12.3 ESTABLISHMENT OF MASTER PLAN ROAD NETWORK

Necessary reinforcement to the Basic Road Network was identified to make the network more flexible and stronger to natural disasters and increasing traffic growth. In order to achieve above objectives, disaster-detour analysis and traffic congestion analysis were undertaken.

12.3.1 Disaster-Detour Analysis

Road network should be developed in that alternative (or detour) route can be available when a certain road link would be cut. The flexibility of the Basic Road Network to natural calamities was examined.

Figure 12.3-1 shows major natural disaster-prone sections.

Mindoro Island

Most disaster-prone sections are located along the coast and rivers. A long detour would not be avoided if any one of those sections is cut. A possible option is to provide another cross island roads or another parallel road to a coastal road located inland side with some connecting links. However, this option is greatly constrained by mountainous topography and high expensive. A practical solution would be to make existing roads strong enough against natural disasters. Additional roads were not proposed for this island.

Palawan Island

The road condition is similar to Mindoro Island. The same solution as for Mindoro Island was recommended.

Panay Island

P-1 : Detour length is not so long, thus an additional road link was not recommended.

P-2 : Quite long detour would be required. Additional road links should be preferably developed, however, development of such road links is greatly constrained by mountainous topography. A practical solution is to make existing road strong against natural disasters.

P-3 & 4 : When one of those sections is cut, the other would be served as a detour road. When both are cut, a long detour would be required. A practical solution is to make P-3 sections a natural disaster-proof road.

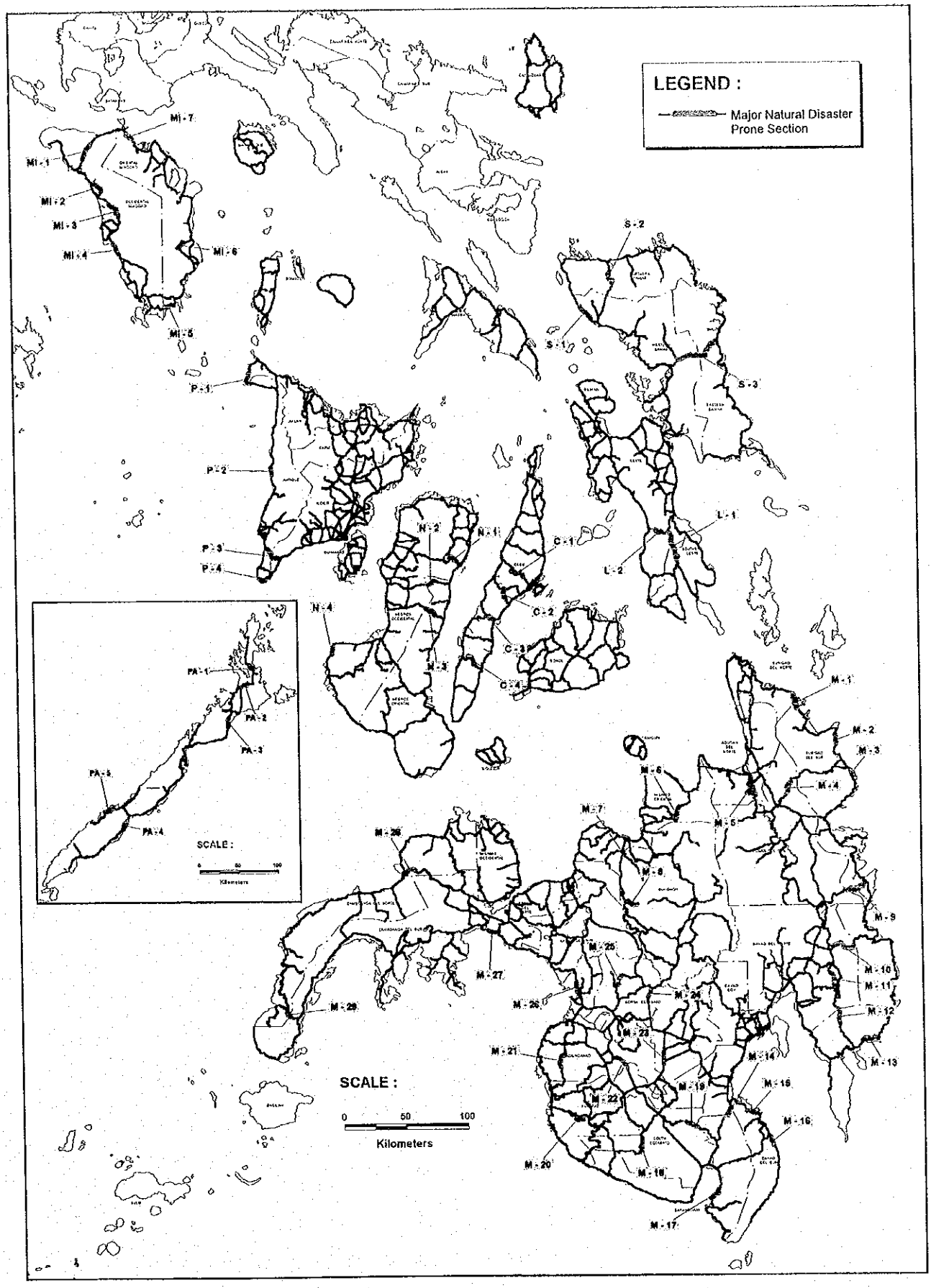


FIGURE 12.3-1 MAJOR NATURAL DISASTER PRONE SECTION

Negros Island

N-1, 2 & 3 : These are three cross island roads located at about 25 km interval. To make at least one of these three roads stronger against natural calamity is a practical solution.

N-4 : Another existing road could serve as a detour route, and additional link is not needed.

Cebu Island

The condition is similar to Negros Island. The same solution as for Negros Island was recommended.

Samar Island

S-1 & 2 : This is the same situation as P-3 & 4 of Panay Island. The same solution was recommended.

S-3 : A long detour would be required when this link is cut. However, it is difficult and costly to provide another link to the basic road network. A practical solution is to make this link stronger against natural disaster.

Leyte Island

L-1 & 2 : L-1 is one of the most serious disaster-prone sections in the country. When either of L-1 or L-2 is cut, a detour route would be available. When both links are cut simultaneously, a long detour would be required, since a Pacific side coastal road is still to be developed.

A practical solution is to make each component road stronger against natural disasters.

Mindanao Island

The proposed Basic Road Network is reasonably sufficient therefore, once it is completed, flexibility of network to cope with natural disasters would be attained. However, some of the east-west lateral roads and many of strategic roads(B) are still to be developed. Efforts should be made to make existing roads stronger against natural disasters.

Summary

The flexibility of the proposed Basic Road Network to natural disasters is not sufficient in Mindoro, western part of Panay and Samar. However, to provide additional links is quite difficult and costly due to severe constraint of mountainous topography, therefore the practical solution is to make existing roads of the basic road network stronger against natural disasters.

In another islands, upon completion of the proposed Basic Road Network, the flexibility to road cut due to natural disasters would be achieved. However, many existing roads are still to be improved, they should be converted to natural disaster-proof roads.

No additional road to the proposed Basic Road Network was considered.

12.3.2 Traffic Congestion Analysis

Traffic demand forecast on the Basic Road Network was undertaken and discussed in Chapter 9.

Traffic congestion analysis was undertaken to identify road sections with traffic capacity problems. Forecasted traffic volume was converted to passenger car unit (PCU) and compared with traffic capacity. The adopted assumptions were as follows:

- Passenger car unit factor (PCUF)
  - 1.0 for car/van
  - 1.5 for jeepney
  - 2.0 for bus and truck
- Peak hour factor and directional factor combined = 0.08
- Capacity = 2,000 pcu per hour for a 2-lane road.
- Volume-to-capacity ratio of 0.4 or more is judged congested, since local traffic is not included in the forecast. Traffic volume of about 9,500 pcu/day is the capacity limit of a 2-lane road.

Road sections which will suffer traffic capacity problem were identified as shown in Figure 12.3-2 and Table 12.3-1.

Road sections shown in Figure 12.3-2 were proposed to be widened to a 4-lane road. In addition to above, the following road sections were also proposed to be widened to a 4-lane road to maintain continuity of the same standards of a road between major urban centers as well as to strategically strengthen the arterial road network:

Panay Island

- Iloilo City – Roxas City Road (All Section)

Negros Island

- Dumaguete – Bais Road (Extended up to Bais)

Leyte Island

- Palo – Sta. Fe Section of Palo – Ormoc Road

Mindanao Island

- Tangub – Ozamiz – Oroquieta Road (Extended up to Oroquieta)

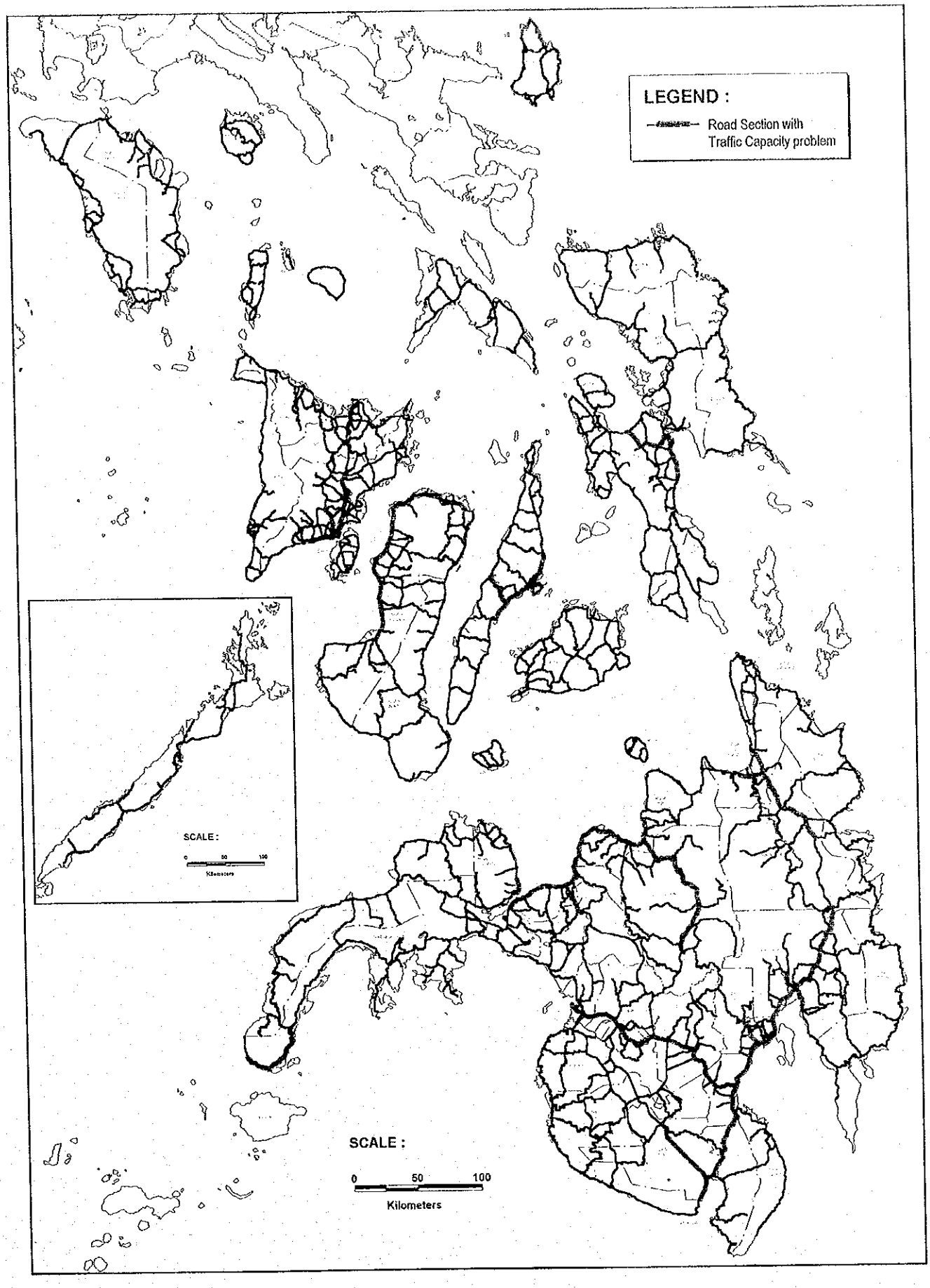


FIGURE 12.3 - 2 ROAD SECTIONS WITH TRAFFIC CAPACITY PROBLEM : 2016

TABLE 12.3-1 ROAD SECTIONS WITH TRAFFIC CAPACITY PROBLEM

Island	Road Section	Traffic Volume in 2016 (PCU/day)	Approx. Timing of 4-lane Required
Panay	1) Iloilo City - Roxas City Road		
	• Iloilo - Passi Section	43,700~16,000	Near Iloilo City: Year 1997, other 2004-2010
	• Dumarag - Roxas Section	12,000~16,500	Near Roxas City by 2004, other 2010
	2) Iloilo City - Antique Road		
	• Iloilo - Guimbal Section	24,800~10,000	Near Iloilo City: Year 2004, other 2010
	3) Iloilo City - Cabatuan - Lumbunao Road	21,100~12,800	Near Iloilo City: Year 2004, other 2010
Negros	1) Bacolod City - Escalante Road		
	• Bacolod - Victorias Section	37,000~13,300	Silay - Victorias: Year 2004 (Note 1)
	• New Sagay - near Escalante Section	10,000~14,300	Year 2016
	2) Bacolod City - Kabankalan Road		
	• Bacolod - Hinigaran Section	31,000~11,000	Bacolod - Bago City: Year 1997 (Note 2), other 2010
	• Hinigaran - Kabankalan Section	11,800~11,100	Year 2016
	3) Dumaguete - Bais Road		
	• Dumaguete - Sibulan Section	11,900	Year 2010
Cebu	1) Cebu North Road		
	• Cebu City - Danao City Section	177,600~11,400	(Note 3)
	2) Cebu South Road		
	• Cebu City - Carcar Section	101,500~17,600	(Note 4)
	3) Naga - Toledo Road		Year 2010
Leyte	1) Pan-Philippine Highway		
	• Tacloban - Mac Arthur Section	19,000~10,900	Tacloban - Palo by 2004, Palo - Tolosa by 2010
	2) Tacloban City - Ormoc City Road		
	• Sta. Fe - Carigara Section	17,000~10,300	Sta. Fe - Palo by 2010, other by 2016
	3) Tacloban City - Sta. Fe Road	12,300	By 2010
Mindanao	1) Pan-Philippine Highway		
	• Remedios T. Romualdez - San Francisco Section	20,100~11,500	RTR-Butuan by 2004, others by 2010
	• Tolento - Tagum Section	10,600~31,700	Tagum - Mawab by 2004, Mawab - Monkayo by 2010 others by 2016
	• Tagum Davao City Section	35,800~44,600	4-lane already required.
	2) Davao City - Digos Road	39,900~18,500	By 2004
	3) Digos - Gen. Santos City Road	9,900~32,900	By 2010 except near Boundary (2016)
	4) Digos - Cotabato City Road		
	• Digos - Provincial Boundary Sect.	13,700~16,000	By 2010
	• Sections in North Cotabato	13,700~22,800	By 2004
	5) Gen. Santos City - Cotabato City Road		
	• Gen. Santos - Koronadal Section	30,000~18,600	Near Gen. Santos by 1997, other by 2004
	6) Gen. Santos City - Maasim Road (up to Prov. Bdry.)	12,400	By 2010
	7) Sayre Highway		
	• Cag. de Oro City - Malaybalay Sect.	11,100~11,700	By 2016
	• Malaybalay - Valencia Section	13,300~16,600	Malaybalay - Valencia by 2010,others by 2016
	8) Butuan - Cagayan de Oro - Iligan Road		
	• Jct. PJHL - Buenavista Section	29,100~13,300	Near Butuan City by 2004, others by 2010
	• Jasaan - Cagayan de Oro Section	12,000~34,600	Near Cagayan alrady 4-lane. Up to Villanueva by 2004, other s by 2010
	• Cagayan de Oro - Boundary Sect.	27,500~18,100	Near Cagayan alrady 4-lane, others by 2004
	• Boundary - Iligan City Section	18,000~19,600	By 2004
	• Iligan City - Linamon	22,200~17,100	By 2004
	• Linamon - Tubod	15,500~16,200	By 2010
	9) Tangub - Ozamis Oroquieta Road		
	• Tangub - Ozamis - Tudela Section	10,800~13,500	By 2016
	10) Iligan City - Marawi City Road	13,800~18,000	By 2010
	11) Zamboanga City - Pagadian City Road		
	• Zamboanga City - Jct. To Subic	10,700	By 2016
	• Zamboanga City - Free Port	11,400	By 2016
	12) Tagum - Mati Road		
	• Tagum - Pindasan Section	9,900~13,200	By 2016
	13) Tagum - Kapalong Road	10,500	By 2016

Note:
1) Bacolod - Silay already 4-lane.
2) Section near Bacolod City is already 4-lane.
3) Cebu - Consolacion already 4-lane, but additional lanes required
Consolacion - Compostela already 4-lane needed,
Compostela - Danao City by year 2010.
4) Cebu - Talisay already 6-4 lanes
Talisay - Naga: 4-lane already required
Naga - San Fernando: 4-lane by 2004
San Fernando - Carcar: 4-lane by 2010

12.3.3 Reinforcement of Basic Road Network

The Basic Road Network needs to be further strengthened, particularly at and between major urban centers in order to provide more efficient transport means. The following three types of reinforcement were proposed:

a) Expressway

An expressway was proposed for a corridor under the following situation:

- A corridor connecting several highly urbanized centers with concentration of commercial, business and industrial establishments.
- A corridor with high traffic demand
- A corridor designated as "Growth Corridor".

Proposed corridors for an expressway were as follows:

- Naga – Cebu City – Danao City Corridor in Cebu Island
- Digos – Davao City – Tagum Corridor in Mindanao Island

b) Bypass

A bypass was proposed for an urban center under the following situation:

- An urban center where local traffic is expected to increase at high rate, and through traffic and/or traffic going to the central area of urban center should be diverted.
- An urban center in which widening of an existing road is difficult due to roadside development.

Proposed urban centers where a bypass is needed were as follows:

- Iloilo City in Panay Island
- Bacolod City in Negros Island
- Cagayan de Oro City in Mindanao Island
- Iligan City in Mindanao Island
- Butuan City in Mindanao Island
- Malaybalay in Mindanao Island
- Valencia in Mindanao Island

c) Inter-Island Link

Inter-Island links proposed by DPWH were decided to be included in Master Plan Road Network.

- Luzon (Batangas) – Mindoro Link
- Iloilo – Guimaras Link
- Guimaras – Negros Link
- Cebu – Negros (Dumaguete) Link
- Luzon (Sorsogon) – Samar Link

12.3.4 Master Plan Road Network

The Master Plan Road Network was established by reinforcing the Basic Road Network with a 4-lane roads, expressways, bypasses and inter-island links and presented in Figure 12.3-3.

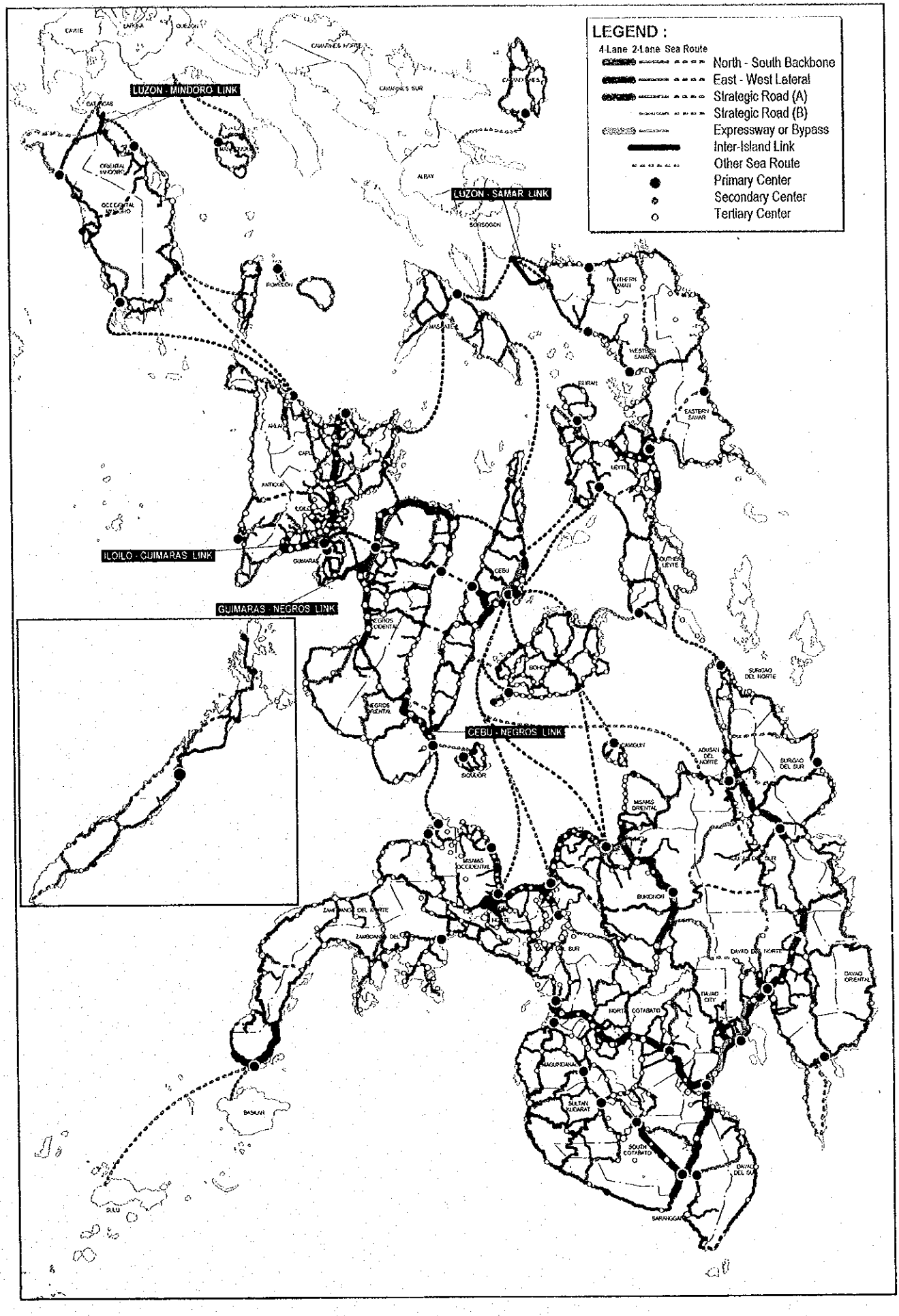


FIGURE 12.3 - 3 MASTER PLAN ROAD NETWORK

CHAPTER 13

PROJECT IDENTIFICATION

13.1 PROJECT IDENTIFICATION

13.1.1 Project Identification Criteria

Project identification criteria were established as shown in Table 13.1-1. Main concepts are as follows:

ROAD

- Existing pavement in bad/very bad condition shall be rehabilitated.
- Existing pavement in fair condition will be further deteriorated and require rehabilitation within a plan period, particularly AC pavements have a life of about 10 years (though depends largely on traffic loading condition and pavement thickness). However, lower priority for such road sections shall be given.
- All existing gravel/earth roads shall be improved to a 2-lane paved road.
- Impassable roads shall be improved to a 2-lane paved road.
- Missing links and new links shall be constructed with a 2-lane paved road standard.
- Road sections with traffic capacity problems shall be upgraded by one of the following measures depending on possibility of widening and distribution condition of urban sections:
  - Widening to a 4-lane road
  - Construction of a bypass
  - Construction of a parallel road
- Expressways and inter-island link bridges or tunnels shall be strategically planned.

BRIDGES

- All temporary bridges shall be converted to permanent bridges.
- All permanent bridges with major defects shall be reconstructed or rehabilitated.
- All permanent bridges with minor defects shall be rehabilitated or repaired.

NATURAL DISASTERS

- All identified natural disaster-prone locations shall be provided with countermeasures.

TABLE 13.1-1 PROJECT IDENTIFICATION CRITERIA

	Existing Defects	Required Type of Improvement	Present Condition		Type of Work	Abbreviation		Remarks
ROAD	• Pavement Condition Inferior	• Rehabilitation	PC	Bad/Very Bad	• Pavement rehabilitation/reconstruction	Reh. (1-1)	Reh. A	
			AC	Bad/Very Bad	• Pavement rehabilitation /reconstruction	Reh. (2-1)		
			PCC	Fair	• Pavement rehabilitation (overlay)	Reh. (1-2)	Reh. B	• Lower Priority
			AC	Fair	• Pavement rehabilitation (overlay)	Reh. (2-2)		• Lower Priority
	• Pavement Type Inferior	• Improvement	Gravel/ Earth	2-lane Gravel/Earth	• Construction of paved 2-lane road	Imp. (1)	Imp.	
				1-lane Gravel/Earth	• Construction of paved 2-lane road	Imp. (2)		
	• Impassable/Missing Link/New Link	• Improvement/ New Construction	Impassable		• Construction of paved 2-lane road	New-1	New	
			Missing Link/New Link		• Construction of paved 2-lane road	New-2		
	• Traffic Capacity Inferior	• Widening	• Roadside development allows widening		• Widening to a 4-lane road	W-4		
		• Bypass	• Widening is difficult in urban sections		• Construction of a 2-lane or 4-lane bypass	BY		• Stage construction
		• Parallel Road to the Existing Road	• Urban sections are located at short interval		• Construction of a 2-lane or 4-lane parallel road	BY		• Stage construction
	• Strategic measures required to drastically improve transport network.	• Expressway	• Major urban centers need to be connected by efficient road		• Construction of a 2-lane or 4-lane expressway	EX-4		• Stage construction
		• Inter-Island Link Bridge or Tunnel	• No connection is made by land transport between islands		• Construction of a 2-lane bridge or tunnel	SPE		
BRIDGE	• Still temporary structure	• Construction of permanent bridge	• Bailey, timber, spillway, ford crossing		• Construction of permanent bridge	Per. B		• To be included in a road project
	• Major defects in permanent bridge	• Reconstruction/ Rehabilitation	• Major defects in structural stability and river conditions		• Reconstruction	Rec. B		• To be included in a road project
	• Minor defects in permanent bridge	• Rehabilitation/Repair	• Minor defects in structure and river conditions		• Rehabilitation/repair	Reh. B		• To be included in a road project
NATURAL DISASTER	• Frequent traffic interruption/disturbance	• Countermeasures against road disaster	• Slope failures, land slides, debris flow, scouring and flooding		• Construction of countermeasures	RD		• To be included in a road project

13.1.2 On-going and Committed Projects

Information on foreign-assisted on-going and committed projects were collected which were the projects already identified by DPWH. Past, on-going and committed projects under IBRD, ADB (including Kuwait finance) and OECF are shown in Figure 13.1-1, 2 and 3, respectively.

13.1.3 Project Title and Segments

The titles of projects were based on those used in foreign-assisted projects, commonly used in DPWH and their location and road classifications. Those titles were numbered in the order of the hierarchy of functional road classification in each island (see Figure 13.1-4).

Following island codes were applied:

MA	:	Marinduque	NE	:	Negros
MR	:	Mindoro	BO	:	Bohol
PL	:	Palawan	CE	:	Cebu
RO	:	Romblon	SI	:	Siquijor
CA	:	Catanduanes	LE	:	Leyte
MS	:	Masbate	SA	:	Samar
PA	:	Panay	CM	:	Camiguin
GU	:	Guimaras	MI	:	Mindanao

Each project was further sub-divided into segments as shown in Figure 13.1-5.

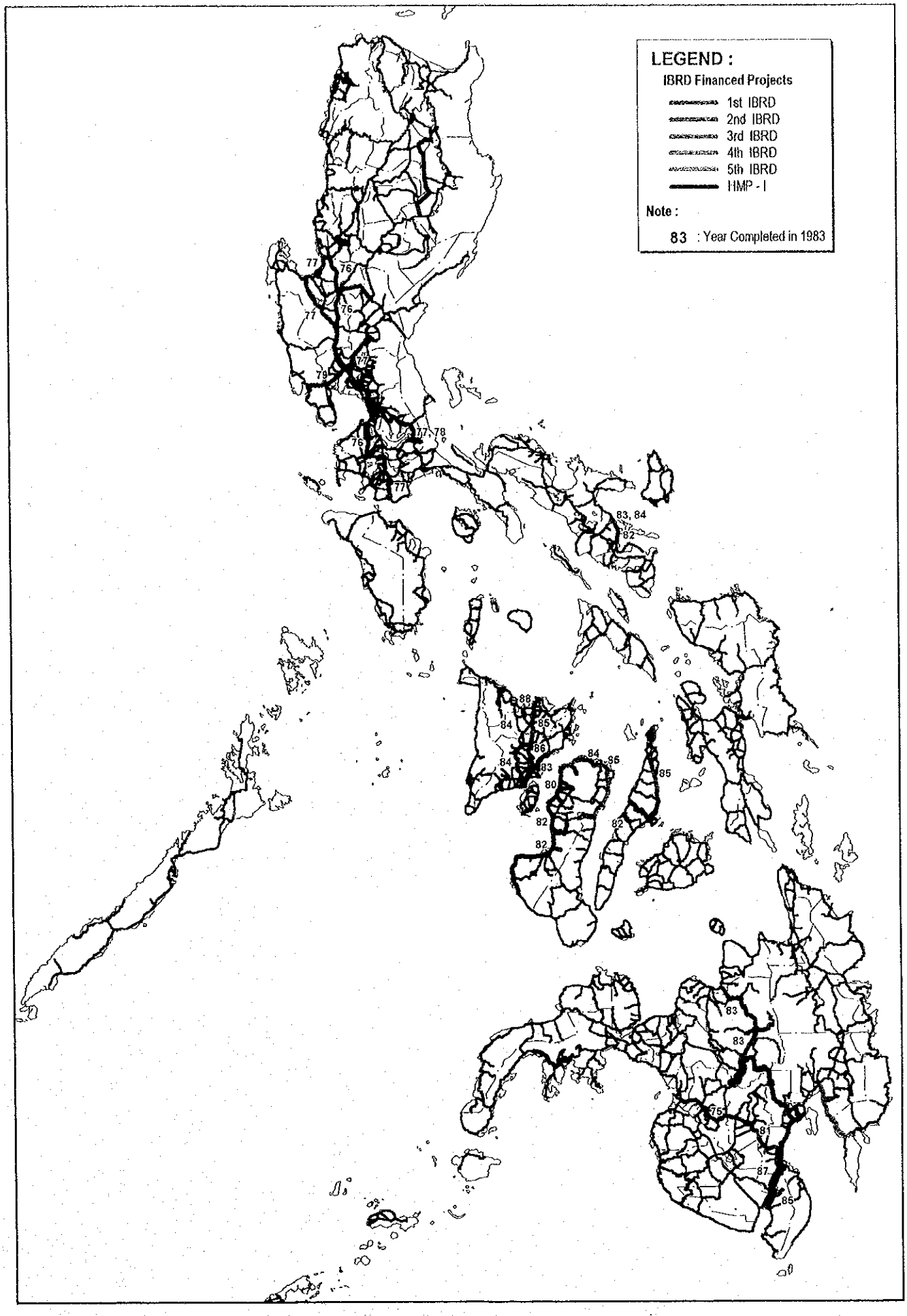


FIGURE 13.1 - 1 IBRD HIGHWAY PROJECTS

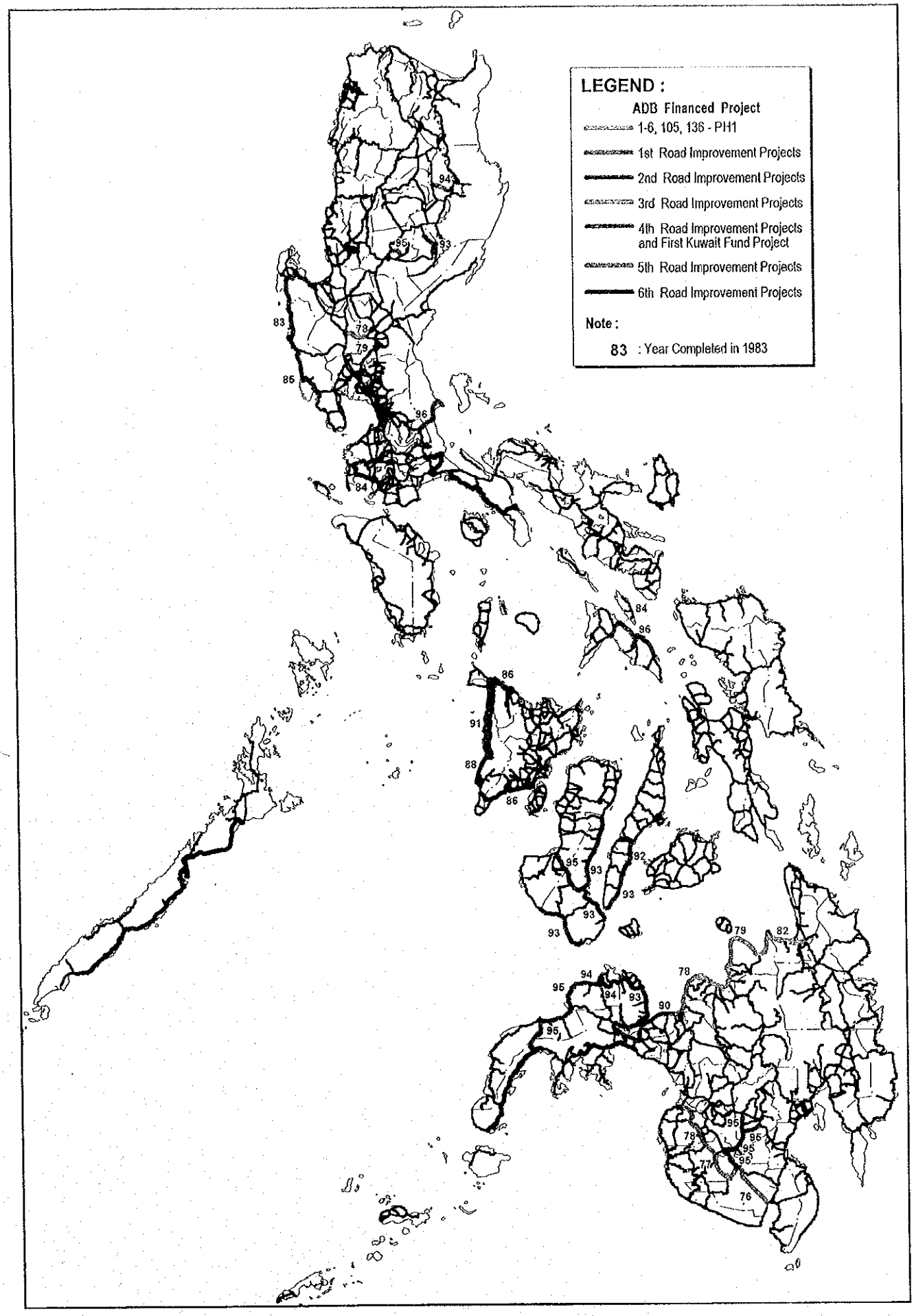


FIGURE 13.1 - 2 ADB HIGHWAY PROJECTS

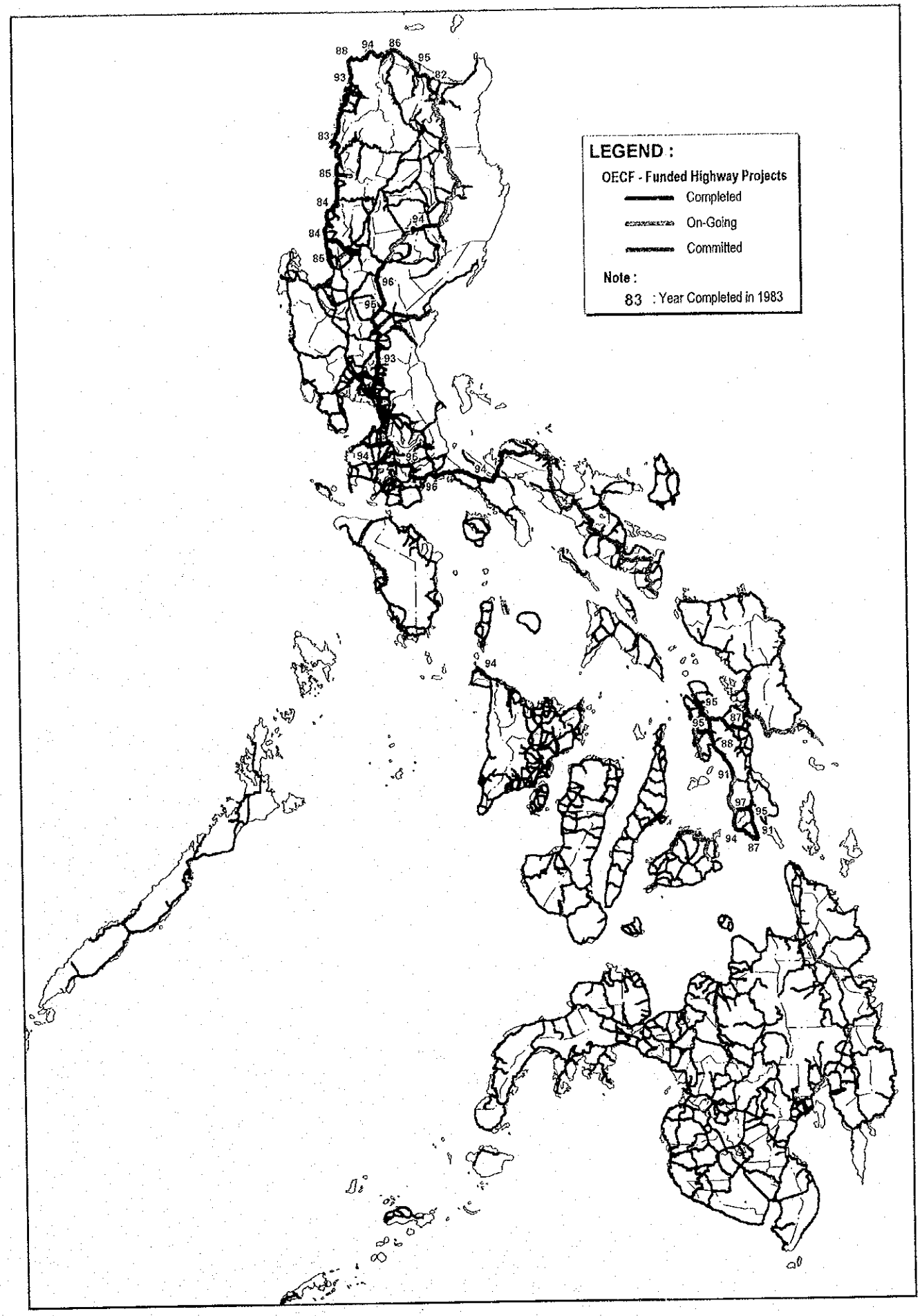


FIGURE 13.1 - 3 OECF HIGHWAY PROJECTS

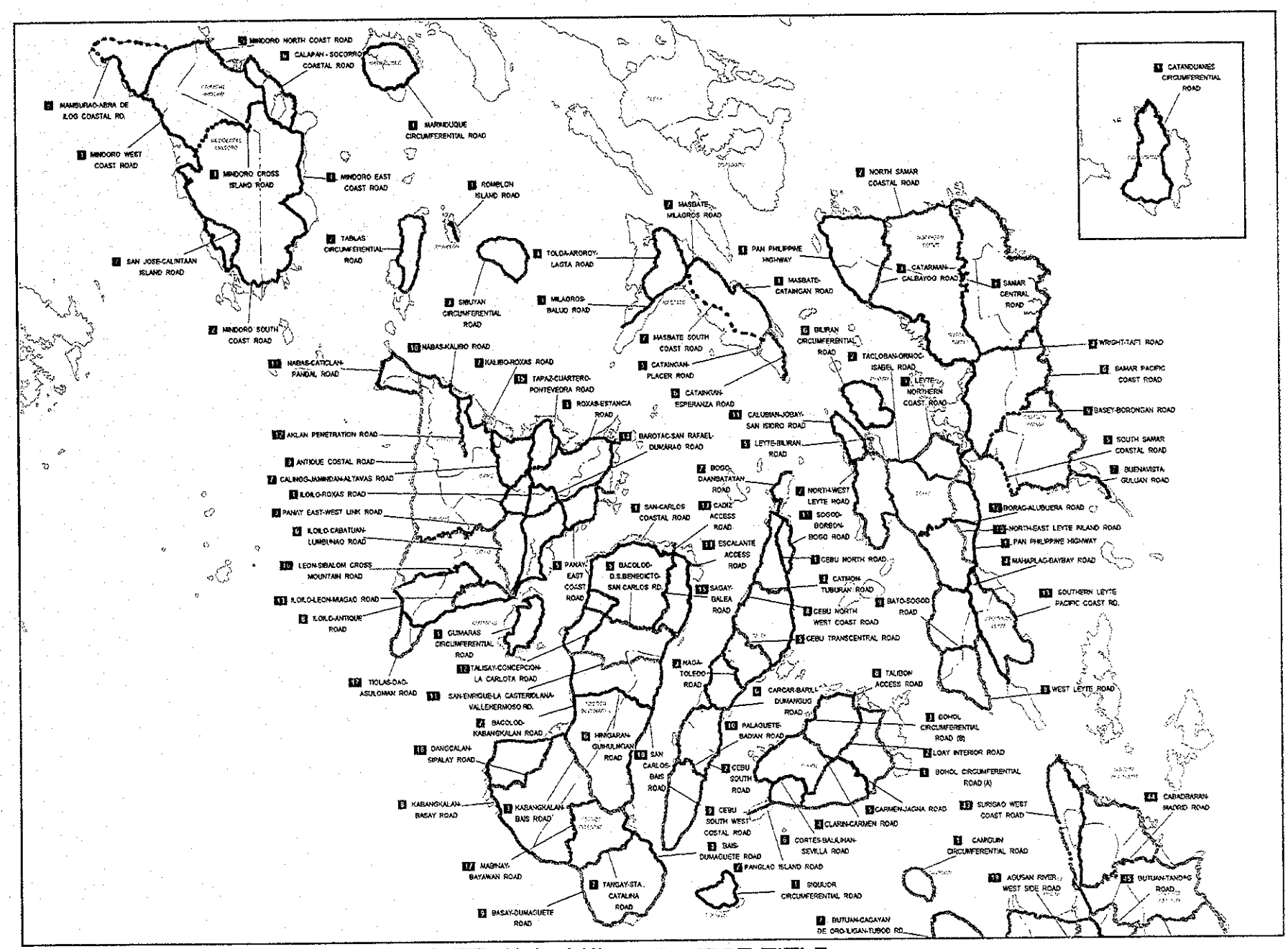


FIGURE 13.1 - 4 (1) PROJECT TITLE

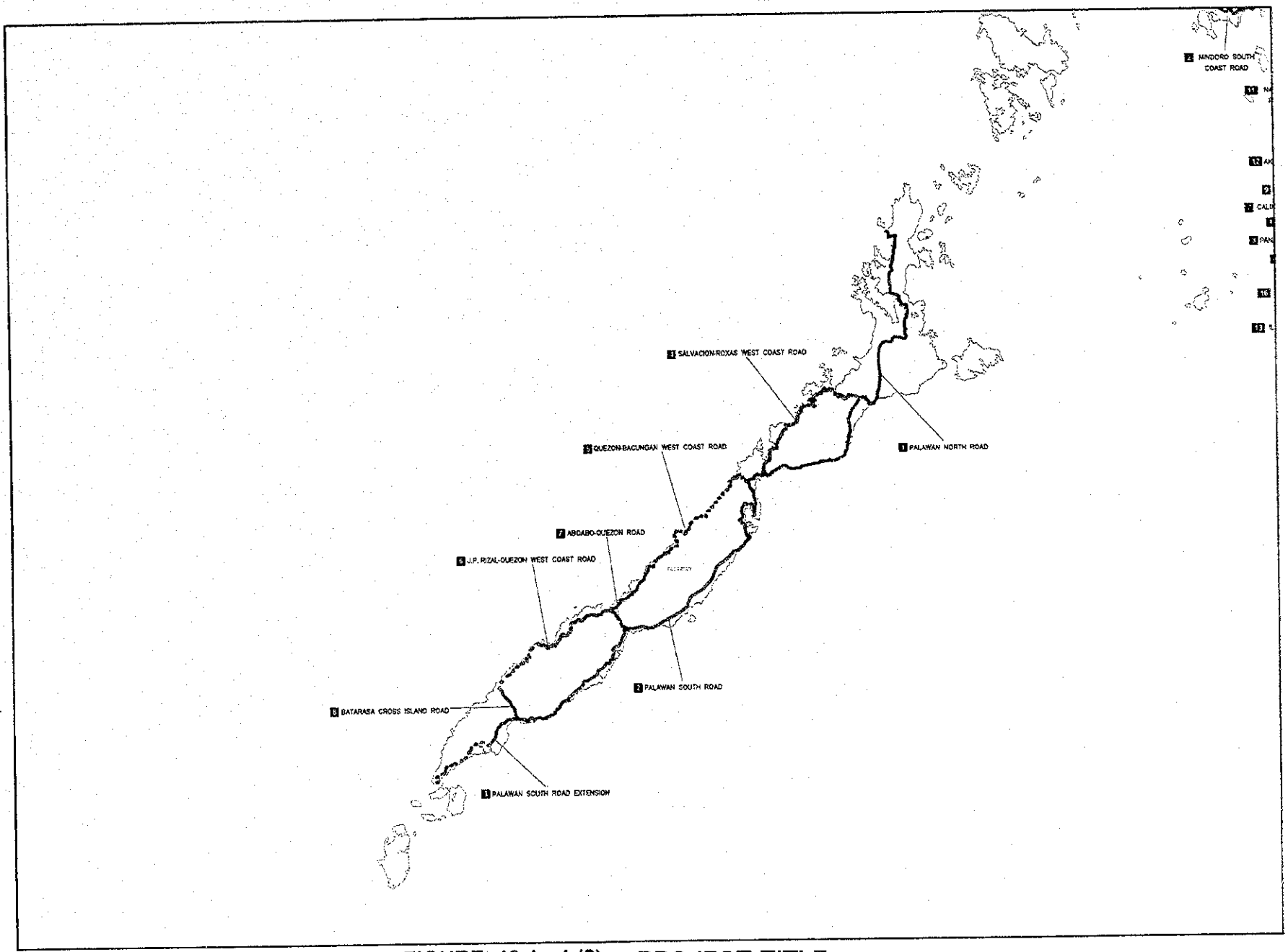


FIGURE 13.1 - 4 (2) PROJECT TITLE

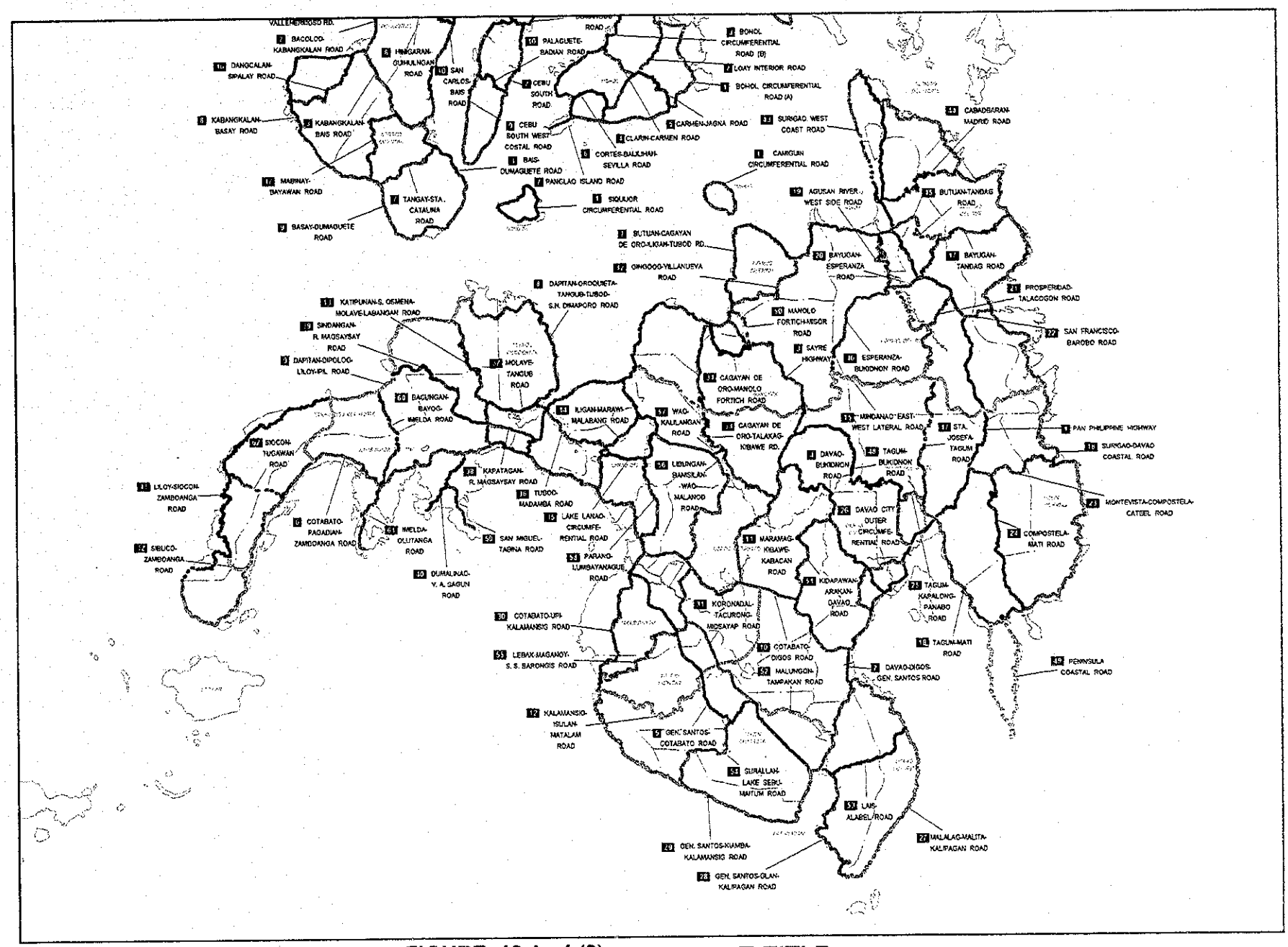


FIGURE 13.1 - 4 (3) PROJECT TITLE

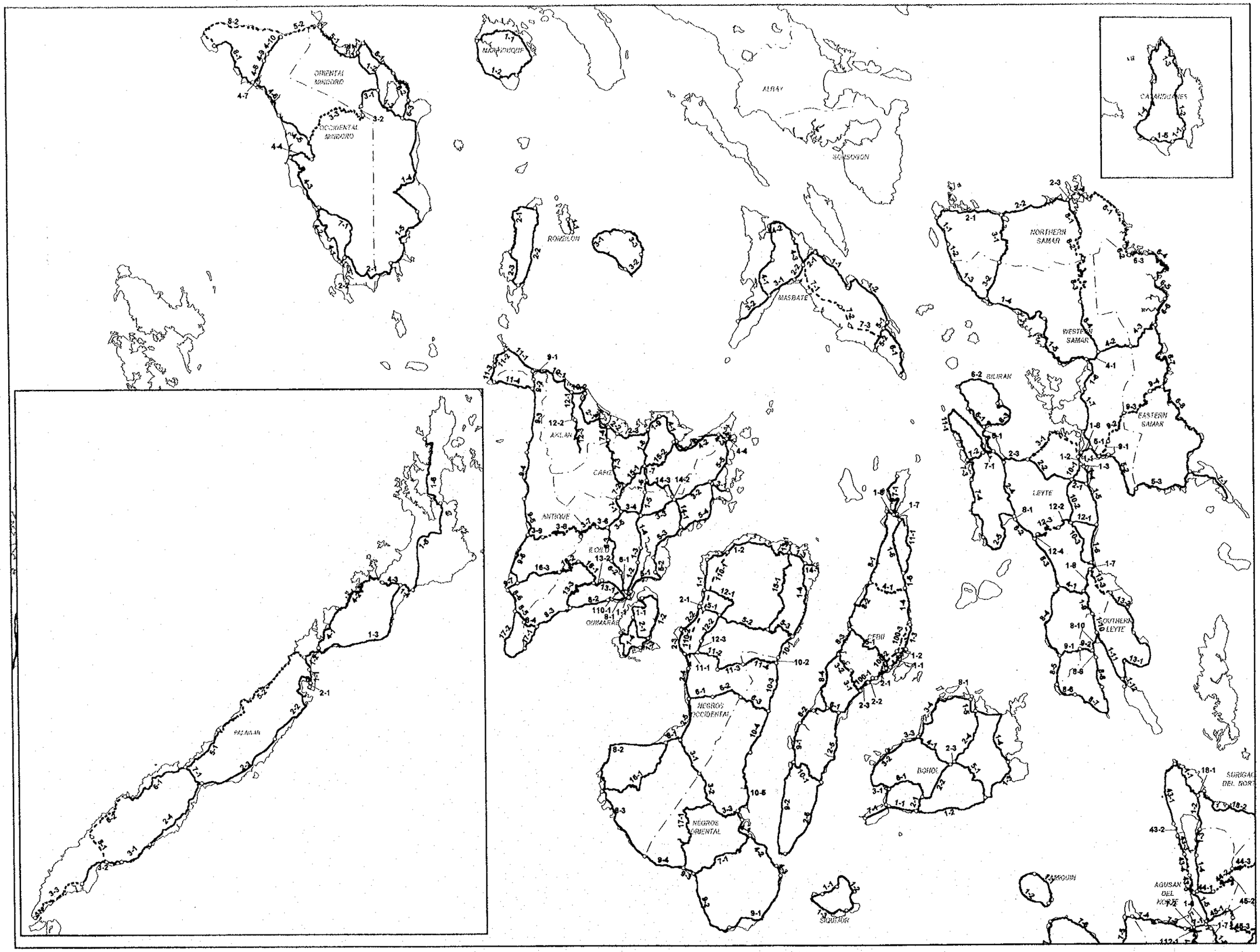


FIGURE 13.1 - 5 (1) SEGMENT NUMBER

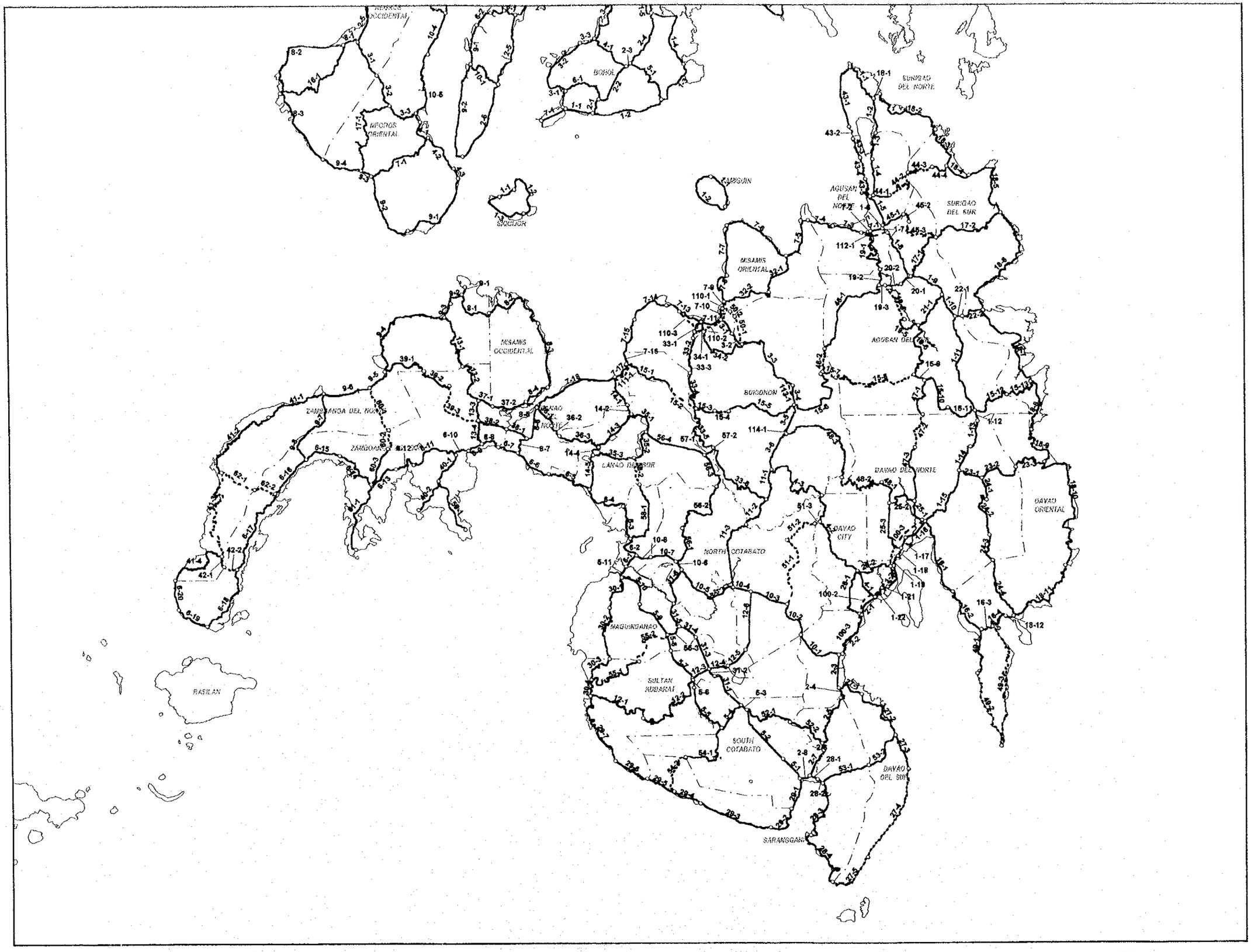


FIGURE 13.1 - 5 (2) SEGMENT NUMBER

13.2 IDENTIFIED ROAD PROJECTS

13.2.1 Group 1 Projects

Projects were classified into the following three groups:

- Group 1 : Rehabilitation / improvement / new construction of 2-lane road
- Group 2 : Capacity Expansion from a 2-lane road to a 4-lane road
- Group 3 : Special projects such as bypasses, expressways and inter-island links

Based on the project identification criteria, rehabilitation / improvement / new construction projects were identified by the established database.

Identified projects under above categories are summarized below and shown in Table 13.2-1. Required works for each road are shown in Table 13.2-2. On-going and committed projects are listed in Table 13.2-3. Identified projects by segment is attached in Appendix 13.2-1.

SUMMARY OF GROUP 1 PROJECTS

Rehabilitation				
Reh. (1-1) and Reh. (2-1)	:	Reh. A	1,117	km
Reh. (1-2) and Reh. (2-2)	:	Reh. B	2,452	km
			3,569	km
Improvement				
Imp. (1) and Imp. (2)	:	Imp.	6,135	km
New Construction				
New – 1 and New – 2	:	New	2,197	km
Bridges				
Temporary to Permanent Bridge			39,993	m
Reconstruction of Major Damaged Bridge			6,246	m
Rehabilitation / Repair of Minor Damaged Bridge			16,186	m
Road Disaster				
Protection Work Against Road Disaster			155	km
No Work (still in good condition)			3,302	km
On-going / Committed (Foreign-assisted)			1,696	km

TABLE 13.2-1 SUMMARY OF IDENTIFIED PROJECT: GROUP 1

Island Name	Number of Roads	Road Length (km)	Roads								Bridges			Road Disaster (km)	No Work (km)	Committed/ On-going (km)
			Rehabilitation			Improvement			New-1 and New-2 (km)	Grand Total (km)	Temporary (m)	Major Repair (m)	Minor Repair (m)			
			Reh. (A) (km)	Reh. (B) (km)	Subtotal (km)	Imp (1) (km)	Imp (2) (km)	Subtotal (km)								
Marinduque	1	119.39	27.13	33.56	60.69	12.33	17.62	29.95	0.00	90.63	65.60	31.60	91.60	0.83	28.76	0.00
Mindoro	8	815.45	67.73	96.57	164.30	150.52	171.43	321.95	199.68	685.93	5,100.20	318.20	1,255.95	12.48	22.37	107.14
Palawan	8	1,024.63	87.88	76.92	164.80	185.54	187.61	373.15	322.86	860.81	2,704.19	300.70	438.01	8.77	27.08	136.74
Romblon	3	237.74	46.35	16.96	63.30	29.91	141.69	171.60	0.00	234.90	1,076.27	436.55	584.70	10.77	2.84	0.00
Catanduanes	1	204.74	4.45	15.54	19.98	57.69	105.62	163.32	0.00	183.30	437.00	120.80	222.30	1.61	21.44	0.00
Masbate	7	359.45	4.13	24.57	28.70	55.66	115.98	171.64	75.48	275.82	1,105.42	30.00	133.15	3.32	83.64	0.00
Panay	17	1,404.06	156.28	409.59	565.86	192.99	246.92	439.91	128.83	1,134.61	3,439.86	2,406.45	1,646.10	6.25	152.45	117.00
Guimaras	2	126.56	27.99	4.39	32.38	29.06	51.92	80.98	0.00	113.36	183.80	0.00	0.00	1.15	13.20	0.00
Negros	17	1,259.39	50.90	157.21	208.11	266.26	121.23	387.49	0.00	595.59	1,001.44	279.90	671.20	1.87	555.59	108.21
Bohol	8	462.68	94.44	58.62	153.06	81.63	35.20	116.83	0.00	269.89	125.85	11.85	23.80	0.64	77.84	114.96
Cebu	11	711.06	82.72	39.53	122.26	96.45	78.70	175.15	30.21	327.61	780.12	0.00	25.40	4.96	270.80	112.65
Siquijor	1	75.13	3.25	47.87	51.12	0.29	0.00	0.29	0.00	51.41	0.00	0.00	0.00	0.00	23.72	0.00
Leyte	13	1,151.18	18.85	215.11	233.96	106.89	241.62	348.51	75.65	658.12	3,047.61	22.15	2,955.75	11.70	374.24	118.82
Samar	9	1,116.57	117.15	344.00	461.15	72.63	112.26	184.89	238.87	884.91	2,518.74	1,121.95	1,677.55	7.80	71.29	160.37
Camiguin	1	64.00	22.87	1.24	24.11	9.75	4.21	13.96	0.00	38.07	0.00	0.00	36.00	0.51	25.94	0.00
Mindanao	62	7,767.38	305.54	910.04	1,215.57	1,977.24	1,178.45	3,155.69	1,125.07	5,496.33	18,406.42	1,165.95	6,424.31	81.99	1,550.46	719.69
Total	169	16,899.43	1,117.64	2,451.71	3,569.35	3,324.84	2,810.46	6,135.30	2,196.64	11,901.29	39,992.52	6,246.10	16,185.82	154.63	3,301.66	1,695.58

TABLE 13.2-2 PROJECT LIST: GROUP 1

PROJECT LIST: REHABILITATION / IMPROVEMENT / NEW CONSTRUCTION (1/3)

Road No.	PROJECT TITLE	Segment Length (km)	Reh. A	Reh. B	Imp	New	Total (km)	Bridges Per. B (m)	Bridges Rec. B (m)	Bridges Reh. B (m)	Road Disaster (m)
MA 1	Marinduque Circumferential Road	119.39	27.13	33.56	29.95	0.00	90.63	65.60	31.60	91.60	830.00
MR 1	Mindoro East Coast Road	183.66	59.59	47.44	61.27	0.00	168.69	586.60	110.60	295.35	5112.00
MR 2	Mindoro South Coast Road	46.87	2.45	4.53	34.22	5.66	46.87	23.00	15.10	105.00	185.00
MR 3	Mindoro Cross Island Road	83.54	0.19	2.93	14.54	65.89	83.54	1029.90	0.00	47.30	0.00
MR 4	Mindoro West Coast Road	202.49	0.00	12.27	80.66	0.00	92.94	1283.00	0.00	332.10	430.00
MR 5	Mindoro North Coast Road	69.44	2.17	20.34	33.75	12.00	68.26	192.50	34.00	24.00	614.00
MR 6	Calapan - Socorro Coastal Road	76.19	2.93	5.62	25.11	38.95	72.61	695.00	158.30	371.40	3809.00
MR 7	San Jose - Calintaan Inland Road	43.57	0.00	0.00	33.46	10.10	43.57	233.70	0.00	0.00	1280.00
MR 8	Mamburao - Abra de Ilog Coastal Road	109.69	0.00	3.45	38.94	67.07	109.46	1050.50	0.00	80.80	1050.00
	Sub-total	815.45	67.73	96.57	321.95	199.68	685.93	5100.20	318.20	1255.95	12480.00
PL 1	Palawan North Road	270.23	0.00	0.00	132.61	0.00	132.61	830.00	0.00	0.00	200.00
PL 2	Palawan South Road	189.42	87.88	76.33	0.44	0.00	164.65	0.00	300.70	362.31	900.00
PL 3	Palawan South Road Extension	121.57	0.00	0.59	66.75	54.23	121.57	334.83	0.00	15.70	5015.00
PL 4	Salvacion - Roxas West Coast Road	149.33	0.00	0.00	58.49	90.84	149.33	372.98	0.00	0.00	540.00
PL 5	Quezon - Bacungan West Coast Road	153.63	0.00	0.00	35.98	117.65	153.63	534.46	0.00	60.00	0.00
PL 6	J.P. Rizal - Quezon West Coast Road	102.41	0.00	0.00	58.54	42.45	100.99	631.92	0.00	0.00	2117.50
PL 7	Aboabo - Quezon Road	18.38	0.00	0.00	18.38	0.00	18.38	0.00	0.00	0.00	0.00
PL 8	Batarasa Cross Island Road	19.66	0.00	0.00	1.97	17.69	19.66	0.00	0.00	0.00	0.00
	Sub-total	1024.63	87.88	76.92	373.15	322.86	860.81	2704.19	300.70	438.01	8772.50
RO 1	Romblon Island Road	19.39	1.21	1.01	17.17	0.00	19.39	79.60	10.50	53.80	435.00
RO 2	Tablas Circumferential Road	125.10	42.63	10.09	69.53	0.00	122.26	190.20	226.55	237.60	6020.00
RO 3	Sibuyan Circumferential Road	93.25	2.50	5.86	84.90	0.00	93.25	806.47	199.50	293.30	4312.50
	Sub-total	237.74	46.35	16.96	171.60	0.00	234.90	1076.27	436.55	584.70	10767.50
CA 1	Catanduanes Circumferential Road	204.74	4.45	15.54	163.32	0.00	183.30	437.00	120.80	222.30	1609.00
MS 1	Masbate - Cataingan Road	74.76	1.79	5.10	0.00	0.00	6.89	0.00	0.00	42.30	0.00
MS 2	Masbate - Milagros Road	23.51	0.00	12.32	0.00	0.00	12.32	0.00	0.00	14.90	30.00
MS 3	Milagros - Balud Road	46.00	0.00	3.75	39.89	0.00	43.65	87.30	0.00	30.10	40.00
MS 4	Tolda - Aroroy - Lagta Road	92.29	0.96	2.31	81.18	6.32	90.78	403.20	30.00	15.10	1730.00
MS 5	Cataingan - Placer Road	20.20	0.57	0.28	18.64	0.00	19.49	12.00	0.00	30.75	965.00
MS 6	Cataingan - Esperanza Road	36.31	0.80	0.80	31.92	2.78	36.31	18.00	0.00	0.00	557.00
MS 7	Masbate South Coast Road	66.38	0.00	0.00	0.00	66.38	66.38	584.92	0.00	0.00	0.00
	Sub-total	359.45	4.13	24.57	171.64	75.48	275.82	1105.42	30.00	133.15	3322.00
PA 1	Iloilo - Roxas Road	112.10	50.94	50.24	0.65	0.00	101.84	0.00	459.40	27.00	70.00
PA 2	Kalibo - Roxas Road	69.09	2.33	18.38	32.70	0.00	53.41	0.00	24.00	47.00	0.00
PA 3	Panay East-West Link Road	196.06	7.84	14.55	75.99	85.97	184.35	939.92	155.70	16.00	1830.00
PA 4	Roxas - Estancia Road	65.26	0.42	33.26	0.00	0.00	33.68	0.00	203.80	0.00	100.00
PA 5	Panay East Coast Road	132.81	21.32	78.79	9.84	0.00	109.95	0.00	97.00	398.20	0.00
PA 6	Iloilo - Cabatuan - Lumbunao Road	44.97	10.31	26.59	0.65	0.00	37.55	0.00	168.00	104.70	0.00
PA 7	Calinog - Jamindan - Altavas Road	65.68	0.42	19.78	43.90	0.00	64.10	0.00	55.90	162.00	560.00
PA 8	Iloilo - Antique Road	97.45	27.43	66.90	0.00	0.00	94.33	0.00	413.65	546.70	625.00
PA 9	Antique Coastal Road	138.64	6.62	28.64	0.00	0.00	35.27	513.00	0.00	0.00	800.00
PA 10	Nabas - Kalibo Road	44.46	19.50	24.58	0.00	0.00	44.08	22.00	474.00	0.00	0.00
PA 11	Nabas - Caticlan - Pandal Road	77.44	1.31	22.11	49.50	0.00	72.91	96.00	54.00	120.00	150.00
PA 12	Aklan Penetration Road	45.12	0.00	0.00	39.09	3.14	42.23	800.00	0.00	36.00	50.00
PA 13	Iloilo - Leon - Miagao Road	66.80	5.18	17.35	37.32	0.00	59.85	204.00	77.00	41.50	50.00
PA 14	Barotac - San Rafael - Dumarao Road	44.74	0.00	0.42	24.44	0.00	24.86	58.40	22.20	0.00	150.00
PA 15	Tapaz - Cuartero - Pontevedra Road	52.30	0.19	5.69	33.40	0.00	39.28	90.50	0.00	0.00	660.00
PA 16	Leon - Sibalom Cross Mountain Road	94.49	2.29	0.79	46.56	39.72	89.36	225.04	0.00	105.00	1000.00
PA 17	Tiolas - Dao - Asuloman Road	56.63	0.19	1.49	45.86	0.00	47.54	491.00	201.80	42.00	200.00
	Sub-total	1404.06	156.28	409.59	439.91	128.83	1134.61	3439.86	2406.45	1646.10	6245.00
GU 1	Guimaras Circumferential Road	110.98	27.99	4.39	65.40	0.00	97.78	183.80	0.00	0.00	1150.00
GU 2	Guimaras Cross Island Road	15.58	0.00	0.00	15.58	0.00	15.58	0.00	0.00	0.00	0.00
	Sub-total	126.56	27.99	4.39	80.98	0.00	113.36	183.80	0.00	0.00	1150.00
NE 1	Bacolod - San Carlos Coastal Road	144.94	0.00	31.98	0.00	0.00	31.98	0.00	0.00	222.00	390.00
NE 2	Bacolod - Kabankalan Road	87.02	0.30	6.44	0.00	0.00	6.73	0.00	0.00	0.00	0.00
NE 3	Kabankalan - Bais Road	81.68	3.47	2.57	0.00	0.00	6.04	0.00	0.00	0.00	0.00
NE 4	Bais - Dumaguete Road	44.95	4.90	8.22	0.00	0.00	13.12	0.00	0.00	0.00	0.00
NE 5	Bacolod - D.S. Benedicto - San Carlos Road	80.59	0.30	3.07	44.70	0.00	48.06	55.00	6.00	69.60	140.00
NE 6	Hinigaran - Guihulngan Road	60.49	2.23	5.45	50.14	0.00	57.82	140.00	0.00	0.00	680.00
NE 7	Tanjay - Sta. Catalina Road	50.74	0.00	0.00	40.69	0.00	40.69	45.00	0.00	0.00	0.00
NE 8	Kabankalan - Basay Road	125.78	1.88	0.79	44.25	0.00	46.93	72.00	0.00	0.00	0.00
NE 9	Basay - Dumaguete Road	129.69	6.14	34.75	6.83	0.00	47.72	132.44	0.00	36.00	200.00
NE 10	San Carlos - Bais Road	115.14	2.57	30.44	0.74	0.00	33.76	0.00	0.00	300.00	100.00
NE 11	San Enrique - La Casterillana - Vallehermoso Road	74.80	5.95	12.47	18.56	0.00	36.99	45.00	178.40	0.00	0.00
NE 12	Tatisay - Concepcion - La Carlota Road	61.28	2.77	15.15	22.32	0.00	40.24	12.00	95.50	43.60	0.00
NE 13	Cadiz Access Road	5.94	0.00	2.57	0.00	0.00	2.57	0.00	0.00	0.00	0.00
NE 14	Escalante Access Road	5.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE 15	Sagay - Balea Road	60.98	20.10	1.09	36.73	0.00	57.92	179.00	0.00	0.00	100.00
NE 16	Dancalan - Sipalay Road	67.86	0.30	2.23	63.61	0.00	66.13	172.00	0.00	0.00	260.00
NE 17	Mabinay - Bayawan Road	61.58	0.00	0.00	58.91	0.00	58.91	149.00	0.00	0.00	0.00
	Sub-total	1259.39	50.90	157.21	387.49	0.00	595.59	1001.44	279.90	671.20	1870.00
BO 1	Bohol Circumferential Road (A)	148.48	47.22	32.58	0.56	0.00	80.36	0.00	11.85	0.00	0.00
BO 2	Loay Interior Road	77.75	22.49	4.68	28.61	0.00	55.77	9.20	0.00	0.00	641.00
BO 3	Bohol Circumferential Road (B)	112.34	16.69	11.31	3.93	0.00	31.93	0.00	0.00	23.80	0.00

PROJECT LIST: REHABILITATION / IMPROVEMENT / NEW CONSTRUCTION (2/3)

Road No.	PROJECT TITLE	Segment Length (km)	Reh. A	Reh. B	Imp	New	Total (km)	Bridges Per. B (m)	Bridges Rec. B (m)	Bridges Reh. B (m)	Road Disaster (m)
BO 4	Clarin - Carmen Road	28.28	0.75	0.37	25.99	0.00	27.12	0.00	0.00	0.00	0.00
BO 5	Carmen - Jagna Road	45.58	1.87	0.70	40.11	0.00	42.68	55.35	0.00	0.00	0.00
BO 6	Cortes - Balilihan - Sevilla Road	32.77	3.79	2.06	17.62	0.00	23.47	61.30	0.00	0.00	0.00
BO 7	Panglao Island Road	15.61	1.31	5.84	0.00	0.00	7.15	0.00	0.00	0.00	0.00
BO 8	Talibon Access Road	1.87	0.33	1.08	0.00	0.00	1.40	0.00	0.00	0.00	0.00
	Sub-total	462.68	94.44	58.62	116.83	0.00	269.89	125.85	11.85	23.80	641.00
CE 1	Cebu North Road	104.60	26.10	6.65	0.00	0.00	32.75	0.00	0.00	0.00	825.00
CE 2	Cebu South Road	134.66	4.10	11.45	0.00	0.00	15.55	0.00	0.00	0.00	325.00
CE 3	Naga - Toledo Road	32.54	3.71	7.84	0.00	0.00	11.55	0.00	0.00	0.00	0.00
CE 4	Catmon - Tuburan Road	32.43	0.10	0.00	3.20	29.13	32.43	125.00	0.00	0.00	650.00
CE 5	Cebu Transcentral Road	49.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CE 6	Carcar - Barili - Dumanjug Road	33.65	0.19	0.94	0.00	0.00	1.13	0.00	0.00	0.00	50.00
CE 7	Bogo - Daan Bantayan Road	33.45	27.05	4.25	0.00	0.00	31.30	7.15	0.00	0.00	0.00
CE 8	Cebu North West Coastal Road	134.46	2.30	4.37	76.48	0.00	83.15	384.85	0.00	25.40	1306.00
CE 9	Cebu South West Coastal Road	83.27	17.57	4.04	50.01	0.00	71.62	247.10	0.00	0.00	650.00
CE 10	Dalaguete - Badian Road	31.47	0.66	0.00	28.46	1.08	30.20	9.27	0.00	0.00	1050.00
CE 11	Sogod - Borbon - Bogo Road	41.55	0.95	0.00	17.00	0.00	17.95	6.75	0.00	0.00	100.00
	Sub-total	711.06	82.72	39.53	175.15	30.21	327.61	780.12	0.00	25.40	4956.00
SI 1	Siquijor Circumferential Road	75.13	3.25	47.87	0.29	0.00	51.41	0.00	0.00	0.00	0.00
LE 1	Pan Philippine Highway (Visayas)	159.38	10.07	83.18	0.25	0.00	93.49	0.00	0.00	1727.20	660.00
LE 2	Tacloban - Ormoc - Isabel Road	139.74	4.76	78.85	0.00	0.00	83.62	180.00	22.15	562.85	0.00
LE 3	Leyte Northern Coast Road	49.95	0.64	0.93	18.07	12.88	32.52	45.00	0.00	0.00	1465.00
LE 4	Mahaplag - Baybay Road	23.08	1.77	21.21	0.00	0.00	22.98	0.00	0.00	88.15	330.00
LE 5	Leyte - Biliran Road	31.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LE 6	Biliran Circumferential Road	110.67	0.29	4.81	83.08	0.00	88.18	429.50	0.00	22.75	1800.00
LE 7	North-West Leyte Road	82.24	0.00	0.49	38.20	0.00	38.69	140.20	0.00	13.65	1640.00
LE 8	West Leyte Road	203.57	0.00	7.91	0.00	0.00	7.91	0.00	0.00	208.40	0.00
LE 9	Bato - Sogod Road	24.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LE 10	North-East Leyte Inland Road	70.07	0.34	8.49	47.28	0.00	56.12	209.85	0.00	0.00	1000.00
LE 11	Calubian - Jubay - San Isidro Road	72.72	0.00	3.98	54.70	12.96	71.64	521.50	0.00	36.80	700.00
LE 12	Durag - Alubuera Road	66.80	0.39	3.00	23.08	35.07	61.53	372.50	0.00	0.00	380.00
LE 13	Southern Leyte Pacific Coast Road	115.19	0.59	2.26	83.86	14.73	101.44	1149.06	0.00	295.95	3722.50
	Sub-total	1151.18	18.85	215.11	348.51	75.65	658.12	3047.61	22.15	2955.75	11697.50
SA 1	Pan Philippine Highway (Visayas)	232.78	113.86	66.68	0.15	0.00	180.69	0.00	883.95	1005.55	1615.00
SA 2	North Samar Coastal Road	103.88	0.00	58.20	1.68	10.32	70.19	220.00	226.00	130.80	700.00
SA 3	Catarman - Calbayog Road	68.30	0.00	20.07	45.77	0.00	65.84	0.00	0.00	0.00	1705.00
SA 4	Wright - Taft Road	62.21	0.00	41.88	0.00	0.00	41.88	0.00	0.00	258.90	1605.00
SA 5	South Samar Coastal Road	96.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SA 6	Samar Pacific Coast Road	282.49	1.18	122.01	67.87	67.86	258.92	1264.49	12.00	237.30	920.00
SA 7	Buenavista - Guiuan Road	33.44	0.00	33.44	0.00	0.00	33.44	0.00	0.00	0.00	0.00
SA 8	Samar Central Road	147.26	2.11	0.00	55.09	87.21	144.41	447.96	0.00	45.00	400.00
SA 9	Basey - Borongan Road	89.53	0.00	1.72	14.34	73.48	89.53	586.29	0.00	0.00	850.00
	Sub-total	1116.57	117.15	344.00	184.89	238.87	884.91	2518.74	1121.95	1677.55	7795.00
CM 1	Camiguin Circumferential Road	64.00	22.87	1.24	13.96	0.00	38.07	0.00	0.00	36.00	505.00
MI 1	Pan Philippine Highway (Mindanao)	409.05	105.26	109.63	0.00	0.00	214.88	0.00	12.00	1900.05	2500.00
MI 2	Davao - Digos - Gen. Santos Road	139.68	2.46	0.31	0.00	0.00	2.77	0.00	0.00	0.00	0.00
MI 3	Sayre Highway	134.84	3.79	107.78	9.99	0.56	122.13	0.00	0.00	119.10	80.00
MI 4	Davao - Bukidnon Road	139.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MI 5	Gen. Santos - Cotabato Road	199.06	24.15	62.38	0.00	0.00	86.53	0.00	211.70	53.20	100.00
MI 6	Cotabato - Pagadian - Zamboanga Road	489.82	21.11	86.51	45.16	0.00	152.78	273.10	162.40	302.52	420.00
MI 7	Butuan - Cagayan de Oro - Iligan - Tubod Road	354.13	4.63	68.48	1.50	0.00	74.61	0.00	0.00	890.72	0.00
MI 8	apitan - Oroquieta - Tangub - Tubod - S.N. Dimaporo Roa	185.38	0.00	18.05	6.50	4.23	28.78	1950.00	0.00	0.00	0.00
MI 9	Dapitan - Dipolog - Liloy - Ipil Road	196.24	5.59	32.63	0.00	0.00	38.22	0.00	12.00	105.20	300.00
MI 10	Cotabato - Digos Road	161.67	45.11	46.99	0.30	0.00	92.40	0.00	62.75	146.75	2048.50
MI 11	Maramag - Kibawe - Kabacan Road	93.69	0.00	1.55	29.06	0.00	30.61	0.00	0.00	89.01	800.00
MI 12	Kalamansig - Isulan - Matalam Road	197.73	3.80	62.78	126.48	0.00	193.05	36.00	36.00	278.50	7236.57
MI 13	Katipunan - S. Osmena - Molave - Labangan Road	113.60	9.45	8.54	76.00	0.00	93.98	112.00	21.00	45.62	20.00
MI 14	Iligan - Marawi - Malabang Road	95.05	0.00	68.70	0.00	0.00	68.70	0.00	0.00	0.00	0.00
MI 15	Mindanao East-West Lateral Road	407.61	2.50	11.63	243.76	145.01	402.90	711.75	49.90	42.30	2325.00
MI 16	Tagum - Mati Road	111.14	16.60	19.44	0.00	0.00	36.04	0.00	0.00	0.00	1282.50
MI 17	Bayugan - Tandag Road	95.88	0.00	0.10	78.09	15.38	93.57	248.80	104.70	79.30	220.00
MI 18	Surigao - Davao Coastal Road	572.06	6.64	5.56	473.53	1.28	487.01	2833.95	427.90	1557.69	26359.05
MI 19	Agusan River West Side Road	142.29	0.21	0.00	91.46	47.96	139.63	650.30	0.00	0.00	7670.00
MI 20	Bayugan - Esperanza Road	17.56	0.00	3.28	12.74	0.00	16.02	80.00	0.00	0.00	0.00
MI 21	Prosperidad - Talacogon Road	28.19	0.00	25.01	0.00	0.00	25.01	0.00	0.00	0.00	130.00
MI 22	San Francisco - Barobo Road	20.09	0.31	11.58	4.31	0.00	16.20	0.00	0.00	25.00	80.00
MI 23	Montevista - Compostela - Cateel Road	72.61	0.00	0.00	57.75	0.00	57.75	97.30	0.00	0.00	874.00
MI 24	Compostela - Mati Road	107.32	0.00	0.00	91.79	0.00	91.79	180.00	0.00	0.00	1900.00
MI 25	Tagum - Kapalong - Panabo Road	69.52	0.00	16.78	20.47	0.00	37.25	0.00	0.00	0.00	0.00
MI 26	Davao City Outer Circumferential Road	61.24	5.39	3.58	41.08	9.18	59.22	254.20	0.00	0.00	0.00
MI 27	Malalag - Malita - Kalipagan Road	184.82	0.00	11.69	72.16	99.74	183.59	1013.96	0.00	0.00	850.00
MI 28	Gen. Santos - Glan - Kalipagan Road	105.47	0.00	35.41	38.44	14.86	88.71	340.35	0.00	0.00	1300.00
MI 29	Gen. Santos - Kiamba - Kalamansig Road	221.71	0.00	0.00	108.22	7.00	115.22	835.00	0.00	0.00	0.00
MI 30	Cotabato - Upi - Kalamansig Road	108.76	1.42	13.54	93.79	0.00	108.76	324.15	0.00	0.00	1650.00
MI 31	Koronadal - Tacurong - Midsayap Road	100.75	0.00	23.05	53.51	0.00	76.56	132.00	65.60	55.52	5486.00
MI 32	Gingoog - Villanueva Road	71.90	10.56	4.92	51.30	0.00	66.78	300.45	0.00	186.40	1117.50
MI 33	Cagayan de Oro - Talakag - Kibawe Road	165.79	1.08	6.05	126.02	0.00	133.15	79.30	0.00	51.05	100.00
MI 34	Cagayan de Oro - Manolo Fortich Road	54.74	7.89	9.48	31.78	0.00	49.15	57.95	0.00	0.00	233.33

PROJECT LIST: REHABILITATION / IMPROVEMENT / NEW CONSTRUCTION (3/3)

Road No.	PROJECT TITLE	Segment Length (km)	Reh. A	Reh. B	Imp	New	Total (km)	Bridges Per. B (m)	Bridges Rec. B (m)	Bridges Reh. B (m)	Road Disaster (m)
MI 35	Lake Lanao Circumferential Road	70.80	0.00	22.95	28.25	0.00	51.20	226.00	0.00	0.00	0.00
MI 36	Tubod - Madamba Road	56.70	0.00	0.00	49.40	0.00	49.40	44.00	0.00	0.00	0.00
MI 37	Molave - Tangub Road	32.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MI 38	Kapatagan - R. Magsaysay Road	32.19	9.44	0.00	10.30	0.00	19.74	0.00	0.00	0.00	0.00
MI 39	Sindangan - R. Magsaysay Road	96.43	1.96	0.00	76.08	17.00	95.04	236.00	0.00	0.00	200.00
MI 40	Dumalinao - V.A. Sagun Road	45.43	9.80	9.10	16.33	0.00	35.23	0.00	0.00	218.02	0.00
MI 41	Liloy - Siocon - Zamboanga Road	245.15	0.00	0.00	155.13	83.16	238.29	482.60	0.00	15.70	200.00
MI 42	Sibuco - Zamboanga Road	19.05	0.00	0.10	10.91	8.04	19.05	100.00	0.00	0.00	100.00
MI 43	Surigao West Coast Road	90.90	0.00	0.00	52.07	27.02	79.09	1016.00	0.00	154.50	1420.00
MI 44	Cabadbaran - Madrid Road	99.36	0.00	0.00	9.81	89.56	99.36	447.96	0.00	0.00	0.00
MI 45	Butuan - Tandag Road	59.34	0.00	0.00	15.90	42.02	57.92	332.00	0.00	0.00	335.00
MI 46	Esperanza - Bukidnon Road	80.15	0.00	0.00	61.92	18.23	80.15	270.00	0.00	0.00	0.00
MI 47	Sta. Josefa - Tagum Road	85.85	0.00	0.00	62.83	23.02	85.85	59.00	0.00	0.00	0.00
MI 48	Tagum - Bukidnon Road	145.60	0.00	0.00	74.13	71.01	145.14	218.00	0.00	0.00	0.00
MI 49	Peninsula Coastal Road	181.25	0.21	0.00	25.73	150.91	176.84	904.00	0.00	0.00	3240.00
MI 50	Manolo Fortich - Misor Road	21.80	0.00	0.00	0.00	21.80	21.80	500.00	0.00	0.00	0.00
MI 51	Kidapawan - Arakan - Davao Road	75.40	3.20	1.16	11.61	59.43	75.40	235.00	0.00	0.00	3150.00
MI 52	Malungon - Tampakan Road	66.32	0.00	0.00	64.37	0.00	64.37	270.00	0.00	0.00	2016.67
MI 53	Lais - Alabel Road	61.14	0.00	0.00	51.05	7.89	58.94	463.00	0.00	0.00	470.00
MI 54	Surallah - Lake Sebu - Maitum Road	75.13	0.00	0.00	33.93	39.26	73.19	183.30	0.00	0.00	830.00
MI 55	Lebak - Maganoy - S.S. Barongis Road	96.10	0.00	1.30	67.13	27.67	96.10	293.00	0.00	0.00	2600.00
MI 56	Libungan - Banisilan - Wao - Malanod Road	134.54	0.00	0.00	117.41	6.50	123.91	521.00	0.00	80.56	2325.00
MI 57	Wao - Kalilangan Road	7.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MI 58	Parang - Lumbayanague Road	61.70	0.00	0.00	49.00	10.20	59.20	100.00	0.00	0.00	0.00
MI 59	San Miguel - Tabina Road	36.20	1.00	0.00	35.20	0.00	36.20	0.00	0.00	0.00	0.00
MI 60	Bacungan - Bayog Road	57.82	2.01	0.00	25.31	40.44	67.76	180.00	0.00	0.00	20.00
MI 61	Imelda - Olutanga Road	47.65	0.00	0.00	47.65	0.00	47.65	700.00	0.00	27.60	0.00
MI 62	Siocon - Tugawan Road	45.71	0.00	0.00	9.00	36.71	45.71	115.00	0.00	0.00	0.00
Sub-total		7767.38	305.54	910.04	3155.69	1125.07	5486.23	18406.42	1165.95	6424.31	81989.22
Grand Total		16899.43	1117.64	2451.71	6135.30	2196.64	11891.19	39992.52	6246.10	16185.82	154629.72

TABLE 13.2-3 MAJOR ON-GOING / COMMITTED PROJECTS

ISLAND	ROAD NO.	PROJECT TITLE	SEGMENT NO.	TOTAL SEGMENT LENGTH	REMARKS
MINDORO	MR 4	Mindoro West Coast Road	4-1, 4-4, 4-5, 4-8, 4-9, 4-10	107.14	OECF
PALAWAN	PL 1	Palawan North Road	1-1, 1-2, 1-3, 1-4	136.74	ADB (6th)
MASBATE	MS 5	Cataingan - Placer Road	5-1, 5-2	20.20	ADB (6th)
PANAY	PA 9	Antique Coastal Road	9-1, 9-2, 9-3, 9-4, 9-5	99.13	ADB (6th)
	PA 14	Barotac - San Rafael - Dumarao Rd	14-1	17.87	OECF
NEGROS	NE 8	Kabankalan - Basay Road	8-1, 8-2	78.85	IBRD (HMP-1)
		San Enrique - La Castellana - Vallehermoso Road	11-4	29.35	IBRD (HMP-1)
BOHOL	BO 1	Bohol Circumferential Road (A)	1-4, 1-5	56.10	OECF
	BO 3	Bohol Circumferential Road (B)	3-3, 3-4	58.86	OECF
CEBU	CE 1	Cebu North Road	1-1, 1-2	14.95	IBRD (HMP-1)
	CE 2	Cebu South Road	2-2, 2-3, 2-4	30.25	OECF
	CE 2	Cebu South Road	2-5, 2-6	95.10	ADB (6th)
	CE 5	Cebu Transcentral Road	5-1	49.00	IBRD (HMP-1)
	CE 6	Carcar - Barili - Dumanjug Road	6-1	20.97	ADB (6th)
LEYTE	LE 1	Pan-Philippine Highway (Visayas)	1-1	0.79	OECF
	LE 7	North-West Leyte Road	7-4	42.18	OECF
	LE 8	West Leyte Road	8-4, 8-9	51.60	OECF
	LE 9	Bato - Sogod Road	9-1, 9-2	24.26	OECF
SAMAR	SA 1	Pan-Philippine Highway (Visayas)	1-7, 1-8	45.61	OECF
	SA 5	South Samar Coastal Road	5-1, 5-2, 5-3	96.69	OECF
	SA 6	Samar Pacific Coast Road	6-6	18.07	OECF
MINDANAO	MI 1	Pan-Philippine Highway (Mindanao)	1-8, 1-9, 1-10, 1-13, 1-16, 1-20, 1-21	124.21	OECF
	MI 2	Davao - Digos - Gen. Santos Rd	2-4, 2-5, 2-6, 2-7, 2-8	72.98	IBRD (HMP-1)
	MI 4	Davao - Bukidnon Road	4-1, 4-2, 4-3	139.74	IBRD (HMP-1)
	MI 6	Cotabato - Pagadian - Zambo. Rd	6-5, 6-6	55.80	KUWAIT
	MI 6	Cotabato - Pagadian - Zambo. Rd	6-7, 6-8, 6-9, 6-10, 6-11 6-12, 6-13, 6-16, 6-17, 6-18	257.91	ADB (6th)
	MI 6	Cotabato - Pagadian - Zambo. Rd	6-14, 6-15	55.81	IBRD (HMP-1)
	MI 11	Maramag - Kibawe - Kabacan Rd	11-1, 11-2	45.05	IBRD (HMP-1)
	MI 24	Compostela - Mati Road	24-1	13.89	OECF
	MI 33	Cag. de Oro - Talakag - Kibawe Rd	33-1, 33-2	28.39	OECF

13.2.2 Group 2: Widening Projects

Road sections which would confront traffic capacity problem were identified in Section 12.3 of this report.

The project list of the widening projects is shown in Table 13.2-4.

TABLE 13.2-4 PROJECT LIST: WIDENING PROJECT

ISLAND	ROAD NO.	PROJECT TITLE	LENGTH (Km)
Panay	PA 1	Iloilo - Roxas Road	112.1
	PA 6	Iloilo - Cabatuan - Lumbunao Road	21.2
	PA 8	Iloilo - Antique Road	36.5
		Total	169.8
Negros	NE 1	Bacolod - San Carlos Coastal Road	95.0
	NE 2	Bacolod - Kabankalan Road	85.5
	NE 4	Bais - Dumaguete Road	44.9
		Total	225.4
Cebu	CE 1	Cebu North Road	16.3
	CE 2	Cebu South Road	18.3
	CE 3	Naga - Toledo Road	34.8
		Total	69.4
Leyte	LE 1	Pan-Philippine Highway	41.8
	LE 2	Tacloban - Ormoc - Isabel Road	42.1
	LE 10	North - East Leyte Inland Road	12.0
		Total	95.9
Mindanao	MI 1	Pan-Philippine Highway	245.4
	MI 2	Davao - Digos - Gen.Santos Road	139.7
	MI 3	Sayre Highway	136.9
	MI 4	Davao - Bukidnon Road	21.4
	MI 5	Gen. Santos - Cotabato Road	55.8
	MI 6	Cotabato - Pagadian - Zamboanga Road	86.1
	MI 7	Butuan - Cagayan - Iligan - Tubod road	209.4
	MI 8	Dapitan - Oroquieta - Tangub Road	64.0
	MI 10	Cotabato - Digos Road	161.7
	MI 14	Iligan - Marawi Road	29.8
	MI 16	Tagum - Mati Road	21.0
	MI 25	Tagum - Kapalong - Panabo Road	15.6
	MI 29	Gen. Santos - Kiamba Road	19.8
	MI 35	Lake Lanao Circumferential Road	2.0
		Total	1,208.6
		Grand Total	1,769.1

13.2.3 Expressway and Bypass Projects

In accordance with the criteria in Section 12.3.3, expressway and bypass projects were identified.

A) EXPRESSWAYS

- Cebu City Expressway (Naga – Cebu City – Danao City):

  Metro Cebu is the second largest urban center of the country. The Naga – Cebu City – Danao City Corridor is a part of Iloilo – Cebu – Tacloban Growth Corridor and is growing rapidly with the concentration of population, commercial, financial and industrial activities. The present road network should be drastically strengthened to provide the efficient means of transportation.

- Davao City Expressway (Digos – Davao City – Tagum):

  The Digos – Davao City – Tagum Corridor is the major transport corridor along the southern coast area of Mindanao and constitutes a part of the Zamboanga – Cotabato – Gen. Santos – Davao Growth Corridor. By providing efficient transport network along the corridor, the development of the southern coastal area of Mindanao would be vitally supported.

B) BYPASSES

- Iloilo City Bypass:

  Many radial roads are extended from the Iloilo City. The proposed bypass would function as a circumferential road to distribute traffic movements from radial roads.

- Bacolod City Bypass:

  The proposed bypass would not only reduce traffic problem of Bacolod Urban Areas, but also function as a direct access road to a new airport built in Silay City.

- Cagayan de Oro Bypass:

  Existing industrial estates are being developed in the western and the eastern areas of the city proper. A new airport will be constructed at Laguindingan in the west of city proper. All roads in the city center are congested, and a bypass would be needed for traffic movements in the east-west direction.

- Iligan City Bypass:

  The situation is almost the same as the case of Cagayan de Oro.

- Butuan City Bypass:

  The existing road section in the city center is a 4-lane road and still suffers traffic congestion. In addition, the existing bridge over Agusan River is deteriorating.

  In order to provide safe and sure access to the city, a bypass would be needed.

- Malaybalay Bypass and Valencia Bypass:

  Both Malaybalay and Valencia are major urban centers along Sayre Highway. A bypass to assure smooth flow of thru traffic would be needed at these urban centers.

Expressway and bypass projects are listed in Table 13.2-5. Proposed rough alignment of each project is attached in Appendix 13.2-1.

TABLE 13.2-5 PROJECT LIST: EXPRESSWAY AND BYPASS PROJECTS

Island	Road No.	Project Title		Length (Km)
Panay	110-1	Iloilo Circumferential Road	(4-lane)	15.2
Negros	110-1,2	Bacolod City Bypass (Parallel Road)	(2-lane)	72.0
Cebu	110-1,2,3	Cebu City Expressway	(4-lane)	40.3
	101-107	Cebu City Expressway Access Roads		20.3
		Cebu Total		60.6
Mindanao	100-1,2,3	Davao City Expressway	(2-lane)	98.6
	101-106	Davao City Expressway Access Roads		9.9
	110-1,2,3	Cagayan de Oro Bypass	(2-lane)	49.5
	111-1	Iligan City Bypass	(2-lane)	19.0
	112-1	Butuan City Bypass	(2-lane)	15.1
	113-1	Malaybalay Bypass	(2-lane)	9.6
	V	Valencia Bypass	(2-lane)	4.9
		Mindanao Total		206.6
		Grand-Total		**354.4**

13.2.4 Inter-Island Link Projects

In order to integrate socio-economic activities between islands and to make development efforts more effective by spreading impacts between islands, the possible inter-island links by means of a bridge or an under-sea tunnel were identified as follows:

- Luzon (Batangas) – Mindoro Link
- Iloilo – Guimaras Link
- Guimaras – Negros Link
- Cebu – Negros (Dumaguete) Link
- Luzon (Sorsogon) – Samar Link

TABLE 13.2-6 PROJECT LIST: INTER-ISLAND LINK PROJECTS

Project No.	Project Title	Scope of Work	
IL - 1	Luzon (Batangas) - Mindoro Link (L = 25.0 km)	• Under-Sea Tunnel • Ventilation Tower	L = 25km M = 5
IL - 2	Iloilo - Guimaras Link (L = 2.59 km)	• Suspension Bridge • Approach Viaduct	L = 1,330m L = 1,260m
IL - 3	Guimaras - Negros Link (L = 20.60 km)	• 5 long span Bridges • Approach Viaduct • Causeway	L = 2,900m L = 10,100m L = 7,600m
IL - 4	Cebu - Negros Link (L = 14.3 km)	• Under-Sea Tunnel • Ventilation Tower • Approach	L = 14.0km M = 2 L = 0.3 km
IL - 5	Luzon (Sorsogon) - Samar Link (L = 41.3 km)	• Under-Sea Tunnel • Ventilation Tower • Approach	L = 35.95km M = 7 L = 5.35km

13.2.5 Project Map

Maps showing all projects were prepared and presented in Figure 13.2-1(1) and 1(2).

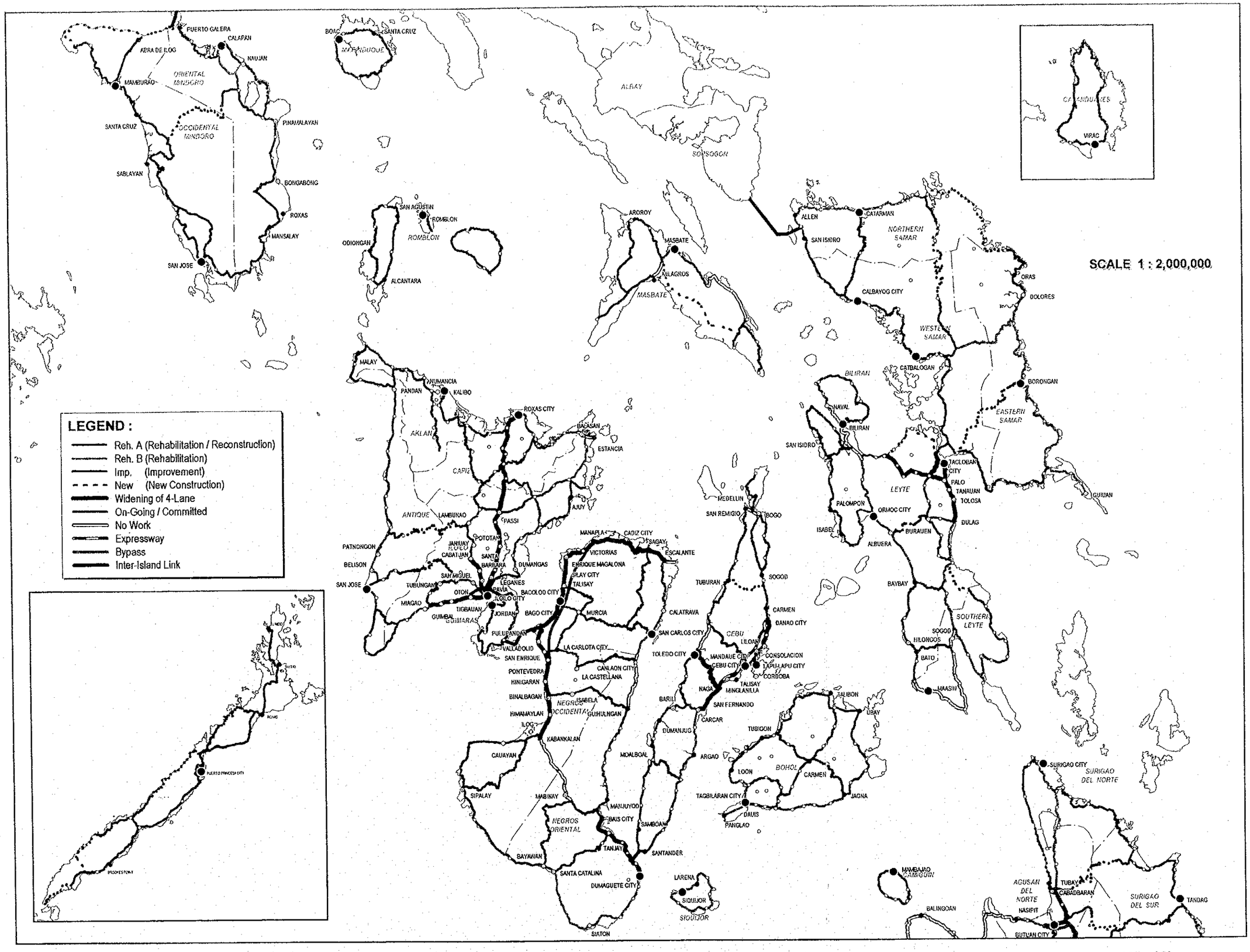


FIGURE 13.2 - 1 (1) PROJECT MAP

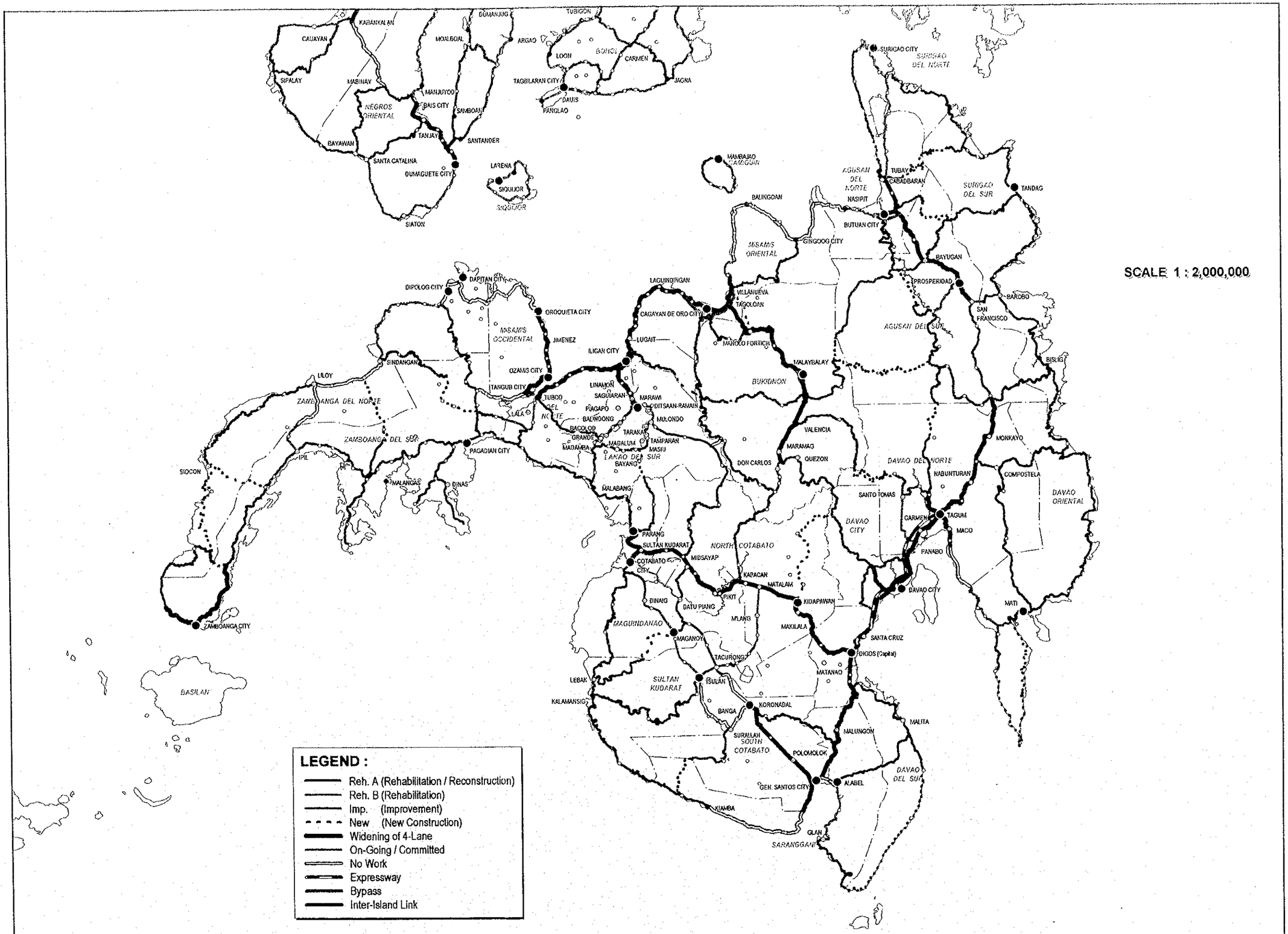


FIGURE 13.2 - 1 (2) PROJECT MAP

CHAPTER 14

DESIGN STANDARDS

14.1 DESIGN STANDARDS

14.1.1 DPWH's Minimum Design Standards and requirements

DPWH's minimum design standards for highways are shown in Table 14.1-1. It is for a 2-lane road in rural areas and not for a multiple-lane road. The design standards are determined only by the traffic volume at the opening year, regardless of traffic characteristics.

In general, design standards should cover following items:

- Road class based on the functional classification
- Level of service to be achieved
- Social impacts (mainly ROW acquisition and relocation of people)

Road Class Based on Functional Classification

Arterial roads of which main function is mobility should be planned with higher design standards, even though traffic volume is not so heavy. On the other hand, for a road with heavy traffic volume due to local traffic, an accessibility to adjacent areas is its main function, therefore, lower design standards can be adaptable. Road class based on functional classification is one of the most important factors to be considered in establishing design standards.

Level of Service to be Achieved

Traffic volume and traffic characteristics (mainly composition of thru and local traffic and vehicle type) are major factors to dictate level of service. Appropriate level of service, which most road users can accept, should be determined and reflected in design standards.

Social Impacts

Higher design standards require wider right-of-way, additional land acquisition and/or resettlement. It might cause higher negative social impacts in and around inhabitant areas. Social impacts would influence the project feasibility and should be considered in establishing design standards.

TABLE 14.1-1 MINIMUM DESIGN STANDARD PHILIPPINE HIGHWAYS

ADT AVERAGE DAILY TRAFFIC ON	UNDER 200	200-400	400 - 1000		1000 - 2000		MORE THAN 2000	
OPENING			MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE
DESIGN SPEED (km / h)								
FLAT TOPOGRAPHY	60	70	70	90	80	95	90	100
ROLLING "	40	50	60	80	60	80	70	90
MOUNTAINOUS "	30	40	40	50	50	60	60	70
RADIUS (metre)								
FLAT TOPOGRAPHY	120	160	160	280	220	320	260	350
ROLLING "	55	85	120	220	120	220	160	280
MOUNTAINOUS "	30	50	50	80	80	120	180	160
GRADE (PERCENT)								
FLAT TOPOGRAPHY	6.0	6.0	5.0	3.0	4.0	3.0	4.0	3.0
ROLLING "	8.0	7.0	6.0	5.0	5.0	5.0	5.0	4.0
MOUNTAINOUS "	10.0	9.0	8.0	6.0	7.0	6.0	7.0	5.0
PAVEMENT WIDTH (m)	4.0	5.5 ; 6.0	6.10		6.70		6.70	7.30
SHOULDER WIDTH (m)	0.50	1.00	1.50	2.00	2.50	3.00	3.00	
RIGHT-OF-WAY WIDTH (m)	20	30	30		30	30	60	
SUPERELEVATION (m/m)	0.10 (MAX.)		0.10 (MAX.)		0.10 (MAX.)		0.10 (MAX.)	
NON-PASSING SIGHT DISTANCE (metre)								
FLAT TOPOGRAPHY	70	90	90	135	115	150	135	160
ROLLING "	40	60	70	115	70	115	90	135
MOUNTAINOUS "	40	40	40	60	60	70	70	90
PASSING SIGHT DISTANCE (metre)								
FLAT TOPOGRAPHY	420	490	490	615	560	645	615	675
ROLLING "	270	350	420	560	420	560	490	615
MOUNTAINOUS "	190	270	270	350	360	420	420	490
TYPE OF SURFACING	GRAVEL, CRUSHED GRAVEL OR CRUSHED STONE BIT. PRESERVATIVE TREATMENT SINGLE OR DOUBLE BIT. SURFACE TREATMENT, BITUMINOUS MACADAM PAVEMENT.		BITUMINOUS MACADAM PAVEMENT, DENSE OR OPEN GRADED PLANT MIX SURFACE COURSE, BITUMINOUS CONCRETE SURFACE COURSE.		BITUMINOUS CONCRETE SURFACE COURSE		BITUMINOUS CONCRETE SURFACE COURSE, PORTLAND CEMENT CONCRETE PAVEMENT	

SOURCE: Design Guidelines, Criteria and Standards, Bureau of Design, DPWH

14.1.2 Proposed Minimum Design Standards

It was proposed that the minimum design standards be established based on road classification and traffic volume. Road classes were proposed to be as follows in consideration of above two factors.

Road Class	Functional Classification and AADT
Road Class I	• N-S Backbones and E-W Laterals with AADT in opening year of more than 2,000 veh./day • Strategic Roads (A) and (B) with AADT in opening year of more than 3,000 veh./day
Road Class II	• N-S Backbones and E-W Laterals with AADT in opening year of less than 2,000 veh./day • Strategic Roads (A) and (B) with AADT in opening year of less than 3,000 veh./day • National Secondary Roads with AADT in opening year of more than 1,000 veh./day
Road Class III	• National Secondary Roads with AADT in opening year of less than 1,000 veh./day

Proposed minimum standards for 2-lane roads in rural section are presented in Table 14.1-2. Standard cross section of each road class by terrain is shown in Figure 14.1-1.

It was also recommended that the shoulders should be paved as much as possible to protect carriageway pavement and reduce maintenance requirement.

Standard cross sections for 4-lane roads are presented in Figure 14.1-2. Proposed cross sections require about 25 to 30 meters right-of-way.

The demands for widening of existing 2-lane to 4-lane roads are increasing in urban and suburban areas year by year, however, the existing road right-of-way, in many cases, is only 20 meters, and additional right-of-way acquisitions become more difficult. Present practice for this case is just to pave additional one-lane (3.0 to 3.35 meters in width) on each side without shoulders and sidewalks. The proposed complete cross sections with shoulders and sidewalks as shown in Figure 14.1-3 should be constructed.

TABLE 14.1-2 PROPOSED MINIMUM DESIGN STANDARDS
2-Lane Rural Section

ROAD CLASSIFICATION		AADT ON OPENING		
		1,000 Veh./Day	2,000 Veh./Day	3,000 Veh./Day
Arterial Road	N-S Backbone and E-W Lateral	[Road Class II] Pavement Width = 6.7m Flat / Rolling / Mountainous Design Speed (km/hr): 80 / 70 / 50 Shoulder Width (m): 2.5 / 2.0 / 1.5	[Road Class I] Pavement Width = 7.0m ~ 7.3m Flat / Rolling / Mountainous Design Speed (km/hr): 90 / 80 / 60 Shoulder Width (m): 3.0 / 2.5 / 2.0	
	Strategic Road (A) and (B)	[Road Class II] Pavement Width = 6.7m Flat / Rolling / Mountainous Design Speed (km/hr): 80 / 70 / 50 Shoulder Width (m): 2.5 / 2.0 / 1.5		[Road Class I] Pavement Width = 7.0m ~ 7.3m F / R / M Design Speed (km/hr): 90 / 80 / 60 Shoulder Width (m): 3.0 / 2.5 / 2.0
National Secondary Road		[Road Class III] Pavement Width = 6.1m F / R / M Design Speed (km/hr): 70 / 60 / 40 Shoulder Width (m): 2.5 / 2.0 / 1.0	[Road Class II] Pavement Width = 6.7m Flat / Rolling / Mountainous Design Speed (km/hr): 80 / 70 / 50 Shoulder Width (m): 2.5 / 2.0 / 1.5	

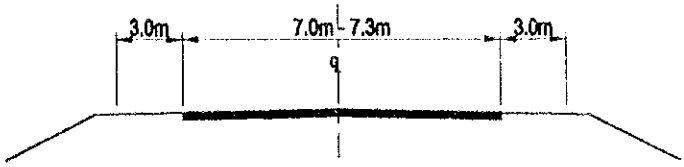
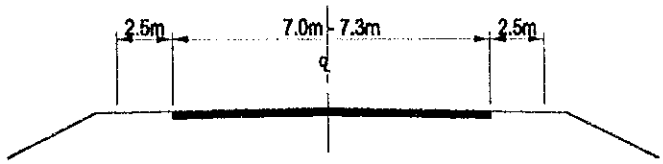
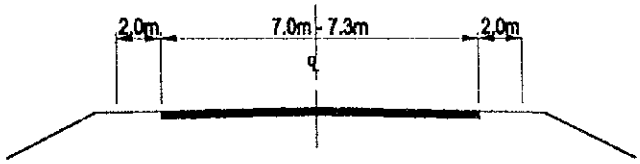
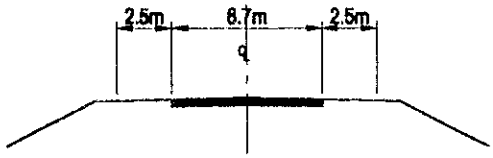
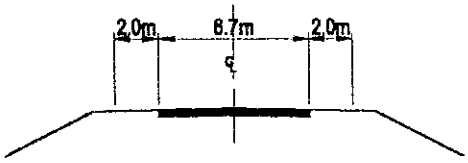
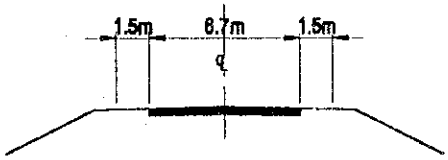
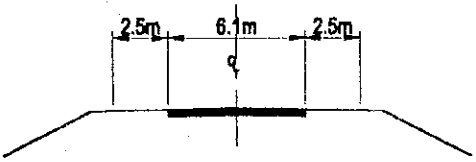
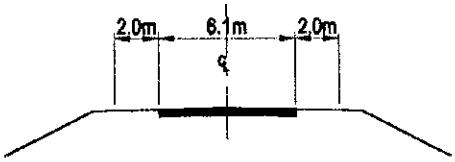
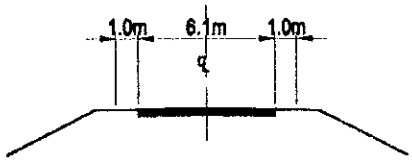
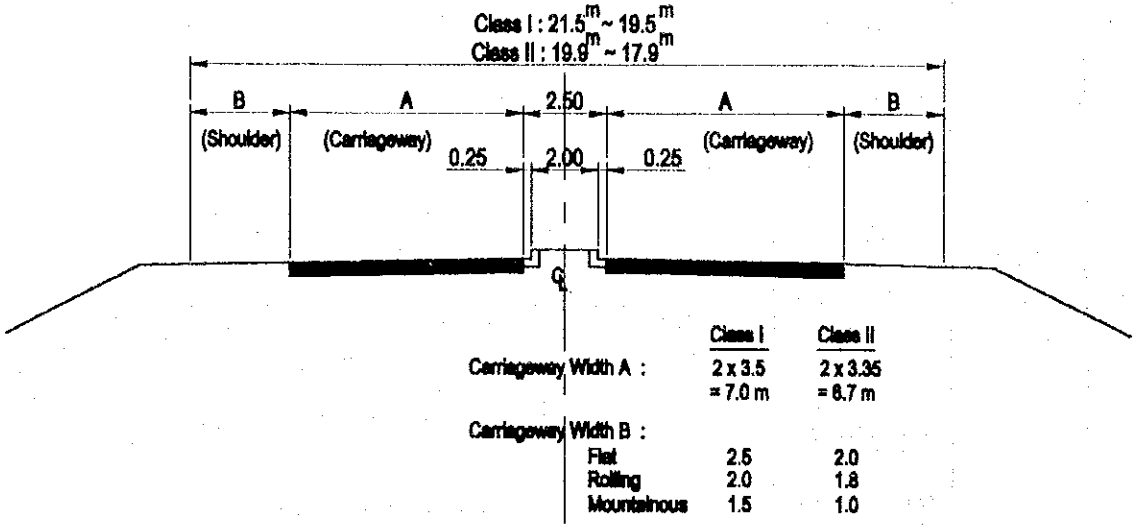
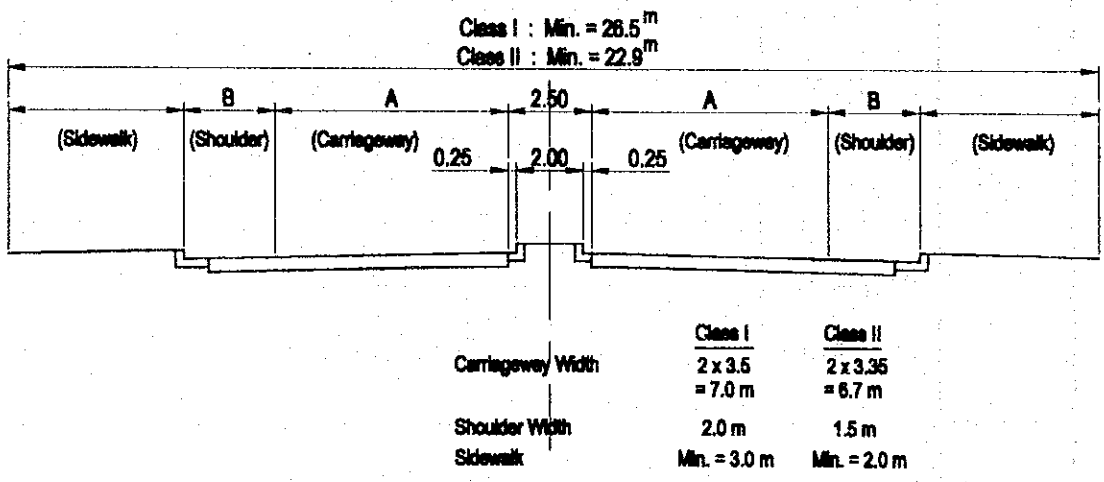
ROAD CLASS	TERRAIN AND DESIGN SPEED	STANDARD CROSS SECTION
I	FLAT Min. = 90 km/hour	
	ROLLING Min. = 80 km/hour	
	MOUNTAINOUS Min. = 60 km/hour	
II	FLAT Min. = 80 km/hour	
	ROLLING Min. = 70 km/hour	
	MOUNTAINOUS Min. = 50 km/hour	
III	FLAT Min. = 70 km/hour	
	ROLLING Min. = 60 km/hour	
	MOUNTAINOUS Min. = 40 km/hour	

FIGURE 14.1-1 STANDARD CROSS SECTION OF 2-LANE SECTION

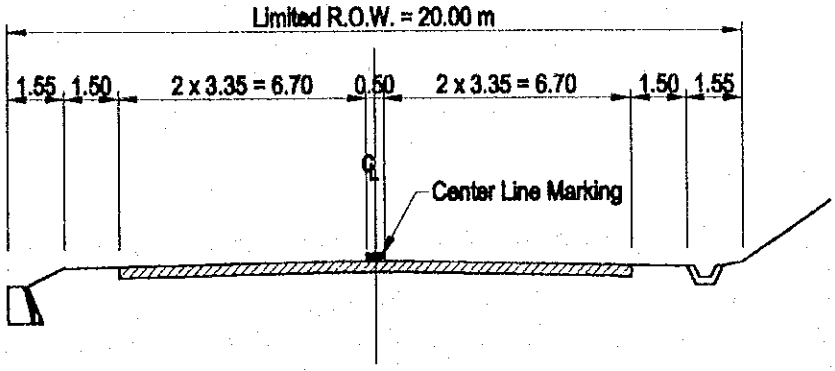


4-Lane Road : Rural Section

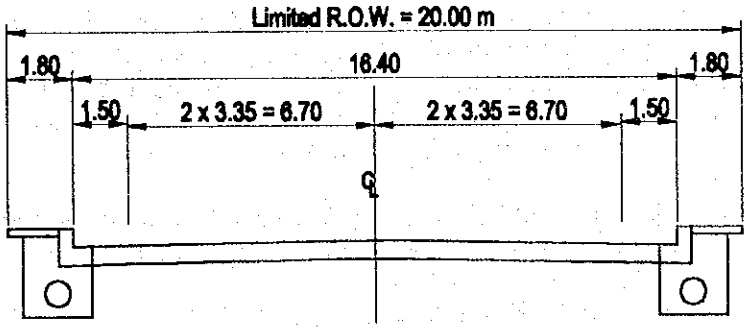


4-Lane Road : Urban Section

FIGURE 14.1-2 STANDARD CROSS SECTION FOR 4-LANE ROAD



Rural Section



Urban Section

NOTE : To be used only when R.O.W. acquisition of more than 20 m is extreamly difficult.

FIGURE 14.1-3 STANDARD CROSS SECTION FOR 4-LANE ROAD WITHIN LIMITED ROAD RIGHT-OF-WAY

14.2 ALTERNATIVE ROUTES SELECTION

Alternative routes of proposed new roads including expressways and bypasses were selected in the 1/50,000 topographic maps. Most of the roads pass through mountainous areas, therefore, the detailed route selection during feasibility studies must be undertaken in a bigger scale of topographic maps and aerial photographs.

Proposed Expressways

Two proposed expressways in Cebu and Davao pass through the corridor not topographically favorable for an expressway, therefore, the detailed route selection study must be undertaken during feasibility studies. Development project, future land use plans, connection with access roads, etc. must be coordinated during the route selection stage.

Proposed Bypasses in Mindanao

Proposed Cagayan de Oro, Iligan, Malaybalay and Valencia bypasses are required to pass through the mountainous areas due to the narrow coastal or inland flat plain. Therefore, careful route selection must be undertaken during feasibility studies. Also taken into accounts are urbanization trend, development projects and the future land use plan.

Selected route alignment under this Study based on 1/50,000 topographic maps was digitized and recorded in the computerized mapping system.

14.3 STANDARD DESIGN BY TYPE OF WORK

Typical cross sections for each type of work are presented in Figure 14.3-1 and project cost estimates were conducted according to those plans.

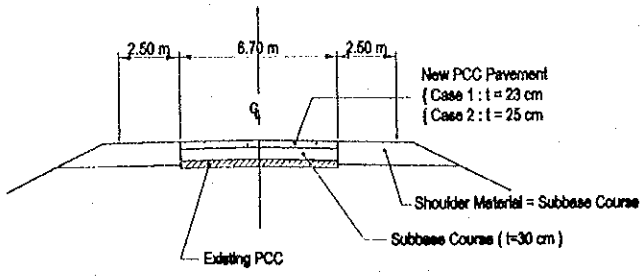
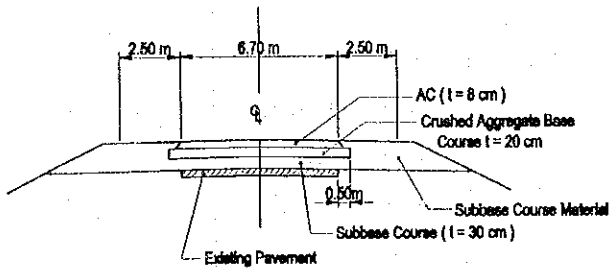
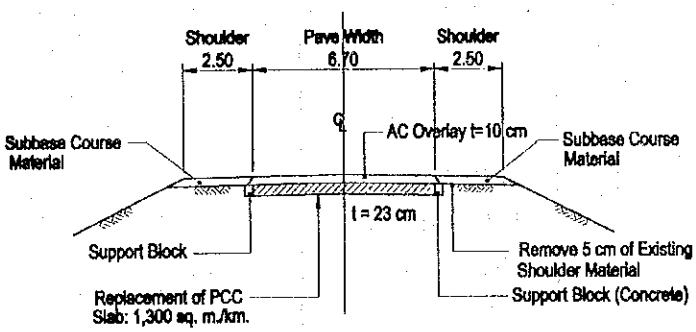
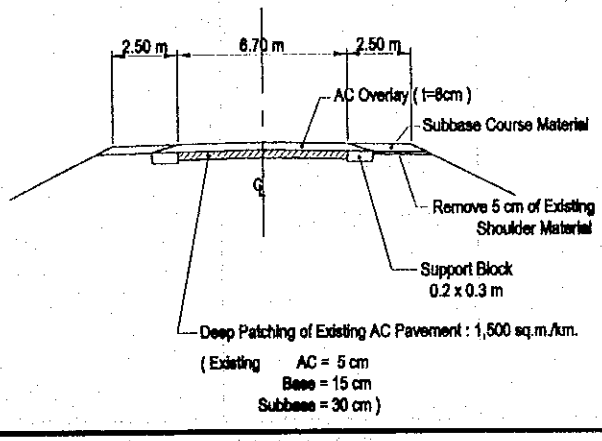
Type of Work		Typical Cross Section
Reh. A	Reh. (1-1) : PCC Pavement Rehabilitation/ Reconstruction	
	Reh. (2-1) : AC Pavement Rehabilitation/ Reconstruction	
Reh. B	Reh. (1-2) : PCC Pavement Rehabilitation/ Overlay	
	Reh. (2-2) : AC Pavement Rehabilitation/ Overlay	

FIGURE 14.3-1 TYPICAL CROSS SECTIONS (1/4)

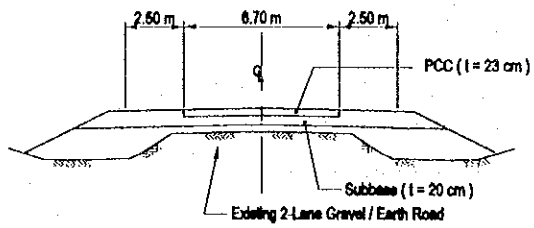
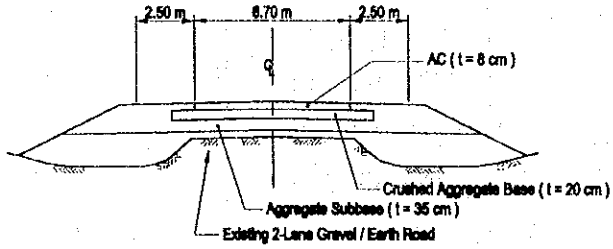
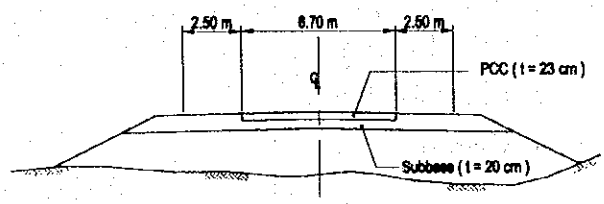
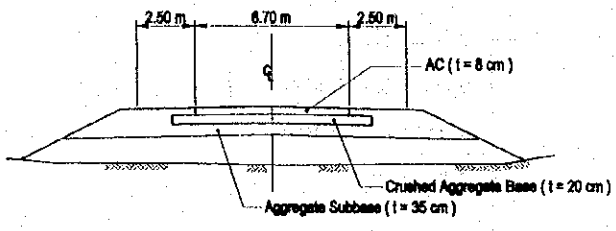
Type of Work		Typical Cross Section
Imp.	Gravel/Earth to a 2-lane paved road with PCC	
	Gravel/Earth to a 2-lane paved road with AC	
New	New Cons-truction with PCC	
	New Cons-truction with AC	

FIGURE 14.3-1 TYPICAL CROSS SECTIONS (2/4)

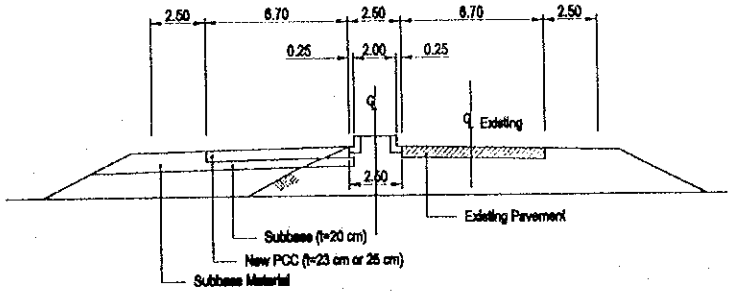
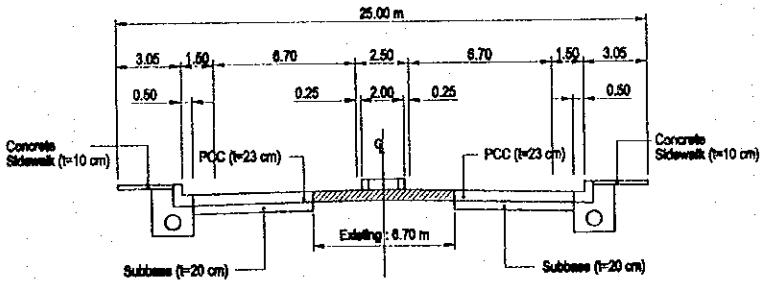
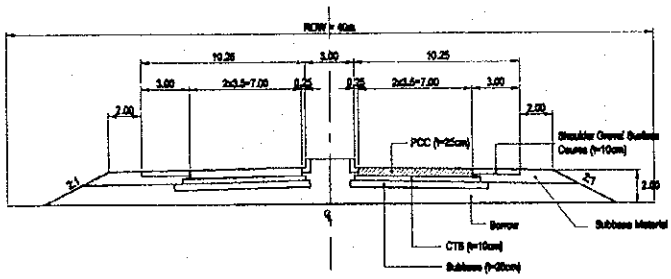
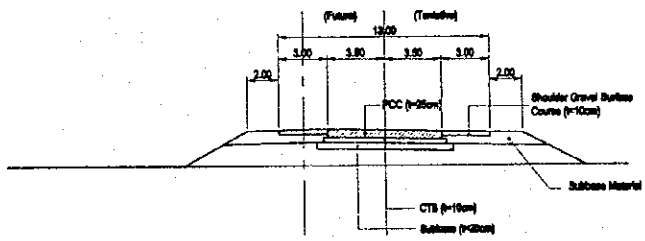
Type of Work		Typical Cross Section
Widening to a 4-lane Road (W-4)	Rural Section	
	Urban Section	
Bypass (BY)	4-lane Bypass	
	2-lane Bypass	

FIGURE 14.3-1 TYPICAL CROSS SECTIONS (3/4)

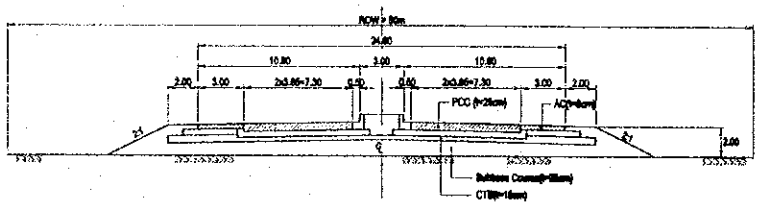
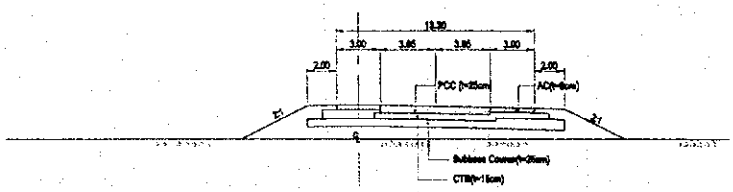
Type of Work		Typical Cross Section
Express-way (Exp.)	4-lane	
	2-lane	

FIGURE 14.3-1 TYPICAL CROSS SECTIONS (4/4)

CHAPTER 15

PROJECT COST ESTIMATE

15.1 PROCEDURE OF PROJECT COST ESTIMATE

The procedure of project cost estimate is shown in Figure 15.1-1. Based on the collected unit prices of construction materials, labor costs and equipment costs, unit costs of major construction items were examined and compared with latest bid prices and prices of on-going projects. Quantity estimate for each type of work was conducted and each construction cost per km (or per meter for bridges and natural disaster countermeasures) was estimated for each type of work based on the determined unit cost of major construction items.

Engineering services cost was estimated by using the percentage (%) of construction cost. ROW acquisition costs for new roads and widenings were estimated by the prevailing land cost.

The foreign exchange rates on October 30, 1998 were applied.

1 US$ = ₱ 40.831 = Yen 116.90

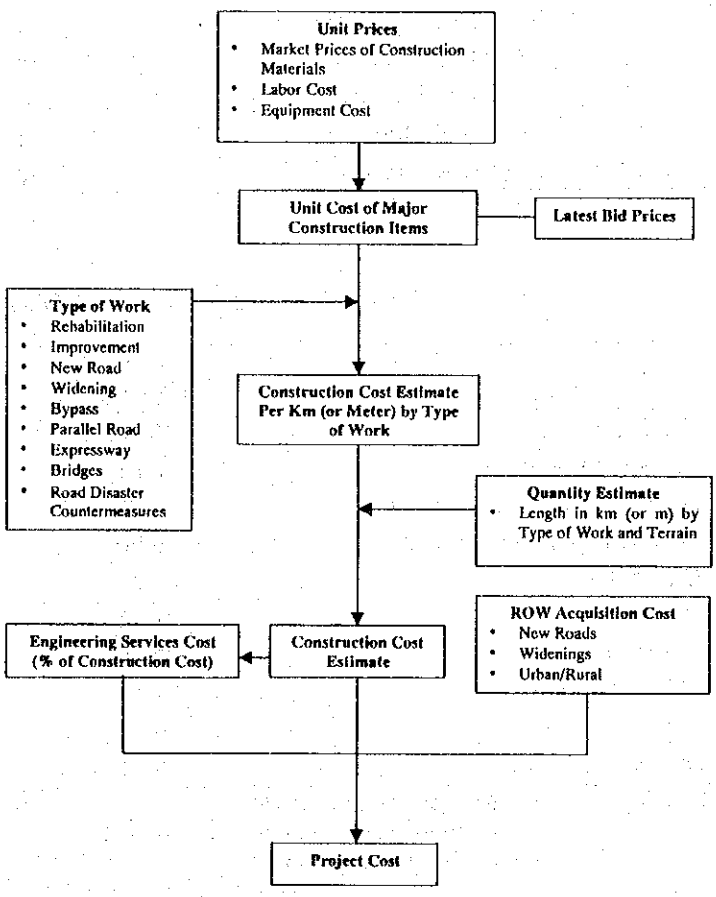


FIGURE 15.1-1 PROCEDURE OF PROJECT COST ESTIMATE

15.2 UNIT COST

Unit prices of construction materials, labor cost and equipment cost are shown in Table 15.2-1, 2 and 3, respectively.

Unit cost of major construction items is presented in Table 15.2-4.

TABLE 15.2-1 MARKET PRICE OF CONSTRUCTION MATERIALS

(March 1998 Prices)

Price No.	Description	Unit	Unit Price (P)
1	Portland Cement	Bag	130.00
2	Reinforcing Steel Bar, Gr. 40	kg.	29.00
3	Reinforcing Steel Bar, Gr. 60	kg.	34.00
4	Gasoline, Premium	lit.	13.50
5	Gasoline, Regular	lit.	12.50
6	Diesel	lit.	8.00
7	Lumber, Yakal or Apitong	bd. ft.	26.00
8	Form Lumber	bd. ft.	18.00
9	MC-70 Cutback Asphalt	Tonne	13,500.00
10	Emulsified Asphalt SS-1	Tonne	13,500.00
11	Asphalt Cement Pen. 60-70	Tonne	12,000.00
12	Asphalt Cement Pen. 85-100	Tonne	12,500.00
13	Filler	lit.	16.00
14	RCPC 910 mm dia.	M	1,900.00
15	RCPC 1220 mm dia.	M	3,000.00
16	RCPC 1520 mm dia.	M	4,000.00
17	Gabions Steelmesh, 2m x 1m x 1m	ea.	2,800.00
18	Structural Steel	kg.	80.00
19	Royalty for Quarry	m^3	15.00

Source : Study Team Survey

TABLE 15.2-2 LABOR COST

(March 1998 Prices)

Labor Category	Hourly Rate (Pesos)	Daily Rate (Pesos)
Foreman	38.58	394.48
Assistant Foreman	35.83	364.64
Heavy Equipment Operator	34.33	347.60
Light Equipment Operator	29.90	302.80
Carpenter	31.45	315.76
Mason	31.45	315.76
Steelman	31.45	315.76
Skilled Laborer	31.45	315.76
Driver	26.33	265.36
Unskilled Labor	18.21	185.52

Source :
- National Wage Council
- Department of Labor and Employment
- Social Security System

TABLE 15.2-3 HOURLY COST OF CONSTRUCTION EQUIPMENT

(March 1998 Prices)

	Construction Equipment	Hourly Cost (P)
1.	Tractor Crawler with Dozer, 11t, 110 HP	1,129.70
2.	Tractor Crawler with Dozer, 21t, 110 HP	2,213.20
3.	Wheel Loader, 0.57 cu. m., 39 HP	271.70
4.	Wheel Loader, 0.57 cu. m., 50 HP	326.70
5.	Wheel Loader, 0.57 cu. m., 80 HP	683.10
6.	Wheel Loader, 1.62 cu. m., 100 HP	852.50
7.	Backhoe Crawler, 0.6 cu. m., 92 HP	858.00
8.	Dumptruck, 6.1 cu. m., 190 HP	597.30
9.	Motorized Grader, 10t, 110 HP	740.30
10.	Macadam Roller, 10-12t, 105 HP	845.90
11.	Tandem Roller, 8t, 82 HP	941.60
12.	Tandem Roller, 9-10t, 105 HP	991.10
13.	Vibratory Roller, 12t, 175 HP	1,181.40
14.	Pneumatic Roller, 12t, 175 HP	757.86
15.	Sheepsfoot Roller, Towed Type, 5-8t	240.63
16.	Asphalt Sprayer	832.70
17.	Asphalt Paver, 3.1m	1,018.60
18.	Transit Mixer, 5 cu. m., 190 HP	1,057.10
19.	Concrete Breaker	135.47
20.	Concrete Saw, 180 kg., 5 HP	161.87
21.	Sand Blaster, 1.35t, 82 HP	149.05
22.	Concrete Vibrator (small works)	131.79
23.	Concrete Vibrator with Engine, 145 kg., 3 HP	247.94
24.	Vibratory Tamper, 80 kg., 3 HP	107.80
25.	Air Compressor	713.90
26.	Generator, 100 kw	336.67
27.	Mobile Screening and Washing Plant, 60 tph	1,020.20
28.	Batching Plant, 60 tph	1,226.39
29.	Crushing Plant, 60 tph	1,551.88
30.	Water Truck, 6 cu. m., 140 HP	1,580.70
31.	Water Truck, 1 cu. m.	1,159.40
32.	Water Pump	130.90
33.	Mixer, 1 1/2-2 bagger	175.58
34.	Mixer, 3-4 bagger	199.90
35.	Pick-up, 41 HP	345.40
36.	Bar Cutter	80.92

Source : Associated Construction Equipment Lessors (ACEL)

TABLE 15.2-4 UNIT COST OF MAJOR CONSTRUCTION ITEMS (1/2)

ITEM NO.	DESCRIPTION	UNIT	UNIT COST (Peso)	COMPONENT (%) Foreign	Local	Tax
1	EARTHWORKS					
1-1	Clearing and Grubbing	sq. m.	10.00	54	33	13
1-2	Surplus Common Excavation (Roadway and Shoulder)	cu. m.	110.00	54	31	15
1-3	Surplus Common Excavation (Drainage and Ditch Structure)	cu. m.	180.00	57	27	16
1-4	Surplus Rock Excavation	cu. m.	390.00	54	31	15
1-5	Structure Excavation	cu. m.	240.00	57	27	16
1-6	Embankment from Roadway/Drainage Excavation	cu. m.	220.00	62	22	16
1-7	Embankment from Borrow	cu. m.	290.00	62	22	16
1-8	Removal of Existing PCC Pavement	sq. m.	170.00	57	29	14
1-9	Subgrade Preparation of Gravel Surface	sq. m.	32.00	60	25	15
1-10	Subgrade Preparation of Existing PCC Pavement	sq. m.	77.00	60	25	15
1-11	Subgrade Preparation for Shoulder	sq. m.	22.00	60	25	15
1-12	Removal of Existing RCPC Pavement	ea.	11,200.00	60	25	15
1-13	Removal of Existing RCBC Pavement	ea.	28,000.00	60	25	15
2	SUBBASE AND BASE COURSE					
2-1	Aggregate Subbase Course	cu. m.	280.00	58	28	14
2-2	Aggregate Base Course	cu. m.	460.00	58	28	14
2-3	Crushed Aggregate Base Course	cu. m.	550.00	60	25	15
2-4	Bituminous Treated Base	cu. m.	1,900.00	62	22	16
2-5	Cement Treated Base	cu. m.	1,600.00	61	23	16
3	PAVEMENT SURFACE COURSE					
3-1	Bituminous Prime Coat	ton	23,000.00	58	22	20
3-2	Bituminous Tack Coat	ton	23,500.00	58	22	20
3-3	Joint/Crack Sealing	m	50.00	55	31	14
3-4	Bituminous Concrete Surface Course (Hot Laid)	ton	2,450.00	58	22	20
3-5	Bituminous Concrete Binder Course (Hot Laid)	ton	2,400.00	58	22	20
3-6	PCC Pavement (t=10 cm)	sq. m.	540.00	53	31	16
3-7	PCC Pavement (t=20 cm)	sq. m.	700.00	53	31	16
3-8	PCC Pavement (t=23 cm)	sq. m.	490.00	53	31	16
3-9	PCC Pavement (t=25 cm)	sq. m.	870.00	53	31	16
3-10	PCC Pavement (t=28 cm)	sq. m.	960.00	53	31	16
3-11	PCC Pavement for Shoulder (t=18 cm)	sq. m.	550.00	53	31	16
3-12	Aggregate Surface Course for Shoulder	cu. m.	550.00	60	25	15
4	BRIDGE STRUCTURE					
4-1	Bridge Excavation (A.O.W.L.)	cu. m.	280.00	60	24	16
4-2	Bridge Excavation (B.O.W.L.)	cu. m.	550.00	56	30	14
4-3	Foundation Fill	cu. m.	600.00	57	27	16
4-4	Removal of Existing Concrete Bridge	m.	40,000.00	53	32	15
4-5	Structural Concrete for PC Superstructure	cu. m.	8,960.00	53	30	17
4-6	Structural Concrete for RC Superstructure	cu. m.	4,900.00	53	30	17
4-7	Structural Concrete for Minor Substructure	cu. m.	4,500.00	53	30	17
4-8	Structural Concrete for RC Thin Members	cu. m.	5,200.00	53	30	17
4-9	Lean Concrete	cu. m.	3,600.00	53	30	17
4-10	Reinforcing Steel Bar (Grade 40)	kg.	34.00	50	36	14
4-11	Reinforcing Steel Bar (Grade 60)	kg.	35.00	50	36	14
4-12	Structural Steel	kg.	72.00	59	23	18
4-13	Precast Concrete Pile (0.4m x 0.4 m)	m.	3,000.00	53	30	17
4-14	Cast-in-place Concrete Bored Piles (1.10m dia.)	m.	19,000.00	60	22	16
4-15	PC Girder (AASHTO Type, L=20m)	each	319,000.00	55	27	18
4-16	PC Girder (AASHTO Type, L=25m)	each	418,000.00	55	27	18
4-17	PC Girder (AASHTO Type, L=30m)	each	495,000.00	55	27	18
4-18	PC Girder (AASHTO Type, L=35m)	each	682,000.00	55	27	18
4-19	timber Structure for Detour Bridge	m.	24,000.00	30	56	14
4-20	Reinforced Concrete Railing	m.	1,500.00	50	36	14
5	SLOPE PROTECTION					
5-1	Recutting Surface Soil	cu. m.	120.00	55	30	15
5-2	Recutting Soft Rock	cu. m.	420.00	58	27	15
5-3	Recutting Hard Rock	cu. m.	580.00	58	27	15
5-4	Refilling of Common Material	cu. m.	420.00	57	27	16
5-5	Concrete Spray (t=15 cm)	cu. m.	1,320.00	59	27	14
5-6	Stone Pitching	cu. m.	1,650.00	51	35	14

TABLE 15.2-4 UNIT COST OF MAJOR CONSTRUCTUION ITEMS (2/2)

ITEM NO.	DESCRIPTION	UNIT	UNIT COST (Peso)	COMPONENT (%) Foreign	Local	Tax
5-7	Supported Type Concrete Wall	cu. m.	4,400.00	53	30	17
5-8	Supported Type Masonry Wall	cu. m.	2,420.00	51	35	14
5-9	Cast-in-place Crib	cu. m.	2,310.00	58	27	15
5-10	Gabion	cu. m.	3,740.00	47	39	14
5-11	Horizontal Underdrain	m.	1,080.00	56	29	15
5-12	Berm Ditch	m.	660.00	52	33	15
5-13	Seeding	sq. m.	24.00	10	76	14
5-14	Grouted Riprap	cu. m.	2,000.00	51	35	14
5-15	Stone Masonry	cu. m.	2,300.00	51	35	14
6	DRAINAGE STRUCTURE					
6-1	RCBC, 1-1.8 x 2.0	m.	37,200.00	55	30	15
6-2	RCBC, 1-2.4 x 2.4	m.	48,000.00	55	30	15
6-3	RCBC, 1-3.0 x 3.0	m.	58,800.00	55	30	15
6-4	RCBC, 2-1.8 x 2.0	m.	64,800.00	55	30	15
6-5	RCBC, 2-2.4 x 2.4	m.	84,000.00	55	30	15
6-6	RCBC, 2-3.0 x 3.0	m	102,000.00	55	30	15
6-7	RCPC, 0.61m dia.	m.	2,880.00	56	29	15
6-8	RCPC, 0.91m dia.	m.	4,680.00	56	29	15
6-9	RCPC, 1.07m dia.	m	5,400.00	56	29	15
6-10	RCPC, 1.22 m dia.	m.	9,360.00	56	29	15
6-11	RCPC, 1.52m dia	m.	13,800.00	56	29	15
6-12	Catch Basin for 0.61m dia. RCPC	each	11,400.00	53	32	15
6-13	Catch Basin for 0.91m dia. RCPC	each	16,800.00	53	32	15
6-14	Catch Basin for 1.07m dia. RCPC	each	20,400.00	53	32	15
6-15	Catch Basin for 1.22m dia. RCPC	each	22,800.00	53	32	15
6-16	Catch Basin for 1.52m dia. RCPC	each	28,200.00	53	32	15
6-17	Side Ditch Type A	m	3,720.00	52	34	14
6-18	Side Ditch Type B	m.	5,940.00	52	34	14
6-19	Side Ditch Type C	m.	7,200.00	52	34	14
6-20	Side Ditch Type D	m.	11,040.00	51	35	14
6-21	Underdrain (Granular Material, 15cm Slotted PVC Pipe Filter Cloth)	m.	970.00	51	35	14
6-22	Water Channel (w=1.5m)	m.	3,700.00	54	31	15
6-32	Water Channel (w=2.0m)	m.	7,200.00	54	31	15
6-24	Loose Boulder Toe	cu. m.	540.00	54	31	15
6-25	Concrete Sheet Pile	sq. m.	7,500.00	59	27	14
7	MISCELLANEOUS FACILITIES					
7-1	For 2-lane Ordinary Road	km.	100,000.00	56	29	15
7-2	For 4-lane By-pass/Parallel Road	km.	250,000.00	56	29	15
7-3	For 2-lane Expressway (Stage Construction)	km.	300,000.00	56	29	15
7-4	For 4-lane Expressway	km	500,000.00	56	29	15
8	ENGINNER'S FACILITY, OTHER GENERAL REQUIREMENT AND MOBILIZATION/DEMOBILIZATION					
8-1	Engineer's Facility, Other General Requirement and Mobilization/Demobilization		(10 % of civil work cost)			