

4) PROFILE OF PROJECT
PROJECT NO. RW 7-1: YALA - NARATHIWAT LINK

(1/2)

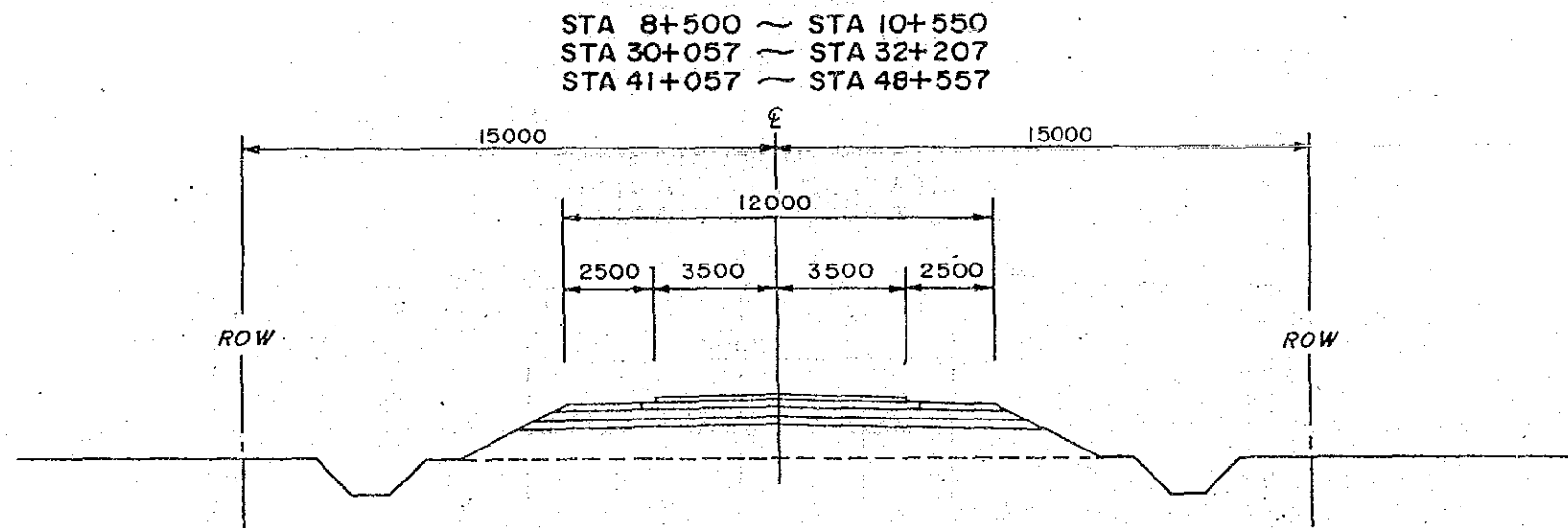
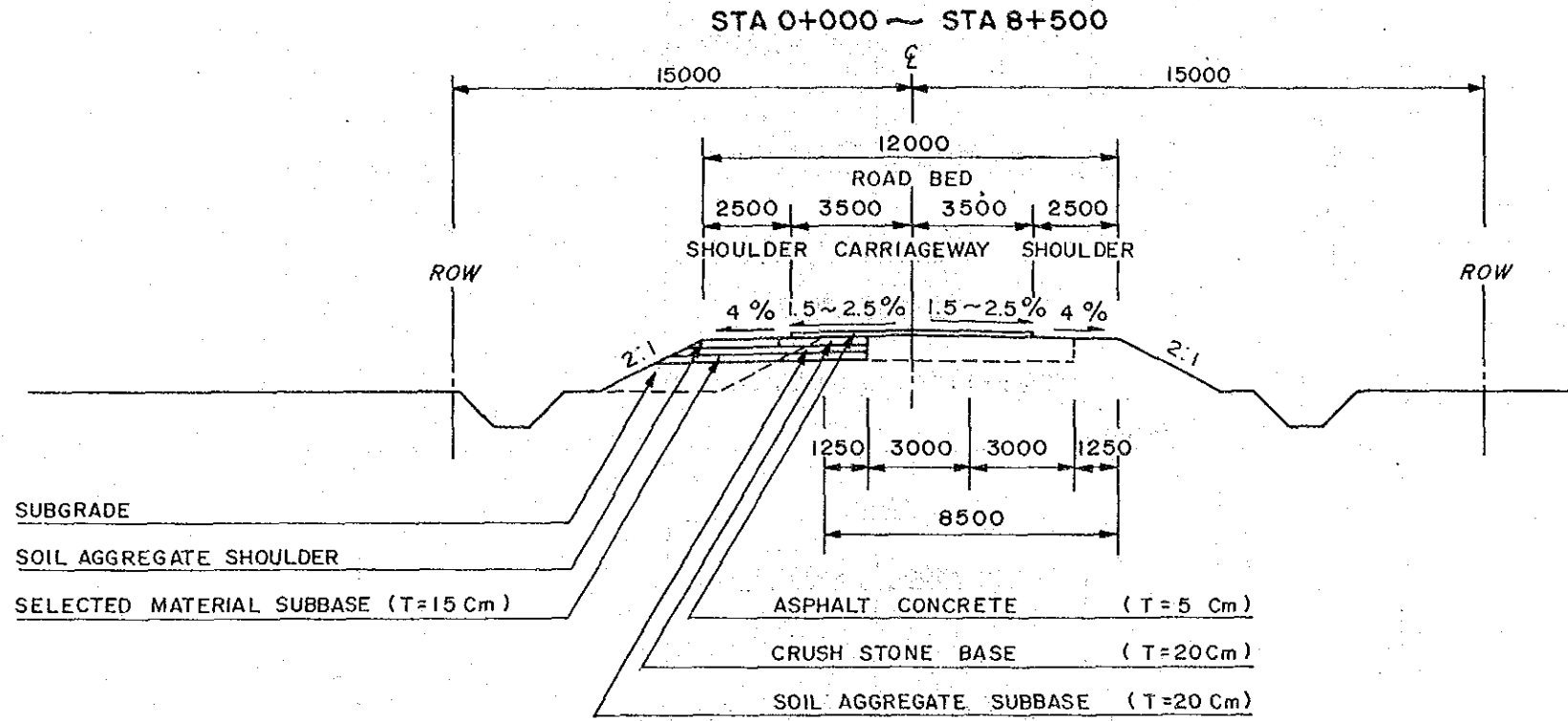
STATION (Km)		0	2	2+650	3+780	4	6+200	7+400	8	9+100	10	12	14	16	18	19+249	20	22	24	24+347	24+547	26	26+207	28	30				
VILLAGE ROAD INTERSECTION		J. Rt. 410		BUDI		BOUBAE		BAI		BOUMAE		KOTA BARU		RAMAN		B. KAMPONG-BOE-NE B. MUI		J. DA LO HA LO											
LAND USE		RUBBER, RICE, FRUIT 100% DEVELOPED										RUBBER, RICE, 100% DEVELOPED						RUBBER, FRUIT, 100% DEVELOPED											
TERRAIN		FLAT 8.7 KM ROLLING 0.4 KM										FLAT 8.7 KM ROLLING 1.4 KM						FLAT 5.1 KM ROLLING 1.8 KM											
FLOODING LENGTH		0+000~7+000, 8+200~8+900, 7.7 KM										9+100~10+100, 10+500~12+600, 14+600~16+050, 4.6 KM						19+300 20+900 21+300 23+000, 3.6 KM											
EXISTING CONDITIONS	RIGHT OF WAY	30.00 M (15.00+15.00)										30.00 M (15.00+15.00)						30.00 M (15.00+15.00)						5.00 M					
	ALIGNMENT	HOR.	NA										NUMBER OF HORIZONTAL CURVES 5						NUMBER OF HORIZONTAL CURVES 15										
		VER.	NA										NUMBER OF VERTICAL CURVES 7						NUMBER OF VERTICAL CURVES 17										
	CROSS SECTION	F4 1.25+6.00+1.25 = 8.50 M										F4 1.50+5.00+1.50 = 8.00 M						F4 1.50+5.00+1.50 = 8.00 M						5.00 M (ARD)					
	SURFACE	SA+DBST (G/F) + SA										SA+PMC (G/F)+SA						SA+DBST (G)+SA						LT					
BRIDGES AND (Type - Width - Length (m))	BOX CULVERTS (Width - Height - Length (m))	1+540		2+729		8+305		10+119		12+134		15+120		16+076		19+807		21+007		23+519		24+072							
		BX 3-1.8x1.8x11.0		RC 8.0x3x6.0		BX 2-2.1x1.8x11.0		BX 4-1.8x1.8x12.0		RC 7.0x3x7.0		BX 2-1.5x1.5x11.0		BX 3-1.8x1.8x11.0		RC 9.0x5x8.0		RC 9.0x14x18.6		RC 10.0x3x10.0		RC 8.0x3x6.7							
PROPOSED CONDITIONS	CROSS SECTION	FI 2.50+7.00+2.50 = 12.00 M, R/W = 30.00 M																											
	TYPE OF IMPROVEMENT	WD(1) 8,500 M										RA 2,050 M		WD(2) 8,550 M						RB 3,400 M		WD(3) 3,207 M						RC 4,350 M	
	BRIDGES (Type - Width - Length (m))	0+000		8+500		11+050 (10+550)		18+747		19+100		22+500		25+707															
		RC 12.0x3x6.0		RC 12.0x3x8.0		RC 12.0x1x8.0		RC 12.0x3x6.0		RC 12.0x3x7.0		RC 12.0x3x5.0		RC 12.0x5x8.0		RC 12.0x7x37.2		RC 12.0x3x10.0		RC 12.0x3x10.0		RC 12.0x3x6.7		RC 12.0x3x10.0		RC 12.0x3x10.0			

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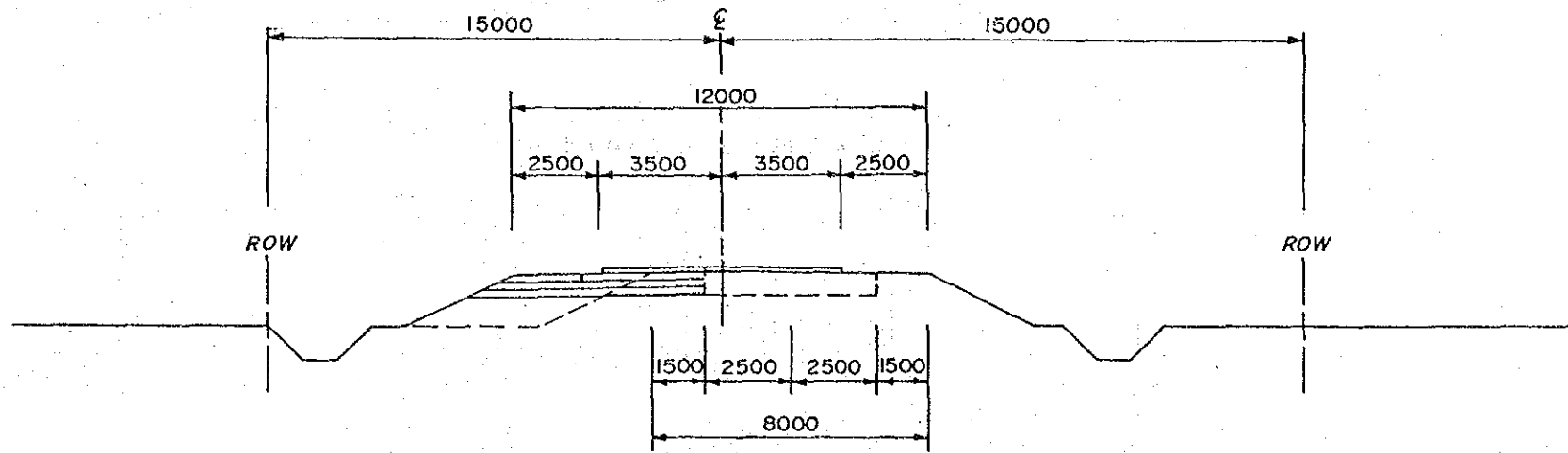
(2/2)

STATION (Km)		30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	
VILLAGE ROAD INTERSECTION		BU LENG NUA	BU LENG					YU RA BAE				TO RAE PATO	PARAPATA					
LAND USE		FOREST		FOREST					FOREST			RICE						
TERRAIN		MOUNTAINOUS		MOUNTAINOUS					MOUNTAINOUS			FLAT						
FLOODING LENGTH																		
EXISTING CONDITIONS	RIGHT OF WAY						5.00 M					5.00 M						
	ALIGNMENT	HOR.																
		VER.																
	CROSS SECTION						5.00 M (ARD)					5.00 M (ARD)						
	SURFACE						LT					LT						
BRIDGES AND (Type - Width - Length (m))																		
BOX CULVERTS (Width - Height - Length (m))																		
PROPOSED CONDITIONS	CROSS SECTION						FI 2.50 + 7.00 + 2.50 = 12.00 M, R/W = 30.00 M											
	TYPE OF IMPROVEMENT		NC 2,150 M				RC 8,050 M					NC 7,500 M					RC 2,600 M	
	BRIDGES (Type - Width - Length (m))	(30+057)	(32+207)					(41+057)				(48+557)		(51+157)				
						RC 12.0x3x10.0											RC 12.0x5x10.0	

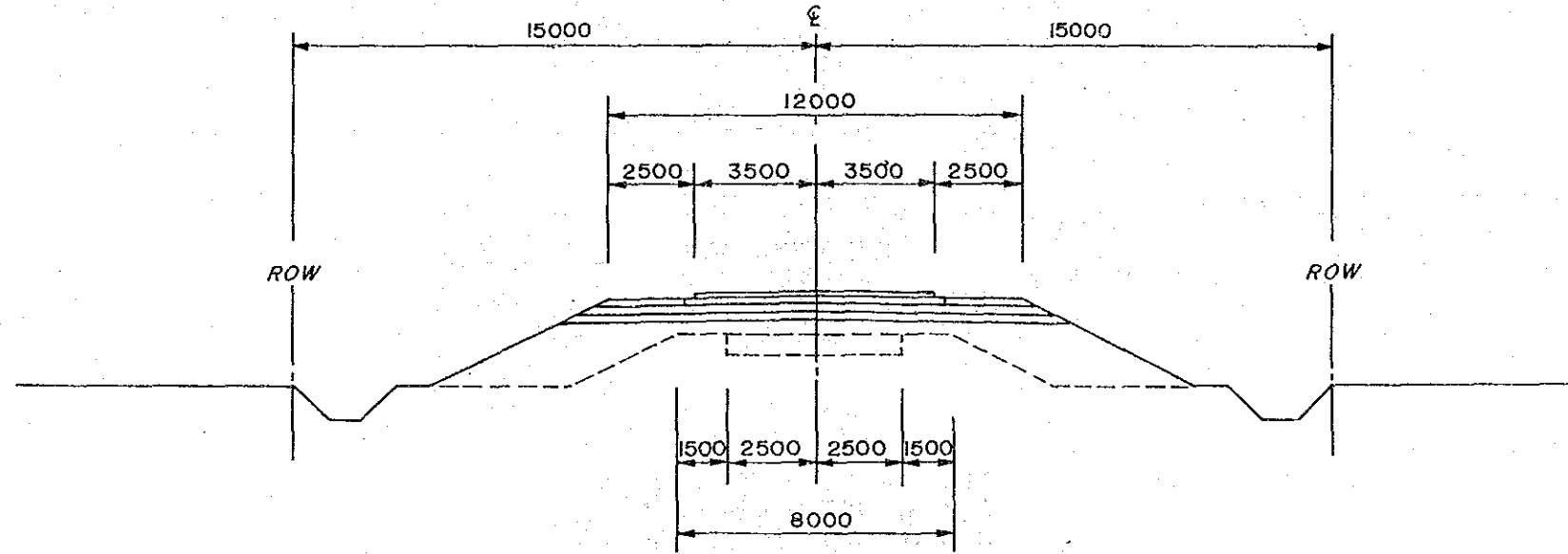
5) TYPICAL CROSS SECTION



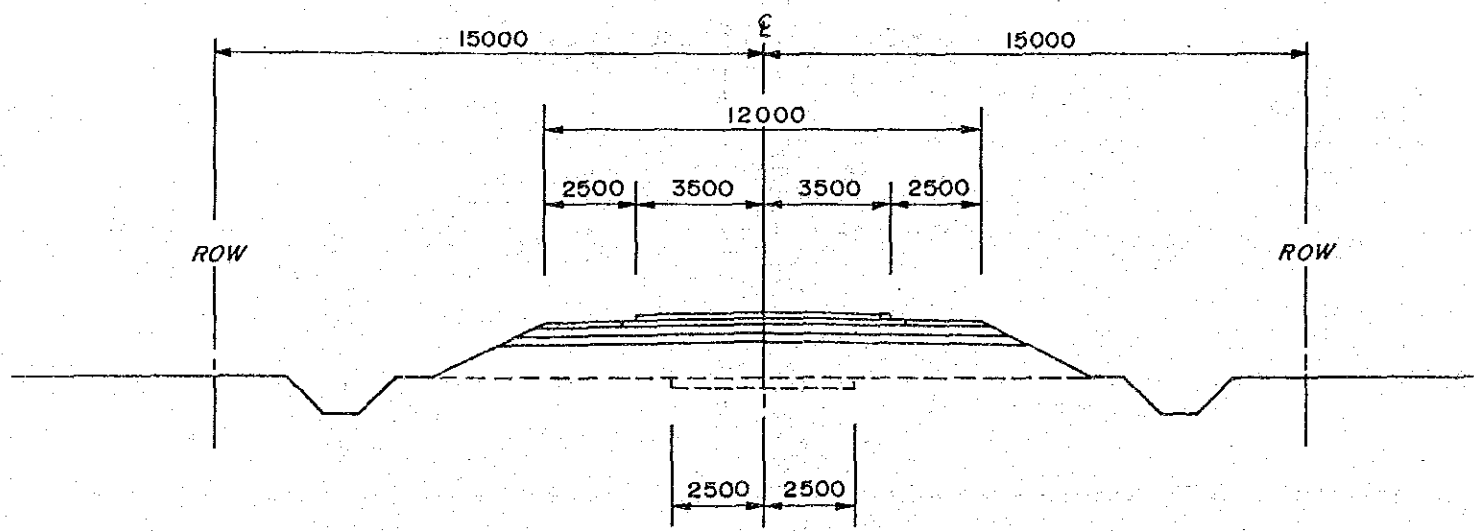
STA 10+550 ~ STA 19+100
STA 22+500 ~ STA 25+707



STA 19+100 ~ STA 22+500



STA 25+707 ~ STA 30+057
STA 32+207 ~ STA 41+057
STA 48+557 ~ STA 51+157



6) CONSTRUCTION QUANTITIES AND COSTS

CONSTRUCTION QUANTITIES AND COSTS
(Project RW7-1 Length = 51.697 Km)
(Improved Length 51.157 Km)

ITEM	Unit	Financial		Financial	Economic cost		Residual Value
		Unit Cost	Quantity	Total cost	%	%	%
		Baht		1000 Baht	1000 Baht	1000 Baht	1000 Baht
=====							
EARTH WORK							
Clearing & Grubbing	SQ.M	1	598,978	599			
Roadway Excavation(Unclassified)	CU.M	30	0	0			
Embankment(Borrowed Material)	CU.M	100	547,740	54,774			
Slope Protection(Stripe Sodding)	SQ.M	6	290,424	1,743			
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	37,475	525			
SUB TOTAL				57,640	47,841	43,057	
=====							
SUBBASE AND BASE							
Subbase(Selected Material)	CU.M	190	86,146	16,368	83	50	
Subbase(Soil Aggregate)	CU.M	190	114,861	21,824			
Base Coarses(Crush Stone)	CU.M	280	59,063	16,538			
Shoulder(Soil Aggregate)	CU.M	190	36,105	6,860			
SUB TOTAL				61,589	51,119	25,559	
=====							
SURFACE							
Asphaltic Prime coat	SQ.M	13	270,696	3,519	83	50	
Asphaltic Tack coat	SQ.M	7	40,375	283			
Asphalt concrete Surfacing	CU.M	1,900	17,905	34,019			
SUB TOTAL				37,821	31,391	15,696	
=====							
STRUCTURES(Equivalent)							
RC Pipe Culvert(D= 600 m)	M	1,380	187	258	83	50	
(D= 800 m)	M	1,950	328	640			
(D=1000 m)	M	2,640	187	494			
RC Box Culvert(2-2.10*2.10 m)	M	10,000	129	1,290			
RC Bridge (W=15.0 m)	M	96,000	242	23,232			
RC Bridge Widening	SQ.M	9,600	849	8,150			
PC Bridge (W=15.0 m)	M	150,000	260	39,000			
SUB TOTAL				73,064	60,643	30,321	
=====							
TOTAL (a)				230,114	190,995	114,634	

Miscellaneous Works [(a)*7%]	Ls	1		16,108	13,370	8,024	

CONTRACT AMOUNT (b)				246,222	204,364	122,658	

PHYSICAL CONTINGENCIES [(b)*10%] (c)	Ls	1		24,622	20,436	12,266	

ENGINEERING & SUPERVISION [(b)+(c)*10%] (d)	Ls	1		27,084	23,022	0	0

LAND ACQUISITION(Average) (e)	SQ.M	15	746,000	11,190	100	11,190	100

PROJECT COST [(b)+(c)+(d)+(e)]				309,118	259,012	146,114	

AVERAGE COST PER KM				6,043			
=====							

MAINTENANCE BUDGET CALCULATION

Project Road No, RW 7-1 Na= 9,300 Baht/Km/year
(Existing Road) Km= 1.162
Length = 51.697 Km

Laterite Surface

ITEMS	Existing		
	Condition	Factor	
1. A.D.T	A1	2600	0.95
2. Width Of Embankment (Surface & Shoulder)	A3	8.0 m	0.33
3. R-O-W Width	B1	30 m	0.08
4. Traffic Service Operation Topography	B2	0 - 3 %	0.05
5. Drainage Topography	B3	0 - 3 %	0.00
6. Bridge Quantity (m/Km)	B4	12	0.02
7. NO. Of Lanes		2	

Ks (Existing)= 1+0.7(A1+A3)+0.3(B1+B2+B3+B4) = 1.941
Maintenance cost + Overhead = KS * Km * Na * 1.28 = 26,849 Baht/Km/year
Total Cost(Existing) = Length *(Baht/Km/year)= 1,388,001 Baht/year
Financial Cost = 1,388,000 Baht/year
Economic Cost = 1,152,000 Baht/year
(1,152,040)Baht/year

Project Road No, RW 7-1 Na= 8,200 Baht/Km/year
(Proposed Road) Km= 1.001
Length = 51.697 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	3700	1.37
4. Service Life (year)	X4	10	1.40
5. Pavement Width (m)	X5	7 m	0.19
6. R-O-W Width (m)	Y1	30 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	12	0.00
11. NO. Of Lanes		2	

Ka(Existing) =1+0.5(X1+X2+X3+X4+X5+Y1+Y2+Y3+Y4+Y5)= 2.755
Maintenance cost + Overhead= Ka * Km * Na * 1.28 = 28,945 Baht/Km/year
Total Cost(Existing) =Length *(Baht/Km/year)= 1,496,390 Baht/year
Financial Cost = 1,496,000 Baht/year
Economic Cost = 1,242,000 Baht/year
(1,241,680)Baht/year

7) Construction Schedule

Project RW7-1 Yala - Narathiwat Link

year and Month	First Year												Second Year												Third Year											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Land Acquisition	=====																																			
Preparatory Works	=====																																			
Earth Works	=====																																			
Pavement Works													=====																							
Bridge Works	=====																																			
Miscellaneous Works													=====												=====											
Clearing -Up																									=====											
Percentage Of Disbursement (%)	27 %												50 %												23 %											

8) Economic Evaluation

Project RW7-1 Yala - Narathiwat Link

(unit ; 1000 Baht)

Year	Const- ruction Cost	Mainte- nance Cost	Total Cost	VOC Saving	Time Saving	Balance	Sensi- Analysis Benefit= Cost=	
1990	0	0	0	0	0	0	0	
1991	0	0	0	0	0	0	0	
1992	0	0	0	0	0	0	0	
1993	76,635	0	76,635	0	0	(76,635)	(91,961)	
1994	131,132	0	131,132	0	0	(131,132)	(157,358)	
1995	51,246	0	51,246	0	0	(51,246)	(61,495)	
1996	0	1,152	1,152	37,931	11,892	48,671	38,476	
1997	0	1,152	1,152	42,979	15,439	57,265	45,351	
1998	0	1,152	1,152	48,026	18,985	65,859	52,227	
1999	0	1,152	1,152	53,074	22,532	74,454	59,102	
2000	0	1,152	1,152	58,121	26,078	83,048	65,977	
2001	0	1,152	1,152	63,169	29,625	91,642	72,853	
2002	0	1,152	1,152	68,216	33,172	100,260	81,728	
2003	0	1,152	1,152	73,263	36,719	108,877	91,613	
2004	0	1,152	1,152	78,310	40,266	117,484	102,508	
2005	0	1,152	1,152	83,357	43,813	126,091	113,403	
2006	0	1,152	1,152	88,404	47,360	134,698	124,298	
2007	0	1,152	1,152	93,451	50,907	143,305	135,193	
2008	0	1,152	1,152	98,498	54,454	151,912	146,088	
2009	0	1,152	1,152	103,545	58,001	160,519	156,983	
2010	0	1,152	1,152	108,592	61,548	169,126	167,878	
Total	259,012	17,280	276,292	1,785,174	696,131	2,205,013	1,653,493	
						IRR =	26.73%	20.40%
						NPV (i;12%) =	282,876	
						B/C (i;12%) =	2.85	

PROJECT UBS-1

KO LANTA LINK

CHANGWAT: KRABI

2) ROUTE MAP

3.19 Ko Lanta Link (UBS-1)

1) Summary

The aim of the project is to develop a DOH highway to amphoe Ko Lanta, the only amphoe center in the Southern Region that has not been connected to the DOH highway system.

"F3" standard is to be applied to the project which comprises the following three sections:

- upgrading of Route 4206 to bitumen standard over a distance of 10.6 kilometers on the main land;
- reconstruction of PWD road over a distance of 26.7 kilometers on the two islands of Ko Klang and Ko Lanta Noi; and
- new road construction on the island of Ko Lanta Yai and construction of two long bridges between Ko Klang and Ko Lanta Noi (1,400 m) and between Ko Lanta Noi and Ko Lanta Yai (500 m), total length amounting to 41.4 kilometers.

The project starts from the junction with Route 4 at Ban Ko Yang and ends at amphoe Ko Lanta on the Ko Lanta Yai Island. The total length of the project is 78.7 kilometers.

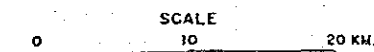
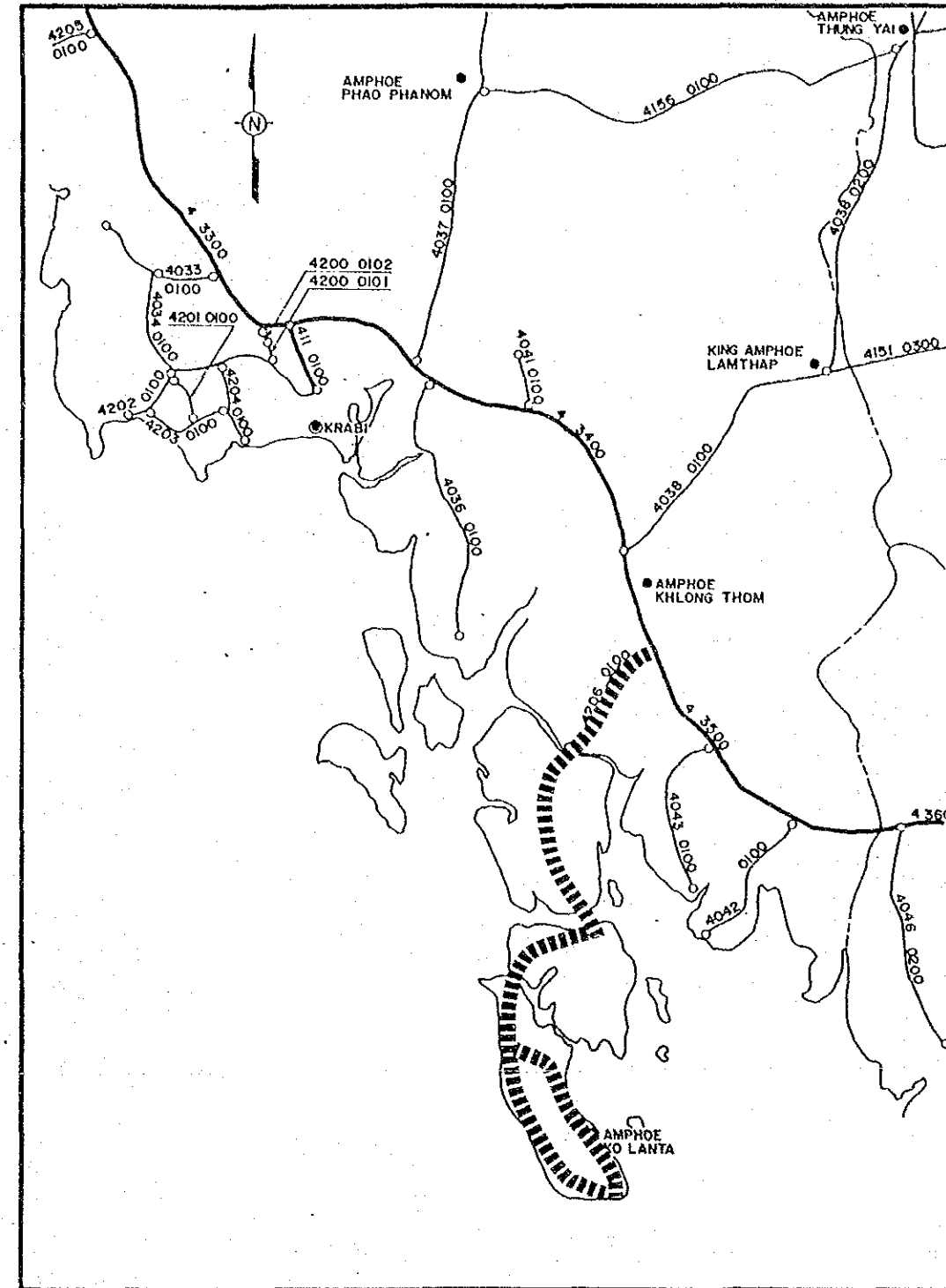
Viability of the project is largely dependent on future prospect of the tourism development on the islands to compensate the huge amount of investment to construct two bridges between islands.

UBS-1	Description
Changwat	: Krabi
Name or Location	: Rt.4206 Khlong Thom - Ko Lanta
Road Class	: F3 (F6)
Cross Section (m)	: 2.00+6.00+2.00 (6.00 and 4.00:PWD)
Surface Type	: SA /ASC / SA (SA and SA)
Surface Condition	:
Length: Total	: 78.7 km
DOH Road	: 10.1 km + 41.6 km:New
Others	: 27.0 km:PWD

AADT<'96/'01/'06>	: dependent on tourism development

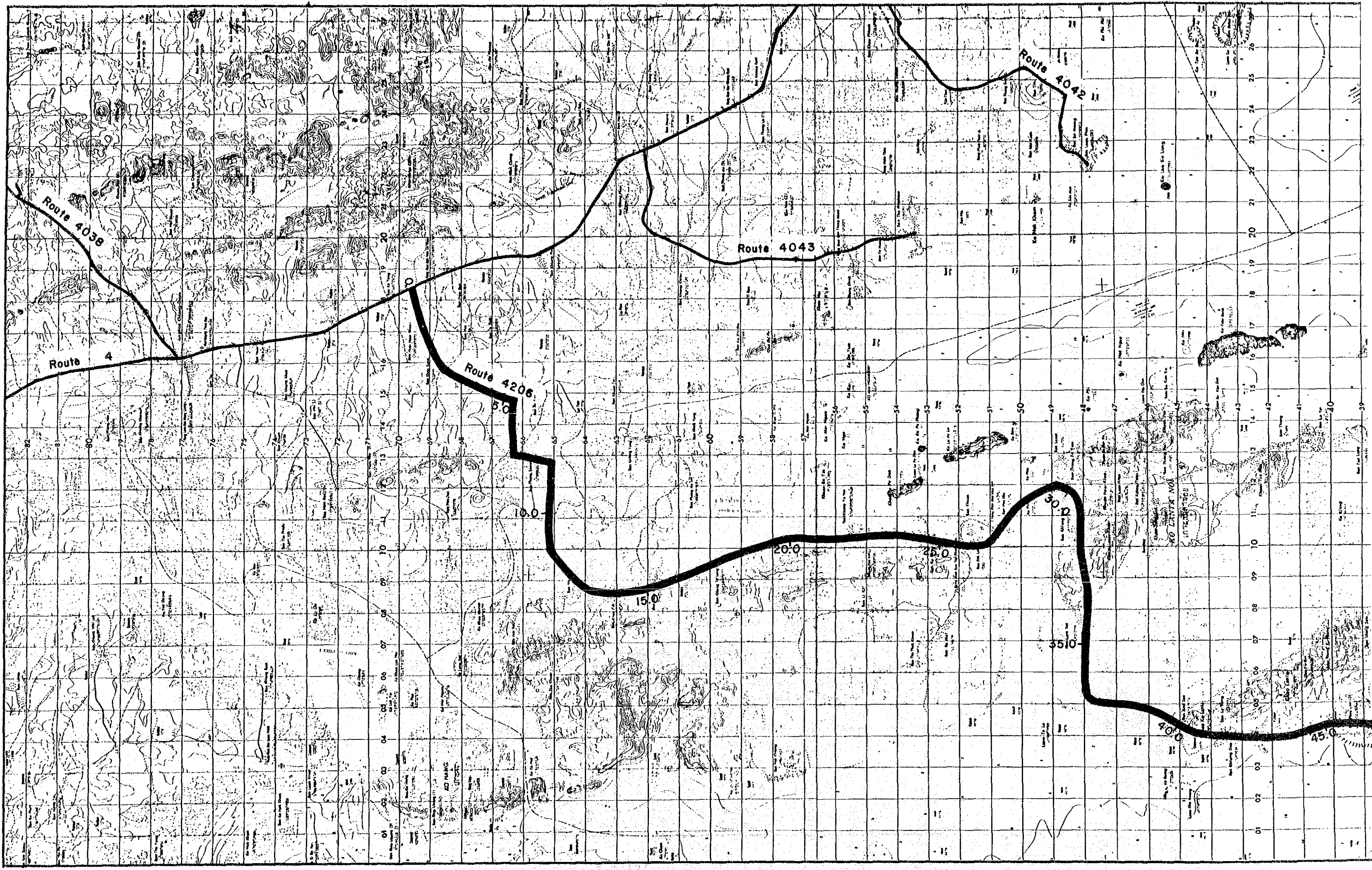
Financial Cost	: 804.0 million baht
EIRR	: 12%-22%

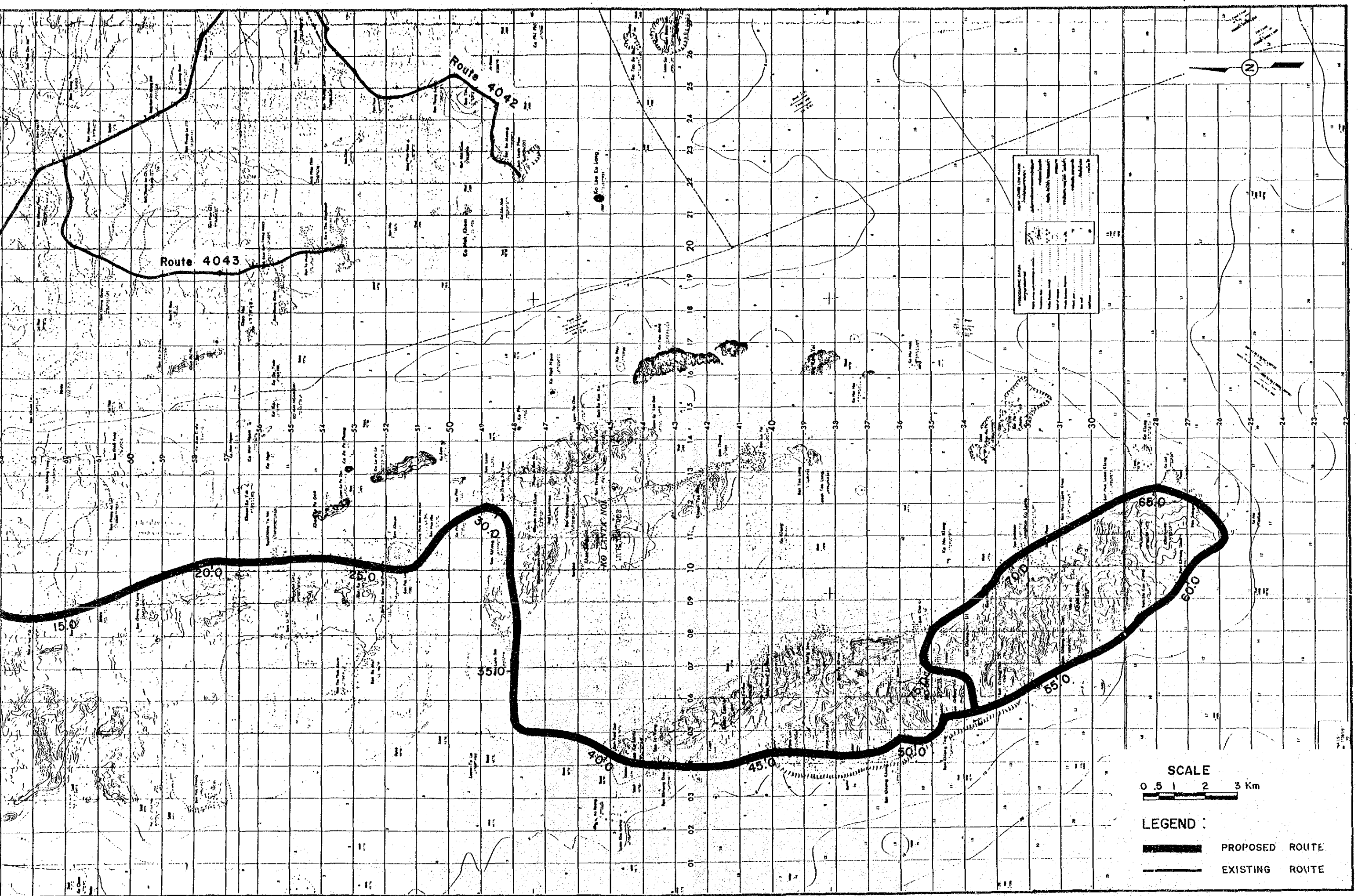
(): Existing Condition or Value



LEGEND :

- | | | | |
|--|-------------------|--|---------------------|
| | PROJECT ROUTE | | PROVINCIAL HIGHWAYS |
| | DIVIDED HIGHWAYS | | CHANGWAT , AMPHOE |
| | NATIONAL HIGHWAYS | | |





4) PROFILE OF PROJECT
PROJECT NO. UBS - I: KO LANTA LINK

(1/3)

STATION (KM)		0		2		4		6		8		10		12		14		16		18		20		22		24		26		27+800		29+200		30		
VILLAGE ROAD INTERSECTION		J. Rt. 4						THUNG SAMET						KHAO FAK		KHUN RAYA		KHLONG TA LANG				KHLONG YA NET		RA PU		HUA HIN		THONG TO YOM								
LAND USE				RICE		RICE		FOREST		FOREST		RICE		RICE		RICE		RICE		FOREST		FOREST		FOREST		RICE		RICE		RICE		RICE				
TERRAIN				FLAT		FLAT		FLAT		FLAT		FLAT		FLAT		FLAT		FLAT		ROLLING		ROLLING		ROLLING		FLAT		FLAT		FLAT		FLAT				
FLOODING LENGTH																																				
EXISTING CONDITIONS	RIGHT OF WAY (L+R)			30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		30.00 M (15.00+15.00)		5.00 M		5.00 M		5.00 M		5.00 M		5.00 M		5.00 M				
	ALIGNMENT	HOR.																																		
		VER.																																		
	CROSS SECTION					F6, 6.00 M		F6, 6.00 M		F6, 6.00 M		F6, 6.00 M		F6, 6.00 M		F6, 6.00 M		F6, 6.00 M		F6, 6.00 M		F6, 6.00 M		4.00 M (PWD)		4.00 M (PWD)		4.00 M (PWD)		4.00 M (PWD)		4.00 M (PWD)		4.00 M (PWD)		
	SURFACE					SA		SA		SA		SA		SA		SA		SA		SA		SA		SA		SA		SA		SA		SA		SA		SA
BRIDGES AND BOX CULVERTS	BRIDGES AND (Type - Width - Length (m))			RC 4.0x1 x7.0 1+743		RC 4.0x2 x5.0 2+169		RC 4.0x2 x5.0 5+700		RC 4.0x1000 10+061		RC 4.0x30.0 11+000														RC 4.0x10.0 27+600										
	BOX CULVERTS (Width - Height - Length (m))			RC 4.0x1 x7.0 1+743		RC 4.0x2 x5.0 2+169		RC 4.0x2 x5.0 5+700		RC 4.0x1000 10+061		RC 4.0x30.0 11+000														RC 4.0x10.0 27+600										
PROPOSED CONDITIONS	CROSS SECTION			PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		PV, F3, 2.0(SA)+6.0(ASC)+2.0(SA) = 10.00 M		RC, F3, R/W = 40.00 M		RC, F3, R/W = 40.00 M		RC, F3, R/W = 40.00 M		RC, F3, R/W = 40.00 M		NC, F3		NC, F3				
	EMBANKMENT / CUT (Height (m))			1.5 (E)		1.5 (E)		1.5 (E)		1.5 (E)		2.5 (E)		2.5 (E)		2.5 (E)		2.5 (E)		2.5 (E)		2.5 (E)		1.0 (E)		1.0 (E)		1.0 (E)		3.0 (E)		3.0 (E)				
	BRIDGES (Type - Width - Length (m))			RC 10.0x1 x7.0 1+743		RC 10.0x2 x5.0 2+167		RC 10.0x2 x5.0 5+700		RC 10.0x1000 10+061		RC 10.0x30.0 11+000		RC 10.0x30.0 11+000		RC 10.0x30.0 11+000		RC 10.0x30.0 11+000		RC 10.0x30.0 11+000		RC 10.0x30.0 11+000		RC 10.0x10.0 27+000		RC 10.0x10.0 27+600		PC 10.0x1400.0 27+800		PC 10.0x1400.0 29+200		PC 10.0x1400.0 30+000				

PROJECT NO. UBS - I: KO LANTA LINK

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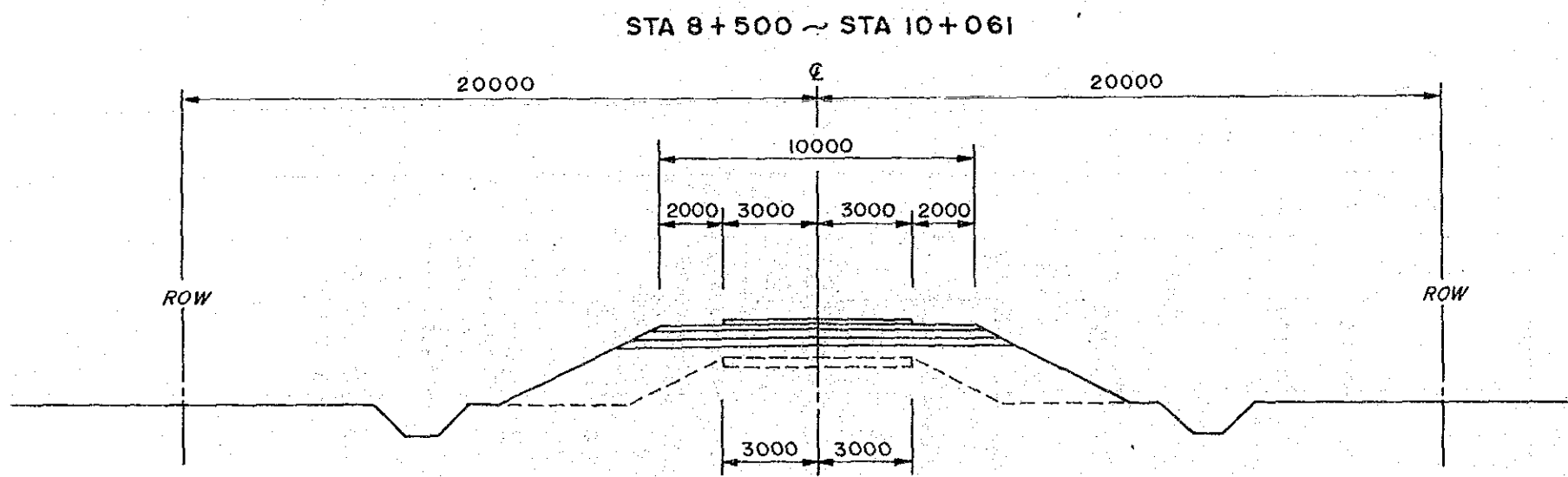
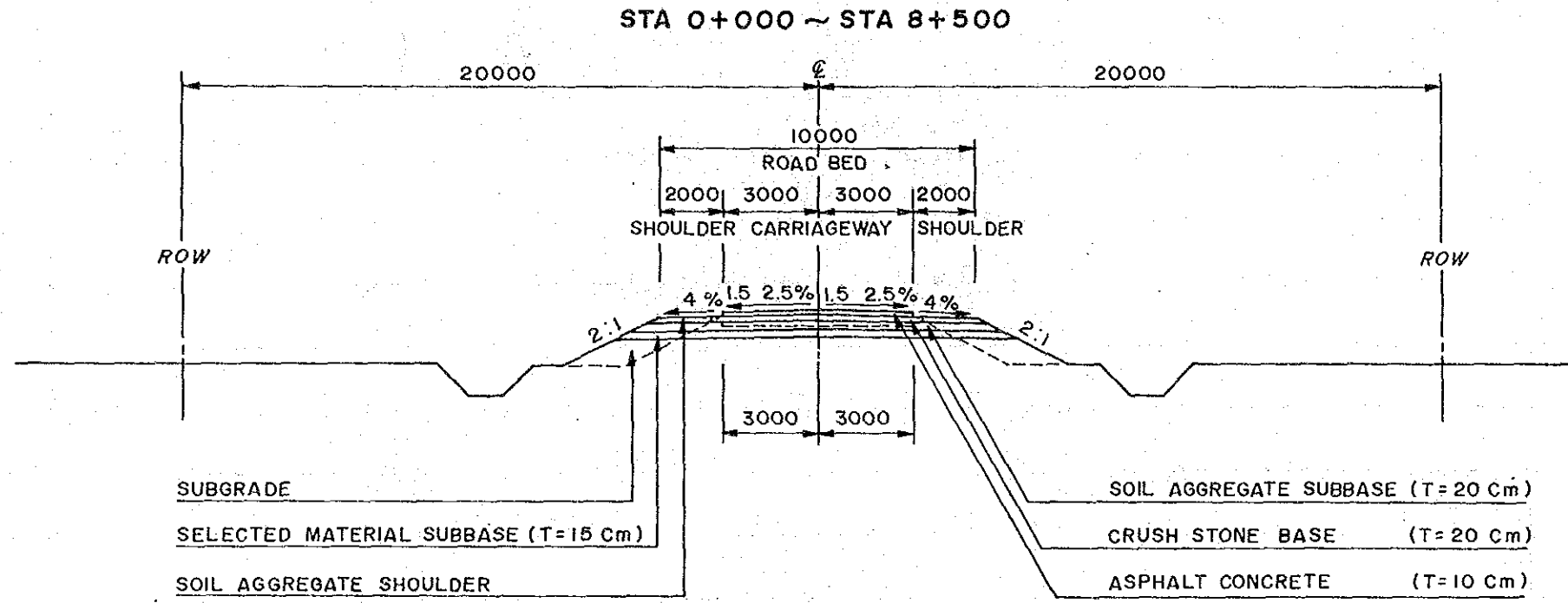
STATION (Km)		30	32	34	36	38	38+500	40	42	44	46	48	50	52	54	56	58	60		
VILLAGE ROAD INTERSECTION			KHLONG MAK		LANG SOT			SALA DAN		KHLONG DAO		PHRA AE (2)	PHRA AE (1)		KHLONG NIN		CHE LI	NA		
LAND USE		RICE			FOREST							PLANTATION						RICE		
TERRAIN		FLAT		ROLLING		FLAT						FLAT					ROLLING			
FLOODING LENGTH																				
EXISTING CONDITIONS	RIGHT OF WAY	5.00 M																		
	ALIGNMENT	HOR.																		
		VER.																		
	CROSS SECTION	4.00 M (PWD)																		
	SURFACE	SA																		
BRIDGES AND (Type - Width - Length(m))																				
BOX CULVERTS (Width - Height - Length(m))																				
PROPOSED CONDITIONS	CROSS SECTION	RC, F3, R/W = 40.00M									NC, F3, 2.0 (SA) + 6.0 (ASC) + 2.0 (SA) = 10.00 M, R/W = 40.00 M									
	EMBANKMENT / CUT (Height (m))	1.0 (E)			2.5 (E)			BRIDGE			1.0 (E)			1.0 (E)						
	BRIDGES AND (Type - Width - Length (m))							PC 10.0 x 50.0			RC 10.0 x 10.0			RC 10.0 x 10.0			RC 10.0 x 10.0			

PROJECT NO. UBS - I: KO LANTA LINK

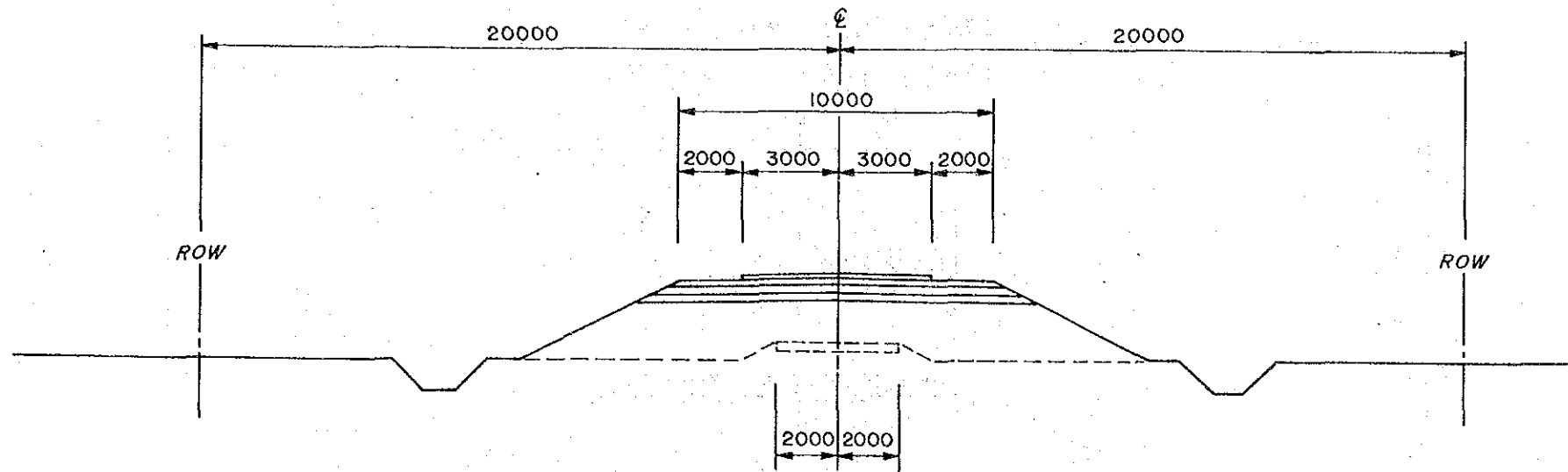
(3/3)

STATION (Km)		60	62	64	66	68	70	72	74	76	78	79+700	80
VILLAGE ROAD INTERSECTION			AMPHOE KO LANTA	HUA LAEM KLANG	SANGAO		KHLONG CHAK	BA KAN TIANG		KHLONG NAM CHUT	KHLONG NIN (3)		
LAND USE						FOREST							
TERRAIN			FLAT			MOUNTAINOUS							
FLOODING LENGTH													
EXISTING CONDITIONS	RIGHT OF WAY												
	ALIGNMENT	HOR.											
		VER.											
	CROSS SECTION												
	SURFACE												
BRIDGES AND (Type - Width - Length(m))													
BOX CULVERTS (Width - Height - Length(m))													
PROPOSED CONDITIONS	CROSS SECTION	NC, F3, R/W = 40.00M			NC, F3, R/W = 30.00M								
	EMBANKMENT / CUT (Height (m))	1.0 (E)			2.0 (C)			1.0 (E)	2.0 (C)	1.0 (E)	2.0 (C)	1.0 (E)	
	BRIDGES AND (Type - Width - Length (m))		RC 10.0 x 10.0			RC 10.0 x 10.0			RC 10.0 x 10.0			RC 10.0 x 10.0	

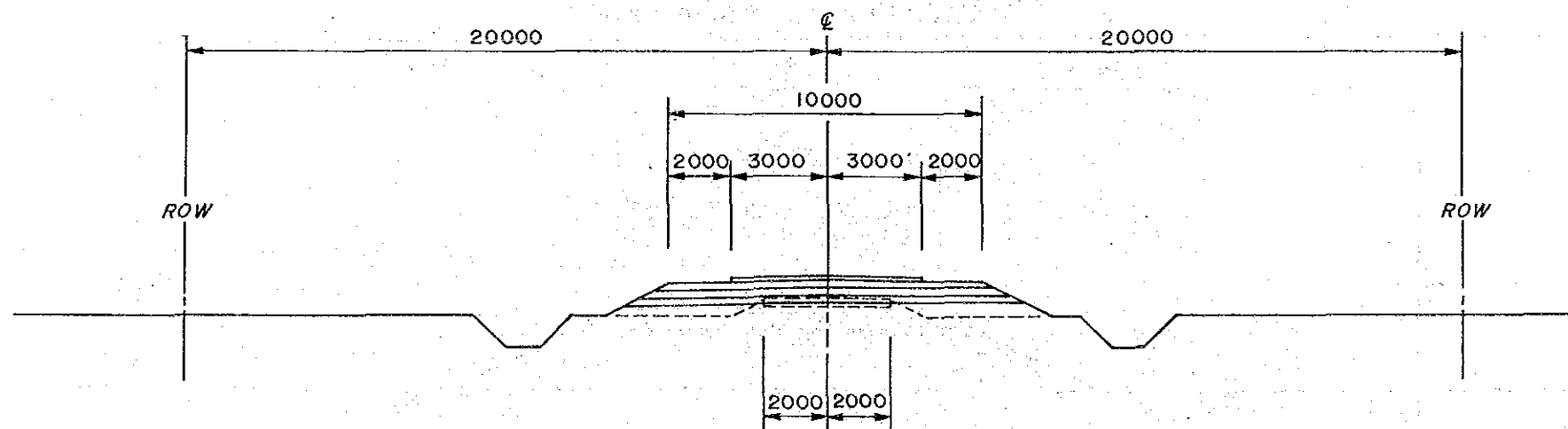
5) TYPICAL CROSS SECTION



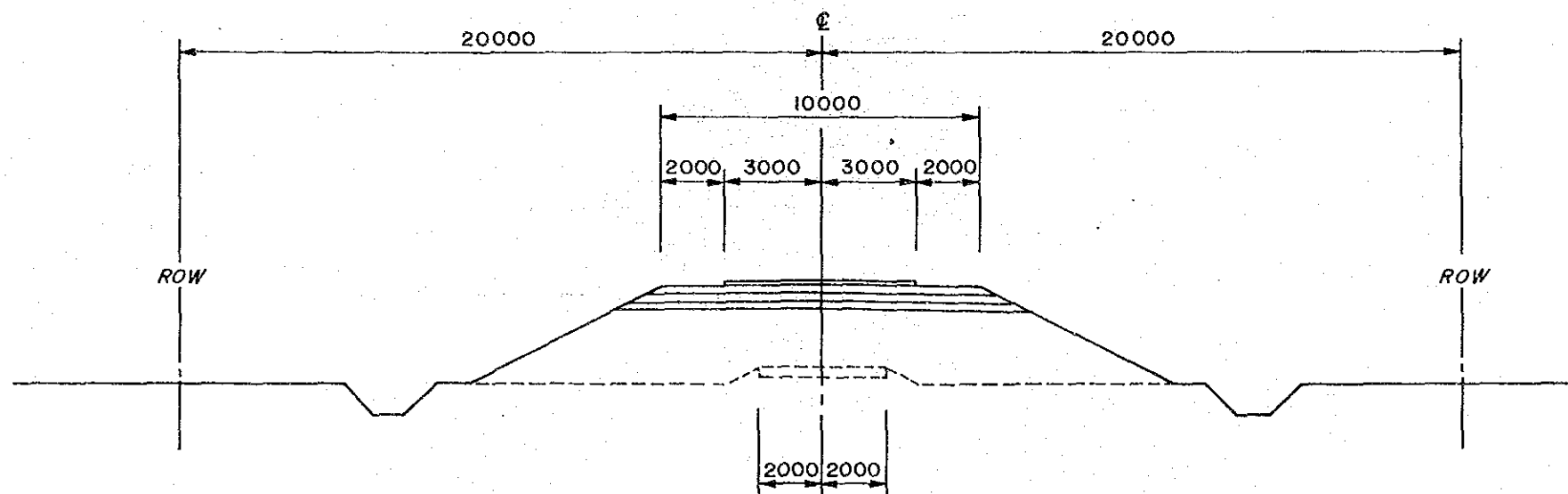
STA 10+061 ~ STA 13+000
STA 35+000 ~ STA 38+500



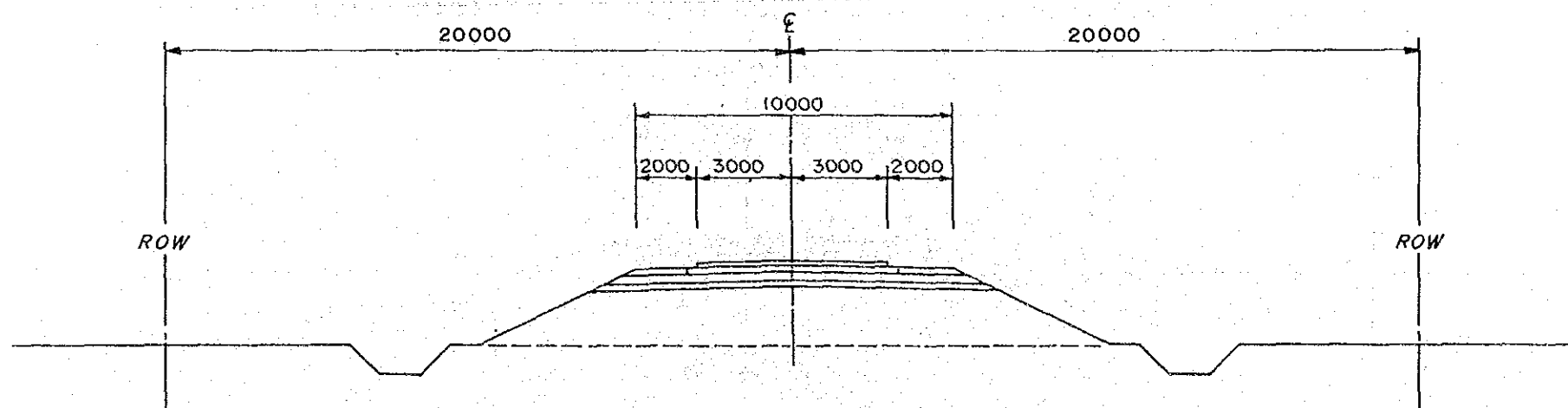
STA 13+000 ~ STA 27+000
STA 30+000 ~ STA 35+000



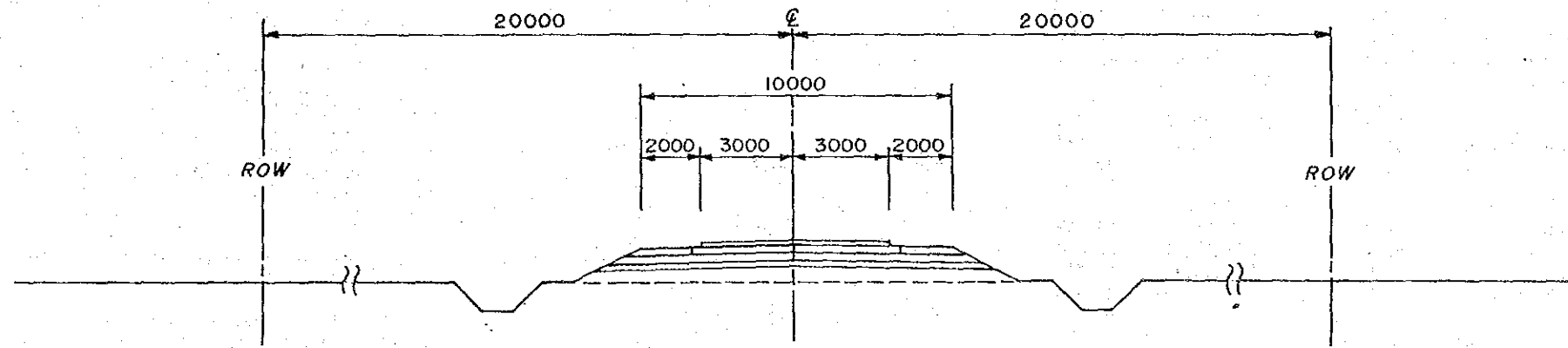
STA 27+000 ~ STA 27+600
STA 29+200 ~ STA 30+000



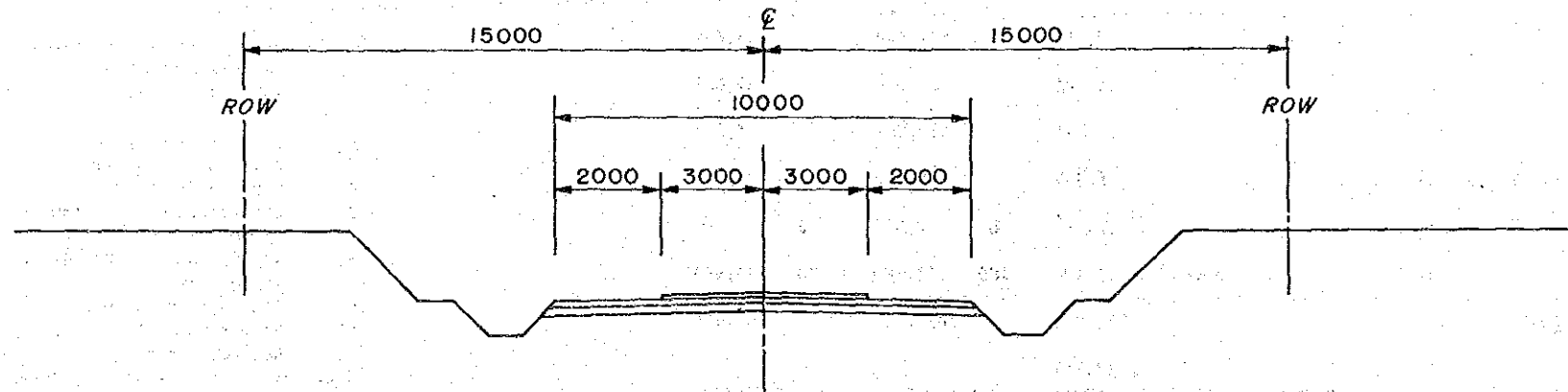
STA 38+500 ~ STA 39+000
STA 39+500 ~ STA 40+000



STA 40+000 ~ STA 63+500
 STA 70+500 ~ STA 71+000
 STA 72+000 ~ STA 73+000
 STA 74+000 ~ STA 76+000
 STA 77+000 ~ STA 78+700



STA 63+500 ~ STA 70+500
 STA 71+000 ~ STA 72+000
 STA 73+000 ~ STA 74+000
 STA 76+000 ~ STA 77+000



6) CONSTRUCTION QUANTITIES AND COSTS

CONSTRUCTION QUANTITIES AND COSTS
(Project UBS -1 Length = 78.700 Km)
(Improved Length 78.700 Km)

ITEM	Unit	Financial		Financial		Economic cost		Residual Value	
		Unit Cost	Quantity	Total cost		%	1000 Baht	%	1000 Baht
		Baht		1000 Baht					
EARTH WORK									
Clearing & Grubbing	SQ.M	1,007,668		1,008		83		90	
Roadway Excavation(Unclassified)	CU.M	30	610,500	18,315					
Embankment(Borrowed Material)	CU.M	100	574,355	57,436					
Slope Protection(Stripe Sodding)	SQ.M	6	434,609	2,608					
Sand Mat (t=0.5m)	SQ.M	50	0	0					
Excavate Existing Surface	SQ.M	2	30,175	60					
Thickness Over 10Cm (2 Lay)	SQ.M	14	30,175	422					
SUB TOTAL				79,849			66,274		59,647
SUBBASE AND BASE									
Subbase(Selected Material)	CU.M	190	114,467	21,749		83		50	
Subbase(Soil Aggregate)	CU.M	190	133,517	25,368					
Base Coarses(Crush Stone)	CU.M	280	95,766	26,814					
Shoulder(Soil Aggregate)	CU.M	190	53,334	10,133					
SUB TOTAL				84,065			69,774		34,887
SURFACE									
Asphaltic Prime coat	SQ.M	13	435,300	5,659		83		50	
Asphaltic Tack coat	SQ.M	7	0	0					
Asphalt concrete Surfacing	CU.M	1,900	23,040	43,776					
SUB TOTAL				49,435			41,031		20,515
STRUCTURES(Equivalent)									
RC Pipe Culvert(D= 600 m)	M	1,300	3,392	4,410		83		50	
(D= 800 m)	M	1,950	0	0					
(D=1000 m)	M	2,650	0	0					
(D=1200 m)	M	3,850	0	0					
RC Box Culvert(1-2.40*2.40 m)	M	5,700	1,120	6,384					
RC Bridge Wideing	SQ.M	9,600	1,335	12,816					
RC Bridge (W=13.0 m)	M	83,200	150	12,480					
PC Bridge (W=13.0 m, L=50 m)	M	195,000	1,900	370,500					
SUB TOTAL				406,590			337,469		168,735
TOTAL (a)				619,938			514,548		283,784
Miscellaneous Works [(a)*7%]	Ls	1		43,396			36,018		19,865
CONTRACT AMOUNT (b)				663,333			550,567		303,649
PHYSICAL CONTINGENCIES [(b)*10%] (c)	Ls	1		66,333			55,057		30,365
ENGINEERING & SUPERVISION [(b)+(c)*10%] (d)	Ls	1		72,967	85	62,022	0	0	0
LAND ACQUISITION(Average) (e)	SQ.M	25	456,000	11,400	100	11,400	100	11,400	11,400
PROJECT COST [(b)+(c)+(d)+(e)]				814,034			679,045		345,414
AVERAGE COST PER KM				10,344					

MAINTENANCE BUDGET CALCULATION

Project Road No, UBS -1 Na= 9,300 Baht/Km/year
(Existing Road) Km= 1.162
Length = 78.700 Km

Laterite Surface

ITEMS	Existing		
	Condition	Factor	
1. A.D.T	A1	100	0.00
2. Width Of Embankment (Surface & Shoulder)	A3	4.0 m	0.00
3. R-O-W Width	B1	30 m	0.08
4. Traffic Service Operation Topography	B2	0 - 3 %	0.05
5. Drainage Topography	B3	0 - 3 %	0.00
6. Bridge Quantity (m/Km)	B4	2	0.02
7. NO. Of Lanes		2	

Ks (Existing)= 1+0.7(A1+A3)+0.3(B1+B2+B3+B4) = 1.045
Maintenance cost + Overhead = Ks * Km * Na * 1.28 = 14,455 Baht/Km/year
Total Cost(Existing) = Length *(Baht/Km/year)= 1,137,601 Baht/year
Financial Cost = 1,138,000 Baht/year
Economic Cost = 945,000 Baht/year
(944,540)Baht/year

Project Road No, UBS -1 Na= 8,200 Baht/Km/year
(Proposed Road) Km= 1.001
Length = 78.700 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	500	0.00
4. Service Life (year)	X4	10	1.40
5. Pavement Width (m)	X5	6.0 m	0.05
6. R-O-W Width (m)	Y1	40 m	0.00
7. Shoulder, Access, Median Width (m)	Y2	2.0 m	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	28	0.04
11. NO. Of Lanes		2	

Ka(Existing) =1+0.5(X1+X2+X3+X4+X5+Y1+Y2+Y3+Y4+Y5)= 1.995
Maintenance cost + Overhead= Ka * Km * Na * 1.28 = 20,960 Baht/Km/year
Total Cost(Existing) =Length *(Baht/Km/year)= 1,649,588 Baht/year
Financial Cost = 1,650,000 Baht/year
Economic Cost = 1,370,000 Baht/year
(1,369,500)Baht/year

7) Construction Schedule

Project UBS-1 Ko Lanta Link

Year and Month	First Year												Second Year												Third Year												Fourth Year											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Land Acquisition	=====																																															
Preparatory Works	=====																																															
Earth Works	=====																																															
Pavement Works	=====																																															
Bridge Works	=====																																															
Miscellaneous Works	=====																																															
Clearing -Up	=====																																															
Percentage of Disbursement (X)	20 %												30 %												30 %												20 %											

8) Economic Evaluation

Project UBS-1 Ko Lanta Link

(unit ; 1000 Baht)

No.	Year	1) 100 % of Expenditures			2) 50 % of Expenditures			3) 20 % of Expenditures					
		Cost	Benefit	Balance	Cost	Benefit	Balance	Cost	Benefit	Balance			
		(1)	(2)	(3)	(4)	(5)							
1	1990	0	0	0	0	0	0	0	0	0	0	0	0
2	1991	0	0	0	0	0	0	0	0	0	0	0	0
3	1992	119181	0	119181	0	-119181	119181	0	-119181	119181	0	-119181	0
4	1993	216541	0	216541	0	-216541	216541	0	-216541	216541	0	-216541	0
5	1994	205976	0	205976	0	-205976	205976	0	-205976	205976	0	-205976	0
6	1995	127315	0	127315	0	-127315	127315	0	-127315	127315	0	-127315	0
7	1996	0	-56	-56	177400	177456	-56	88700	88756	-56	35480	35536	
8	1997	0	-56	-56	210800	210856	-56	105400	105456	-56	42160	42216	
9	1998	0	-56	-56	250500	250556	-56	125250	125306	-56	50100	50156	
10	1999	0	-56	-56	297600	297656	-56	148800	148856	-56	59520	59576	
11	2000	0	-56	-56	353600	353656	-56	176800	176856	-56	70720	70776	
12	2001	0	-56	-56	420200	420256	-56	210100	210156	-56	84040	84096	
13	2002	0	-56	-56	499400	499456	-56	249700	249756	-56	99880	99936	
14	2003	0	-56	-56	593500	593556	-56	296750	296806	-56	118700	118756	
15	2004	0	-56	-56	705400	705456	-56	352700	352756	-56	141080	141136	
16	2005	0	-56	-56	838400	838456	-56	419200	419256	-56	167680	167736	
17	2006	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
18	2007	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
19	2008	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
20	2009	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
21	2010	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
22	2011	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
23	2012	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
24	2013	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
25	2014	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
26	2015	0	-56	-56	996400	996456	-56	498200	498256	-56	199280	199336	
Total		669013	-1120	667893	16310800	13642907	667893	2862160	2194267	667893	2862160	2194267	
EIRR					32.12			21.97			11.82		
NPV(12%)					403613			990463			396185		
B/C(12%)					4.91			2.45			0.98		

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