PROJECT IM - 8

Changwat : Lop Buri

B. Khao Noi - B. Chang Ko Nok

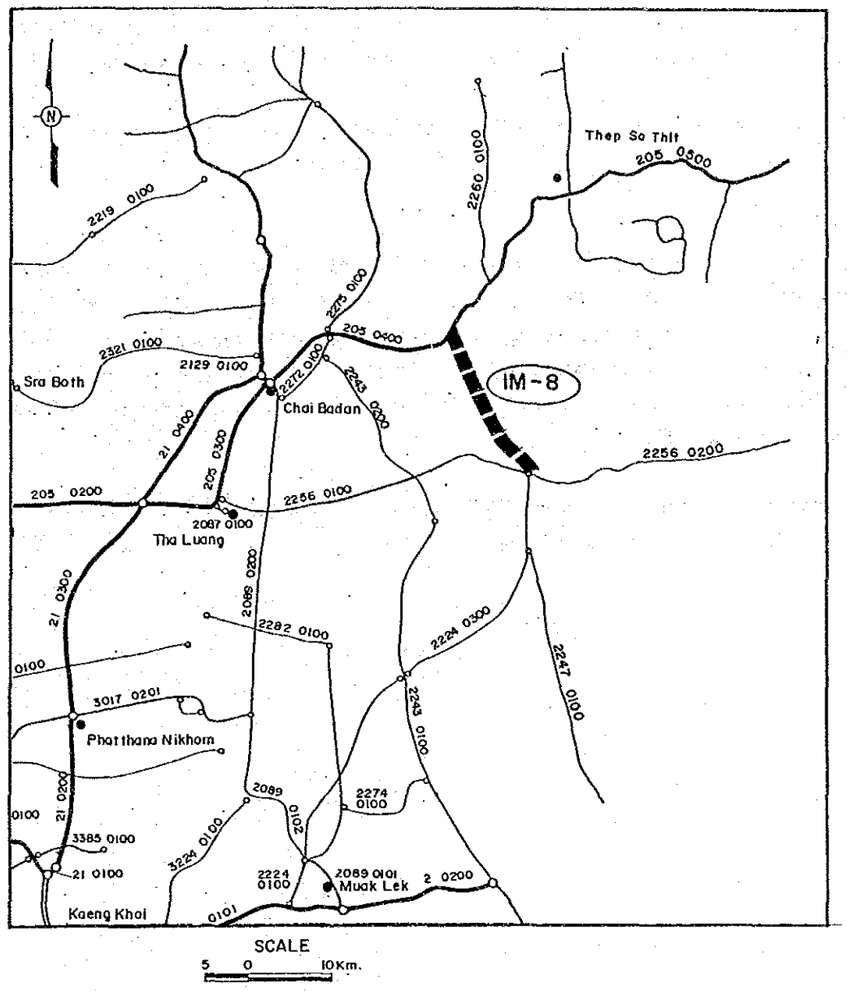
Length : 18.00 km

SUMMARY

PROJECT IM-8

Item	Description
Changwat	Lop Buri
Origin	B. Khao Noi (J.R.2256)
Destination	B. Chang Ko Nok (J.R.205)
Length	
Total	16.8 km
Improvement Section	16.8 km
DOH Road	No.2247 16.8 km
Others	-
New Construction Section	-
Surface Type and Condition	SBST Fair 3.5 km S/A Good/Fair 13.3 km
Terrain	Flat
Traffic (ADT)	
Existing	531
2000	1,118
2008	1,609
Existing Standard	Laterite, Substandard
Proposed Standard	F3
Construction Cost	
Financial	42,394 Thousand Baht
Economic	35,263 Thousand Baht
IRR	20.8%
B/C	1.80

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route lies entirely within Changwat Lopburi.

It originates at the junction with Route 2256 in Ban Khao Noi, runs northward through flat land and ends at the junction with Route 205 in Ban Chang Ko Nok. Its total length is 16.8 km.

The embankment of the existing road is generally low, 0–1.0 m, but mostly on the lower side. There are five permanent bridges, which appear adequate.

Land along the route is well cultivated with generally cash crops such as sugarcane, wheat, cotton, maize and peanuts. Farmhouses along the route are relatively sparse. However, during the peak season, traffic of 500 heavy trucks a day can be observed. Traffic volume is generally high. Sugarcane is transported to sugar mills in Chaiyaphum or Singburi at present. When this road is paved, it will be possible to use Route 205 with a considerable saving in distance. Travel distance from the area along the road to Amphoe Chai Badan will be shorter than the present route using Route 2256.

Four short stretches are covered with SBST, including at both ends. Other sections are of laterite. The surface condition is generally fair to good.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-8	2247	1986	290	48	158	0	198	40	87	531

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-8	- 1993	4.95	6.55	5.72	5.39	4.53	4.51	4.60	4.95
	1994 - 2000	4.49	5.77	5.07	5.57	4.10	4.13	4.09	4.49
	2001 - 2008	4.55	5.77	5.11	4.97	4.15	4.13	4.09	4.55

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-8	1.11	1.12	1.07	1.11	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-8	2247	1993	442	83	260	0	300	54	119	816
		2000	442	123	367	0	398	72	158	1118
		2008	859	193	546	0	552	100	218	1609

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	16.80	LATERITE GOOD	GOOD	GOOD	0	0
WITH PROJECT	16.80	PAVED F3	GOOD	GOOD	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1036.	991.	2362.	0.	2526.	832.	2546.	10293.
2008	1480.	1554.	3516.	0.	3502.	1155.	3512.	14719.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	67.	79.	562.	0.	156.	30.	65.	960.
2008	95.	125.	837.	0.	217.	41.	90.	1405.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1103.	1070.	2925.	0.	2682.	861.	2611.	11252.
2008	1575.	1678.	4353.	0.	3718.	1196.	3602.	16124.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-8)

Item	Description
Changwat	Lop Buri
Origin	B. Khao Noi (J.R.2256)
Destination	B. Chang Ko Nok (J.R.205)
Length	
Total	16.8 km
Improvement Section	16.8 km
DOH Road	No.2247 16.8 km
Others	-
New Construction Section	-
Terrain	Flat
Alignment (Hori./Vert.)	Good/Good
Formation Width	7.0 m ~ 9.0 m
Embankment Section	
Length	16.8 km
Height	0.3 m ~ 1.0 m
Cut Section	-
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	Fair 3.5 km
Soil Aggregate	Good/Fair 13.3 km
Earth	-
Box Culvert	-
Bridge	
Permanent Bridge	5 sites 246.0 m
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	40.0 m

CONSTRUCTION QUANTITIES AND COSTS

(Project IM-8 Length = 16.8 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	6	57				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	168,900	6,756				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				6,813		5,655		5,090
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	24,800	4,464				
Subbase (Soil Aggregate)	m3	220	33,100	7,282				
Base (Soil Aggregate)	m3	350	17,400	6,090				
Shoulder (Soil Aggregate)	m3	250	7,500	1,875				
Asphaltic Prime/Tack Coat	m2	12	115,900	1,391				
DBST	m2	40	99,300	3,972				
AC Surfacing	m2	190	-	0				
Sub Total				25,074		20,811		10,406
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	476	857				
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				857		711		356
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				32,744		27,177		15,852
Miscellaneous Work ((a) x 7%)	ls			2,292	83	1,902	0	0
CONTRACT AMOUNT (b)				35,036		29,079		15,852
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	ls			3,504		2,908		1,585
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	ls			3,854	85	3,276	0	0
LAND ACQUISITION					100		100	
Highly Developed Land	ha	-	-	0				
Less Developed Land	ha	-	-	0				
Sub Total (e)	ls			0		0		0
PROJECT COST ((b) + (c) + (d) + (e))				42,394		35,263		17,437
AVERAGE COST PER KM				2,523				

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	14,105			0	17,693	0
1993	21,158			0	23,697	0
1994		7,942	729	8,671	0	7,742
1995		8,334	767	9,101	0	7,255
1996		8,726	806	9,532	0	6,785
1997		9,118	844	9,962	0	6,331
1998		9,509	883	10,392	0	5,897
1999		9,901	921	10,822	0	5,483
2000		10,293	960	11,253	0	5,090
2001	8,984	10,846	1,015	11,861	4,064	4,790
2002		11,400	1,071	12,471	0	4,497
2003		11,953	1,127	13,080	0	4,211
2004		12,506	1,182	13,688	0	3,935
2005		13,059	1,238	14,297	0	3,670
2006		13,613	1,293	14,906	0	3,416
2007		14,166	1,349	15,515	0	3,175
2008	(17,437)	14,719	1,405	16,124	(3,568)	2,946
TOTAL	26,810	166,084	15,589	181,675	41,886	75,223

NET PRESENT VALUE : 33,337
BENEFIT COST RATIO : 1.80
INTERNAL RATE OF RETURN : 20.8%

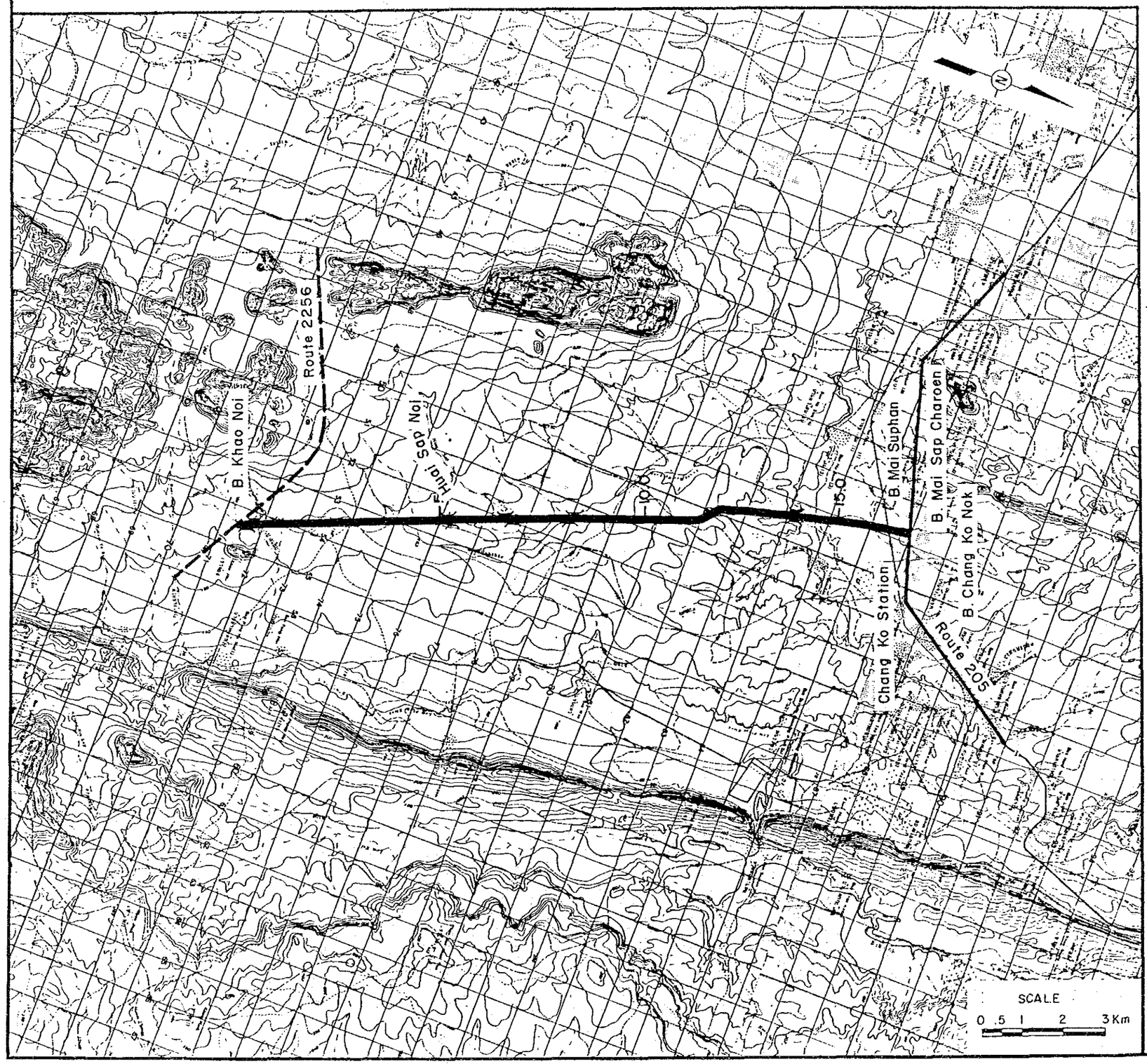
6. DEVELOPMENT AND SOCIAL IMPACTS

Improved access would allow farmers to adjust their cropping pattern more suitable to market changes. Farmers may obtain better prices as well. Changes in agricultural production attributable to the improvement of this road alone would probably be small.

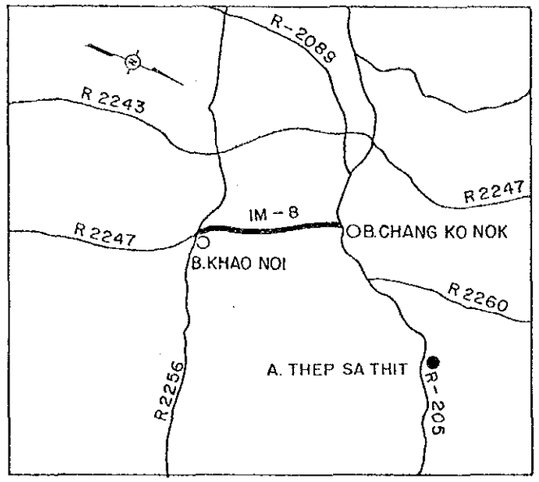
PROJECT NO. IM – 8

B. KHAO NOI – B. CHANG KO NOK
C. LOP BURI

L = 16.80 KM.



LOCATION MAP



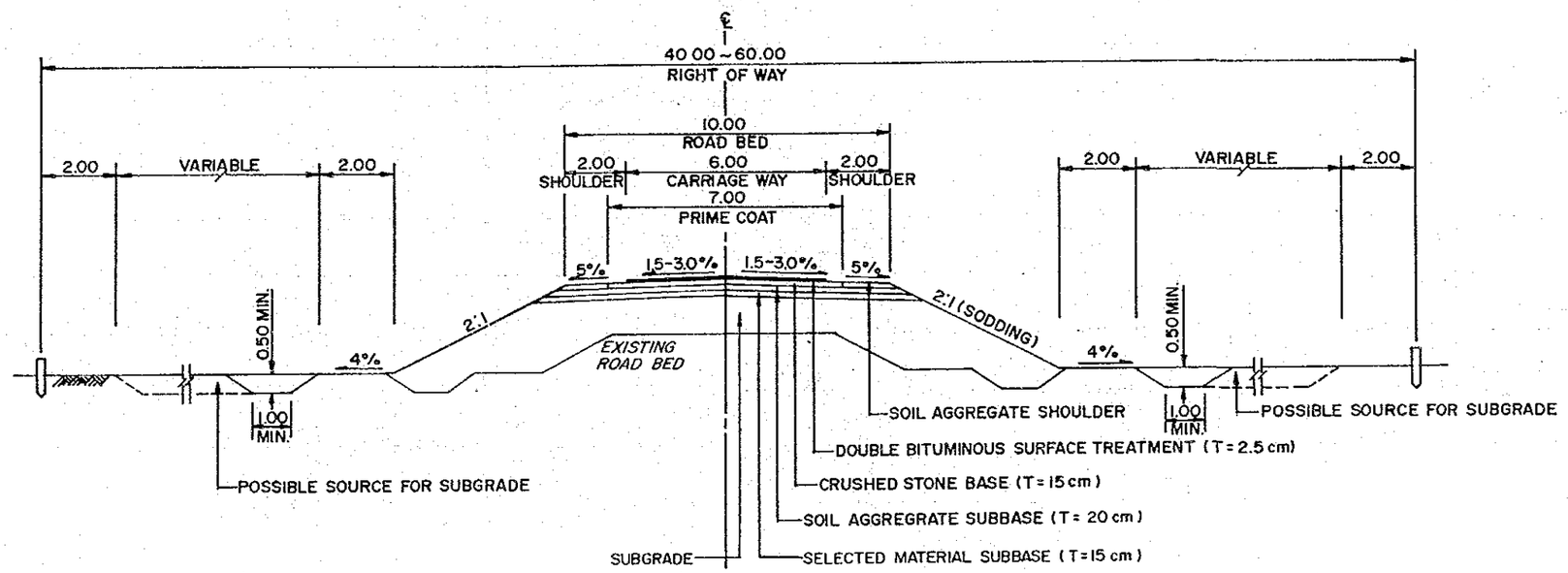
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge
1	0.1	–	C – 7.00 x 27.00
2	4.9	–	C – 7.00 x 75.00
3	6.3	–	C – 7.00 x 45.00
4	7.9	–	C – 7.00 x 24.00
5	13.9	–	C – 7.00 x 75.00

LEGEND

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

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F3)

ROAD INVENTORY

PROJECT NO. IM-8 **PRO** **ROUTE NO. 2247** **B. KHAO NOI (J.R. 2256) – B. CHANG KO NOK (J.R. 205)** **L = 16.8 km**

C. LOP BURI

STATION (Km)		0 2 4 6 8 10 12 14 16 16.8 18 20 22 24 26 28 30
VILLAGE	Name of Village	B.Khao Noi (J.R.2256) / Village / B.Sub Takein / B.Tha Yai / 16.2 Railway / B.Chang Ko Nok (J.R. 205)
TERRAIN		Flat
CROSS SECTION	Formation Width (m)	5.0 (1.0) / 6.0 (1.5) / 6.0 (1.5) / 6.0 (1.5) / 5.5 (1.5) / 2.5 / 5.5 (1.5)
	Embankment Height (m)	0 0 0.3 0.5 0.7 1.0 0.5 0.3
	Cutting Depth (m)	No
SURFACE	Type/Length (km)	SBST Laterite SBST Laterite SBST Lat. SBST
	Condition	F 0.1 Good/Fair 5.3 F 6.3 Good 13.2 F 14.4 Good 16.0 F
FLOODING	Overflow Length (km)/Height (m)	No
LAND USE	Left	Sugarcane Wheat / Wheat / Cat. / Maize / Wheat / Peanut
	Right	Maize / Cotton / Cotton / Cat. / Maize / Cat. / Wheat
BOX CULVERT & BRIDGE	Station (km)	0+100 / 4+900 / 6+300 / 7+900 / 13+900
	Dimension (m) Bridge - Conc.or Wooden - Width - (Sidewalk) - Length	C-Br. 7.0(1.0)x27.0 / C-Br. 7.0(0.7)x75.0 / C-Br. 7.0(0.7)x45.0 / C-Br. 7.0(0.7)x14.0 / C-Br. 7.0(0.7)x75.0
RIGHT OF WAY (m) (Left/Right)		40.0 (20.0/20.0)
ALIGNMENT	Horizontal	Good
	Vertical	Good / Fair / Good
ROUTE NO., AGENCIES		

PROJECT IM - 9

Changwat : Lop Buri

B. Dilang - B. Wang Phloeng

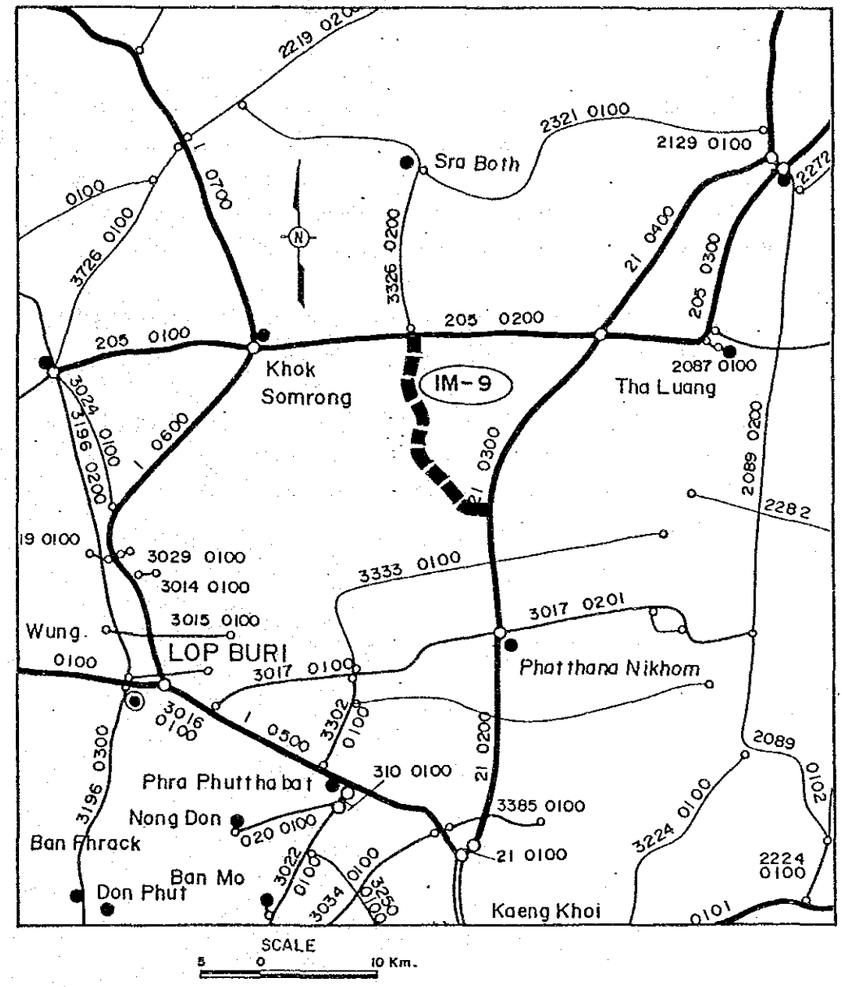
Length : 18.00 km

SUMMARY

PROJECT IM-9

Item	Description
Origin	B. Dilang (J.R.21)
Destination	B. Wang Phloeng (J.R.205)
Length	
Total	18.0 km
Improvement Section	18.0 km
DOH Road	-
Others	PWD 18.0 km
New Construction Section	-
Surface Type and Condition	SBST S/A Good
Terrain	Flat/Roll
Traffic (ADT)	
Existing	202
2000	374
2008	506
Existing Standard	Laterite, Substandard
Proposed Standard	F4
Construction Cost	
Financial	43,633 Thousand Baht
Economic	36,295 Thousand Baht
IRR	8.7 %
B/C	0.76

LOCATION OF PROJECT ROUTE



LEGEND :

- PROJECT ROUTE
- DIVIDED HIGHWAYS
- NATIONAL HIGHWAYS
- PROVINCIAL HIGHWAYS
- PROVINCIAL HIGHWAYS (Unpaved)
- CHANGWAT, AMPHOE

1. GENERAL

The proposed route lies entirely within Changwat Lopburi.

It originates at the junction with Route 21 in Ban Dilang and runs generally northward until it joins Route 205 in Ban Phloeng. Its total length is 18.0 km.

The route starts in flat terrain, becomes rolling as it passes a knoll between two low hills, followed by a flat section, becomes rolling again at the foot of another low hill, followed by flat terrain in which it meets with Route 205. Due to the presence of nearby hills, cultivable land is limited along the route. Paddy is grown in the flat land at both ends, and wheat and cassava are planted in the rolling terrain. A significant area of hilly terrain is left unused. There is one permanent bridge, and no other waterways exist requiring bridges.

No section of this road is applied with a surface treatment. However, the general condition of its laterite surface is good throughout its length.

Route 3326, which runs northward from the junction of the proposed route with Route 205, is under construction with the scheduled pavement completion by the end of 1988. The proposed route, upon completion, will form an alternative north-south route to Route 21 which joins Route 1 north of Saraburi.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-9	PWD	1987	0	0	22	0	92	22	66	202

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-9	- 1993	6.79	9.49	3.94	3.20	7.25	4.51	3.68	6.79
	1994 - 2000	4.17	5.12	2.75	3.76	3.93	4.14	1.62	4.17
	2001 - 2008	4.65	5.39	4.03	4.53	3.48	4.14	4.45	4.65

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-9	1.11	1.12	1.07	1.12	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-9	PWD	1993	0	0	31	0	157	29	82	299
		2000	0	0	38	0	205	39	92	374
		2008	0	0	53	0	269	54	130	506

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	18.00	LATERITE GOOD	FAIR	GOOD	0	0
WITH PROJECT	18.00	PAVED F4	FAIR	GOOD	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	0.	0.	292.	0.	1536.	564.	2199.	4592.
2008	0.	0.	406.	0.	2020.	781.	3108.	6314.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	0.	0.	62.	0.	86.	17.	41.	206.
2008	0.	0.	87.	0.	113.	24.	58.	281.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	0.	0.	355.	0.	1622.	581.	2240.	4798.
2008	0.	0.	493.	0.	2132.	805.	3165.	6595.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-9)

Item	Description
Origin	B. Dilang (J.R.21)
Destination	B. Wang Phloeng (J.R.205)
Length	
Total	18.0 km
Improvement Section	18.0 km
DOH Road	-
Others	PWD 18.0 km
New Construction Section	-
Terrain	Flat/Rolling
Alignment (Hori./Vert.)	Good/Good to Fair
Formation Width	8.0 m ~ 8.5 m
Embankment Section	
Length	18.0 m
Height	0.5 ~ 1.2 m
Cut Section	
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	-
Soil Aggregate	Good
Earth	-
Box Culvert	-
Bridge	
Permanent Bridge	1 unit 16.0 m
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	30.0 m

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-9 Length = 18.0 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	4	38				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	197,800	7,912				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				7,950		6,599		5,939
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	24,300	4,374				
Subbase (Soil Aggregate)	m3	220	32,400	7,128				
Base (Soil Aggregate)	m3	350	17,600	6,160				
Shoulder (Soil Aggregate)	m3	250	6,800	1,700				
Asphaltic Prime/Tack Coat	m2	12	116,900	1,403				
DBST	m2	40	98,900	3,956				
AC Surfacing	m2	190	-	0				
Sub Total				24,721		20,518		10,259
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	572	1,030				
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				1,030		855		428
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				33,701		27,972		16,626
Miscellaneous Work ((a) x 7%)	1s			2,359	83	1,958	0	0
CONTRACT AMOUNT (b)				36,060		29,930		16,626
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			3,606		2,993		1,663
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			3,967	85	3,372	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))				43,633		36,295		18,289
AVERAGE COST PER KM				2,424				

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	14,518			0	18,211	0
1993	21,777			0	24,390	0
1994		3,909	172	4,081	0	3,644
1995		4,023	178	4,201	0	3,349
1996		4,137	183	4,320	0	3,075
1997		4,250	189	4,439	0	2,821
1998		4,361	195	4,559	0	2,587
1999		4,478	201	4,679	0	2,371
2000		4,592	206	4,798	0	2,170
2001	8,962	4,807	216	5,023	4,054	2,029
2002		5,022	225	5,247	0	1,892
2003		5,238	234	5,472	0	1,762
2004		5,453	244	5,697	0	1,638
2005		5,668	253	5,921	0	1,520
2006		5,883	262	6,145	0	1,408
2007		6,099	272	6,371	0	1,304
2008	(18,289)	6,314	281	6,595	(3,742)	1,205
TOTAL	26,968	74,236	3,309	77,548	42,913	32,775

NET PRESENT VALUE :	(10,138)
BENEFIT COST RATIO :	0.76
INTERNAL RATE OF RETURN :	8.7%

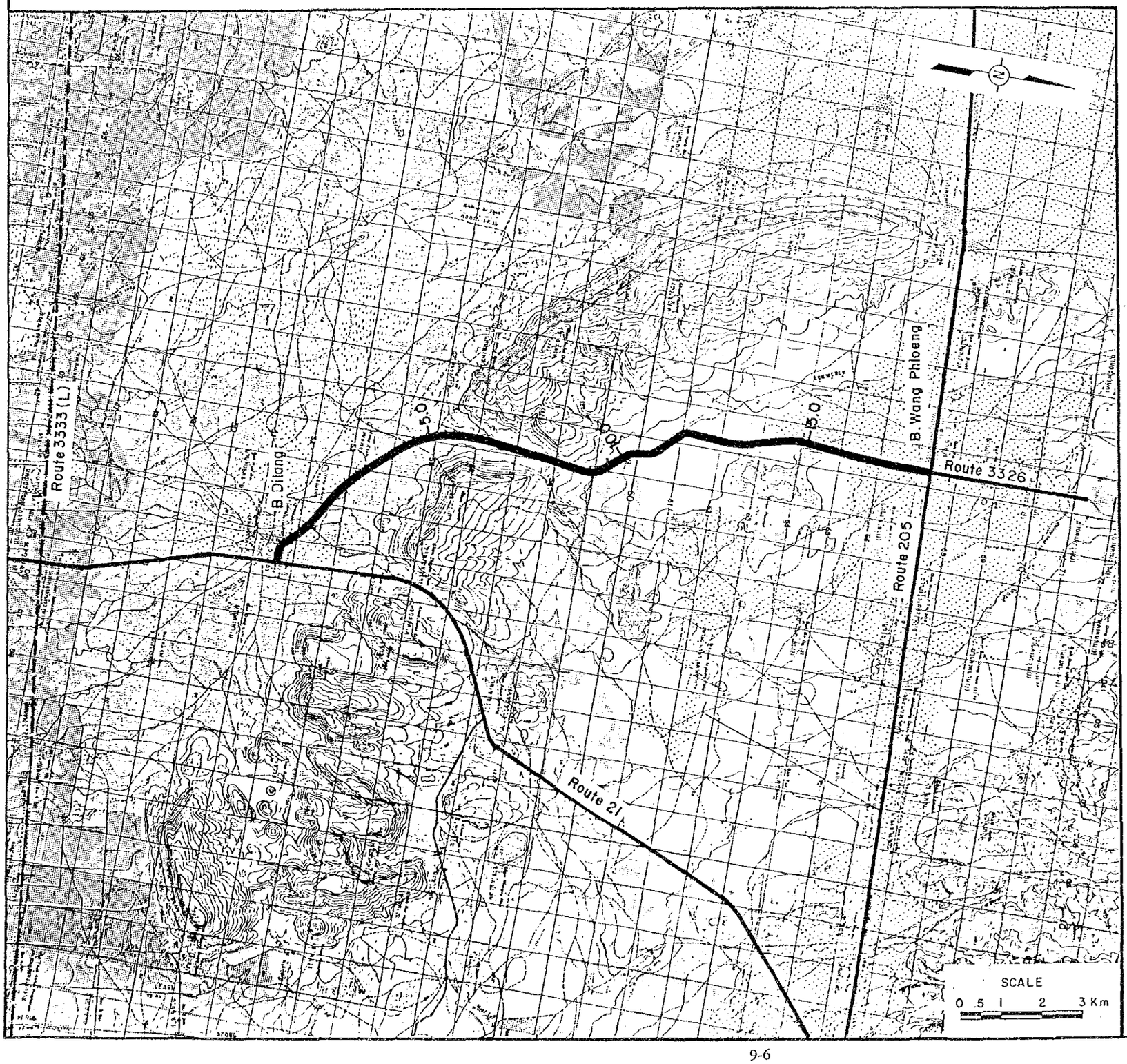
6. DEVELOPMENT AND SOCIAL IMPACTS

It is possible that easier access may prompt cultivation of hitherto unused hilly land along the road. Existing cassava planters may obtain better prices due to higher competition among buyers as a result of better access. Effects of traffic diverted from Route 21 would probably be minor for dwellers of villages along the road.

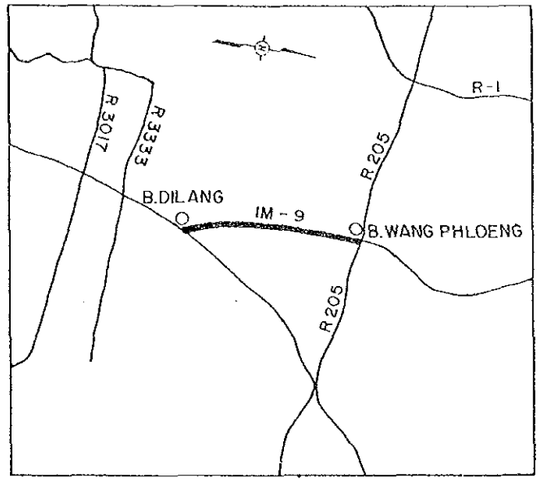
PROJECT NO. IM - 9

B. DILANG — B. WANG PHLOENG
C. LOP BURI

L = 18.00 KM.



LOCATION MAP



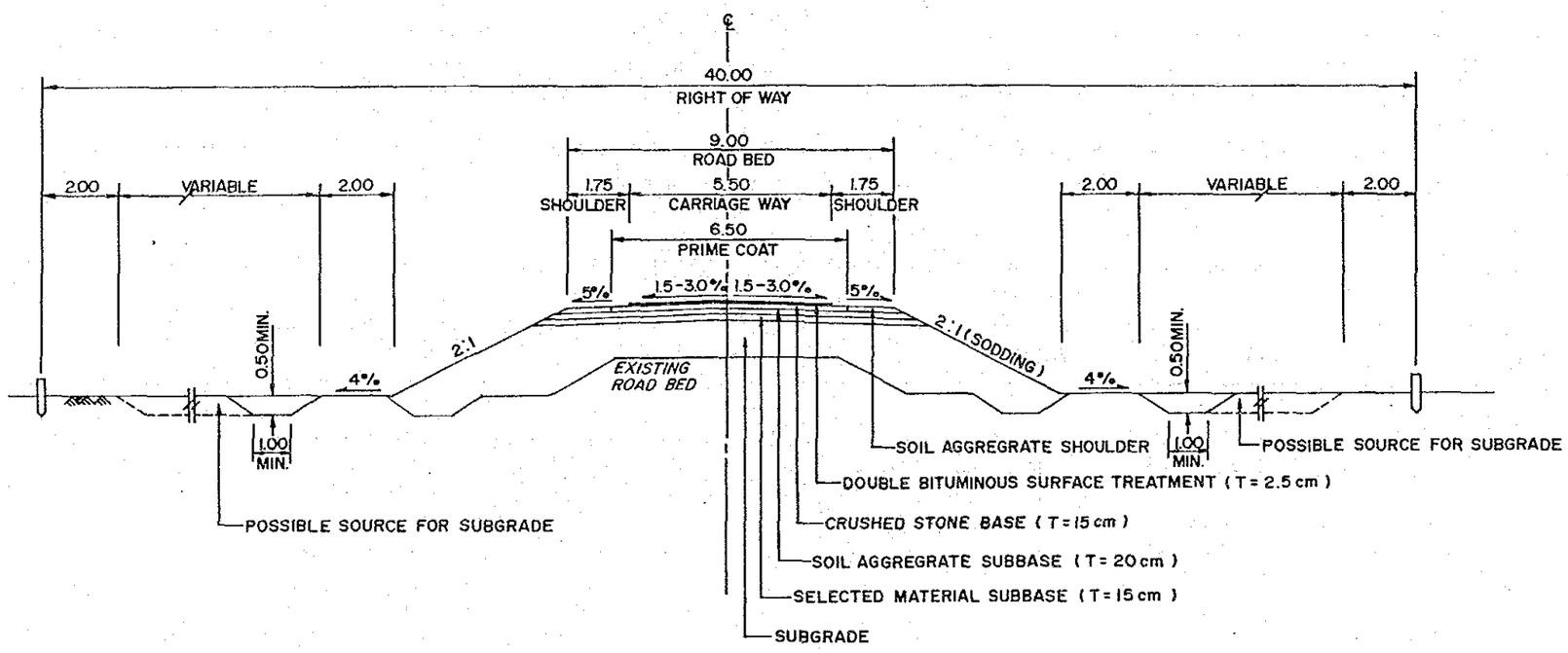
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge
1	12.0	—	C—7.00 x 16.00

LEGEND

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

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F4)

ROAD INVENTORY

PROJECT NO. IM-9 | **ROUTE NO. ARD B. DILANG (J.R. 21) – B. WANG PHLOENG (J.R. 205)** | **L = 18.0 km**

PWD C. LOP BURI

STATION (Km)		0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
VILLAGE Name of Village		B. DILANG (J.R. 21)				B.TUNG PONG			B.PU MUANG		B.NONG YAI			B.WANG PHLOENG (J.R. 205)			
TERRAIN		Flat				Rolling			Flat		Rolling			Flat			
CROSS SECTION	Formation Width (m)	6.0-6.5 (1.0)															
	Embankment Height (m)	1.2	1.0	1.0	1.2	1.2	1.0	1.0	0.5	0.8	1.0						
	Cutting Depth (m)																
SURFACE	Type/Length (km)	Laterite															
	Condition	Good			Fair			Good									
FLOODING	Overflow Length (km)/Height,(m)																
LAND USE	Left	Paddy	Wheat	Cassava	Cassava	Cassava	Wheat	Idle	Paddy/Wheat								
	Right	Paddy	Wheat	Cassava	Wheat	Cassava	Wheat	Idle	Wheat								
BOX CULVERT & BRIDGE	Station (km)	12+000															
	Dimension (m)	C-Br. 7.00(0.50)x16.00															
	Bridge																
	- Conc.or Wooden																
	- Width																
	- (Sidewalk)																
	- Length																
RIGHT OF WAY (m) (Left/Right)		Left 15 Right 15										20 20					
ALIGNMENT	Horizontal	Good															
	Vertical	Good			Fair			Good									
ROUTE NO., AGENCIES		PWD															

PROJECT IM - 10

Changwat : Lop Buri, Ang Thong

B. Rong Sung - C. Lop Buri

Length : 34.80 km

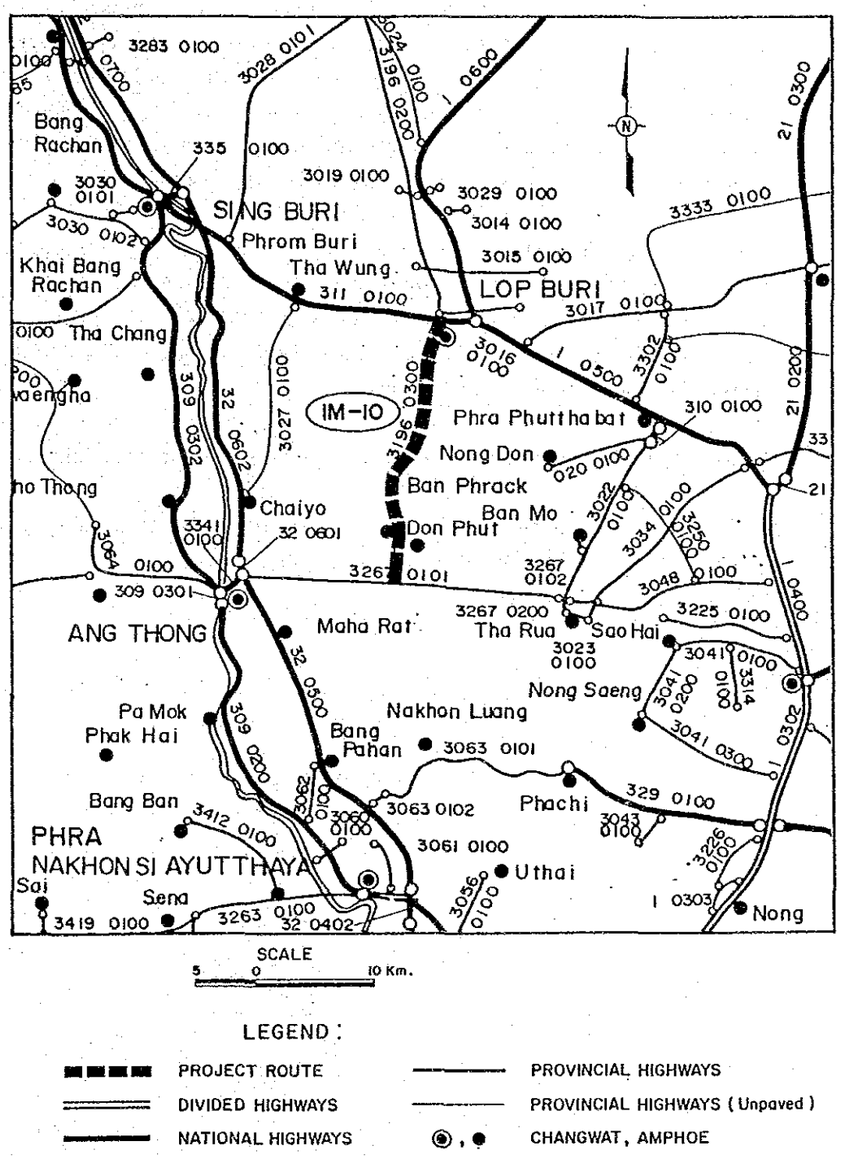
SUMMARY

PROJECT IM-10

Item	Description
Changwat	Lop Buri/Ang Thong
Origin	B. Reng Sung (J.R.3267)
Destination	C. Lop Buri (J.R.311)
Length	
Total	34.8 km
Improvement Section	34.8
DOH Road	No.3196 34.8 km
Others	-
New Construction Section	-
Surface Type and Condition	SBST Poor 34.8 km
Terrain	Flat
Traffic (ADT)	
Existing	550
2000	1,462
2008	2,067
Existing Standard	*
Proposed Standard	F2
Construction Cost	
Financial	124,047 Thousand Baht
Economic	103,185 Thousand Baht
IRR	17.0 %
B/C	1.48

* Recently transfered from RID. Paved carriageway width 5 m and road bed width 8m.

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route extends over the two Changwats of Lopburi and Ayutthaya.

The route originates in Ban Reng Sung in Changwat Ayutthaya, runs northward passing through or beside more than 30 villages and Amphoe Ban Pharaek and ends in Muang Lopburi. Its total length is 34.8 km. It was transferred from RID recently to DOH and was given a DOH link number of 3196–0300. This road was made on top of the east embankment of an RID canal with a width of about 20 m for its entire length. The embankment height is substantial, from 1.5 m to 3.0 m. However, occasional high water in this canal has caused considerable damage to the road shoulder as one side of the road is directly exposed to canal water. It has been suggested by a DOH division engineer that the improved road be shifted some distance away from the canal to avoid direct and constant exposure to canal water. Such an improvement was already applied to another nearby road section, Link 3196–0100, which was also recently transfered from RID. The terrain is flat, and the area along the route is fully cultivated. Farmhouses densely line the western side of the road.

SBST is applied to the road surface for its entire length, but the condition is generally poor.

This road, upon completion, will significantly cut travel time from Lopburi to Bangkok, as it will enable the use of Route 32 instead of Route 1.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-10	3196	1987	384	106	12	48	276	72	36	550

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-10	- 1993	4.84	5.13	5.23	4.22	4.85	4.54	3.76	4.84
	1994 - 2000	5.07	5.56	4.01	4.58	5.35	4.44	3.39	5.07
	2001 - 2008	4.75	5.44	4.22	4.28	4.21	4.02	3.00	4.75

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-10	1.52	1.56	1.32	1.54	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-10	3196	1993	722	217	25	82	566	94	45	1029
		2000	722	318	33	112	815	127	57	1462
		2008	1491	485	45	157	1134	174	72	2067

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	34.80	PAVED POOR	GOOD	FAIR	0	0
WITH PROJECT	34.80	PAVED F2	GOOD	FAIR	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	2288.	3496.	301.	2107.	7434.	2245.	1911.	19782.
2008	3324.	5334.	412.	2951.	10344.	3075.	2414.	27855.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	657.	1167.	285.	3786.	1812.	342.	154.	8203.
2008	954.	1781.	390.	5305.	2521.	469.	194.	11614.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	2945.	4664.	586.	5893.	9246.	2587.	2065.	27985.
2008	4278.	7115.	802.	8256.	12864.	3545.	2609.	39469.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-10)

Item	Description
Changwat	Lop Buri/Ang Thong
Origin	B. Reng Sung (J.R.3267)
Destination	C. Lop Buri (J.R.311)
Length	
Total	34.8 km
Improvement Section	34.8
DOH Road	No.3196 34.8 km
Others	-
New Construction Section	-
Terrain	Flat
Alignment (Hori./Vert.)	Fair / Good
Formation Width	8.0 m
Embankment Section	
Length	34.8 km
Height	1.5 m ~ 3.0 m
Cut Section	
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	Poor 34.8 km
Soil Aggregate	-
Earth	-
Box Culvert	-
Bridge	
Permanent Bridge	2 sites 82.0 m
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	Left (canal), Right (10~15m)

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-10 Length = 34.8 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	21	200				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	-	0				
Embankment (Borrow Pit)	m3	100	364,500	36,450				
Sub Total				36,650		30,420		27,378
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	57,300	10,314				
Subbase (Soil Aggregate)	m3	220	76,400	16,808				
Base (Soil Aggregate)	m3	350	39,200	13,720				
Shoulder (Soil Aggregate)	m3	250	18,400	4,600				
Asphaltic Prime/Tack Coat	m2	12	260,400	3,125				
DBST	m2	40	225,700	9,028				
AC Surfacing	m2	190	-	0				
Sub Total				57,595		47,804		23,902
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	870	1,566				
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				1,566		1,300		650
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				95,811		79,524		51,930
Miscellaneous Work ((a) x 7%)	1s			6,707	83	5,567	0	0
CONTRACT AMOUNT (b)				102,518		85,091		51,930
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			10,252		8,509		5,193
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			11,277	85	9,585	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))				124,047		103,185		57,123
AVERAGE COST PER KM				3,565				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

	COST	BENEFITS			DISCOUNTED(12%)	
YEAR	CONST. COST	VOC SAVING	TIME SAVING	TOTAL	COST	BENEFIT
1991	20,637			0	28,993	0
1992	51,593			0	64,718	0
1993	30,956			0	34,671	0
1994		14,914	6,210	21,124	0	18,861
1995		15,725	6,542	22,267	0	17,751
1996		16,537	6,874	23,411	0	16,663
1997		17,348	7,206	24,554	0	15,605
1998		18,159	7,539	25,698	0	14,582
1999		18,971	7,871	26,842	0	13,599
2000		19,782	8,203	27,985	0	12,659
2001	19,560	20,791	8,629	29,420	8,848	11,882
2002		21,800	9,056	30,856	0	11,127
2003		22,809	9,482	32,291	0	10,397
2004		23,818	9,909	33,727	0	9,696
2005		24,828	10,335	35,163	0	9,025
2006		25,837	10,761	36,598	0	8,387
2007		26,846	11,188	38,034	0	7,783
2008	(57,123)	27,855	11,614	39,469	(11,688)	7,211
TOTAL	65,623	316,019	131,417	447,439	125,542	185,228

NET PRESENT VALUE :	59,686
BENEFIT COST RATIO :	1.48
INTERNAL RATE OF RETURN :	17.0%

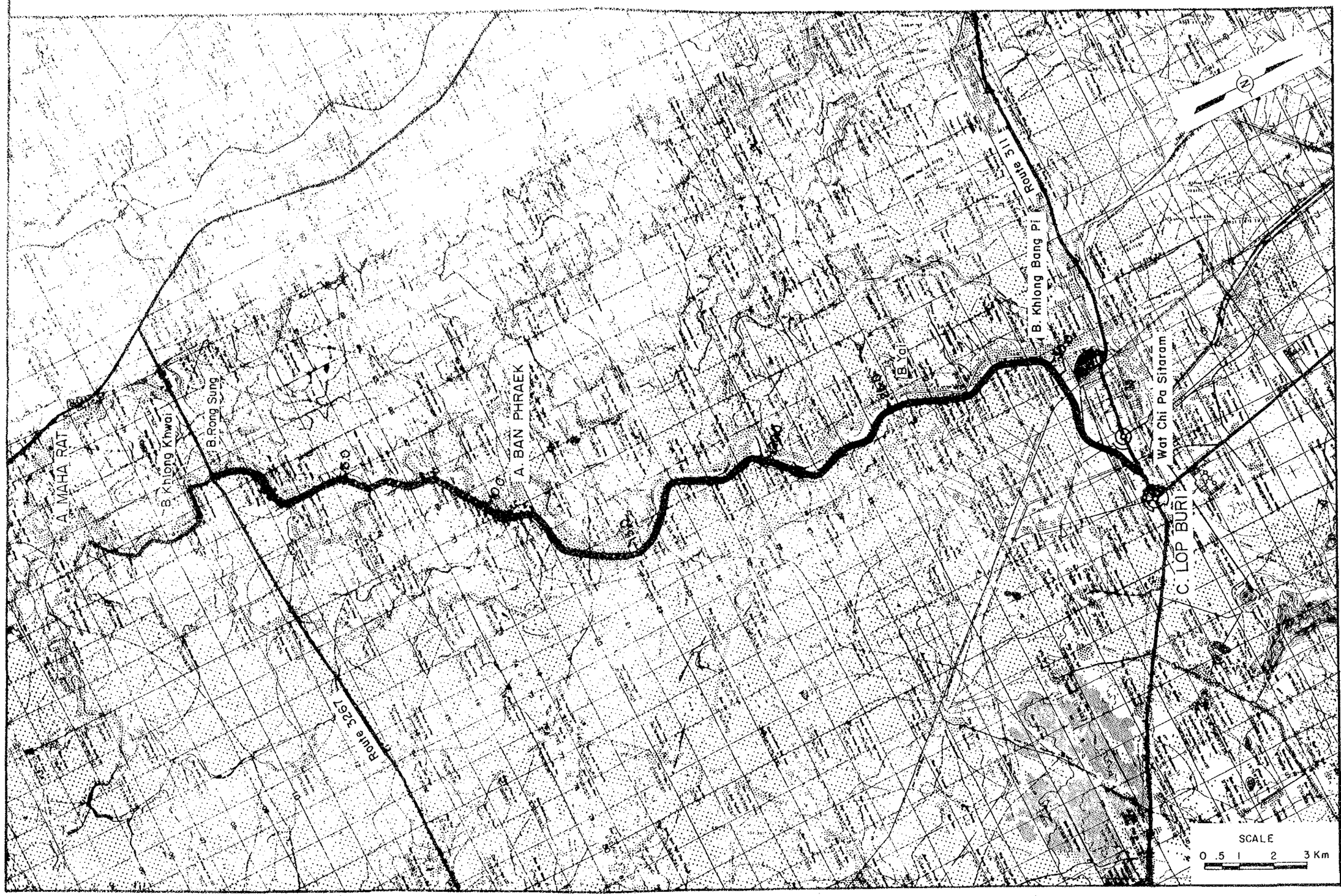
6. DEVELOPMENT AND SOCIAL IMPACTS

The improved road will probably induce better bus services to Lop Buri, resulting in a higher level of access to urban services to the large number of people living along the road. To a lesser extent better access to Bangkok will also widen the scope of opportunities available to the people in the area. It is, however, unlikely that the improvement of this road will result in significant changes in agricultural production process as it is already paved with SBST albeit in poor condition.

PROJECT NO. IM - 10

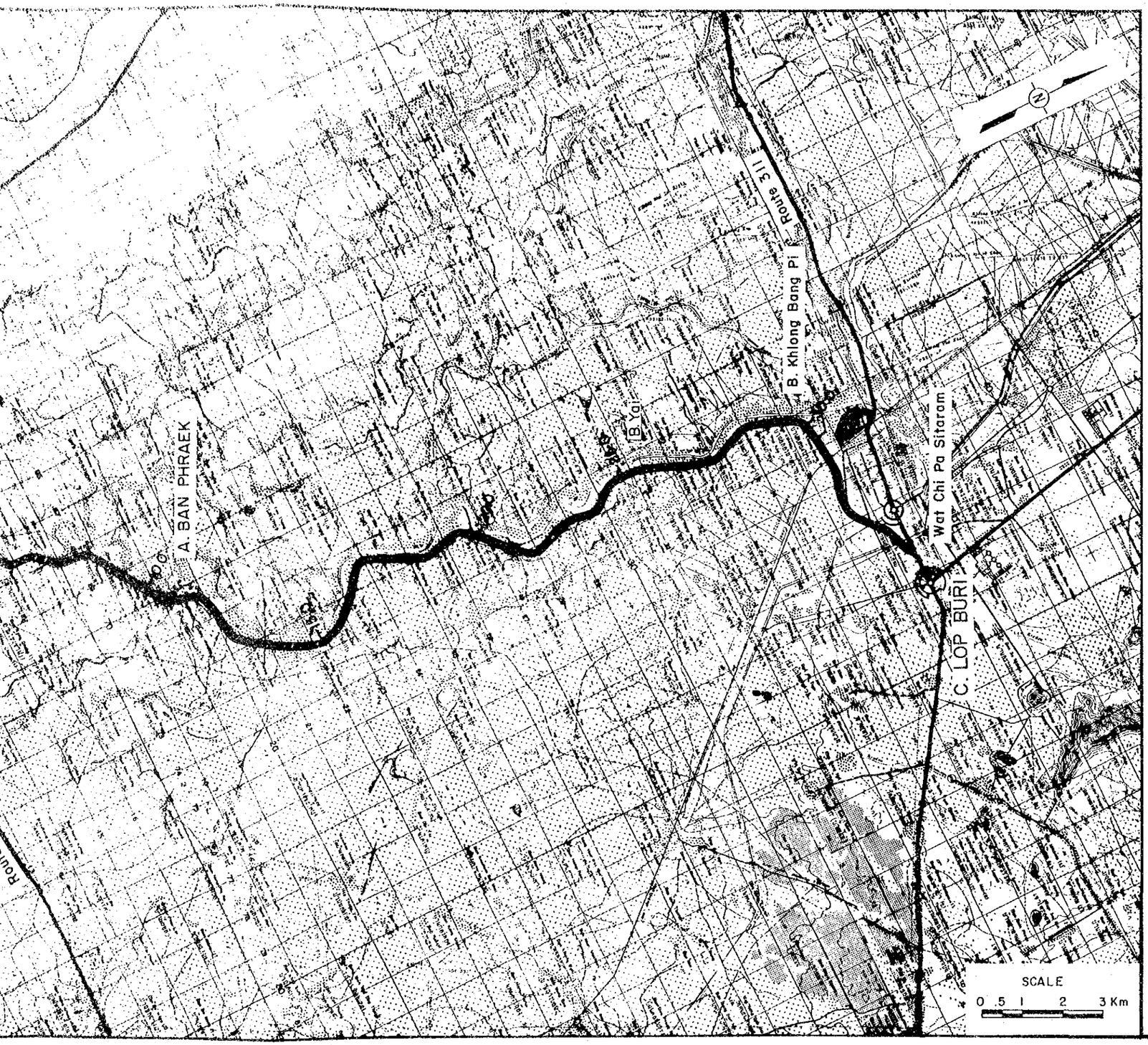
B. RONG SUNG — C. LOP BURI
C. LOP BURI, C. ANG THONG

L = 34.80 KM.

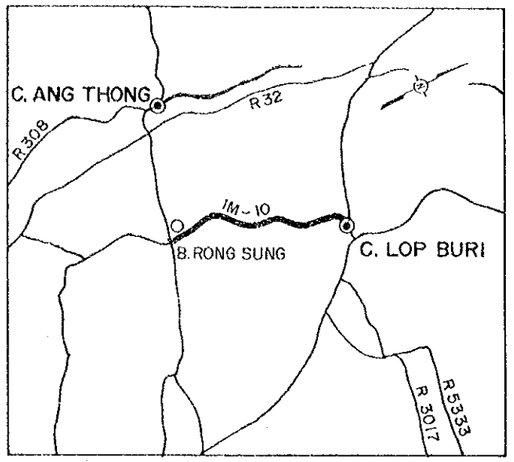


No.	Station Km.
1	9.9
	21.3

CT NO. IM - 10 B. RONG SUNG — C. LOP BURI / C. LOP BURI, C. ANG THONG L = 34.80 KM.



LOCATION MAP



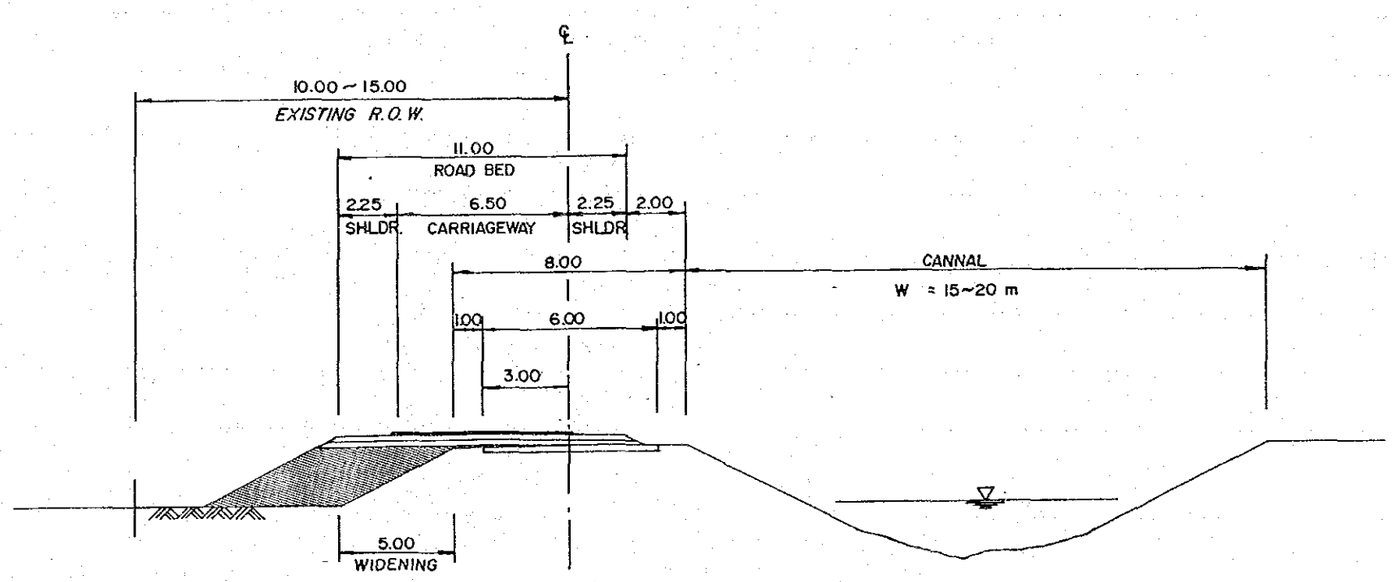
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge
1	9.9	—	C-8.00 x 50.00
	21.3	—	C-8.00 x 32.00

LEGEND

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

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F2)

PROJECT NO. IM-10

ROAD INVENTORY (1/2)

ROUTE NO. 3196 B. RENG SUNG (J.R. 3267) – C. LOP BURI (J.R. 311)

C. LOP BURI

L = 34.8 km

STATION (Km)		0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
VILLAGE Name of Village		B.Reng Sung (J.R. 3267) — Village densely located along the Road (Left Side Only)
TERRAIN		Flat
CROSS SECTION	Formation Width (m)	6.0 (1.0)
	Embankment Height (m)	2.5 2.5 2.0 1.5 2.5 1.5 2.0 2.5 2.0 1.5 3.0 2.0 2.0 3.0 2.0 1.5 1.3 2.0 2.0
	Cutting Depth (m)	-
SURFACE	Type/Length (km)	SBST
	Condition	Poor
FLOODING	Overflow Length (km)/Height (m)	No
LAND USE	Left	Houses located along the Road
	Right	RID Canal
BOX CULVERT & BRIDGE	Station (km)	9+900 21+300
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length	C-Br. 8.00(1.20)x50.00 C-Br. 8.00(1.20)x32.00
RIGHT OF WAY (m) (Left/Right)		15 10 10 15 15 10 10 10 Left 10-15 m, 10 Right (Canal) 10 15 10 20 15 15
ALIGNMENT	Horizontal	Fair
	Vertical	Good
ROUTE NO., AGENCIES		DOH Route No. 3196

ROAD INVENTORY (2/2)

PROJECT NO. IM-10 **ROUTE NO. 3196 B. RENG SUNG (J.R. 3267) – C. LOP BURI (J.R. 311)** **L = 34.8 km**

C. LOP BURI

STATION (Km)		30 32 34 36 38 40
VILLAGE	Name of Village	Sta. 31+400 Railway ########## C. LOP BURI (J.R. 311)
TERRAIN		Flat
CROSS SECTION	Formation Width (m)	6.0 (1.0)
	Embankment Height (m)	3.0 3.0 1.5 2.0 0
	Cutting Depth (m)	-
SURFACE	Type/Length (km)	SBST
	Condition	
FLOODING	Overflow Length (km)/Height.(m)	
LAND USE	Left	Houses located along the Road
	Right	RID Canal
BOX CULVERT & BRIDGE	Station (km)	
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length	
RIGHT OF WAY (m) (Left/Right)		25 25 10
ALIGNMENT	Horizontal	Fair
	Vertical	Good
ROUTE NO., AGENCIES		

PROJECT IM - 11

Changwat : Sing Buri, Ang Thong

B. Chana Soot - A. Pho Thong

Length : 41.00 km

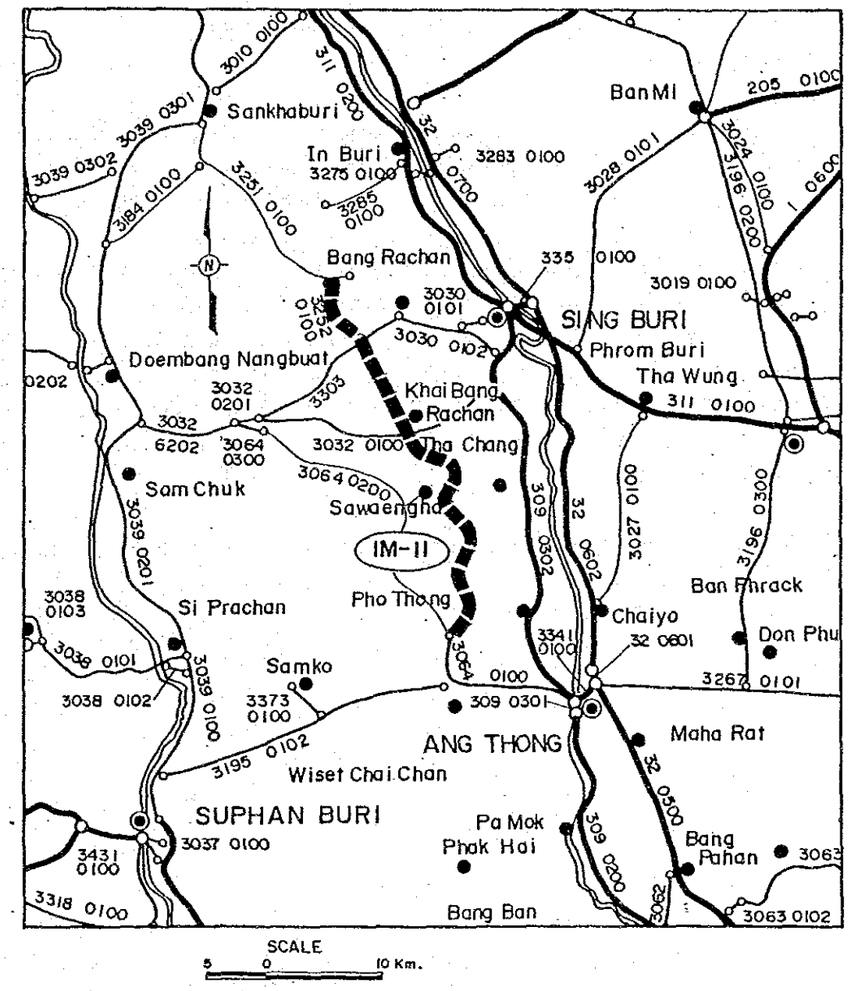
SUMMARY

PROJECT IM-11

Item	Description
Changwat	Sing Buri/Ang Thong
Origin	B. Channa Soot (J.R.3251)
Destination	A. Pho Thong (J.R.3064)
Length	
Total	41.0 km
Improvement Section	41.0 km
DOH Road	-
Others	RID 41.0 km
New Construction Section	-
Surface Type and Condition	SBST Poor 41.0 km
Terrain	Flat
Traffic (ADT)	
Existing	510
2000	2,511
2008	3,908
Existing Standard	*
Proposed Standard	F2
Construction Cost	
Financial	132,540 Thousand Baht
Economic	110,250 Thousand Baht
IRR	28.6 %
B/C	3.23

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

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed road extends over Changwat Ang Thong and Changwat Singburi. It originates at the junction with Route 3251 in Ban Channasut in Singburi, runs southward paralleling the Chao Phya River at a distance and ends at the junction with Route 3064 in Ang Thong. Its total length is 41 km.

The road is made on top of the eastern embankment of a large-scale irrigation canal for its entire length. Asphaltic pavement is applied for the entire length, but its condition is generally poor and occasionally very poor, particularly in the middle section. Paddy fields alternating with sugarcane fields are observed in the first 10-km section on both sides of the road. In the next 10-km section, both sides (the western side lies across the canal) are sugarcane fields. The remaining section runs through rice fields on both sides. Houses are concentrated on the immediate eastern side as a river flows about 1 km from the road. There is a very large sugar mill one-third along the road length. Heavy 10-wheel trucks laden with sugarcane stacked high can often be observed. At many places the pavement is so poor that trucks have to negotiate over shoulders at a crawling speed. Horizontal alignment is fair to good. The embankment is high, up to 3.0 m.

Upon completion this road, together with IM-12, will form an alternate to Route 309.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-11	RID-N	1988	479	72	16	0	214	101	60	463
	RID-M	1987	232	17	81	0	126	56	0	280
	RID-S	1988	1169	44	208	38	296	69	132	787
	Average	–	627	44	102	13	212	75	64	510

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-11	– 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-11	1.57	1.61	1.34	1.59	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-11	RID-N	1993	1079	193	34	0	580	150	98	1055
		2000	1079	294	48	0	934	252	784	2312
		2008	2324	459	71	0	1371	407	1323	3631
	RID-M	1993	610	50	180	0	380	90	0	700
		2000	610	77	259	0	612	151	0	1099
		2008	1460	119	382	0	898	244	0	1643
	RID-S	1993	2694	117	439	68	802	102	217	1745
		2000	2694	180	628	114	1293	171	1736	4122
		2008	5607	280	927	137	1899	276	2930	6449
	Average	1993	1461	120	218	23	587	114	105	1167
		2000	2084	184	312	38	946	191	840	2511
		2008	3130	286	460	46	1389	309	1418	3908

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	41.00	PAVED POOR	GOOD	FAIR	0	0
WITH PROJECT	41.00	PAVED F2	GOOD	FAIR	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	5735.	2352.	3318.	835.	10049.	3984.	33187.	59461.
2008	8665.	3664.	4897.	1004.	14751.	6435.	56010.	95427.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1647.	785.	3142.	1501.	2449.	608.	2668.	12800.
2008	2488.	1223.	4636.	1805.	3595.	981.	4503.	19232.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	7382.	3137.	6460.	2337.	12499.	4591.	35855.	72260.
2008	11153.	4887.	9534.	2809.	18346.	7416.	60514.	114658.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-11)

Item	Description
Changwat	Sing Buri/Ang Thong
Origin	B. Channasut (J.R.3251)
Destination	A. Pho Thong (J.R.3064)
Length	
Total	41.0 km
Improvement Section	41.0 km
DOH Road	-
Others	RID 41.0 km
New Construction Section	-
Terrain	Flat
Alignment (Hori./Vert.)	Fair/Good
Formation Width	5.20 m ~ 6.00 m
Embankment Section	
Length	41.0 km
Height	1.00 m ~ 3.00 m
Cut Section	-
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	Poor 41.0 km
Soil Aggregate	-
Earth	-
Box Culvert	-
Bridge	-
Permanent Bridge	-
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	Left(12m ~ 20 m), Right (Canal)

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-11 Length = 41.0 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	25	238				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	-	0				
Embankment (Borrow Pit)	m3	100	328,000	32,800				
Sub Total				33,038		27,422		24,680
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	67,700	12,186				
Subbase (Soil Aggregate)	m3	220	90,200	19,844				
Base (Soil Aggregate)	m3	350	46,300	16,205				
Shoulder (Soil Aggregate)	m3	250	21,700	5,425				
Asphaltic Prime/Tack Coat	m2	12	307,500	3,690				
DBST	m2	40	266,500	10,660				
AC Surfacing	m2	190	-	0				
Sub Total				68,010		56,448		28,224
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	735	1,323				
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				1,323		1,098		549
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				102,371		84,968		53,453
Miscellaneous Work ((a) x 7%)	1s			7,166	83	5,948	0	0
CONTRACT AMOUNT (b)				109,537		90,916		53,453
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			10,954		9,092		5,345
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			12,049	85	10,242	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))				132,540		110,250		58,798
AVERAGE COST PER KM				3,233				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

	COST	BENEFITS			DISCOUNTED(12%)	
YEAR	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		26,452	7,762	34,214	0	30,548
1995		31,954	8,602	40,556	0	32,331
1996		37,455	9,441	46,896	0	33,380
1997		42,957	10,281	53,238	0	33,834
1998		48,458	11,120	59,578	0	33,806
1999		53,959	11,960	65,919	0	33,397
2000		59,461	12,800	72,261	0	32,687
2001	24,077	63,956	13,604	77,560	10,891	31,325
2002		68,452	14,408	82,860	0	29,880
2003		72,948	15,212	88,160	0	28,385
2004		77,444	16,016	93,460	0	26,868
2005		81,939	16,820	98,759	0	25,349
2006		86,435	17,624	104,059	0	23,848
2007		90,931	18,428	109,359	0	22,377
2008	(58,798)	95,427	19,232	114,659	(12,031)	20,948
TOTAL	75,529	938,228	203,307	1,141,538	136,032	438,963

NET PRESENT VALUE :	302,931
BENEFIT COST RATIO :	3.23
INTERNAL RATE OF RETURN :	28.6%

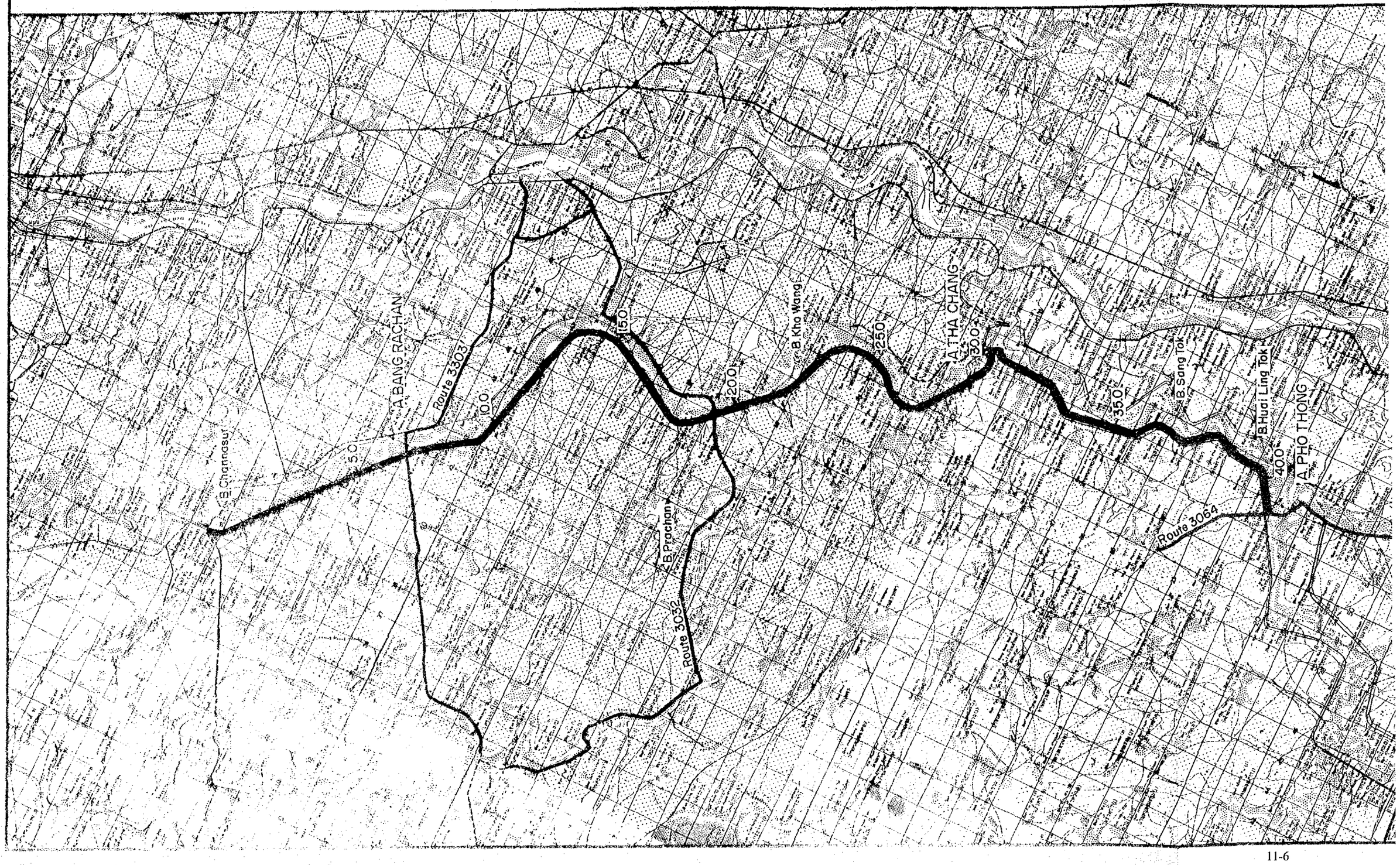
6. DEVELOPMENT AND SOCIAL IMPACTS

This once asphalt paved road has been virtually destroyed by extremely overloaded sugarcane trucks, which travel only short distances. The road will have to be paved with an extra strength as elimination of overloading of sugarcane trucks is neither practical nor economical. Benefits accrued would be mostly reaped by sugarcane trucks and the sugarmill. It can be expected that better bus services would be introduced to this densely populated area along the road. Residents' exposure to urban activities in Sing Buri would be increased.

PROJECT NO. IM – II

B. CHANA SOOT – A. PHO THONG
C. SING BURI, C. ANG THONG

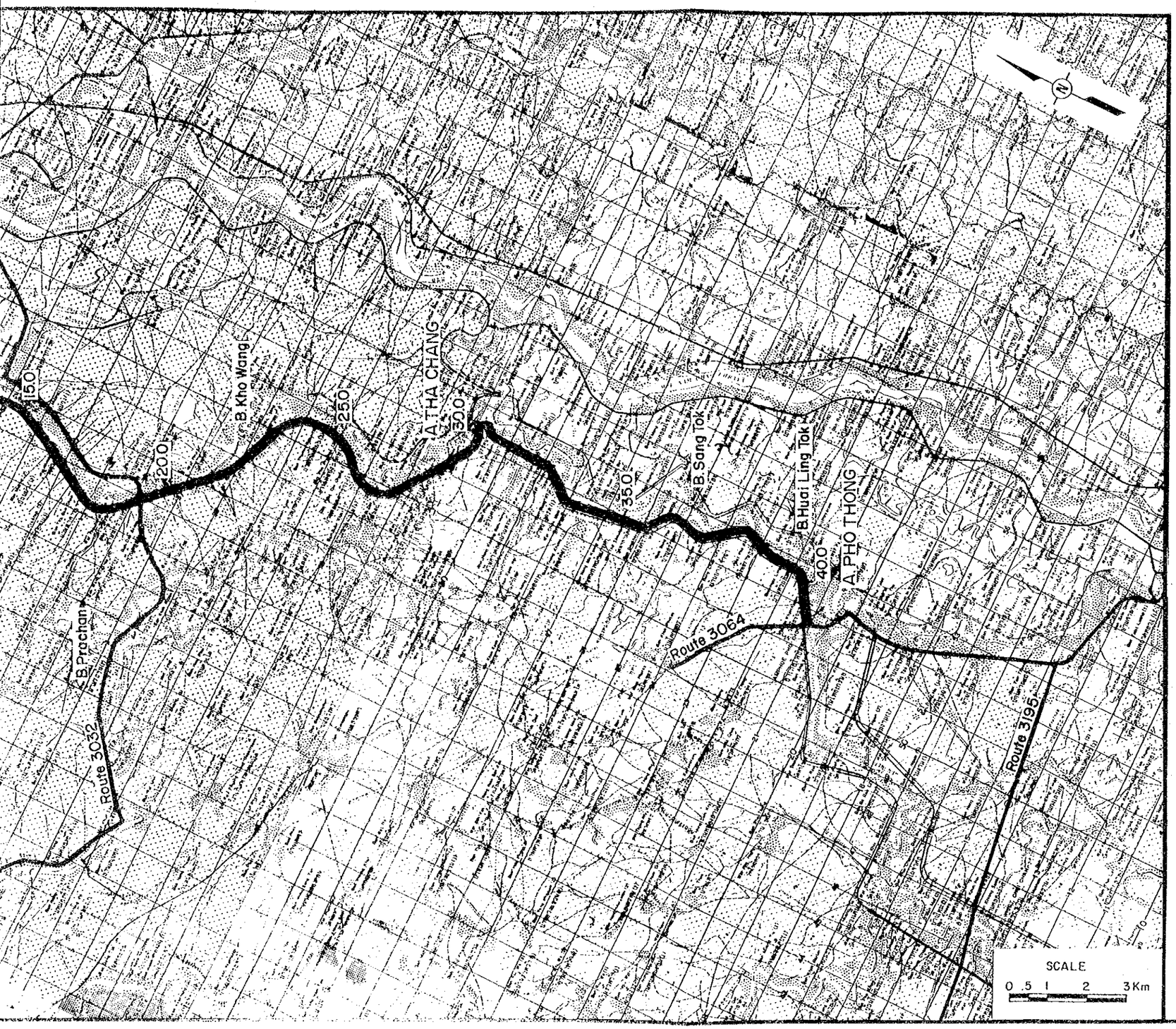
L = 41.00 KM.



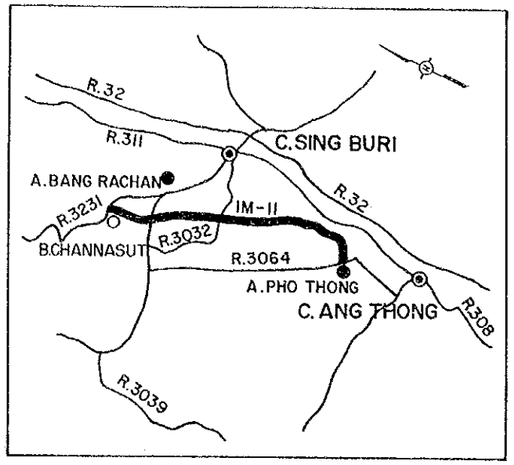
– 11

B. CHANA SOOT – A. PHO THONG
C. SING BURI, C. ANG THONG

L = 41.00 KM.



LOCATION MAP



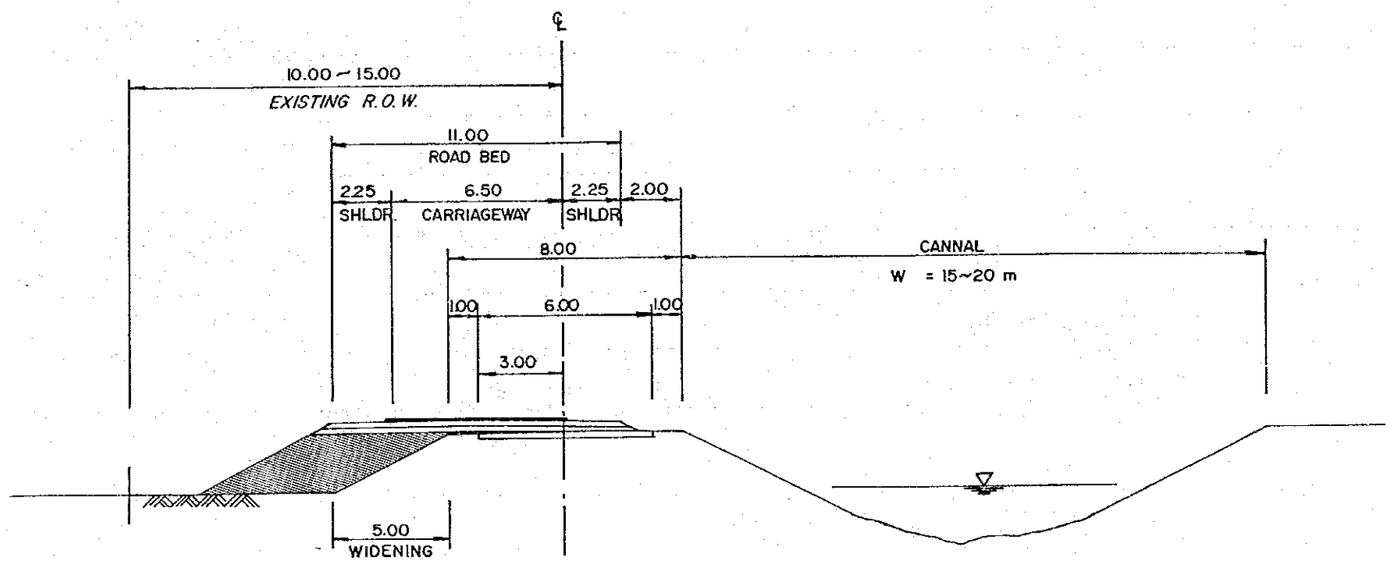
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge

LEGEND

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

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F2)

PROJECT NO. IM-11

ROAD INVENTORY (2/2)

CHANNASUT (J.R. 3251) – BANG RACHAN – THA CHANG – PHO THONG (J.R. 3064)

C. SING BURI – ANG THONG

L = 41.0 km

STATION (Km)		0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
VILLAGE	Name of Village	B. Chana Soot			A.BANG PA CHAN				B.PHO SANG CO	B. MUANG	B. THA KHAM		B. THONG KUNG B. CO WANG	B.SAO THONG HIN B. CHAM PA THONG	B.PI KUL THONG B.SE MA THONG	A. THA CHANG	
TERRAIN								Flat									
CROSS SECTION	Formation Width (m)			6.10				5.80				6.00				5.20	
	Embankment Height (m)						1.00						2.00			1.50	
	Cutting Depth (m)																
SURFACE	Type/Length (km)								Asphaltic Pavement								
	Condition			Poor					Very Poor					Poor			Fair
FLOODING	Overflow Length (km)/Height (m)																
LAND USE	Left				Paddy and Sugar Cane				Sugar Cane						Paddy		
	Right				Paddy and Sugar Cane				Sugar Cane						Paddy		
BOX CULVERT & BRIDGE	Station (km)																
	Dimension (m)																
RIGHT OF WAY (m) (Left/Right)				41.90			20.40					15.00				12.00	
ALIGNMENT	Horizontal			Good				Fair				Good		Poor		Good	
	Vertical		Fair							Good							
ROUTE NO., AGENCIES																	

PROJECT NO. IM-11

ROAD INVENTORY (2/2)

CHANNASUT (J.R. 3251) – BANG RACHAN – THA CHANG – PHO THONG (J.R. 3064)

C. SING BURI – ANG THONG

L = 41.0 km

STATION (Km)		30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
VILLAGE Name of Village		B. Hong / T. Ong Ka Rak / T. Bang Chao Cha / B. Sang / B. Huay Ling / A. Pho Thong
TERRAIN		Flat
CROSS SECTION	Formation Width (m)	5.8
	Embankment Height (m)	1.50 / 3.0 / 1.50 / 2.50
	Cutting Depth (m)	
SURFACE	Type/Length (km)	Asphaltic Pavement
	Condition	Fair / Poor
FLOODING	Overflow Length (km)/Height (m)	
LAND USE	Left	Paddy
	Right	Paddy
BOX CULVERT & BRIDGE	Station (km)	
	Dimension (m)	
RIGHT OF WAY (m) (Left/Right)		25.00
ALIGNMENT	Horizontal	V.Poor / Fair / Poor
	Vertical	Good
ROUTE NO., AGENCIES		