

PROJECT WD7-5

RT. 4 RANONG - J. RT. 4006

CHANGWAT: RANONG

2) ROUTE MAP

3.15 Route No. 4 Ranong - 4006 (WD7-5)

1) Summary

The aim of the project is to facilitate the inter-regional traffic between Bangkok and Phuket as well as to cope with the increasing traffic in the vicinity of Ranong city.

The existing road is of "P3" standard with paved carriageway width of 6 meters and shoulder of 2.0 meters on both sides. Surface condition is good to fair. The proposed highway is of "P1" standard with carriageway width of 7.0 meters and shoulder of 2.5 meters on both sides.

The project starts from Ranong city and ends at the intersection with route 4006. The total length amounts to 25.9 kilometers. There are as many as 19 bridges made of reinforced concrete with the 8 meter width. The total length of the bridges amounts to 800 meters, including four bridges of longer than 50 meters.

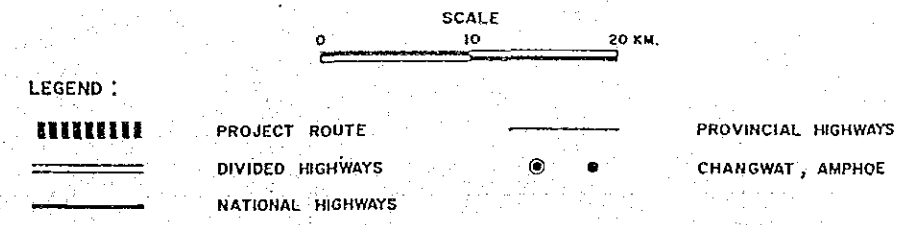
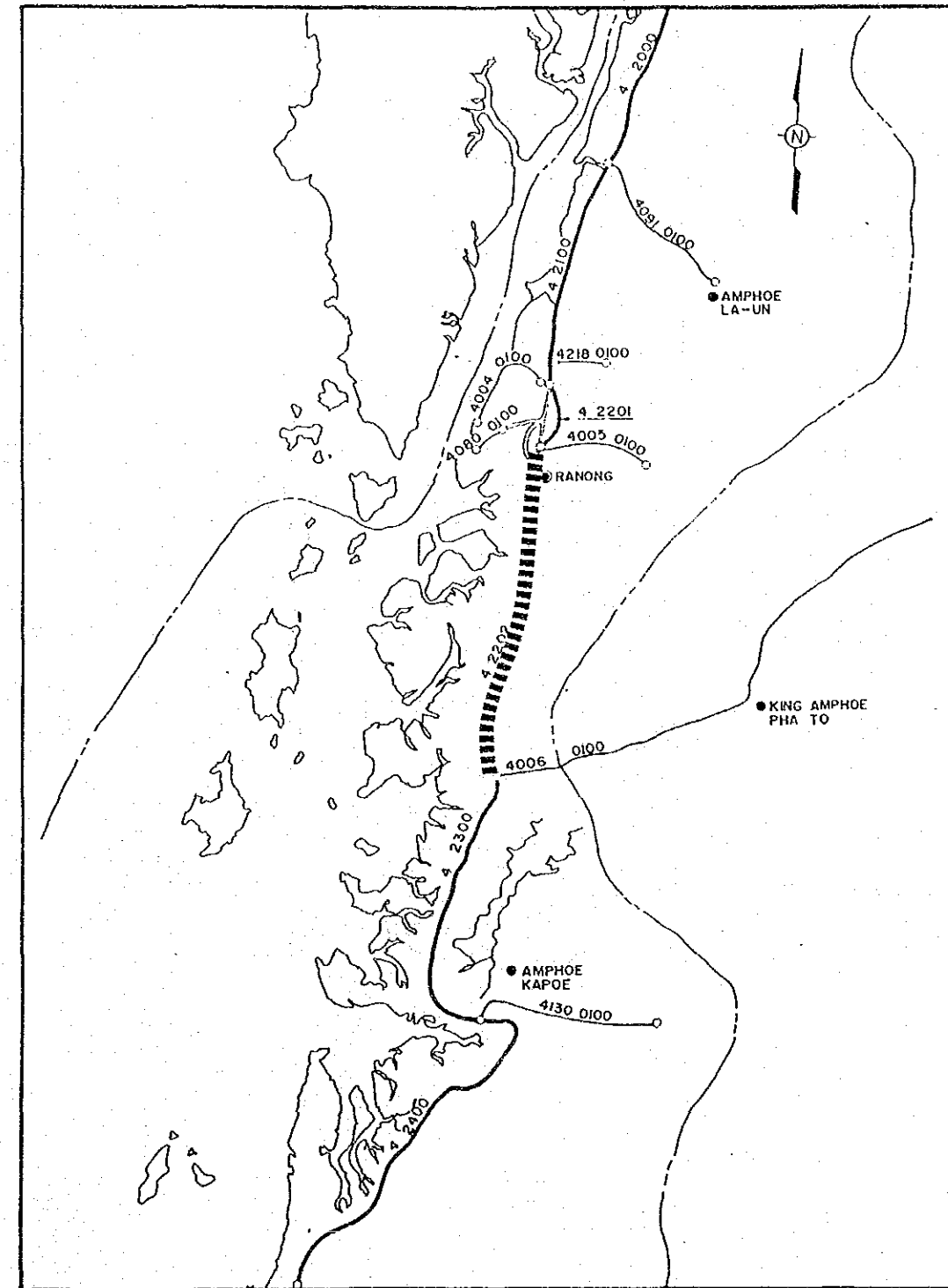
The project lies in hilly terrain for about 70 % of the total length and in flat terrain for 30 %. Due to hilly terrain, there are many curves of small radius. Rubber plantation dominates in land use along the highway, accounting for about 90 %.

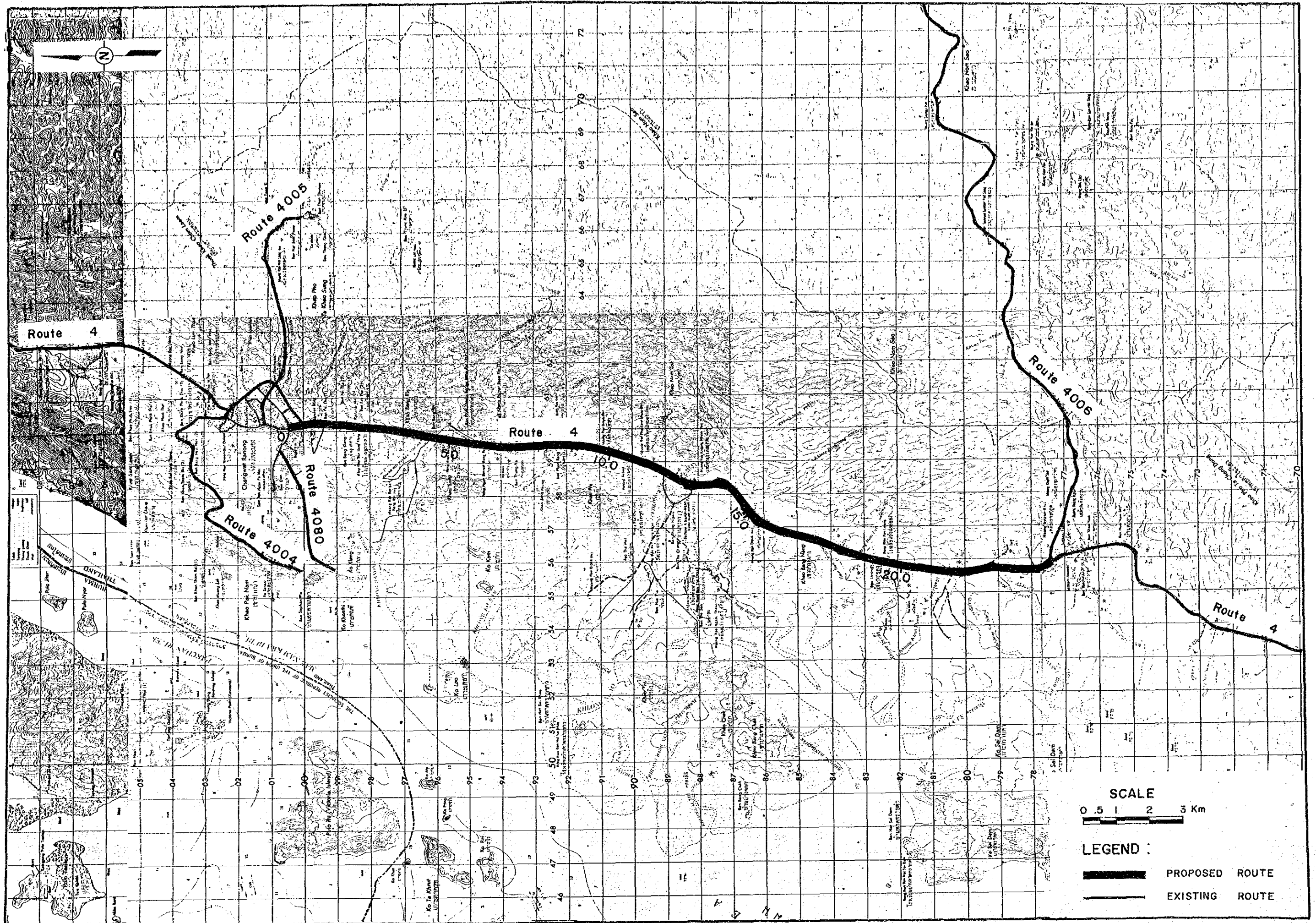
WD7-5	Description
Changwat	: Ranong
Name or Location	: Rt.4 Ranong - J.Rt.4006
Road Class	: P1 (P3)
Cross Section (m)	: 2.50+7.00+2.50 (2.00+6.00+2.00)
Surface Type	: SA /ASC / SA (SA /ASC / SA)
Surface Condition	: (G/F)
Length: Total	: 25.9 km
DOH Road	: 25.9 km

AADT<'96/'01/'06>	: 1,800 / 3,500 / 5,700

Financial Cost	: 88.0 million baht
NPV	: 29 million baht (12% discount rate)
B/C	: 1.7 (12% discount rate)
EIRR	: 18.1 %

(): Existing Condition or Value



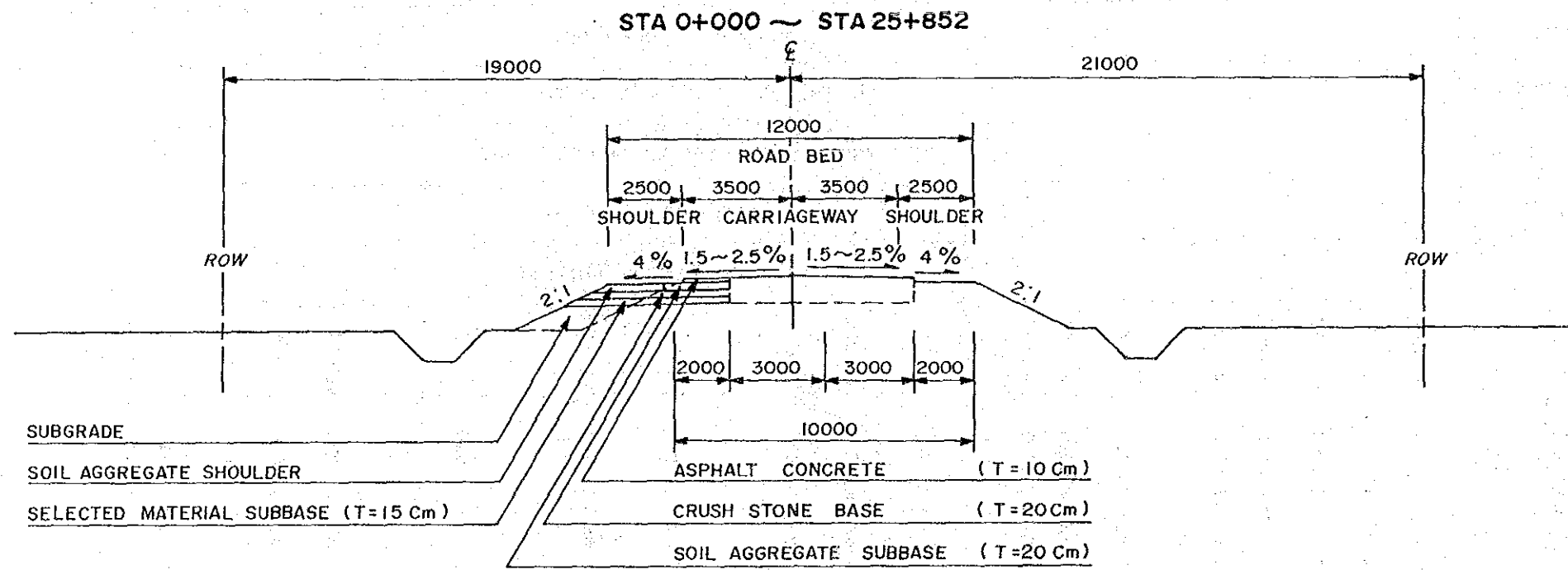


4) PROFILE OF PROJECT

PROJECT NO. WD 7-5 ROUTE NO. 4 RANONG - 4006

STATION (Km)	0		2		4		5+212		6		8		10		12		12+412		14		16		18		20+212		22		24		25+852		26		28		30																																																																																																																											
VILLAGE ROAD INTERSECTION	RANONG																																BANG RIN																																BAN NGAW																																THUNG LA ONG																																J. Rt. 4006																															
LAND USE	RUBBER 90% DEVELOPED																																																																																																																																																															
TERRAIN	FLAT 7.5 KM ROLLING 18.4 KM																																																																																																																																																															
FLOODING LENGTH	NO FLOODING REPORTED																																																																																																																																																															
EXISTING CONDITIONS	RIGHT OF WAY		40.00 M (20.00+20.00)																																																																																																																																																													
	ALIGNMENT	HOR.	NUMBER OF HORIZONTAL CURVES 38																																																																																																																																																													
		VER.	NUMBER OF VERTICAL CURVES 157																																																																																																																																																													
	CROSS SECTION		P 3 2.00 + 6.00 + 2.00 = 10.00 M																																																																																																																																																													
	SURFACE		SA + ASC (GOOD/FAIR)+SA																																																																																																																																																													
	BRIDGES AND (Type - Width - Length (m))		0+573	1+273	2+167	2+987	3+705	5+344	6+282	6+897	8+632	9+914	10+812	12+999	14+266	16+333	18+502	19+434	21+337	21+946	24+164	25+308																																																																																																																																										
BOX CULVERTS (Width - Height - Length (m))		RC 8.0 x 6 x 10.0	BX6-2.4x1.0x16.0	RC 7.0 x 3 x 4.0	RC 8.0 x 4 x 6.0	RC 8.0 x 3 x 8.7	RC 8.0 x 14 x 9.4	RC 8.0 x 3 x 8.0	RC 8.0 x 3 x 8.0	RC 9.0 x 3 x 8.7	RC 8.0 x 10 x 10.0	RC 8.0 x 4 x 6.0	RC 8.0 x 3 x 6.0	RC 8.0 x 6 x 10.0	RC 8.0 x 2 x 10.0	RC 8.0 x 3 x 10.0	RC 8.0 x 5 x 8.4	RC 8.0 x 4 x 9.0	RC 8.0 x 4 x 9.0	RC 8.0 x 5 x 10.0	RC 8.0 x 1 x 8.0																																																																																																																																											
PROPOSED CONDITIONS	CROSS SECTION		P 1 2.50 + 7.00 + 2.50 = 12.00 M																																																																																																																																																													
	TYPE OF IMPROVEMENT		WD 25,852 M																																																																																																																																																													
	BRIDGES (Type - Width - Length (m))		0+000																															25+852																																																																																																																														
		RC 12.0 x 6 x 10.0	RC 12.0 x 3 x 4.0	RC 12.0 x 4 x 6.0	RC 12.0 x 3 x 8.7	RC 12.0 x 14 x 9.4	RC 12.0 x 3 x 8.0	RC 12.0 x 3 x 8.0	RC 12.0 x 3 x 8.7	RC 12.0 x 10 x 10.0	RC 12.0 x 4 x 6.0	RC 12.0 x 3 x 6.0	RC 12.0 x 6 x 10.0	RC 12.0 x 2 x 10.0	RC 12.0 x 3 x 10.0	RC 12.0 x 5 x 8.4	RC 12.0 x 4 x 9.0	RC 12.0 x 4 x 9.0	RC 12.0 x 5 x 10.0	RC 12.0 x 1 x 8.0																																																																																																																																												

5) TYPICAL CROSS SECTION



6) CONSTRUCTION QUANTITIES AND COSTS

CONSTRUCTION QUANTITIES AND COSTS
(Project WD 7-5 Length = 25.852 Km)
(Improved Length 25.852 Km)

ITEM	Unit	Financial		Financial		Economic cost		Residual Value	
		Unit Cost Baht	Quantity	Total cost 1000 Baht	%	1000 Baht	%	1000 Baht	
EARTH WORK									
Clearing & Grubbing	SQ.M	1	51,704	52					
Roadway Excavation(Unclassified)	CU.M	30	0	0					
Embankment(Borrowed Material)	CU.M	100	43,948	4,395					
Slope Protection(Stripe Sodding)	SQ.M	6	86,708	520					
Sand Mat (t=0.5m)	SQ.M	50	0	0					
Excavate Existing Surface	SQ.M	2	0	0					
Thickness Over 10Cm (2 Lay)	SQ.M	14	68,508	959					
SUB TOTAL				5,926		4,918		4,427	
SUBBASE AND BASE									
Subbase(Selected Material)	CU.M	190	20,552	3,905					
Subbase(Soil Aggregate)	CU.M	190	27,403	5,207					
Base Coarses(Crush Stone)	CU.M	280	9,307	2,606					
Shoulder(Soil Aggregate)	CU.M	190	11,375	2,161					
SUB TOTAL				13,879		11,519		5,760	
SURFACE									
Asphaltic Prime coat	SQ.M	13	38,778	504					
Asphaltic Tack coat	SQ.M	7	38,778	271					
Asphalt concrete Surfacing	CU.M	1,900	3,878	7,368					
SUB TOTAL				8,143		6,759		3,380	
STRUCTURES(Equivalent)									
RC Pipe Culvert(D= 600 m)	M	1,380	16	22					
(D= 800 m)	M	1,950	64	125					
(D=1000 m)	M	2,640	12	32					
RC Box Culvert(6-2.40*1.00 m)	M	32,000	2	64					
RC Bridge (W=15.0 m)	M	96,000	0	0					
RC Bridge Widening	SQ.M	9,600	4,147	39,811					
PC Bridge (W= m)	M		0	0					
SUB TOTAL				40,054		33,245		16,622	
TOTAL (a)				68,002		56,441		30,188	
Miscellaneous Works [(a)*7%]	Ls	1		4,760		3,951		2,113	
CONTRACT AMOUNT (b)				72,762		60,392		32,301	
PHYSICAL CONTINGENCIES [(b)*10%] (c)	Ls	1		7,276		6,039		3,230	
ENGINEERING & SUPERVISION [(b)+(c)*10%] (d)	Ls	1		8,004	85	6,803	0	0	
LAND ACQUISITION(Average) (e)	SQ.M	50	0	0	100	0	100	0	
PROJECT COST [(b)+(c)+(d)+(e)]				88,042		73,235		35,531	
AVERAGE COST PER KM				3,406					

MAINTENANCE BUDGET CALCULATION

Project Road No, WD 7-5 (Existing Road) Na= 8,200 Baht/Km/year
Km= 1.00
Length = 25.852 Km

Asphalt Pavement

ITEMS	Existing Road		
	Condition	Factor	
1. Surface /Base Type	X1 AC		0.00
2. Subgrade CBR	X2 4 %		0.50
3. A.D.T	X3 1,800		0.53
4. Service Life (year)	X4 5		0.40
5. Pavement Width (m)	X5 6 m		0.05
6. R-O-W Width (m)	Y1 40 m		0.00
7. Shoulder, Access, Median Width (m)	Y2 2.00m		0.00
8. Traffic Service Operation Topography	Y3 0 - 3 %		0.00
9. Drainage Topography	Y4 0 - 3 %		0.00
10. Bridge Quantity (m/Km)	Y5 30		0.04
11. NO. Of Lanes	2		

Ka/Existing = 1+0.5(X1+X2+X3+X4+X5+Y1+Y2+Y3+Y4+Y5) = 1.76
Maintenance cost + Overhead = Ka * Km * Na * 1.28 = 18,491 Baht/Km/year
Total Cost(Existing) = Length *(Baht/Km/year) = 478,041 Baht/year
Financial Cost = 478,000 Baht/year
Economic Cost = 397,000 Baht/year
(396,740)Baht/year

Project Road No, WD 7-5 (Proposed Road) Na= 8,200 Baht/Km/year
Km= 1.00
Length = 25.852 Km

Asphalt Pavement

ITEMS	Proposed Road		
	Condition	Factor	
1. Surface /Base Type	X1 AC		0.00
2. Subgrade CBR	X2 4 %		0.50
3. A.D.T	X3 1,800		0.53
4. Service Life (year)	X4 10		1.40
5. Pavement Width (m)	X5 7 m		0.19
6. R-O-W Width (m)	Y1 40 m		0.00
7. Shoulder, Access, Median Width (m)	Y2 2.5 m		0.05
8. Traffic Service Operation Topography	Y3 0 - 3 %		0.00
9. Drainage Topography	Y4 0 - 3 %		0.00
10. Bridge Quantity (m/Km)	Y5 30		0.04
11. NO. Of Lanes	2		

Ka = 1+0.5(X1+X2+X3+X4+X5+Y1+Y2+Y3+Y4+Y5) = 2.36
Maintenance cost + Overhead = Ka * Km * Na * 1.28 = 24,743 Baht/Km/year
Total Cost = Length *(Baht/Km/year) = 639,651 Baht/year
Financial Cost = 640,000 Baht/year
Economic Cost = 531,000 Baht/year
(531,200)Baht/year

PROJECT WD7-6

RT. 401 J. RT. 416 - PHUN PHIN

CHANGWAT: SURAT THANI

2) ROUTE MAP

3.16 Route No. 401 from Phun Phin to 416 (WD7-6)

1) Summary

The aim of the project is to improve east west link between both sides of the peninsula as well as to facilitate traffic between Surat Thani city and the districts in the west of Surat Thani province.

The existing highway is of "S3" standard with carriageway width of 6.0 meters and shoulder of 2.0 meters on both sides. Surface condition is good to fair. There are fourteen bridges in this section. A 120 meter bridge is the longest one that crosses the Tapi River. The proposed highway is of "S3" standard with carriageway width of 7.0 meters and shoulders of 2.5 meters.

The project starts from the intersection with Route 416 and ends at the intersection with Route 4008 in Amphoe Phunphin. The total length amounts to 64.0 kilometers. The project lies mostly in flat terrain, excluding some part in amphoe Ban Takhun. Land use along the highway is rubber plantation, rice field, fruit orchard and forest.

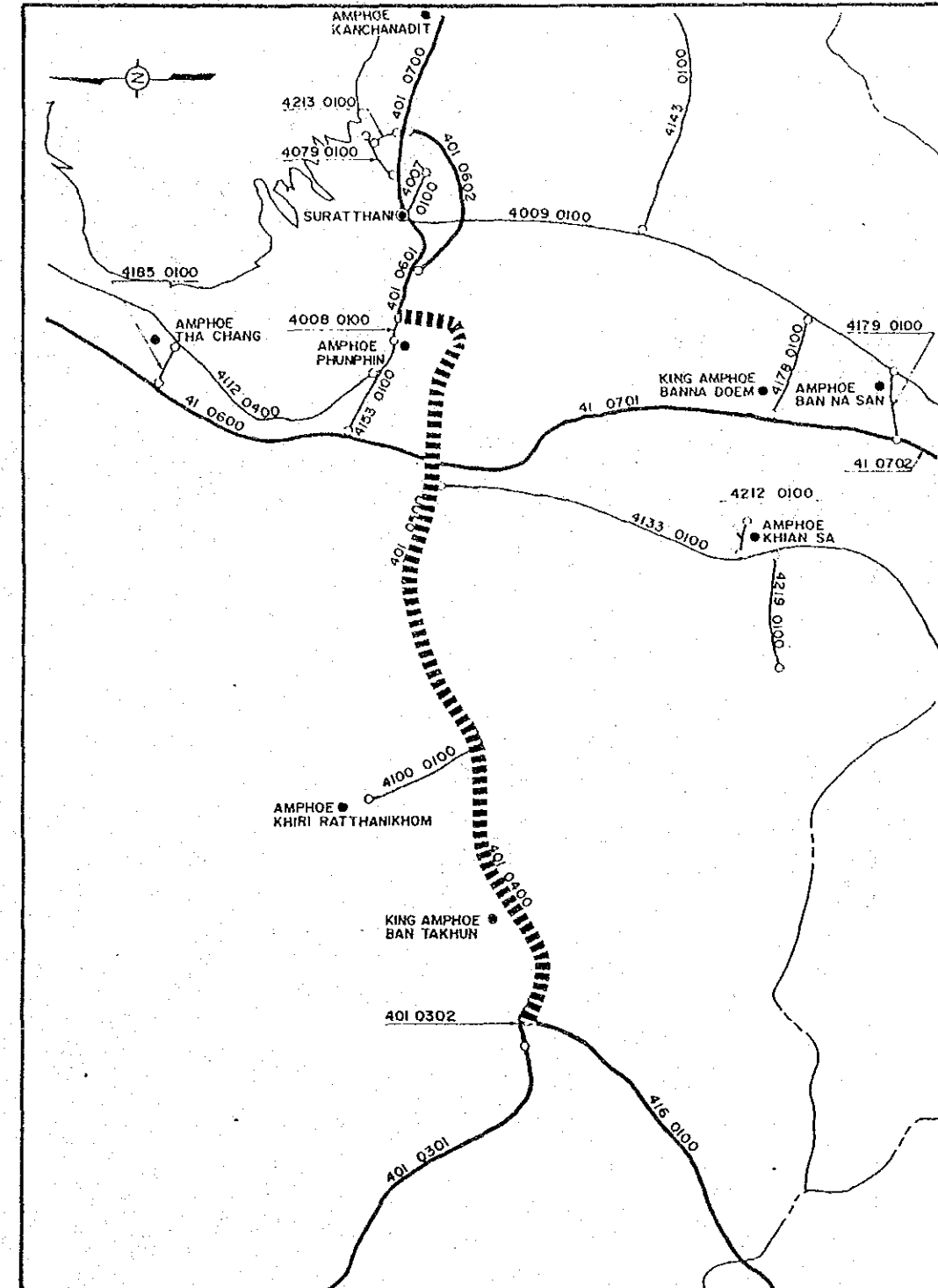
The EIRR is calculated at 10.8 %, lower than the bench mark value of 12 %. The reason can be attributable to the competition with the parallel highway of Route 4035 which connects the east side with the west side of the Peninsula as well.

WD7-6	Description
Changwat	: Surat Thani
Name or Location	: Rt.401 J.Rt.416 - Phun Phin
Road Class	: S1 (S3)
Cross Section (m)	: 2.50+7.00+2.50 (2.00+6.00+2.00)
Surface Type	: SA /ASC / SA (SA /DBST/ SA)
Surface Condition	: (G/F)
Length: Total	: 64.0 km
DOH Road	: 64.0 km

AADT<'96/'01/'06>	: 2,800 / 4,000 / 5,600

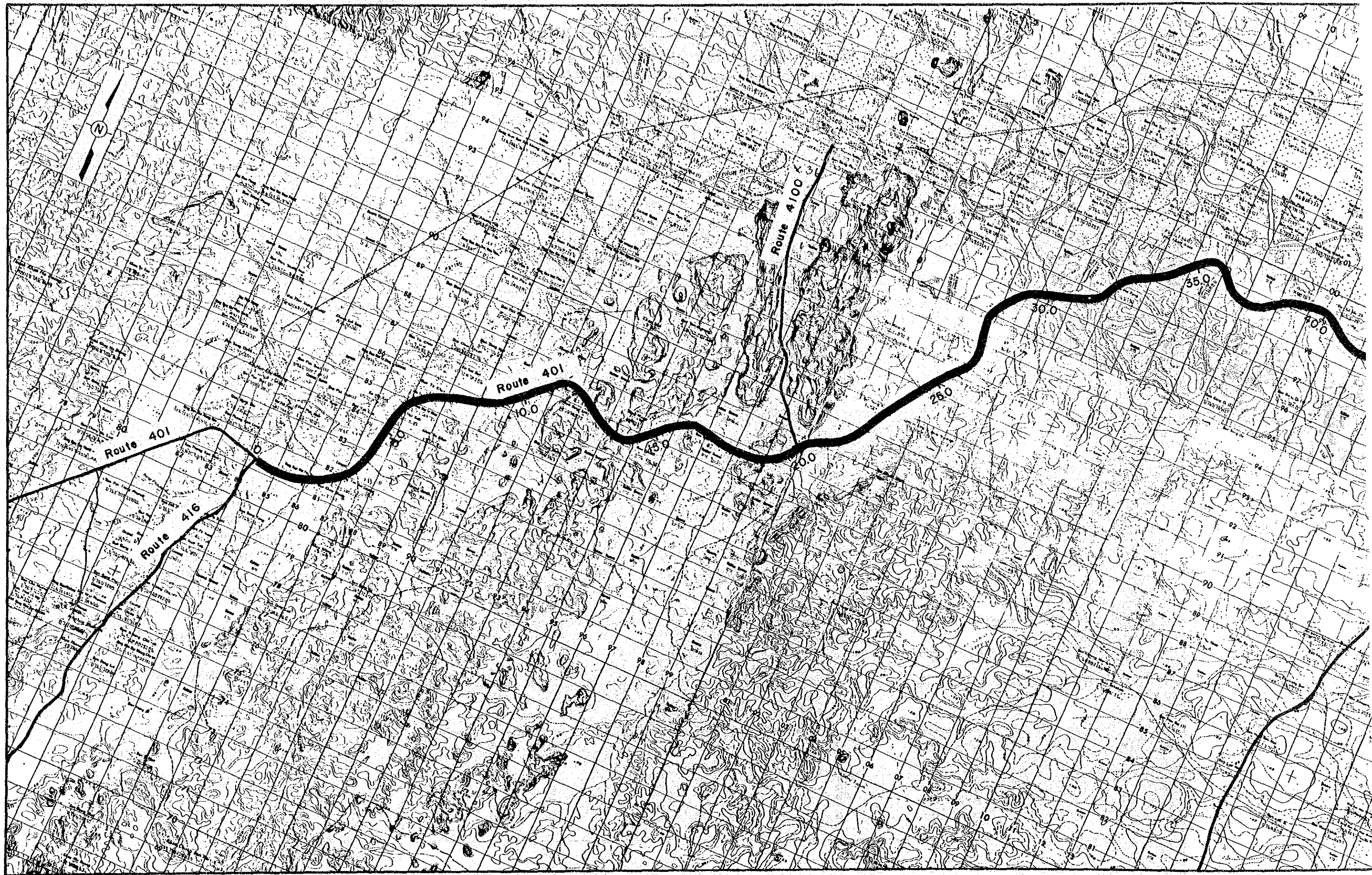
Financial Cost	: 165.6 million baht
NPV	: - 7 million baht (12% discount rate)
B/C	: 0.9 (12% discount rate)
EIRR	: 10.8 %

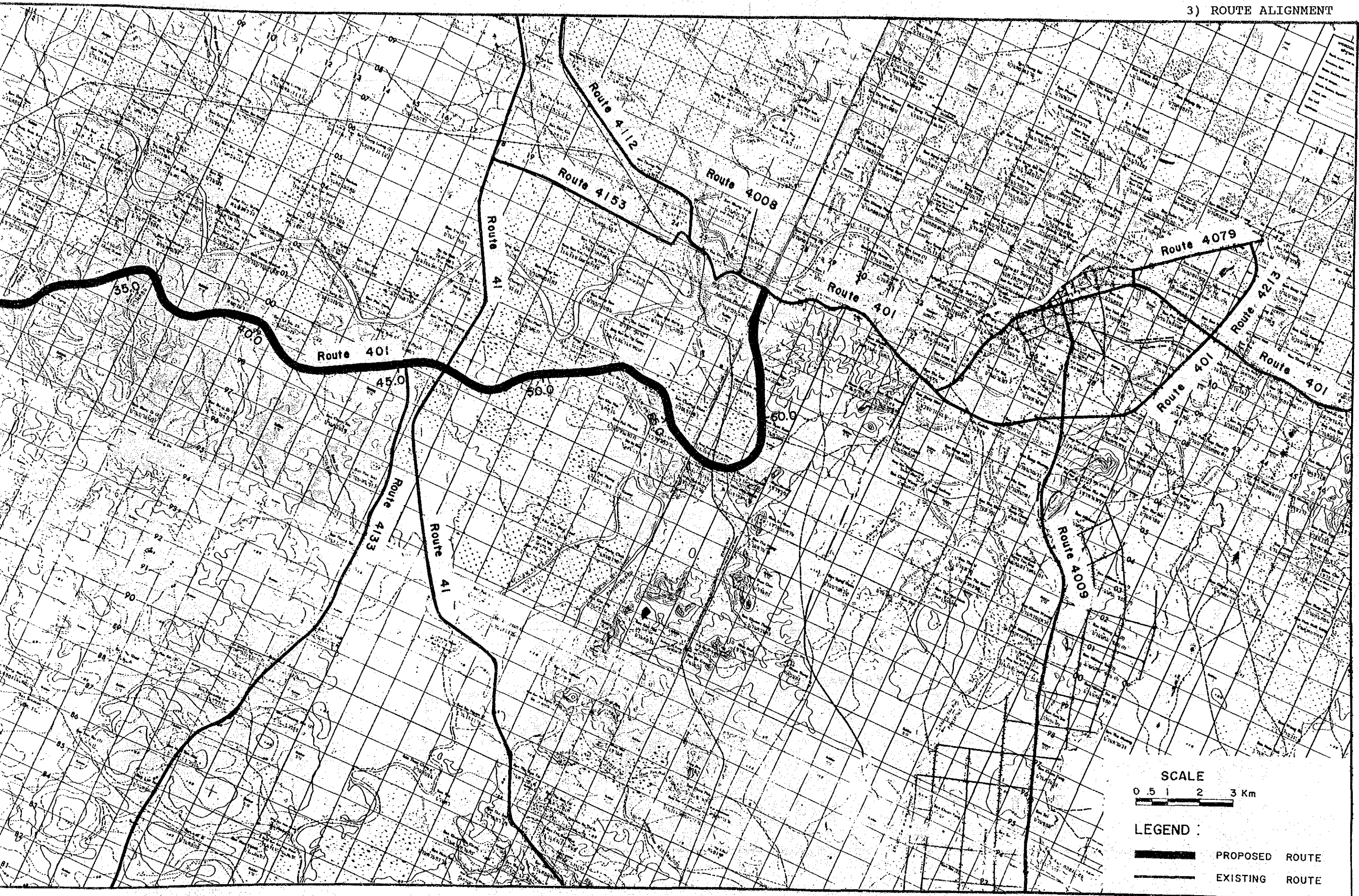
(): Existing Condition or Value	



LEGEND :

	PROJECT ROUTE		PROVINCIAL HIGHWAYS
	DIVIDED HIGHWAYS		CHANGWAT, AMPHOE
	NATIONAL HIGHWAYS		





4) PROFILE OF PROJECT

PROJECT NO. WD 7-6 ROUTE NO. 401 416 - PHUN PHIN

(1/3)

STATION (Km)		0	2+076	4	5+500	6	8	10	12	14	16	18	19+800	20	21+000	22	24	26	28	29+900			
VILLAGE ROAD INTERSECTION		J. Rt. 416 KP 61+924		TA KHUN								J. Rt. 4100		HUAI HIN KONG				LUK KANKASET					
LAND USE		RICE RUBBER		RICE, RUBBER, FRUIT, FOREST , 80% DEVELOPED																			
TERRAIN		FLAT		FLAT 11.3 KM ROLLING 18.6 KM																			
FLOODING LENGTH		N. F. R.		NO FLOODING REPORTED																			
EXISTING CONDITIONS	RIGHT OF WAY	30.00+30.00		60.00 M (30.00+30.00)																			
	ALIGNMENT	HOR.	NA		NUMBER OF HORIZONTAL CURVES 38																		
		VER.	NA		NUMBER OF VERTICAL CURVES 128																		
	CROSS SECTION	S3 2.00+6.00+2.00		S3 2.00 + 6.00 + 2.00 = 10.00 M																			
	SURFACE	DBST (G/F)		SA + DBST (GOOD/FAIR) + SA																			
BRIDGES AND (Type - Width - Length (m))				6+315		8+209				17+331		20+390		21+862				26+800		28+100		29+838	
BOX CULVERTS (Width - Height - Length (m))				RC 7.0 x 3 x 8.7		RC 7.0 x 5 x 10.0				RC 7.0 x 3 x 7.0		RC 7.0 x 3 x 6.7		RC 7.0 x 7 x 10.0				RC 7.0 x 2 x 7.0		RC 7.0 x 1 x 10.0		RC 7.0 x 3 x 5.3	
PROPOSED CONDITIONS	CROSS SECTION			S1 2.50 + 7.00 + 2.50 = 12.00 M																			
	TYPE OF IMPROVEMENT			WD 64,000 M																			
	BRIDGES (Type - Width - Length (m))	0+000	2+076	RC 12.0 x 3 x 8.7		RC 12.0 x 5 x 10.0				RC 12.0 x 3 x 7.0		RC 12.0 x 3 x 6.7		RC 12.0 x 7 x 10.0				RC 12.0 x 2 x 7.0		RC 12.0 x 1 x 10.0		RC 12.0 x 3 x 5.3	

STATION (Km)		60	62	64+000	66
VILLAGE ROAD INTERSECTION		PHUN PHIN			
LAND USE					
TERRAIN					
FLOODING LENGTH					
EXISTING CONDITIONS	RIGHT OF WAY	30.00 + 30.00			
	ALIGNMENT	HOR.			
		VER.			
	CROSS SECTION	S3 2.00 + 6.00 + 2.00			
	SURFACE	SA + DBST + SA			
	BRIDGES AND (Type - Width - Length (m))				
BOX CULVERTS (Width - Height - Length (m))					
PROPOSED CONDITIONS	CROSS SECTION	S1 2.50 + 7.00 + 2.50			
	TYPE OF IMPROVEMENT	WD			
	BRIDGES (Type - Width - Length (m))				

5) TYPICAL CROSS SECTION

