PROJECT IM - 12

Changwat : Ang Thong, Ayutthaya

A. Pho Thong - A. Sena

Length : 50.00 km.

SUMMARY

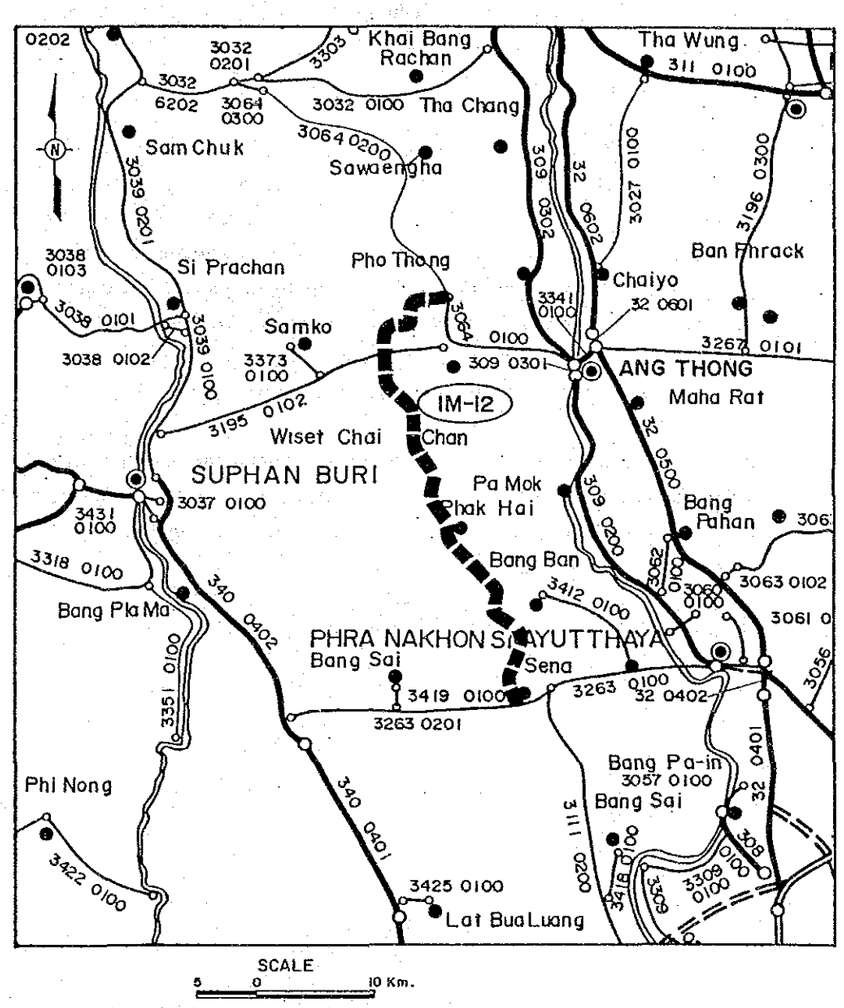
PROJECT IM-12

Item	Description
Changwat	Ang Thong/Ayutthaya
Origin	A. Pho Thong (J.R.3064)
Destination	A. Sena (J.R.3263)
Length	
Total	50.0 km
Improvement Section	50.0 km
DOH Road	-
Others	RID 50.0 km
New Construction Section	-
Surface Type and Condition	SBST Fair/Poor 50.0 km
Terrain	Flat
Traffic (ADT)	
Existing	240
2000	945
2008	1,456
Existing Standard	*
Proposed Standard	F2
Construction Cost	
Financial	178,910 Thousand Baht
Economic	148,821 Thousand Baht
IRR	17.3%
B/C	1.54

Diverted traffic will be expected to increase after improvement.

* Under RID. Paved carriageway width 5 m and road bed width 8 m.

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route extends over Changwat Ang Thong and Changwat Ayutthaya. It originates at the junction with Route 3064 in Amphoe Pho Thong in Changwat Ang Thong and runs southward to end at the junction with Route 3263 in Amphoe Sena in Changwat Ayutthaya. Its total length is 50.0 km.

The road is made on top of the eastern embankment of a large-scale canal throughout its length. The surrounding terrain is flat. The embankment is generally high, reaching 3.0 m in some places. Horizontal alignment is generally fair with some poor sections. There are five adequate permanent bridges, and two narrow concrete bridges requiring widening. Both sides of the road (the western side is across the canal) are well cultivated with paddy. The road has asphaltic pavement except for the last 10-km section, which is of laterite surface. The first 12-km section between Routes 3064 and 3195 has little traffic and is therefore in good condition. The remaining section has more traffic and is in poor condition in places.

This road, upon improvement, will form an alternate route, together with IM-11, to Route 309 and will provide a fast north-south road to the area surrounded by Routes 309 and 340. Traffic can be expected to divert from Route 309 to a certain degree.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-12	RID	1987	70	28	110	0	60	28	14	240

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-12	- 1993	10.06	11.34	5.59	5.96	11.27	8.19	10.41	10.06
	1994 - 2000	6.86	6.25	5.28	7.57	7.06	7.67	34.59	6.86
	2001 - 2008	5.39	5.70	4.99	2.31	4.92	6.18	6.76	5.39

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-12	1.37	1.40	1.23	1.39	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-12	RID	1993	164	73	212	0	158	45	25	513
		2000	164	111	304	0	255	75	200	945
		2008	371	173	450	0	374	121	338	1456

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	50.00	PAVED POOR	GOOD	FAIR	2	0
WITH PROJECT	50.00	PAVED F2	GOOD	FAIR	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	948.	2009.	4739.	0.	3857.	2250.	13339.	27143.
2008	1436.	3129.	7009.	0.	5658.	3630.	22544.	43405.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	240.	611.	3955.	0.	850.	291.	775.	6721.
2008	363.	952.	5849.	0.	1247.	469.	1309.	10188.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1187.	2620.	8694.	0.	4707.	2540.	14114.	33863.
2008	1798.	4080.	12858.	0.	6905.	4099.	23853.	53594.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-12)

Item	Description
Changwat	Ang Thong/Ayutthaya
Origin	A. Pho Thong (J.R.3064)
Destination	A. Sena (J.R.3263)
Length	
Total	50.0 km
Improvement Section	50.0 km
DOH Road	-
Others	RID 50.0 km
New Construction Section	-
Terrain	Flat
Alignment (Hori./Vert.)	Fair/Poor / Good
Formation Width	5.60 m ~ 7.80 m
Embankment Section	
Length	50.0 km
Height	1.00 m ~ 3.00 m
Cut Section	-
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	Fair/Poor 50.0 km
Soil Aggregate	-
Earth	-
Box Culvert	2 sites 20.0 m
Bridge	
Permanent Bridge	5 sites 358.6 m
Narrow Concrete Bridge	2 sites 12.0 m
Wooden Bridge	-
Overflow Section	-
Right of way	Left 20.0 m Right (canal)

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-12 Length = 50.0 km)

Item	Unit	Financial Unit Rate Baht	Quantity	Financial Total Cost 1000 Baht	Economic Cost %	Economic Cost 1000 Baht	Residual Value %	Residual Value 1000 Baht
EARTHWORK					83		90	
Clearing & Grubbing	ha	9,500	30	285				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	-	0				
Embankment (Borrow Pit)	m3	100	522,200	52,220				
Sub Total				52,505		43,579		39,221
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	82,000	14,760				
Subbase (Soil Aggregate)	m3	220	109,400	24,068				
Base (Soil Aggregate)	m3	350	56,200	19,670				
Shoulder (Soil Aggregate)	m3	250	26,400	6,600				
Asphaltic Prime/Tack Coat	m2	12	373,000	4,476				
DBST	m2	40	323,200	12,928				
AC Surfacing	m2	190	-	0				
Sub Total				82,502		68,477		34,239
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	1,255	2,259				
RC Box Culvert (2 x 2.4 x 2.4 Equivalent)	m	20,000	10	200				
RC Bridge (W=7.0 L=10.0 Equivalent)	m	60,000	12	720				
Sub Total				3,179		2,639		1,320
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				138,186		114,695		74,780
Miscellaneous Work ((a) x 7%)	1s			9,673	83	8,029	0	0
CONTRACT AMOUNT (b)				147,859		122,724		74,780
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			14,786		12,272		7,478
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			16,265	85	13,825	0	0
LAND ACQUISITION					100		100	
Highly Developed Land	ha	-	-	0				
Less Developed Land	ha	-	-	0				
Sub Total (e)	1s			0		0		0
PROJECT COST ((b) + (c) + (d) + (e))				178,910		148,821		82,258
AVERAGE COST PER KM				3,578				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

YEAR	COST	BENEFITS			DISCOUNTED(12%)	
	CONST. COST	VOC SAVING	TIME SAVING	TOTAL	COST	BENEFIT
1991	22,050			0	30,979	0
1992	55,125			0	69,149	0
1993	33,075			0	37,044	0
1994		13,003	4,485	17,488	0	15,614
1995		15,360	4,858	20,218	0	16,118
1996		17,716	5,230	22,946	0	16,333
1997		20,073	5,603	25,676	0	16,318
1998		22,430	5,975	28,405	0	16,118
1999		24,786	6,348	31,134	0	15,773
2000		27,143	6,721	33,864	0	15,318
2001	24,077	29,176	7,154	36,330	10,891	14,673
2002		31,208	7,588	38,796	0	13,990
2003		33,241	8,021	41,262	0	13,285
2004		35,274	8,455	43,729	0	12,571
2005		37,307	8,888	46,195	0	11,857
2006		39,340	9,321	48,661	0	11,152
2007		41,373	9,755	51,128	0	10,462
2008	(58,798)	43,405	10,188	53,593	(12,031)	9,791
TOTAL	75,529	430,835	108,589	539,425	136,032	209,373

NET PRESENT VALUE :	73,341
BENEFIT COST RATIO :	1.54
INTERNAL RATE OF RETURN :	17.3%

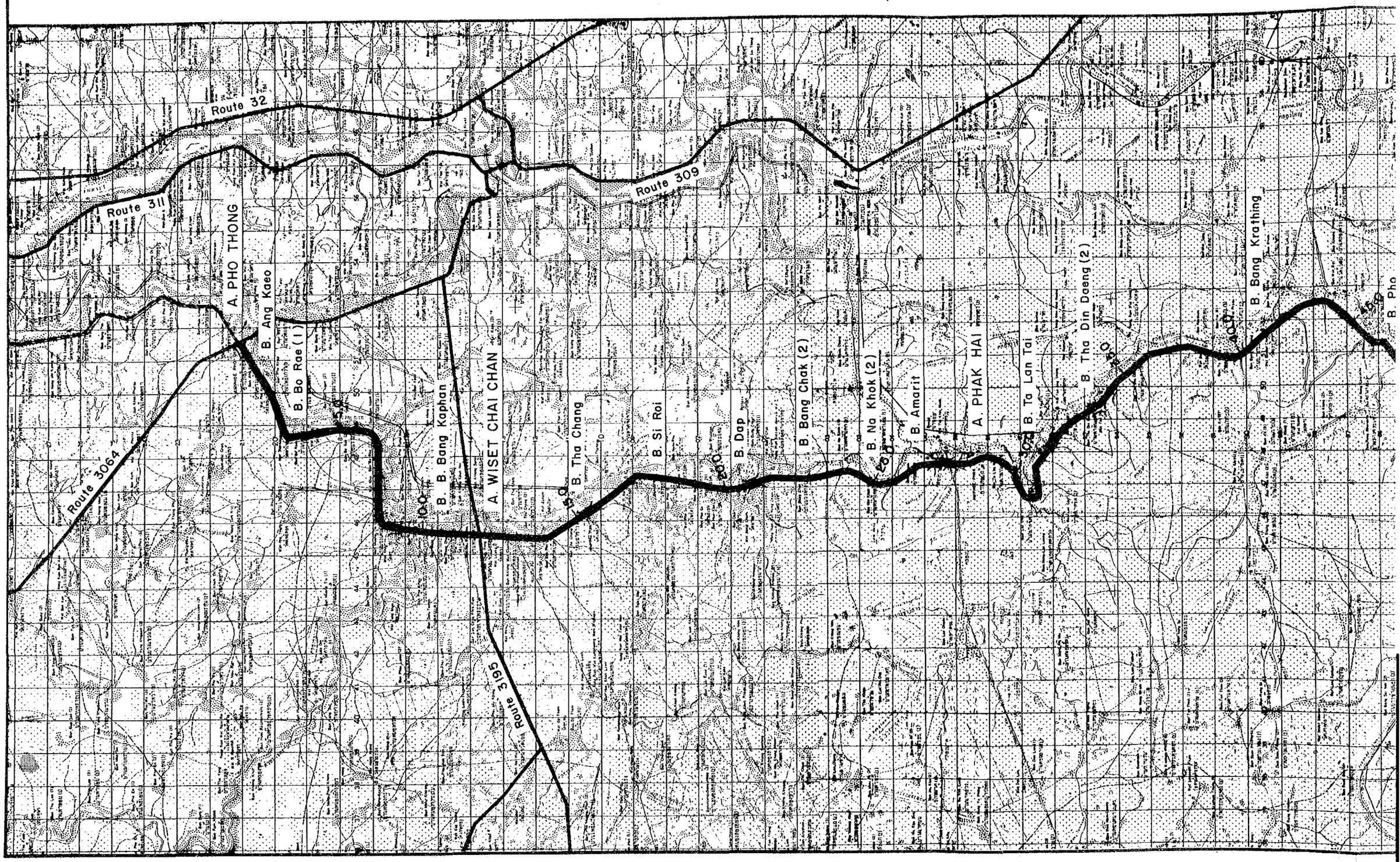
6. DEVELOPMENT AND SOCIAL IMPACTS

Changes in travel speed and perceived accessibility to this area to be realized by the improvement alone would not be sufficiently large enough to alter the agricultural production in this area. However the area's proximity to Ayutthaya would induce more people in this area to visit the city more often, resulting in changes in life style.

PROJECT NO. IM – 12

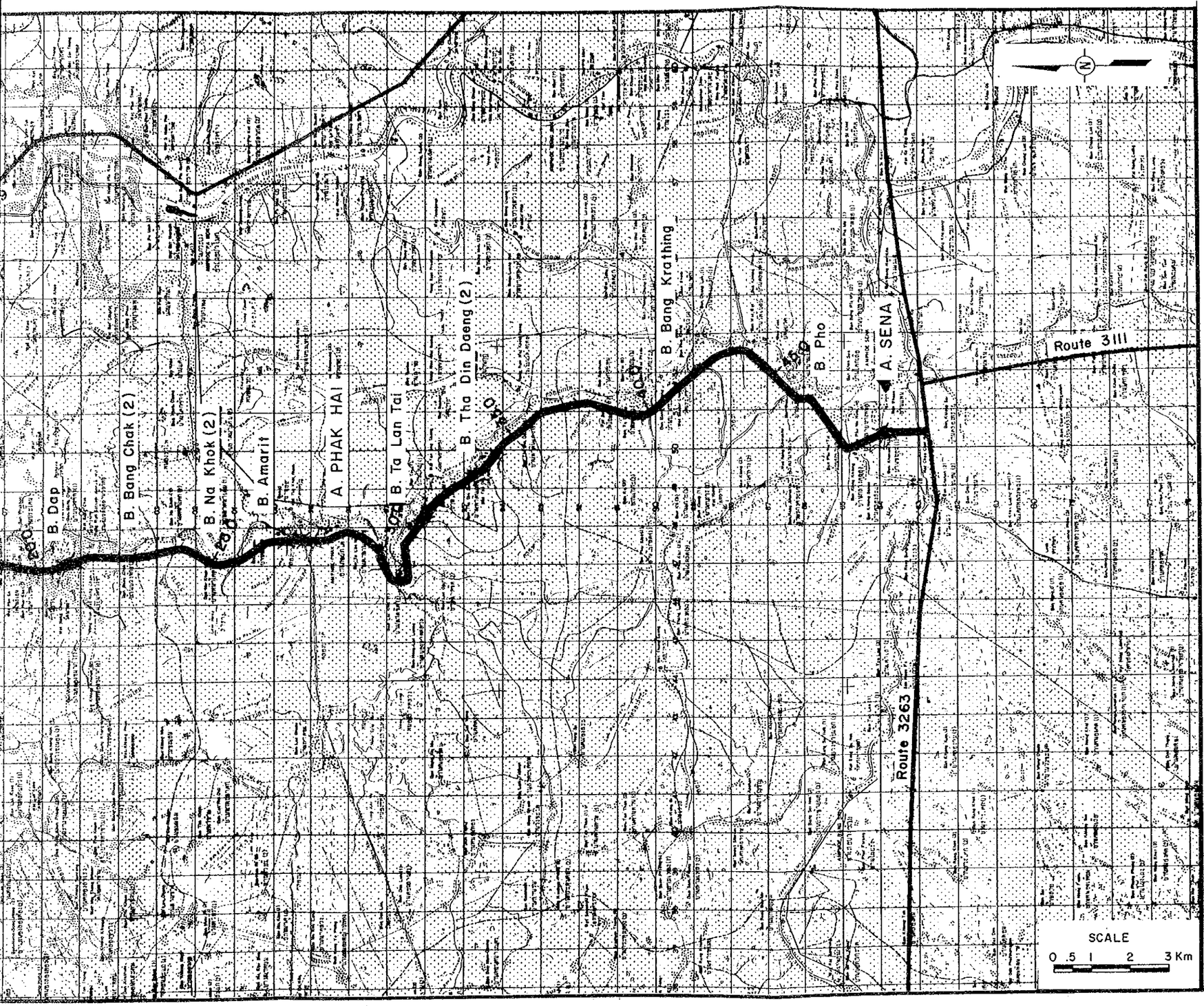
A. PHO THONG – A. SENA
C. ANG THONG, C. AYUTTHAYA

L = 50.00 KM.

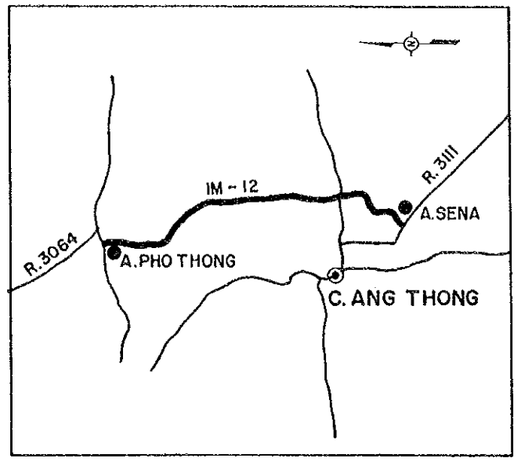


12 A. PHO THONG — A. SENA
C. ANG THONG, C. AYUTTHAYA

L = 50.00 KM.



LOCATION MAP



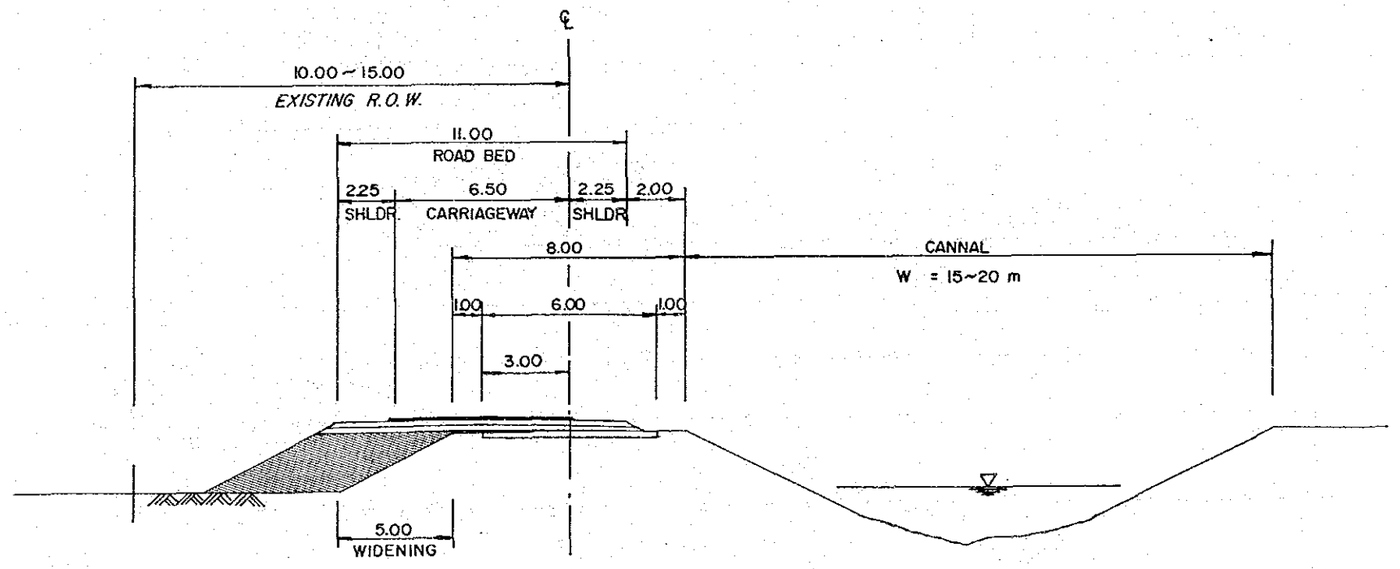
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge
1	0.4	—	C-8.00 x 24.00
2	9.5	—	C-8.00 x 28.00
3	15.7	—	C-6.00 x 4.70
4	20.4	C-7.00 x 8.00	C-5.00 x 8.00
5	28.0	—	C-8.00 x 70.00
6	28.3	—	C-8.00 x 35.00
7	31.6	—	C-8.00 x 40.00
8	33.5	C-7.00 x 4.00	C-4.00 x 4.00
9	34.1	—	C-8.00 x 57.00

LEGEND

- PROPOSED ROUTE (IMPROVEMENT)
- PROPOSED ROUTE (NEW CONSTRUCTION)
- PAVED ROUTE
- UNPAVED ROUTE
- INVENTORY SURVEY ROUTE

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F2)

ROAD INVENTORY (1/2)

PROJECT NO. IM-12 | **ROUTE NO. PHO THONG (J.R. 3064) – PAK HAI – SENA (J.R. 3263)** | **L = 50.0 km**

C. ANG THONG –AYUTTHAYA

STATION (Km)		0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 (C.Ang Thong)
VILLAGE Name of Village		A. PO THONG / T. ANG KAEW / B. KHLONG MAKAM / B. BOR RAE / B. SALA DIN / T. SARN CHAO / B. KHLONG WAT SING / A. WISET CHAI CHAN / B.BANG KRAPAN / B. THA CHANG / B. THAM NOB / B. SIE ROI / T. KHLONG KANAK / B. DARB / B. BANG CHAK / B. NA KHOK / B. AMMARIT / A. PAK HAI
TERRAIN		Flat
CROSS SECTION	Formation Width (m)	5.60 | 5.90
	Embankment Height (m)	2.50 | 3.00 | 2.50 | 1.50 | 2.00 | 2.50 | 3.00 | 2.50
	Cutting Depth (m)	
SURFACE	Type/Length (km)	Asphaltic Pavement
	Condition	Fair | Poor | Very Poor | Fair
FLOODING	Overflow Length (km)/Height (m)	
LAND USE	Left	Paddy
	Right	
BOX CULVERT & BRIDGE	Station (km)	0+400 / 9+500 / 15+700 / 20+400 / 28+000 / 28+300
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length	C-Br. 7.90(1.10)x24.00 / C-Br. 8.00(1.10)x27.90 / C-Br. 6.00x4.70 / C-Br. 4.90x8.00 / C-Br. 8.00(1.00)x70.00 / C-Br. 8.00(1.00)x35.00
RIGHT OF WAY (m) (Left/Right)		18.80 (Half Left) | 24.70 | 45.00
ALIGNMENT	Horizontal	Good | Fair | Good | Poor | Good | P. | Good | Poor | Good | Poor
	Vertical	Good
ROUTE NO., AGENCIES		

PROJECT NO. IM-12

ROAD INVENTORY (2/2)

ROUTE NO. PHO THONG(J.R. 3064) – PAK HAI – SENA (J.R. 3263)

C. ANG THONG –AYUTTHAYA

L = 50.0 km

STATION (Km)		30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60

Item	Sub-item	Entries (left to right along stations)					
VILLAGE	Name of Village	A. Pak Hai, B. Lan Chit, B. Talan Tai, T.Tha Din Dang, B. Tai Wat	T.Ban Kra Tum	B. Bang Kratim, T. Hua Wiang	B. Po	A. Sena	
TERRAIN		Flat					
CROSS SECTION	Formation Width (m)	6.00	5.80	5.70	7.80		
	Embankment Height (m)	3.00	2.50	3.00	2.50	3.00	2.50
	Cutting Depth (m)						
SURFACE	Type/Length (km)	Asphaltic Pavement	Laterite				
	Condition	Fair	Poor	Fair			
FLOODING	Overflow Length (km)/Height (m)						
LAND USE	Left	Paddy					
	Right	Paddy					
BOX CULVERT & BRIDGE	Station (km)	31+000	31+600	32+300	33+500	34+100	
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length Box - Width - Height - Length	C-Box 2.80x3.00x10.00	C-Br.7.70(1.00)x40.00	C-Box 2.80x3.00x10.00	C-Br.4.00x4.00	C-Br.8.10(1.00)x57.00	
RIGHT OF WAY (m) (Left/Right)		70.00	50.00				
ALIGNMENT	Horizontal	Poor	Fair	Poor			
	Vertical	Good					
ROUTE NO., AGENCIES							

PROJECT IM - 13

Changwat : Ayutthaya

A. Bang Pa - in - C. Ayutthaya

Length : 16.20 km

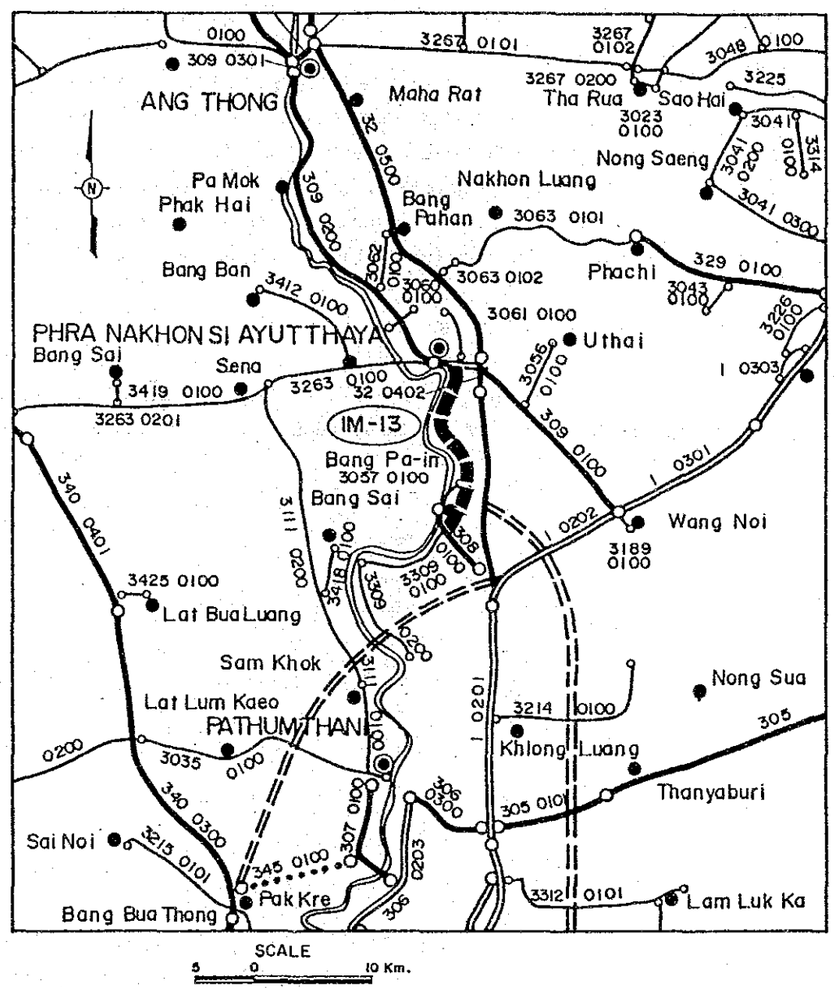
SUMMARY

PROJECT IM-13

Item	Description
Changwat	Ayutthaya
Origin	A. Bang Pa-in (J.R.308)
Destination	C. Ayutthaya (J.R.3059)
Length	
Total	16.2 km
Improvement Section	16.2 km
DOH Road	-
Others	PWD 16.2 km
New Construction Section	-
Surface Type and Condition	SBST Fair 1.0 km S/A Fair 15.2 km
Terrain	Flat
Traffic (ADT)	
Existing	200
2000	1,071
2008	1,577
Existing Standard	*
Proposed Standard	F3
Construction Cost	
Financial	13,193 Thousand Baht
Economic	10,975 Thousand Baht
IRR	38.5 %
B/C	3.38

* PWD plans to carry out pavement construction for a 5 m carriage with a roadbed width of 8 m.

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route lies in Changwat Ayutthaya. It originates at the junction with Route 308 in Amphoe Bang Pa-In, runs northward paralleling the Chao Phya River and ends at the junction with Route 3059 in Muang Ayutthaya. Its total length is 16.2 km.

The road is currently under the jurisdiction of PWD. The last 1-km section is applied with SBST. The terrain is flat, and the alignment of the existing road is fair. There are seven permanent bridges along the road. Both sides of the first 2-km section, which runs along the eastern edge of Bang Pa-In town, are paddy fields. The eastern side of the remaining section is well cultivated by paddy for the entire length, but the western side faces the river. The current use of the existing road appears to be to serve residents in the area along the road.

The surface condition of the existing road is fair at present.

Upon completion of the improvement, however, the first 2-km section could serve as a bypass road for the town of Bang Pa-In, and the remaining section could be used for tourist traffic visiting Ayutthaya and Bang Pa-In.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-13	PWD	1986	110	7	48	0	100	18	27	200

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-13	- 1993	5.96	6.15	6.53	5.38	5.62	6.85	6.36	5.96
	1994 - 2000	5.39	5.65	6.31	5.30	4.80	5.17	4.62	5.39
	2001 - 2008	4.93	5.56	4.50	4.55	4.63	4.68	3.73	4.93

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-13	1.11	1.11	1.07	1.11	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-13	PWD	1993	180	302	142	59	163	29	42	737
		2000	180	444	218	84	226	41	58	1071
		2008	383	684	310	121	325	59	78	1577

Note: Diverted traffic from Route 32 was counted on IM-13.

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	16.20	PAVED FAIR	FAIR	FAIR	0	0
WITH PROJECT	16.20	PAVED F3	FAIR	FAIR	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	165.	1891.	721.	604.	670.	257.	642.	4950.
2008	243.	2913.	1025.	867.	963.	370.	863.	7245.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	66.	664.	774.	1111.	206.	39.	55.	2916.
2008	98.	1023.	1102.	1595.	295.	56.	75.	4244.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	232.	2555.	1495.	1715.	876.	296.	697.	7866.
2008	341.	3936.	2127.	2462.	1259.	426.	938.	11489.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-13)

Item	Description
Changwat	Ayutthaya
Origin	A. Bang Pa-in (J.R.308)
Destination	C. Ayutthaya (J.R.3059)
Length	
Total	16.2 km
Improvement Section	16.2 km
DOH Road	-
Others	PWD 16.2 km
New Construction Section	-
Terrain	Flat
Alignment (Hori./Vert.)	Fair/Fair
Formation Width	6.9 ~ 6.5 m
Embankment Section	
Length	16.2 km
Height	1.0 m ~ 2.0 m
Cut Section	
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	Fair 1.0 km
Soil Aggregate	Fair 15.2 km
Earth	
Box Culvert	
Bridge	
Permanent Bridge	1 site 214 m
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	30.0 m

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-13 Length = 16.2 km)

Item	Unit	Financial Unit Rate Baht	Quantity	Financial Total Cost 1000 Baht	Economic Cost %	Economic Cost 1000 Baht	Residual Value %	Residual Value 1000 Baht
EARTHWORK					83		90	
Clearing & Grubbing	ha	9,500	3	29				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	48,000	1,920				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				1,949		1,618		1,456
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	4,800	864				
Subbase (Soil Aggregate)	m3	220	6,400	1,408				
Base (Soil Aggregate)	m3	350	4,800	1,680				
Shoulder (Soil Aggregate)	m3	250	4,800	1,200				
Asphaltic Prime/Tack Coat	m2	12	32,000	384				
DBST	m2	40	16,000	640				
AC Surfacing	m2	190	-	0				
Sub Total				6,176		5,126		2,563
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	1,148	2,066				
RC Box Culvert (2 x 2.4 x 2.4 Equivalent)	m	20,000	-	0				
RC Bridge (W=7.0 L=10.0 Equivalent)	m	60,000	-	0				
Sub Total				2,066		1,715		858
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				10,191		8,459		4,877
Miscellaneous Work ((a) x 7%)	1s			713	83	592	0	0
CONTRACT AMOUNT (b)				10,904		9,051		4,877
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			1,090		905		488
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			1,199	85	1,019	0	0
LAND ACQUISITION					100		100	
Highly Developed Land	ha	-	-	0				
Less Developed Land	ha	-	-	0				
Sub Total (e)	1s			0		0		0
PROJECT COST ((b) + (c) + (d) + (e))				13,193		10,975		5,365
AVERAGE COST PER KM				814				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

	COST	BENEFITS			DISCOUNTED(12%)	
YEAR	CONST. COST	VOC SAVING	TIME SAVING	TOTAL	COST	BENEFIT
1991	0			0	0	0
1992	2,195			0	2,753	0
1993	8,780			0	9,834	0
1994		3,641	2,127	5,768	0	5,150
1995		3,859	2,259	6,118	0	4,877
1996		4,077	2,390	6,467	0	4,603
1997		4,296	2,522	6,818	0	4,333
1998		4,514	2,653	7,167	0	4,067
1999		4,732	2,785	7,517	0	3,808
2000		4,950	2,916	7,866	0	3,558
2001	8,684	5,237	3,082	8,319	3,928	3,360
2002		5,524	3,248	8,772	0	3,163
2003		5,811	3,414	9,225	0	2,970
2004		6,097	3,580	9,677	0	2,782
2005		6,384	3,746	10,130	0	2,600
2006		6,671	3,912	10,583	0	2,425
2007		6,958	4,078	11,036	0	2,258
2008	(5,365)	7,245	4,244	11,489	(1,098)	2,099
TOTAL	14,294	79,996	46,955	126,952	15,417	52,053

NET PRESENT VALUE :	36,636
BENEFIT COST RATIO :	3.38
INTERNAL RATE OF RETURN :	38.5%

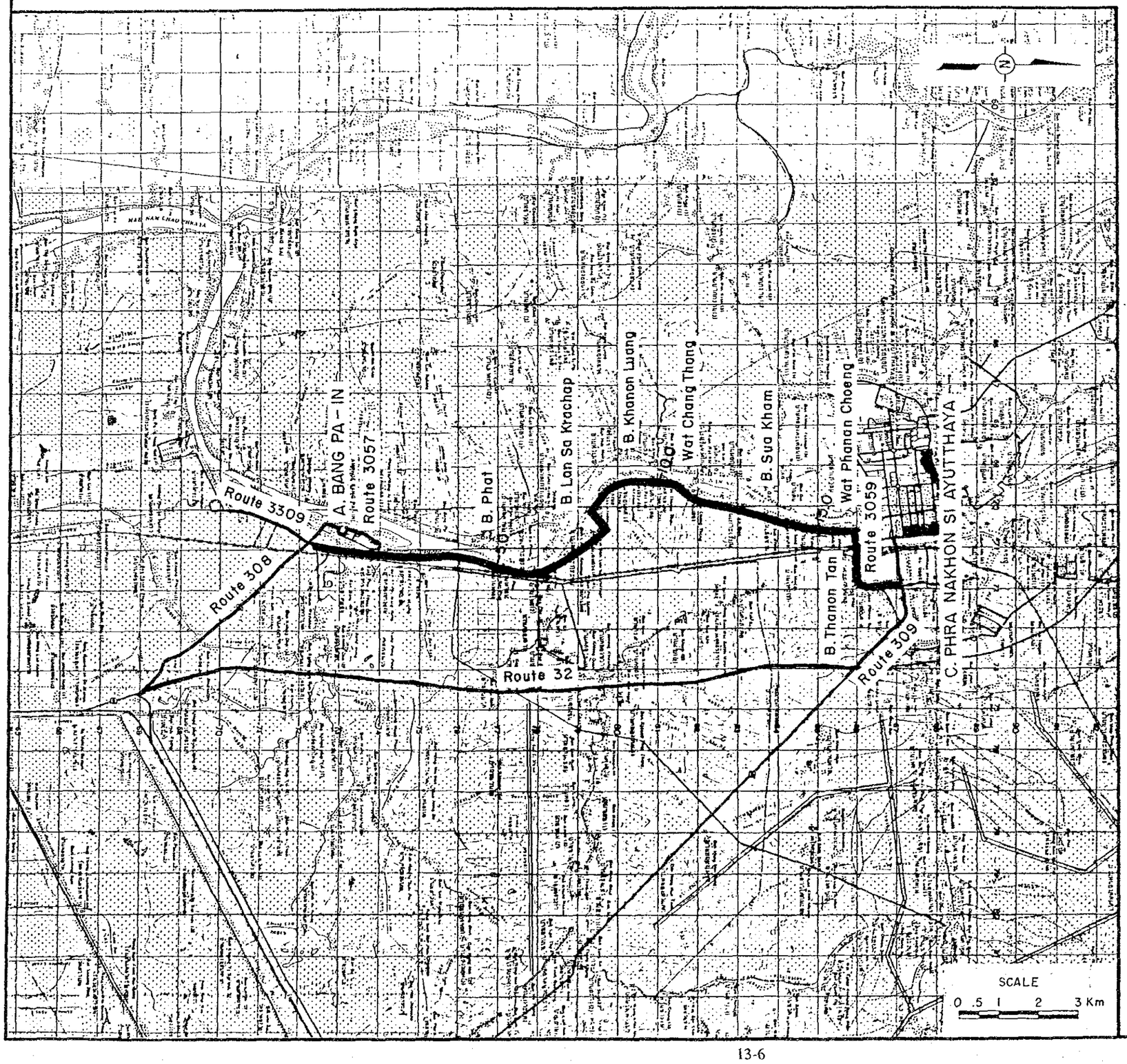
6. DEVELOPMENT AND SOCIAL IMPACTS

After the improvement its proximity to the river and being the fastest route between the two big tourist attractions of Ayutthaya and Bang Pa-In would induce some tourism oriented development, such as rest areas, restaurants, gas stations, etc. Such development would not only generate employment but considerable social impact on the surrounding communities. Impact on agricultural production would probably be minor.

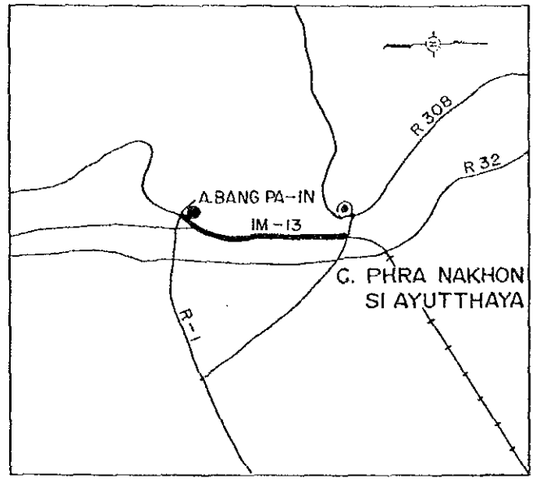
PROJECT NO. IM – 13

A. BANG PA – IN – C. AYUTTHAYA
C. AYUTTHAYA

L = 16.20 KM.



LOCATION MAP



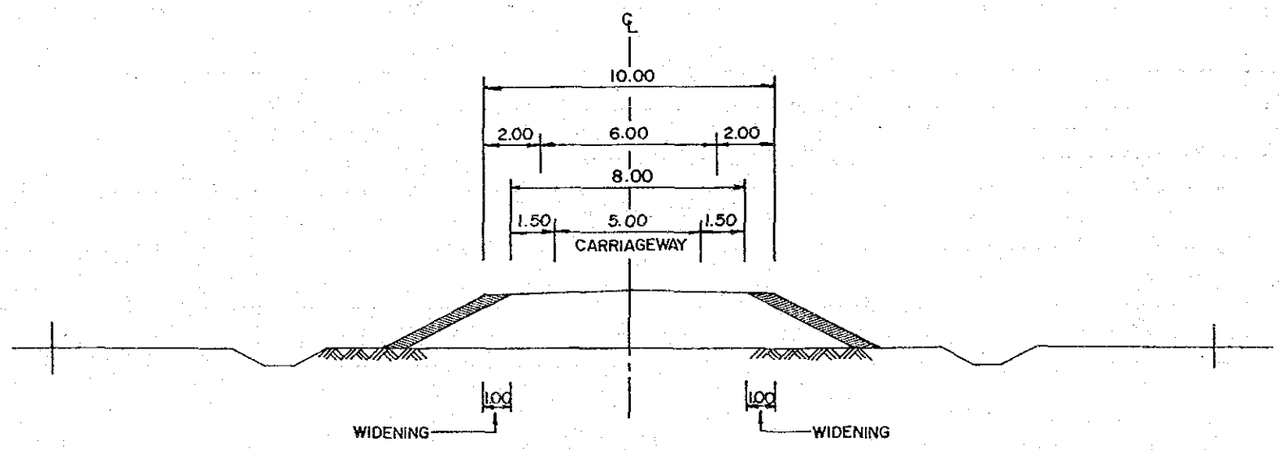
BRIDGE LIST

No	Station Km.	Proposed Bridge	Existing Bridge
1	0.6	—	C–7.00x30.00
2	0.9	—	C–7.00x34.00
3	1.7	—	C–7.00x26.00
4	2.8	—	C–7.00x40.00
5	4.9	—	C–7.00x10.00
6	6.3	—	C–7.00x56.00
7	15.5	—	C–8.00x18.00

LEGEND

- PROPOSED ROUTE (IMPROVEMENT)
- PROPOSED ROUTE (NEW CONSTRUCTION)
- PAVED ROUTE
- UNPAVED ROUTE
- INVENTORY SURVEY ROUTE

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY
WIDENING SECTION (PWD 5/8 → CLASS F3)

ROAD INVENTORY

PROJECT NO. IM-13 | **ROUTE NO. PWD BANG PA-IN (J.R. 308) – AYUTTHAYA (J.R. 3059)** | **L = 16.20 km**

C. AYUTTHAYA

STATION (Km)		0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 Sta. 2+200 Sta. 10.20 Sta. 16.20
VILLAGE Name of Village		+ Intersection with Rt. No. 3057; B. Len; B.Phat; B. Pho; B. Len Srakachap; Borrow Pit (for embankment material); B. Ko Rain; B. Thoong Mo; end of route
TERRAIN		Flat — Sta.15.20
CROSS SECTION	Formation Width (m)	15.30 — 6.50 — 6.00
	Embankment Height (m)	1.50 — 2.00 — 1.50 — 1.0
	Cutting Depth (m)	Sta.14.8
SURFACE	Type/Length (km)	Gravel — SBST
	Condition	Fair
FLOODING	Overflow Length (km)/Height (m)	
LAND USE	Left	Paddy
	Right	Swamp Channel — Paddy
BOX CULVERT & BRIDGE	Station (km)	
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length	Sta. 0+600: Length 30.00, Width 7.00, Walkway Width 0.30, RC Sta. 0+900: Length 34.00, Width 7.00, Walkway Width 0.30, RC Sta. 1+700: Length 26.00, Width 7.00, Walkway Width 0.30, RC Sta. 2+800: Length 40.00, Width 7.00, Walkway Width 0.70, RC Sta. 4+900: Length 10.00, Width 7.00, Walkway Width 0.70, RC Sta. 6+300: Length 56.00, Width 7.00, Walkway Width 0.70, RC Sta. 15+500: Length 18.00, Width 8.00, Walkway Width 1.00, RC
RIGHT OF WAY (m) (Left/Right)		15.00/each — Sta. 8+600 B — Sta. 11+900 B
ALIGNMENT	Horizontal	
	Vertical	
ROUTE NO., AGENCIES		PWD

PROJECT IM - 14

Changwat : Ayutthaya, Pathum Thani

A. Wang Noi - A. Thanyaburi

Length : 24.40 km

SUMMARY

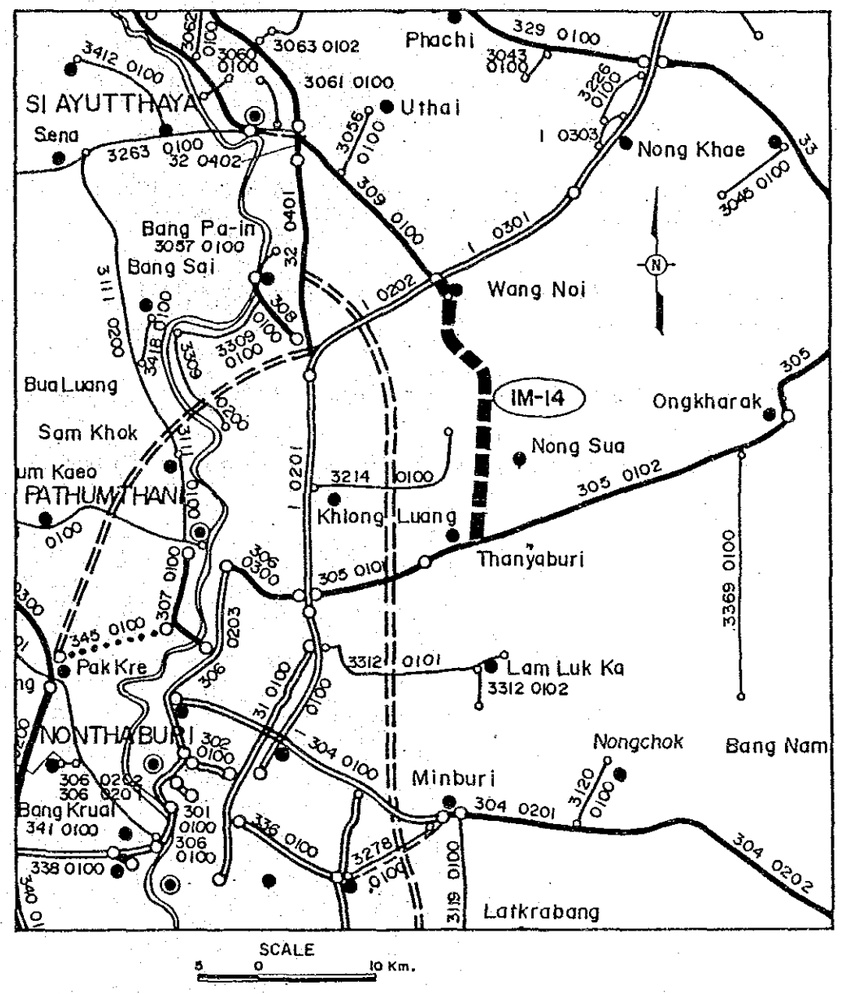
PROJECT IM-14

Item	Description
Changwat	Ayutthaya/Phathom Thani
Origin	A. Wang Noi (J.R.1, J.R.309)
Destination	A. Thanyaburi (J.R.305)
Length	
Total	24.4 km
Improvement Section	19.9 km
DOH Road	-
Others	19.9 km
New Construction Section	4.5 km
Surface Type and Condition	SBST Poor S/A
Terrain	Flat
Traffic (ADT)	
Existing	196
2000	443
2008	631
Existing Standard	F6
Proposed Standard	*
Construction Cost	
Financial	69,706 Thousand Baht
Economic	58,589 Thousand Baht
IRR	23.0 %
B/C	2.03

* Roadbed F4 standards but pavement width 6.5 m (F2 standards).

Diverted traffic will be expected to increase after improvement.

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route lies in Changwat Pathum Thani. It originates at the intersection of Routes 1 and 309 in Amphoe Wang Noi and runs southward to end at the junction with Route 305 in Amphoe Thanyaburi, with a total length of 24.4 km.

The proposed route follows an existing road except for a section south of Khlong Ruphiphat where a shortcut is proposed to avoid an undesirable horizontal alignment. Thus the proposed route is 4.4 km shorter than the existing road length.

The route runs along two klongs for the most part. Houses are densely built along the khlongs, and it would be difficult to widen the existing road.

Except for two short sections (1 km each) at both ends, the surface is of laterite and its condition is generally poor.

The area is well cultivated with paddy throughout the area along the road.

There are two concrete bridges, one 40 m in length, but narrow. The other, 26 m in length, is adequate.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-14	RURAL	1988	76	11	5	0	120	16	44	196

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-14	- 1993	4.11	4.78	3.92	4.62	4.08	4.11	3.55	4.11
	1994 - 2000	5.03	5.67	5.91	5.08	4.62	4.86	4.42	5.03
	2001 - 2008	4.87	5.69	5.69	4.78	4.47	4.28	4.18	4.87

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-14	1.47	1.50	1.29	1.49	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-14	RURAL	1993	125	21	9	0	218	20	52	320
		2000	125	31	14	0	300	28	70	443
		2008	258	48	21	0	426	39	97	631

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	28.80	LATERITE POOR	GOOD	FAIR	2	0
WITH PROJECT	24.40	PAVED F4(F2)	GOOD	GOOD	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1254.	921.	353.	0.	7006.	1708.	6818.	18060.
2008	1838.	1434.	537.	0.	9950.	2380.	9448.	25587.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	271.	270.	284.	0.	1585.	177.	442.	3029.
2008	397.	420.	432.	0.	2252.	246.	613.	4360.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1525.	1190.	637.	0.	8591.	1885.	7260.	21089.
2008	2235.	1854.	969.	0.	12202.	2626.	10061.	29947.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-14)

Item	Description
Changwat	Ayutthaya/Phathum Thani
Origin	A. Wang Noi (J.R.1, J.R.309)
Destination	A. Thanyaburi (J.R.305)
Length	
Total	24.4 km
Improvement Section	19.9 km
DOH Road	-
Others	19.9 km
New Construction Section	4.5 km
Terrain	Flat
Alignment (Hori./Vert.)	Fair//Good
Formation Width	3.50 m ~ 6.50 m
Embankment Section	
Length	24.4 km
Height	0.5 m ~ 2.50 m
Cut Section	
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	-
Soil Aggregate	Poor
Earth	-
Box Culvert	-
Bridge	
Permanent Bridge	2 sites 66.0 m
Narrow Concrete Bridge	1 site 42.0 m
Wooden Bridge	-
Overflow Section	-
Right of way	10.0 m ~ 20.0 m

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-14 Length = 24.4 km)

Item	Unit	Financial Unit Rate Baht	Quantity	Financial Total Cost 1000 Baht	Economic Cost %	Economic Cost 1000 Baht	Residual Value %	Residual Value 1000 Baht
EARTHWORK					83		90	
Clearing & Grubbing	ha	9,500	12	114				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	247,100	9,884				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				9,998		8,298		7,468
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	32,800	5,904				
Subbase (Soil Aggregate)	m3	220	43,700	9,614				
Base (Soil Aggregate)	m3	350	27,400	9,590				
Shoulder (Soil Aggregate)	m3	250	7,500	1,875				
Asphaltic Prime/Tack Coat	m2	12	182,000	2,184				
DBST	m2	40	157,900	6,316				
AC Surfacing	m2	190	-	0				
Sub Total				35,483		29,451		14,726
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	1,599	2,878				
RC Box Culvert (2 x 2.4 x 2.4 Equivalent)	m	20,000	9	180				
RC Bridge (W=7.0 L=10.0 Equivalent)	m	60,000	42	2,520				
Sub Total				5,578		4,630		2,315
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				51,059		42,379		24,509
Miscellaneous Work ((a) x 7%)	ls			3,574	83	2,966	0	0
CONTRACT AMOUNT (b)				54,633		45,345		24,509
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	ls			5,463		4,535		2,451
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	ls			6,010	85	5,109	0	0
LAND ACQUISITION					100		100	
Highly Developed Land	ha	200,000	18	3,600				
Less Developed Land	ha	-	-	0				
Sub Total (e)	ls			3,600		3,600		3,600
PROJECT COST ((b) + (c) + (d) + (e))				69,706		58,589		30,560
AVERAGE COST PER KM				2,857				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

	COST	BENEFITS			DISCOUNTED(12%)	
YEAR	CONST. COST	VOC SAVING	TIME SAVING	TOTAL	COST	BENEFIT
1991	0			0	0	0
1992	23,436			0	29,398	0
1993	35,153			0	39,371	0
1994		13,825	2,290	16,115	0	14,388
1995		14,531	2,413	16,944	0	13,508
1996		15,237	2,536	17,773	0	12,650
1997		15,943	2,659	18,602	0	11,822
1998		16,648	2,782	19,430	0	11,025
1999		17,354	2,906	20,260	0	10,264
2000		18,060	3,029	21,089	0	9,540
2001	14,264	19,001	3,195	22,196	6,452	8,965
2002		19,942	3,362	23,304	0	8,404
2003		20,883	3,528	24,411	0	7,860
2004		21,824	3,694	25,518	0	7,336
2005		22,765	3,861	26,626	0	6,834
2006		23,705	4,027	27,732	0	6,355
2007		24,646	4,193	28,839	0	5,901
2008	(30,560)	25,587	4,360	29,947	(6,253)	5,471
TOTAL	42,293	289,950	48,834	338,786	68,968	140,323

NET PRESENT VALUE :	71,355
BENEFIT COST RATIO :	2.03
INTERNAL RATE OF RETURN :	23.0%

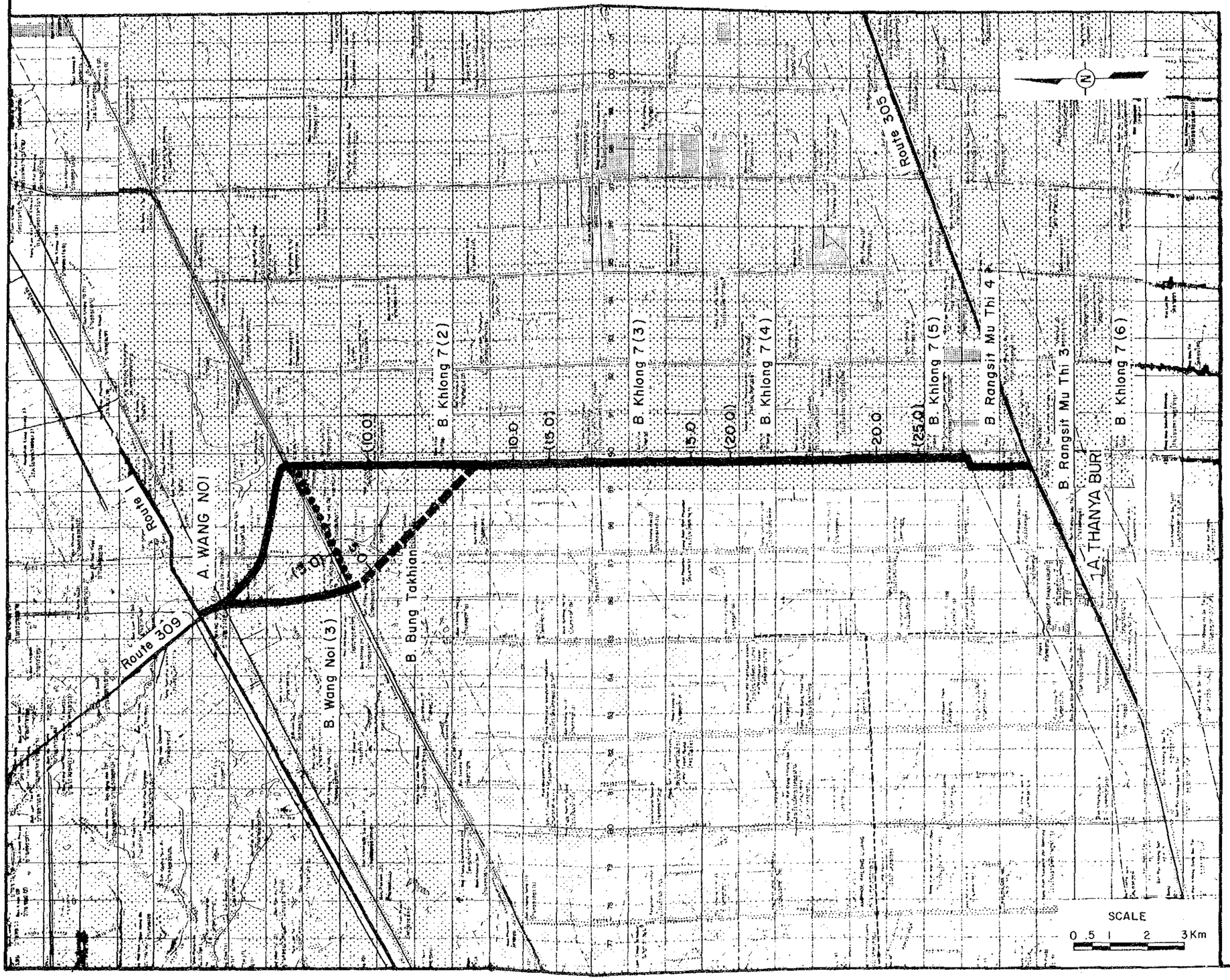
6. DEVELOPMENT AND SOCIAL IMPACTS

It is possible that greatly improved accessibility would induce farmers along the road to diversity their production such as suburban agriculture like vegetable gardening, particularly considering the access to markets in Bangkok. In any case easier access to urban services in Bangkok in particular would result in changes in life patterns of the residents in the area.

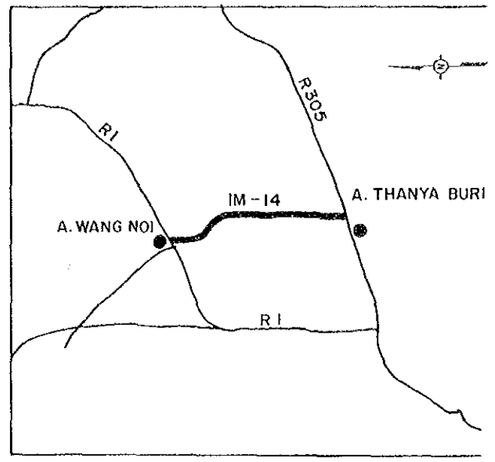
PROJECT NO. IM - 14

A. WANG NOI - A. THANYA BURI
C. AYUTTHAYA, C. PHATHUM THANI

L = 24.40 KM.



LOCATION MAP



BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridg
1	0.4	—	C-7.00x26.00
2	0.7	C-7.00x42.00	C-5.00x42.00
3	4.0	—	C-7.00x40.00

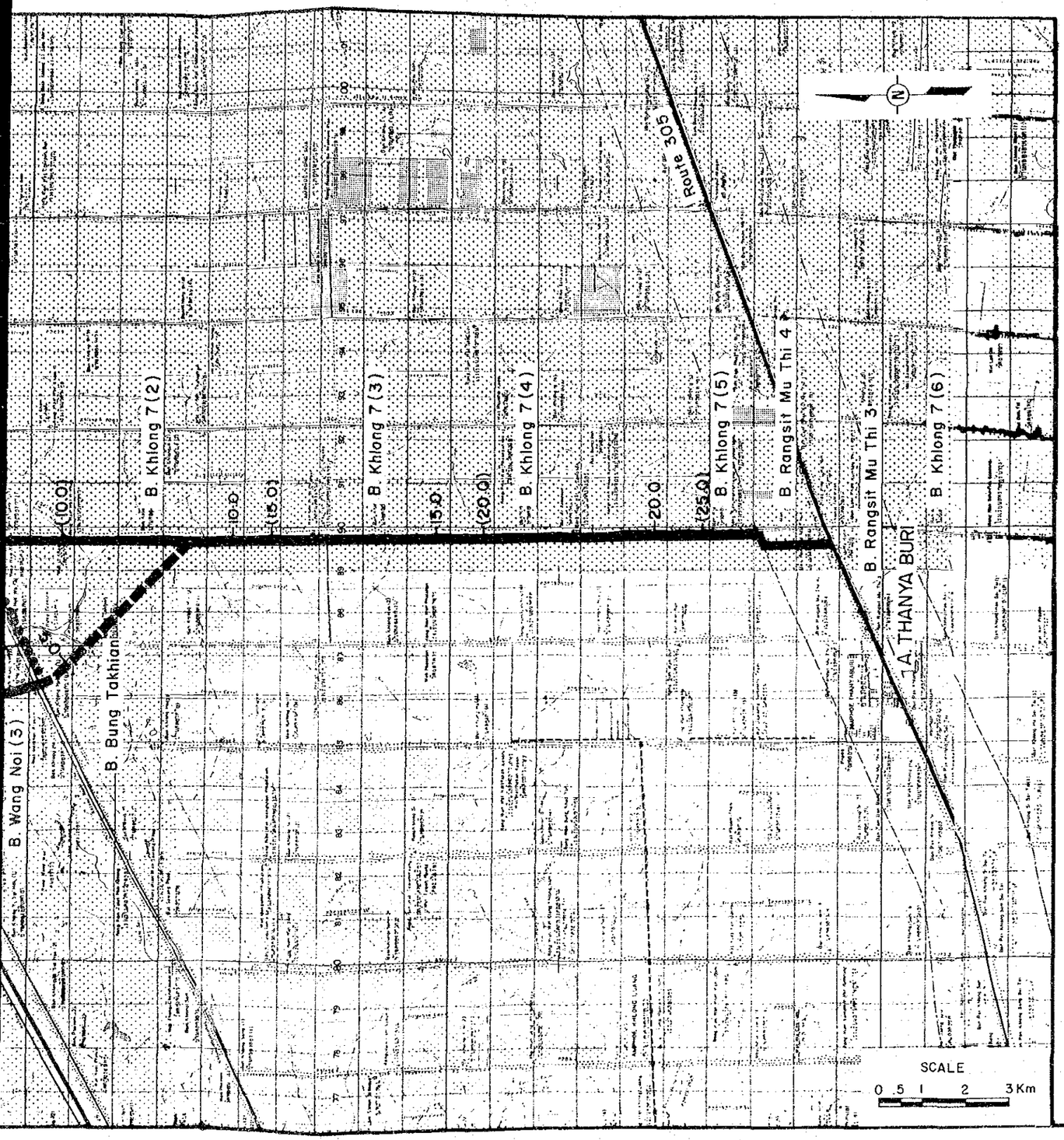
LEGEND

- PROPOSED ROUTE (IMPROVEMENT)
- PROPOSED ROUTE (NEW CONSTRUC
- PAVED ROUTE
- UNPAVED ROUTE
- INVENTORY SURVEY ROUTE

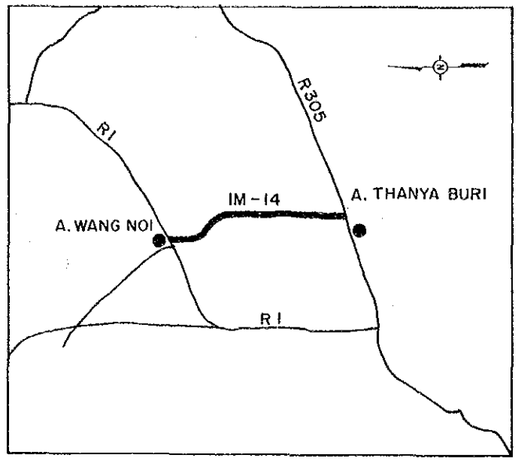
NO. IM – 14

A. WANG NOI – A. THANYA BURI
C. AYUTTHAYA, C. PHATHUM THANI

L = 24.40 KM.



LOCATION MAP



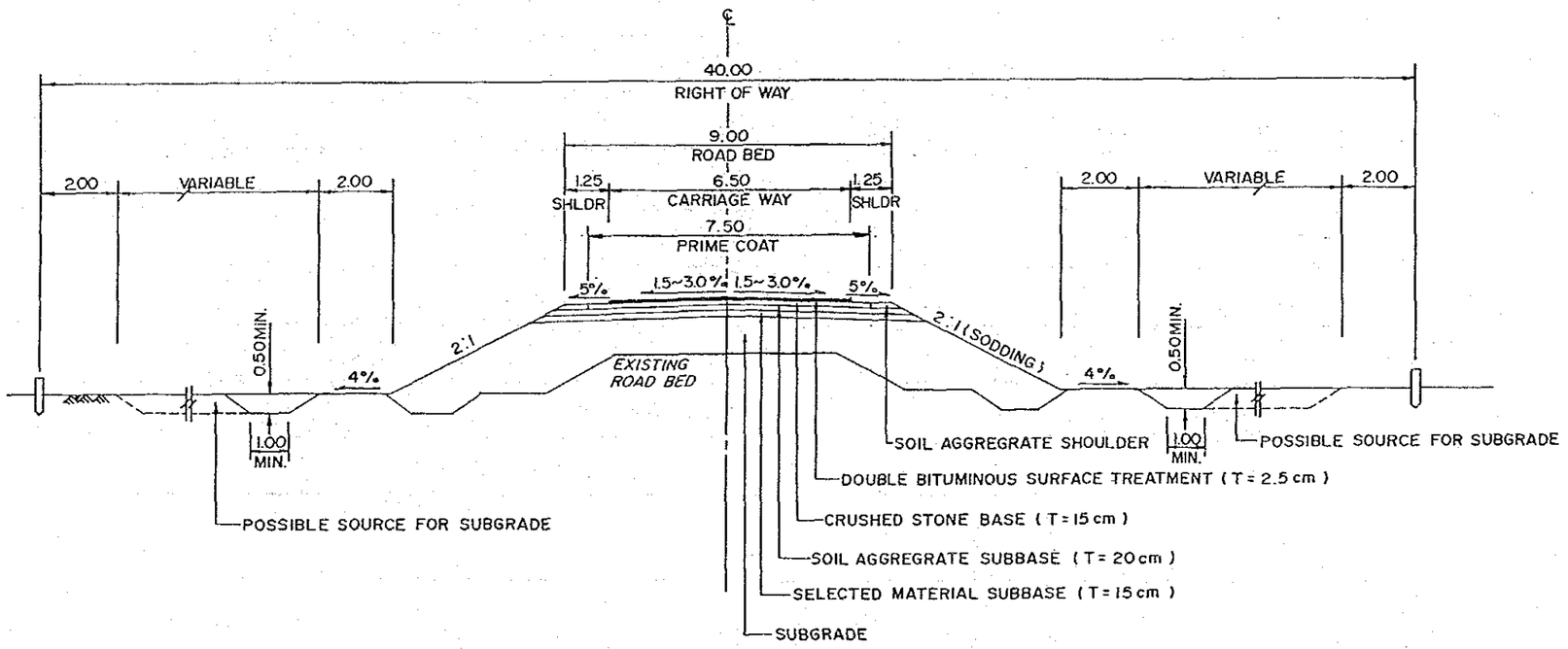
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge
1	0.4	—	C–7.00x26.00
2	0.7	C–7.00x42.00	C–5.00x42.00
3	4.0	—	C–7.00x40.00

LEGEND

- PROPOSED ROUTE (IMPROVEMENT)
- PROPOSED ROUTE (NEW CONSTRUCTION)
- PAVED ROUTE
- UNPAVED ROUTE
- INVENTORY SURVEY ROUTE

TYPICAL CROSS SECTION



PROVINCIAL HGIHWAY (CLASS F4 , PAVED F2)

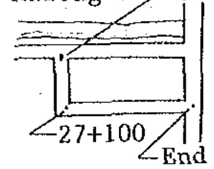
PROJECT NO. IM-14

ROAD INVENTORY

ROUTE NO. A. WANG NOI (J.R. 1, J.R. 309) – A. THANYABURI (J.R. 305)

C. AYUTTHAYA/PATHUM THANI

L = 28.8 km

STATION (Km)		0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 28+800, 30
VILLAGE Name of Village		A.Wang Noi; 8+000 Khlong 7  ; Khlong 7 26+800, 27+100, End Point 28+800 
TERRAIN		Flat
CROSS SECTION	Formation Width (m)	5.00 / 4.00 / 3.50 / 5.00 / 4.50 / 6.50 / 4.50
	Embankment Height (m)	2.50 / 1.50 / 2.00 / 1.50 / 0.50 / 1.20 / 0.80
	Cutting Depth (m)	
SURFACE	Type/Length (km)	SBST / Laterite / SBST
	Condition	Fair / Poor / Fair
FLOODING	Overflow Length (km)/Height (m)	
LAND USE	Left	Paddy / Canal (Khlong 7) / Paddy
	Right	Paddy / Paddy
BOX CULVERT & BRIDGE	Station (km)	0+400 / 0+700 / 4+000 / 5+100 / 6+600
	Dimension (m) Bridge - Conc. or wooden - Width - (Side walk) - Length Box - width - Height - Length	C-Br. 7.00x26.00 / C-Br. 5.00(1.20)x42.00 / C-Br. 7.00x40.00 / C-Box 4.0x4.00x4.00 / C-Br. 3.50x4.00
RIGHT OF WAY (m) (Left/Right)		20.0 (10.0/10.0) / R = 10.0, L = Canal / 20.0
ALIGNMENT	Horizontal	Fair
	Vertical	Good
ROUTE NO., AGENCIES		

New const. L = 4.5 km

PROJECT IM - 15

Changwat : Phathum Thani, Bangkok

B. Klong Luang - A. Min Buri

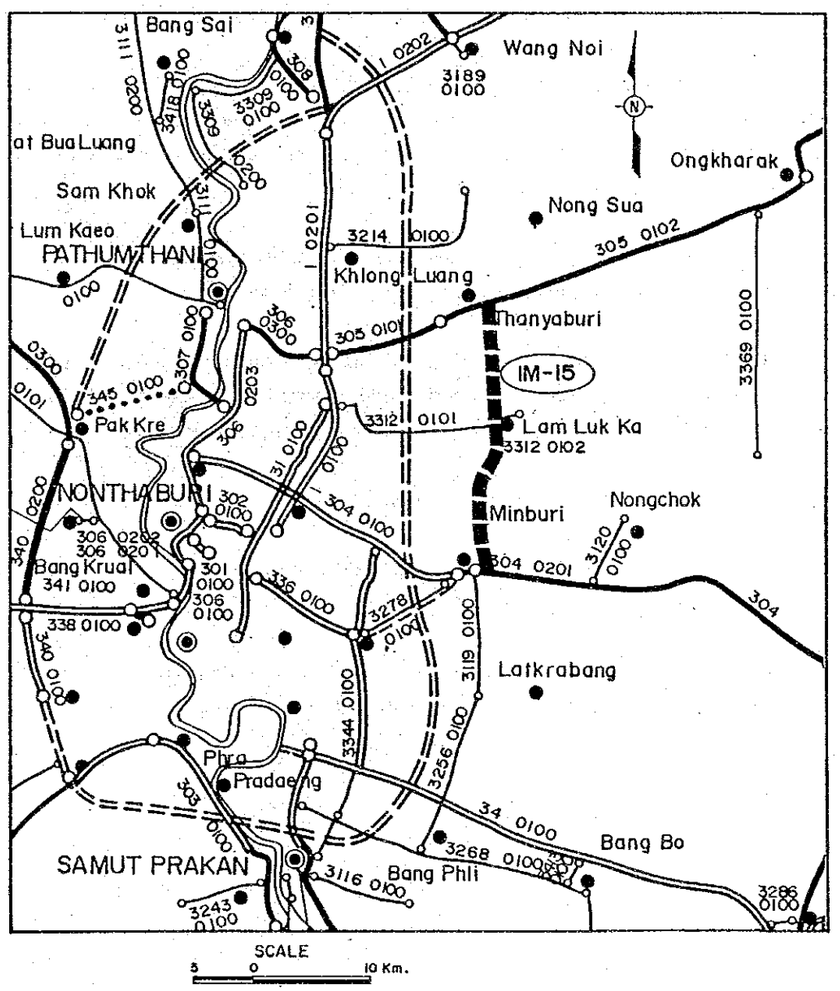
Length : 24.30 km

SUMMARY

PROJECT IM-15

Item	Description
Changwat	Pathum Thani/Bangkok
Origin	B. Klong Luang (J.R.305)
Destination	A. Min Buri (J.R.304)
Length	
Total	24.3 km
Improvement Section	24.3 km
DOH Road	-
Others	24.3 km
New Construction Section	-
Surface Type and Condition	SBST Fair 9.0 km S/A Poor 15.3 km
Terrain	Flat
Traffic (ADT)	
Existing	1,120
2000	2,567
2008	3,779
Existing Standard	Laterite, Substandard
Proposed Standard	F2
Construction Cost	
Financial	62,268 Thousand Baht
Economic	51,796 Thousand Baht
IRR	28.0 %
B/C	2.62

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route is located in Bangkok and Changwat Pathum Thani.

It originates at the junction with Route 305 in Ban Klong Luang and runs southward to join Route 3312 near Amphoe Lam Luk Ka. The length of this section is about 10.3 km.

The second section starts at a point about 600 m east of the end point of the first section of Route 3312 and runs southward to end at the junction with Route 304 in Amphoe Min Buri. The length of the second section is 14.0 km. Combined, the total length of this project road is 24.3 km.

The terrain is flat. Paddy fields and orange orchards alternate along the first section. Along the second section, paddy fields completely fill the area.

The first section is currently under PWD and the second under ARD. Except for the last 1-km of SBST, the first section is a laterite road, whereas the second section is applied with SBST over the entire length. The surface condition is fair to poor on both sections.

Traffic is heavier on the second section.

Out of a total of eight bridges, seven are in the second section. All of them are of permanent structure and sufficient standards.

When completed, this road will form a north-south route paralleling Route 1, together with Route 319 and proposed project road IM-14. Some traffic diversion can be expected.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-15	RURAL-N	1988	493	15	0	0	358	154	55	582
	RURAL-S	1988	348	239	85	5	791	229	308	1657
	Average	-	421	127	43	3	575	192	182	1120

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-15	- 1993	6.23	6.35	6.71	5.68	4.87	6.67	6.29	6.23
	1994 - 2000	5.99	6.22	6.13	6.26	5.37	5.54	5.00	5.99
	2001 - 2008	5.61	6.09	5.66	4.93	4.77	4.74	4.52	5.61

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-15	1.34	1.36	1.21	1.35	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-15	RULRL-N	1993	847	28	0	0	652	213	75	968
		2000	847	44	0	0	941	311	106	1402
		2008	1974	71	0	0	1367	450	151	2039
	RULRL-S	1993	552	407	150	8	1264	316	418	2563
		2000	552	620	227	13	1823	461	588	3732
		2008	1288	996	352	19	2647	668	837	5519
	Average	1993	700	218	75	4	958	265	247	1766
		2000	1052	332	114	7	1382	386	347	2567
		2008	1631	534	176	10	2007	559	494	3779

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	24.30	PAVED/ LATERITE	GOOD	FAIR	0	0
WITH PROJECT	24.30	PAVED F2	GOOD	FAIR	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1527.	2248.	604.	64.	7995.	3097.	5710.	21243.
2008	2366.	3611.	937.	93.	11609.	4484.	8128.	31228.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	278.	512.	415.	89.	1272.	404.	363.	3334.
2008	431.	822.	644.	130.	1848.	585.	517.	4977.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1805.	2760.	1019.	153.	9267.	3500.	6073.	24577.
2008	2797.	4433.	1581.	223.	13457.	5069.	8645.	36205.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-15)

Item	Description
Changwat	Phathum Thani/Bangkok
Origin	B. Klong Luang (J.R.305)
Destination	A. Min Buri (J.R.304)
Length	
Total	24.3 km
Improvement Section	24.3 km
DOH Road	-
Others	24.3 km
New Construction Section	-
Terrain	Flat
Alignment (Hori./Vert.)	Fair/Good
Formation Width	6.00 m ~ 7.50 m
Embankment Section	
Length	24.3 km
Height	0.60 m ~ 1.50 m
Cut Section	-
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	9.0 km
Soil Aggregate	15.3 km
Earth	-
Box Culvert	2 units 15.7 m
Bridge	
Permanent Bridge	3 sites 193.0 m
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	16.00 m ~ 28.00 m

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-15 Length = 24.3 km)

Item	Unit	Financial Unit Rate Baht	Quantity	Financial Total Cost 1000 Baht	Economic Cost %	Economic Cost 1000 Baht	Residual Value %	Residual Value 1000 Baht
EARTHWORK					83		90	
Clearing & Grubbing	ha	9,500	11	105				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	157,400	6,296				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				6,401		5,313		4,782
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	39,800	7,164				
Subbase (Soil Aggregate)	m3	220	53,000	11,660				
Base (Soil Aggregate)	m3	350	27,200	9,520				
Shoulder (Soil Aggregate)	m3	250	12,800	3,200				
Asphaltic Prime/Tack Coat	m2	12	180,800	2,170				
DBST	m2	40	156,700	6,268				
AC Surfacing	m2	190	-	0				
Sub Total				39,982		33,185		16,593
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	795	1,431				
RC Box Culvert (2 x 2.4 x 2.4 Equivalent)	m	20,000	14	280				
RC Bridge (W=7.0 L=10.0 Equivalent)	m	60,000	-	0				
Sub Total				1,711		1,420		710
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				48,094		39,918		22,085
Miscellaneous Work ((a) x 7%)	1s			3,367	83	2,795	0	0
CONTRACT AMOUNT (b)				51,461		42,713		22,085
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			5,146		4,271		2,209
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			5,661	85	4,812	0	0
LAND ACQUISITION					100		100	
Highly Developed Land	ha	-	-	0				
Less Developed Land	ha	-	-	0				
Sub Total (e)	1s			0		0		0
PROJECT COST ((b) + (c) + (d) + (e))				62,268		51,796		24,294
AVERAGE COST PER KM				2,562				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

	COST	BENEFITS			DISCOUNTED(12%)	
YEAR	CONST. COST	VOC SAVING	TIME SAVING	TOTAL	COST	BENEFIT
1991	0			0	0	0
1992	20,718			0	25,989	0
1993	31,078			0	34,807	0
1994		15,588	2,419	18,007	0	16,078
1995		16,531	2,572	19,103	0	15,229
1996		17,473	2,724	20,197	0	14,376
1997		18,416	2,876	21,292	0	13,531
1998		19,358	3,029	22,387	0	12,703
1999		20,301	3,181	23,482	0	11,897
2000		21,243	3,334	24,577	0	11,117
2001	14,156	22,491	3,539	26,030	6,403	10,513
2002		23,739	3,744	27,483	0	9,911
2003		24,988	3,950	28,938	0	9,317
2004		26,236	4,155	30,391	0	8,737
2005		27,484	4,361	31,845	0	8,174
2006		28,732	4,566	33,298	0	7,631
2007		29,980	4,771	34,751	0	7,111
2008	(24,294)	31,228	4,977	36,205	(4,971)	6,615
TOTAL	41,658	343,787	54,198	397,986	62,228	162,940

NET PRESENT VALUE :	100,712
BENEFIT COST RATIO :	2.62
INTERNAL RATE OF RETURN :	28.0%

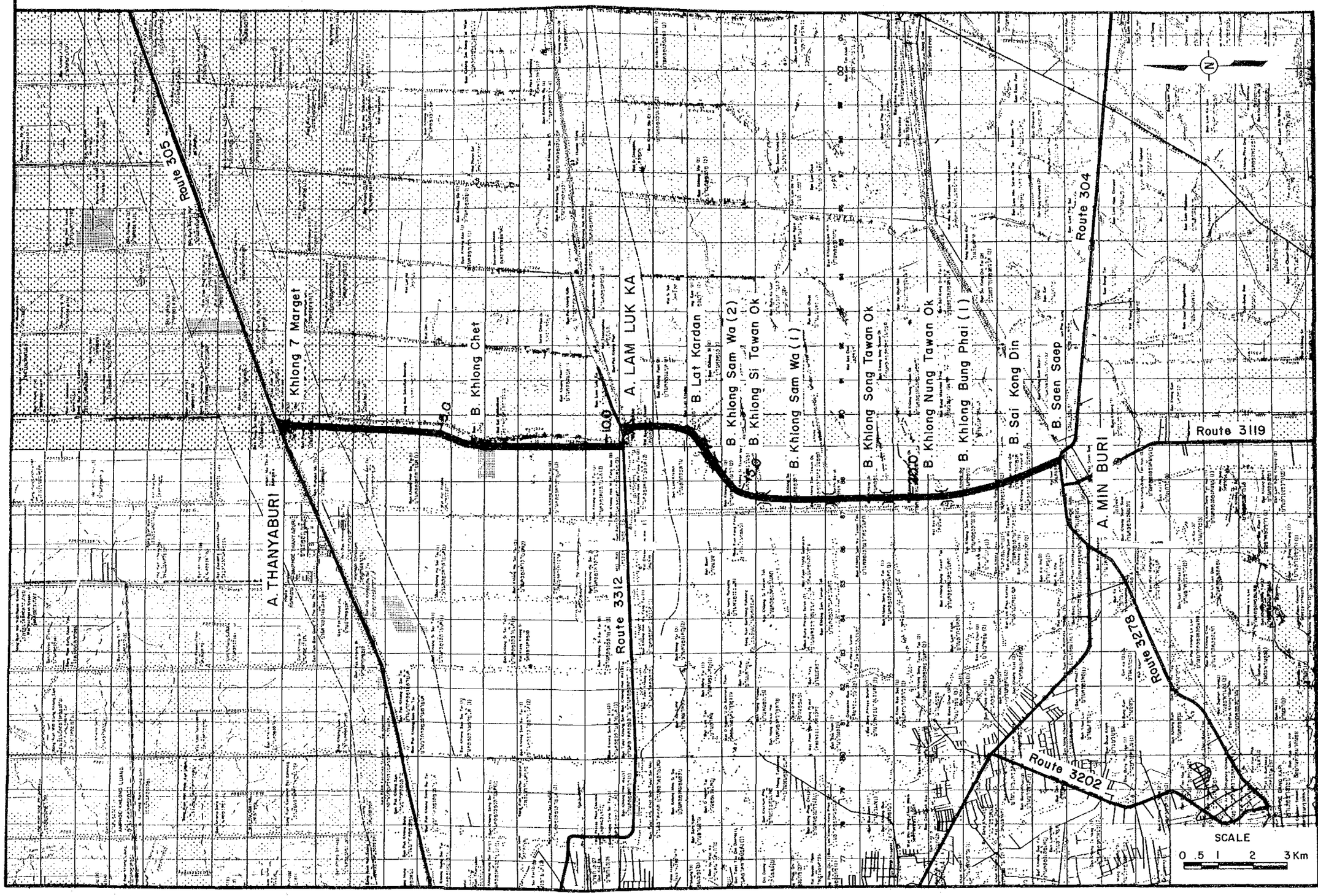
6. DEVELOPMENT AND SOCIAL IMPACTS

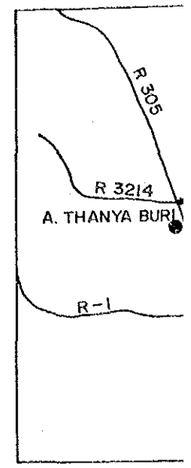
Suburban agriculture such as vegetable gardens may be induced should the proposed road improvement be implemented because of the proximity of the area to Bangkok. The Social impact of higher exposure to Bangkok life would be felt among people living along the road.

PROJECT NO. IM – 15

B. KHLONG LUANG – A. MIN BURI
C. PHATHUM THANI, C. BANGKOK

L =24.30 KM.





No.	Station Km.	Pro
1	0.1	
2	10.6	
3	12.9	
4	13.1	
5	15.4	
6	17.5	
7	19.2	
8	20.7	

LEGEND

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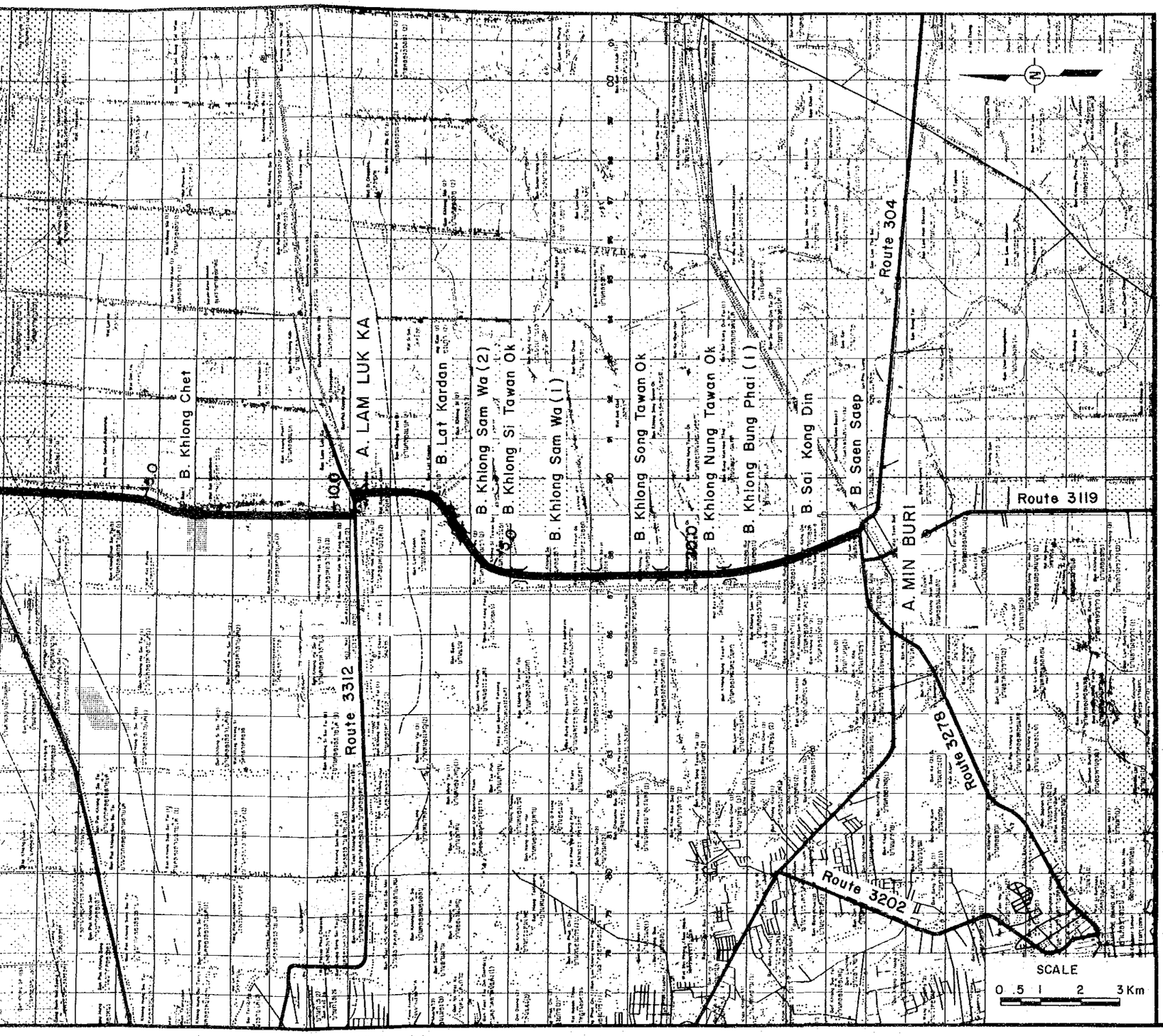
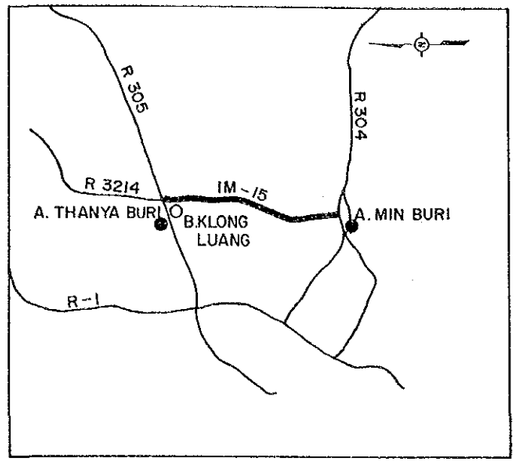
ROJECT NO. IM - 15

B. KHLONG LUANG — A. MIN BURI
C. PHATHUM THANI, C. BANGKOK

L =24.30 KM.



LOCATION MAP



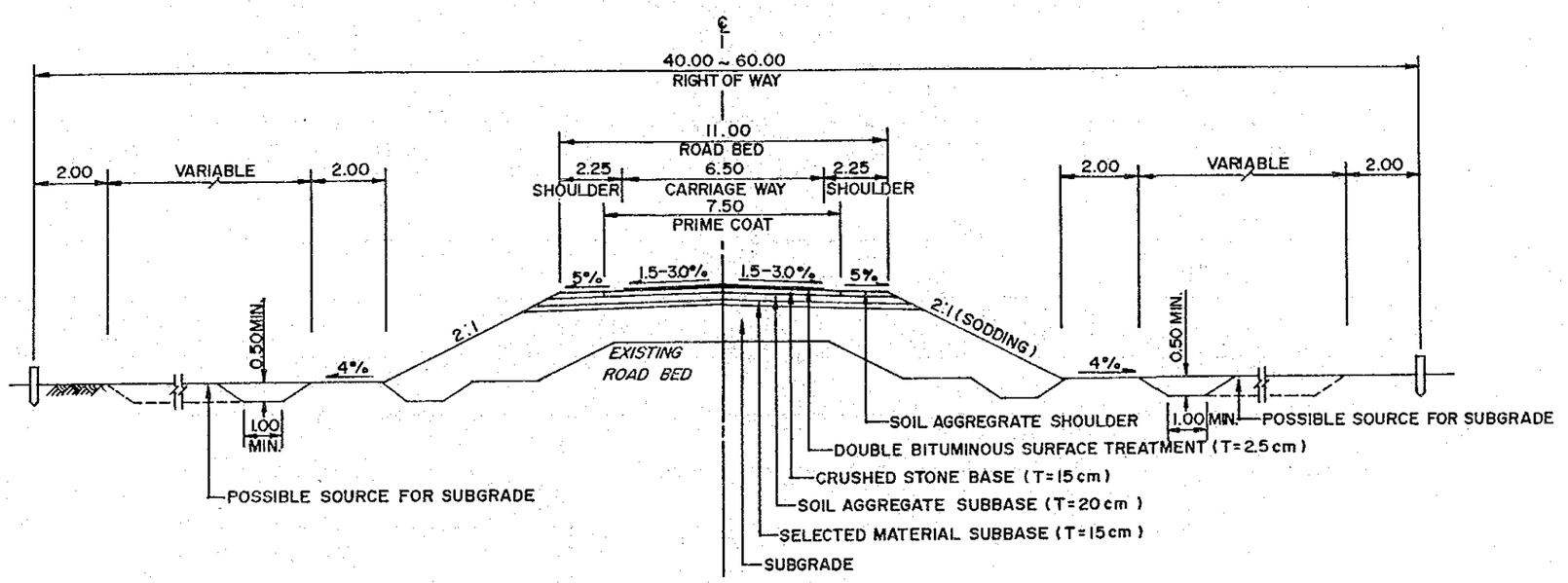
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge
1	0.1	—	C-7.00x51.00
2	10.6	—	C-11.00x70.00
3	12.9	—	C-7.00x8.00
4	13.1	—	C-7.00x8.00
5	15.4	—	C-7.00x10.00
6	17.5	—	C-7.00x10.00
7	19.2	—	C-7.00x18.00
8	20.7	—	C-6.80x18.00

LEGEND

- PROPOSED ROUTE (IMPROVEMENT)
- PROPOSED ROUTE (NEW CONSTRUCTION)
- PAVED ROUTE
- UNPAVED ROUTE
- INVENTORY SURVEY ROUTE

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F2)

ROAD INVENTORY

PROJECT NO. IM-15

ROUTE NO. B. KLONG LUANG (J.R. 305) – A. MIN BURI (J.R. 304)

ARD

RURAL C. PHATHUM THANI/BANGKOK

L = 24.30 km

Item		Entries along route (in order, left to right)
STATION (Km)		0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30
VILLAGE	Name of Village	B.Klong Luang / B.Khlong Chet / Wat Rat-Satthatham / A.Lam Lukka / Wat Sutthi Sa-at / Wat Bua Kaeo / A. Min Buri
TERRAIN		Flate
CROSS SECTION	Formation Width (m)	7.50 / 6.00
	Embankment Height (m)	1.50 / 1.00 / 1.50 / 1.00 / 0.80 / 0.60 / 0.80
	Cutting Depth (m)	
SURFACE	Type/Length (km)	Laterite / Paved
	Condition	Poor / Fair/Poor / Fair / Fair/Poor / Fair/Good / Fair / Fair/Good / Fair / Fair/Poor
FLOODING	Overflow Length (km)/Height (m)	
LAND USE	Left	Paddy / Orange / Paddy / Ora-nge / Paddy
	Right	Paddy / Orange / Paddy / Ora-nge / Paddy
BOX CULVERT & BRIDGE	Station (km)	0+100 / 10+600 / 12+900 / 13+100 / 15+400 / 16+500 / 17+500 / 19+200 / 20+600 / 20+700
	Dimension (m) Bridge - Conc. or wooden - Width - (Side walk) - Length Box - width - Height - Length	C-Br. 7.00(0.75)x51.00 / C-Br. 11.00(-)x70.00 / C-Br. 7.00(0.60)x8.00 / C-Br. 7.00x(0.60)x8.00 / C-Br. 7.00(0.50)x10.00 / C-Box 1.50x1.50x8.00 / C-Br. 7.00(0.60)x10.00 / C-Br. 7.00(1.10)x18.00 / C-Box 2.0x2.0x7.70 / C-Br. 6.80(1.10)x18.00
RIGHT OF WAY (m) (Left/Right)		16.00 / 28.00
ALIGNMENT	Horizontal	Good / Fair
	Vertical	Good
ROUTE NO., AGENCIES		PWD / RURAL