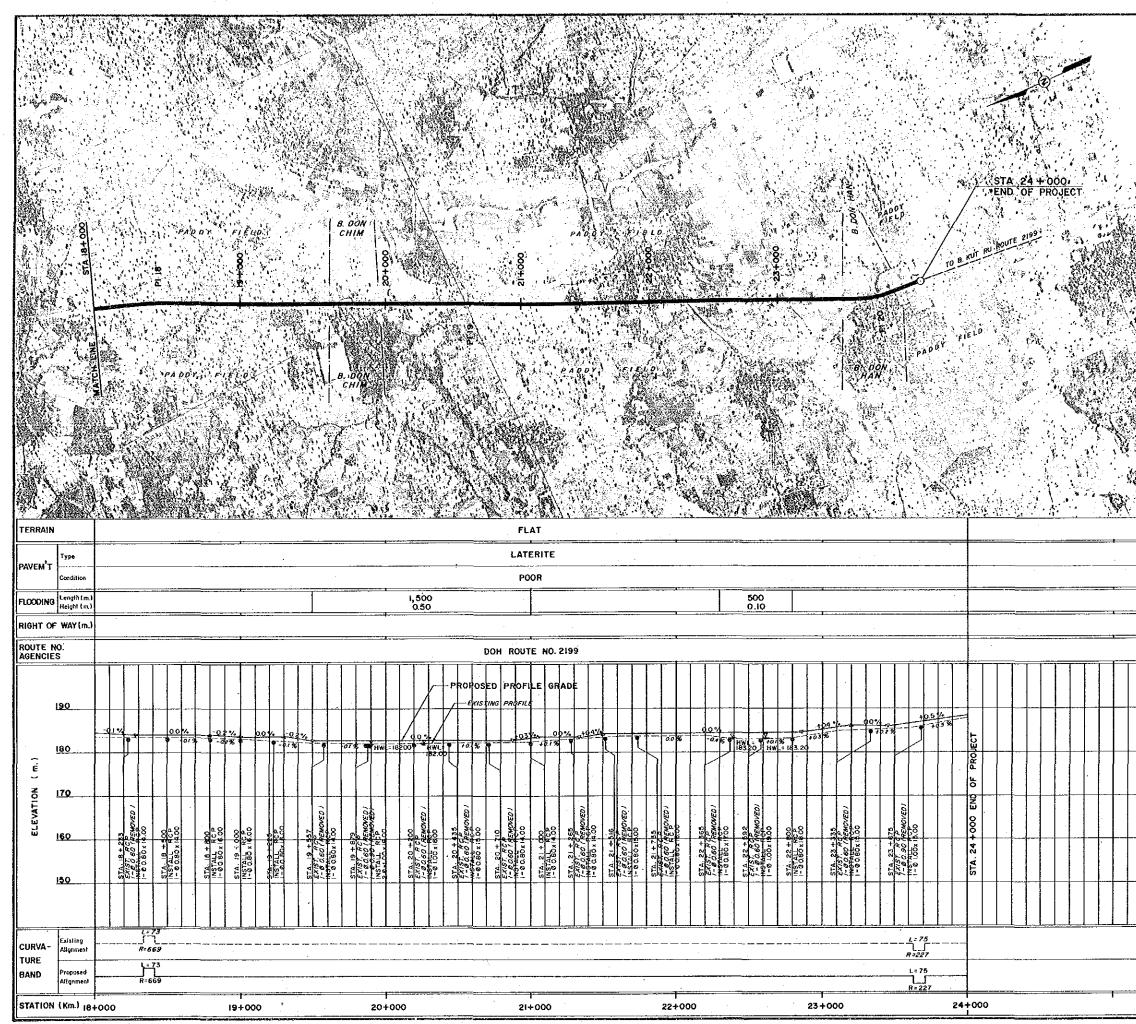


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STUDY ROUTE NO. IM - 5 Changwat : Khon Kaen A. Nam Phong (J.R. 2039)-B. Nong Tum Length : 28.0 KM.

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SUMMARY	STUDY ROU	ік ім-5		LO	CATION OF STUDY ROUTE
General					
Changwat	· · · ·	: Khon Kaen			0-2020
Origin and Destination		: A. Nam Phong—B. Nong Tum			AMPHOE NON SA-
Connected Road Netwo	k	: 2039 ······		$= \left\{ 1 + \frac{1}{2} + \frac{1}{2} \right\}$	AMPHUE NUIL SA-
Amphoe on Route		te de la Terra de La Basse an 1999 - 1933 - 1915 - 1915 - 1915 Al			
Number of Related Vill	ges	r - Charles II and the first second second second		AMPHOE NON SANG	S
Influence Area				13056	
Area	5. 	: 189 km ²			· · · · · · · · · · · · · · · · · · ·
Cultivated Area Ratio t	n e di secondo Filippi	an an an Arthrean a' Bhaile Baile Ar Anna. An ann an anna	й. 1	UBONBAT DAM	
Total Land Area in %	· · · ·	89			
Population in 1983		40,400	·	i i i i i i i i i i i i i i i i i i i	AMPHOE NAM PHONG
Main Crops		: Paddy & Sugar cane			
Number of Public Activ	ties		н. Н		
Public Health Service	Centers	• •			
Hospitals Changwat	Level	• • • • • • • • • • • • • • • • • • •			
Amphoe 1	evel	: 1		AMPHOE NONG BUA	
Schools Primary	· · · ·	: 10		AMPHOE NONG RUA 12 AMPHOE BAN	I FANG
Secondary		: 3		BAN NONG BUA	209
Traffic (ADT)	en e	: 1984-186 1988-317	• *		2131 CHANGWAT
		1994—461 2002776		BAN LAD AN	KHON KAEN
Nomenclature of Study Re	ute	na sena sena sena sena sena sena sena se			BAN KHU
Total Length	· · · · ·	: 28.0 km			208
Improvement Section		: 28.0 km			
DOH Road		: 23.0 km		\$	
ARD Road		: 5.0 km			
Other Road		🗄 👘 🗧 🗧 🗧 🗧 🗧		AMPHOE MANCHA	Z 1300 Z
New Construction Sec		: -		2143 CKHIRI	2228
Design Standard Emplo	ed	: F4	· · ·	AMPHOE CHONNA BOT	AMPHOE BAN PHAI
Construction Cost in Baht		than the second s	•		AMPHOE 8
Financial		: 61,886,000			Amirnuc c
Economic		: 51,725,000		SGAL.E 50 Km.	
Economic Indicators				· · · · · · · · · · · · · · · · · · ·	LEGEND
IRR		: 14.6% Ranking: 7		STUDY ROUTE	PROVIN COMMI
Social Impact			• •	REPORT NATIONAL HIGHWAYS (PA	
Social B/C Ratio		: 0.263 Ranking: 5		PROVINCIAL HIGHWAYS (F	AVED) OTHER
Recommendations		··· ··································			
Recommentations				· · · · · · · · · · · · · · · · · · ·	

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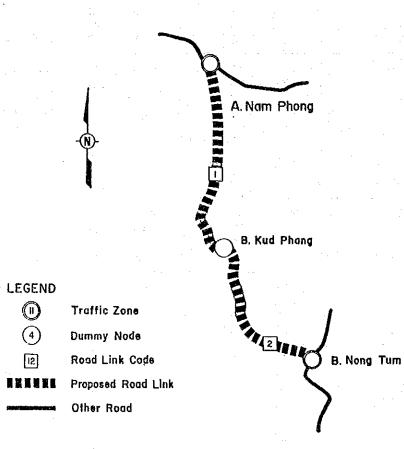
CIAL HIGHWAYS (TO BE PAVED, FTED IN 5 IN PLAN) CIAL HIGHWAYS (UNPAVED) ROAD

5.1 TRAFFIC

5.1.1 Method Employed in Traffic Forecasting

The growth rate method was employed in forecasting because no diverted traffic after improvement was expected on this study route.

5.1.2 Assumed Road Link



5.1.3 Traffic Forecast

- 1) Items necessary for forecasting traffic were:
- Traffic volume in base year
- Passenger and freight movements in base year
- Growth rates of passenger and freight movements
- Rate of induced and developed movements
- Traffic composition

TRAFFIC VOLUME IN BASE YEAR

LINK	TYPE OF VEHICLE										TOT 01
					P/P&T				AUT	11/L	DUTAL
1 2					46 137						
AVE.	12	4	87	3	87	13	13	2	219	322	542
22 888	******		*==222	izaszn:	222222					izzona:	

PASSENGER AND FREIGHT MOVEMENT IN BASE YEAR

PROPOSED ROAD	PASSENGER MOVEMENT	FREIGHT MOVEMENT (TONNAGE PER DAY)						
LINK	(TRIPS PER DAY)	NON-AGRI.	AGRI.	TOTAL				
1	1189	38.0	5.7	43.7				
2	3974	70.3	10.5	80.8				

GROWTH RATE OF PASSENGER MOVEMENT

		(UNI	T : % F.A.)
YËAR	PER CAPITA INCOME	POPULATION	FASSENGER MOVEMENT
1984 - 1988	3.1	1.3	5.7
1988 - 1994	3.1	1.1	5.6
1994 - 2002	3.1	1.0	5,4
25377722888			************

GROWTH RATE OF FREIGHT MOVEMENT

		(UNIT : % F.A.)			
YEAR	NON-AGRI. FREIGHT	AGRI. FREIGHT	FREIGHT MOVEMENT		
1984 - 1988	7.1	0.5	6.3		
1988 - 1994	6.9	0.6	6.3		
1994 - 2002	6.7	0.6	6.3		

5-3

YE	AR		1988			1994			2002	
ĻI	NK	1	2	AVR.		ິ 316 2 	AVR.	1	2	AVR
P/C	а N+D стола С N+D стола С Т	20 3	71	े :43 	ം 52 ്,8		109		474 71	29 .4
	ŪΥ	ŏ	Ô	õ	ō	O	0	Ŏ	Ō	
	TOTAL.	23	82	49	60	206	125	163	545	33
	N+D	1	11	5	. 3	18	10	11	36	
_/B	I	0	2	1	1	3	2	2 0	5	
	DV	0	12	0	0	··· 21	0 12	13	42	2
	TOTAL		_ع I حب_ب	صد سدر سد سدر						
	N+D	37	158	91	44	175	103	47	158 24	· 9 1
M/B	I DV	- 6	24 0	_14 0	7	26 0	15 01	-7	24	1
	TOTAL	43_́	182	and the second second	ິ <u></u> 50	202	118	54	182	11
	N+D		7	8	3 13		 19	25		5
Н/В	I	1	1	1	ੁੰ 2	4	,	4	13	
	Ð٧	0	<u></u> 0	Ó	0	0	. 0	0	0	
	TOTAL	9	8	9	15	31	22	29	98	6
	N+D	79	237	150	103	318	199	144	472	29
P/P&T	I	12	36	22		48	30	22	71	4
	DV	0 - 91	0 273	े े 0 172	12	0 365	0 229	0 165	0 543	33
	TOTAL								~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u> </u>
	N+D	10	13		8	11 2	9 1	5	9	
4/T	I DV	1 20.	2 0	2	1	ŏ	a a sa ta ta	Ō		
	TOTAL	11	15	13	9	13	1,1	5	10	
	N+E		19	15	15	26	20	22	40	3
6/T	I	2	, 3	2	2	4	3	<u>,</u> 3	6	
	DV	0	0	.0			0 23	0 25,	46	3
·	TOTAL	13	22	17	1/			. <u>.</u>		
	N+D	З,	6	4		11 2		11 2		1
10/T	I DV	0	1	-1 0	1	~ 0	Ŏ	2	ې 0.	
	TOTAL	3	7	5	6	12	9	13	24	1
	N+D	169		327	243	765	476	407	1295	30
ADT	I			49	36	115	71 0	61	124	- 12
	DV	0	0	0		0	0 	0	0	92
	TOTAL				توریکہ سار یں۔			· ```````` _		<u></u>
W/0	N+D	243	408	317	297	463	371	371	5 <u>39</u> 20	- 2
M/C	I DV	20 ∩_	20 0	20	20 0	0	0	20	20	4
	TOTAL	264	428	337	317	483	391	371	559	46
	N+D						847	778		124
TOTAL		46	. 99	69	57	135	92	81	215	14
· · ·	DV TOTAL			~		· ·	~	<u> </u>	~ ~	
	TOTAL	458	1029	713	596	1363	939	859	2049	137

RATE OF INDUCED AND DEVELOPED MOVEMENT

en egi e en en el en en el persona de la recurso de se reger ancos (UNIT: 40%) freeze e crasso de l

	anna Cairt	INDU							
	YEAR	i en el l I	NK 2	PASSENGER		AGRI. FREIGHT MOVEMENT	* 		
90 - 4 	1988 1994 2002		15.0 15.0 15.0		0.0 0.0 0.0	0.4 2.8 6.4			

$(x_{1}, y_{1}) = (x_{1}, y_{2}) + (x_{1}, y_{2}) + (y_{2}, y_{3}) + (y_{3}) + (y_{3}$

TRAFFIC: COMPOSITION DESCRIPTION STATES COMPOSITION

====≈ LINK		••••••••••••••••••••••••••••••••••••••	PA	SSENGE	R	FREIGHT				
NO.	YEAR	P/C	P/P	L/B	<u>м</u> /в	H/B	P/T	4/T	6/T	10/T
1	1984	7.2	56.5	0.0	30.9	5.3	24.1	37.9	34.5	3.4
	1988	14.3	52.4	0.7	26.9	5.7	21.7	31.9	37.9	8.5
	1994	24.9	46.2	1.7	21.0	6.2	18.0	23.0	43.1	16.0
	2002	39.0	38.0	3.0	13.0	7.0	13.0	11.0	50.0	26.0
2	1984	8.6	49.3	2.1	40.0	0.0	39.3	26.8	28.6	5.4
	1988	15.3	46.8	2.3	34.0	1.6	33.4	23.3	33.3	9.9
	1994	25.5	43.0	2.6	25.0	3.9	24.7	18.0	40.5	16.8
	2002	39.0	38.0	3.0	13.0	7.0	13.0	11.0	50.0	26.0

2) The following were output: - Forecasted ADT

- Traffic volumes

TRAFFTC ON PROPOSED ROUTE

AVERAGE	FUTURE IRAFFIC ON FROFOSED ROOTE	- 10 A A

		1.15	1. . .	1.4.7.13	• • • • •						
	•	· ·	. T Y	/PE_OF V	'EHICL	_E			i da la Al		
YEAR			,						ADT	M/C	TOTAL
	₽/C	L/B	M/B	H/B F	7P&T	4/T	6/T	10/T	de la contra		
							·				
1988	49	6	105	9	172		17	5	376	337	713
1994	125	12	118	22	229	11	23	9	548	391	939
2002	334	26	111	60	334	8	34	18	924	466	1390
							======	****	=======	======	=====

5-4

I : INDUCED TRAFFIC

5.2 AGRICULTURAL DEVELOPMENT

5.2.1 Present Condition

Almost all the cultivated land in the influence area is covered by paddy fields, since the area extends along the Chi River basin. In Amphoe Nam Phong, there is a large sugar factory with a 9,600-ton/day capacity and the ability to process nearly 1.4 million tons per year. For this reason, sugarcane is the major upland field crop.

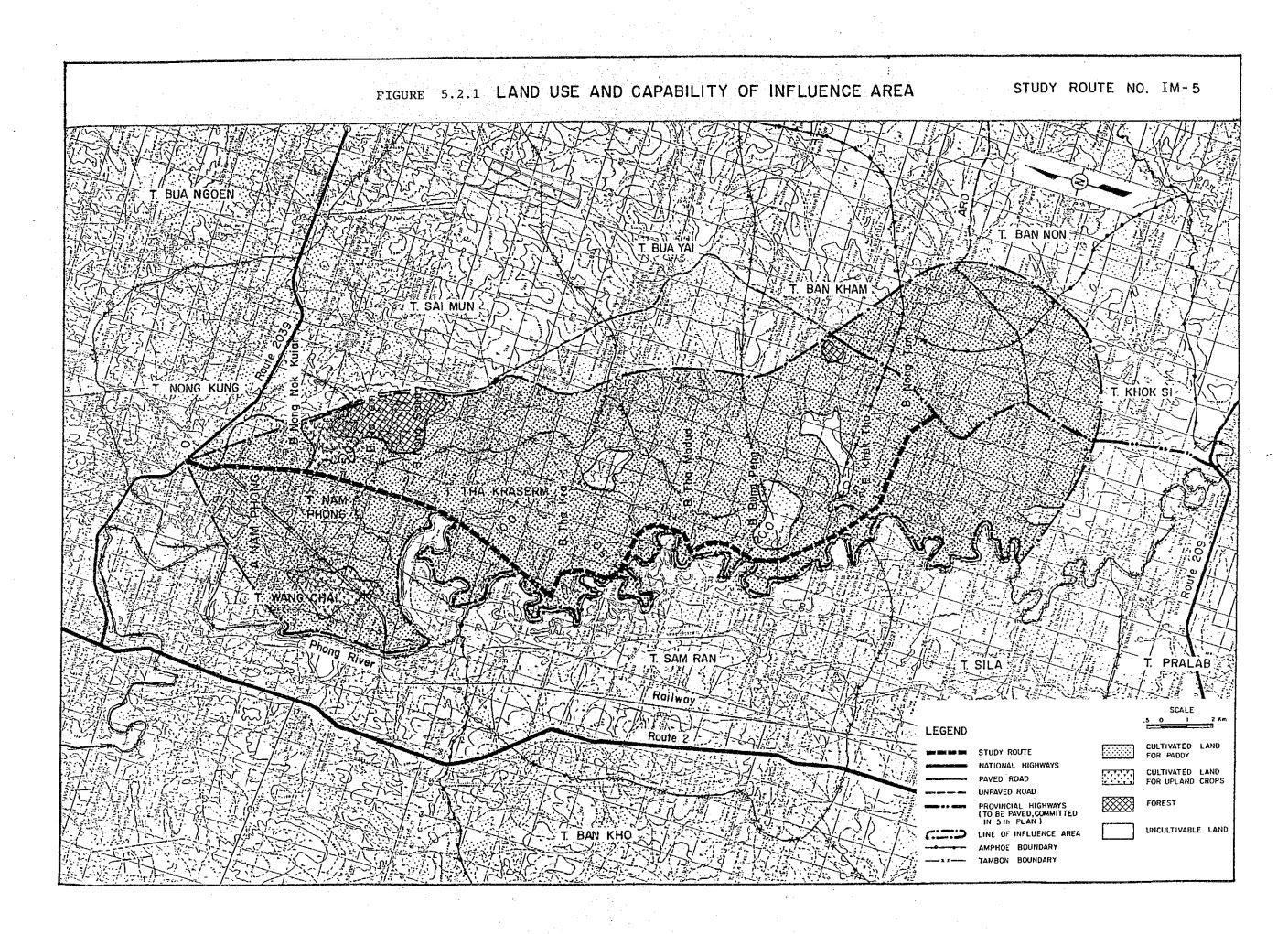
Land use and capability conditions in the area are shown in Table 5.2.1 and Figure 5.2.1. A typical cropping calendar in the area is shown in Figure 5.2.2.

5.2.2 Development Projection

5-5

Future agricultural development in the area of influence was projected for both cases of "with and without project". The projected planted area, unit yields by crop, and the consequent production amount are shown in Table 5.2.2.

Based on the above projected production amount, farmgate prices and production costs estimated separately, net production value (NPV) was obtained as shown in Table 5.2.3. The difference in NPV between the two cases is deemed to be the development benefit of the study route.



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FIGURE 5.2.2 CROPPING CALENDAR

ROUTE IM-5 1997 - 1999 - 1

MONTH JAN FEB MAR APR MAY JU CROP RICE 1st CROP EARLY VAR. LATE VAR. 2nd CROP SUGARCANE

Note:

FIRST CROP

sowing season	growing season	harvesting season
	an an an an An an an an An an an an An an an an An an an an an an	nita Silana Silana Silana

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Related Amphoes: 0601 M. Khon Kaen 0609 Nam Phong 0610 Kranuan

JUN	JUL	AUG	SEP	ост	NOV	DEC
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		(}		<u> </u>)
					-0- 	
:	:					
į -	·					

SECOND CROP

O-

TABLE 5.2.1 CULTIVATED LAND

[UNIT : 1000 RAI (KM2)]

		CHANC	WAT	AMF	PHOE		اندا و من مند من ومن ولد و من اور و	CULTIVATE	ED LAND		نیے وہے جب سے جس بینہ بنے لیے کے	• •
		NAM	1E	Nf	AME	PADD	/ FIELD	UPLANI) FIELD	τι	DTAL	• •
	e de la presentación a presentación de la construcción a construcción de la construcción de la construcción de la construcción de la a construcción de la construcción d	KHON HAEN		M. KHON NAM PHON KRANUAN	NG .	66.00	(48.80) (105.60) (9.01)	2.37	(0.00) (3.79) (0.00)	68.37	(48.80) (109.39) (9.01)	
		TOTAL				102.13	(163.41)	2.37	3.79)	104.50	(167.20)	
satt i ser e e				14 gan, ann 214 gan, ann 217 r			ورو ها بین برای باری وی وی وی وی		<u></u>			
:					TABL	5.2.2 CR	OP PRODUC	TION	•			
	ITEM		RICE (PADDY)		SORGHUM	BEANS	GROUND NUTS	CASSAVA	KENAF	SUGAR CANE	COTTON	CASTOR BEANS
- - 	PLANTED AREA	(1000 RAI)	<u>_</u>							·		نىڭ نىڭ بايتى قىرى بىت _{تى} ت مىي
•	BASE YEAR	(1983)	74.04	·	· -	, , , , , , , , , , , , , , , , , , ,	–			1.85		·
	WITHOUT PROJECT	(1988)	77.20			-	-		~~	1.85		
-		(1994) (2002)	81.18 86.80			-	· -	· •	_	1.85 1.85		· -
	WITH PROJECT	(1988)	77.39		_		-	-	-	1.85		_
		(1994) (2002)	82.56 90.00						- - -	1.85 1.85		
:	· · · · · · · · · · · · · · · · · · ·				-							
	CROP YIELD	(KG/RAI)										
·	BASE YEAR	(1983)	269.0		- 	· •••				8000.0		-
	WITHOUT PROJECT	(1988) (1994)	270.3 271.9		·	-	-	` 		8000.0 8000.0		
		(2002)	274.0		*0		· <u> </u>			8000.0		
	WITH PROJECT	(1988)	271.3	· -	•	· _	· _	. –	·	8008.0	-	-
,		(1994) (2002)	278.7 289.0	· · · · ·					·	8056.2 8120.8		
i.	CROP PRODUCTION AMOUNT	·	1	· · · · · · · · · · · · ·				••• •• •				• .
	BASE YEAR	(1983)	19,917	n in <u>a</u> n. Tha in the	lan an a					14,800	. –	_
	WITHOUT PROJECT	(1988)	20,869				· -			14,800		
		(1994) (2002)	22,071 [.] 23,783	-						14,800	-	-
	WITH PROJECT	(1988)	20,994		. - .	-	. ~	· •••	· <u> </u>	14,815	<u>-</u>	-
		(1994)	23,013	· *			-			14,904		· -

NOTE : SYMBOL "-" MEANS ZERO OR NEGLIGIBLE

UPLAND TOTAL	TOTAL
1.85	75.89
1.85	79.05
1.85	83.03
1.85	88.65
1.85	79.24
1.85	84.41
1.85	91.85

14,800	34,717
14,800	35,669
14,800	36,871
14,800	38,583
14,815	35,808
14,904	37,917
15,024	41,034

ITEM		RICE (PADDY)	MAIZE	SORGHUM	BEANS	GROUND NUTS	CASSAVA	KENAF	SUGAR CANE	COTTON	CASTOR BEANS	UPLAND TOTAL	TOTAL
ARMGATE PRICE	(BAHT/TON)							ا بنین ولیس بیمی ولیس میں میں میں ا			ا میں میں جب یے میں شہ جب		
WITHOUT PROJECT (1	783 - 2002)	3,705	 			 Te	ere prove <u>s</u> j	tan an tan ta <u>n</u> ta	489		- 1949-1949 - <u>- 1</u> 9	et de la construction P	an an an ann an Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean An an an Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaichtean Aonaich
WITH PROJECT (1		3,719					_	. –	499				
ATT		· · · · ·					. Triphica i gra	الي روايين جاري ال	Sigti Sociati	e toga in	an An an	± 7	en el construction de la construcción de la
ROP PRODUCTION COST	(BAHT/RAI)				an taon ta		•	·					
BASE YEAR	(1983)	700	 —		 	· · · <u>-</u>	· · · ·	· _	1,954				
WITHOUT PROJECT	(1988) (1994)	703 706						·	1,954 1,954	-	·		
	(2002)	711	·		· · · · · · · · · · · · · · · · · · ·	-	_	<u></u>	1,954	_	-		
WITH PROJECT	(1988)	704	· —		-	.	. .		1,955 1,964	-	-		
	(1994) (2002)	719 738	_	·		_		· <u></u>	1,974		-		
							•	+ *.1	e salate 1		et iste i	a a tera t	
ET PRODUCTION VALUE	(1000 ВАНТ)												
WITHOUT PROJECT	(1988)	23,044			· _		. <u> </u>		3,626	. –		3,626	26,670 28,088
·.	(1994)	24,462	-	. –	<u> </u>	. –		· ••••	3,626		·	3,626 3,626	28,088
	(2002)	26,402		·		-			3,626	· · · -		3,020	50,020
WITH PROJECT	(1988)	23,592		_	_		· _		3,776	· _	· •	3,776	27,368
WITH PROJECT	(1994)	26,222					······································		3,804	· _	· -	3,804	30,026
	(2002)	30,311			-	_	-		3,845		·	3,845	34,156
	(1			-									
ET VALUE ADDED	(1000 BAHT)									-			
• · · · ·		er a ->		_	:		· _		150	°.	-	150	678
1988		548	· • _	_	_			_	178			178	1,938
1994 2002	· · · ·	1,760 3,909				. –		· _	219			219	4,128

5-11

TABLE 5.2.3 NET PRODUCTION VALUE

NOTE : SYMBOL "-" MEANS ZERO OR NEGLIGIBLE SMALL

5.3 VOC SAVINGS

ð

海豚 医马克氏 化马克斯马克斯马克斯马克 化乙基 化化乙基

In accordance with the concept and data given in Section 3.4 of the Text Report, VOCs on the AREADO COMPRESSIONES road link concerned were calculated in the two cases of "with and without project".

Road length by road class is shown in Table 5.3.1. Data for additional VOCs are shown in Table 5.3.2.

VOC savings, obtained as the balance of total link VOCs between the two cases, were calculated as shown in Table 5.3.3.

TABLE 5.3.3 VEHICLE OPERATING COST SAVING

	2002	海市 的复数	je stera	1994	r ja endet.	eren e	1988		LINK
SAVIN	WITH	WITHOUT	SAVING	WITH	WITHOUT	SAVING	WITH	WITHOUT	NO.
5,737 9,044	12,502 18,205	18,239 27,249	3,562 5,506	7,859 11,236	11,421 14,741	2,443 31793	5,612 7,951	8,055 11,744	1 2
14,781	30,707	45,488	9,068	19,095	28,163	6,237	13,563	19,800	TOTAL

 $(x,\xi) \geq (x,y) \in \{1\}$

NOTE

(1) WITHOUT : WITHOUT PROJECT CASE
(3) SAVING : VEHICLE OPERATING COST SAVING
(4) LINK NO. = 1 - 9 : PROPOSED LINK

 $||M_{i}^{2}|| \leq 1$ $\tau_{i}^{-1} \in \mathcal{A}$

TABLE 5.3.1	ROAD LENGTH BY ROAD CLASS	

 $\{i,j,k\} \in \{i,j\}$

===		2012233 2 22	WITHOUT PRO	JECT CASE	*********	*********	WITH PROJECT
	BAUED		LATERITE		EARTH	TOTAL	CASE
NO.	PAVED	6000	FAIR	POOR			PAVED
1				15,5	N 2 1 🗕	15.5	·
2	-	-	-	12.5	-	12.5	12.5

	•	•	· .		a Angelang ang tanggang ang tanggan Ang tanggang ang tang
· 			e está cost Gran Catalon e Catalon esta		
			i for e Ma	1 4 m d 2 H	

10.20 AVA ____

					100 - C.	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -
					· .	
1999 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		1. <u>}</u>	1		•	The second s
and the second	ويعتبر المتحدين الجواجا كالت	وروابية المراجعة التراجعون مدورا الأرجع	ana an	and the second second second	and a the second second second second	المتحارب المحير المتحار فالحوام المتحد وماليك

TABLE 5.3.2 DATA FOR ADDITIONAL VOC COST

																	· · · · · · · · · · · · · · · · · · ·		"(UNIT	TOFICENC	5TH (M)
INK	CASE					URVE							GRADE			V	ILLAGE	NO. OF	NO. OF	NO, OF NARROW	NQ, OF
NO.		100	150	200	250	300	375	500	750	1500	1	2	3	4	5	NO.	LENGTH	SECTION	BRIDGE	BRIDGE	CORNER
1	WITHOUT WITH	357 213	283 283	132 247	214 214	170 170	124 186	-	491 491	419 419	3100 2400	1200 1550	100	200 150	-	10 10	5270 5270	4	- -	5	10 2
-	WITHOUT WITH	239 239	49 49	83 83	137	-	408 408	226 226	909 909	388 388	1900 1900	200 200	·			2	1100 1100	-	2	1	

(2) WITH : WITH PROJECT CASE

(5) LINK NO. = 11 - 19 : SURROUNDING LINK

5.4 ENGINEERING

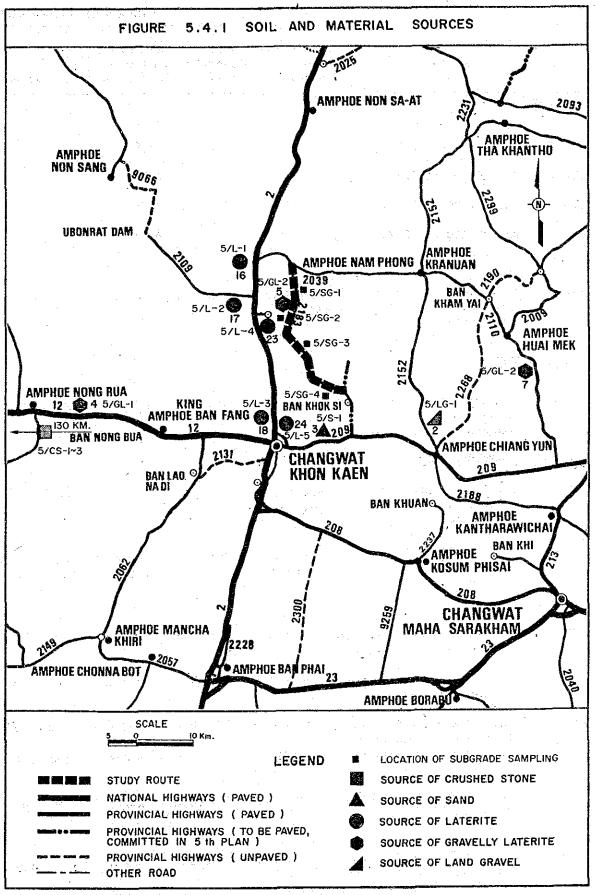
5.4.1 Soil and Materials

Existing subgrade soil and material sources in the vicinity of the Study Route investigated by DOH and their physical characteristics are shown in Figure 5.4.1 and Table 5.4.1, respectively.

Rock aggregate sources were assumed as shown below:

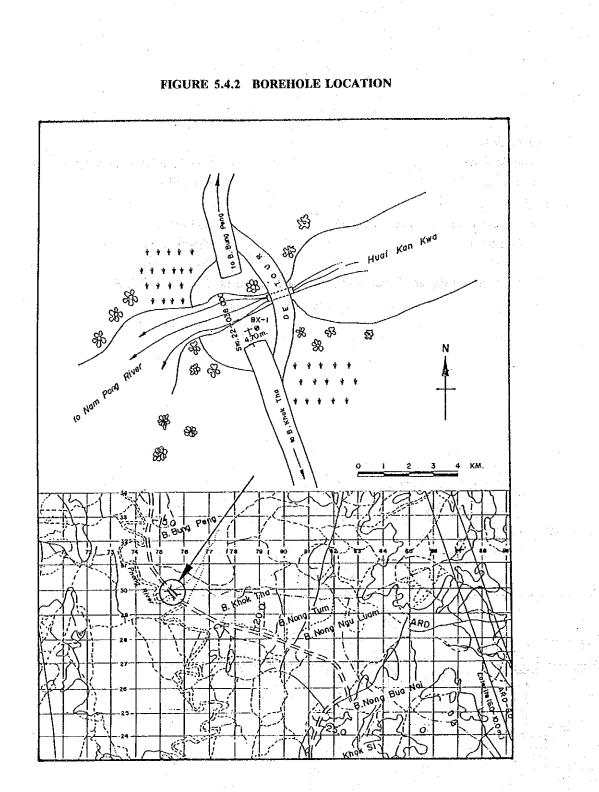
No.	Source	Description of Sample	Estim. Quantity m ³
5/CS-1	KM. 90+800 Lt 1,500 M. Chum Pae Rung Rueng Quarry	Lime Stone	Plenty
5/CS-2	KM. 105+600 Lt 6,000 M. Sila Sri Buri Quarry	Lime Stone	Plenty
5/CS-3	KM. 109+300 Lt 6,000 M. Sila Esarn Quarry	Lime Stone	Plenty

The borehole location, boring log and summary of boring test results are shown in Figures 5.4.2 and 5.4.3 and Table 5.4.2, respectively.



· · · · · ·	e de la companya de l	Description	Est.	AASHTO		5	Sieve	Analysi	s 🗞 Pa	ssing			Plast	icity	DH-T	Stand.	Lab. CBR	C.B.R. Swell	Durab	ility
No.	Source and	of Sample	Quantity m ³	Classifi- cation	50.0	25.0	19.0	9.5	#4	#10	#40	#200	LL	PT	0pt. 95%	gm/cc	95¥	Swell .%	Abr	
SUBGR	ADE 10 10 10 10 10 10 10 10 10 10 10 10 10				· · · · · · · · · · · · · · · · · · ·													n an star Marine d	andar Antaria	
5/SG-1.	KM. 5+000 Lt 15 M.			A4	。 和13時時分				100.0	. 99.0	95.2	37.4	N	~P	10.6	1.750	29.0	-		· · · · :
5/SG-2.	KM. 10+000 Rt 12 M.			A-7-6	法认为分			100.0	9.8.2	96.4	95.4	94.8	40.00	19.17	20.8	1,603	2.5	2.8	a sha a	· • *
5/SG-3.	KM. 16+000 Lt 14 M.		. ·	A-7-6				·	•	100.0	92.0	90.0	37,90	15.72	17.3	1,691	4.8	1.5		
5/SG-4.	KM. 22+000 Rt 12 M.			A-7-6						97.4	94.2		40,60	13.68	21.8	1.599	2.2	2.7		
SAND				1		- 				genaense. Tak			• •			4 - 1.1 - 1.				
5/s-1.	КМ. 10+000 Lt 700 M. Khon Kaen -	Pong River Sand	Plentifu	1 A-3					100	99	95	6		.P.		· ·· ·	··· · ·			
	Yang Talad			•				-						÷			· · · ·		• •	-
LAND G	RAVEL								·						÷.,			- 		
5/LG-1	KM. 29+000 Lt, Rt close to	Land gravel	70,000	A-2-7	100	92.3		71.6	55.4						8.0	2.170	5.4			
	Kranuan - Chiang Yuen		1. 1997 - 1997 - 1997 1. 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 199	A-2-7	100	93.6		71.7	55.8	41.1	24.2	14.3	45.3	17.8	e ta terej	la Prize		·· · ·		
GRAVEL	LY LATERITE			ана на селото на село При селото на селото н	-				2.3			er Norg	i e di						:	
5/GL-1	KM. 42+000 Rt 45 M. Khon Kaen - Chum Phae	Gravelly laterite	20,000		100	98.	1.	81.	3	36.7	22.0	12.0	31.3	8.2	6.9	2.092	54.5	· · · · · · · · · · · · · · · · · · ·		
5/GL-2	KM. 16+000 Lt close	Gravelly	100,000	A-2-4	100	94.	 A	90	2 72	.5 52.9	20 6	20.1						_		
•	to Yang Talad - ' Kra Nuan	laterite		A-2-4	100	98.				0 49.1					8.0	2.101	24.8	3		
LATERI	<u>PE</u>												· .			њ.,				
5/L-1	KM. 483+000 Lt close to Khon Kaen - Udon Thani	Laterite	60,000	A-2-4	100		97	94	57	31	16	9	31.1	9.6	5.	5 2.149	5 31.	0	52.4	78.6
5/L-2	KM. 14000 Rt close to Ubon Rat Dam	Laterite	22,500	A-1- a	100		88	60	41	20	12	- 8 88-415		I.P.	5. 1	6 2.184	50.	0	59.8	70.0
5/L-3	КМ. 450+150 Lt 4.5 КМ. Khon Daen - Udon Thani	Laterite	100,000	A-2-6	100	96	91	67		34	23	14		13.6		na stale de				
	L3:S2 = 4:1 by weight	Laterite With sand		A-2-4	100 Set <u>a</u> (11)	2	93	71	59	48	38	13	15.7	6.6	5.0	5 2.258	51.	0 0.40		
5/L-4	KM. 468+000 Rt 1.50 KM. Khon Kaen - Udon Thani	Laterite		A-2-4	100	98	87	48	25	18	17	12	29.3	8.5	·				30.0	68,9
5/L-5	KM. 450+200 Rt 1.7 KM.	Laterite	30,000		مربع معرد مربع معرد				· .											
• -	Khon Kaen - Udon Thani L2:S2 = 4:1 by weight	Laterite		A-2-6 A-2-4	ار موجد ملک ملک	100 100	92 93	73	55	43	28	17		15.5					28.2	68,9
		with sand	·			700			61	4.7	32	17	26.0	11.0	7.2	2.150	. 39.0	0.61		

TABLE 5.4.1 PHYSICAL CHARACTERISTICS OF MATERIALS



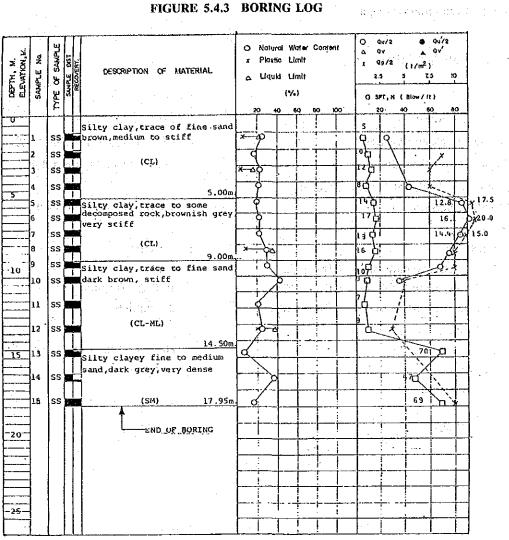


TABLE 5.4.2 SUMMARY OF TEST RESULTS

	-	DI	 ртн .	L L	АТ	TERBERG	LIMIT	CH-1	<u> </u>	SIEV	E ANA	LYSIS		Z	UND	RAINED	HEAR ST	RENGTH		2 Q T	
•	SAMPLE No.		м.	8 CONTENT %		· %		UNIT WEICHT		و 	16 FINE	R <u>N. S.</u>	÷	CLASSIFICATION		NFINED EAR	FIELO SHI	VANE	NH POCKET	STANDARD PENETRATION (N)	
	SAA	FROM	то	WATER	- LL.	PL.	Pt.	WET U	No. 3/8*	No.	No. 10	No. 40	No. 200	GLAS	ζως	Qu'n	Qv.	Qv'	r P F S NET P	PENE'	
	ss-1	1.00	1.45	23.9	20.8	5.9	14.9	2.06			100	99	97	CL	3.2				-	5	
	55-2	2.00	2.45	17.9				-						CL	-				8.7	10	
	SS-3	/3.00	3.45	21.8	14.9	4.4	10.5				100	99	92	сг	- ⁻	:			7.5	12	
·	SS-4	4.00	4.45	21.4				1.99						сr	5.5				7.5	в	
	SS-5	5.00	5.45	19.3				2.02				_		CL	12.8				17.5	14	 <u>.</u>
	SS-6	6.00	6.45	22.3				1.99						cr .	16.1	÷			20.0	17	
	<u>55-7</u>	7.00	7.45	21.8			<u> </u>	2.02	,				3	rı.	14.4				15.0	_11_	
	<u>55-8</u>	8.00	8,45	28.7	34.8	9.8	25.0	1.96				100	99	сь	9.5				10.0	_16_	
	<u>55-9</u>	9.00	9.45	29.8				1.90			<u> </u>			CI.	8.7				10.0	ا_مر	
1	SS-10	10.00	10.45	41.6				1.79	• • • • •					CL	4.6				5.0	9	
	ss-11	11.50	11.95	20.5		NF.		<u></u>		·	100	99	70	ML	-				-	7	
	55-12	13.00	13.45	24.4	38.0	19.9	18.1	_	100		96	92	71	CL -					3.7	9	
ļ	<u>\$5-13</u>	14,50	14.95	7.7										SM_							
- 1			16.45			NP.			<u>100</u>	80	63	48	33	SM						47	
·	<u>\$\$-15</u>	17.50	17.95	17.4				_ ·		·				SM	-				10.0	69	 {
ļ				I																	

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11.5

5.4.2	Preliminary	Design
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5.4.2.1	Design	Criteria	

Design Standard

Geometric Design Criteria

Typical Cross Section Minimum Height of Embankment in Flooding Section

Pavement Structure

DBST

Crushed Aggregate Base CBR≥ 80% Soil Aggregate Subbase $CBR \ge 25\%$

Selected Materials CBR≥ 6%

Pipe Culvert

Standardized type Location

Standard intervals Paddy area

Others

: F4 : DOH (Provincial Highway) : as shown in Figure 5.4.4.

: 0.7 m above flood level

: 2.5 cm

: 15.0 cm

: 10.0 cm (minimum requirement) : as required

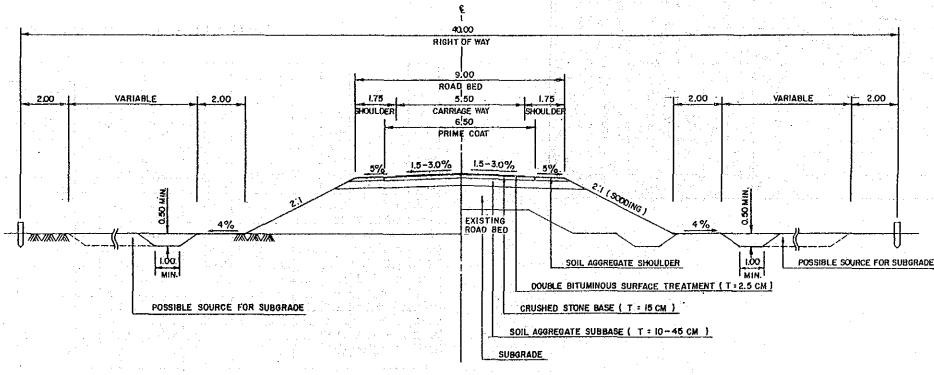
: 80, 100, 120 & 150 cm in diameter

: as required

: 200 m : 500 m Box Culvert Standard size : 1.5×1.5, 2.4×2.4 & 3.0×3.0 m Location : as required Bridge Reinforced concrete standard type : Width 9.0 m Substructure : Pile-bent type

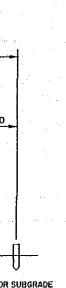
The existing and designed plan and profile are shown in Drawings 5-1/5-4.

FIGURE 5.4.4 TYPICAL CROSS SECTION



PROVINCIAL HIGHWAY (CLASS F4)

5-16



5.4.2.2 Special Conditions in Designing

Minor Modifications in Alignment

The existing road crosses many small irrigation canals at right angles. Minor modifications in alignment were made by removing the bridges crossing canals.

5.4.2.3 Pavement Design

1) Cumulative number of ESA in one direction

- ESA conversion factors
 - Heavy bus : 0.50 : 0.76 Medium truck : 1.24 Heavy truck

 - Forecasted ADT by vehicle type

이 같은 것 같은	1 di 1		· .			1				
Year		19	88			19	94			
Trafic/road link	1	2	3	4	. 1	2	3	4		
Heavy bus	2			<u> </u>	5	—				
Medium truck	6			<u> </u>	12		— '			
Heavy truck	10				11				-	

- Cumulative number of ESA in one direction by road link Road link 2 1 3 7 years (10⁶) 0.029 0.050

2) Design CBR values

Road link		1	2	3	4
Design CBR (%)	n an an tha an	3.9	2.2	-	-

5-17

3) Required thickness of pavement and the state of the second : DBST (2.5 cm) Surfacing Aggregate base : 15 cm (CBR not less than 25%) Subbase : Minimum requirement 10 cm Road link of enclose the Matthew Responsel.

25 cm

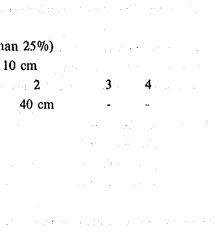
4) Overlay required in 7 years DBST resurfacing

5.4.2.4 Drainage and Structures

The locations of existing and designed RC box culverts and RC bridges and their dimensions are shown below:

	EXISTING	STRUCTURES	PROPOSE	D STRUCTURES
STATION	Түре	SIZE	TYPE	SIZE
4 + 843	RC Bridge	8.0 x 30.0		. .
5 + 352	11 11	4.0 x 14.0	RC Bridge	4.5 x 14.0
5 + 870	Box Culvert	1-2.5 x 2.5 x 12.0	Extd	. 6.0 m
8 + 191	RC Bridge	4.0 x 8.0	RC Bridge	4.5 x 8.0
9 + 404	0 h	4.0 x 8.0	1) II	4.5 x 8.0
1 + 120	17 11	4.0 x 7.0	11 11	9.0 x 15.0
3 +907	11 H	4.0 x 6.0	u ti	9.0 x 15.0
.6 + 445	Box Culvert	3-3.0 x 3.0 x 18.5	-	. –
2 + 173	Timber Bridge	4.0 x 15.0	RC Bridge	9.0 x 15.0
3 + 059	и п	4.5 x 30.0	11 17	9.0 x 30.0
6 + 771	RC Bridge	4.0 x 8.0	ta 14	4.5 x 8.0
9 + 653	Timber Bridge	4.0 x 15.4	RC Bridge	9.0 x 20.0
9 + 787	Pipe Culvert	2-Ø1.0 x 13.0	Box Culvert	1-2.4 x 2.4 x 13.0

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5.4.3 Quantities and Construction and Road Maintenance Costs degree to the defenses of a filiping a filiping a same tana ang kanang k

The required construction costs were estimated based on the results of the preliminary design as shown in Table 5.4.2. Financial costs with breakdown into local and foreign currency portions, economic costs and residual values were estimated as follows and in 5.4.4: Good

te sue a provincia a contra de la contra da ser entre da període entre da

IM5	L = 28.0 km	(baht)
	Financial cost	: 61,886,000
	Economic cost	: 51,725,000
	Residual value	: 21,531,000

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The required road maintenance cost savings are shown in Table 5.4.4.

5.4.4 Construction and Disbursement Schedules and the second state of the second secon

IM---5

Length = 28.0 km

Construction Schedule Assumption: Completion date December 31, 1987

Year &						.1	9	8	6					
Month		Ľ	r	Ý	se	as	on		W	et		-	D	
WORK ITEMS	1	T	2	3	4	S	6	7	- 8	9	10	11	12	
CONTRACT PREPARATORY WORKS	 - -			-			7.	7						
MAJOR WORKS (PRECEDING) PAVEMENT WORKS														
MAJOR WORKS (FOLLOWING)	-			-						-				
STRUCTURE WORKS MISC. WORKS CLEARING-UP								-	~			-		
PAYMENT IN %		_L_			L		.		•		<u> </u>	30	18	

Yearly Disbursement Schedule Assumption: Annual rise in prices

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	Ye Currency	ar	Base 198		(19	85)
	Local	· · ·	10	0	11	.0.0
	Foreig	n	10	0	10	6.5
	LOCAL	AND FORE	IGN COMP	ONENTS OF	CONSTRU	CTION C
			(Rou	te 1H - 5)	
=======			1986	.szezezeze	*======	
		L/C	F/C	Total	L/C	F/C
			·			~ / /

Construction Cost Price Contingency	9.3 2.0	7.2 1.2	18.5 3.2	21.8 7.2	21.6 4.5
Total	11.3 (0.42) (0.39)	(0.80)	(1.07)	26.1 (0.97)
Remarks L/C Local					********

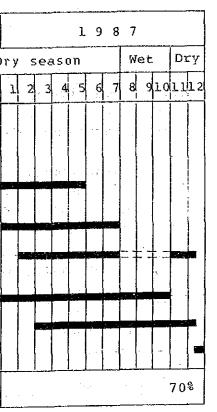
F/C : Foreisn Currency Portion () : US\$ Equivalent (US\$ 1 = 27 Baht)

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1987 1986 133.1 121.0 113.4 120.8 :05T (Unit : Million Baht)

	*********		icanaca-
	Ţ	otal	
Total	L/C	F/C	Total
43.4 11.7	31.1 9.2	30.8 5.7	61.9 14.9
55,1	40.3 (1.49)	36.5 (1.35)	76.8 (2.84)

TABLE 5.4.3 CONSTRUCTION QUANTITIES AND COSTS (ROUTE IM---5 Length = 28.0 km)

•

		Financial			nancial Cos			mic Cost	Residua	1 Value
Item	Unit	Unit Rate B	Quantity		Local		%	1000 8	%	1000 (
						. <u></u>	83		90	
EARTHWORK		10,000	65	650			00			· .
Clearing & Grubbing	na m3	10,000	61500	124						
Roadway Excavation, Unclassified	m3 m3	38	203,200	7,722						
Embankment, Common Soil	ີກວັ	70	0	0				· ·		
Embankment, Selected Material	m3	88	2,800	246					:	
Replacement of Soft Spot				8,742	4 : 458	4,283	·	7,255		6.530
Sub Total							-			
SUBBASE & BASE COURSES							83		50	
Subbase, Soil Assresate	ທ3່	112	83,400	7,341	• • •					
Assresate Base*	m3	37.2	27,300	10,156						
Cement Stabilized Base	mЗ	390	0	0		•				
Shoulder: Soil Assregate	៣3	120	10,500	1,260		, .				
Sub Total				20,756	11,208	9,548		17,228		8,614
								•		
SURFACE COURSES				1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			85		50**	
Asphaltic Prime/Tack Coat	m2	12	182,100	2:185						
Double Bituminous Surface Treatment*	m2	39	154,100	6,010						
Asphaltic Concrete Surfacing**	t	750	0	0		4				
Sub Total				8,195	3,606	4,587	:	6,966		l
STRUCTURES						· .	83		50	
RC Pipe Culvert (D 1.Om Equivalent)	m .	2,000	2;452	4,704	and the second second					
RC Box Culvert (2.4mx2.4m Equivalent)	m	18:800	8	150	e de la seconda	4 .				
RC Bridge(W=9.0m L=10m Equivalent)	ព .	46,500	102	4,743						4,060
Sub Total				9,797	4,899	4:879		8,132	. .	41000
Total (a)				47,490	24,171	23,319		39,581	· .	19,21(
						1				
INCIDENTALS							83		0	,
Miscellaneous Work ((a)x7%)	ls			3,324	1,662	1,662		2+759	ж.н. н <u>–</u>	{
								42,340		19,210
CONTRACT AMOUNT (b)			lan in ser	50,815	25,833	24,981	. *	421040		1/1/1
PHYSICAL CONTINGENCIES ((b)×10%) (c)	ls			5,081	2,583	2,498		4,234		1:92:
							85		0	
ENGINEERING AND SUPERVISION	•			5,590	2,236	3,354	42	4,751	-	(
(((b)+(c))x10%) (d)	15			07666	2,200	01004		11.21		
100 1001TION							100		100	
LAND ACQUISITION	ha	50:000	8	400						
Hishly Developed Land	ha	15,000	n n	0						
Less Developed Land	15	127000	0	400	400	Ũ		400		400
Sub Total (e)	** ~~~~~									
				61,886	31,053	30,833		51,725		21:53
PROJECT COST ((b)+(c)+(d)+(e))		•		01,000	01,020					
AVERAGE COST PER KM				2,210						

Note : * The unit prices are modified by assresate haulase distance

** Rate is applied only for Asphaltic Concrete Surfacing

			÷.,			TABLE	5.4.4 ROAD MA	INTENANCE C	OST SAVI	\G	•			
			وربار وروار ویون کرد. وروار وروار وروار	WITHOUT	PROJECT	CASE	و ایند مند مند وی وی وی وی وی وی وی وی وی	ura Alexania ach reig seo suo san ace ana i		WITH	PROJECT	CASE	ی چین است مند بعد مدد وی پیل اید این این وی بین است می این این این این این این این این این ای	ROAD
LÌNK NO.	YEAR	AVERAGE DAILY TRAFFIC <adt> (VEHICLE</adt>	OF LINK <l></l>	H FACTOR FOR ADT <a1></a1>	ROAD CHARA. FACTOR <ka></ka>	UNIT MAINTE: COST (U) (BAHT/KM)	TOTAL MAINTE. COST <t> (1000 BAHT)</t>	AVERAGE DAILY TRAFFIC <adt> (VEHICLE)</adt>	LENGTH OF LINK <l> (KM)</l>	FACTOR FOR ADT <x3></x3>	ROAD CHARA. FACTOR <kb></kb>	UNIT MAINTE. COST (U) (BAHT/KM)	TOTAL MAINTE. COST <t> (1000 BAHT)</t>	MAINTE COST SAVING (1000 BAH
1	1983 1994 2002	163.4 252.2 457.7	15.5 15.5 15.5	0.22 0.42 0.90	1.61	15,399 16,917 20,435	239 262 317	181.2 261.3 437.2	15.5 15.5 15.5	0.00 0.00 0.00	1.22 1.22 1.22	13,690 13,690 13,690	212 212 212 212	26 50 105
2	1988 1994 2002	501,9 773.3 1395.7	12.5 12.5 12.5	0.95 0.95 0.95		20,811 20,811 20,811 20,811	260 260 260	561.8 822.4 1392.0	12.5 12.5 12.5	0.00 0.00 0.08	1.22 1.22 1.22	13,690 13,690 13,736	171 171 172	89 89 88
TOTAL	1988 1994 2002	314.5 484.8 876.5	28.0 28.0 28.0 28.0			17,815 18,656 20,603	499 522 577	351.1 511.8 863.5	28.0 28.0 28.0			13,690 13,690 13,711	383 383 384	115 139 193
NO	TE (1	2) UNIT	MAINTE 1; SPE WIT	NANCE CO NANCE CO CIFIED M HOUT PRO	ST U AINTENAN JECT CAS	ICE COST E M =	9 or KB) * Fi 7,700 ВАНТ/I	<m.< th=""><th>R) * FE</th><th></th><th></th><th></th><th></th><th></th></m.<>	R) * FE					
NO		2) UNIT	MAINTE 1 ; SPE WIT WIT FA = 1. FR = 0.	NANCE CO CIFIED M HOUT PRO H PRO H PRO 10	ST U AINTENAN JECT CAS JECT CAS ADMINIS EMERGEN	I = M * (Ki E COST E M = E M = TRATION F ICY REHABI	7,700 BAHT/ 8,200 BAHT/ ACTOR FOR DI LITATION COS	<m KM RECT LABOU T FACTOR</m 	R OPERA	TION BY	and the second			
NO	(2	2) UNIT 3) ROAD	MAINTE 1 ; SPE WIT WIT FA = 1. FR = 0. FE = 0. CHARACT WITHOUT	VANCE CO CIFIED M HOUT PRO H PRO 15 35 ERISTIC I PROJECT	ST U AINTENAN JECT CAS JECT CAS ADMINIS EMERGEN ECONOMI FACTOR CASE	I = M * (K) ICE COST E M = ICY REHABIN C MAINTENN $KA = 1.3$	7,700 BAHT/ 8,200 BAHT/ ACTOR FOR DI LITATION COS ANCE COST FAU 31 + 0,70 * 0	KM KECT LABOU T FACTOR CTOR TO FIN	R OPERA NANCIAL	TION BY MAINTE	and the second)ST		
•	(2 (3 (4	2) UNIT 3) ROAD 4) FACTO	MAINTE 1 ; SPE WIT WIT FA = 1. FR = 0. FE = 0. CHARACT VITHOUT VITH R FOR A VITHOUT	VANCE CO CIFIED M HOUT PRO H PRO 15 35 ERISTIC (PROJECT PROJECT	ST U AINTENAN JECT CAS JECT CAS ADMINIS EMERGEN ECONOMI FACTOR CASE CASE	K = M * (K) E COST E M = TRATION F(CY REHABI) C MAINTEN(KA = 1.3 KB = 1.3 A1 = -0	7,700 BAHT/ 8,200 BAHT/ ACTOR FOR DI LITATION COS ANCE COST FA	<m KM T FACTOR CTOR TO FII A1 X3 2320 * AD 2409 * (AD</m 	R OPERA NANCIAL T T / LANI	TION BY MAINTE	NANCE CO ; LANE =	• 2		
•	(2 (3 (4	2) UNIT 3) ROAD 4) FACTO	MAINTE WIT WIT FA = 1. FR = 0. FE = 0. CHARACT WITHOUT WITH R FOR A WITHOUT	VANCE CO CIFIED M HOUT PRO H PRO HO 15 35 ERISTIC H PROJECT PROJECT PROJECT	ST U AINTENAN JECT CAS JECT CAS ADMINIS EMERGEN ECONOMI FACTOR CASE CASE CASE	K = M * (K) K = M = K = 1.3 K = 1	7,700 BAHT/ 8,200 BAHT/ ACTOR FOR DI LITATION COS ANCE COST FA 31 + 0.70 * (22 + 0.05 *)	KM KECT LABOU T FACTOR CTOR TO FI A1 X3 2320 * AD 2320 * AD	R OPERA NANCIAL T T / LAN	TION BY MAINTE	NANCE CO 5 LANE =	• • • • • • •		· · · ·

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5.5 EVALUATION

5.5.1 Economic Evaluation

The yearly distribution of the economic costs and benefits and the calculated economic indicators for evaluation are given in the table below.

The results indicate that the improvement of this study route is feasible by employing the F4 standard with DBST surfacing.

COST AND BENEFIT STATEMENT OF ROUTE IM - 5

						(100	DO BAHT)
	COST	m 200 am ha 621 ab an 622 -	BENEF	ITS		DISCOUN	reD(12%)
YEAR	CONST. COST	AGRI. BENEFIT	VOC SAVING	RMC SAVING	TOTAL	TOTAL	TOTAL BENEFIT
1986	15,518	0	.0	0	0	19,466	0
1987	36,207	0	0	ŏ	0	40,552	· 0
1988	0	698	6,237	115	7,050	0	6,295
1989	0	905	6,708	119	7,733	0	6,164
1990	0	1,111	7,180	123	8,415	0	5,990
1991	0	1,318	7,652	127	9,097	0	5,782
1992	0	1,525	8,124	131	9,780	0	5,549
1993	0	1,731	8,596	135	10,462	0	5,301
1994	0	1,938	9,068	139	11,145	0	5,041
1995	10,079	2,212	9,782	146	12,139	4,559	4,903
1996	0	2,486	10,496	153	13,134	0	4,736
1997	0	2,759	11,210	159	14,129	Ó.	4,549
1998	0	3,033	11,924	166	15,123	0	4,348
1999	0	3,307	12,638	173	16,118	0	4,137
2000	0	3,581	13,352	179	17,112	0	3,922
2001	0	3,854	14,067	186	18,107	0	3,705
2002	-21,531	4,128	14,781	193	19,102	-3,934	3,490
TOTAL	40,273	34,585	151,815	2,246	188,646	60,643	73,911
DISCOUNTED	60,643	12,354	60,612	944	73,911		

NET PRESENT VALUE 13,268 : BENEFIT/COST RATIO 1.22 1 INTERNAL RATE OF RETURN ŝ 14.6 % FIRST YEAR RATE OF RETURN 10.5 % 1 OPTIMUM OPENING YEAR : 1988

SENSITIVITY TESTS

		CASE	
ITEM	BASE	1	2
NET PRESENT VALUE	13,268	4,171	2,181
BENEFIT/COST RATIO	1.22	1.06	1.04
INTERNAL RATE OF RETURN	14.6 %	12.7 %	12.4 %
FIRST YEAR RATE OF RETURN	10.5 %	9.1 %	8.9 %
COSTS	BASE	+15%	BASE
BENEFITS	BASE	BASE	-15%

5.5.2 Social Impact

The social impact brought about by the improvement of the study route is shown by the following social benefit indicators:

Construction Cost (million baht)

1) Gen	eral Access	ibility Ber	ıefit (mill	ion baht
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2) Education Benefit (million baht)

3) Medical Care Benefit (million baht)

- 4) Total Social Benefits (million baht) (1+2+3)
- 5) Social Benefit/Cost Ratio ($\times 10^{-2}$)
- 6) Ranking by Social Benefit
- 7) Weighted Production Value Gain/Cost ($\times 10^{-2}$)
- 8) Ranking by 7
- 9) Combined Ratio ($\times 10^{-2}$)

Overall Ranking

:	51.7
:	3.60
:	4.29
:	0.079
:	7.97
:	15.42
:	5
:	10.92
:	6
:	26.34
:	5

5.5.3 Overall Evaluation

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It is concluded and recommended that, considering the overall ranking and possible schedule of the improvement and/or new construction of the study routes, this study route should be constructed with the opening year 1988. all sector

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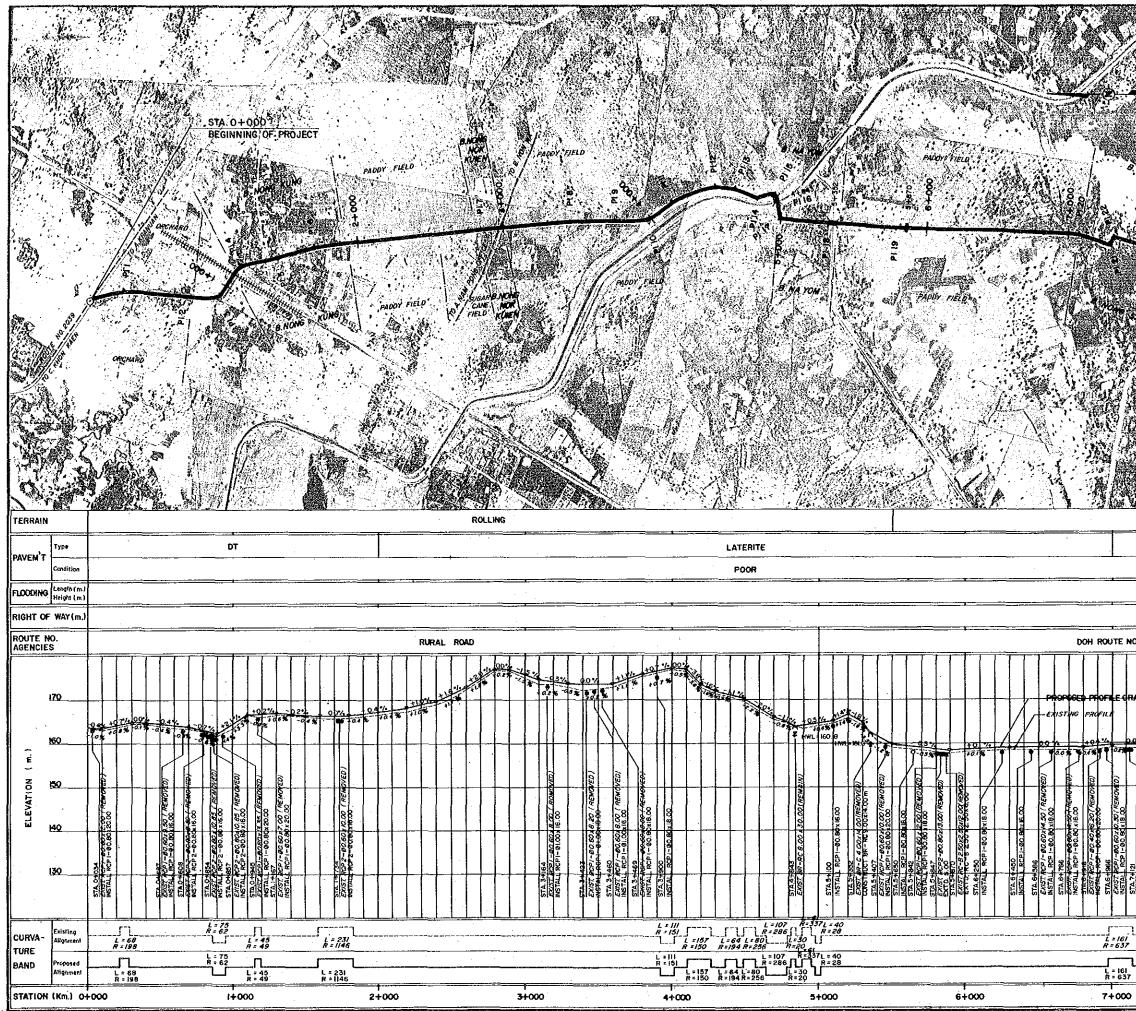
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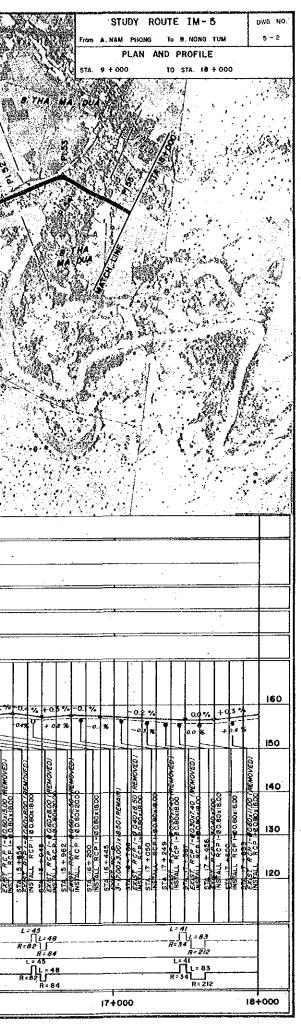
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FLOODING	Length(m. Height(m.) F WAY(m.)	1,100 1,100 0,30	•	 	DOH ROUTE NO 2183		LATERITE
FLOODING RIGHT O ROUTE I AGENCIE	Length (m. Height (m.) F WAY (m.) Ю. S				DOH ROUTE NO 2183 ROPOSED PROFILE GRADE		
FLOODING RIGHT O ROUTE I AGENCIE	Length (m. Height (m.) F WAY (m.) KO: S				DOH ROUTE NO 2183 ROPOSED PROFILE GRADE		LATERITE
	Length (m. Height (m.) WAY (m.) KO: S 160				DOH ROUTE NO 2183 ROPOSED PROFILE GRADE 21/57/AF PROFILE 21/57/AF PROFILE 21/57/	EMOVED) EMOVED) EMOVED) REMOVED) REMOVED)	0 2 1/4 0 9 0
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	Length (m. Height (m.) WAY (m.) KO: S 160		2.301.000 REMOVED 0.301.200 REMOVED 0.301.200 REMOVED 0.301.310 REMOVED 0.301.310 REMOVED 0.301.310 REMOVED 0.301.310 REMOVED 0.301.310 REMOVED 0.301.310 REMOVED 0.301.310 REMOVED 0.301.301 REM		DOH ROUTE NO 2183 ROPOSED PROFILE GRADE 5/7 0.00% + 0.4 / 0.0 %	Половод 2001 Темночер) Толовод 2001 Темночер) Толовод 2001 Темночер) Толовод 2001 Темночер) Толовод 2001 Темночер)	1 4 2016041800
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