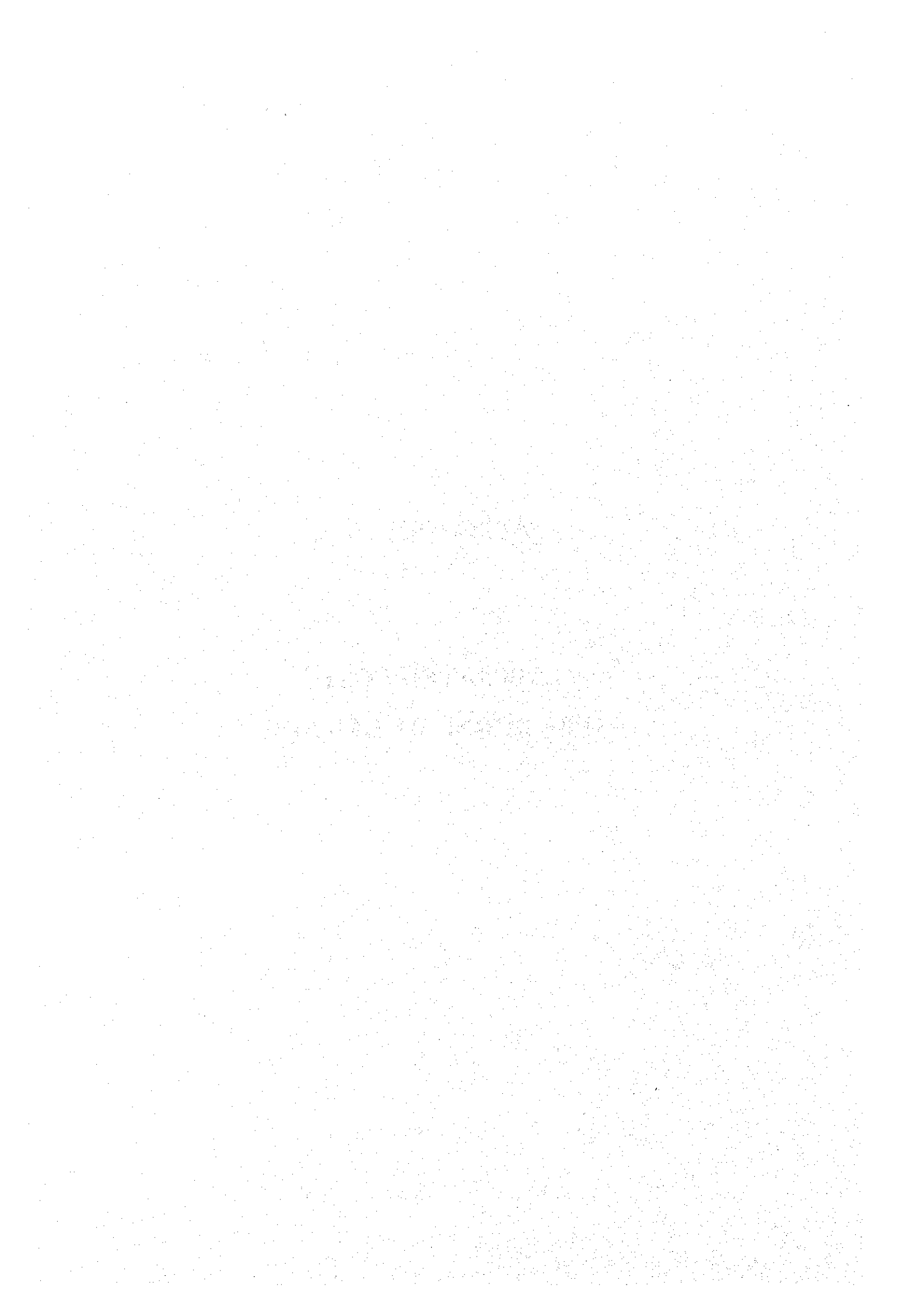


APPENDIX 5

ESTIMATED COST TO BE BORNE BY LAO PDR



ESTIMATED COST TO BE BORN BY LAO PDR

1) Land Acquisition

No.	Chainage	Side	Length	Width	Area
1	11,000 ~ 11,200	Right	200	6	1,200
2	30,565 ~ 30,635	Right	70	5	350
3	46,675 ~ 46,925	Right	250	10	2,500
4	48,200 ~ 48,400	Left	200	10	2,000
5	69,625 ~ 69,775	Right	150	7	1,050
6	71,100 ~ 71,300	Right	200	7	1,400
7	72,525 ~ 72,675	Left	150	6	900
Total					9,400 m ²

Land Acquisition is required for Improvement of Road Alignment but the above are approximate figures based on the estimated ROW.

2) Relocation of Hut

No.	Chainage	Side	Type	Size	Area
1	38,300	Left	Hut	3m*3m	9
2	72,565	Right	Hut	6m*6m	36
3	72,570	Left	Hut	6m*6m	36
4	72,600	Left	Hut	6m*6m	36
5	72,670	Left	Hut	6m*3m	18
Total					135 m ²

The above huts are supposed to be inside of ROW at Basic Design stage. Relocations are required for Road Widening.

3) Clearance of UXO Contamination

According to the discussion with Mr. Sommad PHONSENA, General Director of Communication Department. MCTPC, which was held on 27th October 1998, Lao Government prepares a budget of one hundred and fifty million kip (same amount as a Basing Design Stage) for the implementation of the removal and disposal work of UXO.

4) Cost

- It is advised that both required Land acquisition and Relocation are carried out smoothly with unestimable cost in Lao PDR.
- It is advised that the removal and disposal cost is estimated with one hundred and fifty million kip.

From above mentioned items the Estimated Cost to be born by Lao PDR is summarized to one hundred and fifty million kip.

APPENDIX 6

ROAD CONDITION SURVEY

The following road condition surveys were conducted to assess the existing condition of road and pavement.

- General Condition of Existing Road
 - Chainage
 - Alignment
 - Road width (Carriage way, Shoulder)
 - Pavement Type (Carriage way, Shoulder)
 - Road structure
 - Roadside environment
- Pavement Condition of Existing Road
 - Functional Condition
 - Structural Condition
 - Geotechnical Investigation

General conditions of existing road are reported in Table 6-1.

The brief explanation on survey method of pavement condition is explained here after.

Outputs of survey are illustrated in Figure 2.3.3-3.

Pavement Condition Survey

Accurate condition survey which assesses a pavement physical distress is vital to a successful improvement work. In order to evaluate the pavement condition of existing roads, the following survey were conducted.

- Visual Survey
 - Functional condition (Present Serviceability Rating)
 - Structural condition (Structural adequacy and effective structural capacity)
 - Other relevant Condition (Shoulder, Drainage, Environment etc.)
- Material Testing
 - C.B.R Test (Strength of subgrade)

1. Functional Condition

The functional condition of existing pavement are visually assessed based on comfortability of road users and pavement functional deterioration such as roughness, potholes, and safety consideration. Based on the field survey, the conditions were classified into the following five (5) categories for each section of 1km.

- Very Good (VG)
- Good (G)
- Fair (F)
- Bad (B)
- Very Bad (VB)

2. Structural Condition

The structural condition of existing pavement involves the assessment of current condition based on distress including its type, amount and severity.

The following distress were visually assessed.

- Fatigue or alligator cracking (AL,AM,AH)
- Localized Failing area (LFA)
 - Disintegrated underlying layer
 - Collapse of AC surface
 - Stripping of AC basecourse

Alligator cracking which is considered a major structural distress of AC pavement, were assessed and classified into the following level of severity for each sections of 1km.

- Low Severity (AL)
Longitudinal disconnected hairline cracks running paralleled to each other.
The cracks are not spalled. (class 1 cracking)
- Medium Severity (AM)
Further development of low-severity alligator cracking into pattern of pieces formed by cracks that may be lightly surfaced spalled. (class 2 cracking)
- High Severity (AH)
Medium alligator cracking has progressed so those pieces are more severely at the edges and loosened until the cell rock under traffic (class 3 cracking)

Each section of 1 km was assessed and rated at highest severity level of the Section.

3. Geotechnical Investigation

The geotechnical investigation was conducted to identify the causes of the observed surface distress and to obtain the engineering information or pavement design. The investigation was made on subgrade materials of 1 m in depth for every 2 km. including the following test.

- Sampling
- Soil Classification
- C.B.R. Test
- Natural Moisture Content
- Sieve Analysis
- Specific Gravity

Table 6-1 General Condition of Existing Road

1	2	3		4	5	6	7	Remarks		
		Carriage way (m)	Shoulder (m)							
Chainage (Km)	Align-ment	Road width		Pavement Type		Functional Condition	Structural Condition	Road Structure	Roadside Environ-ment	
		Carriage way (m)	Shoulder (m)	Carriage way (m)	Shoulder (m)					
0.0-1.0	F	7.3	1.6	D	G	G	AL	L	R/P	
1.0-2.0	F	7.5	1.7	D	S	G	AL	L	R/P	
2.0-3.0	F	7.5	2.5	D	S	G	AL	L	R	
3.0-4.0	F	7.5	1.9	D	S	G	AL	L	R	(SENO)
4.0-5.0	F	7.3	2.0	D	S	G	AL	L	R/P	
5.0-6.0	F	7.5	1.8	D	S	G	AL	L	R/P	
6.0-7.0	F	7.0	1.6	D	G	G	AL/AM	L	P	Br.No1 6.9Km
7.0-8.0	F	6.9	1.8	D	G	B	AM(LFA)	L/B	P	
8.0-9.0	F	7.0	1.8	D	S	B	AL/AM	L/B	R/P	
9.0-10.0	F	6.8	1.6	D	G	F	AL/AM	L/B	P	
10.0-11.0	F	6.5	1.5	D	G	B	AL/AM	L	P	
11.0-12.0	R	6.6	1.5	D	G	B	AL/AM	L/C	F	
12.0-13.0	F	6.7	1.5	D	G	F/B	AL/AM	L	P	
13.0-14.0	F	6.6	1.5	D	G	F	AL/AM	L	P	
14.0-15.0	F	6.5	1.5	D	G	F/B	AL/AM	L	P/F	
15.0-16.0	F	6.5	1.5	D	G	F/B	AL/AM	L	F/R	
16.0-17.0	F	6.7	1.3	D	G	F/B	AL/AM	L/C	F	
17.0-18.0	F	6.8	1.3	D	G	F/B	AL/AM	L	F/R	
18.0-19.0	F	6.8	1.7	D	G	F/B	AL/AM	L	P	Br.No2 18.9Km
19.0-20.0	F	6.7	1.7	D	G	VB	AH(LFA)	L	P/W	
20.0-21.0	F	6.7	1.3	D	G	VB	AH(LFA)	L/B	P	Br.No3 21.0Km
21.0-22.0	F	6.8	1.4	D	G	VB	AH(LFA)	L	P	
22.0-23.0	F	7.5	1.6	D	G	B	AH(LFA)	L/B	W	
23.0-24.0	F	6.8	1.5	D	G	VB	AH(LFA)	L	W	
24.0-25.0	F	6.8	1.5	D	G	VB	AH(LFA)	L	W	
25.0-26.0	F	7.1	1.5	D	G	VB	AH(LFA)	L	F	Br.No4 25.4Km
26.0-27.0	F	7.2	1.2	D	G	B	AM	L/B	R/P	
27.0-28.0	F	7.1	1.0	D	G	B	AM(LFA)	L	F	
28.0-29.0	F	7.7	1.0	D	G	B	AM(LFA)	L	F	
29.0-30.0	F	7.6	1.0	D	G	B	AM	L	W/R	
30.0-31.0	F	7.2	1.0	D	G	B	AM(LFA)	L	W/F	
31.0-32.0	F	7.0	1.3	D	G	B	AM	L	R/P	
32.0-33.0	F	7.0	1.5	D	G	B	AM	L/C	P/F	
33.0-34.0	F	6.9	1.5	D	G	B	AM	L	P	
34.0-35.0	F	6.8	1.5	D	G	B	AM	L	F	
35.0-36.0	F	6.9	1.5	D	G	B	AH(LFA)	L	W/F	
36.0-37.0	F	7.0	1.5	D	G	VB	AH(LFA)	L	R/P	Br.No5 36.9Km
37.0-38.0	F	7.5	1.5	D	G	F	AL/AM	L/B	R	(DONG HEN)
38.0-39.0	F	7.1	1.3	D	G	F	AL/AM	L/B	W/P	Br.No6 38.7Km
39.0-40.0	F	7.1	1.3	D	G	F	AL/AM	L	W	
40.0-41.0	F	7.2	1.0	D	G	B	AL/AM	L	W/P	
41.0-42.0	F	7.5	1.3	D	G	B	AL/AM	L	W/P	
42.0-43.0	F	7.5	1.5	D	G	VB	AH(LFA)	L	W/F	
43.0-44.0	R	7.8	1.5	D	G	B	AH	L	W/F	
44.0-45.0	R	8.0	1.3	D	G	VB	AH(LFA)	L	R/F	
45.0-46.0	F	7.5	1.0	D	G	VB	AH(LFA)	L	P/F	
46.0-47.0	F	7.2	1.0	D	G	B	AH	L	R/P	
47.0-48.0	F	7.0	1.0	D	G	VB	AH(LFA)	L	W/F	
48.0-49.0	F	6.9	1.2	D	G	VB	AH(LFA)	L	P/F	
49.0-50.0	F	6.9	1.5	D	G	VB	AH(LFA)	L/B	P/F	

1 Chainage (Km)	2 Align- ment	Road width		3 Pavement Type		4 Functional Condition	5 Structural Condition	6 Road Structure	7 Roadside Environ- ment	Remarks
		Carriage way (m)	Shoulder (m)	Carriage way (m)	Shoulder (m)					
50.0-51.0	F	6.9	1.6	D	G	B	AH	L	P/W	
51.0-52.0	F	7.0	1.4	D	G	B	AH(L.F.A)	L/C	P/R	
52.0-53.0	F	7.1	1.0	D	G	VB	AH(L.F.A)	L	R	
53.0-54.0	F	6.9	1.0	D	G	VB	AH(L.F.A)	L	W/F	
54.0-55.0	F	7.0	1.0	D	G	VB	AH(L.F.A)	L	W	
55.0-56.0	F	7.3	1.0	D	G	B	AL/AM	L	R	
56.0-57.0	F	7.4	1.0	D	G	F	AL/AM	L	P/F	
57.0-58.0	F	7.2	1.0	D	G	F	AL/AM	L	P	
58.0-59.0	F	6.8	1.0	D	G	B	AL/AM	L	R	
59.0-60.0	F	6.7	1.0	D	G	B	AL/AM	L	W/F	
60.0-61.0	F	6.8	1.0	D	G	B	AL/AM	L	W/F	
61.0-62.0	F	6.7	1.0	D	G	B	AL/AM	L	R	
62.0-63.0	F	6.9	1.0	D	G	B	AL/AM	L	P/F	
63.0-64.0	F	7.1	1.0	D	G	VB	AH(L.F.A)	L	F	
64.0-65.0	F	6.9	1.0	D	G	VB	AH(L.F.A)	L	W/F	
65.0-66.0	F	6.6	1.0	D	G	VB	AH(L.F.A)	L	F	
66.0-67.0	F	6.8	1.0	D	G	VB	AH	L	R/F	
67.0-68.0	F	7.7	1.0	D	G	B	AH	L	R	
68.0-69.0	F	7.5	1.2	D	G	B	AH(L.F.A)	L	F	
69.0-70.0	F	6.9	1.5	D	G	VB	AH(L.F.A)	L	F	
70.0-71.0	F	7.2	1.5	D	G	VB	AH(L.F.A)	L/C	F	
71.0-72.0	F	7.4	1.5	D	G	VB	AH(L.F.A)	L/B	F/R	
72.0-73.0	F	8.1	1.5	D	S	VB/F	AH/AL (L.F.A)	B	R	(M.PHALAN) Br.No7 72.9Km

- 1) Chainage
Distance from the beginning point of the Project
- 2) Alignment
F = Flat
R = Rolling
M = Mountainous
- 3) Pavement Type
D = Double Bituminous Surface Treatment
S = Single Bituminous Surface Treatment
G = Gravel
- 4) Pavement Type
VG = Very Good
G = Good
F = Fair
B = Bad
VB = Very Bad
- 5) Structural Condition
AL; Low-severity Alligator Cracking
AM; Medium-severity Alligator Cracking
AH; High-severity Alligator Cracking
LFA; Localized Failing Area

- 6) Road Structure
L; Level
B; Embankment
C; Cut
- 7) Roadside Environment
R; Resident Area
P; Rice Field
F; Forest Area
W; Wasteland

APPENDIX 7

EXISTING CONDITION AND REHABILITATION METHOD OF BRIDGES

Existing Condition and Rehabilitation Methods of Bridge (1/2)

Name of Bridge	HOUY LAI (1)		HOUY KAR SAE (2)		HOUY RONG PONG (3)		HOUY MOUNG (4)	
	Existing	Rehabilitation	Existing	Rehabilitation	Existing	Rehabilitation	Existing	Rehabilitation
Side View								
Cross Section of bridge								
Super Structure	R,C,Simple girder		R,C,Simple girder		R,C,Simple girder		R,C,Simple girder	
Support	Plate type		Plate type		Plate type		Plate type	
Expansion Joint	Butt joint		Butt joint		Butt joint		Butt joint	
Abutment	Abutment on pile bent		Abutment on pile bent		Abutment on pile bent		Abutment on pile bent	
Pier	Wall type		Wall type		Wall type		Wall type	
Concrete Slab	Hairline cracks in all most all section	Overlay with asphalt concrete	Longitudinal cracks due to concrete filling between girder	Overlay with asphalt concrete	Longitudinal cracks due to concrete filling between girder	Overlay with asphalt concrete	Hairline cracks in all most all section	Overlay with asphalt concrete
Expansion Joint	Fair	No repair	Fair	No repair	Fair	No repair	Fair	No repair
Drainage	Bad	Provision of drainage paths with A,C overlay	Bad	Provision of drainage paths with A,C overlay	Bad	Provision of drainage paths with A,C overlay	Bad	Provision of drainage paths with A,C overlay
Railing	Partial damage in vertical members at down stream	Repair	Rust and damage in vertical members on both sides	Repair	*Rust and damage on both sides	Repair	Rust and damage in vertical members at down stream	Repair
Scouring of Abutment/pier	Good	No repair	Good	No repair	Fair	No repair	Exposed footing at PHIN side pier	Repair with gabion
Approach sidewalk	No sidewalk on both side	New Construction	No sidewalk on both side	New Construction	No sidewalk on both sides	New Construction	No sidewalk on both side	New Construction
Special Issue	Settlement of embankment at abutment	Repair with pavement reconstruction

Item of Space Investigation

APPENDIX 8

DESIGN STANDARDS

Design Manual (Provisional Use), Communication Department, MCTPC

I	Road Design Class			I			II			III			IV			V			VI			VII		
	(ADT)			> 8000			3000-8000			1000-3000			300-1000			100-300			50-100			< 50		
II	Traffic			F	R	M	F	R	M	F	R	M	F	R	M	F	R	M	F	R	M	F	R	M
III	Terrain			60	80	100	80	60	40	60	40	20	60	40	20	60	40	20	60	40	20	40	30	20
IV	Design Speed (km/hr)			32	32	20	21.5	21.5	11	12	12	8	9	9	7	7	7	6.5	6.5	6.5	6	6	6	5.5
V	Total Formation Width			4			2			2			2			2			1			1		
1	Number of Lanes			3.75	3.75	3.5	3.75	3.5	3.0	3.5	3.5	3.0	3.0	3.0	3.0	2.75	2.75	2.5	2.5	2.5	2.5	3.5	3.5	3.5
2	Lane Width (m)			15	15	14	7.5	7.5	7	7	7	6	6	6	6	5.5	5.5	5	5	5	5	3.5	3.5	3.5
3	Carriageway (m)			3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Median Width (m)			2 x 3	2 x 3	-	2 x 3	2 x 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Island between motorized and non-motorized traffic			2 x 3	2 x 3	-	2 x 3	2 x 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Paved shoulder (m)			2x0.5	2x0.5	2 x 2	2x0.5	2x0.5	2 x 2	2 x 2	2 x 2	2 x 1	2 x 1	2 x 1	2 x 1	2x0.75	2x0.75	2x0.5	2x0.5	2x0.5	2x0.5	-	-	-
7	Lane for slow traffic (m)			2 x 3	2 x 3	-	2 x 3	2 x 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Unpaved shoulder (m)			2x0.5	2x0.5	-	2x0.5	2x0.5	-	2x0.5	2x0.5	-	-	-	-	-	-	-	2x1.5	2x1.25	2x1.25	2 x 1	2 x 1	2 x 1
VI	Max. Gradient (%)			5	6	7	5	6	7	6	7	8	6	7	8	7	8	9	7	8	9	8	9	10
VII	Min. Horizontal Curve (m)			400	250	130	400	250	130	250	130	60	250	130	60	130	60	20	130	60	20	60	30	20
VIII	Min. Vertical Curves :																							
1	Crest (km)			10	5	2.5	10	5	2.5	5	2.5	1	5.0	2.5	1	2.5	1	0.5	2.5	1	0.5	1	0.5	0.2
2	Sag (km)			3	2	1.5	3	2	1.5	2	1.5	0.6	2.0	1.5	0.6	1.5	0.6	0.2	1.5	0.6	0.2	0.6	0.2	0.2
IX	Superelevation (m)			3 - 10																				
X	Crossfall :			2 - 3																				
1	Paved (%)			3 - 4																				
2	Unpaved (%)			> 3																				
3	Paved Shoulder (%)			> 4																				
4	Unpaved Shoulder (%)			> 4																				
XI	ROW Reserve (m)			60				40				30				HS - 20 - 44			20					
XII	Bridge Design Live Load			HS - 25 - 44																				
XIII	Max. Axle Load (Ton)			9.1																				

APPENDIX 9

TOPOGRAPHICAL SURVEY

Technical Specifications

The topographical survey shall be carried out for Basic Design Study on the Project for the Improvement of National Road No.9 between Seno and Muang Phalan Section (approximately 73 km) in Lao PDR.

The surveyed data will be used for the design and planning for above mentioned Road Improvement Project.

1) Centerline Survey

The centerline staking out shall be conducted at 50 m (maximum) interval. The centerline survey shall be undertaken to establish a point of intersection (PI), beginning of curve (BC) and end of curve (EC) along the existing road.

2) Profile Survey (Longitudinal section survey)

The temporary bench marks (TBM) shall be established at about 1,000 m interval. The leveling survey to determine an elevation of TBM shall be tied to the existing National Grid System.

3) Cross Section Survey

The cross section survey at 100 m interval shall be undertaken. Cross section along the normal line to the centerline shall be taken. Every inclination point shall be measured. The distance to be covered by this survey shall be as 20 m either side of the centerline (if possible).

The location of houses, side ditches, etc. shall be noted on the field notebook.

4) Plane Table Survey for Bridge Design

The topographic survey shall include the measuring of existing bridge structure.

The area to be surveyed for bridge sites shall cover following limit:

Left Bank Side	:	+10 m from the bridge end
Right Bank Side	:	+10 m from the bridge end
Up-stream Side	:	+20 m along the bridge center
Down-stream Side	:	+20 m along the bridge center

5) Topographic Survey

The topographic survey along the centerline shall be undertaken covering 20 m either side from the centerline. The survey with contour interval of 1 m shall be attained.

All structures such as houses, buildings, electric poles, side ditches, cross drainage facilities, existing km posts and all other man-made facilities as well as topographic changes shall be measured. Particular attention shall be paid to cross drainage facilities. Particular attention shall be paid to cross drainage facilities. All locations of cross drainage shall be identified in coordination with Ministry of Works maintenance engineers and elevation of inlet and outlet shall be surveyed.

Presentation of Survey Result

Topographic map, profile, cross sections and plane table survey shall be presented in accordance with the following specifications:

Topographic map (including the centerline alignment)

Scale : 1/1,000
Contour Interval : 1 m

Profile (Longitudinal Section)

Scale : Horizontal = 1/1,000
Vertical = 1/100

Cross Section

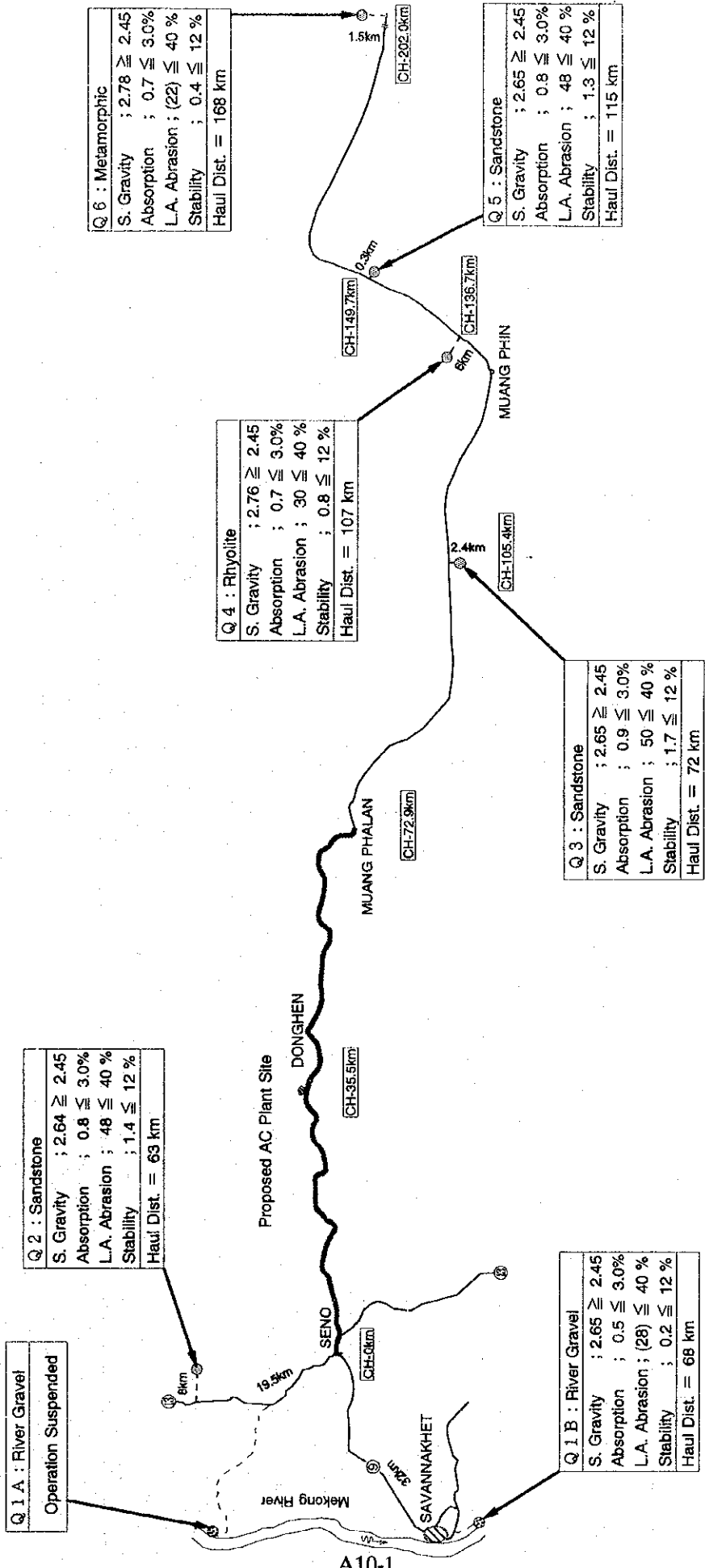
Scale : 1/200

Plane Table Survey

Scale : 1/100
Contour Interval : 1 m

APPENDIX 10

GEOTECHNICAL SURVEY



Locations of Proposed Quarries and Test Results

SUMMARIES OF THE TESTS RESULTS OBTAINED

PROJECT : Improvement of National Road No.9
 SUBMITTED BY : _____ DATE : 29 / 07 / 98

Sample No.	Km Location	Description	PARTICLE SIZE DISTRIBUTION								Classification	Specific Gravity	ATTERBERG LIMITS		AASHTO. T 99 COMP. S			CBR	REMARKS
			% PASSING SIEVE SIZE										PI	FL	MDD	OMC	*NMC		
			50.00	25.00	9.50	4.75	2.00	0.425	0.075	mm									
1	0+000	Silty Clay with Sand	100	94.13	86.34	75.61	67.10	23.88		A-2-4	2.67	20.00	6.73	2.00	11.50	7.00	15.80		
2	2+000	Clayey Sand	100	99.00	98.50	98.00	97.25	25.50		A-2-4	2.68	22.00	8.31	1.93	11.50	6.85	13.75		
3	4+000	Clay Sand with Laterite and Sandstone	100	90.70	78.14	79.90	68.06	32.08		A-2-4	2.68	22.00	7.73	2.05	10.50	7.35	12.00		
4	6+000	Clay Sand with Laterite and Sandstone	100	97.12	83.63	64.32	50.42	43.35	23.09	A-2-6	2.69	30.00	13.27	2.02	13.80	10.61	10.00		
5	8+000	Clay Sand with Laterite and Gravel	100	88.78	73.24	62.49	56.27	24.66		A-2-4	2.69	28.00	10.67	2.08	10.80	5.09	10.50		
6	10+000	Clay Sand with Laterite	100	90.72	77.12	67.43	63.46	31.04		A-2-4	2.67	22.00	7.86	2.09	10.30	13.23	17.75		
7	12+000	Clayey Sand	100	100	99.67	98.80	97.94	23.95		A-2-4	2.68	22.00	7.79	1.71	11.60	10.69	15.00		
8	14+000	Sandy Lean Clay	100	95.56	88.55	82.05	78.45	47.11		A-6	2.69	29.00	12.27	1.78	16.80	12.79	6.25		
9	16+000	Clay Sand with Laterite	100	95.87	84.34	76.93	73.53	34.51		A-2-6	2.69	28.00	11.04	1.93	12.50	5.52	5.60		
10	18+000	Clayey Sand	100	94.95	87.81	81.54	78.71	34.97		A-2-6	2.69	29.00	11.73	1.92	14.60	10.59	5.90		
11	20+000	Clayey Sand	100	100	98.20	97.39	95.68	25.67		A-2-4	2.68	22.00	7.73	1.84	11.40	7.66	11.65		
12	22+200	Clayey Sand	100	97.68	87.73	77.14	66.24	27.97		A-2-4	2.69	22.00	7.58	1.95	12.80	5.70	4.75		

Note : * N M C = Natural Moisture Content

SAMPLING DATE : 11 / 07 / 98 - 13 / 07 / 98

TESTED DATE : 14 / 07 / 98

TESTED BY	CHECKED BY
DIRECTOR	DIRECTOR

SUMMARIES OF THE TESTS RESULTS OBTAINED

PROJECT : Improvement of National Road No.9
 SUBMITTED BY :

DATE : 04 / 08 / 98

Sample No.	Km Location	Description	PARTICLE SIZE DISTRIBUTION							Classification	Specific Gravity	ATTERBERG LIMITS		AASHTO. T 99 COMP. S			REMARKS	
			50.00	25.00	9.50	4.75	2.00	0.425	0.075			F	P	MDD	OMC	*NMC		CBR
			mm															
13	24+400	Clay Sand with Laterite and Sandstone	-	100	97.46	94.08	58.85	49.46	33.80	A-2-7	2.71	41.00	2.08	11.50	11.71	8.55	15.80	
14	26+600	Clayey Sand	-	100	98.99	95.43	91.71	89.70	29.89	A-2-4	2.68	22.00	7.89	1.92	11.00	6.87	6.00	
15	28+800	Clayey Sand	-	100	96.06	88.20	78.80	74.53	28.60	A-2-4	2.67	22.00	7.26	2.01	11.10	6.58	8.60	
16	31+000	Sandy Lean Clay	-	100	98.85	92.19	83.56	80.74	72.22	A-7-6	2.70	41.00	17.28	1.89	14.00	7.52	1.40	
17	33+200	Sandy Lean Clay with Laterite and Sandstone	-	100	94.68	83.61	71.30	65.38	46.61	A-6	2.70	30.00	13.35	1.86	12.41	8.97	4.75	
18	35+400	Clay Sand with Laterite and Sandstone	100	98.19	91.15	77.43	62.86	57.23	28.30	A-2-4	2.68	22.00	7.74	2.09	110.44	5.71	24.00	
19	37+600	Sandy Lean Clay	-	100	98.08	91.29	78.28	57.99	37.80	A-4	2.69	25.00	8.93	1.98	11.50	5.87	5.35	
20	39+800	Clayey Sand	100	97.97	93.91	88.64	83.34	78.07	29.64	A-2-4	2.68	23.00	8.64	1.97	11.00	5.73	5.00	
21	42+000	Clayey Sand	-	100	99.03	98.18	97.47	94.80	43.40	A-4	2.68	24.00	9.53	1.92	12.60	6.60	3.70	
22	44+200	Sandy Lean Clay with Gravel and Sandstone	-	100	93.64	79.96	70.14	62.22	39.34	A-6	2.70	38.00	16.39	1.93	11.80	8.63	4.50	
23	46+500	Sandy Lean Clay with Laterite and Sandstone	-	100	95.23	79.80	71.70	69.97	38.04	A-6	2.69	38.00	16.75	1.90	13.50	9.23	5.25	
24	22+200	Sandy Lean Clay	-	100	98.97	92.36	79.33	74.97	53.02	A-7-6	2.72	41.00	17.83	1.81	15.00	7.68	0.65	

Note: * N M C = Natural Moisture Content

SAMPLING DATE : 11 / 07 / 98 - 13 / 07 / 98

TESTED DATE : 14 / 07 / 98

TESTED BY	CHECKED BY
DIRECTOR	DIRECTOR

SUMMARIES OF THE TESTS RESULTS OBTAINED

PROJECT : Improvement of National Road No.9
 SUBMITTED BY : _____

DATE : 29 / 07 / 98

Sample No.	Km Location	Description	PARTICLE SIZE DISTRIBUTION								Classification	Specific Gravity	ATTERBERG LIMITS			AASHTO. T 99 COMP. S			REMARKS
			% PASSING SIEVE SIZE										MDD	PL	PI	OMC	#NMC	CBR	
			50.00	25.00	9.50	4.75	2.00	0.425	0.075										
38/1	Q2 Ban Na Khou	Crushed Sandstone	-	100	72.06	56.54	44.90	31.87	9.73	A-2-4	-	18.90	5.26	2.10	10.30	-	95	36.15	
38/2	Q2 Ban Na Khou	Crushed Sandstone	-	100	71.22	53.55	41.38	29.79	11.00	A-2-4	-	19.00	5.57	2.09	11.00	-	36.30		
38/3	Q2 Ban Na Khou	Crushed Sandstone	-	100	72.01	53.25	41.58	28.98	8.89	A-2-4	-	19.00	5.60	2.09	11.00	-	32.00		
39/1	Q3 Phou Touip Mouip	Crushed Sandstone	-	100	69.90	49.95	37.69	26.17	8.17	A-2-4	-	18.20	5.02	2.04	10.32	-	43.95		
39/2	Q3 Phou Touip Mouip	Crushed Sandstone	-	100	70.40	53.30	42.11	30.36	10.69	A-2-4	-	18.50	5.26	2.04	11.00	-	36.05		
39/2	Q3 Phou Touip Mouip	Crushed Sandstone	-	100	71.39	54.69	41.00	29.33	9.67	A-2-4	-	18.50	5.02	2.04	11.30	-	38.50		

Note : * N M C = Natural Moisture Content

SAMPLING DATE : 11 / 07 / 98 - 13 / 07 / 98

TESTED DATE : 14 / 07 / 98

TESTED BY	DIRECTOR

SUMMARIES OF THE TESTS RESULTS OBTAINED

PROJECT : Improvement of National Road No.9
 SUBMITTED BY : -

DATE : 05 / 08 / 98

Sample No.	Location	Type of Material	PARTICLE SIZE DISTRIBUTION										Specific Gravity	Absorption %	Abrasion L.A %	Sulphate Resistance %	REMARKS	
			% PASSING SIEVE SIZE															
			75.00	63.00	50.00	38.10	25.00	19.00	12.50	9.50	4.75	2.36						
			mm															
36	Q1 A Tha Houa Xang	Gravel	-	100	95.31	47.57	8.09	1.46	0.03	-	-	-	-	2.65	0.26	-	0.08	
37/1	Q1 B Ban Done Xeng	Gravel	-	100	89.55	66.42	39.96	18.19	3.94	0.69	0.03	-	-	2.65	0.49	-	0.19	
37/2	Q1 B Ban Done Xeng	Gravel	-	-	100	87.16	39.09	10.02	0.94	0.21	0.03	-	-	2.65	0.56	-	0.21	
38/1	Q2 Ban Na Khou	Sandstone	-	-	-	-	-	-	-	-	-	-	-	2.65	0.86	48.10	1.33	
38/2	Q2 Ban Na Khou	Sandstone	-	-	-	-	-	-	-	-	-	-	-	2.64	0.67	49.10	1.33	
38/3	Q2 Ban Na Khou	Sandstone	-	-	-	-	-	-	-	-	-	-	-	2.64	0.76	48.30	1.66	
Sc/1	Q2 Ban Na Khou	Sandstone	-	-	-	-	-	-	-	-	-	-	-	-	-	36.10	-	Second.
Sc/2	Q2 Ban Na Khou	Sandstone	-	-	-	-	-	-	-	-	-	-	-	-	-	40.44	-	Field
Sc/3	Q2 Ban Na Khou	Sandstone	-	-	-	-	-	-	-	-	-	-	-	-	-	37.68	-	Survey
39/1	Q3 Phou Toup Moup	Sandstone	-	-	-	-	-	-	-	-	-	-	-	2.65	0.93	50.12	1.66	27/10/98
39/2	Q3 Phou Toup Moup	Sandstone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
39/3	Q3 Phou Toup Moup	Sandstone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40/1	Q4 Ban Saloy	Rhyolite	-	-	-	-	-	-	-	-	-	-	-	-	0.73	31.00	0.66	
40/2	Q4 Ban Saloy	Rhyolite	-	-	-	-	-	-	-	-	-	-	-	2.75	0.70	30.62	1.00	
40/3	Q4 Ban Saloy	Rhyolite	-	-	-	-	-	-	-	-	-	-	-	2.76	0.73	29.20	1.00	
40/4	Q4 Ban Saloy	Rhyolite	-	-	-	-	-	-	-	-	-	-	-	2.75	0.74	-	0.66	
40/5	Q4 Ban Saloy	Rhyolite	-	-	-	-	-	-	-	-	-	-	-	2.75	0.77	-	0.66	
40/6	Q4 Ban Saloy	Rhyolite	-	-	-	-	-	-	-	-	-	-	-	2.76	0.75	-	1.00	
41/1	Q5 Junction Road Ban Kong Hine	Sandstone	-	-	-	-	-	-	-	-	-	-	-	2.65	0.74	48.60	1.33	
41/2	Q5 Junction Road Ban Kong Hine	Sandstone	-	-	-	-	-	-	-	-	-	-	-	2.64	0.79	48.00	1.33	
42/1	Q6 Ban Houay Loye	Metamorphic	-	-	-	-	-	-	-	-	-	-	-	2.79	0.75	-	0.66	
42/1	Q6 Ban Houay Loye	Metamorphic	-	-	-	-	-	-	-	-	-	-	-	2.78	0.72	-	0.33	
42/1	Q6 Ban Houay Loye	Metamorphic	-	-	-	-	-	-	-	-	-	-	-	2.78	0.73	-	0.33	

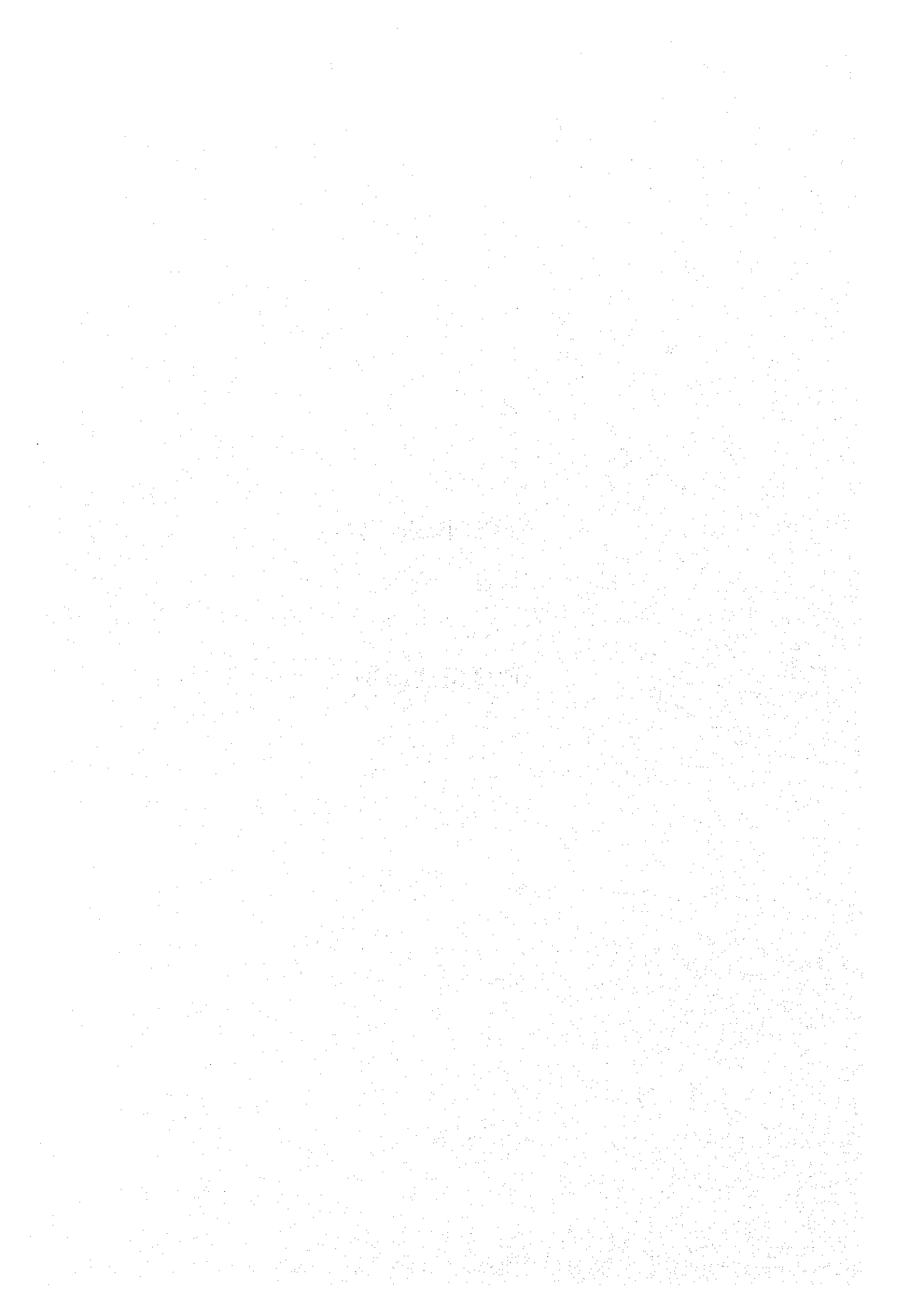
Note :

SAMPLING DATE :
 TESTED DATE :

TESTED BY	CHECKED BY
DIRECTOR	DIRECTOR

APPENDIX 11

UXO SEARCH



UXO SEARCH

Objective:

During the war years significant ground fighting and air bombardment occurred in Savannakhet province, all recognized roads leading across the province, especially National Road No.9 was fought over and heavily targeted for interdiction airstrikes. As a result of these activities, quantities of UXO remain today on and below the surface posing a serious risk to personnel and equipment involved in road construction project.

In order to ensure the safetyguard for the personnel and equipment during the implementation of the project, UXO search aims at finding out these remaining ordinances that proceeds the removal and disposal of them.

Technical Specification:

UXO support work for the project shall be divided into following 2 (two) stages. Detailed technical specification of the Stage 2, will be decided based on the results of the Stage 1.

Stage 1

Desk Top Review

The purpose of the desk top review shall be an assessment of the extent of UXO physical risks to the project staffs and equipment during all phases of the project.

- (1) The desk top review shall consist of a review of historical military information and contemporary UXO data.
- (2) The information gained by the route reconnaissance and village level interviews.
- (3) Report shall include the preparation of the UXO hazard assessment maps based on the findings of above review works among others.

Safety Support and Search

- (1) Preparation and Support

Safety awareness training/safeguarding support shall be conducted to protect the project staffs from UXO physical risk.

- (2) Pathfinding Search/Shallow Search

Safeguarding support shall be provided to the project staffs who are required to move off the paved surface where they will be exposed to the risk of UXO.

Special attention to the staffs shall be given to point out discrete points where pegs are to be given in, or shallow soil samples be taken.

(3) Deep Search

Where deep invasive testing is necessary for example deep soil sampling, trenching, bore holding, etc., a deep search in shallow steps shall be conducted.

Sampling Programme

(1) Sampling and Report

A sampling programme shall be required both to determine the full extent of the contamination along the route and to gather the fundamental data to the development of the necessary UXO clearance plan and specification.

A sampling programme shall be assessed following items in 2% overall samples of the project road section with 50 m in width.

Vegetation density, Terrain, Soil type, Metallic contamination density and other clearance factor.

(2) Preparation of Plan, Specification and Terms of Reference for UXO Search

Based on the data gathered during the desk top review and sampling programme, the Contractor shall prepare Plan, Specification and Terms of Reference for the implementation of UXO search.

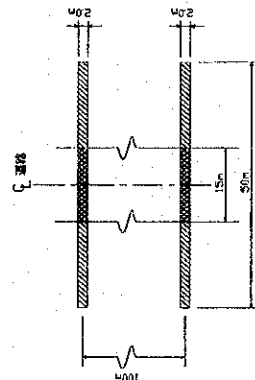
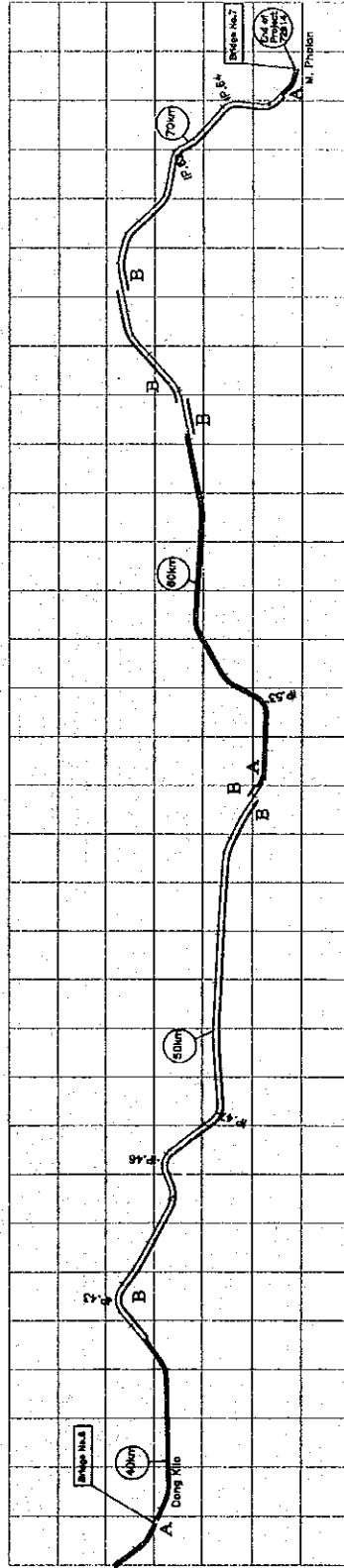
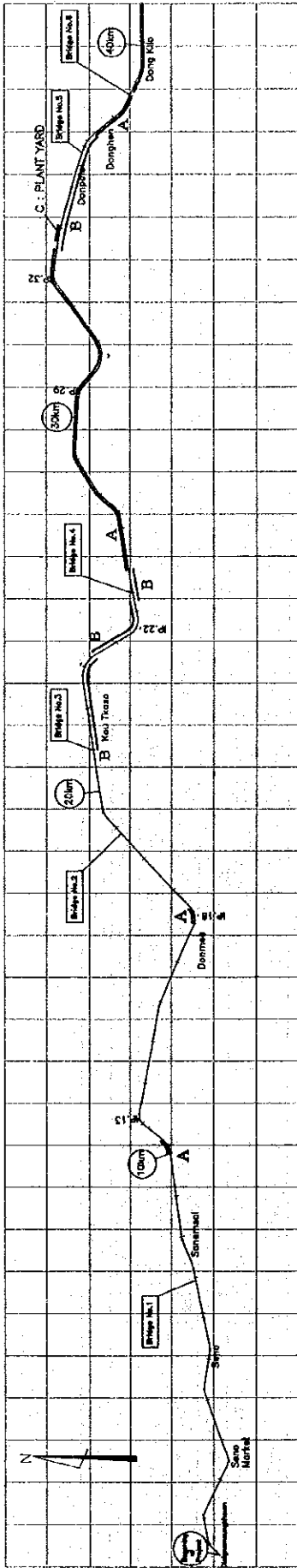
Stage 2

UXO Search

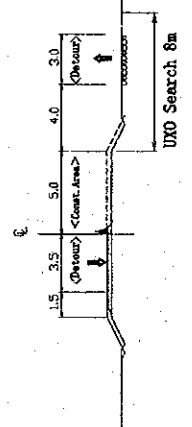
All specified area including the easement civil work area, borrow areas, bridges site access roads and traffic bypass potentially contaminated with UXO shall be searched to ensure the safety of personnel concerned the project in accordance with the Plan, Specification and Terms of Reference, which shall be prepared in Stage 1.

Result:

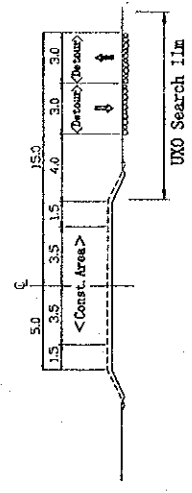
Survey map, List of discovered UXO and Clearance Certificate are attached hereinafter.



Stage 1 Works (2% overall sample)



A : Overlay Section
(23km x 8m = 18.40ha)



B : Reconstruction Section
(29.7km x 11m = 32.67ha)

Stage 2 Works (search and excavation)

A : Overlay Section	18.40ha
B : Reconstruction Section	32.67ha
C : PLANT YARD	2.58ha
TOTAL	53.65ha

U X O Search Map

Reference Number	Date UXO Located	UXO Type	Qty	Location	Date Reported to Lao Army (MCTPC)	Date Reported Cleared by Lao Army	UXO Site Checked
R9/01	11-Nov-98	BLU26/36 (Bomblet)	1	34.913 RS at 240cm-200mm deep	13-Nov-98	9-Dec-98	Checked Cleared
R9/02	12-Nov-98	Bomb Mortar 60mm HE	1	35.000 RS at 1,000 cm-100mm deep	13-Nov-98	9-Dec-98	Checked Cleared
R9/03	12-Nov-98	Bomb Mortar 60mm HE	1	35.004 RS at 1070cm-100mm deep	13-Nov-98	9-Dec-98	Checked Cleared
R9/04	12-Nov-98	BLU26/36 (Bomblet)	1	34.932 RS at 640cm-100mm deep	13-Nov-98	9-Dec-98	Checked Cleared
R9/05	13-Nov-98	Bomb Mortar 60mm HE	1	33.585 LS at 640cm-surface	30-Nov-98	9-Dec-98	Checked Cleared
R9/06	17-Nov-98	RPG motor, fuze, partial head	1	36.275RS at 1100cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/07	17-Nov-98	Grenade M203	1	36.275 RS at 1100cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/08	18-Nov-98	Bomb Mortar 60mm HE	1	36.410 RS at 1040cm-120mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/09	20-Nov-98	BLU26/36 (Bomblet)	1	34.824 LS at 1500cm-20mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/10	20-Nov-98	BLU26/36 (Bomblet)	1	34.8275 LS at 1550cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/11	20-Nov-98	BLU26/36 (Bomblet)	1	34.8275 LS at 5750cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/12	20-Nov-98	BLU26/36 (Bomblet)	1	34.8275 LS at 5950cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/13	20-Nov-98	BLU26/36 (Bomblet)	1	34.8355 LS at 5800cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/14	20-Nov-98	BLU26/36 (Bomblet)	1	34.844 LS 1300cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/15	20-Nov-98	BLU26/36 (Bomblet)	1	34.8465 LS at 6100cm-surface	30-Nov-98	9-Dec-98	Checked Cleared
R9/16	20-Nov-98	BLU26/36 (Bomblet)	1	34.8725 LS at 1700cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/17	20-Nov-98	BLU26/36 (Bomblet)	1	34.8765 LS at 2250cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/18	20-Nov-98	BLU26/36 (Bomblet)	1	34.882 LS at 5600cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/19	20-Nov-98	BLU26/36 (Bomblet)	1	34.756 LS at 1130cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/20	20-Nov-98	BLU26/36 (Bomblet)	1	34.749 LS at 7000cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/21	20-Nov-98	Grenade 40mm HE	1	34.721 LS at 1900cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/22	20-Nov-98	Grenade 40mm HE	1	34.743 LS at 750cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/23	20-Nov-98	Fuze Artillery 105mm	1	34.705 LS at 1700cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/24	21-Nov-98	BLU26/36 (Bomblet)	1	34.903 LS at 4750cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/25	21-Nov-98	BLU26/36 (Bomblet)	1	34.8965 LS at 6100cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/26	21-Nov-98	BLU26/36 (Bomblet)	1	34.961 LS at 1950cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/27	21-Nov-98	BLU26/36 (Bomblet)	1	34.975 LS at 2200cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/28	21-Nov-98	BLU26/36 (Bomblet)	1	34.995 LS at 400cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/29	21-Nov-98	BLU26/36 (Bomblet)	1	34.988 LS at 2450cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/30	21-Nov-98	BLU26/36 (Bomblet)	1	34.977 LS at 2400cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/31	21-Nov-98	BLU26/36 (Bomblet)	1	34.781 LS at 5900cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/32	21-Nov-98	BLU26/36 (Bomblet)	1	34.783 LS at 6950cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared

ANNEX B TO
FINAL SEARCH REPORT
DATED FEB 1999

R9/33	21-Nov-98	BLU26/36 (Bomblet)	1	34.783 LS at 725cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/34	21-Nov-98	BLU26/36 (Bomblet)	1	34.777 LS at 640cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/35	21-Nov-98	Grenade LCM 28	1	34.783 LS at 320cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/36	21-Nov-98	Fuze Artillery	1	34.783 LS at 310cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/37	21-Nov-98	Fuze Artillery	1	34.773 LS at 1400cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/38	21-Nov-98	BLU26/36 (Bomblet)	1	34.7865 LS at 5250cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/39	21-Nov-98	BLU26/36 (Bomblet)	1	34.794 LS at 6400-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/40	21-Nov-98	BLU26/36 (Bomblet)	1	34.794 LS at 6550cm-600mm up tree	30-Nov-98	9-Dec-98	Checked Cleared
R9/41	21-Nov-98	Projectile 57mm HE	1	34.794 LS at 6550cm-600mm up tree	30-Nov-98	9-Dec-98	Checked Cleared
R9/42	21-Nov-98	BLU26/36 (Bomblet)	1	34.7955 LS at 7200cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/43	21-Nov-98	BLU26/36 (Bomblet)	1	34.8015 LS at 5500cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/44	21-Nov-98	BLU26/36 (Bomblet)	1	34.806 LS at 6400cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/45	21-Nov-98	BLU26/36 (Bomblet)	1	34.8015 LS at 3100cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/46	21-Nov-98	BLU26/36 (Bomblet)	1	34.809 LS at 6400cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/47	21-Nov-98	BLU26/36 (Bomblet)	1	34.817 LS at 1900cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/48	21-Nov-98	Grenade Det. 40mm M397	1	34.812 LS at 6400cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/49	21-Nov-98	BLU26/36 (Bomblet)	2	36.381 RS at 670cm-620mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/50	22-Nov-98	Grenade 40mm HE	1	26.081 LS at 750cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/51	23-Nov-98	Bomb Mortar 82mm HE	1	36.574 RS at 700cm-500mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/52	23-Nov-98	Bomb Mortar 60mm HE	1	26.8015 LS at 760cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/53	23-Nov-98	Bomb Mortar 60mm HE	1	26.710 LS at 410cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/54	24-Nov-98	Bomb Mortar 60mm HE	1	30.839 LS at 300cm-25mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/55	24-Nov-98	Grenade 40mm HE	1	30.738 LS at 650cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/56	24-Nov-98	Grenade 40mm HE	2	27.221 LS at 700cm-35mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/57	26-Nov-98	Grenade 40mm HE	1	29.516 LS at 750cm-200mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/58	26-Nov-98	Projectile 20mm HE	4	28.973 LS at 600cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/59	26-Nov-98	Bomb Mortar 81mm HE	1	28.162 LS at 700cm-surface	30-Nov-98	9-Dec-98	Checked Cleared
R9/60	28-Nov-98	Projectile 20mm HE	1	45.595 RS at 250cm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/61	28-Nov-98	Projectile 20mm HE	1	45.576 RS at 500cm-90mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/62	28-Nov-98	Projectile 20mm HE	1	45.515 RS at 900cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/63	29-Nov-98	Projectile 20mm HE	1	46.582 RS at 450cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/64	29-Nov-98	Bomb Mortar 60mm HE	1	47.626 RS at 800cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/65	29-Nov-98	BLU26/36 (Bomblet)	1	45.209 RS at 300mm-100mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/66	30-Nov-98	BLU26/36 (Bomblet)	1	50.005 RS at 950cm-50mm deep	30-Nov-98	9-Dec-98	Checked Cleared

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R9/67	30-Nov-98	Projectile 57mm HE	1	48.413 RS at 650cm-150mm deep	30-Nov-98	9-Dec-98	Checked Cleared
R9/68	1-Dec-98	Bomb Mortar 60mm HE	1	51.639 RS at 550cm-300mm deep	6-Dec-98	9-Dec-98	Checked Cleared
R9/69	1-Dec-98	Bomb Mortar 60mm HE	1	51.489 RS at 850cm-50mm deep	6-Dec-98	9-Dec-98	Checked Cleared
R9/70	1-Dec-98	Grenade 40mm HE	1	51.739 RS at 500cm-200mm deep	6-Dec-98	9-Dec-98	Checked Cleared
R9/71	3-Dec-98	Bomb Mortar 60mm HE	1	21.488 RS at 320cm-100mm deep	6-Dec-98	9-Dec-98	Checked Cleared
R9/72	4-Dec-98	Bomb Mortar 60mm HE	1	24.711 LS at 900cm-150mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/73	6-Dec-98	Bomb Aircraft 20lb Frag M41A2	1	52.567 RS at 1100cm-600mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/74	6-Dec-98	Bomb Mortar 60mm HE	1	52.800 RS at 500cm-120mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/75	7-Dec-98	Bomb Mortar 60mm HE	1	53.305 RS at 750cm-200mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/76	7-Dec-98	Fuze Artillery 105mm	1	51.429 RS at 1000cm-75mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/77	7-Dec-98	Fuze Artillery 105mm	1	51.389 RS at 1010cm-200mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/78	7-Dec-98	Bomb Mortar 60mm HE	1	51.389 RS at 1000cm-200mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/79	7-Dec-98	Bomb Mortar 60mm HE	1	54.086 RS at 250cm-300mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/80	7-Dec-98	Bomb Mortar 60mm HE	1	54.055 RS at 400cm-200mm deep	8-Dec-98	Reported cleared	Checked Cleared
R9/81	8-Dec-98	Bomb Mortar 60mm HE	1	55.591 LS at 500cm-500mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/82	8-Dec-98	Bomb Mortar 60mm HE	1	54.647 RS at 460cm-200mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/83	8-Dec-98	Grenade DEF 37	1	54.696 RS at 900cm-20mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/84	8-Dec-98	Bomb Mortar 60mm HE	1	54.700 RS at 800cm-1000mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/85	9-Dec-98	Bomb Mortar 60mm HE	1	50.053 RS at 1100cm-550mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/86	9-Dec-98	Bomb Mortar 60mm HE	1	52.533 RS at 1000cm-489mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/87	10-Dec-98	Grenade 40mm HE	1	58.594 RS at 700cm-10mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/88	10-Dec-98	Grenade Hand Chinese	1	58.579 RS at 400cm-30mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/89	10-Dec-98	BLU24 (Bomblet)	1	61.572 RS at 550cm-250mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/90	10-Dec-98	BLU24 (Bomblet)	1	61.571 RS at 600cm-250mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/91	10-Dec-98	Projectile 20mm HE	1	59.808 RS at 50cm-50mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/92	10-Dec-98	Projectile 20mm HE	1	59.809 RS at 300cm-50mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/93	10-Dec-98	Grenade 40mm HE	1	60.473 RS at 450cm-50mm deep	11-Dec-98	Reported cleared	Checked Cleared
R9/94	11-Dec-98	Projectile 37mm HE	1	60.738 RS at 700cm-120mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/95	11-Dec-98	Grenade 40mm HE	1	60.7575 RS at 450cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/96	11-Dec-98	Grenade Hand Vietnamese	1	62.982 RS at 250cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/97	11-Dec-98	Projectile 57mm HE	1	62.329 RS at 600cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/98	12-Dec-98	Bomb Mortar 82mm Illum.	1	63.800 RS at 650cm-200mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/99	12-Dec-98	Grenade 40mm HE	1	65.089 LS at 450cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/100	12-Dec-98	Bomb Mortar 60mm HE	1	65.196 LS at 900cm-300mm deep	17-Dec-98	Reported cleared	Checked Cleared

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R9/101	12-Dec-98	Round 57mm Recoilless Rifle	1	65.382 LS at 900cm-200mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/102	12-Dec-98	Bomb Mortar 81mm HE	1	65.652 LS at 650cm-200mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/103	12-Dec-98	Bomb Mortar 60mm HE	1	63.861 LS at 800cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/104	12-Dec-98	Bomb Mortar 60mm HE	1	63.849 LS at 700cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/105	12-Dec-98	Bomb Mortar 60mm HE	1	64.125 LS at 1100cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/106	12-Dec-98	Projectile 57mm HE	1	63.816 LS at 700cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/107	12-Dec-98	Grenade Hand Fragmentation	3	64.130 LS at 900cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/108	12-Dec-98	Bomb Mortar 60mm HE	1	64.053 LS at 1000cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/109	12-Dec-98	Bomb Mortar 60mm HE	1	64.006 LS at 1050cm-10mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/110	12-Dec-98	Bomb Mortar 50mm HE	1	64.130 LS at 900cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/111	12-Dec-98	Bomb Mortar 50mm HE	1	64.130 LS at 900cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/112	12-Dec-98	Bomb Mortar 50mm HE	1	64.139 LS at 1000cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/113	12-Dec-98	Bomb Mortar 60mm HE	1	58.866 RS at 400cm-475mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/114	13-Dec-98	Projectile 37mm HE	1	65.810 LS at 400cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/115	13-Dec-98	Bomb Mortar 60mm HE	1	66.299 LS at 900cm-200mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/116	13-Dec-98	Bomb Mortar 60mm HE	1	66.205 LS at 300cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/117	13-Dec-98	Bomb Mortar 60mm HE	1	66.629 RS at 850cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/118	13-Dec-98	Projectile 76mm HE	1	66.717 RS at 800cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/119	13-Dec-98	Grenade 40mm HE	1	64.902 LS at 800cm-30mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/120	13-Dec-98	Grenade 40mm HE	1	64.940 LS at 350cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/121	13-Dec-98	Bomb Mortar 60mm HE	1	67.177 RS at 800cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/122	13-Dec-98	Rocket 3.5" Antitank	1	67.541 RS at 700cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/123	13-Dec-98	Bomb Mortar 60mm HE	1	67.402 RS at 1000cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/124	14-Dec-98	Grenade (mine) Trip-wire	1	68.069 RS at 350cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/125	14-Dec-98	BLU24 (Bomblet)	1	68.015 RS at 900cm-200mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/126	14-Dec-98	Bomb Mortar 60mm HE	1	68.442 RS at 150cm-100 mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/127	14-Dec-98	Igniter Bomb Napalm	1	68.629 RS at 250cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/128	14-Dec-98	Bomb Mortar 60mm HE	1	68.746 RS at 700cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/129	14-Dec-98	Grenade 40mm HE	1	68.830 RS at 300cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/130	14-Dec-98	Grenade 40mm HE	1	68.823 RS at 500cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/131	14-Dec-98	Grenade 40mm HE	1	67.780 RS at 1000cm-40mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/132	14-Dec-98	Motor Rocket 3.5" Antitank	1	63.813 RS at 650-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/133	15-Dec-98	Bomb Mortar 82mm HE	1	64.905 RS at 900cm-810mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/134	15-Dec-98	Bomb Mortar 60mm HE	1	68.895 RS at 600cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared

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R9/135	15-Dec-98	Projectile 20mm HE	1	68.890 RS at 300cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/136	15-Dec-98	Projectile 57mm HE	1	68.918 RS at 200cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/137	15-Dec-98	Bomb Mortar 60mm HE	1	68.955 RS at 500cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/138	15-Dec-98	Bomb Mortar 60mm HE	1	68.872 RS at 850cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/139	15-Dec-98	Projectile 57mm HE	1	68.914 RS at 500cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/140	15-Dec-98	Grenade 40mm HE	1	69.000 RS at 302cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/141	15-Dec-98	Projectile 76mm HE	2	69.017 RS at 403cm-300mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/142	15-Dec-98	Round 57mm Recoilless Rifle	1	68.992 RS at 50cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/143	15-Dec-98	BLU 3B (Bomblet)	1	68.894 RS at 700cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/144	15-Dec-98	Grenade 40mm HE	1	68.912 RS at 700cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/145	15-Dec-98	Grenade 40mm HE	1	68.9905 RS at 700cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/146	15-Dec-98	Grenade 40mm HE	1	69.091 RS at 800cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/147	15-Dec-98	Grenade 40mm HE	1	68.891 RS at 1100cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/148	15-Dec-98	Bomb Mortar 60mm HE	1	70.111 RS at 300cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/149	15-Dec-98	Bomb Mortar 60mm HE	1	70.147 RS at 500cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/150	15-Dec-98	Bomb Mortar 60mm HE	5	70.136 RS at 600cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/151	15-Dec-98	Projectile 57mm HE	1	70.103 RS at 1100cm-surface	17-Dec-98	Reported cleared	Checked Cleared
R9/152	15-Dec-98	Projectile 20mm HE	6	70.175 RS at 150cm-10mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/153	15-Dec-98	Projectile 20mm HE	4	70.332 RS at 150cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/154	15-Dec-98	Projectile 20mm HE	2	70.382 RS at 100cm-30mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/155	15-Dec-98	Bomb Mortar 60mm HE	1	70.383 RS at 500cm-150mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/156	15-Dec-98	Bomb Mortar 60mm HE	1	70.313 RS at 900cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/157	15-Dec-98	Projectile 20mm HE	3	70.435 RS at 600cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/158	15-Dec-98	Projectile 20mm HE	5	70.468 RS at 200cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/159	15-Dec-98	Projectile 20mm HE	1	70.651 RS at 300cm-10mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/160	15-Dec-98	Grenade 40mm HE	1	70.702 RS at 500cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/161	16-Dec-98	Bomb Mortar 60mm HE	1	71.714 RS at 500cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/162	16-Dec-98	Bomb Mortar 60mm HE	1	71.789 RS at 500cm-250mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/163	16-Dec-98	Bomb Mortar 60mm HE	1	71.825 RS at 700cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/164	16-Dec-98	Bomb Mortar 60mm HE	2	71.835 RS at 900cm-200mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/165	16-Dec-98	Projectile 57mm HE	1	71.998 RS at 800cm-100mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/166	16-Dec-98	Mine Anti-personnel	1	72.101 RS at 900cm-200mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/167	16-Dec-98	Projectile 20mm HE	12	70.398 RS at 50cm-50mm deep	17-Dec-98	Reported cleared	Checked Cleared
R9/168	16-Dec-98	Bomb Mortar 60mm HE	1	71.182 RS at 800cm-40mm deep	17-Dec-98	Reported cleared	Checked Cleared

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R9/169	16-Dec-98	BLU26/36 (Bomblet)	1	71.206 RS at 300cm-100mm deep	17-Dec-98	Reported cleared	Checked
R9/170	16-Dec-98	Bomb Mortar 60mm HE	1	67.975 RS at 600cm-420mm deep	17-Dec-98	Reported cleared	Checked
R9/171	16-Dec-98	Mine Anti-personnel	1	67.933 RS at 605cm-512mm deep	17-Dec-98	Reported cleared	Checked
R9/172	17-Dec-98	Round 76mm Recoilless Rifle	1	72.491 RS at 705cm-surface	21-Dec-98	Reported cleared	Checked
R9/173	17-Dec-98	Projectile 57mm HE	1	68.896 RS at 1000cm-50mm deep	21-Dec-98	Reported cleared	Checked
R9/174	17-Dec-98	Grenade 40mm HE	1	69.137 RS at 300cm-100mm deep	21-Dec-98	Reported cleared	Checked
R9/175	17-Dec-98	Projectile 57mm HE	1	68.905 RS at 1100cm-50mm deep	21-Dec-98	Reported cleared	Checked
R9/176	17-Dec-98	Mine Anti-personnel	1	71.366 RS at 600cm-300mm deep	21-Dec-98	Reported cleared	Checked
R9/177	17-Dec-98	Bomb Mortar 82mm HE	1	71.680 RS at 200cm-40mm deep	21-Dec-98	Reported cleared	Checked
R9/178	17-Dec-98	Rocket 3.5" Antitank	1	69.699 RS at 100cm-100mm deep	21-Dec-98	Reported cleared	Checked
R9/179	17-Dec-98	Rocket 3.5" Antitank	1	69.718 RS at 300cm-250mm deep	21-Dec-98	Reported cleared	Checked
R9/180	17-Dec-98	Projectile 105mm HE	1	71.037 RS at 1100cm-200mm deep	21-Dec-98	Reported cleared	Checked
R9/181	17-Dec-98	Projectile 105mm HE	1	71.050 RS at 1100cm-100mm deep	21-Dec-98	Reported cleared	Checked
R9/182	17-Dec-98	Grenade 40mm HE	1	36.272 RS at 1100cm-150mm deep	21-Dec-98	Reported cleared	Checked
R9/183	18-Dec-98	Projectile 57mm HE	1	68.912 RS at 1000cm-250mm deep	21-Dec-98	Reported cleared	Checked
R9/184	18-Dec-98	Grenade 40mm HE	1	69.105 RS at 1100cm-150mm deep	21-Dec-98	Reported cleared	Checked
R9/185	18-Dec-98	Grenade 40mm HE	1	69.123 RS at 700cm-150mm deep	21-Dec-98	Reported cleared	Checked
R9/186	18-Dec-98	Grenade Fragmentation M1930	1	69.167 RS at 600cm-50mm deep	21-Dec-98	Reported cleared	Checked
R9/187	18-Dec-98	Grenade Fragmentation M1931	1	69.625 RS at 601cm-350mm deep	21-Dec-98	Reported cleared	Checked
R9/188	18-Dec-98	Projectile 57mm HE	1	69.178 RS at 410cm-surface	21-Dec-98	Reported cleared	Checked
R9/189	18-Dec-98	Bomb Mortar 60mm HE	1	69.338 RS at 207cm-100mm deep	21-Dec-98	Reported cleared	Checked
R9/190	18-Dec-98	Mine Anti-personnel M16	1	69.704 RS at 712cm-165mm deep	21-Dec-98	Reported cleared	Checked
R9/191	18-Dec-98	Rocket 3.5" Antitank	1	69.629 RS at 800cm-210mm deep	21-Dec-98	Reported cleared	Checked
R9/192	18-Dec-98	Projectile 20mm HE	1	69.637 RS at 800cm-110mm deep	21-Dec-98	Reported cleared	Checked
R9/193	18-Dec-98	Bomb Mortar 82mm HE	1	69.546 RS at 700cm-250mm deep	21-Dec-98	Reported cleared	Checked
R9/194	18-Dec-98	Bomb Mortar 82mm HE	1	72.085 RS at 802cm-200mm deep	21-Dec-98	Reported cleared	Checked
R9/195	19-Dec-98	Projectile 105mm HE	1	40.803 RS at 310cm-30mm deep	21-Dec-98	Reported cleared	Checked
R9/196	19-Dec-98	Bomb Mortar 60mm HE	1	37.630 RS at 800cm-250mm deep	21-Dec-98	Reported cleared	Checked
R9/197	19-Dec-98	Round 57mm Recoilless Rifle	1	37.630 RS at 800cm-250mm deep	21-Dec-98	Reported cleared	Checked
R9/198	19-Dec-98	Rocket 3.5" Antitank	2	71.596 RS at 1100cm-55mm deep	21-Dec-98	Reported cleared	Checked
R9/199	21-Dec-98	Grenade 40mm HE	1	39.172 RS 50cm-50mm deep	22-Dec-98	Reported cleared	Checked
R9/200	21-Dec-98	Grenade Hand French 1930	1	39.220 RS at 600cm-250mm deep	22-Dec-98	Reported cleared	Checked
			Total UXO	240			

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LAO PEOPLE'S DEMOCRATIC REPUBLIC
Peace Independence Democracy Unity Prosperity

Ministry of Communication Transport Post and Construction
Communication Department

No. 0229 - 111

Vientiane, February 19, 1999

Certificate of Completion

This is to certify the completion of removal works of UXO found in specified areas of the Contract between Katahira & Engineers International Japan and Milsearch Australia for the UXO search under the Basic Design Study on the Project for Improvement of National Road No. 9 in Lao People's Democratic Republic.

This Certificate is hereby issued in accordance with Clause 5. (4) of Attachment, Minutes of Discussion, Signed by Mr. Sommad PHOLSENA, Director General Communication Department, MCTPC and Mr. Satoshi UMENAGA, Leader of JICA Study Team on October 29, 1998.



Sommad PHOLSENA
Director General
Communication Department,

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JICA

