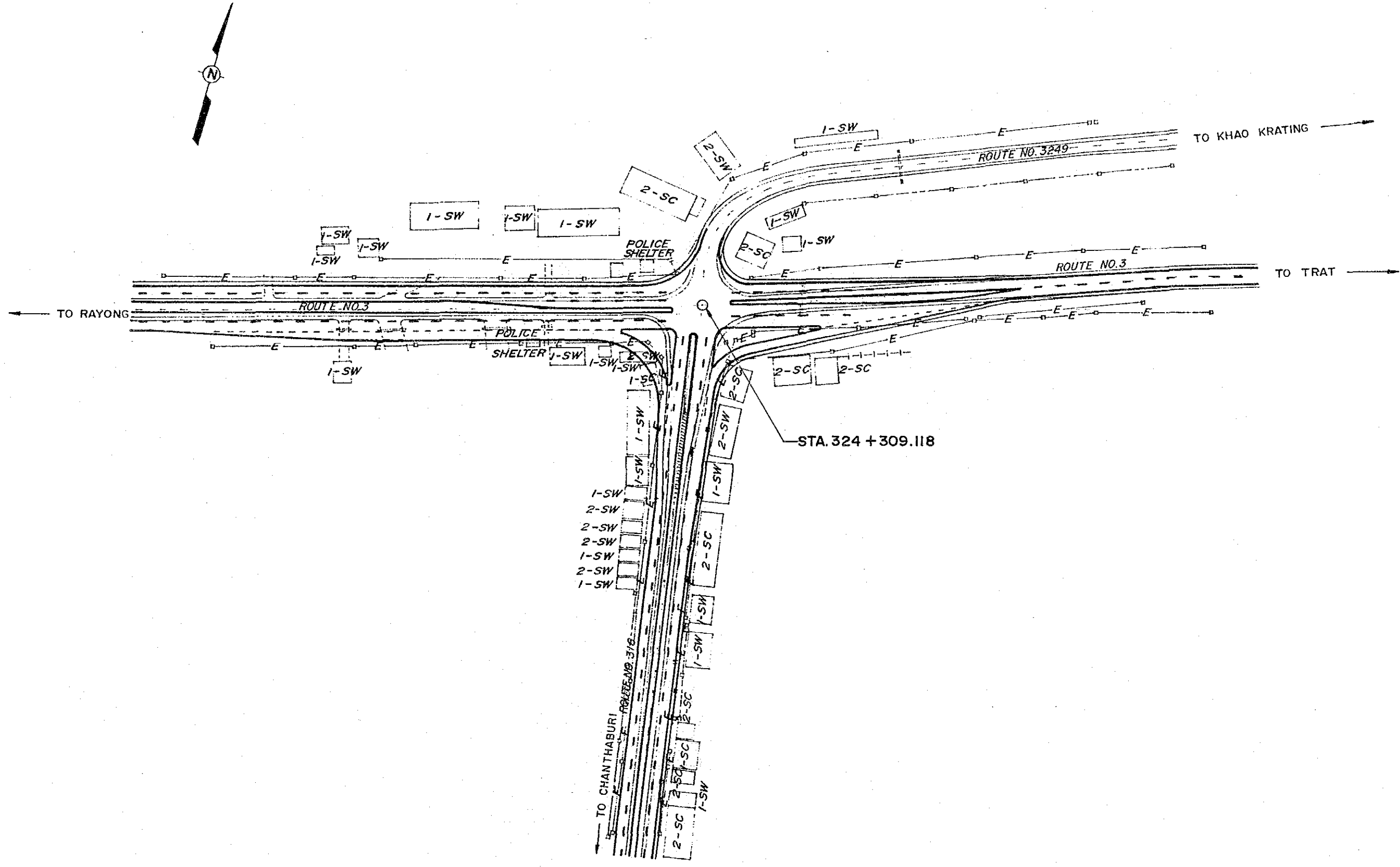


LAYOUT OF INTERSECTION
SCALE 1 : 2,000



LAYOUT OF INTERSECTION
SCALE 1 : 2,000

PROJECT ML - 5

Changwat : Chon Buri

Chon Buri - Pattaya New Highway

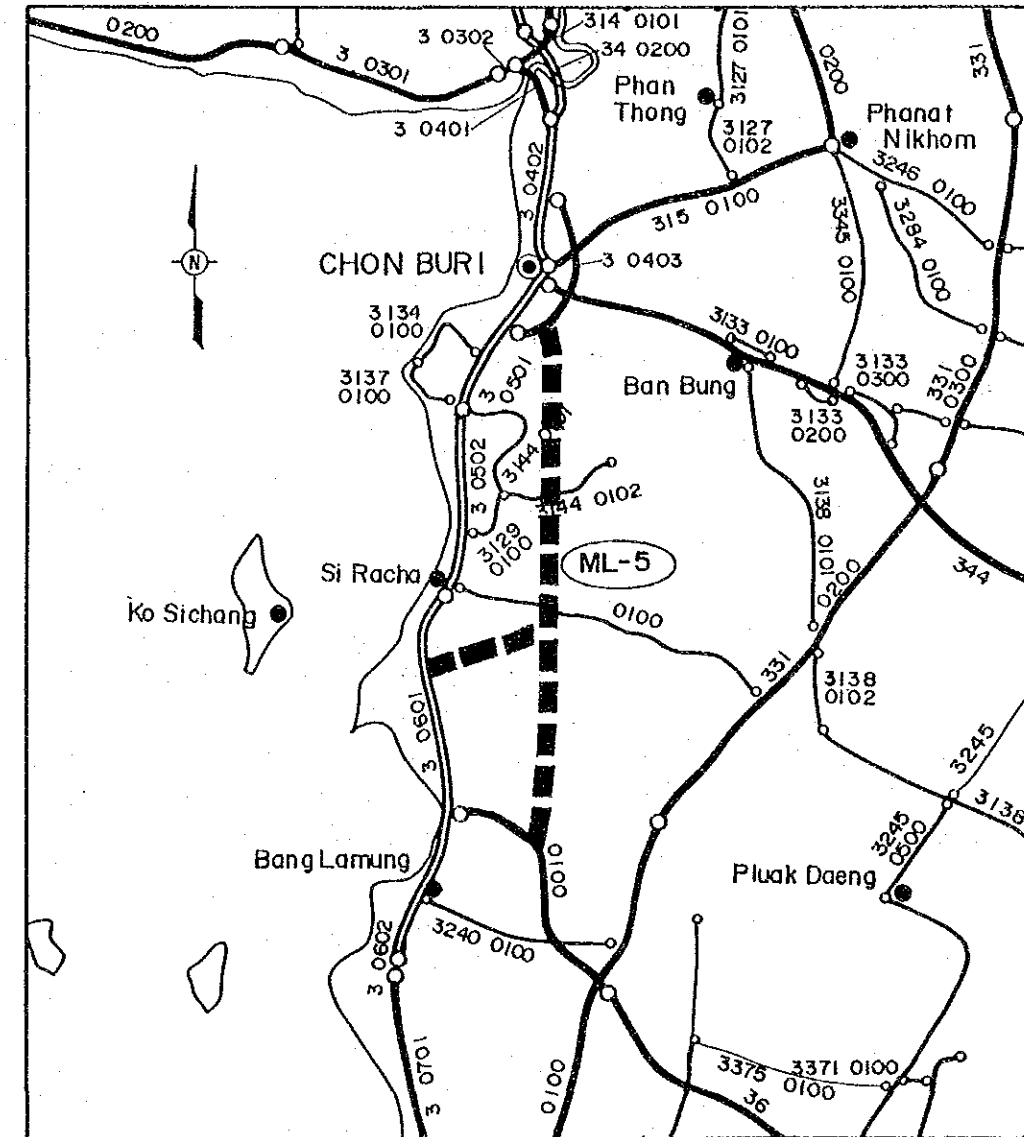
Length : 50.33 km

SUMMARY

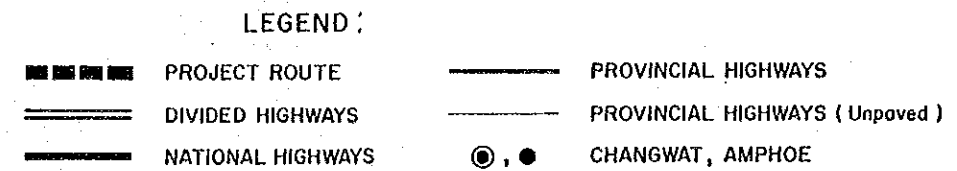
PROJECT ML-5

ITEM	DESCRIPTION
Changwat	Chon Buri
Origin	Chon Buri Bypass
Destination	Pattaya New Highway (including access road to Laem Chabang)
Route No.	Rt. 3
Project Length	50.33 km
Standard	PD (N section), P1 (S section) and FD (W section)
Traffic	—
- Base	—
- 2000	5,100~25,500
- 2008	7,200~38,500
Pavement Type	—
- Existing	—
- Proposed	PCC pavement (23-28 cm concrete slab)
Bridges	13 sites, 1,202 m
Intersections	2 each 1 each
- Trumpet Type	2 each
- Partial Cloverleaf Type	1 each
Construction Costs	1,105,048,000 Baht 1,020,239,000 Baht
- Financial	1,105,048,000 Baht
- Economic	1,020,239,000 Baht
Economic Evaluation	30.6% (25.6%) 5.23 (3.71)
- IRR	30.6% (25.6%)
- B/C	5.23 (3.71)

LOCATION OF PROJECT ROUTE



SCALE
0 10 Km.



() opening year of 1992

1. GENERAL

Project ML-5 is an entirely new highway in Changwat Chon Buri. The planned route originates at a junction with Chon Buri Bypass (at Km 11 + 600) and immediately crosses (at about 100 m) the Sattahip Railway, runs almost exactly southward to pass the east side of the Bang Phara reservoir, and ends at a junction with Route 36. The total length of this route is 41.9 km. A spur road is also planned, which turns off the main route at Km 24 + 500 and proceeds southwestward to end at a junction with Route 3 at the site of the Laem Chabang Port and Industrial Complex, with a length of 8.4 km. The total project road length is 50.33 km.

Proposed design standards are four-lane PD from the starting point to the spur road junction, two-lane PI standards from that point to the end point and four-lane FD standards for the spur road. Cement concrete is planned for the pavement for the entire length.

This project is intended to segregate local traffic in the increasingly densely developed Eastern Seaboard area, and long distance traffic.

The terrain along the proposed route is generally rolling. The section between Km 5 and Km 9 is mountainous. There are no major river crossings. Eight short bridges with a total length of about 160 m will be needed.

Three major grade-separation intersections are provided at the beginning point, at the junction with the spur road and at the point of the spur road crossing Route 3.

The alignment of the new road follows the DOH survey line with only one revision at the point where the spur road crosses Route 3 to avoid passing within the Wat Manorom property and to match the interchange design to the North Route of the Laem Chabang Port Network.

2. TRAFFIC FORECAST

Base Traffic Volume

(Unit: Vehicles/Day)

Project Code	Section	Year	Traffic Volume							
			MC	PC	LB	HB	LT	MT	HT	ADT
ML-5	BP-N	-	-	-	-	-	-	-	-	-
	BP-S	-	-	-	-	-	-	-	-	-
	BP-W	-	-	-	-	-	-	-	-	-
	3-0502	1988	2729	5724	2101	2447	7776	1383	2399	21830
	3-0601	1987	1682	5649	1925	1397	2830	1229	530	13560

Traffic Growth Rate

(Unit: Percent)

Project	Section	Period	Traffic Growth Rate							
			MC	PC	LB	HB	LT	MT	HT	ADT
ML-5	BP-N	-1993	-	-	-	-	-	-	-	-
	BP-S	1994-2000	6.55	6.77	7.80	6.37	5.60	5.94	2.08	
	BP-W	2000-2008	6.09	6.43	7.07	5.58	5.07	4.99	1.88	
3-0502		-1993	7.88	8.55	7.42	7.31	7.05	7.19	4.72	
	3-0601	1994-2000	6.55	6.77	7.80	6.37	5.60	5.94	2.08	
		2000-2008	6.09	6.43	7.07	5.58	5.07	4.99	1.88	

Traffic Volumes Generated from Industrial Estates

(Unit: Vehicles/Day)

Project Name	Year	Traffic Volume								Total
		MC	PC	LB	HB	LT	MT	HT	CT	
LAWM CHABANG	1992		639				432	746	1279	3096
	1994		782				461	798	1564	3605
	2000		1210				636	1103	2419	5368
	2008		1780				869	1510	3559	7718
MAP TA PHUT	1992		0				523	922		1445
	1994		0				566	981		1547
	2000		0				803	1393		2196
	2008		0				1049	1819		2868

Note. CT: Container Truck

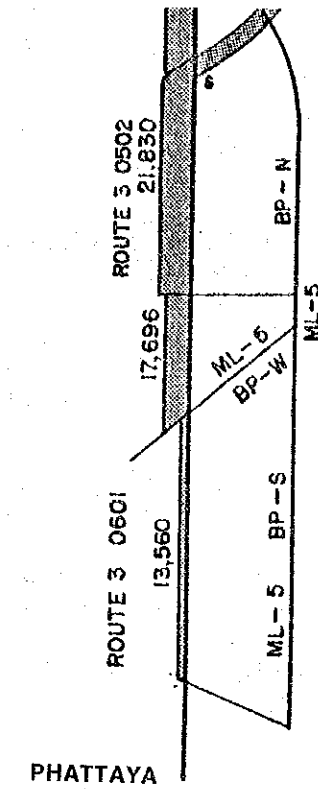
Future Traffic Volume

(Unit: Vehicles/Day)

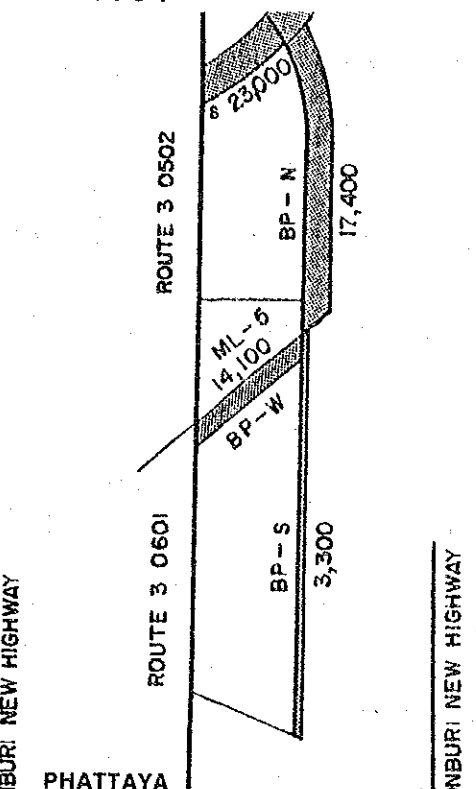
Project	Section	Year	Future Traffic Volume							
			MC	PC	LB	HB	LT	MT	HT	ADT
ML-5	BP-N	1992	1497	3919	984	1869	3768	1553	3601	15694
		1994	1700	4522	1143	2115	4202	1599	3850	17431
		2000	2487	6750	1795	3063	5827	2389	5686	25510
		2008	3991	10901	3100	4730	8655	3320	7783	36489
	BP-S	1992	314	250	47	494	766	582	1144	3283
		1994	357	286	55	559	854	533	1038	3325
		2000	522	423	87	810	1185	897	1655	5057
		2008	838	696	150	1251	1759	1188	2123	7167
	BP-W	1992	1183	3669	937	1375	3002	971	2457	12411
		1994	1343	4236	1088	1556	3348	1066	2812	14106
		2000	1965	6327	1708	2253	4642	1492	4031	20453
		2008	3153	10205	2950	3479	6896	2132	5660	31322
	Average	1992	998	2613	656	1246	2512	1035	2401	10463
1994		1133	3015	762	1410	2801	1066	2567	11621	
2000		1658	4500	1197	2042	3885	1593	3791	17007	
2008		2661	7267	2067	3153	5770	2213	5189	25659	

Note. BP-N: North section BP-S: South section BP-W: West section

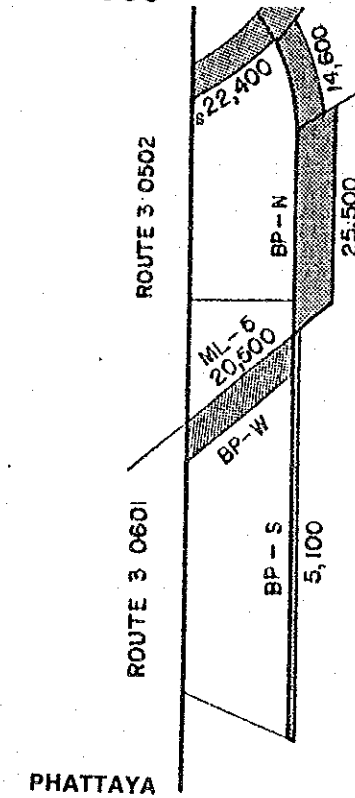
BASE



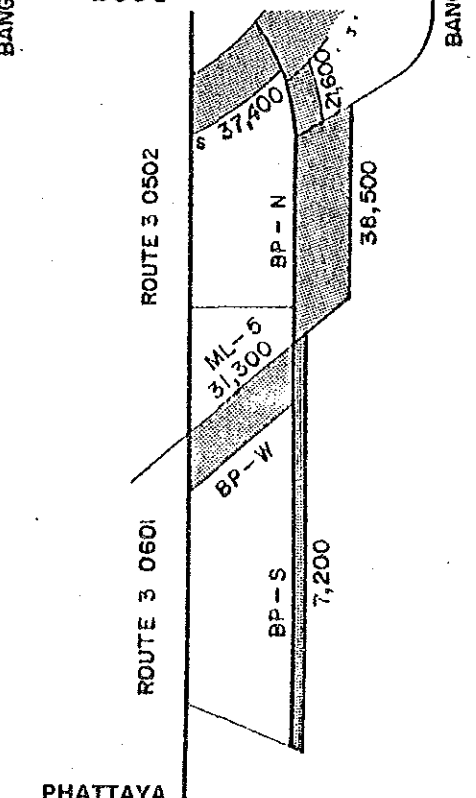
1994



2000



2008



UNIT: VEHICLE / DAY

3. ENGINEERING

3.1 Materials and Boring Results

(1) Materials

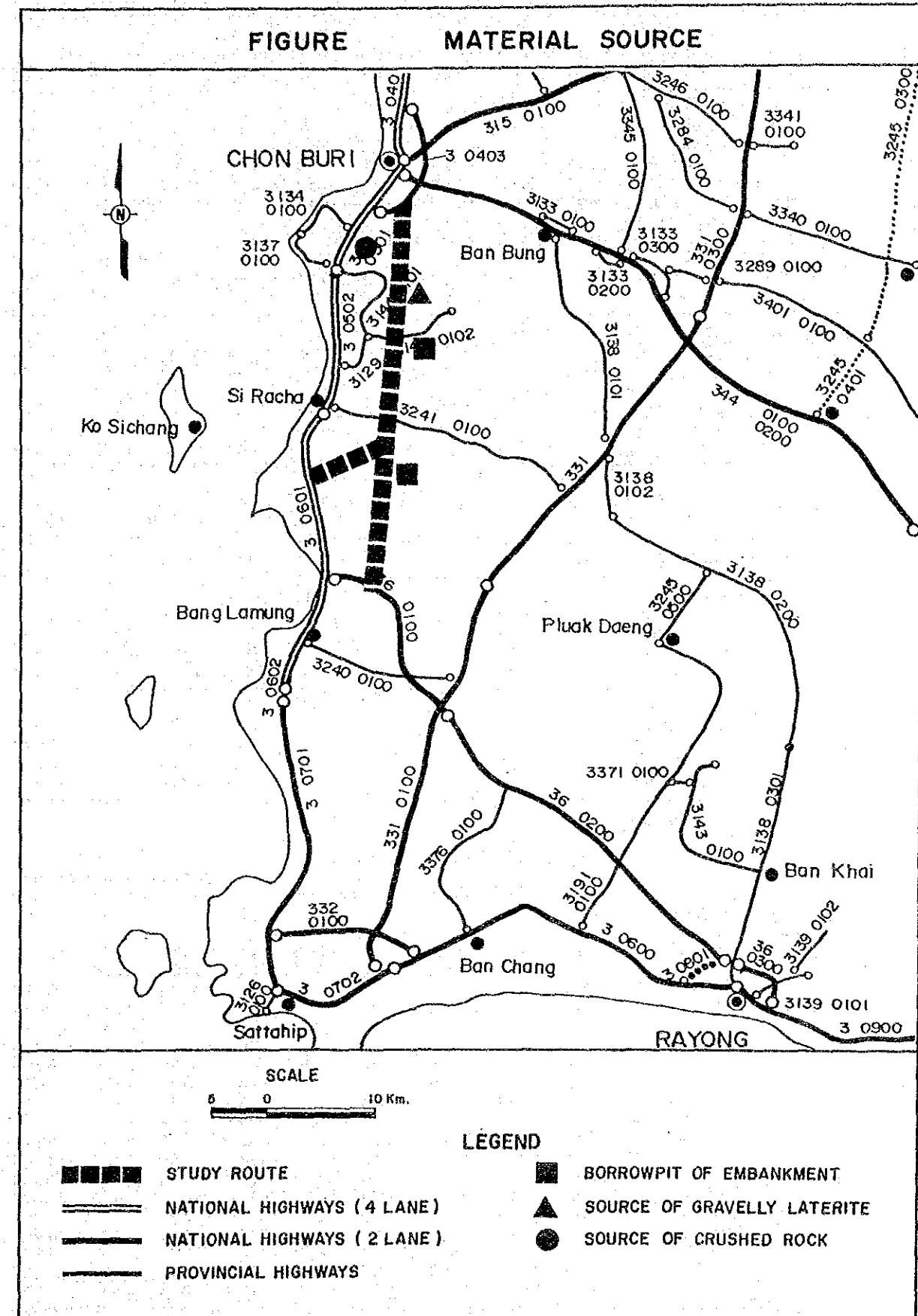
DESCRIPTION OF MATERIAL SOURCES

Material	Source	Description of Sample	Estimated Quantity cu.m.	Hauling Distance (km)
Soil	Route 3241 Km 7+500 Both Sides	Silty Sand	Plentiful	10.00
Laterite	Route 3144 Km 4+950 Left Side 1.0 Km	Gravelly Laterite	75,000	14.00
Crushed Rock	Route 3 Km 99+150 Left Side 2.1 Km	Lime Stone	Plentiful	17.00

RESULTS OF LABORATORY TESTS

	Sieve Analysis % Passing								Plasticity		Comp. DH-T Stand.		Lab. C.B.R.	
	50.0	25.0	19.0	9.5	#4	#10	#40	#200	LL	PT	Opt. 95%	gm/cc	CBR 95%	Swell %
Soil		100	99.4	88.6	78.2	23.1	-	-	-	-	1.962	8.0	-	
Laterite	100	97.5	82.6	55.9	41.0	29.1	19.6	33.5	9.9	7.1	2.190	43.0	0.76	
Crushed Rock	-	-	-	-	-	-	-	-	-	-	-	>80	-	

Note: Abrasion test result of Crushed Rock 31.2 %



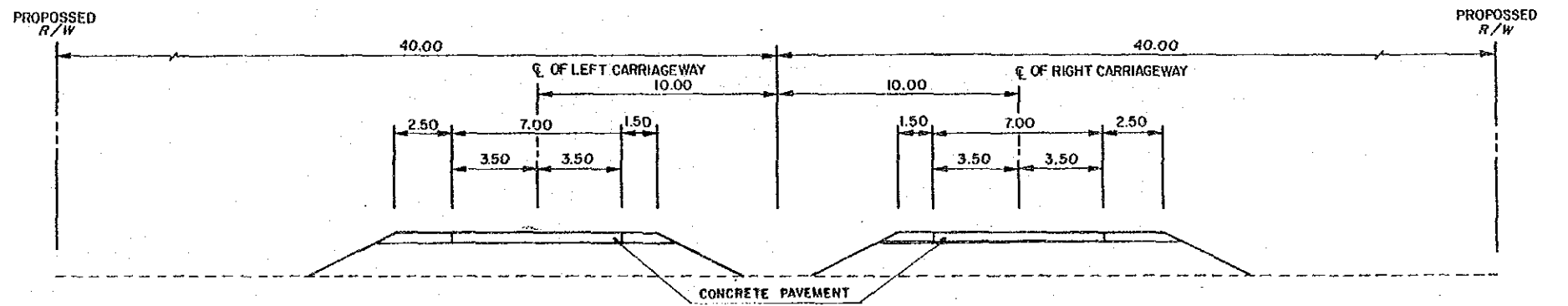
3.2 Preliminary Design

(1) Geometric Design Criteria

Design Standard : PD, P1, FD
 Design Speed : PD, P1 - Flat 80-100 km/h
 FD - Flat 70-90 km/h

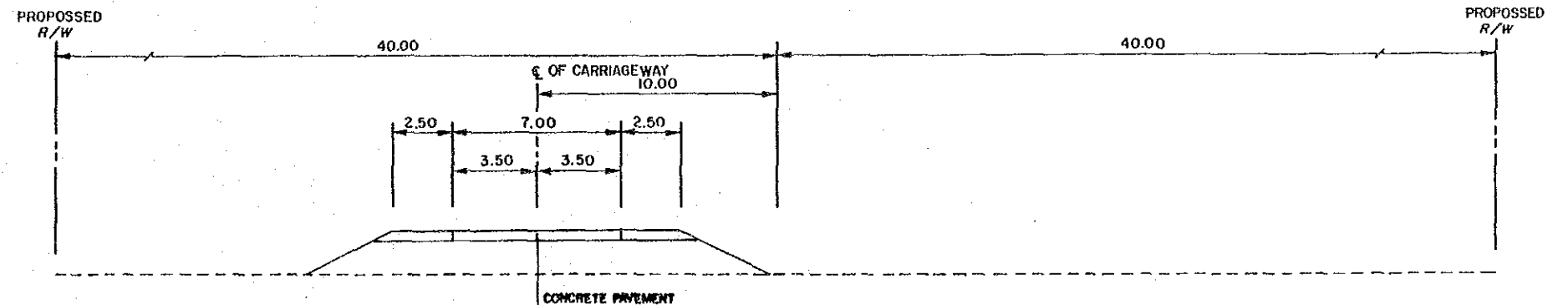
Geometric Design Criteria

Description	Design Speed (Km/h)			
	100	90	80	70
Minimum Radius & Curvature (m)	360	280	210	160
Minimum Stopping Sight Distance (m)	160	140	115	90
Maximum Gradient (%)	6	7	8	9



MAINLINE STA. 0+000 TO STA. 24+800

SPUR STA. 0+000 TO STA. 8+366



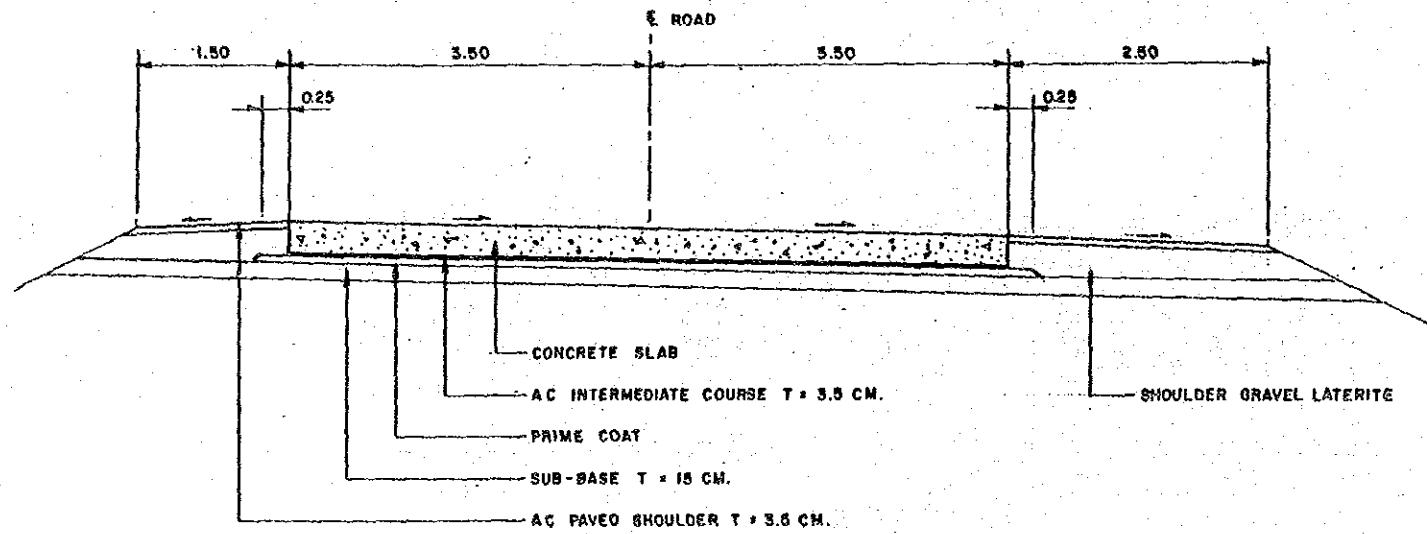
MAINLINE STA. 24+800 TO STA. 41+932

TYPICAL CROSS SECTION (ROUTE ML-5)

(2) Pavement Design

Pavement for New Construction Lane

Section	Design CBR of Subgrade	Cumulative No. of ESA W18 x 10 (20 years)	Thickness of Pavement Structure (cm)
N	8.0	51,660	Slab 28
			Intermediate AC Layer 3.5
			Subbase 15
W	8.0	36,936	Slab 25
			Intermediate AC Layer 3.5
			Subbase 15
S	8.0	14,722	Slab 23
			Intermediate AC Layer 3.5
			Subbase 15



(3) Culverts

No.	CHAINAGE	EXISTING CULVERT	NEW CULVERT	
			LT ROADWAY	RT ROADWAY
1	0+600		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
2	1+750		RCP 1-Ø1.00x17.00	RCP 1-Ø1.00x17.00
3	2+225		RCP 1-Ø1.00x20.00	RCP 1-Ø1.00x20.00
4	3+311		BOX 2-2.50x2.00x15.00	BOX 2-2.50x2.00x15.00
5	3+830		RCP 1-Ø1.00x17.00	RCP 1-Ø1.00x17.00
6	4+064		RCP 1-Ø1.00x13.00	RCP 1-Ø1.00x13.00
7	4+900		RCP 1-Ø1.00x16.00	RCP 1-Ø1.00x16.00
8	5+180		RCP 1-Ø1.00x16.00	RCP 1-Ø1.00x16.00
9	5+850		RCP 2-Ø1.00x13.00	RCP 2-Ø1.00x13.00
10	6+475		RCP 1-Ø1.00x18.00	RCP 1-Ø1.00x18.00
11	7+042.50		BOX 2-2.00x2.00x16.00	BOX 2-2.00x2.00x16.00
12	7+450		RCP 1-Ø1.00x16.00	RCP 1-Ø1.00x16.00
13	8+150		RCP 1-Ø1.00x20.00	RCP 1-Ø1.00x20.00
14	8+600		RCP 1-Ø1.00x22.00	RCP 1-Ø1.00x22.00
15	8+816		BOX 2-2.00x2.00x16.00	BOX 2-2.00x2.00x16.00
16	8+968		RCP 1-Ø1.00x22.00	RCP 1-Ø1.00x22.00
17	10+174		RCP 1-Ø1.00x12.00	RCP 1-Ø1.00x12.00
18	10+693.50		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
19	11+700		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
20	12+325		RCP 1-Ø1.00x17.00	RCP 1-Ø1.00x17.00
21	12+460		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
22	12+543		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
23	13+325		RCP 1-Ø1.00x22.00	RCP 1-Ø1.00x22.00
24	14+562		RCP 1-Ø1.00x19.00	RCP 1-Ø1.00x19.00
25	15+373		RCP 2-Ø1.00x19.00	RCP 2-Ø1.00x19.00
26	16+710		RCP 1-Ø1.00x19.00	RCP 1-Ø1.00x19.00
27	17+450		RCP 1-Ø1.00x22.00	RCP 1-Ø1.00x22.00
28	18+229		RCP 1-Ø1.00x17.00	RCP 1-Ø1.00x17.00
29	18+242		RCP 1-Ø1.00x17.00	RCP 1-Ø1.00x17.00
30	18+380		RCP 1-Ø1.00x13.00	RCP 1-Ø1.00x13.00
31	18+409		RCP 1-Ø1.00x17.00	RCP 1-Ø1.00x17.00
32	18+620		BOX 1-2.50x2.00x16.00	BOX 1-2.50x2.00x16.00
33	18+745		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
34	19+125		RCP 1-Ø1.00x13.00	RCP 1-Ø1.00x13.00
35	20+560		RCP 1-Ø1.00x13.00	RCP 1-Ø1.00x13.00
36	21+369		BOX 1-2.50x2.00x22.00	BOX 1-2.50x2.00x22.00
37	21+660		RCP 1-Ø1.00x26.00	RCP 1-Ø1.00x26.00
38	23+200		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
39	24+763		BOX 1-2.50x1.75x14.00	BOX 1-2.50x1.75x14.00
40	25+225		RCP 1-Ø1.00x22.00	
41	26+414		RCP 1-Ø1.00x20.00	
42	27+075		RCP 1-Ø1.00x13.00	
43	27+525		RCP 1-Ø1.00x16.00	
44	27+775		BOX 1-2.00x2.00x17.00	
45	27+950		RCP 1-Ø1.00x14.00	
46	28+730		RCP 1-Ø1.00x13.00	
47	29+056.40		RCP 1-Ø1.00x24.00	
48	29+580		BOX 2-2.50x2.00x15.00	
49	30+475		RCP 1-Ø1.00x13.00	

No.	CHAINAGE	EXISTING CULVERT	NEW CULVERT	
			LT ROADWAY	RT ROADWAY
50	31+618		BOX 3-2.50x2.00x20.00	
51	32+090		RCP 1-Ø1.00x16.00	
52	32+575		RCP 1-Ø1.00x16.00	
53	33+150		RCP 1-Ø1.00x21.00	
54	33+223		BOX 1-2.00x1.75x22.00	
55	33+925		BOX 2-2.00x1.50x13.00	
56	34+981		RCP 1-Ø1.00x20.00	
57	35+537.50		RCP 1-Ø1.00x16.00	
58	36+100.40		RCP 1-Ø1.00x26.00	
59	36+550		RCP 1-Ø1.00x21.00	
60	36+808.50		BOX 2-2.50x1.75x14.00	
61	37+077.50		RCP 1-Ø1.00x23.00	
62	37+464		BOX 2-2.00x2.00x17.00	
63	38+326		RCP 1-Ø1.00x16.00	
64	38+610		RCP 1-Ø1.00x14.00	
65	38+630		RCP 1-Ø1.00x18.00	
66	39+617		RCP 1-Ø1.00x18.00	
67	39+839		RCP 2-Ø1.00x23.00	
68	41+431.50		BOX 1-2.50x2.00x20.00	
1	0+500		BOX 1-3.00x2.00x14.00	BOX 1-3.00x2.00x14.00
2	1+155		RCP 1-Ø1.00x12.00	RCP 1-Ø1.00x12.00
3	2+125		RCP 1-Ø1.00x18.00	RCP 1-Ø1.00x18.00
4	3+250		RCP 1-Ø1.00x14.00	RCP 1-Ø1.00x14.00
5	4+225		BOX 2-2.00x2.00x23.00	BOX 2-2.00x2.00x23.00
6	5+295		RCP 1-Ø1.00x16.00	RCP 1-Ø1.00x16.00
7	6+485.50		RCP 1-Ø1.00x17.00	RCP 1-Ø1.00x17.00
8	6+675		RCP 1-Ø1.00x19.00	RCP 1-Ø1.00x19.00
9	7+030		RCP 1-Ø1.00x12.00	RCP 1-Ø1.00x12.00

(4) Bridges

NO.	STATION	EXISTING RC BRIDGE	PROPOSED RC BRIDGE
1	0+000 (Interchange)	-	11.00x350.00 STEEL BOX GIRDER
2	002+576	-	2x(11.00x18.00) SLAB TYPE
3	005+345	-	2x(11.00x15.00) SLAB TYPE
4	011+327	-	2x(11.00x24.00) SLAB TYPE
5	012+565	-	2x(11.00x24.00) SLAB TYPE
6	014+066	-	2x(11.00x40.00) SLAB TYPE
7	015+992	-	2x(11.00x50.00) SLAB TYPE
8	016+881	-	2x(11.00x26.00) SLAB TYPE
9	026+084.50	-	11.00x30.00 SLAB TYPE
10	029+922	-	11.00x18.00 SLAB TYPE
11	035+987.50	-	11.00x15.00 SLAB TYPE
12	040+470	-	11.00x25.00 SLAB TYPE
13	0+000 (Interchange)	-	11.00x140.00 STEEL BOX GIRDER
14	002+513 (Spur)	-	2x(11.00x30.00) SLAB TYPE
15	004+545 (Railway Overpassing)	-	2x(11.00x60.00) GIRDER TYPE
16	7+718 (Interchange)	-	11.00x50.00 PC I GIRDER

3.3 Quantities and Construction and Road Maintenance Costs

(1) CONSTRUCTION QUANTITIES AND COSTS

(Project ML-5 Length = 50.33 km)

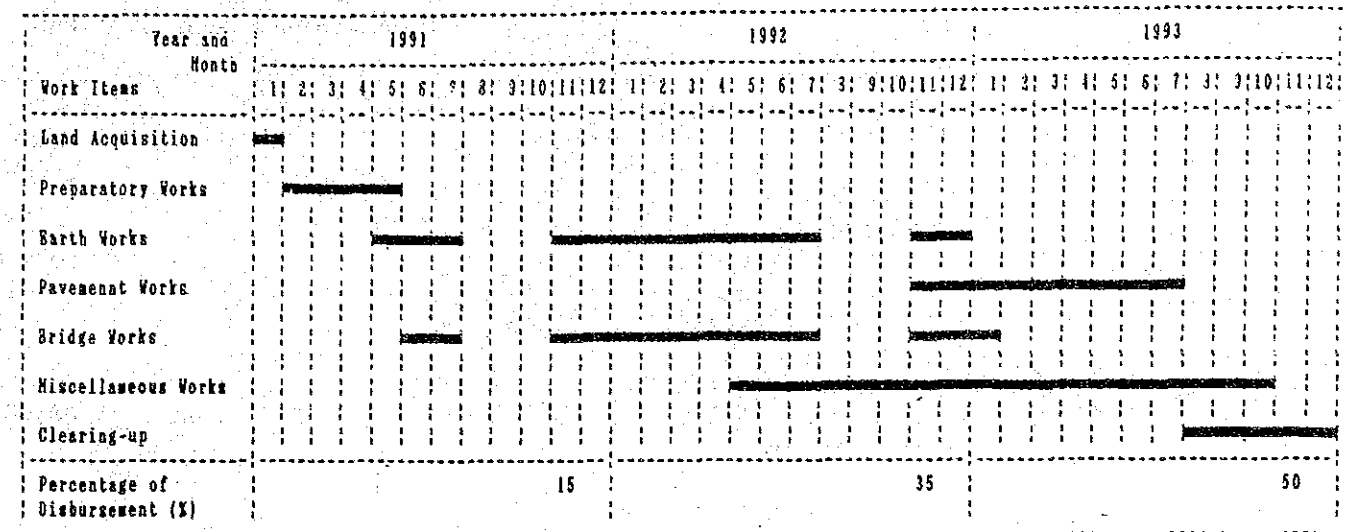
Item	Unit	Financial Unit Rate Baht	Quantity	Financial Total Cost 1000 Baht	Economic Cost		Residual Value		
					%	1000 Baht	%	1000 Baht	
EARTHWORK									
Clearing & Grubbing	ha	10,000	417	4,170	85	3,545	90	3,190	
Roadway Excavation (Unclassified)	m ³	18	496,000	8,928	84	7,500	90	6,750	
Roadway Excavation (Classified)	m ³	38	-	-	84	-	90	-	
Embankment (Common)	m ³	33	392,000	12,936	86	11,125	90	10,012	
Embankment (Borrow)	m ³	71	1,529,000	108,559	86	93,361	90	84,025	
Removal of Existing Structure	each	60,000	-	-	84	-	90	-	
Sub Total				134,593		115,530		103,977	
SUBBASE and BASE COURSES									
Subbase	m ³	133	108,000	14,364	83	11,922	50	5,961	
Aggregate base	m ³	272	-	-	84	-	50	-	
Shoulder (Soil Aggregate)	m ³	157	94,100	14,774	83	12,262	50	6,131	
Sub Total				29,138		24,184		12,092	
SURFACE COURSES									
Asphaltic Prime Coat	m ²	11	698,400	7,682	93	7,145	50	3,572	
Asphaltic Tack Coat	m ²	5	-	-	93	-	50	-	
Double Bituminous Surface Treatment	m ²	32	-	-	91	-	50	-	
Asphalt Concrete Surfacing	ton	902	85,100	76,760	90	69,084	50	34,542	
Portland Cement Concrete Pavement	m ³	1,609	163,500	263,072	90	236,764	50	118,382	
Sub Total				347,514		312,993		156,496	
STRUCTURES (Equivalent)									
RC Pipe Culvert (D=1.00 m)	m	1,800	1,808	3,254	88	2,864	50	1,432	
RC Box Culvert (2-2.40x 2.40 m)	m	9,000	250	2,250	90	2,025	50	1,013	
RC Bridge (W=11.0 m)	m	63,000	542	34,146	87	29,707	50	14,854	
PC Bridge (W=11.0 m)	m	86,000	710	61,060	87	53,122	50	26,561	
Bearing Unit	m ²	2,200	-	-	87	-	50	-	
Sub Total				100,710		87,718		43,860	
Total (a)				611,955		540,425		316,425	
Miscellaneous Work ((a) x 7%)		1s		42,837	87	37,268	0	0	
CONTRACT AMOUNT (b)				654,792		577,693		316,425	
PHYSICAL CONTINGENCIES ((b) x 10%) (c)		1s		65,479		57,769		31,643	
ENGINEERING AND SUPERVISION (((b) + (c)) x 10%) (d)		1s		72,027	100	72,027	0	0	
LAND ACQUISITION (Average) (e)		ha	750,000	417	312,750	100	312,750	100	312,750
PROJECT COST ((b) + (c) + (d) + (e))				1,105,048		1,020,239		660,818	
AVERAGE COST PER KM				21,956					

(2) Road Maintenance Costs

(Unit : Baht/Year)

	Without Project	With Project
Existing	-	-
1994	-	890,539
2008	-	1,108,870

3.4 Construction Schedule



4. BENEFITS

ROAD CONDITIONS

(unit : km)

Section	Without Project									With Project				
	Road Length	Paved			Laterite			NO. of Narrow Bridge	NO. of Wooden Bridge	Road Length	Road Paved	NO. of Narrow Bridge	NO. of Wooden Bridge	
		Good	Fair	Poor	Good	Fair	Poor							Good
BP-N	-	-	-	-	-	-	-	-	-	-	20.6	20.6	-	-
BP-M	-	-	-	-	-	-	-	-	-	-	4.0	4.0	-	-
BP-S	-	-	-	-	-	-	-	-	-	-	17.4	17.4	-	-
BP-W	-	-	-	-	-	-	-	-	-	-	7.7	7.7	-	-

BENEFITS

(1000 BAHT)

Year	VOC Savings			Time Savings			Total Savings		
	Nomal Traffic	Induced Traffic	Total	Nomal Traffic	Induced Traffic	Total	Nomal Traffic	Induced Traffic	Total
1994	105,206	-	105,206	115,967	-	115,967	221,173	-	221,173
2000	320,988	-	320,988	428,365	-	428,365	749,353	-	749,353
2008	1,548,475	-	1,548,475	1,348,348	-	1,348,348	2,896,823	-	2,896,823

5. ECONOMIC EVALUATION

COST AND BENEFIT STATEMENT

(1000 BAHT)

YEAR	COST		BENEFITS			DISCOUNTED(12%)	
	CONST. COST	VOC SAVING	TIME SAVING	MAINT. SAVING	TOTAL	COST	BENEFIT
1991	418,873				0	588,486	0
1992	247,621				0	310,616	0
1993	353,745				0	396,194	0
1994		105,206	115,967	(1,514)	219,659	0	196,124
1995		141,170	168,033	(1,540)	307,663	0	245,267
1996		177,134	220,099	(1,566)	395,667	0	281,628
1997		213,098	272,165	(1,592)	483,671	0	307,382
1998		249,062	324,231	(1,618)	571,675	0	324,384
1999		285,026	376,297	(1,644)	659,679	0	334,214
2000		320,988	428,365	(1,670)	747,683	0	338,214
2001		474,424	543,363	(1,696)	1,016,091	0	410,382
2002		627,860	658,360	(1,722)	1,284,498	0	463,203
2003		781,296	773,358	(1,748)	1,552,906	0	499,994
2004		934,731	888,356	(1,774)	1,821,313	0	523,584
2005		1,088,167	1,003,354	(1,800)	2,089,721	0	536,379
2006		1,241,603	1,118,352	(1,826)	2,358,129	0	540,422
2007		1,395,039	1,233,350	(1,852)	2,626,537	0	537,442
2008	(660,818)	1,548,475	1,348,348	(1,872)	2,894,951	(135,216)	528,897
TOTAL	359,421	9,583,279	9,471,998	(25,434)	19,029,843	1,160,080	6,067,516

NET PRESENT VALUE : 4,907,436
 BENEFIT COST RATIO : 5.23
 INTERNAL RATE OF RETURN : 30.6%
 FIRST YEAR RATE OF RETURN : 15.1%

COST AND BENEFIT STATEMENT







(1000 BAHT)

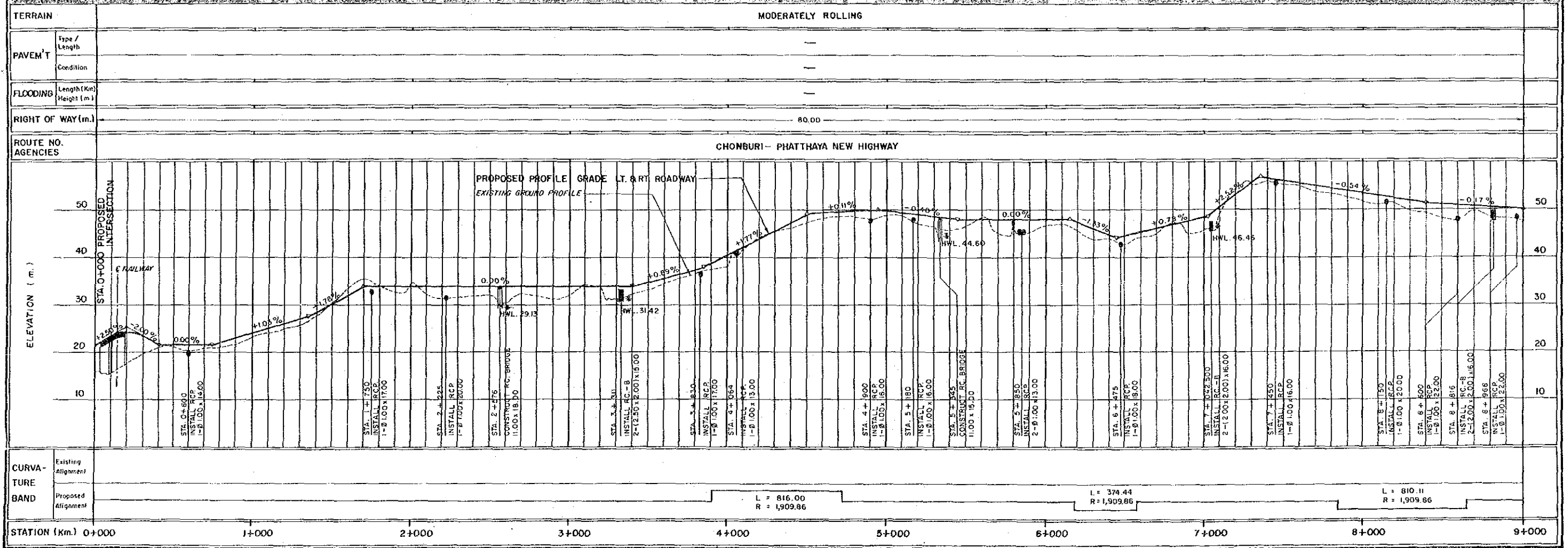
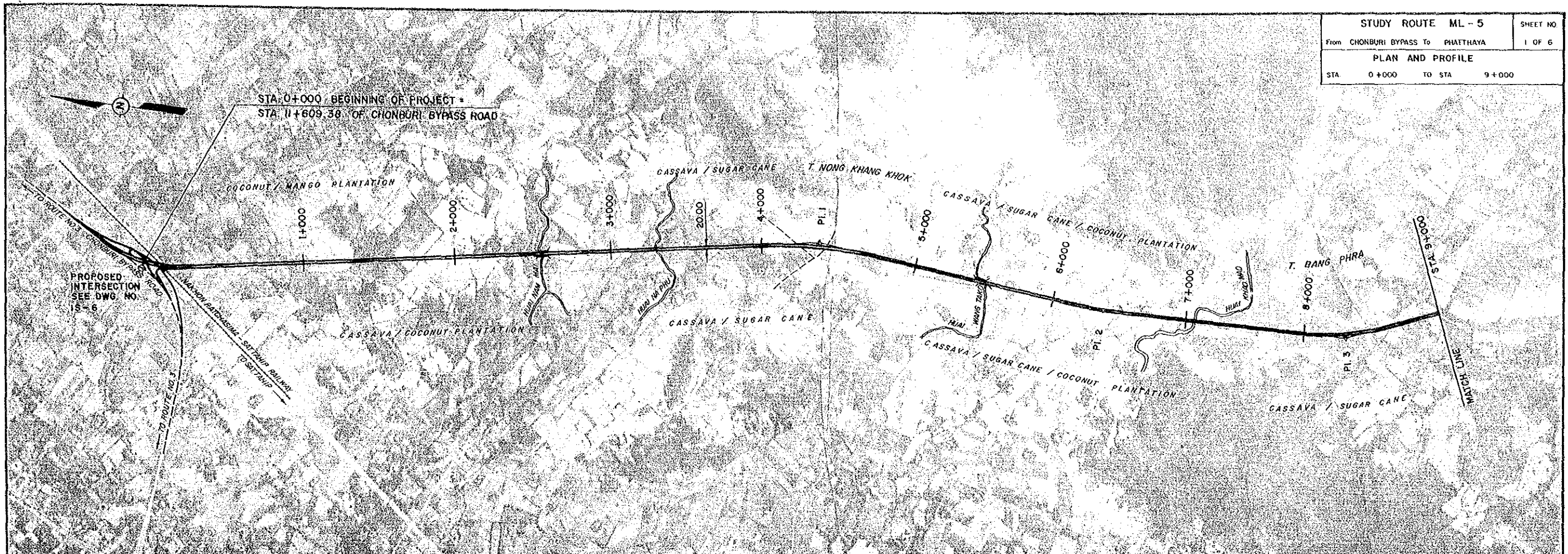
YEAR	COST		BENEFITS			DISCOUNTED(12%)	
	CONST. COST	VOC SAVING	TIME SAVING	MAINT. SAVING	TOTAL	COST	BENEFIT
1989	418,873				0	738,197	0
1990	247,621				0	389,636	0
1991	353,745				0	496,986	0
1992		88,310	88,036	(1,463)	174,883	0	195,869
1993		96,758	102,002	(1,488)	197,272	0	197,272
1994		105,206	115,967	(1,514)	219,659	0	196,124
1995		141,170	168,033	(1,540)	307,663	0	245,267
1996		177,134	220,099	(1,566)	395,667	0	281,628
1997		213,098	272,165	(1,592)	483,671	0	307,382
1998		249,062	324,231	(1,618)	571,675	0	324,384
1999		285,026	376,297	(1,644)	659,679	0	334,214
2000		320,988	428,365	(1,670)	747,683	0	338,214
2001		474,424	543,363	(1,696)	1,016,091	0	410,382
2002		627,860	658,360	(1,722)	1,284,498	0	463,203
2003		781,296	773,358	(1,748)	1,552,906	0	499,994
2004		934,731	888,356	(1,774)	1,821,313	0	523,584
2005		1,088,167	1,003,354	(1,800)	2,089,721	0	536,379
2006	(660,818)	1,241,603	1,118,352	(1,826)	2,358,129	(169,616)	540,422
TOTAL	359,421	6,824,833	7,080,338	(24,661)	13,880,510	1,455,203	5,394,318

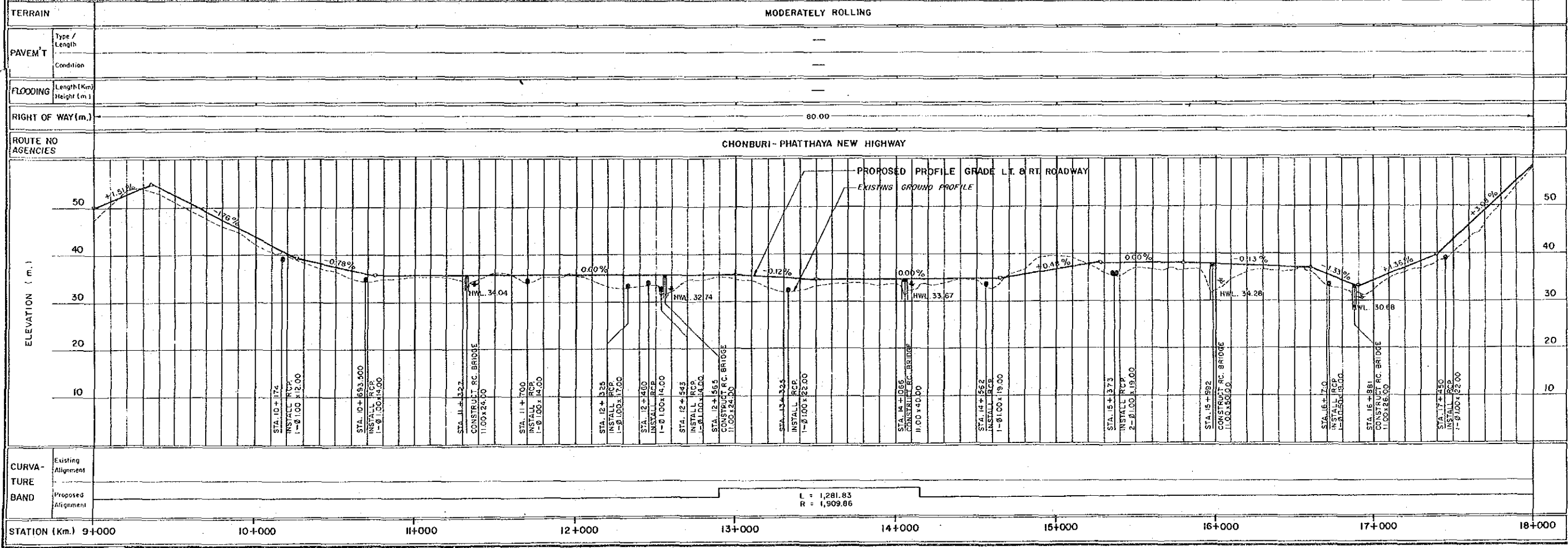
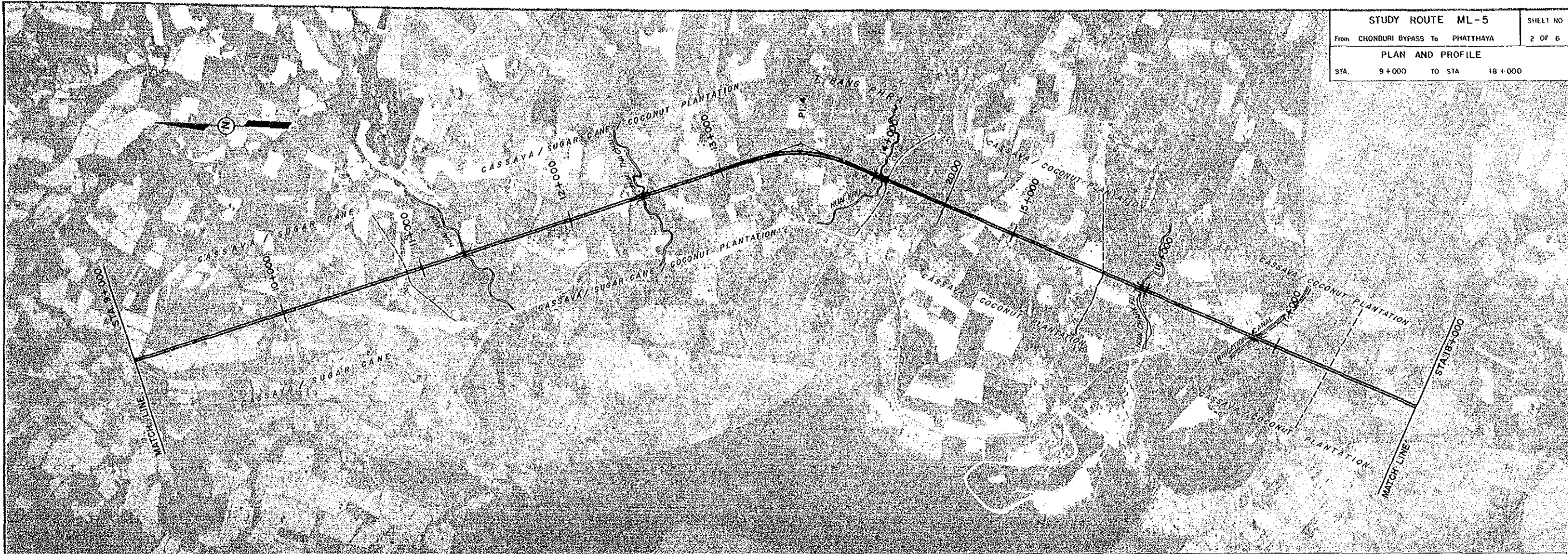
NET PRESENT VALUE : 3,939,115
 BENEFIT COST RATIO : 3.71
 INTERNAL RATE OF RETURN : 25.6%
 FIRST YEAR RATE OF RETURN : 12.1%

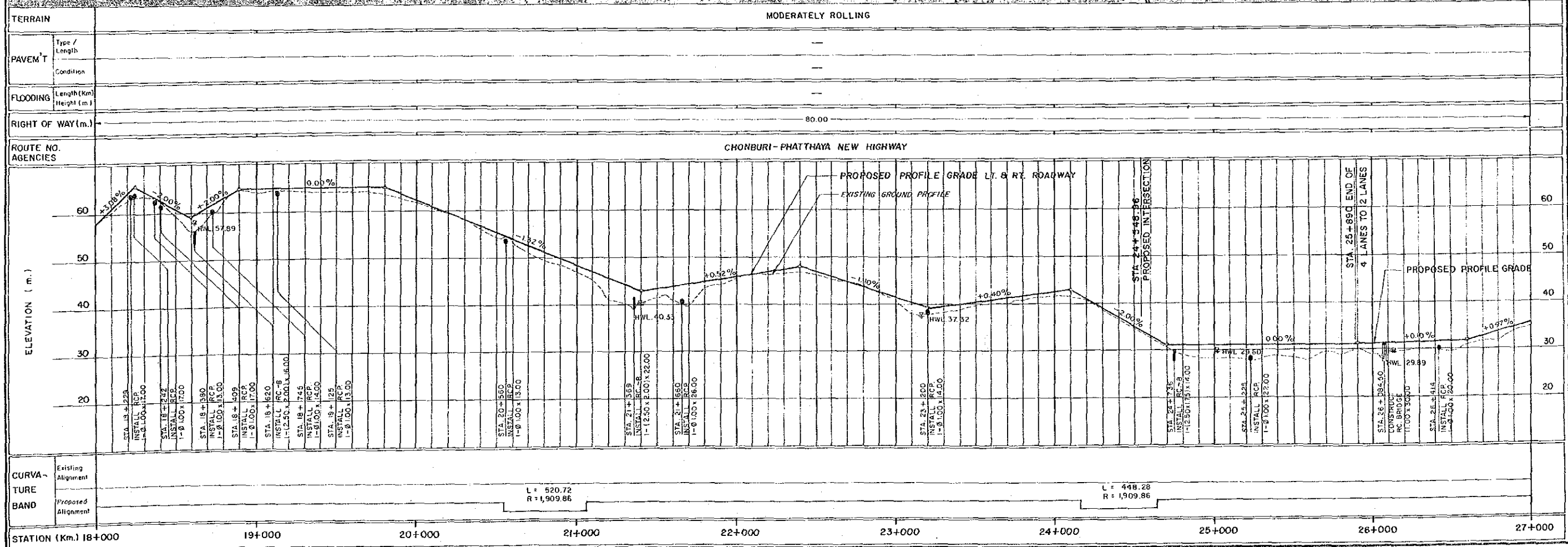
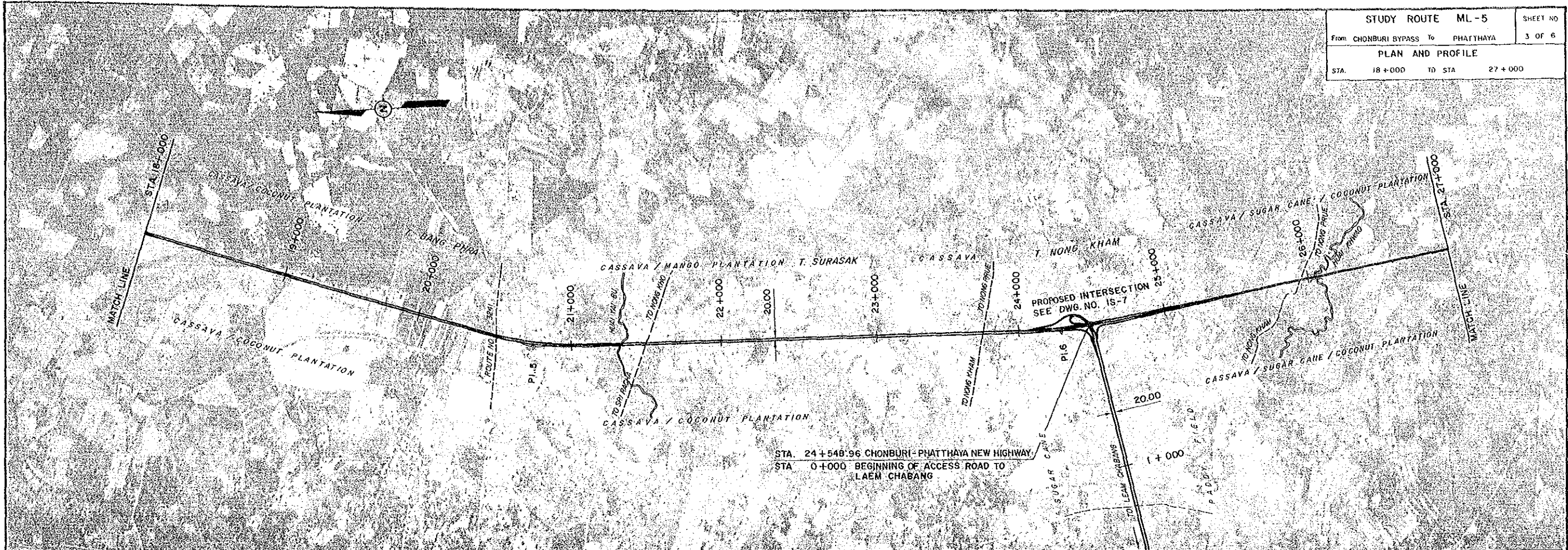
6. DRAWINGS

ABBREVIATIONS and SYMBOLS for PLAN and PROFILE

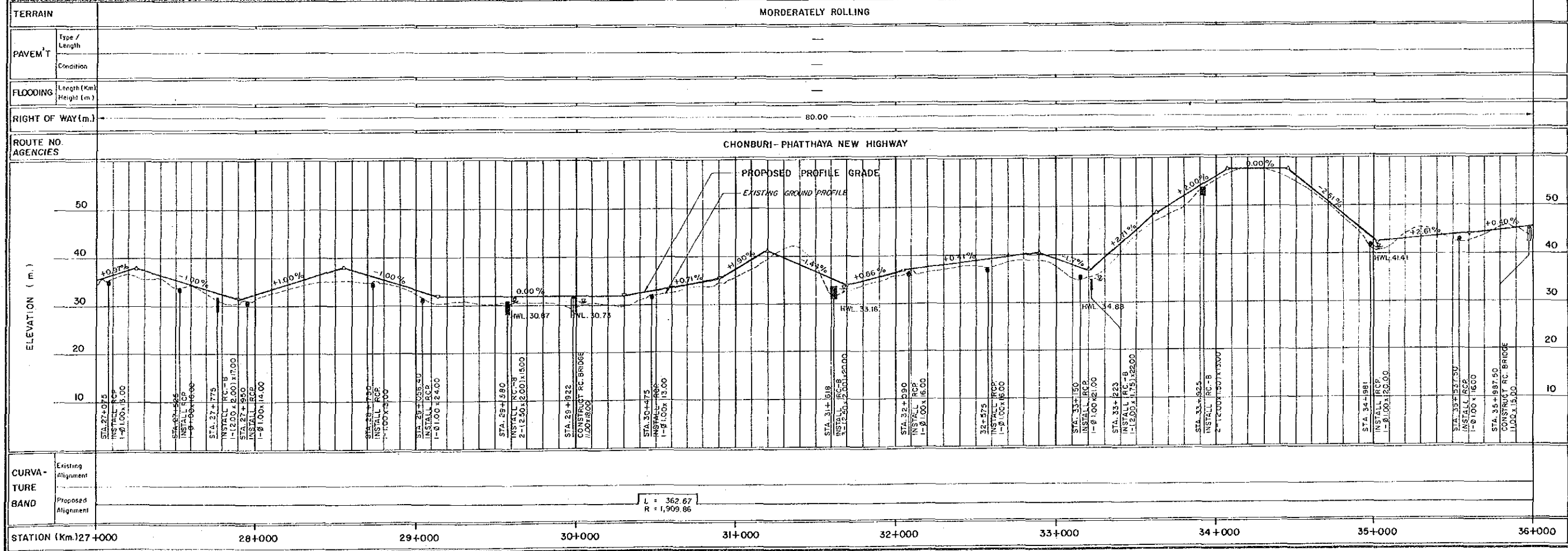
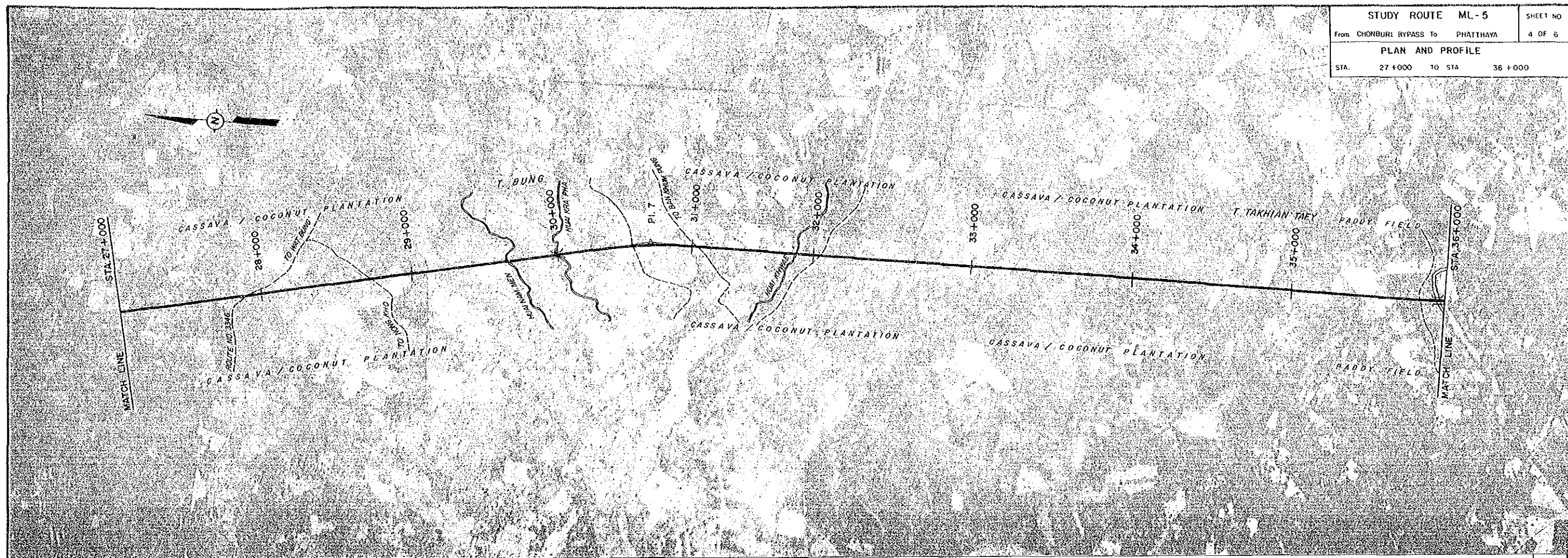
	NEW CONSTRUCTION SECTION OF STUDY ROUTE
	IMPROVEMENT SECTION OF STUDY ROUTE
	BRIDGE (PROPOSED, EXISTING)
	BOX CULVERT (PROPOSED, EXISTING)
	PIPE CULVERT (PROPOSED, EXISTING)
	HIGH WATER LEVEL
HWY	HIGHWAY
PI	POINT OF HORIZONTAL INTERSECTION
NO. or #	NUMBER
Δ	DEFLECTION ANGLE
R	RADIUS OF CURVATURE
T	TANGENT LENGTH
L	LENGTH OF CURVE
RT	RIGHT
LT	LEFT
EXIST.	EXISTING
EXTD.	EXTEND
RC-P-n- $\phi a \times l$	PIPE CULVERT, n (ROW), ϕa (DIAMETER, m), l (LENGTH, m)
RC-B-n-a $\times b \times l$	BOX CULVERT, n (NO. OF CELLS), a $\times b \times l$ (CLEAR SPAN \times DEPTH \times LENGTH, m)
BR-T-a $\times l - n$	TIMBER BRIDGE, a $\times l$ (WIDTH \times LENGTH, m), n (NO. OF SPANS)
BR-RC-a $\times l - n$	CONCRETE BRIDGE, a $\times l$ (ROADWAY WIDTH \times LENGTH, m) n (NO. OF SPANS)







CURVA- TURE BAND	Existing Alignment	
	Proposed Alignment	
STATION (Km.)		18+000 19+000 20+000 21+000 22+000 23+000 24+000 25+000 26+000 27+000



CURVA- TURE BAND	Existing Alignment	
	Proposed Alignment	
STATION (Km.)	27+000	28+000
	29+000	30+000
	31+000	32+000
	33+000	34+000
	35+000	36+000

