PROJECT IM - 20

Changwat : Chanthaburi

B. Khlong Takhian - J. R. 3322

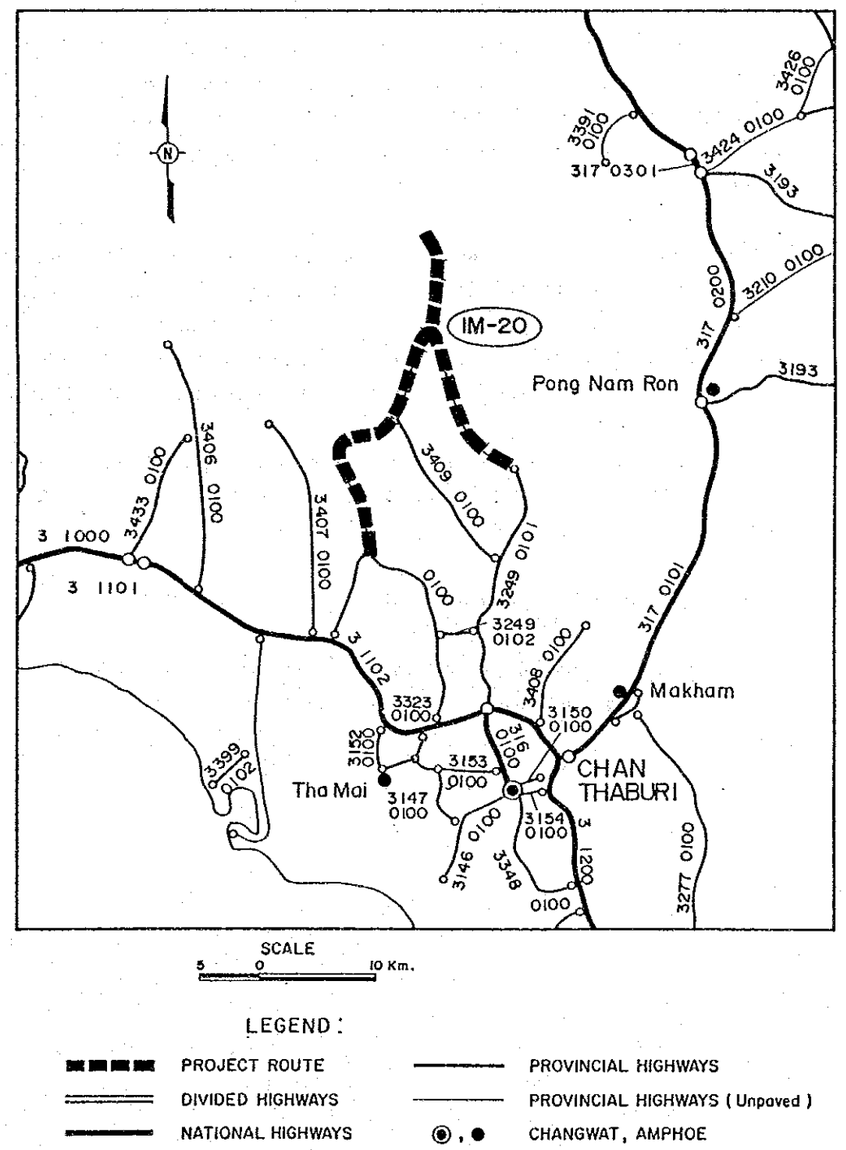
Length : 44.50 km

SUMMARY

PROJECT IM-20

Item	Description
Changwat	Chanthaburi
Origin	B. Khlong Takhian (Rt. 3249)
Destination	Rt. 3322 / B. Chan Khrem
Length	
Total	44.5 km
Improvement Section	44.5 km
DOH Road	No.3249 36.2 km
Others	8.3 km
New Construction Section	-
Surface Type and Condition	SBST Fair S/A Fair, Fair/Poor
Terrain	
Traffic (ADT)	
Existing	409
2000	977
2008	1,447
Existing Standard	Laterite, Substandard
Proposed Standard	F4
Construction Cost	
Financial	105,575 Thousand Baht
Economic	87,820 Thousand Baht
IRR	21.8%
B/C	1.99

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route lies in Changwat Chanthaburi.

It originates in Ban Khleng Takhian at the end of existing Route 3249 (paved F4 standards), runs northward for about 12 km, then turns southwestward and ends at the junction with Route 3322. A spur is proposed to be included in this project, which starts at about Km 11 of the main road, runs northward for about 8 km and ends in Ban Chan Khrem. The total length of the main road is 36.2 km and that of the spur road 8.3 km, making an overall total length of 44.5 km.

From the starting point, the road extends northward at the foot of a mountain range. Paddy is grown on low land, and hillsides are made into orchards for durian, rambutan, etc. A good size cluster of houses is located at about Km 12, where the road turns southwestward through hilly terrain. The section of about 10 km in the latter half is in the middle of a rubber plantation. The spur road runs through low land between hills until it ends at the foot of another hill.

The existing road is of generally laterite surface with two short stretches of SBST through villages and a 2-km section of SBST at the end of the main road. Two concrete bridges are under construction on the main road.

Traffic is considerable on the main road.

Upon completion of the improvement, this road will greatly increase the accessibility of the area along the road and of the area north of this road.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-20	3249~0200	1986	185	16	17	2	119	22	3	179
	3249~0300	1986	171	12	8	5	102	17	0	144
	RURAL	1988	638	73	75	0	672	61	24	905
	Average	--	331	34	33	2	298	33	9	409

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-20	- 1993	6.17	6.88	7.24	6.37	5.76	5.79	5.64	6.17
	1994 - 2000	5.81	5.87	8.60	4.94	5.21	5.81	5.66	5.81
	2001 - 2008	5.07	5.56	7.02	4.24	4.72	4.42	3.45	5.07

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-20	1.19	1.21	1.12	1.20	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-20	3249~0200	1993	329	30	34	3	211	33	4	315
		2000	329	44	60	4	301	49	6	464
		2008	727	68	104	7	436	69	8	692
	3249~0300	1993	306	23	16	9	181	25	0	254
		2000	306	33	28	12	258	37	0	368
		2008	674	51	48	17	374	52	0	542
	RURAL	1993	1018	122	128	0	1068	81	32	1431
		2000	1018	181	228	0	1524	120	47	2100
		2008	2246	279	392	0	2204	170	62	3107
	Average	1993	551	58	59	4	487	46	12	667
		2000	816	86	105	5	694	69	18	977
		2008	1216	133	181	8	1005	97	23	1447

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	44.50	LATERITE FAIR	FAIR	FAIR	0	0
WITH PROJECT	44.50	PAVED F4	FAIR	FAIR	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	5132.	2534.	2278.	223.	15485.	2593.	1110.	29354.
2008	7633.	3914.	3927.	334.	22412.	3645.	1418.	43283.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	554.	341.	986.	187.	1671.	181.	47.	3967.
2008	823.	527.	1700.	281.	2418.	255.	60.	6064.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	5685.	2875.	3264.	410.	17156.	2774.	1157.	33322.
2008	8456.	4440.	5628.	615.	24830.	3900.	1479.	49347.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-20)

Item	Description
Changwat	Chanthaburi
Origin	B. Khleng Takhian (Rt. 3249)
Destination	Rt. 3322 / B. Chan Khrem
Length	
Total	44.5 km
Improvement Section	44.5 km
DOH Road	No.3249 36.2 km
Others	8.3 km
New Construction Section	-
Terrain	Flat/Rolling
Alignment (Hori./Vert.)	Fair/Poor (H)/ Fair/Poor (V)
Formation Width	5 m ~ 6 m
Embankment Section	
Length	44.5 km
Height	0.5 m
Cut Section	-
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	Poor
Soil Aggregate	Fair, Fair/Poor
Earth	-
Box Culvert	1 unit
Bridge	
Permanent Bridge	6 sites 168 m, 2 sites under construction
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	20 m ~ 30 m

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-20 Length = 44.5 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	365,000	14,600				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				14,705		12,205		10,985
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	59,700	10,746				
Subbase (Soil Aggregate)	m3	220	79,600	17,512				
Base (Soil Aggregate)	m3	350	43,400	15,190				
Shoulder (Soil Aggregate)	m3	250	16,800	4,200				
Asphaltic Prime/Tack Coat	m2	12	287,600	3,451				
DBST	m2	40	243,300	9,732				
AC Surfacing	m2	190	-	0				
Sub Total				60,831		50,490		25,245
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	1,482	2,668				
RC Box Culvert (2 x 2.4 x 2.4 Equivalent)	m	20,000	5	100				
RC Bridge (W=7.0 L=10.0 Equivalent)	m	60,000	54	3,240				
Sub Total				6,008		4,987		2,494
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				81,544		67,682		38,724
Miscellaneous Work ((a) x 7%)	1s			5,708	83	4,738	0	0
CONTRACT AMOUNT (b)				87,252		72,420		38,724
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			8,725		7,242		3,872
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			9,598	85	8,158	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))				105,575		87,820		42,596
AVERAGE COST PER KM				2,372				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

	COST	BENEFITS			DISCOUNTED(12%)	
YEAR	CONST. COST	VOC SAVING	TIME SAVING	TOTAL	COST	BENEFIT
1991	17,564			0	24,676	0
1992	43,910			0	55,081	0
1993	26,346			0	29,508	0
1994		21,305	2,823	24,128	0	21,543
1995		22,646	3,014	25,660	0	20,456
1996		23,988	3,205	27,193	0	19,355
1997		25,330	3,395	28,725	0	18,255
1998		26,671	3,586	30,257	0	17,169
1999		28,013	3,777	31,790	0	16,106
2000		29,355	3,967	33,322	0	15,073
2001	22,049	31,096	4,229	35,325	9,974	14,267
2002		32,837	4,492	37,329	0	13,461
2003		34,578	4,754	39,332	0	12,664
2004		36,319	5,016	41,335	0	11,883
2005		38,060	5,278	43,338	0	11,124
2006		39,801	5,540	45,341	0	10,391
2007		41,542	5,802	47,344	0	9,688
2008	(42,596)	43,283	6,064	49,347	(8,716)	9,016
TOTAL	67,273	474,821	64,941	539,766	110,523	220,451

NET PRESENT VALUE :	109,928
BENEFIT COST RATIO :	1.99
INTERNAL RATE OF RETURN :	21.8%

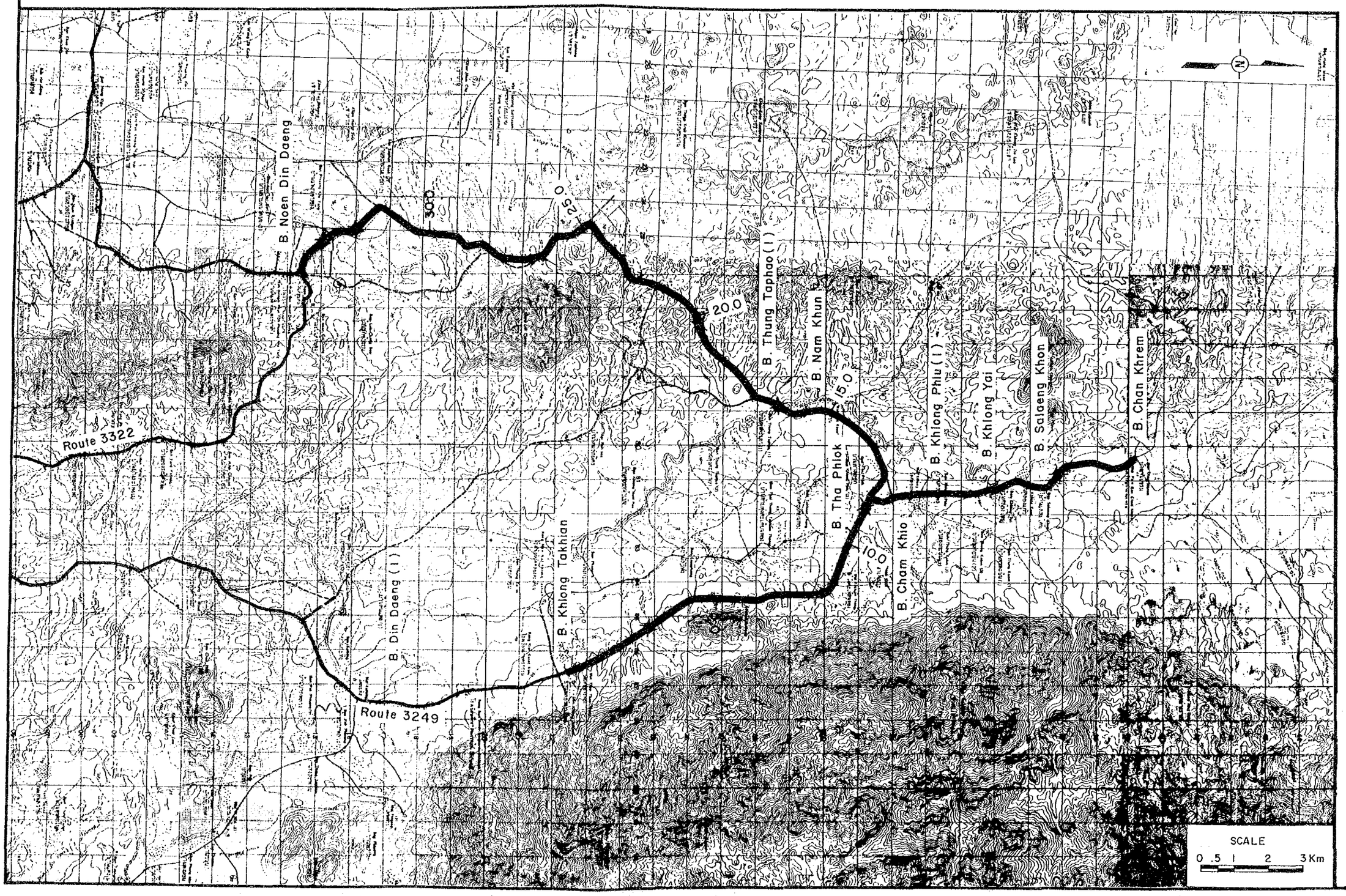
6. DEVELOPMENT AND SOCIAL IMPACTS

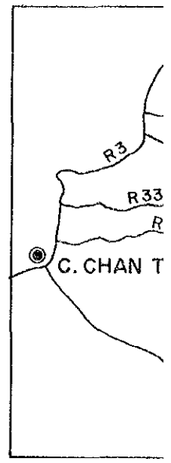
Impact of the project road on fruit production in the surrounding area would be significant. The Social impacts on villagers who can travel to Chanthaburi easier would also be significant.

PROJECT NO. IM - 20

B. KHLONG TAKHIAN — J. R. 3322
C. CHANTHABURI

L. = 44.50 KM.



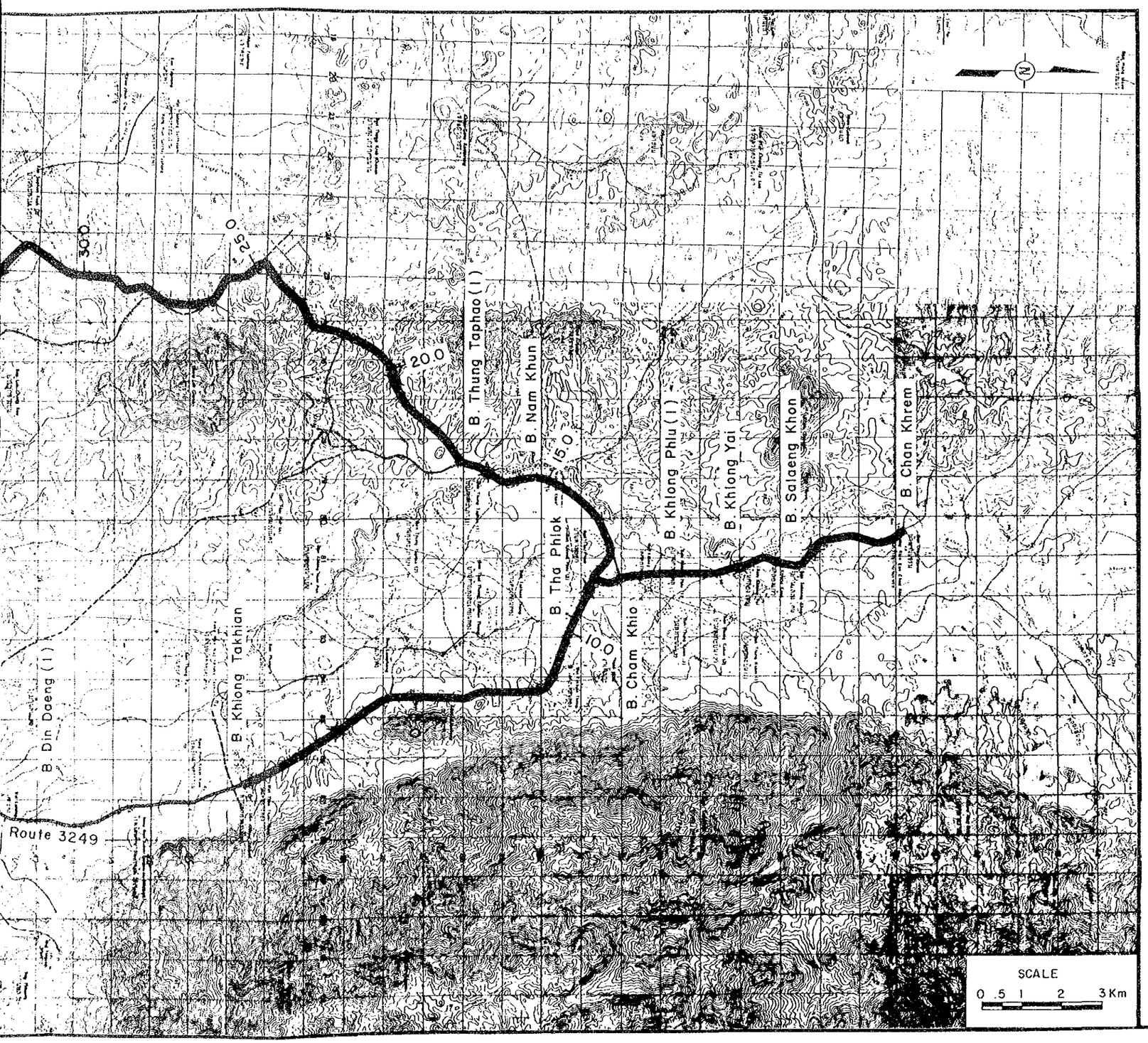


No	Station Km.	Pr
1	0.05	
2	2.8	
3	11.2	
4	16.3	
5	19.7	
6	34.1	
7	34.8	
8	3.6	
9	5.6	

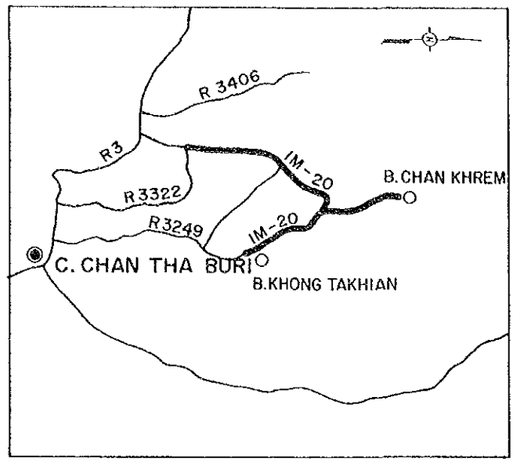
LEGEND

P
P
P
U
IN

CT NO. IM – 20 B. KHLONG TAKHIAN — J. R. 3322
C. CHANTHABURI L = 44.50 KM.



LOCATION MAP



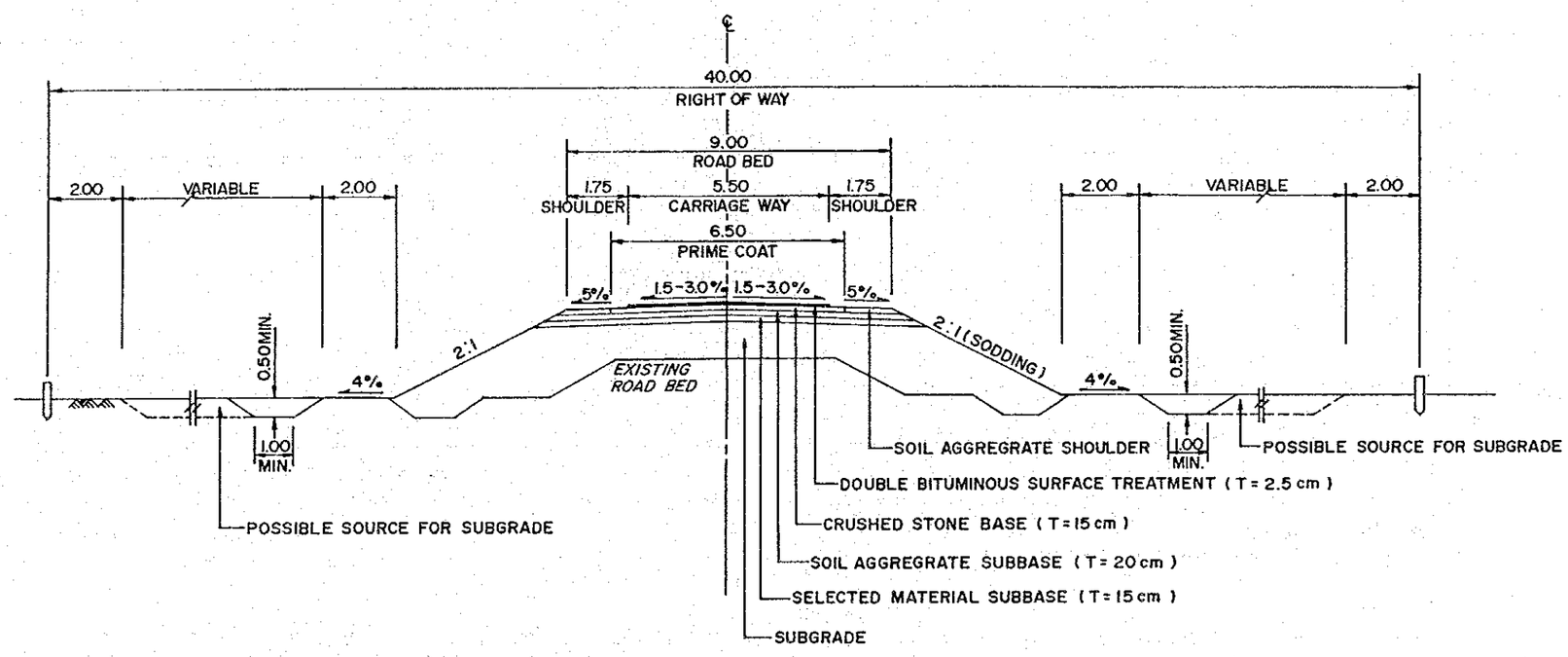
BRIDGE LIST

No	Station Km.	Proposed Bridge	Existing Bridge
1	0.05	C – 7.00 x 9.00	C – 5.50 x 8.50
2	2.8	C – 7.00 x 45.00	M – 7.00 x 45.00
3	11.2	–	C – 7.00 x 10.00
4	16.3	–	C – 7.00 x 60.00
5	19.7	–	C – 7.00 x 20.00
6	34.1	–	C – 9.00 x 16.50
7	34.8	–	C – 9.00 x 24.00
8	3.6	–	C – 7.00 x 50.00
9	5.6	–	C – 7.00 x 22.50

LEGEND

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

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F4)

ROAD INVENTORY 1/3

PROJECT NO. IM-20 | **ROUTE NO. 3249 B. KHLONG TAKHIAN (R. 3249) – (BRANCH) B. CHAN KHREM (J.R. 3322)** | **L = 44.5 km**

ARD Rural C. CHANTHABURI

STATION (Km)		0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30													
VILLAGE Name of Village		B. Khleng Takhian (R. 3249)						(Branch) 11+200	B.NAM KHUM		R.3409 18.3																			
TERRAIN		Flat										Rolling																		
CROSS SECTION	Formation Width (m)	6.0 (1.0)							5.0 (1.0)	6.0 (1.0)	5.5 (1.0)			6.0 (1.0)																
	Embankment Height (m)	0.5							0.5	0.5	0.5																			
	Cutting Depth (m)																													
SURFACE	Type/Length (km)	Laterite							SB ST		SB ST																			
	Condition	Fair							Poor		Poor																			
FLOODING	Overflow Length (km)/Height (m)	No																												
LAND USE	Left	Ranbutan			Paddy	Paddy			Cassava		Banana		Durian	Rubber			Rubber													
	Right	Ranbutan	Durian			Paddy	Paddy		Cassava		Banana		Durian	Rubber			Rubber													
BOX CULVERT & BRIDGE	Station (km)	0+050	2+800					11+200		16+300		19+700																		
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length Box - Width - Height - Length	C-Box 5.50x8.50	M-Br. 7.00(0.50)x45.00					C-Br. 7.00(0)x10.00		C-Br. (Under Const.) L = 60 m.		C-Br. (Under Const.) L = 20 m.																		
RIGHT OF WAY (m) (Left/Right)		10 10	15 15					15 15						15 15																
ALIGNMENT	Horizontal	Fair										Fair/Poor																		
	Vertical	Fair										Fair/Poor																		
ROUTE NO., AGENCIES								3249																						

ROAD INVENTORY 2/3

PROJECT NO. IM-20

ROUTE NO. 3249 B. KHLONG TAKHIAN (R. 3249) – (BRANCH) B. CHAN KHREM (J.R. 3322)

L = 44.5 km

ARD Rural C. CHANTHABURI

STATION (Km)		30	32	34	36 36.2	38	40	42	44	46	48	50	52	54	56	58	60
VILLAGE Name of Village					J.R. 3322												
TERRAIN																	
CROSS SECTION	Formation Width (m)			4.5 (0.75)													
	Embankment Height (m)			0.5													
	Cutting Depth (m)																
SURFACE	Type/Length (km)		Laterite	SBST													
	Condition		Fair	Fair													
FLOODING	Overflow Length (km)/Height (m)																
LAND USE	Left		Cassava														
	Right		Cassava														
BOX CULVERT & BRIDGE	Station (km)			34+100 34+800													
	Dimension (m) Bridge - Conc.or Wooden - Width - (Sidewalk) - Length			C-Br. 9.00(0)x16.50 C-Br. 9.00(0)x24.00													
RIGHT OF WAY (m) (Left/Right)			10 10														
ALIGNMENT	Horizontal		Fair/Poor														
	Vertical		Fair/Poor														
ROUTE NO., AGENCIES			3249														

ROAD INVENTORY 3/3

PROJECT NO. IM-20 | **ROUTE NO. 3249** | **B. KHLONG TAKHIAN (R. 3249) – (BRANCH) B. CHAN KHREM (J.R. 3322)** | **L = 44.5 km**

ARD Rural | **C. CHANTHABURI**

STATION (Km)		0	2	4	6	8 / 8.3	10	12	14	16	18	20	22	24	26	28	30
VILLAGE Name of Village		B.Khlong Phlu				B.Chan Khrem											
TERRAIN				Flat													
CROSS SECTION	Formation Width (m)			6.5 (1.0)													
	Embankment Height (m)			0.5													
	Cutting Depth (m)																
SURFACE	Type/Length (km)			Laterite													
	Condition			Fair/Poor													
FLOODING	Overflow Length (km)/Height (m)			No													
LAND USE	Left		Banana	Banana	Cassava												
	Right		Cassava	Banana	Cassava												
BOX CULVERT & BRIDGE	Station (km)			3+600	5+600												
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length			C-Br. 7.00(1.20)x50.00	C-Br. 7.00(1.20)x22.50												
RIGHT OF WAY (m) (Left/Right)		15 15		10-15 10-15													
ALIGNMENT	Horizontal			Fair													
	Vertical			Fair													
ROUTE NO., AGENCIES				Rural													

PROJECT IM - 21

Changwat : Chon Buri, Rayong

B. Nong Chang - J. R. 3138

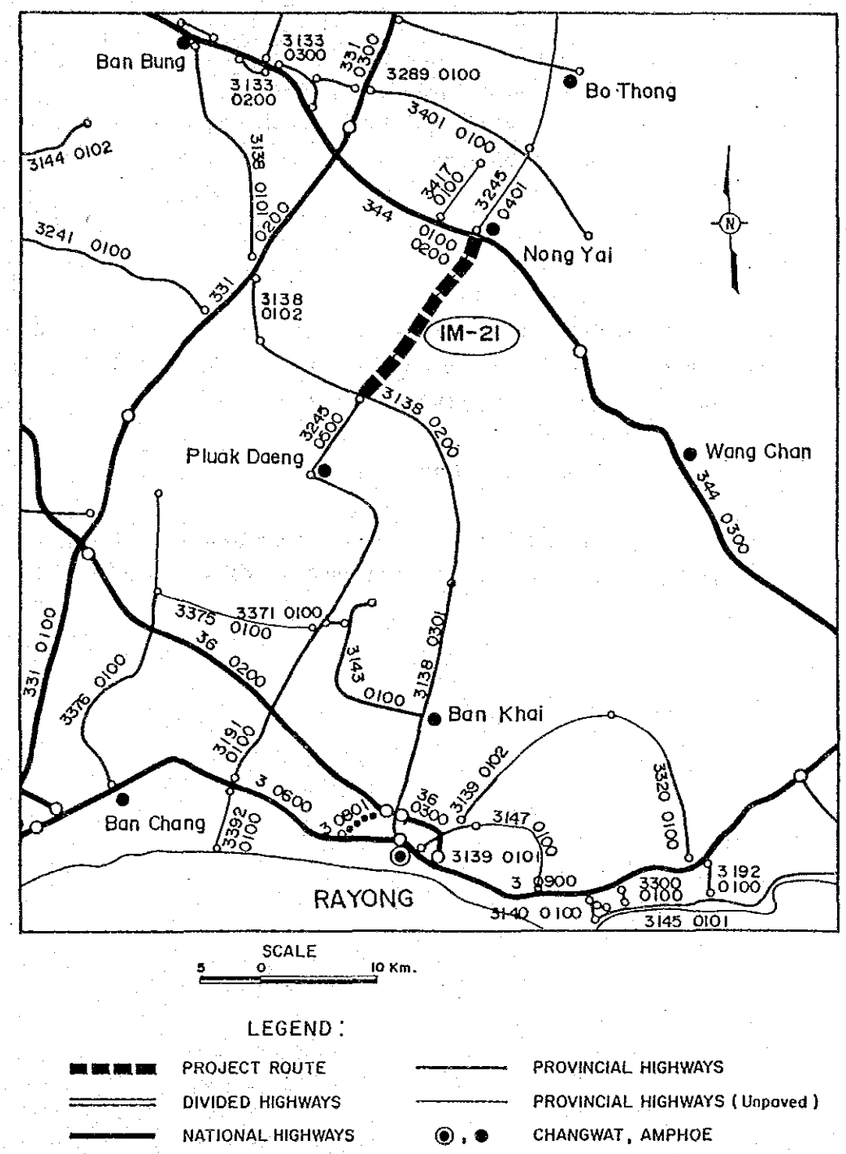
Length : 18.30 km

SUMMARY

PROJECT IM-21

Item	Description
Changwat	Chon Buri/Rayong
Origin	B. Nong Chang (J.R.344)
Destination	J.R. 3138
Length	
Total	18.3 km
Improvement Section	18.3 km
DOH Road	No.3245 18.3 km
Others	-
New Construction Section	-
Surface Type and Condition	SBST Fair S/A Fair
Terrain	
Traffic (ADT)	
Existing	338
2000	521
2008	697
Existing Standard	Laterite, Substandard
Proposed Standard	F4
Construction Cost	
Financial	41,755 Thousand Baht
Economic	34,733 Thousand Baht
IRR	16.7%
B/C	1.38

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route extends over the two Changwats of Chon Buri and Rayong.

It originates in Ban Nong Chang at the intersection with Route 344, runs southwestward across rolling terrain and ends at the junction with Route 3138 in Changwat Rayong. Its total length is 18.3 km. Currently short stretches of SBST sections exist at both ends and in the middle. The remaining sections are of laterite.

The surface condition of SBST sections and laterite sections was generally fair at the time of the Study Team's inspection.

Because of the terrain, most of the area along the road is planted with sugarcane. Only a handful of villages are located along the road. The major function of the existing road appears to be a conduit for exporting sugarcane from the area.

There is one permanent bridge 22.0 m long.

Upon completion, the improvement of this road will provide a direct paved link between the two important Amphoes in this area: Amphoe Nong Yai and Amphoe Puak Daeng.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-21	3245-0402	1988	152	6	34	0	231	28	39	338

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-21	- 1993	5.87	6.51	4.20	5.71	2.49	4.55	0.00	5.87
	1994 - 2000	4.65	5.85	5.96	5.00	2.20	4.26	3.71	4.65
	2001 - 2008	4.97	5.82	5.20	5.15	3.50	4.30	1.20	4.97

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-21	1.12	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-21	3245-0402	1993	221	9	47	0	292	35	39	422
		2000	221	13	71	0	340	47	50	521
		2008	450	21	107	0	448	66	55	697

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	18.30	LATERITE FAIR	FAIR	GOOD	0	0
WITH PROJECT	18.30	PAVED F4	FAIR	GOOD	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	874.	169.	721.	0.	3319.	900.	1711.	7693.
2008	1291.	270.	1088.	0.	4370.	1263.	1882.	10164.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	88.	22.	283.	0.	348.	51.	54.	846.
2008	130.	35.	427.	0.	458.	71.	59.	1181.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	962.	191.	1005.	0.	3666.	950.	1765.	8539.
2008	1421.	306.	1514.	0.	4828.	1334.	1941.	11345.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-21)

Item	Description
Changwat	Chon Buri/Rayong
Origin	B. Nong Chang (J.R.344)
Destination	J.R. 3138
Length	
Total	18.3 km
Improvement Section	18.3 km
DOH Road	No.3245 18.3 km
Others	-
New Construction Section	-
Terrain	Rolling
Alignment (Hori./Vert.)	Good (H)/Fair~Poor (V)
Formation Width	8.0 m
Embankment Section	
Length	18.3 km
Height	0.3 m ~ 0.5 m
Cut Section	-
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	Fair
Soil Aggregate	Fair
Earth	-
Box Culvert	-
Bridge	
Permanent Bridge	1 site 22.0 m
Narrow Concrete Bridge	-
Wooden Bridge	-
Overflow Section	-
Right of way	20 m ~ 30 m

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-21 Length = 18.3 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	5	48				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	155,400	6,216				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				6,264		5,199		4,679
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	24,700	4,446				
Subbase (Soil Aggregate)	m3	220	32,900	7,238				
Base (Soil Aggregate)	m3	350	17,900	6,265				
Shoulder (Soil Aggregate)	m3	250	6,900	1,725				
Asphaltic Prime/Tack Coat	m2	12	118,800	1,426				
DBST	m2	40	100,500	4,020				
AC Surfacing	m2	190	-	0				
Sub Total				25,120		20,850		10,425
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	481	866				
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				866		719		360
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				32,250		26,768		15,464
Miscellaneous Work ((a) x 7%)	1s			2,258	83	1,874	0	0
CONTRACT AMOUNT (b)				34,508		28,642		15,464
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	1s			3,451		2,864		1,546
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	1s			3,796	85	3,227	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))				41,755		34,733		17,010
AVERAGE COST PER KM				2,282				

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	13,893			0	17,427	0
1993	20,840			0	23,341	0
1994		6,313	674	6,987	0	6,238
1995		6,543	703	7,246	0	5,776
1996		6,773	731	7,504	0	5,341
1997		7,003	760	7,763	0	4,934
1998		7,233	788	8,021	0	4,551
1999		7,463	817	8,280	0	4,195
2000		7,693	846	8,539	0	3,863
2001	9,108	8,002	888	8,890	4,120	3,591
2002		8,311	929	9,240	0	3,332
2003		8,620	971	9,591	0	3,088
2004		8,929	1,013	9,942	0	2,858
2005		9,238	1,055	10,293	0	2,642
2006		9,547	1,097	10,644	0	2,439
2007		9,855	1,139	10,994	0	2,250
2008	(17,010)	10,164	1,181	11,345	(3,481)	2,073
TOTAL	26,831	121,690	13,591	135,279	41,407	57,171

NET PRESENT VALUE :	15,764
BENEFIT COST RATIO :	1.38
INTERNAL RATE OF RETURN :	16.7%

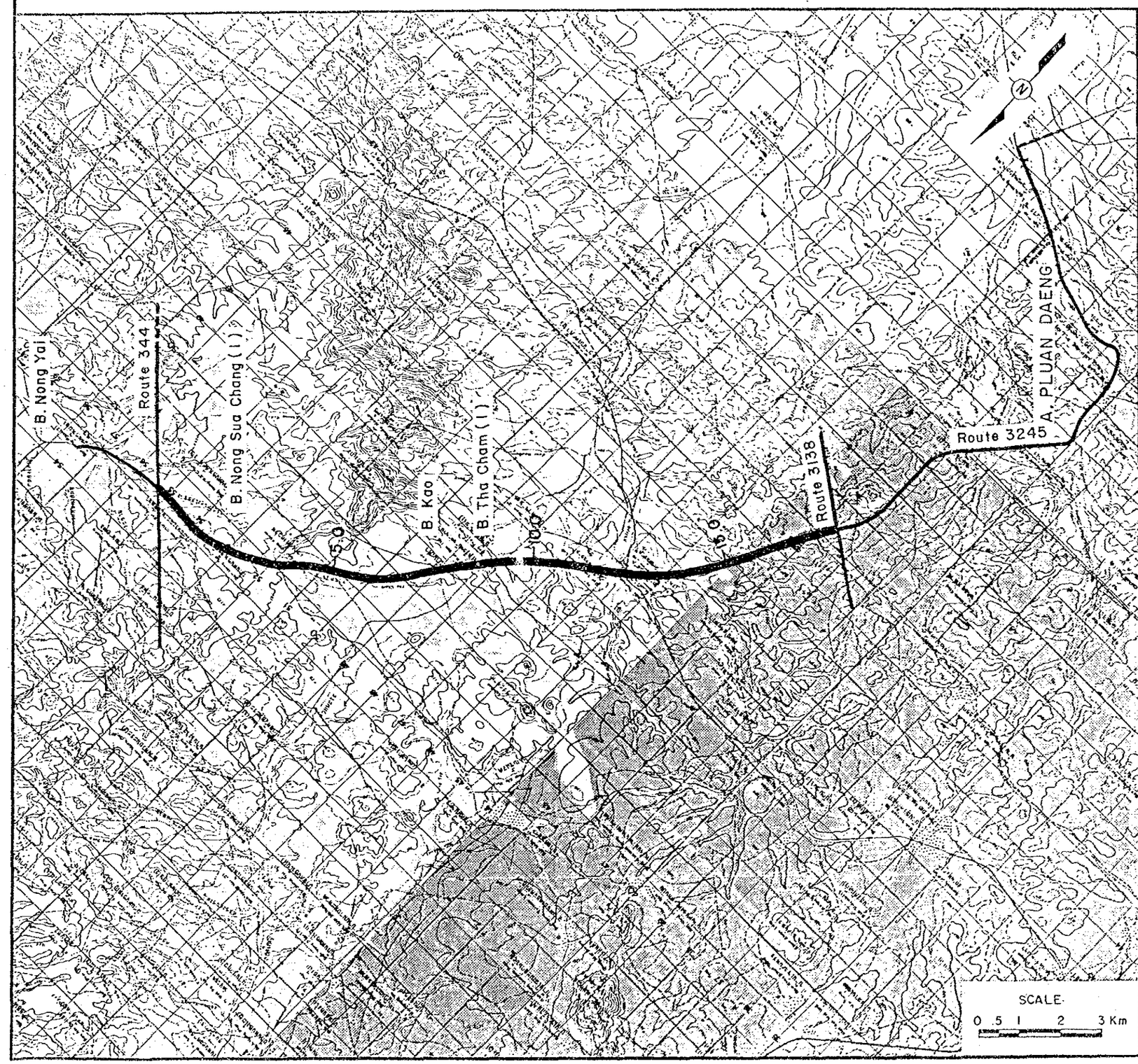
6. DEVELOPMENT AND SOCIAL IMPACTS

It is possible that crop diversification currently advocated by the Government for this part of Thailand may be accelerated by the improvement of this road due to better access to buyers and other general information sources often found in market places such as Amphoe centers. Better connection of two Amphoe would encourage specialization of each. Village dwellers in the area would enjoy better access to urban services.

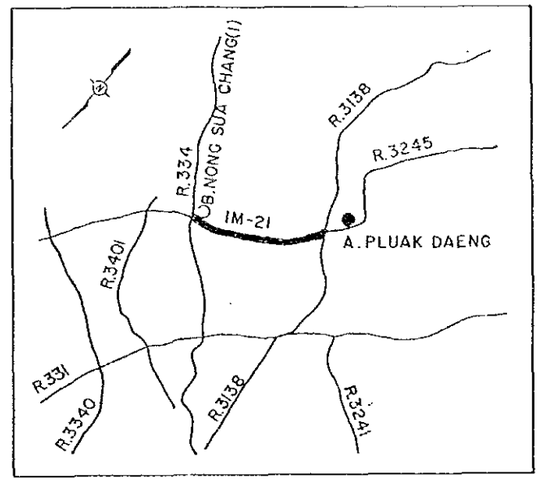
PROJECT NO. IM - 21

B. NONG CHANG — J. R. 3138
C. CHON BURI, C. RAYONG

L = 18.30 KM.



LOCATION MAP



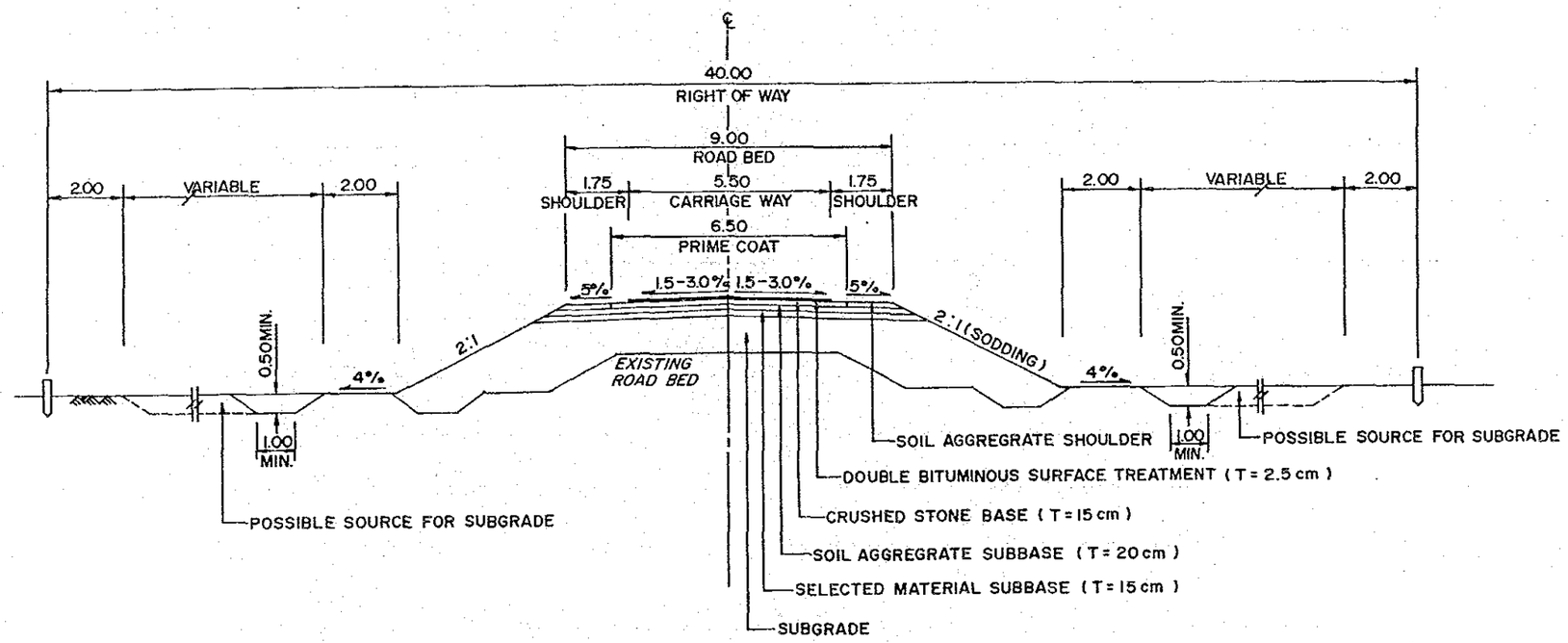
BRIDGE LIST

No	Station Km.	Proposed Bridge	Existing Bridge
1	12.3	—	C-8.00x22.00

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-21 | **ROUTE NO. B. NONG SUA CHANG (J.R. 344) – J.R. 3138** | **L = 18.3 km**

ARD Rural C. CHON BURI/RAYONG

STATION (Km)		0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
VILLAGE Name of Village		B. Nong Sua Chang (J.R. 344) / B. Tha Cham / J.R. 3138
TERRAIN		Rolling
CROSS SECTION	Formation Width (m)	5.5 (1.5) / 6.0 (1.0)
	Embankment Height (m)	0.3–0.5
	Cutting Depth (m)	
SURFACE	Type/Length (km)	SBST / Laterite / SBST / Laterite / SBST
	Condition	Fair / Fair / F / Fair / F
FLOODING	Overflow Length (km)/Height (m)	No
LAND USE	Left	Sugarcane
	Right	Sugarcane
BOX CULVERT & BRIDGE	Station (km)	No / 12+300
	Dimension (m) Bridge - Conc. or Wooden - Width - (Sidewalk) - Length	C-Br. 8.00(0.60)x22.00
RIGHT OF WAY (m) (Left/Right)		Left 10–15 Right 10–15
ALIGNMENT	Horizontal	Good
	Vertical	Fair/Poor
ROUTE NO., AGENCIES		DOH Route No. 3245

PROJECT IM - 22

Changwat : Bangkok, Chachoengsao

A. Nong Chok - A. Bang Nam Prieo

Length : 16.50 km

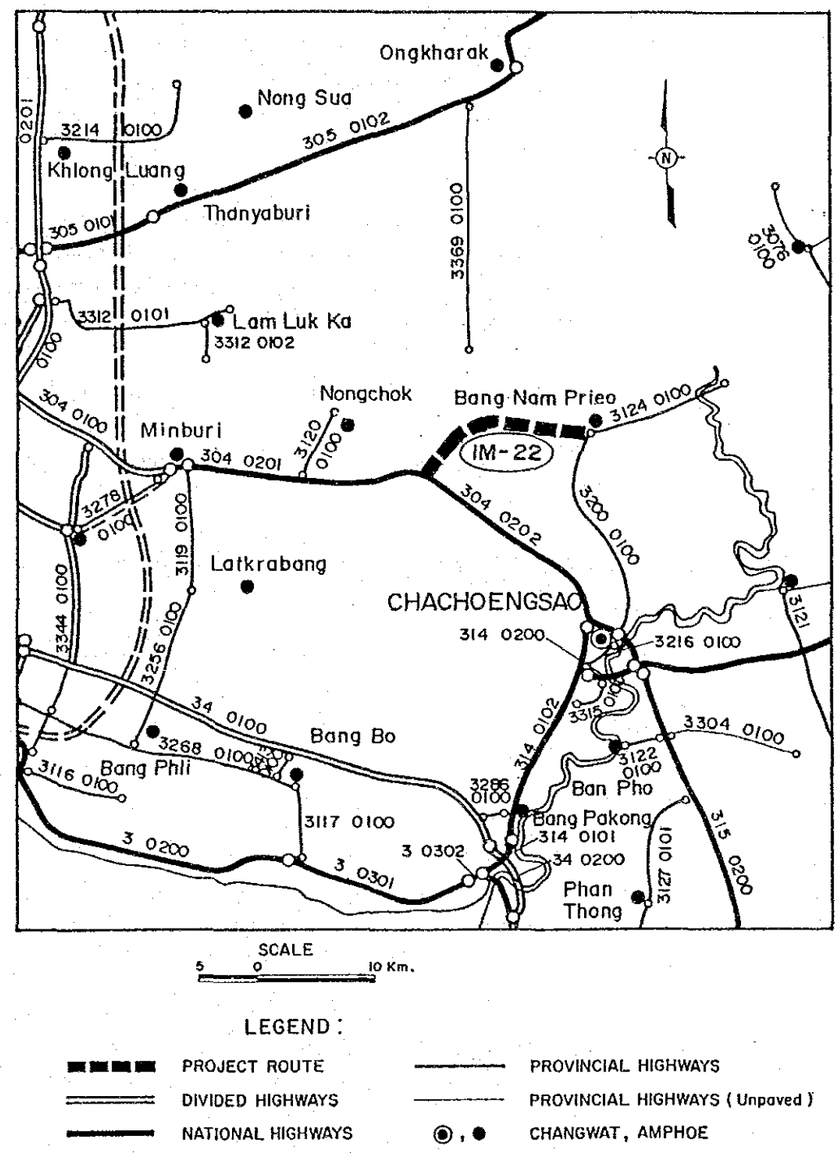
SUMMARY

PROJECT IM-22

Item	Description
Changwat	Bangkok/Chachoengsao
Origin	Rt. 304
Destination	A. Bang Nam Prieo (J.R.3124)
Length	
Total	16.5 km
Improvement Section	12.2 km
DOH Road	-
Others	12.2 km
New Construction Section	4.3 km
Surface Type and Condition	SBST Poor S/A
Terrain	Flat
Traffic (ADT)	
Existing	121
2000	284
2008	418
Existing Standard	Laterite, Substandard
Proposed Standard	F4
Construction Cost	
Financial	61,211 Thousand Baht
Economic	51,774 Thousand Baht
IRR	20.1%
B/C	1.98

Diverted traffic will be expected to increase after improvement.

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route lies in Changwat Chachoengsao and Bangkok.

Two alternative routes are proposed. One follows the existing road which originates in Amphoe Nong Chok and runs eastward to end in Amphoe Bang Nam Prieo with a total length of 22.5 km. The other originates at the junction with Route 304, runs northeastward to join the existing road and ends in Amphoe Bang Nam Prieo, with a total length of 16.5 km. For the latter alternative, there is no existing road for the first 4.3 km. One of the two should be selected by a feasibility study.

The first 5.5-km section of the existing road is already paved with asphalt 5 m wide. Widening is needed to satisfy the F4 standards. The latter alternative requires the complete new construction of a 4.3-km section, including a bridge over a khlong. The former alternative, however, also requires the construction of a new bridge, since the existing one is wooden.

The surface condition of the existing laterite road is poor.

The area along the road in either alternative is fully cultivated with paddy, and no land is left unused.

The primary function of the improved road will be to connect Amphoe Bang Nam Prieo with Bangkok in either case.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-22	RURAL	1988	201	0	48	0	48	17	8	121

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-22	- 1993	5.70	6.68	5.96	5.90	4.01	4.92	1.37	5.70
	1994 - 2000	6.78	8.30	5.70	5.73	5.66	6.62	3.47	6.78
	2001 - 2008	5.95	6.65	5.09	5.05	4.99	4.45	5.71	5.95

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-22	1.32	1.34	1.20	1.33	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-22	RURAL	1993	336	0	86	0	77	22	9	194
		2000	336	0	126	0	113	34	11	284
		2008	842	0	187	0	166	48	17	418

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	22.50	LATERITE POOR	FAIR	FAIR	0	5
WITH PROJECT	16.50	PAVED F4	FAIR	FAIR	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	3531.	0.	3073.	0.	2456.	1858.	1116.	12035.
2008	5602.	0.	4568.	0.	3610.	2624.	1725.	18128.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	704.	0.	2286.	0.	526.	181.	58.	3755.
2008	1117.	0.	3398.	0.	773.	255.	90.	5633.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	4236.	0.	5359.	0.	2982.	2039.	1175.	15790.
2008	6719.	0.	7965.	0.	4383.	2879.	1816.	23761.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-22)

Item	Description
Changwat	Bangkok/Chachoengsao
Origin	Rt. 304
Destination	A. Bang Nam Prieo (J.R.3124)
Length	
Total	16.5 km
Improvement Section	12.2 km
DOH Road	-
Others	12.2 km
New Construction Section	4.3 km
Terrain	Flat
Alignment (Hori./Vert.)	Fair
Formation Width	5.50 m
Embankment Section	
Length	16.5 km
Height	0.5 m
Cut Section	
Length	-
Depth	-
Surface Type and Condition	
SBST or DBST	-
Soil Aggregate	Poor
Earth	-
Box Culvert	1 unit 6.00 m
Bridge	
Permanent Bridge	1 site 32.00 m
Narrow Concrete Bridge	-
Wooden Bridge	5 sites 161.00 m
Overflow Section	1 plxw 2.0 km]0 m
Right of way	(10.0/10.0) 20.00

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-22 Length = 16.5 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	8	76				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	147,000	5,880				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				5,956		4,943		4,449
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	21,900	3,942				
Subbase (Soil Aggregate)	m3	220	29,200	6,424				
Base (Soil Aggregate)	m3	350	15,900	5,565				
Shoulder (Soil Aggregate)	m3	250	6,200	1,550				
Asphaltic Prime/Tack Coat	m2	12	105,600	1,267				
DBST	m2	40	89,400	3,576				
AC Surfacing	m2	190	-	0				
Sub Total				22,324		18,529		9,265
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	1,066	1,919				
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	219	13,140				
Sub Total				15,059		12,499		6,250
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				43,339		35,971		19,964
Miscellaneous Work ((a) x 7%)	ls			3,034	83	2,518	0	0
CONTRACT AMOUNT (b)				46,373		38,489		19,964
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	ls			4,637		3,849		1,996
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	ls			5,101	85	4,336	0	0
LAND ACQUISITION					100		100	
Highly Developed Land	ha	300,000	17	5,100				
Less Developed Land	ha	-	-	0				
Sub Total (e)	ls			5,100		5,100		5,100
PROJECT COST ((b) + (c) + (d) + (e))				61,211		51,774		27,060
AVERAGE COST PER KM				3,710				

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	20,710			0	25,979	0
1993	31,064			0	34,792	0
1994		8,679	2,703	11,382	0	10,163
1995		9,239	2,878	12,117	0	9,660
1996		9,798	3,054	12,852	0	9,148
1997		10,357	3,229	13,586	0	8,634
1998		10,917	3,404	14,321	0	8,126
1999		11,476	3,580	15,056	0	7,628
2000		12,035	3,755	15,790	0	7,143
2001	8,101	12,797	3,990	16,787	3,664	6,780
2002		13,559	4,225	17,784	0	6,413
2003		14,320	4,459	18,779	0	6,046
2004		15,082	4,694	19,776	0	5,685
2005		15,843	4,929	20,772	0	5,332
2006		16,605	5,164	21,769	0	4,989
2007		17,367	5,398	22,765	0	4,658
2008	(27,060)	18,128	5,633	23,761	(5,537)	4,341
TOTAL	32,815	196,201	61,095	257,297	58,898	104,746

NET PRESENT VALUE : 45,848
BENEFIT COST RATIO : 1.78
INTERNAL RATE OF RETURN : 20.1%

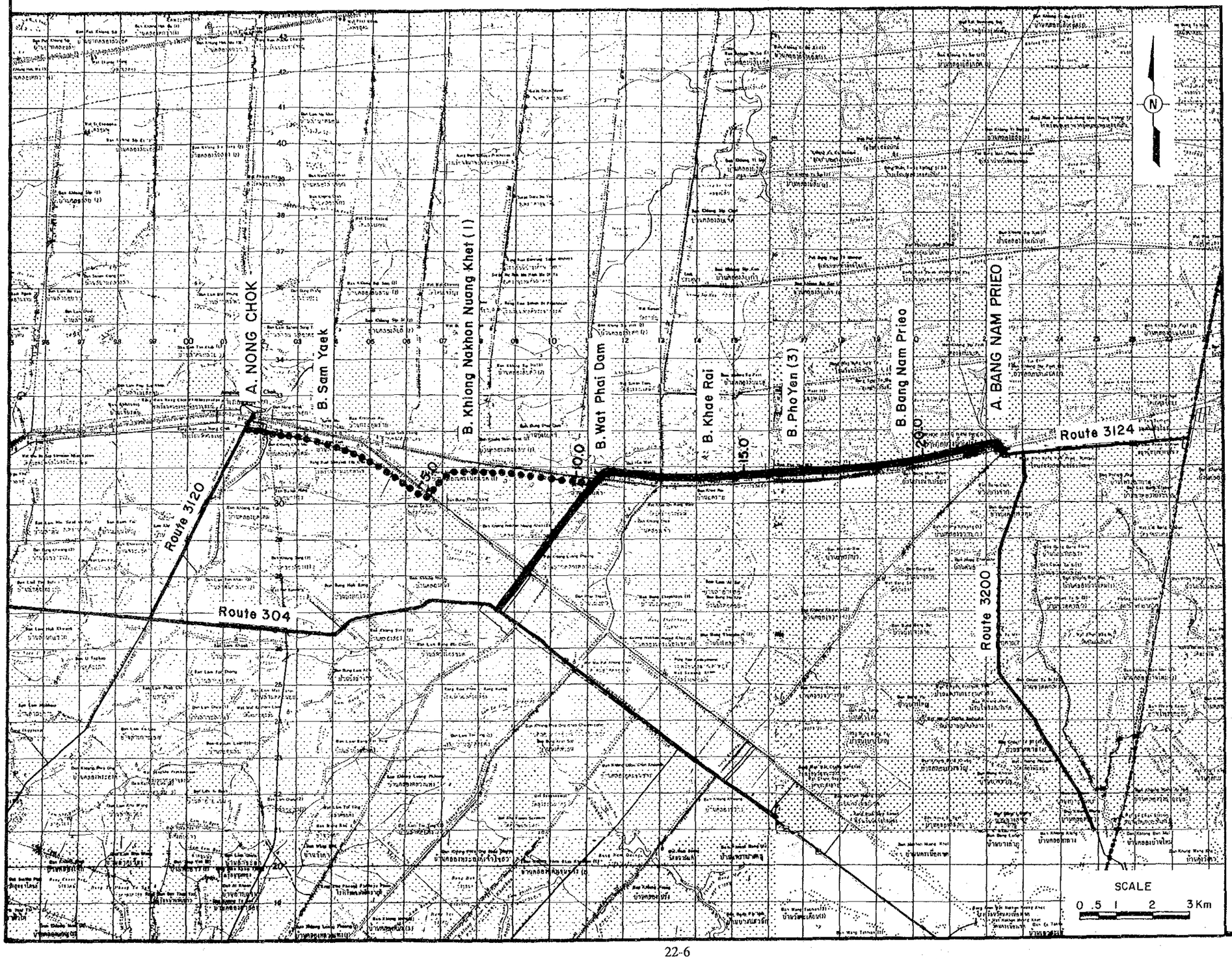
6. DEVELOPMENT AND SOCIAL IMPACTS

It is unlikely that the improved road will have a significant impact on agricultural production in this area. However, the better access in the general direction of Bangkok may well induce local residents to seek employment in the rapidly expanding industrial establishments on the fringe of the Bangkok Metropolitan Area.

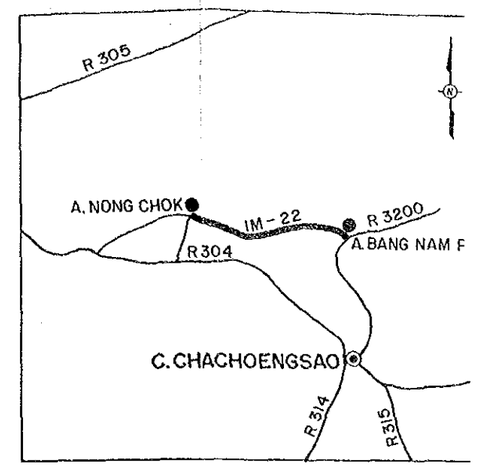
PROJECT NO. IM – 22

A. NONG CHOK – A. BANG NAM PRIEO
C. BANGKOK , C. CHACHOENGSAO

L = 16.50 KM.



LOCATION MAP



BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bri
1	1.4	C – 7.00x48.00	–
2	6.0	C – 7.00x62.00	W – 4.00x60.0
3	6.8	C – 7.00x62.00	W – 4.00x60.0
4	8.0	C – 7.00x12.00	W – 4.00x10.0
5	10.1	C – 7.00x18.00	W – 4.00x16.0
6	13.8	C – 7.00x17.00	W – 4.00x15.0
7	16.4	–	C – 7.00x32.0

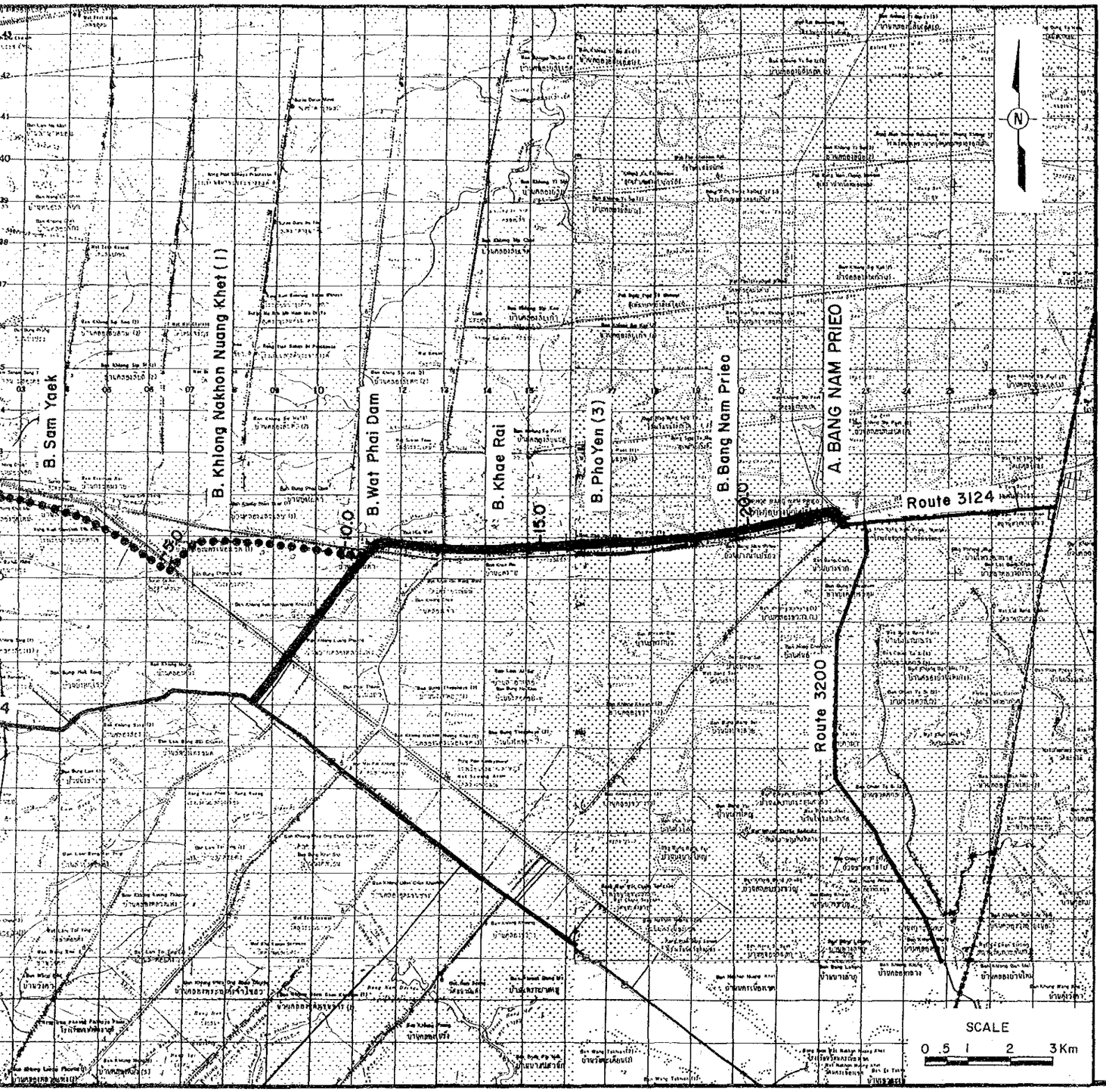
LEGEND

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

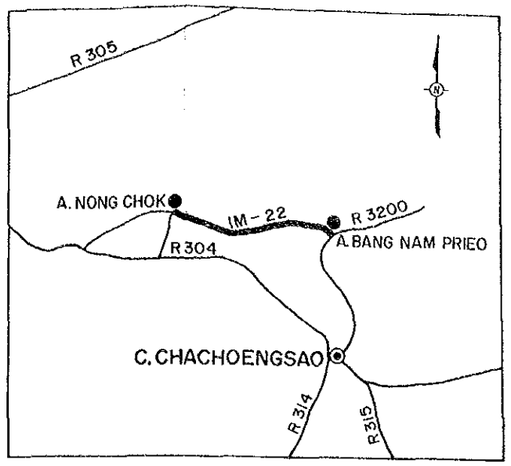
ECT NO. IM – 22

A. NONG CHOK – A. BANG NAM PRIEO
C. BANGKOK, C. CHACHOENGSAO

L = 16.50 KM.



LOCATION MAP



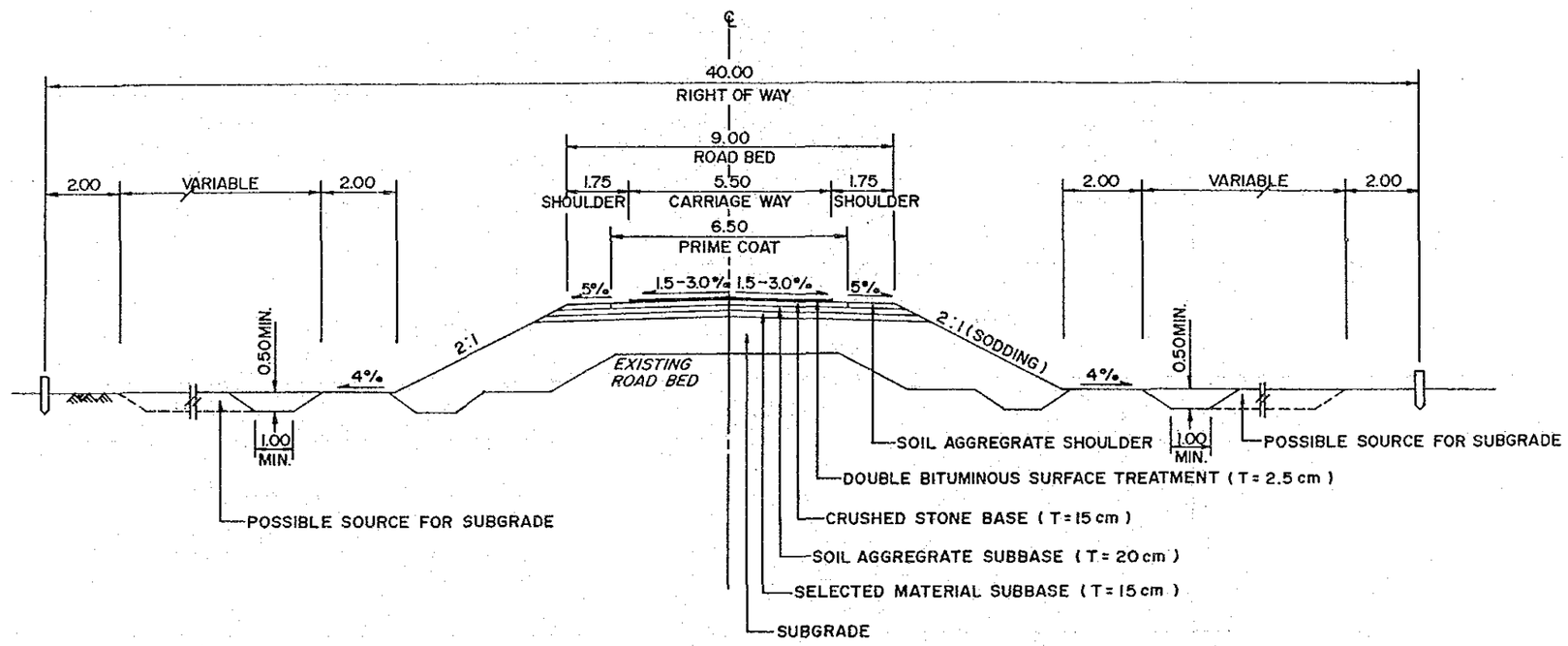
BRIDGE LIST

No.	Station Km.	Proposed Bridge	Existing Bridge
1	1.4	C – 7.00x48.00	–
2	6.0	C – 7.00x62.00	W – 4.00x60.00
3	6.8	C – 7.00x62.00	W – 4.00 x 60.00
4	8.0	C – 7.00x12.00	W – 4.00 x 10.00
5	10.1	C – 7.00x18.00	W – 4.00 x16.00
6	13.8	C – 7.00x17.00	W – 4.00 x 15.00
7	16.4	–	C – 7.00 x 32.00

LEGEND

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

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F4)

ROAD INVENTORY

PROJECT NO. IM-22 | **ROUTE NO. B. NONG CHOK – A. BANG NAM PRIEO (J.R. 3124)** | **L = 16.5 km**

STATION (Km)		0	2	4	4 + 300	6	8	10	12	14	16	16+500	18	20	22	24	26	28	30
VILLAGE Name of Village		No existing road			A. Bang Nam Prieo														
TERRAIN					Flat														
CROSS SECTION	Formation Width (m)				5.50														
	Embankment Height (m)				0.50														
	Cutting Depth (m)																		
SURFACE	Type/Length (km)				Laterite														
	Condition				Poor														
FLOODING	Overflow Length (km)/Height (m)								2.0 km 0.10 m										
LAND USE	Left				Paddy														
	Right				Paddy														
BOX CULVERT & BRIDGE	Station (km)					6+000	6+800	8+000	10+100	11+700	13+300	16+400							
	Dimension (m) Bridge - Conc. or wooden - Width - (Side walk) - Length Box - width - Height - Length					W-Br. 4.00x60.00	W-Br 4.00x60.00	W-Br. 4.00x10.00	W-Br. 4.00x16.00	C-Box 4.00x2.50x6.00	W-Br. 4.00x15.00	C-Br. 7.00x32.00							
RIGHT OF WAY (m) (Left/Right)					Left 10.0 Right 10.0														
ALIGNMENT	Horizontal				Fair														
	Vertical				Fair														
ROUTE NO., AGENCIES					Rural														

PROJECT IM - 23

Changwat : Ayutthaya

J. R. 32 - J. R. 3022

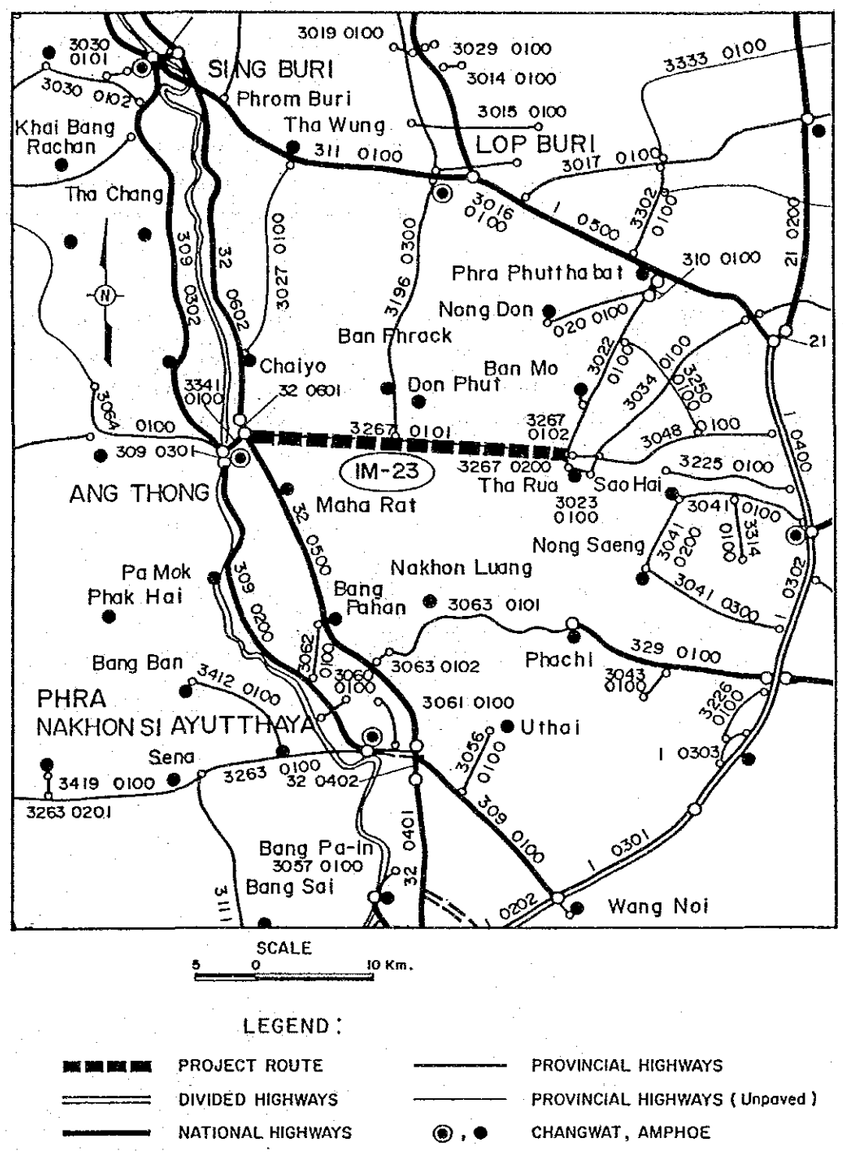
Length : 26.50 km

SUMMARY

PROJECT IM-23

Item	Description
Changwat	Ayutthaya
Origin	J.R. 32
Destination	J.R. 3022
Length	
Total	26.5 km
Improvement Section	26.5 km
DOH Road	No. 3267 26.5 km
Others	-
New Construction Section	-
Surface Type and Condition	AC Surfacing // Fair/Poor
Terrain	Flat
Traffic (ADT)	
Existing	2,587
2000	7,771
2008	10,980
Existing Standard	F4
Proposed Standard	F1
Construction Cost	
Financial	95,561 Thousand Baht
Economic	79,490 Thousand Baht
IRR	40.7%
B/C	5.04

LOCATION OF PROJECT ROUTE



1. GENERAL

The proposed route is located in Changwat Ang Thong and Changwat Ayutthaya.

It originates at the junction with Route 32 in Ban Nam Phung and runs eastward to end at the junction with Route 3022 in Ban Kaok Manao, with a total length of 26.5 km.

DOH previously classified this road among those to be rehabilitated, but later decided to upgrade it from the existing F4 to F1, including work to raise the embankment. The reason for this decision was that this road is the main road connecting the Changwats of Ang Thong and Saraburi.

The terrain is flat, and the area along the road is fully cultivated with paddy. There is a cement production plant of Siam Cement Company in Amphoe Tha Rua near the end point of this road, and heavy vehicle traffic on this road is heavy. The existing road contains several flood-prone sections, and the soil conditions are not favorable. Consequently, the exiting road condition is often poor.

There are nine permanent bridges with a total length of 886 m.

Upon completion, this road will be a part of the trunk road network linking Ang Thong and Saraburi in the shortest travel time.

2. TRAFFIC (Growth Rate Method)

Base Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-23		1986	401	438	99	140	885	361	664	2587

Traffic Growth Rate

Route	Period	MC	PC	LB	HB	LT	MT	HT	ADT
IM-23	- 1993	10.77	13.92	5.71	10.03	8.18	9.70	12.92	10.77
	1994 - 2000	4.44	4.98	5.10	4.93	4.64	4.92	3.39	4.44
	2001 - 2008	4.41	4.56	5.10	4.88	4.44	4.51	4.01	4.41

Induced Traffic Ratio

Route	PC	LB	HB	LT	MT	HT
IM-23	1.15	1.16	1.09	1.15	1.00	1.00

Future Traffic Volume

Route	Section	Year	MC	PC	LB	HB	LT	MT	HT	ADT
IM-23		1993	889	1250	169	299	1767	690	1555	5730
		2000	889	1757	239	418	2427	966	1964	7771
		2008	1708	2510	356	612	3436	1375	2691	10980

3. BENEFITS

ROAD CONDITIONS

	LENGTH (KM)	ROAD CLASS	GRADIENTS	CURVE	NO. OF NARROW BRIDGE	NO. OF WOODEN BRIDGE
WITHOUT PROJECT	26.50	PAVED FAIR	GOOD	GOOD	0	0
WITH PROJECT	26.50	PAVED F1	GOOD	GOOD	0	0

VOC SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	961.	9192.	969.	3291.	8724.	6725.	21317.	51179.
2008	1358.	13131.	1443.	4817.	12351.	9572.	29208.	71880.

TIME SAVINGS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	507.	4228.	1364.	8921.	3546.	1511.	3072.	23149.
2008	716.	6040.	2031.	13058.	5020.	2151.	4209.	33225.

TOTAL BENEFITS

(1000 BAHT/YEAR)

YEAR	MC	PC	LB	HB	LT	MT	HT	TOTAL
2000	1467.	13420.	2334.	12212.	12270.	8236.	24389.	74328.
2008	2074.	19171.	3474.	17875.	17371.	11723.	33417.	105105.

4. ENGINEERING

SUMMARY OF ROAD INVENTORY

(PROJECT IM-23)

Item	Description
Changwat	Ayutthaya
Origin	J.R. 32
Destination	J.R. 3022
Length	
Total	26.5 km
Improvement Section	26.5 km
DOH Road	No. 3267 26.5 km
Others	-
New Construction Section	-
Terrain	Flat
Alignment (Hori./Vert.)	Good // Good
Formation Width	F4 Standard
Embankment Section	
Length	26.5 km
Height	2.0 m
Cut Section	
Length	-
Depth	-
Surface Type and Condition	AC surfacing // Fair/Poor
SBST or DBST	-
Soil Aggregate	-
Earth	-
Box Culvert	7 units 116.0 m
Bridge	9 sites 885 m
Permanent Bridge	-
Narrow Concrete Bridge	-
Wooden Bridge	
Overflow Section	3 place 770 m
Right of way	40.0 m

CONSTRUCTION QUANTITIES AND COSTS
(Project IM-23 Length = 26.5 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	14	133				
Earth Excavation	m3	16	-	0				
Embankment (Side Borrow)	m3	40	221,300	8,852				
Embankment (Borrow Pit)	m3	100	-	0				
Sub Total				8,985		7,458		6,712
PAVEMENT					83		50	
Subbase (Selected Material)	m3	180	46,100	8,298				
Subbase (Soil Aggregate)	m3	220	61,500	13,530				
Base (Soil Aggregate)	m3	350	41,000	14,350				
Shoulder (Soil Aggregate)	m3	250	25,600	6,400				
Asphaltic Prime/Tack Coat	m2	12	204,900	2,459				
DBST	m2	40	-	0				
AC Surfacing	m2	95	179,300	17,034				
Sub Total				62,071		51,519		25,760
STRUCTURES					83		50	
RC Pipe Culvert (D 1.00 Equivalent)	m	1,800	396	713				
RC Box Culvert (2 x 2.4 x 2.4 Equivalent)	m	20,000	102	2,040				
RC Bridge (W=7.0 L=10.0 Equivalent)	m	60,000	-	0				
Sub Total				2,753		2,285		1,143
INTERCHANGE/INTERSECTION	nos.	5,000,000	-	0	83	0	50	0
Total (a)				73,809		61,262		33,615
Miscellaneous Work ((a) x 7%)	ls			5,167	83	4,289	0	0
CONTRACT AMOUNT (b)				78,976		65,551		33,615
PHYSICAL CONTINGENCIES ((b) x 10%) (c)	ls			7,898		6,555		3,362
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)	ls			8,687	85	7,384	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))				95,561		79,490		36,977
AVERAGE COST PER KM				3,606				

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

	COST	BENEFITS			DISCOUNTED(12%)	
YEAR	CONST. COST	VOC SAVING	TIME SAVING	TOTAL	COST	BENEFIT
1991	15,898			0	22,336	0
1992	39,745			0	49,856	0
1993	23,847			0	26,709	0
1994		40,156	17,722	57,878	0	51,677
1995		41,993	18,626	60,619	0	48,325
1996		43,830	19,531	63,361	0	45,099
1997		45,667	20,435	66,102	0	42,009
1998		47,504	21,340	68,844	0	39,064
1999		49,342	22,244	71,586	0	36,268
2000		51,179	23,149	74,328	0	33,622
2001	16,178	53,766	24,408	78,174	7,318	31,573
2002		56,354	25,668	82,022	0	29,578
2003		58,942	26,928	85,870	0	27,648
2004		61,529	28,187	89,716	0	25,791
2005		64,117	29,447	93,564	0	24,016
2006		66,705	30,706	97,411	0	22,324
2007		69,292	31,966	101,258	0	20,719
2008	(36,977)	71,880	33,225	105,105	(7,566)	19,202
TOTAL	58,691	822,255	373,581	1,195,838	98,653	496,915

NET PRESENT VALUE : 398,262
BENEFIT COST RATIO : 5.04
INTERNAL RATE OF RETURN : 40.7%

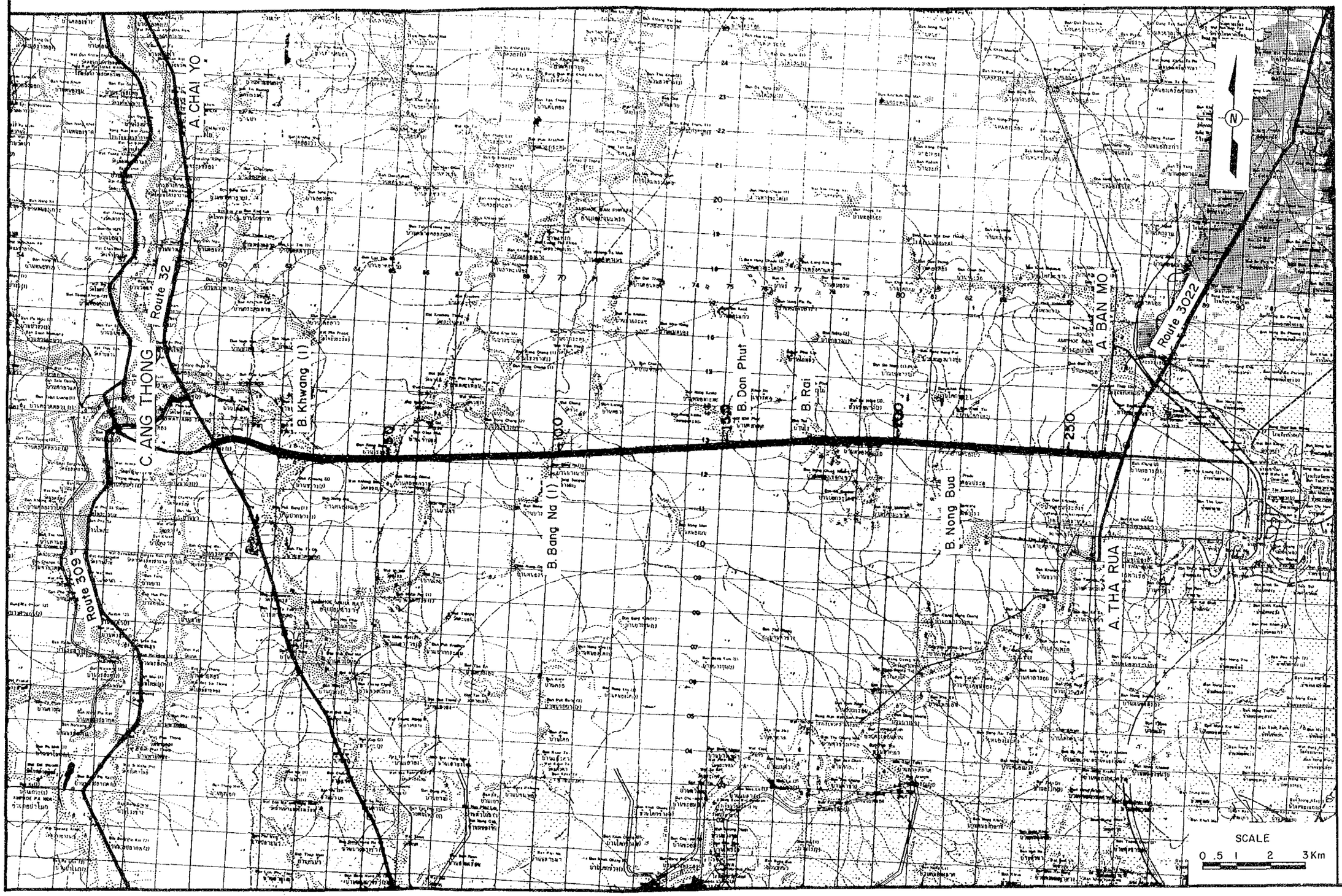
6. DEVELOPMENT AND SOCIAL IMPACTS

Aside from the direct employment generation for the duration of construction work, impact on the surrounding communities would be small. Resulting better travel comfort, however, may induce more community members to venture outside more often to, e.g. Ang Thong, Saraburi or even Bangkok.

PROJECT NO. IM - 23

J. R. 32 - J. R. 3022

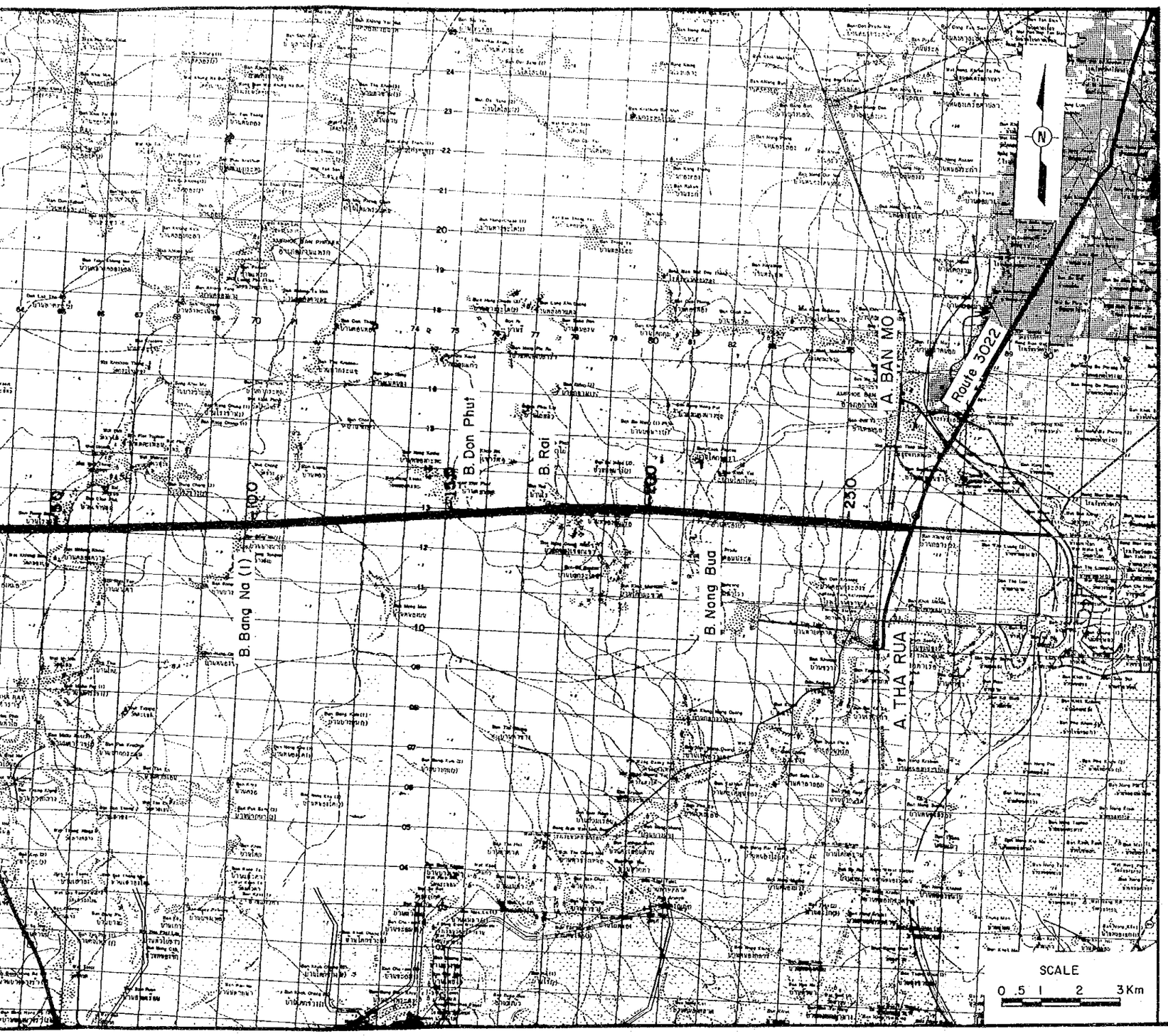
C. AYUTTHAYA



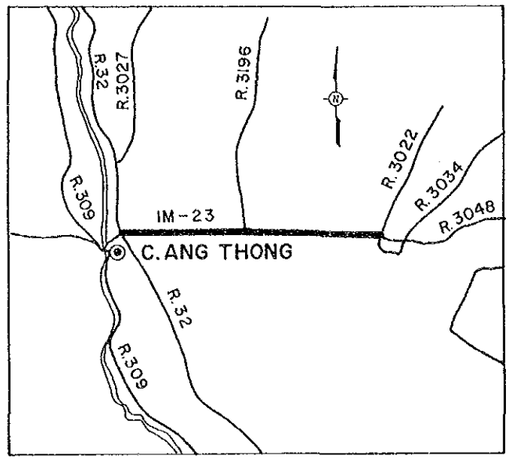
LEGEND

JECT NO. IM - 23

J. R. 32 - J. R. 3022
C. AYUTTHAYA



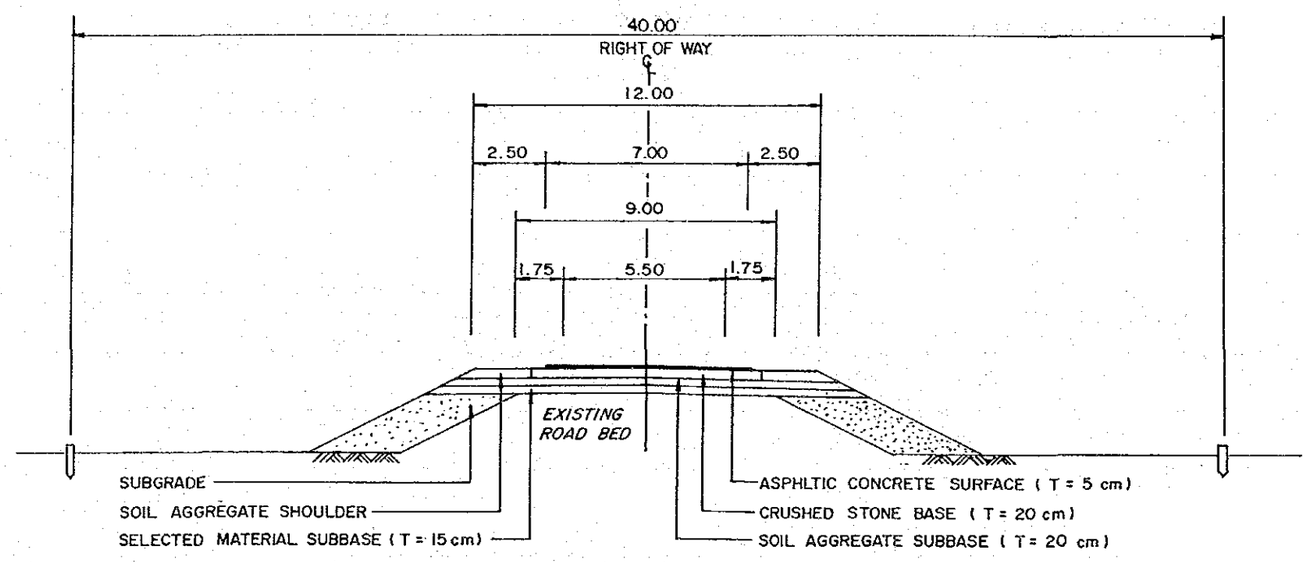
LOCATION MAP



LEGEND

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

TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F I)
RAISING UP AND WIDENING SECTION

ROAD INVENTORY

PROJECT NO. IM-23 | **ROUTE NO. J.R. 32 (I. ANG THONG) – J.R. 3022** | **L = 26.50 km**

C. AYUTTHAYA

STATION (Km)		0	2	3+400 4	6	7+100 8	10	12	14	15+700 16	18	20	22	24	26 26+100	28	30
VILLAGE Name of Village		B. KHLONG KHWAI			B. BANG NA				B. NONG CHUAK						B. KAOK MANAO		
TERRAIN		Flat															
CROSS SECTION	Formation Width (m)	LEFT SHOULDER 1.75 M. PAVEMENT 5.50 M. RIGHT SHOULDER = 1.75 M. TOTAL 9.0 M.															
	Embankment Height (m)	2.0															
	Cutting Depth (m)	—															
SURFACE	Type/Length (km)	Asphaltic Concrete															
	Condition	Fair/Poor															
FLOODING	Overflow Length (km)/Height (m)	STA 2+900 L = 280 M. D = 9 Days (7-10-80)							STA 2+015 L = 50 M. D = 13 Days (19-10-83)					STA 2+720 L = 440 M. D = 13 Days (19-10-83)			
LAND USE	Left	Paddy															
	Right	Paddy															

BRIDGE

Station (km)	STA	2+792	3+880	4+256	4+432	5+334	9+992	11+267	12+153	26+149
Dimension (m) Bridge - Conc. or wooden - Width - (Side walk) - Length Box - width - Height - Length	LENGTH	120.0	40.0	120.0	76.0	190.0	54.0	16.0	60.0	210.0
	WIDTH	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	TYPE	RCC SIMPLY S. BEAM ← RCC BOX GIRDER →						RCC SIMPLY S.BEAM	RCC BOX GIRDER	

BOX CULVERT

STA	1+852	3+168	5+497	9+641	10+160	17+227	19+422
NO OF CELL	2	3	3	2	3	2	2
WIDTH	3.0	2.1	3.0	3.3	2.7	2.4	2.4
HEIGHT	3.0	2.1	3.0	3.3	2.7	2.4	2.4
LENGTH	14.0	17.0	17.0	17.0	17.0	19.0	15.0

RIGHT OF WAY (m) (Left/Right)		20.00 m./20.00 m.
ALIGNMENT	Horizontal	Good
	Vertical	Good
ROUTE NO., AGENCIES		DOH Route No. 3267