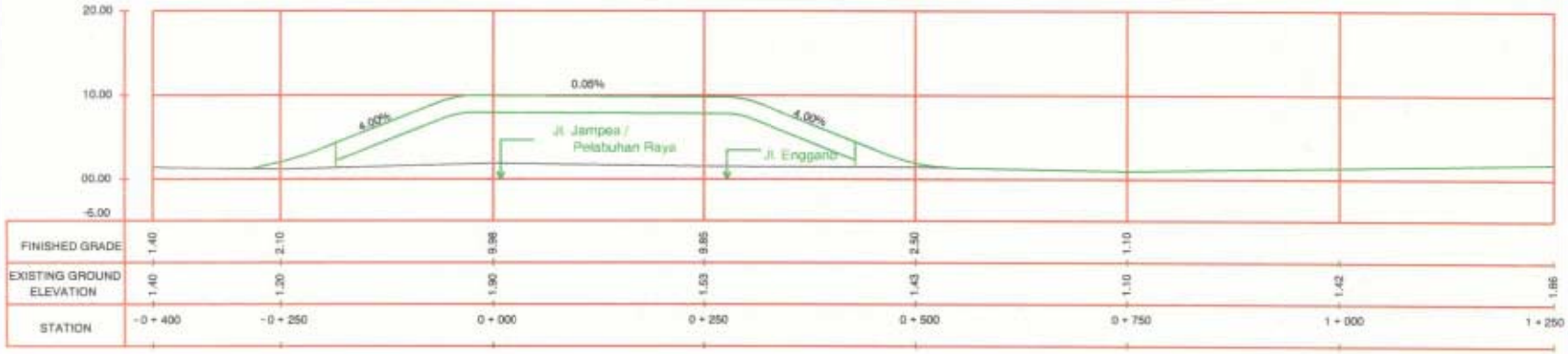


PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

JIUT CONNECTOR - OPTION A

STA. 0-400 ~ STA. 1+250

SCALE HORIZONTAL 1 : 5,000 VERTICAL 1 : 500



PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

JIUT CONNECTOR - OPTION B

STA. -0+400 ~ STA. 1+250

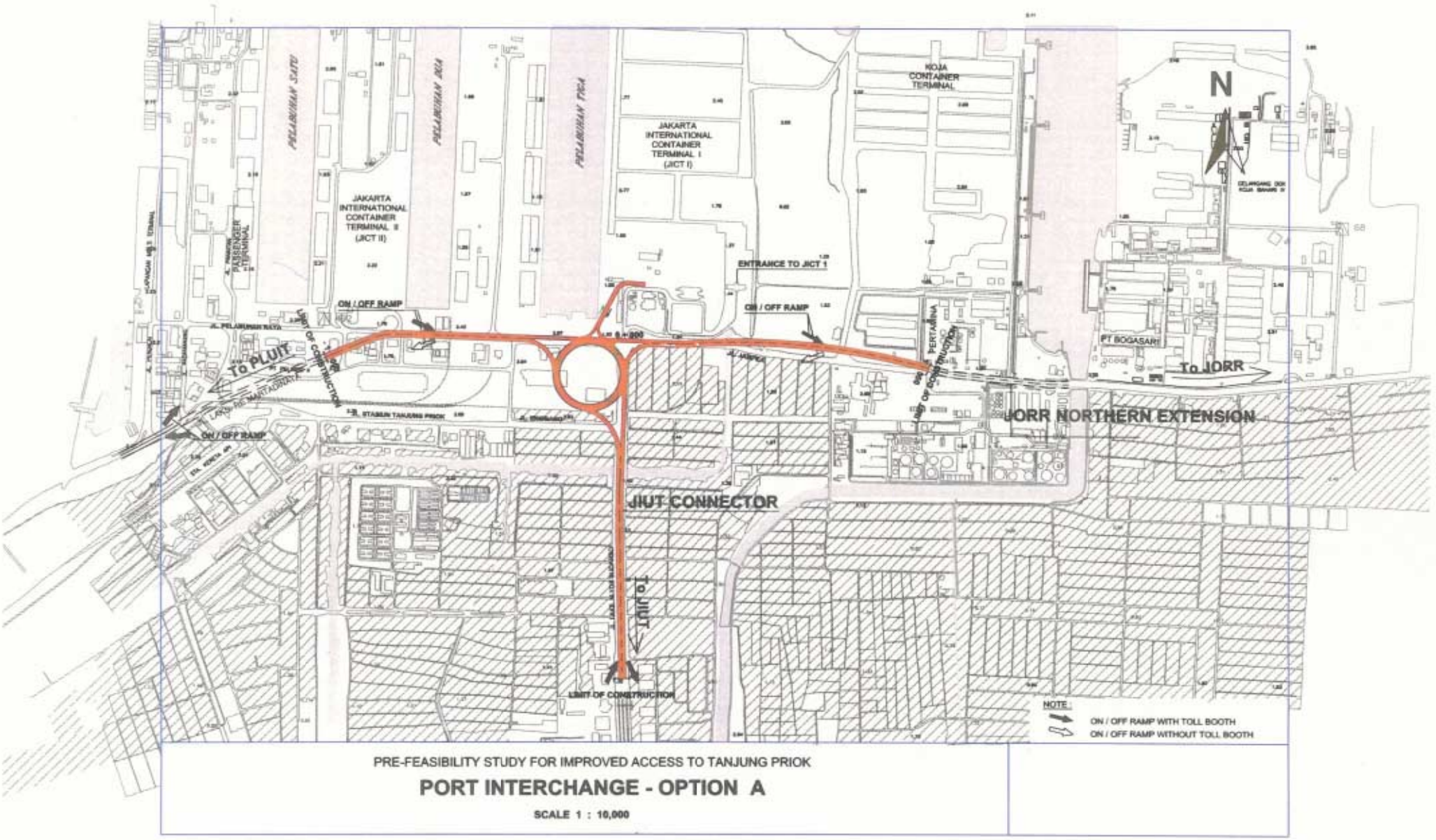
SCALE HORIZONTAL 1 : 5,000 VERTICAL 1 : 500

PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

JIUT CONNECTOR - OPTION B

STA. -0+400 ~ STA. 1+250

SCALE HORIZONTAL 1 : 5,000 VERTICAL 1 : 500



PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

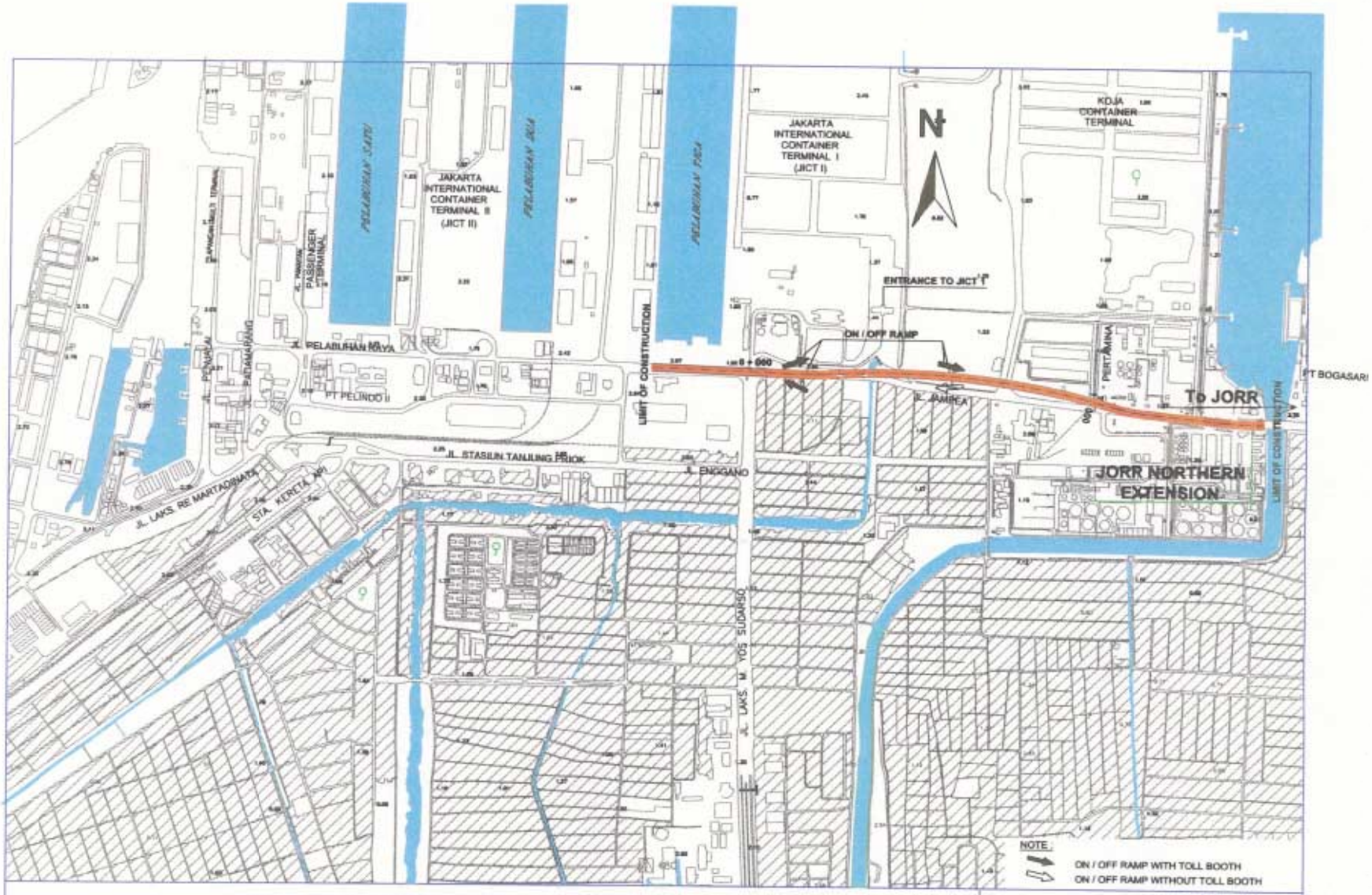
PORT INTERCHANGE - OPTION A

SCALE 1 : 10,000

PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

PORT INTERCHANGE - OPTION B

SCALE 1 : 10,000



PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

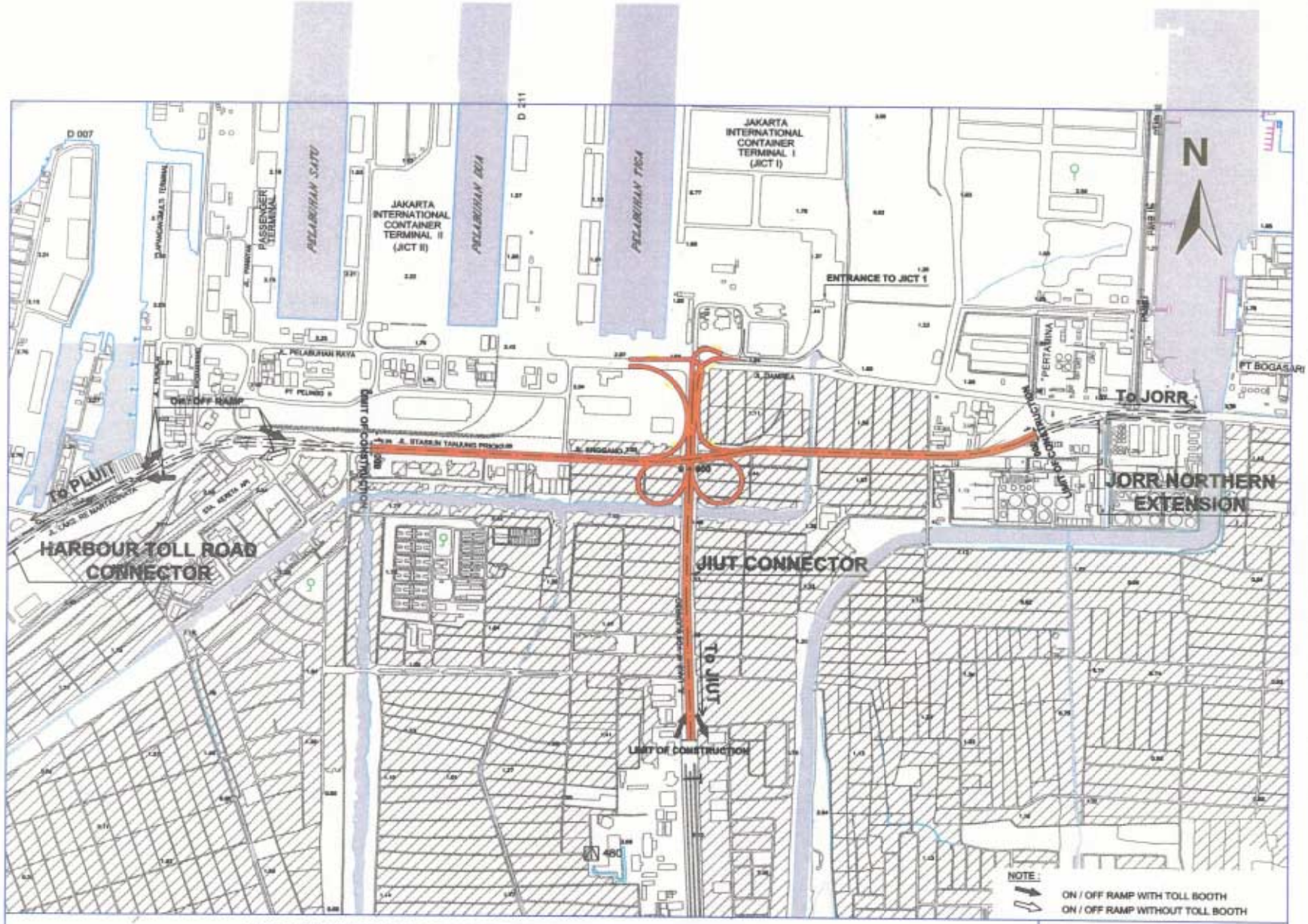
PORT INTERCHANGE - OPTION C

SCALE 1 : 10,000

PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

PORT INTERCHANGE - OPTION D

SCALE 1 : 10,000



PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

PORT INTERCHANGE - OPTION E

SCALE 1 : 10,000

Comparison of Options for Jakarta Intra Urban Toll way (JIUT) Connector

Criteria	Option A		Option B	
	Rating	Remarks	Rating	Remarks
Geometric Layout	Excellent	Provides full grade separation with arterial throughout: Allows right turns or U-turns on arterial.	Fair	Provides partial grade separation with arterial road. Right turns or U-turns cannot be made on the arterial road where grade separation is not provided.
Construction Cost	Poor	Highest Construction cost, Rp. 92 million Cost Index 1.77	Good	Lower Construction cost, Rp. 52 million Cost Index 1.00
Impact on Arterial Road	Excellent	Full width of ROW available for arterial use. No further land requirements until gate 1 of the port from the Ancol ramp.	Poor	Part of existing arterial road is used by toll way, therefore remaining arterial road will have reduced capacity. Additional land required for widening of arterial by year 2010.
Pedestrian Crossing	Good	Zebra crossing located at intersections, Minimal maintenance of crossing parts is required.	Poor	Footbridge, more expensive is requiring maintenance.
Environmental Impact	Good	Reduced noise and air pollution at the ground level.	Fair	Noise and air pollution levels is reduced partially
Traffic management during Construction	Good	Impacts to traffic management by construction will be limited small areas of the existing road for short duration.	Fair	Constructions will impacts on traffic on the existing road for entire duration of works.
Easiness of Construction	Good	Construction works is easy and simple by pile foundation and repeat the same works of erection of PC-I girders.	Good	Standard road construction.
Construction Period	Good	Approx. 18 months repetitive beam erection procedure. Works will not be affected significantly by weather.	Good	Approx. 12 months, It will be possible of some delay due to heavy rainfall.
Necessity of relocation of utilities	Good	Minimal Impact	Good	Minimal Impact
Overall Evaluation	Recommend		2nd best	

Comparison on Options for Port Interchange

CRITERIA	OPTION A		OPTION B		OPTION C		OPTION D		OPTION E	
	Rating	Remarks	Rating	Remarks	Rating	Remarks	Rating	Remarks	Rating	Remarks
Geometric Layout	●	Grade separated interchange with direct access to port and full movement for through trafic from JIUT and JORR	○	3-level interchange with direct access to port and full movement for through traffic from JIUT and JORR. Difficult to obtain adequate weaving lengths on Harbour Toll Road Connector.	◉	Direct access to port from JORR JIUT Connector is not built and all traffic from JIUT continues to use arterial road. JORR Northern Extension requires 6 lanes	●	3-lane interchange with direct access to port from JIUT and JORR but no direct connection i.e. two systems kept separated. Indirect connection between JIUT and JORR by local road network only.		Direct access to port and full movement for through traffic from Harbour Toll Road, JIUT and JORR. Requires 3-level structure with elevated tollways connected by ramps between 2nd and 3rd level. Potentially, contusing layout for driers. Poor driving comfort. Harbour Toll Road Connector utilities congested Jl. Enganno corridor.
Tariff / Toll Gate Arrangement	○	Complex due to mix of JORR and JIUT Systems	○	Complex	●	Simplest	●	Simple	○	Complex due mix of JORR and JIUT systems.
Estimated Construction Cost *	○	Rp.288,000 million Cost Index 1.13	●	Rp.307,000 million Cost Index 1.20	●	Rp.255,000 million Cost Index 1.00	◉	Rp.347,000 million Cost Index 1.00 of port inter-change only, but including JIUT connector flyover cost (Cost Index 1.36)	◉	Rp.268,000 million Cost Index 1.05
Land Requirements	◉	Several industrial buildings on Pelindo II property are affected. On/off ramp encroaches onto JIUT I property.	●	Some impact on buildings on Pelindo II property.	●	Major impact on Jl. Jampea due to massive bridge pier foundations.	●	Minor requirement	○	Greatest requirement, many houses and shops affected. High compensation costs.
Approximate Construction Period	◉	24 months	○	30 months	●	21 months	●	Shortest, 21 months for Inter-change port only. JIUT connector requires around 18 months.	○	30 months
Ease of Construction	○	Complex design and construction	○	Complex box girder design and construction for ramps	●	Easiest, simple PC-I girder erection	◉	Fair, simple PC-I girder with box girder at ramps.	○	Complex multi-level structure
Traffic Management	◉	Control required at pier location but mainly on Pelindo II properly.	◉	More complicated than Option A, because arterial road is affected.	●	Minimal requirement.	◉	Required at on/off ramps on Jl. Jampea.	◉	Difficult to control traffic on Jl. Laks. Sudarso at intersection of tollway and Jl. Enggano.
Relocation of Utilities	◉	Potential conflicts at pier locations	◉	Similar to Option A	●	Minimal. No residents, shop are involved	◉	Conflits at pier locations on arterial road. No residents/ shops are involved	○	Greatest potential for utility conflicts.
Maintenance	◉	Concrete construction	○	Maintenance of ramps is difficult.	●	Least requirement	◉	Generally easy, but 3rd level on-ramp to JIUT Connector may be difficult.	○	3rd level ramps may be difficult
Environmental Impact	●	Reduction in noise and pollution at ground level	◉	As for Option A, but heavy pollution from slow moving trucks on ramps.	○	Partial improvement only in noise and pollution	●	Reduction in noise and pollution at ground level	◉	Reduction in noise and pollution at ground level, but elevatead Harbour Toll Road Connector and portion of JORR Northern Extension pass through narrow, heavily congested residential area ie. Jl. Enggano road corridor.
Social Impact	●	Arterial roads less congested	●	Arterial roads less congested	◉	Continued congestion on Jl. Laks.Sudarso and in vicinity of port.	◉	Arterial roads less congested except at exit/entrance to JICT I.	○	Significant disruption to retail stores, small business and residents.
CONCLUSION	Less desirable		Unfavorable		Least favorable		Most favorable and preferred Option considering the combining JIUT Connector Construction Works.		Not Recommended	

* Cost is for interchange area only with same construction limits for each option
Cost Index express cost as a ratio of the chapest option

● Most favorable ◉ Medium favorable ○ Least favorable

433. This interchange provides movement for traffic to and from Marunda and the port by connecting to toll way. The important consideration is to improve the access of heavy container trucks between Marunda and the Port of Tanjung Priok as shown in the Figure 11-A-12 for option A and Figure 11-A-13 for option B. Taking into consideration of the above, option B provides the most suitable solution.

Figure 11-A-12 Cilincing Interchange-Option A

Figure 11-A-13 Cilincing Interchange-Option B

5) Summary of the Proposed Improvement Access to the Tanjung Priok

434. The proposed improvement access to the Tanjung Priok port from three directions are summarized below:

435. From East, the existing road of Jl. Laks. R.E. Martadinata shall be widened from 4 lanes to 6 lanes up to the gate No.8 of the port. The access road to/from the off-shore development to be connected with the Jl. Laks. RE. Martadinata and JORR northern extension considering the flat tariff system to be introduced.

436. The existing major circle road inside the port will be widen to 3 lanes with one direction flow. Then the Easter bound lane connected to the harbor road toll way by the flyover.

437. The area in front of the Tanjung Priok rail way station on the Jl. Laks. RE. Martadinata is fully occupied with various kind of buses which is being used as commuter bus station and caused heavy traffic congestion for the port related vehicles and city traffic. This area shall be redeveloped by relocation of existing facilities and bus terminal facilities in order to widen the existing Jl Laks. RE. Martadinata.

438. Alternatively, the widened road of the existing road in port should be connected to the port interchange flyover after the Gate No.9, which will be connected to the flyover of the JORR north extension after the Koja Container Terminal.

439. The access from the South will be extended from the existing exit of the JIUT to connect the gate 9 on the Jl. Pelabuhan Raya and gates of container terminal on the Jl. Jampea.

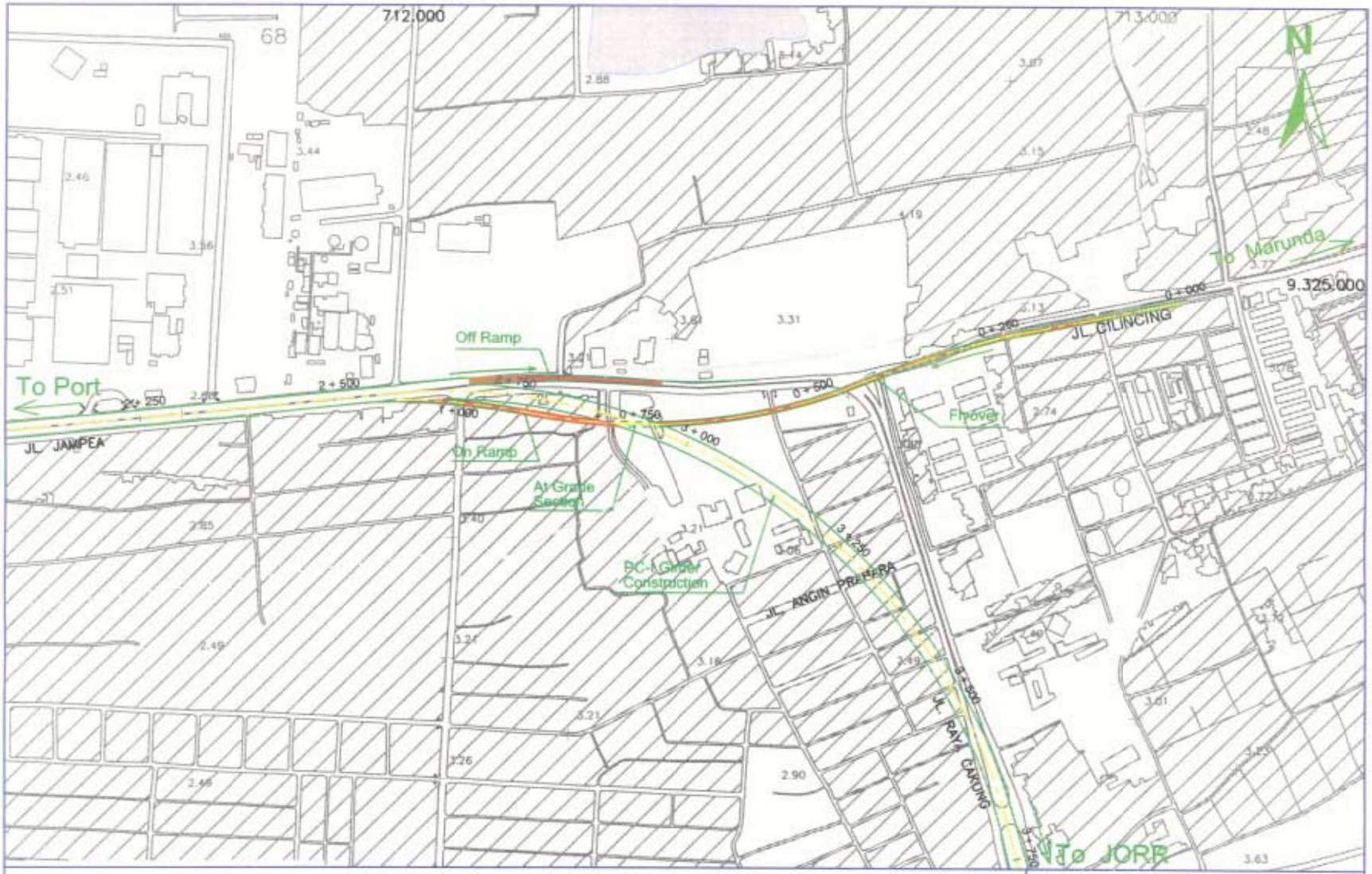
11-A-3 Development Concept of Jakarta Outer Ring Road and Access Road to the Port

1) Jakarta – West Java Tollway System

440. The necessity to strengthen the road network in the Jakarta Metropolitan Area by providing a tollway network is primarily due to the recent drastic increase in vehicle traffic demand. To cope with this situation the Government decided in the late 1970s to develop the Jakarta – West Java Tollway System which consists of radial tollways in the major transportation and development corridors extending from Jakarta together with the inner ring road (ie. Jakarta Intra Urban Tollway and Jakarta Harbour Road) and Jakarta Outer Ring Road (refer to Figure 11-A-14)

Figure 11-A-14 Tollway Location Map

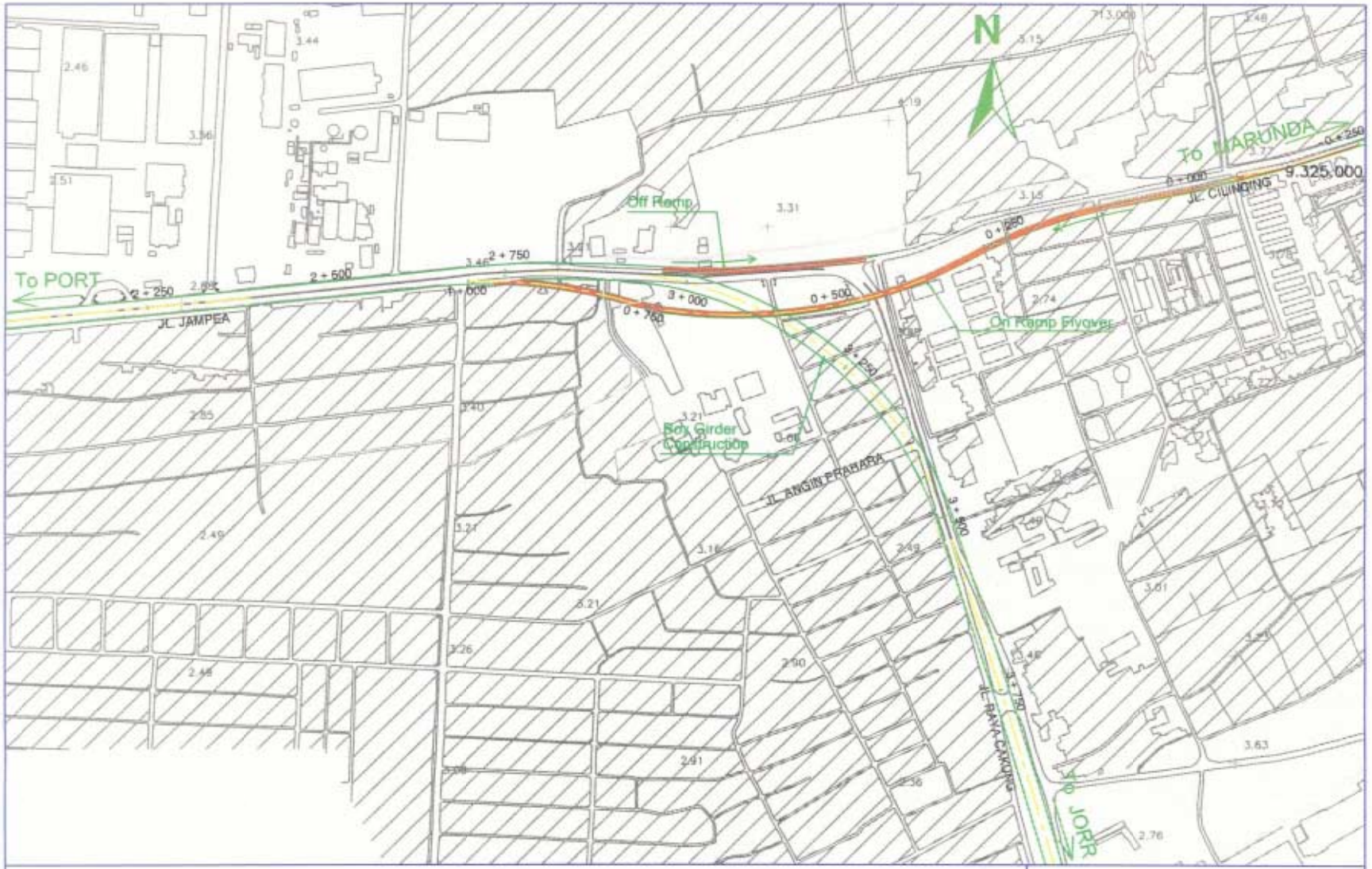
441. Under such background and concept the Jakarta – West Java Tollway System have been established with the following objectives :



PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

CILINCING INTERCHANGE - OPTION A

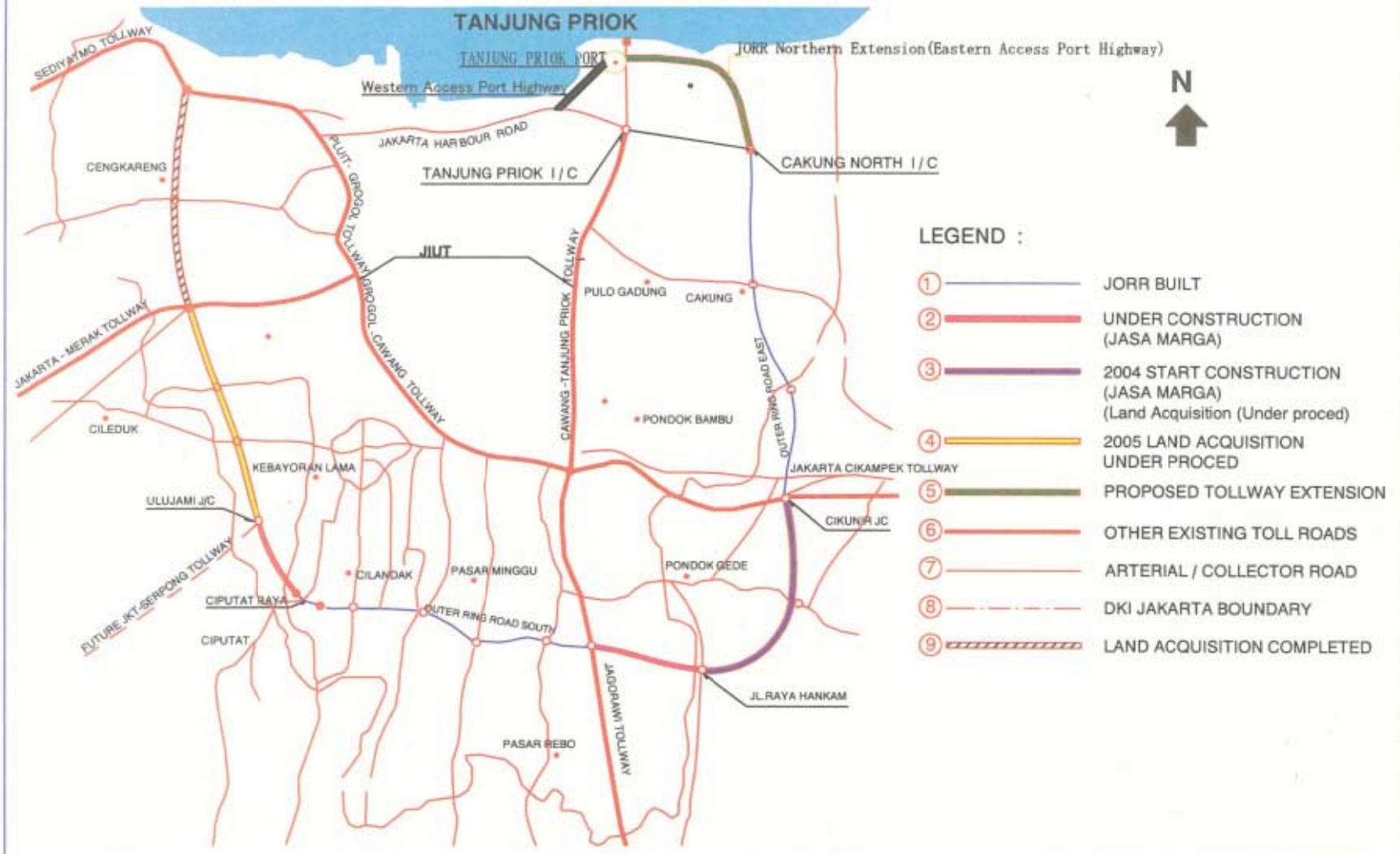
SCALE 1 : 5,000



PRE-FEASIBILITY STUDY FOR IMPROVED ACCESS TO TANJUNG PRIOK

CILINCING INTERCHANGE - OPTION B

SCALE 1 : 5,000



THE STUDY FOR DEVELOPMENT OF THE GREATER JAKARTA METROPOLITAN PORTS IN THE REPUBLIC OF INDONESIA

TOLLWAY LOCATION MAP

- To prevent migration into DKI Jakarta, and encourage the development of the satellite towns in the peripheral area;
- To promote more efficient coordination of JABOTABEK area as a Metropolitan region;
- To assist and improve the port activity functions of Tanjung Priok Port from the point of view of land access which serves not only DKI Jakarta but also West Java and parts of South Sumatra; and
- To encourage an increase in the road density of the area as a whole.

2) Necessity for Jakarta Outer Ring Road

442. As an integral part of the Jakarta – West Java Tollway System, Jakarta Outer Ring Road is planned with expectation to play the following important roles :

- Maintenance of urban activities by avoiding serious traffic congestion;
- Supplementing the function of the radial tollways and the Cengkareng Access; and
- Improvement of landuse in DKI Jakarta, Tangerang and Bekasi.

443. Jakarta Outer Ring Road is planned near the fringe of the future urbanized area of DKI Jakarta and JABOTABEK Metropolitan region. Jakarta Outer Ring Road will become a vital portion of the Jakarta – West Java Tollway System together with the inner ring road and will distribute traffic in urbanized areas.

444. The Jakarta – West Java tollway system have been implemented in the following sequences since 1979.

- Jagorawi toll Road has been open to the public since 1979,
- The Jakarta – Merak Toll Road since 1984,
- The Cengkareng Access since 1985, and
- The Jakarta – Cikampek Toll Road since 1988.

445. Tollway network in the Jakarta Metropolitan Area which is under operation and planning are shown on Figure 11-A-14.

3) Necessity of JORR Northern Extension

446. The existing road access capacity to the Tanjung Priok Port is totally inadequate to accommodate current traffic volume. The traffic counting survey conducted in 2002 proofed that the main arterial roads approaching the port from west (Jl. Martadinata), south (Jl. Laks. M. Yos Sudarso) and east (Jl. Jampea/Cilincing) are heavily congested with a mix of heavy trucks and public city traffic destined to the ports.

447. The construction of JORR Northern Extension Tollway (between Tanjung Priok and Cakung I/C) and JIUT connector (between Tanjung Priok Port and Tanjung Priok I/C) are essentially required for separating port oriented traffic and public through traffic in order to relief the traffic congestion around the port access road area considering the following circumstances :

- The land acquisition of the originally planned routes of JORR between Tanjung Priok I/C and Cakung I/C has been very difficult and become impossible since it was proclaimed as the restricted area by the Governor of the DKI Jakarta Metropolitan.

Alternatively the northern extension of JORR is proposed.

- While the program of JORR development project had been suspended since the economic crisis of 1997, the traffic volume through the Tanjung Priok, particularly containers volume have been increased steadily together with the recovering process of Indonesian economy.
- The implementation program of the remaining parts of JORR in the south and west area had been set by PT. Jasa Marga (Road Development Cooperation) in 2002, who intends to develop and complete gradually, except the routes between Tanjung Priok I/C and Cakung I/C due to the impossible land acquisition situation.

448. At the design stage of JIUT in 1988 – 1990, access to Tanjung Priok port was considered to use the JIUT connector (Jakarta Intra Urban Tollway), which include the Harbour Road from the West.

449. Since then, the Bekasi Industrial Aera and Marunda New Port had been developed remarkably. The necessity of JORR Northern Extension become inevitable as alternative route to access the Tanjung Priok Port than the originally planned route of JORR which could not be developed as part of JORR.

4) Aim of JORR / JORR Northern Extension

450. JIUT (Jakarta Intra Urban Tolway) include Jakarta Harbour Road completed in 1995/96 and since then increase of traffic volume is remarkable through these tollway. Traffic congestion on the tollway occurs daily particularly at four interchanges in the JIUT, namely Cawang, Tomang, Pluit and Tanjung Priok. The heavy congestion at these interchanges were caused physically by the minimum geometric design standard for construction of each interchange, because of the limited land availability by the difficulty of land acquisition. The ramp from the tollway to the public city road thereof is very poor conditions, such as radius of ramp is small, longitudinal slope is steel, and the width of ramps is narrow, etc.

451. Under such geometric design of tollway arrangement, once heavy vehicles enter the ramp, the velocity of vehicles got slow down which subsequently caused heavy congestion with the following vehicles at the adjacent city roads, and correspondingly the lane capacity is decreased.

452. Under such geometric and structural conditions of JIUT, large/heavy trucks especially trailer trucks to/from the port are recommended to use the Outer Ring Road instead of using JIUT through the city for shorter access to the industrial estates in the eastern region (Karawang, Bekasi, Cikarang). Direct access of JORR through the corridor through from Cakung I/C to Harbour Road is not considered physically anymore practical, because of non land availability.

453. Based on the concept of traffic flow of large vehicles using JORR the eastern direction between the industrial estates and the ports, JIUT and Harbour Road structures are designed.

454. Incase the traffic go to the west through the harbour road, the existing arterial road of Jl. Martadinata should be improved and the elevated road along this road should be developed to connect the harbour road due to the limited land for widening on both side of the road.

455. The elevated road on seaside can be connected to the present elevation of the harbour road, but on landside road must be made with flyover the existing level of the harbour road for connection, which is also flyover the railway line area. Thus the elevation of access road of landside will get higher, the construction cost would be very expensive.

11-A-4 Development Plan of JORR Northern Extension for Access Road

1) General Development Plan

456. The result presented in previous section Traffic Analysis, substantiate the urgent necessity and requirement of development of the JORR northern extension to connect between the gate of port to Cakung I/C for improved access to the port and the provision of grade-separated structures at major intersections to alleviate existing congestion. In addition, it is evident that both these requirements can be satisfied in the following manner:

- Widening of Jl. Laks. RE Martadinata or new elevated tollway to provide improved access to the port from the west;
- A new section of elevated tollway to provide direct access from the south, between JIUT and the port;
- A new section of elevated and at-grade tollway to provide direct access from the east, between JORR and the port.

457. These three road elements will embrace following interchanges:

- Port Interchange - to provide direct connections between the road improvements/ tollway construction and the port;
- Cilincing Interchange - to provide direct access to/from the port and Marunda via JORR Northern Extension, for heavy container trucks.

458. It is assumed that if Harbor Toll Road Connector was ever built the tariff policy would ensure that traffic to/from the west would have to pay two toll tariffs compared to traffic using JORR which only has to pay once. In this manner, traffic would be encouraged to use JORR whereby a portion of westbound and southbound traffic is attracted to JORR Northern Extension, would remain valid.

459. The following sections identify a number of possible options for the each of the components. Alternative layouts were considered and evaluated for Port Interchange and Cilincing Interchange and the preferred option for each interchange was combined with the preferred access improvements to create an overall design concept.

2) Port Interchange

460. The intersection of Jl. Pelabuhan Raya, Jl. Jampea and Jl. Sulawesi is in the vicinity of the main port entrance and the entrance to JICT I. This is very congested and there is limited space available for building interchange ramps to connect future tollways or provide access to the port. The most suitable areas for constructing ramps would be adjacent to JICT I or the property along the south side of Jl. Pelabuhan Raya.

461. Very different concepts for Port Interchange were considered for comparative purposes. All options satisfy the primary criteria of providing improved access to the port for traffic approaching from the west, south and east.

462. Widening of Jl. Laks. RE Martadinata from a 4-lane to 6-lane arterial road can take place within the existing right of way from the port to where it passes under the Harbor Toll Road. Thereafter, in the Ancol area there is no room for widening within the existing ROW and the extra lanes will have to be provided either by building a second level or by constructing 3 eastbound lanes on the north side of Kali Ancol and using the existing road for westbound

traffic. The latter option would be considerably cheaper than a costly overhead structure required for an elevated road.

463. Typically at its easterly end, the Harbor Toll Road Connector would enter port (Pelindo II) property before following Jl. Pelabuhan Raya road corridor to Port Interchange. On-off ramps would be provided convenient access to the Passenger Terminal and JICT II.

464. The Harbor Toll Road Connector, provides a less desirable solution because it would have the following adverse impacts:

- Encourage more traffic onto JIUT, which is already congested;
- Cause an increase in traffic volume at Tomang Interchange on JIUT, which is already extremely congested;
- Create an undesirable mix of heavy truck traffic and airport traffic on the tollway to Sukarno-Hatta International Airport.

3) Eastern Access Port Highway

465. Eastern Access Port Highway is 3 km length viaduct to connect the Gate-9 at the port and intersection of Jl. Cilincing which is formed as parts of JORR Northern Extension, and generally follow the alignment of Jl. Jampea and Jl. Cakung.

466. Due to the narrow ROW (Right of Way), it will be built as an elevated structure along Jl. Jampea. Plan, plofile drawings are attached.

467. This highway viaduct starts near the Gate-9 of port entrance and slightly bend to north-side and follow the existing alignment of Jl. Jampea.

468. The exclusive on-off ramps will be developed to connect JICT I/ Koja Container Terminal with this viaduct highway.

Figure 11-A-15 Eastern Access Port Highway Plan and Profile(1/3)

Figure 11-A-16 Eastern Access Port Highway Plan and Profile(2/3)

Figure 11-A-17 Eastern Access Port Highway Plan and Profile(3/3)

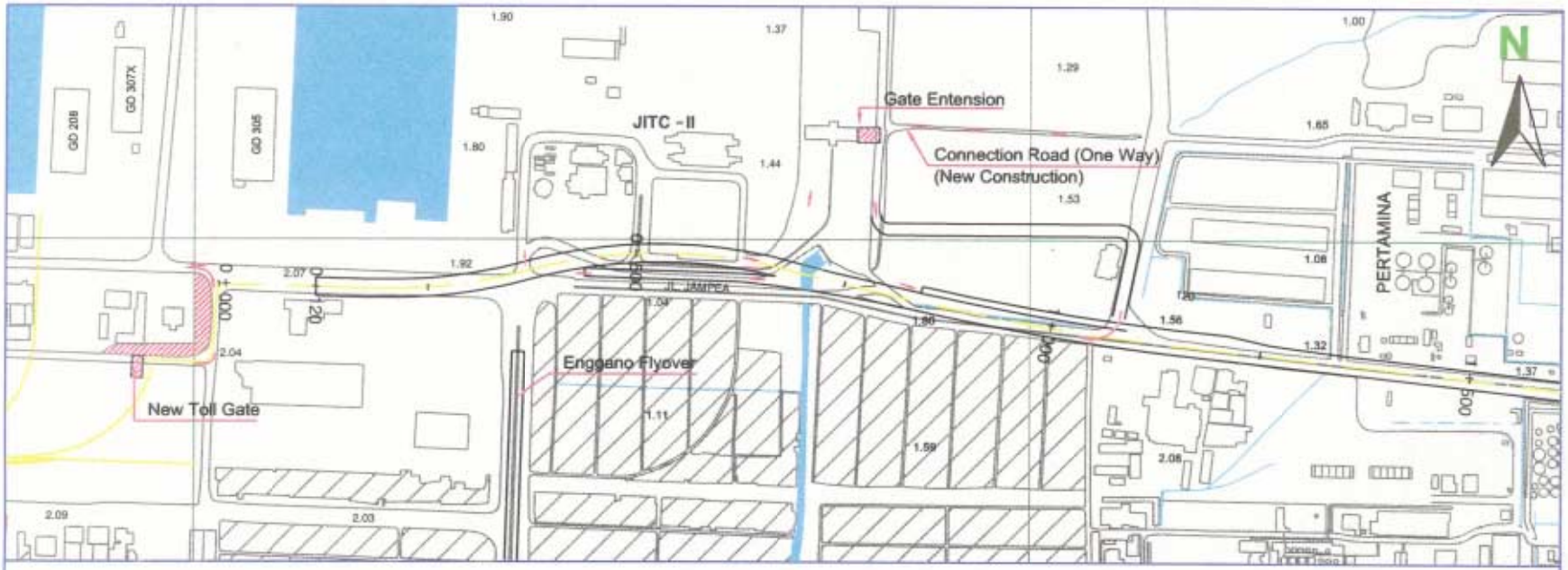
Figure 11-A-18 Car Terminal On-Ramp and Cilincing Interchange

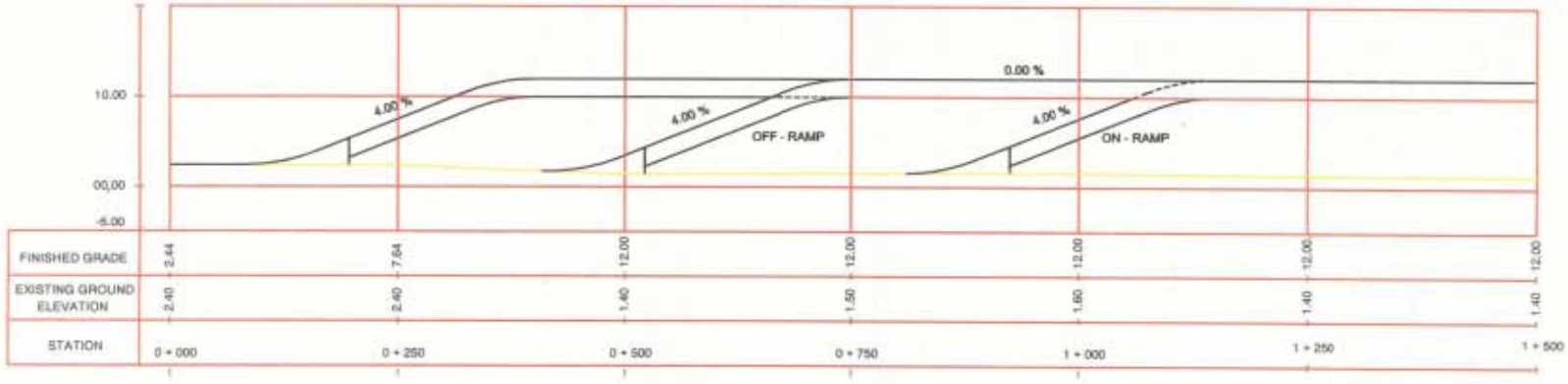
4) JORR Northern Extension

469. This section of tollway will be the extension from the eastern Access Port Highway.

470. JORR Northern Extension is 3.5 km in length and generally follows the alignment of Jl. Jampea and Jl. Cakung. Due to the narrow ROW it will be built as an elevated structure along Jl. Jampea.

471. In Jl. Cakung, the ROW is wider and the tollway can be accommodated at grade within the existing median. A flyover will be required to provide grade separation with Jl. Tugu Raya and the Cakung River. Plan and profile are attached.

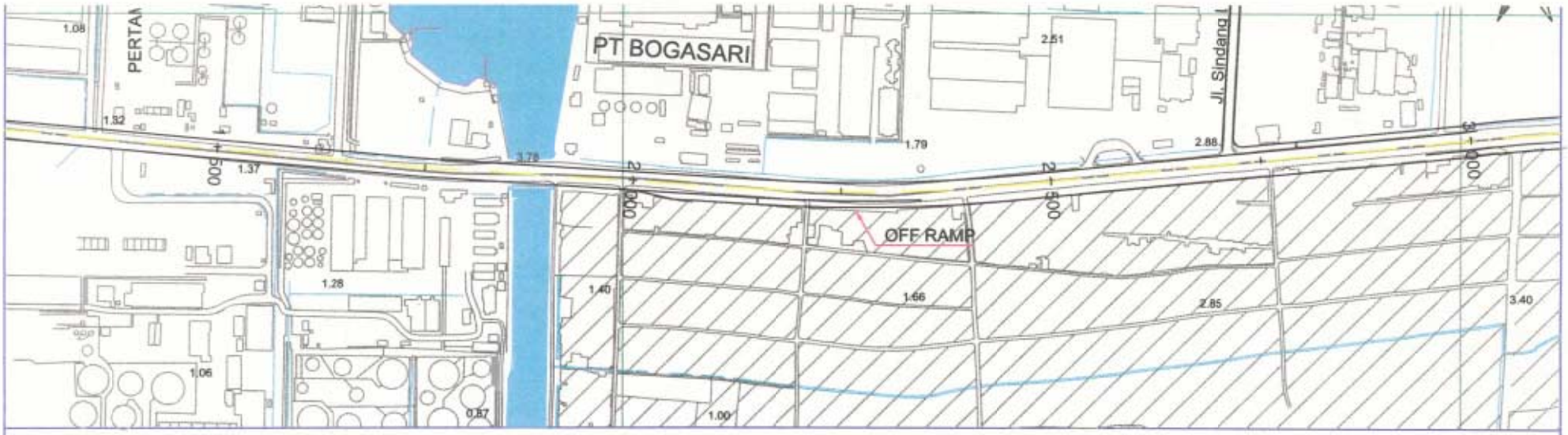


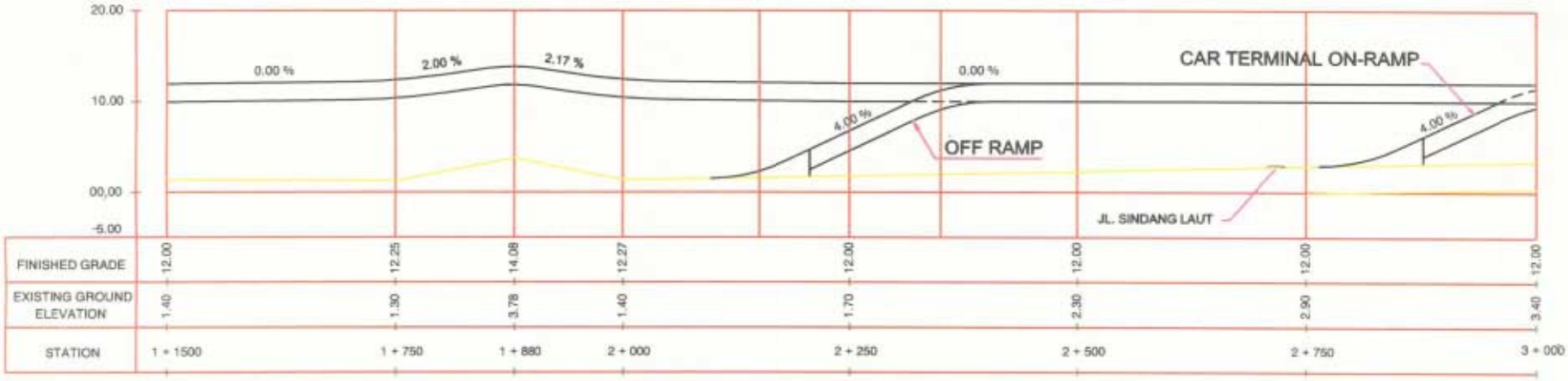


THE STUDY FOR DEVELOPMENT OF THE GREATER JAKARTA METROPOLITAN PORTS IN THE REPUBLIC OF INDONESIA

EASTERN ACCESS PORT HIGHWAY - PLAN AND PROFILE

STA. 0+000 ~ STA. 1+500

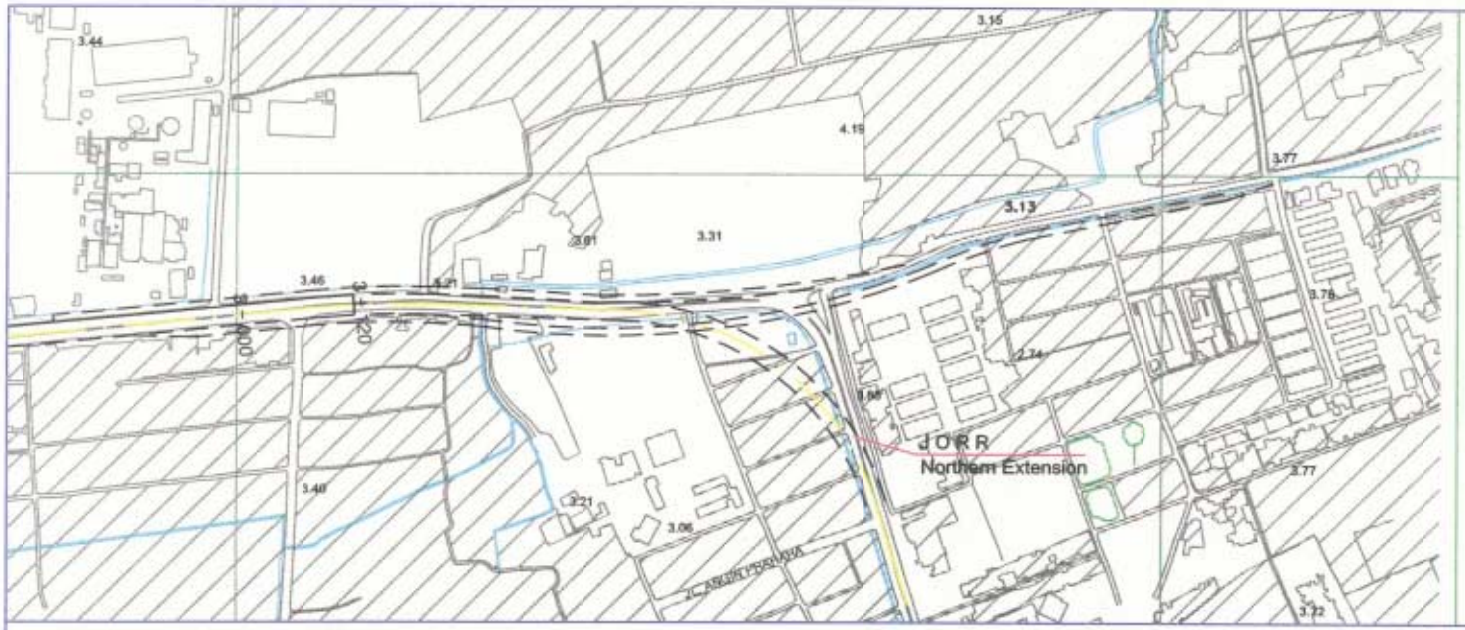


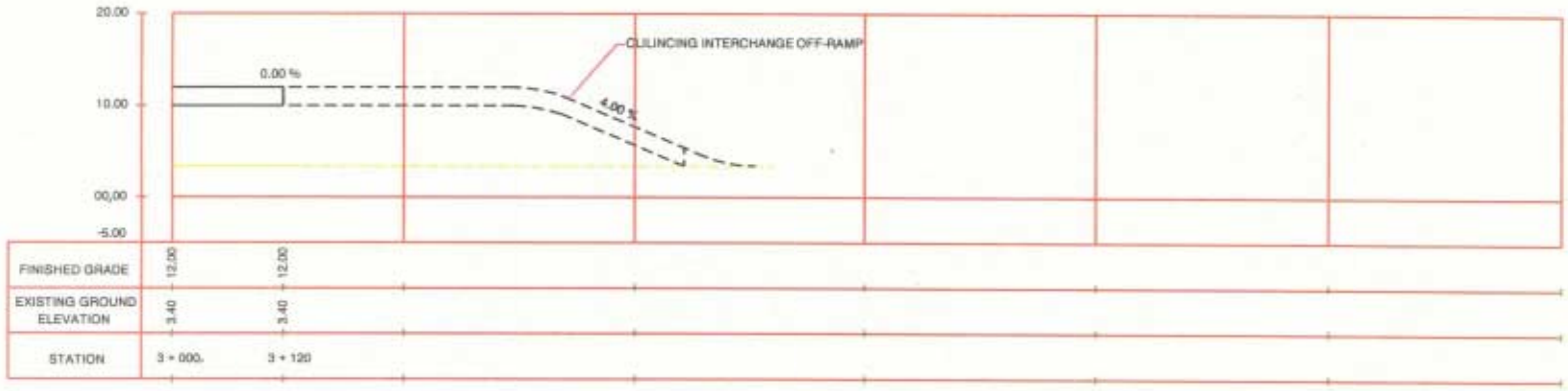


THE STUDY FOR DEVELOPMENT OF THE GREATER JAKARTA METROPOLITAN PORTS IN THE REPUBLIC OF INDONESIA

EASTERN ACCESS PORT HIGHWAY - PLAN AND PROFILE

STA. 1+1500 ~ STA. 3+000

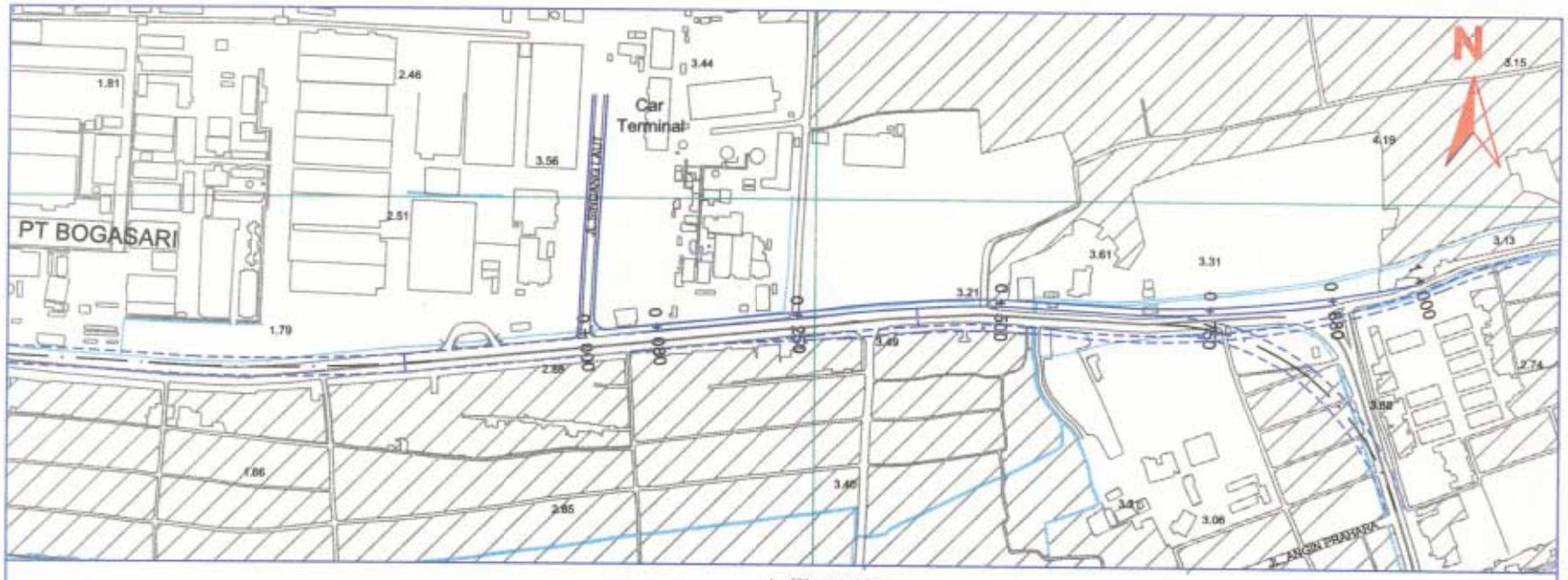


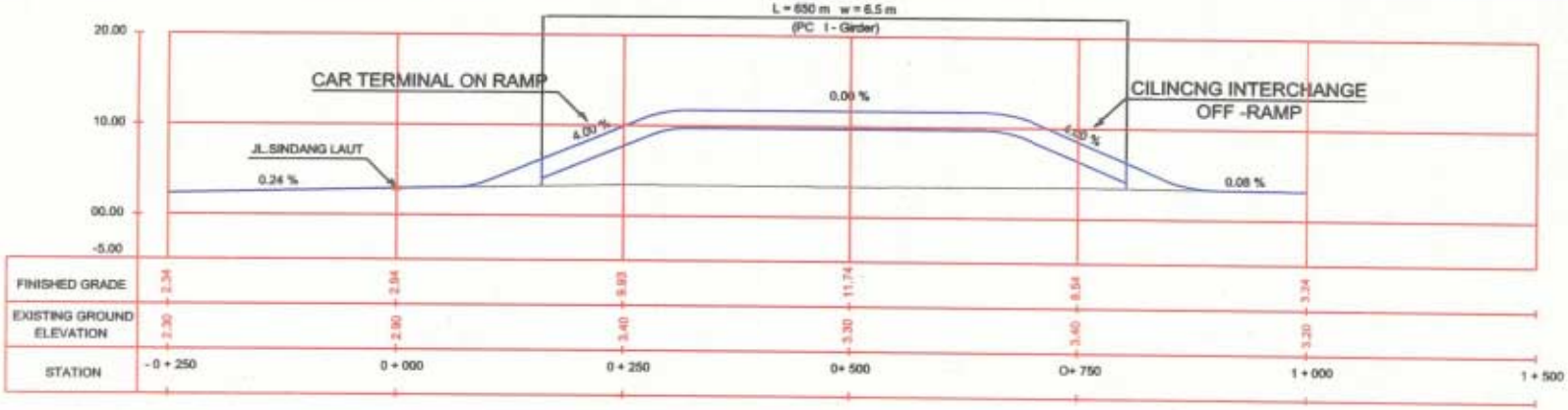


THE STUDY FOR DEVELOPMENT OF THE GREATER JAKARTA METROPOLITAN PORTS IN THE REPUBLIC OF INDONESIA

EASTERN ACCESS PORT HIGHWAY - PLAN AND PROFILE

STA. 0+000 ~ STA. 1+500





THE STUDY FOR DEVELOPMENT OF THE GREATER JAKARTA METROPOLITAN PORTS IN THE REPUBLIC OF INDONESIA

CAR TERMINAL ON-RAMP AND CILINCING INTERCHANGE OFF-RAMP,PLAN AND PROFILE

STA. 0 + 000 ~ STA.1 + 000