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TECHNICAL REPORT NO. 3-726

MOBILITY ENVIRONMENTAL RESEARCH STUDY
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

Volume VIII

TERRAIN FACTOR-FAMILY MAPS OF SELECTED AREAS



Code 25

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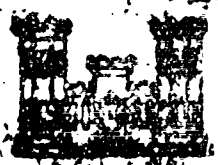
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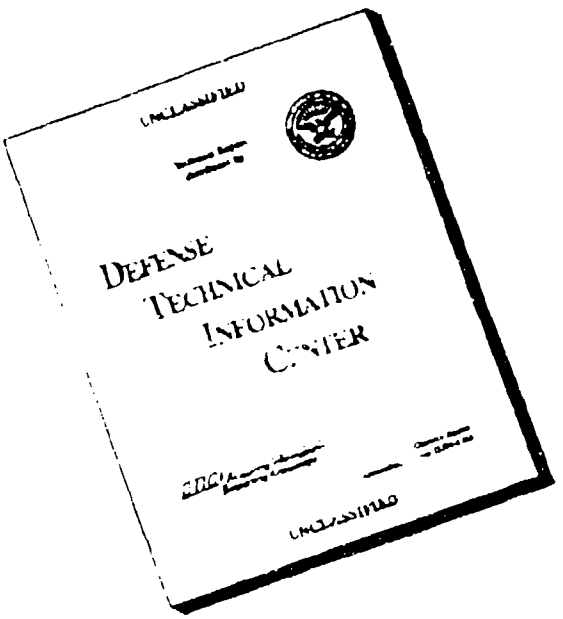
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TERRAIN FOR GROUND MOBILITY

Volume VIII

TERRAIN FACTOR-FAMILY MAPS OF SELECTED AREAS



June 1966

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FOREWORD

This study constitutes a portion of the Mobility Environm
by the Office, Secretary of Defense, Advanced Research Projects
Area Conflict, for which the U. S. Army Engineer Waterways Exp
tractor, and the U. S. Army Materiel Command (AMC) is the se
of Project MERS was to determine the effects of physical environ
east Asia, on the performance of cross-country ground contact
provide data which could be used to improve both the design and en
for this study were allocated to WES through AMC under ARPA Or

The terrain factor-family maps presented in this volume
respc ibility for a factor family. The methods used and techniqu
discussed by factor family in the following volumes of this repor
II, Surface Geometry; Vol IV, Vegetation; and Vol V, Hydrolog

2

FOREWORD

portion of the Mobility Environmental Research Study (MERS), sponsored
se, Advanced Research Projects Agency (ARPA), Directorate of Remote
Army Engineer Waterways Experiment Station (WES) is the prime con-
eriel Command (AMC) is the service agent. An aspect of the mission
e the effects of physical environments, with emphasis on those of South-
cross-country ground contact vehicles. A long-range objective was to
:o improve both the design and employment of such machines. The funds
ES through AMC under ARPA Order No. 400.

/ maps presented in this volume were prepared by four teams, each with
The methods used and techniques developed to compile these maps are
following volumes of this report series: Vol II, Surface Composition;
Vegetation; and Vol V, Hydrologic Geometry.

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NAKHON SAWAN STUDY AREA

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		Plat

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CHANTHAB

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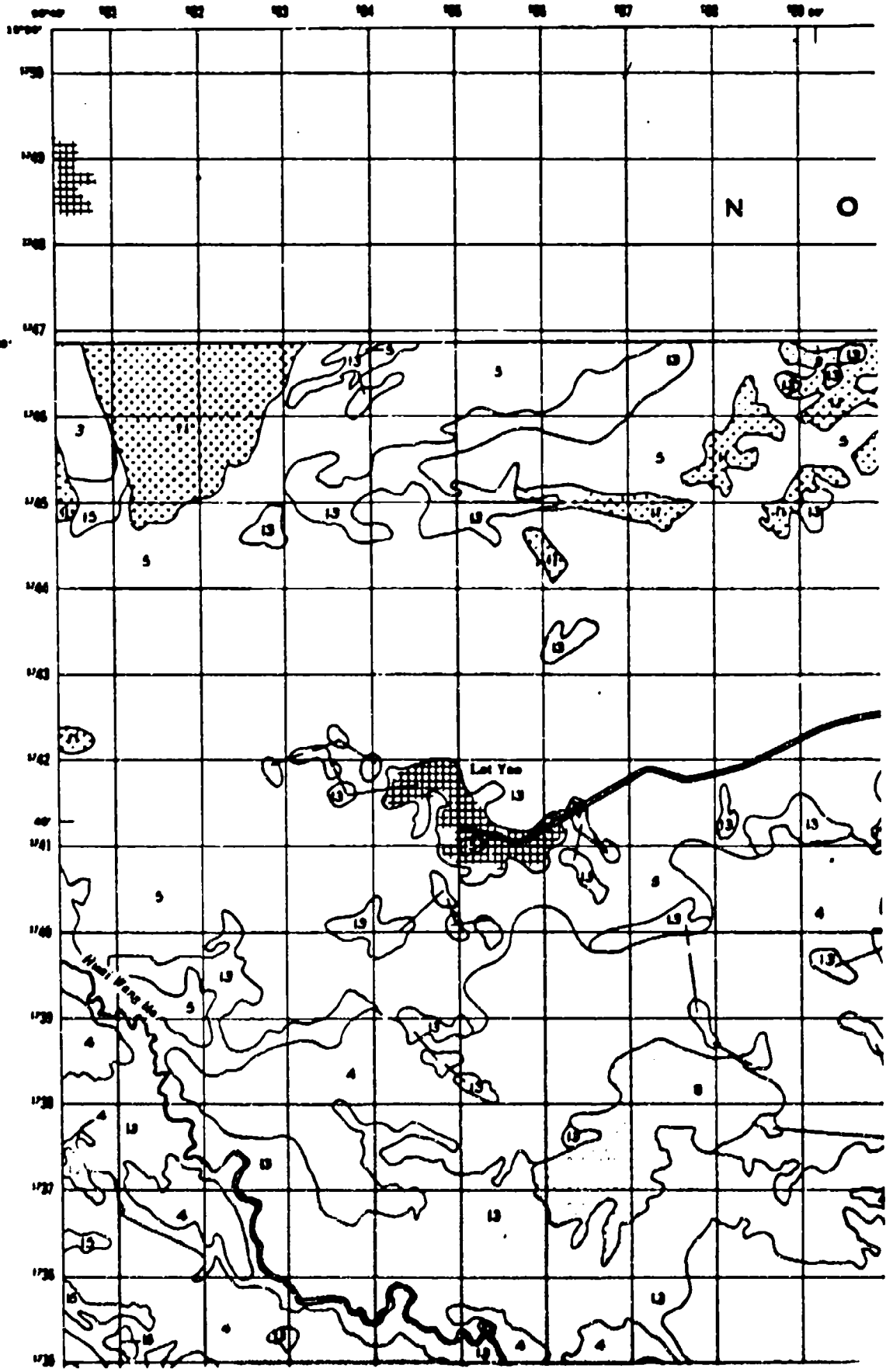
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	Plate 3.4a	Surface Composition
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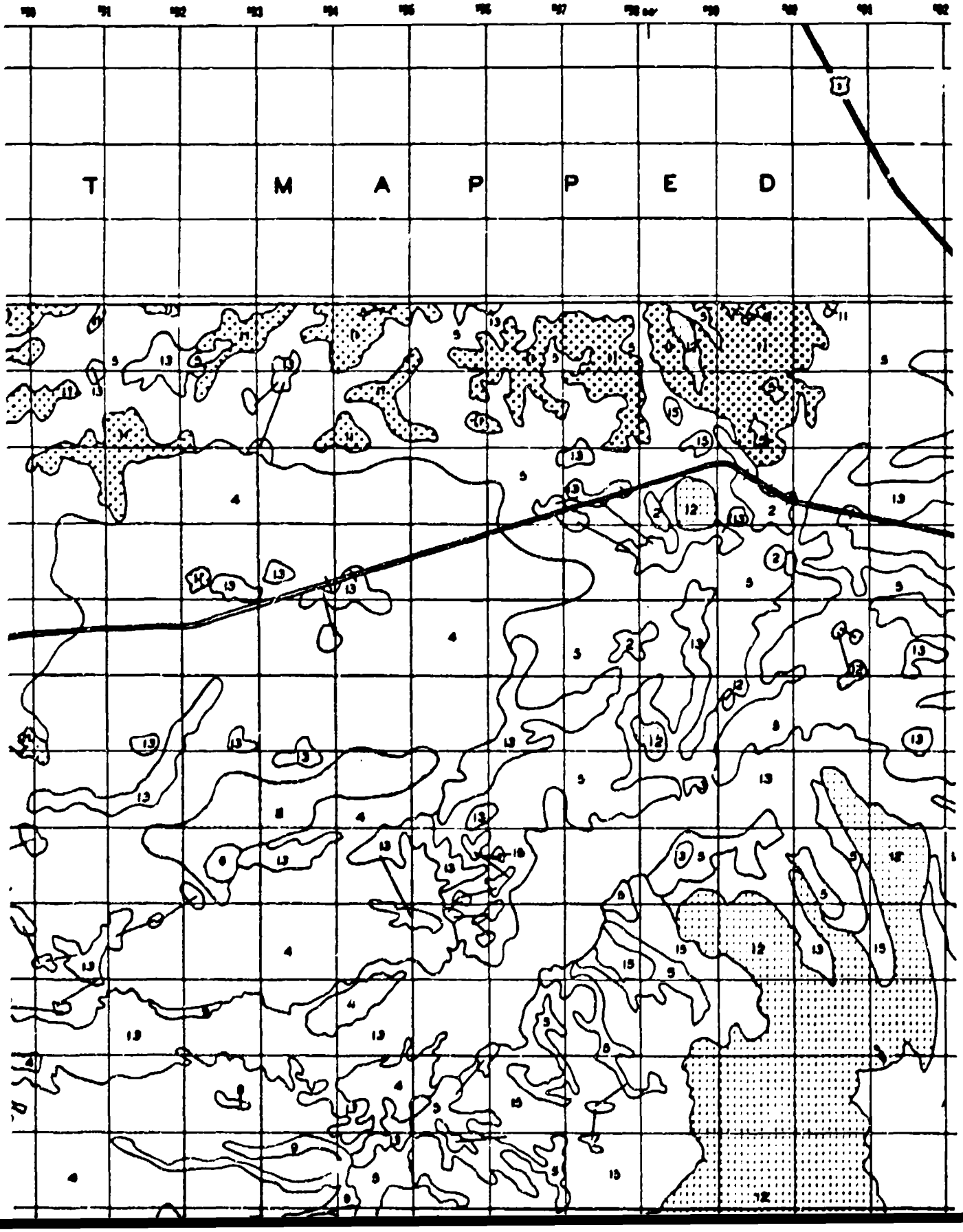
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	Plate 6.4c	Vegetation
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N
O
Lai Yun
West Wind Mt.

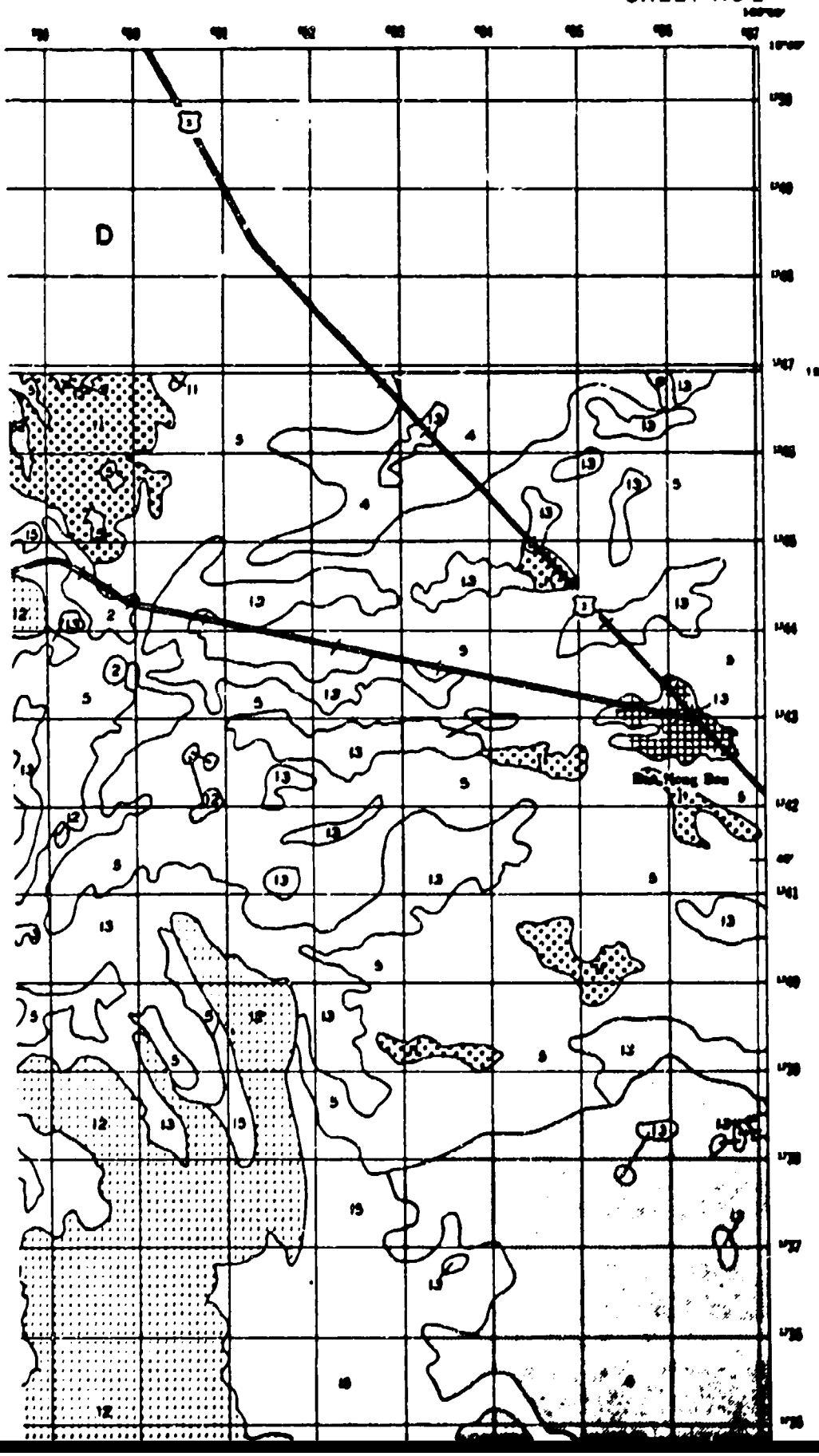
2

NAKHON SAWAN



B

SHEET NS I



Unit	Soil Mass Strength: Remolded Undrained (tsf)	Soil Mass Strength: Undisturbed Undrained (tsf)	Residual Shear Strength: Friction Angle (ϕr) (deg)	Residual Shear Strength: Cohesion (cr) (kg/cm²)
	10-25	25-50	>1	>0.07
2	25-50	50-100	0-1	0-0.07
3	25-50*	50-100	0-1	0-0.07
4	25-50	>100	0-1	0-0.07
5	25-50*	>100	0-1	0-0.07
6	50-100	50-100	0-1	0-0.07
7	50-100	50-100	0-1	0-0.07
8	50-100	>100	0-1	0-0.07
9	50-100	>100	0-1	0-0.07
10	50-100	>100	>1	0-0.07
11	50-100*	>100	0-1	0-0.07
12	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
	Comp Less of 50-1/10 and >100	>100	0-1	0-0.07
15	Comp Less of 50-1/10 and >100	>100	0-1	>0.07

Below: Bench cuttes are rather brittle.

Shear strength at zero normal load.

Angle of internal friction.

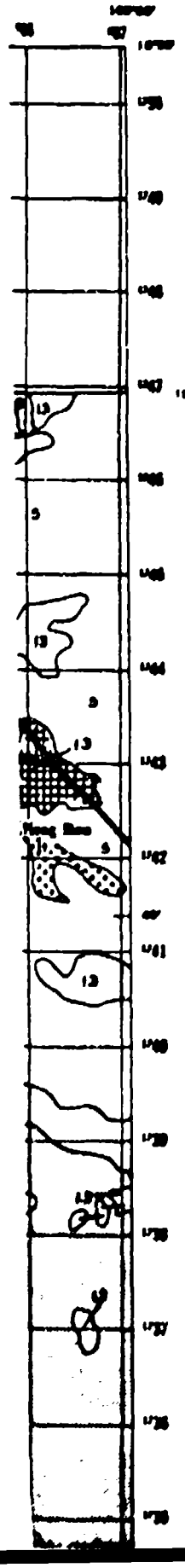
* Residual shear strength less than 30 percent of strengths commonly observed are 50-100 for

This is not shown on this map.

NS I

4

SHEET NS I



LEGEND

Unit	Shear Strength — Residual Envelope: c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Shear Strength — Residual Envelope: c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Shear Strength — Conditions where residual strength governs: c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg
	Residual Strength	Residual Strength								
	RQD	SCR								
	10-75	75-86	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Residual strength governs	
7	75-90	86-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Residual strength governs	
3	75-90*	86-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Residual strength governs	
12	75-90	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
2	75-90*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	90-100	90-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Residual strength governs	
8	90-100	90-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Residual strength governs	
11	90-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	90-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	90-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Residual strength governs	
10	90-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
14	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
5	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
13	Complex of 90-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 90-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Residual strength governs	

Notes: Black areas are water bodies.

c_{ur} Shear strength at zero normal load.

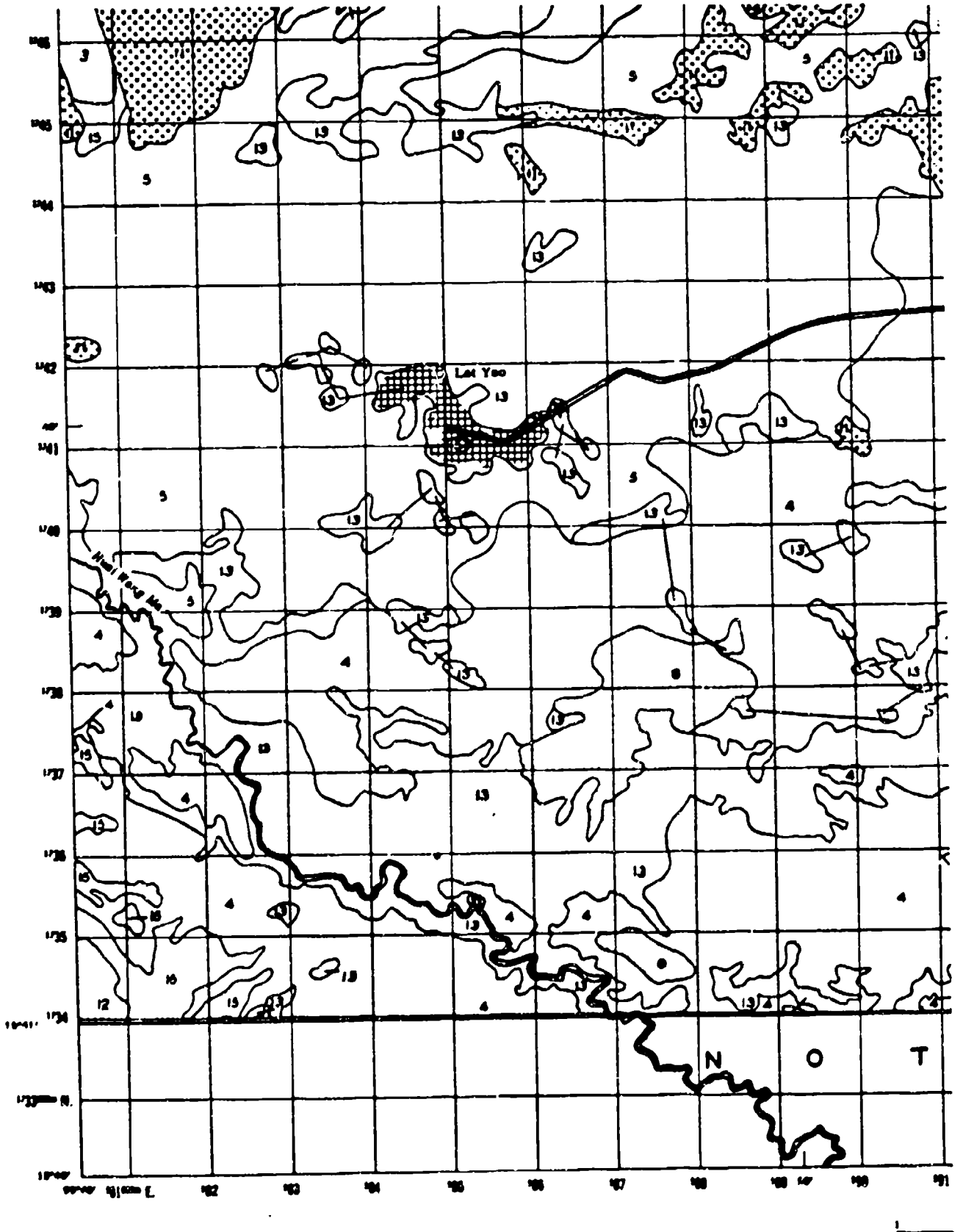
ϕ_{ur} Angle of internal friction.

* Residual conditions has been shown to possess probability of occurrence during the wet season. Lowest strengths actually observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

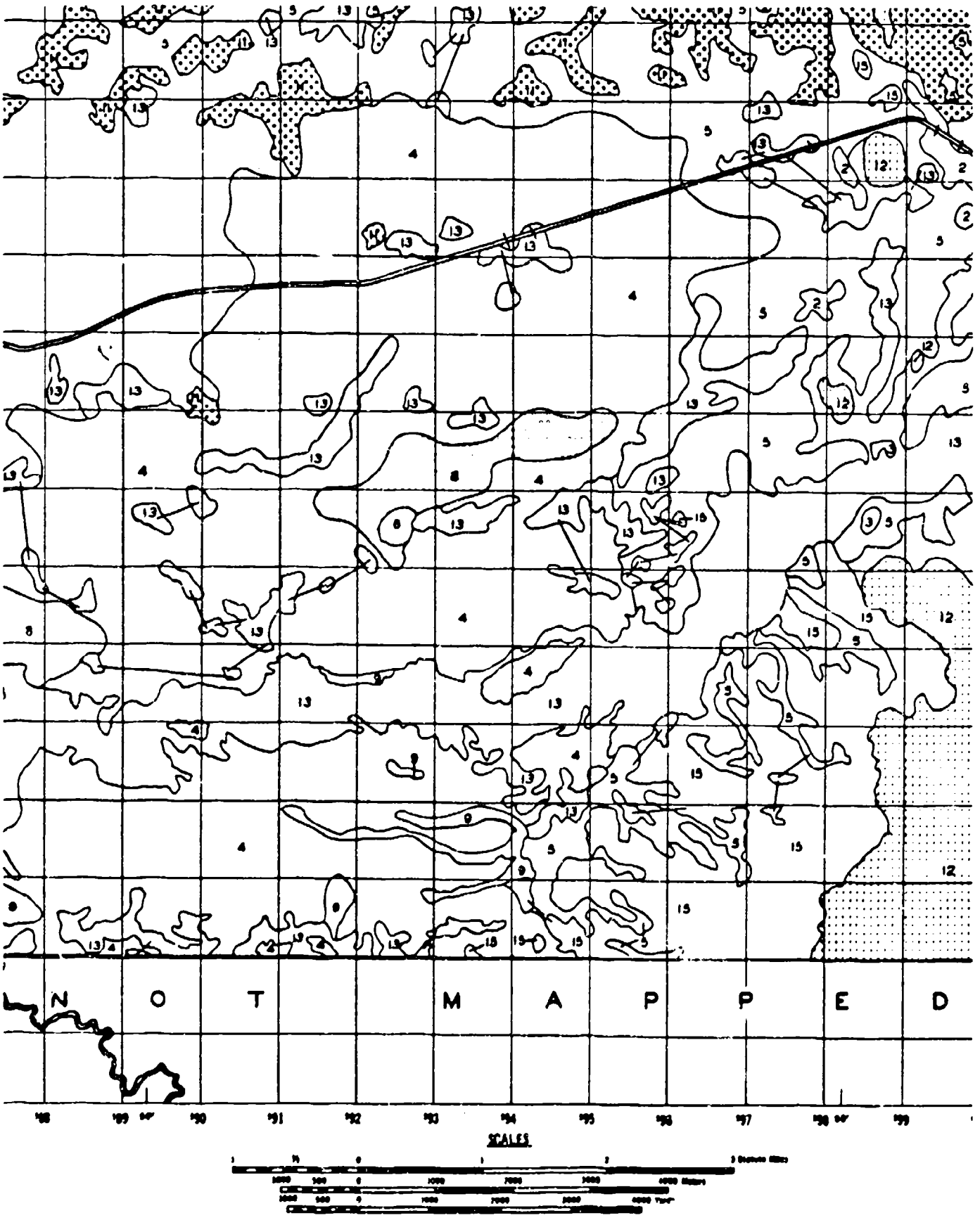
INDEX TO ADJOINING SHEETS

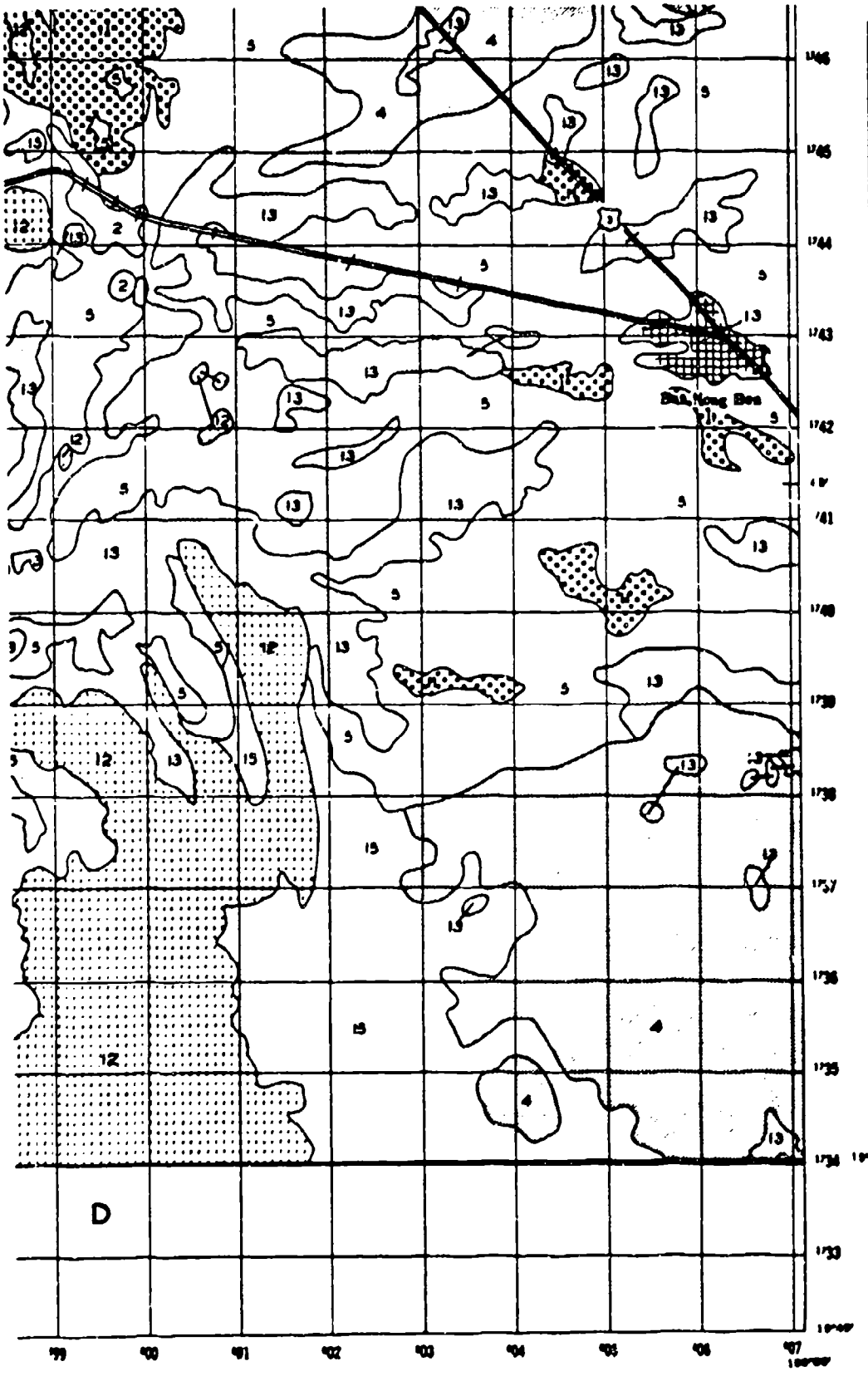
NS I	NS II	NS III
	NS V	NS VI



ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


NOT MAPPED
SCALES



Unit	Soil Mass Strength: Maximum Moisture (%)	Soil Mass Strength: Minimum Moisture (%)	Maximum Max: c_{ur} (psi)	Maximum Max: c_{ur} (kg/cm²)
	10-25	25-60	0-1	0-0.07
2	25-60	60-100	0-1	0-0.07
3	25-60*	60-100	0-1	0-0.07
	25-60	>100	0-1	0-0.07
5	25-60*	>100	0-1	0-0.07
6	60-100	60-100	0-1	0-0.07
	60-100	60-100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
9	60-100	>100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
	60-100*	>100	0-1	0-0.07
	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07
15	Complex of 60-100 and >100	>100	0-1	0-0.07

Notes: Black areas are water bodies.

c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent strengths commonly observed are 60-100 for

Units do not occur on this map.

INDEX 1

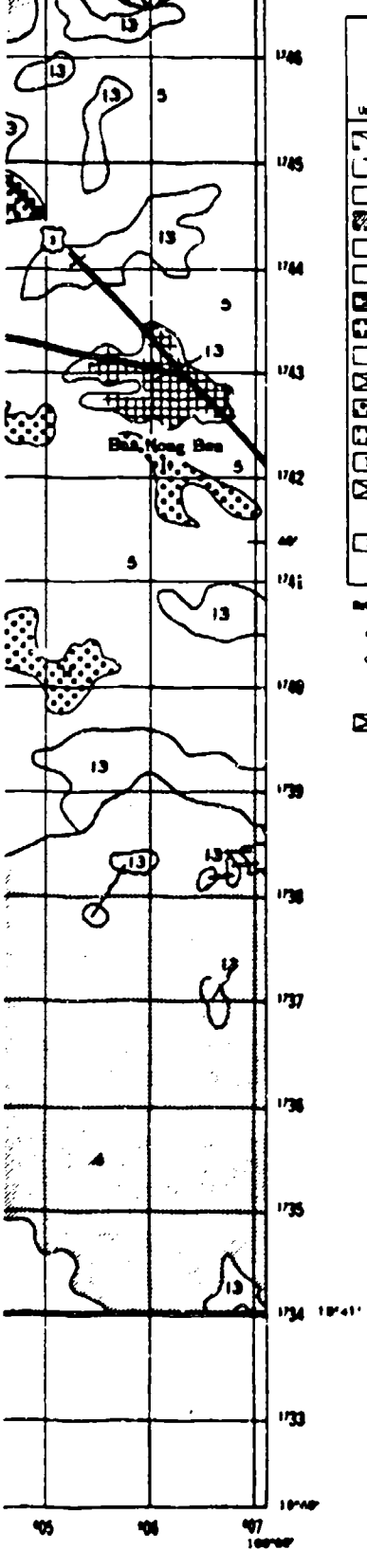
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Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{ur} psi	c_{ur} kg/cm²	σ_{ur} deg	Soil Surface Strength: Minimum Moisture c_{ur} psi	c_{ur} kg/cm²	σ_{ur} deg	Conditions where maximum c_{ur} occurs: c_{ur} psi	c_{ur} kg/cm²	σ_{ur} deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Black areas are water bodies.

c_{ur} Shear strength at zero normal load.

σ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths o[illegible]tually observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

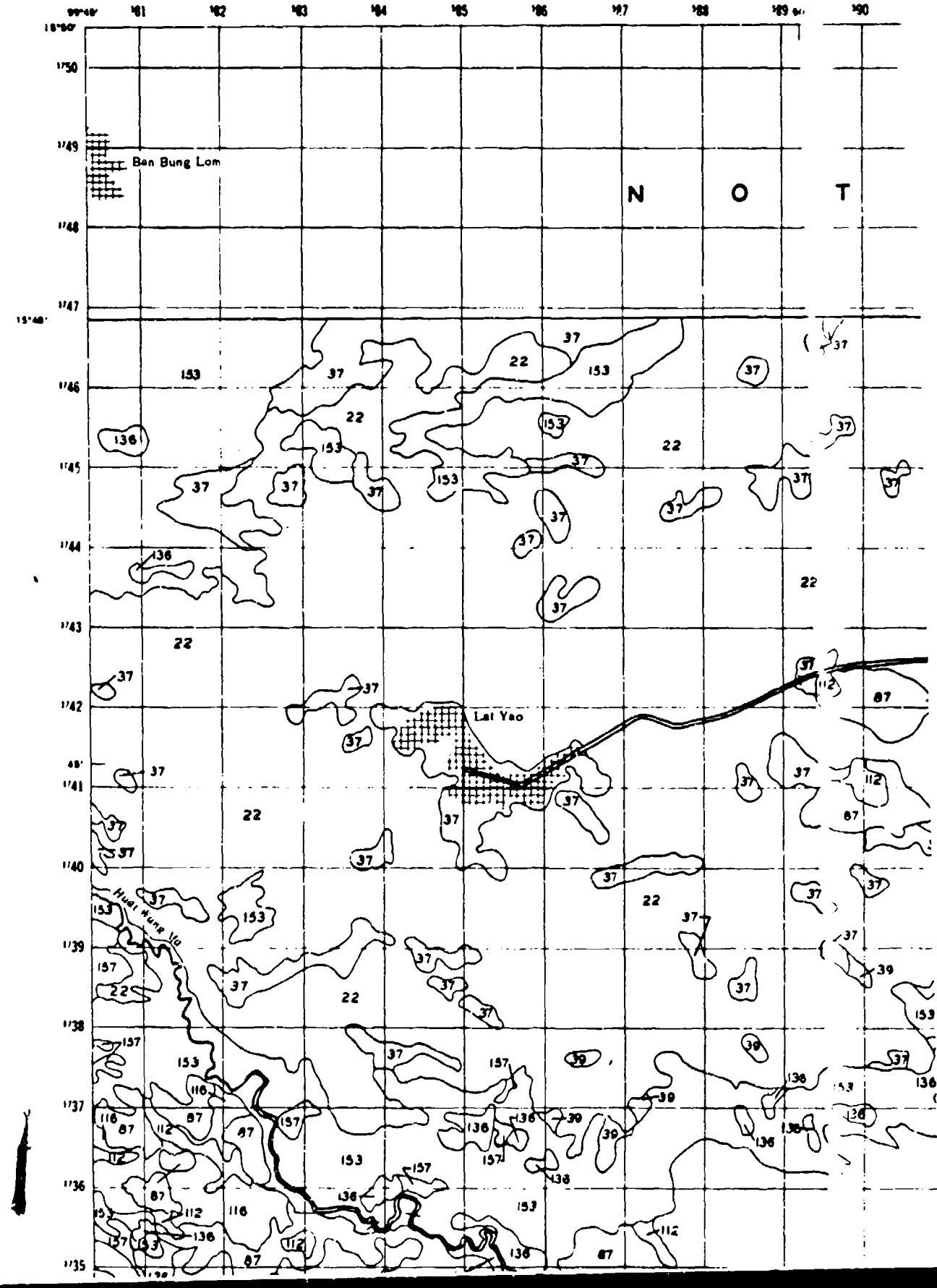
SURFACE COMPOSITION

NAKHON SAWAN STUDY AREA

SHEET NS I

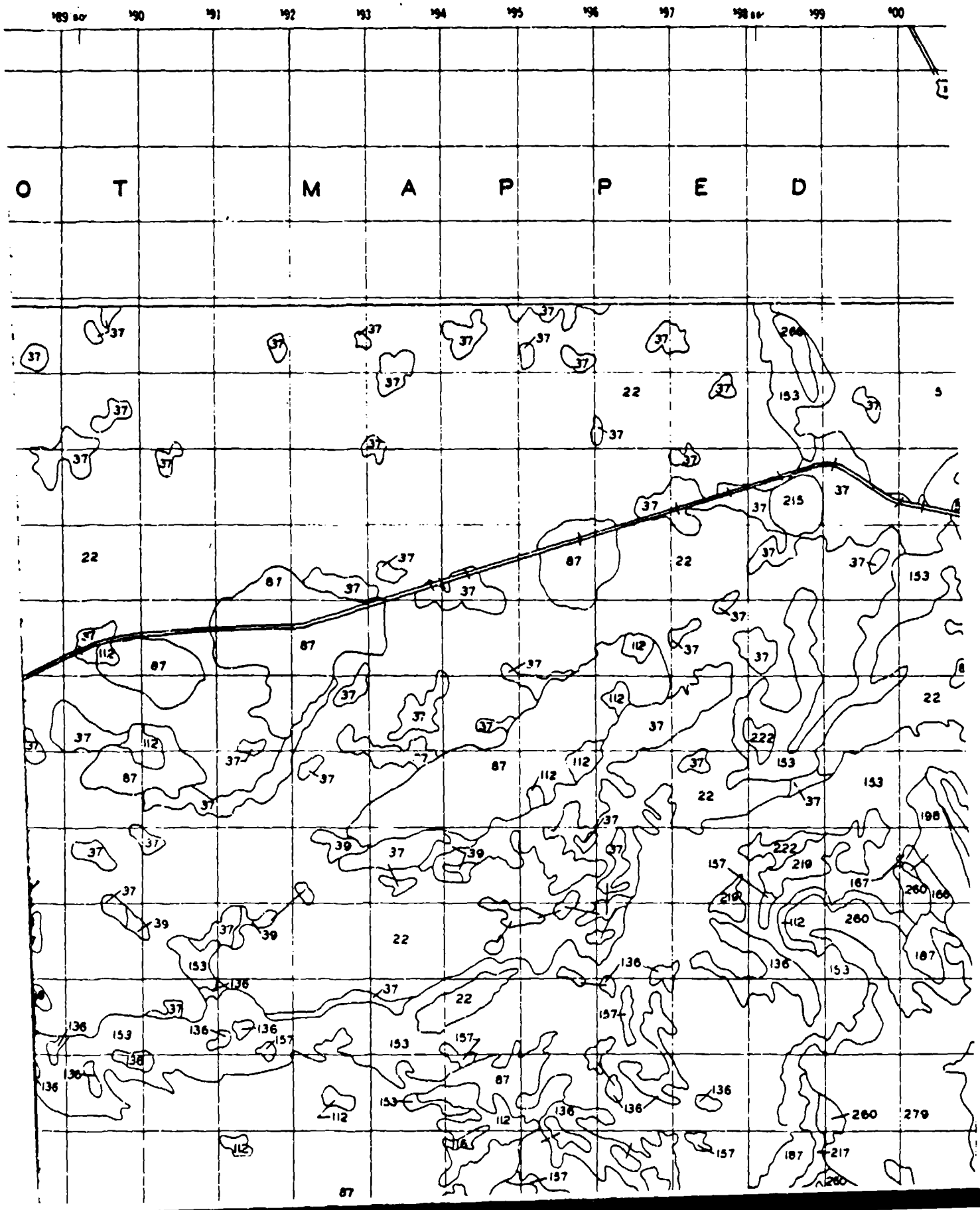
PLATE I.1a

8


Ban Bung Lom
N O T
Lat Yao
Huai Wung Yo

2

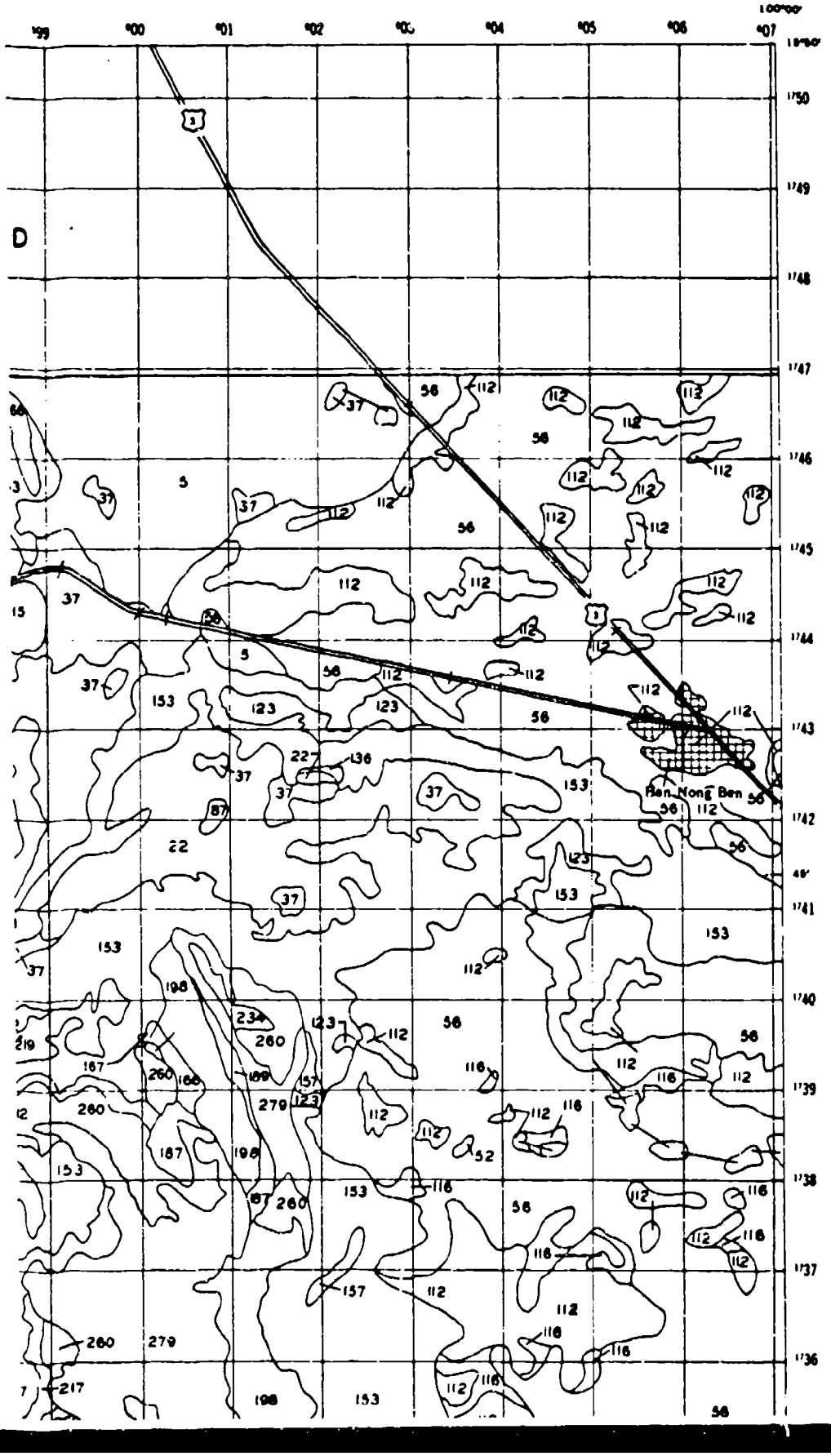
NAKHON SAWAN

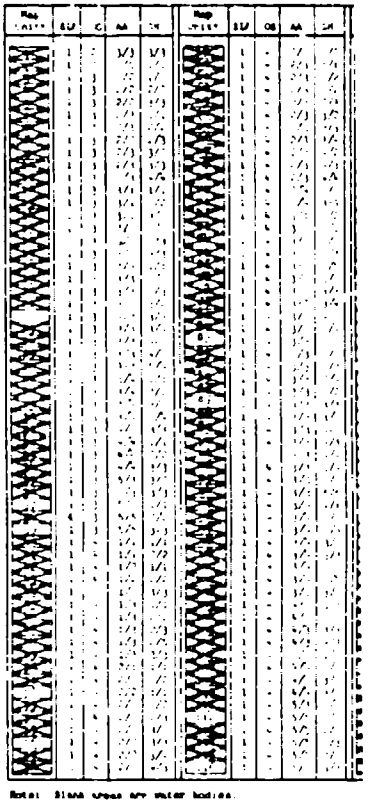


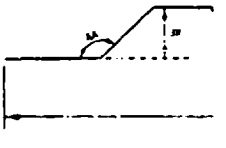
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3

SHEET NS I





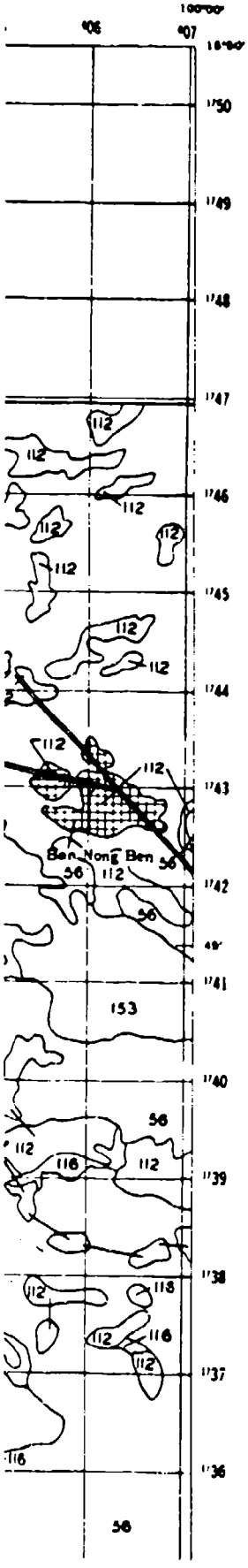


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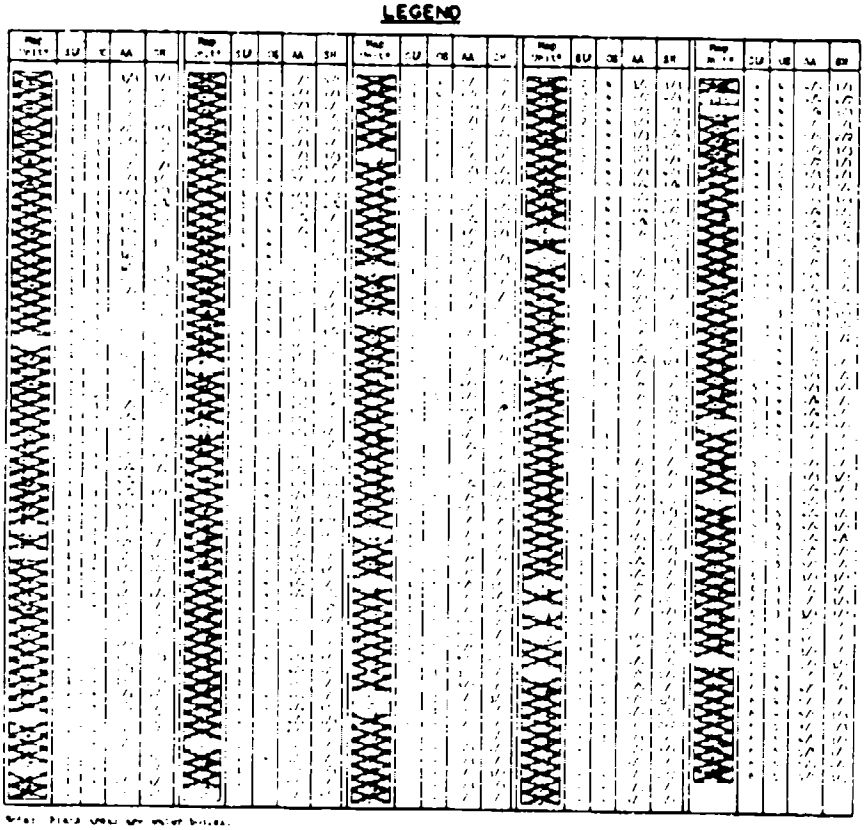
NS I

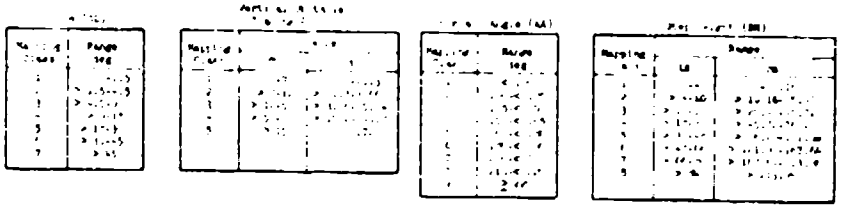
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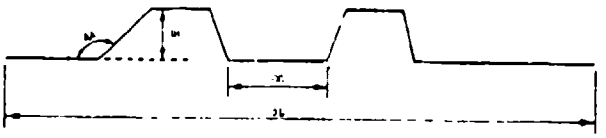
SHEET NS I



LEGEND

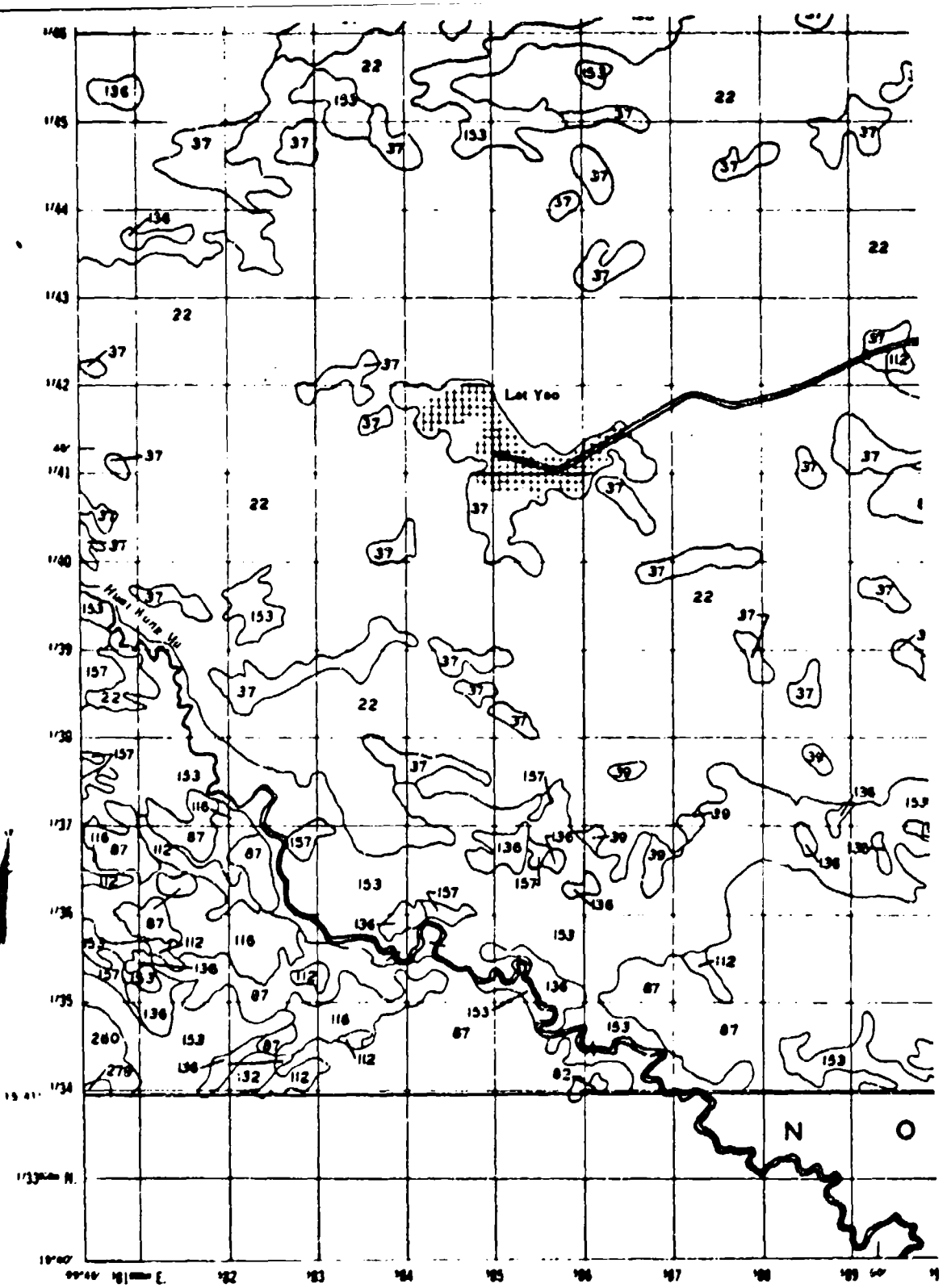






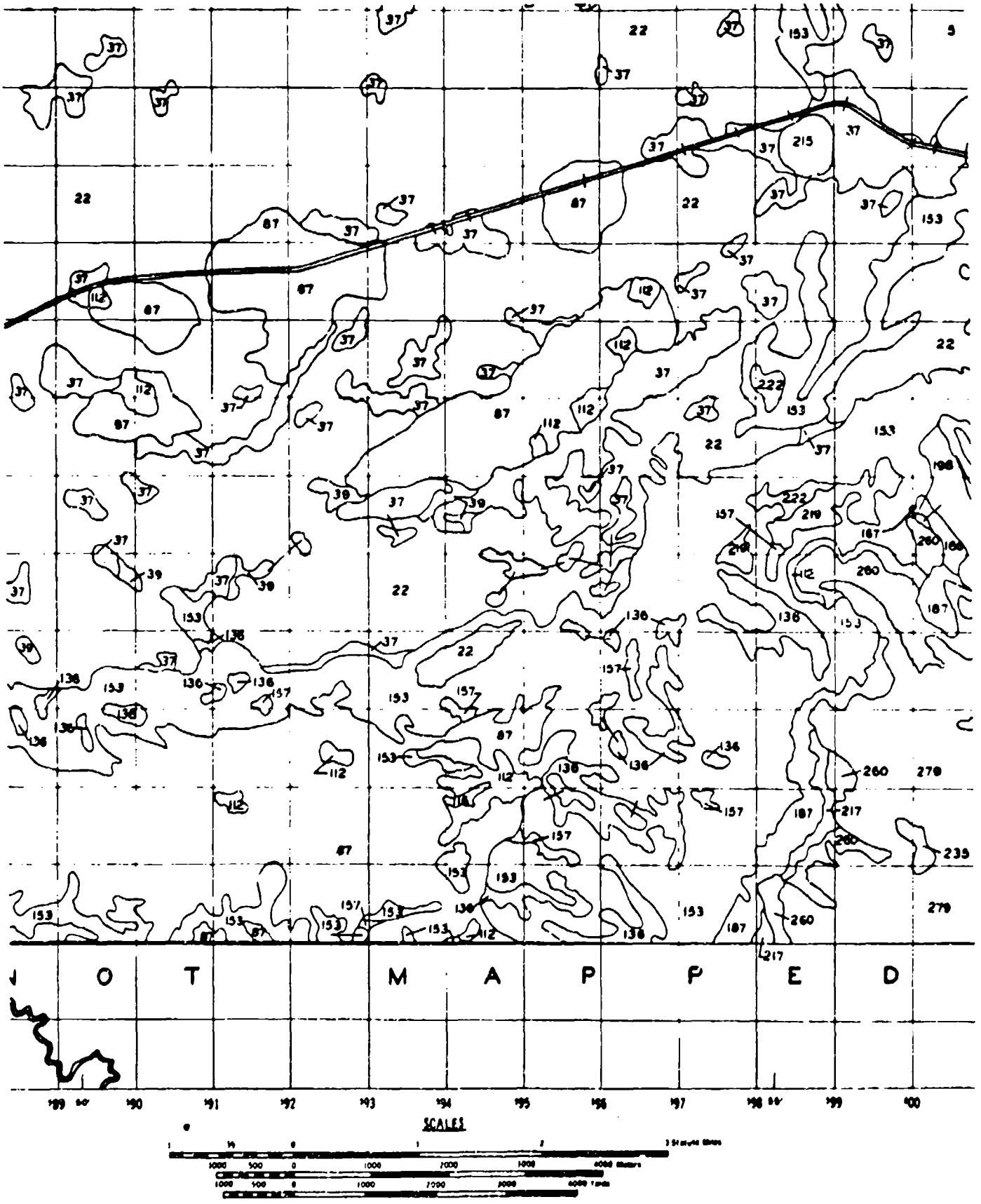
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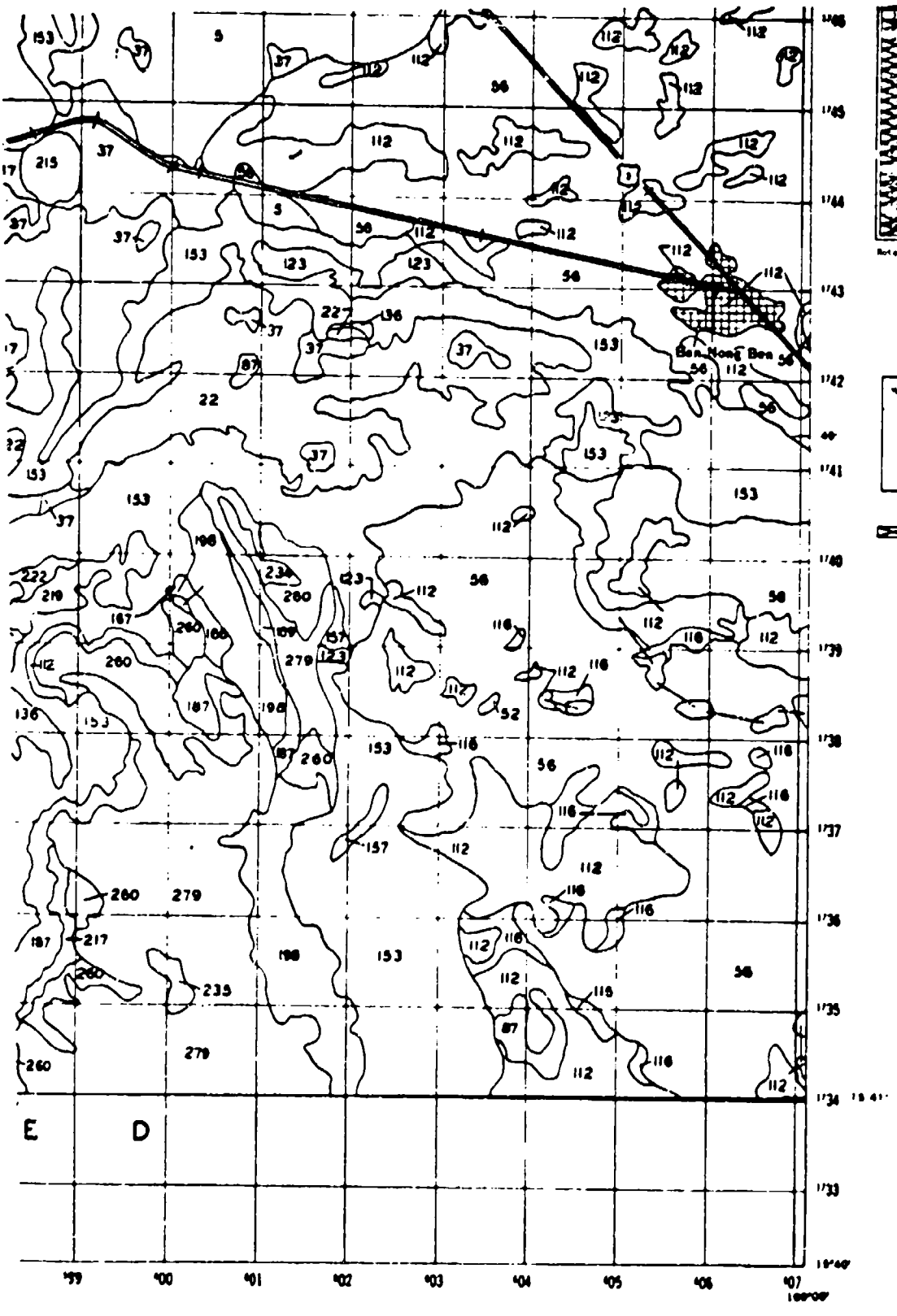


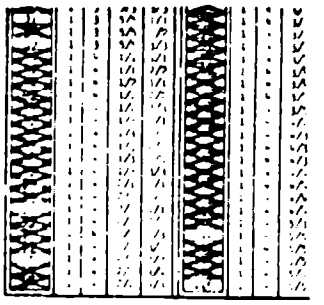
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 P

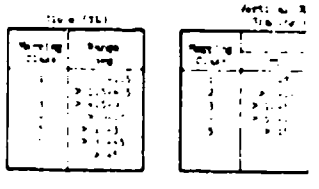
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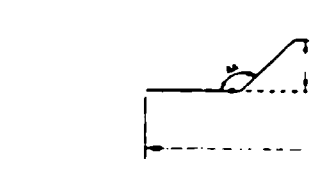


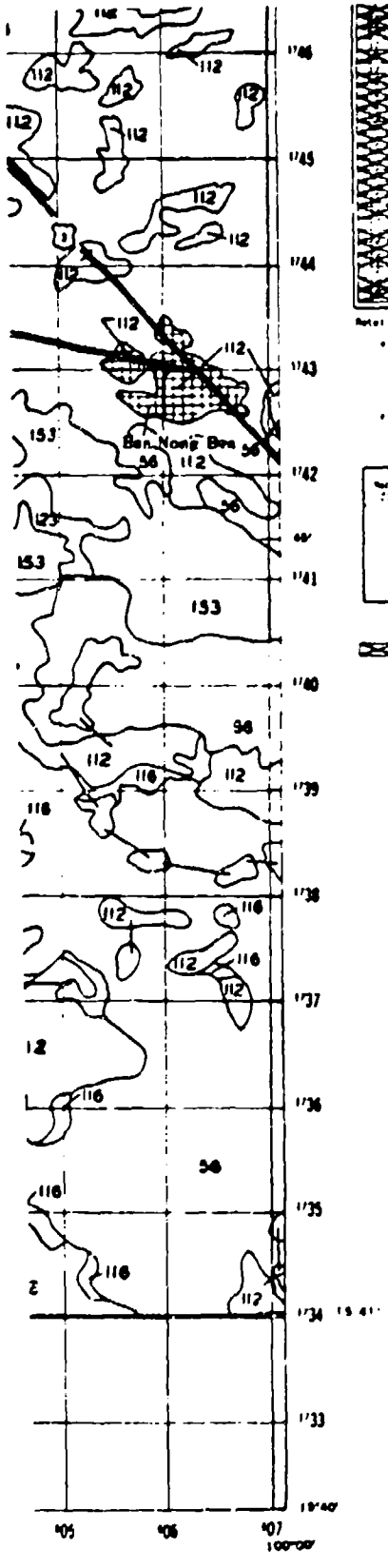
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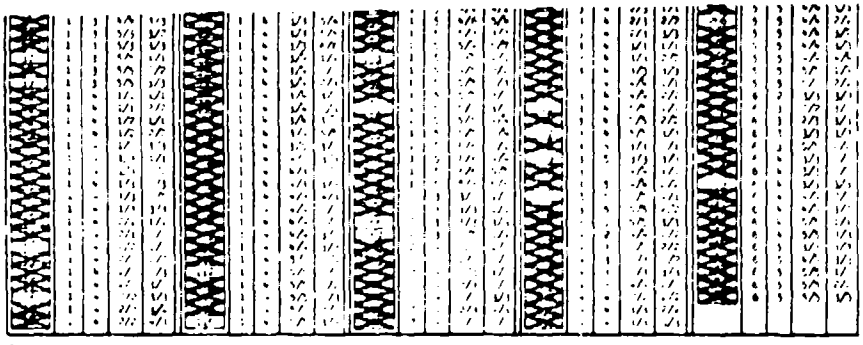

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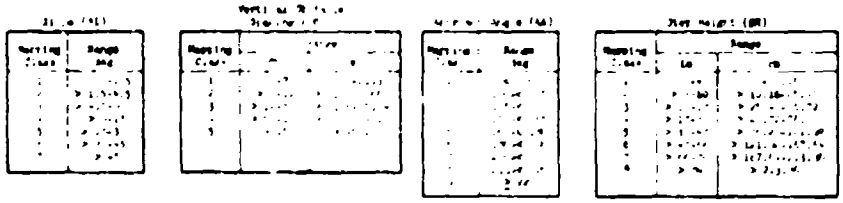


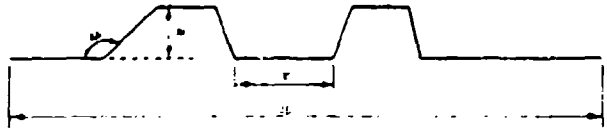












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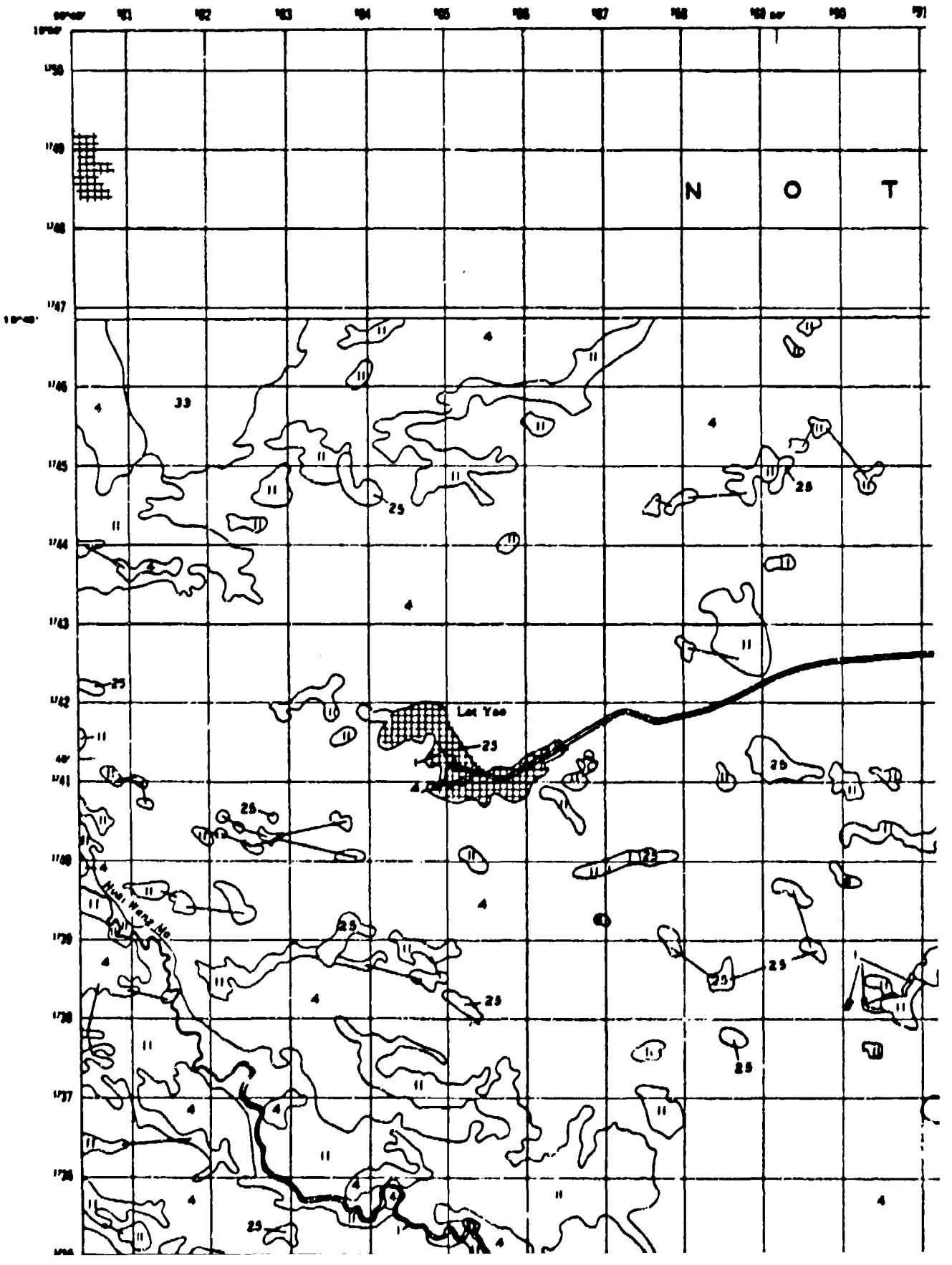
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

NAKHON SAWAN STUDY AREA

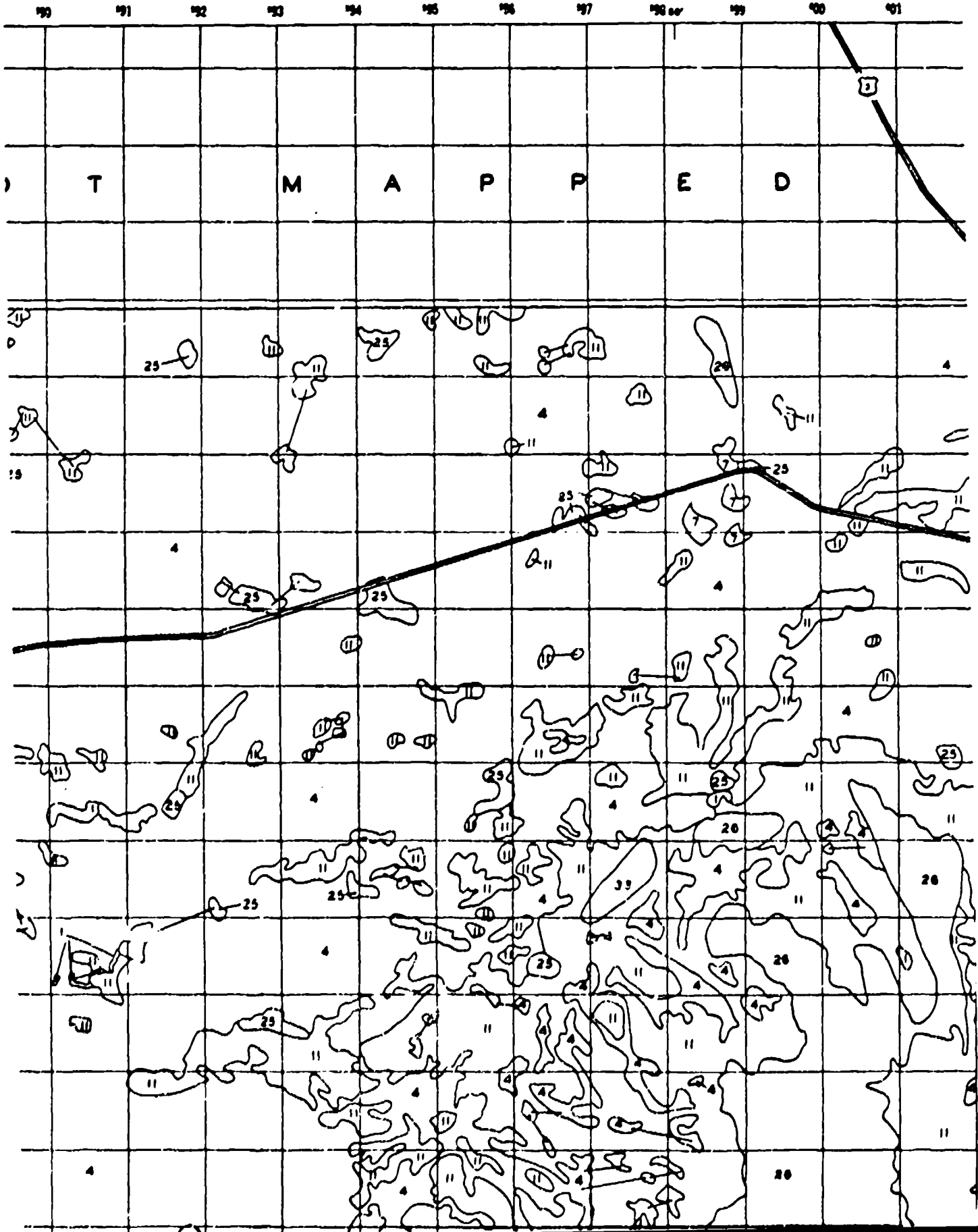
SHEET NS I

PLATE 1.1b


N O T
Lac Vieux Desert

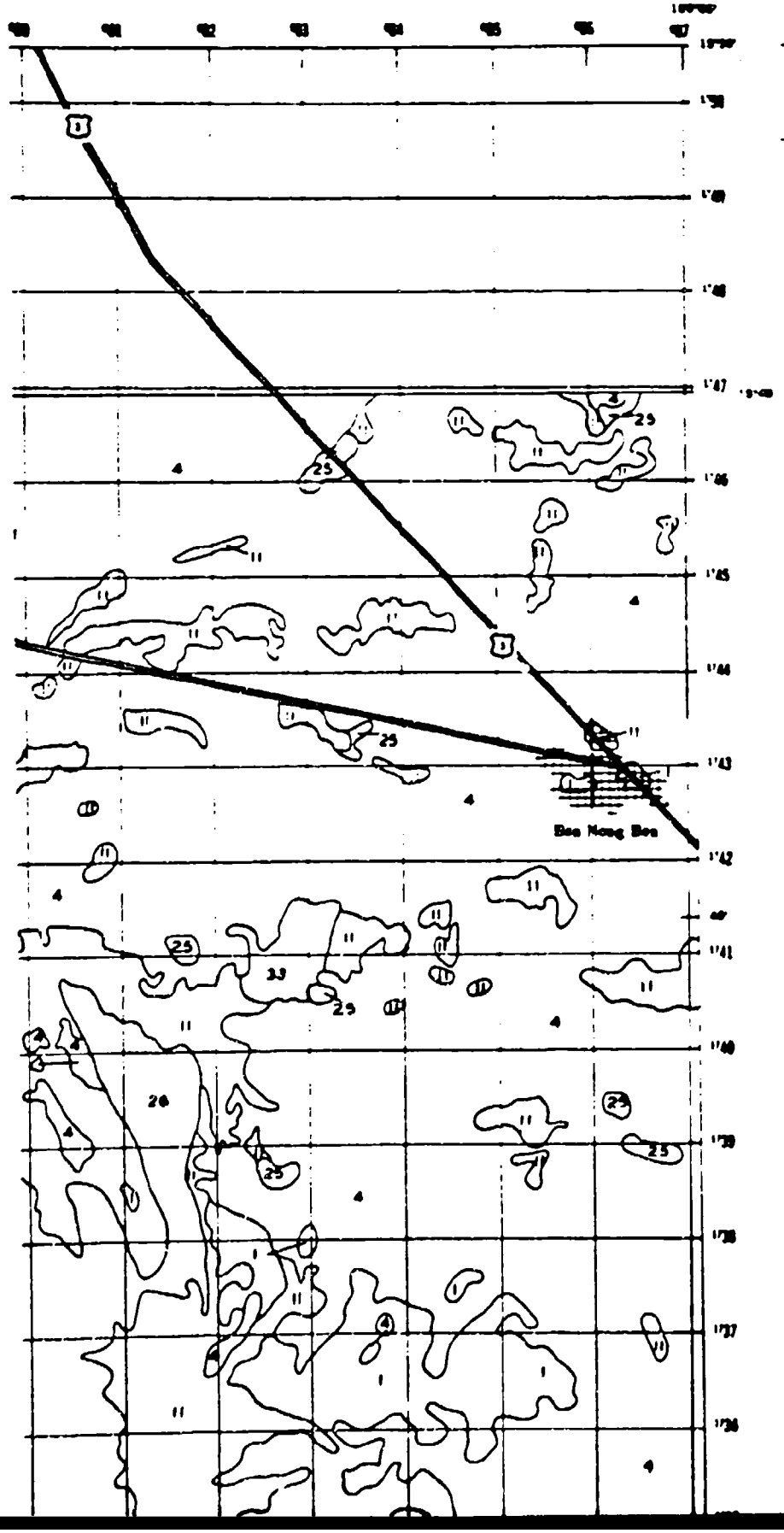
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NAKHON SAWAN



3

SHEET NS I



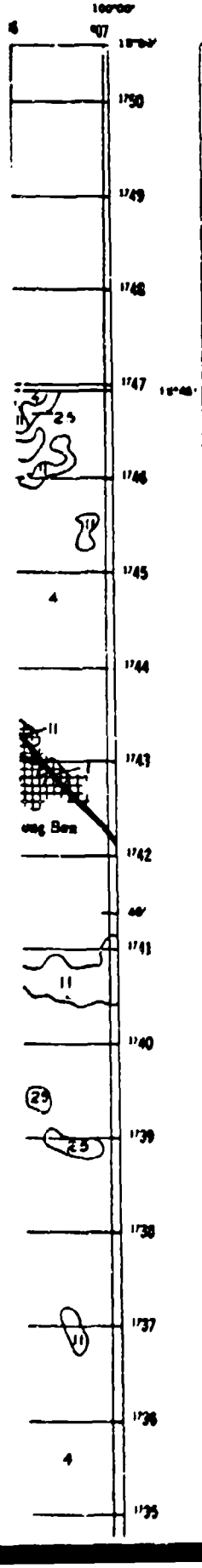
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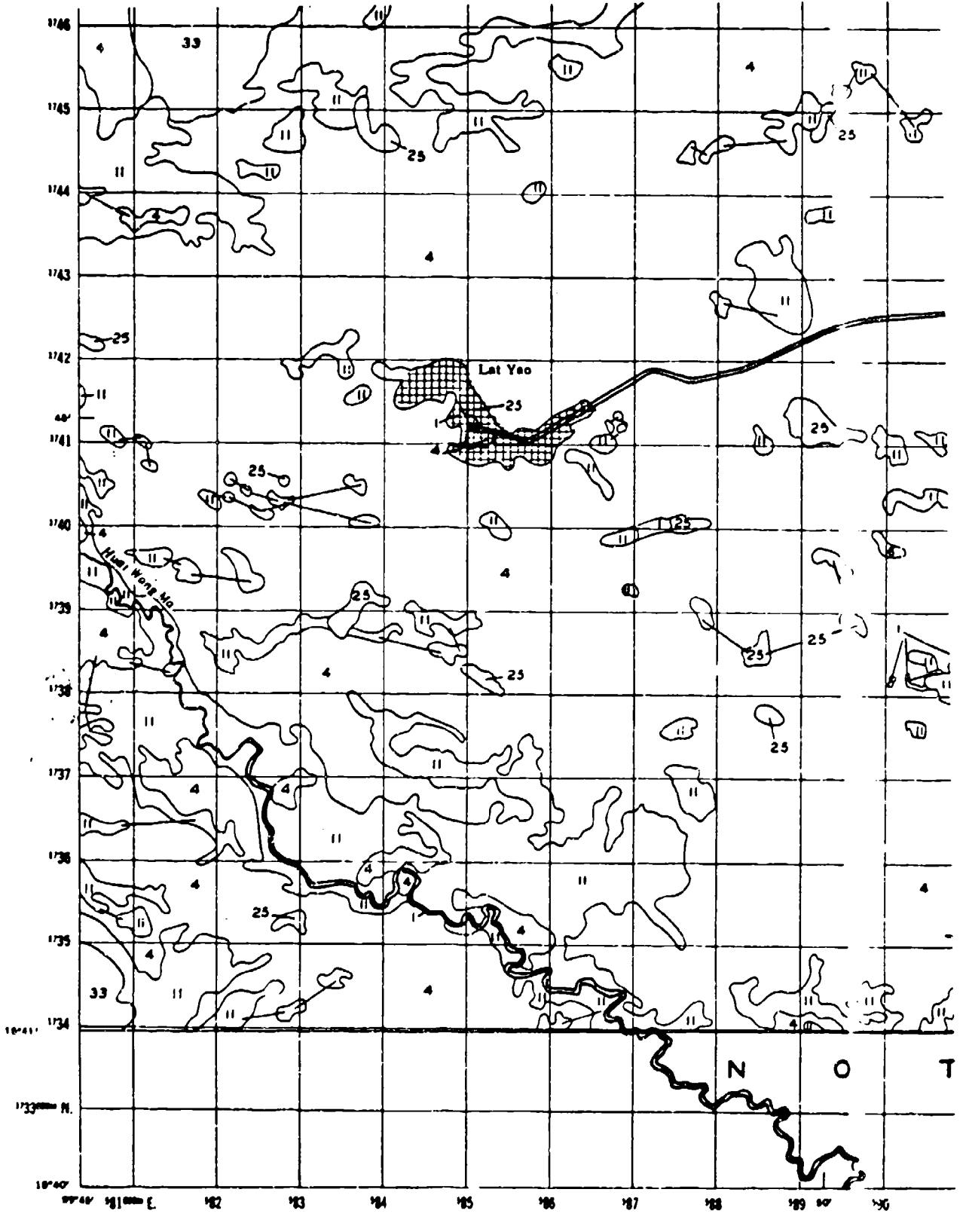
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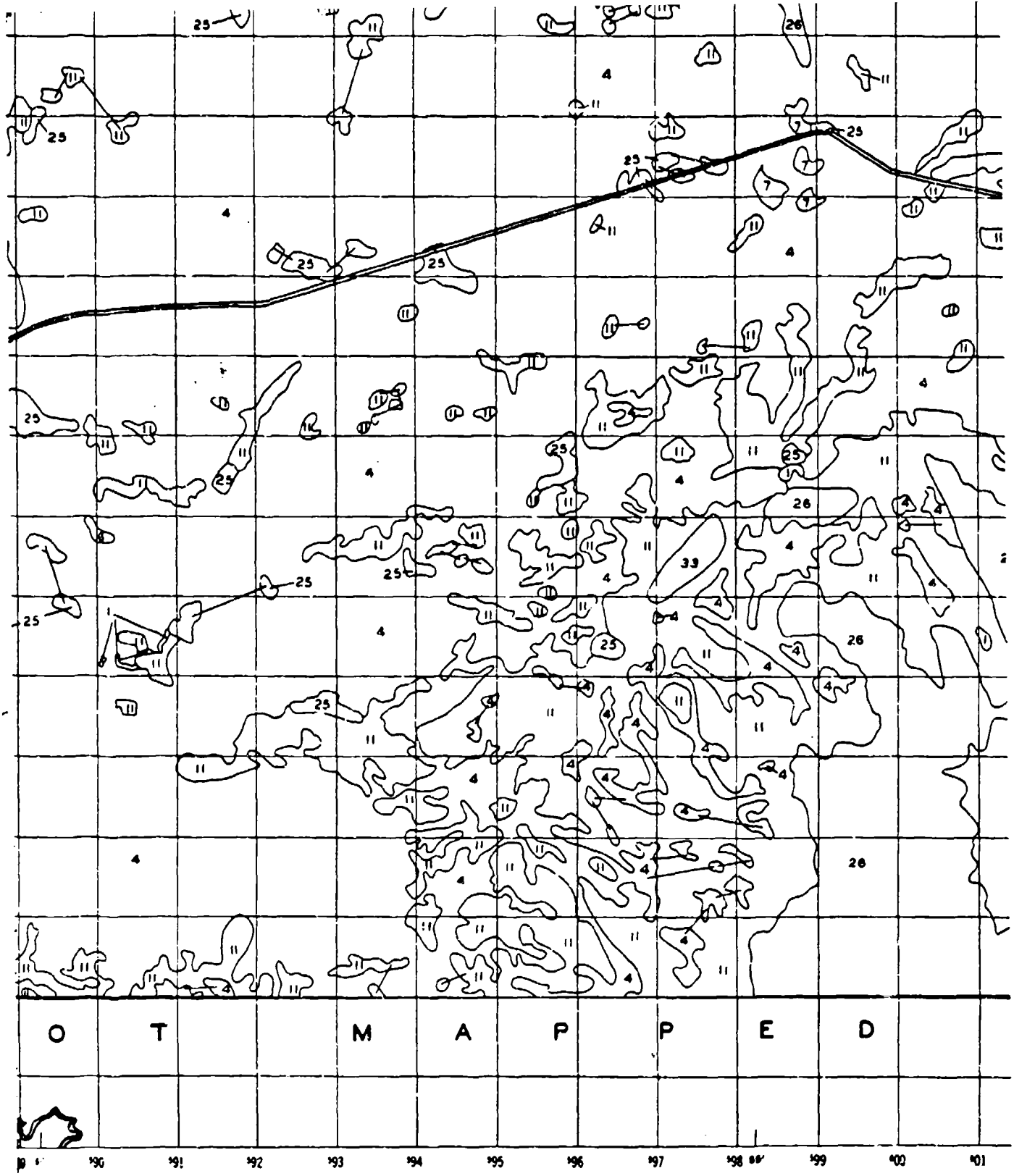
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II

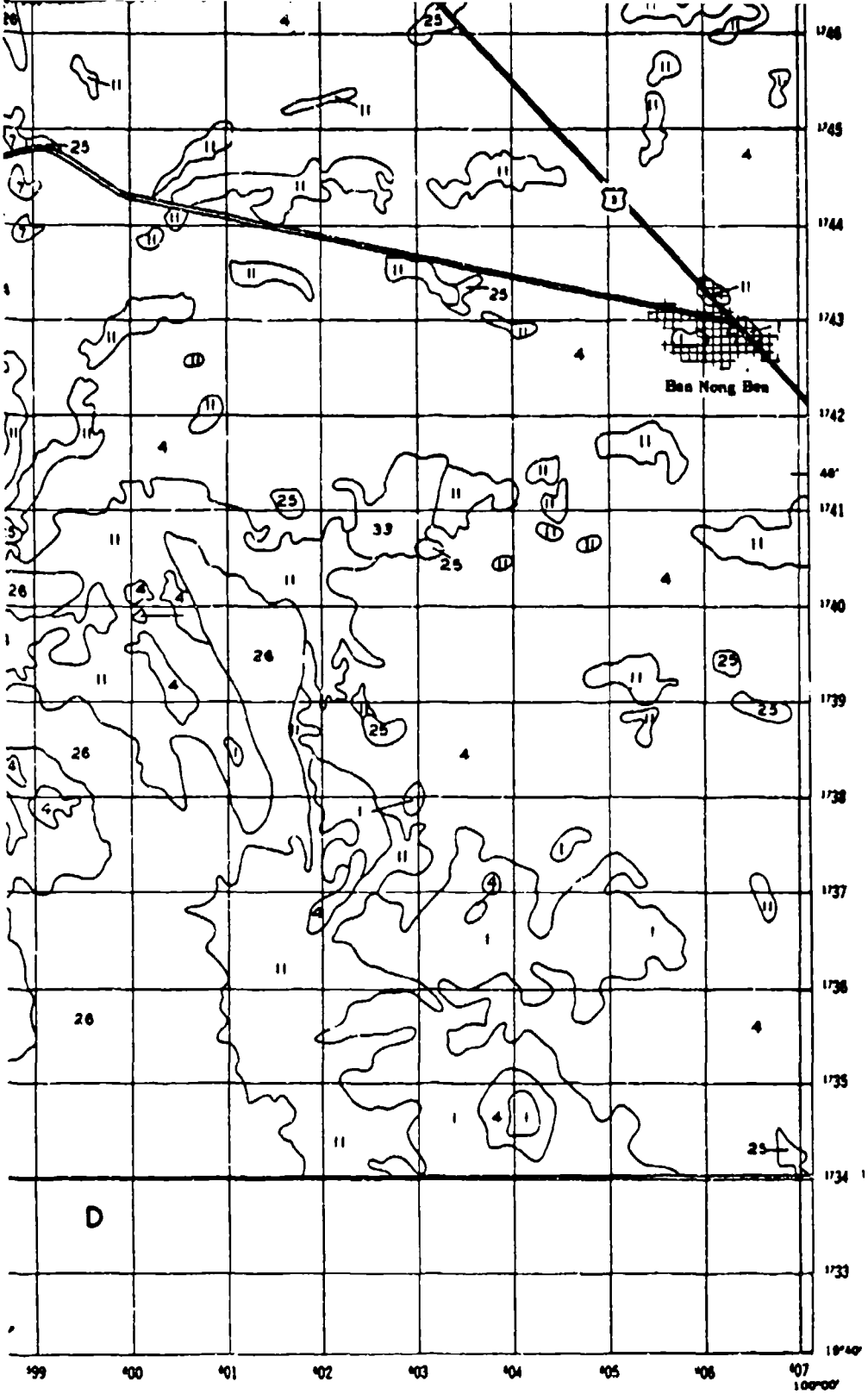


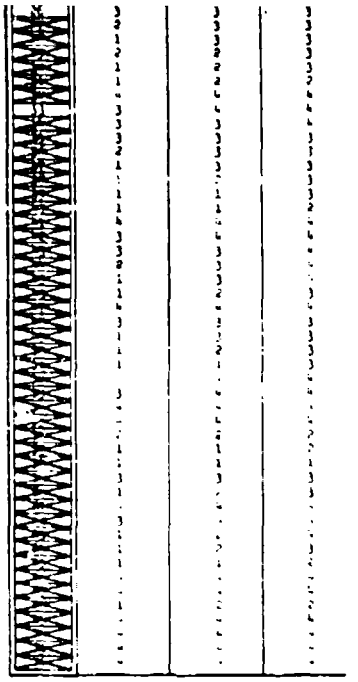
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5



6

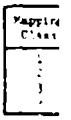




Note: Black areas are unvegetated water bodi

* Each map unit represents an array of e
spacing classes (for strata 2, 5, 9, an
2, 3, 6, and 10 m). (0.2, 0.5, 0.8, 1.2, 1.5, 2.

† Mapping class ranges for each spacing



units do not occur on this map.

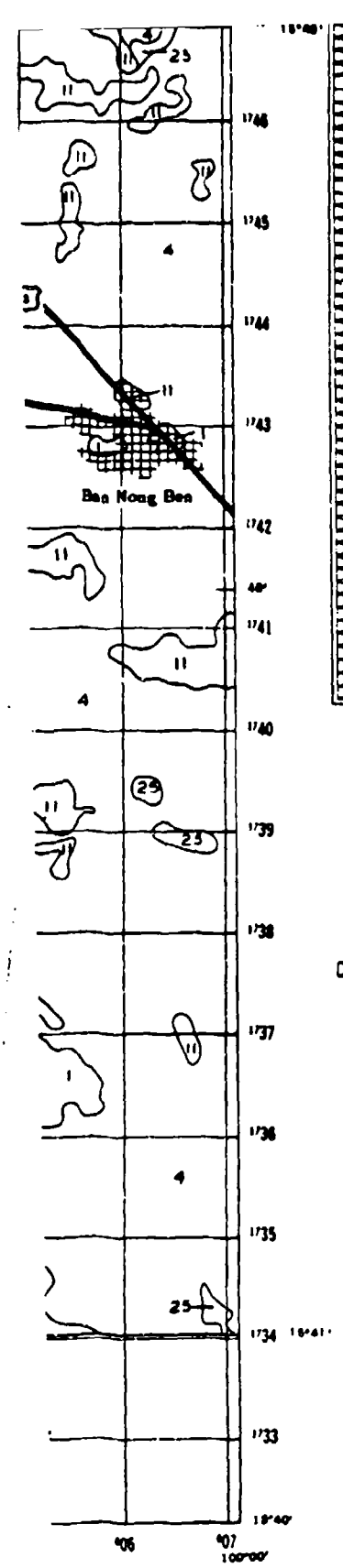
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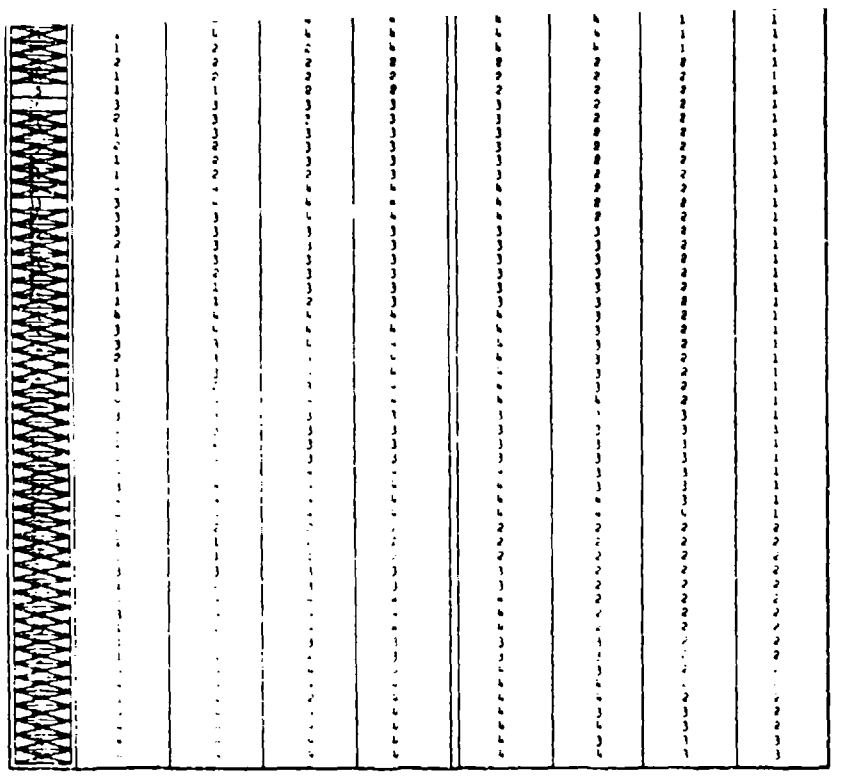
NS 1

A QUANTITATIVE M
TERRAIN FOR

VEG

NAKHON SA'
SH





Water: Blank areas are unvegetated water bodies.

* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1,) indicating spacing classes (in meters, 5, 2, 1, ½ and ¼ in. (≤ 5.08, 12.70, 25.40, and ≤25.00 cm) and 2', 1', ½' and ¼' in. (≤5.08, 7.62, 15.24, and 25.40 cm).

* Mapping the 4 classes for each spacing class area.

Stem Spacing

Mapping Area	Forest	
	m	ft
4	> 1'	> 0.30
3	> 1½-10	> 1.52-3.05
2	> 5-10	> 1½-3
1	<5	0-1.52

Lines do not occur on this map.

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	NS V	NS IV

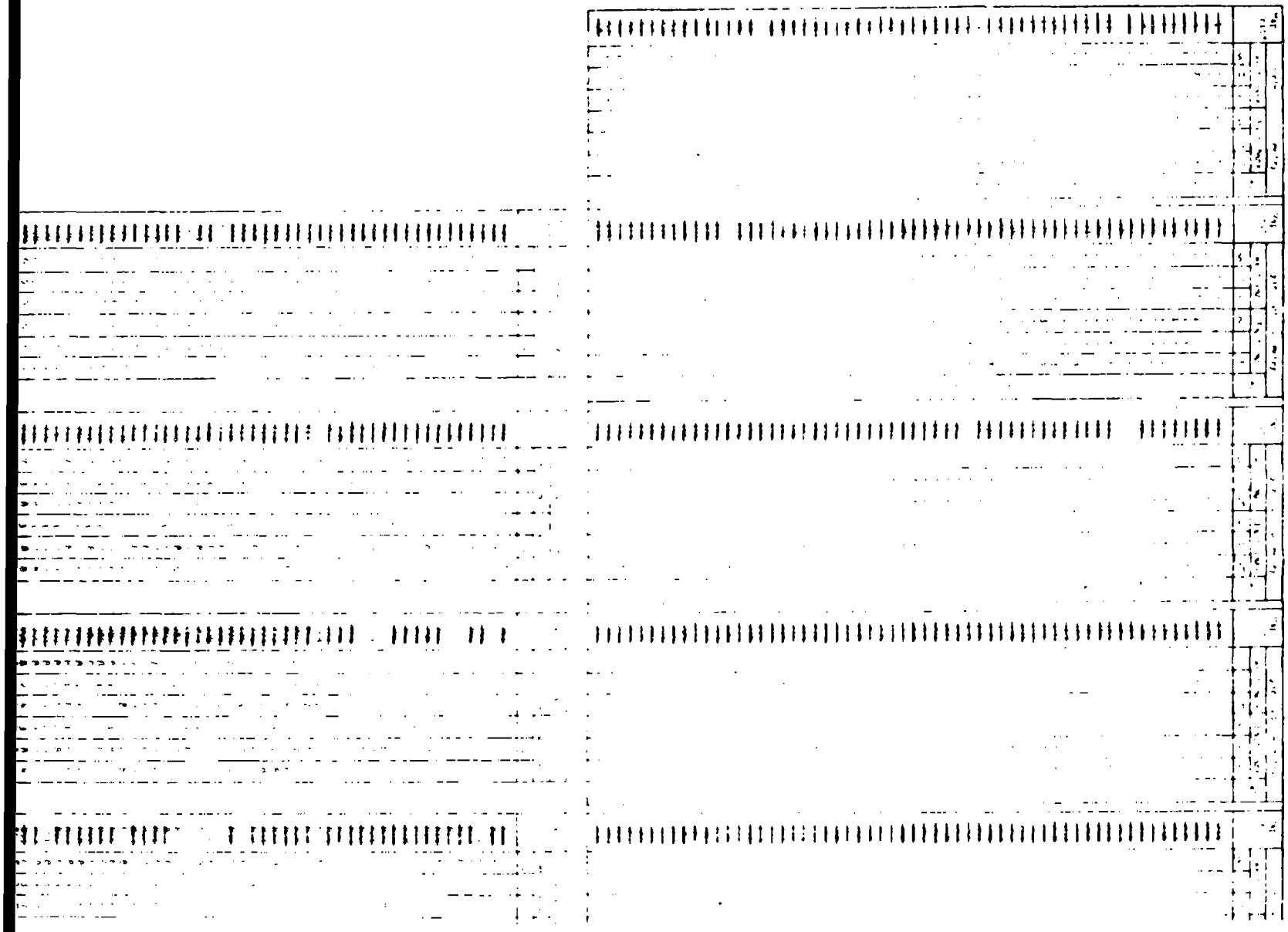
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

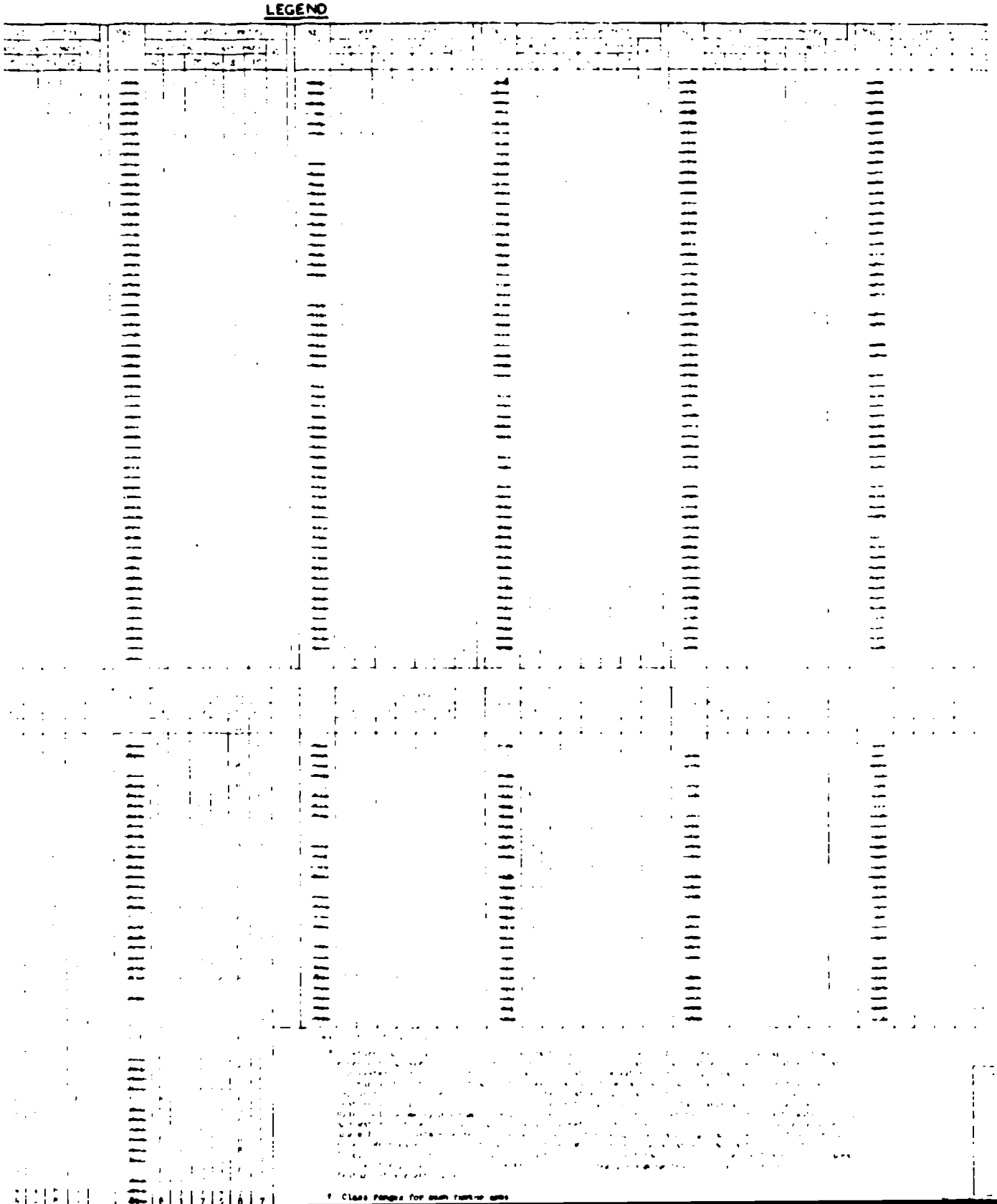
NAKHON SAWAN STUDY AREA

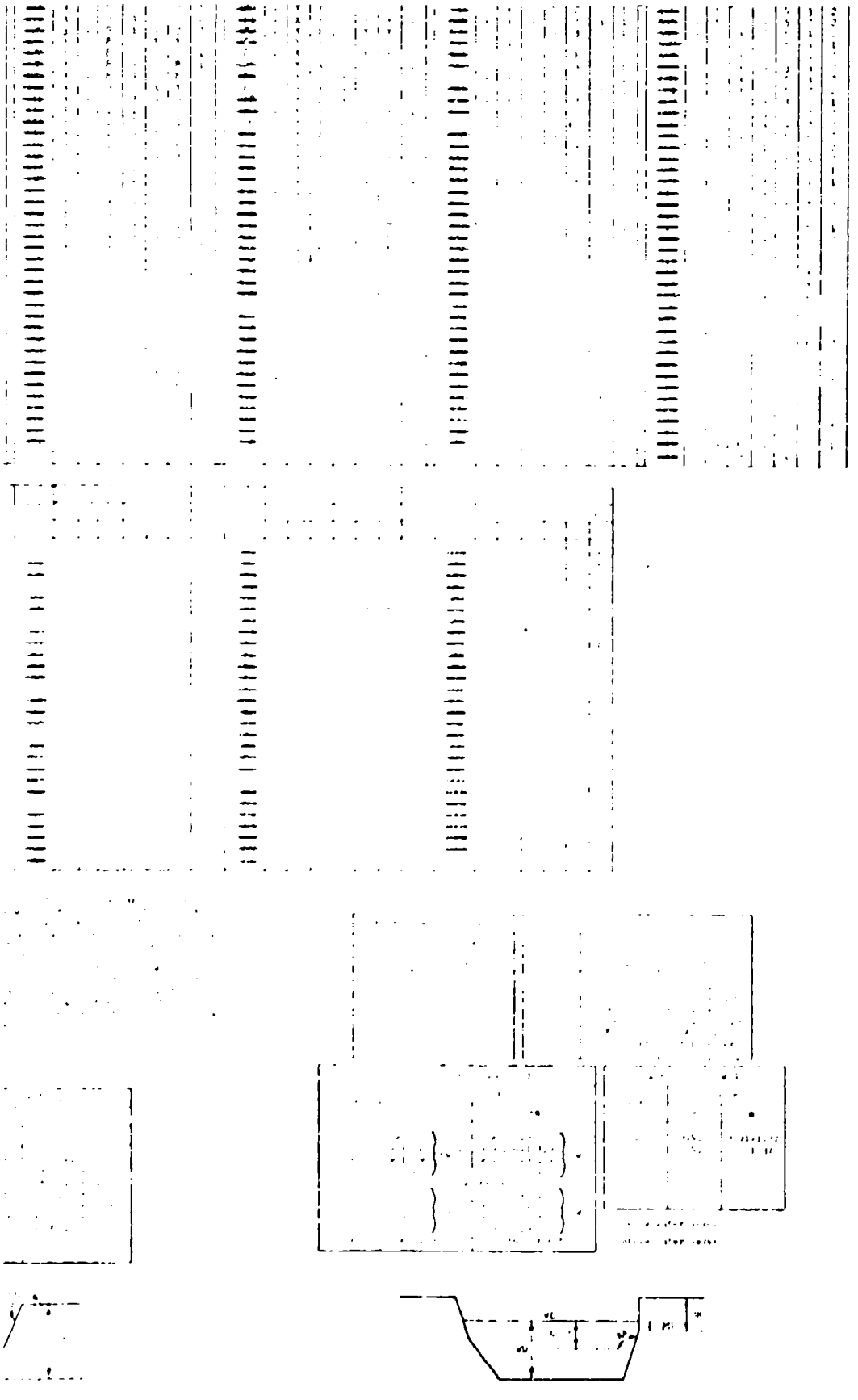
SHEET NS I

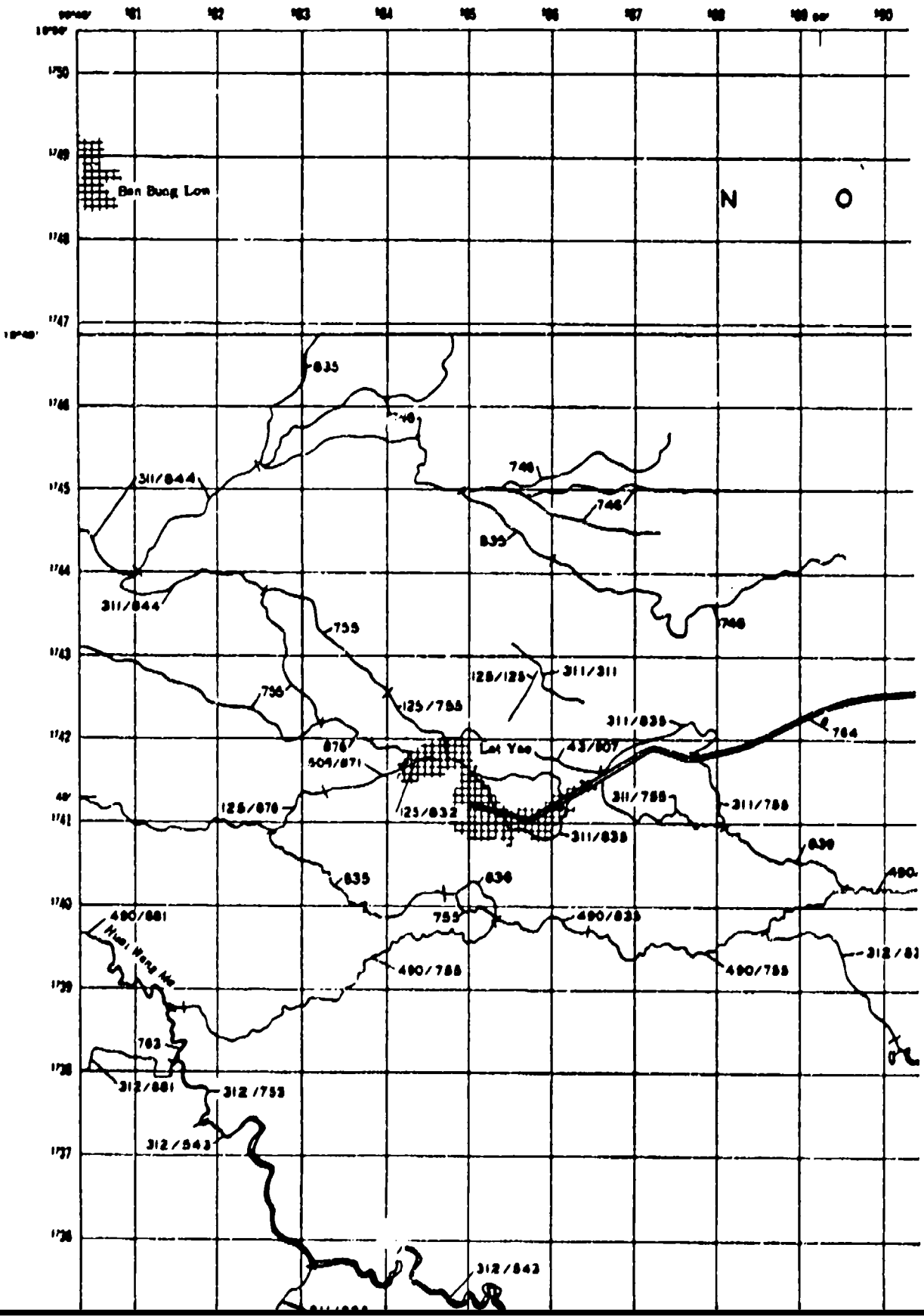
PLATE 1.1c



2

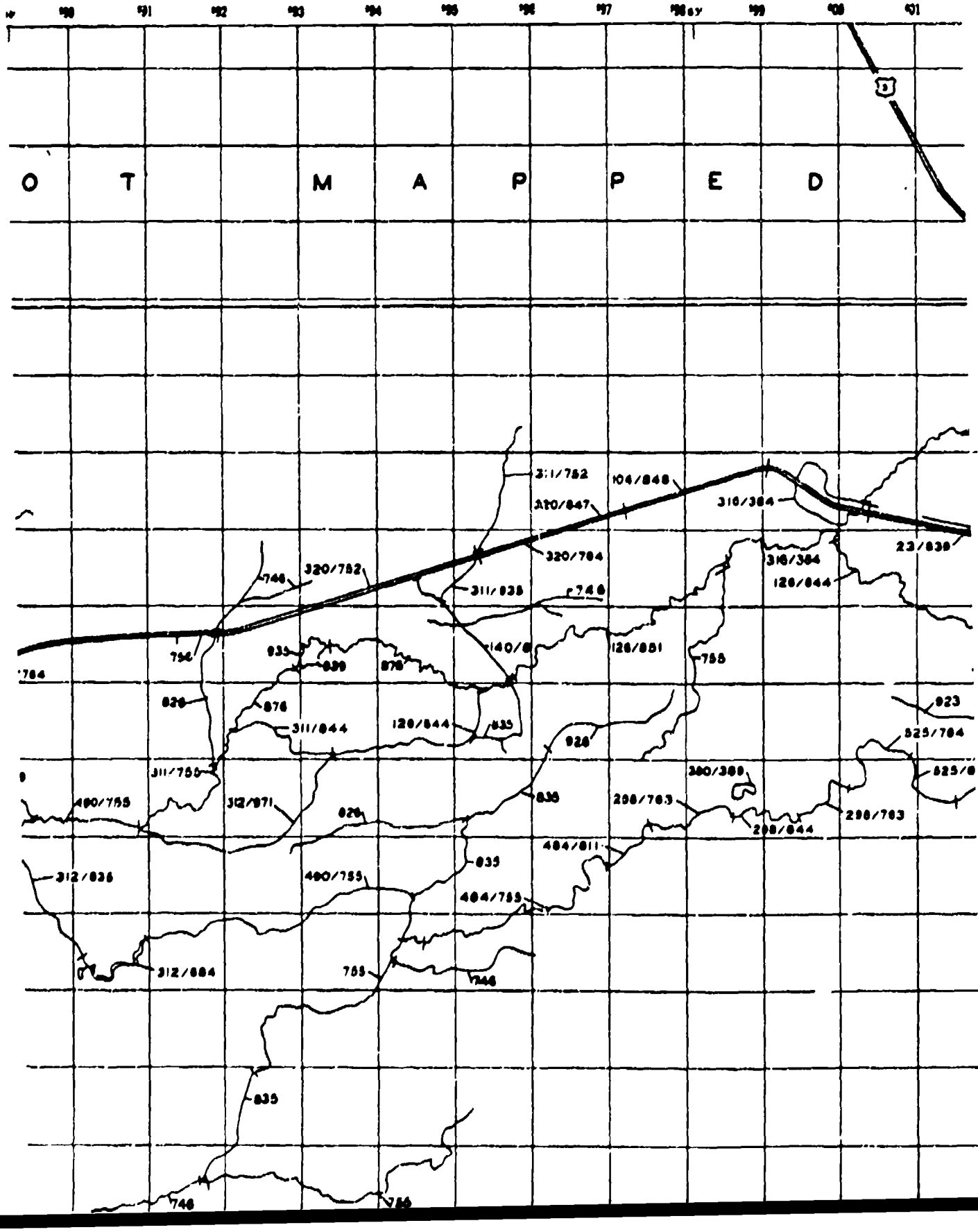





Ban Bung Lom
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O
835
311/844
746
746
895
311/844
755
736
128/128
311/311
125/755
311/835
764
876
504/871
Lat Yao
43/807
125/876
125/832
311/755
311/755
311/835
839
835
836
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312/543
312/543

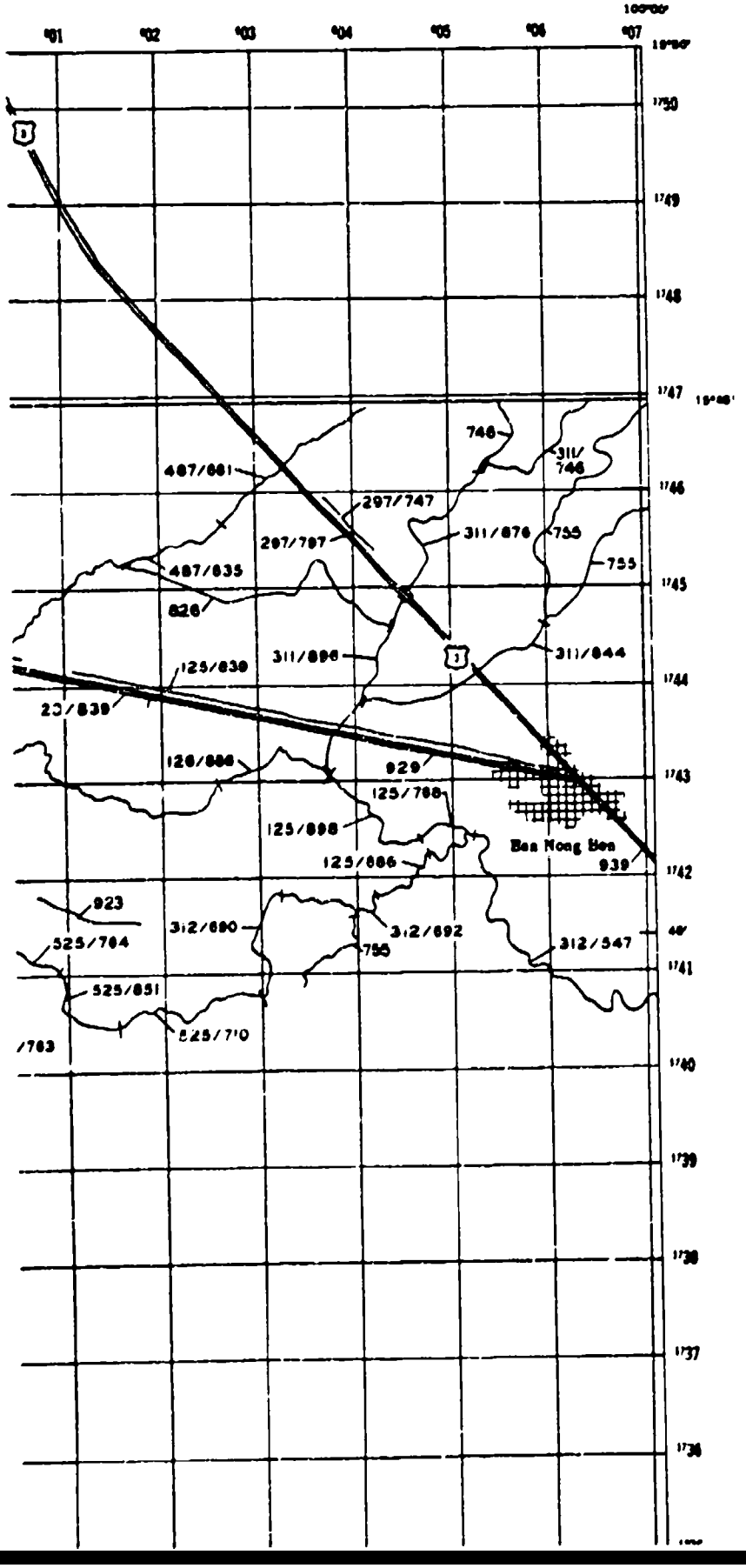
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NAKHON SAWAN



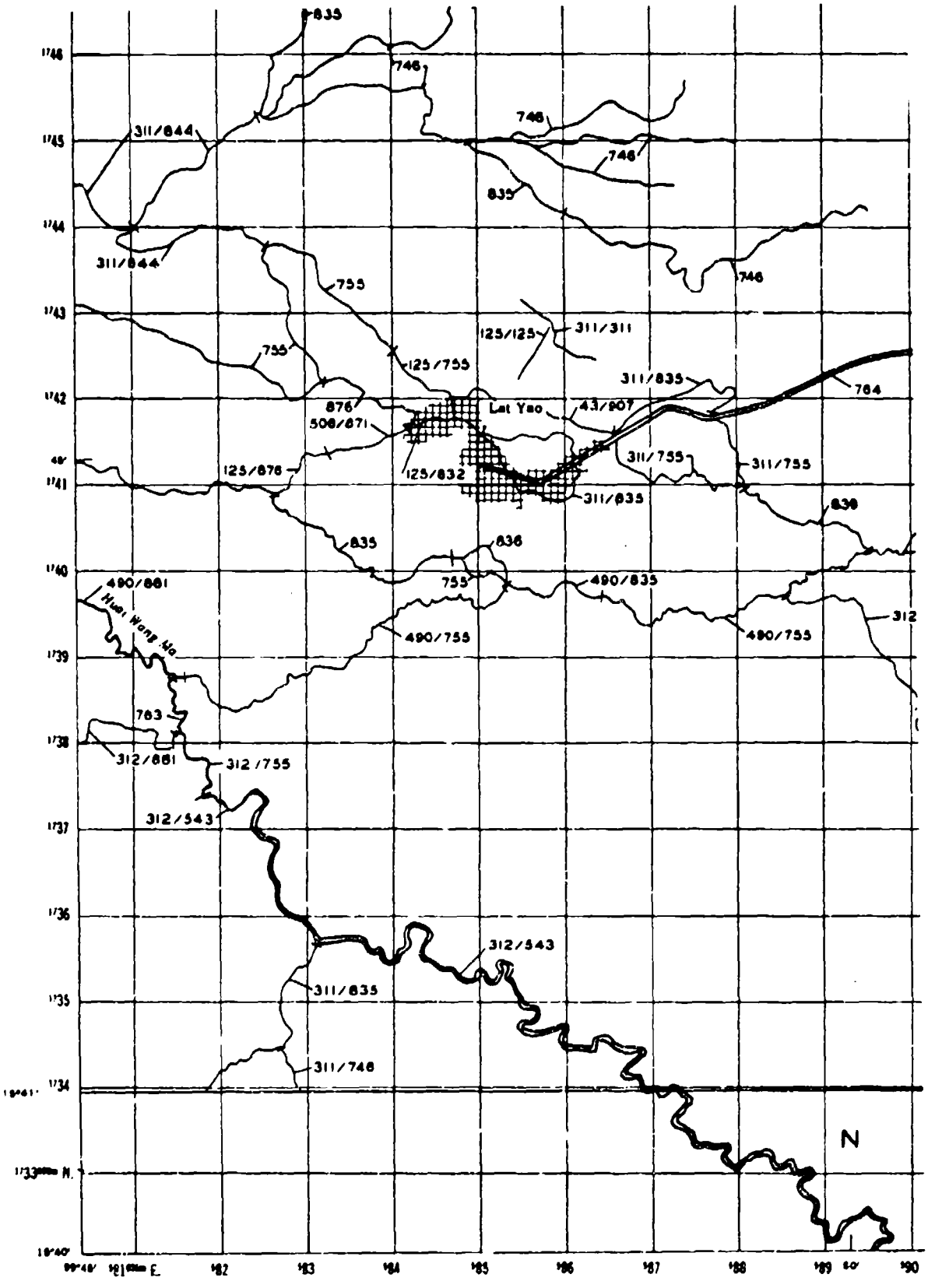
1 3

SHEET NS I



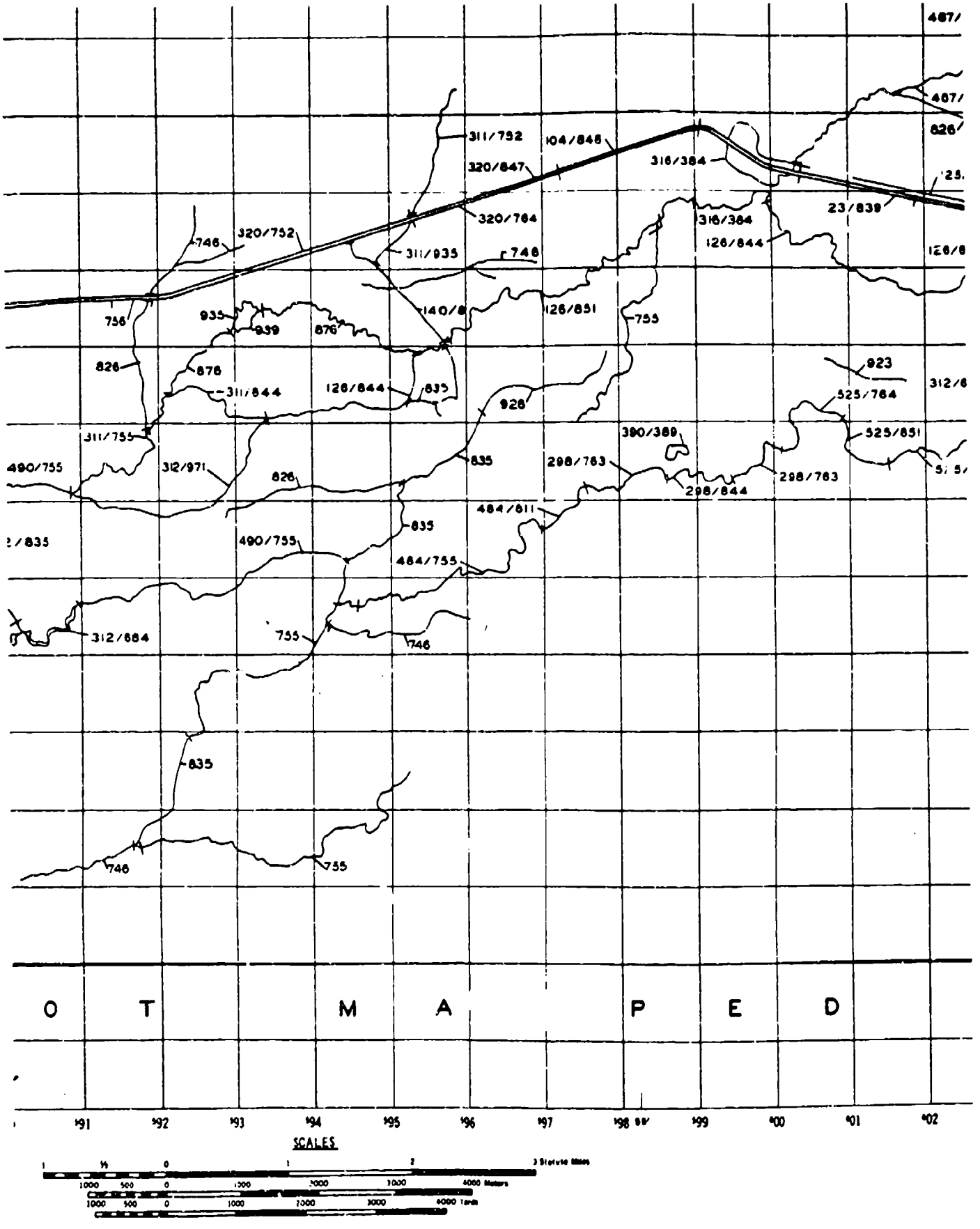
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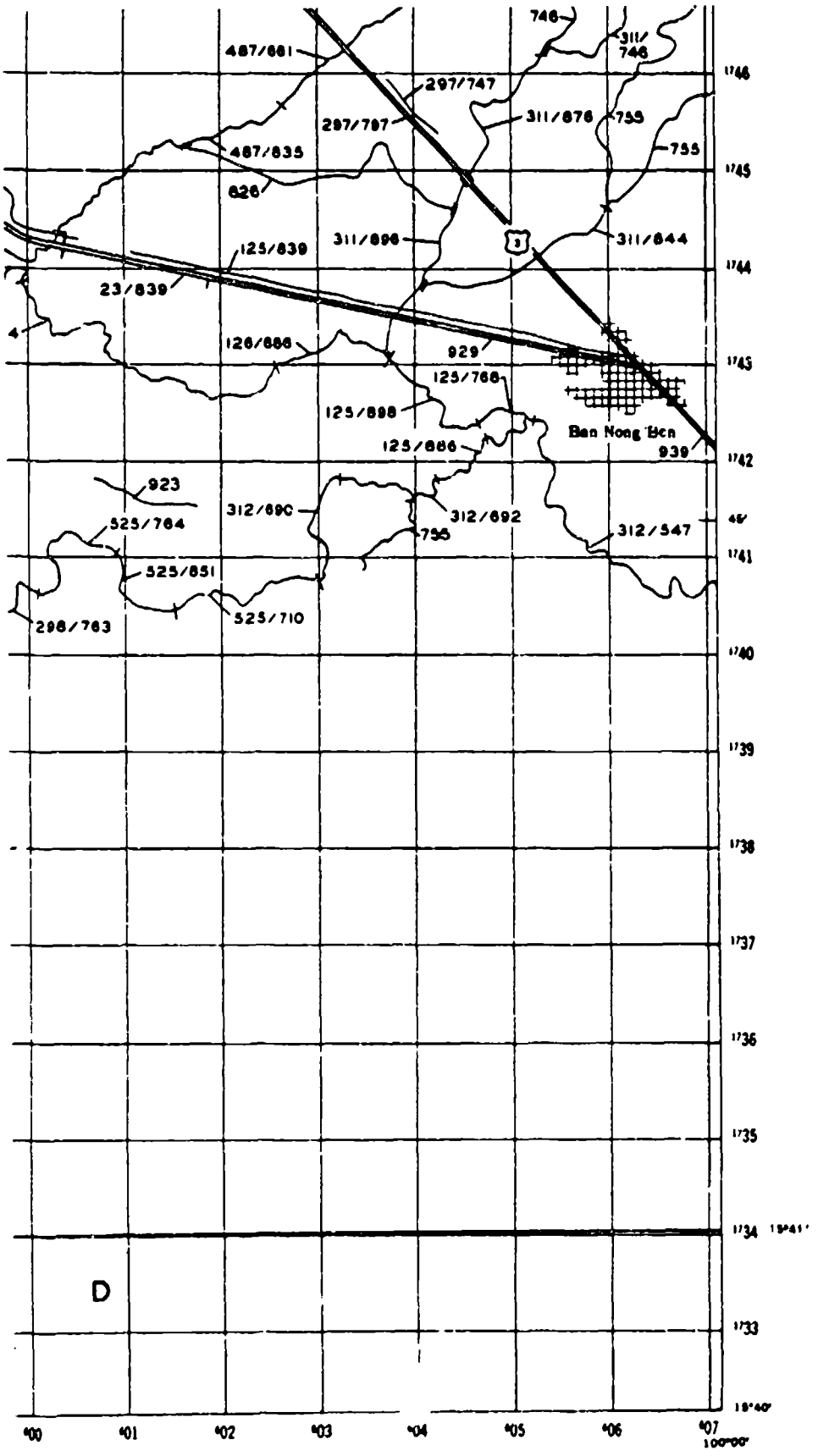


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

4


311/752
104/846
320/847
316/384
320/764
320/752
746
311/935
746
23/839
316/384
126/844
756
935
939
876
140/8
126/851
755
826
876
311/844
126/844
835
926
923
525/764
525/851
311/755
490/755
312/971
826
835
298/763
380/389
298/844
298/763
484/811
835
490/755
484/755
312/884
755
746
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02
SCALES

5

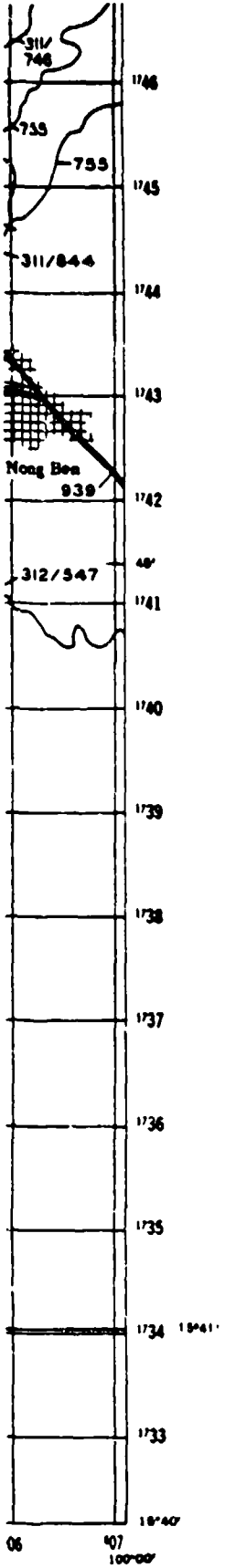


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A QUANTITATIVE METHOD F
TERRAIN FOR GROUND
HYDROLOGIC GE(
NAKHON SAWAN STU
SHEET NS

6



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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

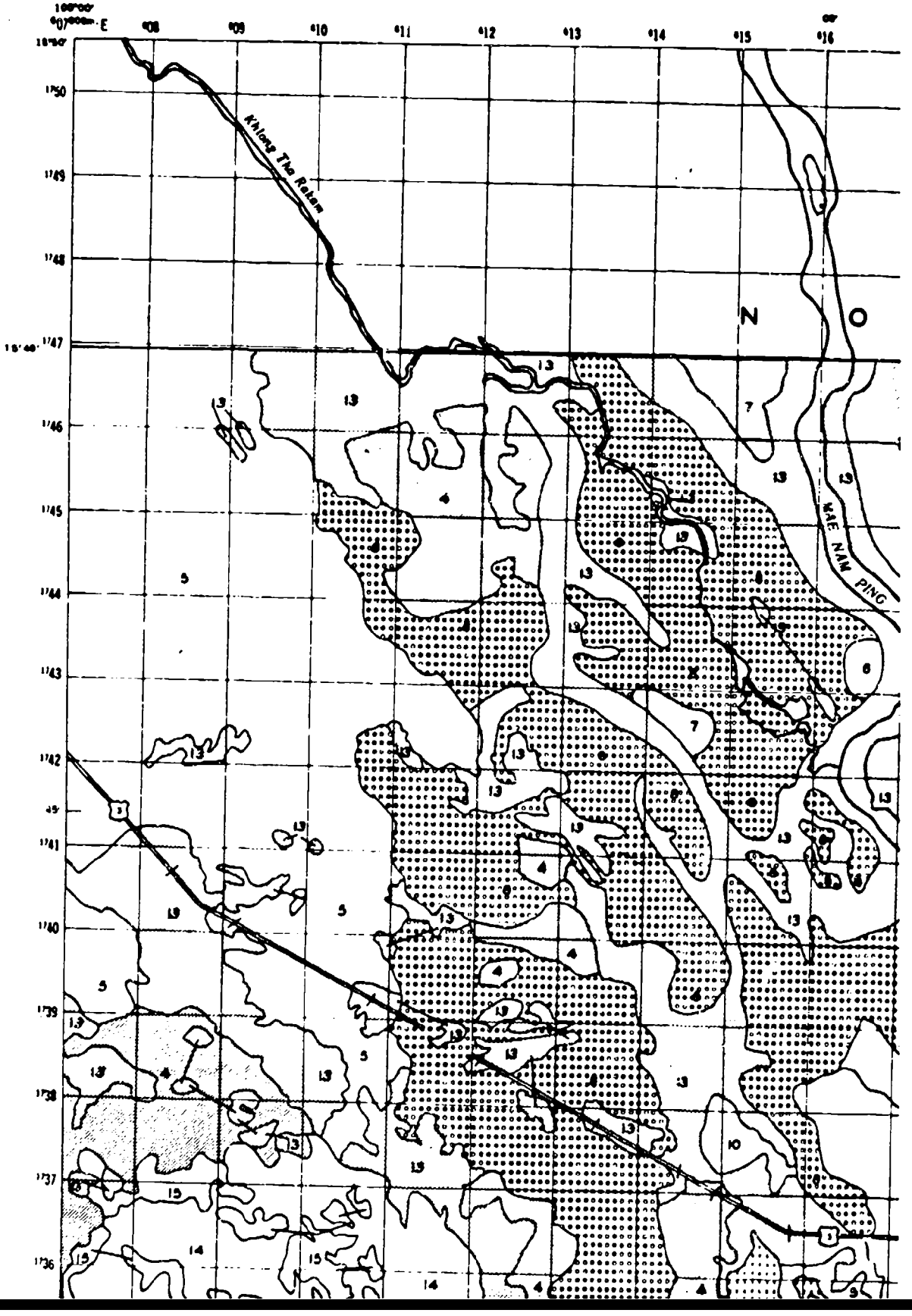
HYDROLOGIC GEOMETRY

NAKHON SAWAN STUDY AREA

SHEET NS I

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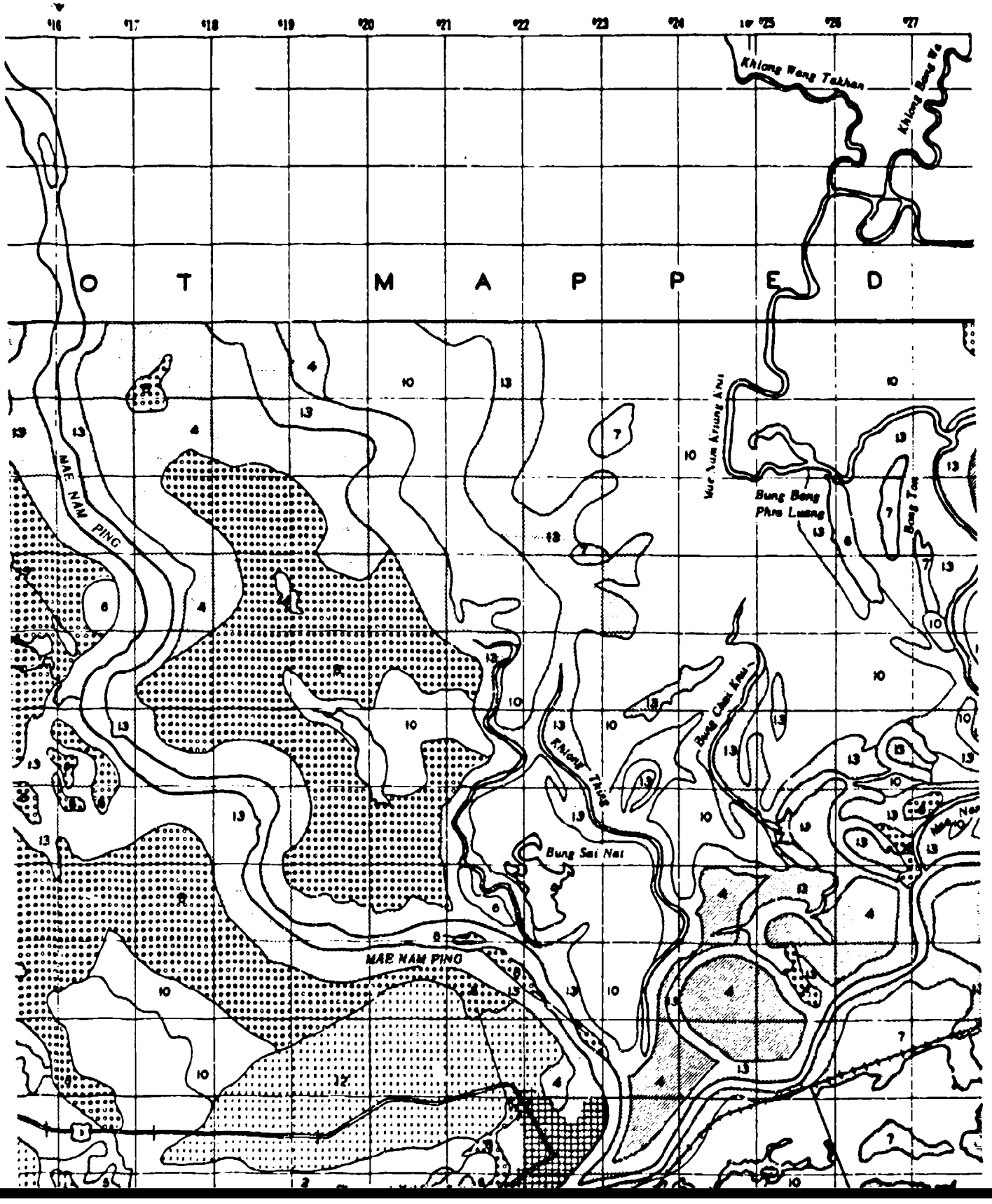
PLATE 1.1d


Khlong Tha Reban
MAE NAM PING
N
O

1

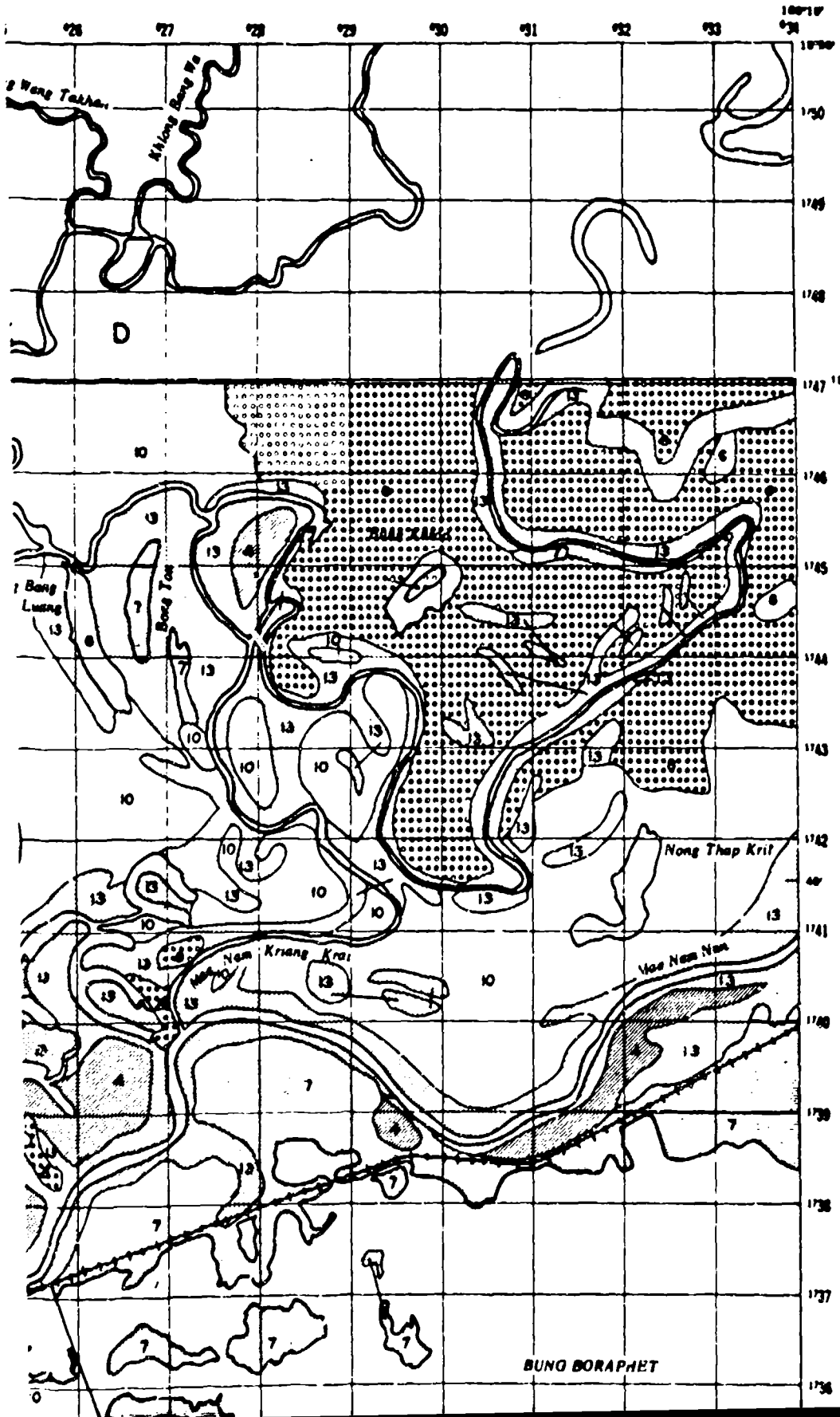
2

NAKHON SAWAN



1 3

SHEET NS II



Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Maximum Moisture: c_{uu} psi	Maximum Moisture: c_{uu} kg/cm²
	10-25	25-60	0-1	0-0.07
2	25-60	60-100	0-1	0-0.07
	25-60*	60-100	0-1	0-0.07
	25-60	>100	0-1	0-0.07
5	25-60*	>100	0-1	0-0.07
6	60-100	60-100	0-1	0-0.07
	60-100	60-100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
10	60-100	>100	0-1	0-0.07
	60-100*	>100	0-1	0-0.07
	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
14	Complex of 60-100 and >100	>100	0-1	0-0.07
15	Complex of 60-100 and >100	>100	0-1	0-0.07

Notes: Blank areas are water bodies.

c_{uu} Shear strength at zero normal load.

ϕ_{uu} Angle of internal friction.

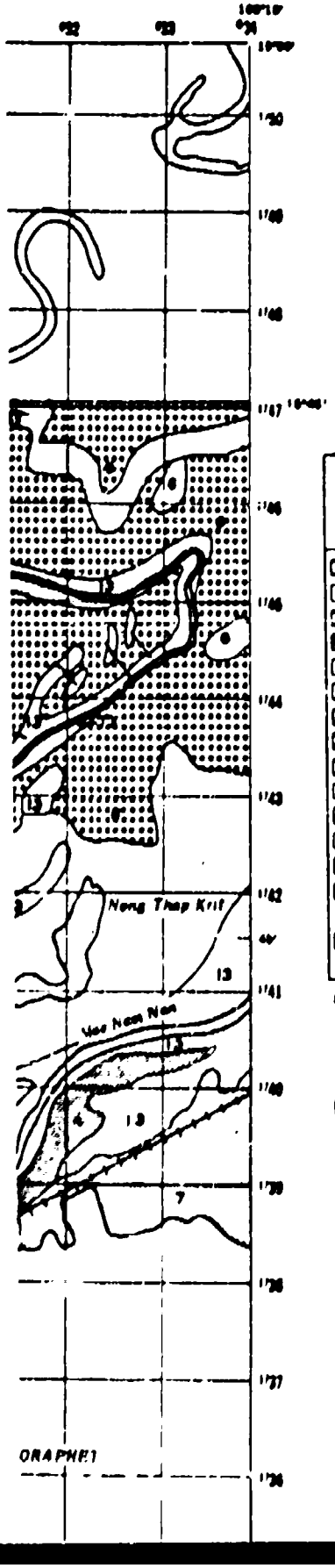
* Maximum moisture has less than 30 percent strengths commonly observed are 60-100 psi

Units do not occur on this map.

INDEX TO

4

SHEET NS II



LEGEND

Unit	Soil Mass Strength: Undrained Resistance (psi)	Soil Mass Strength: Undrained Resistance (kg/cm²)	Soil Surface Strength: Maximum Resistance c_w (psi)	Soil Surface Strength: Maximum Resistance c_w (kg/cm²)	Soil Surface Strength: Maximum Resistance ϕ_w (deg)	Soil Surface Strength: Minimum Resistance c_w (psi)	Soil Surface Strength: Minimum Resistance c_w (kg/cm²)	Soil Surface Strength: Minimum Resistance ϕ_w (deg)	Soil Surface Strength: Conditions where maximum strength c_w (psi)	Soil Surface Strength: Conditions where maximum strength c_w (kg/cm²)	Soil Surface Strength: Conditions where maximum strength ϕ_w (deg)
[illegible]	50-75	75-80	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture		conditions
2	75-80	80-120	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture		conditions
[illegible]	75-80*	80-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture		conditions
[illegible]	75-80	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	75-80*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	80-100	80-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture		conditions
[illegible]	80-120	80-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture		conditions
[illegible]	80-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
[illegible]	80-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	80-120	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture		conditions
[illegible]	80-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
[illegible]	>120	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of Units 12 and 13	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
13	Complex of Units 12 and 13	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture		conditions

Note: Blank areas are water bodies.

c_w Shear strength at zero normal load.

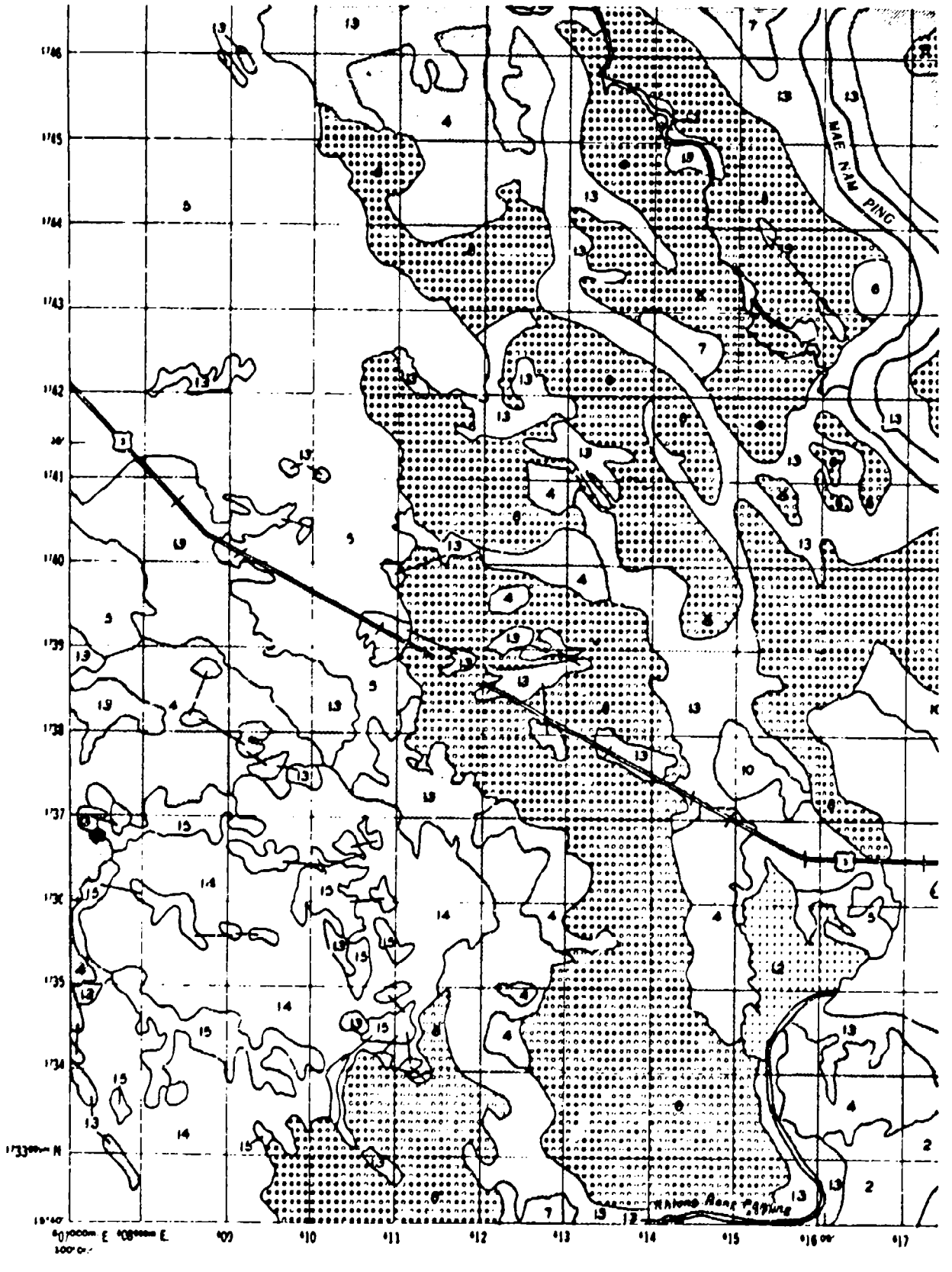
ϕ_w Angle of internal friction.

* Maximum moisture has less than 5% percent probability of occurrence during the wet season. Lowest strengths commonly observed are < 100 for Units 1 and 5; more than 100 for Unit 11.

Units do not occur on this map.

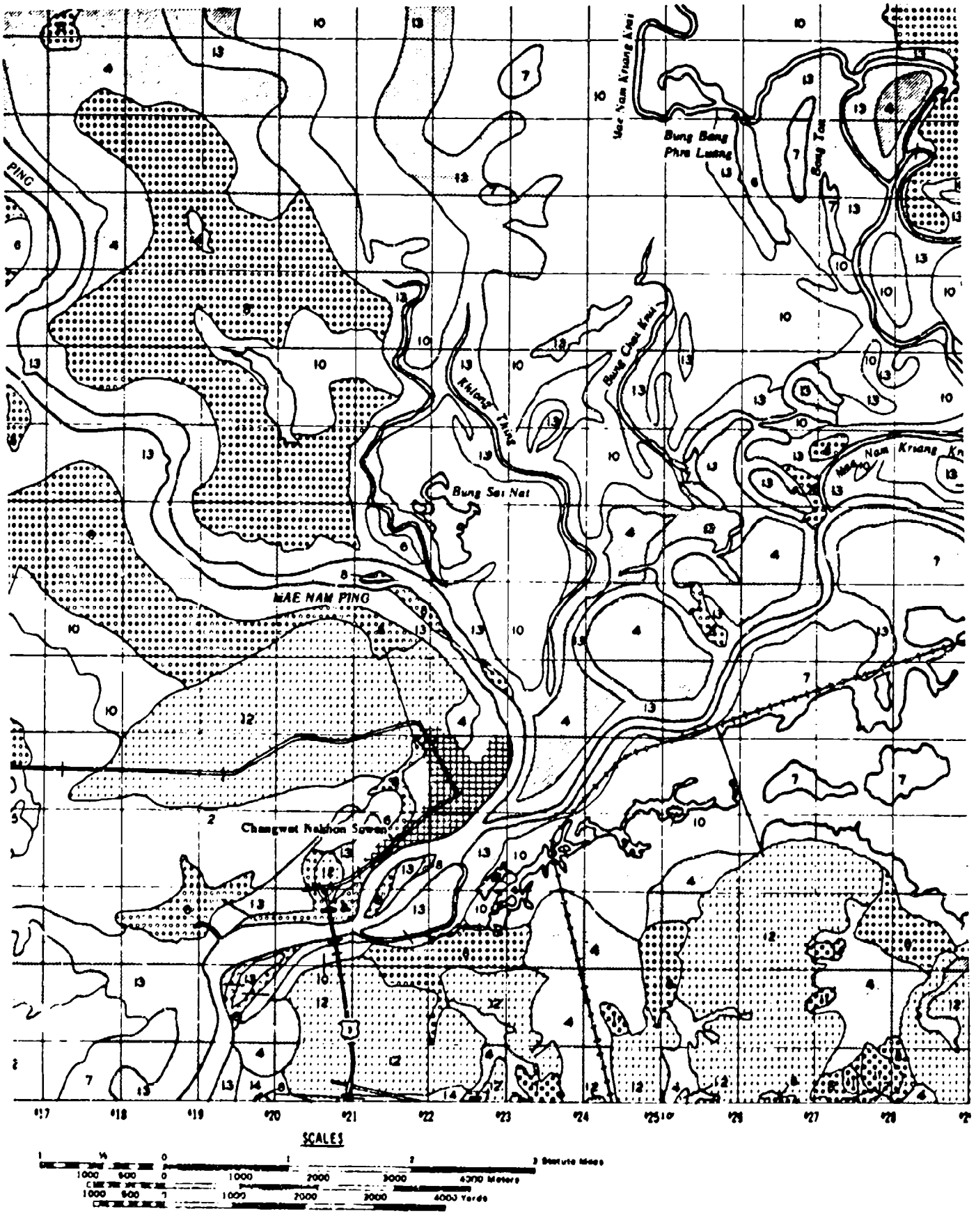
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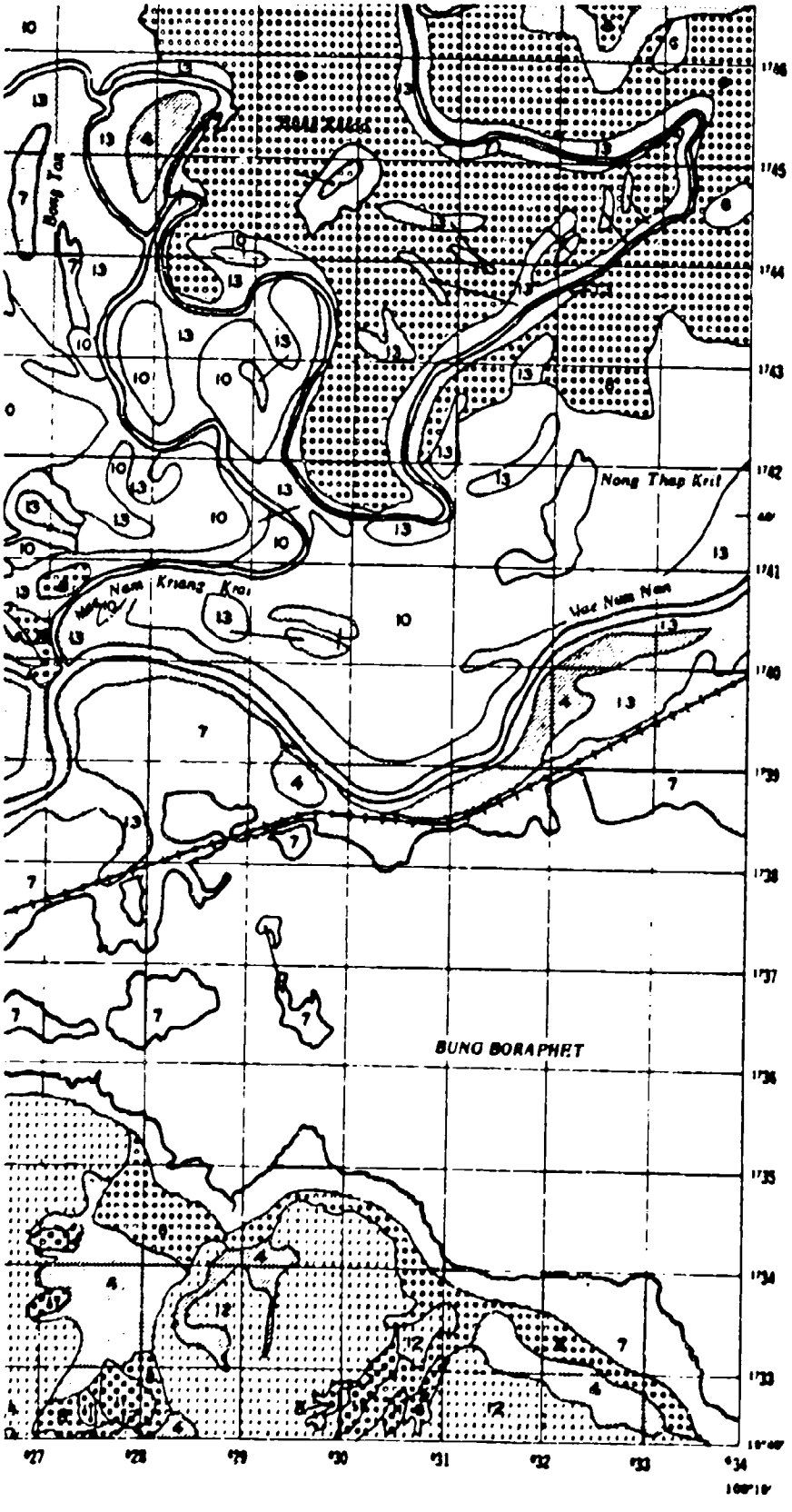


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


PING
Bung Bang Phra Luang
Bung Tao
Khlong Thung
Bung Sai Nat
MAE NAM PING
Changwat Nakhon Sawan
SCALES

6



Unit	Soil Mass Strength: Minimum Moisture — RCI	Soil Mass Strength: Maximum Moisture — RCI	Maximum Moisture: c_w psi	Maximum Moisture: c_w kg/cm²	Maximum Moisture: ϕ_w deg	Minimum Moisture: c_w psi	Minimum Moisture: c_w kg/cm²
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.0
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.1
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.1
	25-60	>100	0-1	0-0.07	0-10	0-1	
5	25-60*	>100	0-1	0-0.07	10-20	0-1	
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.1
	60-100	60-100	0-1	0-0.07	10-20	0-1	
	60-100	>100	0-1	0-0.07	0-10	0-1	
	60-100	>100	0-1	0-0.07	0-10	0-1	
10	60-100	>100	0-1	0-0.07	10-20	0-1	
	60-100*	>100	0-1	0-0.07	10-20	0-1	
	>100	>100	0-1	0-0.07	0-10	0-1	
13	>100	>100	0-1	0-0.07	10-20	0-1	
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	

Note: Blank areas are water bodies.

c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 5 percent probability of occurrence; strengths commonly observed are 60-100 for Units 5 and 5; and

Units do not occur on this map.

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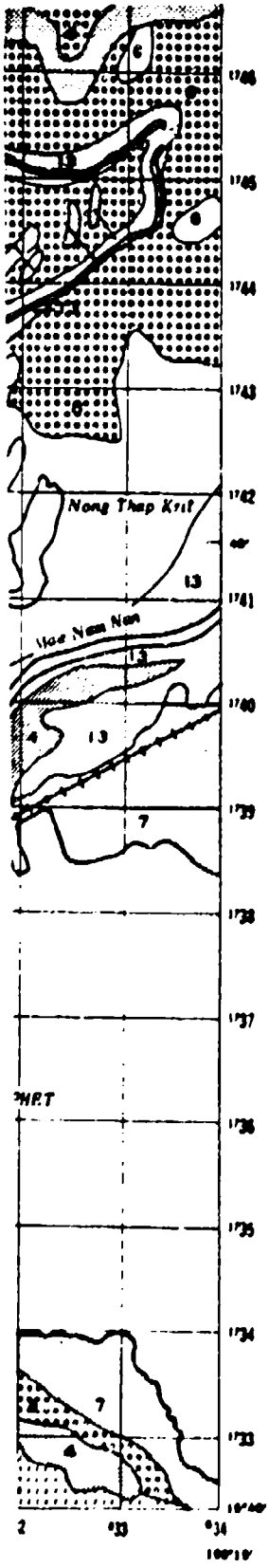
NS I	NS II	
	NS V	

A QUANTITATIVE METHOD FOR
TERRAIN FOR GROUND

SURFACE COMPO

NAKHON SAWAN STU

SHEET NS II



Units	Soil Mass Strength: Maximum Moisture (MC)	Soil Mass Strength: Minimum Moisture (MC)	Soil Surface Strength: Maximum Moisture: c_w (psi)	Maximum Moisture: c_w (kg/cm²)	Maximum Moisture: ϕ_w (deg)	Minimum Moisture: c_w (psi)	Minimum Moisture: c_w (kg/cm²)	Minimum Moisture: ϕ_w (deg)	Critical shear condition: c_w (psi)	Critical shear condition: c_w (kg/cm²)	Critical shear condition: ϕ_w (deg)
[1]	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture conditions		
[2]	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
[3]	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture conditions		
[4]	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
[5]	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
[6]	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
[7]	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
[8]	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
[9]	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
[10]	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
[11]	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
[12]	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
[13]	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
[14]	Complex of [1], [12] and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
[15]	Complex of [1], [12] and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		

Note: Blank areas are water bodies.

c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 5 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 0-0.07 for Units 3 and 5 and more than 1.4 for Unit 11.

Units 14 and 15 not shown on this map.

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	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

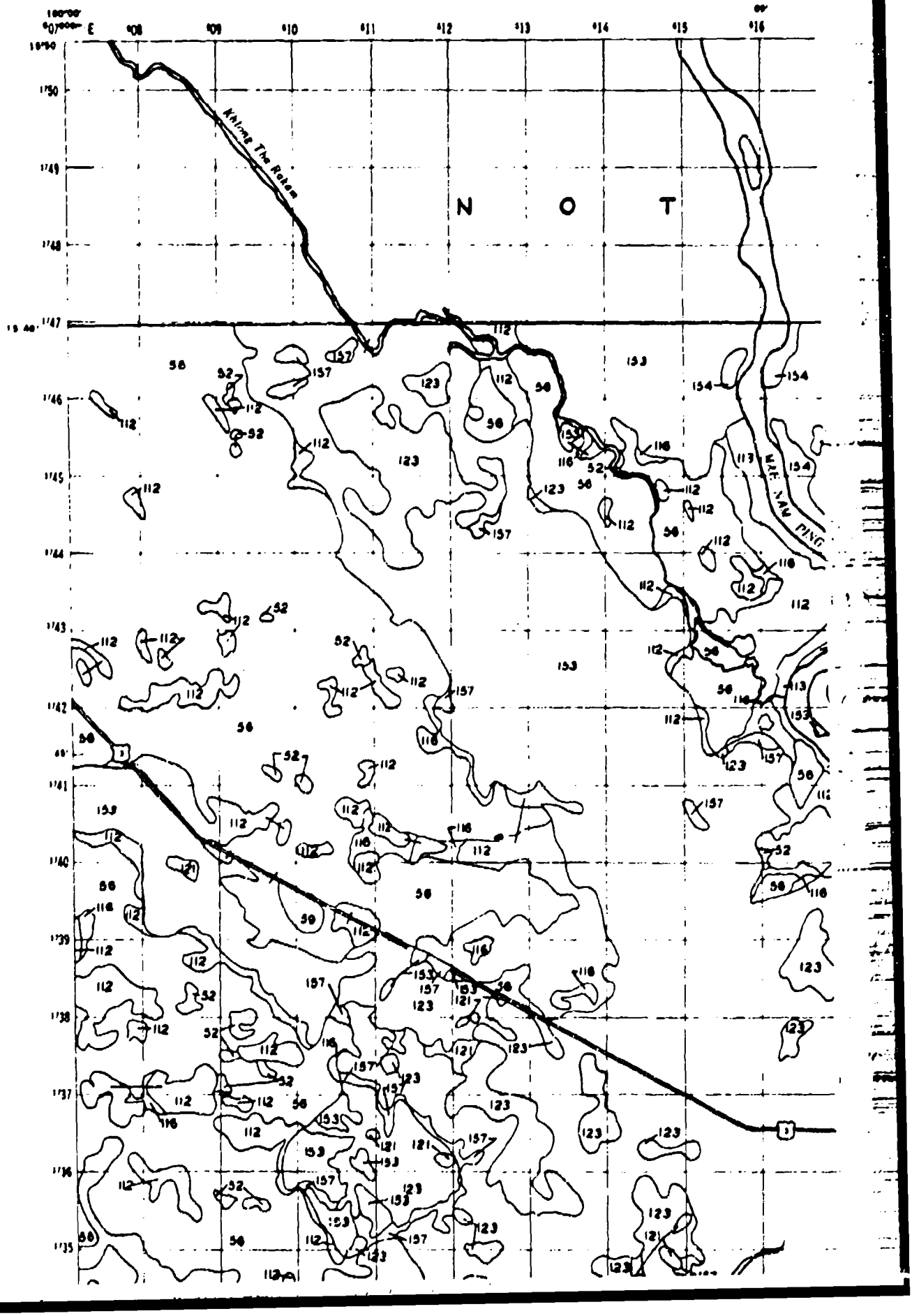
SURFACE COMPOSITION

NAKHON SAWAN STUDY AREA

SHEET NS II

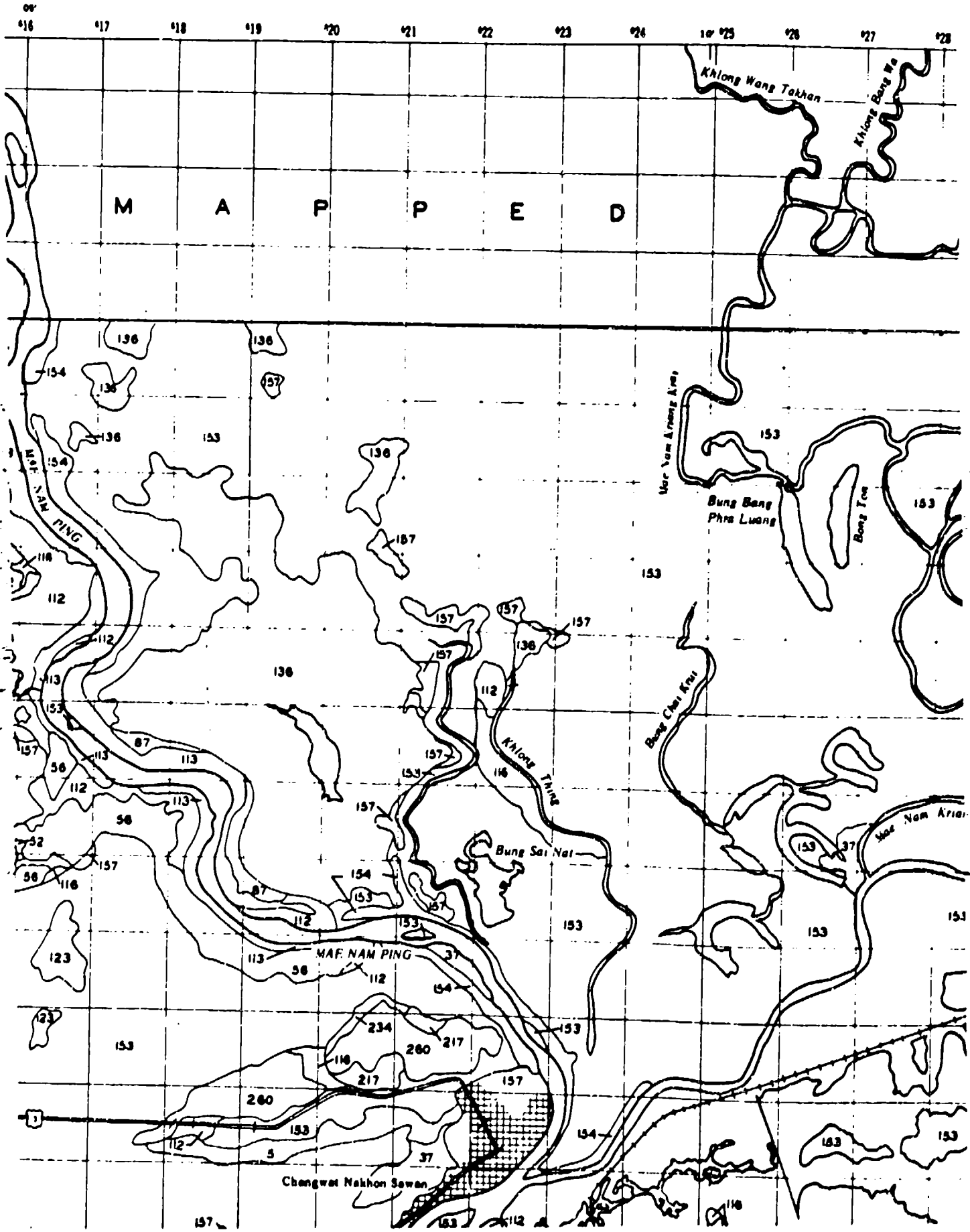
S

PLATE 1.2a


E
108
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112
113
114
115
116
N O T
Khlong Tha Rotan
Wat Nam Ping

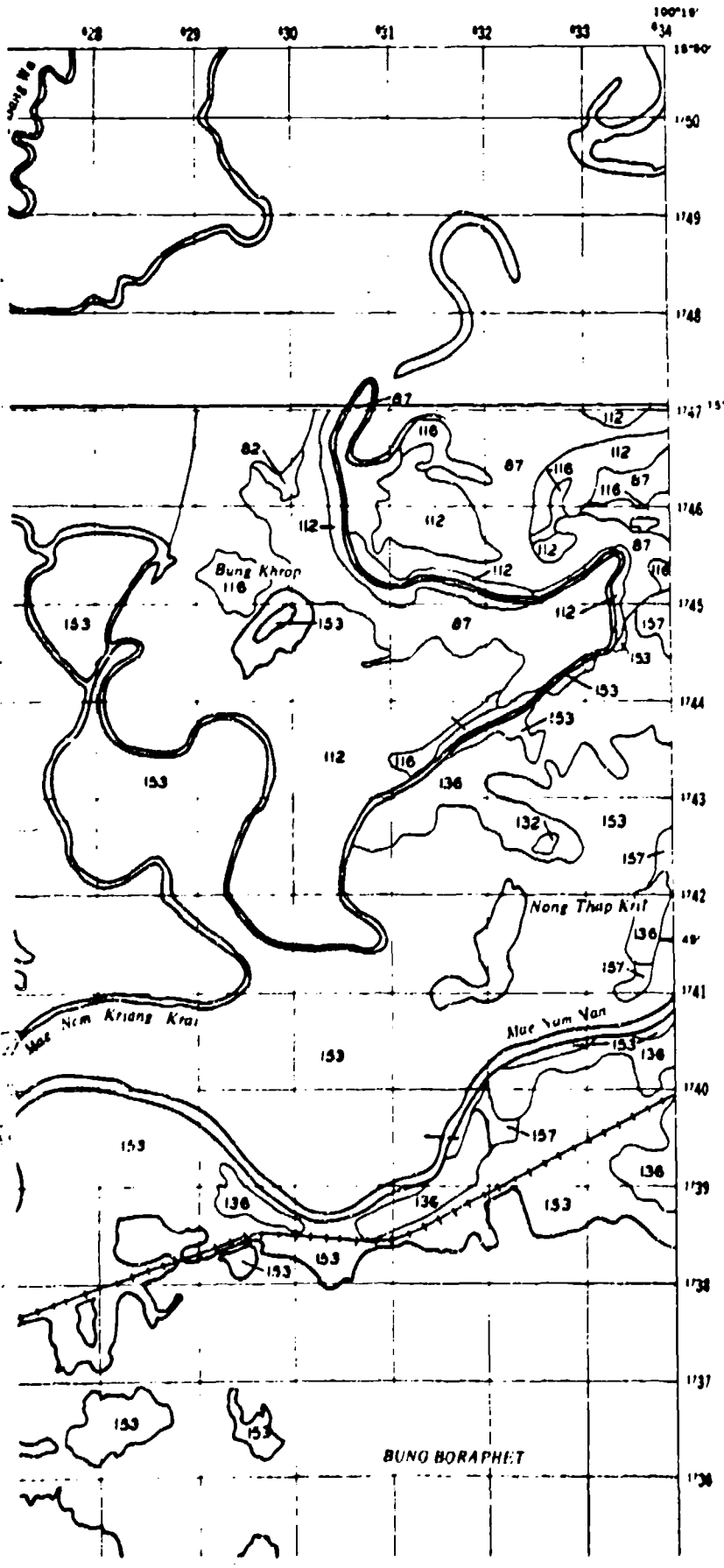
2

NAKHON SAWAN

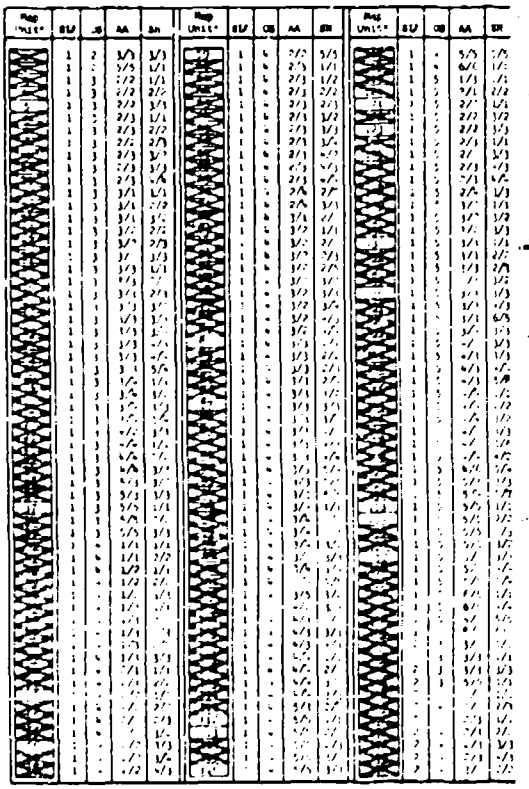


3

SHEET NS II



LEGEND



Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 2, 3/1, 1/1 being), each of which is having AA, dominant angle AA, and stay hole ... were merged. The numerals of the fraction (not stem) ... range from NE easterly direction (i.e. azimuth from ... to ...) and the dominant ... > 1/1 (1 3/1 deg) assuming that the vehicle intercepts the ... is at ...

* Mapping class ranges of each surface in density factor area:

Slope (SL)

Mapping Class	Range deg
1	...
2	> 1.5-4.5
3	> 4.5-9
4	> 9-15
5	> 15-30
6	> 30-45
7	> 45

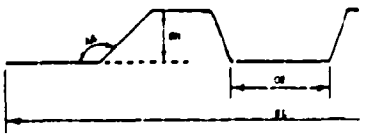
Vertical Obstacle Spacing (OB)

Mapping Class	Value	
	m	ft
1	...	0-2.63
2	> 7-12	> 2.13-3.94
3	> 12-5	> 3.7/-15.75
4	> 5-10	> 15.8 ...-5.7
5	> 15	> 49.21

Attitude (AA)

Mapping Class	
1	
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	

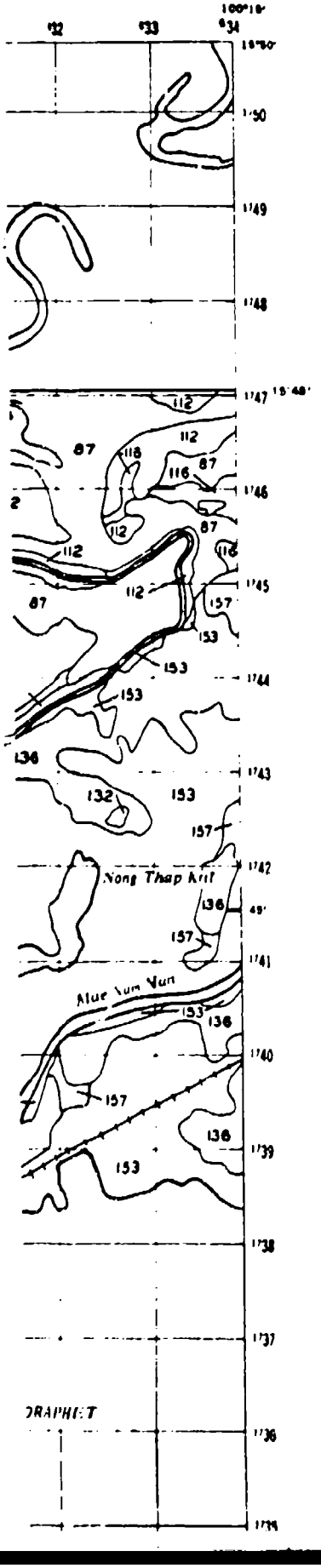
Units or not occur on this map.



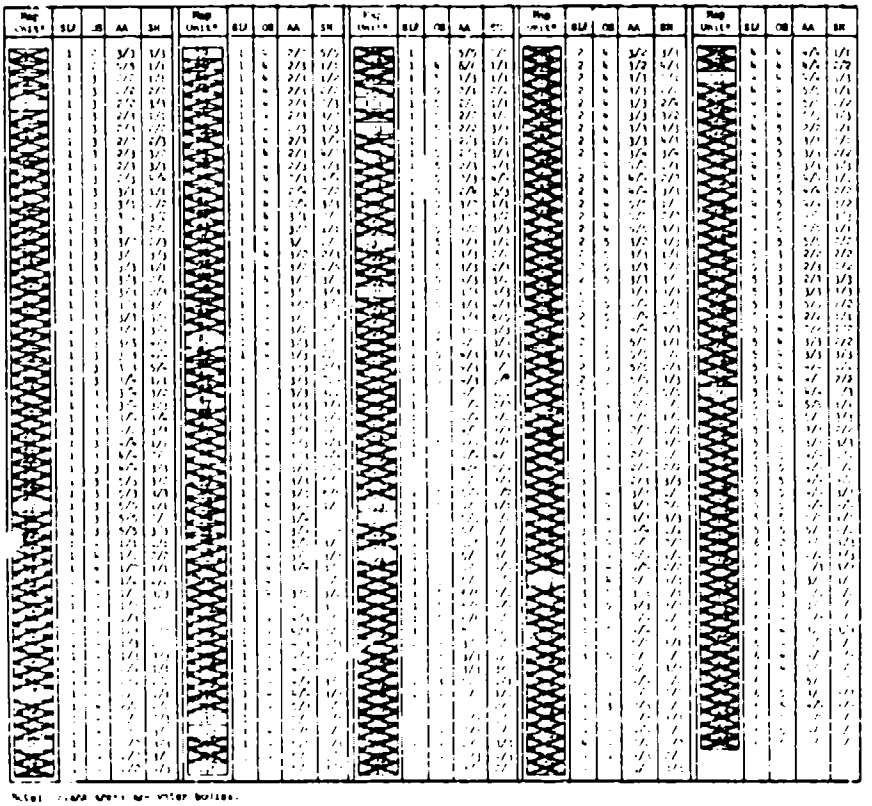
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SHEET NS II



LEGEND



Note: Grade sheets are under bottom.

* Each map unit represents a group of four symbols (i.e. 1/1, 1/2, 1/3, 1/4) with the first number being of class SI (i.e. thickness below), next by letters (i.e. SU, OB, AA, and SR) and last by letter (i.e. ...). The letters are in the order they were mapped. The numerator of the fraction (1/1, 1/2, 1/3, 1/4) is the dominant while the remainder is of the following descending order. Arrows (i.e. ...) indicate trend of the dominant direction (i.e. ...) and the numerical points to a westerly direction (i.e. ...) from the ... (i.e. ...) sampling (not the well) is interpolated (i.e. ...) at a point midway.

* Mapping is based on depth surface or isopach of the unit.

Slope (SL)

Mapping Class	Range deg
1	...
2	...
3	...
4	...
5	...
6	...
7	...

Aspect Ratio (AR)

Mapping Class	Range	
	W	L
1	...	...
2	...	...
3	...	...
4	...	...
5	...	...

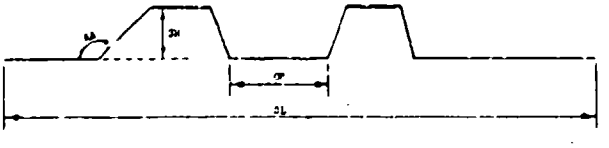
Azimuth Angle (AA)

Mapping Class	Range deg
1	...
2	...
3	...
4	...
5	...
6	...
7	...
8	...
9	...
0	...
/	...

Map Unit (SR)

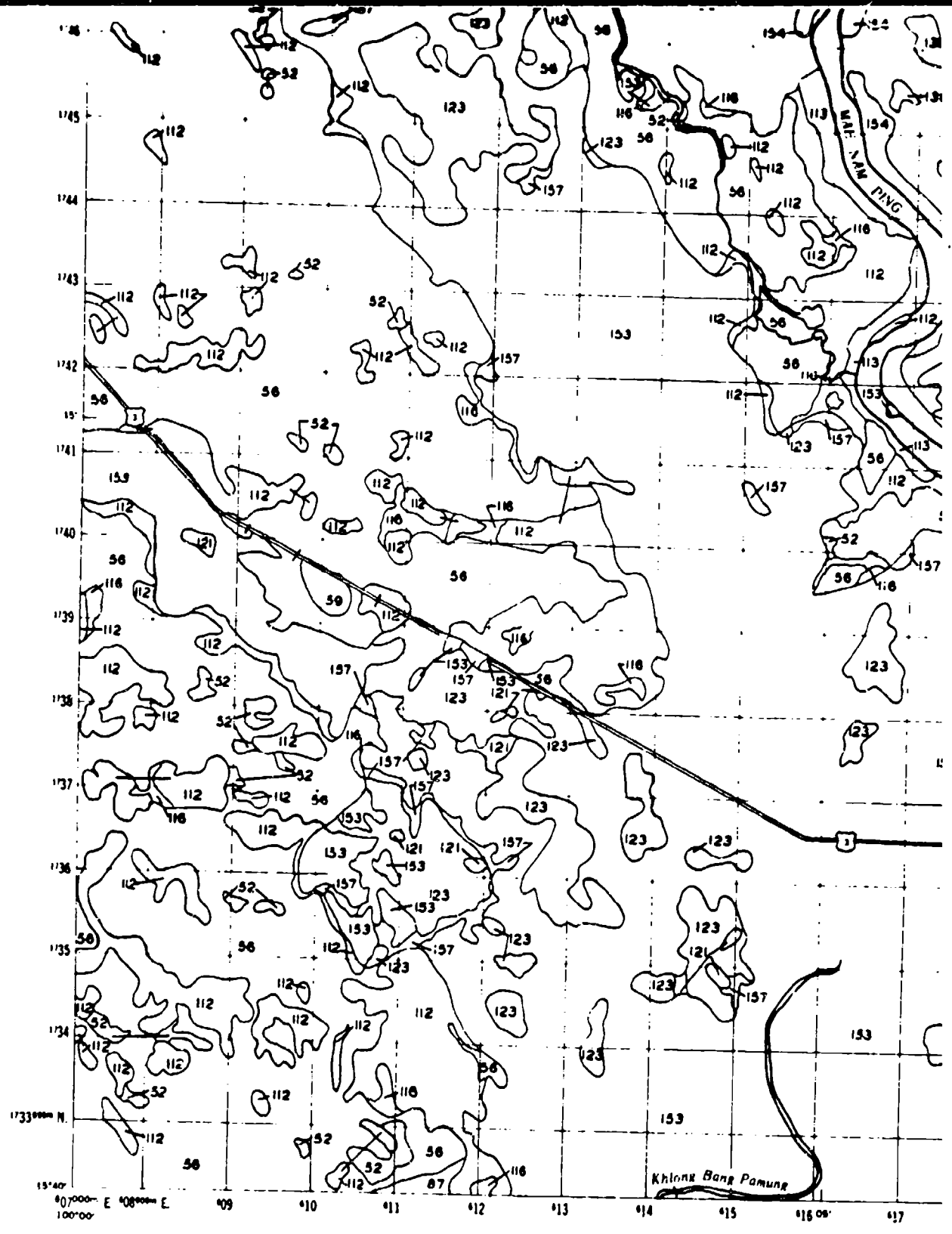
Mapping Class	Range	
	La	Lm
1	...	...
2	...	...
3	...	...
4	...	...
5	...	...
6	...	...
7	...	...
8	...	...

... axis is not shown on this map.



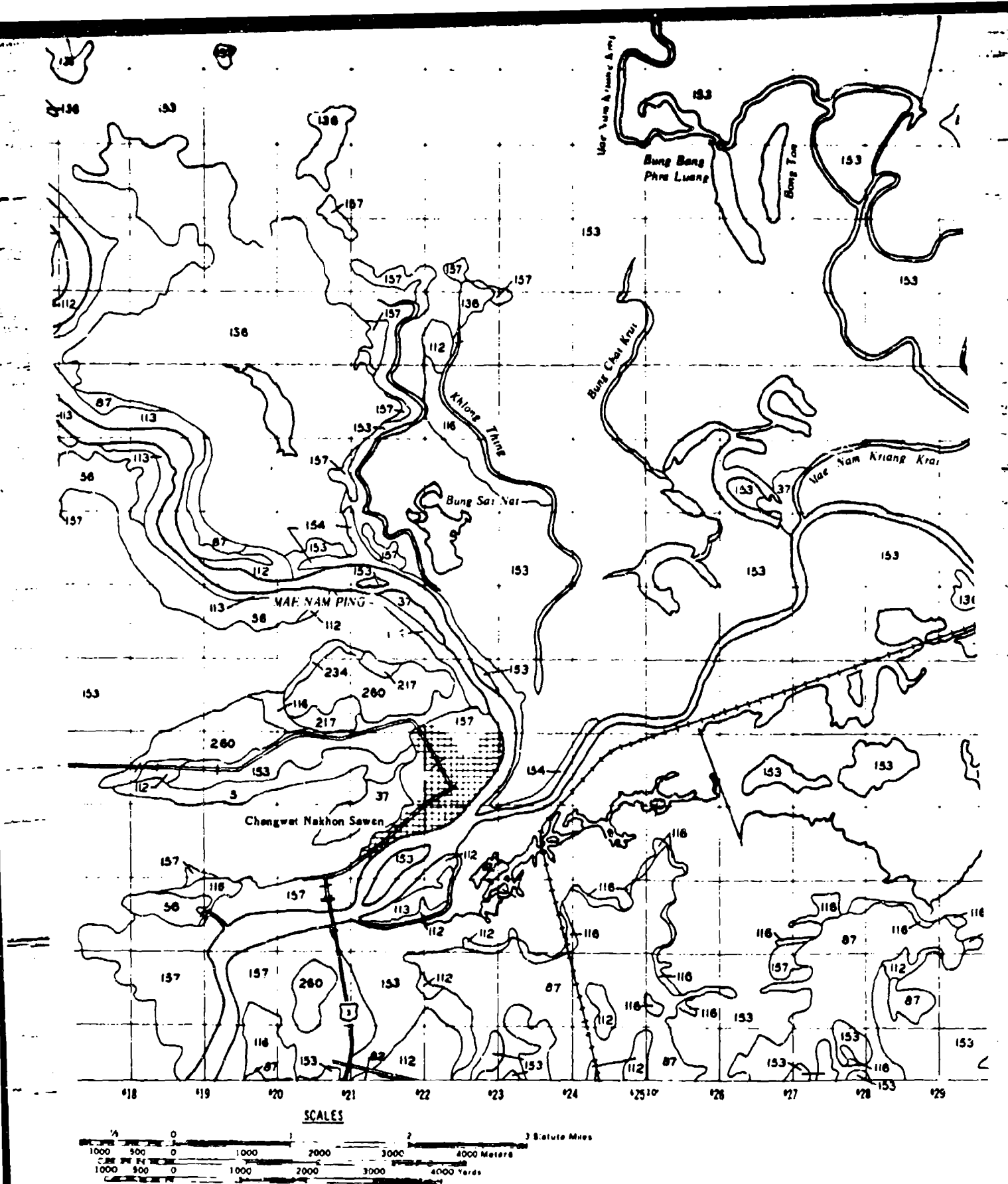
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NS I	NS II	NS III
	...	...

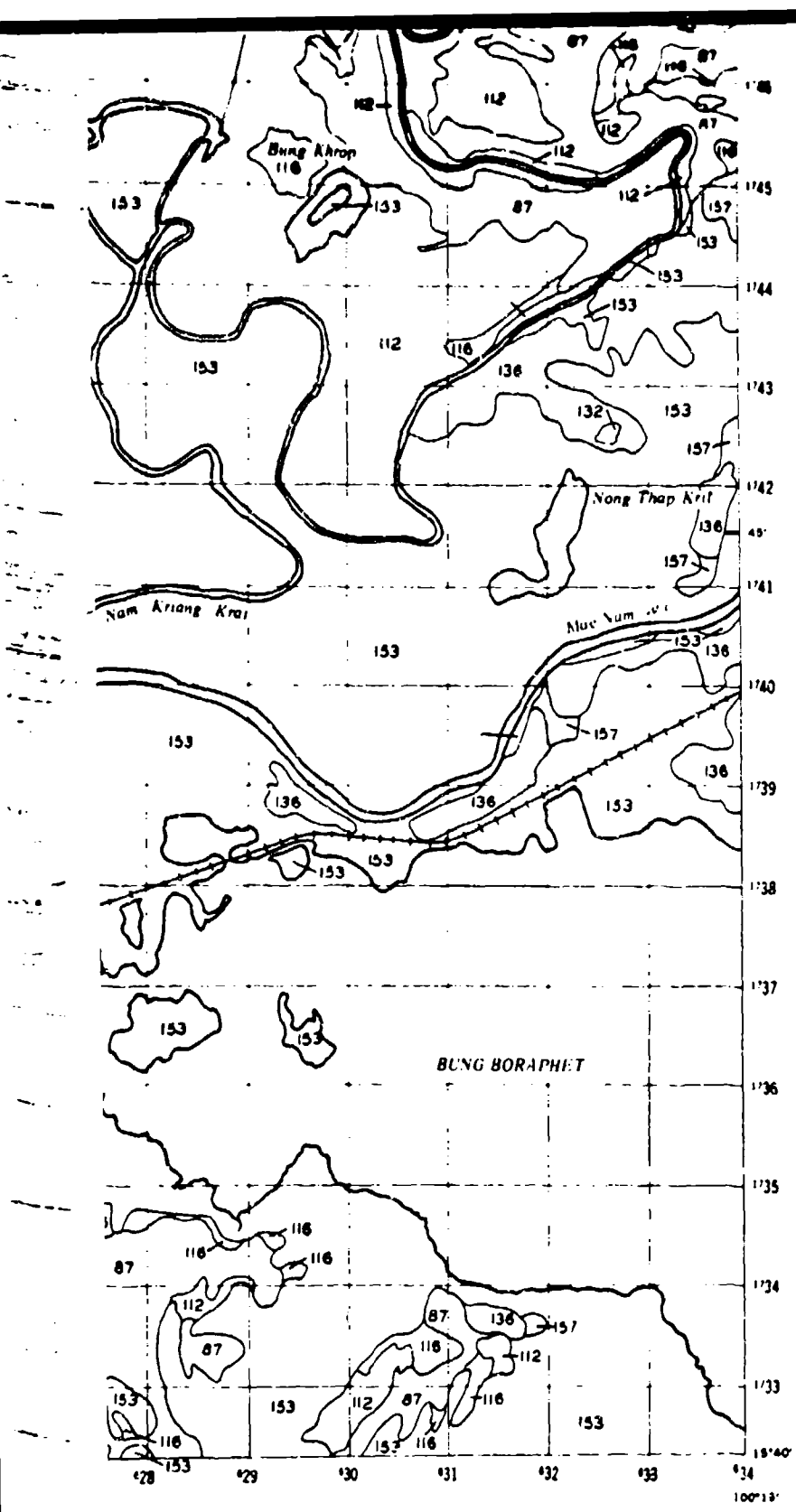


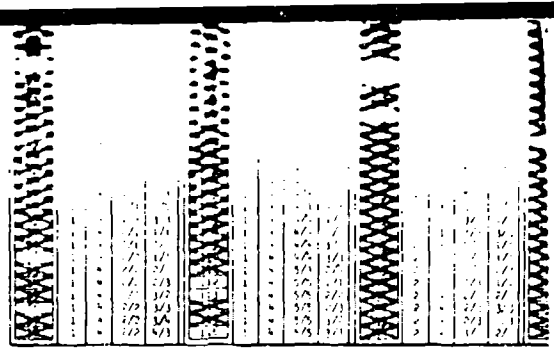
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


Bung Boraphet
Bung Chai Krut
Khlong Thang
Bung Sai Nai
MAE NAM PING
Changwat Nakhon Sawan
Mae Nam Khlang Krai
SCALES
3 Statute Miles
4000 Meters
4000 Yards

6





Note: Blank areas are water bodies

* Each map unit represents an area of four symbols (i.e. 1, 2, 3/1, 3/2) (units below), vertical by 4 m a spacing 20 kilometers apart AA, and step height 20 m were mapped. The numerator of the fraction (all other rows) that will be easterly direction (i.e. azimuth from 0 to 90 deg) and the denominator refer > 15° to 360 deg) assuming that the vehicle intersects the obstacle at a right

† Passing class ranges of each surface geometry factor and

Slope (SL)

Mapping Class	Range (deg)
1	0 - 5
2	> 5 - 15
3	> 15 - 30
4	> 30 - 45
5	> 45 - 60
6	> 60 - 75
7	> 75 - 90
8	> 90

Vertical Obstacle Height (VO)

Mapping Class	Value	
	(1)	(2)
1	0 - 0.3	0 - 0.3
2	> 0.3 - 0.6	> 0.3 - 0.6
3	> 0.6 - 0.9	> 0.6 - 0.9
4	> 0.9 - 1.2	> 0.9 - 1.2
5	> 1.2 - 1.5	> 1.2 - 1.5
6	> 1.5	> 1.5

Approach Angle (A

Mapping Class	Range (deg)
1	< 5
2	5 - < 10
3	10 - < 15
4	15 - < 20
5	20 - < 25
6	25 - < 30
7	30 - < 35
8	35 - < 40
9	≥ 40

Area to not scale or data gap



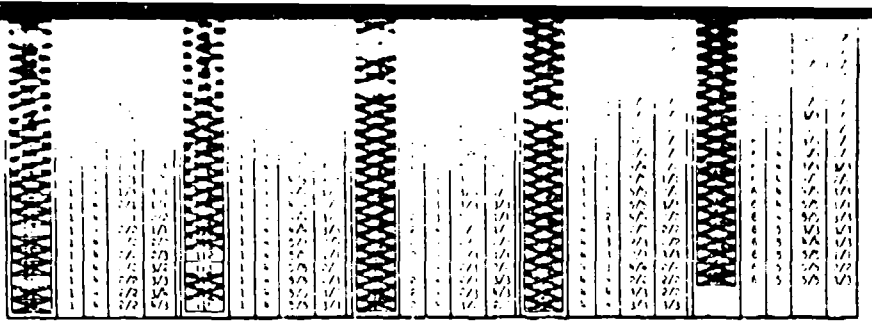
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NS I	NS II	NS III
	NS IV	NS V

A QUANTITATIVE METHOD FOR DESC TERRAIN FOR GROUND MOBILI

SURFACE GEOMETRY

NAKHON SAWAN STUDY AR SHEET NS II



Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 2, 1/1, 1/1) indicative roaring classes of slope SL (see diagram below), vertical obstacle spacing OS, approach angle AA, and step height SH. Front and rear vertical obstacle dimensions were averaged. The orientation of the fraction unit symbol represents that which is dominant relative traversing an area in an easterly direction (i.e. azimuth from > 45 to 135 deg) assuming that the vehicle intersects the obstacle at a right angle.

† Roaring class ranges of each surface as metric or U.S. units

Slope (SL)

Roaring Class	Range (deg)
1	0-1.5
2	> 1.5-3
3	> 3-5
4	> 5-15
5	> 15-30
6	> 30-45
7	> 45

Vertical Obstacle Spacing (OS)

Roaring Class	Range	
	m	ft
1	>0	0-(1.5)
2	> 0-10	> 0-(30)
3	> 10-20	> 30-(60)
4	> 20-40	> 60-(120)
5	> 40	> 120-(>120)

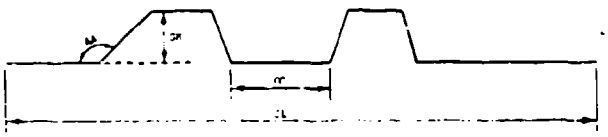
Approach Angle (AA)

Roaring Class	Range (deg)
1	0-10
2	10-20
3	20-30
4	30-45
5	45-60
6	60-75
7	75-90
8	90-105
9	105-120
X	≥ 120

Step Height (SH)

Roaring Class	Range	
	m	ft
1	0-0.5	0-(1.5)
2	> 0.5-1.0	> 1.5-(3.0)
3	> 1.0-1.5	> 3.0-(4.5)
4	> 1.5-2.0	> 4.5-(6.0)
5	> 2.0-2.5	> 6.0-(7.5)
6	> 2.5-3.0	> 7.5-(9.0)
7	> 3.0-3.5	> 9.0-(10.5)
8	> 3.5	> 10.5 ft

Tick to not occur on this map.



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NS I	NS II	NS III
	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

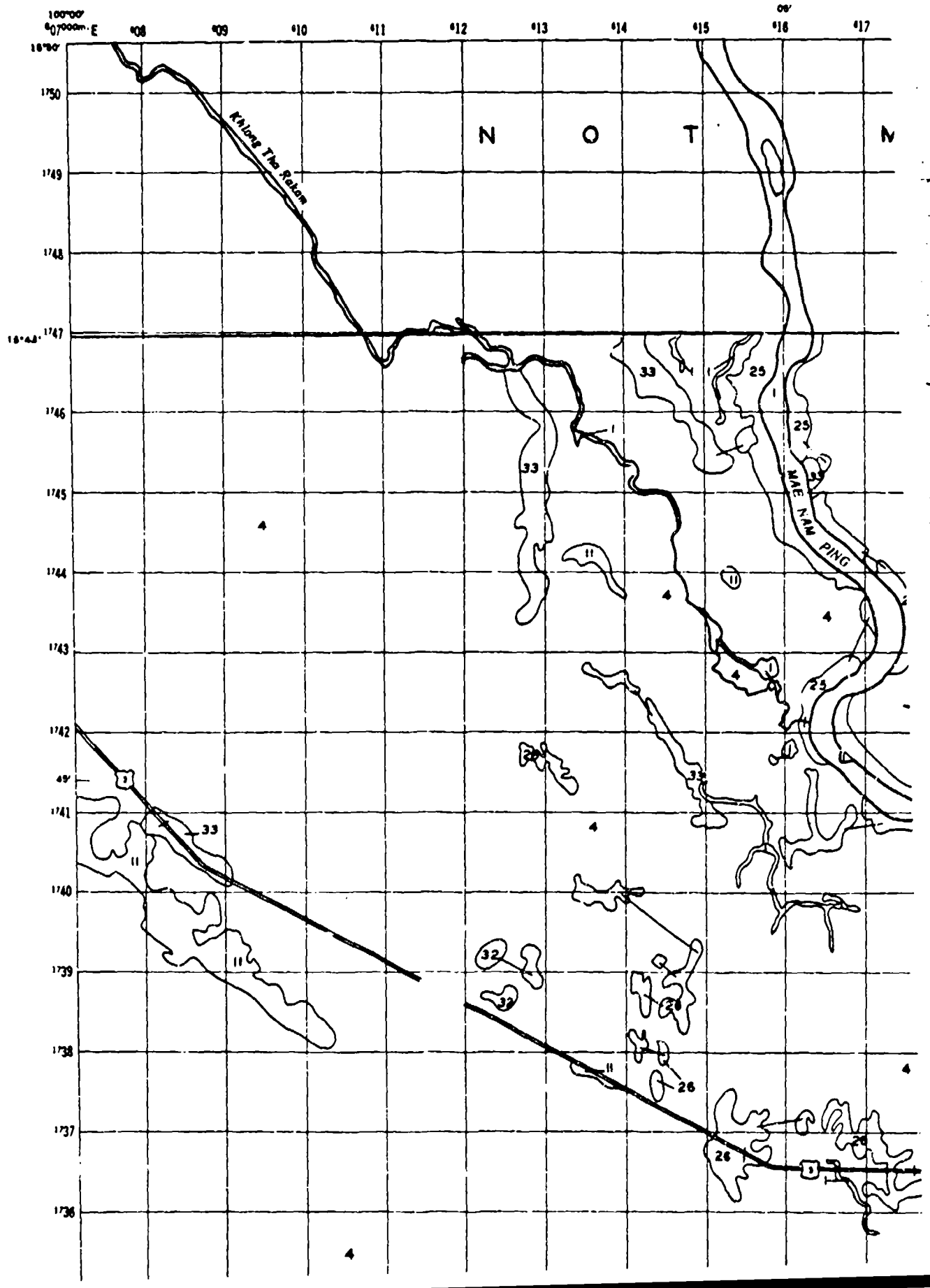
SURFACE GEOMETRY

NAKHON SAWAN STUDY AREA

SHEET NS II

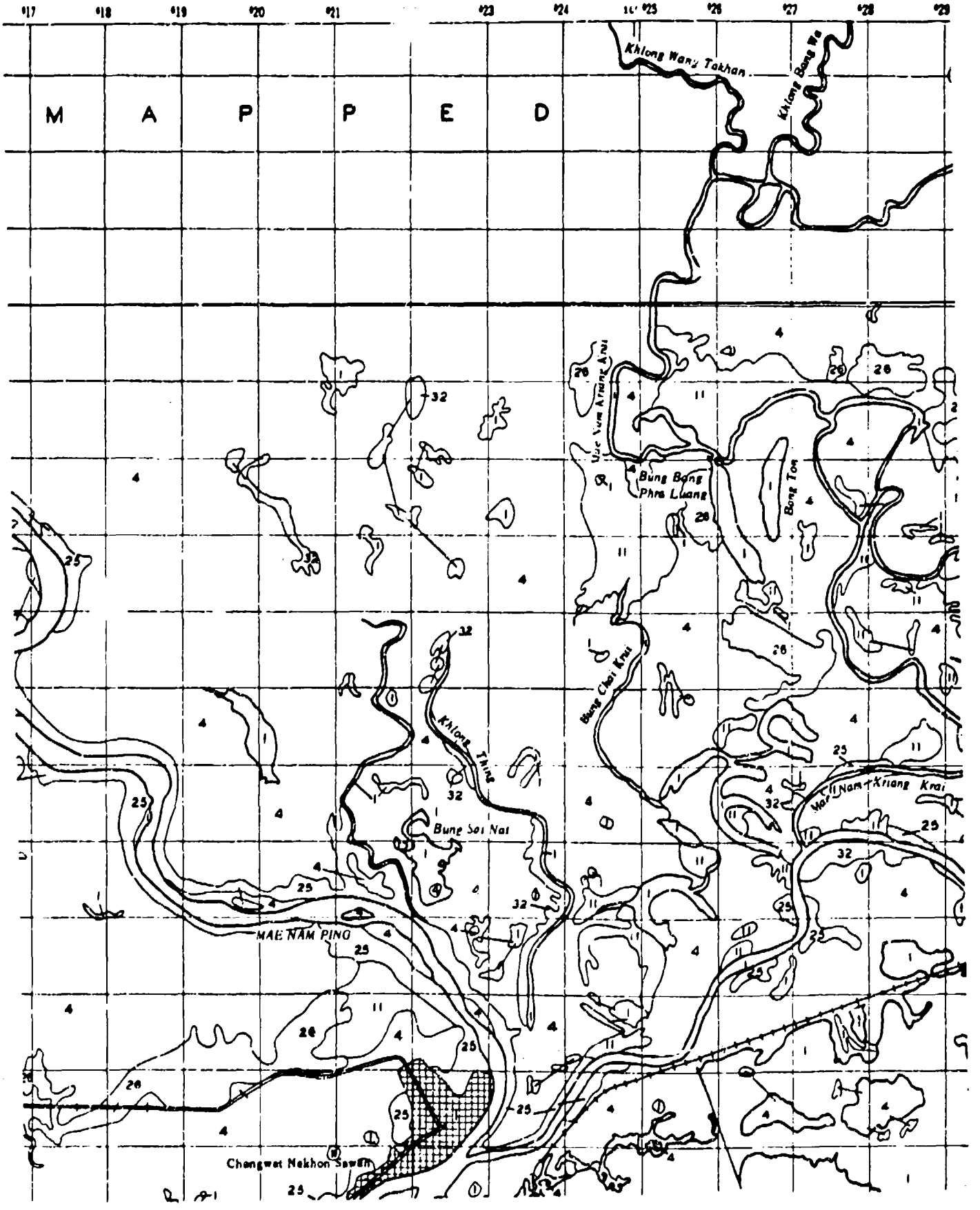
8

PLATE 1.2b


100°00'
607000m. E
08
09
10
11
12
13
14
15
16
17
1750
1749
1748
1747
1746
1745
1744
1743
1742
1741
1740
1739
1738
1737
1736
Khlong Tha Rakam
N O T
MAE NAM PING
33
25
11
4
32
26
1

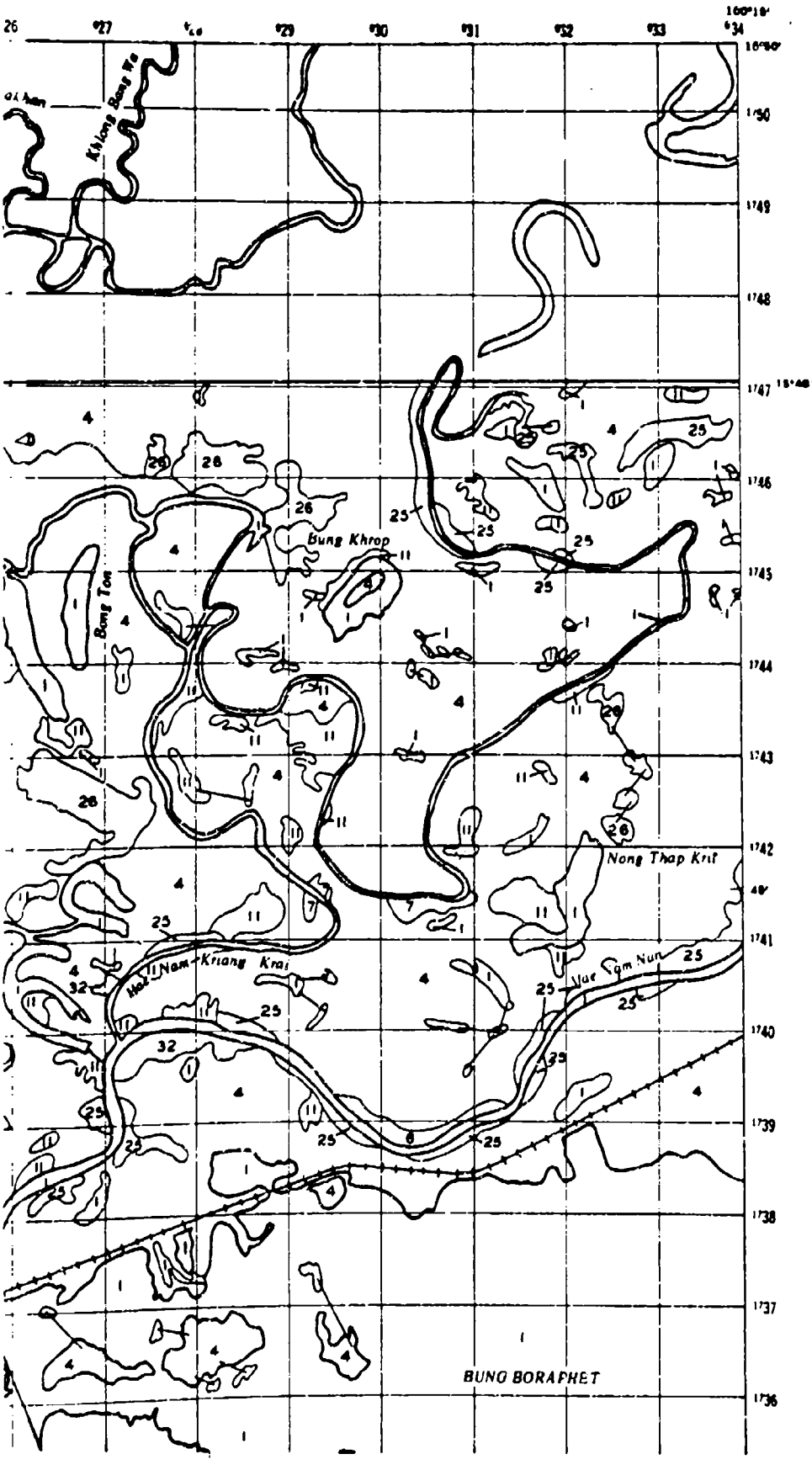
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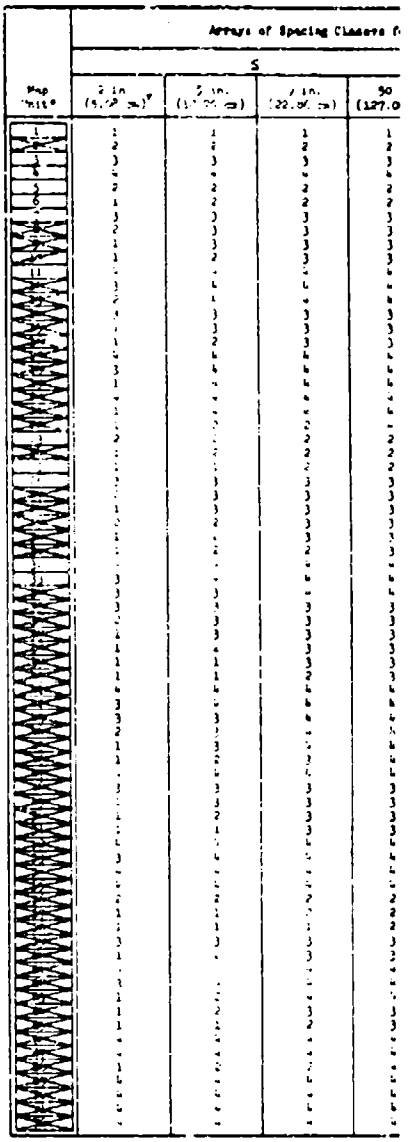
NAKHON SAWAN



3

SHEET NS II





Note: Blank areas are unvegetated water bodies.

* Each map unit represents an array of eight spacing classes for stems ≤ 2, 5, 9, and 50 in. ≥ 1, 3, 6, and 10 in. (2.54, 7.62, 15.24, and 2

* Mapping class ranges for each spacing class ar

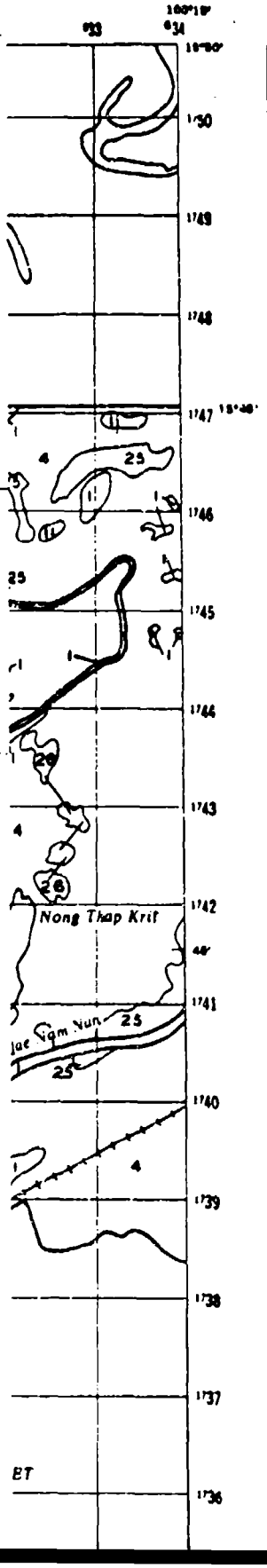
Mapping Class	
1	>
2	> 10
3	> 5
4	0

Units do not occur on this map.

INDEX TO ADJOI

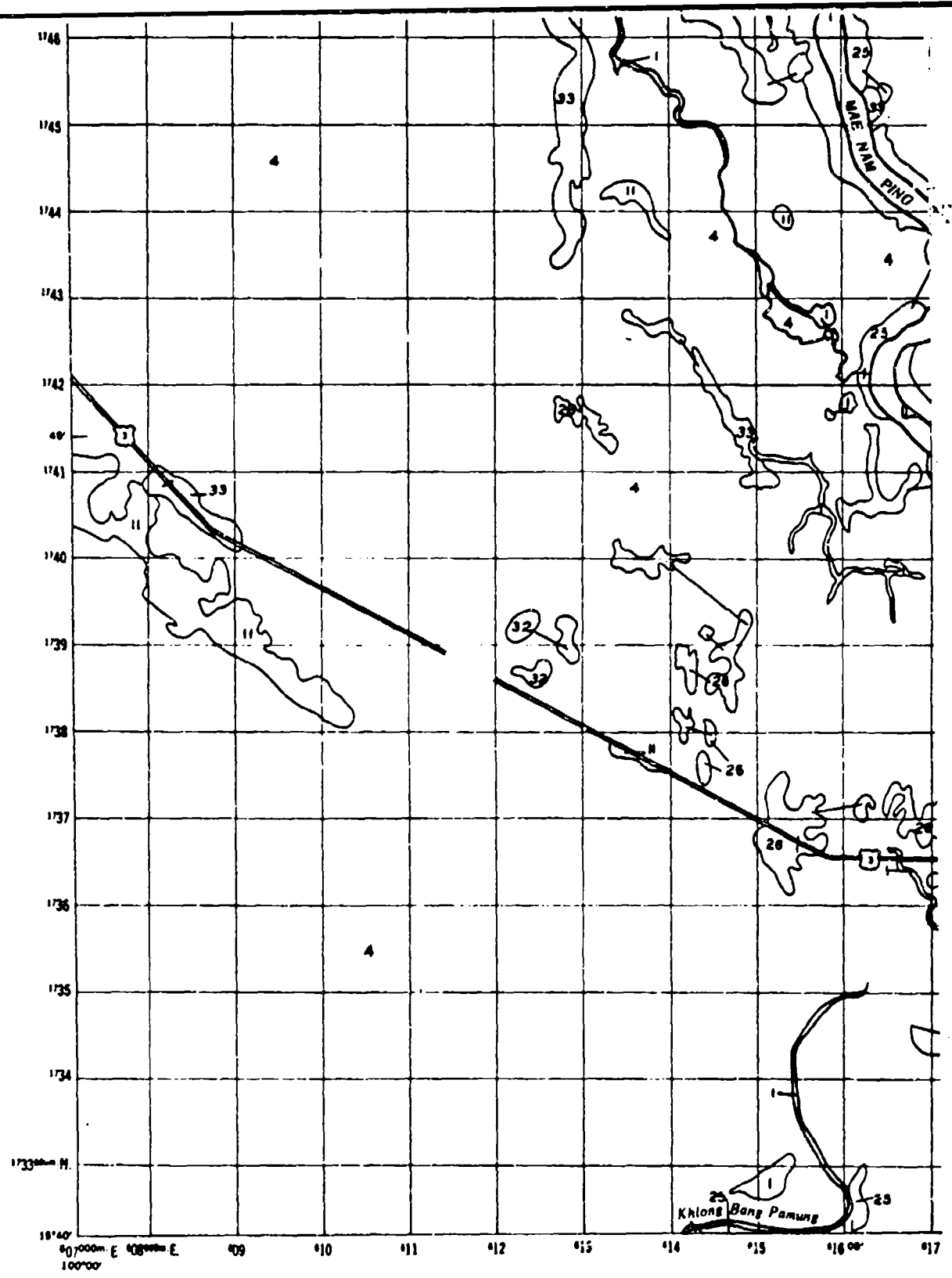
NS I	NS

SHEET NS II



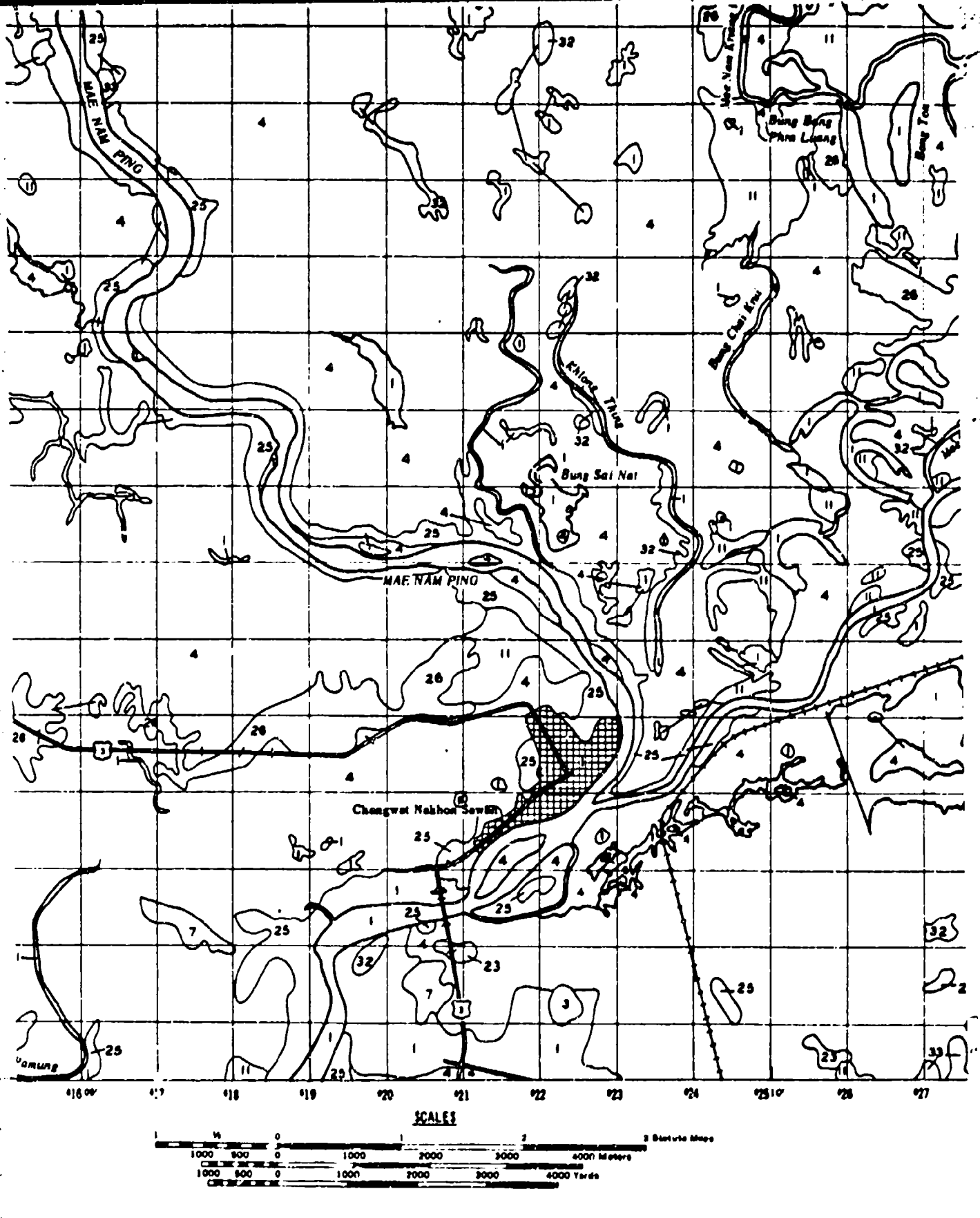
LEGEND

Map Unit*	Arrays of Spacing Classes for Stems ≤ and ≥ the Specified Diameter							
	≤				≥			
	2 in. (5.08 cm)†	5 in. (12.70 cm)	9 in. (22.86 cm)	50 in. (127.00 cm)	1 in. (2.54 cm)	3 in. (7.62 cm)	6 in. (15.24 cm)	10 in. (25.40 cm)
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	1	1	1
3	3	3	3	3	3	1	1	1
4	4	4	4	4	4	1	1	1
2	2	2	2	2	2	2	1	1
1	2	2	2	2	2	2	1	1
3	3	3	3	1	3	2	1	1
2	3	3	3	3	3	2	1	1
1	2	3	3	3	3	2	1	1
2	3	4	4	4	4	2	1	1
3	3	3	3	3	3	3	1	1
2	3	3	3	3	3	3	1	1
3	4	4	4	4	4	3	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	2	2	1
4	4	4	4	4	4	3	2	1
3	3	3	3	3	3	3	2	1
4	4	4	4	4	4	3	2	1
3	3	3	3	3	3	2	2	1
4	4	4	4	4	4	3	2	1
3	3	3	3	3	3	3

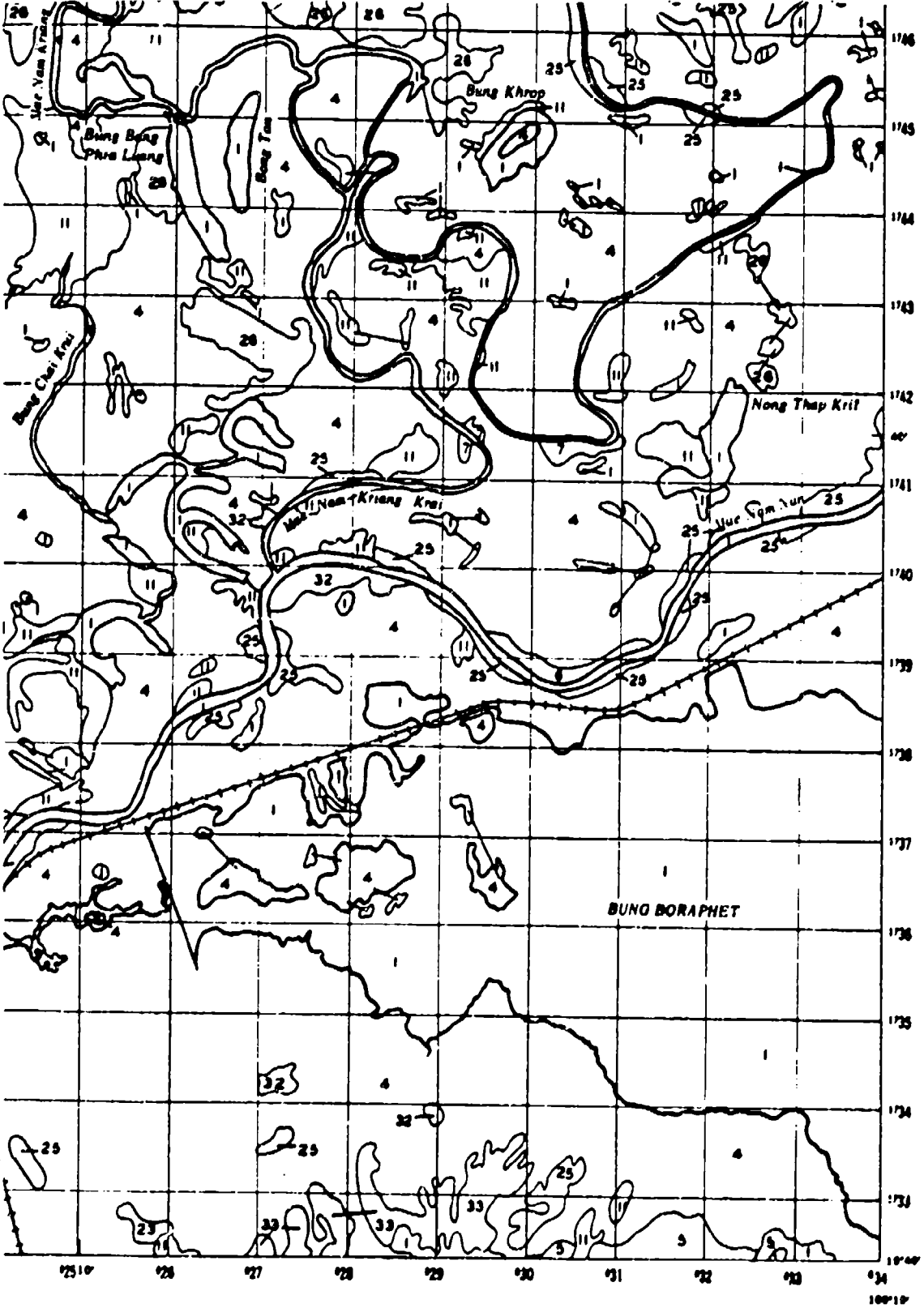


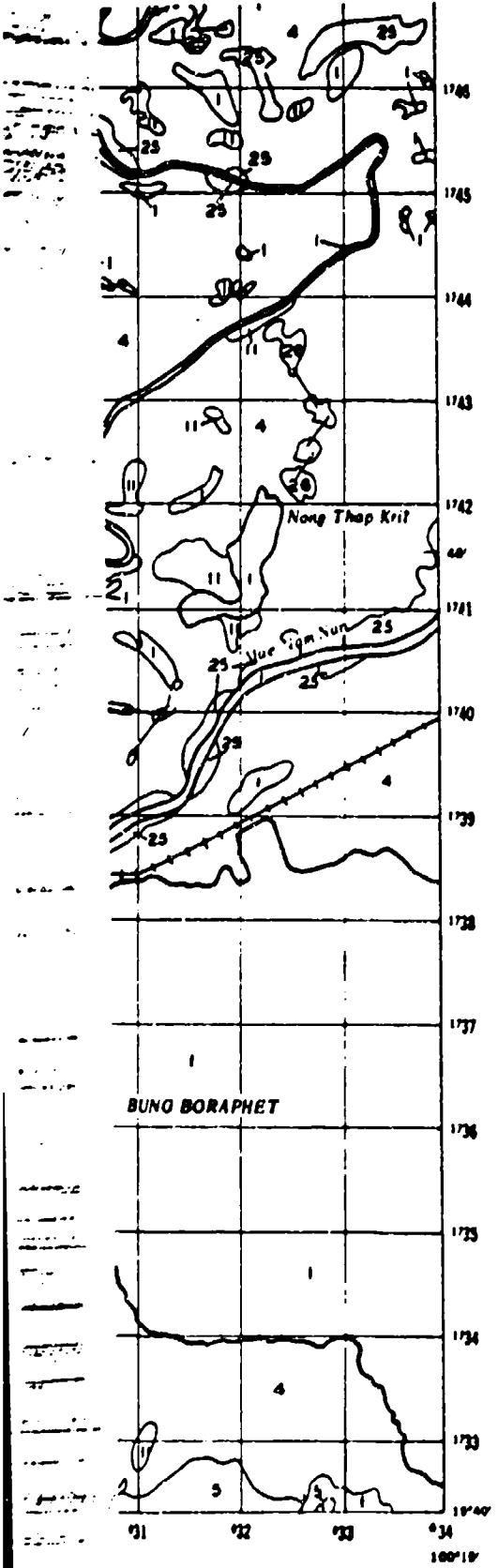
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

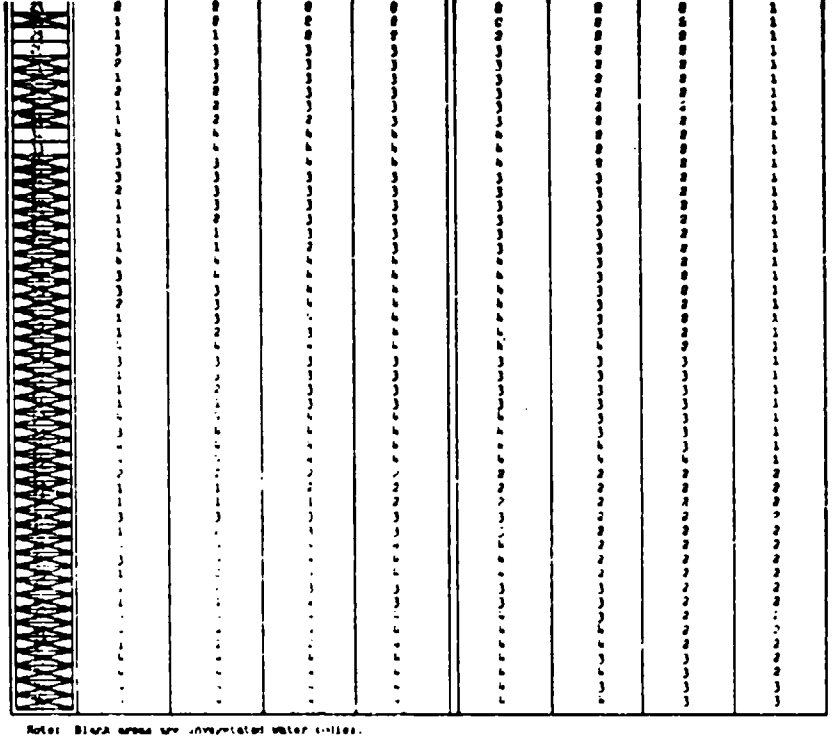
5


MAE NAM PING
Bung Sai Nat
Khlong Thung
Bung Chai Krut
Bung Bang Phra Luang
Bung Tod
Changwat Nakhon Sawan
Uamung
SCALES

6


Bung Khrop
Bung Bung Phra Liang
Bung Tao
Bung Chat Krai
Nong Thap Krit
Nam Khlong Krai
Nam Sam Sun
BUNG BORAPHET





Note: Black areas are impermeable water bodies.

* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1) indicating spacing classes of trees ≤ 2, 2-3, 3-5, and 5+ m. (≤ 5.2ft, 13.1ft, 32.8ft, and 127.0+ ft) and 2 +, 3, 4, and 1 in. (7.5+, 7.6+, 15.2+, and 25.4+ mm).

* Mapping class values for each spacing class are:

3 km Spacing

Mapping Class	Values	
	m	e
1	> 3	> 0.14
2	> 1.5-3	> 0.09-0.14
3	> 0.5-1.5	> 0.02-0.09
4	0-0.5	0-0.02

Cities do not occur on this map.

INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

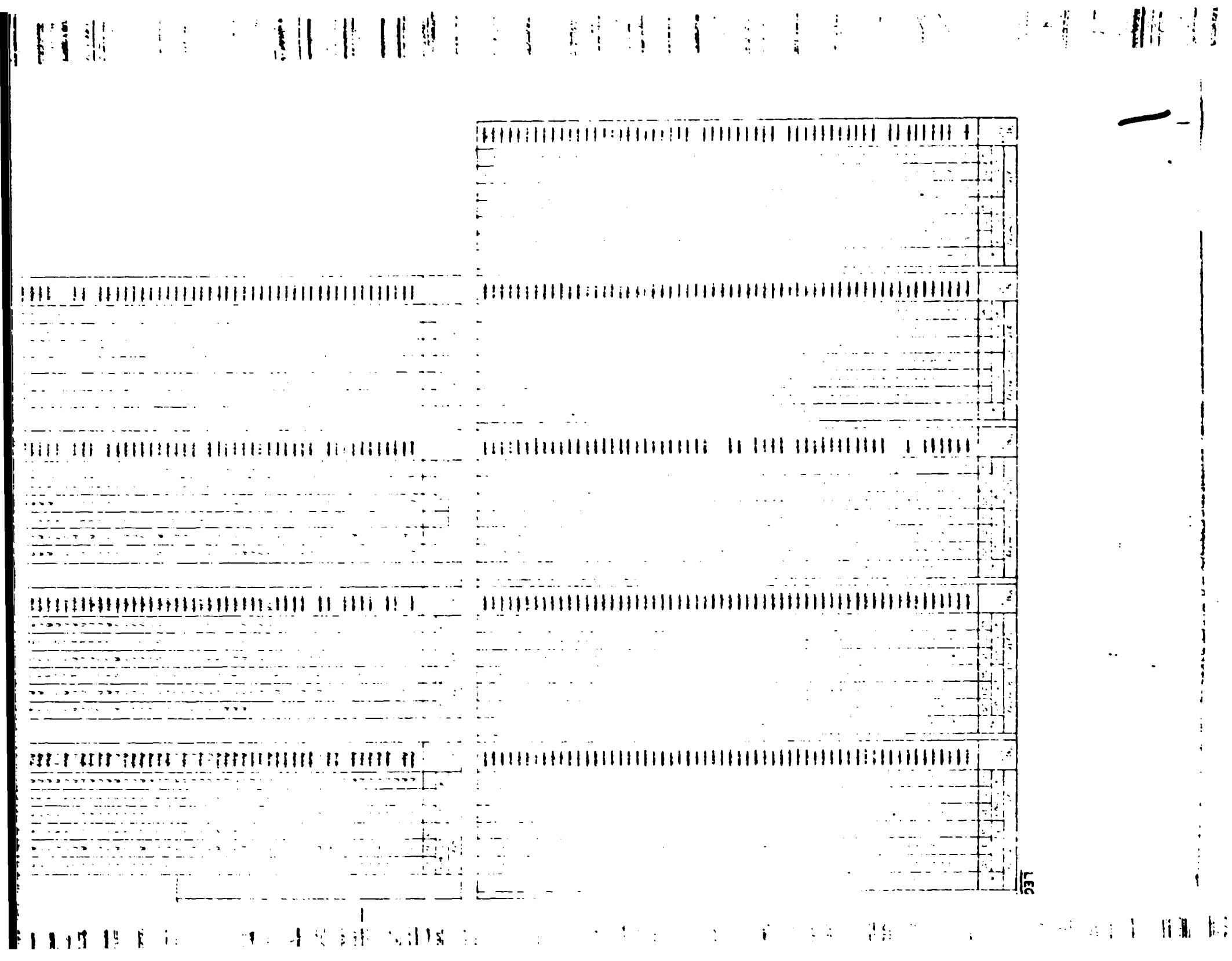
NAKHON SAWAN STUDY AREA

SHEET NS II

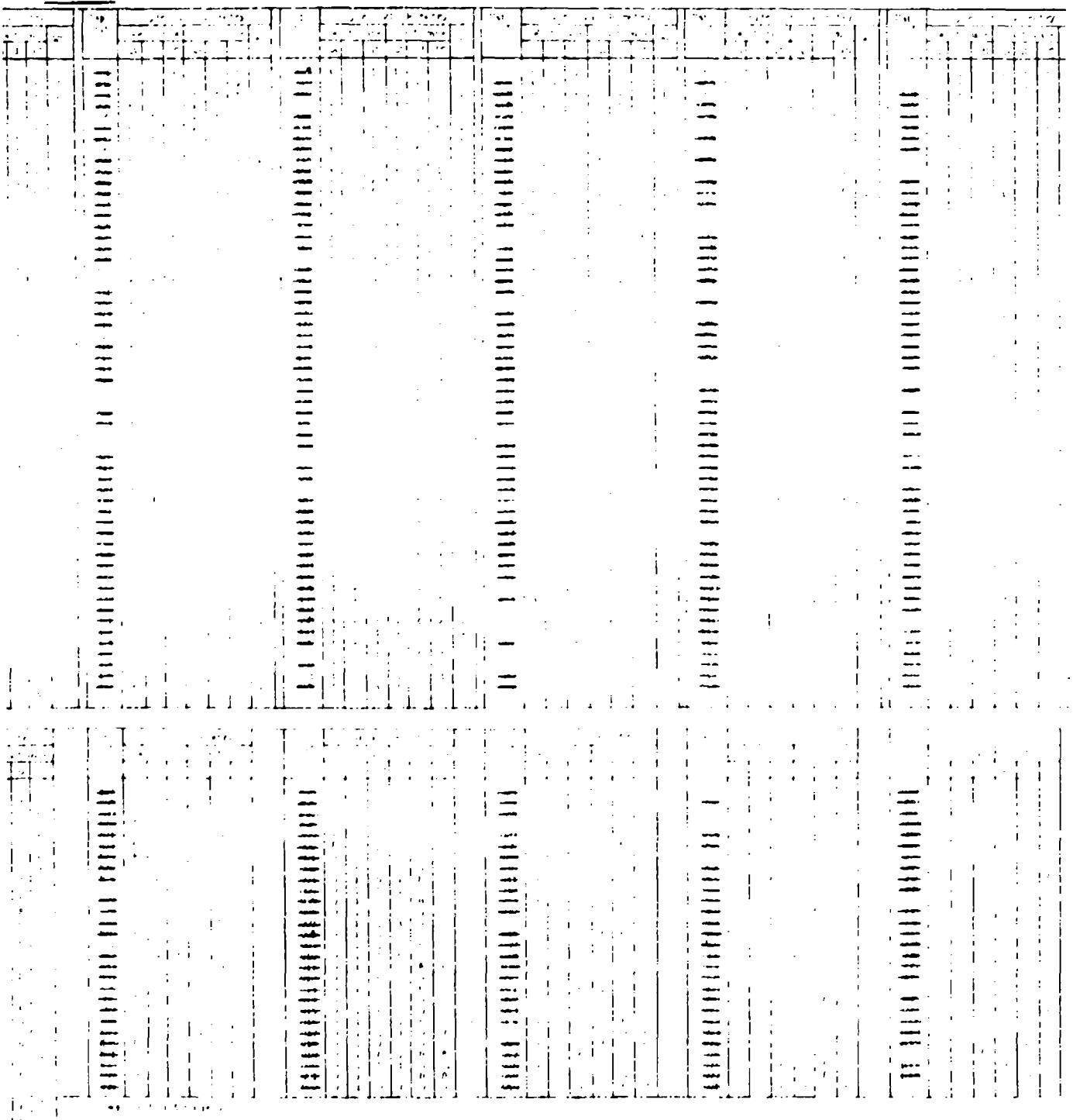
PLATE 1.2c

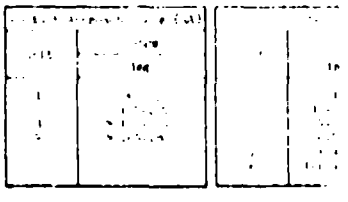
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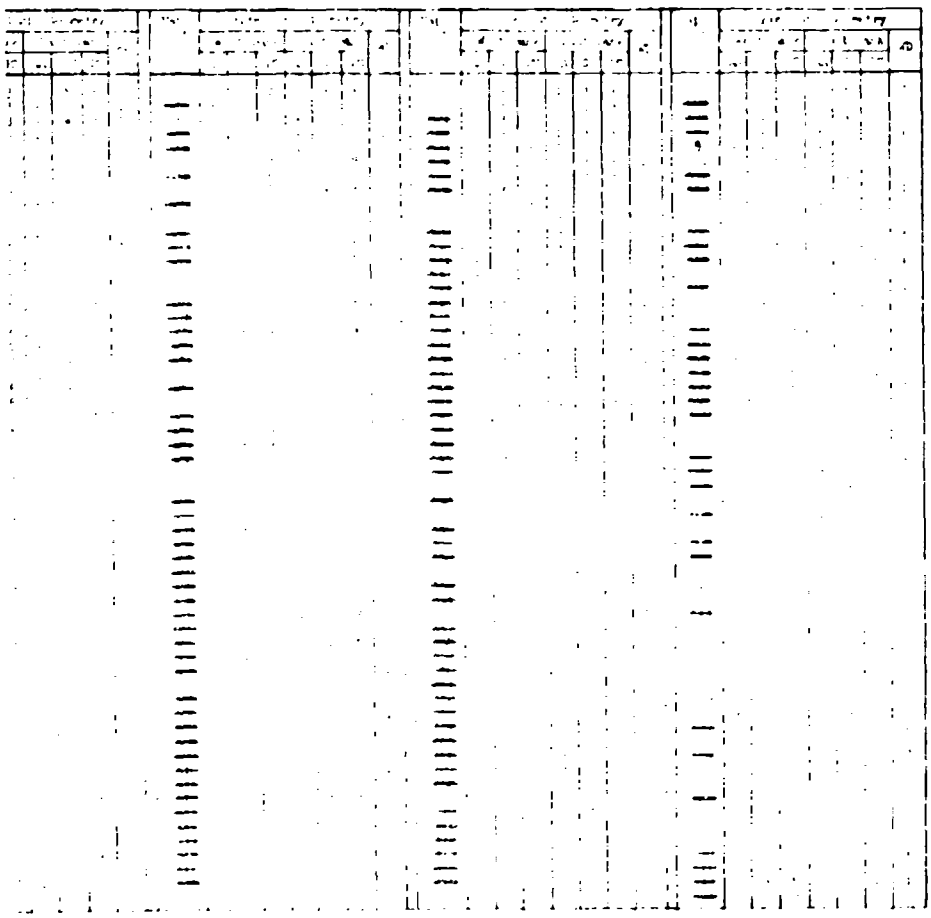
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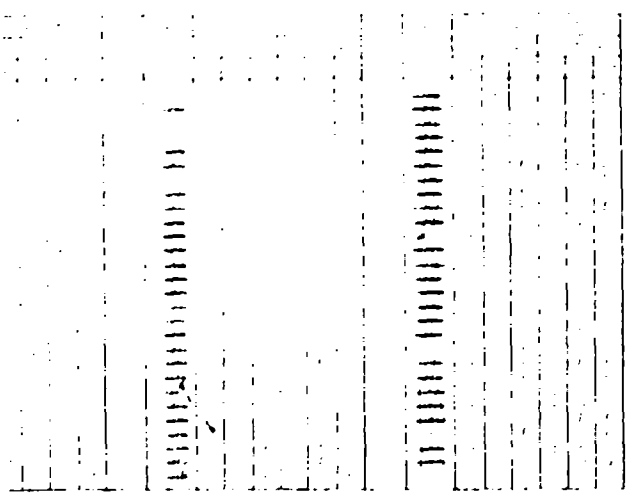


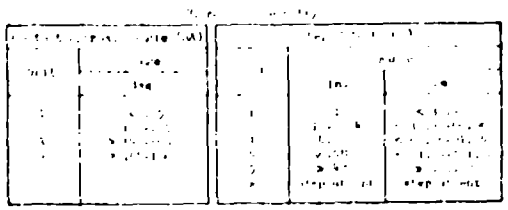
LEGEND

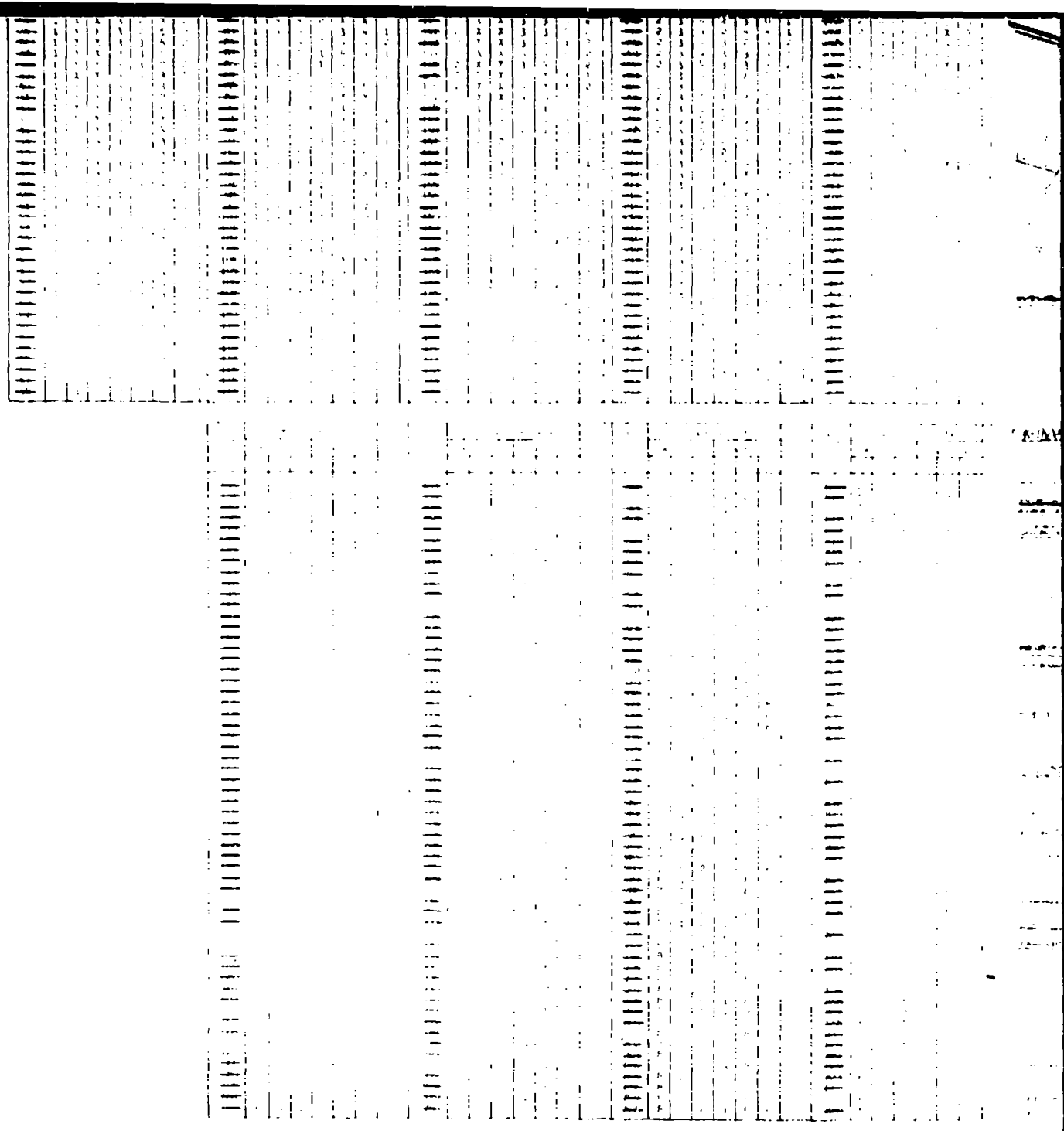


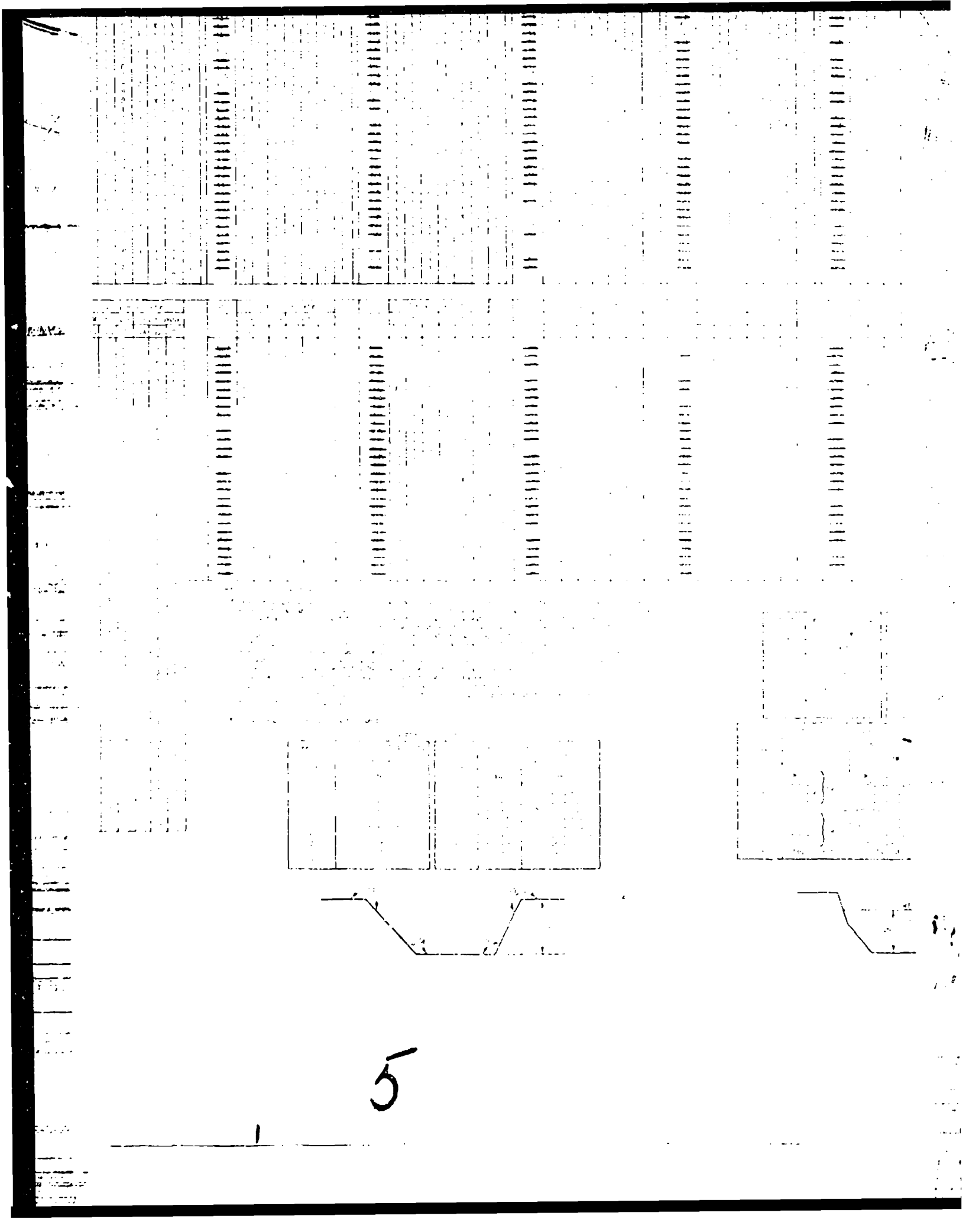




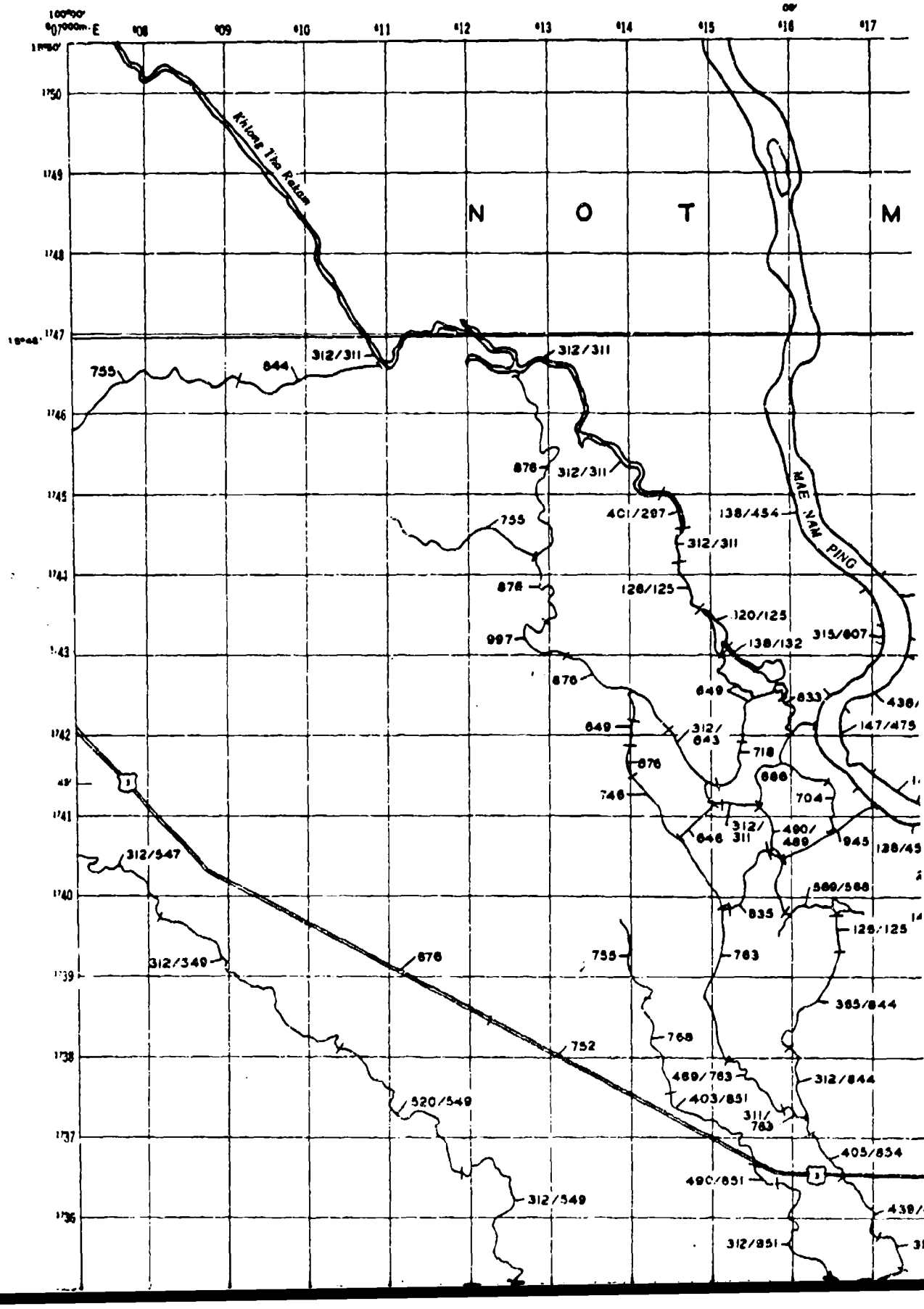






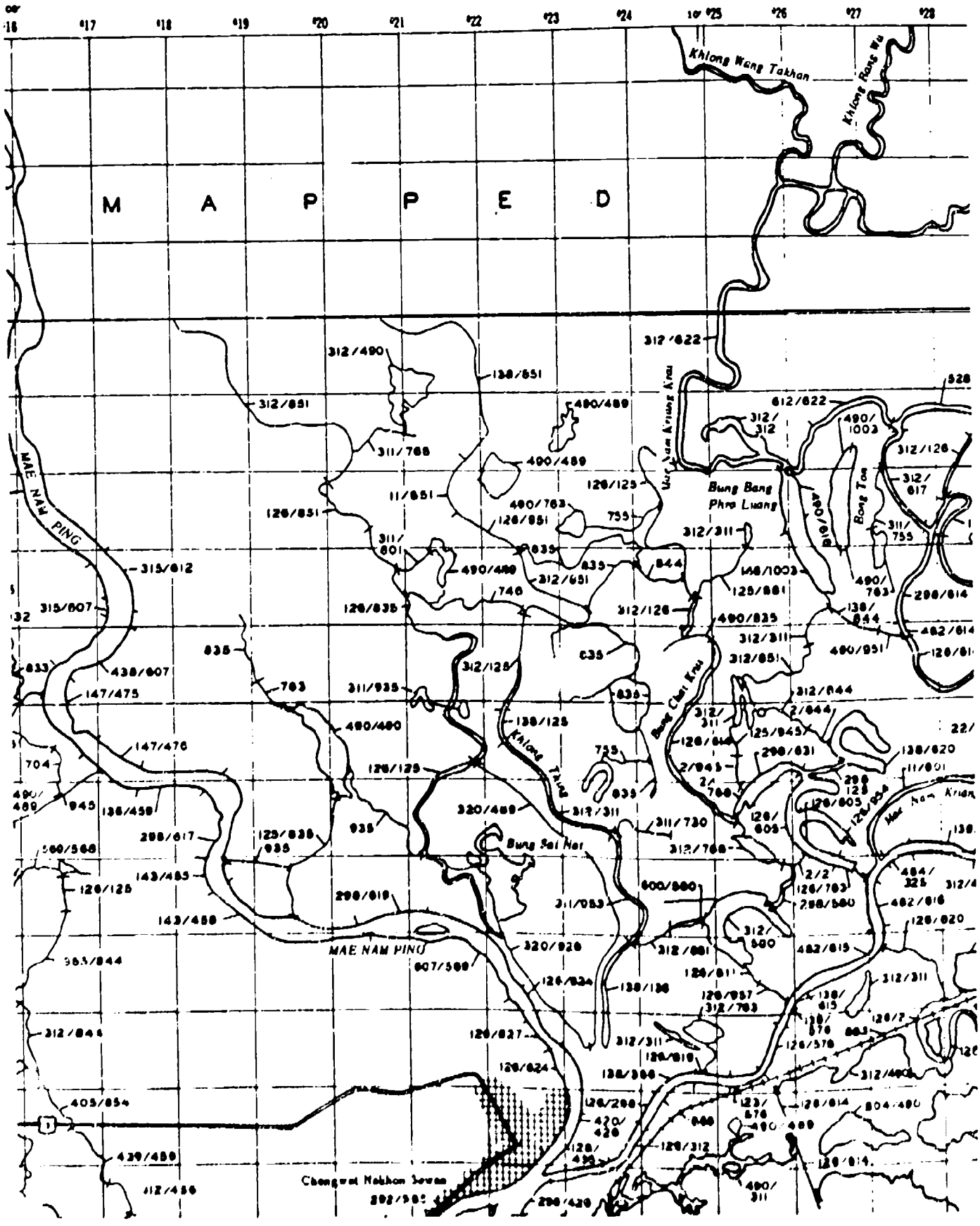


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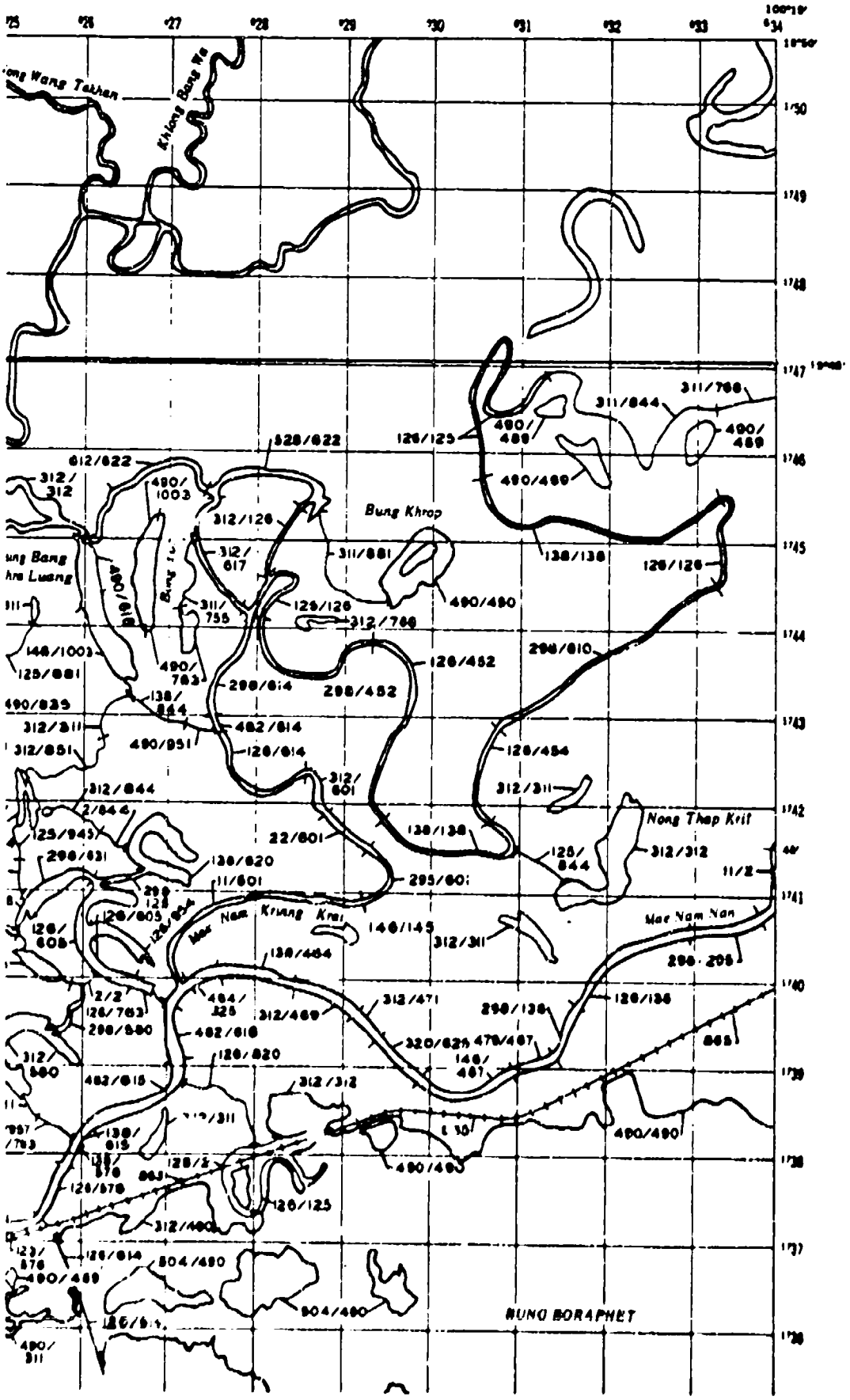

N O T M
Khlong Tha Rakam
MAE NAM PING
312/311
755
644
876
401/287
138/454
128/125
120/125
997
138/132
315/607
649
633
312/643
147/475
718
746
704
312/311
490/489
945
312/547
835
312/349
676
752
768
520/549
469/783
403/851
311/783
405/854
490/851
312/549
312/851
365/844
312/844

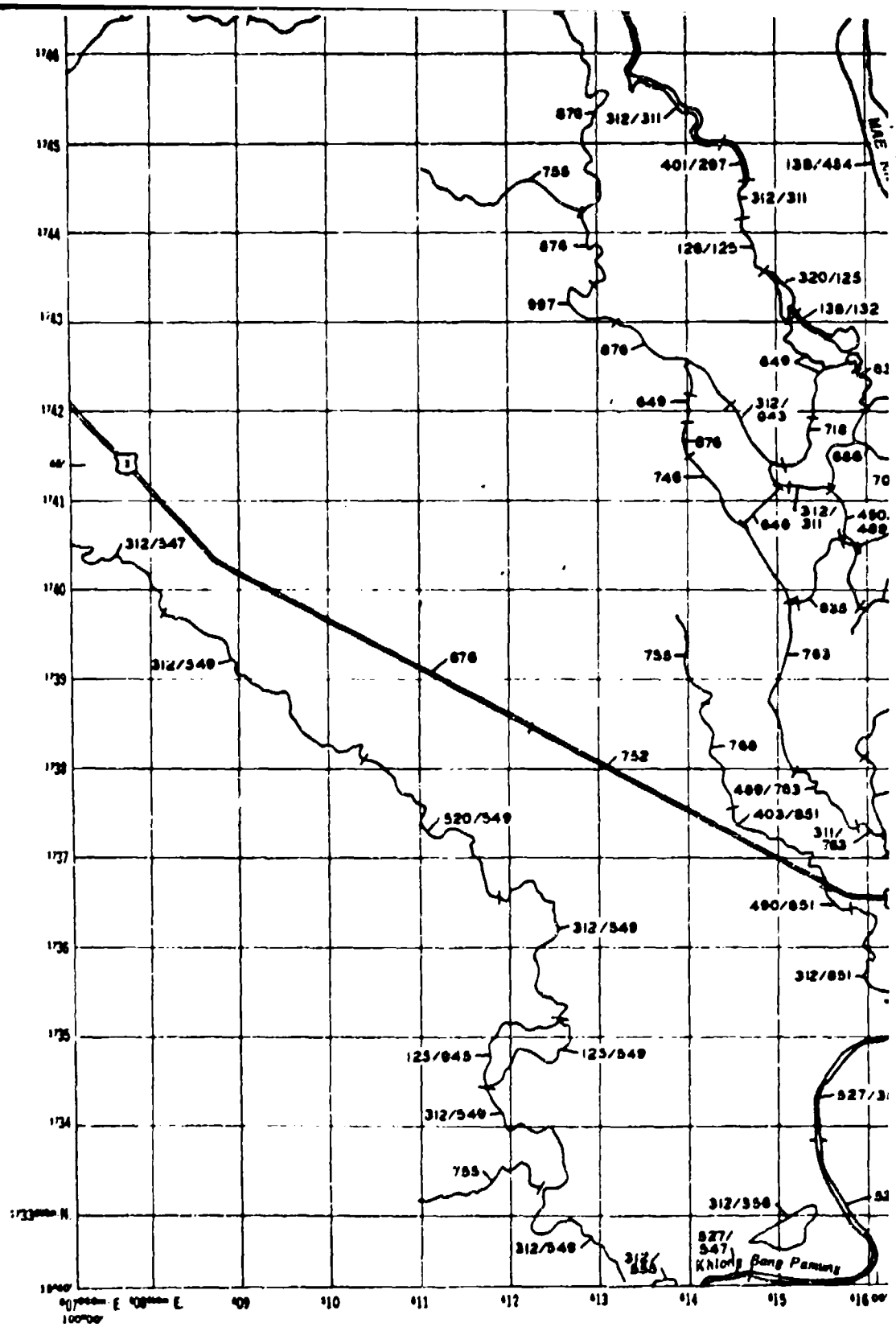
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NAKHON SAWAN



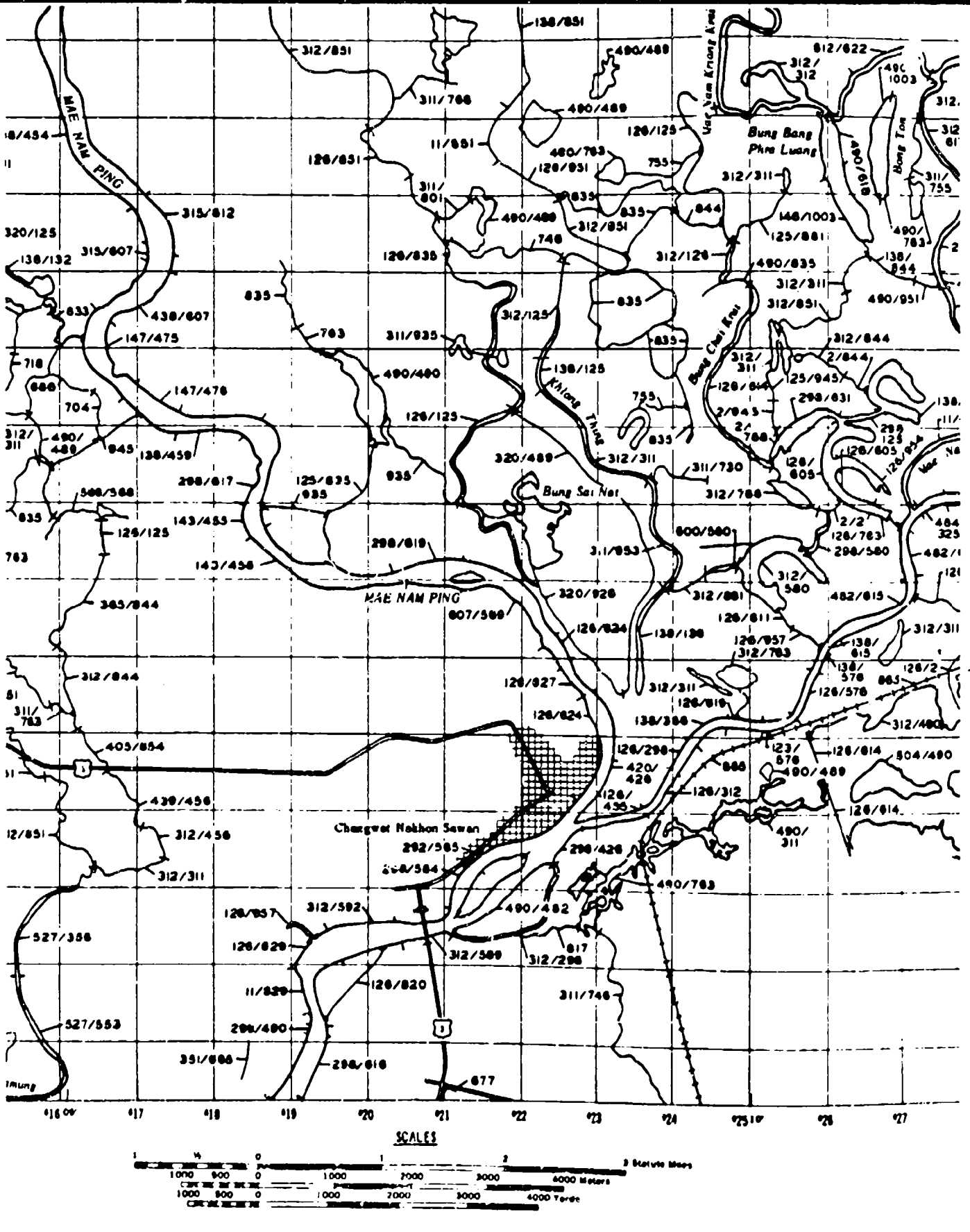
SHEET NS II

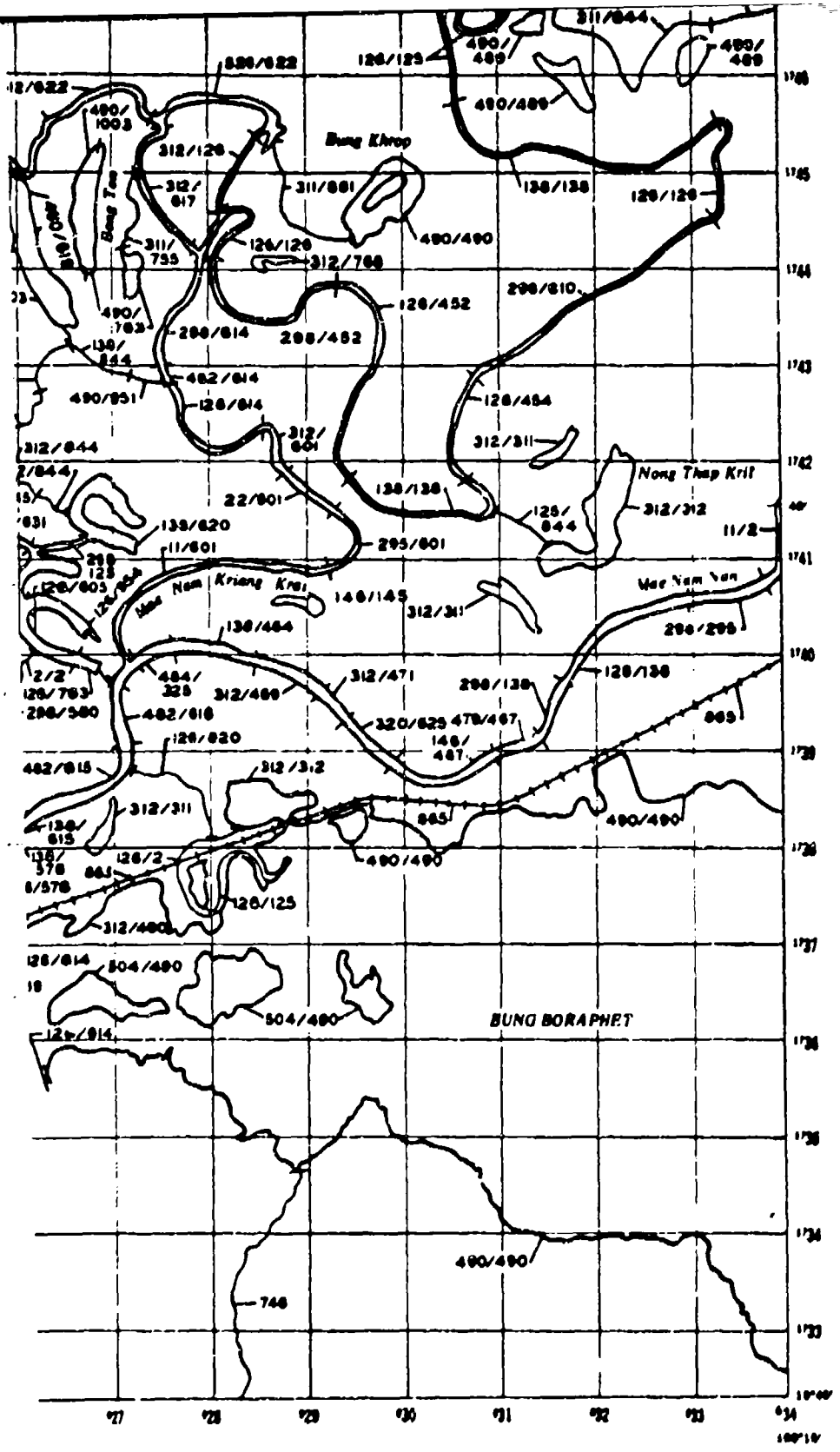

Khong Wang Tathan
Khlong Bang Wa
Bung Khrap
Nong Thap Krit
Mae Nam Nan
Nam Khuang Khai
BUNG BORAPHET
312/622
528/622
126/125
490/489
311/844
311/766
312/312
490/1003
312/126
312/617
311/881
138/138
126/126
311/755
129/126
490/490
312/766
148/1003
125/881
490/783
298/614
298/452
126/452
298/810
138/844
490/839
312/311
482/614
312/851
490/951
126/614
126/454
312/601
312/844
312/311
2/844
125/945
22/601
138/138
298/631
126/620
125/844
312/312
11/601
295/601
126/805
146/145
312/311
138/484
298/295
484/325
312/471
298/138
126/136
2/2
126/783
312/469
298/880
482/618
320/626
478/487
312/880
126/820
146/487
482/615
312/312
490/490
138/615
126/125
312/490
804/480
490/489
126/614
804/480
490/311
126/614



ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

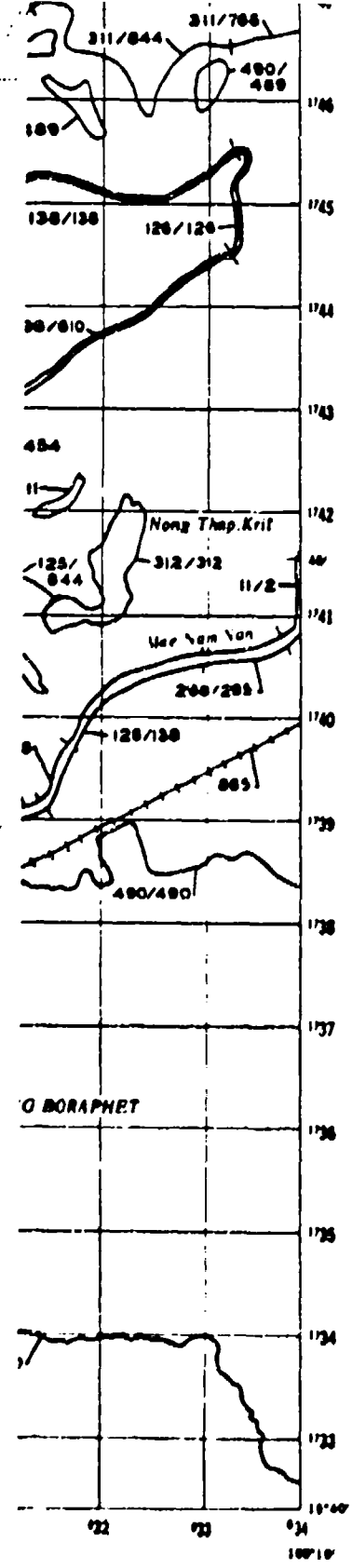
4


MAE NAM PING
Bung Sai Nai
Bung Chai Krut
Khlong Thale
Bung Bang Phra Luang
Chengwat Nakhon Sawan
SCALES



A QUANTITATIVE METHO
TERRAIN FOR GEO
HYDROLOGIC (
NAKHON SAWAN
SHEET N

6



INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

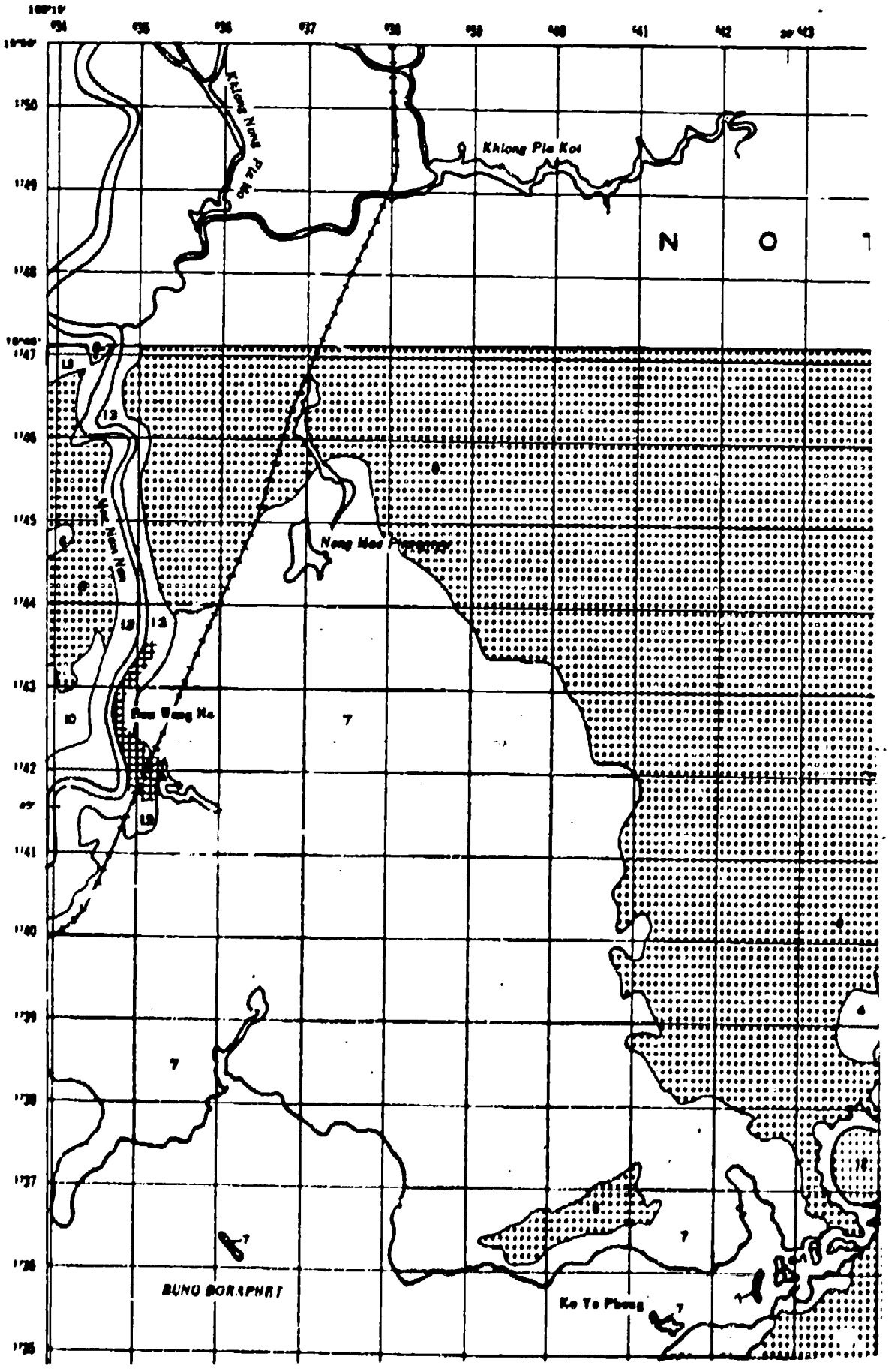
7

HYDROLOGIC GEOMETRY

NAKHON SAWAN STUDY AREA

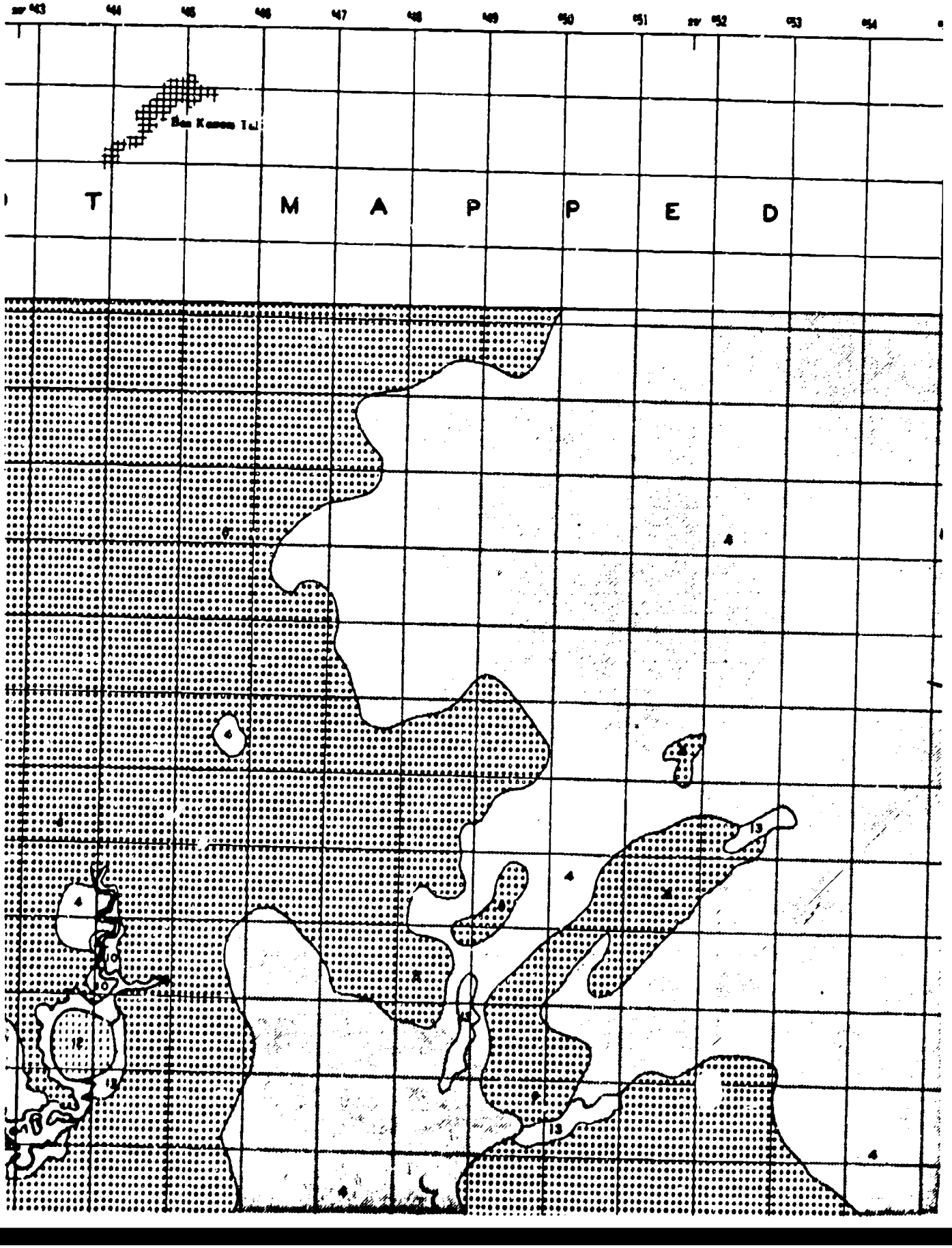
SHEET NS II

PLATE 1.2d


Khlong Nong Pla Mo
Khlong Pla Koi
N O
Nong Mae Phanngan
Ban Wang Ko
BUNG BORAPHET
Ko Ya Phang

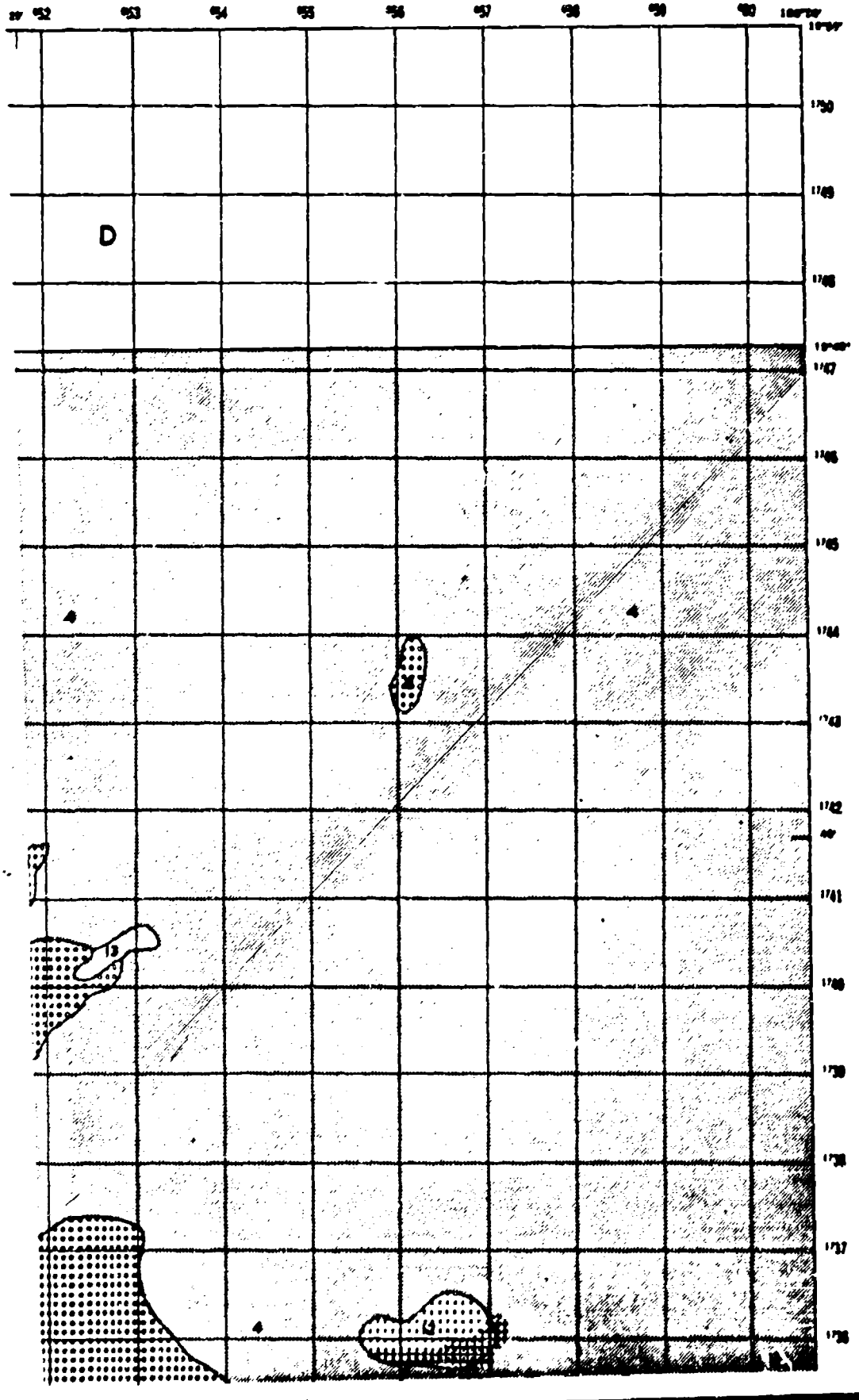
2

NAKHON SAWAN



1 3

SHEET NS III



Unit	Soil Mass Strength: Maximum Strength	Minimum Strength	Maximum c_w psi	Maximum ϕ_w
	RSI	RSI	psi	
	10-25	25-60	0-1	0-0
	25-60	60-100	0-1	0-0
	25-60*	60-100	0-1	0-0
	25-60	>100	0-1	0-0
	25-60*	>100	0-1	0-0
6	60-100	60-100	0-1	0-0
	60-100	60-100	0-1	0-0
	60-100	>100	0-1	0-0
	60-100	>100	0-1	0-0
10	60-100	>100	0-1	0-0
	60-100*	>100	0-1	0-0
	>100	>100	0-1	
13	>100	>100	0-1	0-0
	Complex of 60-100 and >100	>100	0-1	0-0
	Complex of 60-100 and >100	>100	0-1	0-0

Notes: Numbers are color bullets.

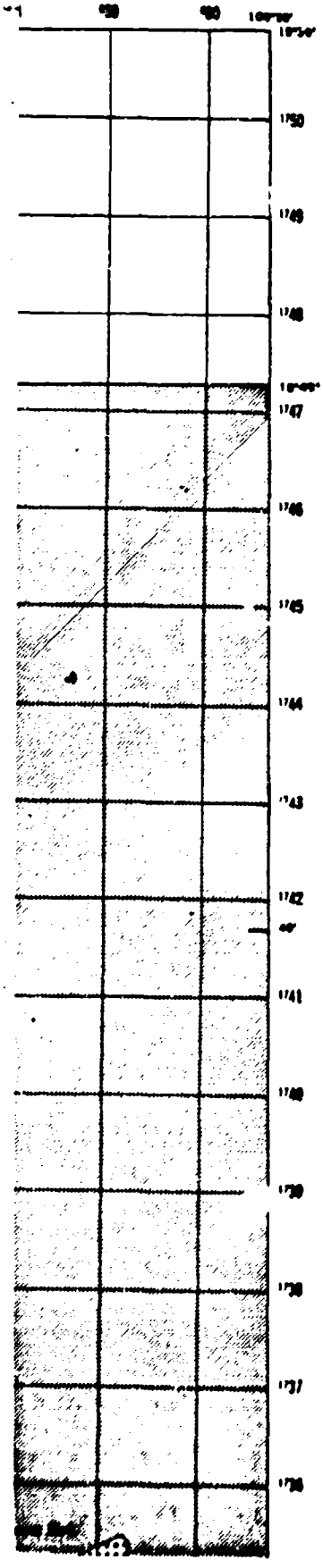
c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum strength has less than 10 percent strengths commonly observed are 60-1

Units do not occur on this map.

SHEET NS III



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RQI	Soil Mass Strength: Minimum Moisture RQI	Soil Surface Strength: Maximum Moisture s_{sp} psi	Maximum Moisture s_{sp} kg/cm²	Maximum Moisture σ_{sf} deg	Minimum Moisture s_{sp} psi	Minimum Moisture s_{sp} kg/cm²	Minimum Moisture σ_{sf} deg	Conditions where maximum s_{sp} occurs: s_{sp} psi	s_{sp} kg/cm²	σ_{sf} deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

s_{sp} Shear strength at zero normal load.

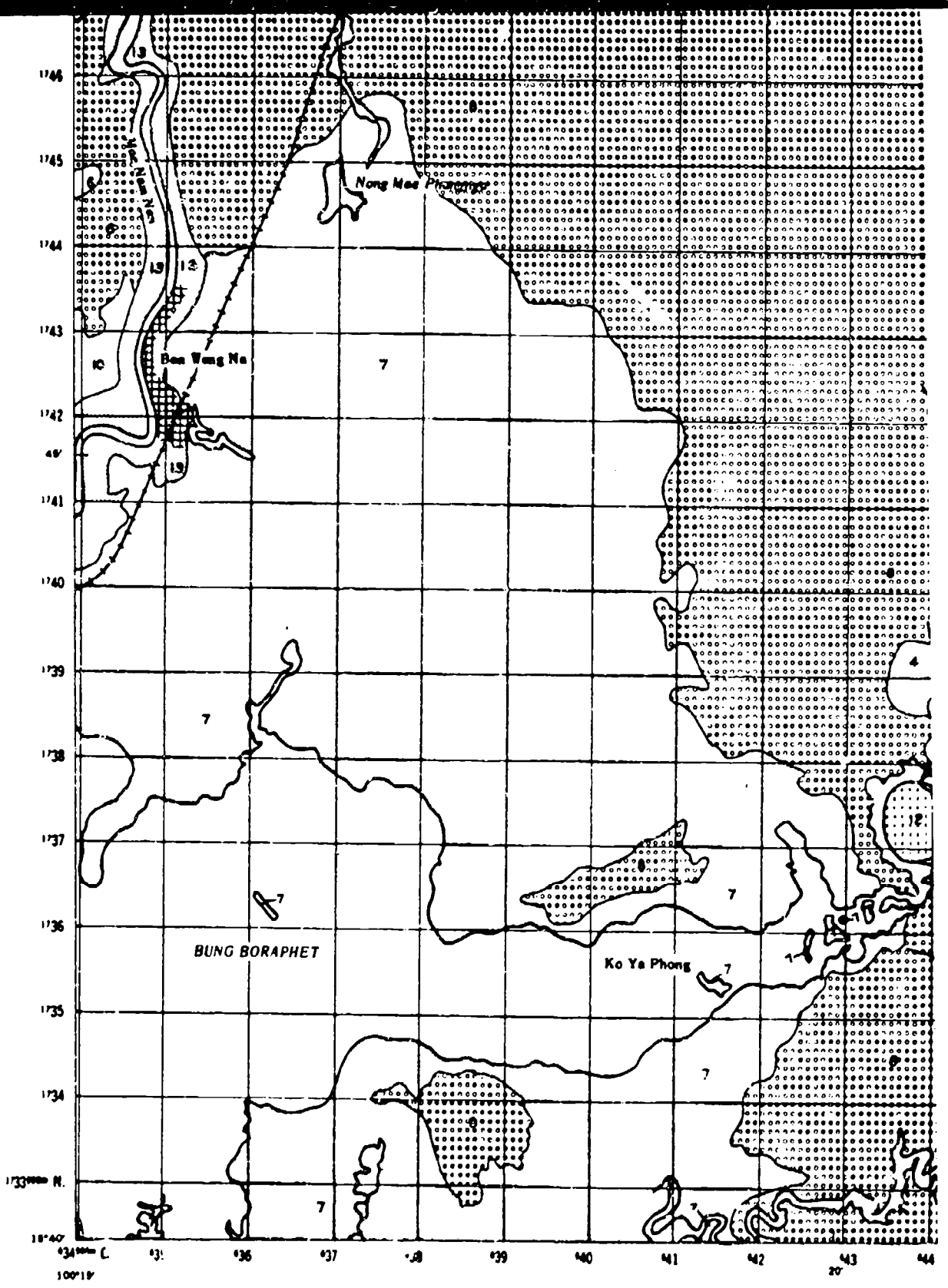
σ_{sf} Angle of internal friction.

* Maximum moisture has less than 50 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

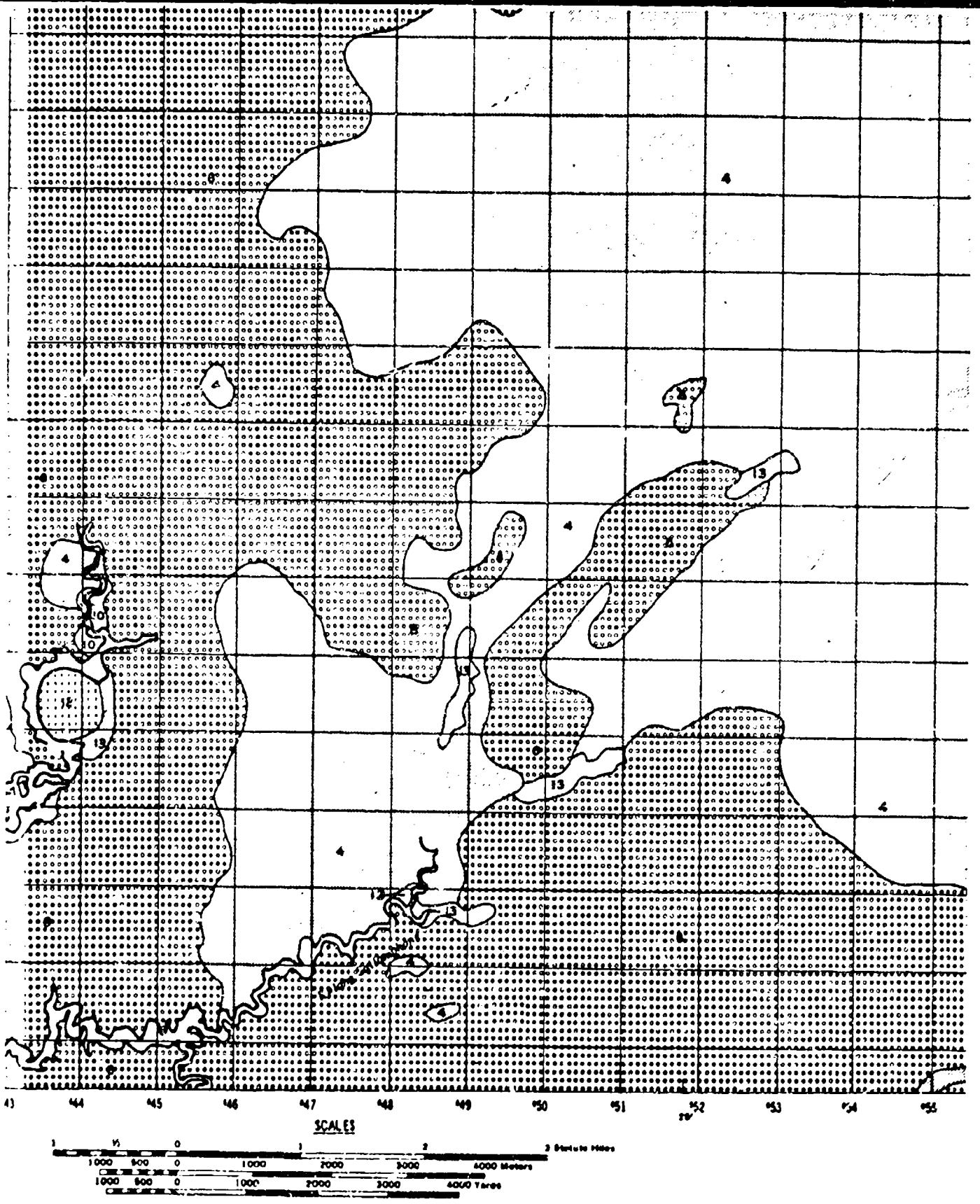
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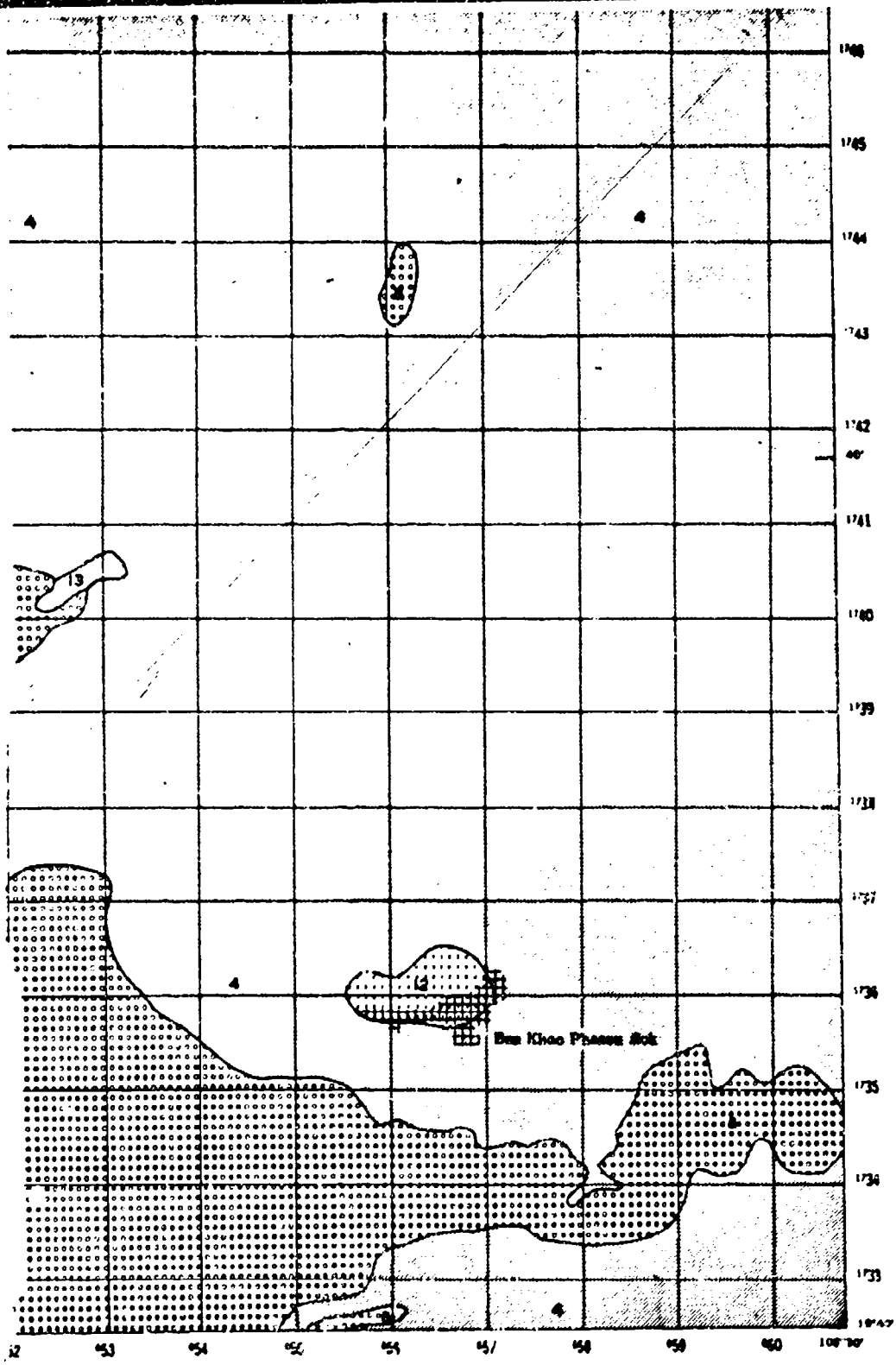


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5



6



Unit	Maximum Moisture	Minimum Moisture	Moisture Rel	
	PCF	PCF	psi	kg/cm²
	10-25	25-60	0-1	0-0.07
	25-60	60-100	0-1	0-0.07
	25-60	60-100	0-1	0-0.07
	60-80	>100	0-1	0-0.07
	60-80	>100	0-1	0-0.07
6	60-100	60-100	0-1	0-0.07
	60-100	60-100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
10	60-100	>100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07

Notes: Blank areas are water bodies.

τ Shear strength a. zero normal load.

ϕ Angle of internal friction.

* Maximum moisture has less than 30 percent strengths commonly observed are 60-100 p

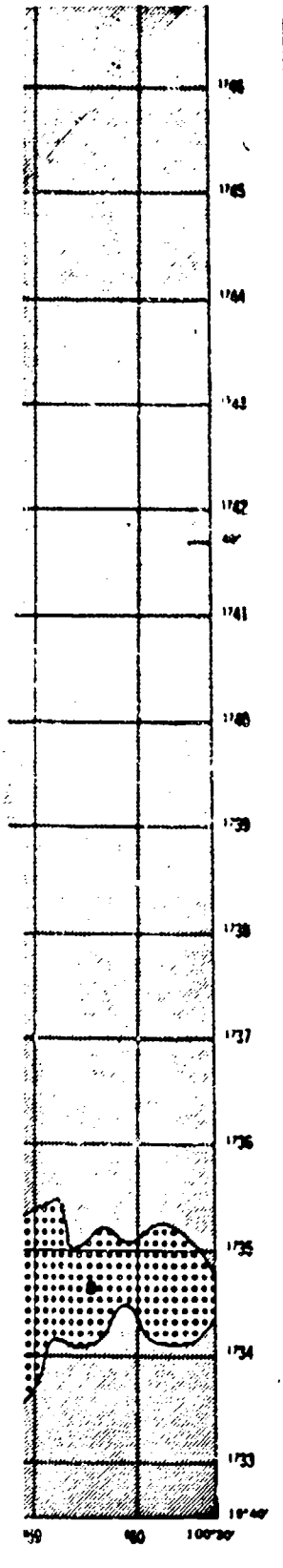
Units do not occur on this map.

INDEX

MS I

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TERRAIN FO
SURFACI
NAKHON SA
SH

7



Unit	Soil Mass Strength: Maximum Moisture RQI	Soil Mass Strength: Minimum Moisture RQI	Soil Surface Strength: Maximum Moisture c_{uz} psi	Maximum Moisture c_{uz} kg/cm²	Maximum Moisture ϕ_{uz} deg	Minimum Moisture c_{uz} psi	Minimum Moisture c_{uz} kg/cm²	Minimum Moisture ϕ_{uz} deg	Conditions where maximum power: c_{uz} psi	c_{uz} kg/cm²	ϕ_{uz} deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Notes: Blank areas are water bodies.

c_{uz} Shear strength at zero normal load.

ϕ_{uz} Angle of internal friction.

* Maximum moisture has less than 3% percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

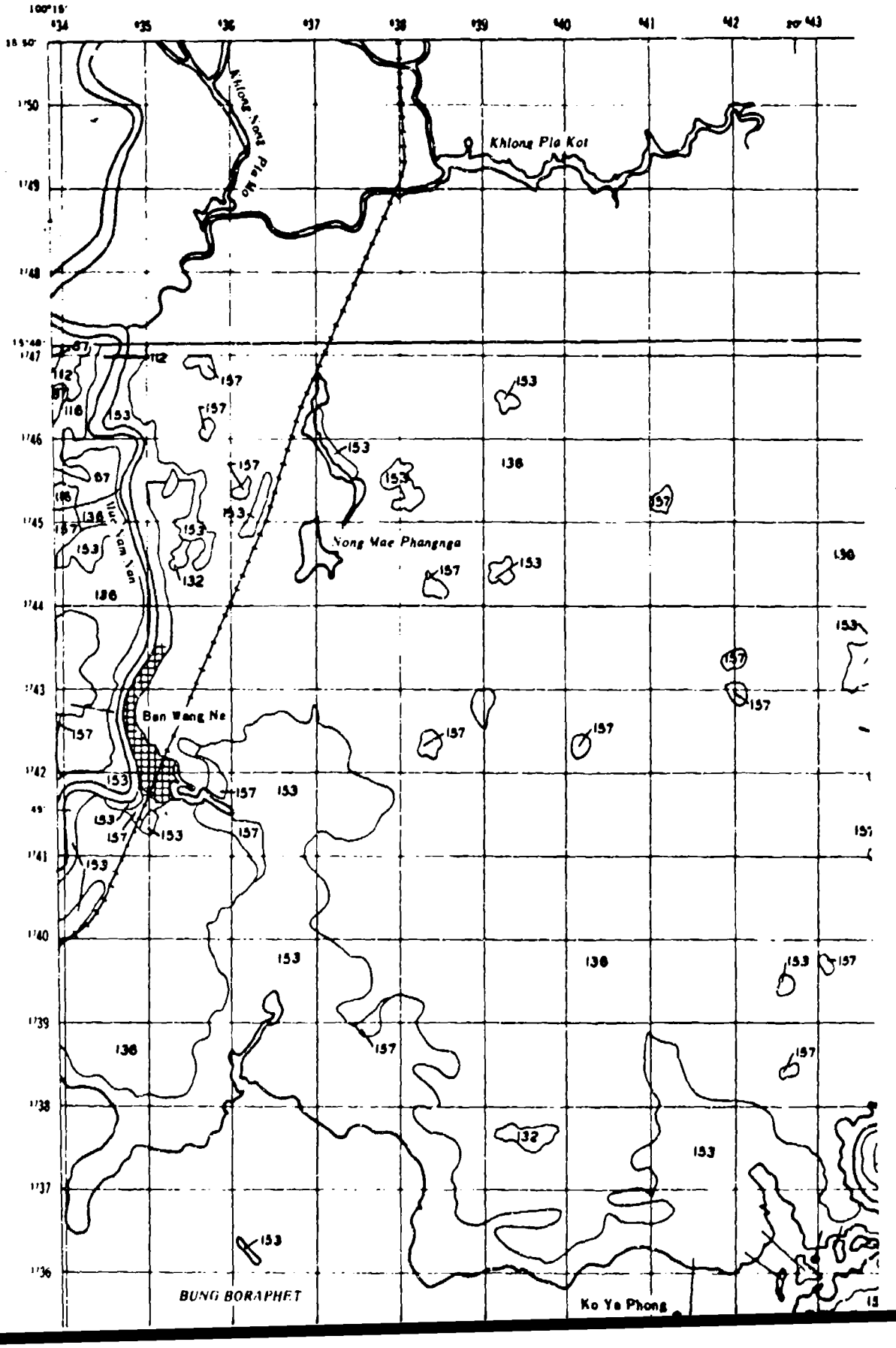
SURFACE COMPOSITION

NAKHON SAWAN STUDY AREA

SHEET NS III

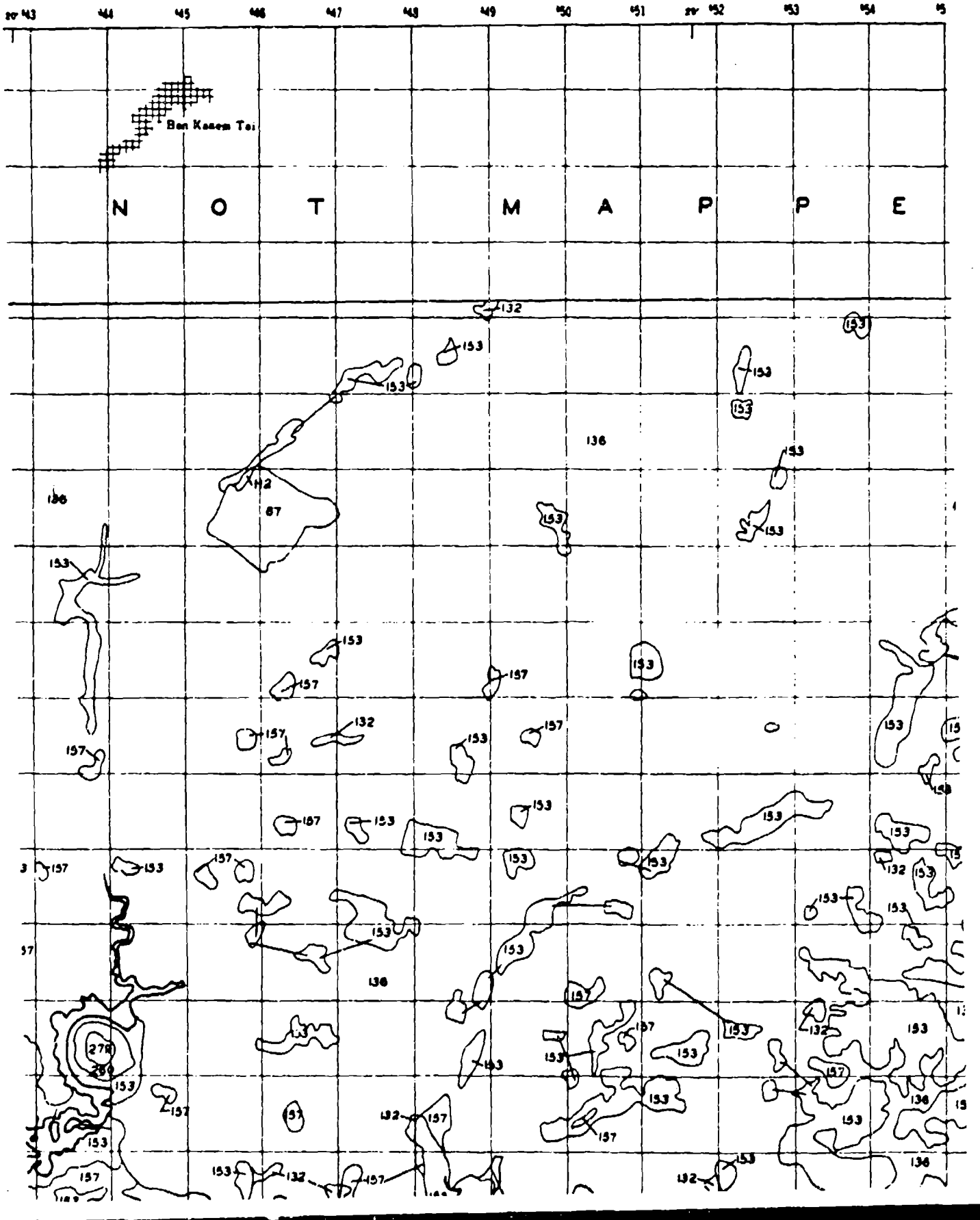
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PLATE 1.3a


Khlong Pla Kot
Nong Wae Phangnga
Ban Wang Ne
BUNG BORAPHET
Ko Ya Phong

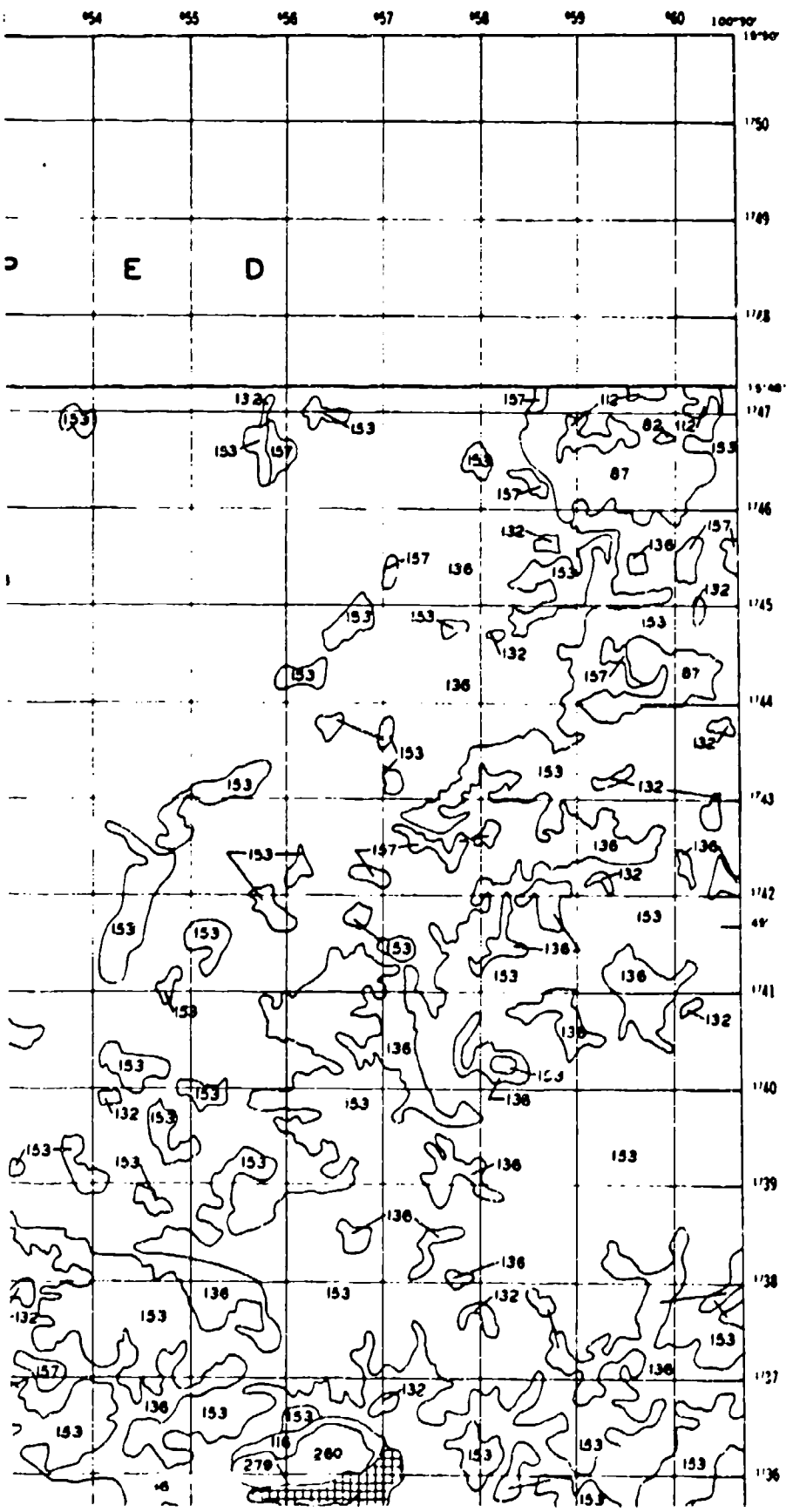
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NAKHON SAWAN

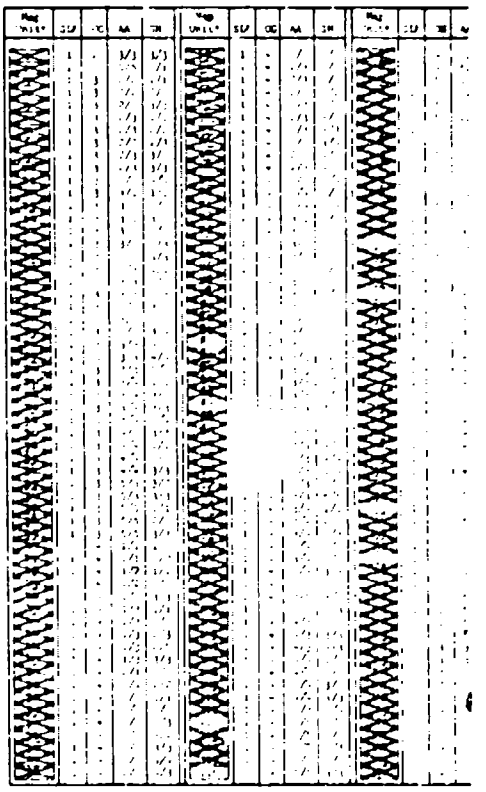


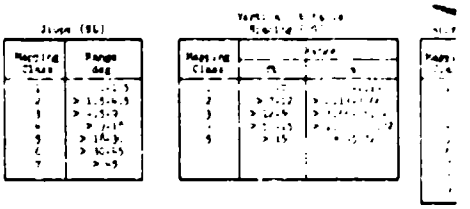
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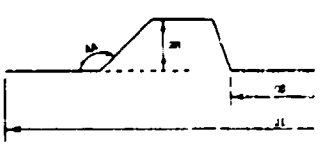
SHEET NS III



LEGEND



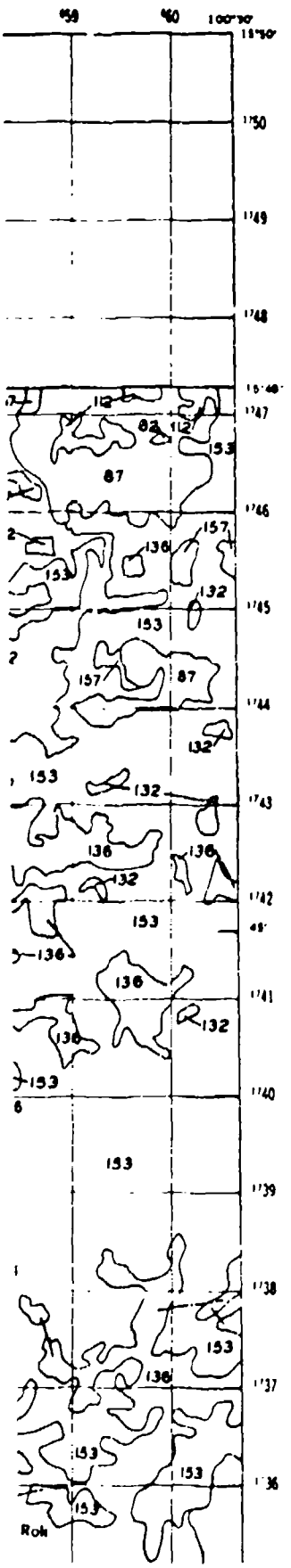




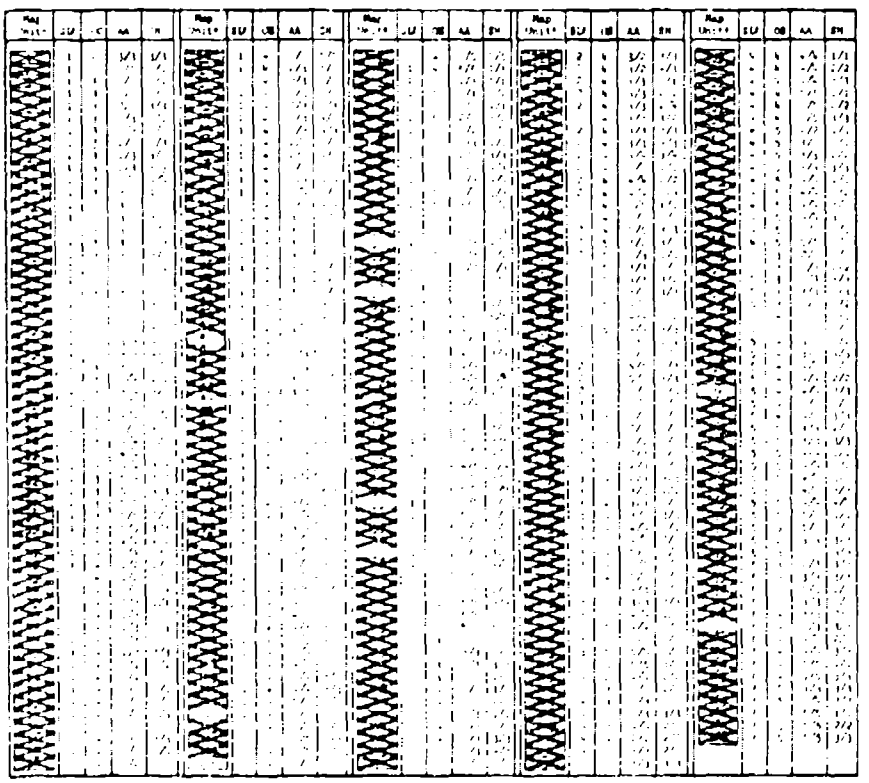
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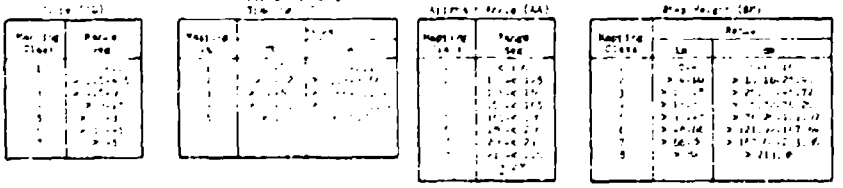
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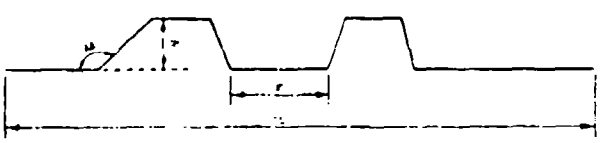
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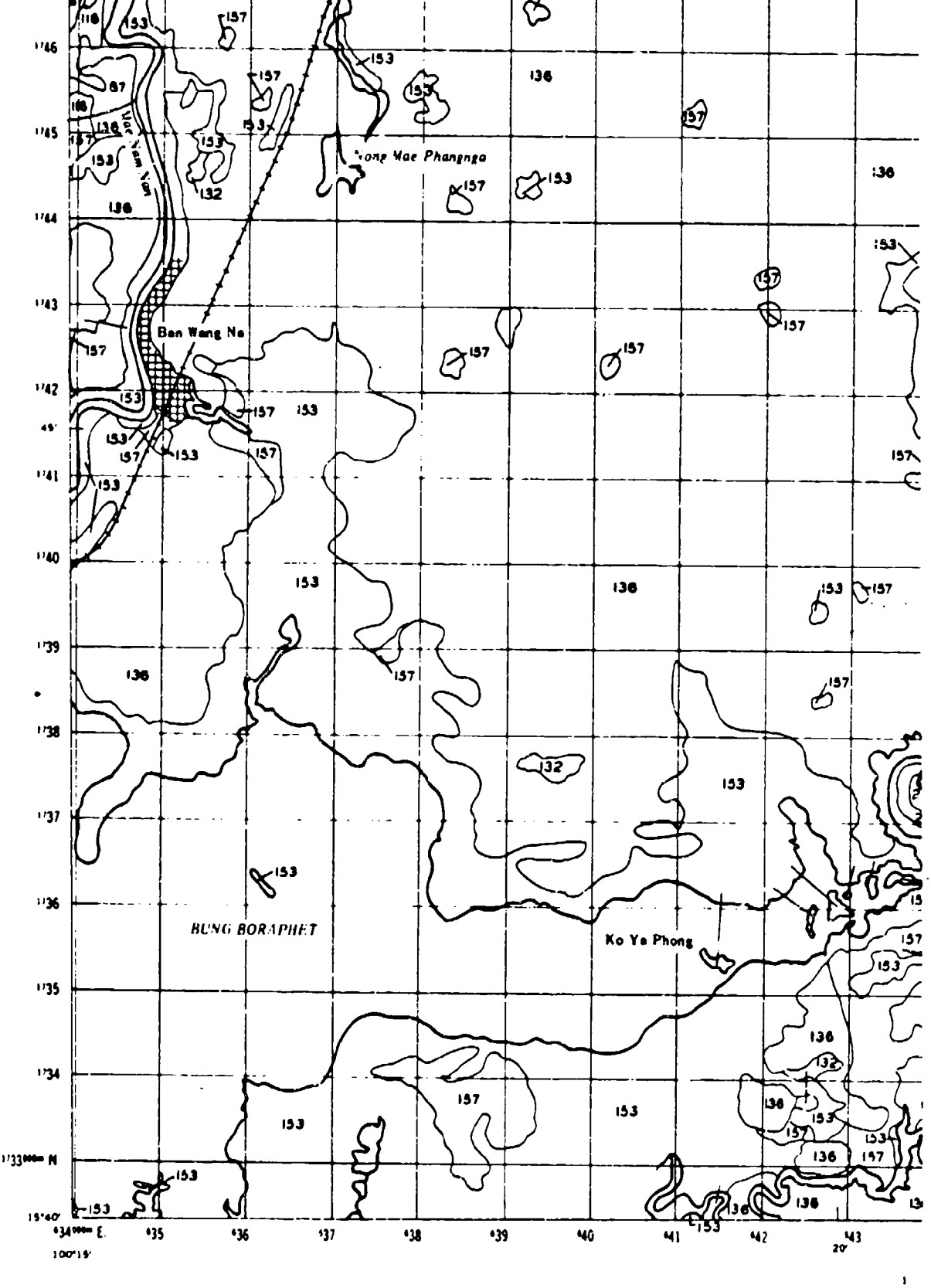






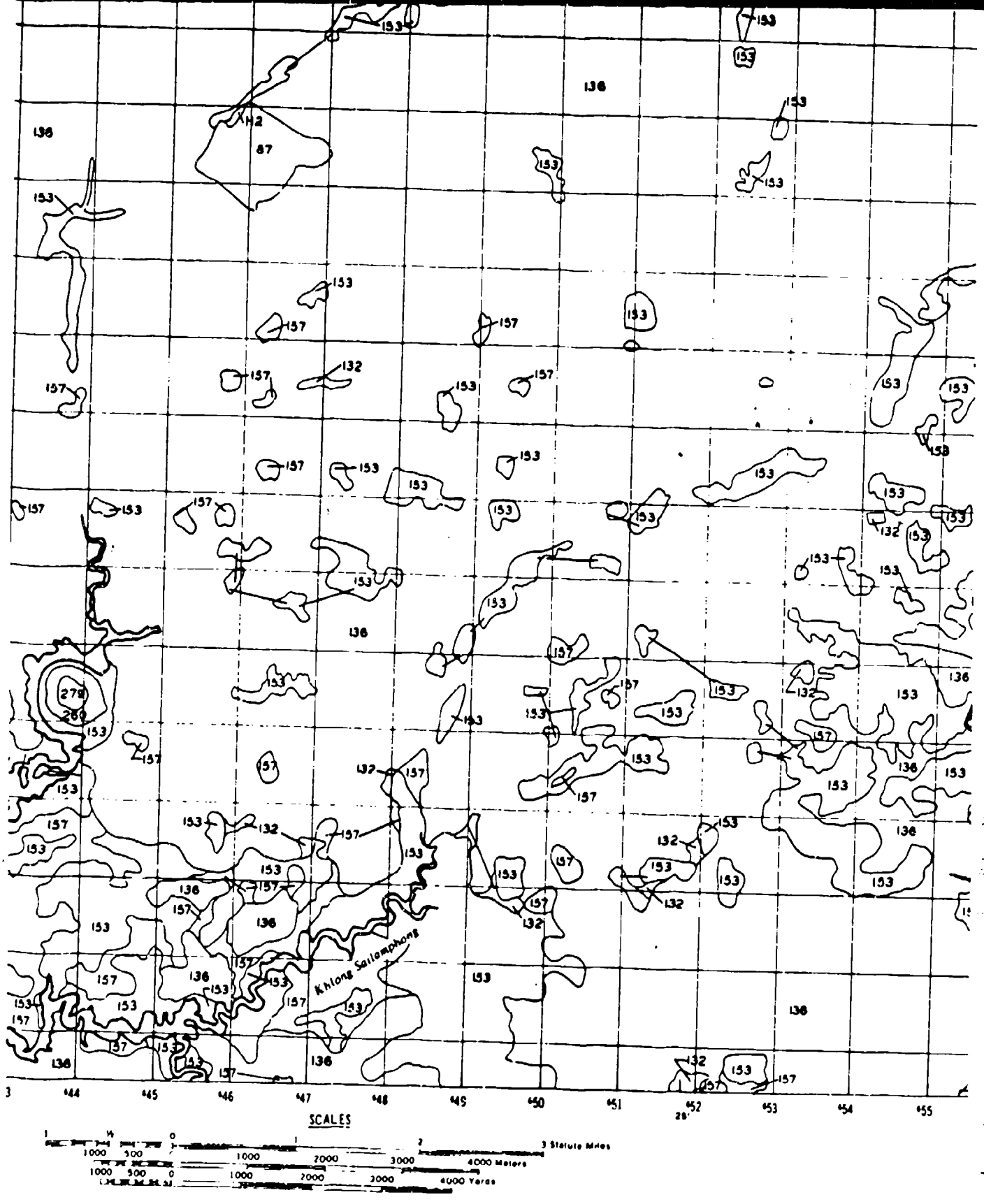
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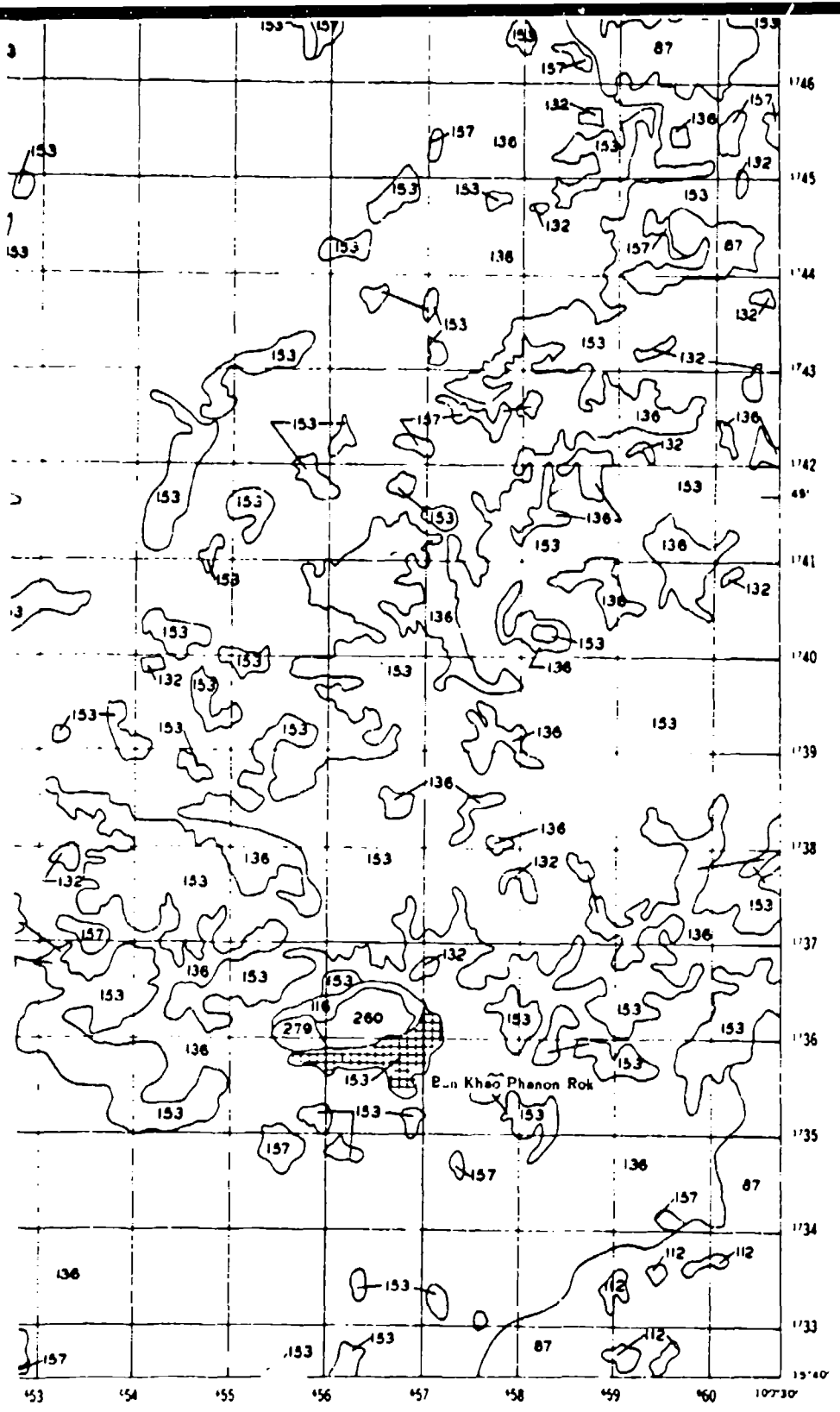


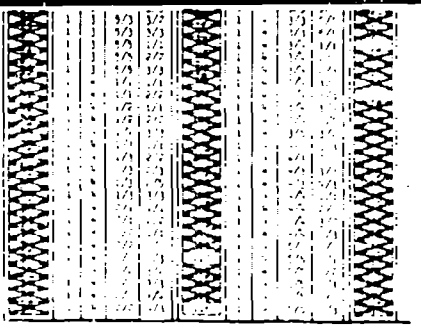
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

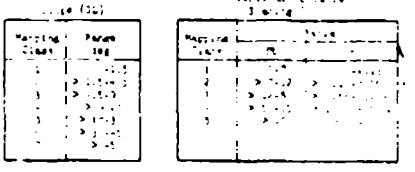
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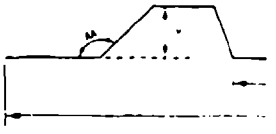

Khlong Sailamphong
SCALES
3 Statute Miles
4000 Meters
4000 Yards

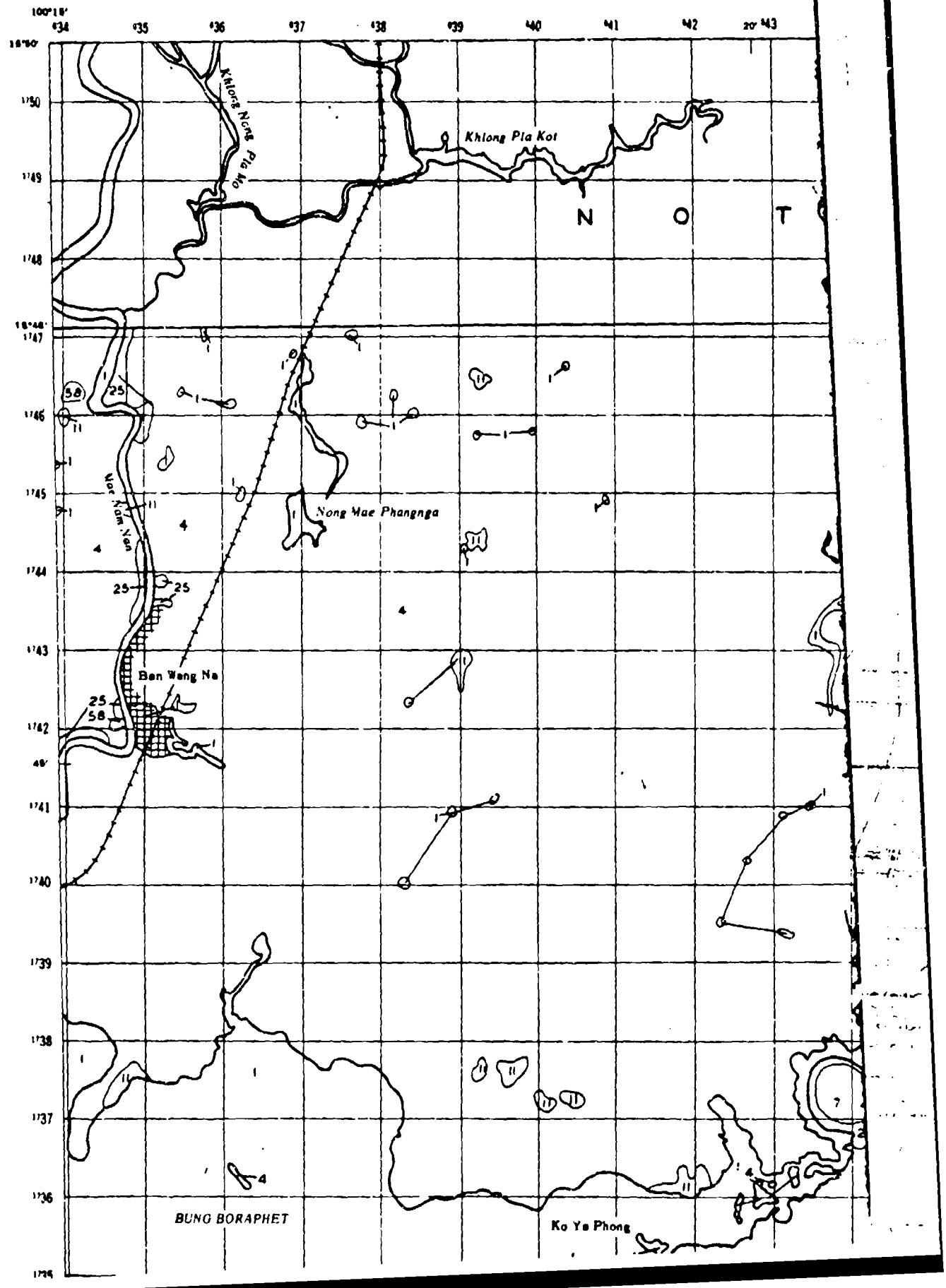
6


Ban Khao Phanon Rok
279
260
116
153
136
132
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112
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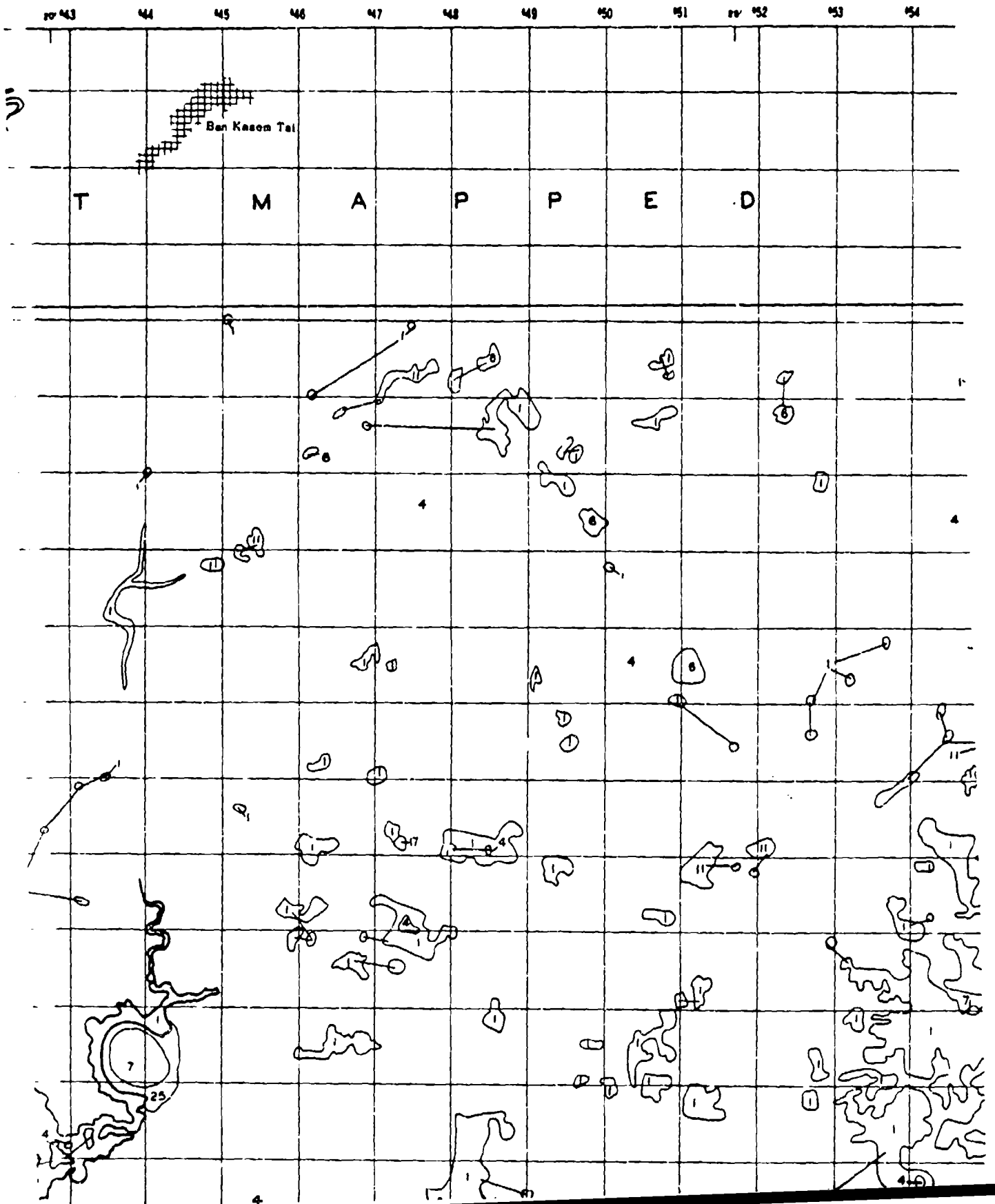





Khlong Nong Pla Mo
Khlong Pla Kot
N O T
Nong Mae Phangnga
Mae Nam Yan
Ban Wang Na
BUNG BORAPHET
Ko Ya Phong

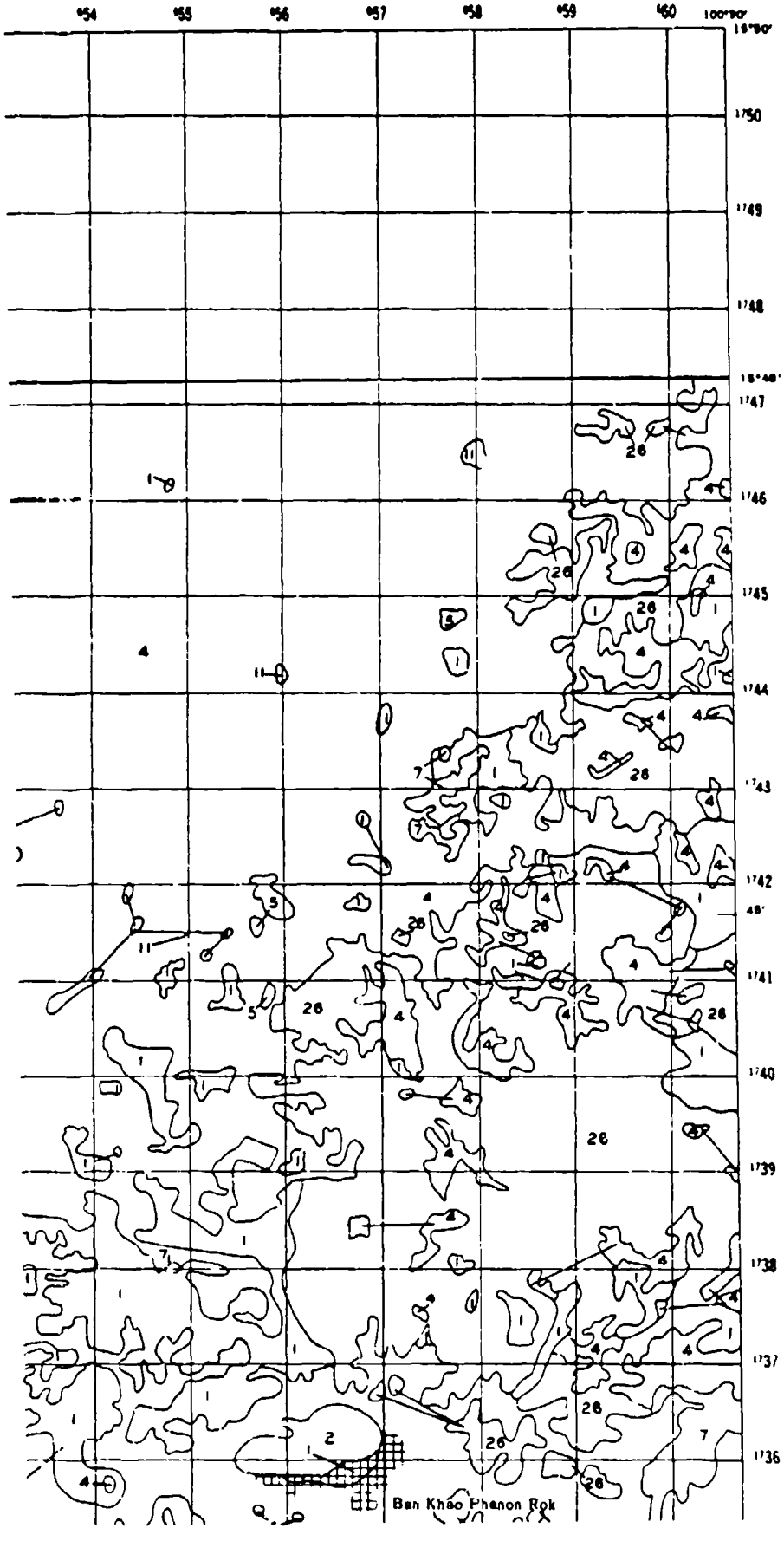
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NAKHON SAWAN



3

SHEET NS III



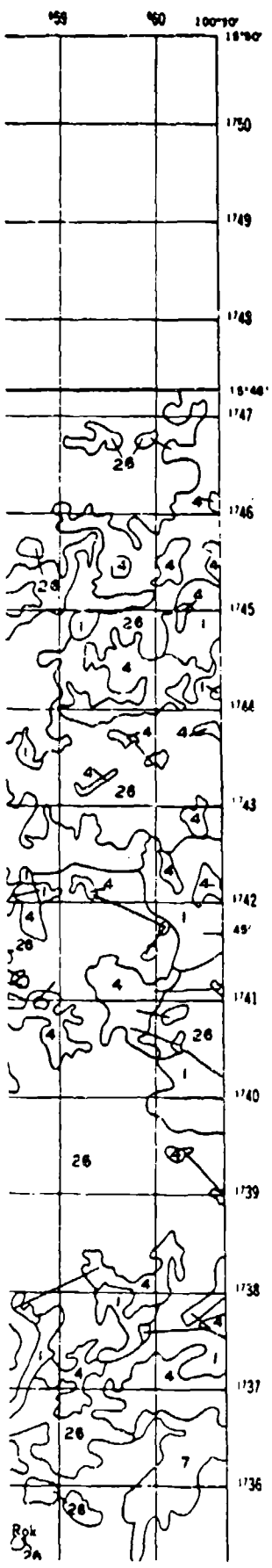
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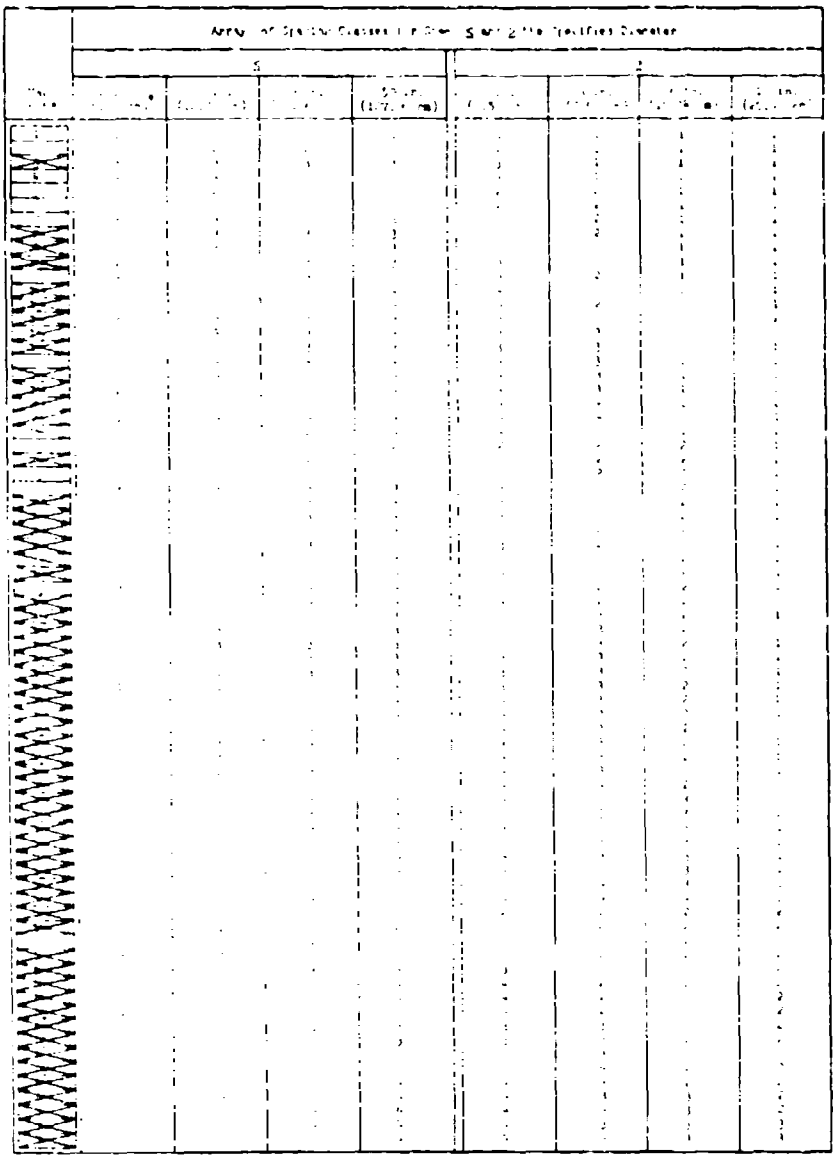
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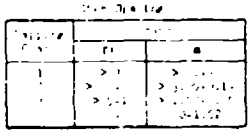
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SHEET NS III



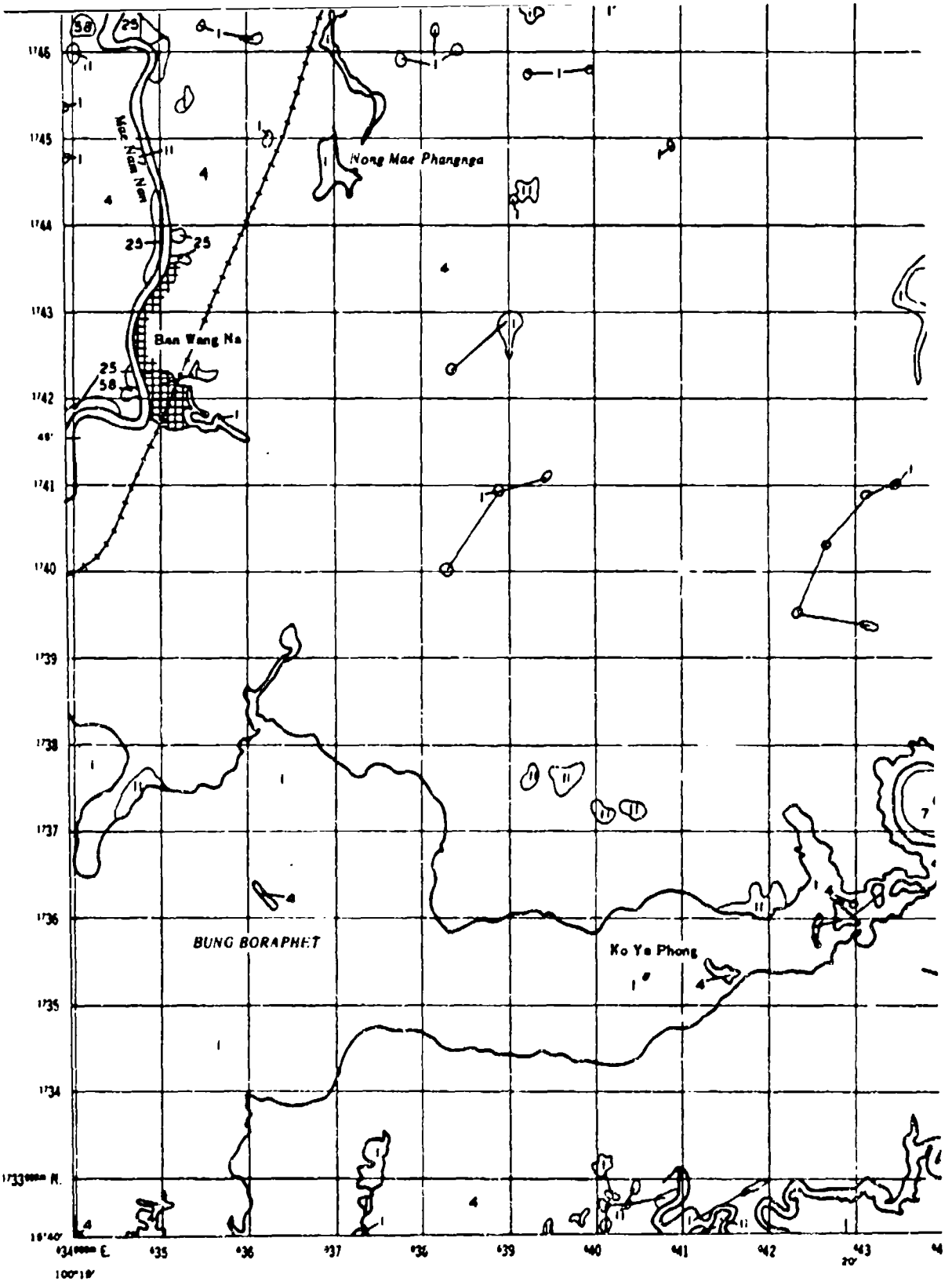
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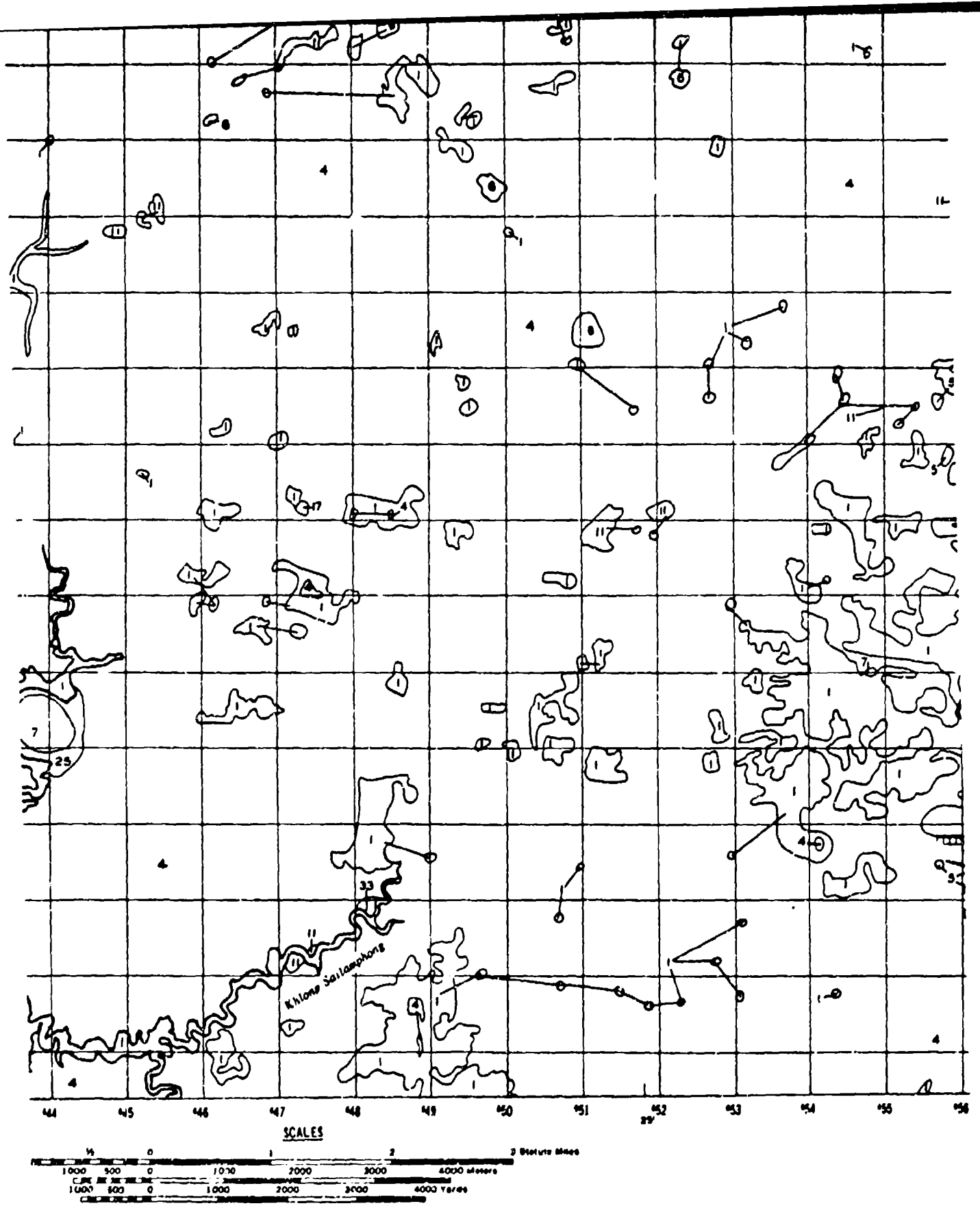
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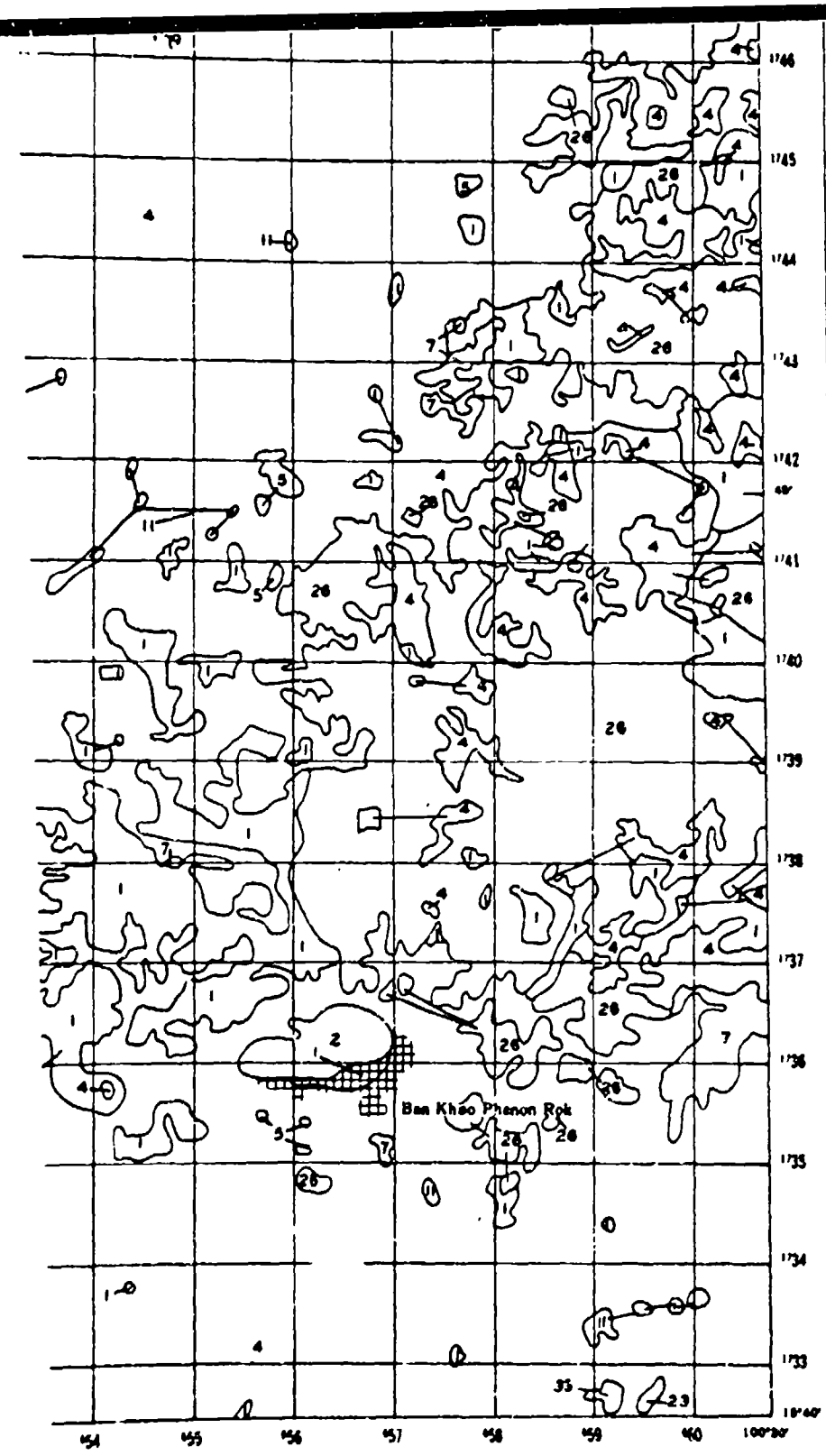


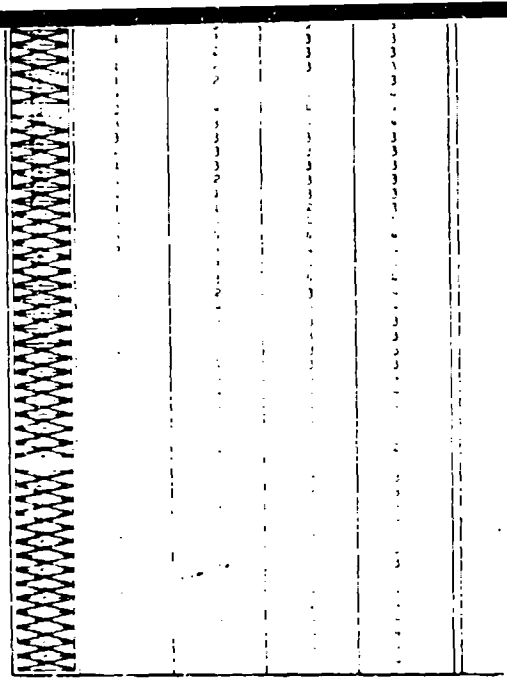
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

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6





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	NS V	N

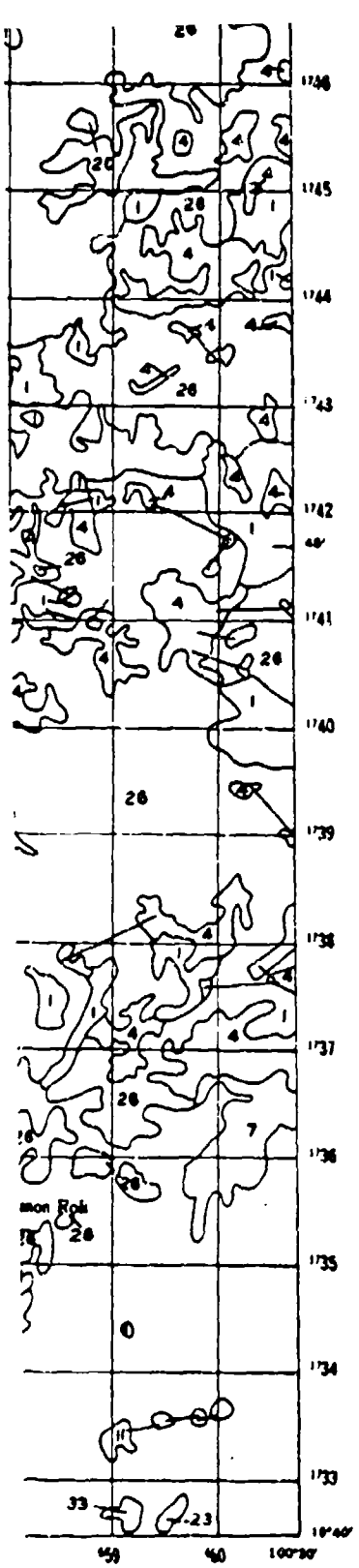
A QUANTITATIVE METHOD FO
TERRAIN FOR GROUND I

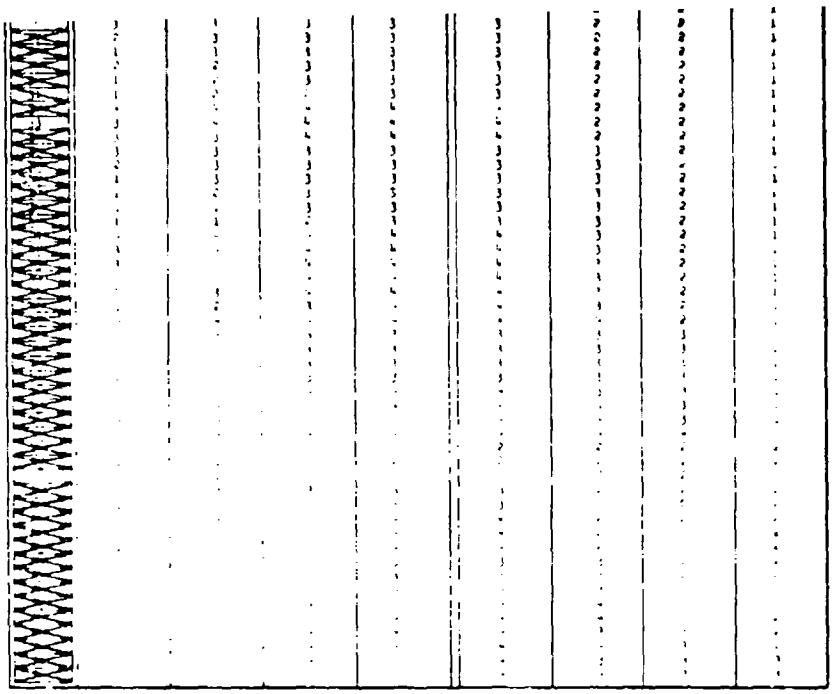
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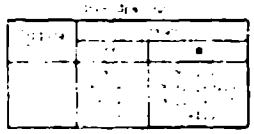
NAKHON SAWAN STU

SHEET NS III

7







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	NS IV	NS IV

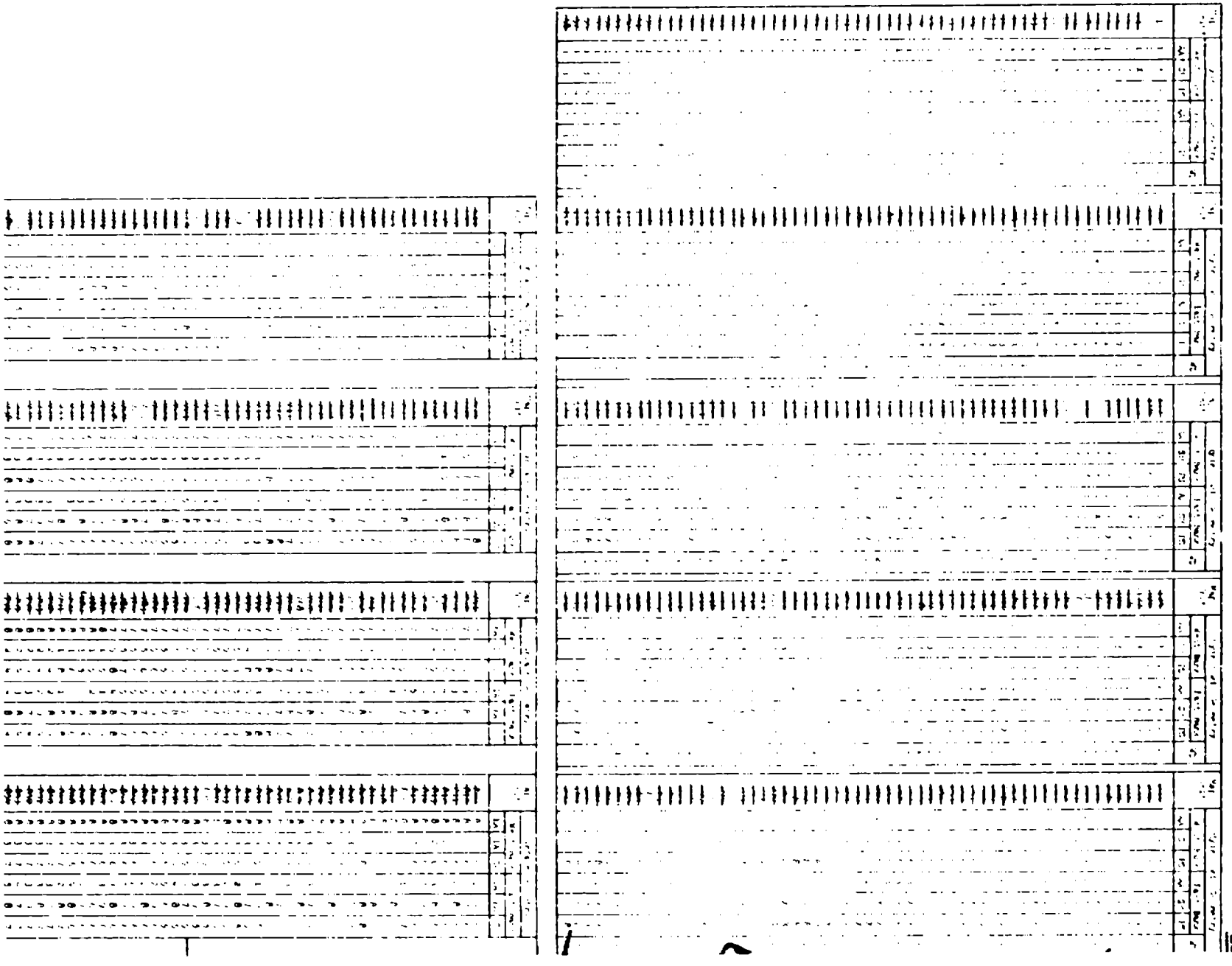
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

NAKHON SAWAN STUDY AREA

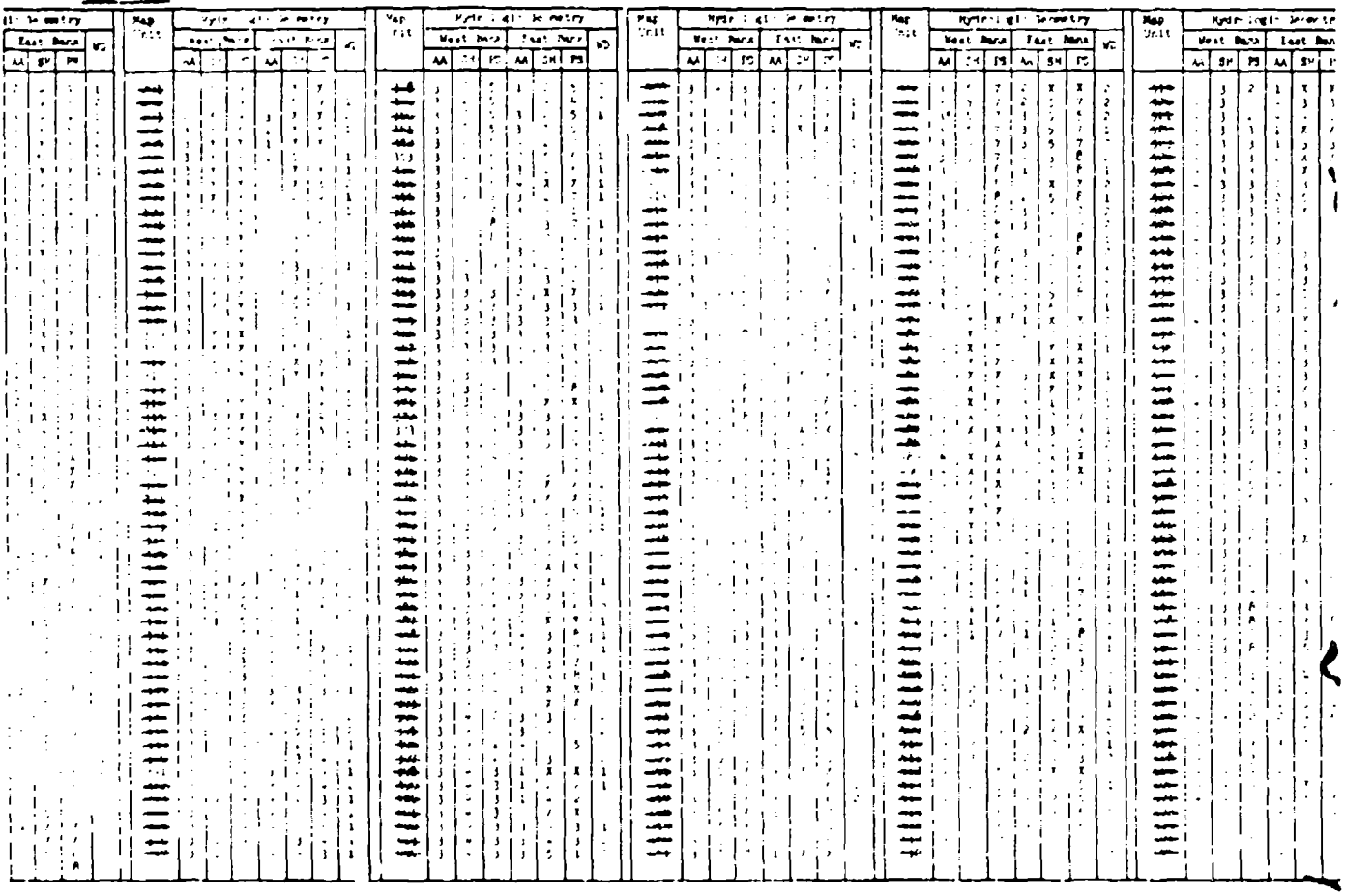
SHEET NS III

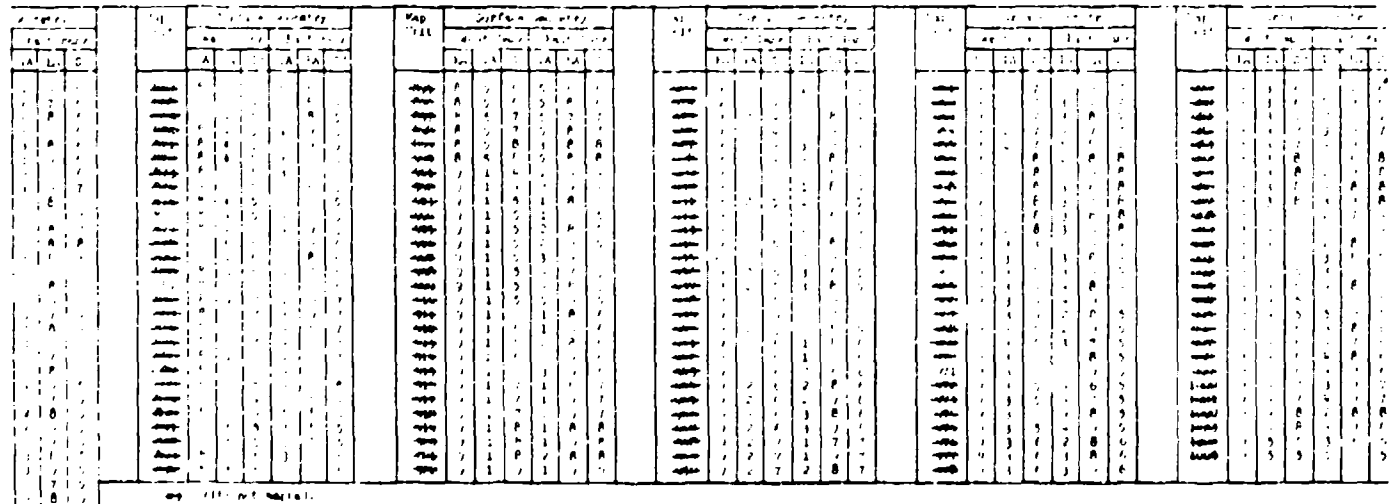
PLATE 1.3c



2

LEGEND





* ... not applicable.

* Features are identified by a fraction. Each component of the fraction is a map unit that contains an array of vertical profiles of terrain bisecting a particular feature. The numerator indicates rainwater retention and the denominator indicates rainwater conditions. Features identified by only one map unit contain less than 3 ft of water at all times and are mapped as surface geometry features. Map units containing hydrologic geometry features and map units displaying surface geometry features typically contain geometry symbols representing ranges of contact approach angle AA (see Hydrologic Geometry Diagram below), step height SH, position of step base PB referenced to water level, and water depth DS for each basin. Surface geometry symbols represent class ranges of exterior approach angle EA (see Surface Geometry Diagram below), interior approach angle IA, and step height SH for each basin. East basin is the first basin encountered while traversing an area in an easterly direction (i.e. azimuth > 270 deg) and the west basin is the first basin encountered while traversing an area in a westerly direction (i.e. azimuth > 180 to 360 deg), assuming that the vehicle intersects the features at a right angle.

† Class ranges for each factor and

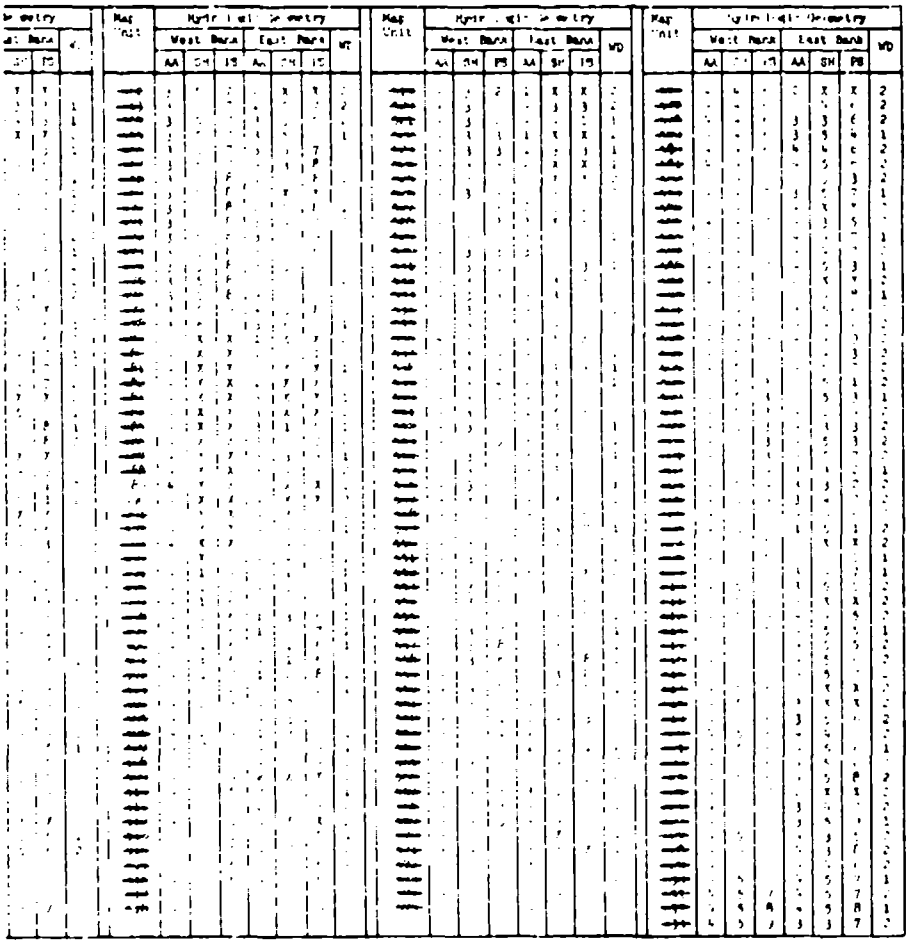
Surface Geometry

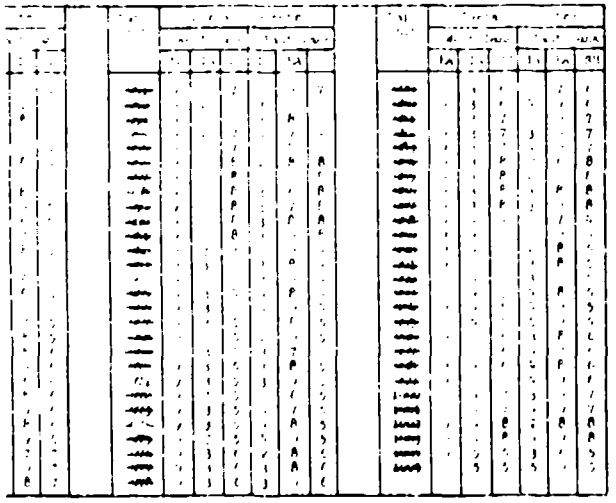
Hydrologic Geometry

Contact Approach Angle (AA)	
Unit	Range (deg)
1	< 135
2	135 - 55
3	> 155-175
4	> 175-180

Unit	
1	
2	1
3	
4	
5	
6	
7	
8	etc

Position of Step Base (PB)

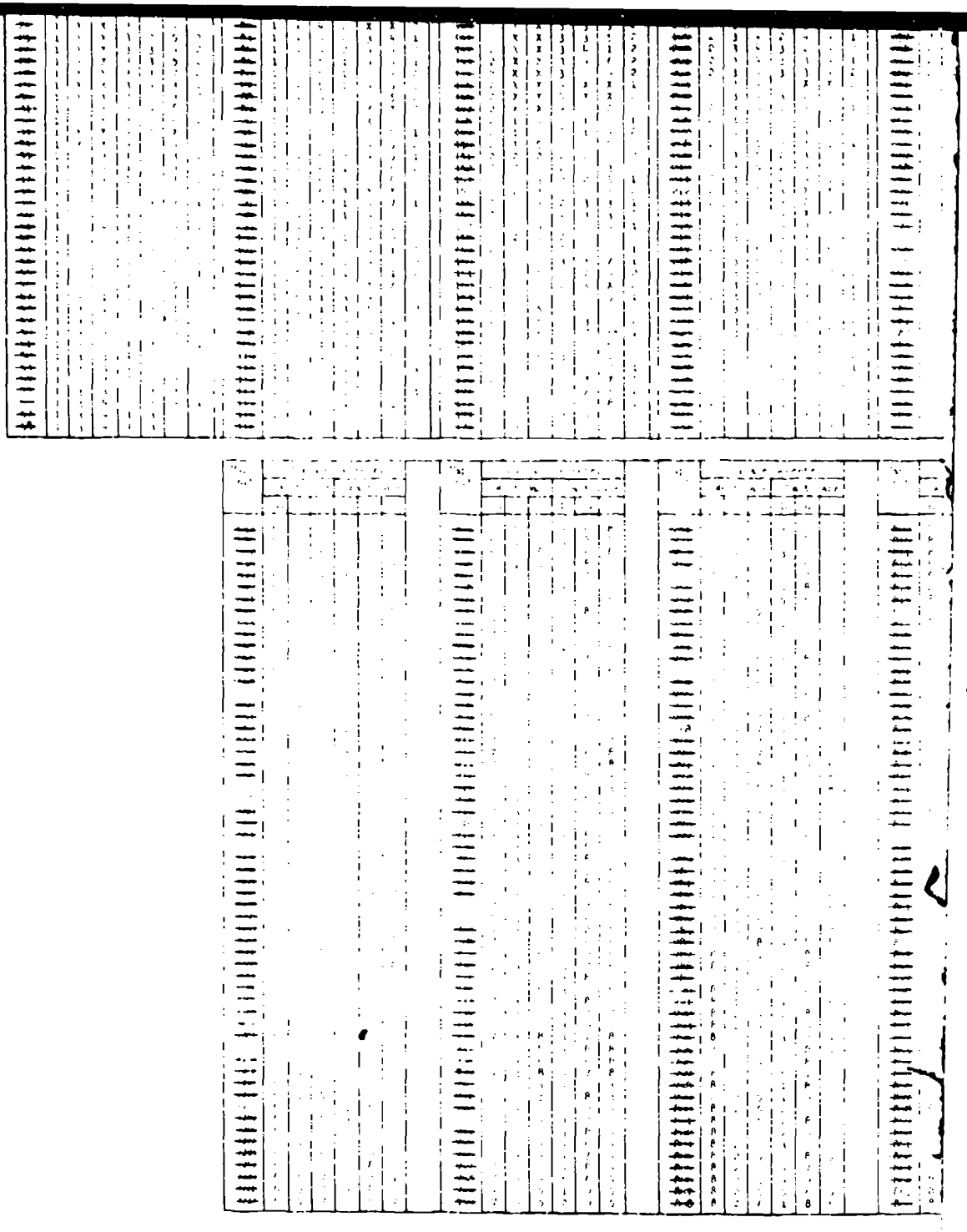


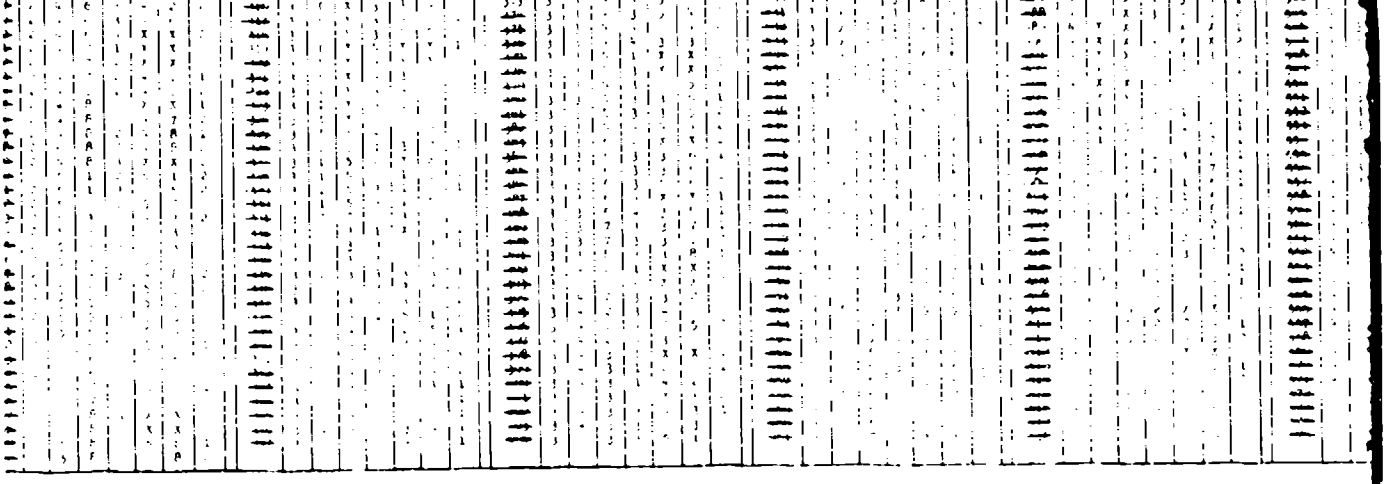


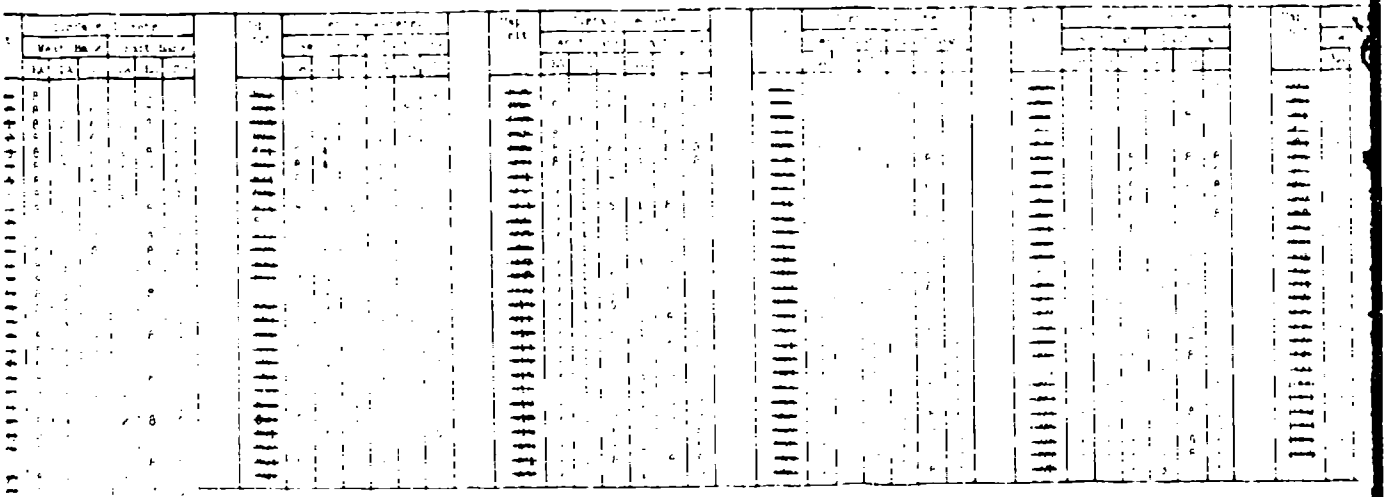
Hydrologic Geometry

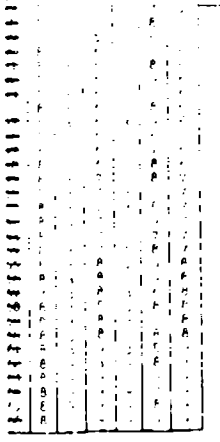
Contact Aperture - Angle (AA)	
Unit	Range
	deg
1	< 175
2	175-155
3	> 155-175
4	> 175-180

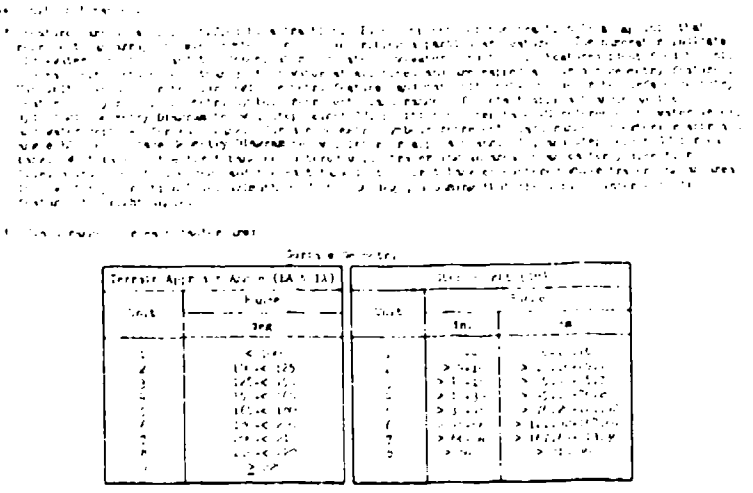
Step Height (SH)		
Unit	Range	
	in.	cm
1	< 12	< 30.48
2	12-6	< 30.48-15.24
3	> 6-12	< 15.24-30.48
4	6-12	15.24-30.48
5	> 12	> 30.48
6	step absent	step absent

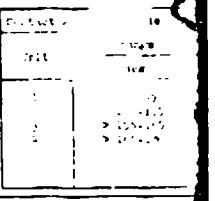


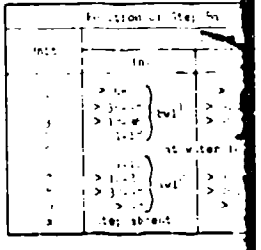




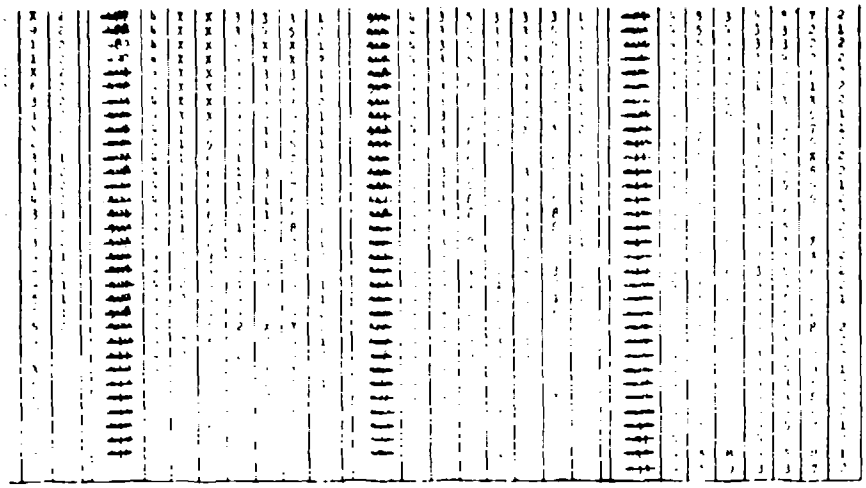


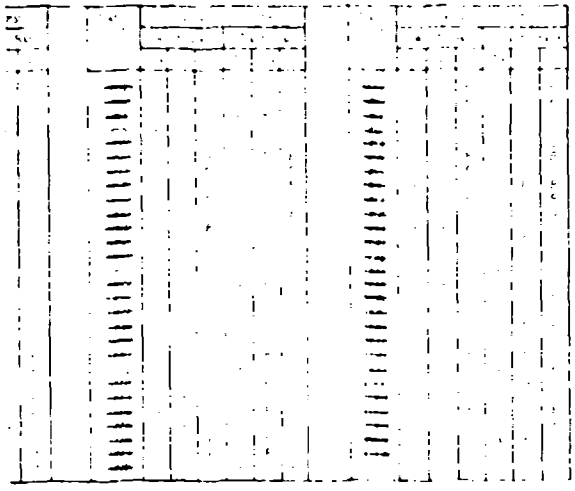


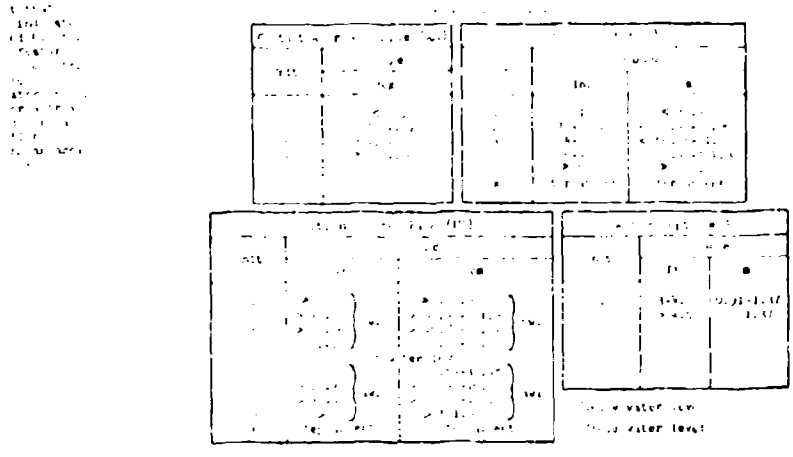


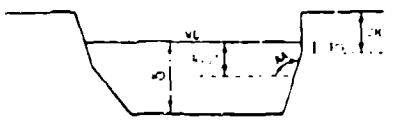


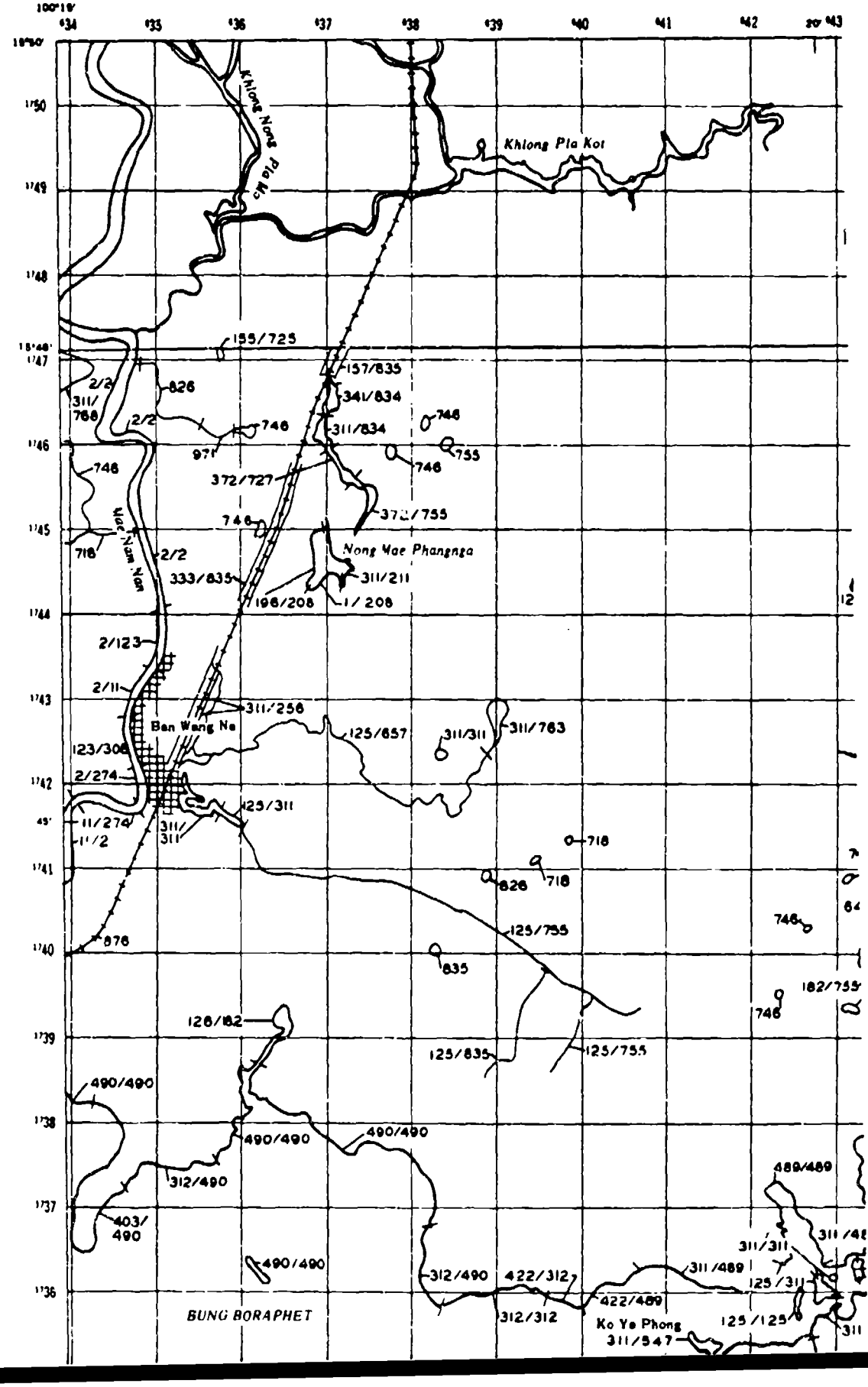






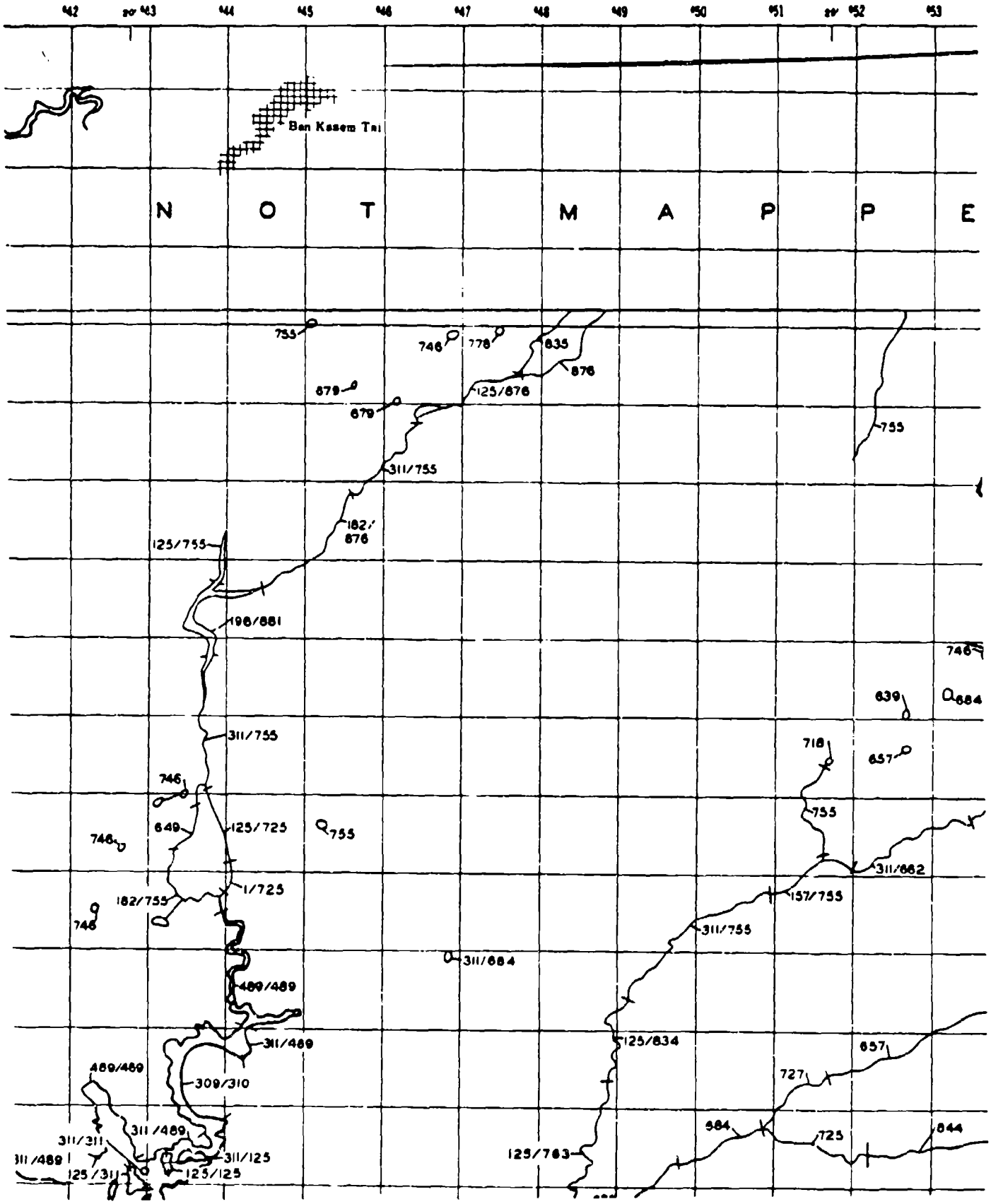





Khlong Nong Pla Mo
Khlong Pla Kot
Nong Wae Phangnga
Wae Nam Noi
Ban Wang Na
BUNG BORAPHET
Ko Ya Phong
155/725
157/835
341/834
311/834
746
755
372/727
372/755
333/835
196/208
1/208
311/211
2/123
2/11
311/256
125/657
311/311
311/763
123/308
2/274
125/311
718
826
876
125/755
835
126/182
182/755
125/835
490/490
312/490
403/490
422/312
422/489
312/312
311/547
489/489
311/489
125/311
125/125
311

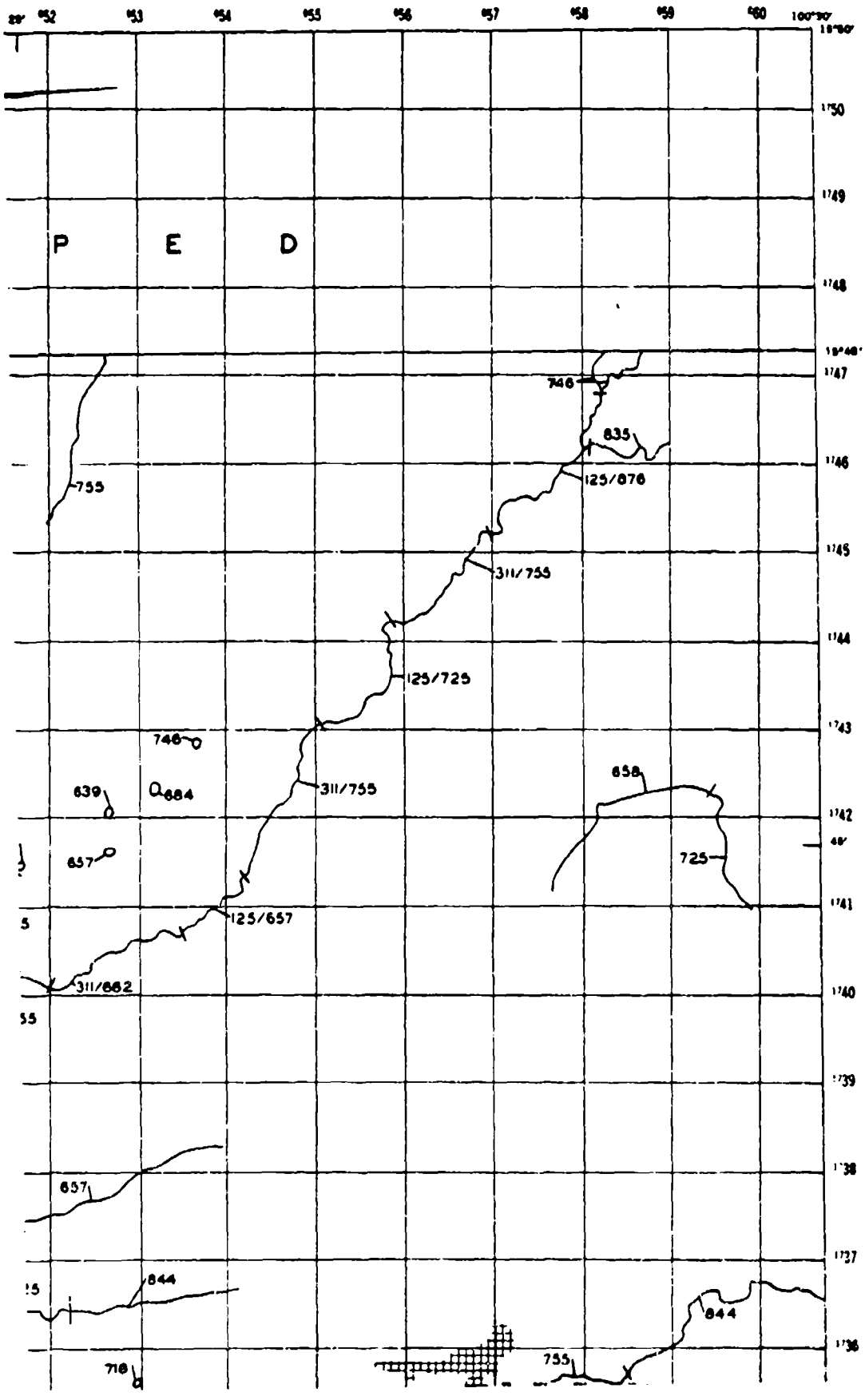
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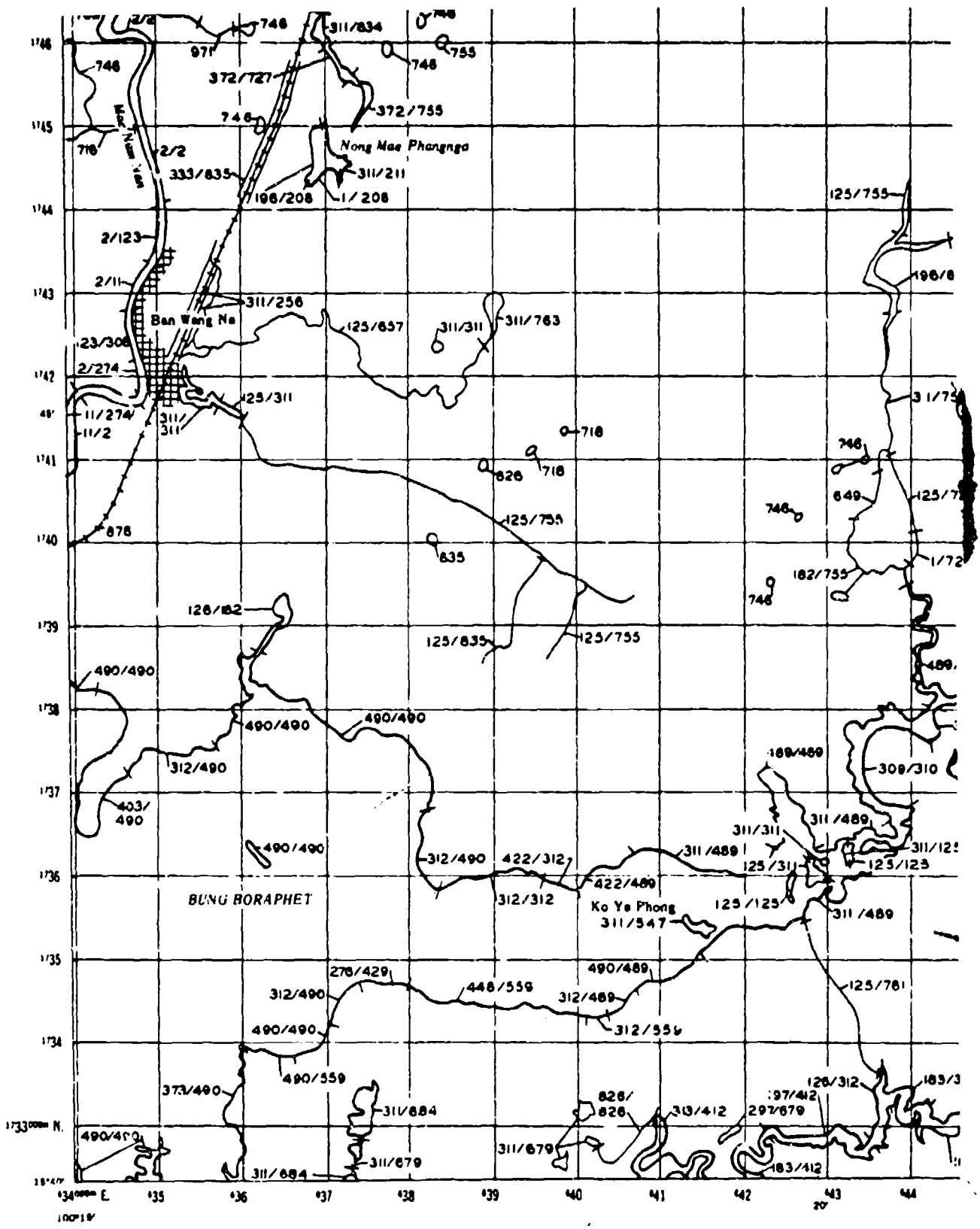
NAKHON SAWAN



1 3

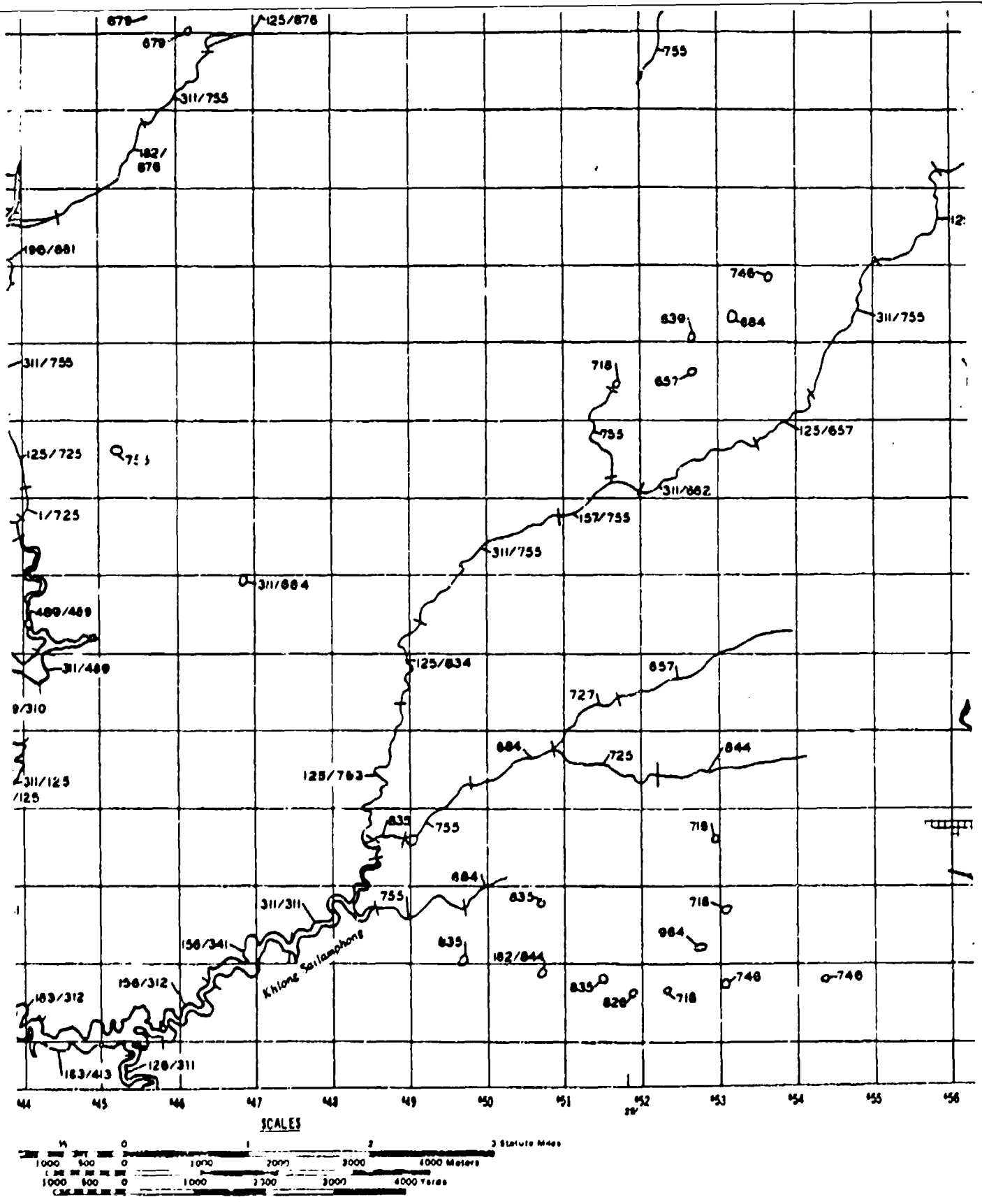
SHEET NS III

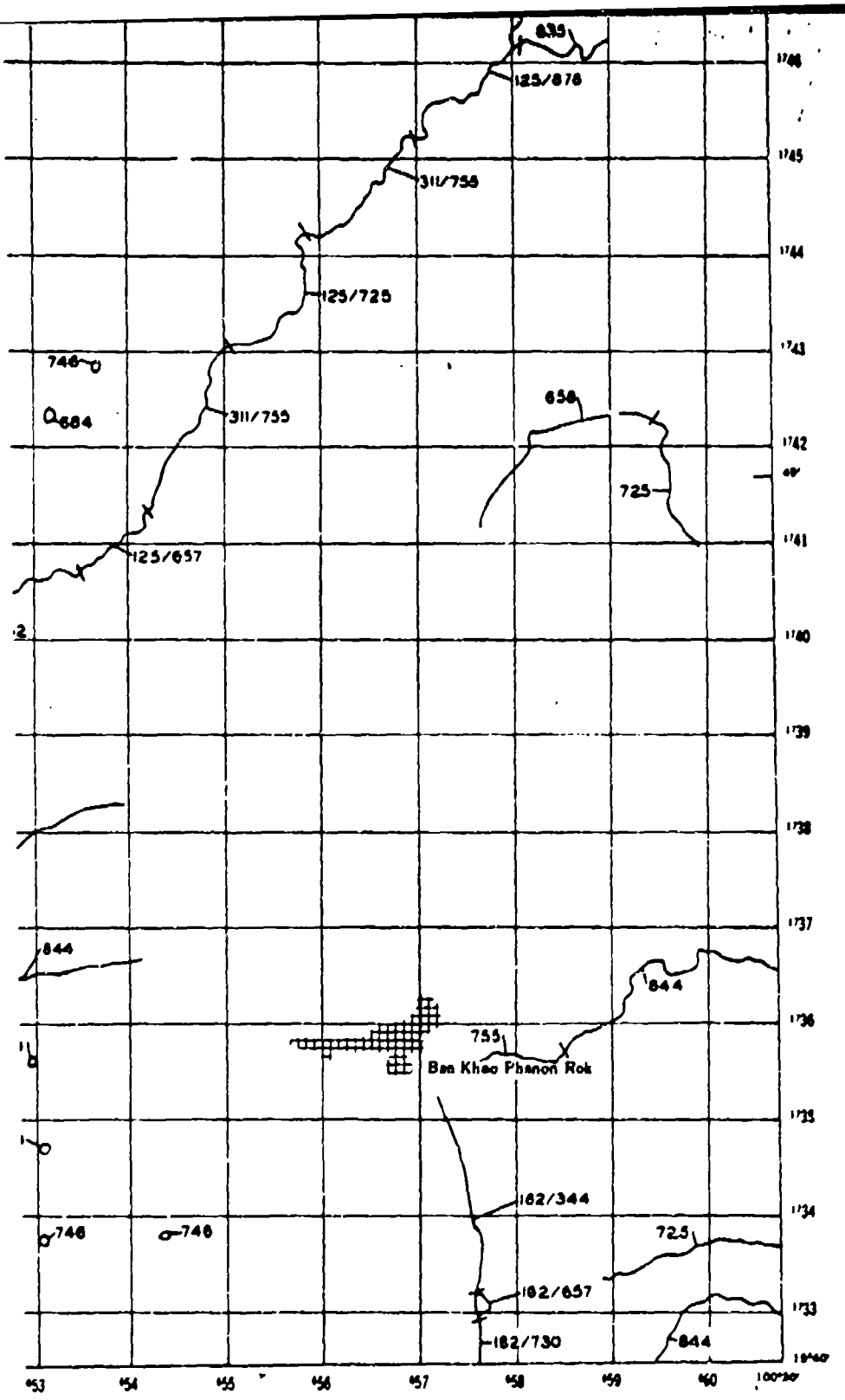




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

4

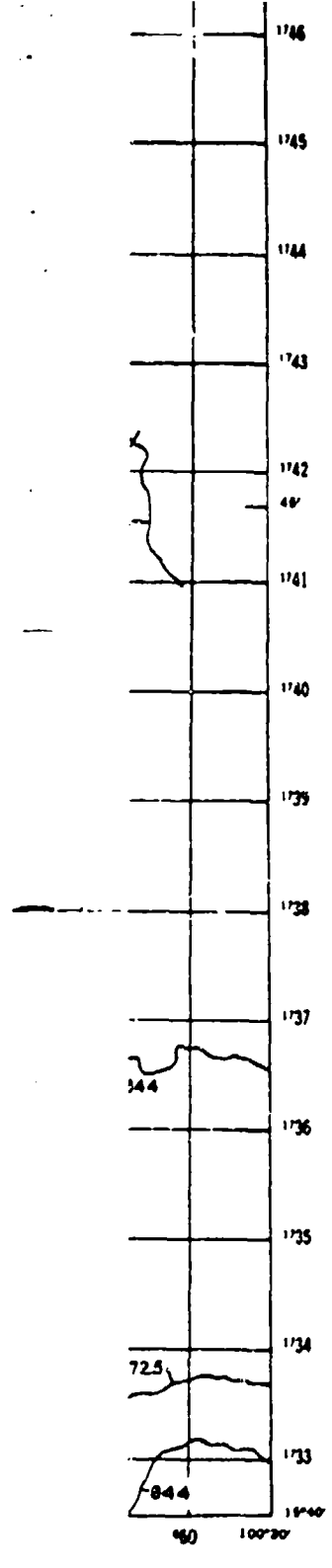

678
679
125/876
311/755
182/
678
190/681
755
746
839
Q884
311/755
718
657
311/755
125/725
Q755
755
125/657
311/882
157/755
311/755
311/884
125/634
657
727
884
725
844
125/763
839
755
718
884
755
311/311
835
718
964
156/341
835
182/844
156/312
Khlong Sallamphong
839
746
746
183/312
820
718
183/413
128/311
SCALES
3 Statute Miles
4000 Meters
4000 Yards



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	NS V

A QUANTITATIVE METH
TERRAIN FOR GR
HYDROLOGIC
NAKHON SAWAN
SHEET



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	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

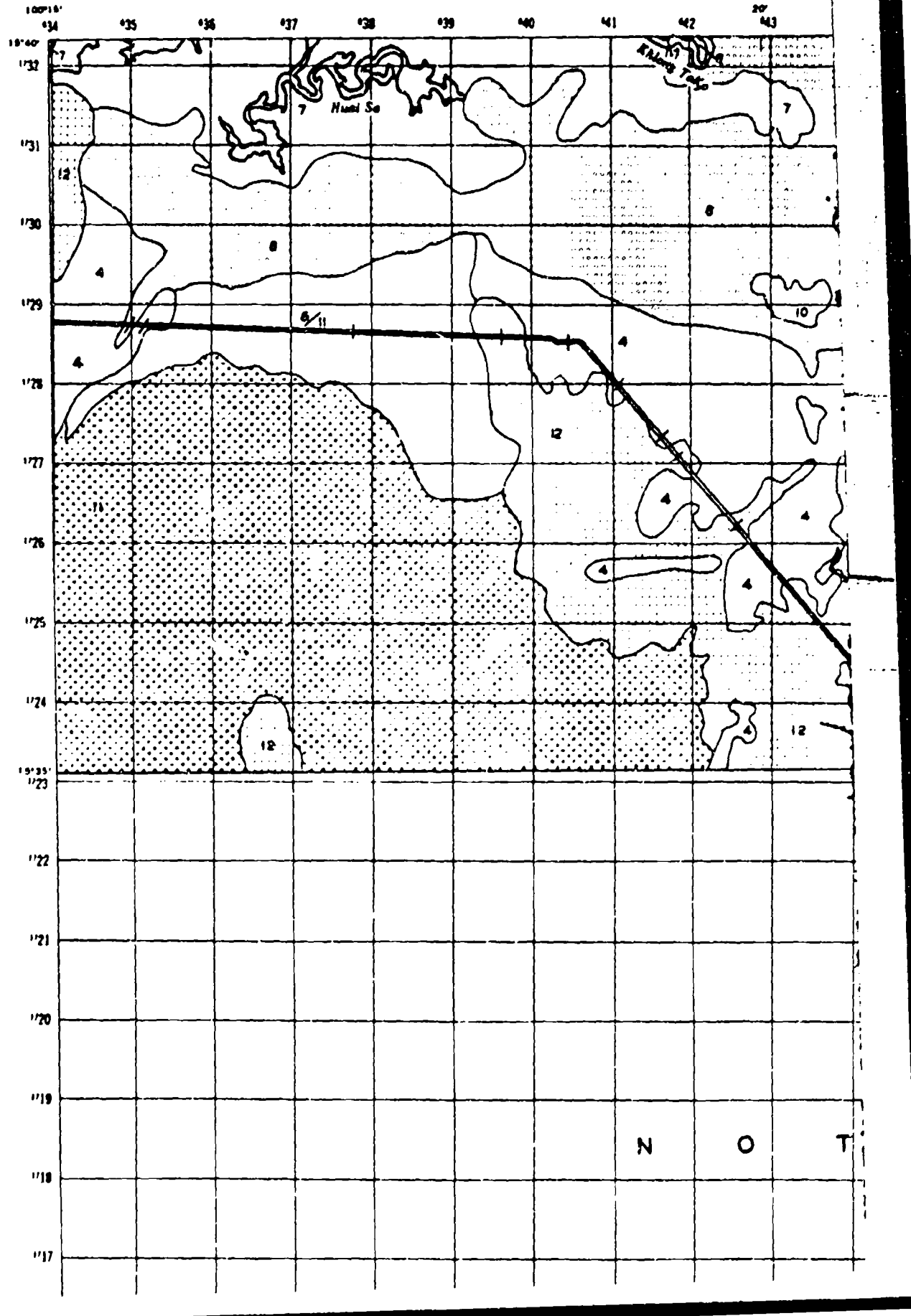
HYDROLOGIC GEOMETRY

NAKHON SAWAN STUDY AREA

SHEET NS III

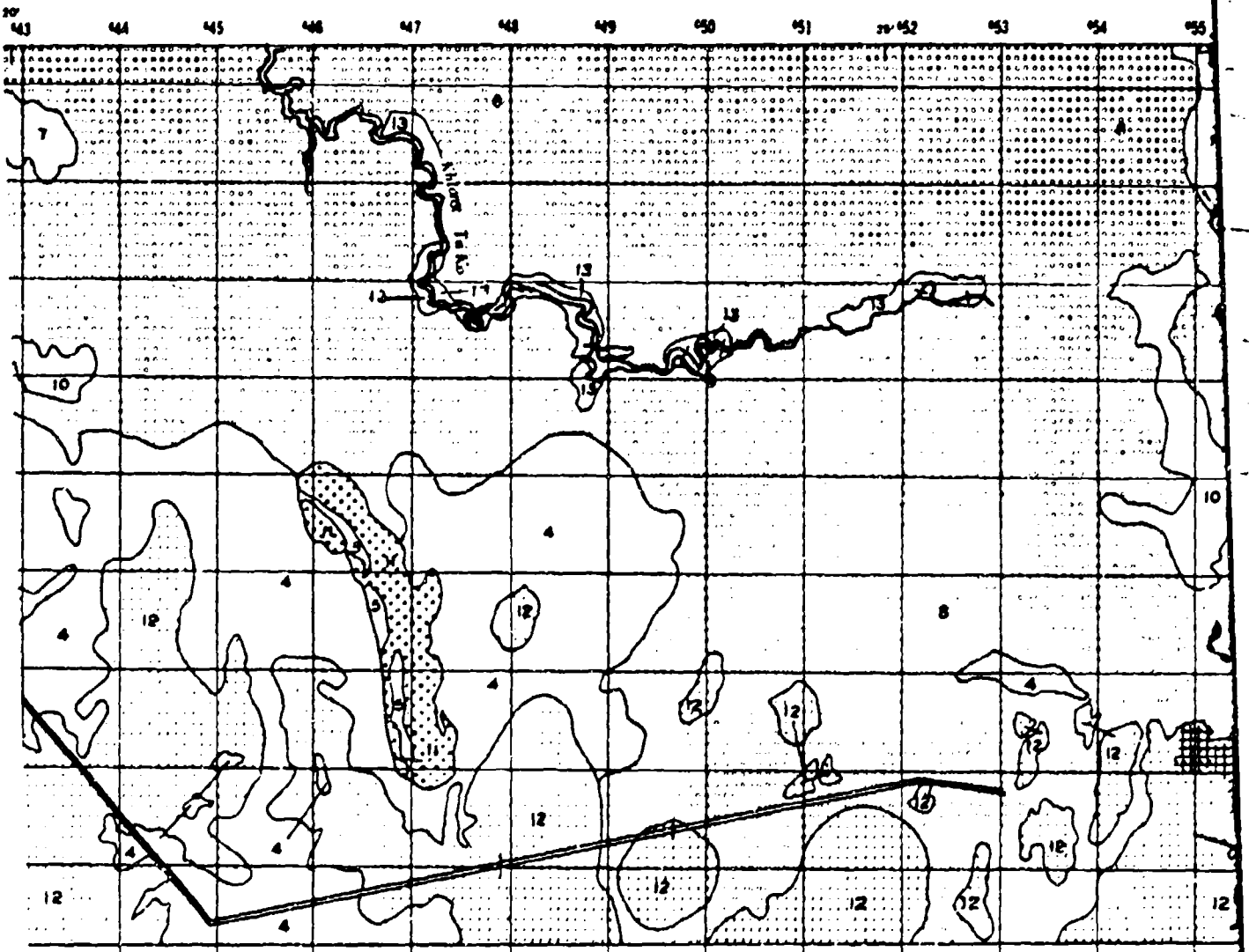
7

PLATE 1.3d


Huai Sa
N O T

2

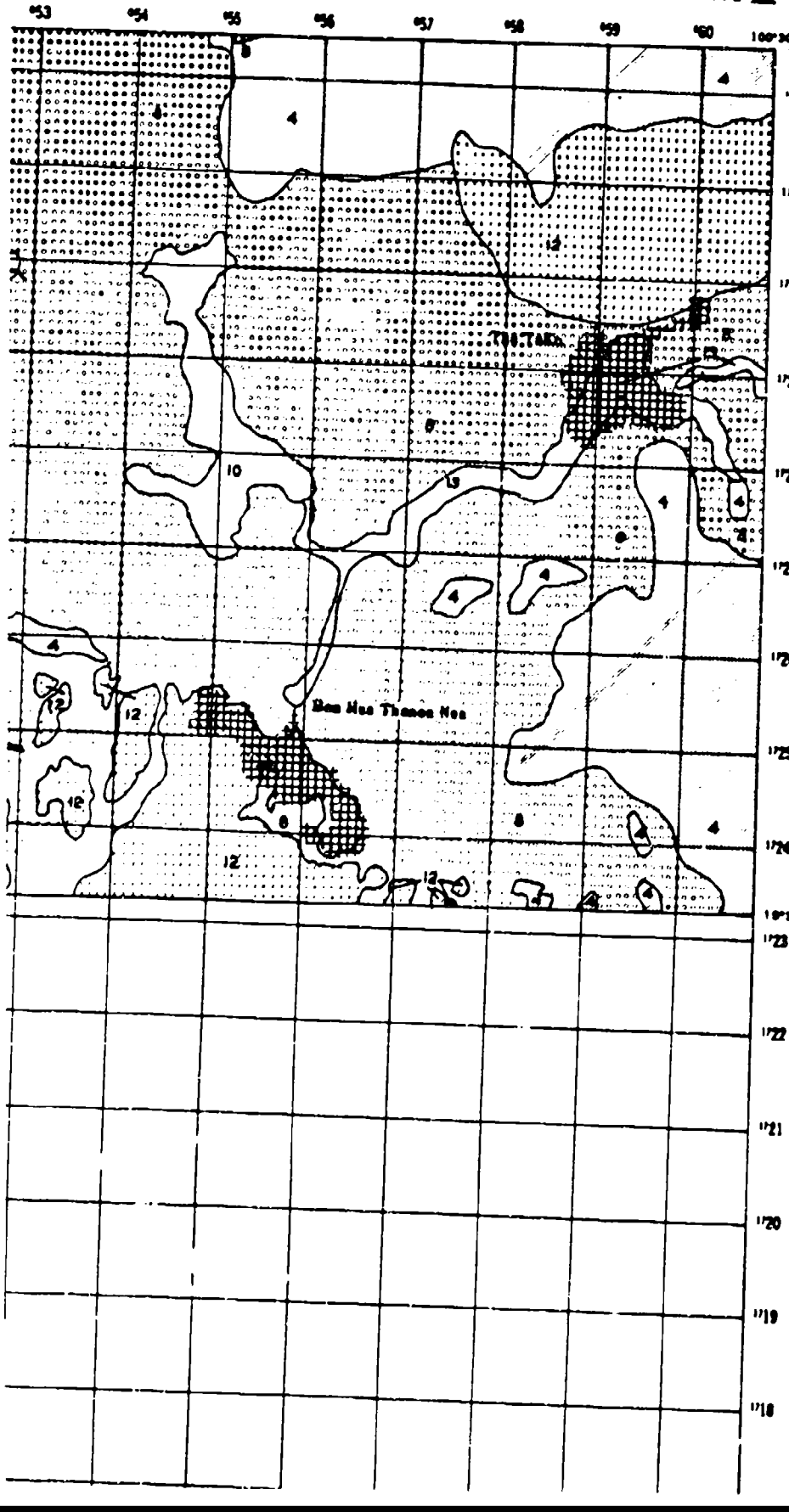
NAKHON SAWAN



T M A P P E D

3

SHEET NS IV



LEG

Unit	Soil Shear Strength: Maximum Moisture	Soil Shear Strength: Minimum Moisture	Maximum Moisture: c_{up} psi	Maximum Moisture: c_{up} kg/cm²	Maximum Moisture: ϕ_{up} deg
	MII	MII			
	10-75	75-60	0-1	0-0.07	0-10
	75-60	60-100	0-1	0-0.07	0-10
	75-60*	60-100	0-1	0-0.07	10-20
	75-60	>100	0-1	0-0.07	0-10
2	75-60*	>100	0-1	0-0.07	10-20
	60-100	60-100	0-1	0-0.07	0-10
	60-100	60-100	0-1	0-0.07	10-20
	60-100	>100	0-1	0-0.07	0-10
	60-100	>100	0-1	0-0.07	0-10
10	60-100	>100	0-1	0-0.07	10-20
12	60-100*	>100	0-1	0-0.07	10-20
14	>100	>100	0-1	0-0.07	0-10
13	>100	>100	0-1	0-0.07	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20

Notes: Blank areas are water bodies.

c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

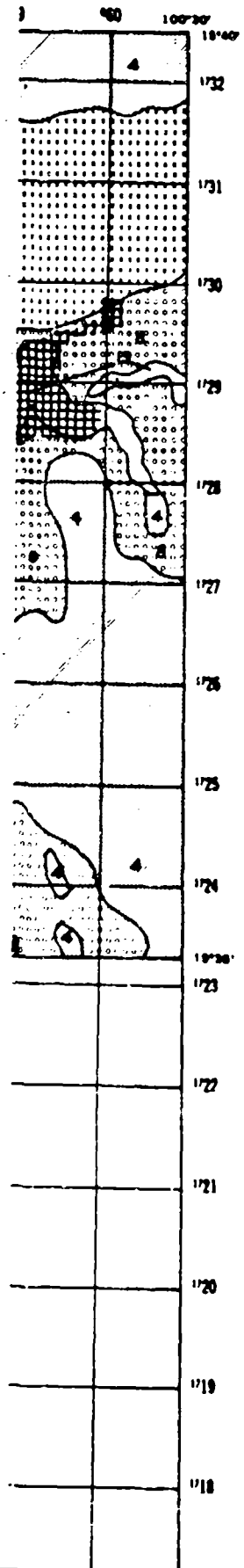
* Maximum moisture has less than 30 percent probabil... strengths commonly observed are 60-100 for Units 3...

Units do not occur on this map.

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SHEET NS IV



LEGEND

Unit	Soil Mass Strength: Minimum Moisture — RCI	Soil Mass Strength: Maximum Moisture — RCI	Soil Surface Strength: Maximum Moisture — c_w psi	Soil Surface Strength: Maximum Moisture — c_w kg/cm²	Soil Surface Strength: Maximum Moisture — ϕ_w deg	Soil Surface Strength: Minimum Moisture — c_w psi	Soil Surface Strength: Minimum Moisture — c_w kg/cm²	Soil Surface Strength: Minimum Moisture — ϕ_w deg	Soil Surface Strength: Conditions where maximum c_w occurs — c_w psi	Soil Surface Strength: Conditions where maximum c_w occurs — c_w kg/cm²	Soil Surface Strength: Conditions where maximum c_w occurs — ϕ_w deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
12	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
14	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

c_w Shear strength at zero normal load.

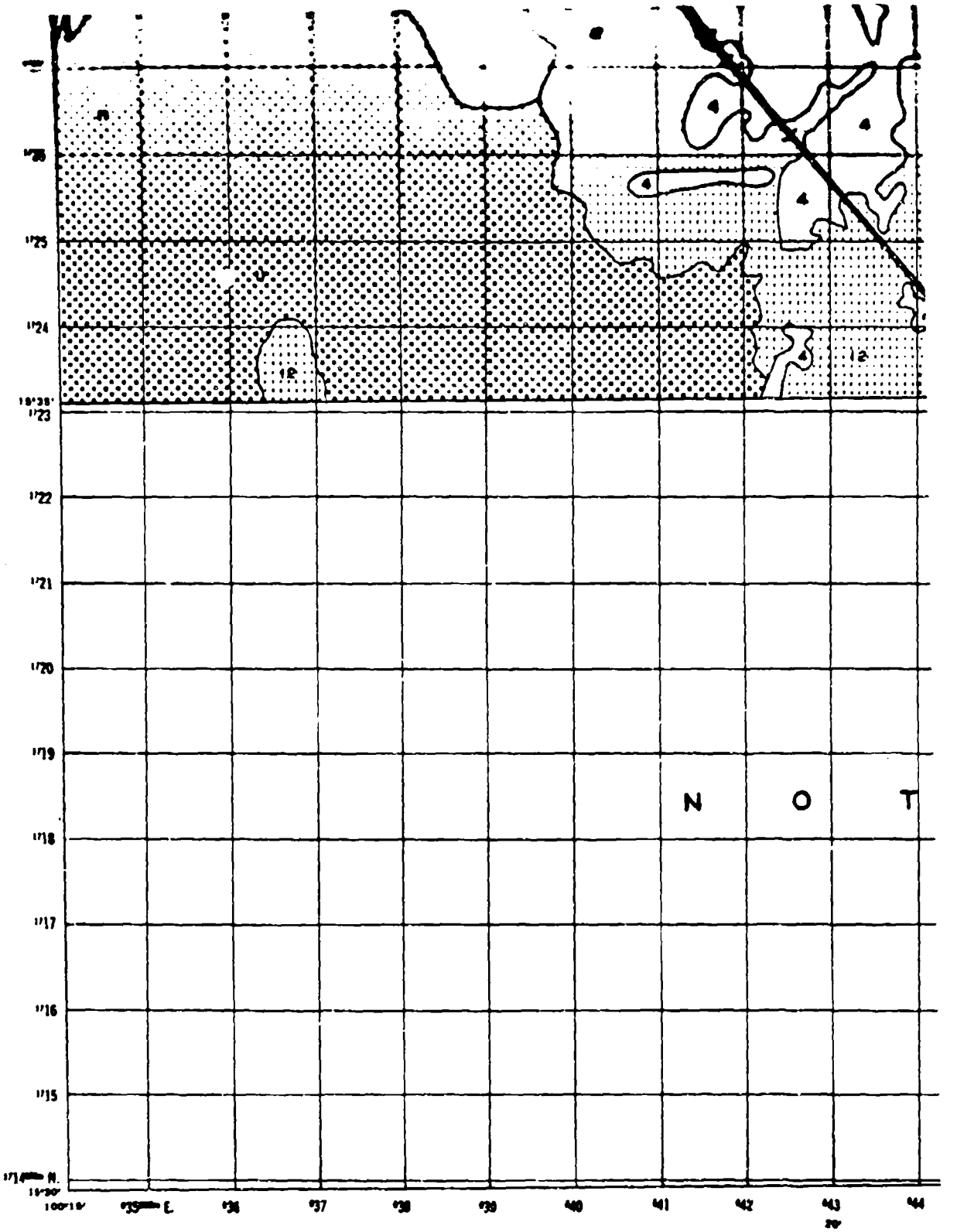
ϕ_w Angle of internal friction.

* Maximum moisture has less than 10 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

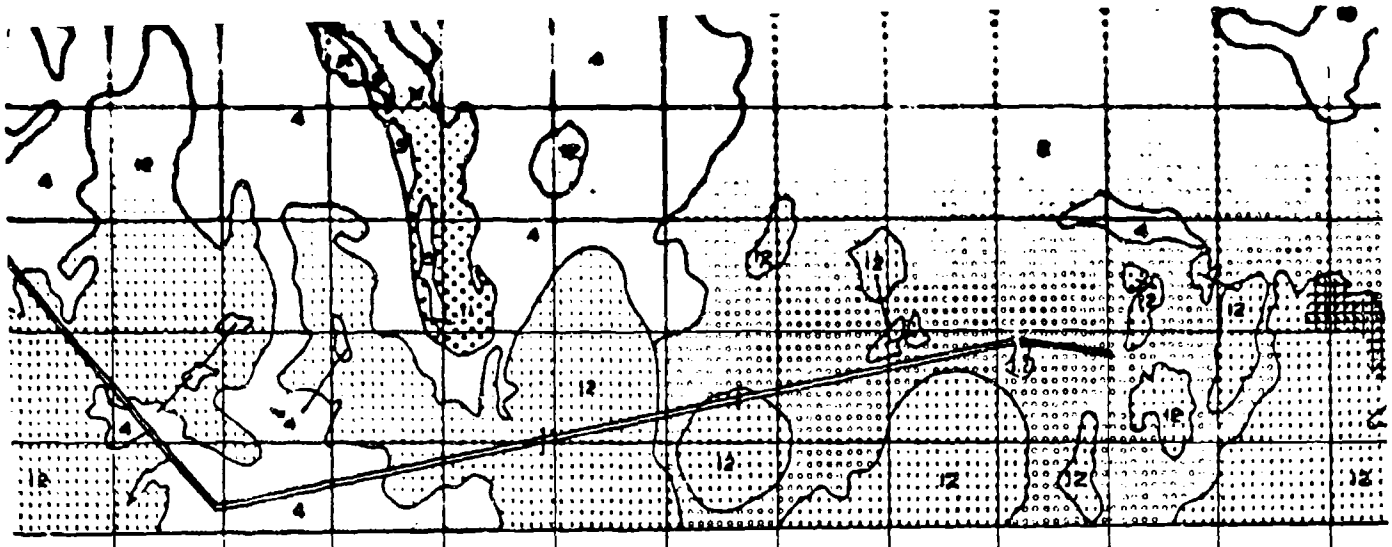
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ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

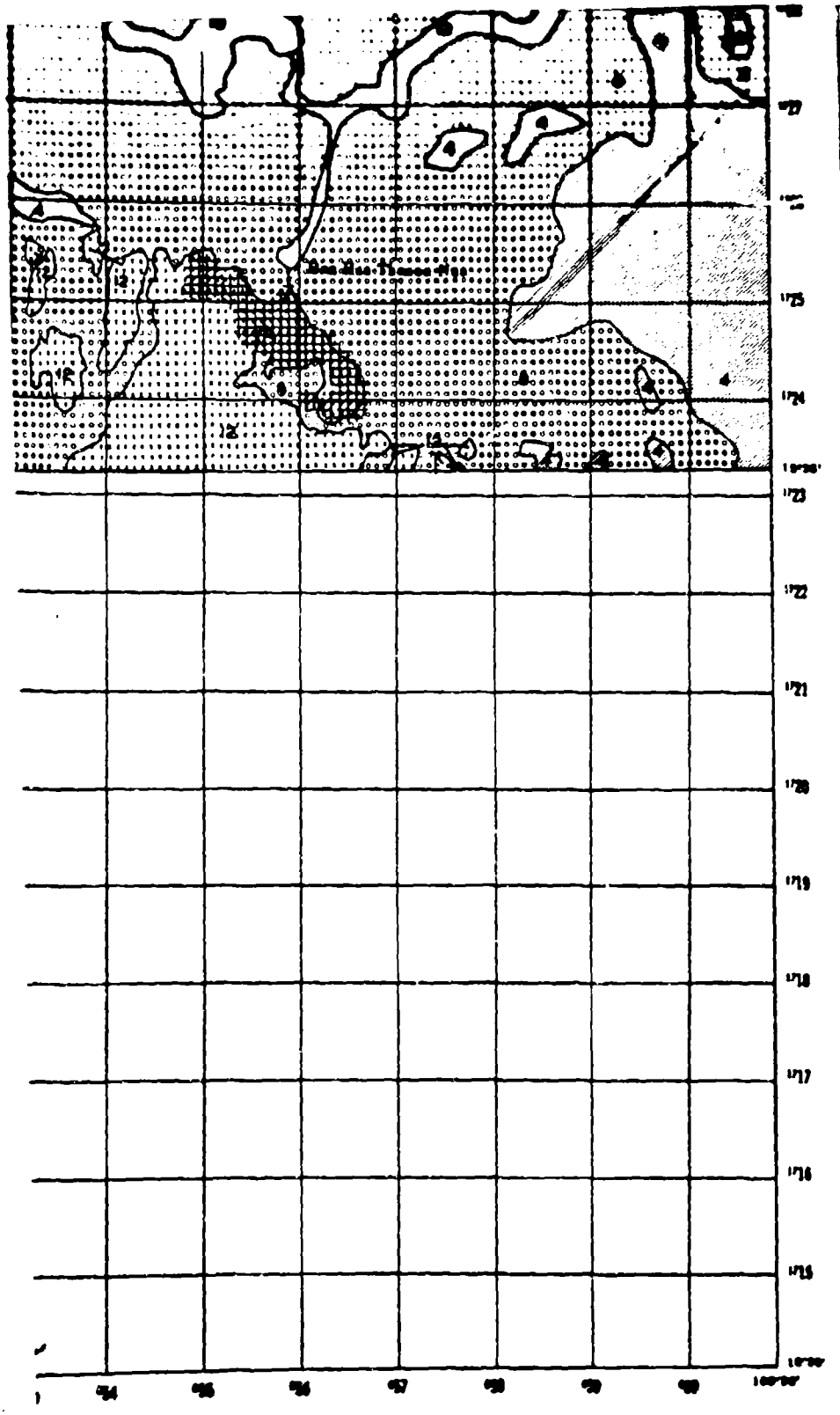
5

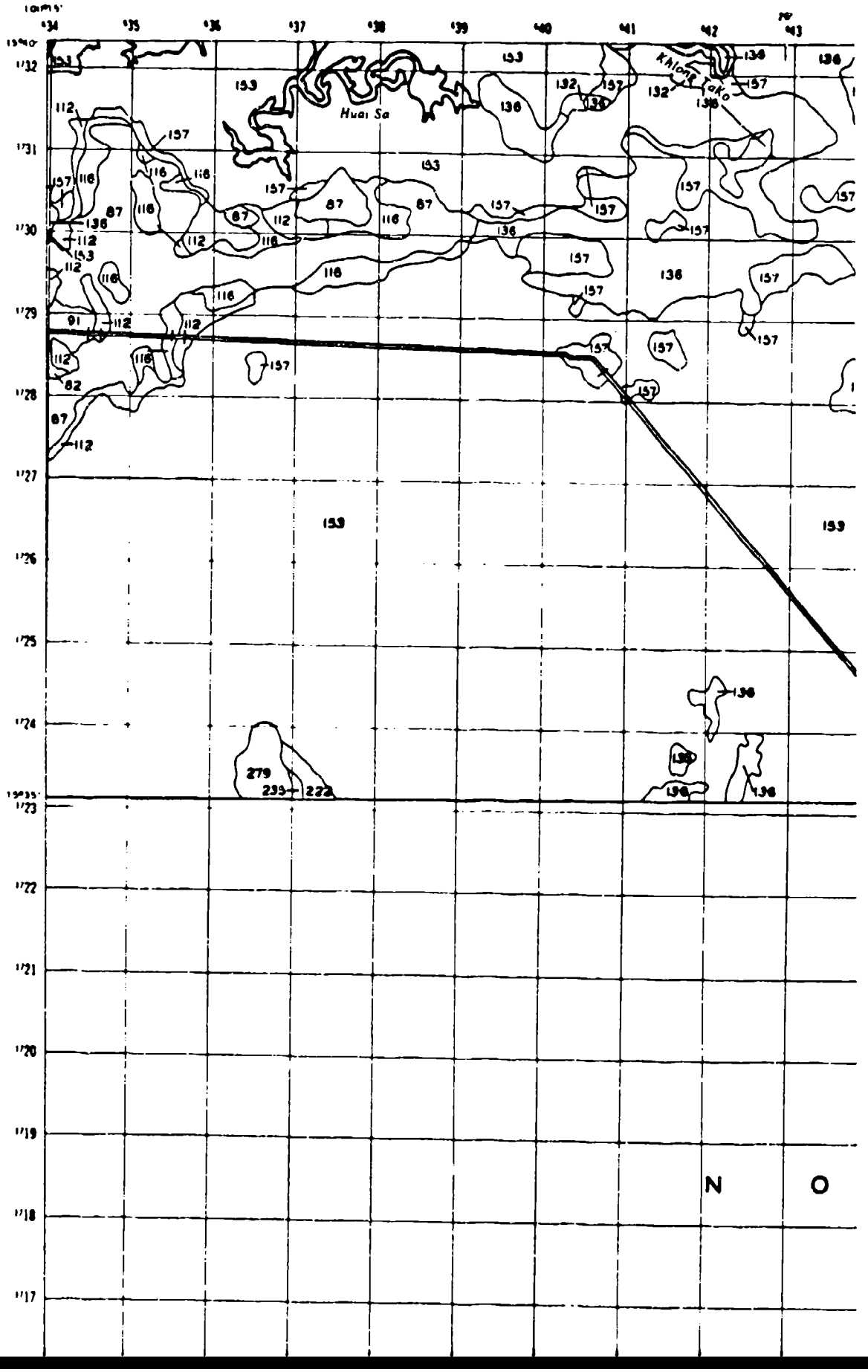


T M A P P E D

SCALES

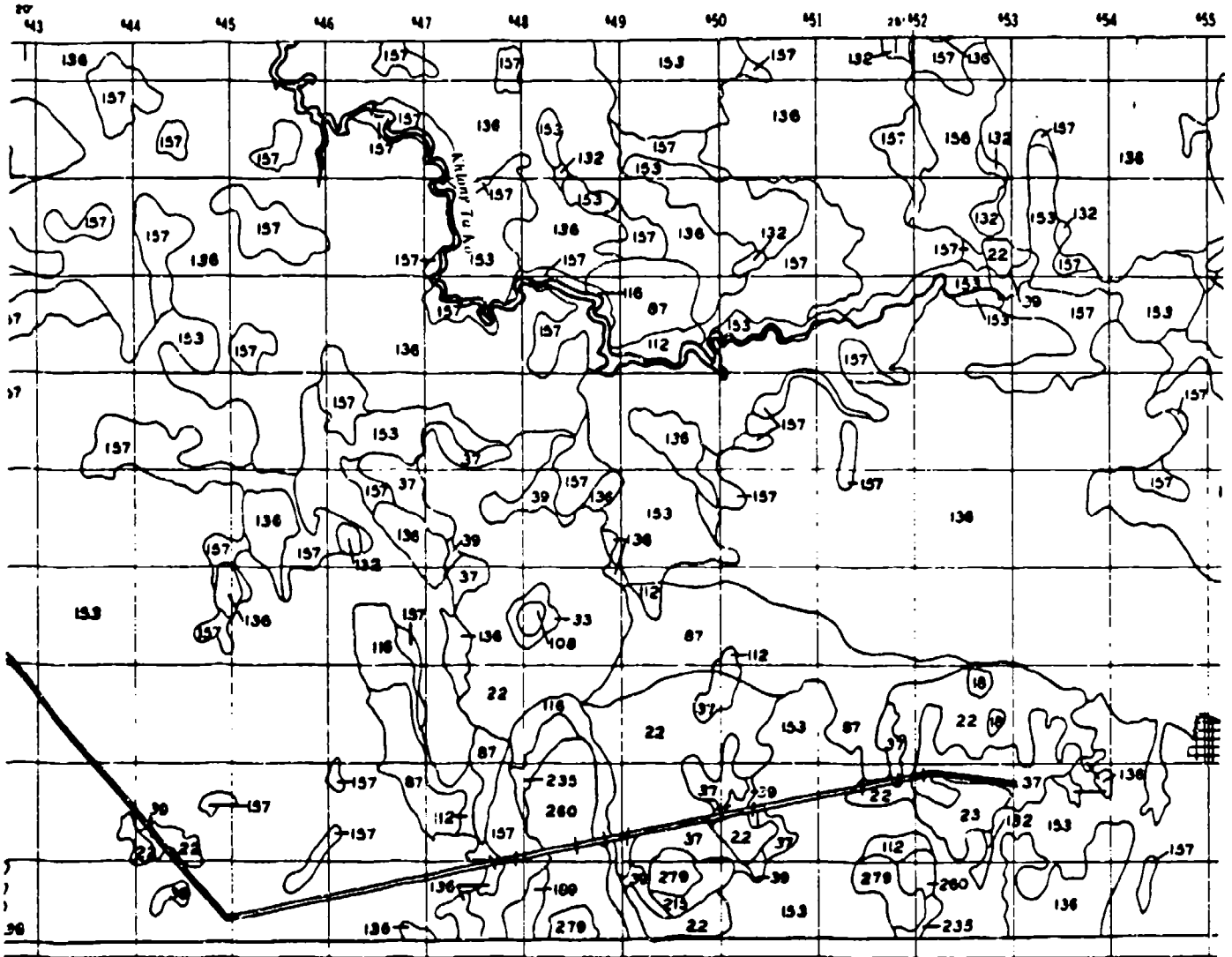
6




Huai Sa
Khlong Tako
N
O

2

NAKHON SAWAN

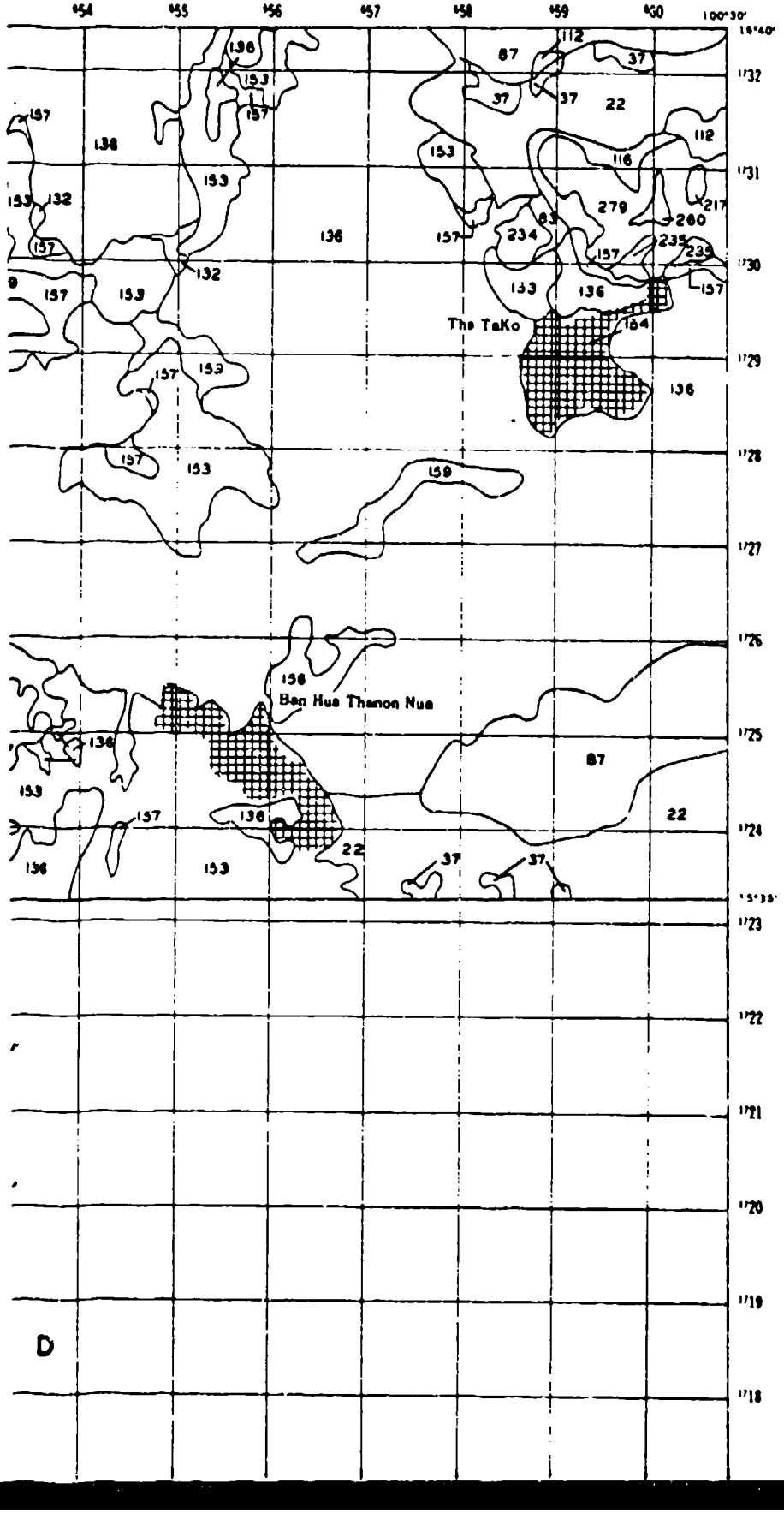


O T M A P P E D

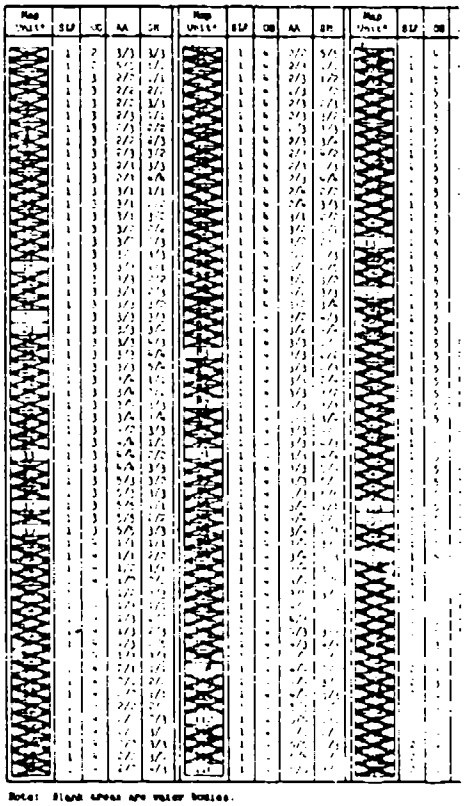
1

3

SHEET NS IV



LEGEND



Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 2, 3/3 below), vertical obstacle spacing OB, approach angle AA, and step were mapped. The numerator of the fraction indicates least severe easterly direction (i.e. azimuth from > to 180 deg) assuming that the vehicle interio

† Key to class ranges of each surface geometry factor used

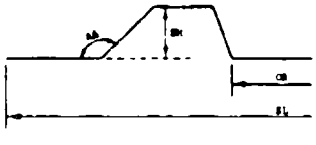
Slope (SL)

Mapping Class	Range deg
1	0-1.5
2	> 1.5-4.5
3	> 4.5-9
4	> 9-15
5	> 15-30
6	> 30-45
7	> 45

Vertical Obstacle Spacing (S)

Mapping Class	Feet	m
1	0-7	0-2.13
2	> 7-12	> 2.13-3.66
3	> 12-45	> 3.66-13.72
4	> 45-75	> 13.72-22.72
5	> 75	> 22.72

Units do not occur on this map.



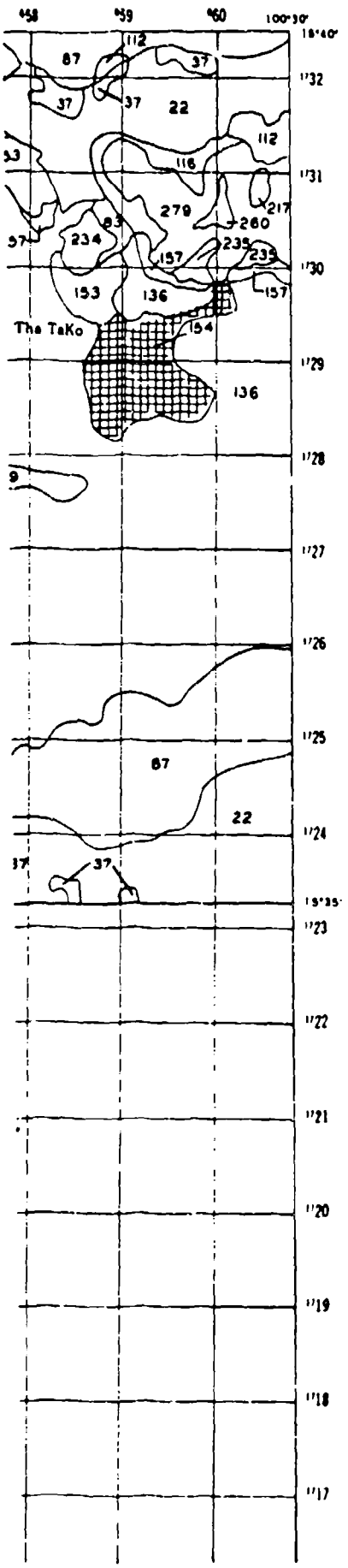
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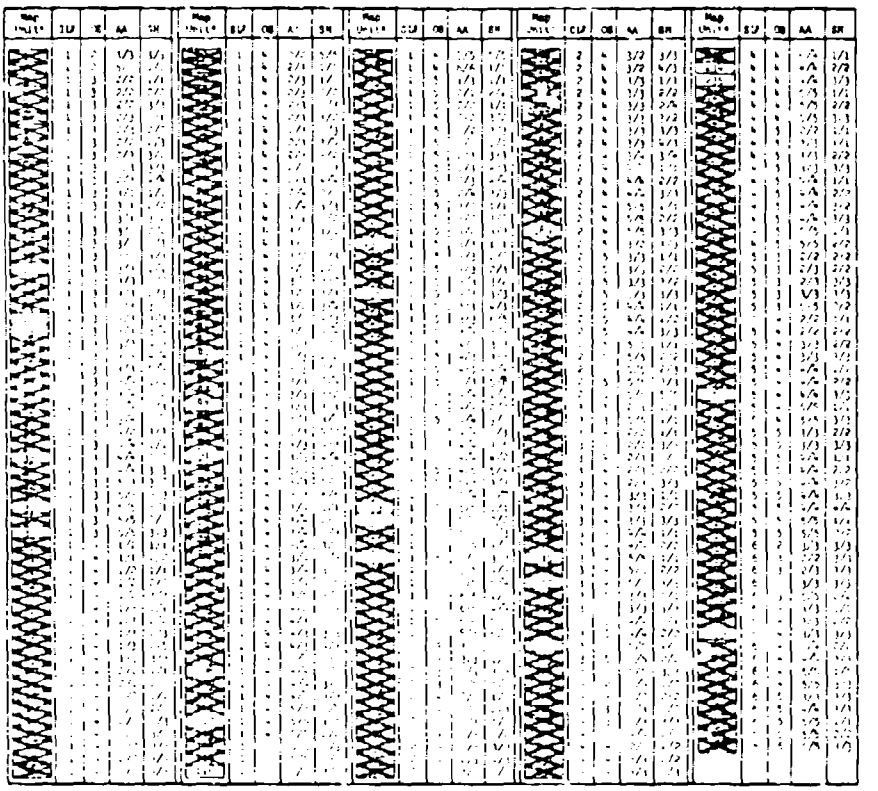
3

4

SHEET NS IV



LEGEND



Water Areas and water bodies.

* Each map unit represents an average (range) of slope symbols (i.e. ..., 1/1, 2/1, 3/1) indicating modal slope classes of slope SL (see diagram below), modal dominant aspect class AA, and modal height class SH. The final letter(s) indicate that special phases were mapped. The separation of the fragipan into strongly developed (duripan) and weakly developed (fragipan) phases was not considered practical at this level of mapping.

† Mapping class ranges of each surface property for the unit.

Slope (SL)

Mapping Class	Range (%)
1	0-2
2	2-5
3	5-10
4	10-15
5	15-25
6	25-45
7	>45

Vertical Axis to Spacing (S)

Mapping Class	Range	
	m	ft
1	<1.2	<4
2	1.2-2.4	4-8
3	2.4-4.8	8-16
4	4.8-9.6	16-32
5	9.6-19.2	32-64
6	>19.2	>64

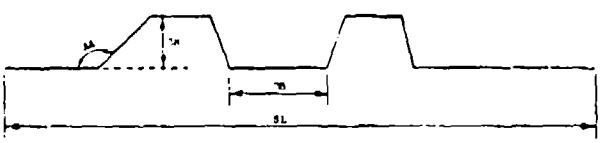
Aspect Angle (AA)

Mapping Class	Range (deg)
1	<22.5
2	22.5-67.5
3	67.5-112.5
4	112.5-157.5
5	157.5-202.5
6	202.5-247.5
7	247.5-292.5
8	292.5-337.5
9	337.5-360
*	>360

Scarp Height (SH)

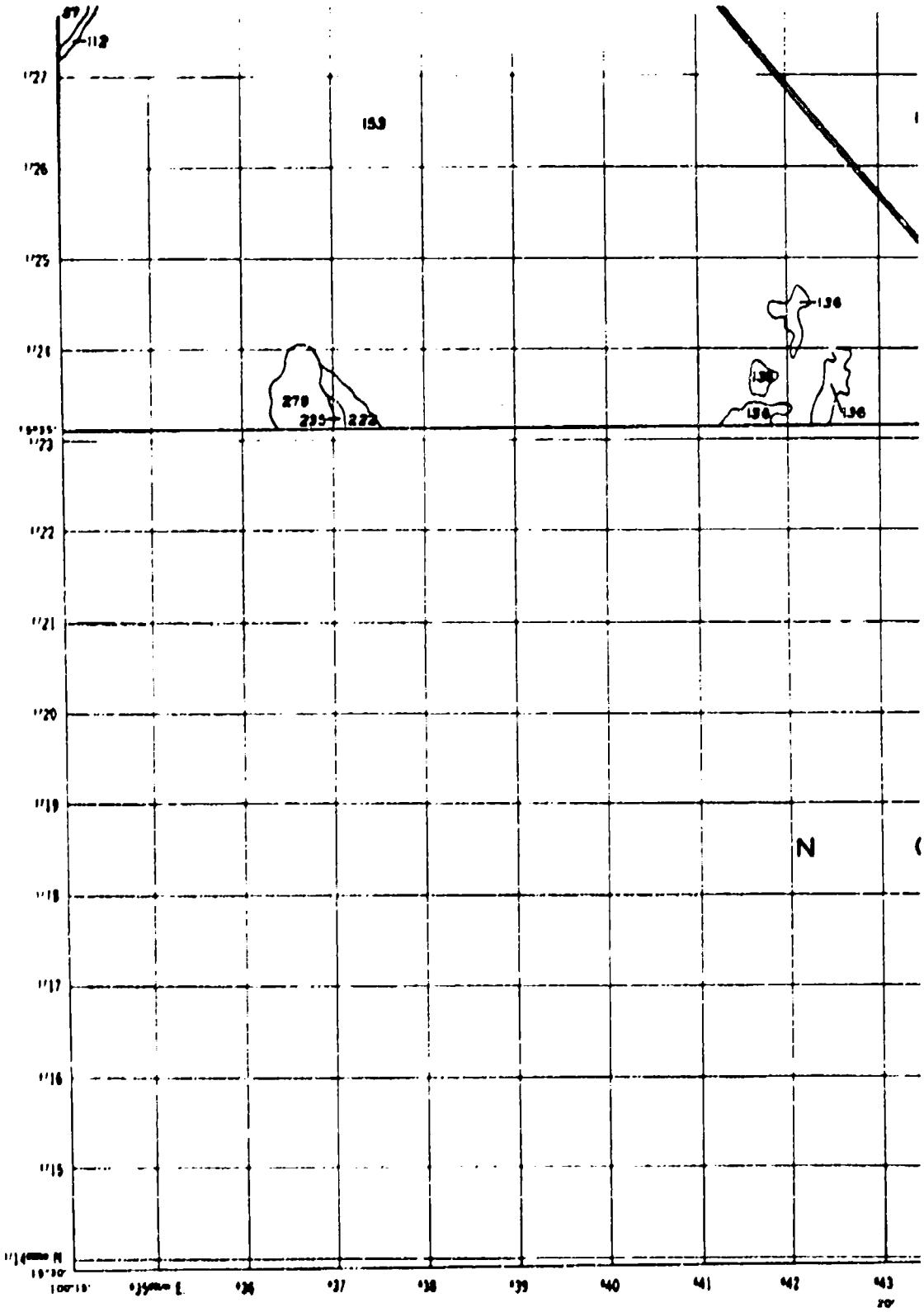
Mapping Class	Range	
	m	ft
1	0-0.6	0-2
2	0.6-1.2	2-4
3	1.2-2.4	4-8
4	2.4-4.8	8-16
5	4.8-9.6	16-32
6	9.6-19.2	32-64
7	19.2-38.4	64-128
8	38.4-76.8	128-256
9	>76.8	>256

Note to not occur on this map.



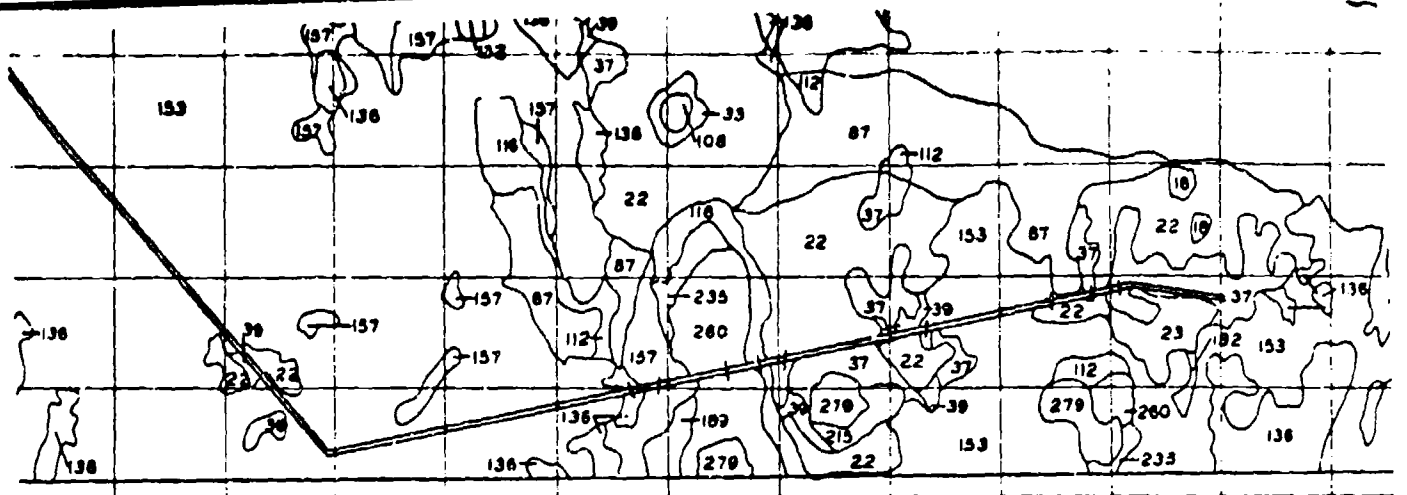
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NS I	NS II	NS III
	NS V	NS IV

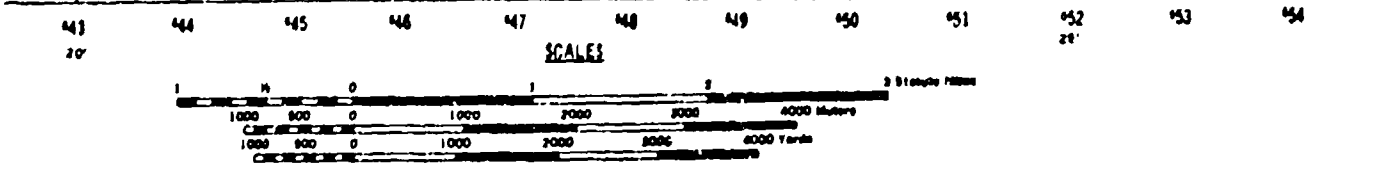


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 P

5

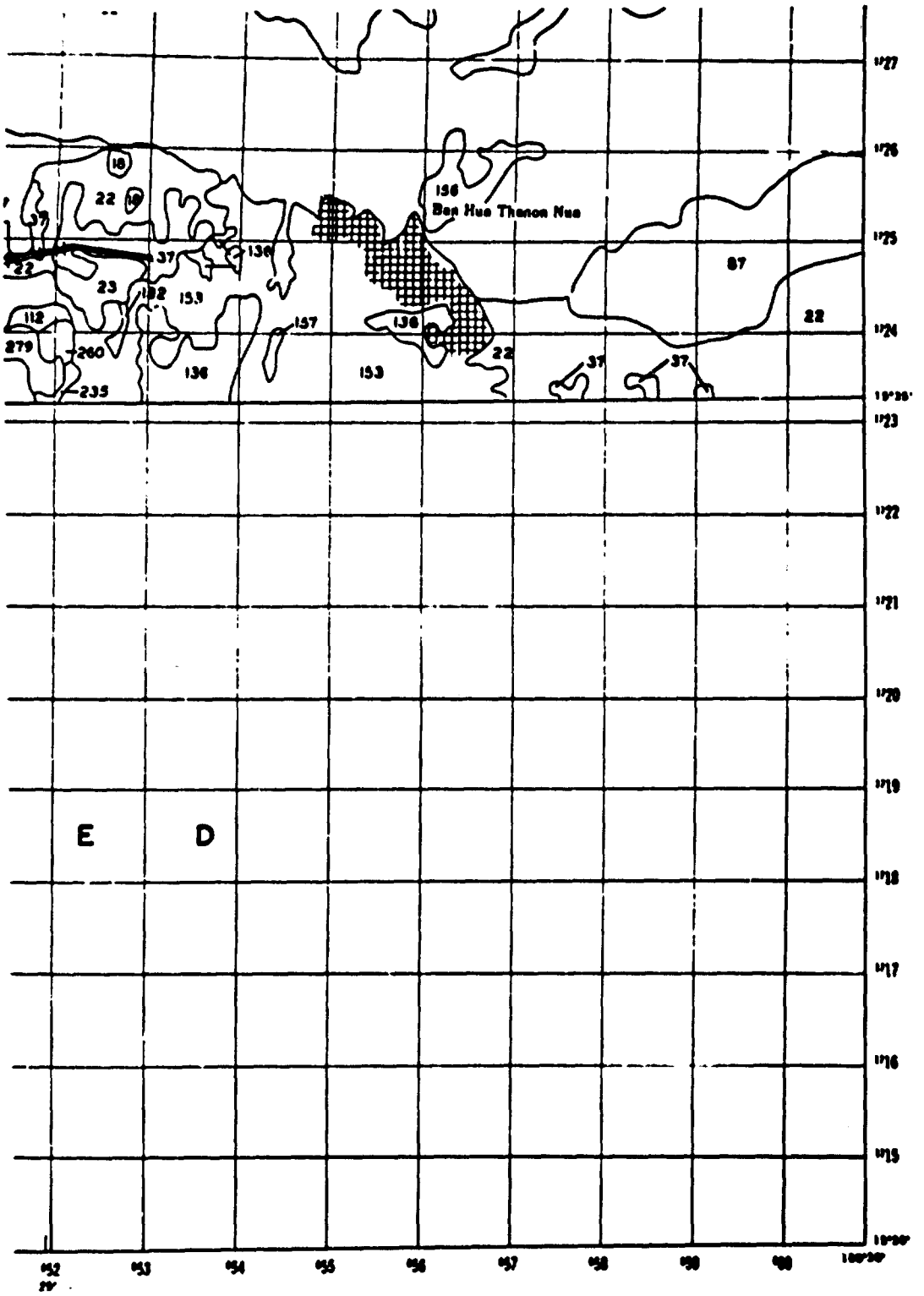


I O T M A P P E D



6

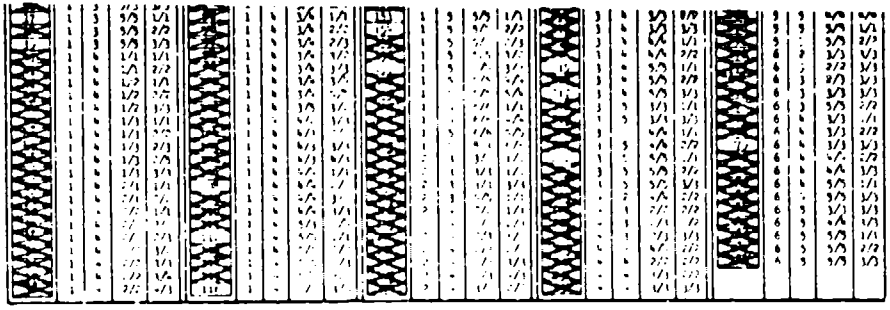
1



A QUANTITA
TERRA
SUI
NAKHO

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Note: Black areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1/1, 1/2, 1/3, 1/4) indicating mapping classes of slope SL (see diagram below), mean obstacle spacing OS, mean obstacle width OW, and mean obstacle height OH. Fractional representations indicate that dual classes were mapped. The numerator of the fraction indicates those values that will be encountered while traversing an area in an easterly direction (i.e. azimuth from > 0° to 180°) assuming that the obstacle intersects the traverse at a right angle.

† Mapping class ranges of each surface geometry unit are as follows:

Slope (SL)

Mapping Class	Range deg
1	0-2.5
2	> 2.5-5.5
3	> 5.5-9
4	> 9-14
5	> 14-23
6	> 23-35
7	> 35

Vertical Obstacle Spacing (OS)

Mapping Class	Range m	
	Urban	Rural
1	0-9	0-13
2	> 9-12	> 13-17
3	> 12-15	> 17-22
4	> 15-19	> 22-30
5	> 19	> 30

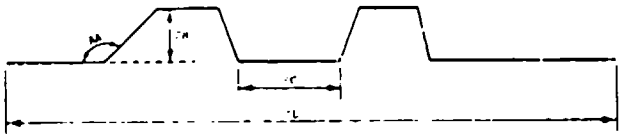
Average Width (AW)

Mapping Class	Range m
1	< 1.5
2	1.5 - < 3.5
3	3.5 - < 7.5
4	7.5 - < 15
5	15 - < 23
6	23 - < 37
7	37 - < 75
8	≥ 75

Step Height (SH)

Mapping Class	Range	
	Up	Down
1	0-0.15	0-0.15
2	> 0.15-0.30	> 0.15-0.30
3	> 0.30-0.61	> 0.30-0.76
4	> 0.61-1.22	> 0.76-1.52
5	> 1.22-2.44	> 1.52-3.05
6	> 2.44-6.10	> 3.05-7.62
7	> 6.10-15.24	> 7.62-19.05
8	> 15.24	> 19.05

Not to be confused with this map.



INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

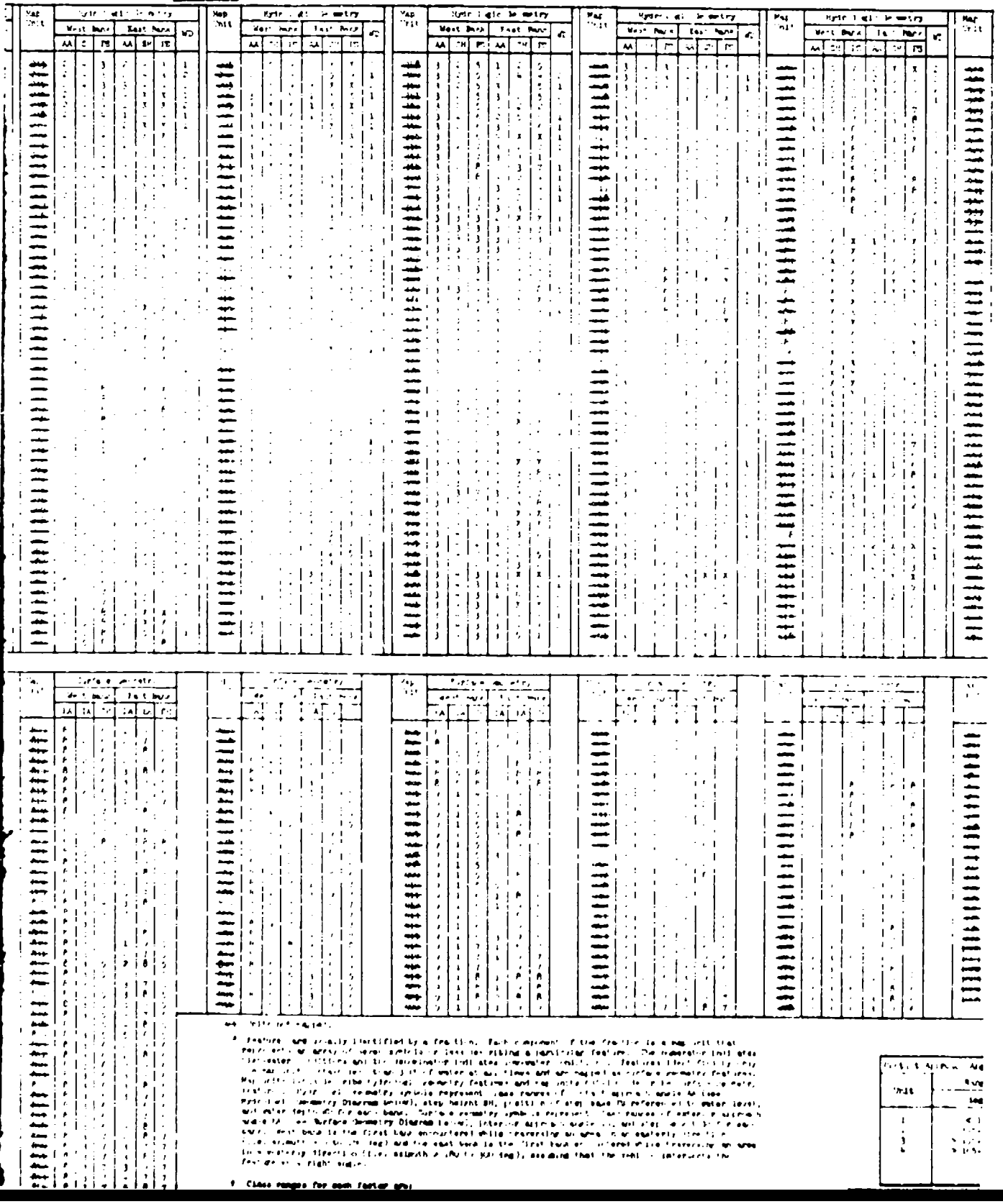
NAKHON SAWAN STUDY AREA

SHEET NS IV

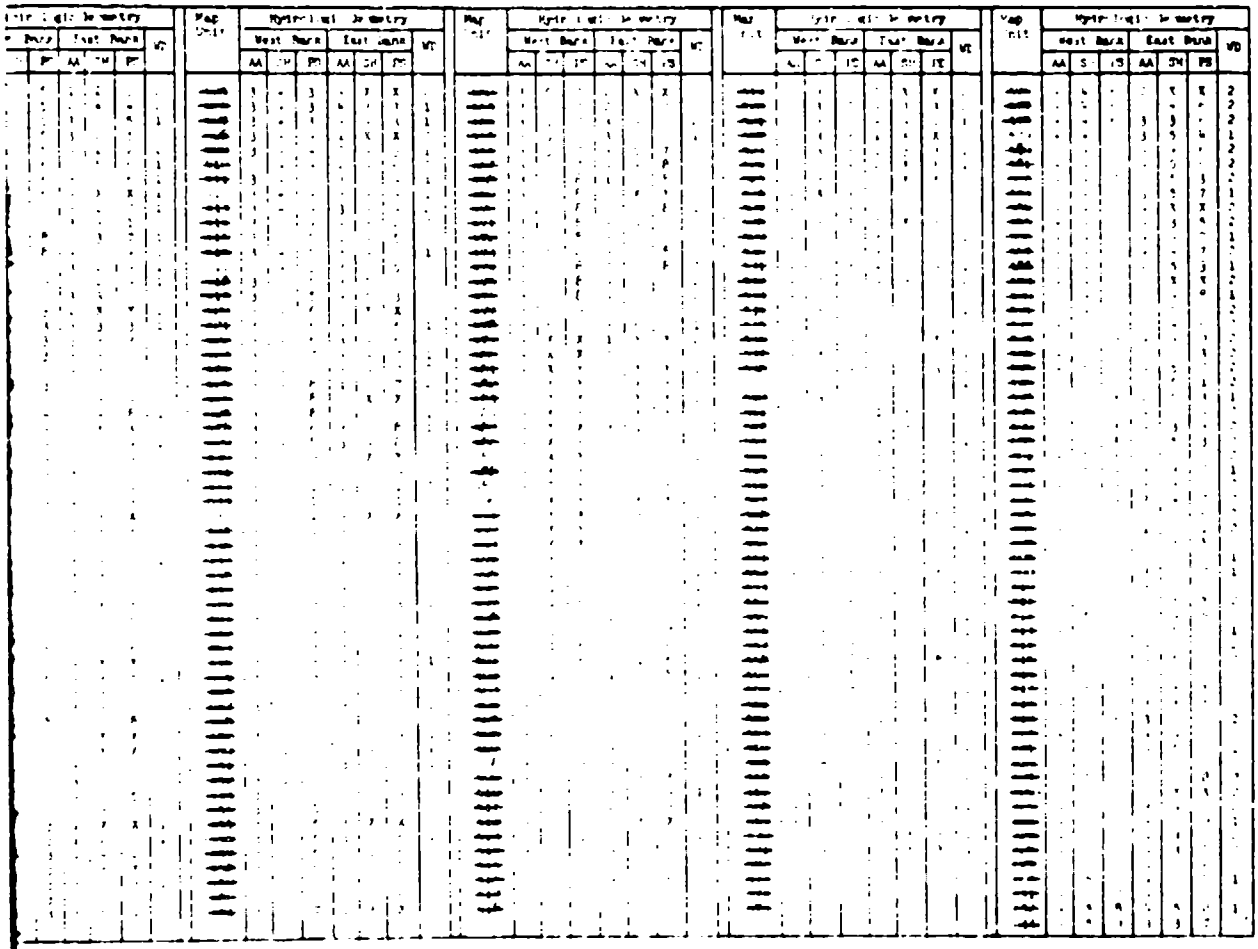
PLATE 1.4b

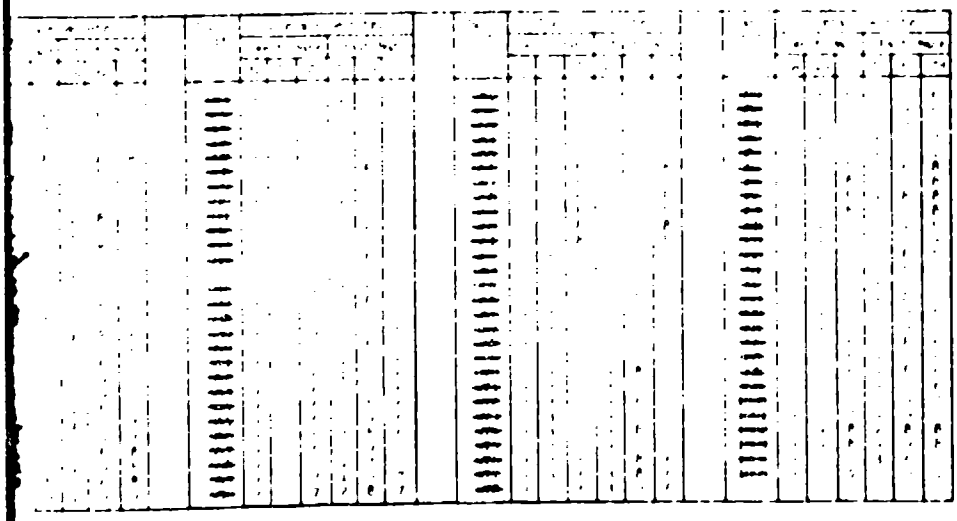
2

LEGEND



3

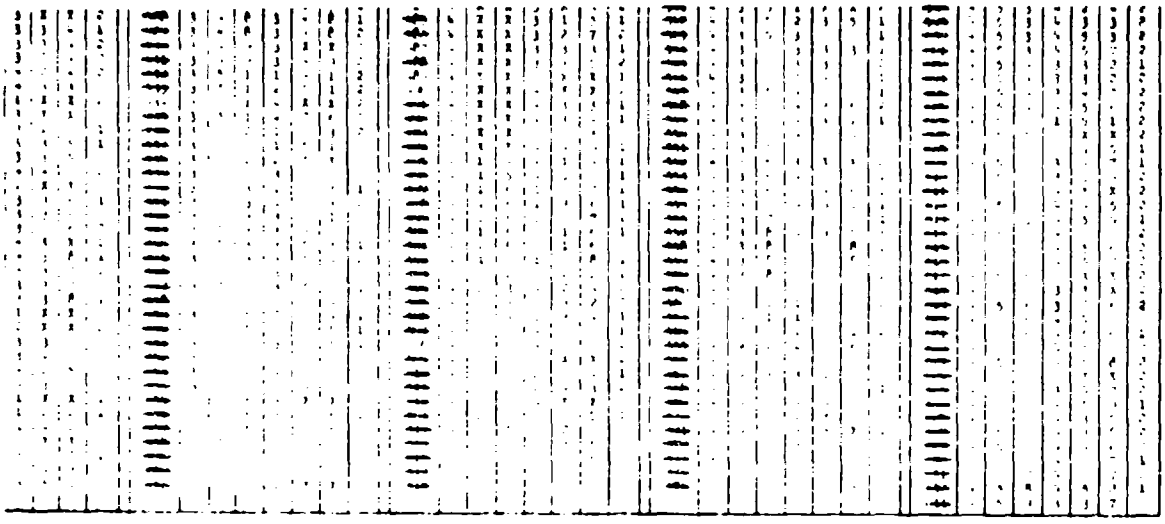


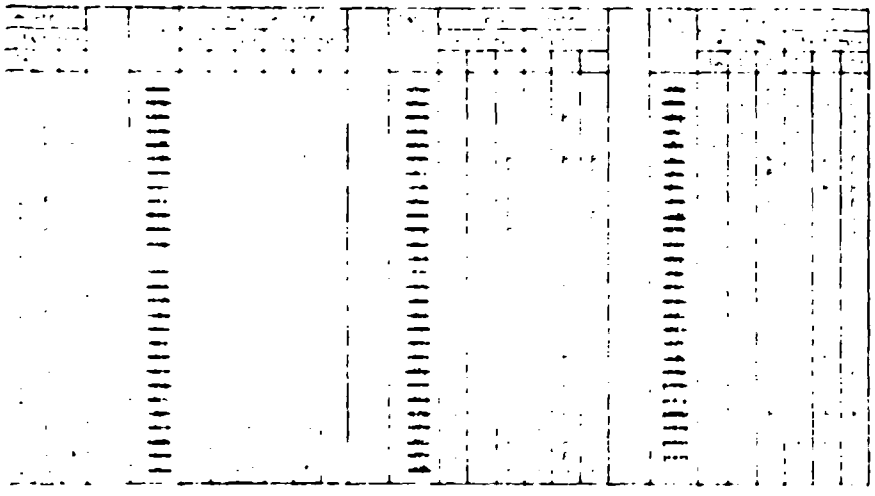


Fracture Azimuth Angle (AA)	
Unit	Range
	NNE
1	< 5 NNE 5 NNE to 5 NNW > 5 NNW
2	< 5 NNE 5 NNE to 5 NNW > 5 NNW
3	< 5 NNE 5 NNE to 5 NNW > 5 NNW
4	< 5 NNE 5 NNE to 5 NNW > 5 NNW

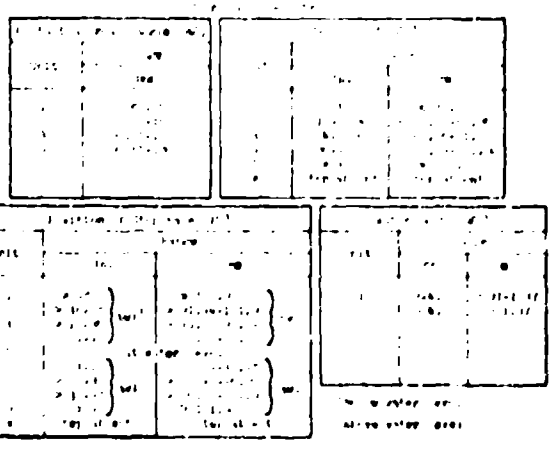
Unit	Range	
	10	20
1	10	< 10 to 5 5 to 10 > 10
2	10 to 5 5 to 10 > 10	< 10 to 5 5 to 10 > 10
3	10 to 5 5 to 10 > 10	< 10 to 5 5 to 10 > 10
4	10 to 5 5 to 10 > 10	< 10 to 5 5 to 10 > 10
5	10 to 5 5 to 10 step shoots	< 10 to 5 5 to 10 step shoots

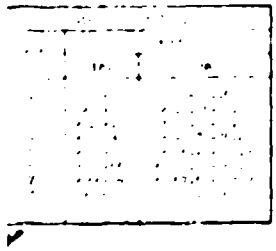
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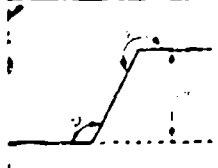


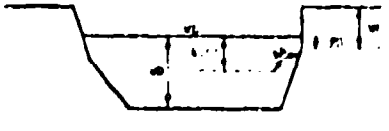


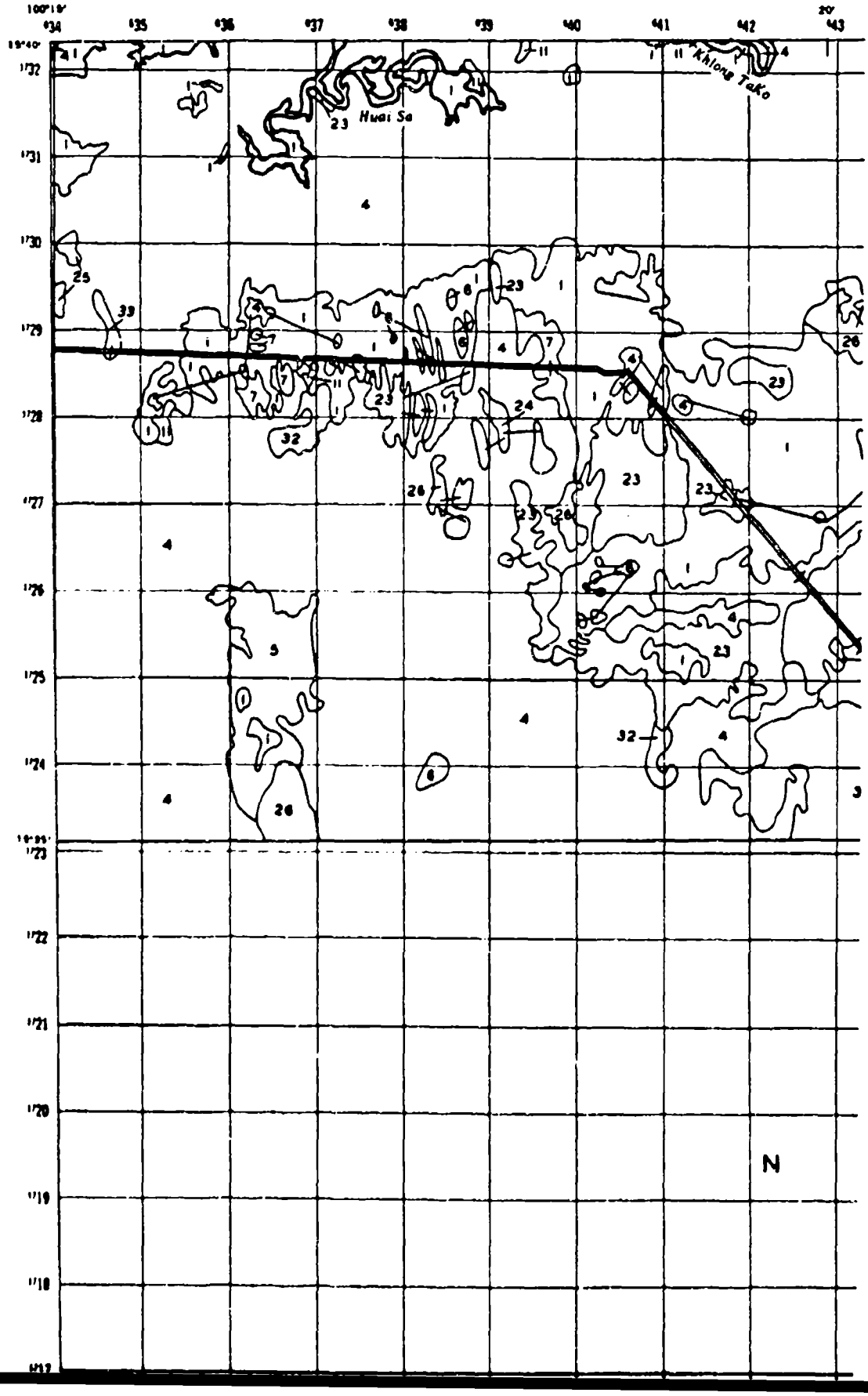






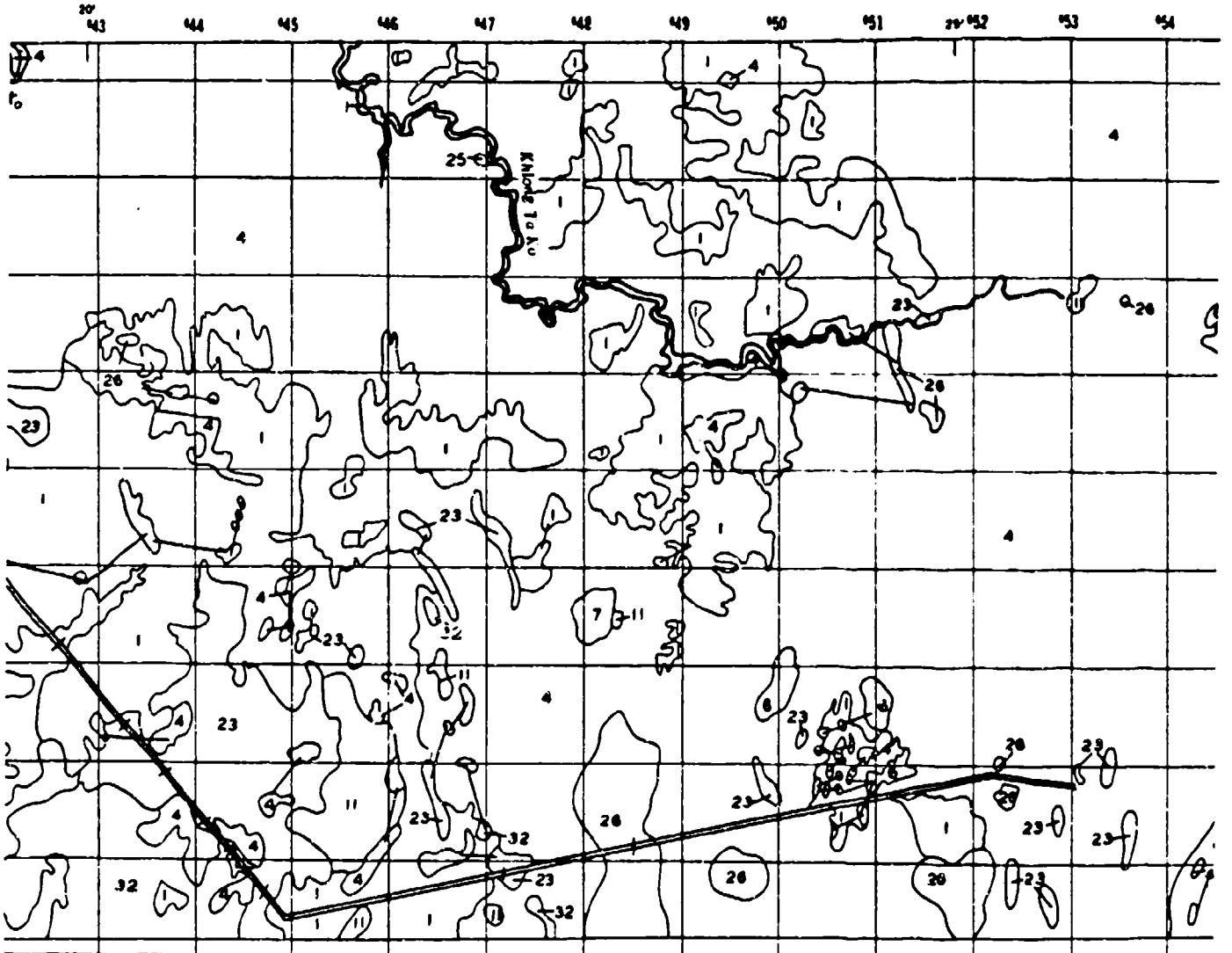





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Khlong Tako
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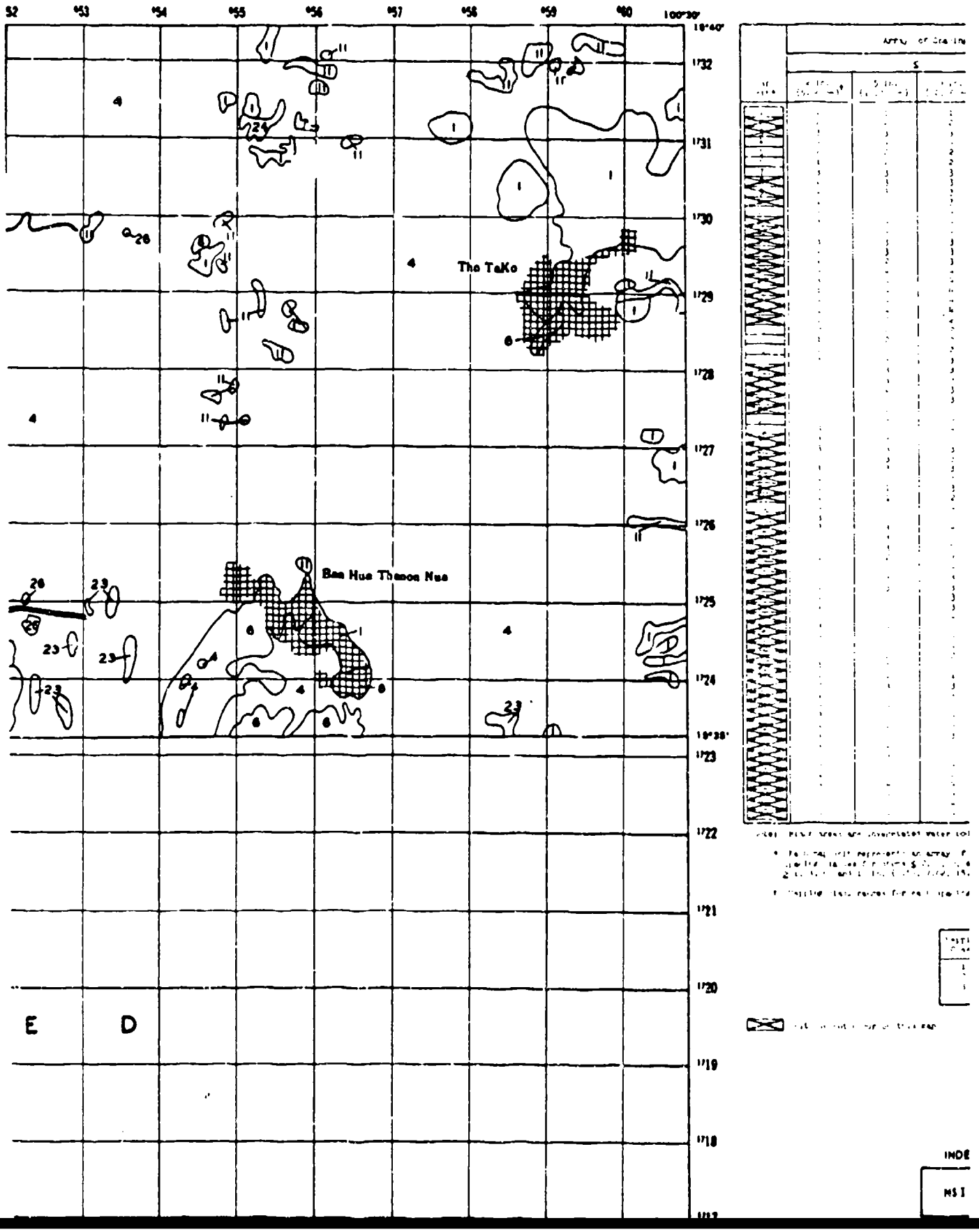
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NAKHON SAWAN



1 3

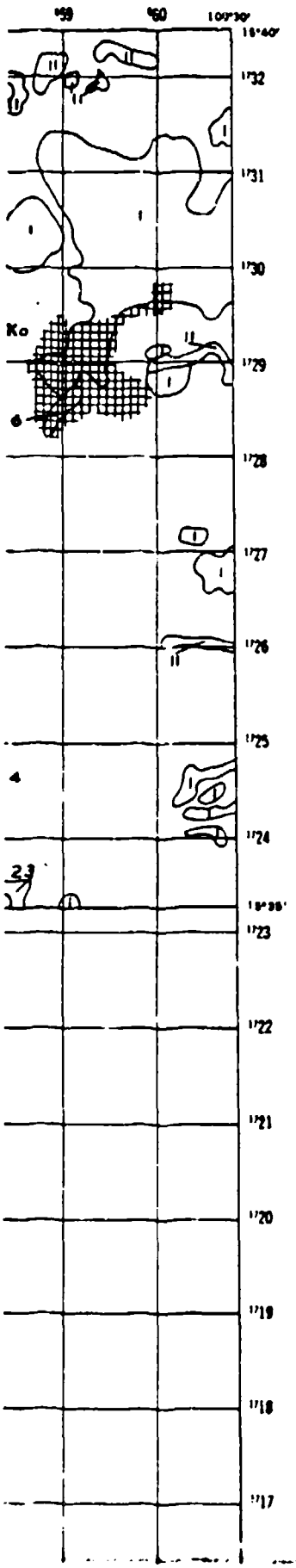
SHEET NS IV



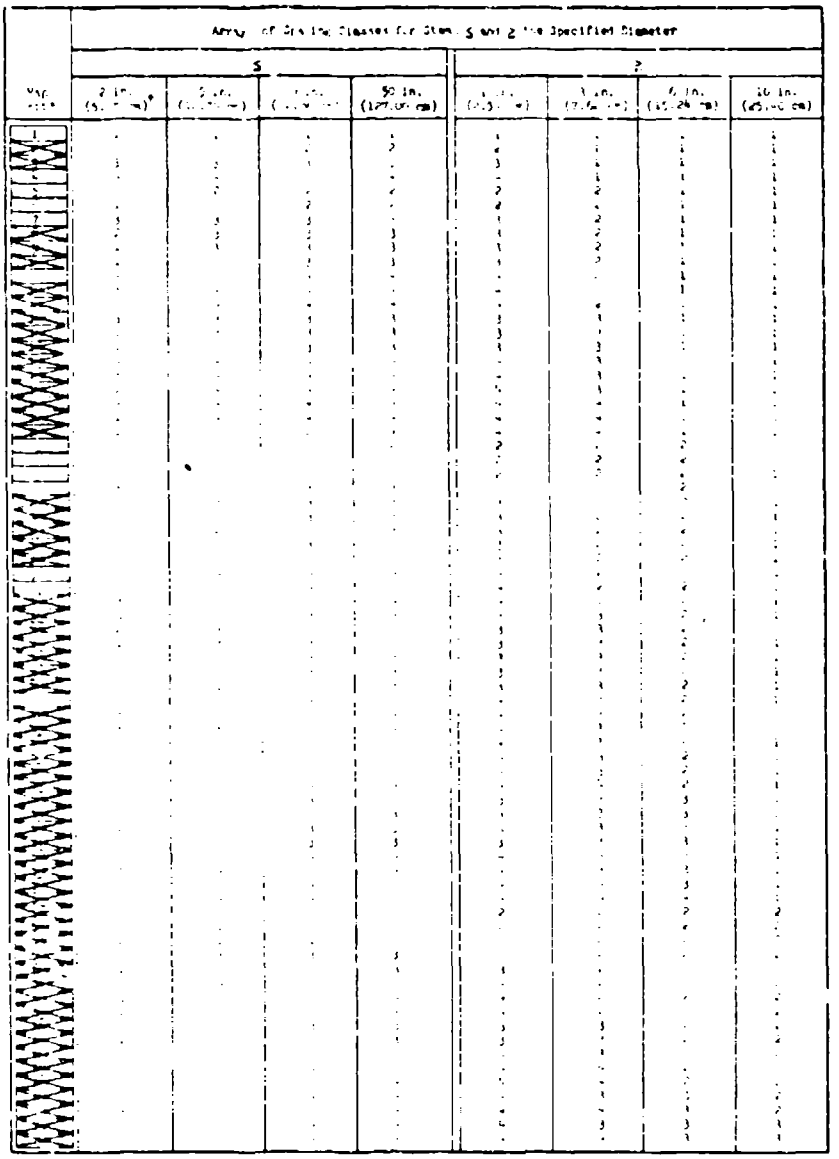
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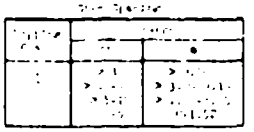
NS I

SHEET NS IV



LEGEND

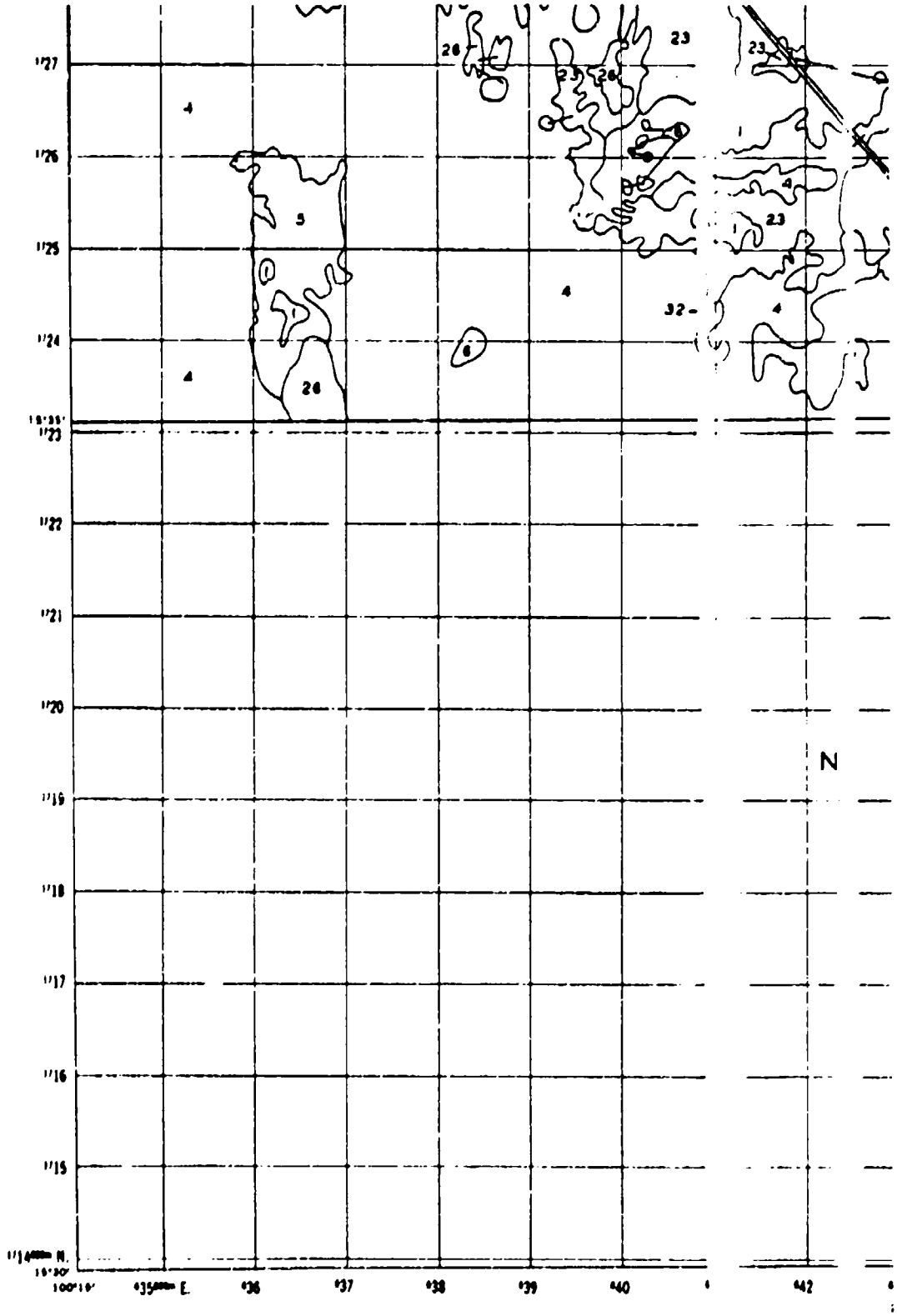






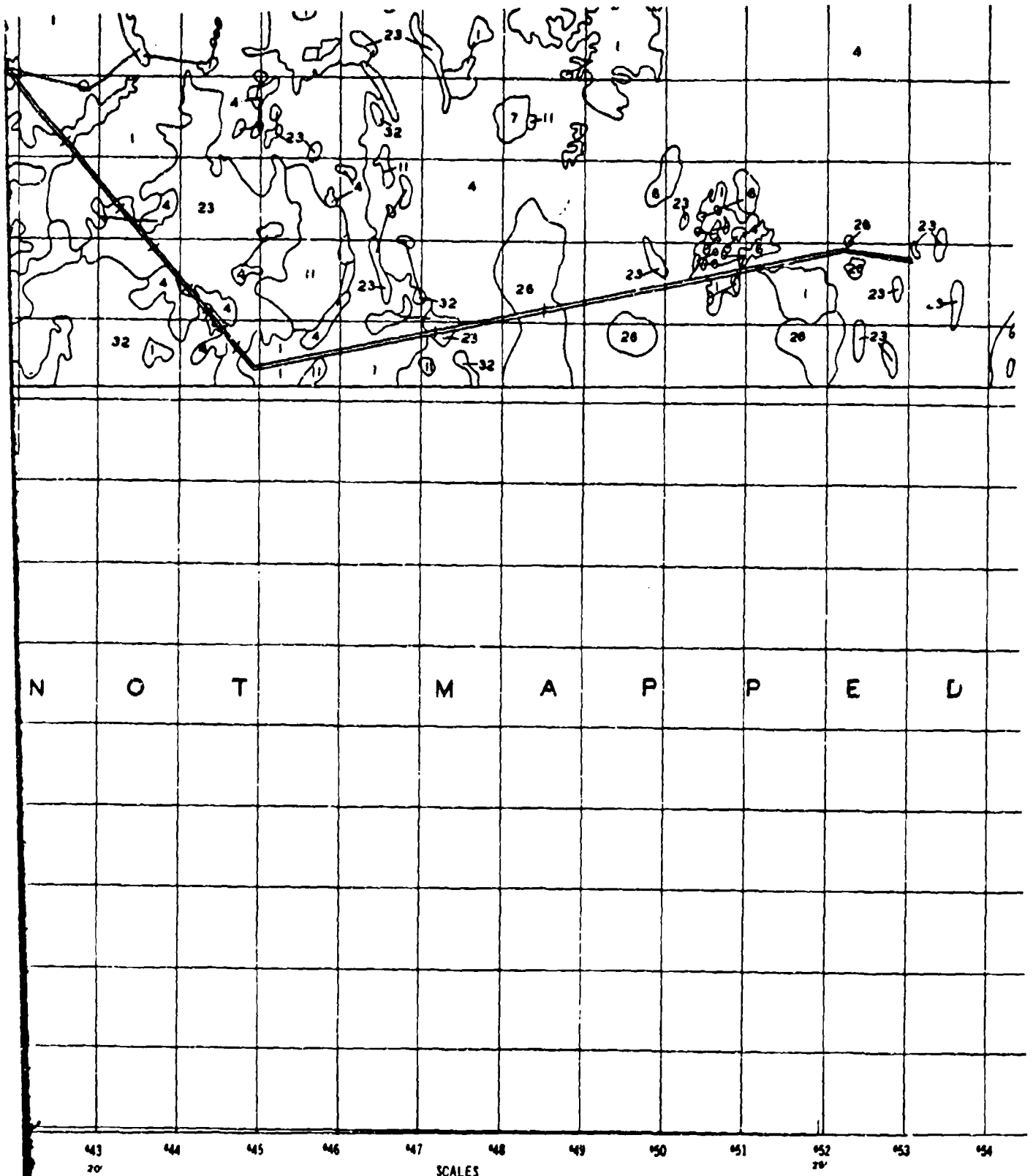
INDEX TO ADJOINING SHEETS

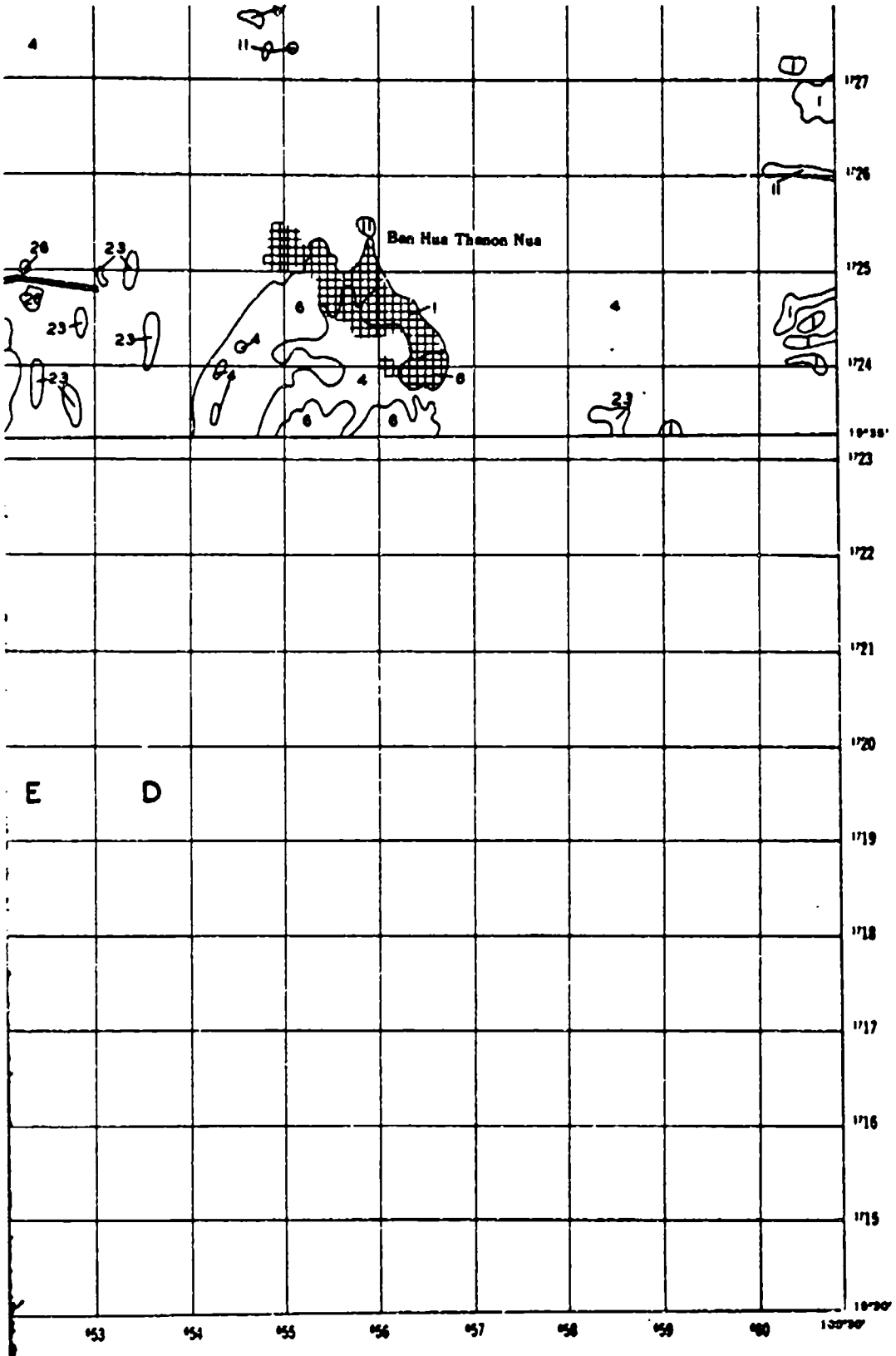
NS I	NS II	NS III
	NS V	NS IX



ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5"


N O T M A P P E D
443
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454
SCALES

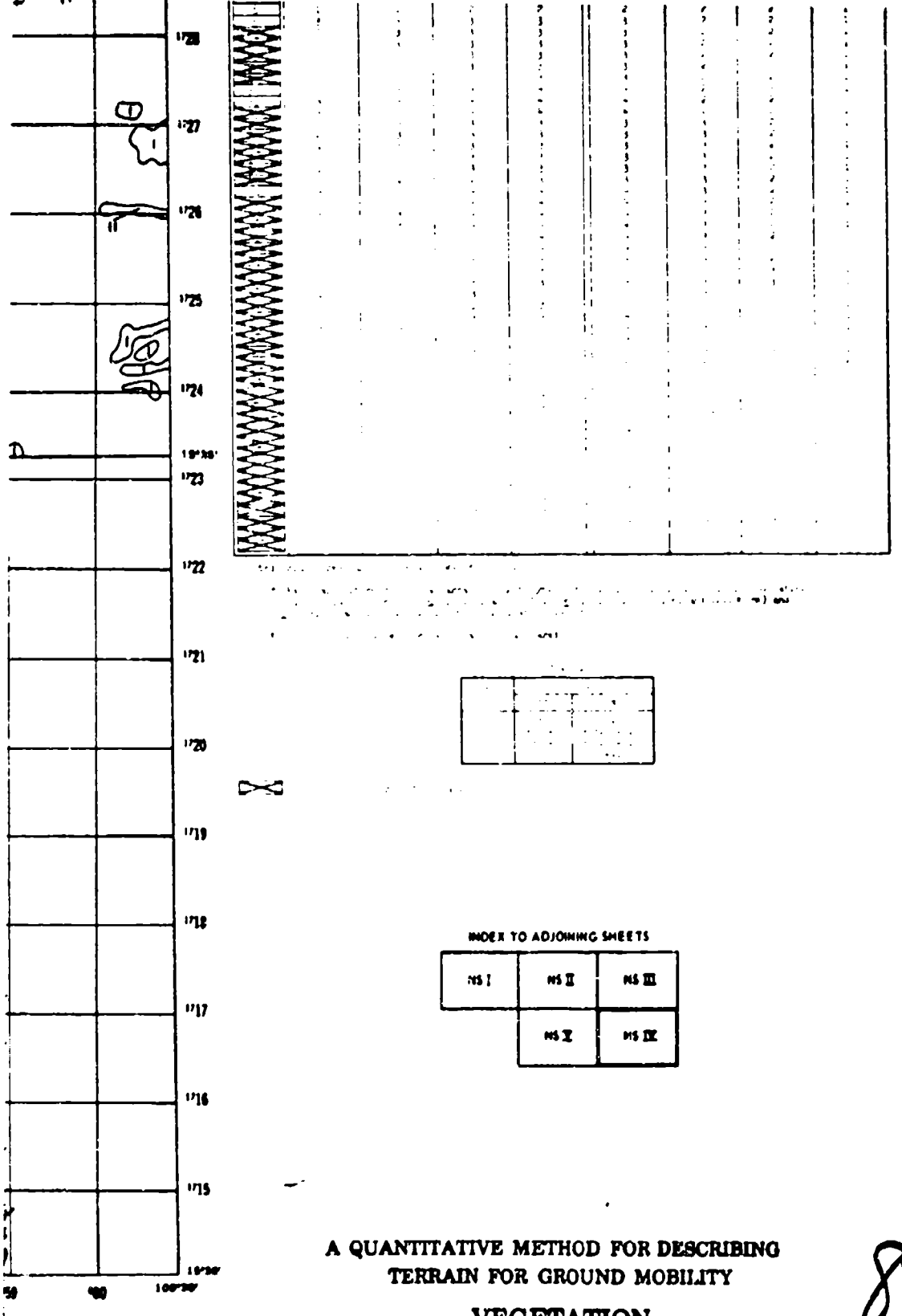


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INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS IV	NS IV

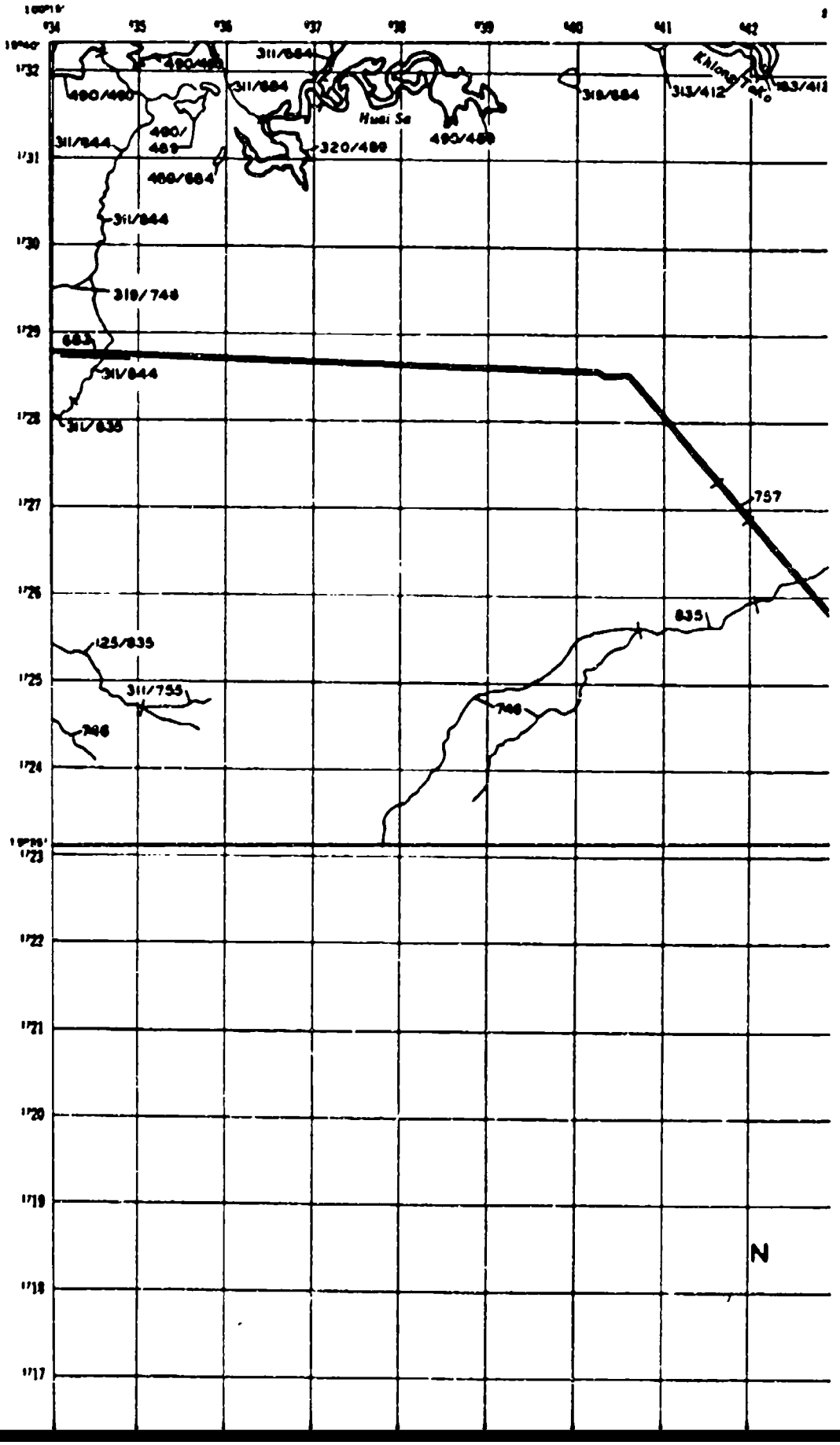
A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

VEGETATION

NAKHON SAWAN STUDY AREA

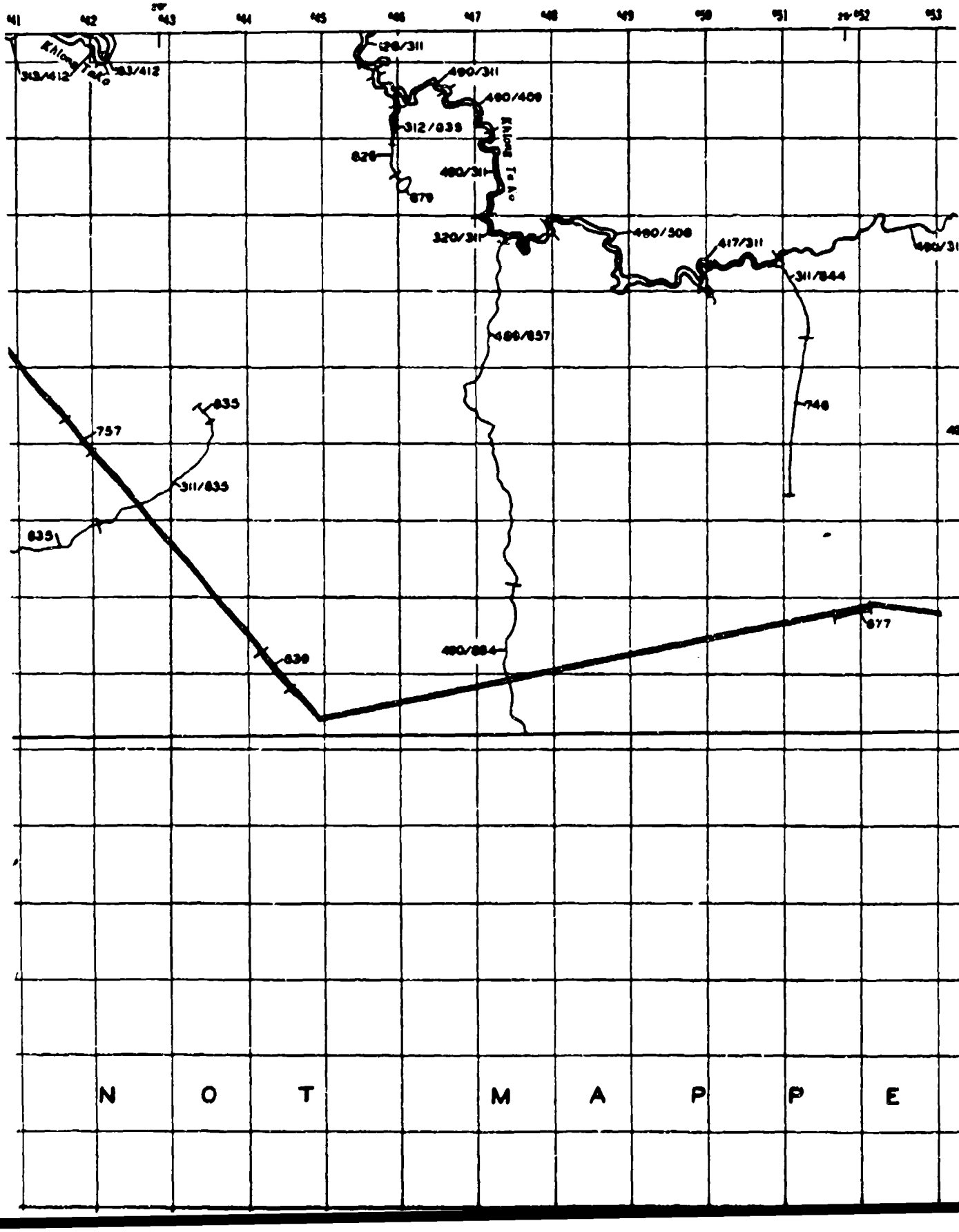
SHEET NS IV

PLATE 1.4c


734
735
736
737
738
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740
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742
1732
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1730
1729
1728
1727
1726
1725
1724
1723
1722
1721
1720
1719
1718
1717
311/844
490/489
311/884
320/489
490/489
318/884
313/412
Khlong
311/844
490/
489
488/884
311/844
319/748
683
311/844
311/835
757
835
125/835
311/755
748
748
N

2

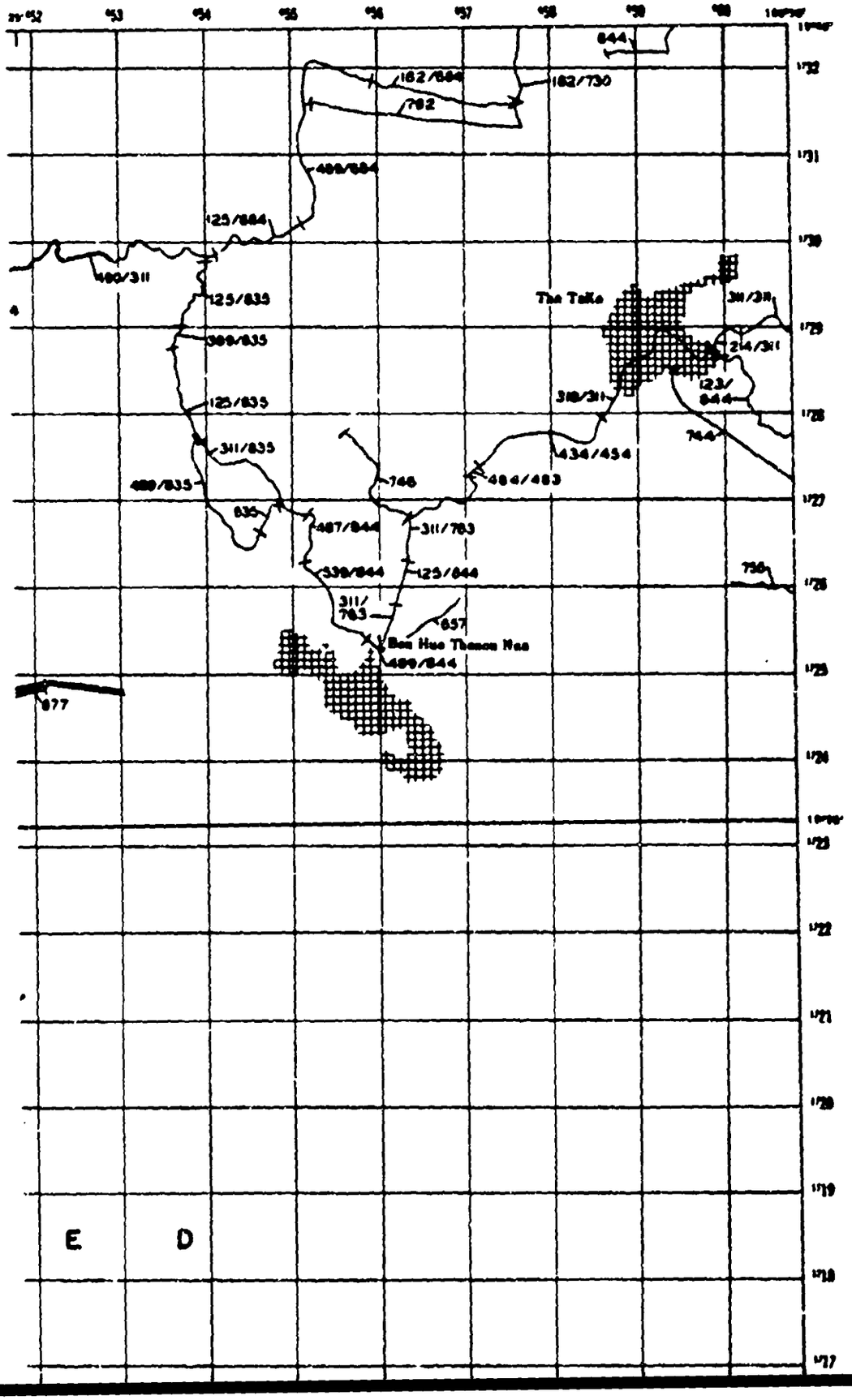
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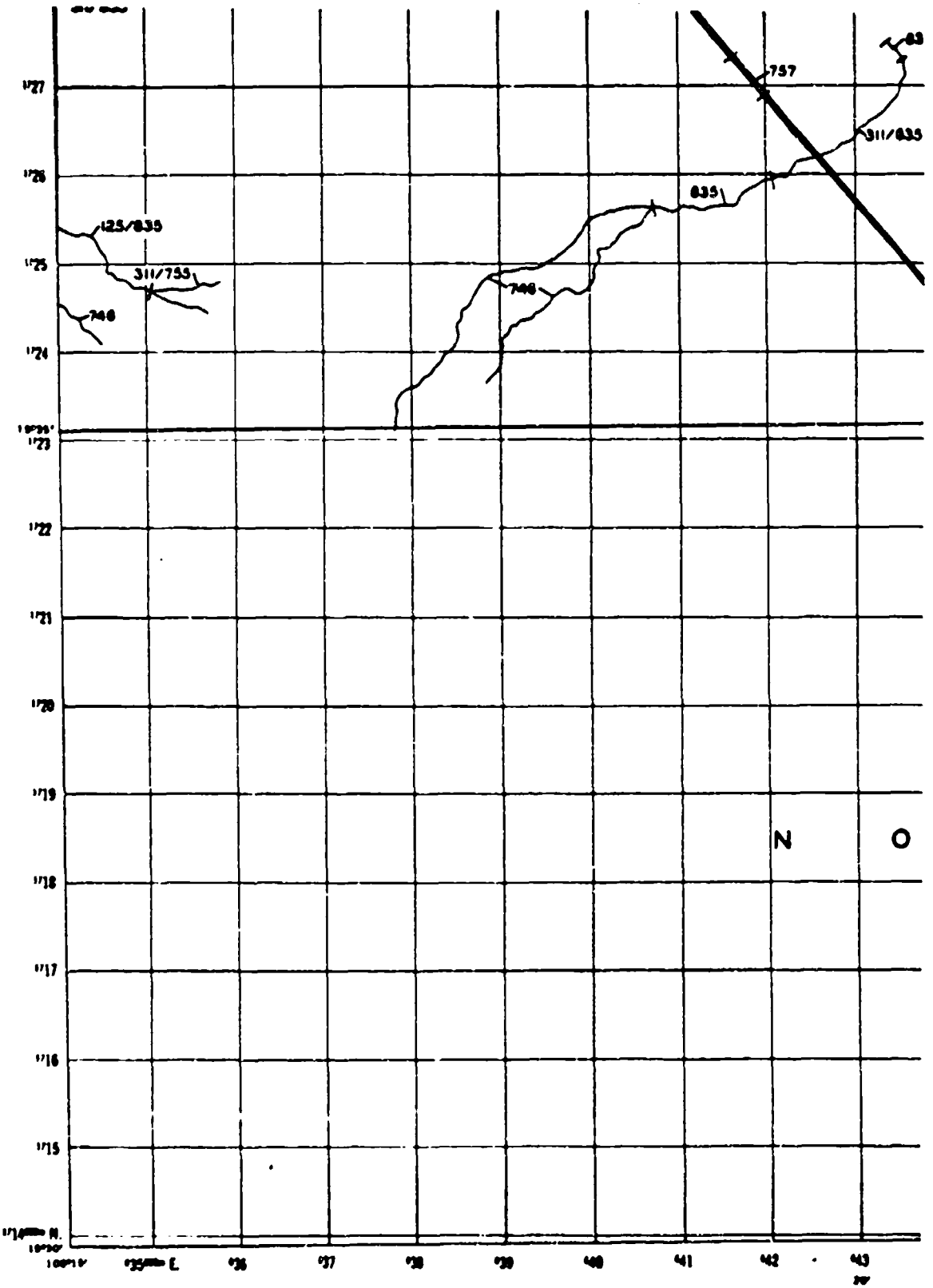


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3

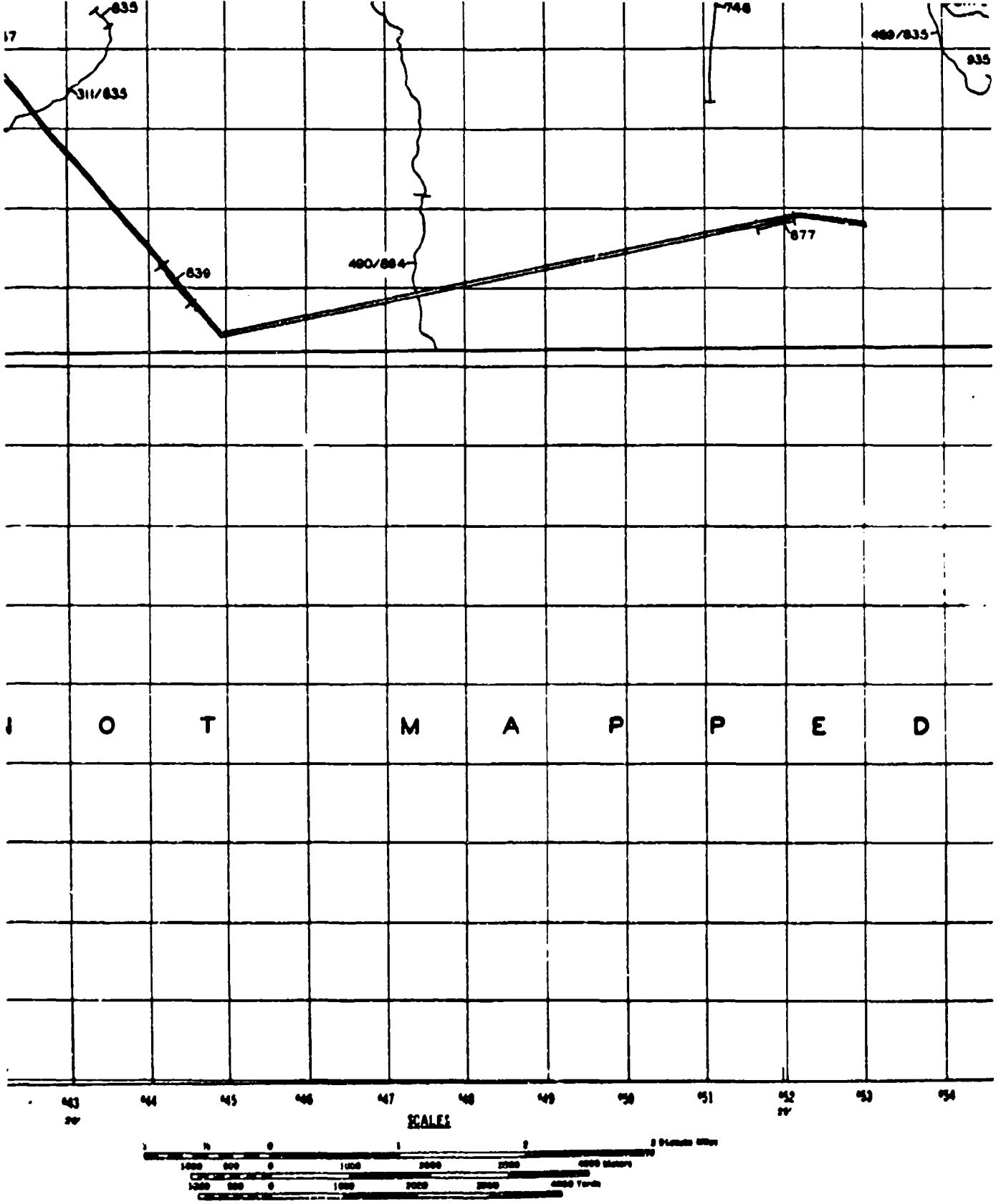
SHEET NS IV


844
162/684
162/730
782
489/684
125/684
400/311
125/835
The Talla
311/311
389/835
214/311
123/
844
125/835
318/311
744
311/835
434/454
489/835
746
484/483
835
487/844
311/783
339/844
125/844
756
311/
783
857
Ben Hue Thanon Nau
489/844
877
E
D

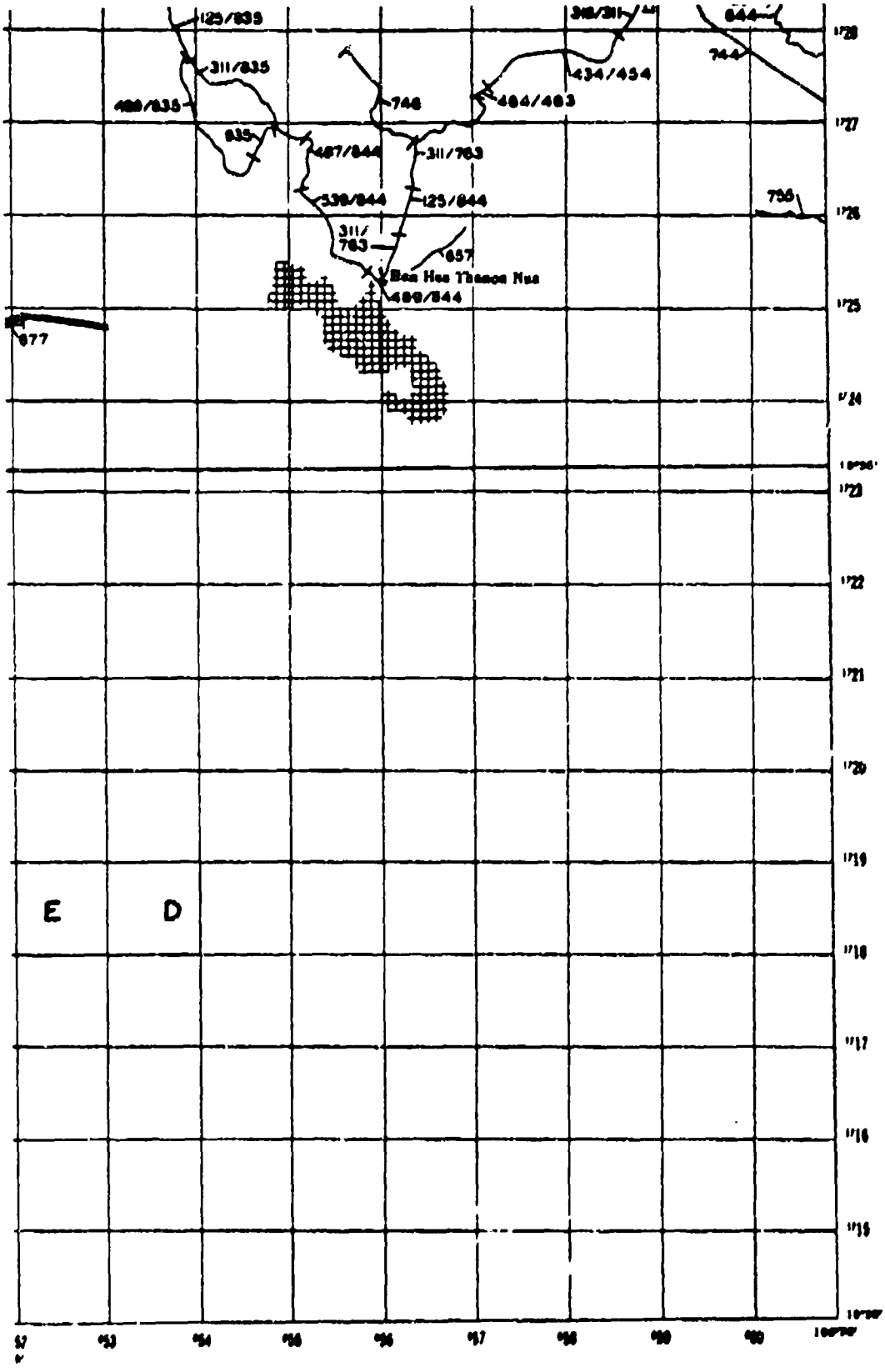


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

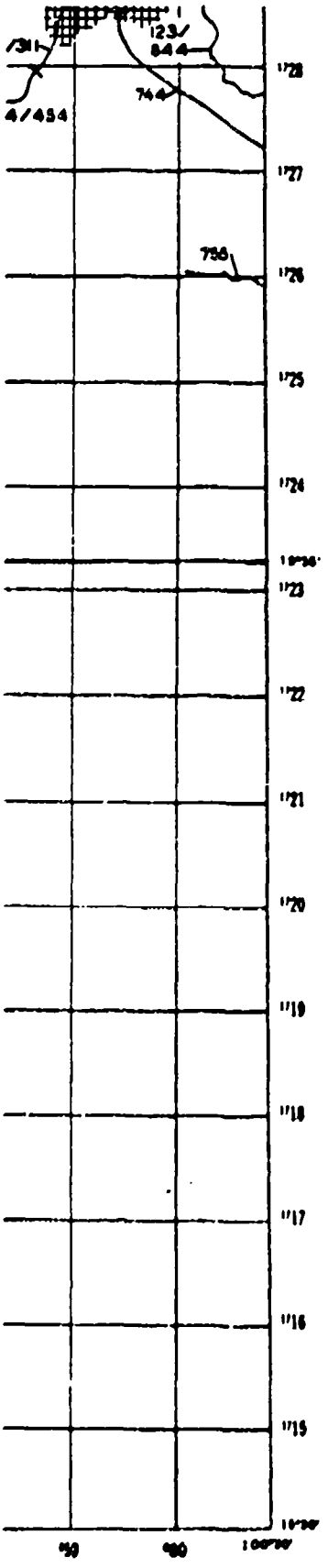
4


835
311/835
639
490/884
877
748
490/835
835
O T M A P P E D
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NS I	NS II	NS III
	NS IV	NS IX

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

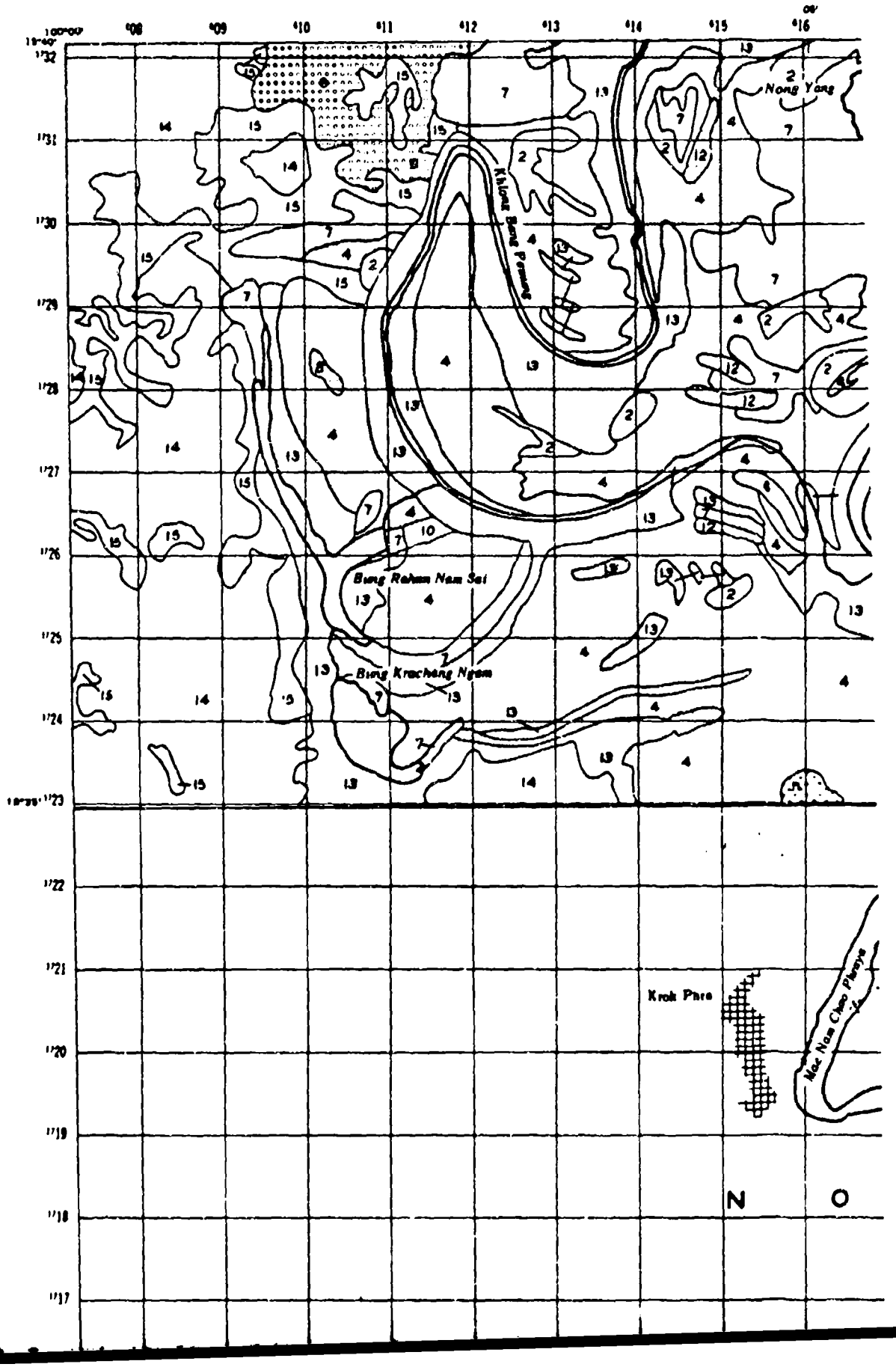
HYDROLOGIC GEOMETRY

NAKHON SAWAN STUDY AREA

SHEET NS IV

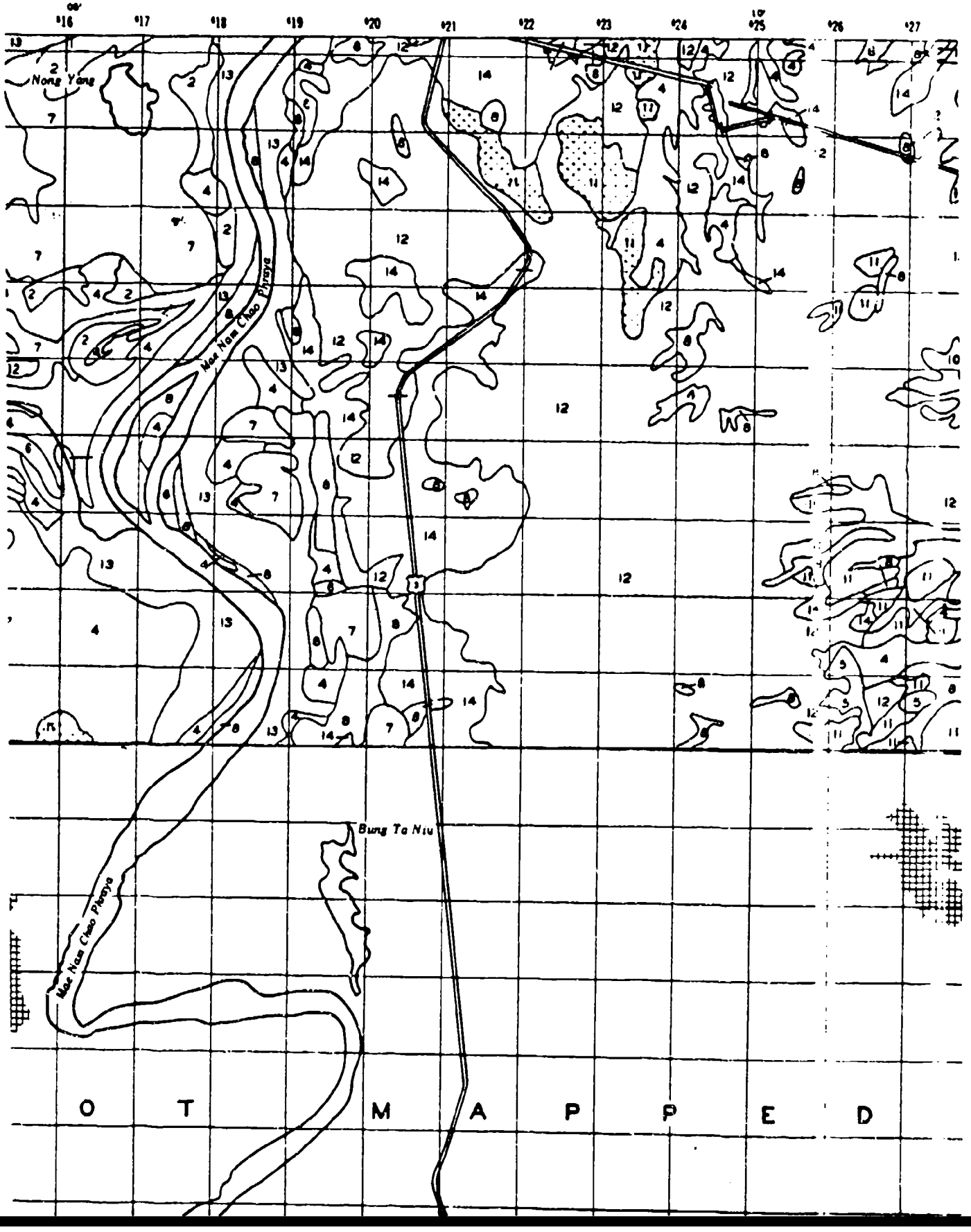
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PLATE 1.4d

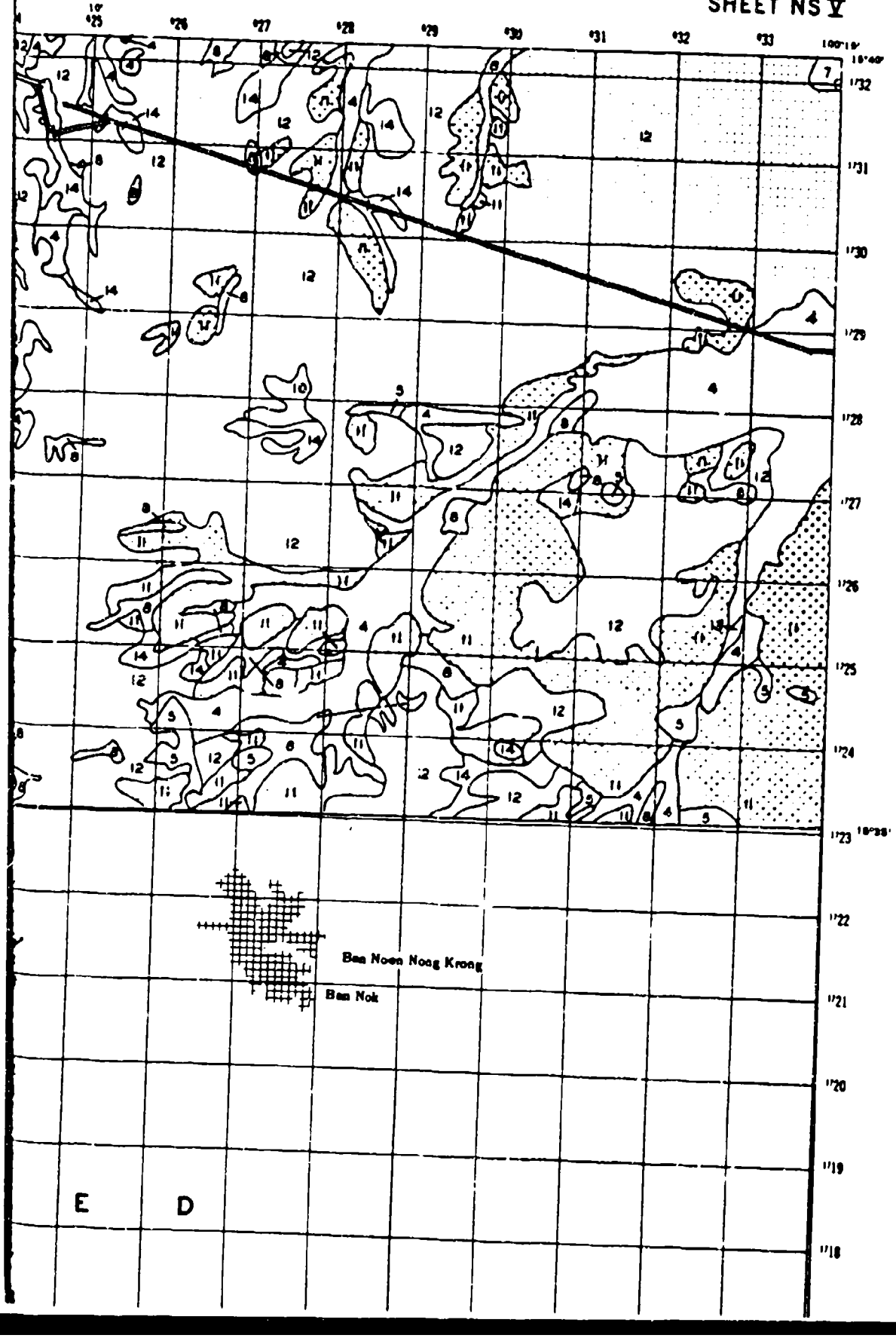

Nong Yang
Khlong Bang Pramong
Bang Rakam Nam Sai
Bang Krachang Ngam
Krok Phra
Mae Nam Chao Phraya
N
O

2

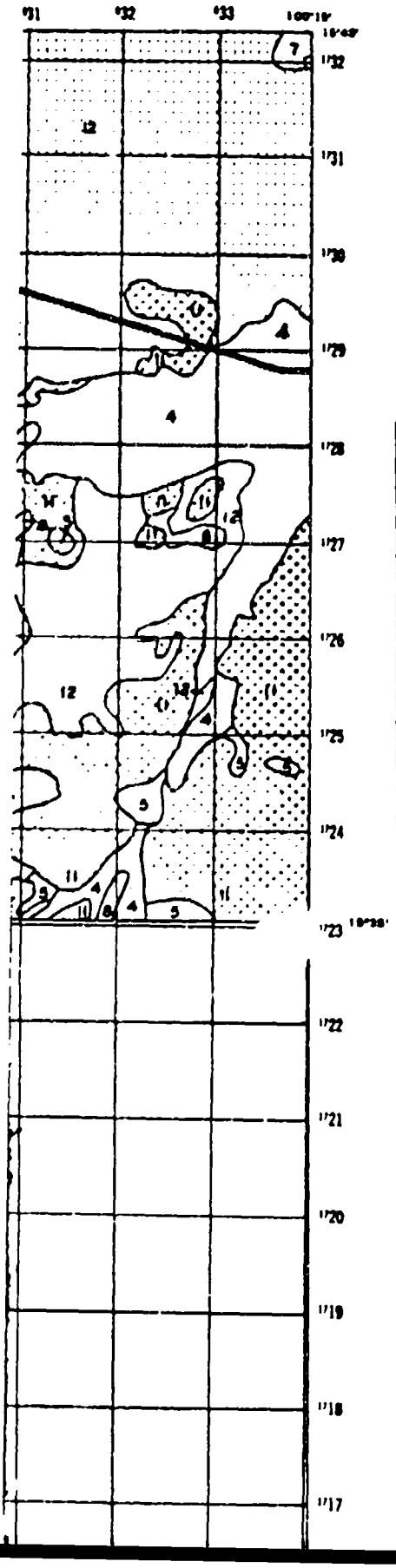
NAKHON SAWAN



SHEET NS V



SHEET NS V



LEGEND

Unit	Soil Mass Strength: Minimum Resistance	Soil Mass Strength: Maximum Resistance	Soil Surface Strength: Minimum Resistance c_w psi	Soil Surface Strength: Minimum Resistance c_w kg/cm²	Soil Surface Strength: Minimum Resistance ϕ_w deg	Soil Surface Strength: Maximum Resistance c_w psi	Soil Surface Strength: Maximum Resistance c_w kg/cm²	Soil Surface Strength: Maximum Resistance ϕ_w deg	Conditions where minimum occurs: c_w psi	Conditions where minimum occurs: c_w kg/cm²	Conditions where minimum occurs: ϕ_w deg
X	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
1	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
X	25-60*	60-100*	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
X	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
15	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Ref. Black areas are water bodies.

c_w Shear strength at zero normal load.

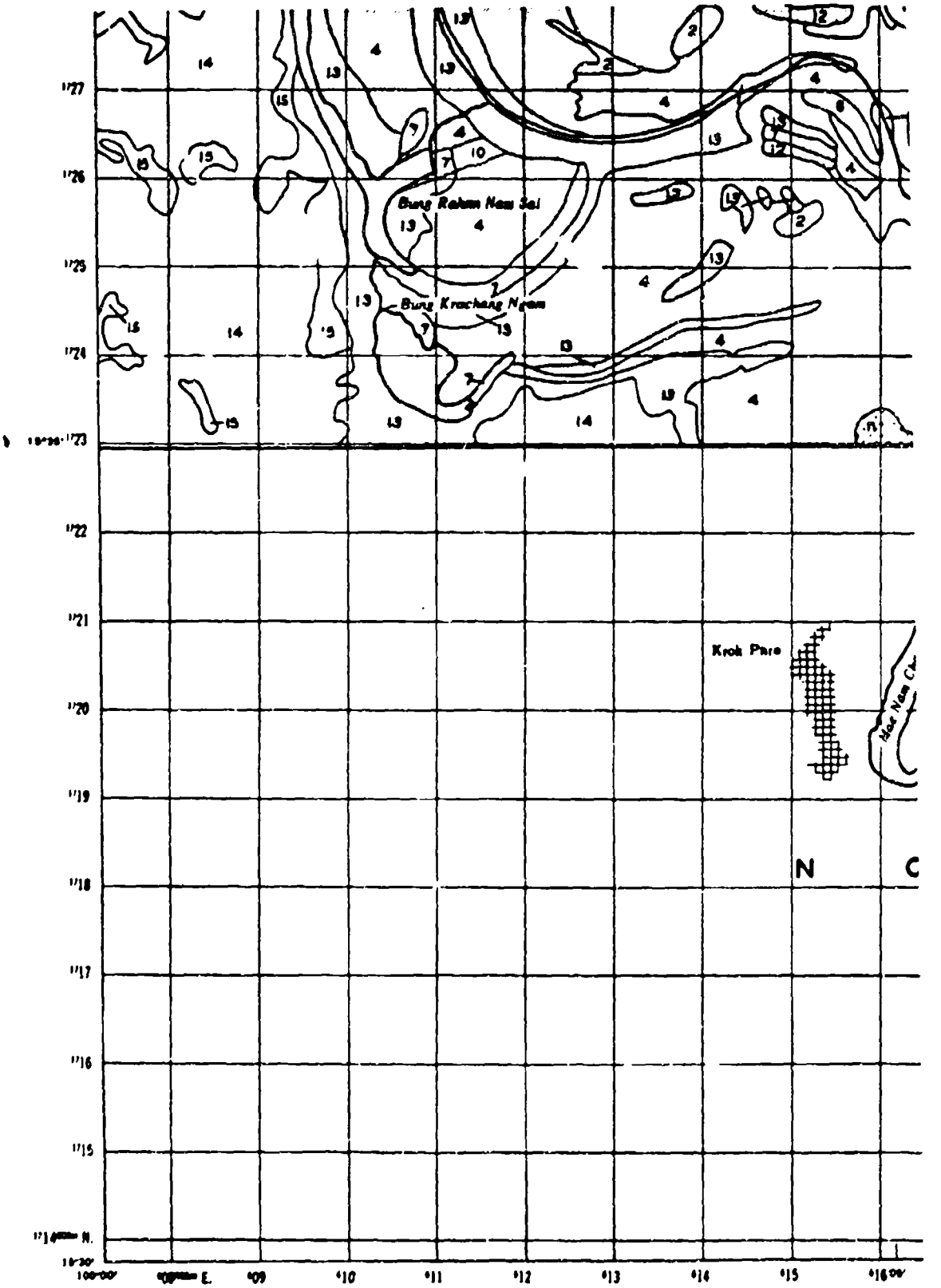
ϕ_w Angle of internal friction.

* Minimum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 1, 3 and 5; more than 100 for Unit 11.

X Units do not occur on this map.

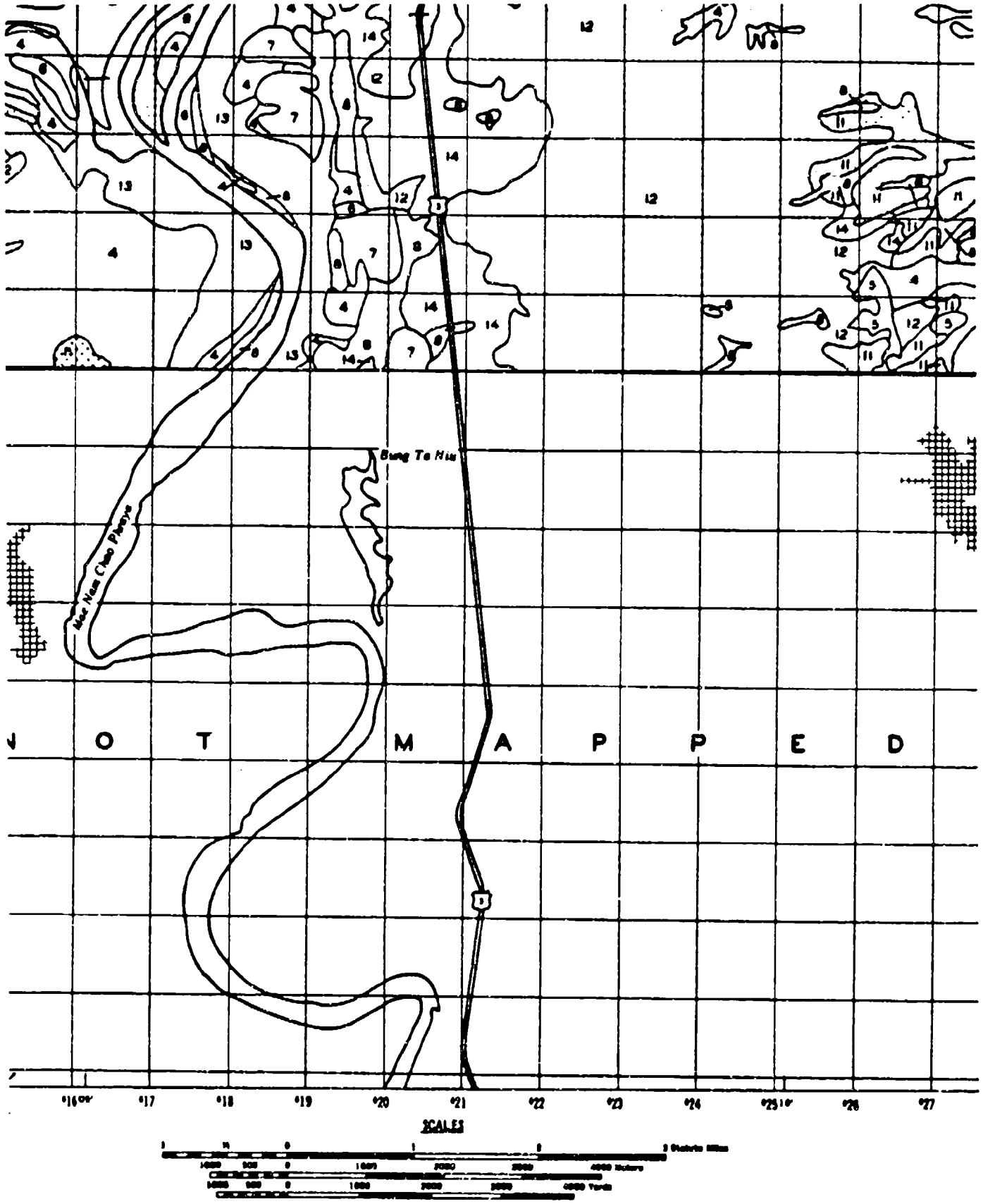
INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS X	NS IX

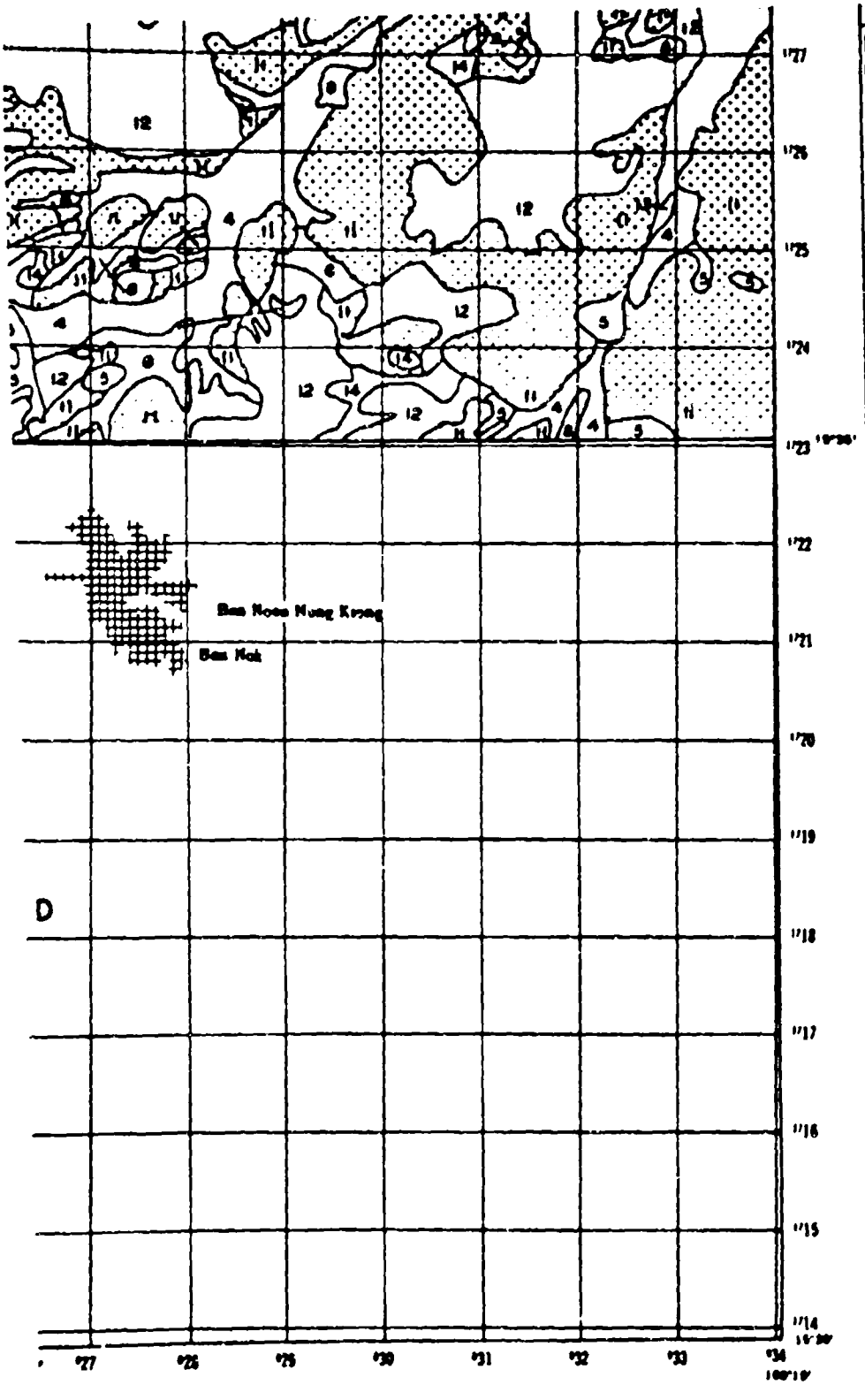


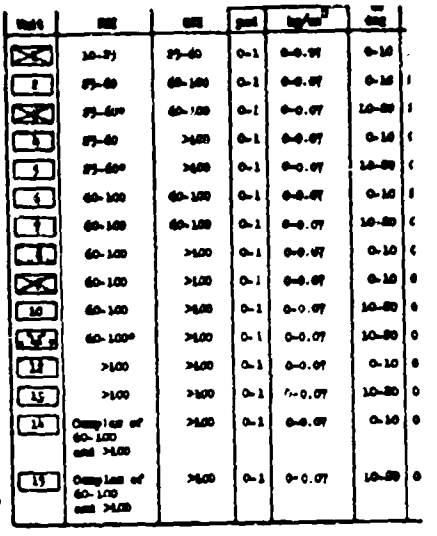
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5



6





Notes: Blank areas are water bodies.

Heavy shrinkage on more normal land.

Angle of internal friction.

Maximum moisture was less than 30 percent probability strengths commonly observed are 60-100 for table 3.

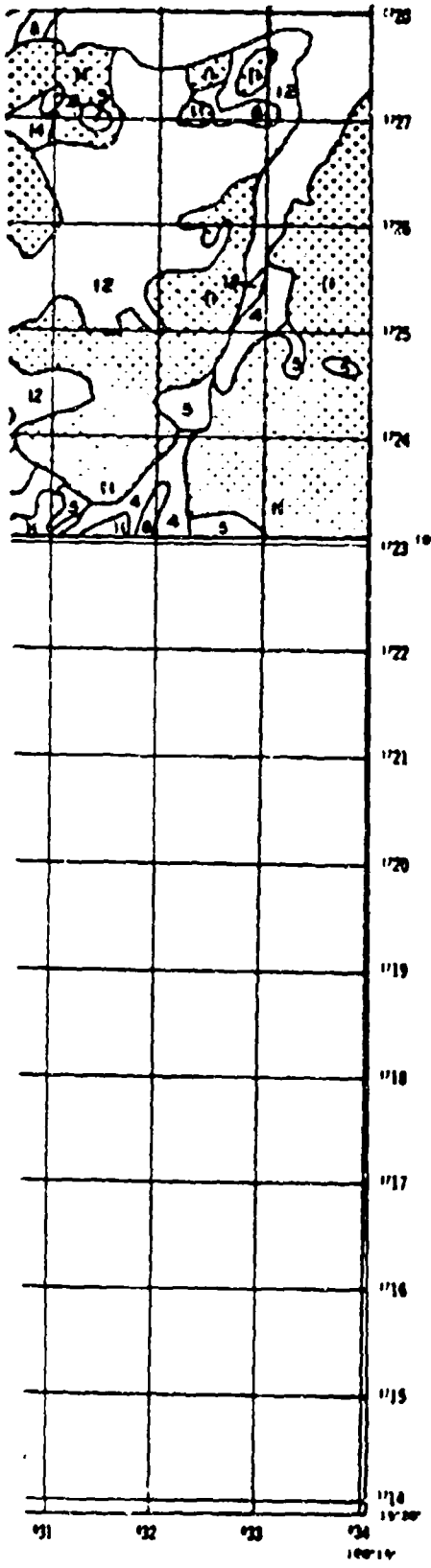
Data do not cover on this map.

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	NS X

A QUANTITATIVE METHOD
TERRAIN FOR GROUN
SURFACE COMI
NAKHON SAWAN S
SHEET NS

7



Unit	Surface Composition	Surface Texture	Maximum Relief over 1 km			Maximum Relief over 10 km			Gentle Slope Condition (ϕ_{sp} degrees)		
			h_{sp}		ϕ_{sp}	h_{sp}		ϕ_{sp}	h_{sp}		ϕ_{sp}
	PSE	SSC	psi	kg/cm²	deg	psi	kg/cm²	deg	psi	kg/cm²	deg
	10-25	25-60	0-1	0-0.07	0-10	1-5	0.07-0.35	10-20	Maximum and others		exceed 5 cone
2	25-60	60-100	0-1	0-0.07	0-10	5-5	0.35-0.70	20-40	Maximum and others		exceed 5 cone
	25-60*	60-100	0-1	0-0.07	10-20	5-5	0.35-0.70	20-40	Maximum and others		exceed 5 cone
6	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	5-5	0.35-0.70	20-40
7	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	5-5	0.35-0.70	20-40
8	60-100	60-100	0-1	0-0.07	0-10	5-5	0.35-0.70	20-40	Maximum and others		exceed 5 cone
9	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum and others		exceed 5 cone
10	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	5-5	0.35-0.70	10-20
11	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	5-5	0.35-0.70	20-40
12	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum and others		exceed 5 cone
13	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-5	0.07-0.35	10-20
14	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-5	0.07-0.35	10-20
15	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-5	0.07-0.35	20-40
16	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	5-5	0.35-0.70	10-20
17	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum and others		exceed 5 cone

* or more Roads across are rather hazards.

h_{sp} Shear strength at zero normal load.

ϕ_{sp} Angle of internal friction.

* Maximum relief over 1 km less than 30 percent probability of occurrence during the wet season. Lowest Armagnac maximum observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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	NS IV	NS VI

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

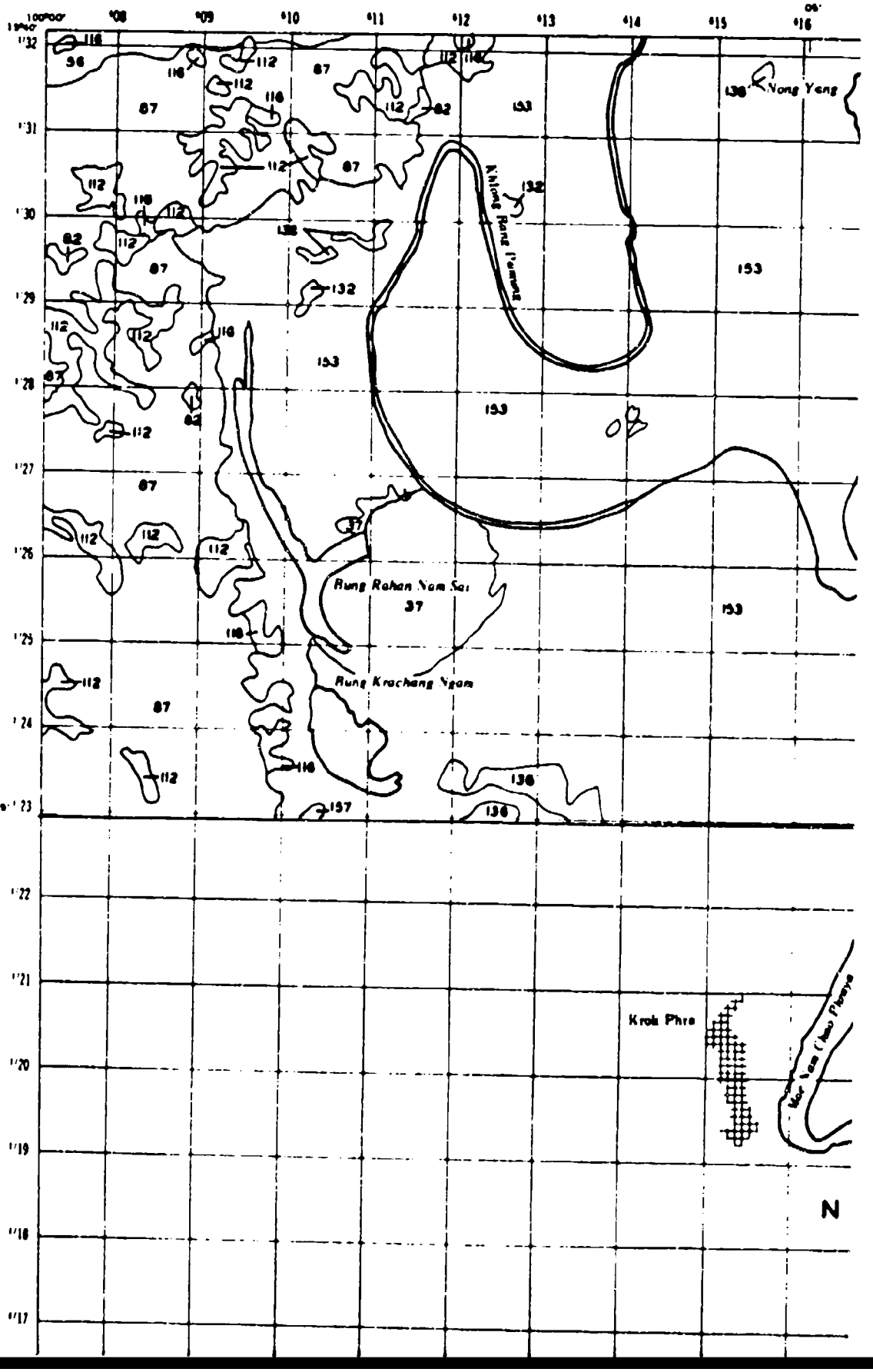
SURFACE COMPOSITION

NAKHON SAWAN STUDY AREA

SHEET NS V

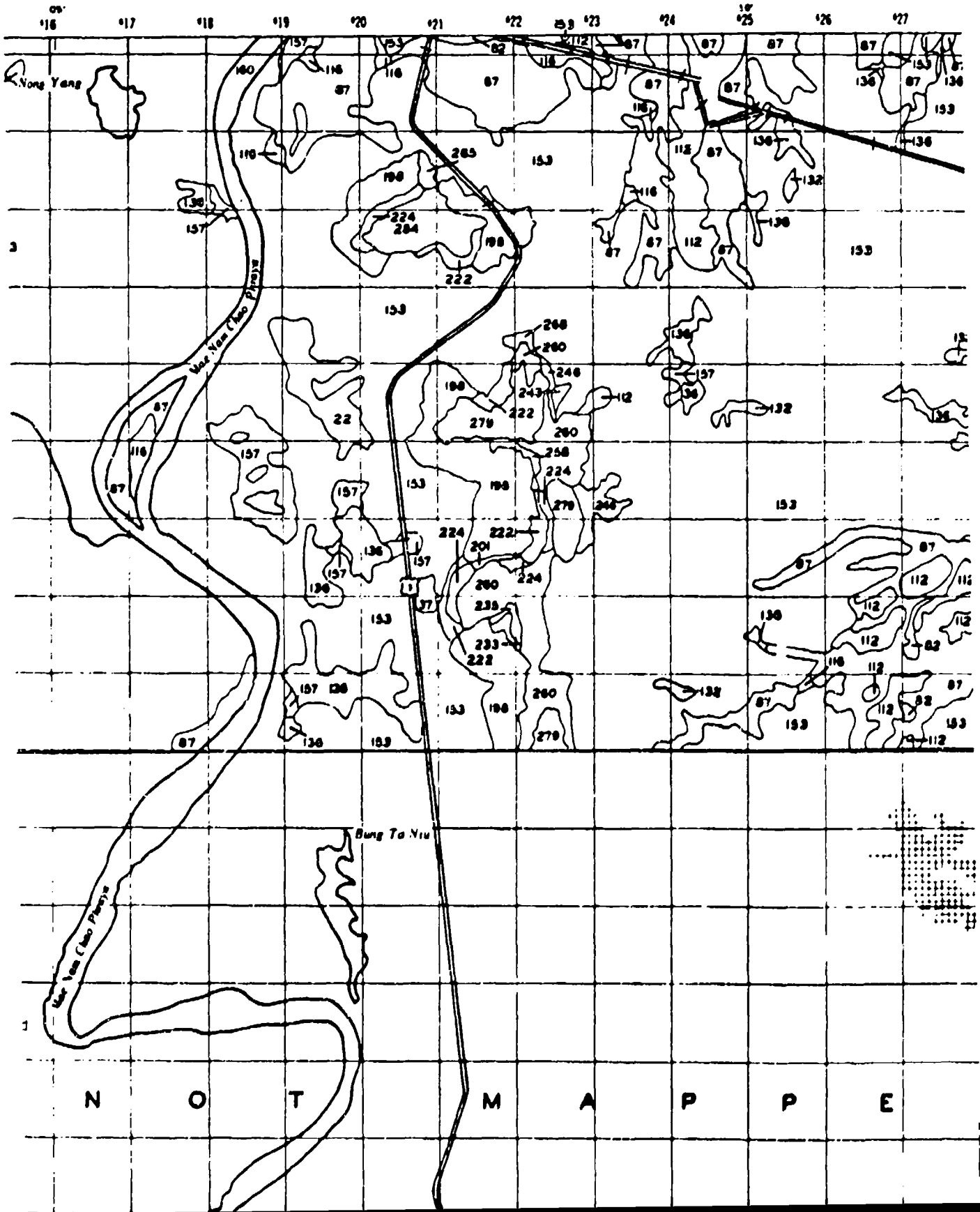
8

PLATE 1.5a


Nong Yang
Khlong Rang Phamong
Rung Rahan Nam Sai
Rung Krachang Ngam
Krok Phra
N

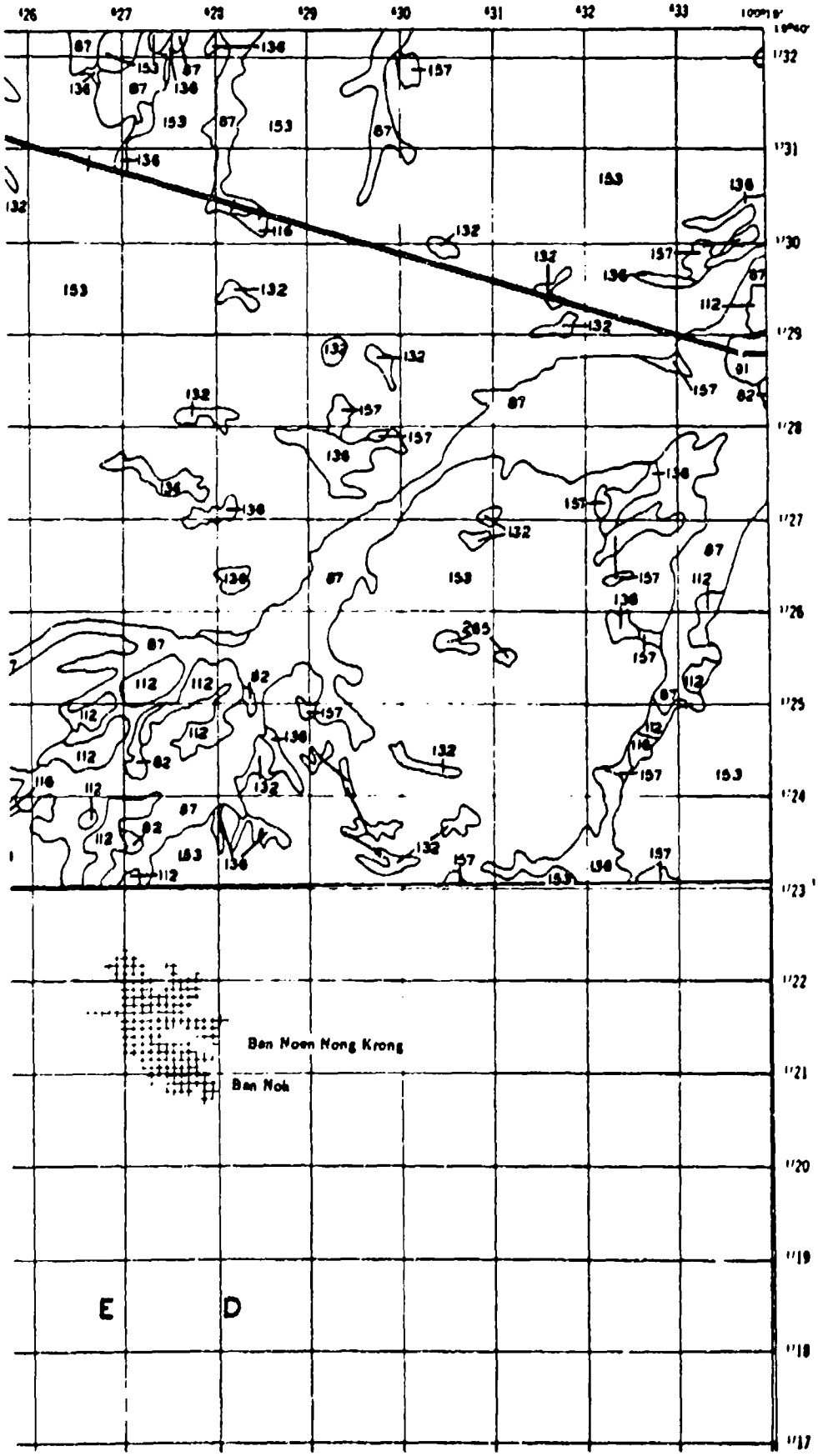
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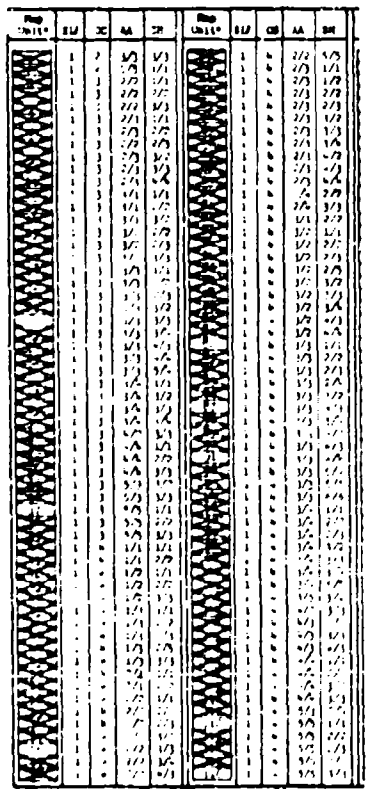
NAKHON SAWAN



3

SHEET NS V





Select those areas are water bodies

* Each map unit represents an array of four symbols (vertical, vertical beside roofing 30, approach on open ocean). The remainder of the fraction indicates primary direction (i.e. azimuth from 0° to 180° to 360° to 360° counting that the primary index

* Rating class ranges of each surface geometry fa

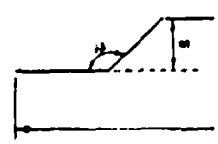
Slope (SL)

Rating Class	Range deg
1	0-3
2	> 3-5
3	> 5-9
4	> 9-15
5	> 15-25
6	> 25-45
7	> 45

Vertical Obstacle Spacing (OS)

Rating Class	Range (ft)	
1	0-7	
2	> 7-12	> 2
3	> 12-20	> 3
4	> 20-35	> 15
5	> 35	>

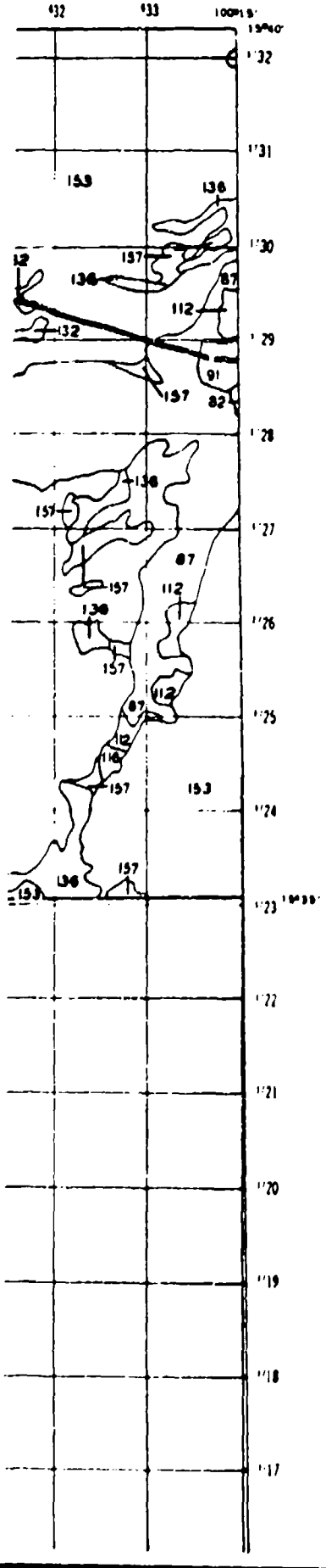
Units do not appear on this map.



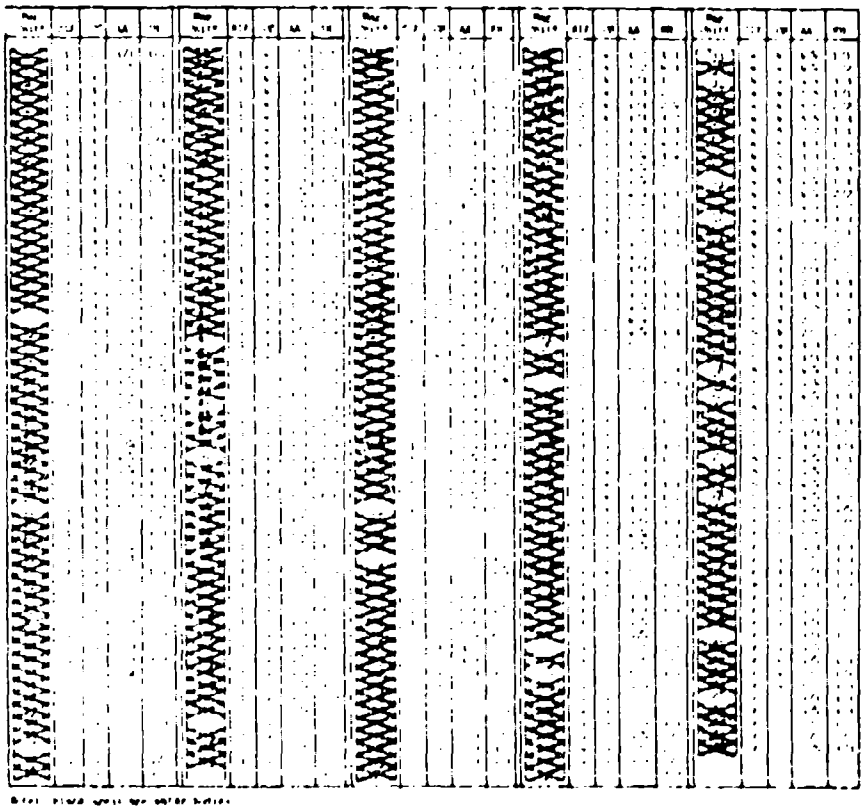
INDEX TO AI

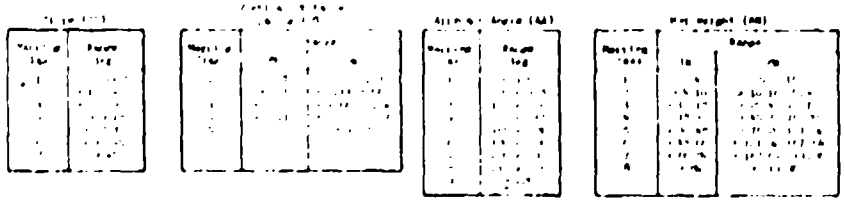
NS I

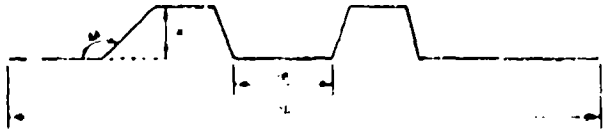
SHEET NS V



LEGEND

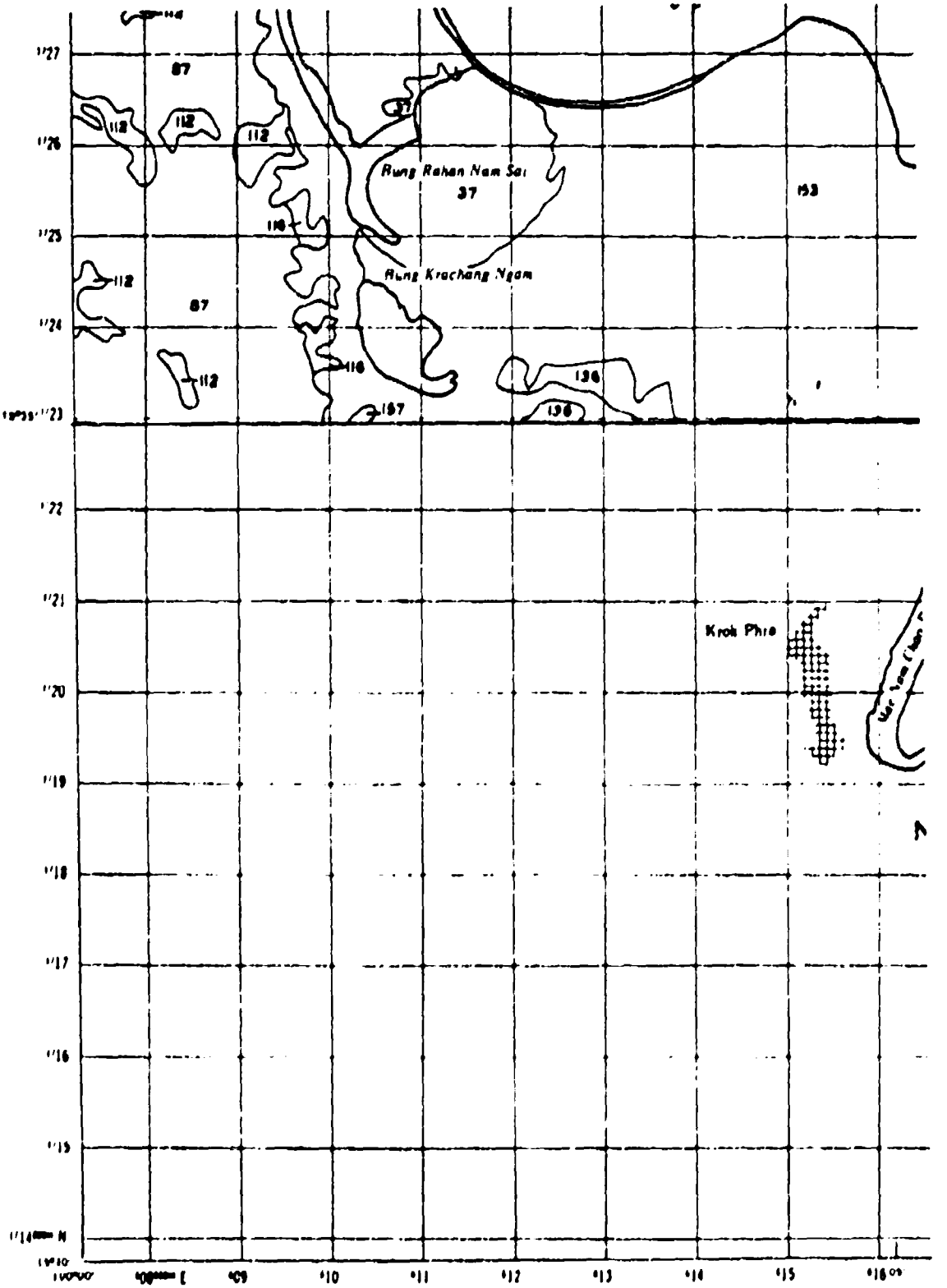






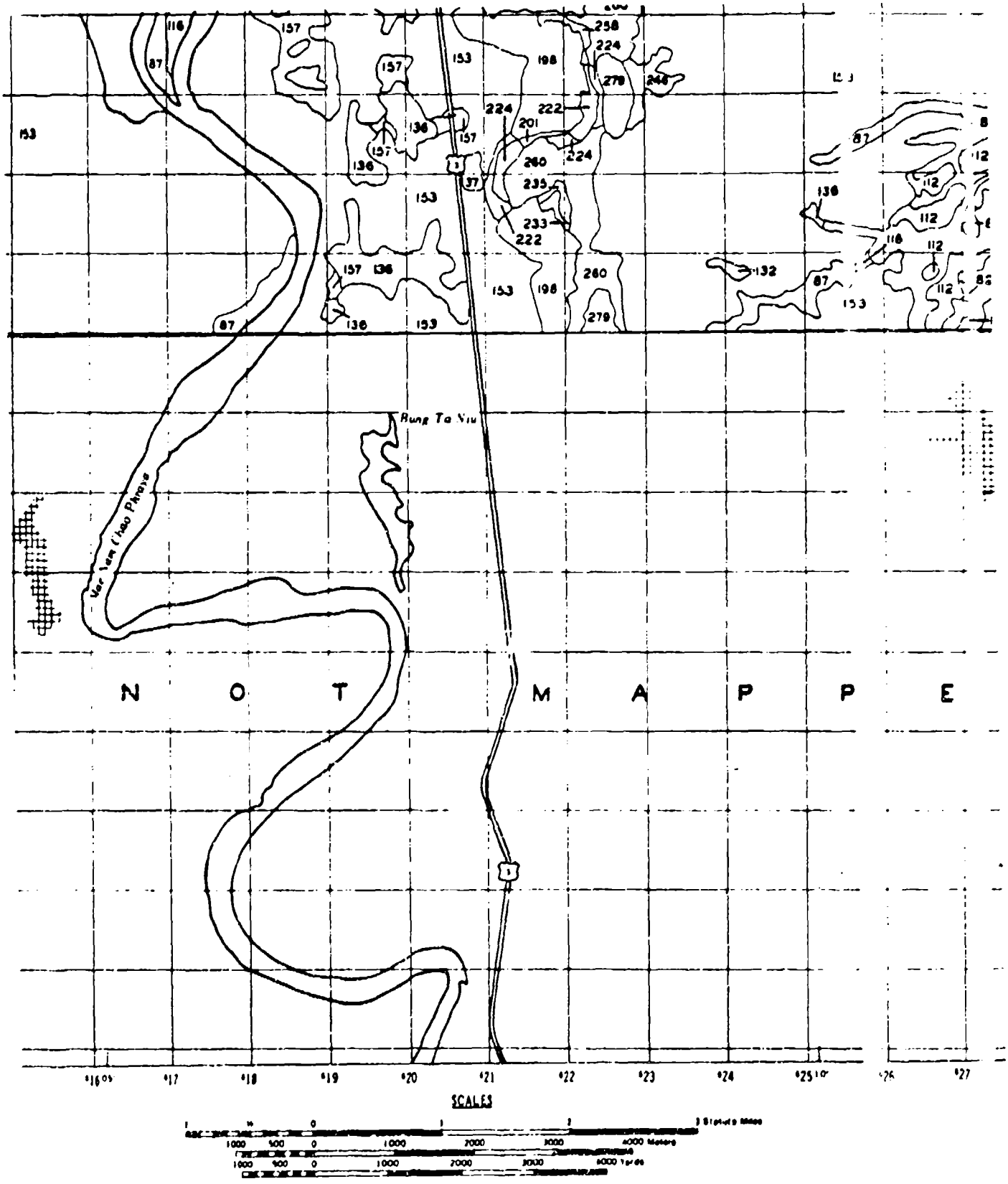
INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS V	NS IV

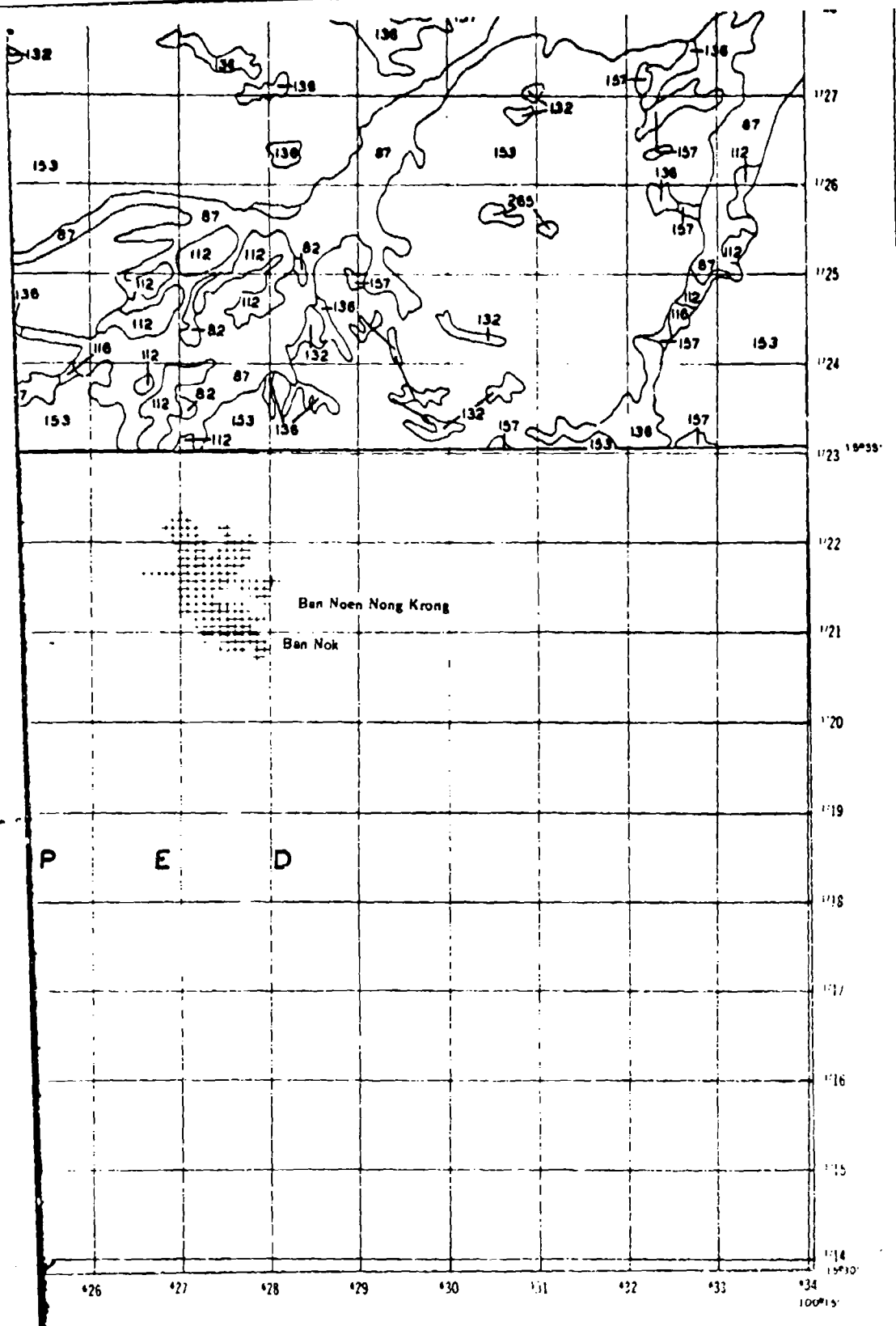


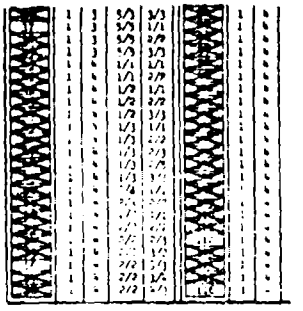
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 P

5



6





Note: Black areas are water bodies.

* Each map cell represents an array of [illegible] vertical [illegible] sparse [illegible] were mapped. The numerator of the [illegible] easterly direction (i.e. azimuth from [illegible] 135 to 360 deg) assuming that the ver[illegible]

* Warping class ranges of each surface [illegible]

Slope (%)	
Warping class	Range deg
1	[illegible]
2	[illegible]
3	[illegible]
4	[illegible]
5	[illegible]
6	[illegible]
7	[illegible]

Warping class	[illegible]
1	[illegible]
2	[illegible]
3	[illegible]
4	[illegible]
5	[illegible]

[illegible] to not occur on this map.

INDEX

NSI

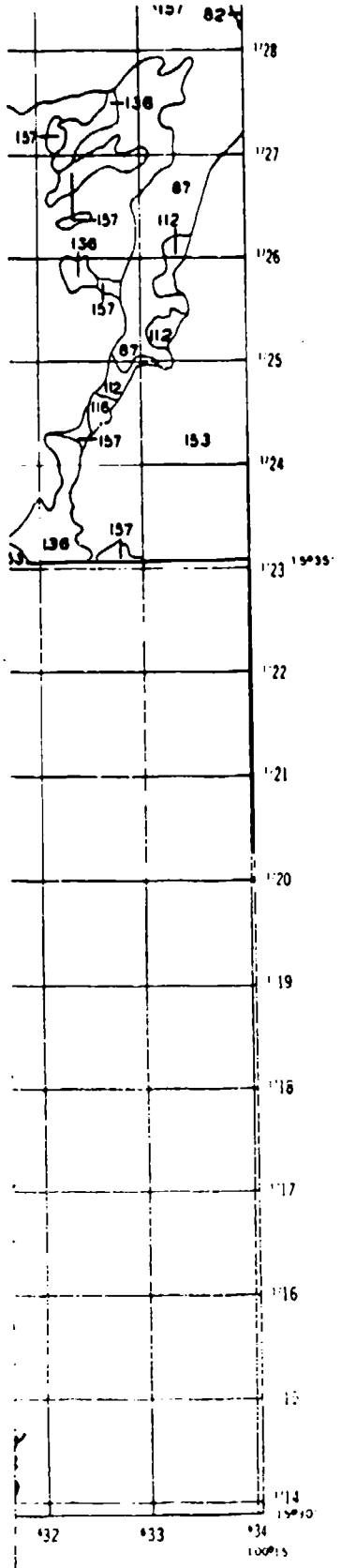
A QUANTITATIVE
TERRAIN F[illegible]

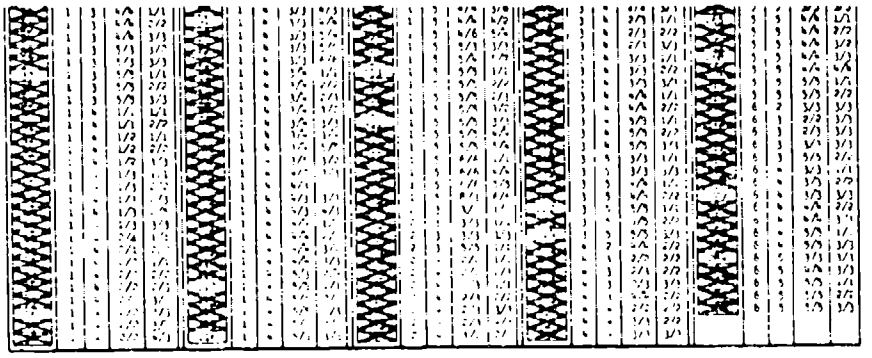
SURFA[illegible]

NAKHON S[illegible]

S

7





Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 2, 1/1, 1/2) indicating mapping classes of slope SL (see diagram below), vertical obstacle spacing VS, approach angle AA, and step height SH. Fractional designations indicate that dual classes were mapped. The numerator of the fraction indicates that will be encountered while traversing an area in an easterly direction (i.e. azimuth from > 1° to 179°) and the denominator refers to a westerly direction (i.e. azimuth from > 179° to 359°) assuming that the path is intersect the route at a right angle.

* Mapping class ranges of each surface geometry is the area

Slope (SL)

Mapping Class	Range deg
* 1	<1.5
* 2	> 1.5 to < 5
3	> 5 to < 8
4	> 8 to < 15
	> 15 to < 23
	> 23 to < 45
	> 45

Vertical Obstacle Spacing (VS)

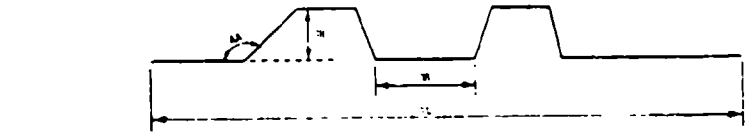
Mapping Class	Range	
	ft	m
2	> 1 to < 5	> 0.3 to < 1.5
3	> 5 to < 10	> 1.5 to < 3
4	> 10 to < 15	> 3 to < 4.5
5	> 15 to < 20	> 4.5 to < 6
6	> 20	> 6

Approach Angle (AA)

Mapping Class	Range deg
1	< 10
2	> 10 to < 20
3	> 20 to < 30
4	> 30 to < 45
5	> 45 to < 60
6	> 60 to < 75
7	> 75 to < 90
8	> 90
*	1/2

Step Height (SH)

Mapping Class	Range	
	in	cm
1	0 to 6	0 to 15
2	> 6 to 10	> 15 to 25
3	> 10 to 19	> 25 to 50
4	> 19 to 31	> 50 to 80
5	> 31 to 49	> 80 to 125
6	> 49 to 79	> 125 to 200
7	> 79 to 126	> 200 to 320
8	> 126	> 320



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	NS V	NS IV

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

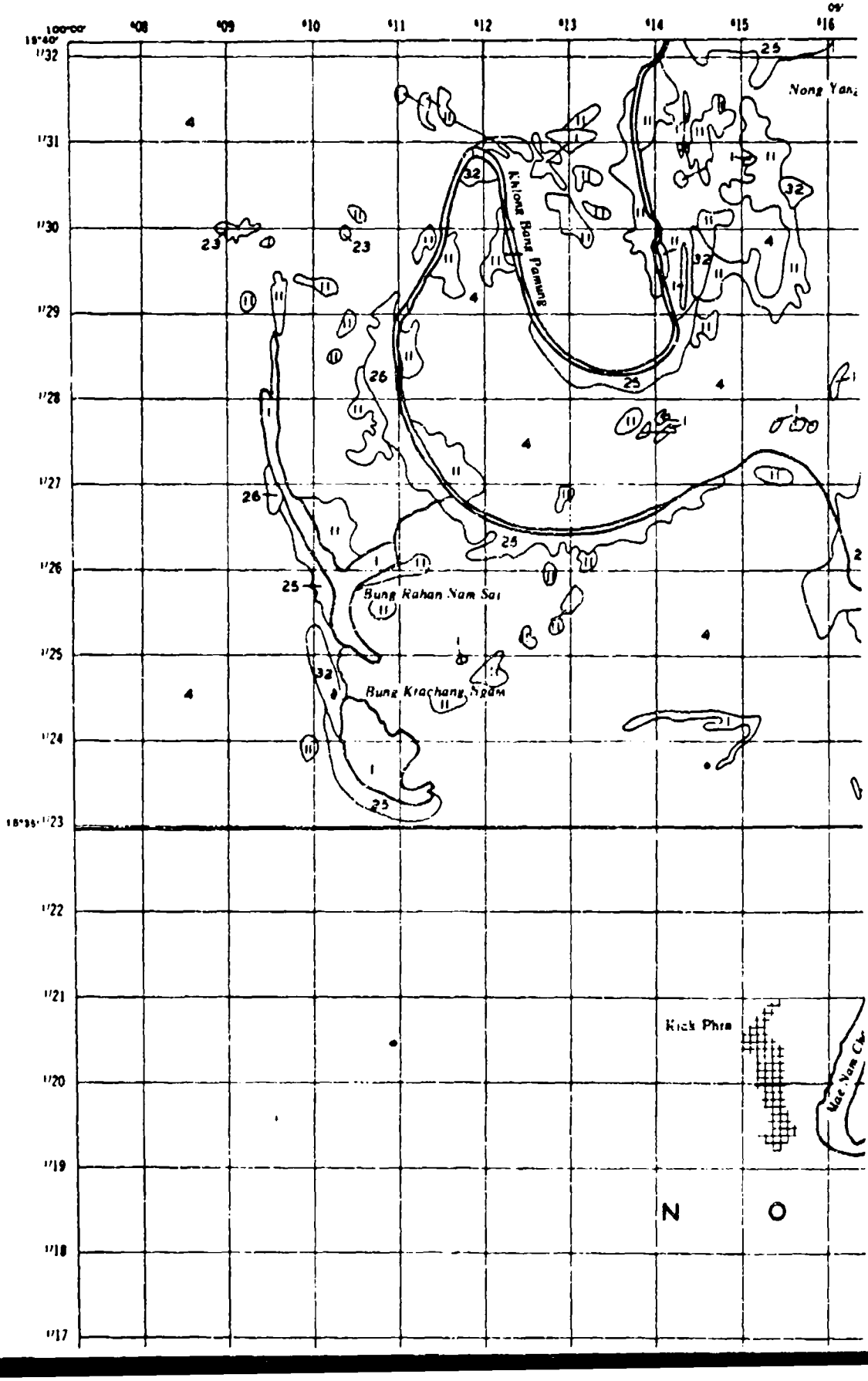
SURFACE GEOMETRY

NAKHON SAWAN STUDY AREA

SHEET NS V

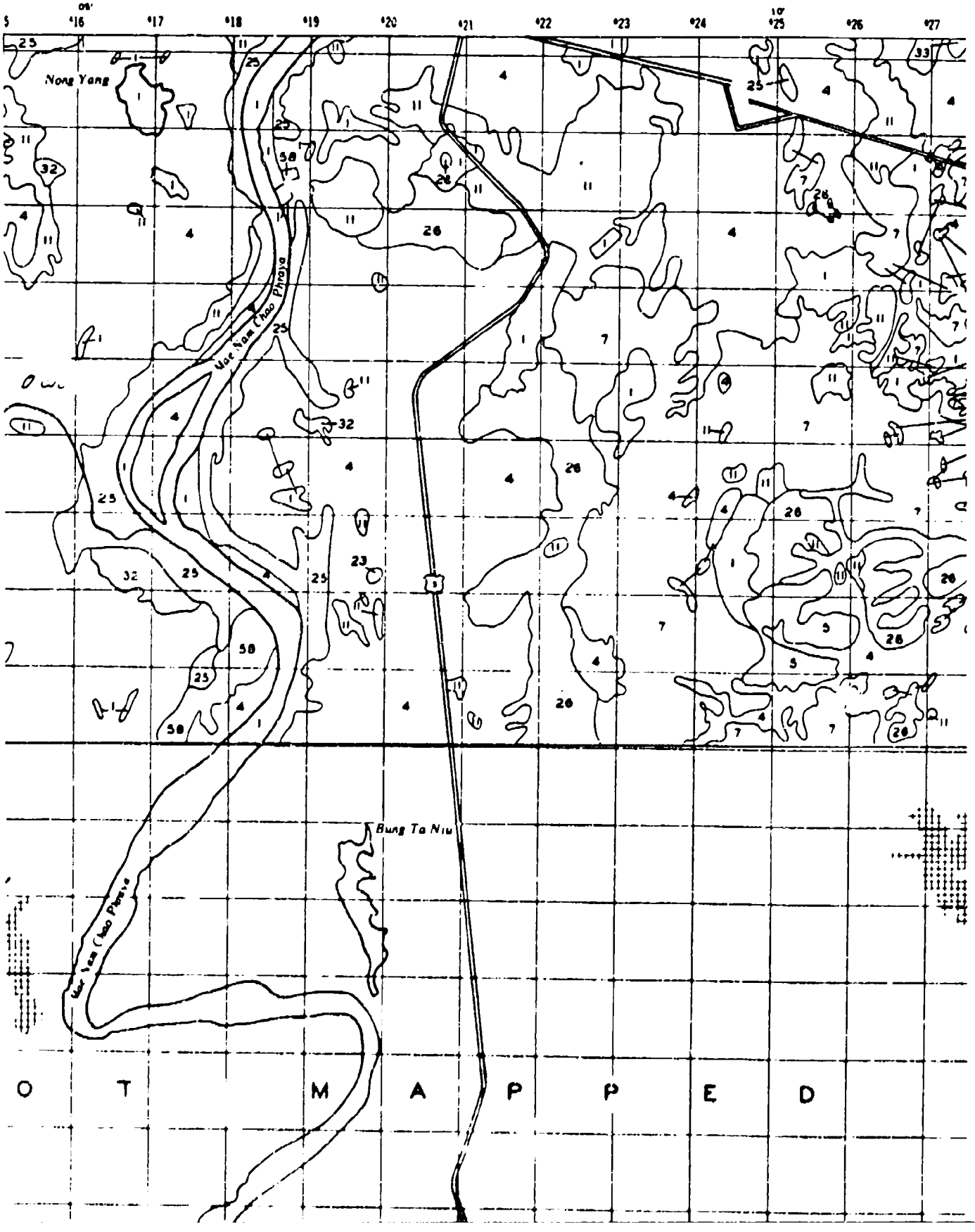
8

PLATE 1.5b


Nong Yan
Khlong Bang Pamung
Bung Rahan Nam Sai
Bung Krachang Ngam
Kick Phra
N
O

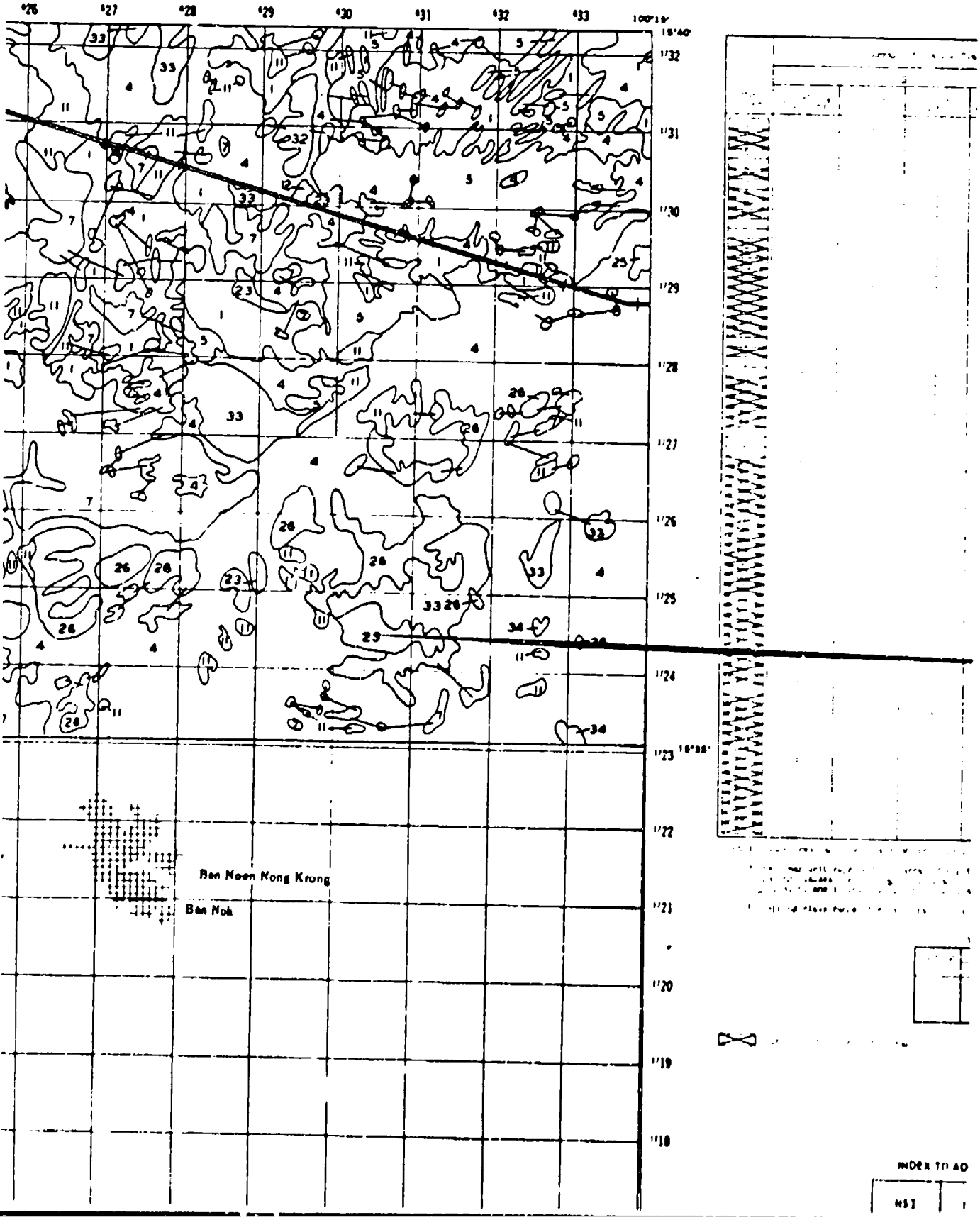
2

NAKHON SAWAN



1 3

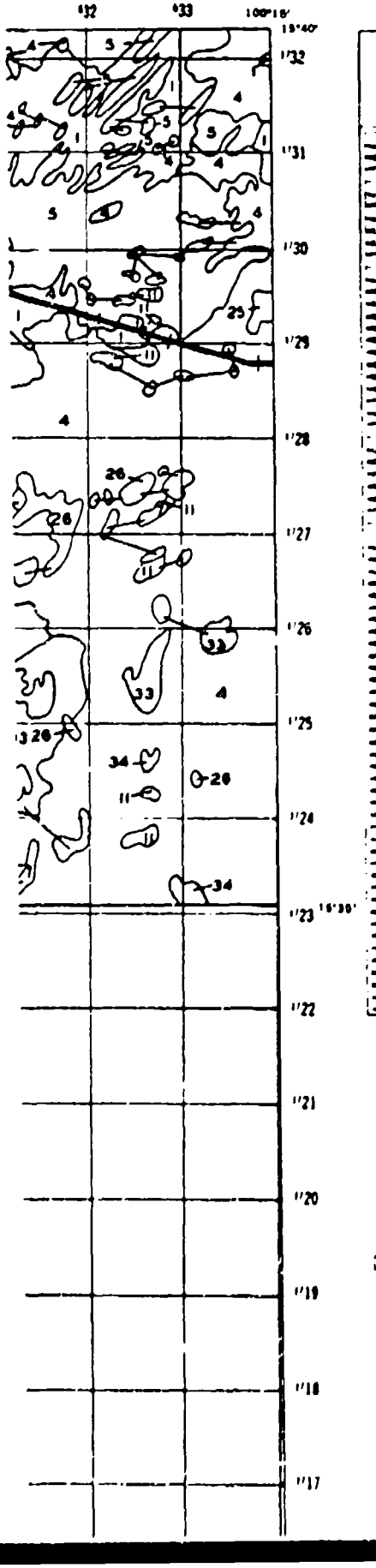
SHEET NS V



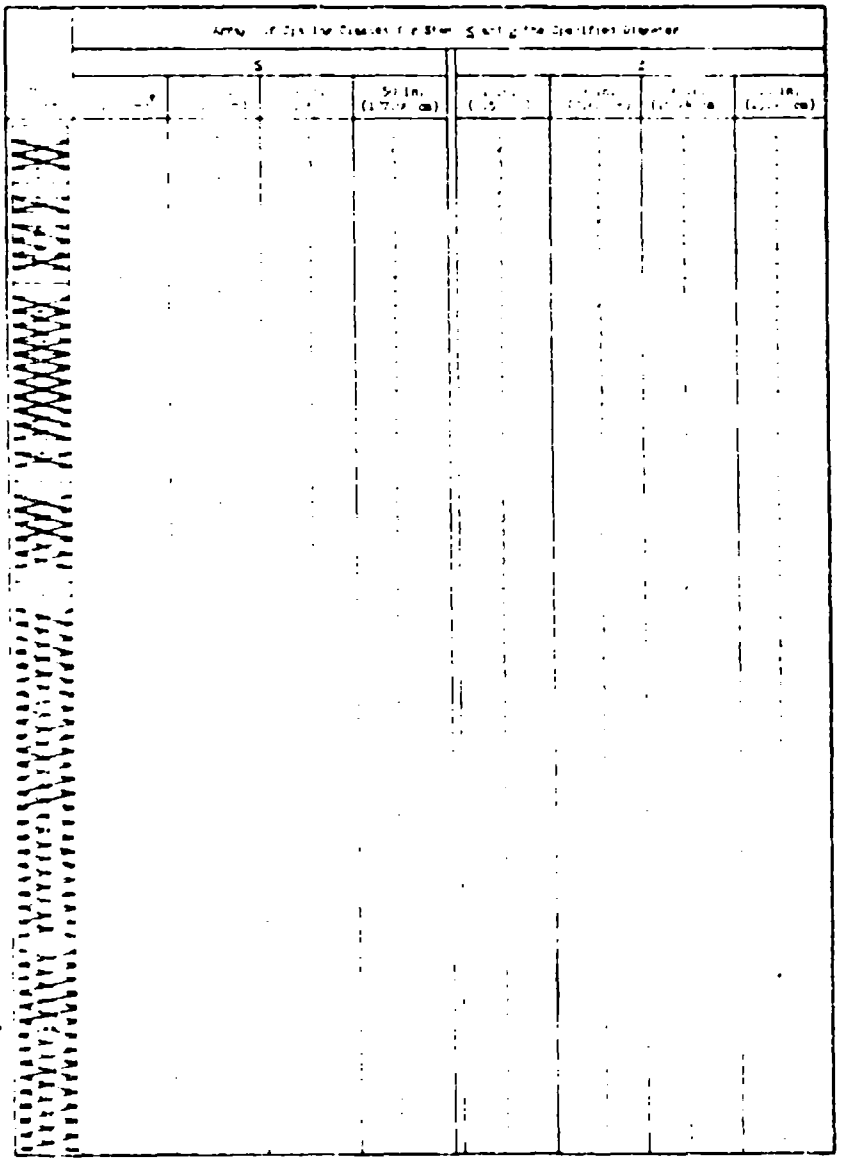
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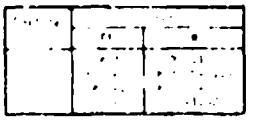
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SHEET NS V



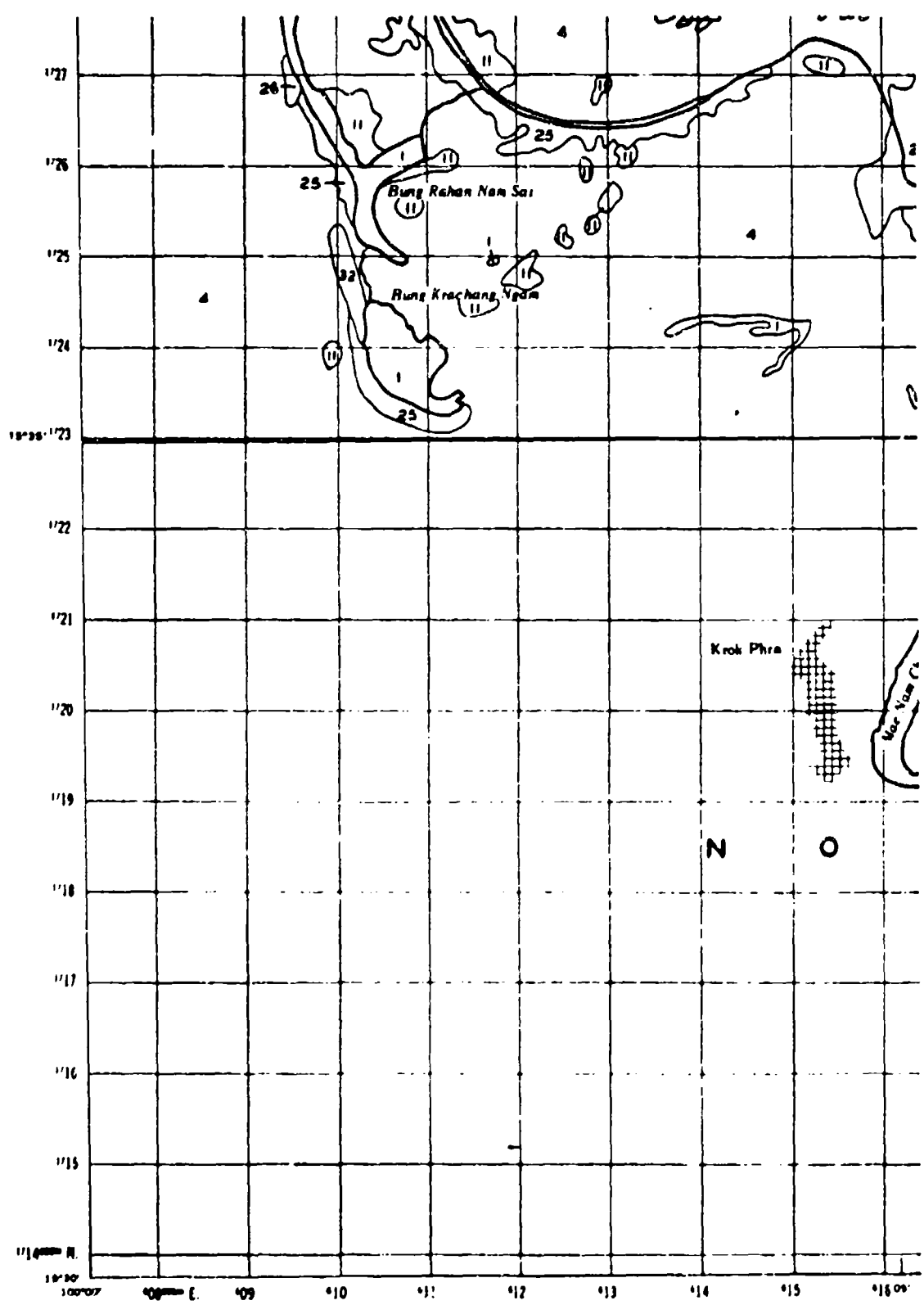
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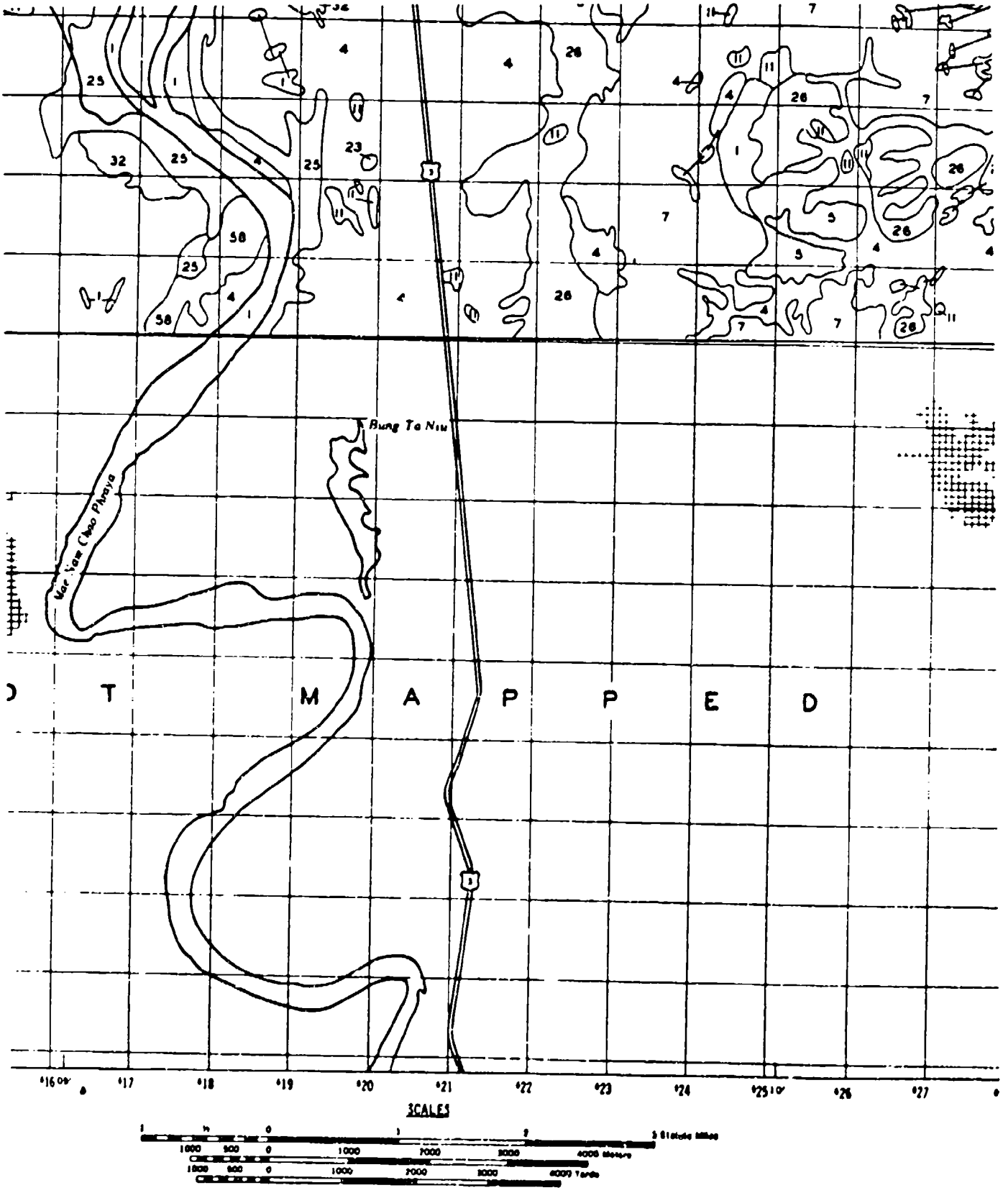
INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS IV	NS VI

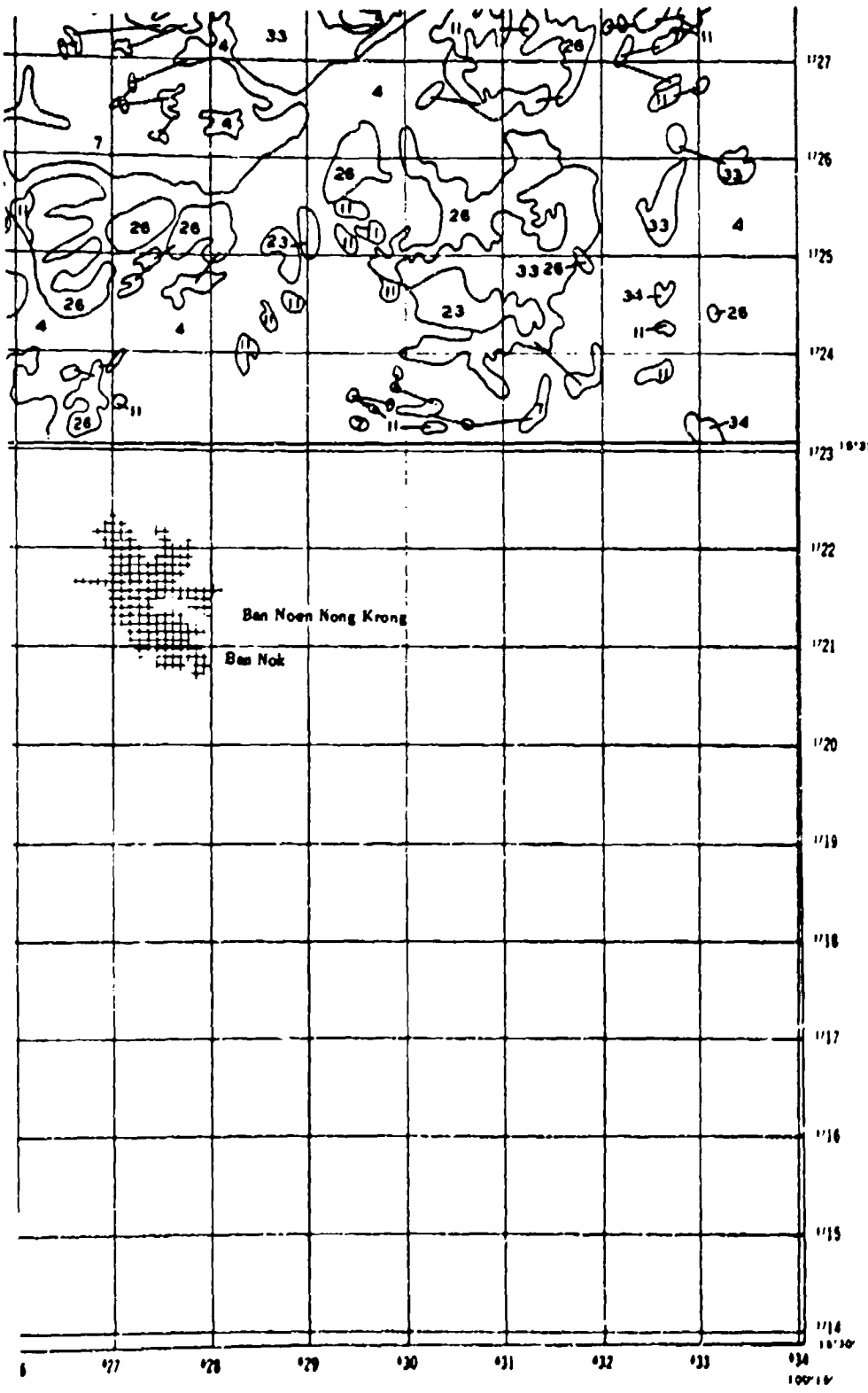


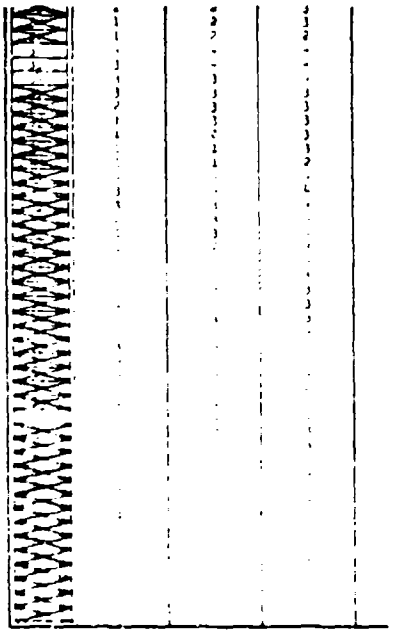
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

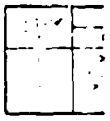
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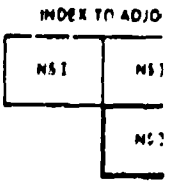
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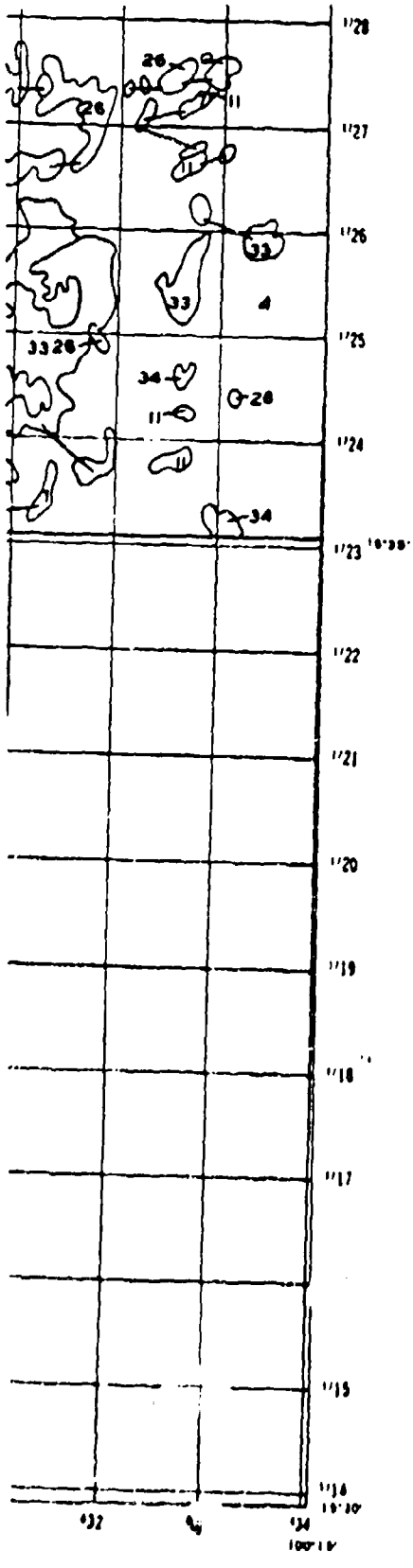
A QUANTITATIVE METI
TERRAIN FOR GR

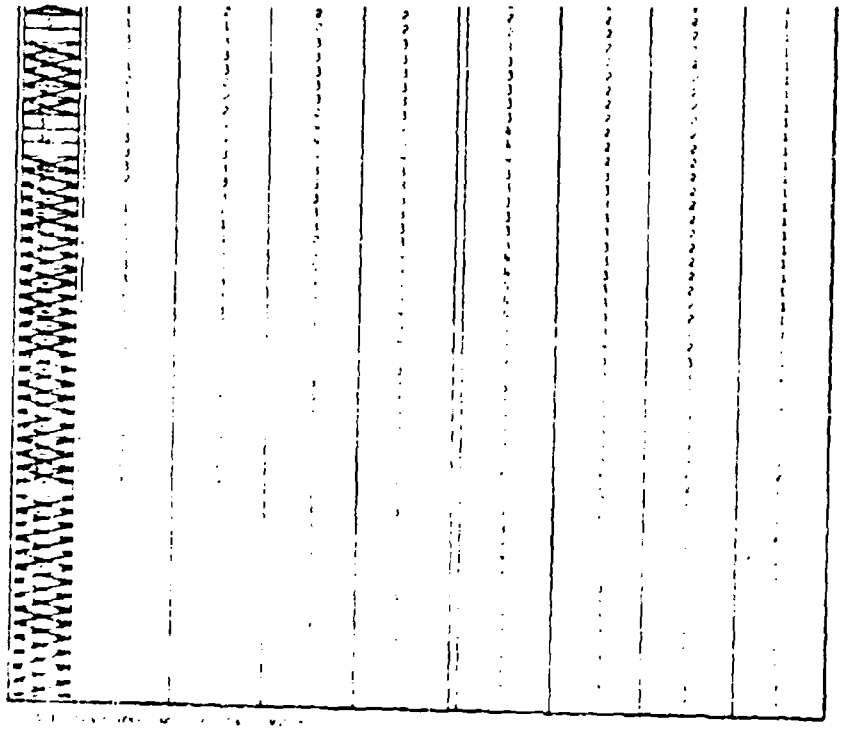
VEGET

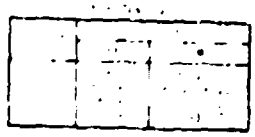
NAKHON SAWA

SHEET

7







INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS IV	NS V

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

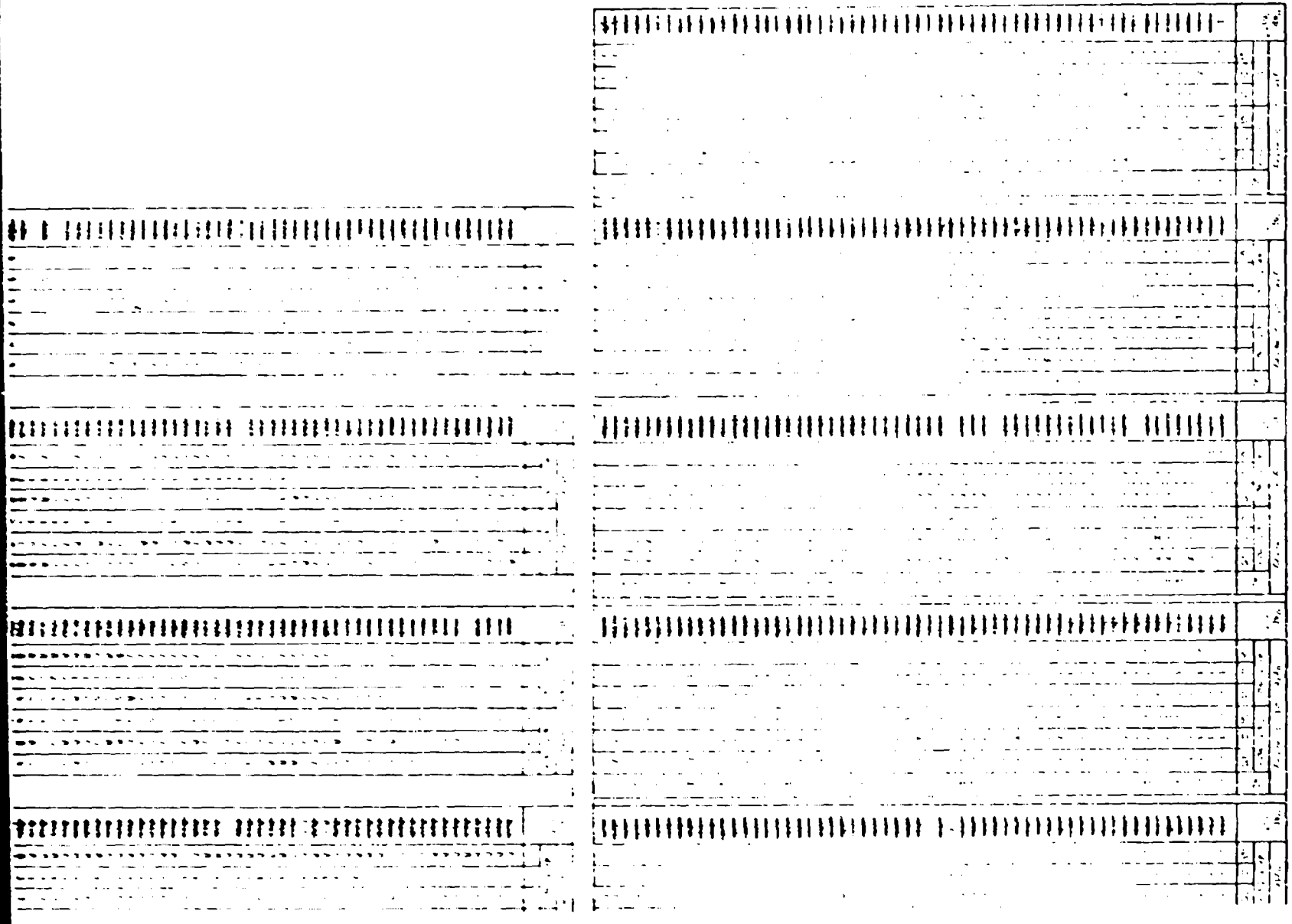
VEGETATION

NAKHON SAWAN STUDY AREA

SHEET NS V

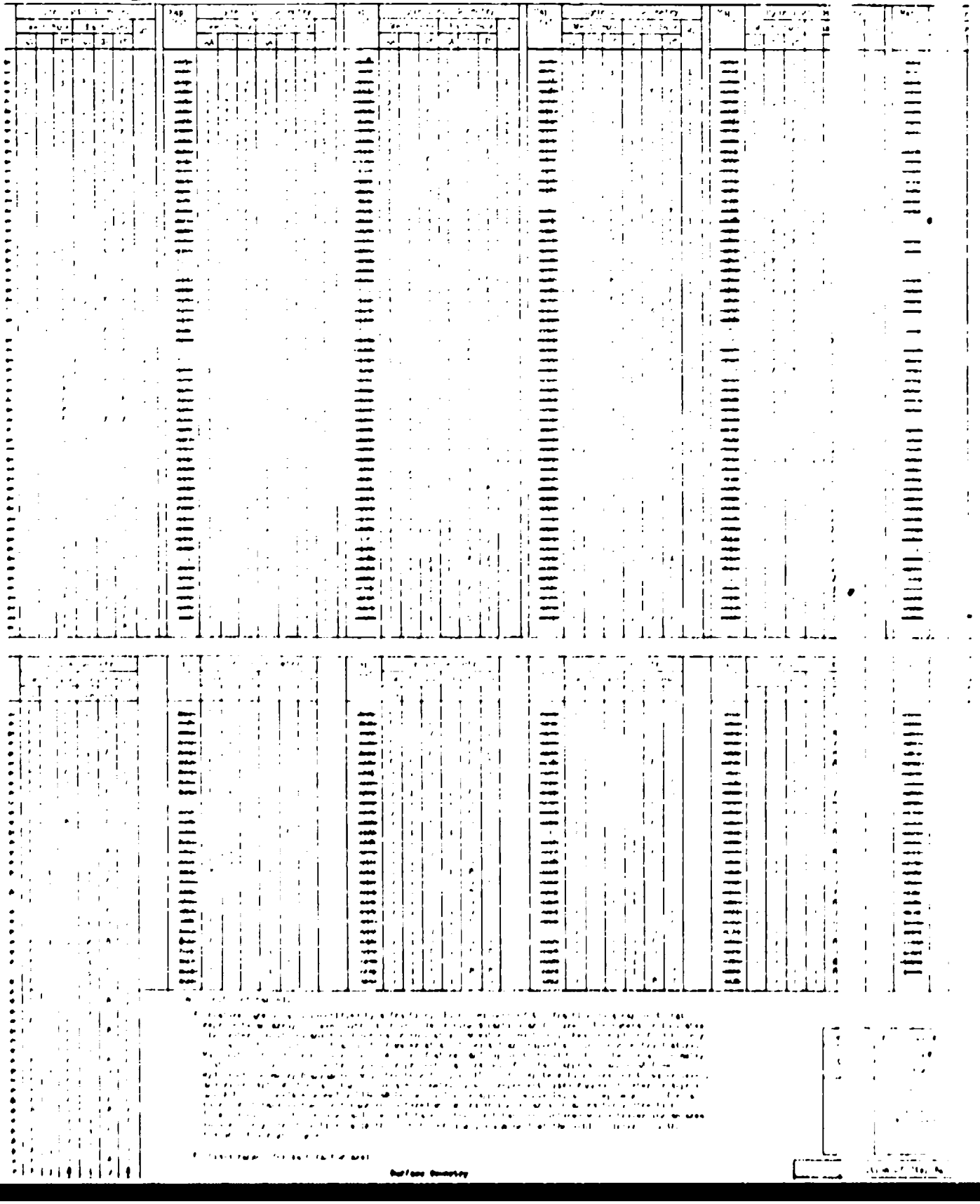
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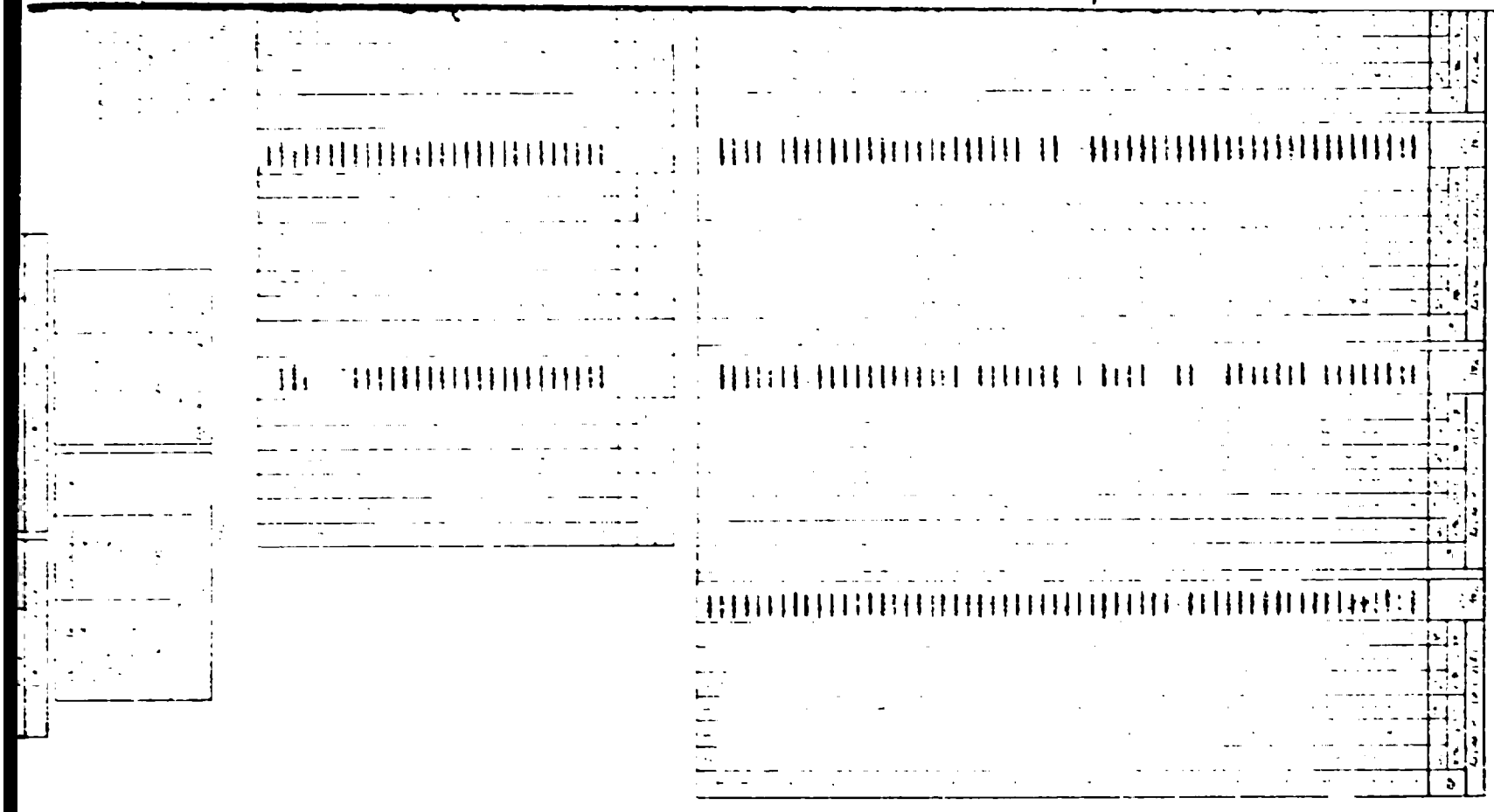
PLATE 1.5c

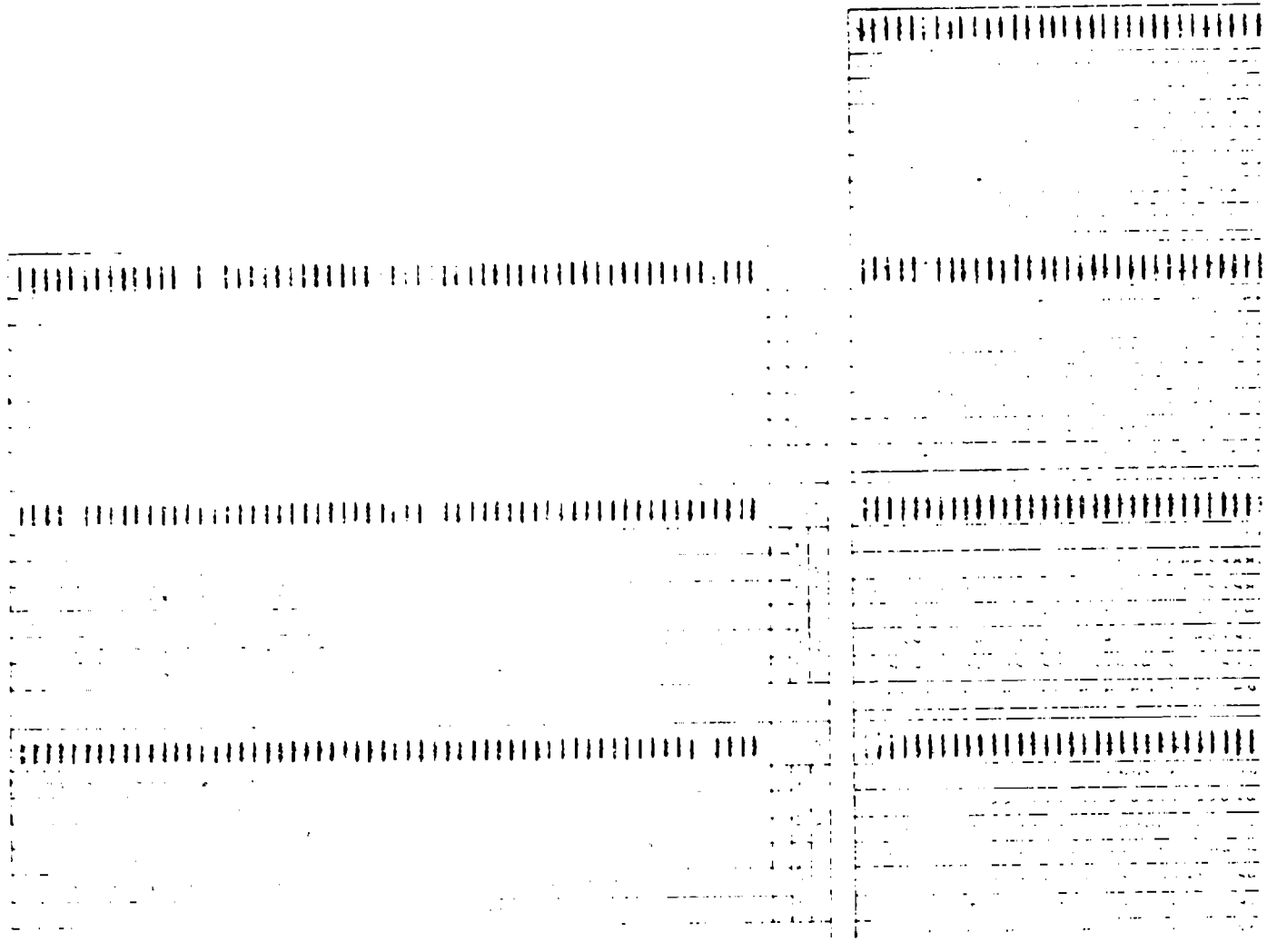


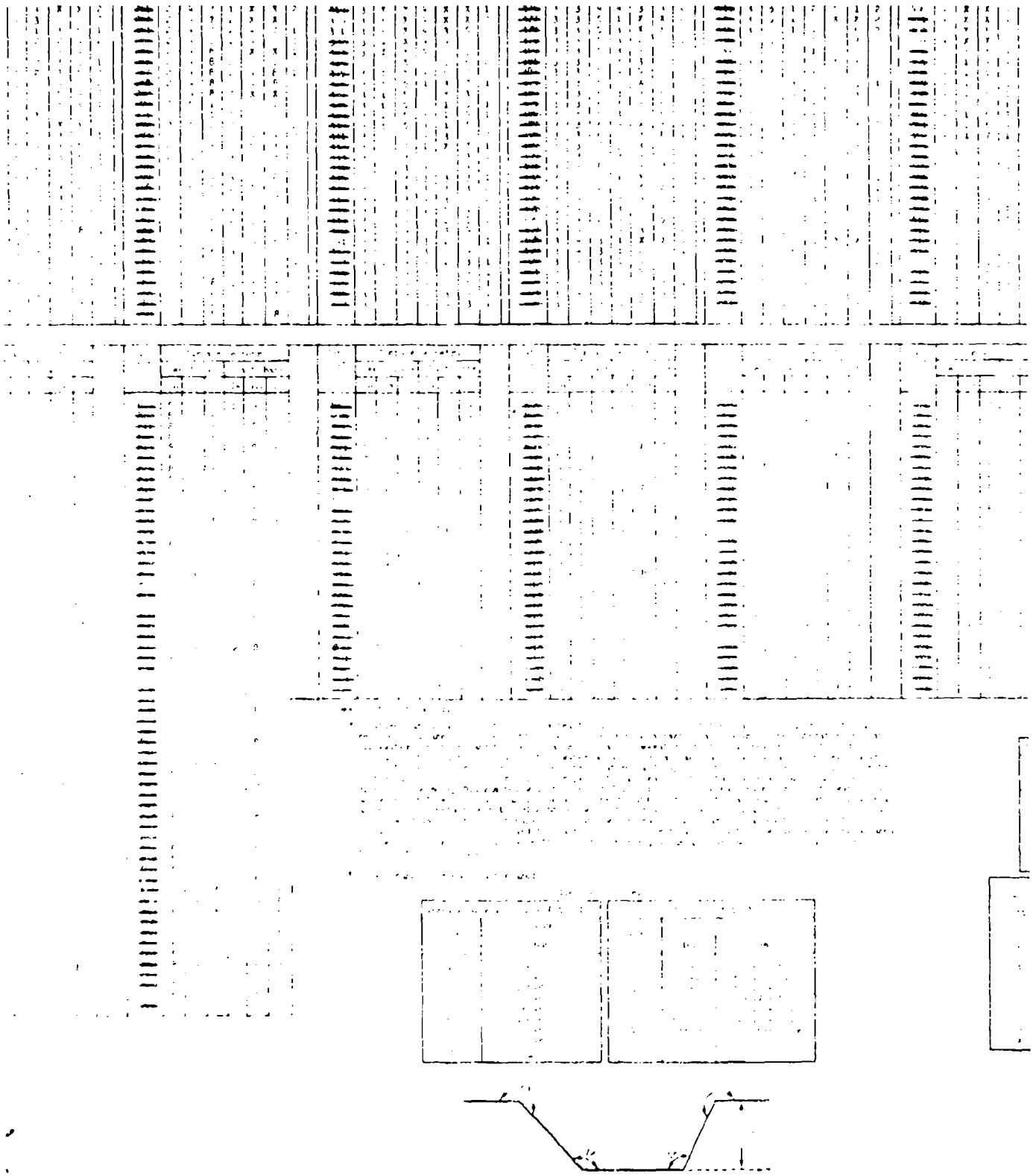
2

LEGEND



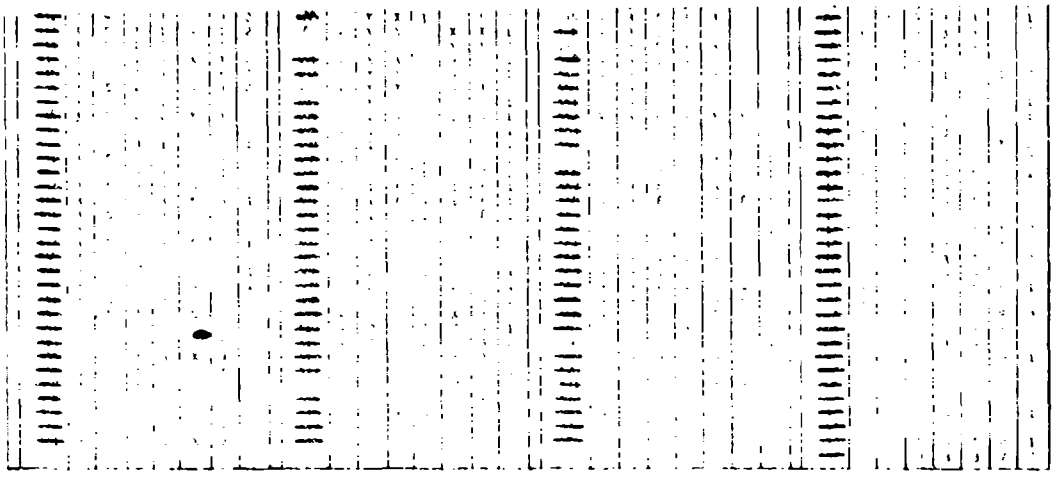


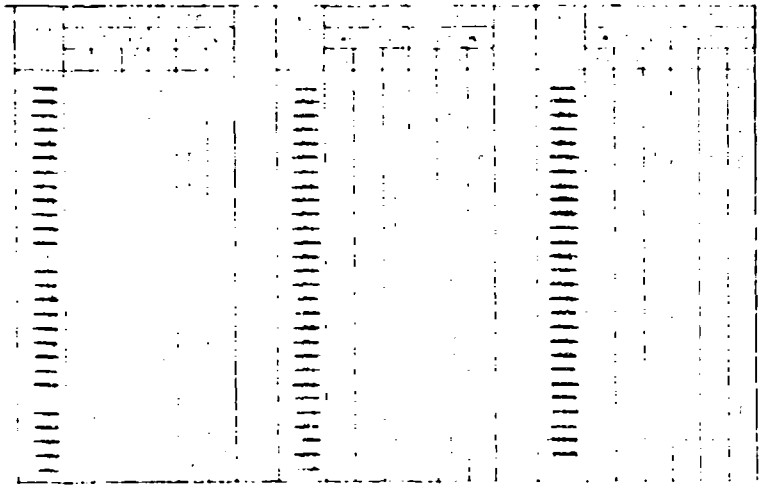


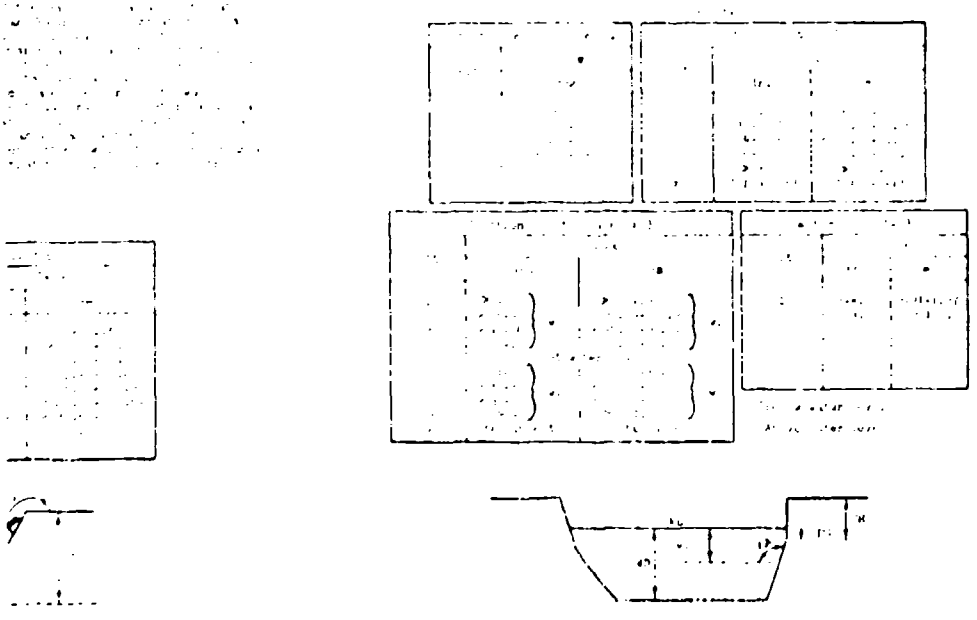


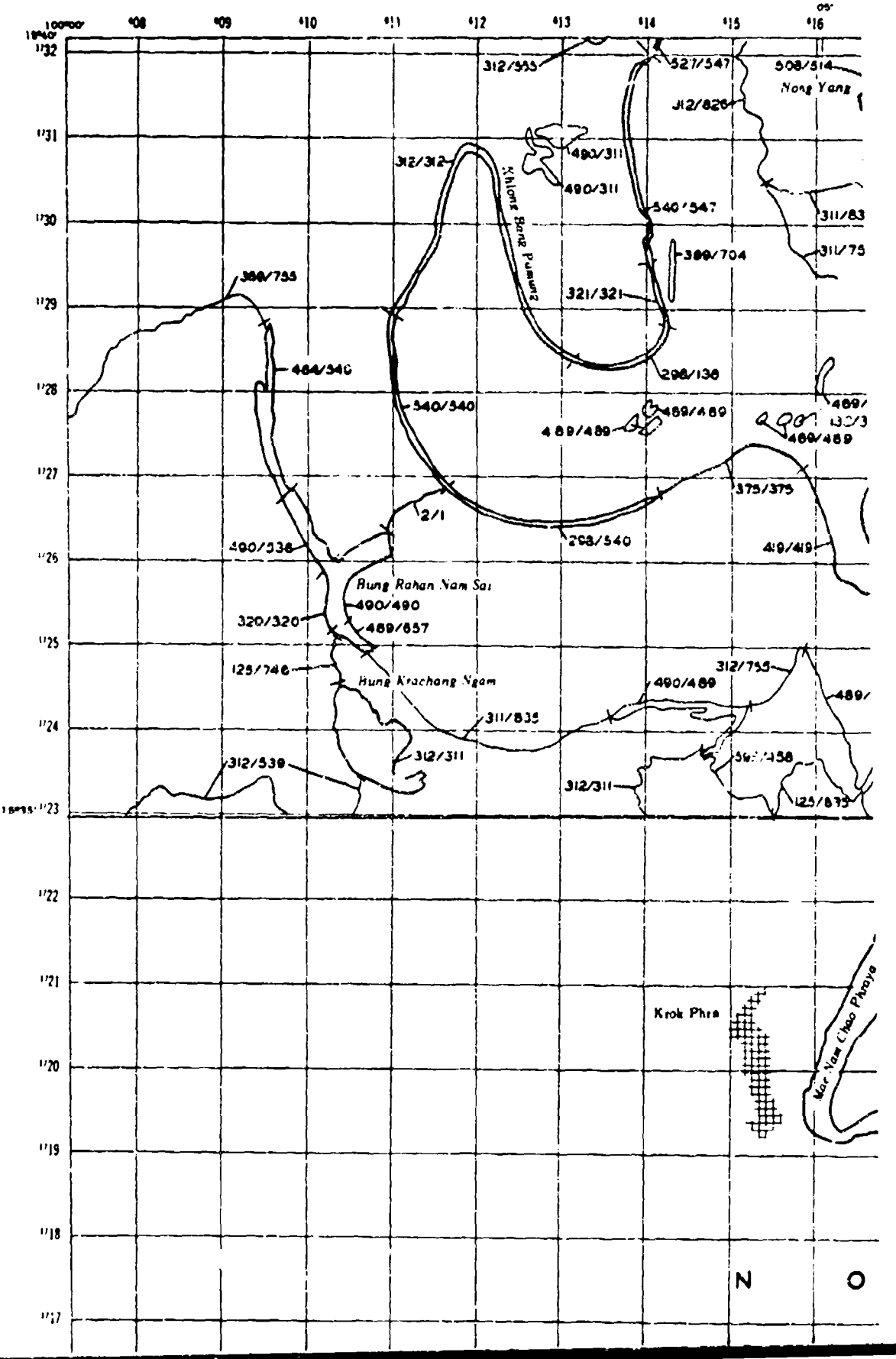
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1



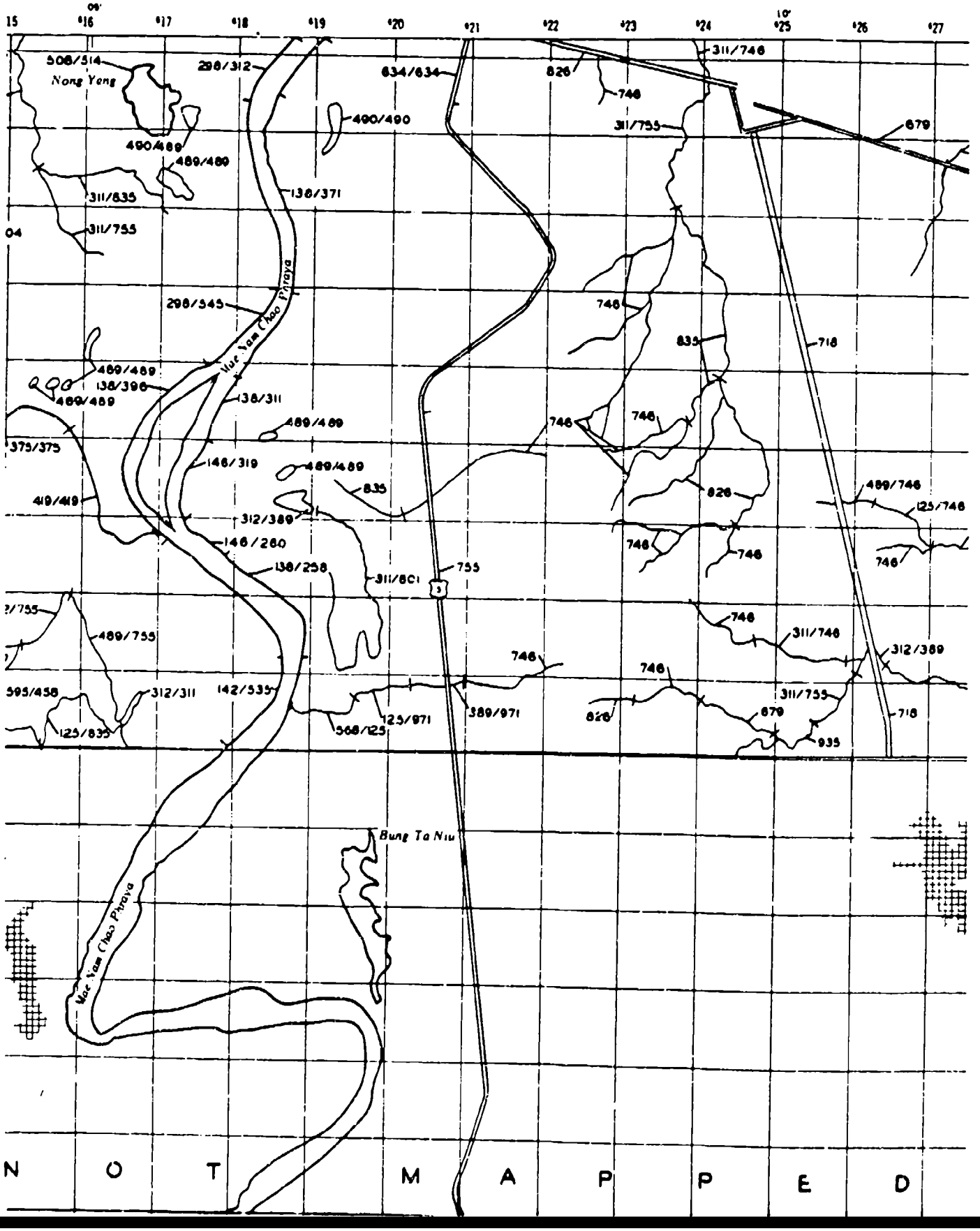





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312/333
521/547
508/514
Nong Yang
312/826
490/311
312/312
Khlong Bang Pumuang
490/311
540/547
311/83
311/75
389/704
389/755
321/321
464/340
298/136
540/540
489/489
489/489
489/489
375/375
2/1
490/536
298/540
489/489
Bung Rahan Nam Sai
490/490
320/320
489/657
125/746
Bung Krachang Ngam
312/755
490/489
311/835
312/539
312/311
312/311
125/875
Krok Phra
Mae Nam Chao Phraya
N
O

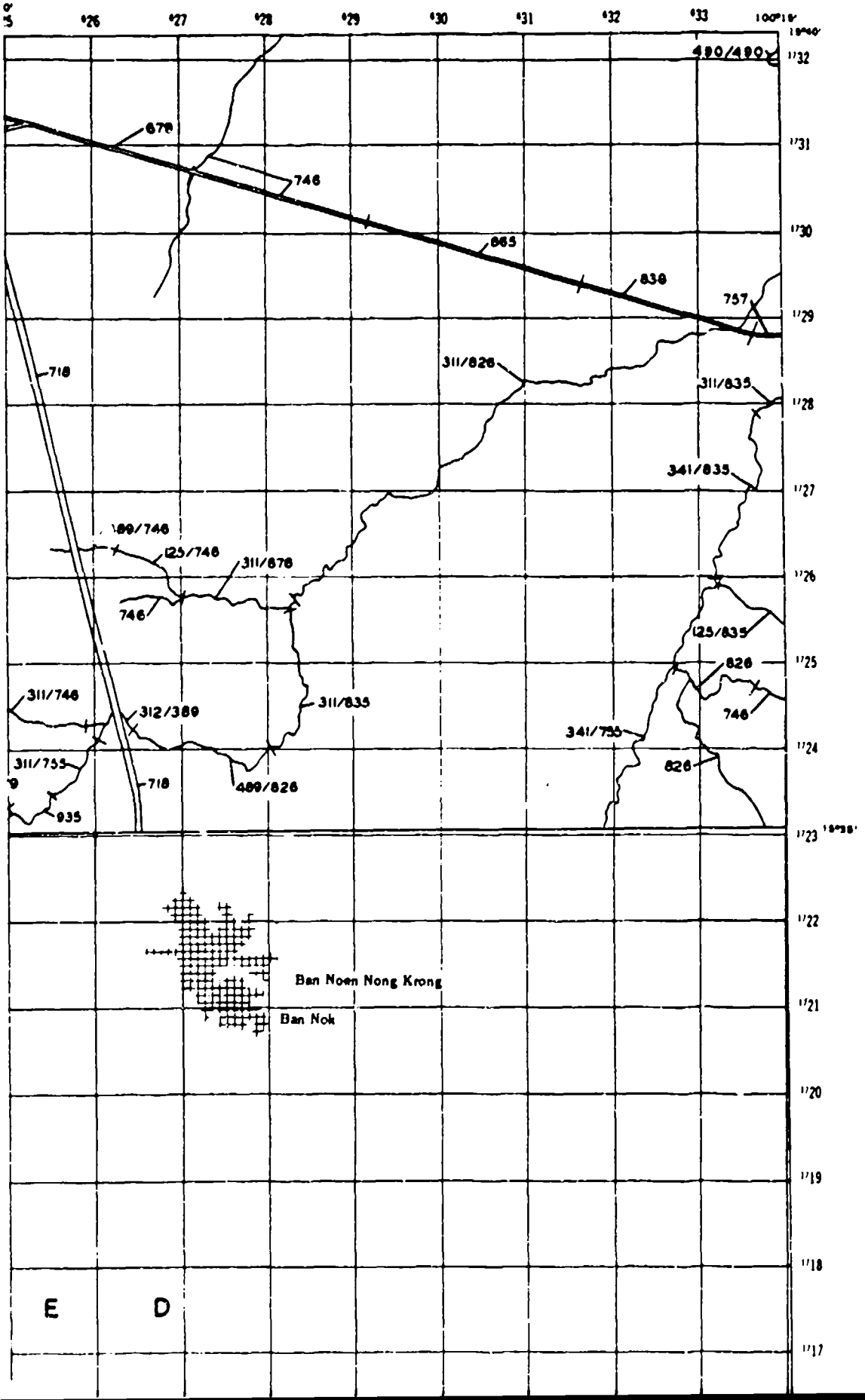
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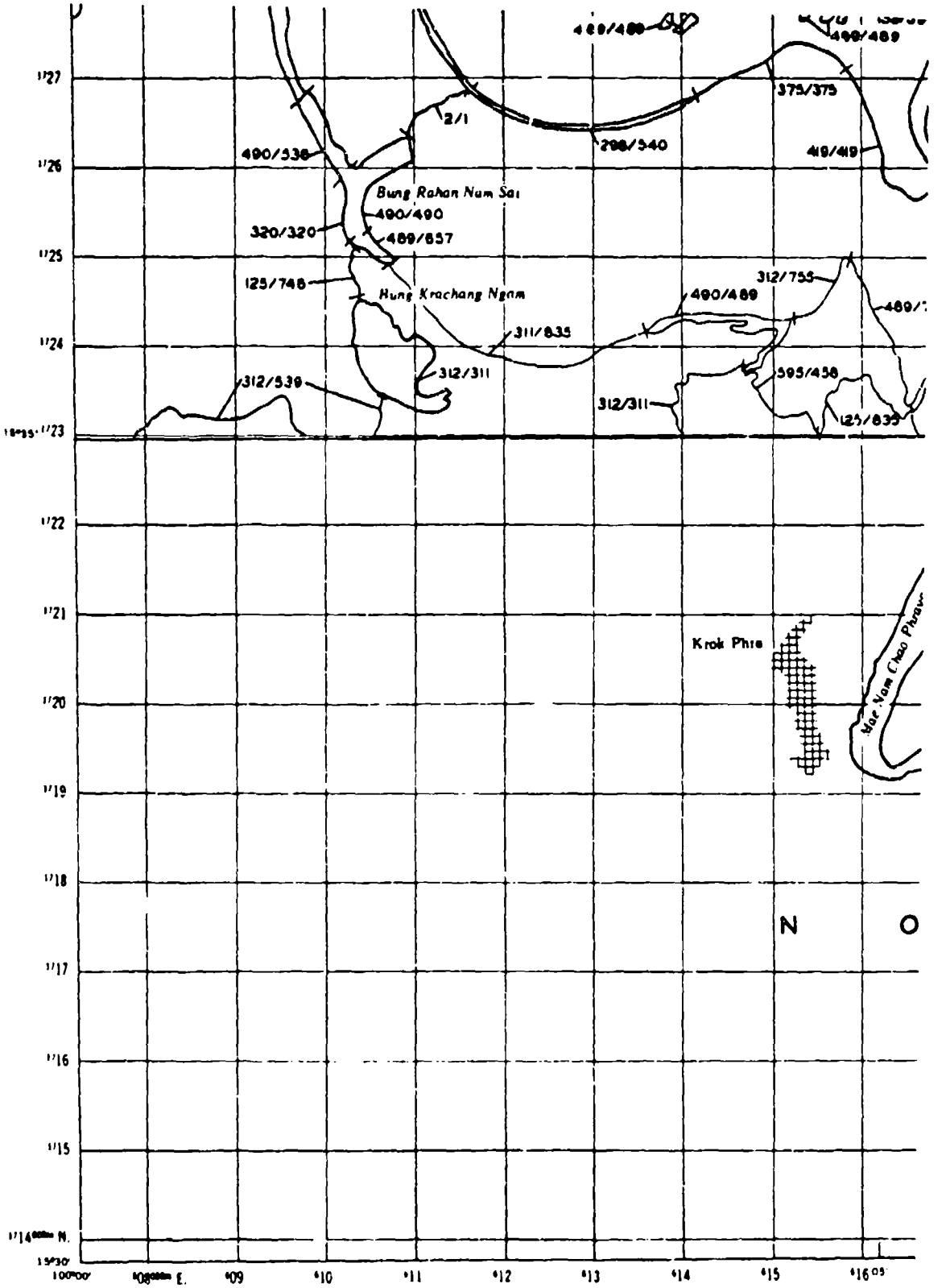
NAKHON SAWAN



3

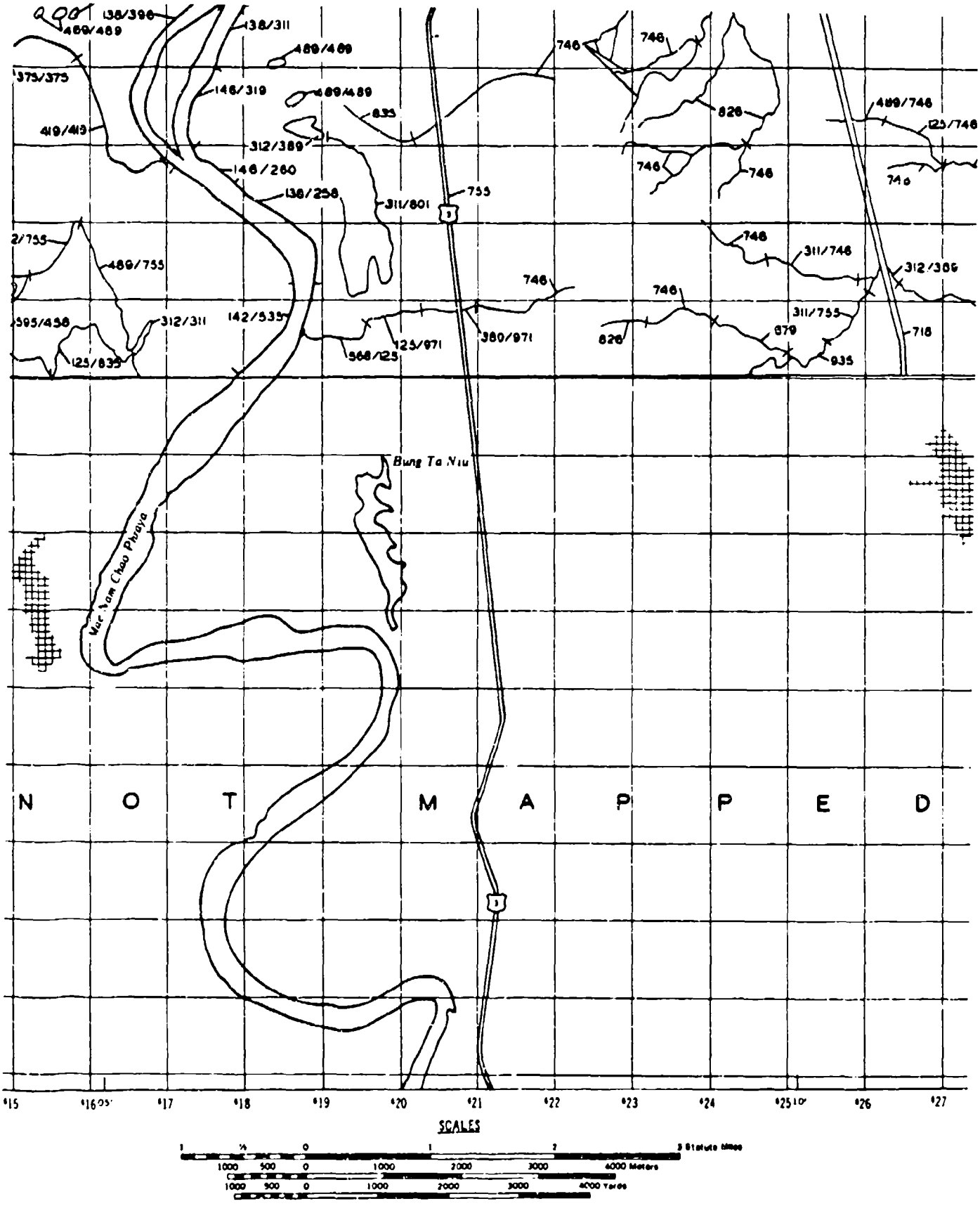
SHEET NS V

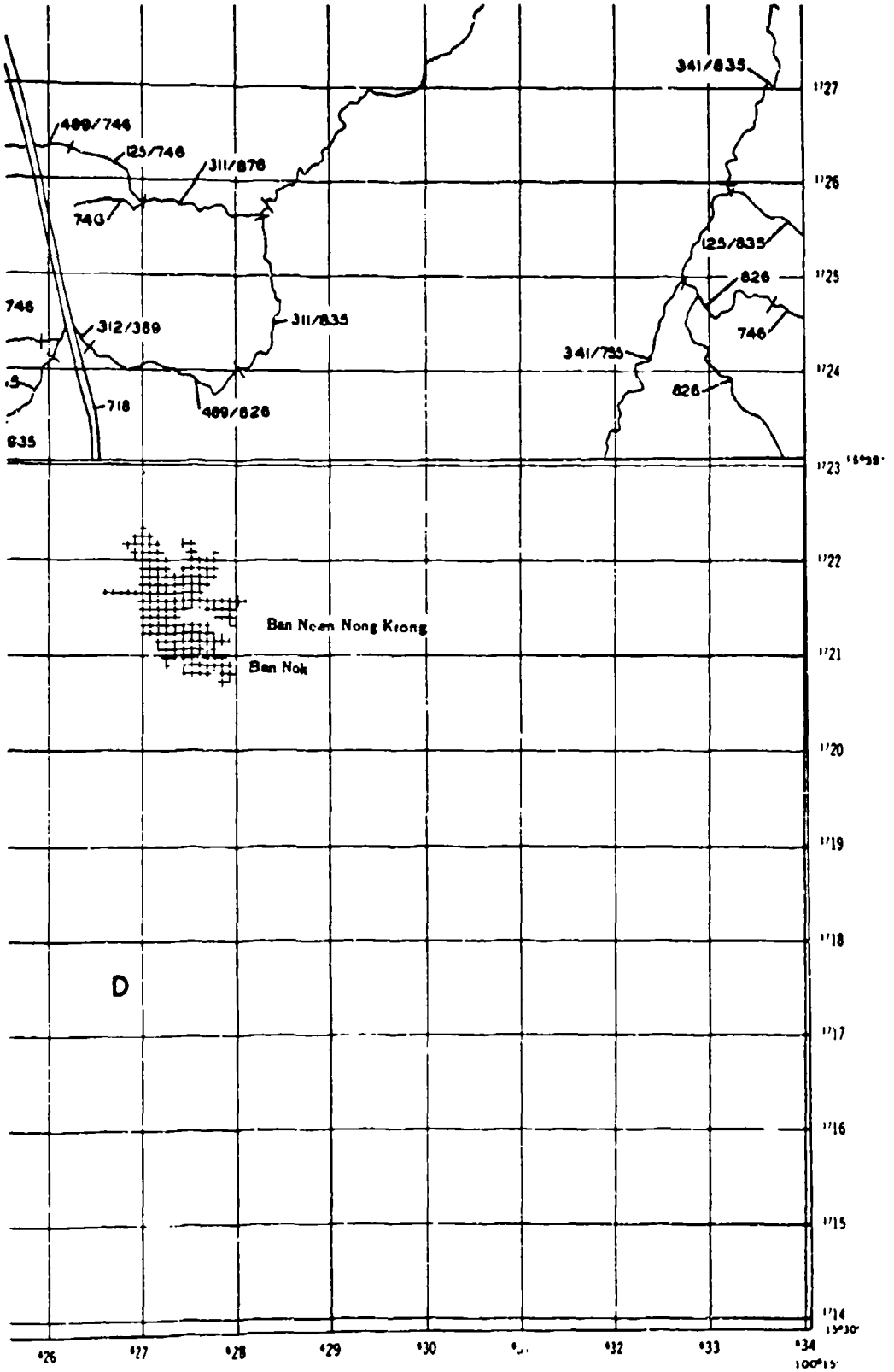

490/490
678
746
865
838
757
718
311/826
311/835
341/835
489/746
125/746
311/678
746
125/835
826
746
311/746
312/389
311/835
341/755
826
311/755
718
489/826
935
Ban Noen Nong Krong
Ban Nok
E
D
IN
NS



ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

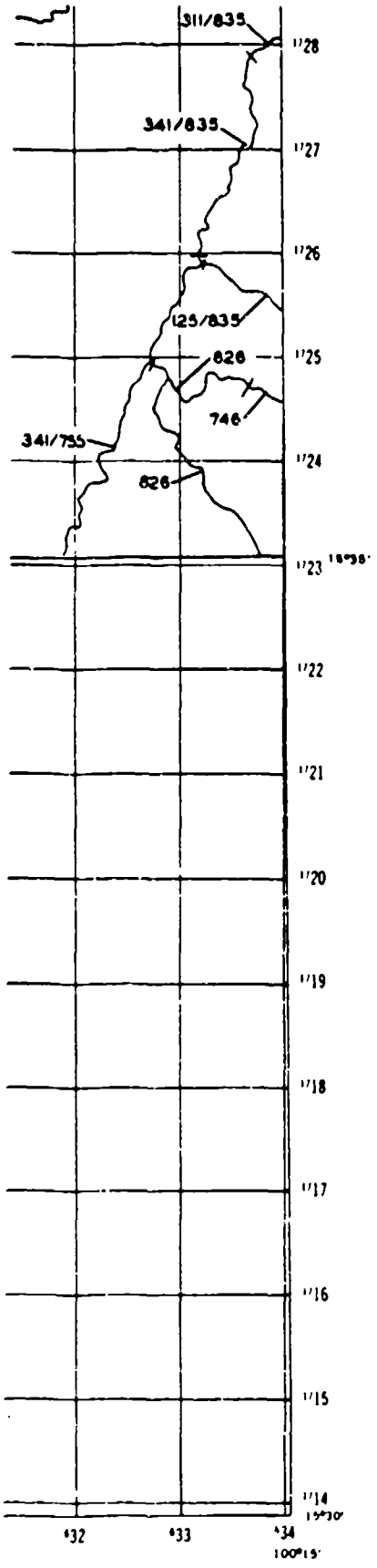
4


138/311
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A QUANTITATIVE M
TERRAIN FOR
HYDROLO(
NAKHON SA
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6



INDEX TO ADJOINING SHEETS

NS I	NS II	NS III
	NS IV	NS V

A QUANTITTATIVE METHO' FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

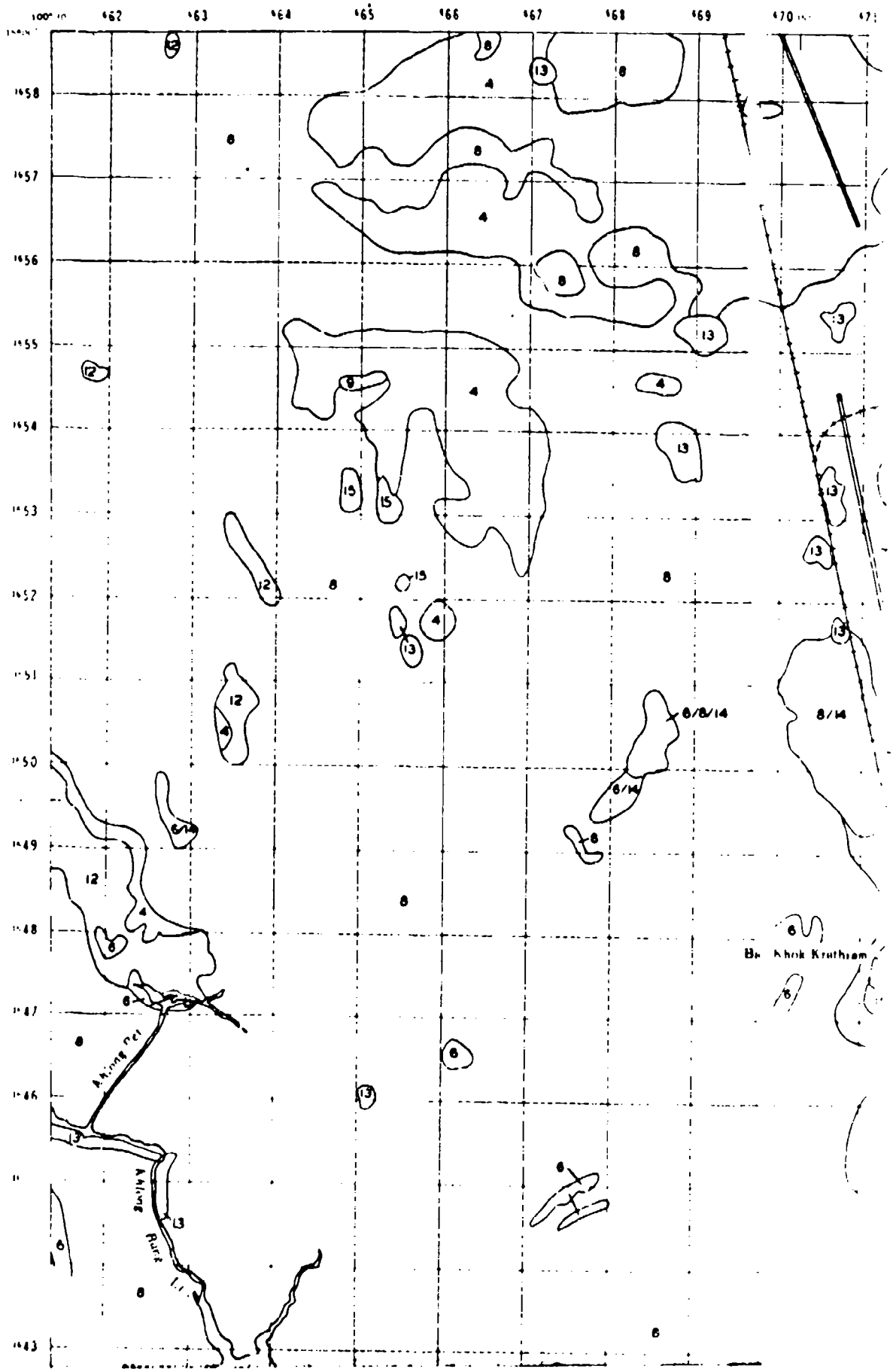
HYDROLOGIC GEOMETRY

NAKHON SAWAN STUDY AREA

SHEET NS V

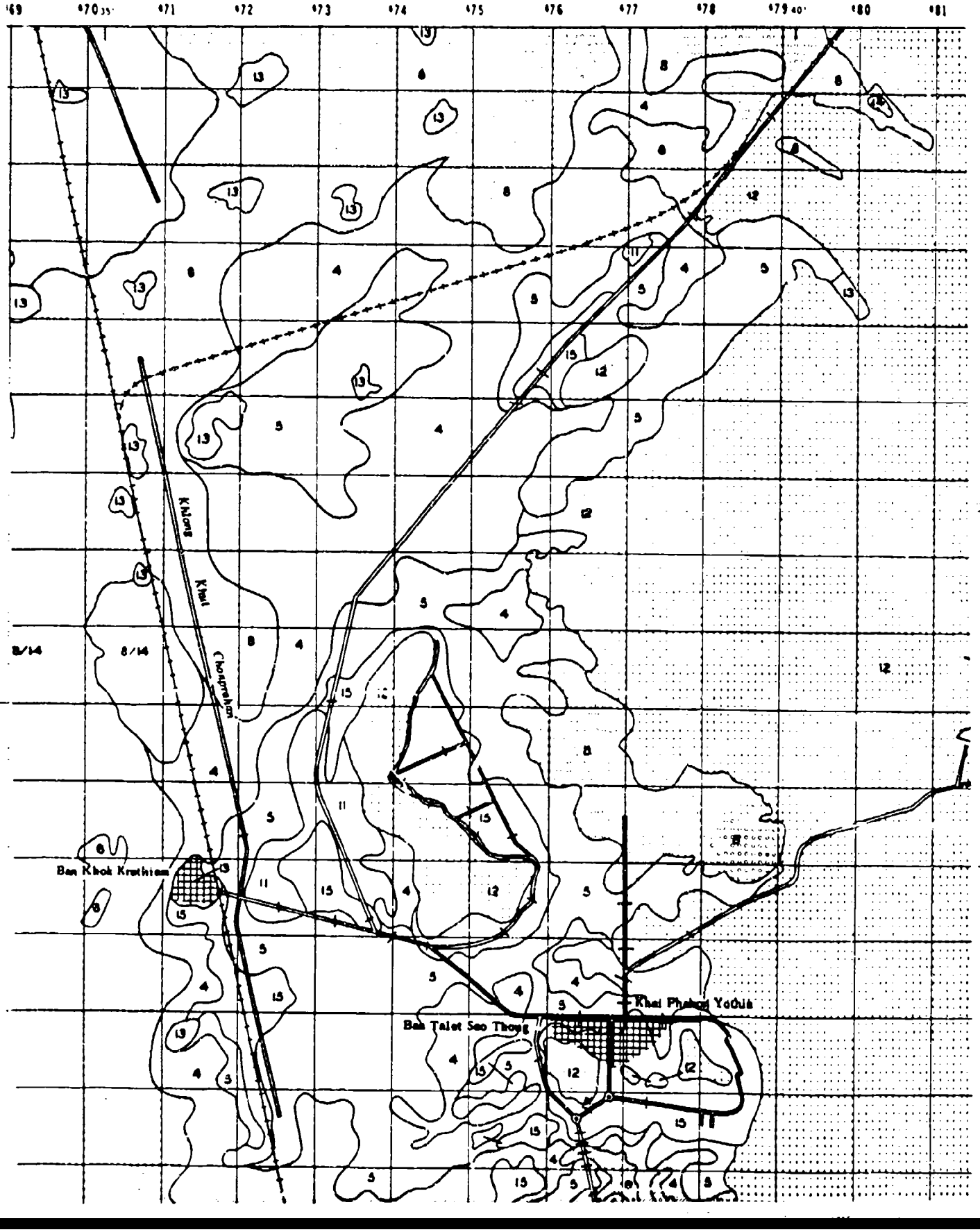
7

PLATE 1.5d

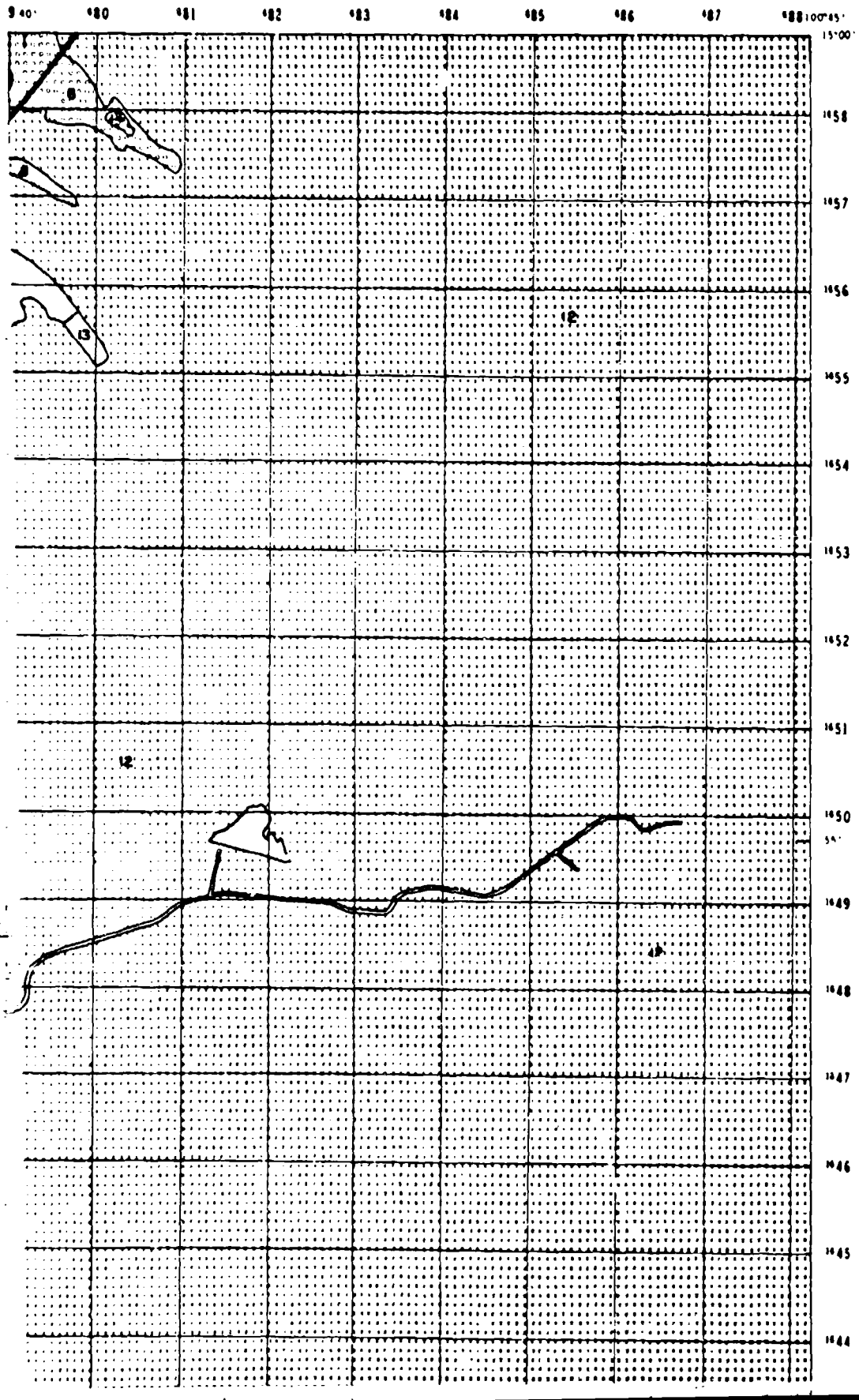

8/8/14
8/14
8/14
Khuk Krathiam
Khlong Dei
White Sand River

2

LOP BURI


Khlong Khai Chonnrahon
Ban Khok Krathiam
Ban Talat Sao Thong
Khai Phakat Yodia

SHEET LB I



Unit	Shear Strength Maximum Moisture	Shear Strength Minimum Moisture	Phase	
	10-25	25-60	0-1	0
	25-60	60-100	0-1	0
	25-60*	60-100	0-1	0
6	25-60	>100	0-1	0
8	25-60*	>100	0-1	0
6	60-100	60-100	0-1	0
	60-100	60-100	0-1	0
8	60-100	>100	0-1	0
9	60-100	>100	0-1	0
	60-100	>100	0-1	0
11	60-100*	>100	0-1	0
12	>100	>100	0-1	0
13	>100	>100	0-1	0
4, 6	Complex of 60-100 and >100	>100	0-1	0
13	Complex of 60-100 and >100	>100	0-1	0

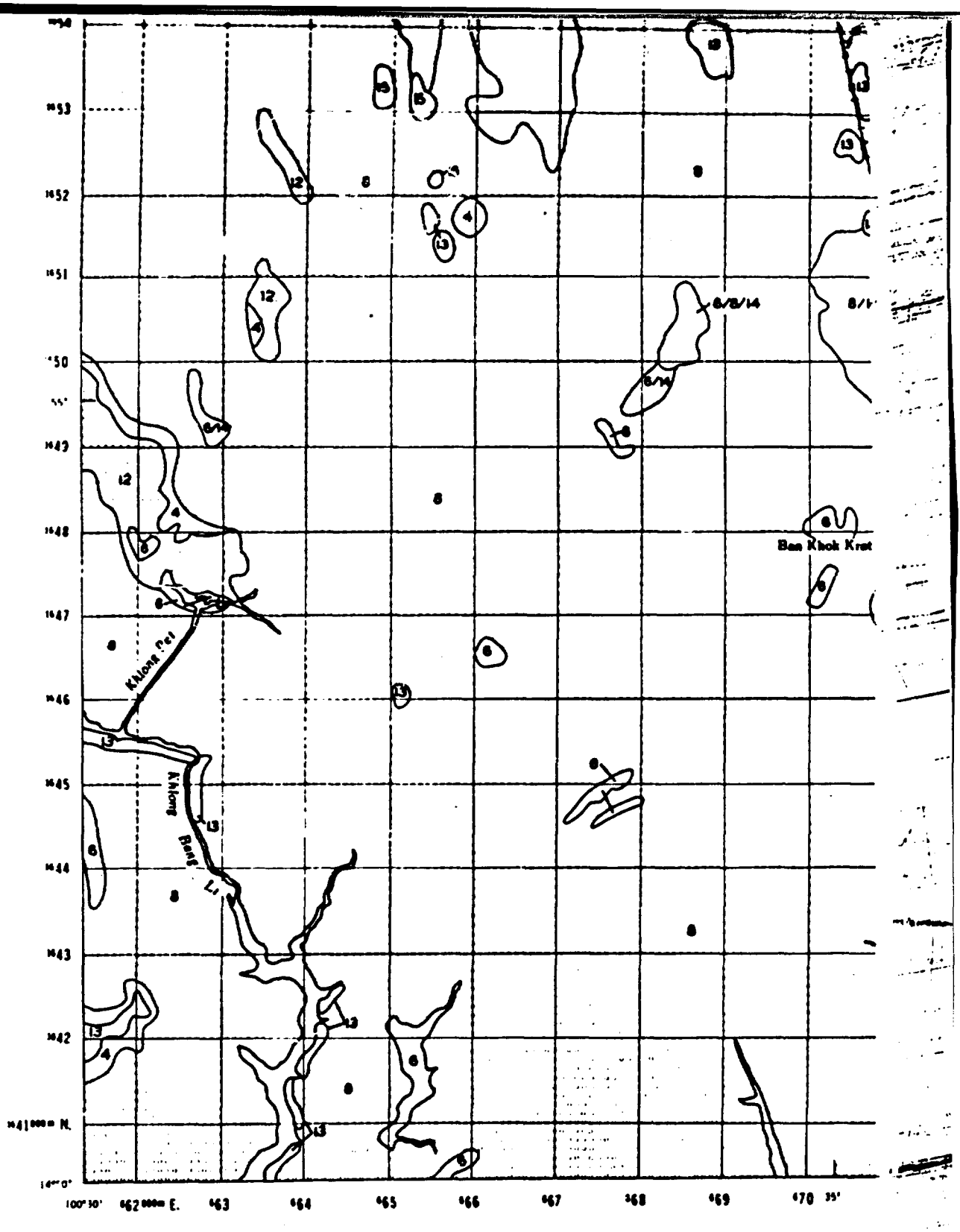
Notes: Black areas are water bodies.

c_{up} Shear strength at zero normal load

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 strengths commonly observed are do

Units do not occur on this map.

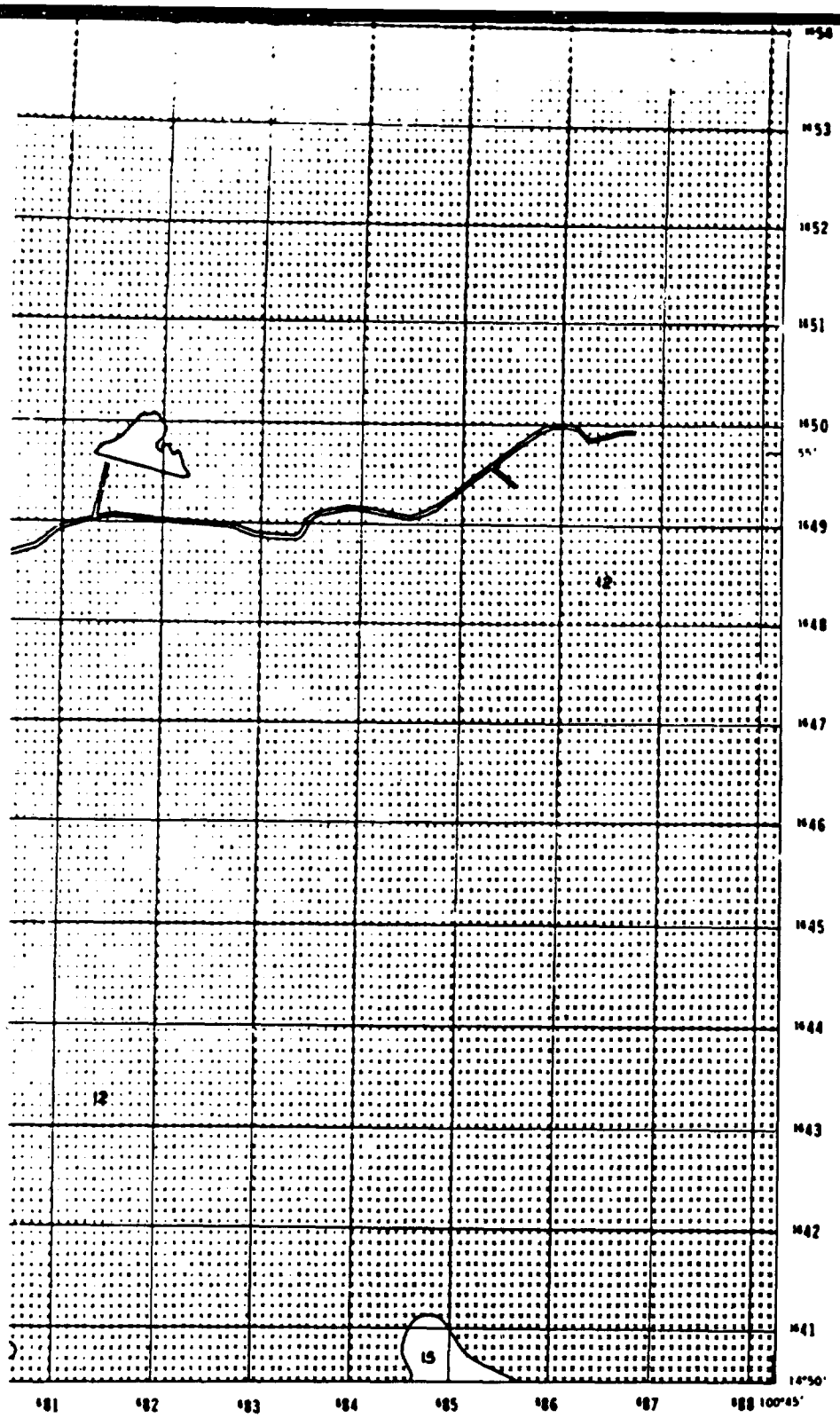


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

4 6


Khlong Khai Chompreham
Ban Khok Krathiam
Ban Talat Sao Thong
Khai Phakon Yodkia
670 35'
671
672
673
674
675
676
677
678
679 40'
680
681
SCALES
1 Statute Miles
4000 Meters
4000 Yards

5



Unit	Soil	Soil	c_{up}	ϕ_{up}	c_{low}	ϕ_{low}
			ppm	kg/cm²	kg/cm²	ppm
	10-75	75-80	0-1	0-0.07	0-10	1-2
	75-80	80-100	0-1	0-0.07	0-10	2-5
	75-80*	80-100	0-1	0-0.07	10-20	2-5
	75-80	>100	0-1	0-0.07	0-10	0-1
	75-80*	>100	0-1	0-0.07	10-20	0-1
6	80-100	80-100	0-1	0-0.07	0-10	2-5
	80-100	80-100	0-1	0-0.07	10-20	0-1
8	80-100	>100	0-1	0-0.07	0-10	0-1
9	80-100	>100	0-1	0-0.07	0-10	0-1
	80-100	>100	0-1	0-0.07	10-20	0-1
11	80-100*	>100	0-1	0-0.07	10-20	0-1
12	>100	>100	0-1	0-0.07	0-10	0-1
13	>100	>100	0-1	0-0.07	10-20	0-1
14	Complex of 80-100 and >100	>100	0-1	0-0.07	0-10	0-1
15	Complex of 80-100 and >100	>100	0-1	0-0.07	10-20	0-1

Note: Blank areas are water bodies.

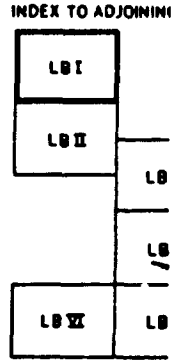
c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent probability strengths commonly observed are 60-100 for Units 3 and

Units do not occur on this map.

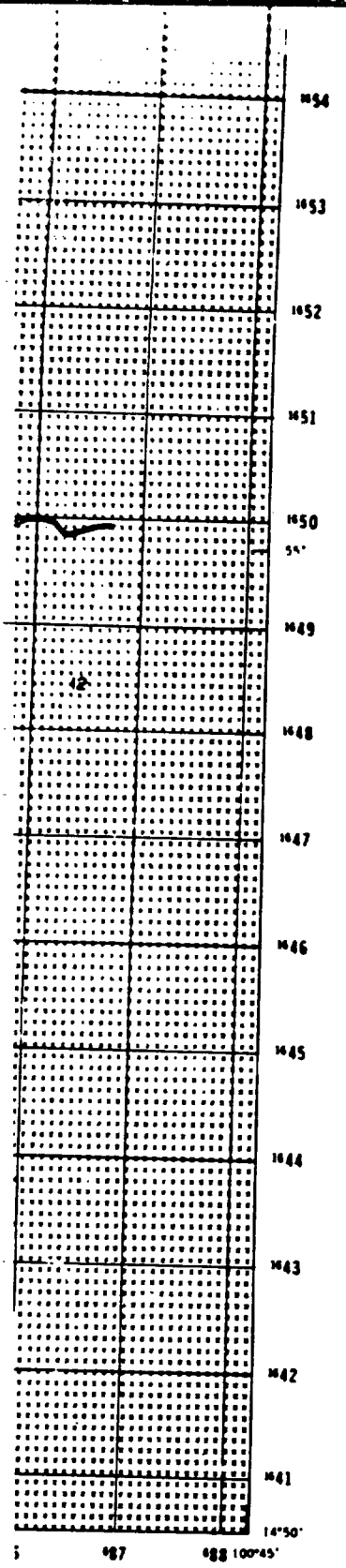
INDEX TO ADJOININ



A QUANTITATIVE METHOD
TERRAIN FOR GROUI

SURFACE COM
LOP BURI STUI
SHEET L

6



Unit	Soil Trafficability: Minimum Moisture: RSI	Soil Trafficability: Maximum Moisture: RSI	Soil Surface Strength: Minimum Moisture: c_{av} psi	c_{av} kg/cm²	ϕ_{av} deg	Soil Surface Strength: Maximum Moisture: c_{av} psi	c_{av} kg/cm²	ϕ_{av} deg	Soil Surface Strength: Continuous Wet Season: c_{av} psi	c_{av} kg/cm²	ϕ_{av} deg
⊠	10-25	25-40	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
⊠	25-40	40-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
6	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
9	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
10 9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11 3	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
5 3	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Notes: Blank areas are water bodies.

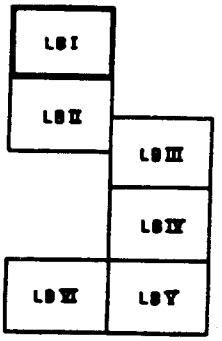
c_{av} Shear strength at zero normal load.

ϕ_{av} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

⊠ Units do not occur on this map.

INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

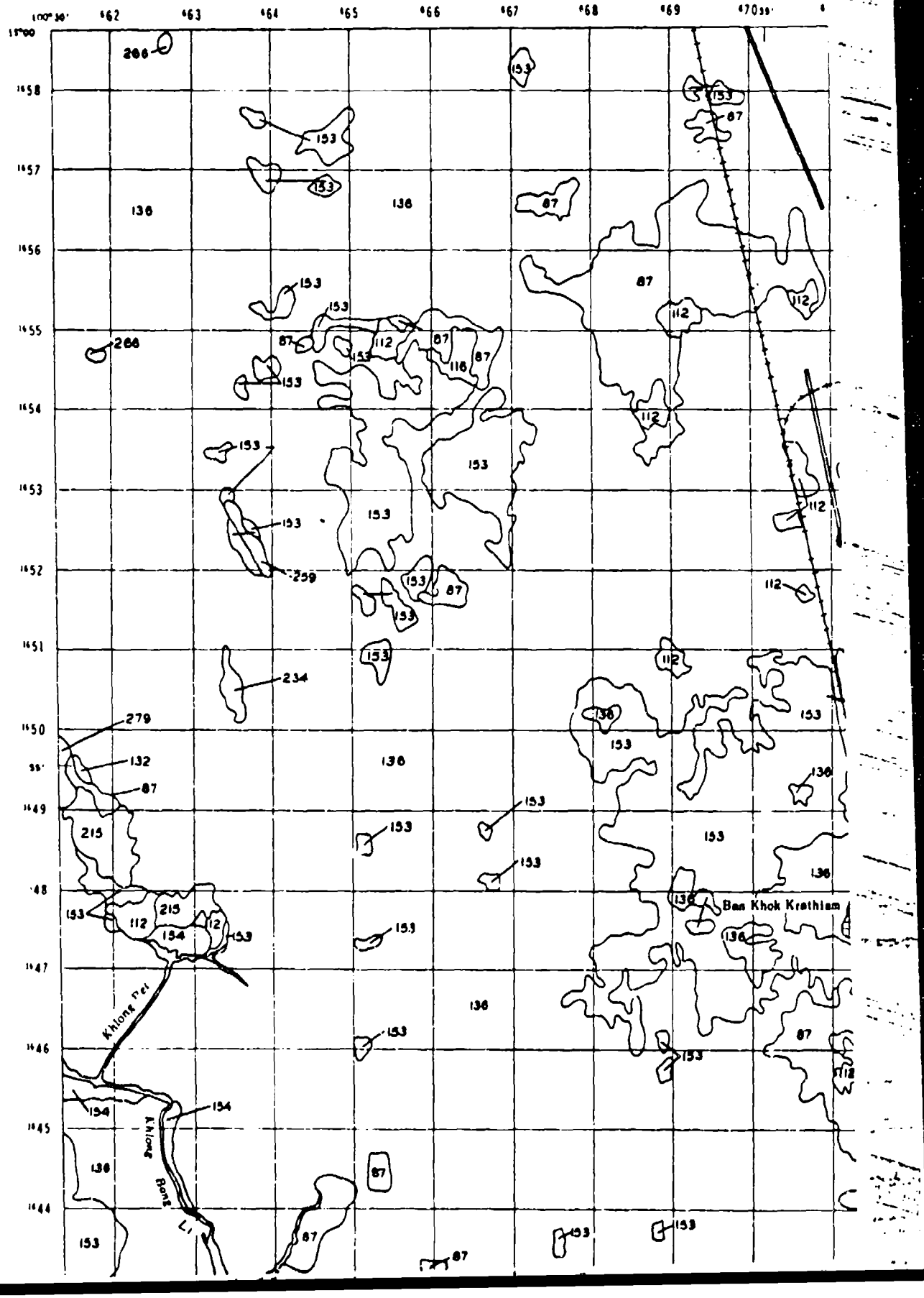
SURFACE COMPOSITION

LOP BURI STUDY AREA

SHEET LB I

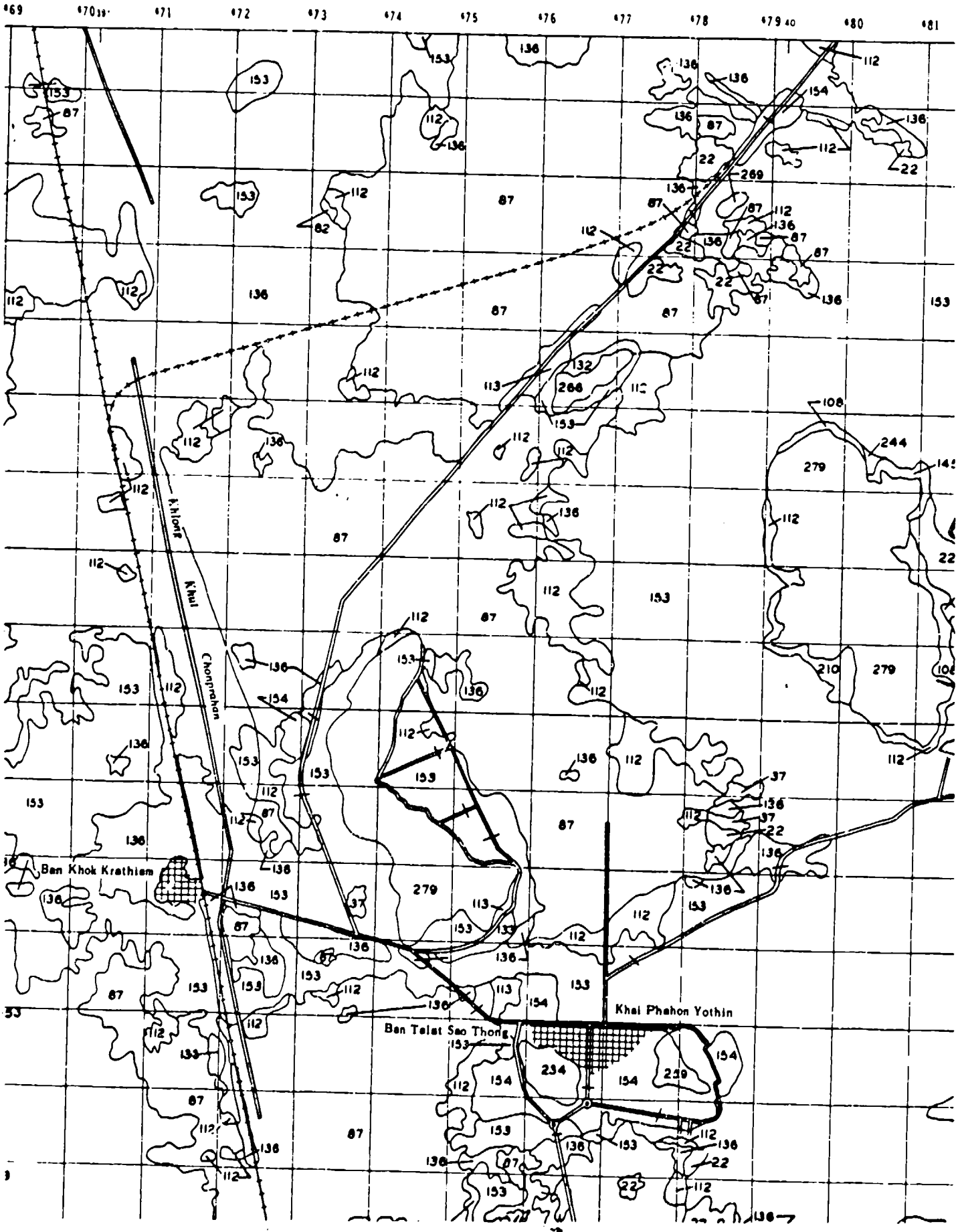
PLATE 2.1a

7


100°30'
662
663
664
665
666
667
668
669
670 30'
15°00
1658
1657
1656
1655
1654
1653
1652
1651
1650
55'
1649
48
1647
1646
1645
1644
266
153
136
87
112
116
259
234
279
132
215
154
Khlong Pai
Khlong Bang Li
Ban Khok Krathiam

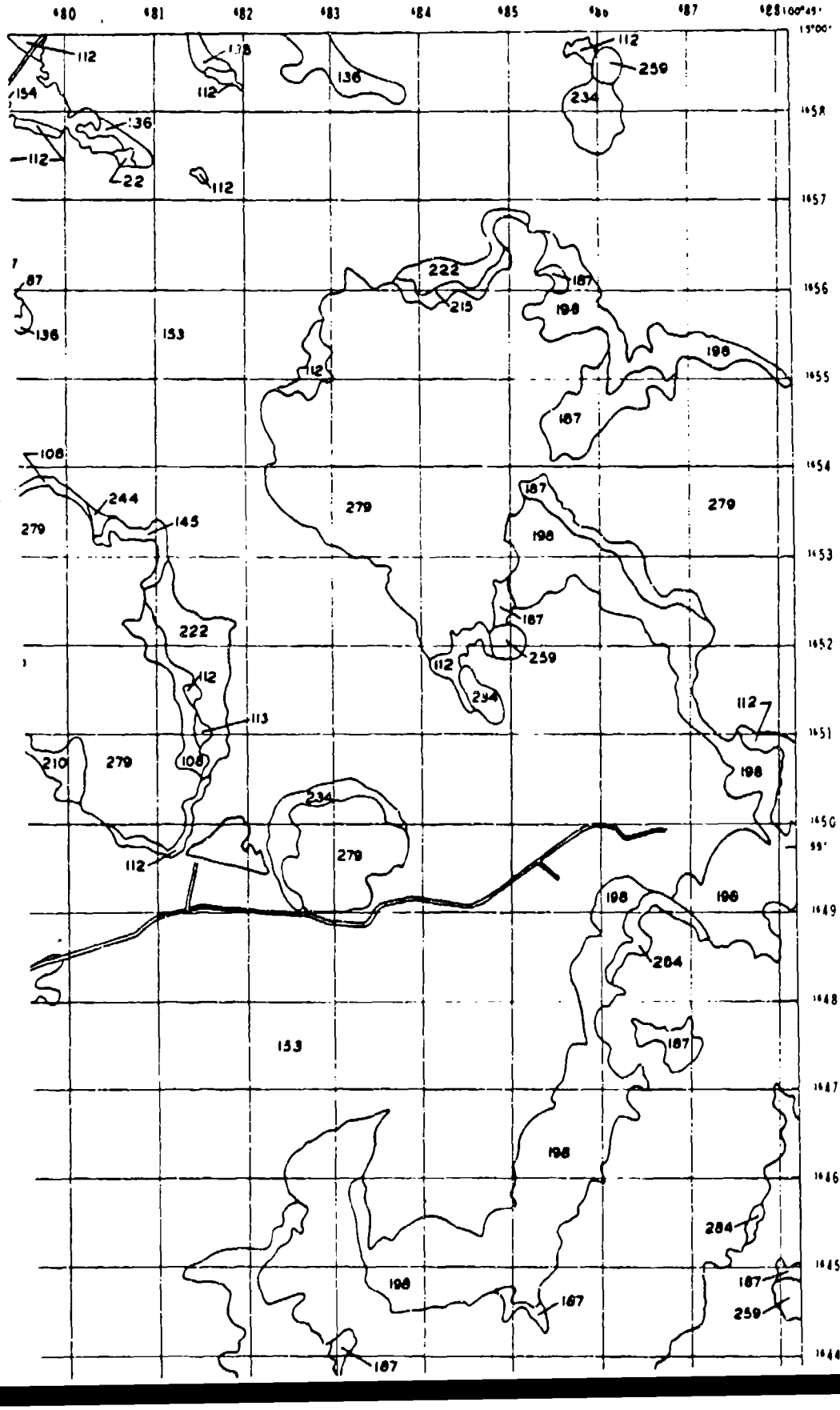
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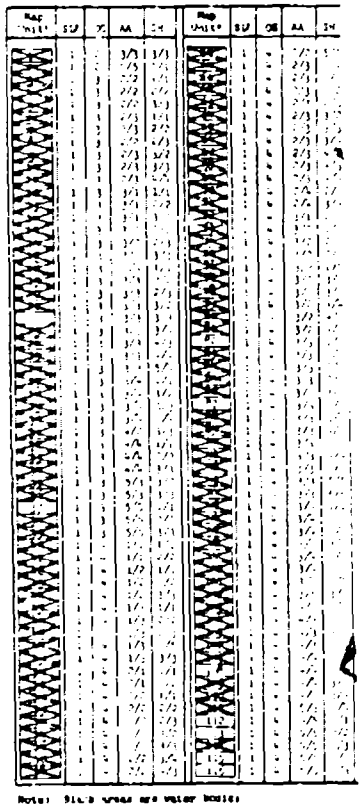
LOP BURI


Khlong Khul Chomphan
Ban Khok Krathiem
Khai Phahon Yothin
Ban Talat Sao Thong

3

SHEET LB I





Note: Black areas are water bodies

* Each map unit represents an array of four symbols (vertical: bedrock spacing OR, spacing OR, slope) separated. The numerator of the fraction indicates slope direction (i.e. azimuth from 0 to 359) and the denominator (i.e. 1 to 360 deg) assuming that the vehicle is

† Mapping index ranges of each surface property

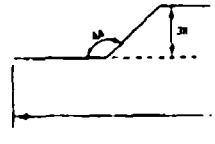
Slope (SL)

Mapping Class	Range deg
1	0-1.5
2	> 1.5-4.9
3	> 4.9-9
4	> 9-15
5	> 15-30
6	> 30-45
7	> 45

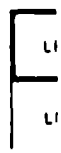
Vertical Obstacle Spacing (OR)

Mapping Class	Range ft	Range m
1	0-3	0-1
2	> 3-12	> 1-3
3	> 12-25	> 3-7
4	> 25-150	> 7-45
5	> 150	> 45

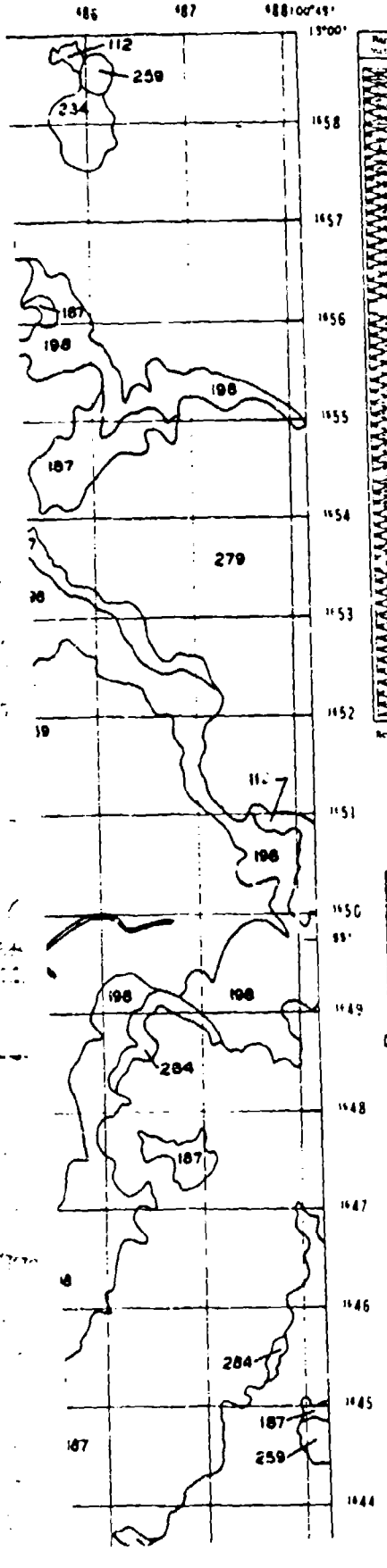
Units to not occur on this map.



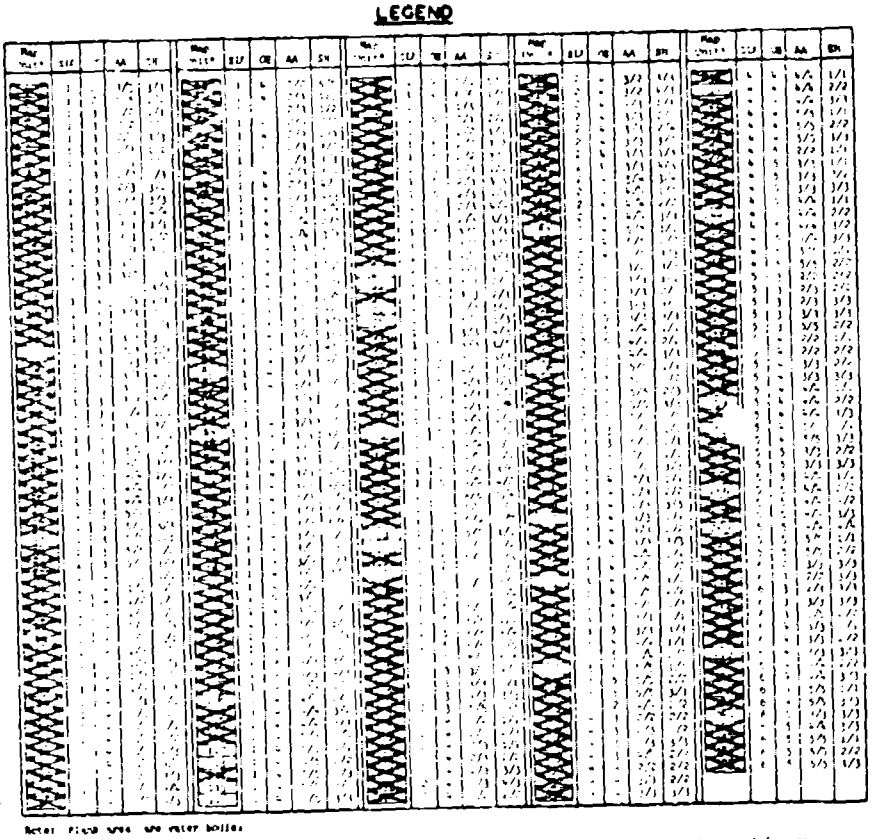
INDEX



SHEET LB I



LEGEND



Note: Piece area and meter bolles

* Each map unit represents an array of four symbols (i.e. 1, 2, 3/3, 1/3) indicating mapping classes of slope SL (see diagram below), vertical obstacle spacing OB, approach angle AA, and step height SH. Fractional terminations indicate that dual classes will be encountered while traversing an area in an approximately equal proportion. The numerator of the fraction indicates the class that will be encountered while traversing an area in an easterly direction (i.e. azimuth from 0° to 180°) and the denominator refers to a westerly direction (i.e. azimuth from 180° to 360°) assuming that the vehicle intersects the obstacle at a right angle.

* Mapping limit ranges for each surface geometry in the area

Slope (SL)

Mapping Class	Range deg
1	0-5
2	> 5 - 15
3	> 15 - 25
4	> 25 - 35
5	> 35 - 45
6	> 45 - 55
7	> 55

Vertical Obstacle Spacing (OB)

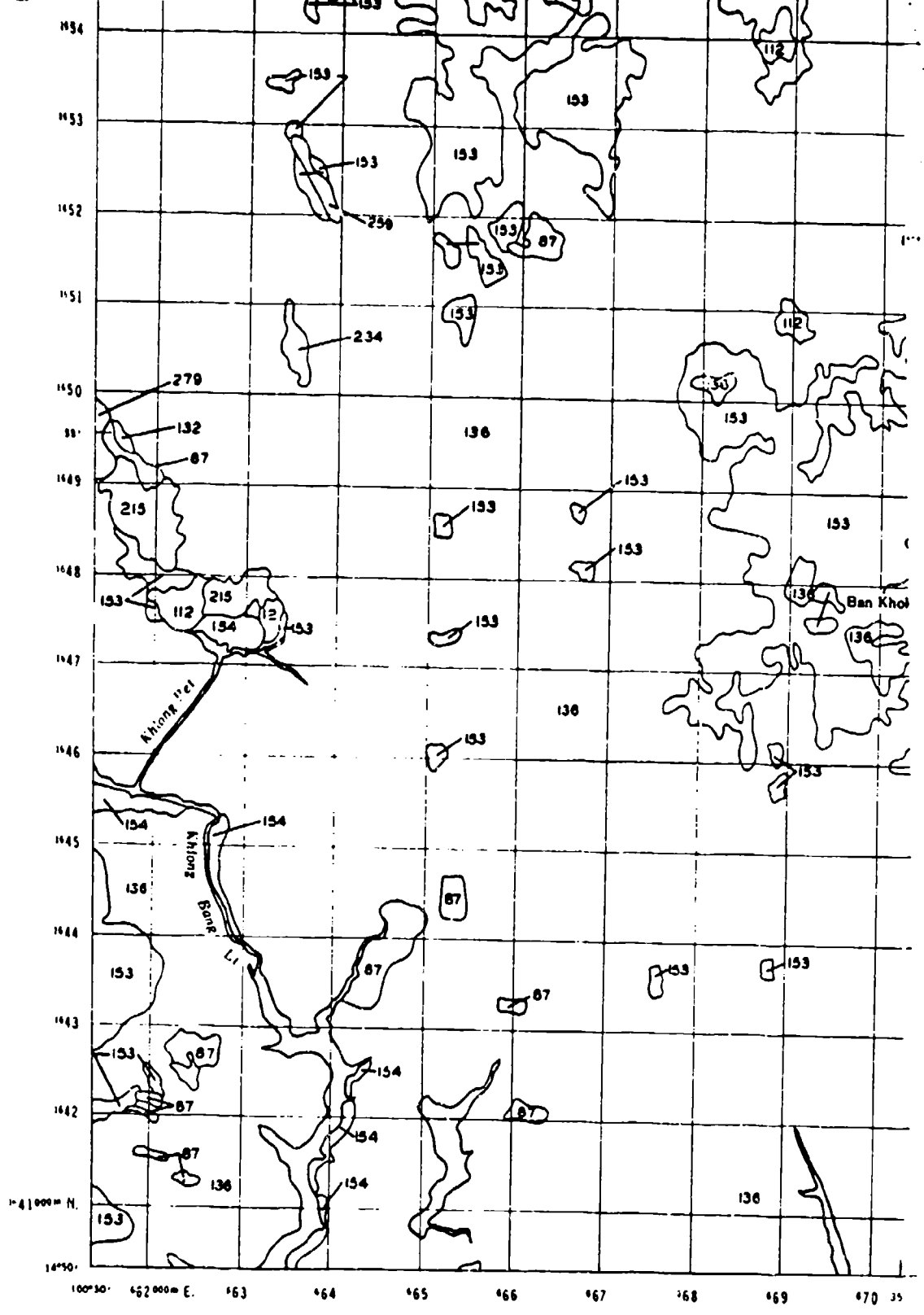
Mapping Class	Range	
	ft	m
1	>47	>14.33
2	> 47 - 27	> 8.23 - 14.33
3	> 27 - 15	> 4.57 - 8.23
4	> 15 - 7½	> 2.29 - 4.57
5	> 7½	> 2.29

Approach Angle (AA)

Mapping Class	Range deg
1	< 115
2	115 < 125
3	125 < 135
4	135 < 145
5	145 < 155
6	155 < 165
7	165 < 175
8	175 < 185
9	185 < 195
10	195 < 205
11	205 < 215
12	215 < 225
13	225 < 235
14	235 < 245
15	245 < 255
16	255 < 265
17	265 < 275
18	275 < 285
19	285 < 295
20	295 < 305
21	305 < 315
22	315 < 325
23	325 < 335
24	335 < 345
25	345 < 355
26	355 < 365
27	365 < 375
28	375 < 385
29	385 < 395
30	395 < 405
31	405 < 415
32	415 < 425
33	425 < 435
34	435 < 445
35	445 < 455
36	455 < 465
37	465 < 475
38	475 < 485
39	485 < 495
40	495 < 505
41	505 < 515
42	515 < 525
43	525 < 535
44	535 < 545
45	545 < 555
46	555 < 565
47	565 < 575
48	575 < 585
49	585 < 595
50	595 < 605
51	605 < 615
52	615 < 625
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55	645 < 655
56	655 < 665
57	665 < 675
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67	765 < 775
68	775 < 785
69	785 < 795
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77	865 < 875
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91	1005 < 1015
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96	1055 < 1065
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109	1185 < 1195
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213	2225 < 2235
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216	2255 < 2265
217	2265 < 2275
218	2275 < 2285
219	2285 < 2295
220	2295 < 2305
221	2305 < 2315
222	2315 < 2325
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224	2335 < 2345
225	2345 < 2355
226	2355 < 2365
227	2365 < 2375
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229	2385 < 2395
230	2395 < 2405
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232	2415 < 2425
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263	2725 < 2735
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265	2745 < 2755
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269	2785 < 2795
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275	2845 < 2855
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277	2865 < 2875
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285	2945 < 2955
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316	3255 < 3265
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345	3545 < 3555
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348	3575 < 3585
349	3585 < 3595
350	3595 < 3605
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352	3615 < 3625
353	3625 < 3635
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359	3685 < 3695
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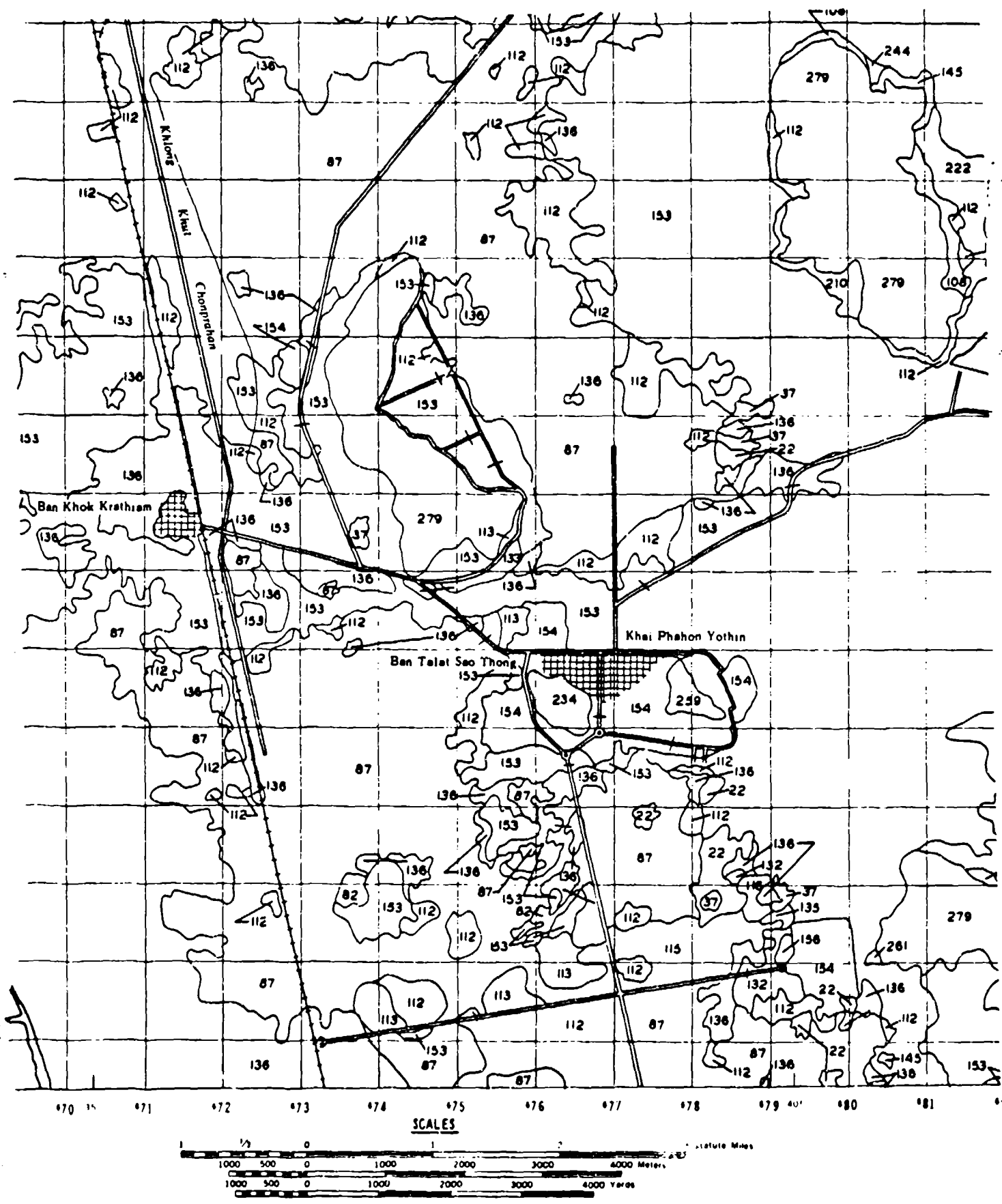
Step Height (SH)

Mapping Class	Range	
	in	cm
1	0 - < 10	0 - < 25.4
2	10 - < 20	25.4 - < 50.8
3	20 - < 30	50.8 - < 76.2

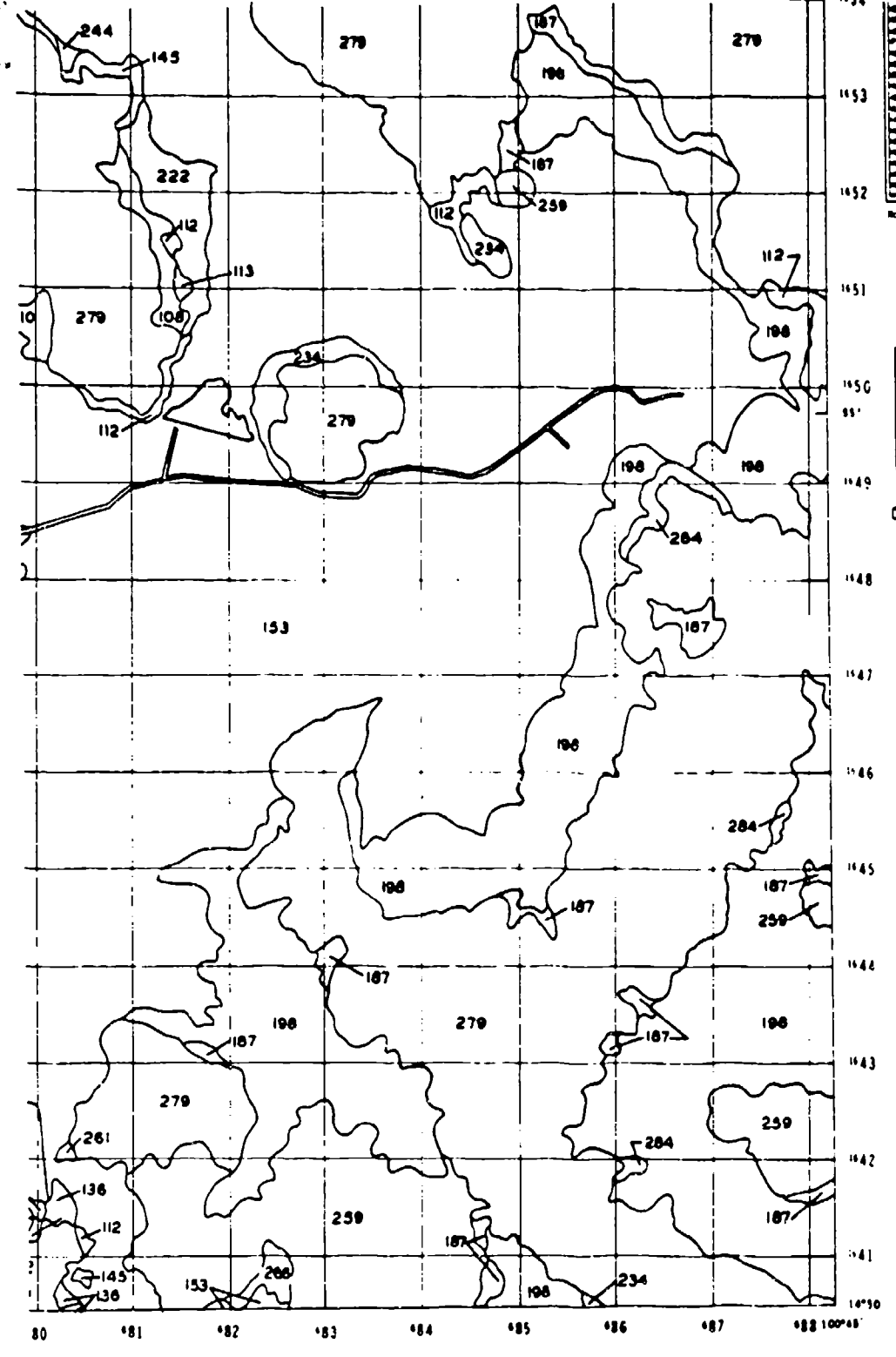


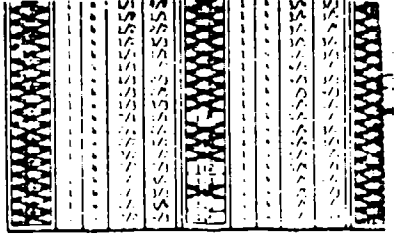
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

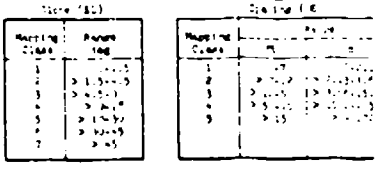
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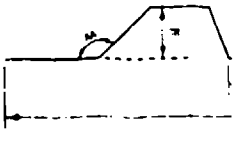

Khlong Khut Chonprahon
Ban Khok Krathiam
Khai Phahon Yothin
Ban Talat Seo Thong
SCALES

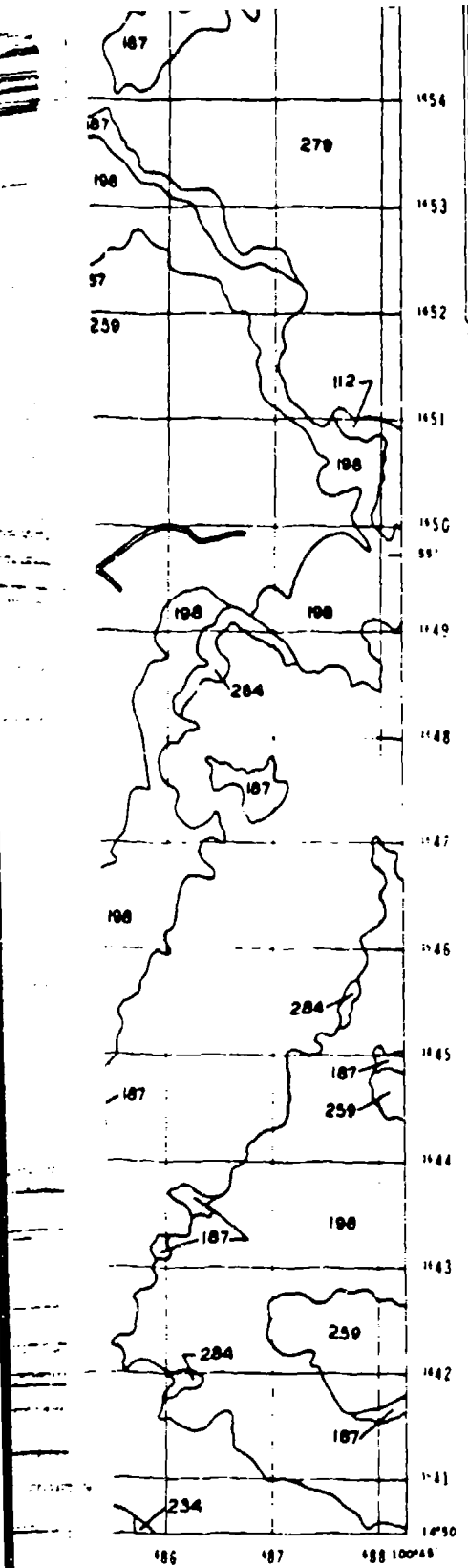
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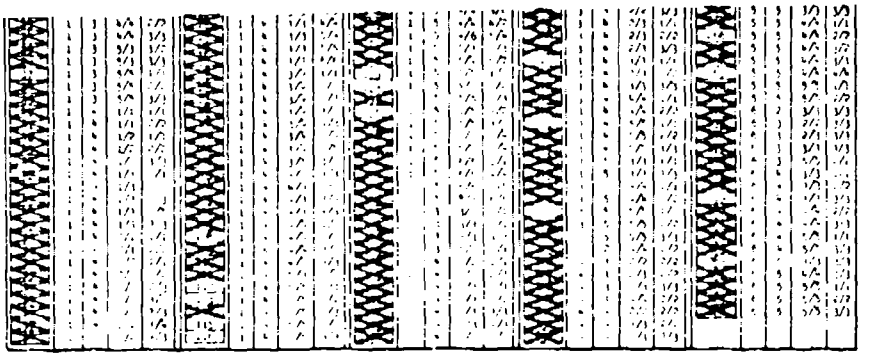

244
145
279
187
198
279
222
187
112
259
112
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234
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108
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234
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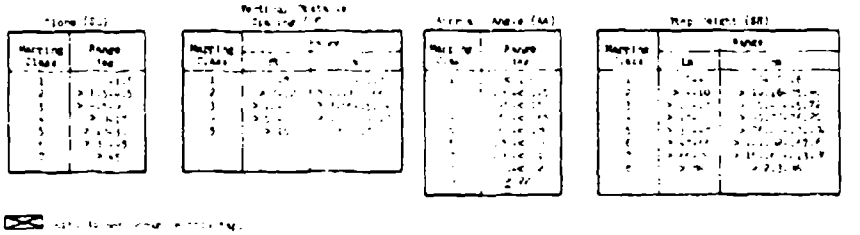


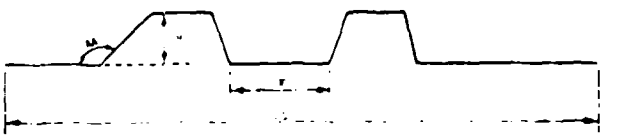




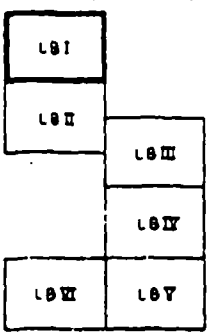








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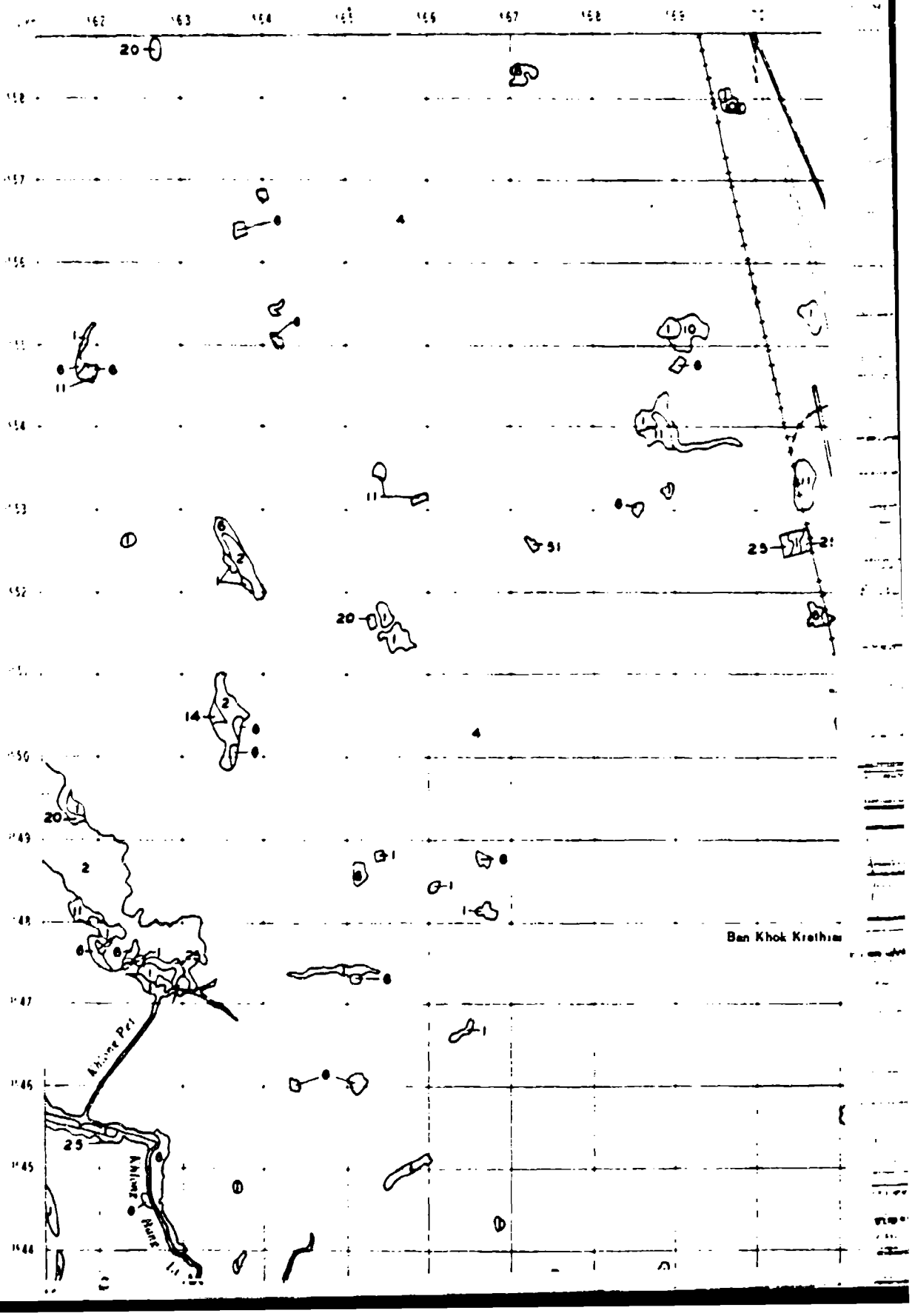
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

LOP BURI STUDY AREA

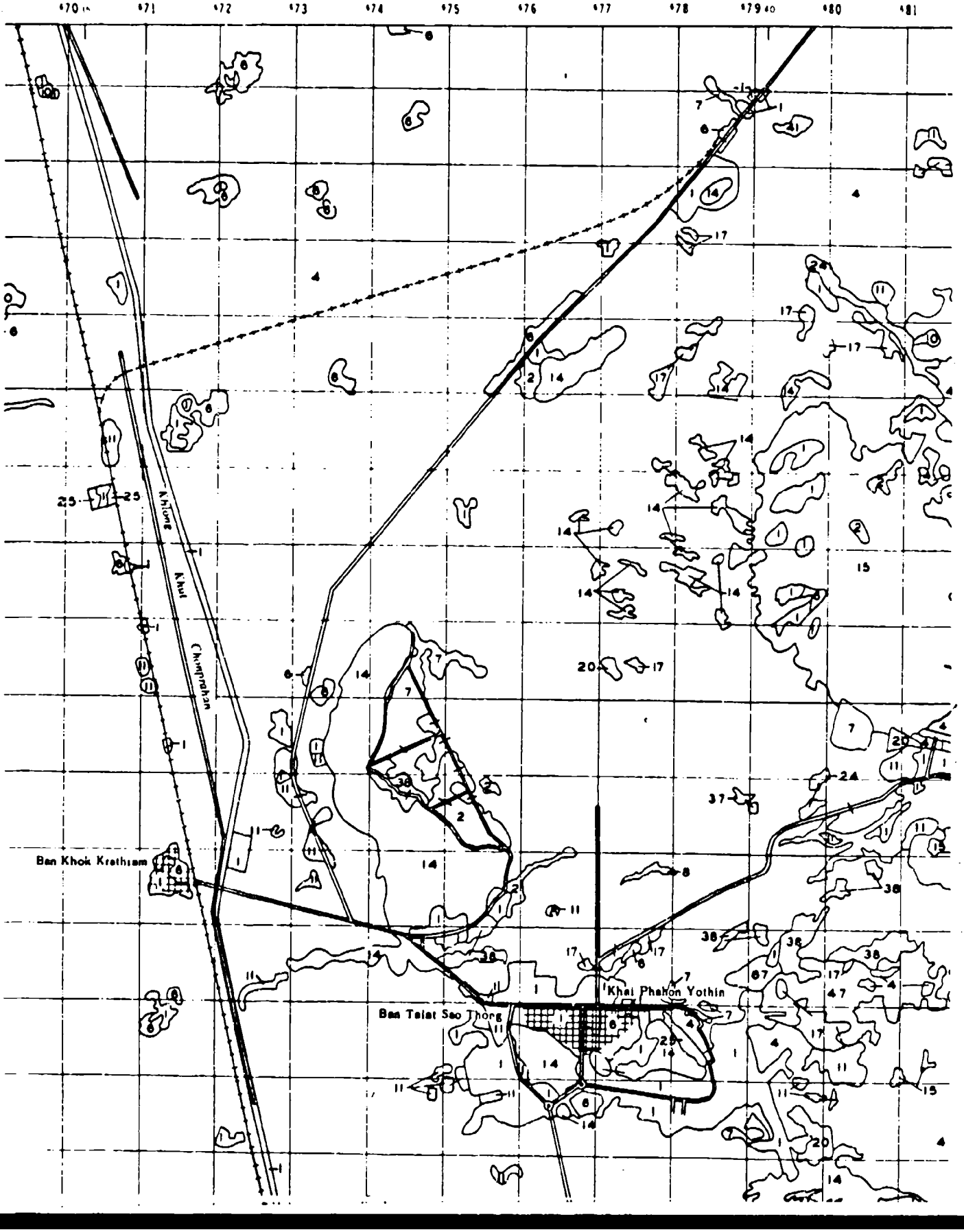
SHEET LB I

PLATE 2.1b


Ban Khok Krathiam

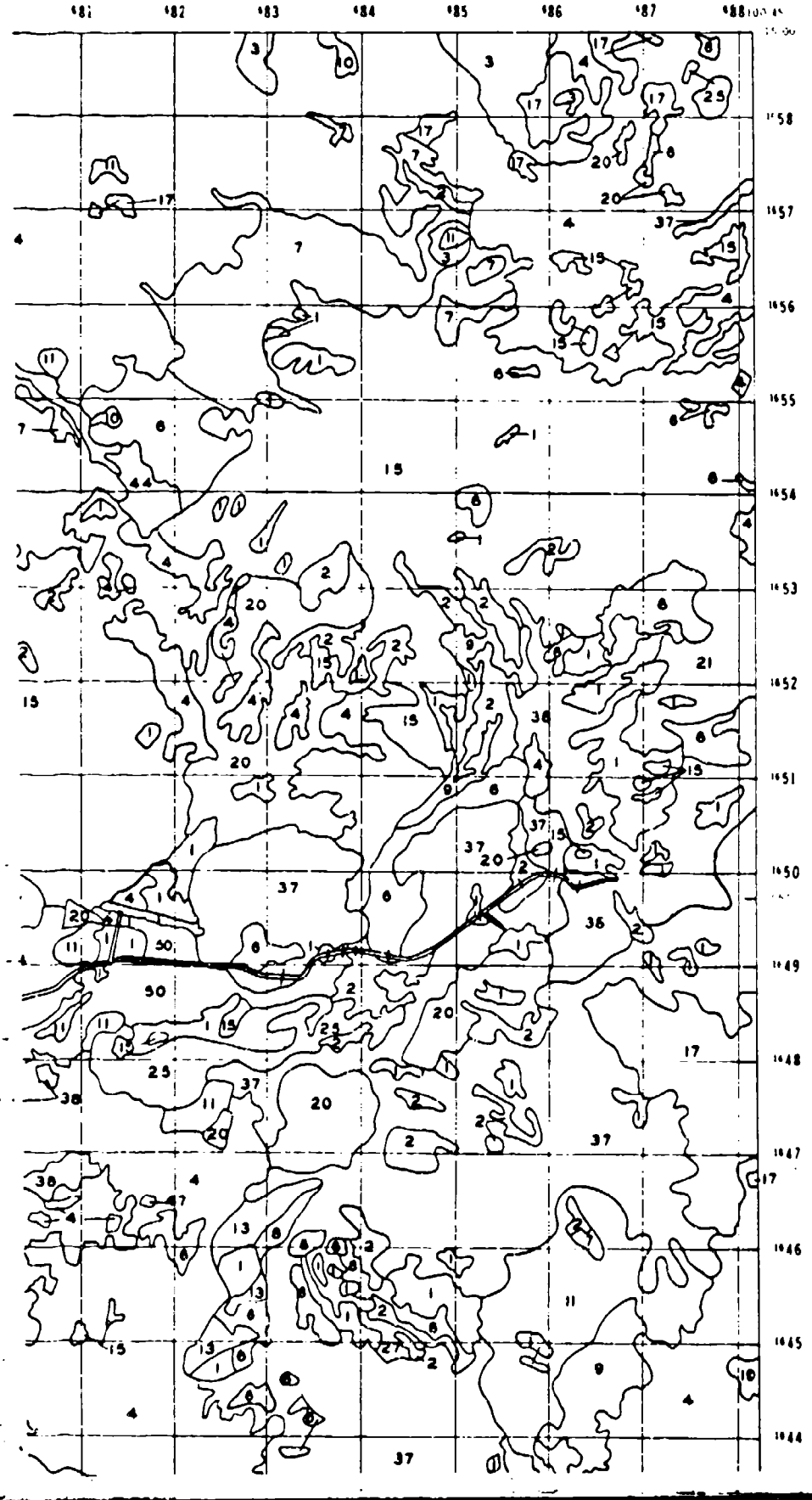
1 2

LOP BURI

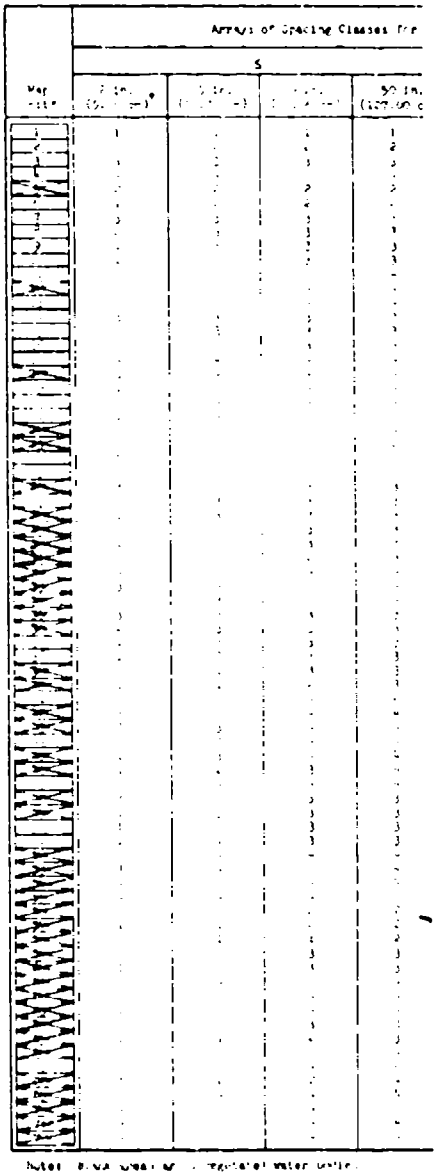

Khlong Khui Champhaen
Ban Khok Krathiam
Khai Phakon Yothin
Ban Talat Sao Thong

3

SHEET LB I



LEGE



Areas of Spacing Classes for

S

Map Unit

Notes: Blue lines on the map indicate areas of water.

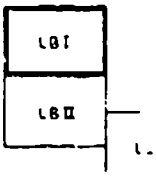
* Each map unit may have one or more of eight symbols indicating the spacing classes and density classes.

** Spacing class is a range of possible spacing class area.

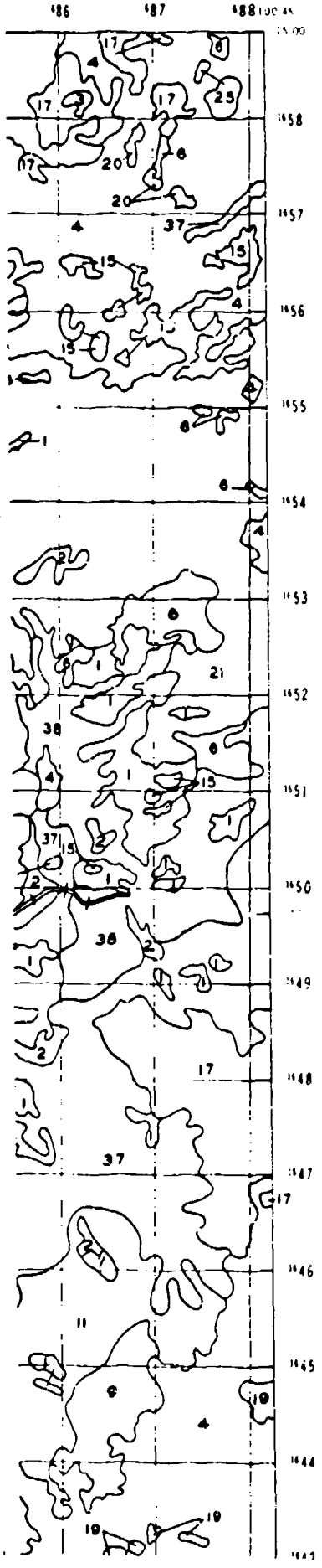
Spacing Class	ft
1	> 17
2	> 17
3	> 17

Drilling not carried out on this map.

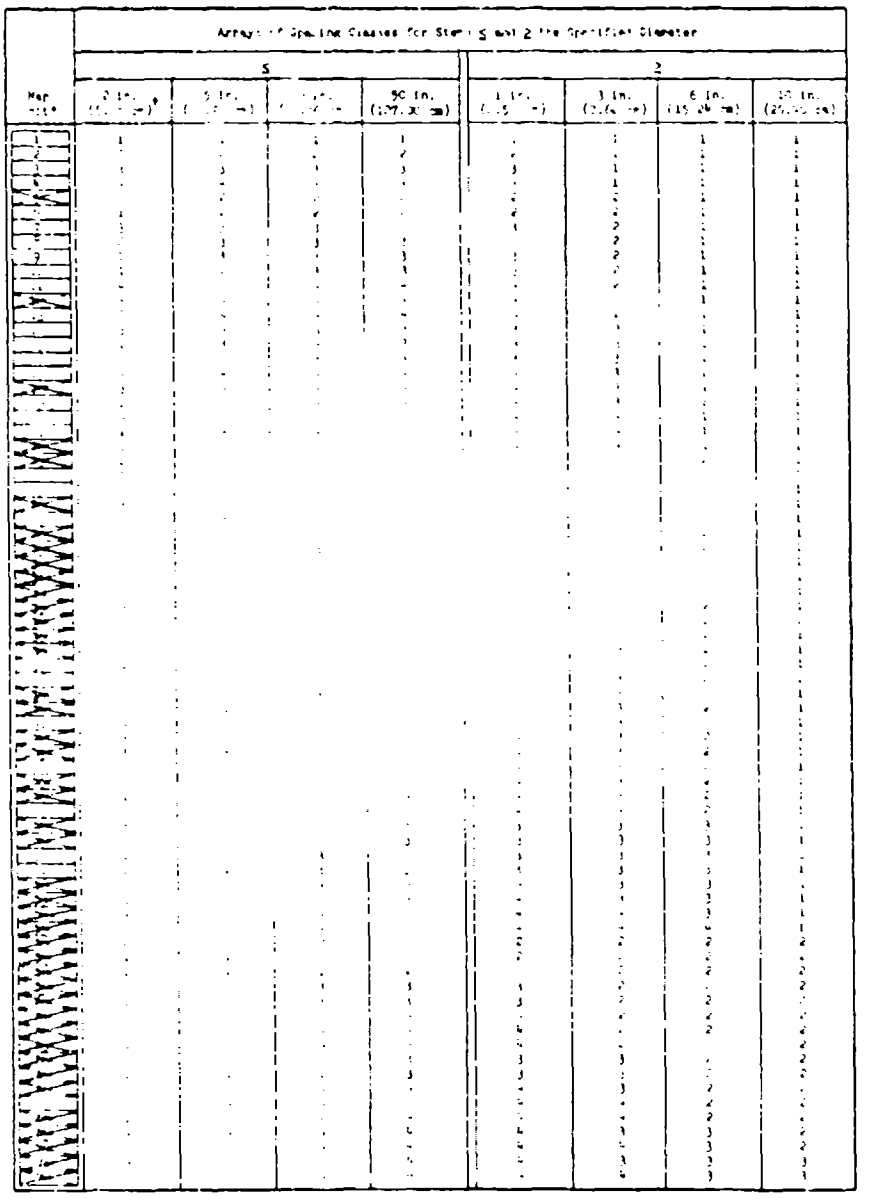
INDEX TO ADJOINI



SHEET LB I



LEGEND



Note: Blank areas are impenetrable water bodies.

* The map unit representation is an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1) indicating spacing classes 5 (5.08, 12.70, 25.40, and 127.00 cm) and 2 (2.54, 7.62, 15.24, and 50.80 cm).

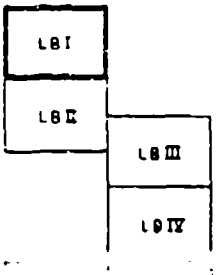
† Mapping Units Pauses: For explanation of Mapping Units see text.

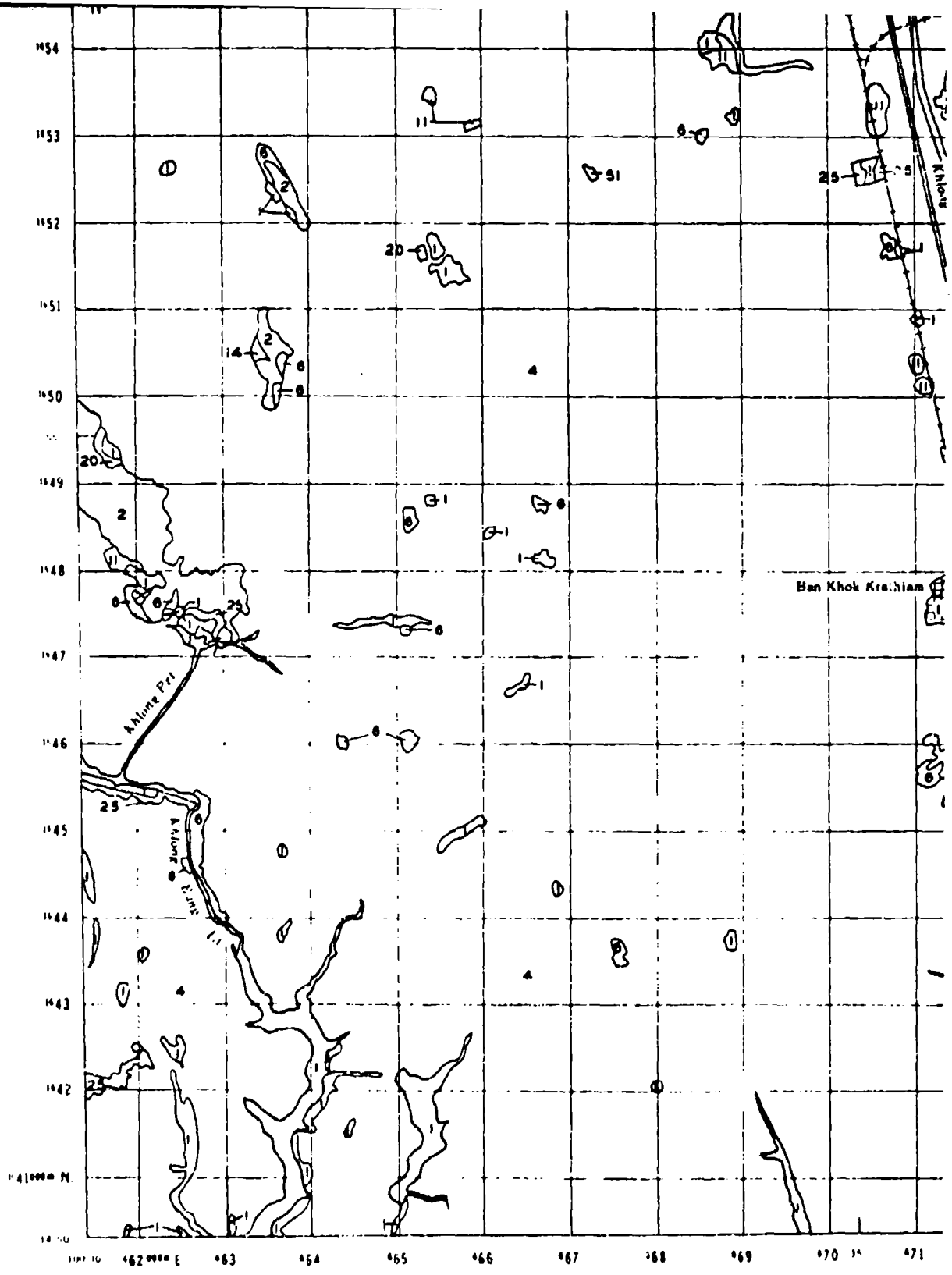
Item Spacing

Mapping Units	Pause	
	ft	m
1	> 30	> 9.14
2	> 15-30	> 4.57-9.14
3	> 5-15	> 1.52-4.57
4	0-5	0-1.52

Units to extend off the Base Map

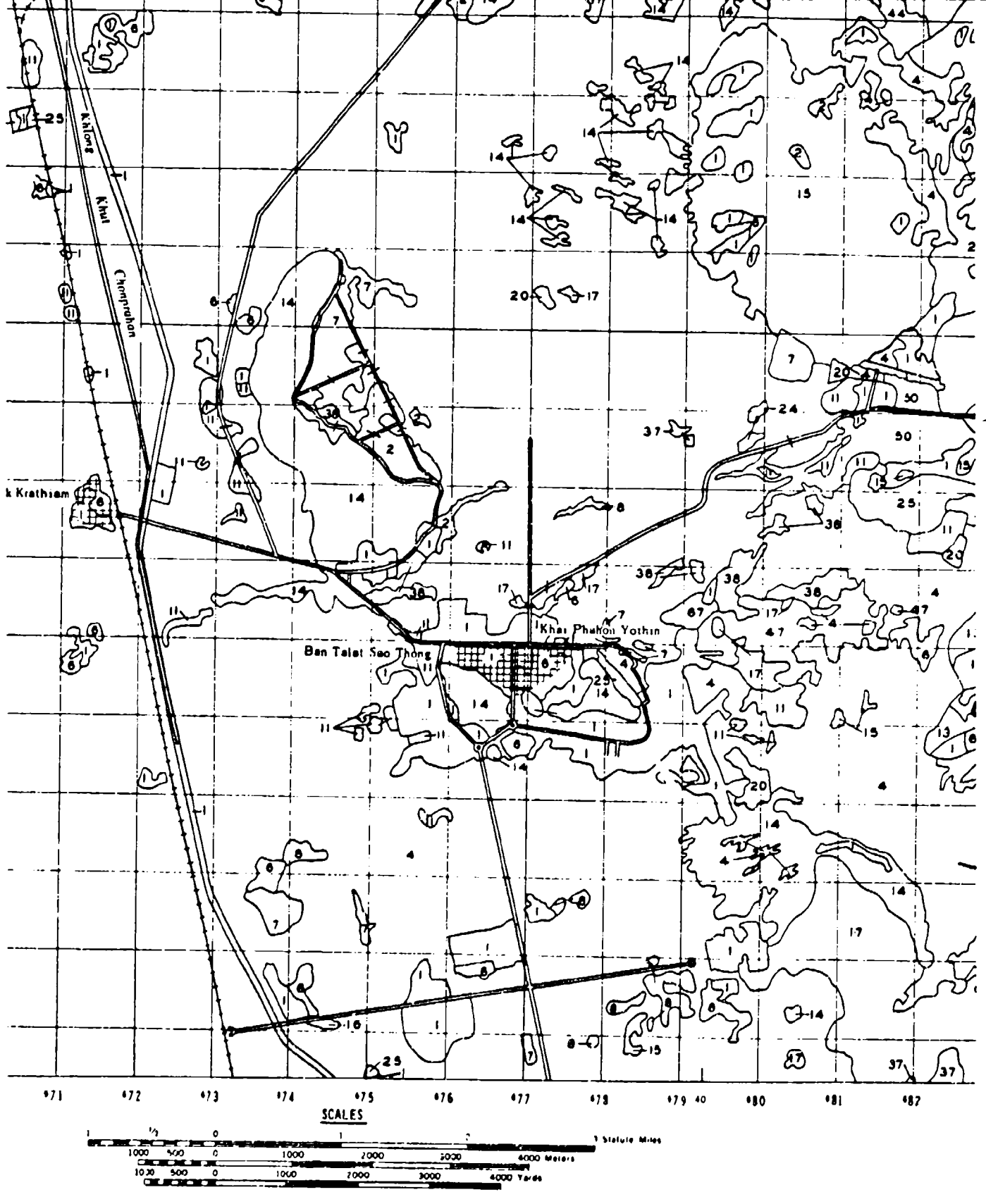
INDEX TO ADJOINING SHEETS



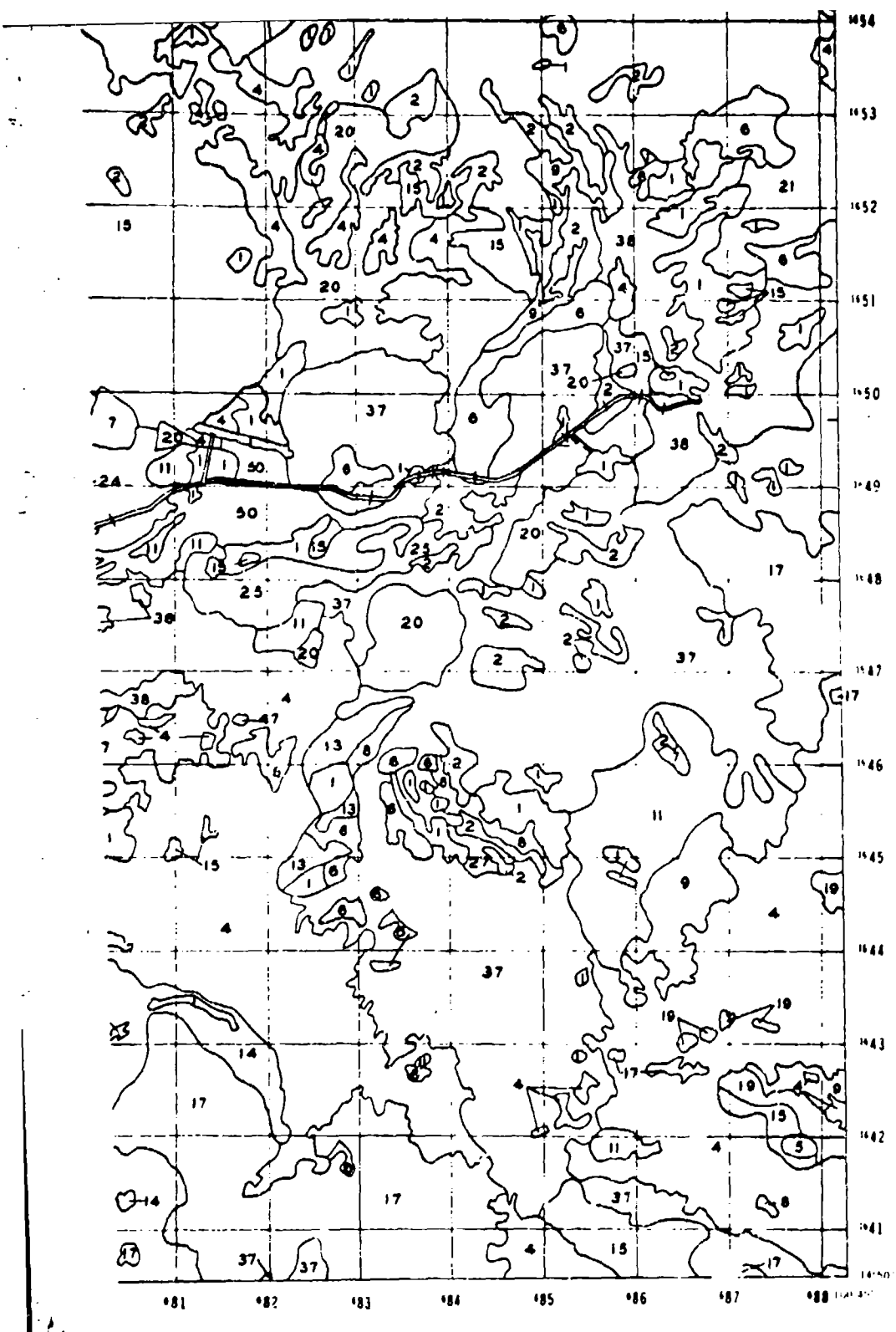


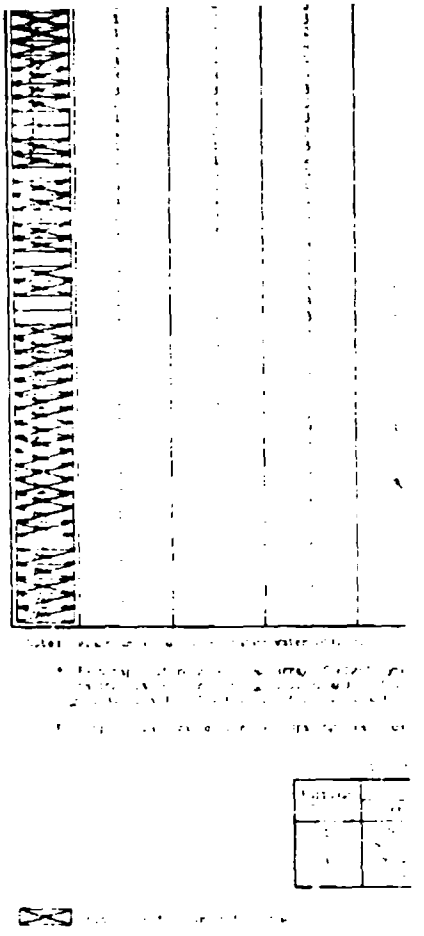
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

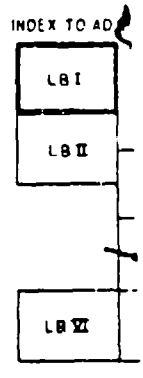
5


Khlong Khut Chomprahon
k Krathiam
Khet Phahon Yothin
Ban Talat Seo Thong
971
972
973
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978
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980
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982
SCALES
Statute Miles
Meters
Yards

6







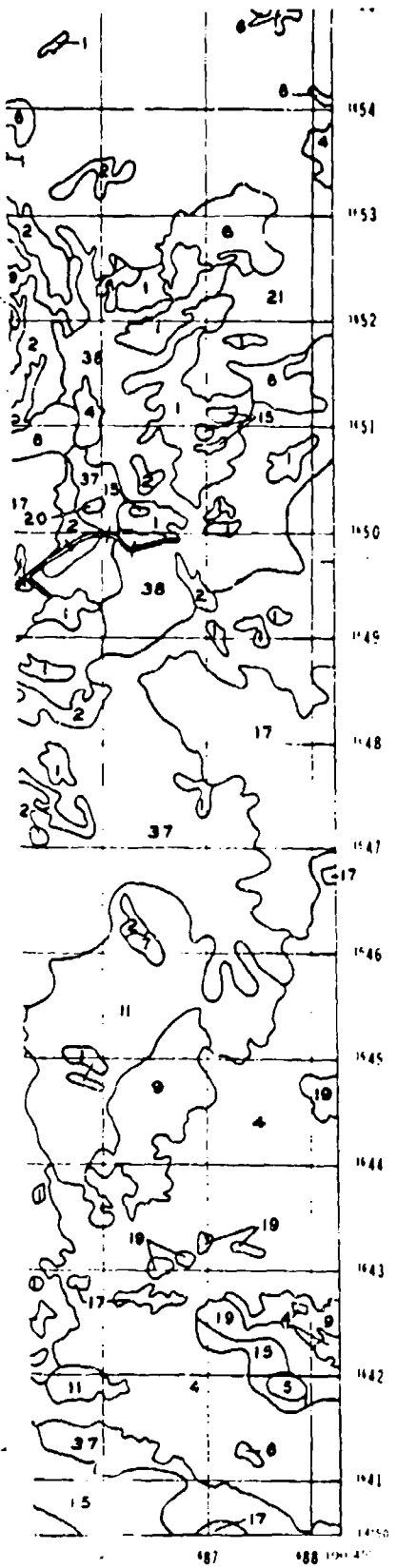
A QUANTITATIVE METH
TERRAIN FOR GR(

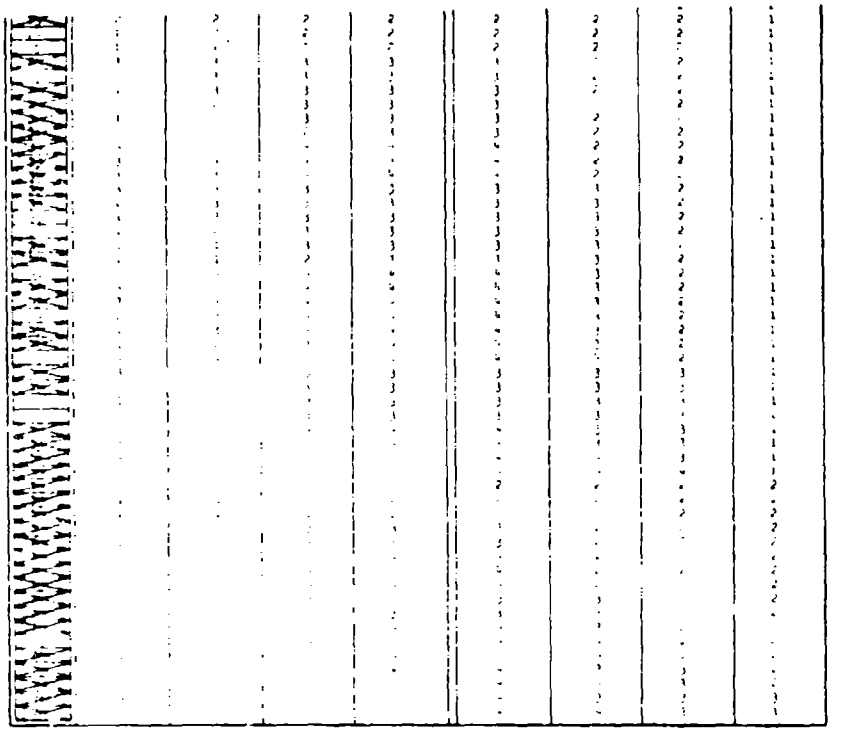
VEGETA

LOP BURI ST

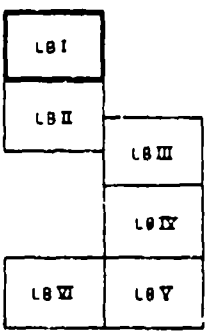
SHEET

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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

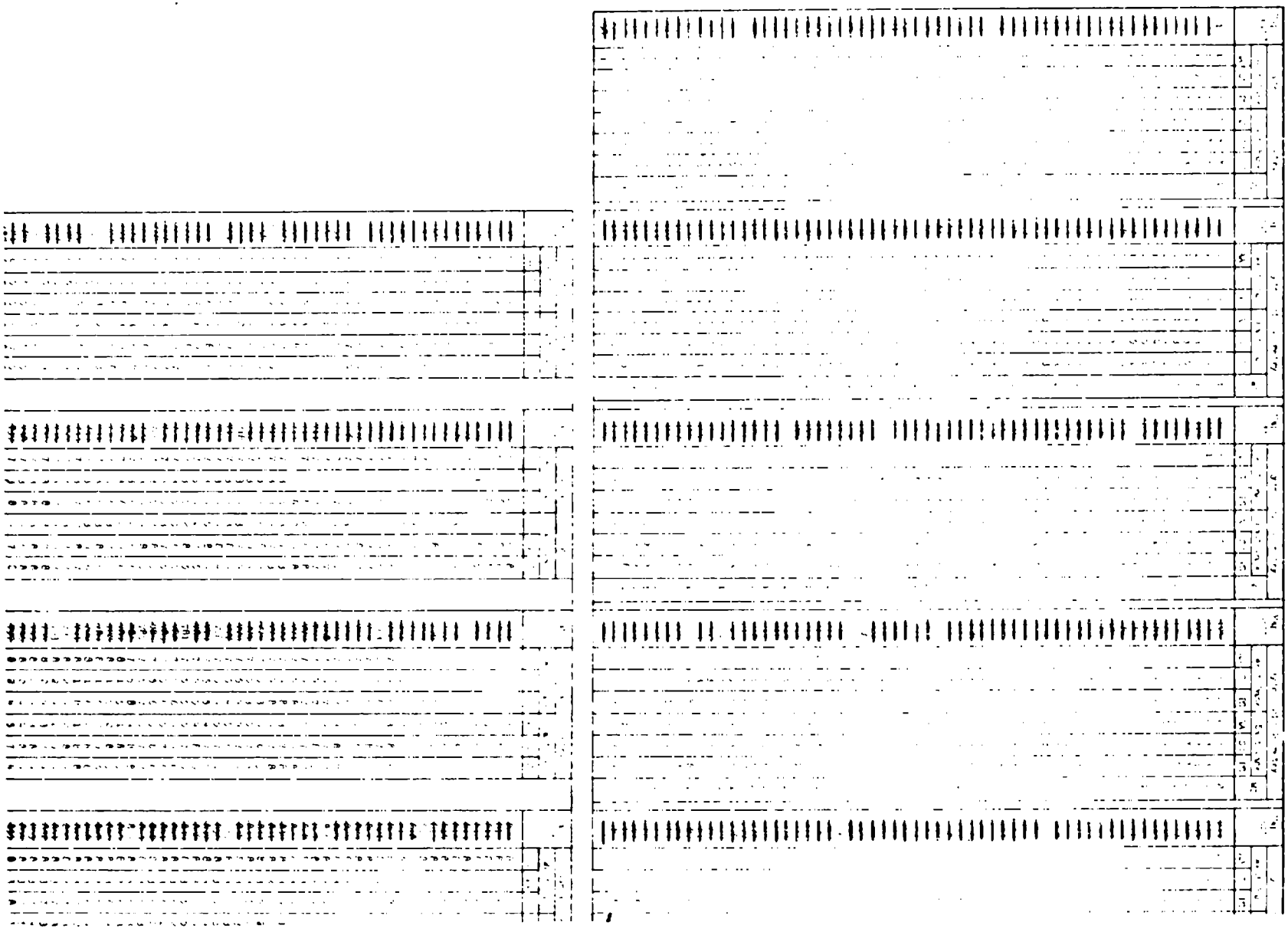
VEGETATION

LOP BURI STUDY AREA

SHEET LB I

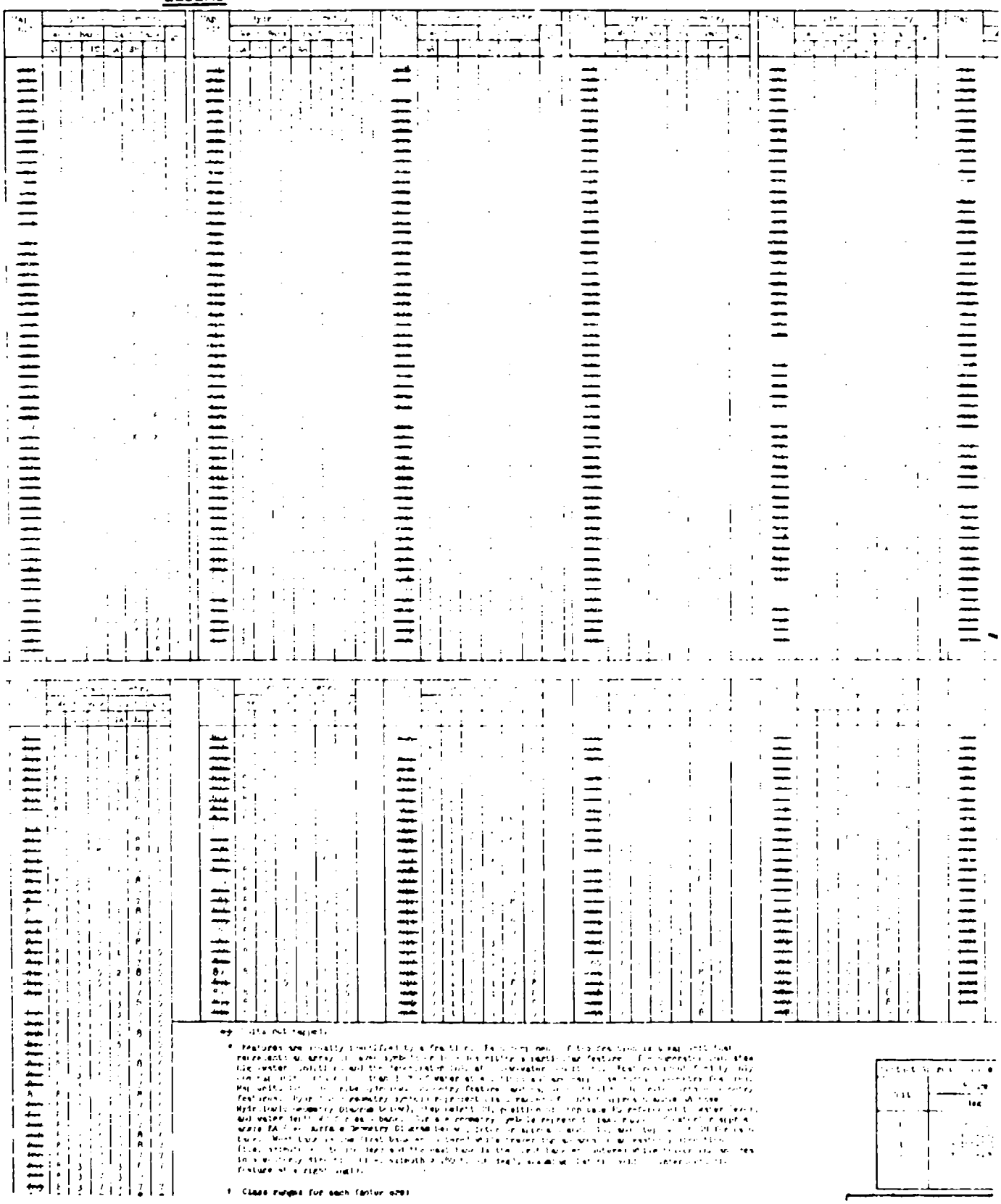
8

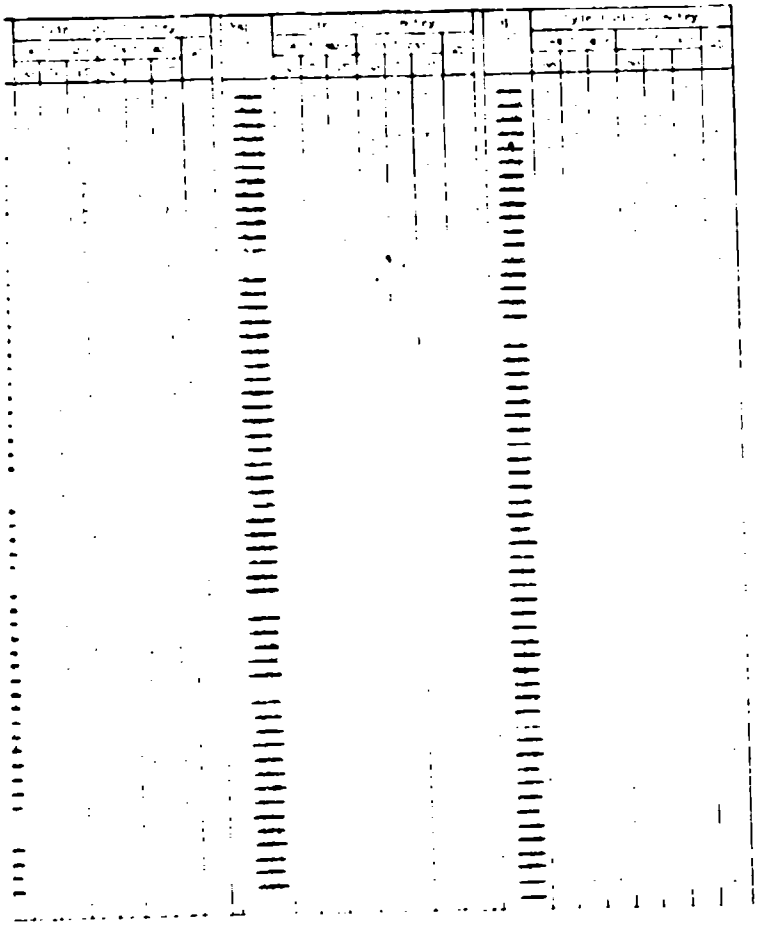
PLATE 2.1c

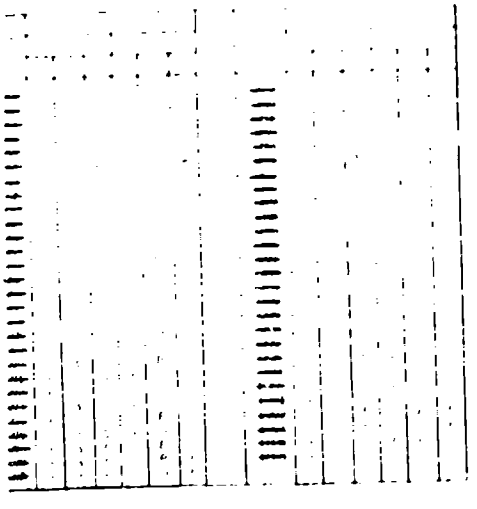


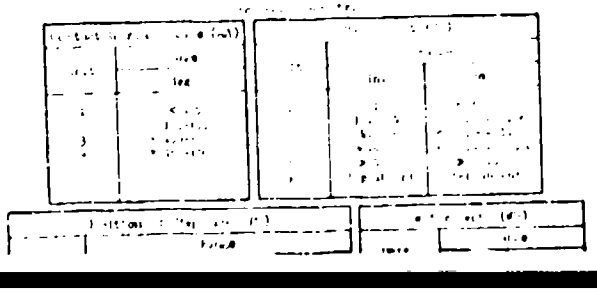
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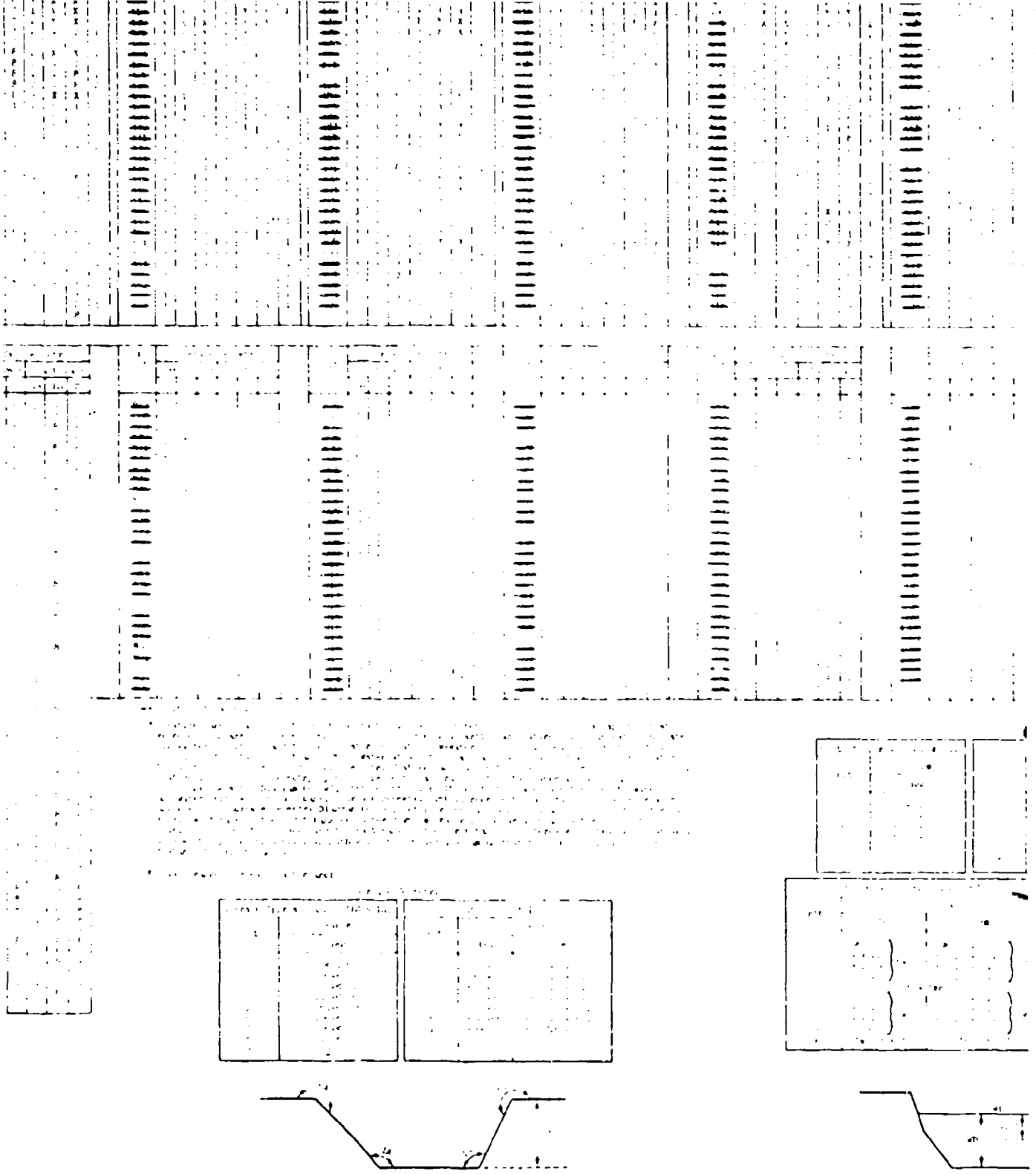
LEGEND



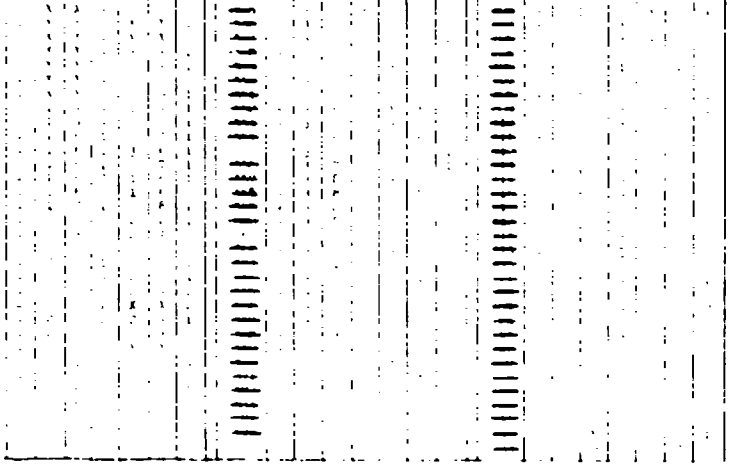


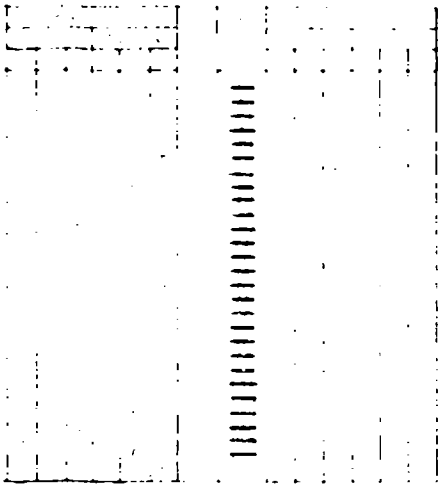


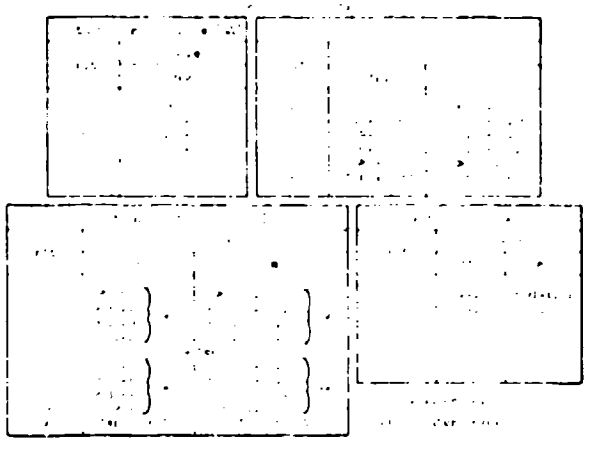


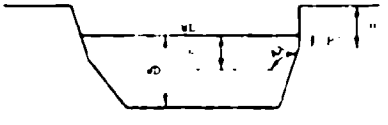


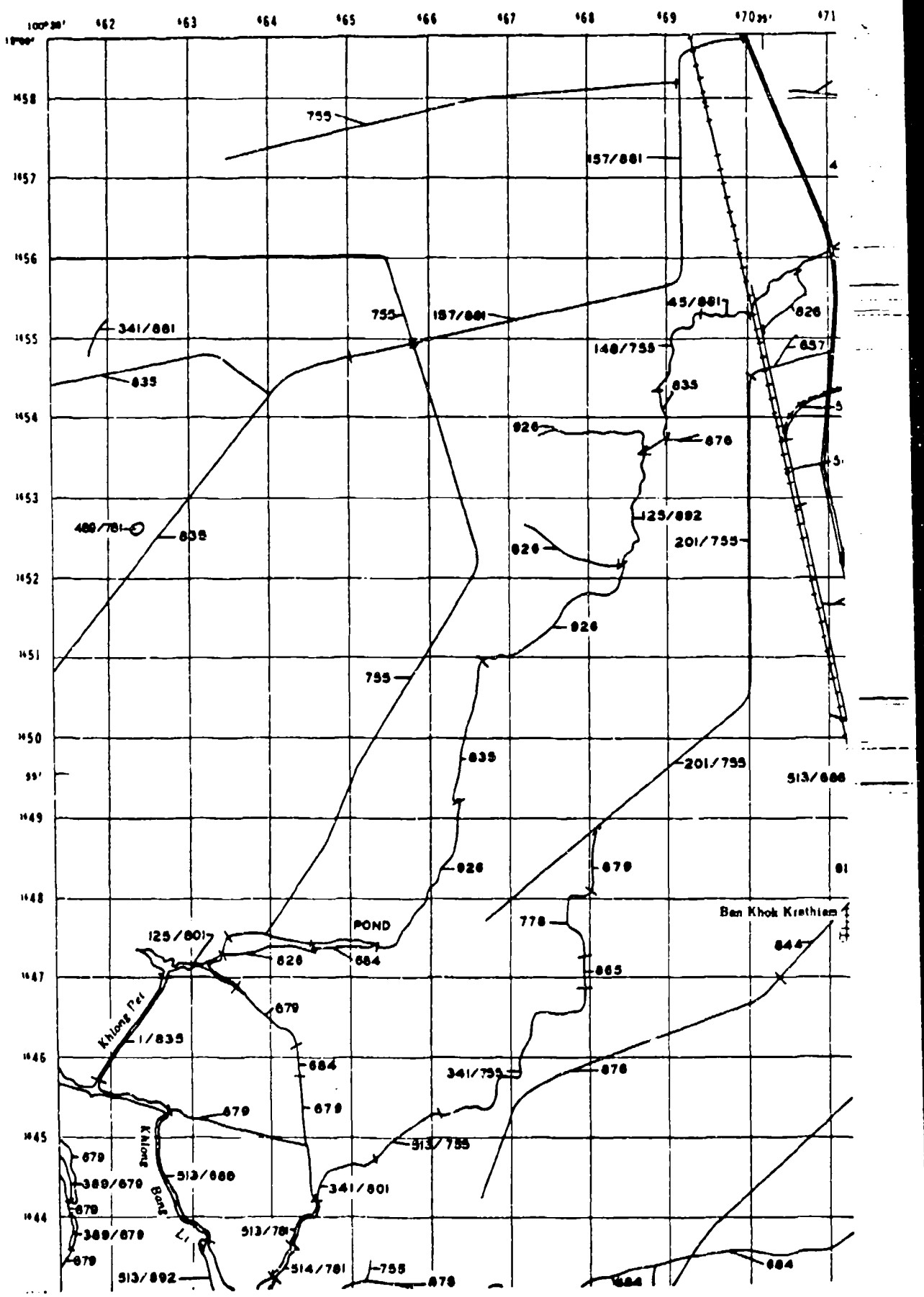
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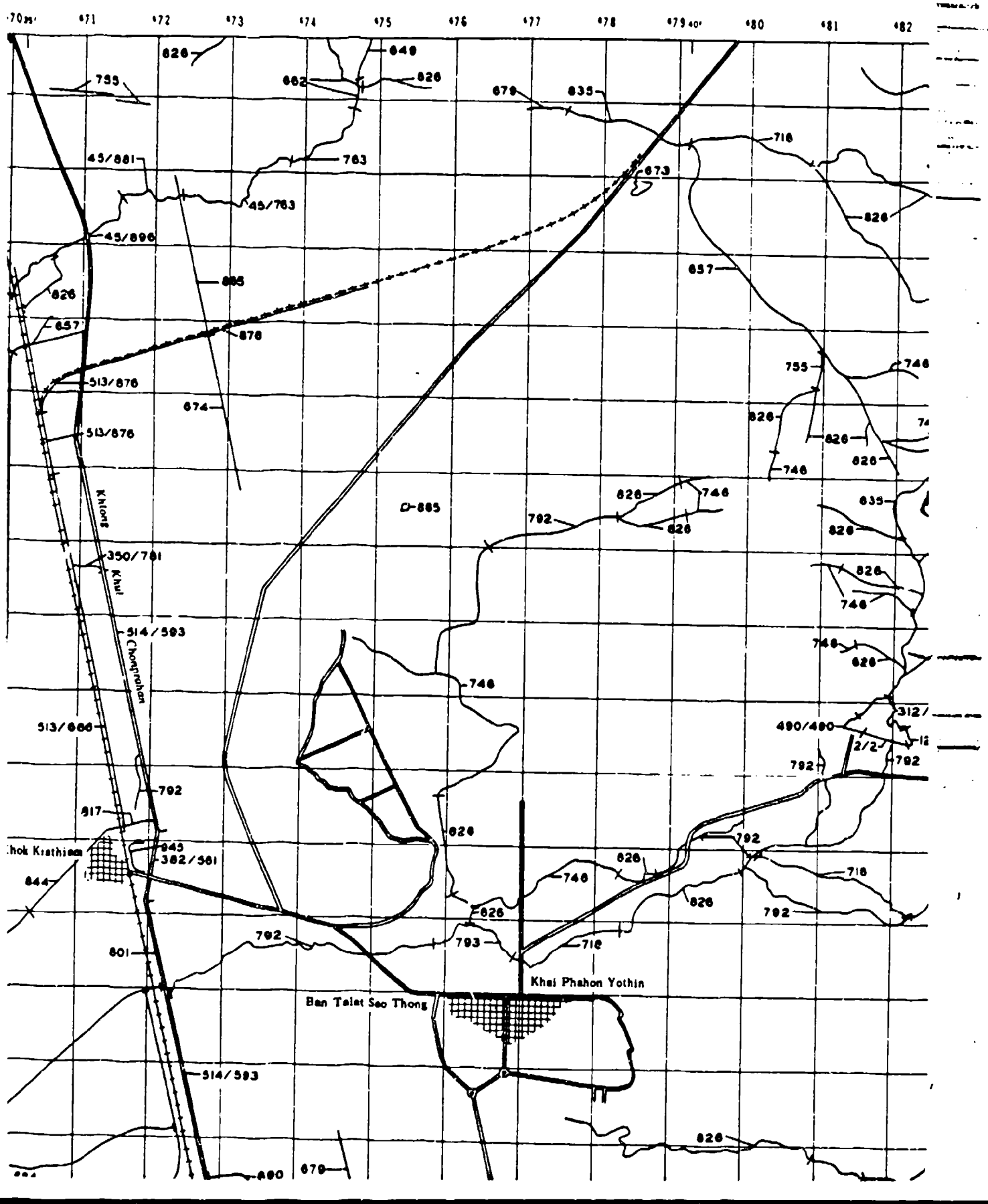





755
157/881
341/881
835
755
187/881
45/881
626
148/755
657
835
626
676
125/892
489/781
835
201/755
626
626
755
835
201/755
513/666
626
679
POND
626
684
778
Ban Khok Krathiam
644
865
Khlong Pai
1/835
679
684
341/755
676
679
679
513/755
Khlong Bang
679
513/666
389/679
341/801
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389/679
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514/781
755
513/892
676
684
684

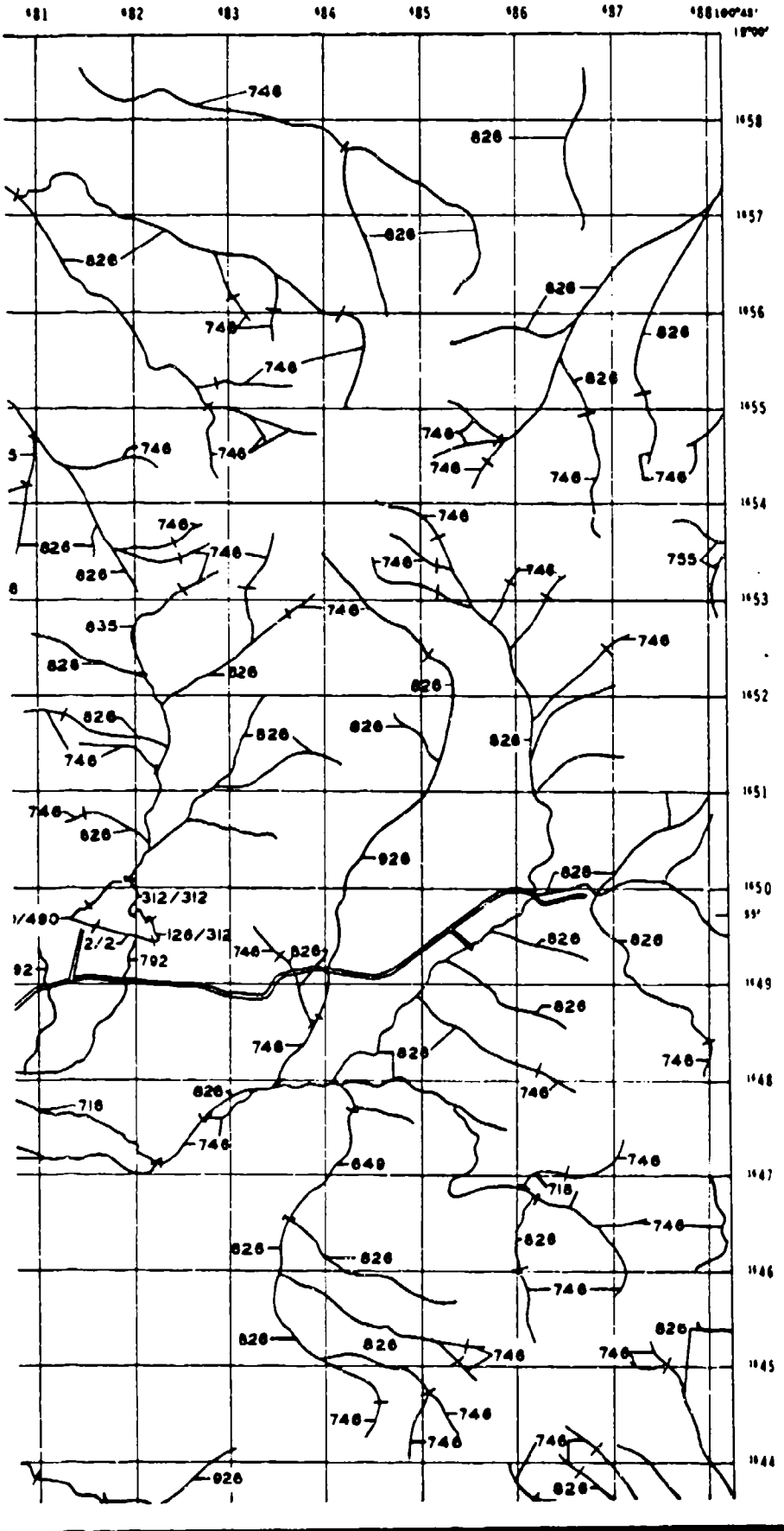
1 2

LOP BURI

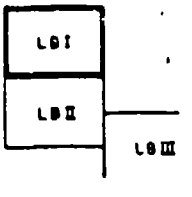

826
649
662
826
679
835
755
716
45/881
783
673
45/783
826
45/896
826
885
657
657
878
513/876
755
746
674
826
826
826
513/876
826
746
826
D-885
792
826
635
826
350/781
826
Khlong Khut
514/593
746
746
826
746
513/666
312/
490/490
2/2
792
792
792
917
826
792
Khok Krathiem
845
382/581
844
826
746
826
718
792
826
792
793
718
601
Khai Phahon Yothin
Ban Talat Sao Thong
514/593
826
880
870

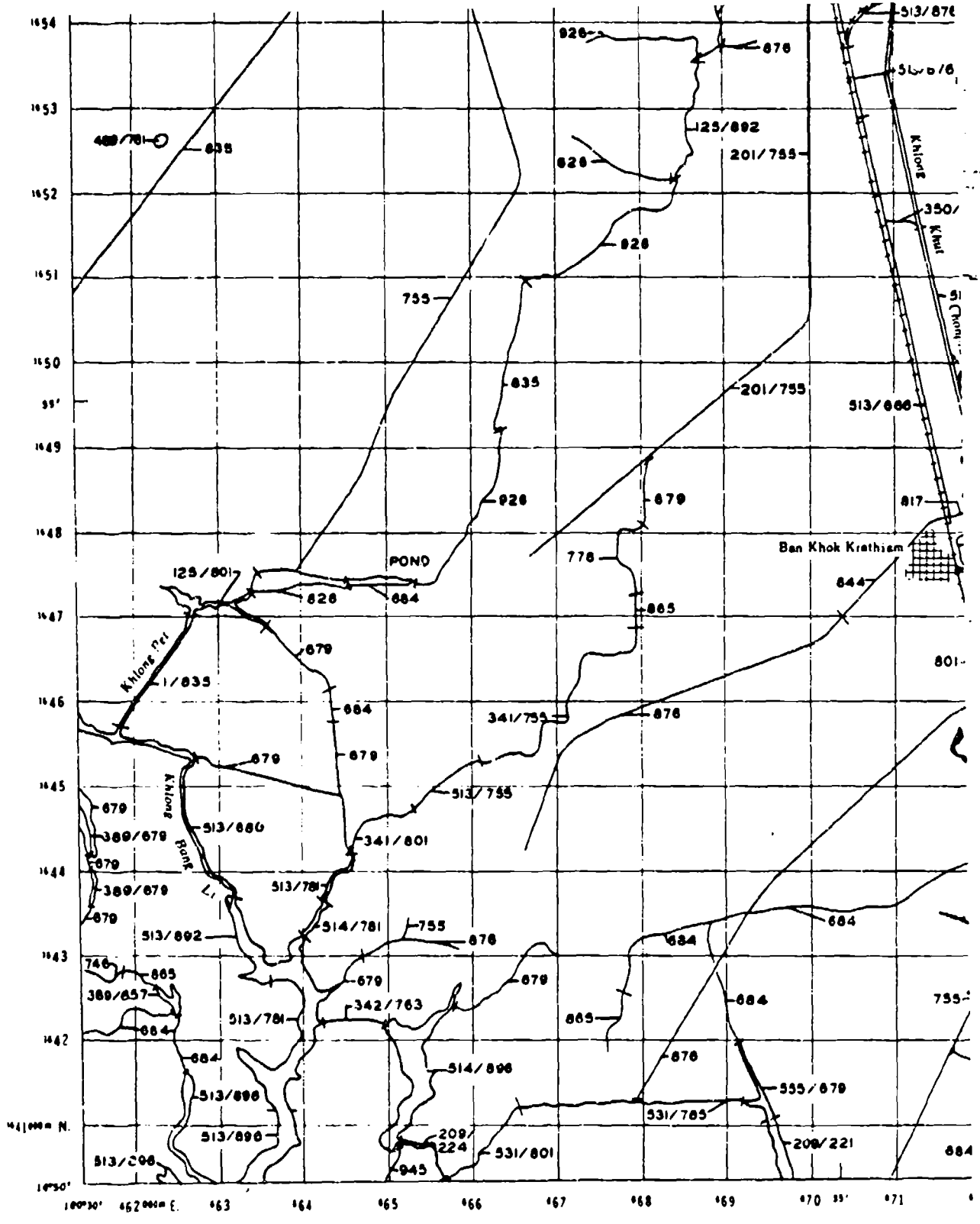
3

SHEET LB I



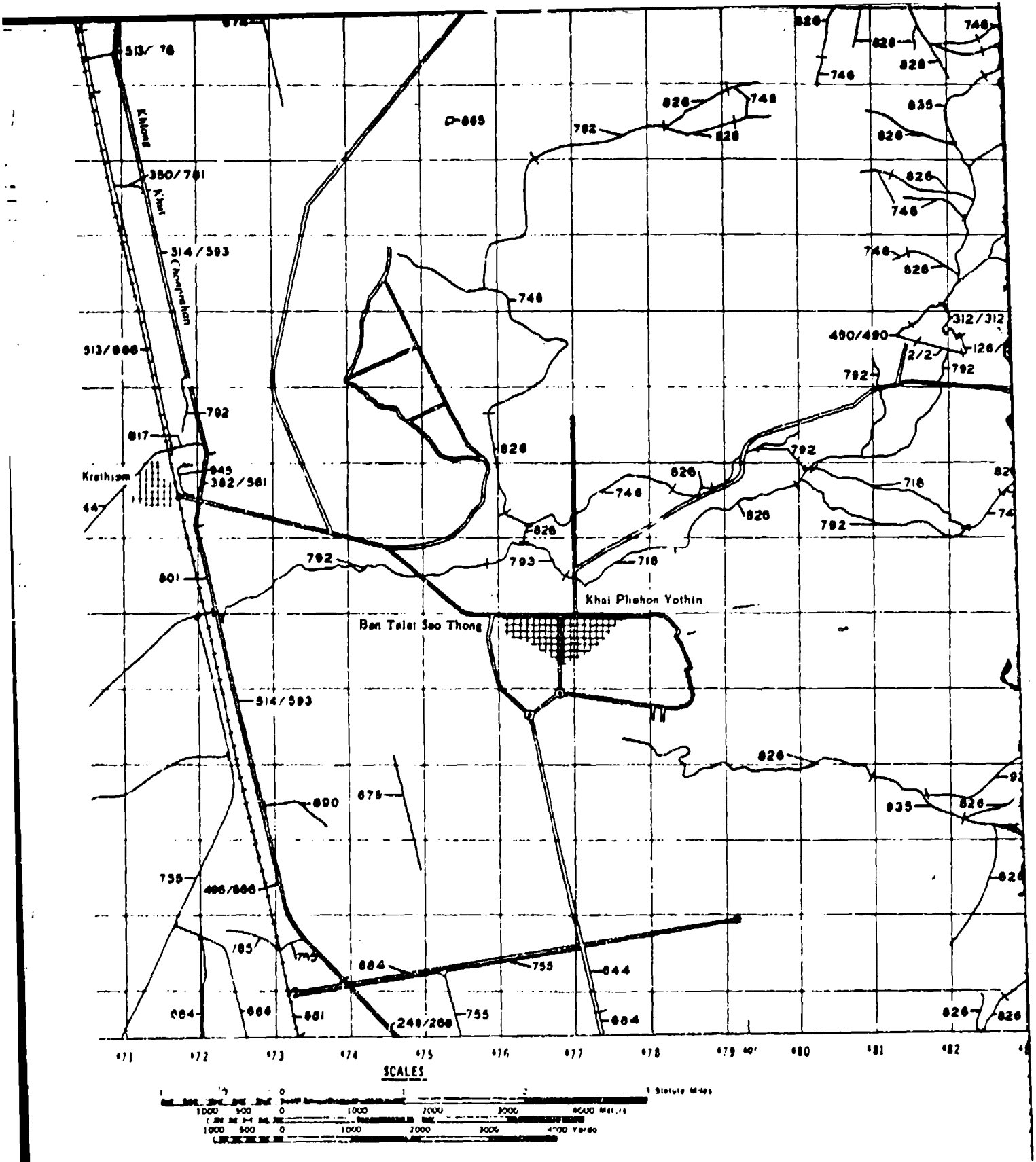
INDEX TO ADJOINING SH





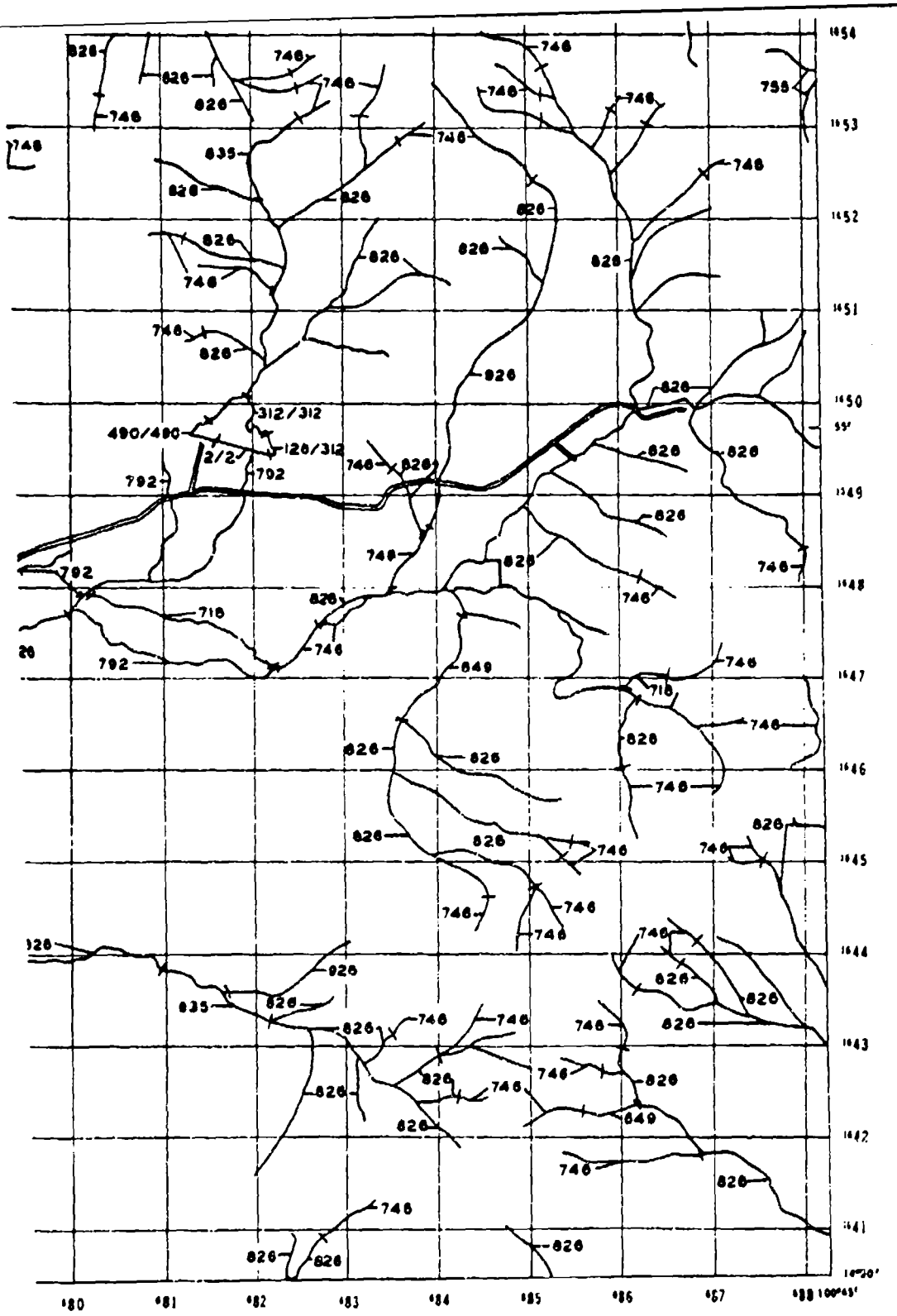
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

4


Khlong Khot Chamrahan
Krathiam
Ban Talat Sao Thong
Khai Phichon Yothin
SCALES
1 Statute Miles
6000 Meters
4700 Yards

5

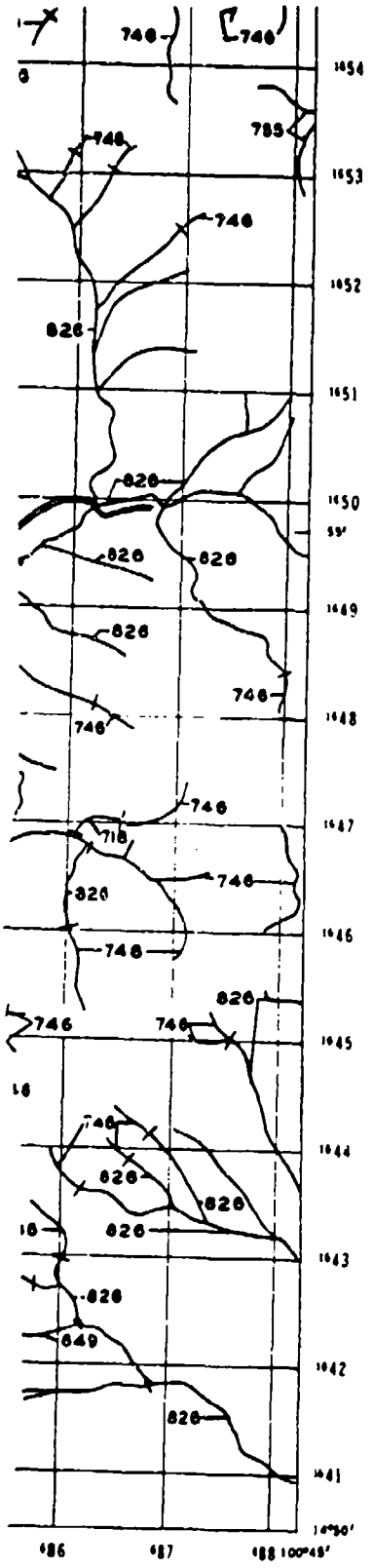
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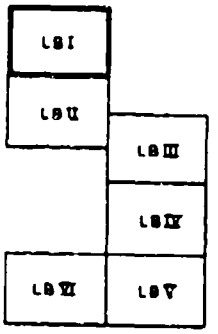
INDE

A QUANTITATIVE
TERRAIN F
HYDROL
LOP BU
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6



INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

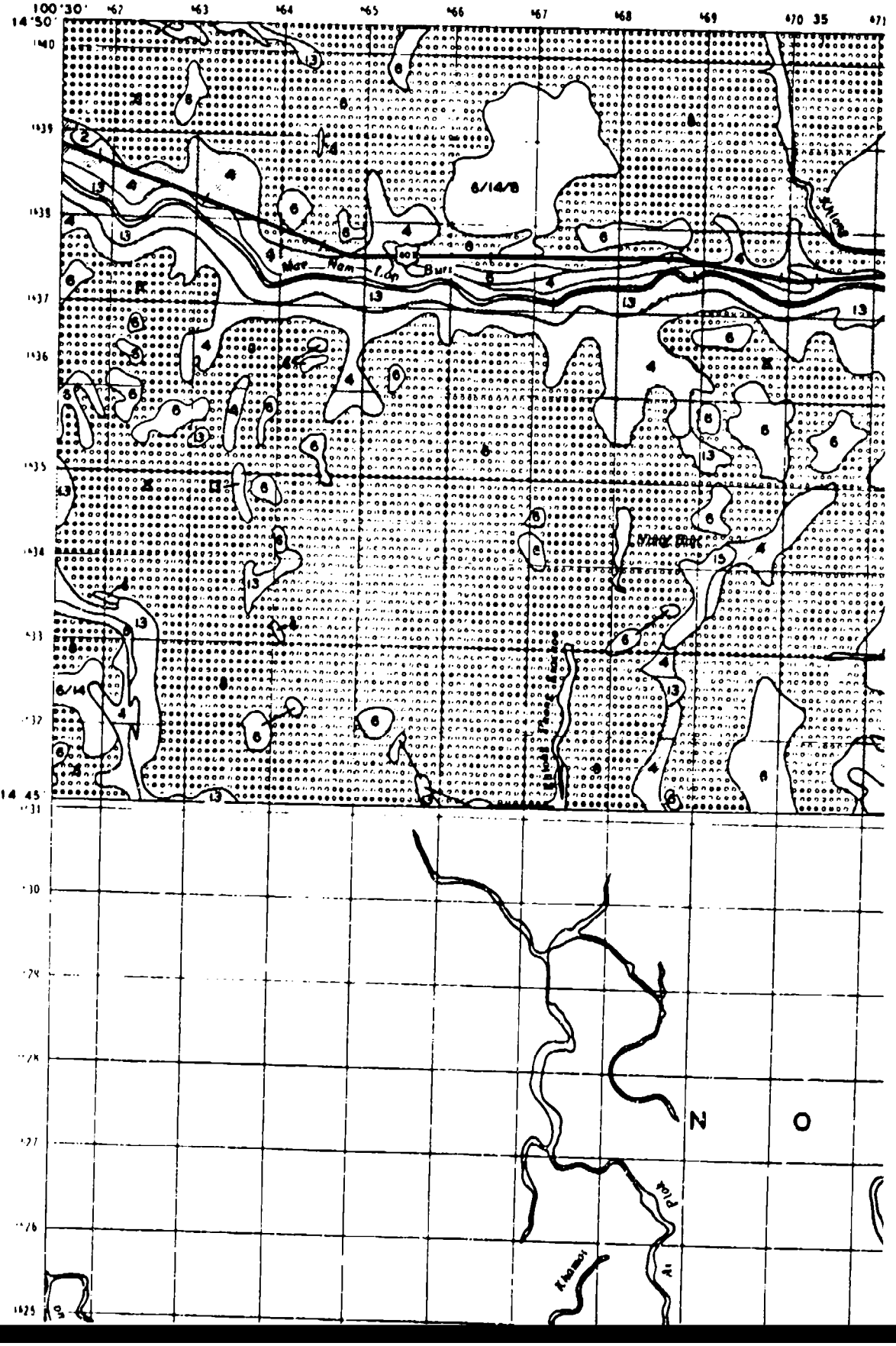
HYDROLOGIC GEOMETRY

LOP BURI STUDY AREA

SHEET LB I

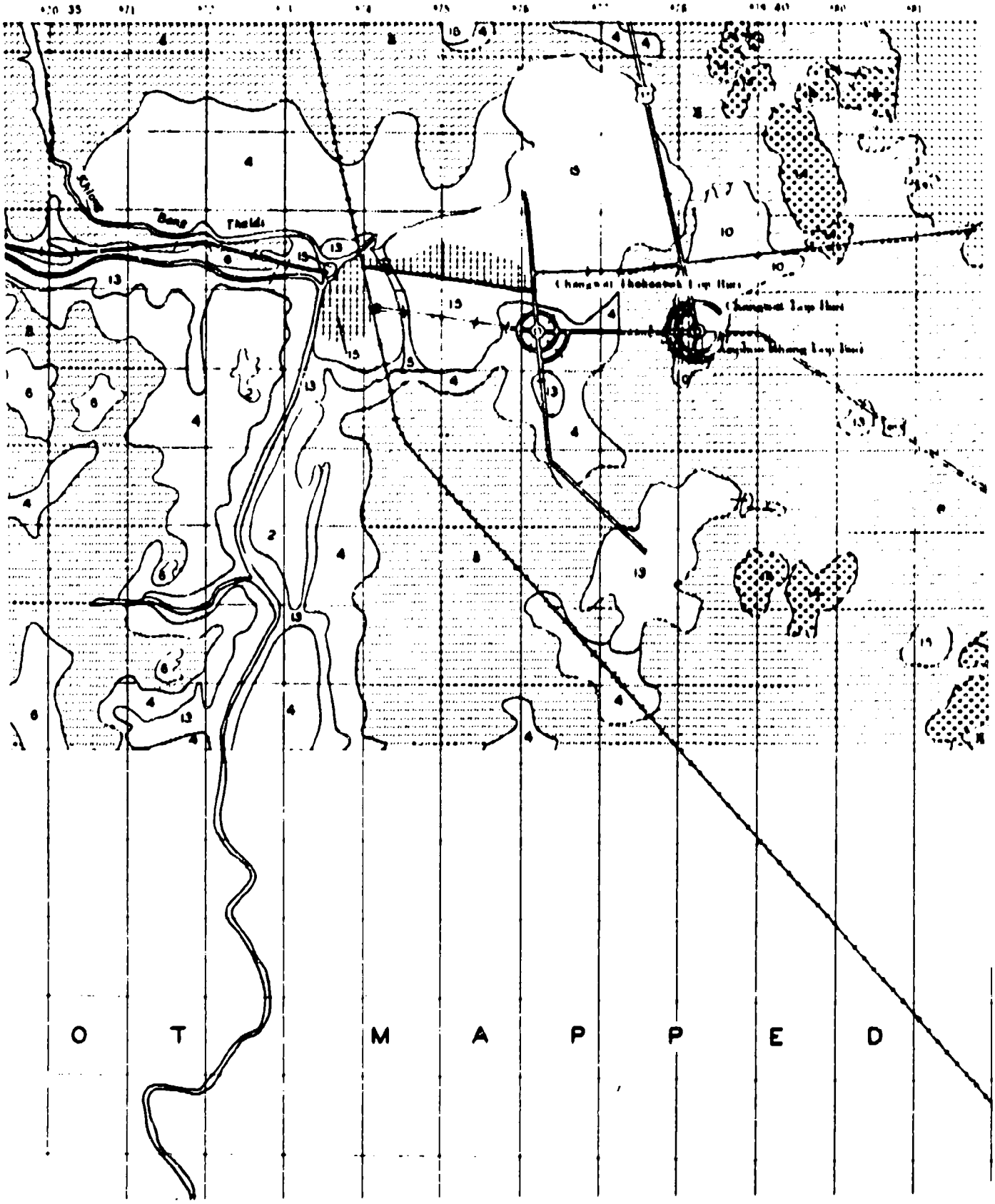
7

PLATE 2.1d

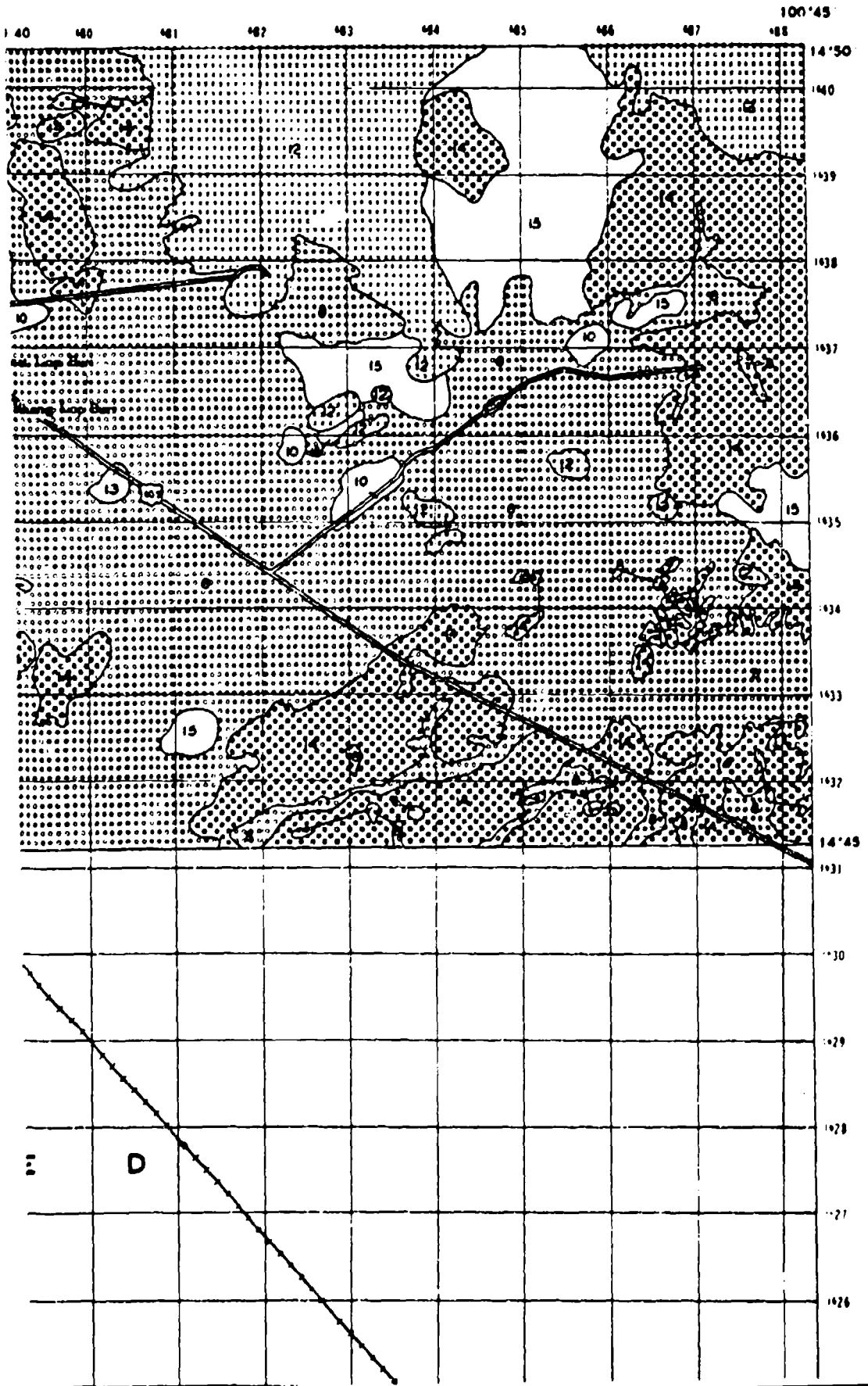

100°30'
14°50'
14°45'
N
O

2

LOP BURI



SHEET LB II



Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Shear pci
	10-25	25-60	0-1
2	25-60	60-100	0-1
	25-60*	60-100	0-1
	25-60	>100	0-1
	25-60*	>100	0-1
6	60-100	60-100	0-1
	60-100	60-100	0-1
	60-100	>100	0-1
	60-100	>100	0-1
10	60-100	>100	0-1
	60-100*	>100	0-1
	>100	>100	0-1
	>100	>100	0-1
	Complex of 60-100 and >100	>100	0-1
15	Complex of 60-100 and >100	>100	0-1

Note: Black areas are water bodies.

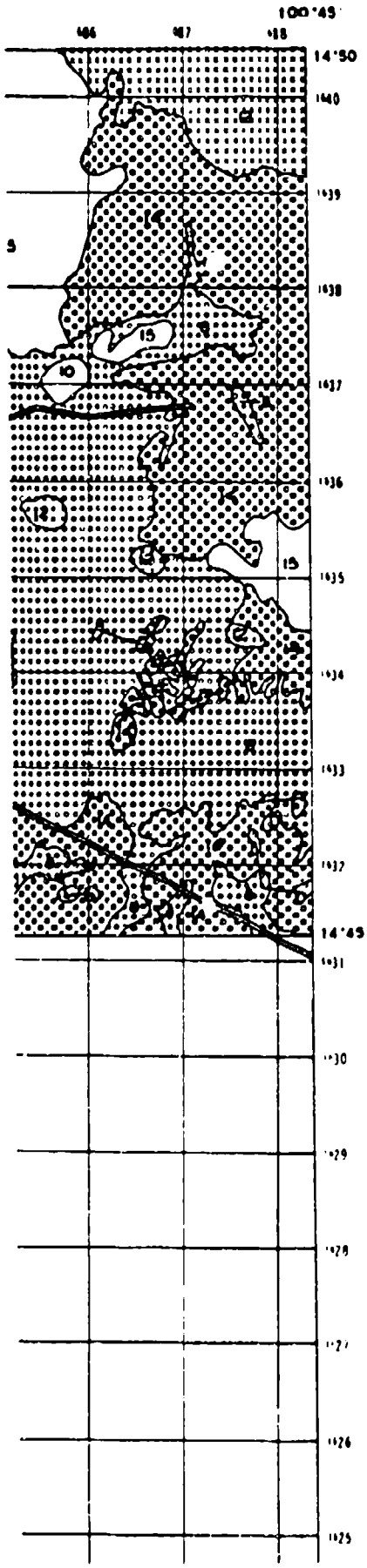
c_{av} Shear strength at zero normal le

ϕ_{av} Angle of internal friction.

* Maximum moisture has less than ... strengths commonly observed are ...

Units do not occur on this map.

SHEET LB II



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_w psi	c_w kg/cm²	ϕ_w deg	Soil Surface Strength: Minimum Moisture c_w psi	c_w kg/cm²	ϕ_w deg	Conditions where maximum occurs: c_w psi	c_w kg/cm²	ϕ_w deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	60-100	>100*	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
12	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
14	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Black areas are water bodies.

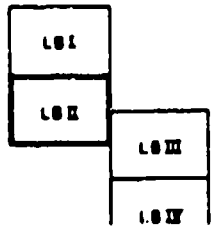
c_w Shear strength at zero normal load.

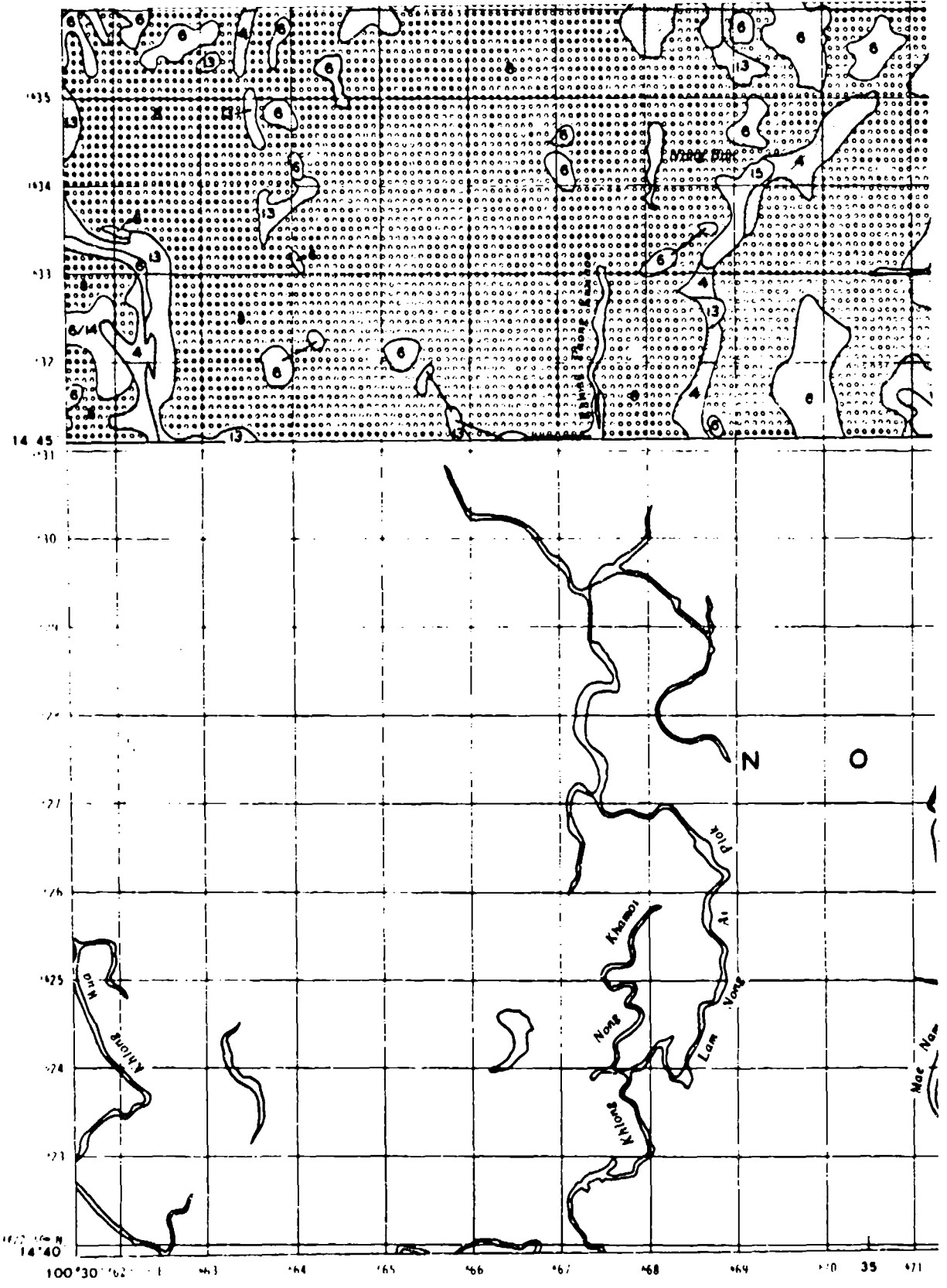
ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 9; more than 100 for Unit 11.

Units do not occur on this map.

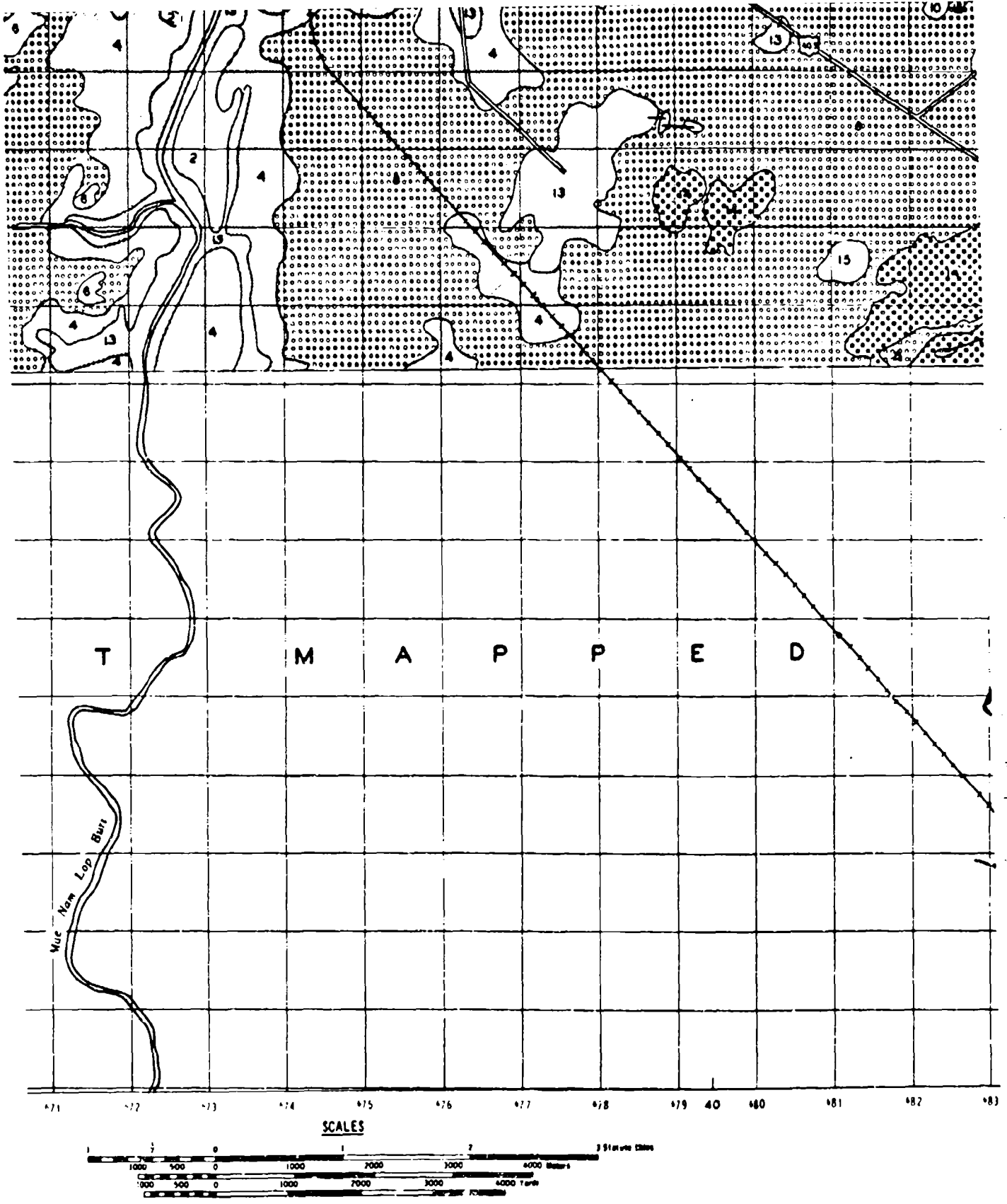
INDEX TO ADJOINING SHEETS



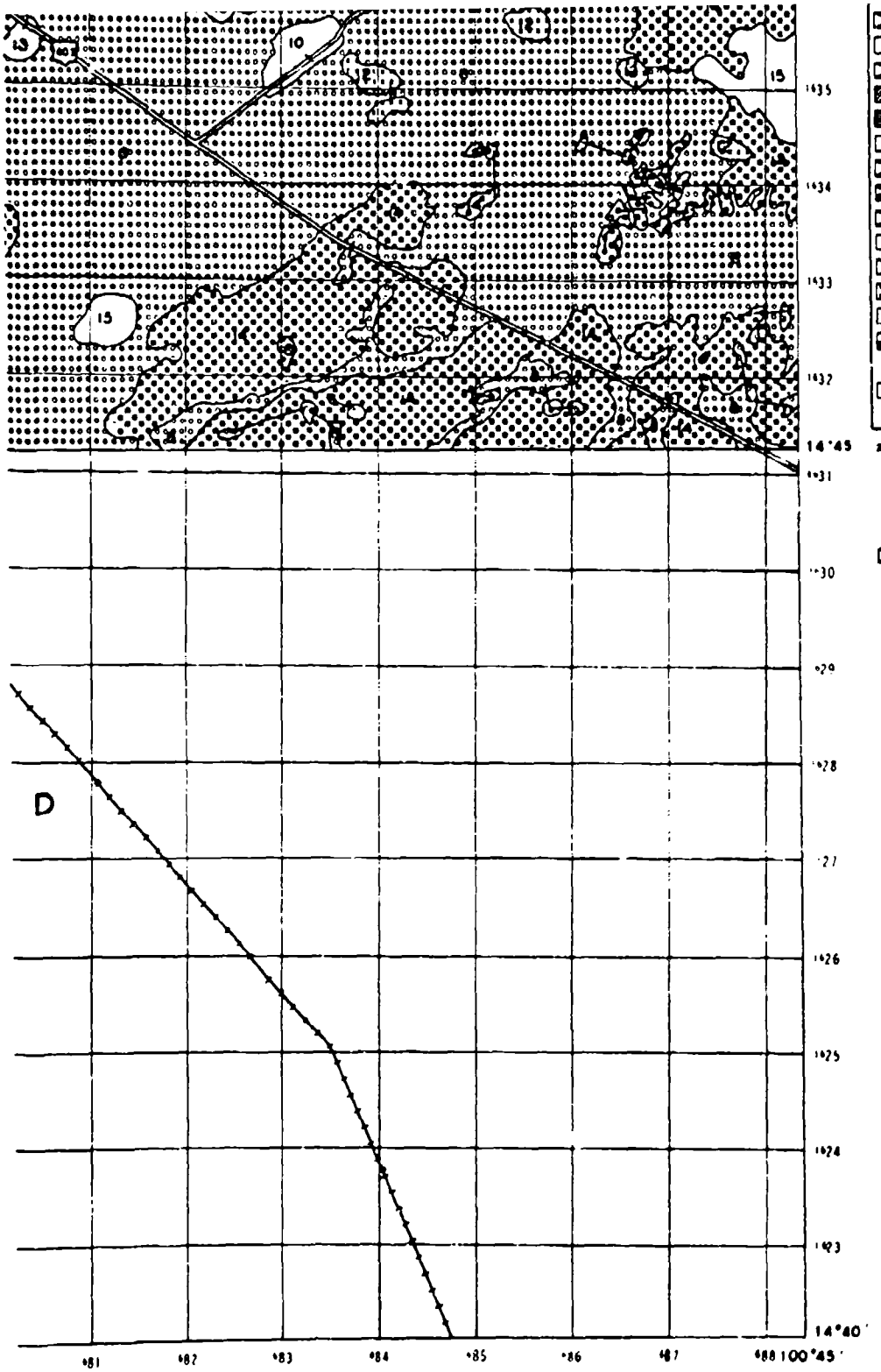


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


T M A P P E D
Mue Nam Lop Burn
671
672
673
674
675
676
677
678
679
40
680
681
682
683
SCALES

6



	10-25	25-60	0-1	0-0.07	0-10
2	25-60	60-100	0-1	0-0.07	0-10
	25-60*	60-100	0-1	0-0.07	10-20
	25-60	>100	0-1	0-0.07	0-10
	25-60*	>100	0-1	0-0.07	10-20
6	60-100	60-100	0-1	0-0.07	0-10
	60-100	60-100	0-1	0-0.07	10-20
	60-100	>100	0-1	0-0.07	0-10
	60-100	>100	0-1	0-0.07	0-10
10	60-100	>100	0-1	0-0.07	10-20
	60-100*	>100	0-1	0-0.07	10-20
	>100	>100	0-1	0-0.07	0-10
18	>100	>100	0-1	0-0.07	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10
19	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20

Note: Blank areas are under holes.

S_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent probe strengths commonly observed are 60-100 for Units

Units do not occur on this map.

INDEX TO A

LB I

LB II

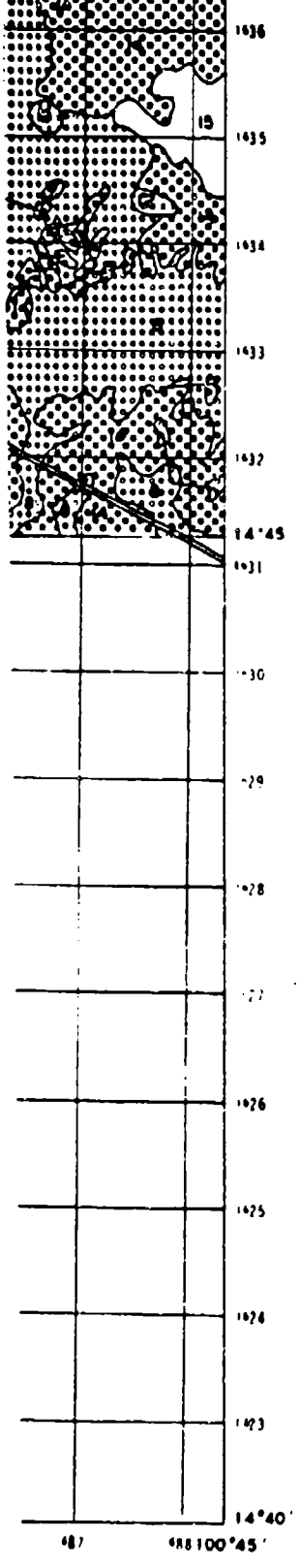
LB VI

A QUANTITATIVE METH
TERRAIN FOR GE

SURFACE C(

LOP BURI S

SHEET



Unit	WET	WET	c_{uw} psi	c_{uw} kg/cm²	ϕ_{uw} deg	c_{uw} psi	c_{uw} kg/cm²	ϕ_{uw} deg	c_{uw} psi	c_{uw} kg/cm²	ϕ_{uw} deg
⊠	10-85	85-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
8	85-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	85-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	85-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	85-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
⊠	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	10-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
⊠	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

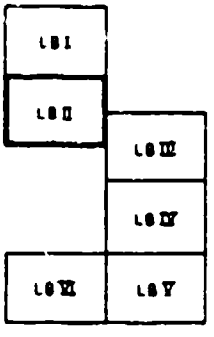
c_{uw} Shear strength at wave normal load.

ϕ_{uw} Angle of internal friction.

* Minimum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 13.

⊠ Units do not occur on this map.

INDEX TO ADJOINING SHEETS



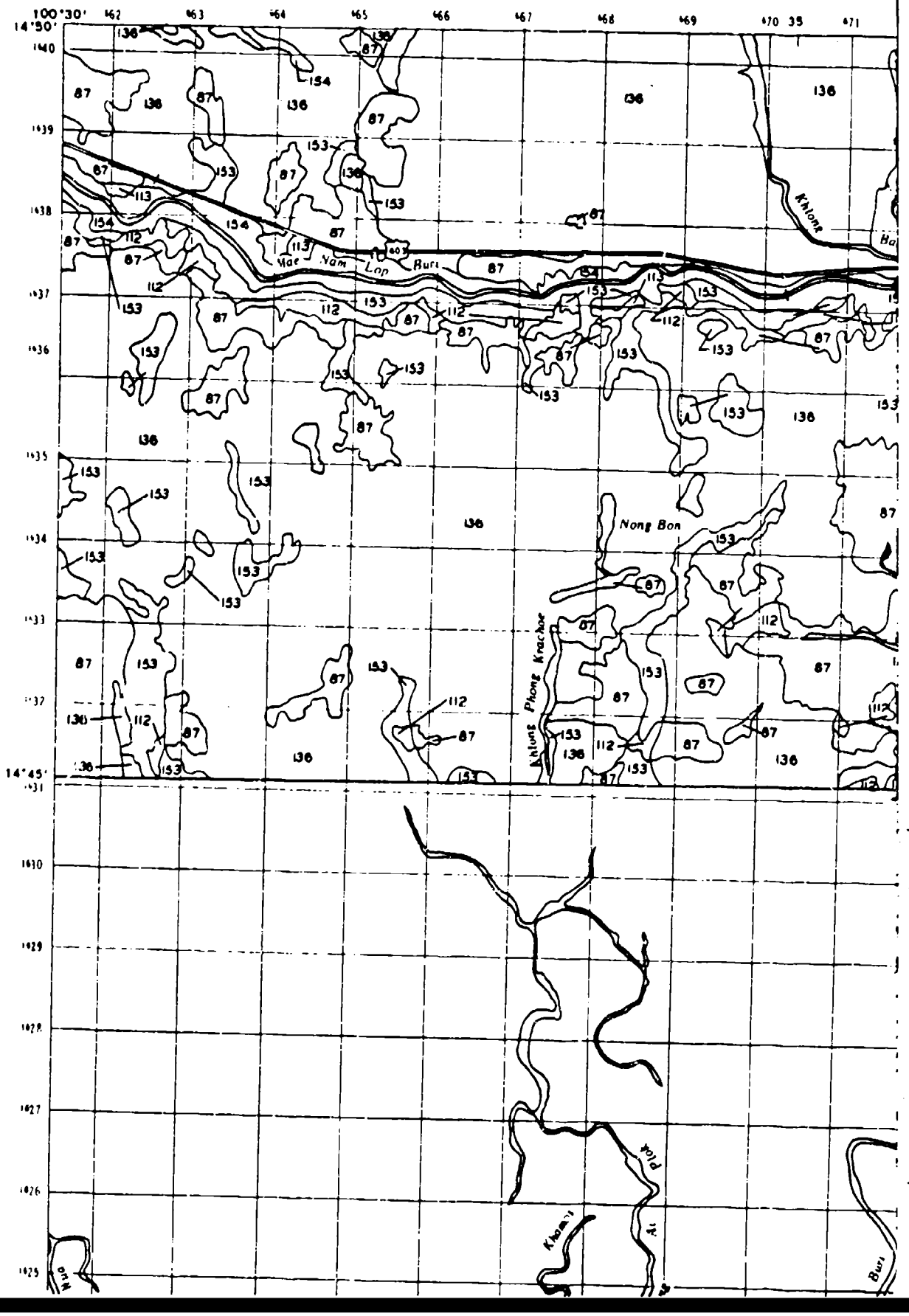
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

LOP BURI STUDY AREA

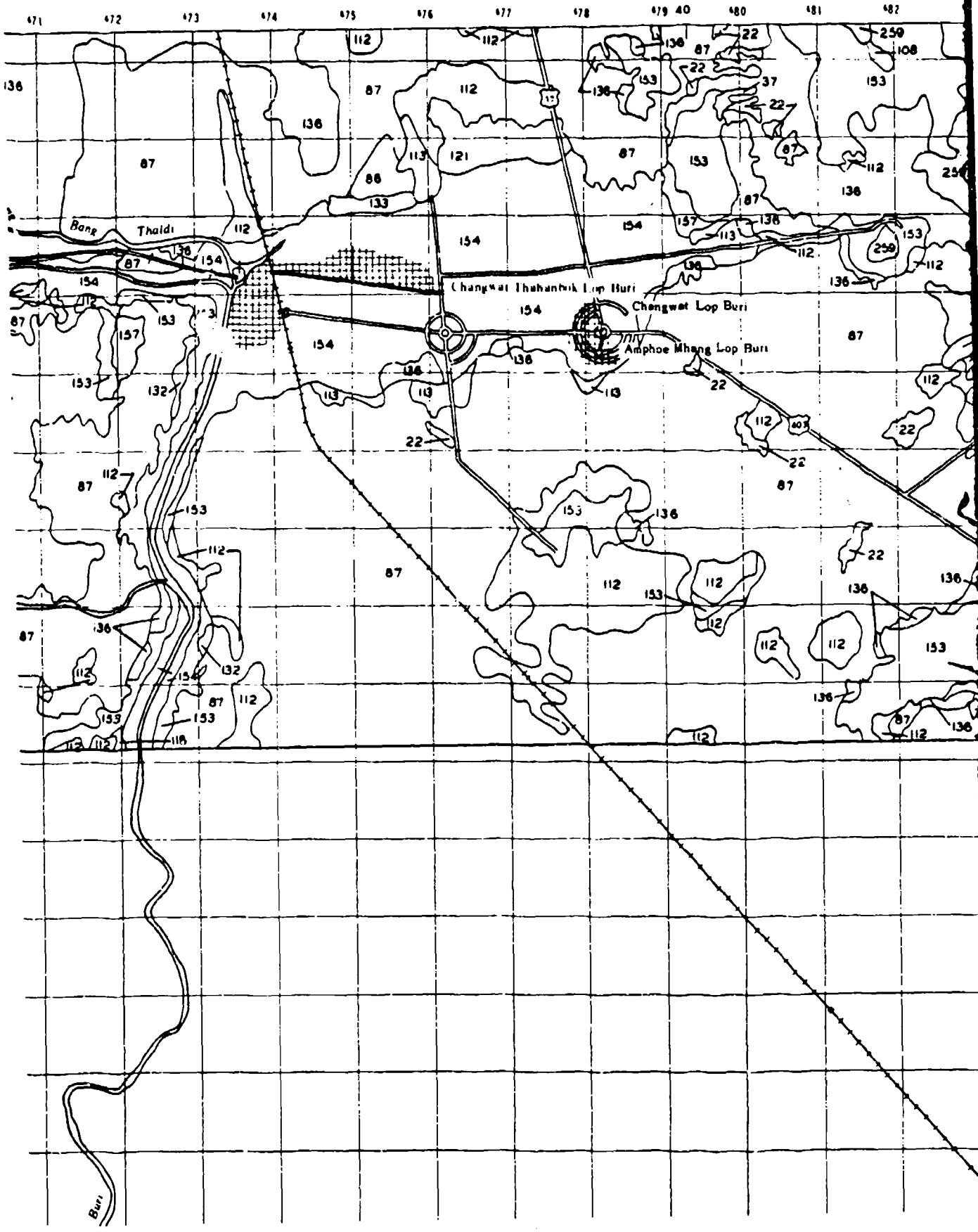
SHEET LB II

PLATE 2.2a


100°30'
462
463
464
465
466
467
468
469
470 35
471
14°50'
14°45'
1440
1439
1438
1437
1436
1435
1434
1433
1432
1431
1430
1429
1428
1427
1426
1425
Mae Nam Lop Buri
Nong Bon
Khlong Phong Krachae
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153
87
112
154
113

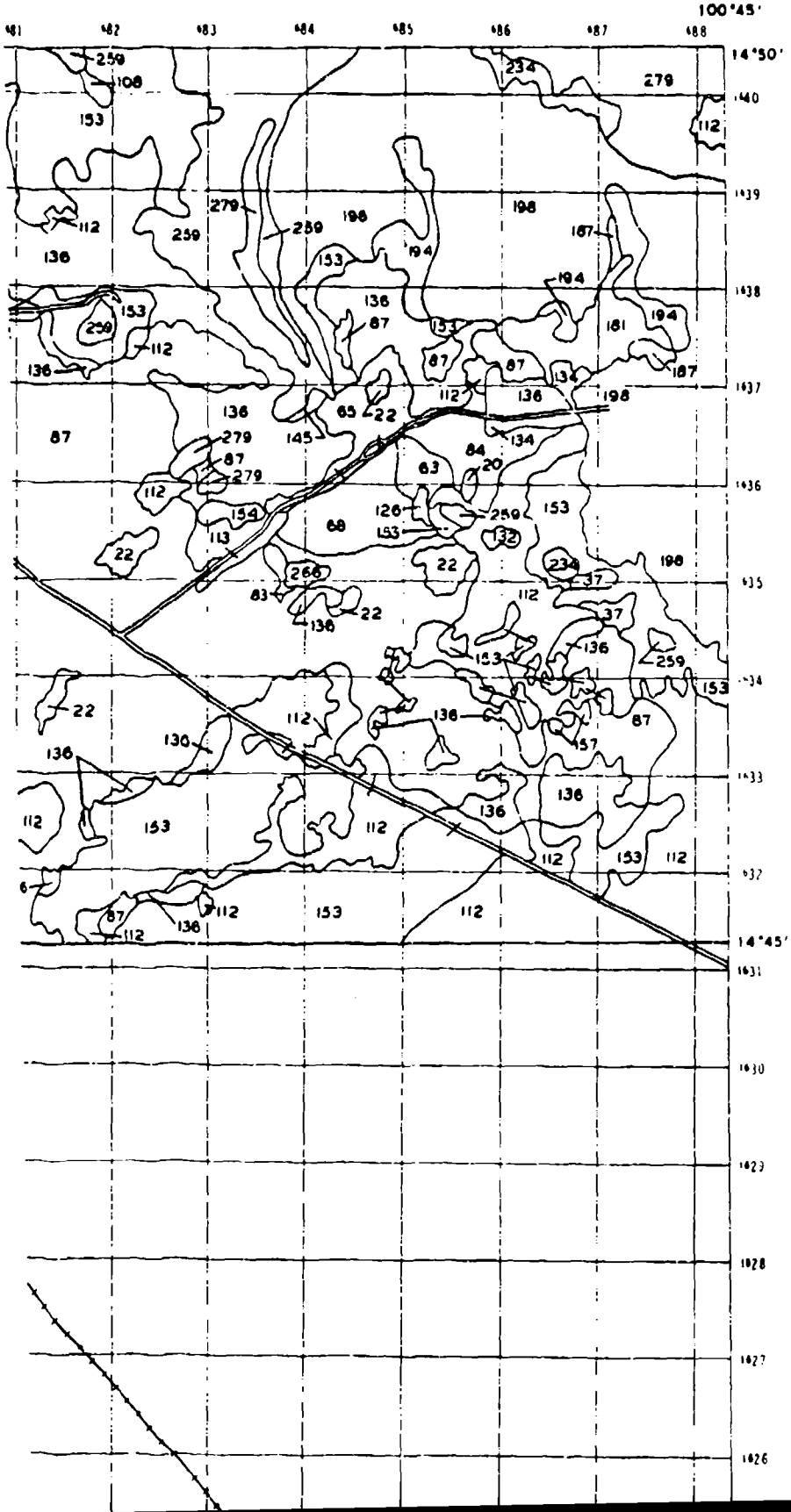
1 2

LOP BURI

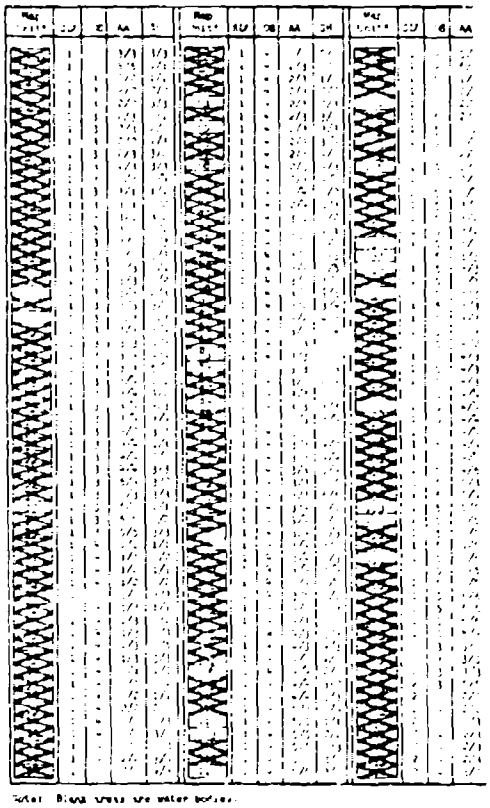

Bang Thaldi
Changwat Thahanbok Lop Buri
Changwat Lop Buri
Amphoe Mhang Lop Buri
Buri

1 3

SHEET LB II



LEGEND



Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. [illegible] below). Each of [illegible] (e.g. symbols with AA, and ones with BB were mapped. The numerator of a fraction indicates [illegible] the easterly direction (i.e. azimuth from [illegible] N) and the [illegible] > 15% to 30% (> 8deg) indicating that the vehicle [illegible]

† Mapping class ranges of each cut-to-[illegible] geometry [illegible]

Slope (SL)

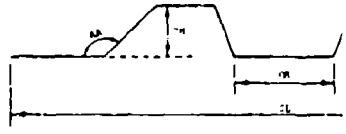
Mapping Class	Range deg
1	[illegible]
2	[illegible]
3	[illegible]
4	[illegible]
5	[illegible]
6	[illegible]
7	[illegible]

Vertical Offset To Spacing (VS)

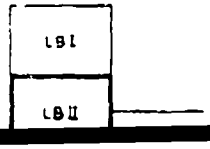
Mapping Class	Value	
	m	ft
1	[illegible]	[illegible]
2	[illegible]	[illegible]
3	[illegible]	[illegible]
4	[illegible]	[illegible]
5	[illegible]	[illegible]

Mapping Class
1
2
3
4
5
6
7

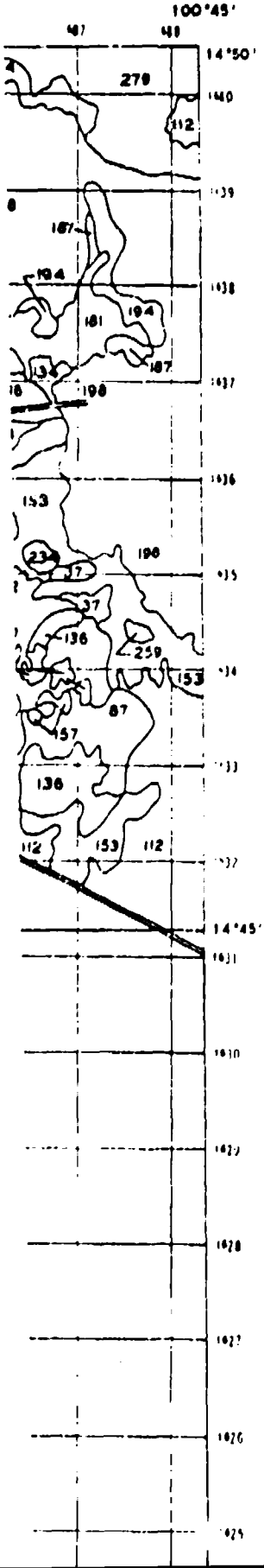
Units do not occur on this map.



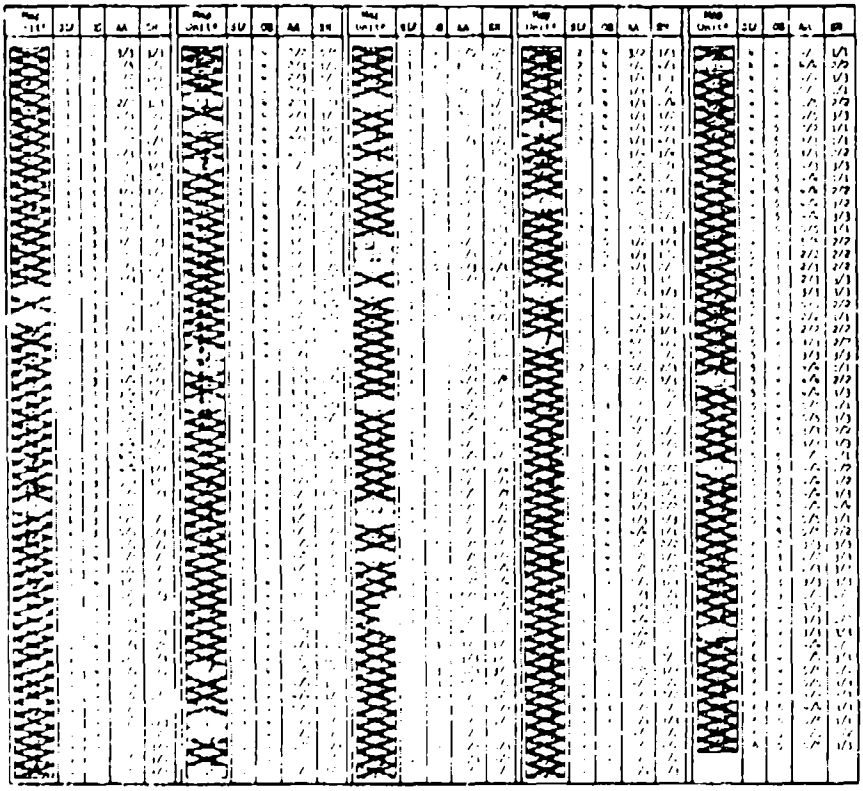
INDEX TO ADJOINING SHEE

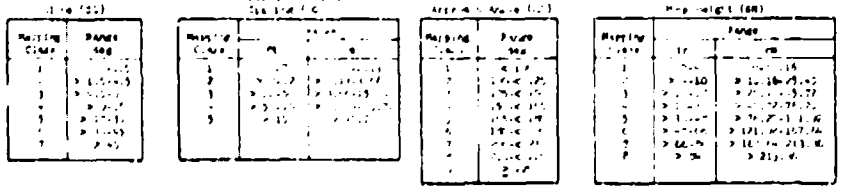


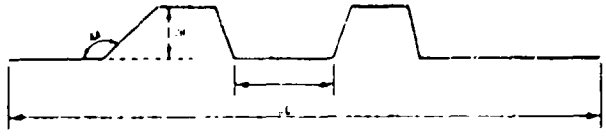
SHEET LB II



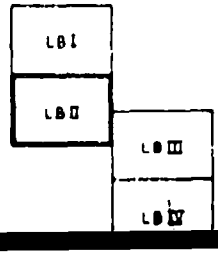
LEGEND

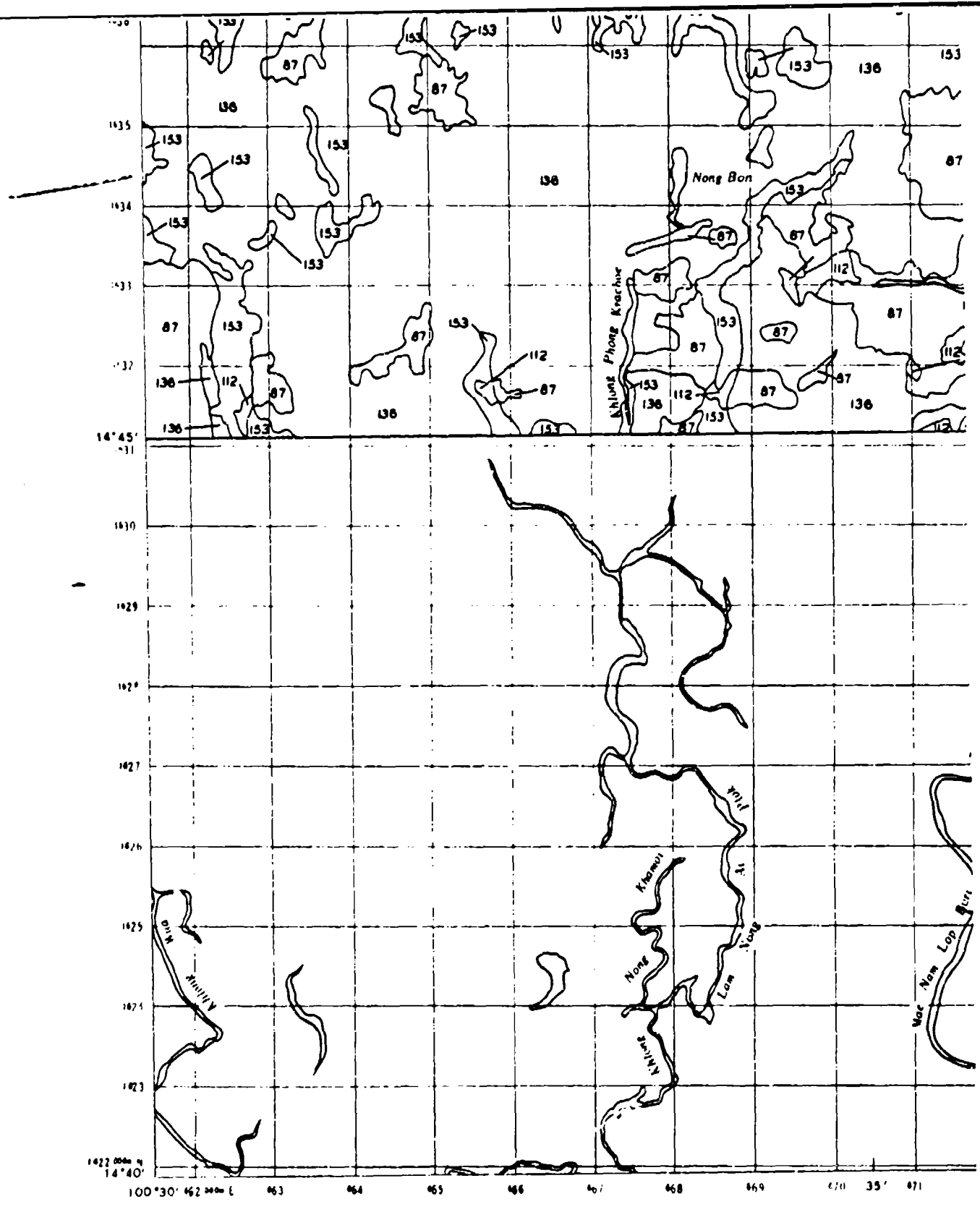






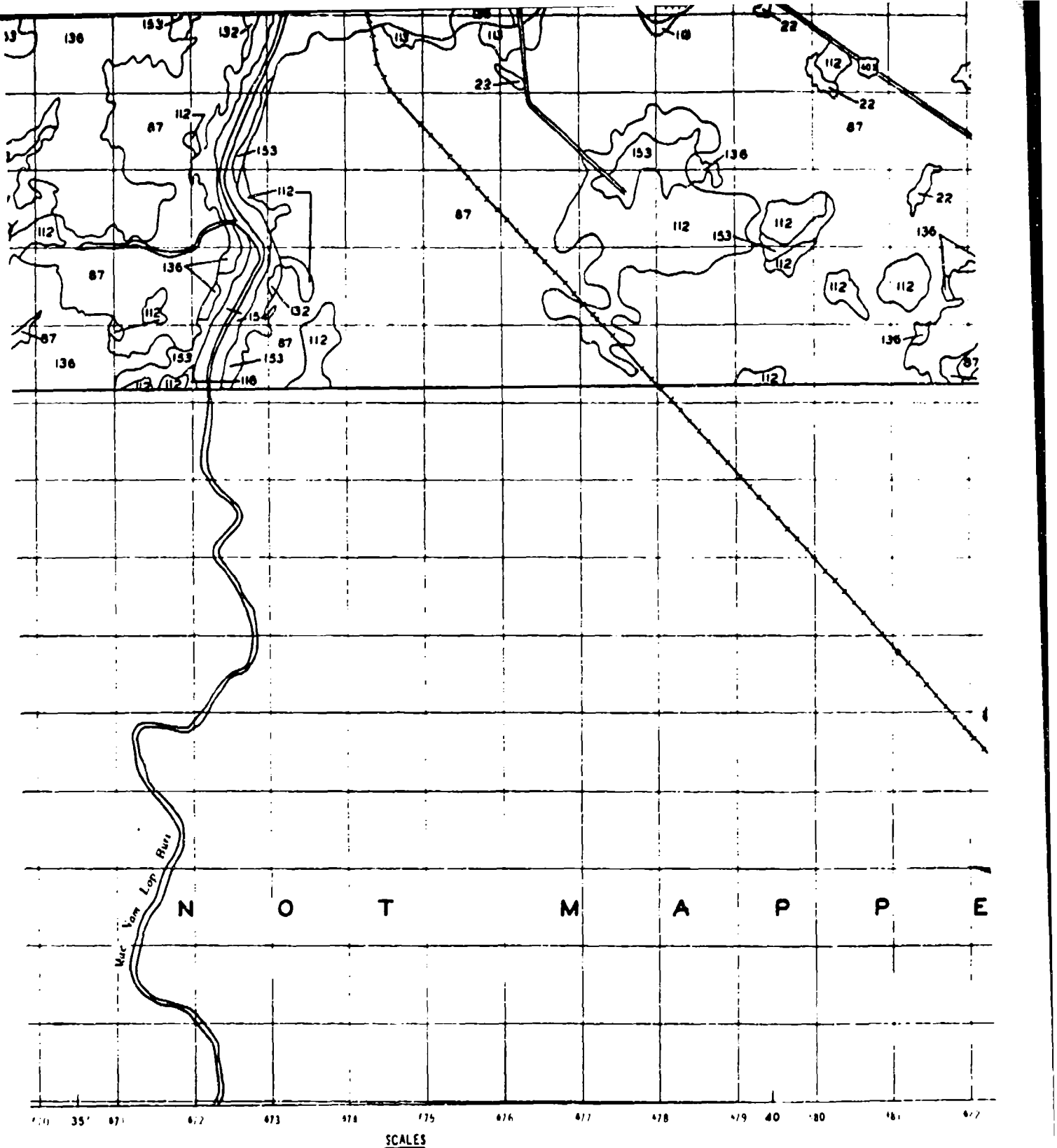
INDEX TO ADJOINING SHEETS



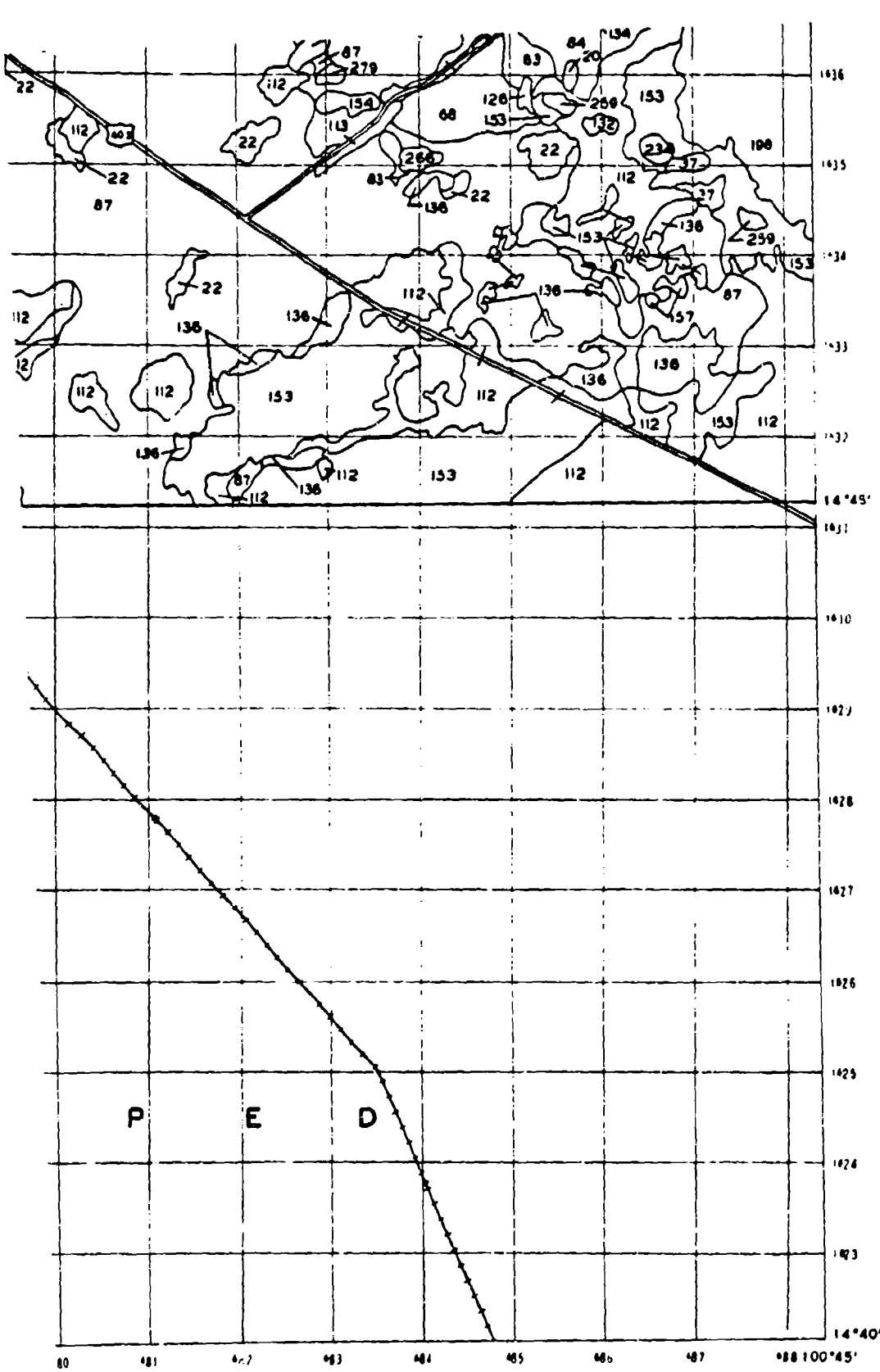


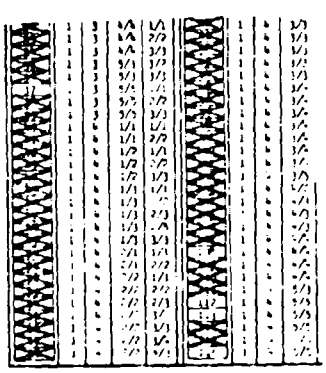
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

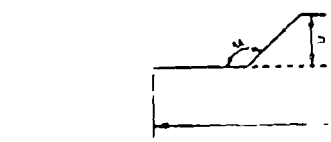
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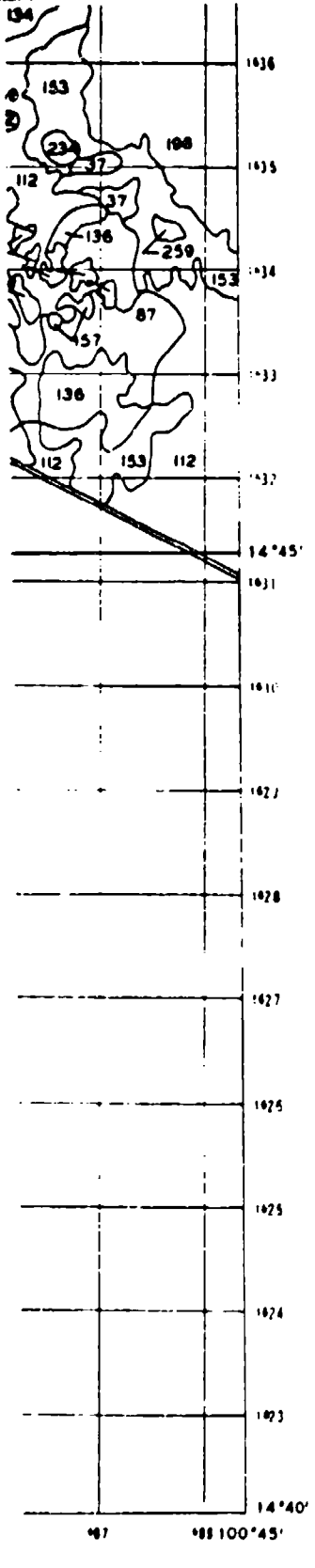


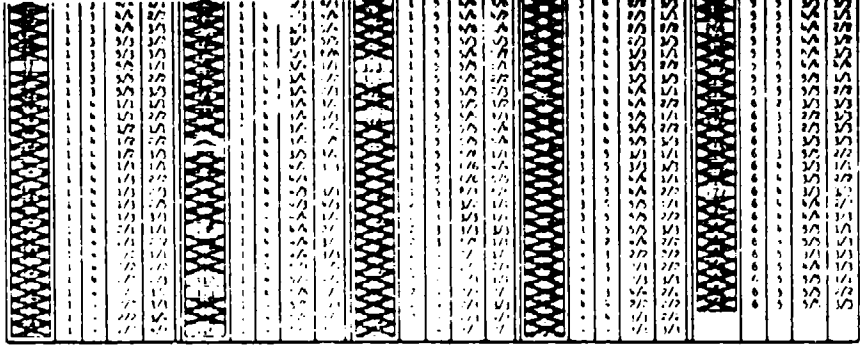
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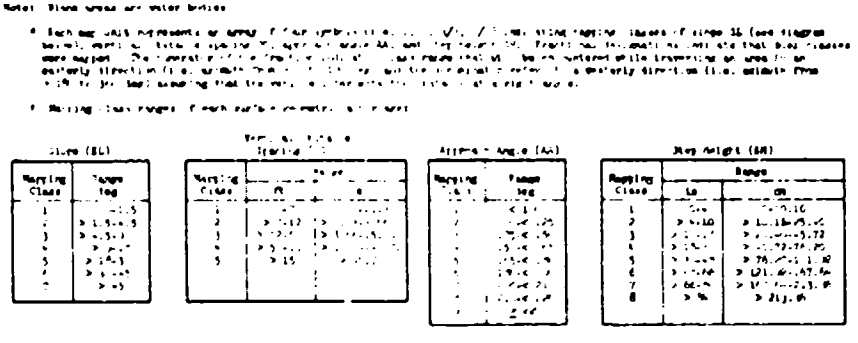

P
E
D
14°45'
14°40'
100°45'

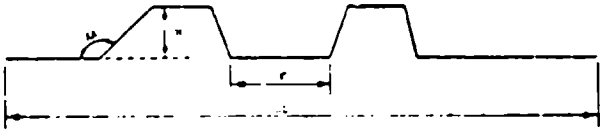




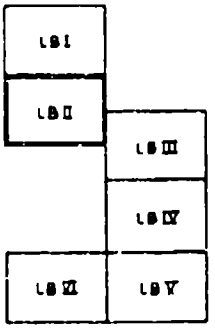








INDEX TO ADJOINING SHEETS



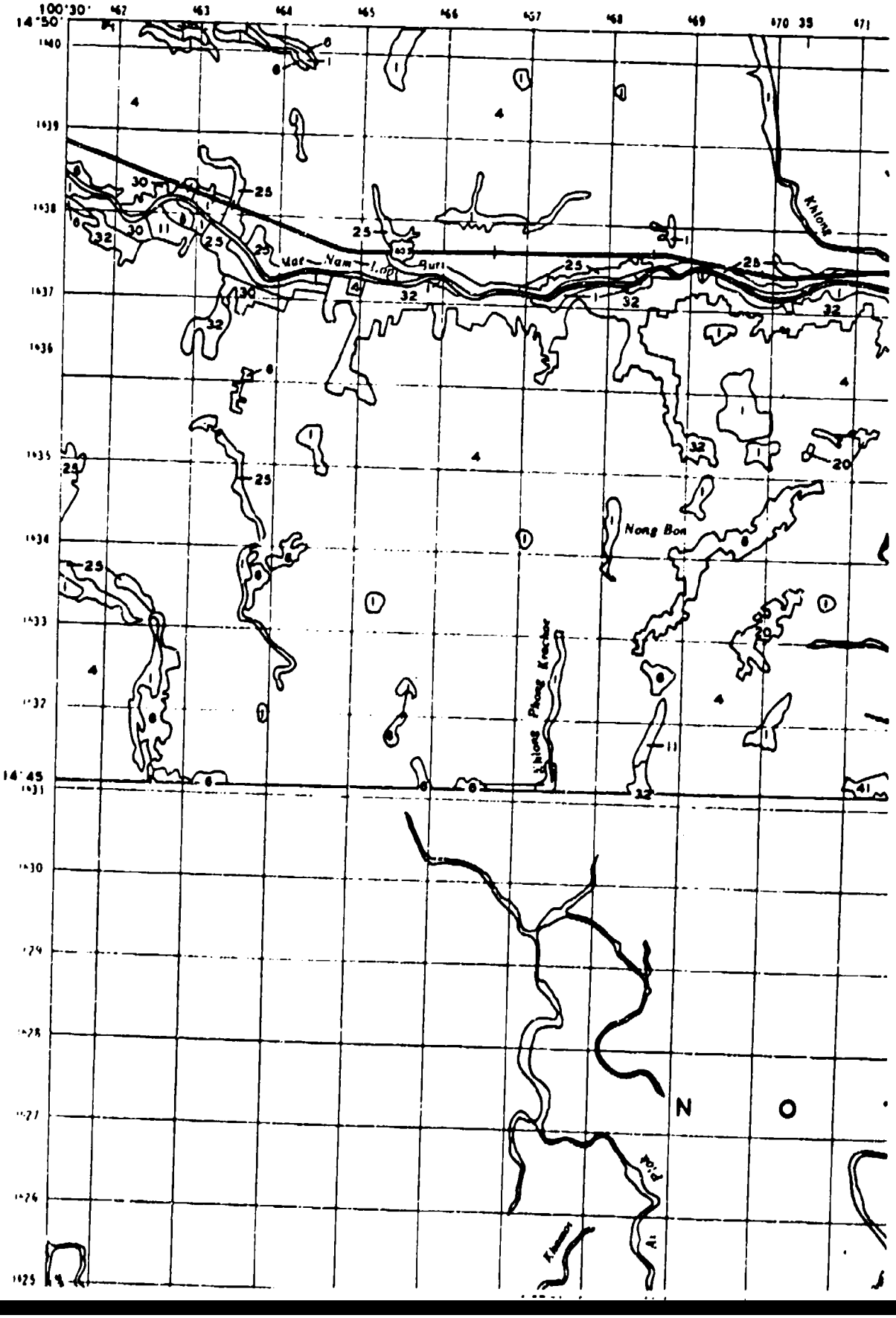
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

LOP BURI STUDY AREA

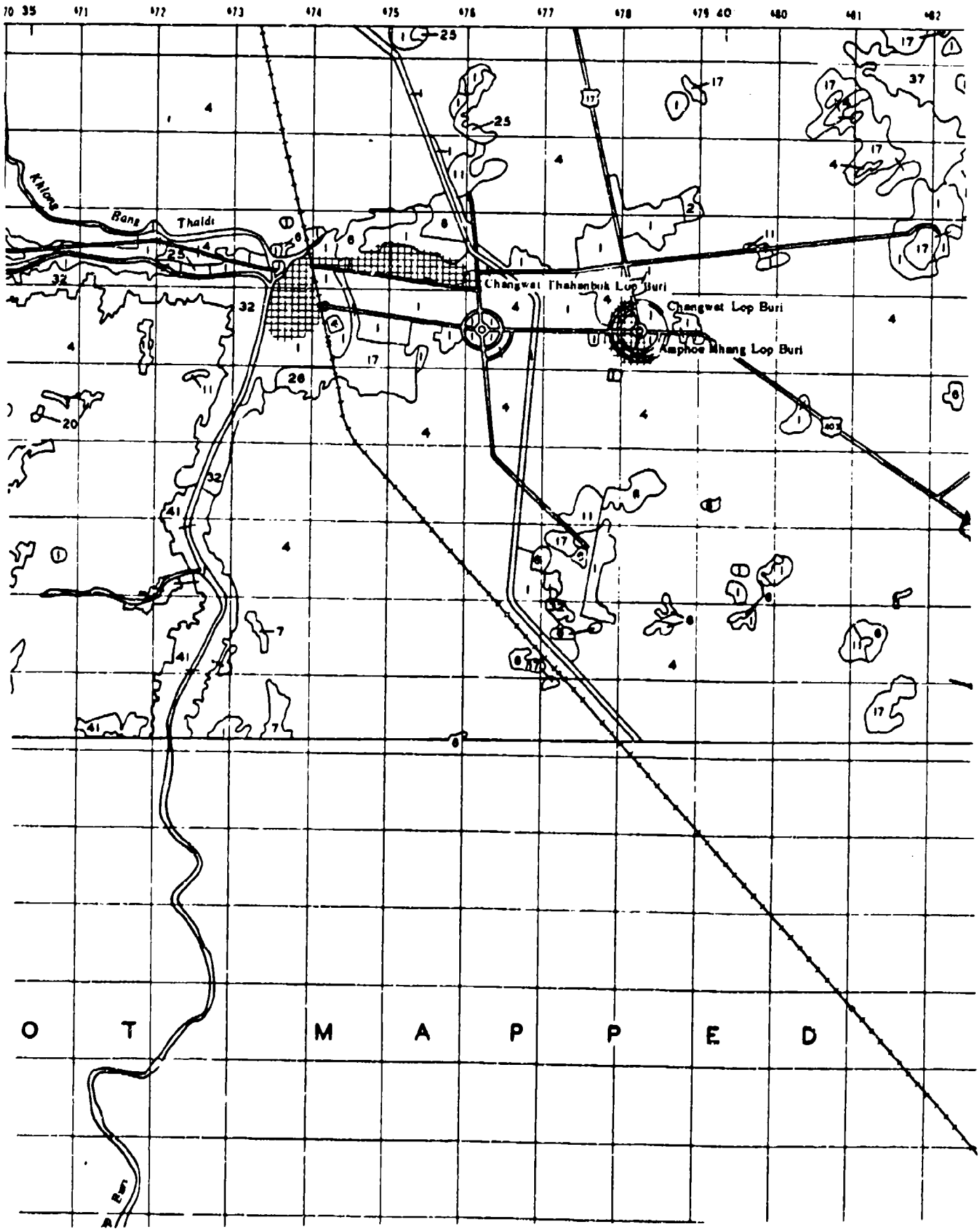
SHEET LB II

PLATE 2.2b

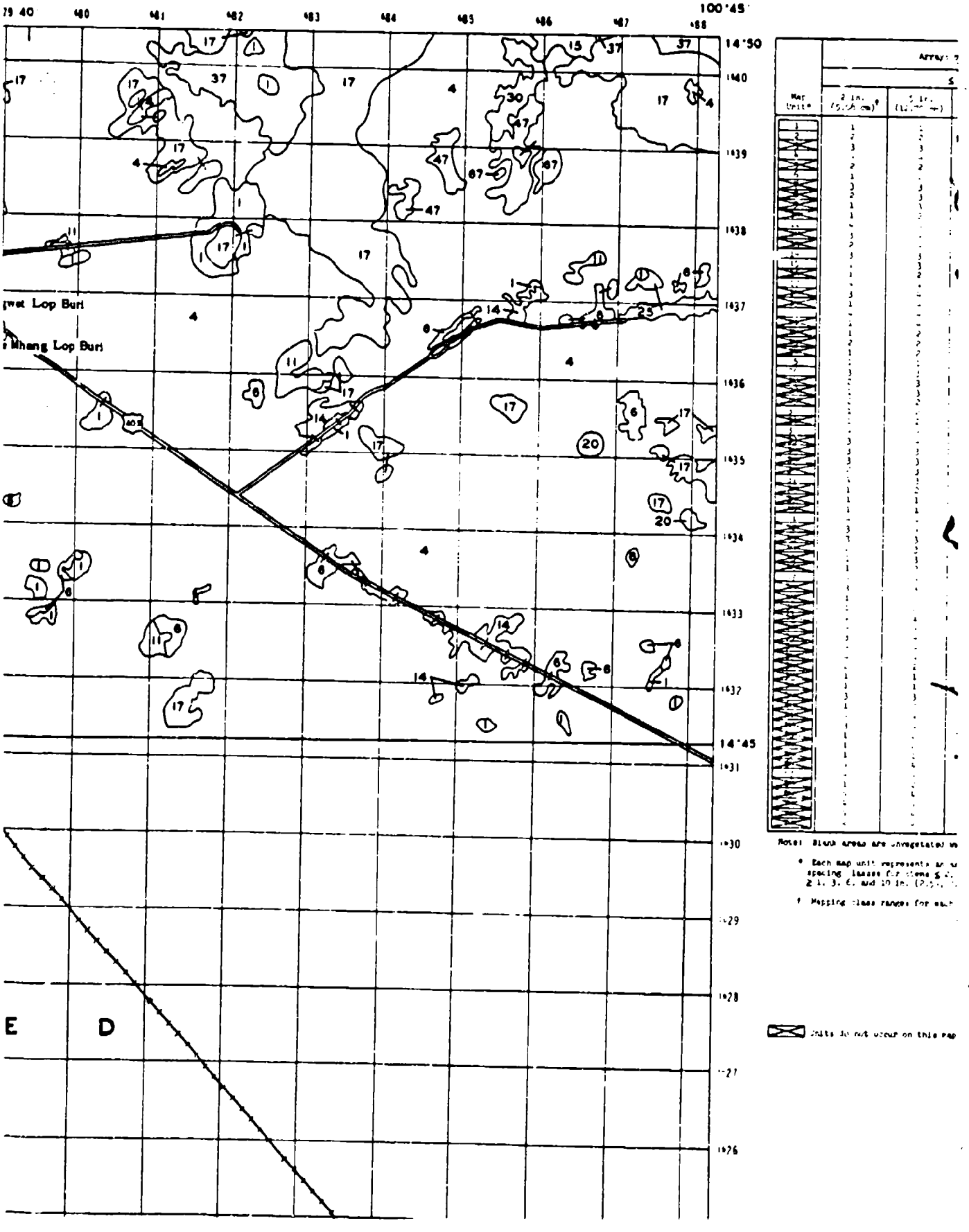

100°30'
14°50'
14°45'
Khlong
Nong Bon
Khlong Phong Krachor
N
O

1 2

LOP BURI


Khlong
Rang
Thaldi
Changwat Thahanbuk Lop Buri
Changwat Lop Buri
Amphoe Muang Lop Buri
O T M A P P E D

SHEET LB II



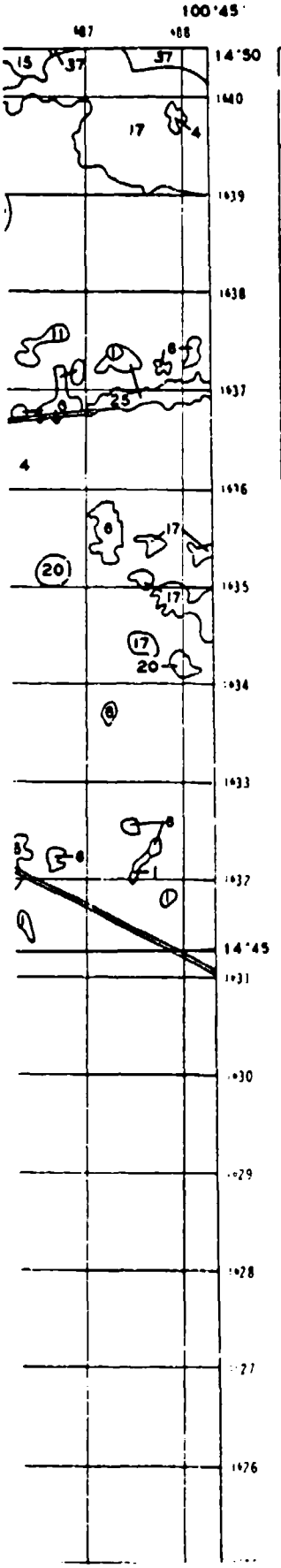
Note: Blank areas are unvegetated wa

* Each map unit represents an a
spacing classes for stems $
≥ 1, 3, 6, and 10 in. (2.5

† Mapping class ranges for each

Units do not occur on this map

SHEET LB II



LEGEND

Map Unit*	Array of Spacing Classes for Stems ≤ and ≥ the Specified Diameter							
	≤				≥			
	2 in. (5.08 cm)†	5 in. (12.70 cm)	10 in. (25.40 cm)	50 in. (127.00 cm)	1 in. (2.54 cm)	3 in. (7.62 cm)	6 in. (15.24 cm)	10 in. (25.40 cm)
	1	1	1	1	1	1	1	1
	2	2	2	2	2	1	1	1
	3	3	3	3	3	1	1	1
	4	4	4	4	4	1	1	1
	1	2	2	2	2	2	1	1
	2	3	3	3	3	2	1	1
	3	4	4	4	4	2	1	1
	4	5	5	5	5	2	1	1
	1	3	3	3	3	2	1	1
	2	4	4	4	4	2	1	1
	3	5	5	5	5	2	1	1
	4	6	6	6	6	2	1	1
	1	4	4	4	4	3	1	1
	2	5	5	5	5	3	1	1
	3	6	6	6	6	3	1	1
	4	7	7	7	7	3	1	1
	1	5	5	5	5	3	1	1
	2	6	6	6	6	3	1	1
	3	7	7	7	7	3	1	1
	4	8	8	8	8	3	1	1
	1	6	6	6	6	4	1	1
	2	7	7	7	7	4	1	1
	3	8	8	8	8	4	1	1
	4	9	9	9	9	4	1	1
	1	7	7	7	7	4	1	1
	2	8	8	8	8	4	1	1
	3	9	9	9	9	4	1	1
	4	10	10	10	10	4	1	1
	1	8	8	8	8	5	1	1
	2	9	9	9	9	5	1	1
	3	10	10	10	10	5	1	1
	4	11	11	11	11	5	1	1
	1	9	9	9	9	5	1	1
	2	10	10	10	10	5	1	1
	3	11	11	11	11	5	1	1
	4	12	12	12	12	5	1	1
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	2	15	15	15	15	8	1	1
	3	16	16	16	16	8	1	1
	4	17	17	17	17	8	1	1
	1	15	15	15	15	8	1	1
	2	16	16	16	16	8	1	1
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	1	16	16	16	16	9	1	1
	2	17	17	17	17	9	1	1
	3	18	18	18	18	9	1	1
	4	19	19	19	19	9	1	1
	1	17	17	17	17	9	1	1
	2	18	18	18	18	9	1	1
	3	19	19	19	19	9	1	1
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	2	19	19	19	19	10	1	1
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	4	21	21	21	21	10	1	1
	1	19	19	19	19	10	1	1
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	4	22	22	22	22	10	1	1
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	3	31	31	31	31	15	1	1
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	3	32	32	32	32	16	1	1
	4	33	33	33	33	16	1	1
	1	31	31	31	31	16	1	1
	2	32	32	32	32	16	1	1
	3	33	33	33	33	16	1	1
	4	34	34	34	34	16	1	1

Note: Blank areas are inaccessible water bodies.

* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1,) indicating spacing classes for stems ≤ 2, 5, 10, and 50 in. (≤ 5.08, 12.70, 22.86, and 127.00 cm) and ≥ 1, 3, 6, and 10 in. (2.54, 7.62, 15.24, and 25.40 cm).

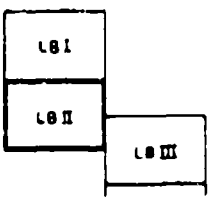
† Mapping class ranges for each spacing class are:

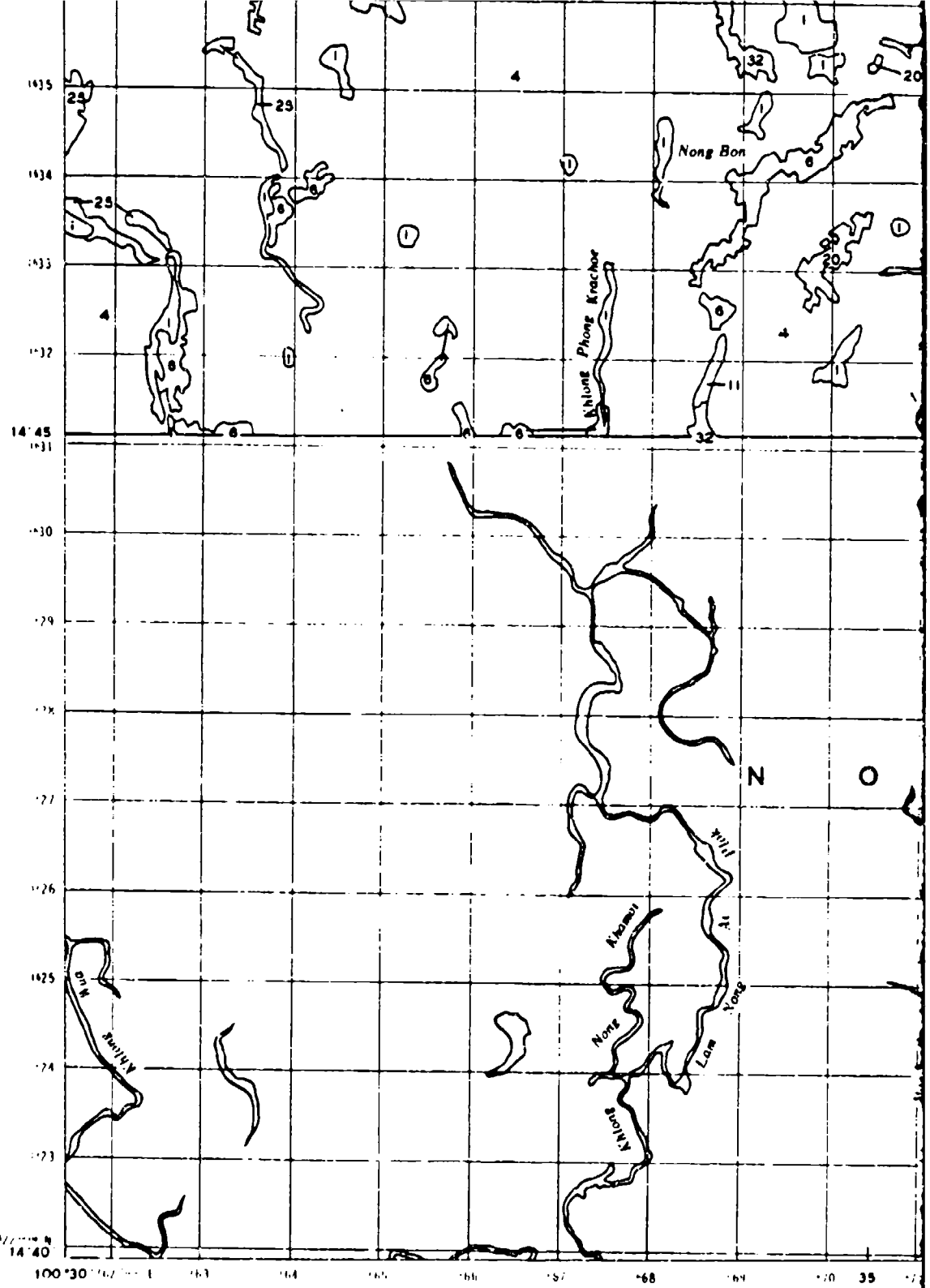
Stem Spacing

Mapping Class	Range	
	ft	m
1	> 30	> 9.14
2	> 10-30	> 3.05-9.14
3	> 5-10	> 1.52-3.05
4	0-5	0-1.52

Units do not occur on this map.

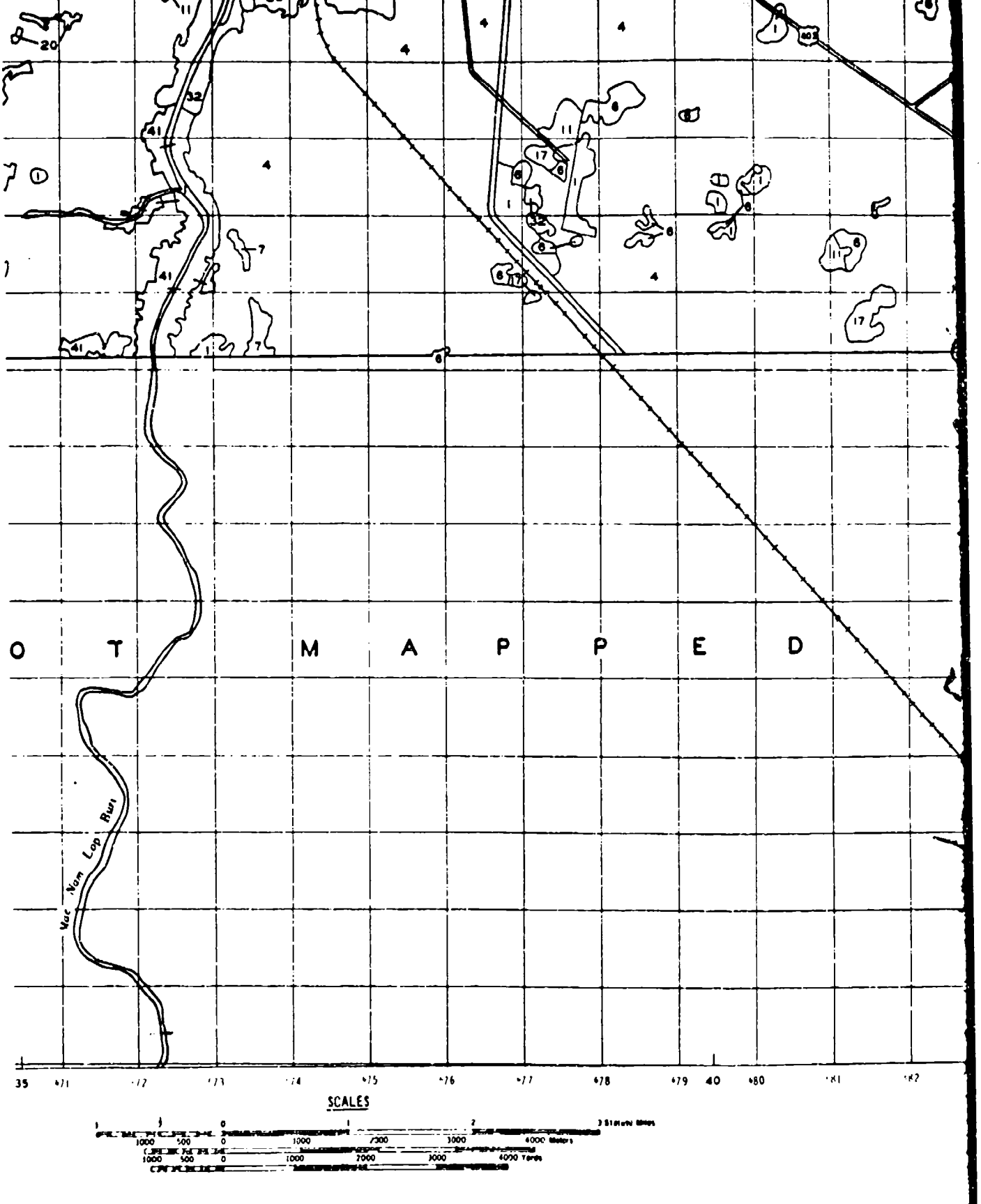
INDEX TO ADJOINING SHEETS



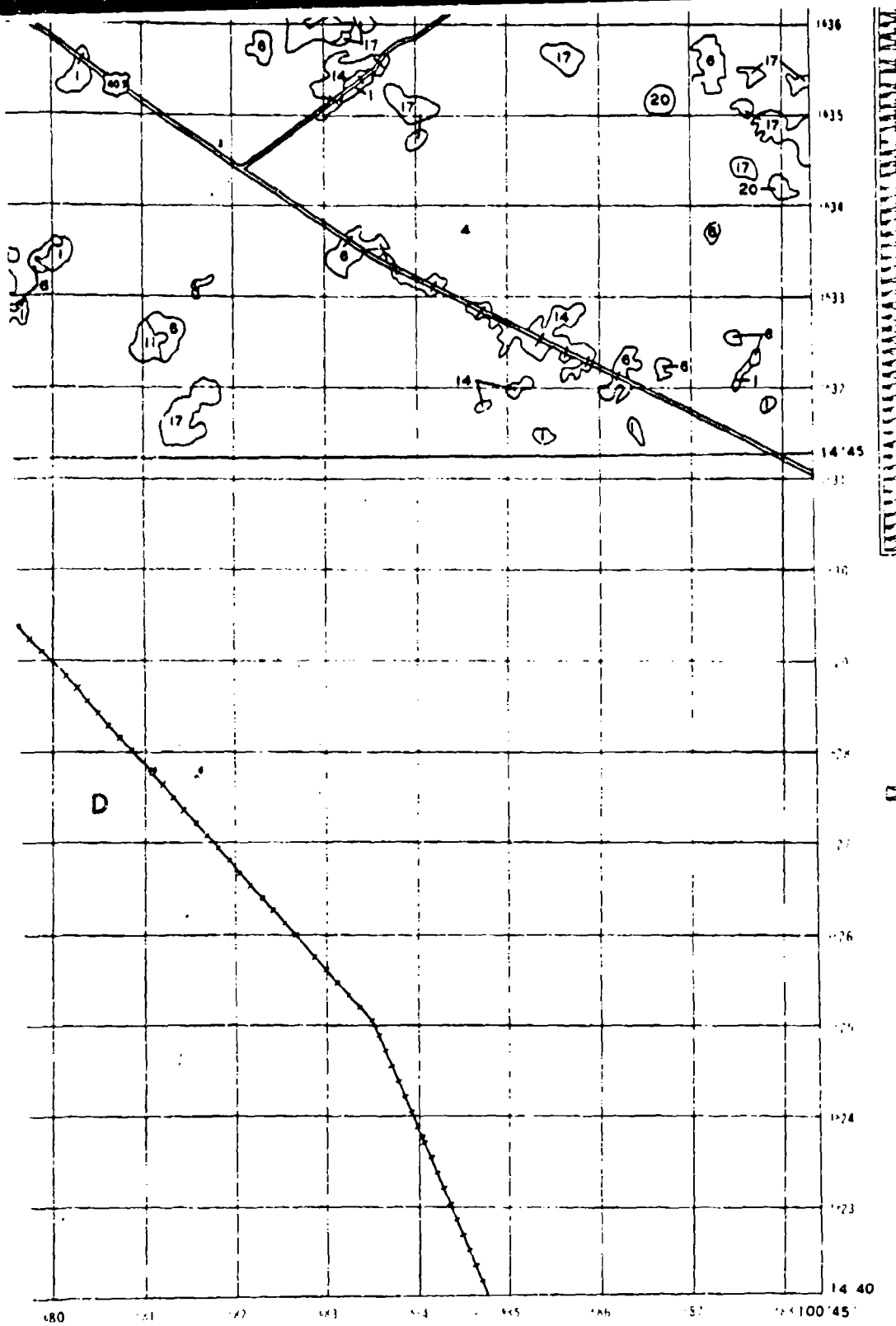


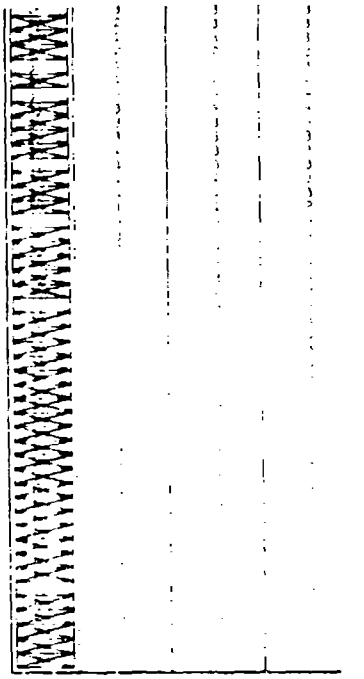
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


O T M A P P E D
Vac Nam Lop Rwi
35 471 472 473 474 475 476 477 478 479 40 480 481 482
SCALES

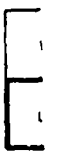
6







INDEX



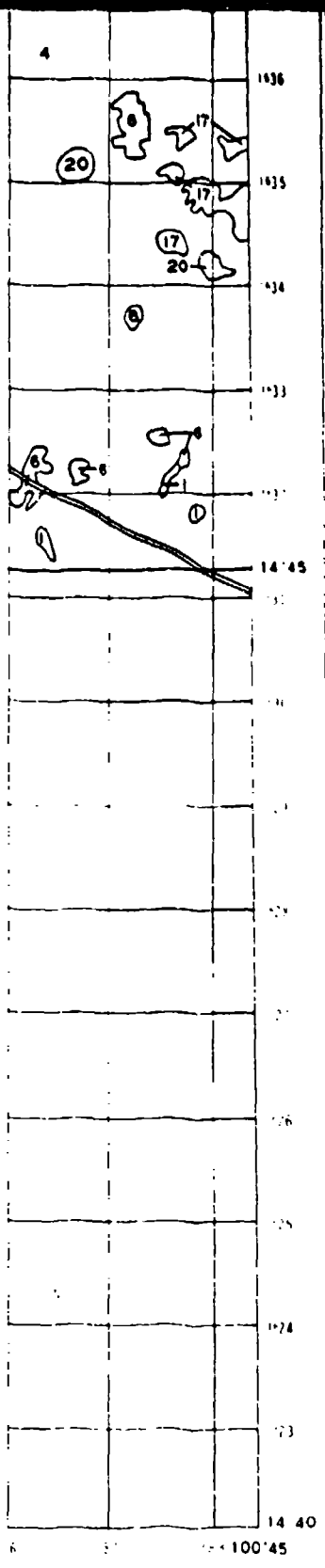


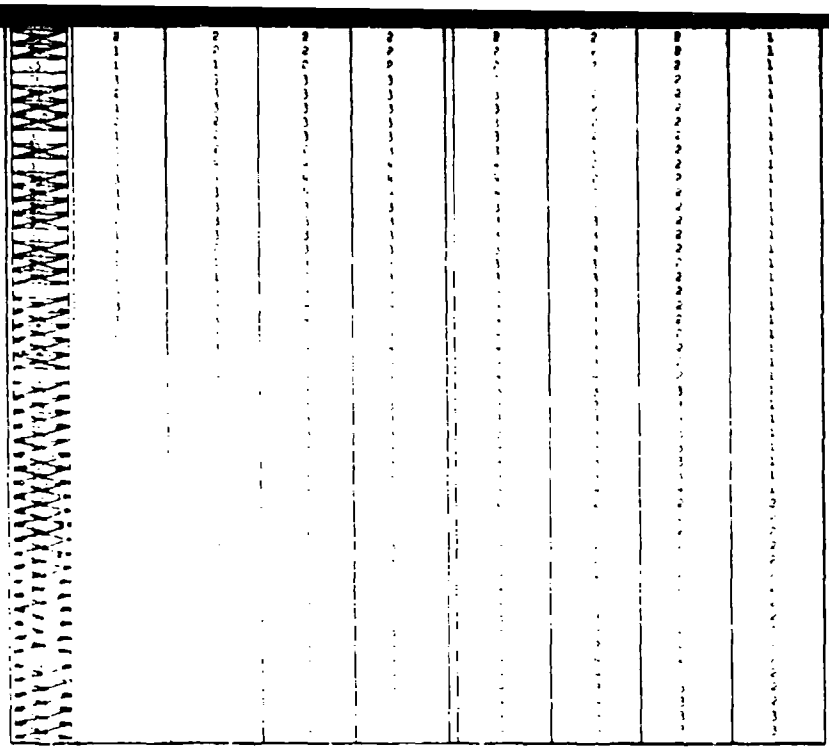
A QUANTITATIVE
TERRAIN FOR

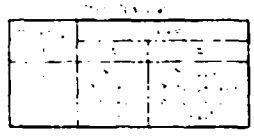
VEC

LOP BUF

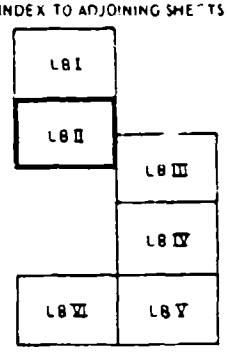
SHI







INDEX TO ADJOINING SHEETS



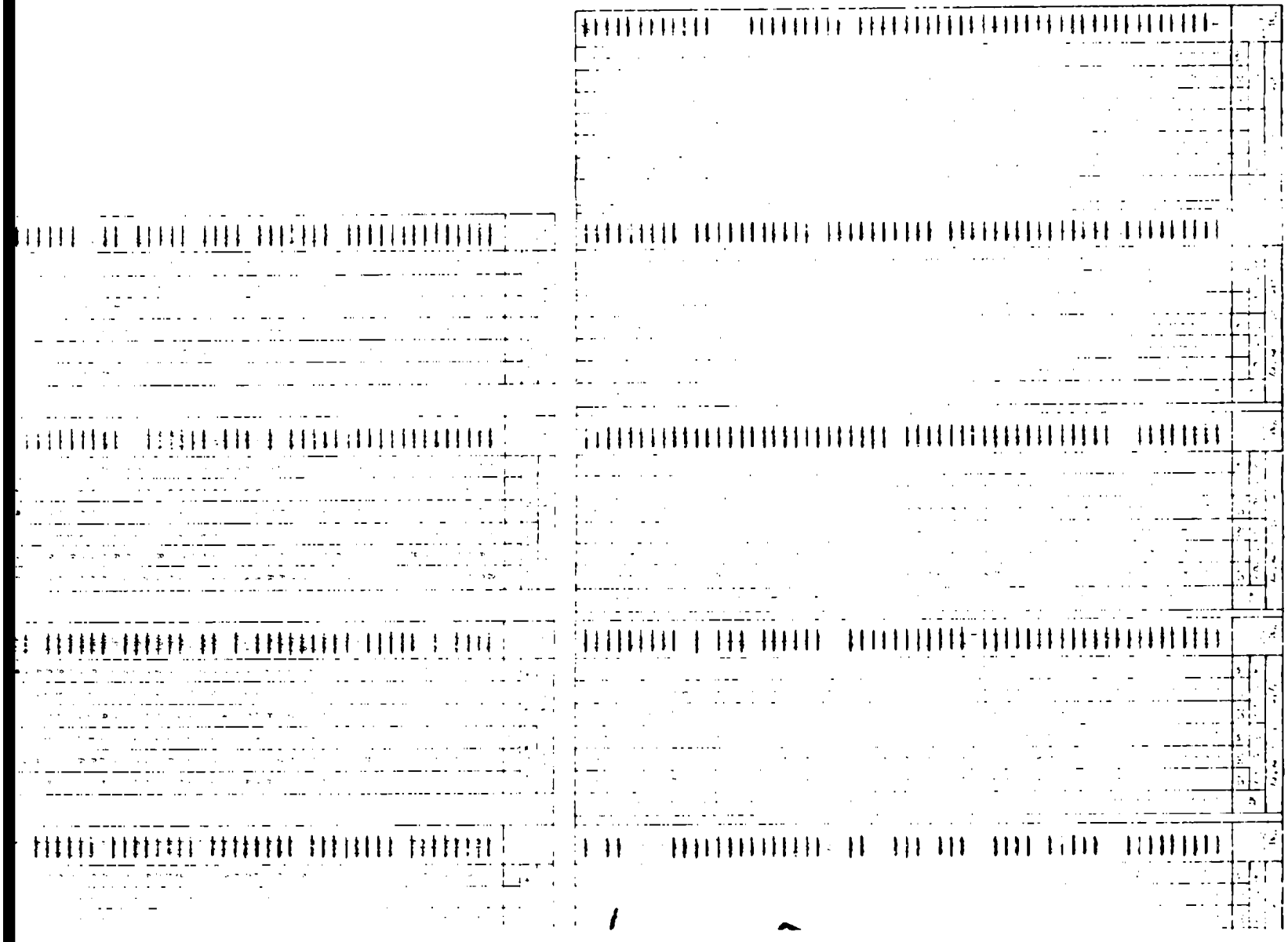
A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

VEGETATION

LOP BURI STUDY AREA

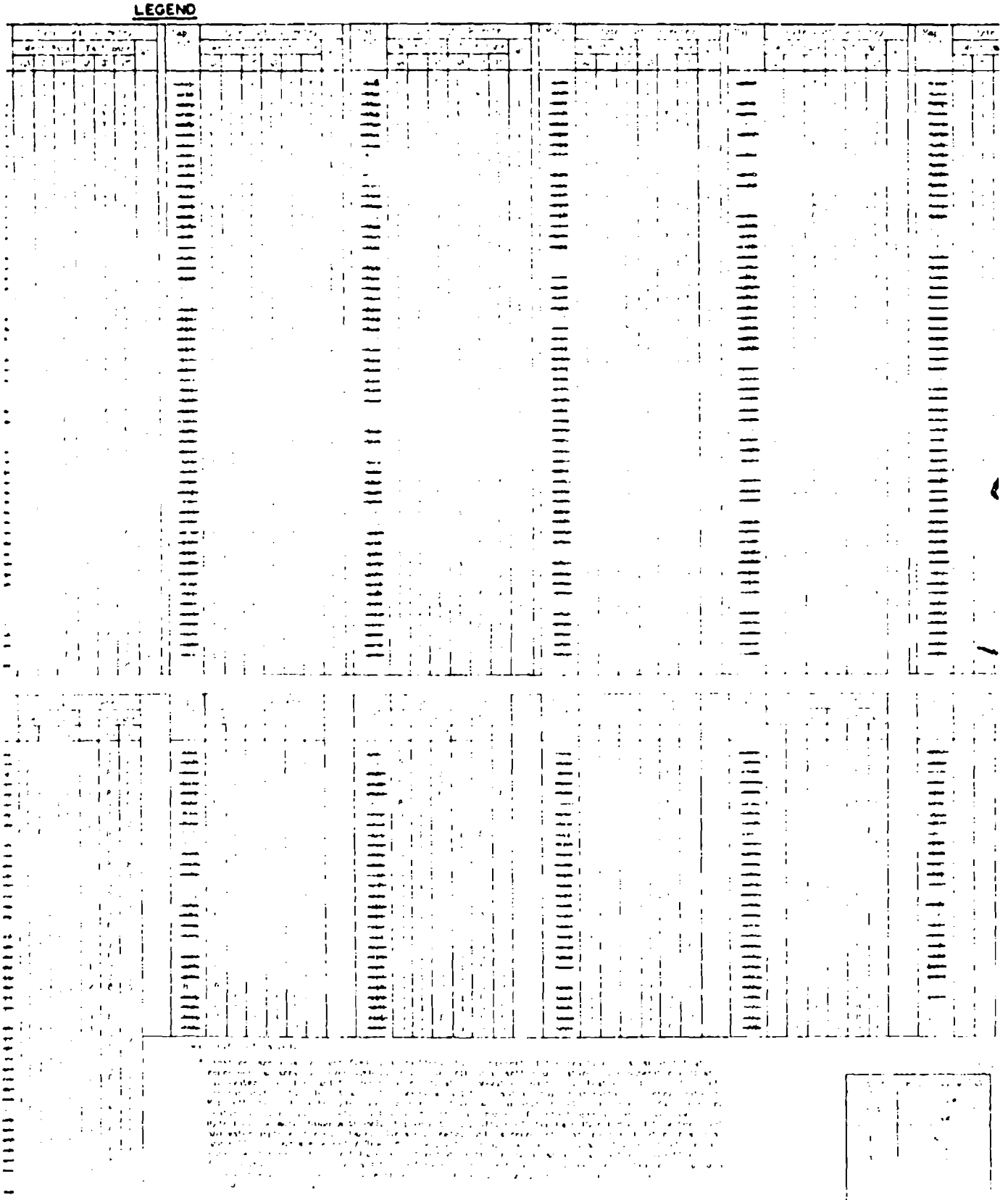
SHEET LB II

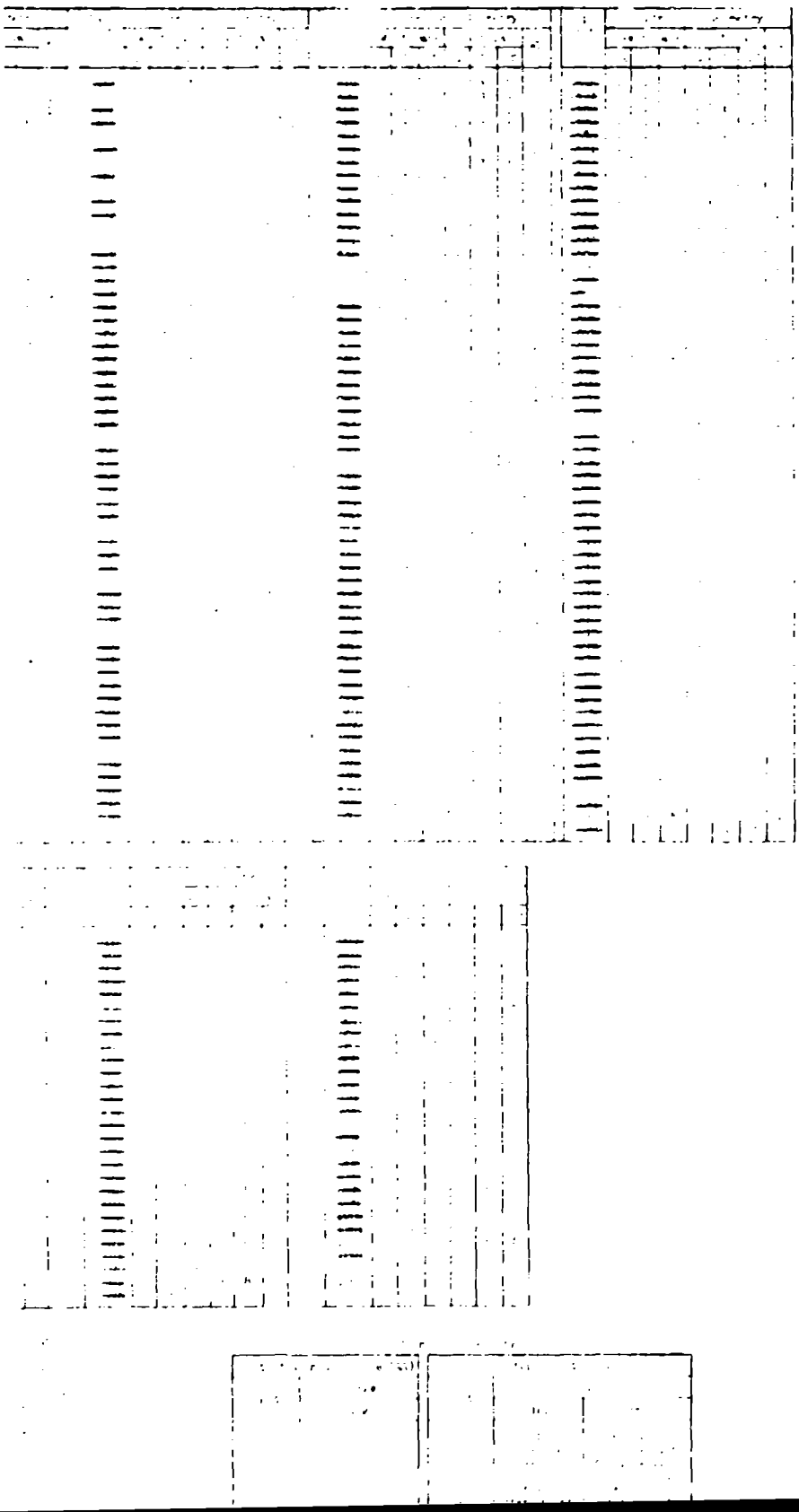
PLATE 2.2c

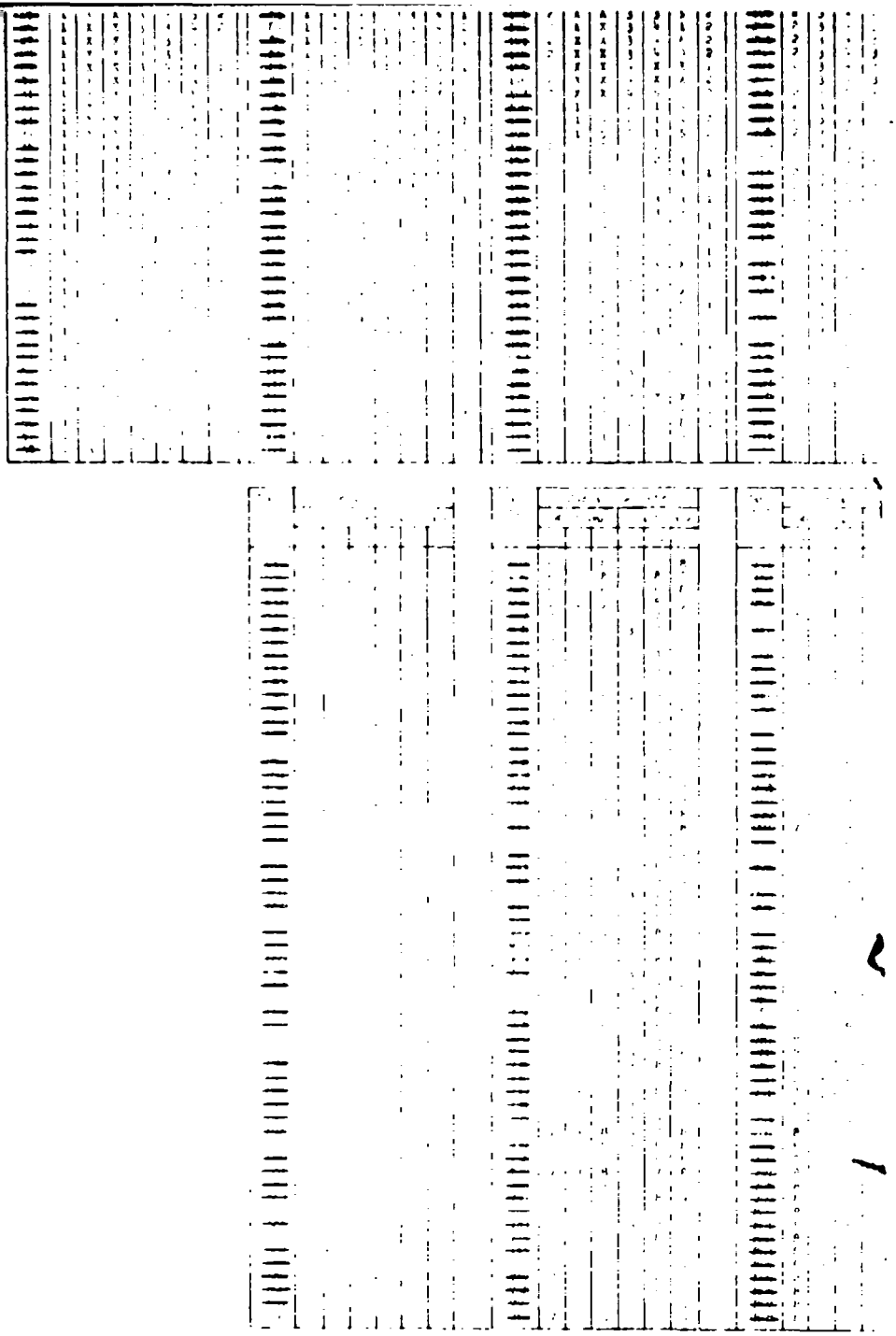


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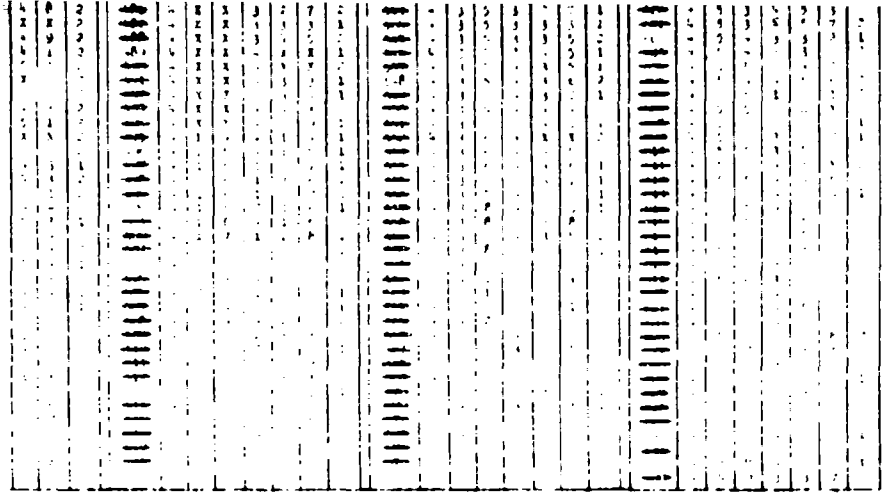
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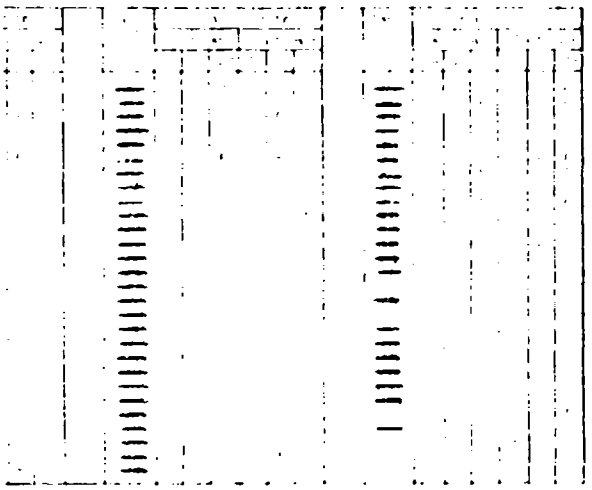


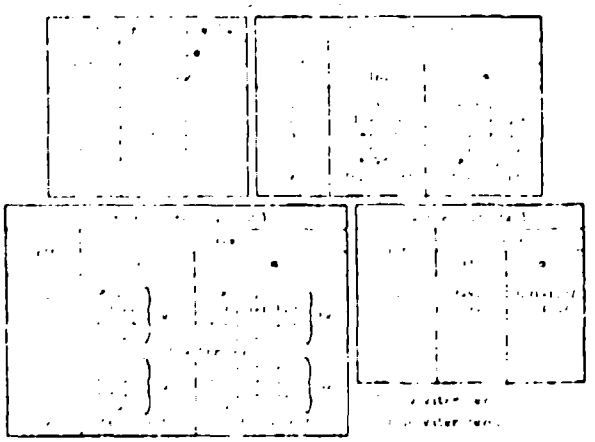


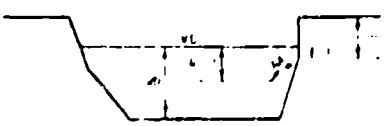


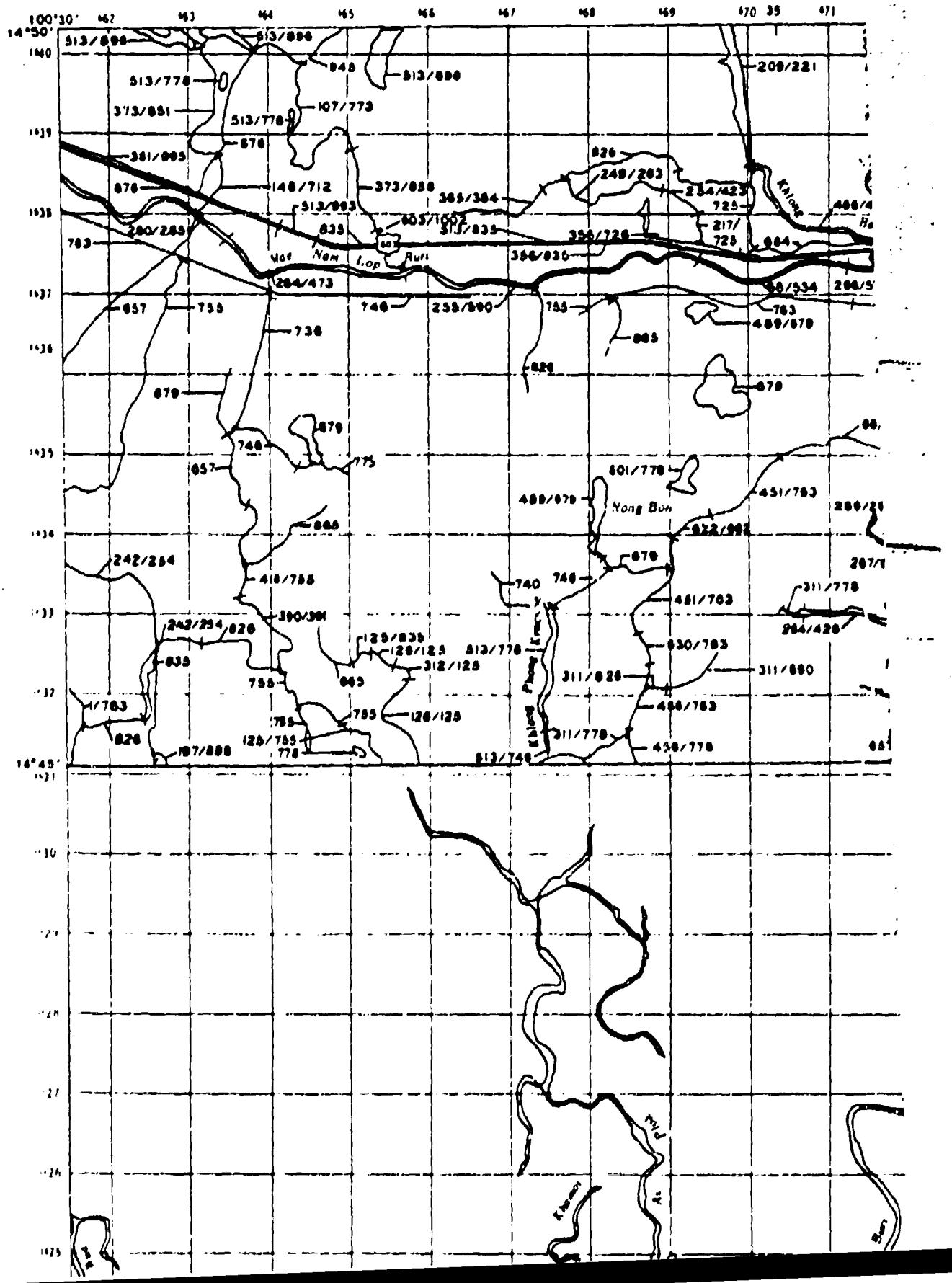
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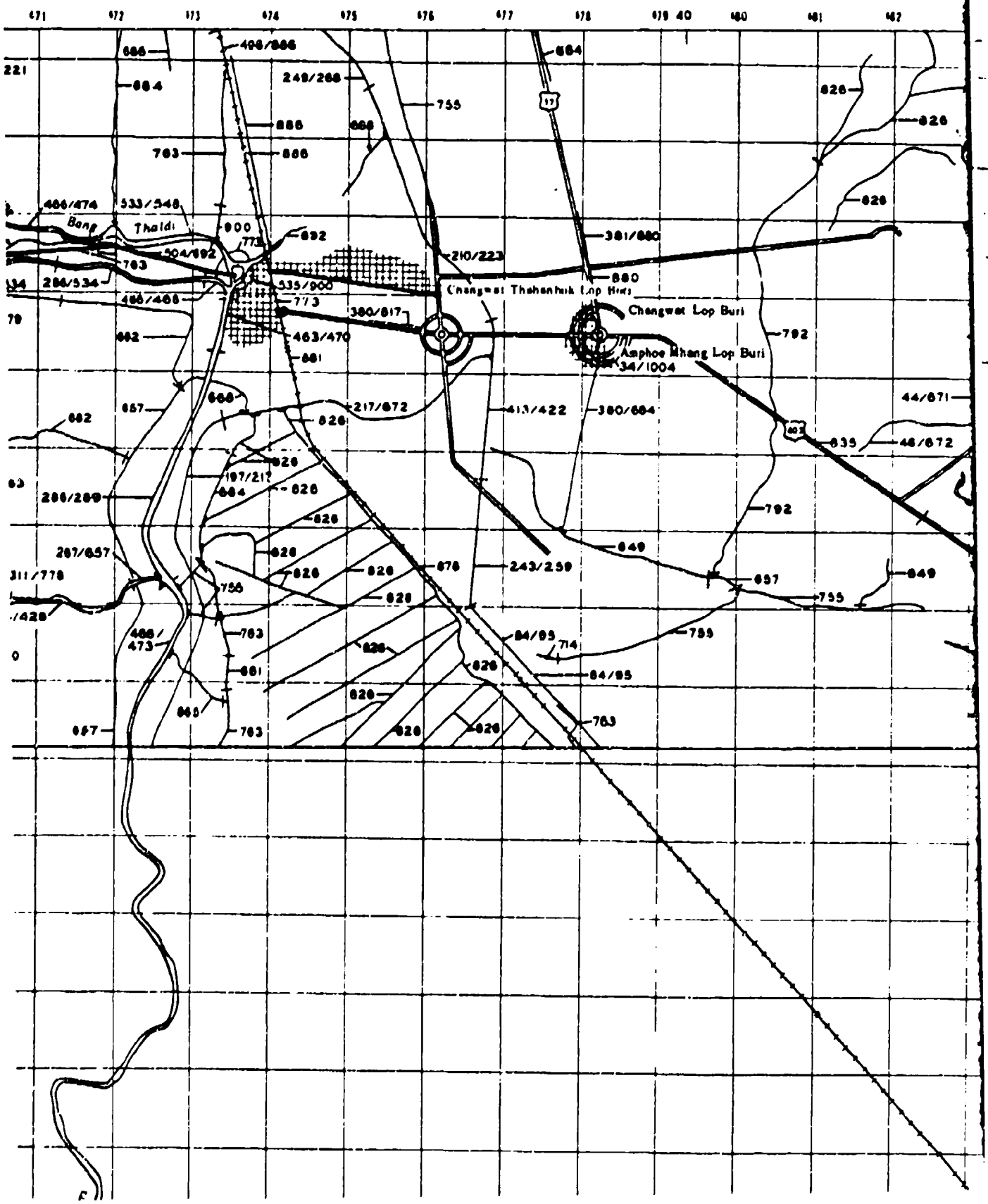



100°30'
14°50'
14°45'
Nong Bon
Khlong Phlong Krieng
Khlong
Prik

1

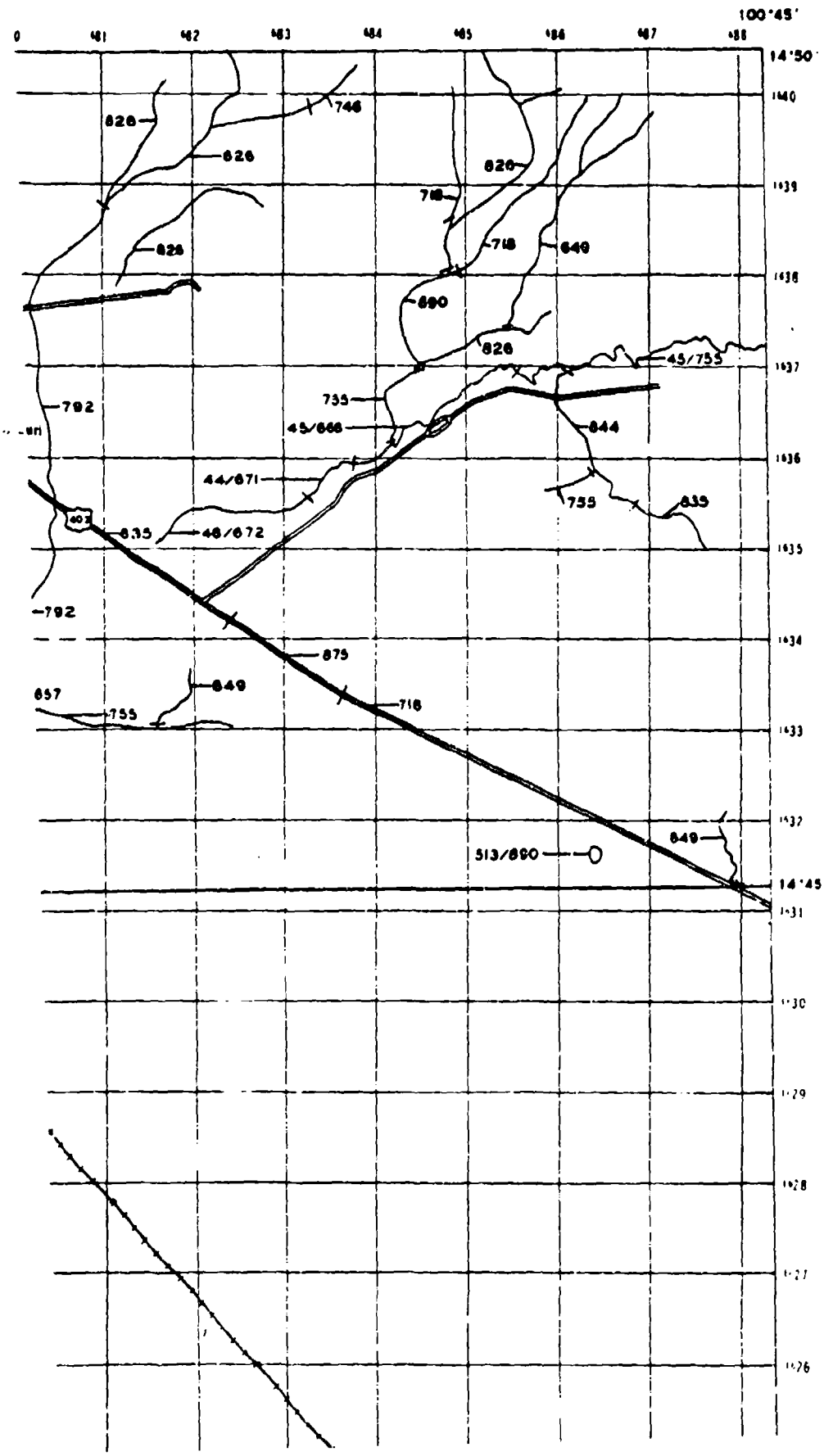
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LOP BURI


Thaldi
Changwat Thahanhak Lop Buri
Changwat Lop Buri
Amphoe Mhang Lop Buri
34/1004

3

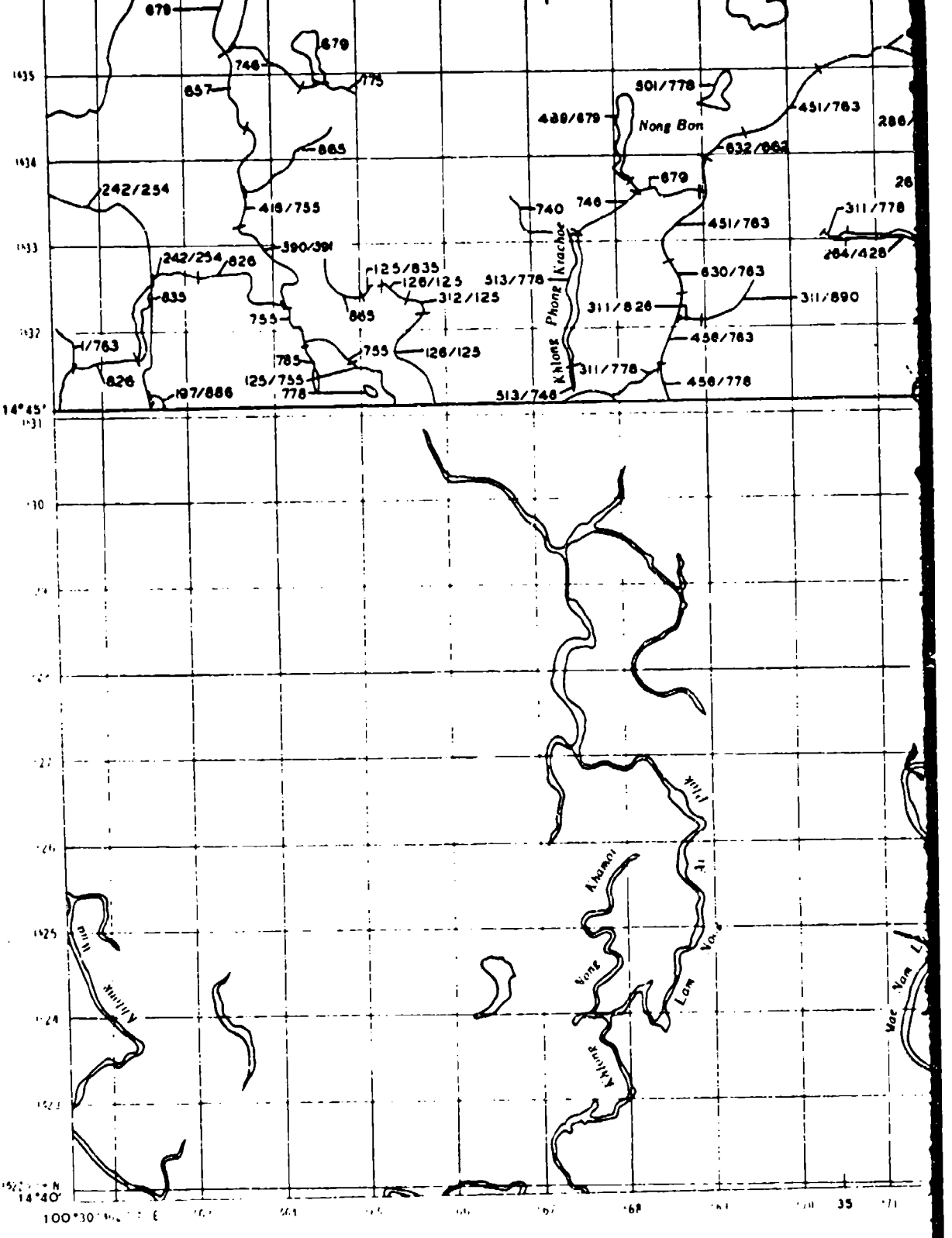
SHEET LB II

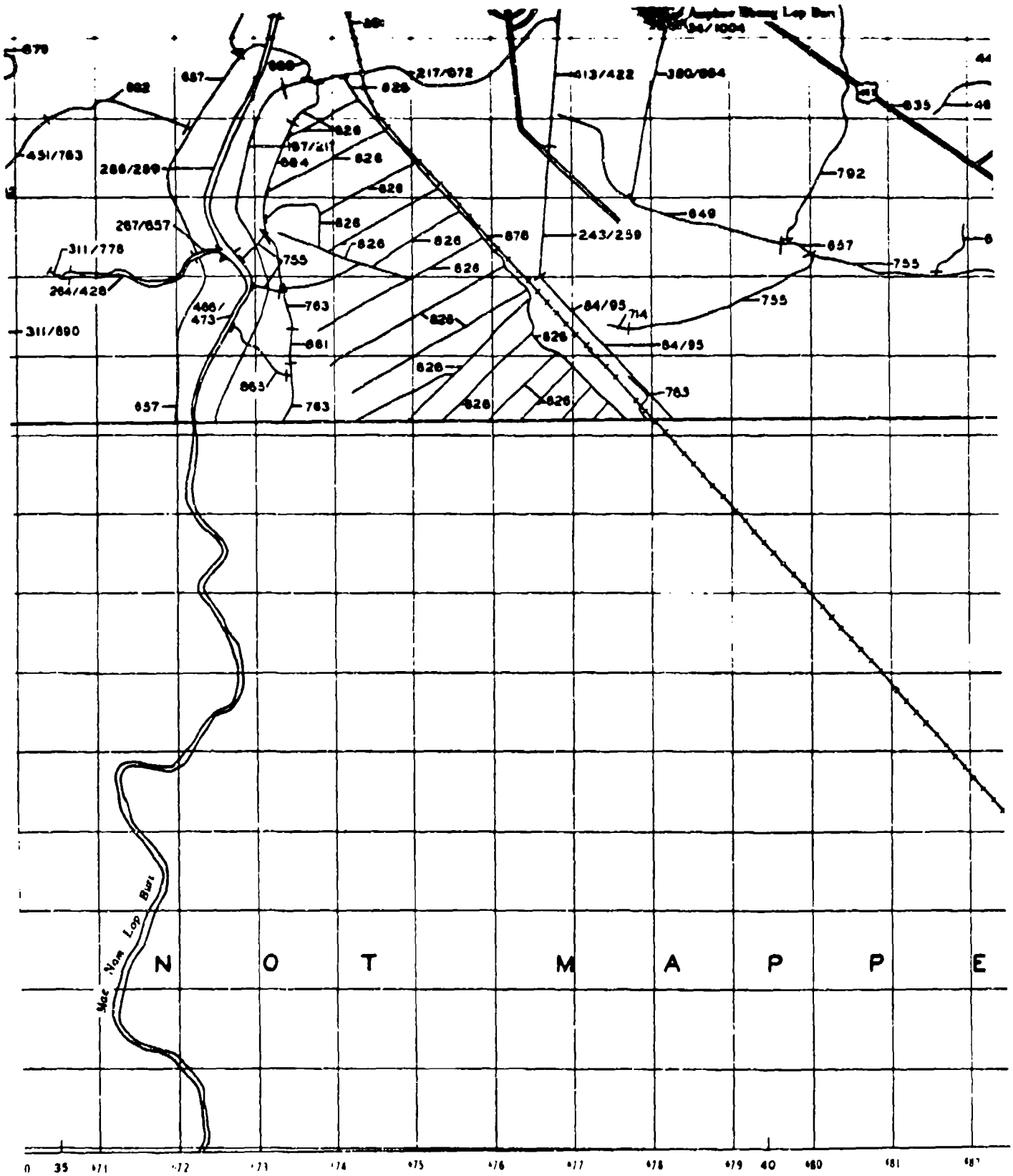


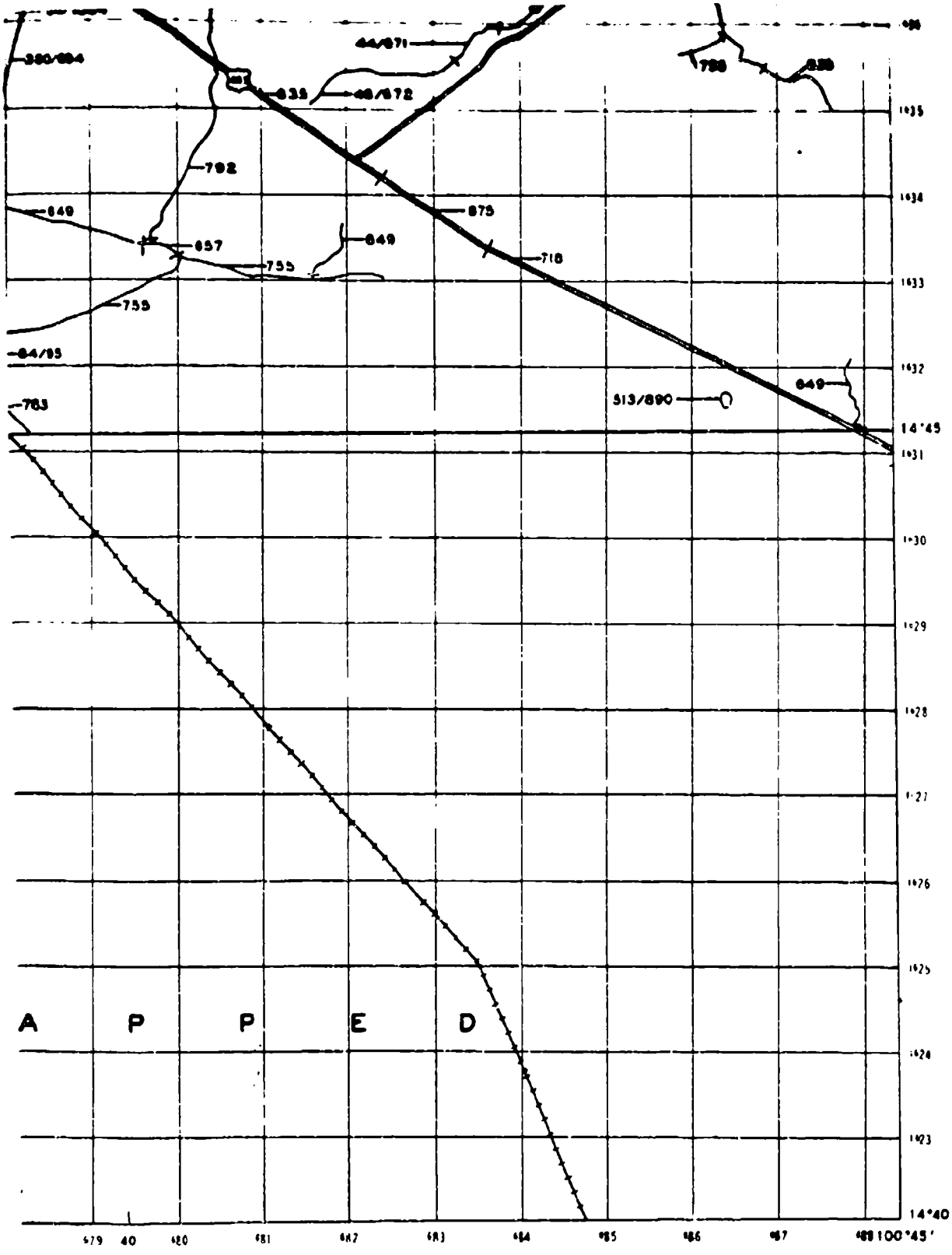
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LB I

LB II

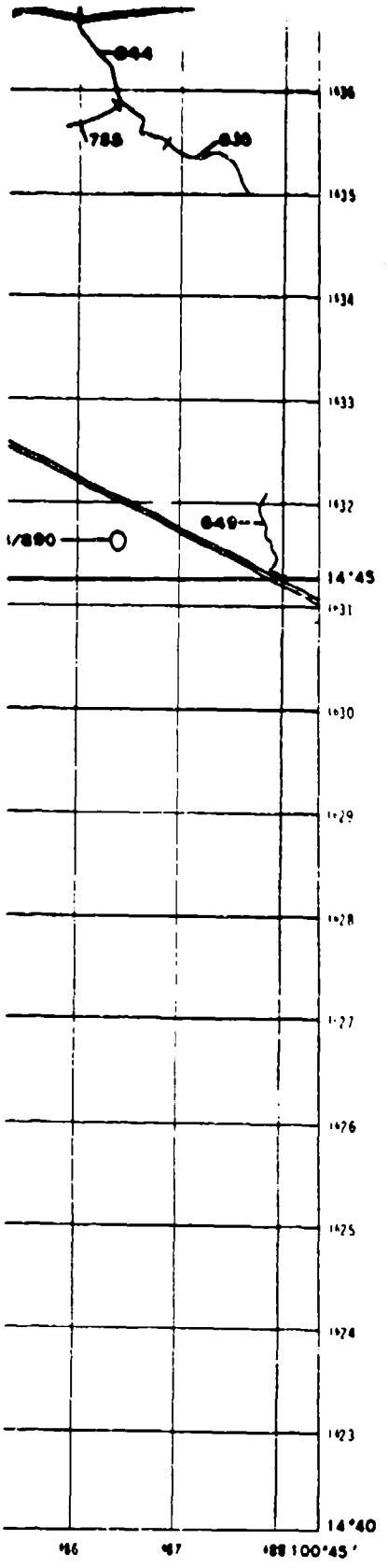

679
746
679
657
775
1635
501/778
439/679
Nong Bon
451/763
865
1634
242/254
679
740
746
451/763
419/755
311/778
390/391
264/428
242/254
826
125/835
126/125
513/778
Khlong Phong Krachae
630/763
835
312/125
311/826
311/890
755
865
1632
1/763
755
126/125
456/763
785
826
125/755
778
311/778
456/778
197/886
513/748
14°45'
1631
1630
1625
1624
1623
14°40'
100°30'
35
Khlong
Khlong
Khlong


Mac Nab Loop Burn
N O T M A P P E
SCALES

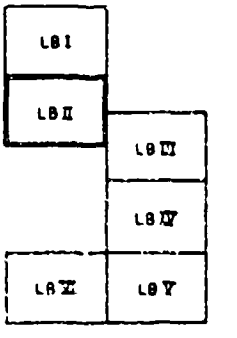

330/864
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763
44/871
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48/872
875
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718
513/890
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INDEX TO ADJOINING SHEETS



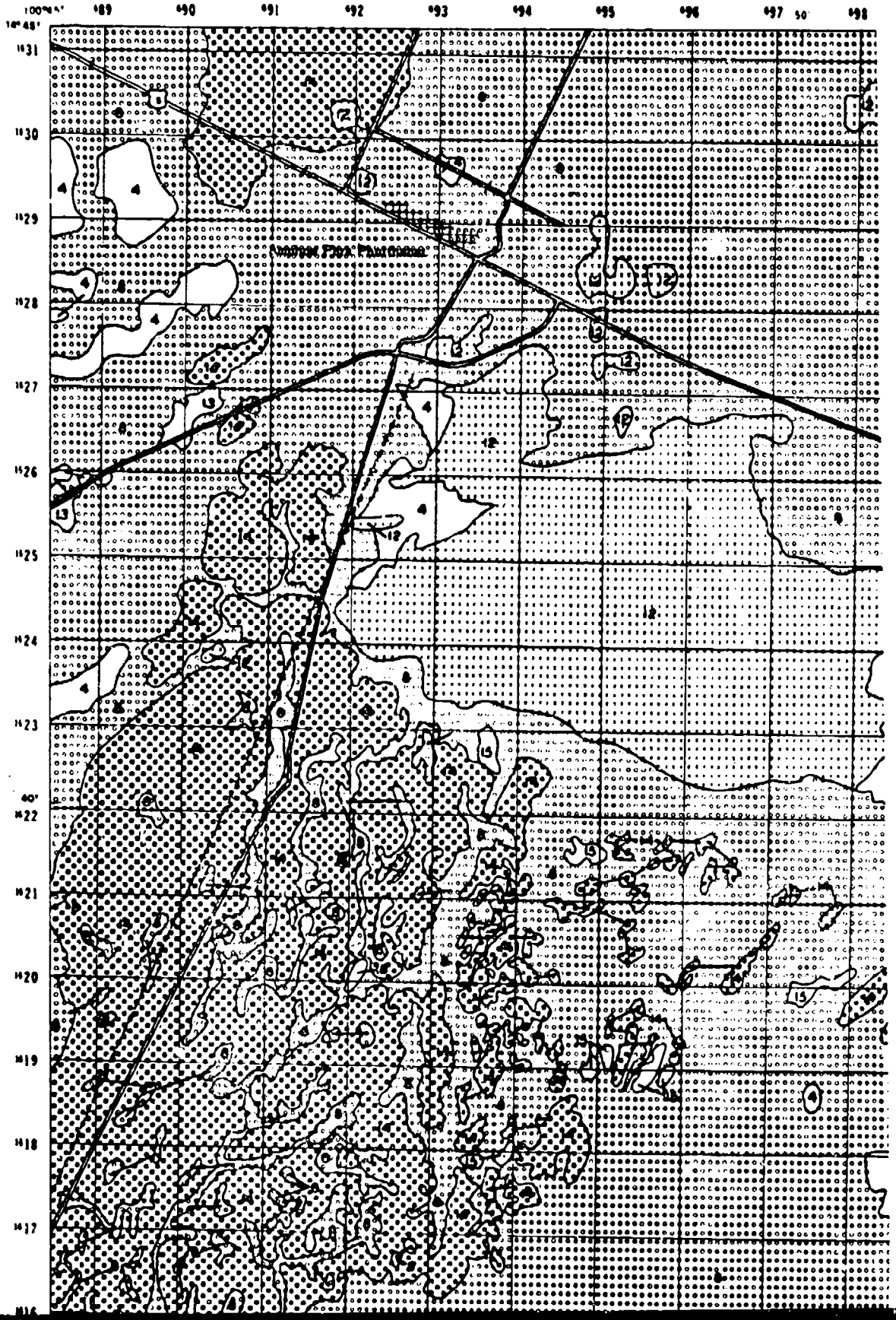
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

IGP BURI STUDY AREA

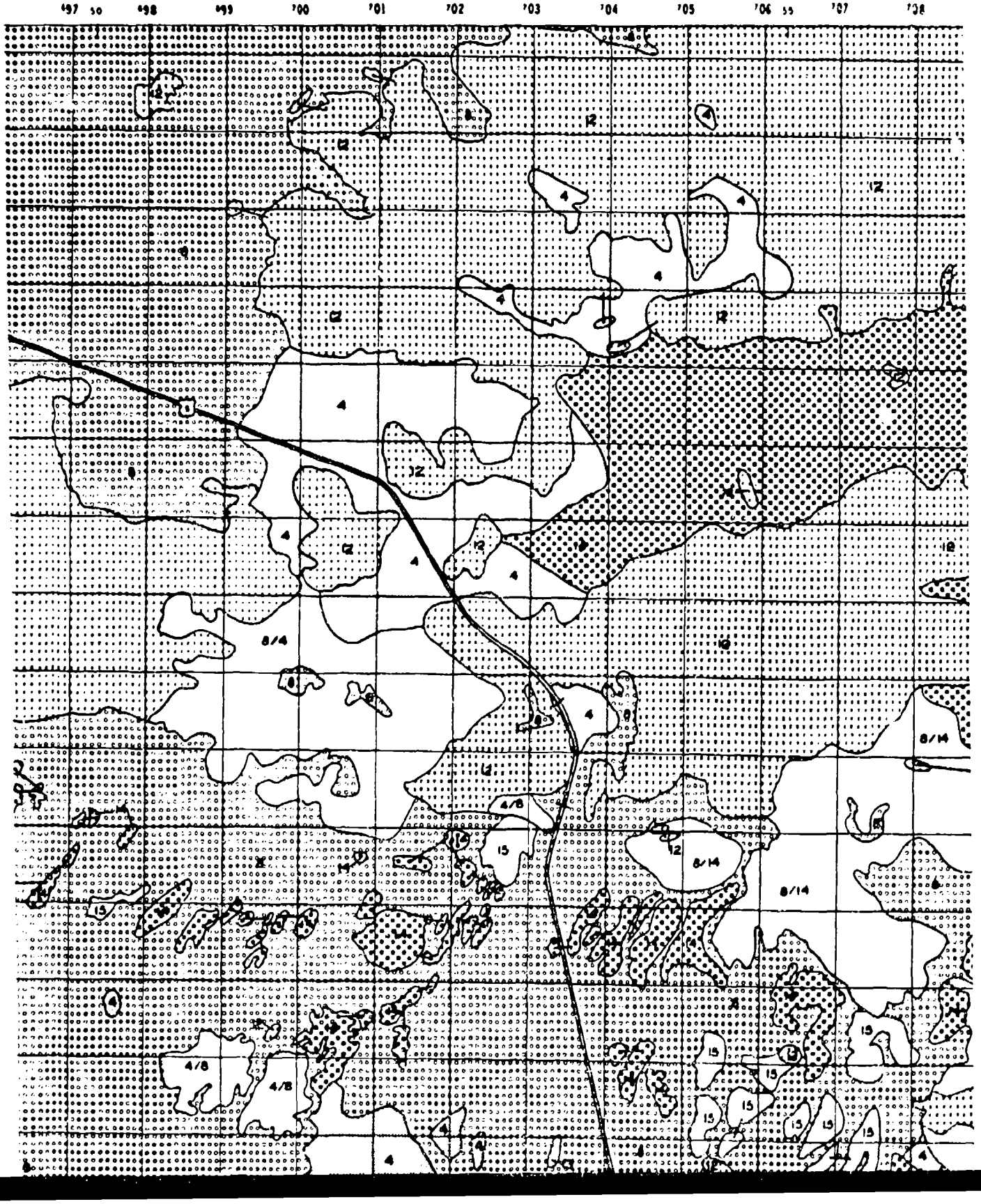
SHEET LB II

PLATE 2.2d


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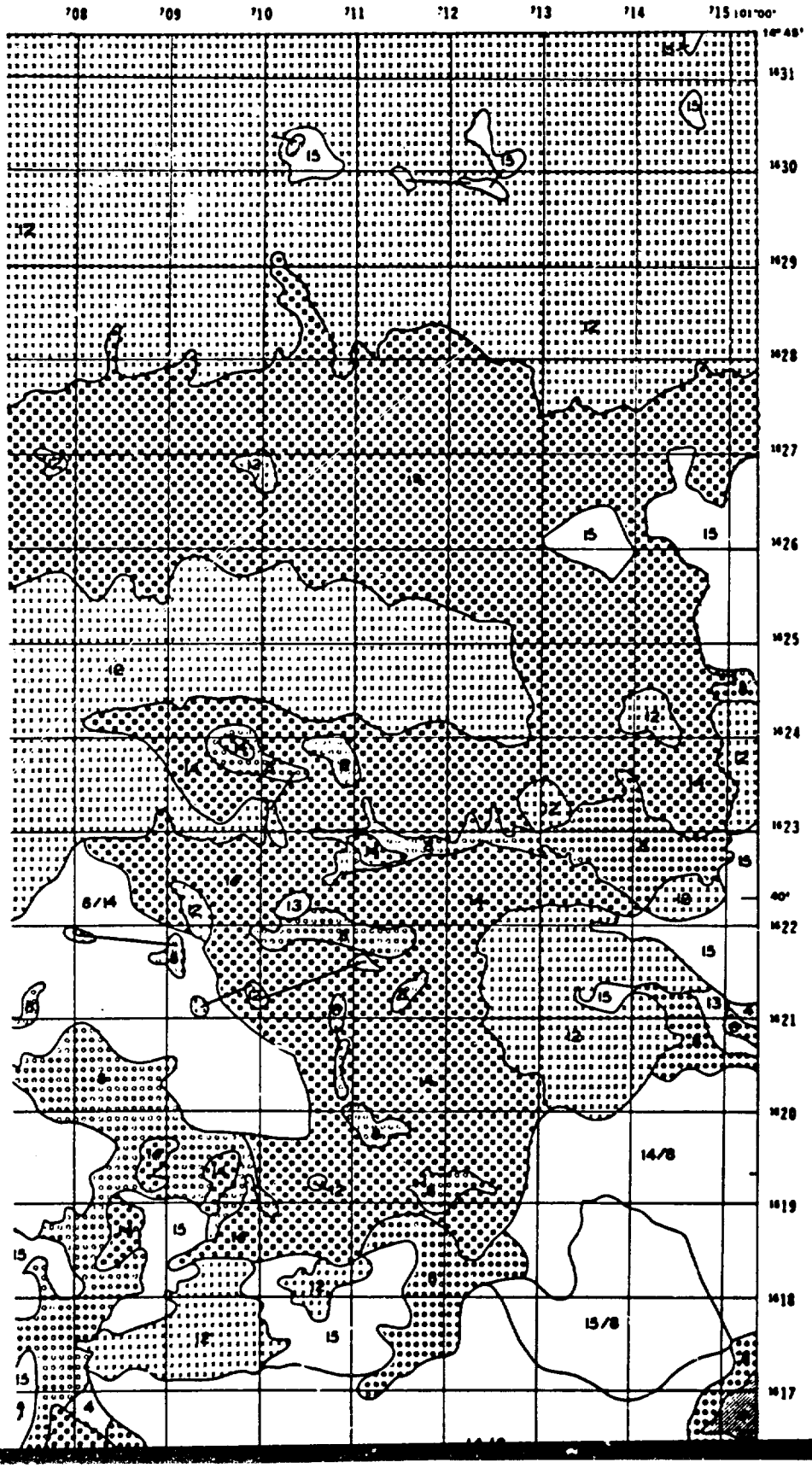
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LOP BURI


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706 55
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708
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8/14
4/8
15

1 3

SHEET LB III



LEGE

Unit	Soil Mass Strength: Maximum Moisture, MCI	Soil Mass Strength: Minimum Moisture, MCI	Maximum Moisture: c_{uu} psi	Maximum Moisture: c_{uu} kg/cm²	Maximum Moisture: ϕ_{uu} deg	P
	10-25	25-60	0-1	0-0.07	0-10	1
	25-60	60-100	0-1	0-0.07	0-10	2
	25-60*	60-100	0-1	0-0.07	10-20	2
5	25-60	>100	0-1	0-0.07	0-10	C
	25-60*	>100	0-1	0-0.07	10-20	C
6	60-100	60-100	0-1	0-0.07	0-10	2
	60-100	60-100	0-1	0-0.07	10-20	C
12	60-100	>100	0-1	0-0.07	0-10	C
	60-100	>100	0-1	0-0.07	0-10	C
10	60-100	>100	0-1	0-0.07	10-20	C
	60-100*	>100	0-1	0-0.07	10-20	C
12	>100	>100	0-1	0-0.07	0-10	C
13	>100	>100	0-1	0-0.07	10-20	C
14/8	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	C
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	C

Note: Blank areas are water bodies.

c_{uu} Shear strength at zero normal load.

ϕ_{uu} Angle of internal friction.

* Maximum moisture has less than 30 percent probabil strengths commonly observed are 60-100 for Units 3

Units do not occur on this map.

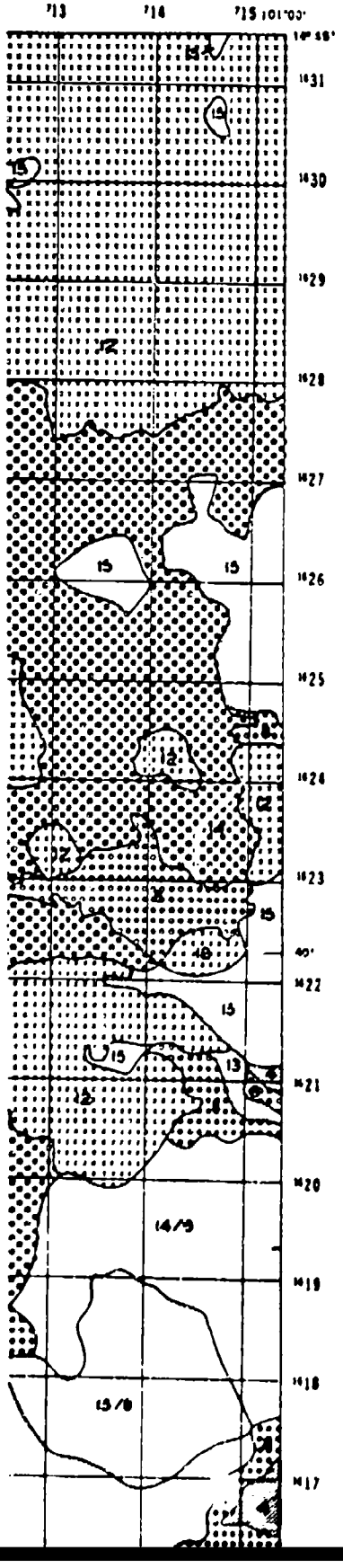
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LB I

LB II

4

SHEET LB III



LEGEND

Unit	Soil Base Strength: Maximum Moisture AASHO	Soil Base Strength: Minimum Moisture AASHO	Soil Surface Strength: Maximum Moisture c_{ur} psi	Soil Surface Strength: Maximum Moisture c_{ur} kg/cm²	Soil Surface Strength: Maximum Moisture ϕ_{ur} deg	Soil Surface Strength: Minimum Moisture c_{ur} psi	Soil Surface Strength: Minimum Moisture c_{ur} kg/cm²	Soil Surface Strength: Minimum Moisture ϕ_{ur} deg	Conditions where maximum ϕ_{ur} occurs: c_{ur} psi	Conditions where maximum ϕ_{ur} occurs: c_{ur} kg/cm²	Conditions where maximum ϕ_{ur} occurs: ϕ_{ur} deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
14	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
8/9*	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Black areas are water bodies.

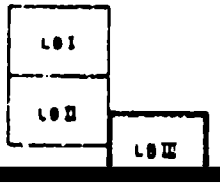
c_{ur} Shear strength at zero normal load.

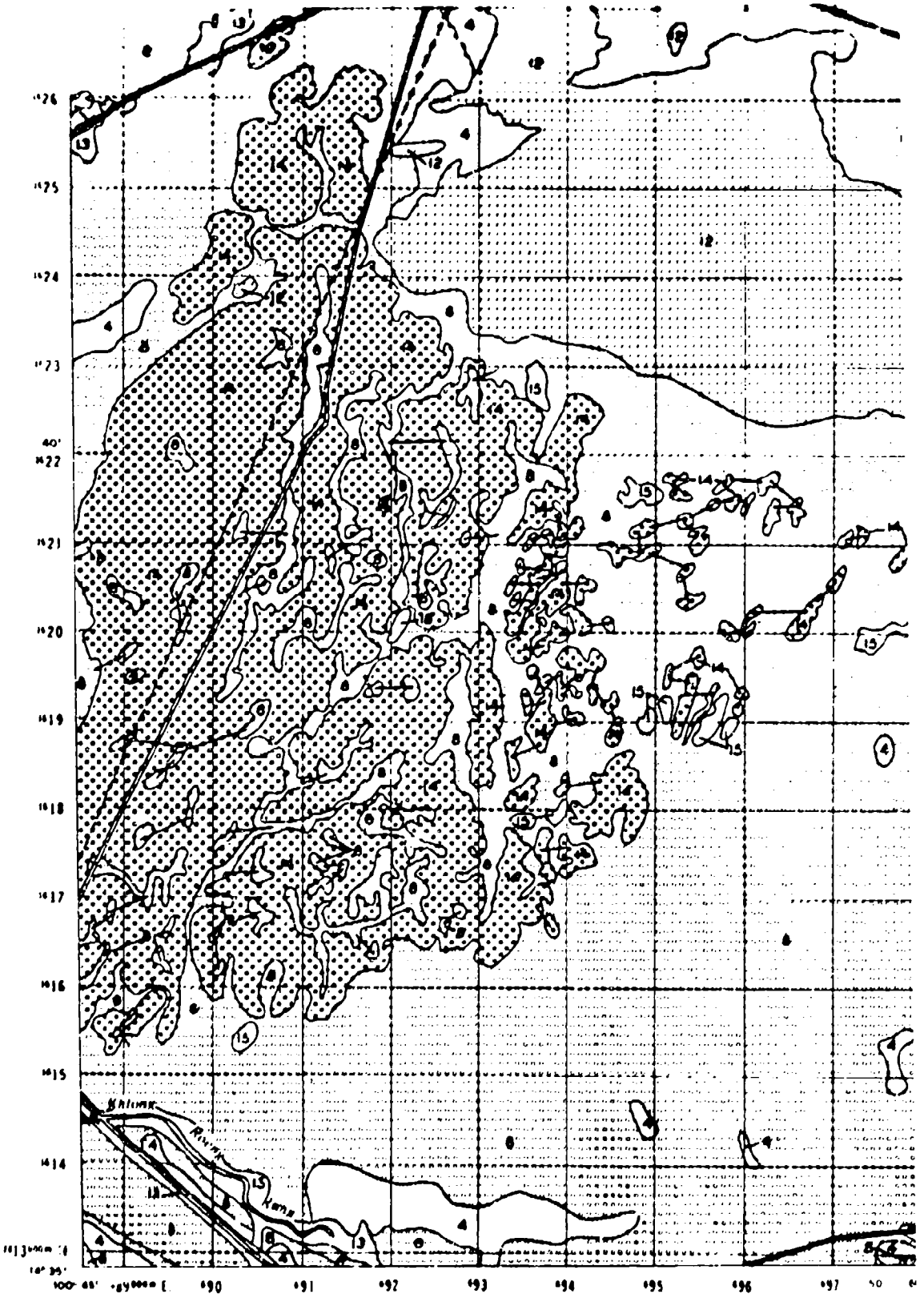
ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 0-100 for Units) and 9; more than 100 for Unit 11.

Units do not occur on this map.

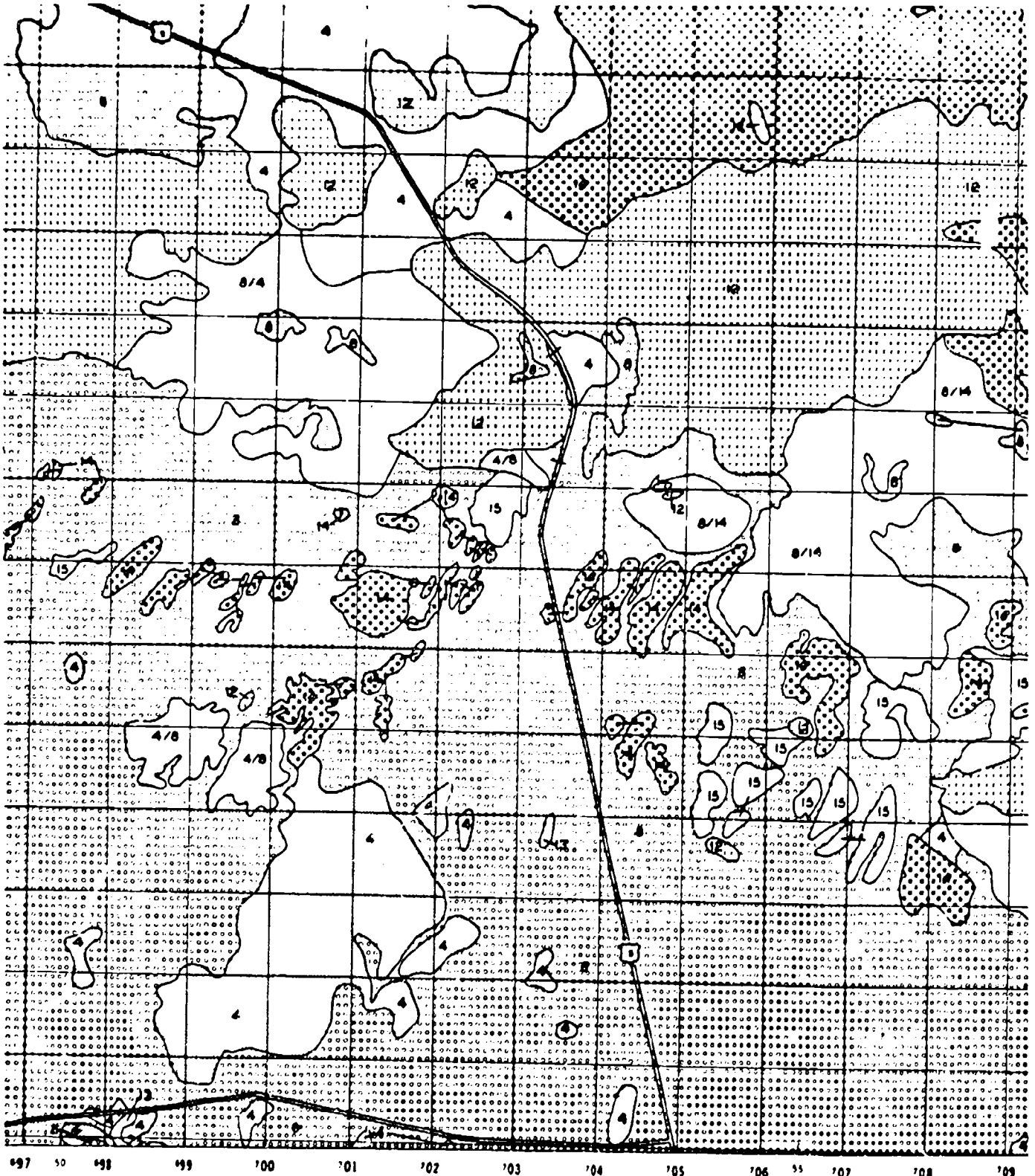
INDEX TO ADJOINING SHEETS

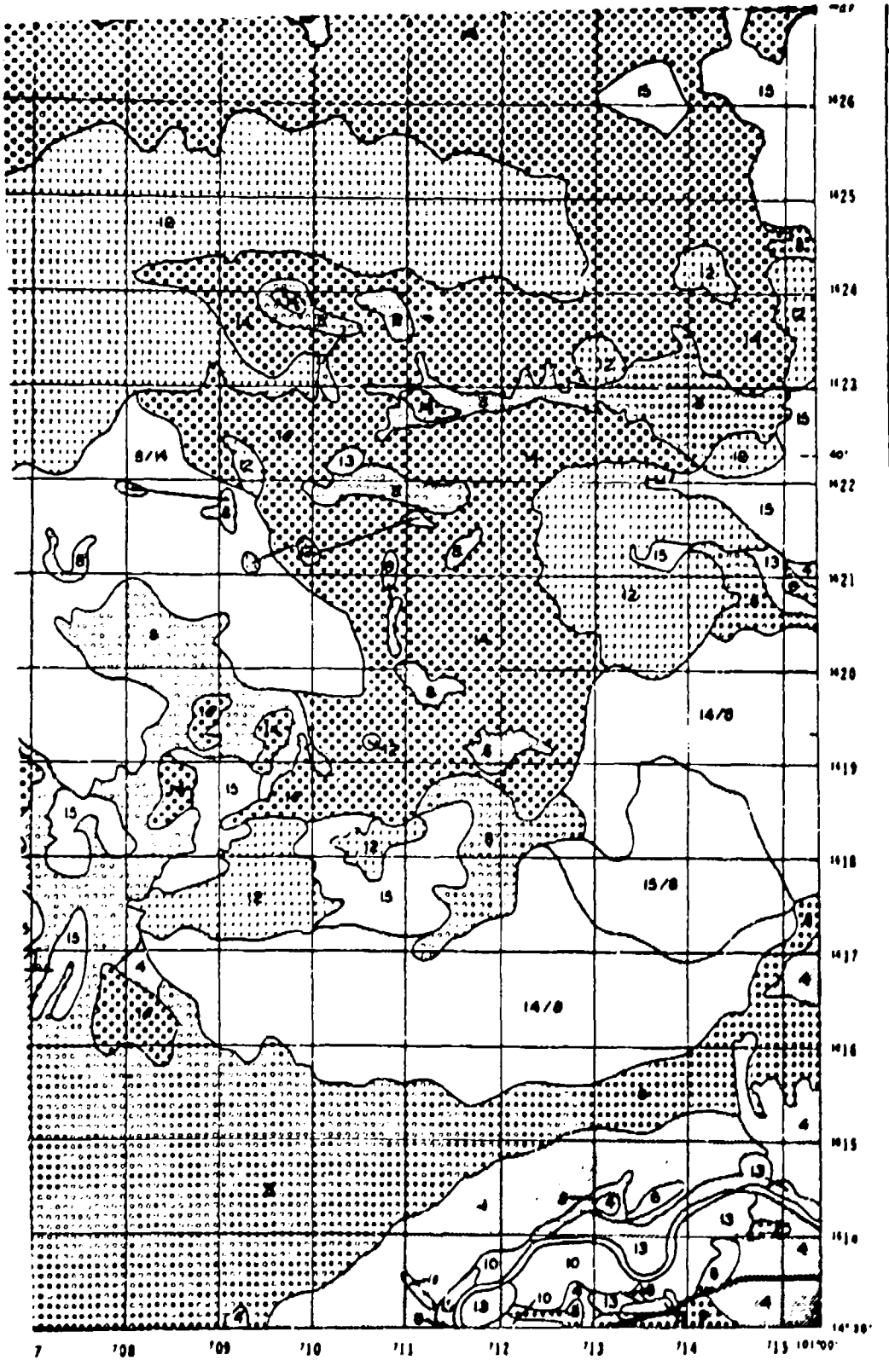




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 P

5


8/4
8/14
4/8
15
12
8
4
SCALES



Unit	PI	PSI	ϕ_{up} peak	ϕ_{up} ult
	17-25	25-60	0-1	0-0.07
	25-40	60-100	0-1	0-0.07
	25-40*	60-170	0-1	0-0.07
	25-60	>100	0-1	0-0.07
	25-60*	>100	0-1	0-0.07
	60-100	60-100	0-1	0-0.07
	60-100	60-170	0-1	0-0.07
	60-170	>100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
10	60-100	>100	0-1	0-0.07
	60-100*	>100	0-	0-0.07
	>100	>100	0-1	0-0.07
	>170	>170	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07
13	Complex of 60-170 and >100	>100	0-1	0-0.07

Notes: Blank areas are water bodies.

ϕ_{up} Shear strength of pore contact sand.

ϕ_{up} Angle of internal friction.

* Residual soil where has less than 30 percent strengths commonly observed are 60-100 for

Units do not crop out on this map.

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LOP BURI

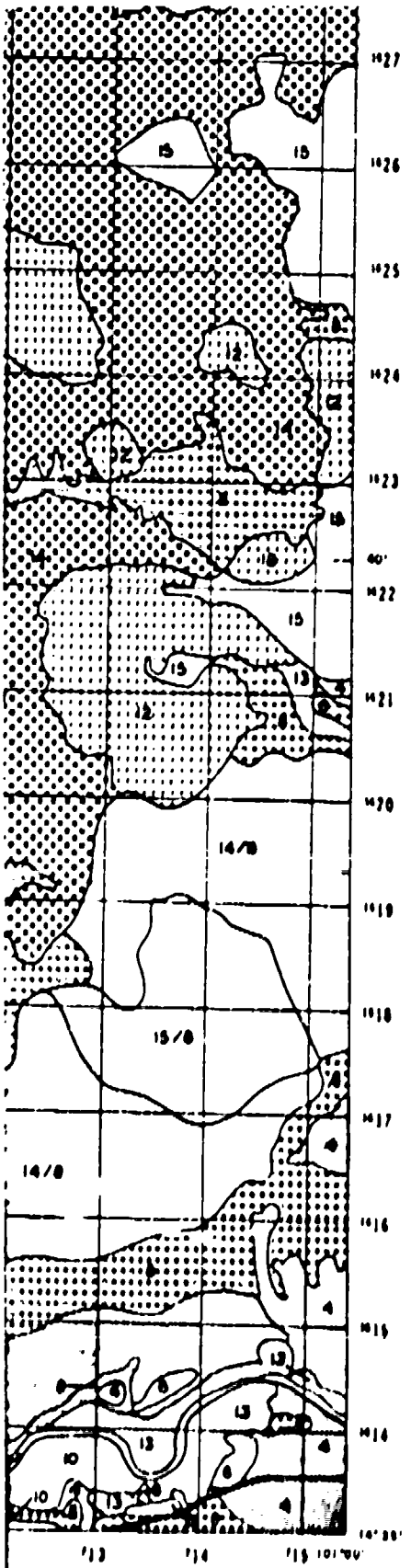
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2



Unit	Soil Base Strength: Maximum Moisture RCI	Soil Base Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_w psi	Maximum Moisture c_w kg/cm²	Maximum Moisture ϕ_w deg	Conditions where maximum moisture exceeds 30 percent: c_w psi	Conditions where maximum moisture exceeds 30 percent: c_w kg/cm²	Conditions where maximum moisture exceeds 30 percent: ϕ_w deg
	10-75	75-80	0-1	0-0.07	0-10	1-3	0.07-0.14	10-20
	75-80	80-100	0-1	0-0.07	0-10	3-5	0.14-0.35	20-40
	75-80*	80-120	0-1	0-0.07	10-20	3-5	0.14-0.35	20-40
	75-80	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40
	75-80*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40
	80-120	80-100	0-1	0-0.07	0-10	3-5	0.14-0.35	20-40
	80-120	80-120	0-1	0-0.07	10-20	0-1	0-0.07	20-40
	80-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40
	80-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40
	80-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40
	80-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40
	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40
	>120	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40
	Complex of 80-120 and >120	>120	0-1	0-0.07	0-10	0-1	0-0.07	20-40
	Complex of 80-120 and >100	>120	0-1	0-0.07	10-20	0-1	0-0.07	20-40

Notes: Blank areas are water bodies.

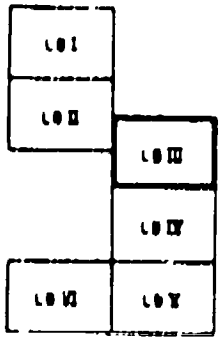
c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum conditions had less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-120 for Units 3 and 5; more than 100 for Unit 13.

Units do not occur on this map.

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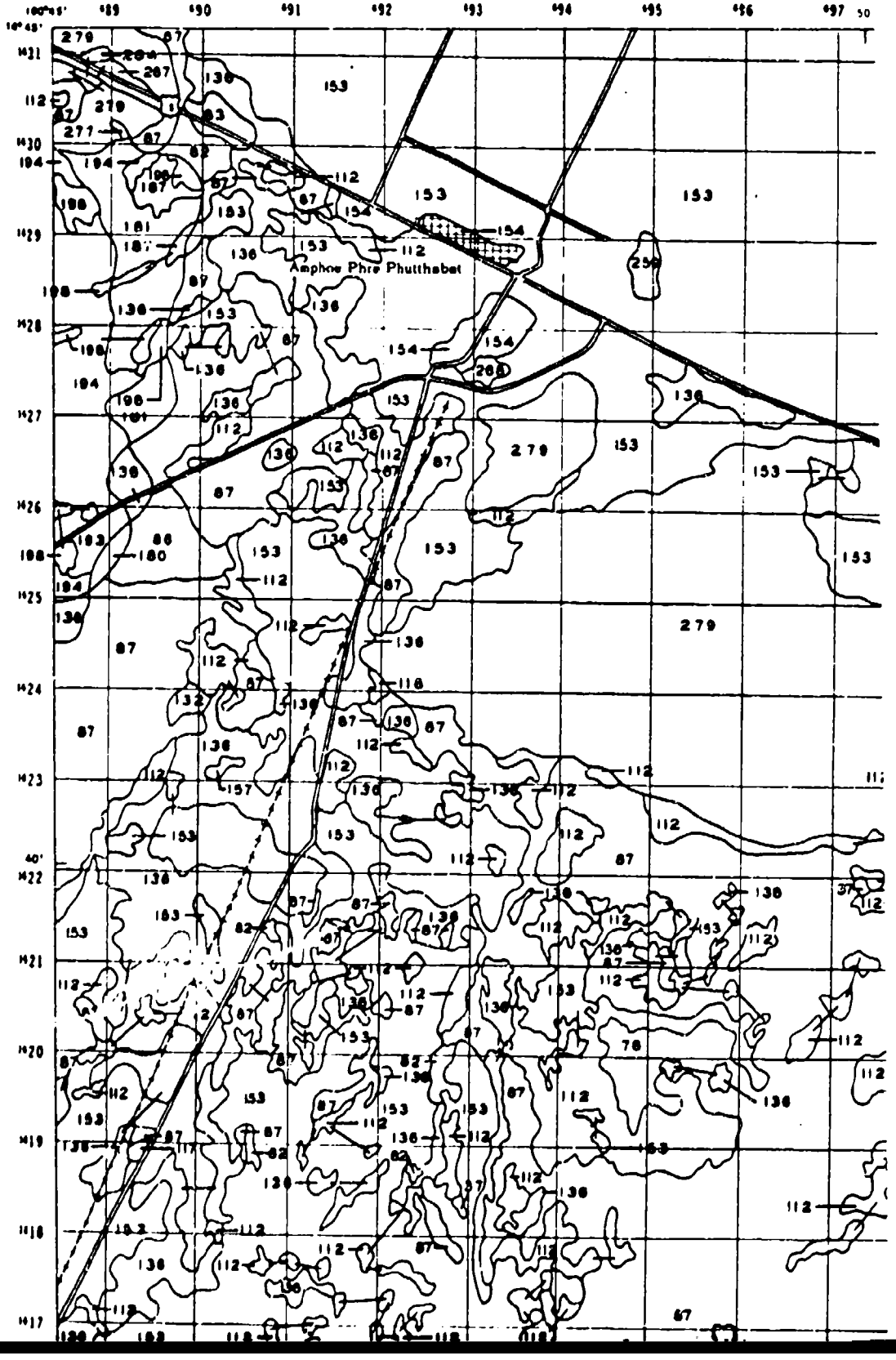
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

LOP BURI STUDY AREA

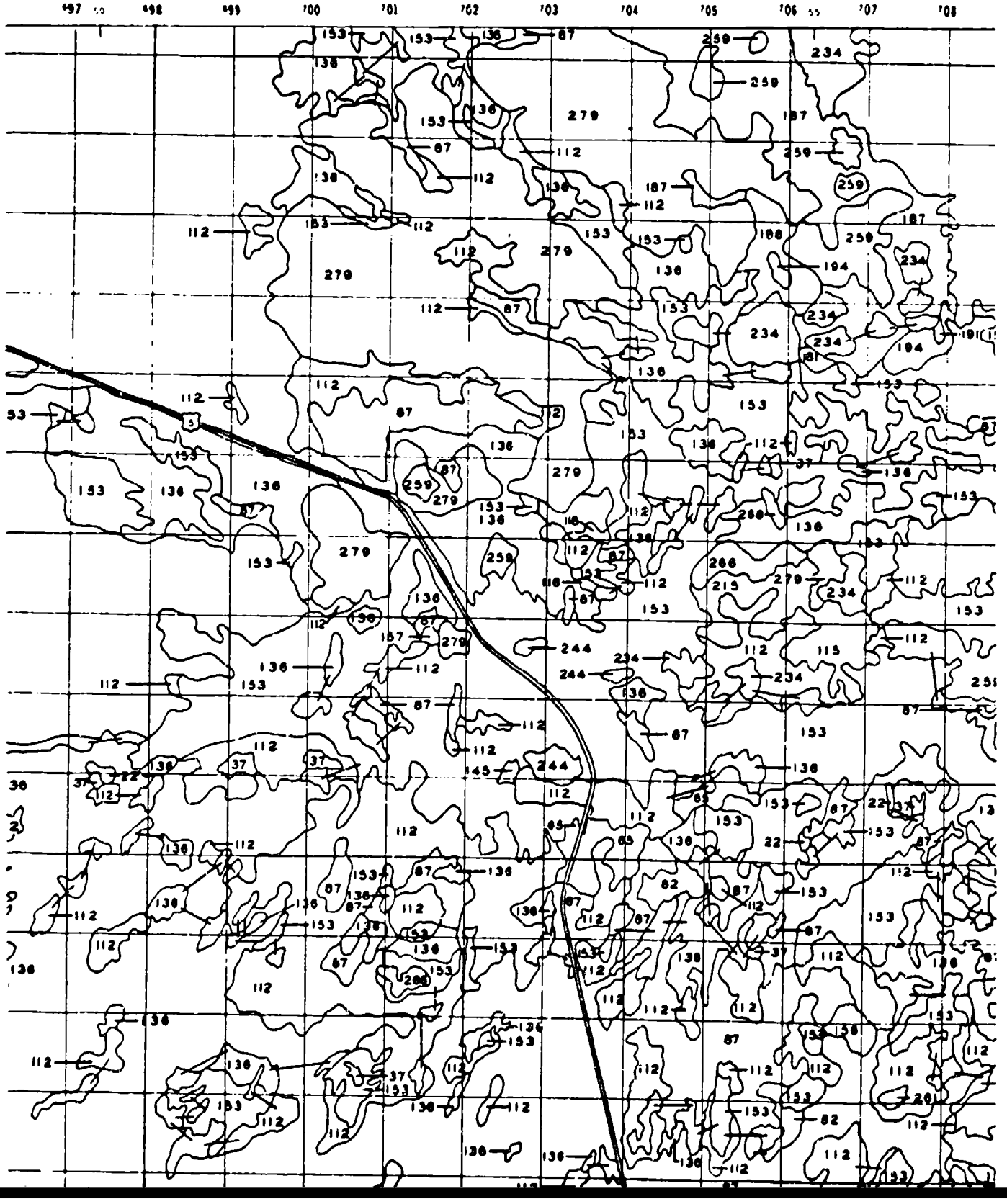
SHEET LB III

PLATE 2.3a

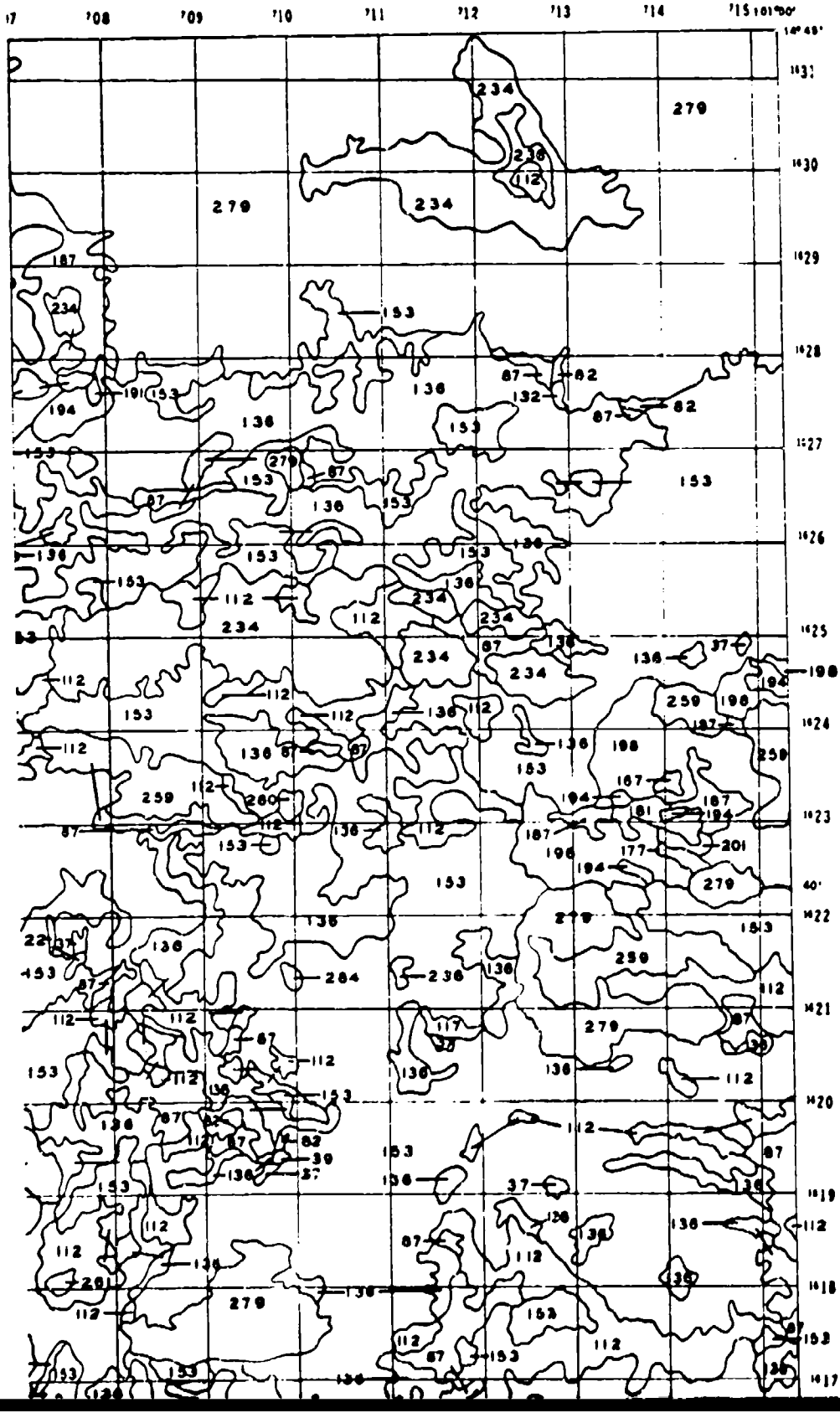

Amphoe Phra Phutthabat

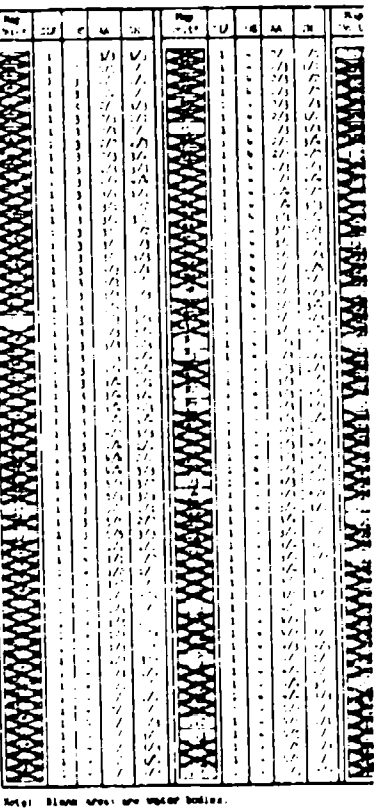
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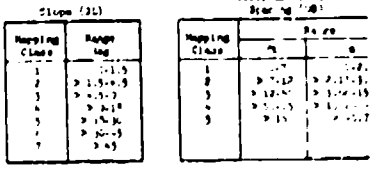
LOP BURI

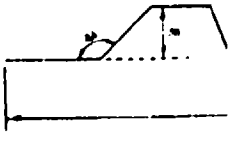


SHEET LB III







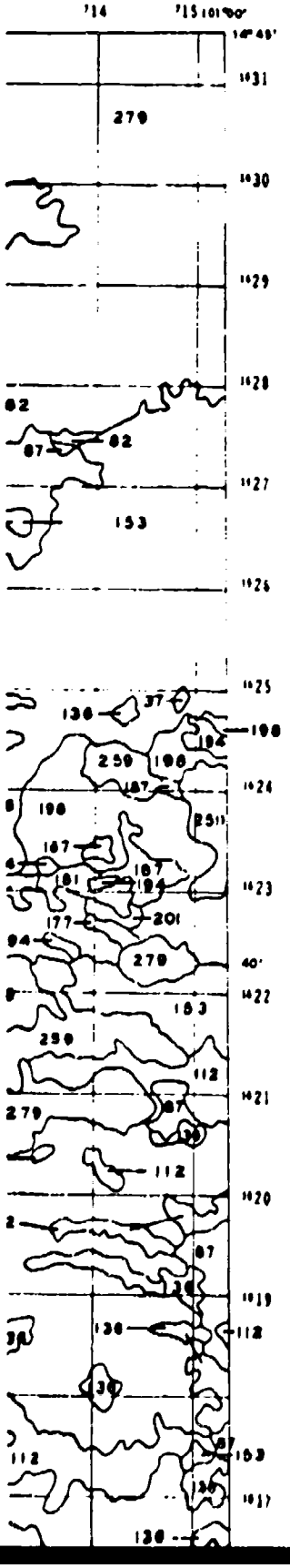


INDEX TO A

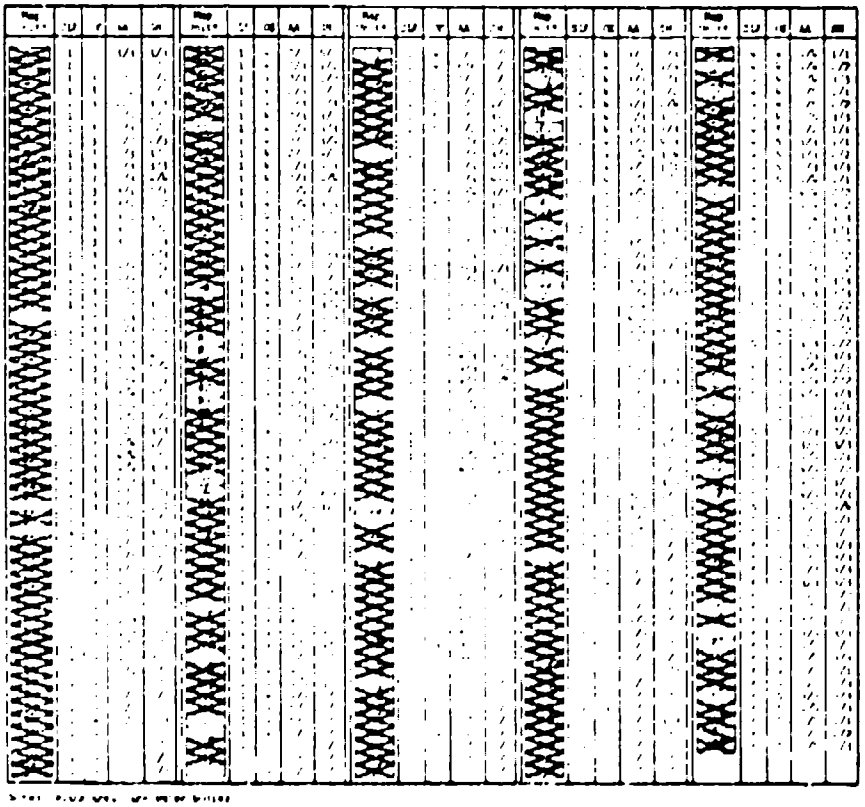
LB1

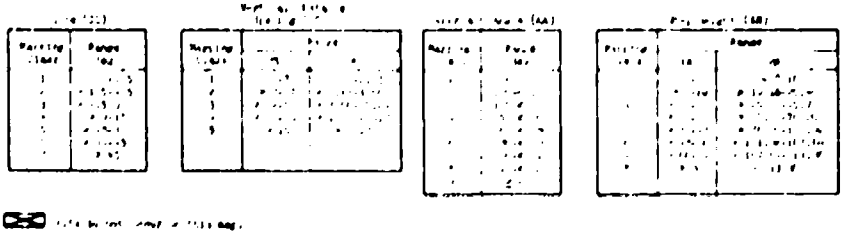
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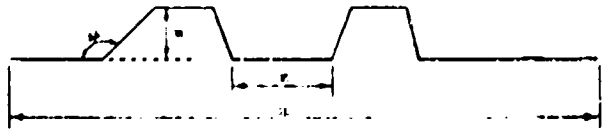
SHEET LB III

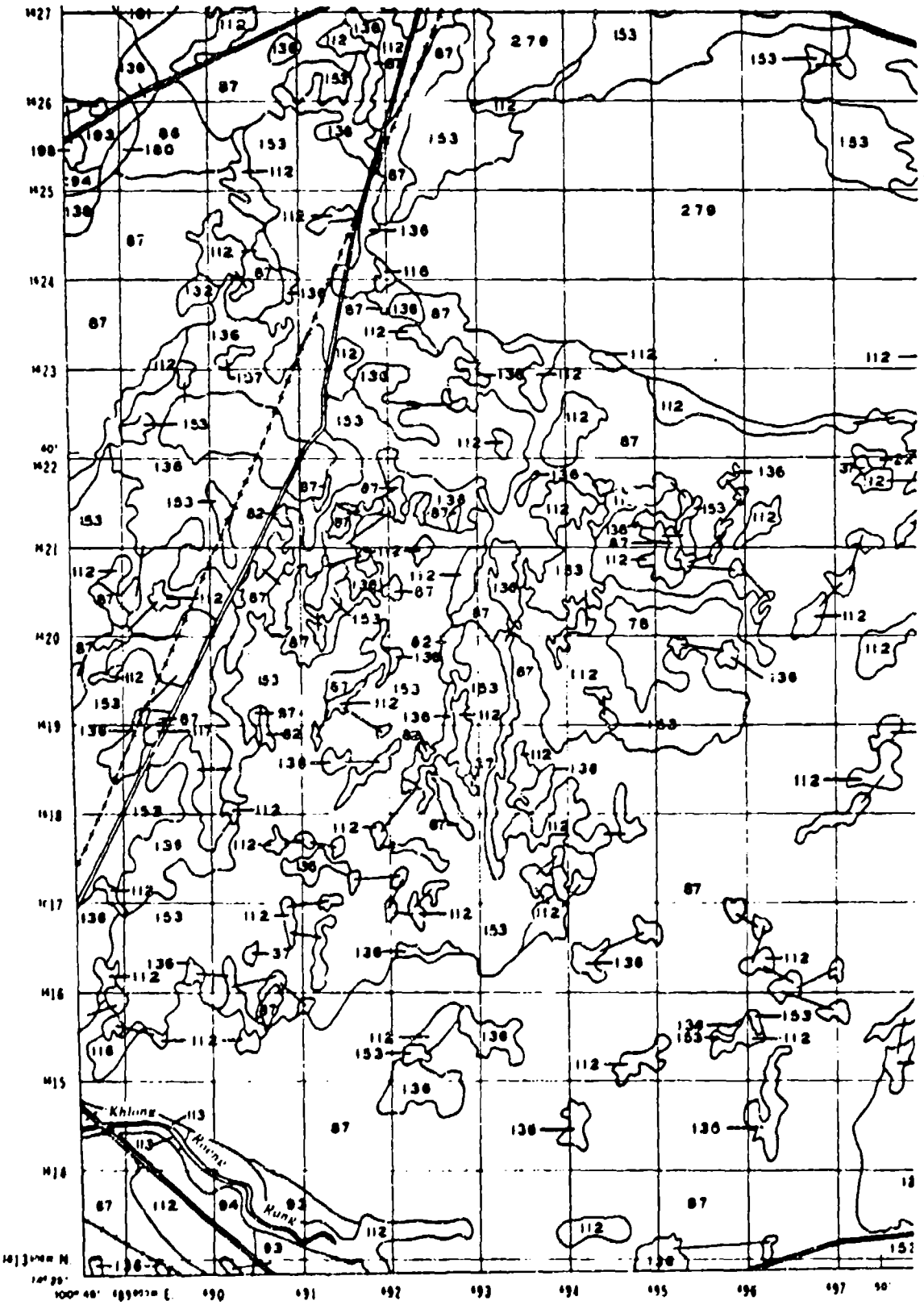


LEGEND



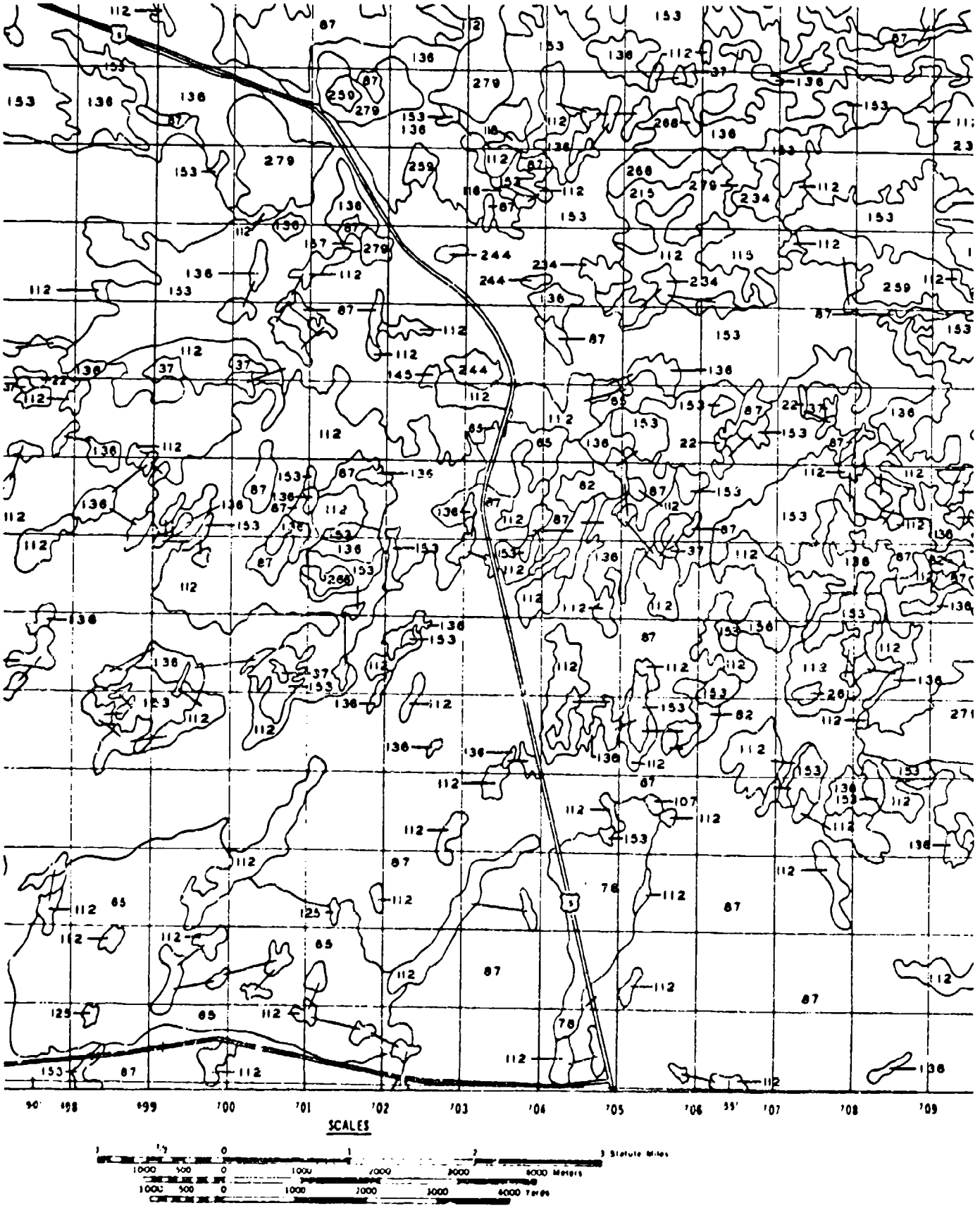




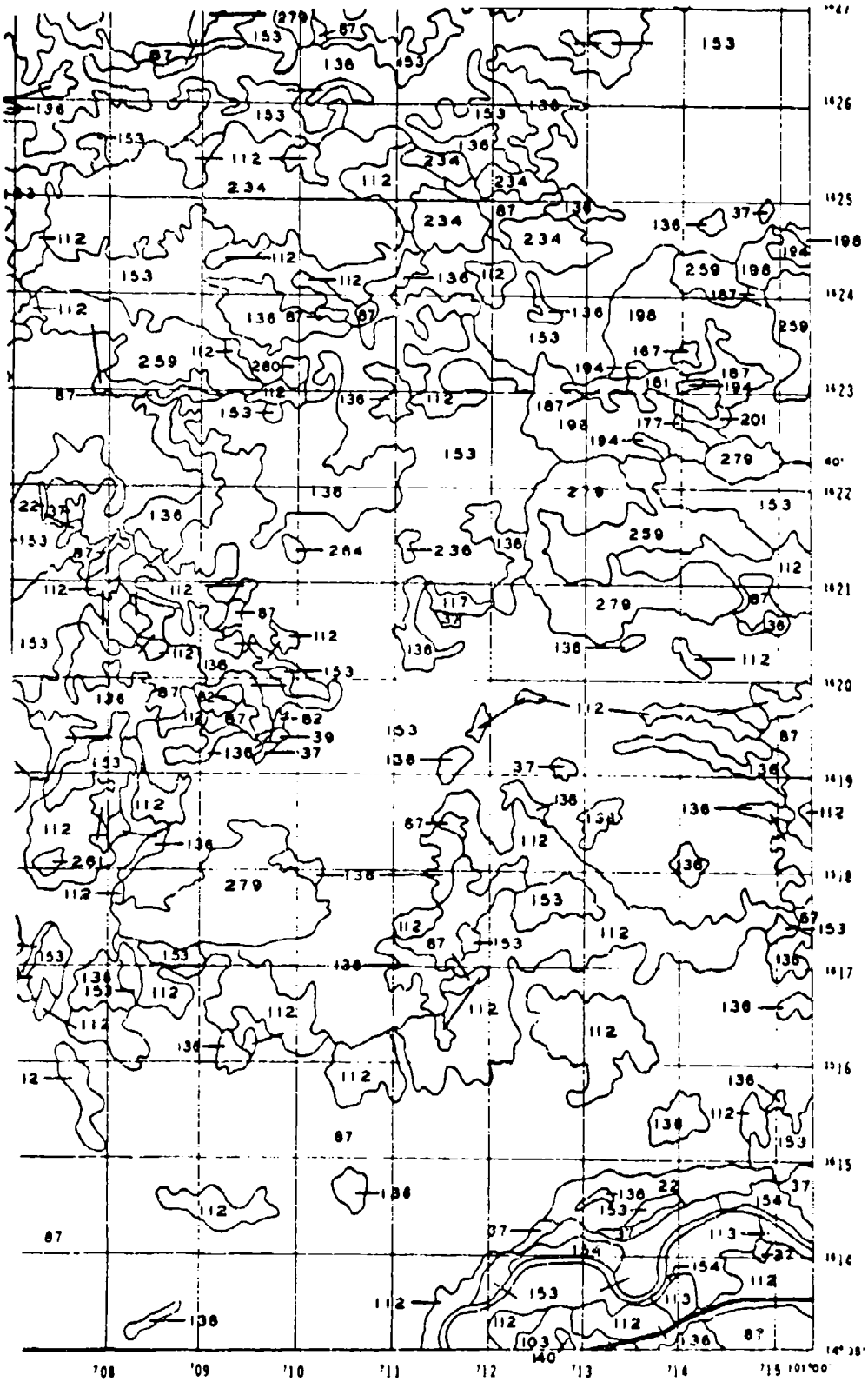


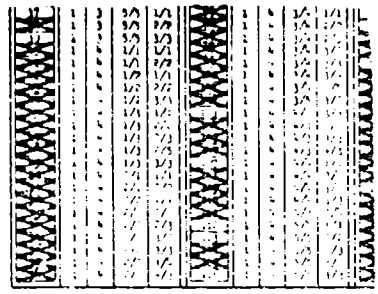
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 P

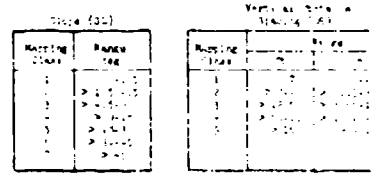
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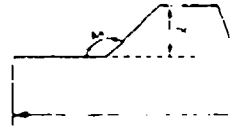


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INDEX TO A

LBI

LBII

LBIII

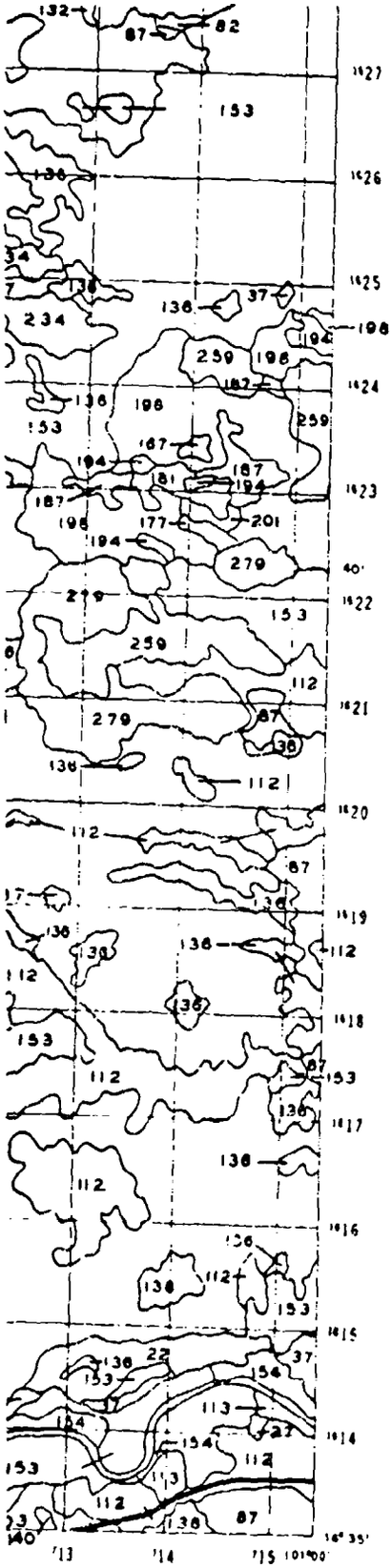
A QUANTITATIVE MET
TERRAIN FOR G

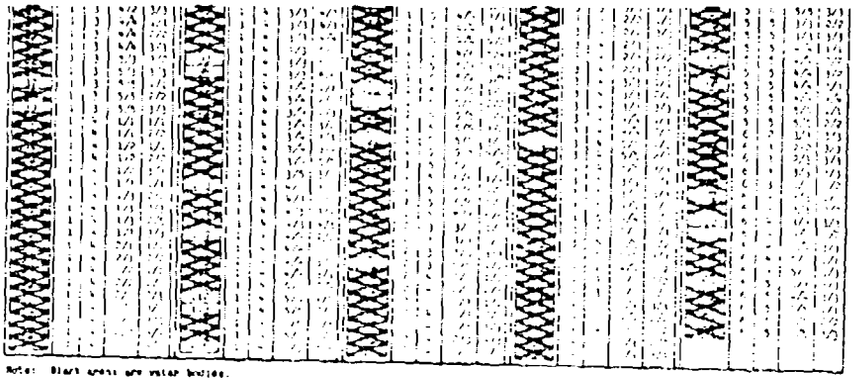
SURFACE

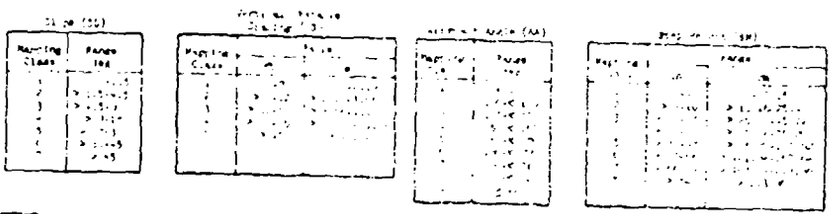
LOP BURI

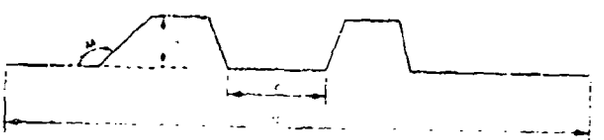
SHE

7

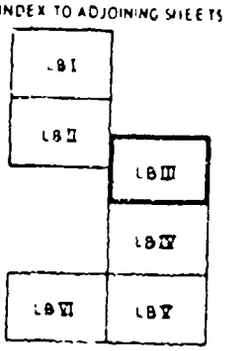








INDEX TO ADJOINING SHEETS



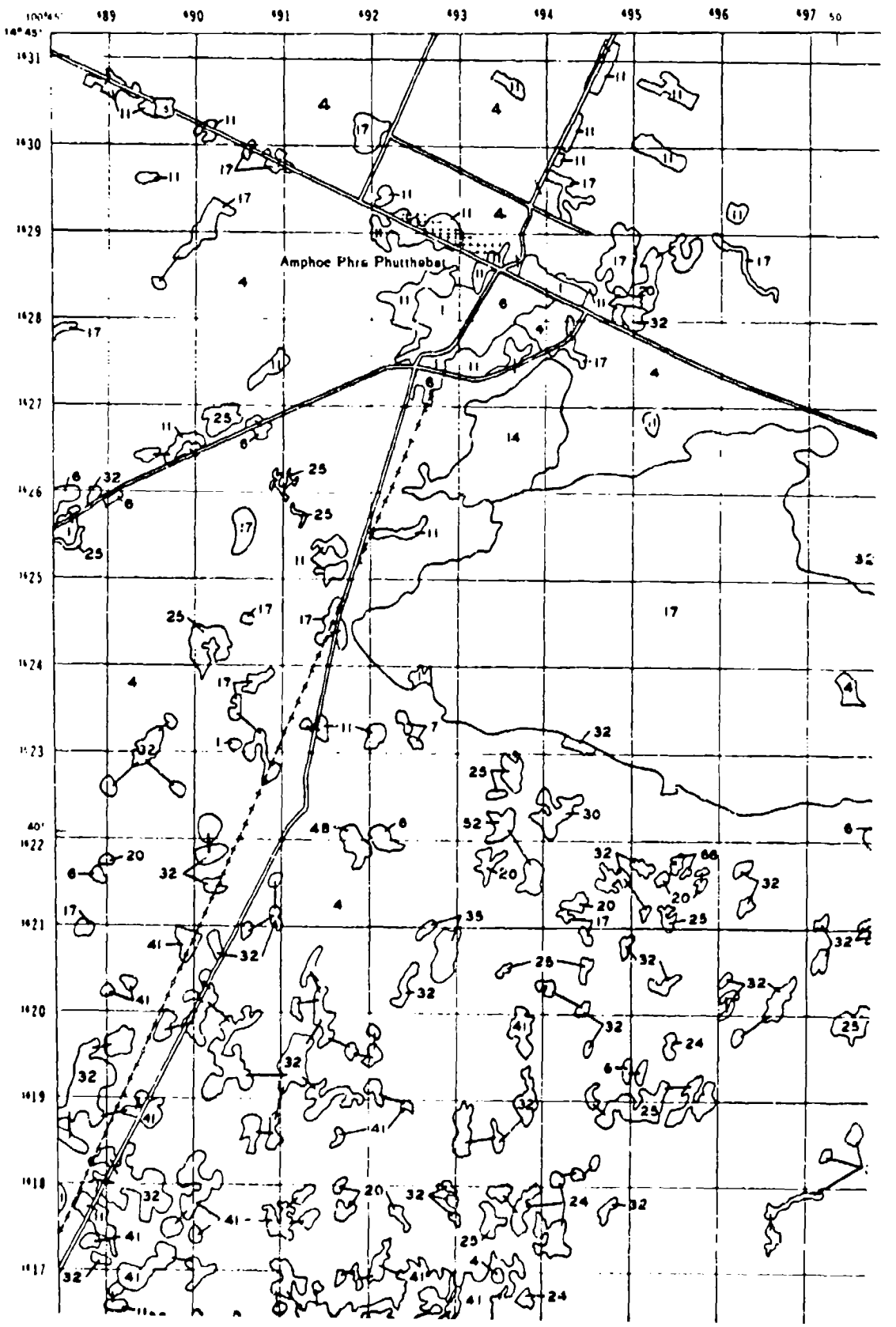
A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

LOP BURI STUDY AREA

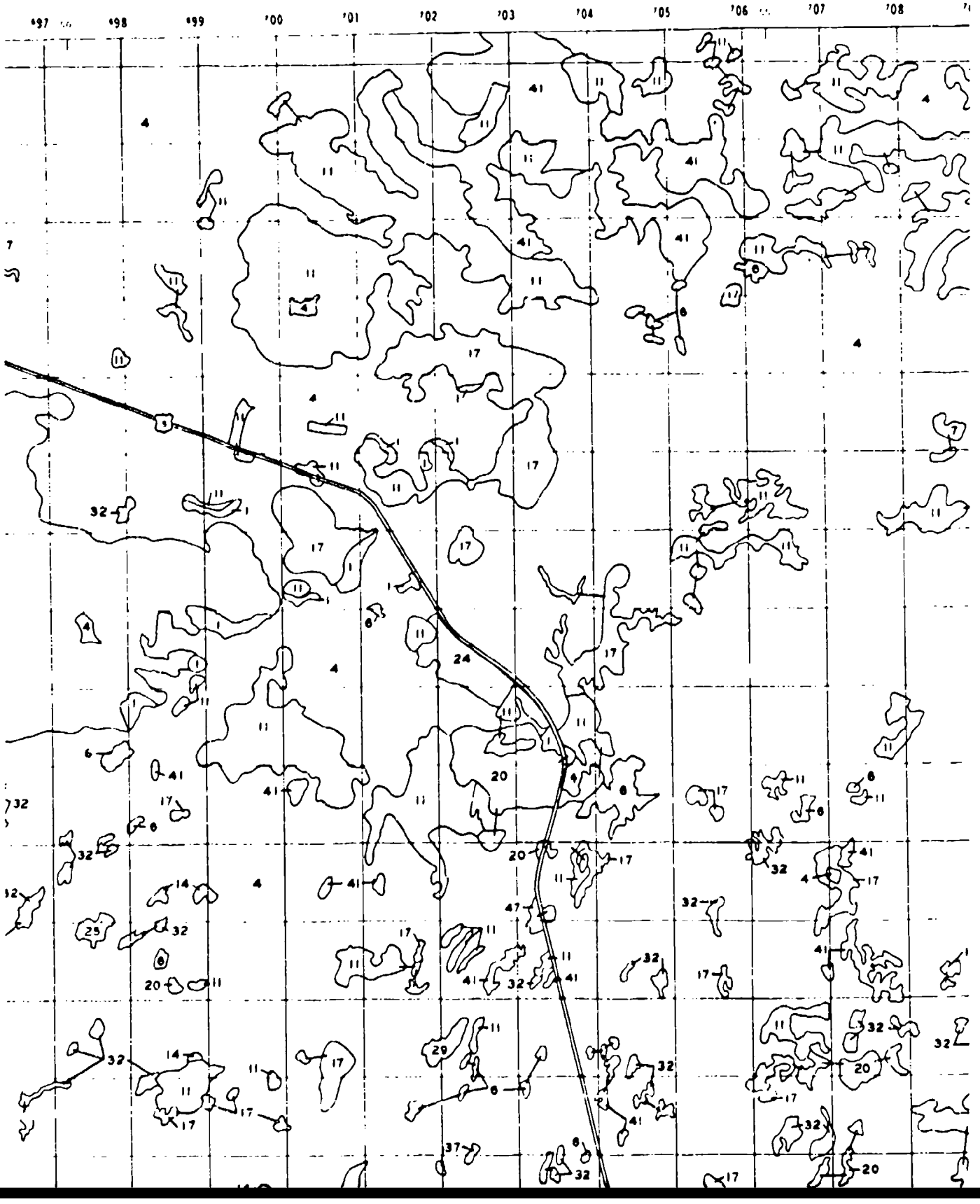
SHEET LB III

PLATE 2.3b


Amphoe Phra Phutthabat

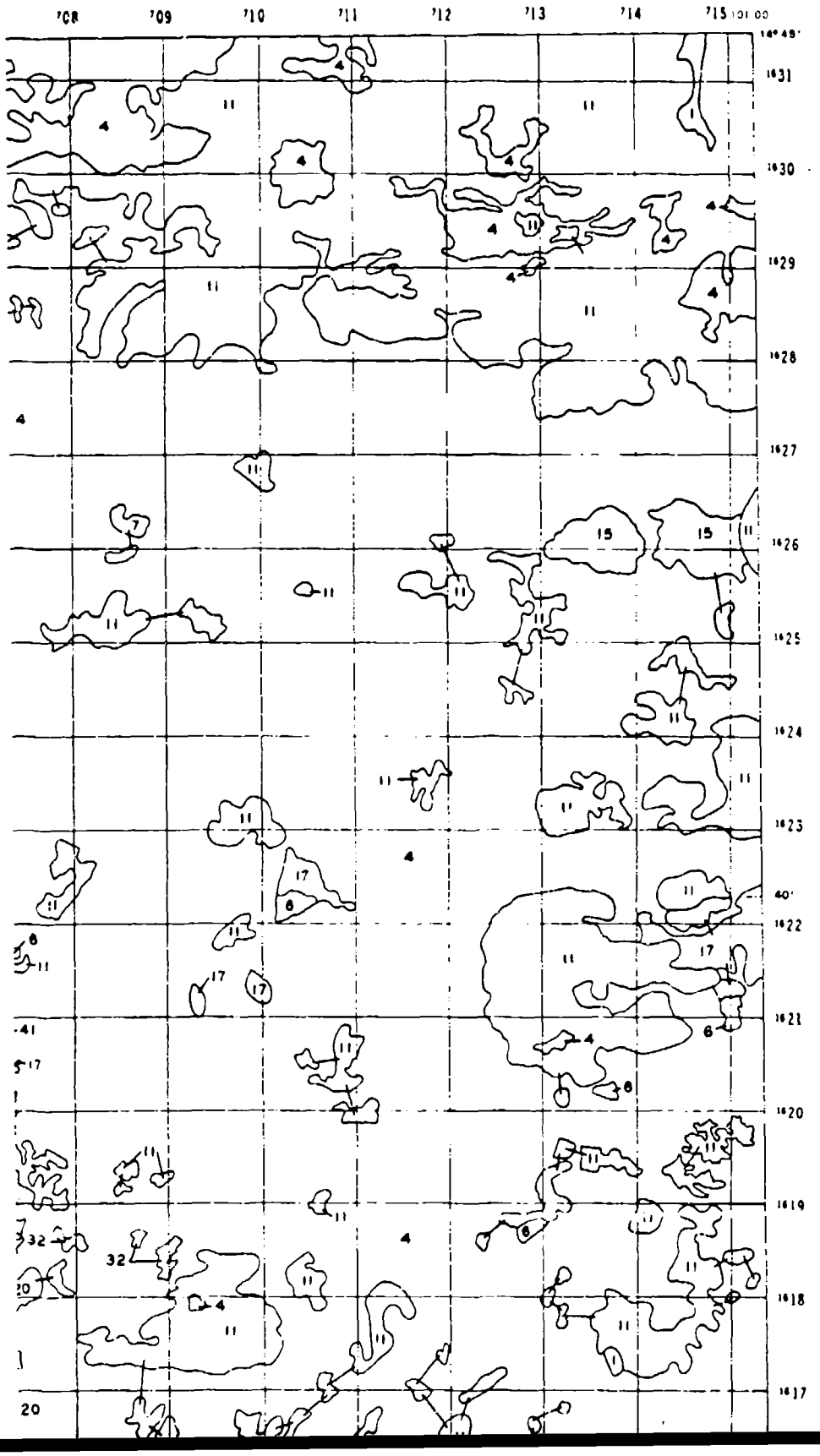
2

LOP BURI



1 3

SHEET LB III



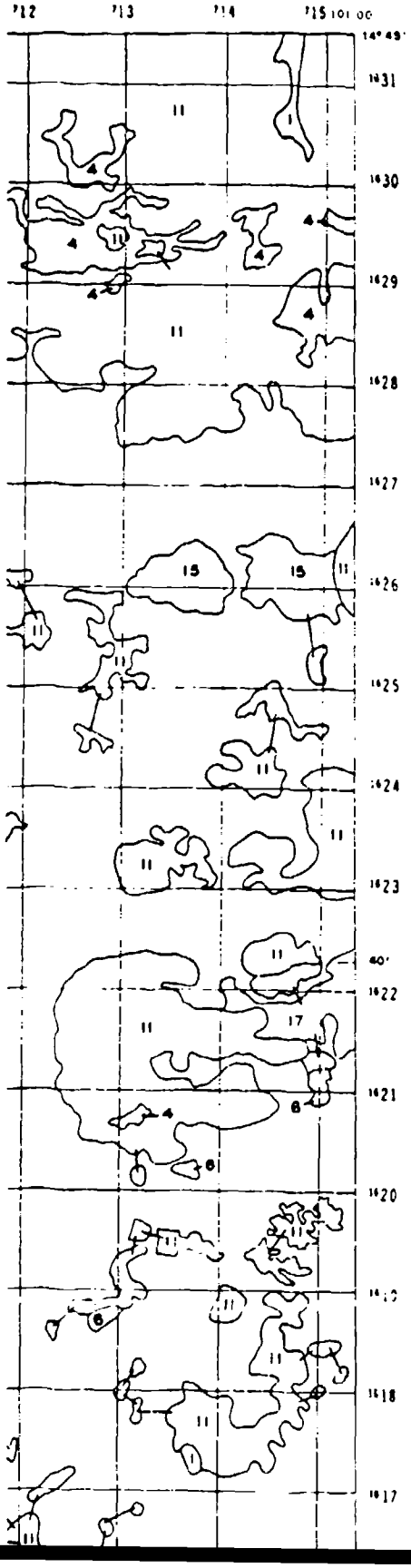
LEG

INDEX TO ADJOI

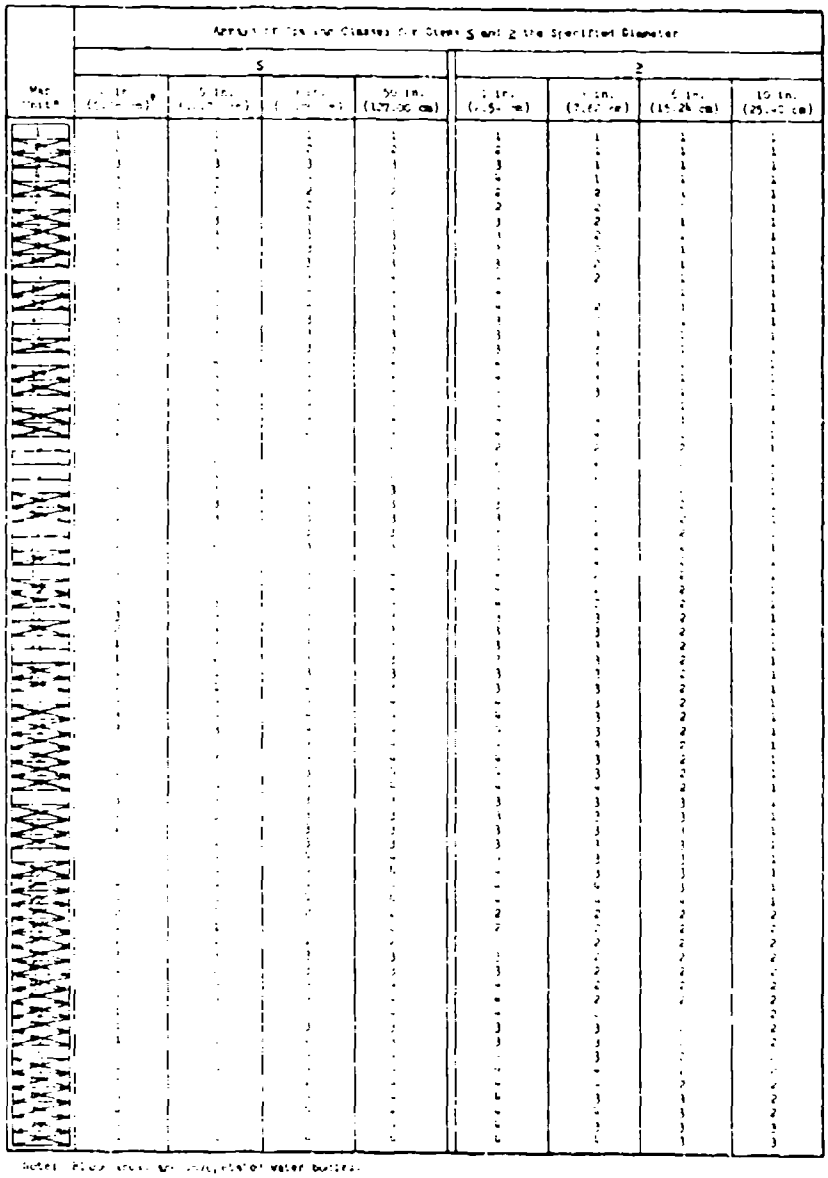
LB I

LB II

SHEET LB III



LEGEND



Note: Place identification water buttons.

* Two rows of numerals or series of alert symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1, 1, 1) indicating [illegible] and S [illegible] and 10 in. (5 [illegible], 12.70 cm, 15.24 cm, and 25.40 cm) and

2 [illegible] 1 [illegible], 3.62, 15.24 cm, and 25.40 cm).

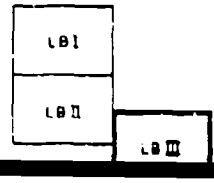
† Material to be marked for each spacing [illegible] sheet

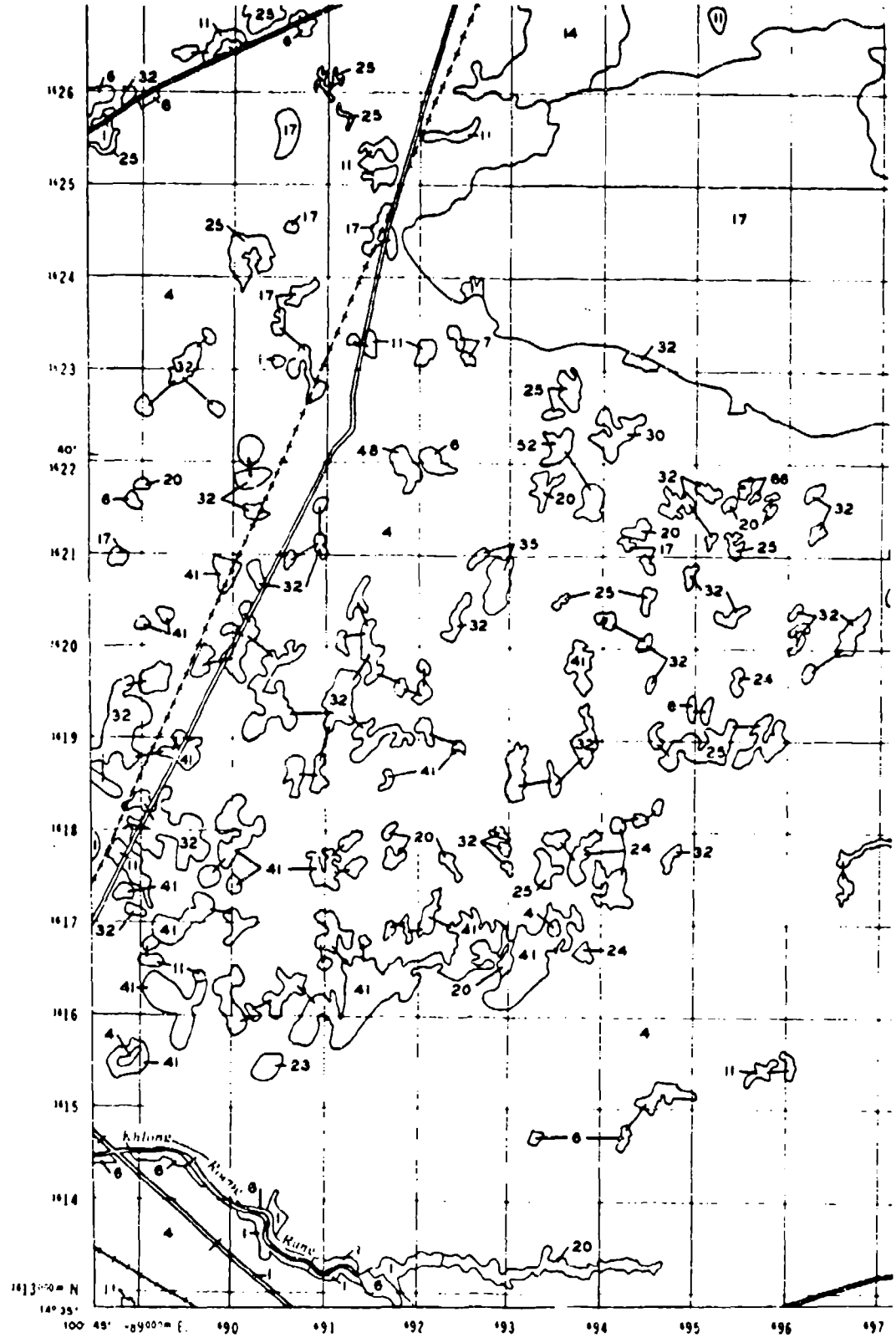
Tolerance Table

Applicable Classes	Values	
1	> 1	> [illegible]
2	> 1 [illegible]	> 3 [illegible]
4	> 4 [illegible]	> 1 [illegible]
[illegible]	[illegible]	[illegible]

[illegible] Indicates not shown on this map.

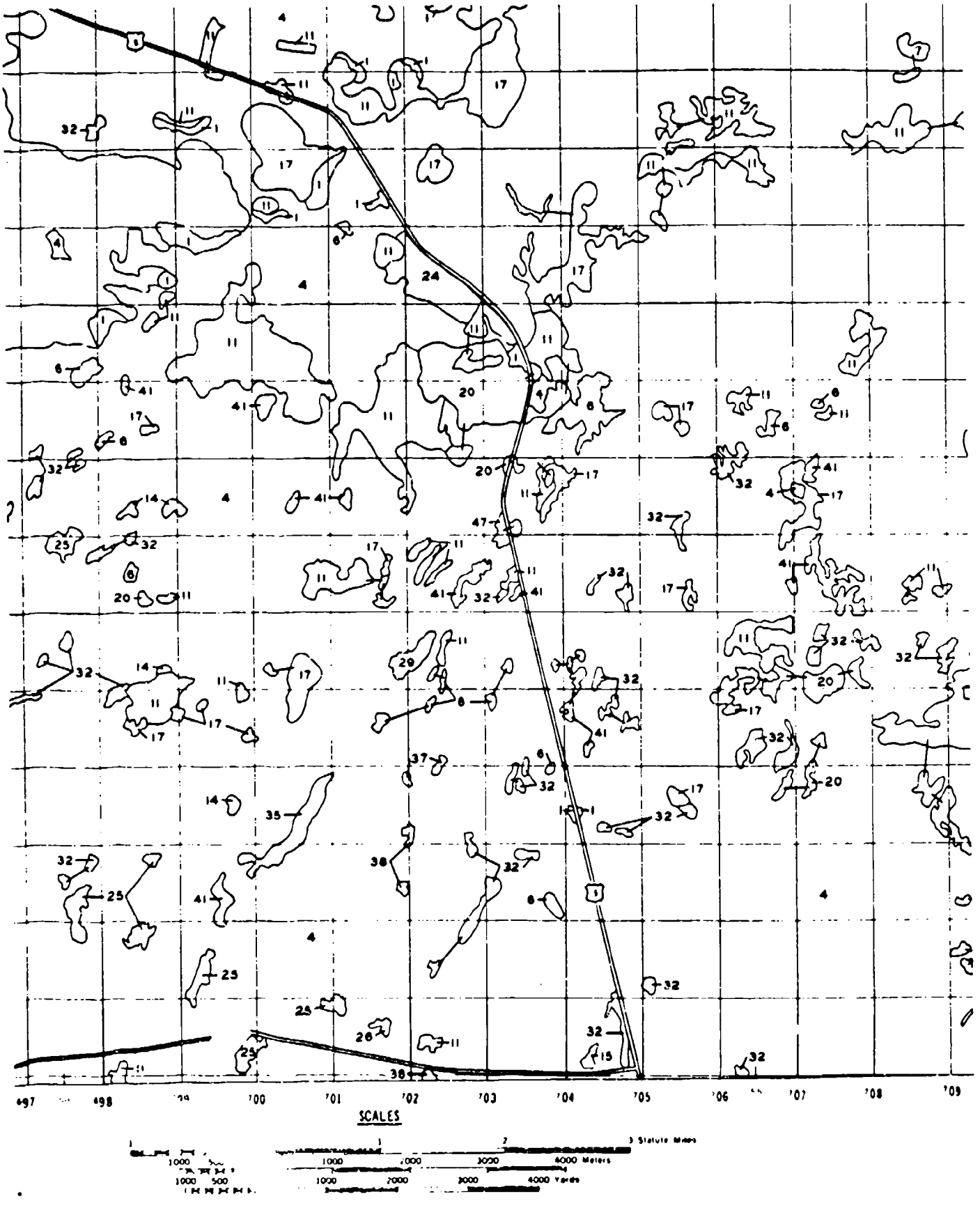
INDEX TO ADJOINING SHEETS



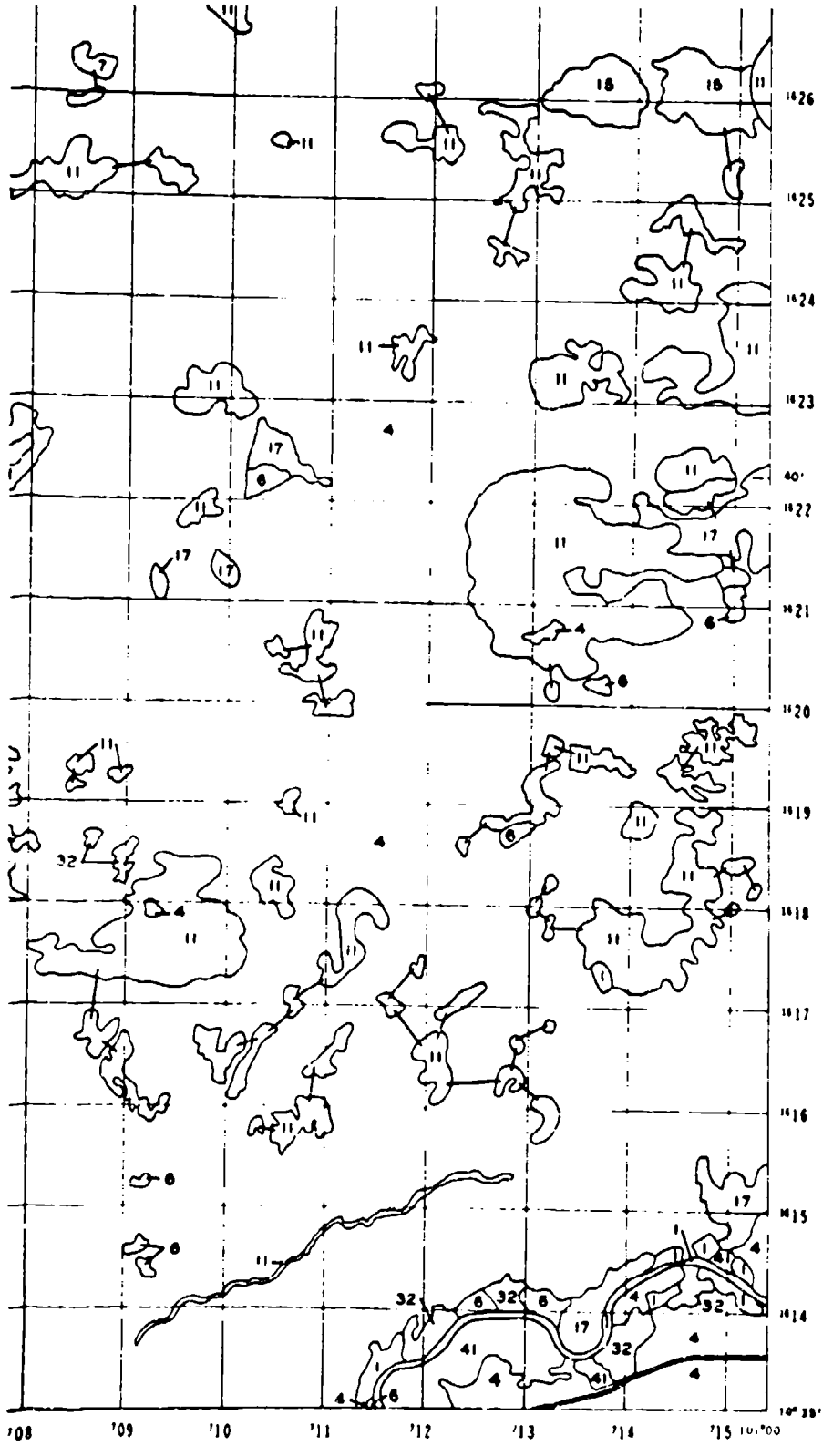


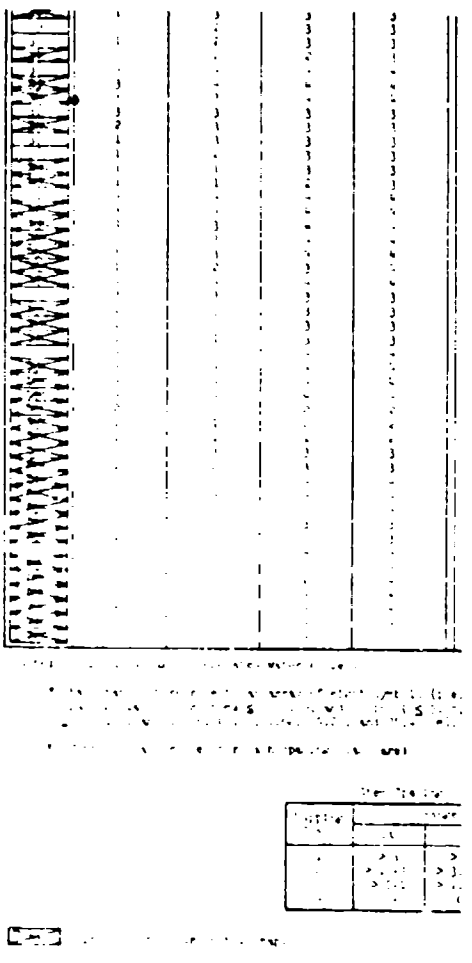
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

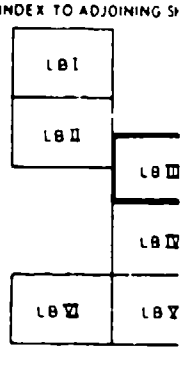
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6







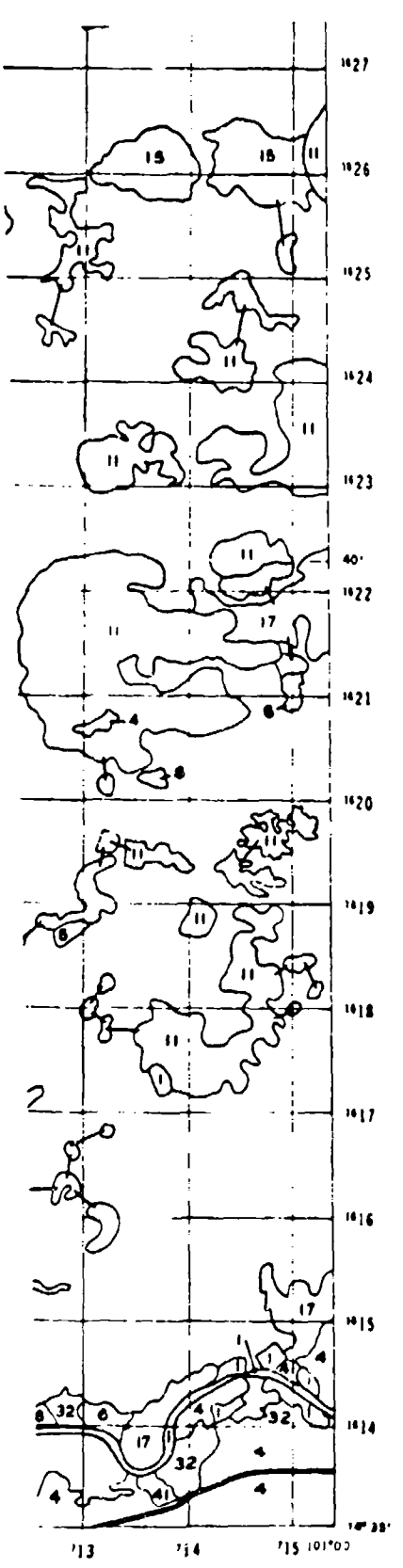
A QUANTITATIVE METHOD F
TERRAIN FOR GROUNI

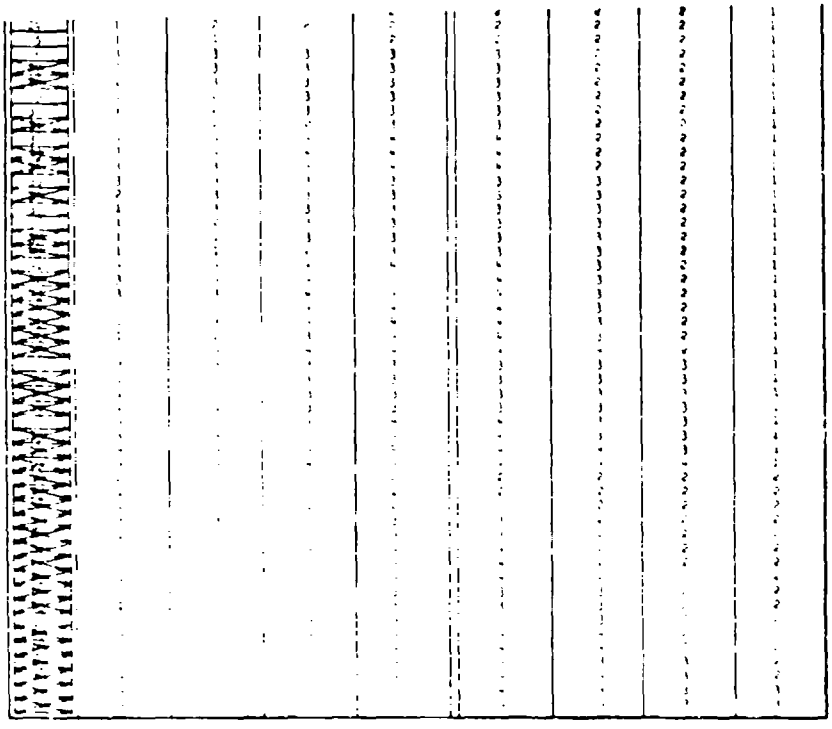
VEGETATI(

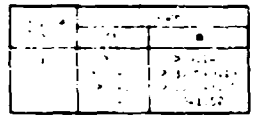
LOP BURI STUDY

SHEET LB I

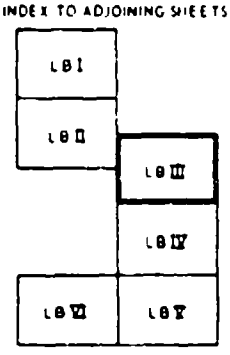
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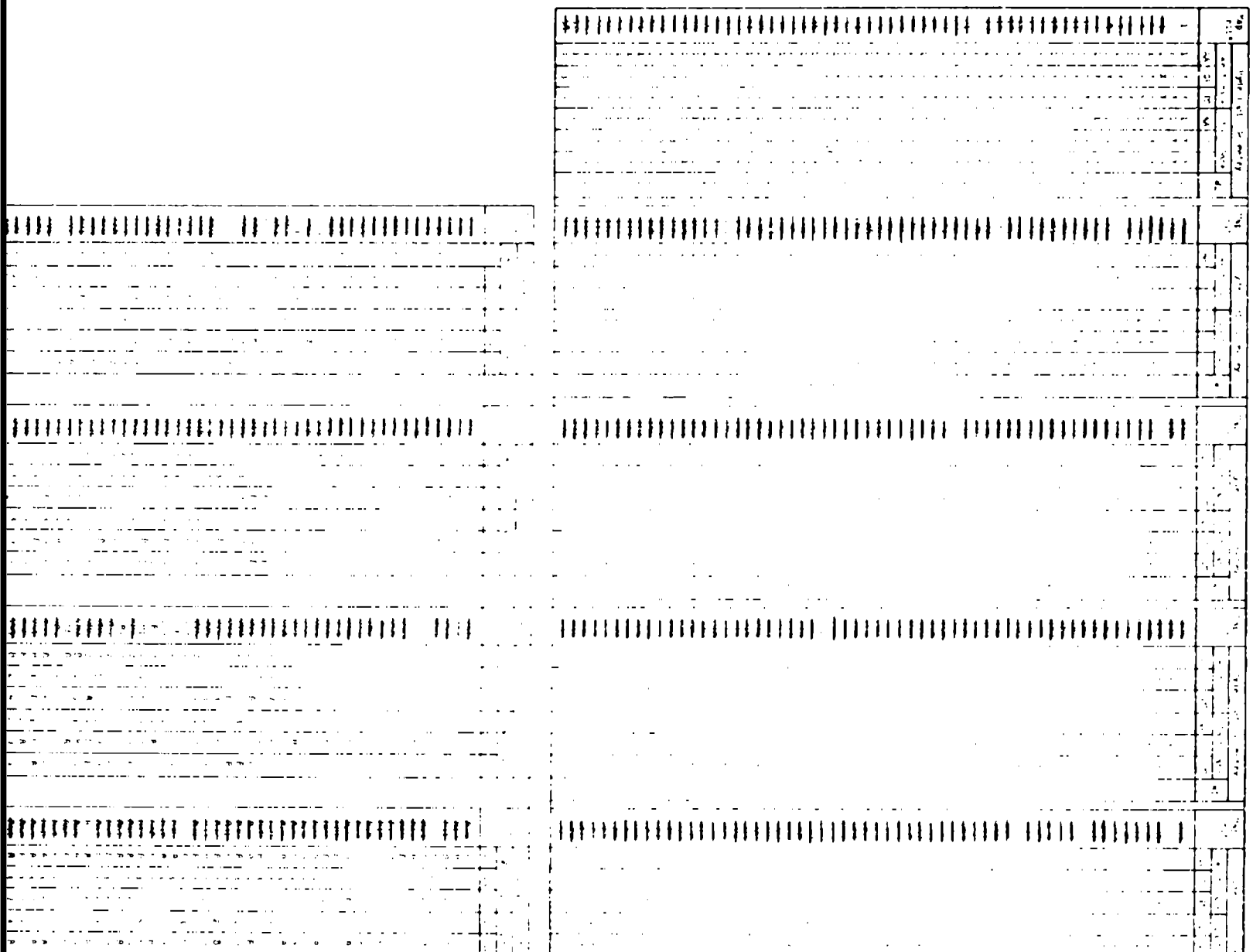
A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

VEGETATION

LOP BURI STUDY AREA

SHEET LB III

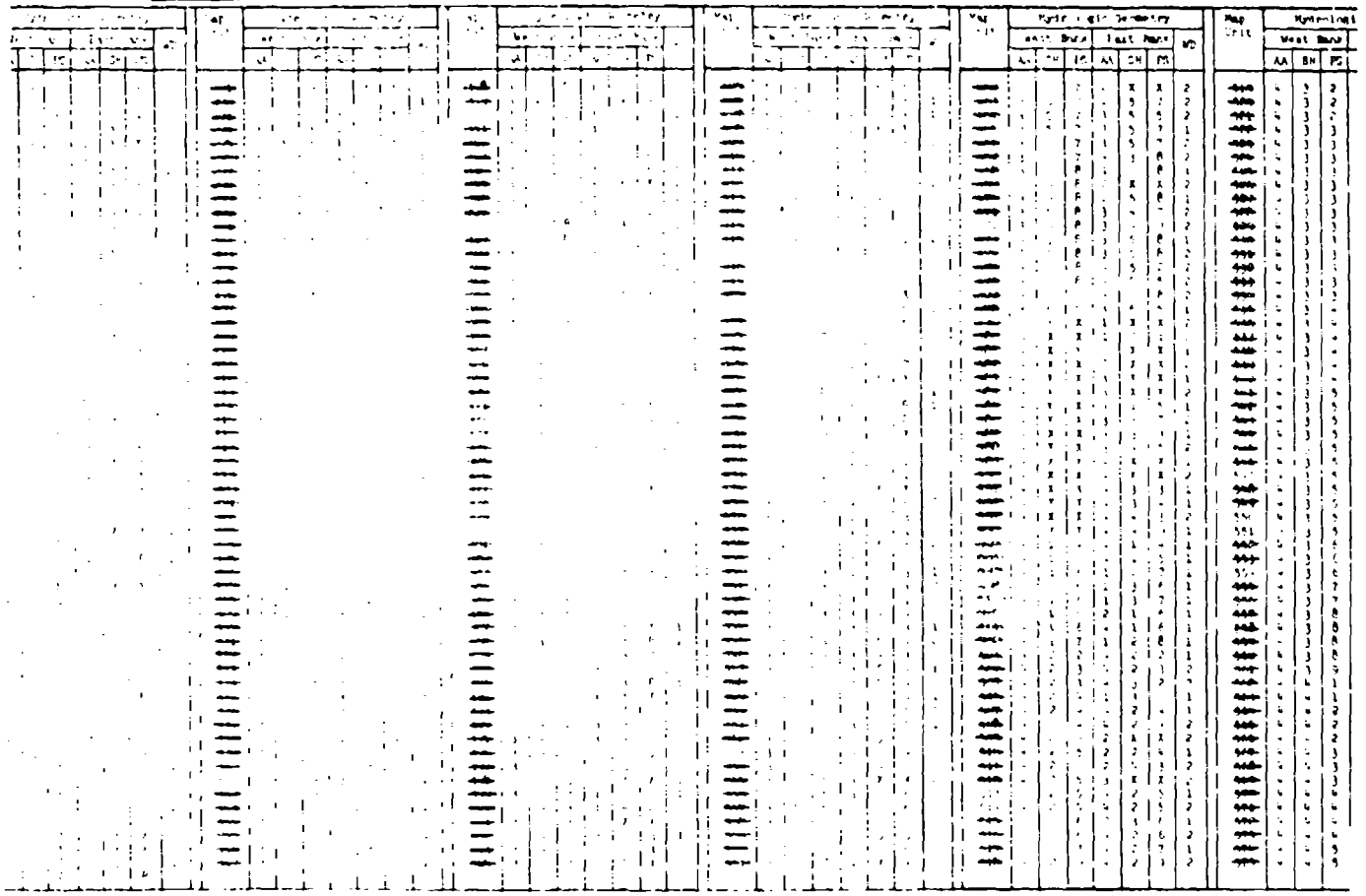
PLATE 2.3c

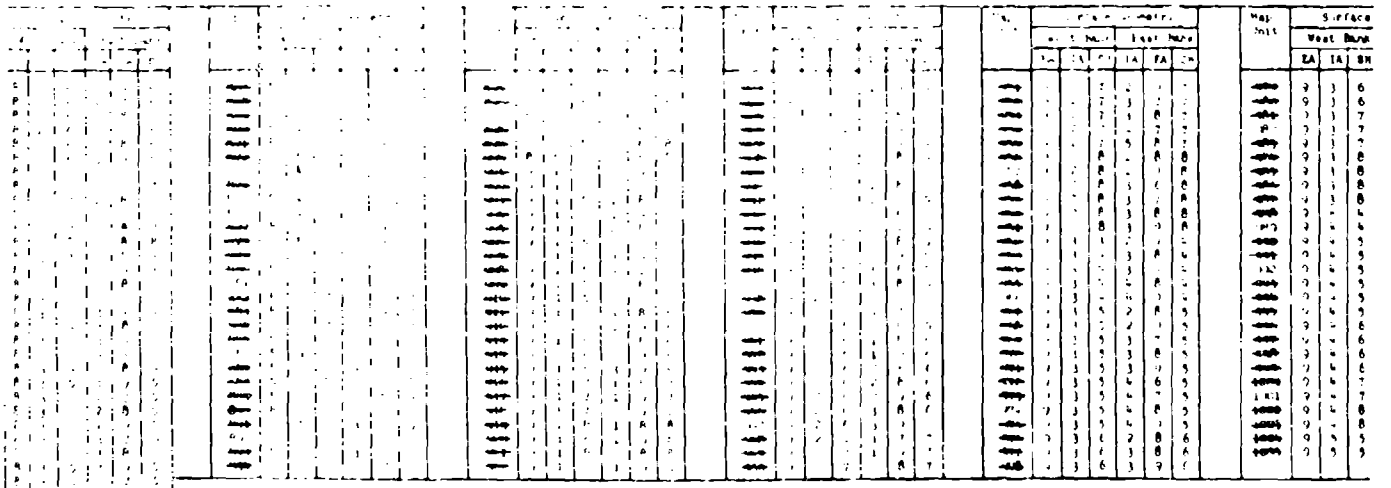


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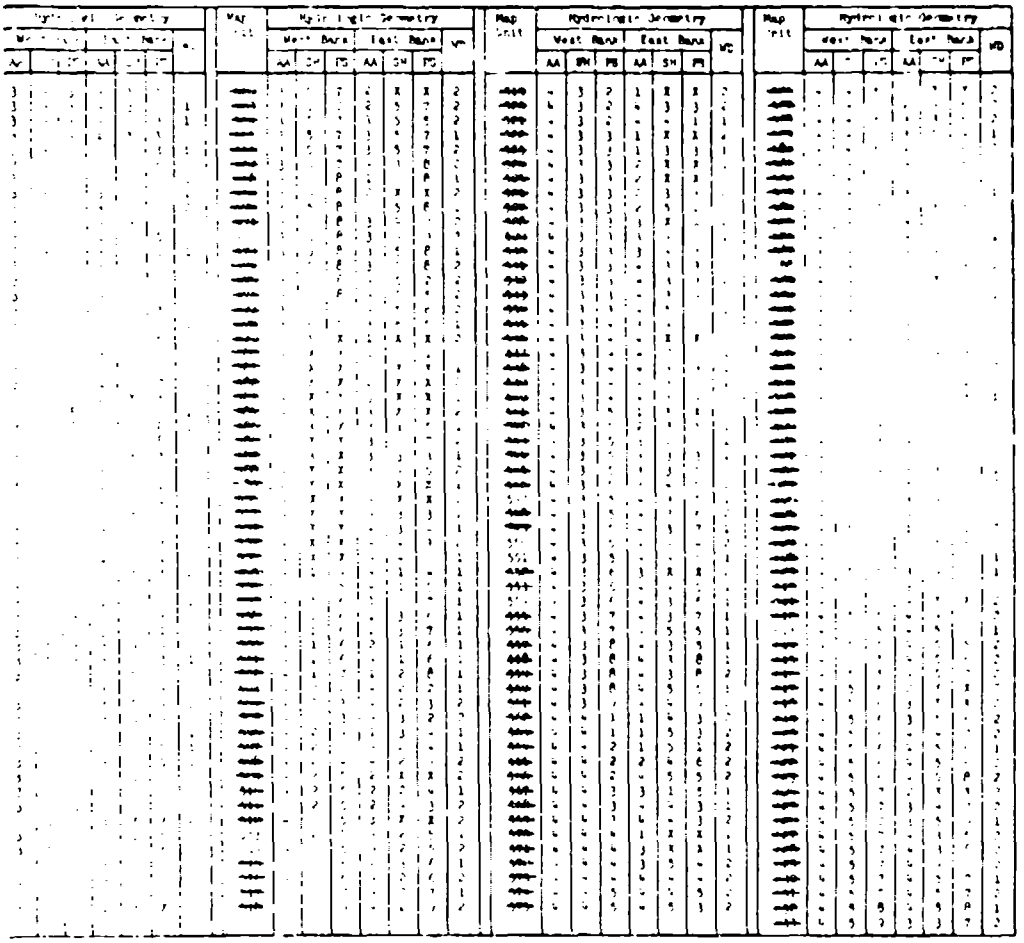
LEGEND

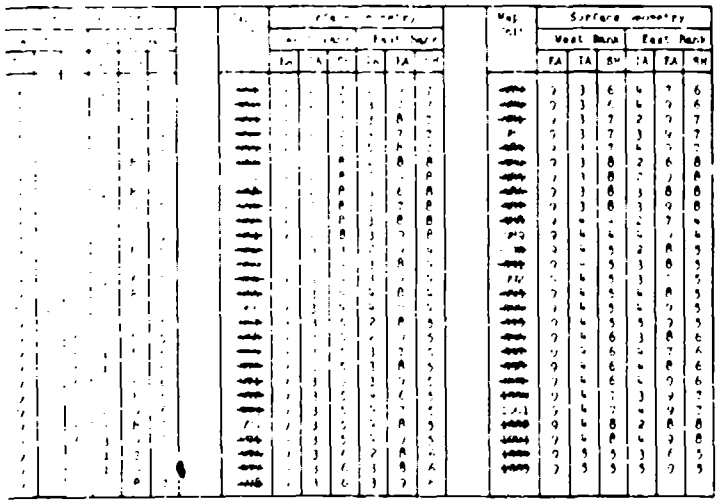




Kinematic

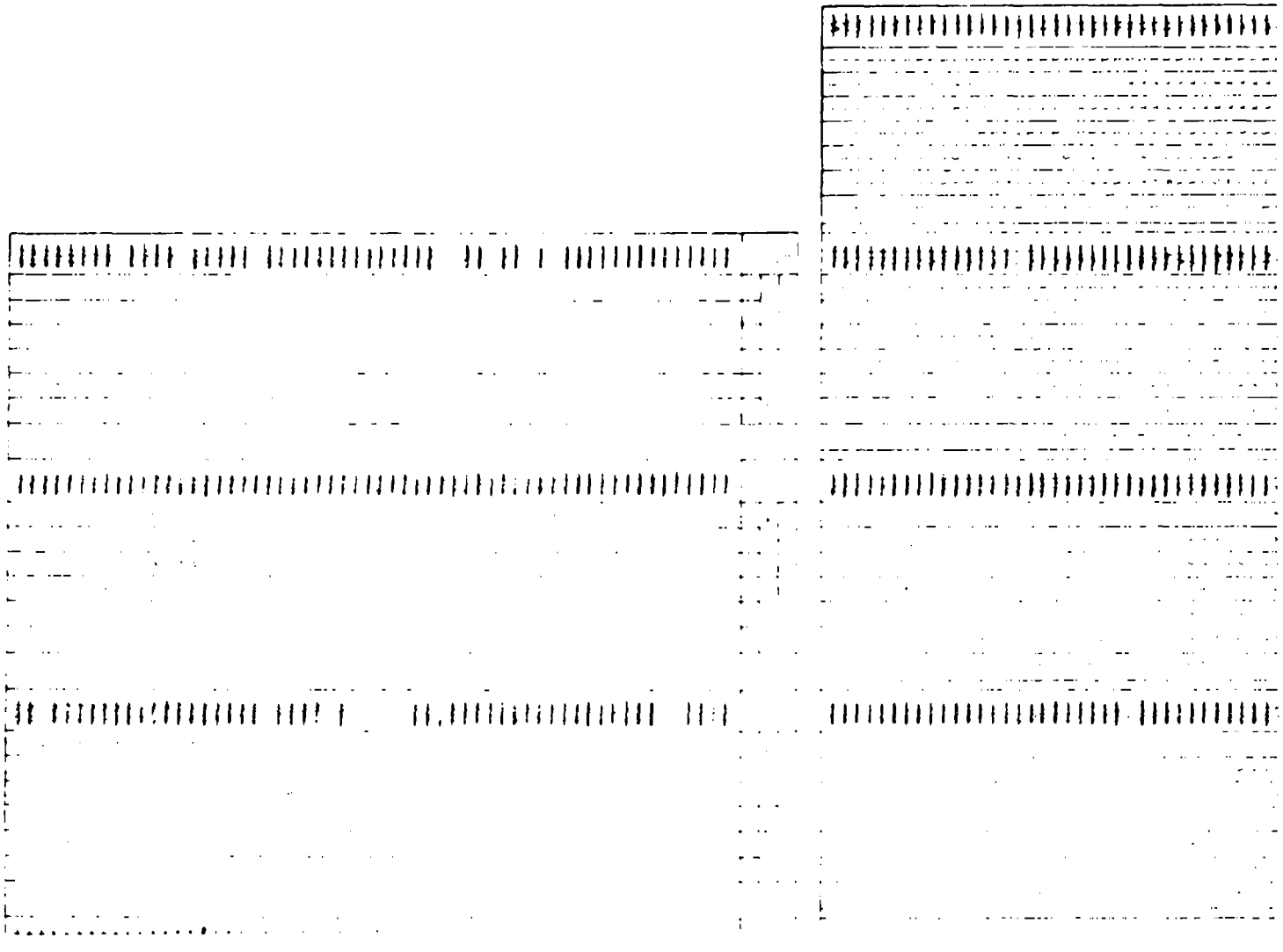
Contact Approach Angle (AA)	
Unit	Range deg
1	< 145
2	145-155
3	> 155-165
4	> 165-180

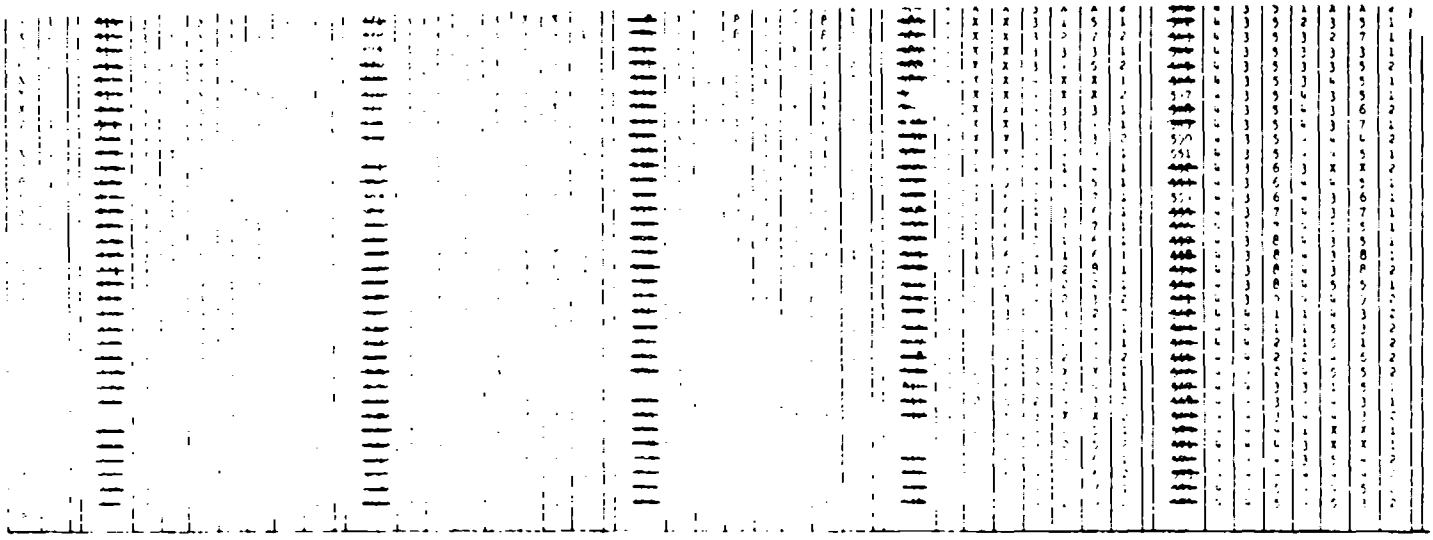


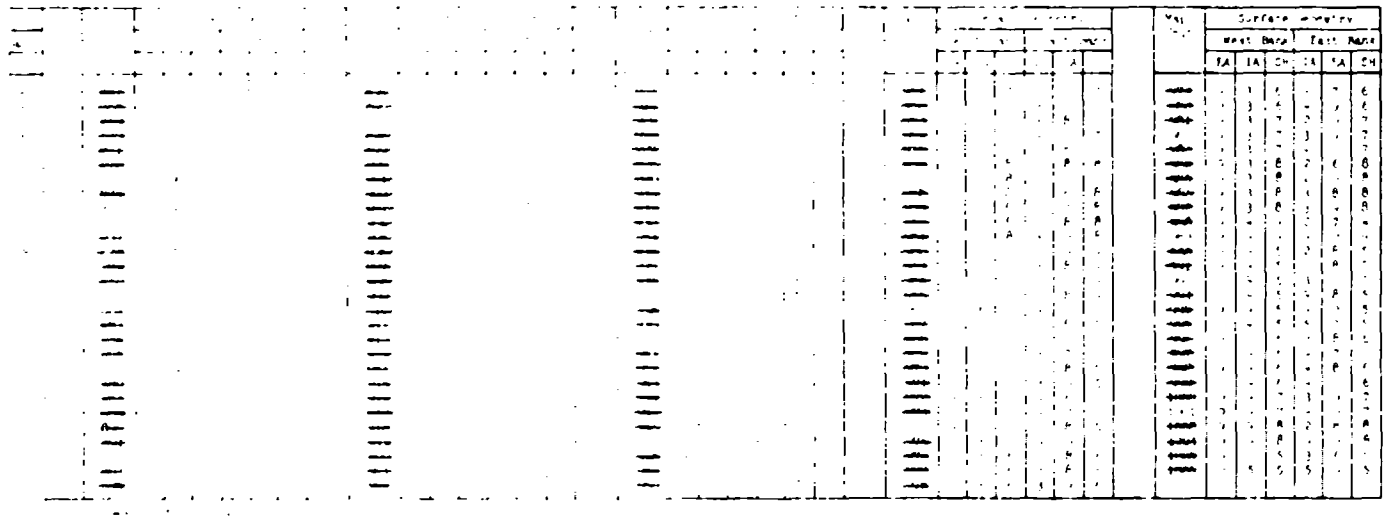


Hydrologic Geometry

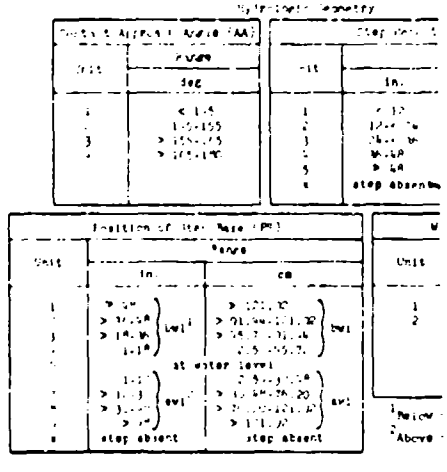
Contact Approach Angle (AA)		Step Height (SH)		
Unit	Range	Unit	Range	
	deg		in.	cm
1	< 1-9	1	< 12	< 30.48
2	1-5-155	2	12-< 24	< [illegible]
3	> 155 -165	3	24-< 36	< 60.96-[illegible]
4	> 165-180	4	36-48	< 91.44-121.92
		5	> 48	> 121.92
		6	step absent	step absent

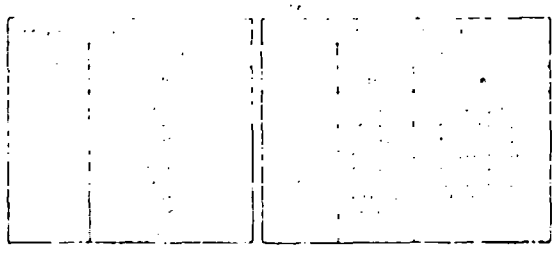




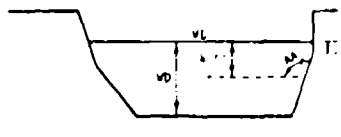




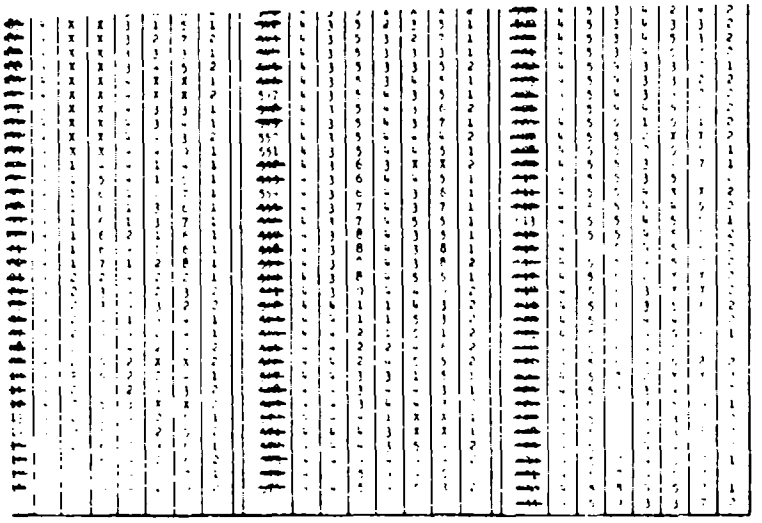


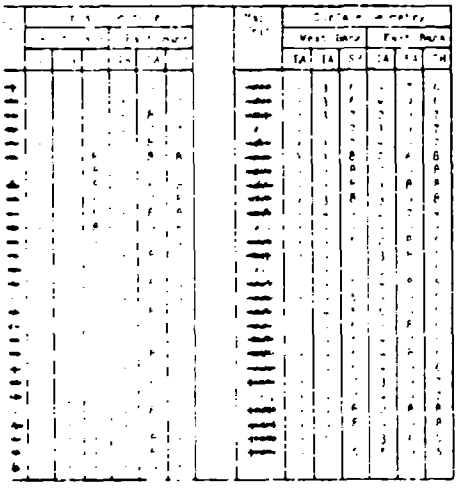


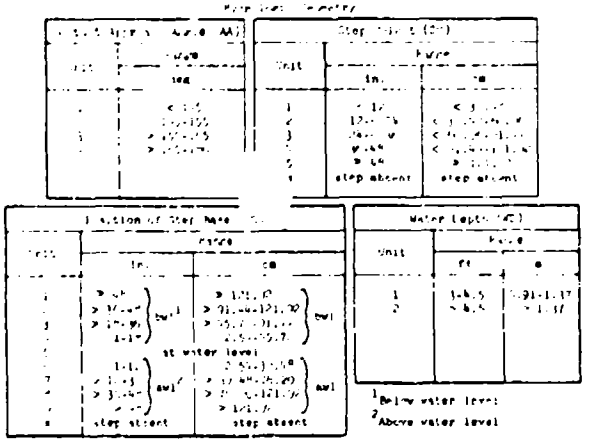


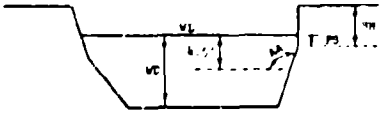


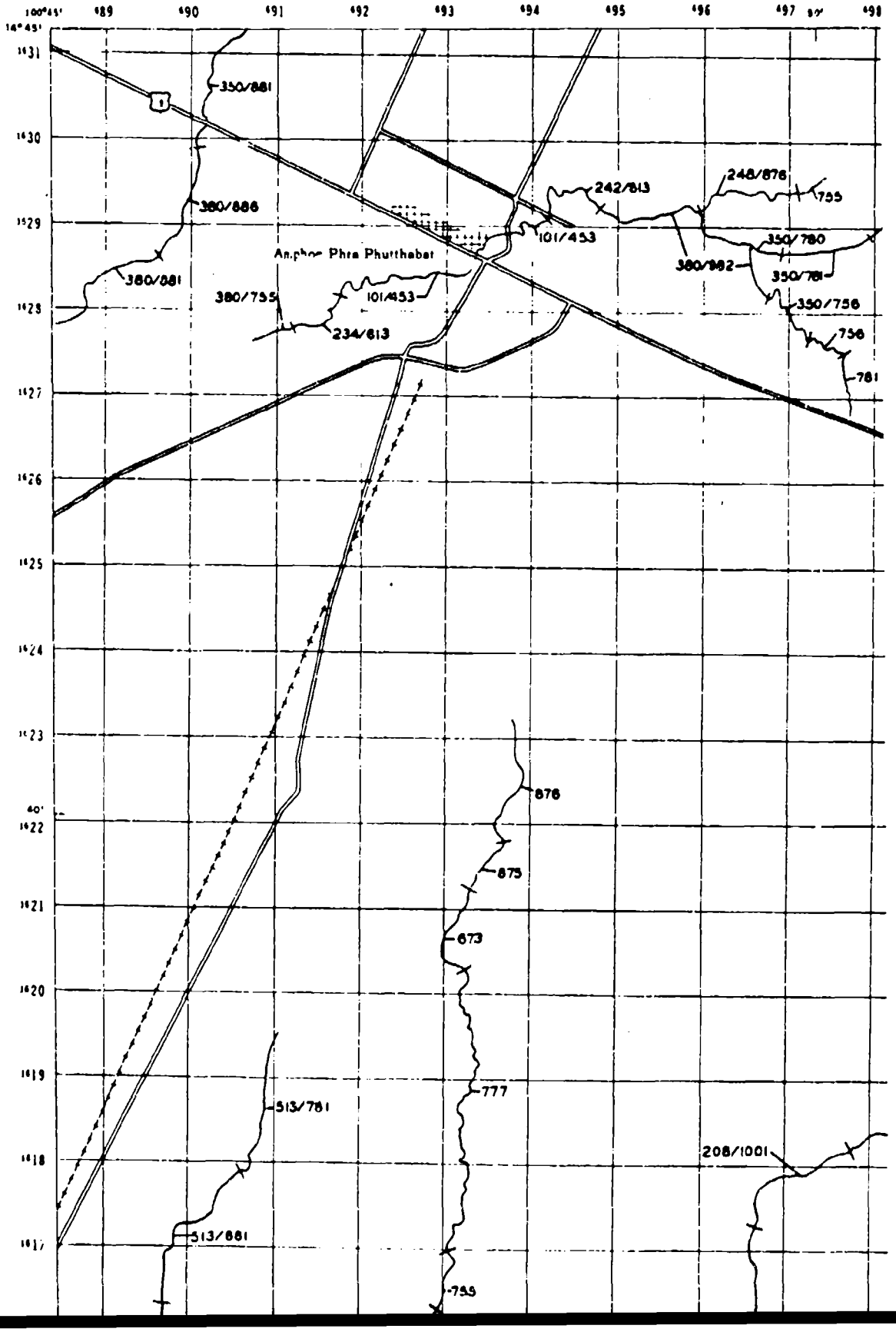
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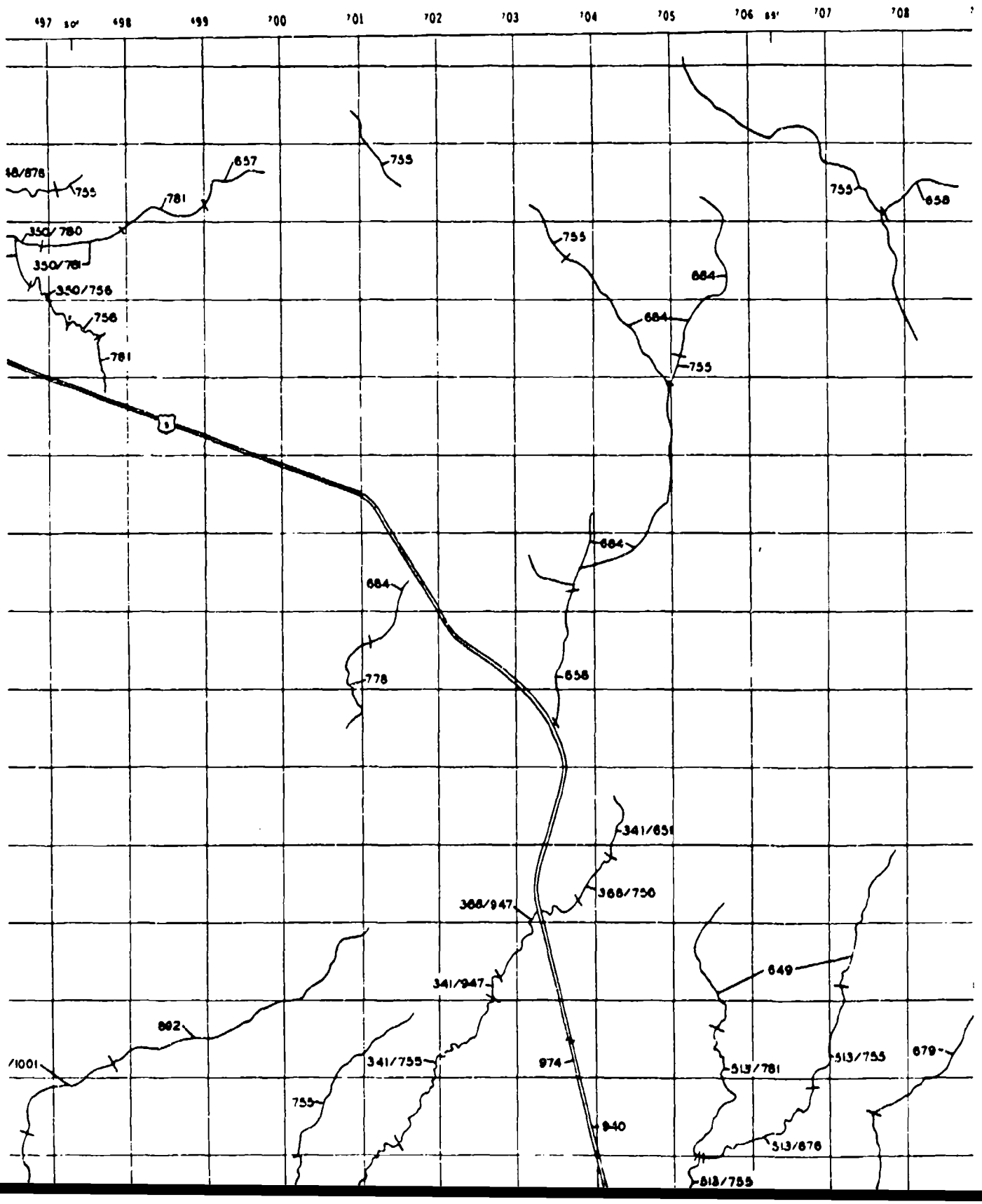





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350/881
380/886
380/881
380/755
101/453
234/613
Amphoe Phra Phutthabat
242/813
248/876
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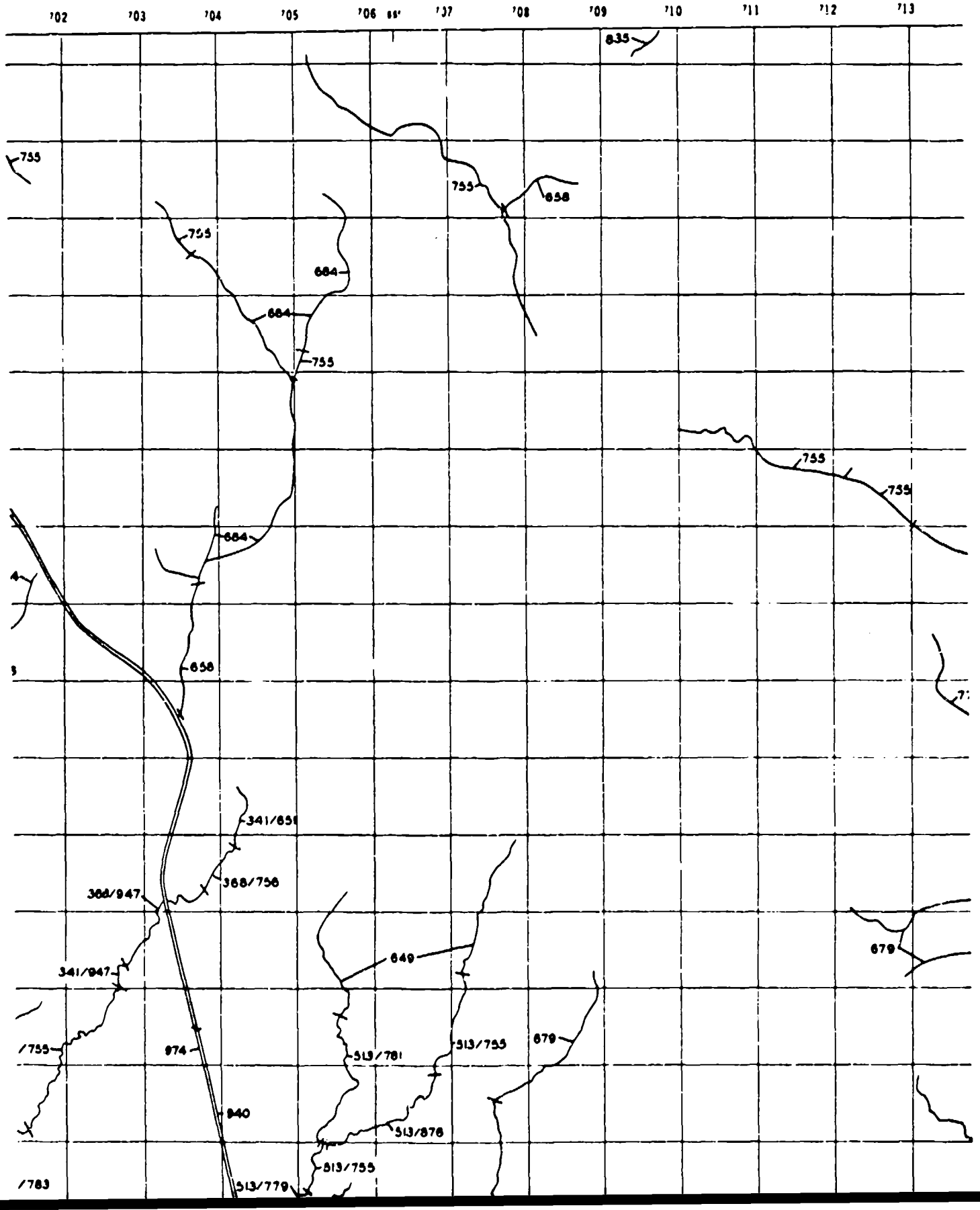
2

LOP BURI


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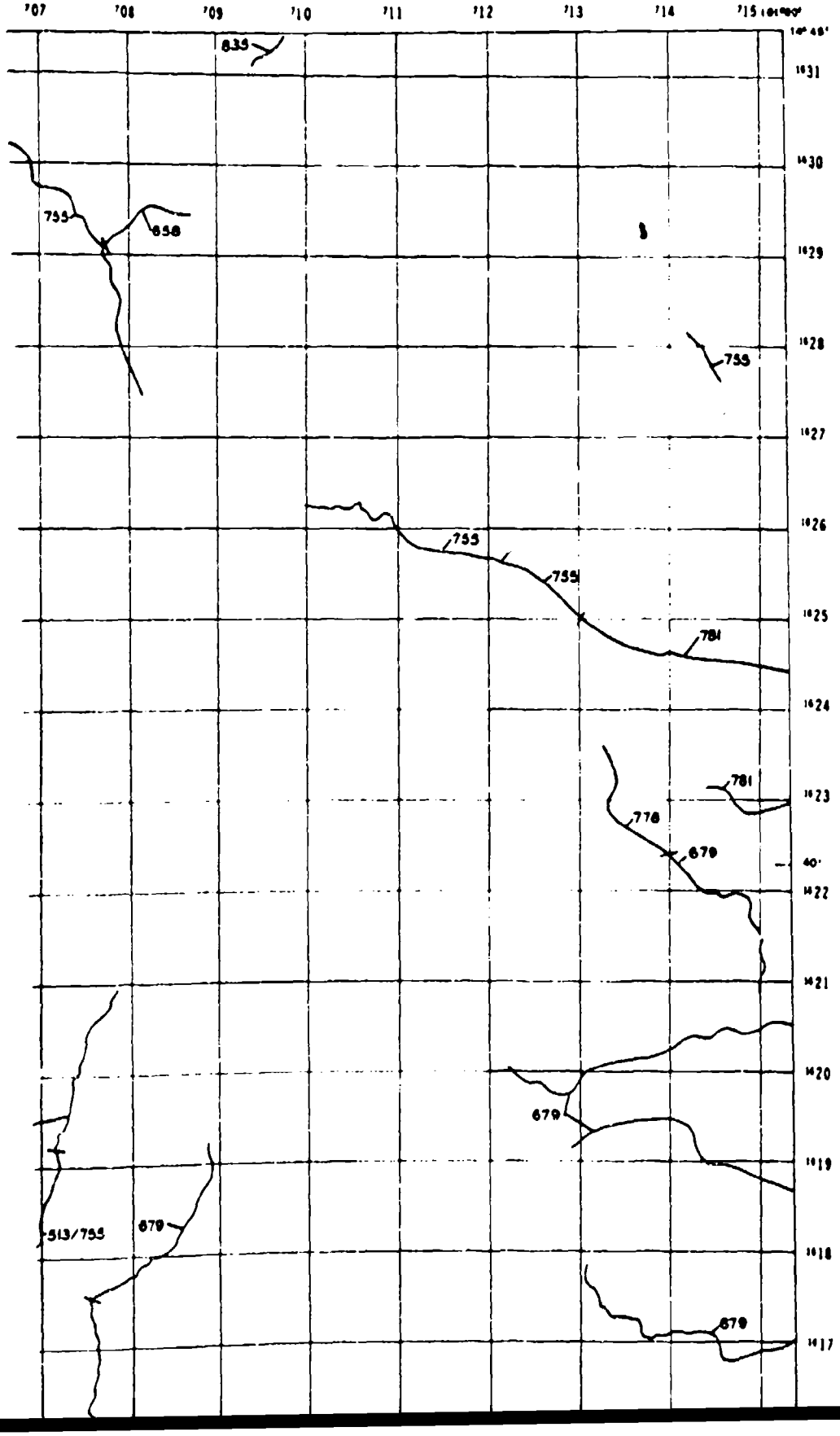
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P BURI


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513/755
513/876
513/755
649
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679

3 4

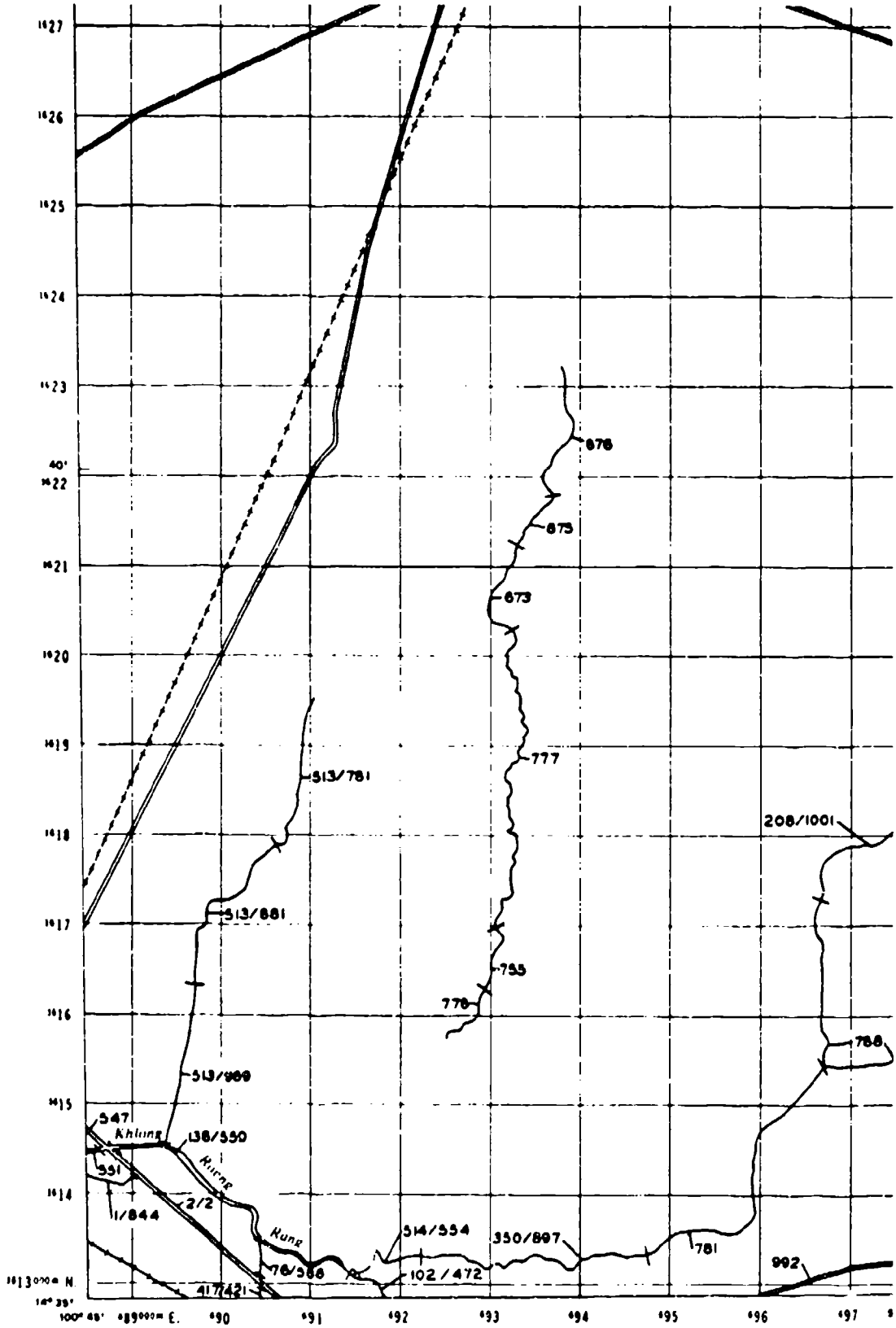
SHEET LB III



INDEX TO

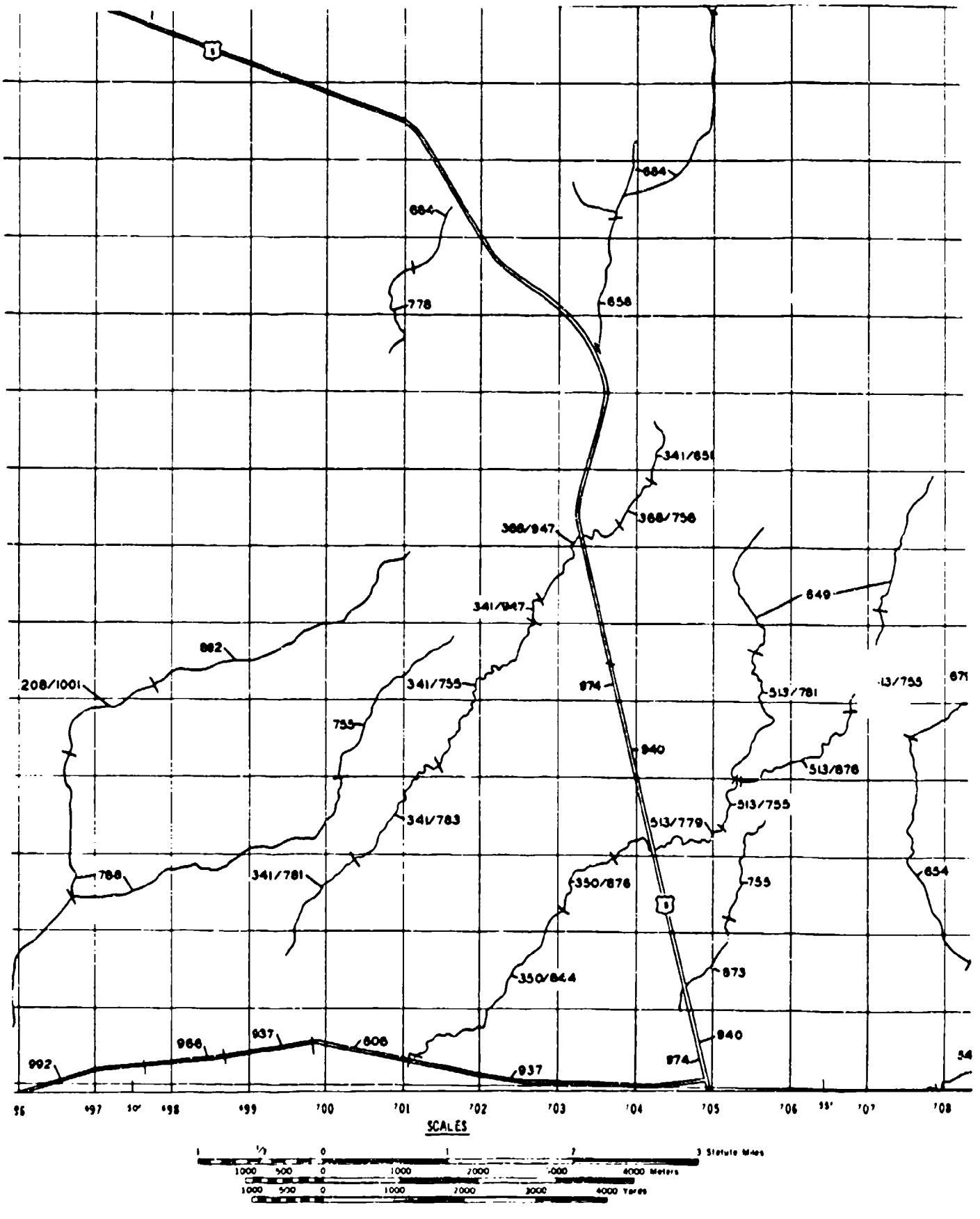
LB I

LB II



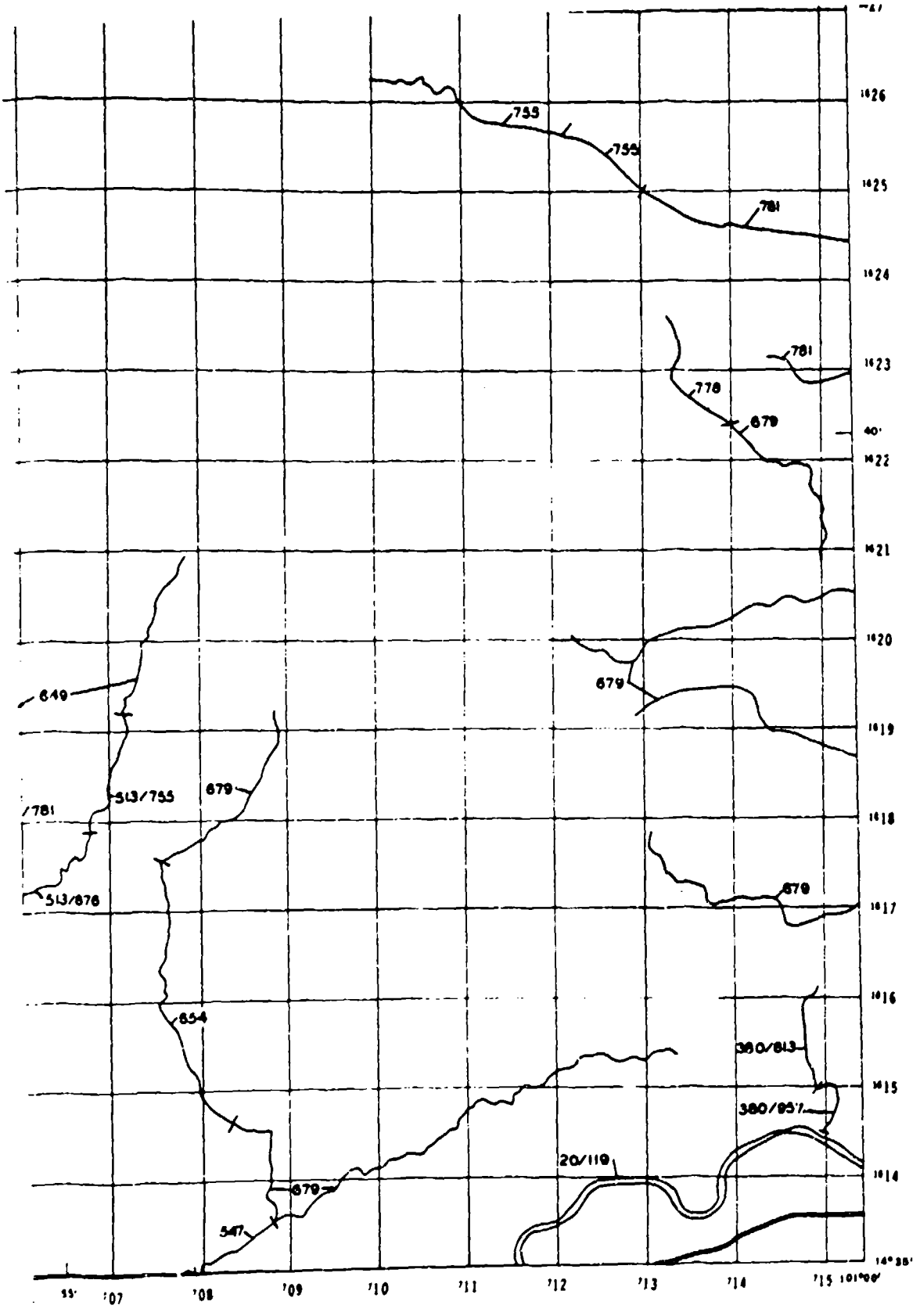
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


684
684
778
658
341/658
368/947
368/756
341/947
649
862
208/1001
341/755
974
513/781
755
940
513/876
513/755
341/783
513/779
788
341/781
350/876
755
654
350/844
873
940
966
937
606
992
937
974
SCALES
3 Statute Miles
4000 Meters
4000 Yards

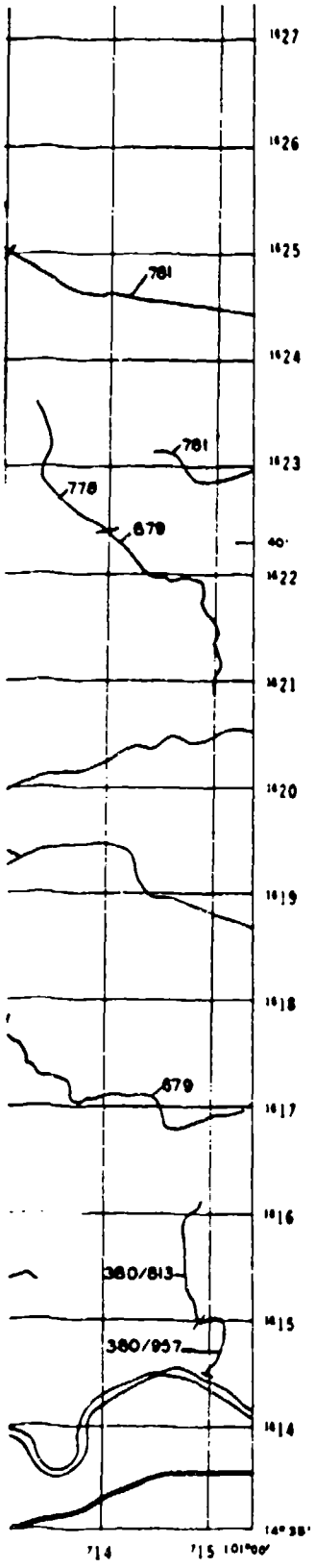
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1

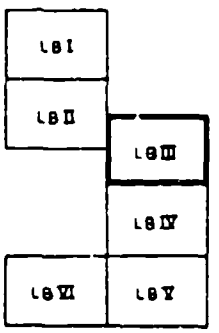


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7



INDEX TO ADJOINING SHEETS



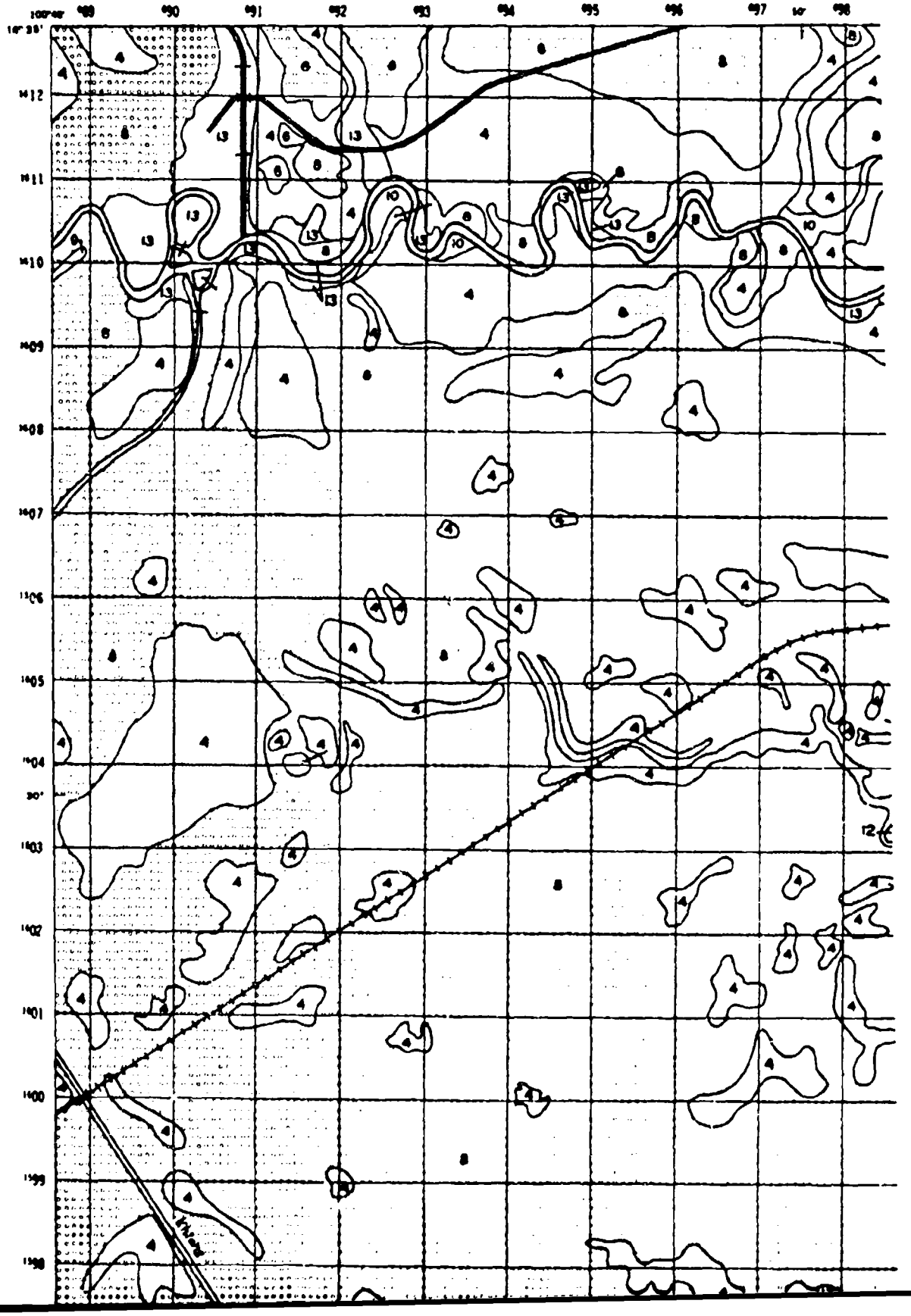
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

LOP BURI STUDY AREA

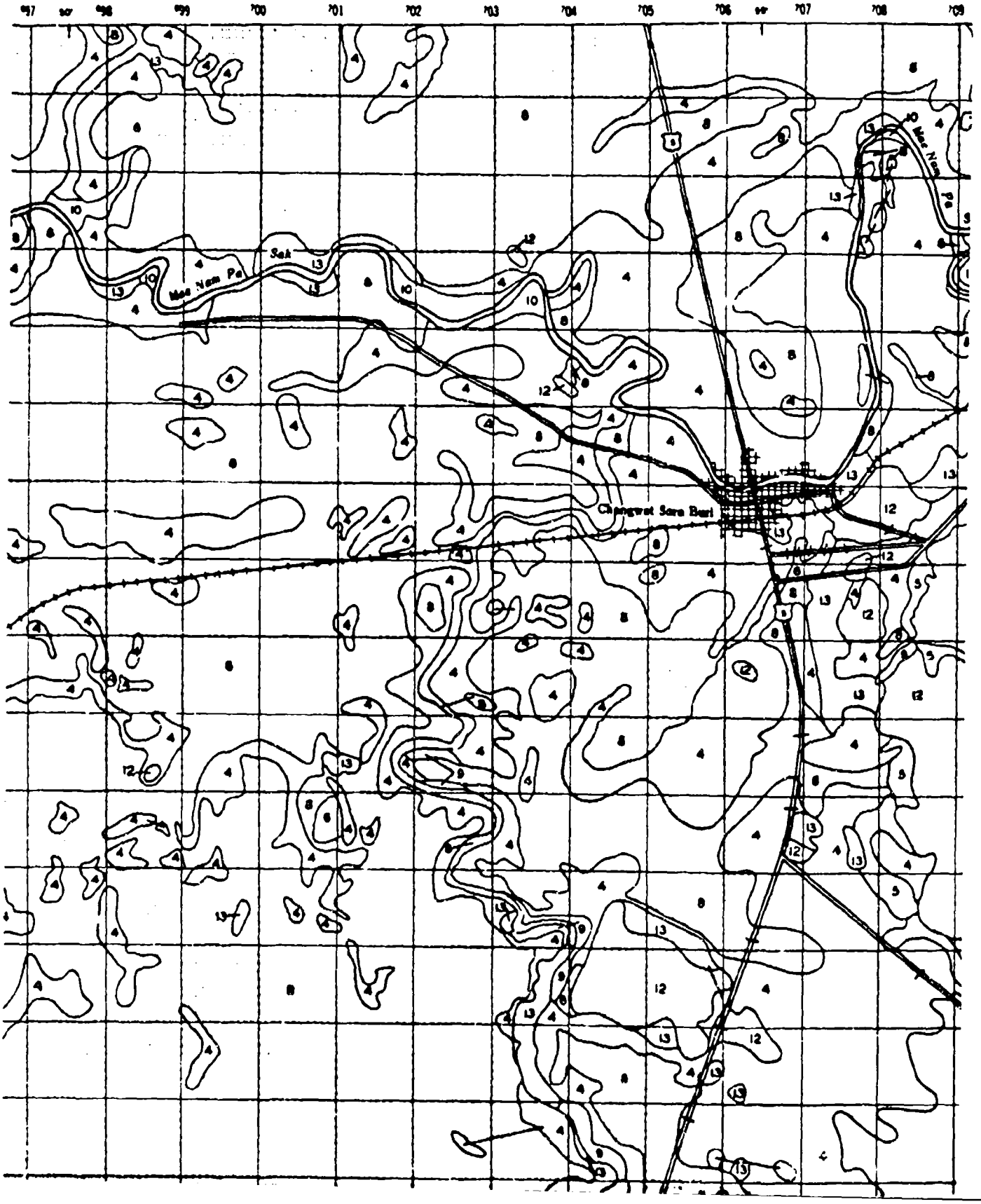
SHEET LB III

PLATE 2.3d



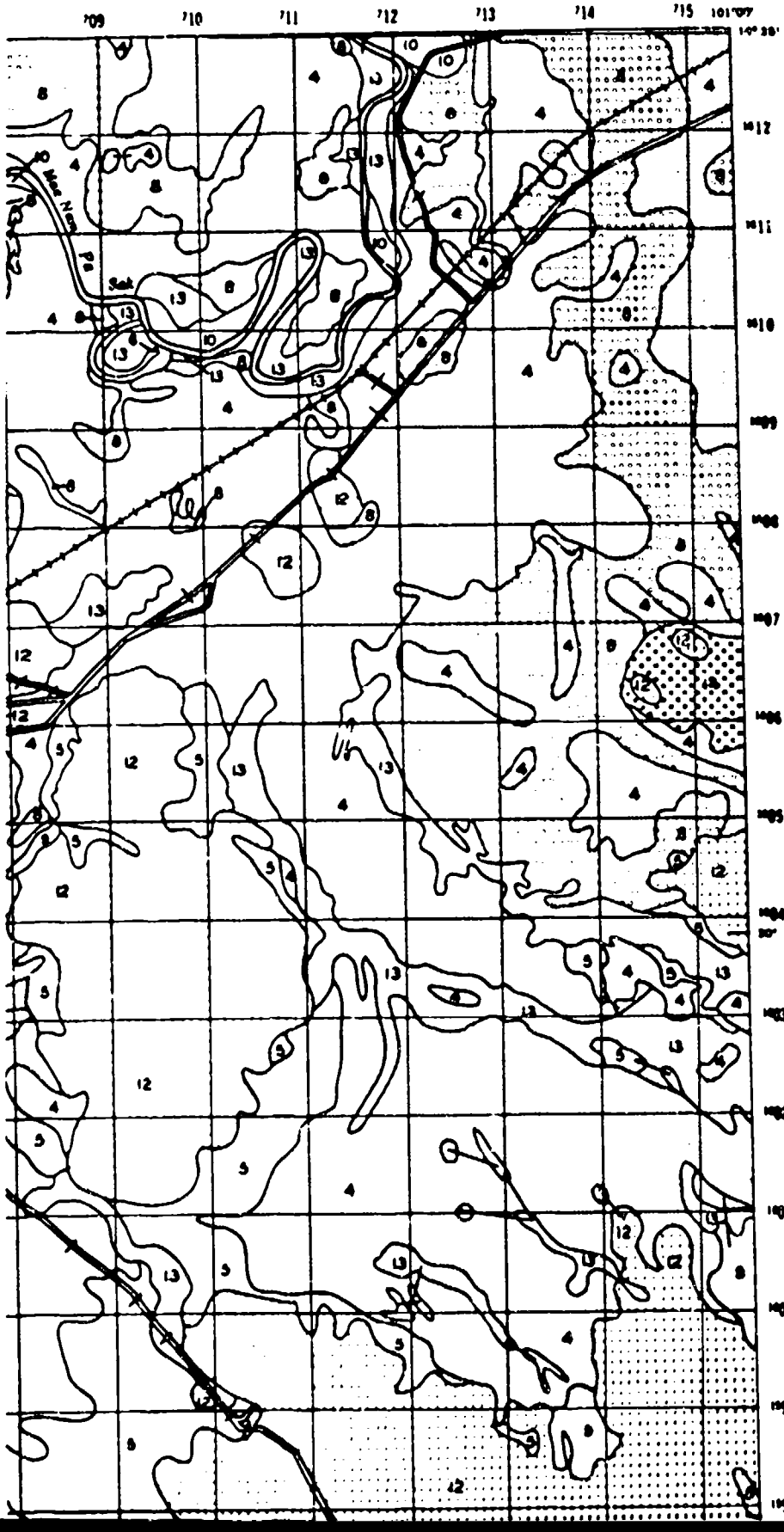
2

LOP BURI



13

SHEET LB IV



LEGEND

Unit	Soil Mass Strength: Moisture Moisture — RQD	Soil Mass Strength: Moisture Moisture — RCI	Moisture Moisture: c_{uu} psi	Moisture Moisture: c_{uu} kg/cm²	Moisture Moisture: ϕ_{uu} deg	Soil: c_{uu} psi	Soil: c_{uu} kg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.0
	25-60	60-100	0-1	0-0.07	0-10	2-4	0.1
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.1
5	25-60	>100	0-1	0-0.07	0-10	0-1	
7	25-60*	>100	0-1	0-0.07	10-20	0-1	
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.1
	60-100	60-100	0-1	0-0.07	10-20	0-1	
	60-100	>100	0-1	0-0.07	0-10	0-1	
9	60-100	>100	0-1	0-0.07	0-10	0-1	
10	60-100	>100	0-1	0-0.07	10-20	0-1	
	60-100*	>100	0-1	0-0.07	10-20	0-1	
	>100	>100	0-1	0-0.07	0-10	0-1	
13	>100	>100	0-1	0-0.07	10-20	0-1	
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	

Notes: Blank areas are water bodies.

c_{uu} Shear strength at zero normal load.

ϕ_{uu} Angle of internal friction.

* Moisture conditions has less than 30 percent probability of strengths commonly observed are 60-100 for Units 3 and 5

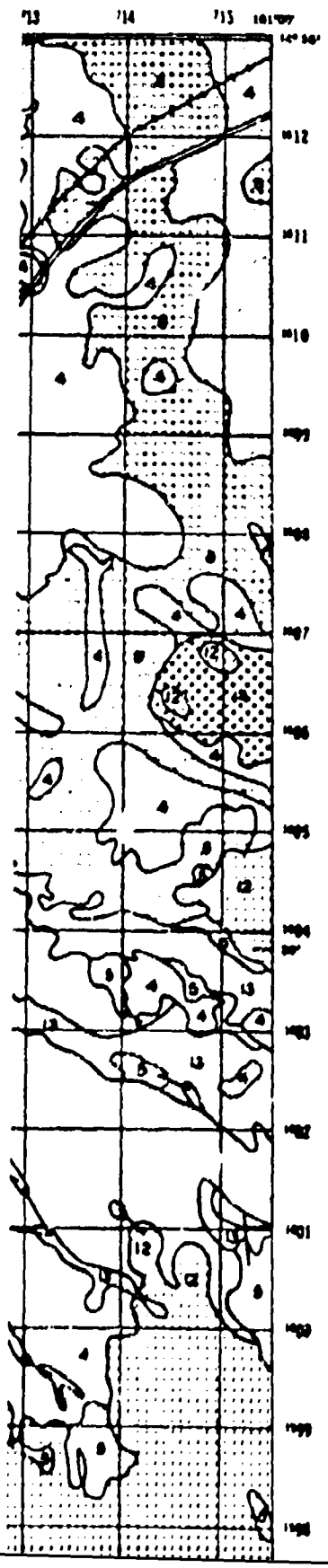
Units do not occur on this map.

INDEX TO ADJOINING

LB I

LB II

SHEET LB IV



LEGEND

Unit	Soil Mass Strength: Maximum Moisture (MCI)	Soil Mass Strength: Minimum Moisture (MCI)	Soil Surface Strength: Maximum Moisture: c_{sw} psf	Soil Surface Strength: Maximum Moisture: c_{sw} kg/cm²	Soil Surface Strength: Maximum Moisture: ϕ_{sw} deg	Soil Surface Strength: Maximum Moisture: c_{sw} psf	Soil Surface Strength: Maximum Moisture: c_{sw} kg/cm²	Soil Surface Strength: Maximum Moisture: ϕ_{sw} deg	Soil Surface Strength: Conditions where maximum c_{sw} occurs: c_{sw} psf	Soil Surface Strength: Conditions where maximum c_{sw} occurs: c_{sw} kg/cm²	Soil Surface Strength: Conditions where maximum c_{sw} occurs: ϕ_{sw} deg
1	10-25	25-60	0-1	0-0.07	0-10	1-5	0.07-0.35	10-20	Maximum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-5	0.15-0.35	20-40	Maximum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-5	0.15-0.35	20-40	Maximum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-5	0.15-0.35	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-5	0.15-0.35	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-5	0.15-0.35	20-40	Maximum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-5	0.15-0.35	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-5	0.15-0.35	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-3	0.07-0.15	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-3	0.07-0.15	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-3	0.07-0.15	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-5	0.15-0.35	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		

Notes: Blank areas are water bodies.

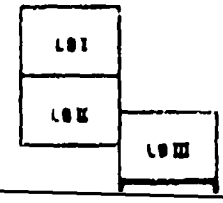
c_{sw} Shear strength at zero normal load.

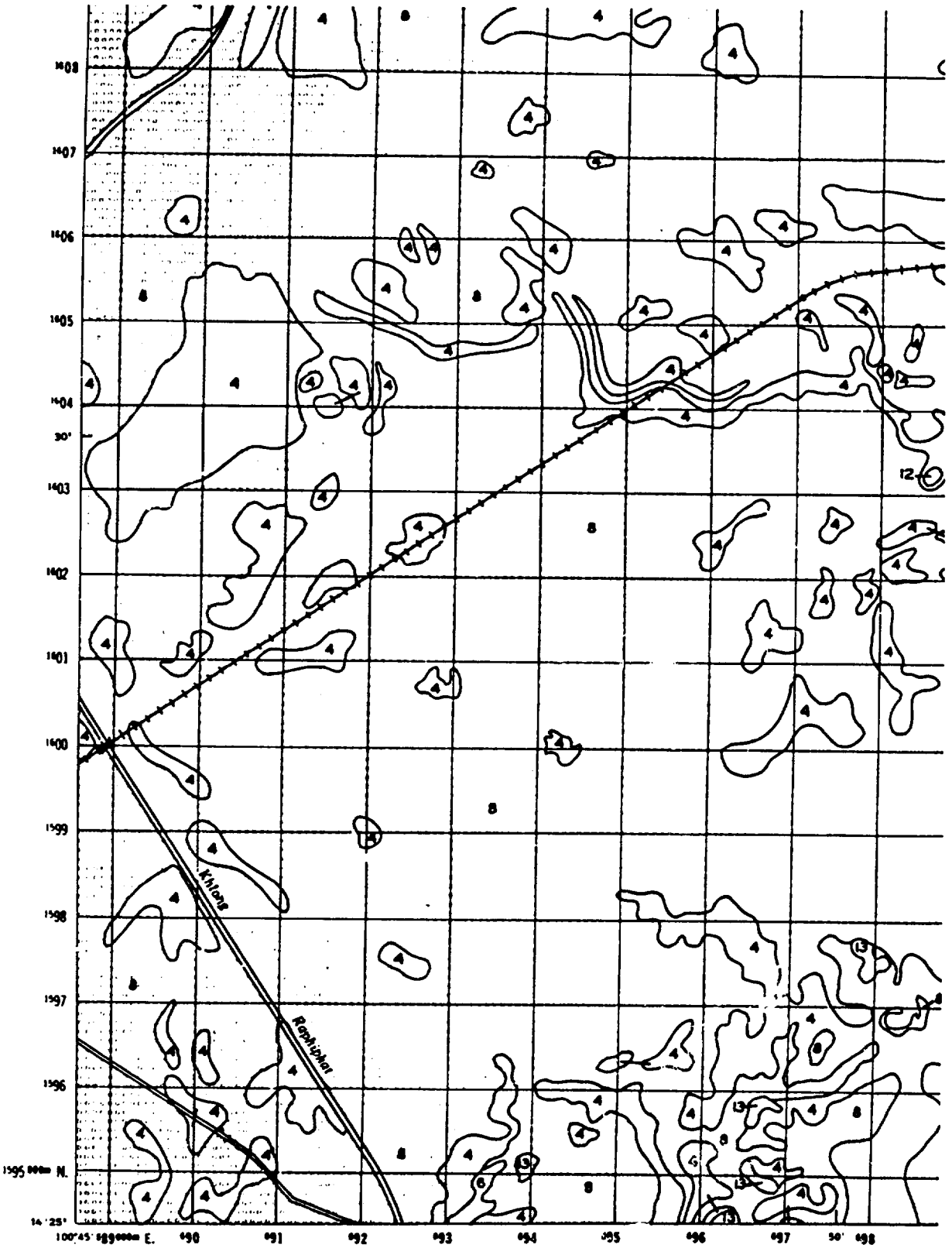
ϕ_{sw} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 1 and 5; more than 100 for Unit 13.

Units do not occur on this map.

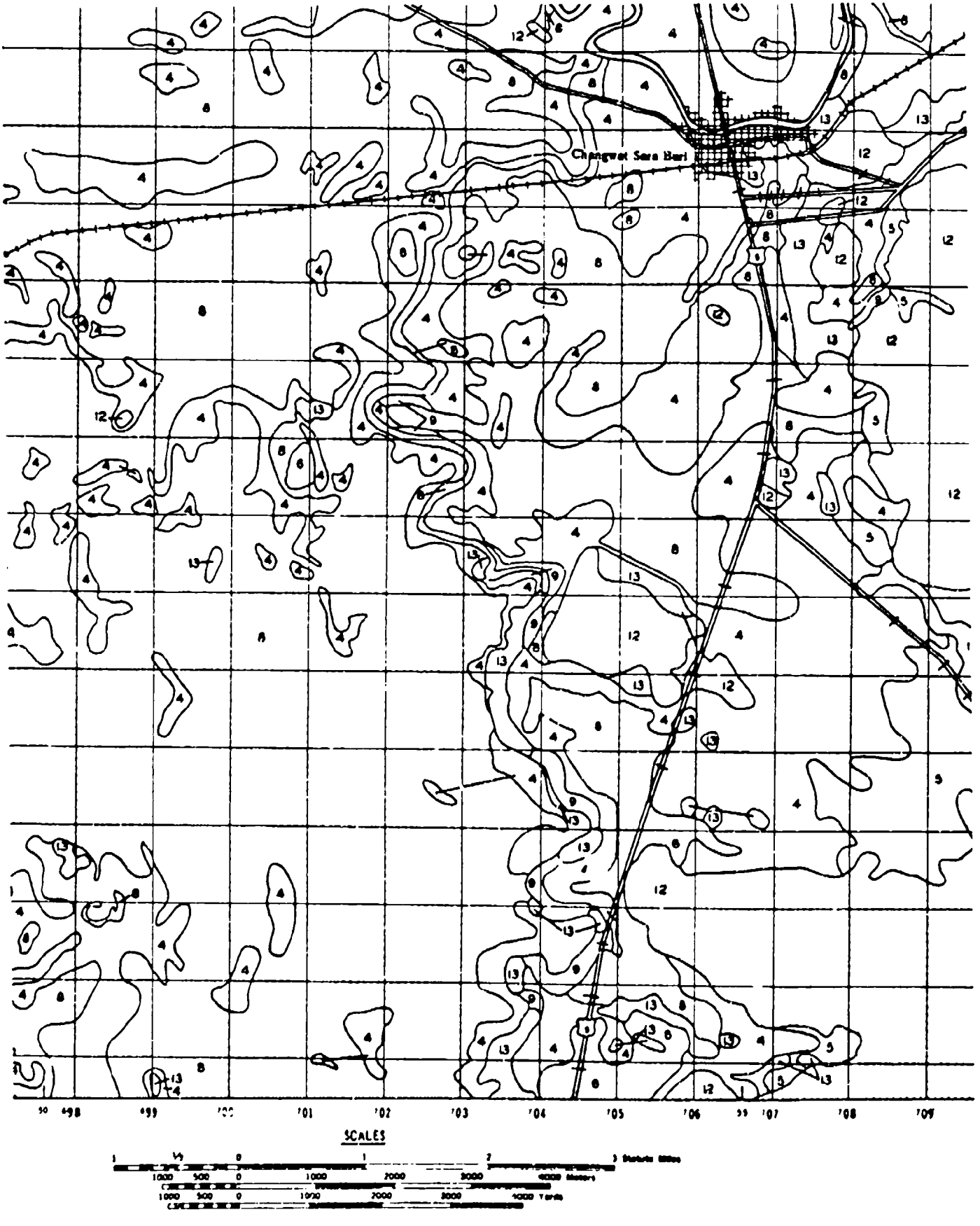
INDEX TO ADJOINING SHEETS



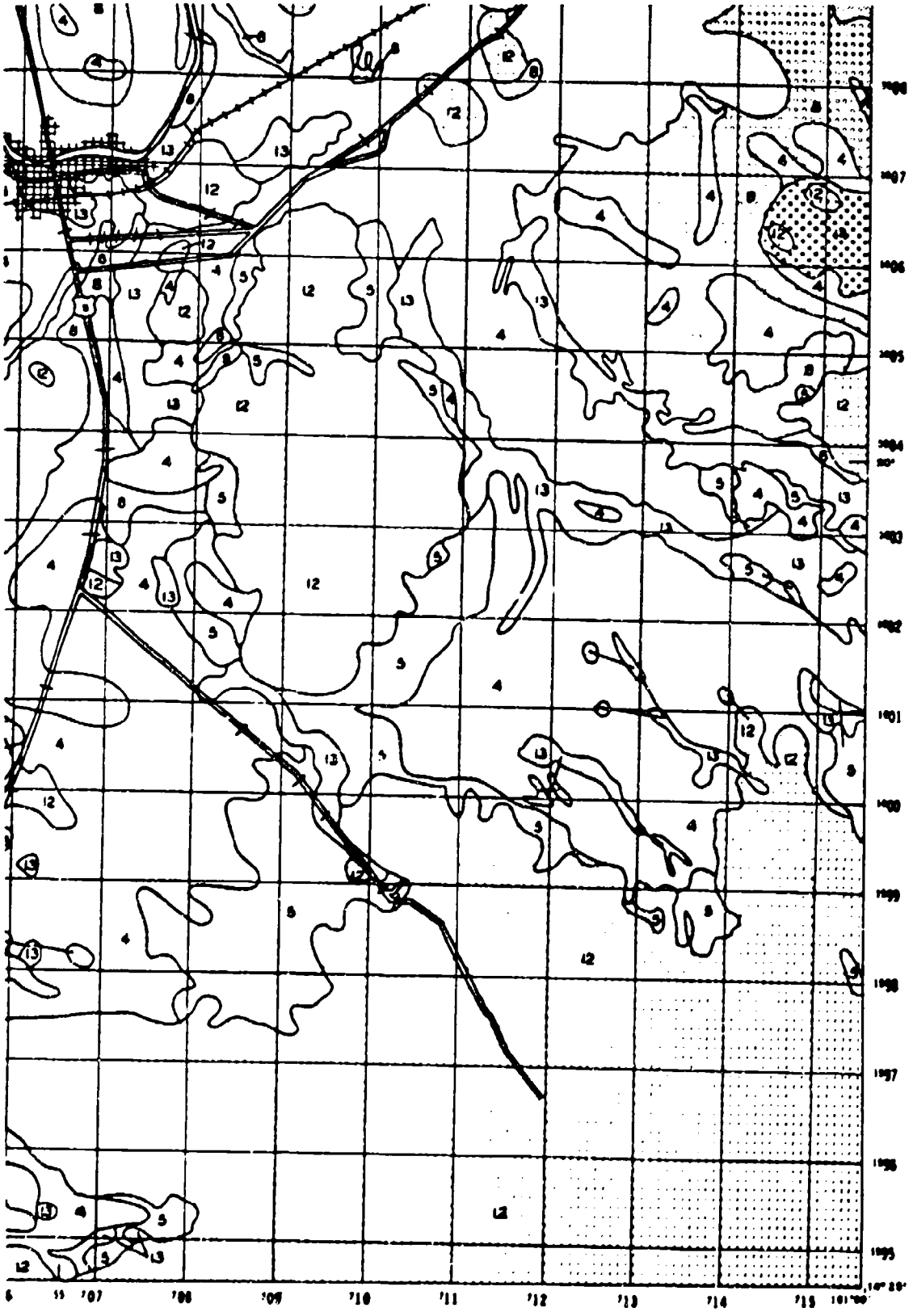


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5



6



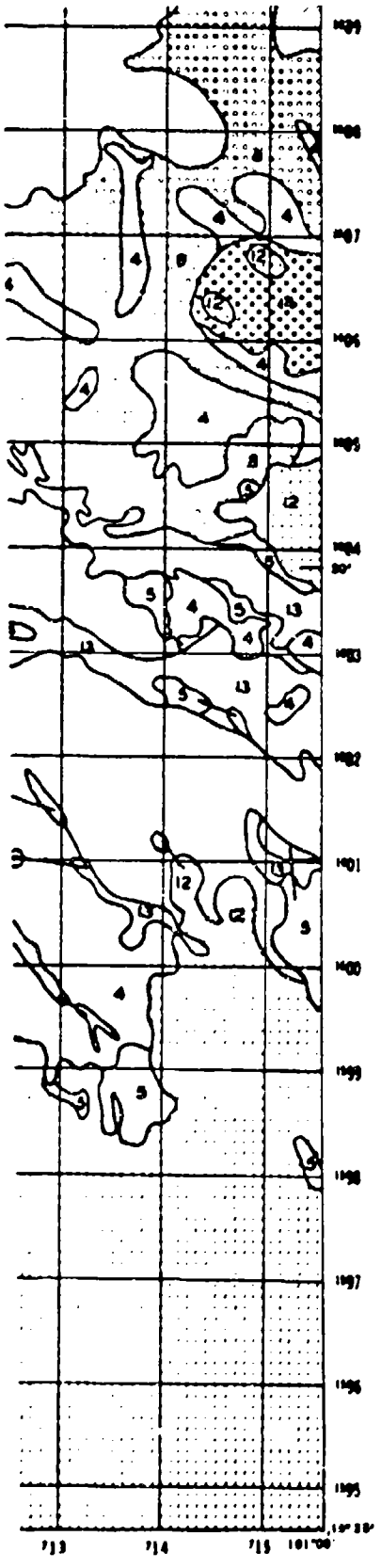
Unit	Soil Mass Strength: Maximum Resistance MPa	Maximum Resistance MPa
	10-25	25-60
	25-60	60-100
	25-60*	60-100
9	25-60	>100
2	25-60*	>100
6	60-100	60-100
	60-100	60-100
11	60-100	>100
7	60-100	>100
10	60-100	>100
	60-100*	>100
8	>100	>100
13	>100	>100
12	Complex of 60-100 and >100	>100
	Complex of 60-100 and >100	>100

Notes: Each areas are value for
Shear strength at zero n
Angle of internal friction
Maximum and where less strengths normally observe
Units do not occur on th

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LEGEND

Unit	Soil Mass Strength: Minimum Moisture (RCI)	Soil Mass Strength: Maximum Moisture (RCI)	Soil Surface Strength: Minimum Moisture c_w (psi)	Soil Surface Strength: Minimum Moisture c_w (kg/cm²)	Soil Surface Strength: Minimum Moisture ϕ_w (deg)	Soil Surface Strength: Maximum Moisture c_w (psi)	Soil Surface Strength: Maximum Moisture c_w (kg/cm²)	Soil Surface Strength: Maximum Moisture ϕ_w (deg)	Soil Surface Strength: Conditions above maximum moisture c_w (psi)	Soil Surface Strength: Conditions above maximum moisture c_w (kg/cm²)	Soil Surface Strength: Conditions above maximum moisture ϕ_w (deg)
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Notes: Black areas are water bodies.

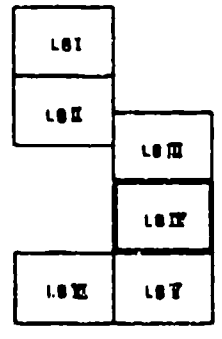
c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 50 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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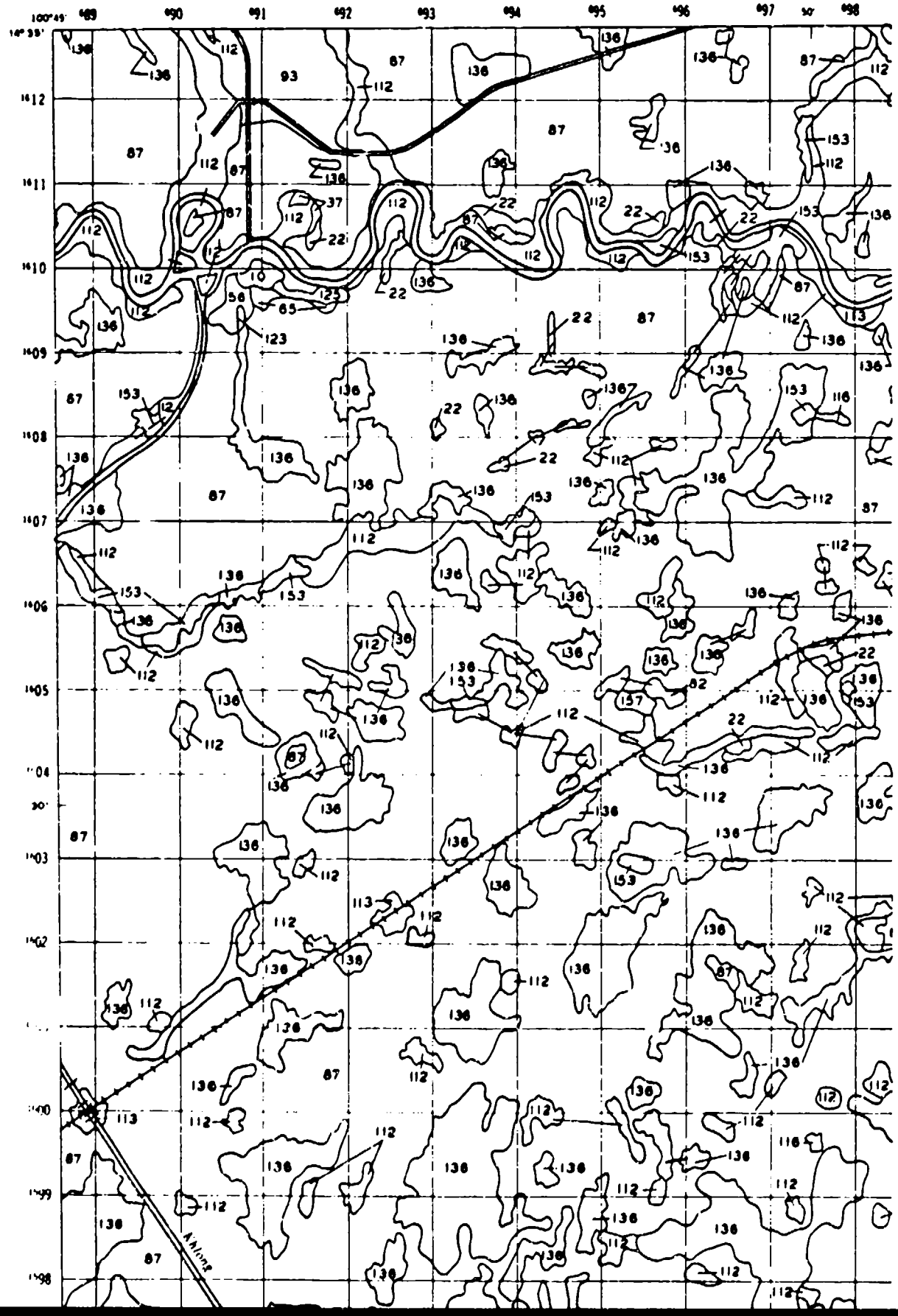
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

LOP BURI STUDY AREA

SHEET LB IV

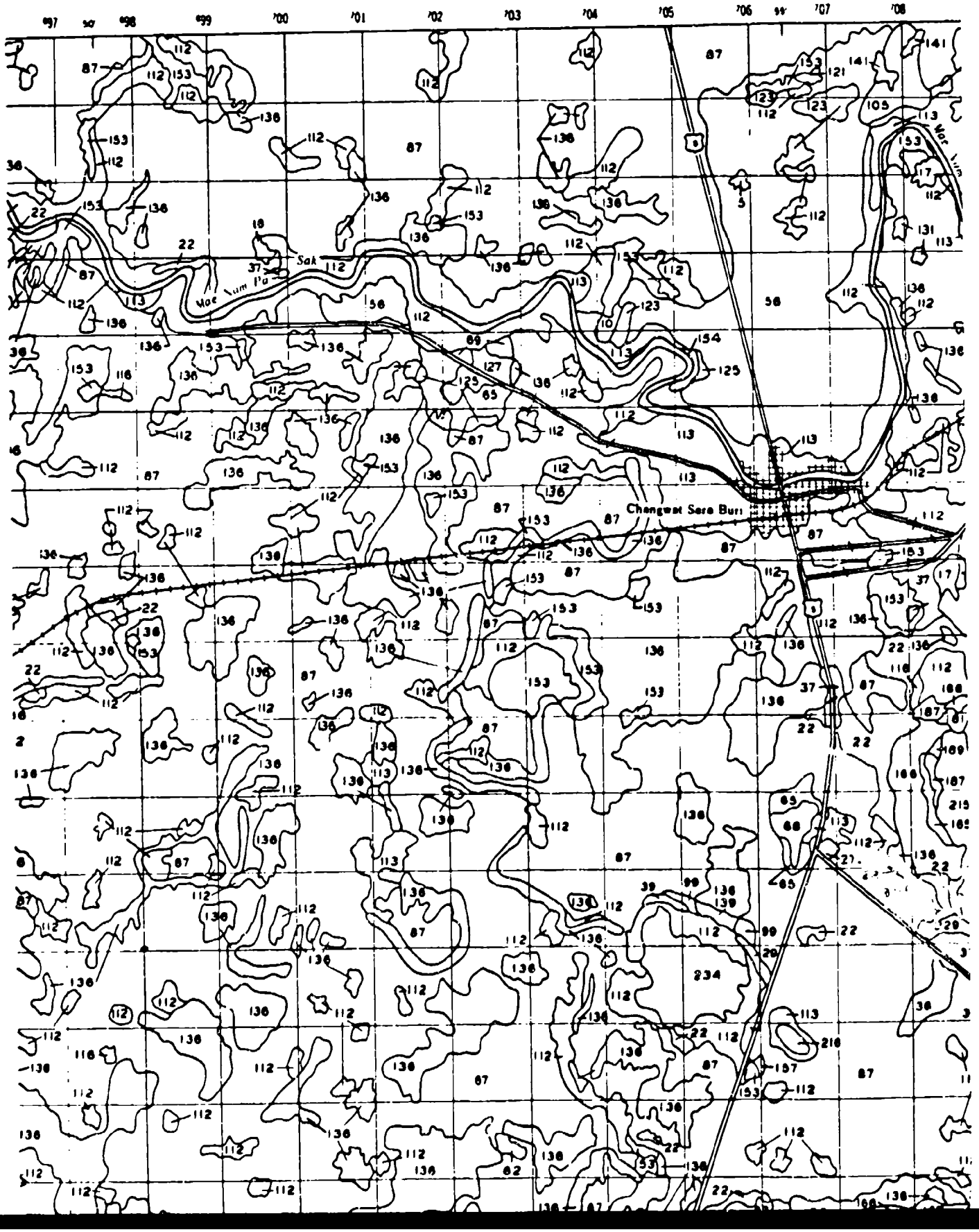
PLATE 2.4a


100°49'
489
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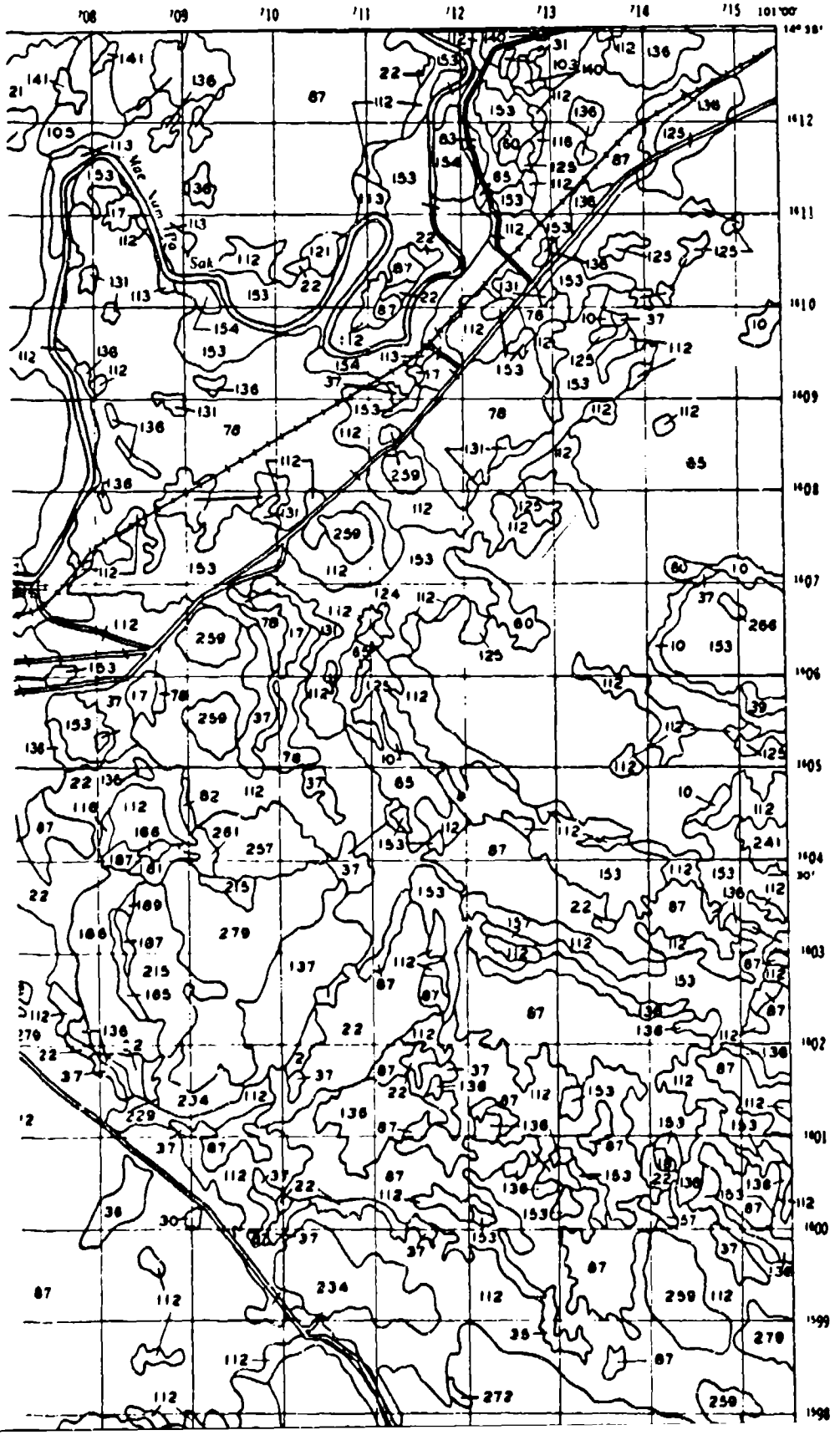
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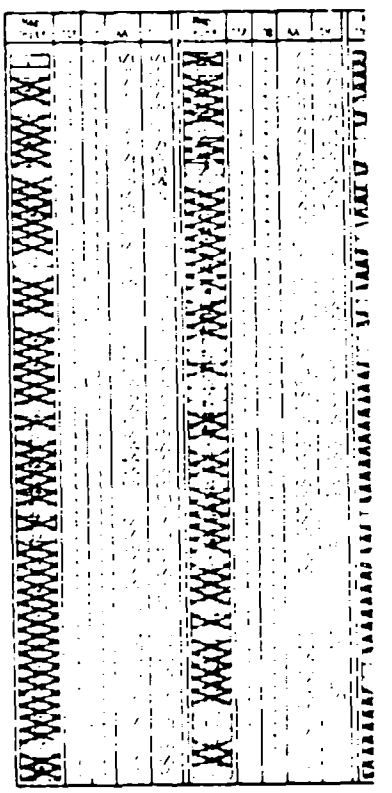
LOP BURI

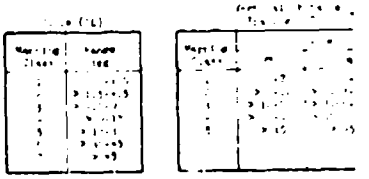


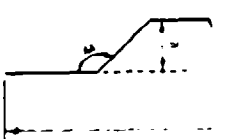
3

SHEET LB IV









INDEX TO

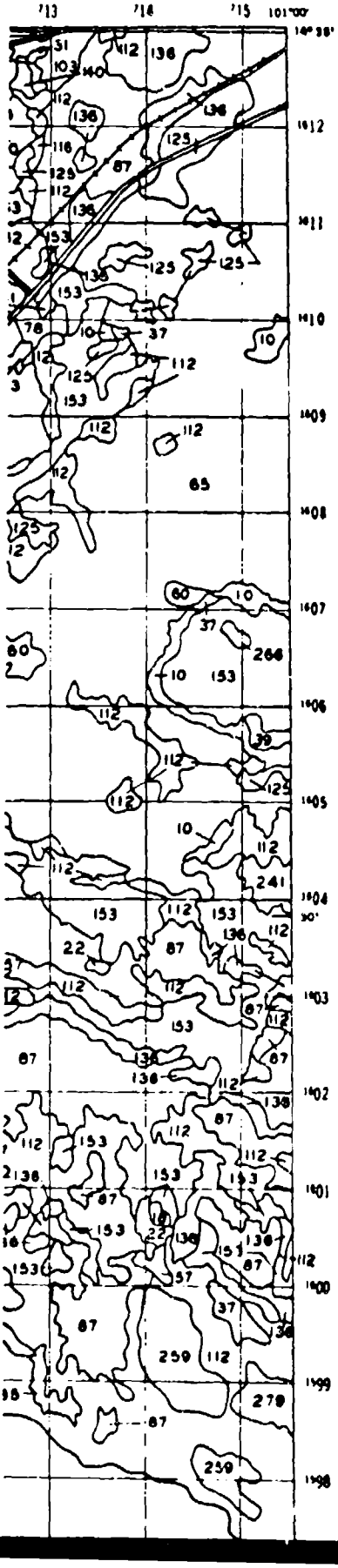
LBI

LBII

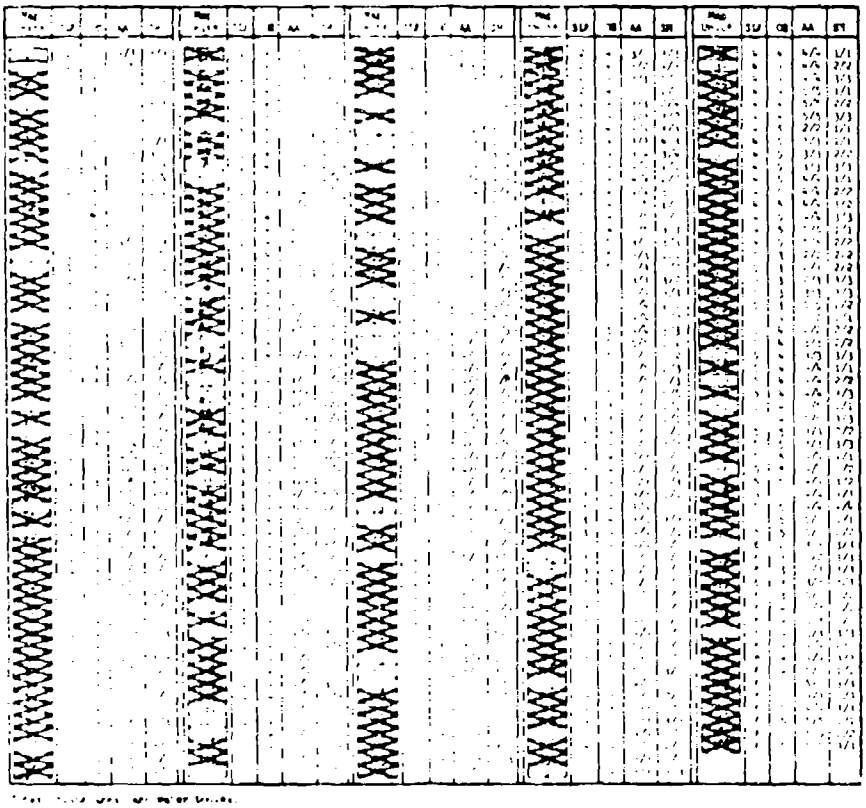
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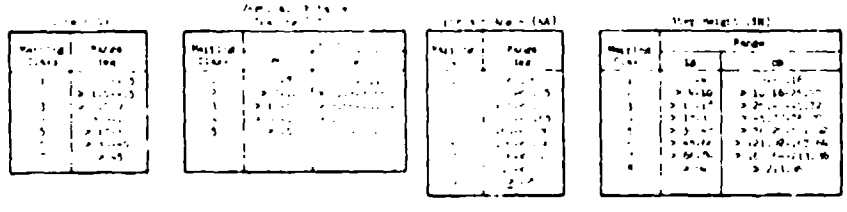
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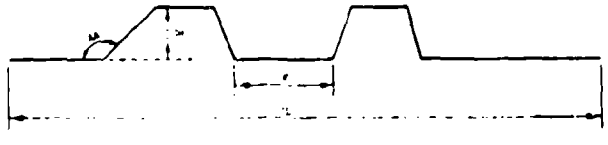
SHEET LB IV



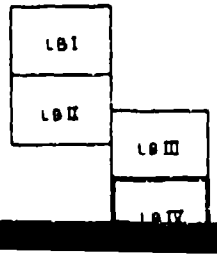
LEGEND

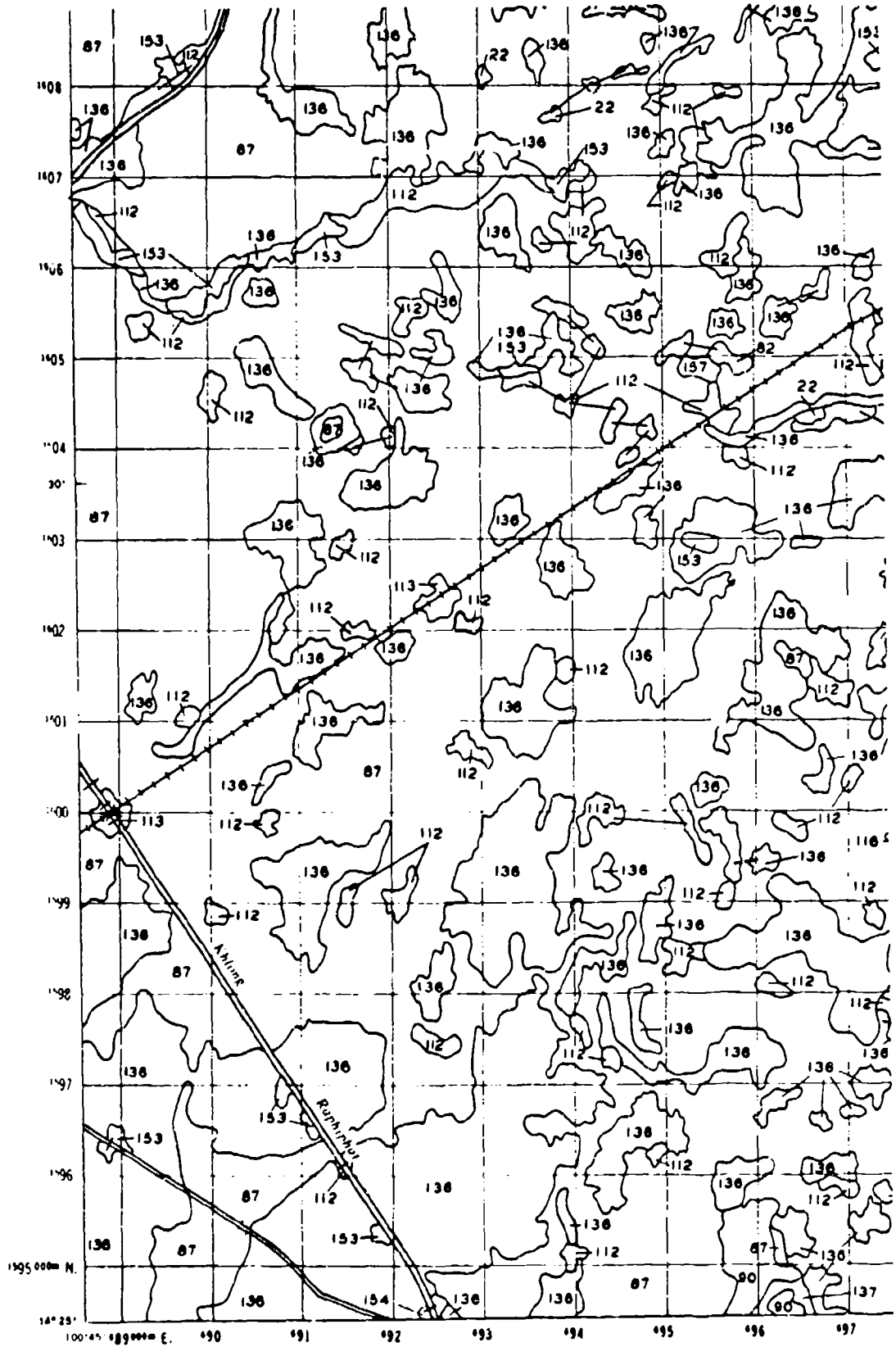






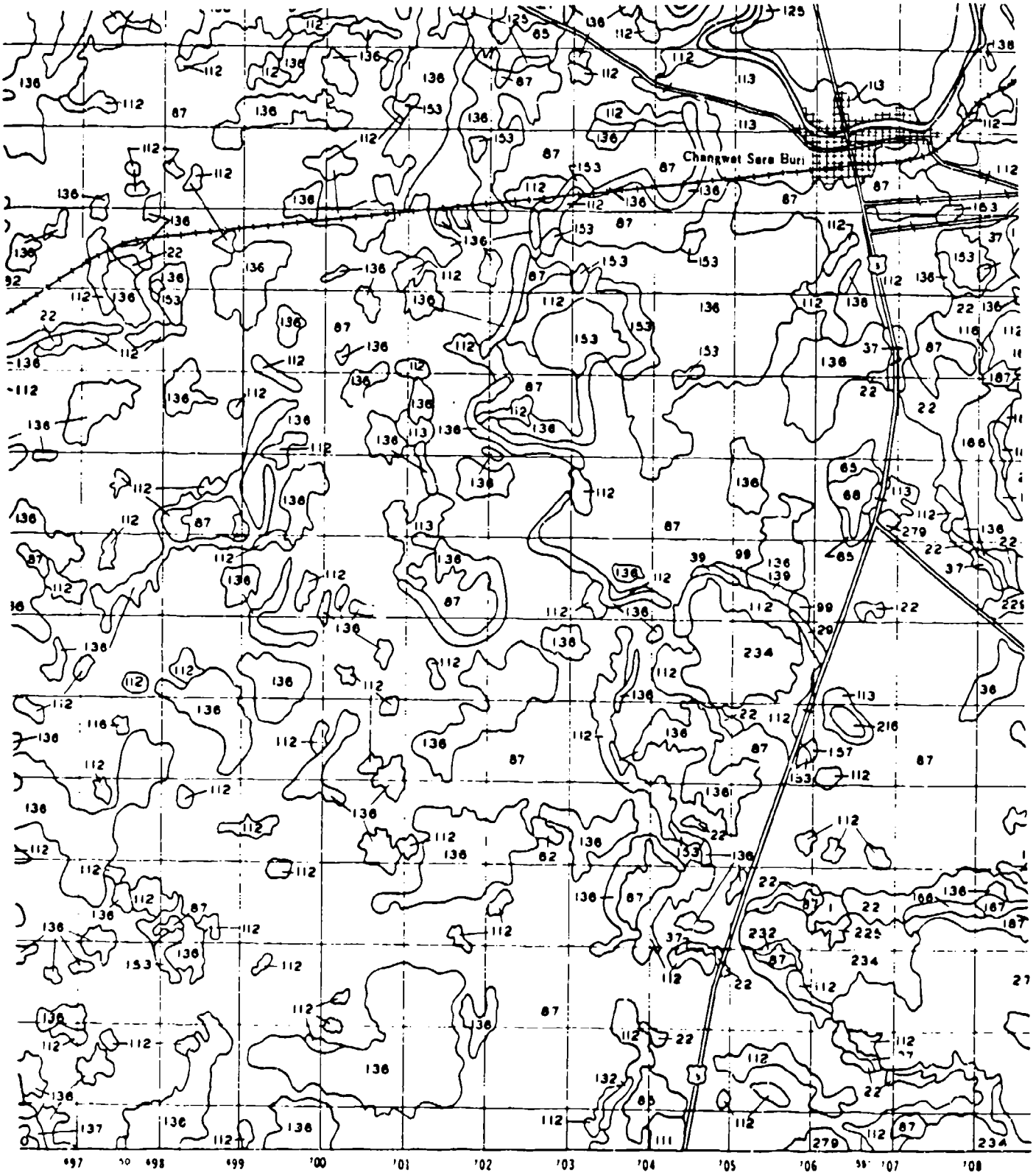
INDEX TO ADJOINING SHEETS





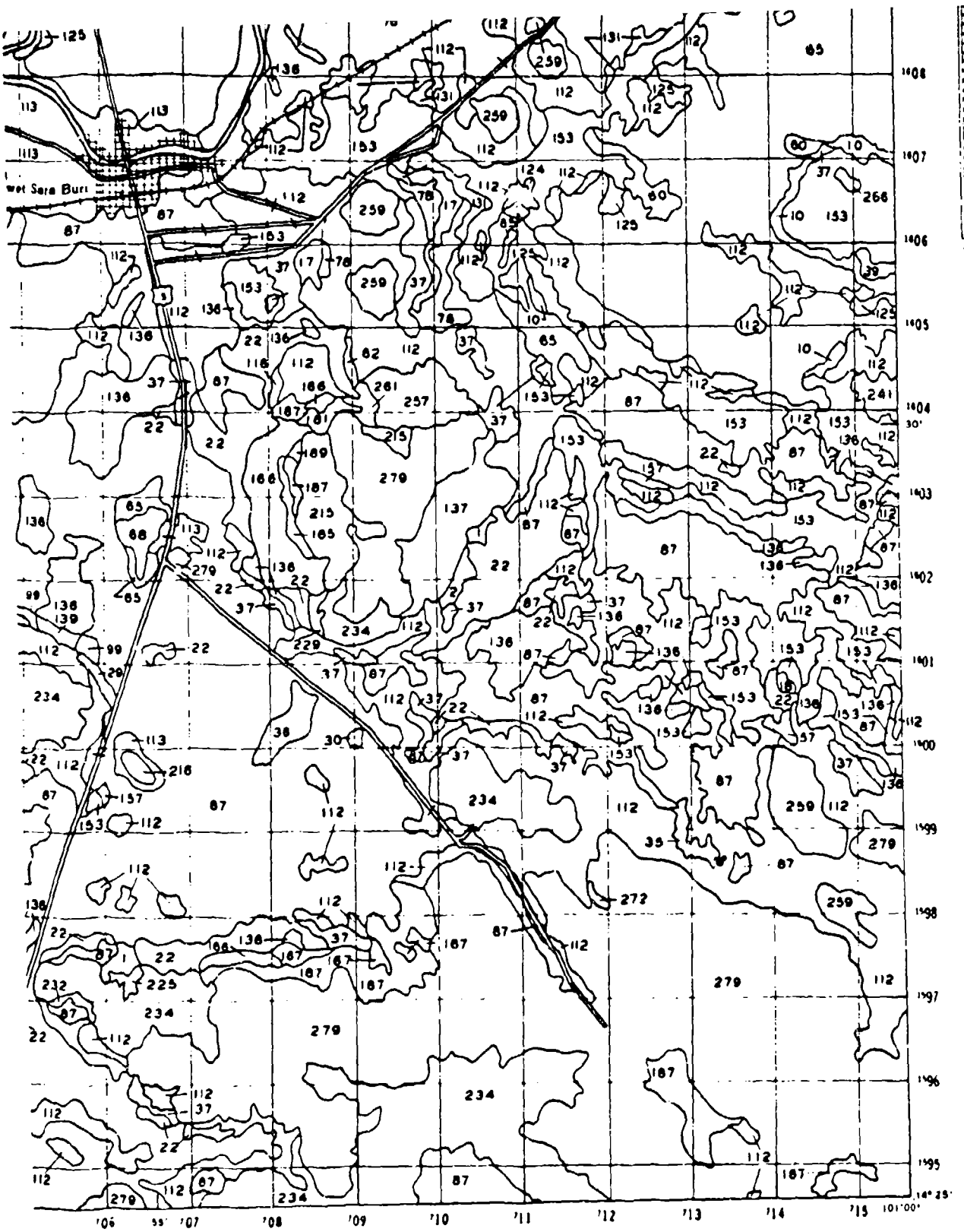
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5

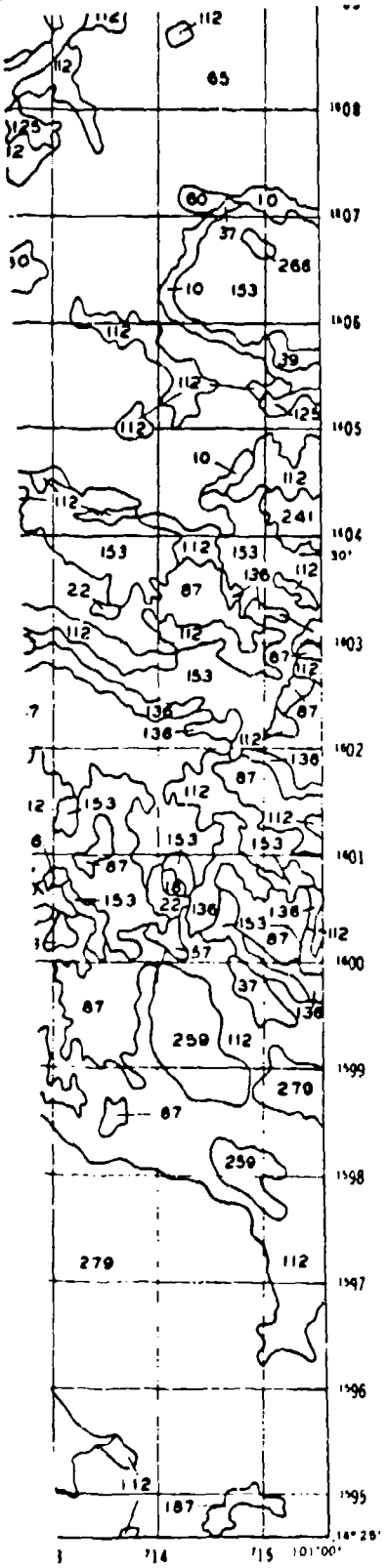


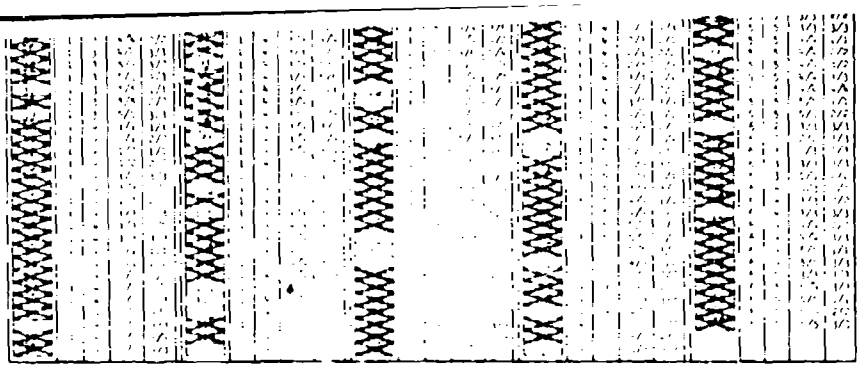
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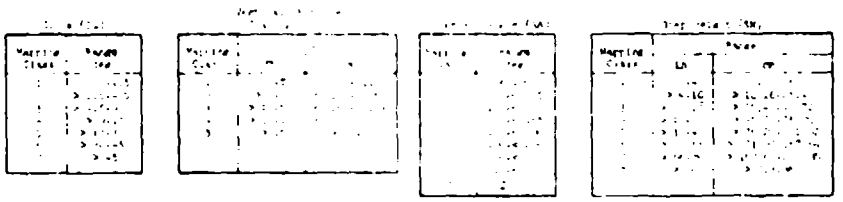
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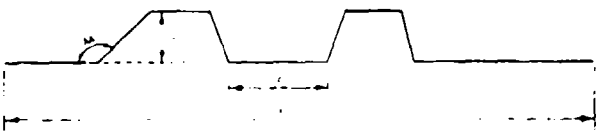

1408
1407
1406
1405
1404
30'
1403
1402
1401
1400
1399
1398
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1395
14° 25'
706
55'
707
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711
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713
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101°00'

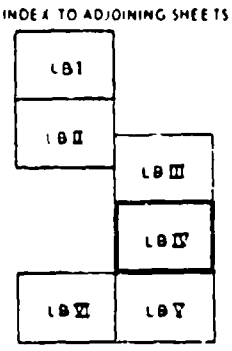
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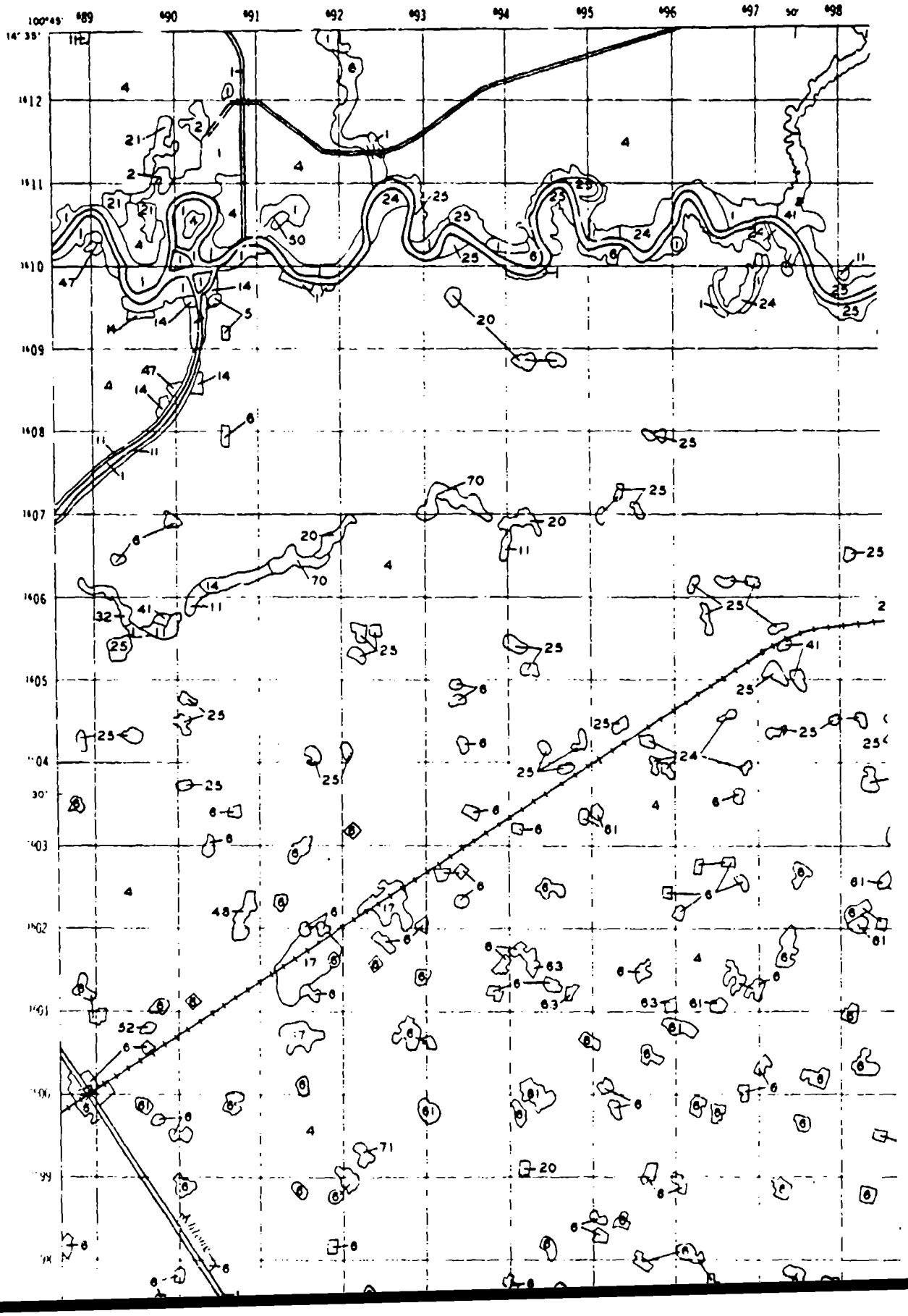
A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

LOP BURI STUDY AREA

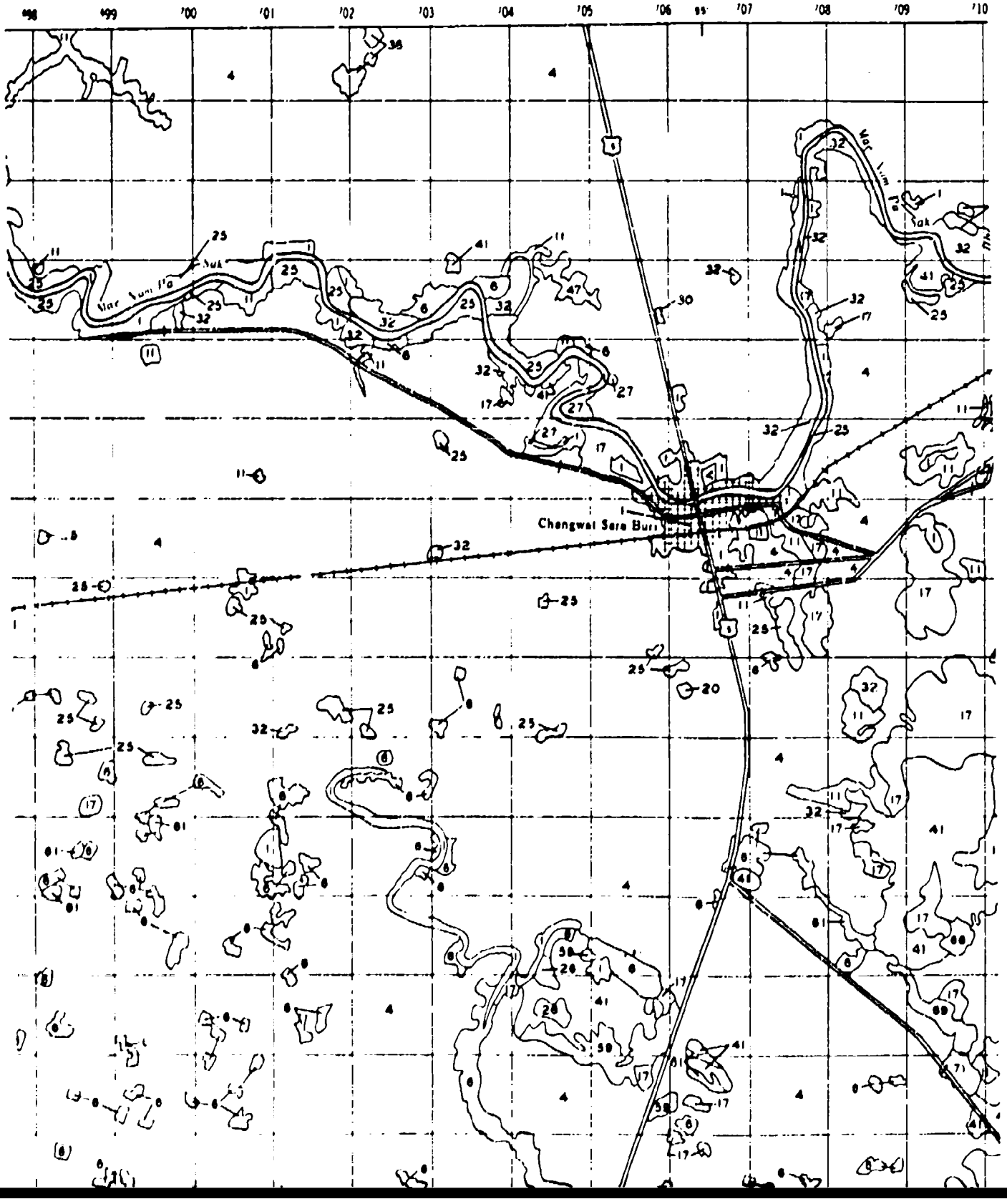
SHEET LB IV

PLATE 2.4b

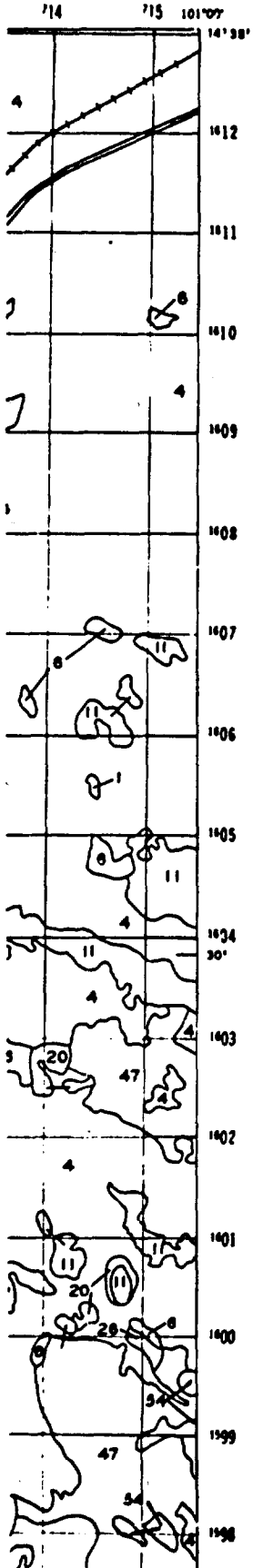


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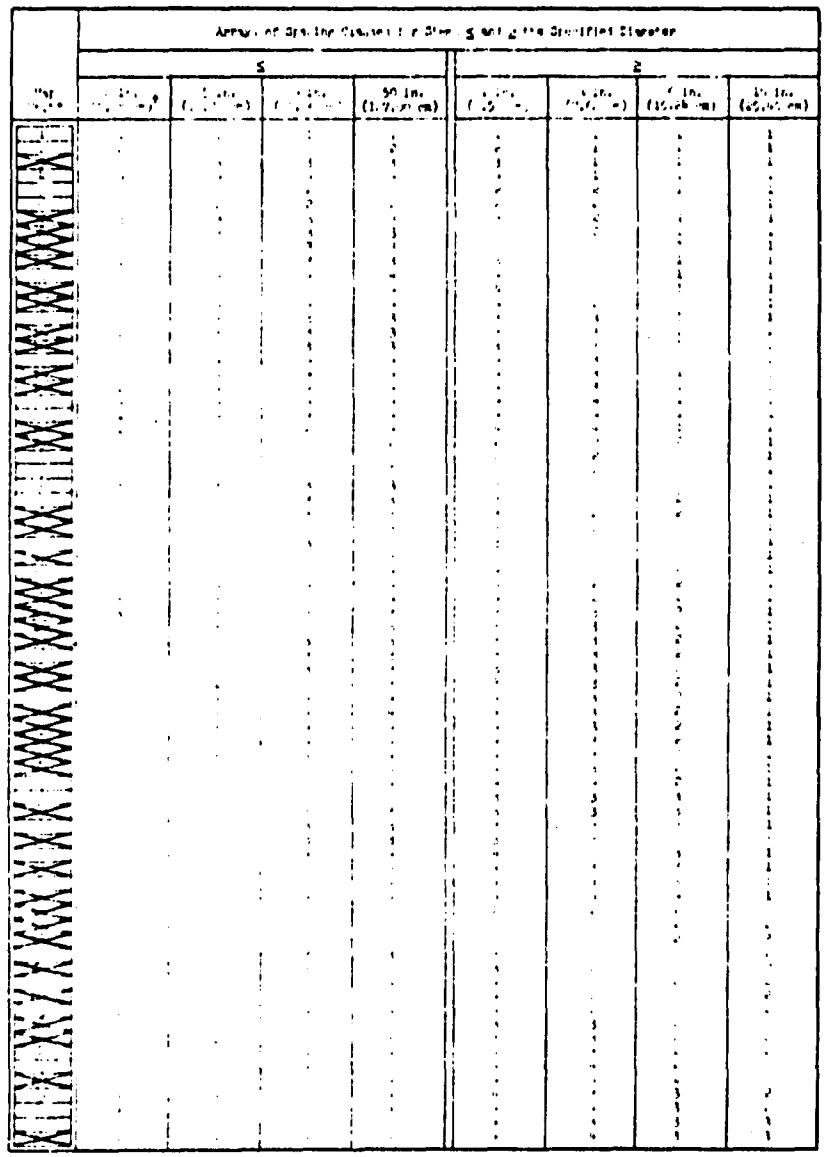
LOP BURI

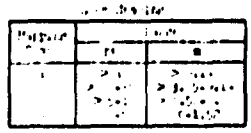


SHEET LB IV



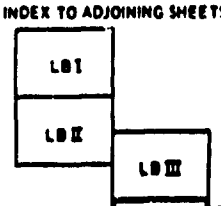
LEGEND

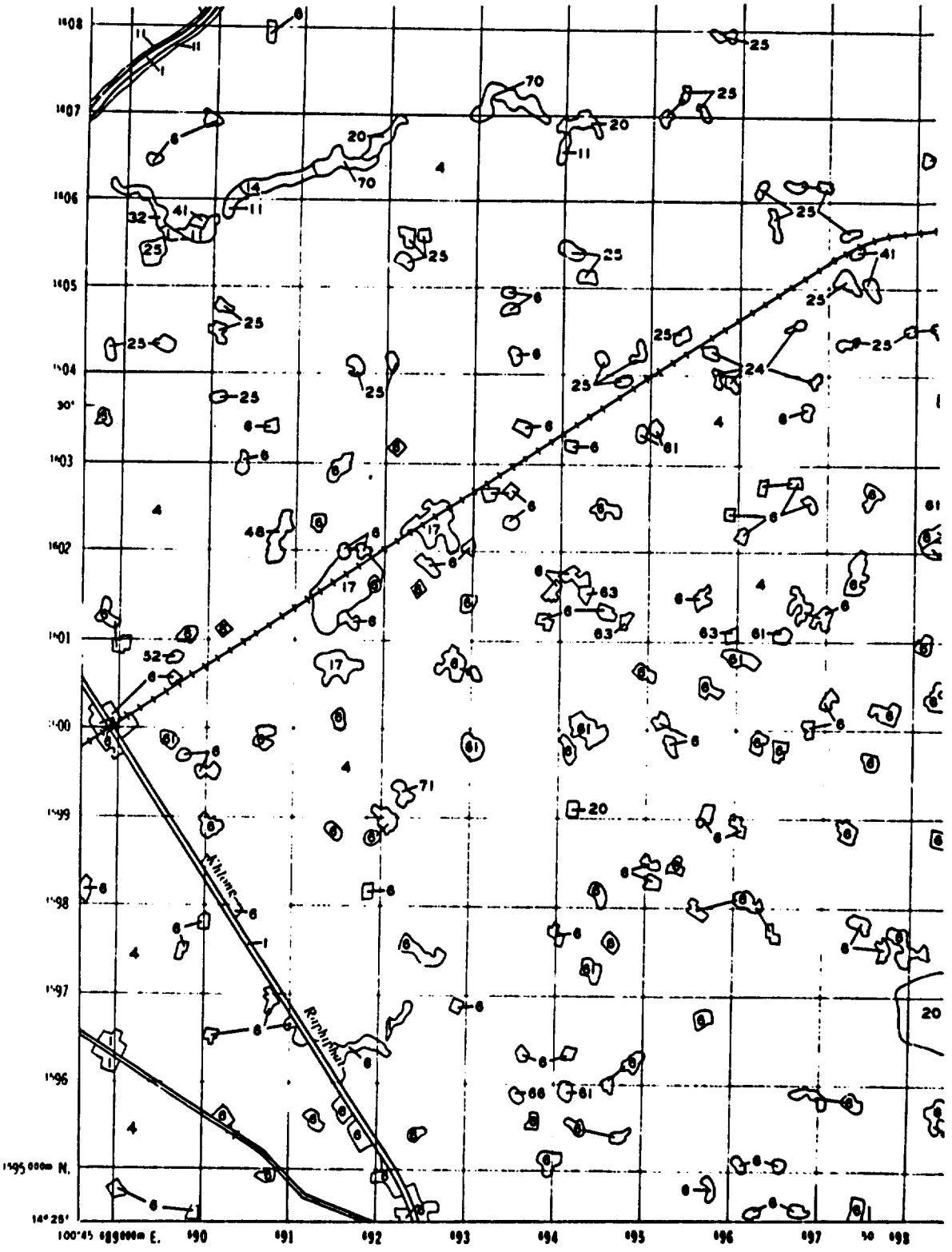






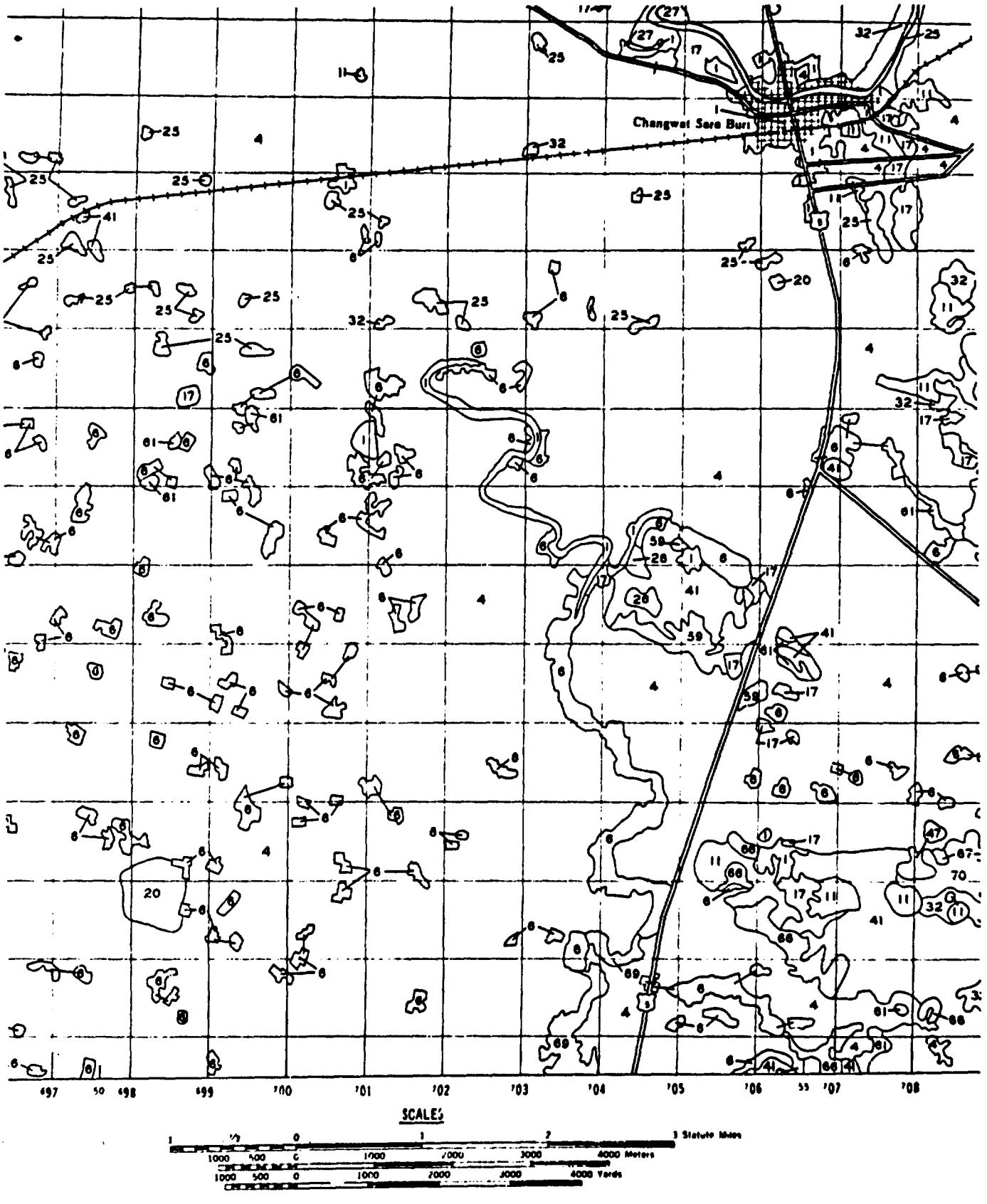
INDEX TO ADJOINING SHEETS



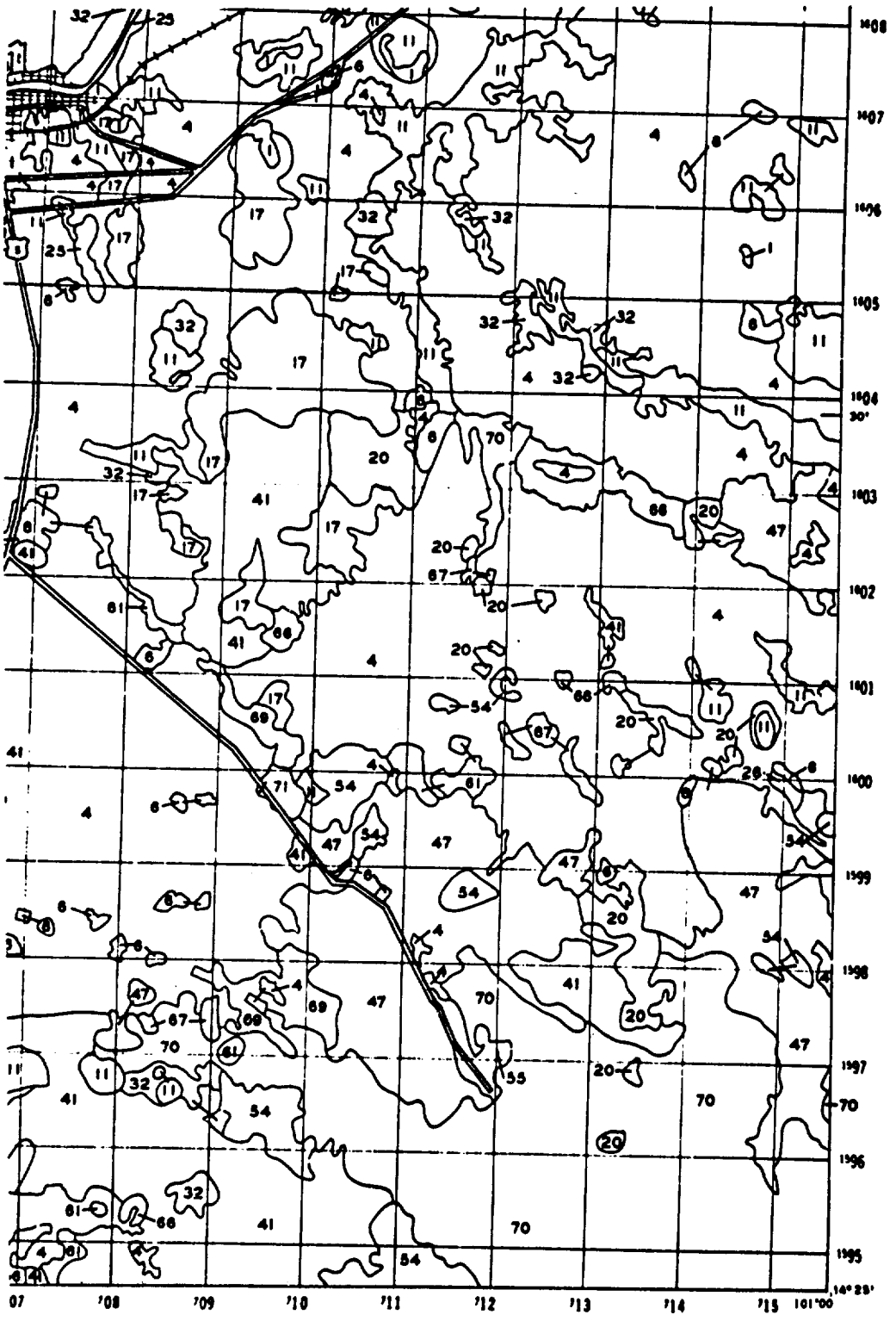


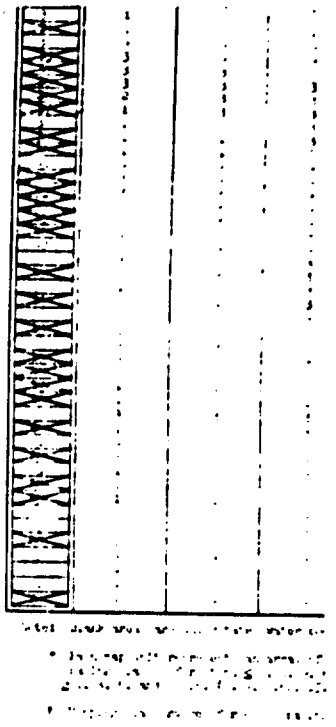
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

4


Changwat Sara Buri
SCALES
3 Statute Miles
4000 Meters
4000 Yards

5





INDEX

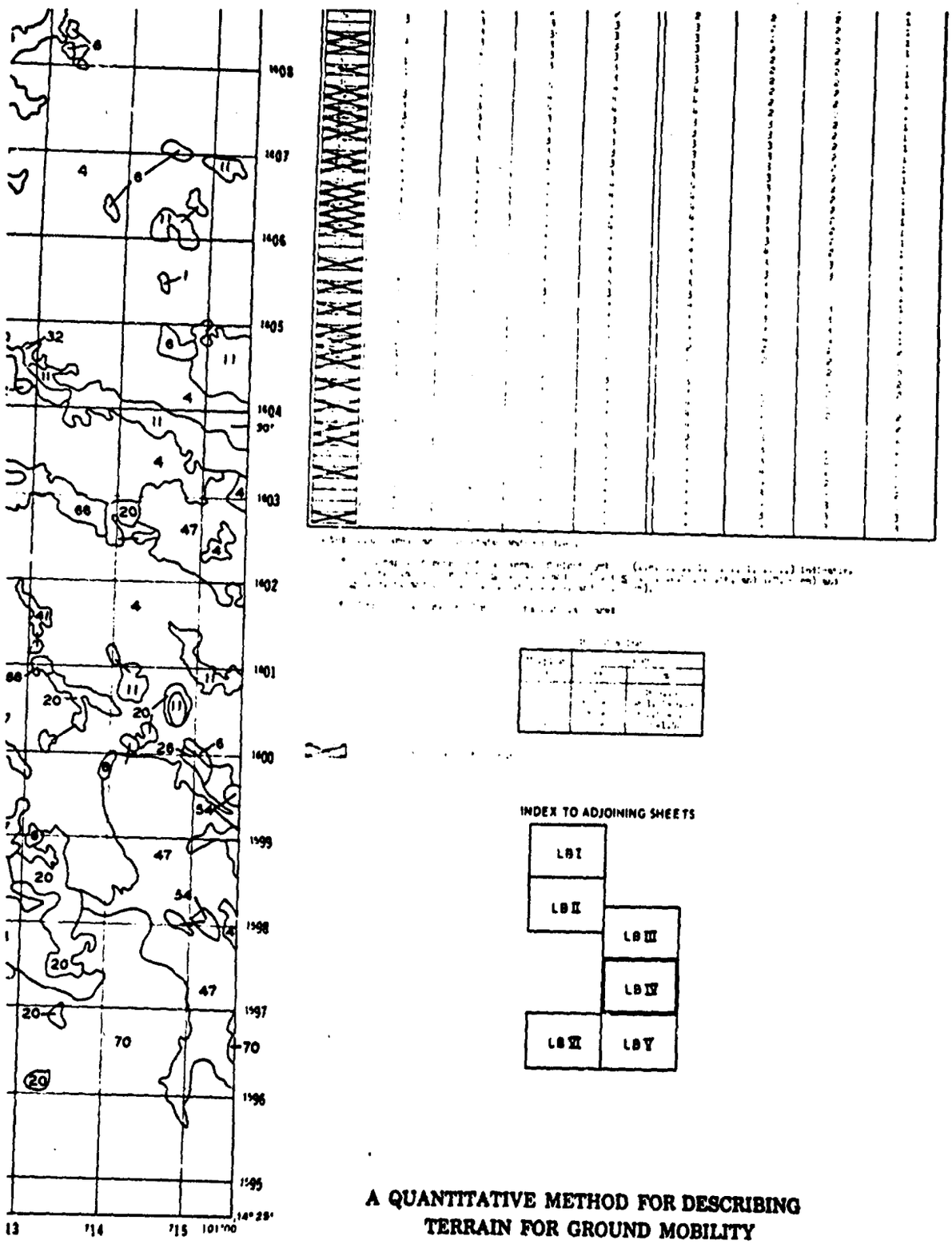
A QUANTITATIVE A
TERRAIN FOR

VEG

LOP BUR

SHE

6.1



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

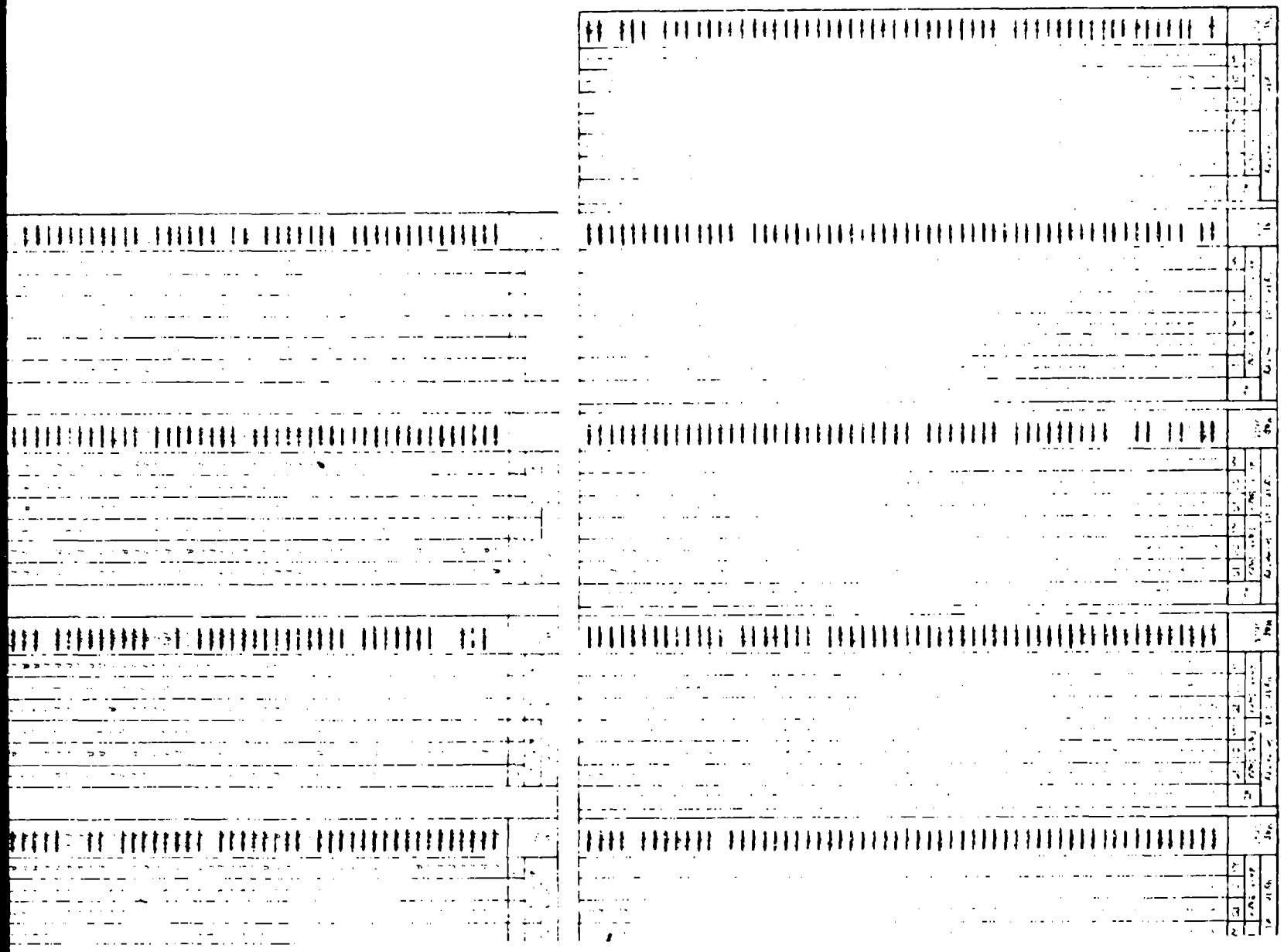
VEGETATION

LOP BURI STUDY AREA

SHEET LB IV

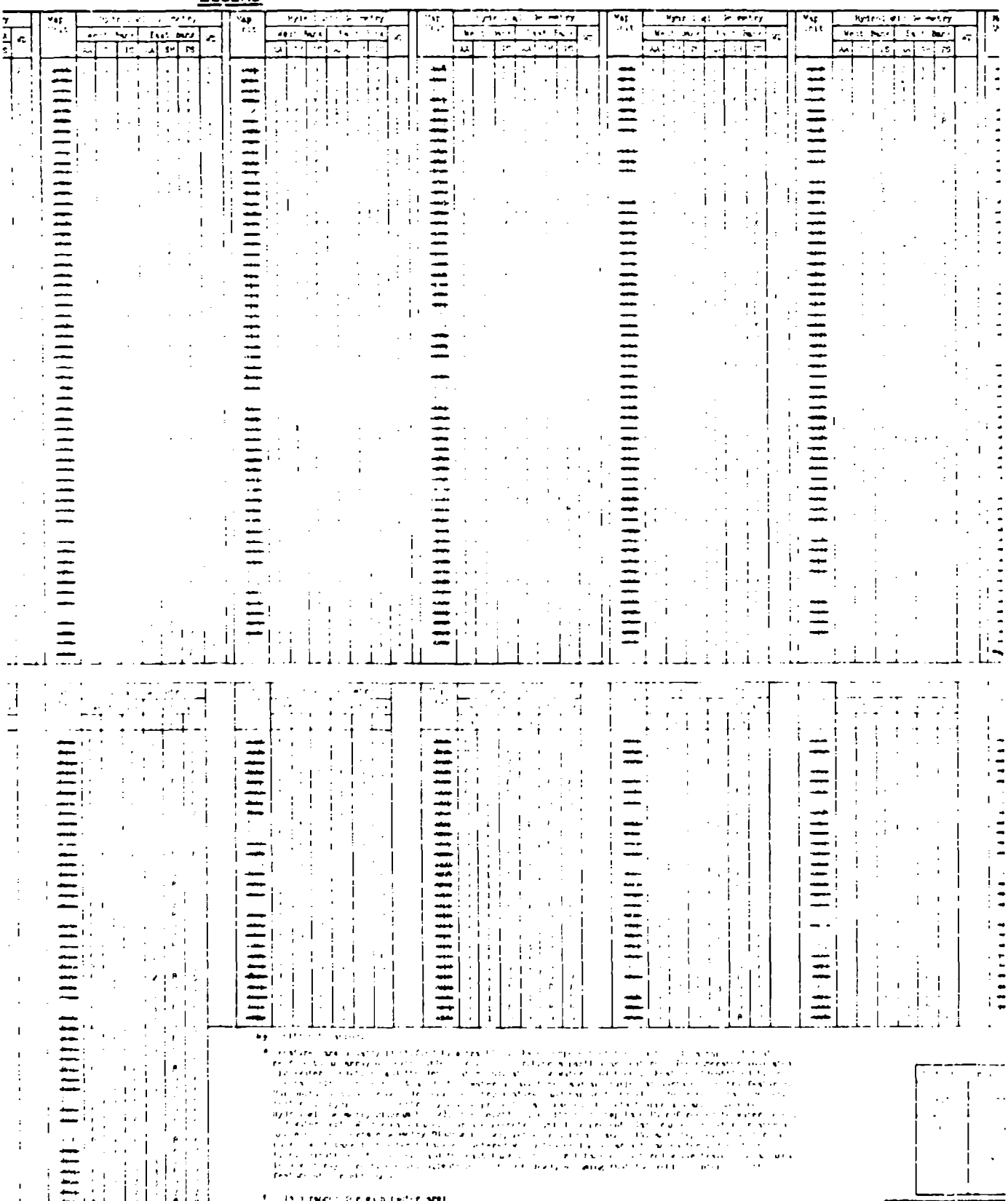
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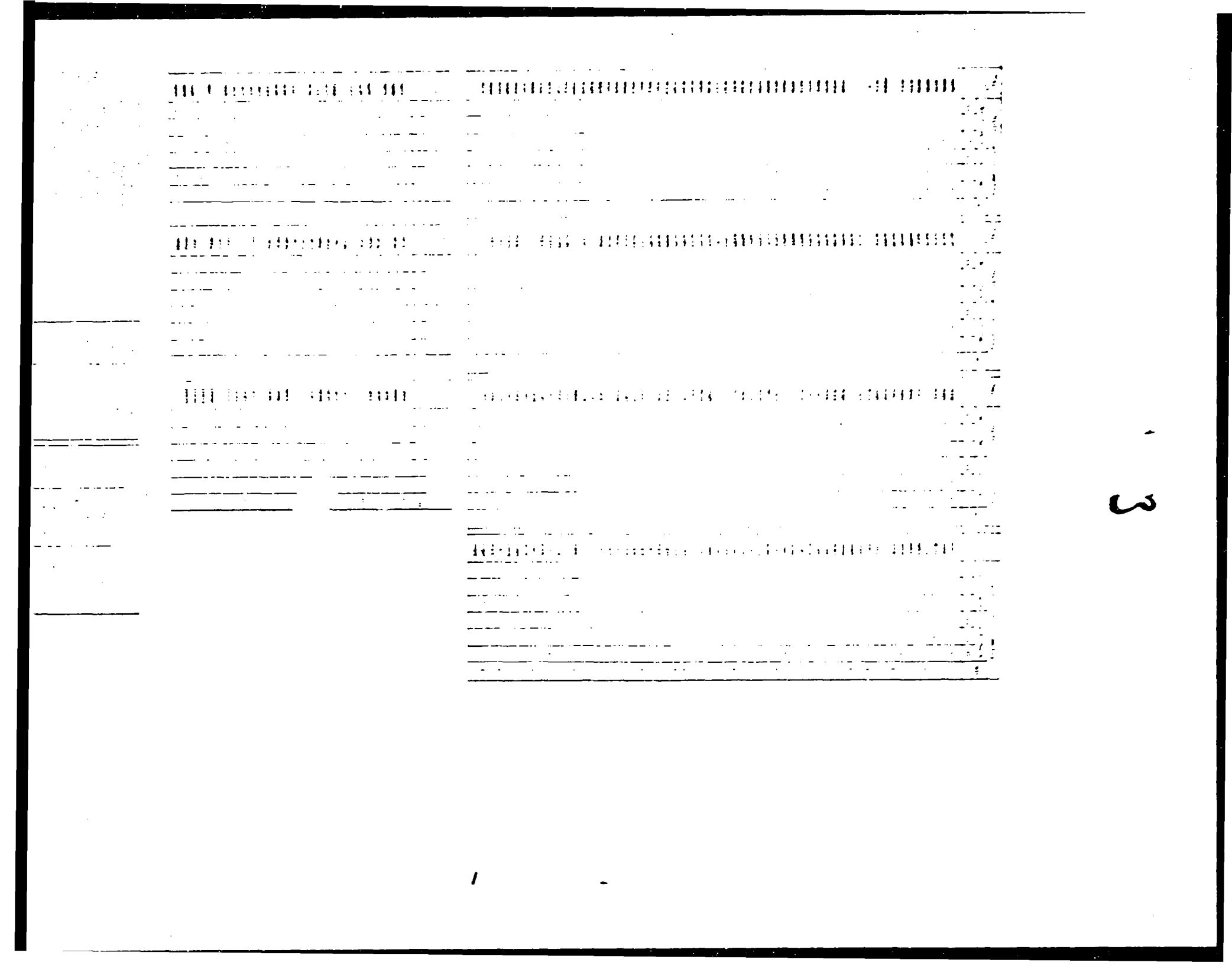
PLATE 2.4c

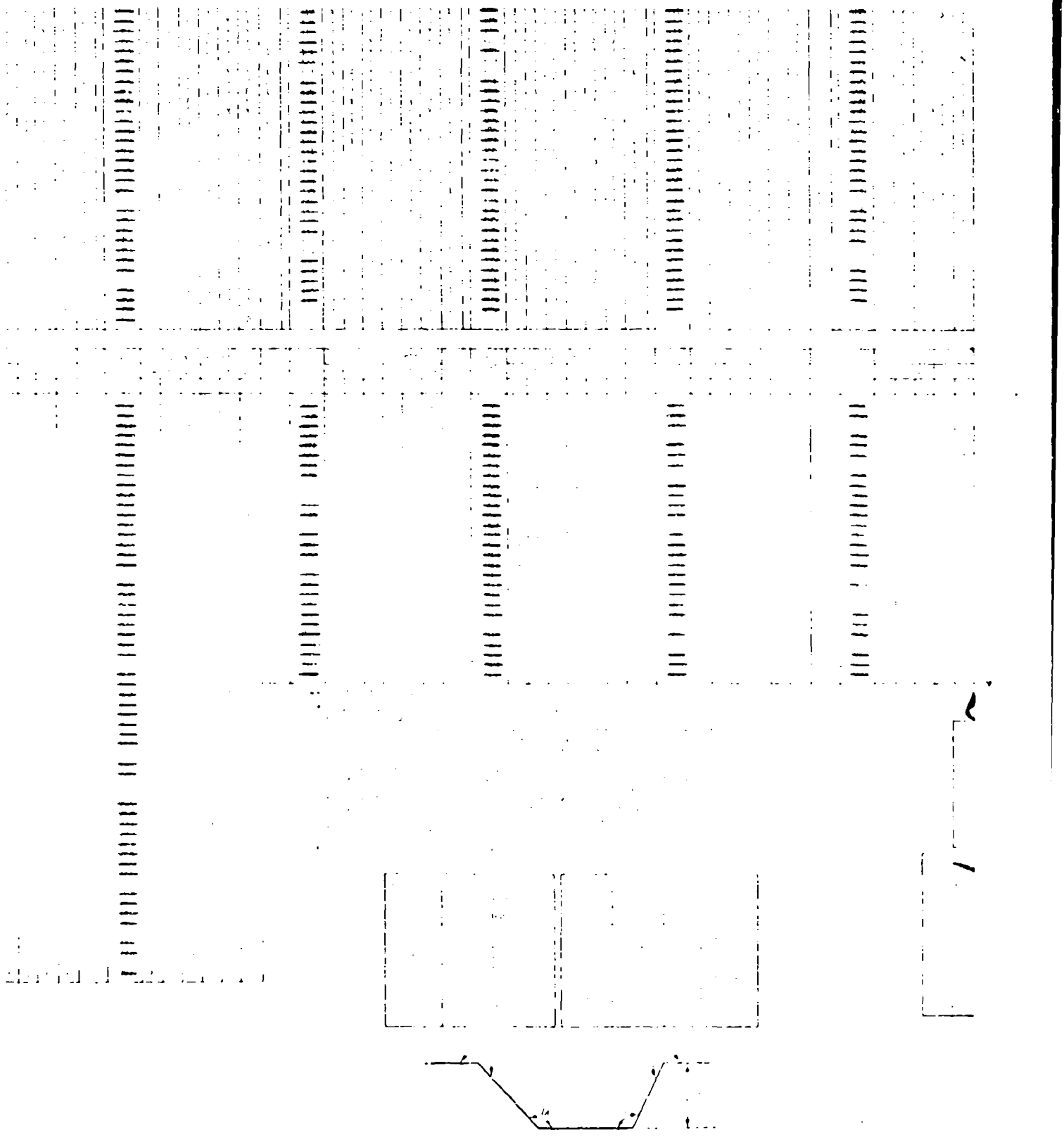


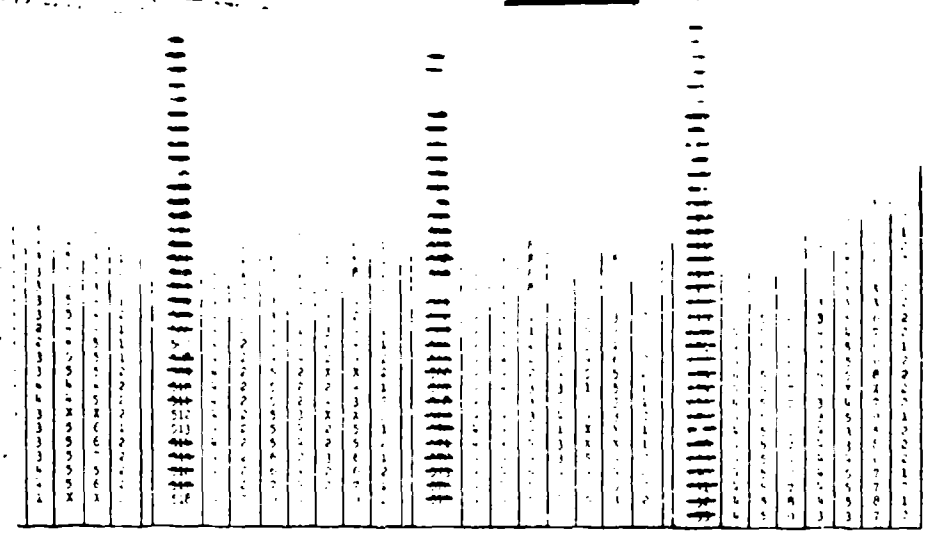
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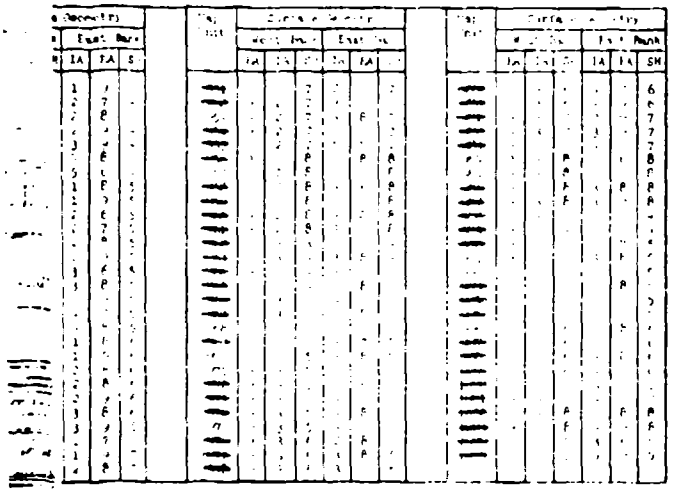
LEGEND

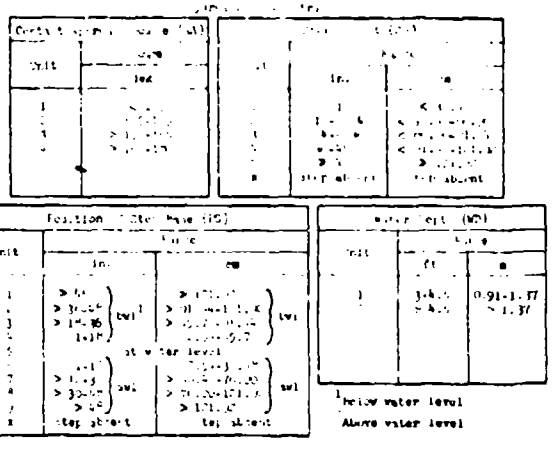


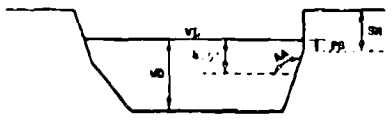


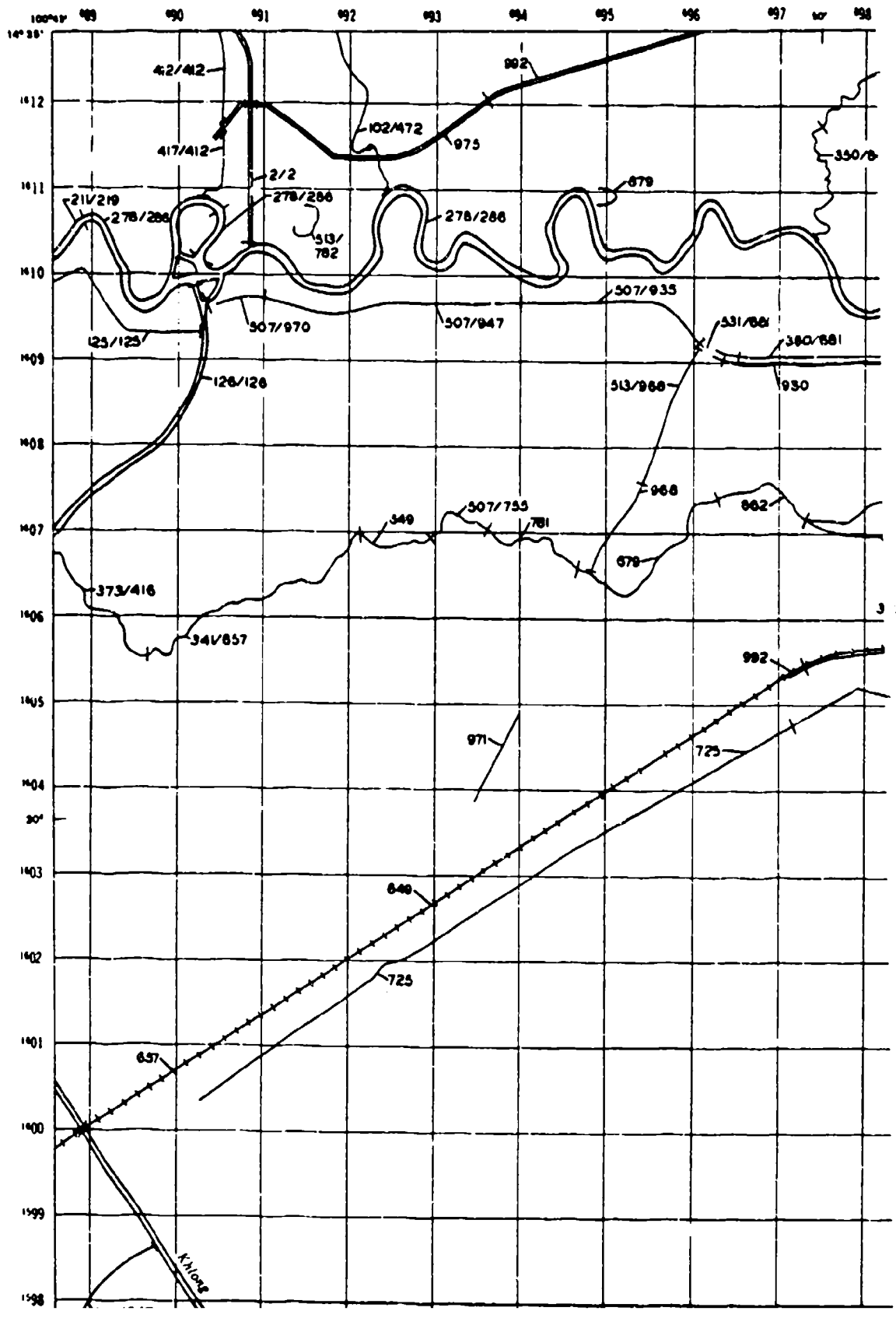






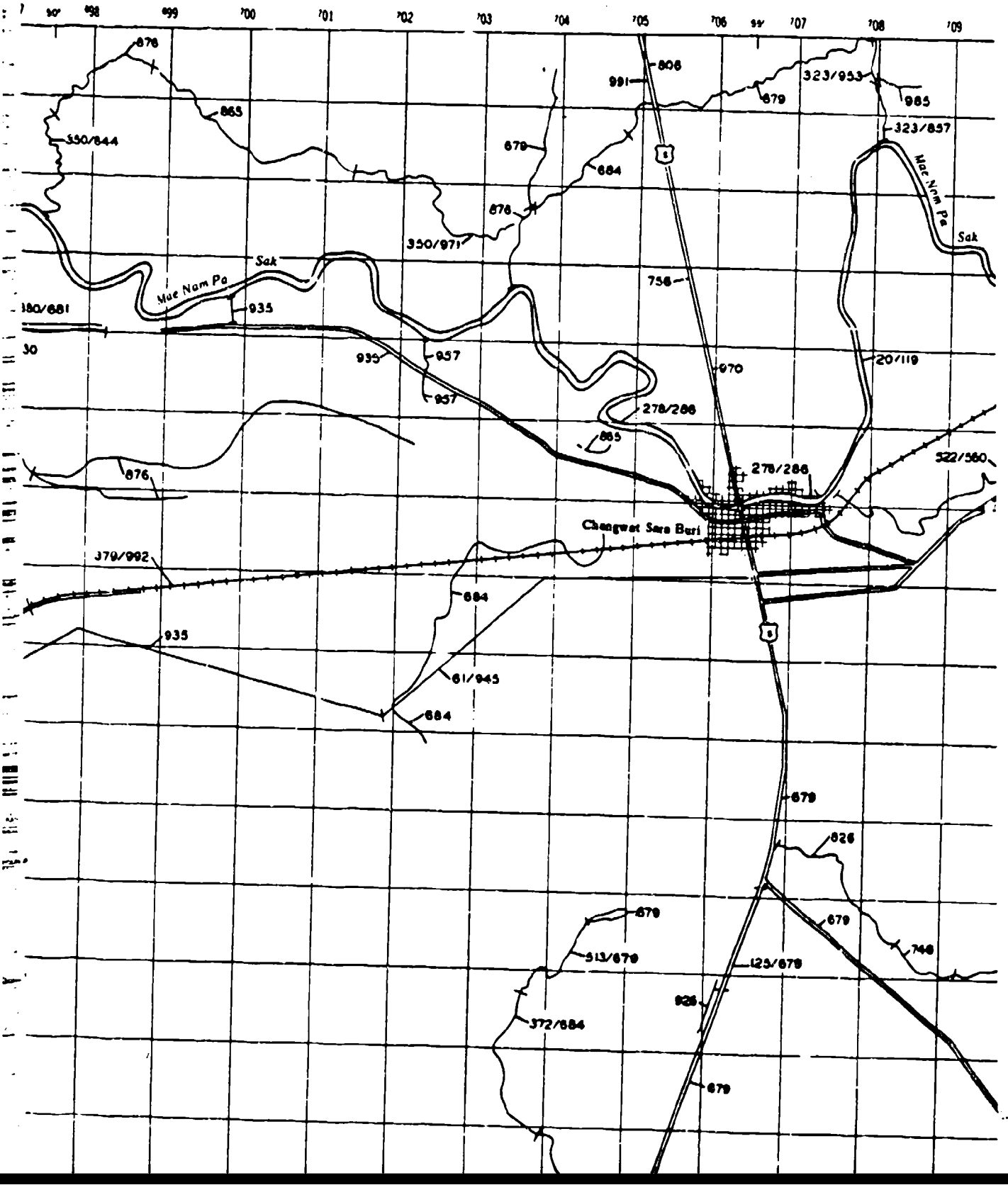





412/412
417/412
2/2
211/219
278/286
513/
782
102/472
975
992
679
350/6
278/286
278/286
507/935
507/970
507/947
125/125
126/126
531/68
380/681
930
513/968
968
882
507/755
781
349
679
373/416
941/857
992
971
725
649
725
657
KHIONE

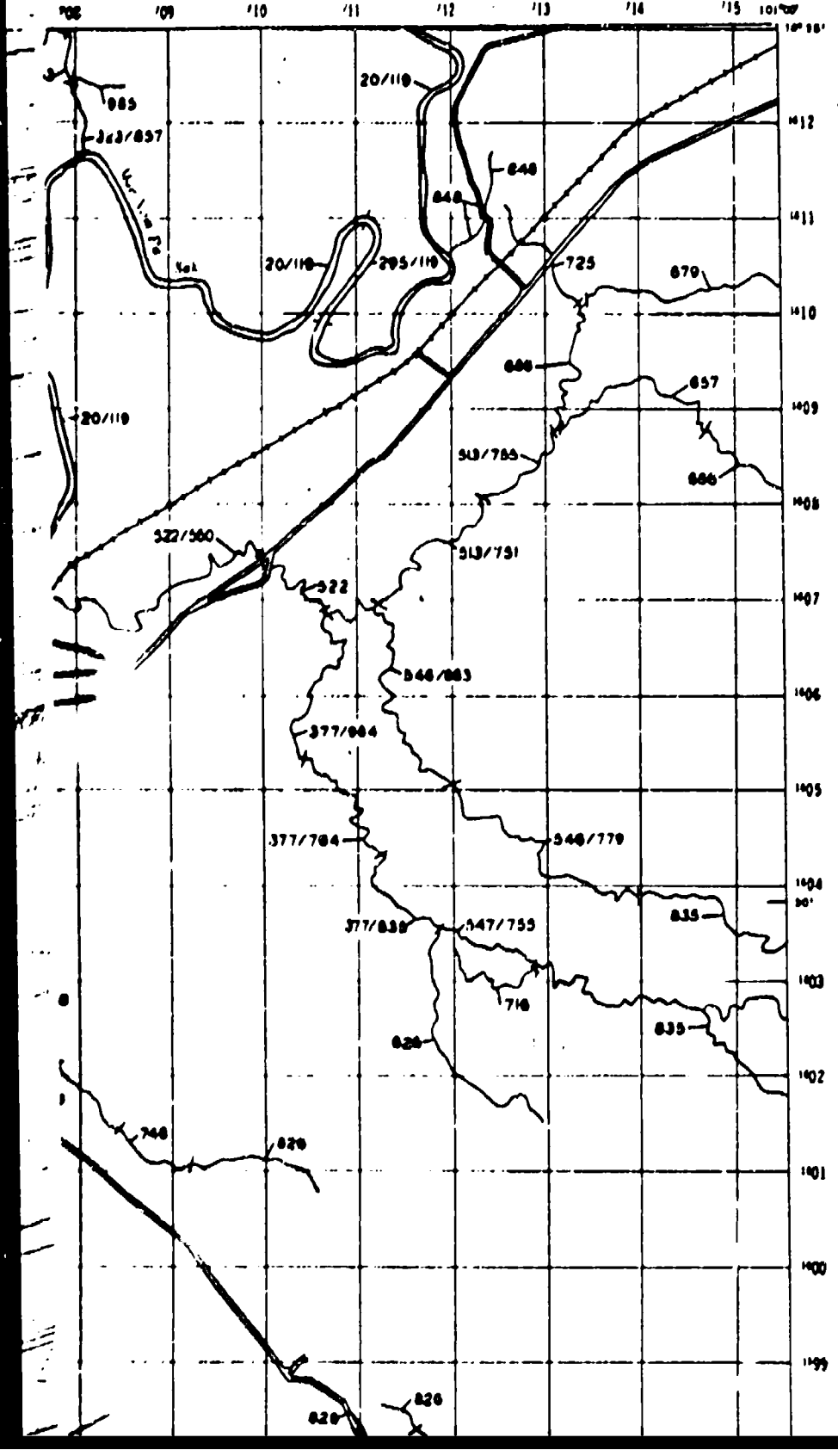
2

LOP BURI


Mae Nam Pa
Sak
Changwat Sara Buri
876
865
330/844
330/971
180/681
935
957
806
991
679
323/953
985
323/857
684
758
970
20/119
278/286
322/560
379/992
61/945
626
513/679
125/679
372/884
748

3

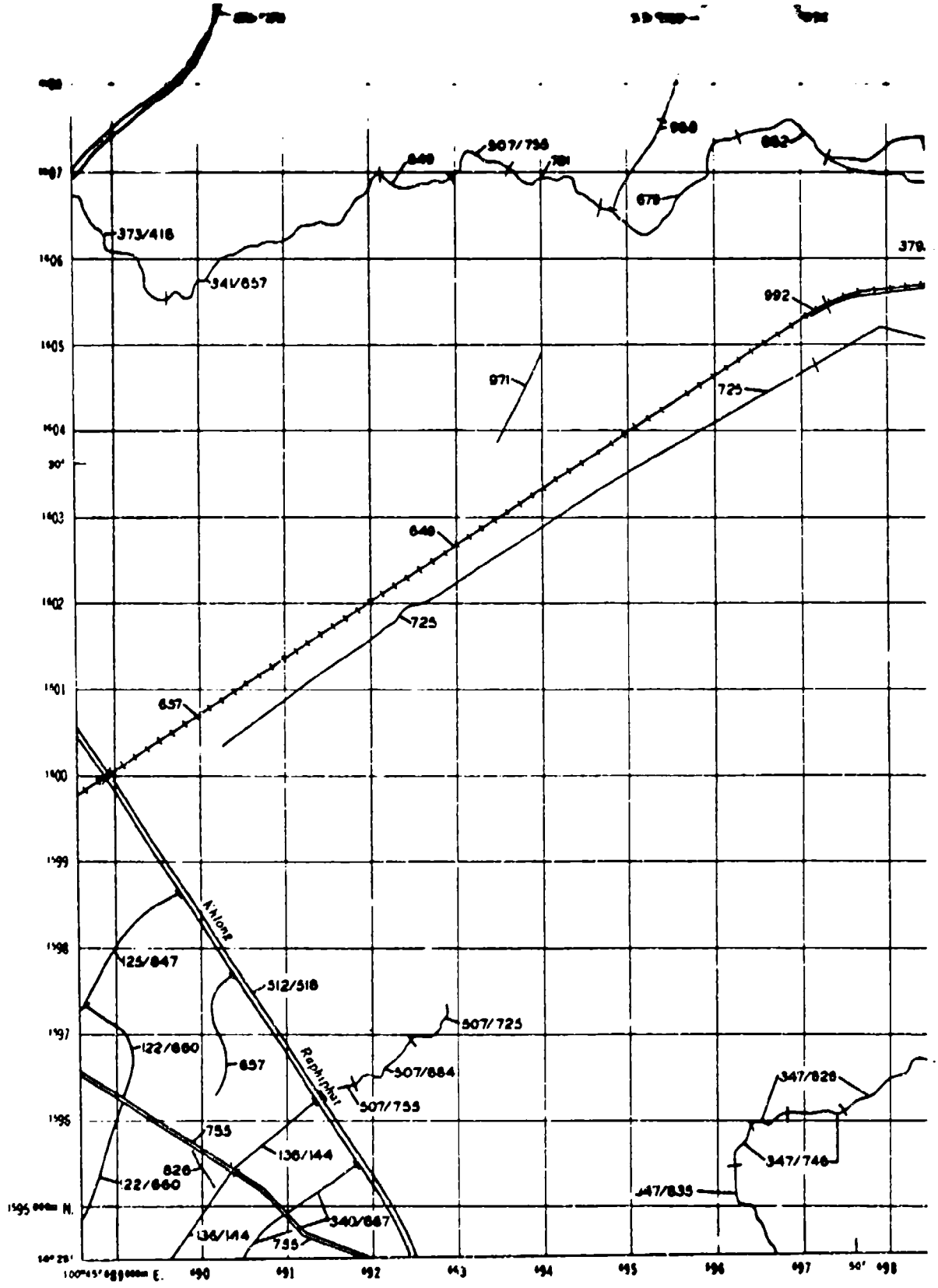
SHEET LB IV



INDEX TO ADJOINING

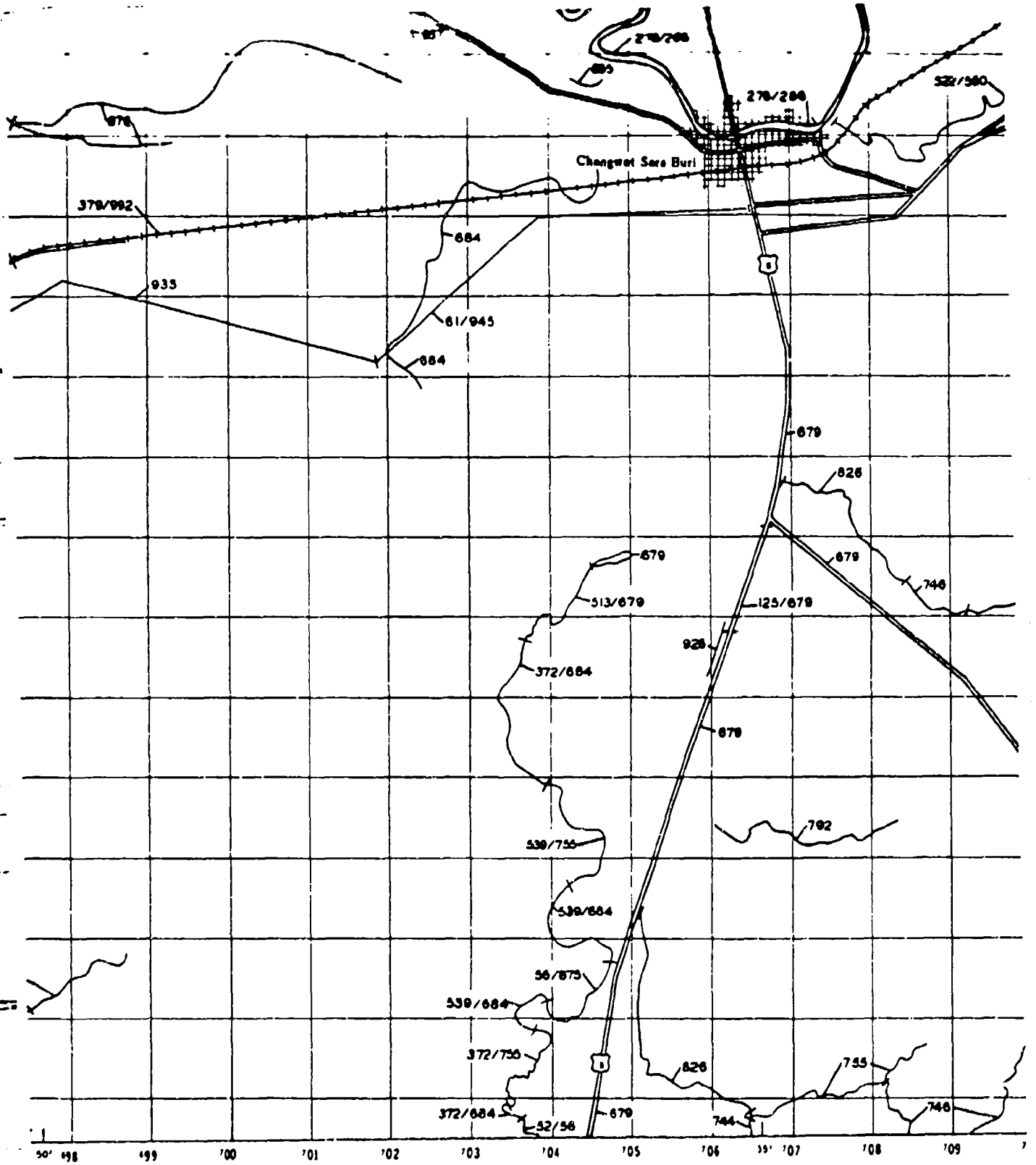
LB I

LB II



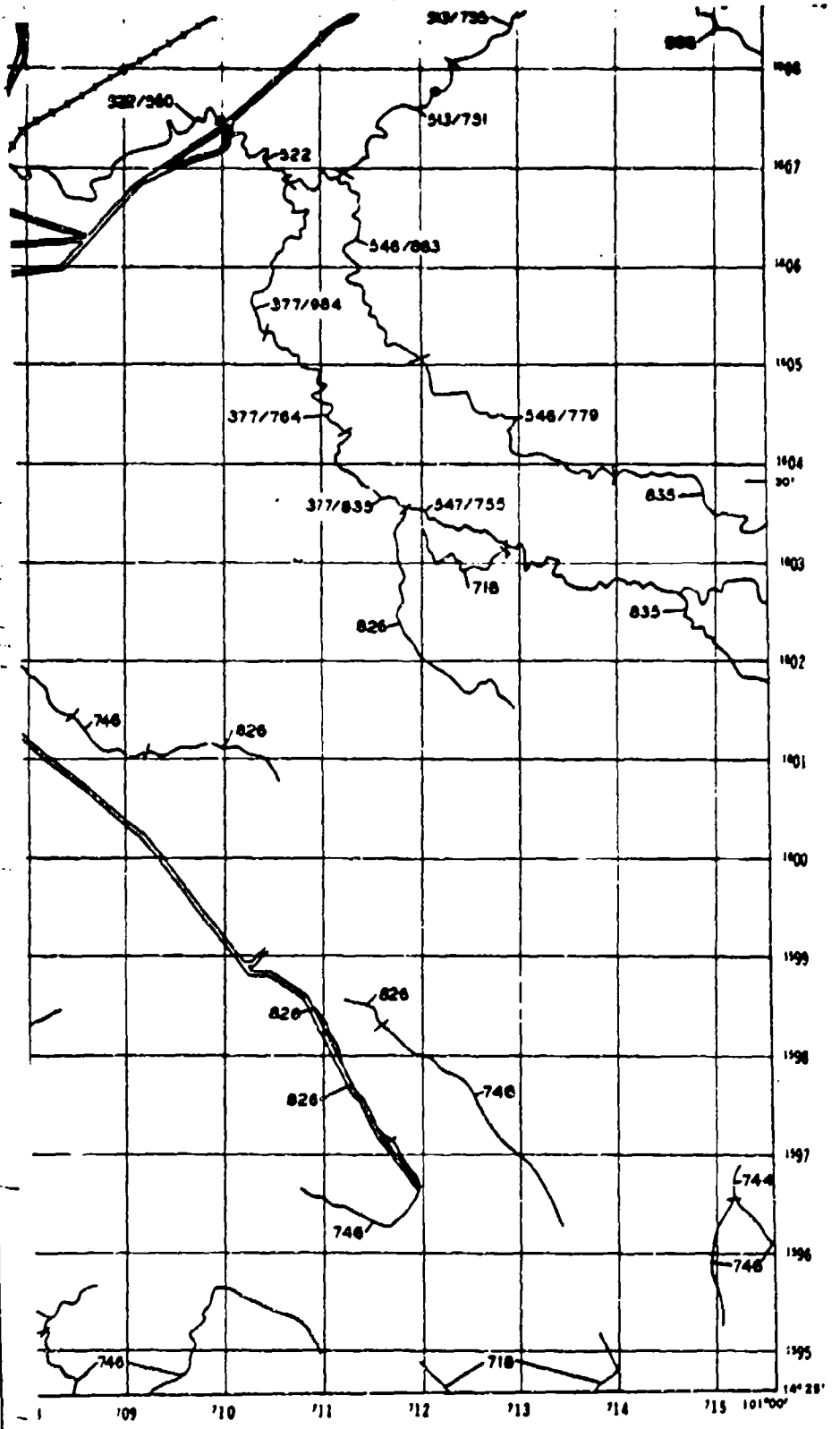
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

4

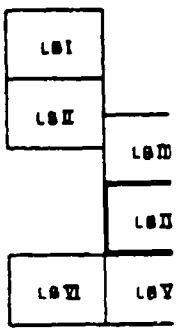

278/288
522/560
Changwat Sara Buri
378/992
684
935
61/945
684
679
826
679
679
746
513/679
125/679
928
372/684
679
792
539/755
539/684
56/679
539/684
372/755
826
755
372/684
52/56
679
744
746
SCALES
Statute Miles
Meters
Yards

5

1



INDEX TO ADJOINING S

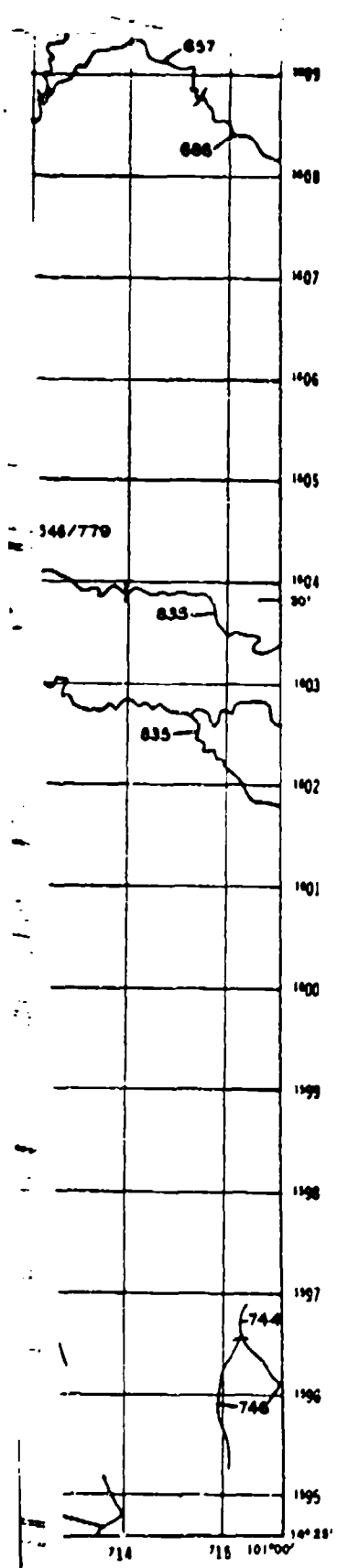


A QUANTITATIVE METHOD I
TERRAIN FOR GROUN

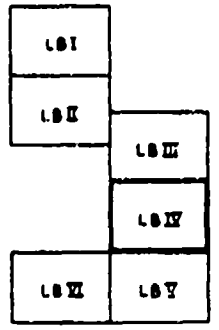
HYDROLOGIC GE

LOP BURI STUDY

SHEET LB 1



INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GEOUND MOBILITY

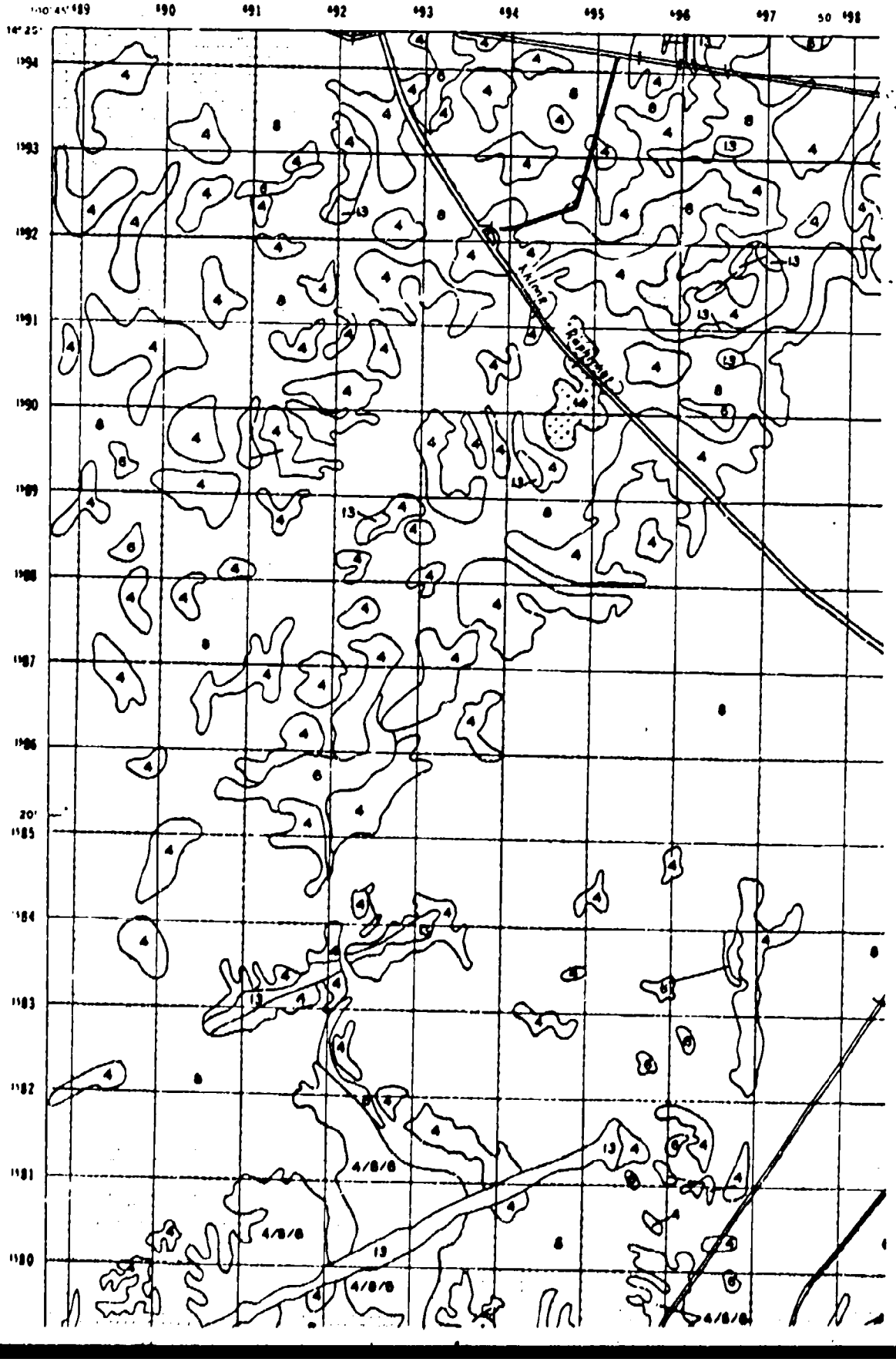
HYDROLOGIC GEOMETRY

LOP BURI STUDY AREA

SHEET LB IV

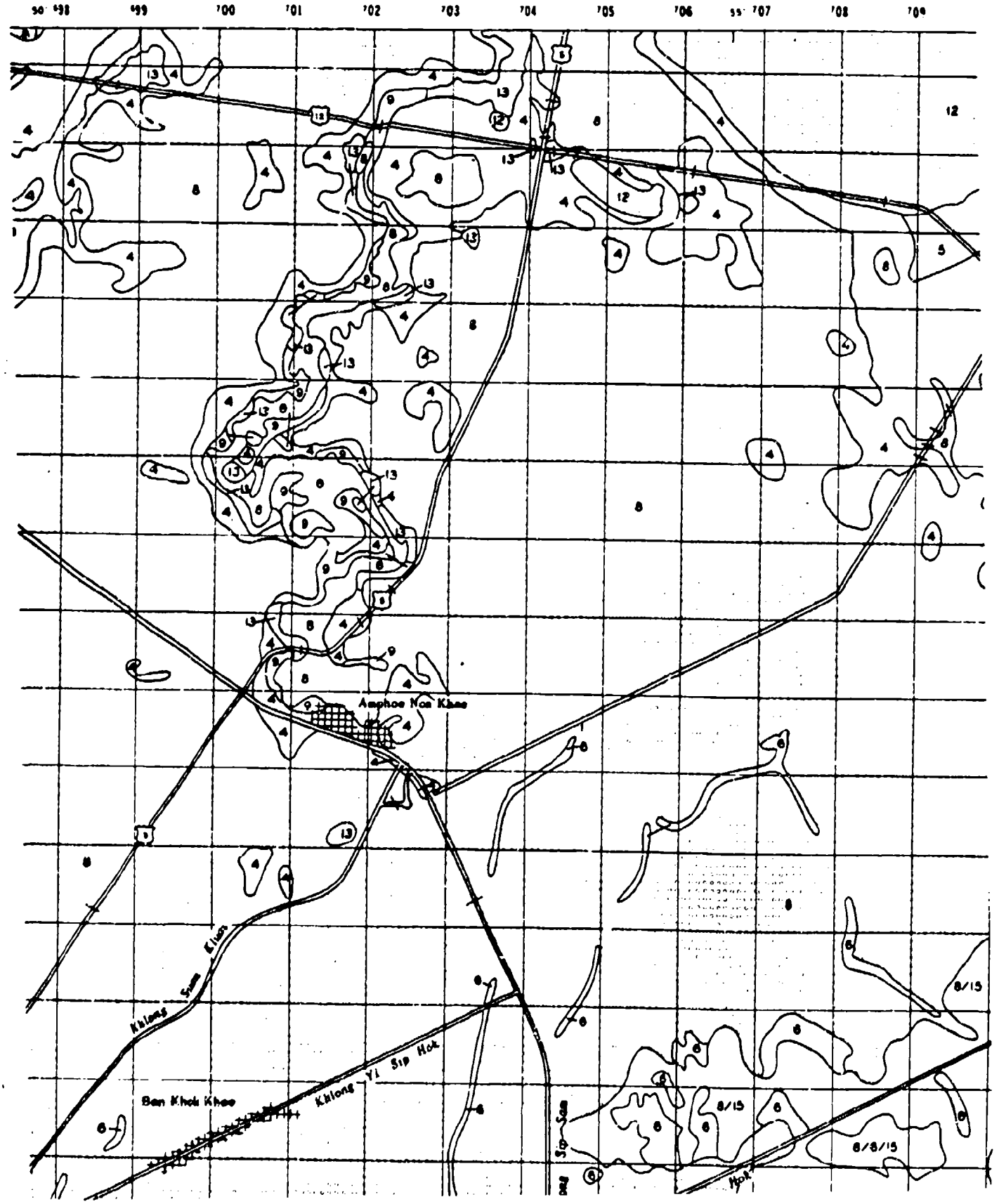
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PLATE 2.4d


Animas
Railroad
4/8/8
4/8/8
4/8/8
4/8/8

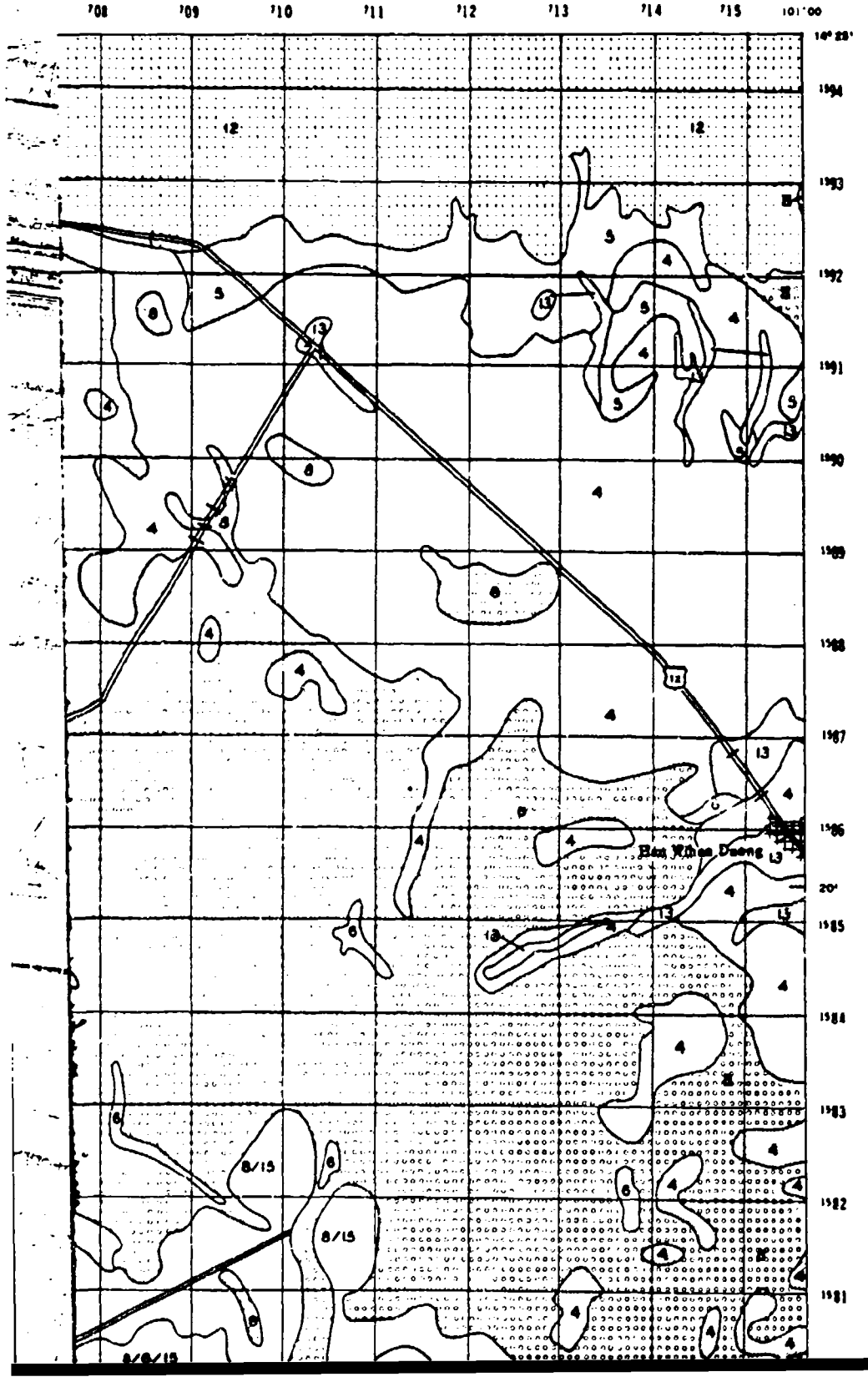
2

LOP BURI


Amphoe Non Khae
Khlong Sam Khon
Khlong Yi Sip Hok
Ban Khok Khae
8/15
8/8/15

3

SHEET LB V



LEGE

Unit	Soil Mass Strength: Maximum Moisture: BCI	Soil Mass Strength: Minimum Moisture: BCI	Maximum Moisture: c_{ur} psi	Maximum Moisture: c_{ur} kg/cm^2	Maximum Moisture: ϕ_{ur} deg
	10-25	25-60	0-1	0-0.07	0-10
	25-60	60-100	0-1	0-0.07	0-10
	25-60*	60-100	0-1	0-0.07	10-20
	25-60	>100	0-1	0-0.07	0-10
	25-60*	>100	0-1	0-0.07	10-20
6	60-100	60-100	0-1	0-0.07	0-10
	60-100	60-100	0-1	0-0.07	10-20
9	60-100	>100	0-1	0-0.07	0-10
9	60-100	>100	0-1	0-0.07	0-10
	60-100	>100	0-1	0-0.07	10-20
	60-100*	>100	0-1	0-0.07	10-20
12	>100	>100	0-1	0-0.07	0-10
13	>100	>100	0-1	0-0.07	10-20
12/13	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10
13	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20

Note: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probabil strengths commonly observed are 60-100 for Units 3

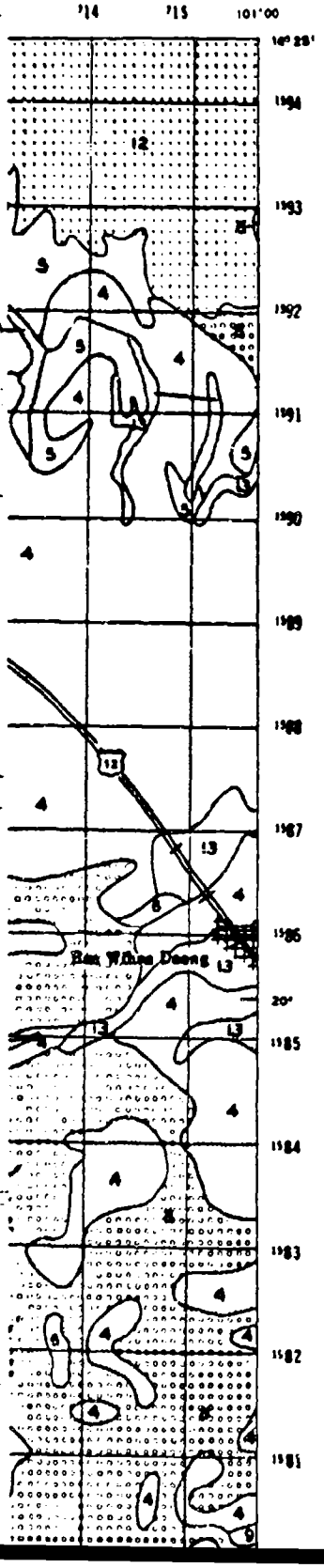
Units do not occur on this map.

INDEX TO ADJOI

LB I

4

SHEET LB V



LEGEND

Unit	Soil Strength: Maximum Moisture — RCI	Soil Strength: Minimum Moisture — RCI	Soil Surface Strength: Maximum Moisture — A_{sw} psi	A_{sw} kg/cm²	σ_{sw} deg	Soil Surface Strength: Minimum Moisture — A_{sw} psi	A_{sw} kg/cm²	σ_{sw} deg	Conditions where maximum A_{sw} occurs: A_{sw} psi	A_{sw} kg/cm²	σ_{sw} deg
⊠	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
⊠	25-40	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
1	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
1	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
⊠	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
10	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
4,6	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

A_{sw} Shear strength at zero normal load.

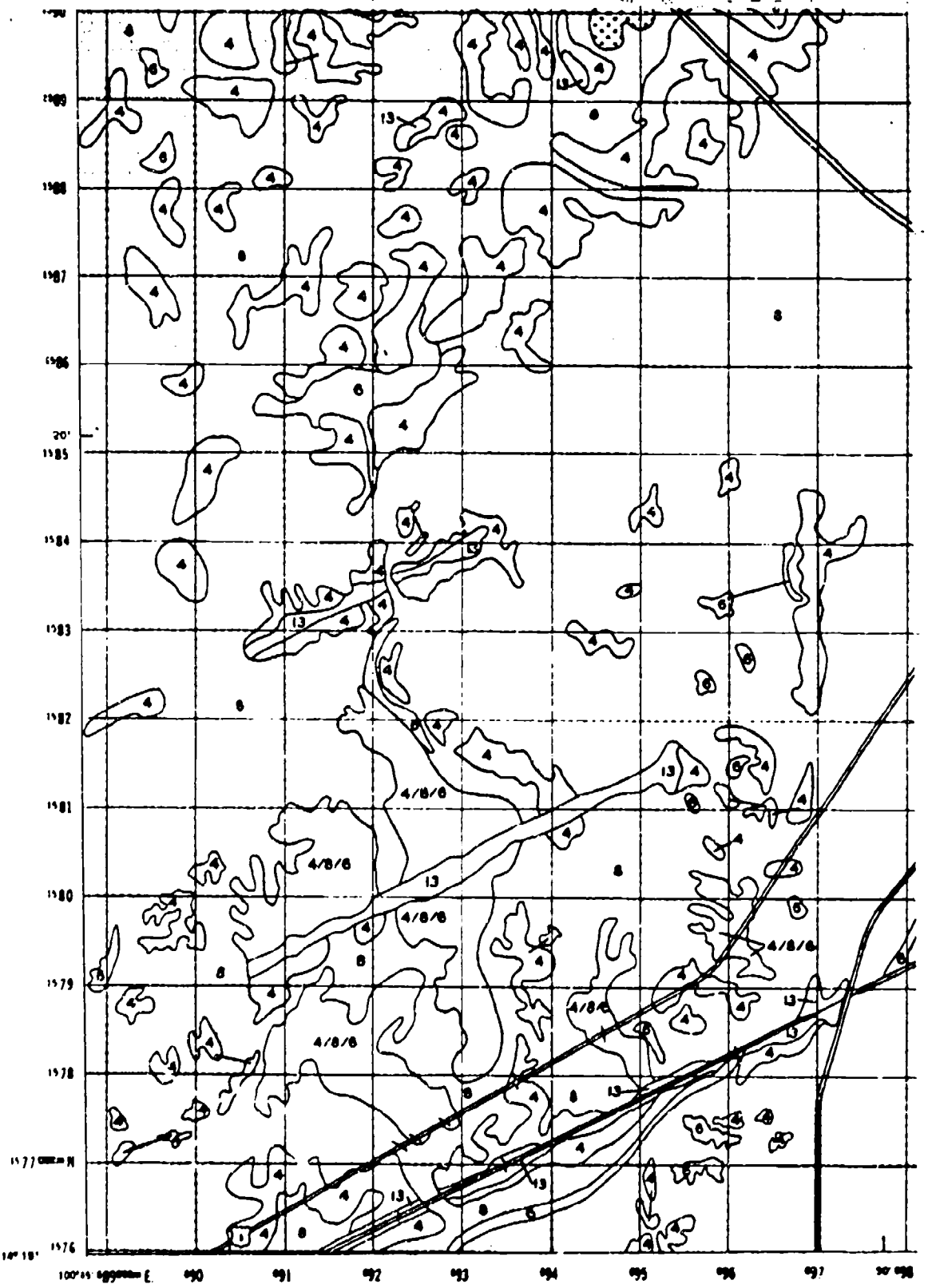
σ_{sw} Angle of internal friction.

* Maximum moisture has less than 50 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 1 and 5; more than 100 for Unit 11.

⊠ Units do not occur on this map.

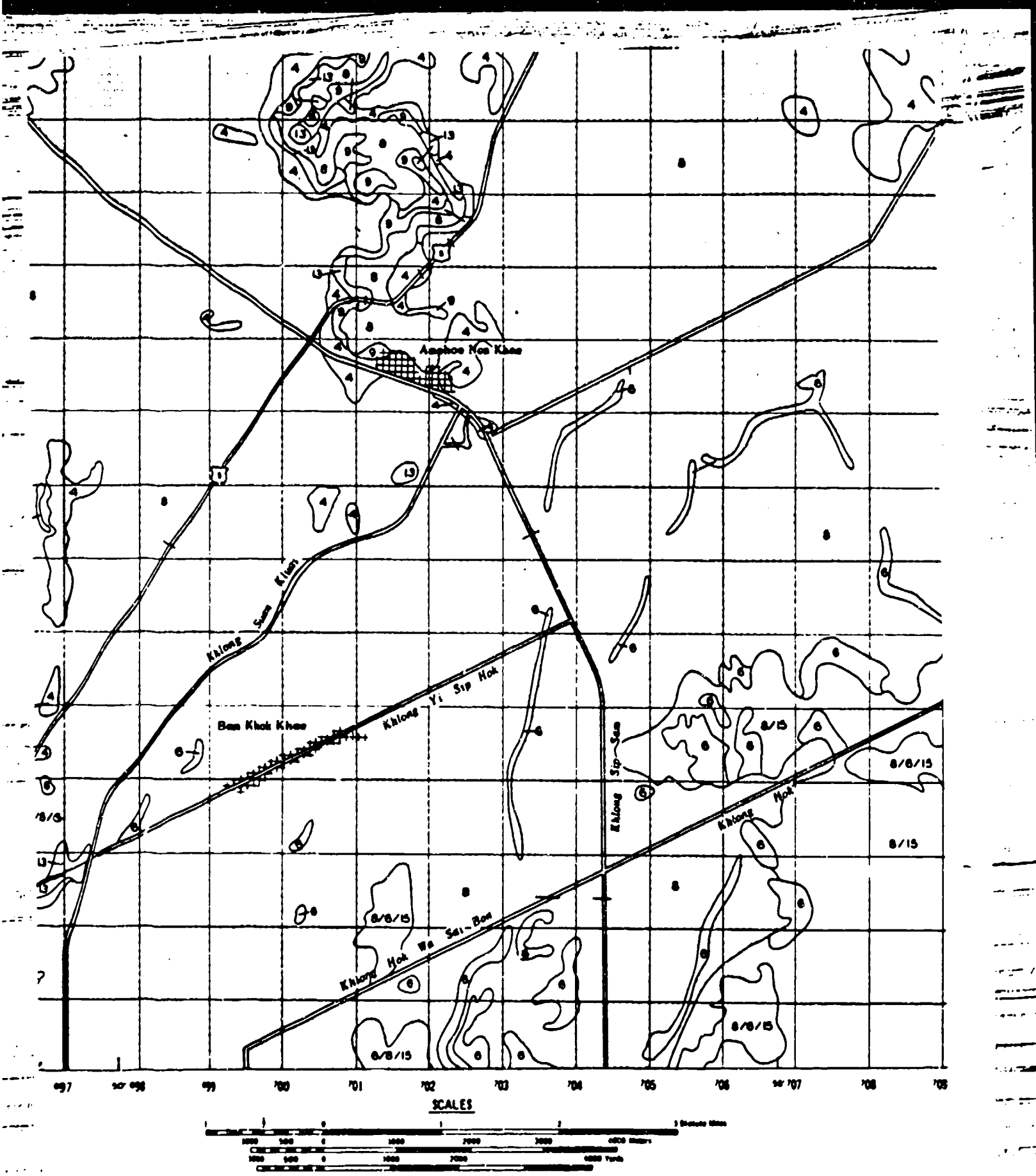
INDEX TO ADJOINING SHEETS

LB I

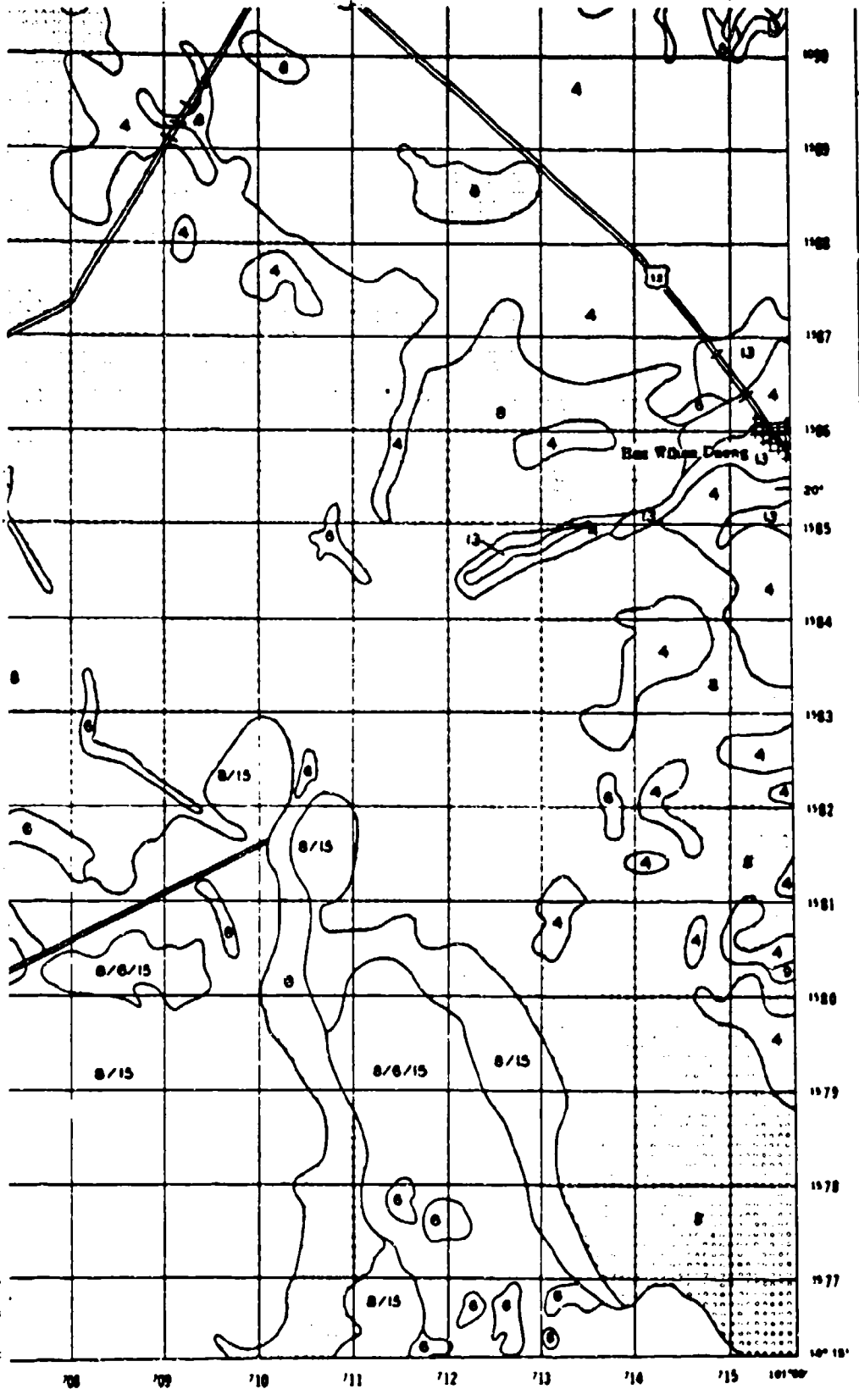


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


Amphoe Mae Khao
Khlong Suea Klueai
Khlong Yi Sip Hok
Ban Khok Khae
Khlong Sip-Saa
Khlong Hok
Khlong Hok Wa Sai-Ban
8/15
8/8/15
SCALES

6



Unit	Soil Mass Strength: Moisture Mixture RMI	Soil Mass Strength: Moisture Mixture RCI	Maximum Moisture: c_{up} psi	c_{up} kg/cm²	ϕ_{up} deg
1	10-25	25-60	0-1	0-0.07	0-
2	25-60	60-100	0-1	0-0.07	0-
3	25-60*	60-100	0-1	0-0.07	10-
4	25-60	>100	0-1	0-0.07	0-
5	25-60*	>100	0-1	0-0.07	10-
6	60-100	60-100	0-1	0-0.07	0-
7	60-100	60-100	0-1	0-0.07	10-
8	60-100	>100	0-1	0-0.07	0-
9	60-100	>100	0-1	0-0.07	0-
10	60-100	>100	0-1	0-0.07	10-
11	60-100*	>100	0-1	0-0.07	10-
12	>100	>100	0-1	0-0.07	0-
13	>100	>100	0-1	0-0.07	10-
SC	Complex of 60-100 and >100	>100	0-1	0-0.07	0-
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-

Note: Blank areas are water bodies.

c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent of strengths commonly observed are 60-100 for Un

Units do not occur on this map.

INDEX TO

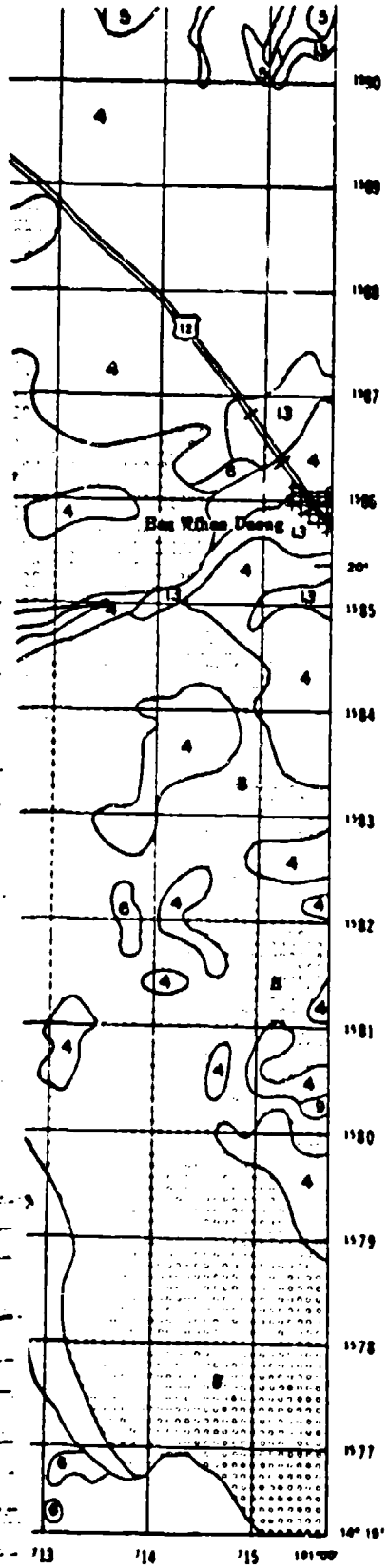
LS I

LS II

LS III

A QUANTITATIVE MI
TERRAIN FOR
SURFACE
LOP BURI
SHE

7



Units	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Minimum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Conditions where maximum c_{ur} occurs c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture conditions		
	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture conditions		
5	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
10	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
5,6	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		

Note: Blank areas are water bodies.

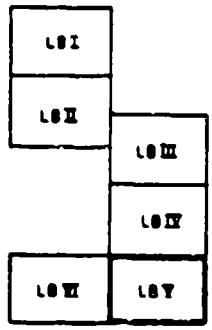
c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 10 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 40-100 for Units 3 and 5; more than 100 for Unit 13.

Units do not occur on this map.

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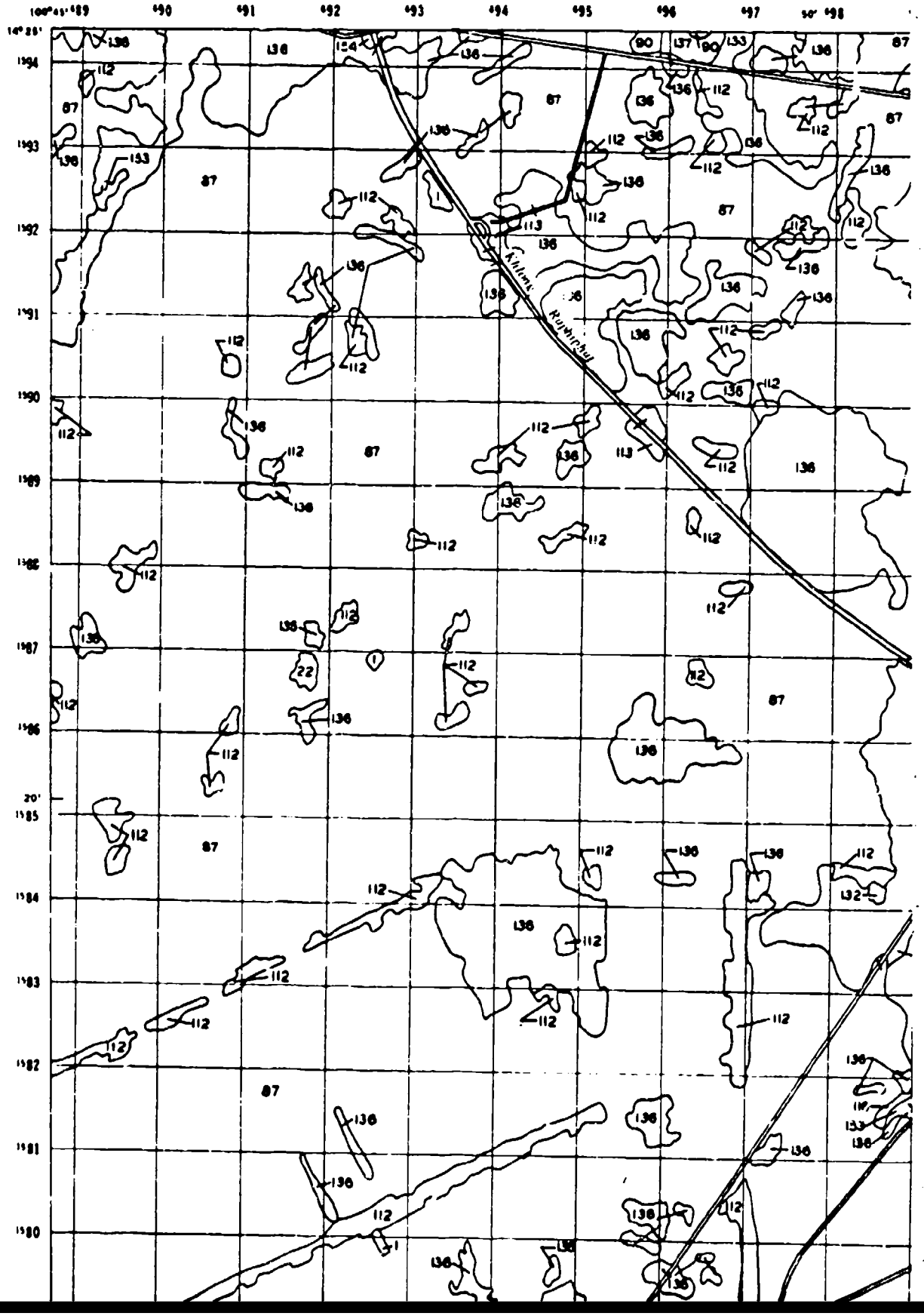
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

LOP BURI STUDY AREA

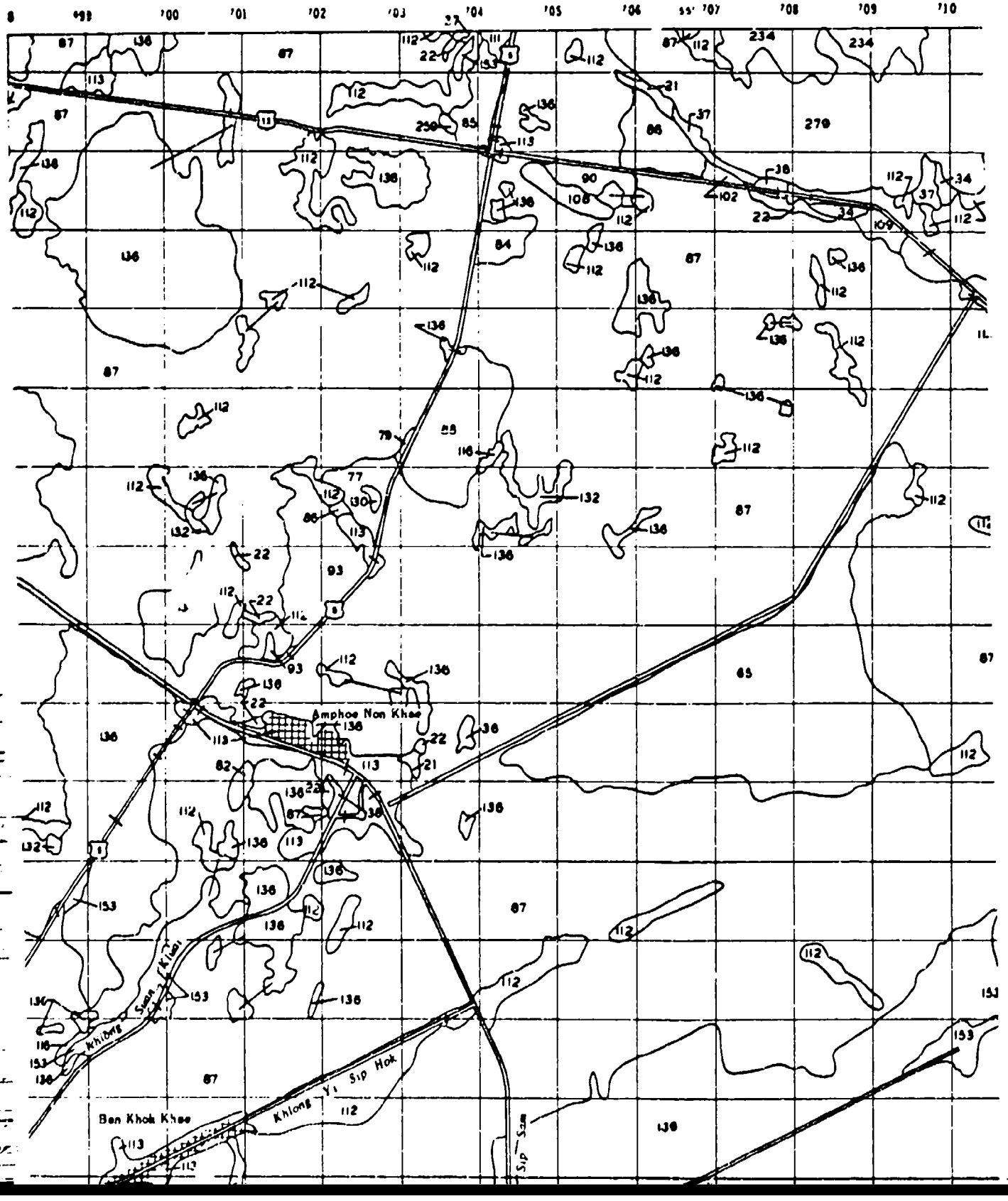
SHEET LB V

PLATE 2.5a


Williamsburg
Richmond

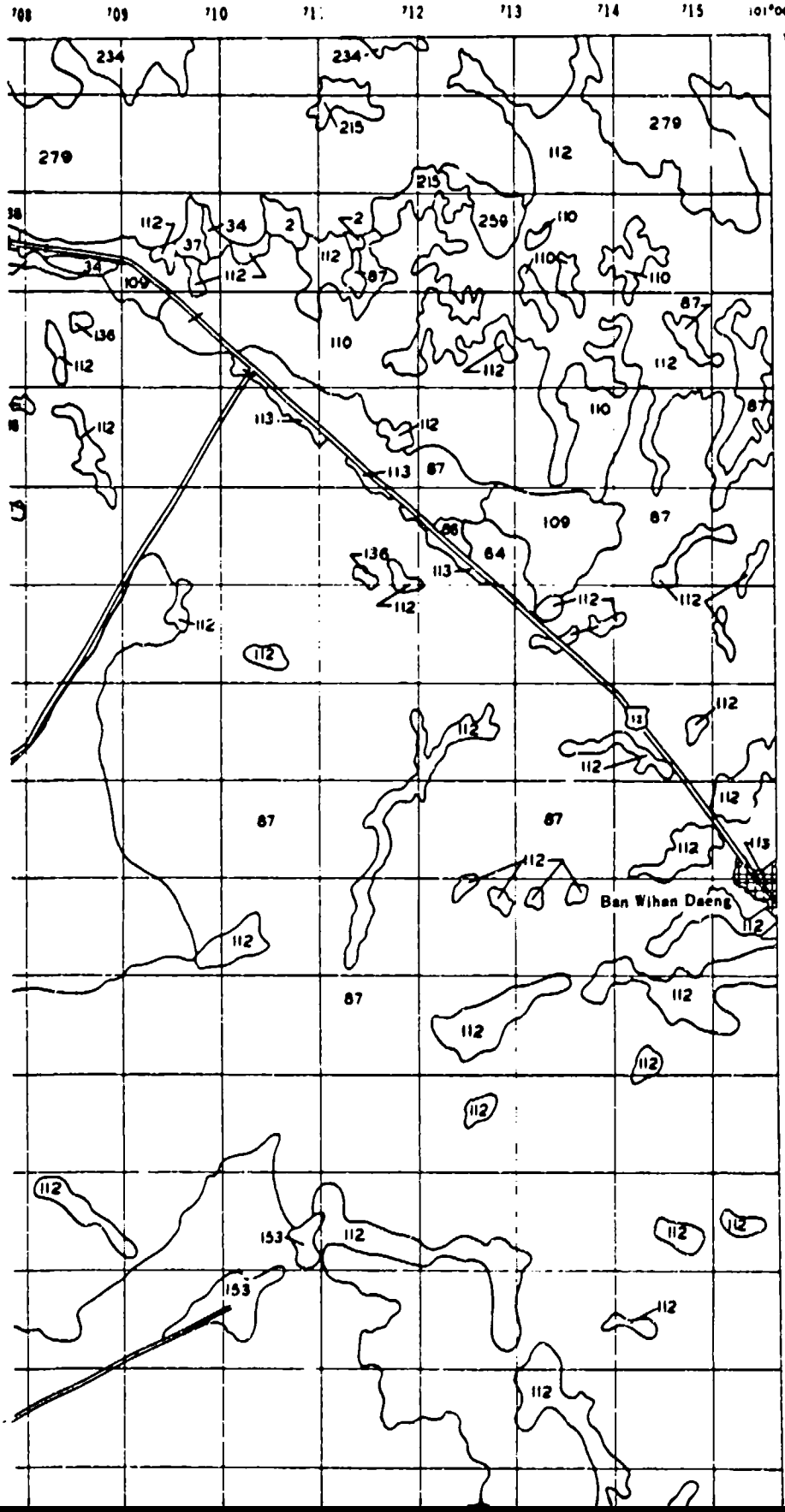
2

LOP BURI


Amphoe Non Khae
Khlong Suan Khai
Khlong Yi Sip Hok
Ban Khok Khae
Sip Sam

1 3

SHEET LB V



LEGEN

Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 2, 3 below), vertical obstacle spacing OS, approach angle AA, and ste were support. The numerator of the fraction (not shown) was rand easterly direction (i.e. azimuth from 2° to 178°, exc) and the fo > 19 to 300 deg) assuming that the vehicle intersects the conta

* Mapping class ranges of each surface geometry factor were

Slope (SL)

Mapping Class	Range deg
1	0-5
2	> 1.5-4.5
3	> 4.5-9
4	> 9-15
5	> 15-30
6	> 30-60
7	> 60

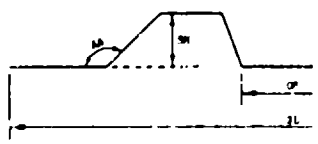
Vertical Obstacle Spacing (OS)

Mapping Class	Range m	Range ft
1	0-.7	0-2.3
2	> .7-1.2	> 2.3-3.9
3	> 1.2-1.5	> 3.9-4.9
4	> 1.5-1.9	> 4.9-6.2
5	> 1.9	> 6.2

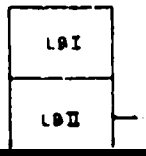
Approach Angle (AA)

Mapping Class	Range deg
1	0-5
2	> 5-15
3	> 15-25
4	> 25-35
5	> 35

Fills do not occur on this map.



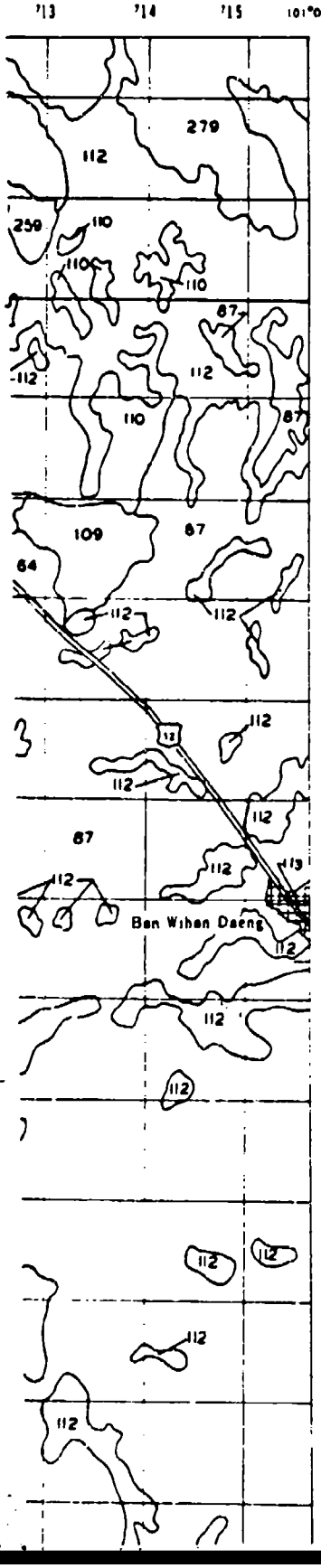
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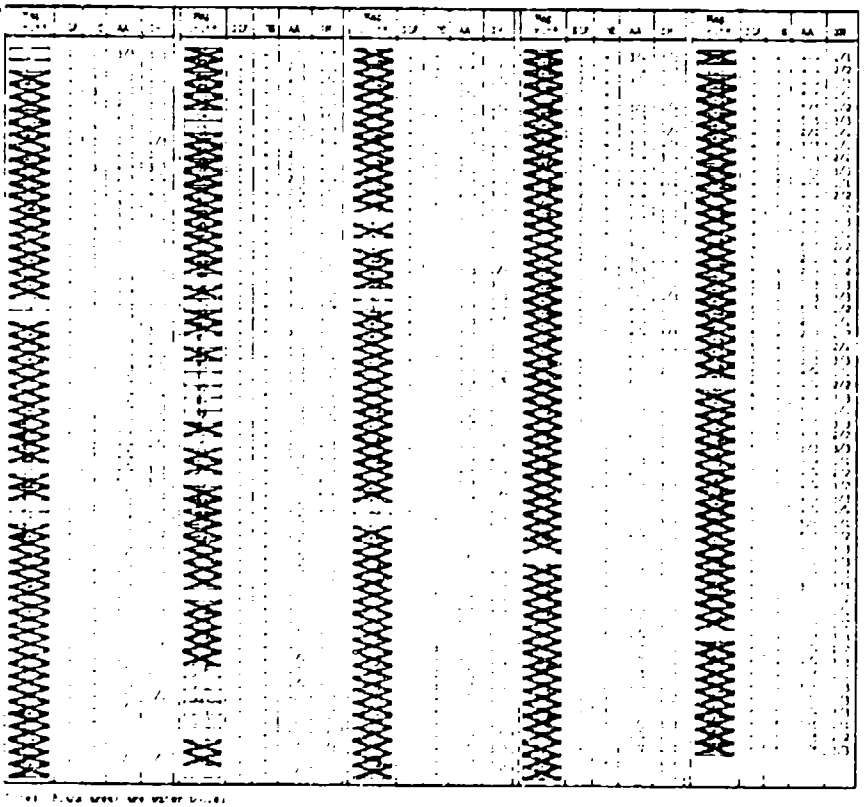
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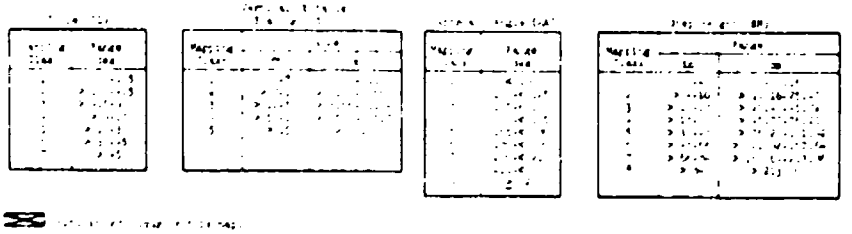
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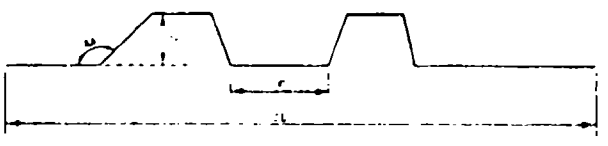
SHEET LB V



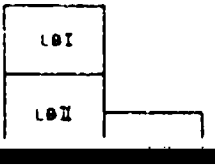
LEGEND

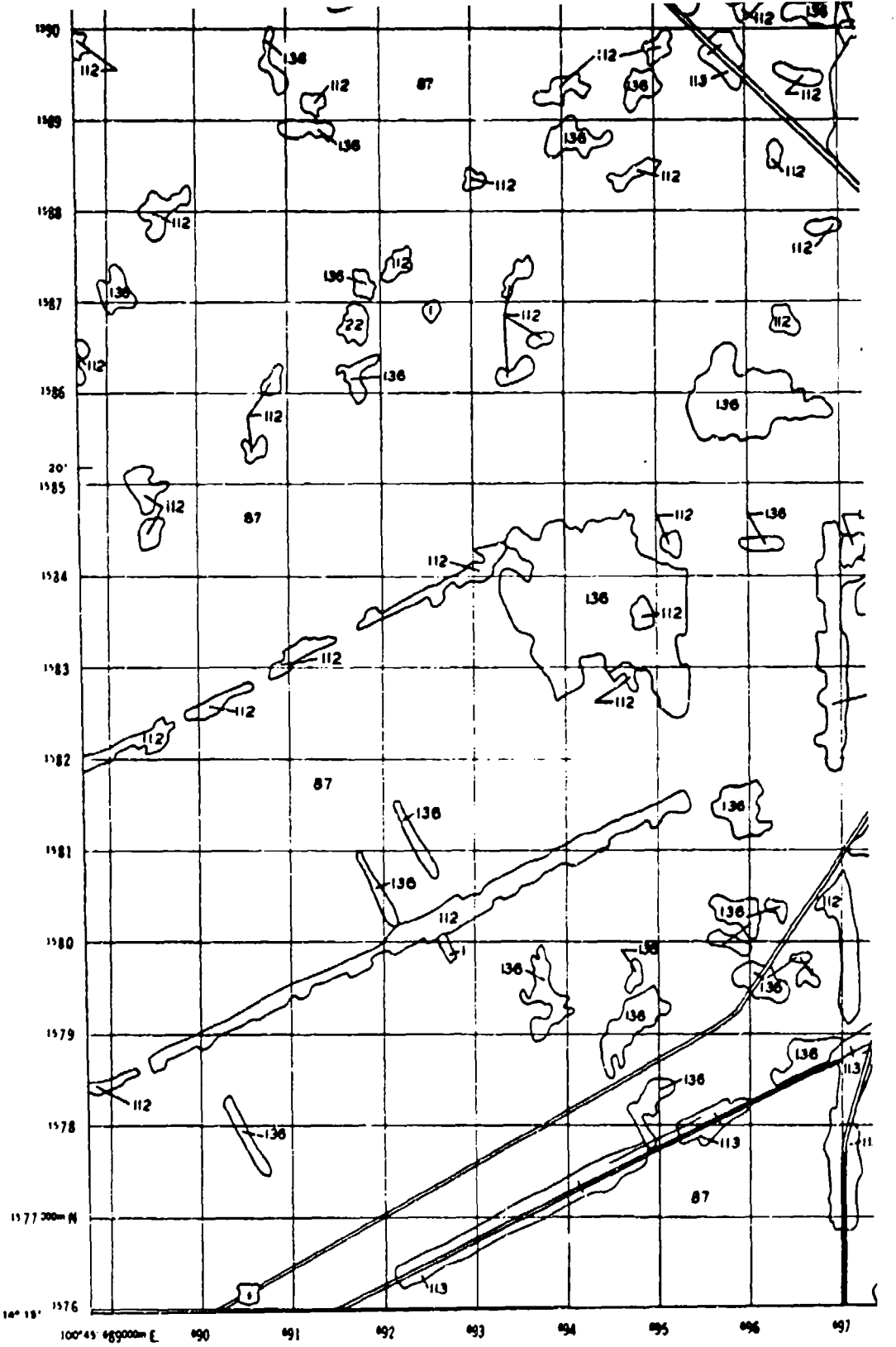






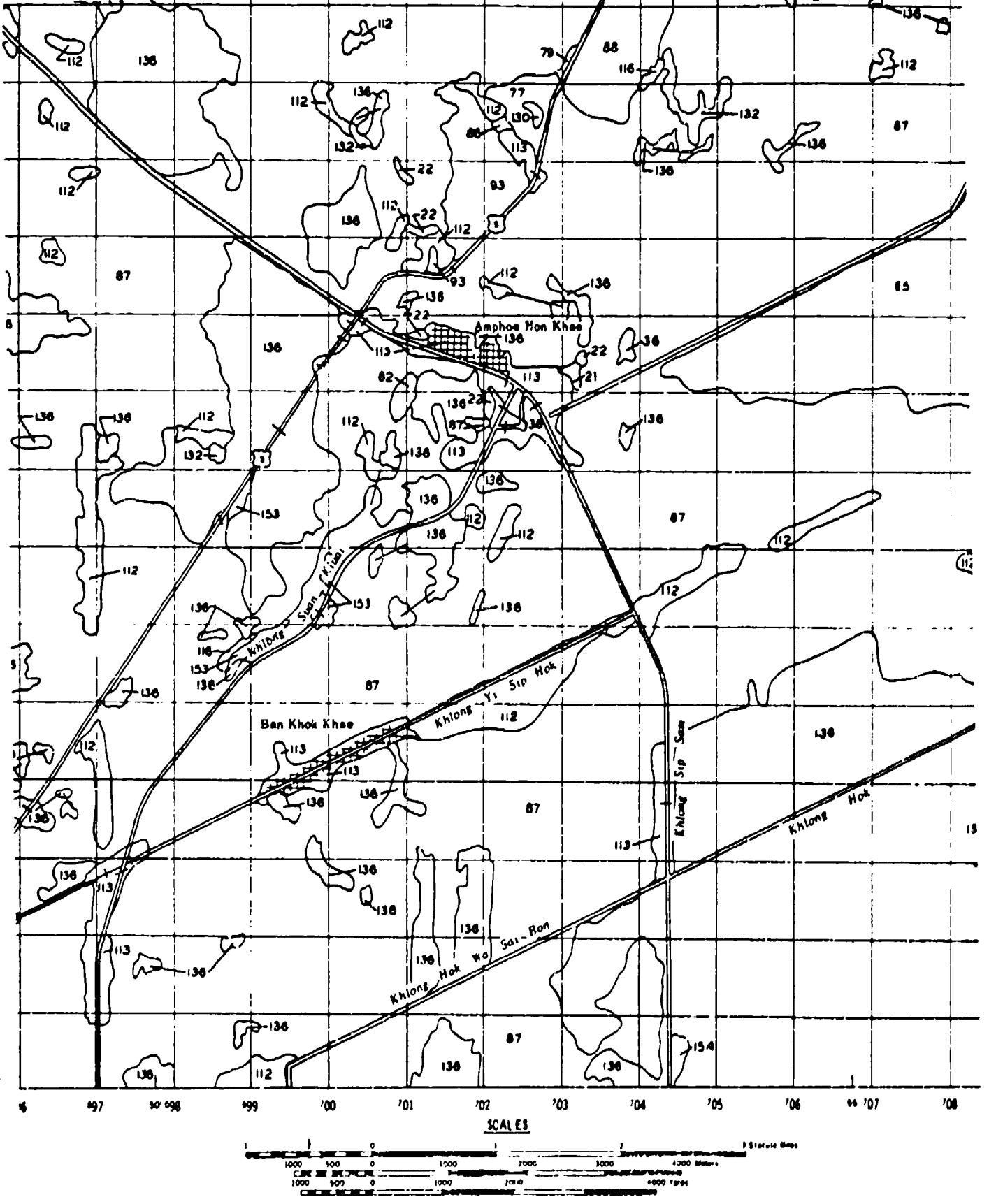
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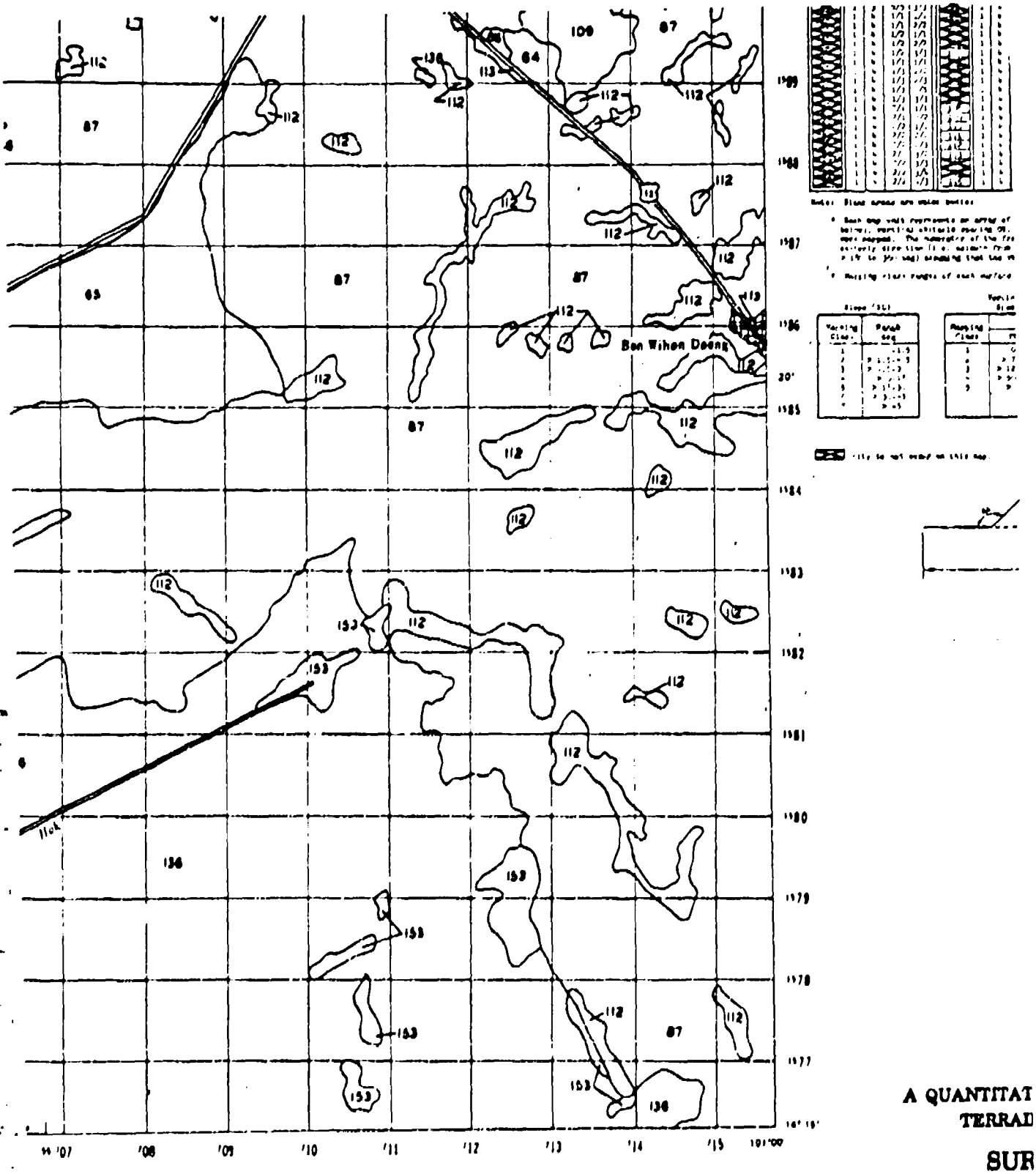




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5

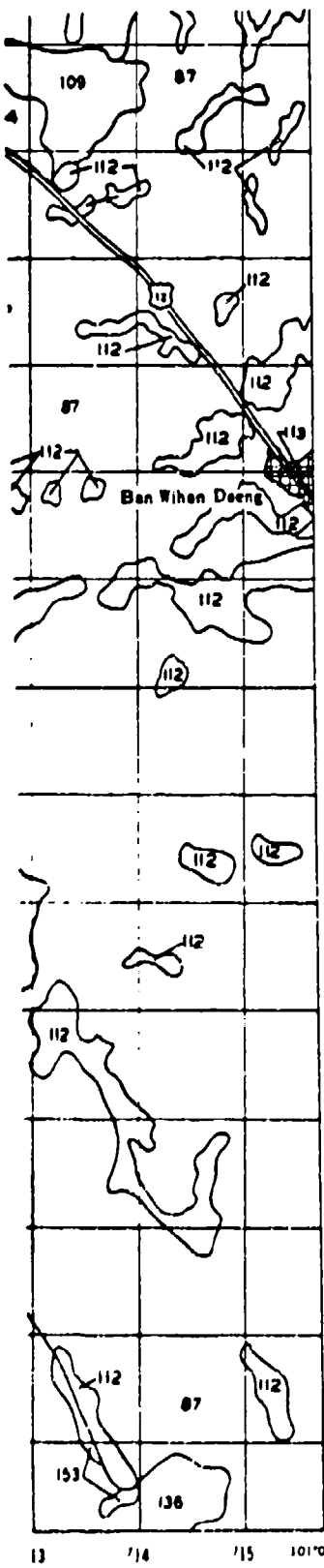

Amphoe Hon Khae
Ban Khok Khae
Khlong Yi Sip Hok
Khlong Yi Sip — Saen
Khlong Hok
Khlong Hok Wa Sai - Ban
Khlong Sam Nuan
SCALES

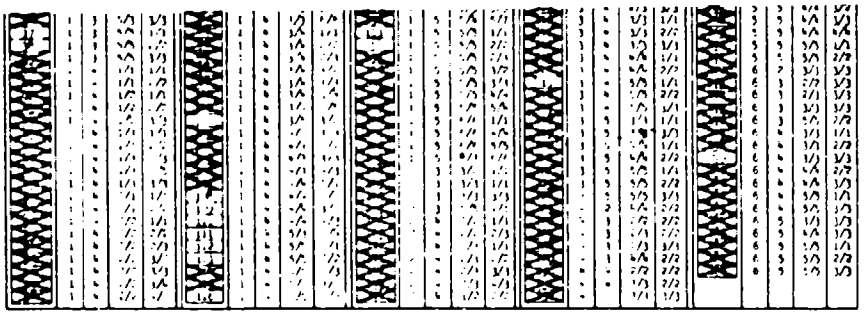


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Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. A, AA, AB, AC) indicating mapping classes of slope SL (see diagram below), vertical obstacle spacing OC, approach angle AA, and step height SH. Fractional designations indicate that dual classes were mapped. The numerator of the fraction indicates the class that will be encountered while traversing an area in an easterly direction (i.e. azimuth from > to); the denominator of the fraction indicates the class that will be encountered while traversing an area in a westerly direction (i.e. azimuth from > to). Example: 3/4 (> 15% to 30% slope) denotes that the vehicle is likely to encounter a mapping class 3 slope while traveling in an easterly direction and a mapping class 4 slope while traveling in a westerly direction.

* Mapping class ranges of each surface geometric factor are as follows:

Slope (SL)

Mapping Class	Range deg
1	0-5
2	> 1.5-5
3	> 5-15
4	> 15-30
5	> 30-45
6	> 45-65
7	> 65

Vertical Obstacle Spacing (OC)

Mapping Class	Range	
	ft	m
1	<7	<2
2	> 7-12	> 2.1-3.7
3	> 12-25	> 3.8-7.6
4	> 25-50	> 7.7-15.2
5	> 50	> 15.3

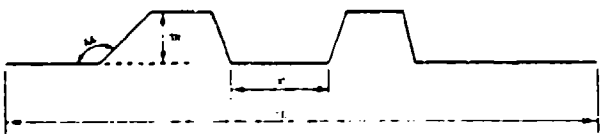
Approach Angle (AA)

Mapping Class	Range deg
1	< 7
2	> 7-15
3	> 15-25
4	> 25-45
5	> 45-65
6	> 65-85
7	> 85-105
8	> 105-125
9	> 125-145
0	> 145-165
	> 165-185
	> 185-205
	> 205-225
	> 225-245
	> 245-265
	> 265-285
	> 285-305
	> 305-325
	> 325-345
	> 345-365

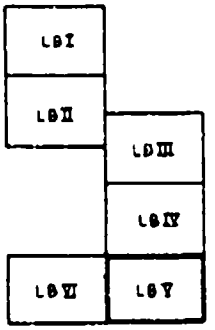
Step Height (SH)

Mapping Class	Range	
	in	cm
1	0-6	0-15.25
2	> 6-10	> 15.26-25.4
3	> 10-15	> 25.41-38.1
4	> 15-20	> 38.2-50.8
5	> 20-30	> 50.9-76.2
6	> 30-40	> 76.3-101.6
7	> 40-50	> 101.7-127.0
8	> 50-60	> 127.1-152.4
9	> 60-70	> 152.5-177.8
0	> 70-80	> 177.9-203.2
	> 80	> 203.2

Fill to not occur on this map.



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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

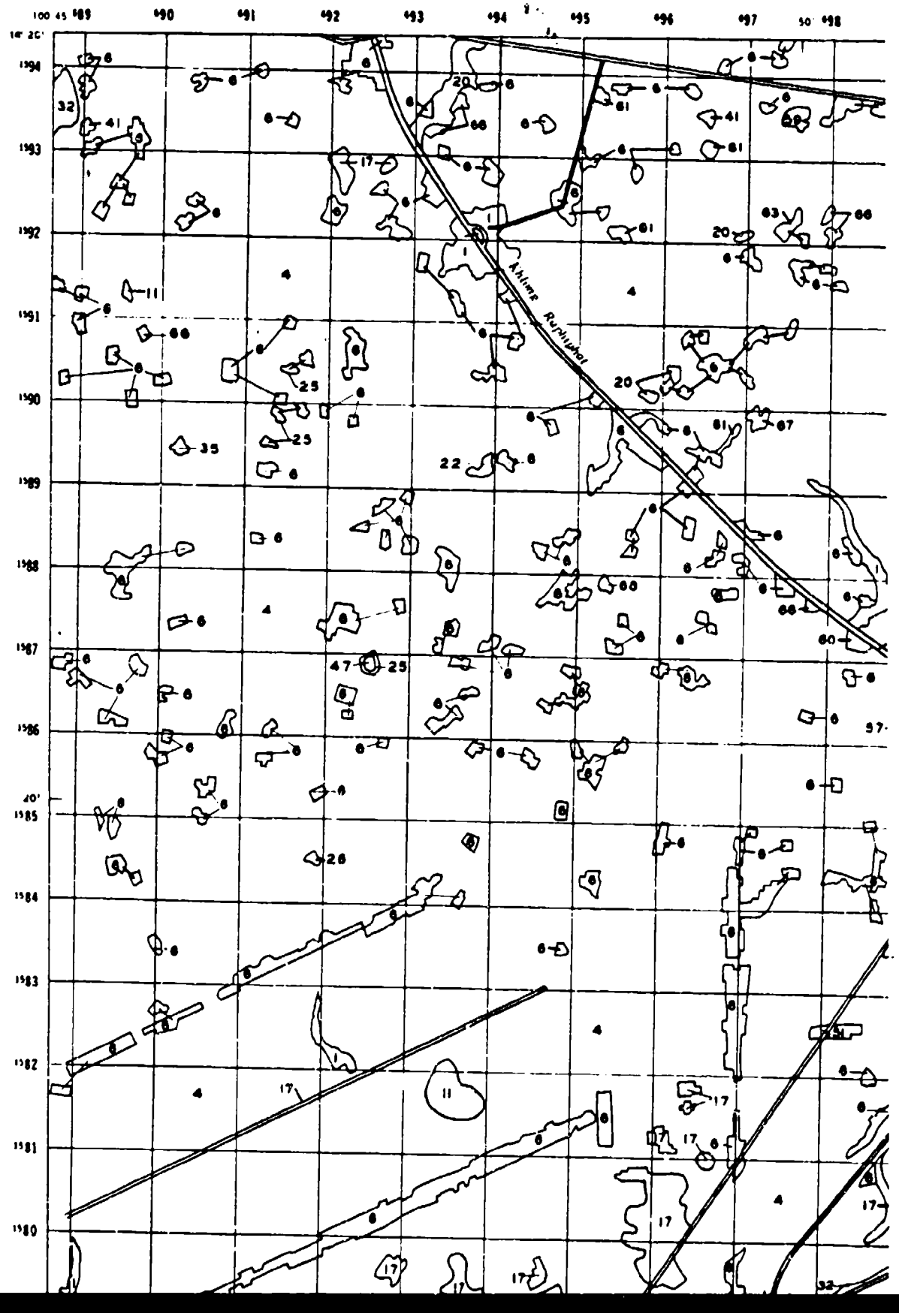
SURFACE GEOMETRY

LOP BURI STUDY AREA

SHEET LB V

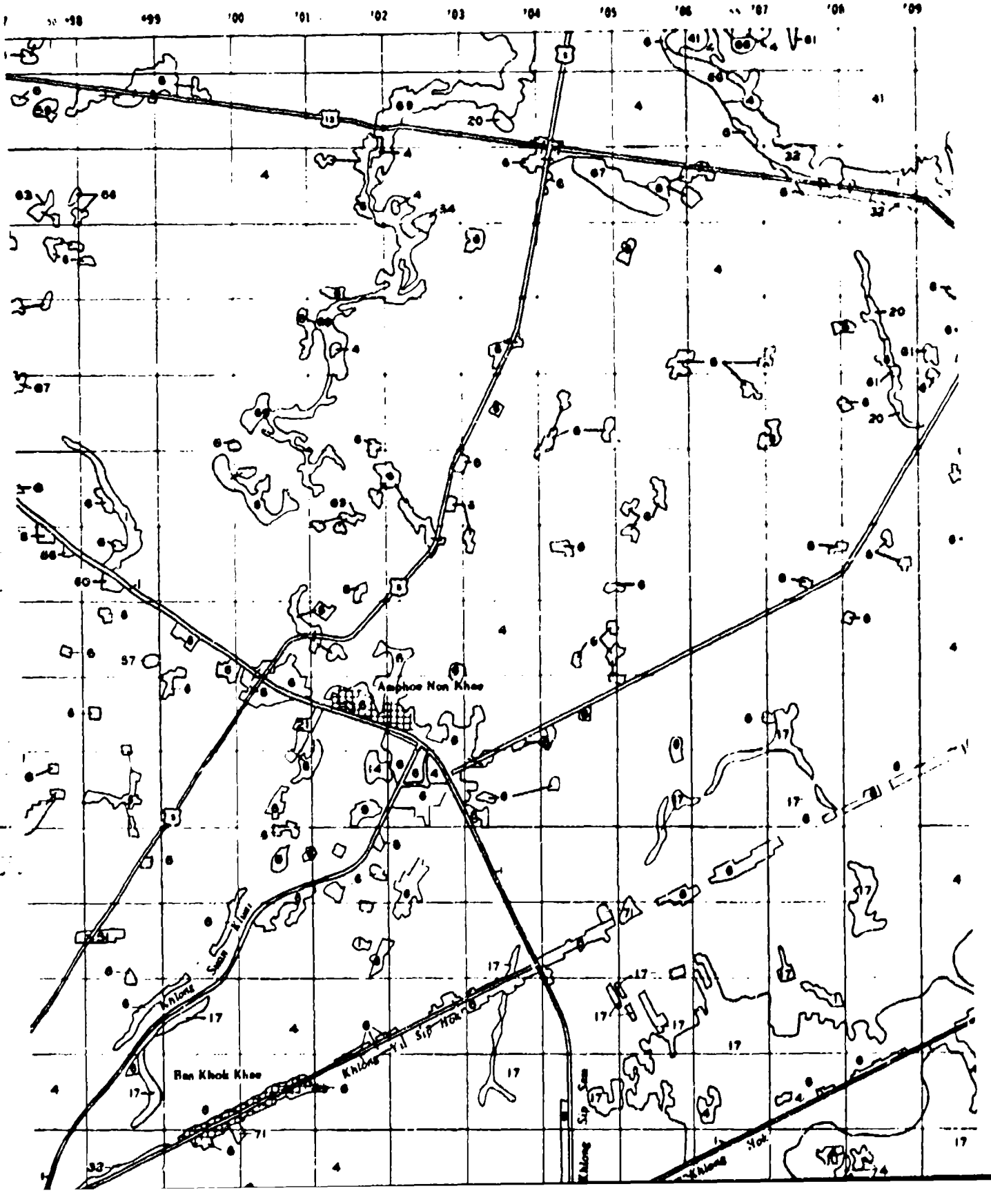
PLATE 2.5b

8


Ahlum Rathaus

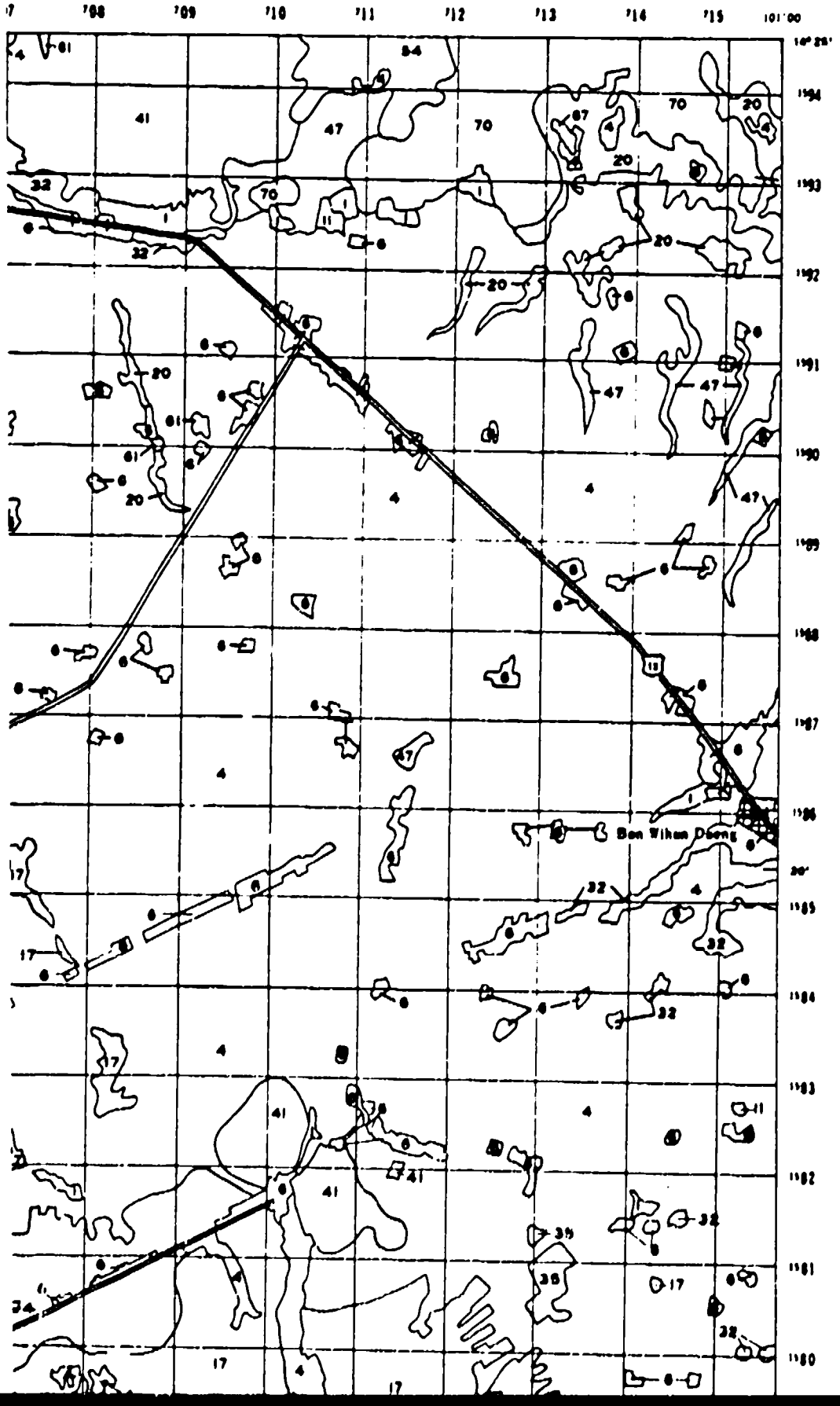
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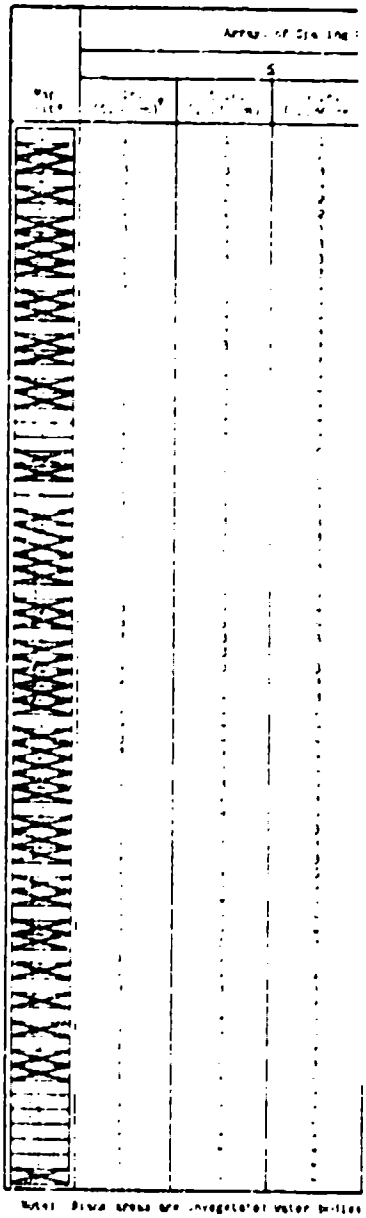
LOP BURI


Amphoe Non Khae
Ban Khok Khae
Khlong Si Sao Hok
Khlong Sao Kluai
Khlong Si Sao
Khlong Hok

3

SHEET LB V

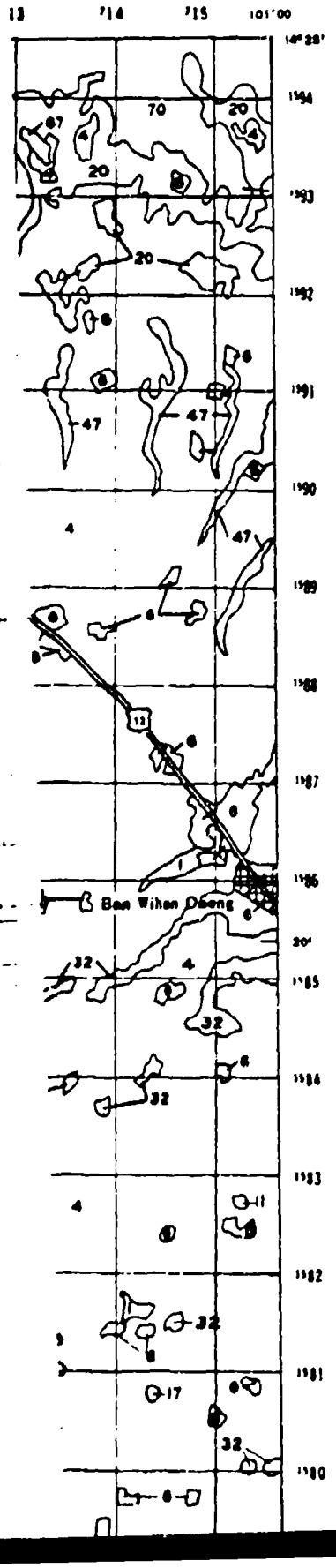




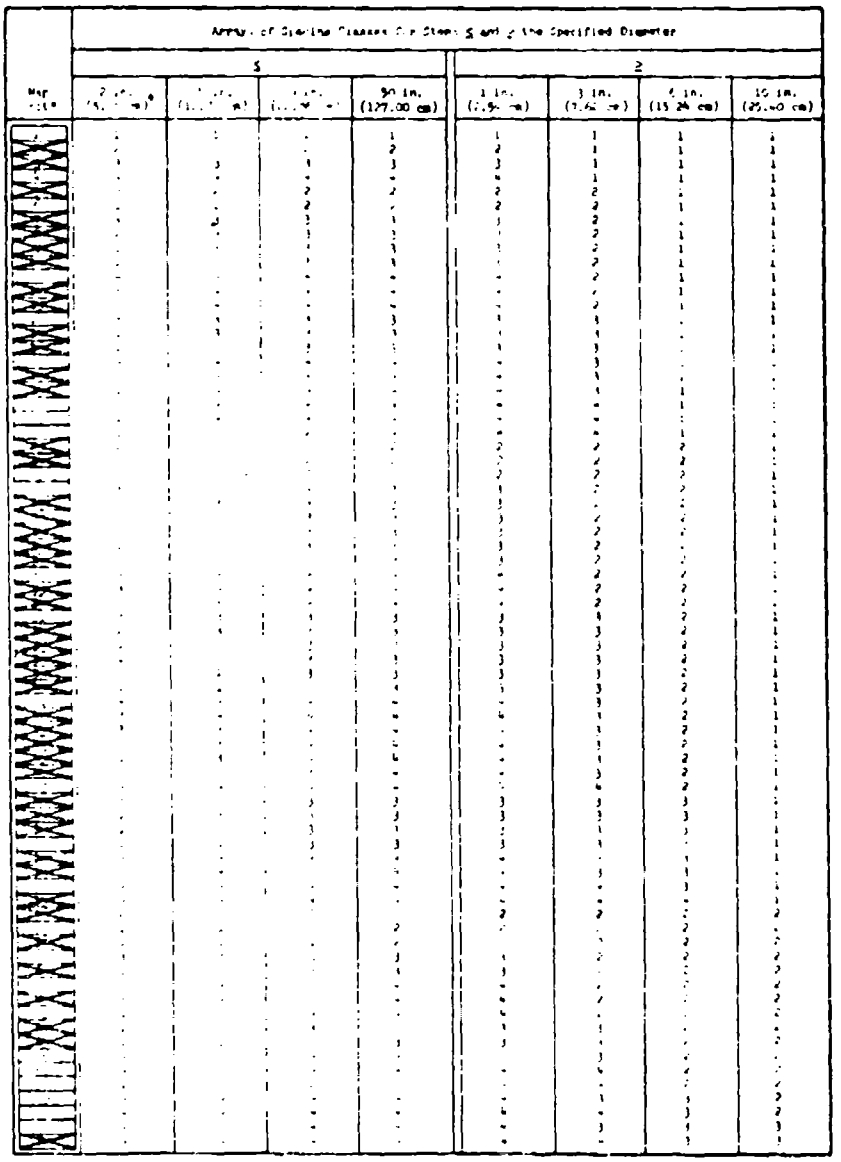
INDEX TO

4

SHEET LB V



LEGEND



Total stocked area over-lain by map units

* Each map unit represents an array of eight symbols (1, 1, 1, 1, 1, 1, 1, 1) indicating stocking in each of the 3 size classes, with 1 = (5 cm, 12.70, 22.9, and 127.00 cm) and 2 = 3, 6, and 10 inch (7.62, 15.24, and 25.40 cm).

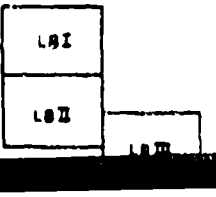
† Mapping unit number for each type of land use

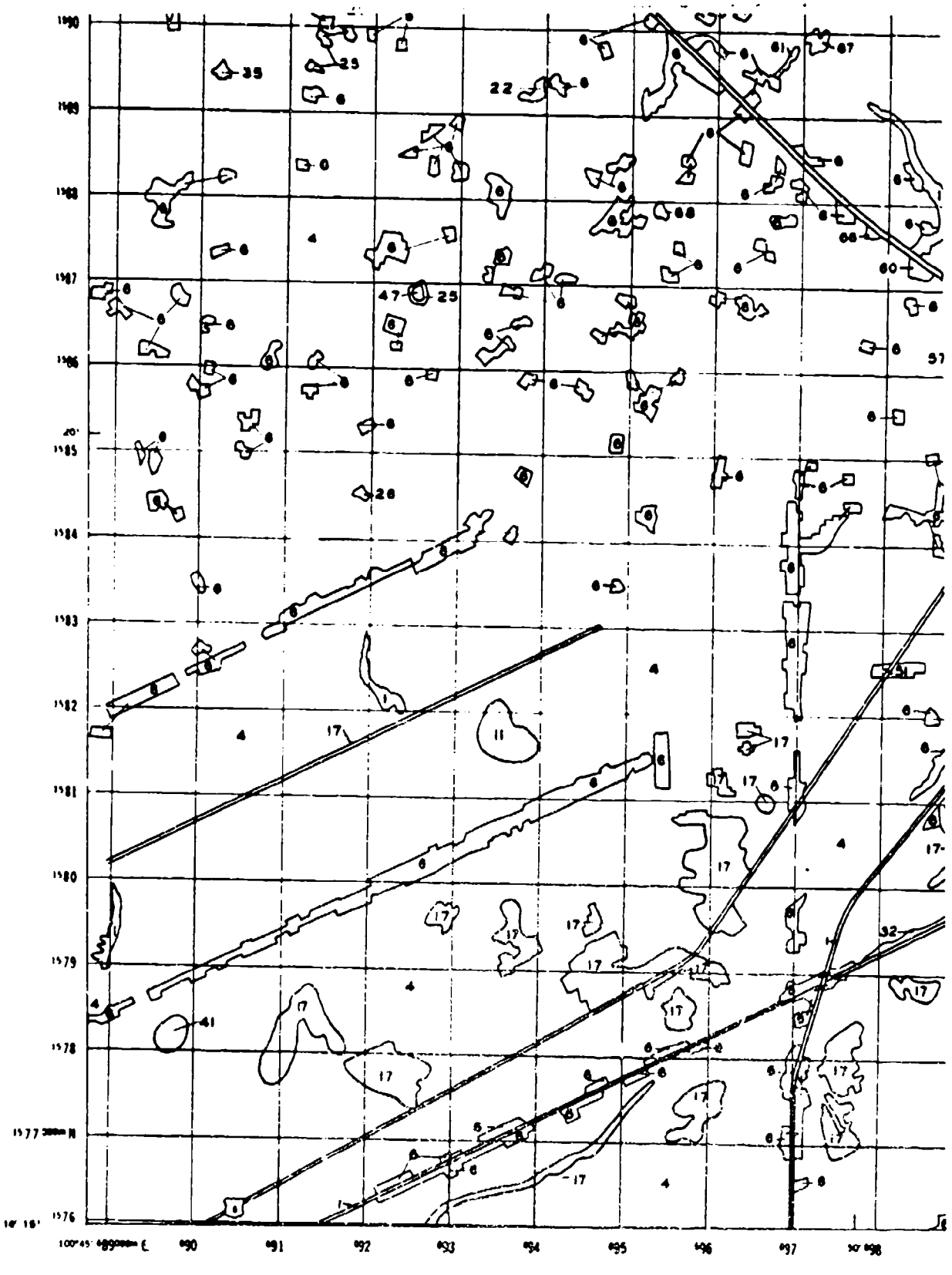
Stem Stocking

Map Unit Class	Yards	
	ft	m
1	[illegible]	[illegible]
2	[illegible]	> 1.05-3.15
3	> 5-10	> 1.52-3.05
4	[illegible]	0-1.52

[illegible] within stocked area on this map

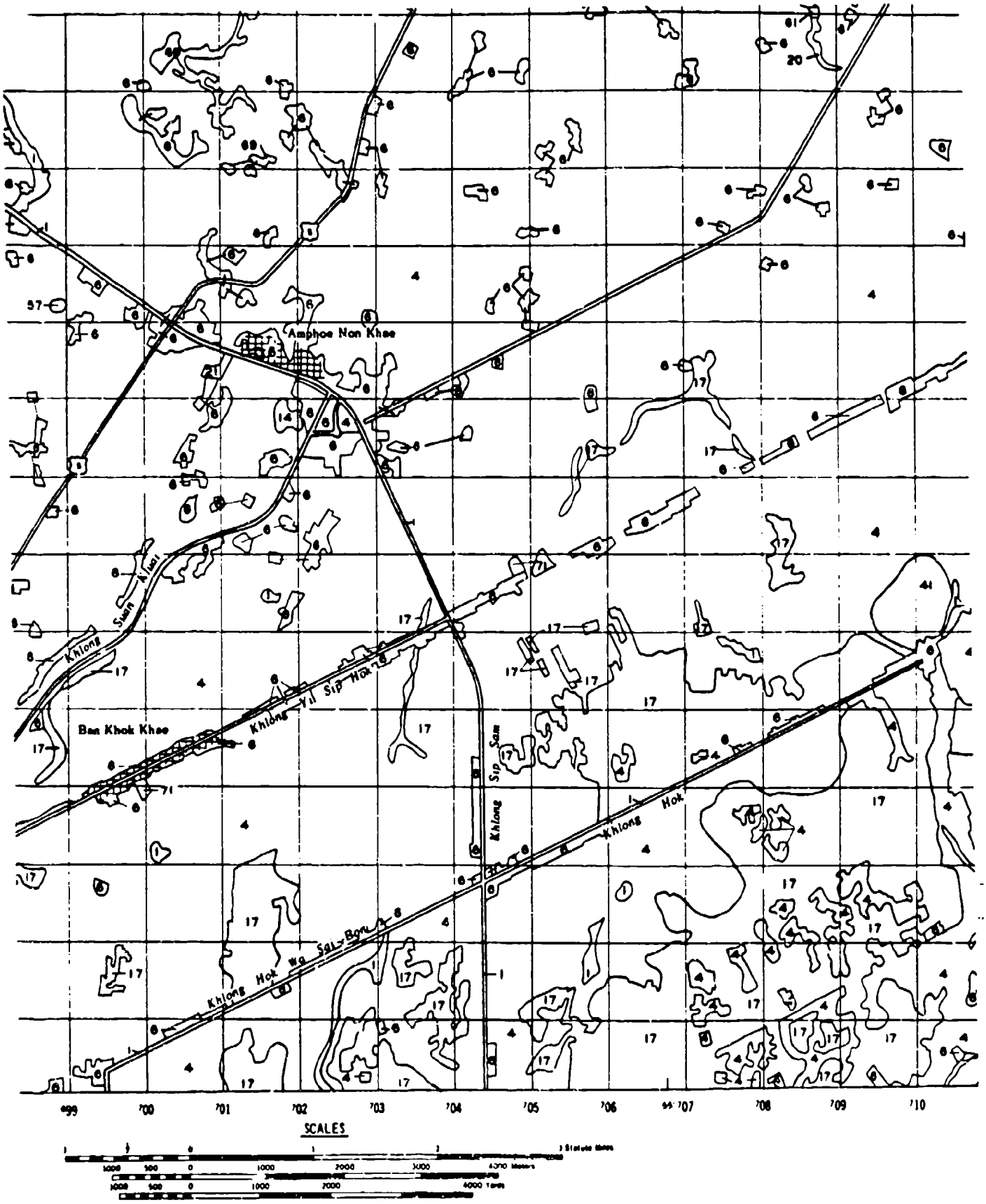
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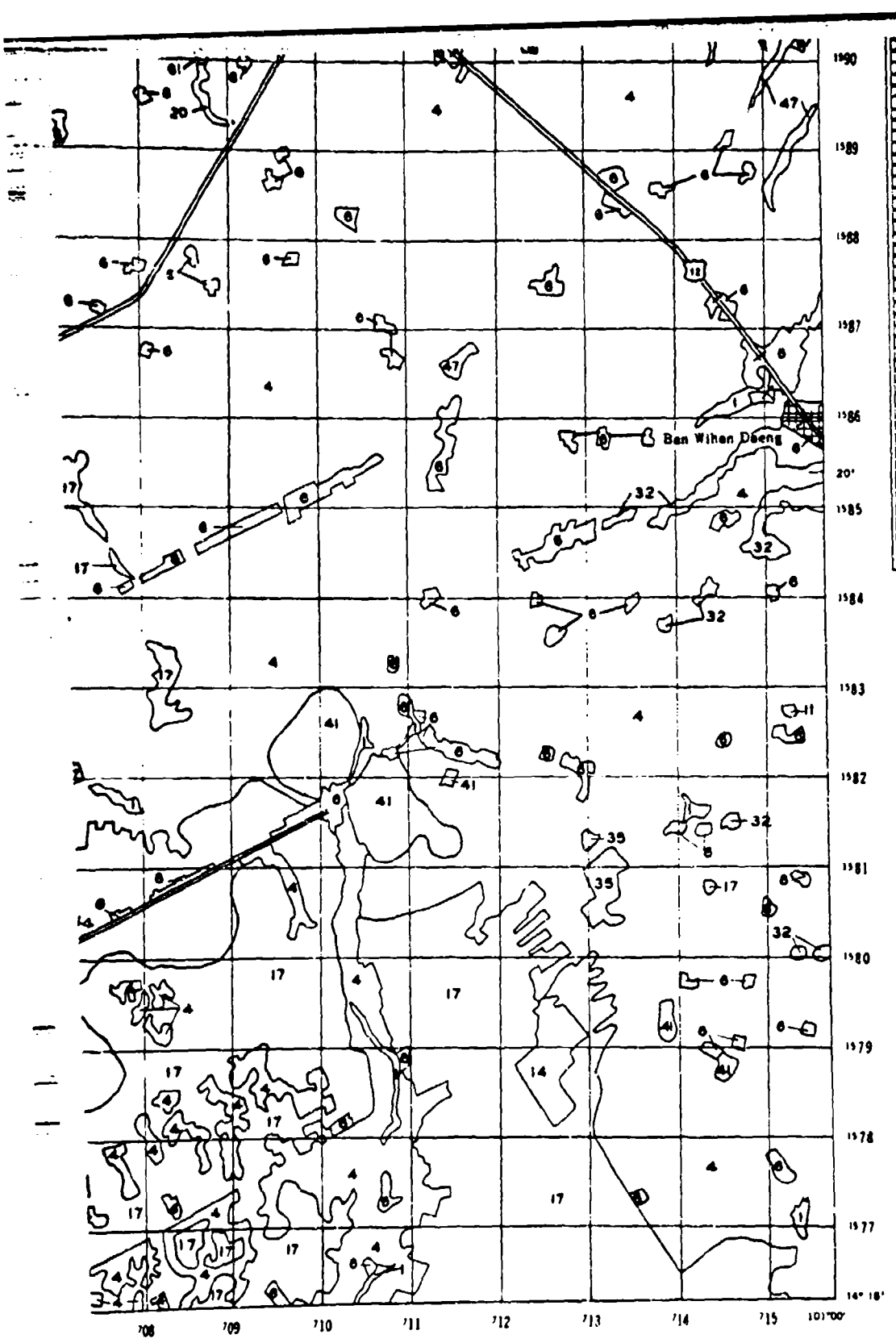
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

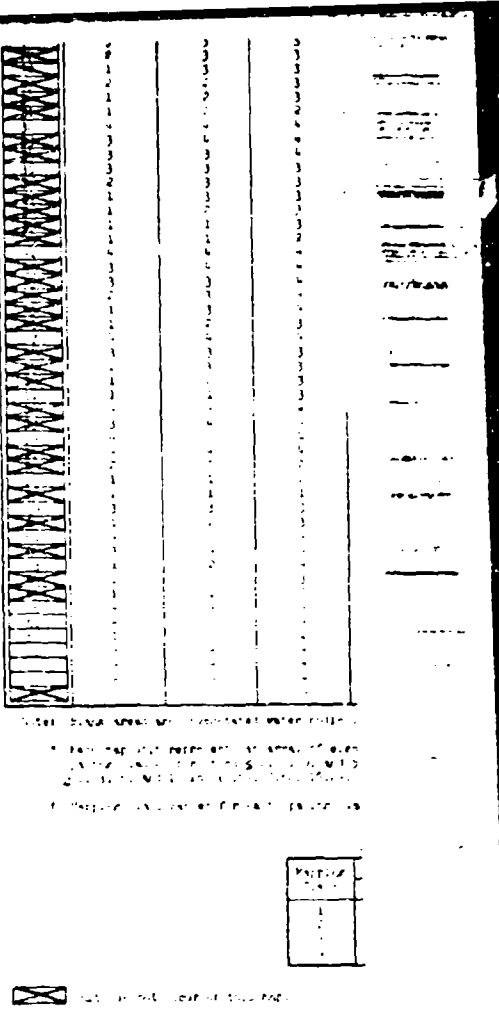
5


Amphoe Nan Khee
Ban Khok Khee
Khlong Suan Kluai
Khlong Yai Sip Hok
Khlong Sip Saam
Khlong Hok
Khlong Hok Wa Sai Bon
699
700
701
702
703
704
705
706
707
708
709
710
SCALES

6

1





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LBI

LB II

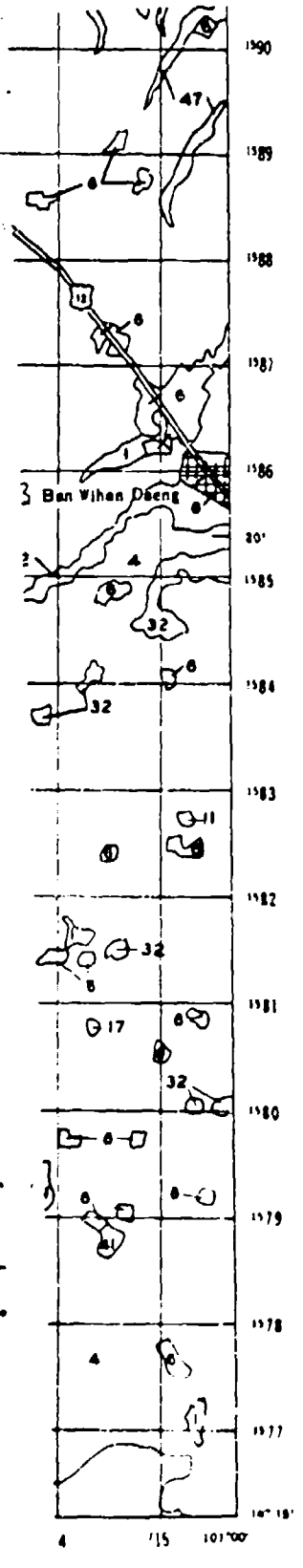
LB III

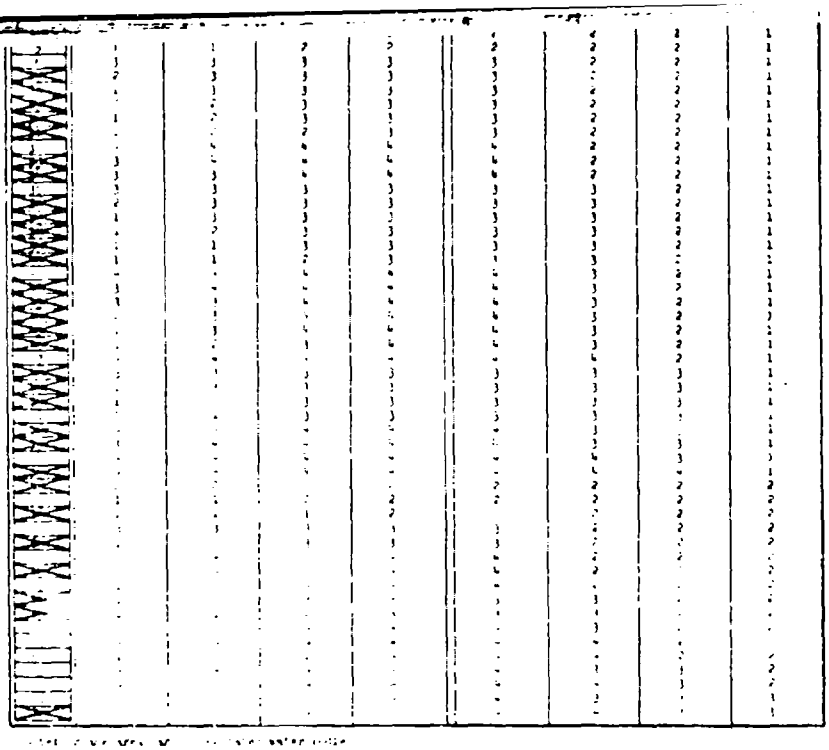
A QUANTITATIVE ME
TERRAIN FOR C

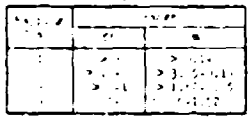
VEGE

LOP BURI I

SHEE

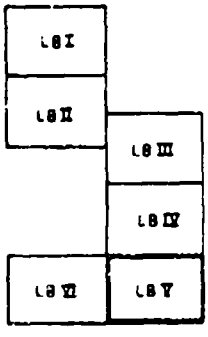








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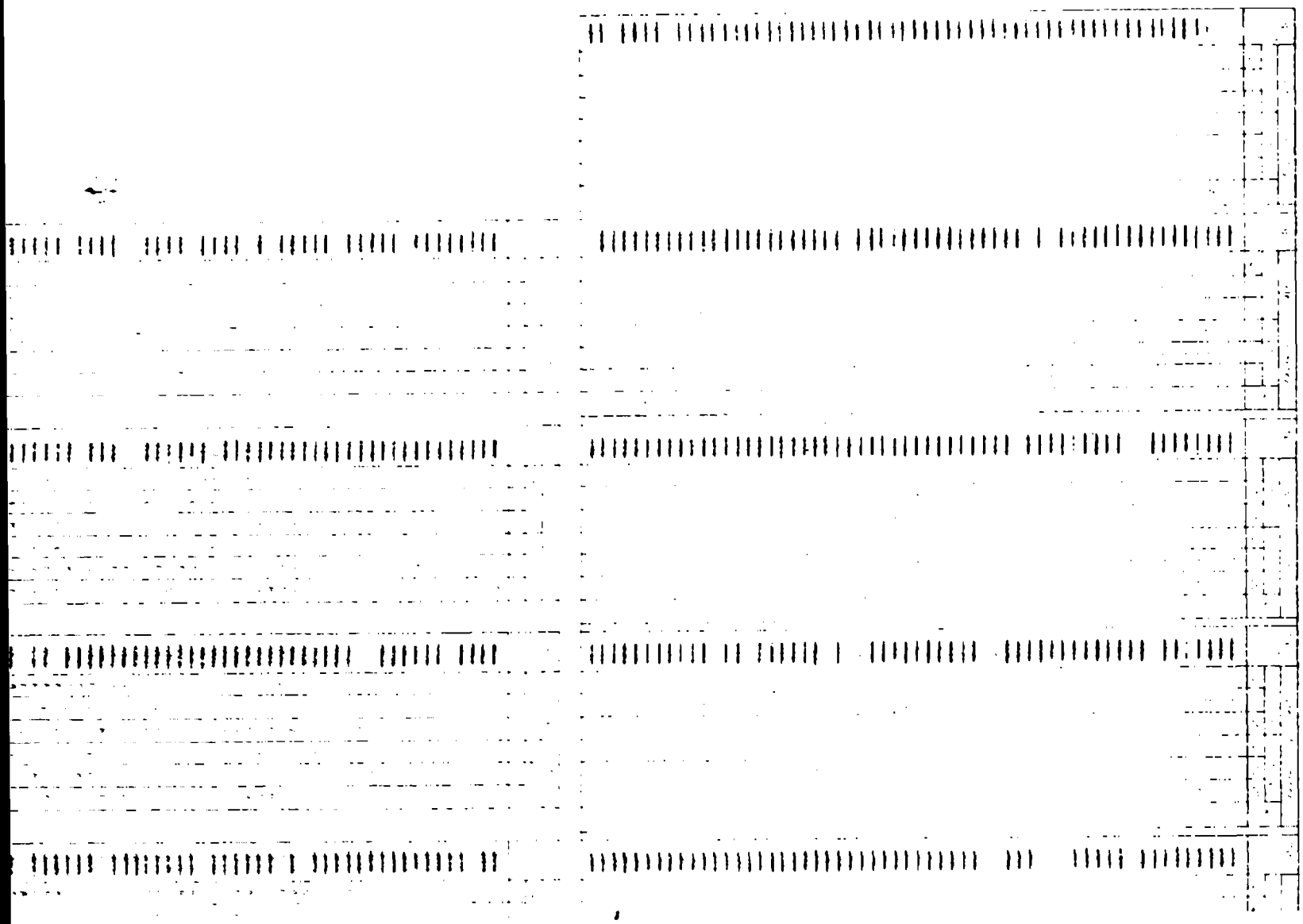
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

LOP BURI STUDY AREA

SHEET LB V

PLATE 2.5c

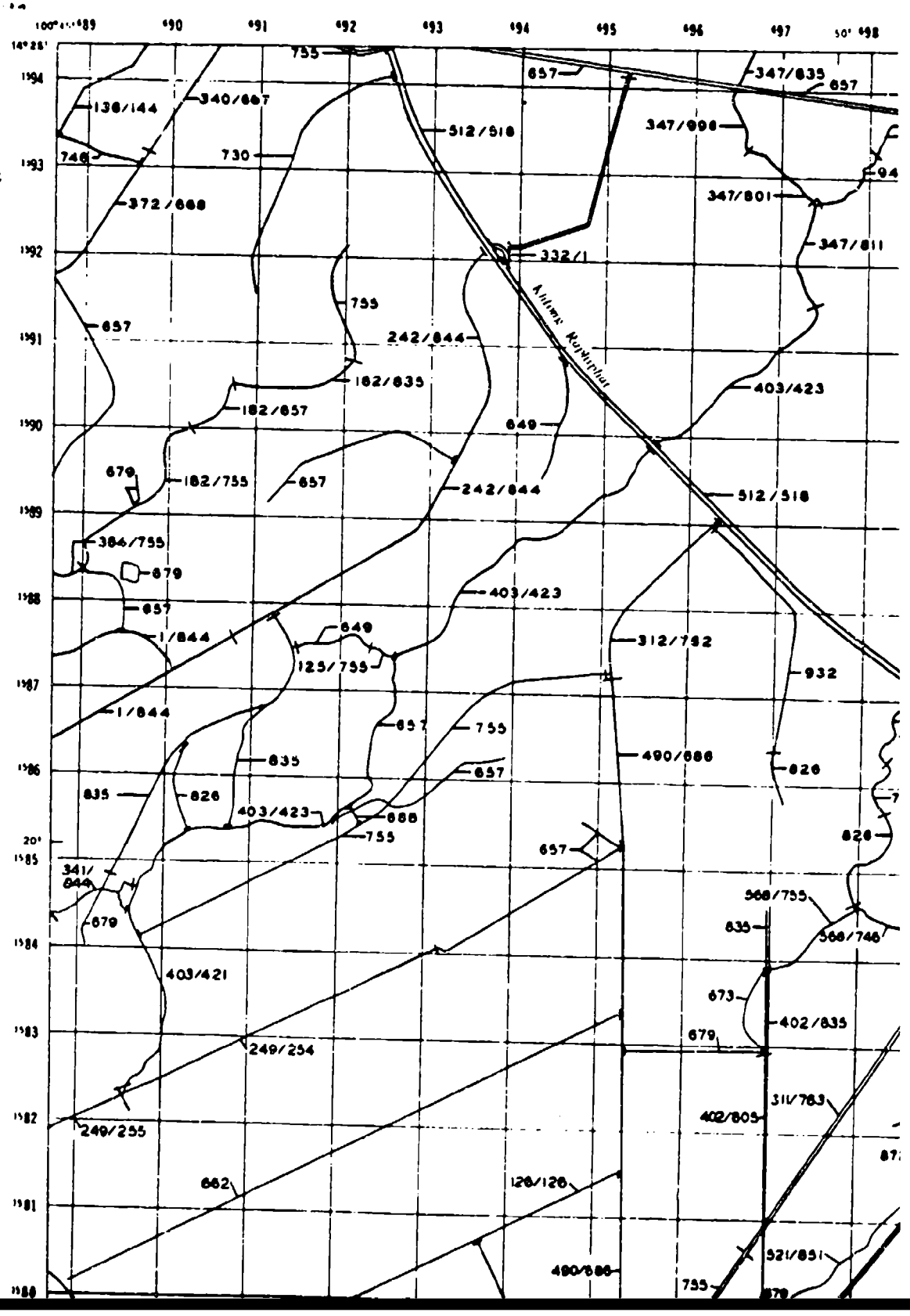


2

LEGEND

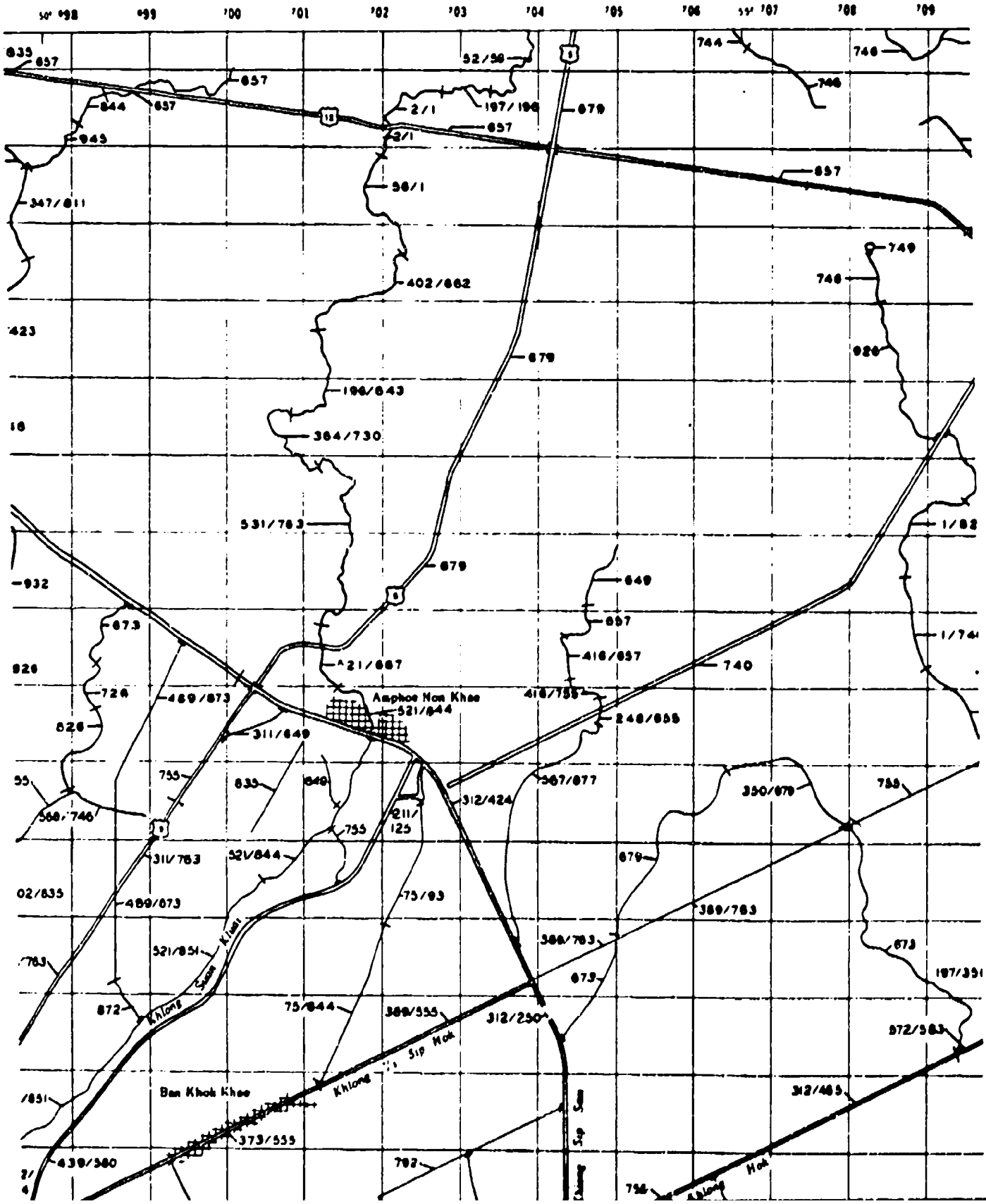


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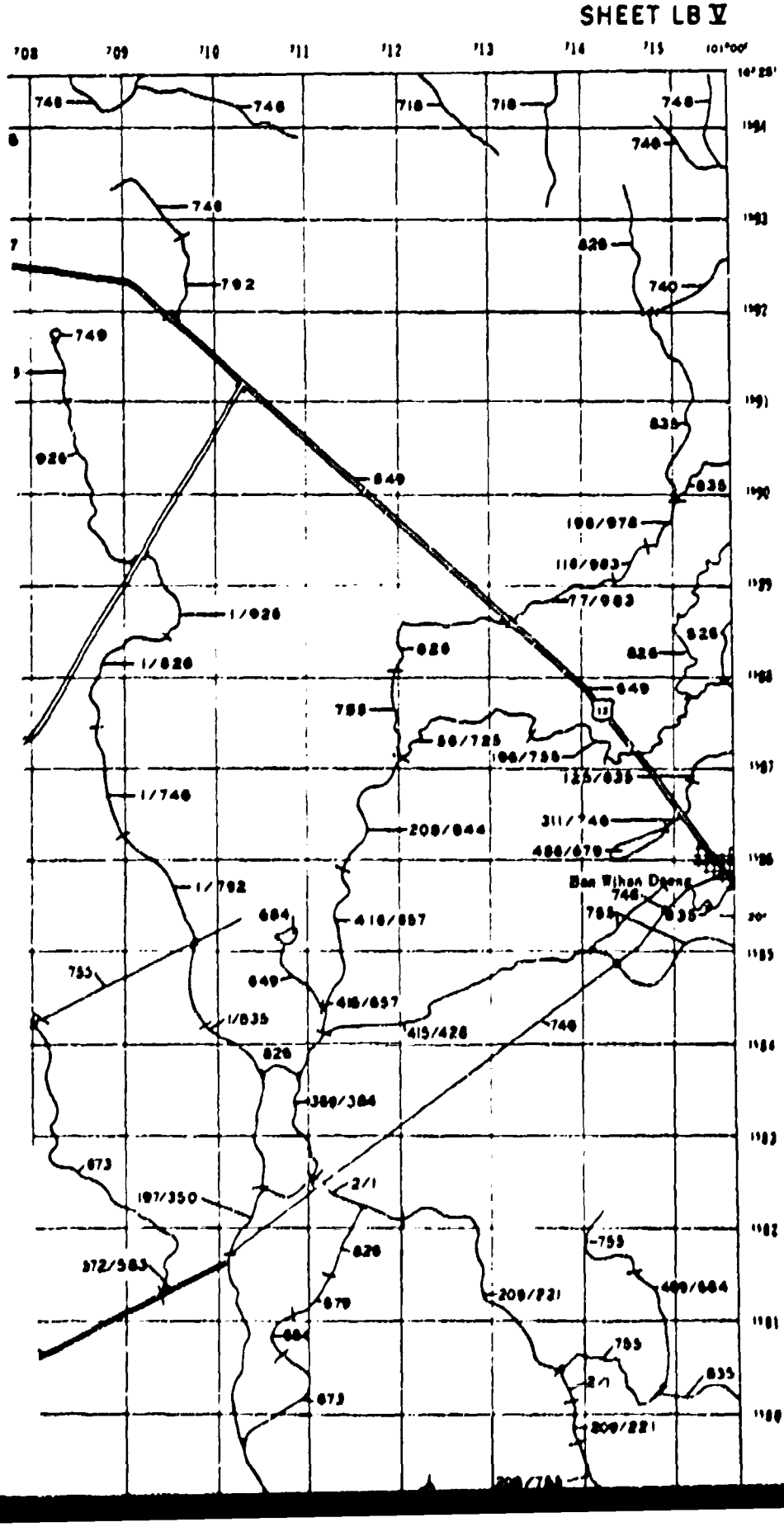

100°
89
90
91
92
93
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96
97
98
14°28'
1594
1593
1592
1591
1590
1589
1588
1587
1586
20'
1585
1584
1583
1582
1581
1580
755
657
347/635
657
138/144
340/667
512/518
347/696
746
730
372/668
347/801
347/811
332/1
Ailuns Rayuniplat
755
657
242/844
182/635
403/423
182/657
649
679
182/755
657
242/844
512/518
384/755
679
403/423
657
1/844
649
125/755
312/792
932
1/844
657
755
835
490/666
835
826
403/423
657
826
755
657
341/
649
679
568/755
835
568/746
403/421
673
402/835
679
249/254
311/763
402/805
249/255
662
126/126
490/666
921/851
755
679

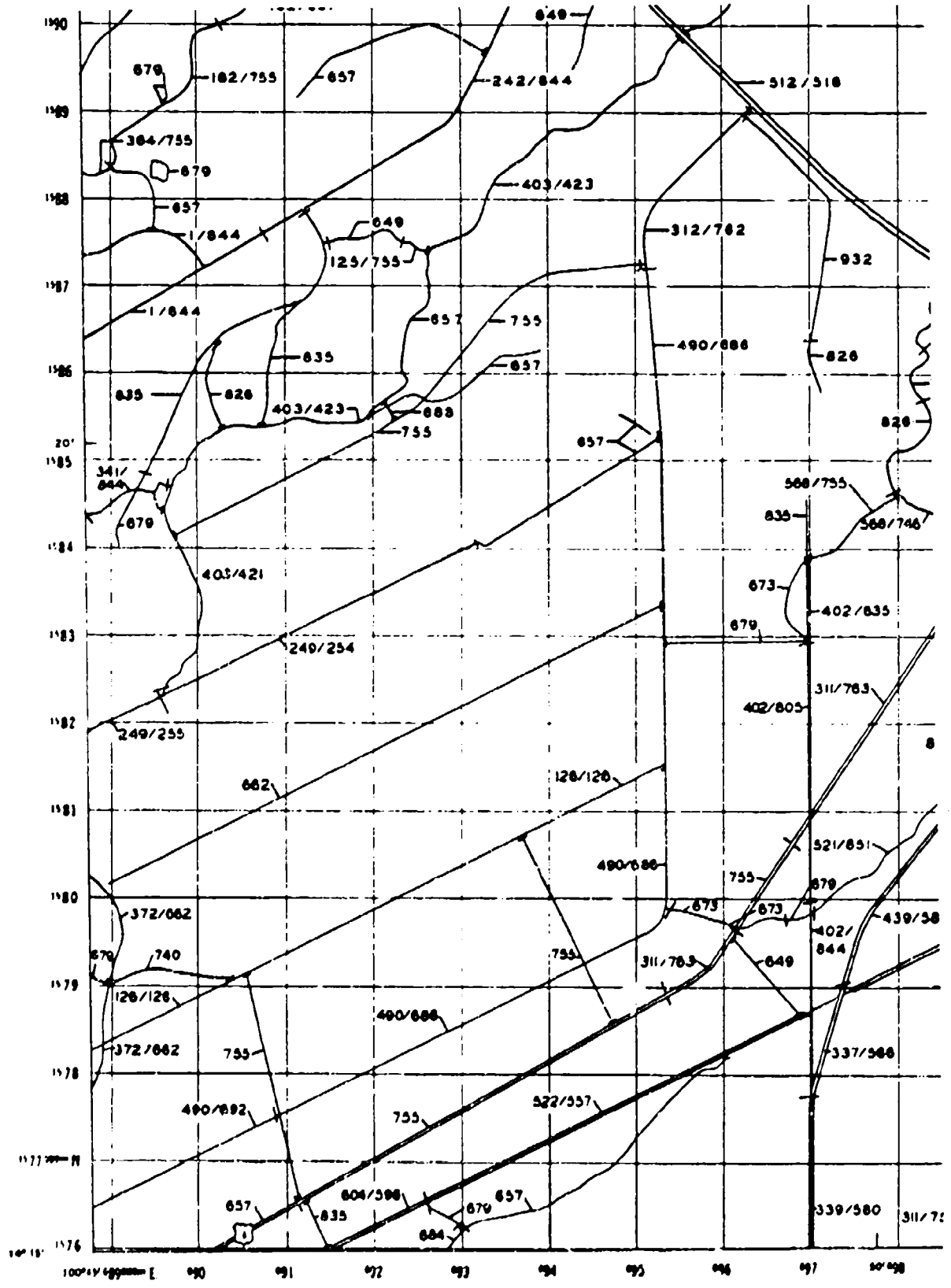
2

LOP BURI


98
99
100
101
102
103
104
105
106
107
108
109
Amphoe Non Khae
Ban Khok Khae
Khlong Suan Khuai
Khlong Sip Hok
Khlong Hok
Sup
Sup
744
746
749
740
679
657
649
673
755
783
792
835
872
926
932
423
18
55
02/835
/783
/851
/831
52/98
2/1
197/196
96/1
347/811
402/662
196/643
384/730
531/783
521/667
489/673
724
826
568/746
311/783
521/844
311/649
75/93
75/844
211/125
312/424
567/677
416/657
416/755
248/655
740
350/678
389/783
388/783
673
197/351
372/583
312/485
312/250
388/555
373/555
439/560

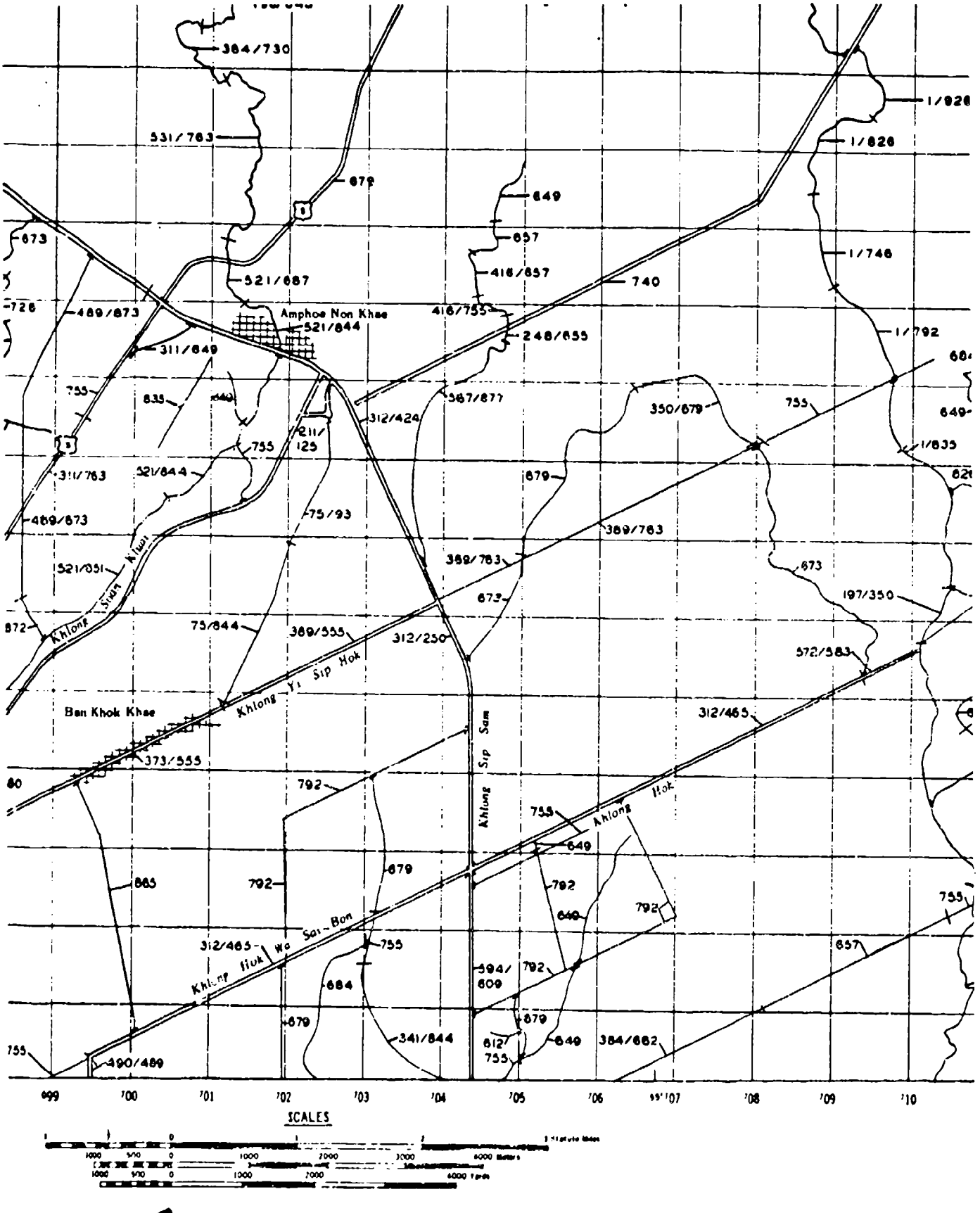
1 3


SHEET LB V
708
709
710
711
712
713
714
715
748
718
740
792
749
828
649
838
1/926
1/828
826
755
1/748
209/844
1/792
684
649
1/835
828
380/384
673
197/350
372/583
209/721
755
835
Ben Wilson Dam
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LB I
LB II
LB



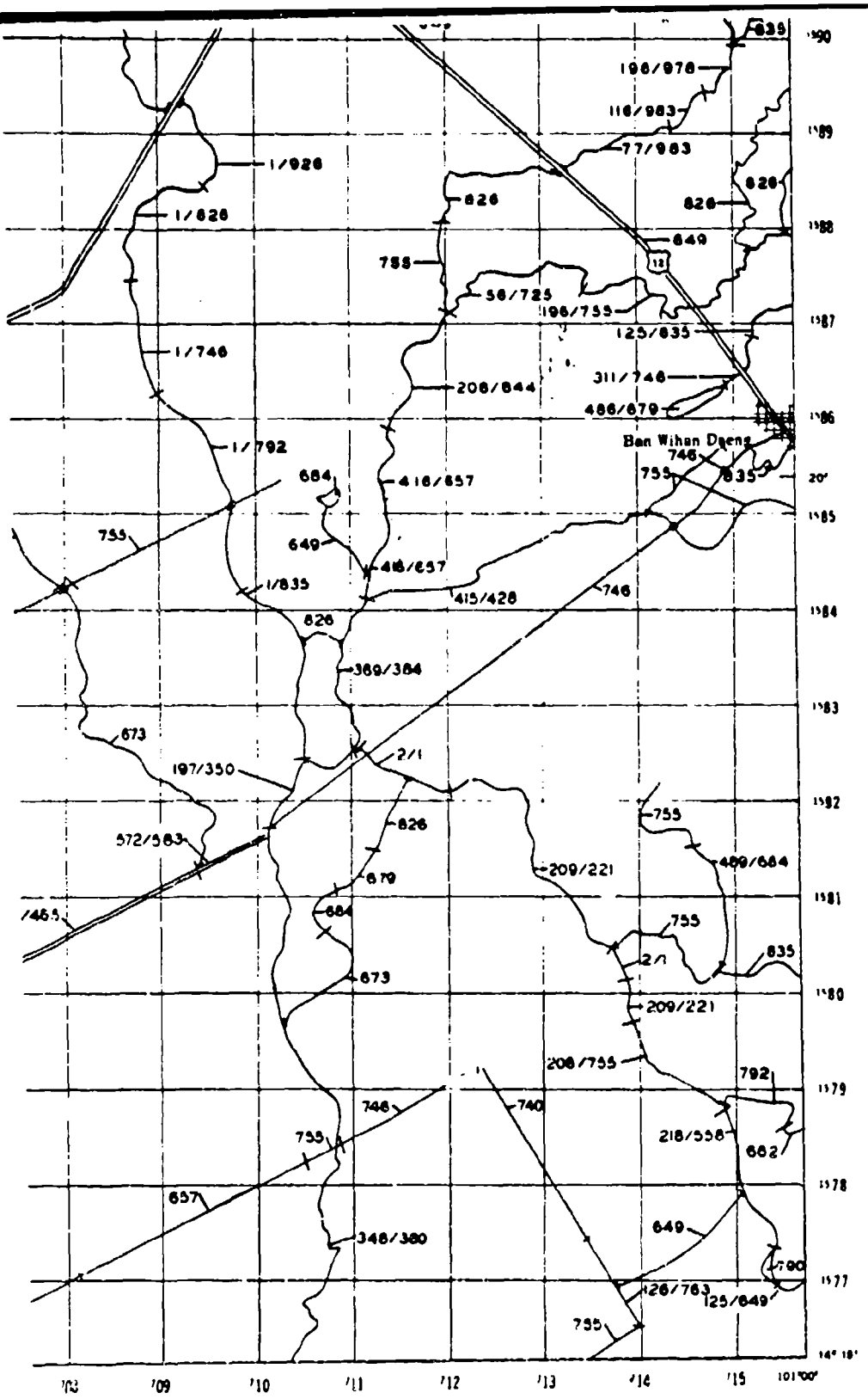
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 17 P

4


384/730
531/763
679
649
657
673
521/687
416/657
740
726
489/873
Amphoe Non Khae
521/844
416/755
248/655
311/649
755
835
640
567/877
312/424
211/
125
350/679
755
311/763
521/844
679
489/873
75/93
389/763
521/851
Khlong Sung Khwai
389/783
673
872
Khlong Yi Sip Hok
75/844
389/555
312/250
197/350
572/583
Ban Khok Khae
Khlong Sip Sam
312/465
373/555
80
792
Khlong Hok
755
649
865
792
679
792
792
640
755
312/465
Khlong Hiuk Wa
Sai-Bon
755
657
684
594/
609
792
679
679
341/844
612/
755
649
384/662
755
490/489
699
700
701
702
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SCALES

15

1



INDEX TO ADJ

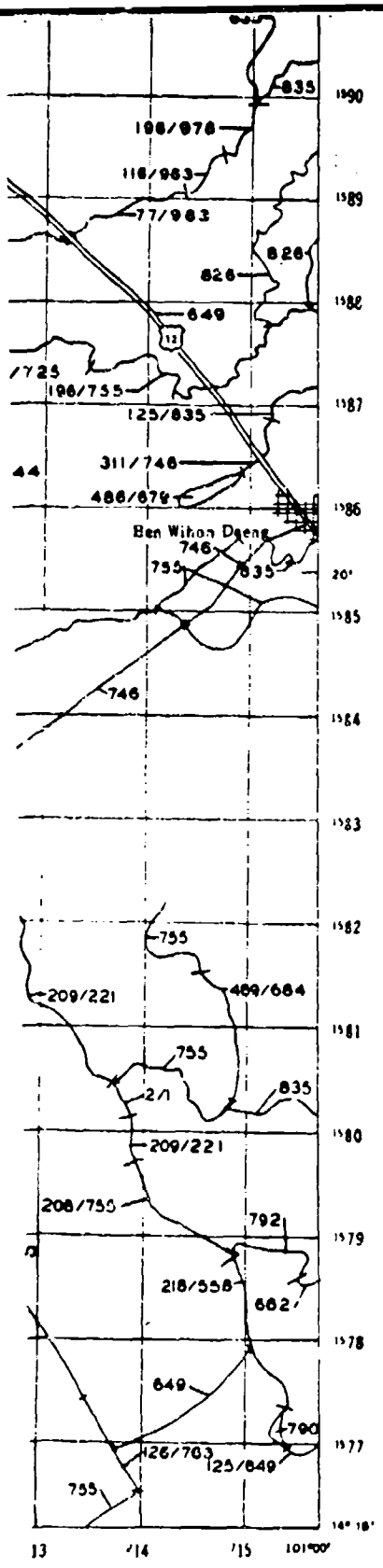
LBI

LBII

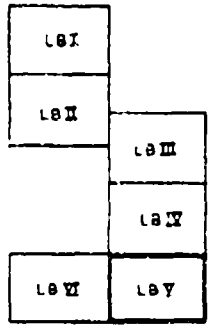
LBVI

A QUANTITATIVE METI
TERRAIN FOR GE
HYDROLOGIC
LOP BURI S1
SHEET

6



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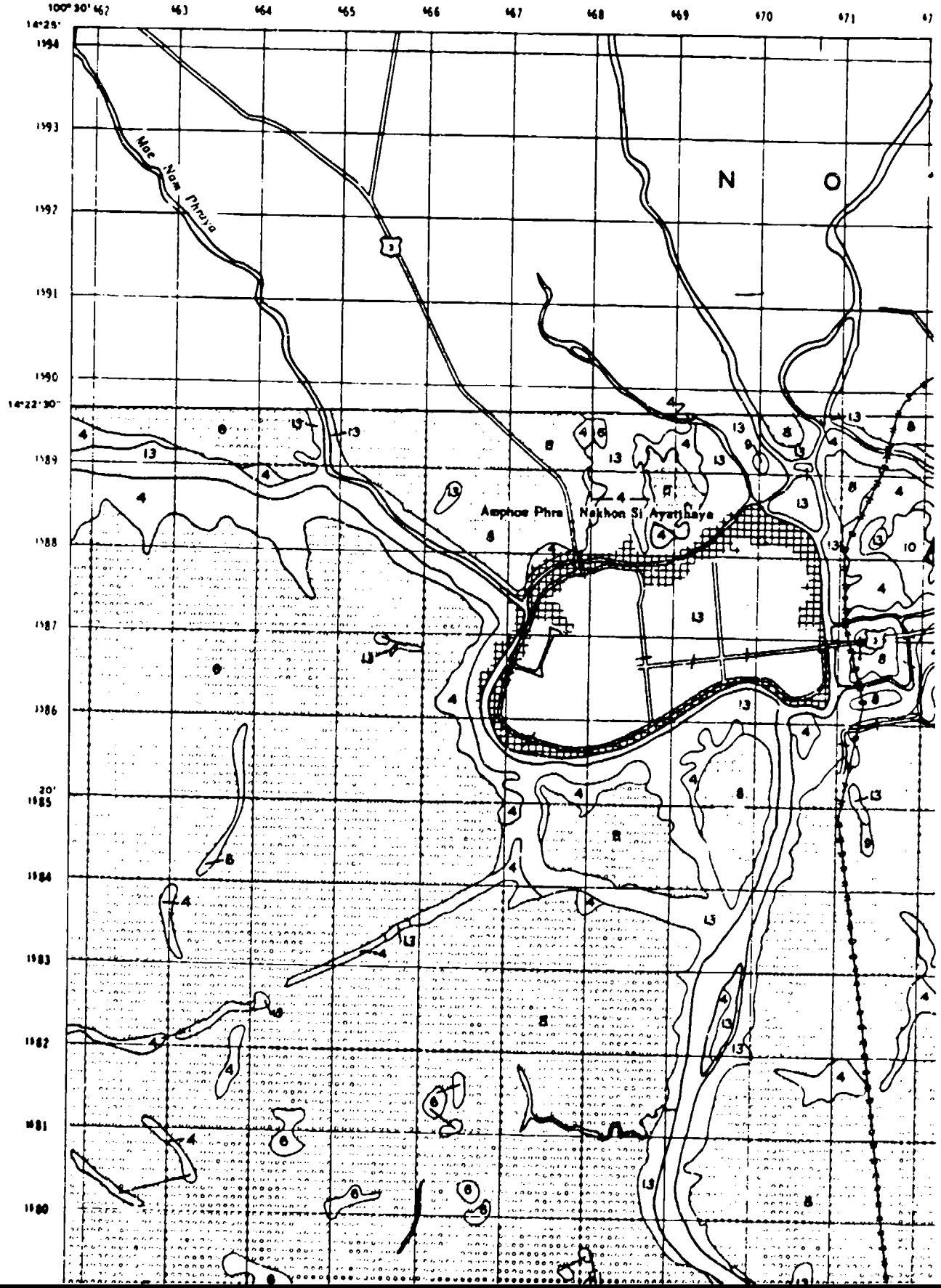
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

LOP BURI STUDY AREA

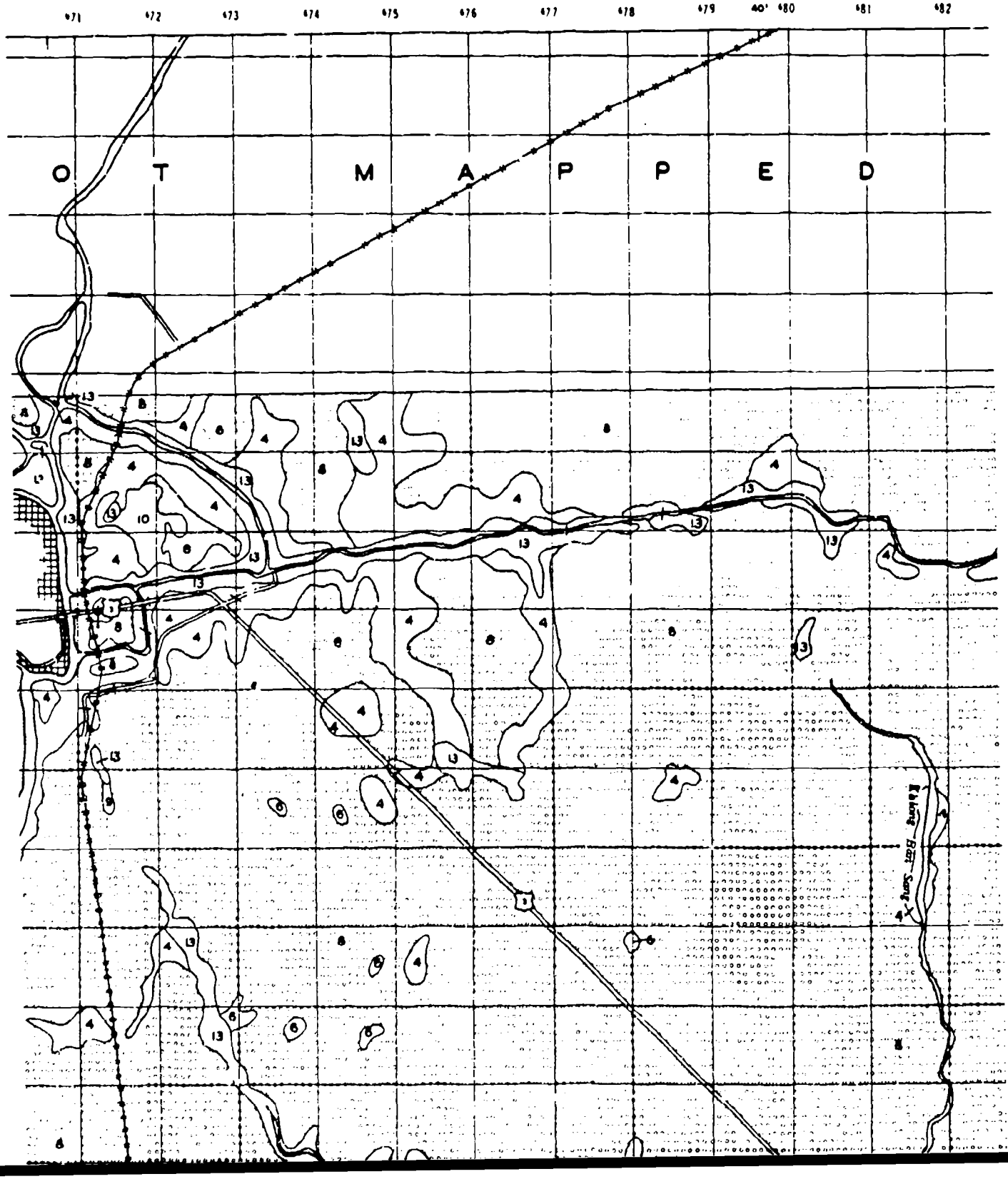
SHEET LB V

PLATE 2.5d

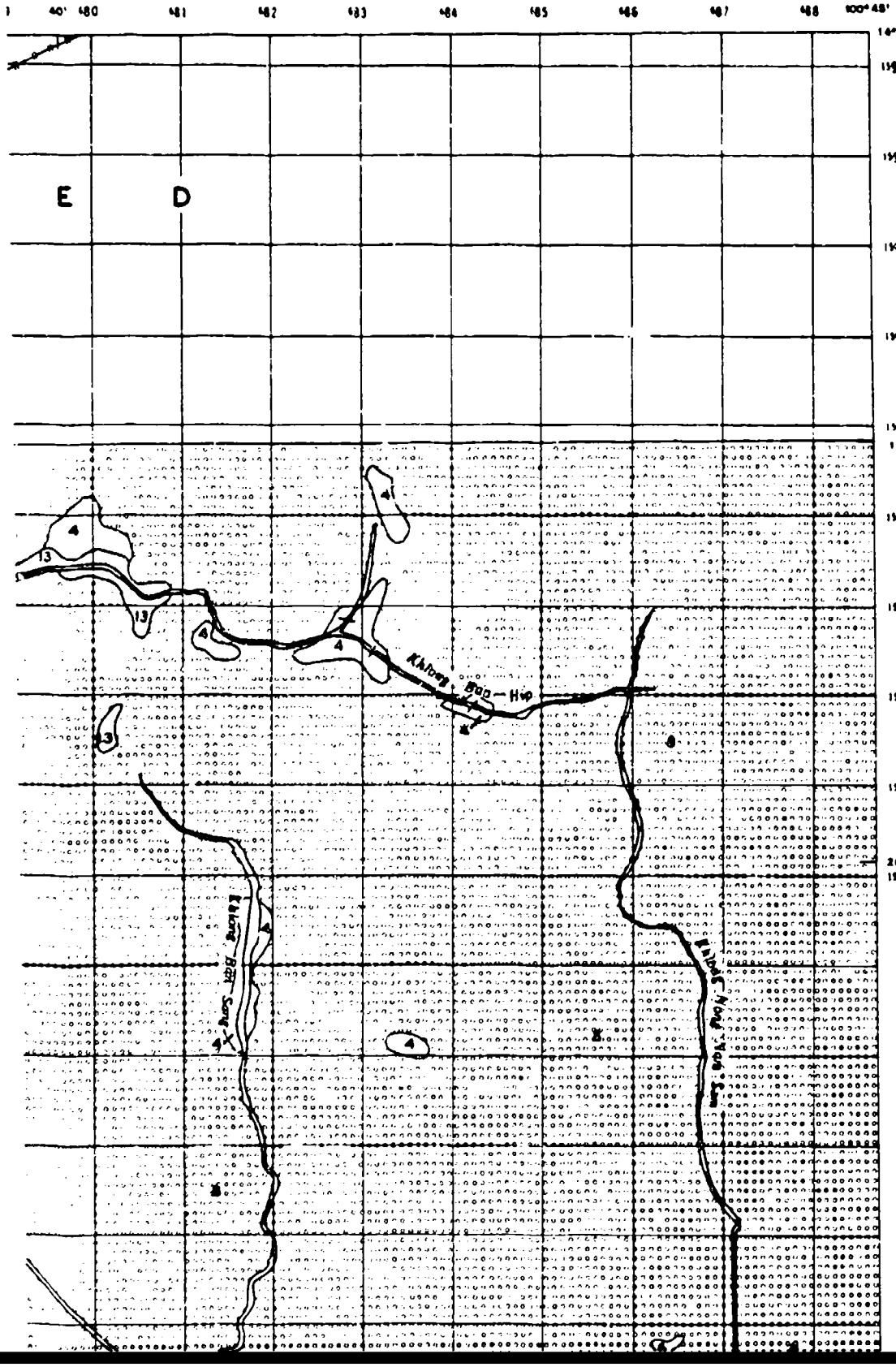

100° 30'
462
463
464
465
466
467
468
469
470
471
14°25'
1994
1993
1992
1991
1990
14°22'30"
1989
1988
1987
1986
20'
1985
1984
1983
1982
1981
1980
Mae Nam Phraya
N
O
Amphoe Phra Nakhon Si Ayutthaya

1 2

LOP BURI



SHEET LB VI



Unit	Soil Mass Strength: Maximum Moisture (PCF)	Minimum Moisture (PCF)
	10-25	25-60
	25-60	60-100
	25-60*	60-100
7	25-60	>100
	25-60*	>100
6	60-100	60-100
	60-100	60-100
9	60-100	>100
10	60-100	>100
	60-100*	>100
	>100	>100
12	>100	>100
	Complex of 60-100 and >100	>100
	Complex of 60-100 and >100	>100

Note: Blank areas are under bo

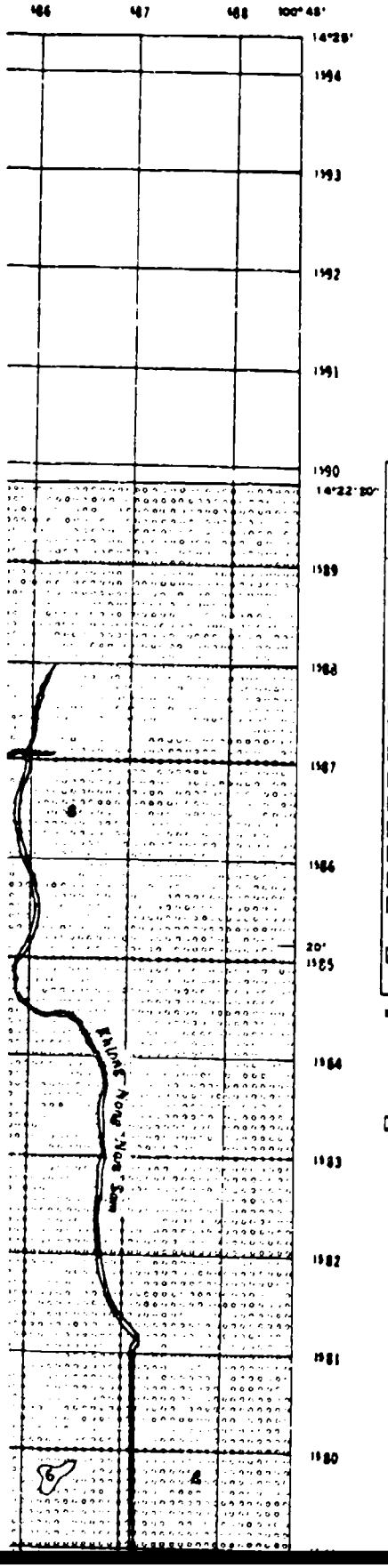
c_{ur} Shear strength at zero s

ϕ_{ur} Angle of internal friti

* Maximum moisture has les strengths commonly observ

Units do not occur on th

SHEET LB VI



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{uf} psi	c_{uf} kg/cm²	α_{uf} deg	Soil Surface Strength: Minimum Moisture c_{uf} psi	c_{uf} kg/cm²	α_{uf} deg	Conditions where maximum c_{uf} occurs: c_{uf} psi	c_{uf} kg/cm²	α_{uf} deg
X	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
X	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
X	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
6	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
X	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
X	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
X	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
X	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
X	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
X	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

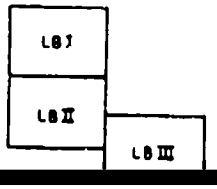
c_{uf} Shear strength at zero normal load.

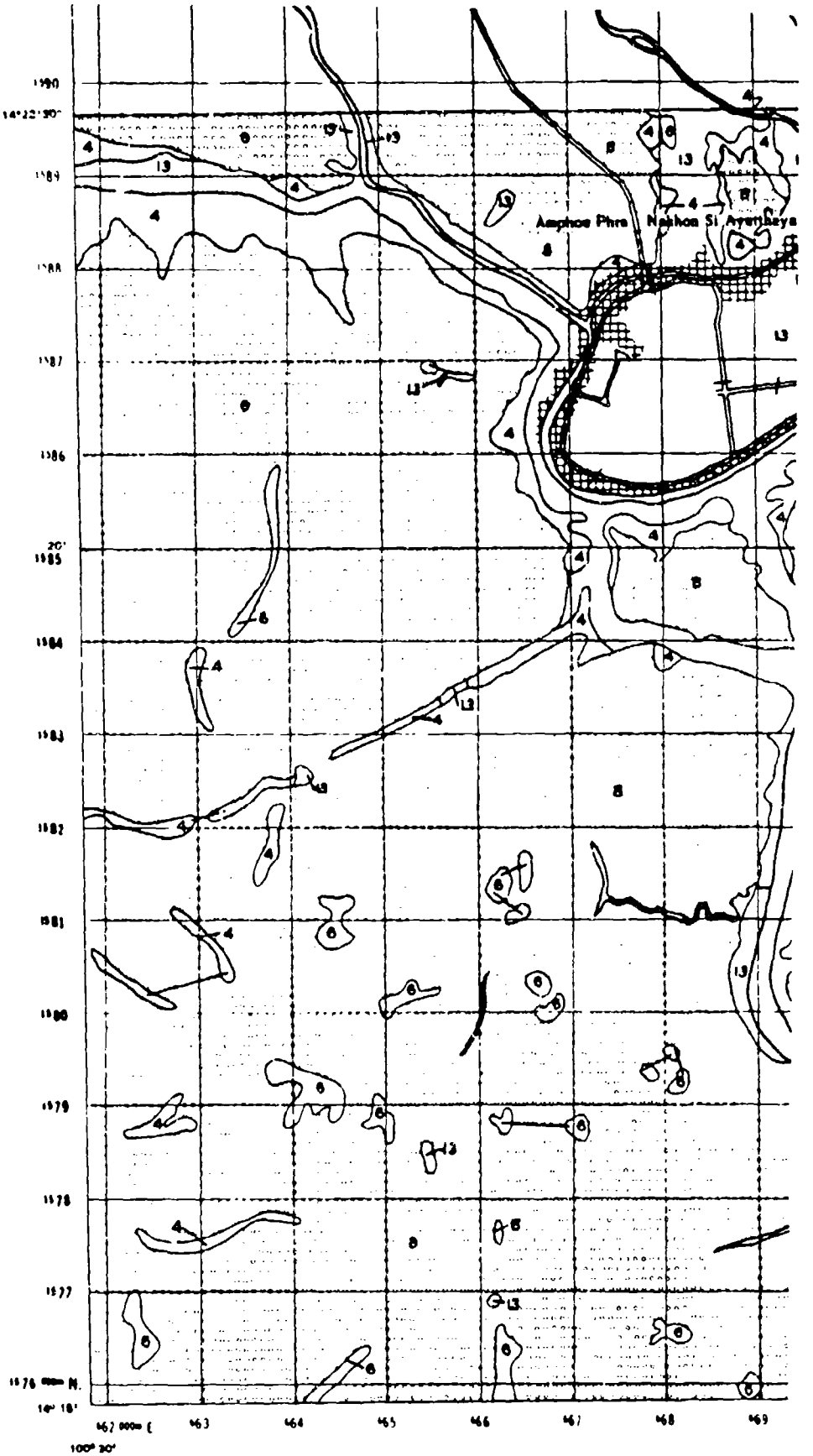
α_{uf} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

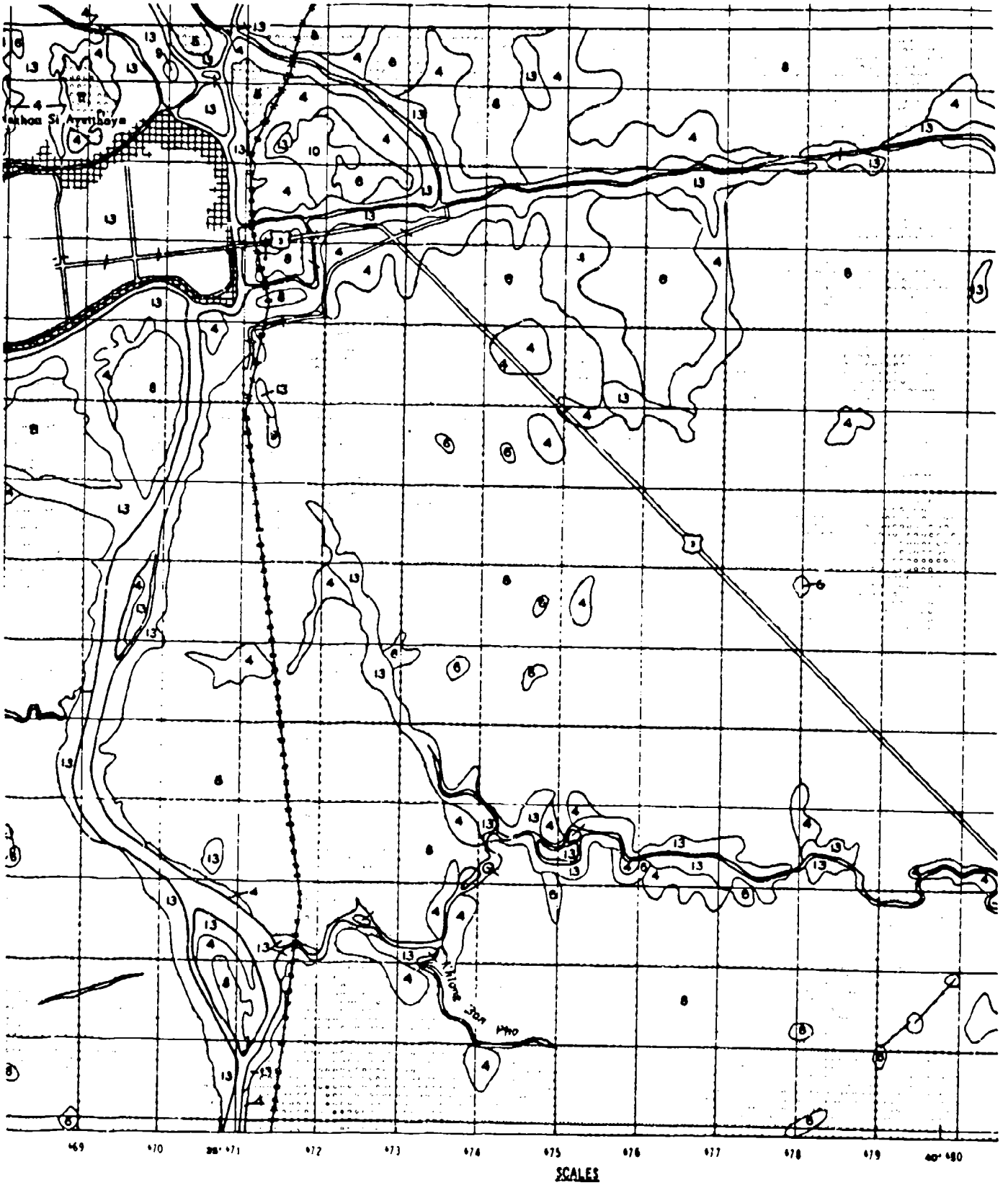
X Units do not occur on this map.

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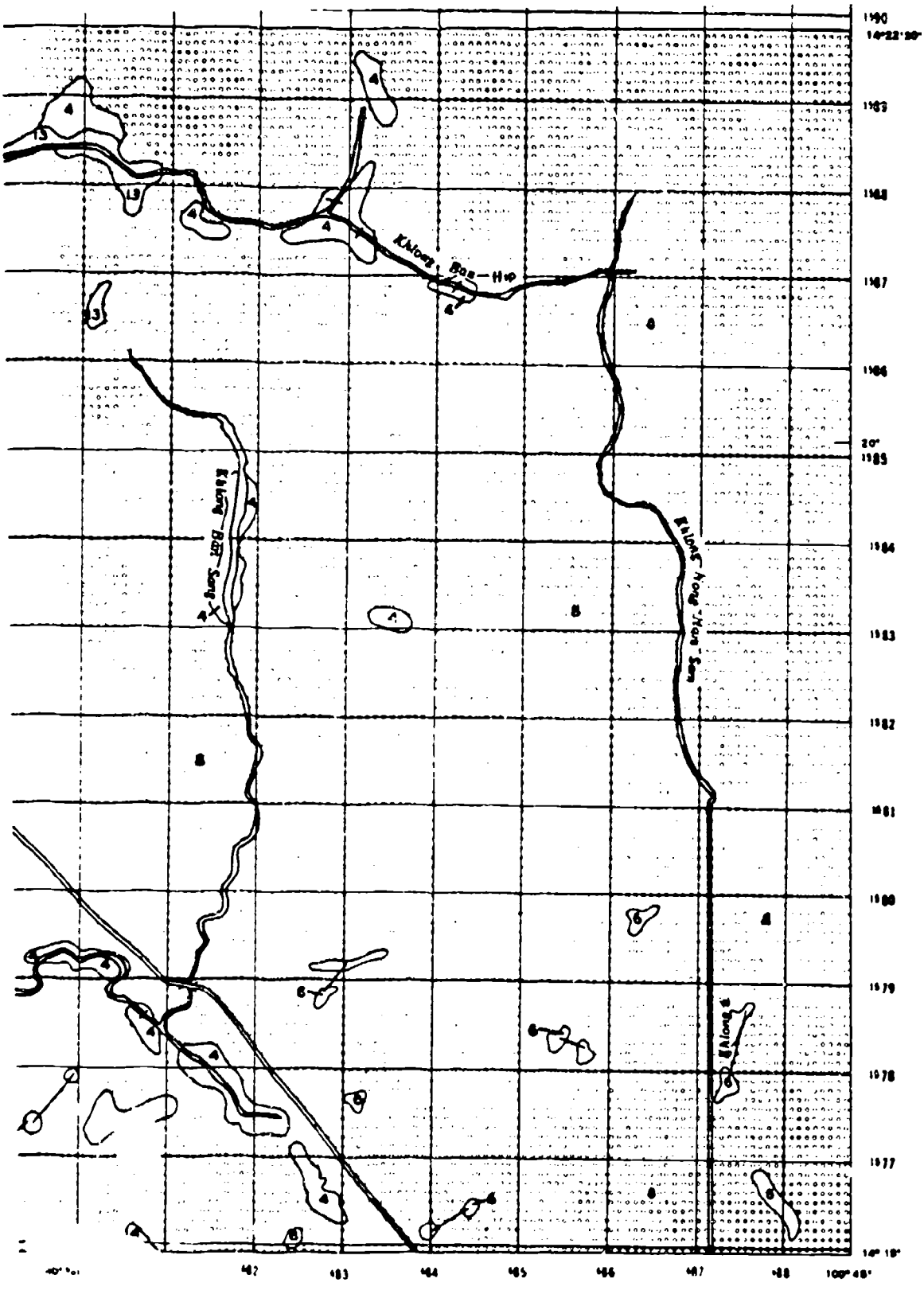




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P



6



Unit	Soil Mass Strength: Maximum Moisture (kPa)	Soil Mass Strength: Minimum Moisture (kPa)
	10-25	25-60
	25-60	60-100
	25-60*	60-100
	25-60	>100
	25-60*	>100
	60-100	60-100
	60-100	60-100
	60-100	>100
9	60-100	>100
10	60-100	>100
	60-100*	>100
	>100	>100
12	>100	>100
	Complex of 60-100 and >100	>100
	Complex of 60-100 and >100	>100

Note: Mixed areas are weaker th

A_{sp} Shear strength at more

α_{sp} Angle of internal fricti

* Maximum moisture has lo strengths commonly observ

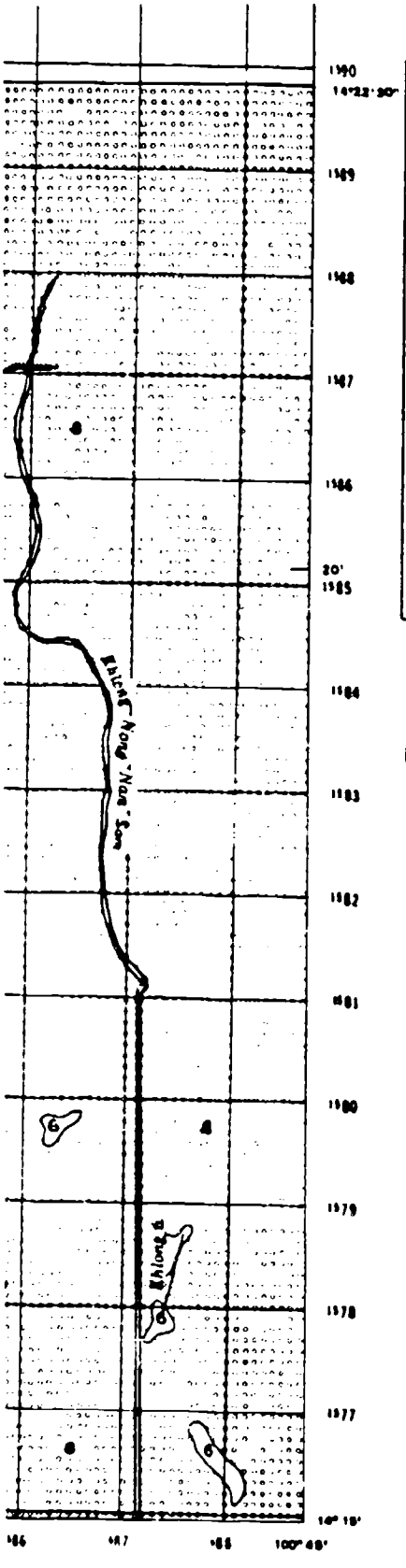
Units do not occur on th

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LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{ur} psi	Maximum Moisture c_{ur} kg/cm²	Maximum Moisture ϕ_{ur} deg	Minimum Moisture c_{ur} psi	Minimum Moisture c_{ur} kg/cm²	Minimum Moisture ϕ_{ur} deg	Conditions where maximum c_{ur} occurs: c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg
☒	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
☒	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
☒	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
☒	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
☒	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
☒	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
☒	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
☒	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
☒	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

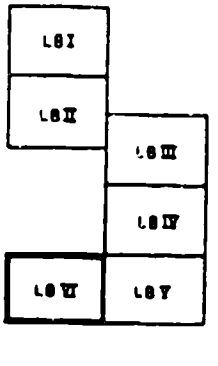
c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

☒ Units do not occur on this map.

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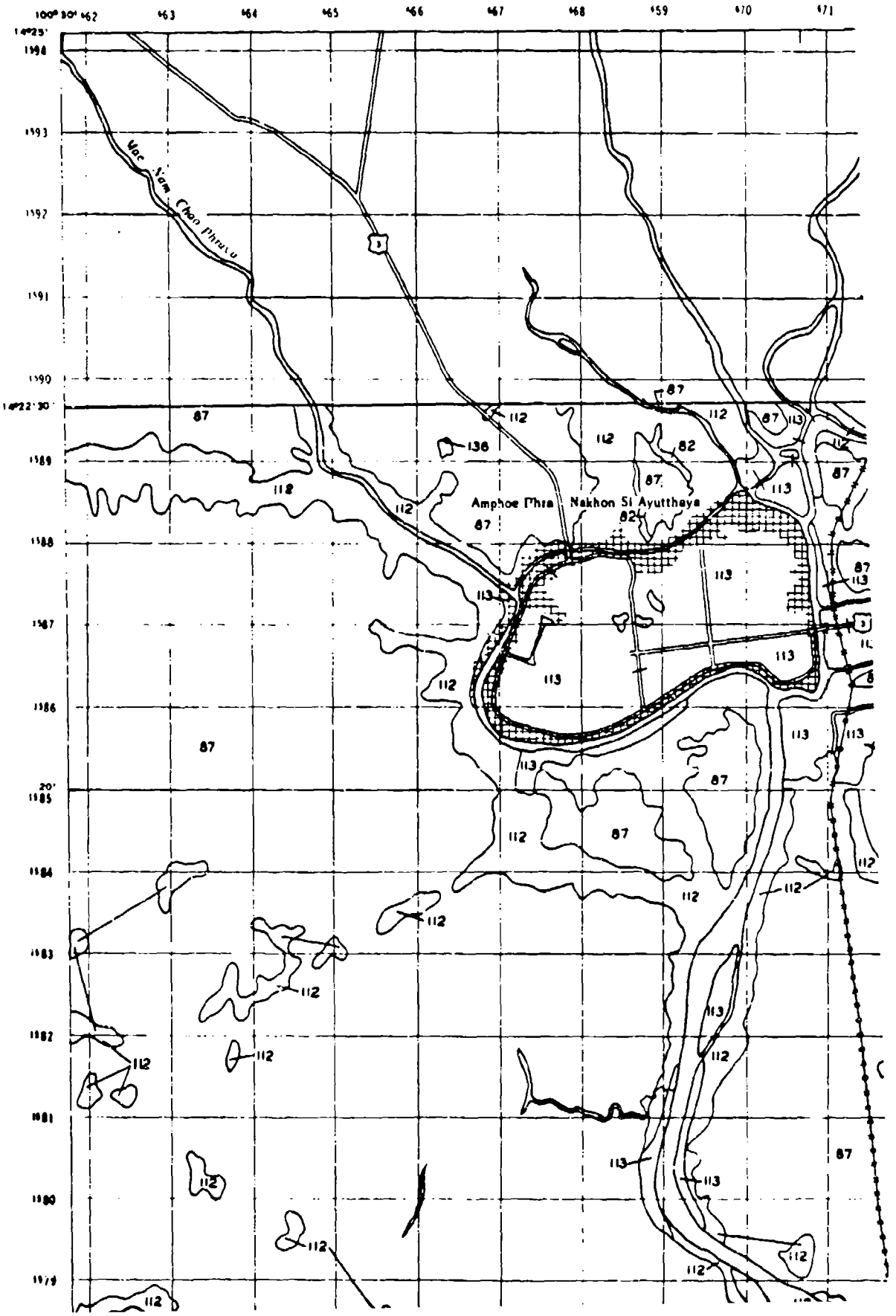
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

LOP BURI STUDY AREA

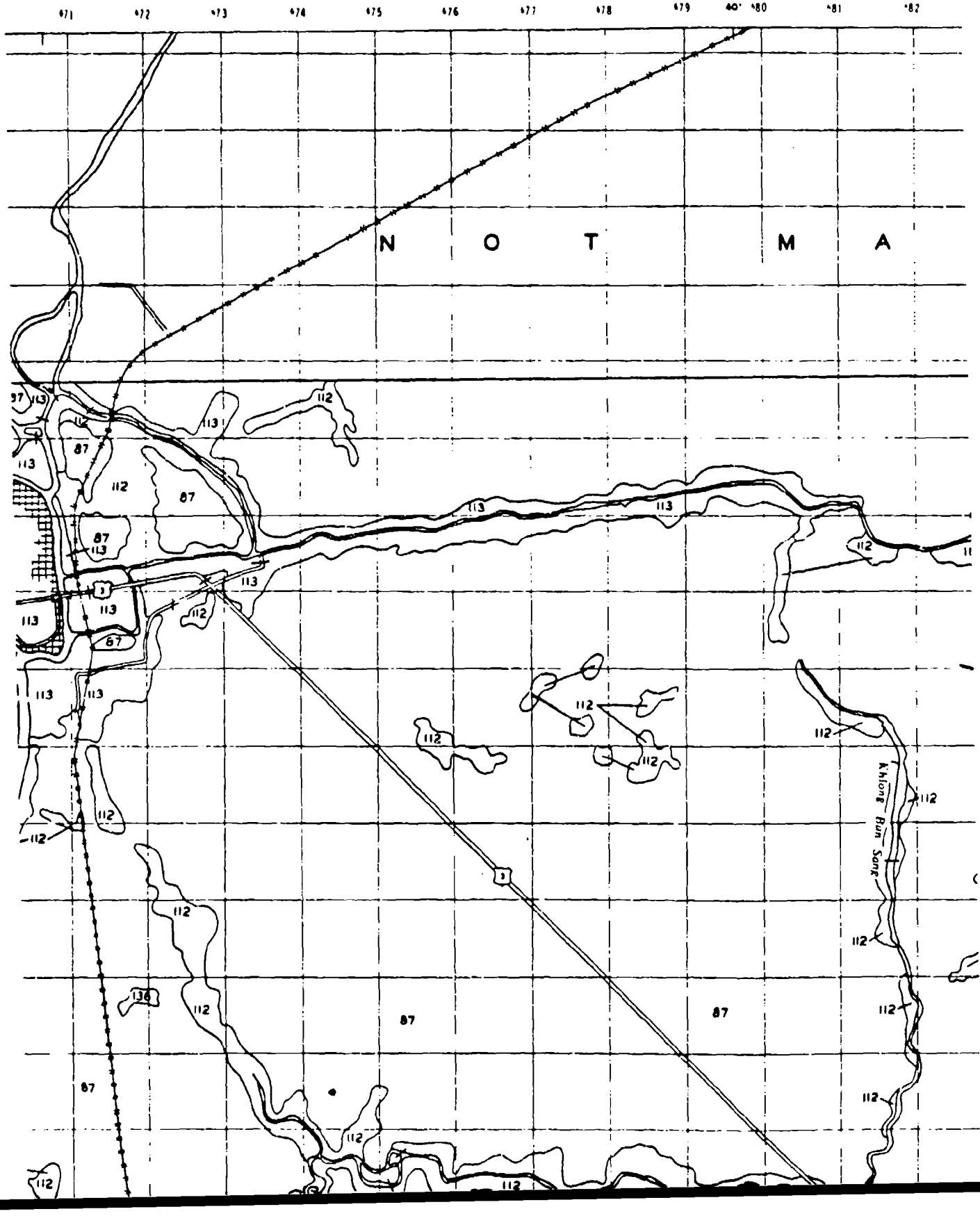
SHEET LB VI

PLATE 2.6a


Mae Nam Chao Phraya
Amphoe Phra Nakhon Si Ayutthaya
87
112
113
136
82

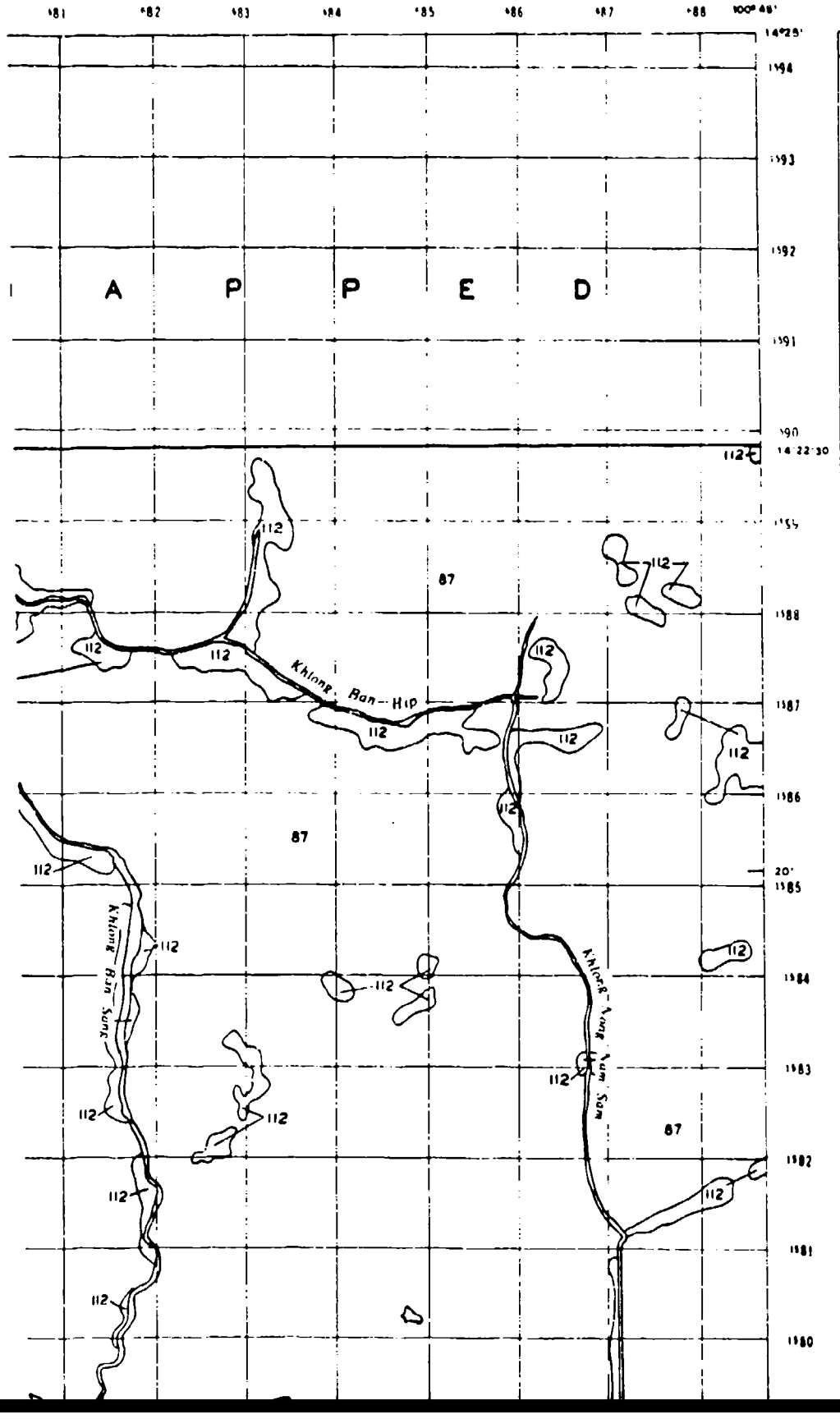
2

LOP BURI



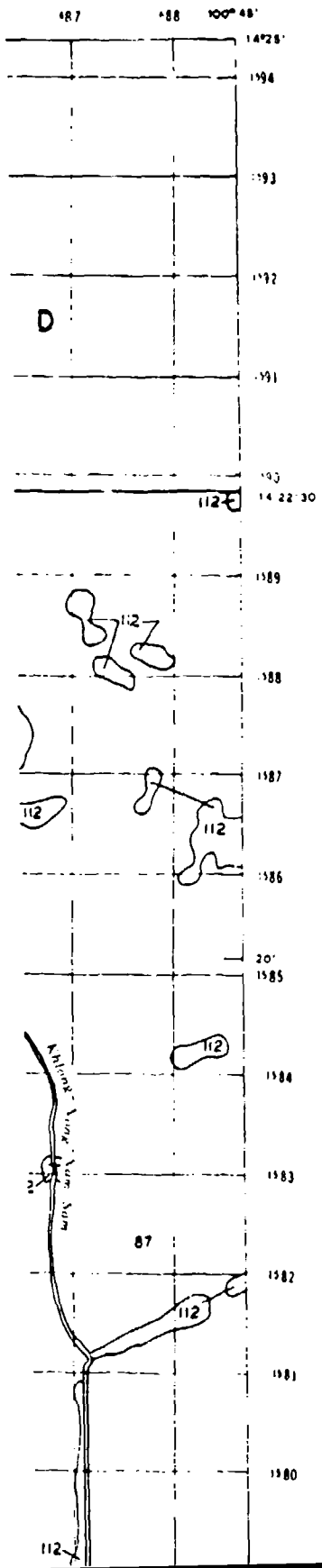
3

SHEET LB VI


A P P E D
87
112
Khlong Ban Hip
Khlong Ban Sam
INDEX TO AD
LB I
LB II

4

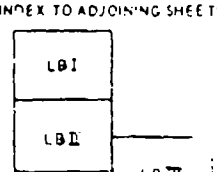
SHEET LB VI

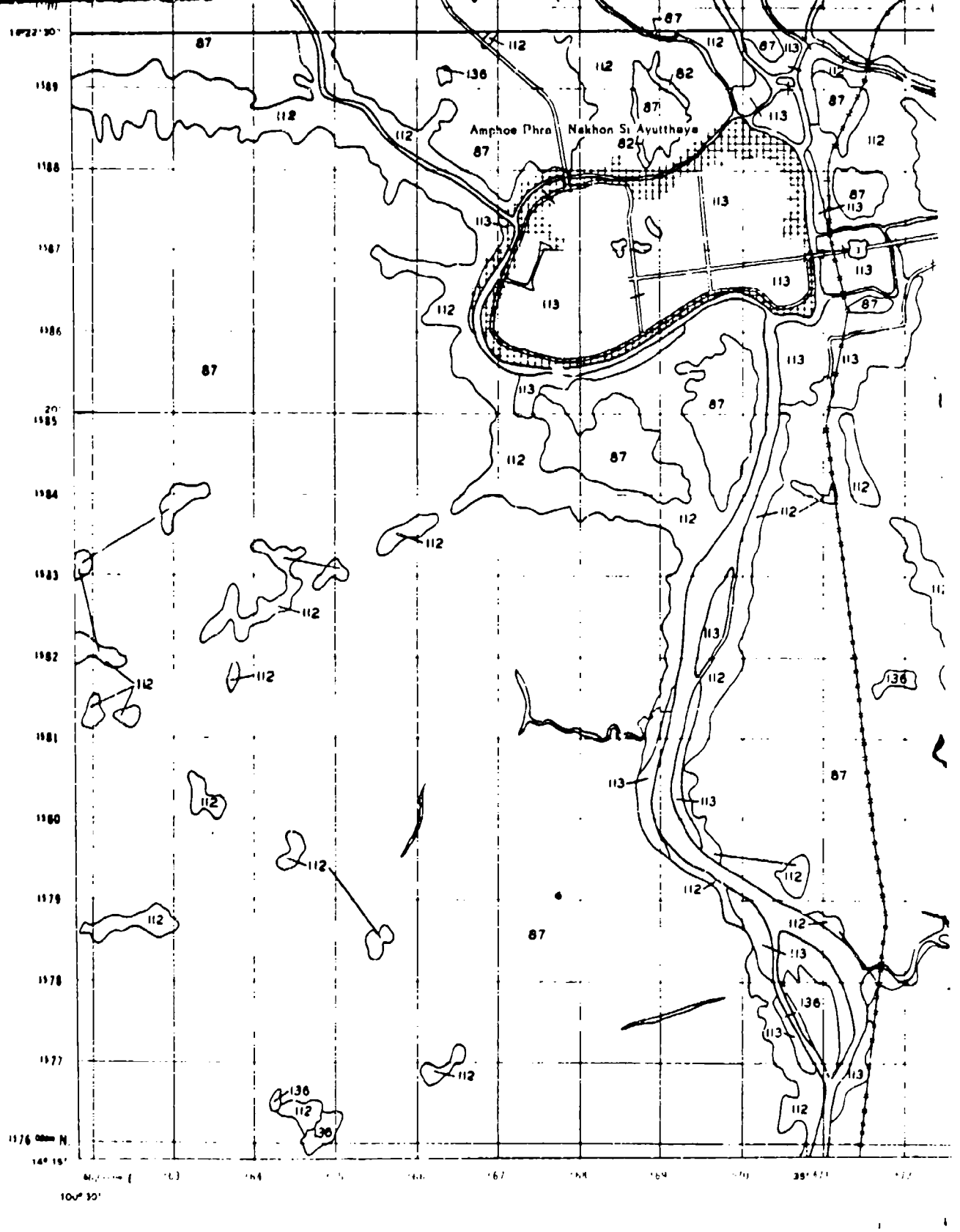


LEGEND



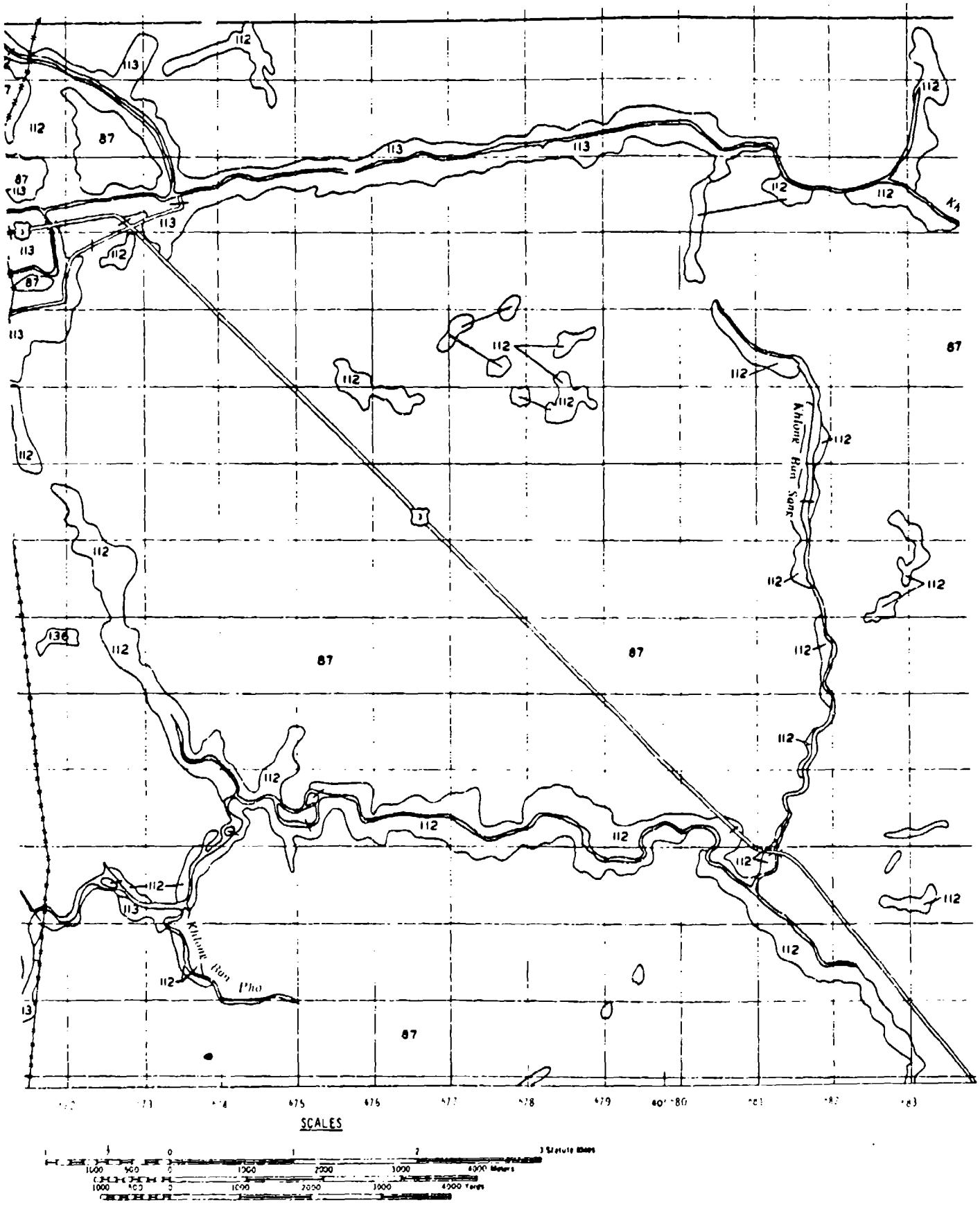
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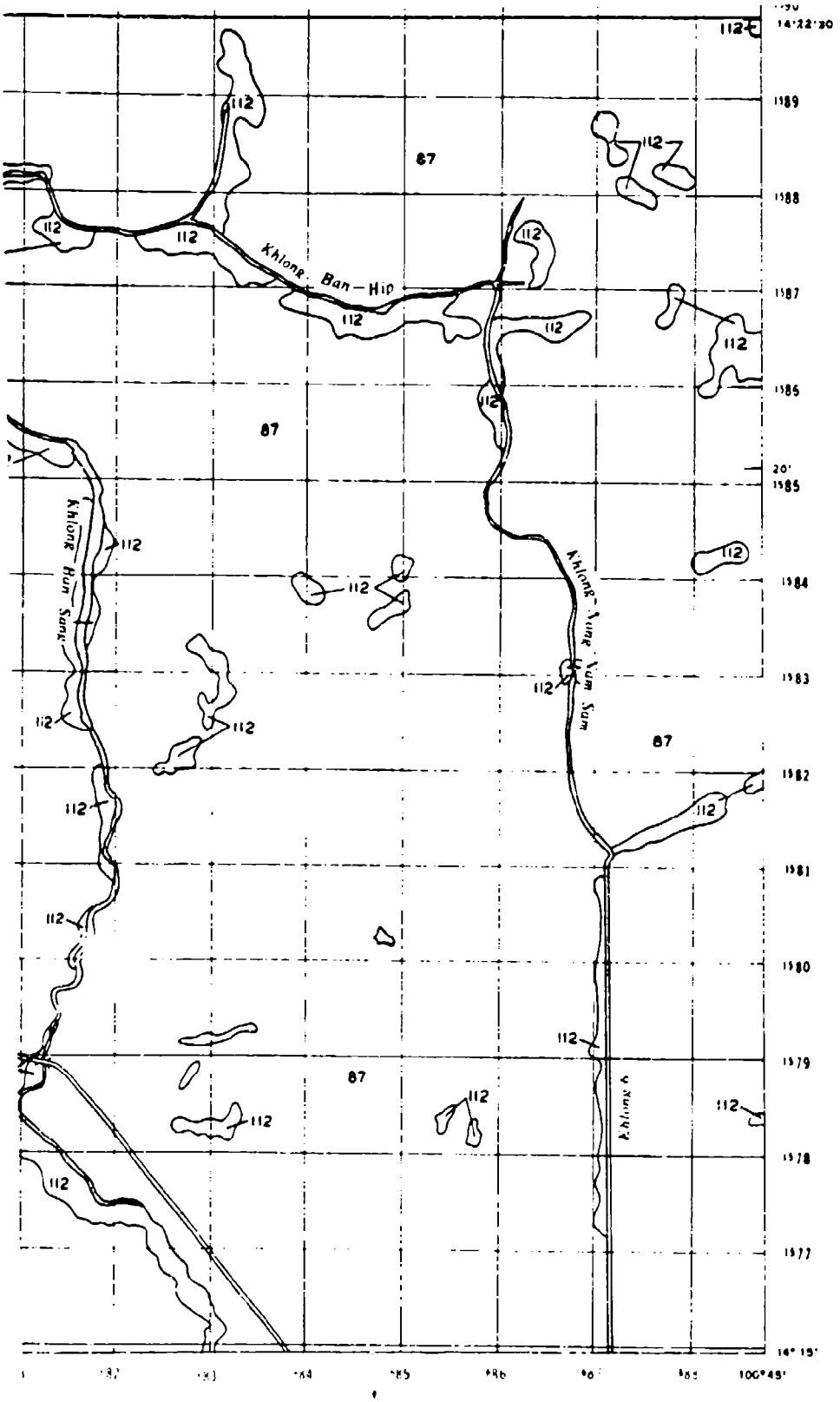
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 P

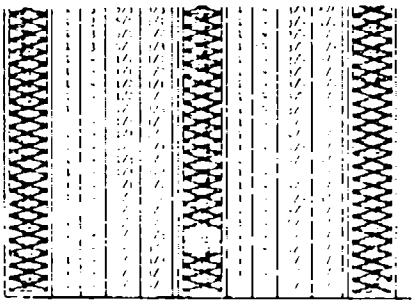
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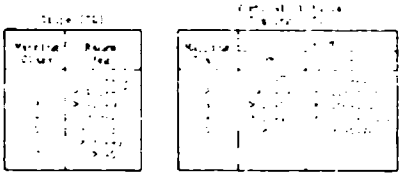


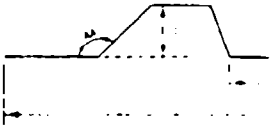
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INDEX TO ADJOININ

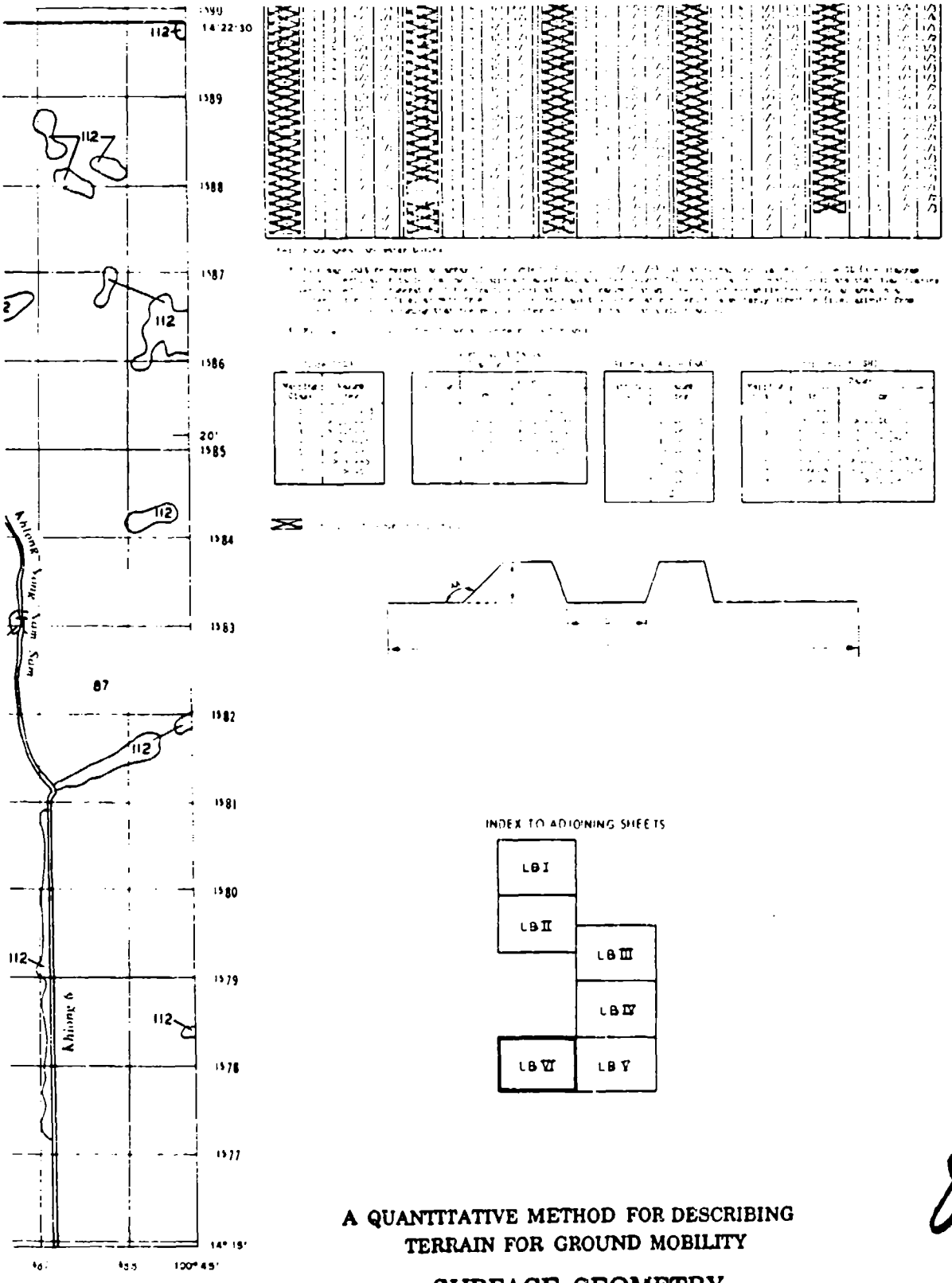
LB I

LB II

LB VI

A QUANTITATIVE METHOI
TERRAIN FOR GROU

SURFACE GE
LOP BURI STUI
SHEET L



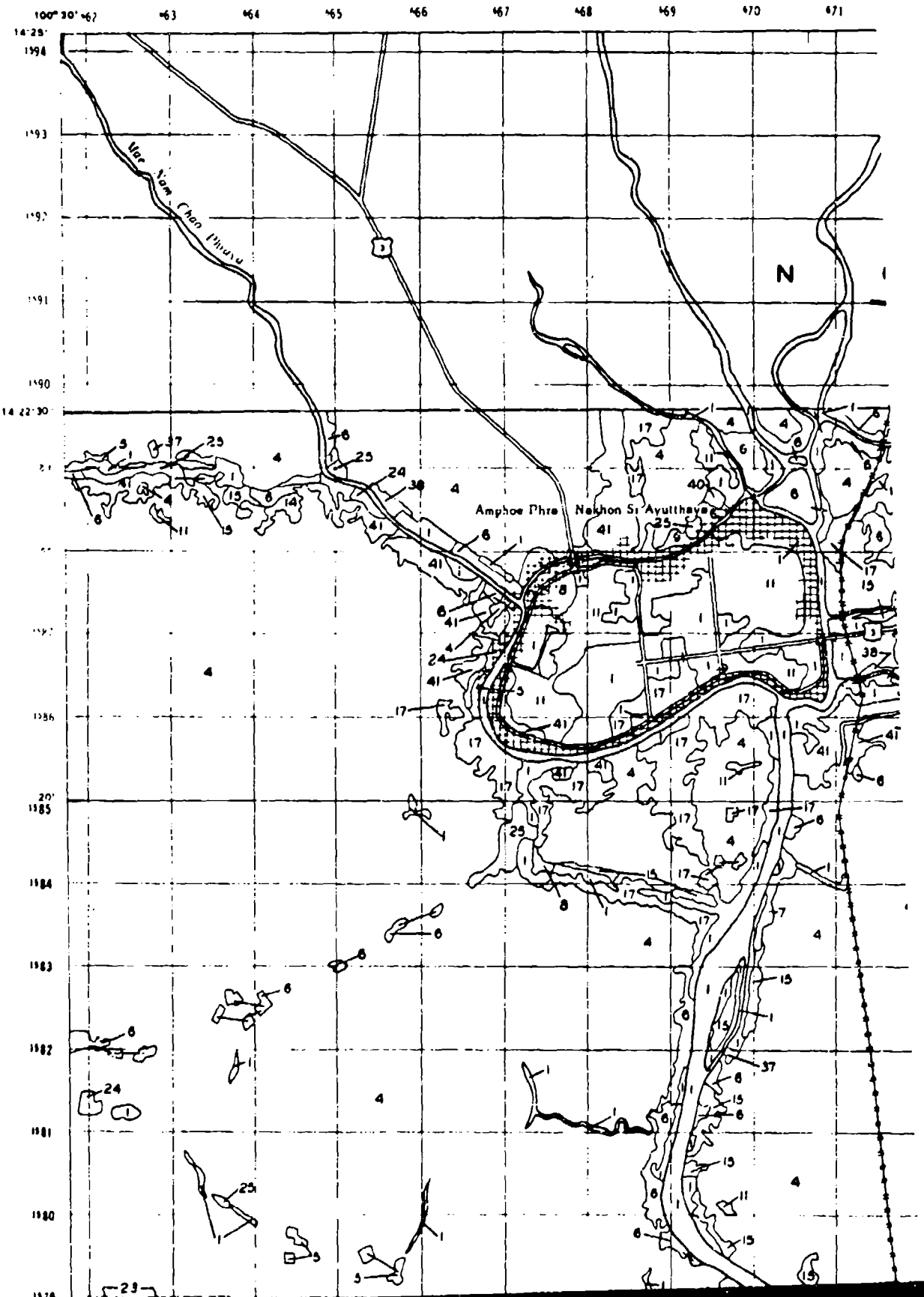
A QUANTITTATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

LOP BURI STUDY AREA

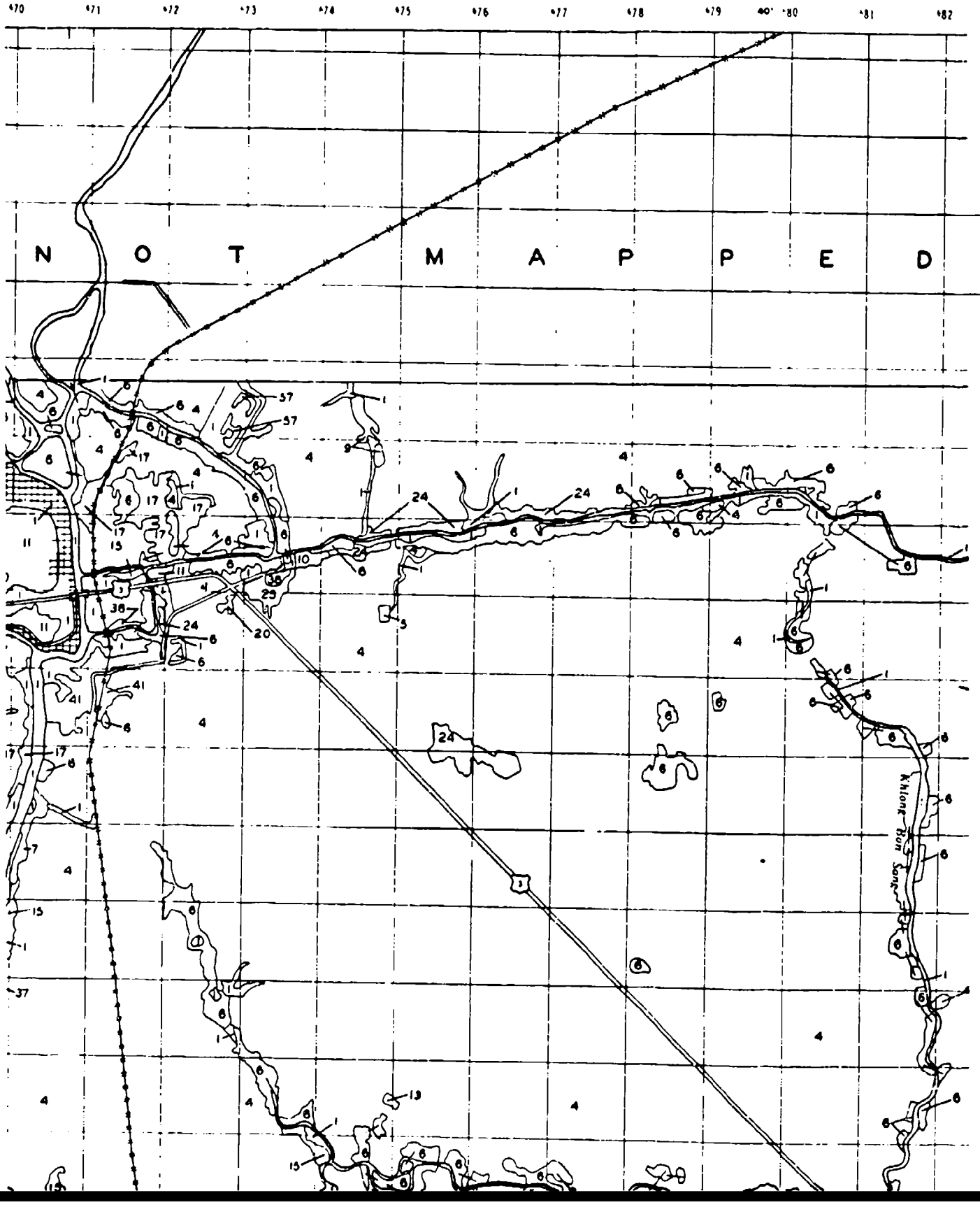
SHEET LB VI

PLATE 2.6b


Amphoe Phra Nakhon Si Ayutthaya
N

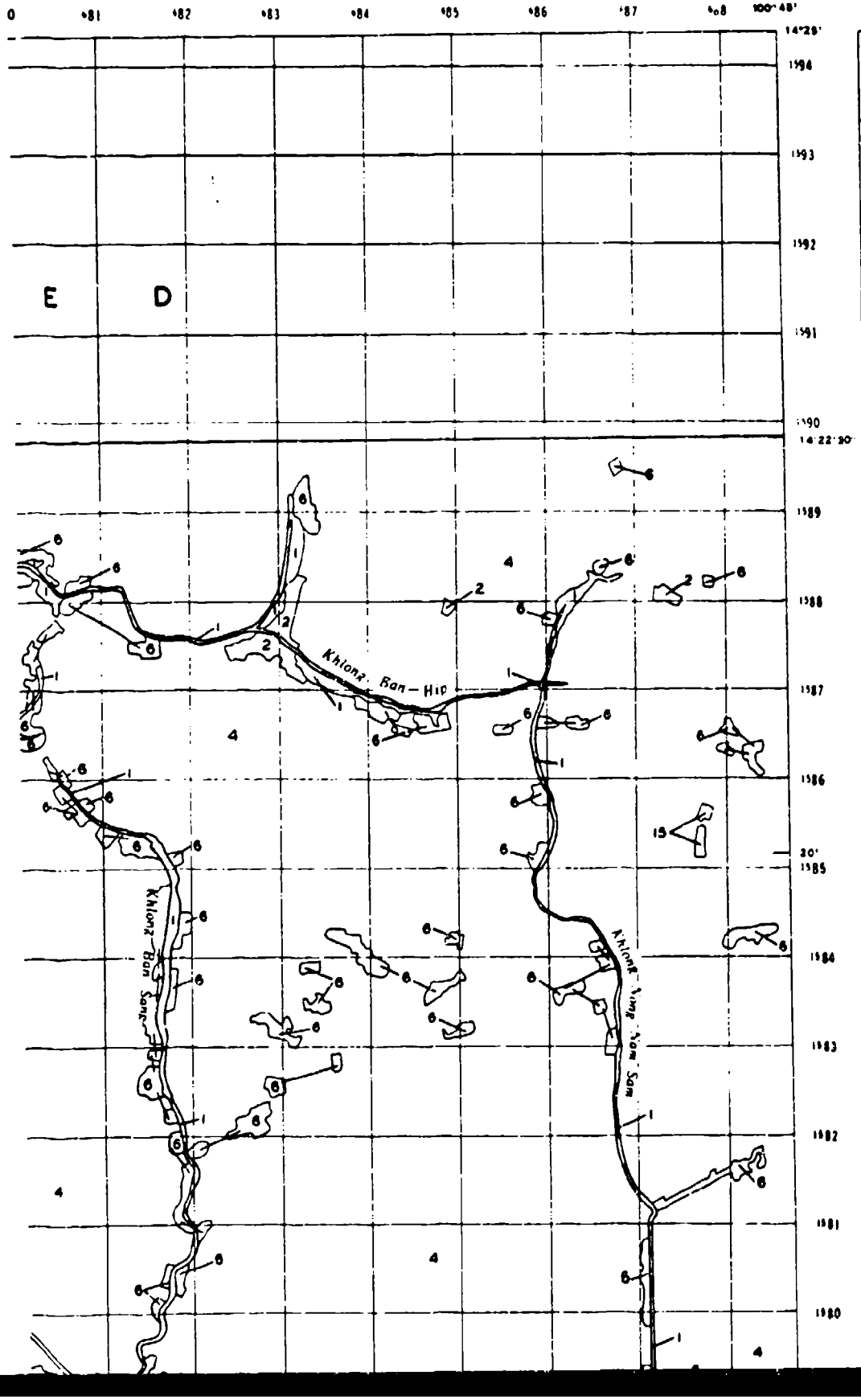
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LOP BURI


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N O T M A P P E D
Khlong Bun Song

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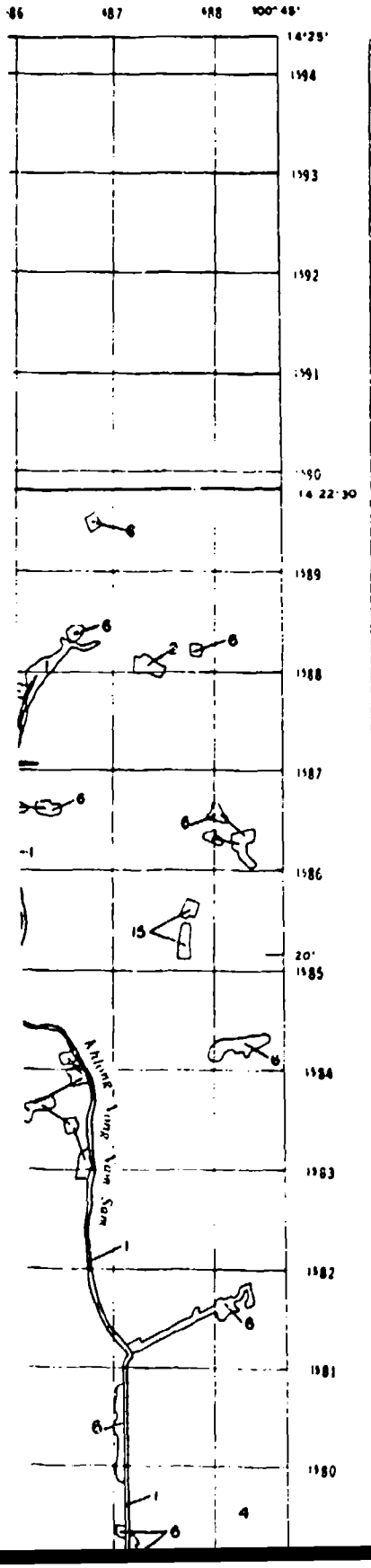
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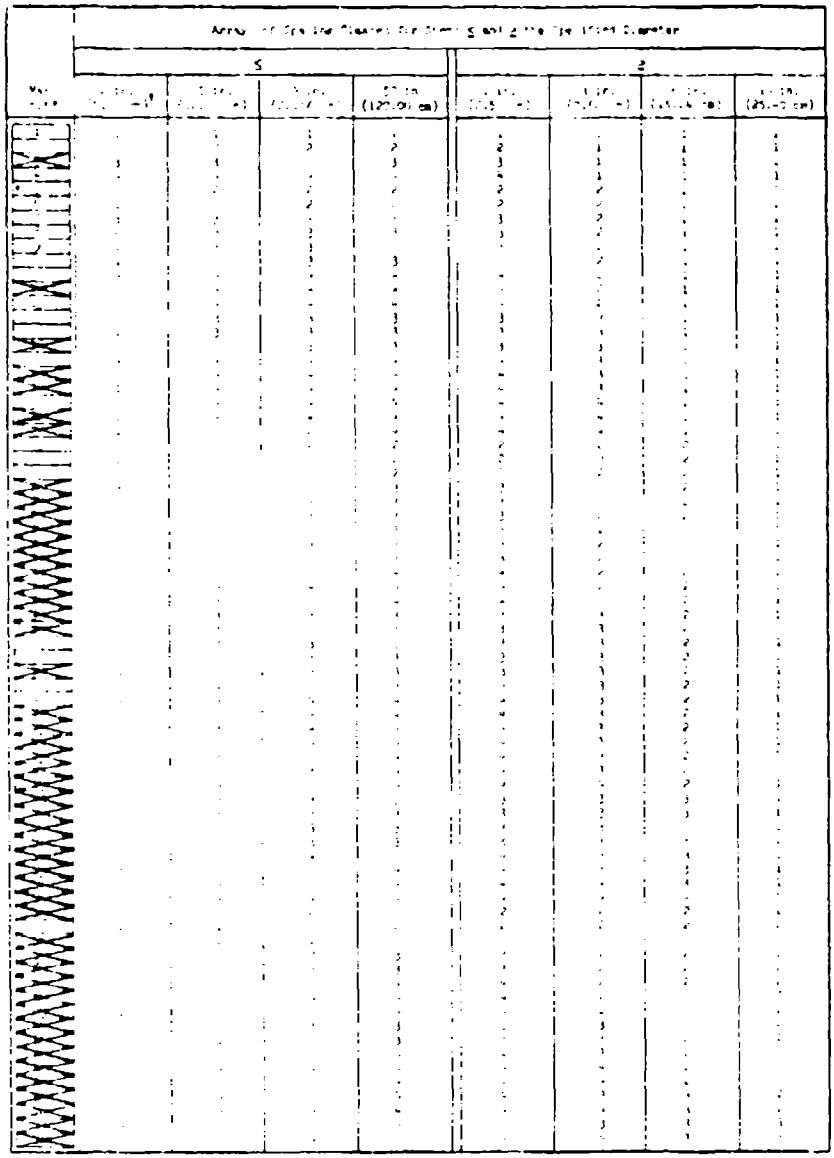
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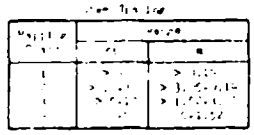
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SHEET LB VI



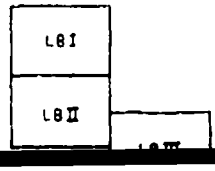
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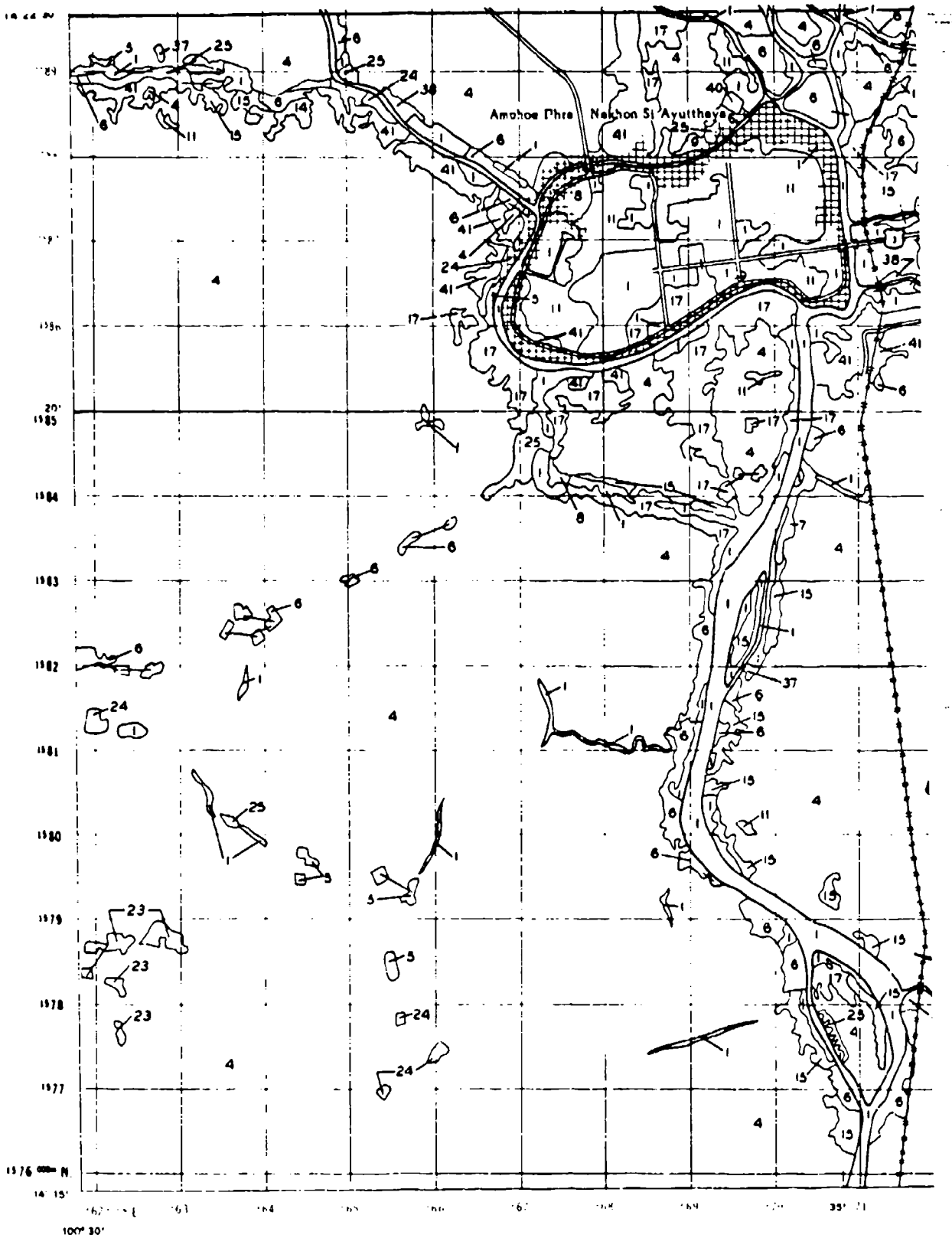






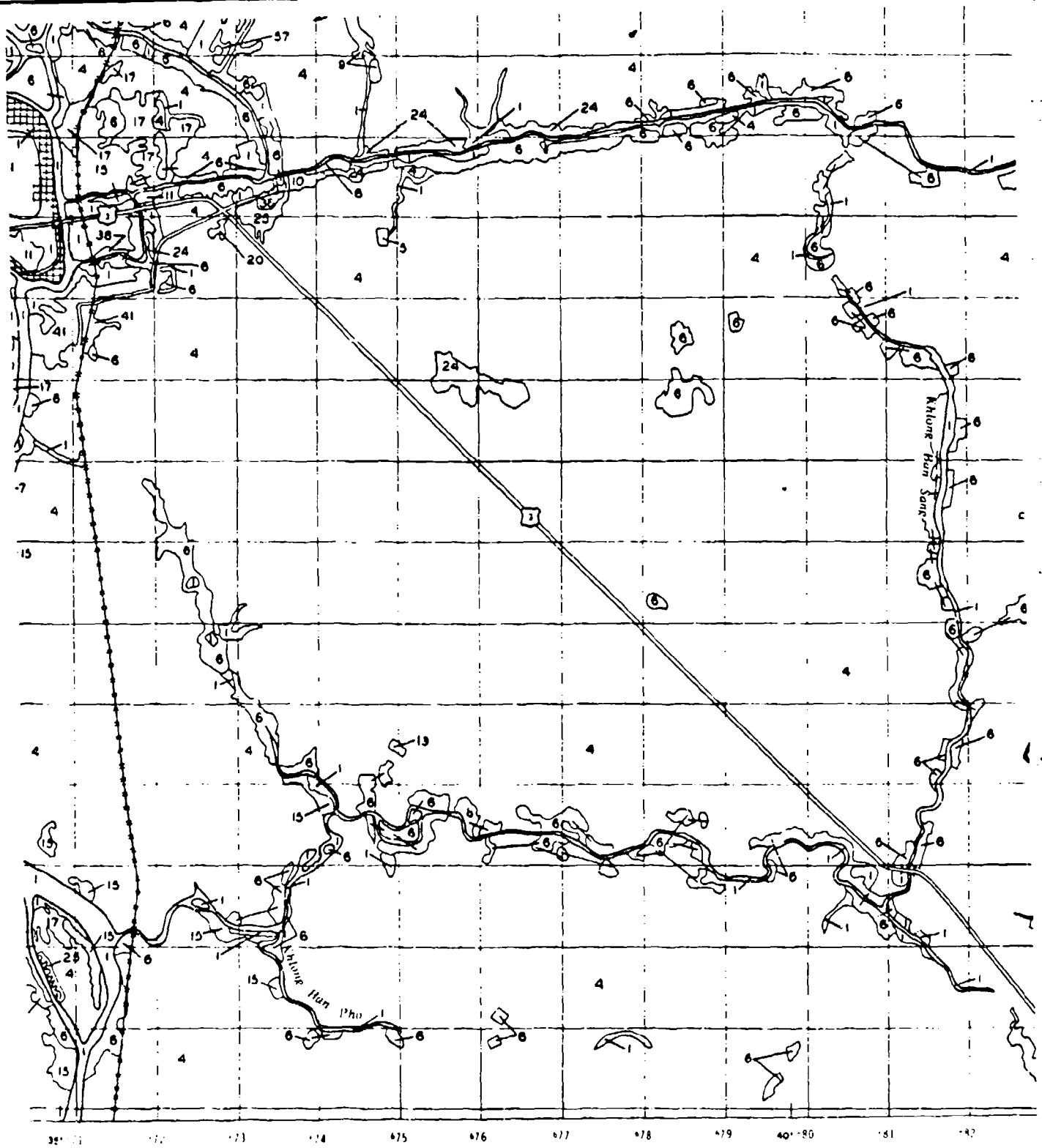
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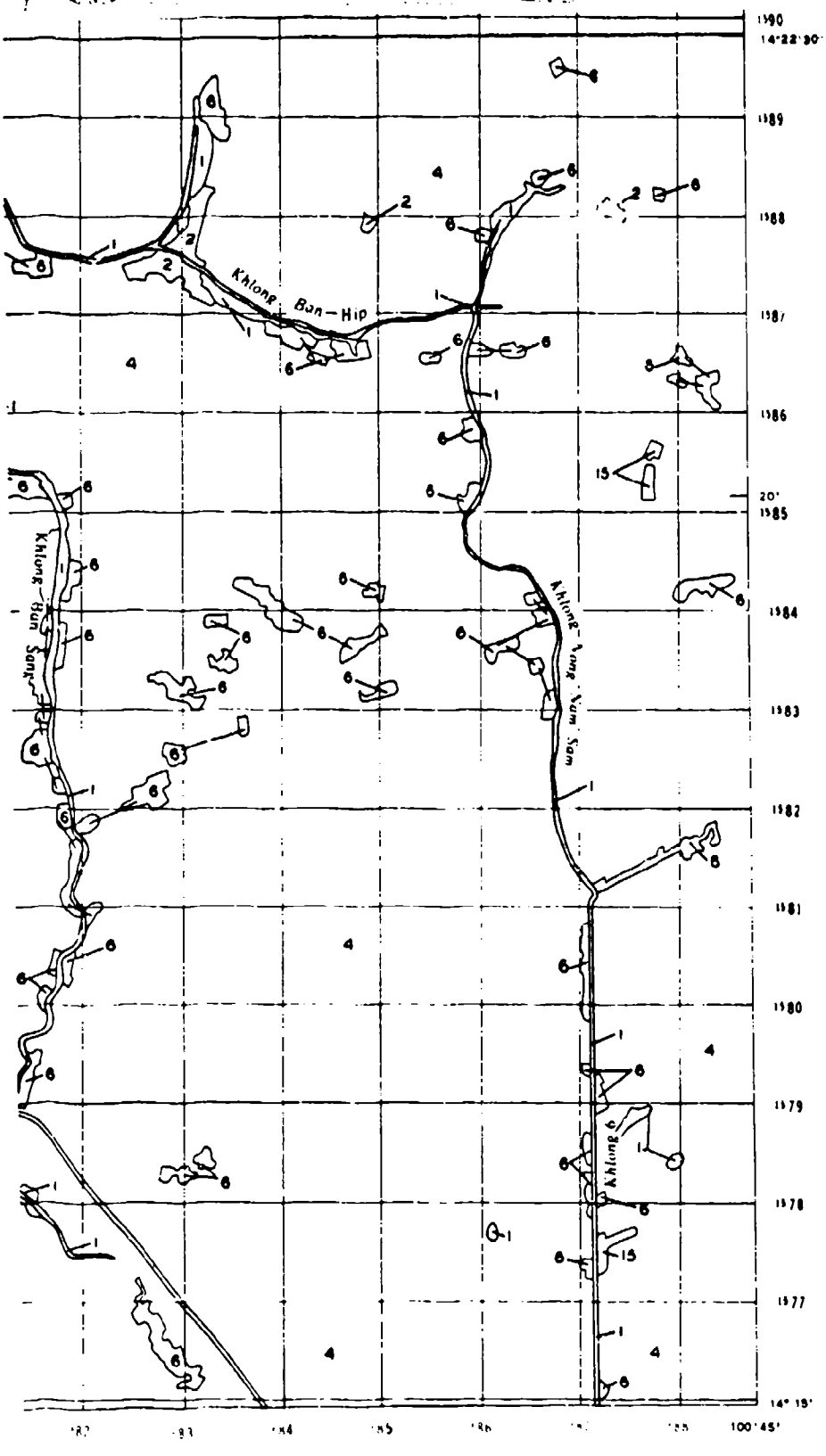
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GRID ZONE DESIGNATION 47 P

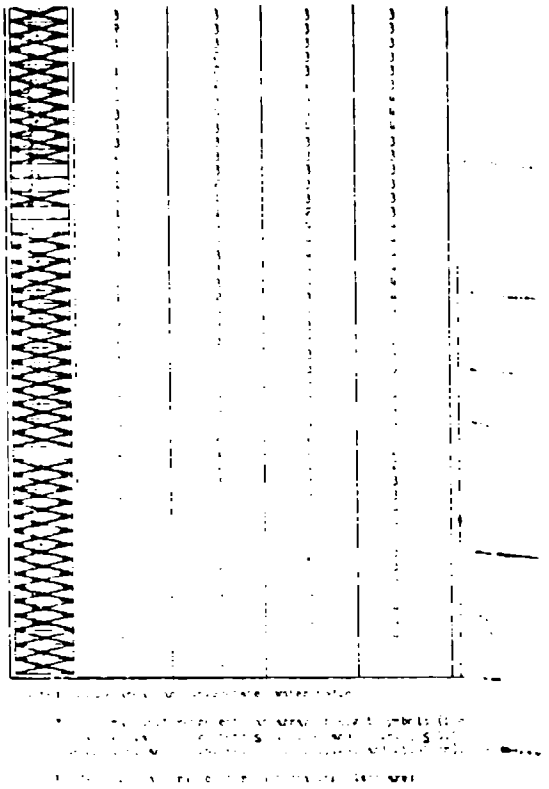
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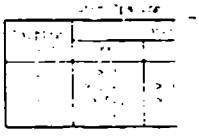


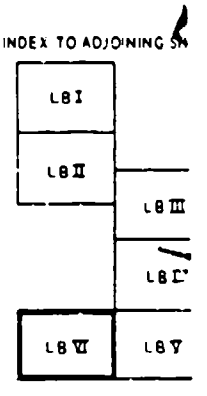
SCALES

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A QUANTITATIVE METHOD F
TERRAIN FOR GROUND

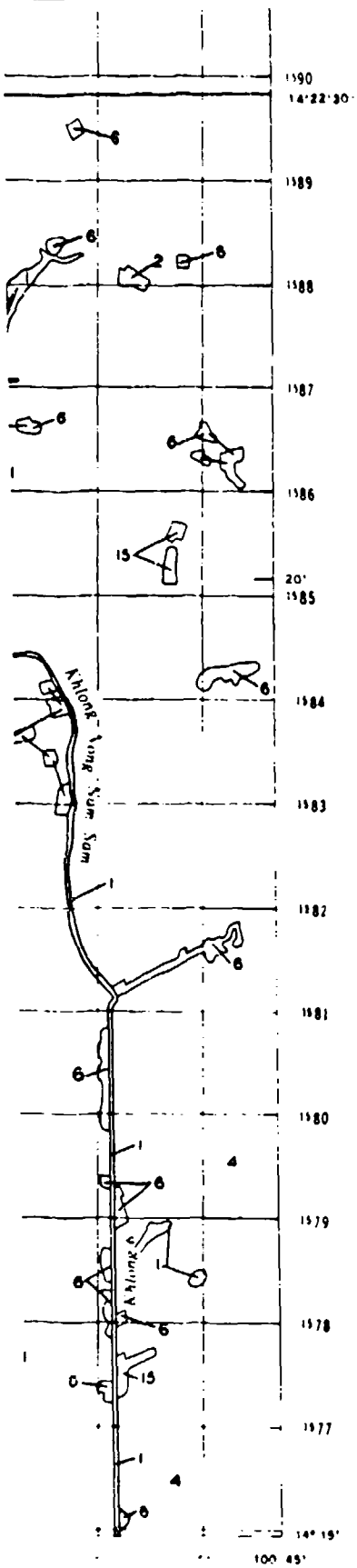
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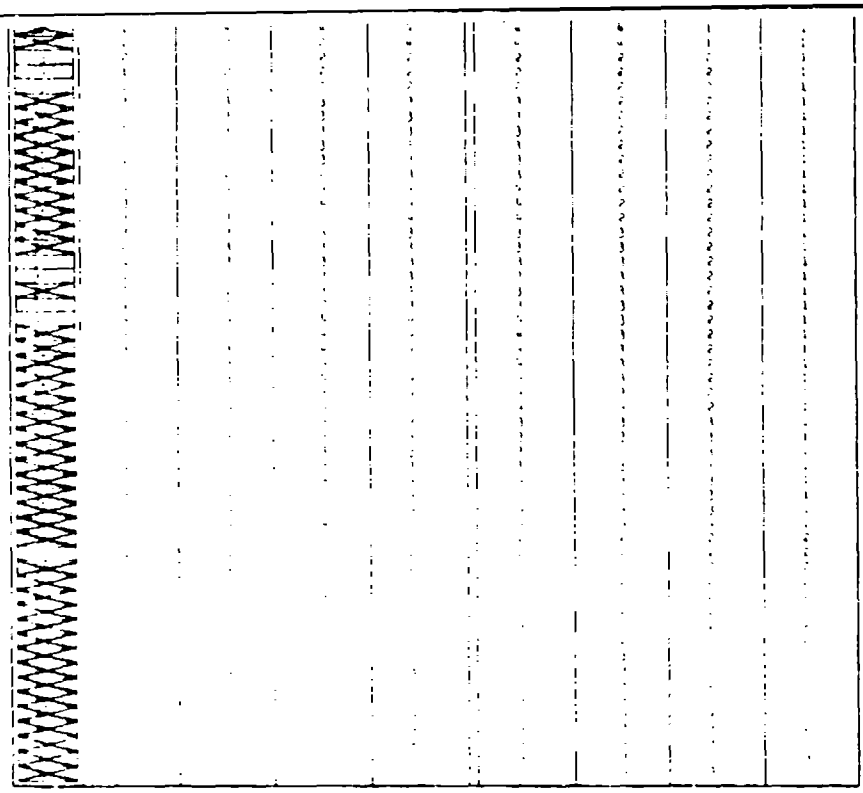
LOP BURI STUDY

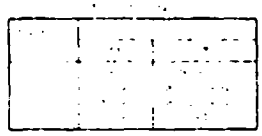
SHEET LB V

7

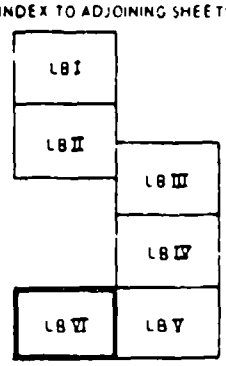
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A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

VEGETATION

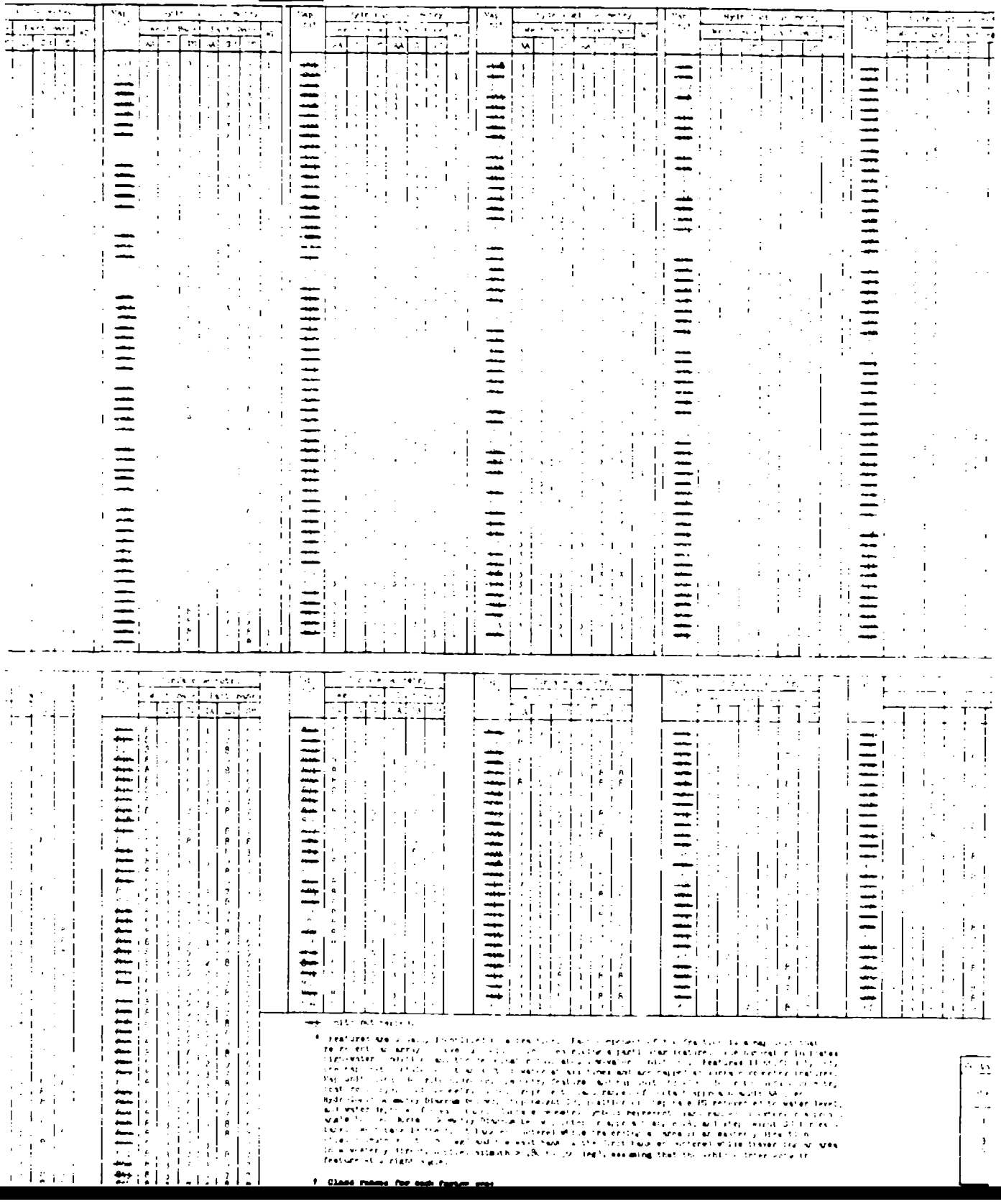
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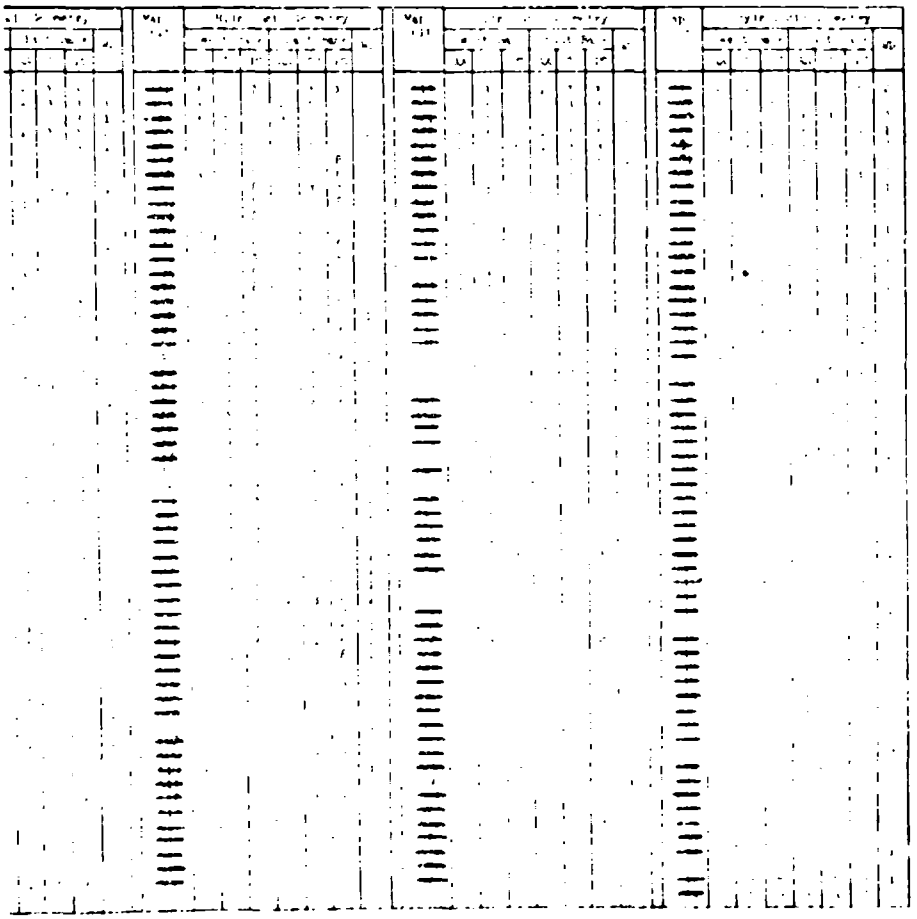
SHEET LB VI

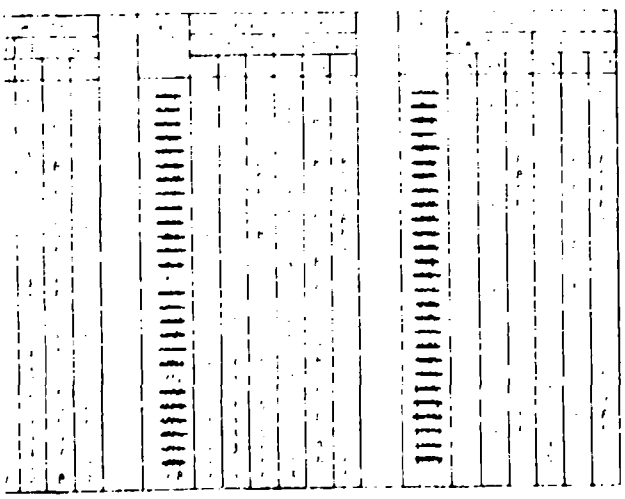
PLATE 2.6c

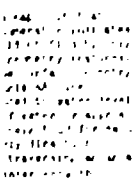
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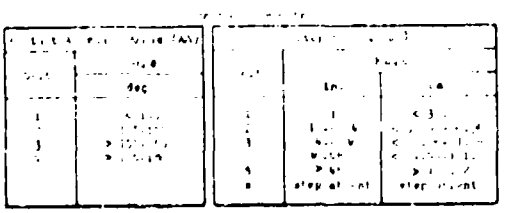
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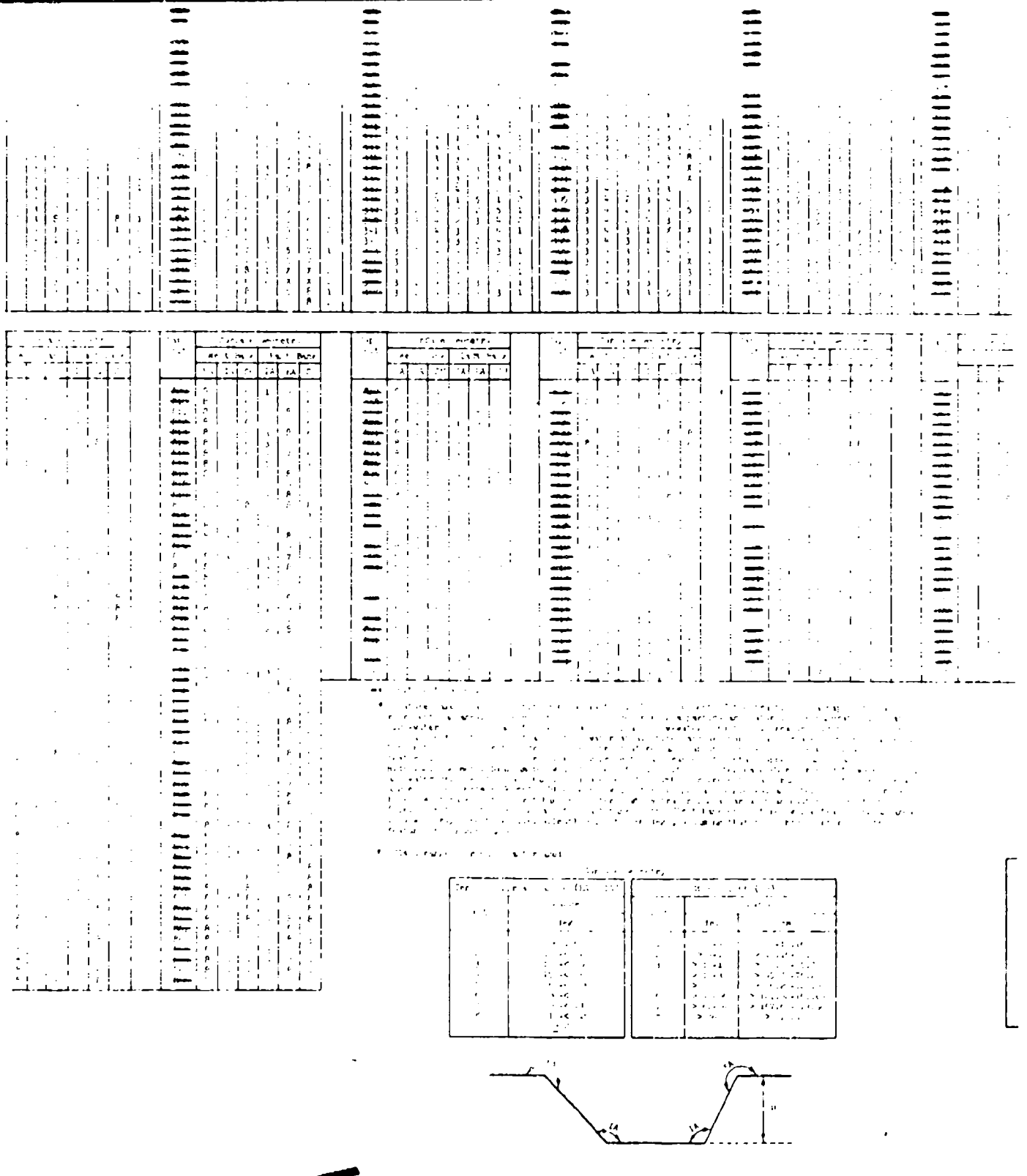




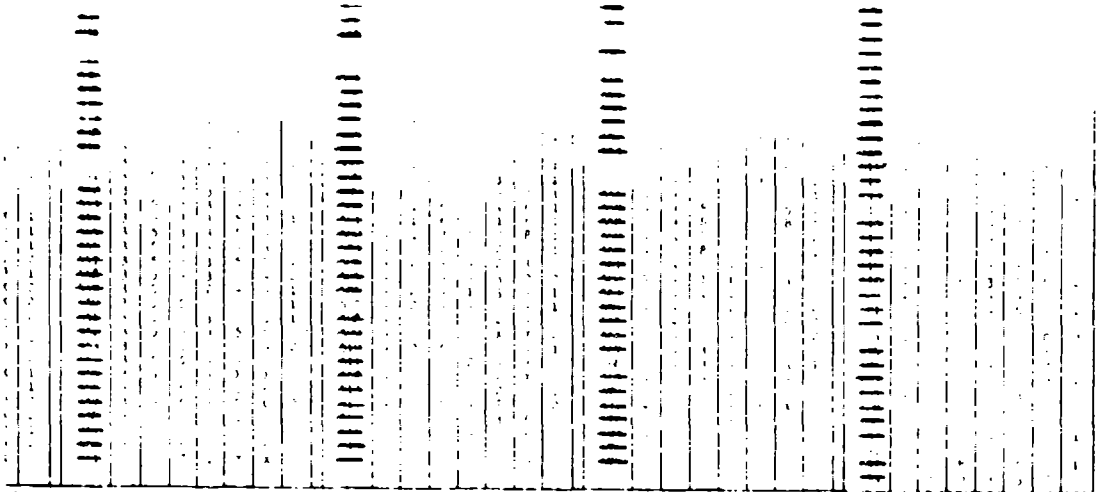


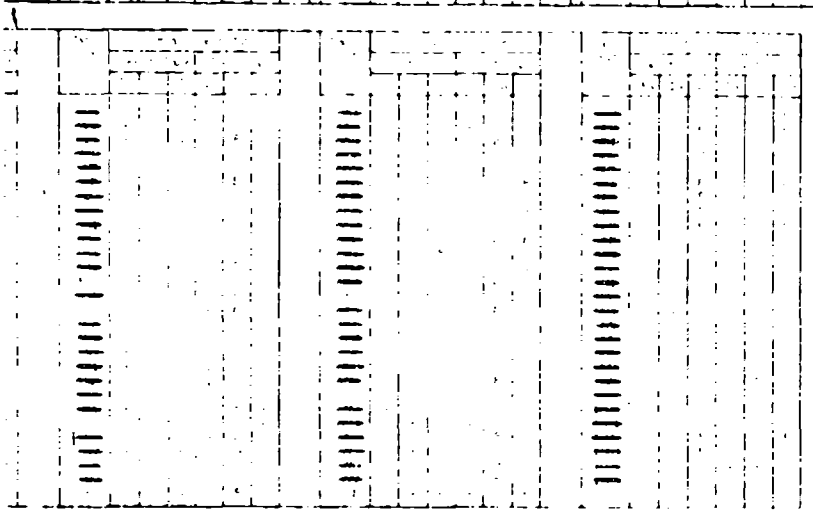




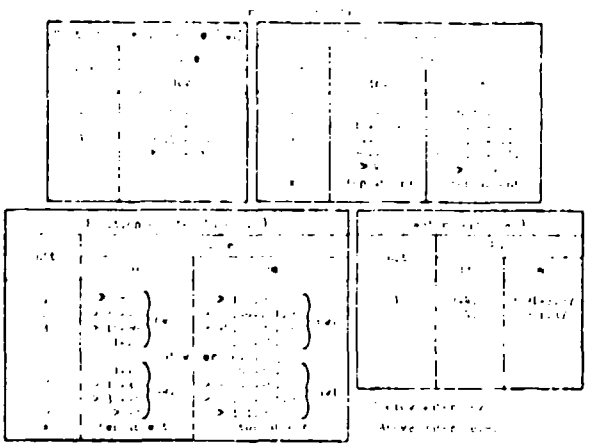


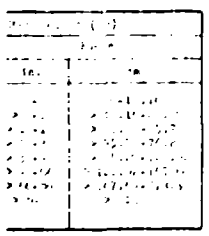
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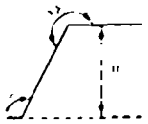


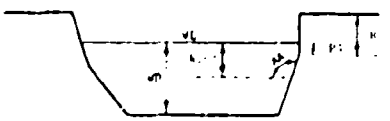




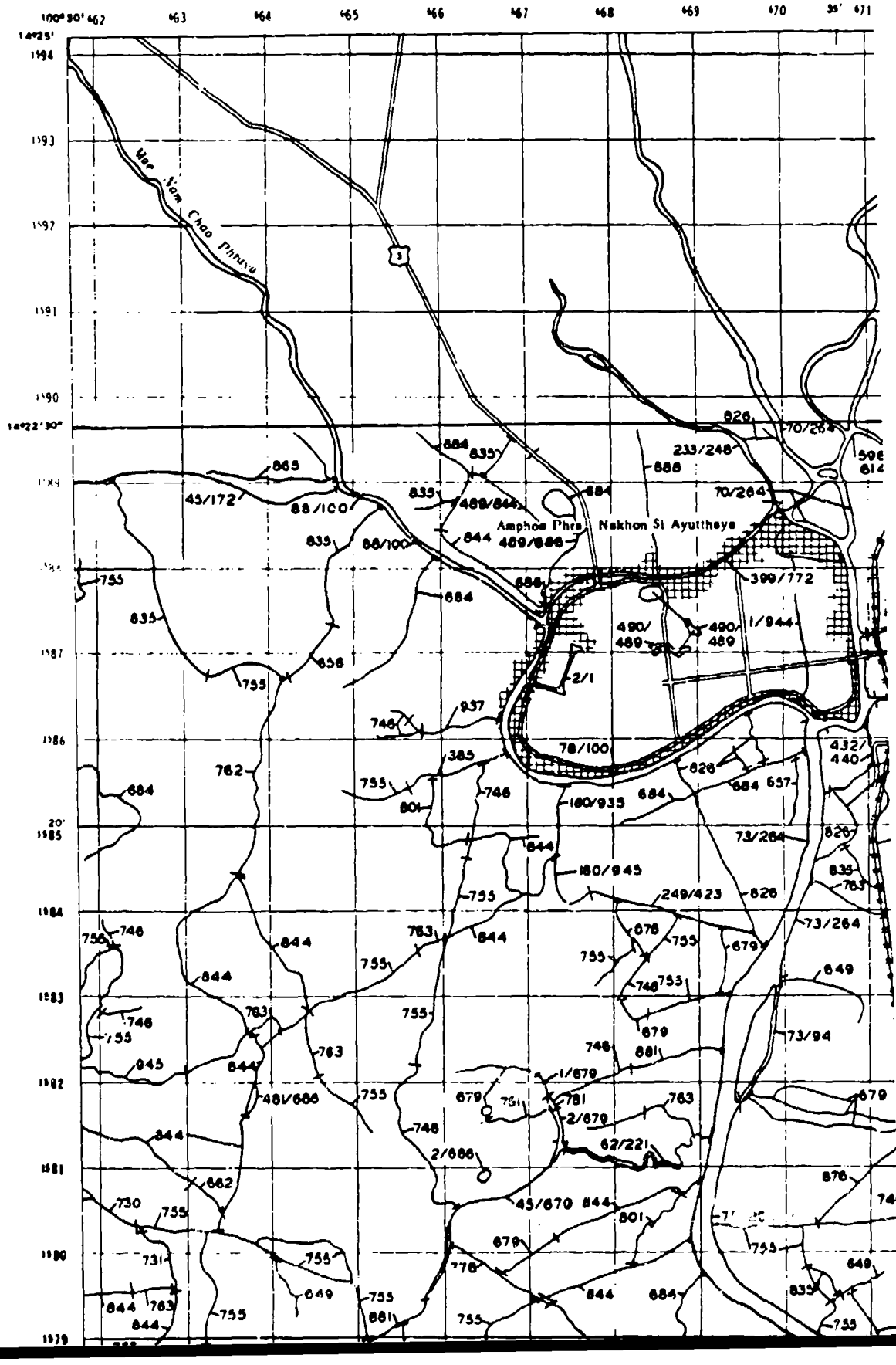






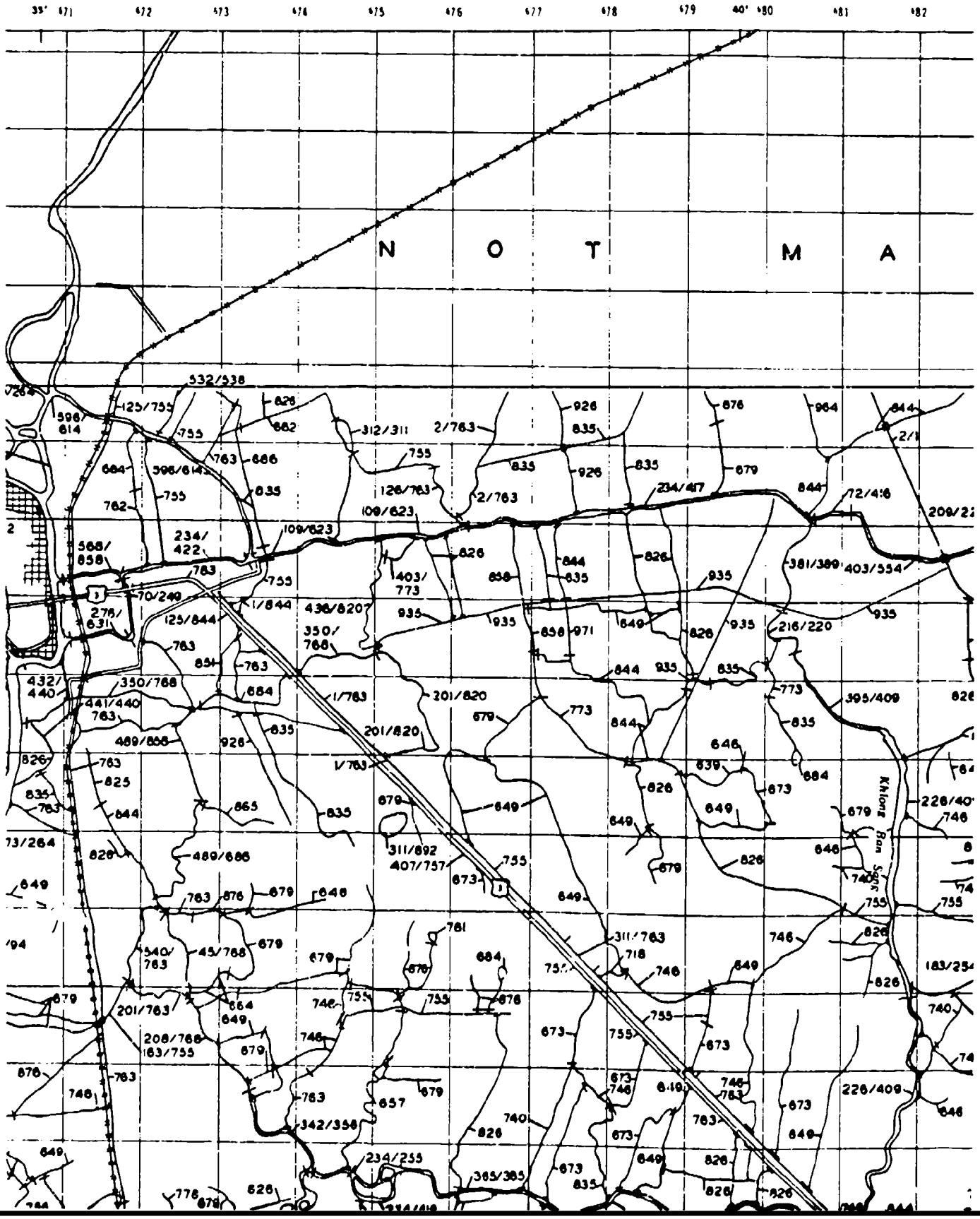


6


Mae Nam Chao Phraya
Amphoe Phra Nakhon Si Ayutthaya
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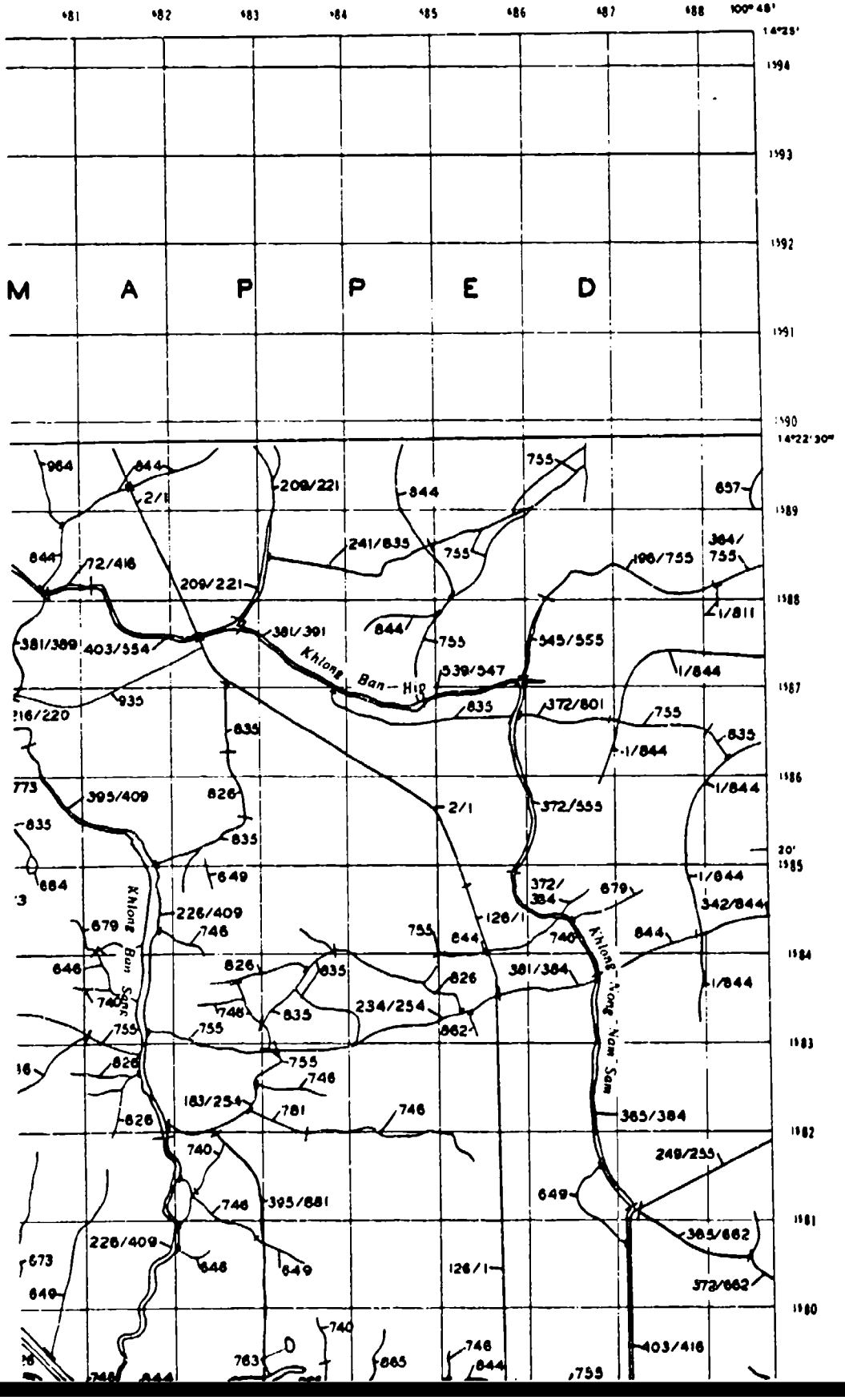
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LOP BURI



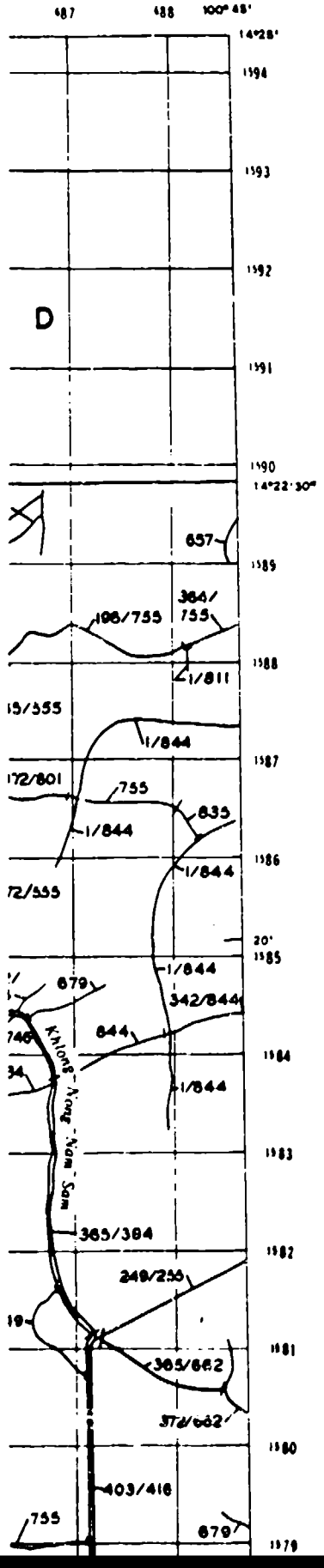
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SHEET LB VI

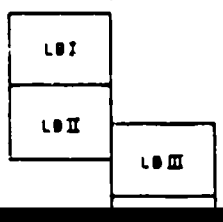

M A P P E D
Khlong Ban – Hip
Khlong Ban Sopa
Khlong Nong Nam Som
964
844
209/221
241/835
755
844
72/416
209/221
381/391
381/389
403/554
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755
545/555
539/547
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835
372/801
755
835
1/844
395/409
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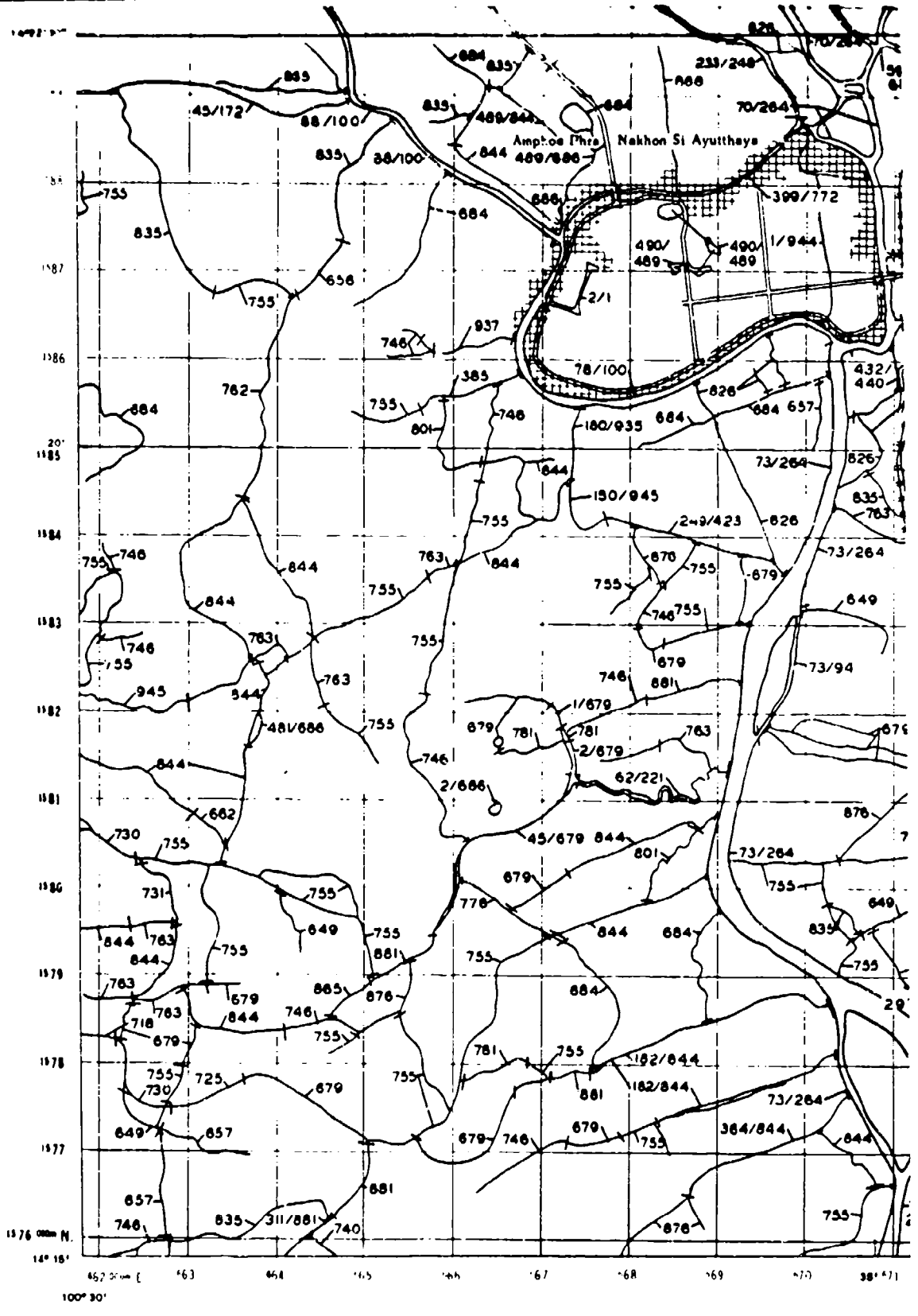
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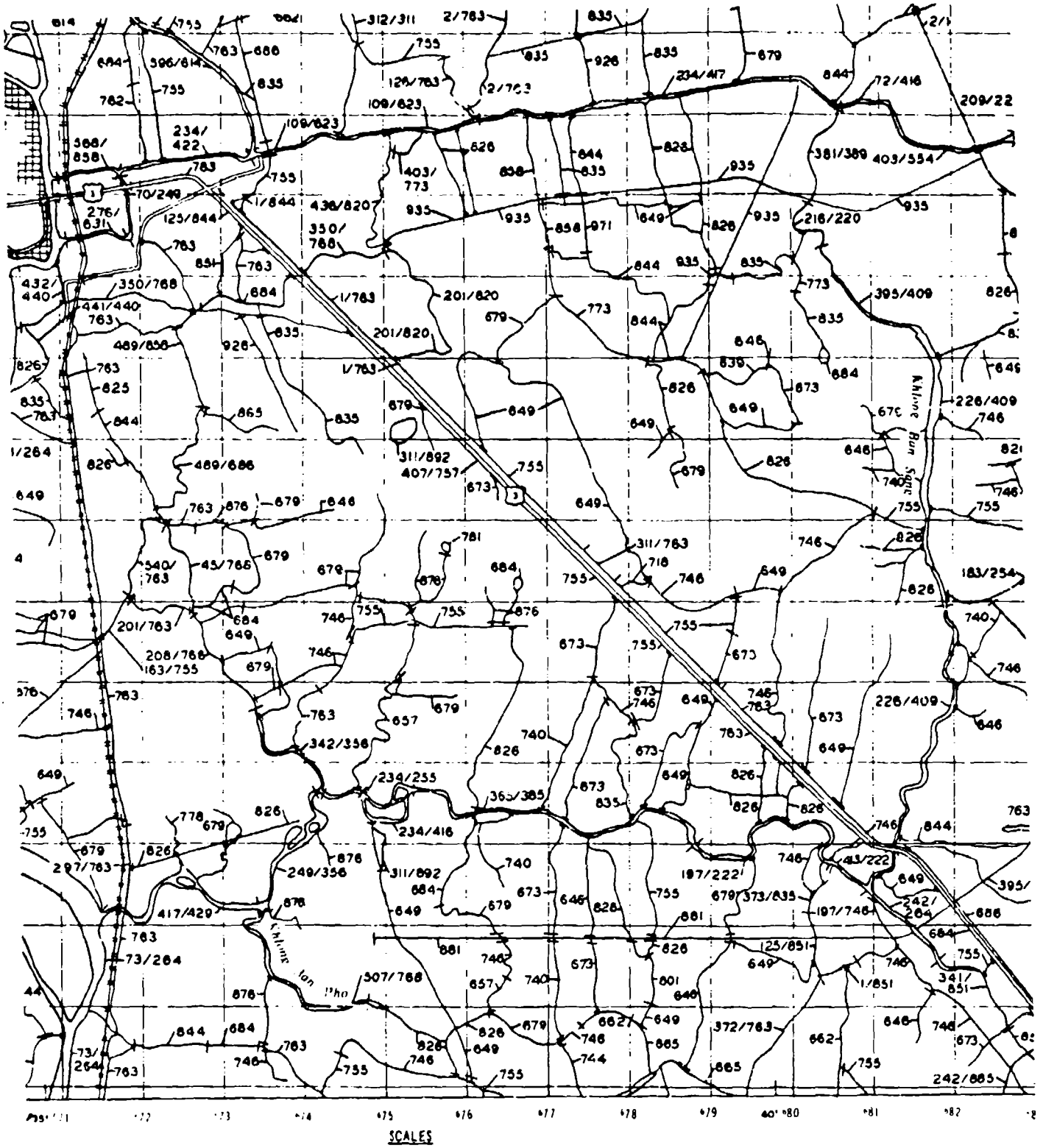
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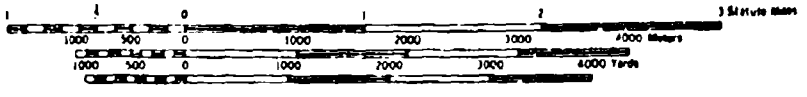


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

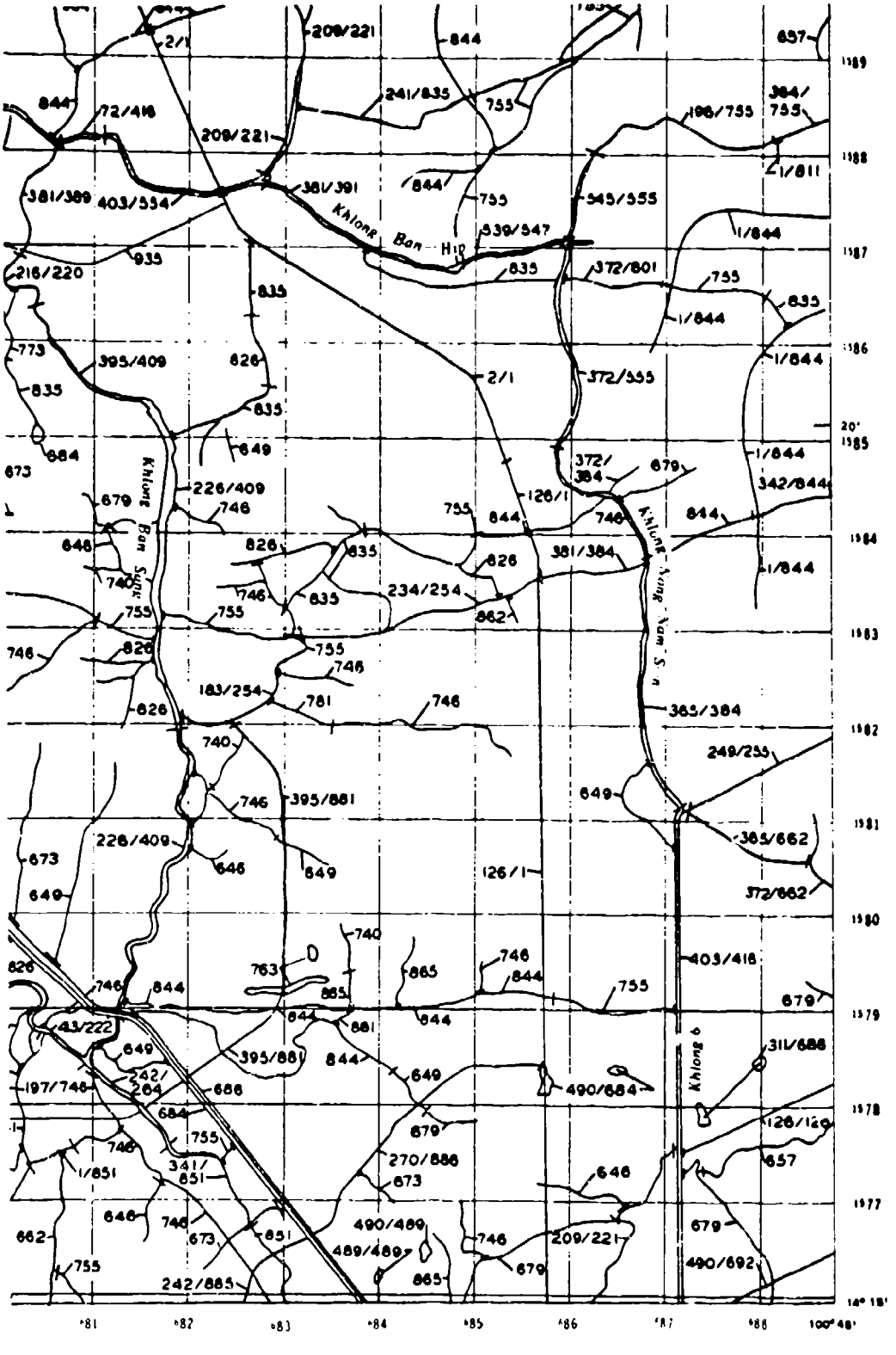
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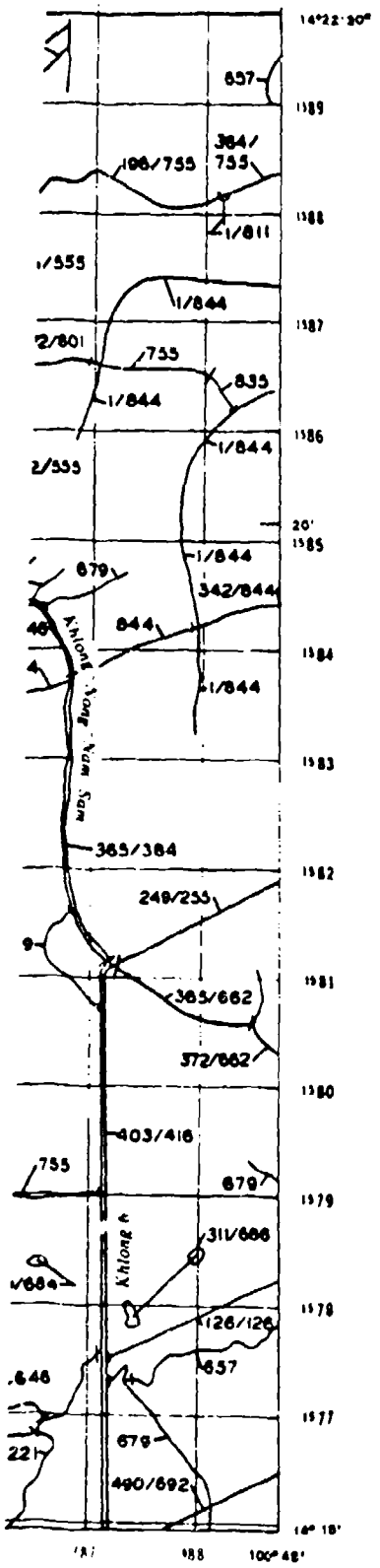
SCALES



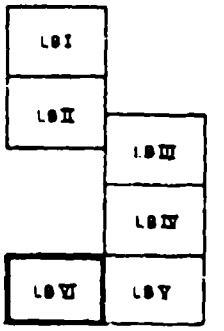
6



A QUANTITATIVE
TERRAIN FO
HYDROLC
LOP BUI
SI



INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

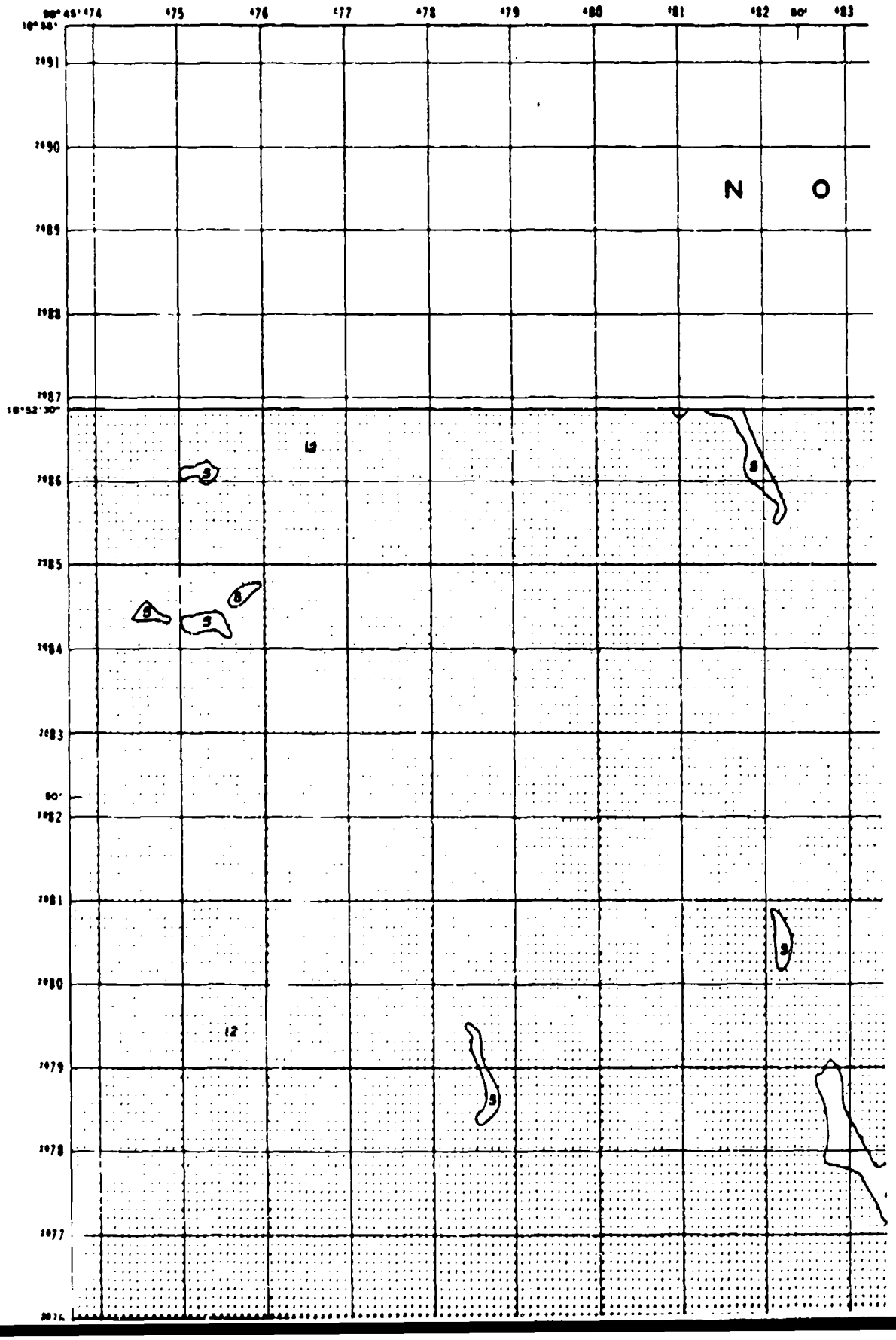
HYDROLOGIC GEOMETRY

LOP BURI STUDY AREA

SHEET LB VI

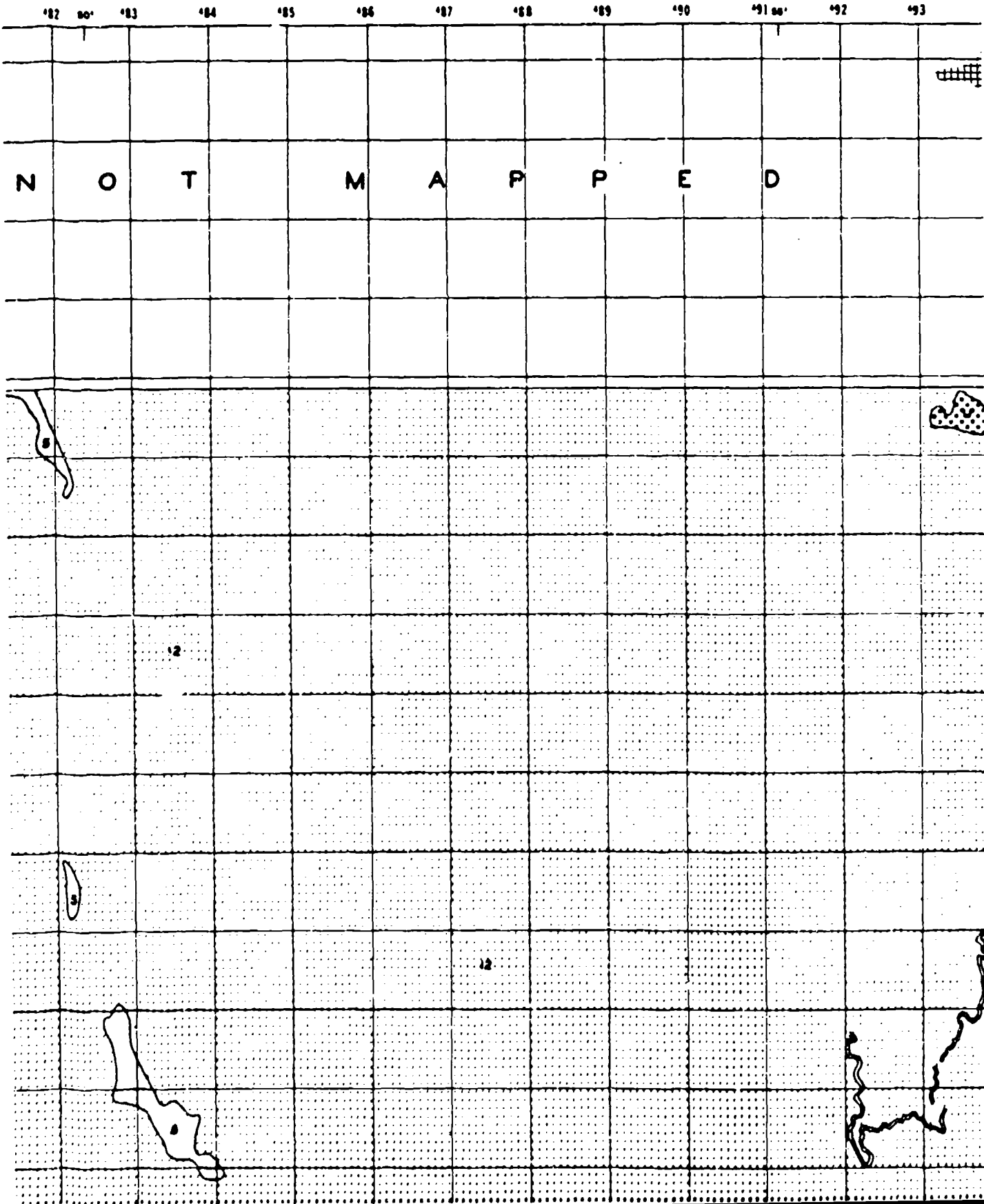
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PLATE 2.6d


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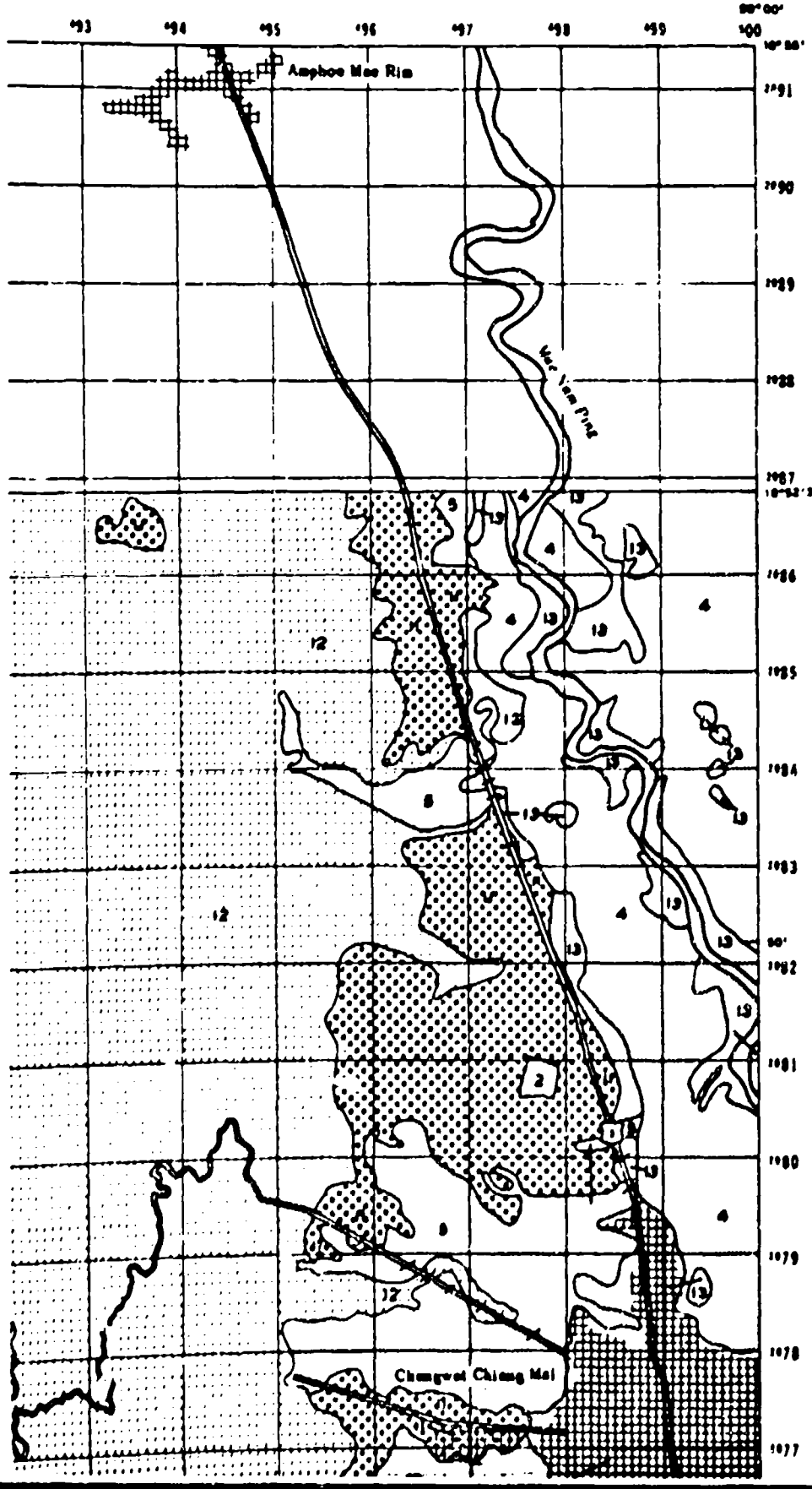
2

CHIANG MAI



13

SHEET CM I



LEGEN

Unit	Soil Mass Strength: Minimum Moisture (BH)	Soil Mass Strength: Maximum Moisture (BT)	Maximum Moisture: c_{uu} (psi)	Maximum Moisture: c_{uu} (kg/cm²)	Maximum Moisture: ϕ_{uu} (deg)	
	10-25	25-40	0-1	0-0.07	0-10	1-2
	25-60	60-100	0-1	0-0.07	0-10	2-4
	25-60*	60-100	0-1	0-0.07	10-20	2-4
	25-60	>100	0-1	0-0.07	0-10	0-1
	25-60*	>100	0-1	0-0.07	10-20	0-1
	60-100	60-100	0-1	0-0.07	0-10	2-4
	60-100	60-170	0-1	0-0.07	10-20	0-1
	60-100	>100	0-1	0-0.07	0-10	0-1
	60-100	>100	0-1	0-0.07	0-10	0-1
	60-100	>100	0-1	0-0.07	10-20	0-1
	60-100*	>100	0-1	0-0.07	10-20	0-1
	>100	>100	0-1	0-0.07	0-10	0-1
	>100	>100	0-1	0-0.07	10-20	0-1
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1

Notes: Blank areas are water bodies.

c_{uu} Shear strength at zero normal load.

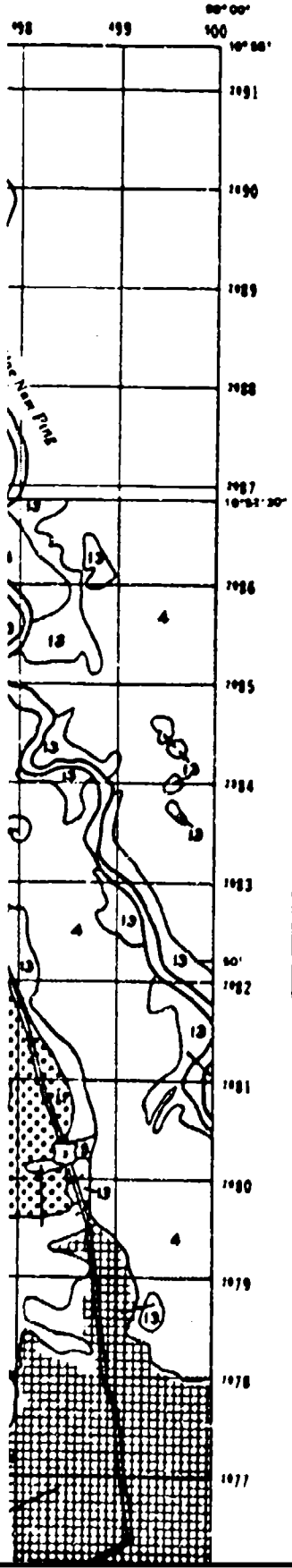
ϕ_{uu} Angle of internal friction.

* Maximum moisture has less than 30 percent probability strengths commonly observed are 60-100 for Units 3 an

Units do not occur on this map.

4

SHEET CM I



LEGEND

Unit	Soil Mass Strength: Maximum Moisture — c_{sw} psi	Soil Mass Strength: Maximum Moisture — c_{sw} kg/cm²	Soil Mass Strength: Maximum Moisture — ϕ_{sw} deg	Soil Surface Strength: Maximum Moisture — c_{sw} psi	Soil Surface Strength: Maximum Moisture — c_{sw} kg/cm²	Soil Surface Strength: Maximum Moisture — ϕ_{sw} deg	Soil Surface Strength: Conditions where maximum c_{sw} occurs — c_{sw} psi	Soil Surface Strength: Conditions where maximum c_{sw} occurs — c_{sw} kg/cm²	Soil Surface Strength: Conditions where maximum c_{sw} occurs — ϕ_{sw} deg
1	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture occurs		
2	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture occurs		
3	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture occurs		
4	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture occurs		
7	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture occurs		
8	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture occurs		
11	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture occurs		

Complex of 60-100 and >100

Complex of 60-100 and >100

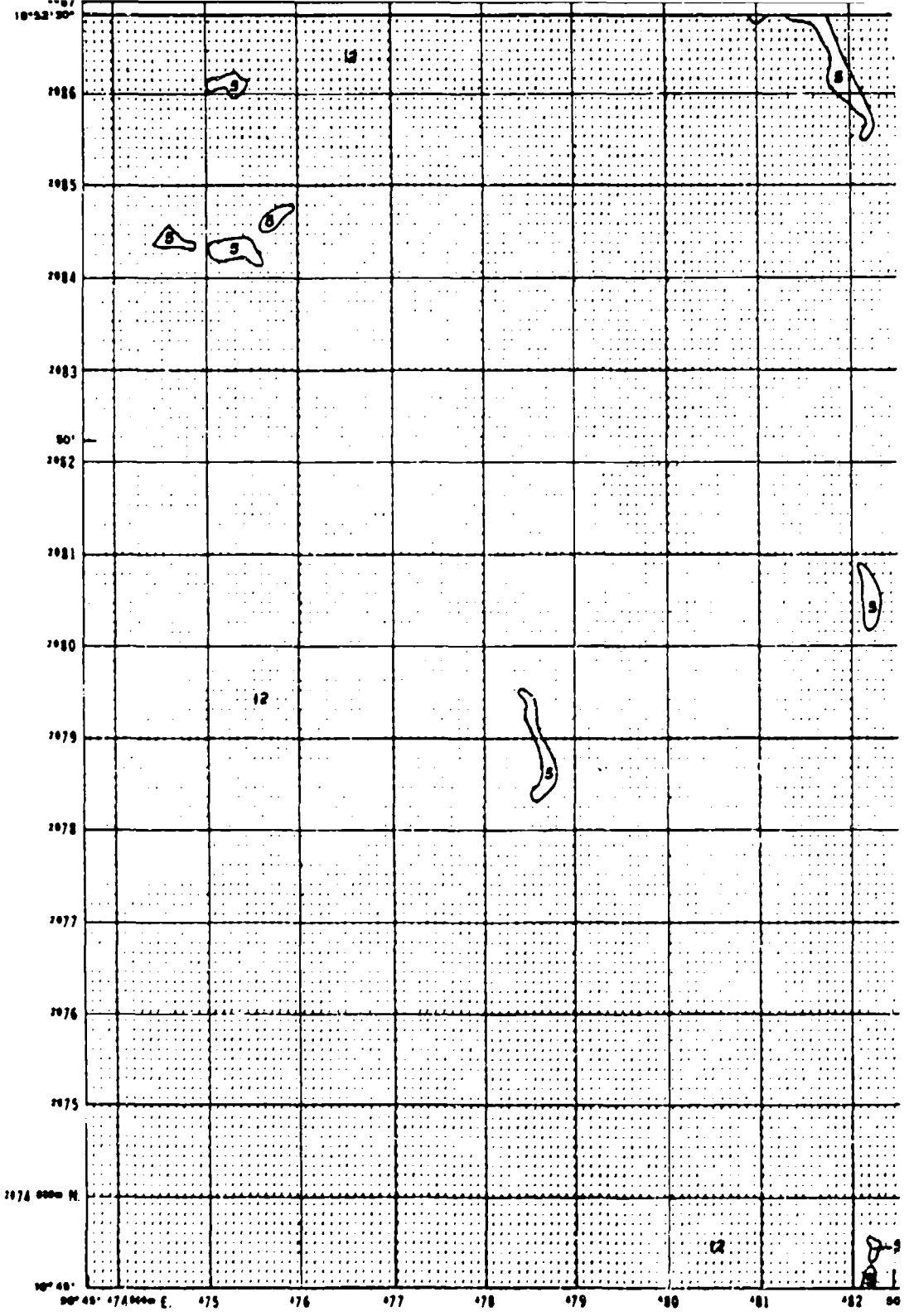
Notes: Bluish areas are water bodies.

c_{sw} Shear strength at zero normal load.

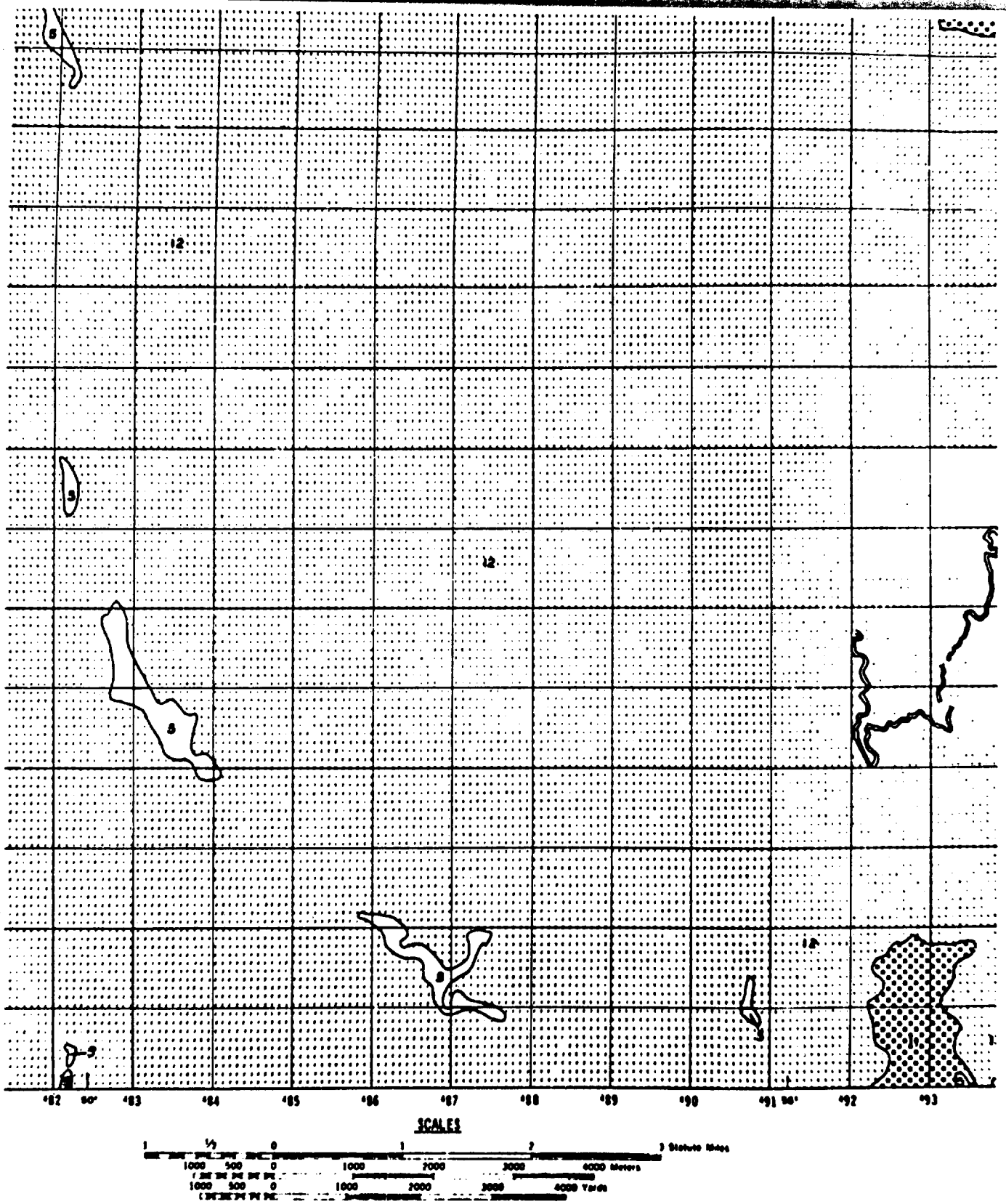
ϕ_{sw} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 9; more than 100 for Unit 11.

Units do not occur on this map.

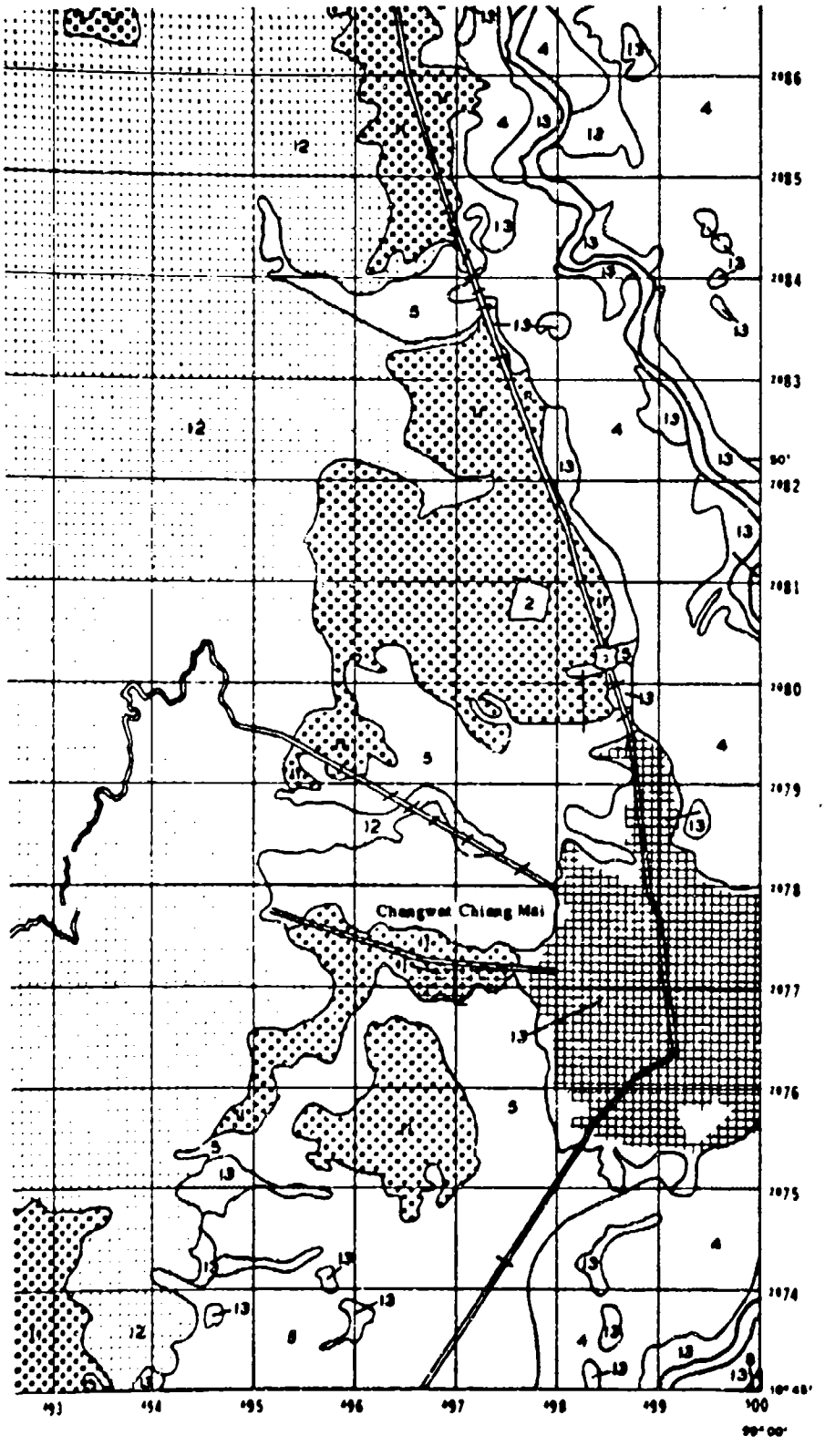


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 C


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1000
2000
3000
4000 Yards

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Unit	RQD	RQI	c_{up} psi	c_{up} kg/cm²	ϕ_{up} deg	psi	
	10-25	25-60	0-1	0-0.07	0-10	1-2	0
	25-60	60-100	0-1	0-0.07	0-10	2-4	0
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.
	25-60	>100	0-1	0-0.07	0-10	0-1	
	25-60*	>100	0-1	0-0.07	10-20	0-1	
	60-100	60-100	0-1	0-0.07	0-10	2-4	0.
	60-100	60-100	0-1	0-0.07	10-20	0-1	
	60-100	>100	0-1	0-0.07	0-10	0-1	
	60-100	>100	0-1	0-0.07	0-10	0-1	
	60-100	>100	0-1	0-0.07	10-20	0-1	
	60-100*	>100	0-1	0-0.07	10-20	0-1	
	>100	>100	0-1	0-0.07	0-10	0-1	
	>100	>100	0-1	0-0.07	10-20	0-1	
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	

Note: Blank areas are water bodies.

c_{up} Shear strength of more normal land.

ϕ_{up} Angle of internal friction.

* Maximum estimate has less than 30 percent probability of strengths commonly observed are 60-100 for Units 3 and 5;

Units do not occur on this map.

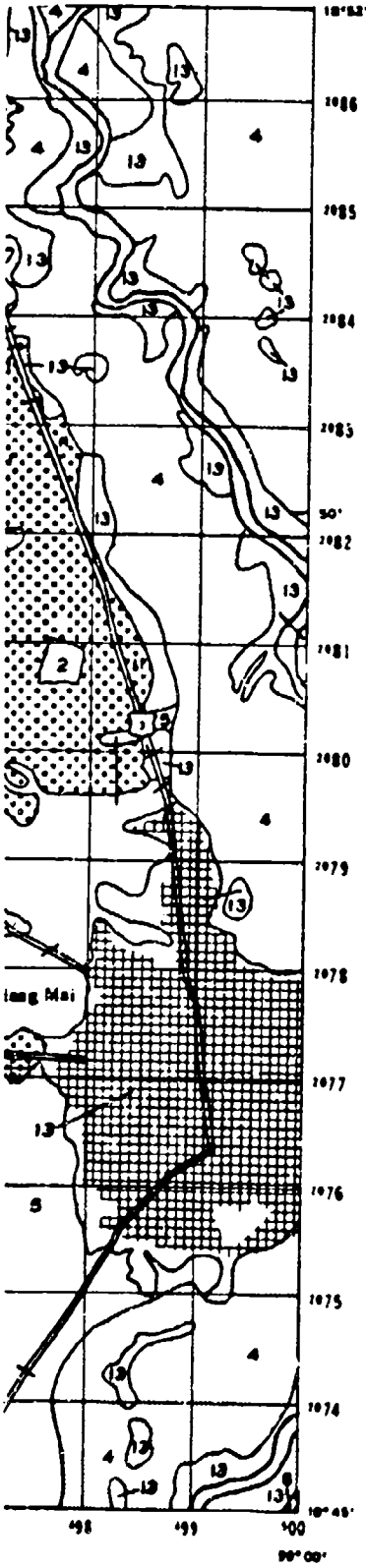
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A QUANTITATIVE METHOD F
TERRAIN FOR GROUND

SURFACE COMP
CHIANG MAI STUD
SHEET CM

7



Unit	Wet-Thaw RCI	Wet-Thaw RCI	Minimum Wet-Thaw c_{uw} psi	Minimum Wet-Thaw c_{uw} kg/cm²	Minimum Wet-Thaw ϕ_{uw} deg	Minimum Wet-Thaw c_{uw} psi	Minimum Wet-Thaw c_{uw} kg/cm²	Minimum Wet-Thaw ϕ_{uw} deg	Maximum Wet-Thaw c_{uw} psi	Maximum Wet-Thaw c_{uw} kg/cm²	Maximum Wet-Thaw ϕ_{uw} deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum wet-thaw conditions		
1	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum wet-thaw conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum wet-thaw conditions		
1	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
2	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum wet-thaw conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum wet-thaw conditions		
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum wet-thaw conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum wet-thaw conditions		

Note: Blank areas are water bodies.

c_{uw} Shear strength of cohesive material.

ϕ_{uw} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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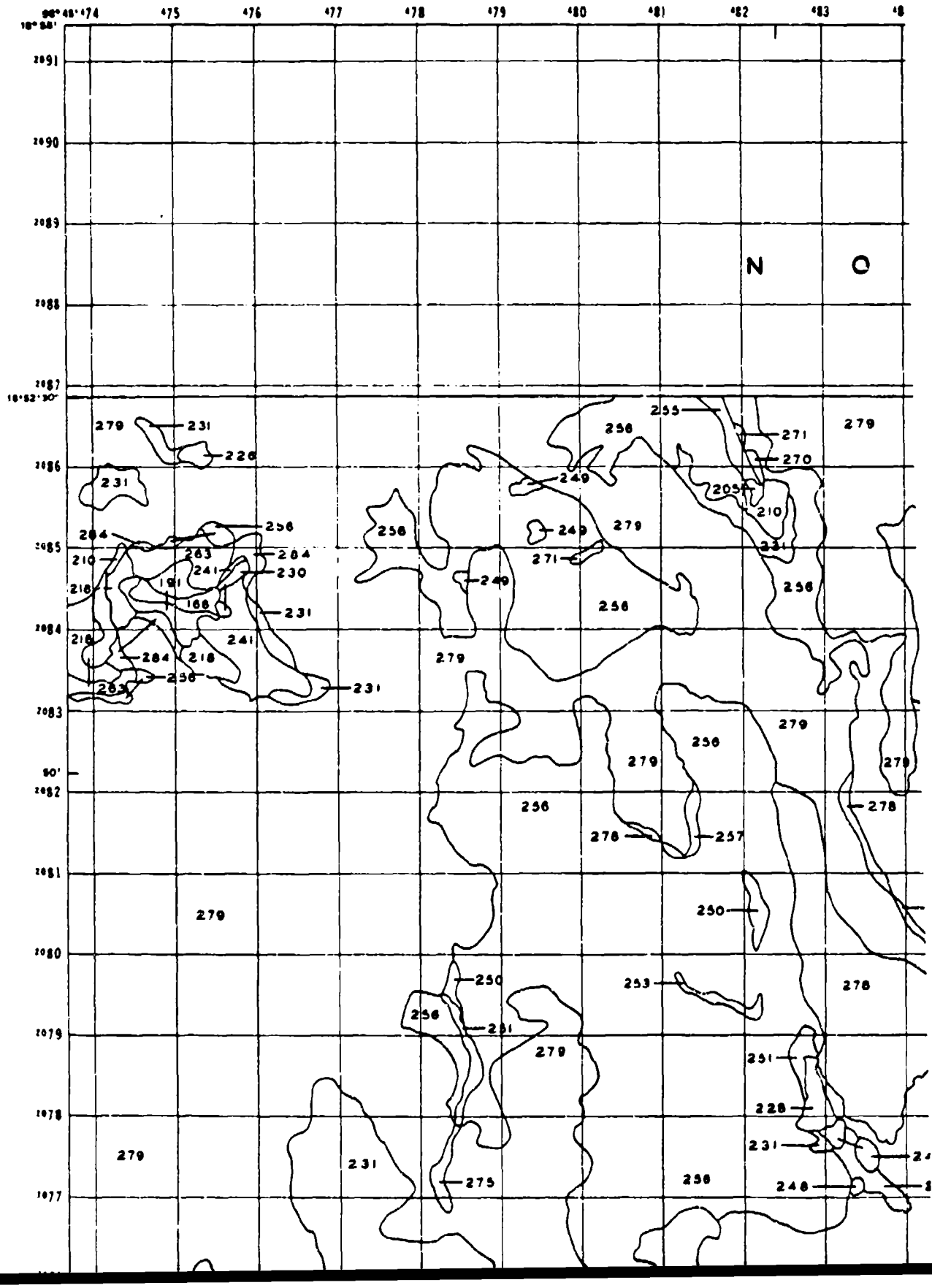
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

CHIANG MAI STUDY AREA

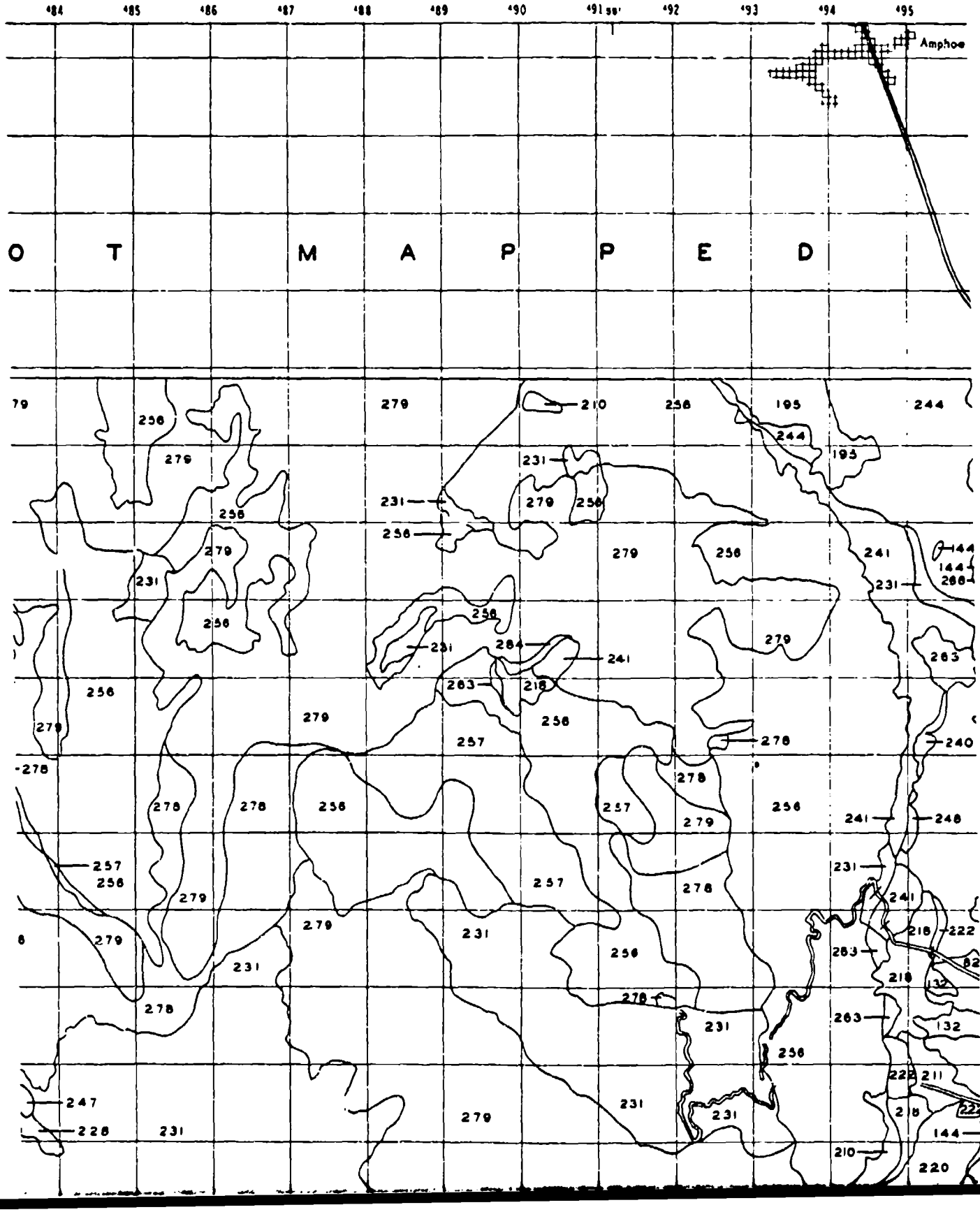
SHEET CM I

PLATE 3.1a

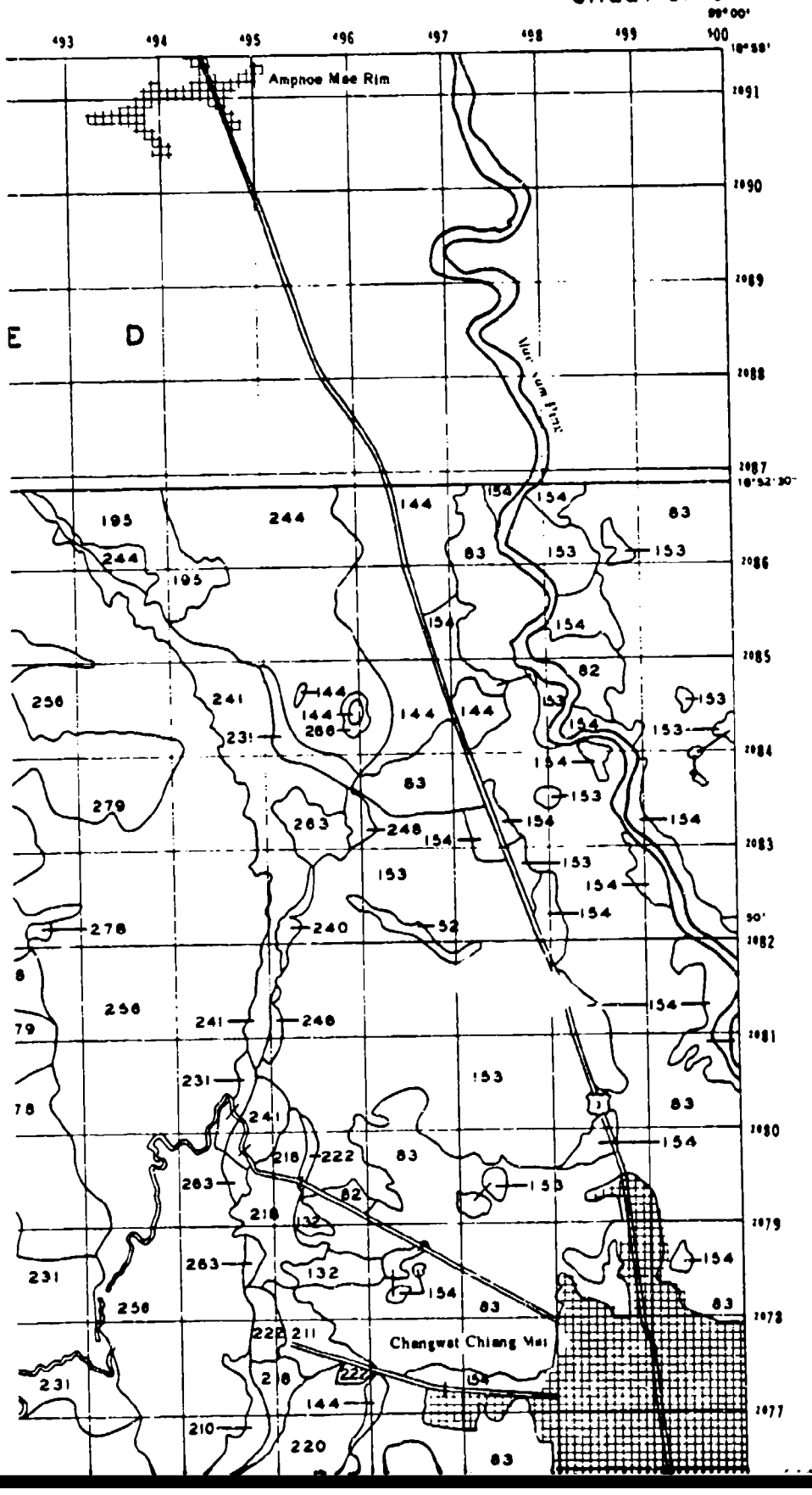

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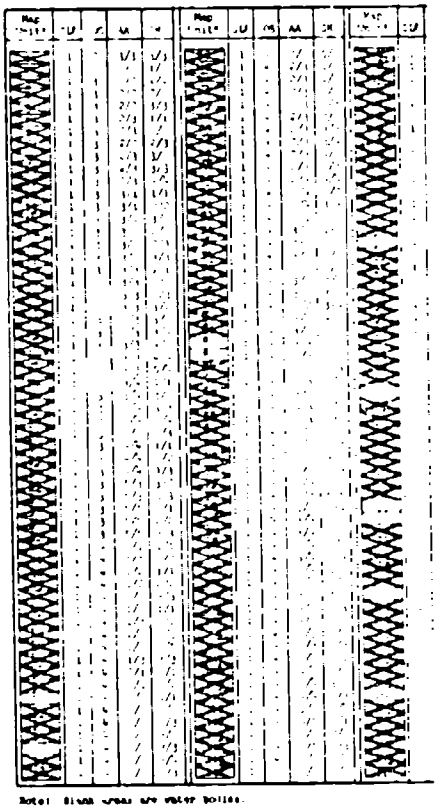
CHIANG MAI

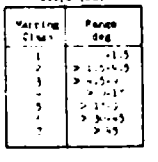


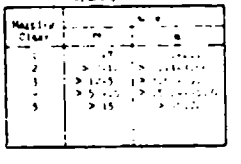
SHEET CM I

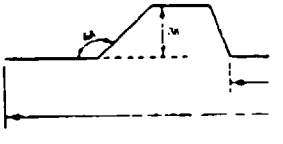


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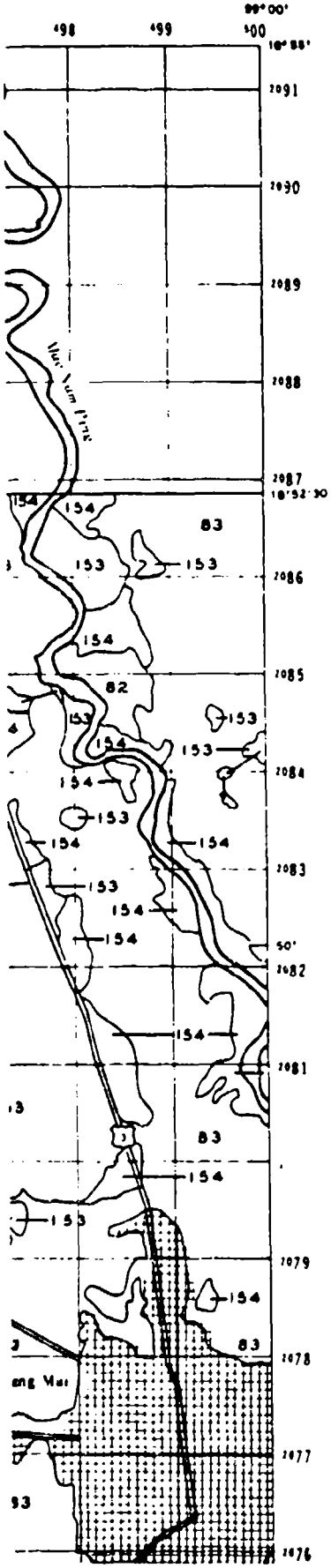




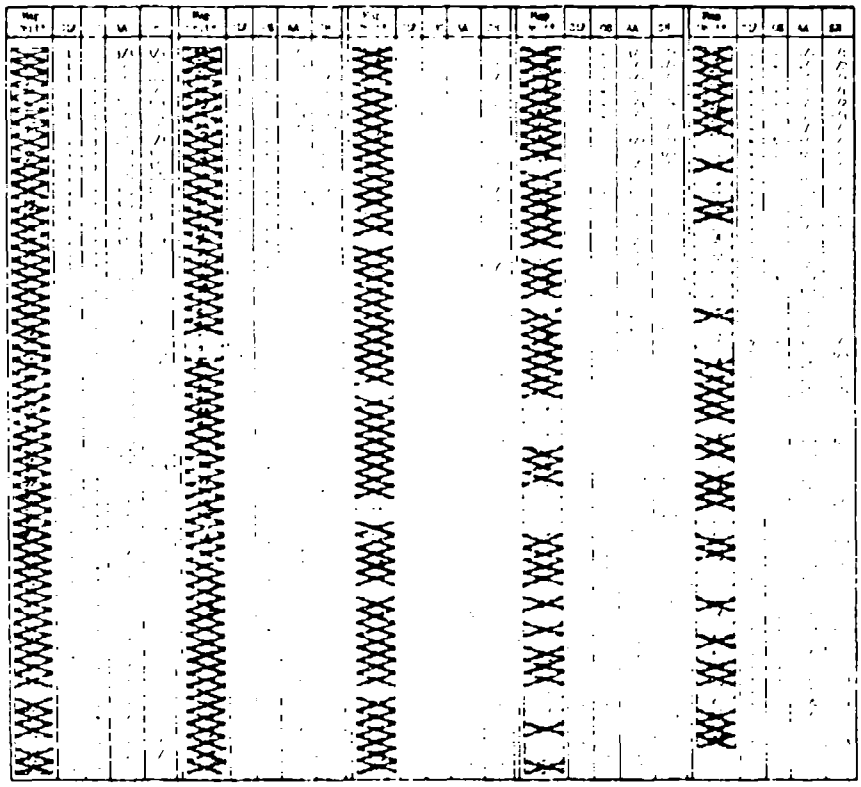
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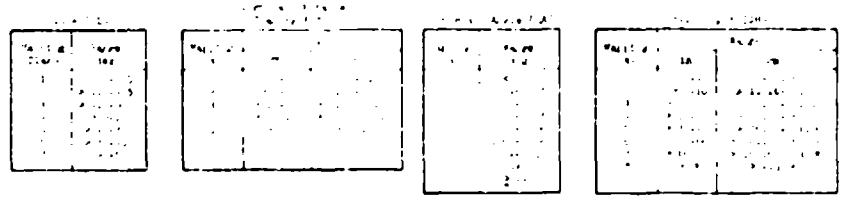
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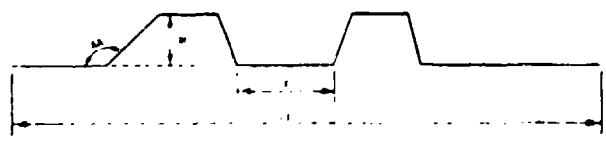
SHEET CM I



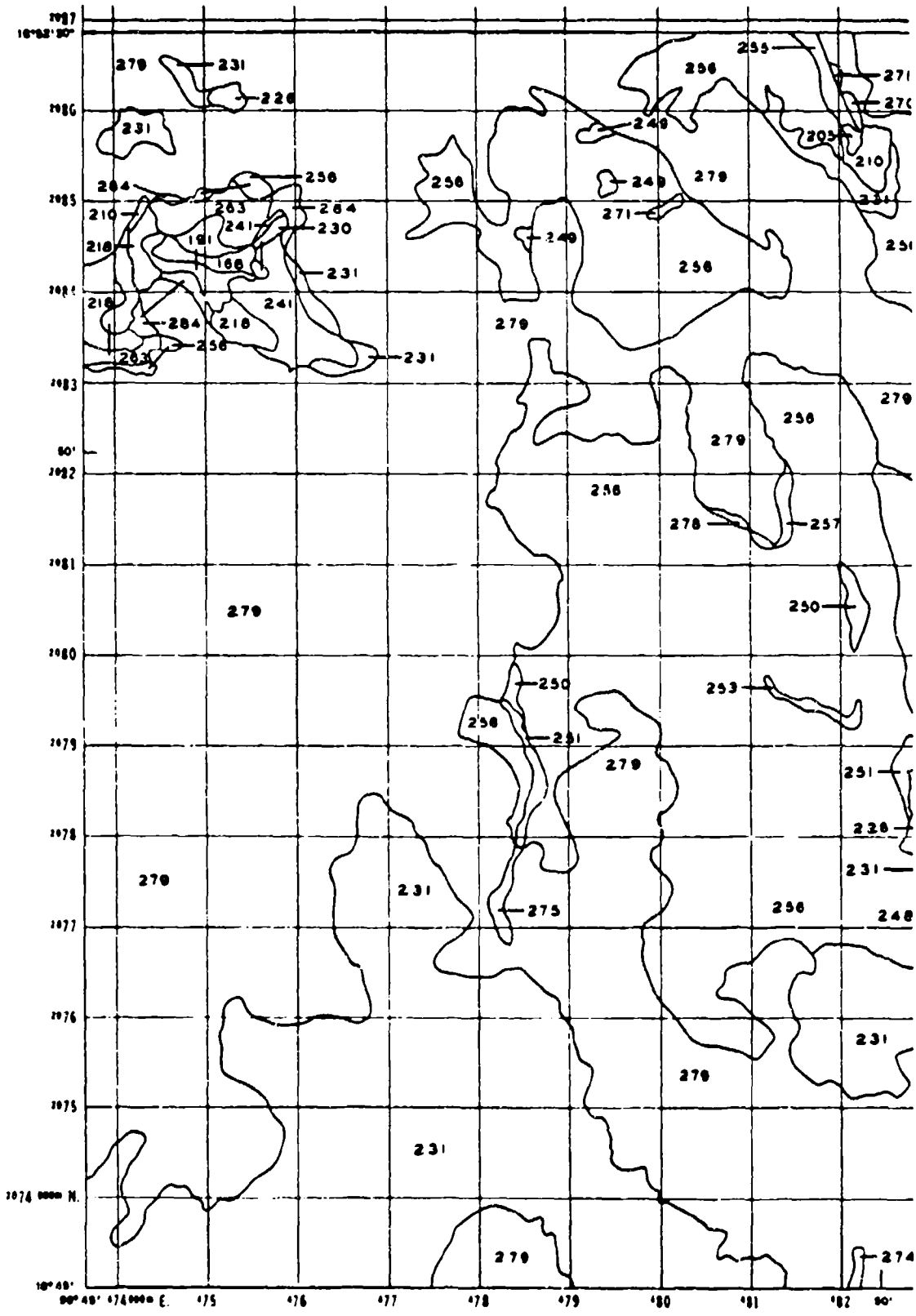
LEGEND





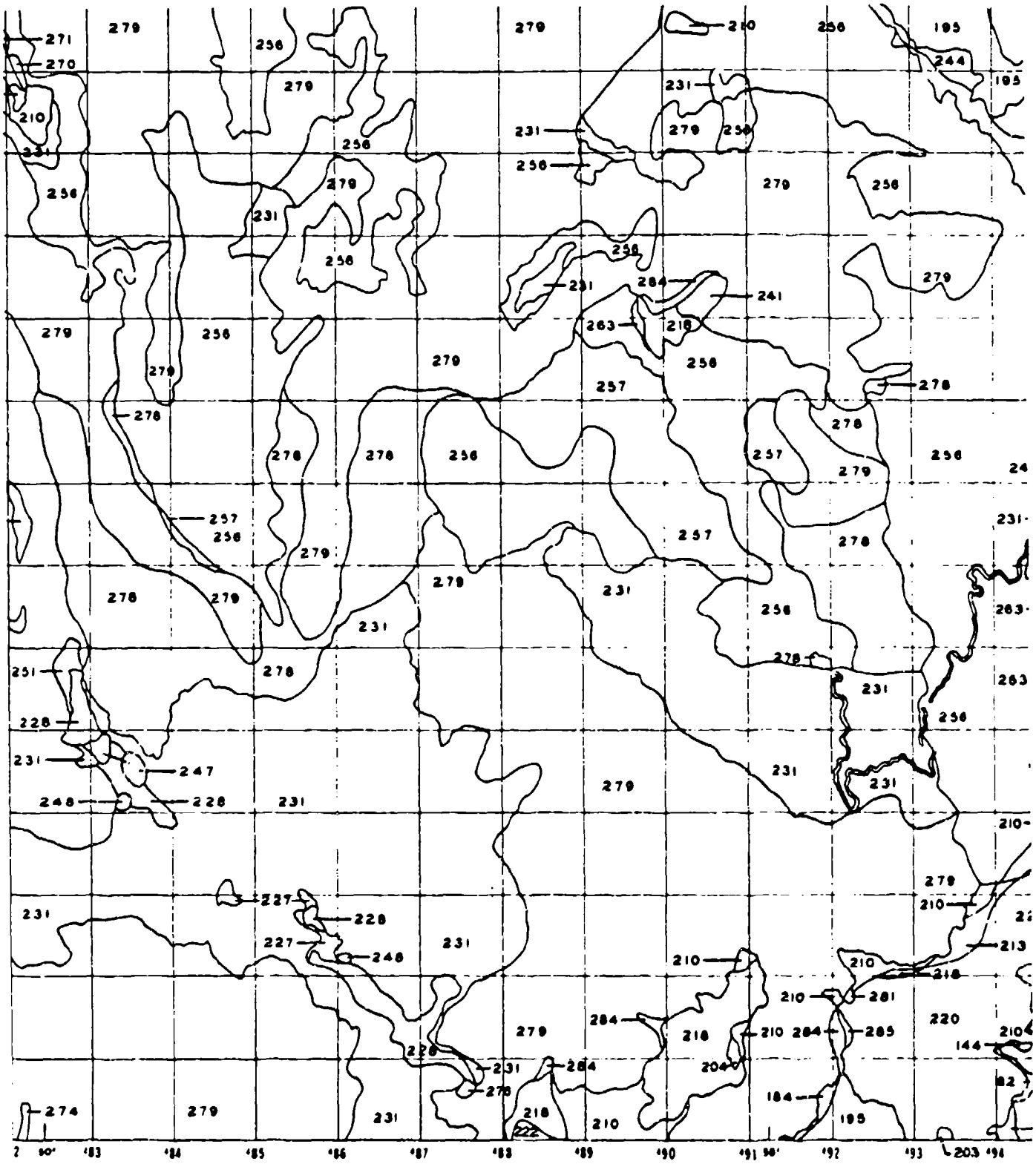


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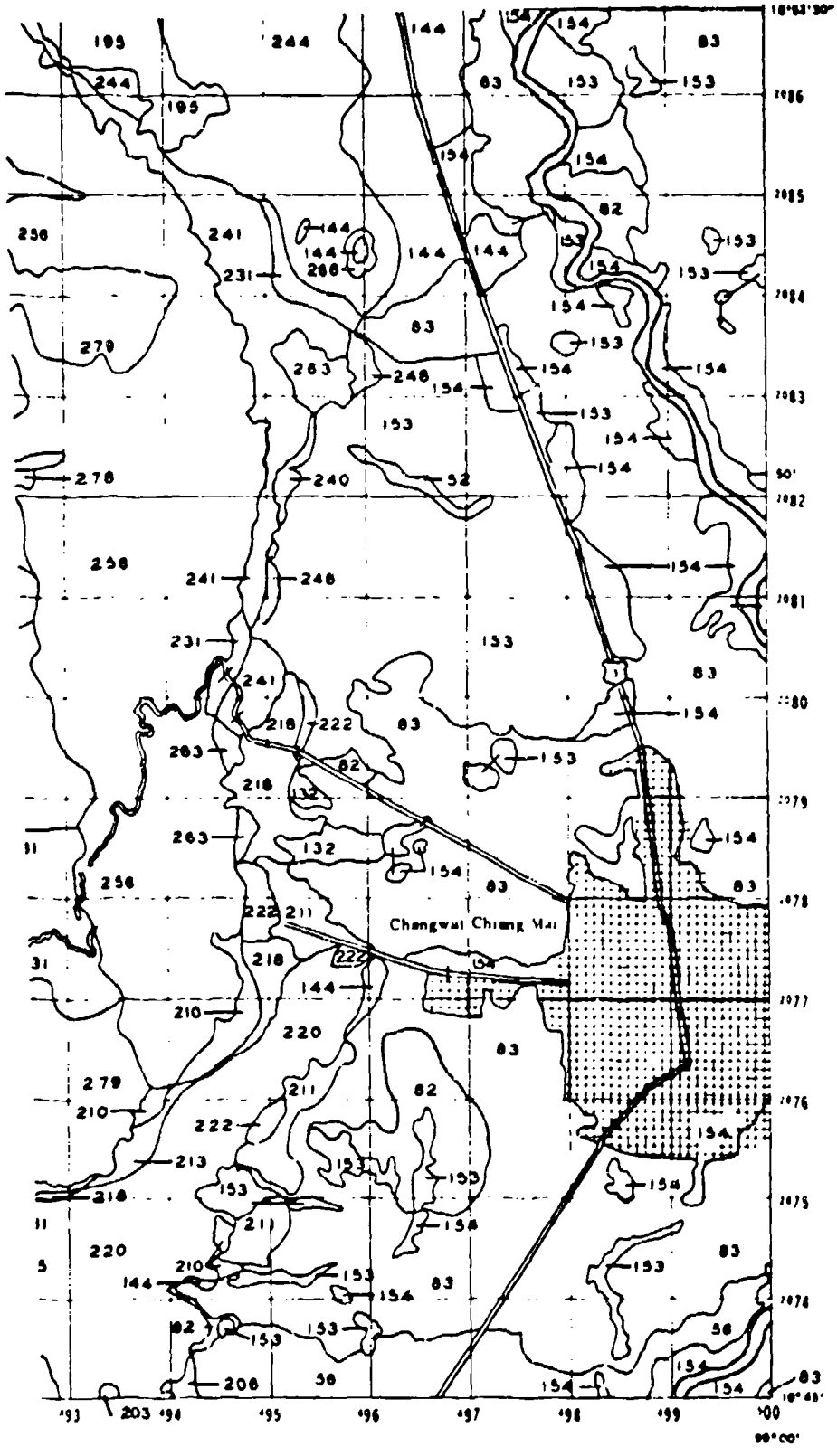
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

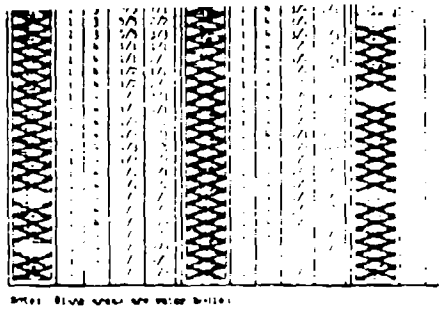
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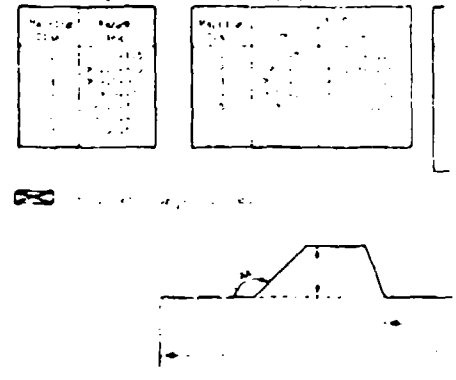


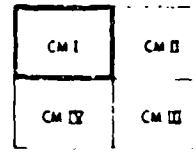
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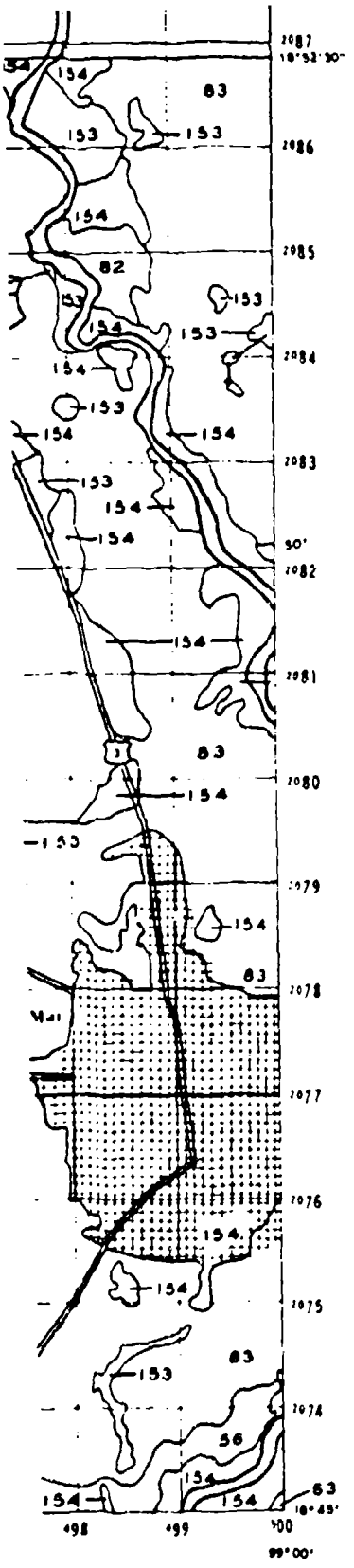
A QUANTITATIVE METHOD F(
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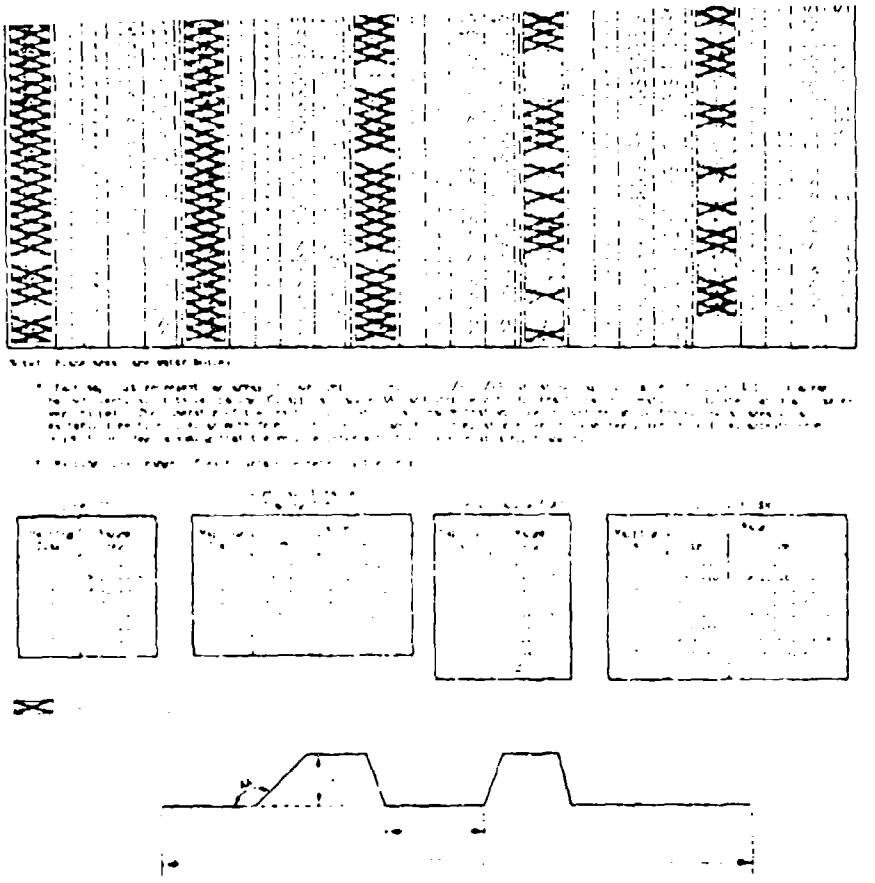
SURFACE GEOM

CHIANG MAI STUD'

SHEET CM I

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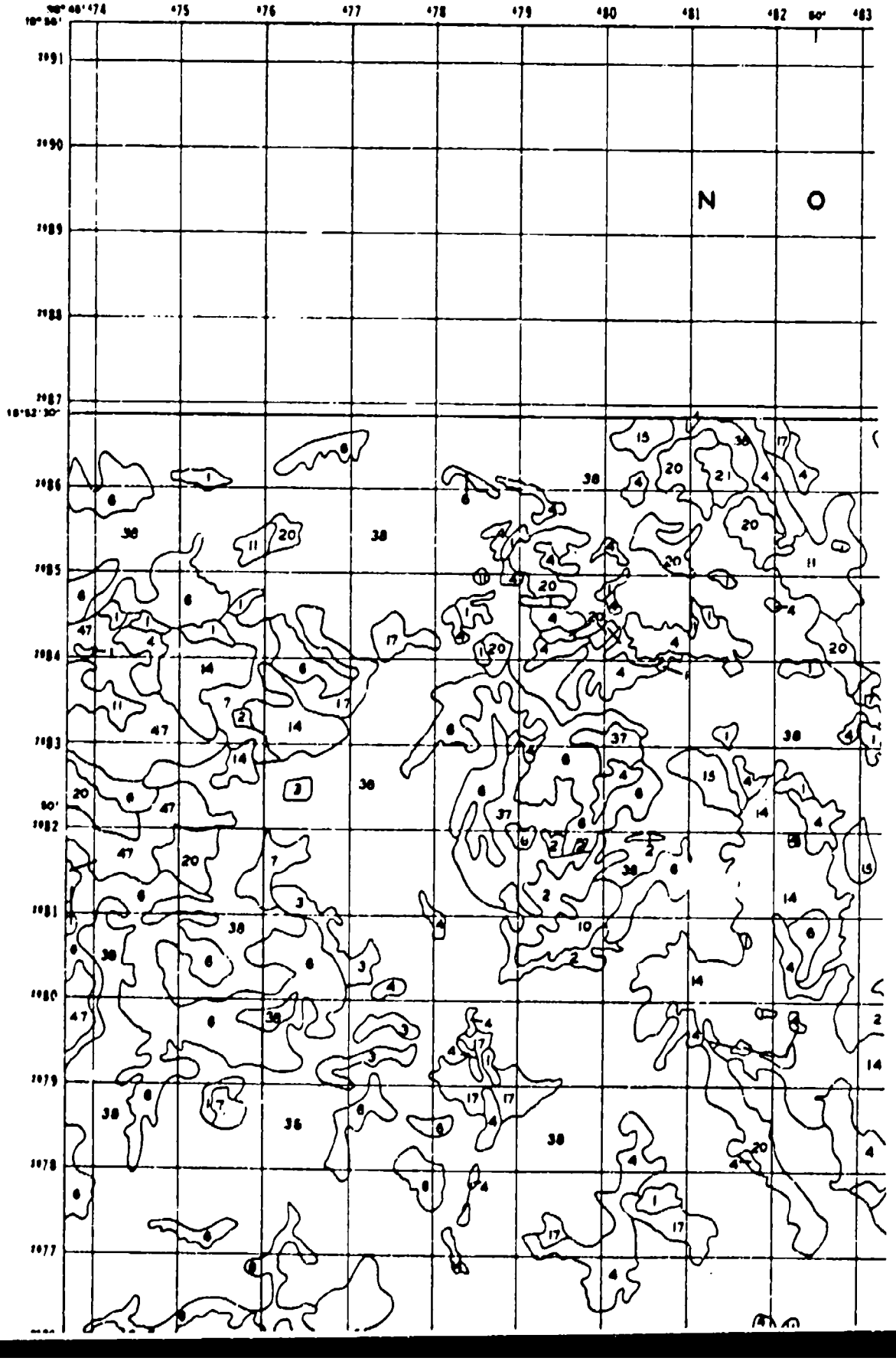
CHIANG MAI STUDY AREA

SHEET CM I

PLATE 3.16

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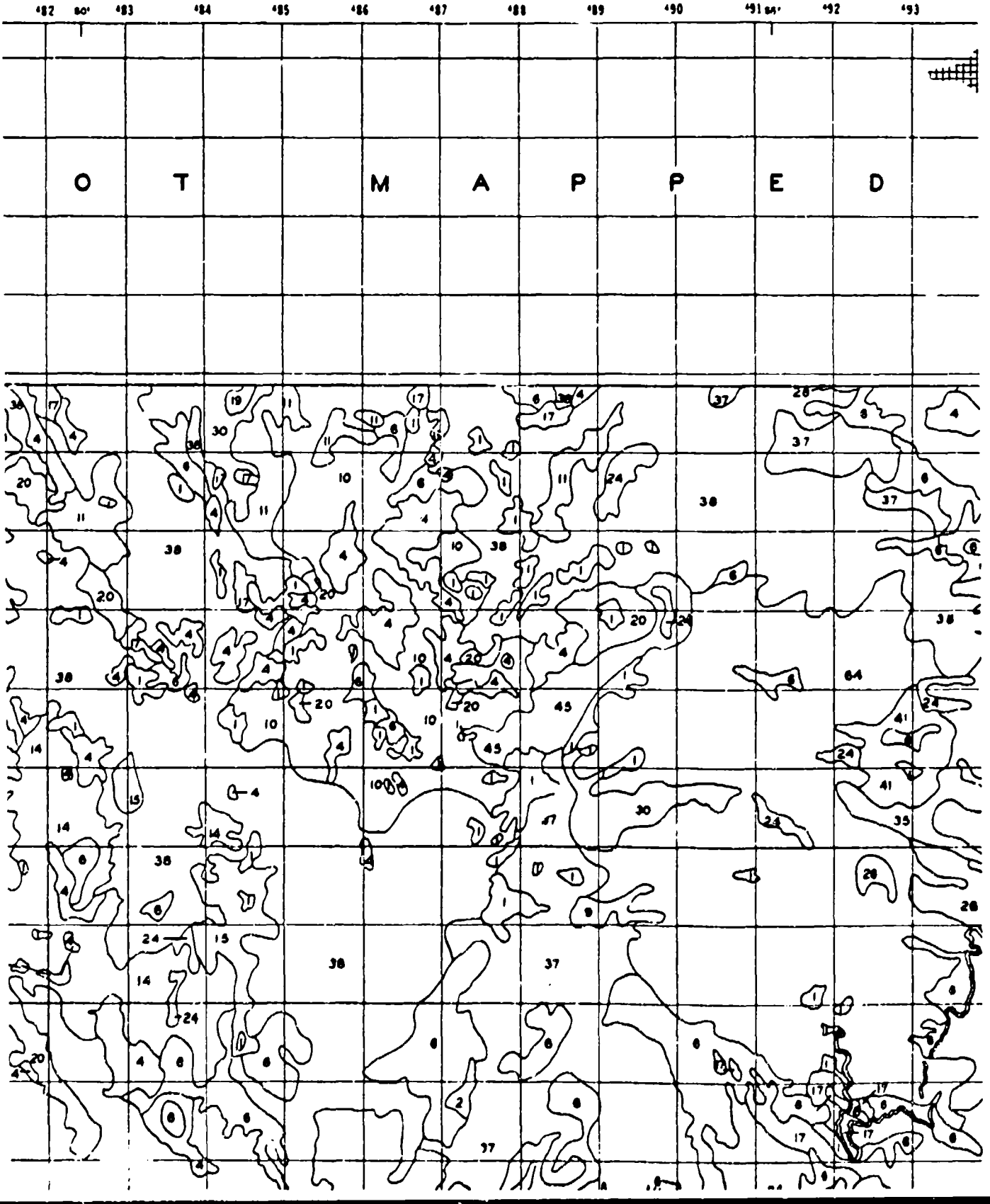
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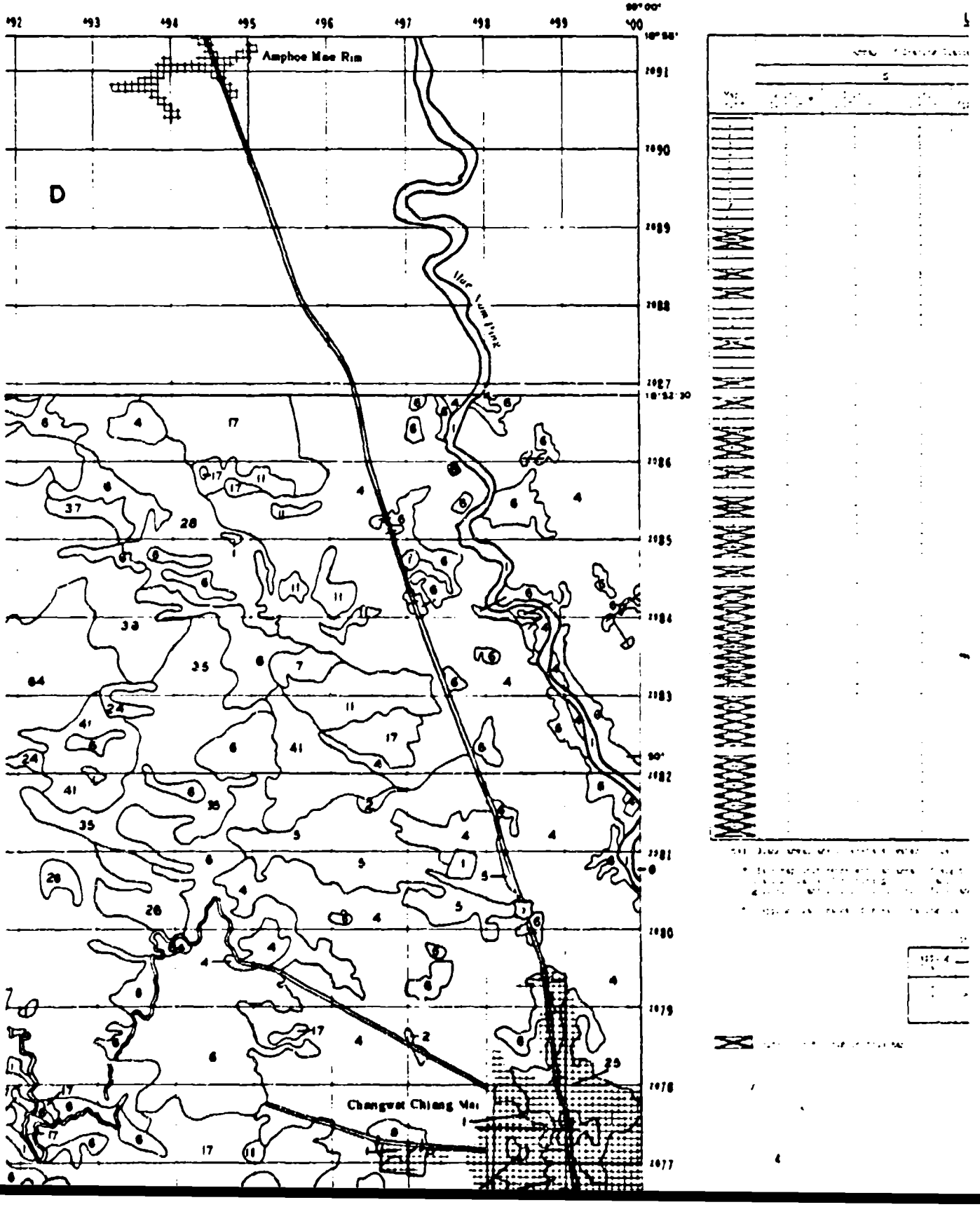
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CHIANG MAI



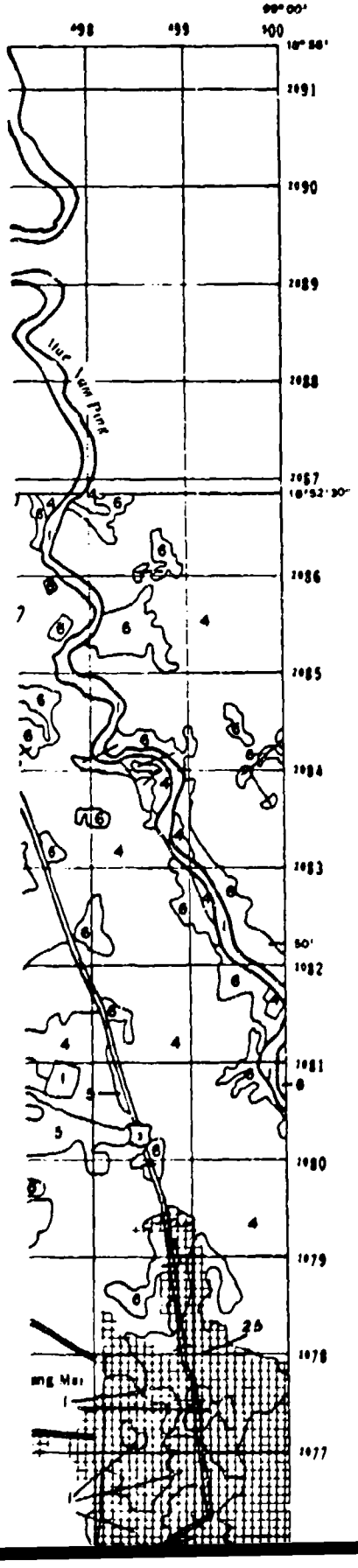
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SHEET CM I


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SHEET CM I



LEGEND

Map code	Array of Stems Classes for Stems ≤ and ≥ the Specified Diameter							
	≤				≥			
	2 in. (5.[illegible] cm)*	5 in. (12.[illegible] cm)	[illegible] in. ([illegible] cm)	50 in. (127.00 cm)	1 in. (2.54 cm)	3 in. (7.62 cm)	6 in. (15.24 cm)	10 in. (25.40 cm)

* Most minor areas are interstitial water bodies.

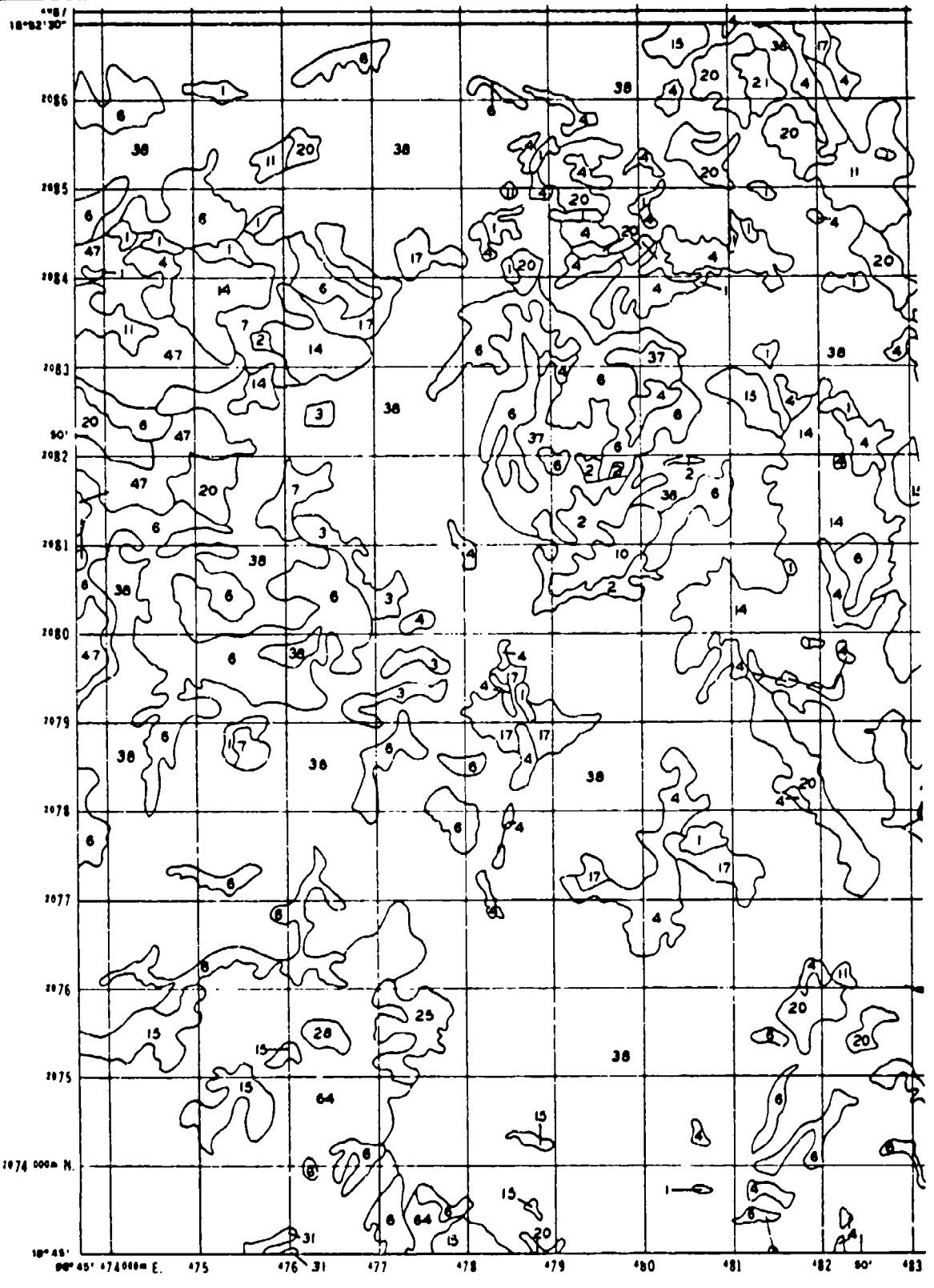
* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1,) indicating relative stem density for stems ≤ 2 in., 5 in., [illegible] in., 50 in. (≤ 5.08, 12.70, 22.90, and 127.00 cm) and ≥ 1, 3, 6, and 10 in. (2.54, 7.62, [illegible], and 25.40 cm).

* Possible less values for each spacing class used.

Stem Spacing

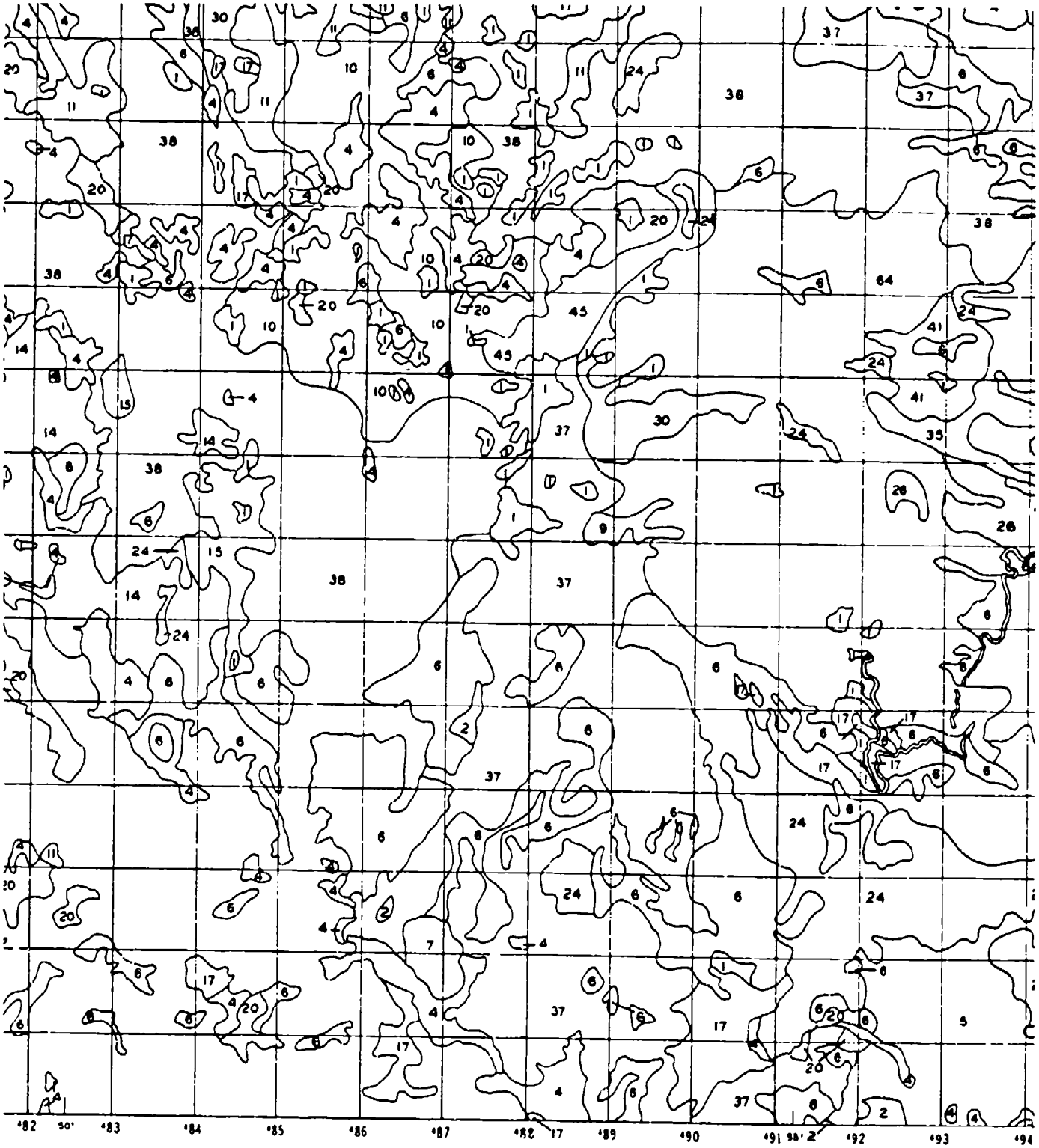
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	ft	m
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2	> 1[illegible]-10	> 3.05-[illegible]
3	> 5-10	> 1.52-[illegible]
4	[illegible]	0-1.52

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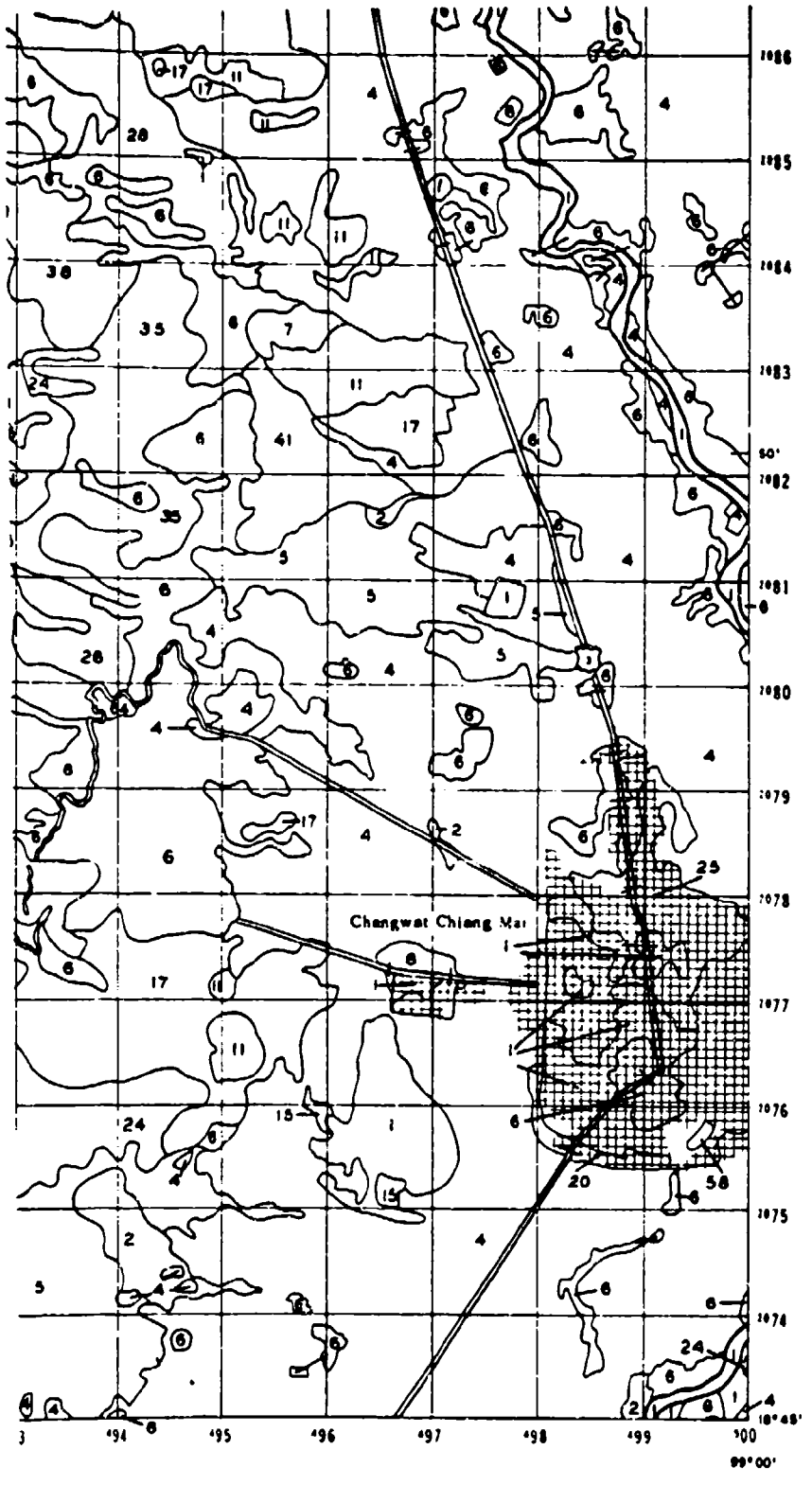


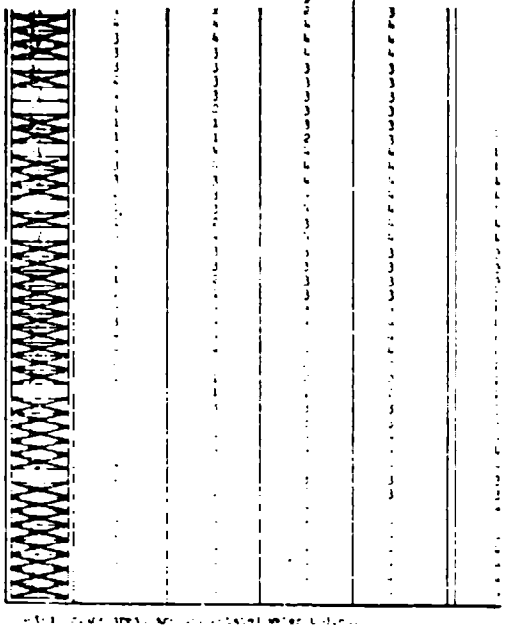
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

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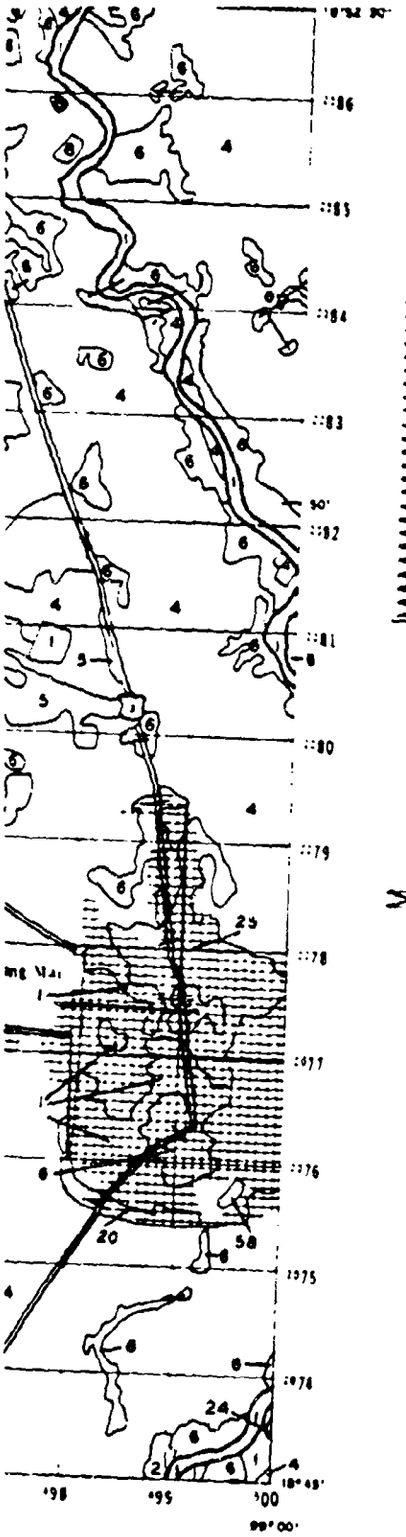
A QUANTITATIVE METHOD FOR I
TERRAIN FOR GROUND MC

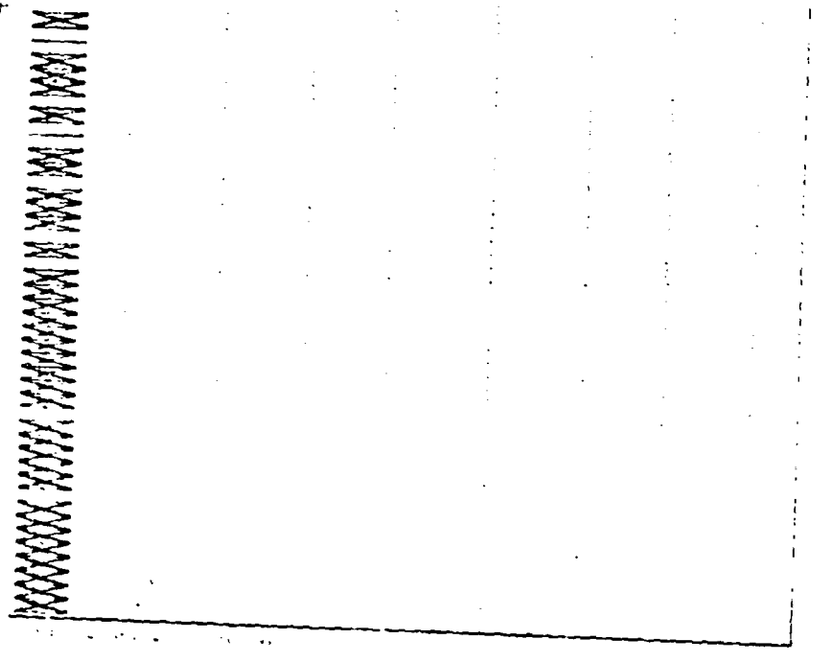
VEGETATION

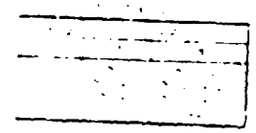
CHIANG MAI STUDY A

SHEET CM I

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CM IV	CM III

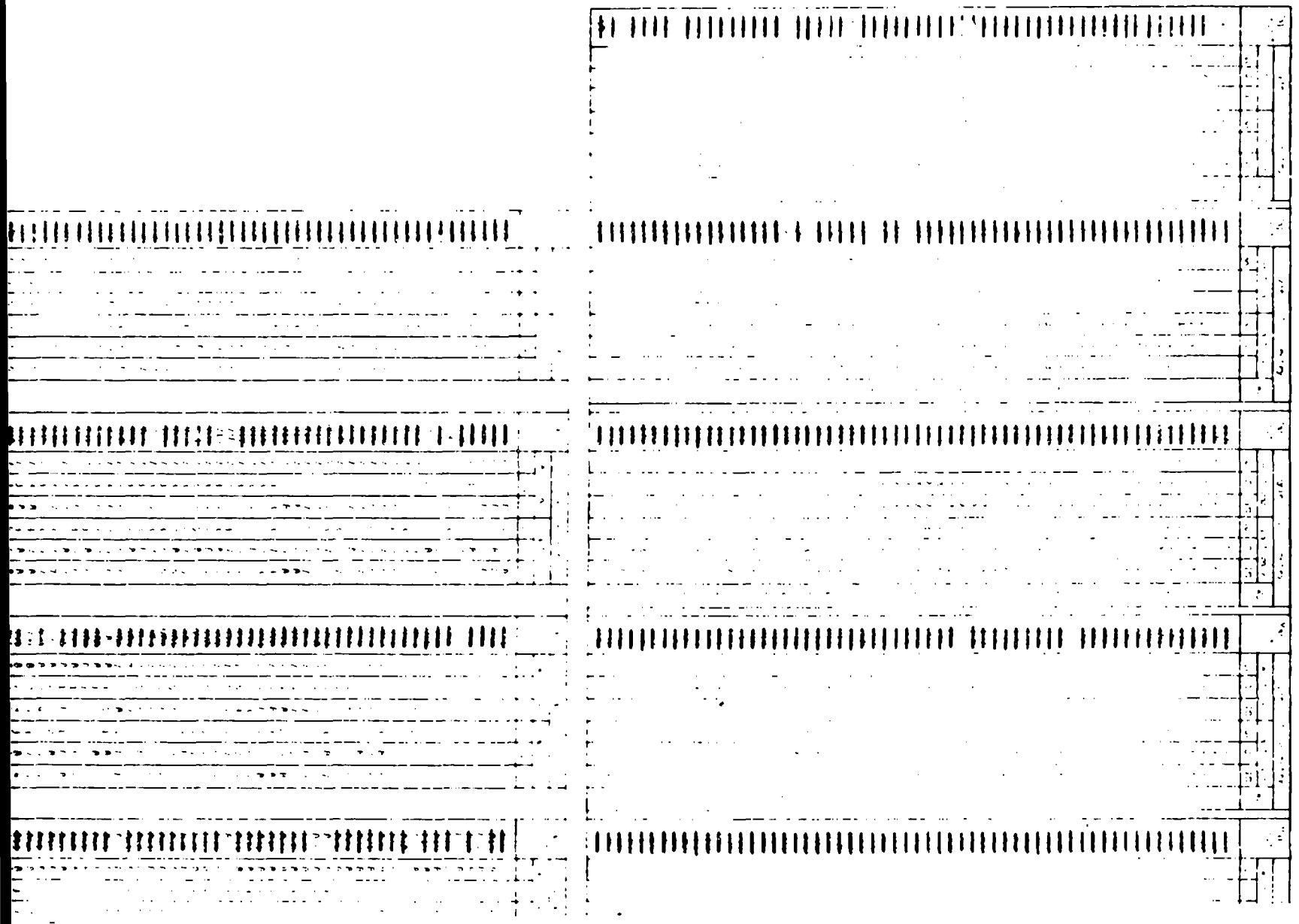
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

CHIANG MAI STUDY AREA

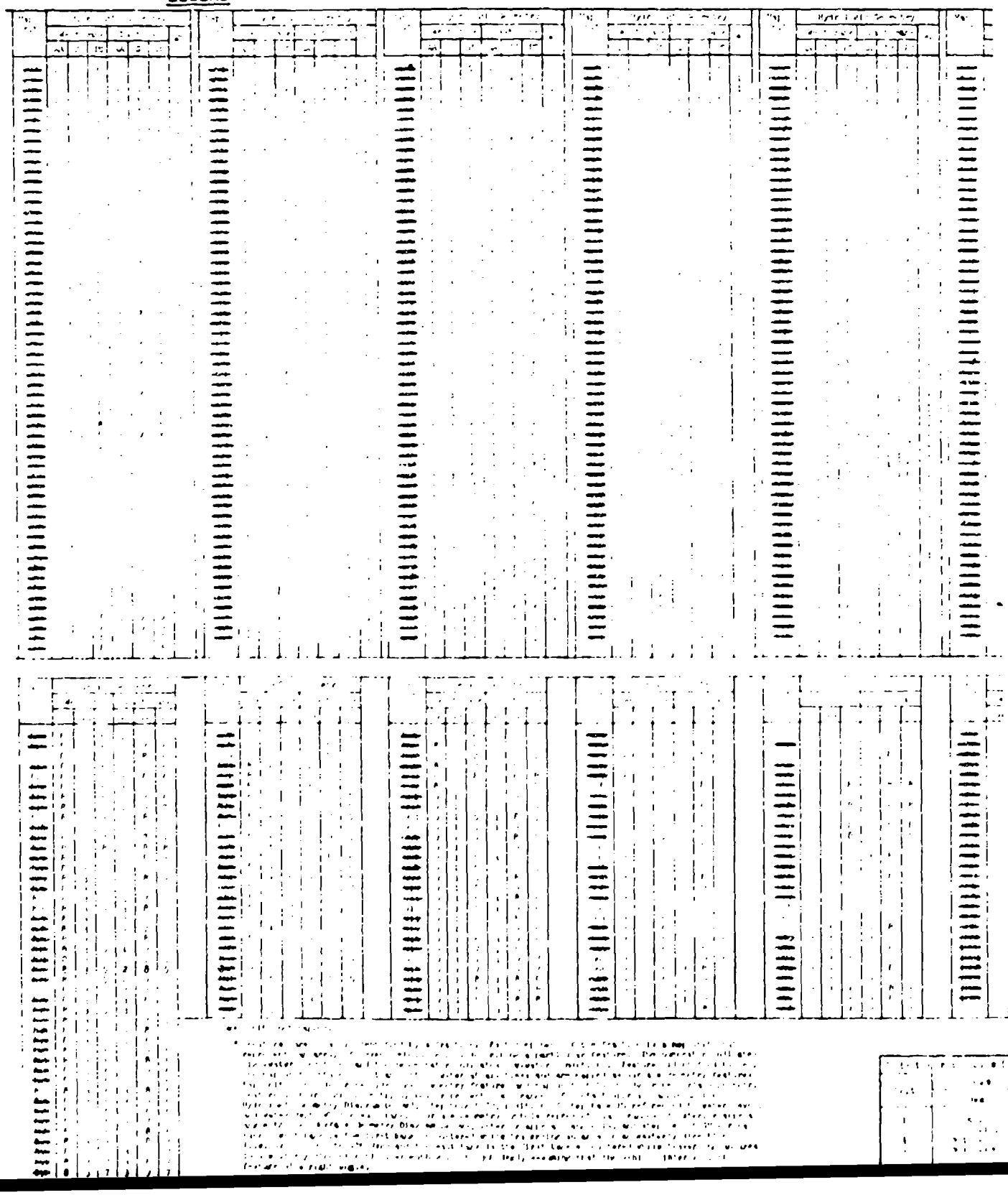
SHEET CM I

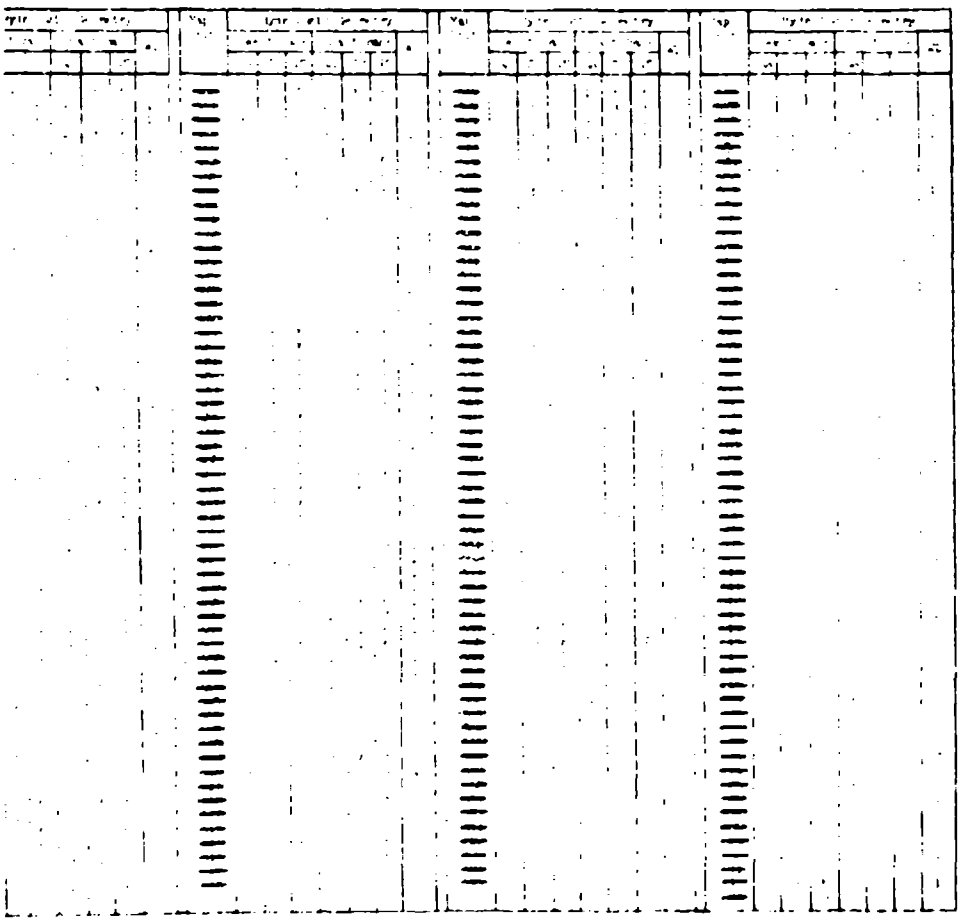
PLATE 3.1c

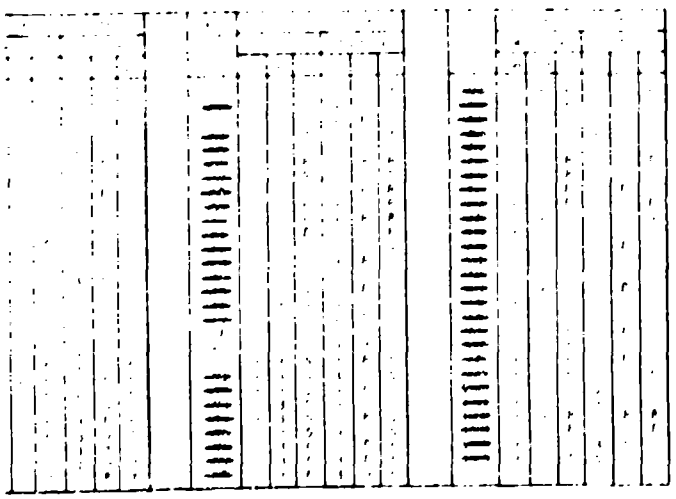


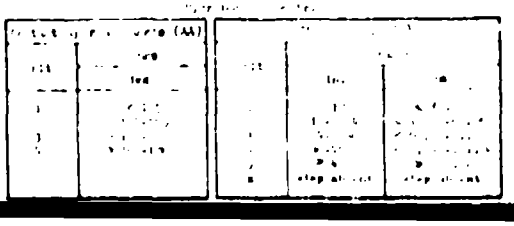
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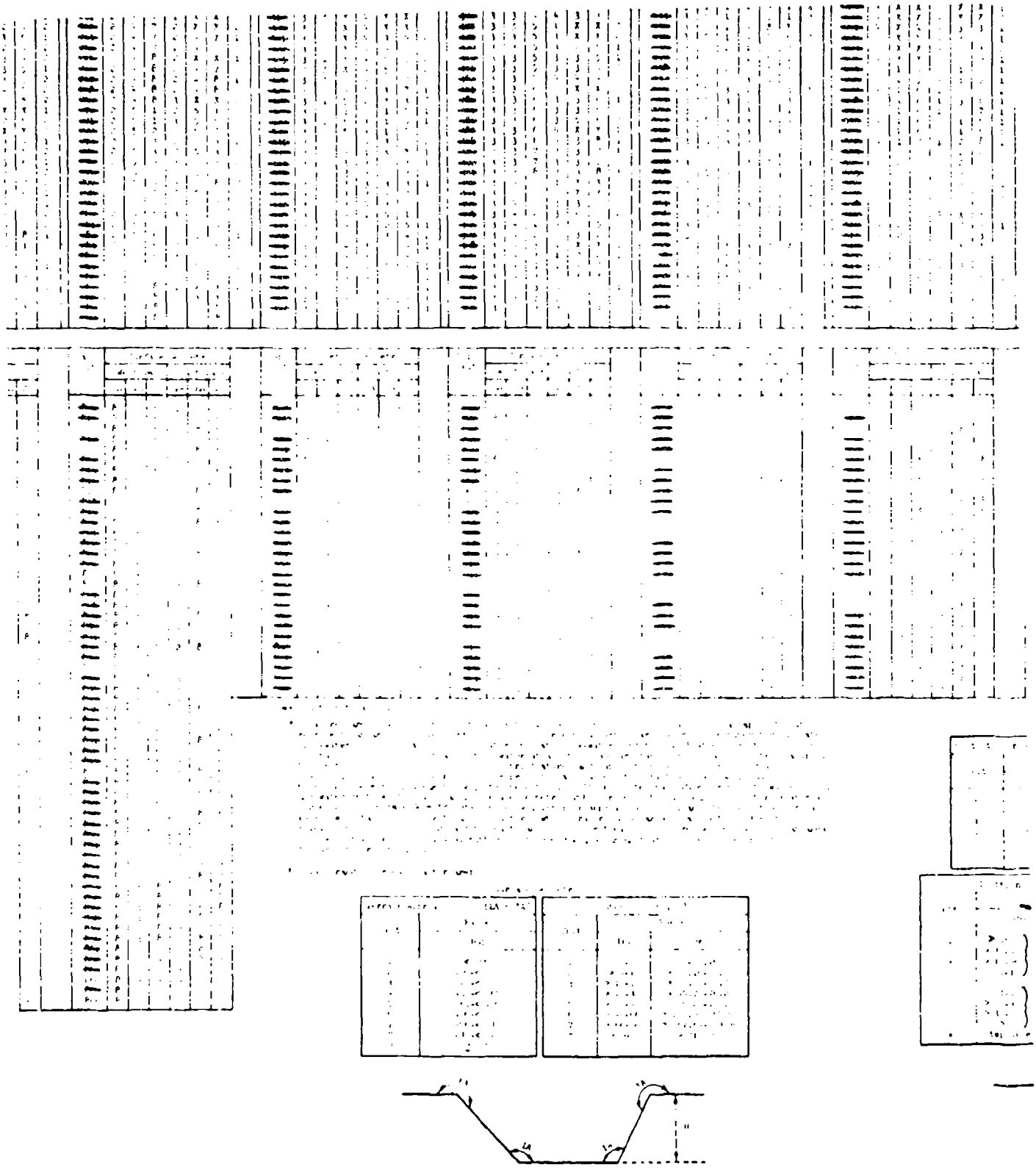
LEGEND



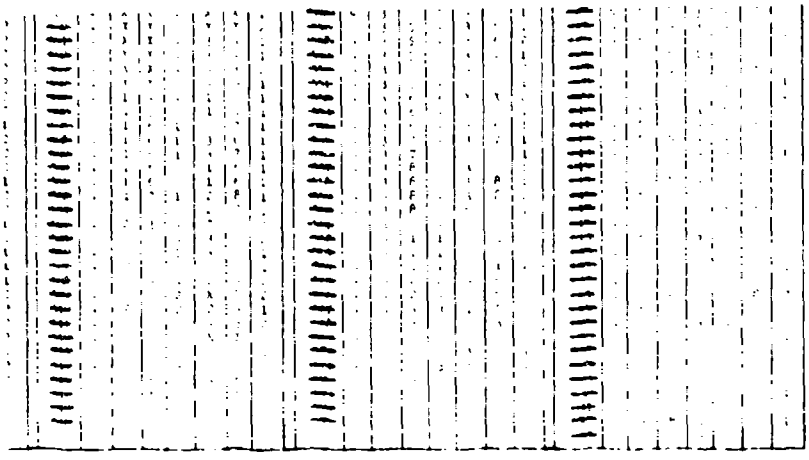


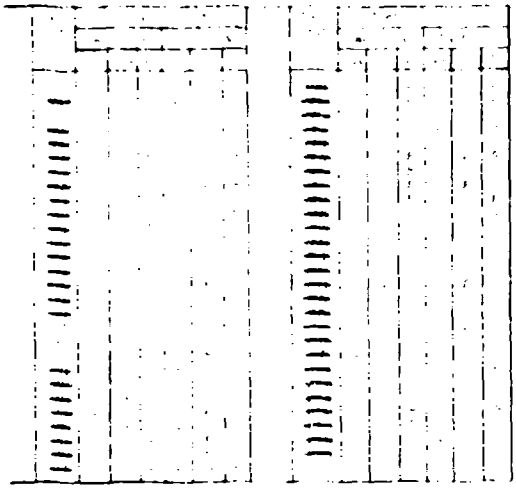


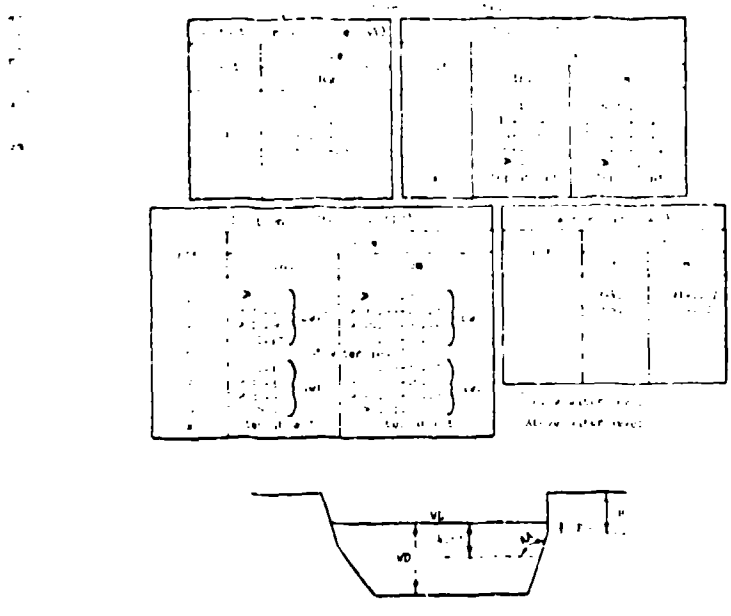


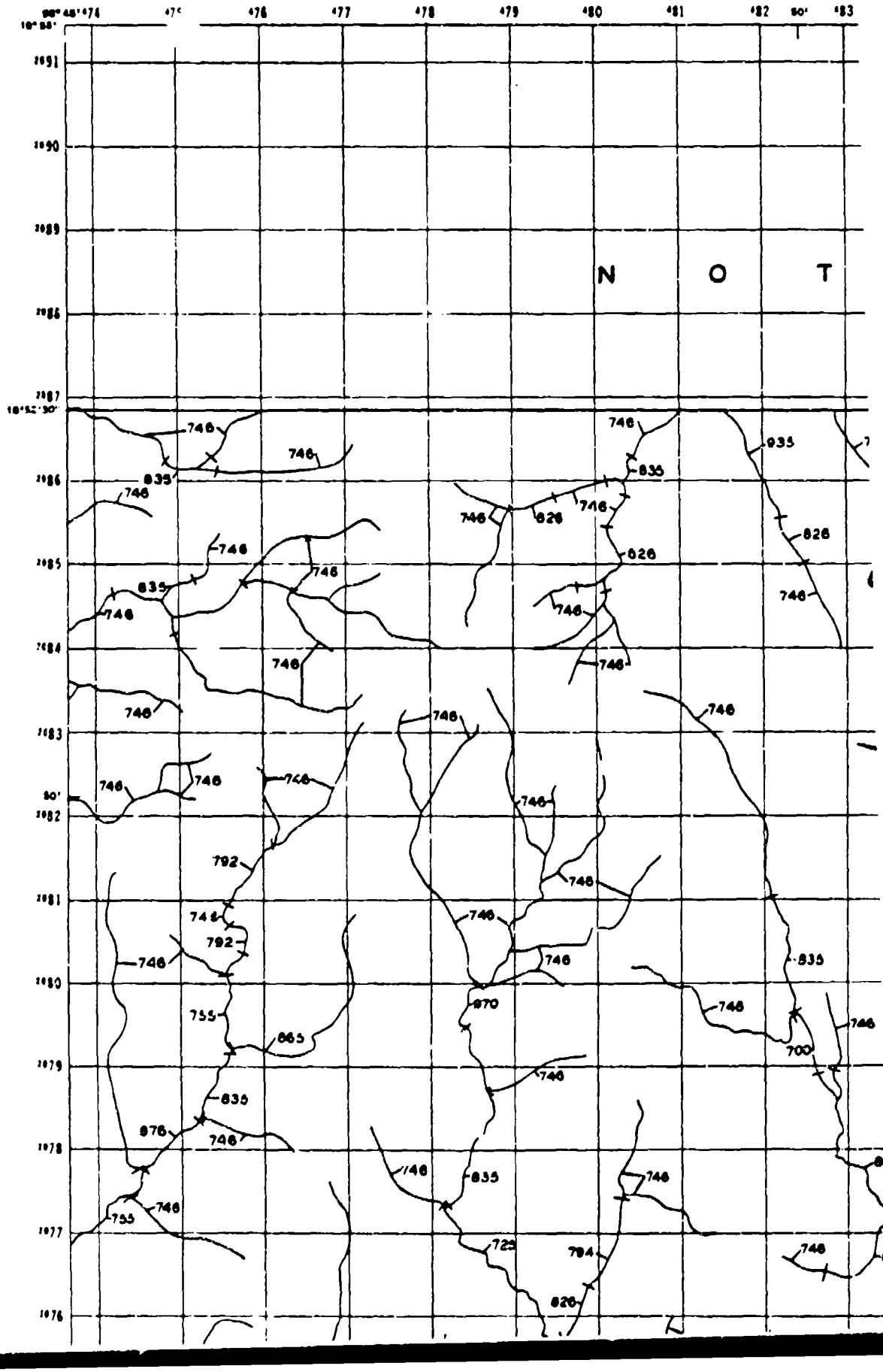


1.5



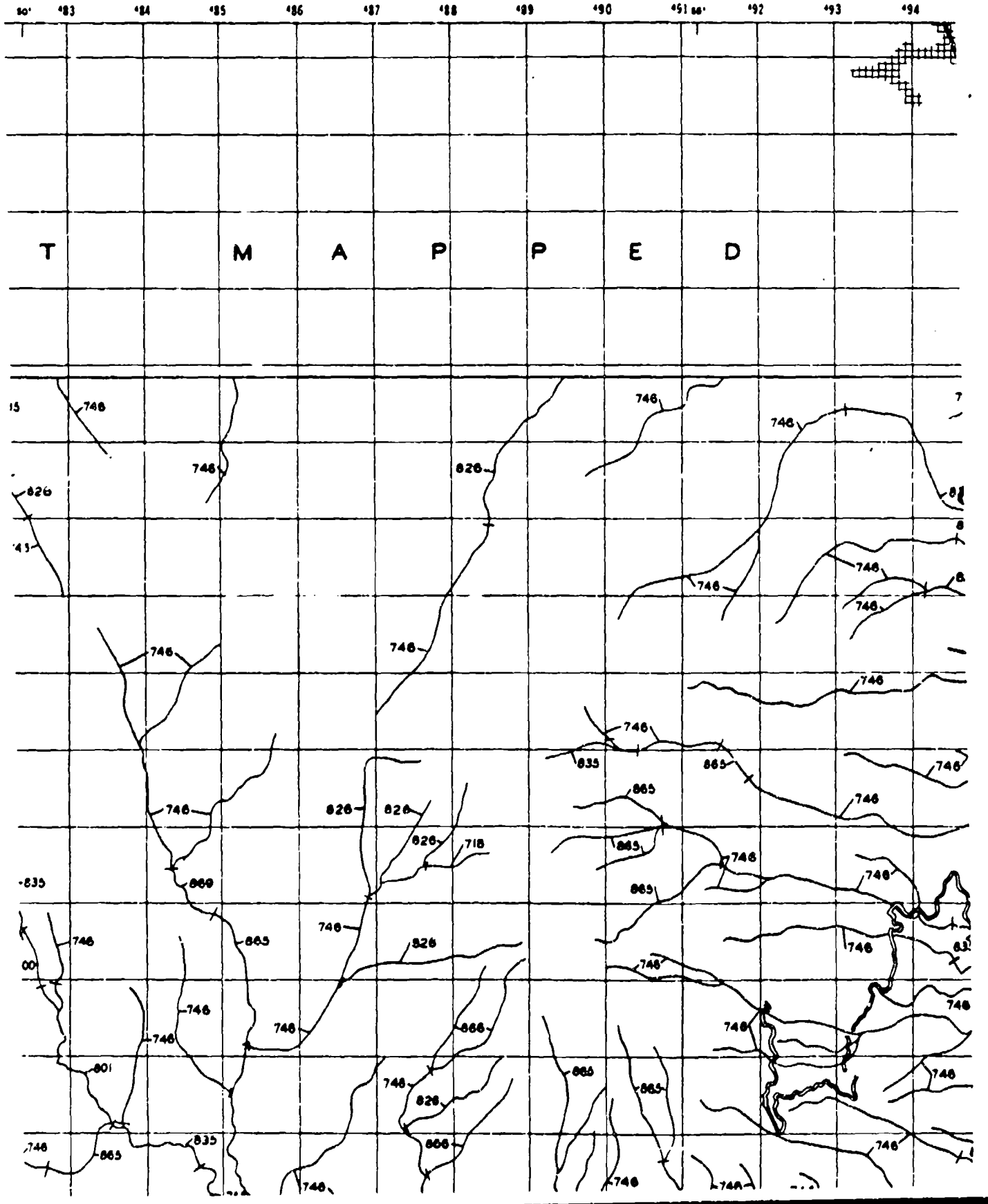


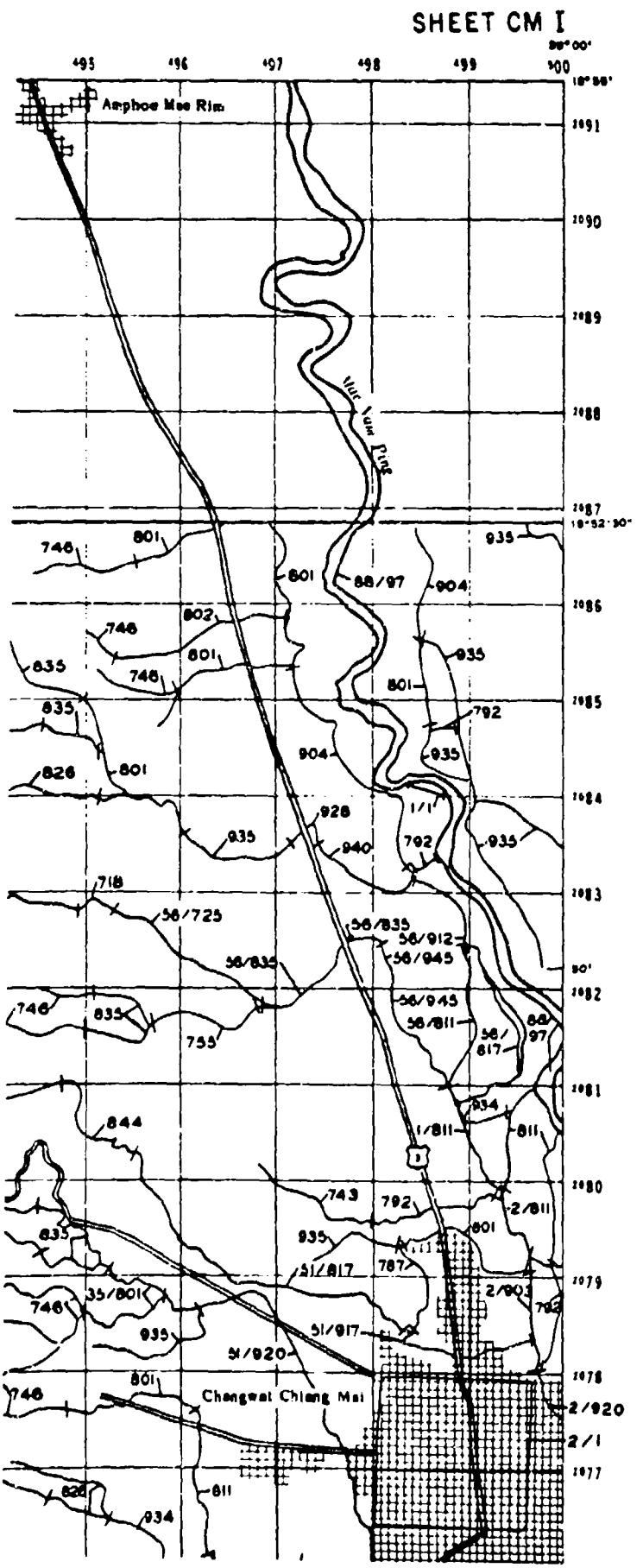


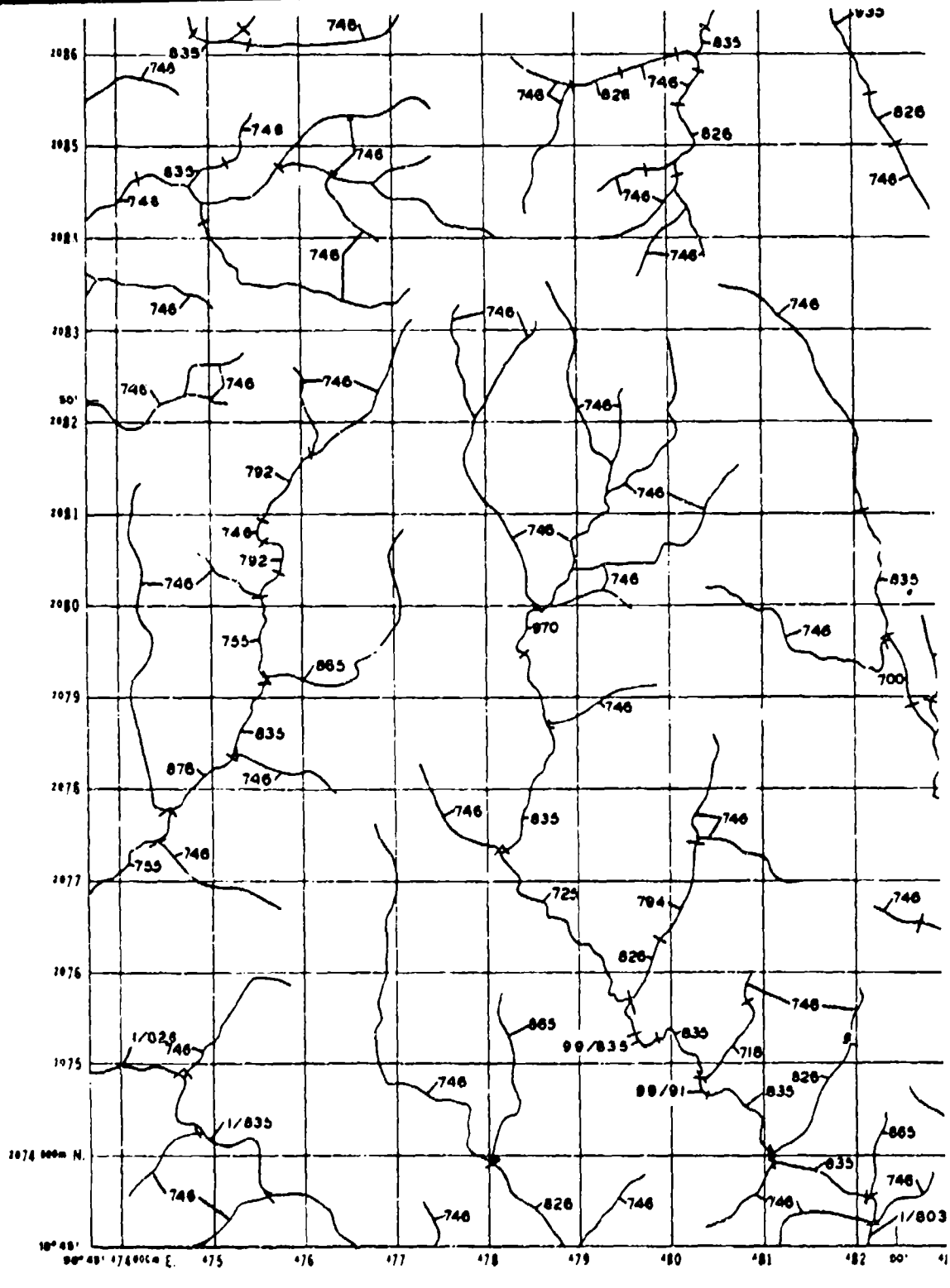

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CHIANG MAI

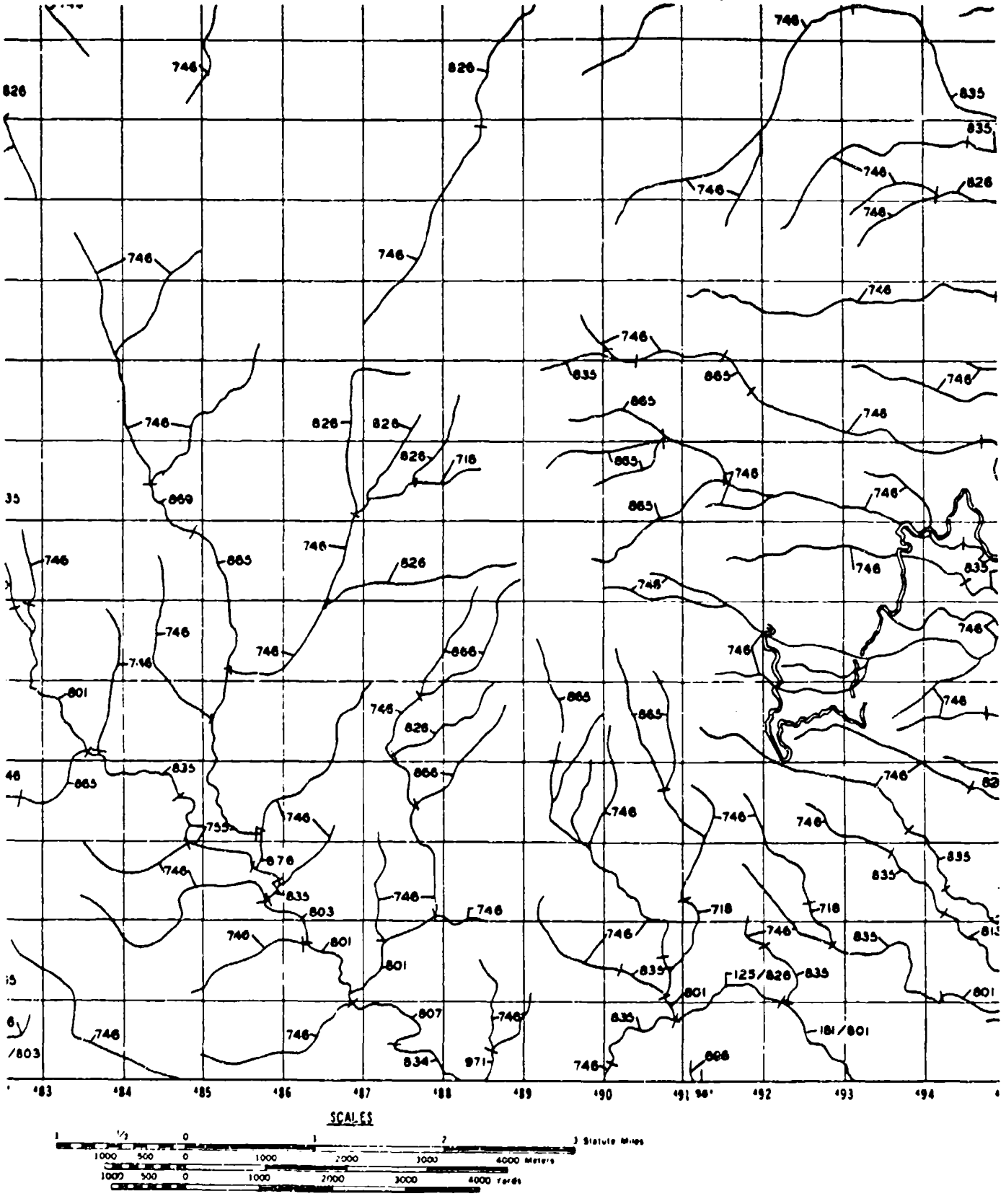



SHEET CM I
Amphoe Mae Rim
Changwat Chiang Mai
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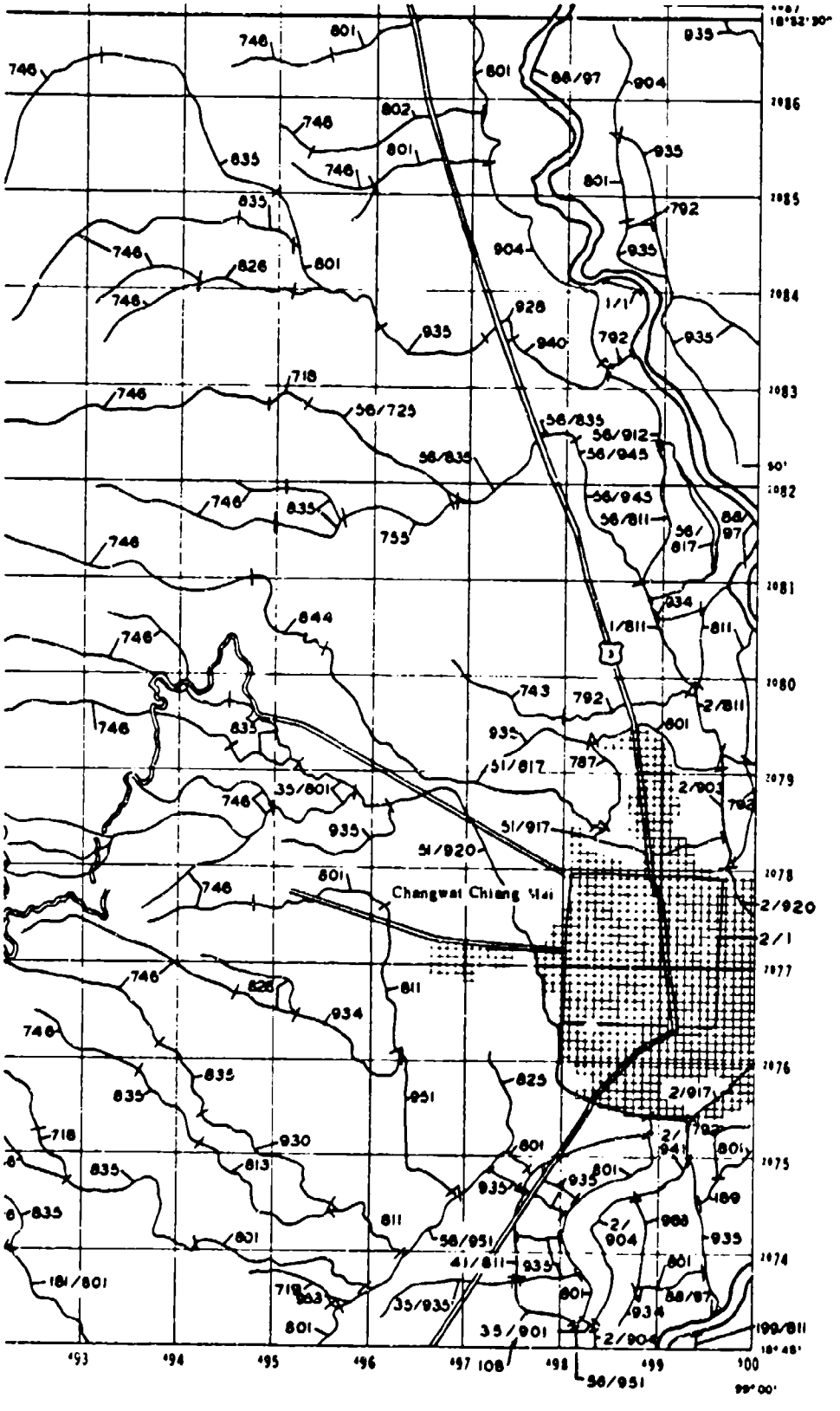


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

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SCALES
1 0 1 2 3 Statute Miles
1000 500 0 1000 2000 3000 4000 Meters
1000 500 0 1000 2000 3000 4000 Yards

5



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CM IV	

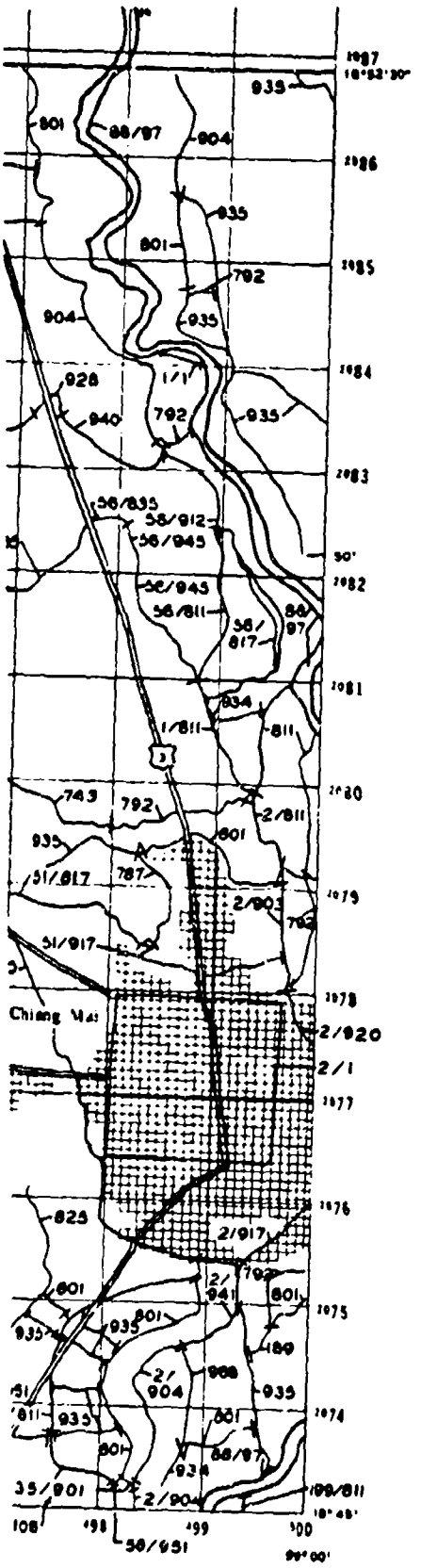
A QUANTITTATIVE METHOD I
TERRAIN FOR GROUNI

HYDROLOGIC GE

CHIANG MAI STUI

SHEET CM

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CM IV	CM III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

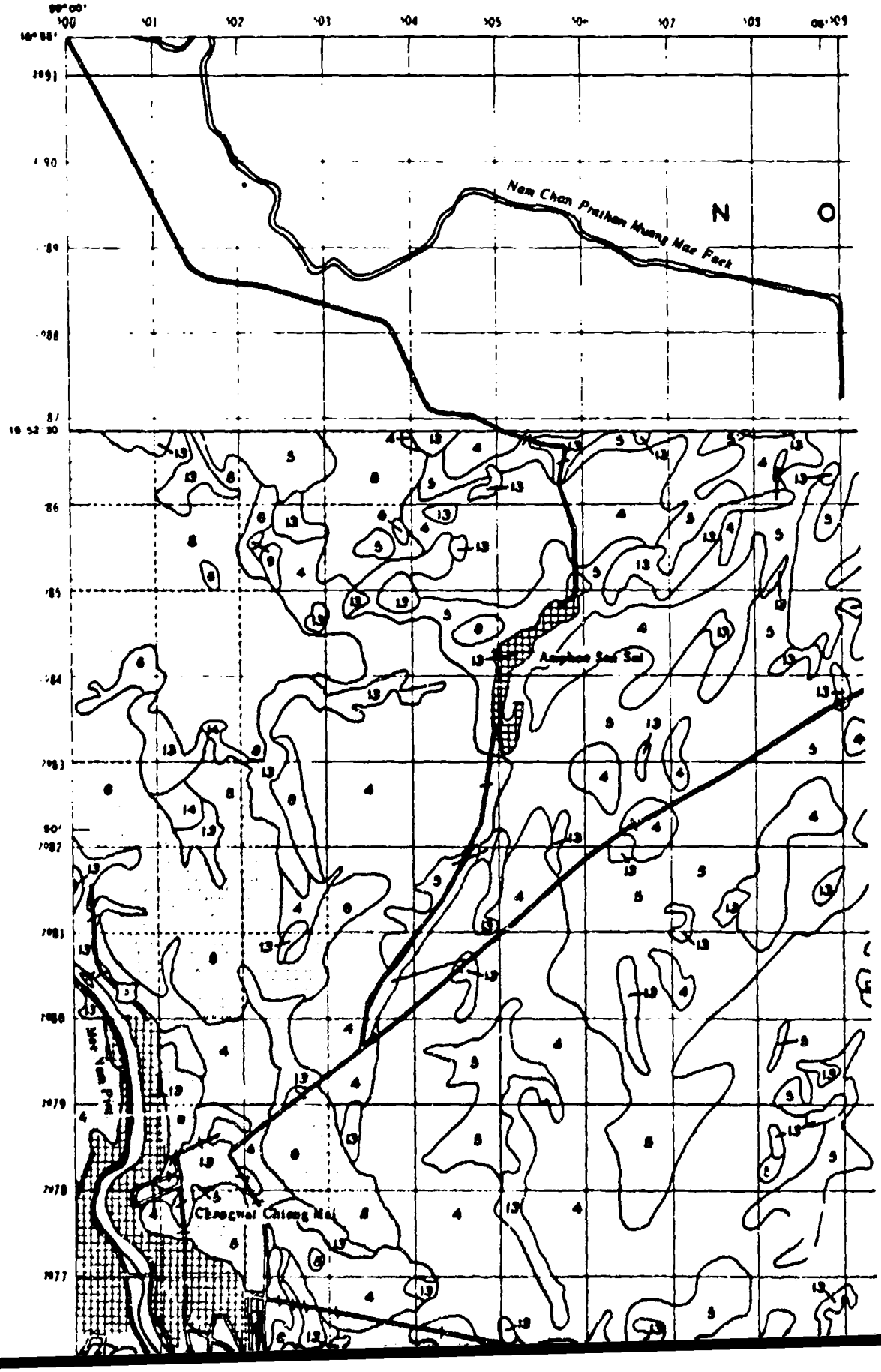
HYDROLOGIC GEOMETRY

CHIANG MAI STUDY AREA

SHEET CM I

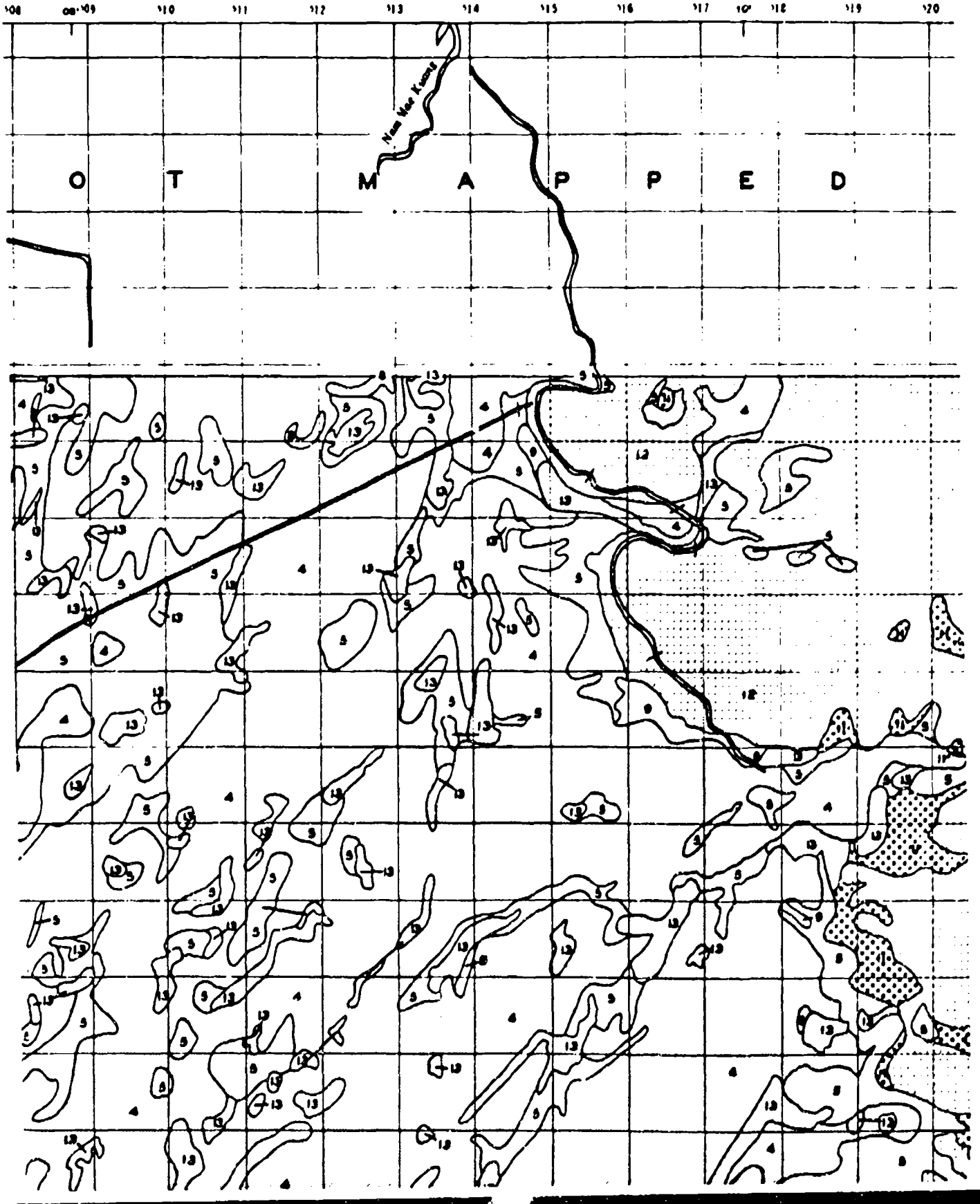
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PLATE 3.1d

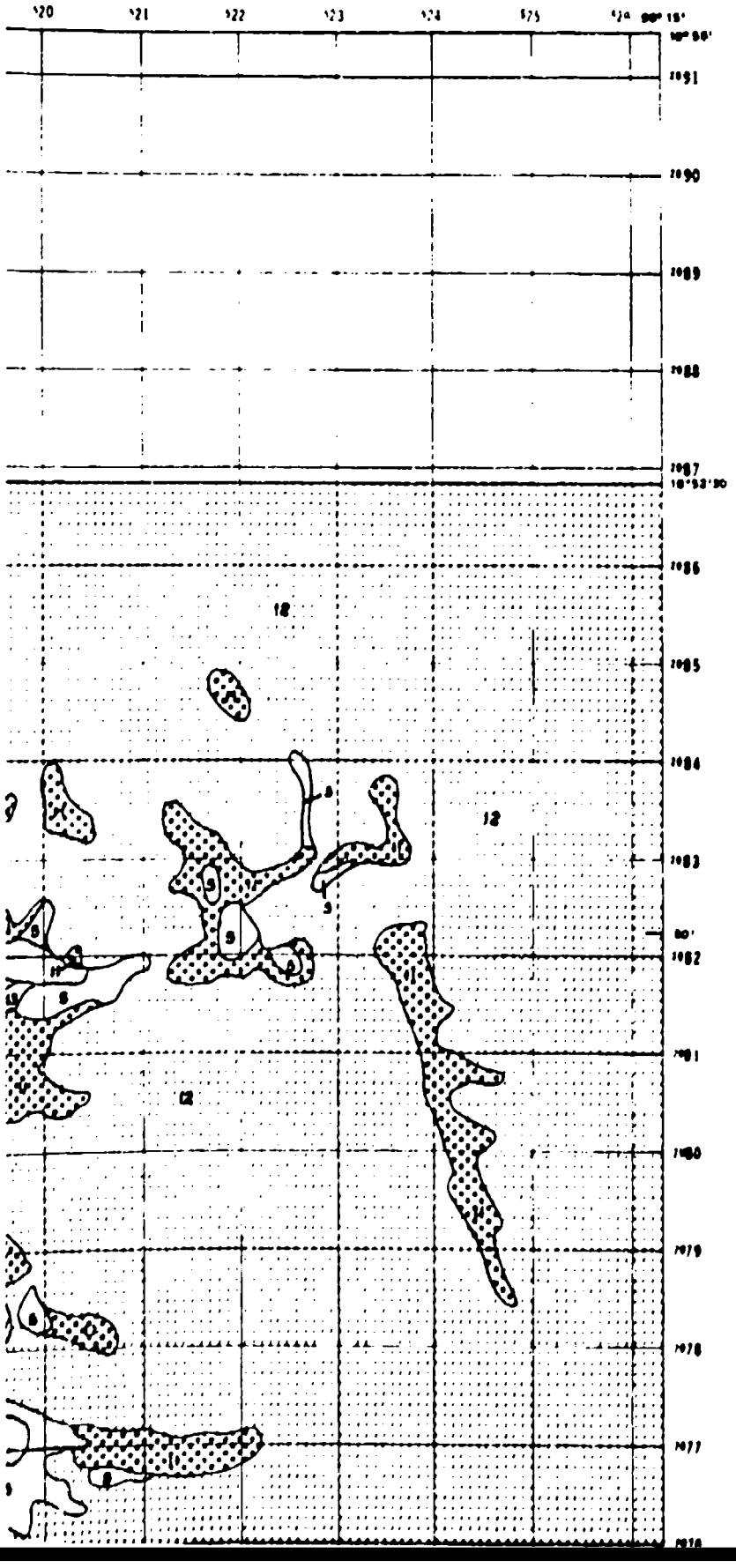

Nam Chan Prathan Muang Mae Fark
N
O
Amphoe Sai Sui
Chiangmai Chiang Mai

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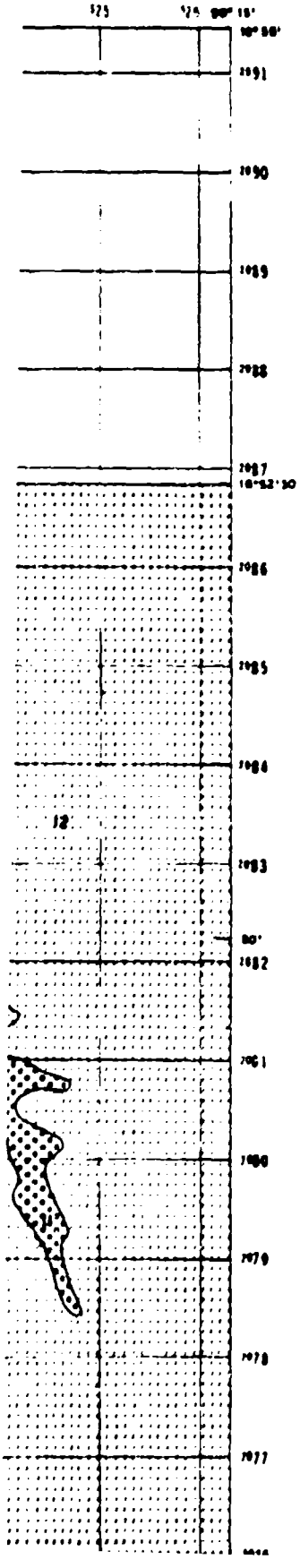
CHIANG MAI



SHEET CM II


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SHEET CM II



LEGEND

Unit	Soil Mass Strength: Minimum Moisture RCI	Soil Mass Strength: Maximum Moisture RCI	Soil Surface Strength: Maximum Moisture psi	c_w kg/cm²	ϕ_w deg	Soil Surface Strength: Minimum Moisture psi	c_w kg/cm²	ϕ_w deg	Conditions where maximum c_w occurs psi	c_w kg/cm²	ϕ_w deg
[X]	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
3	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
[X]	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
5	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
2	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
[X]	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
6	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
7	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
[X]	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
10	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
10	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
12	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
[X]	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

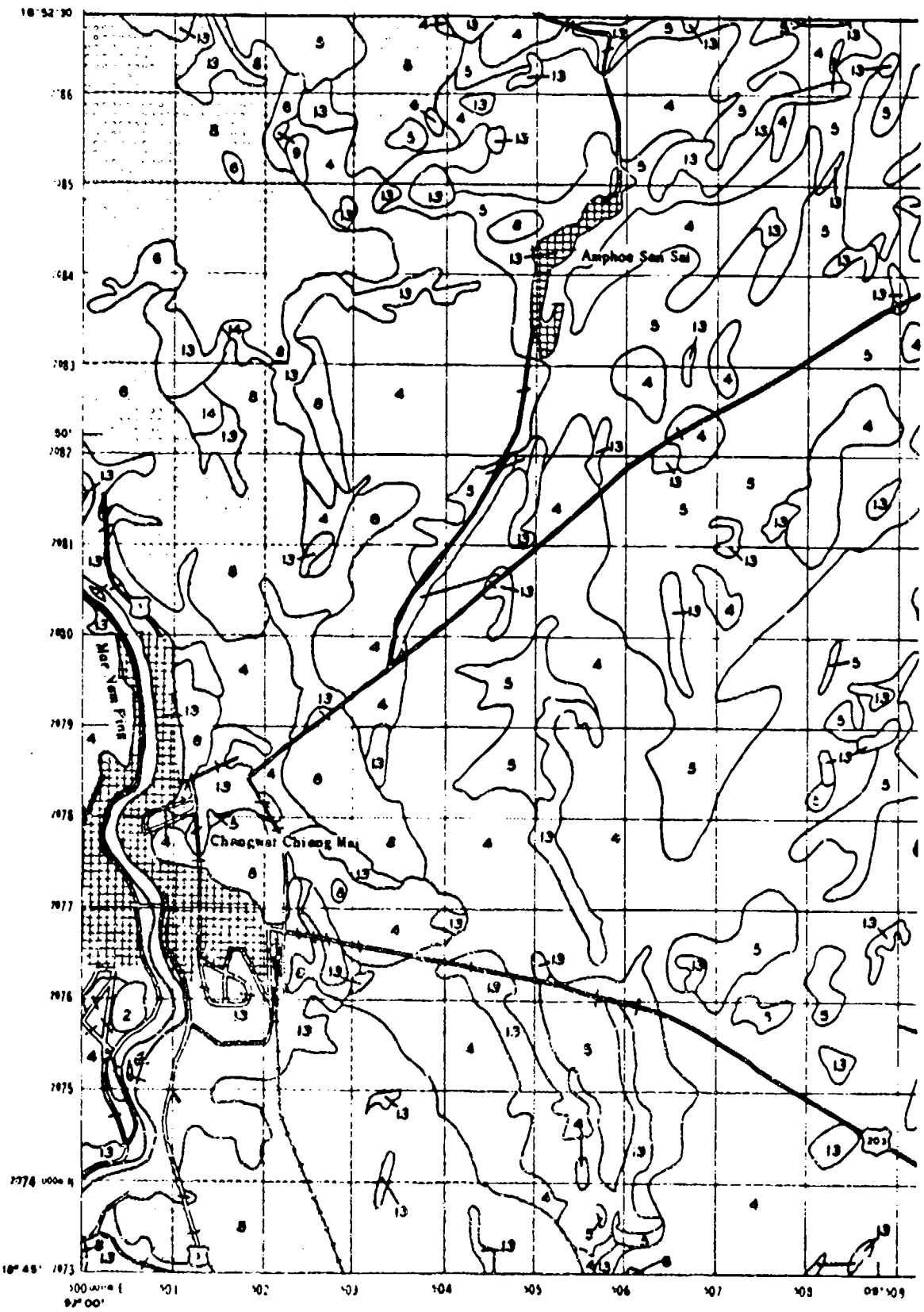
c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

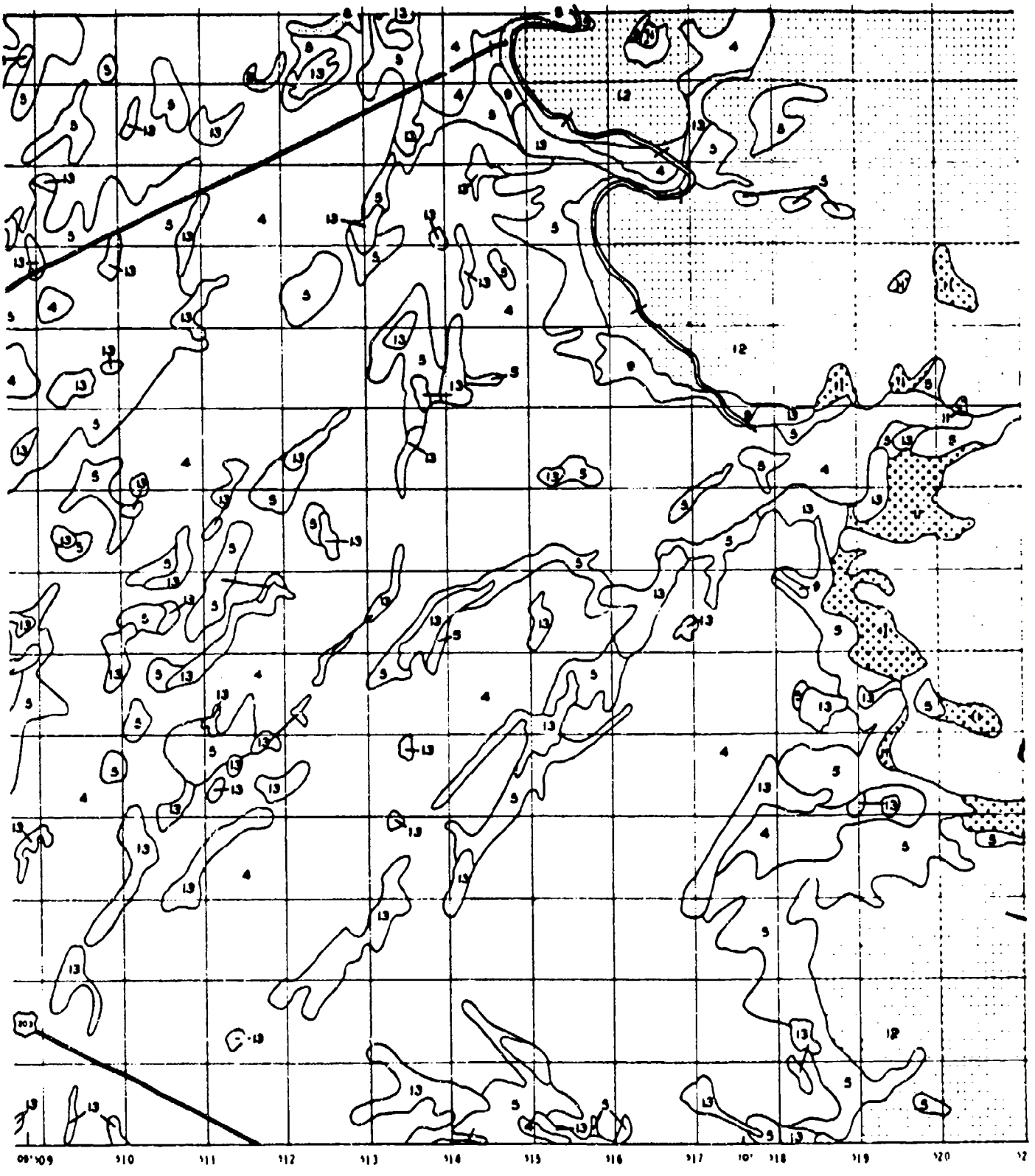
[X] Units do not occur in this map.

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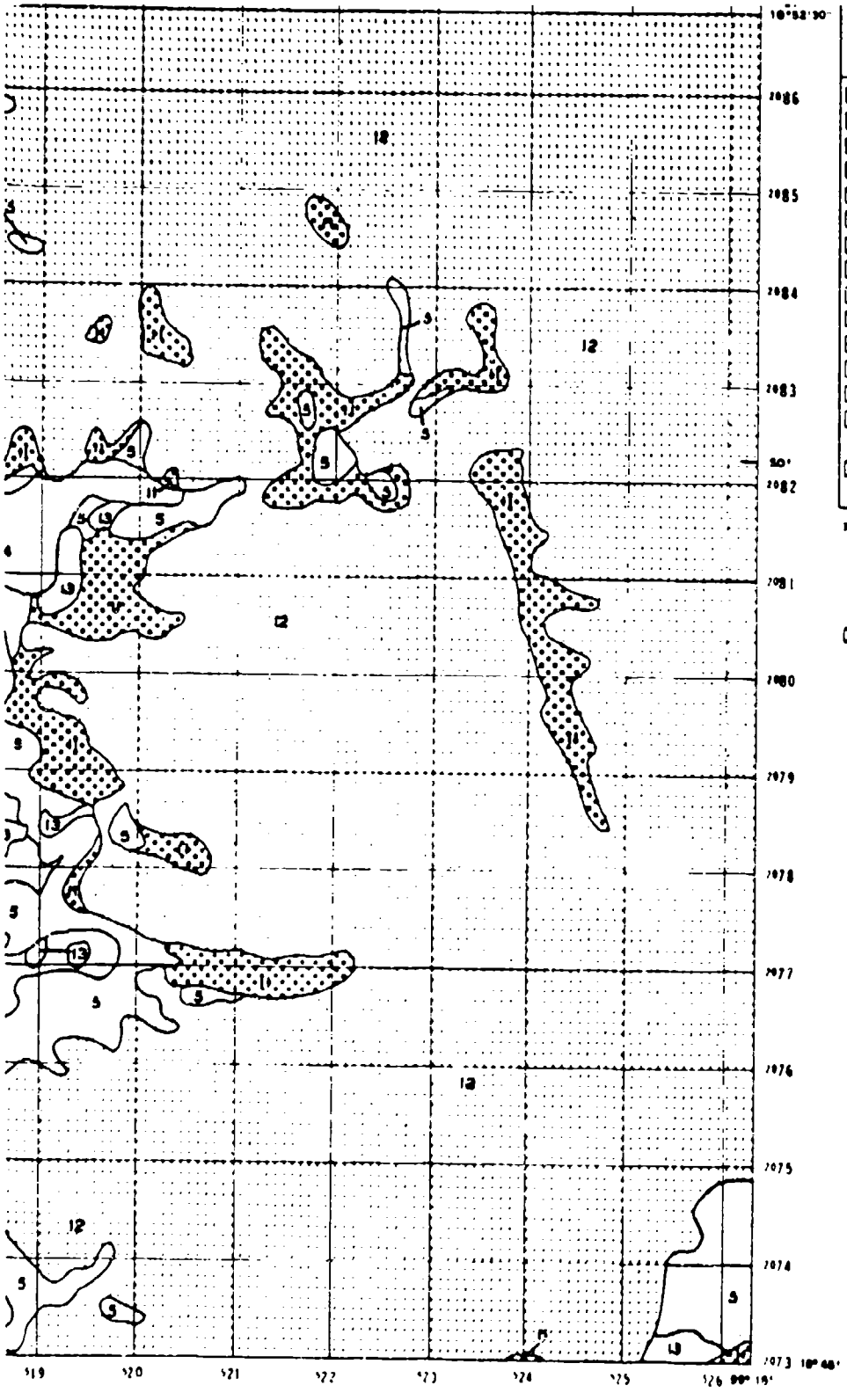


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

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Units	Maximum Moisture ROI	Minimum Moisture RCI	Maximum Moisture c_{ur} psi	Maximum Moisture c_{ur} kg/cm²	Maximum Moisture ϕ_{ur} deg	psi
X	10-25	25-60	0-1	0-0.07	0	1-2
2	25-60	60-100	0-1	0-0.07	0-10	2-4
X	25-60*	60-100	0-1	0-0.07	10-20	2-4
4	25-60	>100	0-1	0-0.07	0-10	0-1
5	25-60*	>100	0-1	0-0.07	10-20	0-1
6	60-100	60-100	0-1	0-0.07	0-10	2-4
X	60-100	60-100	0-1	0-0.07	10-20	0-1
8	60-100	>100	0-1	0-0.07	0-10	0-1
9	60-100	>100	0-1	0-0.07	0-10	0-1
X	60-100	>100	0-1	0-0.07	10-20	0-1
11	60-100*	>100	0-1	0-0.07	10-20	0-1
12	>100	>100	0-1	0-0.07	0-10	0-1
13	>100	>100	0-1	0-0.07	10-20	0-1
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1
X	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1

Note: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability; strengths commonly observed are 60-100 for Units 3 and

X Units do not occur on this map.

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CM I	
CM IV	C

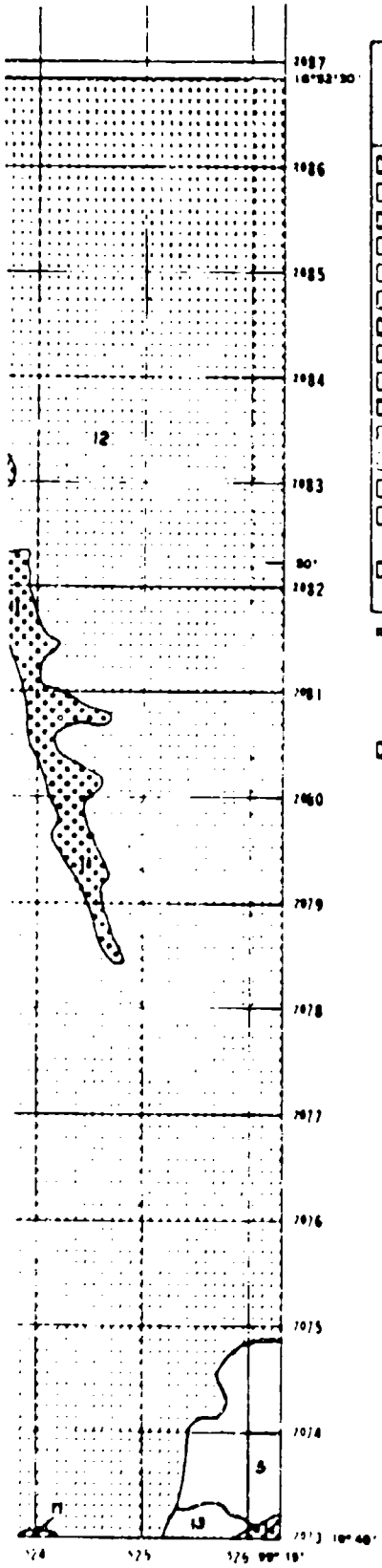
A QUANTITATIVE METHOD TERRAIN FOR GROU

SURFACE COM

CHIANG MAI STI

SHEET C

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LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{uz} psi	c_{uz} kg/cm²	σ_{uz} deg	Soil Surface Strength: Minimum Moisture c_{uz} psi	c_{uz} kg/cm²	σ_{uz} deg	Conditions where maximum c_{uz} occurs: c_{uz} psi	c_{uz} kg/cm²	σ_{uz} deg
⊠	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	[illegible]	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
10	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
[illegible]	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
13	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
⊠	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

c_{uz} Shear strength at zero normal load.

σ_{uz} Angle of internal friction.

* Maximum moisture has less than 5 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

⊠ Units do not occur on this map.

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CM I	CM II
CM IV	CM III

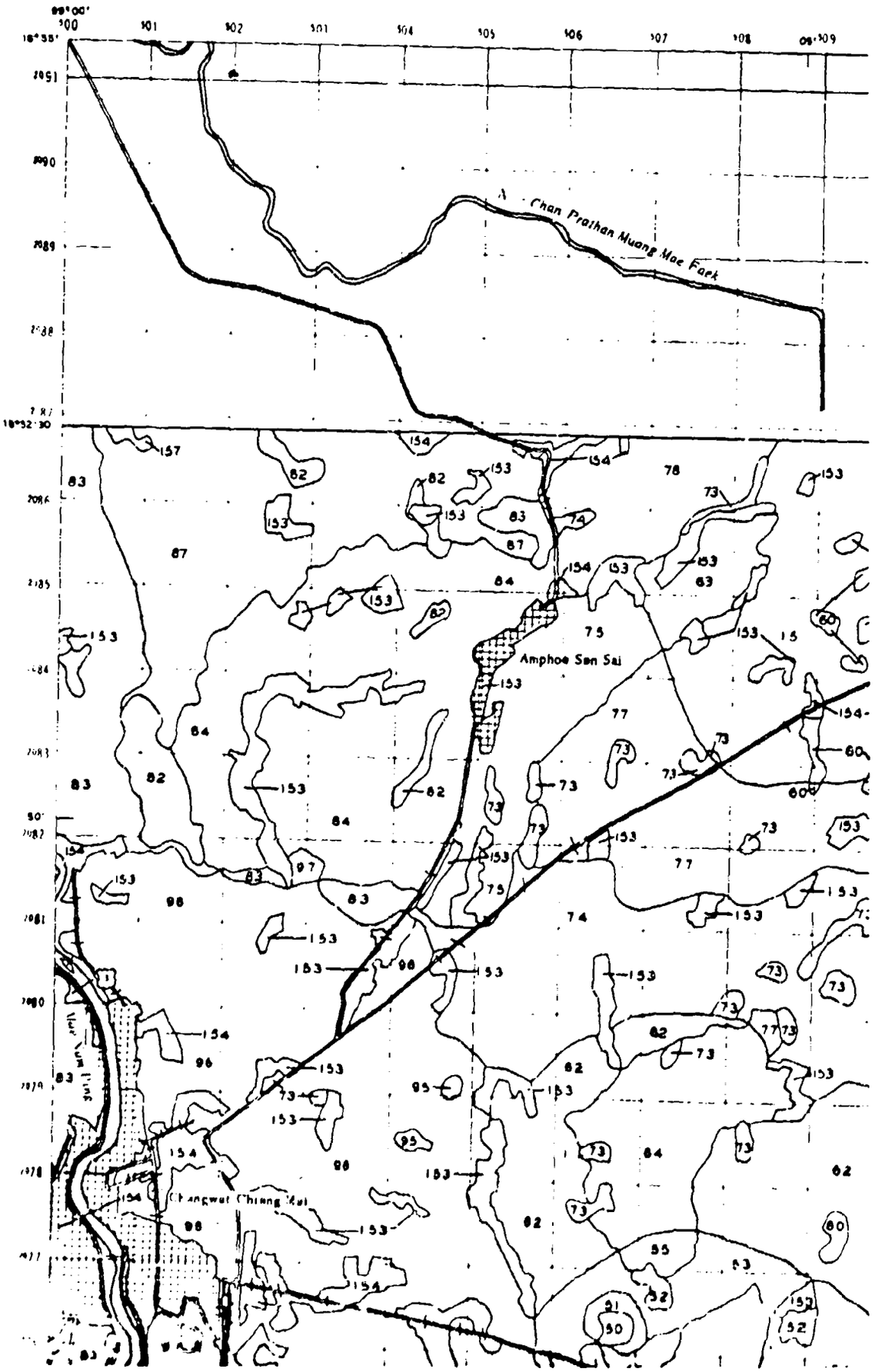
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

CHIANG MAI STUDY AREA

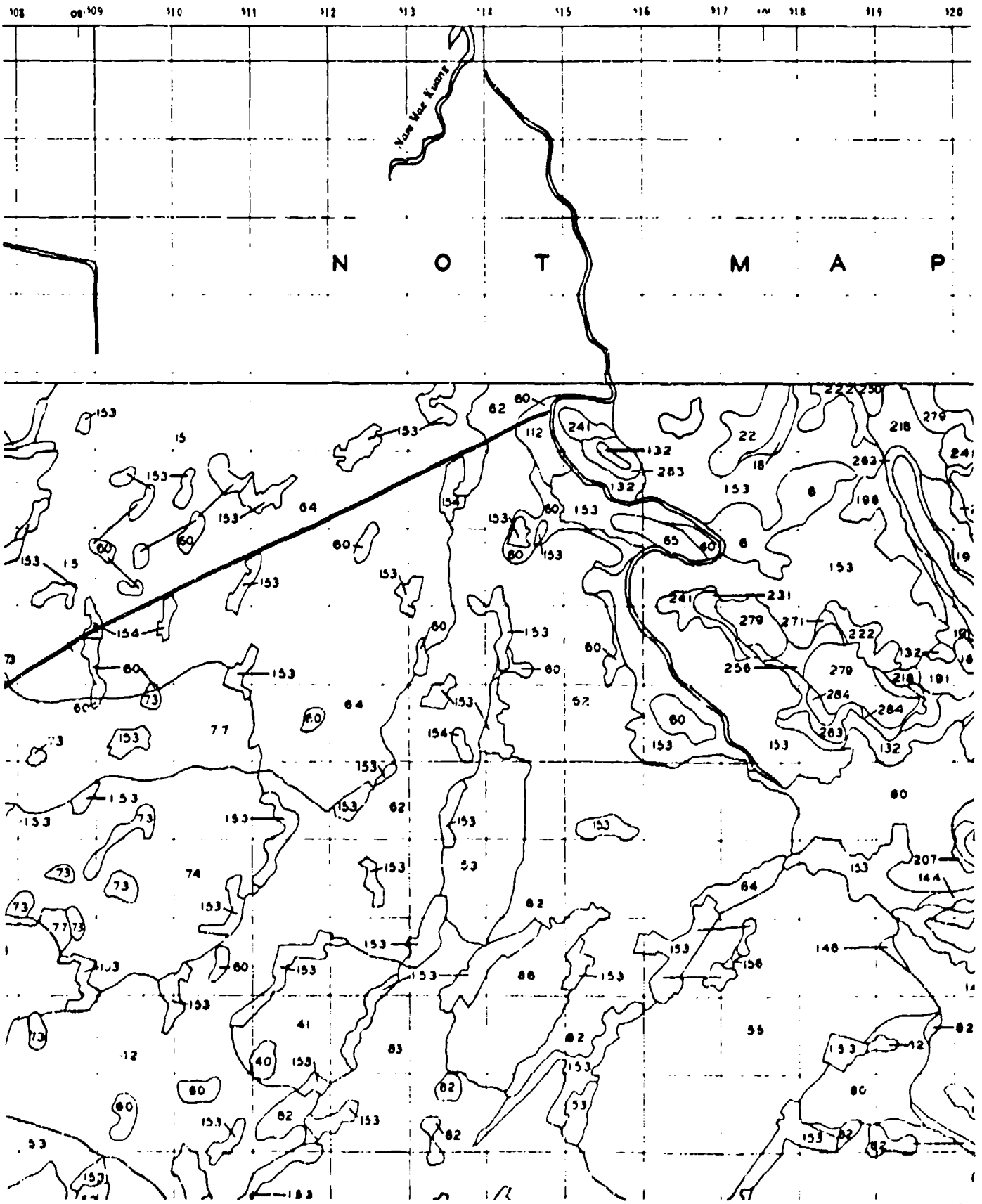
SHEET CM II

PLATE 3.2a


Chan Prathan Muang Mae Faek
Amphoe San Sai
Changwat Chiang Mai

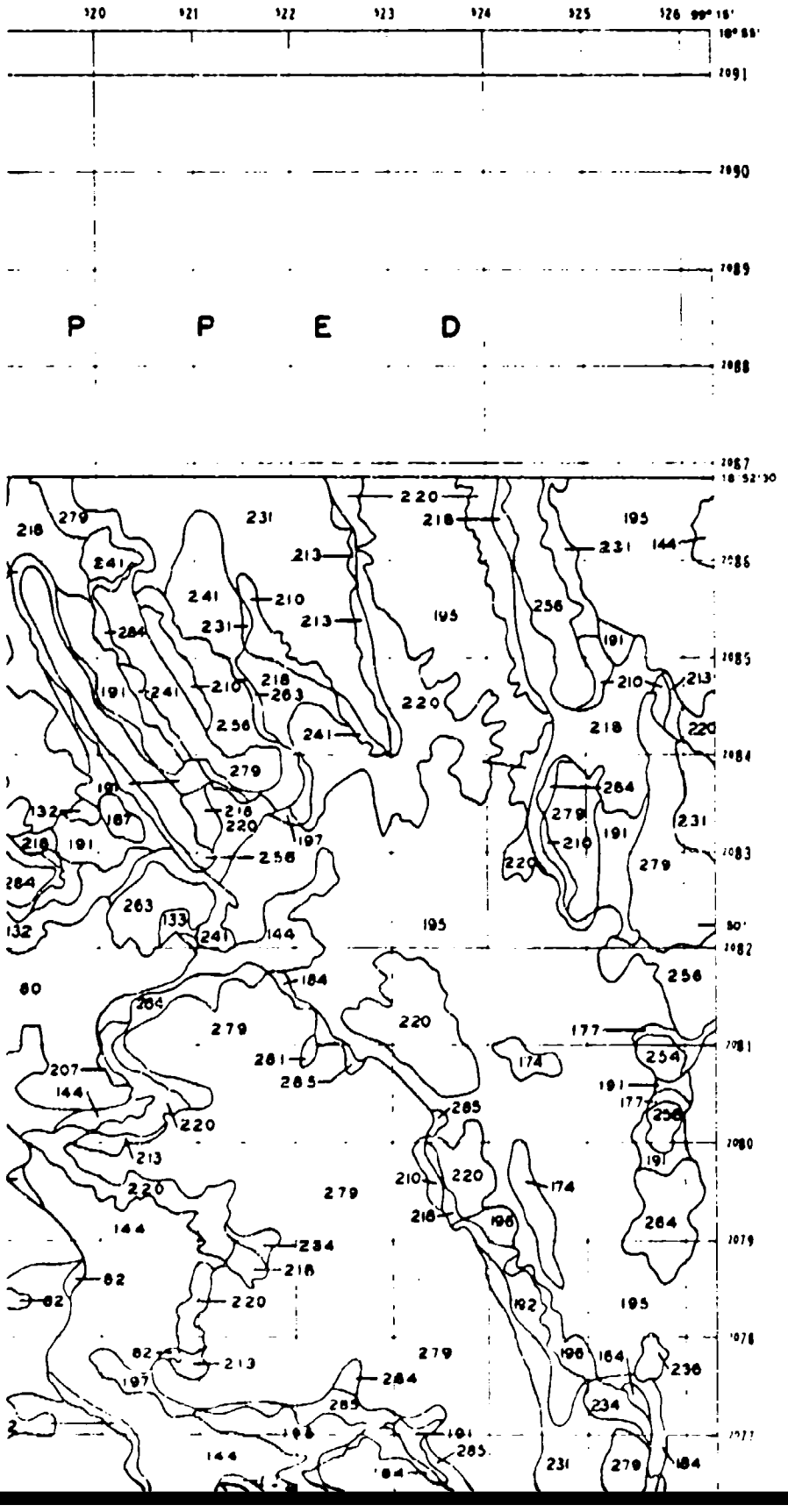
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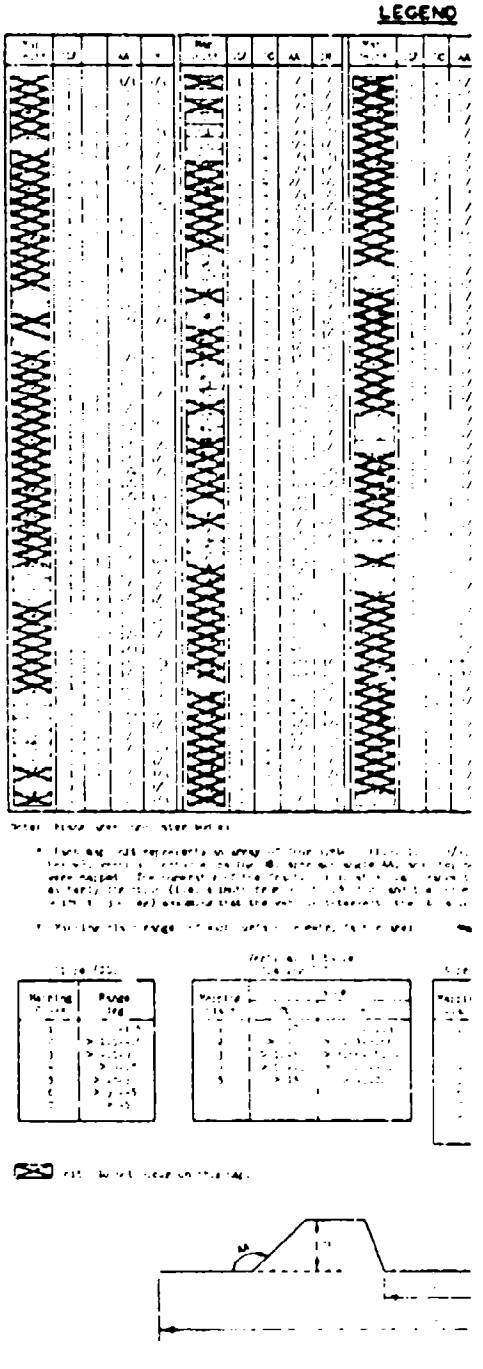
CHIANG MAI



1 3

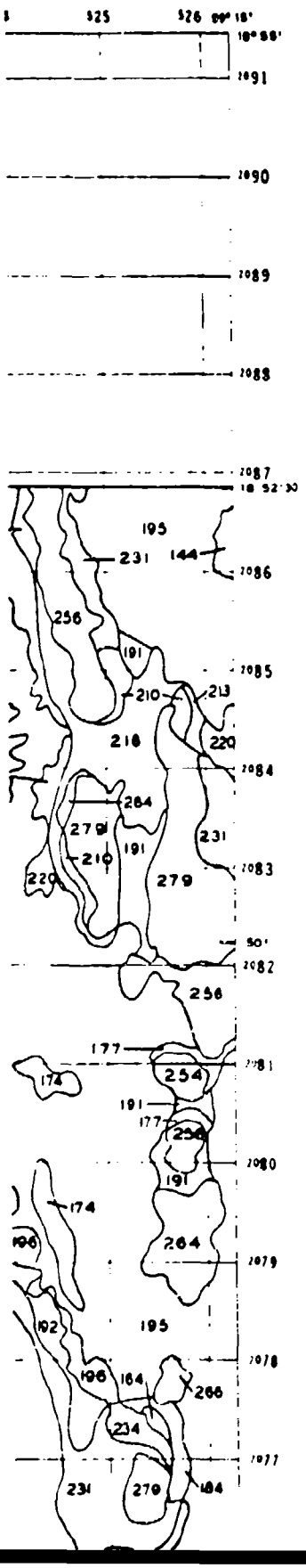
SHEET CM II



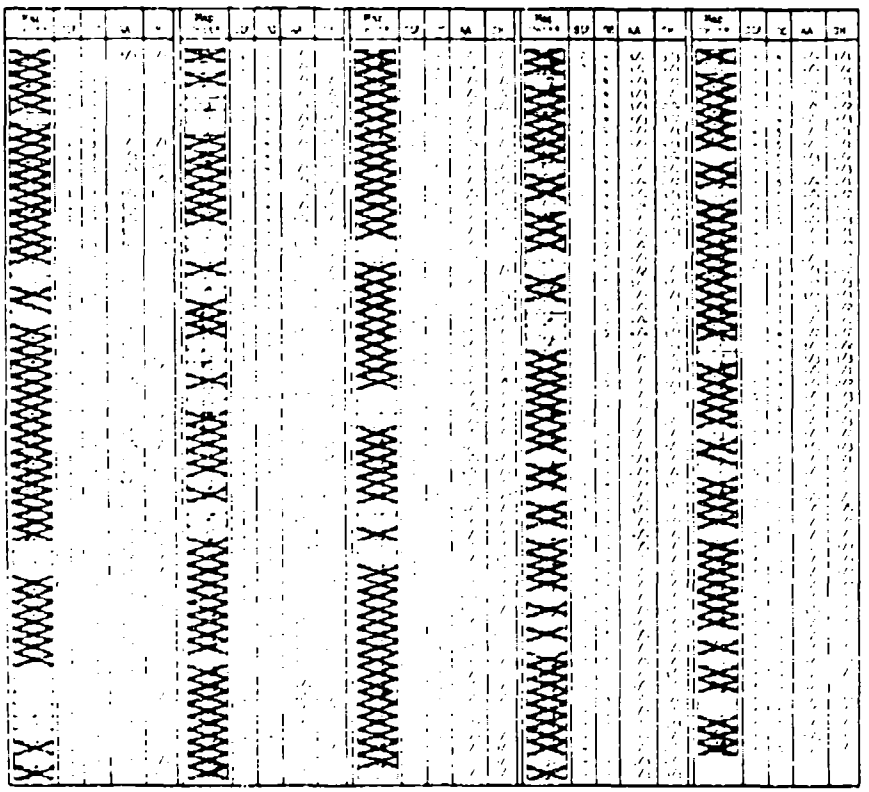


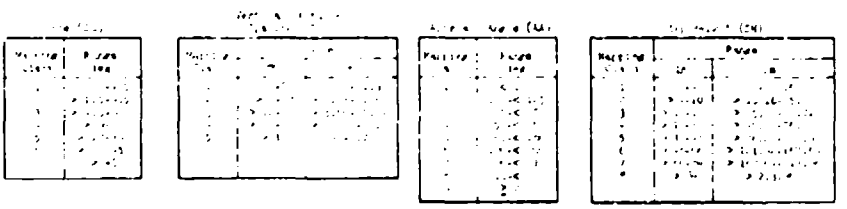
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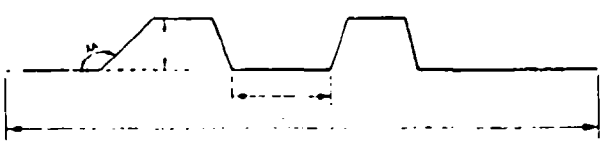
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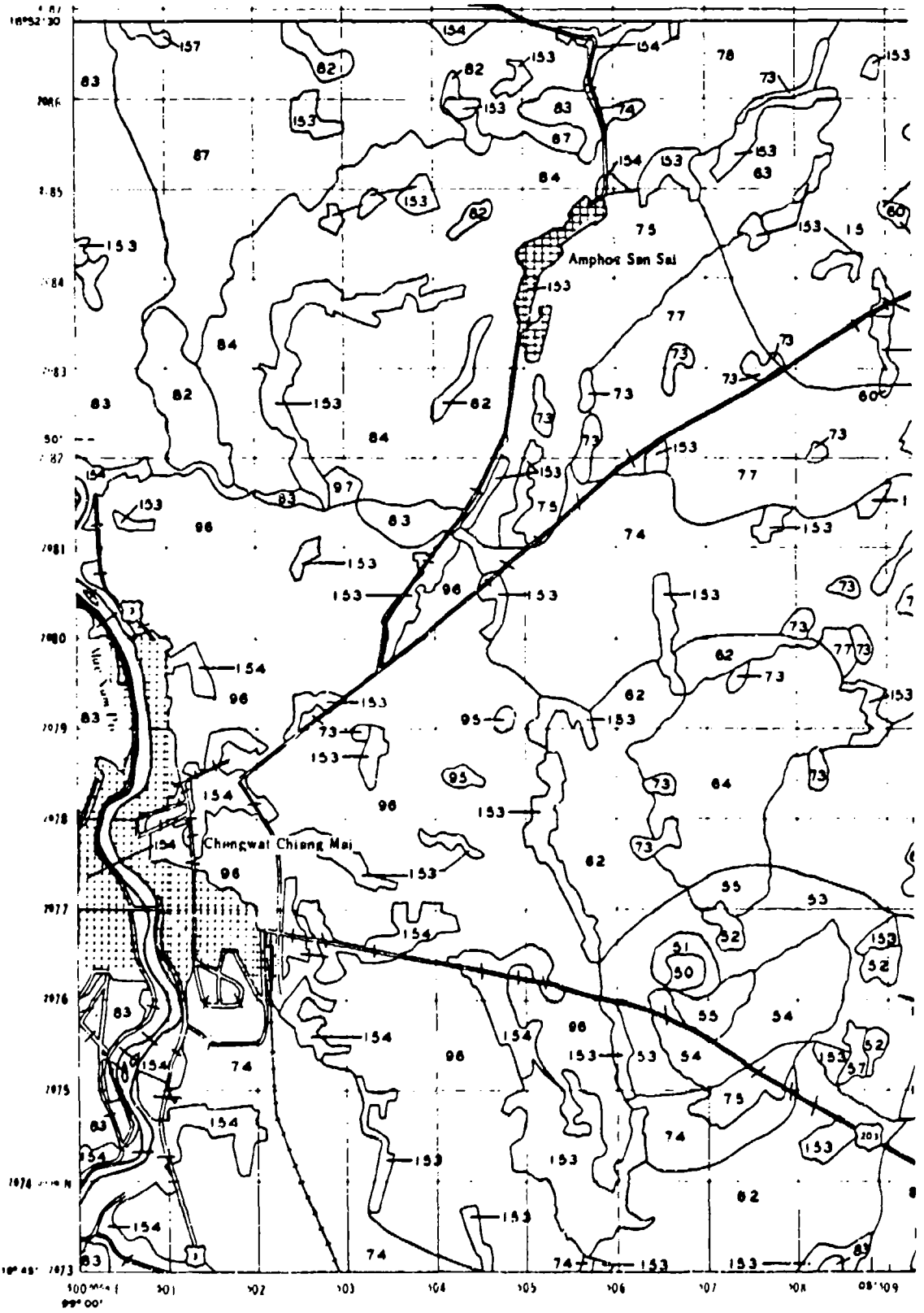
LEGEND





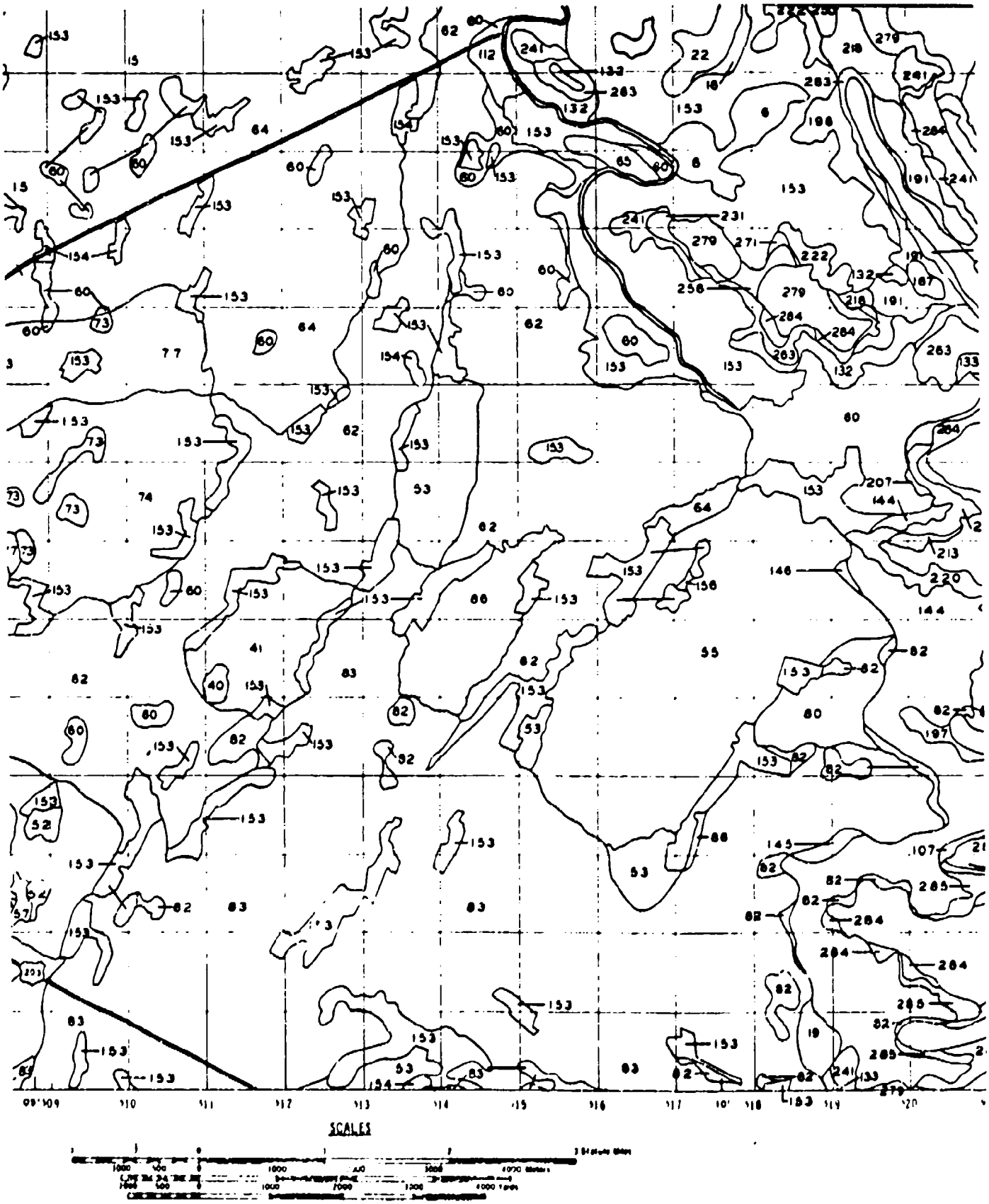


INDEX TO ADJOINING SHEETS

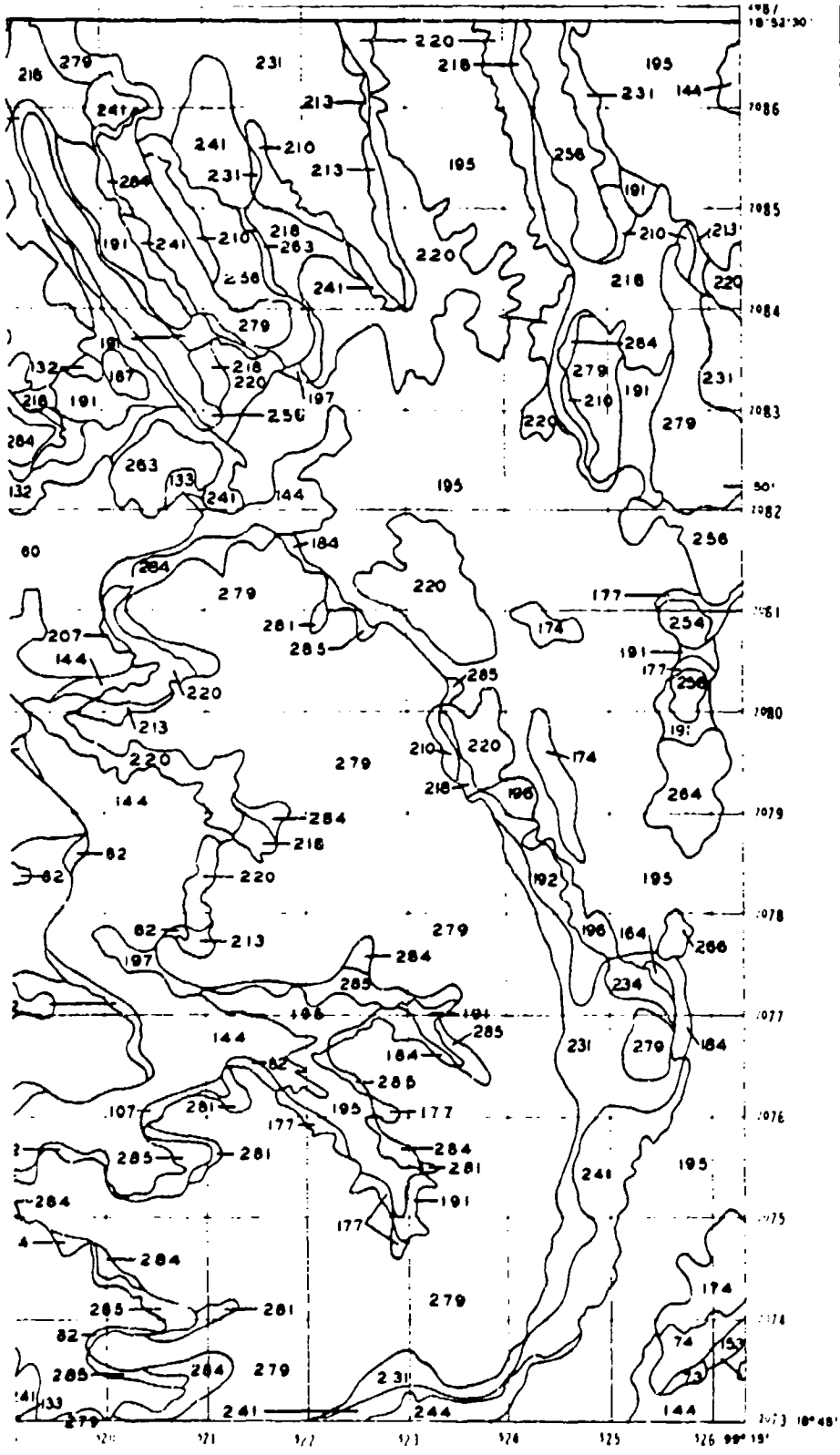


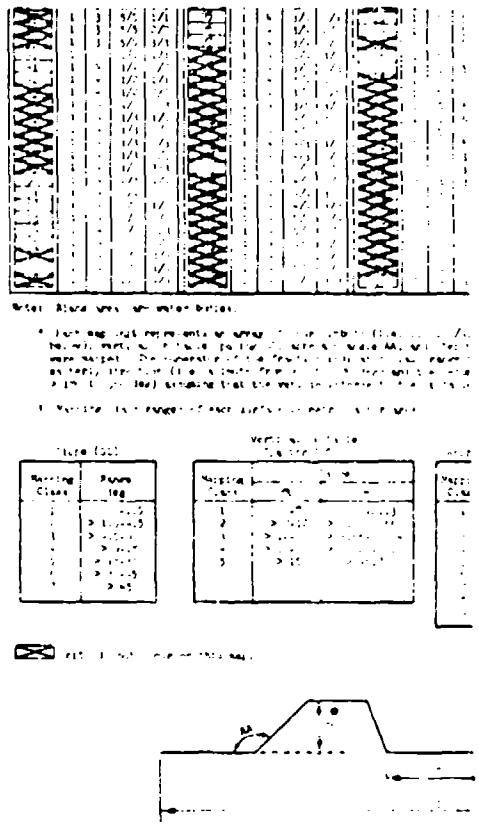
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 U

5



6





INDEX TO ADJOINING SHEE

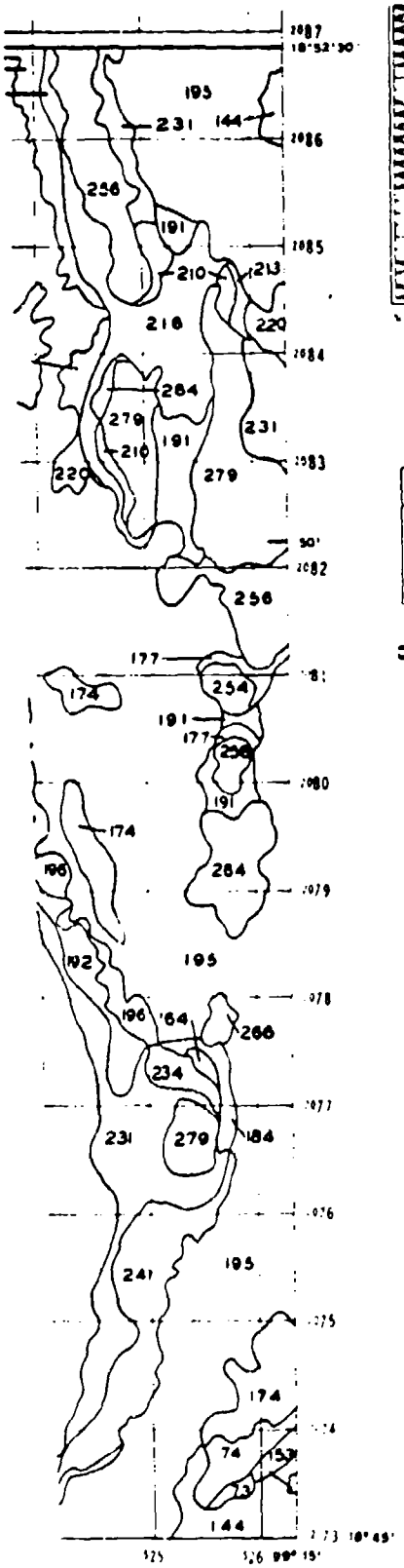
CM I	CM II
CM IV	CM III

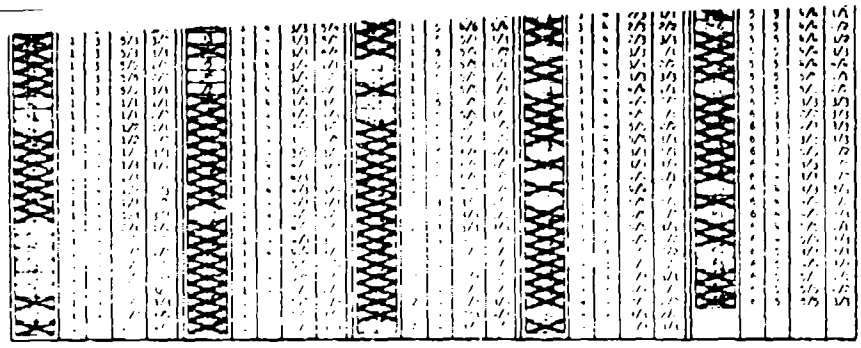
A QUANTITATIVE METHOD FO
TERRAIN FOR GROUND

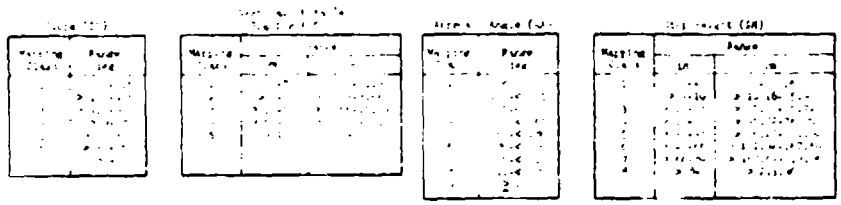
SURFACE GEOM

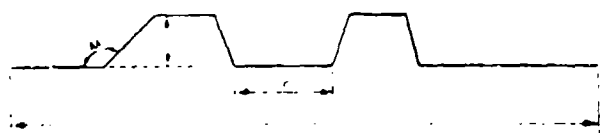
CHIANG MAI STUD
SHEET CM I

7









INDEX TO ADJOINING SHEETS

CM I	CM II
CM IV	CM III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

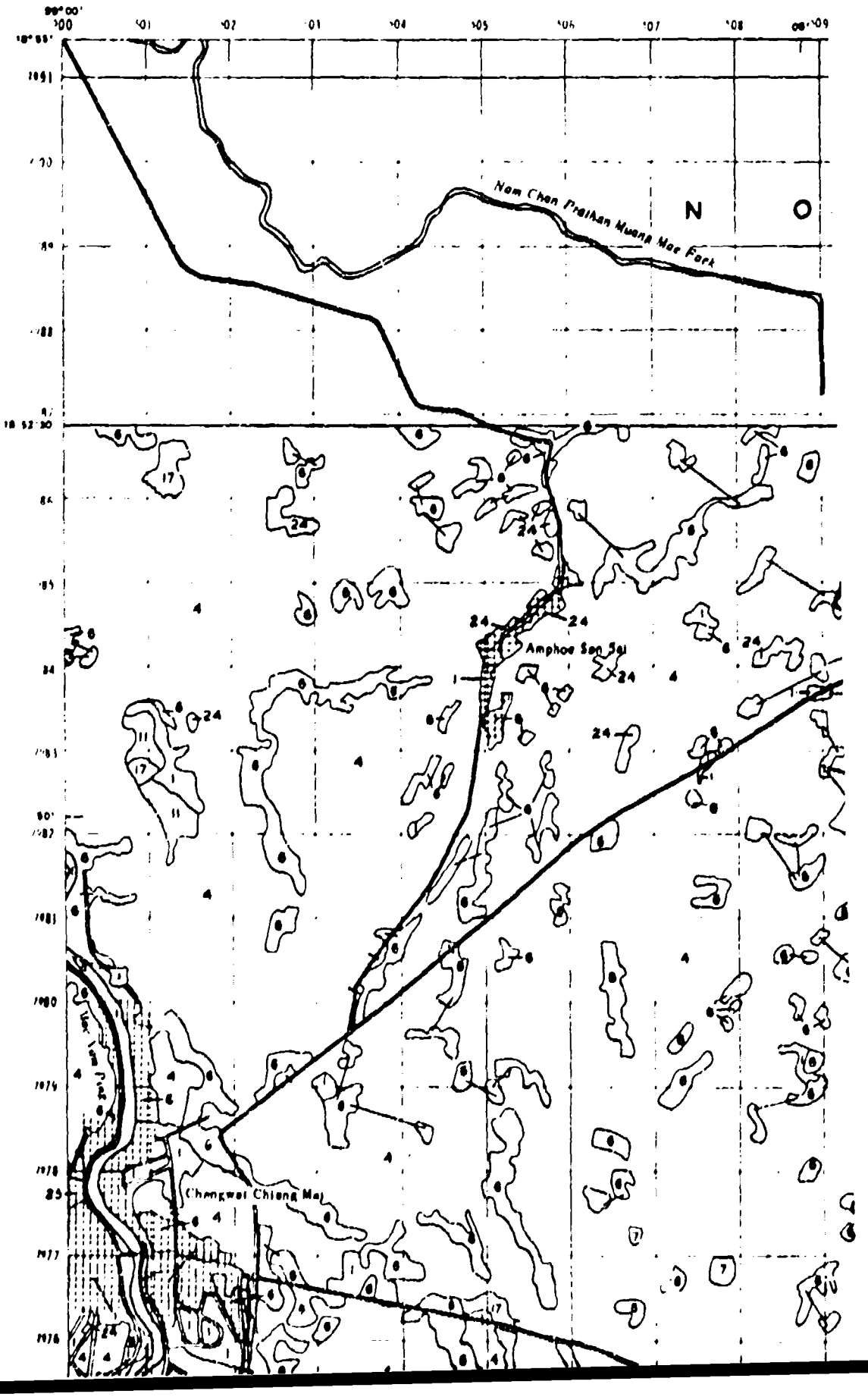
SURFACE GEOMETRY

CHIANG MAI STUDY AREA

SHEET CM II

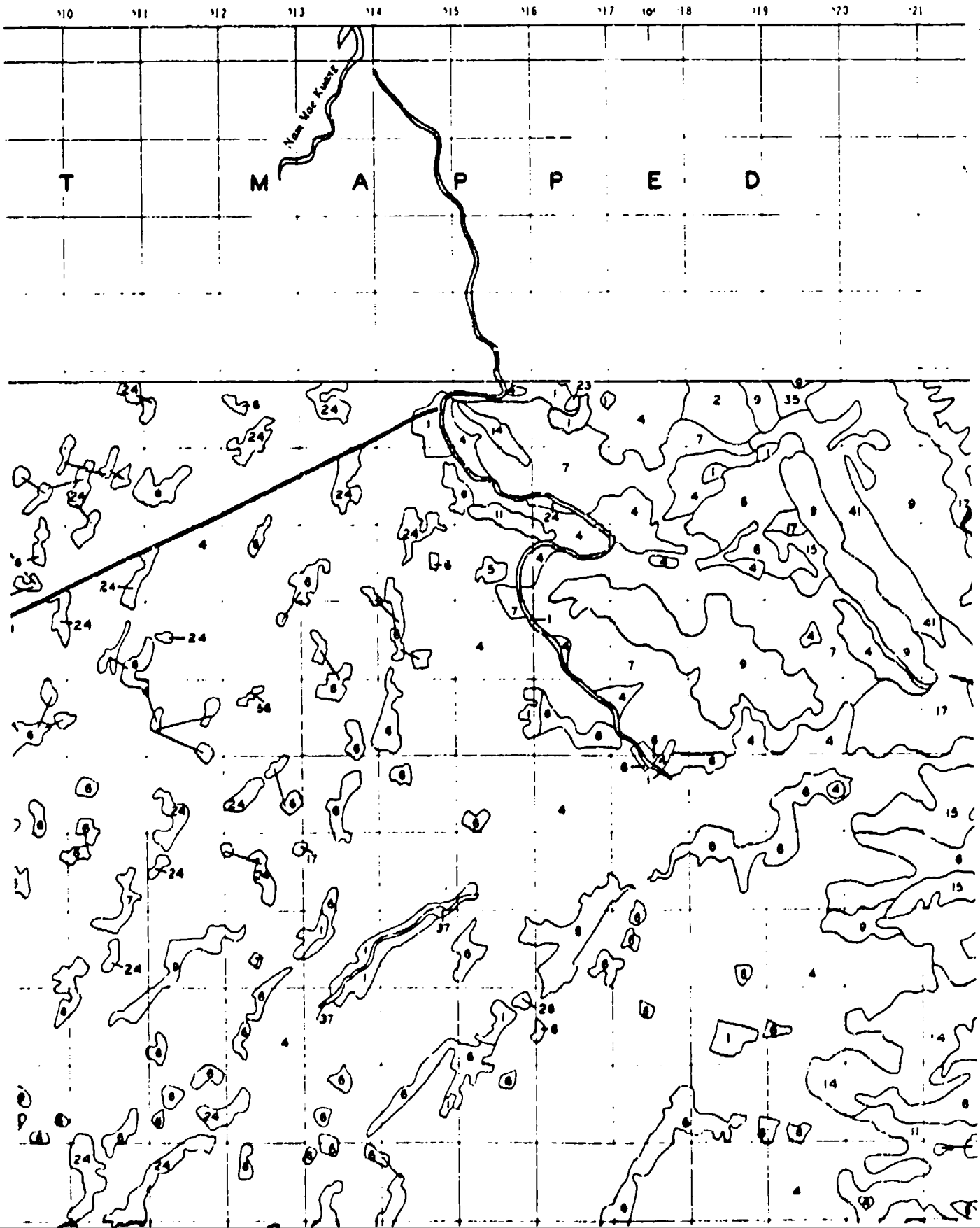
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PLATE 3.2b


Nam Chan Prakan Muang Mae Fark
N
O
Amphoe San Sai
Changwat Chiang Mai

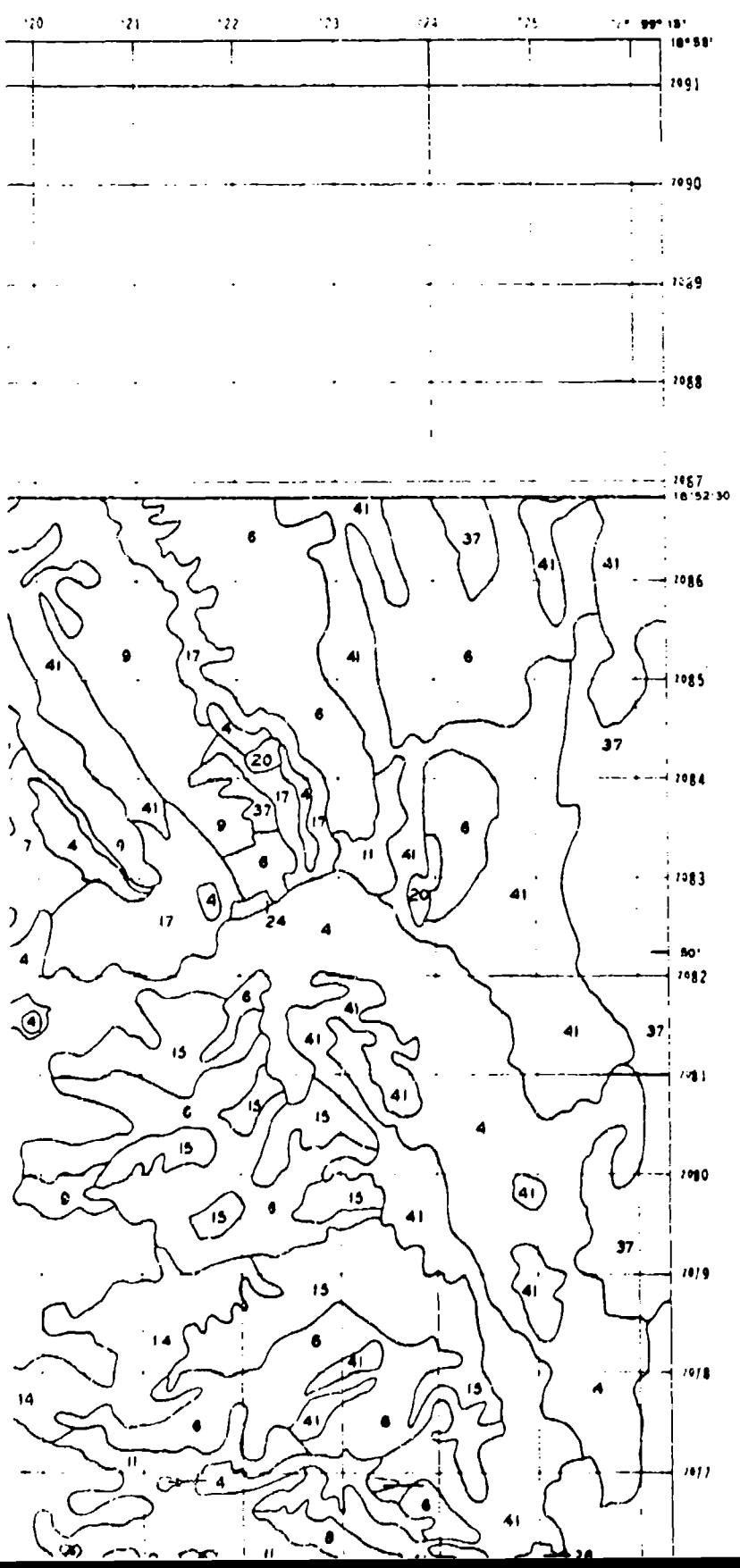
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CHIANG MAI

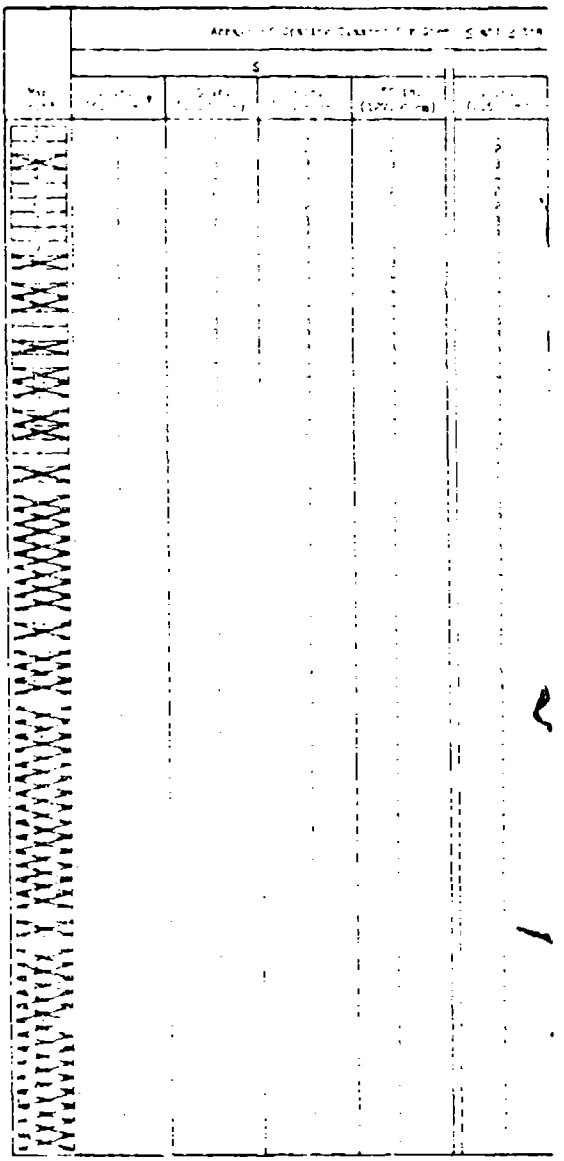


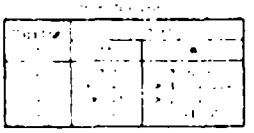
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SHEET CM II



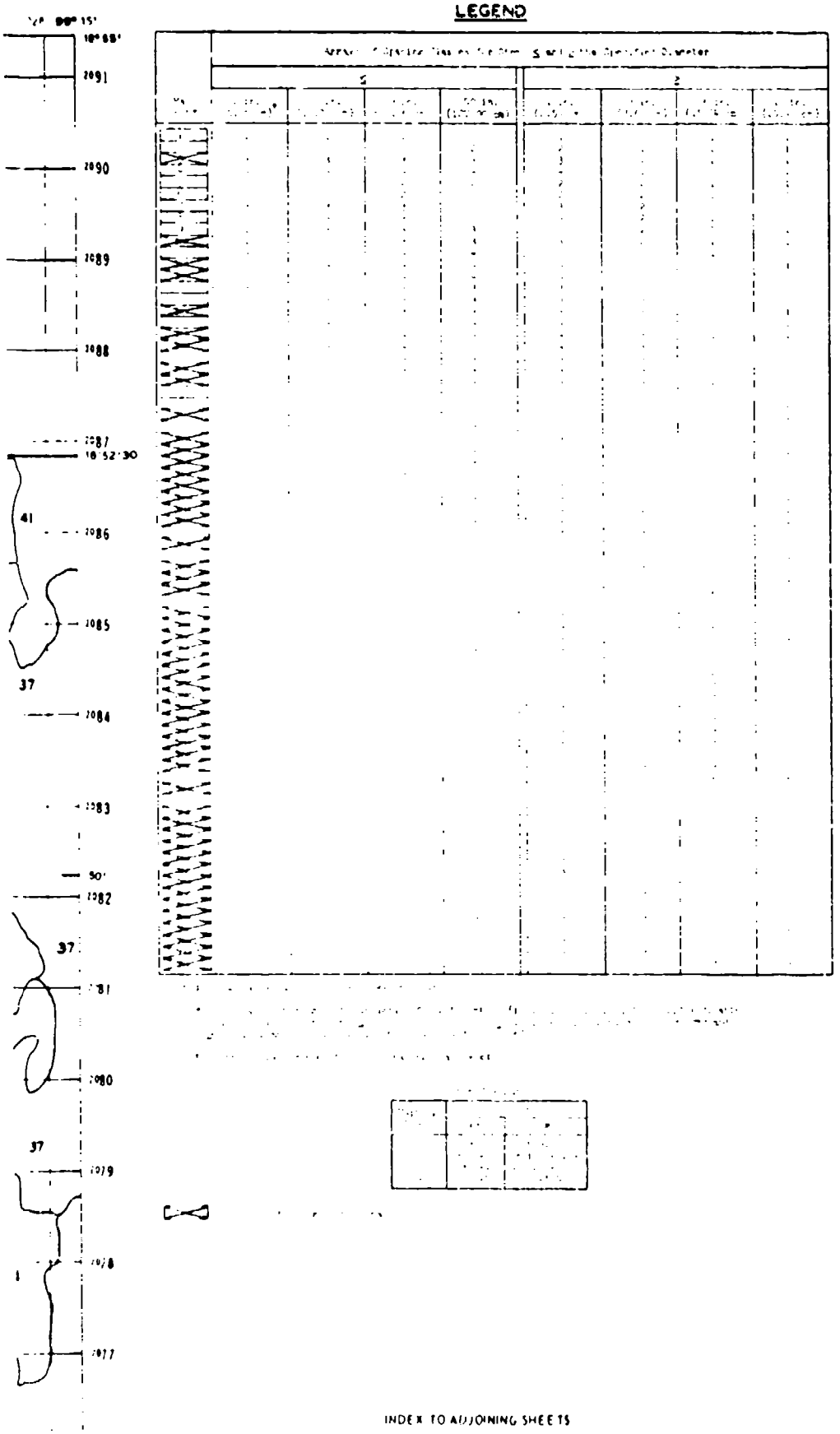
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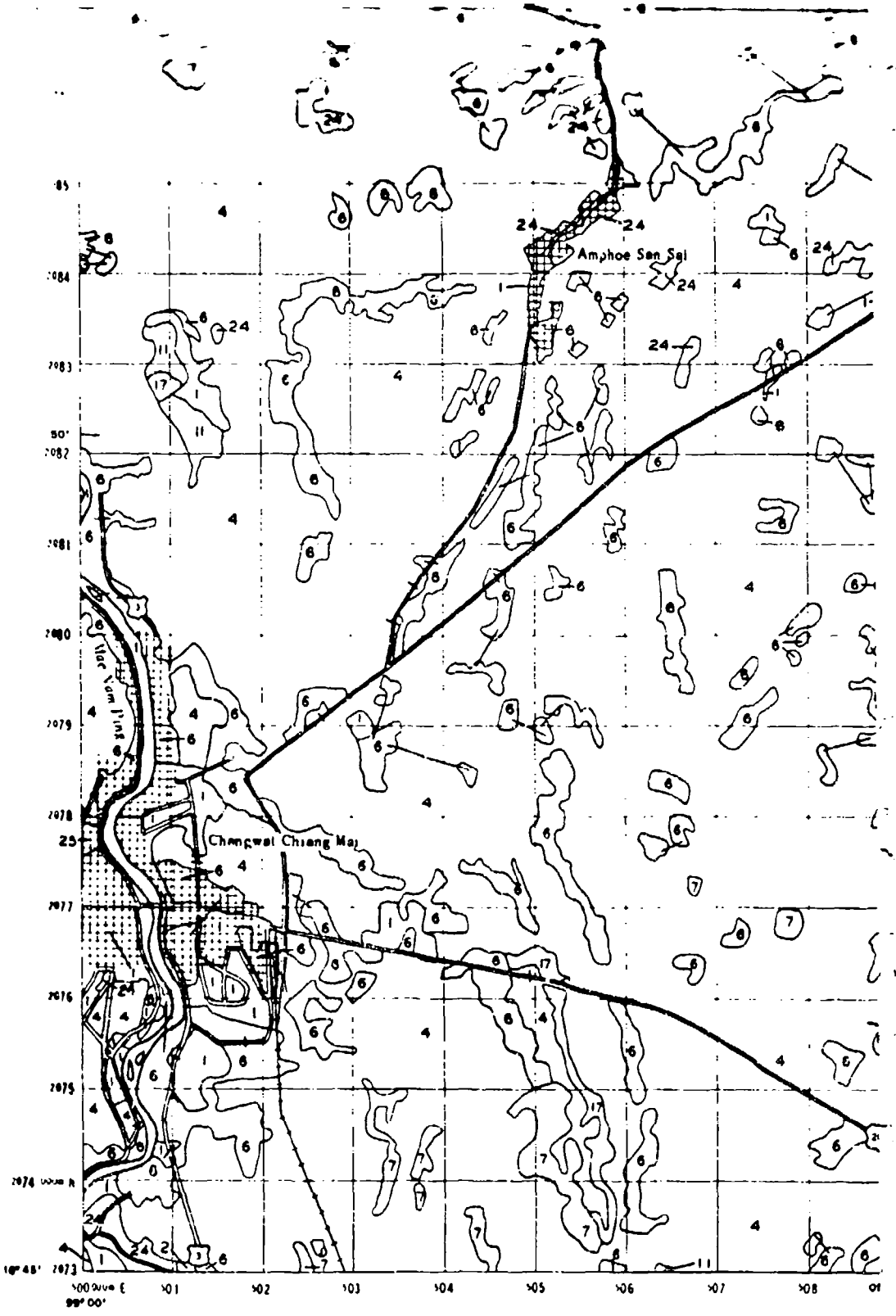




INDEX TO ADJOINING SHEETS

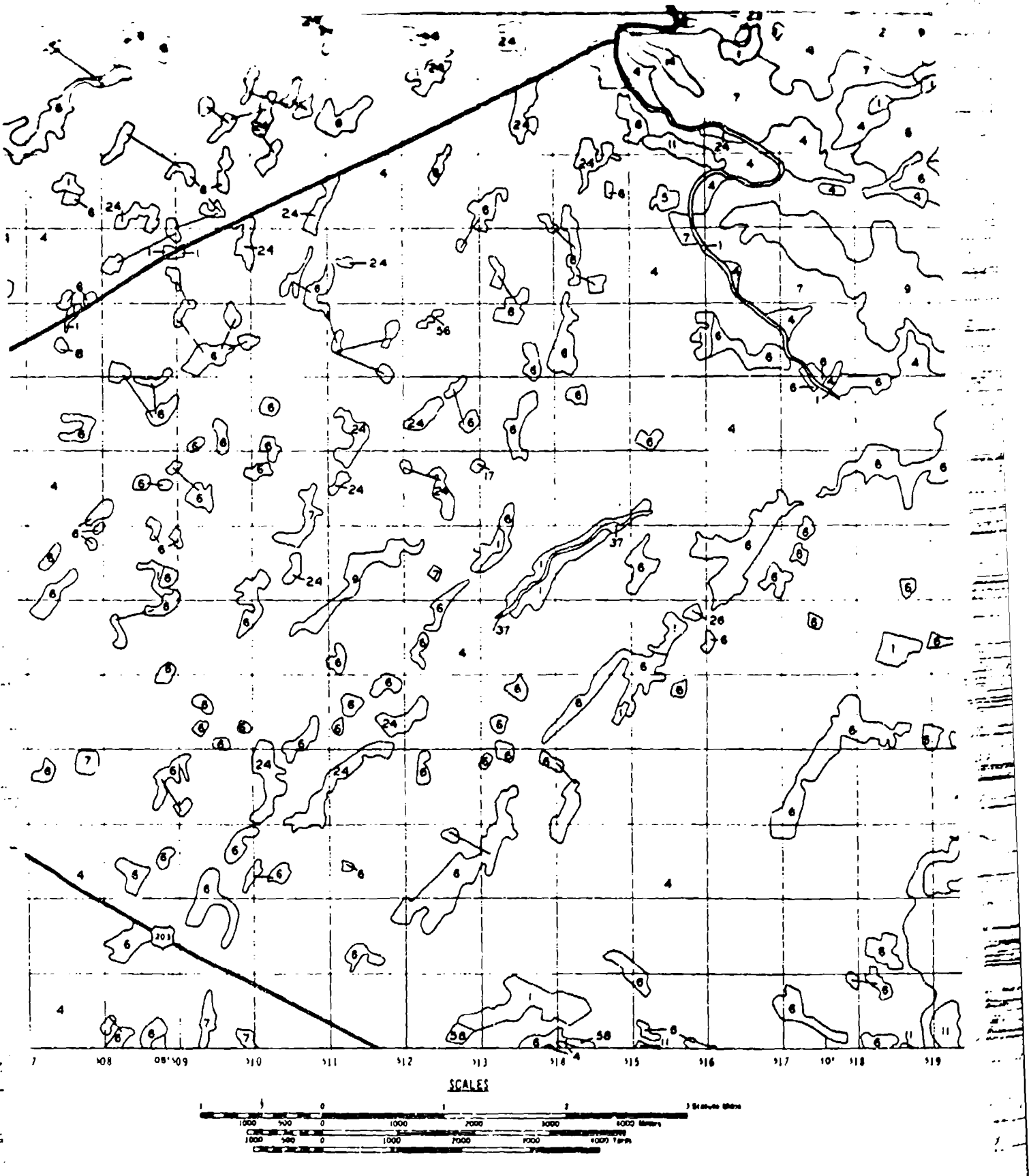
CM II


LEGEND
2091
2090
2089
2088
2087
10°52'30
41
2086
2085
37
2084
2083
50'
2082
37
2081
2080
37
2079
2078
2077
2076
INDEX TO ADJOINING SHEETS

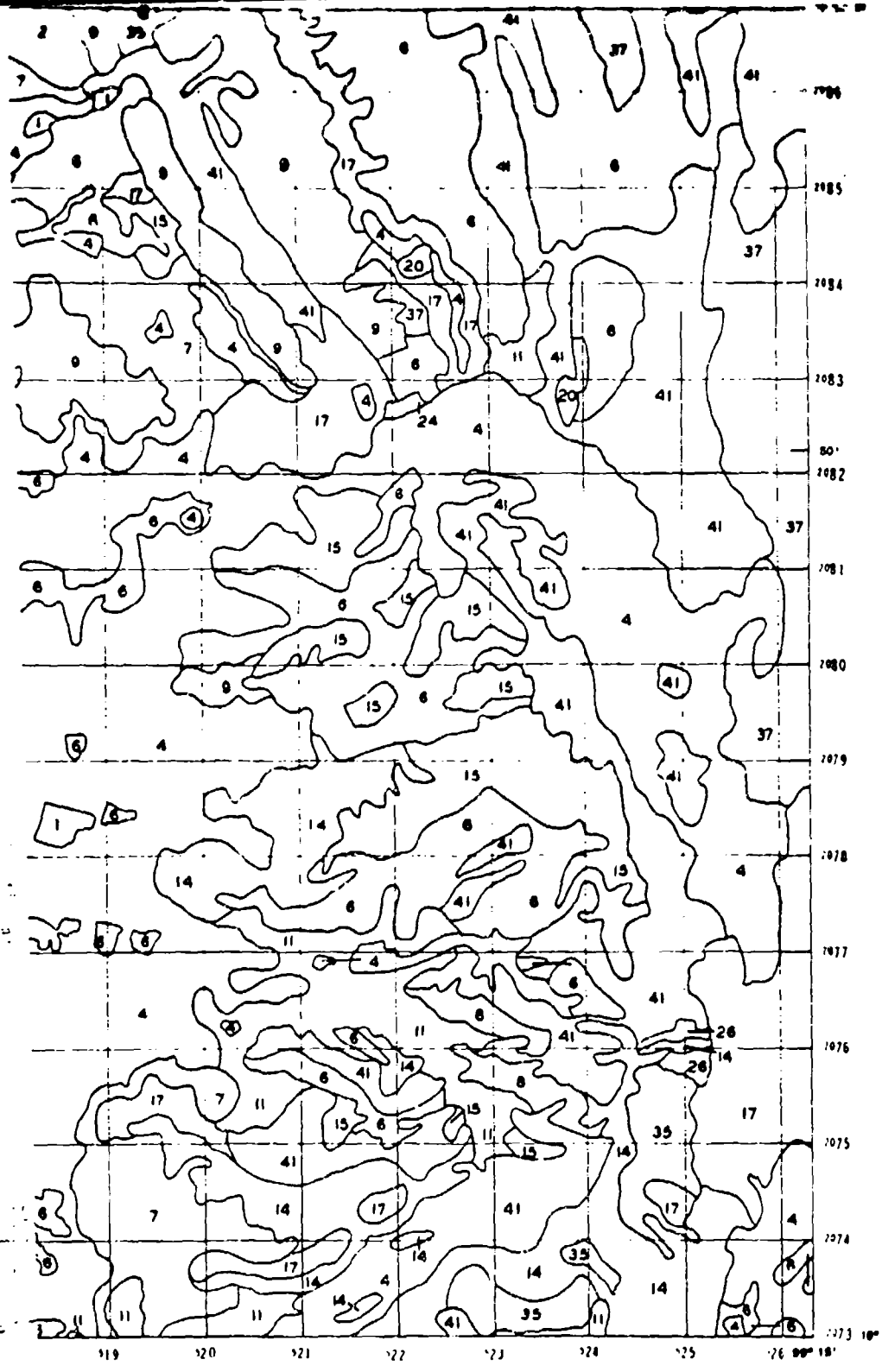


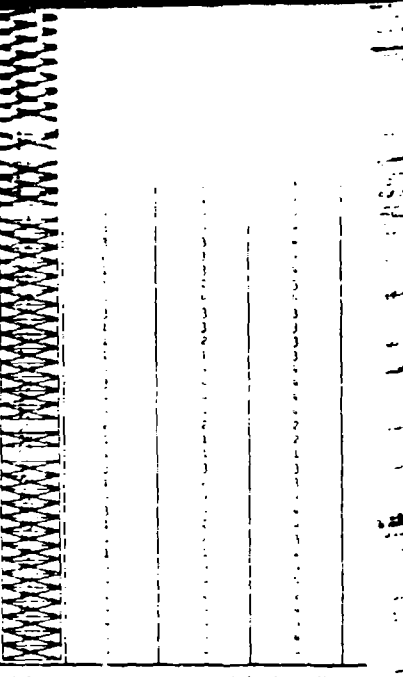
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

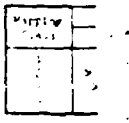
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6

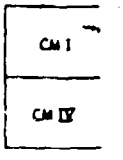








INDEX TO AD



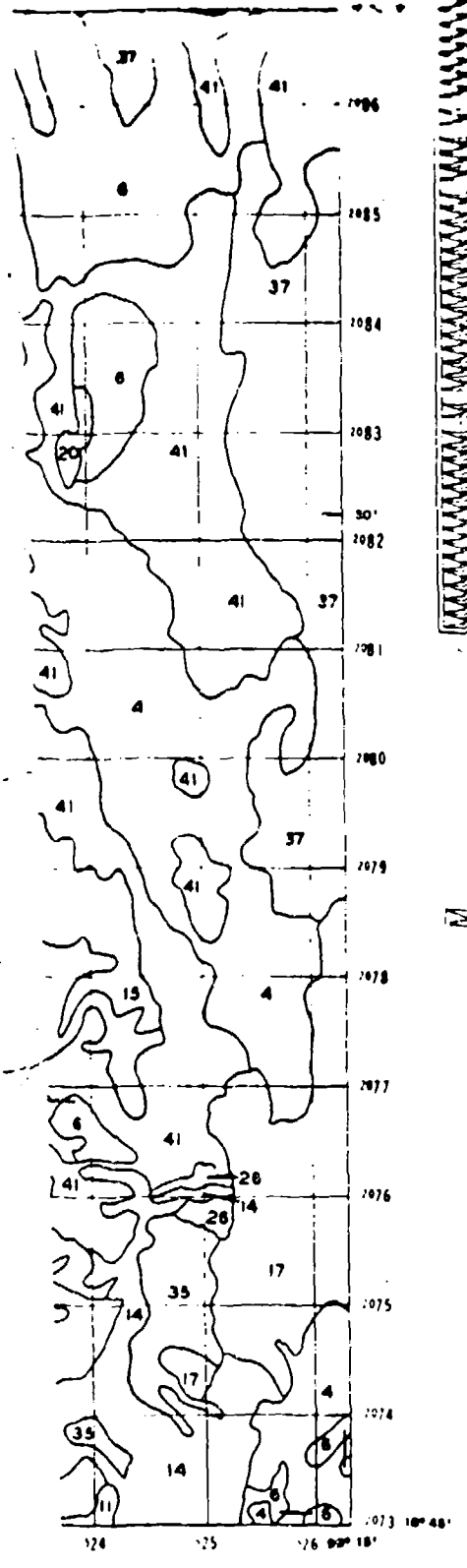
A QUANTITATIVE METI
TERRAIN FOR GR

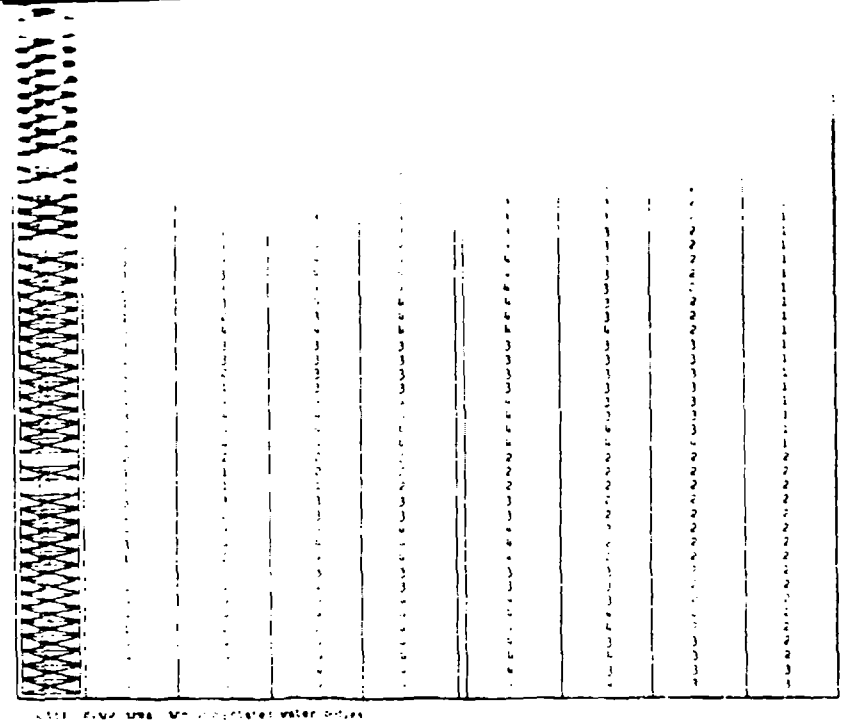
VEGET

CHIANG MAI

SHEET

7





INDEX TO ADJOINING SHEETS

CM I	CM II
CM IV	CM III

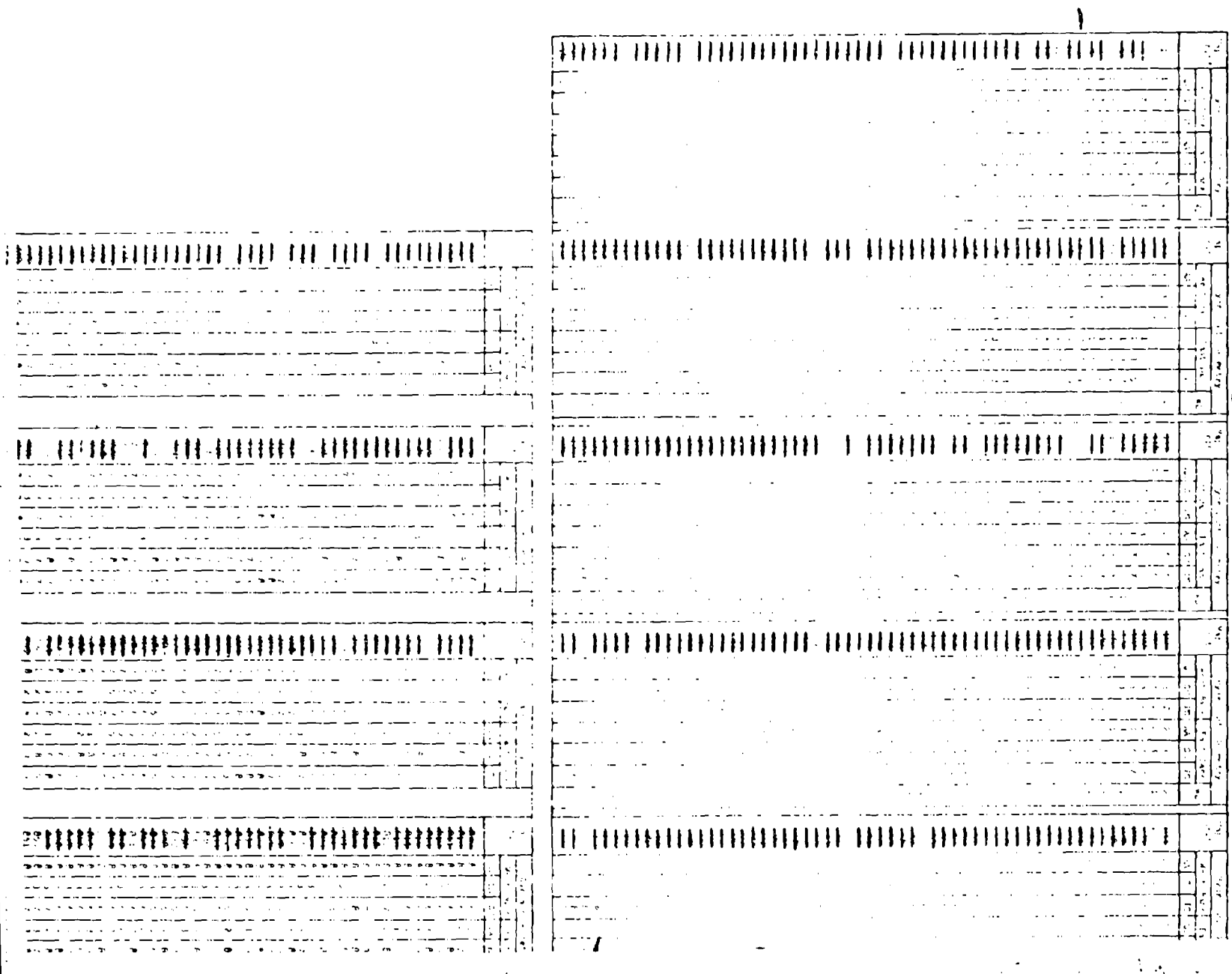
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

CHIANG MAI STUDY AREA

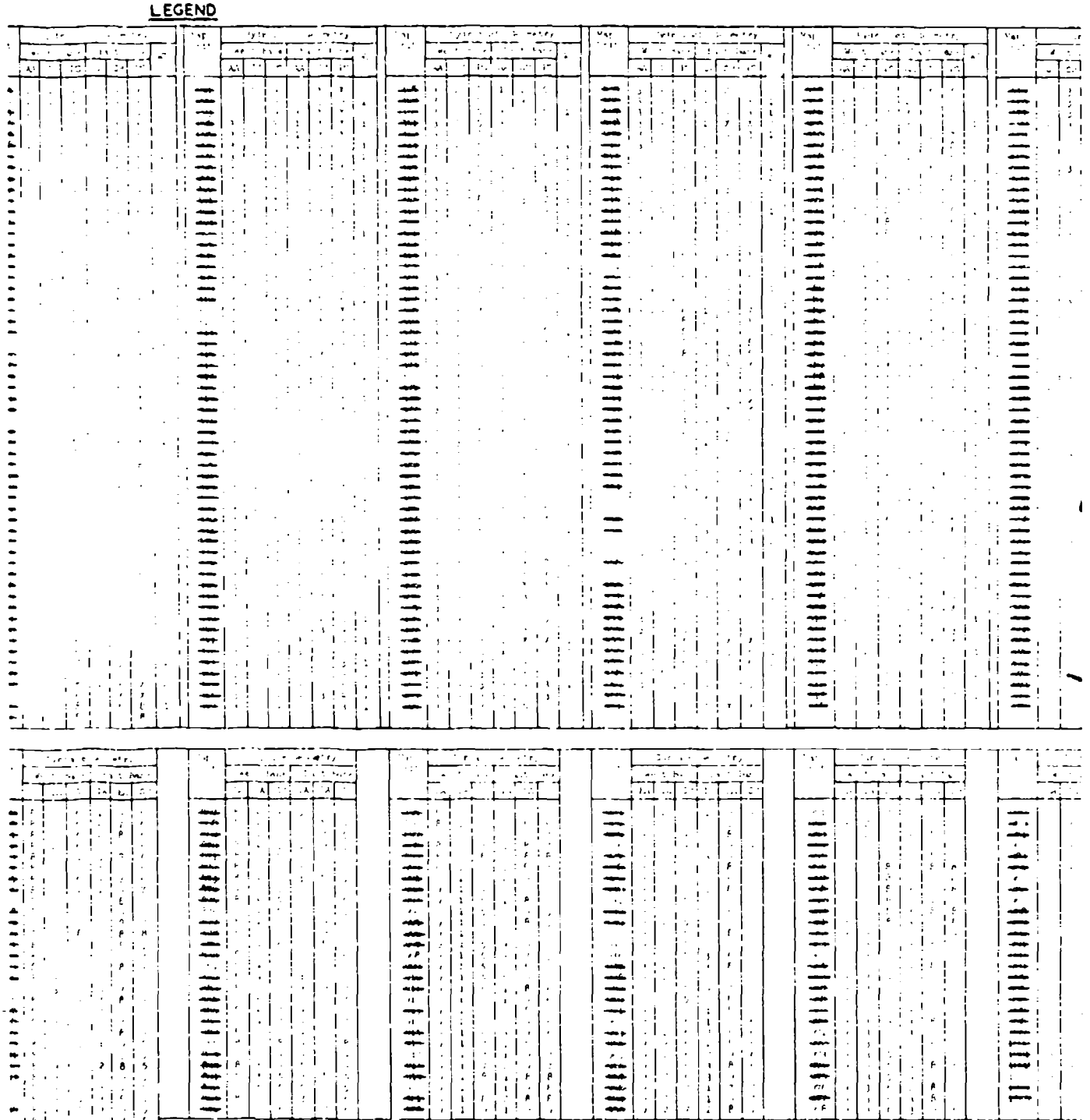
SHEET CM II

PLATE 3.2c

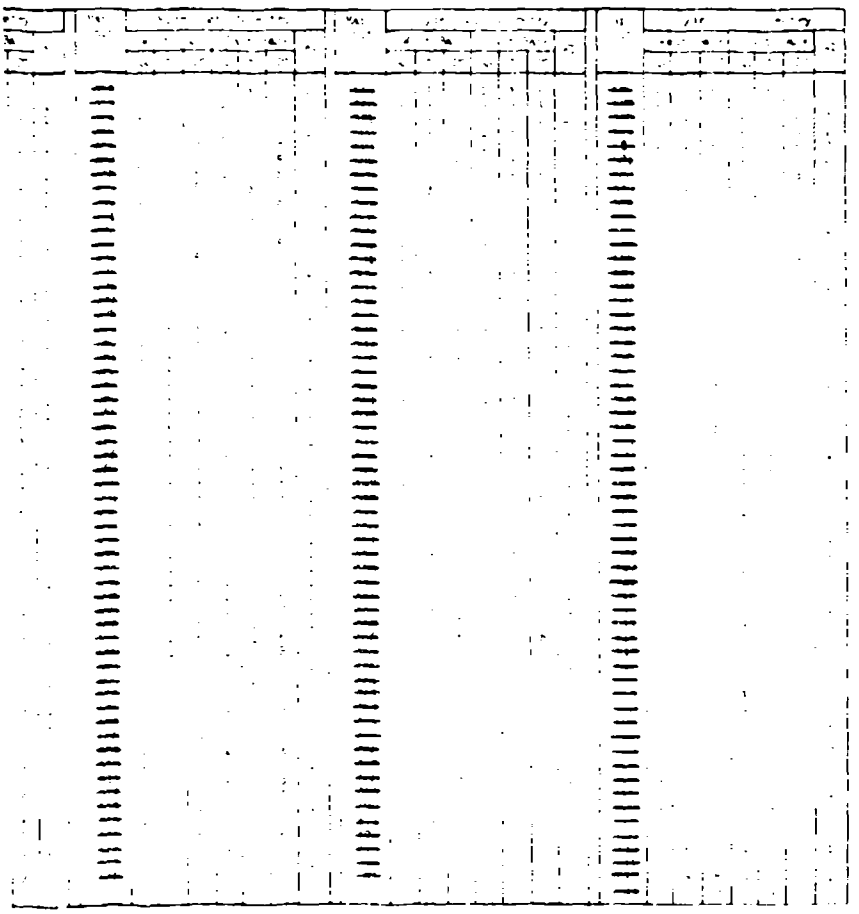


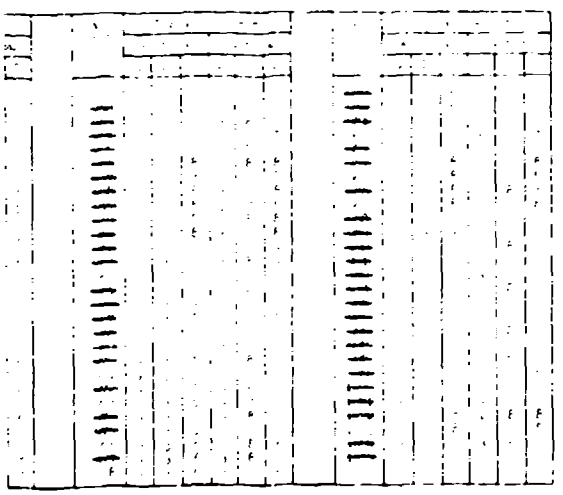
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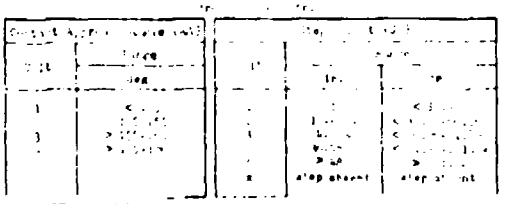
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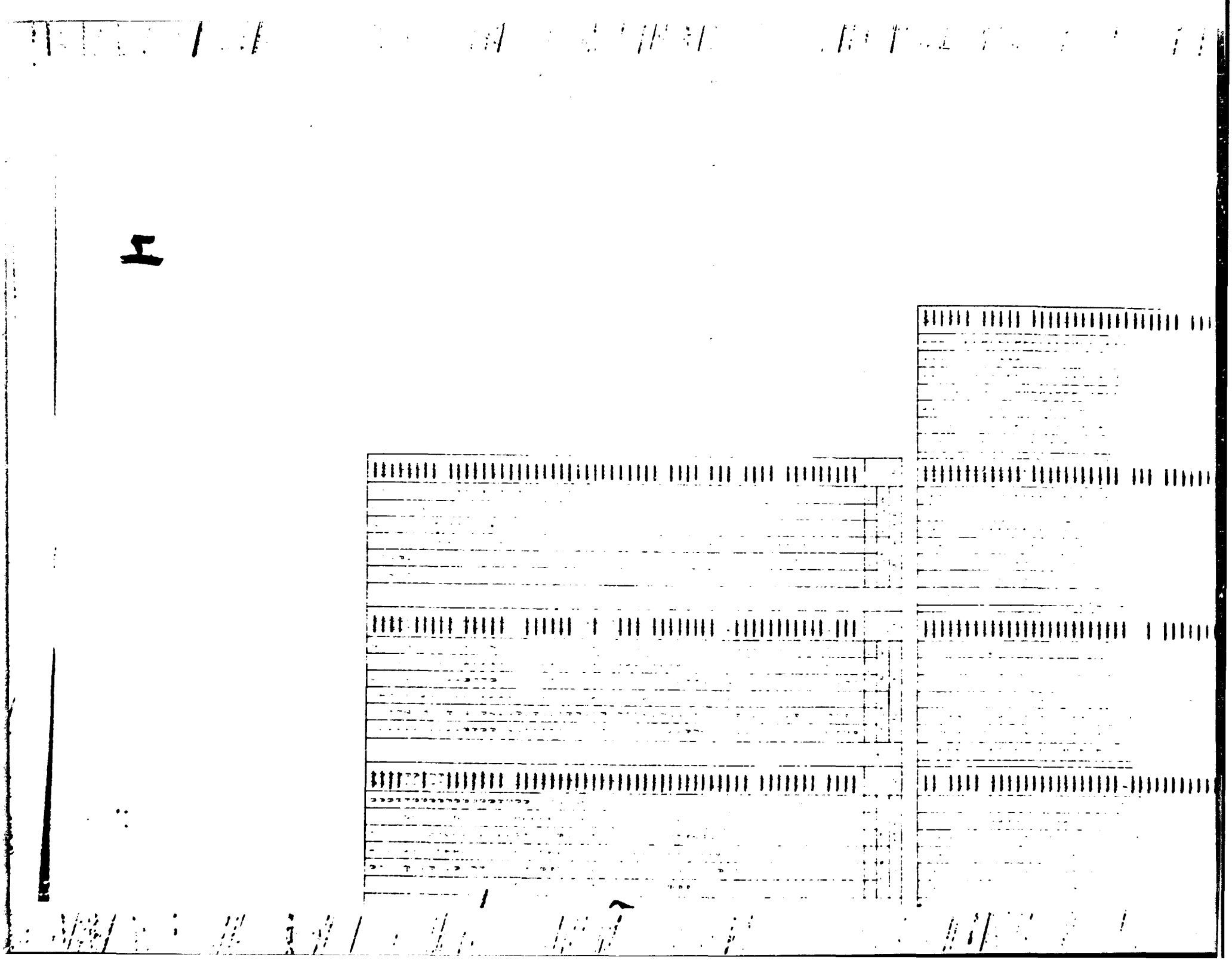


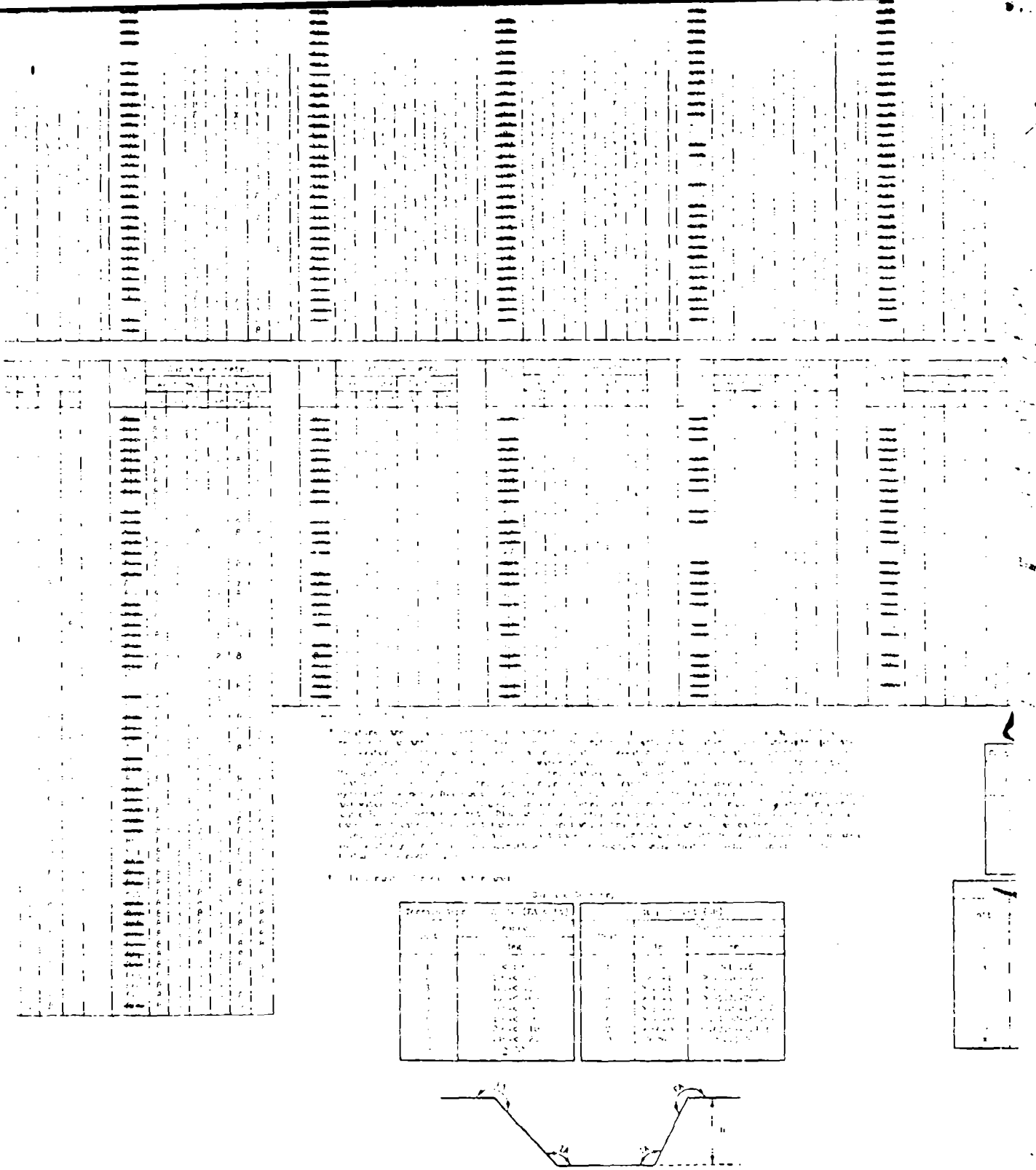
* Test pits are usually backfilled, a practice. Re-development of the fracture is a map unit that [illegible] over [illegible] particular feature. The superficial infiltration [illegible] water [illegible] water [illegible] [illegible] distributed by only [illegible] water [illegible] [illegible] [illegible]

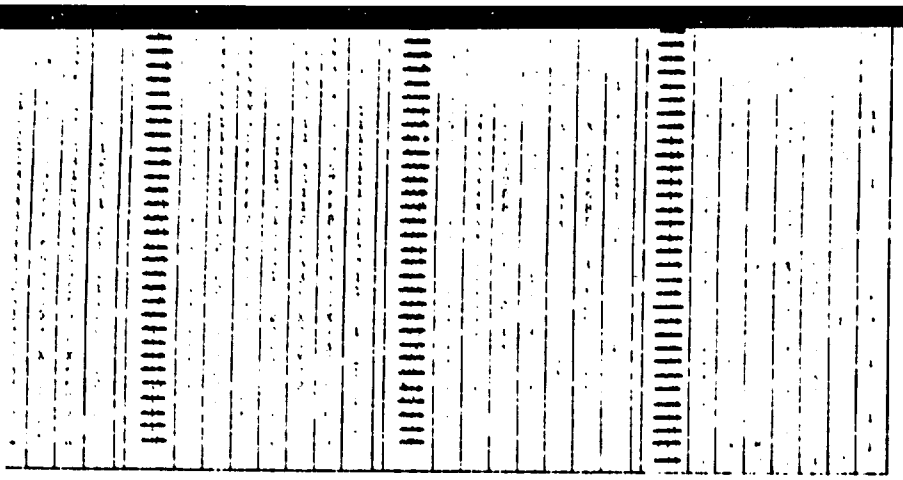


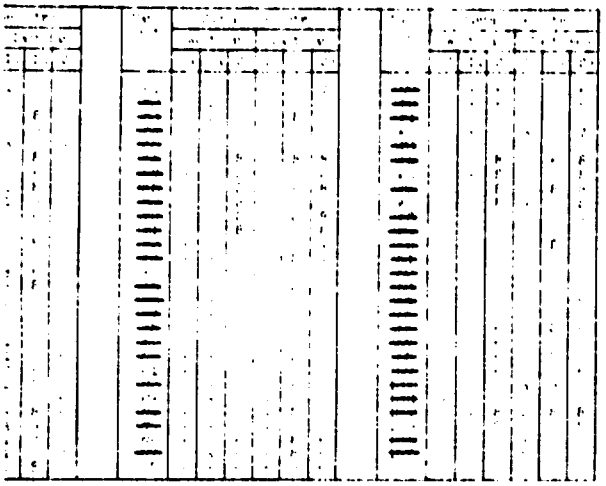


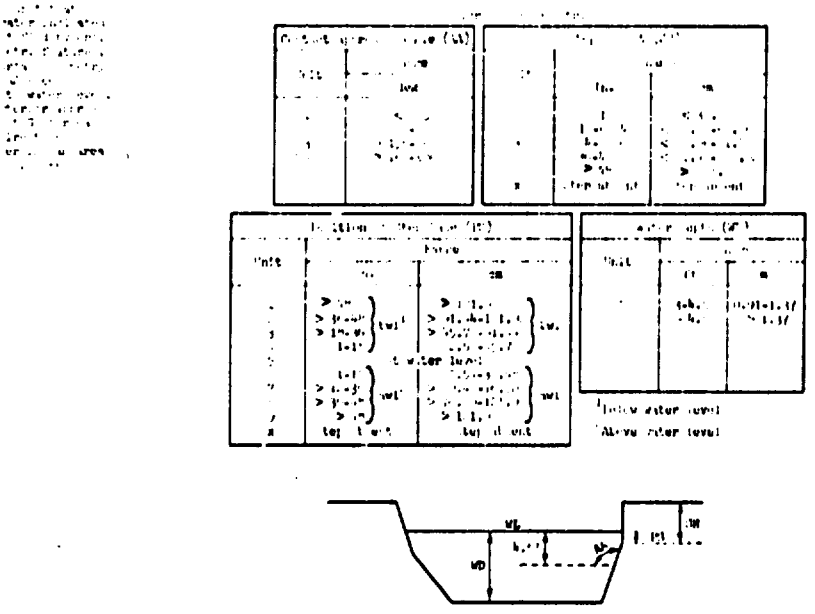




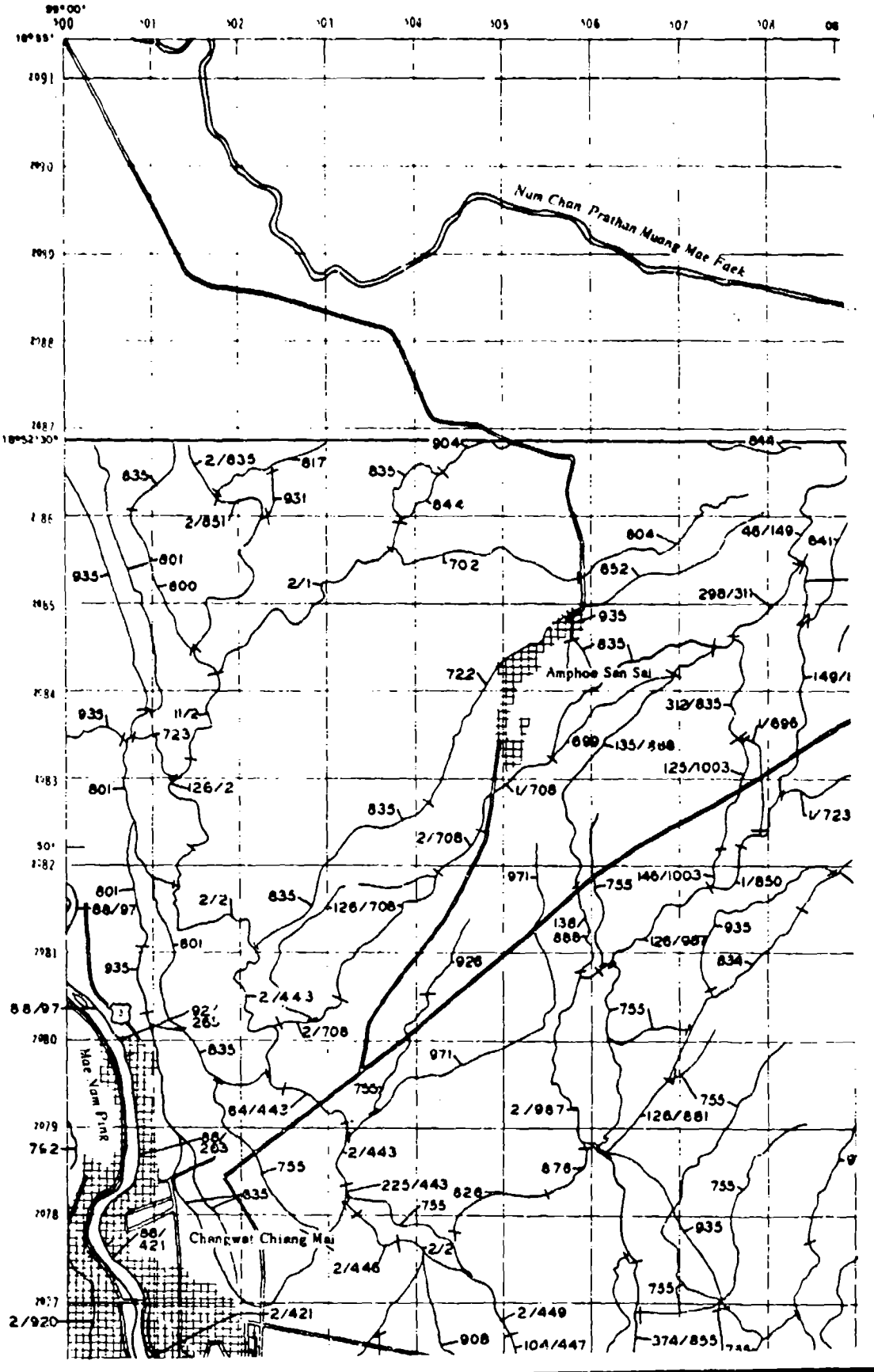






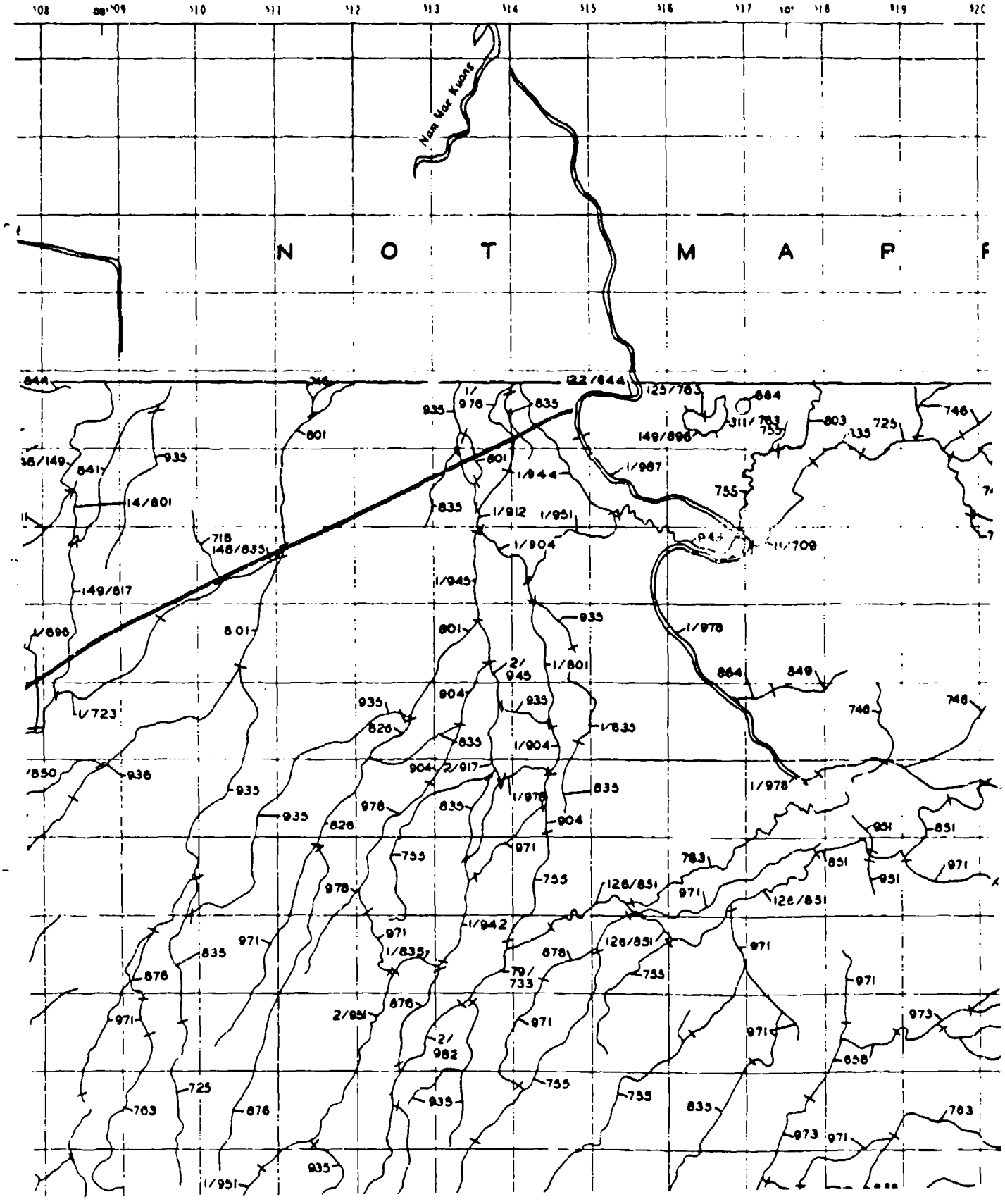


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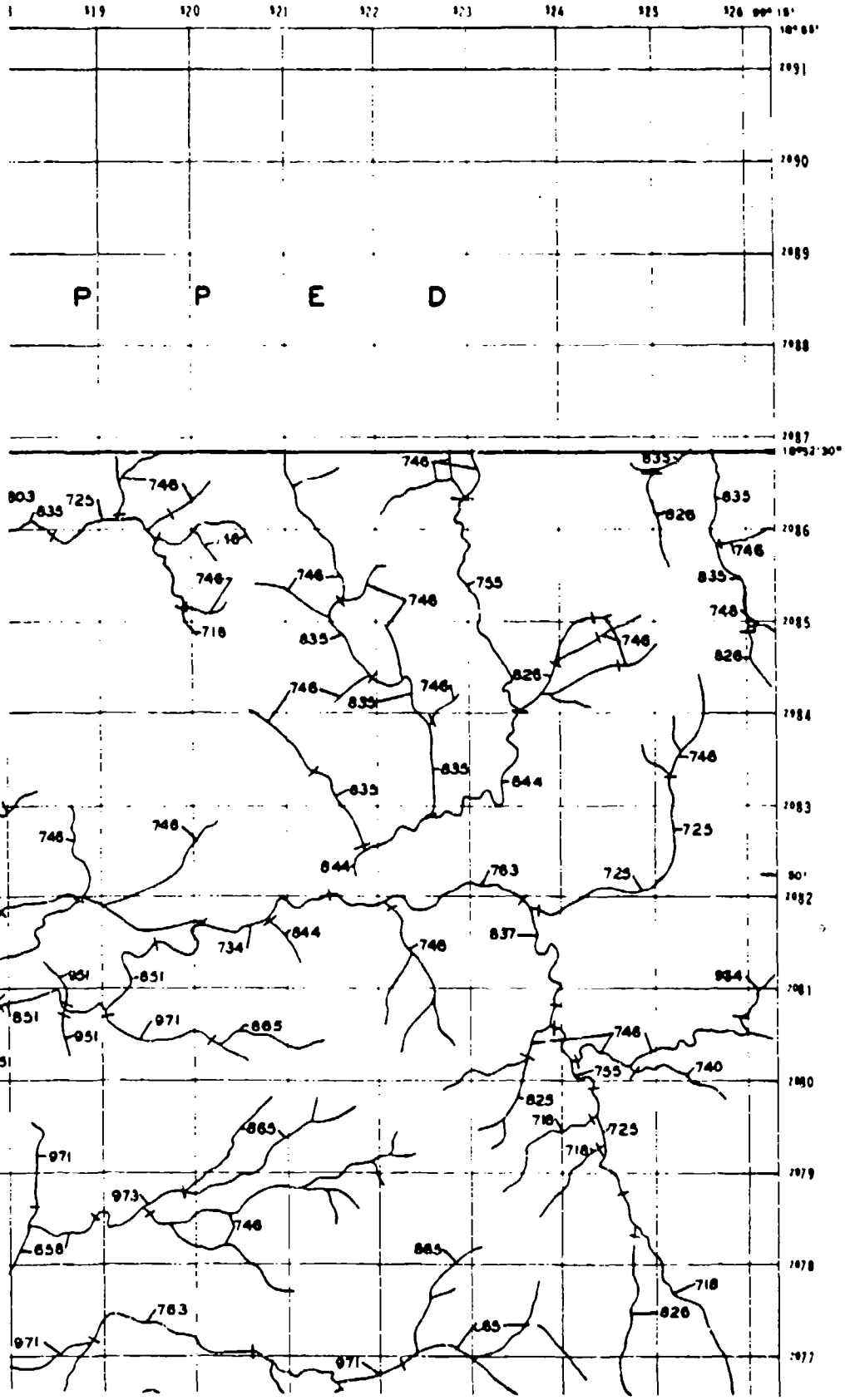

Num Chan Prathan Muang Mae Faek
Amphoe San Sai
Changwat Chiang Mai
Mae Nam Ping
904
844
835
2/835
817
931
2/851
644
804
46/149
641
801
935
800
702
852
2/1
298/311
722
149/1
312/835
696
723
11/2
126/2
135/868
125/1003
708
723
2/708
971
755
146/1003
1/850
801
88/97
2/2
835
126/708
138
888
126/987
935
926
834
2/443
92/
263
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908
104/447
374/855

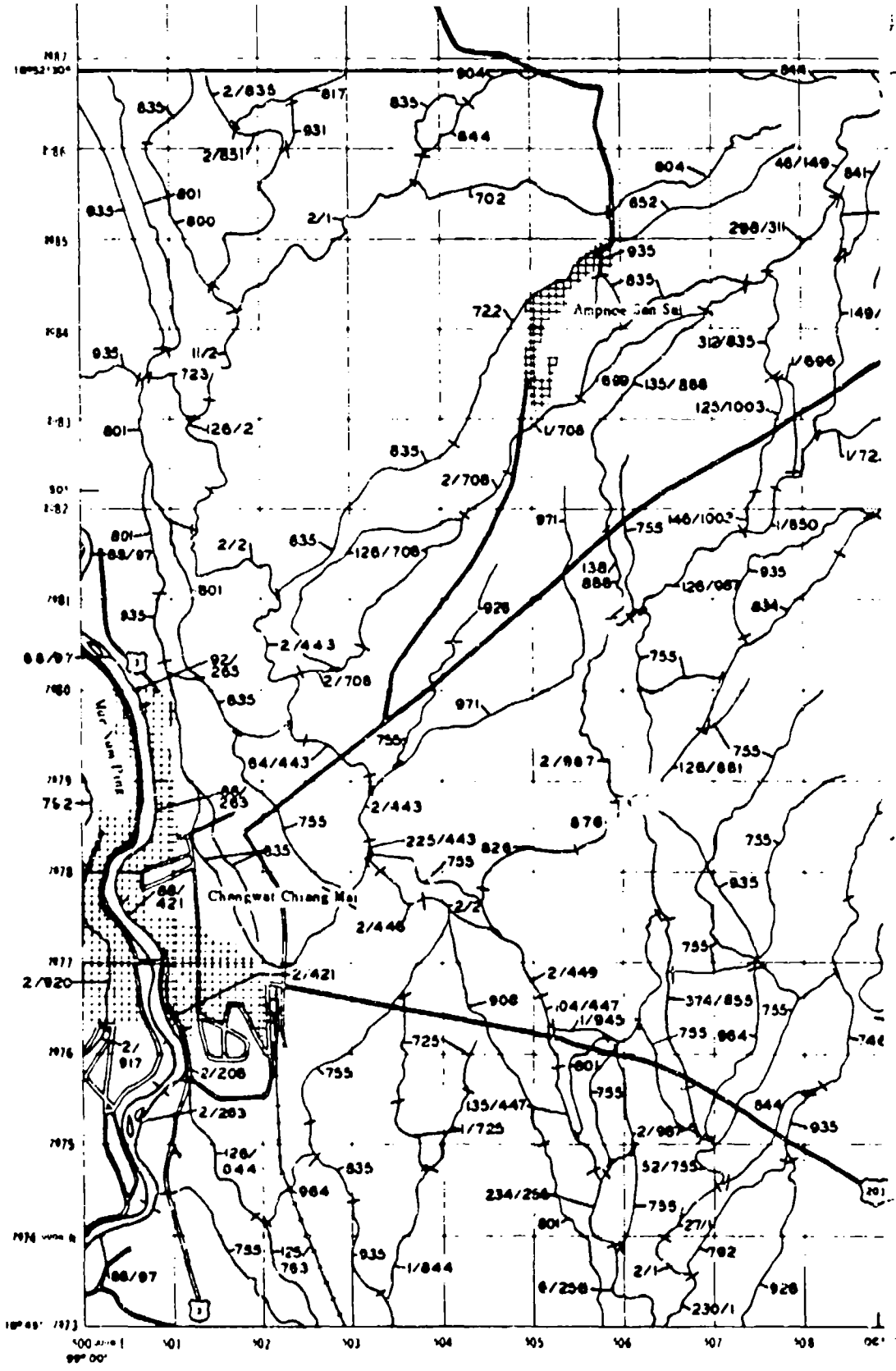
1 2

CHIANG MAI

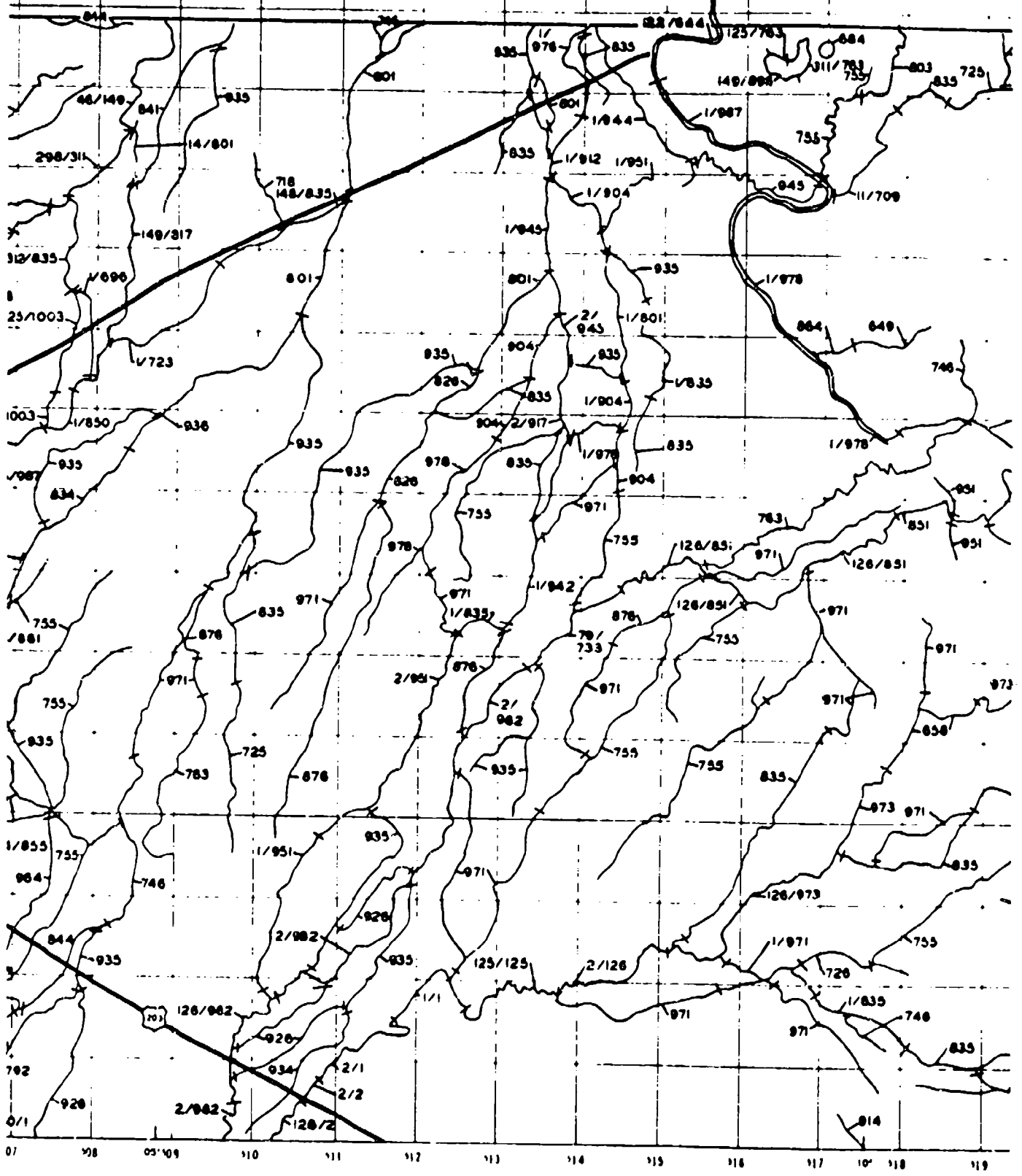


SHEET CM II

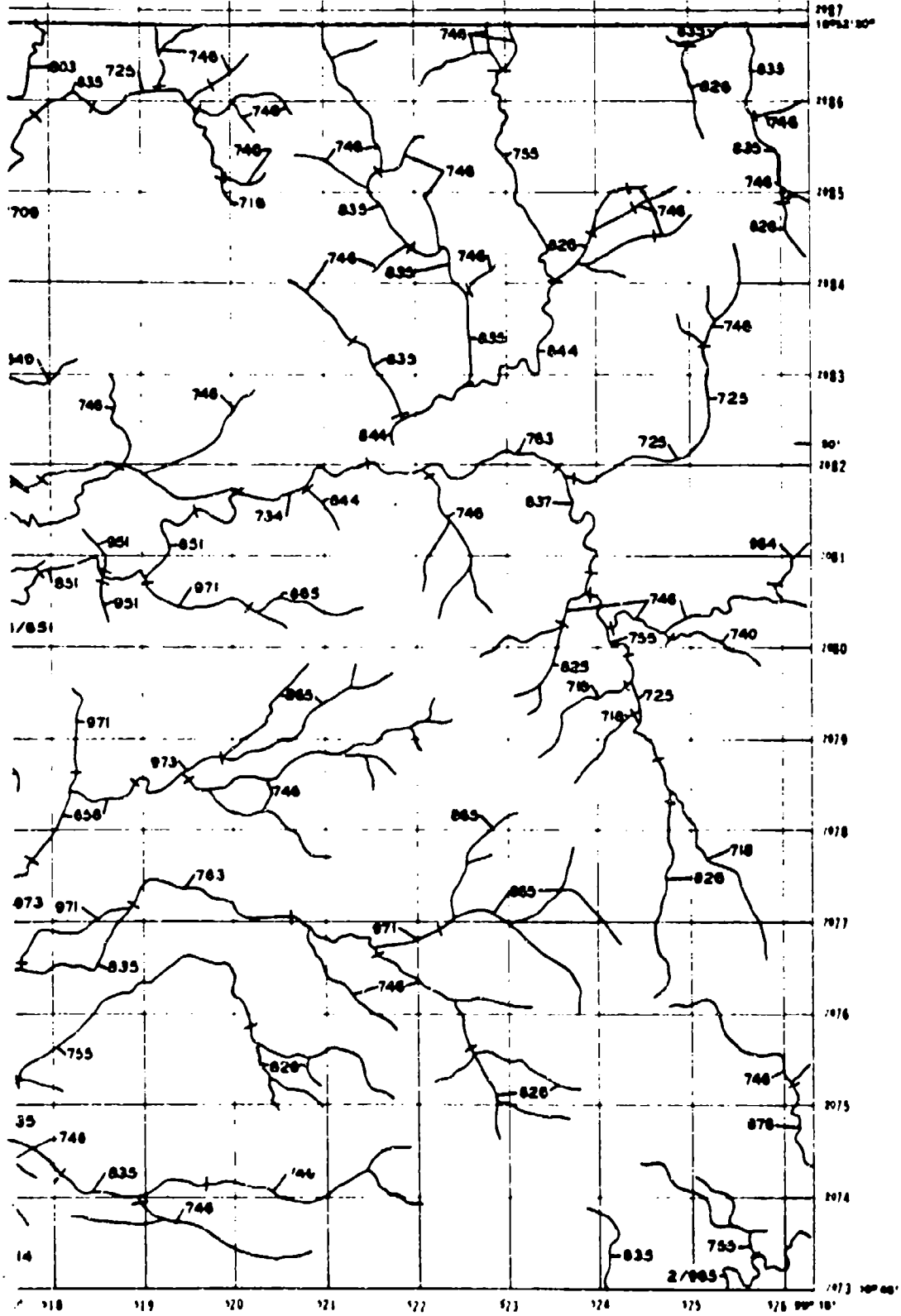




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

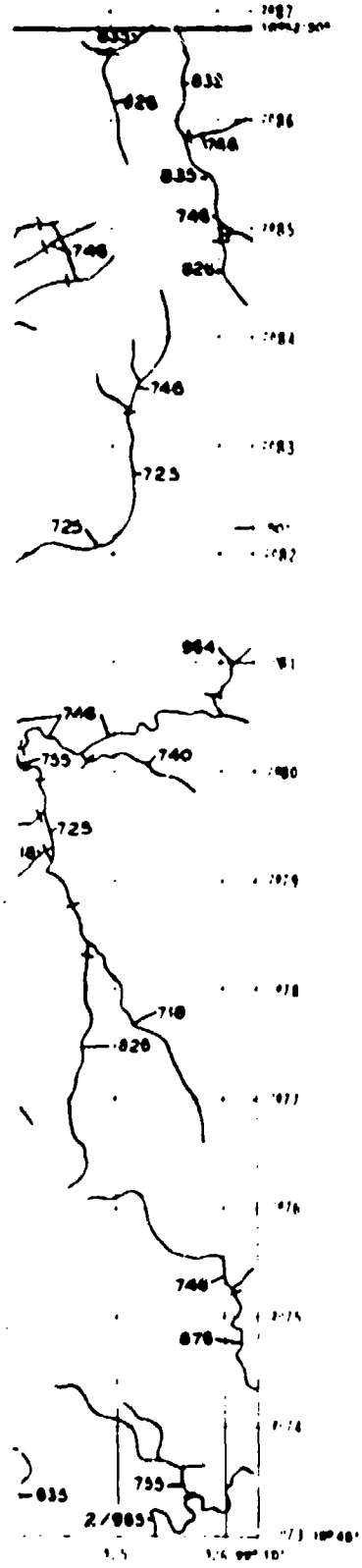


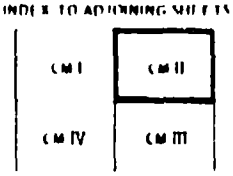
SCALES



INDE

A QUANTITATIVE
TERRAIN F
HYDROL
CHIANG





A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

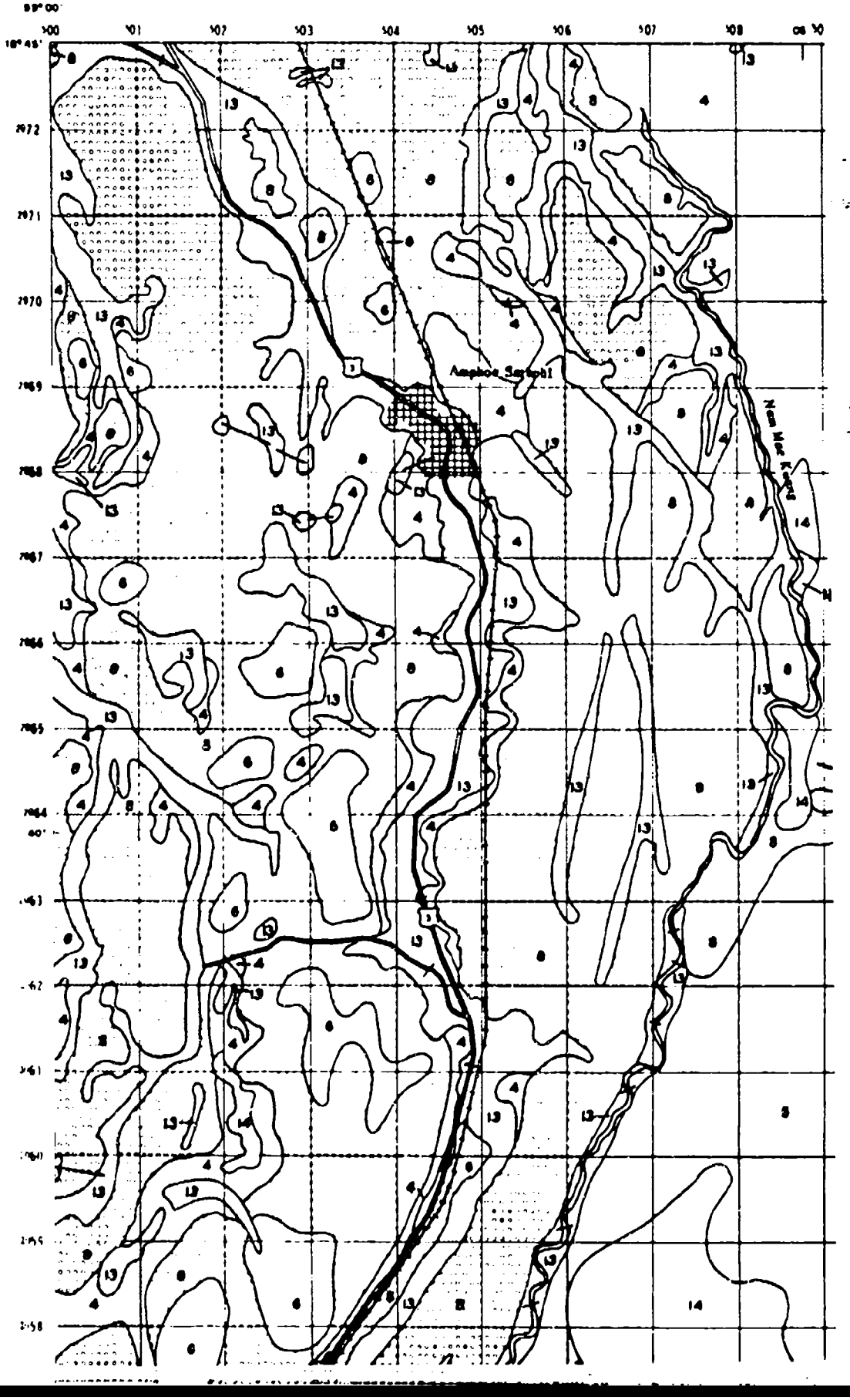
7

HYDROLOGIC GEOMETRY

CHIANG MAI STUDY AREA

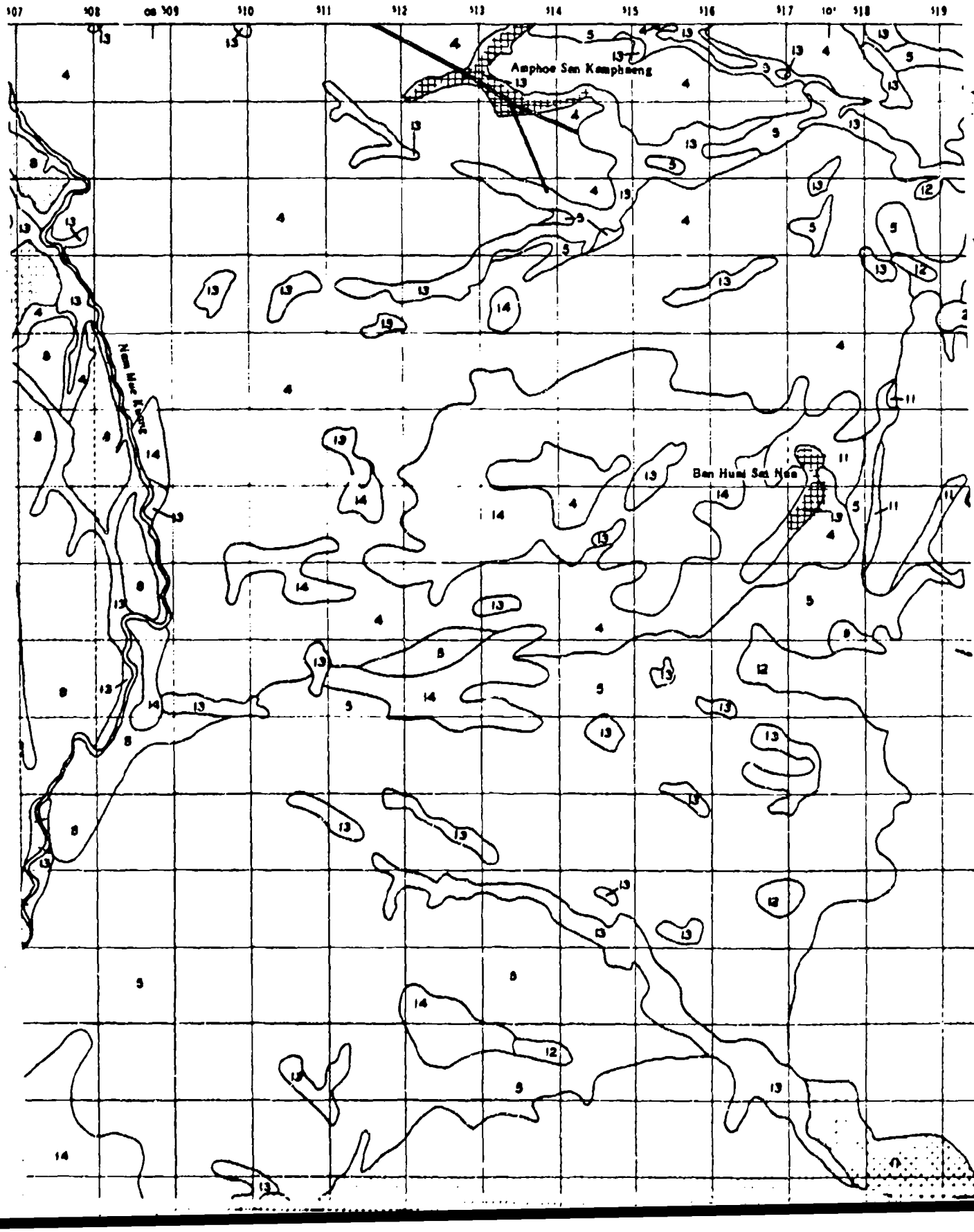
SHEET CM II

PLATE 3.2d


Amphoe Sattahip
Nam Mae Kamo

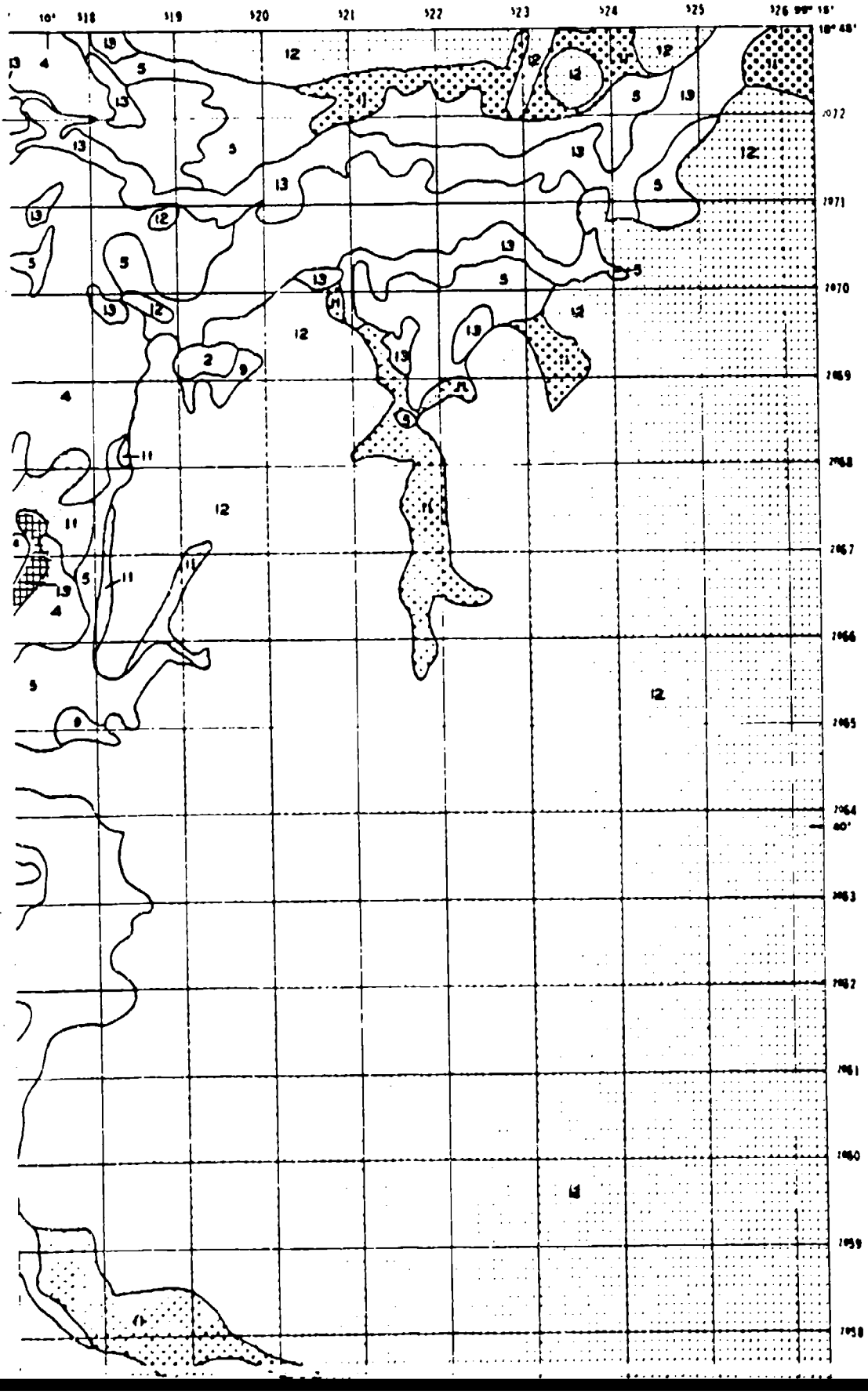
12

CHIANG MAI



1 3

SHEET CM III



Unit	Soil Mass Strength: Maximum Moisture RCI	Minimum Moisture RCI	pcf
	10-25	25-60	0-1
2	25-60	60-100	0-1
	25-60*	60-100	0-1
6	25-60	>100	0-
7	25-60*	>100	0-1
6	60-100	60-100	0-1
	60-100	60-100	0-1
	60-100	>100	0-1
9	60-100	>100	0-1
	60-100	>100	0-1
	60-100*	>100	0-1
12	>100	>100	0-1
13	>100	>100	0-1
14	Complex of 60-100 and >100	>100	0-1
	Complex of 60-100 and >100	>100	0-1

Note: Blank areas are water bodies

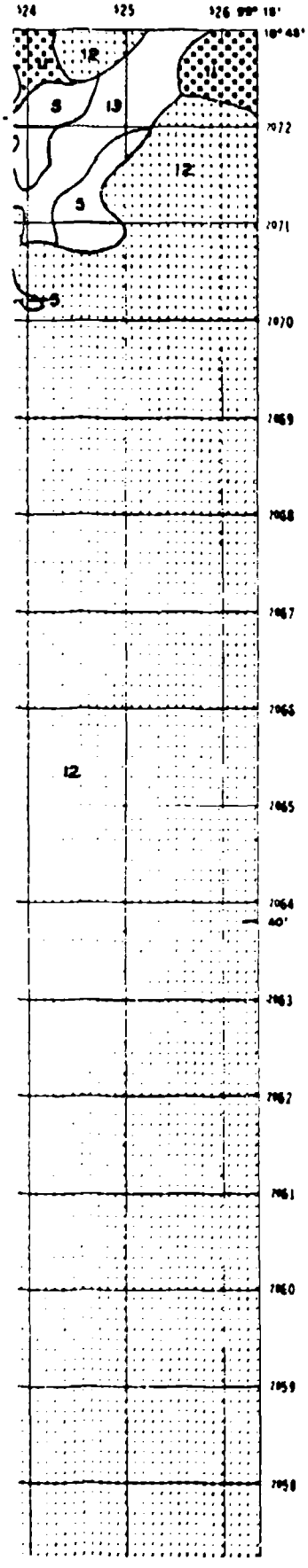
s_w Shear strength at core moisture

ϕ_w Angle of internal friction.

* Maximum moisture has less than strengths commonly observed at

Units do not occur on this m

SHEET CM III



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Soil Surface Strength: Minimum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Conditions where maximum c_{ur} occurs: c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg
[X]	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
[X]	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
7	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
[X]	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
[X]	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
9,10	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
10	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
[X]	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

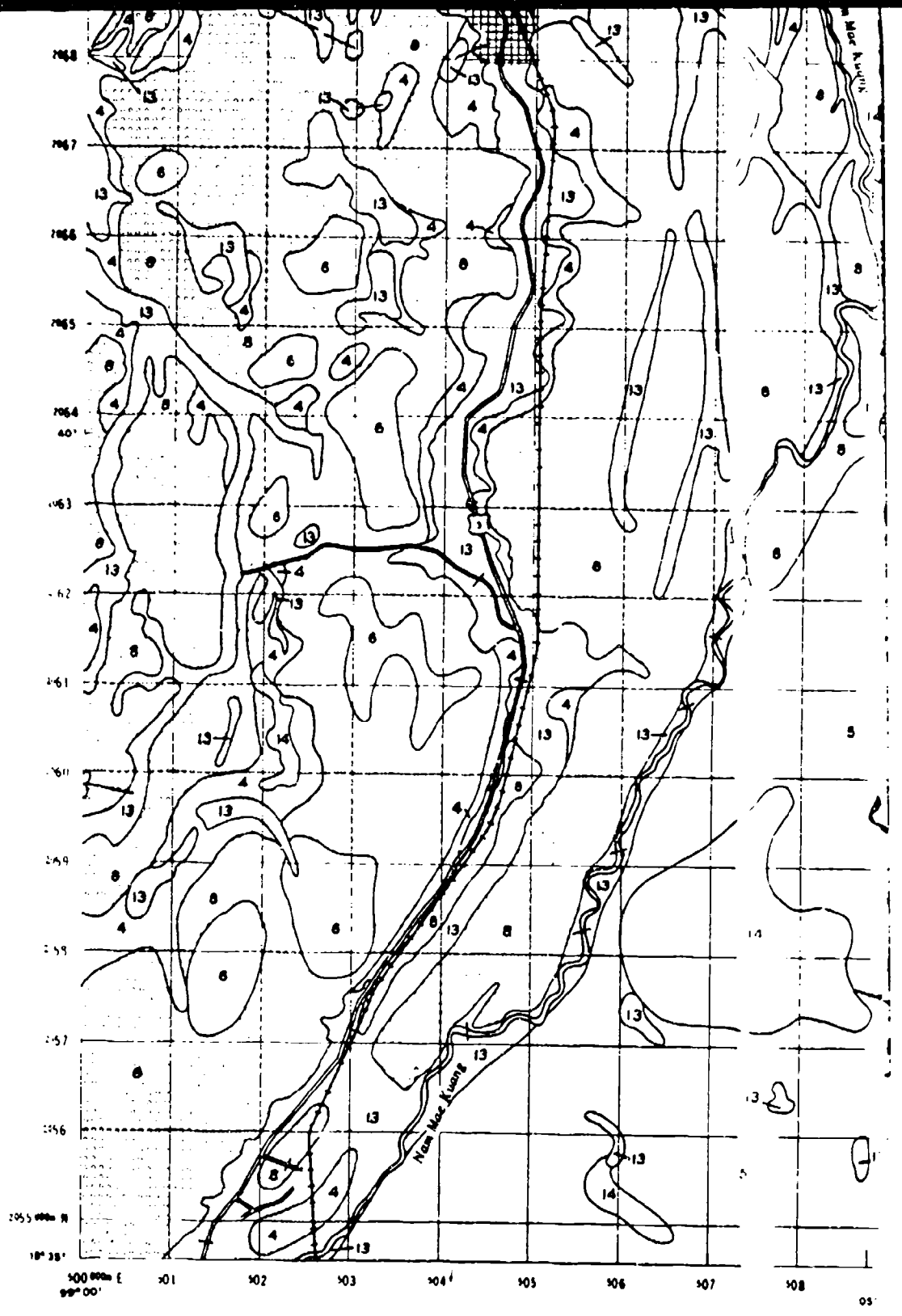
ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

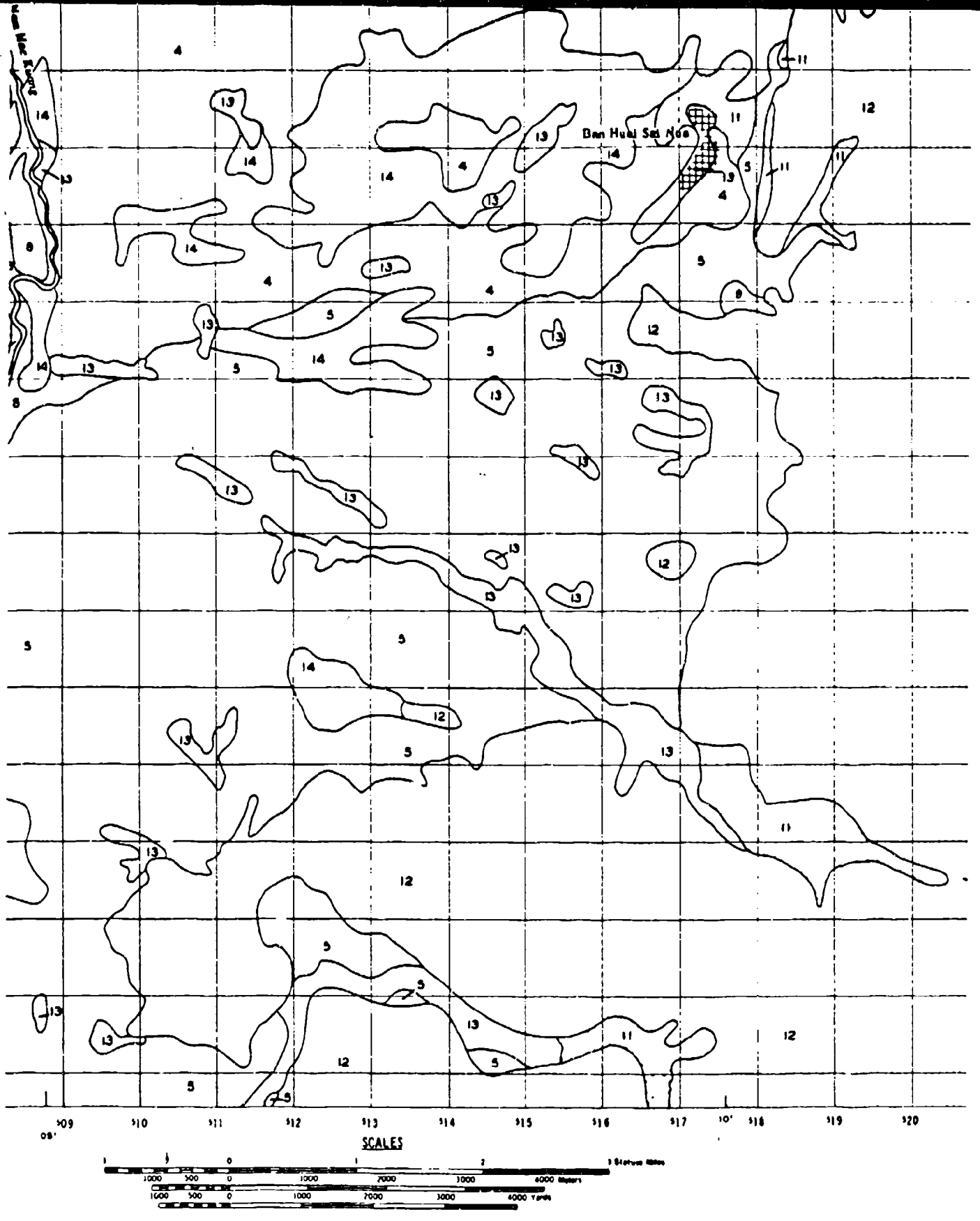
[X] Units do not occur on this map.

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CM I	CM II

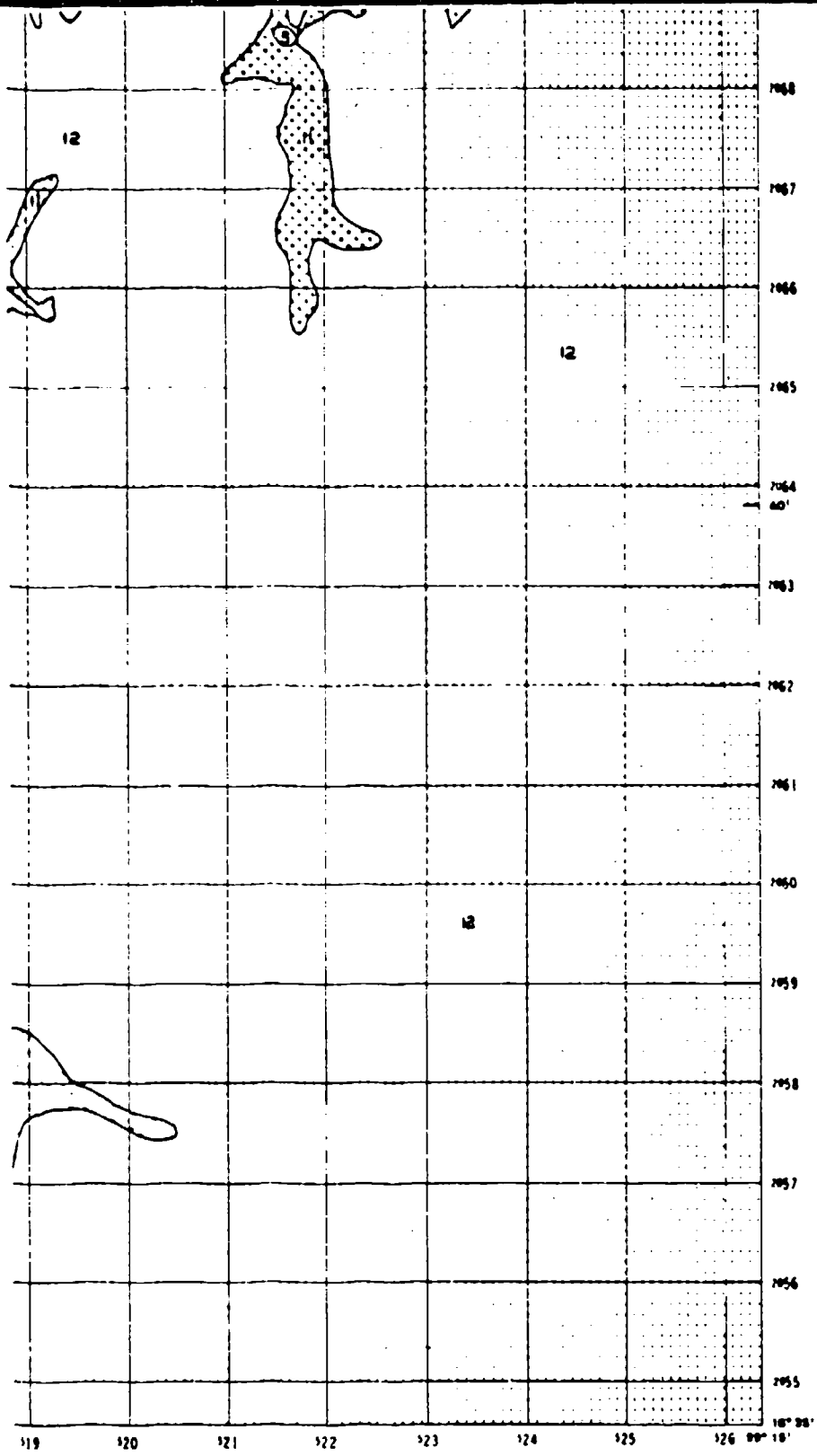


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q


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SCALES

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Unit	Soil Mass Strength: Minimum Moisture RCI	Soil Mass Strength: Maximum Moisture RCI	Maximum Moisture: c_{up} psi	Maximum Moisture: c_{up} kg/cm²	Maximum Moisture: ϕ_{up} deg	Slash: psi	Slash:
X	10-29	29-60	0-1	0-0.07	0-10	1-8	0
2	29-60	60-100	0-1	0-0.07	0-10	2-4	0
X	29-60*	60-100	0-1	0-0.07	10-20	2-4	0
4	29-60	>100	0-1	0-0.07	0-10	0-1	
7	29-60*	>100	0-1	0-0.07	10-20	0-1	
5	60-100	60-100	0-1	0-0.07	0-10	2-4	0
X	60-100	60-100	0-1	0-0.07	10-20	0-1	
8	60-100	>100	0-1	0-0.07	0-10	0-1	
9	60-100	>100	0-1	0-0.07	0-10	0-1	
X	60-100	>100	0-1	0-0.07	10-20	0-1	
10	60-100*	>100	0-1	0-0.07	10-20	0-1	
13	>100	>100	0-1	0-0.07	0-10	0-1	
14	>100	>100	0-1	0-0.07	10-20	0-1	
15	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	
X	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	

Notes: Slash areas are water bodies.

c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of strengths commonly observed are 60-100 for Units 3 and 5;

X Units do not occur on this map.

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CM I	CM II
CM IV	CM III

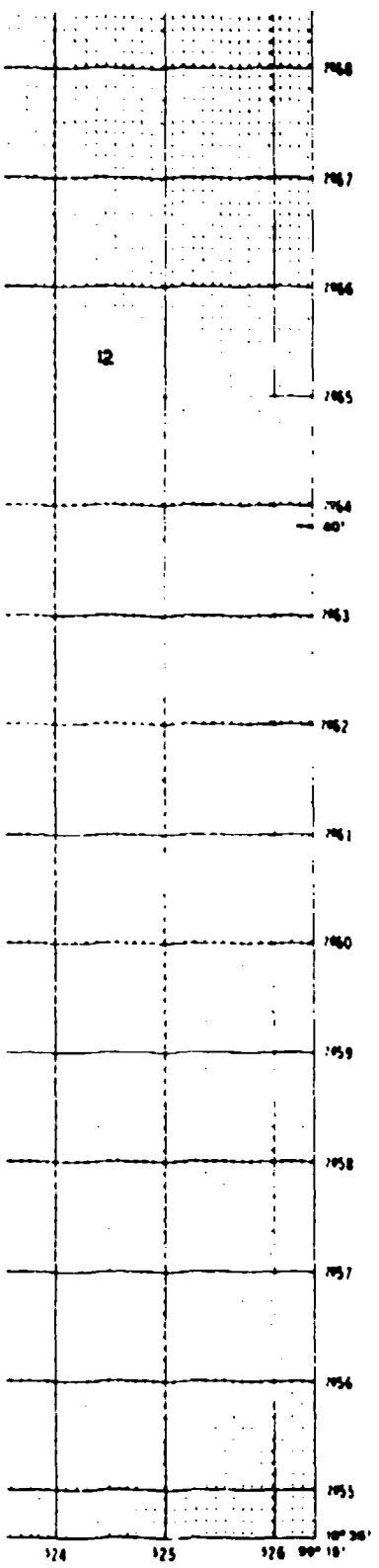
A QUANTITATIVE METHOD F
TERRAIN FOR GROUND

SURFACE COMP(

CHIANG MAI STU

SHEET CM I

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Units	Soil Surface Strength: Minimum Moisture: RI2	Minimum Moisture: RI1	Maximum Moisture: c_w psi	Maximum Moisture: c_w kg/cm²	Maximum Moisture: ϕ_w deg	Minimum Moisture: c_w psi	Minimum Moisture: c_w kg/cm²	Minimum Moisture: ϕ_w deg	Conditions where maximum occurs: c_w psi	Conditions where maximum occurs: c_w kg/cm²	Conditions where maximum occurs: ϕ_w deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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CM I	CM II
CM IV	CM III

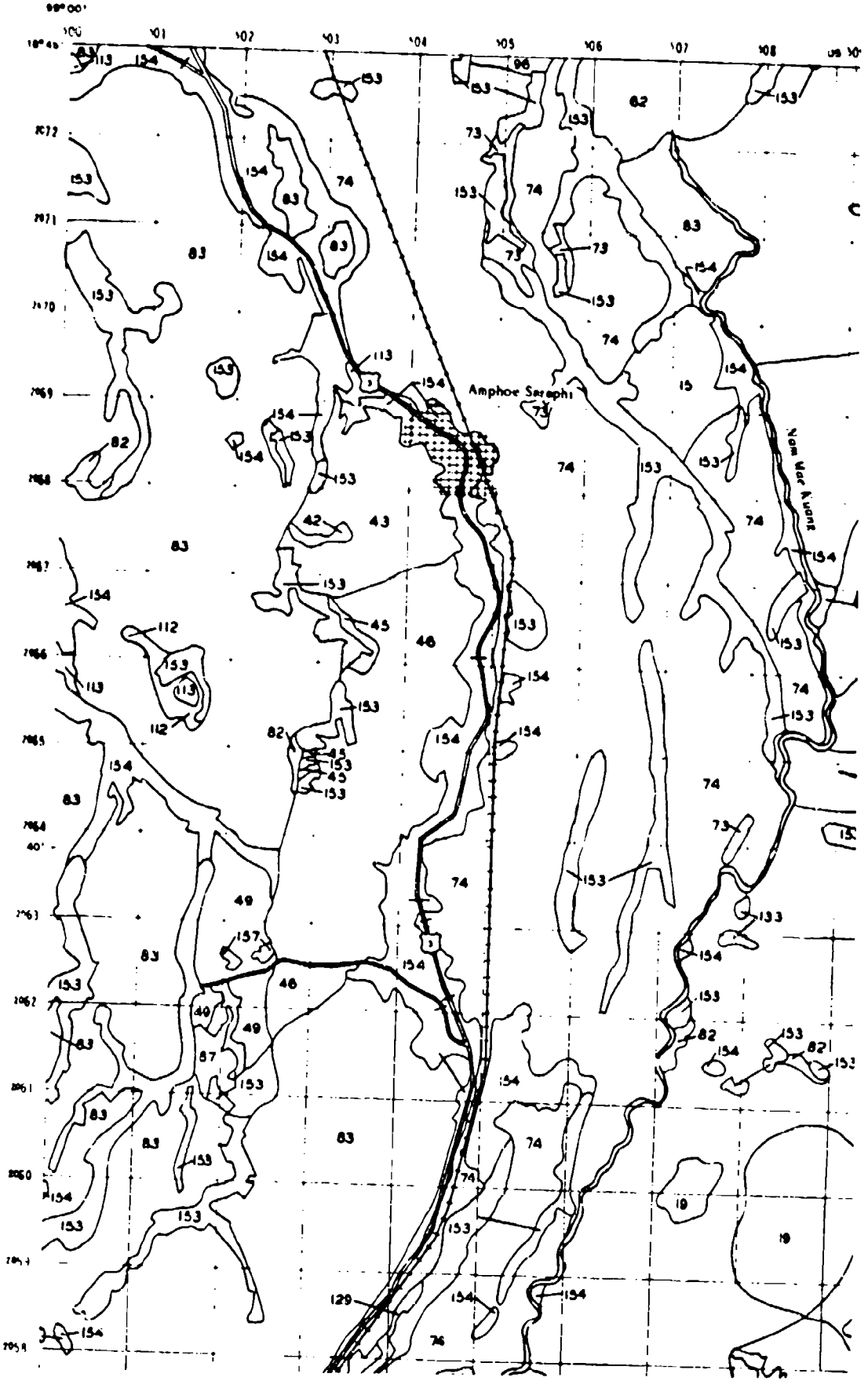
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

CHIANG MAI STUDY AREA

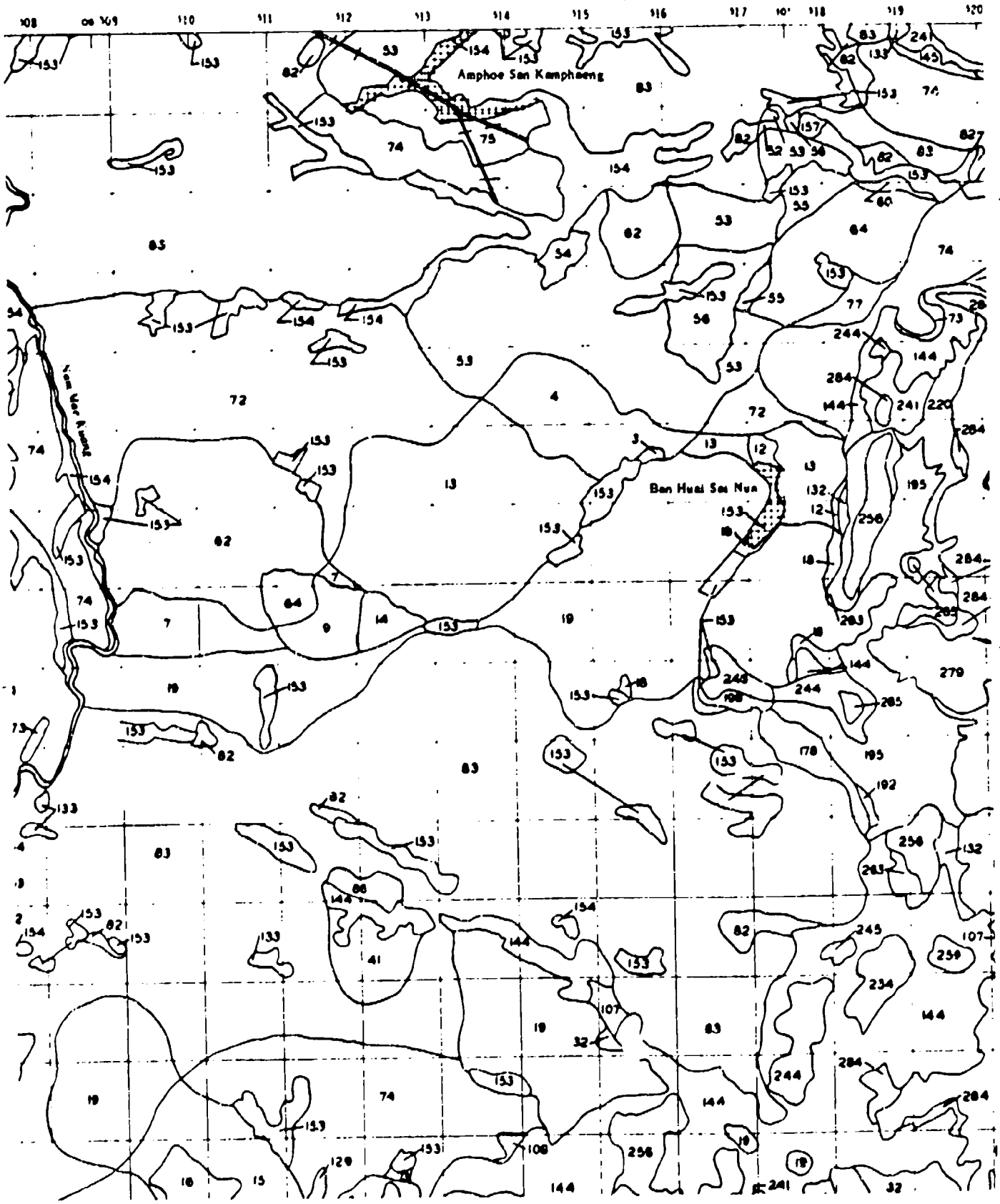
SHEET CM III

PLATE 3.3a


Amphoe Seraphi
Nam Mae Kuang

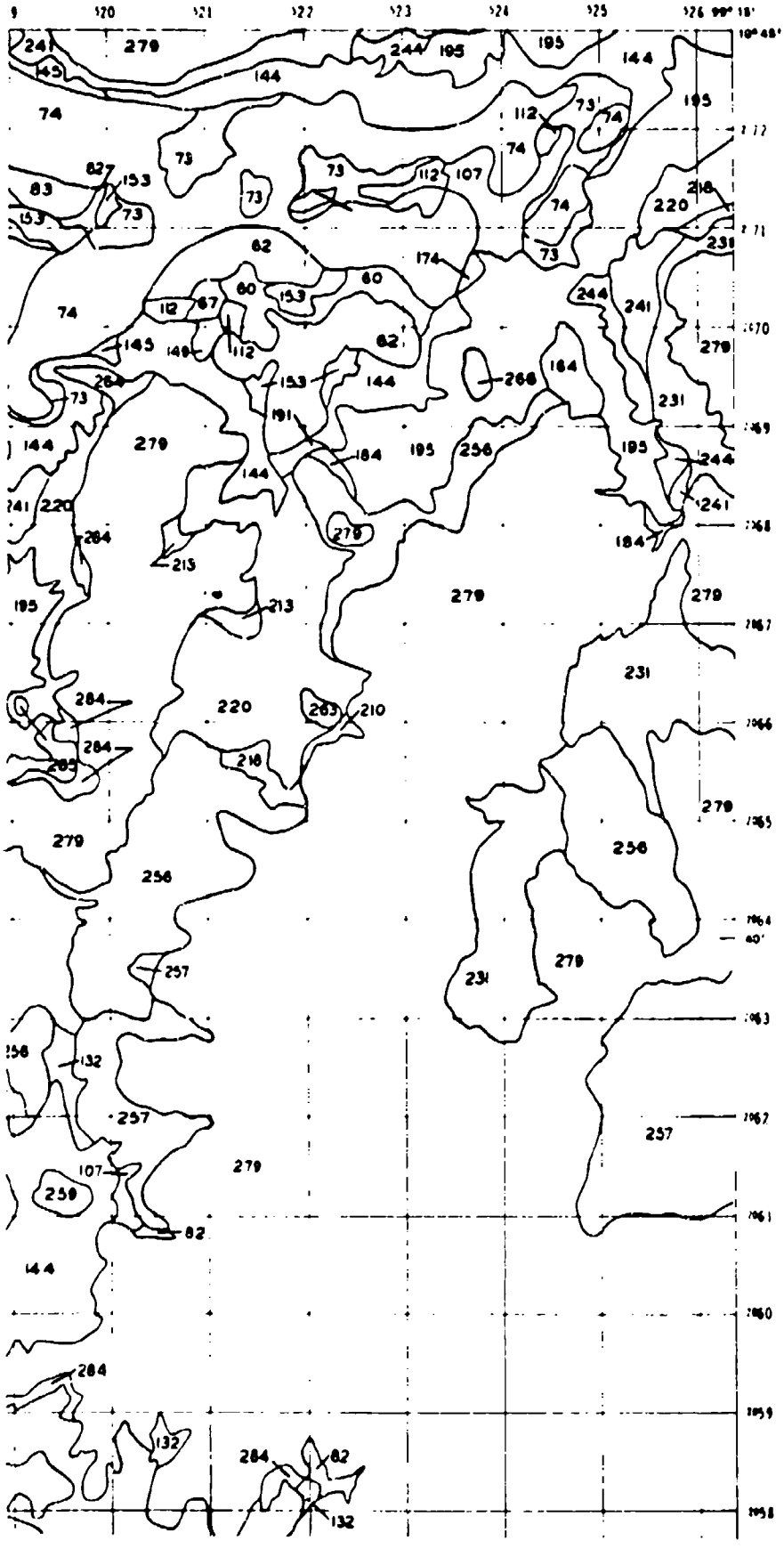
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CHIANG MAI

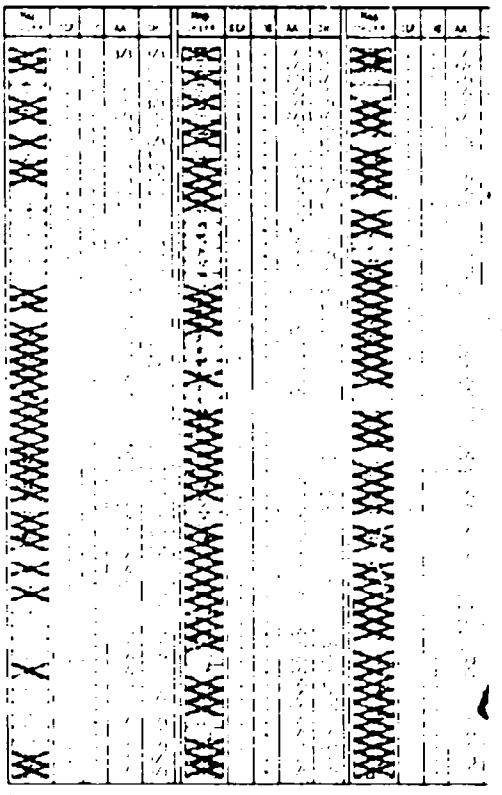


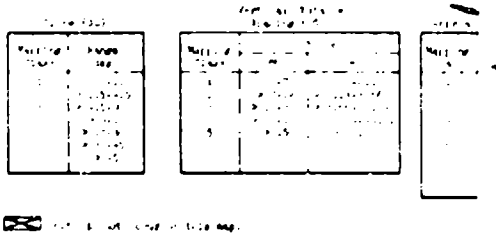
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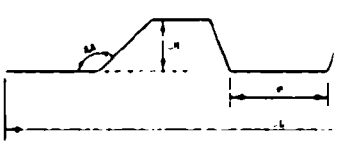
SHEET CM III



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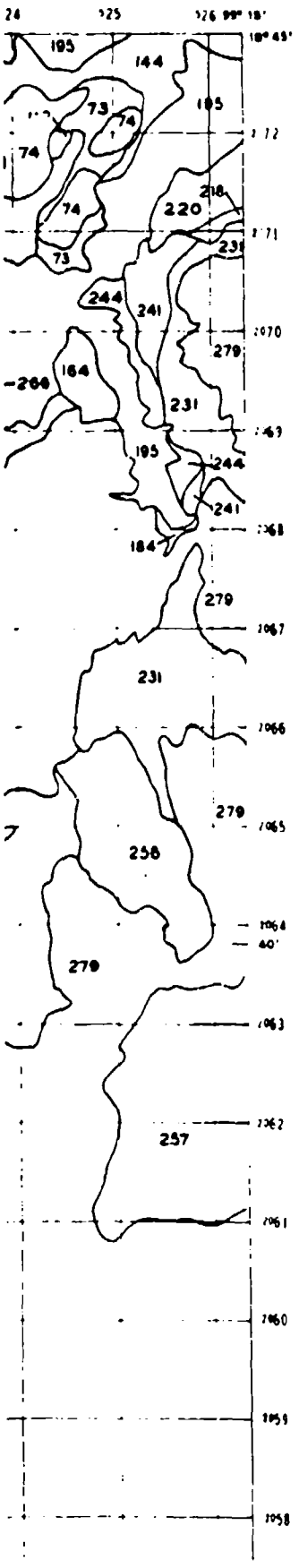




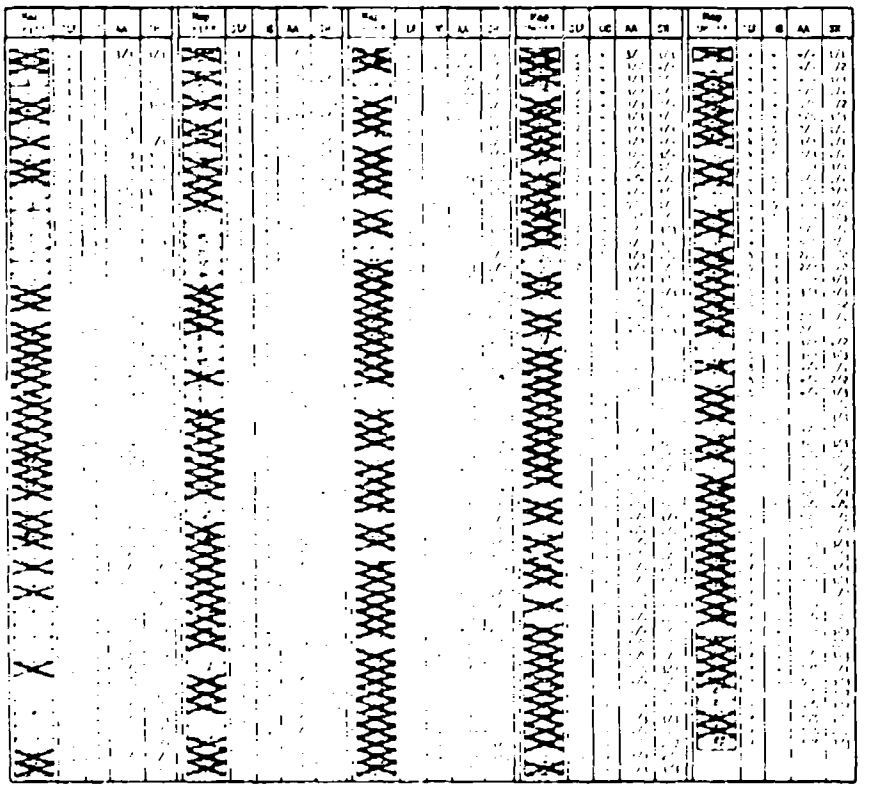
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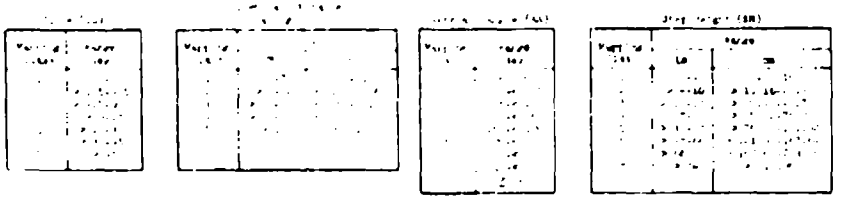
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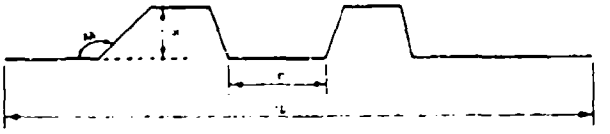
SHEET CM III



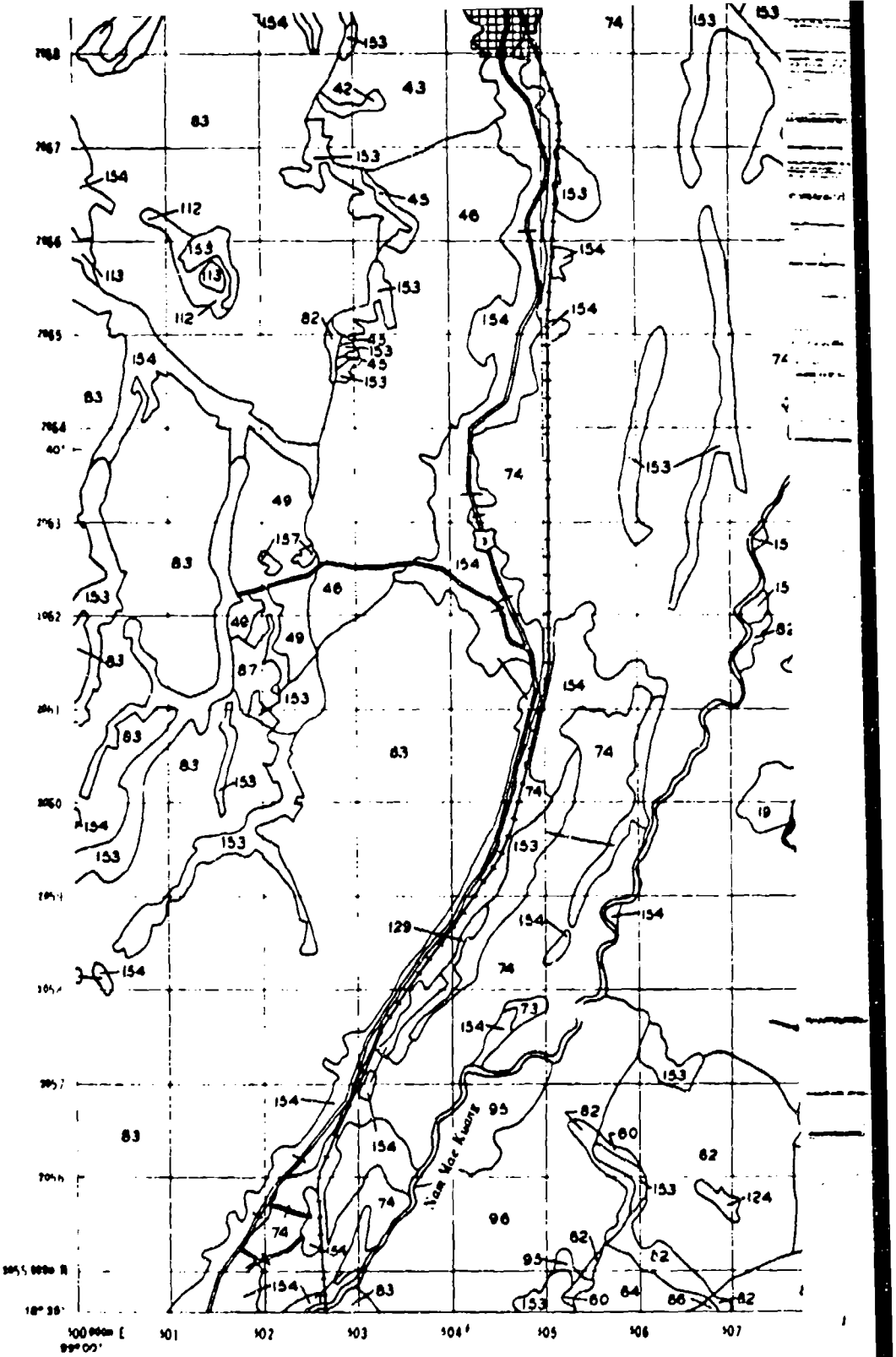
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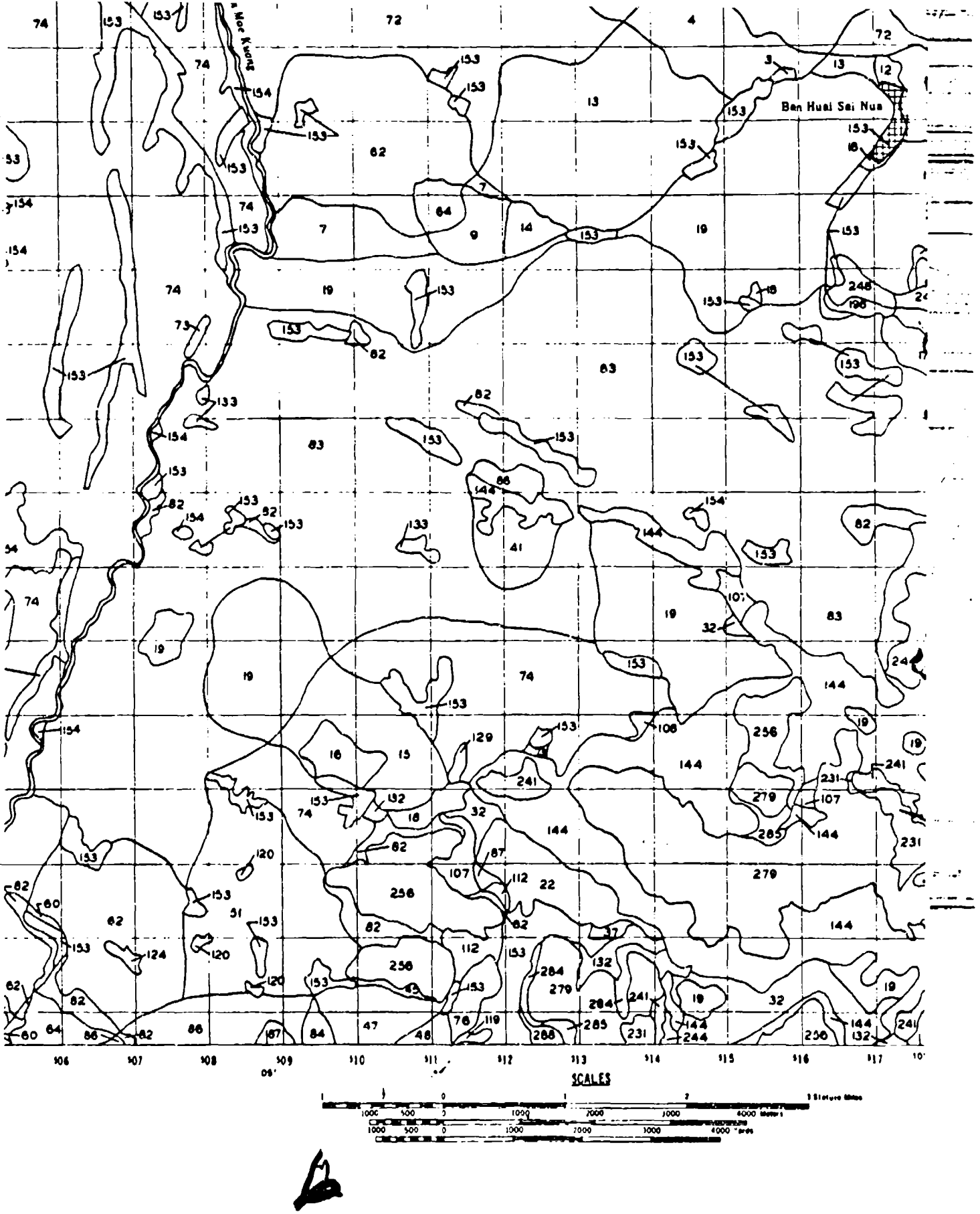


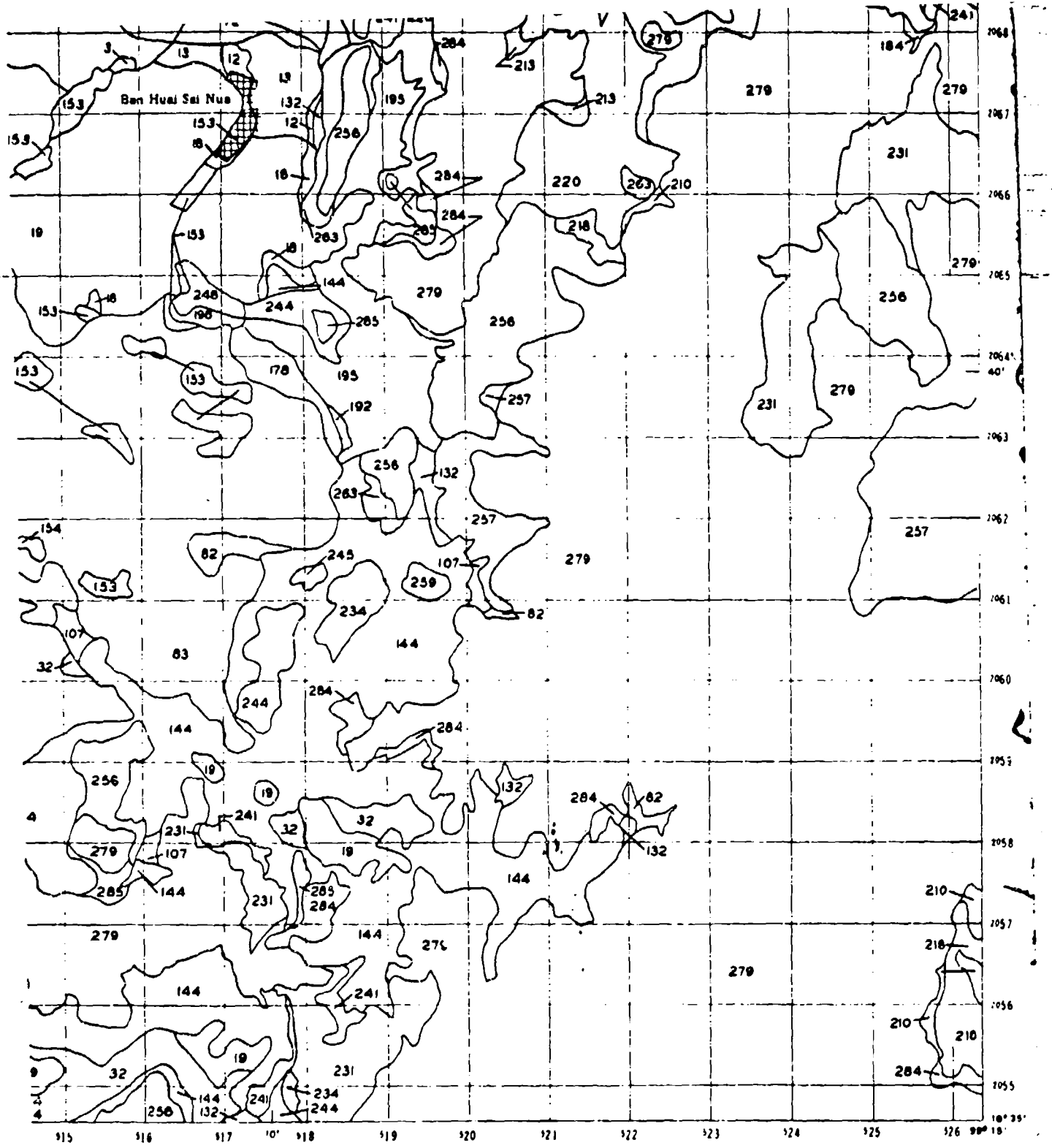
INDEX TO ADJOINING SHEETS



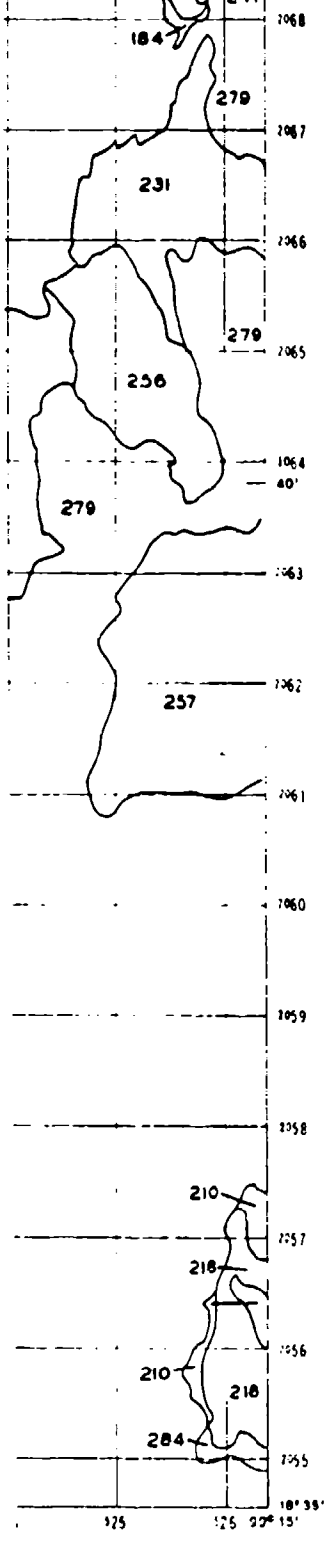
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

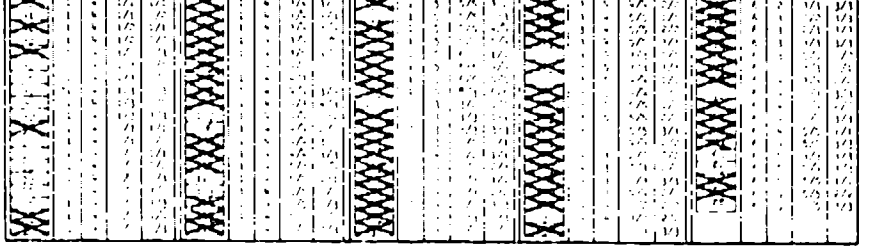
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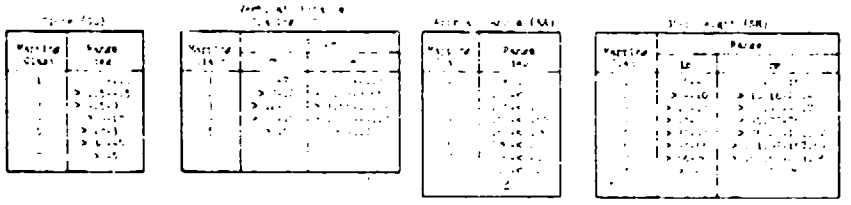

Ban Huai Sai Nua
SCALES

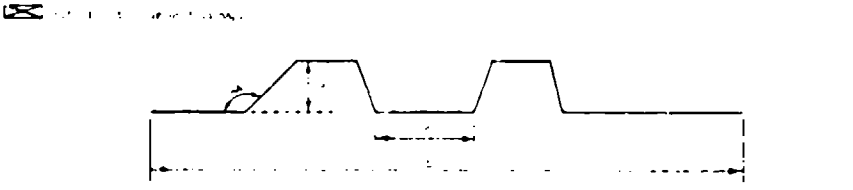

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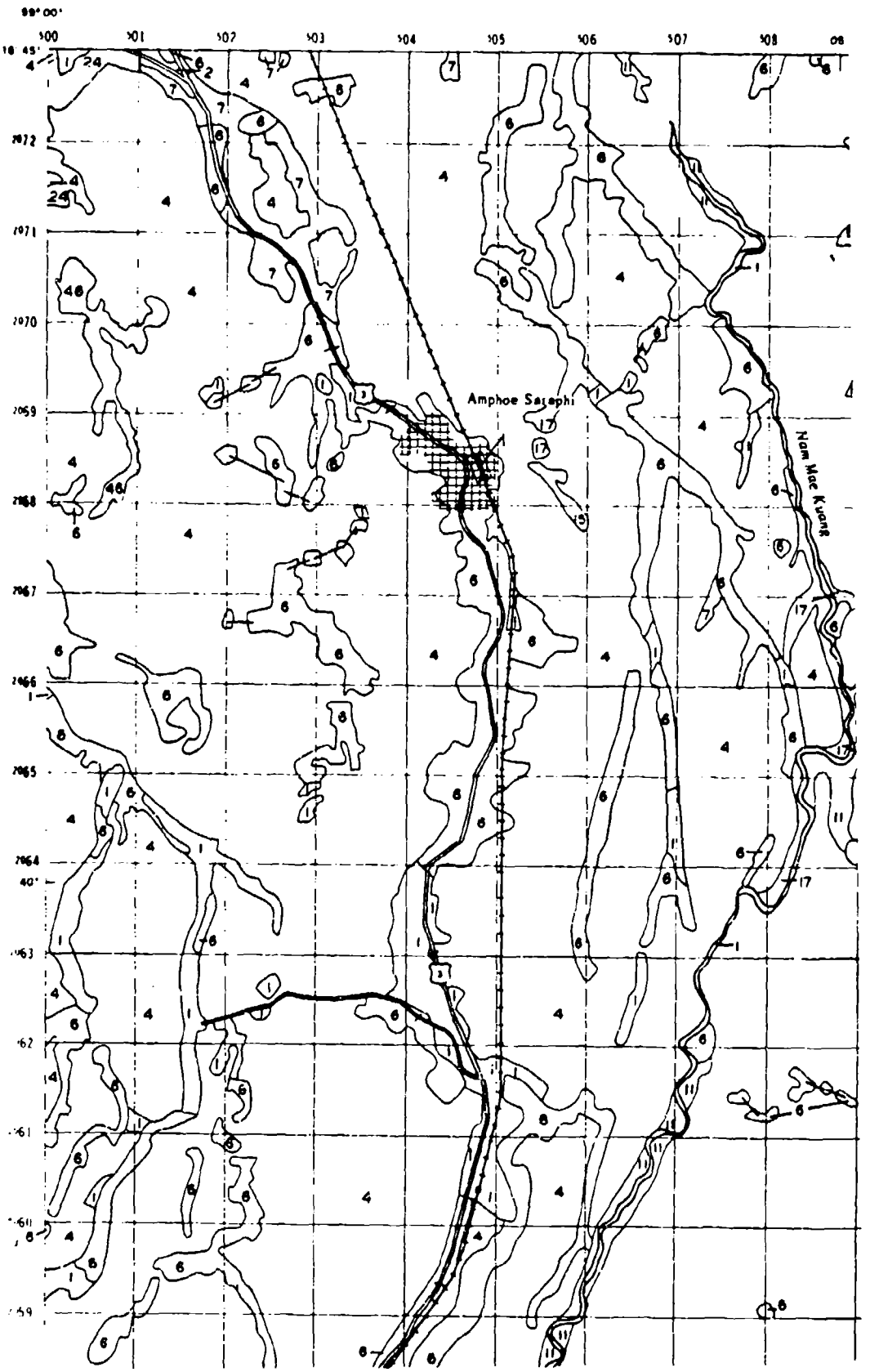
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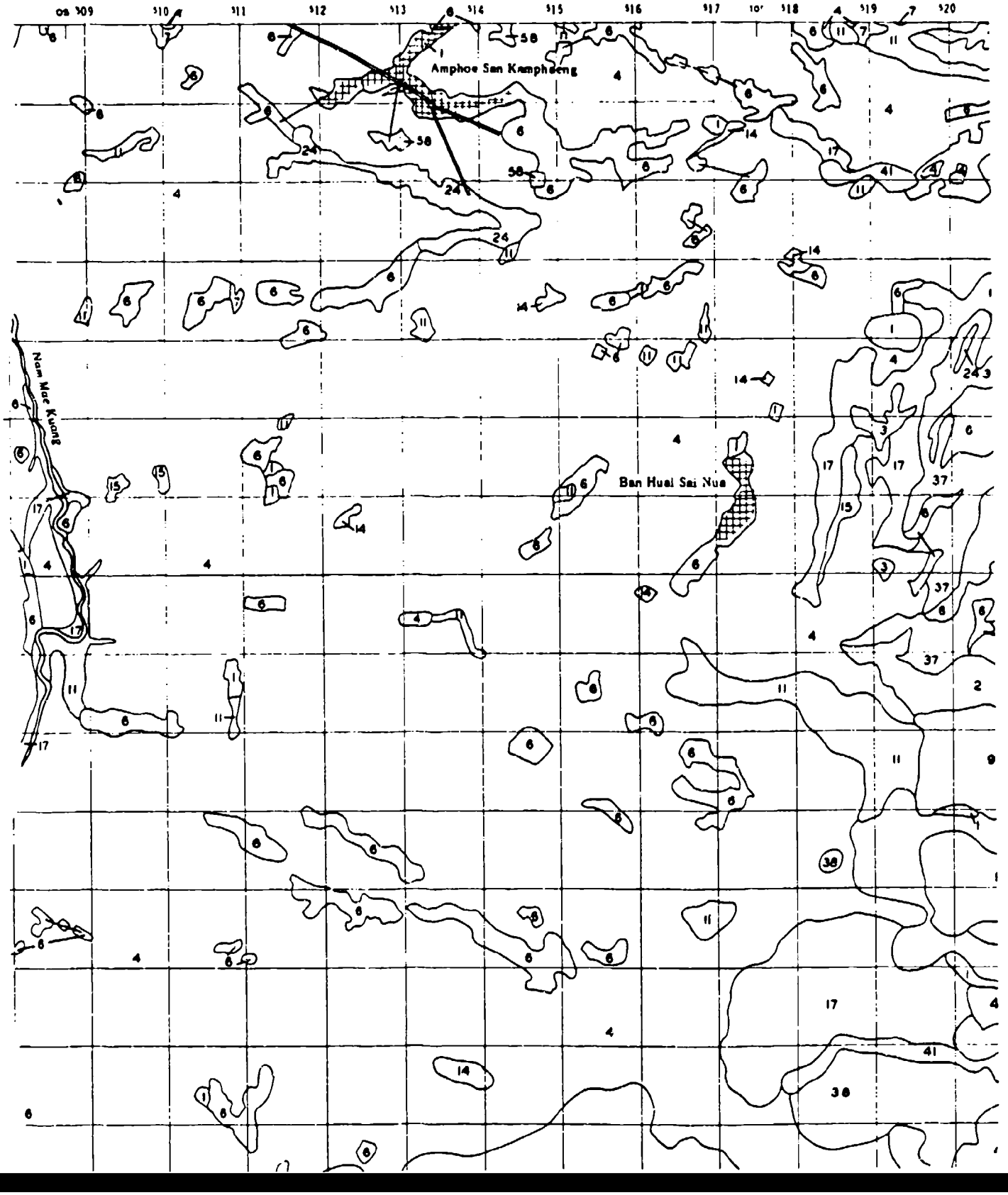





Amphoe Sa-ephi
Nam Mae Kuang

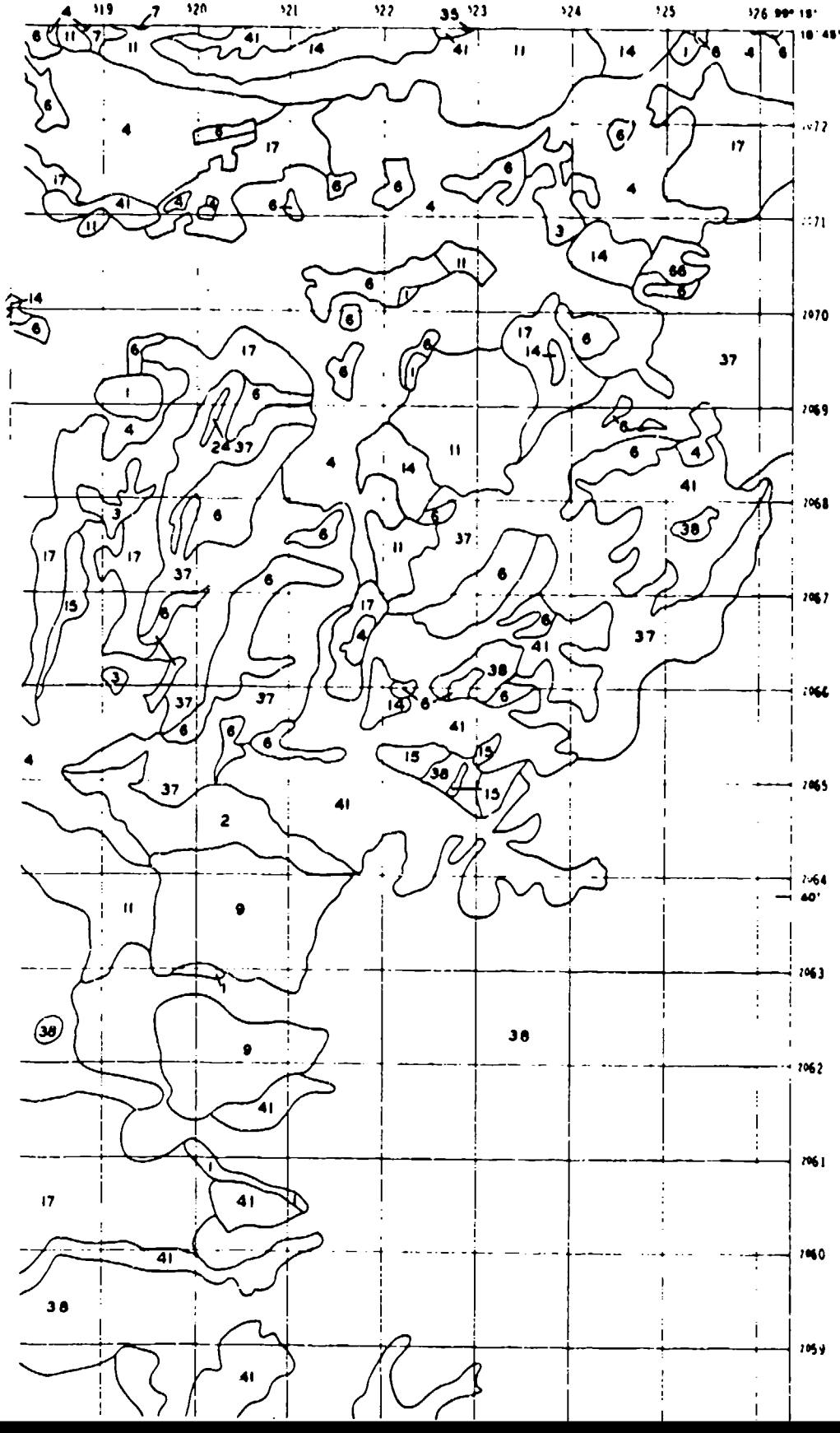
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CHIANG MAI

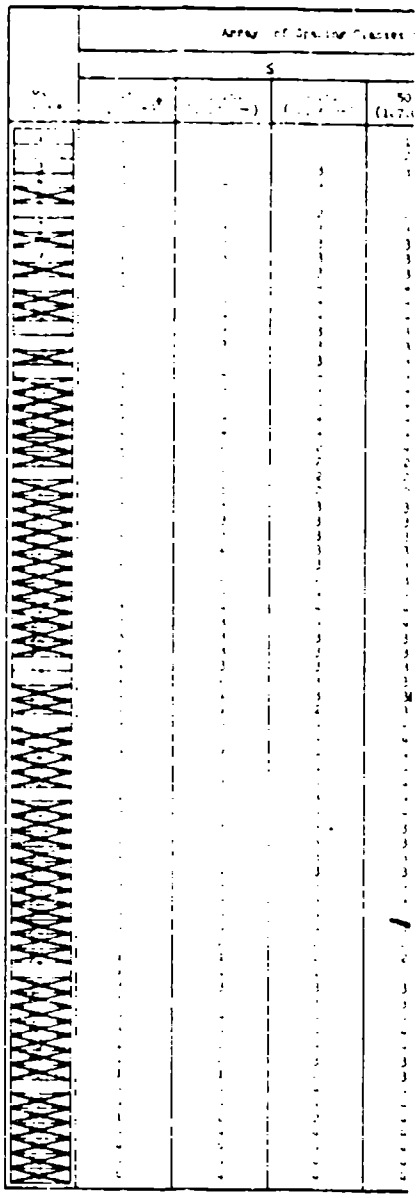


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SHEET CM III



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Note: Blank areas are unvegetated water bodies.

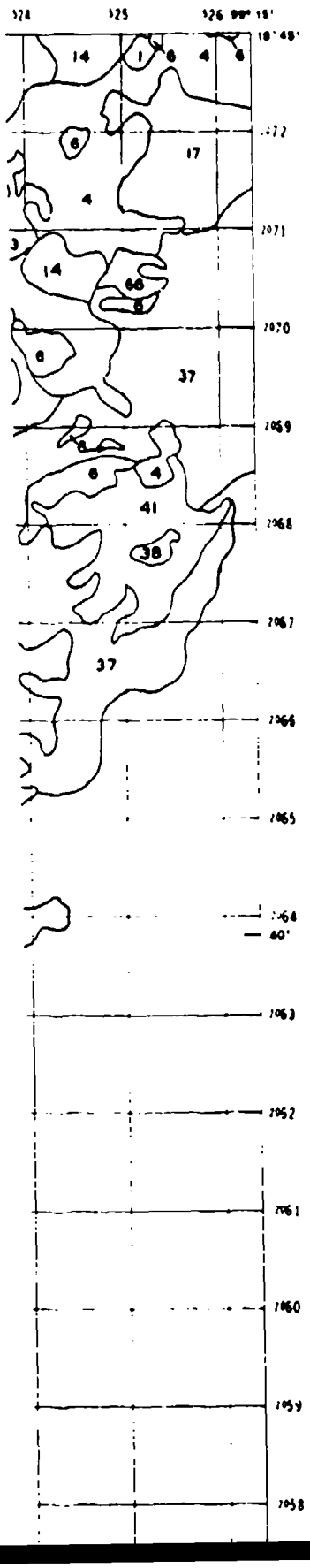
* Each bar unit represents an array of eight sym
  ...ing ...tages for ...s, ... and ... in.
  2 ..., ..., and 15 in. (2.5, ..., 15.2, and ...

† Mapping unit names for ... are ...

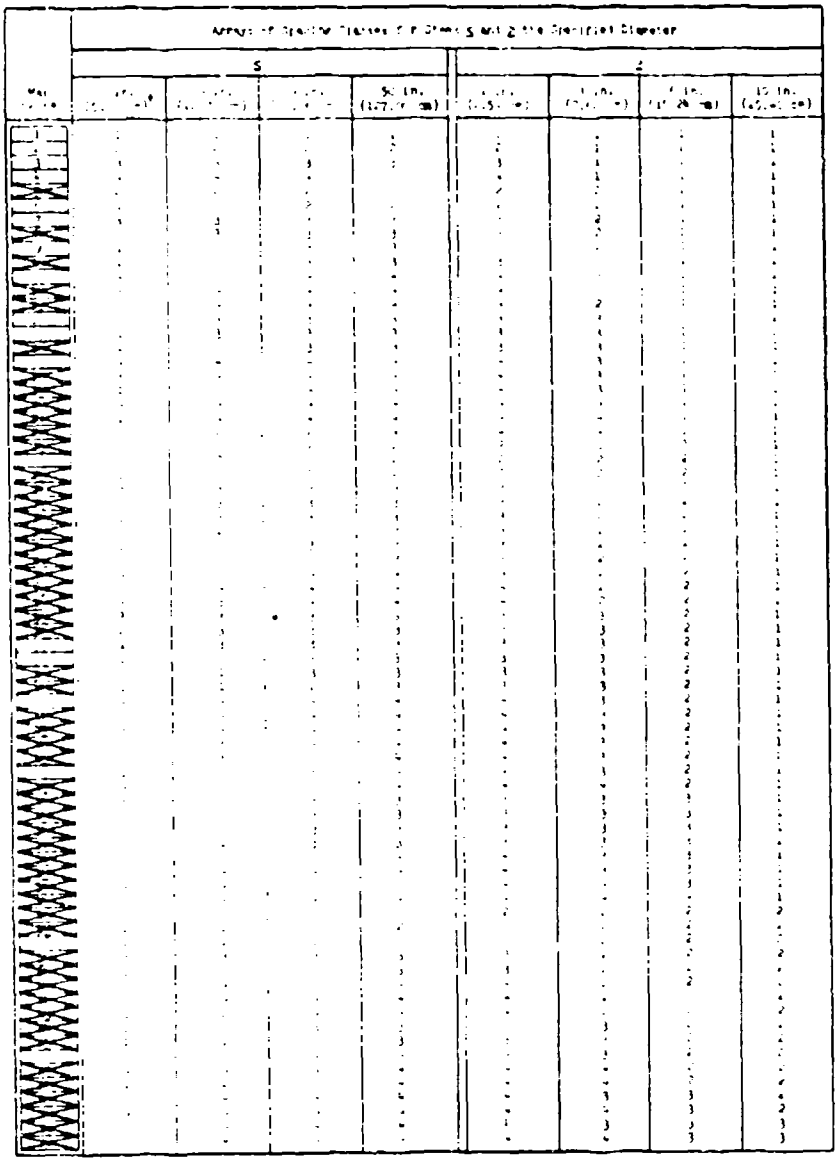
Mapping Class	Item
	ft
1	>
	> 1
	> 5

... not occur on this ...

SHEET CM III



LEGEND



Solid blue areas are corregated water bottle.

* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1) indicating spacing factors for stems S (i.e. 12.70, 22.86, and 127.00 cm) and Z (i.e. 1, 1 and 1 in. (45.5, 71.28, and 254.00 cm).

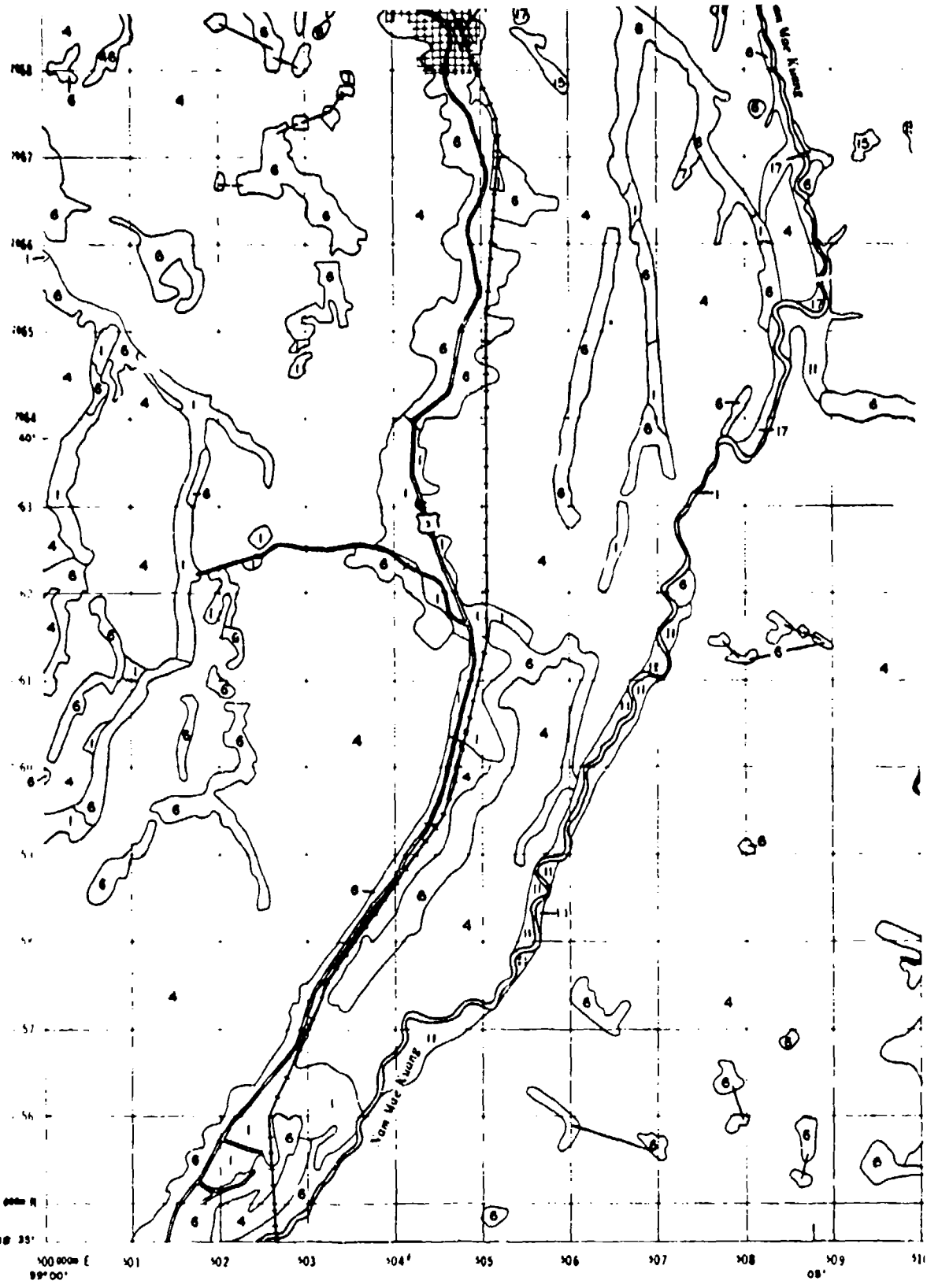
† Mapping class values for each spacing factor.

Stem Spacing

Mapping Class	Range	
	ft	m
1	> 10	> 3.14
2	> 3.0-10	> 0.92-3.14
3	> 1.0-3.0	> 0.31-0.92
4	0-1.0	0-0.31

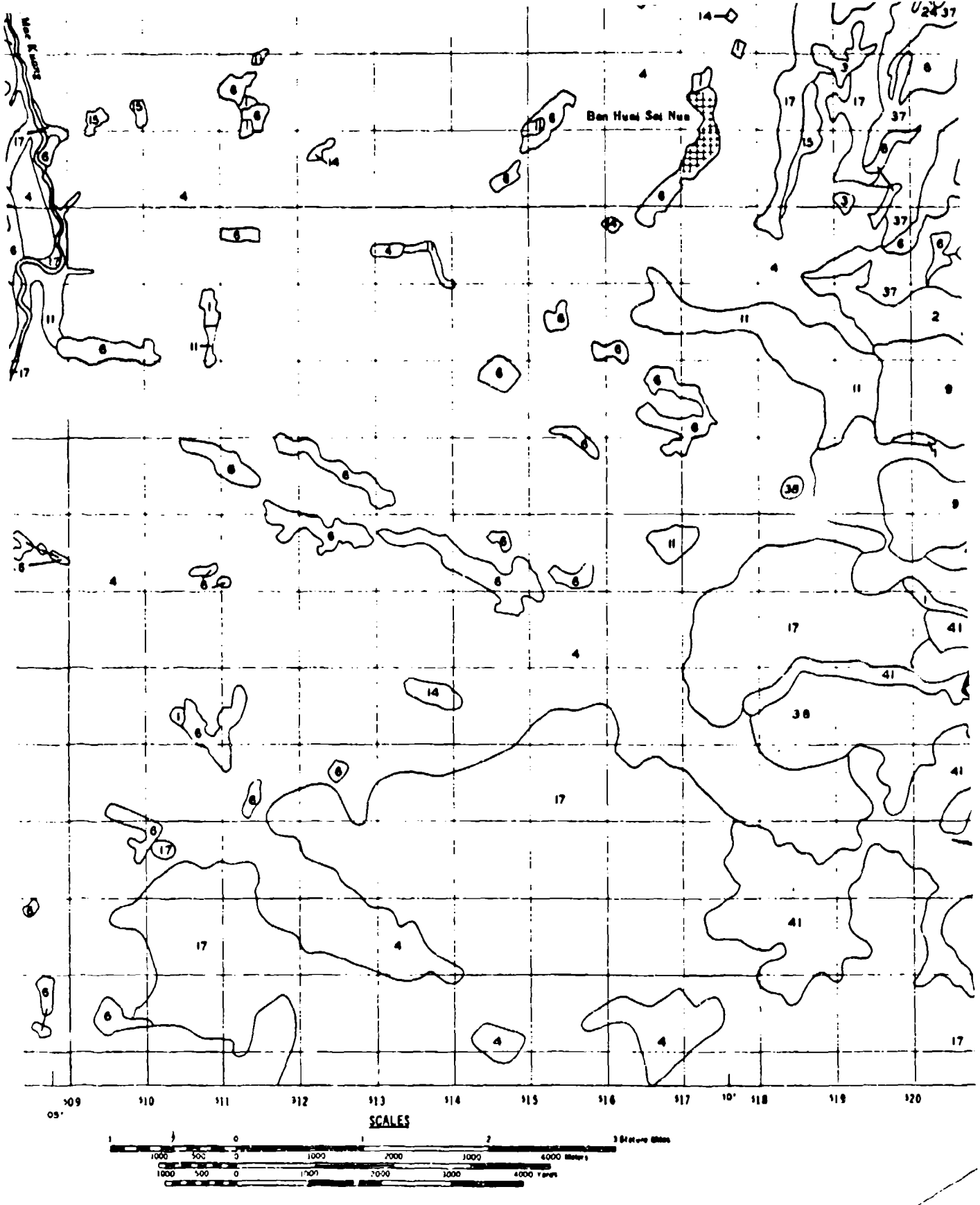
Well to not occur on this map.

INDEX TO ADJOINING SHEET



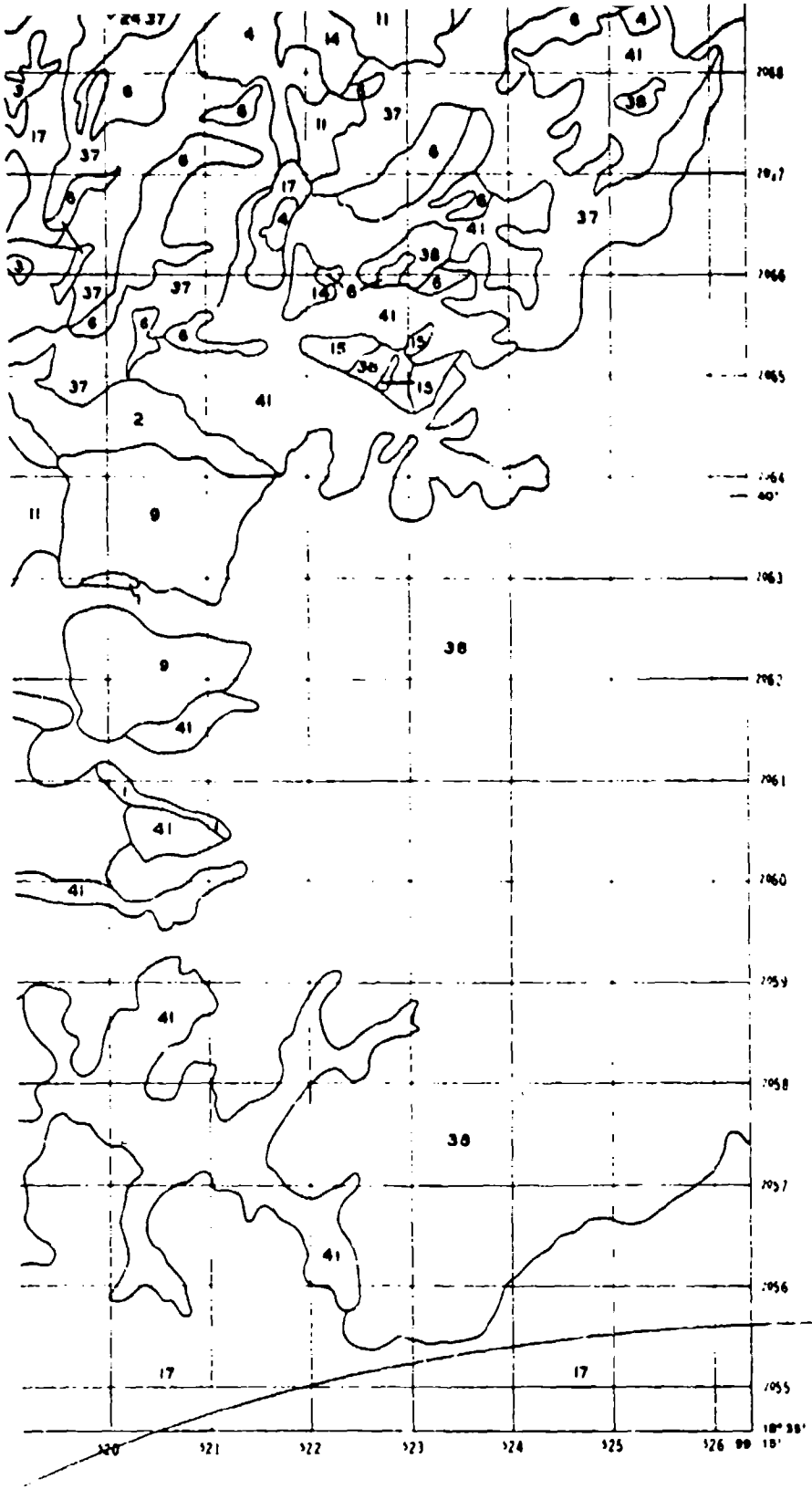
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

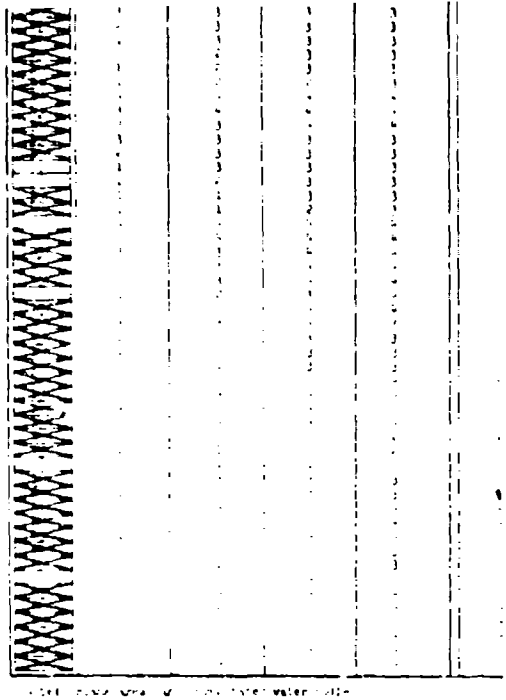
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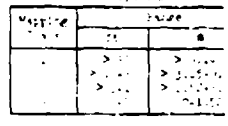


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CM IV	CM III

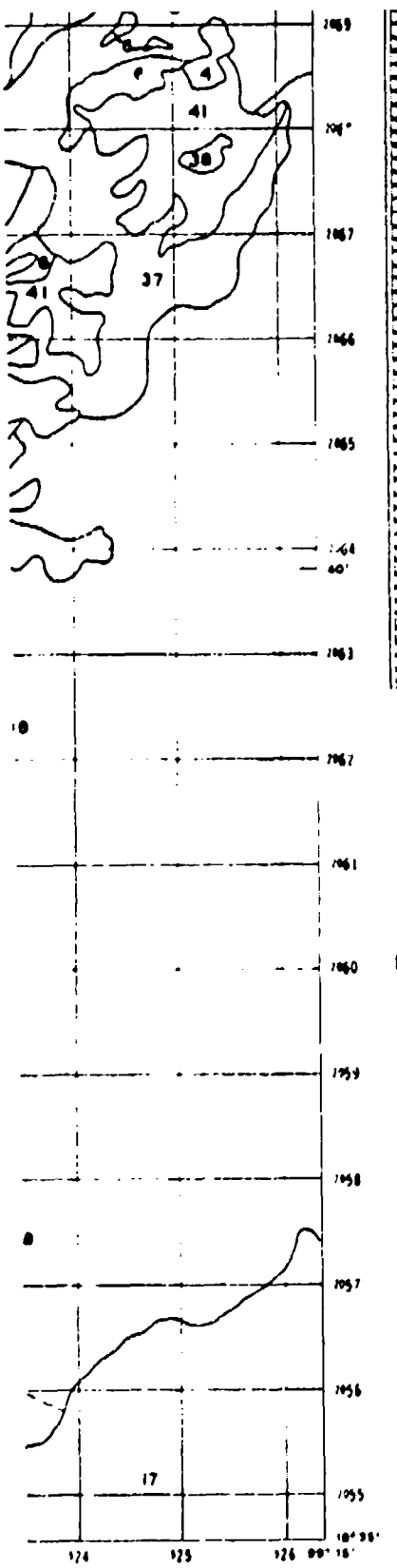
A QUANTITATIVE METHOD FOI
TERRAIN FOR GROUND M

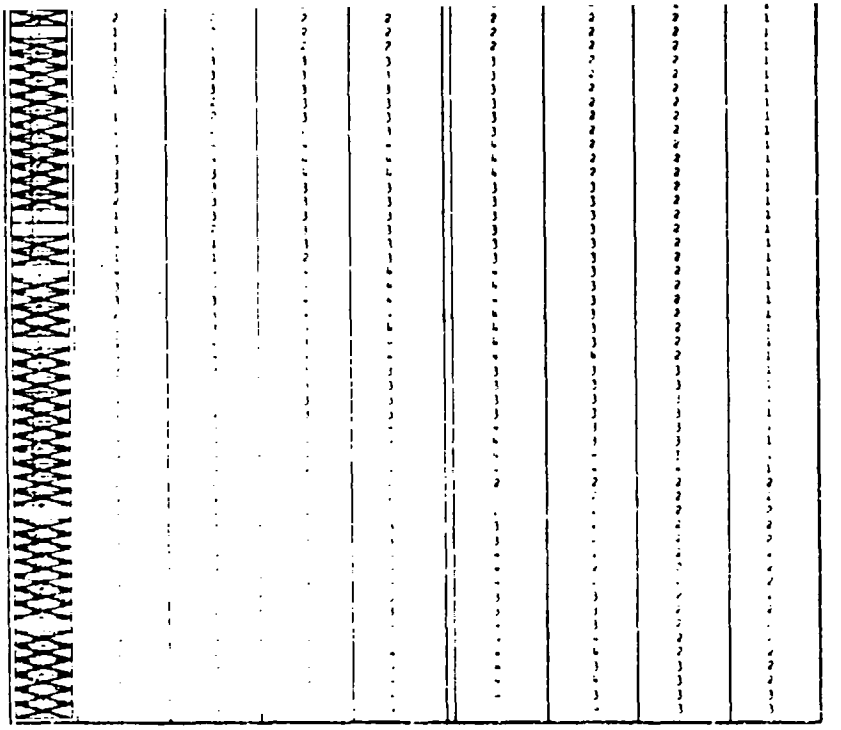
VEGETATION

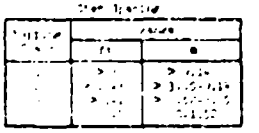
CHIANG MAI STUDY

SHEET CM III

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CM IV	CM III

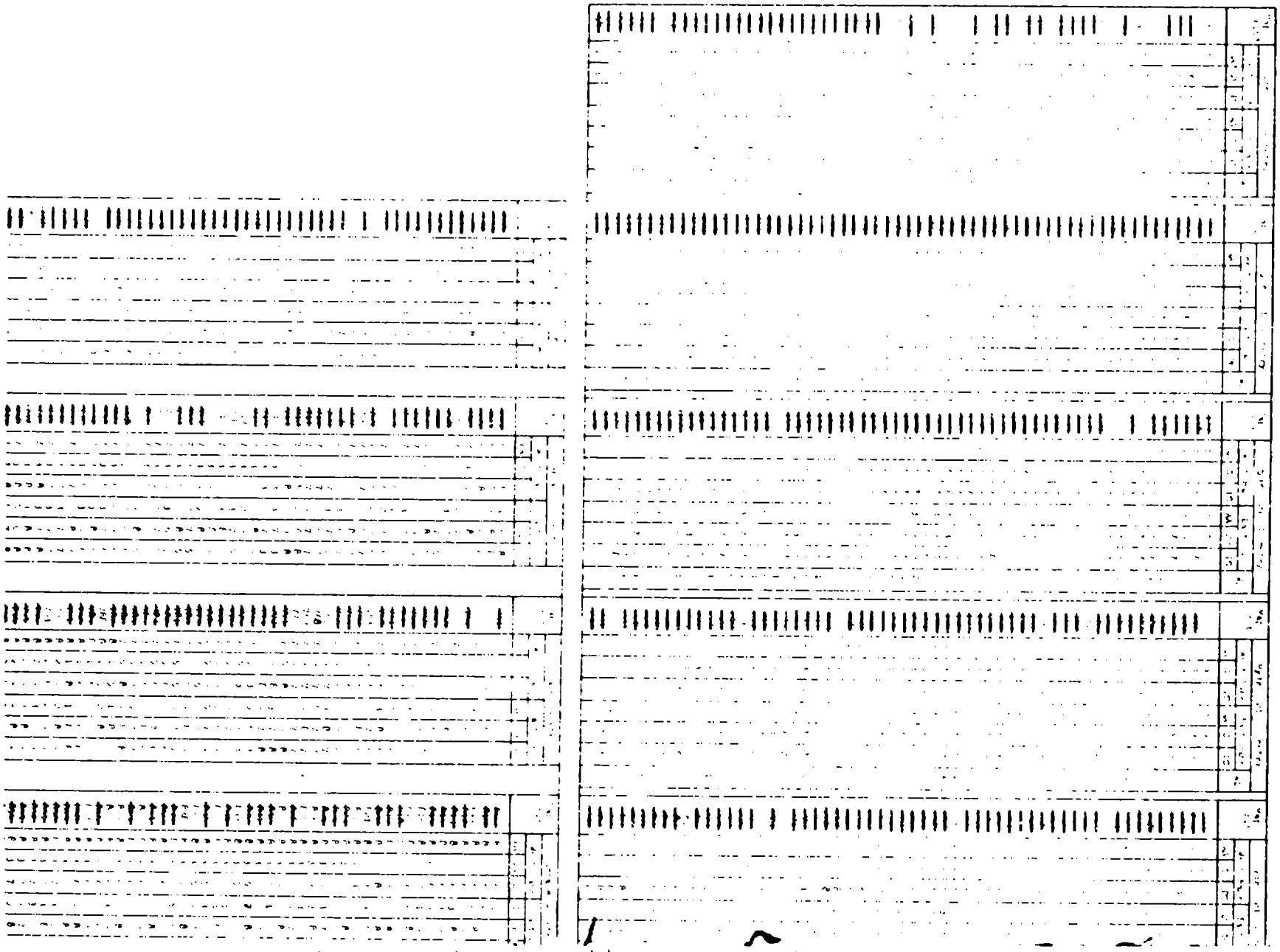
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

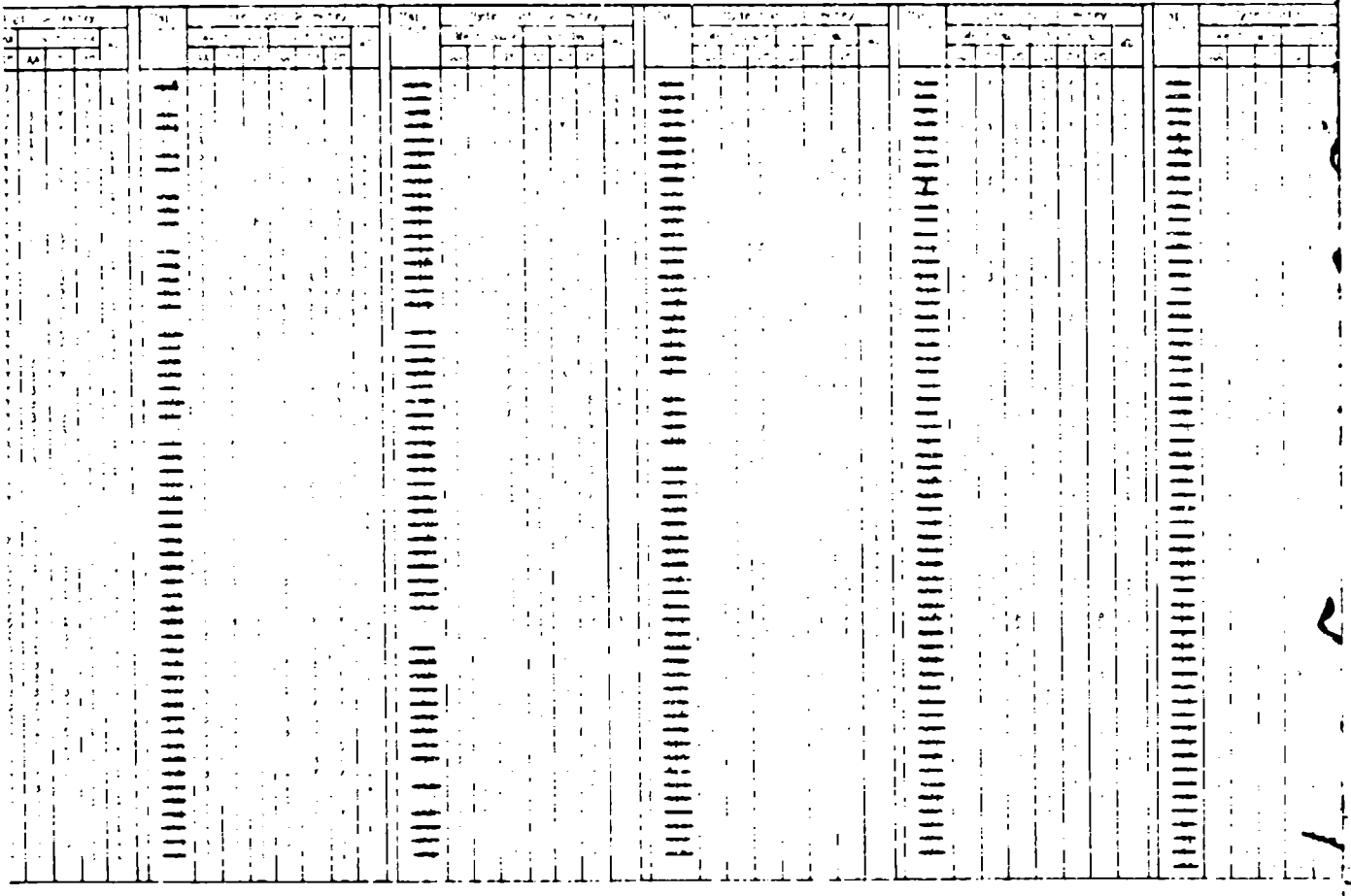
CHIANG MAI STUDY AREA

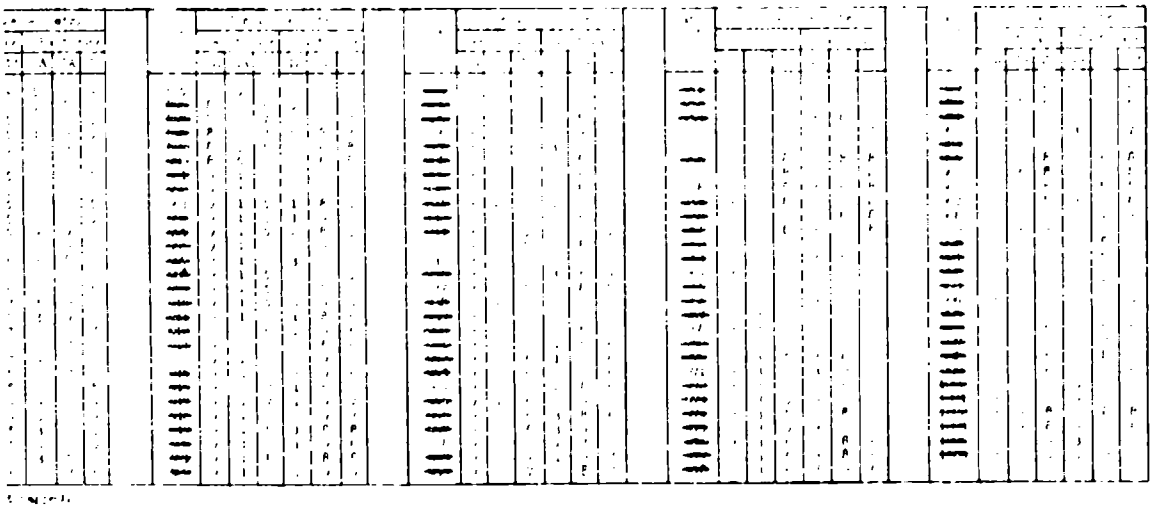
SHEET CM III

PLATE 3.3c

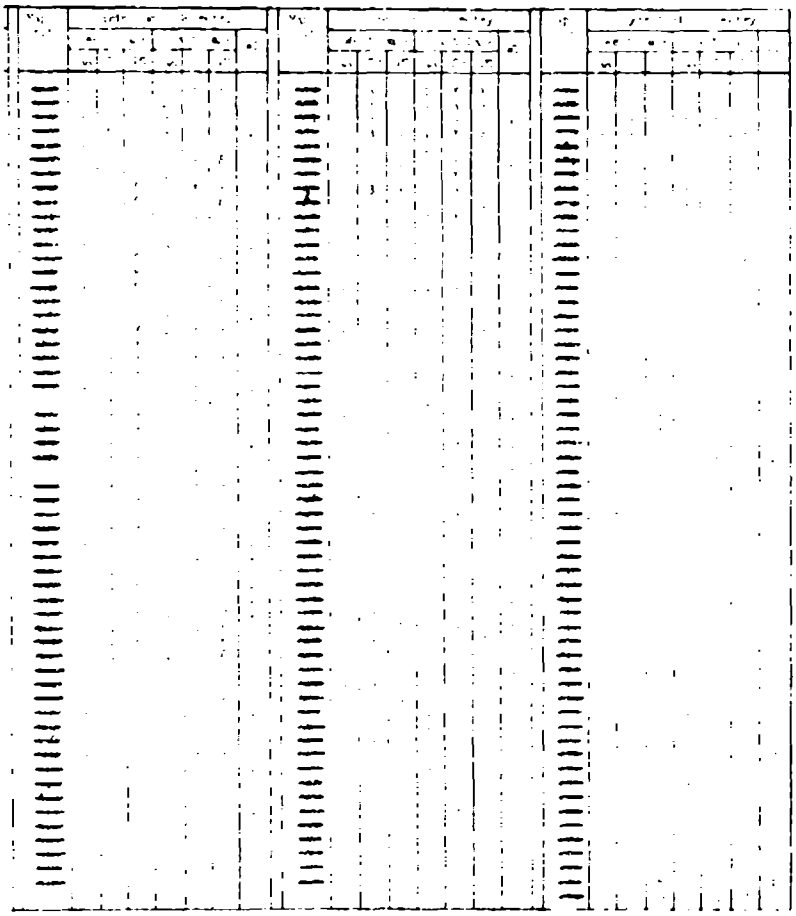


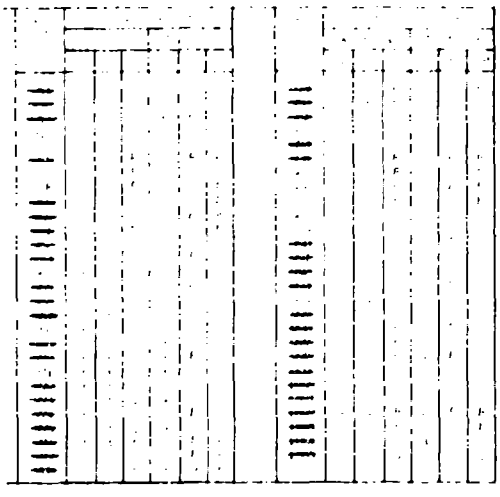
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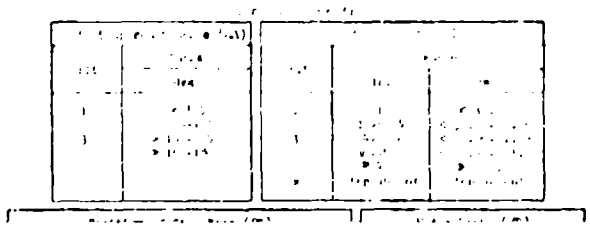




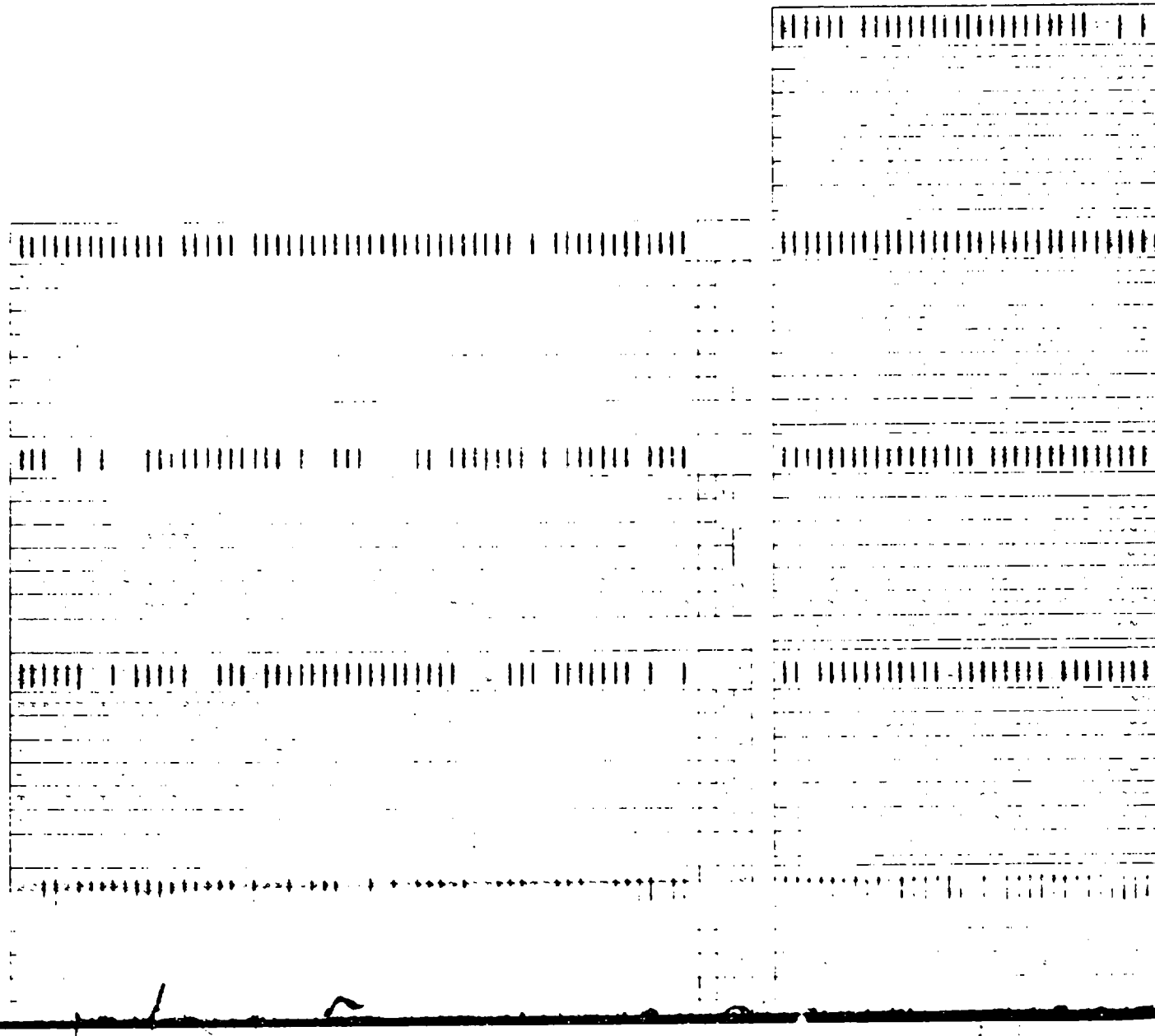
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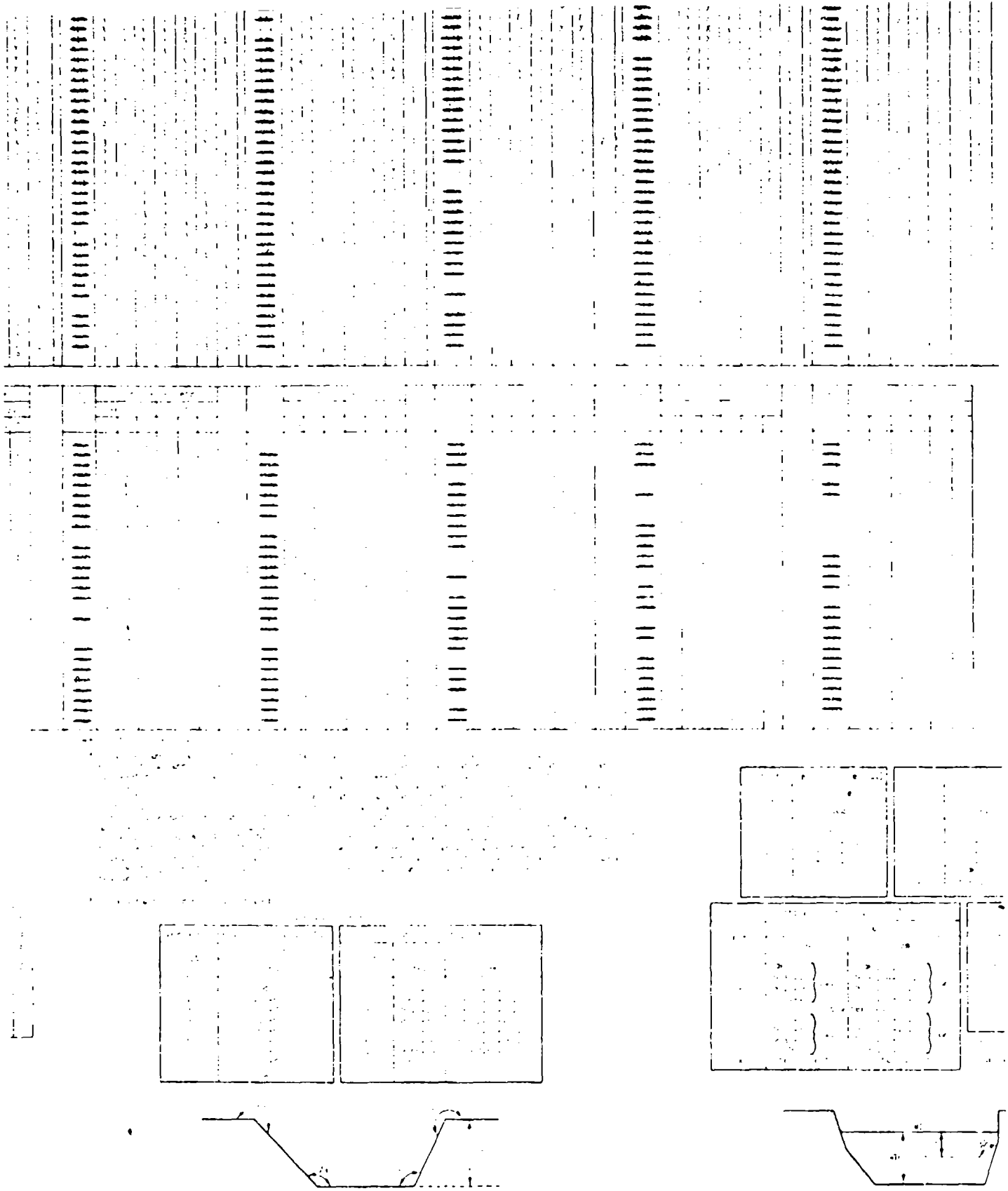


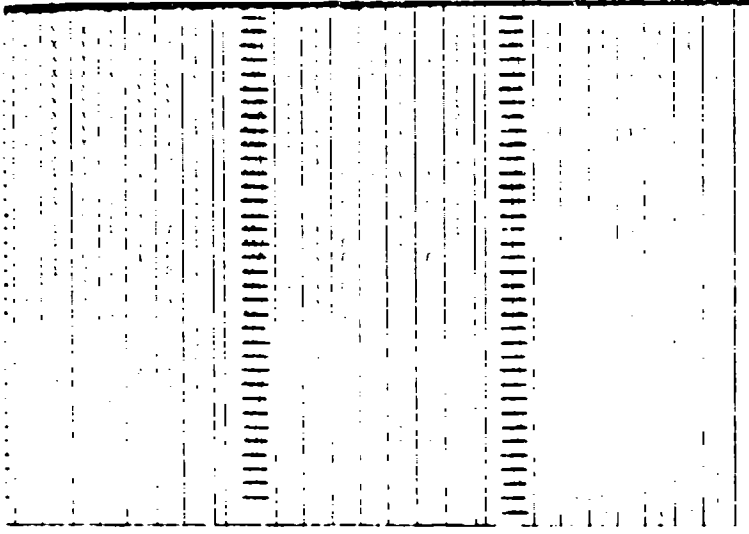


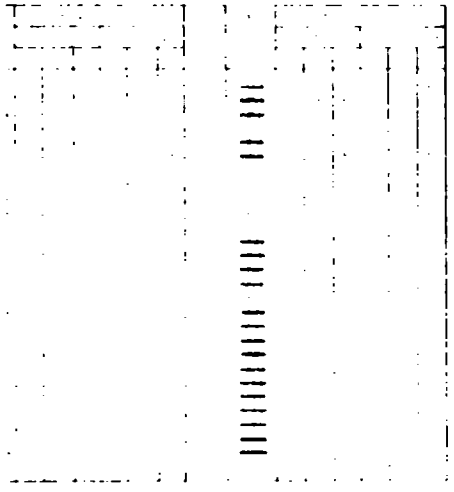


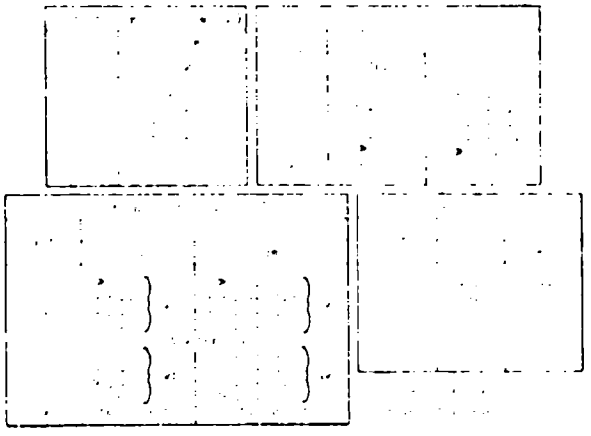
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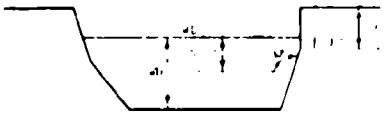




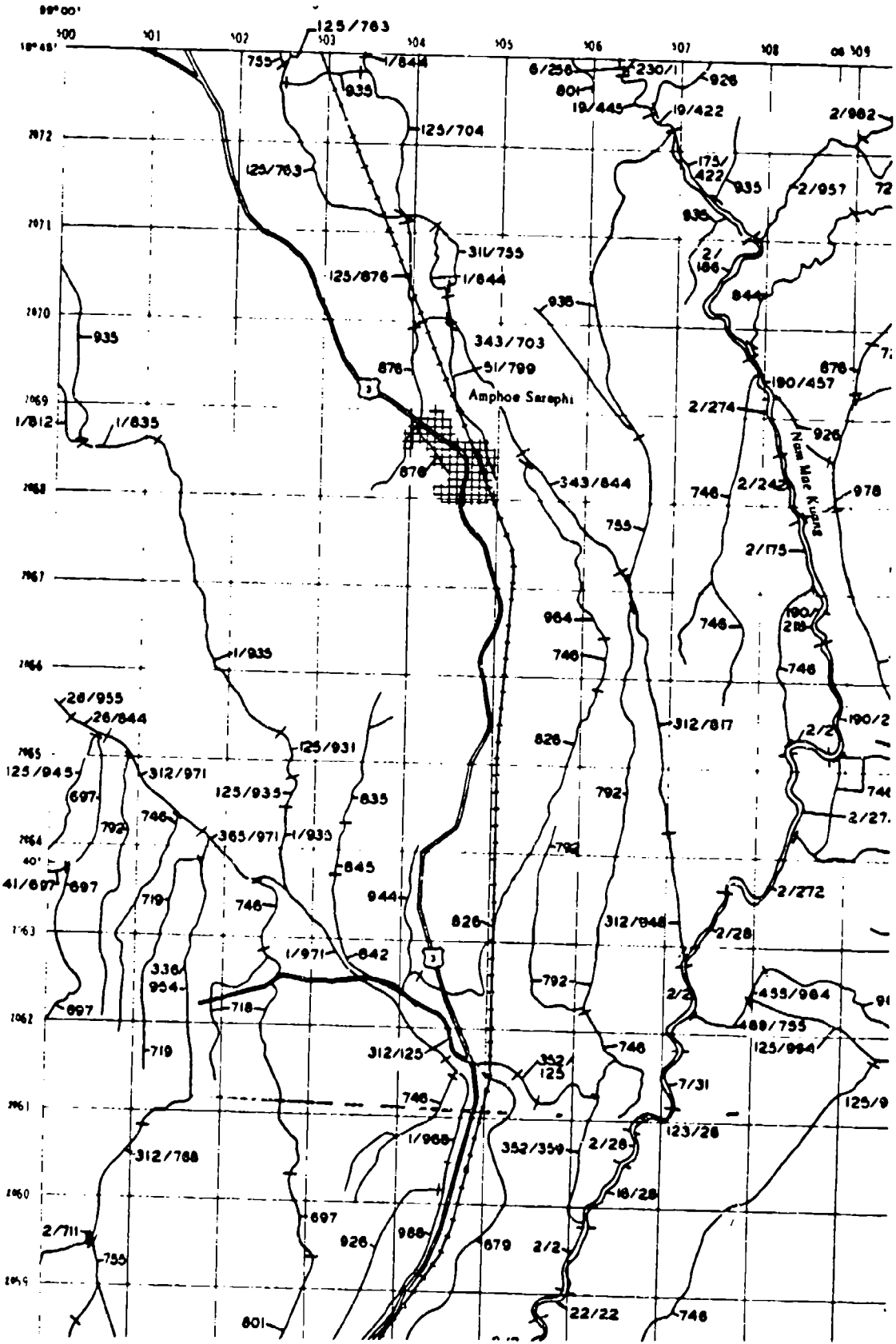






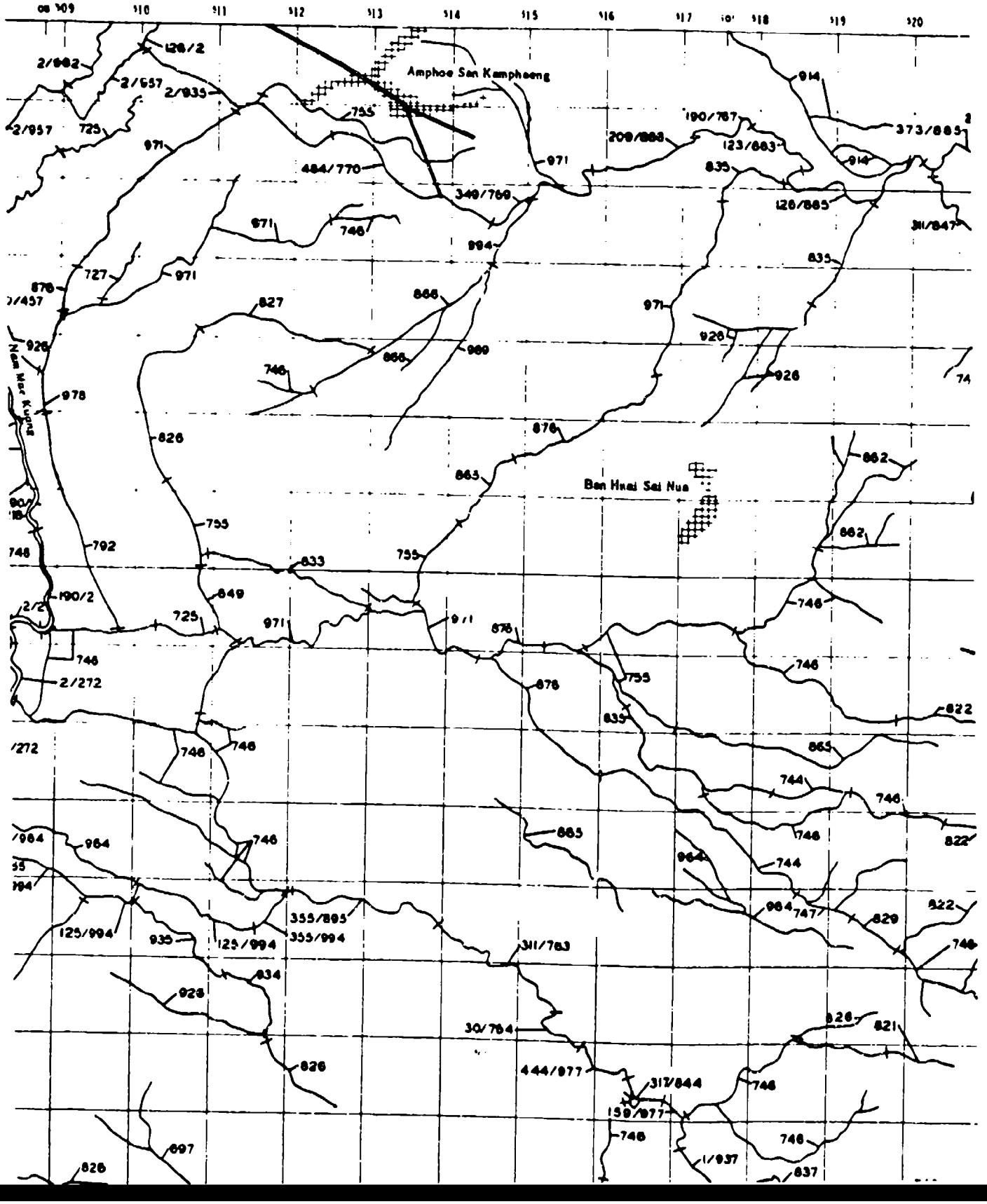


6


Amphoe Saraphi
Nam Mae Kuang

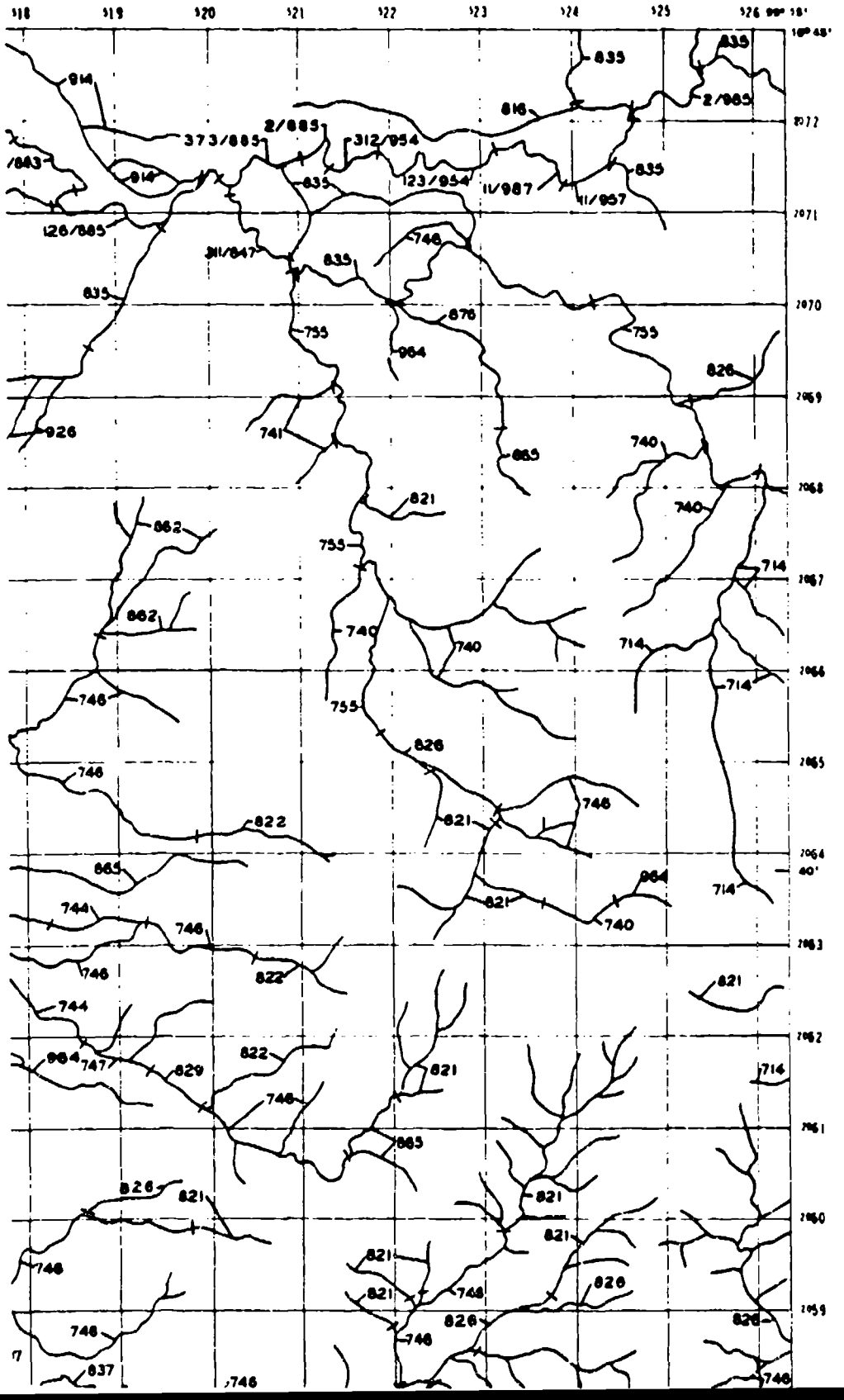
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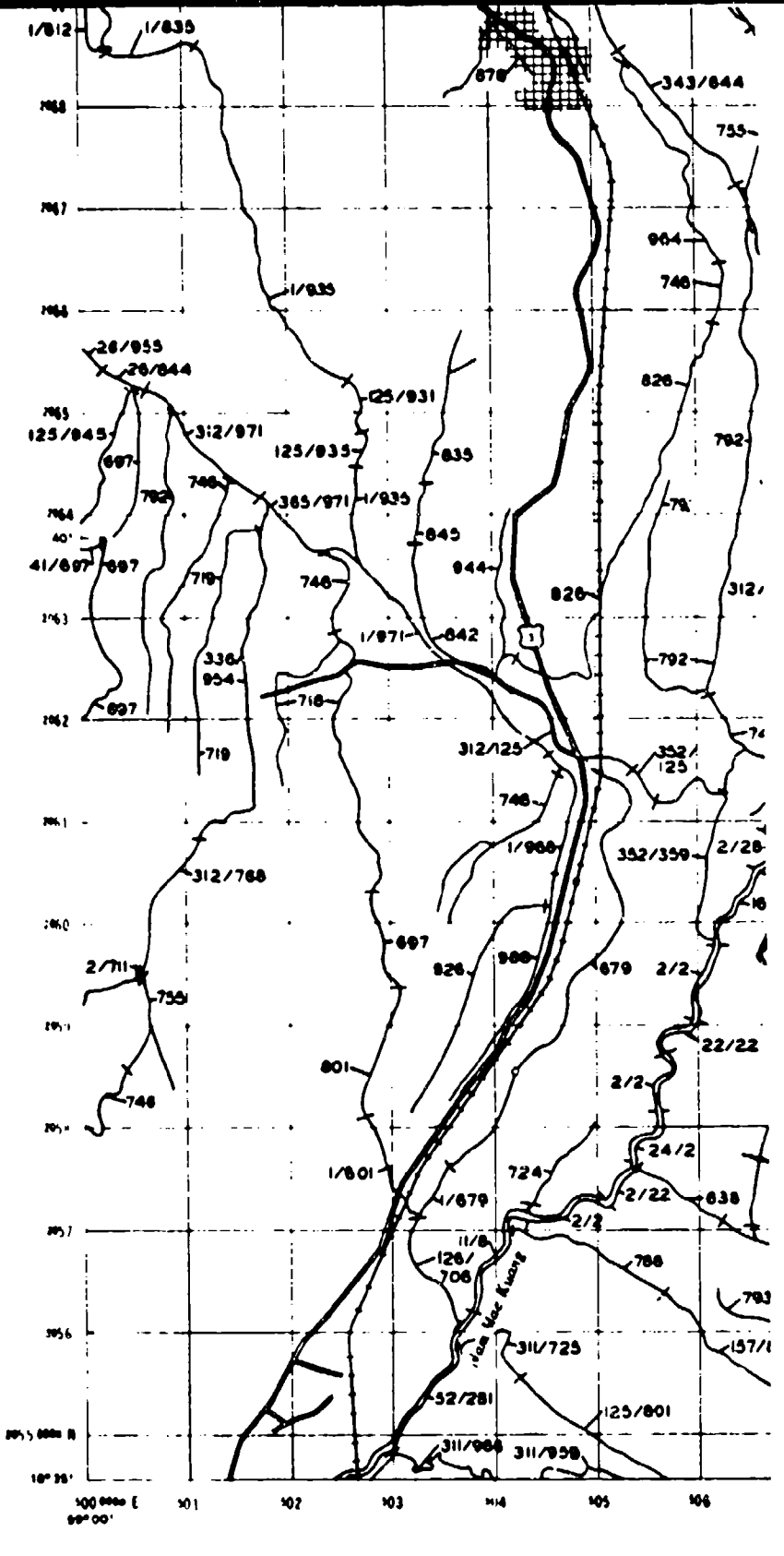
CHIANG MAI



13

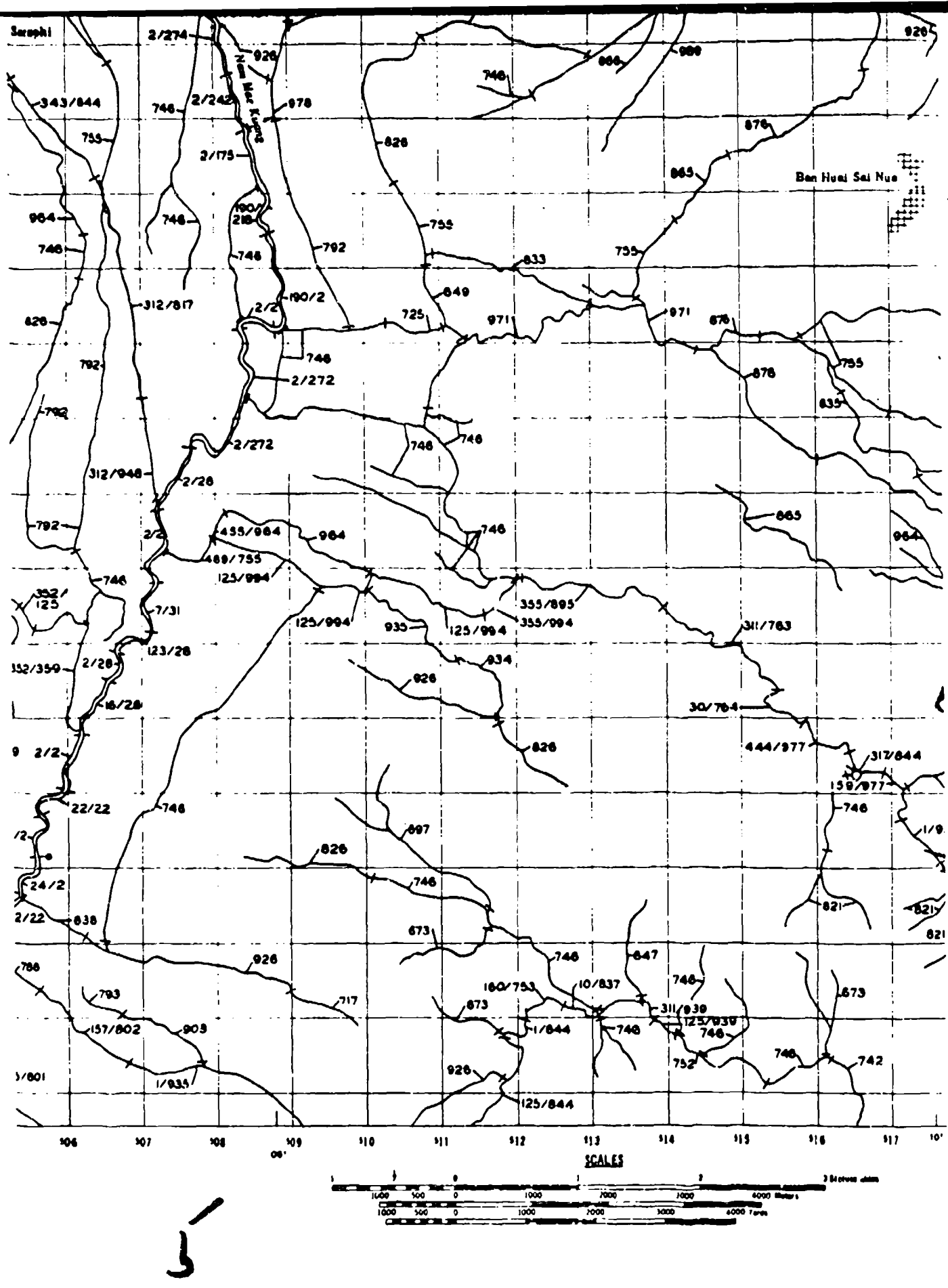
SHEET CM III

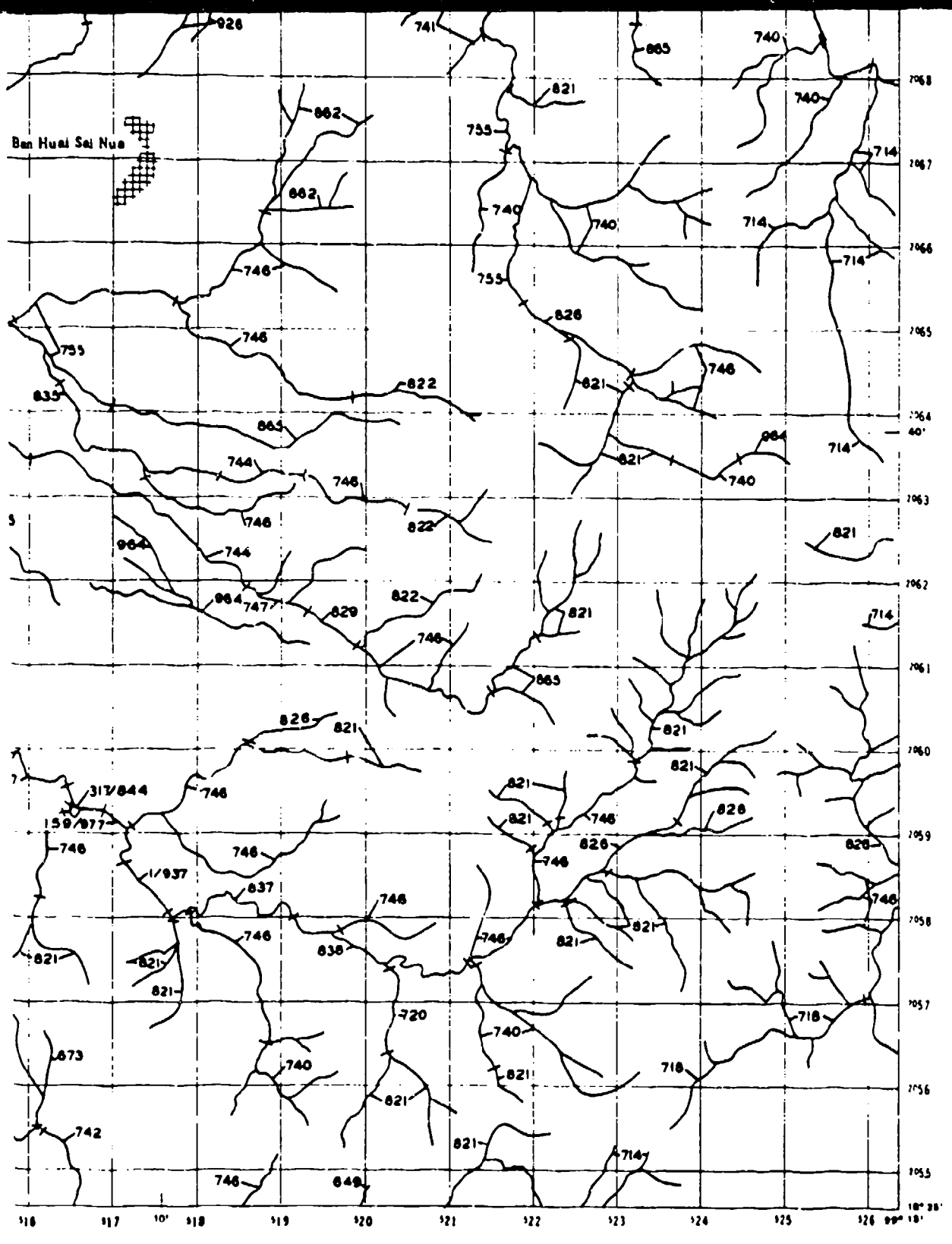




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

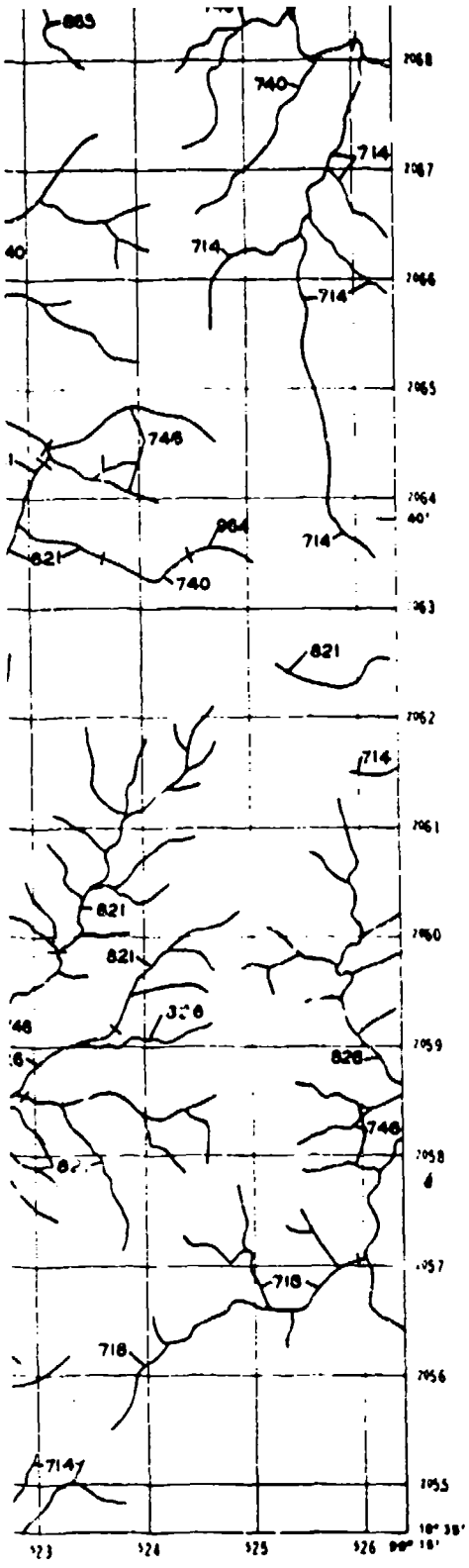
4


Sarophi
Ban Huai Sai Nua
106
107
108
109
110
111
112
113
114
115
116
117
SCALES


Ban Huai Sai Nua
926
741
865
740
821
862
755
740
714
746
740
714
755
826
746
822
835
865
744
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964
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637
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720
740
673
742
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526

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CM IV	CM III

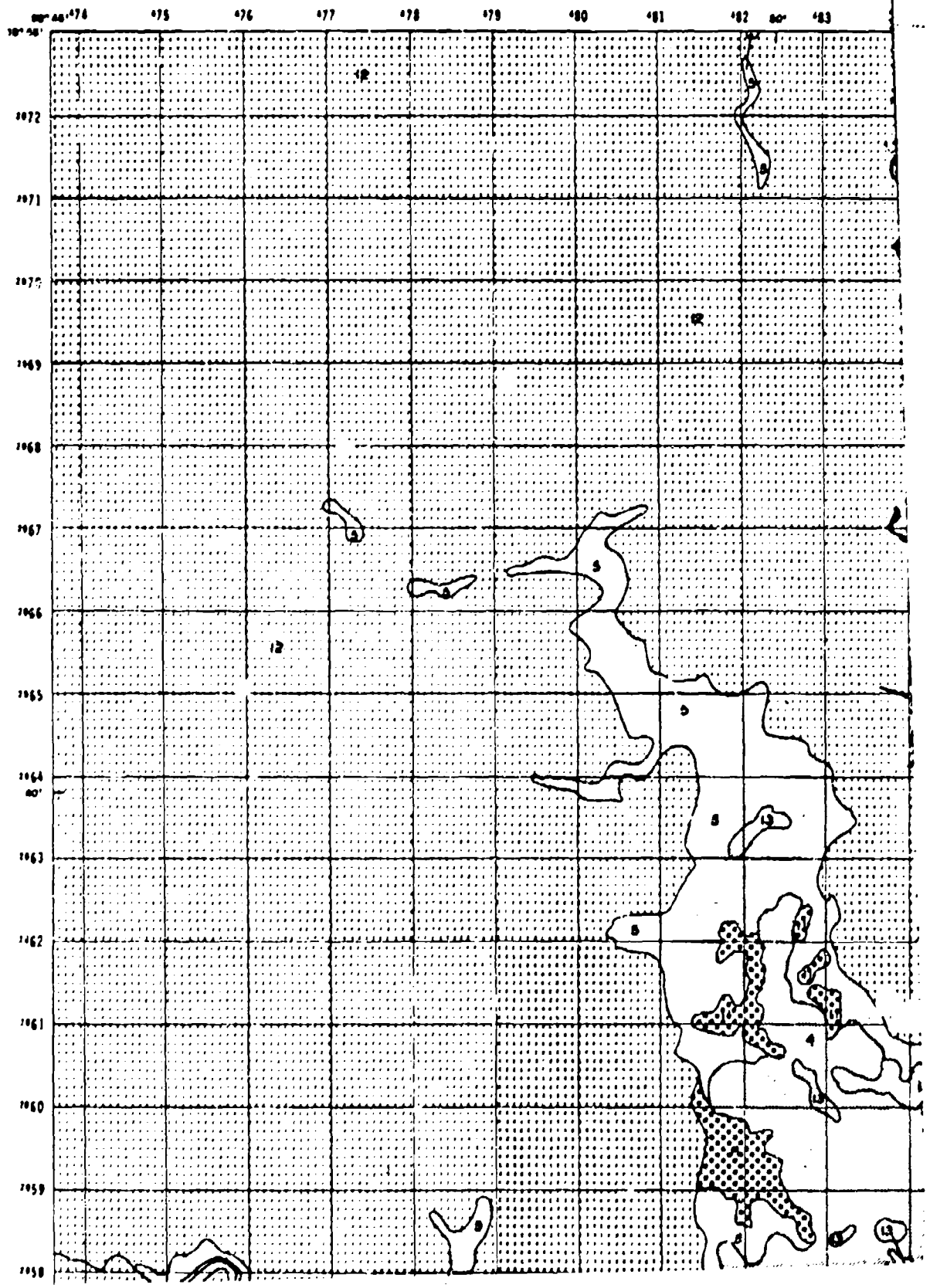
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

CHIANG MAI STUDY AREA

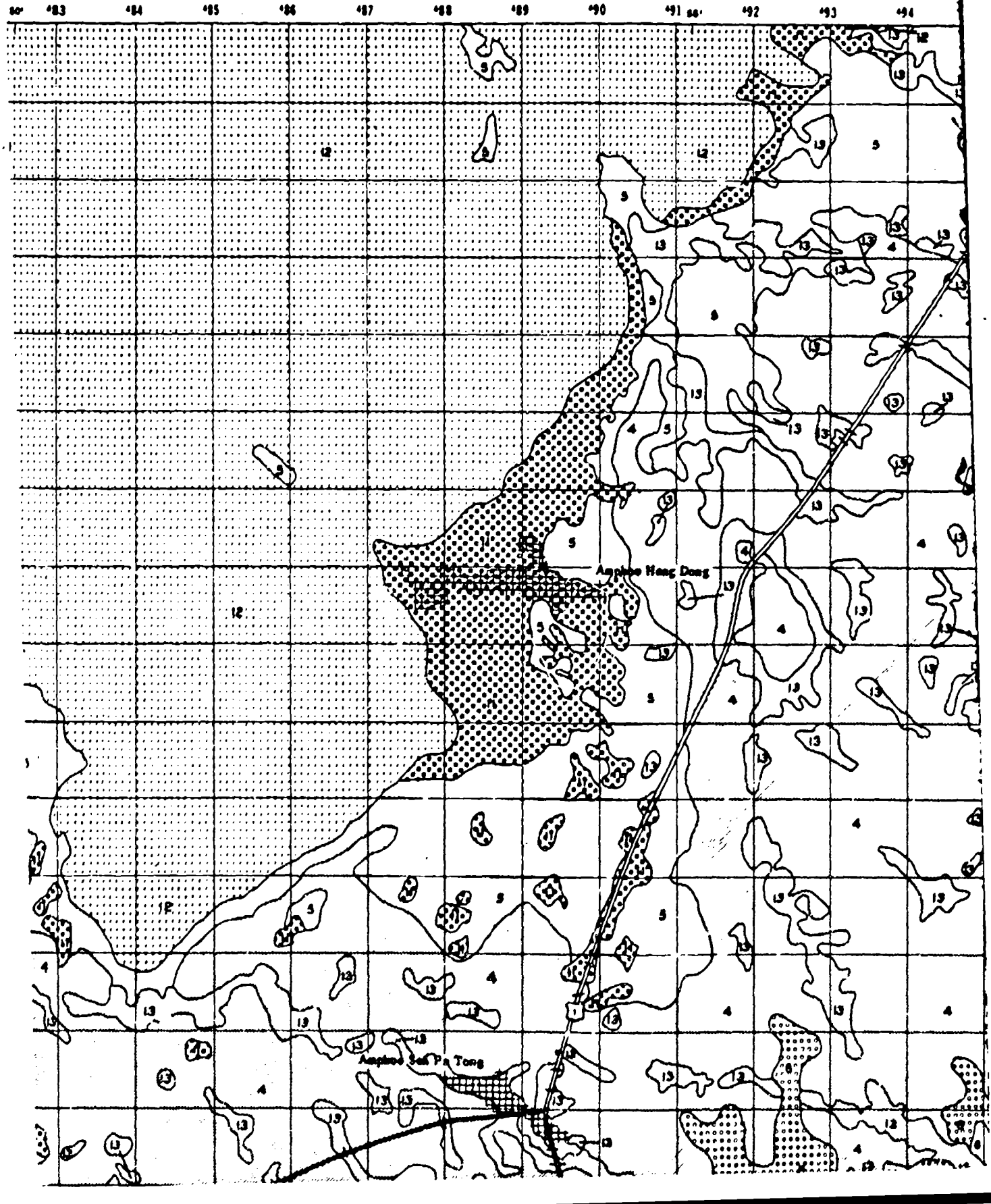
SHEET CM III

PLATE 3.3d


80° 46'
476
475
476
477
478
479
480
481
482
80°
483
30° 58'
3072
3071
3070
3069
3068
3067
3066
3065
3064
80°
3063
3062
3061
3060
3059
3058

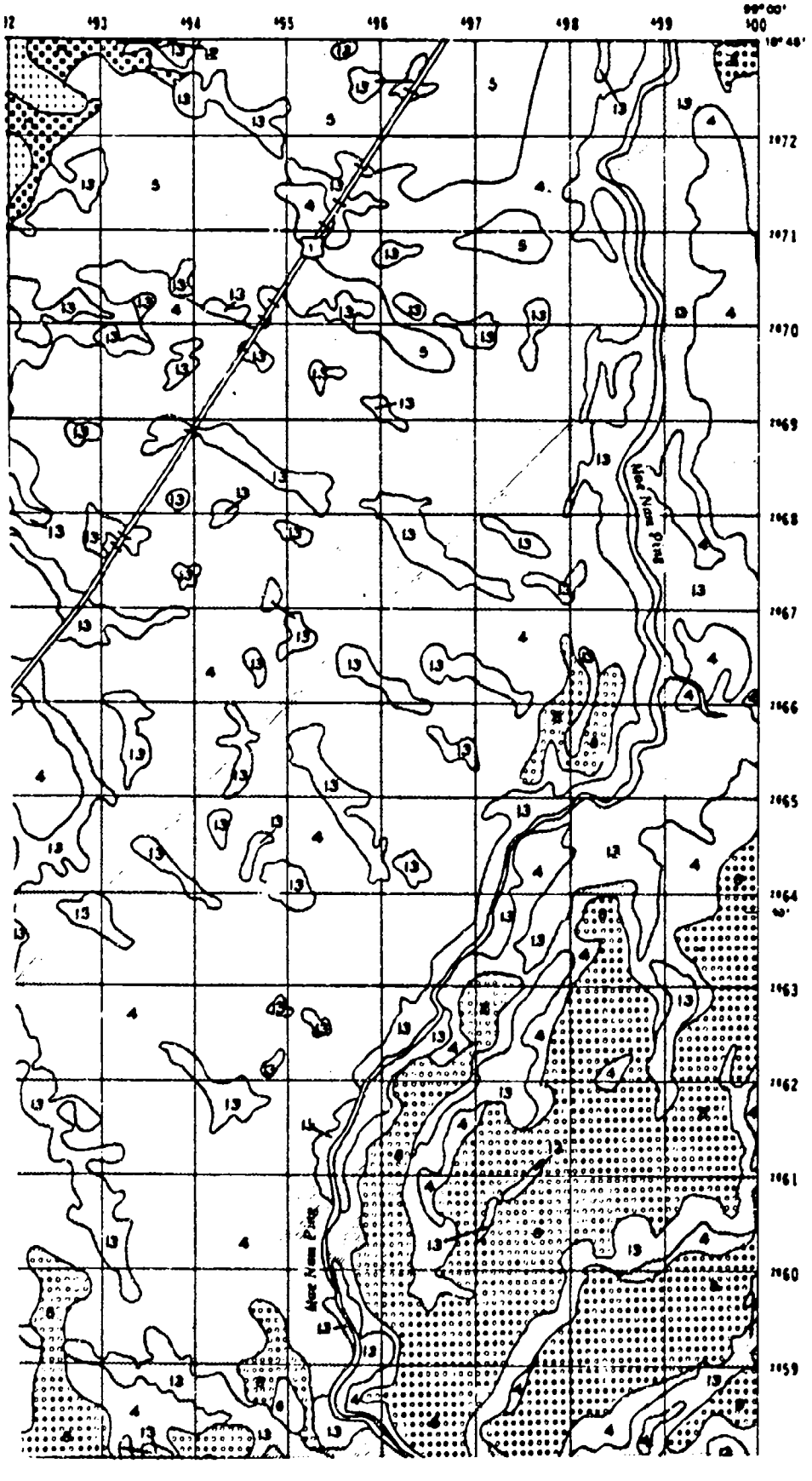
1 2

CHIANG MAI



1 3

SHEET CM IV



LEG

Unit	Soil Mass Strength: Maximum Moisture, RCI	Soil Mass Strength: Minimum Moisture, RCI	c_{up}, psi	c_{up}, kg/cm²	ϕ_{up}, deg
	10-25	25-60	0-1	0-0.07	0-1
2	25-60	60-100	0-1	0-0.07	0-1
	25-60*	60-100	0-1	0-0.07	10-
5	25-60	>100	0-1	0-0.07	0-10
6	25-60*	>100	0-1	0-0.07	10-20
	60-100	60-100	0-1	0-0.07	0-10
	60-100	60-100	0-1	0-0.07	10-20
9	60-100	>100	0-1	0-0.07	0-10
	60-100	>100	0-1	0-0.07	0-10
	AC-100	>100	0-1	0-0.07	10-20
	60-100*	>100	0-1	0-0.07	1
	>100	>100	0-1	0-0.07	0-10
15	>100	>100	0-1	0-0.07	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20

Note: Blank areas are water bodies.

c_{up} Shear strength at zero normal [illegible].

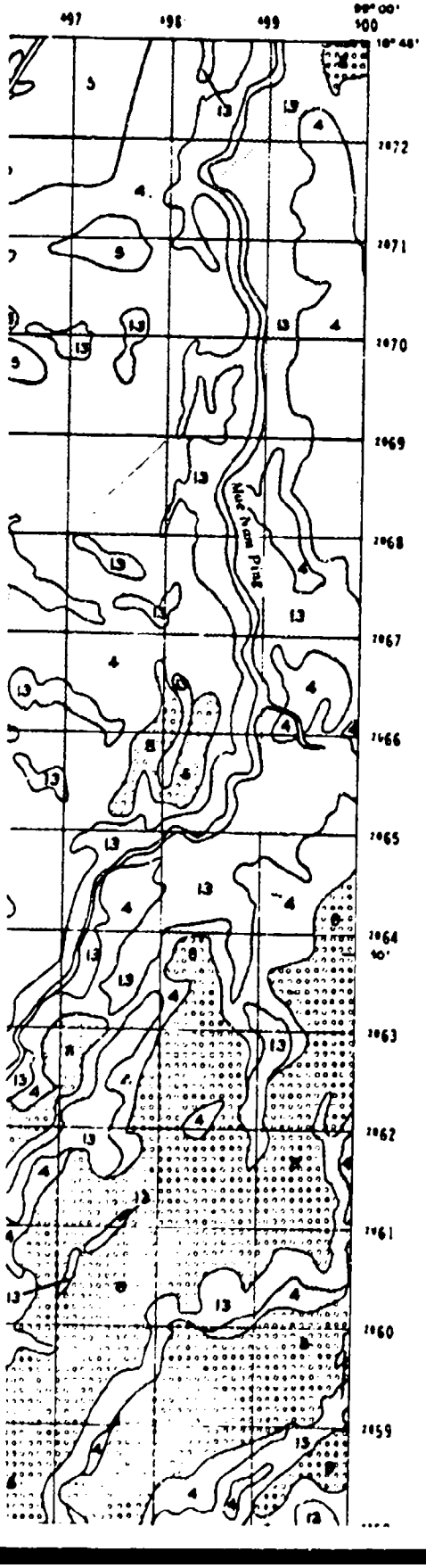
ϕ_{up} Angle of internal friction.

* Maximum moisture has less than [illegible] percent probabi[illegible] strengths commonly observed on [illegible]-100 for Units [illegible]

Units do not occur on this ma[illegible]

1 4

SHEET CM IV



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{uf} psi	c_{uf} kg/cm²	ϕ_{uf} deg	Soil Surface Strength: Minimum Moisture c_{uf} psi	c_{uf} kg/cm²	ϕ_{uf} deg	Conditions where maximum c_{uf} occurs: c_{uf} psi	c_{uf} kg/cm²	ϕ_{uf} deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
10	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 6C-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

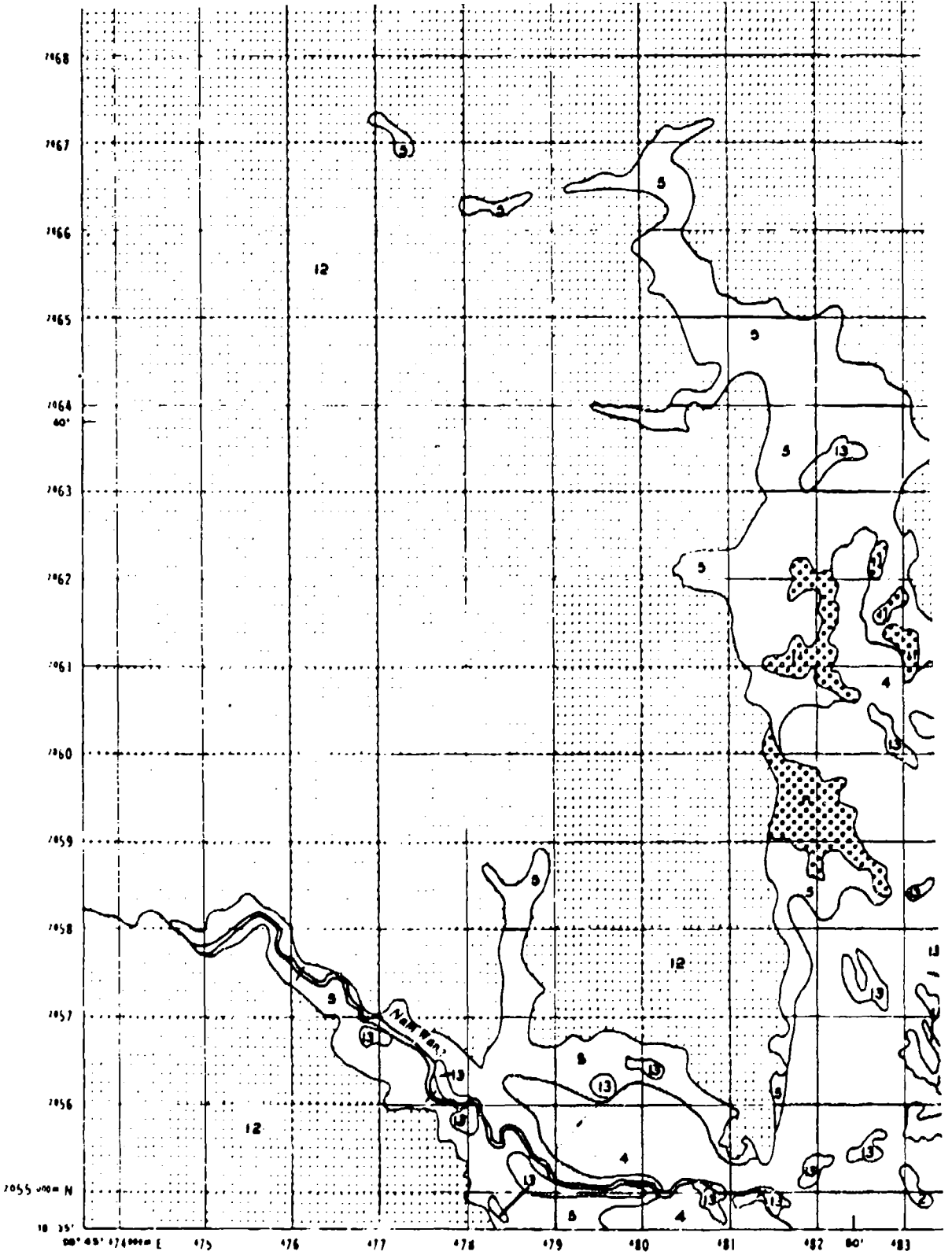
Note: Blank areas are water bodies.

c_{uf} Shear strength at zero normal load.

ϕ_{uf} Angle of internal friction.

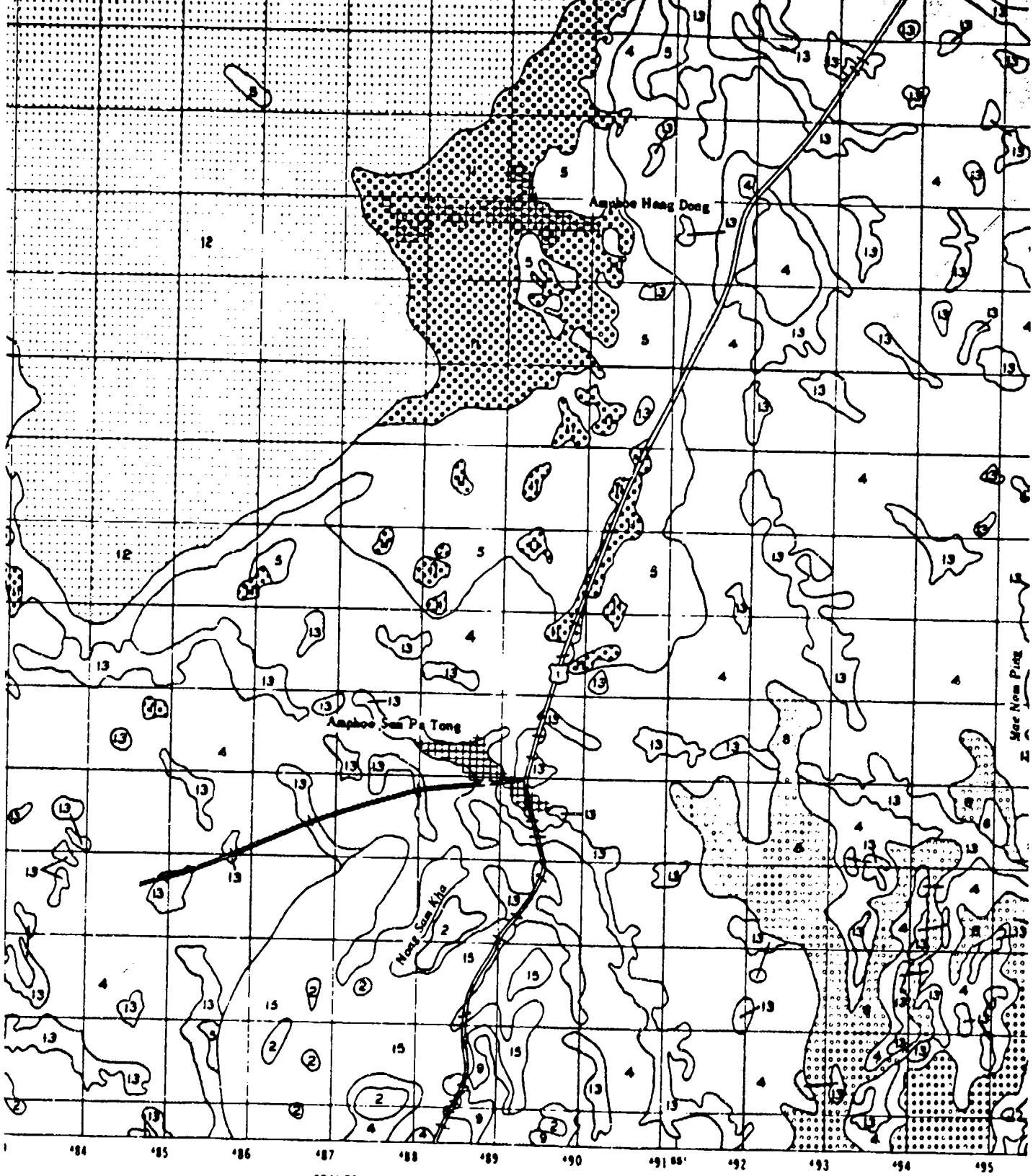
* Maximum moisture has less than 30 percent probability of occurrence during the wet seasons. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

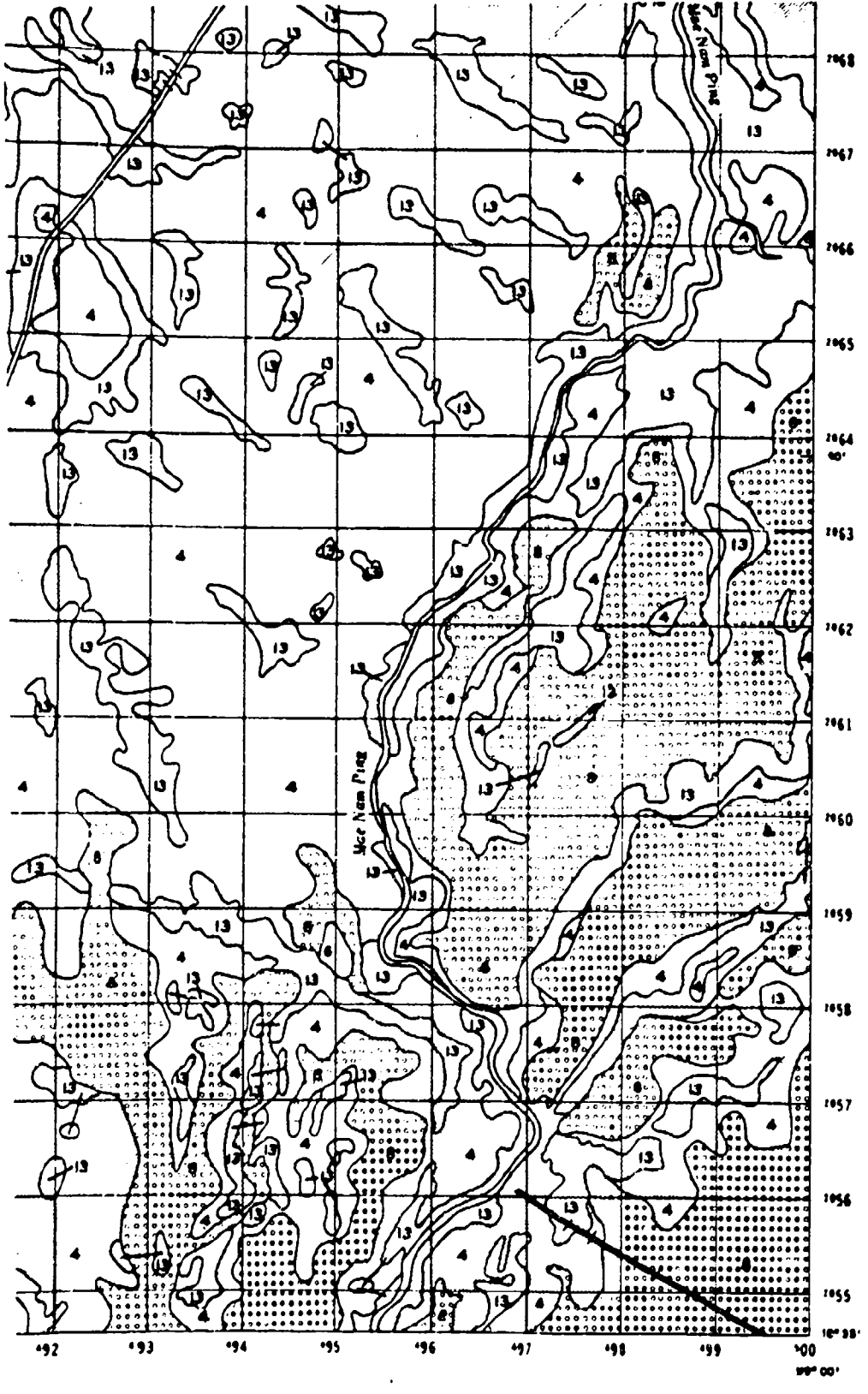


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 Q

5


Amphoe Hang Dong
Amphoe San Pa Tong
Nong San Khai
Mae Nam Ping
SCALES
1000 500 0 1000 2000 3000 4000 Meters
1000 500 0 1000 2000 3000 4000 Yards

6



Unit	Maximum Thickness	Minimum Thickness	Maximum Relief	
	FEET	FEET	Inches	kg/cm^2
	10-25	25-60	0-1	0-0.07
2	25-60	60-100	0-1	0-0.07
	25-60*	60-100	0-1	0-0.07
	25-60	>100	0-1	0-0.07
	25-60*	>100	0-1	0-0.07
6	60-100	60-100	0-1	0-0.07
	60-100	60-100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
9	60-100	>100	0-1	0-0.07
	60-100	>100	0-1	0-0.07
	60-100*	>100	0-1	0-0.07
	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07
15	Complex of 60-100 and >100	>100	0-1	0-0.07

Note: Blank areas are water bodies.

c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent [illegible] strengths commonly observed are 60-100 for [illegible]

Units do not occur on this map.

INDEX TO [illegible]

CM I

CM II

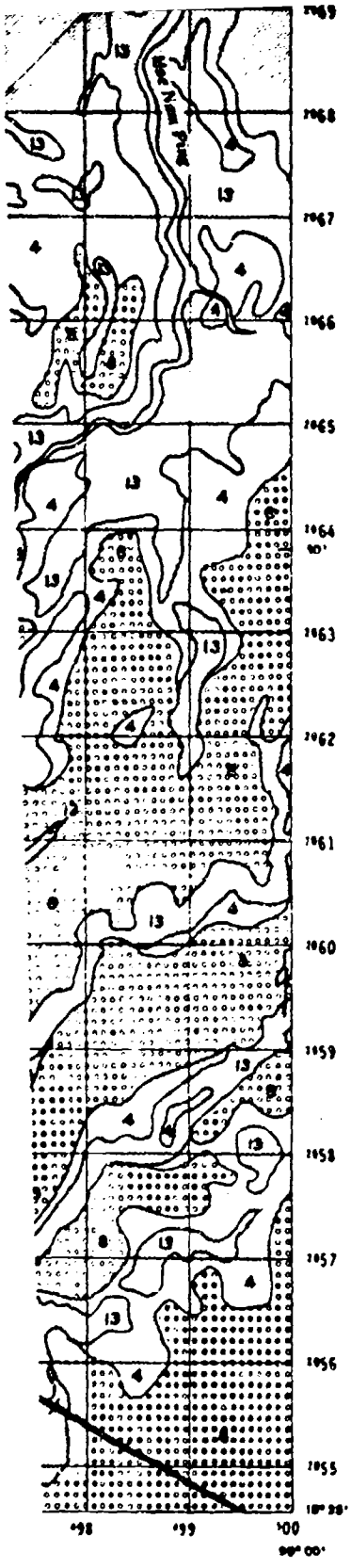
A QUANTITATIVE MI
TERRAIN FOR [illegible]

SURFACE [illegible]

CHIANG MA

SHEE

7



LEGEND

Unit	Soil Mass Strength: Minimum Moisture RMI	Soil Mass Strength: Maximum Moisture RMI	Soil Surface Strength: Maximum Moisture c_w psi	c_w kg/cm²	ϕ_w deg	Soil Surface Strength: Minimum Moisture c_w psi	c_w kg/cm²	ϕ_w deg	Conditions where maximum c_w occurs: c_w psi	c_w kg/cm²	ϕ_w deg
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
1	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
5 6	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
5	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
5 6	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

c_w Shear strength at zero normal load.

ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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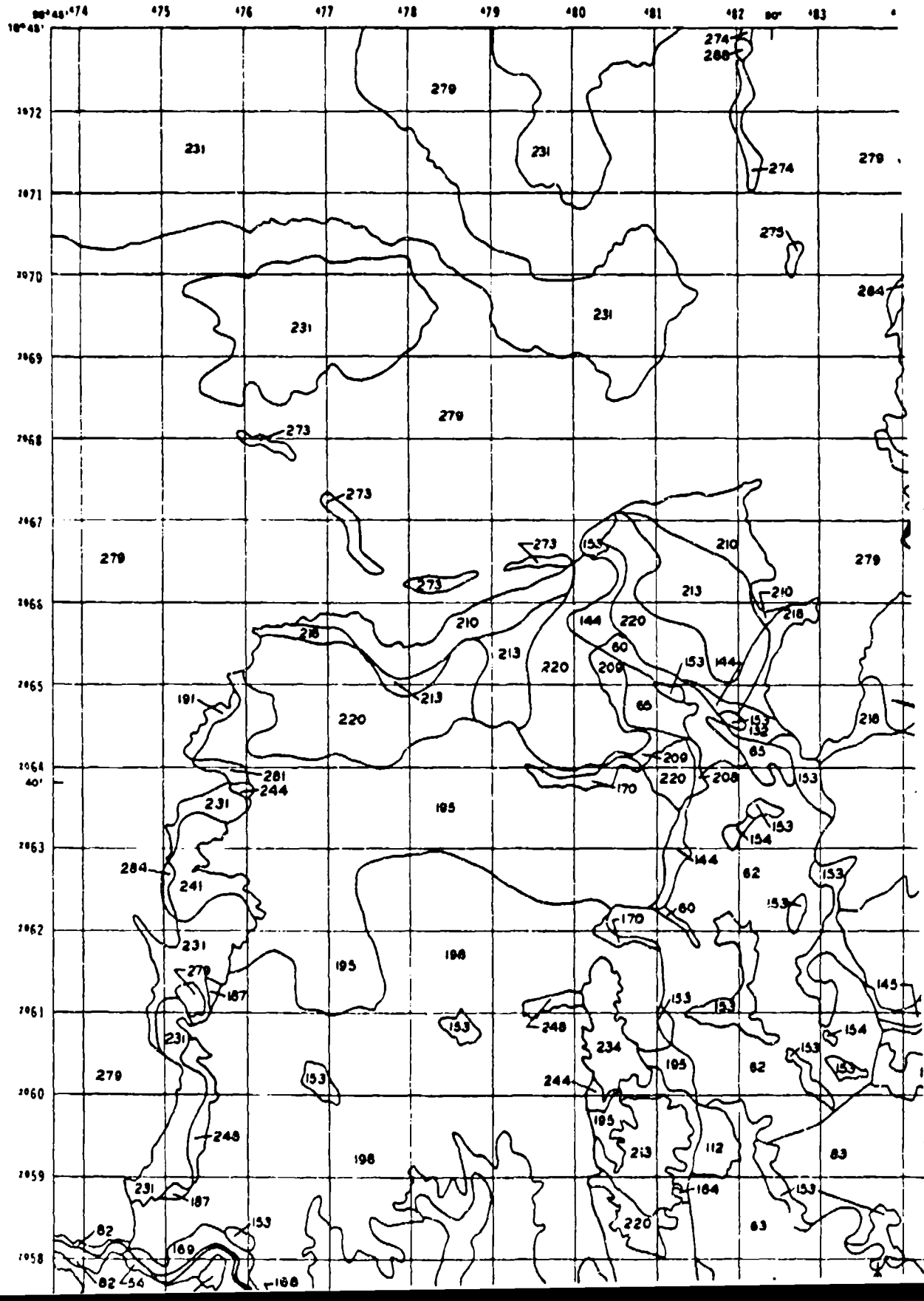
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

CHIANG MAI STUDY AREA

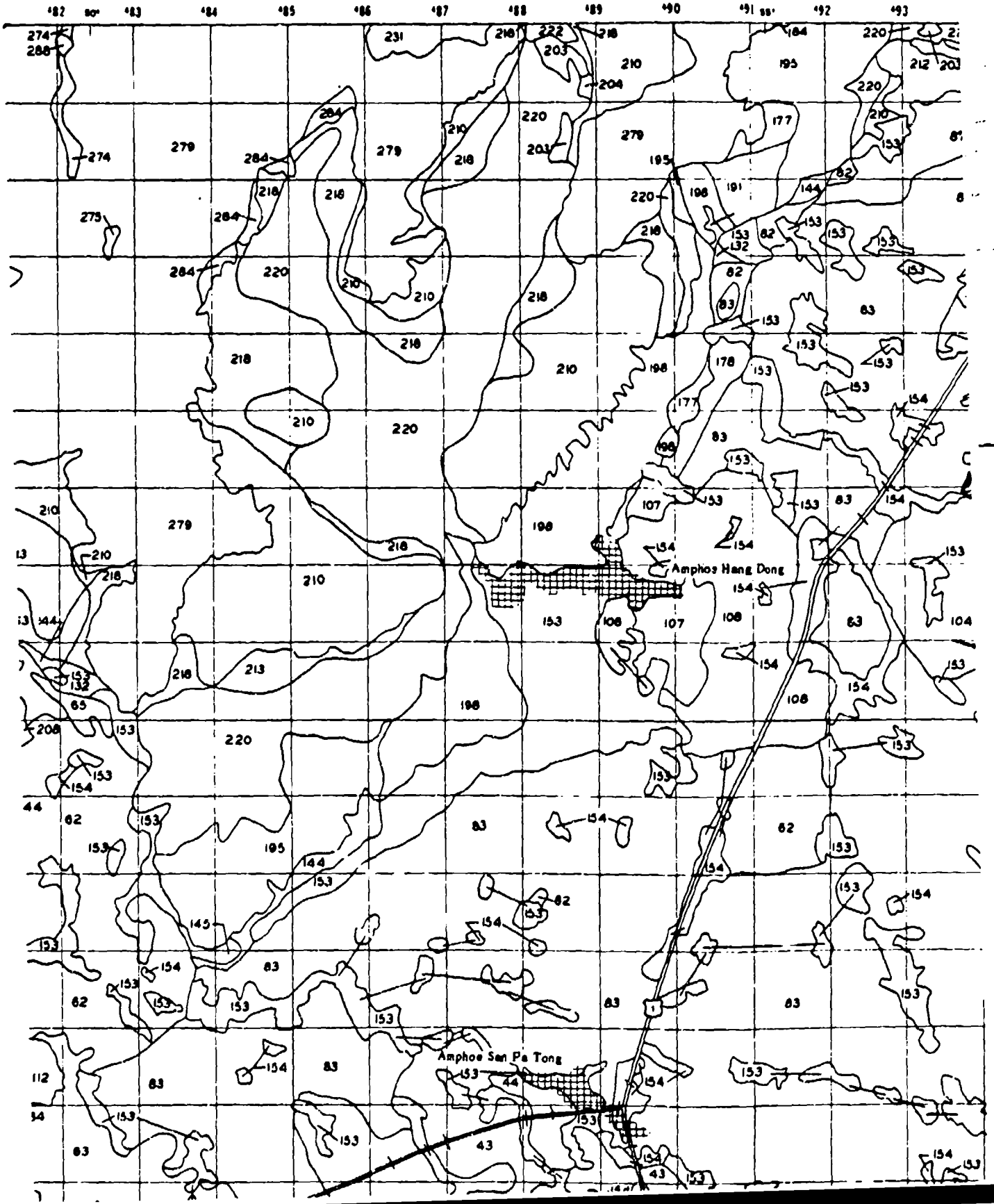
SHEET CM IV

PLATE 3.4a


474
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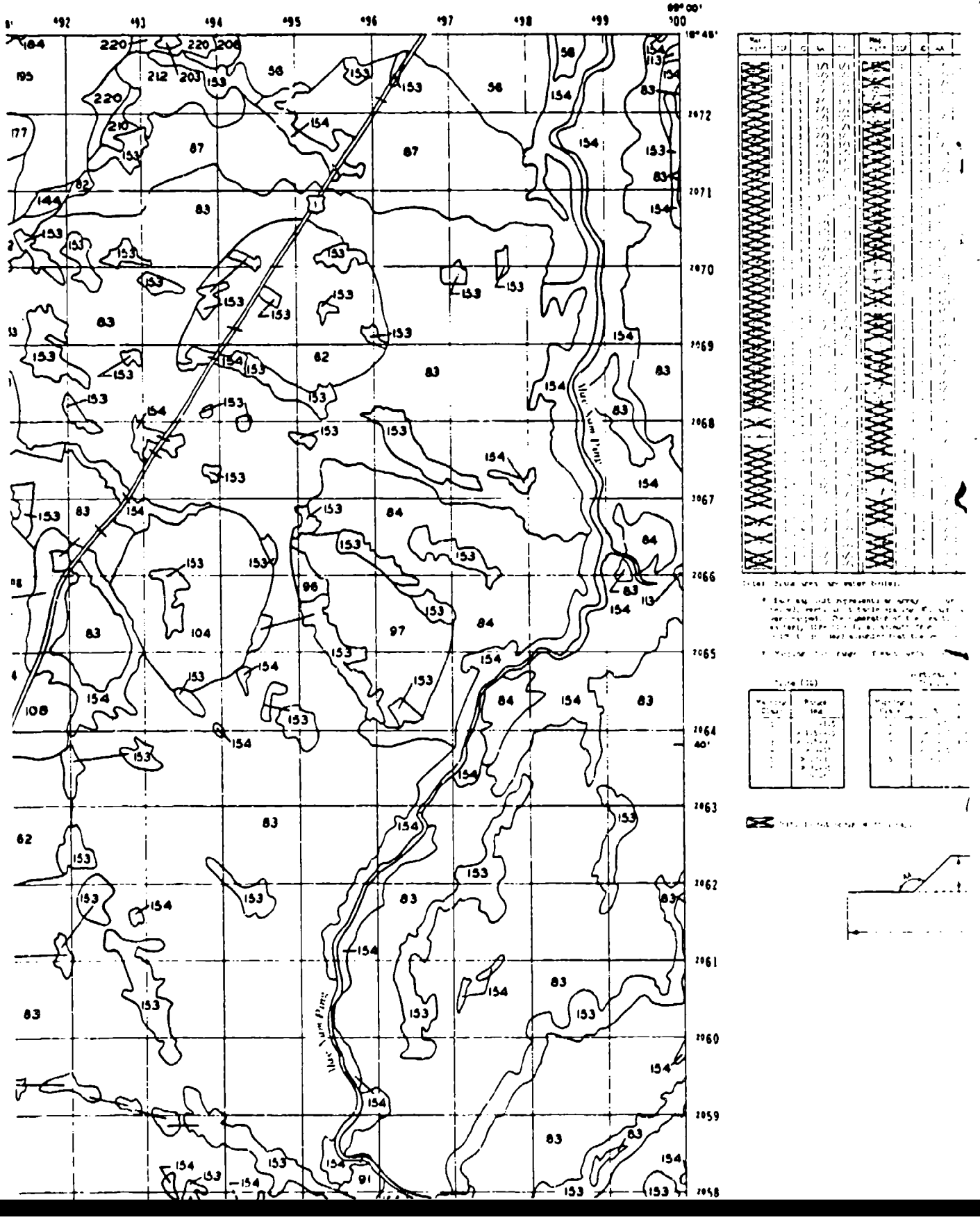
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CHIANG MAI



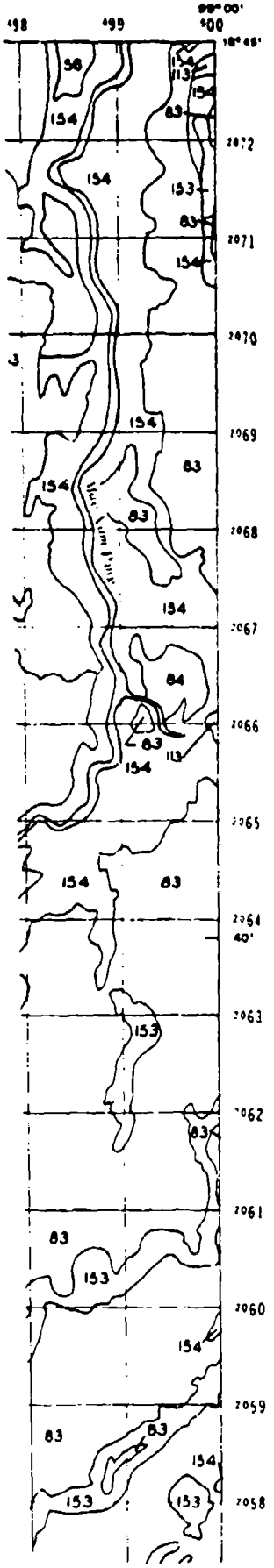
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SHEET CM IV

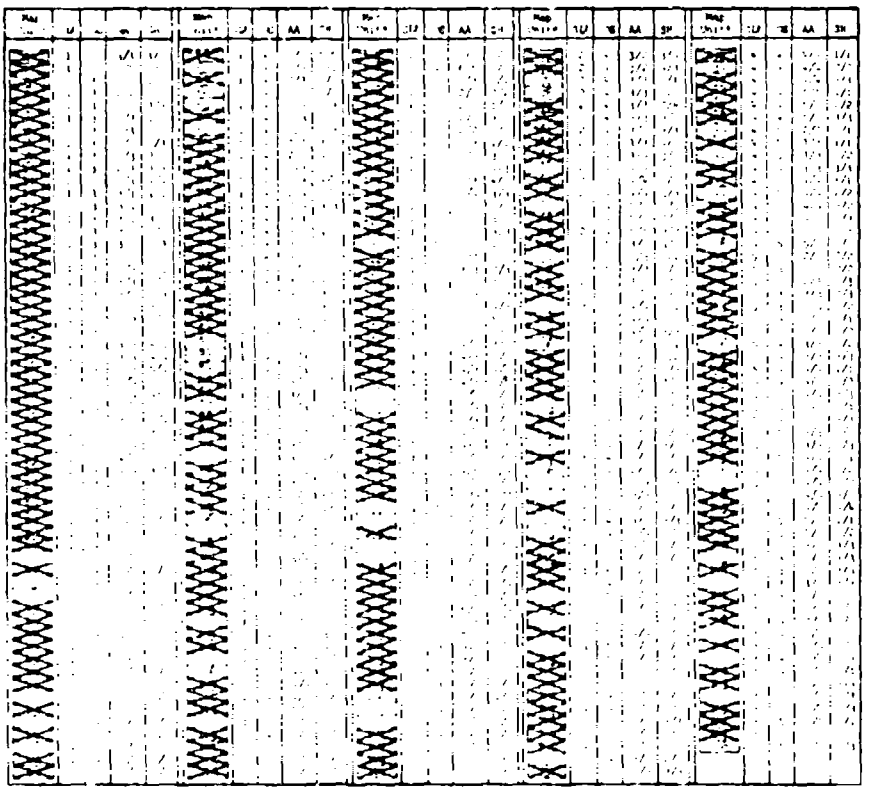


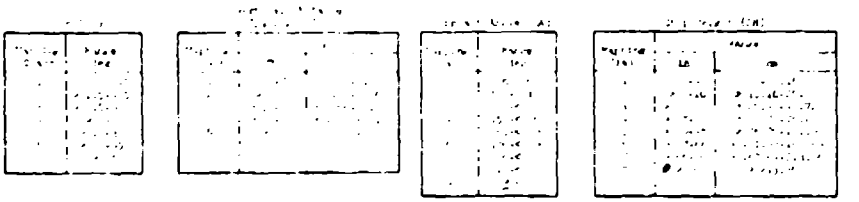
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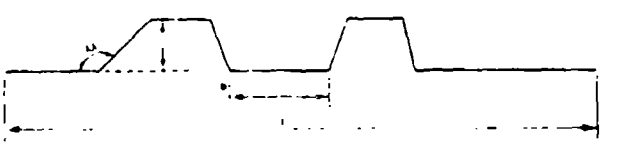
SHEET CM IV



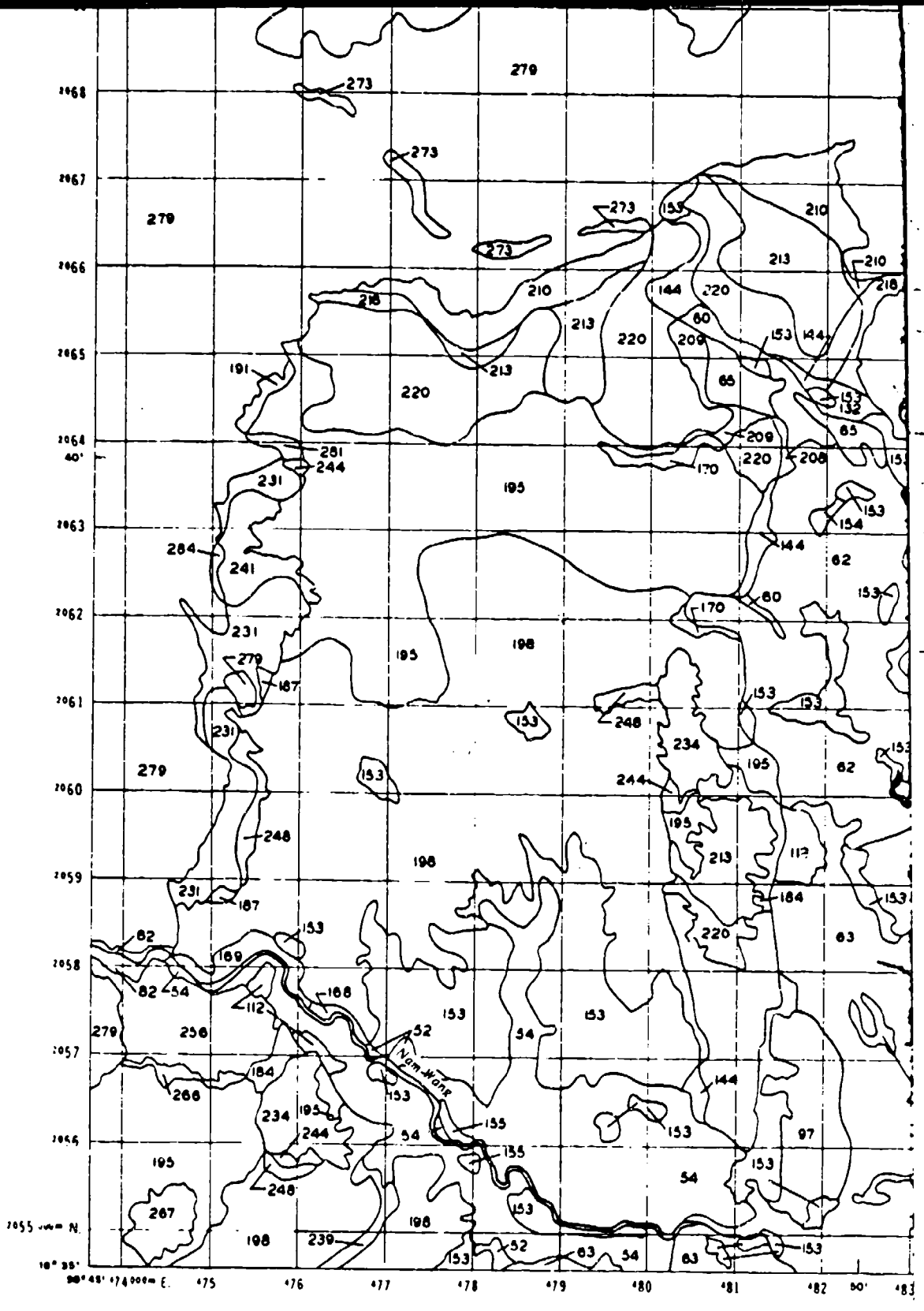
LEGEND





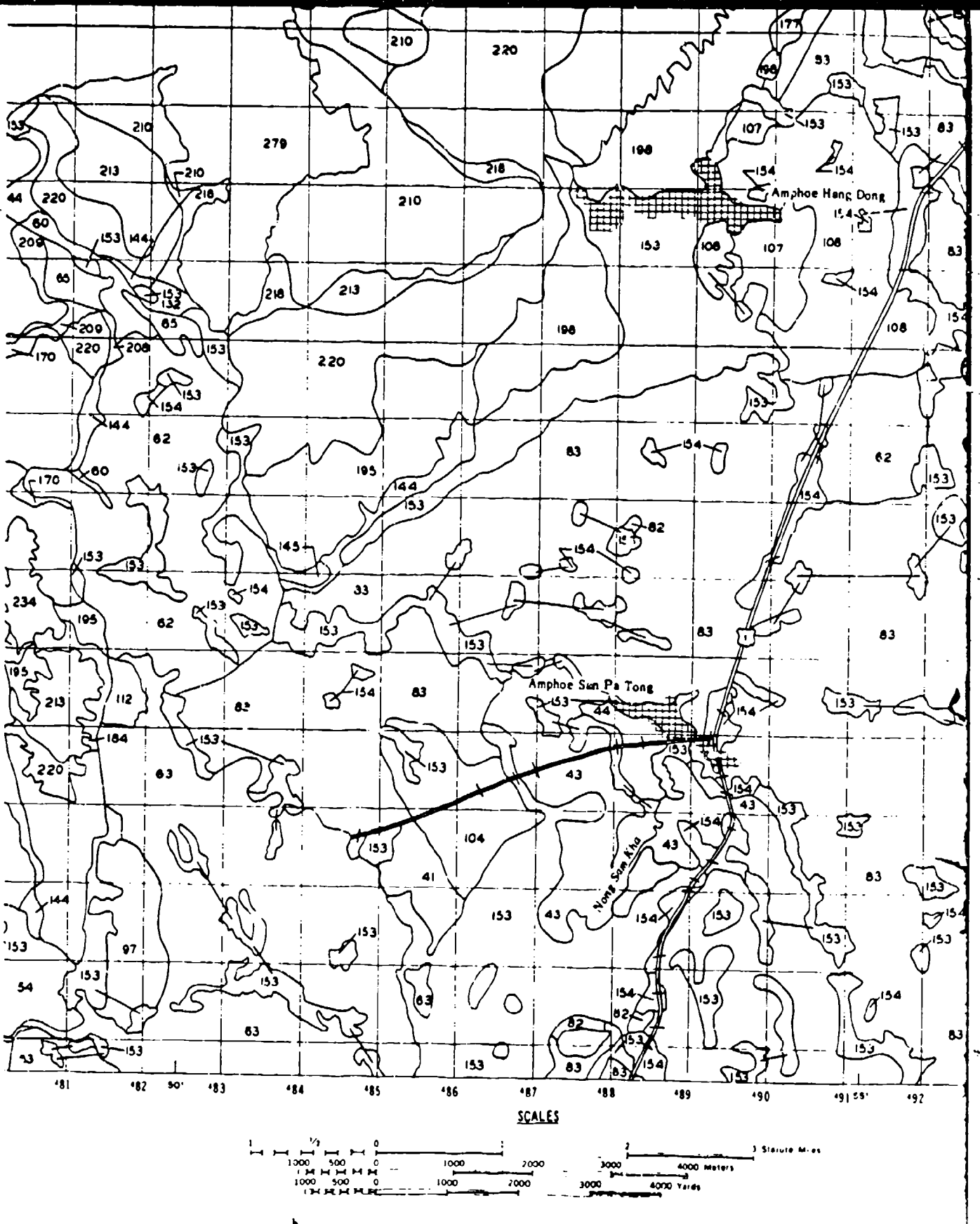


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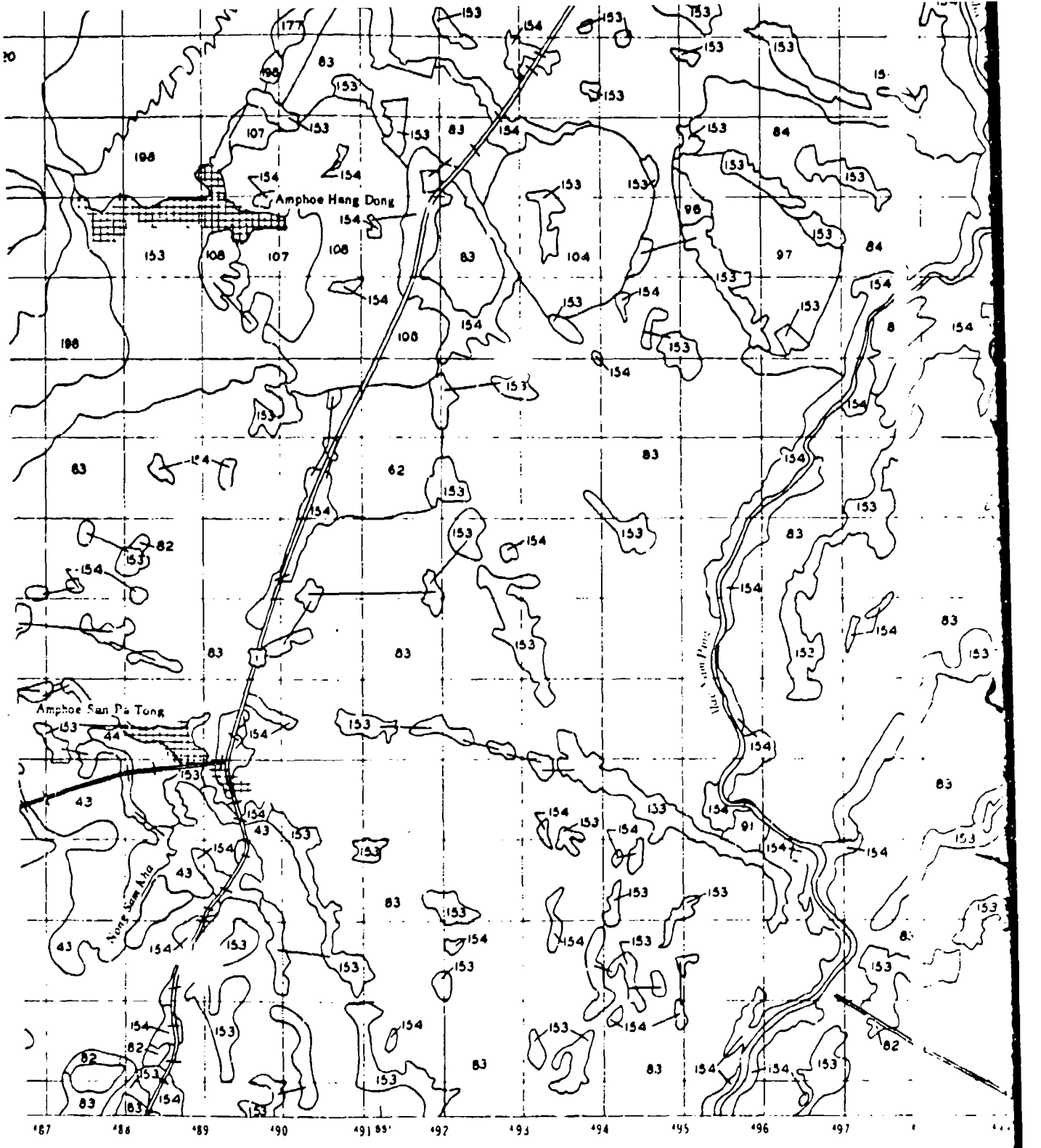


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION. 47 Q

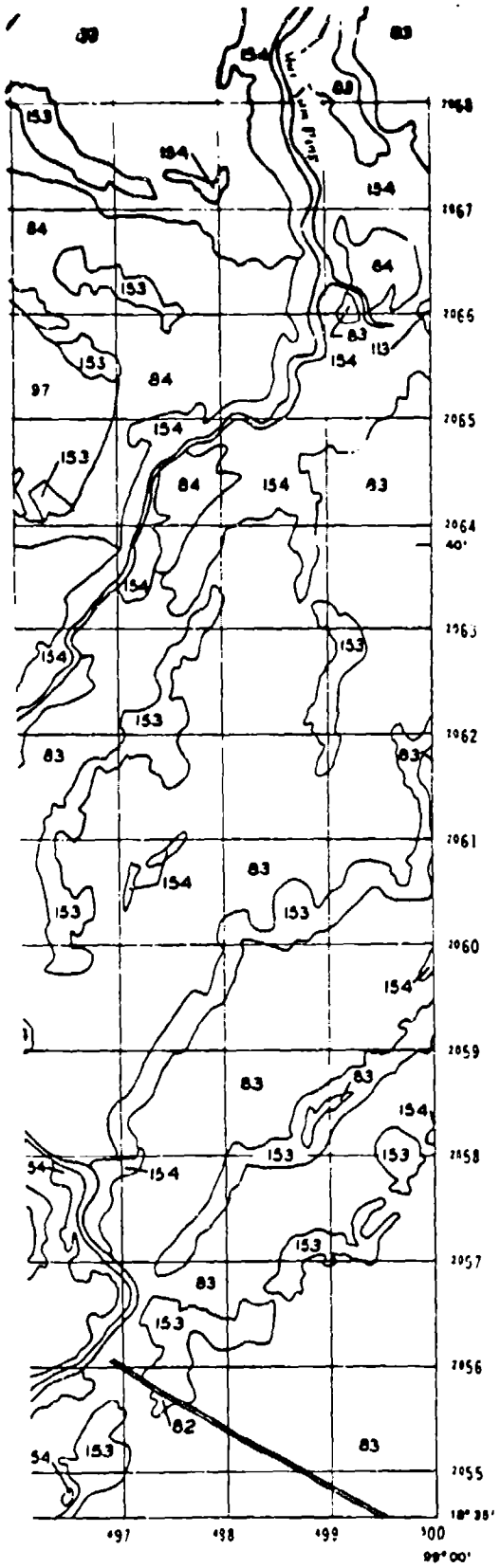
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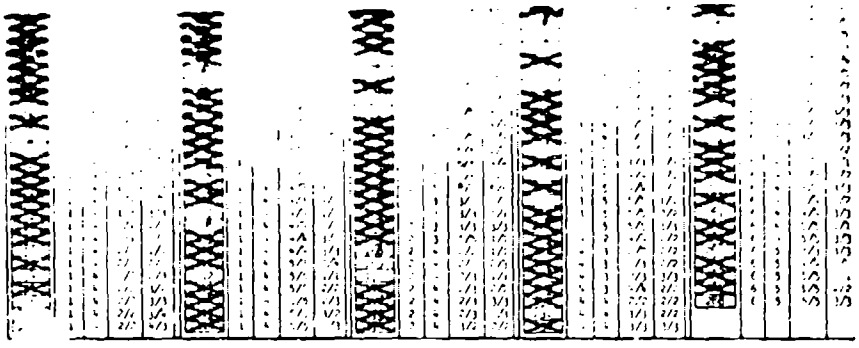

Amphoe Hang Dong
Amphoe San Pa Tong
Nong Sam Khia
SCALES
3 Statute Miles
4000 Meters
4000 Yards

6


Amphoe Hang Dong
Amphoe San Pa Tong
Nong Sam Ang
Mae Sam Paen
SCALES
3000
4000 Meters
3000
4000 Yards

1





Stone areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 2, 3/3, 3/4) indicating mapping classes of slope SL (see diagram below), vertical obstacle spacing OS, approach angle AA, and step height SH. Fractional representations indicate that dual classes were mapped. The numerator of the fraction indicates class range that will be encountered while traversing an area in an easterly direction (i.e. azimuth from > 0° to 179° true) and the denominator refers to a westerly direction (i.e. azimuth from > 180° to 360° degrees) assuming that the vehicle intersects the obstacle at a right angle.

† Mapping class ranges of each surface geometry for our area:

Slope (SL)

Mapping Class	Range deg
1	0-1.5
2	> 1.5-5
3	> 5-15
4	> 15-30
5	> 30-45
6	> 45

Vertical Obstacle Spacing (OS)

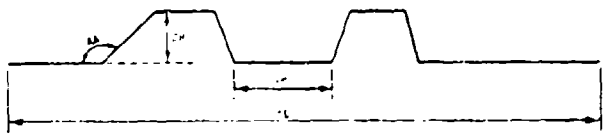
Mapping Class	Range	
	m	ft
1	0-9	0-30
2	> 9-12	> 30-40
3	> 12-15	> 40-50
4	> 15-30	> 50-100
5	> 30	> 100

Approach Angle (AA)

Mapping Class	Range deg
1	0-45
2	> 45-90
3	> 90-135
4	> 135-180
5	> 180-225
6	> 225-270
7	> 270-315
8	> 315-360

Step Height (SH)

Mapping Class	Range	
	m	ft
1	0-0.3	0-1
2	> 0.3-0.6	> 1-2
3	> 0.6-0.9	> 2-3
4	> 0.9-1.2	> 3-4
5	> 1.2-1.5	> 4-5
6	> 1.5-1.8	> 5-6
7	> 1.8-2.1	> 6-7
8	> 2.1	> 7



INDEX TO ADJOINING SHEETS

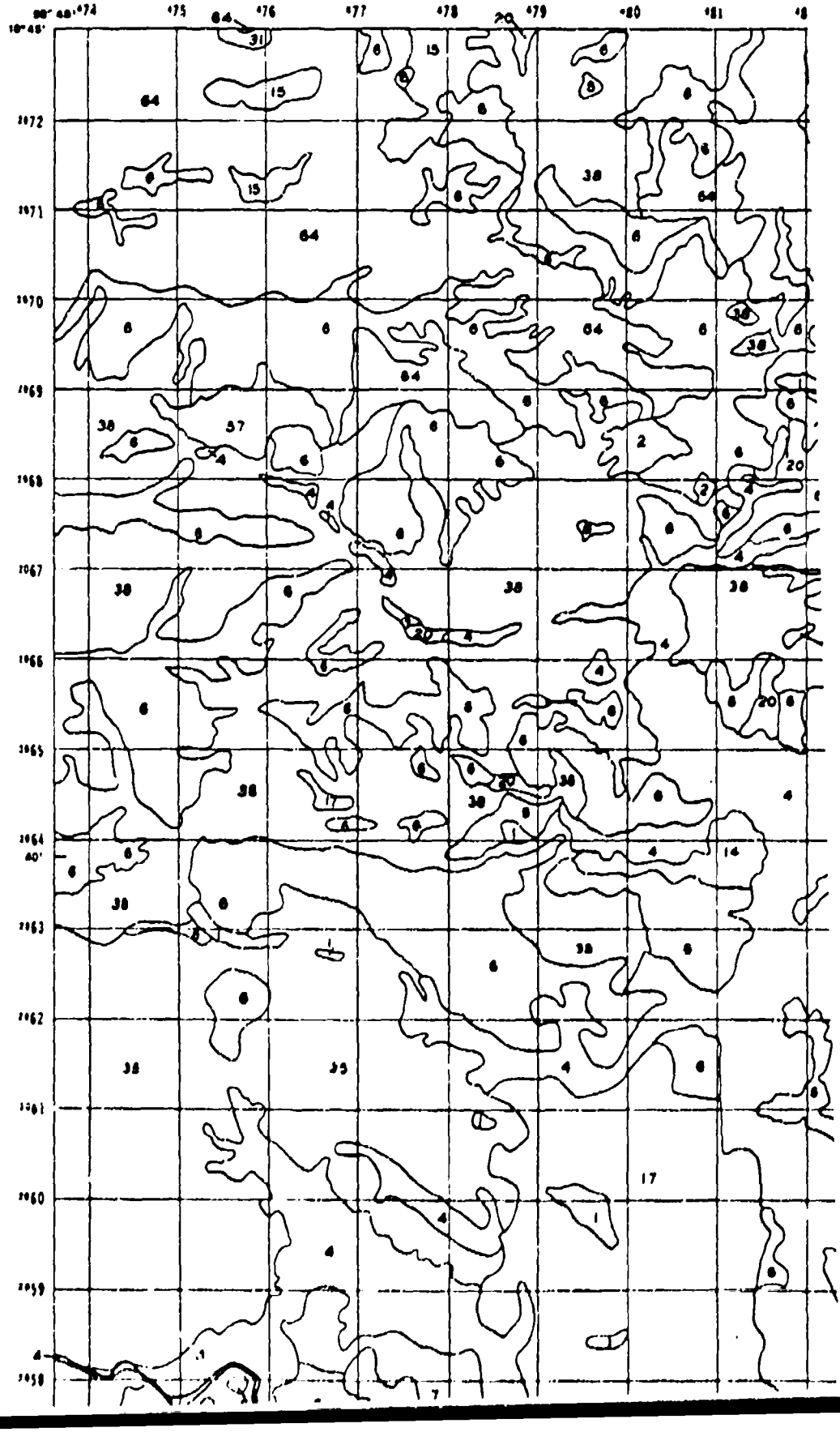
CM I	CM II
CM IV	CM III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

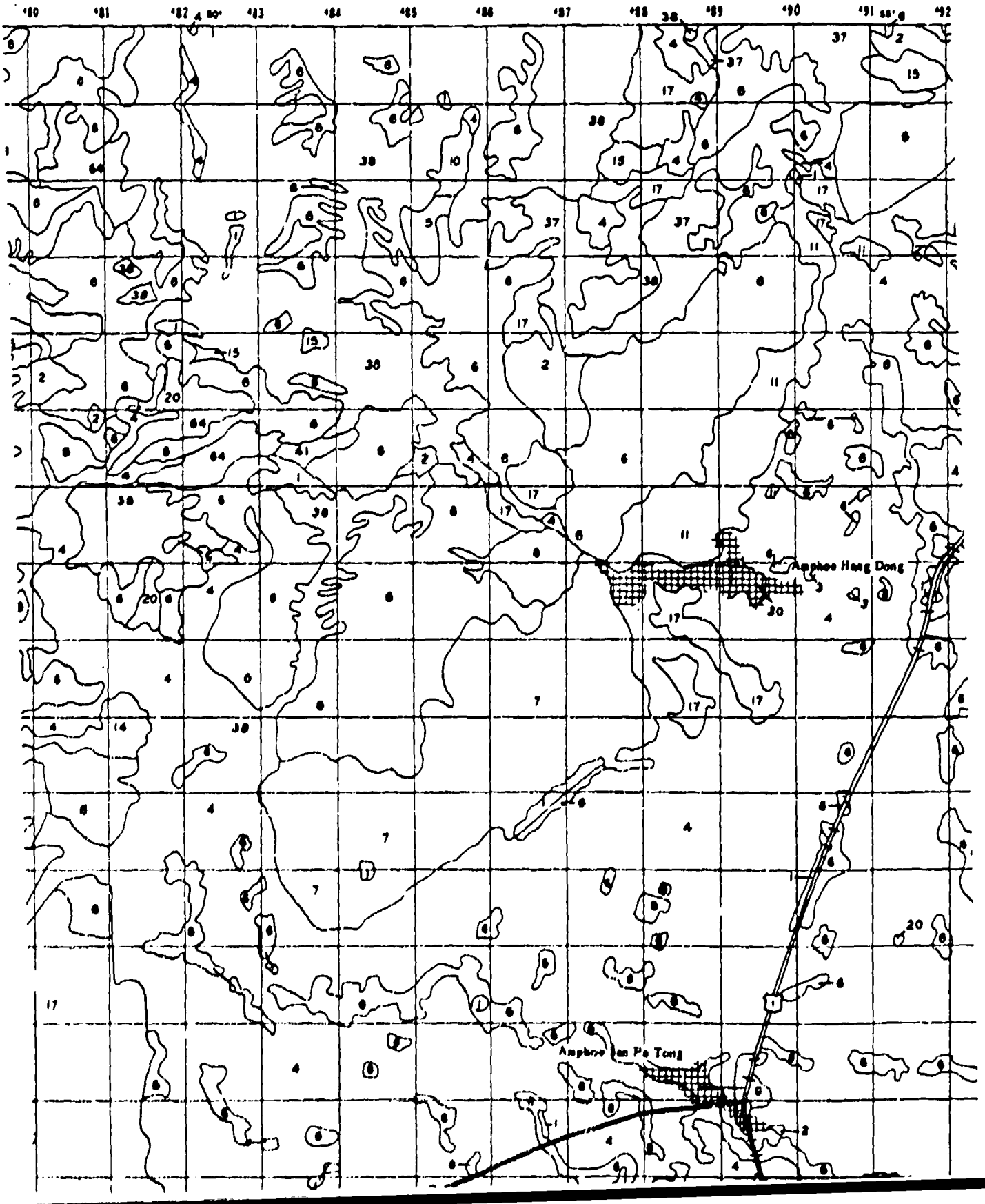
CHIANG MAI STUDY AREA
SHEET CM IV

PLATE 3.4b

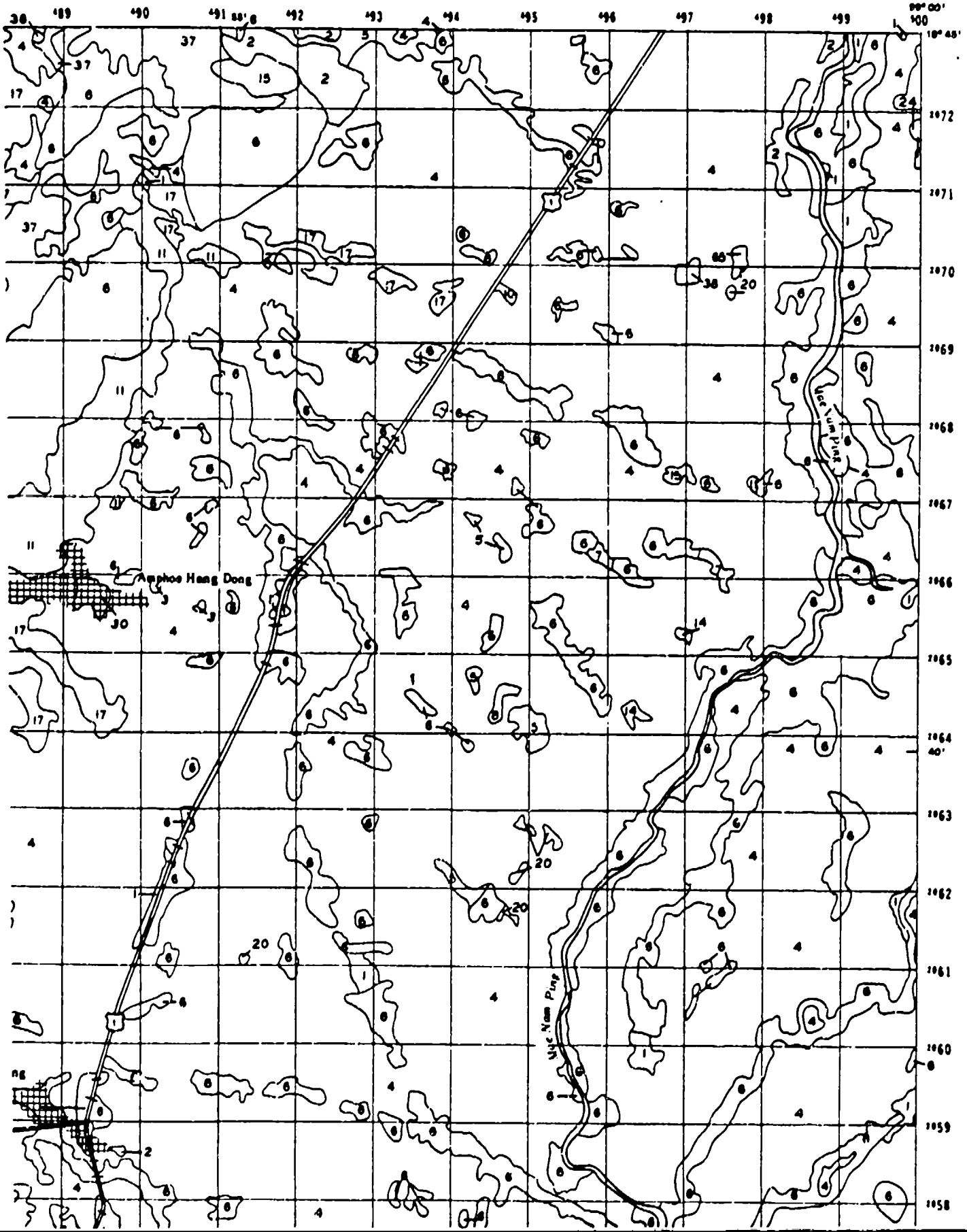


1 2

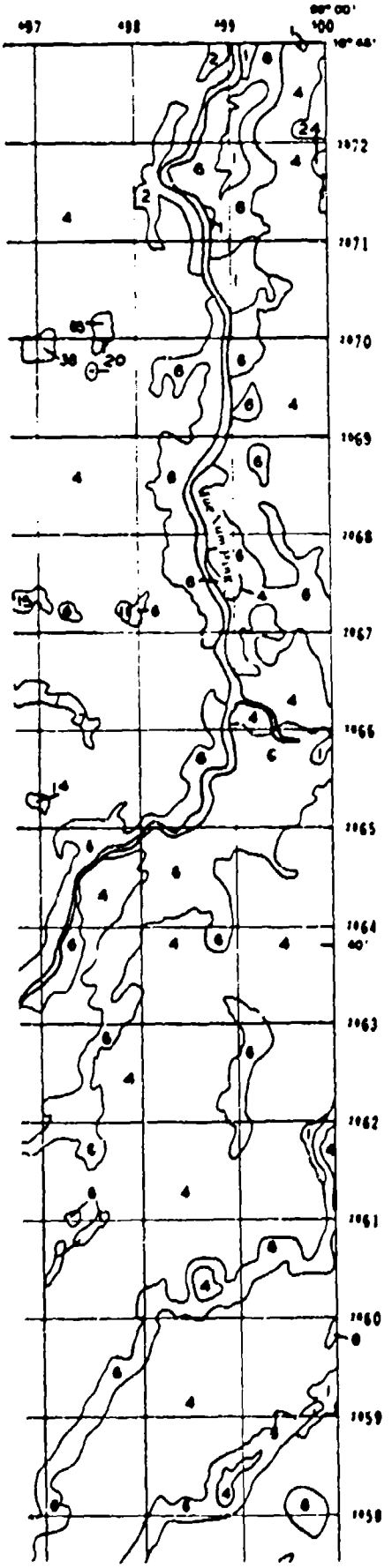
CHIANG MAI



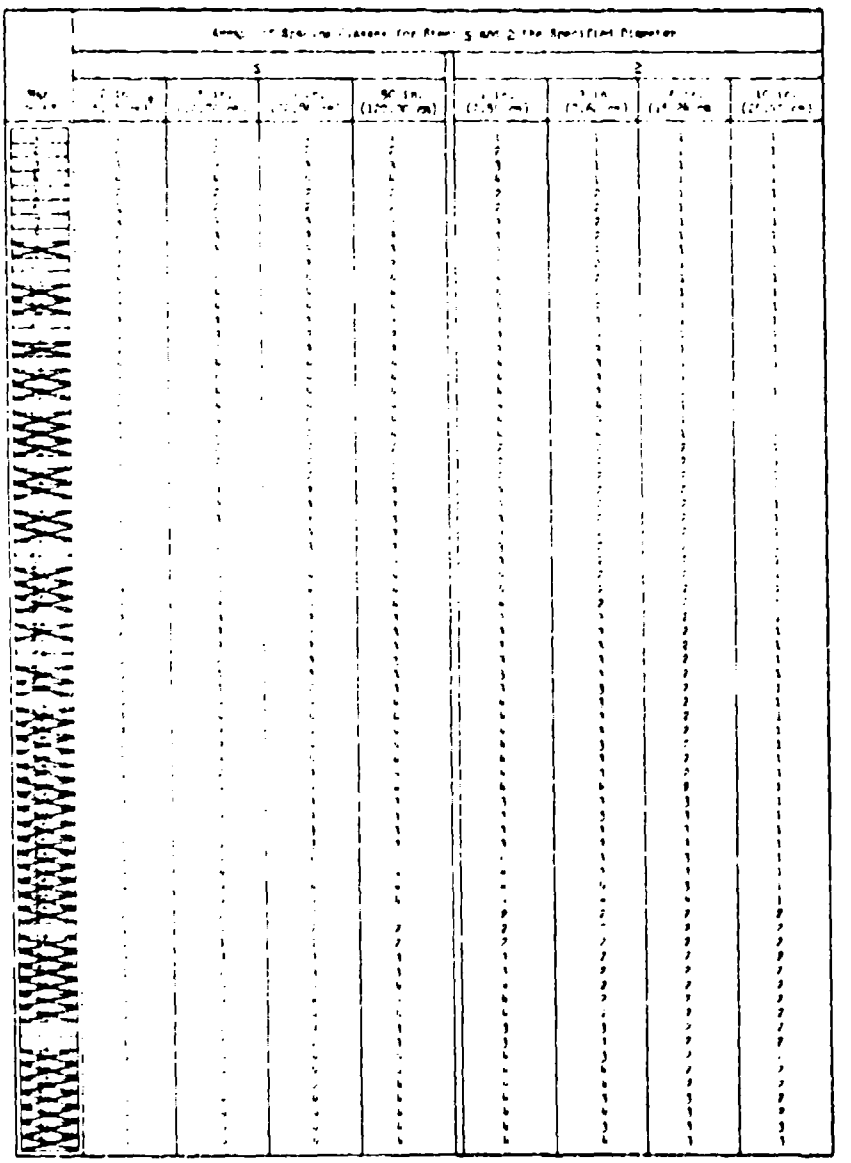
SHEET CM IV



SHEET CM IV



LEGEND



Note: Blank areas are unvegetated water bodies.

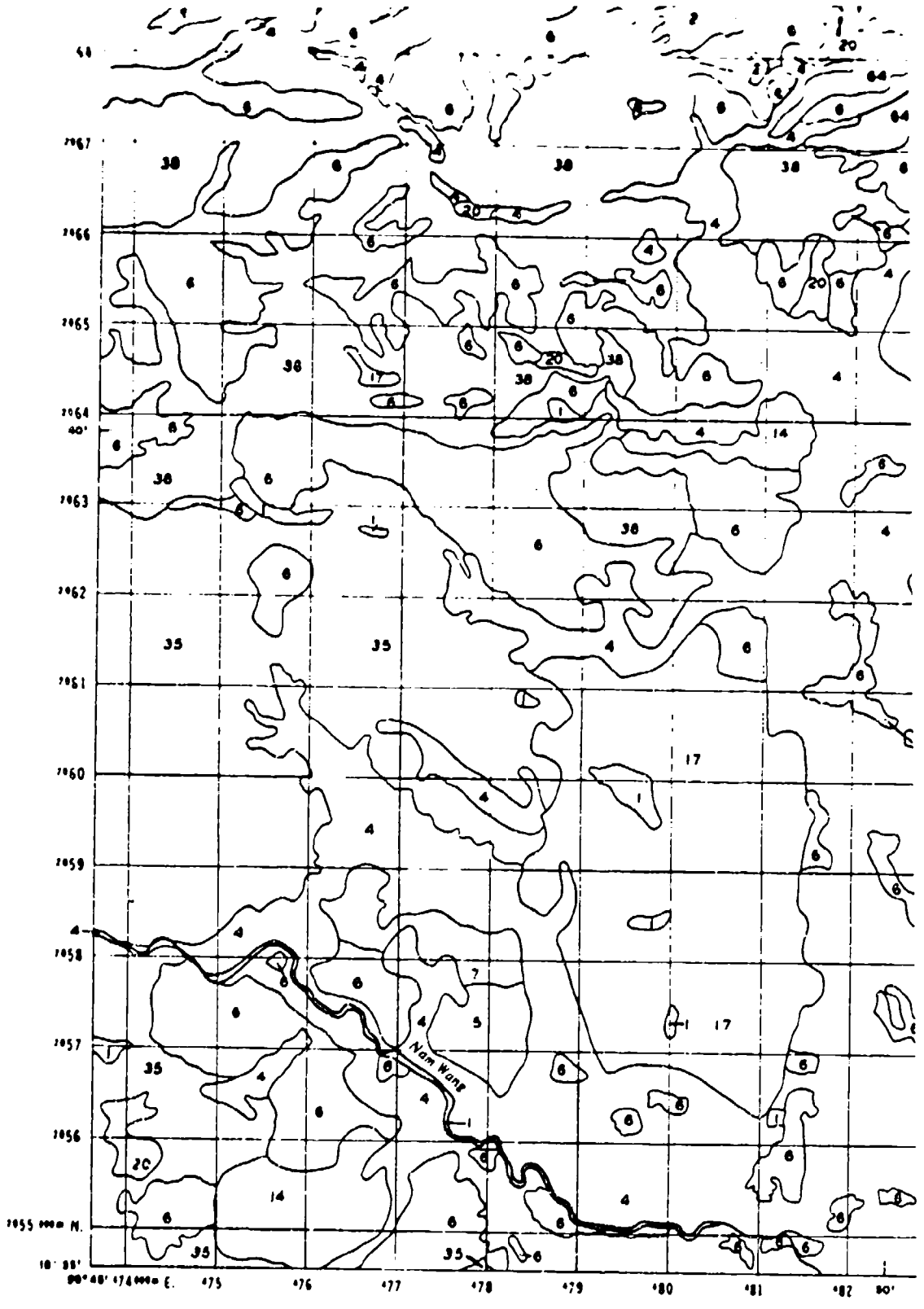
* Each map unit represents an array of eight symbols (1 or 0, 1 or 0, 1 or 0, 1 or 0, 1 or 0, 1 or 0, 1 or 0, 1 or 0) indicating presence (ones) or absence (zeros) of trees greater than 5 in. (12.70, 22.86, and 127.0 cm) and 2 in. (5.08, 7.62, 15.24, and 25.40 cm).

† Mapping class ranges for each sampling class are:

Mapping class	Range	
1		
2		
3		
4		

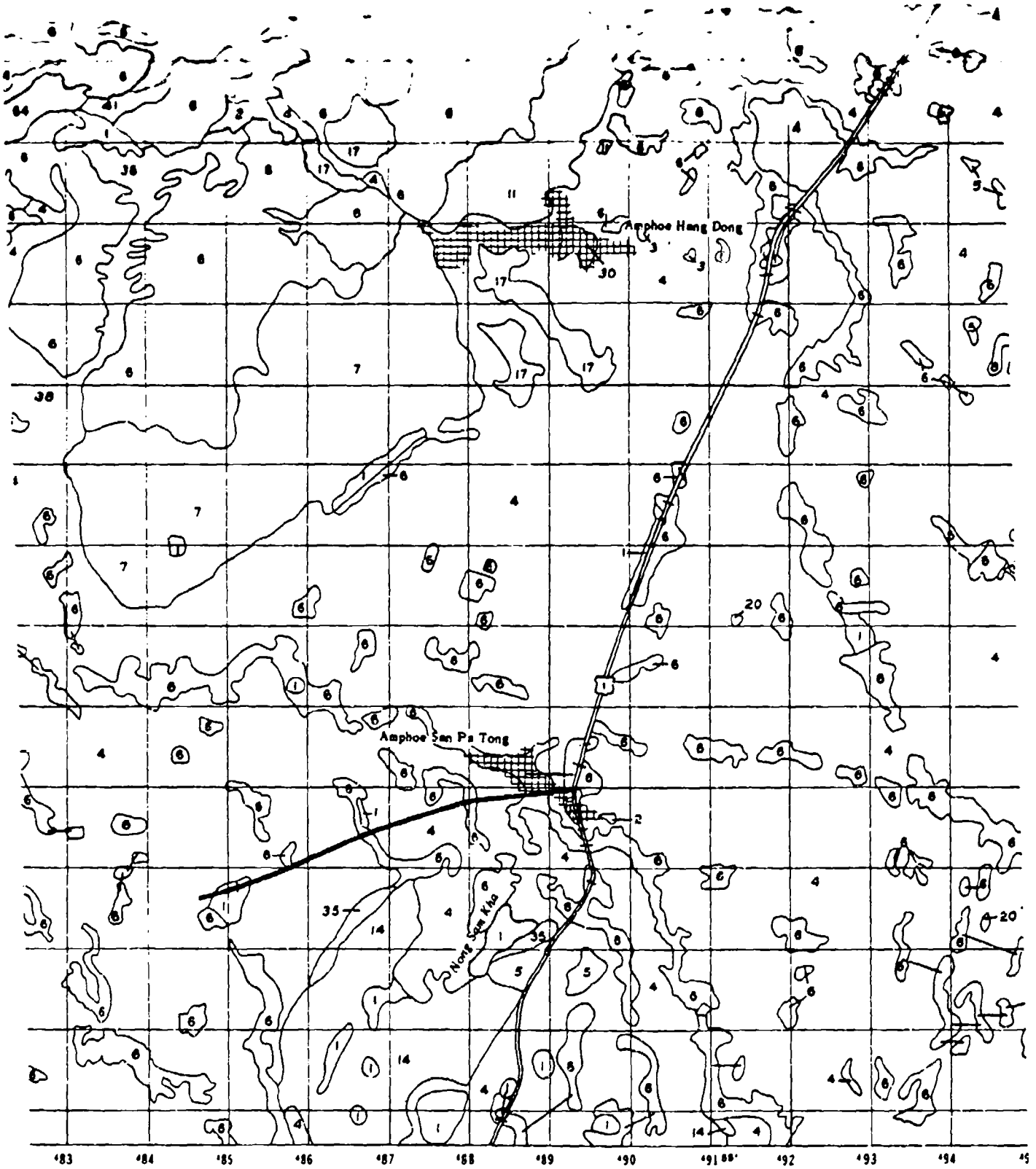
Units formed in this map

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ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

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SCALES

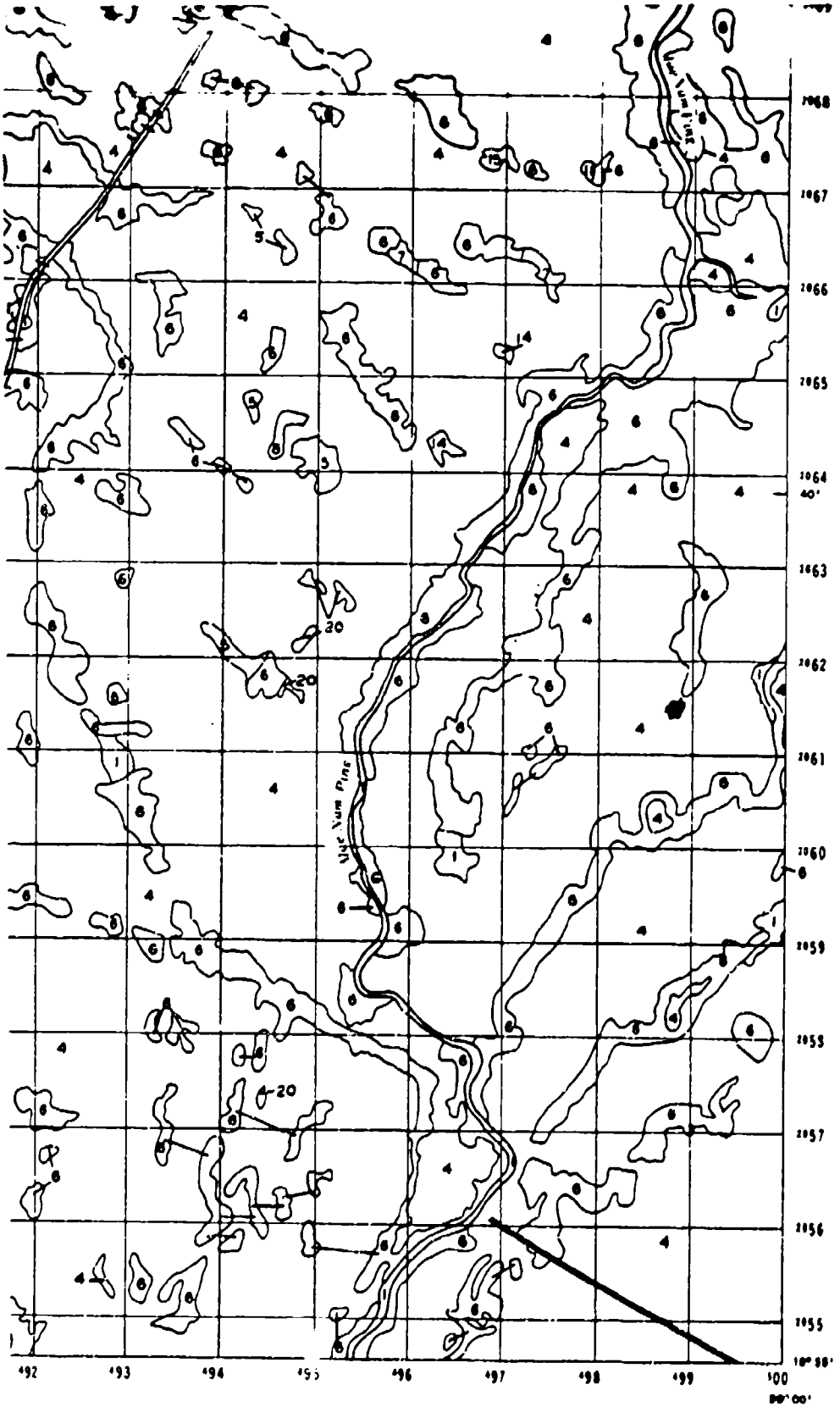
1 ½ 0 1 2 3 Statute Miles

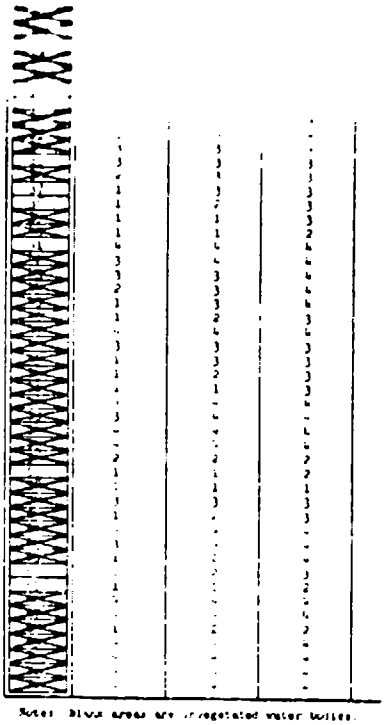
1000 500 0 1000 2000 3000 4000 Meters

1000 500 0 1000 2000 3000 4000 Yards

6

1





Note: Blue areas are irrigated water bodies.

* Each map unit represents an array of eight s
spacing classes (
2.5, 5, 7.5, 10, 15.24, and

† Mapping class names for each spacing cla

Mapping Class	
1	
2	> 1
3	>

Units to not occur on this map.

INDEX TO A

CM I

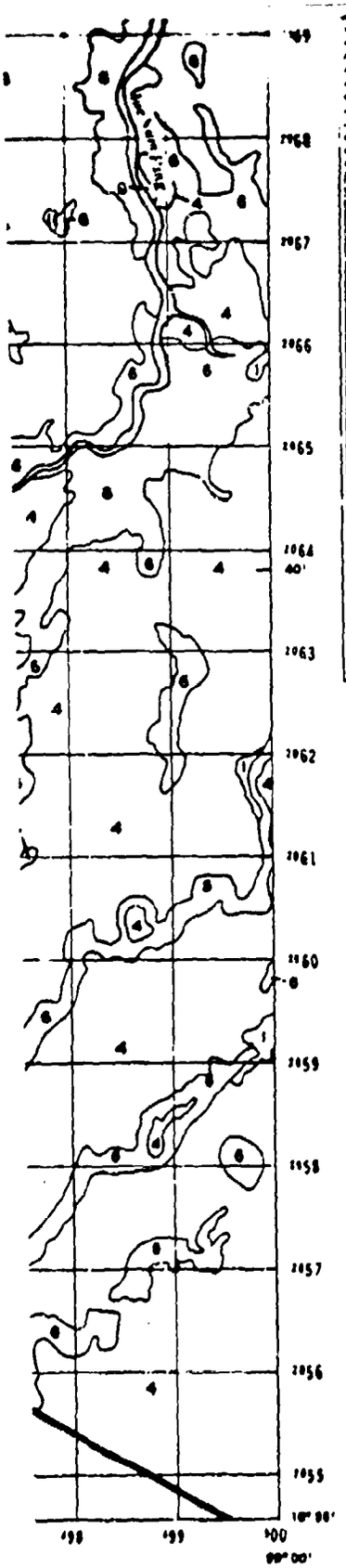
CM IV

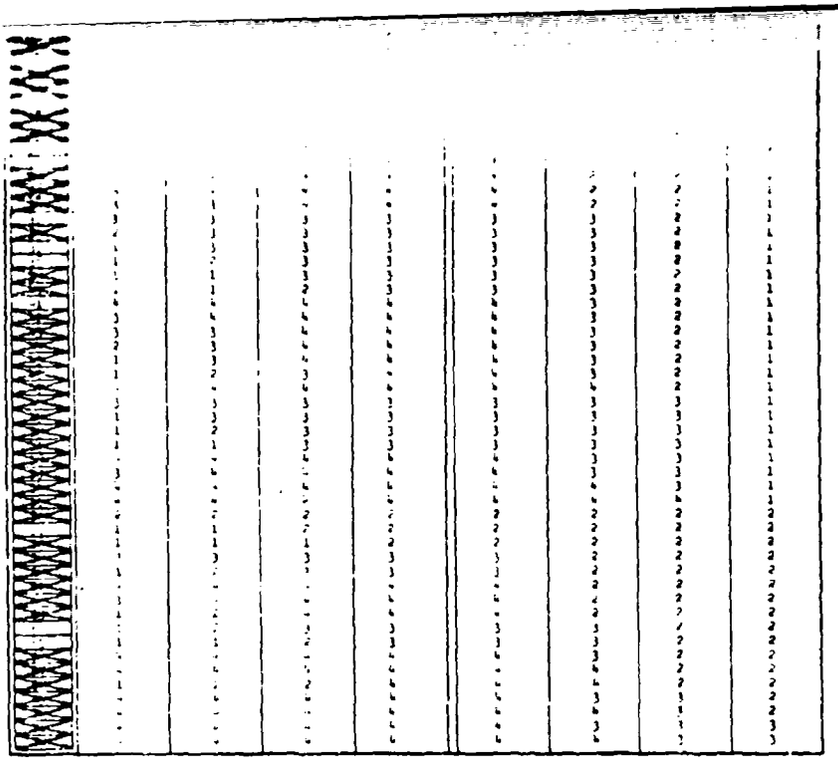
A QUANTITATIVE ME
TERRAIN FOR G

VEGE

CHIANG MAI

SHEE





Notes: Black areas are unvegetated water bodies.

* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1, 1,) indicating spacing classes for stems ≤ 2, 2-3, 3, and 10-16' (≤ 5.08, 12.70, 22.86, and 127.00 cm) and ≥ 1, 3, 7, and 16' (0.5+, 7.62, 15.24, and 25.40 cm).

† Mapping class values for each spacing class shown

Stem Spacing

Mapping Class	Range	
	ft	m
1	> 3'	> 9.14
2	> 10-3'	> 3.05-9.14
3	> 5-10	> 1.52-3.05
4	0-5	0-1.52

Title block does not occur on this map

INDEX TO ADJOINING SHEETS

CM I	CM II
CM IV	CM III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

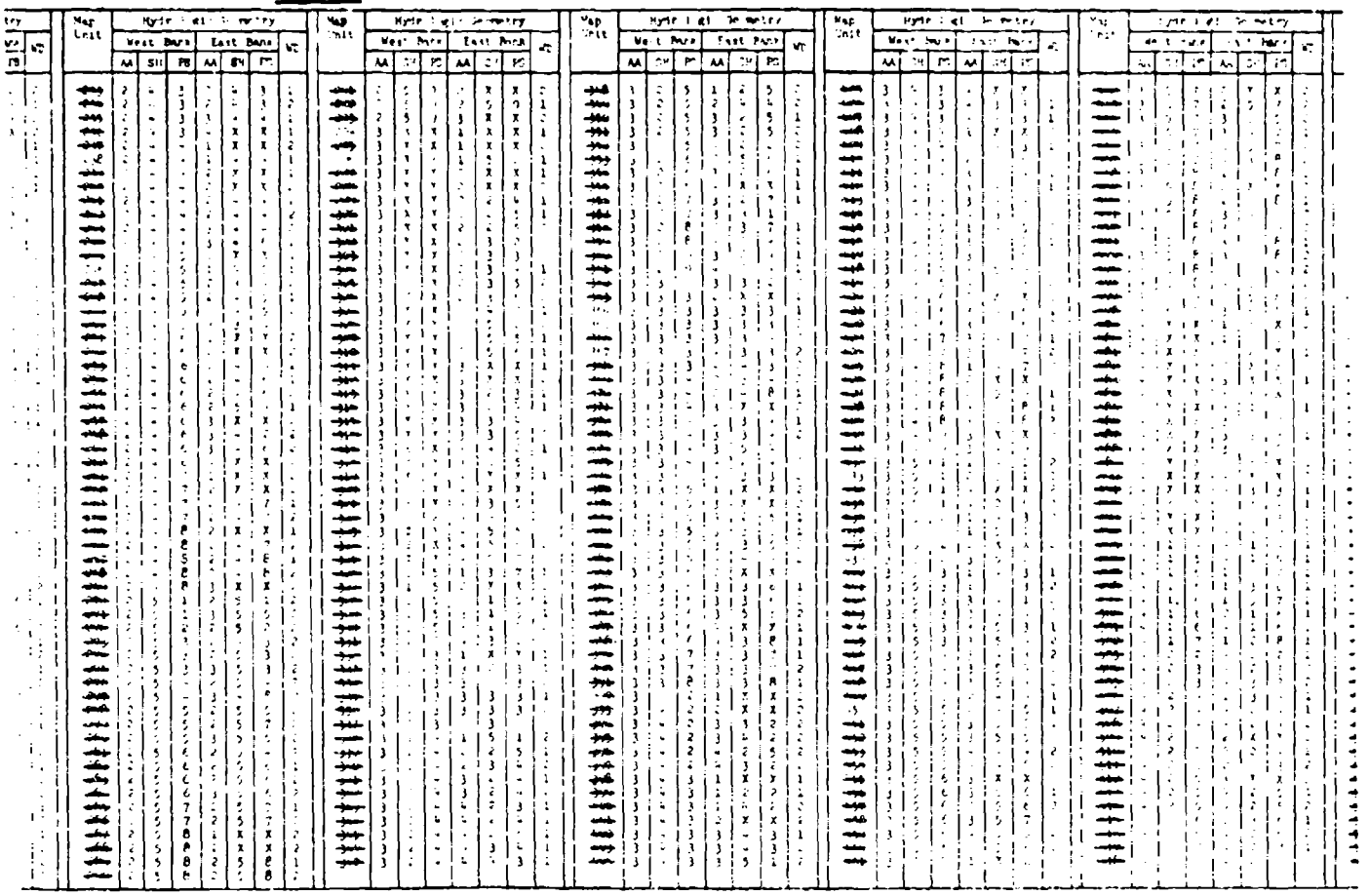
VEGETATION

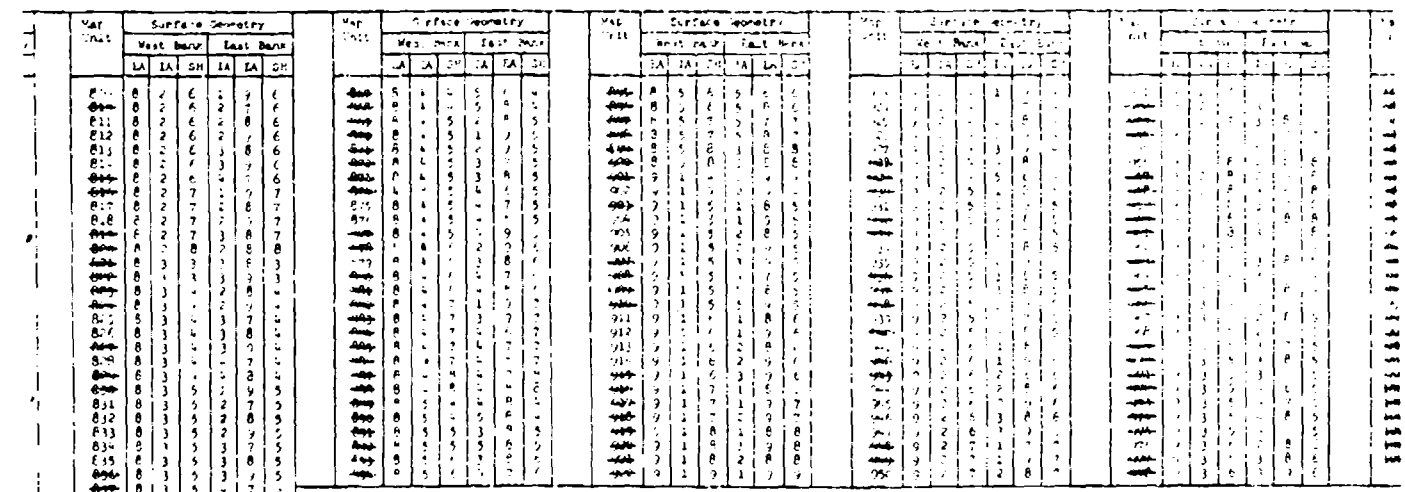
CHIANG MAI STUDY AREA

SHEET CM IV

PLATE 3.4c

LEGEND

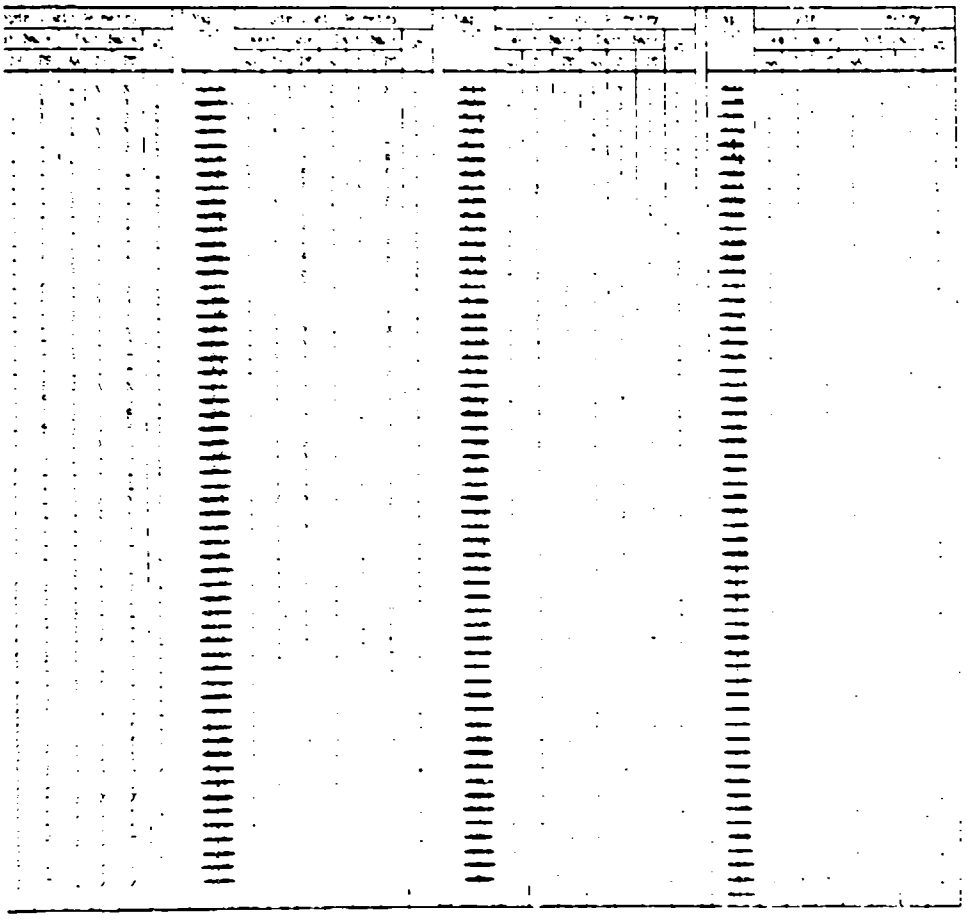


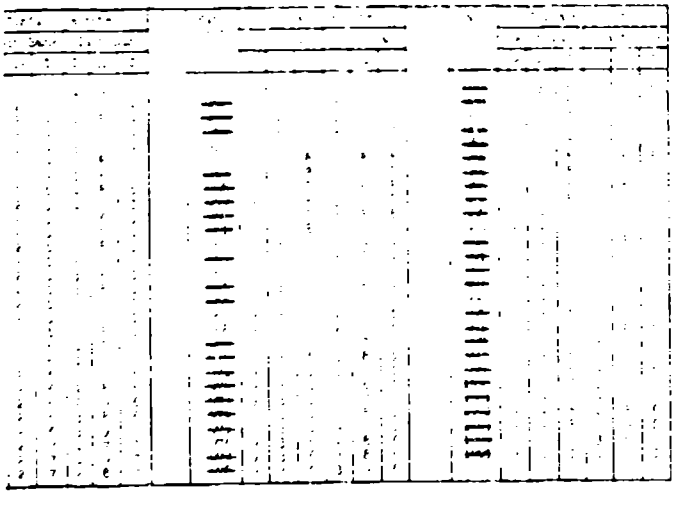


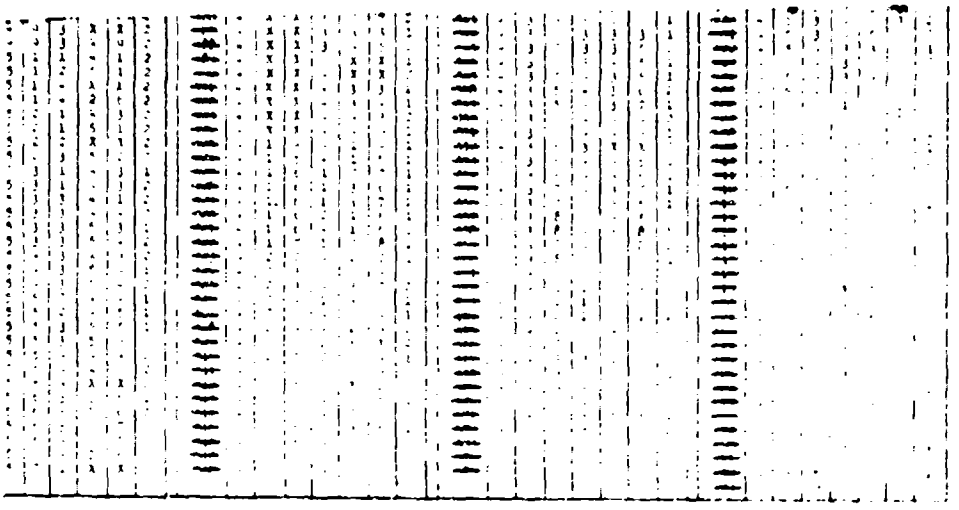
-- Units not mapped.

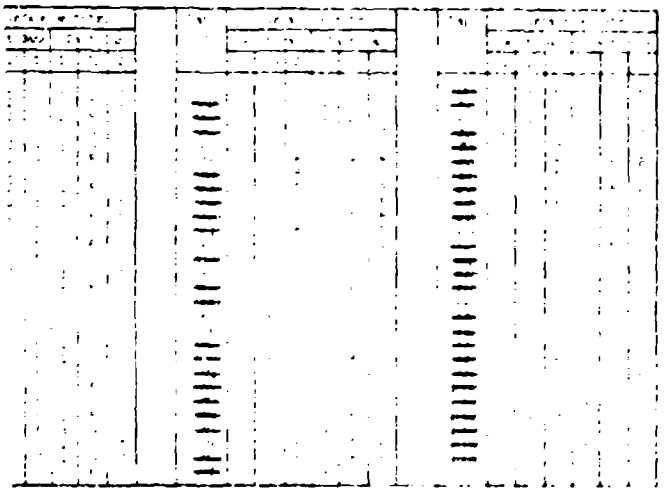
* Features are usually identified by a fraction. Each component of the fraction is a map unit that represents an array of seven symbols or less describing a particular feature. The numerator indicates high-water conditions and the denominator indicates low-water conditions. Features identified by only one map unit contain less than 3 ft o. water at all times and are mapped as surface geometry features. Map units 1-633 describe hydrologic geometry features and map units 635-675 describe surface geometry features. Hydrologic geometry symbols represent class ranges of interior approach angle AA (see Hydrologic Geometry Diagram below), step height SH, position of step, base FB referenced to water level, and water depth WD for each bank. Surface geometry symbols represent class ranges of exterior approach angle EA (see Surface Geometry Diagram below), interior approach angle IA, and step height SH for each bank. West bank is the first bank encountered while traversing an area in an easterly direction (i.e. azimuth > 0 to 180 deg) and the east bank is the first bank encountered while traversing an area in a westerly direction (i.e. azimuth > 180 to 360 deg), assuming that the vehicle intersects the feature at a right angle.

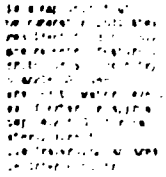
Contact Approach A	
Units	
1	<
2	
3	> 15
-	> 1

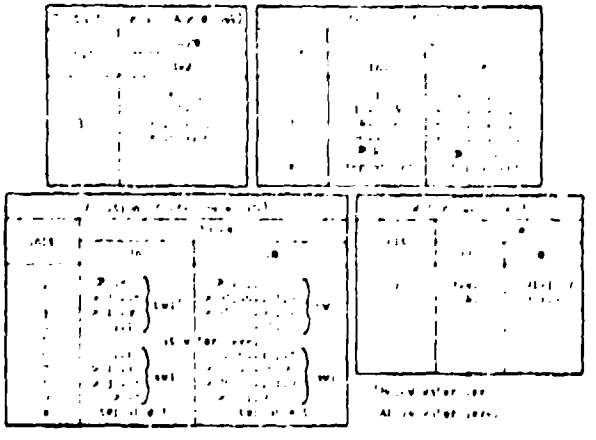


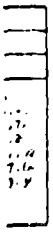


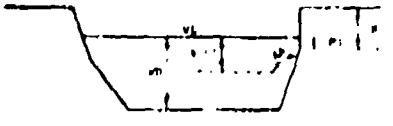


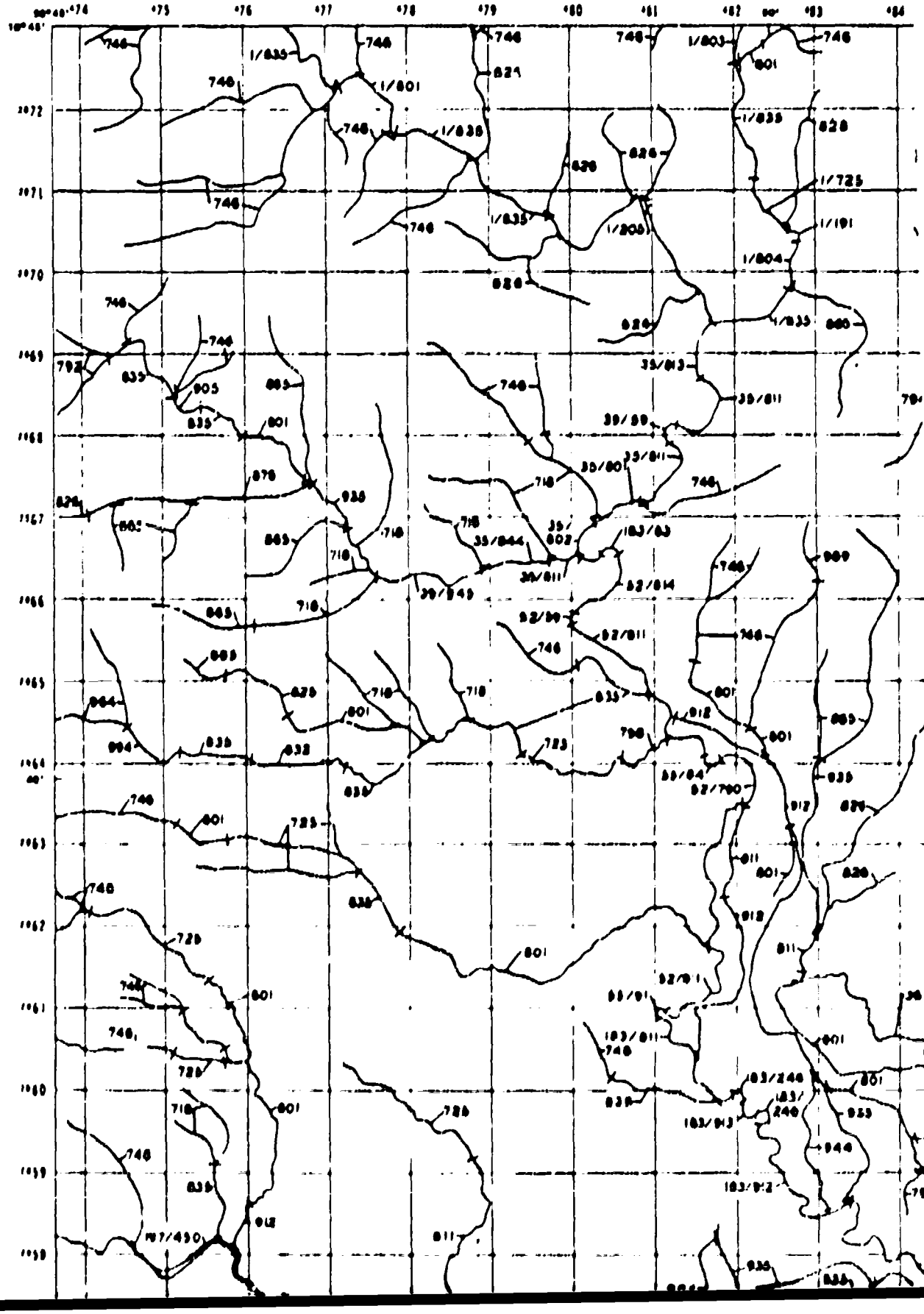






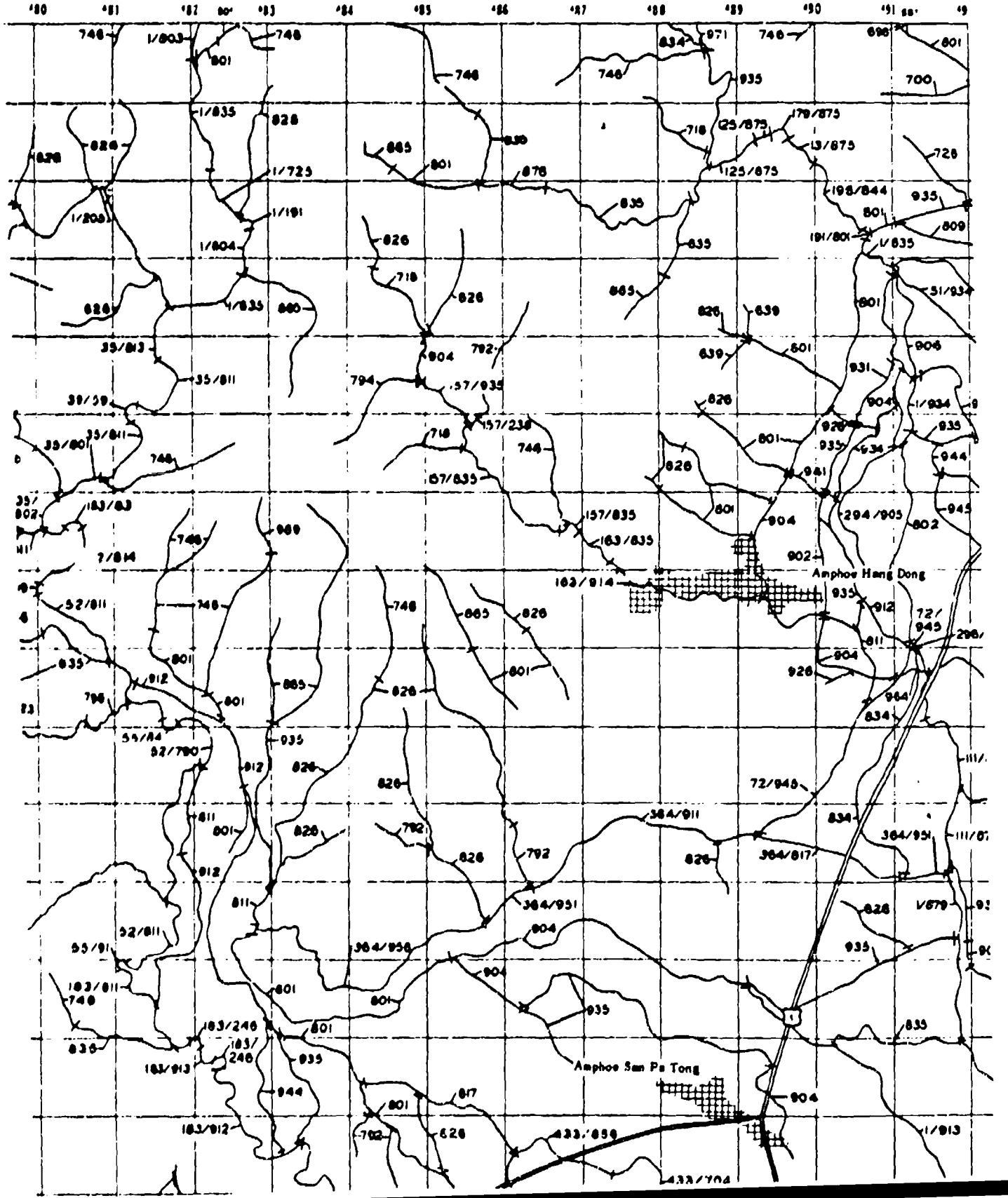






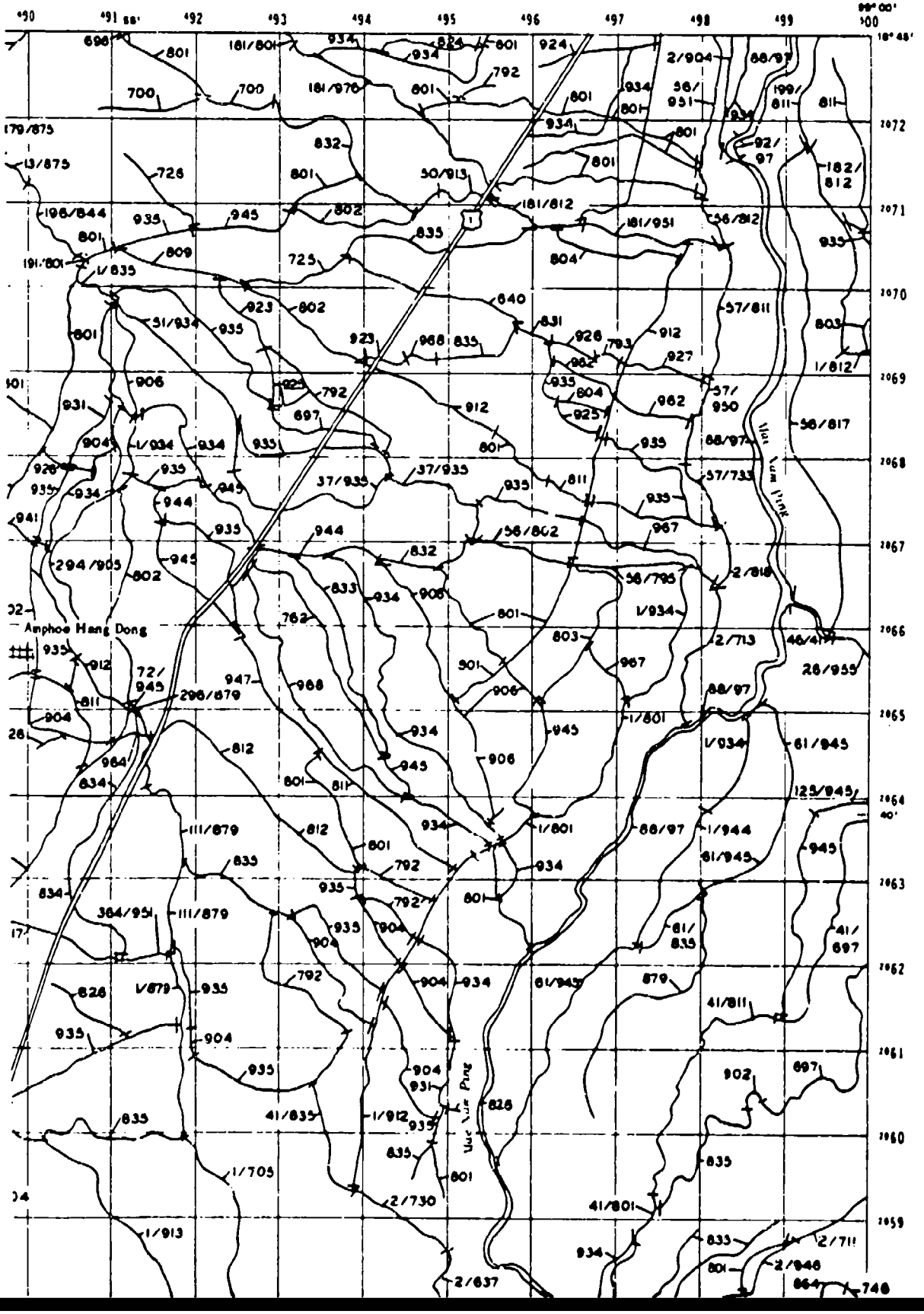
1 2

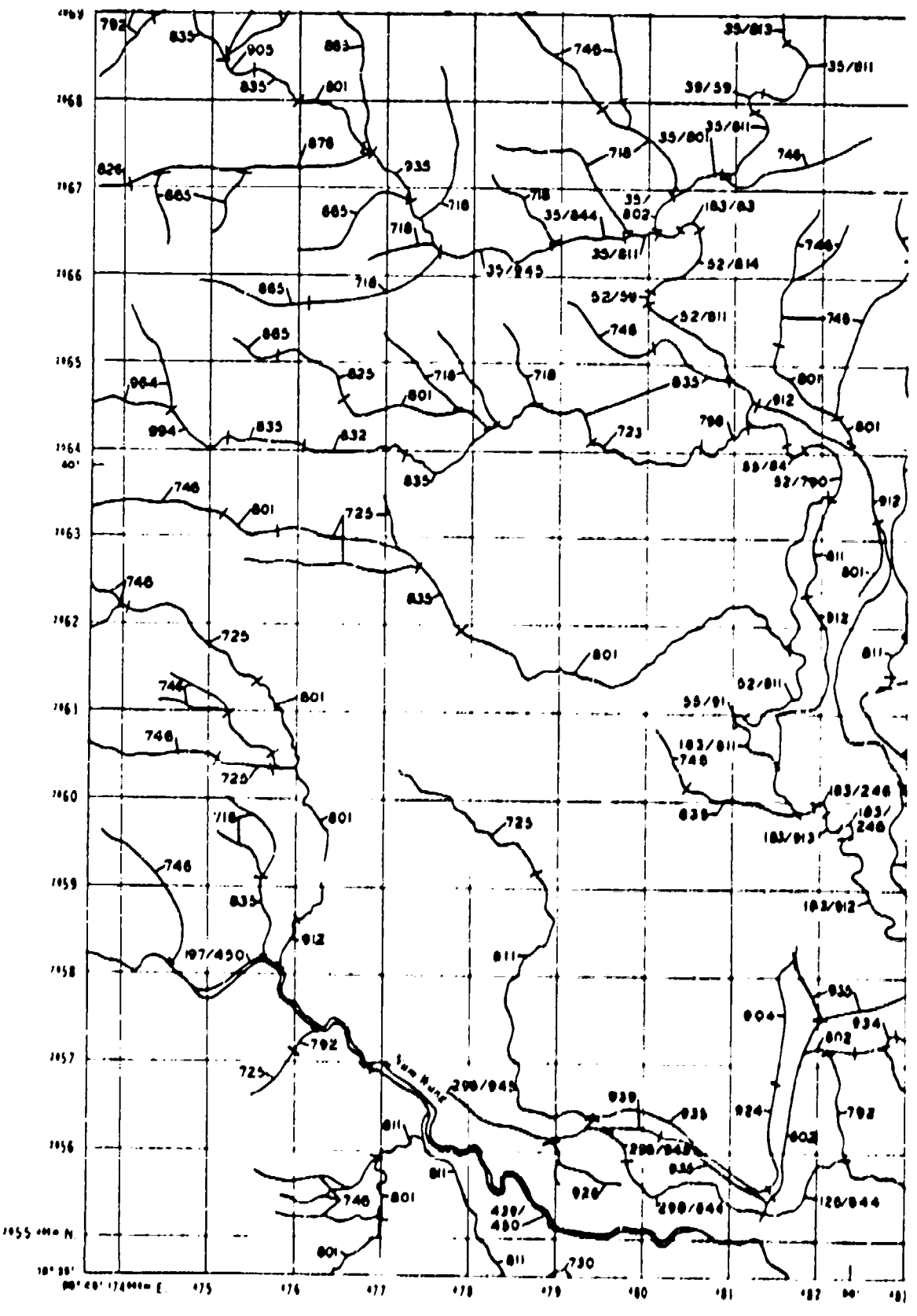
CHIANG MAI



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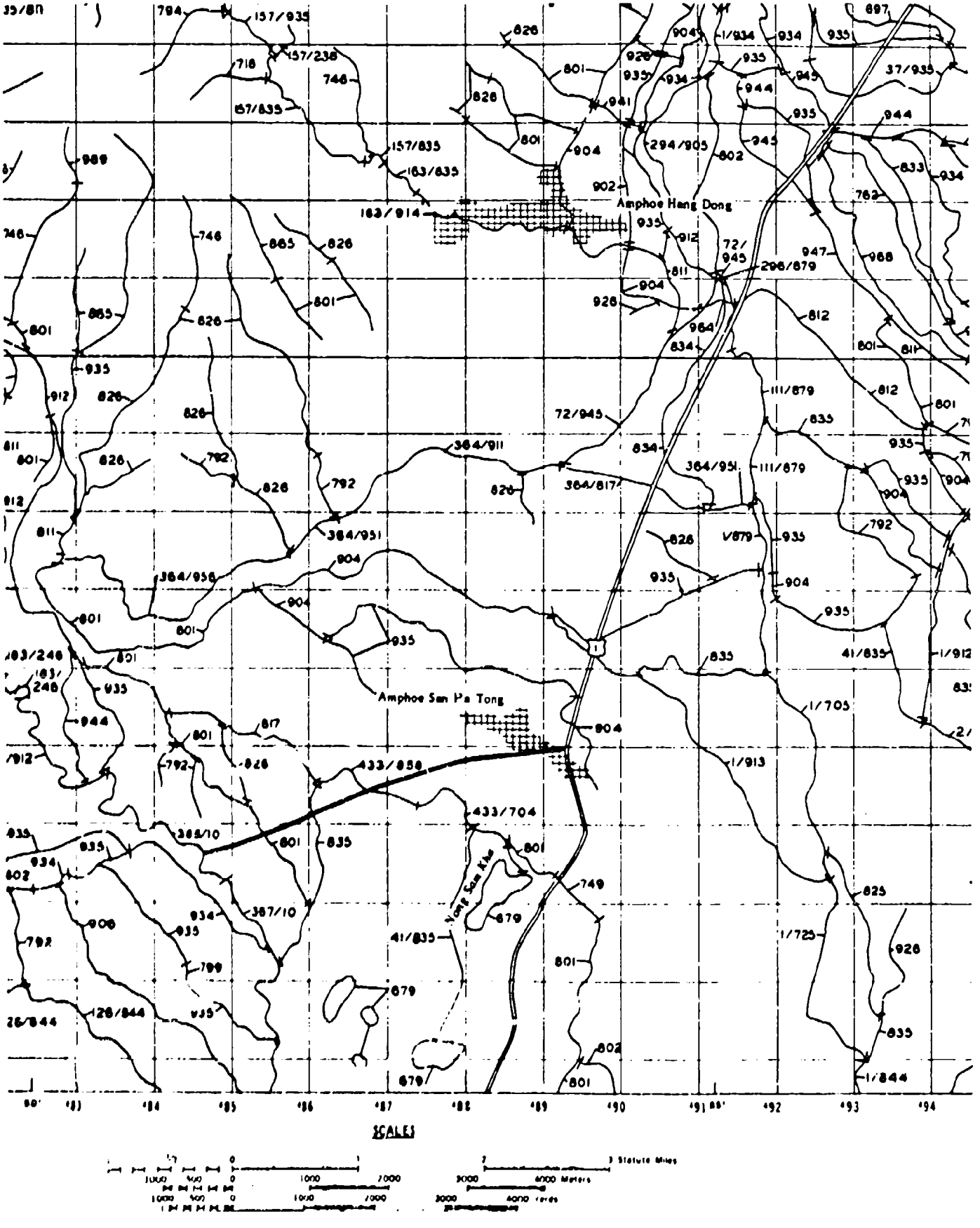
SHEET CM IV



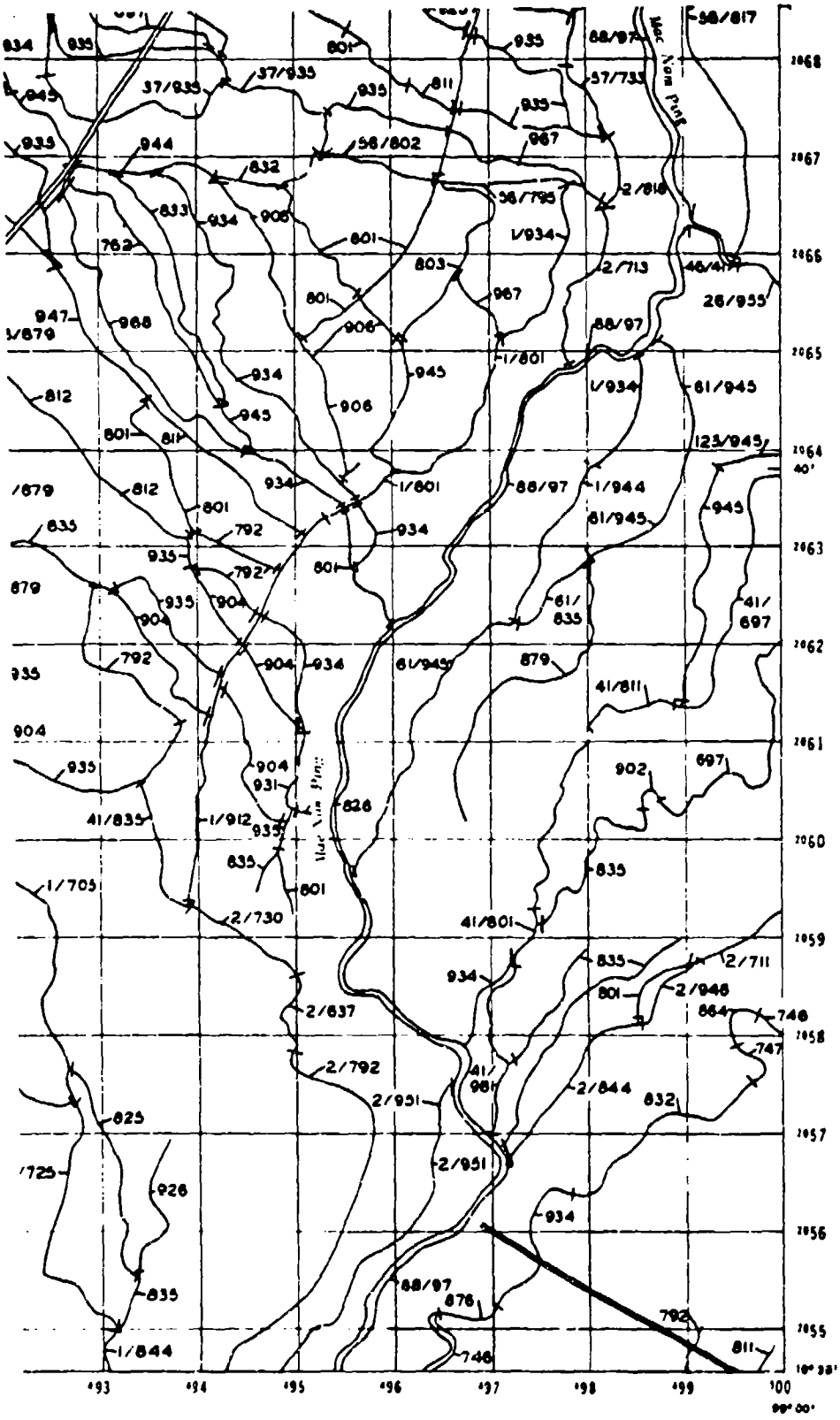


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 Q

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5

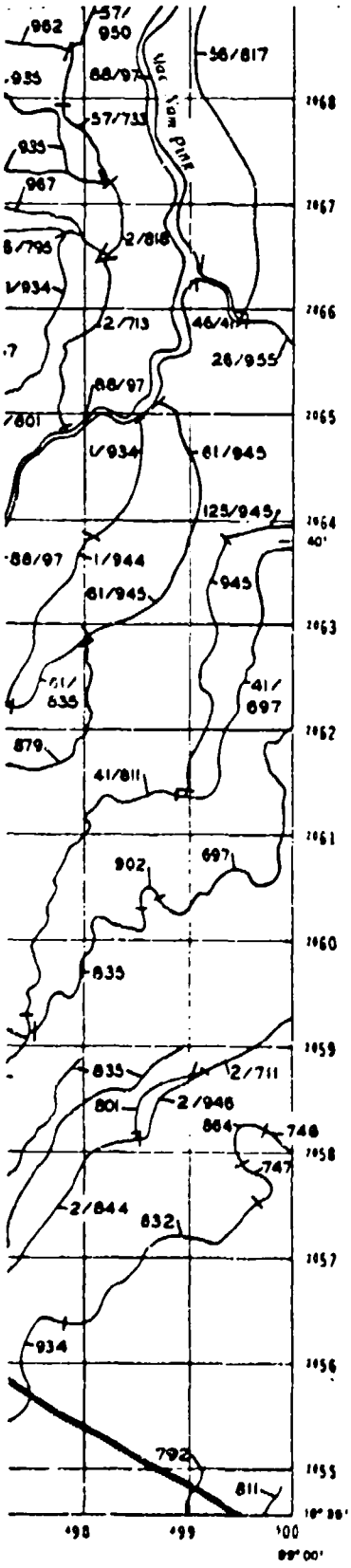


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CM IX	

A QUANTITATIVE METHO
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INDEX TO ADJOINING SHEETS

CM I	CM II
CM IV	CM III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

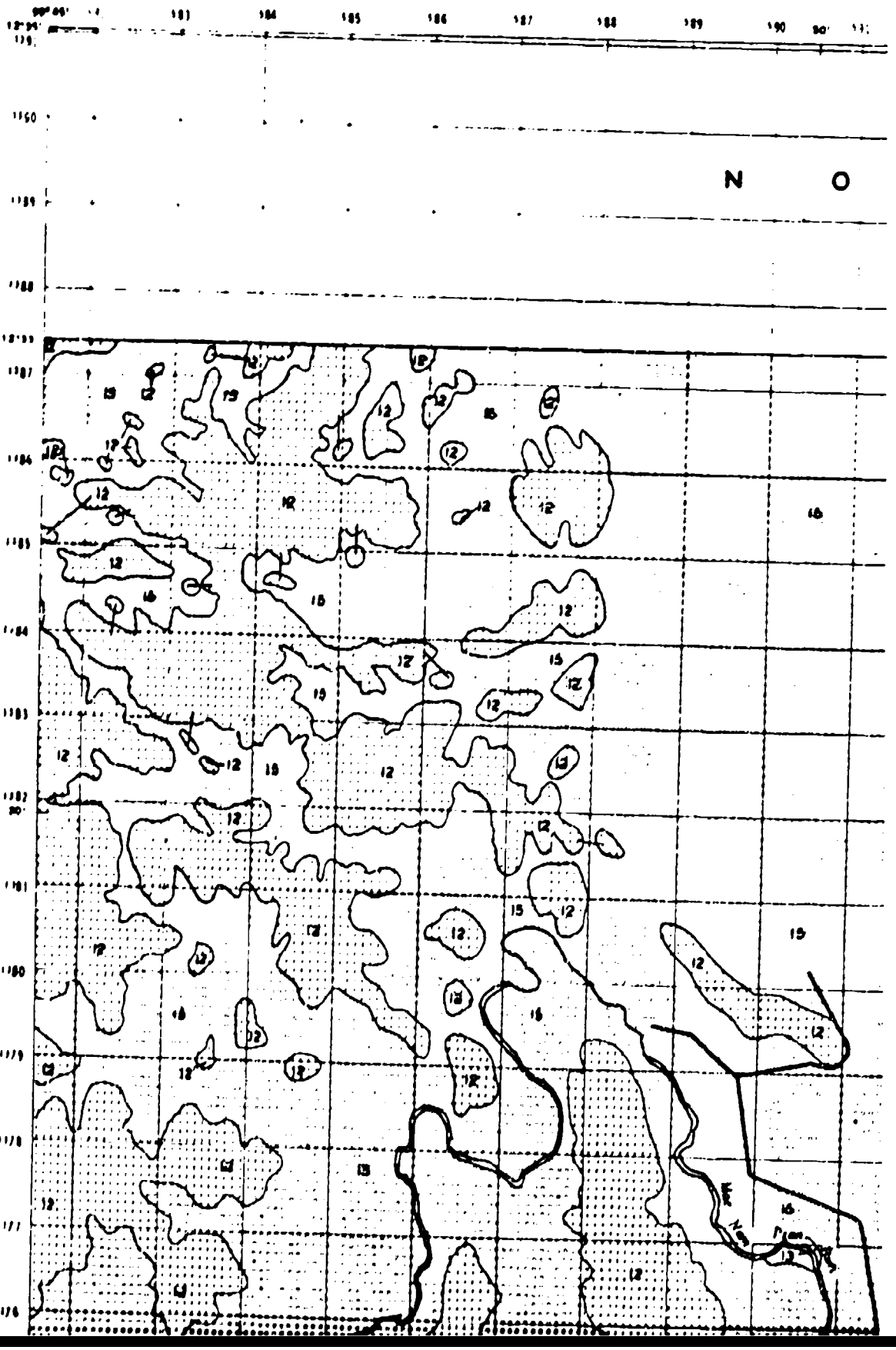
HYDROLOGIC GEOMETRY

CHIANG MAI STUDY AREA

SHEET CM IV

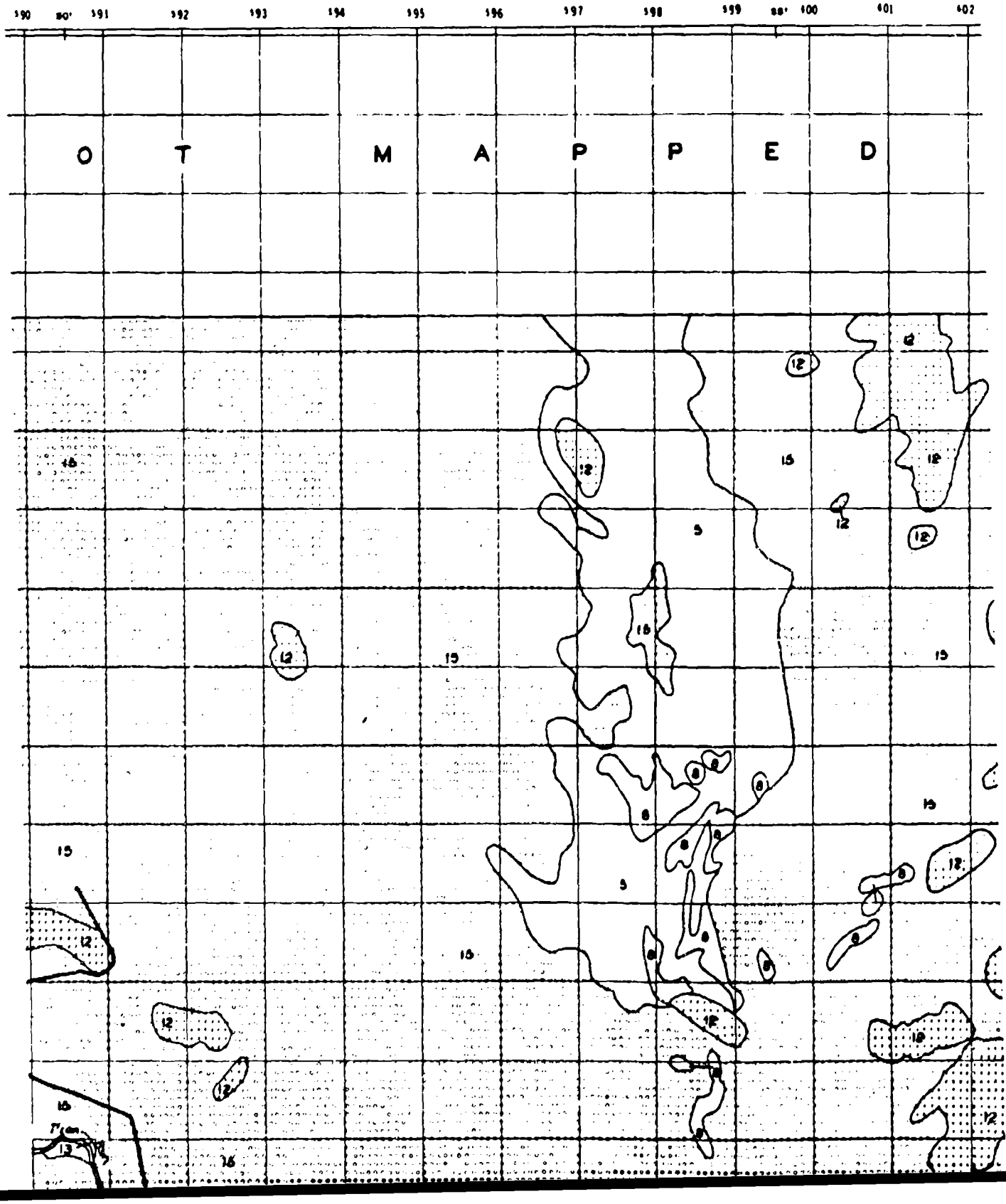
7

PLATE 3.4d


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2

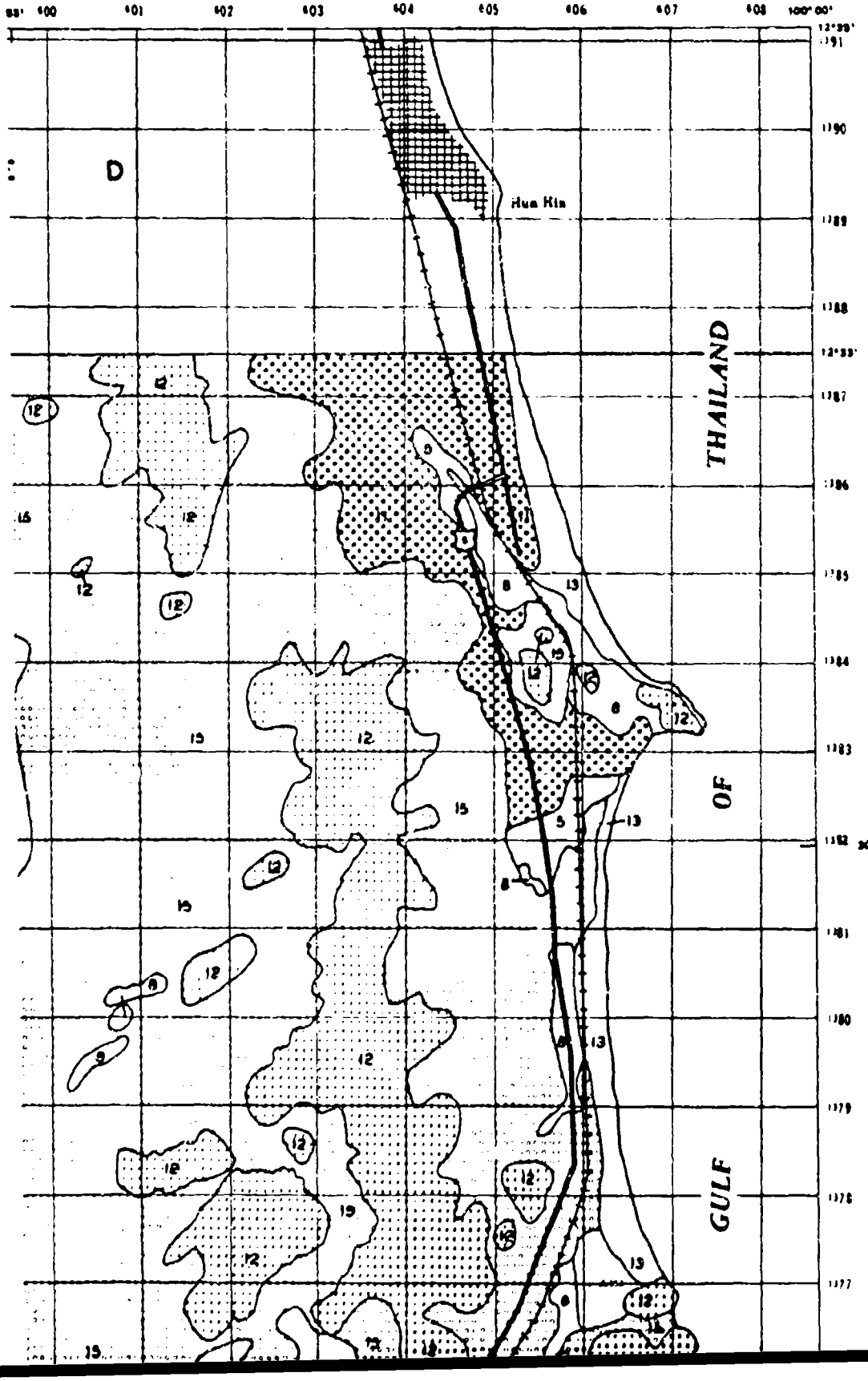
PRAN BURI



1

3

SHEET PB I



Unit	Soil Mass Strength: Relative Moisture RSI	Relative Moisture RSI	Mass
1	10-25	25-60	0-1
	25-60	60-100	0-1
	25-60*	60-100	0-1
	25-60	>100	0-1
2	25-60*	>100	0-1
	60-100	60-100	0-1
	60-100	60-100	0-1
8	60-100	>100	0-1
	60-100	>100	0-1
	60-100	>100	0-1
	60-100*	>100	0-1
	>100	>100	0-1
13	>100	>100	0-1
	Complex of 60-100 and >100	>100	0-1
12*	Complex of 60-100 and >100	>100	0-1

Notes: Blank areas are water bodies.

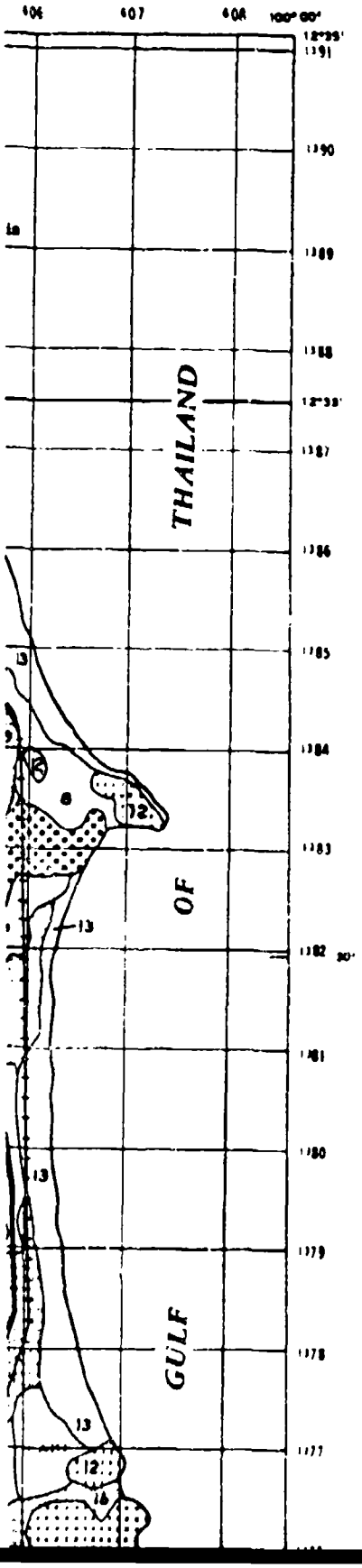
c_{ur} Shear strength at zero normal load

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than X strengths commonly observed are

Units do not occur on this map.

SHEET PB I



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{uw} psi	Maximum Moisture c_{uw} kg/cm²	Maximum Moisture ϕ_{uw} deg	Minimum Moisture c_{uw} psi	Minimum Moisture c_{uw} kg/cm²	Minimum Moisture ϕ_{uw} deg	Conditions where maximum c_{uw} occurs: c_{uw} psi	c_{uw} kg/cm²	ϕ_{uw} deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		

Notes: Black areas are water bodies.

c_{uw} Shear strength at zero normal load.

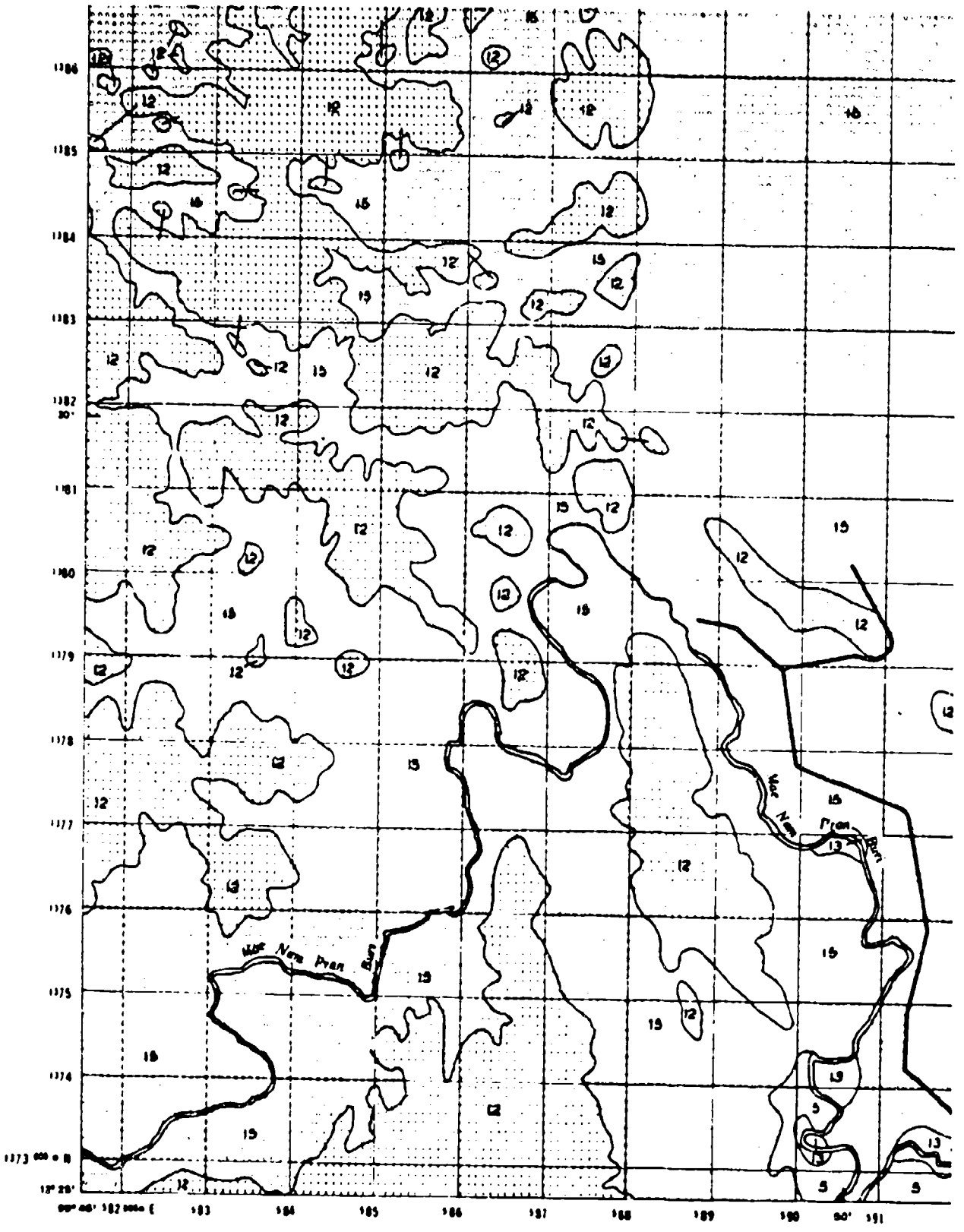
ϕ_{uw} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Highest strengths commonly observed are 60-100 for Units 1 and 3; more than 100 for Unit 13.

Units do not occur on this map.

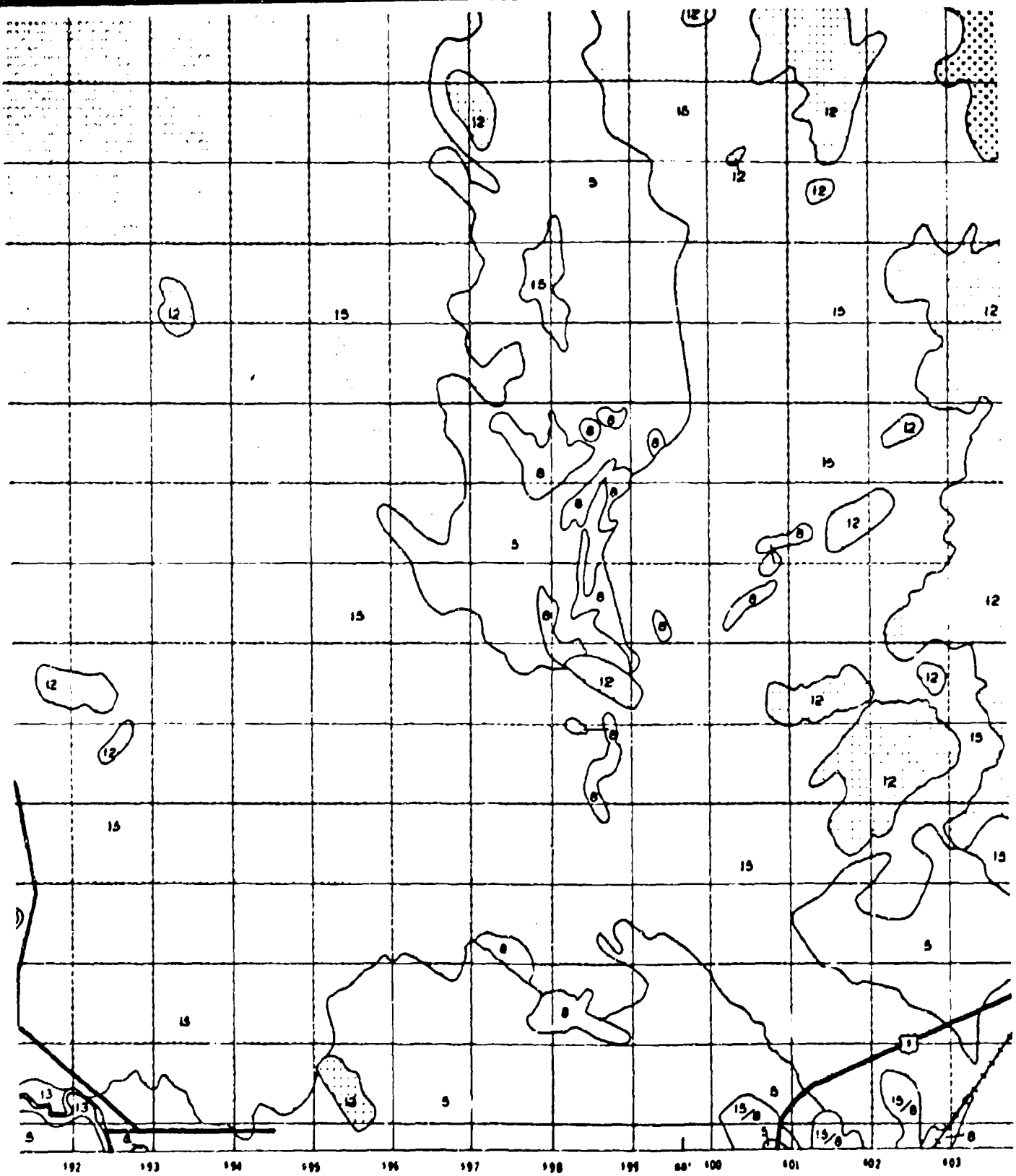
INDEX TO ADJOINING SHEETS

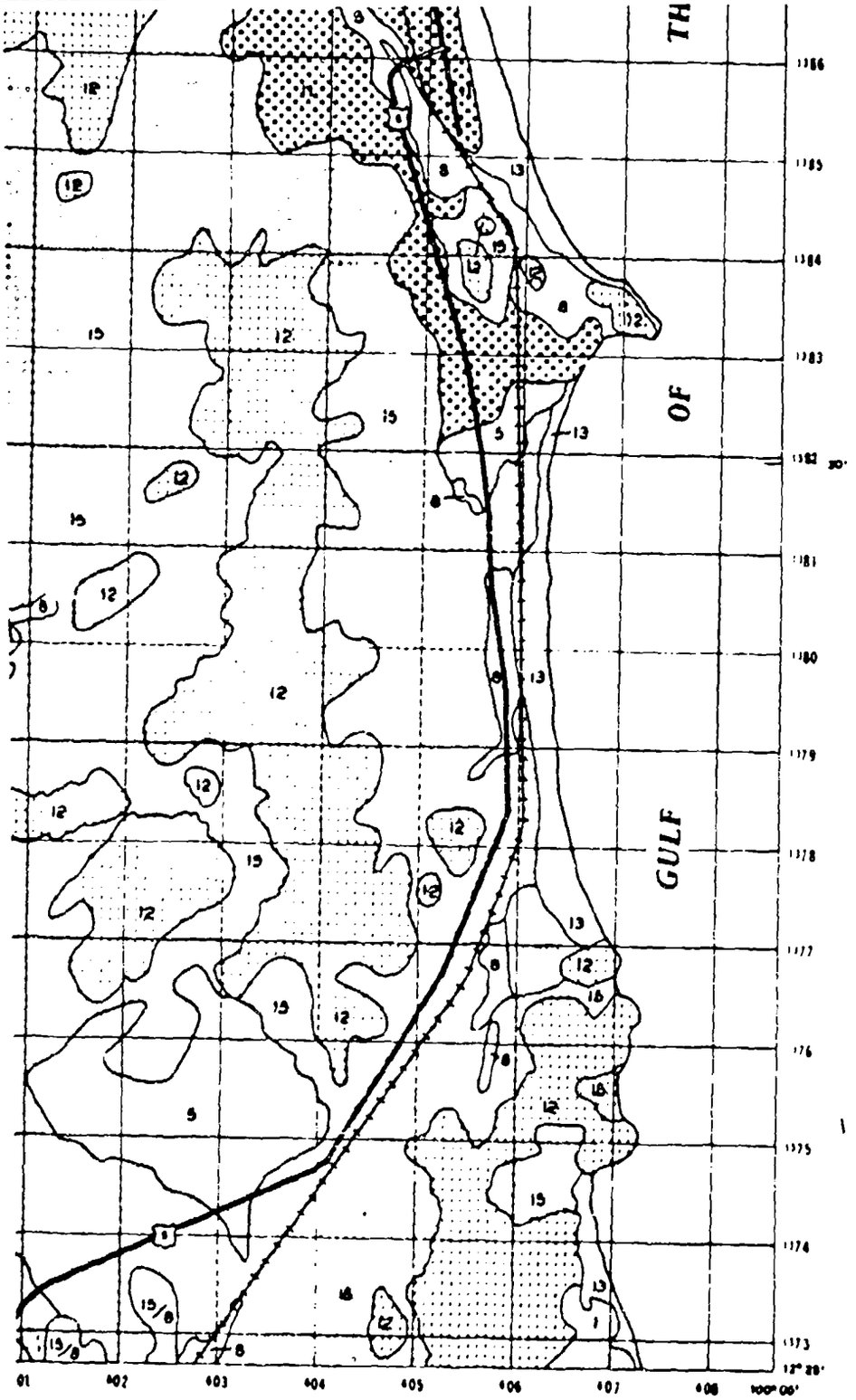




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


SCALES



Unit	Maximum Moisture PCT	Minimum Moisture PCT	Maximum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	
1	10-25	25-60	0-1	0-0.07	0-10	1
2	25-60	60-100	0-1	0-0.07	0-10	2
3	25-60*	60-100	0-1	0-0.07	10-20	3
4	25-60	>100	0-1	0-0.07	0-10	0
5	25-60*	>100	0-1	0-0.07	10-20	0
6	60-100	60-100	0-1	0-0.07	0-10	2
7	60-100	60-100	0-1	0-0.07	10-20	3
8	60-100	>100	0-1	0-0.07	0-10	0
9	60-100	>100	0-1	0-0.07	0-10	0
10	60-100	>100	0-1	0-0.07	10-20	0
11	60-100*	>100	0-1	0-0.07	10-20	0
12	>100	>100	0-1	0-0.07	0-10	0
13	>100	>100	0-1	0-0.07	10-20	0
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0

Notes: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probabili strengths commonly observed are 60-100 for Units 3 a

Units do not occur on this map.

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PB III

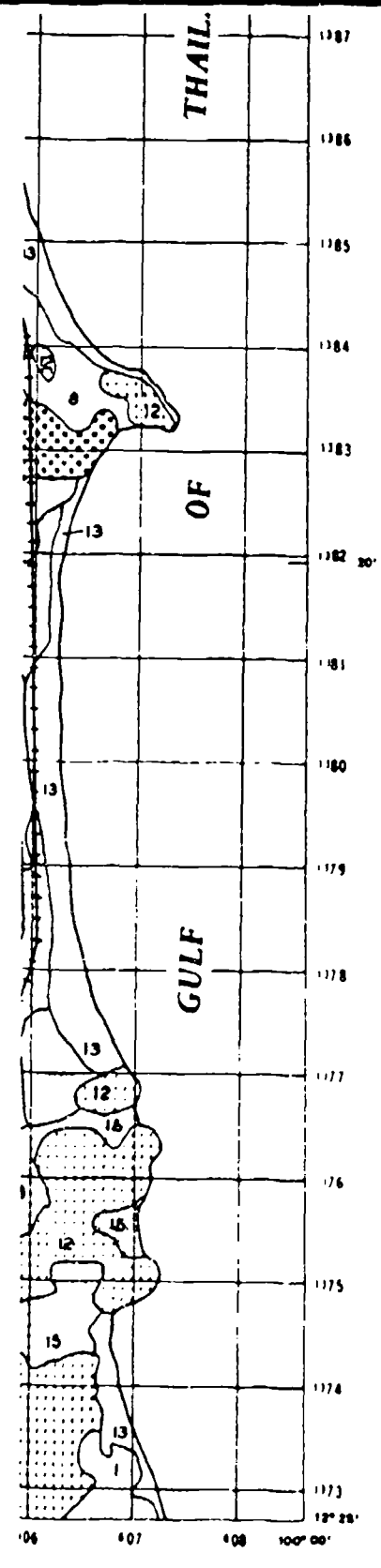
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LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{up} psi	c_{up} kg/cm²	ϕ_{up} deg	Soil Surface Strength: Minimum Moisture c_{up} psi	c_{up} kg/cm²	ϕ_{up} deg	Conditions where maximum c_{up} occurs: c_{up} psi	c_{up} kg/cm²	ϕ_{up} deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
⊠	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
9	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
⊠	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
12	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
18	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
15	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
⊠	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
13	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Black areas are water bodies.

c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 9; more than 100 for Unit 13.

⊠ Units do not occur on this map.

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PB II
PB III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

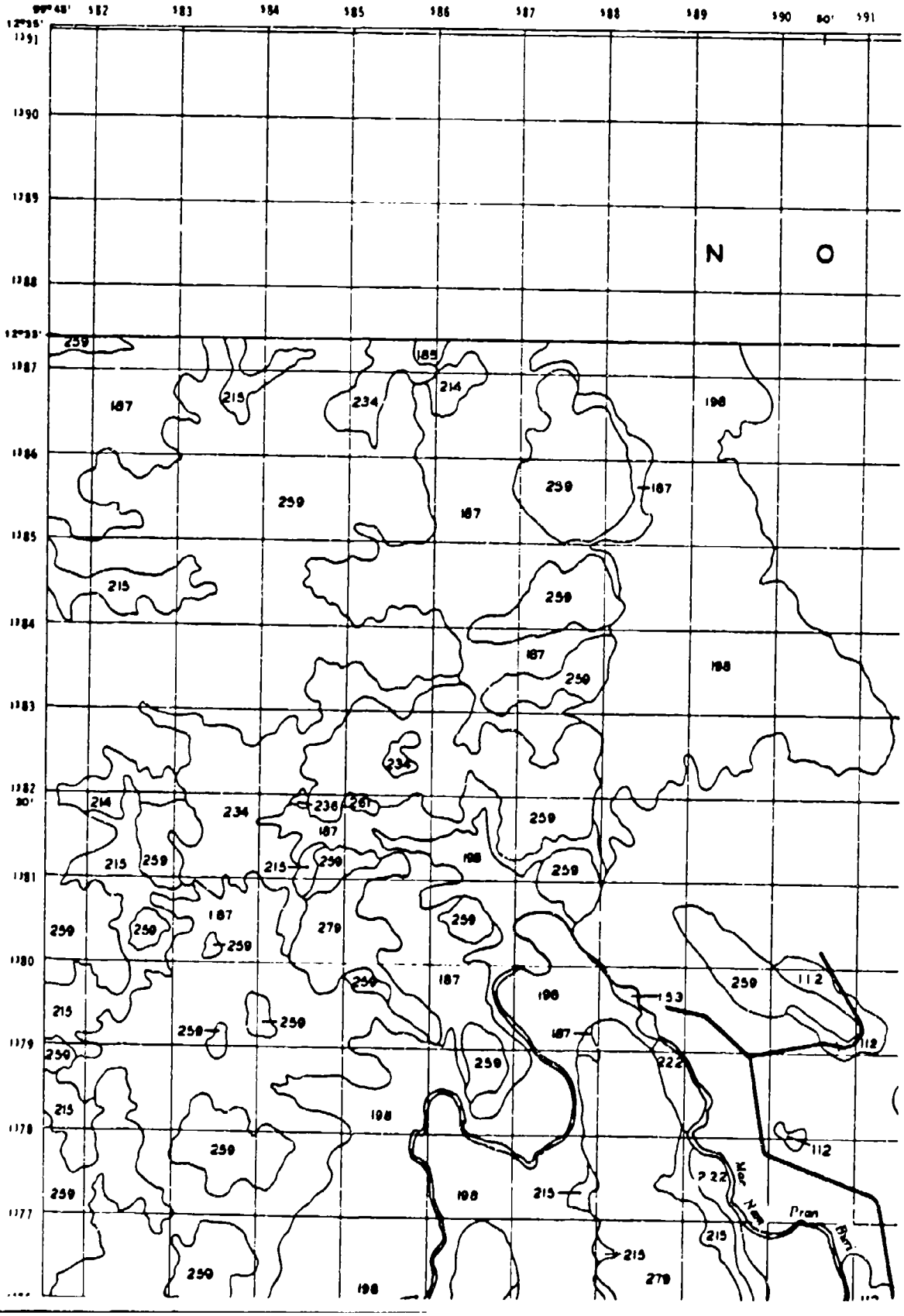
SURFACE COMPOSITION

PRAN BURI STUDY AREA

SHEET PB I

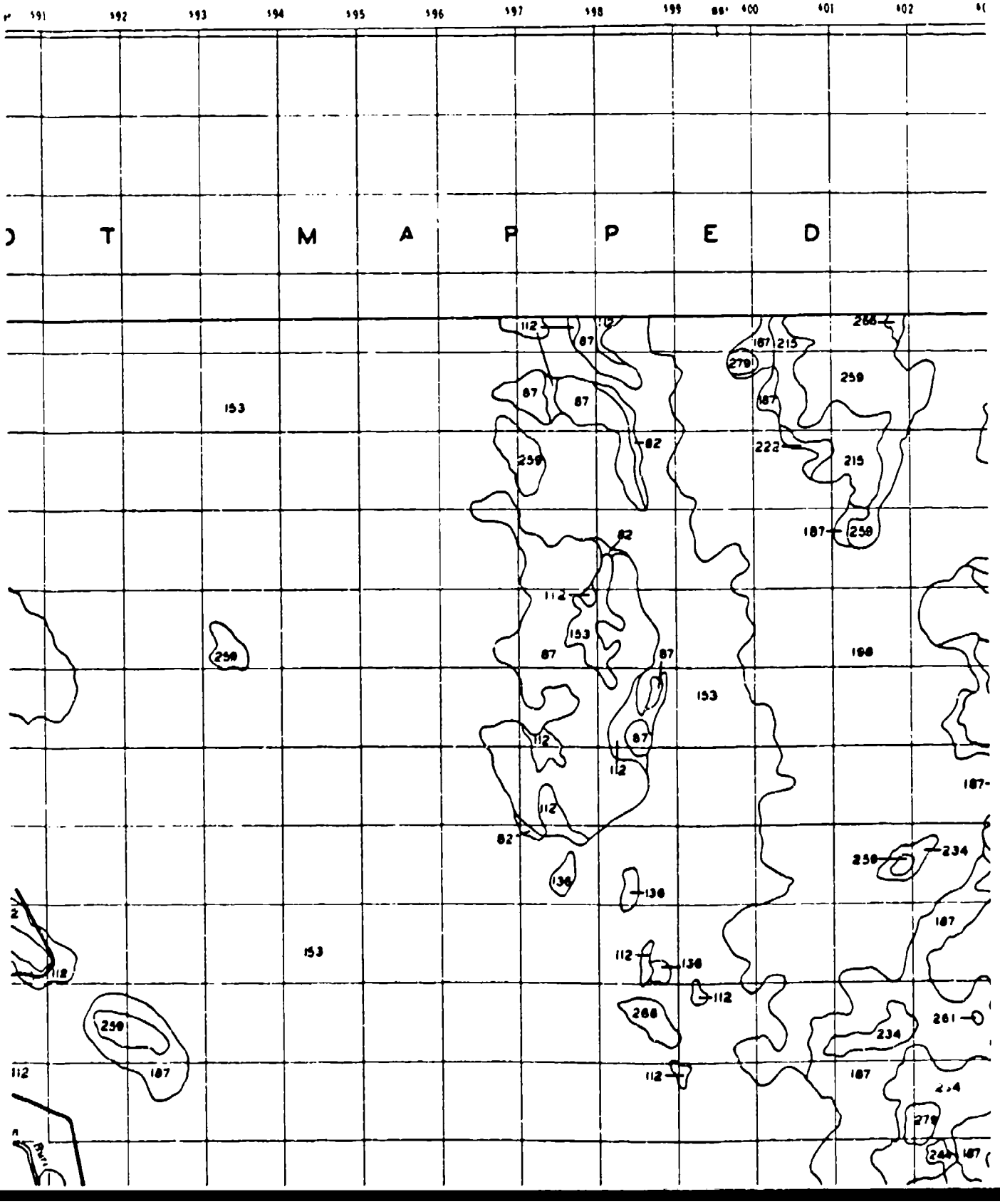
8

PLATE 4.1a


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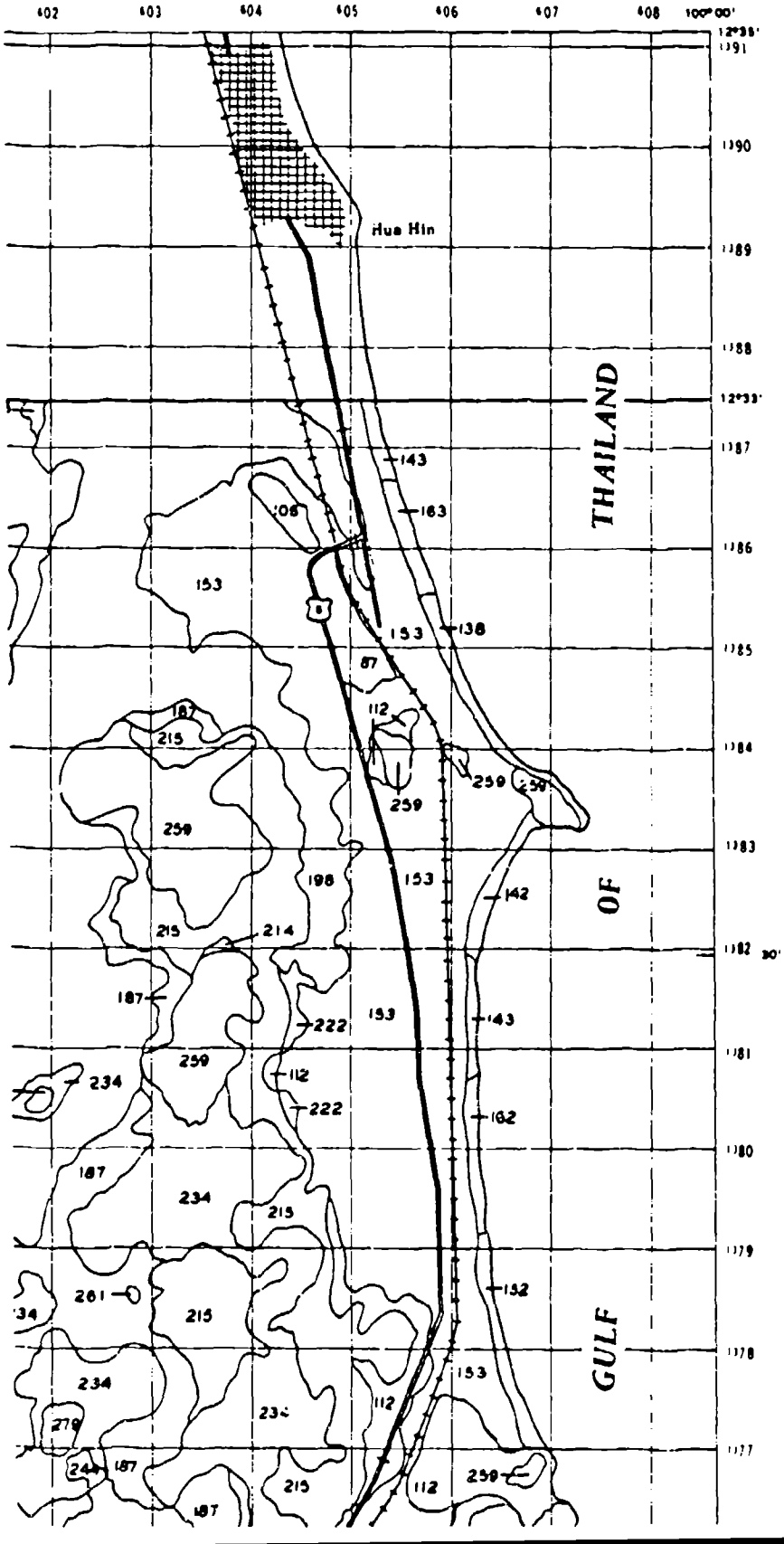
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PRAN BURI

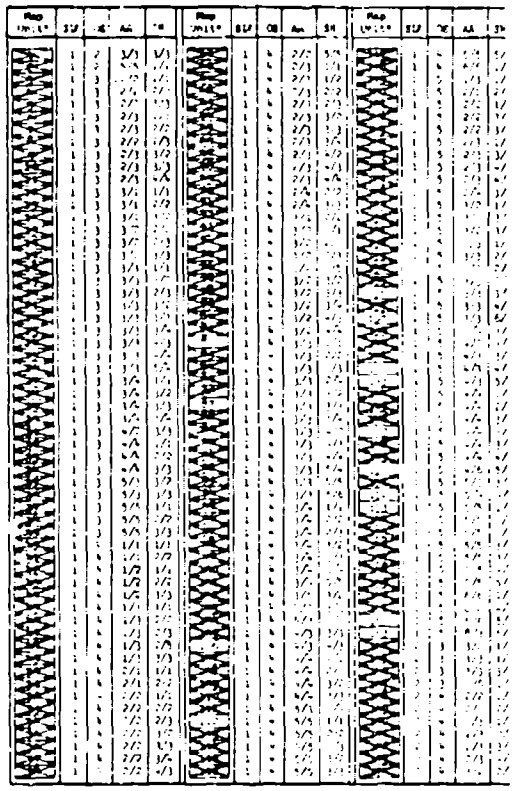

T M A P P E D
391 392 393 394 395 396 397 398 399 400 401 402
112 87 87 153 82 259 187 215 279 222 258 234 136 268 244

13

SHEET PB I



LEGEND



Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1/1, 3/1, 1/3, 3/3) below), vertical obstacle spacing (S), approach angle (A), and step height were mapped. The numerator of the fraction indicates class range that wa easterly direction (i.e. azimuth from 45 to 135 deg) and the denominator > 135 to 360 deg) assuming that the vehicle intersects the obstacle at a

* Mapping class ranges of each surface geometry factor wer

Slope (SL)

Mapping Class	Range deg
1	0-1.5
2	> 1.5-4.5
3	> 4.5-9
4	> 9-18
5	> 18-30
6	> 30-45
7	> 45

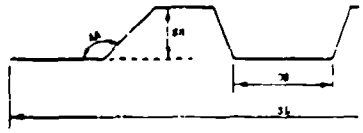
Vertical Obstacle Spacing (VS)

Mapping Class	Range ft	Range m
1	0-7	0-2.13
2	> 7-12	> 2.13-3.66
3	> 12-90	> 3.66-15.24
4	> 90-150	> 15.24-45.72
5	> 150	> 45.72

Approach A

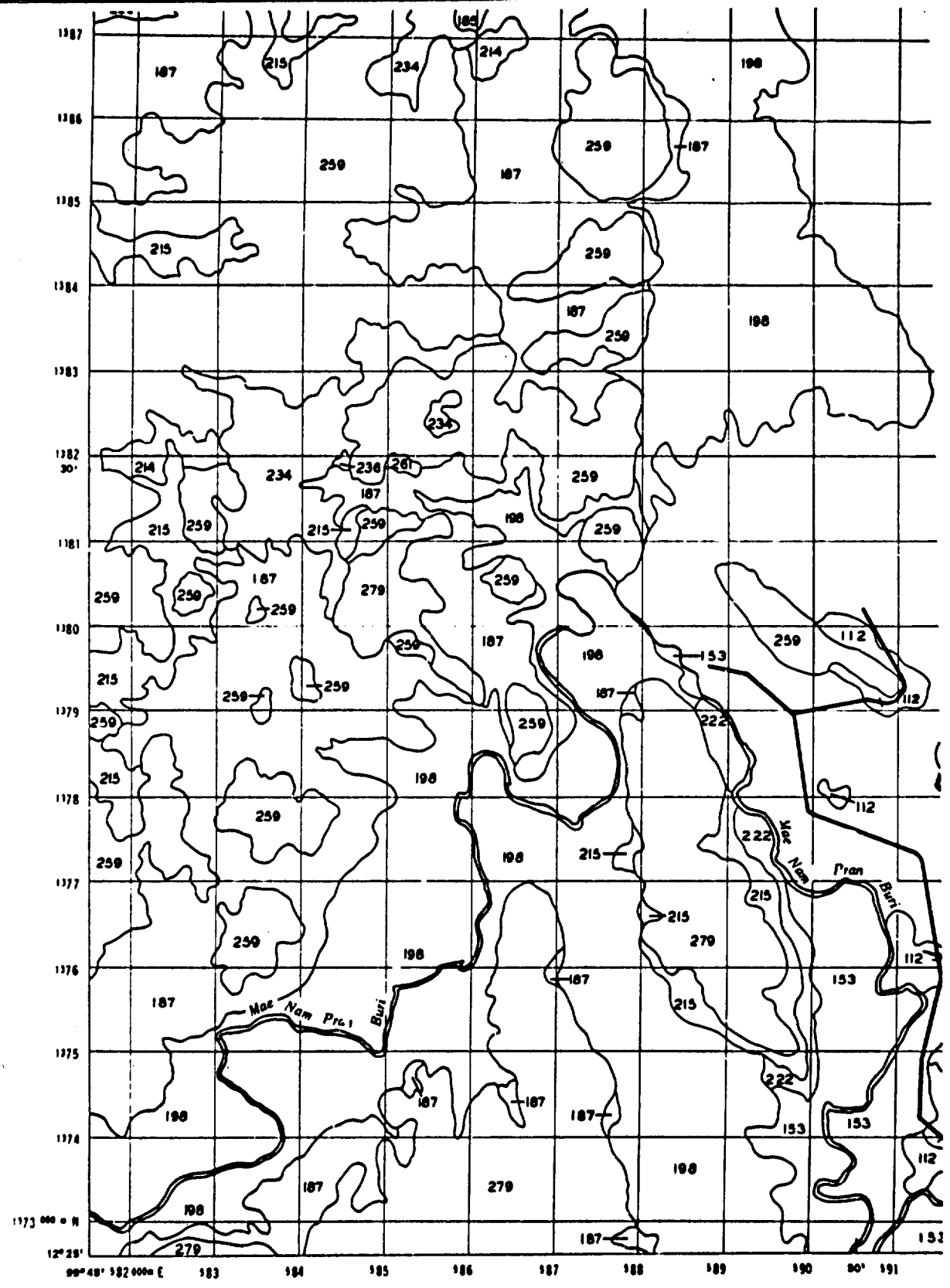
Mapping Class
1
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3
4
5
6
7

Units do not occur on this map.

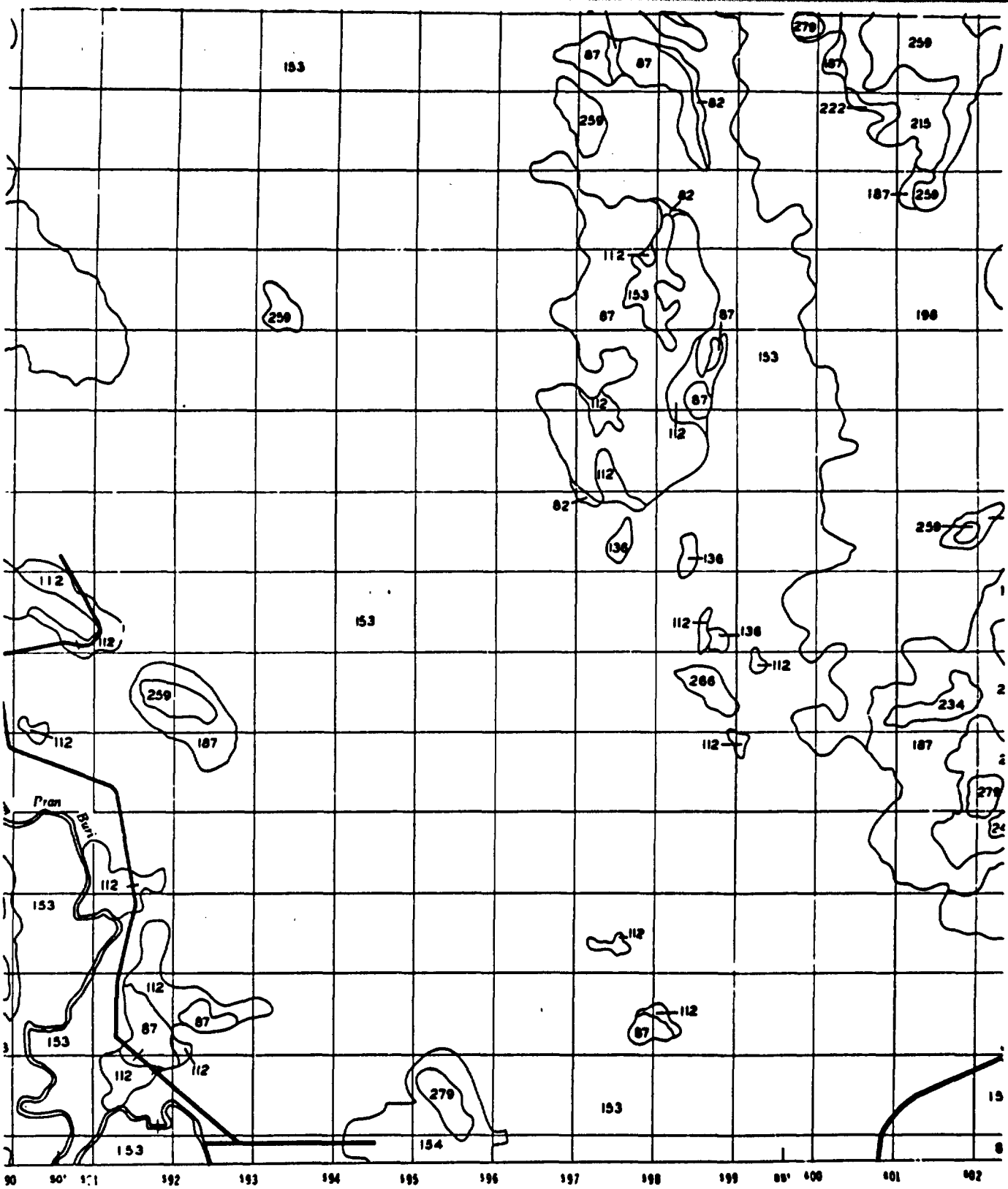


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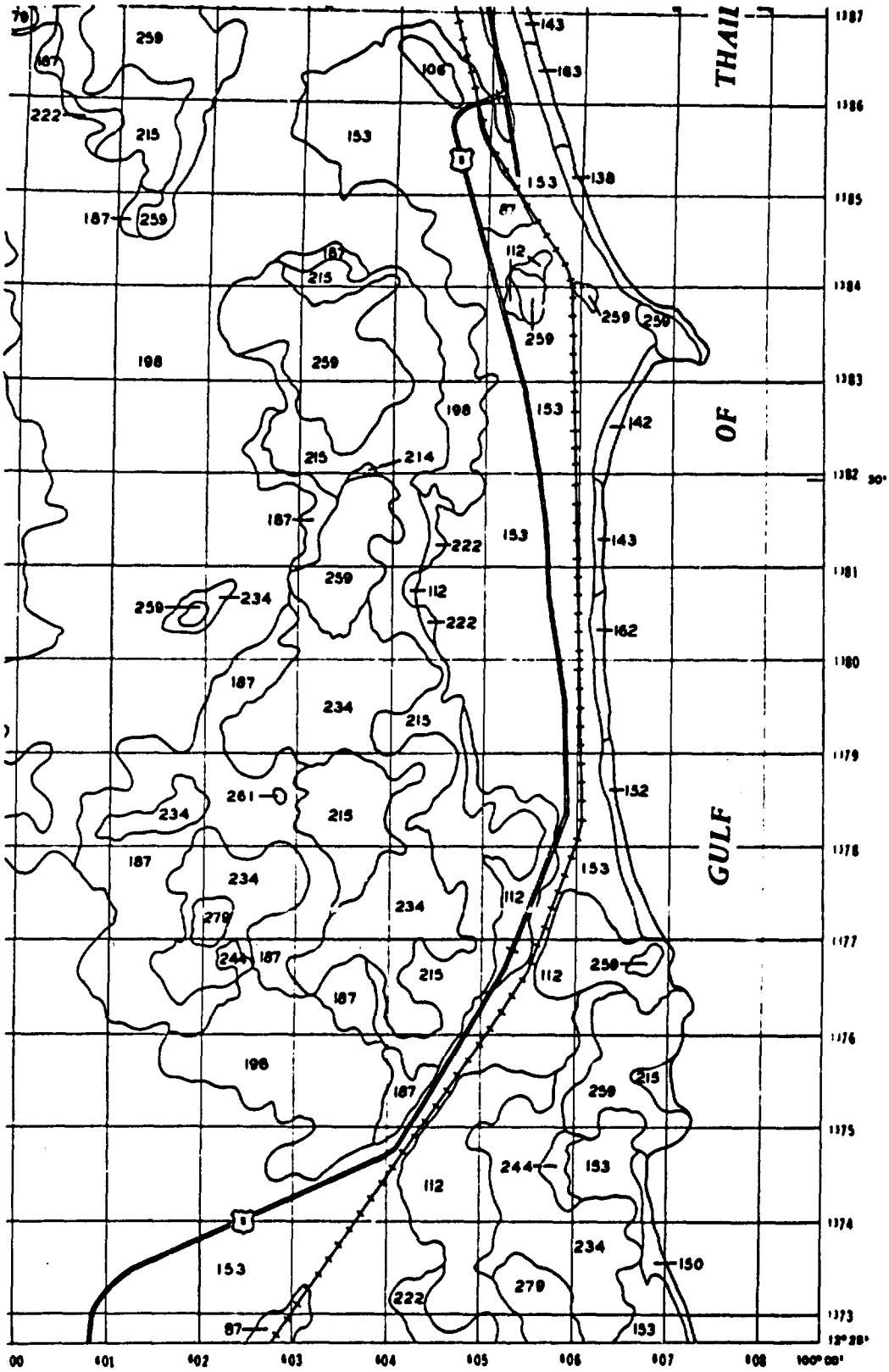
PB I

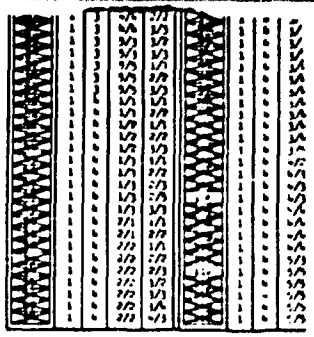


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P


153
87
87
279
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82
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112
266
234
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279
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154
SCALES

5





Note: Blank areas are water bodies.

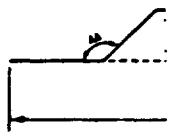
* Each map unit represents an array of [illegible] below), vertical obstacle spacing OR, slope were mapped. The numerator of the fractio easterly direction (i.e. azimuth from > 180 to 360 deg) assuming that the vehicl

* Mapping class ranges of each surface geom

Slope (SL)	
Mapping Class	Range deg
1	0-1.5
2	> 1.5-4.5
3	> 4.5-9
4	> 9-18
5	> 18-30
6	> 30-45
7	> 45

Vertical O Spacing	
Mapping Class	m
1	0-7
2	> 7-12
3	> 12-9[illegible]
4	> 9[illegible]-19[illegible]
5	> 19[illegible]

Units do not occur on this map.

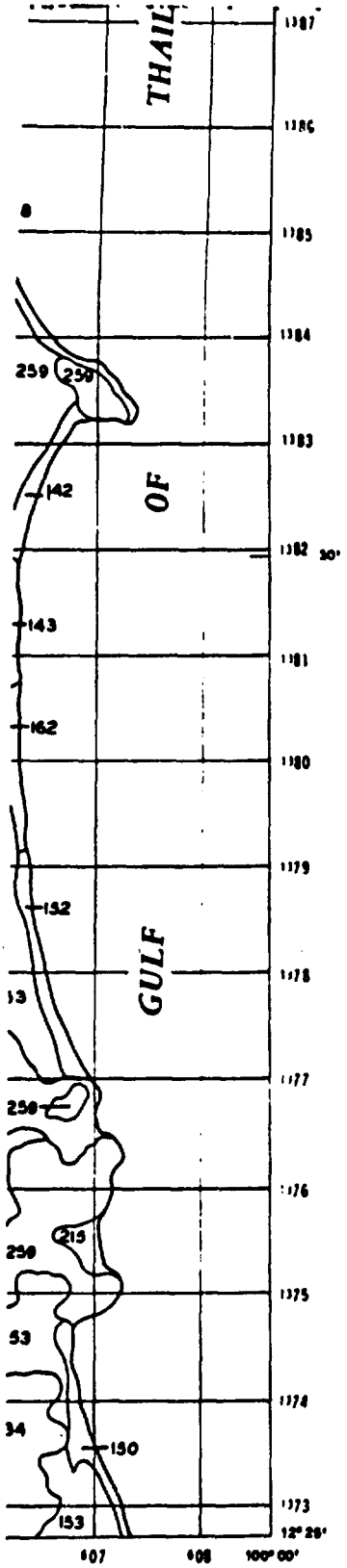


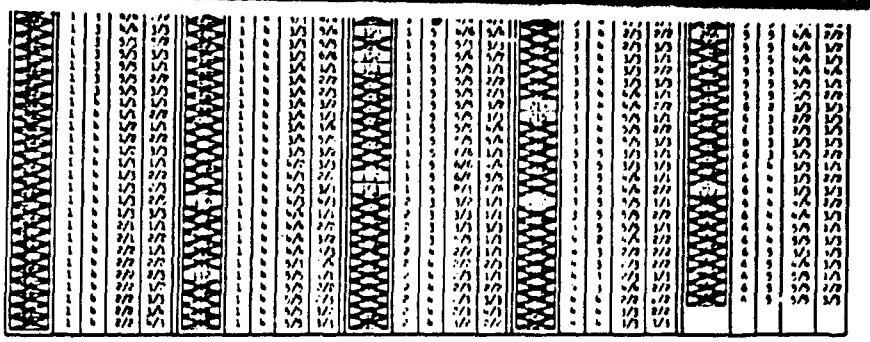
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Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 2, 1/1, 1/1) indicating mapping classes of slope SL (see diagram below), vertical obstacle spacing OS, approach angle AA, and step height SH. Fractional designations indicate that dual classes were mapped. The numerator of the fraction indicates class range that will be encountered while traversing an area in an easterly direction (i.e. azimuth from > 0 to 180 deg) and the denominator refers to a westerly direction (i.e. azimuth from > 180 to 360 deg) assuming that the vehicle traverses the obstacle at a right angle.

* Mapping class ranges of each surface geometry factor are:

Slope (SL)

Mapping Class	Range deg
1	0-1.5
2	> 1.5-4.5
3	> 4.5-9
4	> 9-15
5	> 15-30
6	> 30-45
7	> 45

Vertical Obstacle Spacing (OS)

Mapping Class	Range ft	Range m
1	0-7	[illegible]
2	> 7-12	> 2.1-3.66
3	> 12-50	> 3.66-15.24
4	> 50-150	> 15.24-45.72
5	> 150	> 45.72

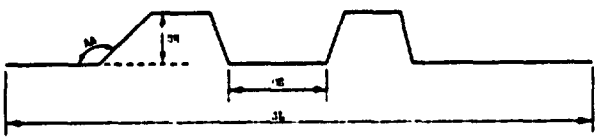
Approach Angle (AA)

Mapping Class	Range deg
1	< 1/0
2	1/0 - 1/5
3	1/5 - 1/9
4	1/9 - 1/15
5	1/15 - 1/30
6	1/30 - 1/45
7	1/45 - 1/60
8	1/60 - 1/90
9	≥ 1/90

Step Height (SH)

Mapping Class	Range in	Range cm
1	0-6	0-15.24
2	> 6-12	> 15.24-30.48
3	> 12-24	> 30.48-60.96
4	> 24-48	> 60.96-121.92
5	> 48-96	> 121.92-243.84
6	> 96-192	> 243.84-487.68
7	> 192-384	> 487.68-975.36
8	> 384	> 975.36

White do not occur on this map.



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PB I
PB II
PB III

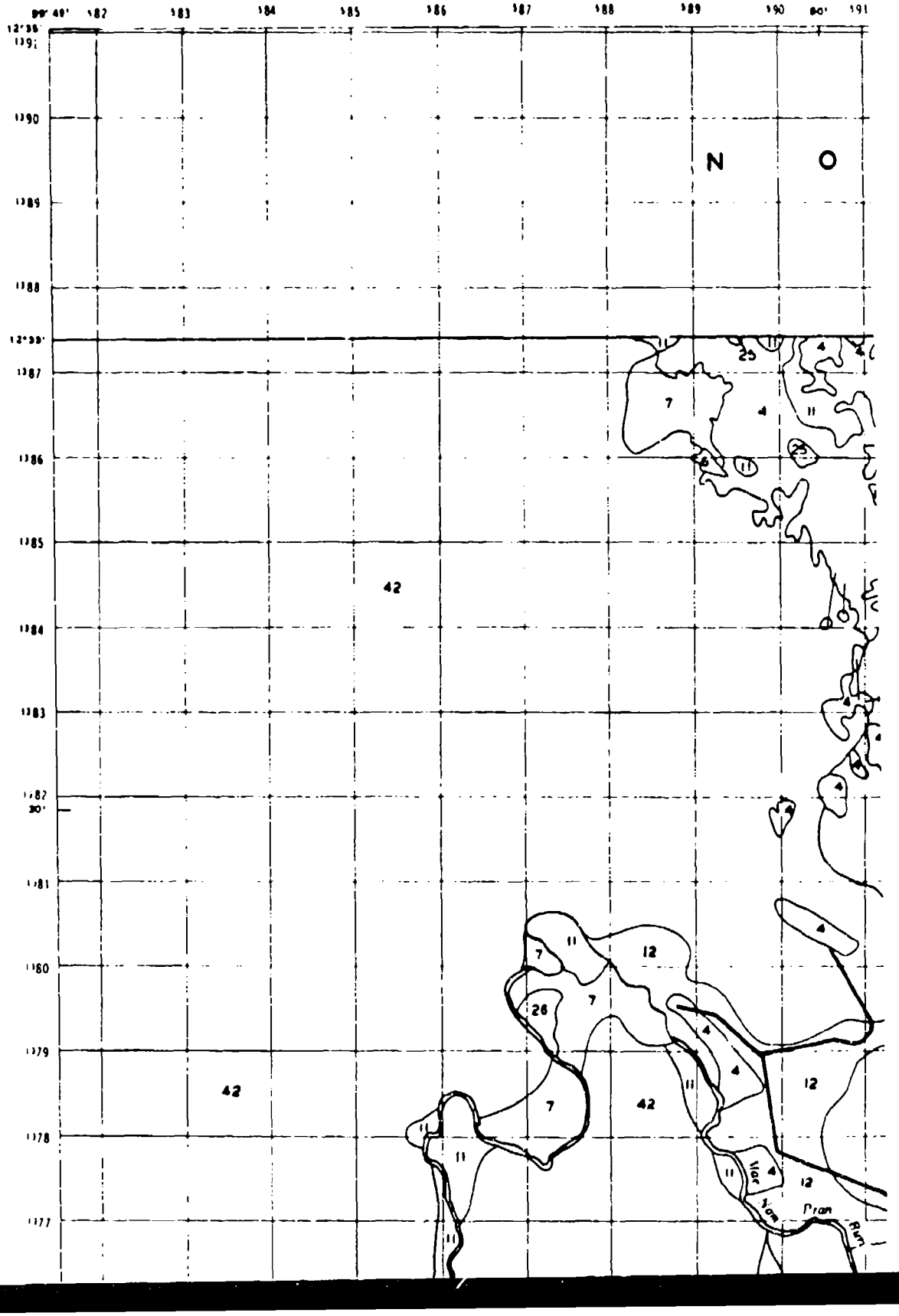
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

PRAN BURI STUDY AREA

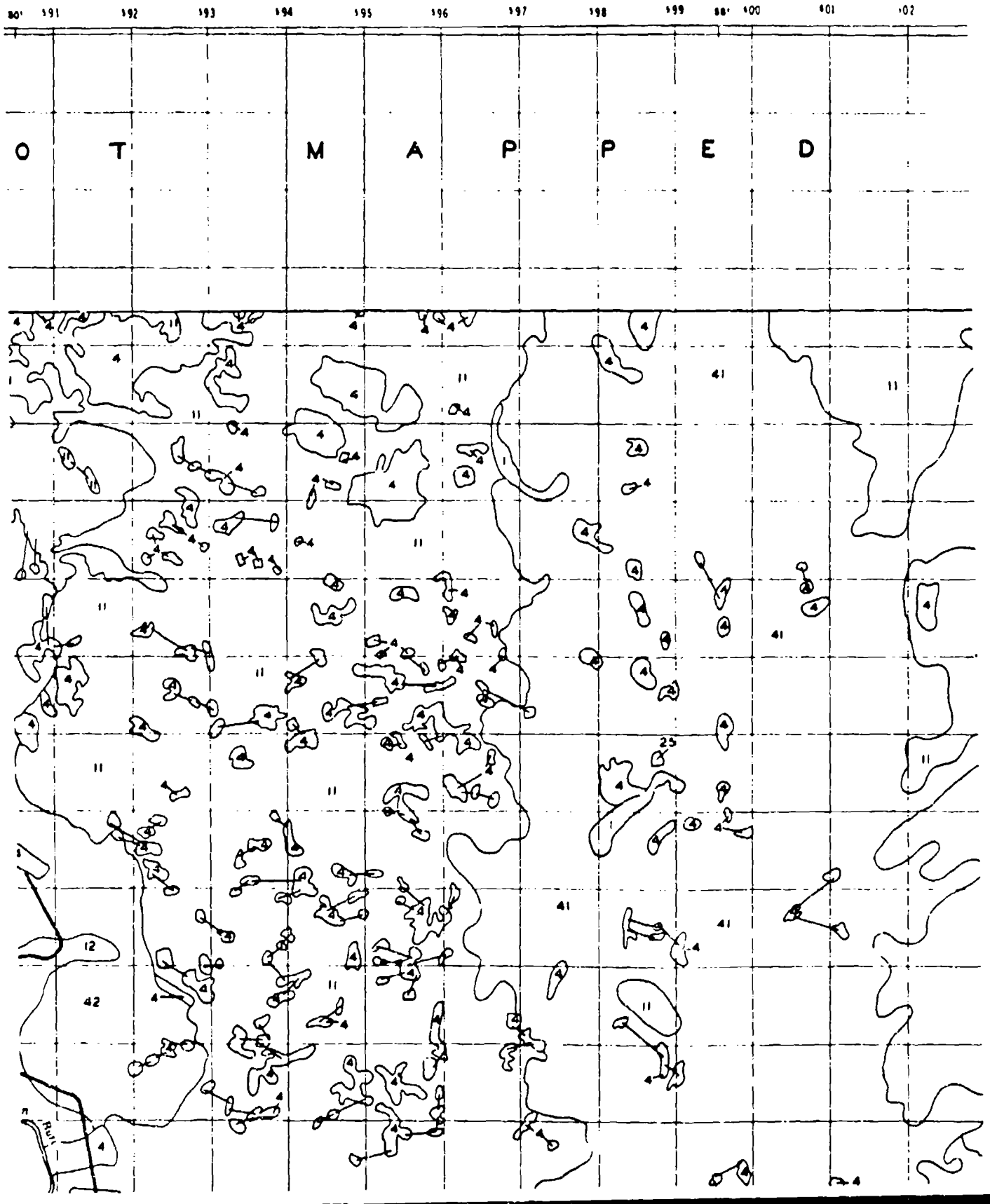
SHEET PB I

PLATE 4.1b


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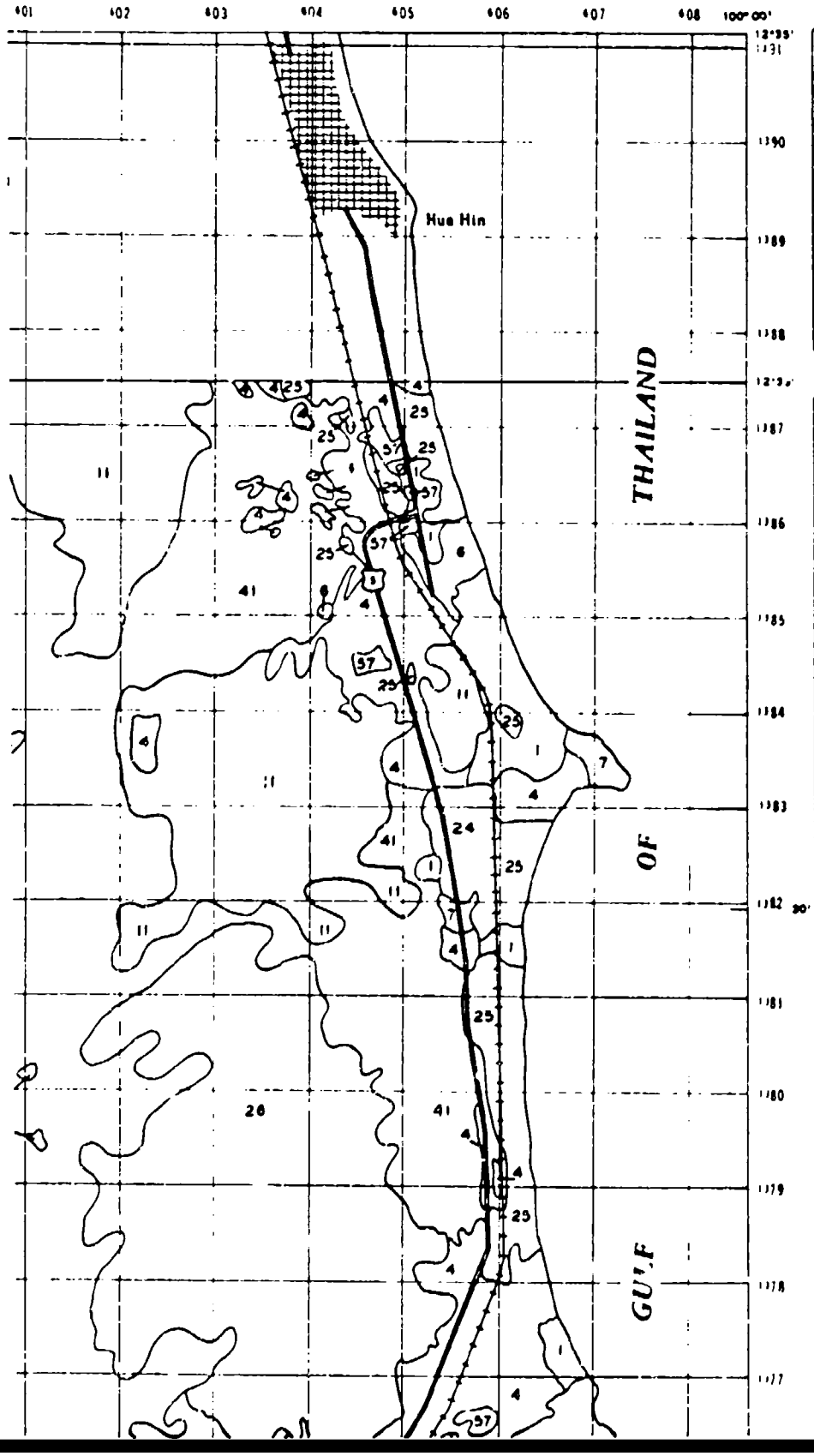
2

PRAN BURI


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88°
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202
Pran Buri

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SHEET PB 1



LEGEN

Arrays of Spacing Classes for St

Map Unit*	S 2 in. (5.08 cm)†	S 5 in. (12.7 cm)	S 9 in. (22.86 cm)	S 50 in. (127.00 cm)
	1	1	1	1
	2	2	2	2
	3	3	3	3
			2	2
			2	2
			3	3
			3	3
			3	3

SHEET PB 7

LEGEND

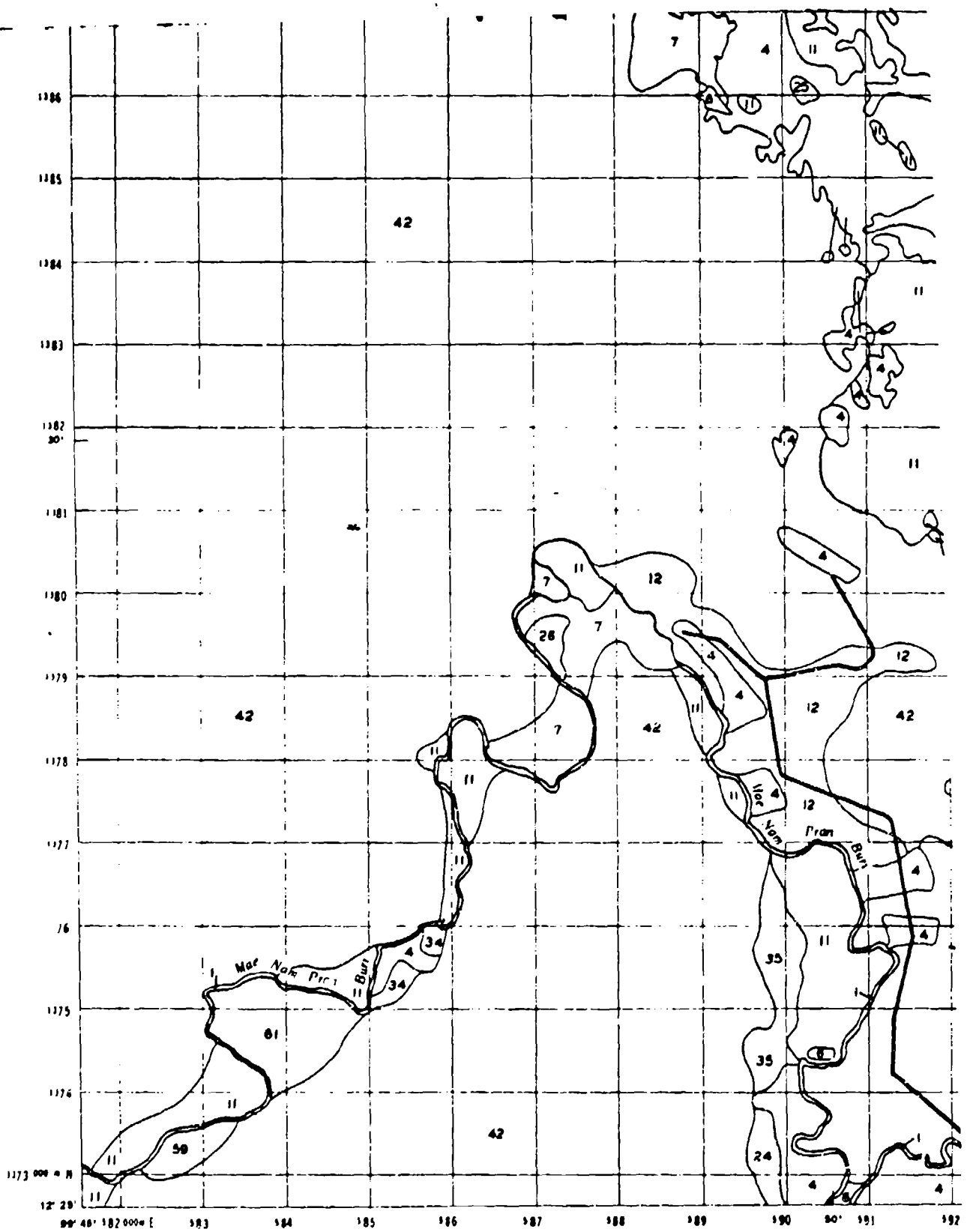
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OF

GULF

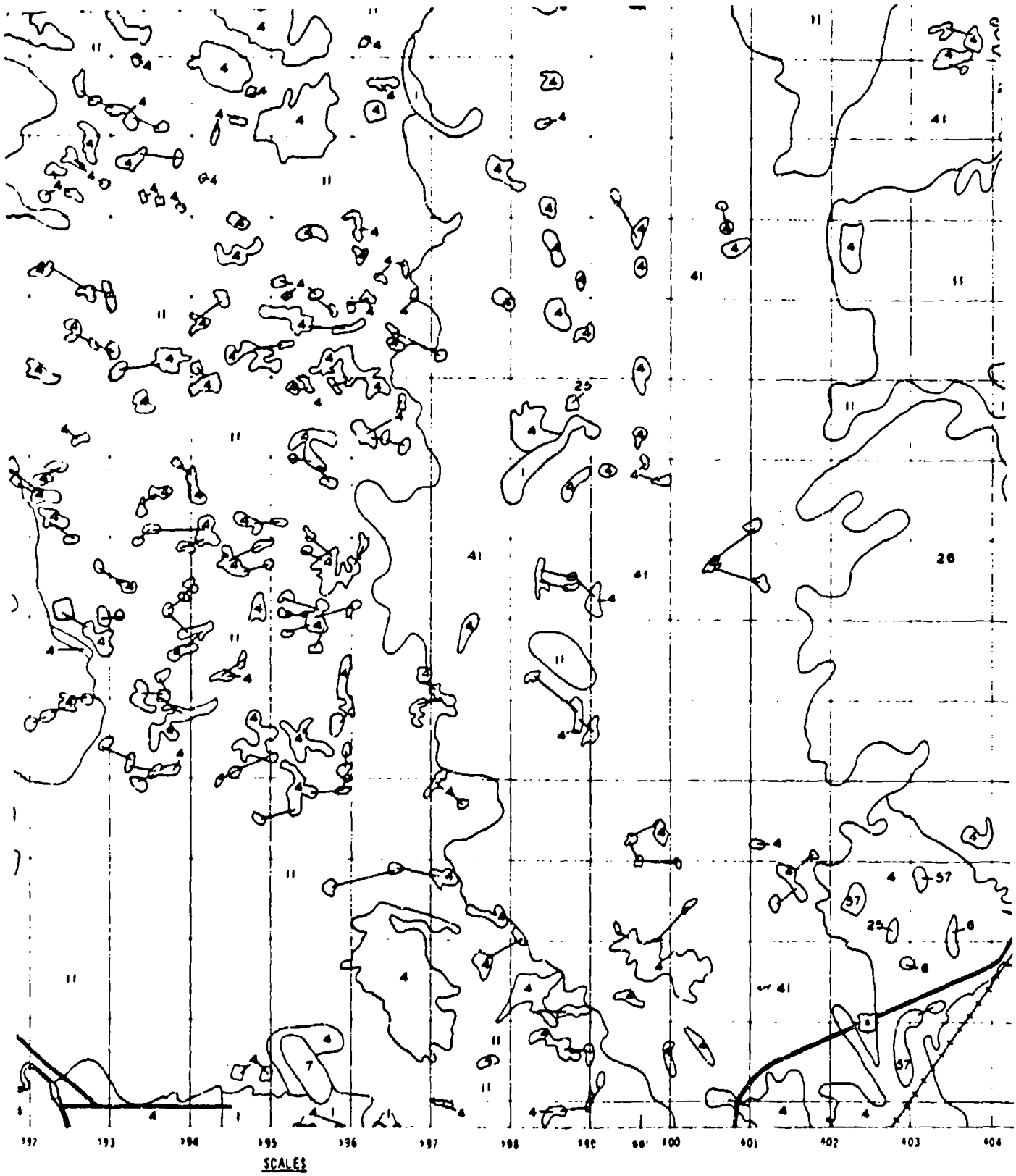
PB I

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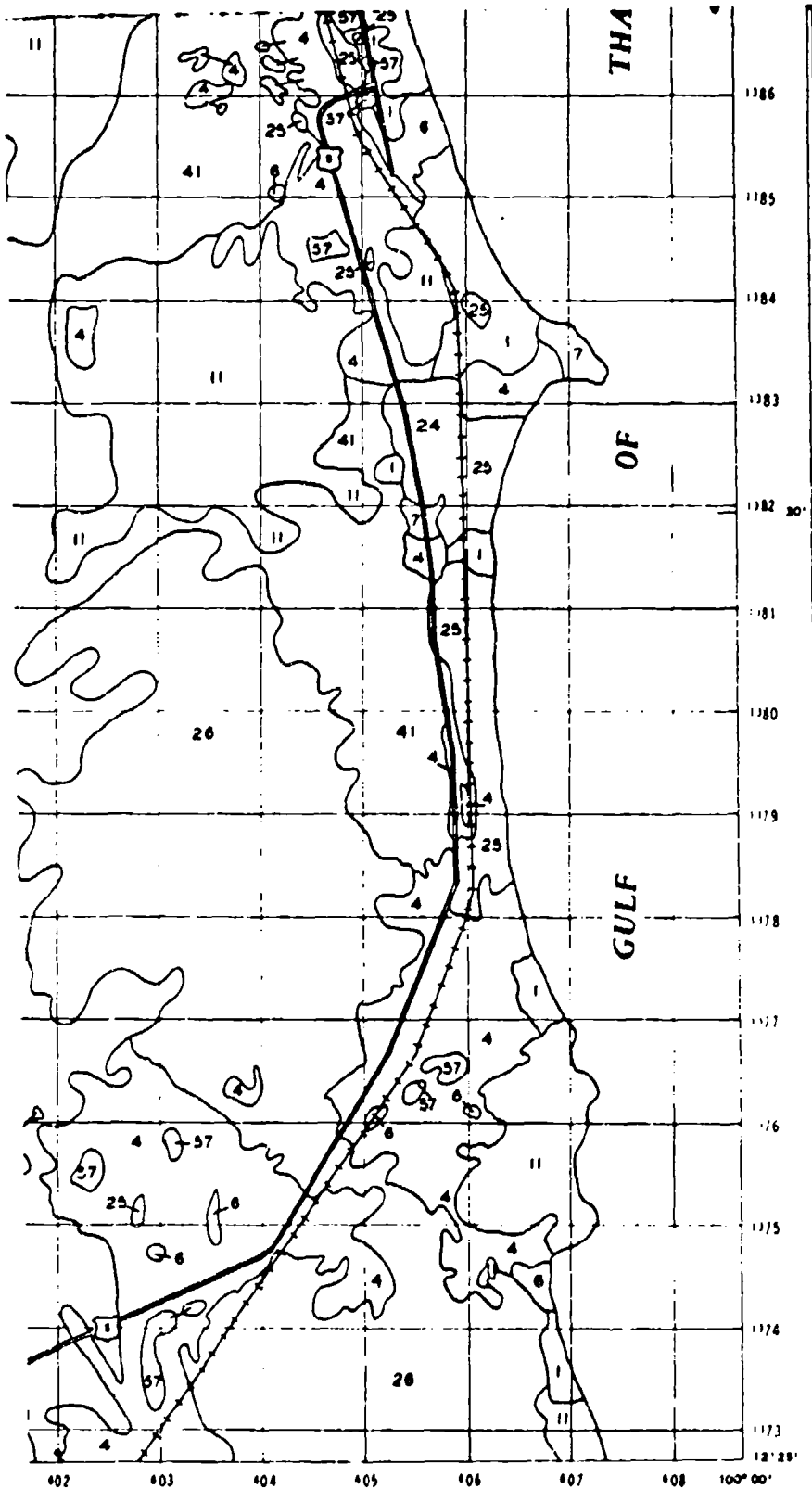


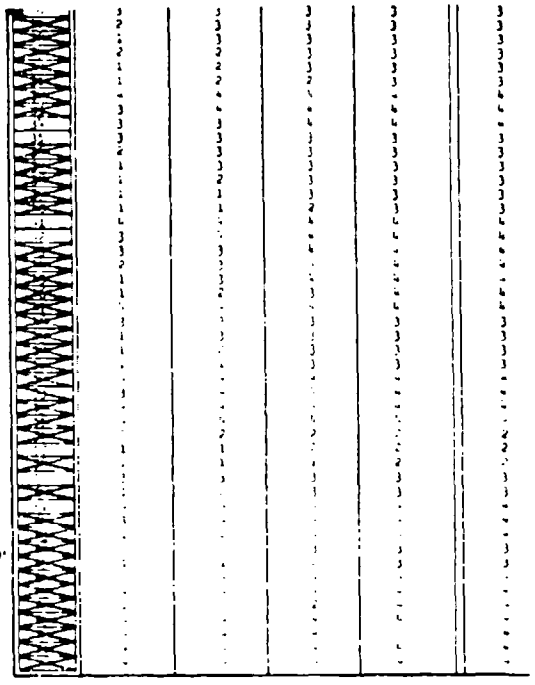
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GRID ZONE DESIGNATION: 47 P

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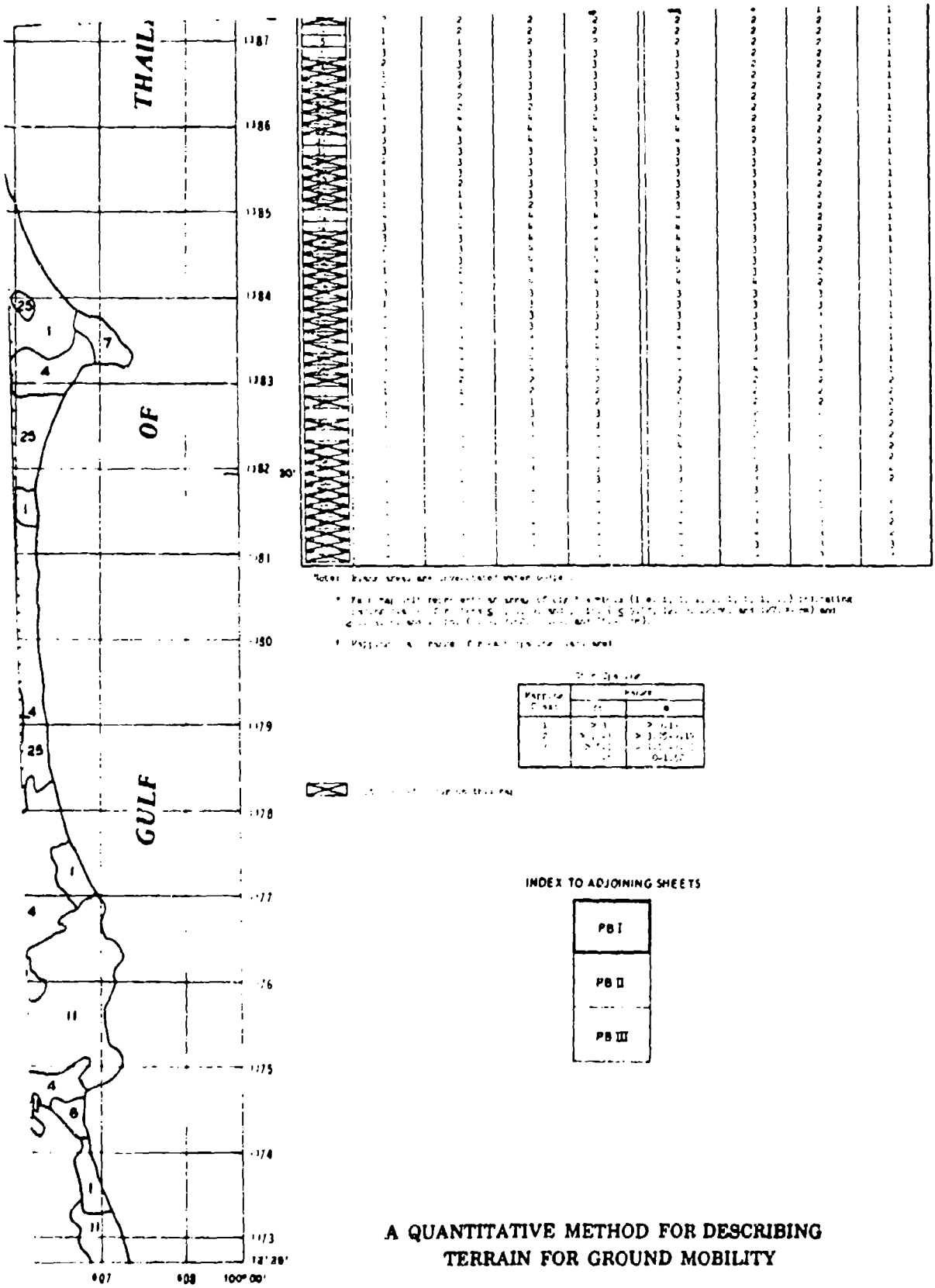
A QUANTITATIVE METHOD FOR I
TERRAIN FOR GROUND MO

VEGETATION

PRAN BURI STUDY A

SHEET PB I

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A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

VEGETATION

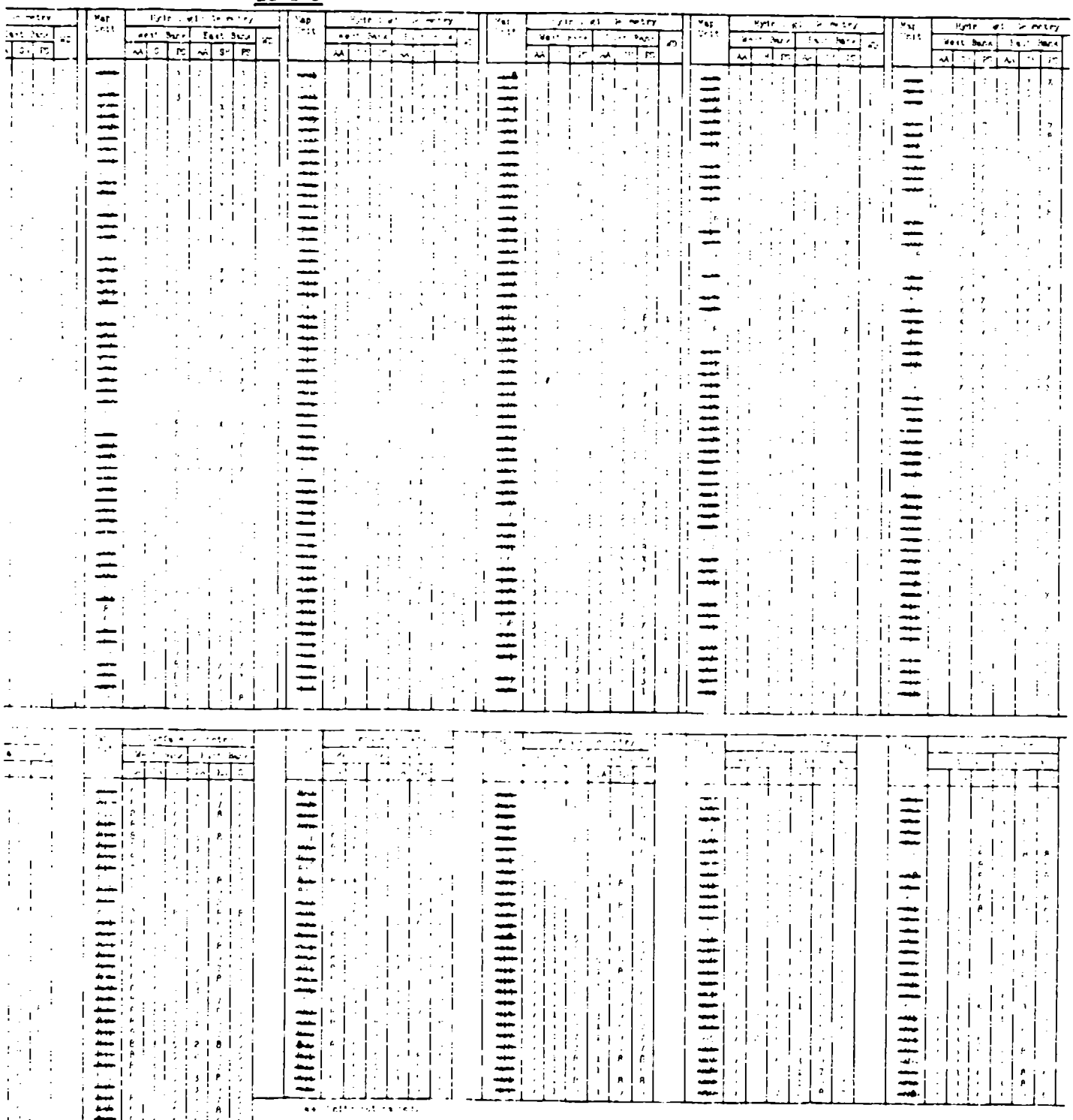
PRAN BURI STUDY AREA

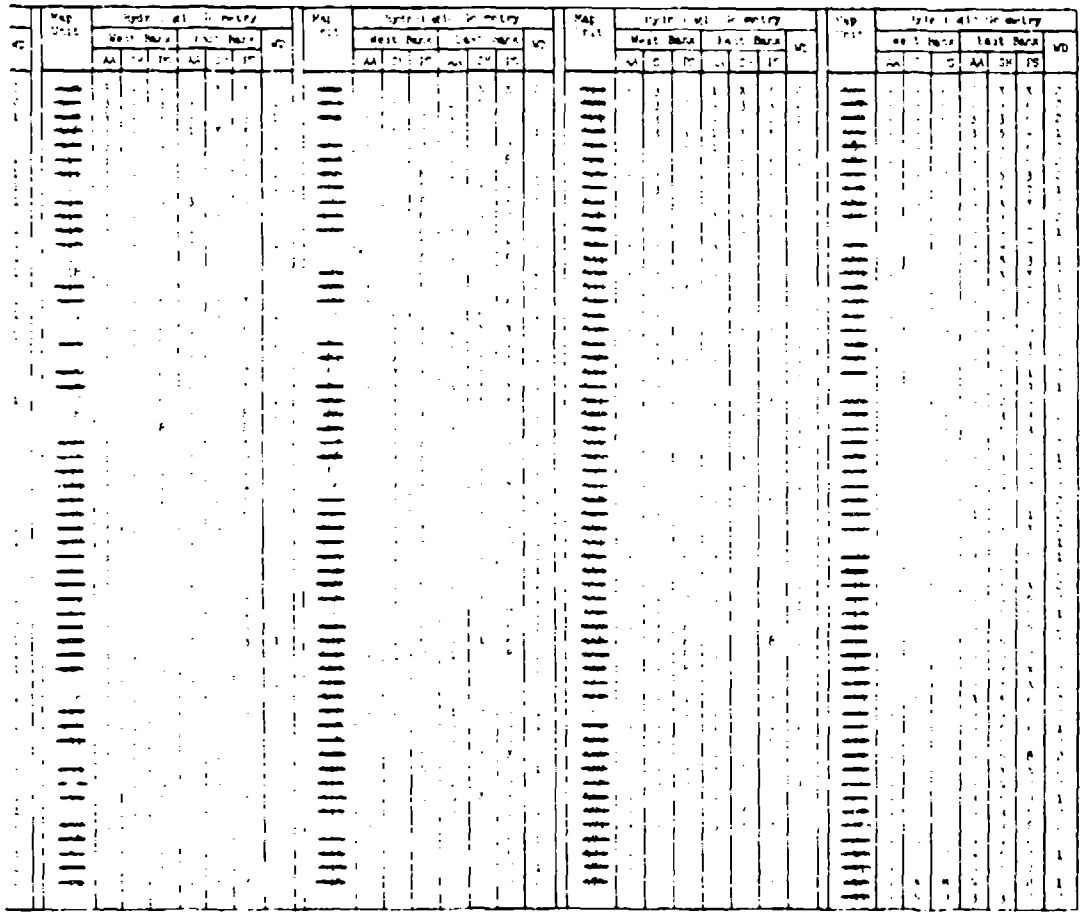
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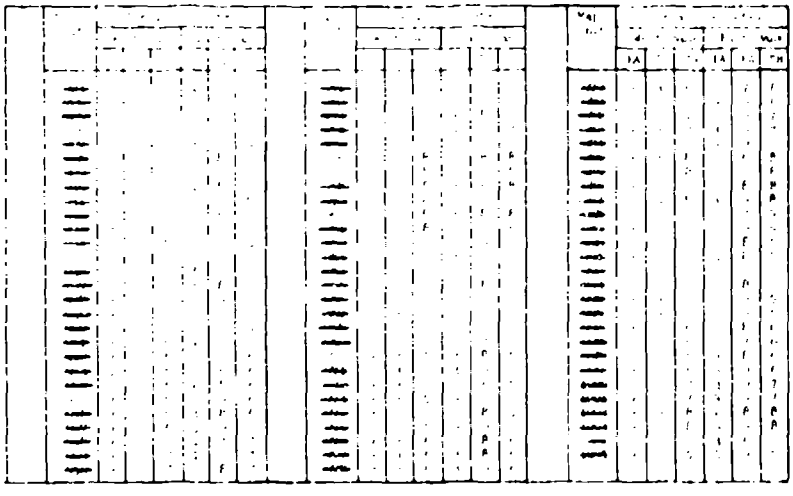
PLATE 4.1c

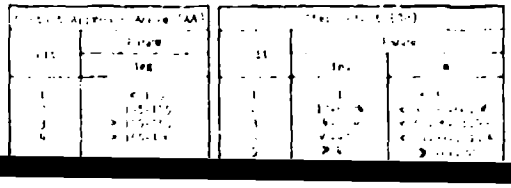
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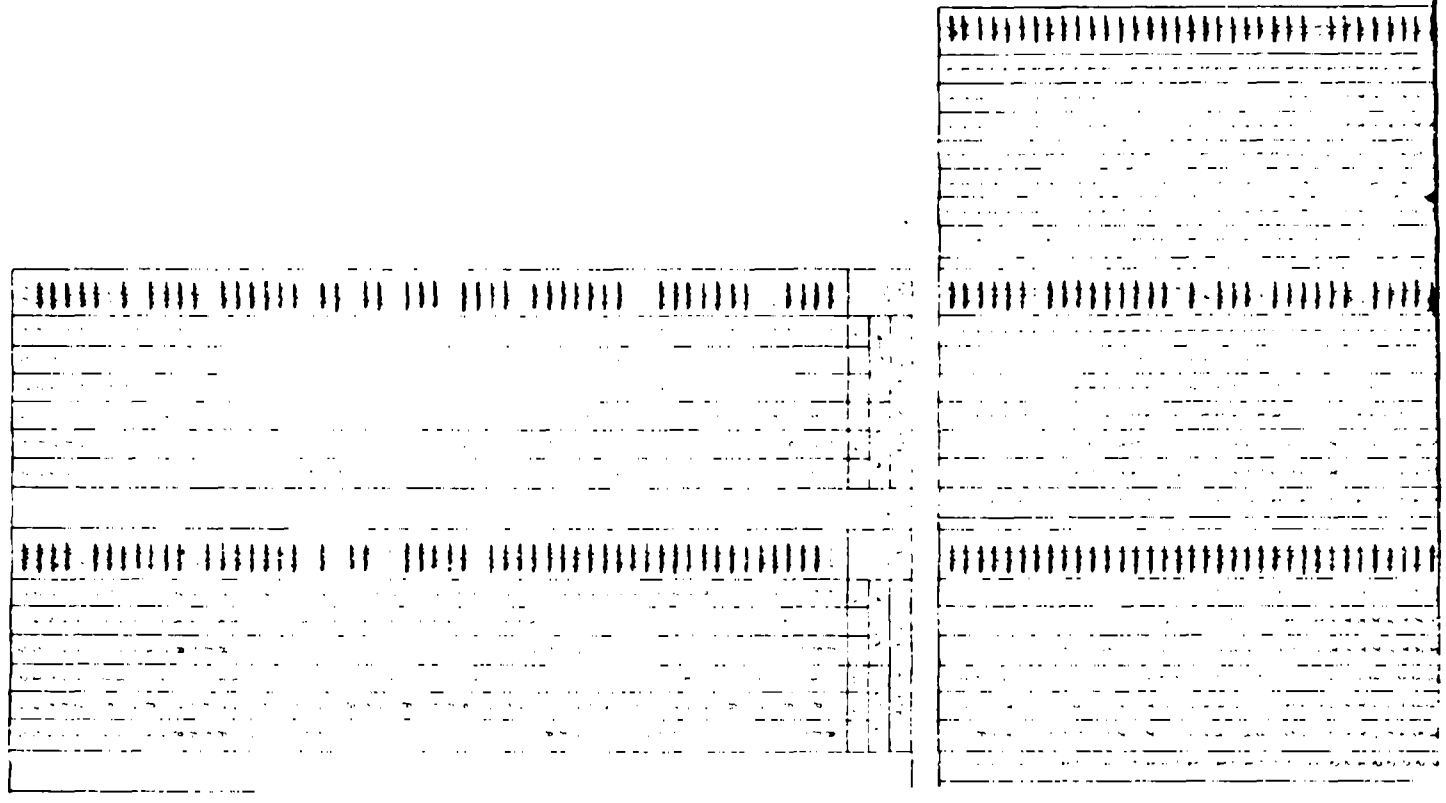
LEGEND

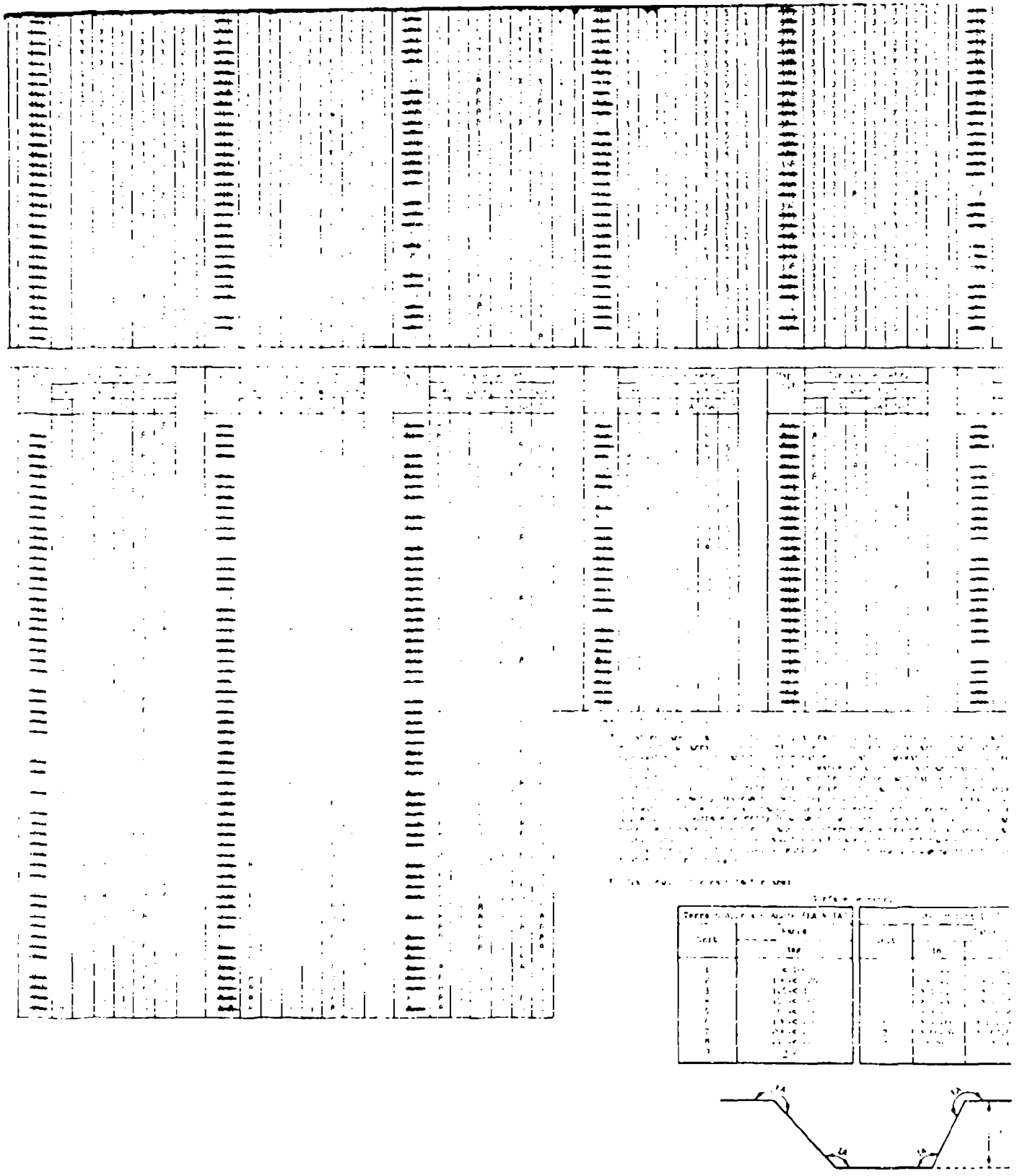


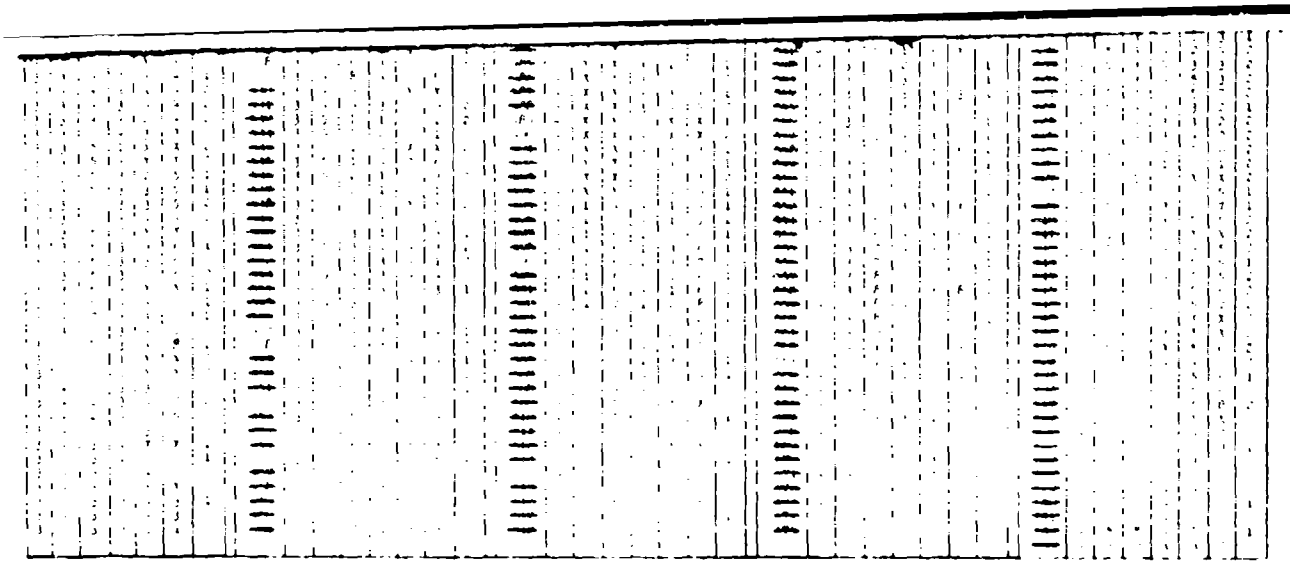


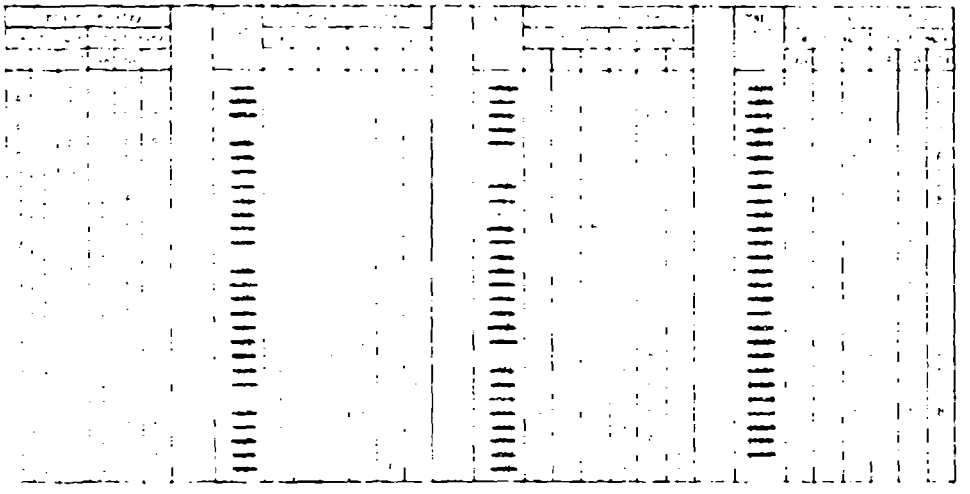




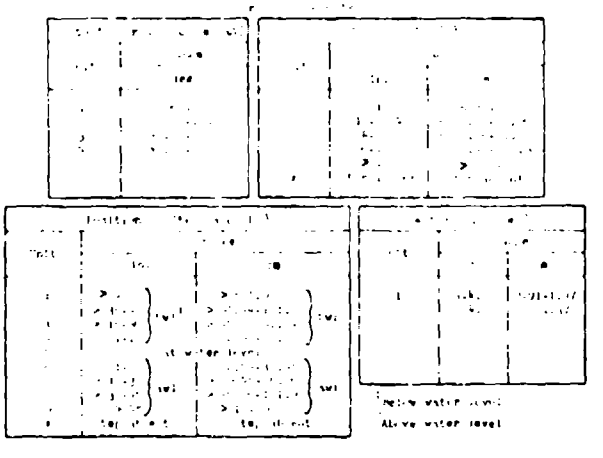


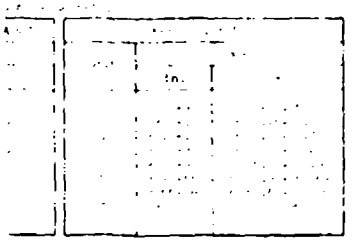


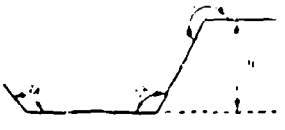


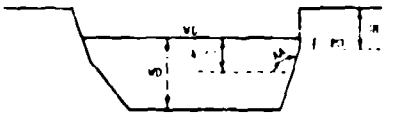


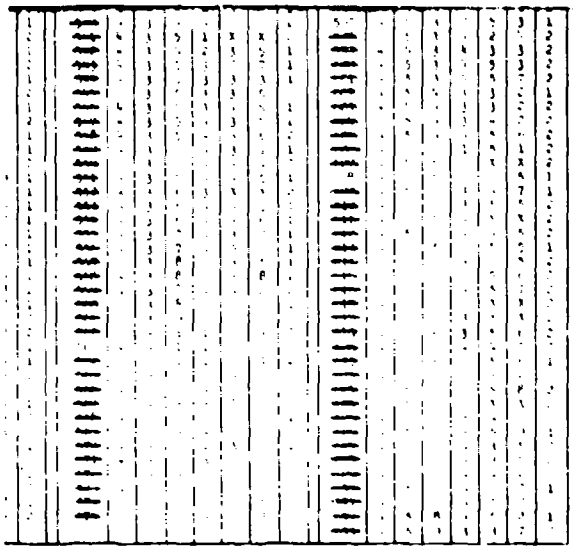


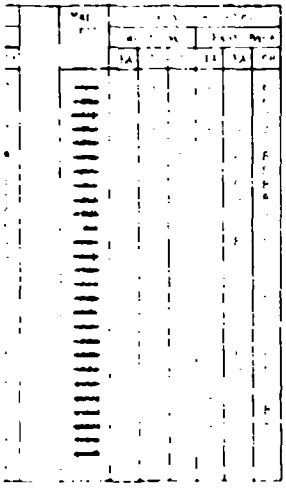

Below water level
Above water level

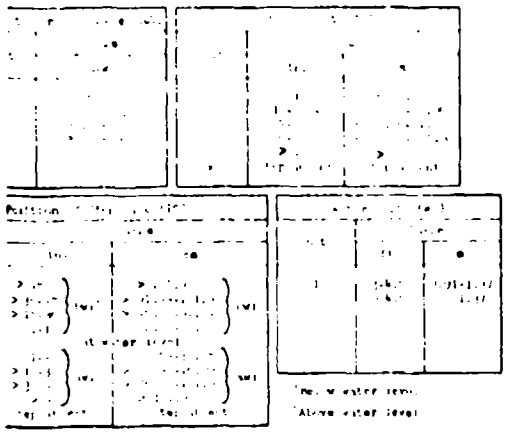


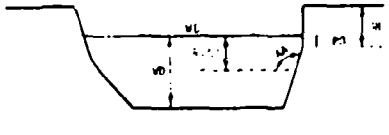


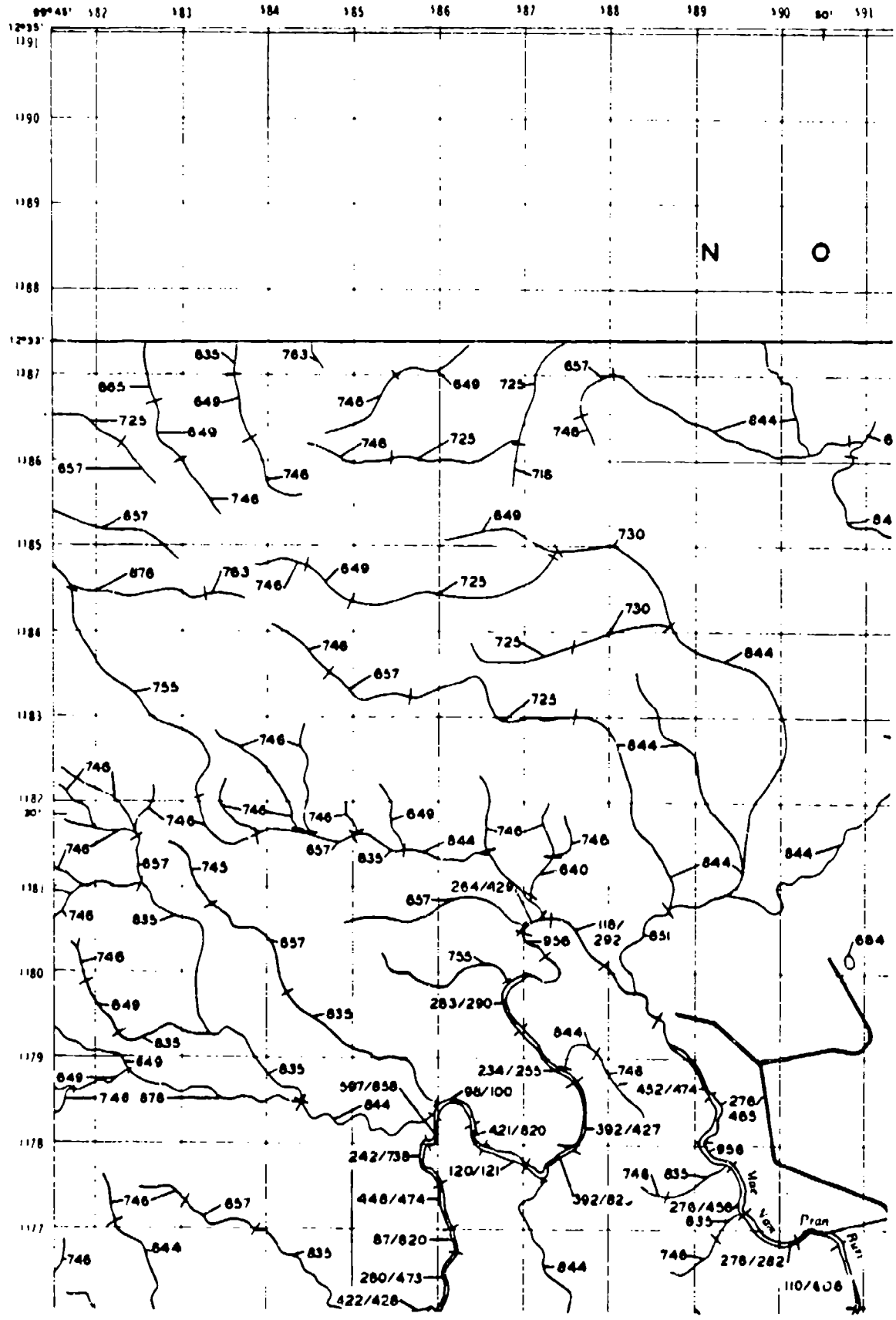






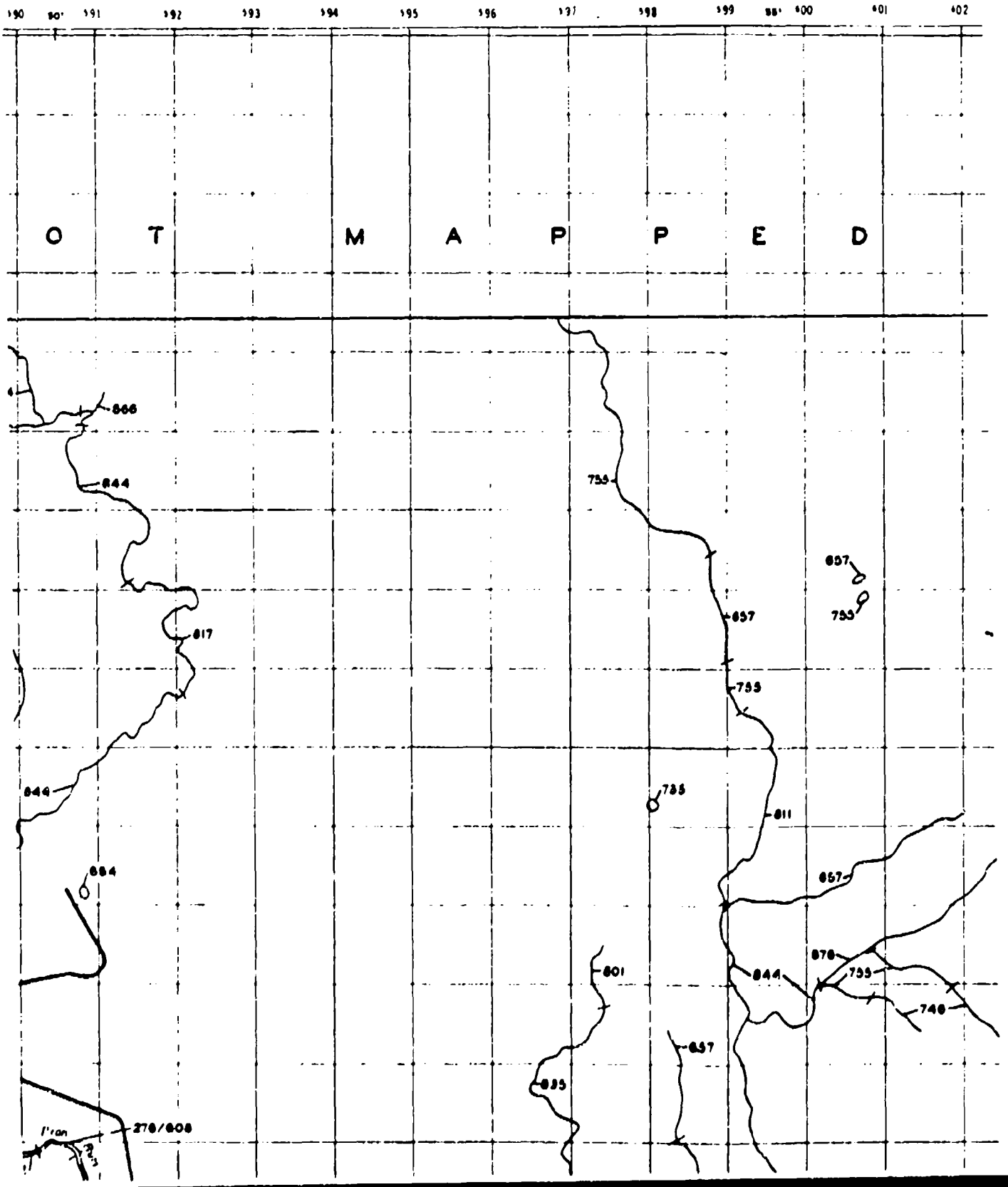




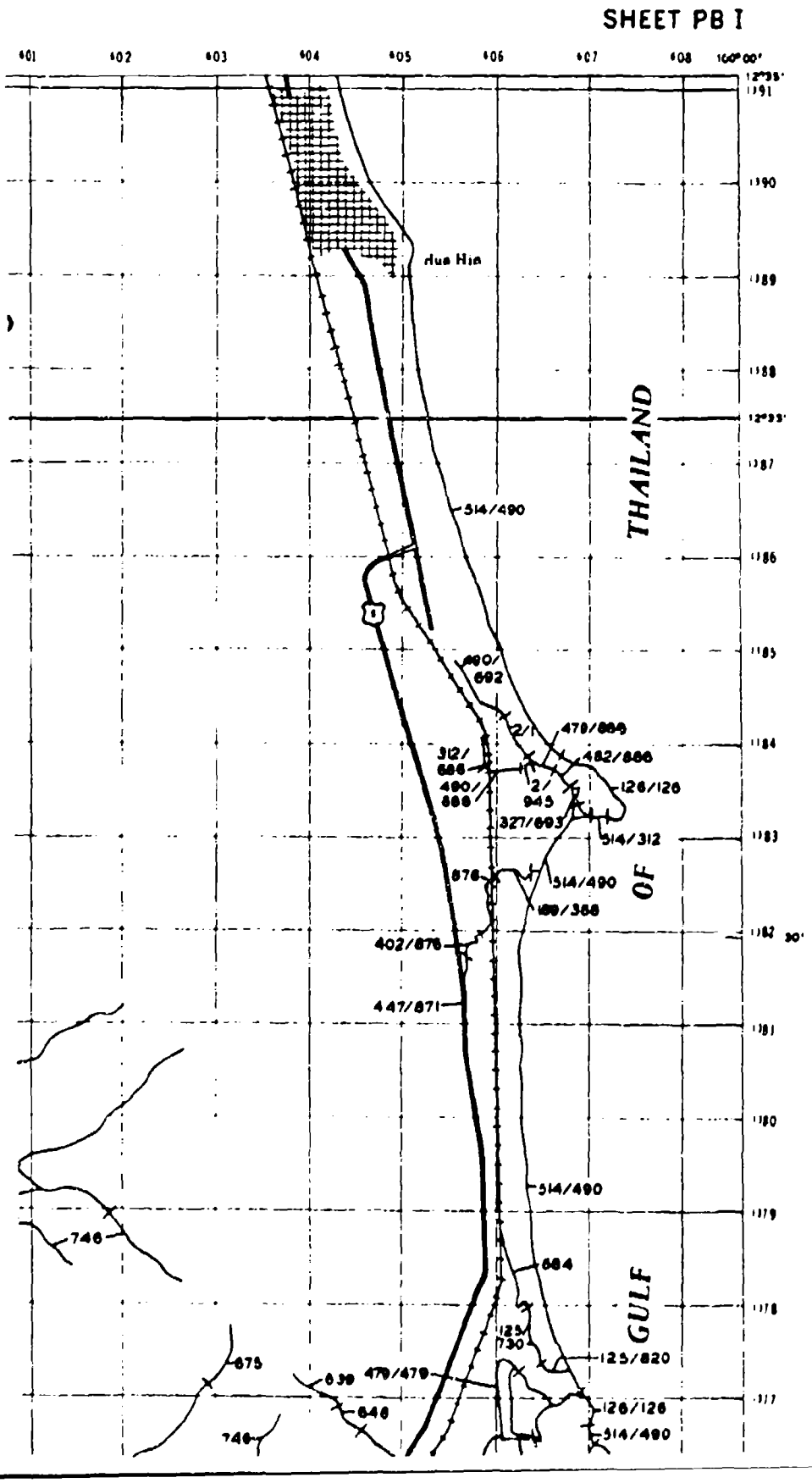

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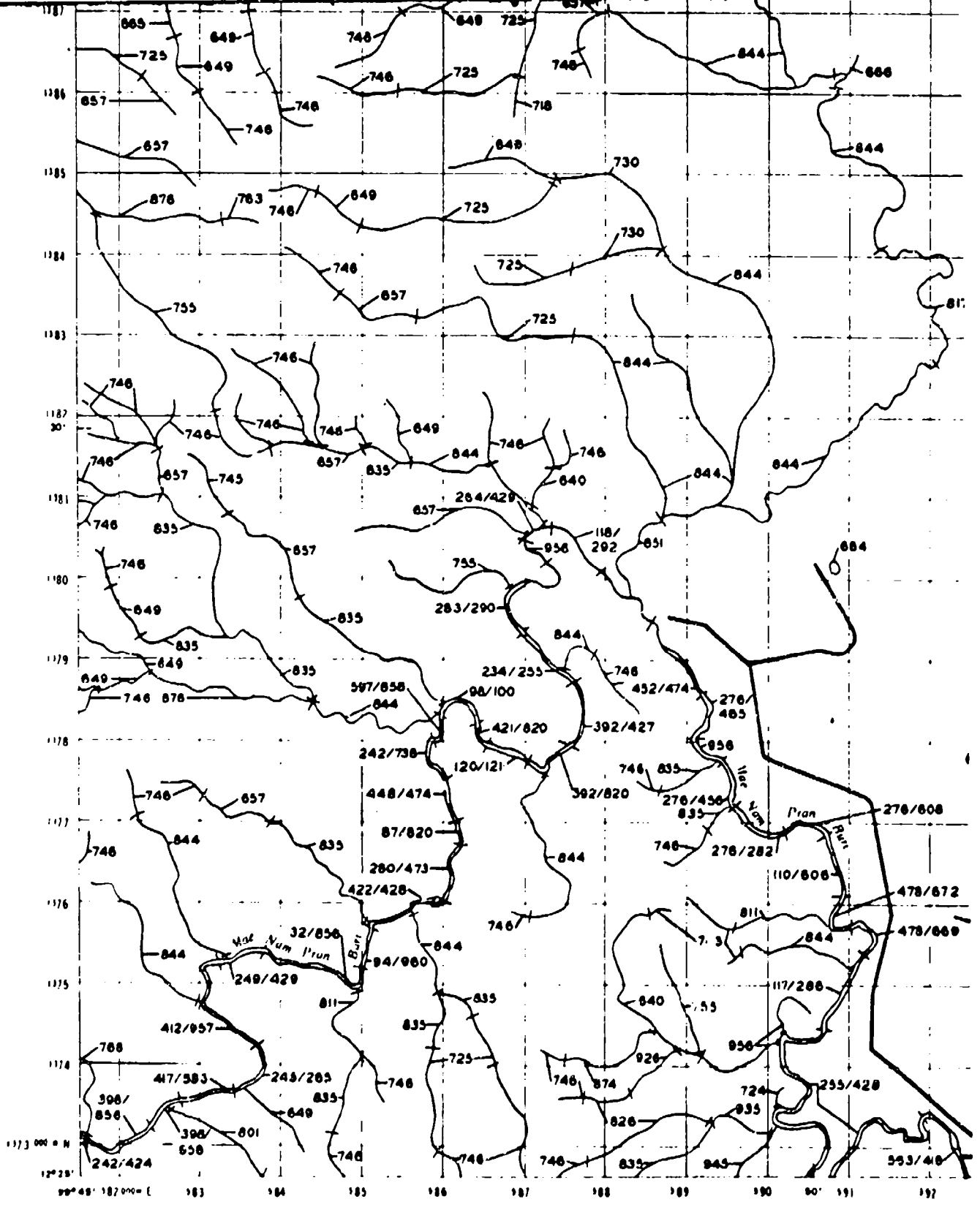

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90'
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88'
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811
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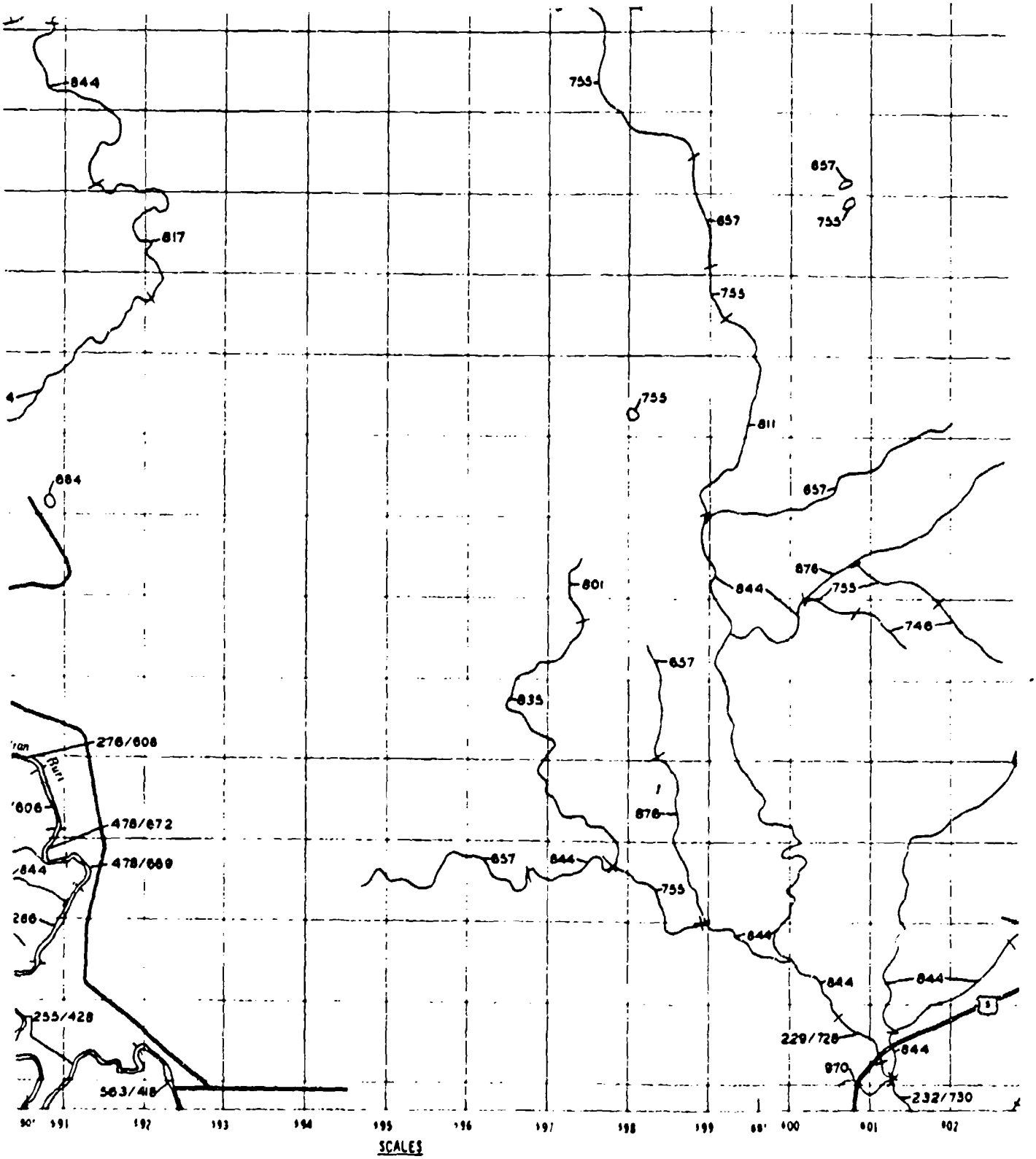
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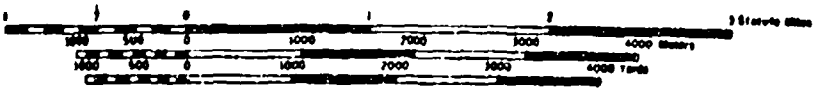


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 47 P

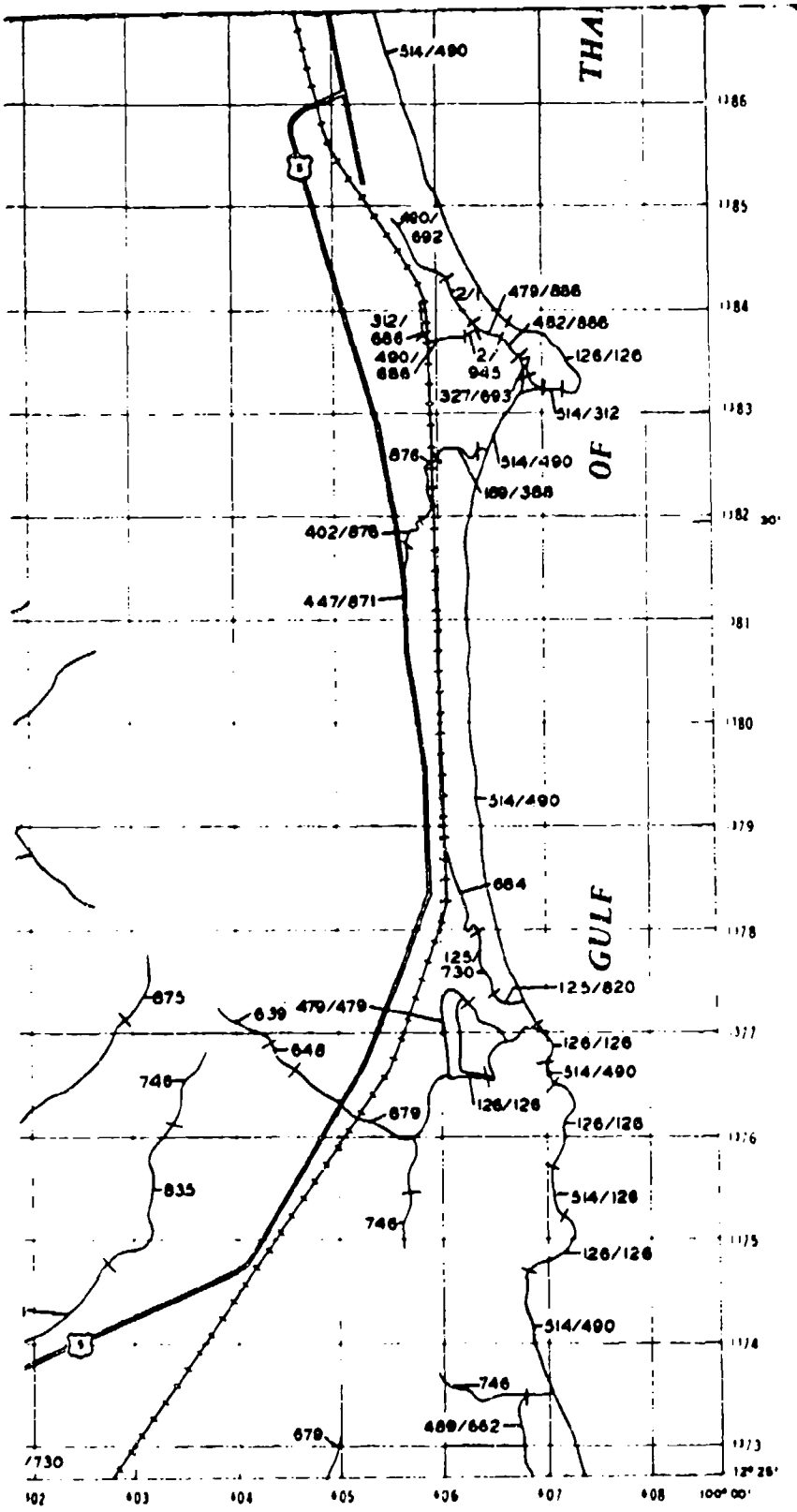
4


844
817
755
657
755
755
811
884
657
876
844
755
746
801
657
835
276/606
Run
606
478/672
844
478/669
266
255/428
563/418
876
657
844
755
844
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844
229/728
844
970
232/730
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02

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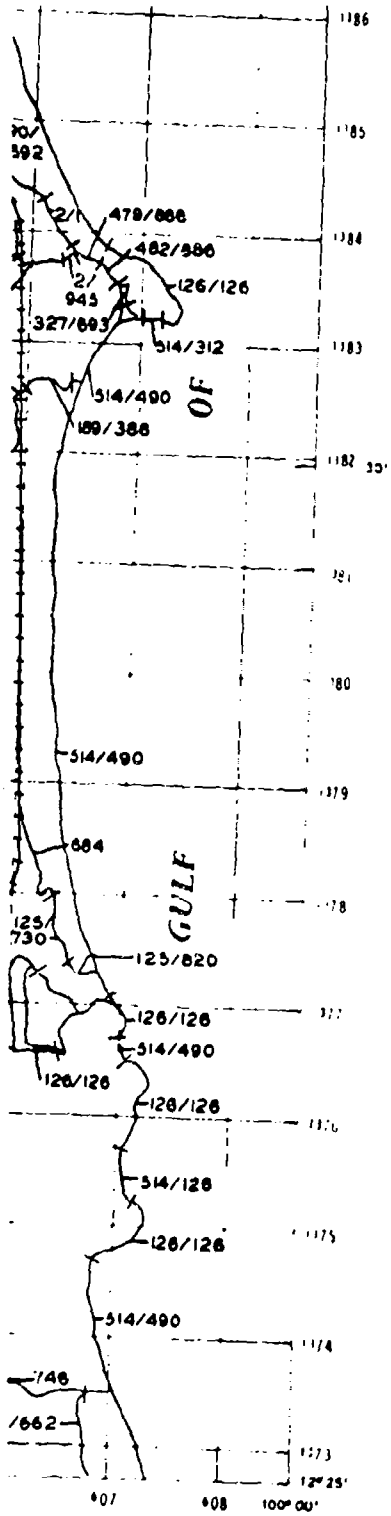
A QUANTITATIVE METHOD FOR D
TERRAIN FOR GROUND MOB

HYDROLOGIC GEOME

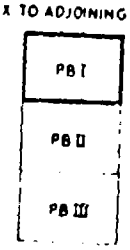
PRAN BURI STUDY AR

SHEET PB I

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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

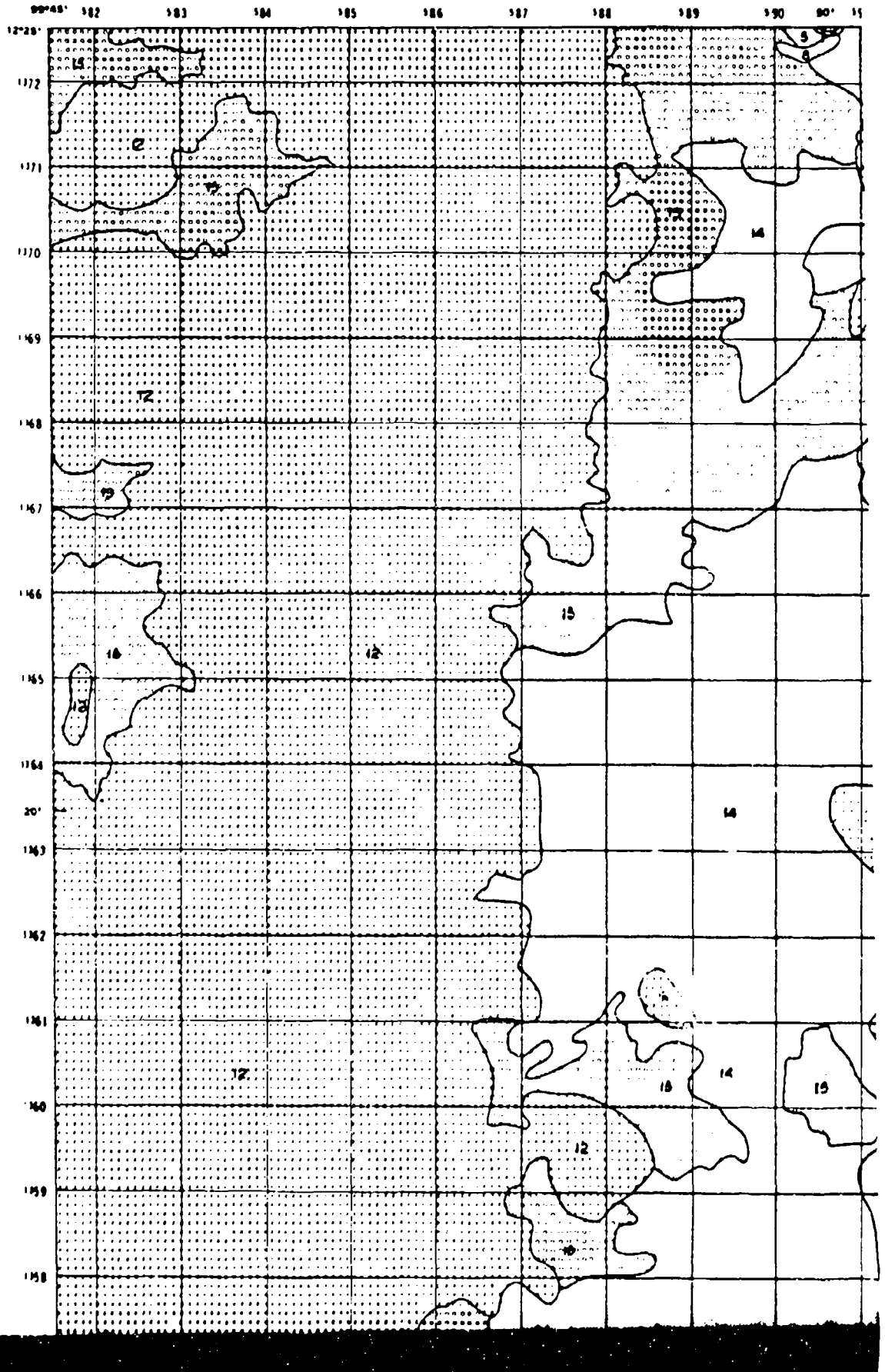
HYDROLOGIC GEOMETRY

PRAN BURI STUDY AREA

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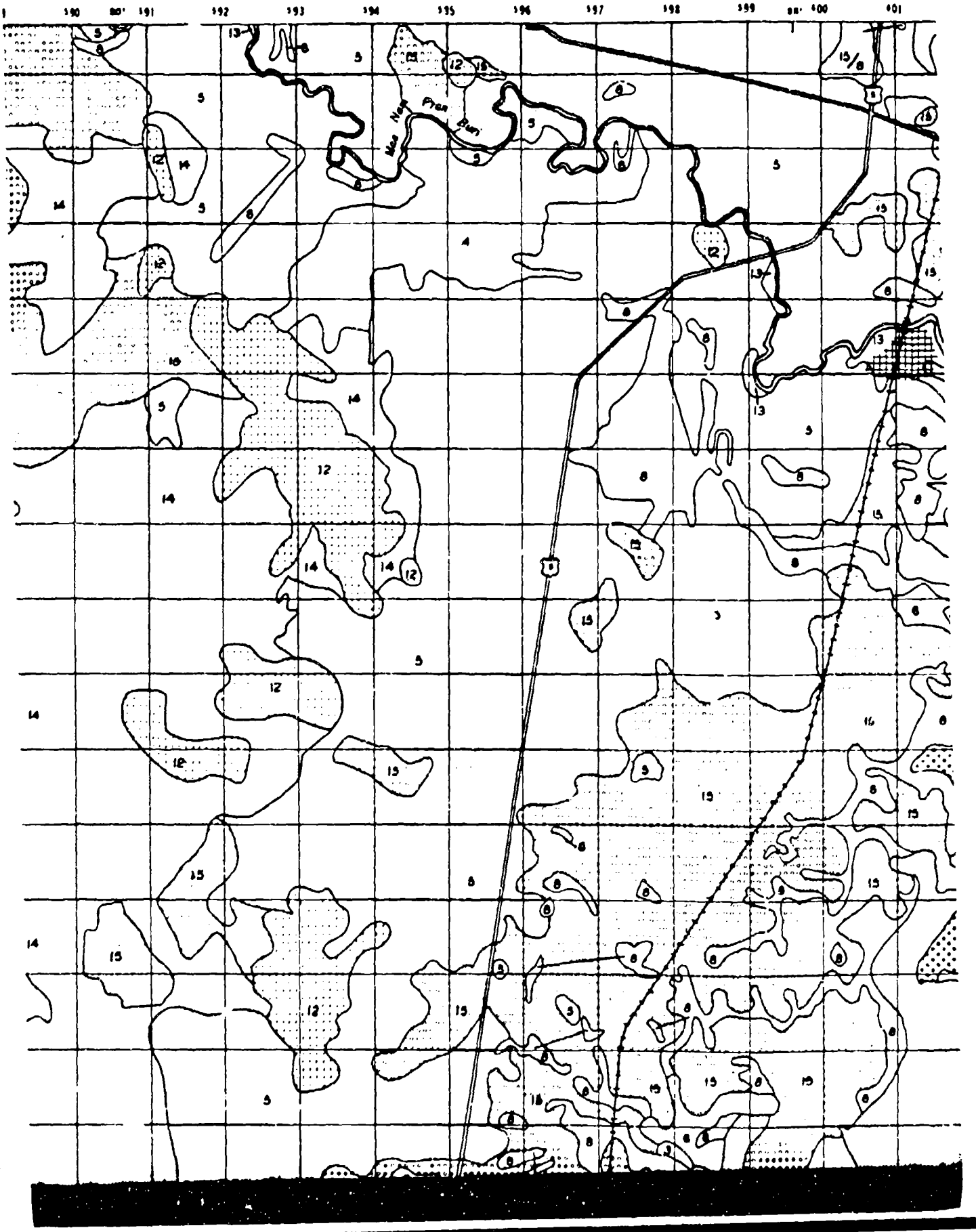
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PLATE 4.1d

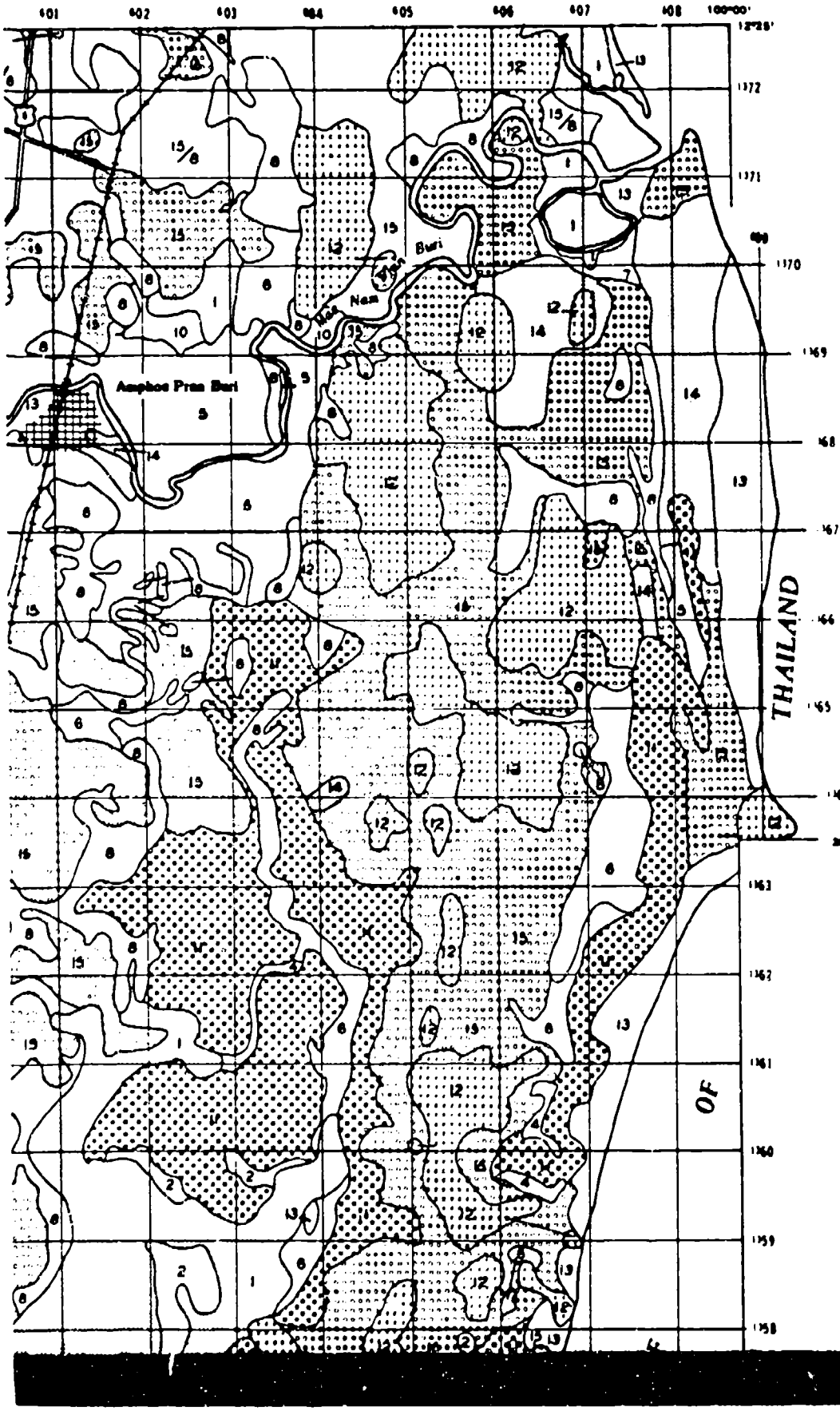

99°45'
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PRAN BURI


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SHEET PB II



Unit	Soil Mass Strength Undrained Shear Strength (kN/m²)	Undrained Shear Strength (kN/m²)	Maximum Shear Strength τ_{max} psi	Maximum Shear Strength τ_{max} kg/cm²
1	10-25	25-60	0-1	0-0.07
2	25-60	60-100	0-1	0-0.07
3	25-60*	60-100	0-1	0-0.07
4	25-60	>100	0-1	0-0.07
4a	25-60*	>100	0-1	0-0.07
6	60-100	60-100	0-1	0-0.07
7	60-100	60-100	0-1	0-0.07
8	60-100	>100	0-1	0-0.07
9	60-100	>100	0-1	0-0.07
10	60-100	>100	0-1	0-0.07
10a	60-100*	>100	0-1	0-0.07
12	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07

Note: Blank areas are water bodies.

τ_{max} Shear strength at zero normal load.

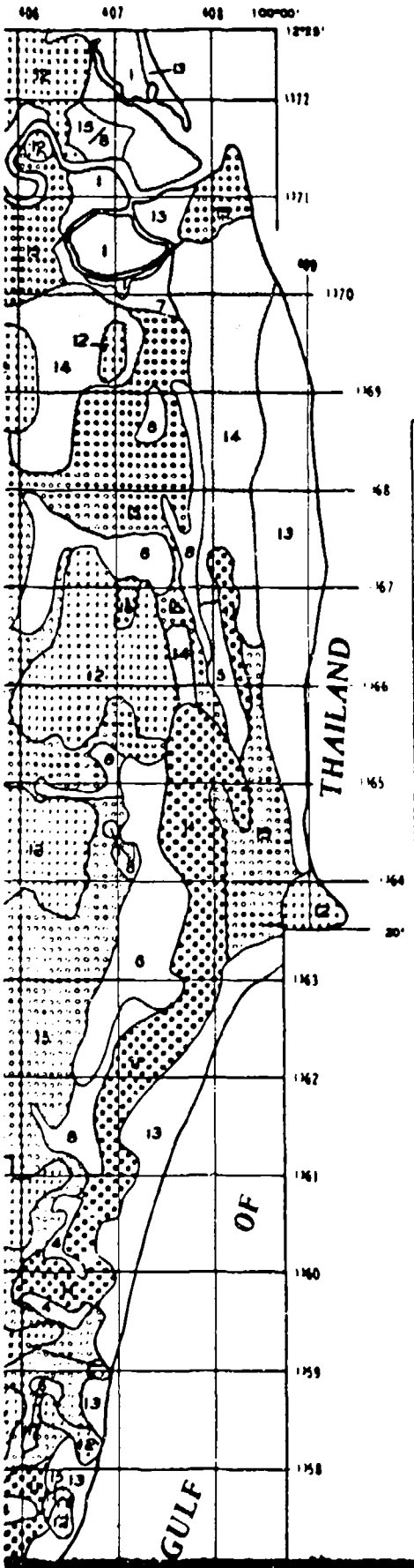
σ_{up} Angle of internal friction.

* Maximum envelope has less than 30 psi strengths commonly observed are 60-10

Units do not occur on this map.

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SHEET PB II



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCT	Soil Surface Strength: Maximum Moisture c_{uf} psi	Soil Surface Strength: Maximum Moisture c_{uf} kg/cm²	Soil Surface Strength: Maximum Moisture α_{uf} deg	Soil Surface Strength: Minimum Moisture c_{uf} psi	Soil Surface Strength: Minimum Moisture c_{uf} kg/cm²	Soil Surface Strength: Minimum Moisture α_{uf} deg	Soil Surface Strength: Conditions where maximum occurs c_{uf} psi	Soil Surface Strength: Conditions where maximum occurs c_{uf} kg/cm²	Soil Surface Strength: Conditions where maximum occurs α_{uf} deg
1	10-75	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	[illegible]	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		

Note: Blank areas are water bodies.

c_{uf} Shear strength at zero normal load.

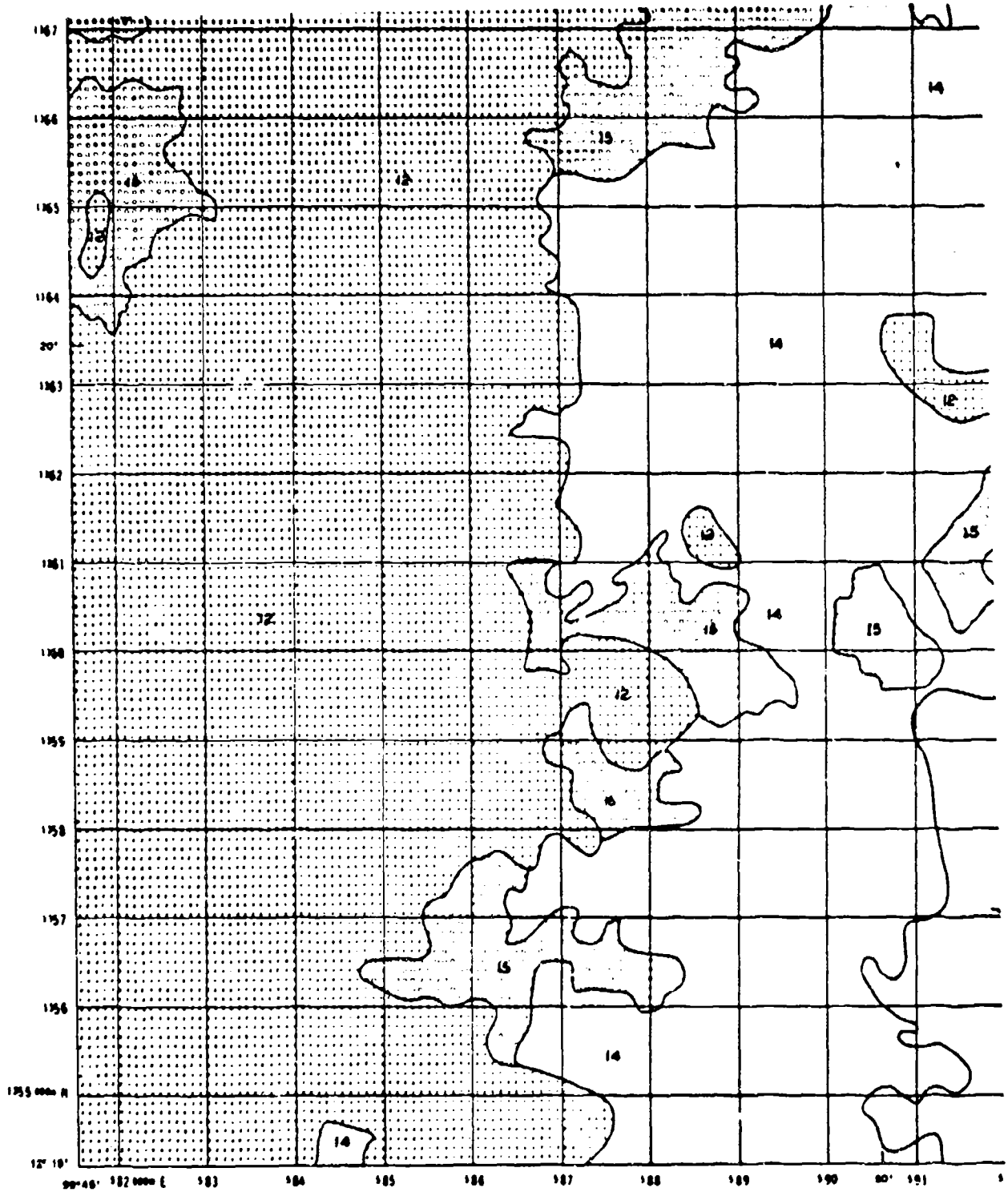
α_{uf} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths normally observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

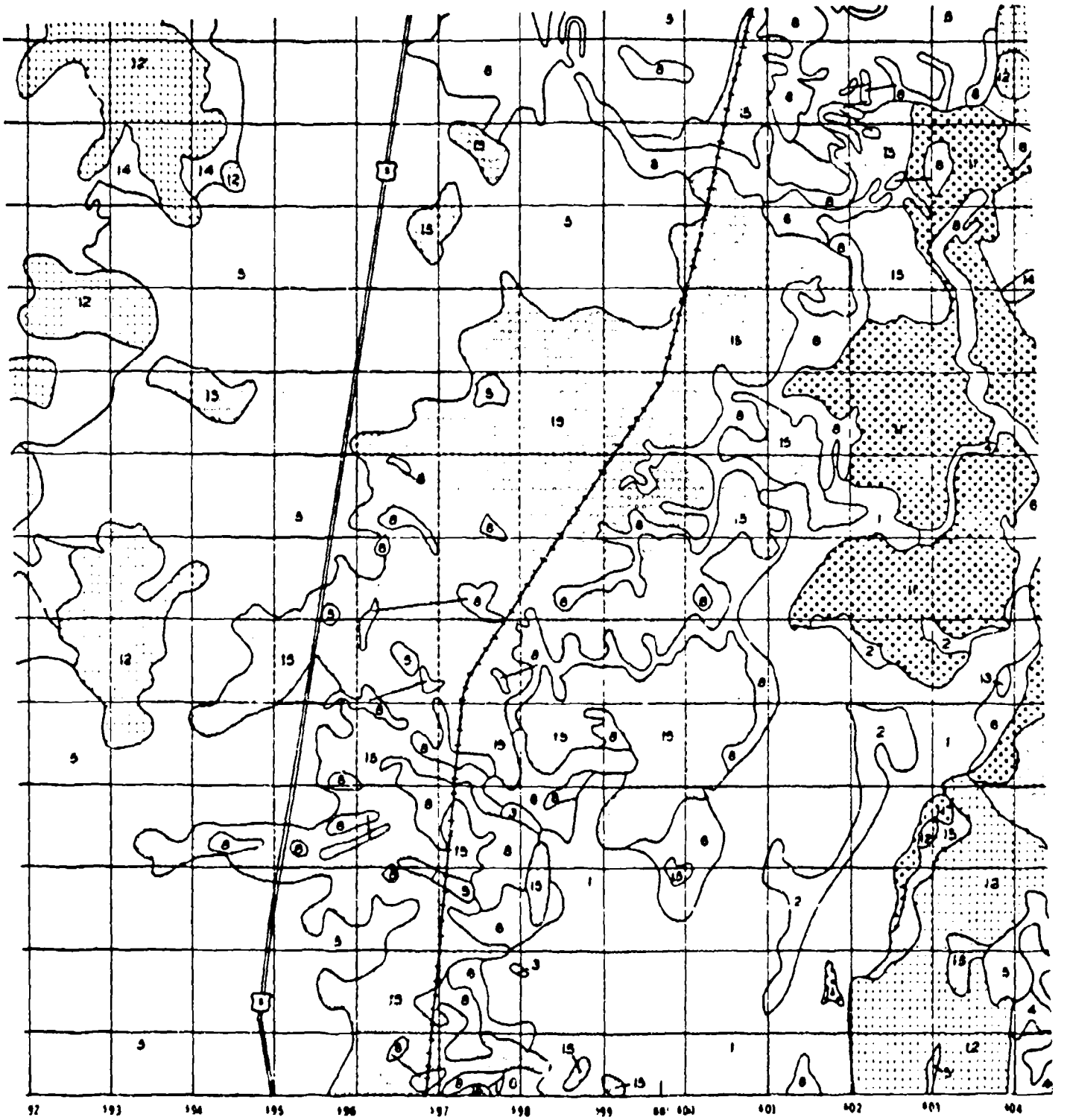
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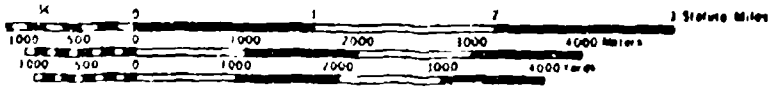


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

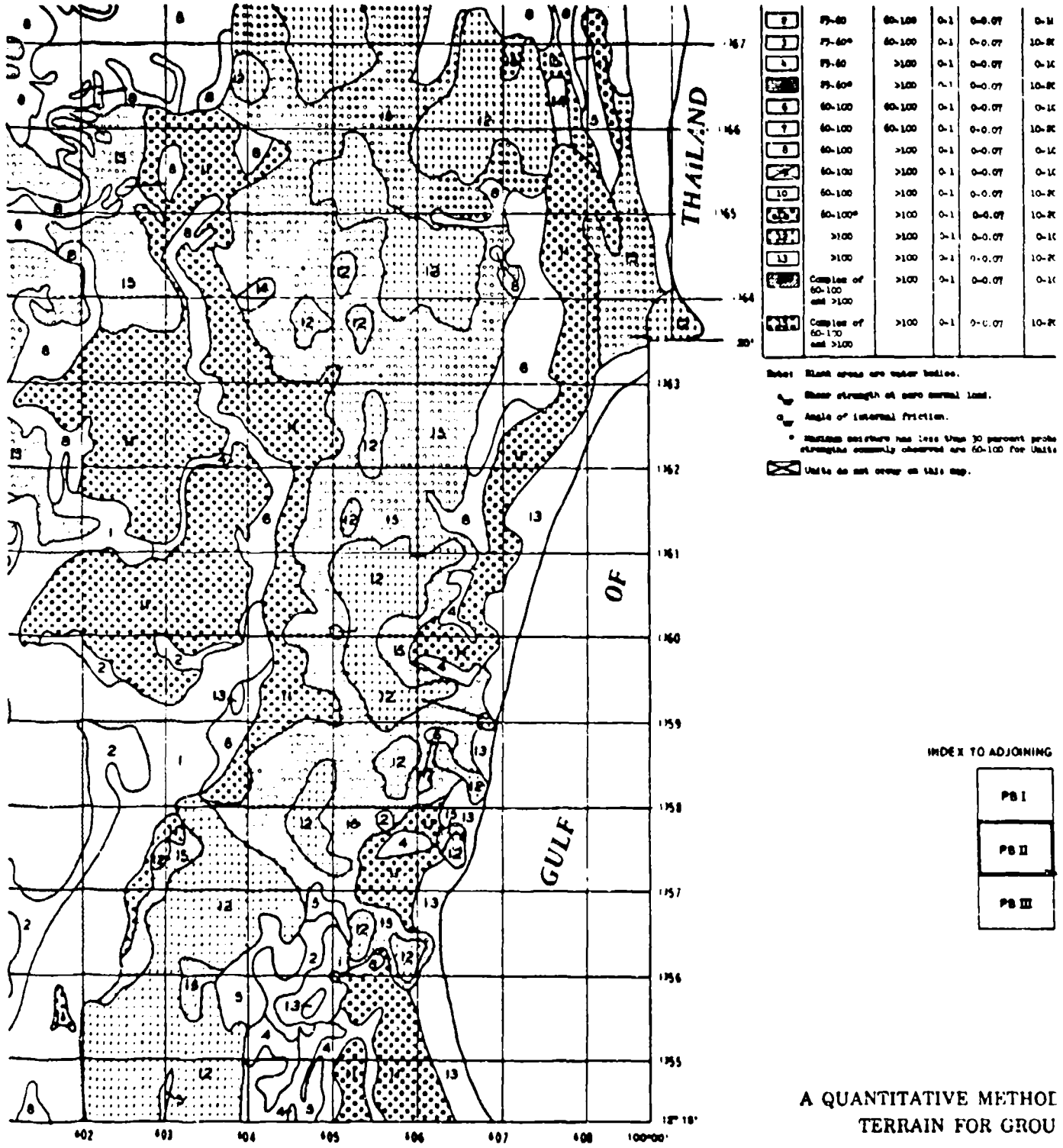
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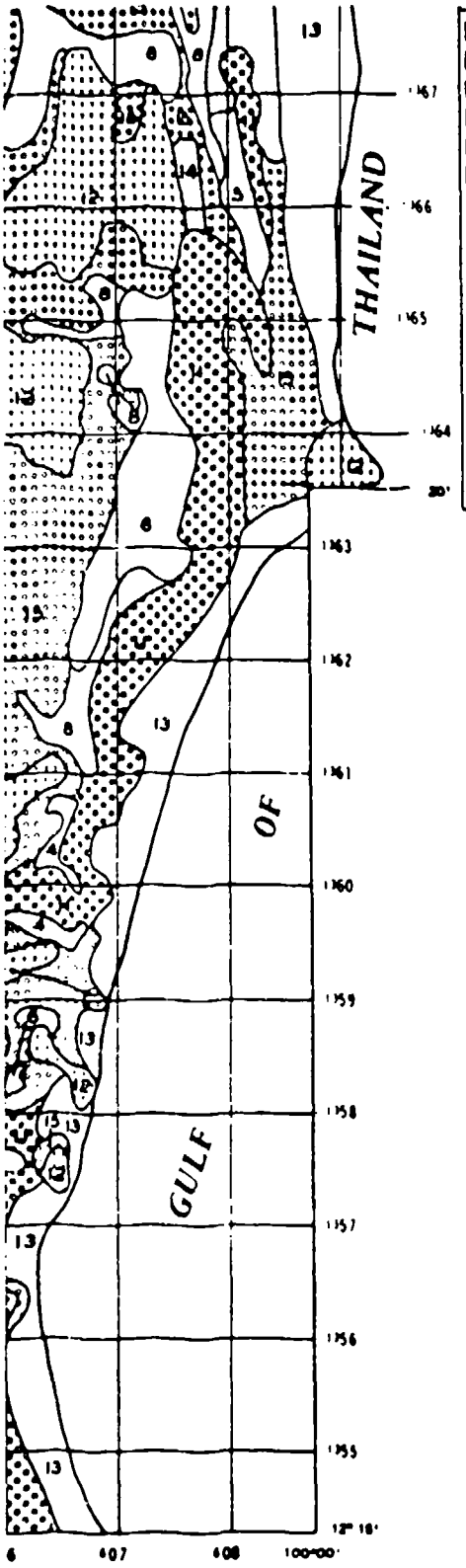


A QUANTITATIVE METHOD
TERRAIN FOR GROU

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SHEET P



1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		

Note: Blank areas are water bodies.

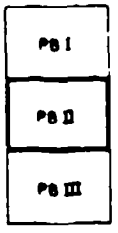
c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

INDEX TO ADJOINING SHEETS



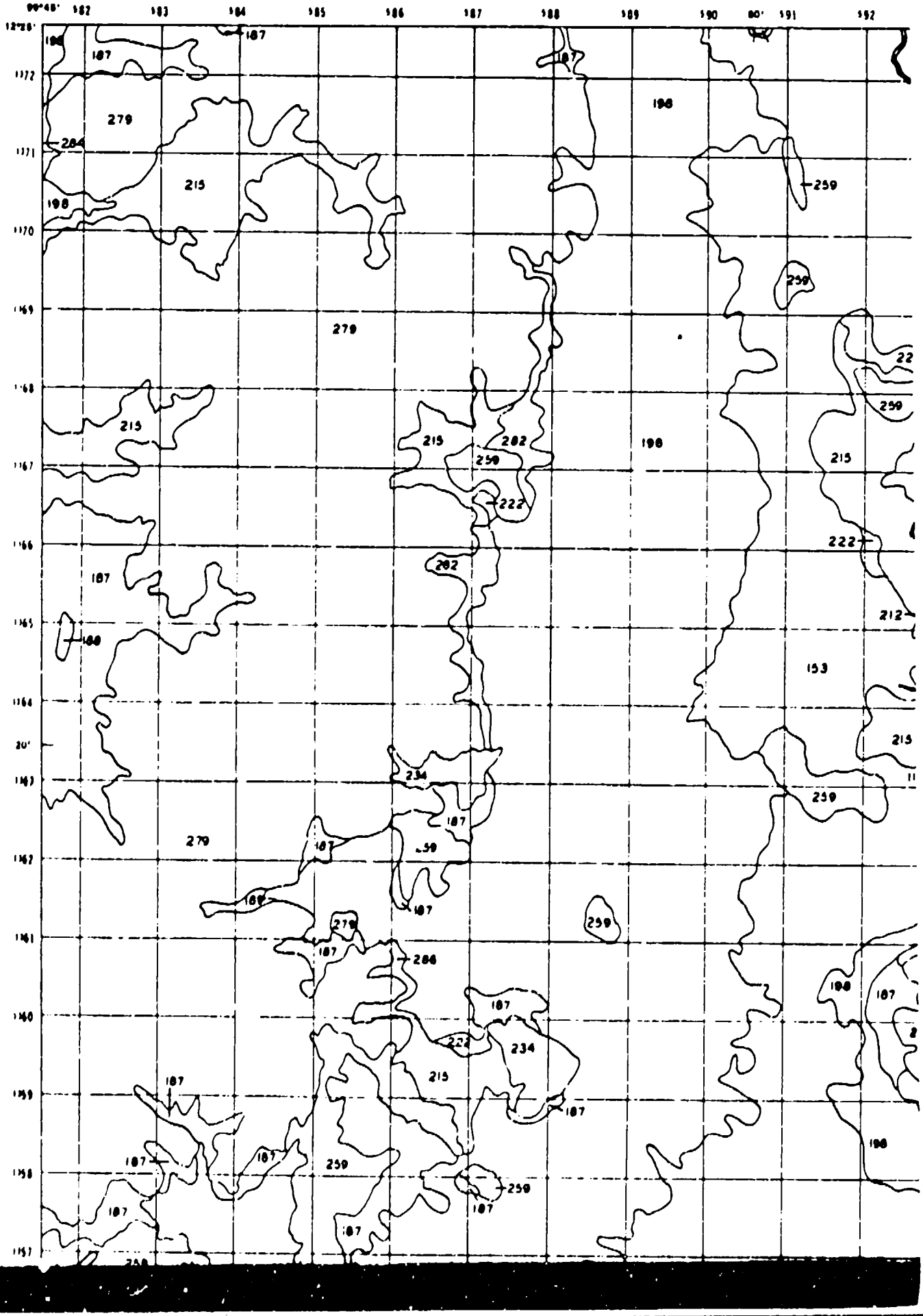
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

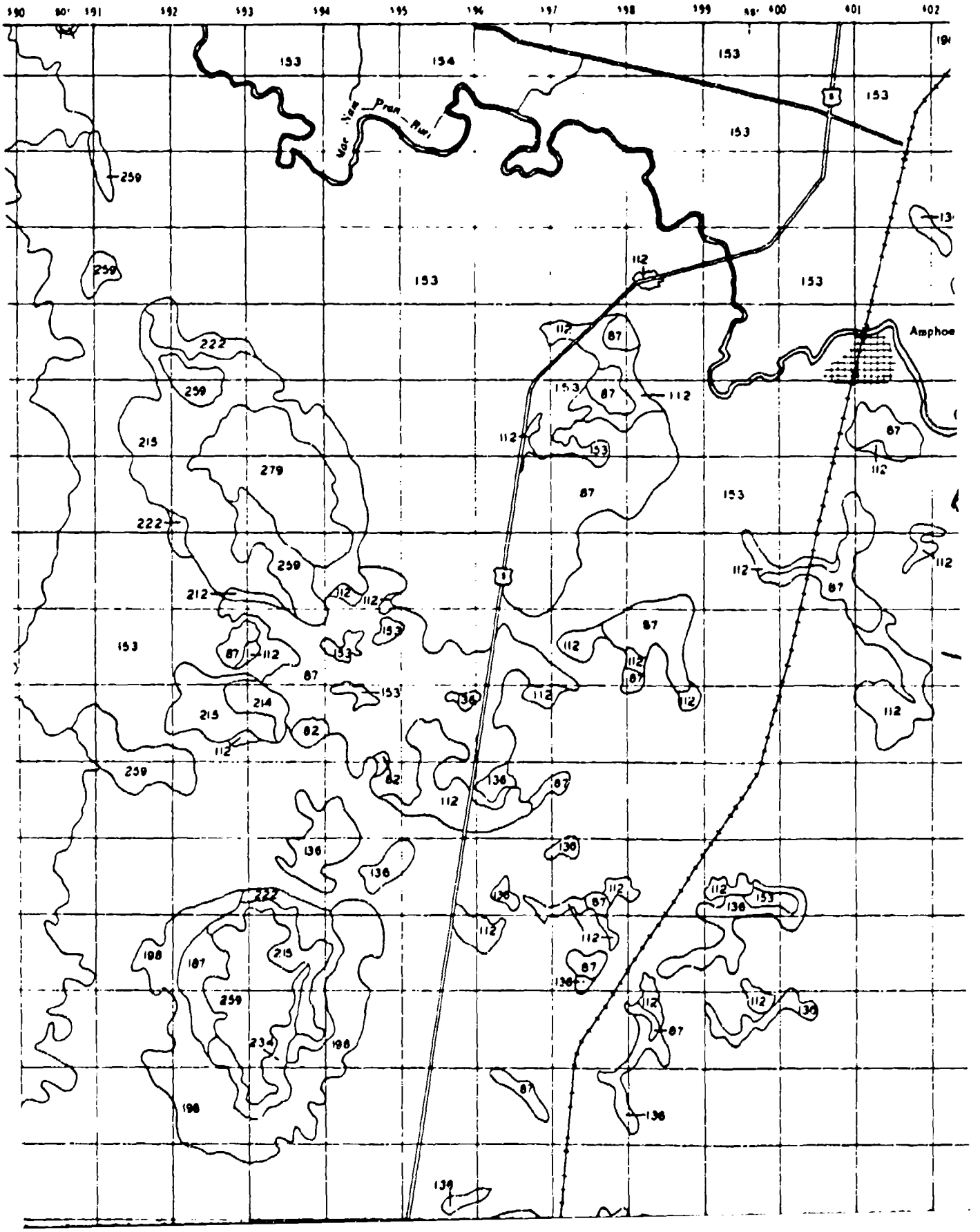
PRAN BURI STUDY AREA

SHEET PB II

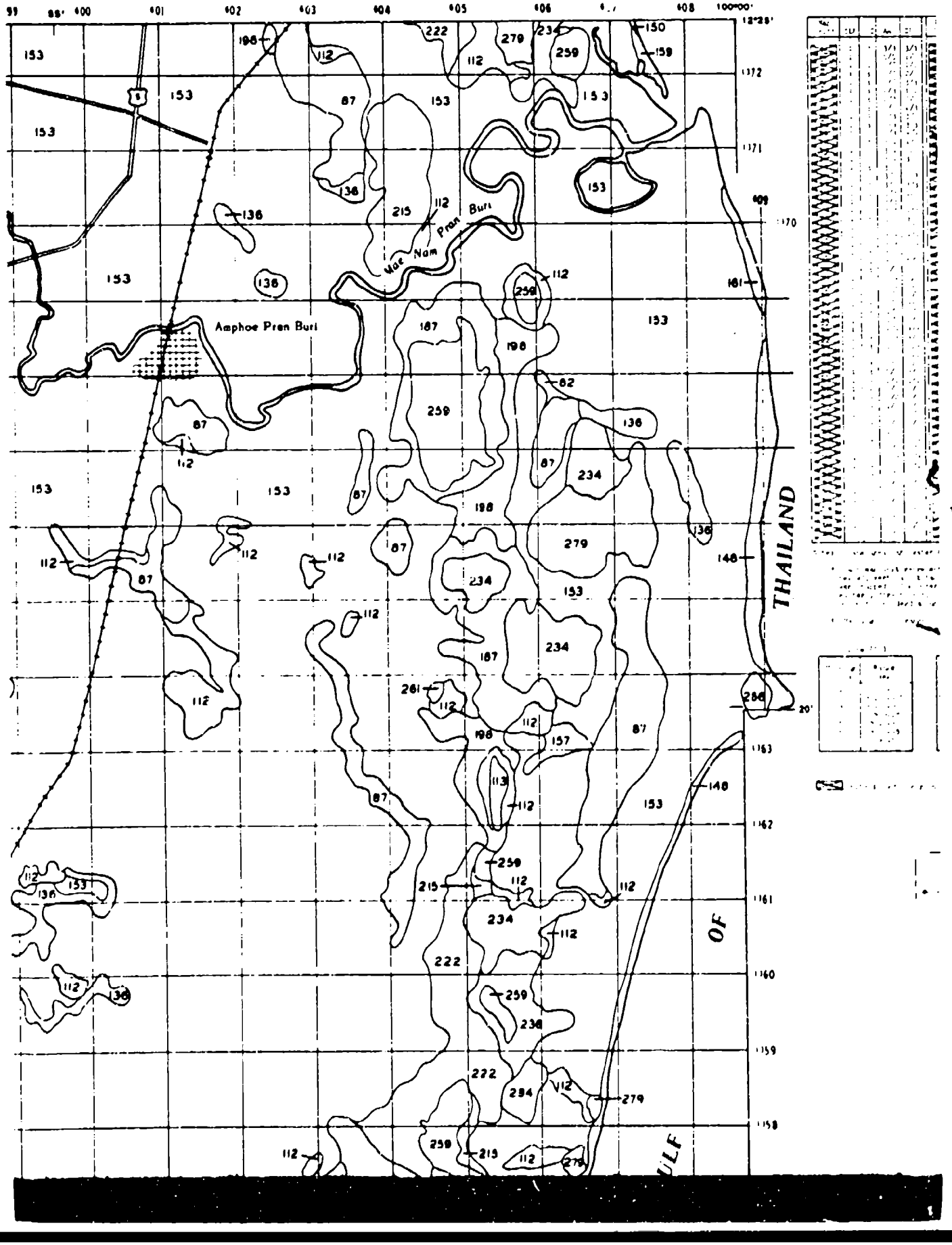
PLATE 4.2a


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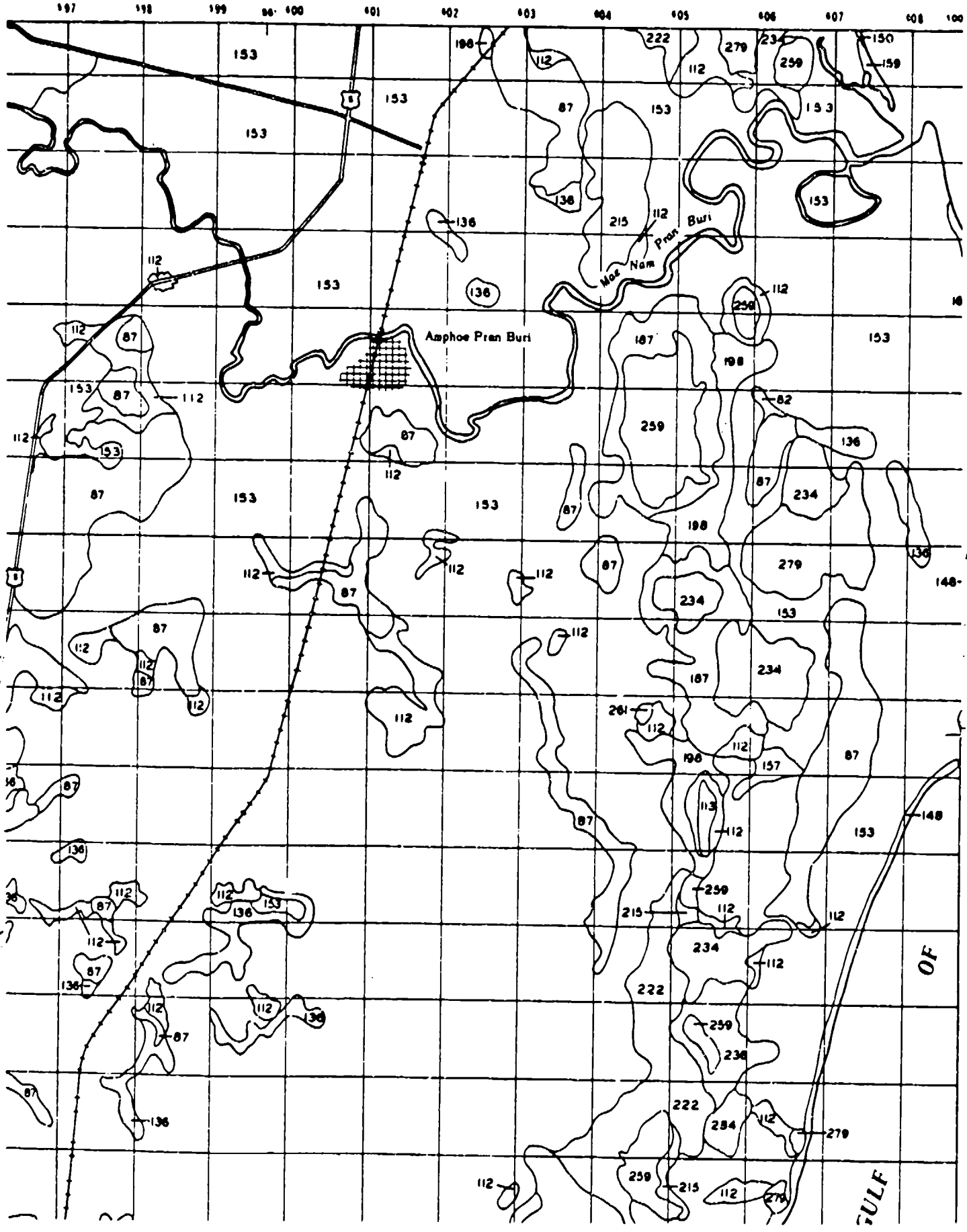
2 PRAN BURI



SHEET PB II

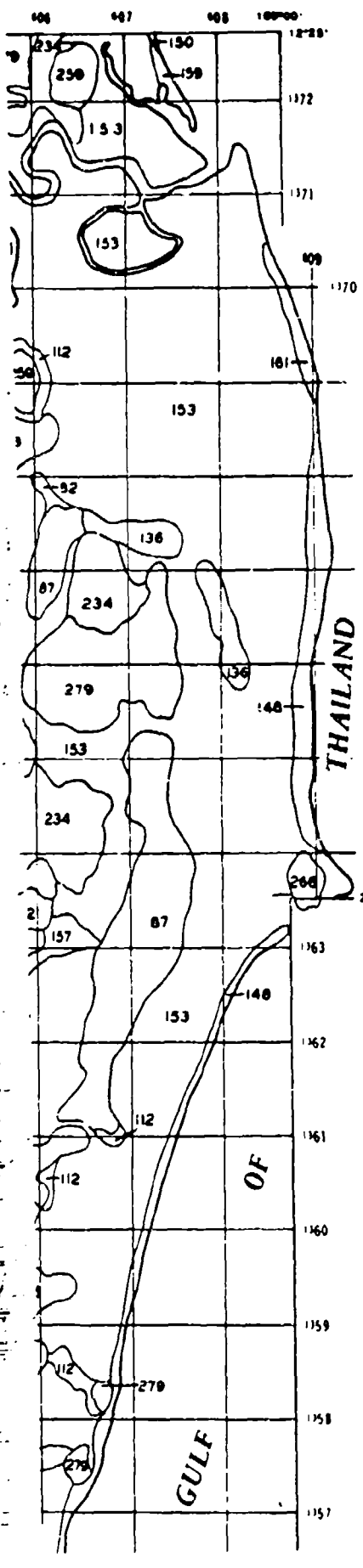

Amphoe Pran Buri
Mae Nam Pran Buri
THAILAND
OF
153
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SHEET PB 1

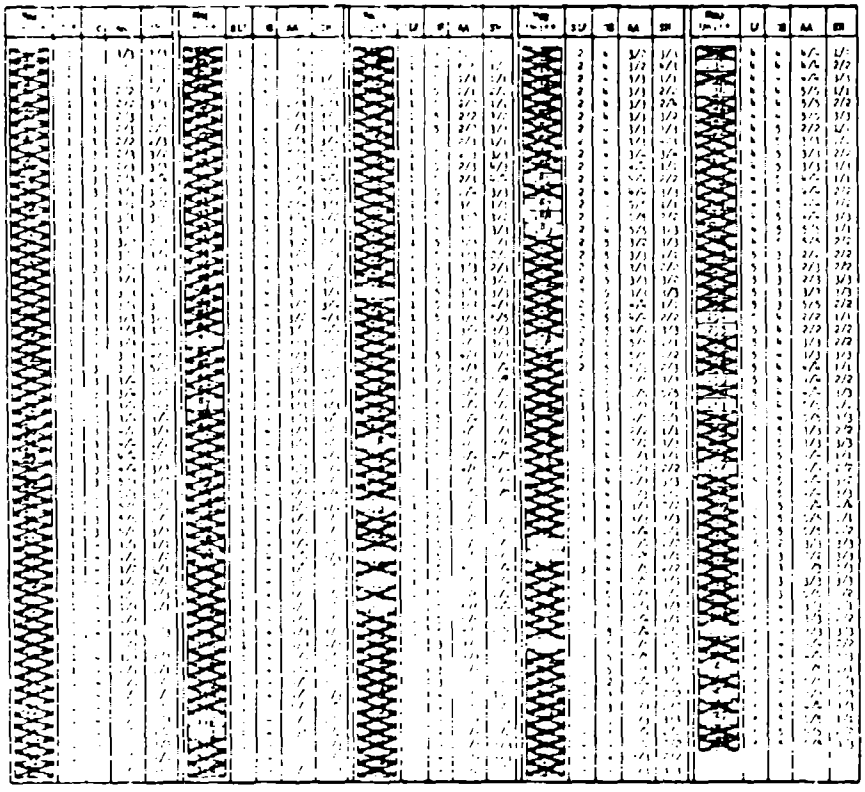


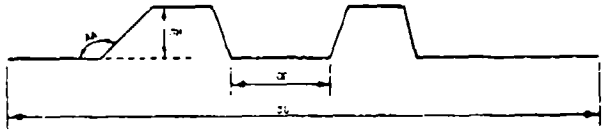
4

SHEET PB II



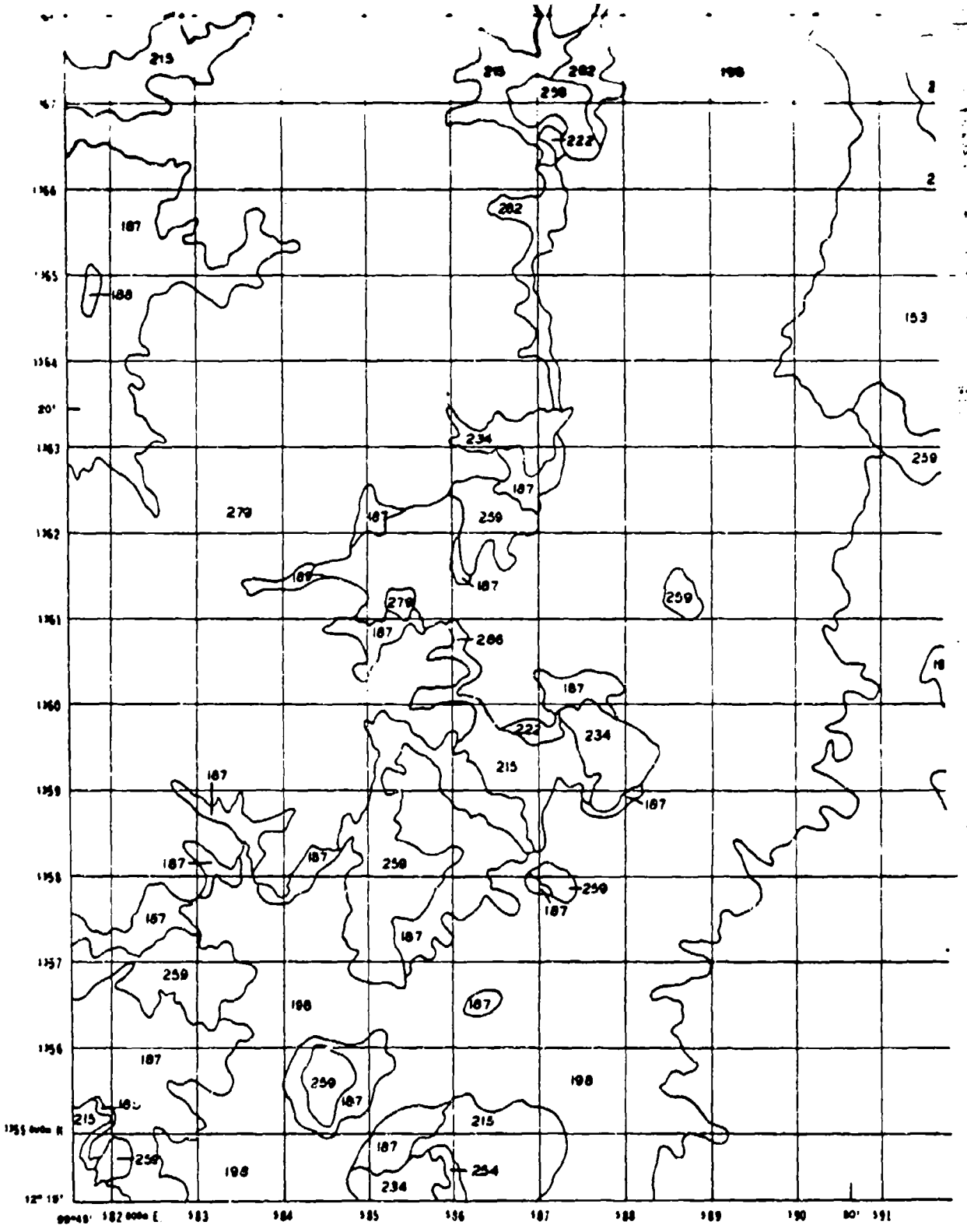
LEGEND





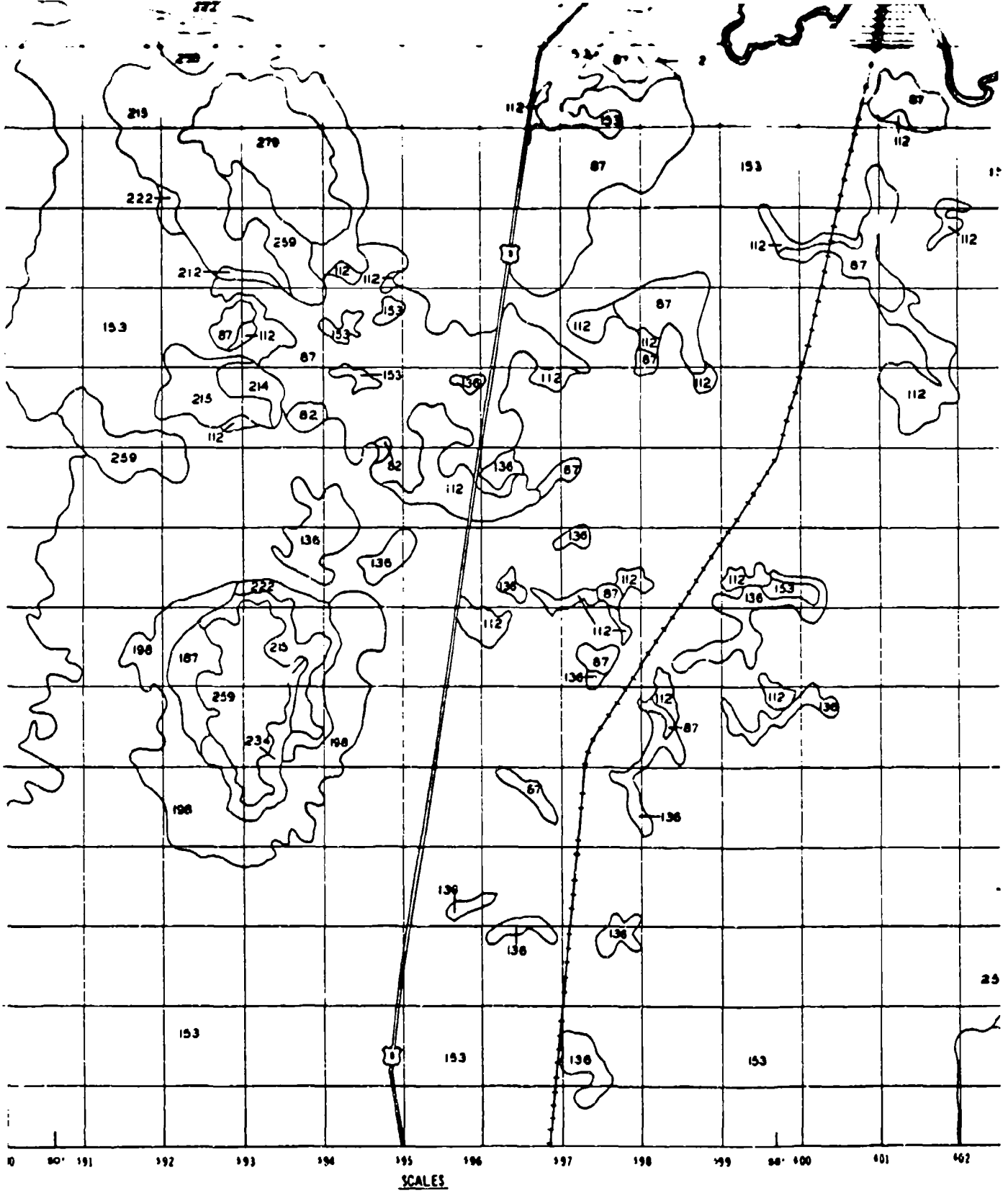
INDEX TO ADJOINING SHEETS

PB I
PB II
PB III

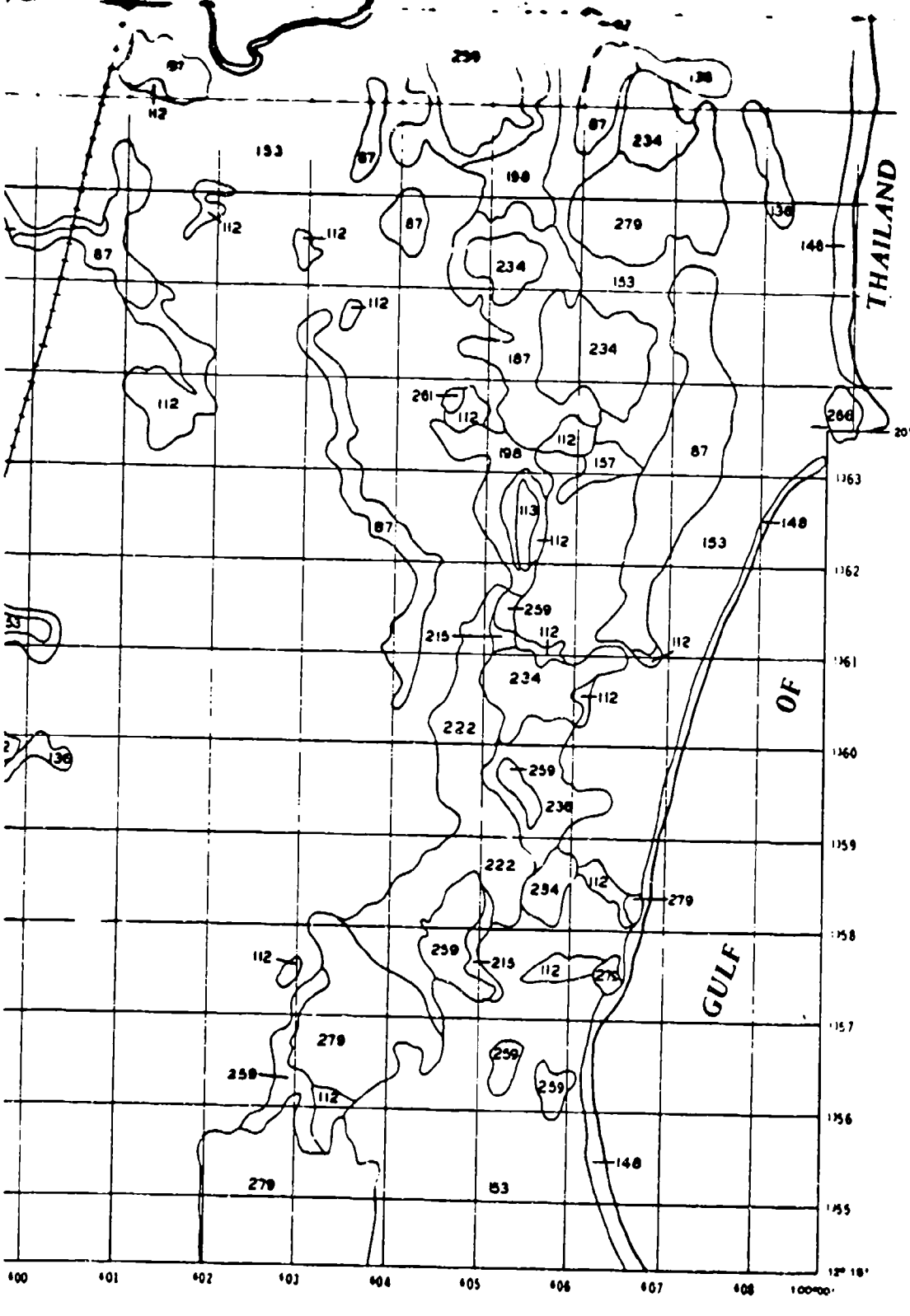


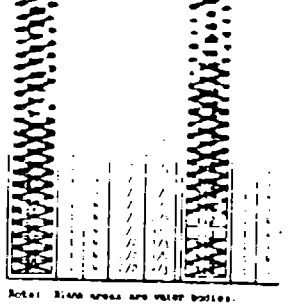
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


112
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87
193
222
259
212
214
215
82
136
198
187
234
SCALES
1 ½ 0 1 2 3 Statute Miles
1000 500 0 1000 2000 3000 6000 Meters
1000 500 0 1000 2000 3000 4000 Yards

6





Note: Blank areas are water bodies.

* Each map unit represents an array of below), vertical relief spacing of were mapped. The numerator of the fr exterior ... portion of a quadrant from ... (0° to 90° being northeast ...

* Mapping class ranges of each surface

Slope (%)

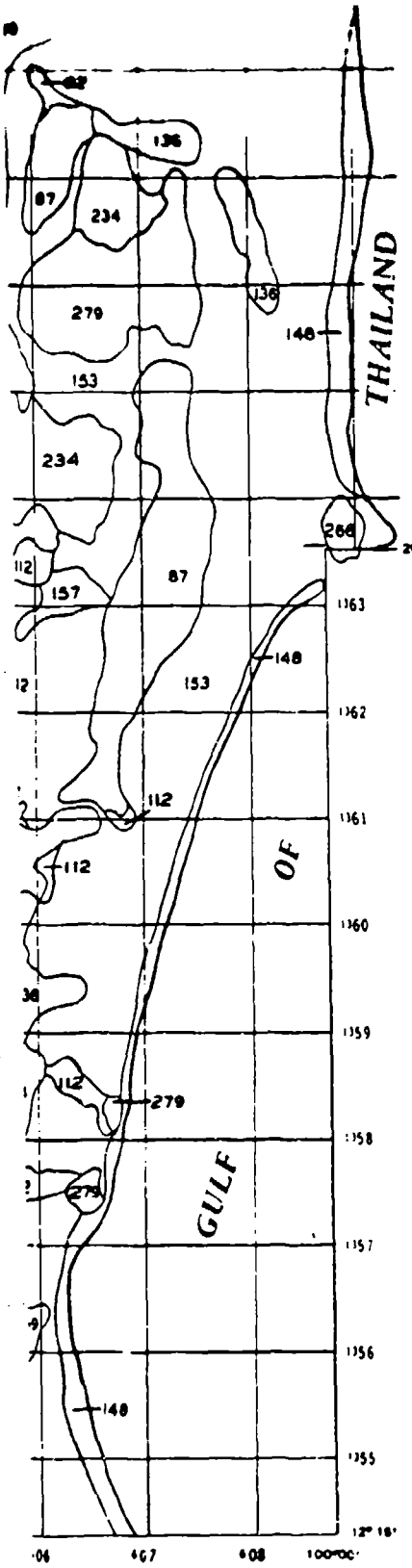
Mapping Class	Range (%)
1	0-0.5
2	> 0.5-1.5
3	> 1.5-3.0
4	> 3-8
5	> 8-15
6	> 15-30
7	> 30

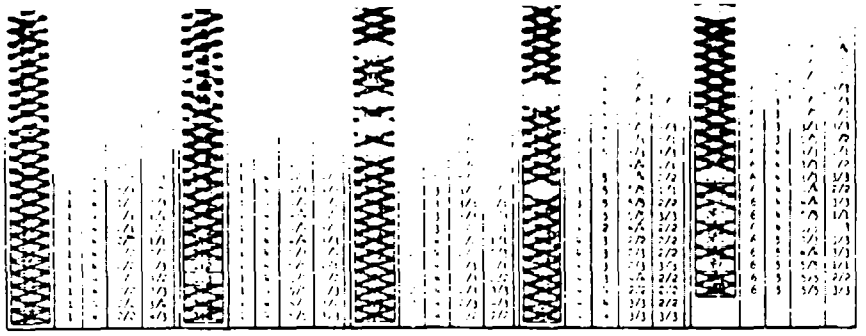
Mapping Class	
1	
2	
3	
4	
5	

Cliffs do not occur on this map.

A QUANTITATI
TERRAIN

SURF
PRAN





Water. Blank areas are water bodies.

* Each map unit represents an array of four cells (i.e. 1 row x 4 columns), 1/2 inch on a side, mapping classes of slope (see diagram below), vertical obstacle spacing (S), approach angle (AA), and step height (SH). Additional information indicates that dual classes were mapped. The numerator of the fraction indicates the class that will be encountered while traversing an area in an easterly direction (i.e. azimuth from > 0° to < 180° and the denominator refers to a westerly direction (i.e. azimuth from > 180° to 360°) assuming that the vehicle approaches the obstacle at a right angle.

* Mapping class ranges of each surface geometry factor were:

Slope (SL)

Mapping Class	Range (deg)
1	0 - < 5
2	> 5 - < 10
3	> 10 - < 15
4	> 15 - < 20
5	> 20 - < 30
6	> 30 - < 45
7	> 45

Vertical Obstacle Spacing (S)

Mapping Class	Range	
	m	ft
1	< 0.7	< 2.3
2	> 0.7 - 2	> 2.3 - 6.6
3	> 2 - 3.5	> 6.6 - 11.5
4	> 3.5 - 5	> 11.5 - 16.4
5	> 5	> 16.4

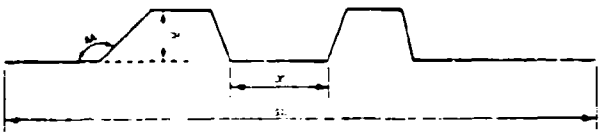
Approach Angle (AA)

Mapping Class	Range (deg)
1	< 11
2	11 - < 22
3	22 - < 33
4	33 - < 45
5	45 - < 56
6	56 - < 67
7	67 - < 78
8	78 - < 90
9	≥ 90

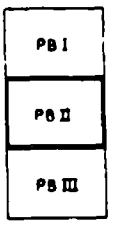
Step Height (SH)

Mapping Class	Range	
	La	m
1	---	0 - < 0.16
2	> --- - 10	> 0.16 - 0.31
3	> 10 - 15	> 0.31 - 0.52
4	> 15 - 20	> 0.52 - 0.70
5	> 20 - 25	> 0.70 - 0.87
6	> 25 - 30	> 0.87 - 1.05
7	> 30 - 35	> 1.05 - 1.22
8	> 35	> 1.22

= area is not shown in this map.



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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

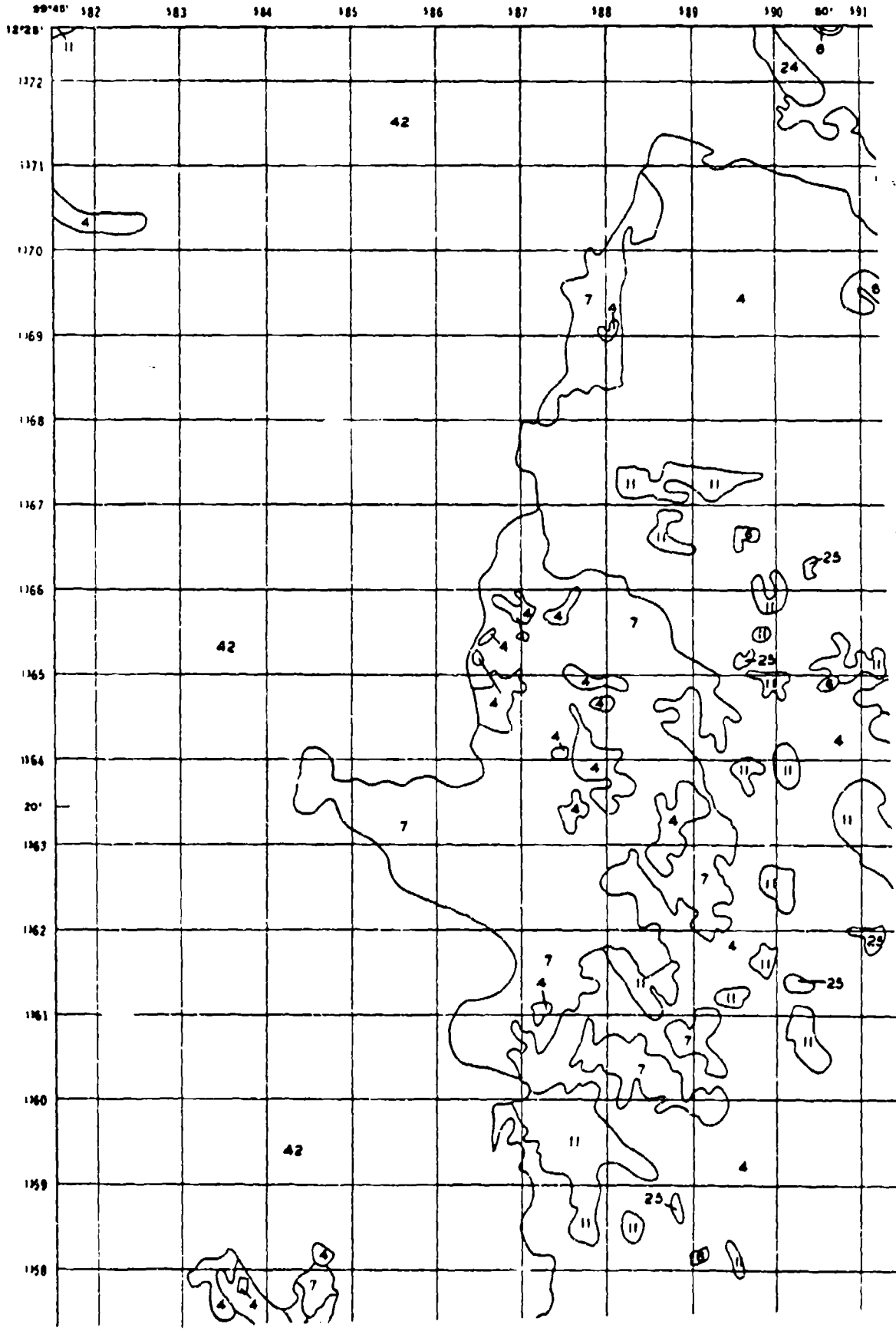
PRAN BURI STUDY AREA

SHEET PB II

PLATE 4.2b

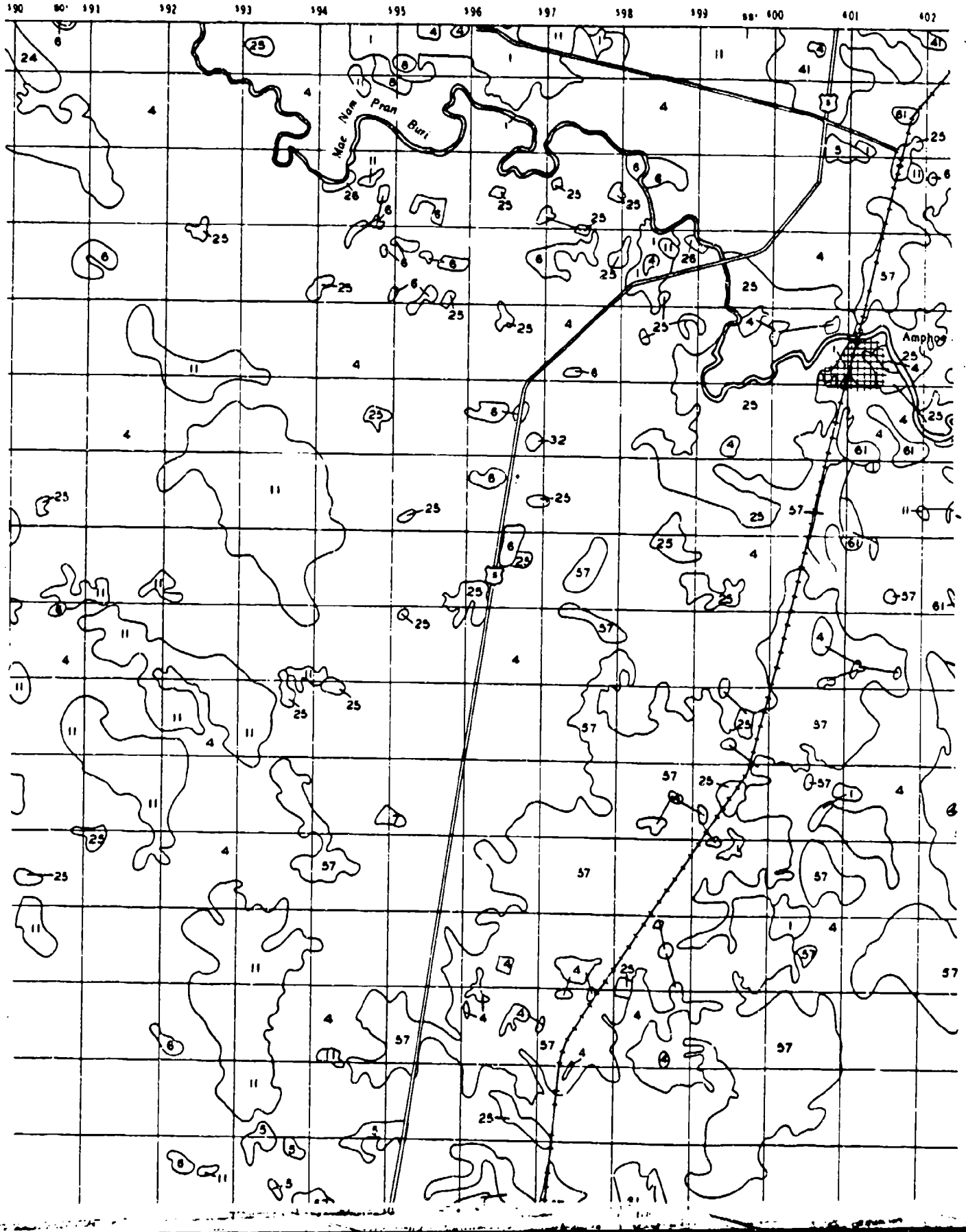
8

7


99°48'
582
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80'
591
12°28'
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1371
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1368
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20'
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25
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25

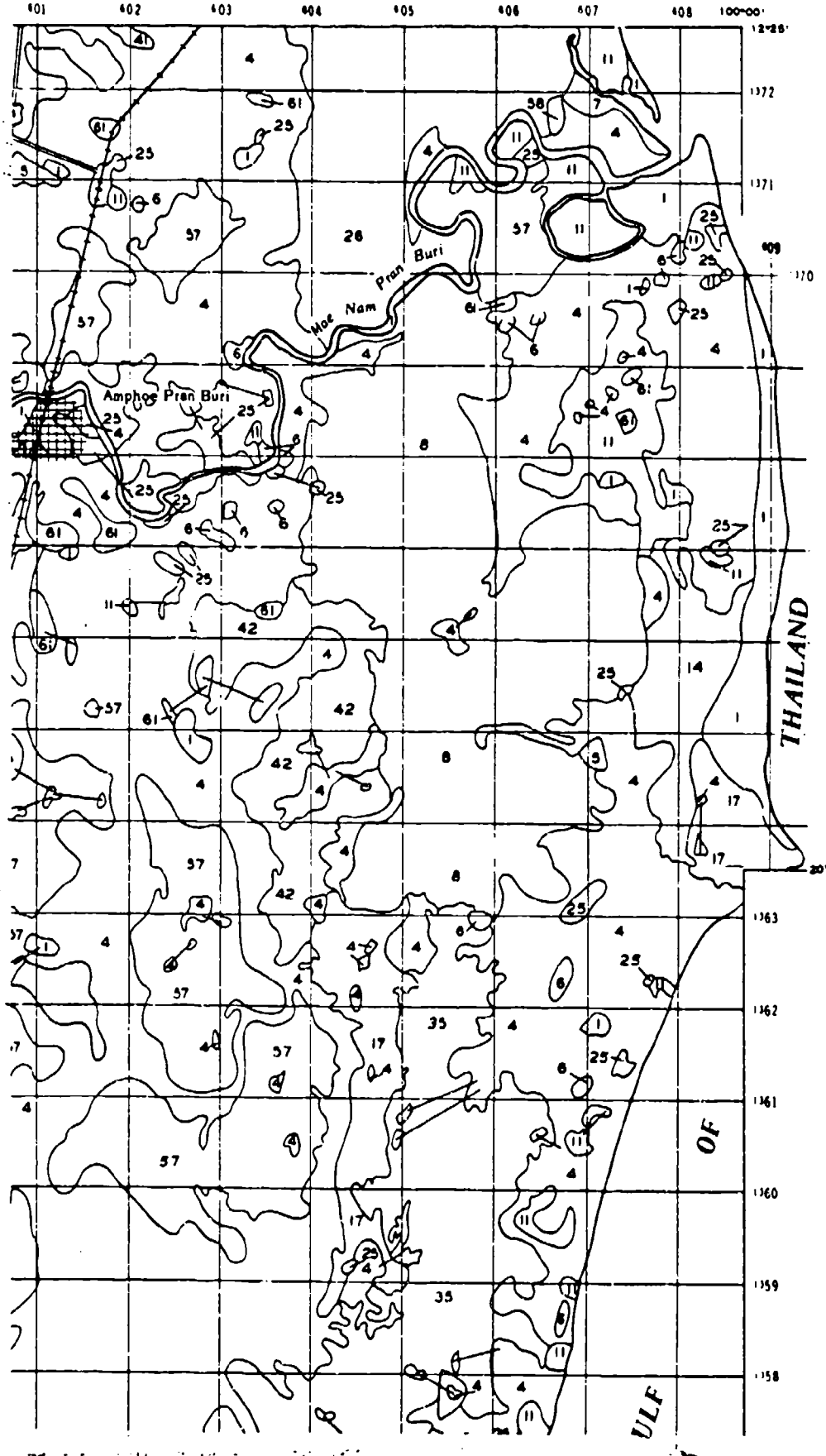
2

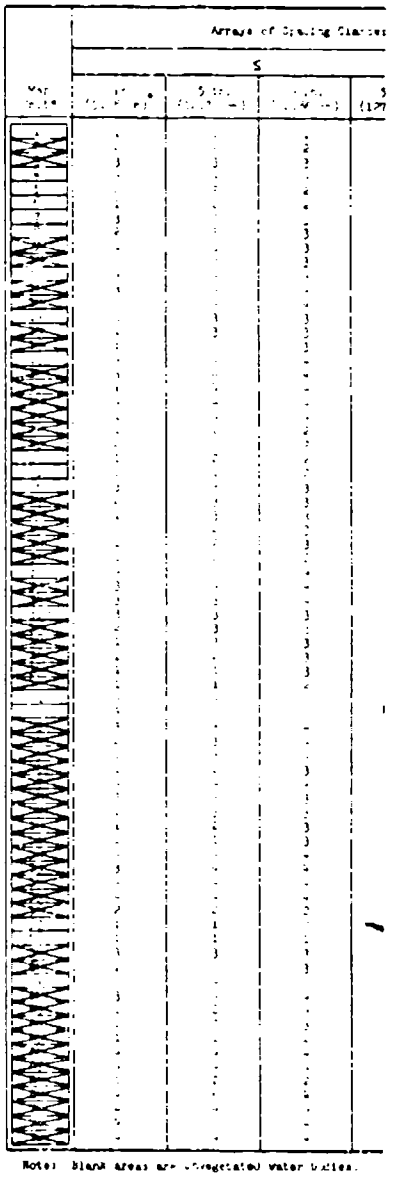
PRAN BURI



1 3

SHEET PB II





Note: Blank areas are unvegetated water bodies.

* Each map unit represents an array of eight s
spacing classes (for strata ≤ 4 m, 5-1
2 m, 3-4, and 4 to 5m, 5-12, and

† Mapping class ranges for each spacing class

Mapping Class	
1	
2	>
3	>
4	

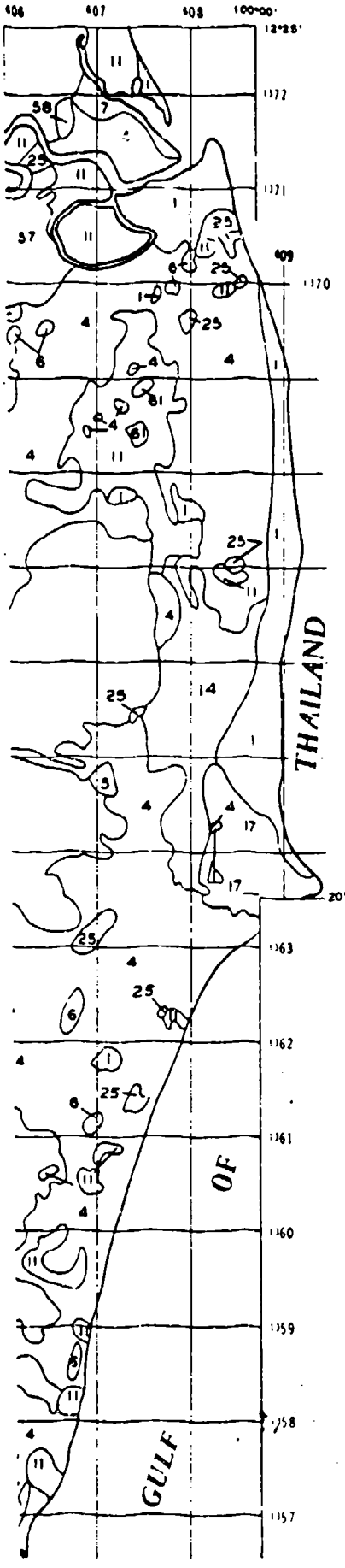
Strata is not occur on this map.

INDEX TO ADJOI

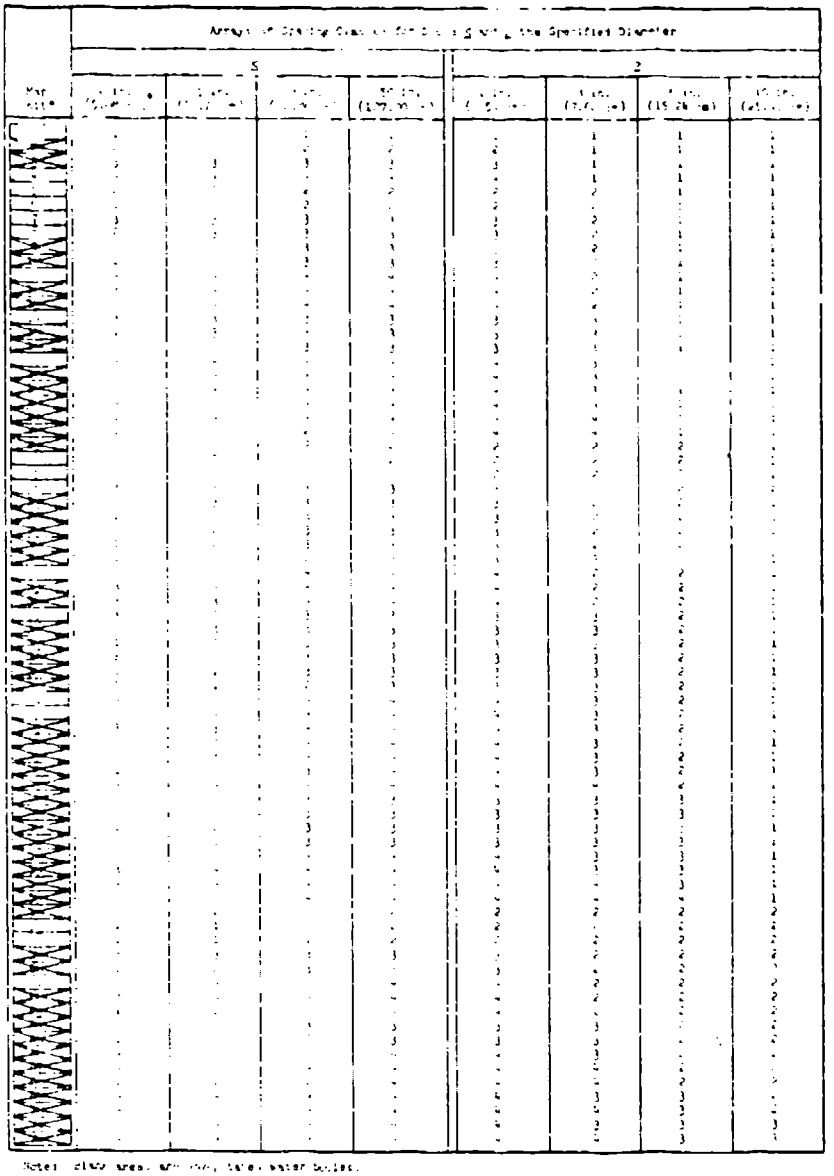
PB

PB

SHEET PB II



LEGEND



Note: [illegible] wells with more than 4 water bodies.

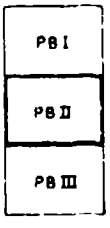
* Each map unit may contain an array of plant symbols (1 e. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13) indicating [illegible] (6.10, 12.20, 22.30, and >27.00 m) and [illegible].

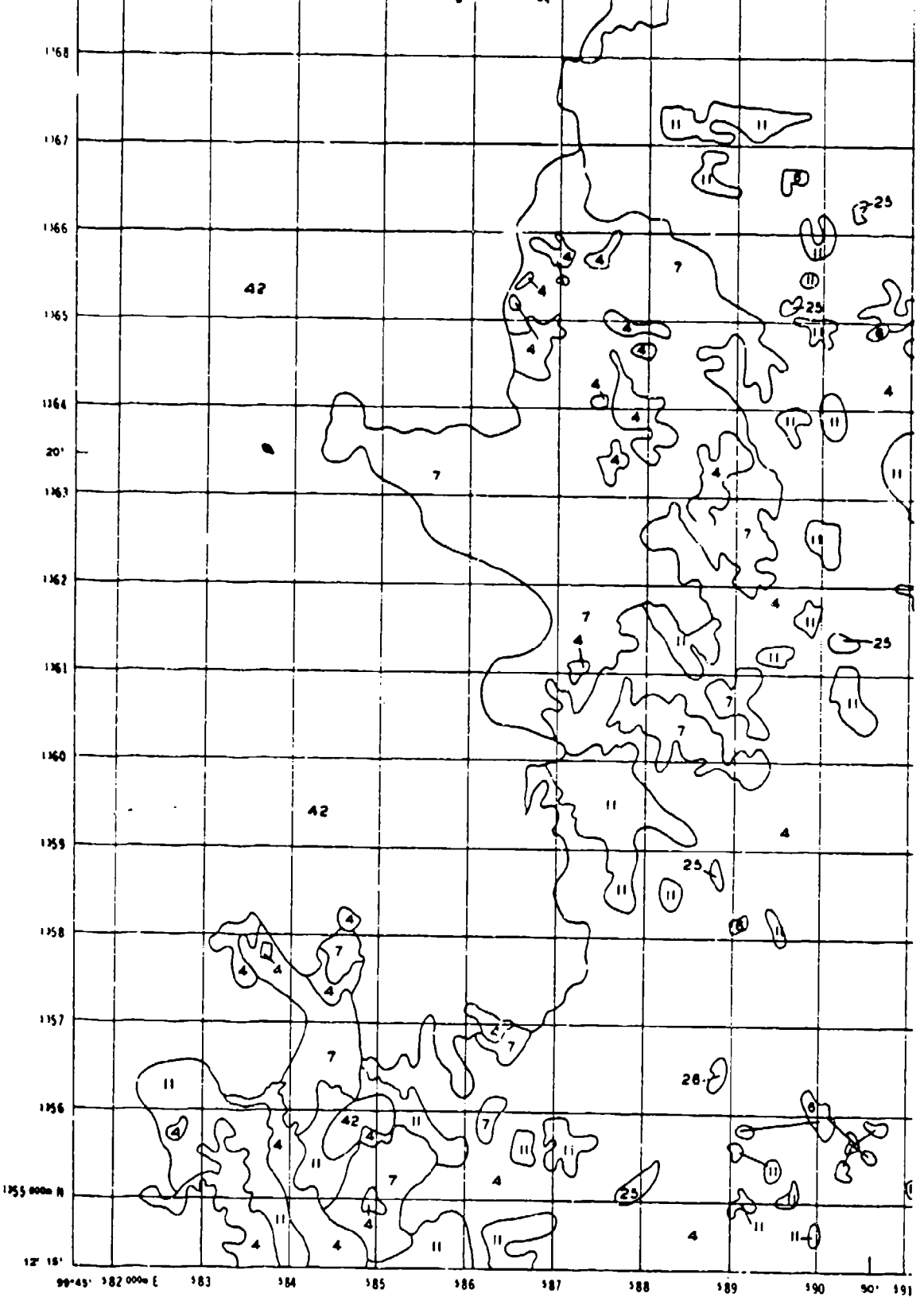
† Maximum [illegible] for each mapping class area.

Mapping Class	Failure	
	FS	B
1	[illegible]	[illegible]
2	[illegible]	[illegible]
3	[illegible]	[illegible]
4	[illegible]	[illegible]
5	[illegible]	[illegible]

[illegible] occur in this PB.

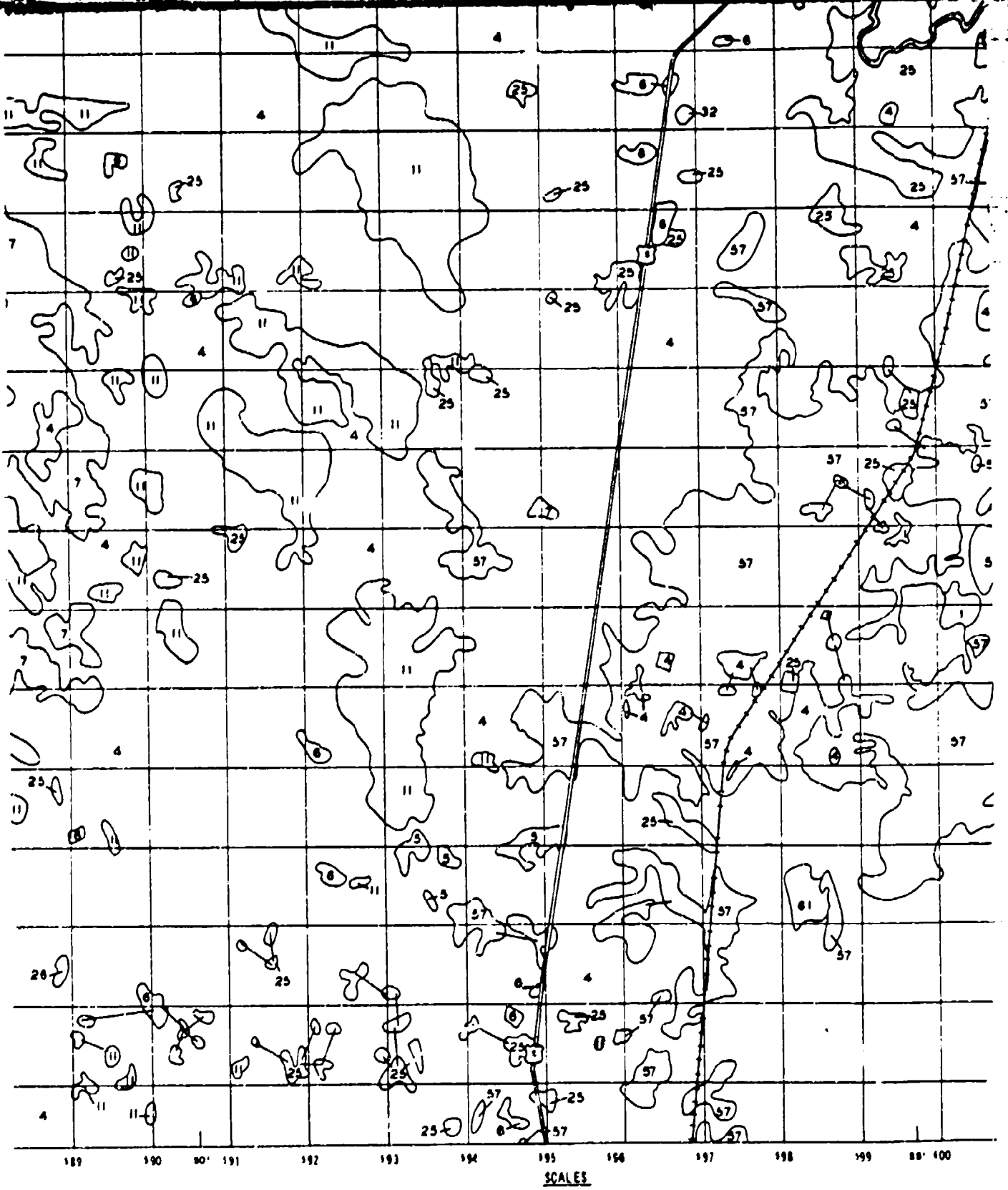
INDEX TO ADJOINING SHEETS

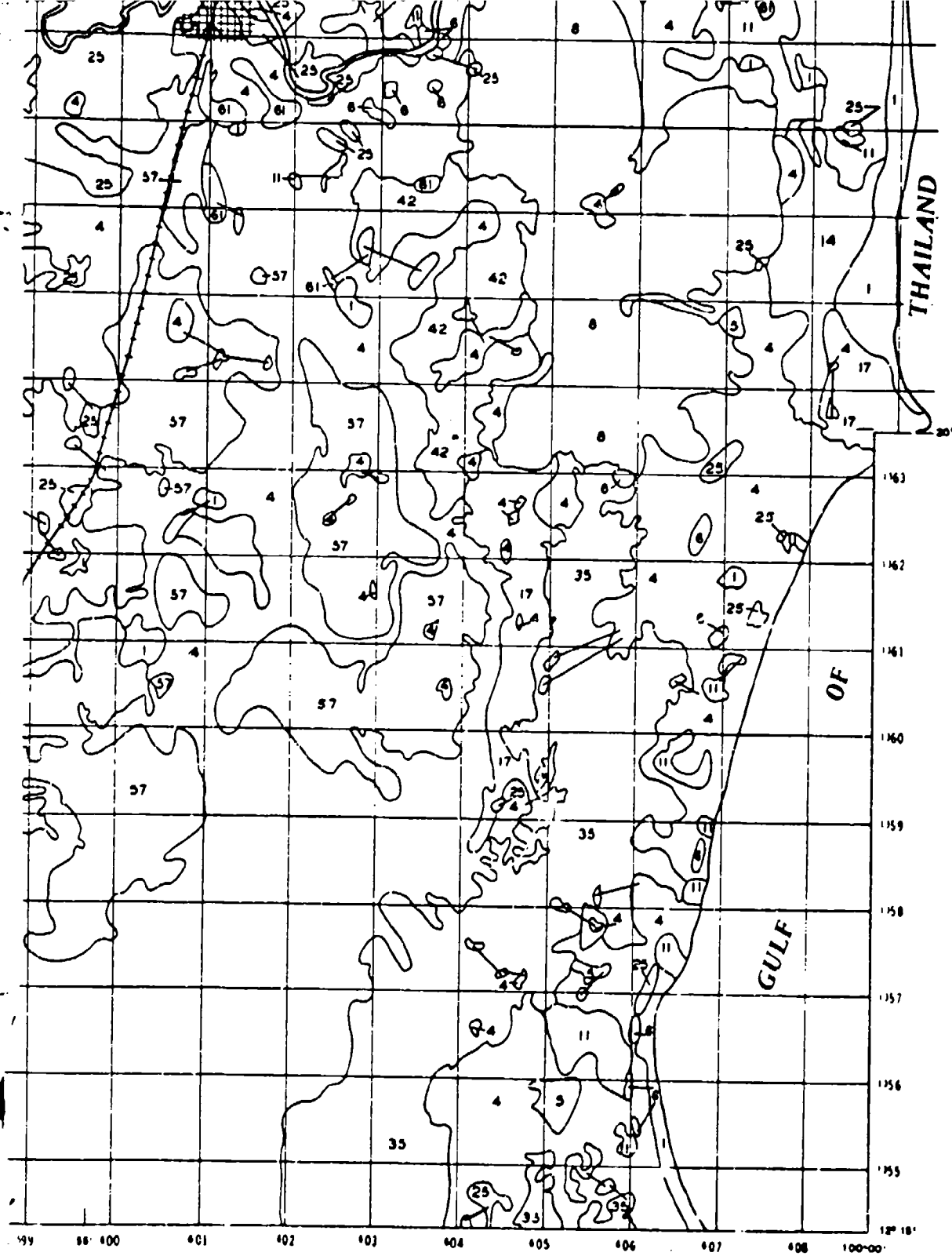




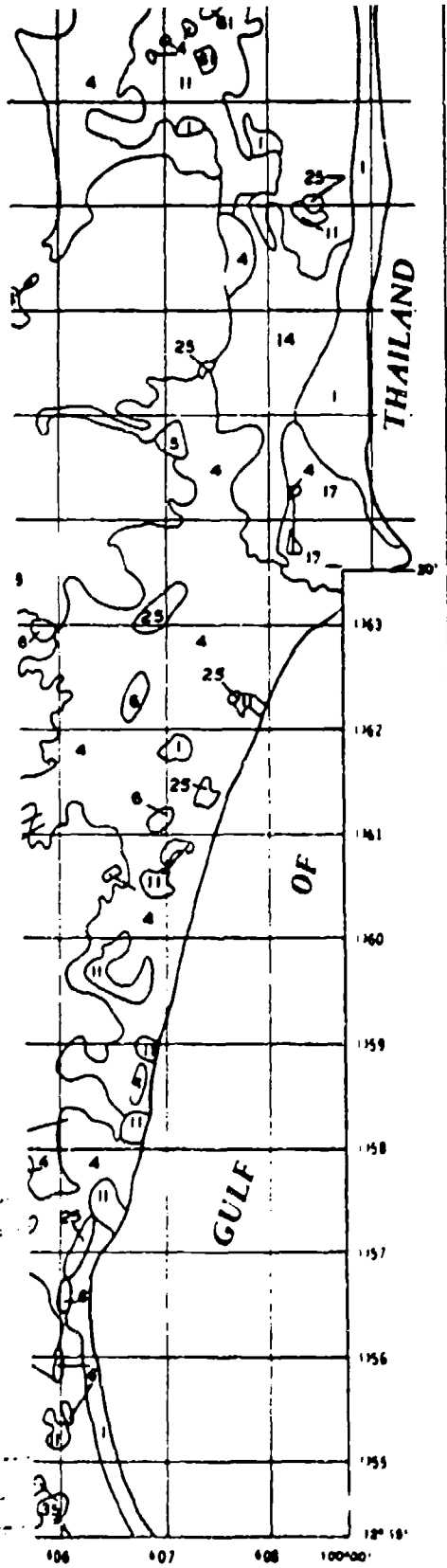
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


SCALES
3 Statute Miles
4000 Meters
4000 Yards



A QUAN
TE



INDEX TO ADJOINING SHEETS

PB I

PB II

PB III

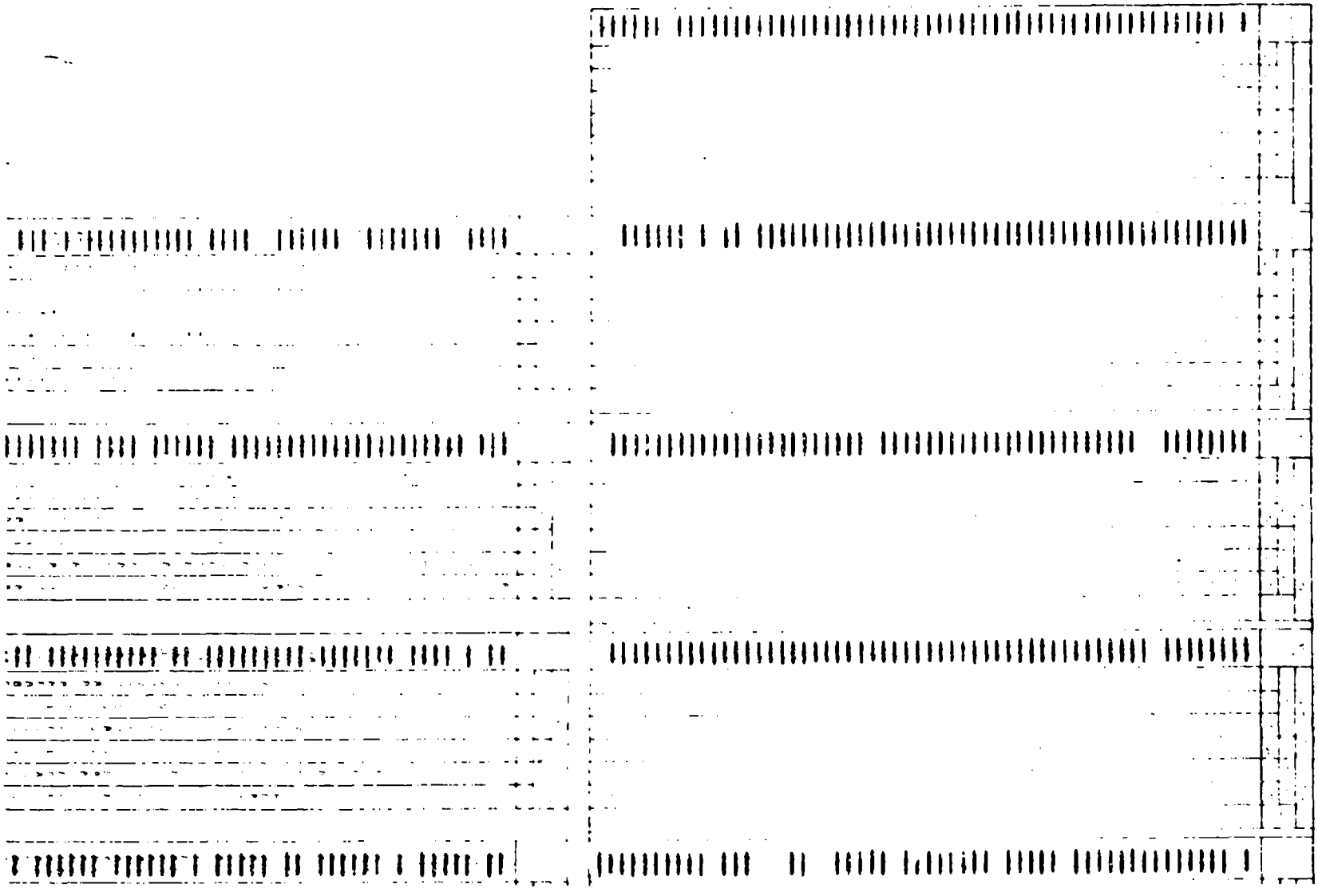
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

PRAN BURI STUDY AREA

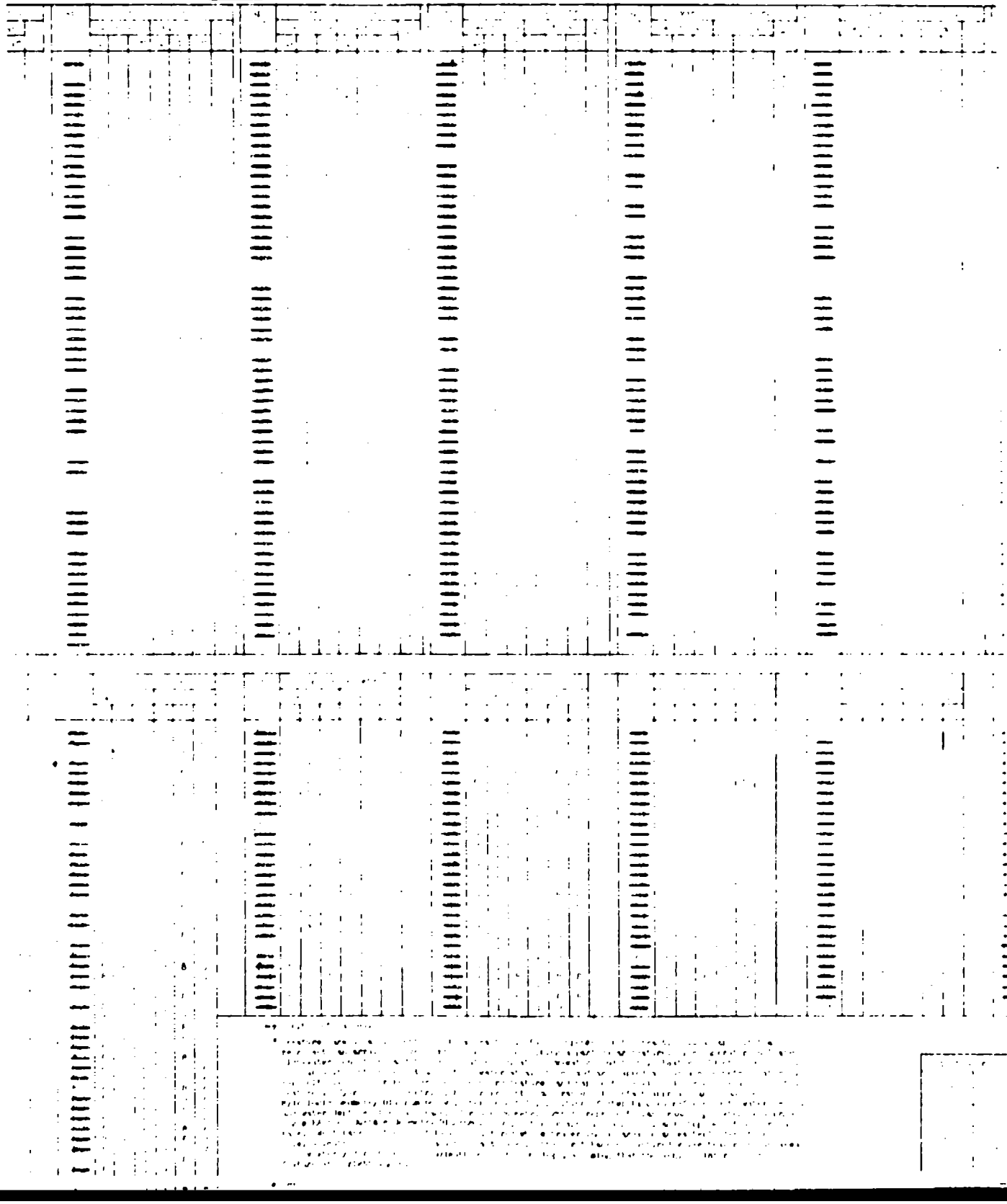
SHEET PB II

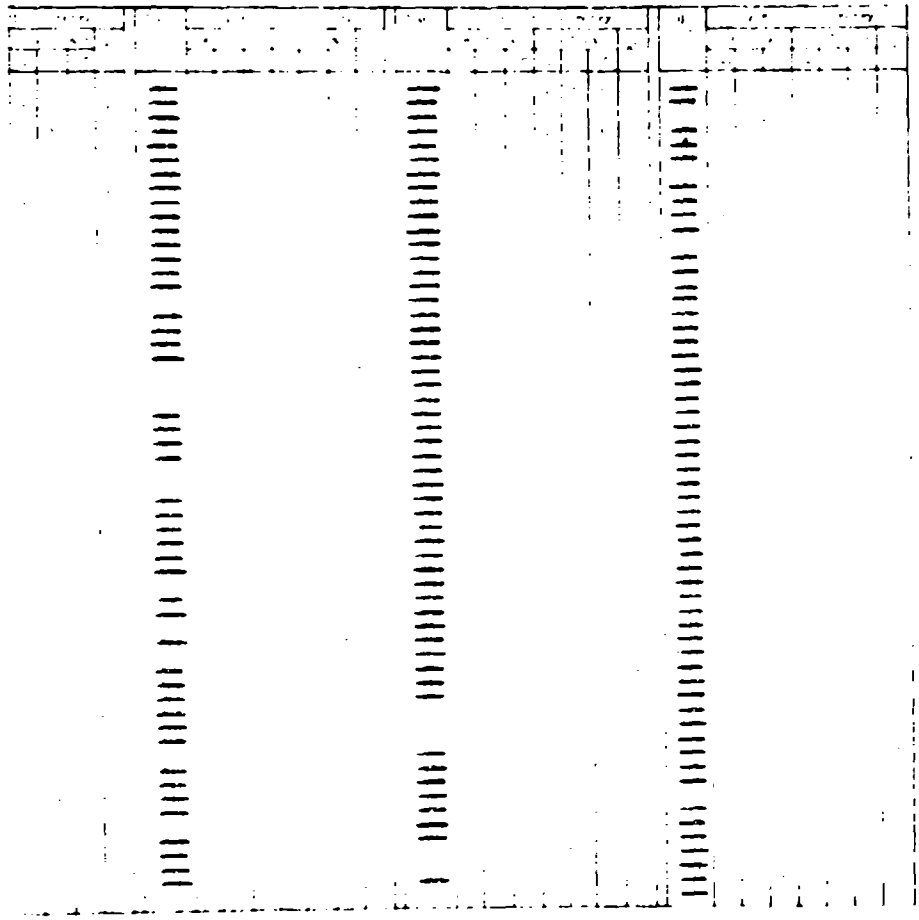
PLATE 4.2c

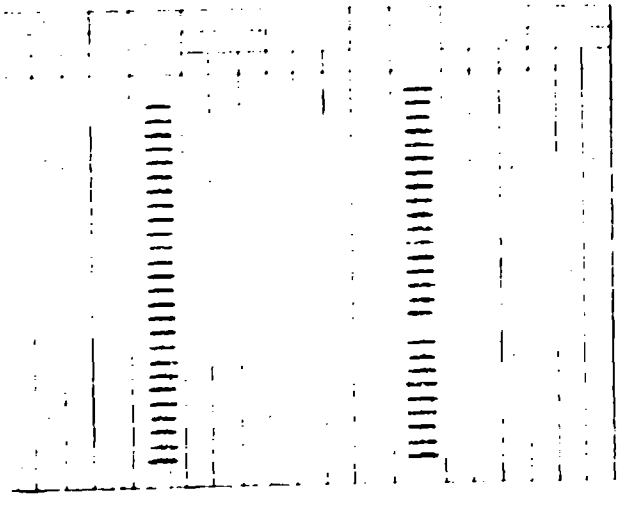


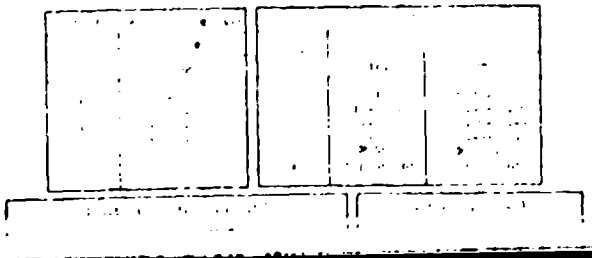
1 2

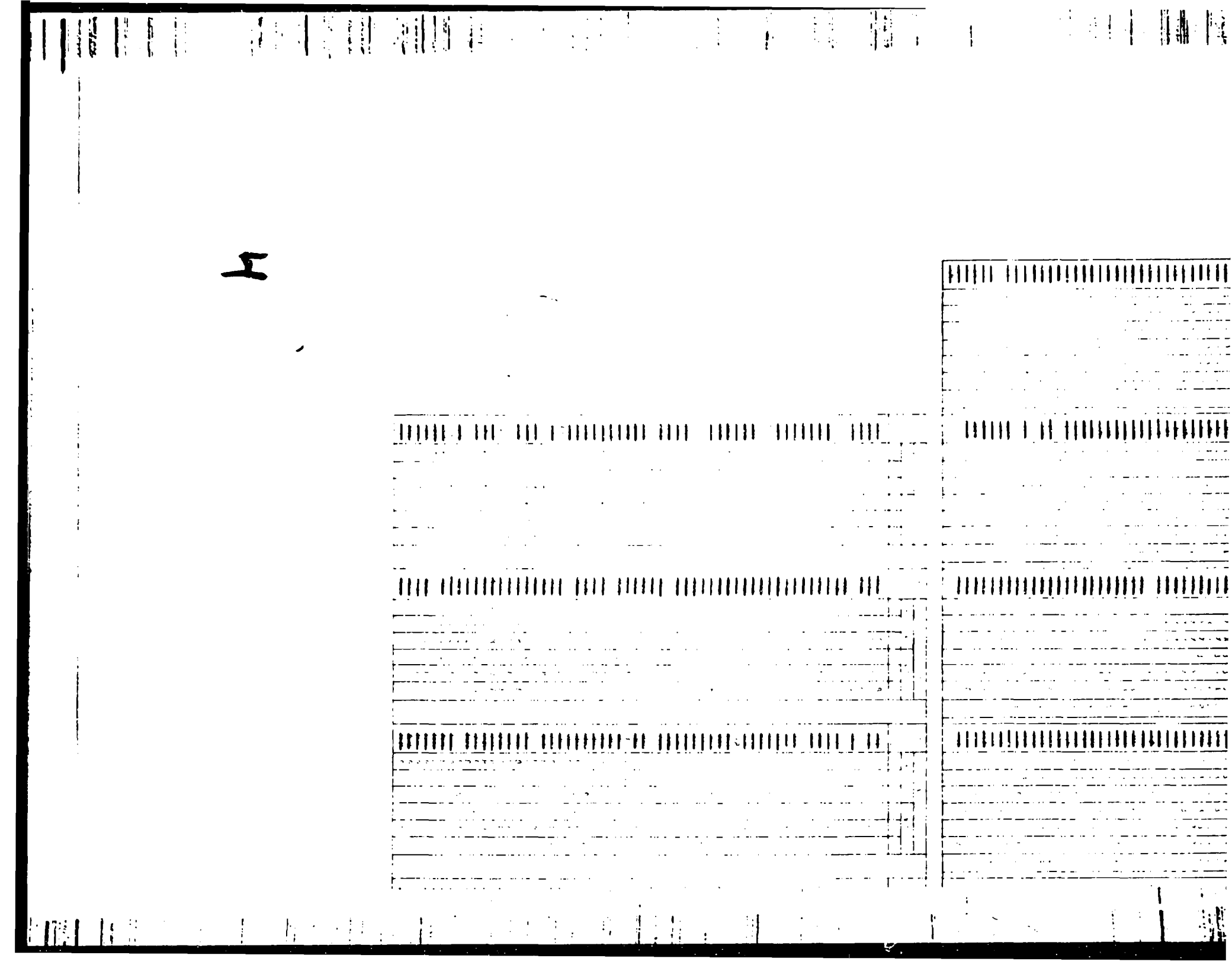
LEGEND

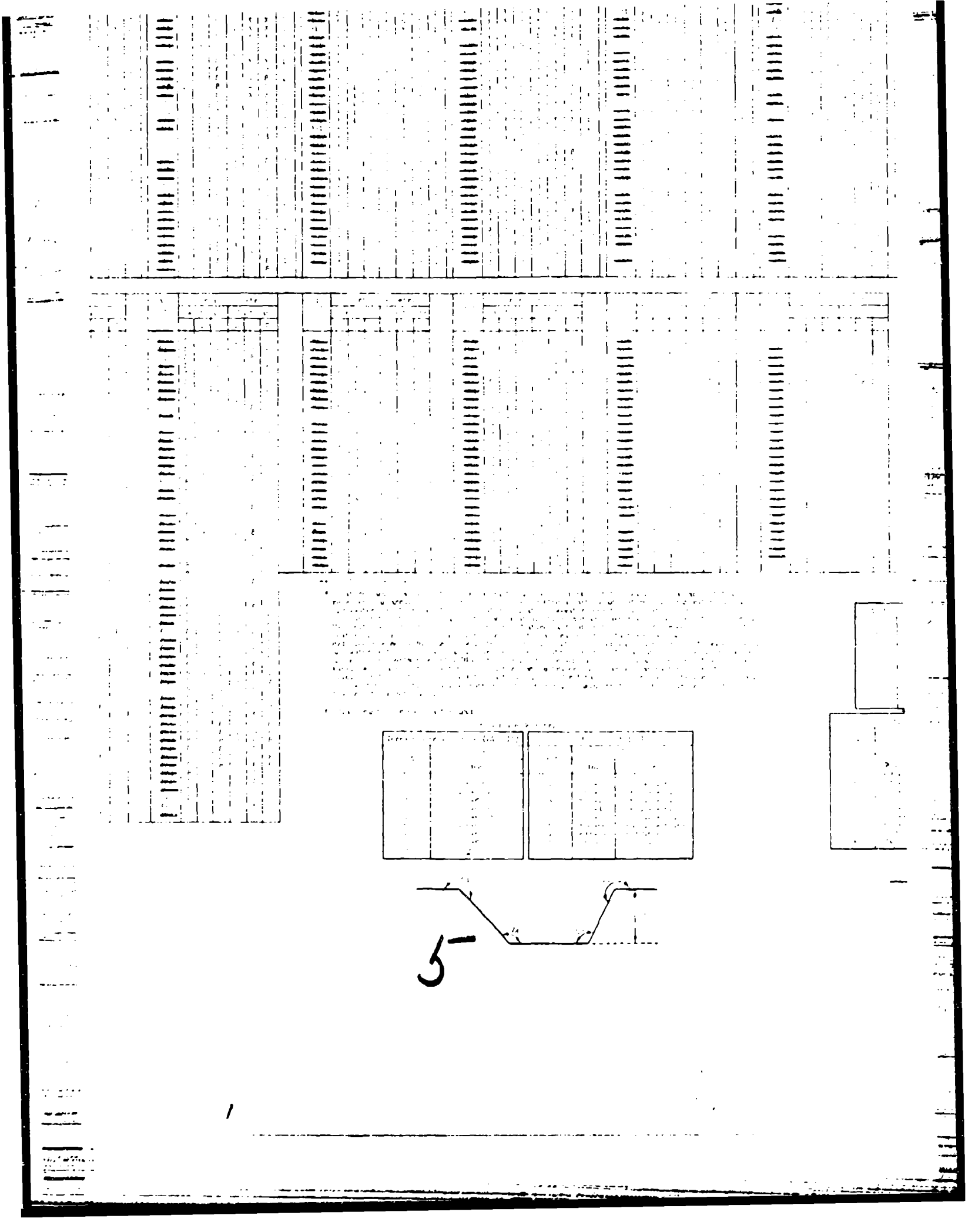


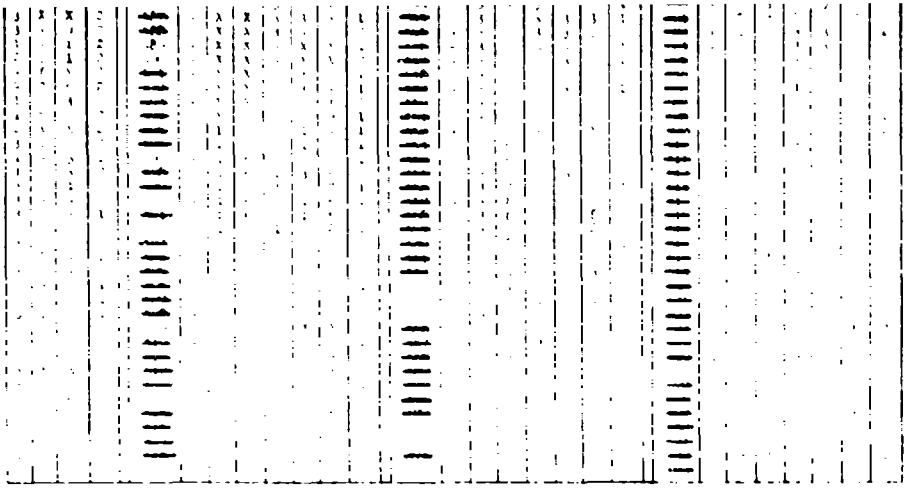


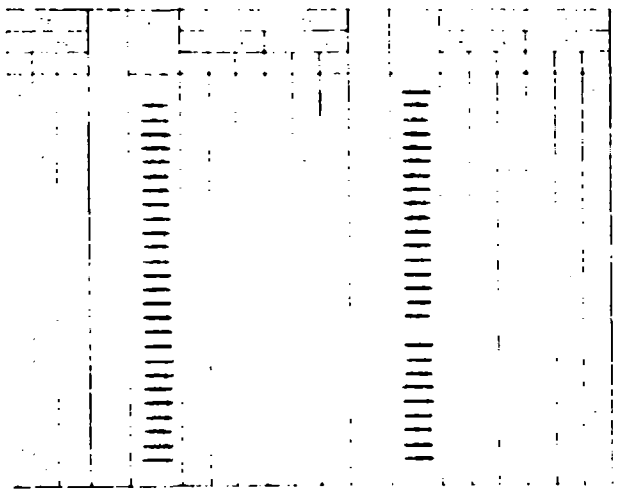


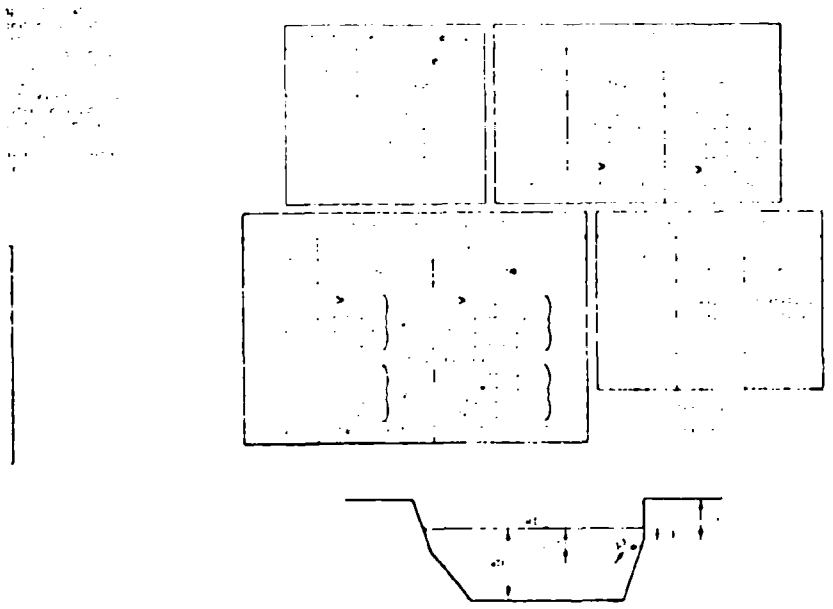


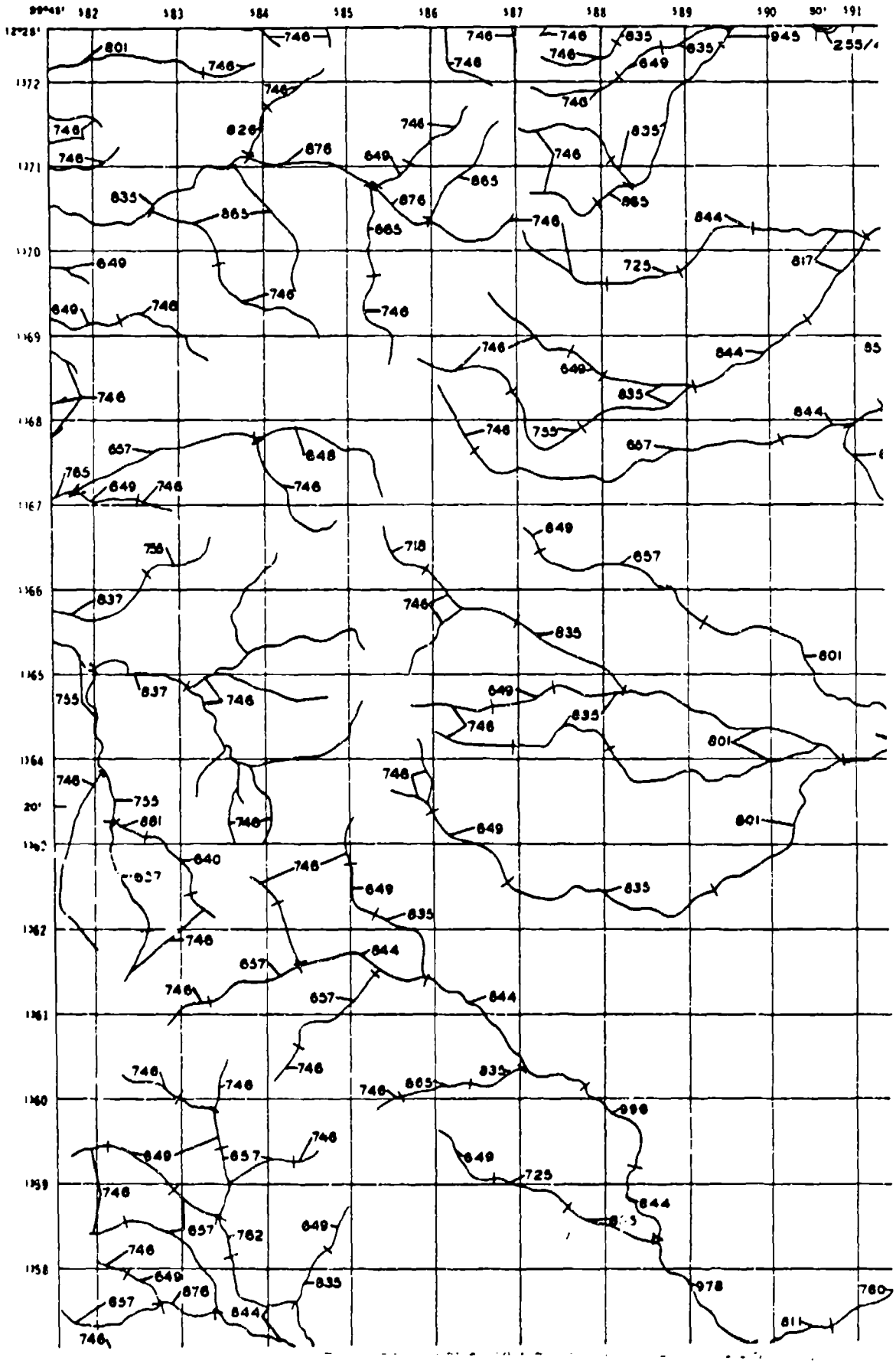






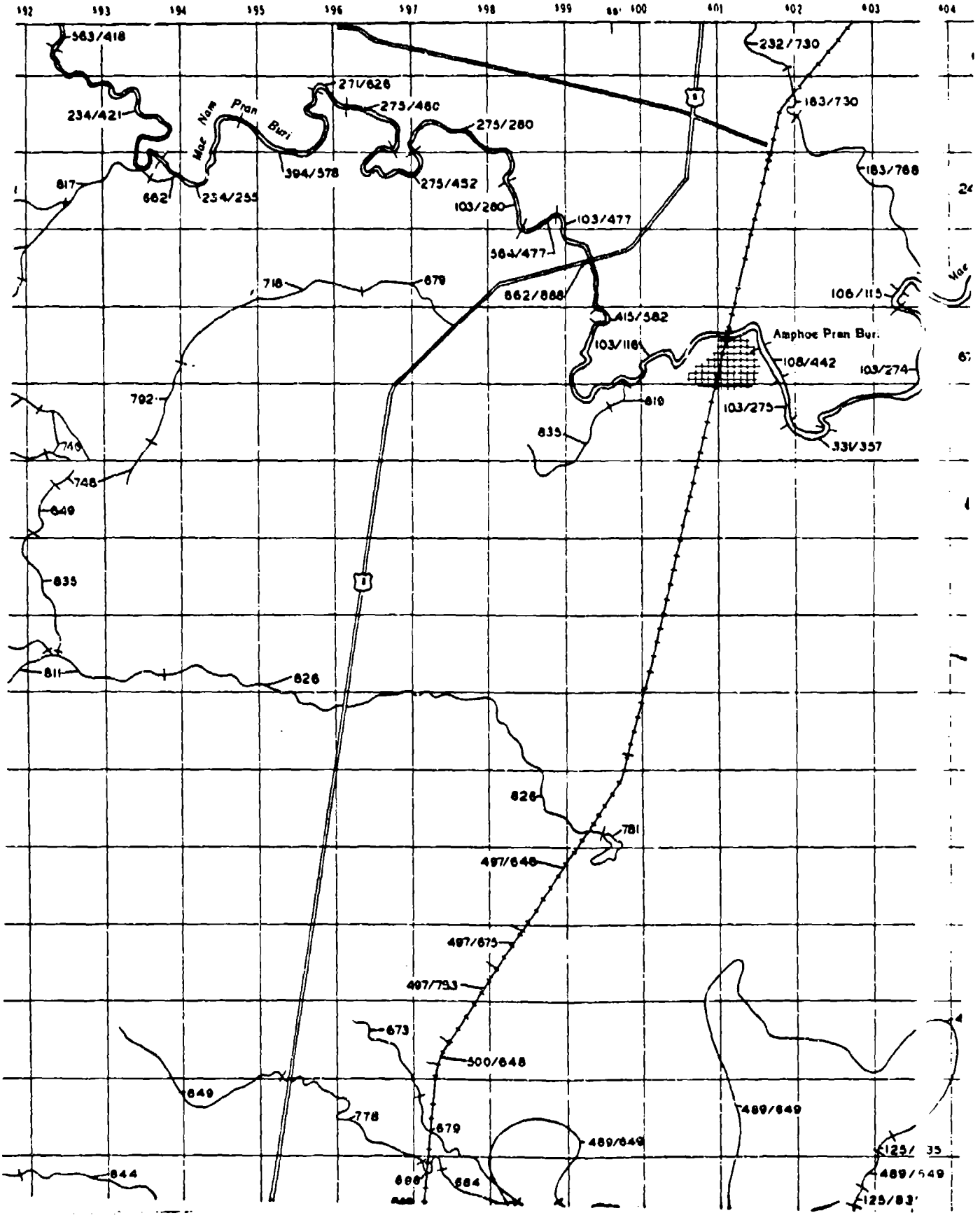





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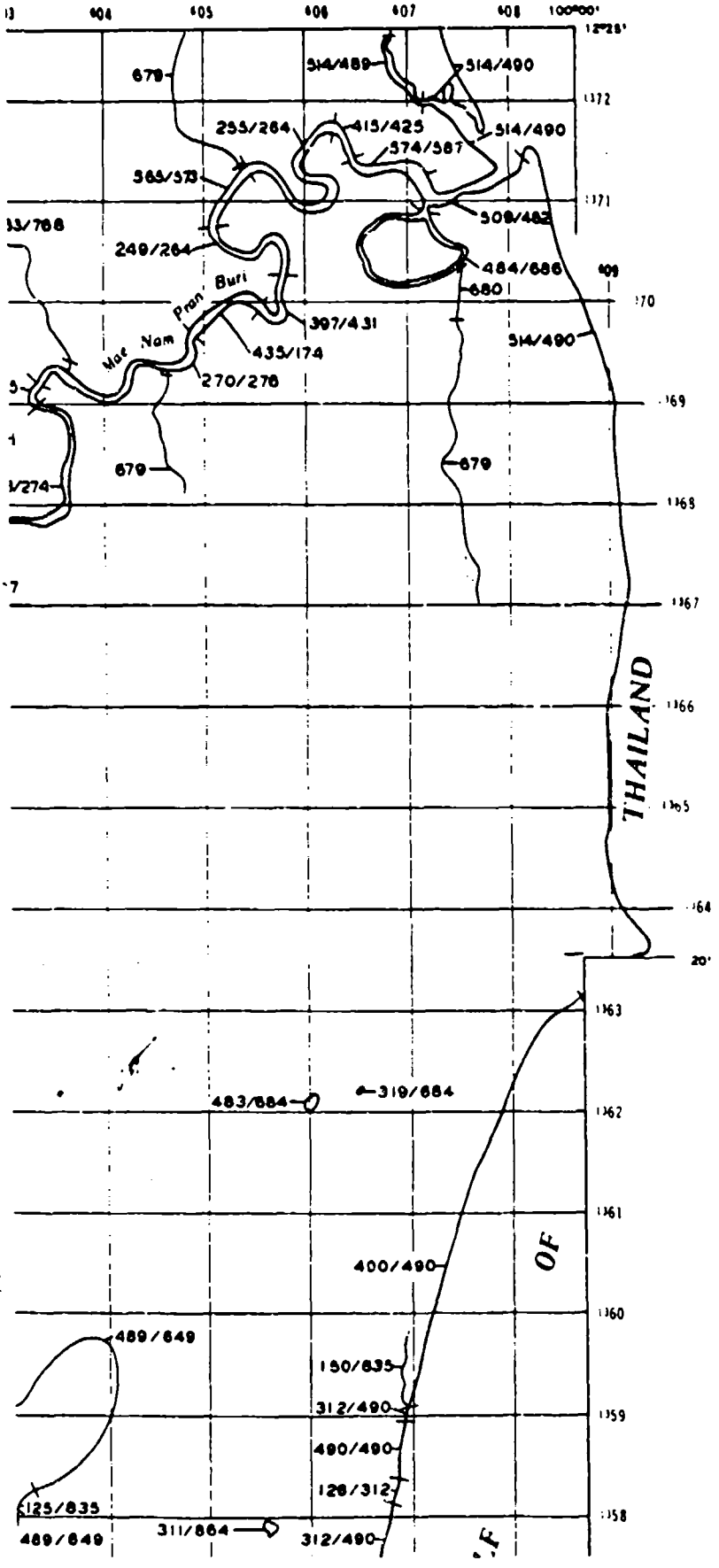
12

PRAN BURI


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563/418
234/421
Mae Nam Pran Buri
271/626
275/460
275/280
394/578
275/452
817
662
234/255
103/280
103/477
564/477
718
679
662/868
415/582
106/115
Amphoe Pran Buri
103/116
108/442
103/274
792
819
103/275
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331/357
749
748
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835
811
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826
781
497/648
497/675
497/753
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500/648
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489/649
125/83

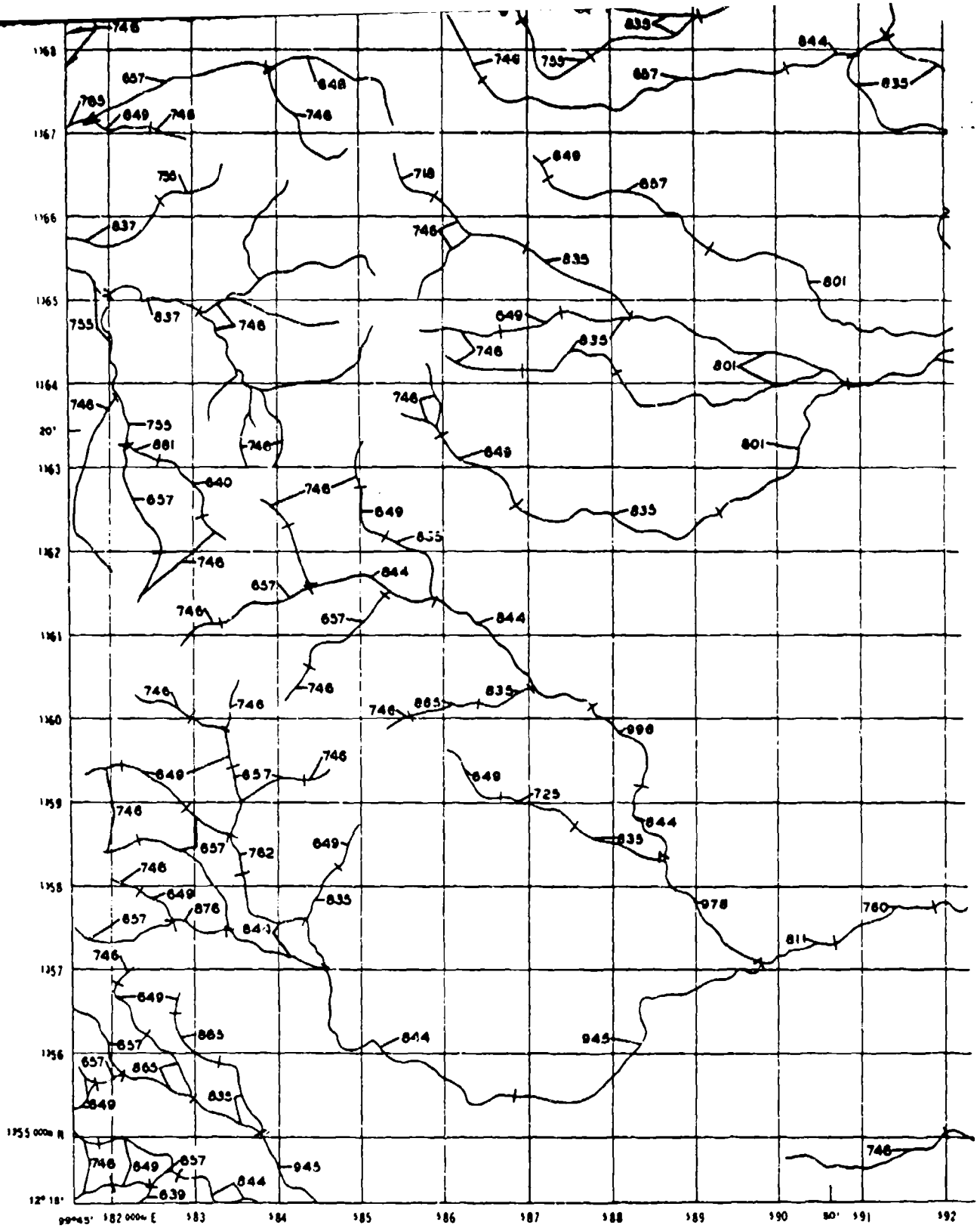
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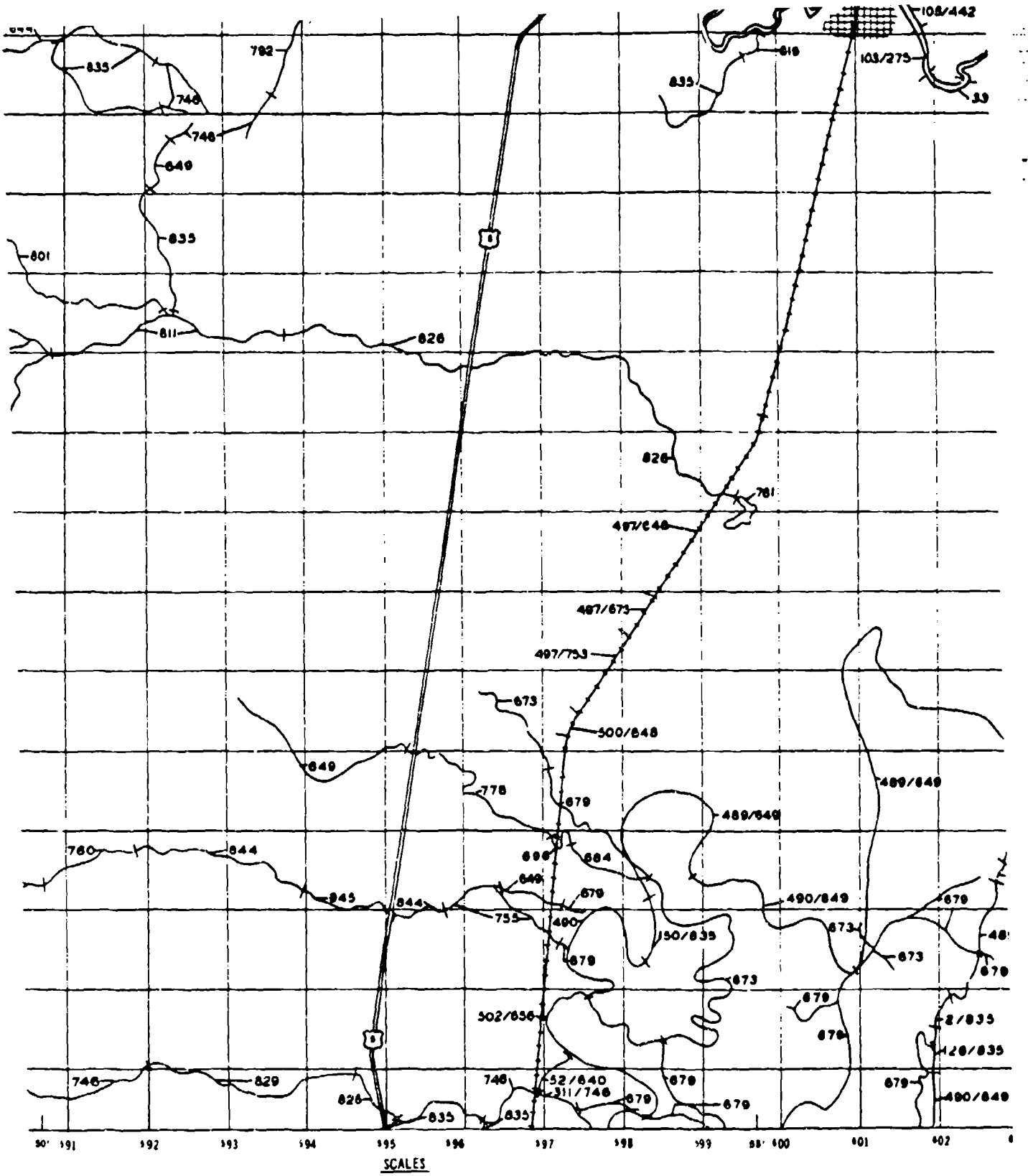
SHEET P8 II



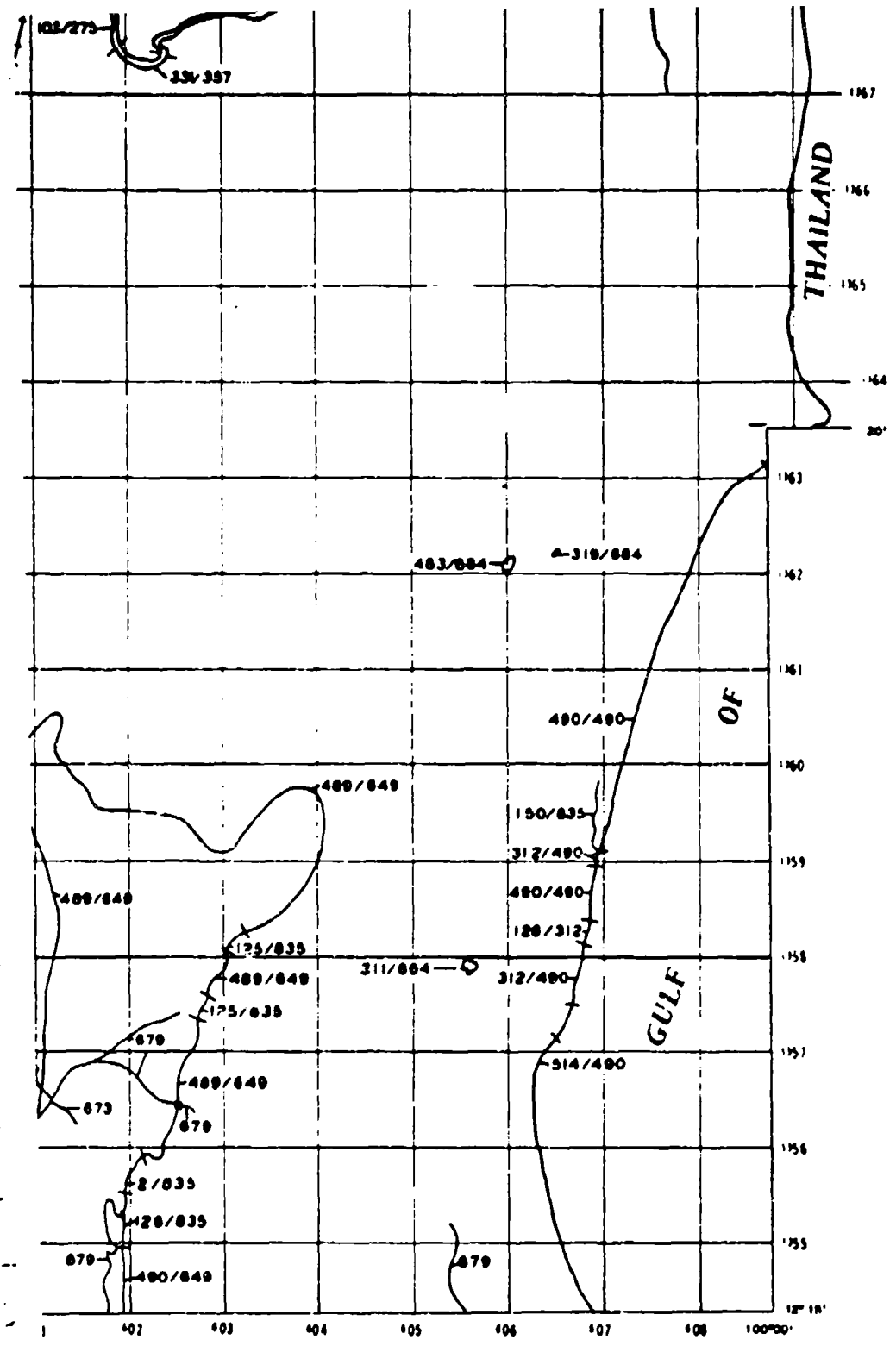
INDEX TO ADJOINING SHEETS

P8 I


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801
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781
497/648
487/673
497/753
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490/849
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829
826
746
52/640
311/746
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679
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679
490/849
SCALES
Statute Miles
Meters
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5



INDEX TO ADJOINING

PB I
PB II
PB III

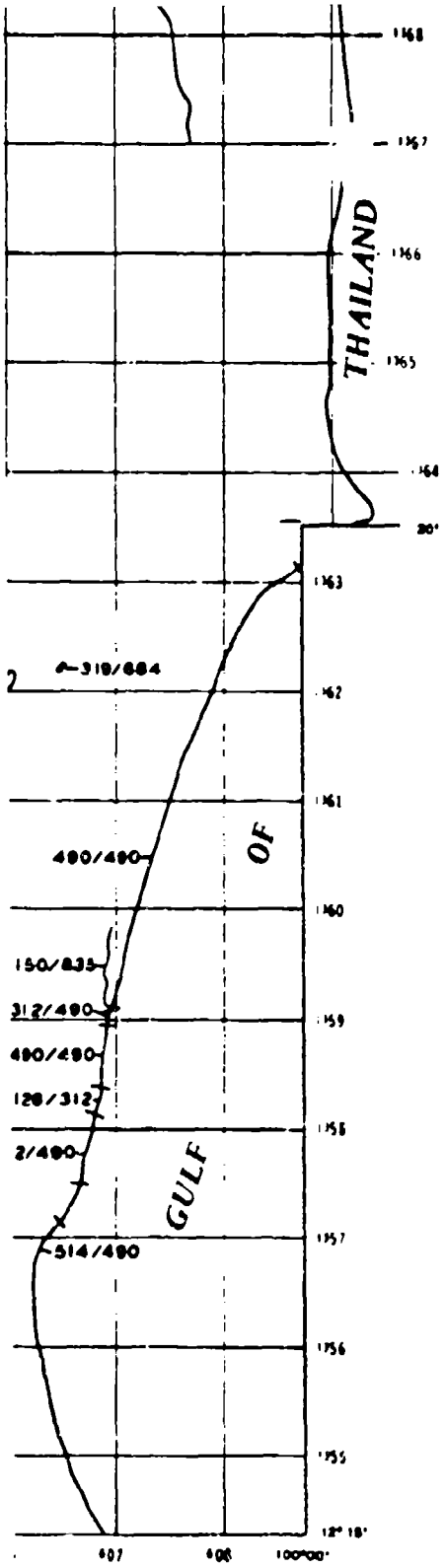
A QUANTITATIVE METHOD
TERRAIN FOR GROU

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SHEET P

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INDEX TO ADJOINING SHEETS



7

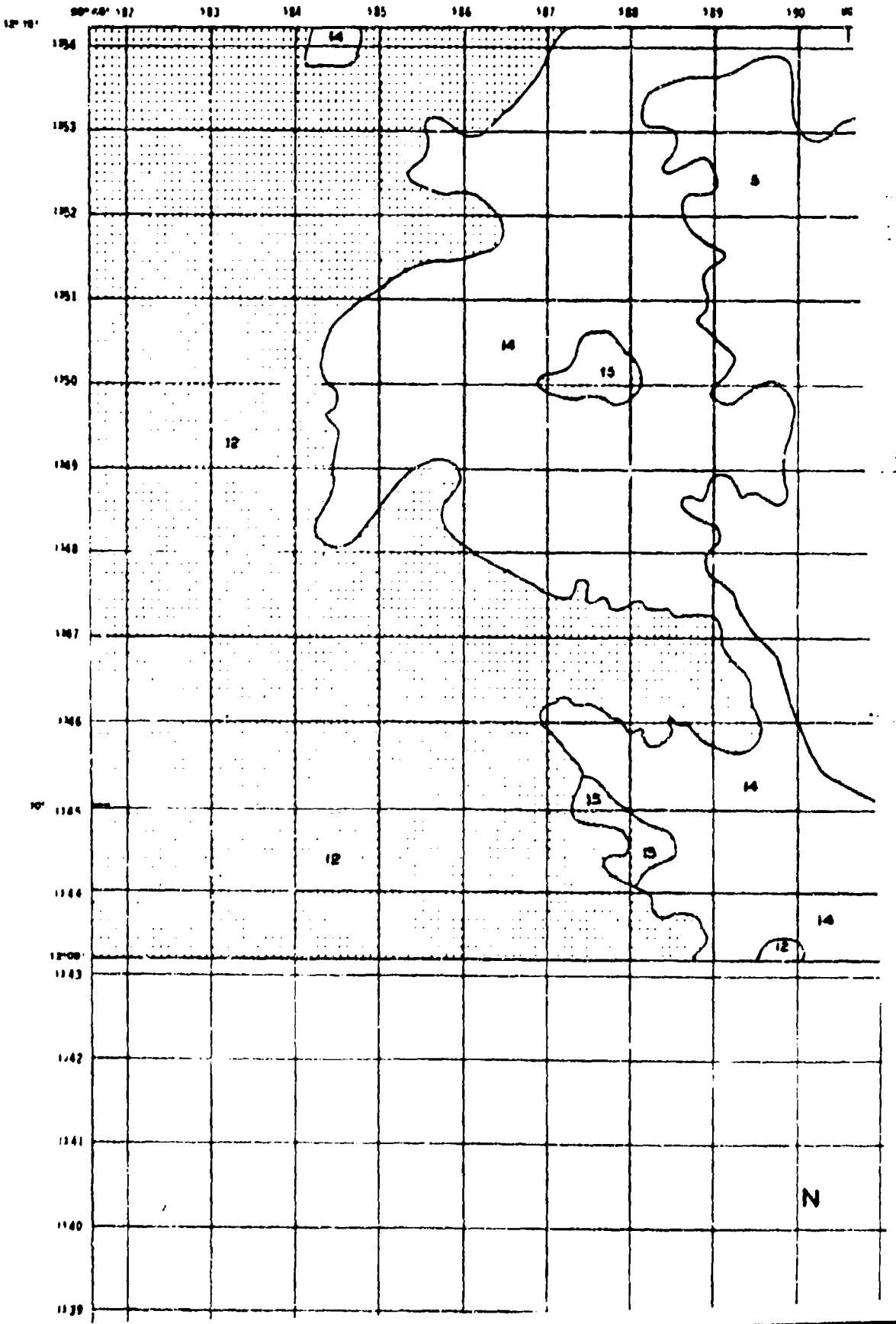
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

PRAN BURI STUDY AREA

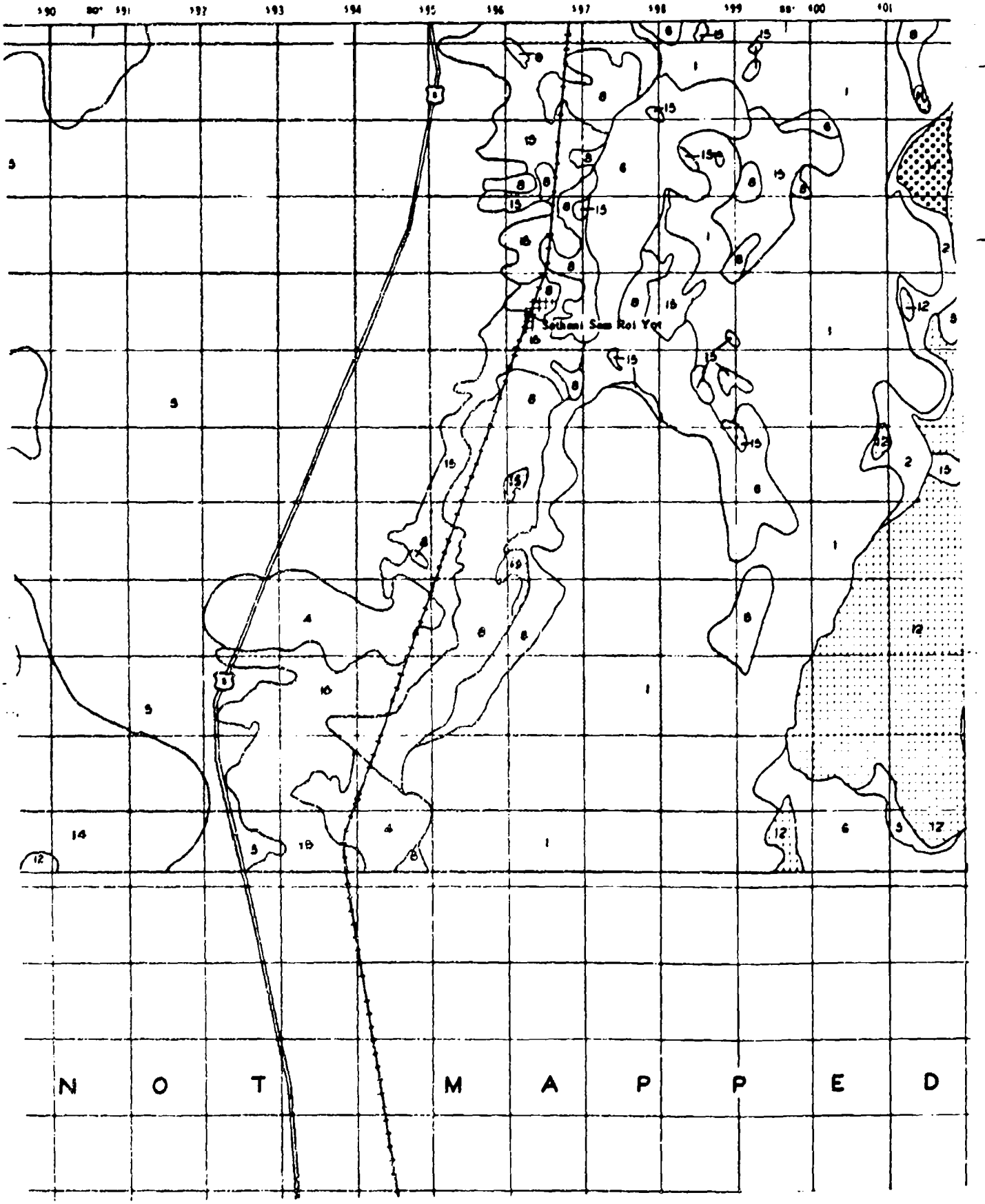
SHEET PB II

PLATE 4.2d

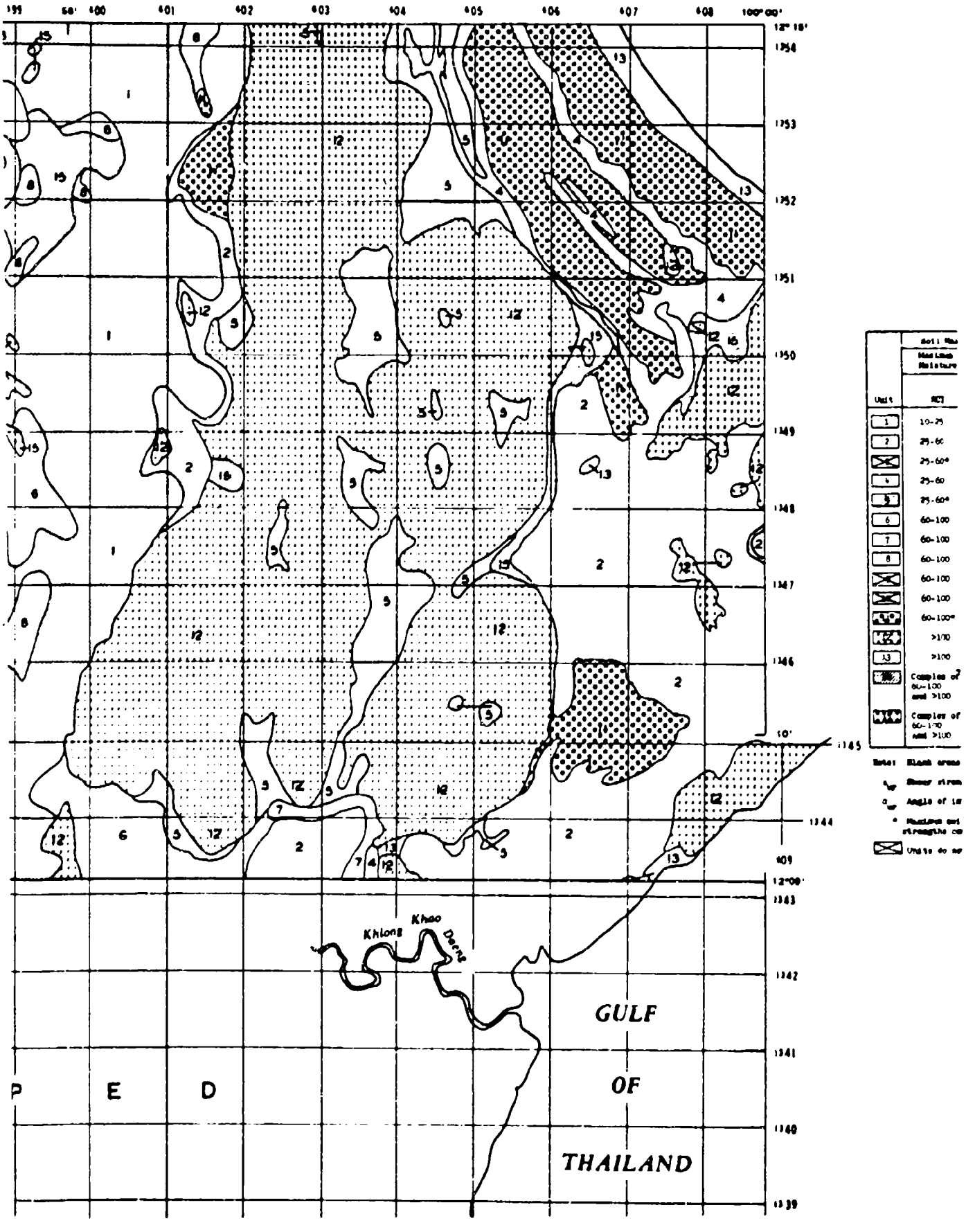

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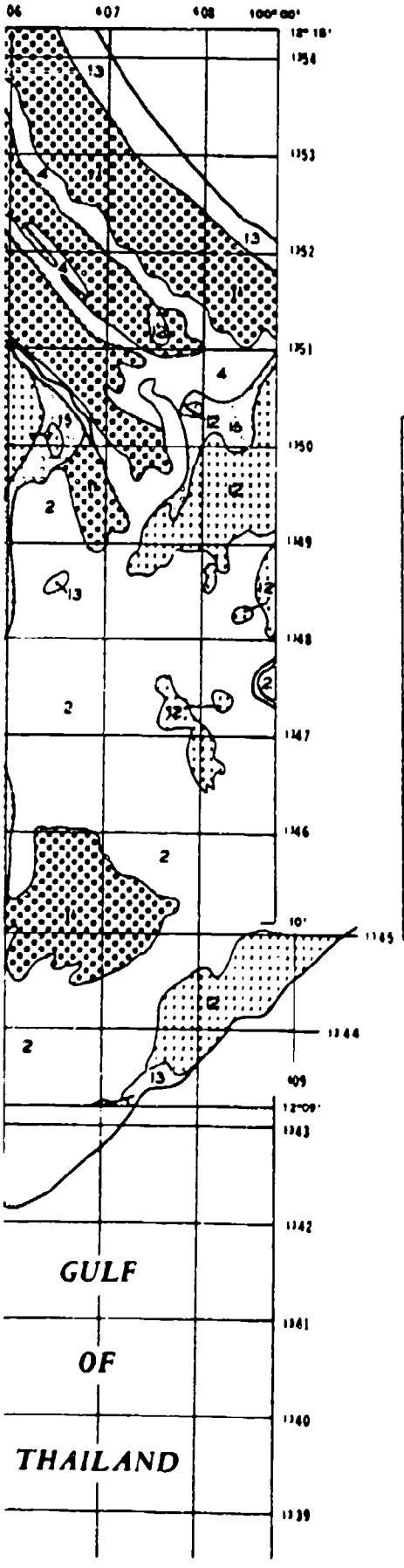
PRAN BURI



SHEET PB III



SHEET PB III



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Soil Surface Strength: Minimum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Conditions where maximum c_{ur} occurs: c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
⊠	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
⊠	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
12	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
2/13	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
⊠ 2/13	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Water: Black areas are water bodies.

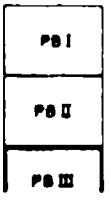
c_{ur} Shear strength at zero normal load.

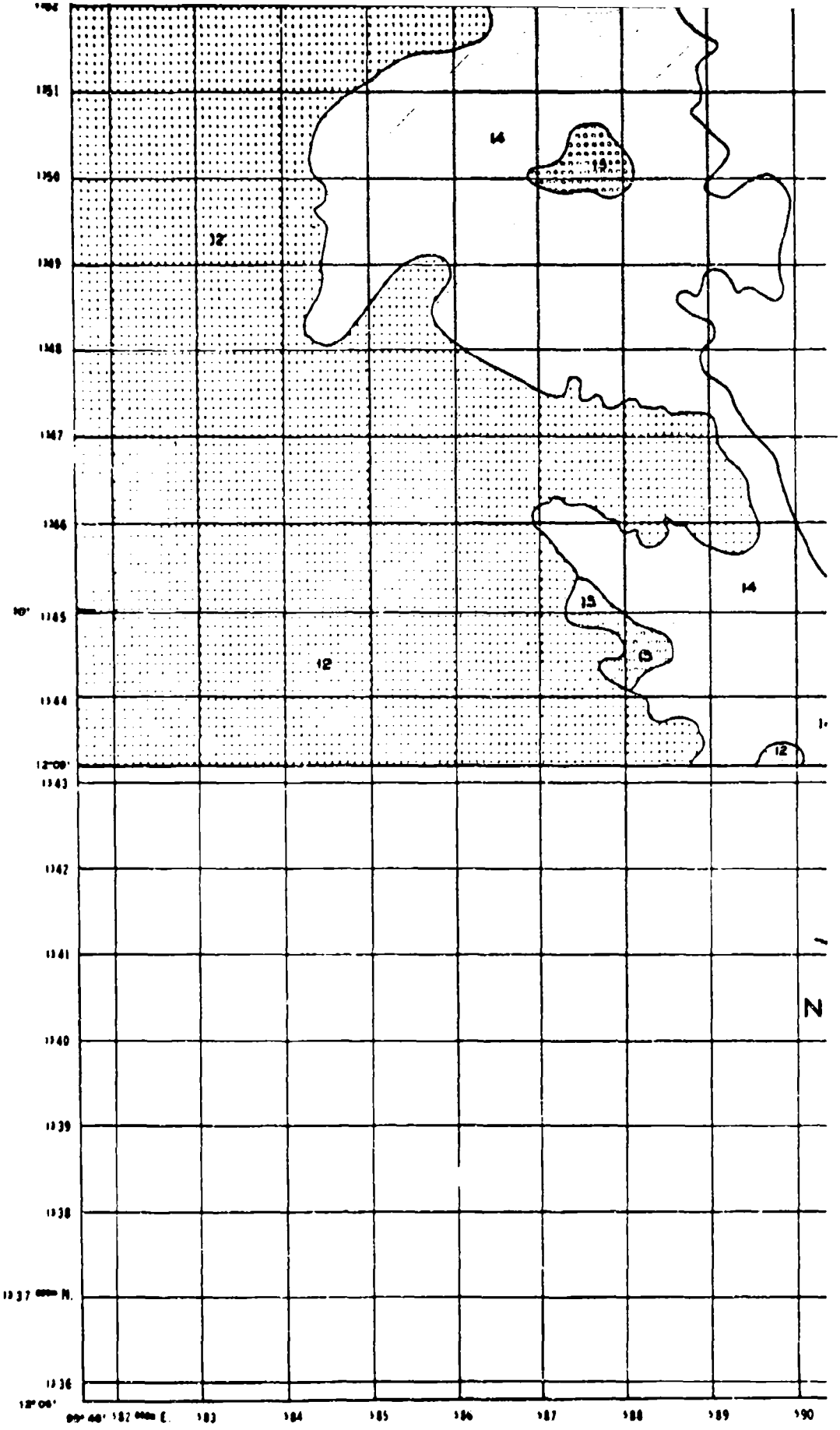
ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

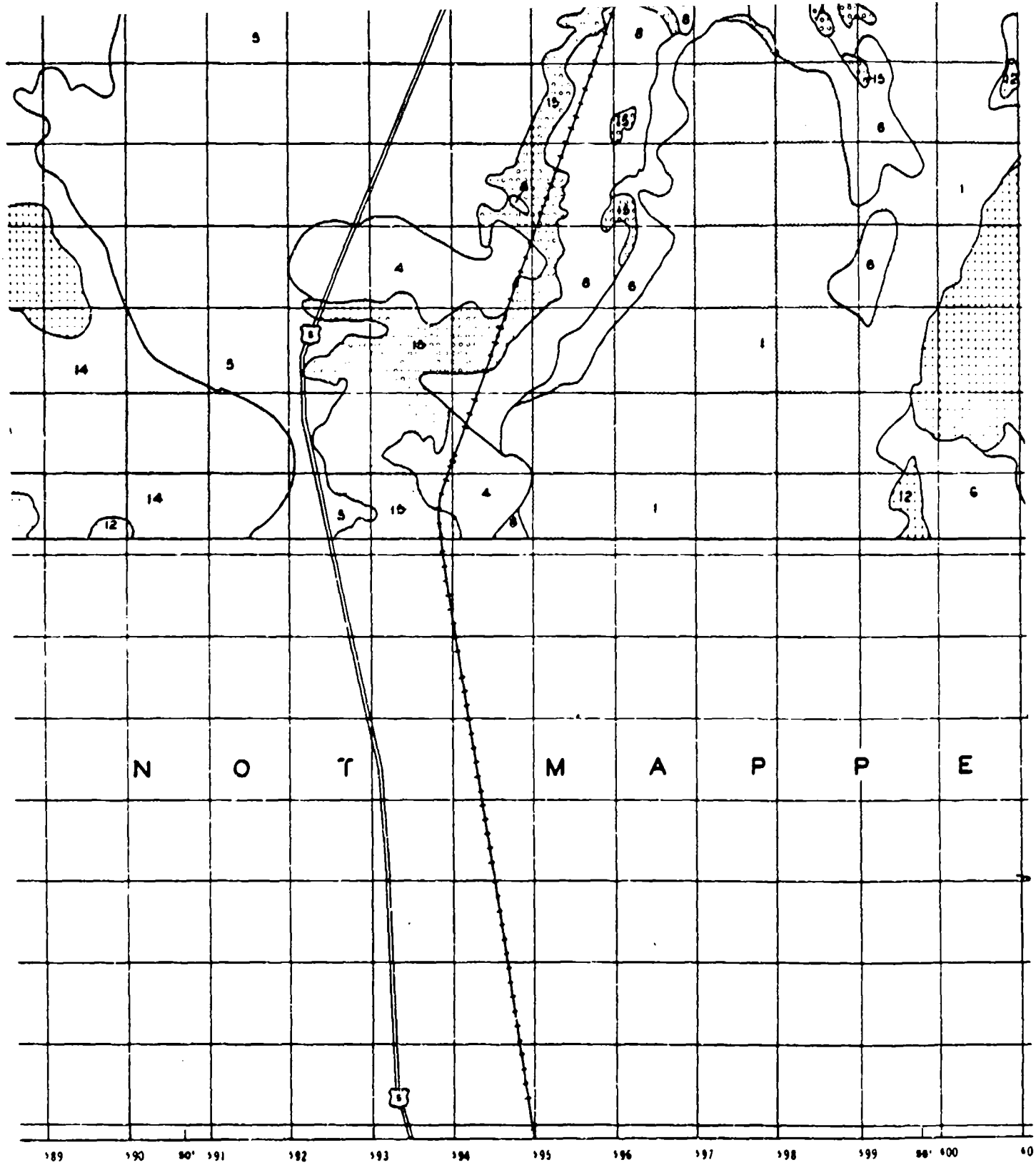
⊠ Units do not occur on this map.

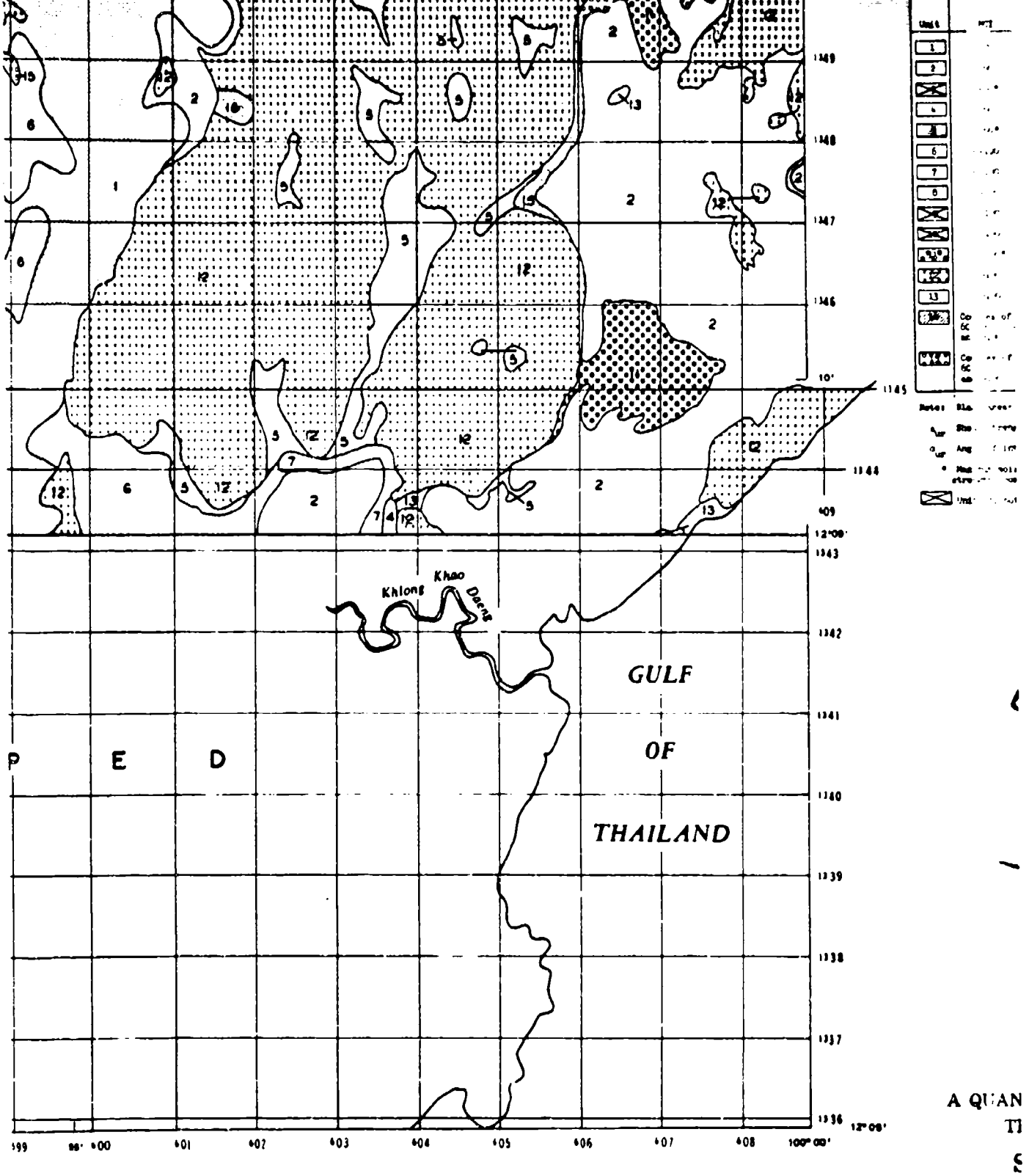
INDEX TO ADJOINING SHEETS





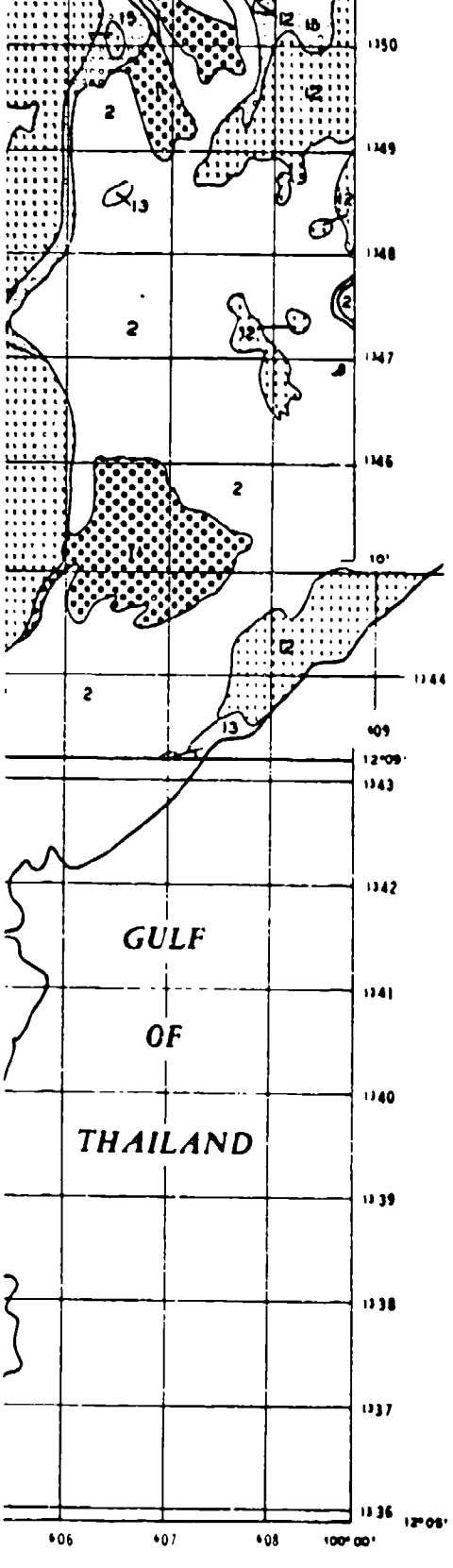
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P


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Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{up} psi	c_{up} kg/cm²	Maximum Moisture ϕ_{up} deg	Minimum Moisture c_{up} psi	c_{up} kg/cm²	Minimum Moisture ϕ_{up} deg	Conditions where maximum c_{up} occurs: c_{up} psi	c_{up} kg/cm²	ϕ_{up} deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	50-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
12/13	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
11/12/13	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

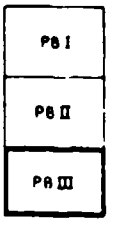
c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

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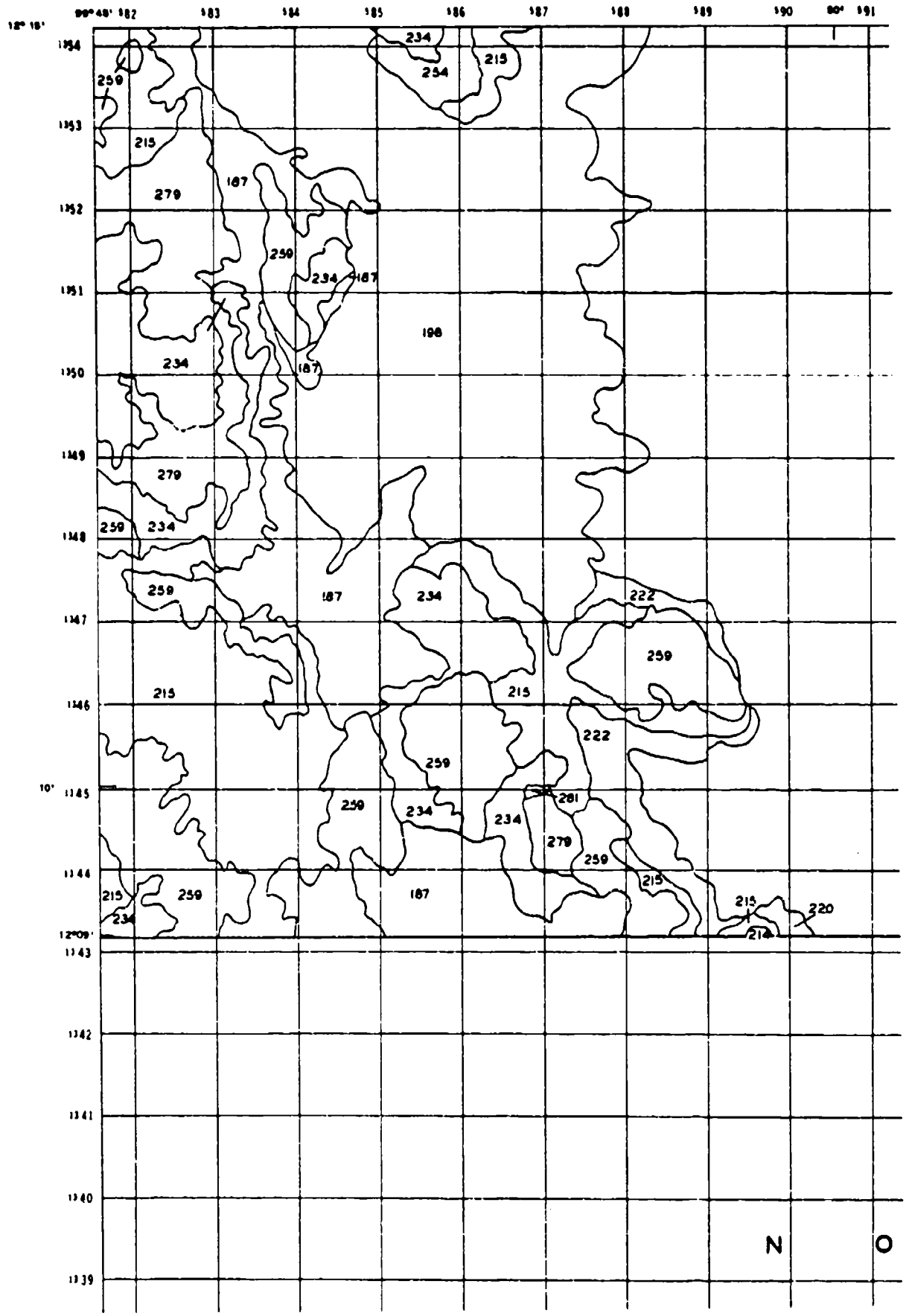
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

PRAN BURI STUDY AREA

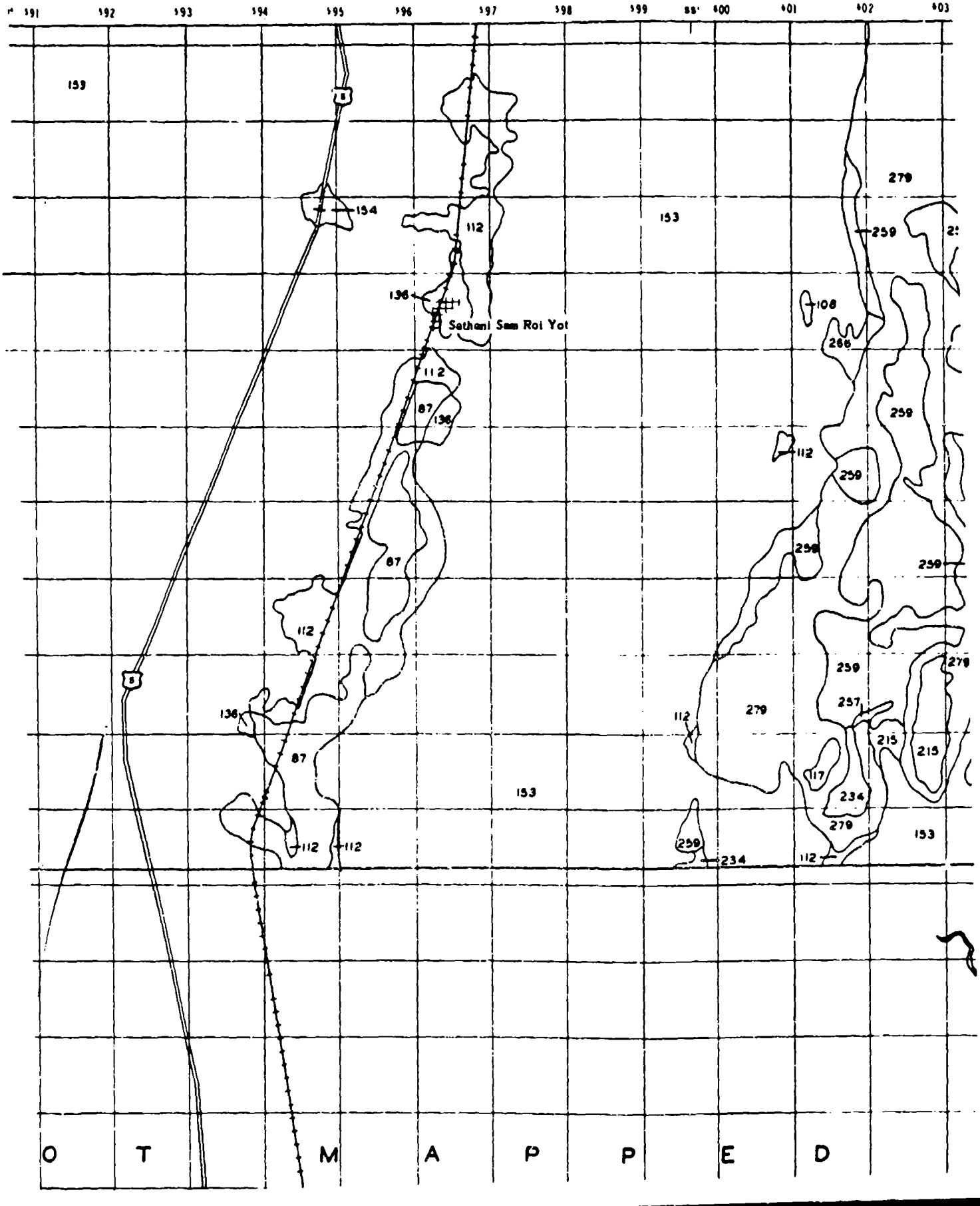
SHEET PB III

PLATE 4.3a


90°48' 182 183 184 185 186 187 188 189 190 80° 191
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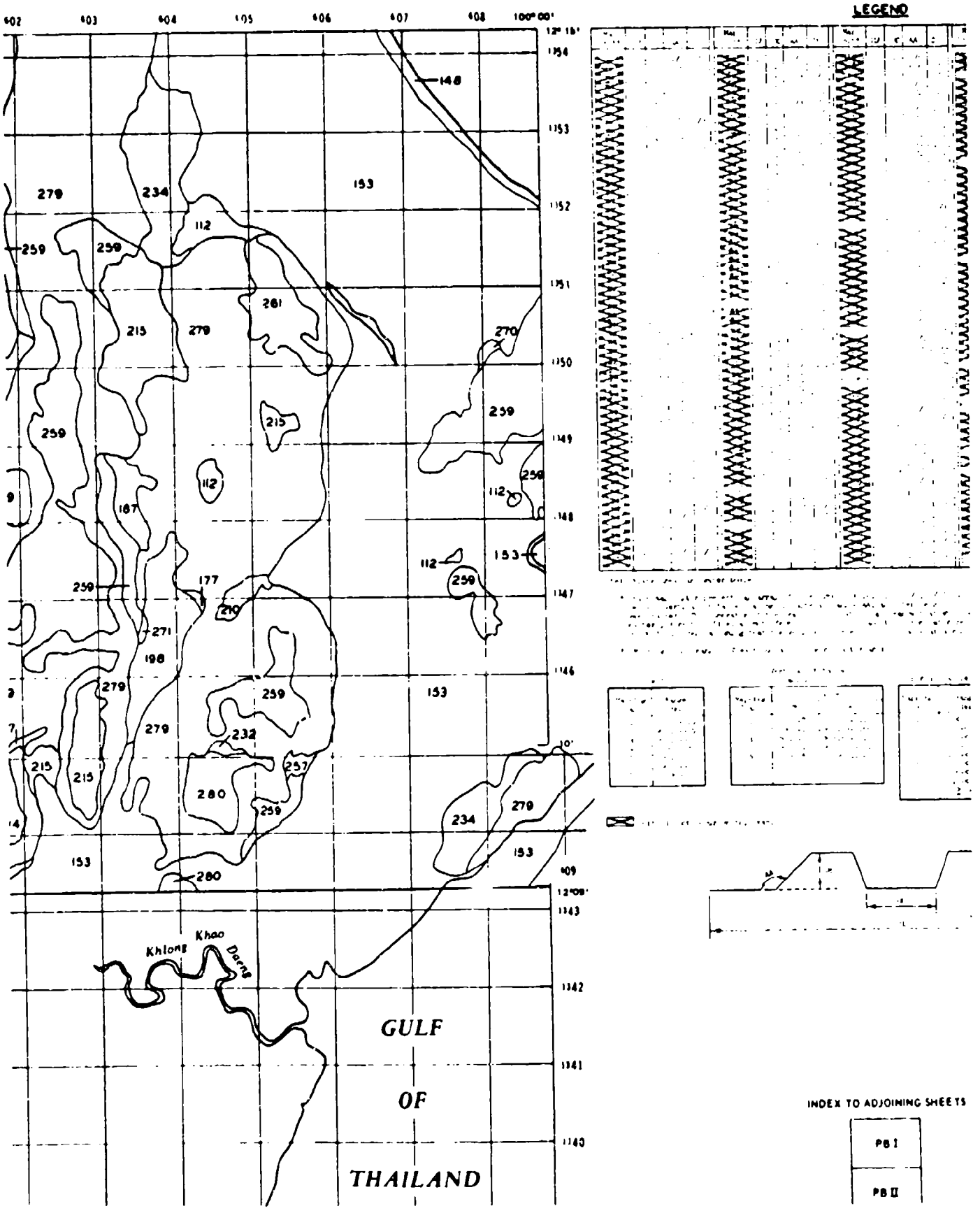
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PRAN BURI


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215
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SHEET PB III

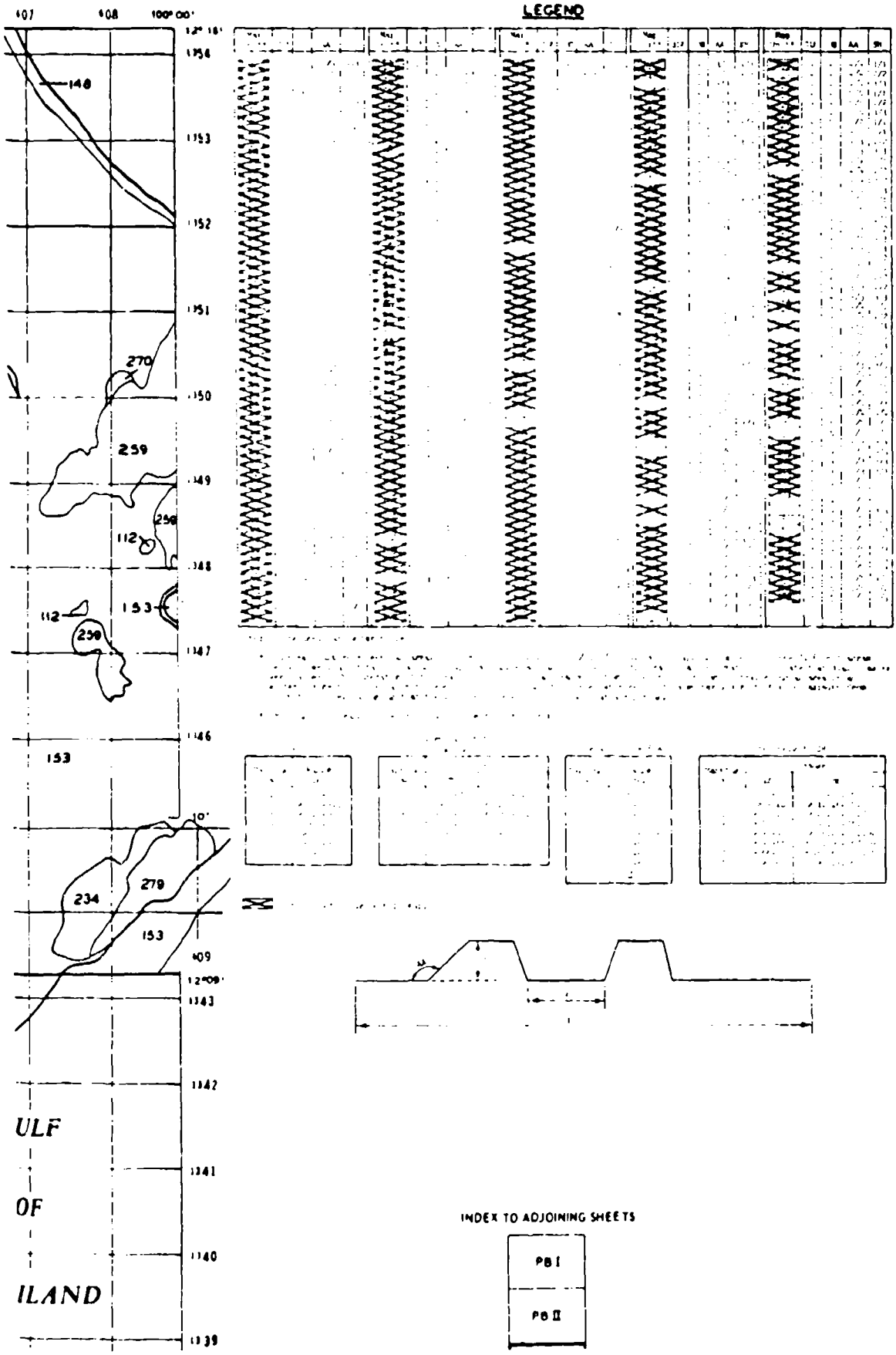


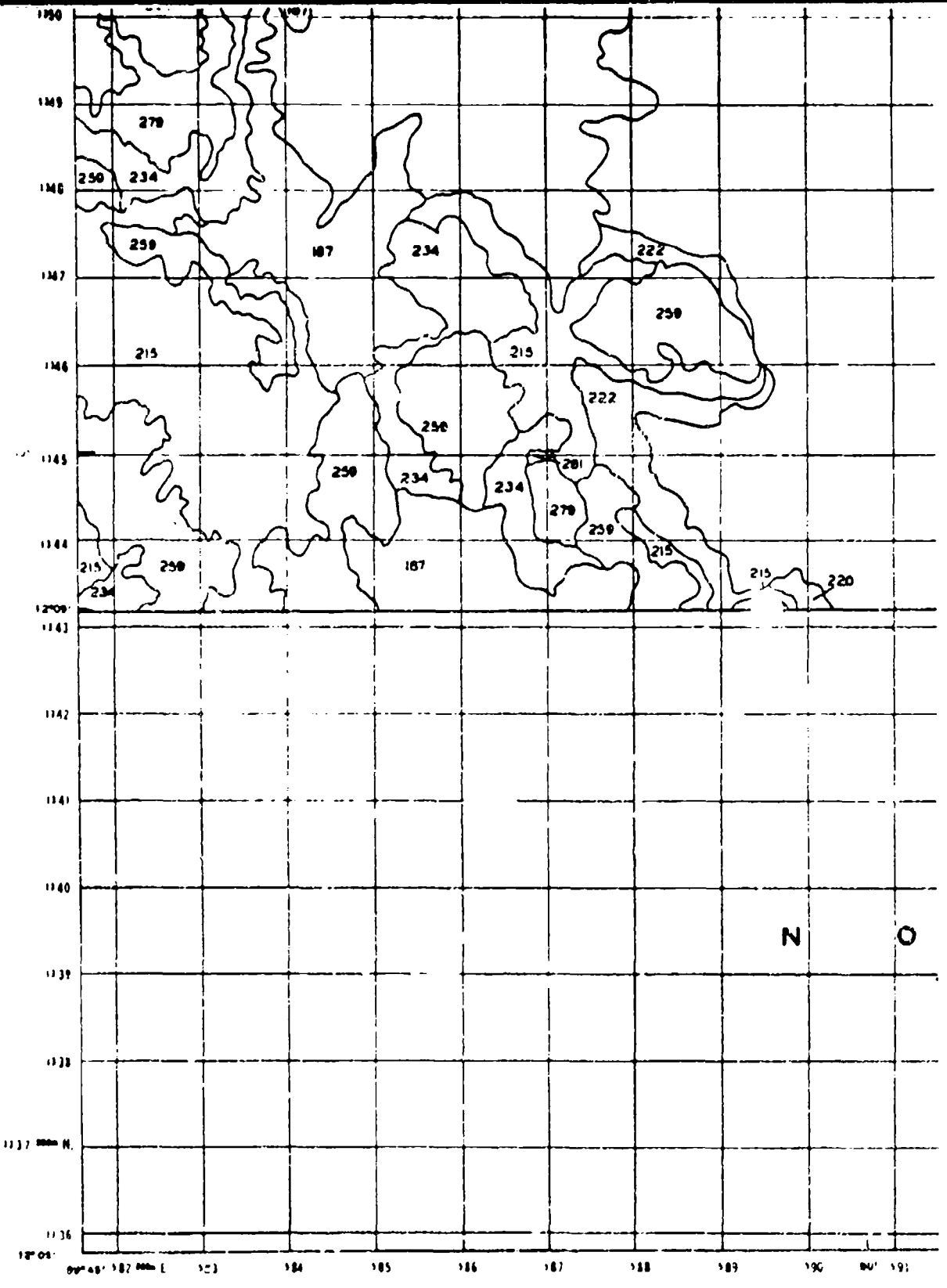
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PB I
PB II

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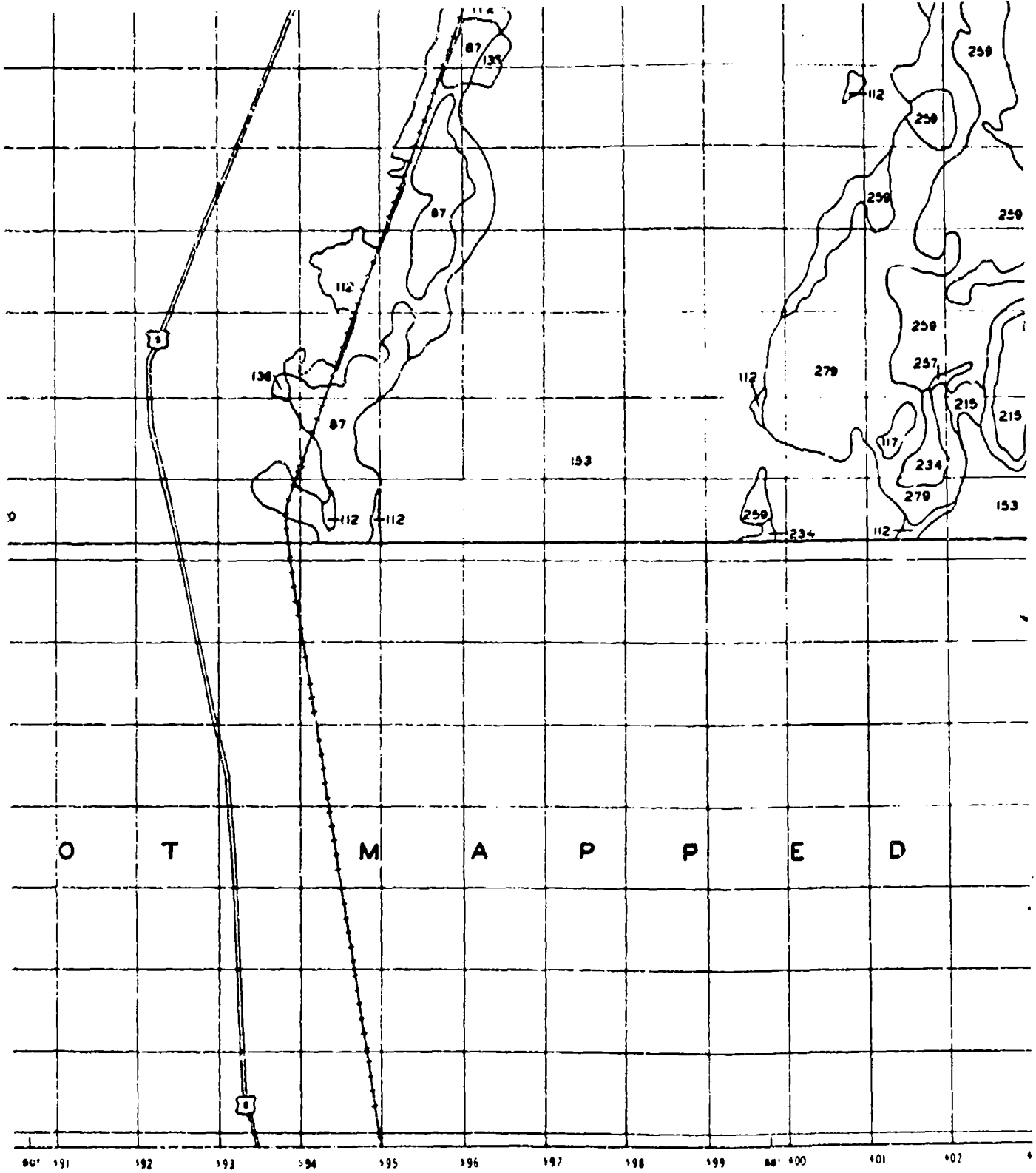
SHEET PB III

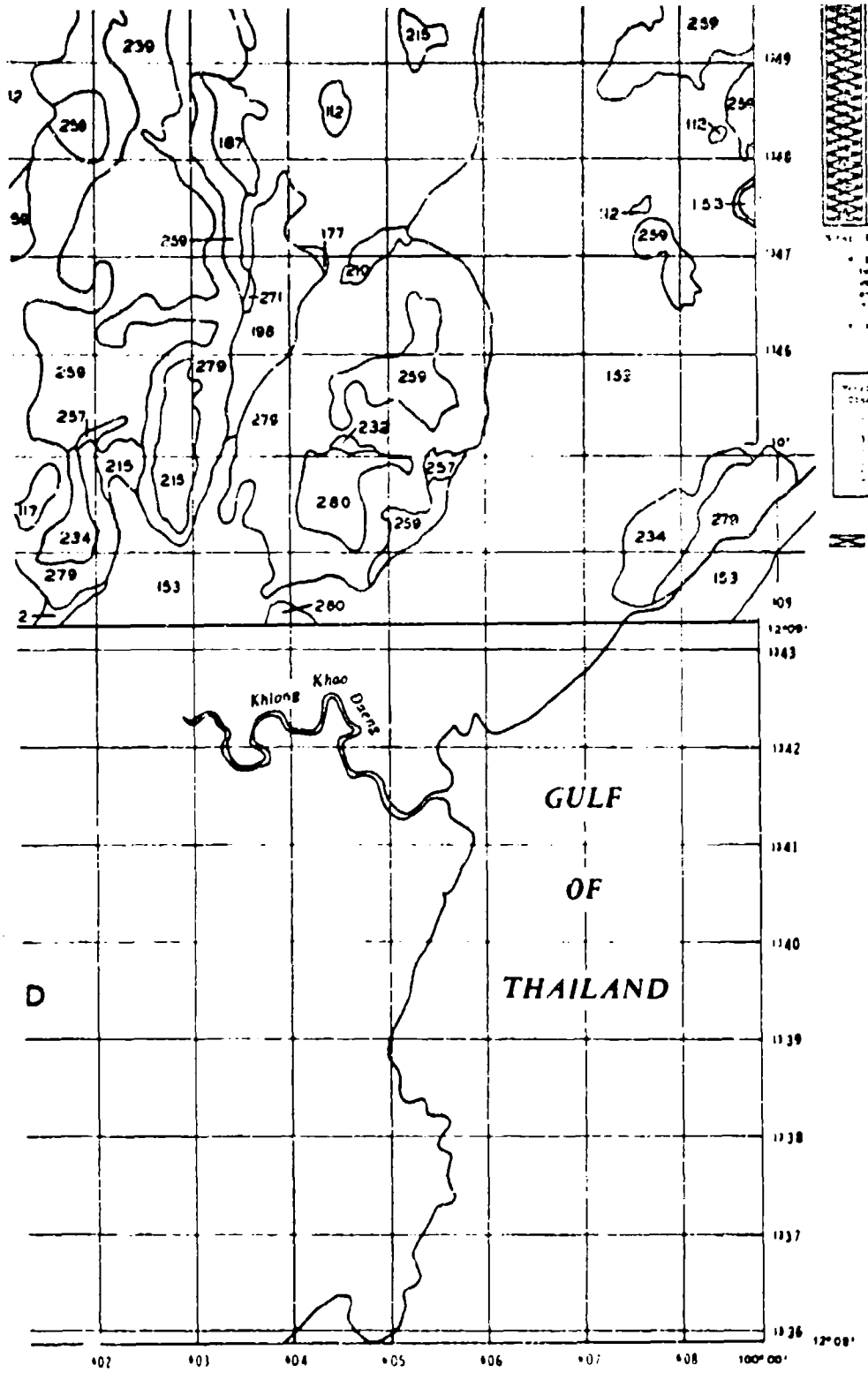


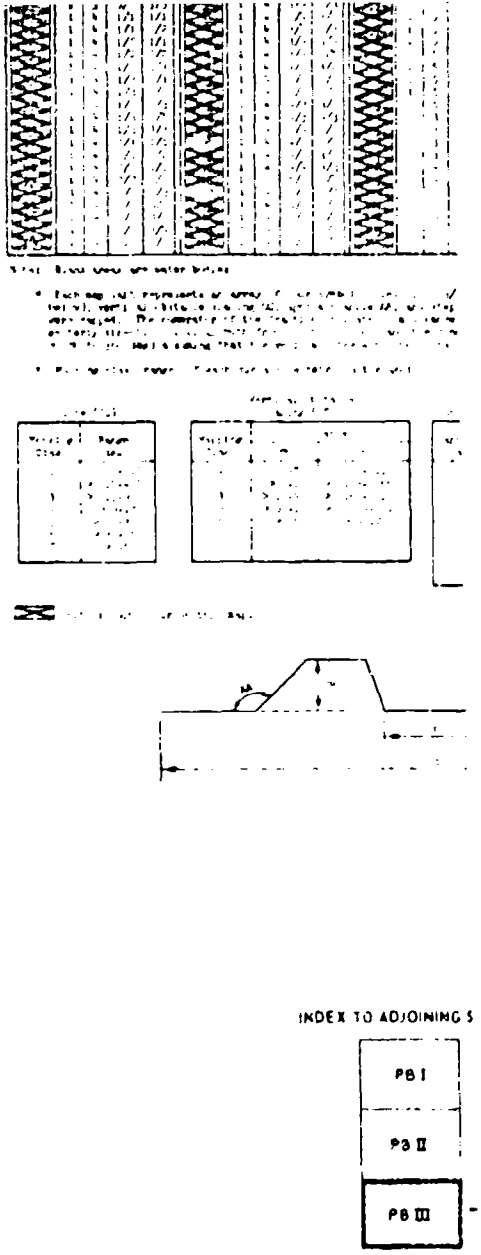


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

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112
O T M A P P E D
SCALES



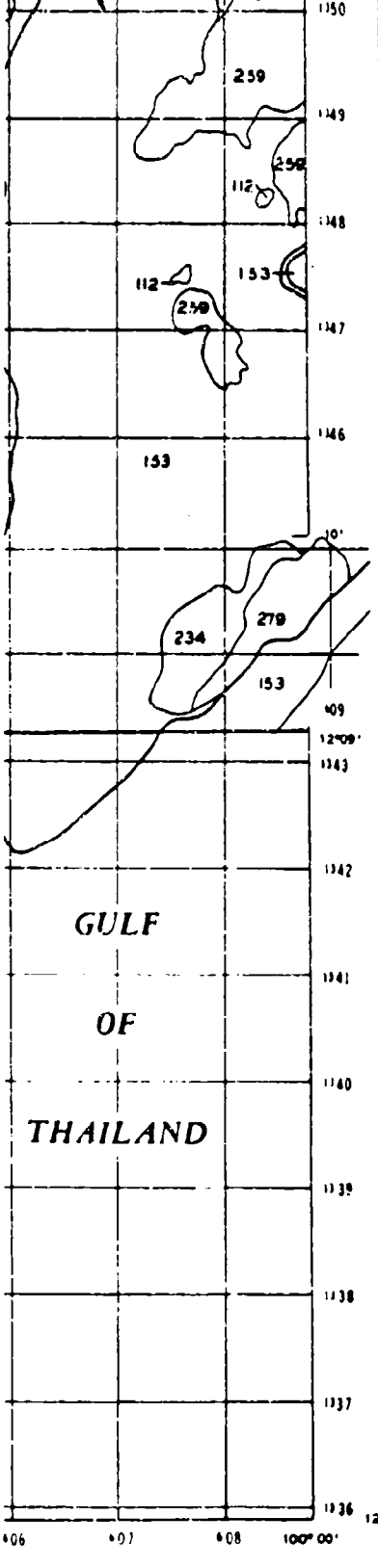


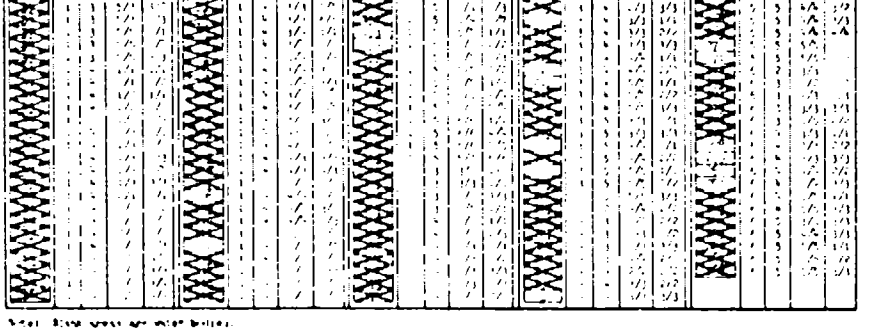
INDEX TO ADJOINING S

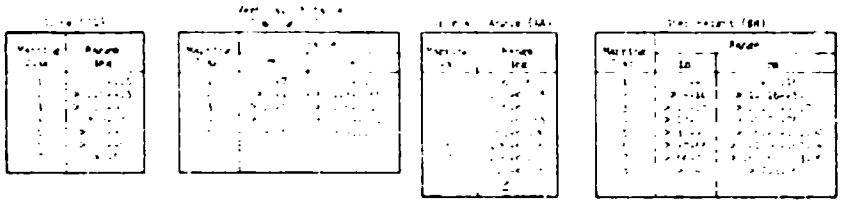
A QUANTITATIVE METHOD
TERRAIN FOR GROUN

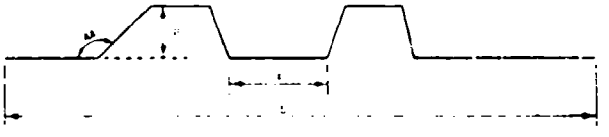
SURFACE GEO
PRAN BURI STUI
SHEET PB

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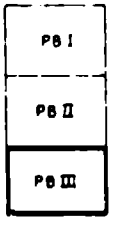








INDEX TO ADJOINING SHEETS



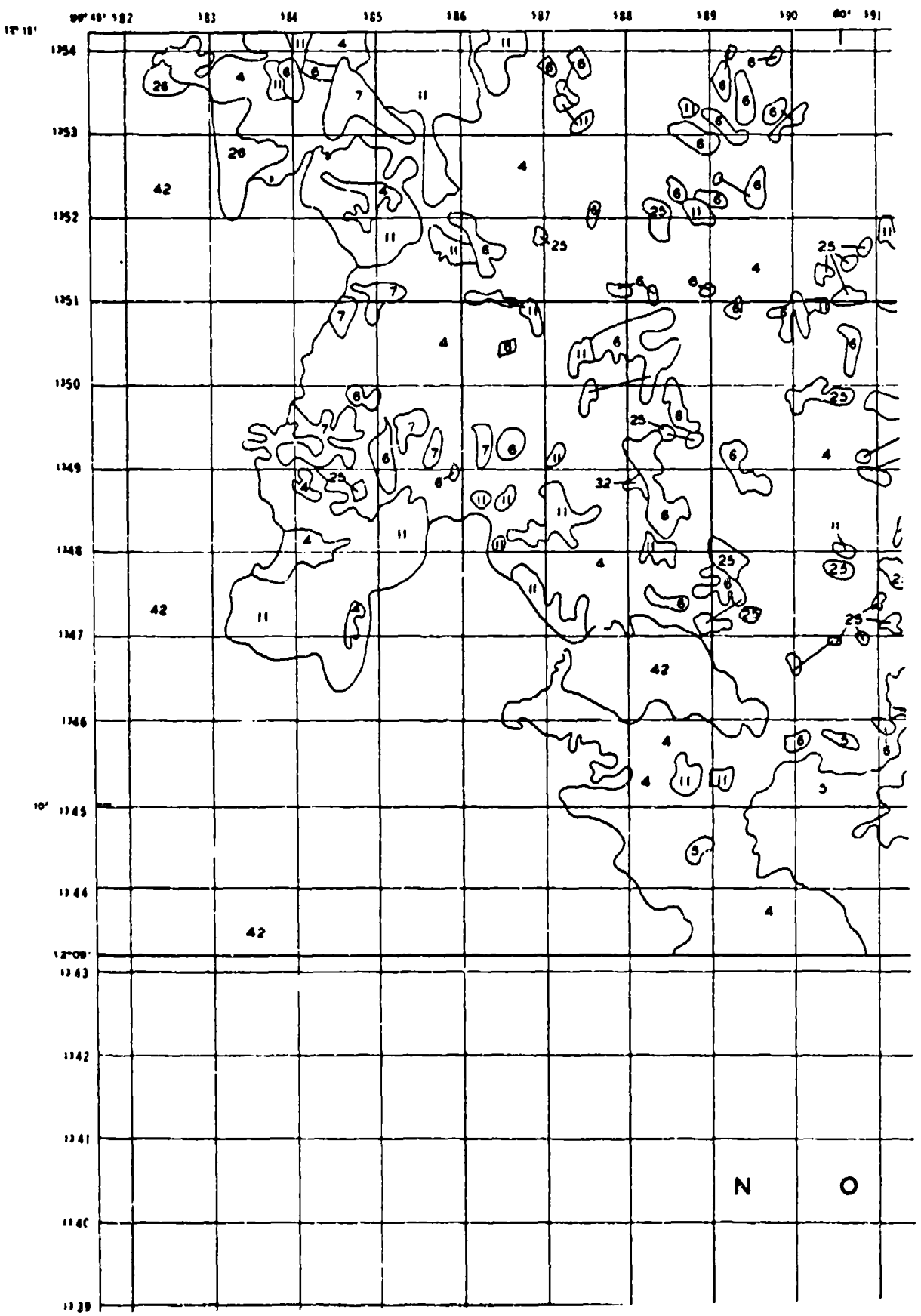
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

PRAN BURI STUDY AREA

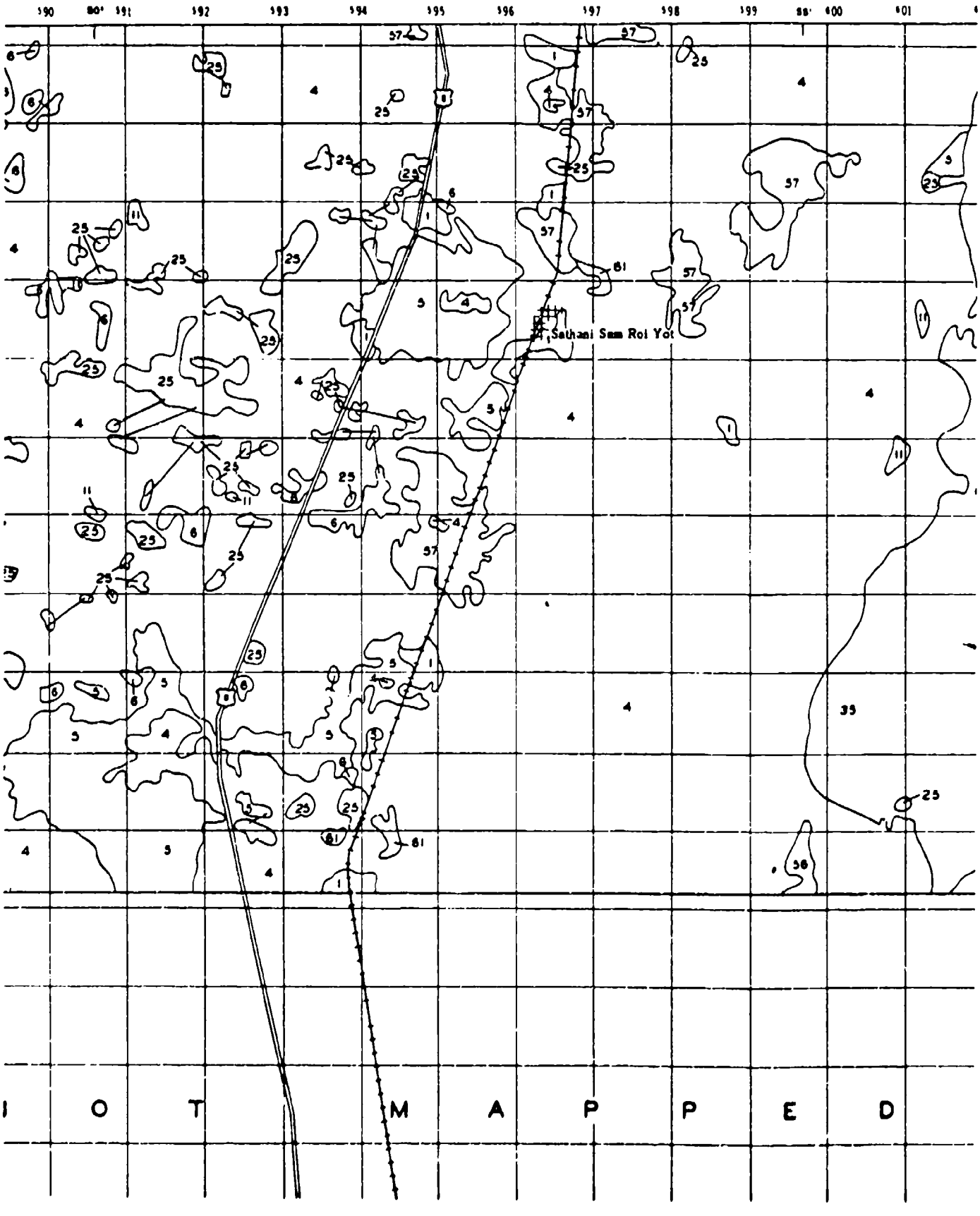
SHEET PB III

PLATE 4.3b


89° 48' 182
183
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80' 191
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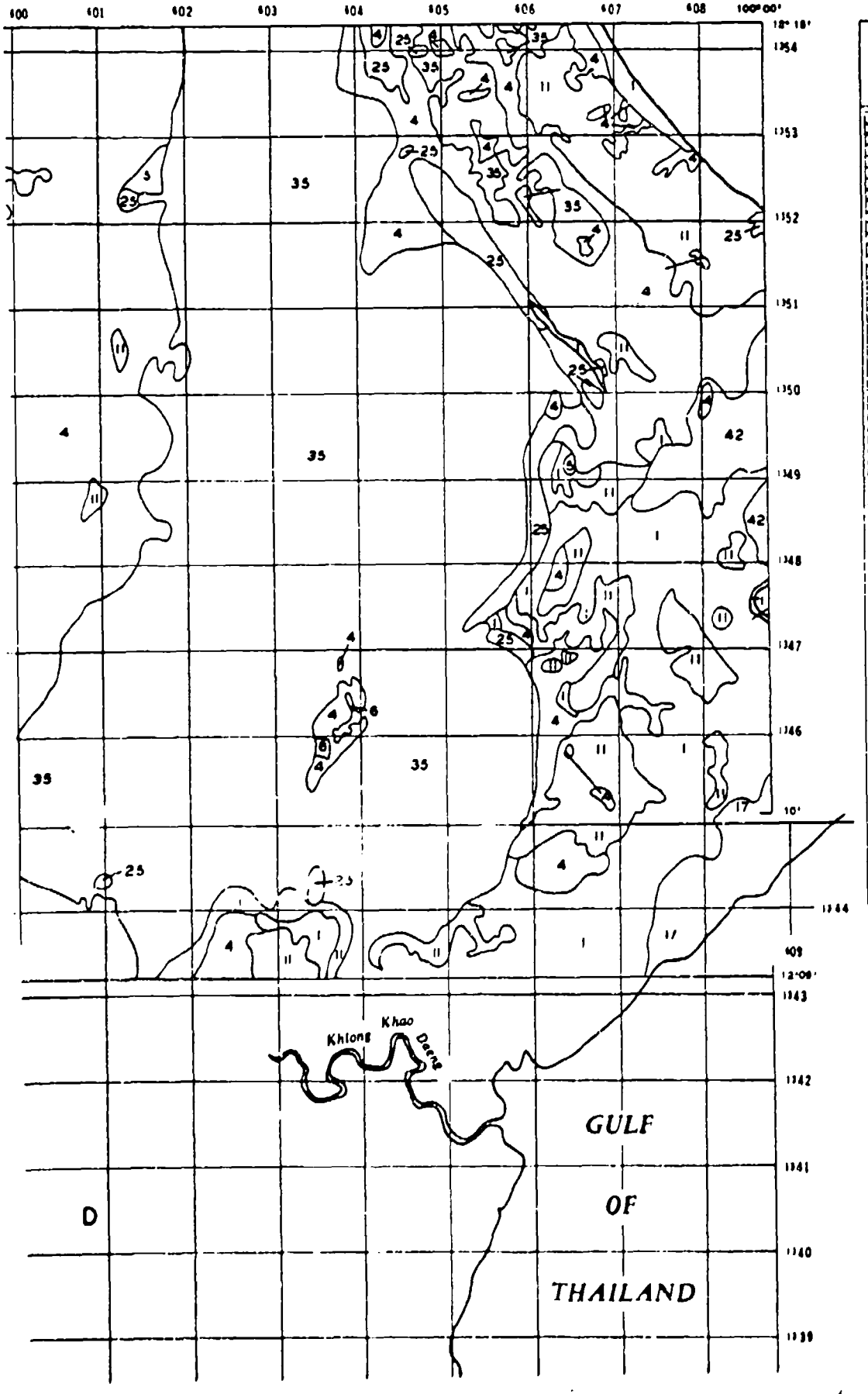
12

PRAN BURI

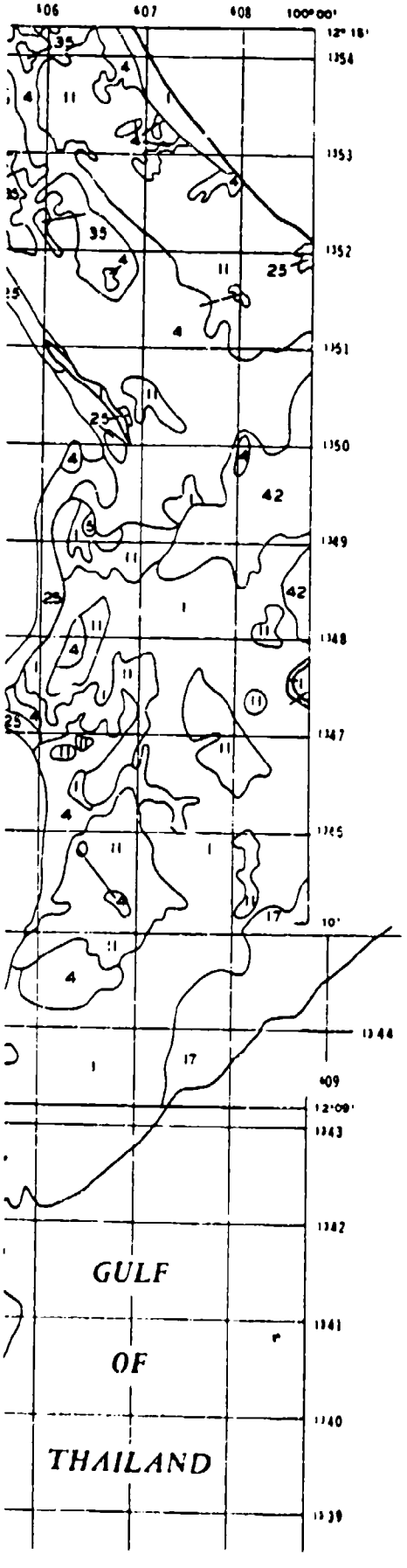

190
191
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201
Sathani Sam Roi Yot
NOT MAPPED

3

SHEET PB III



SHEET PB III



LEGEND

Map Value	Array of Spacing Classes for Stems ≤ and ≥ the Specified Diameter							
	≤				≥			
	2 in. (5.08 cm)*	5 in. (12.70 cm)	7.5 in. (19.05 cm)	50 in. (127.00 cm)	1 in. (2.54 cm)	3 in. (7.62 cm)	6 in. (15.24 cm)	10 in. (25.40 cm)
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4

Water depths in meters are approximate mean values.

* For each mapping class, an array of eight symbols (i.e., 1, 1, 1, 1, 1, 1, 1, 1) indicating spacing classes for stems ≤ 2 in. (≤ 5.08 cm) and ≥ 2 in. (≥ 5.08 cm) at 2 in. (5.08 cm), 5 in. (12.70 cm), 7.5 in. (19.05 cm), 50 in. (127.00 cm), 1 in. (2.54 cm), 3 in. (7.62 cm), 6 in. (15.24 cm), and 10 in. (25.40 cm).

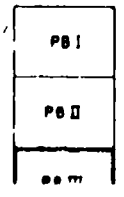
† Mapping class ranges for each spacing class value.

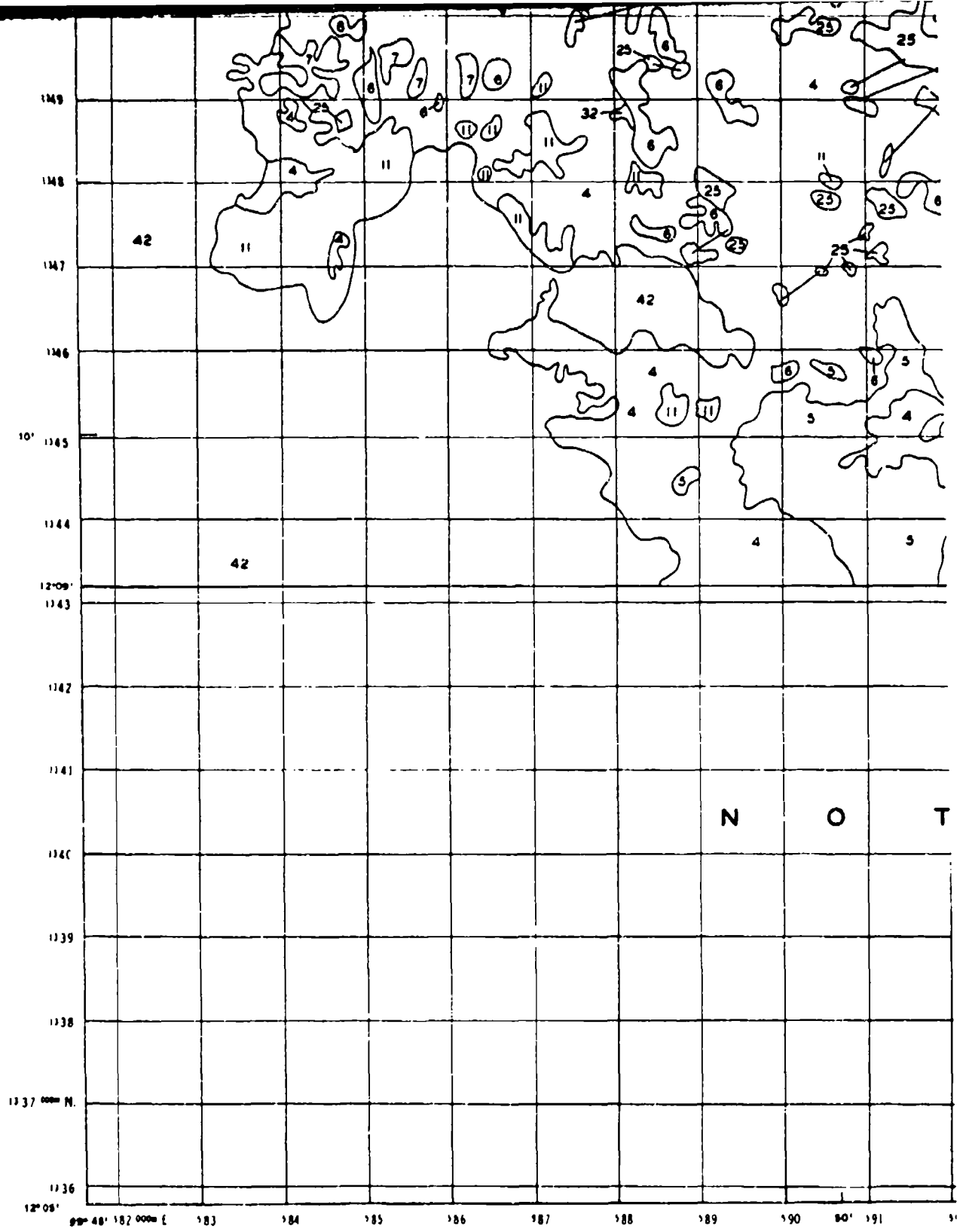
Tree Spacing

Mapping Class	Range	
	ft	m
1	> 15	> 4.6
2	> 7.5-15	> 2.3-4.6
3	> 5-10	> 1.52-3.04
4	≤ 5	0-1.52

Water boundary out of data area

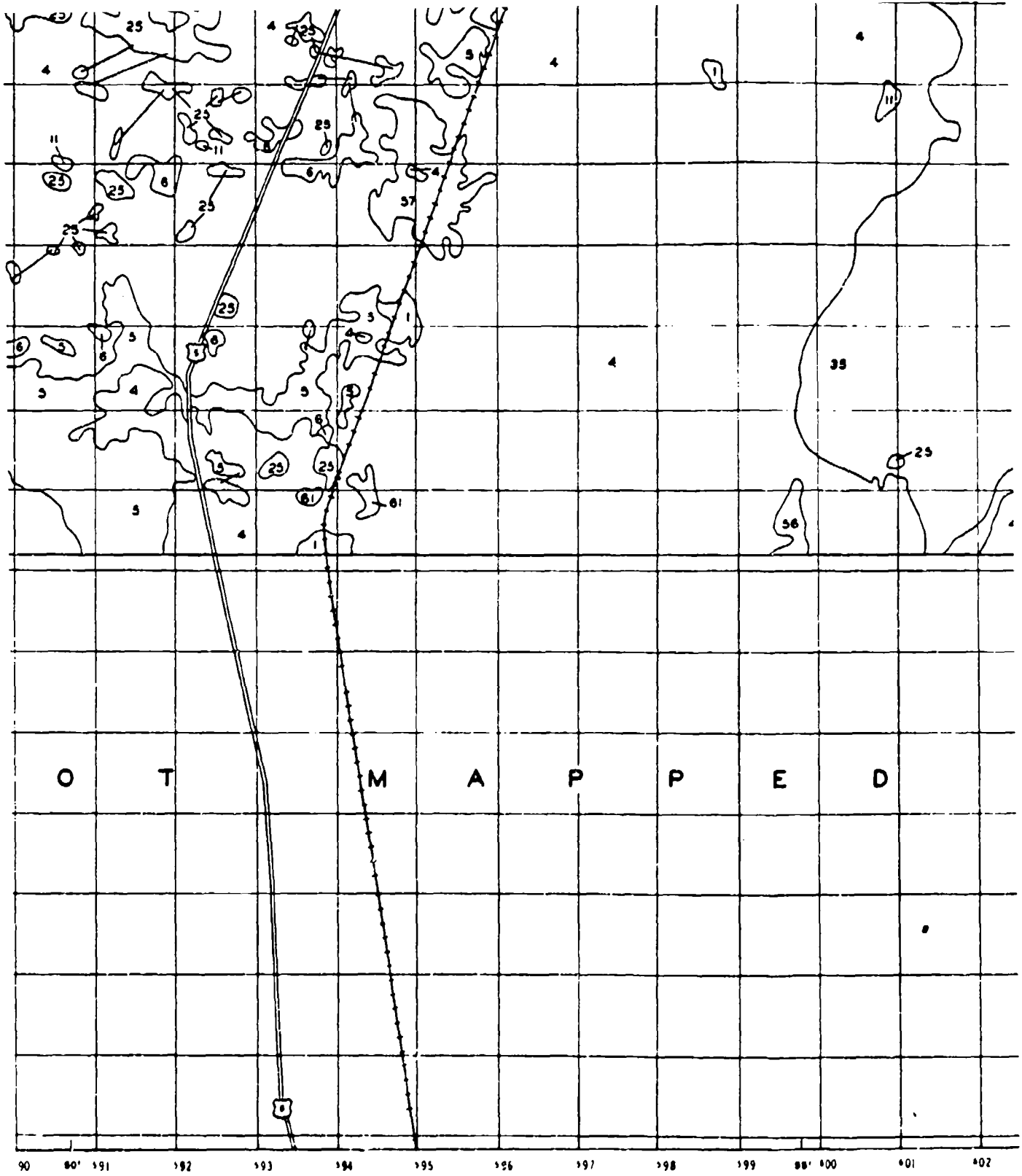
INDEX TO ADJOINING SHEETS

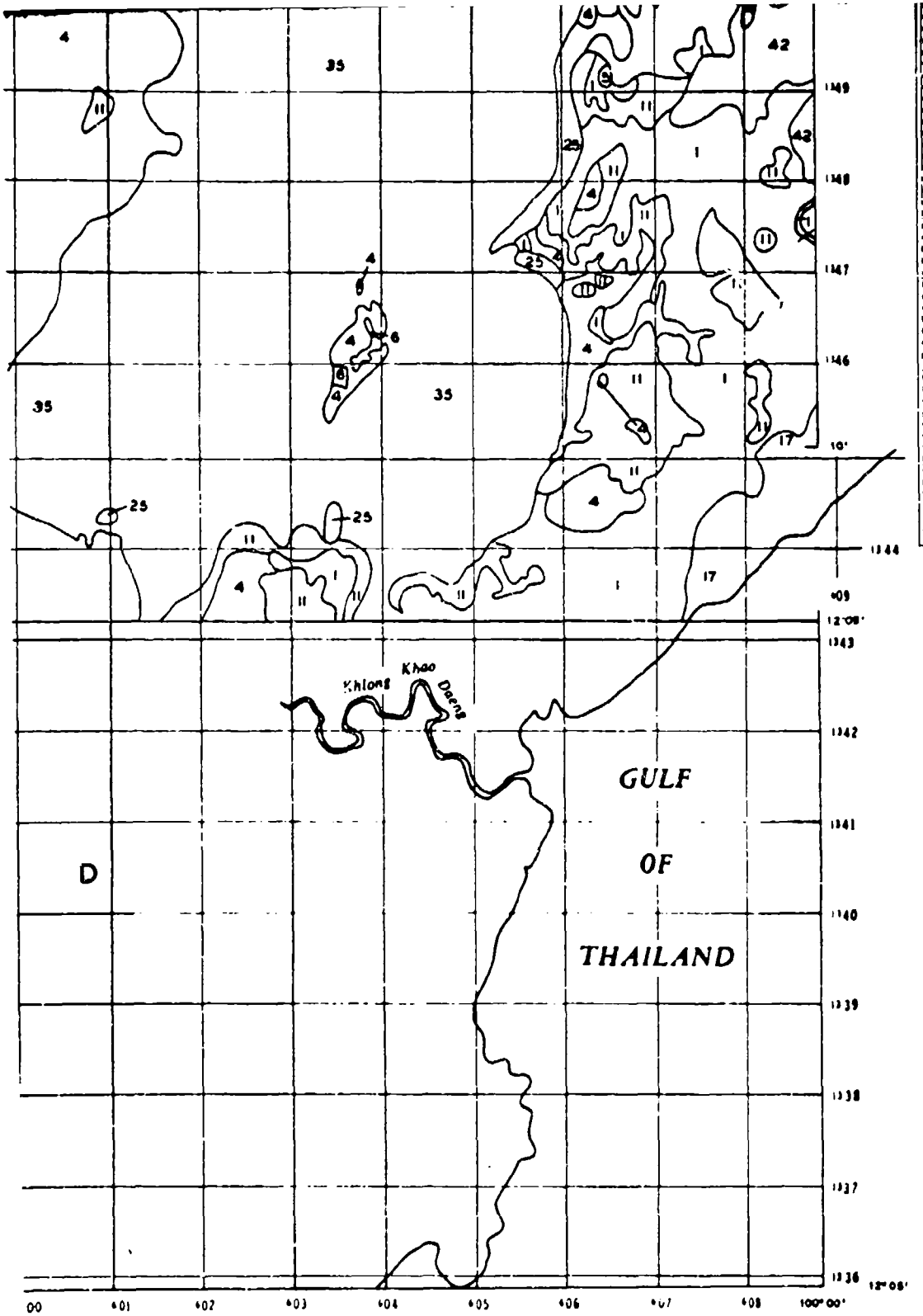




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


O T M A P P E D
90 80' 91 92 93 94 95 96 97 98 99 88' 00 01 02
SCALES

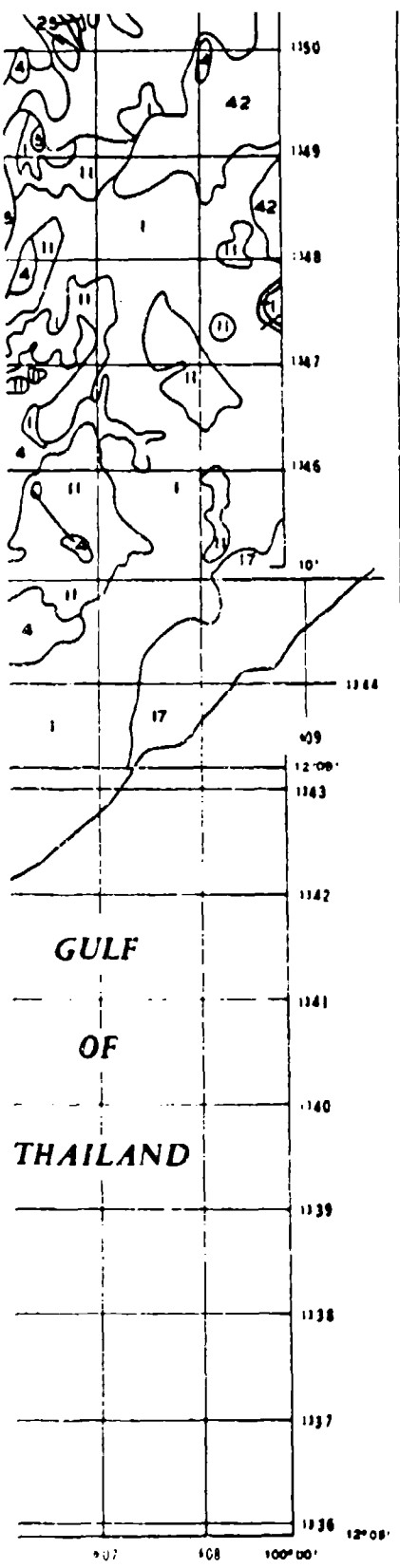


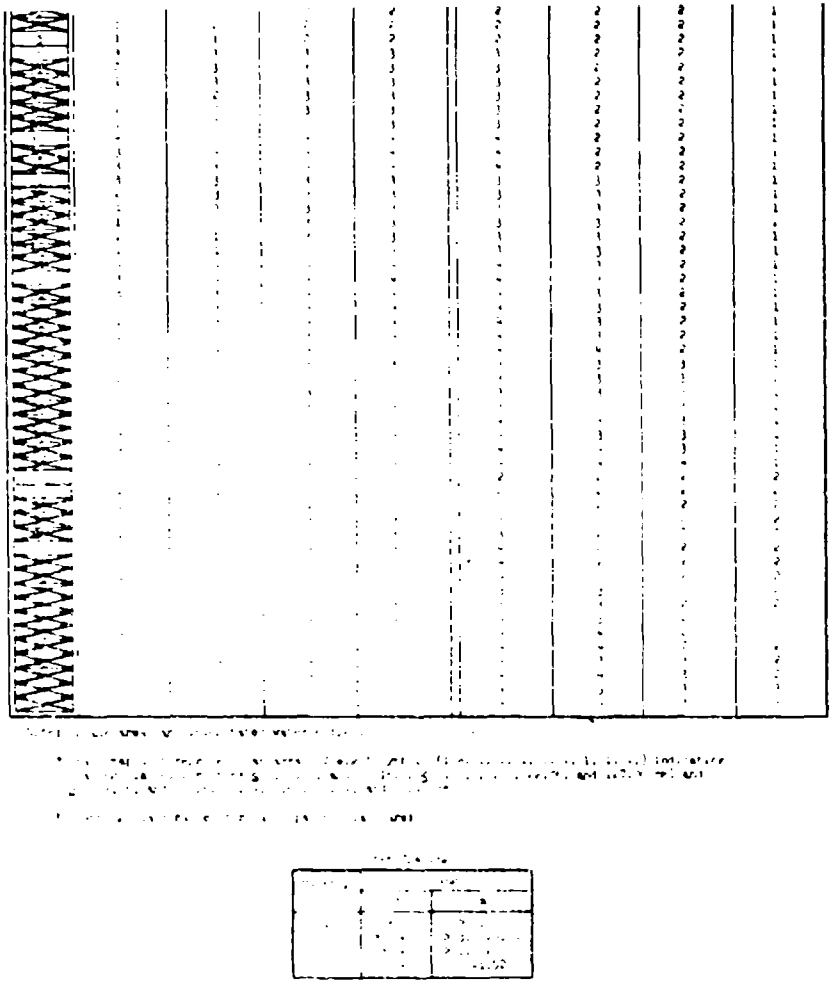
A QUANTITATIVE
TERRAIN F(

VE

PRAN B

SI





INDEX TO ADJOINING SHEETS



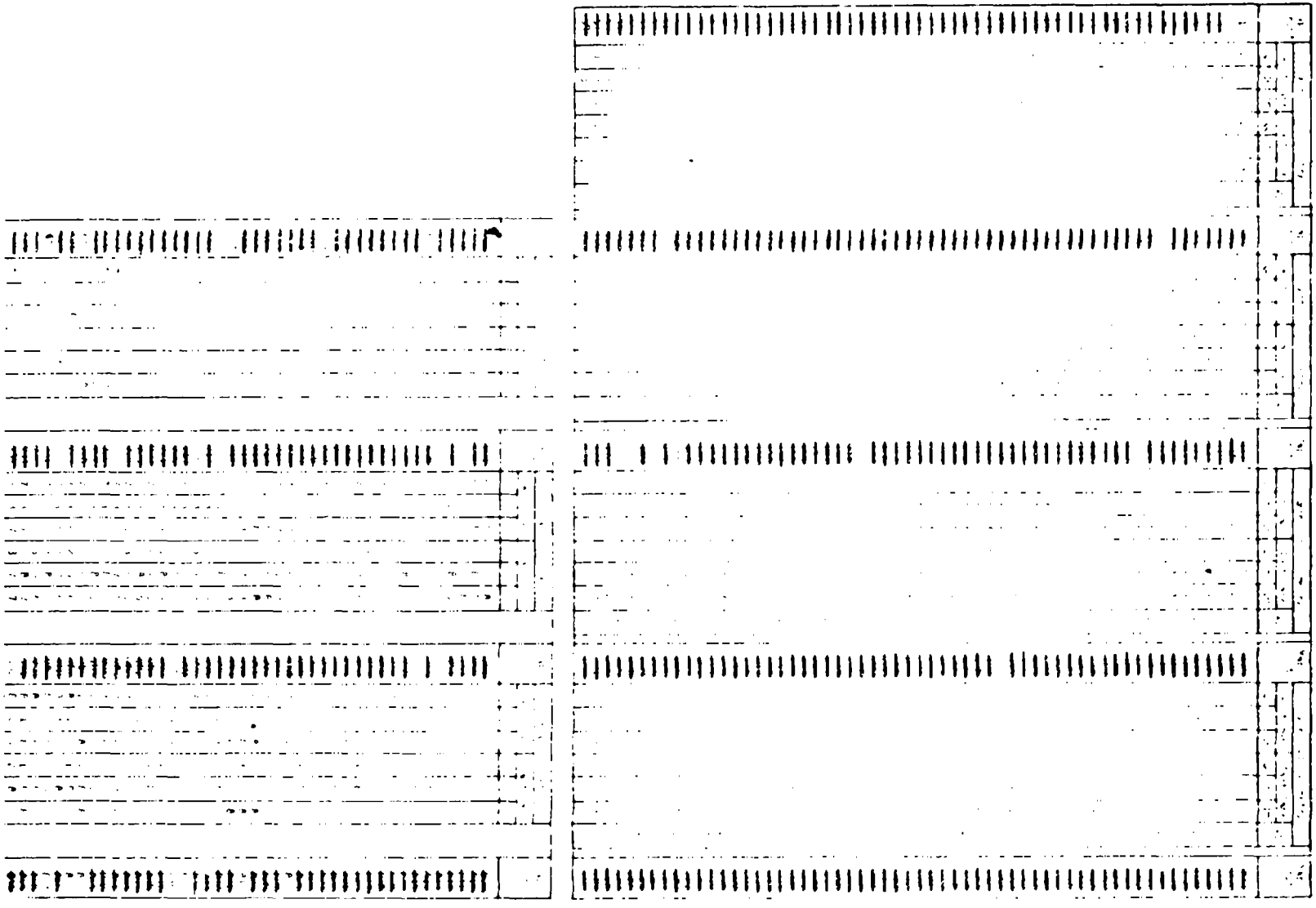
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

PRAN BURI STUDY AREA

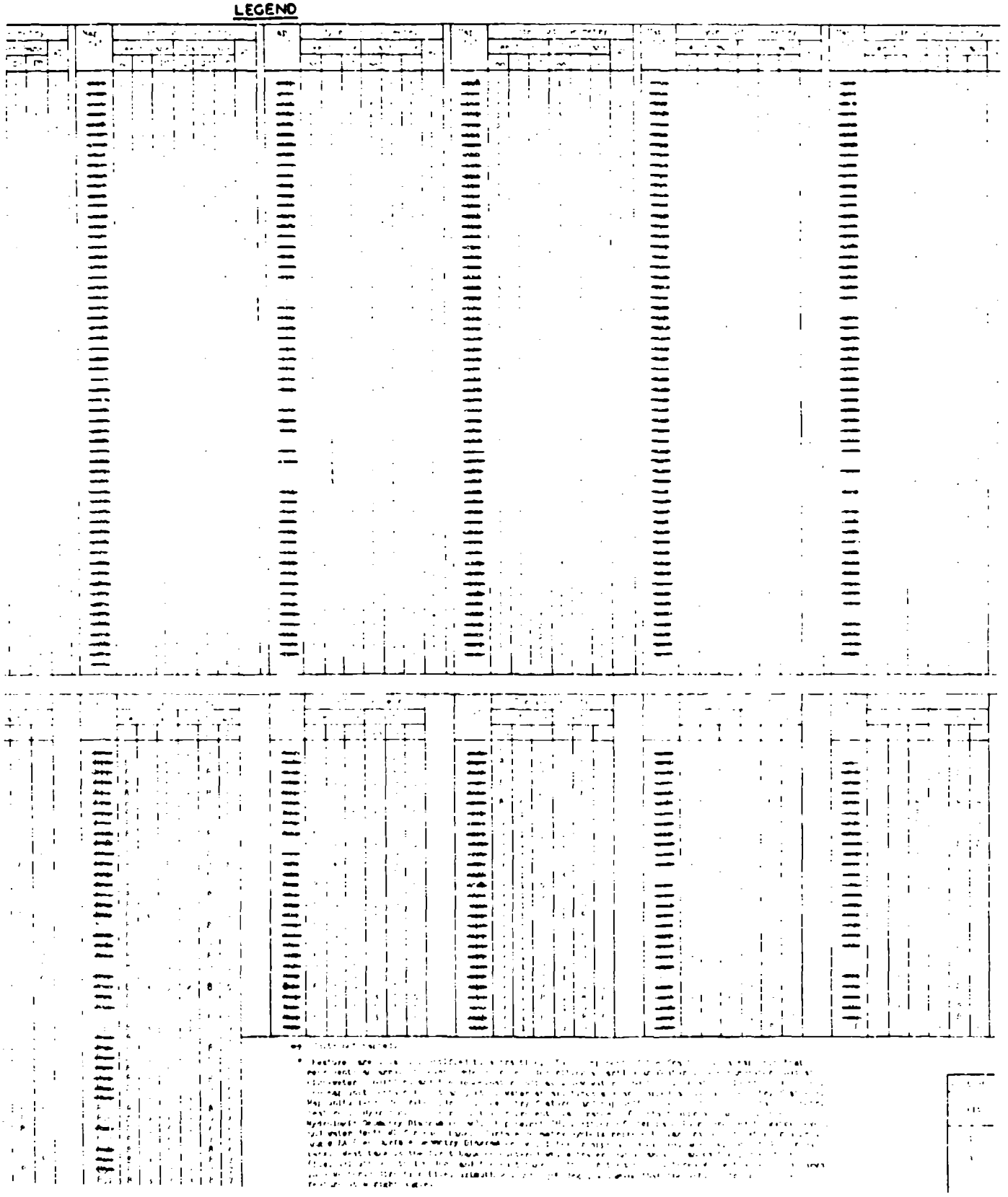
SHEET PB III

PLATE 4.3c

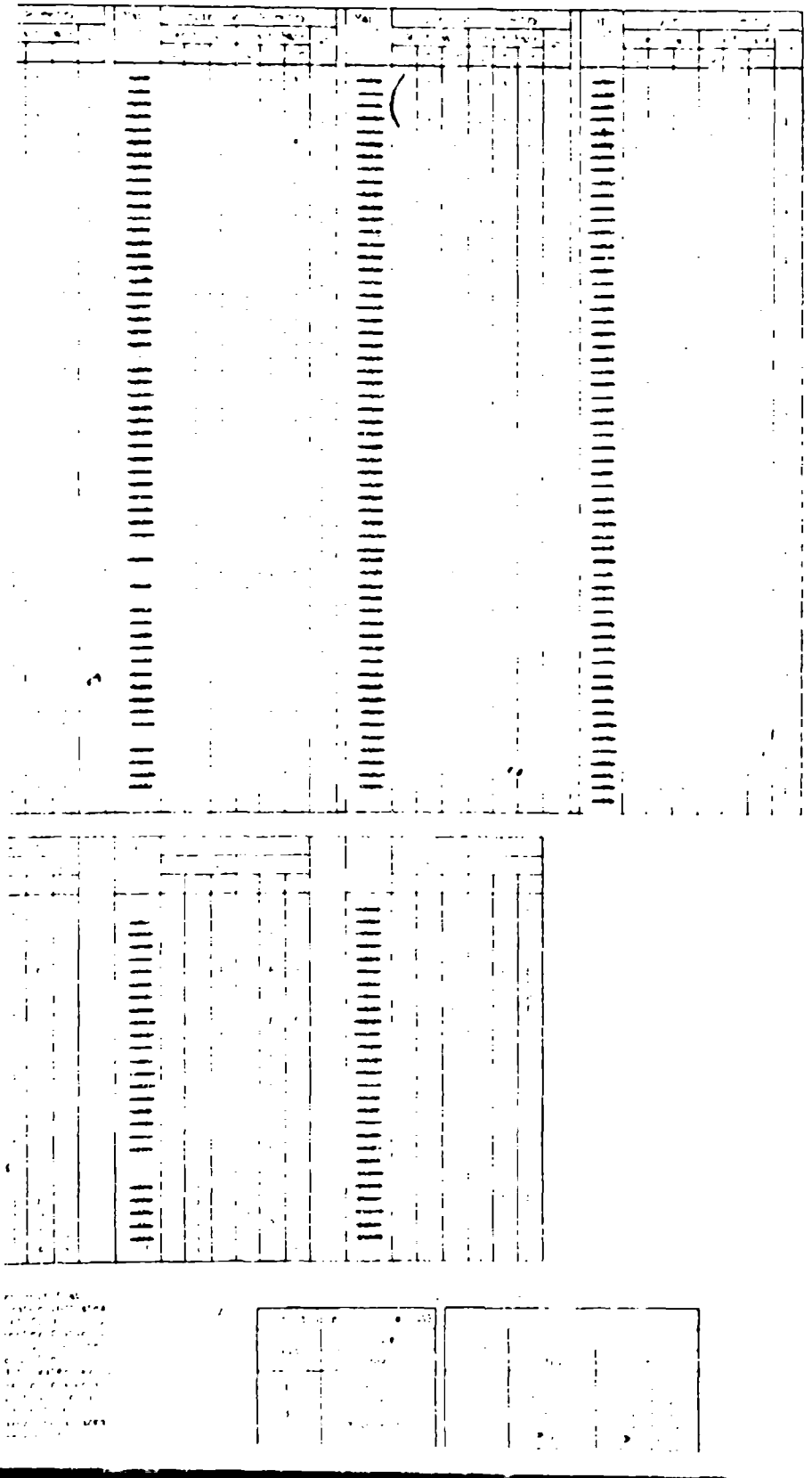


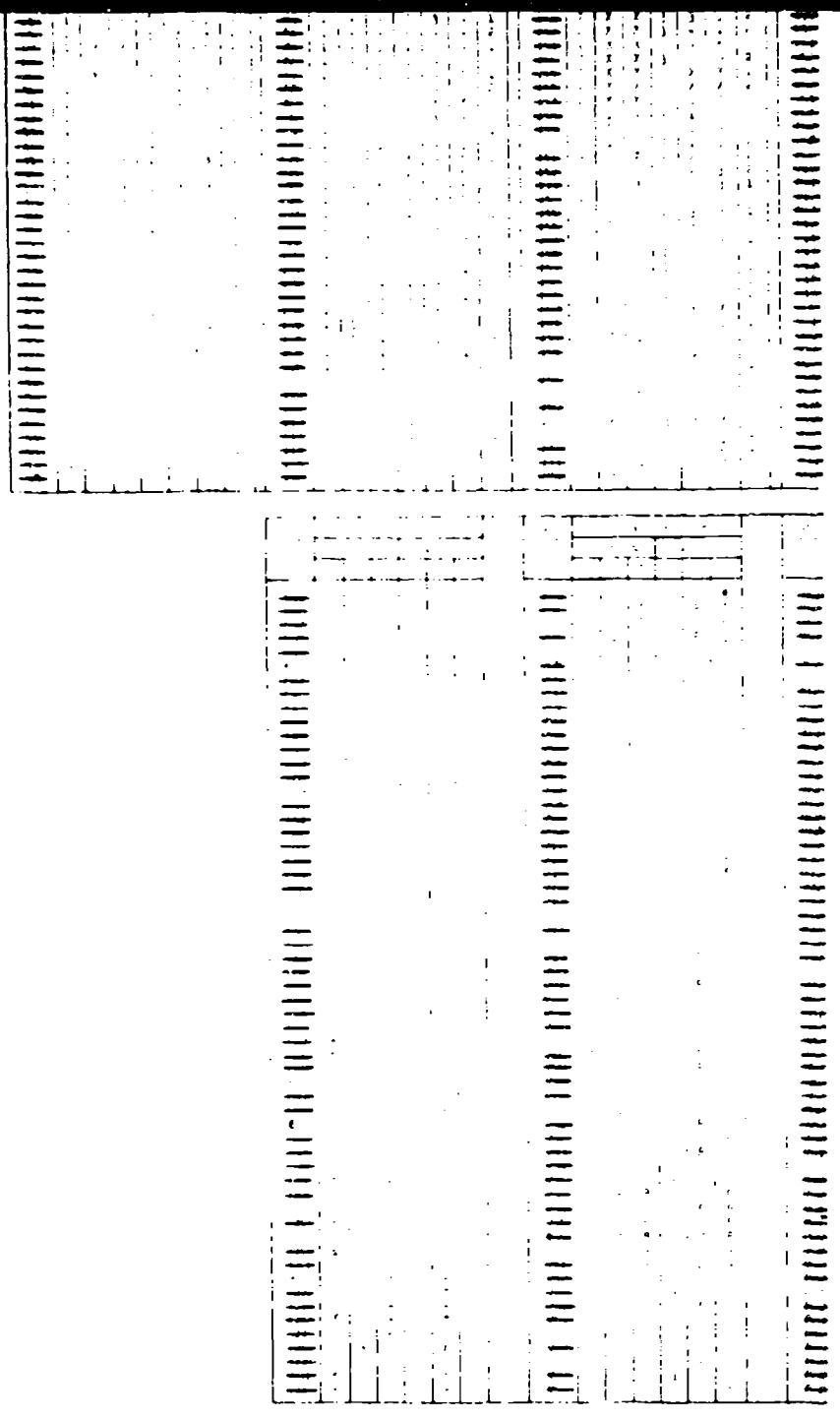
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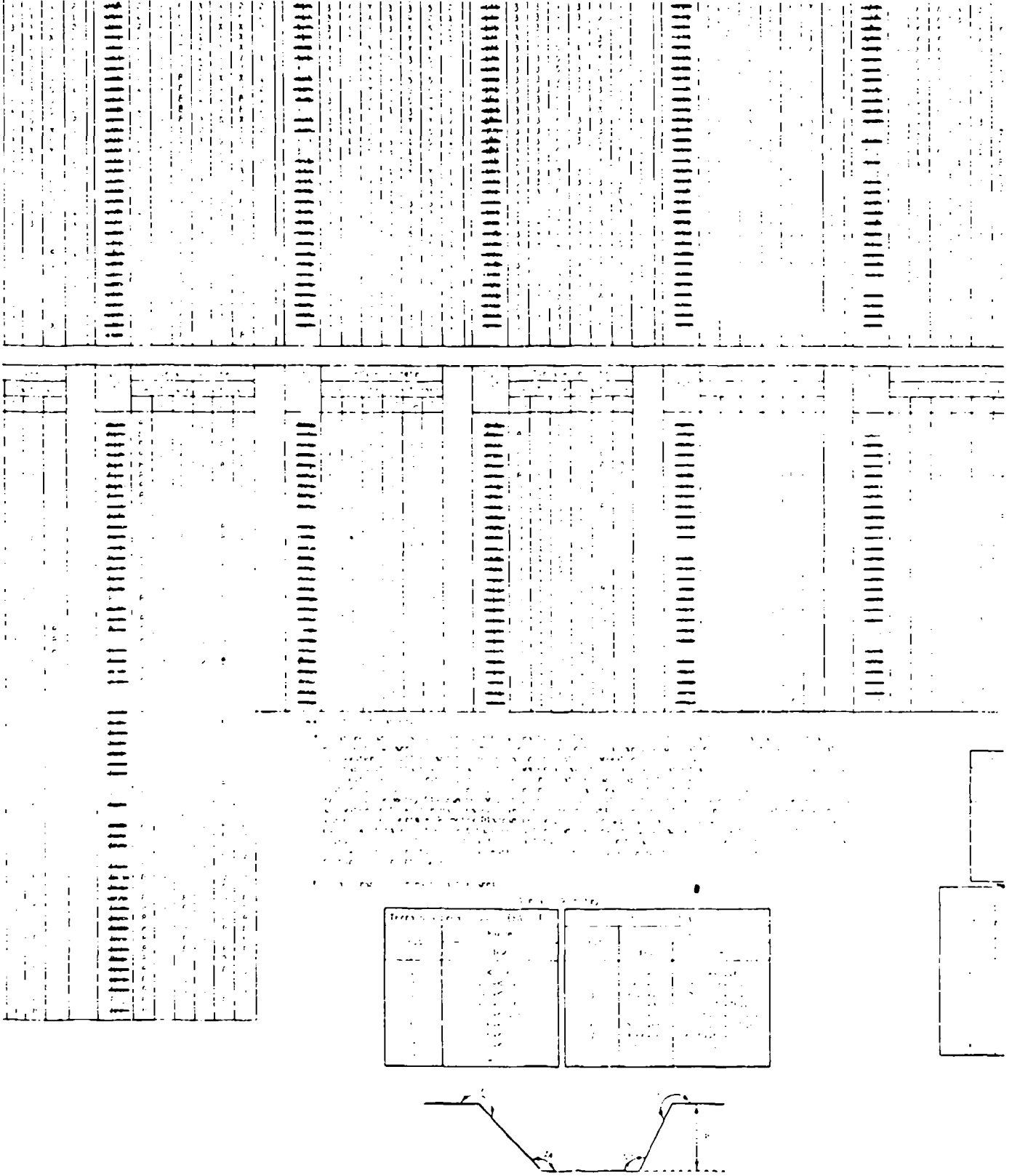
LEGEND



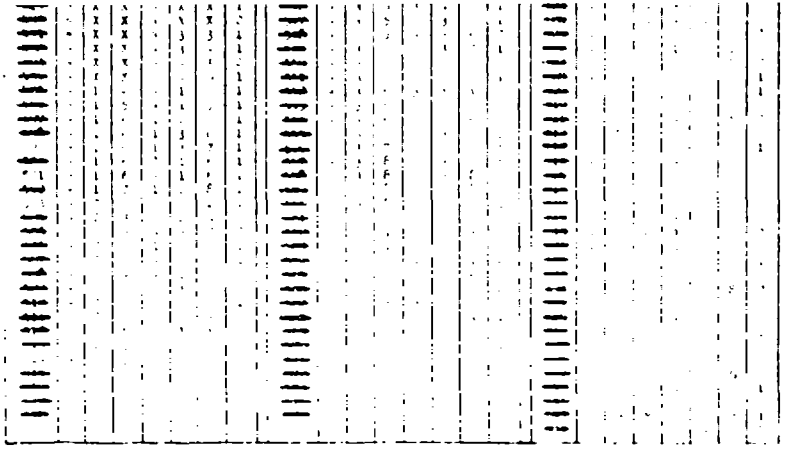
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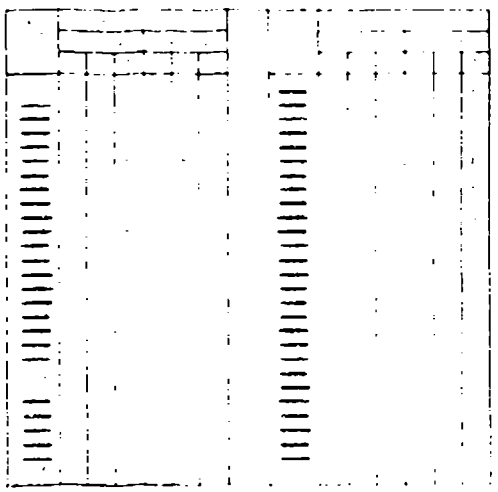


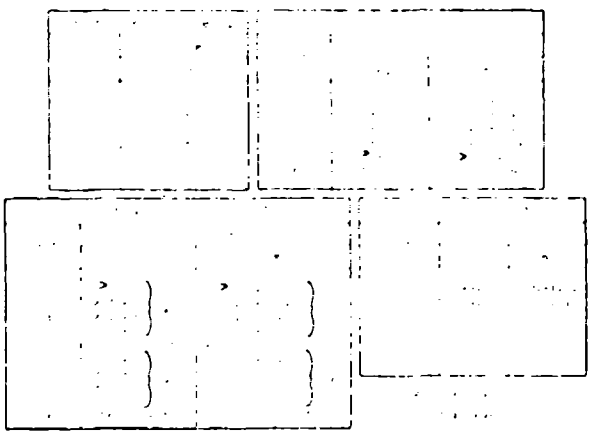




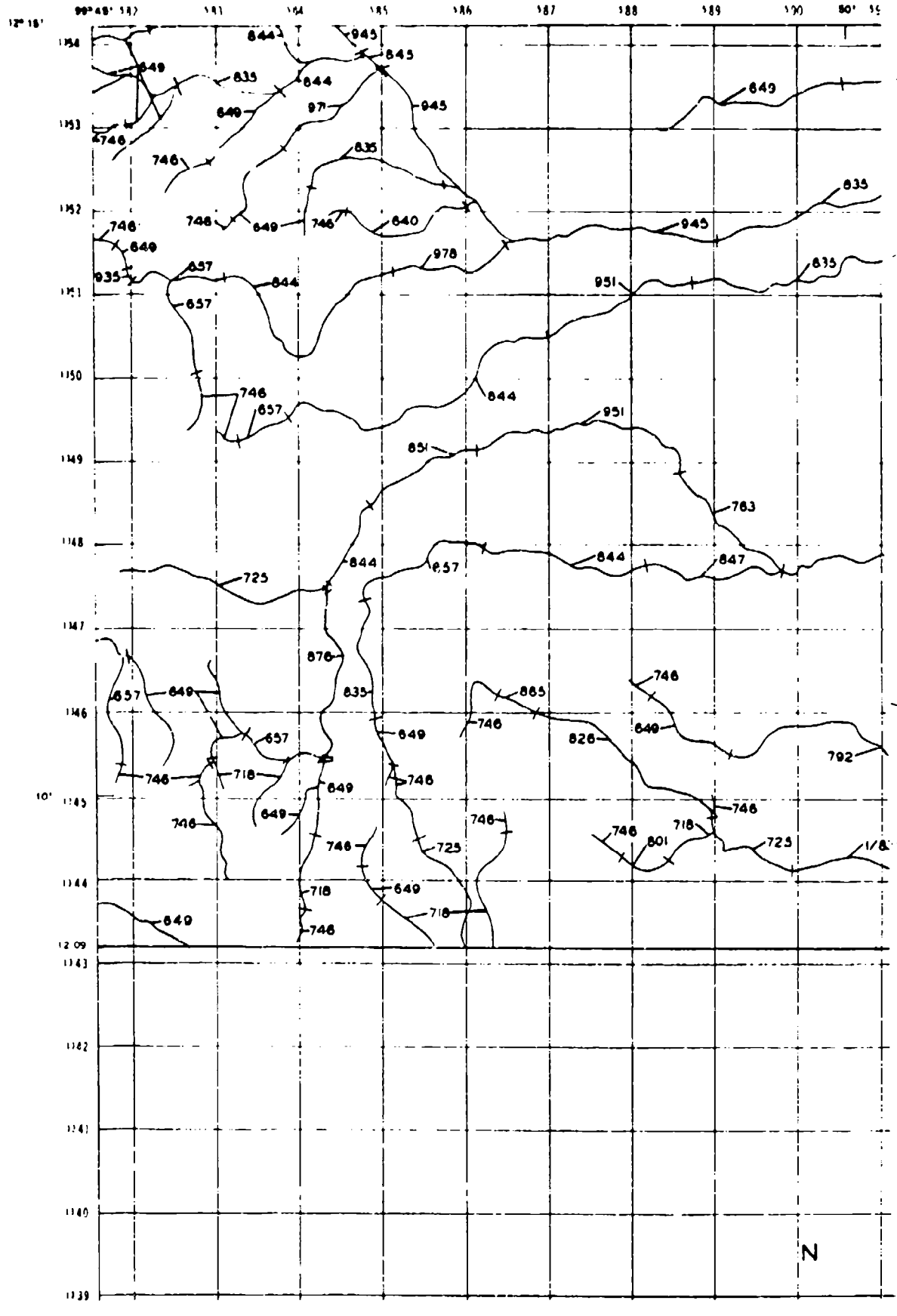
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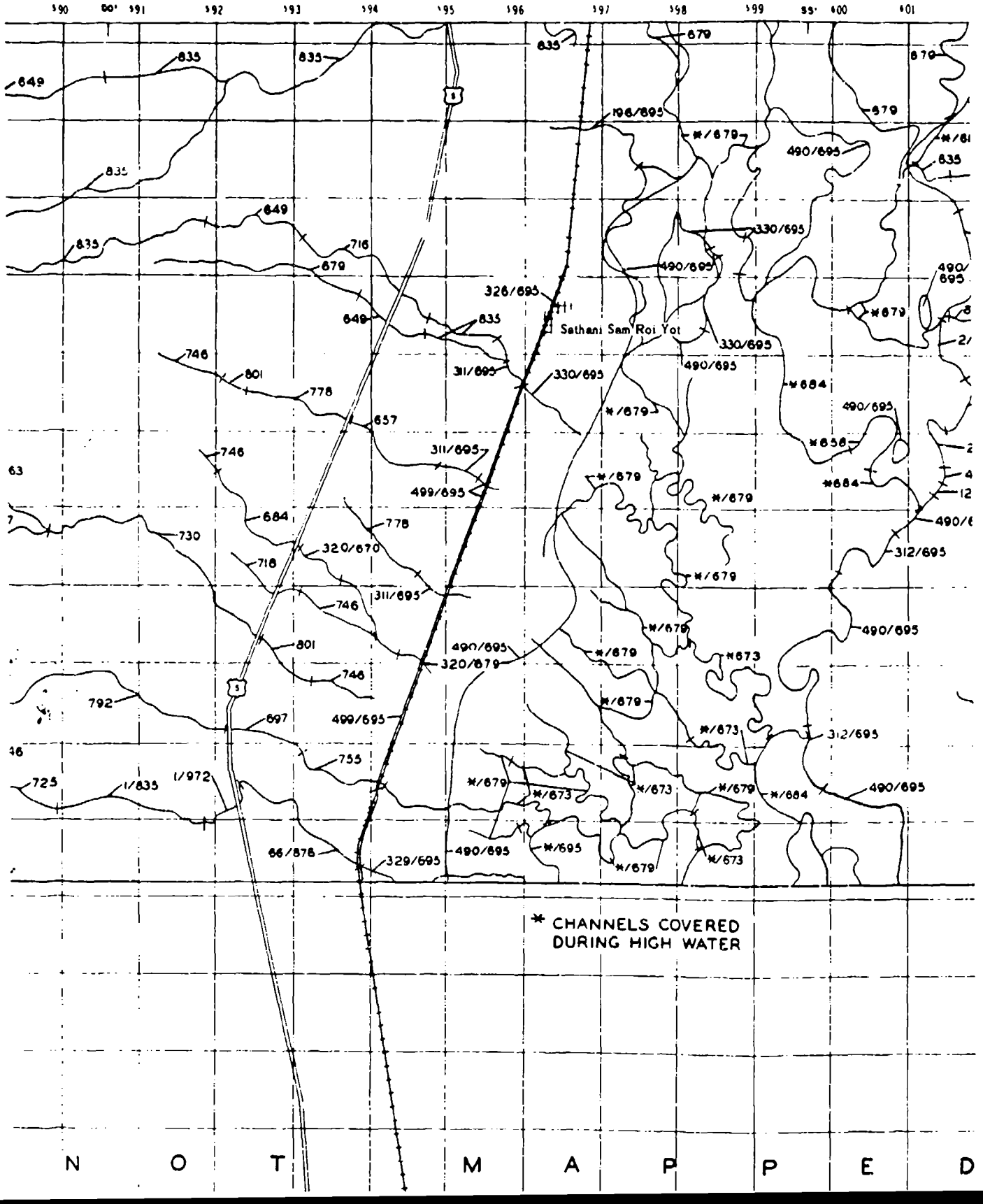






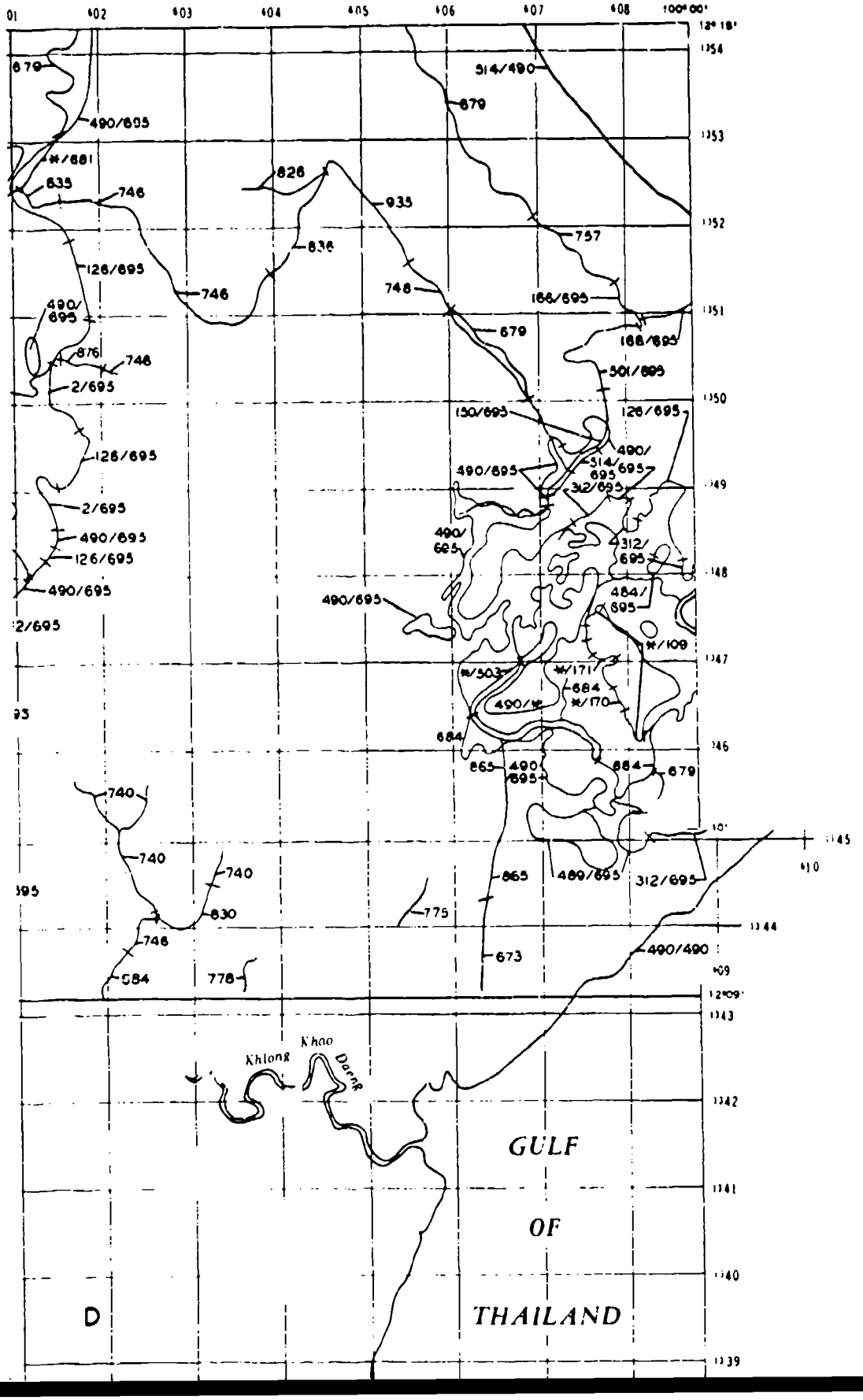

649
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2 PRAN BURI


590 591 592 593 594 595 596 597 598 599 600 601
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679
746
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778
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730
718
320/670
311/695
499/695
330/695
326/695
490/695
320/679
792
697
755
725
1/835
1/972
66/878
329/695
Sathani Sam Roi Yot
* CHANNELS COVERED DURING HIGH WATER
NOT MAPPED

3

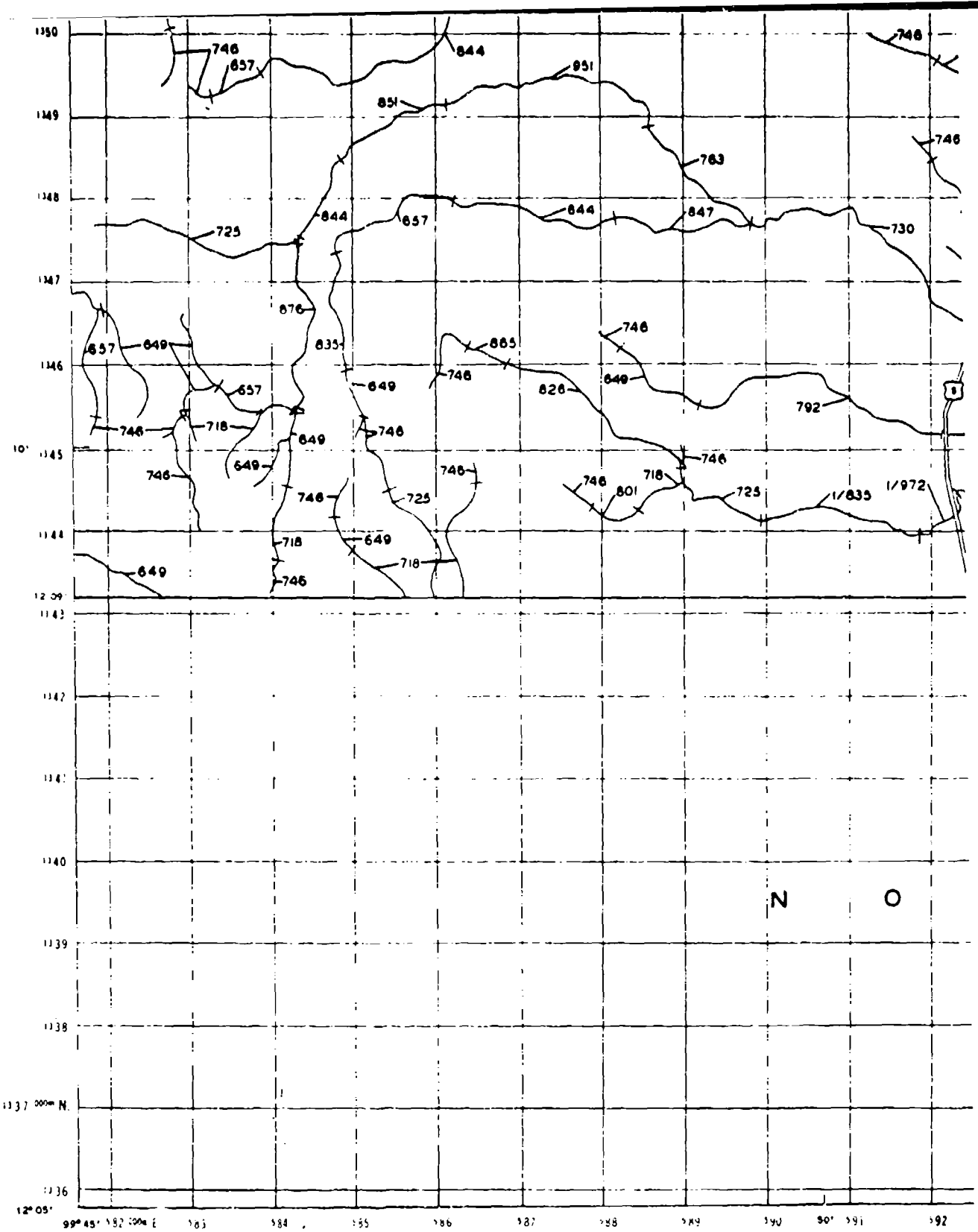
SHEET PB III



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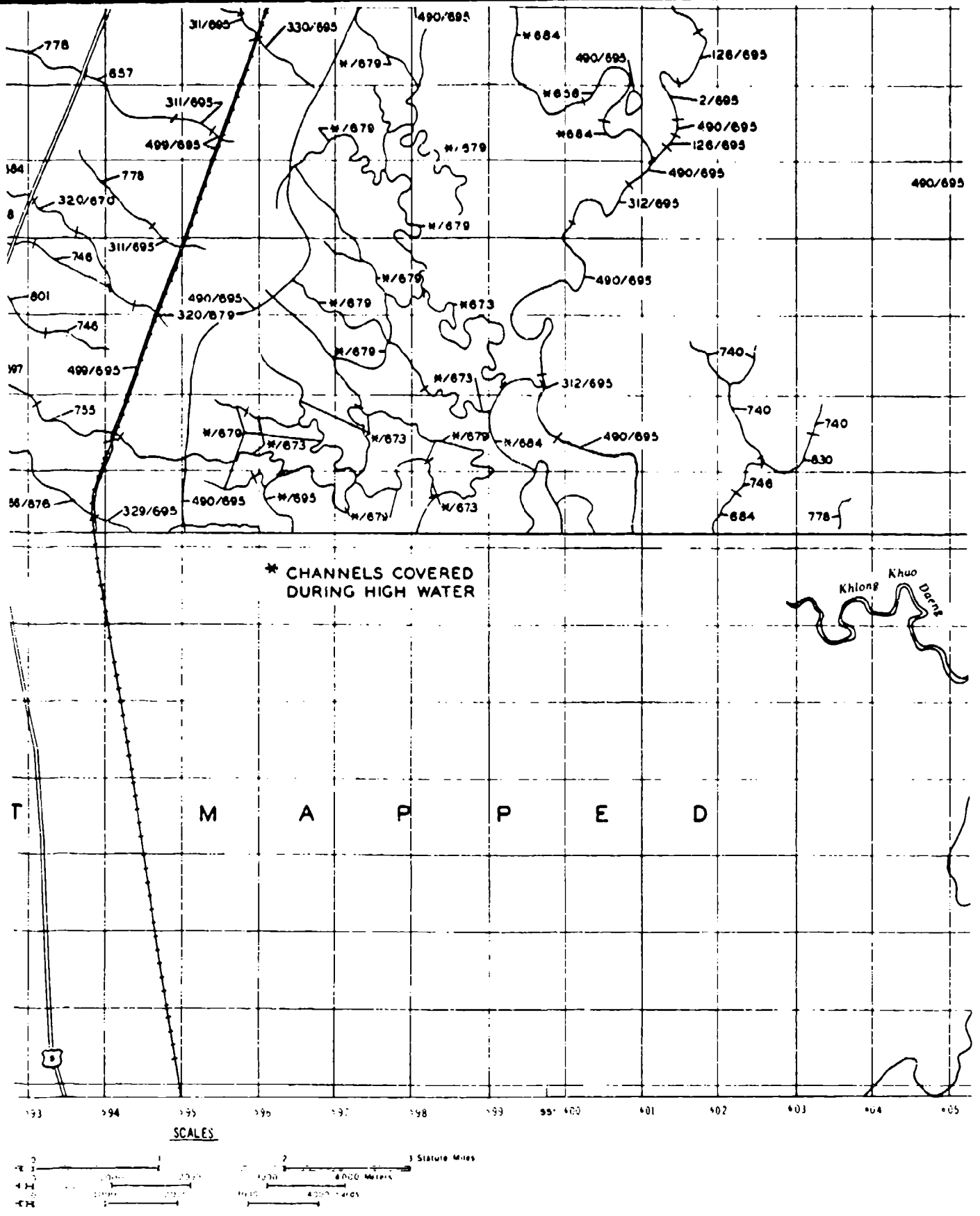
PB I

PB II

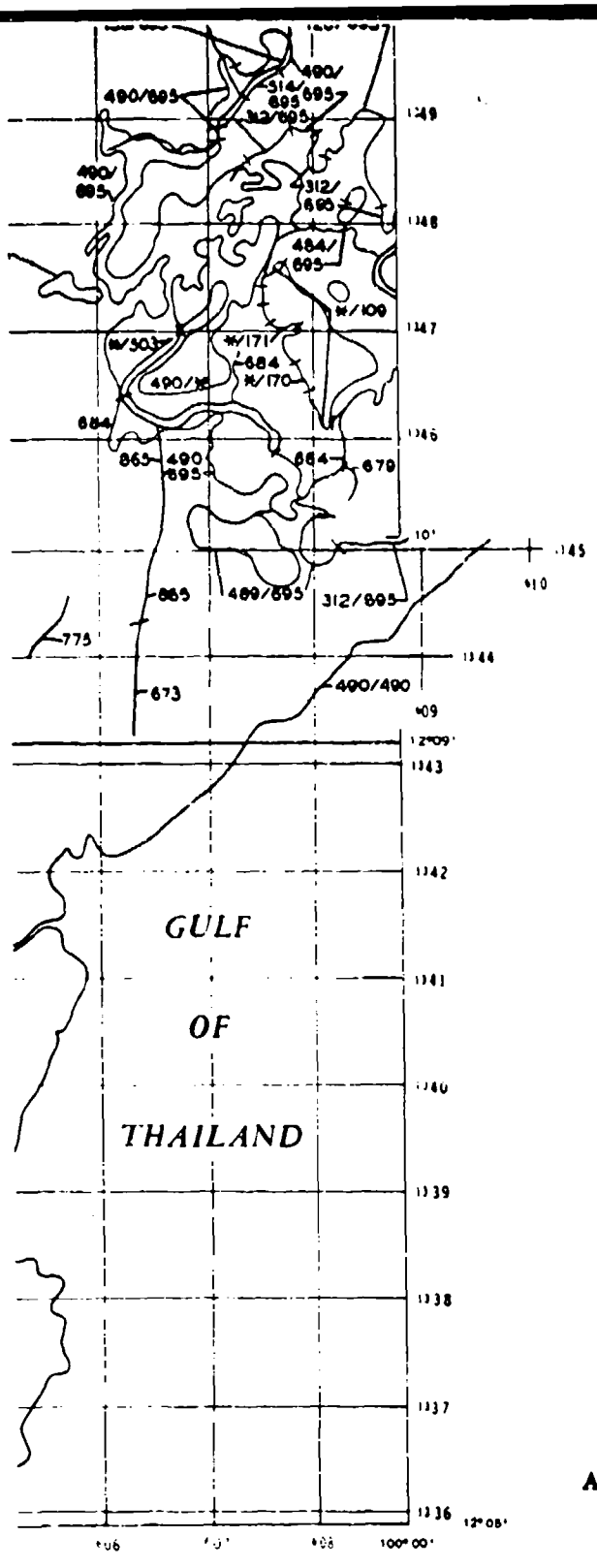


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

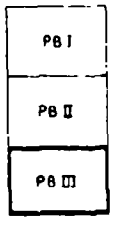
4


778
657
311/695
499/695
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311/695
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499/695
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W/684
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490/695
126/695
490/695
126/695
2/695
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490/695
490/695
312/695
490/695
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490/695
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740
740
830
746
684
778
Khlong
Khuo
Daeng
* CHANNELS COVERED
DURING HIGH WATER
T M A P P E D
SCALES
3 Statute Miles

5-



INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

PRAN BURI STUDY AREA

SHEET PB III

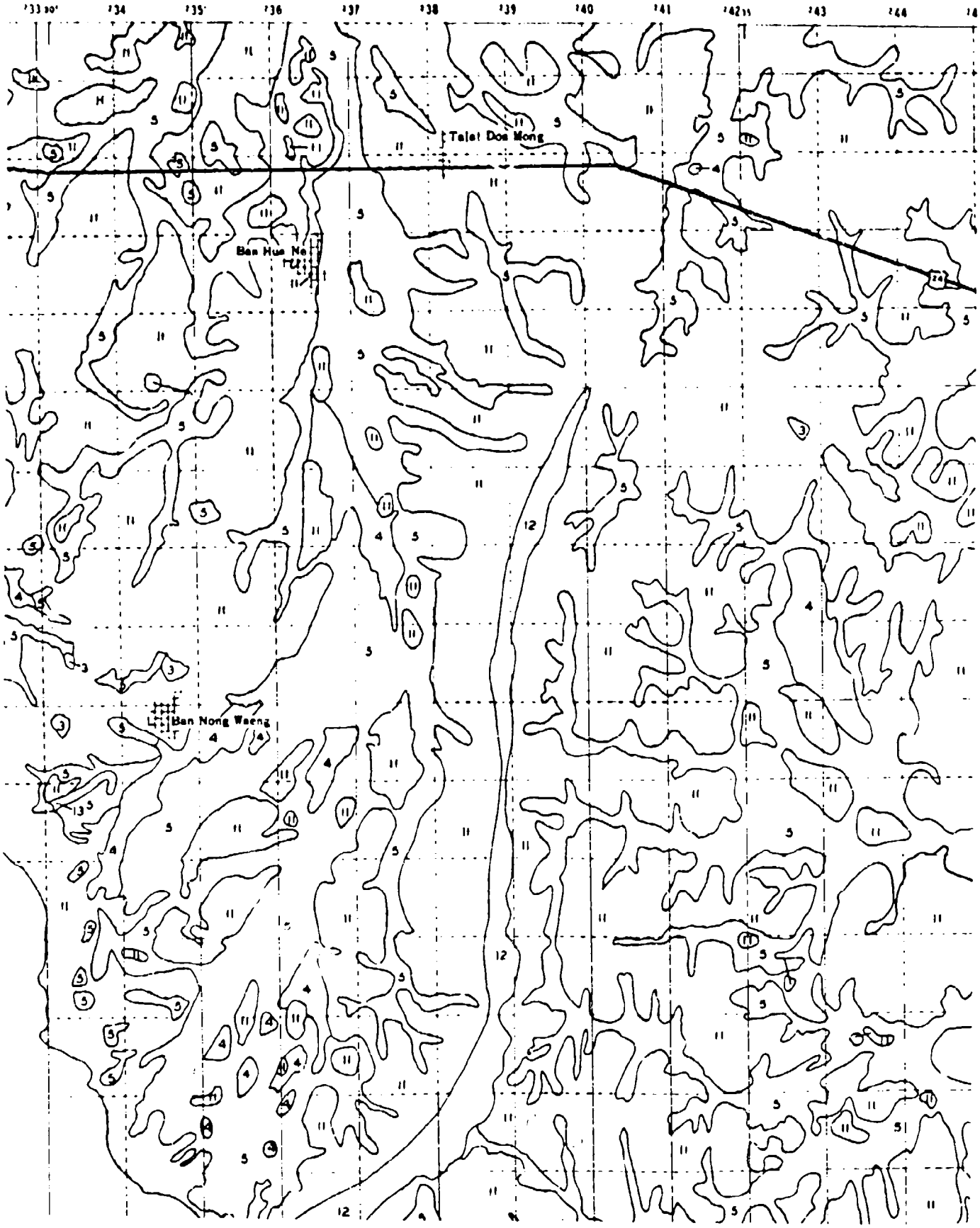
PLATE 4.3d

16

NOT MAPPED

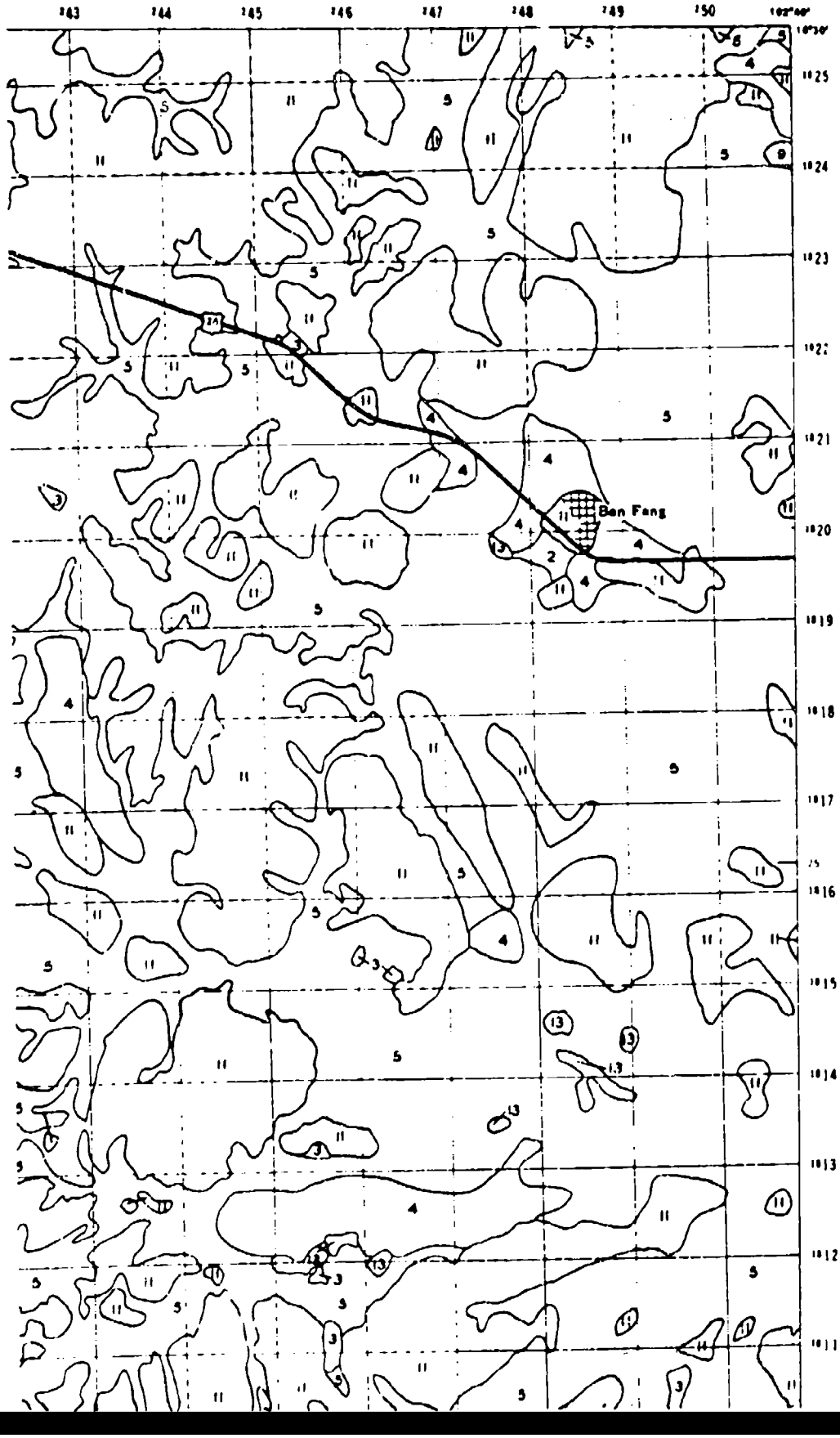
2

KHON KAEN



3

SHEET KK I



Unit	Soil Mass Strength: Maximum Moisture RCI	Maximum Moisture RCI	Maximum Mois: ϕ_{up} pcf	Maximum Mois: ϕ_{up} kg/cm^2
1	10-25	25-60	0-1	0-0.07
2	25-60	60-100	0-1	0-0.07
3	25-60*	60-100	0-1	0-0.07
4	25-60	>100	0-1	0-0.07
5	25-60*	>100	0-1	0-0.07
X	60-100	60-100	0-1	0-0.07
7	60-100	60-100	0-1	0-0.07
8	60-100	>100	0-1	0-0.07
9	60-100	>100	0-1	0-0.07
X	60-100	>100	0-1	0-0.07
11	60-100*	>100	0-1	0-0.07
12	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
X	Complex of 60-100 and >100	>100	0-1	0-0.07
X	Complex of 60-100 and >100	>100	0-1	0-0.07

Notes: Blank areas are water bodies.

ϕ_{up} Shear strength at zero normal load.

α_{up} Angle of internal friction.

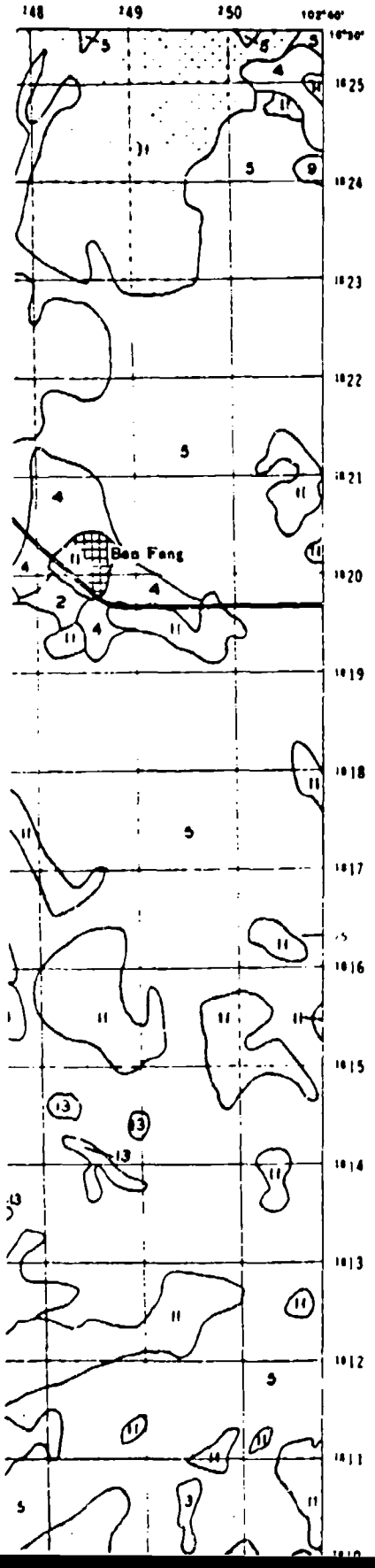
* Maximum moisture for less than 30 percent strengths commonly observed are 60-100 r

X Units do not occur on this map.

INDEX 1

KK I

SHEET KK I



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture τ_{uf} psi	Maximum Moisture τ_{uf} kg/cm²	Maximum Moisture σ_{uf} deg	Minimum Moisture τ_{uf} psi	Minimum Moisture τ_{uf} kg/cm²	Minimum Moisture σ_{uf} deg	Conditions where maximum τ_{uf} occurs: τ_{uf} psi	τ_{uf} kg/cm²	σ_{uf} deg
⊠	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
⊠	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
⊠	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Unit 1 Blank areas are water bodies.

τ_{uf} Shear strength at zero normal load.

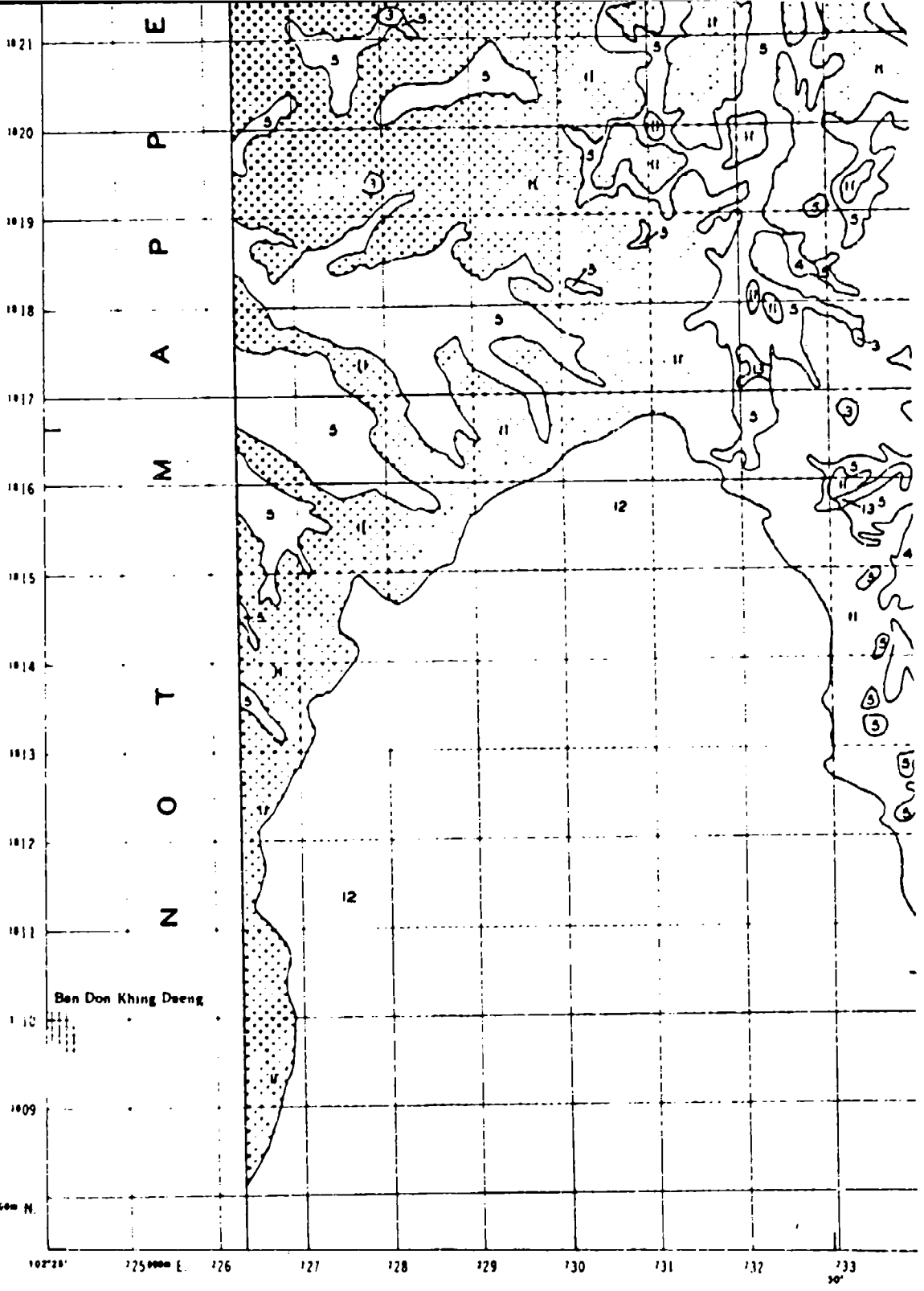
σ_{uf} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 40-100 for Units 3 and 5; more than 100 for Unit 11.

⊠ Units do not occur on this map.

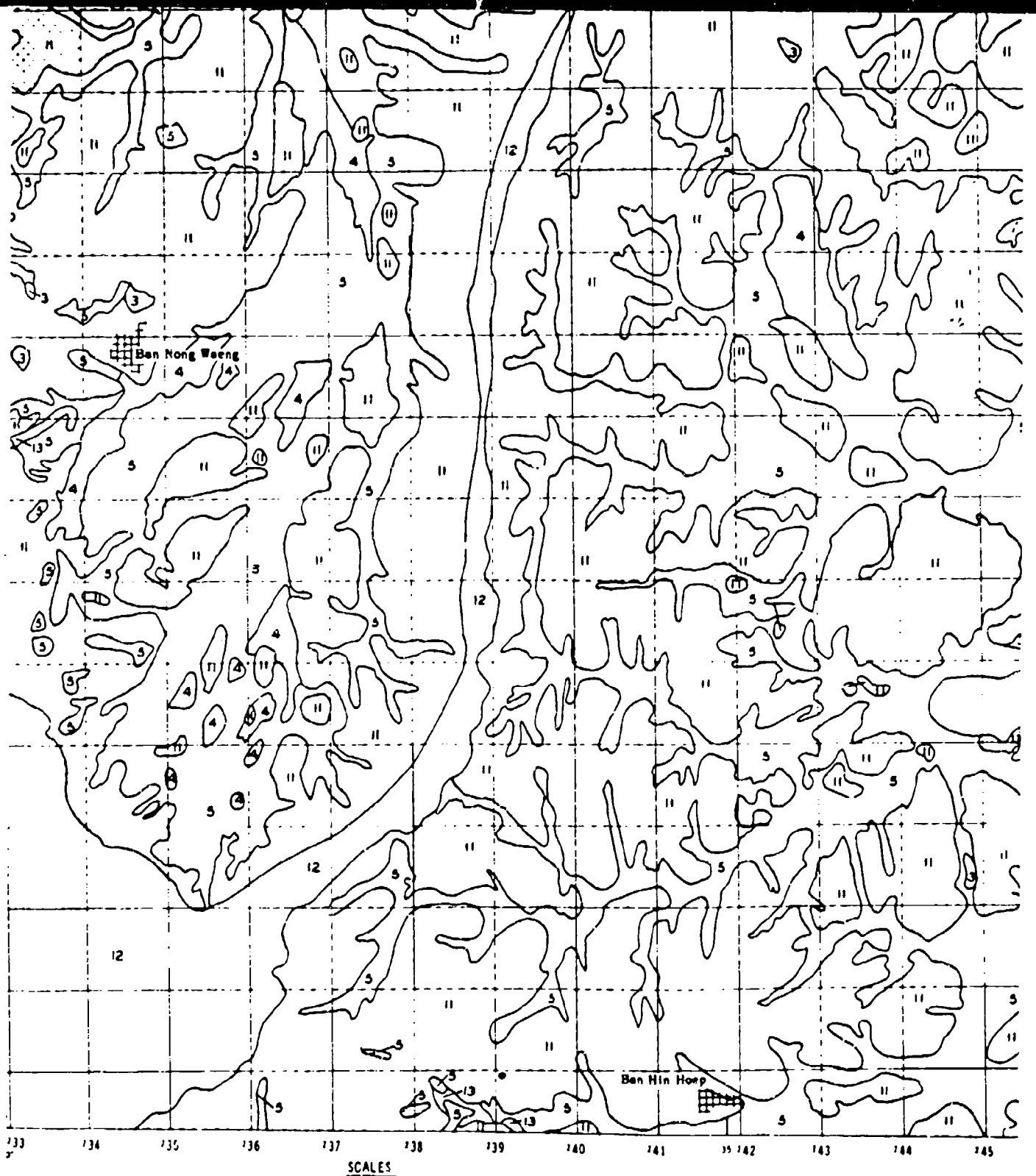
INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

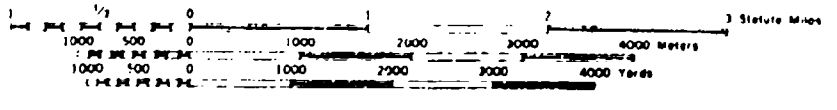


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 48Q

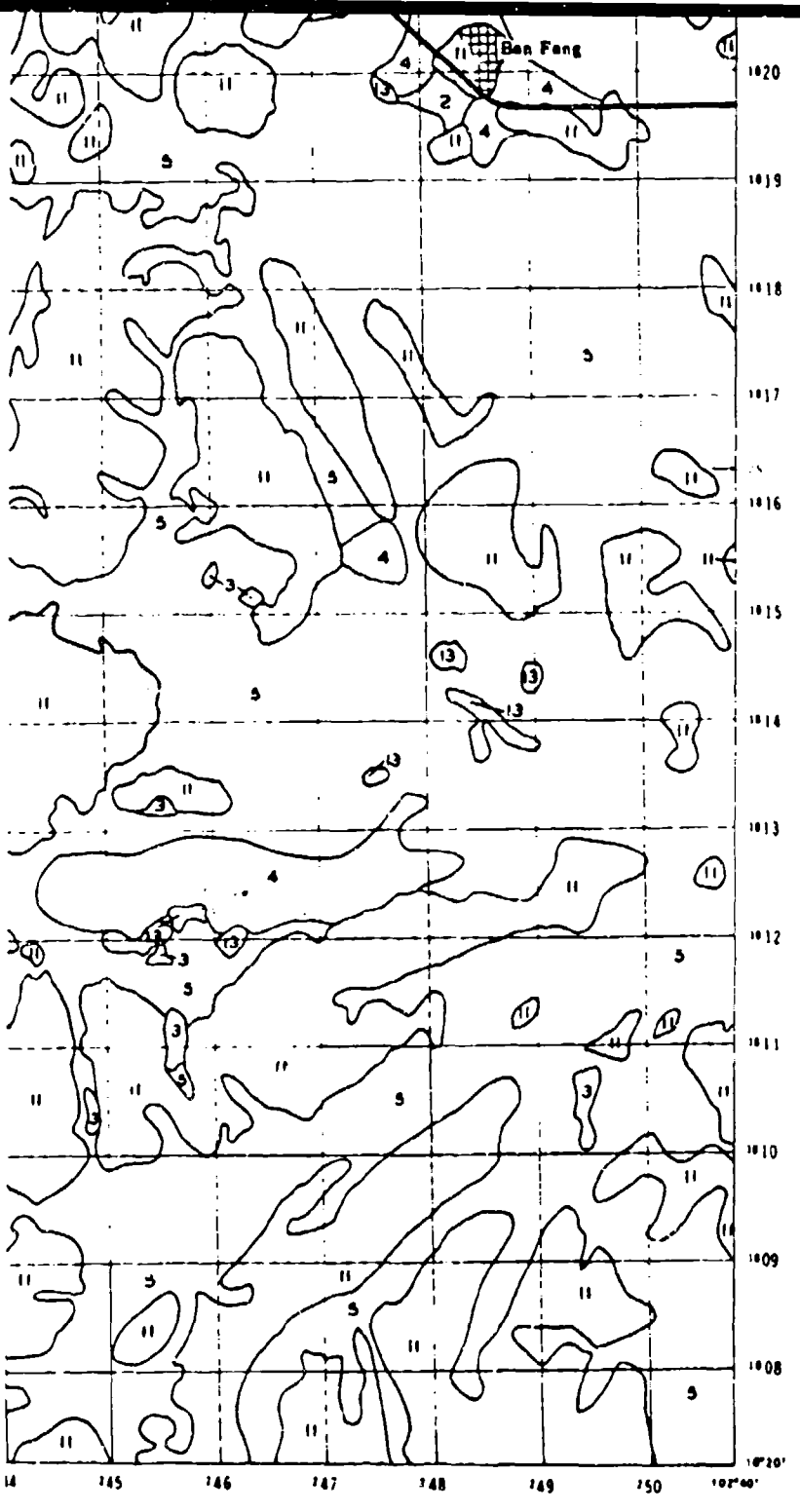
5


Ban Nong Waeng
Ban Hin Hoep
133
134
135
136
137
138
139
140
141
35 142
143
144
145

SCALES


1/2
0
1
2
3 Statute Miles
1000
500
0
1000
2000
3000
4000 Meters
1000
500
0
1000
2000
3000
4000 Yards

6



Units	RCI	RCI	psi	kg/cm²	deg	psi	kg/cm²
X	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07
X	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07
X	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07
13	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07
X	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07
X	Complex of 4, 11 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07

Notes: Blank areas are water bodies.

c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 5% percent probability of occurrence; strengths commonly observed are 60-100 for Units 3 and 5; more than

X Units do not occur on this map.

INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

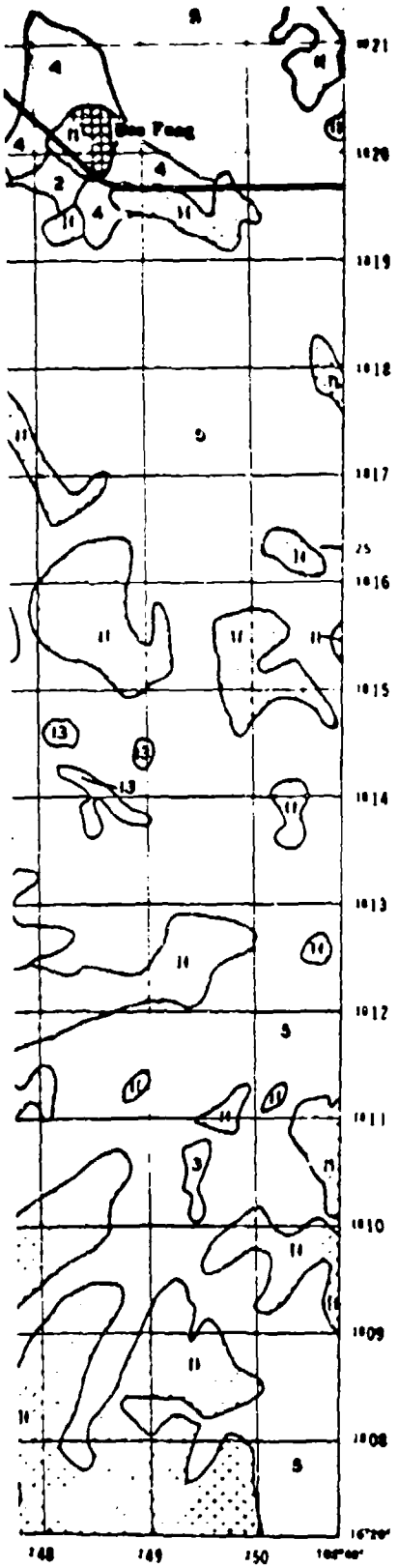
A QUANTITATIVE METHOD FOR D
TERRAIN FOR GROUND MOB

SURFACE COMPOSIT

KHON KAEN STUDY A

SHEET KK I

7



Unit	Soil Shear Strength: Unsaturated Conditions — Unified Classification	Soil Shear Strength: Unsaturated Conditions — Textural Classification	Soil Surface Strength: Moisture Conditions Where Saturation Occurs — c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Soil Surface Strength: Moisture Conditions Where Saturation Occurs — c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Soil Surface Strength: Moisture Conditions Where Saturation Occurs — c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg
⊠	10-75	75-80	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Maximum moisture conditions		
1	75-80	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
1	75-80*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Maximum moisture conditions		
5	75-80	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	75-80*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Maximum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
⊠	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		
10	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
⊠	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
⊠	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Maximum moisture conditions		

Note: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

⊠ Units do not occur on this map.

INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

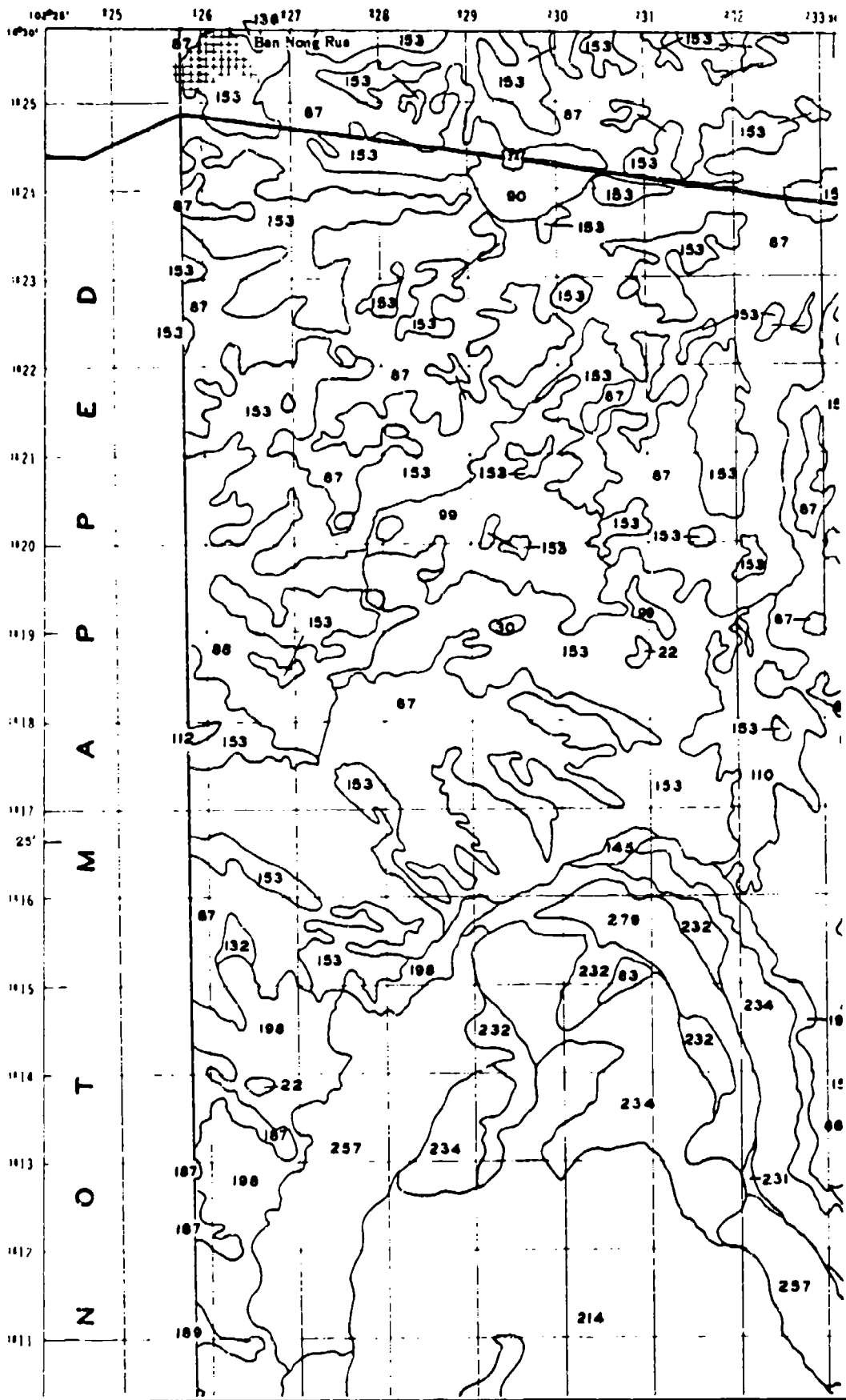
SURFACE COMPOSITION

KHON KAEN STUDY AREA

SHEET KK I

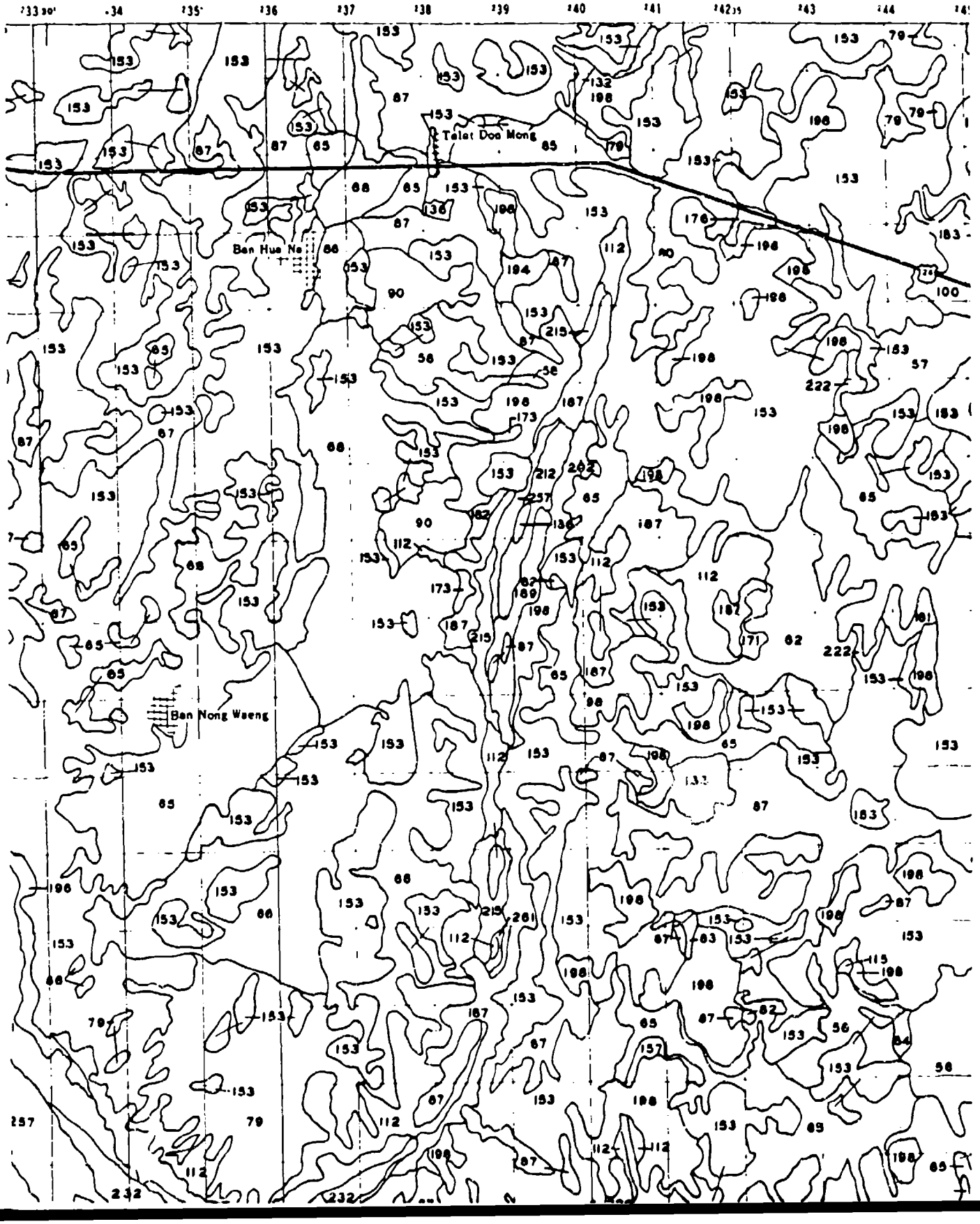
8

PLATE 5.1a


Ban Nong Rua
NOT MAPPED

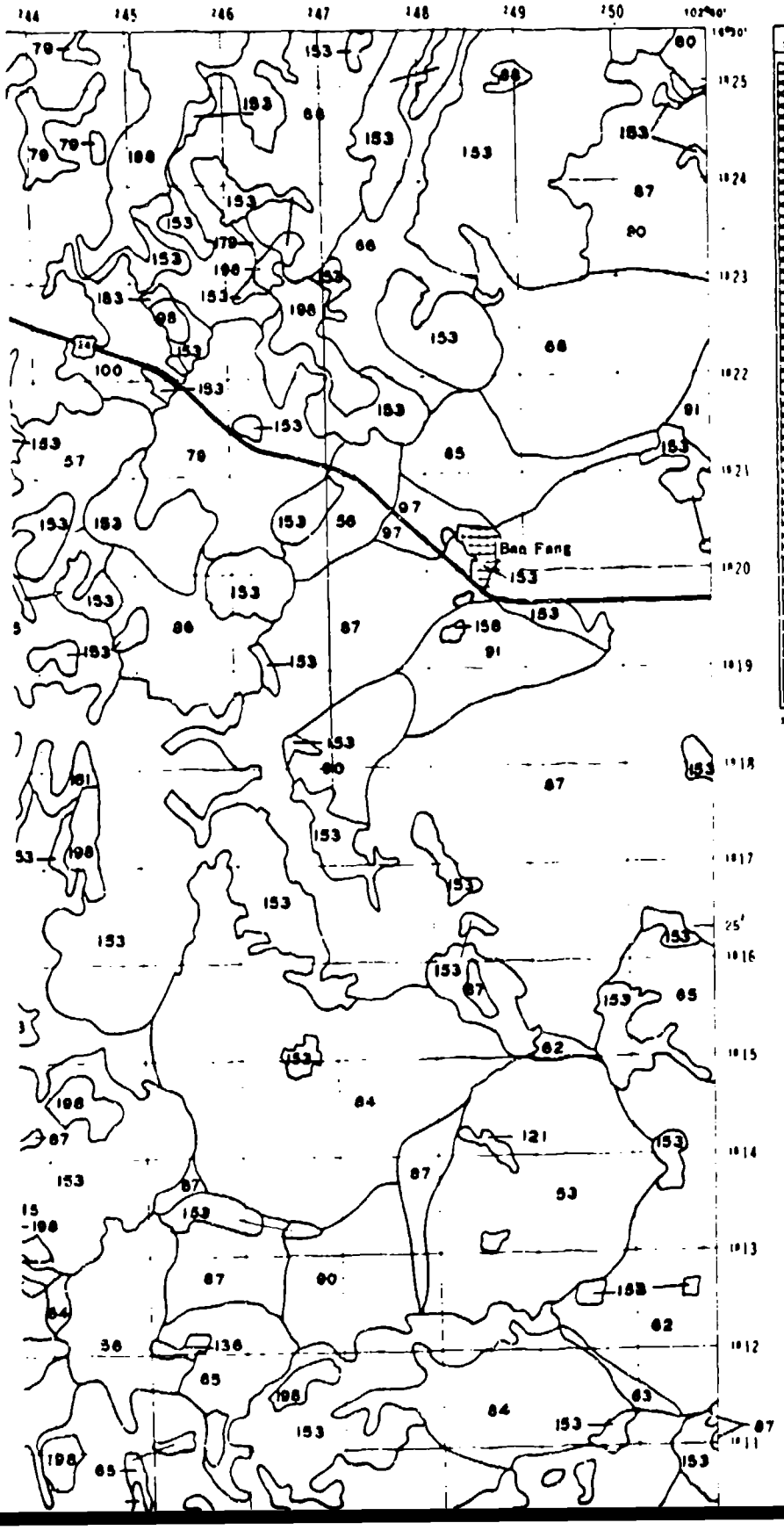
2

KHON KAEN

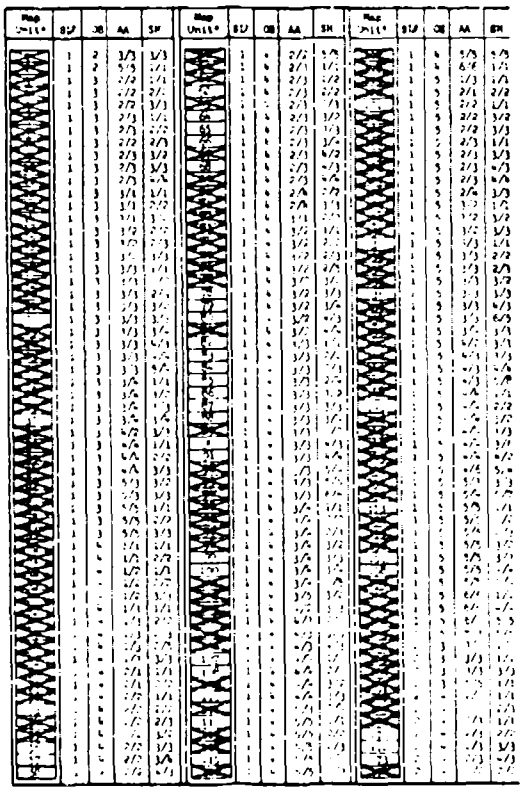


3

SHEET KK I



LEGEND



Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1, 1, 1/1, 1/1) (see below), vertical obstacle spacing (OB), approach angle (AA), and slope (slope) were mapped. The numerator of the fraction indicates data range that will westerly direction (i.e. azimuth from > 0° to 180° true), and the denominator of > 180° to 360° deg) assuming that the vehicle intercepts the obstacle at a r

* Mapping class ranges of each surface geometry factor used

Slope (SL)

Mapping Class	Range deg
1	0-1.5
2	> 1.5-3.5
3	> 3.5-7.5
4	> 7.5-15
5	> 15-30
6	> 30-45
7	> 45

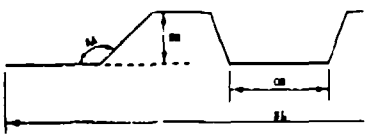
Vertical Obstacle Spacing (OB)

Mapping Class	Range	
	ft	m
1	0-9	0-2.83
2	> 9-12	> 2.83-3.66
3	> 12-45	> 3.66-13.72
4	> 45-150	> 13.72-45.72
5	> 150	> 45.72

Approach An

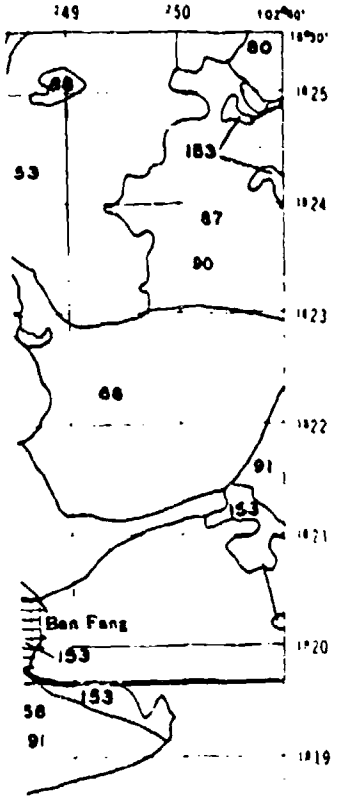
Mapping Class	
1	
2	
3	
4	
5	
6	
7	
8	
9	

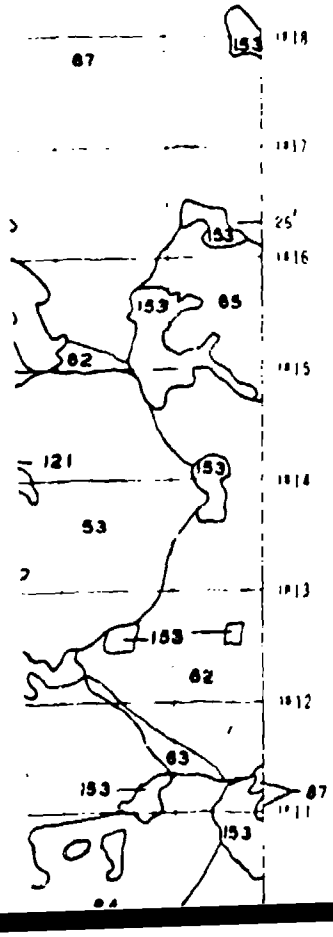
Units do not occur on this map.



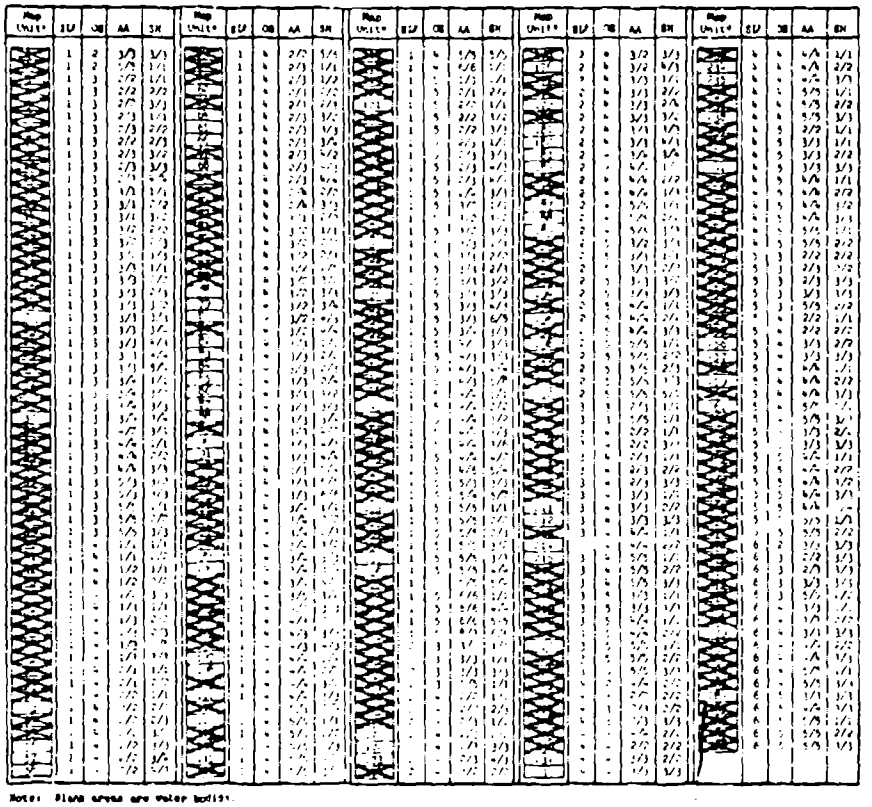
INDEX TO ADJOINING SHEETS

SHEET KK I





LEGEND



Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (i.e. 1/1, 1/2, 1/3, 1/4) indicating mapping classes of slope SL (see diagram below), vertical obstacle spacing OB, approach angle AA, and step height SH. Fractional notations indicate that two classes were mapped. The numerator of the fraction indicates that will be encountered while traversing an area in an easterly direction (i.e. azimuth from > 0 to 179 deg) and the denominator refers to a westerly direction (i.e. azimuth from > 179 to 360 deg) assuming that the vehicle intersects the obstacle at a right angle.

* Mapping class ranges of each surface geometric factor are:

Slope (SL)

Mapping Class	Range deg
1	0-1.9
2	> 1.9-5.9
3	> 5.9-9
4	> 9-18
5	> 18-30
6	> 30-45
7	> 45

Vertical Obstacle Spacing (OB)

Mapping Class	Range	
	ft	m
1	0-9	0-2.7
2	> 9-12	> 2.7-3.7
3	> 12-15	> 3.7-4.6
4	> 15-19	> 4.6-5.8
5	> 19	> 5.8

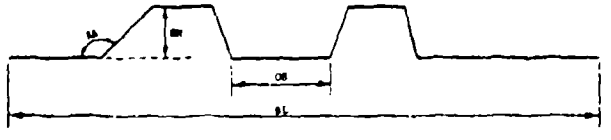
Approach Angle (AA)

Mapping Class	Range deg
1	< 120
2	120-< 135
3	135 < 150
4	150-< 165
5	165-< 180
6	180-< 200
7	200-< 210
8	210-< 220
9	≥ 220

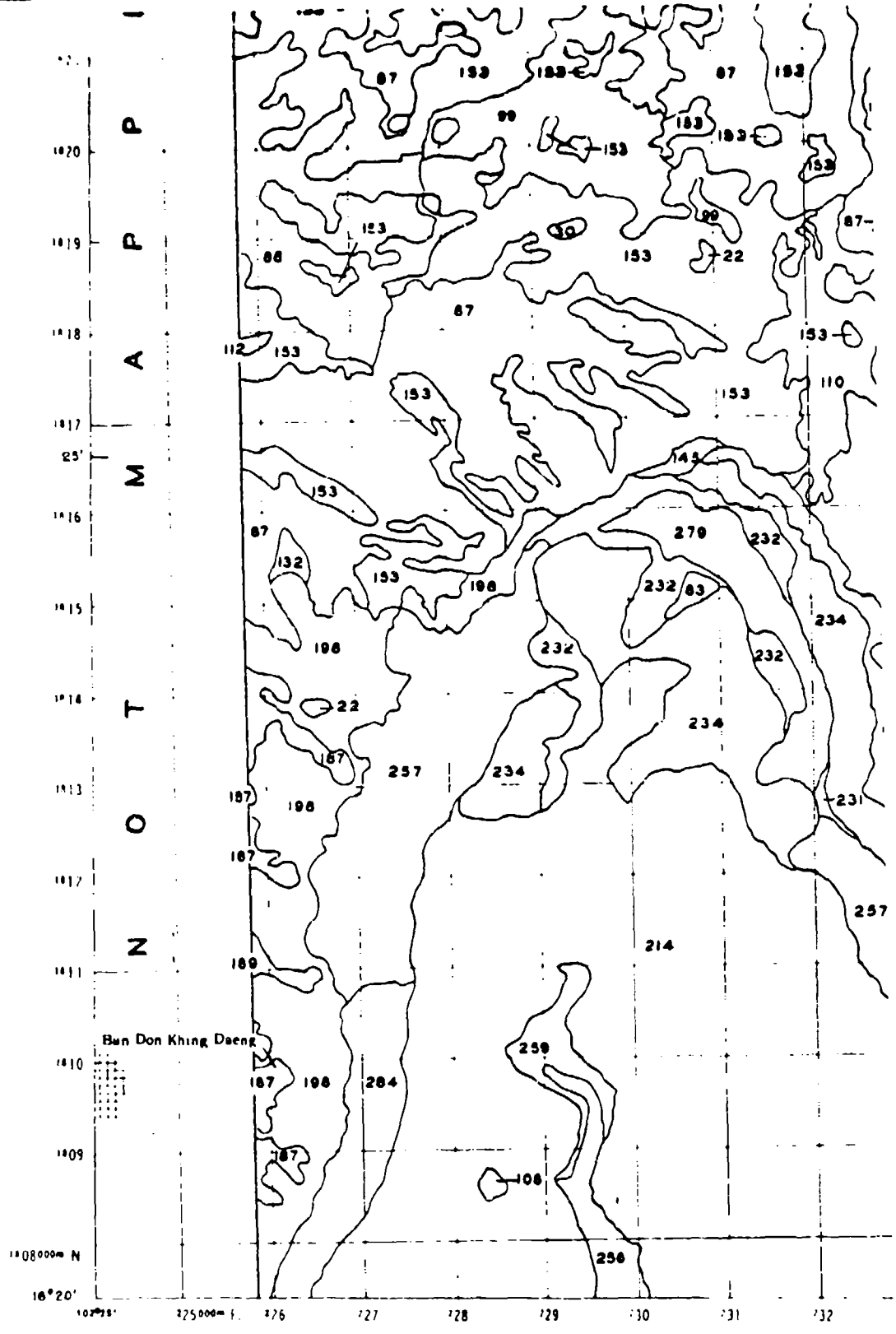
Step Height (SH)

Mapping Class	Range	
	in	cm
1	0-< 4	0-< 10.16
2	≥ 4-< 10	≥ 10.16-25.40
3	≥ 10-< 15	≥ 25.40-< 38.10
4	≥ 15-< 19	≥ 38.10-< 48.26
5	≥ 19-< 24	≥ 48.26-< 60.96
6	≥ 24-< 36	≥ 60.96-< 91.44
7	≥ 36-< 48	≥ 91.44-< 121.92
8	≥ 48-< 66	≥ 121.92-< 167.64
9	≥ 66-< 84	≥ 167.64-< 213.36
A	≥ 84	≥ 213.36

White do not occur on this map.

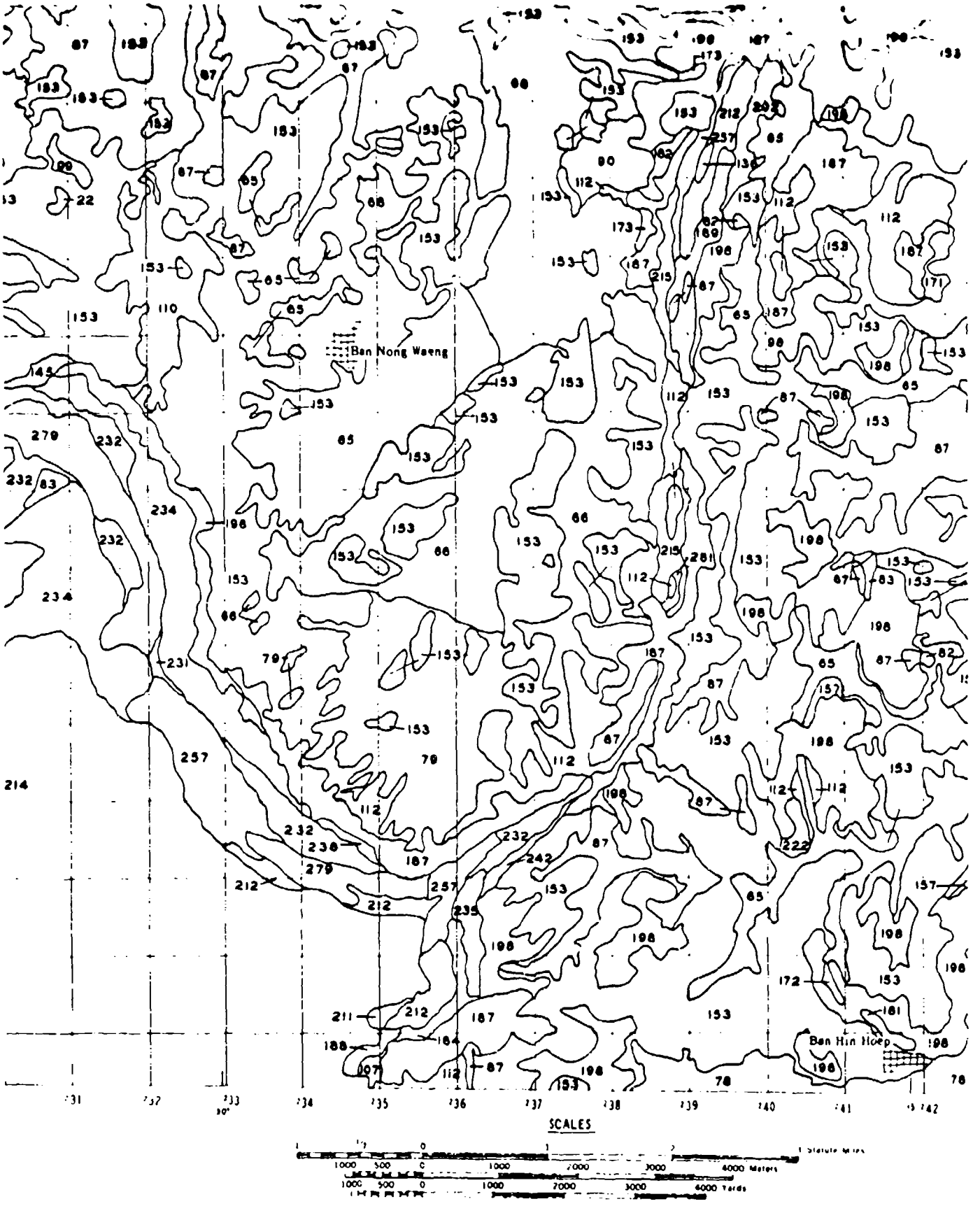


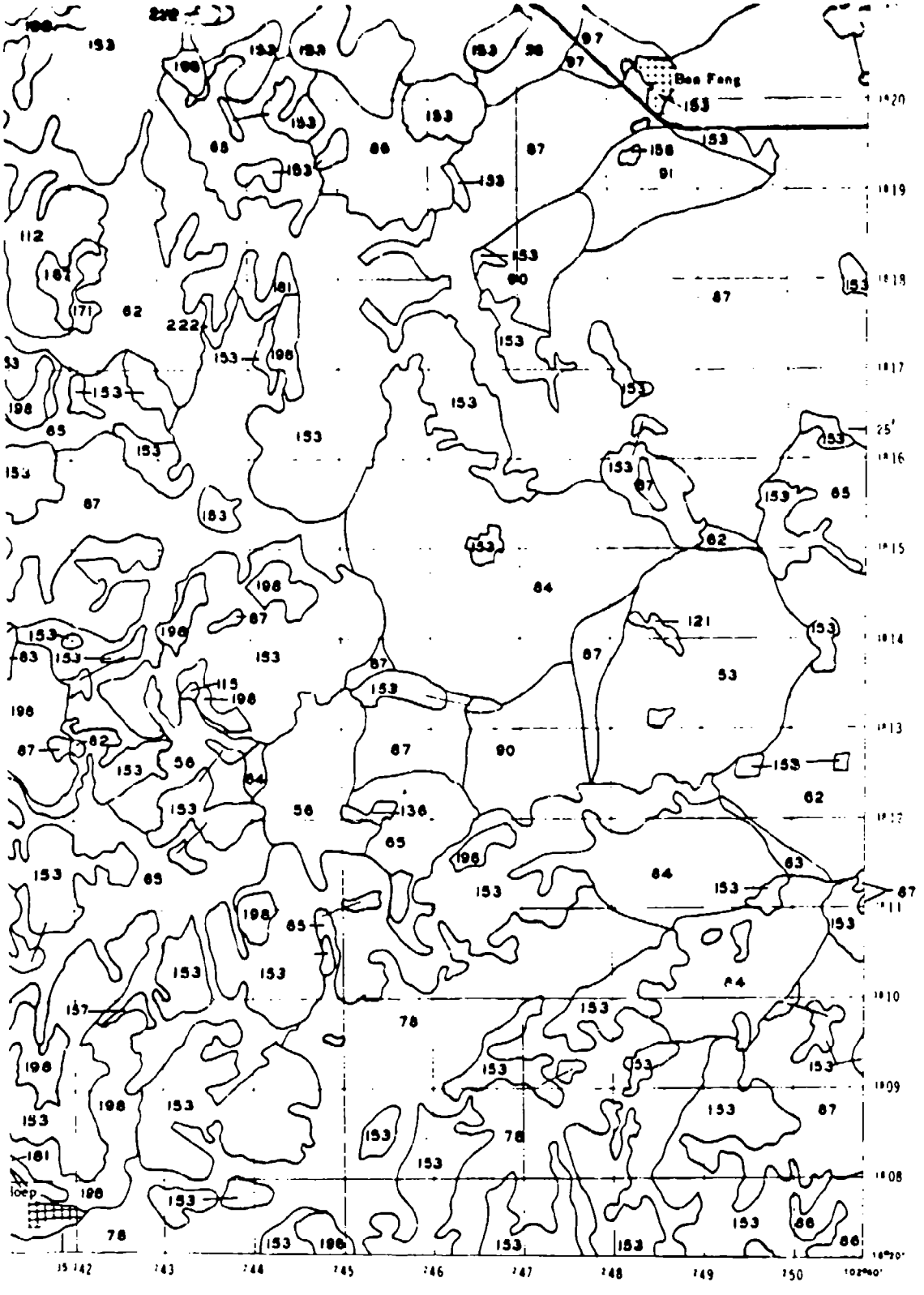
INDEX TO ADJOINING SHEETS

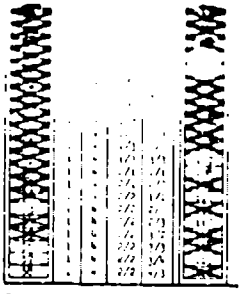


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 48Q

5


Ban Nong Waeng
Ban Hin Hoep
SCALES





Note: Blank areas are water bodies

* Each map unit represents an ar
below), vertical datum sheet
were mapped. The numeric pr
easterly direction (i.e. azimut
> 180° to 360° assuming that

† Mapping class ranges of each

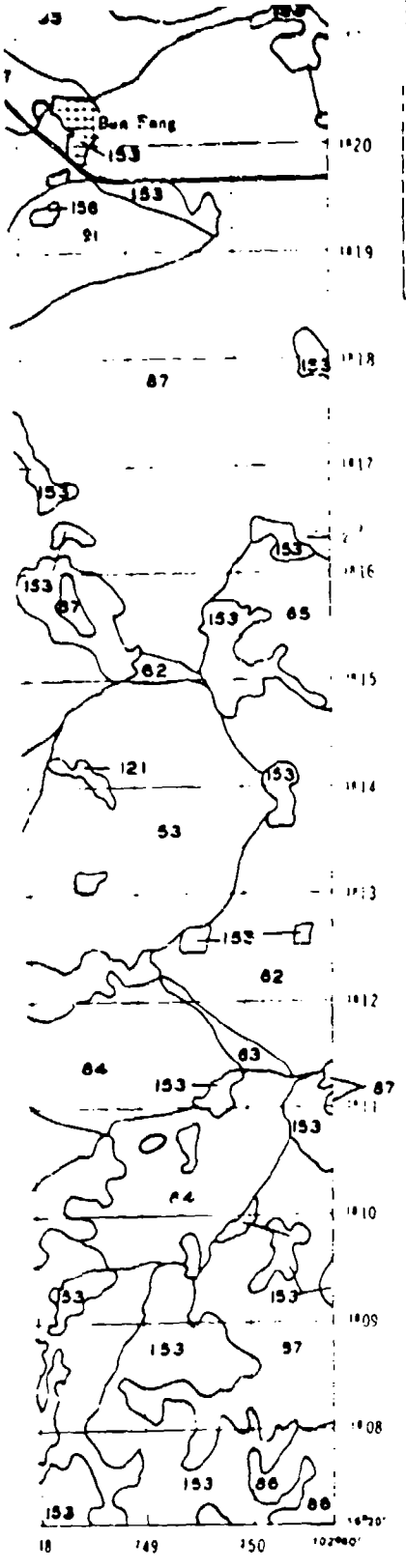
Slope (SL)

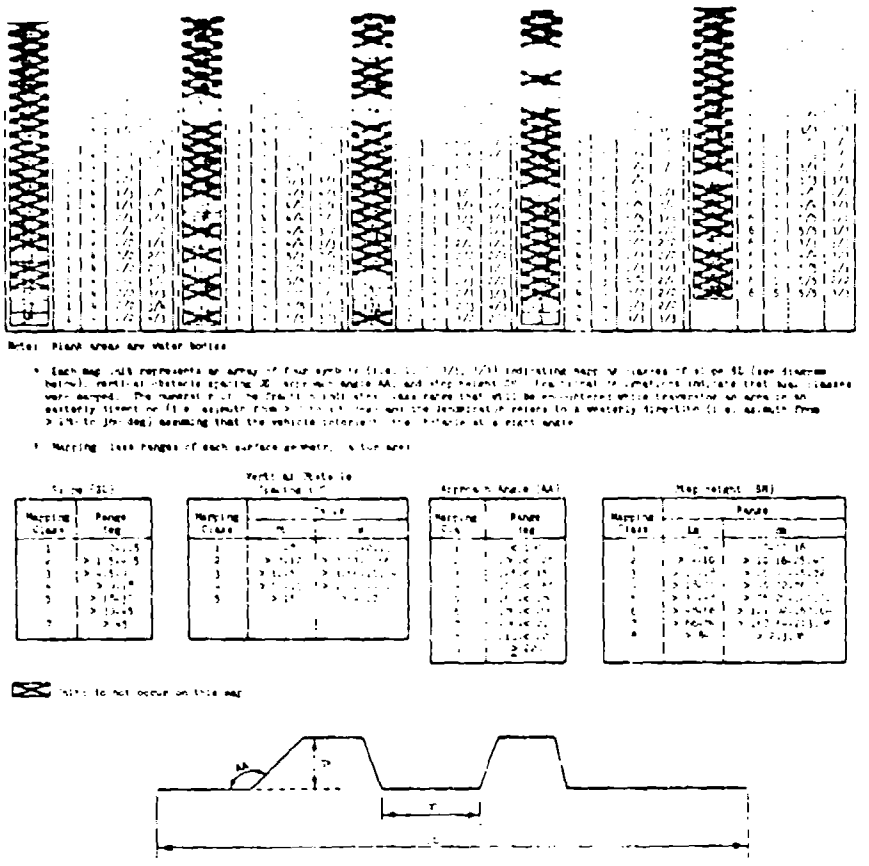
Mapping Class	Ranges deg
1	0-1.5
2	> 1.5-3
3	> 3-5
4	> 5-10
5	> 10-15
6	> 15-45
7	> 45

Mapping Class
1
2
3
4
5
6
7

Units so not occur on this map

A QUANTI
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KH





INDEX TO ADJOINING SHEETS



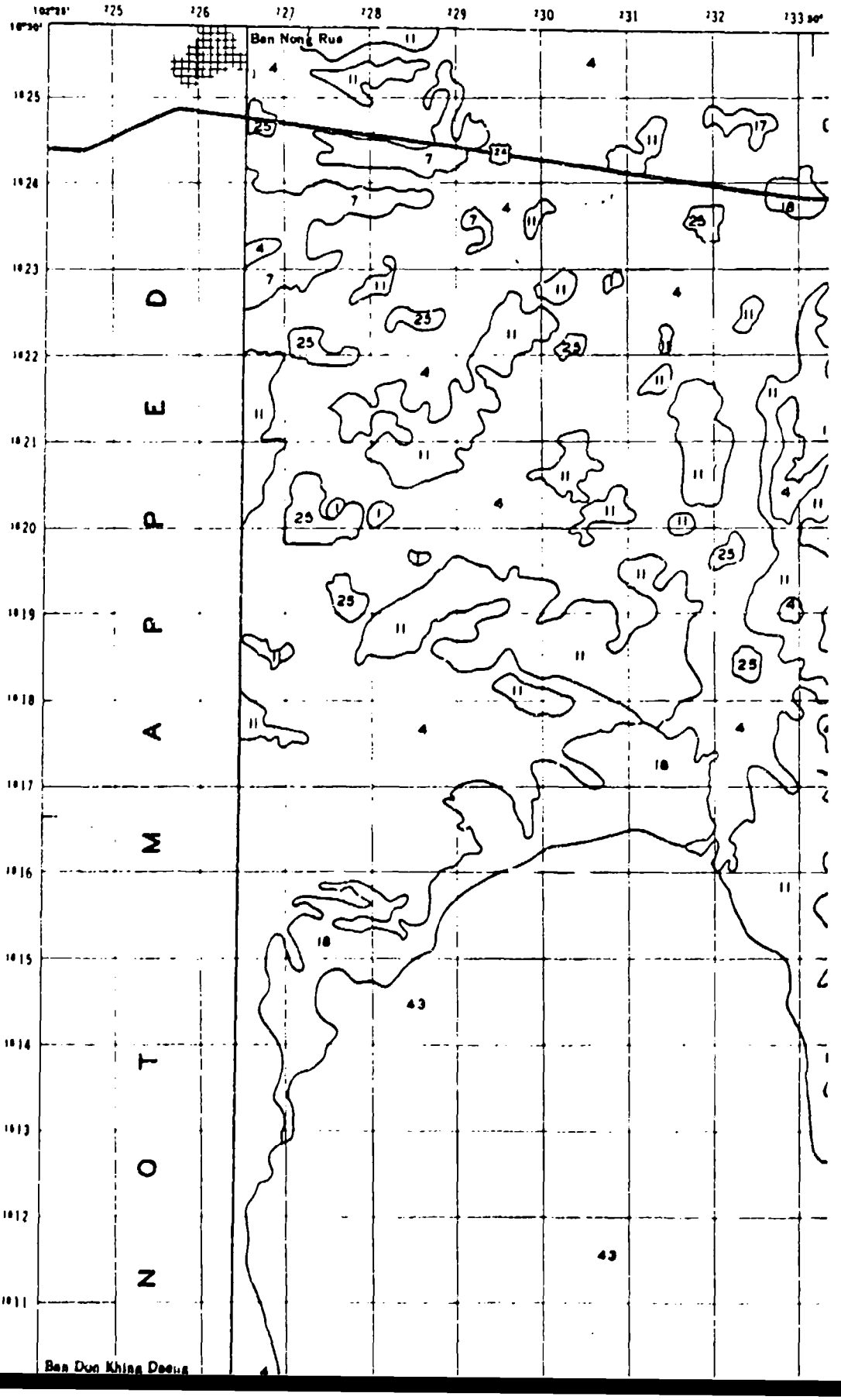
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

KHON KAEN STUDY AREA

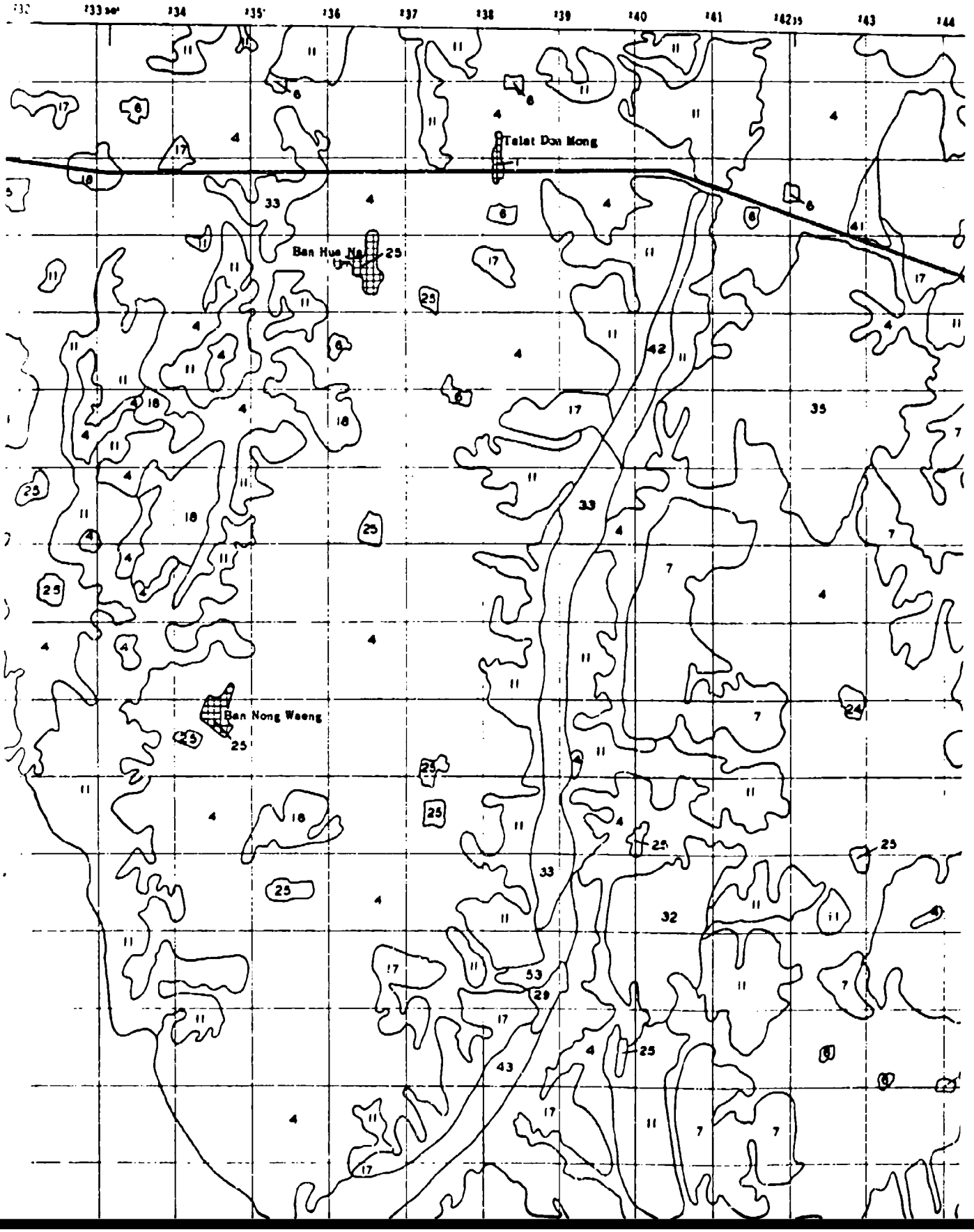
SHEET KK I

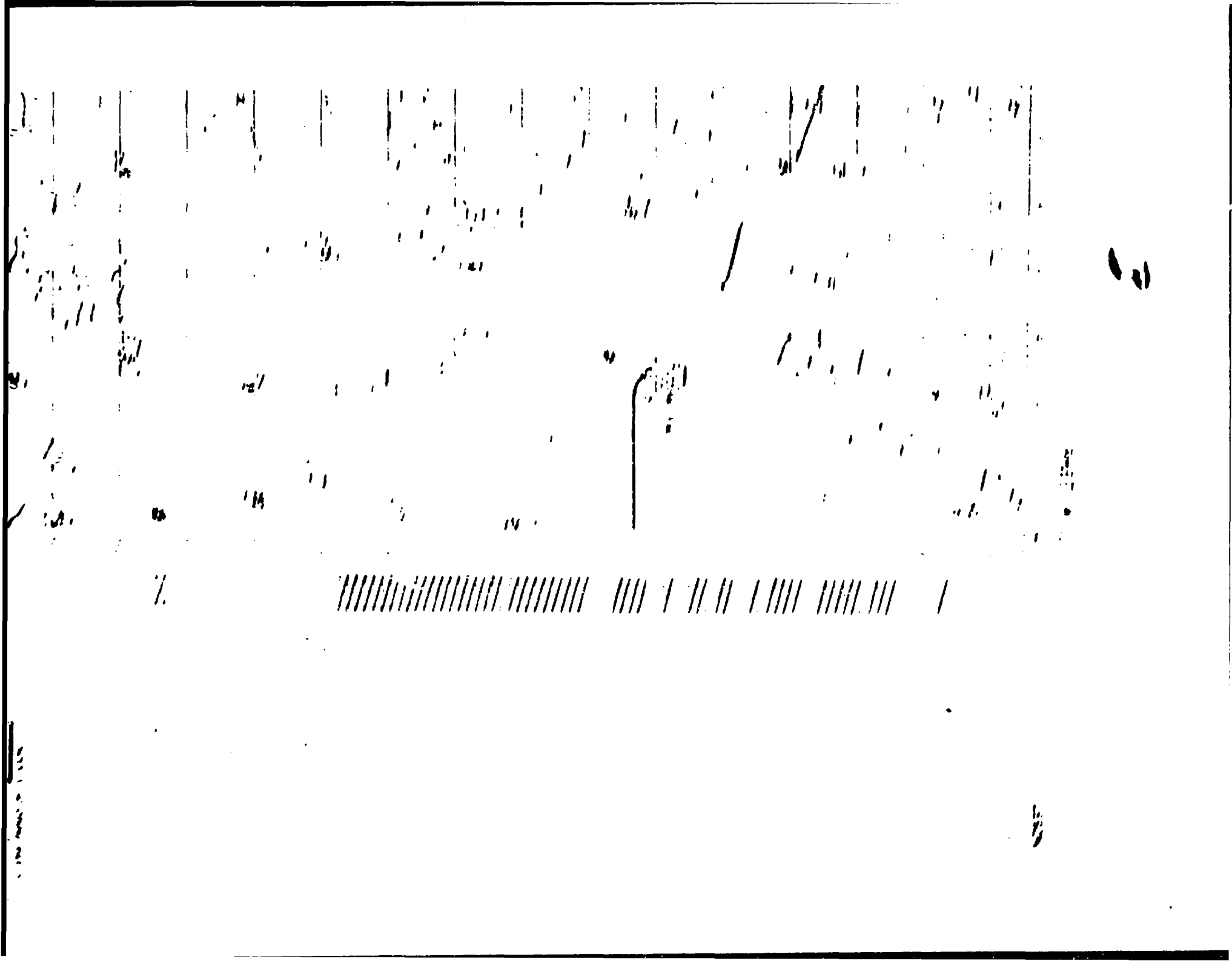
PLATE 5.1b


Ben Nong Rue
Ben Duc Khing Deeus
NOTAMAPPED

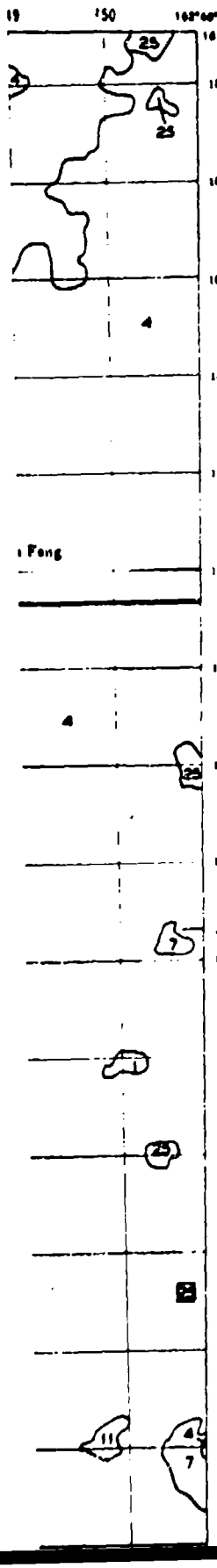
2

KHON KAEN





SHEET KK I



LEGEND

Map Unit*	Arrays of Spacing Classes for Stems ≤ and ≥ the Specified Diameter							
	≤				≥			
	2 in. (5.08 cm)†	5 in. (12.70 cm)	9 in. (22.86 cm)	>9 in. (127.00 cm)	1 in. (2.54 cm)	3 in. (7.62 cm)	6 in. (15.24 cm)	10 in. (25.40 cm)

Note: Blank areas are revegetation water bodies.

* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1.) indicating spacing classes for stems ≤ 2, 5, 9, and >9 in. (≤ 5.08, 12.70, 22.86, and 127.00 cm) and ≥ 1, 3, 6, and 10 in. (2.54, 7.62, 15.24, and 25.40 cm).

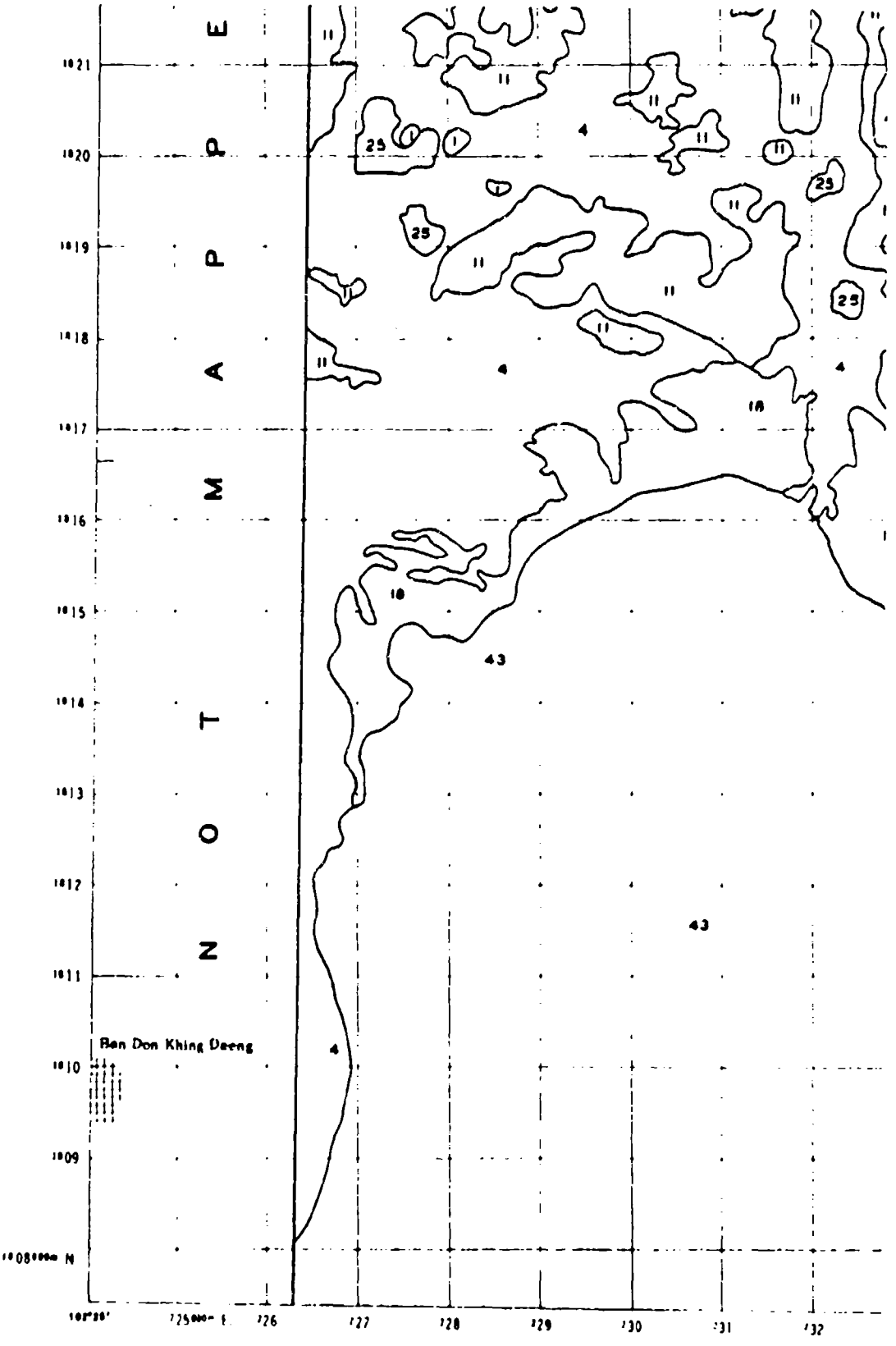
† Mapping class ranges for each spacing class and

Stem Spacing

Mapping Class	Feet	m
1	> 10	> 3.14
2	> 10-15	> 3.05-9.14
3	> 5-10	> 1.52-3.05
4	0-5	0-1.52

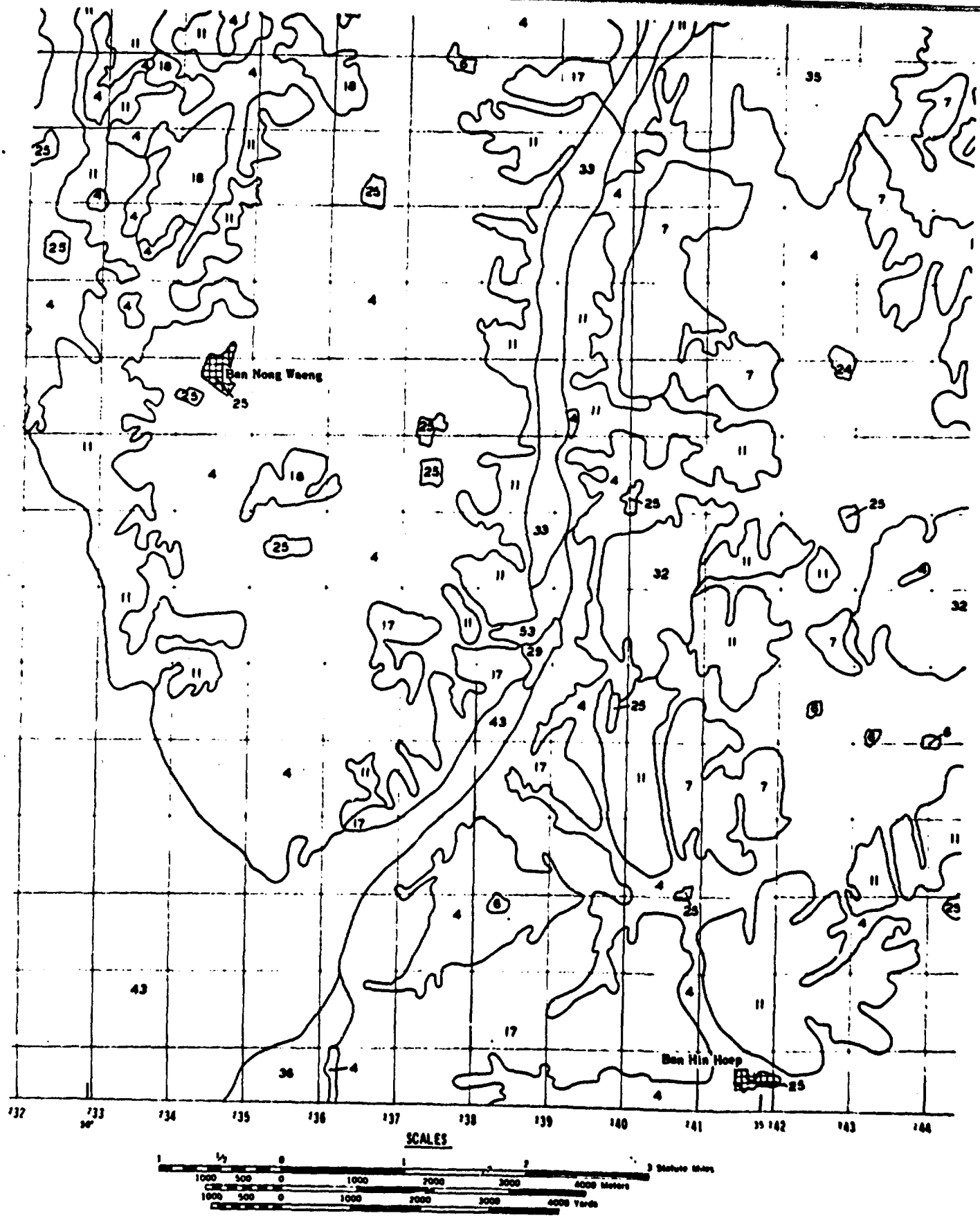
Units to not occur on this map.

INDEX TO ADJOINING SHEETS



ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48Q

5

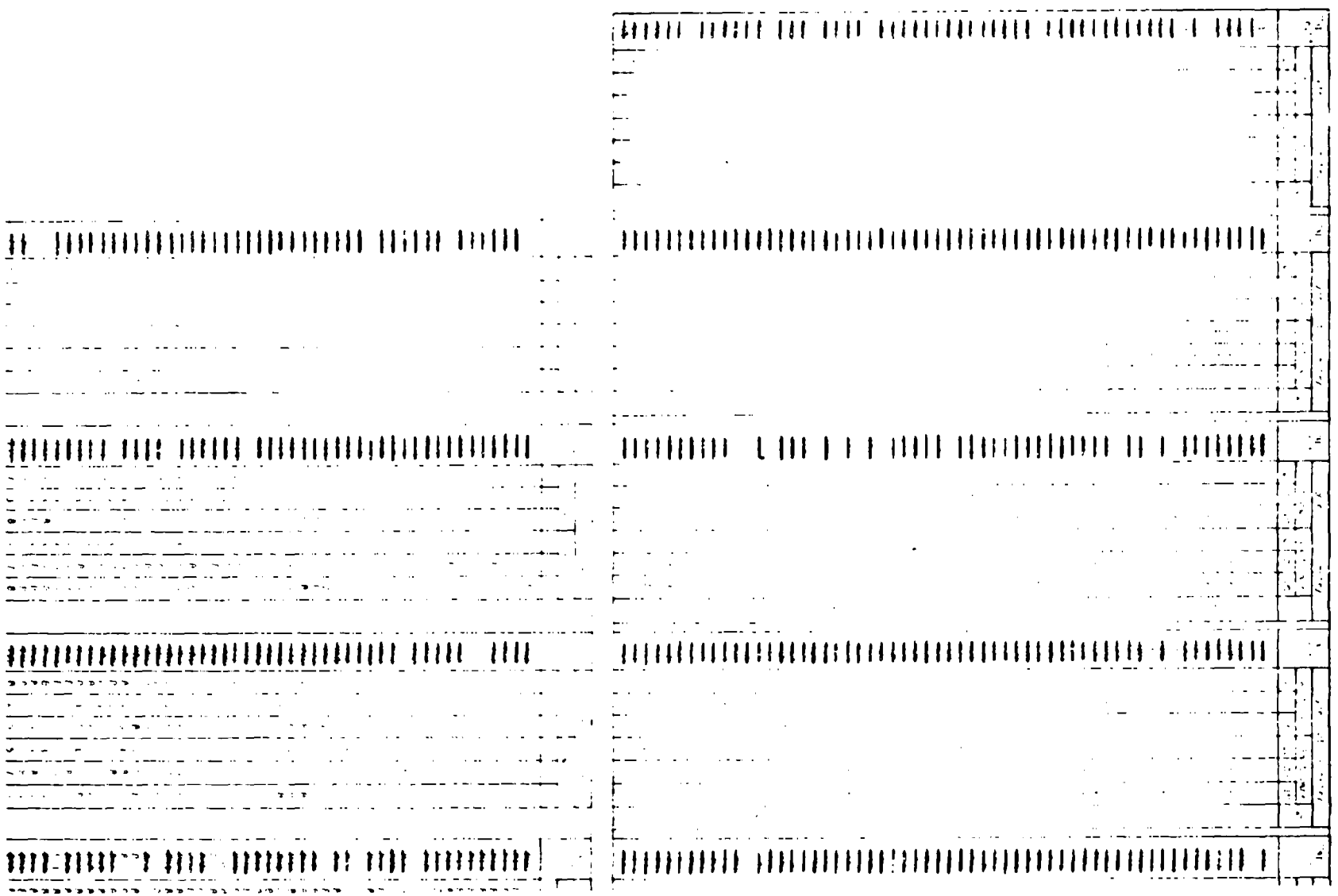


6

A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

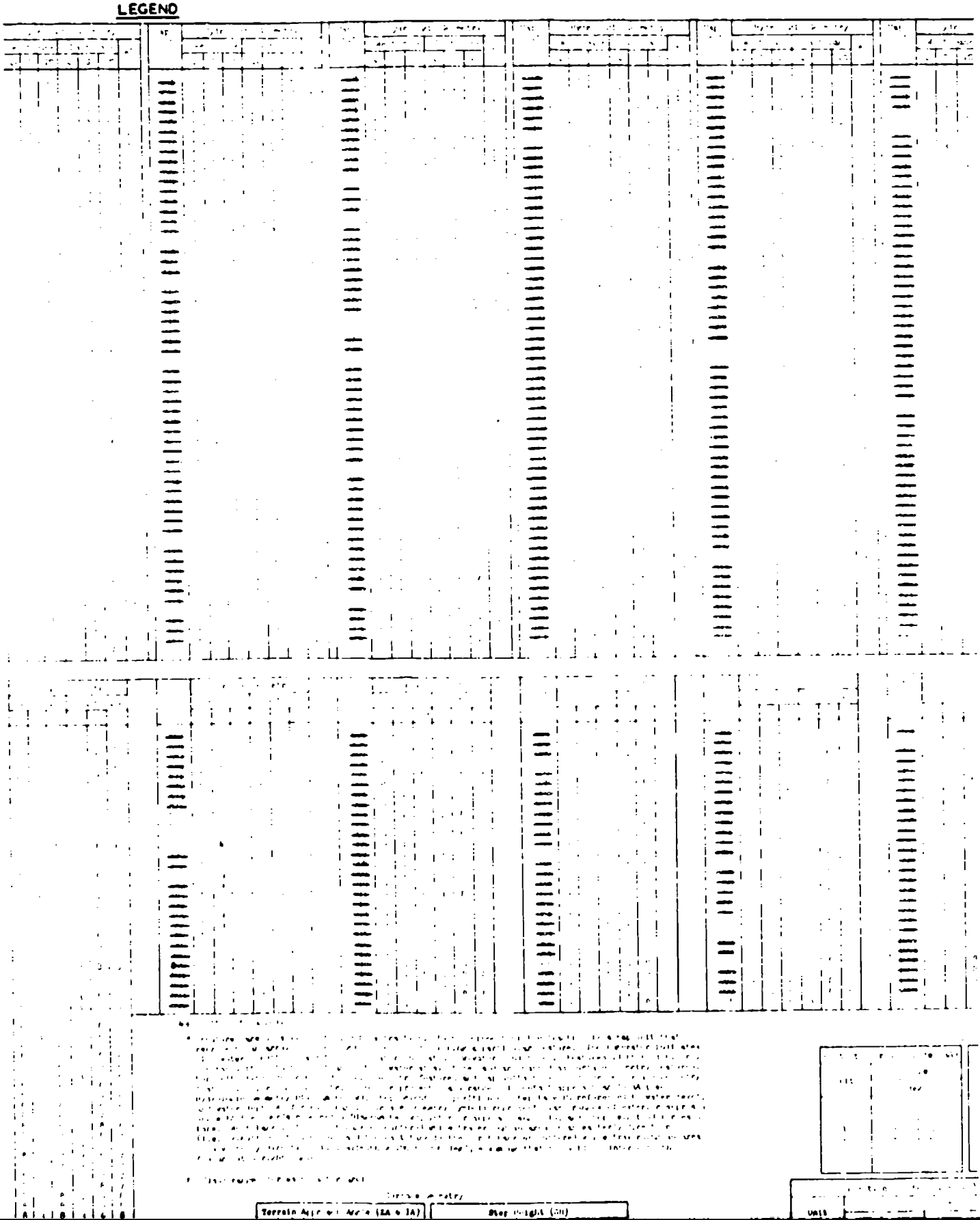
VEGETATION

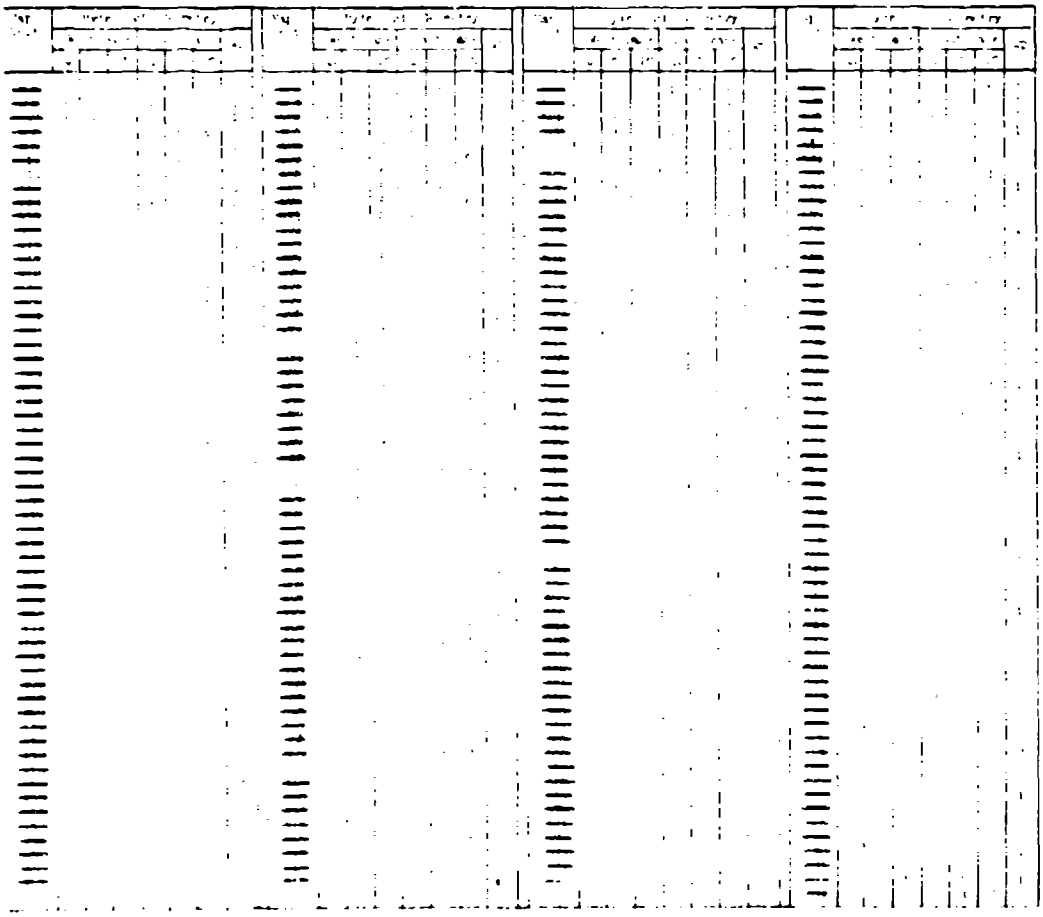
KIRON KAHN MOBILITY AIR
NIRKT KK I

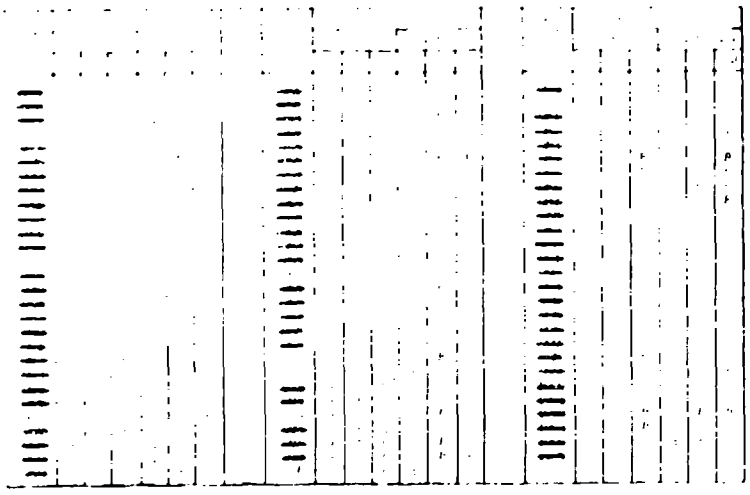


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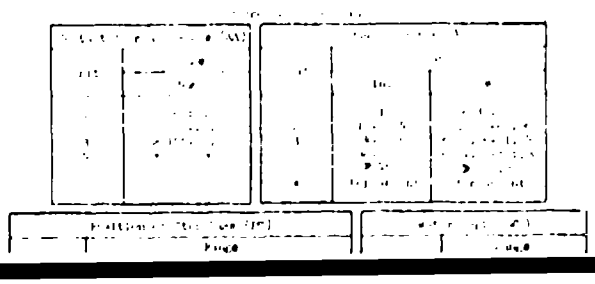
LEGEND





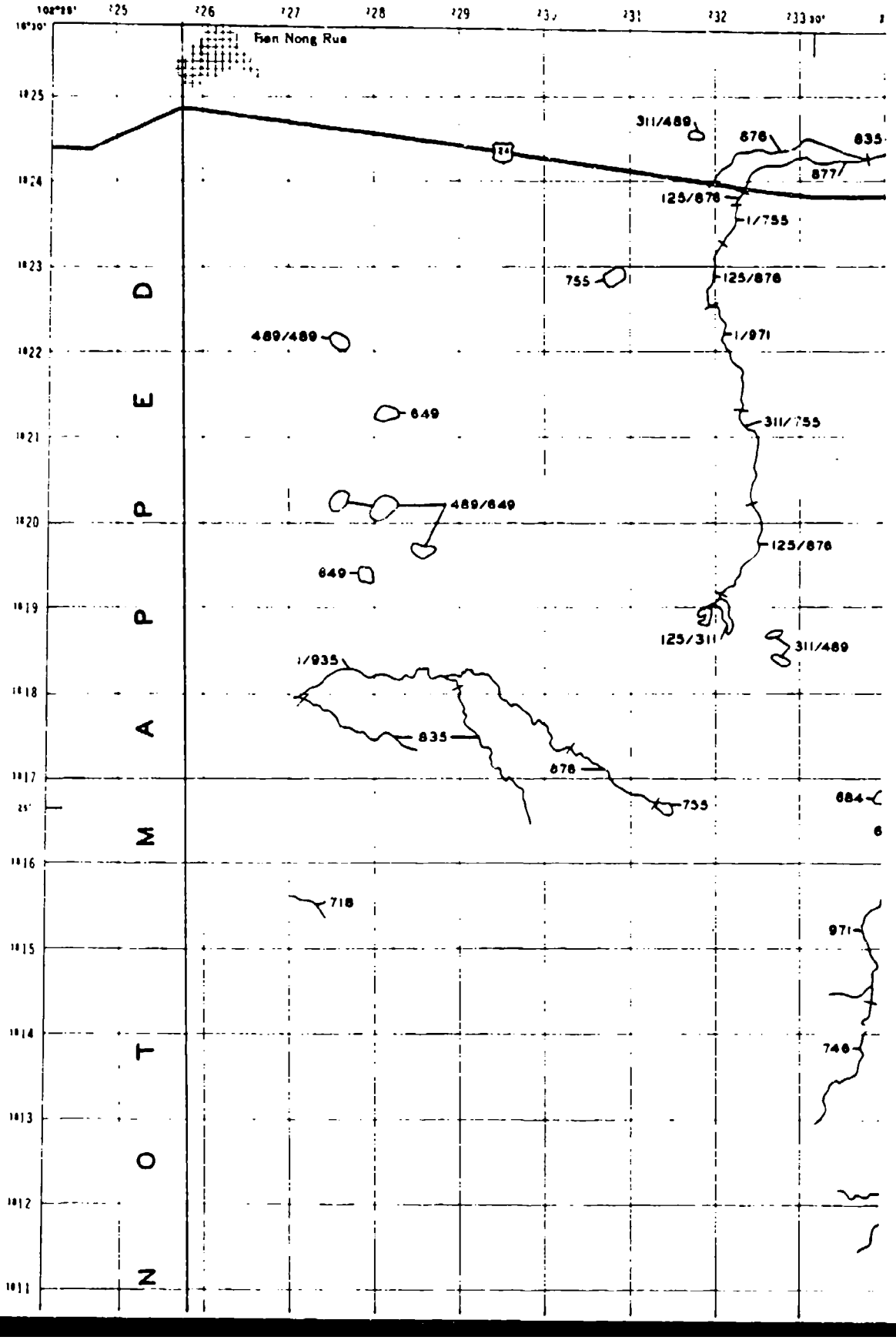






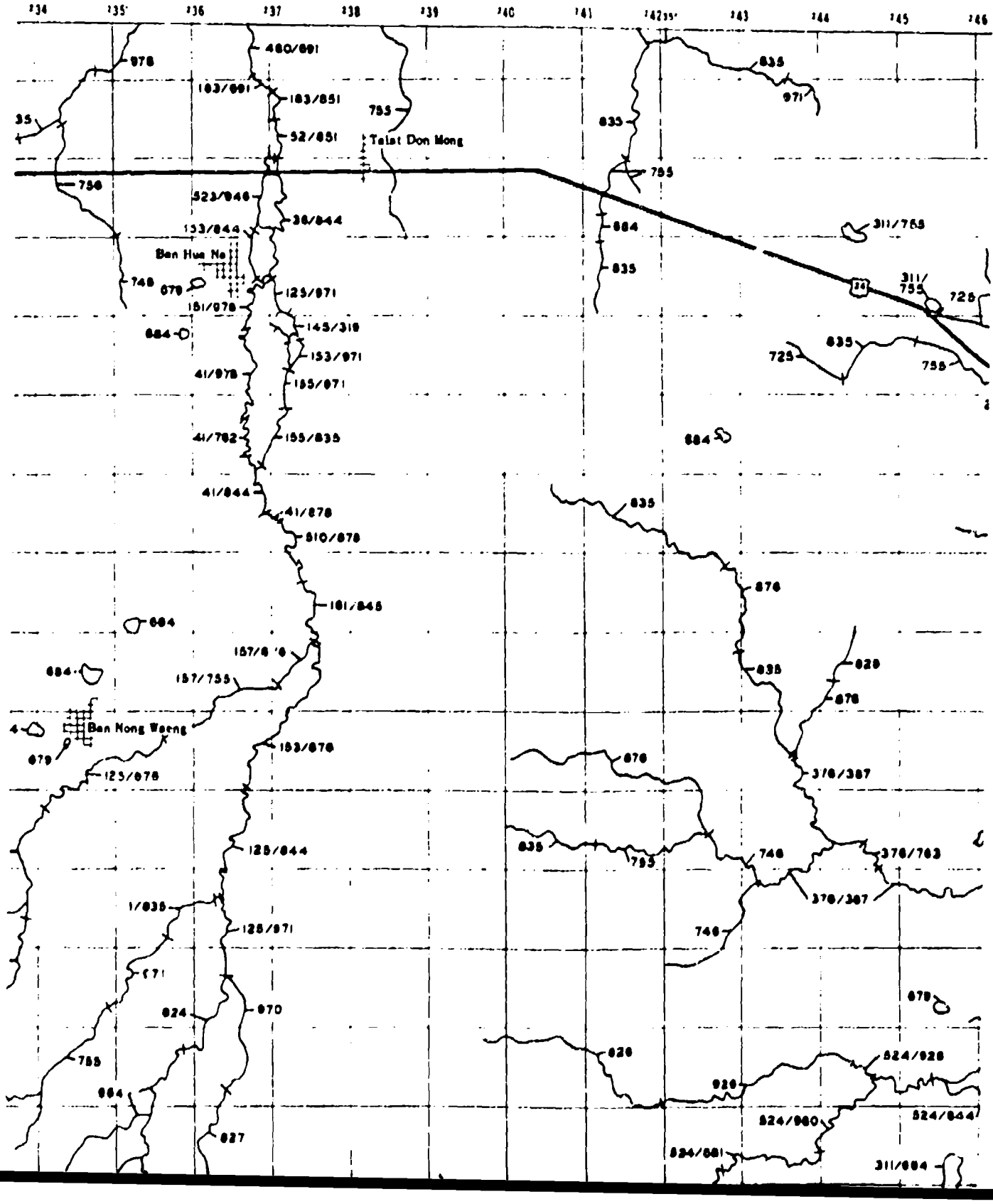
4




Ban Nong Rua
311/489
876
835
877
125/876
1/755
755
125/876
1/971
489/489
649
311/755
489/649
649
125/876
125/311
311/489
1/935
835
876
755
684
718
971
746
24
25
26
27
28
29
30
31
32
33
18°30'
18°25'
18°24'
18°23'
18°22'
18°21'
18°20'
18°19'
18°18'
18°17'
18°16'
18°15'
18°14'
18°13'
18°12'
18°11'
102°25'
102°30'
102°33'30"
M A P P E D
N O T

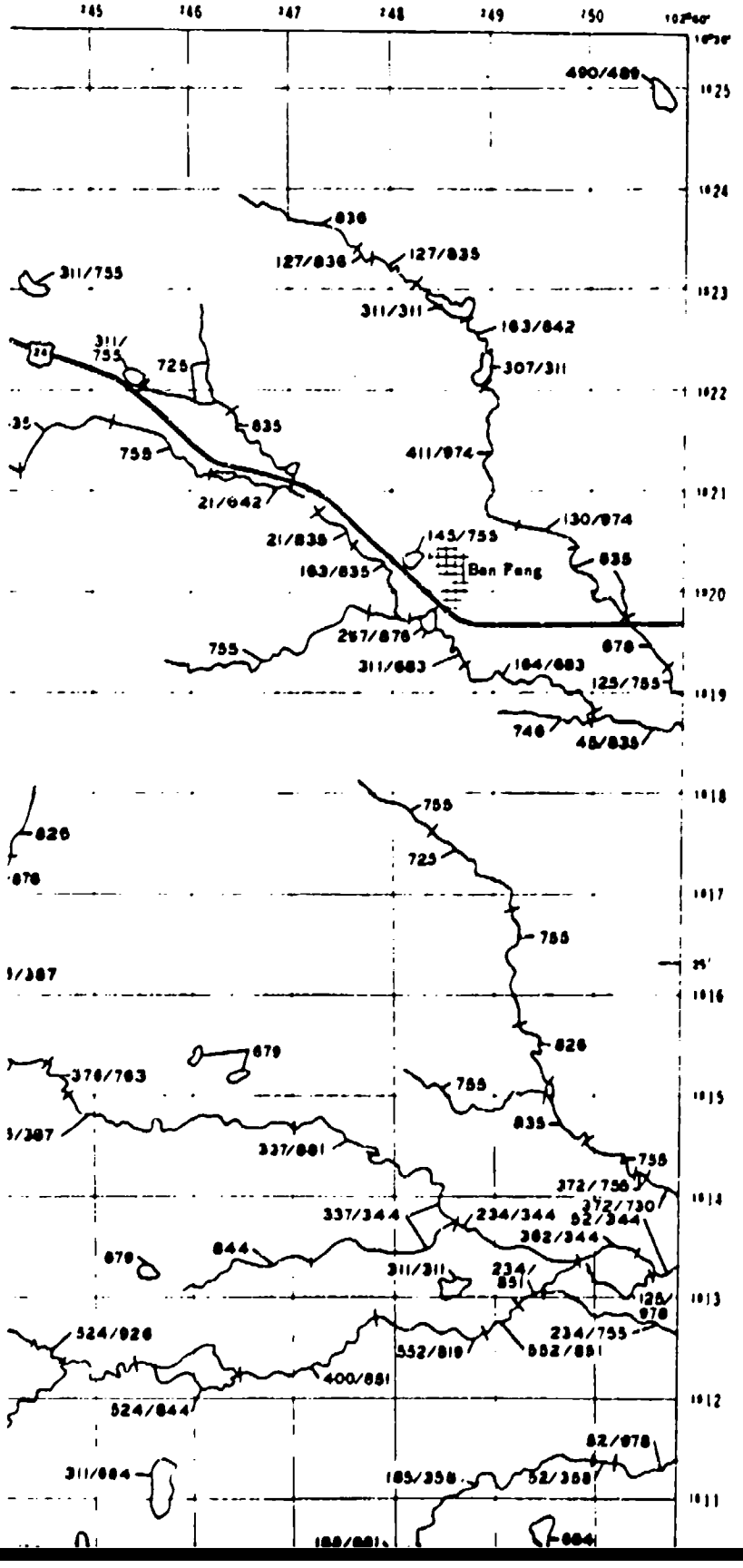
12

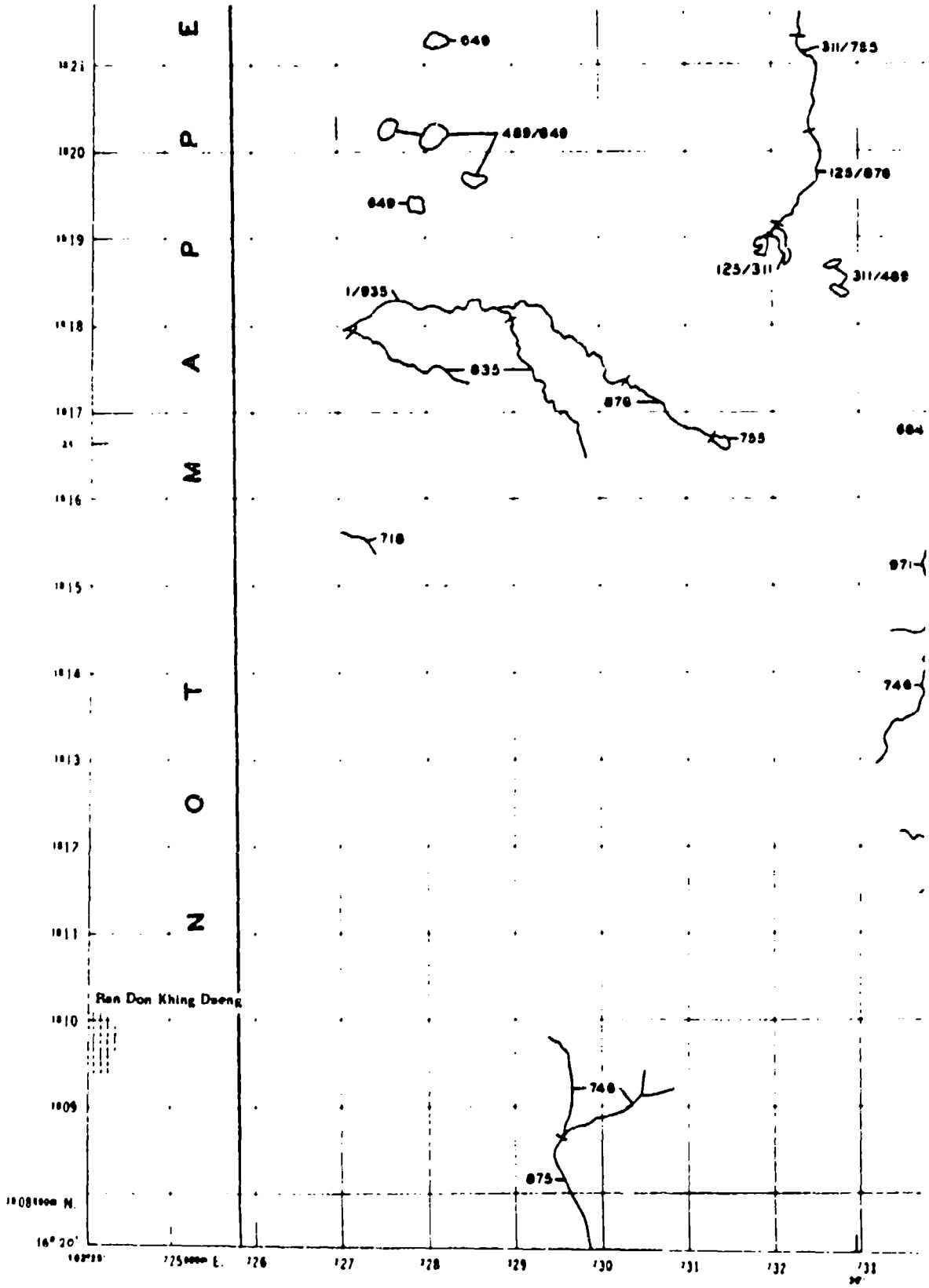
KHON KAEN


234
235
236
237
238
239
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241
242
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246
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460/691
183/691
183/851
52/851
755
Talat Don Mong
35
756
523/846
36/844
133/844
Ban Hua Na
748
679
125/871
181/878
884
145/318
153/871
41/878
155/871
41/782
155/835
41/844
41/878
810/878
181/845
884
157/878
884
157/755
Ban Nong Waeng
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679
183/878
125/878
125/844
1/835
128/871
671
824
870
755
884
827
835
971
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755
884
835
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311/
755
725
725
835
755
884
835
878
828
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878
378/387
835
755
746
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824/960
824/844
824/881
311/884

3

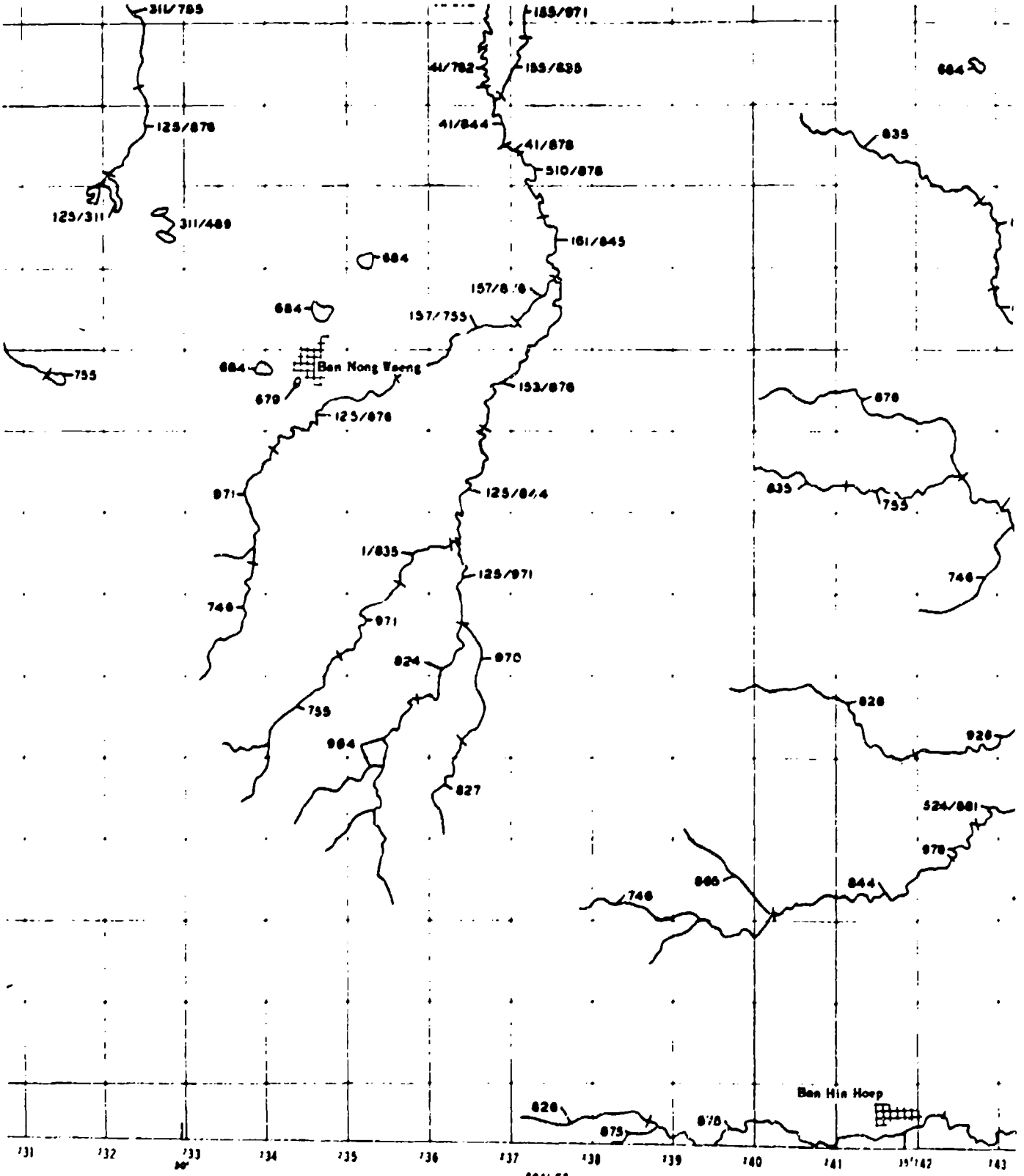
SHEET KK I


145
146
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1025
1024
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1014
1013
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1011
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127/835
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311/311
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755
725
307/311
835
411/874
21/642
21/838
145/755
Ben Pong
130/874
163/835
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257/878
878
755
311/883
164/883
125/755
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48/835
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878
755
725
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376/783
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372/756
372/730
337/344
234/344
82/344
282/344
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879
311/311
234/
851
126/
878
234/755
524/926
552/819
882/881
400/881
524/844
82/878
311/884
185/358
52/358
884

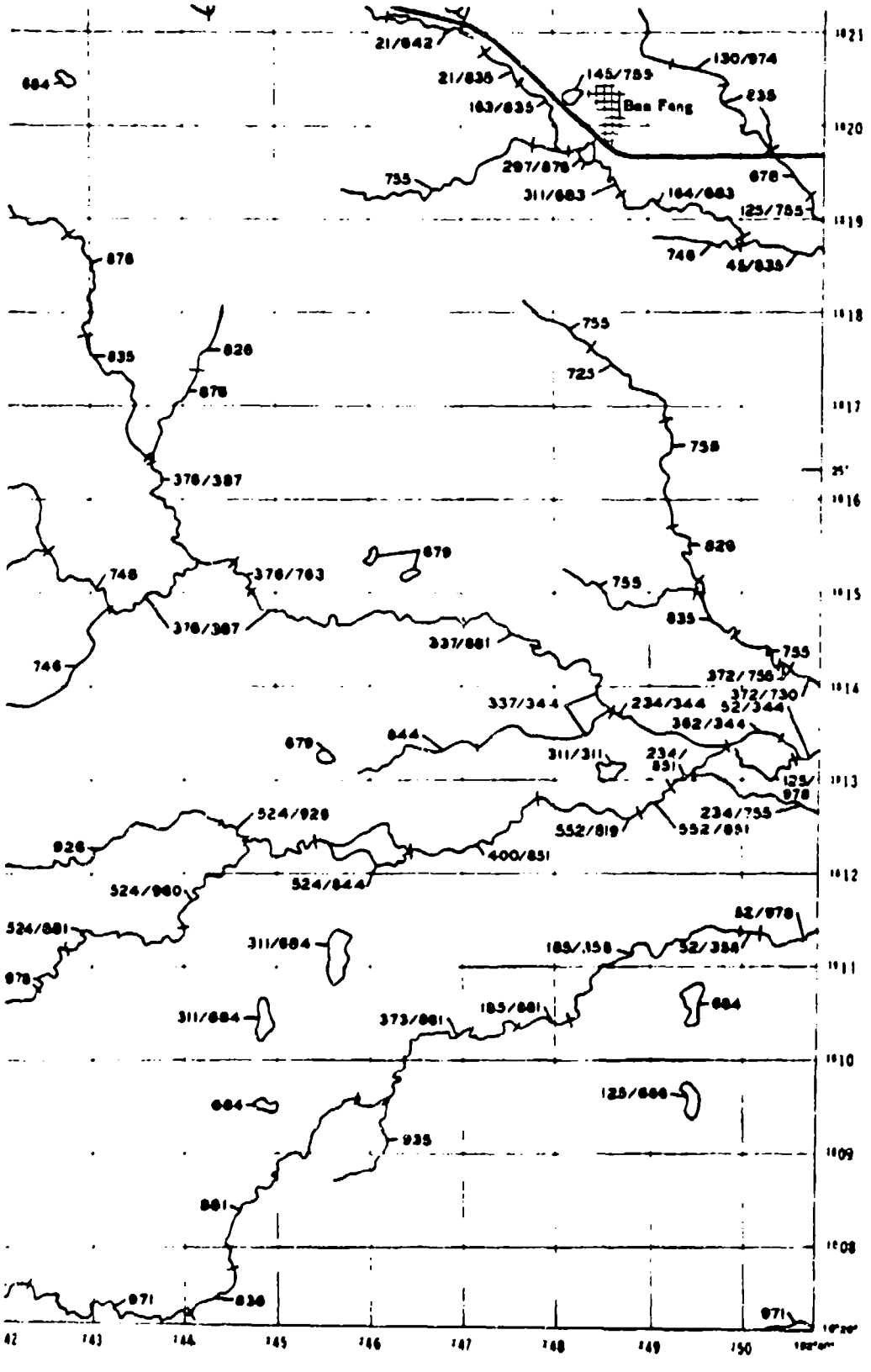


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48Q

4


311/785
125/878
125/311
311/489
185/971
44/782
185/835
41/844
41/878
310/878
161/845
884
157/878
884
157/755
884
Ban Nong Waeng
755
679
193/878
125/878
971
125/844
1/835
125/971
746
971
824
970
755
984
827
878
835
755
746
828
926
524/881
978
866
844
746
828
875
878
Ban Hin Hoop
731
732
733
734
735
736
737
738
739
740
741
742
743
SCALES
Statute Miles
1000
500
0
1000
2000
3000
4000 Meters
1000
500
0
1000
2000
3000
4000 Yards

5



INDEX

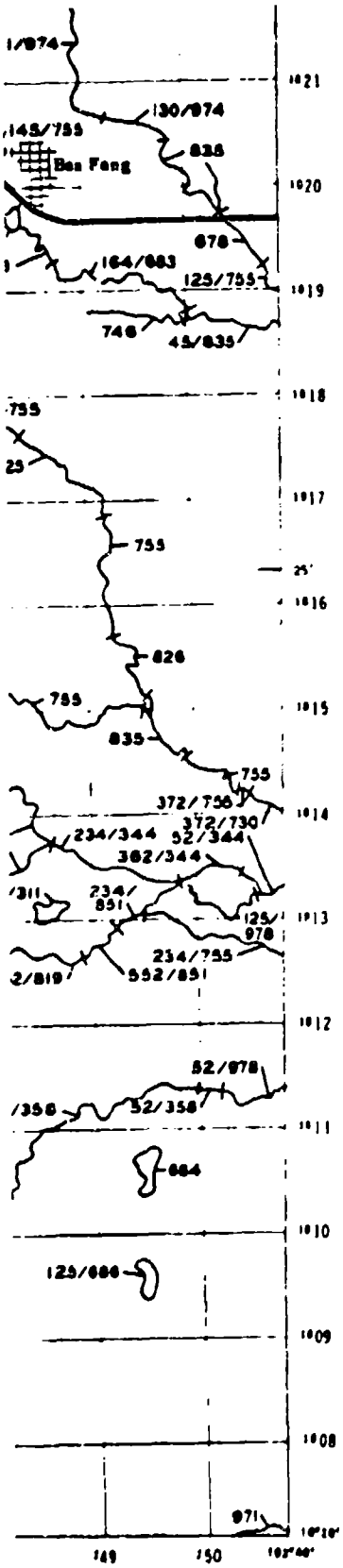
KK I

A QUANTITATIVE
TERRAIN F

HYDROL

KHON K

6



INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

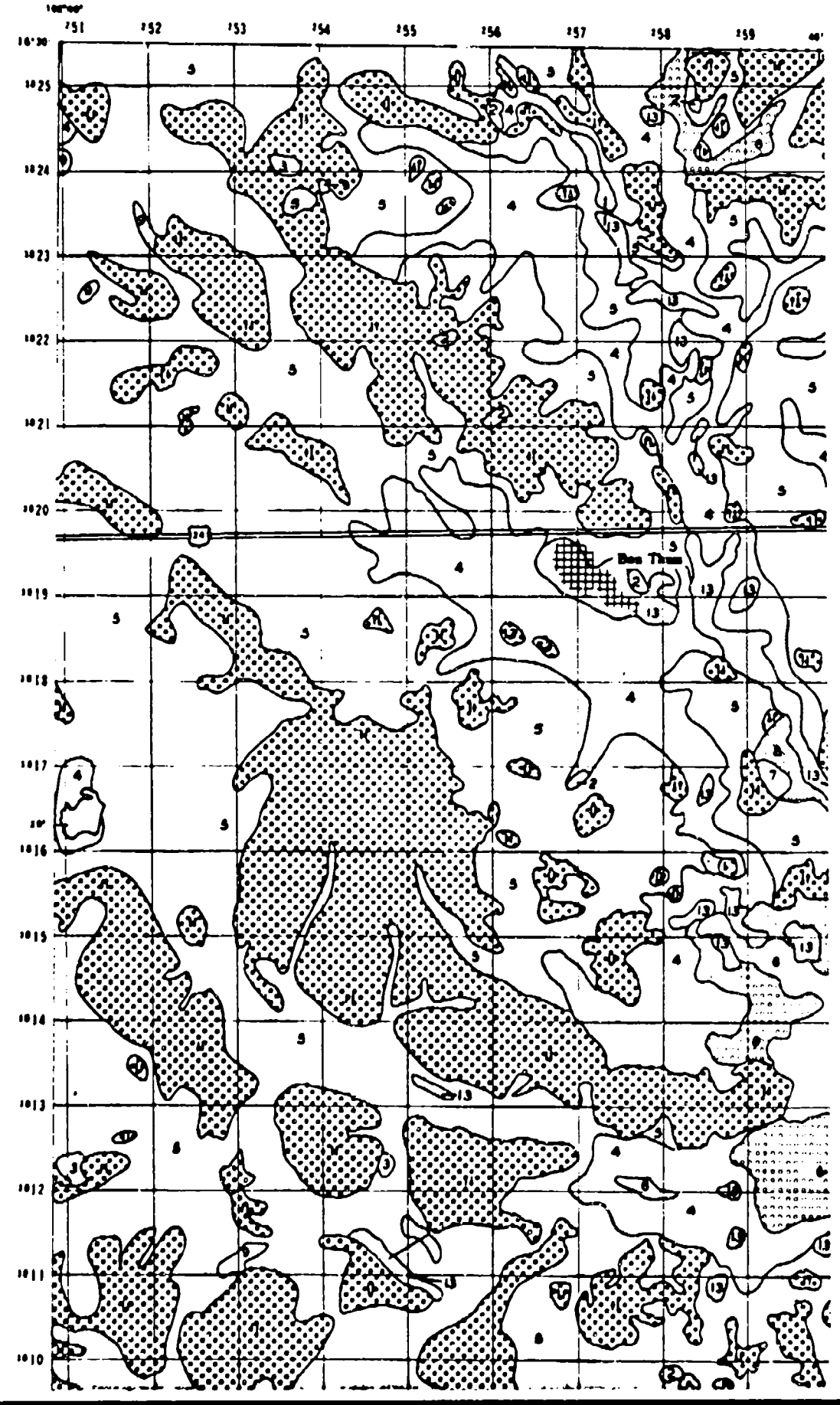
HYDROLOGIC GEOMETRY

KHON KAEN STUDY AREA

SHEET KK I

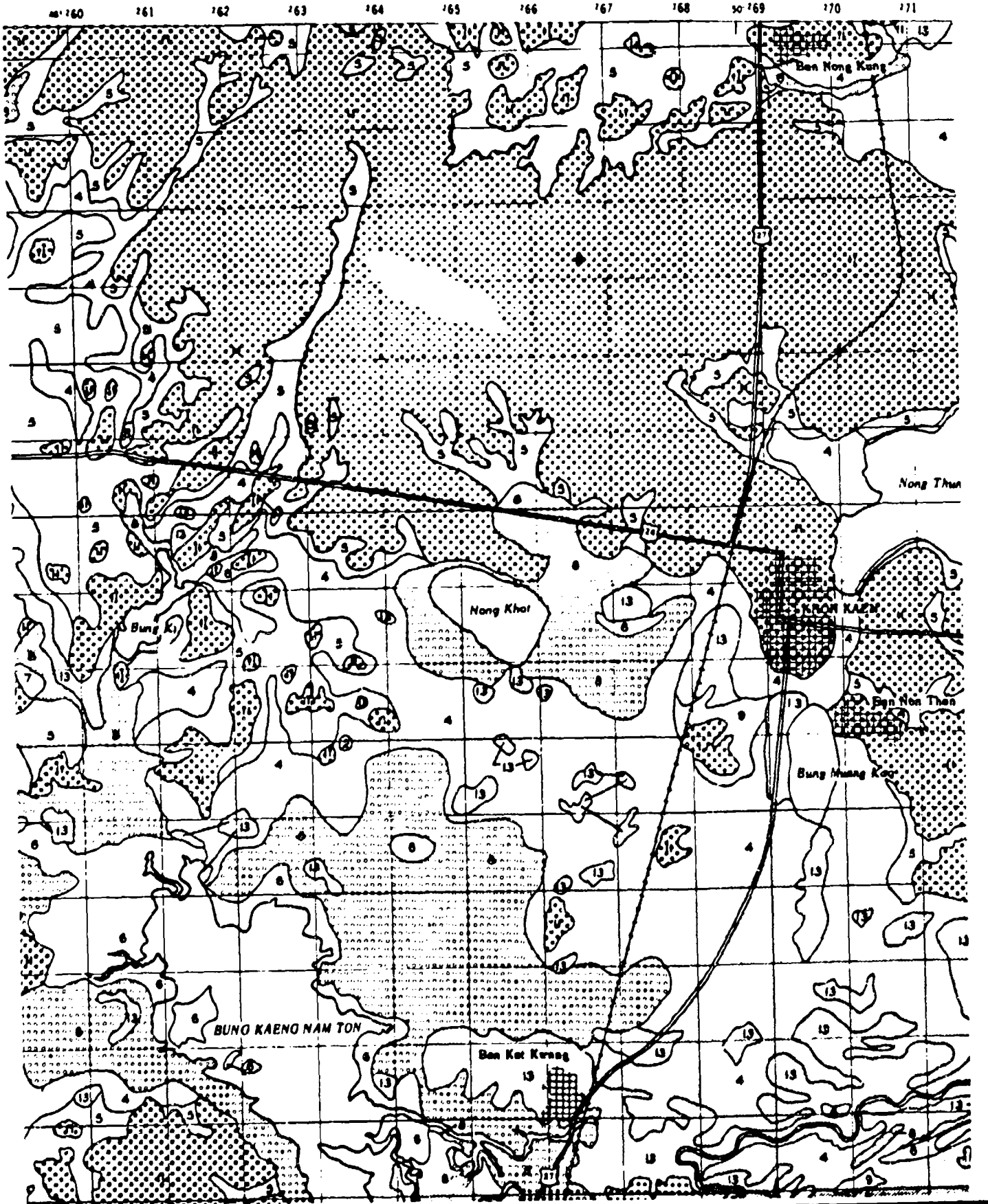
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PLATE 5.1d


Bon Thom

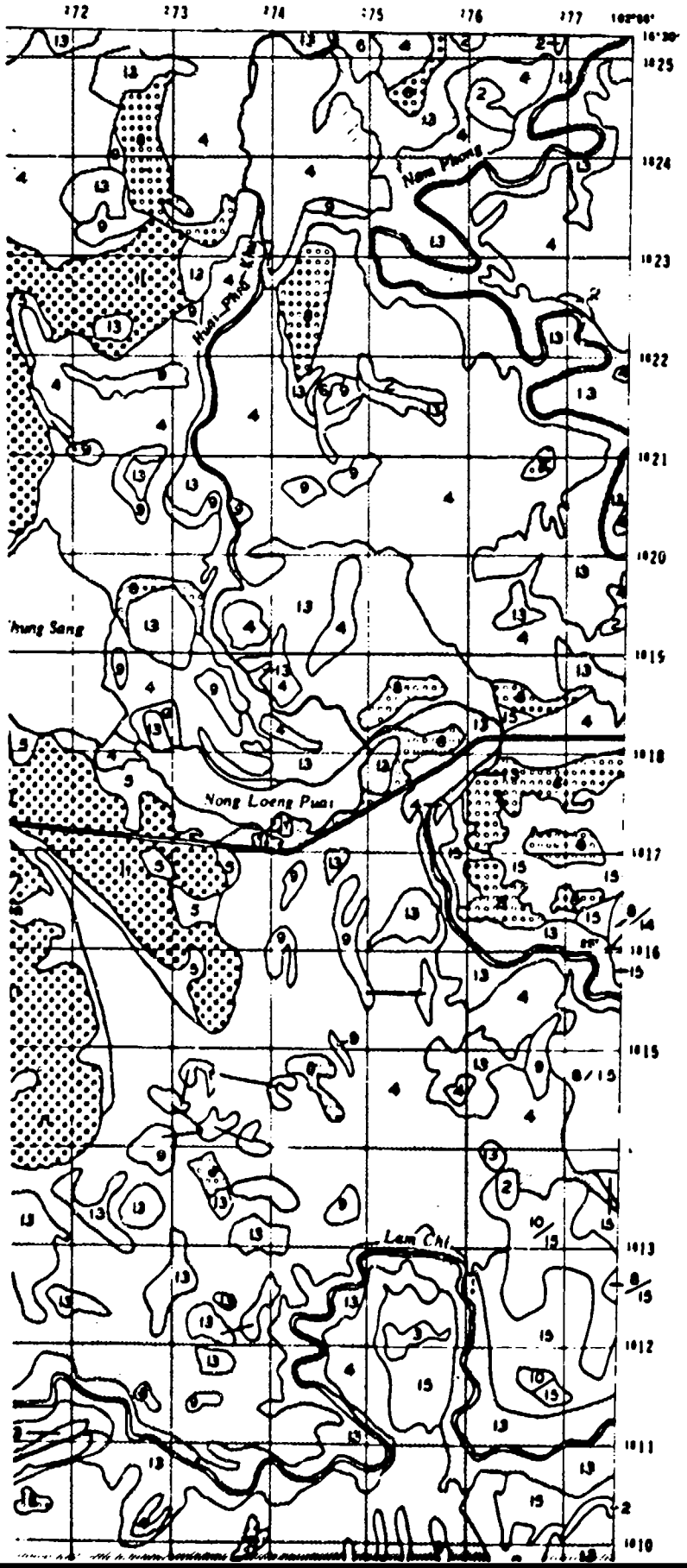
2

KHON KAEN


Ban Nong Kung
Nong Thun
Nong Khot
KHON KAEN
Ban Non Thun
Bung Muang Kao
BUNG KAENG NAM TON
Ban Kut Kwang

1 3

SHEET KK II



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{ur} psi	Maximum Moisture c_{ur} kg/cm²	Maximum Moisture ϕ_{ur} deg	Soil Surface Strength: Minimum Moisture c_{ur} psi	Minimum Moisture c_{ur} kg/cm²	Minimum Moisture ϕ_{ur} deg	Co psi
	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Min.
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Min.
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Min.
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Min.
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Min.
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4
	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Min.
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2
	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2
12	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4
13	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Min.

Note: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

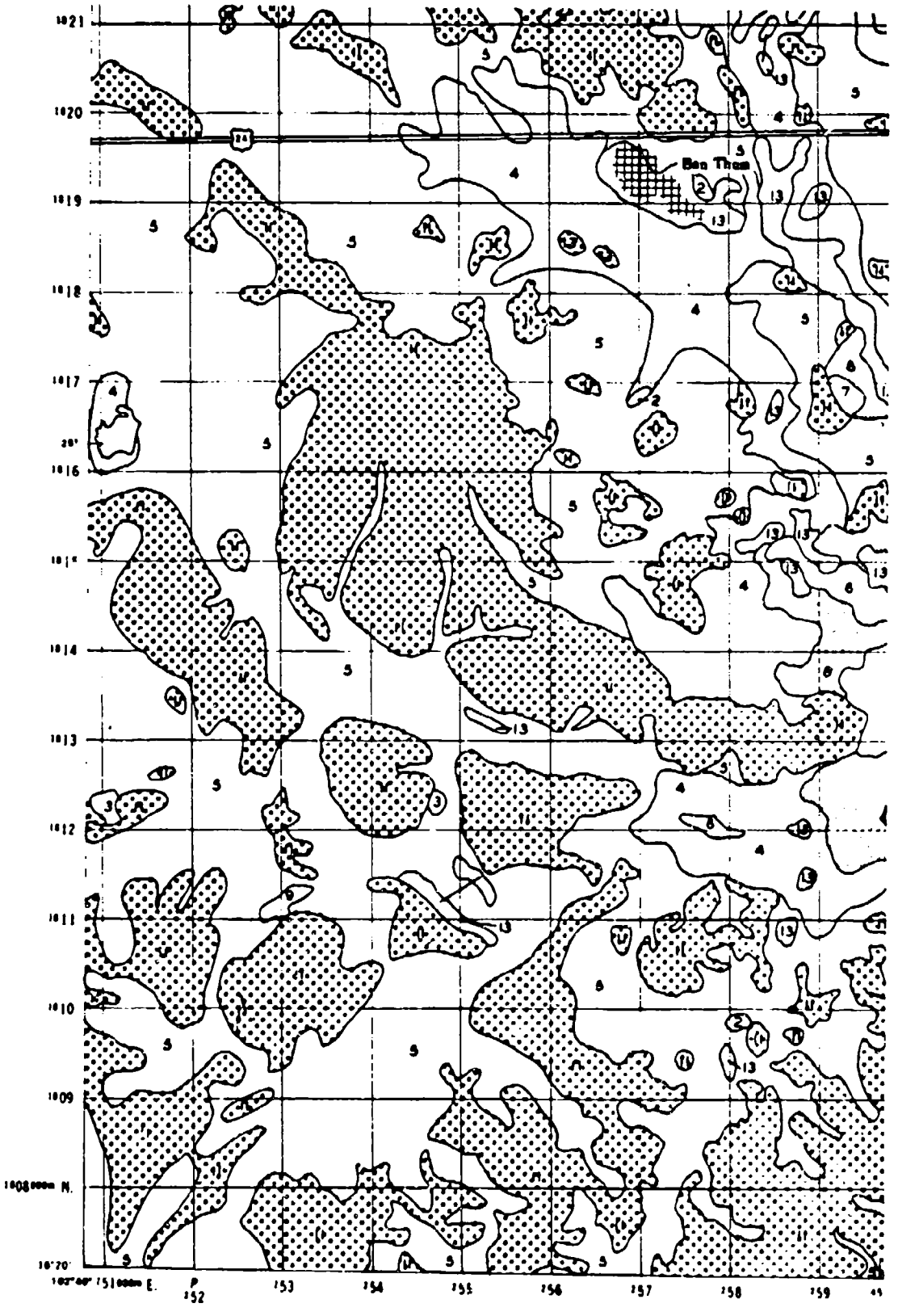
ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit

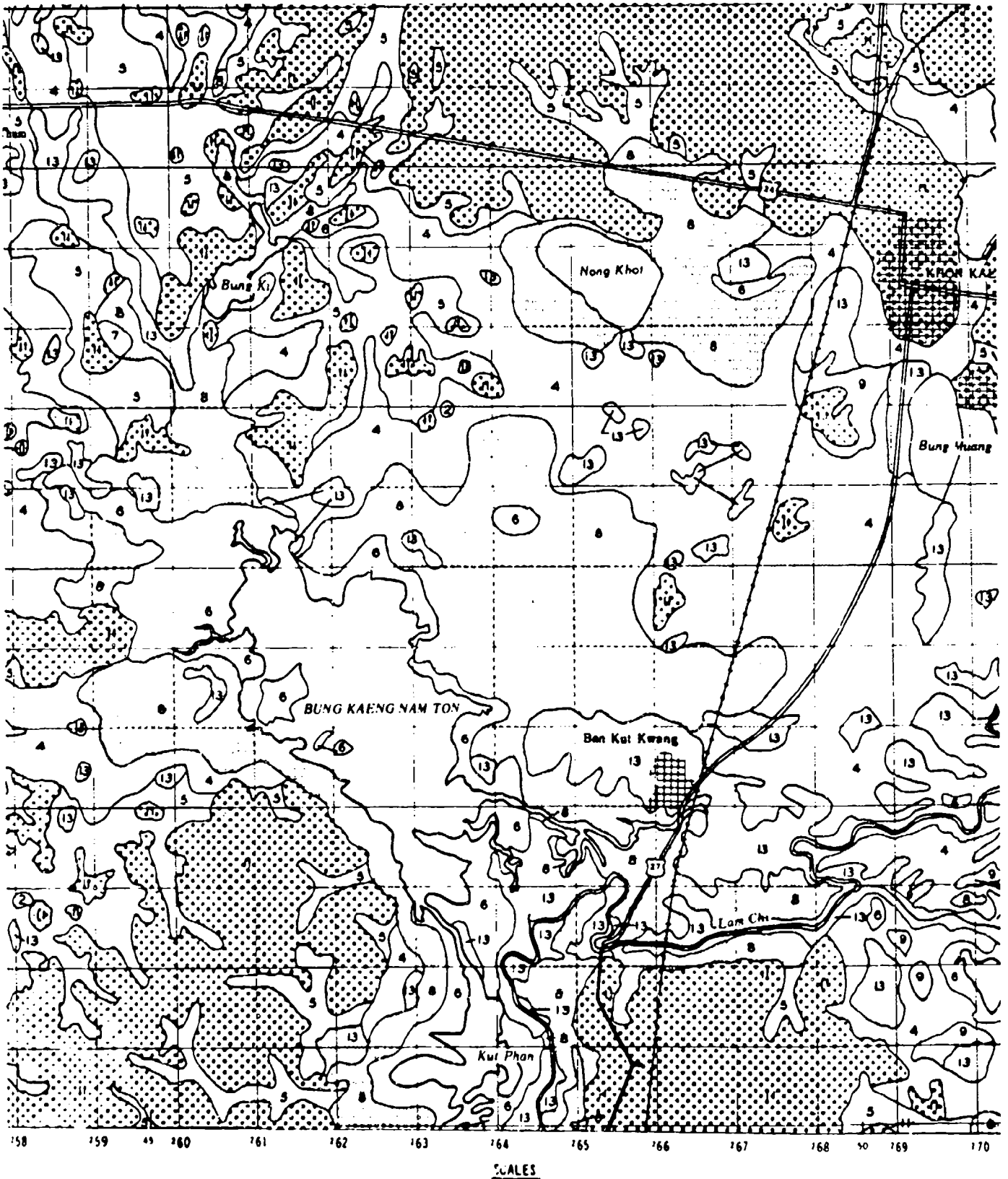
Units do not occur on this map.

INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

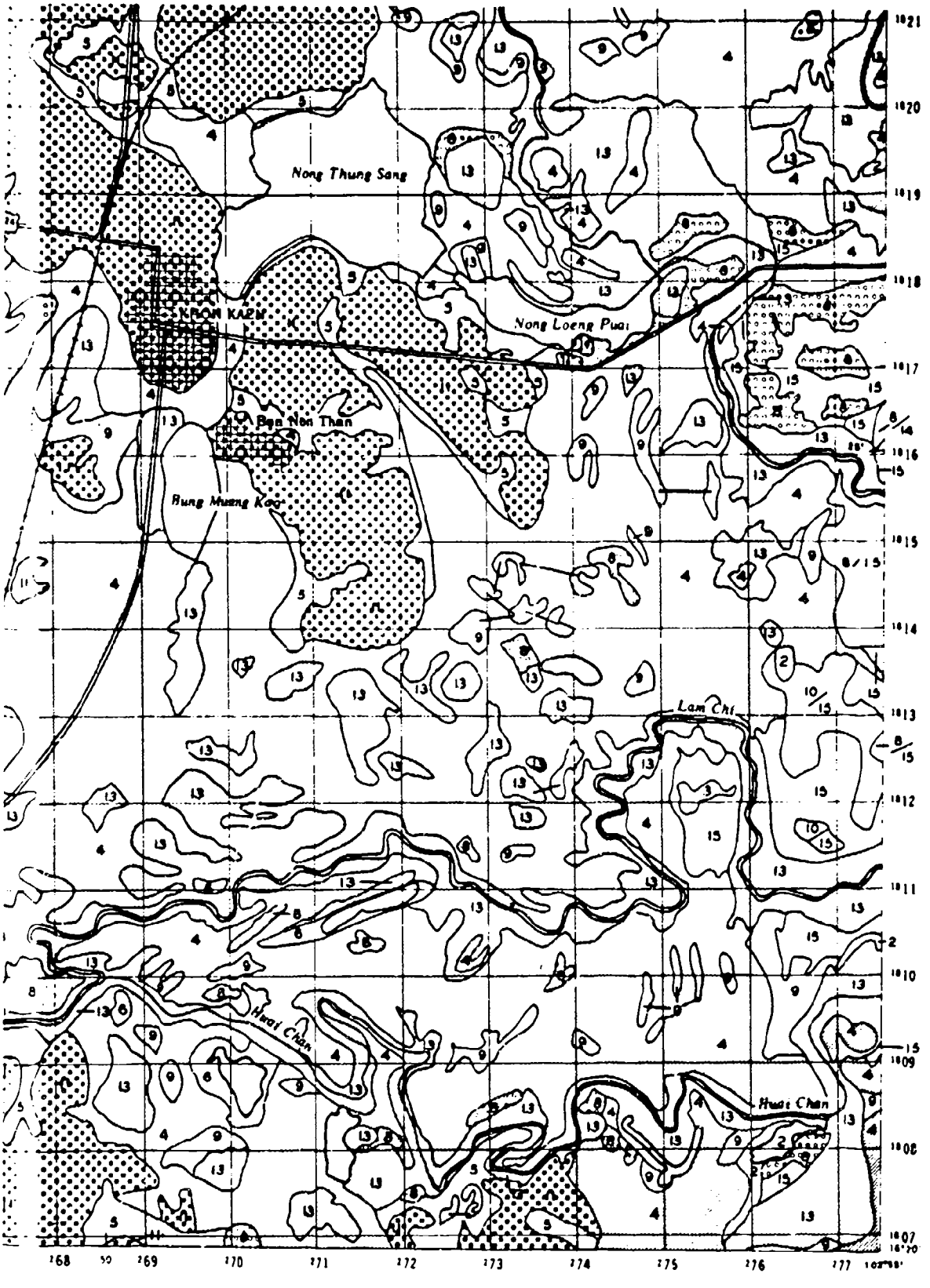


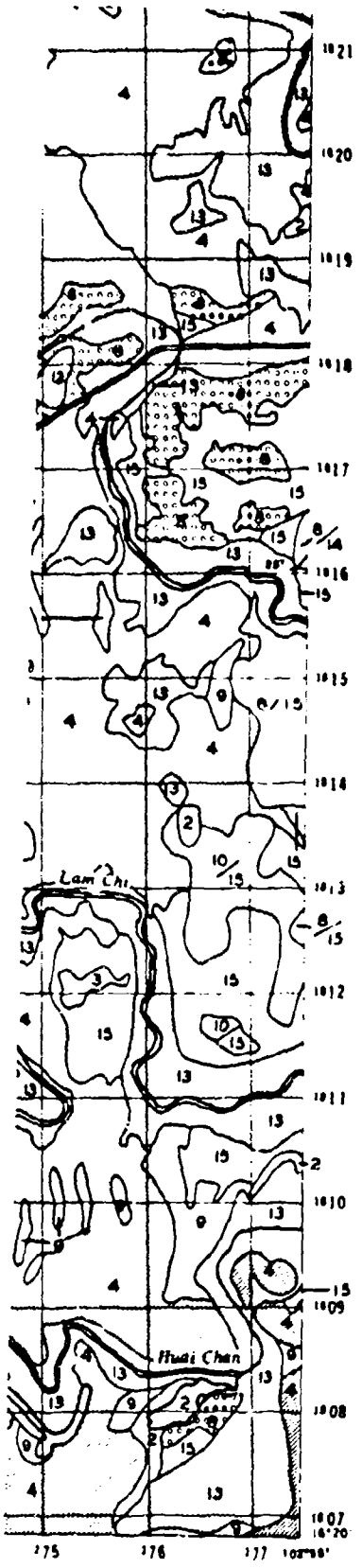
ONE THOUS) METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48Q


Nong Khot
Bung Yhuang
BUNG KAENG NAM TON
Ban Kut Kwang
Kut Phan
158
159
160
161
162
163
164
165
166
167
168
169
170

SCALES

5


Nong Thung Sang
Nong Loeng Phai
Ban Non Than
Lam Chi
Huai Chan
Huai Chan



LEGEND

Unit	Soil Mass Strength: Maximum Moisture PCT	Soil Mass Strength: Minimum Moisture PCT	Soil Surface Strength: Maximum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Soil Surface Strength: Minimum Moisture c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg	Conditions where maximum c_{ur} occurs: c_{ur} psi	c_{ur} kg/cm²	ϕ_{ur} deg
	10-15	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of [illegible] and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of [illegible] and >100	>100	0-1	[illegible]	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units so not occur on this map.

INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

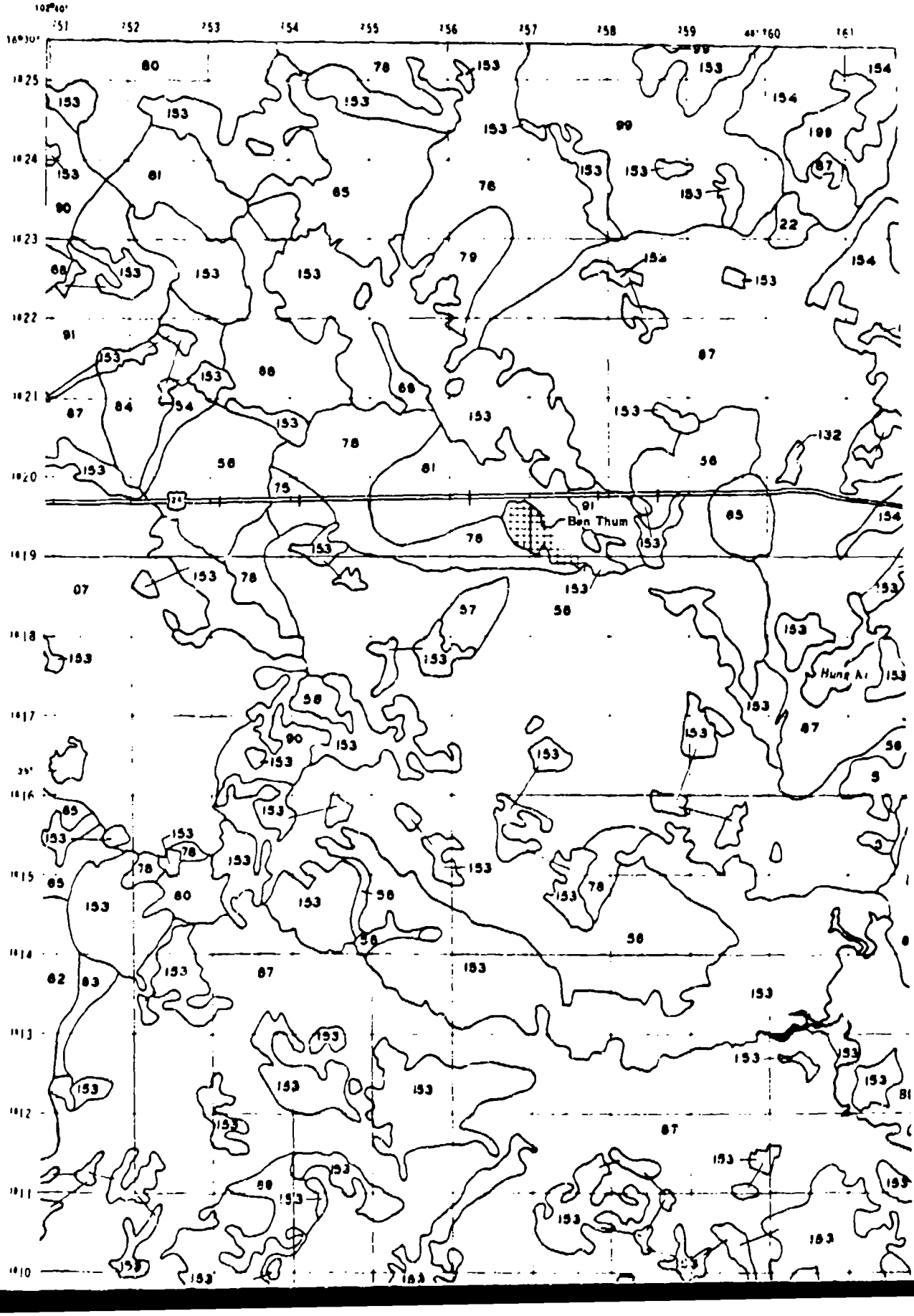
SURFACE COMPOSITION

KHON KAEN STUDY AREA

SHEET KK II

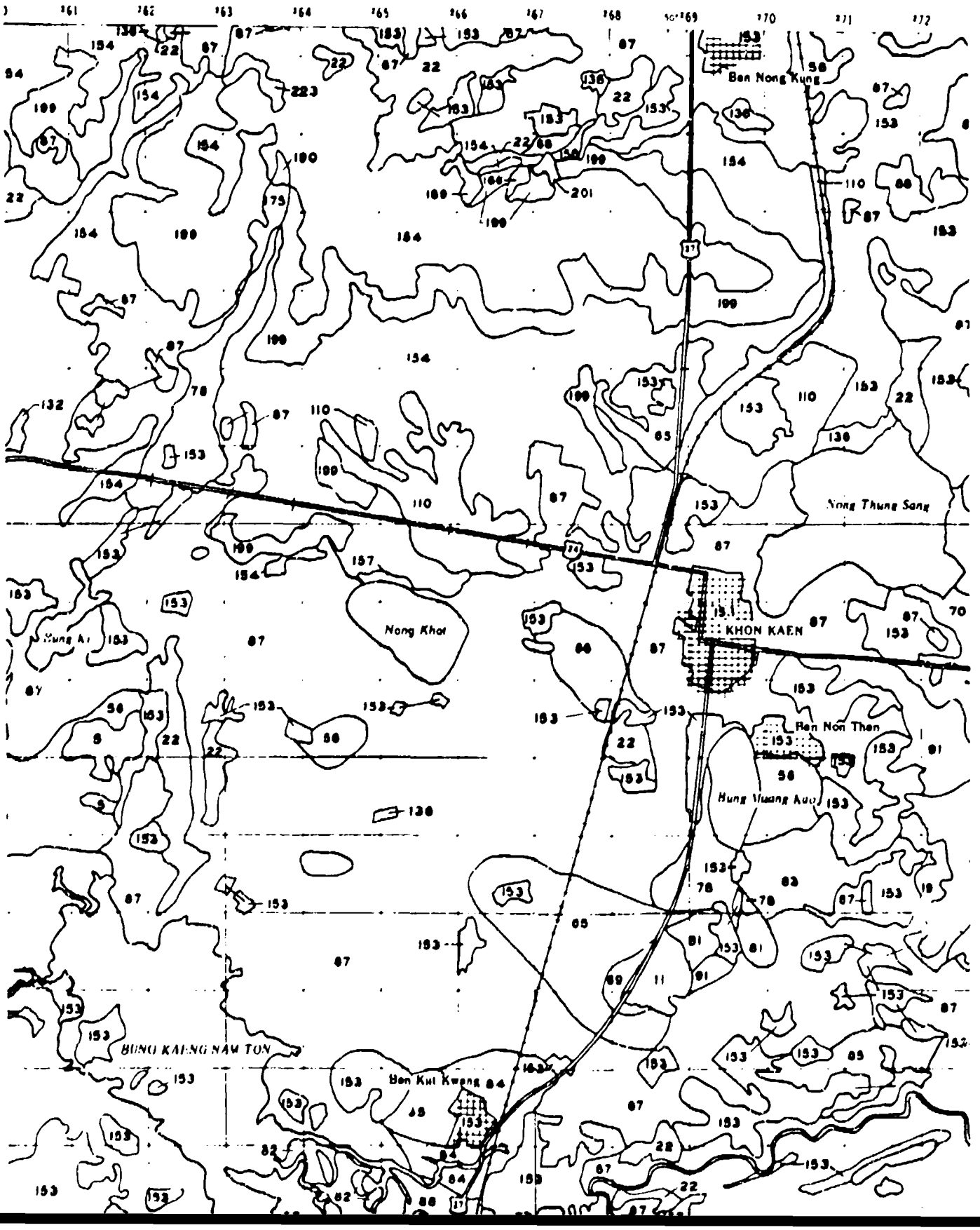
7

PLATE 5.2a


Ben Thum

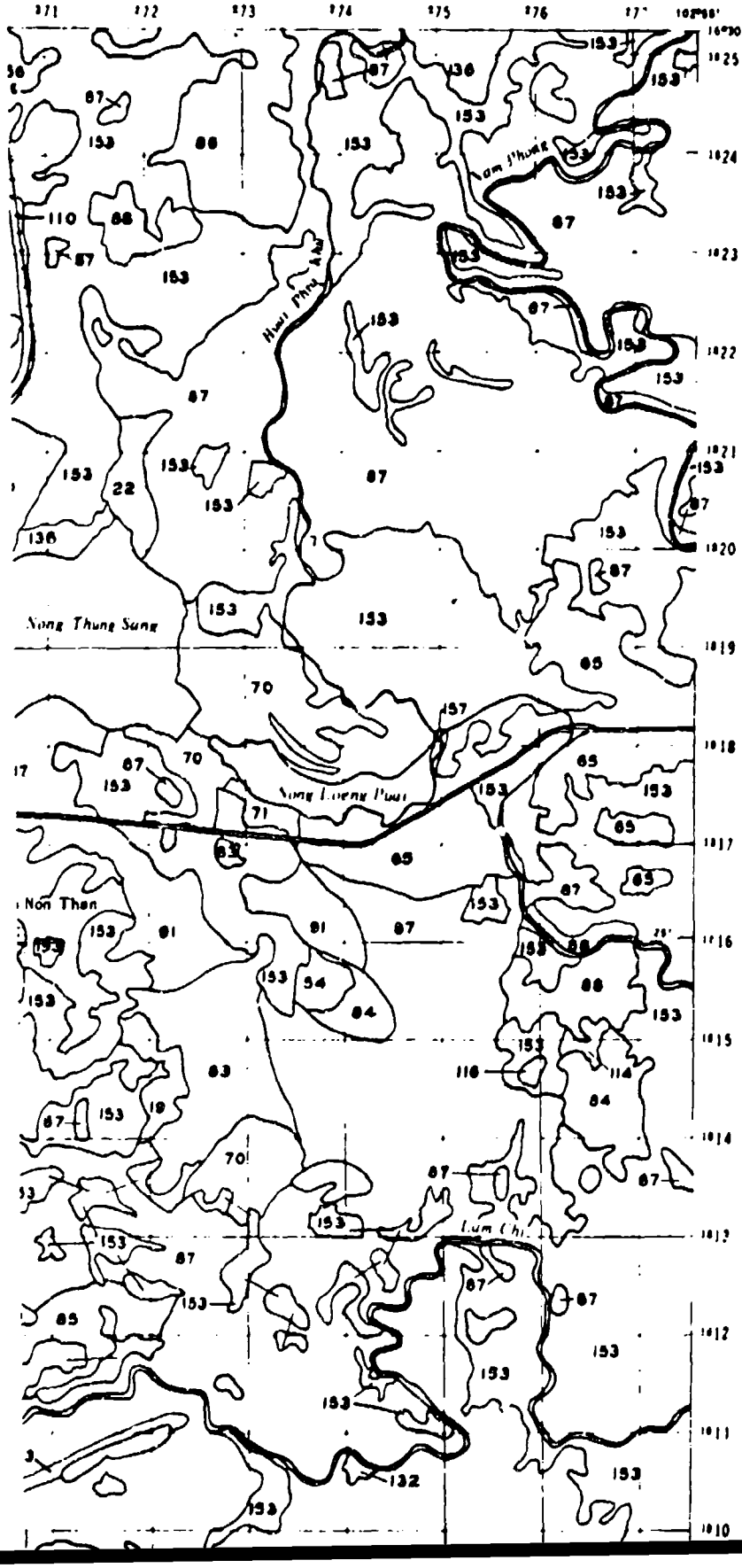
2

KHON KAEN


KHON KAEN
Nong Khot
Nong Thung Sang
Ban Non Than
Hung Muang Kao
BUNG KAENG NAM TON
Ban Kut Kwang 84

3

SHEET KK II

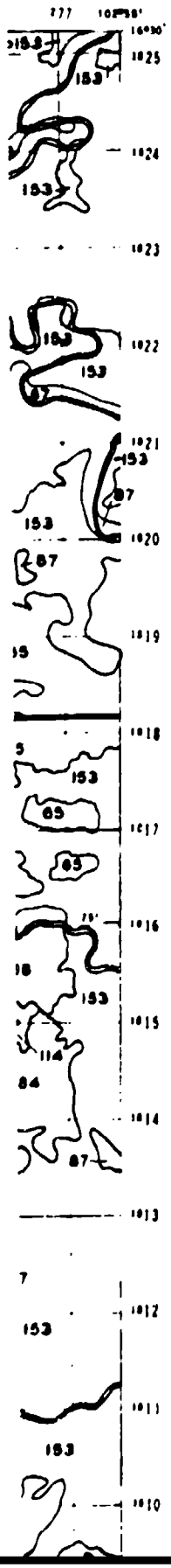


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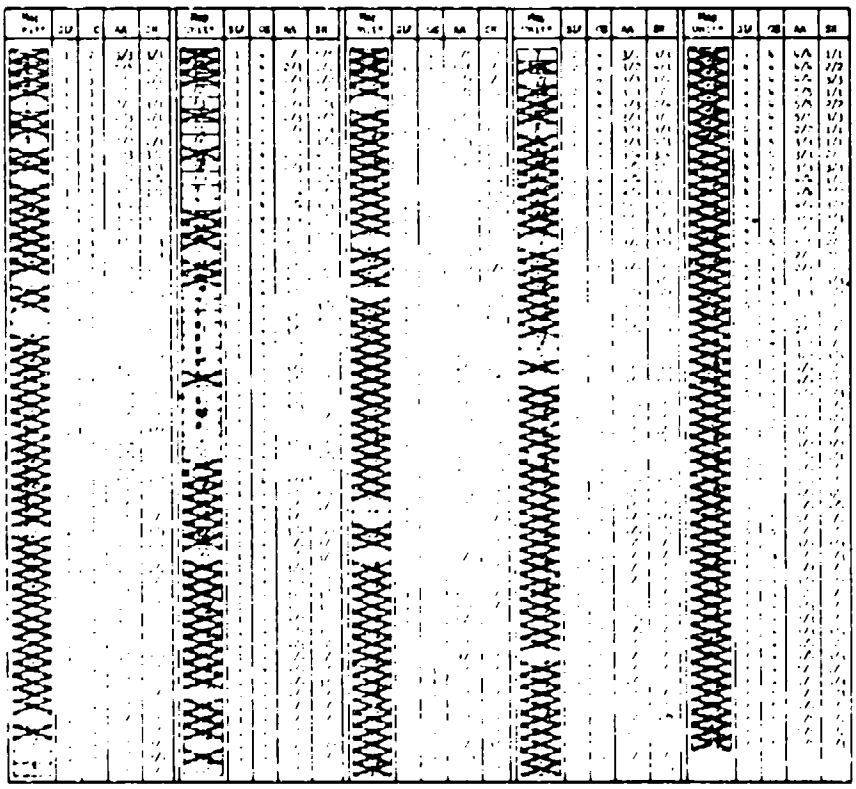
INDEX TO ADJOINING SHEE

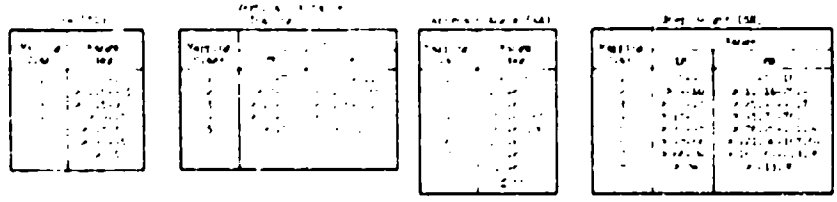
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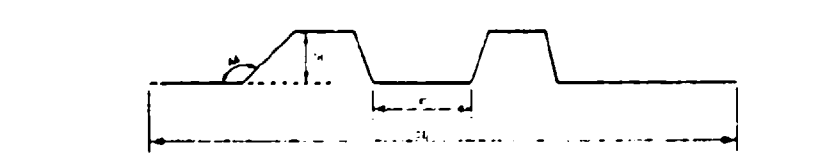
IEET KK II



LEGEND



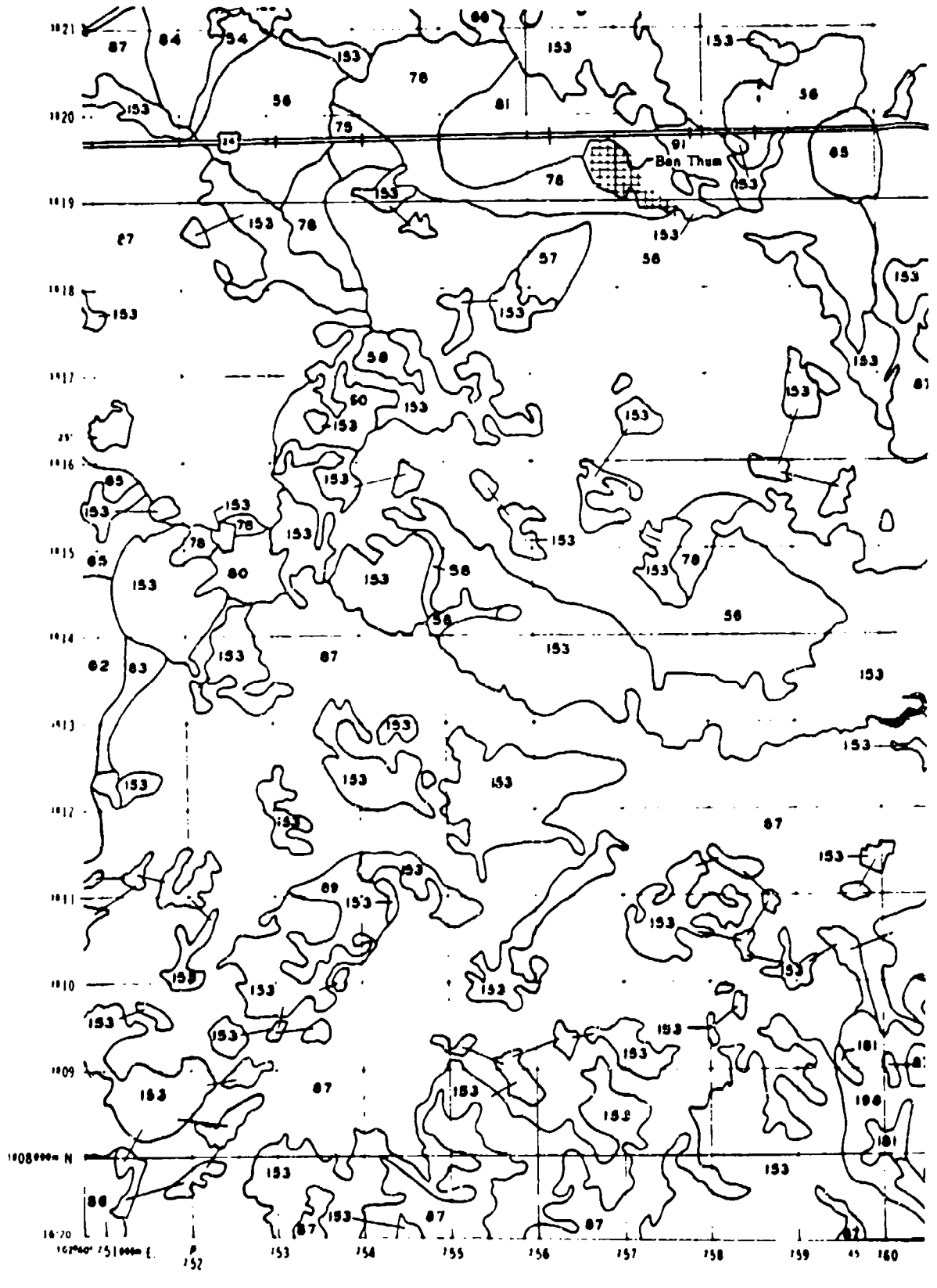






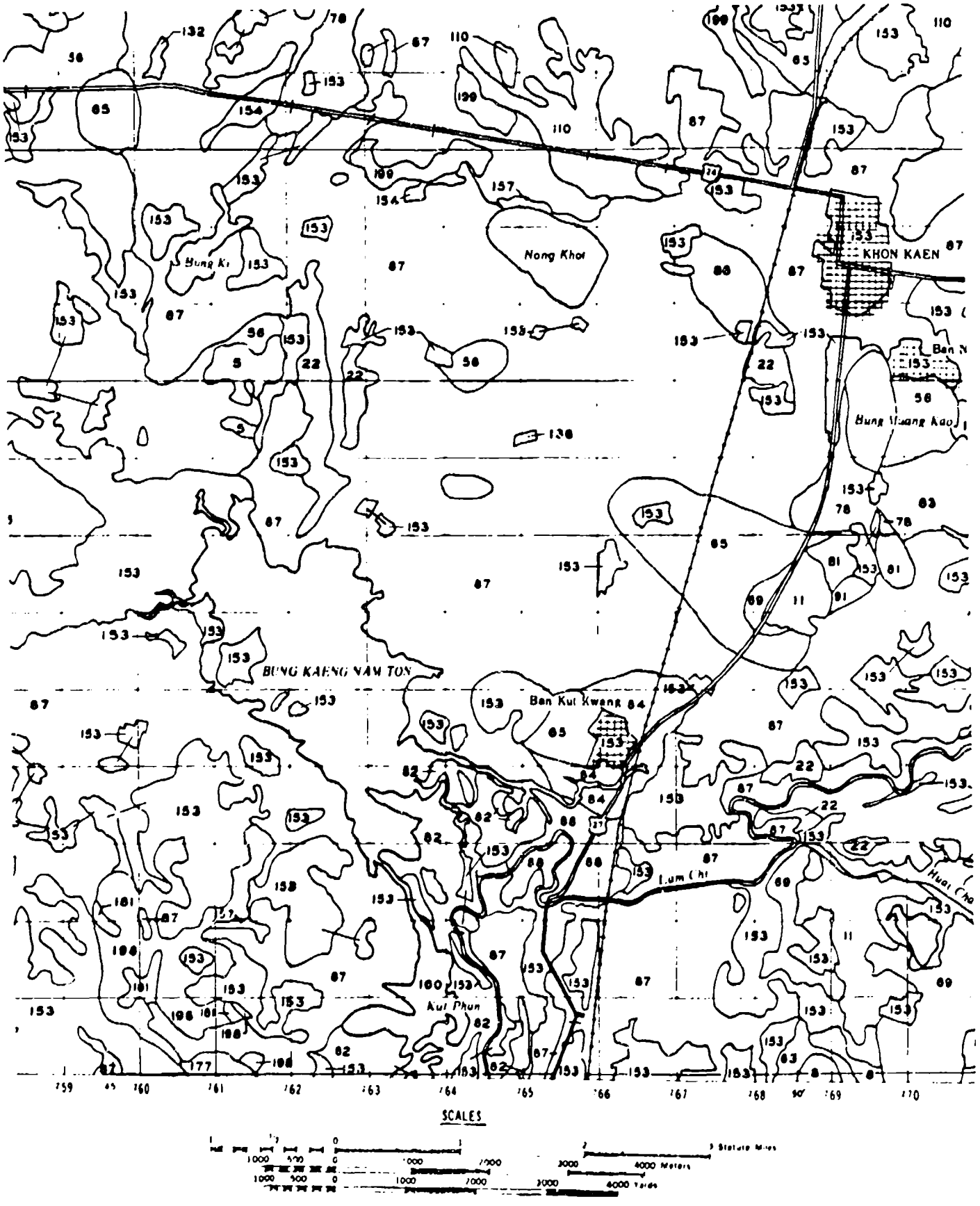
INDEX TO ADJOINING SHEETS



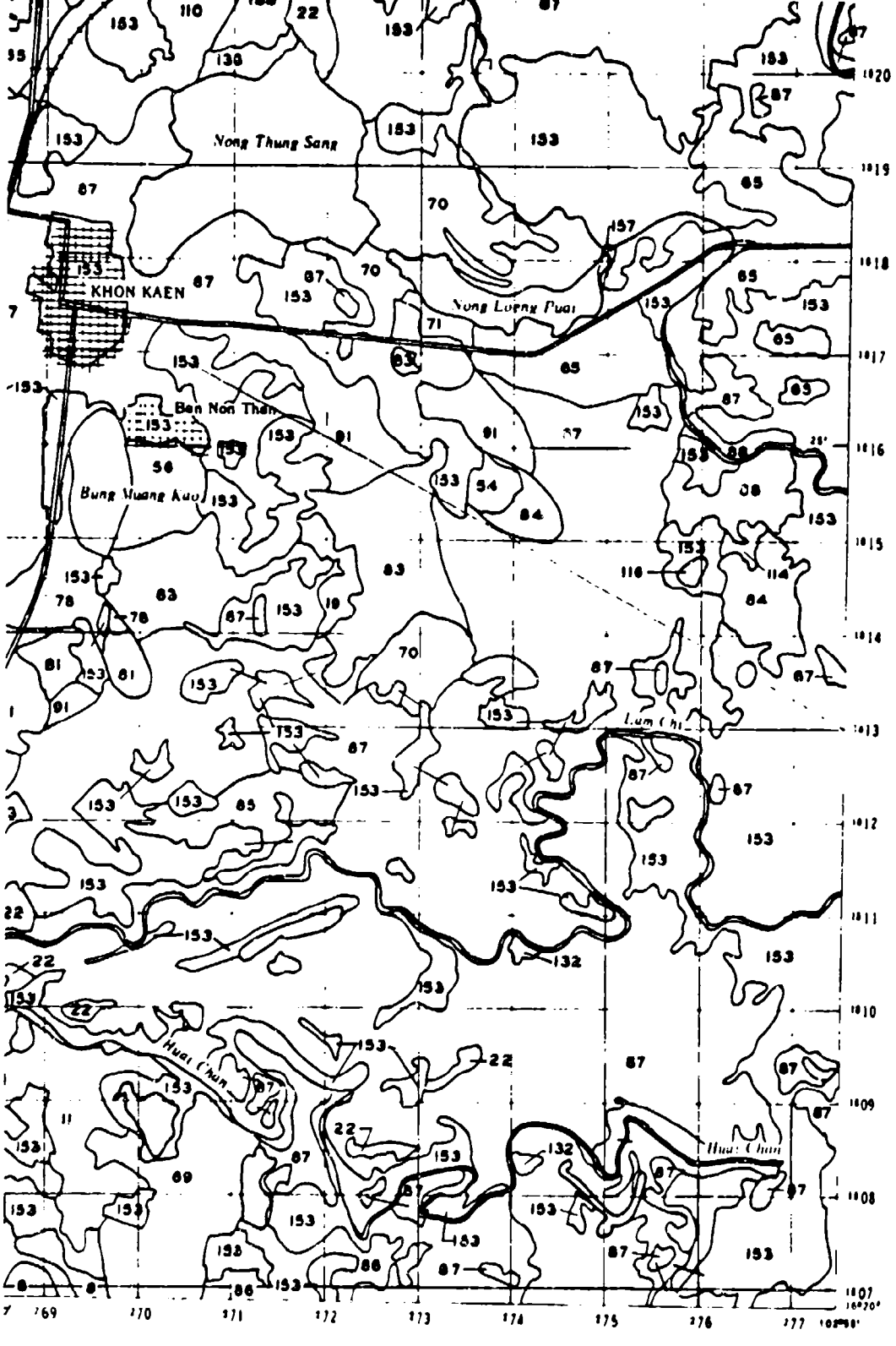


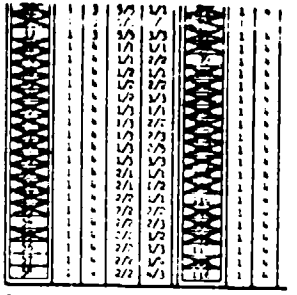
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 40Q

5


KHON KAEN
Nong Khot
BUNG KAENG NAM TON
Ban Kut Kwang
Kut Phun
Lam Chi
SCALES

6





Note: Blank areas are water bodies.

* Each dot unit represents an area of [illegible] below), vertical obstacle spacing [illegible] were mapped. The numerator of the [illegible] easterly direction (i.e. azimuth from [illegible] 180° to 360 deg) assuming that the [illegible]

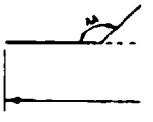
† Mapping class ranges of each surface [illegible]

Slope (%)

Mapping Class	Range deg
1	[illegible]
2	[illegible]
3	[illegible]
4	[illegible]
5	[illegible]
-	[illegible]
-	[illegible]

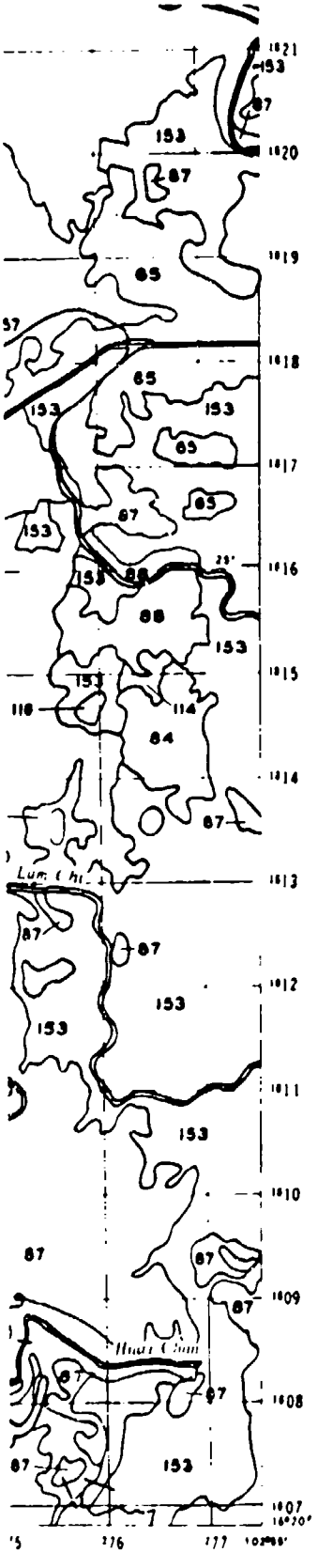
Mapping Class	
1	[illegible]
2	[illegible]
3	[illegible]
5	[illegible]

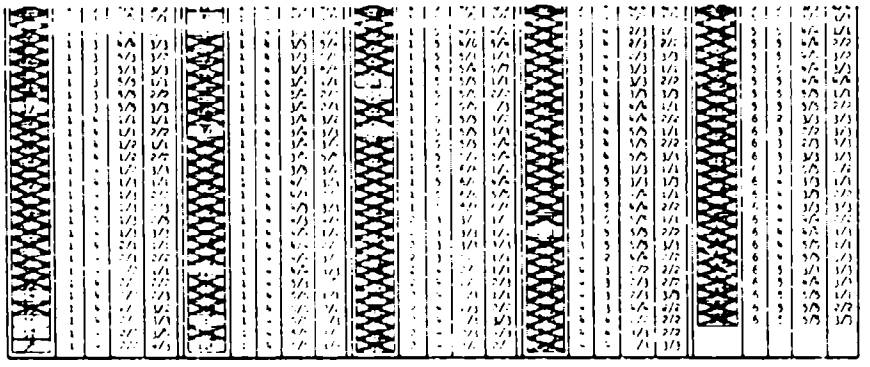
[illegible] to not occur on this map.

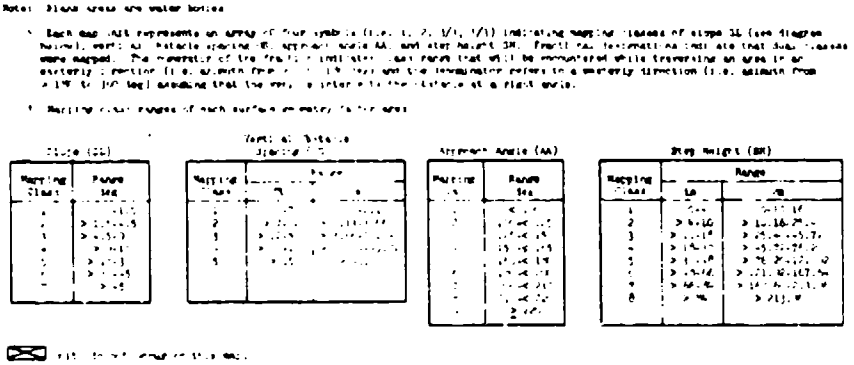


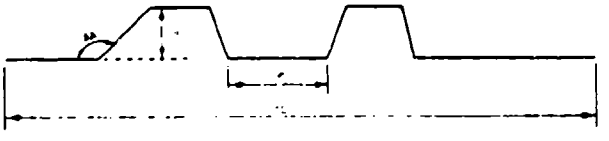
A QUANTIT[illegible]
TERR[illegible]
SU[illegible]
KHC[illegible]

7









INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

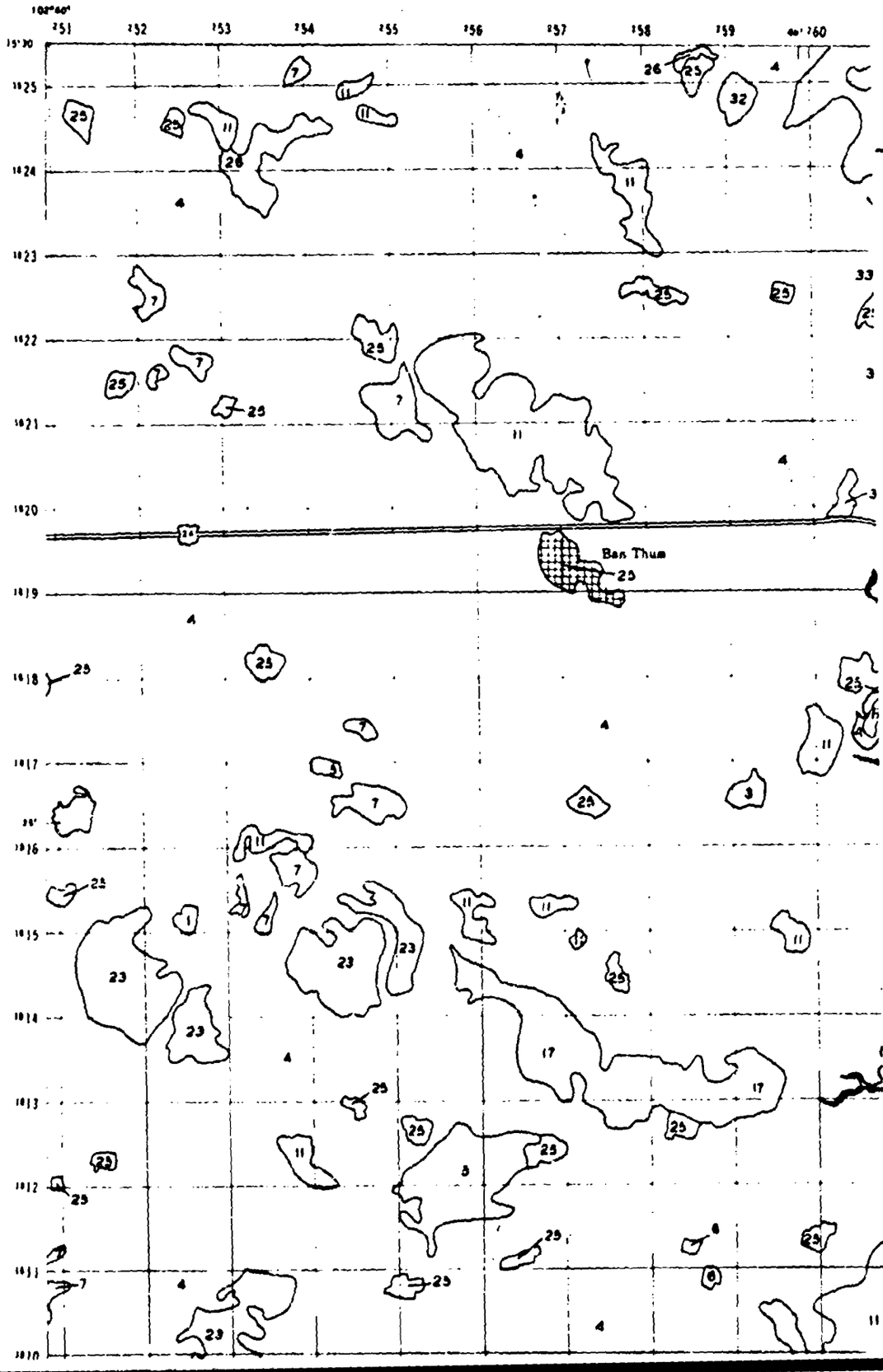
SURFACE GEOMETRY

KHON KAEN STUDY AREA

SHEET KK II

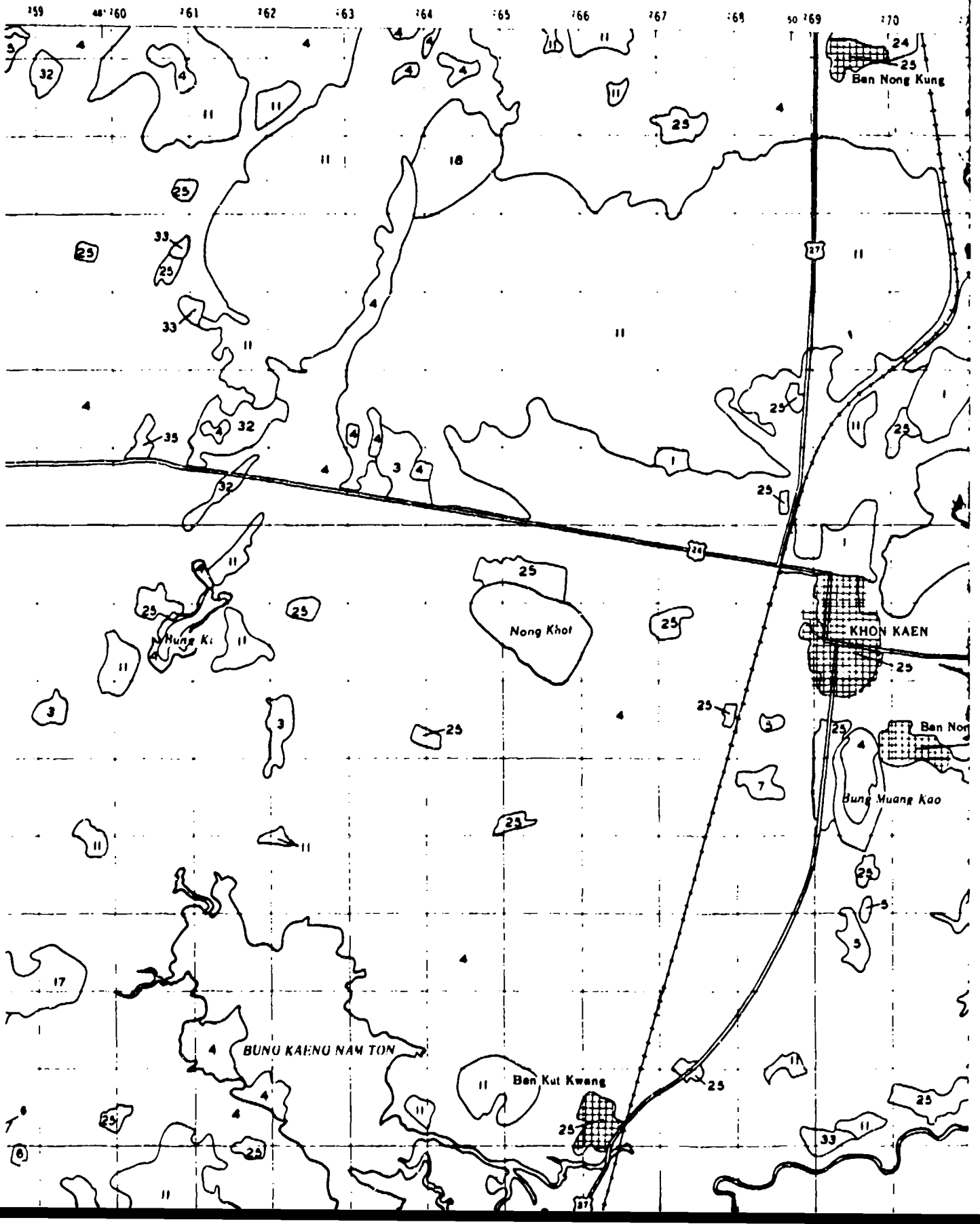
PLATE 5.2b

8


Ban Thum

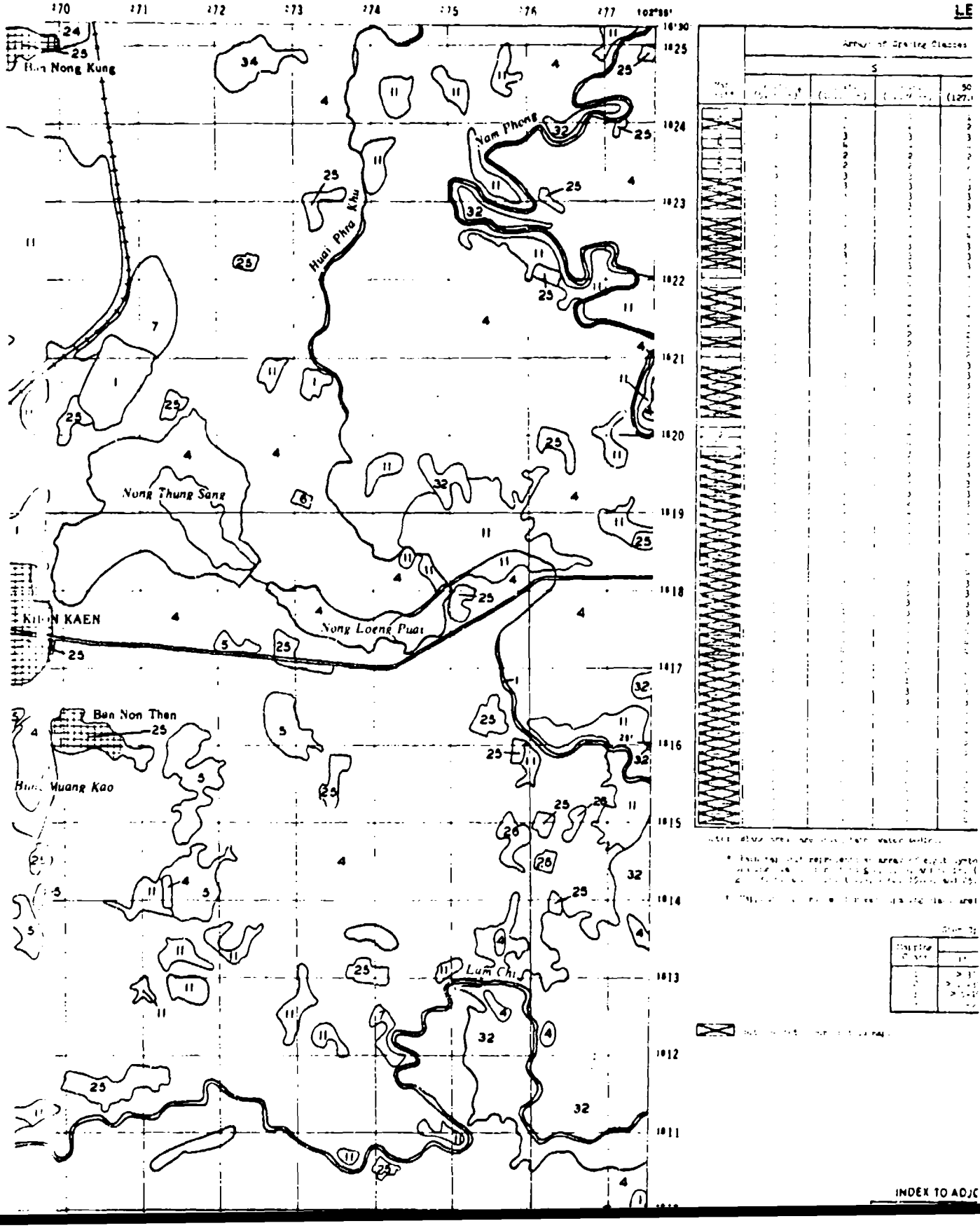
2

KHON KAEN

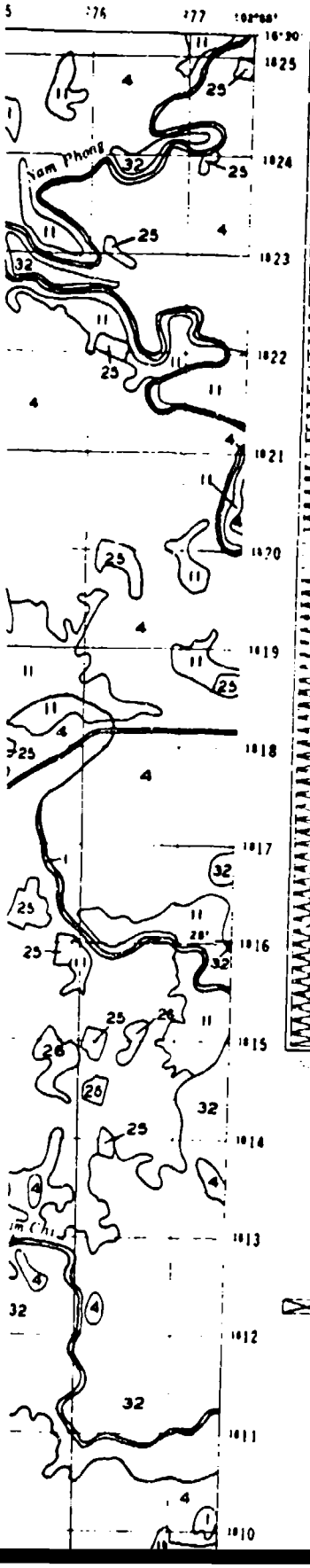

Ban Nong Kung
KHON KAEN
Nong Khot
Bung Muang Kao
BUNG KAENG NAM TON
Ban Kut Kwang

3

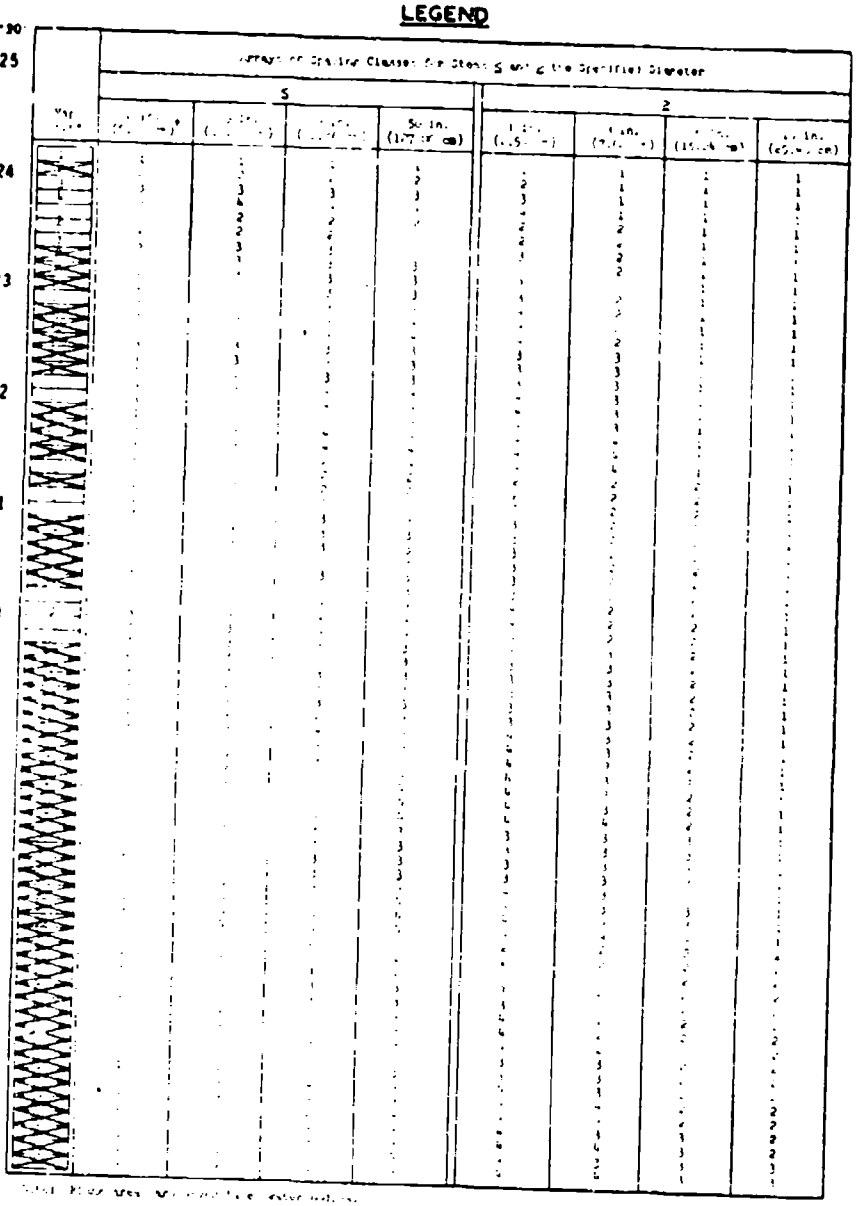
SHEET KK II


Ban Nong Kung
Nong Thung Sang
KHON KAEN
Nong Loeng Puai
Ban Non Then
Huai Muang Kao
Huai Phra Khai
Yam Phong
Lum Chi
INDEX TO ADJ

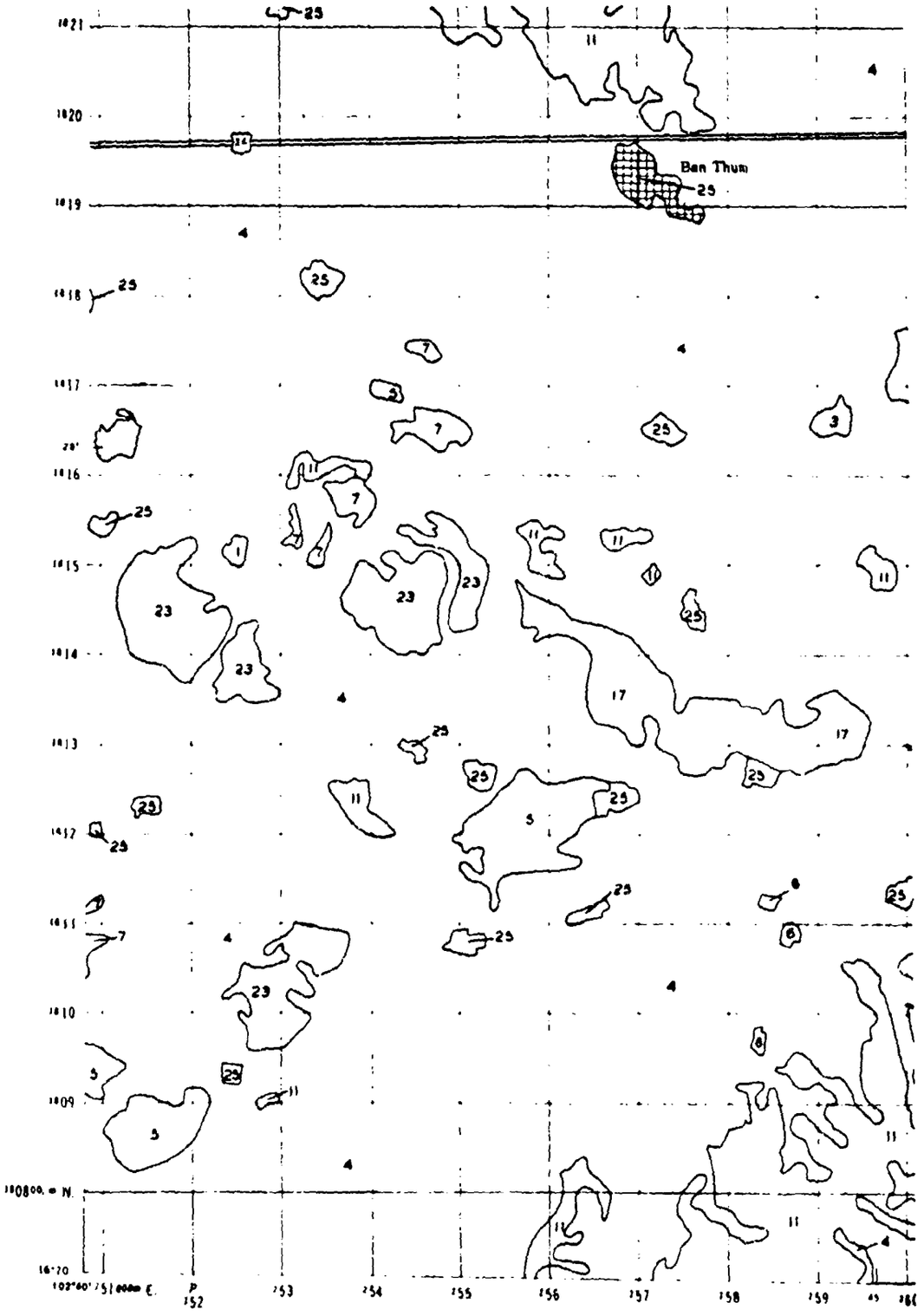
SHEET KK II



LEGEND

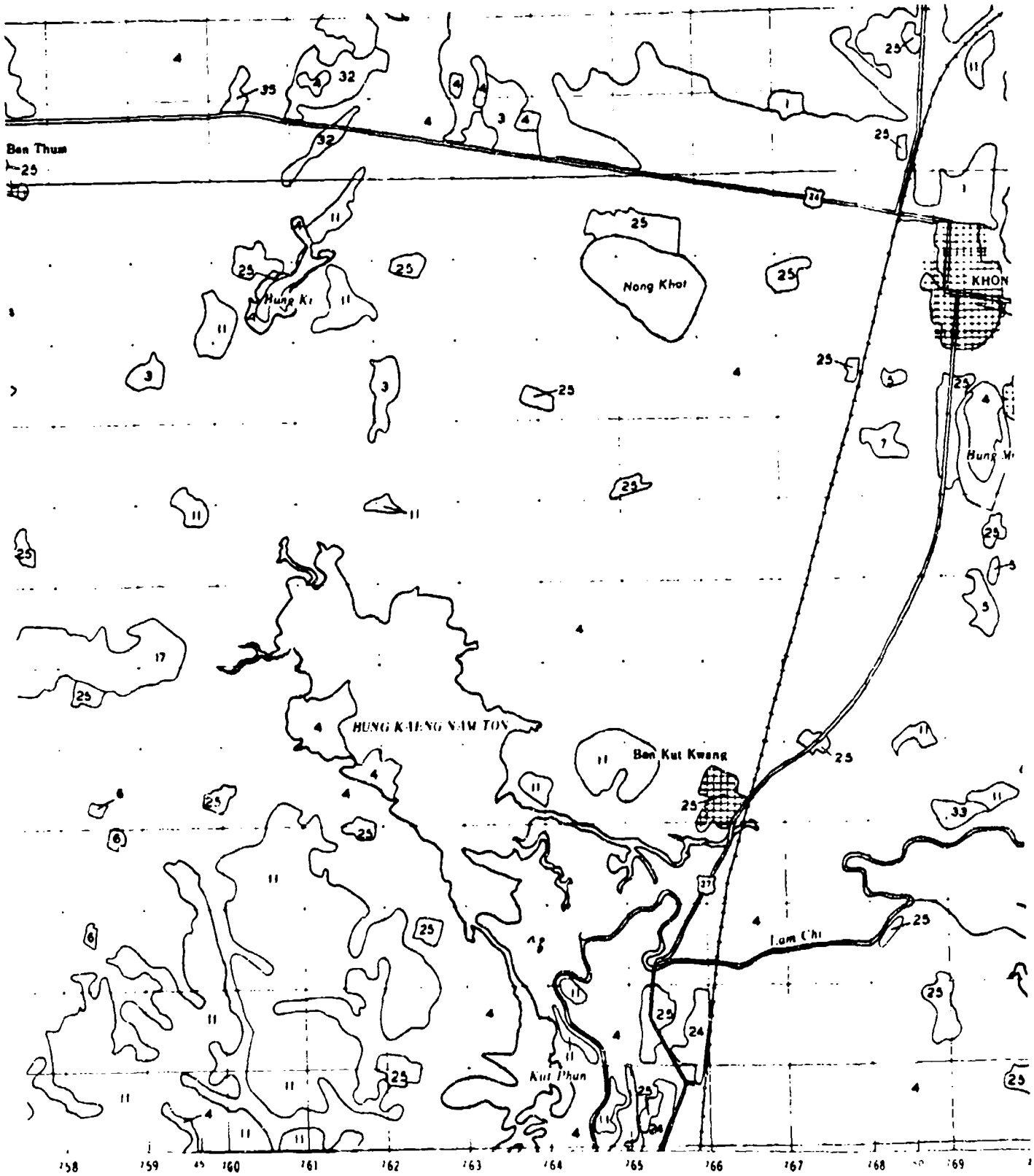


INDEX TO ADJOINING SHEETS

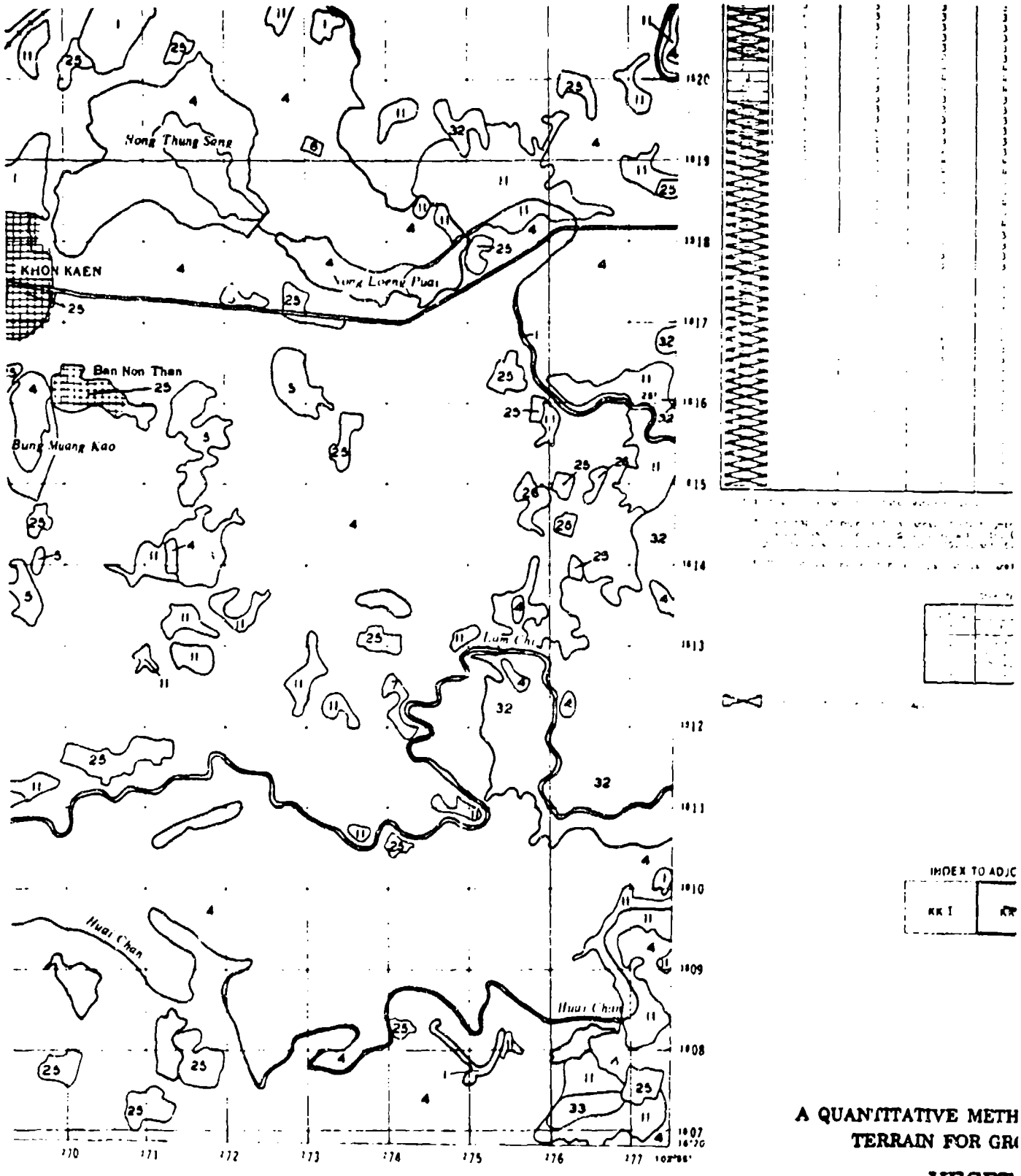


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48Q

5

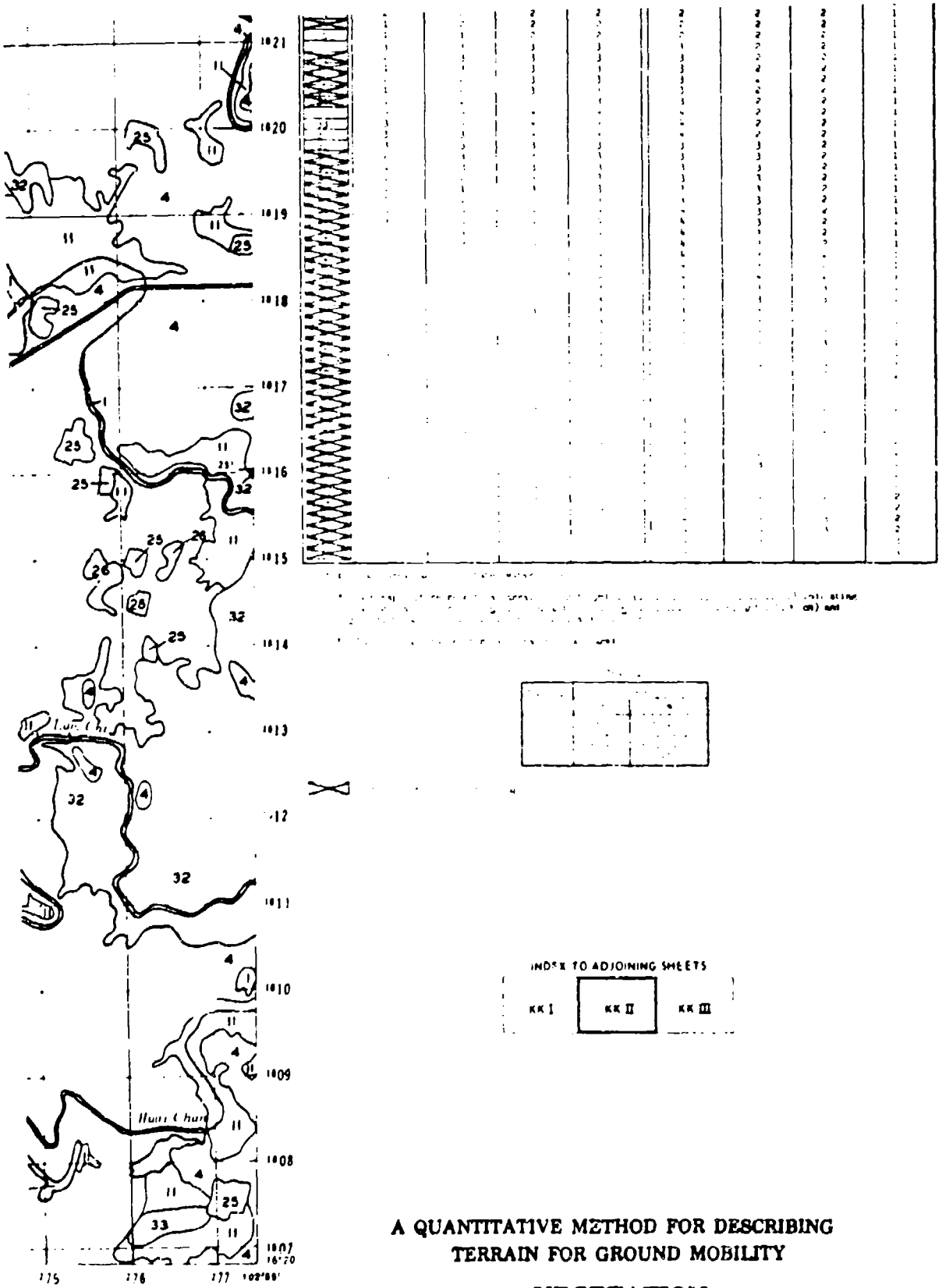

Ban Thum
Nong Khai
KHON
HUNG KAENG SAM TOS
Ban Kut Kwang
Lam Chi
Kut Phun
SCALES

6



A QUANTITATIVE METH
TERRAIN FOR GR
VEGET
KHON KAEN S
SHEET

7



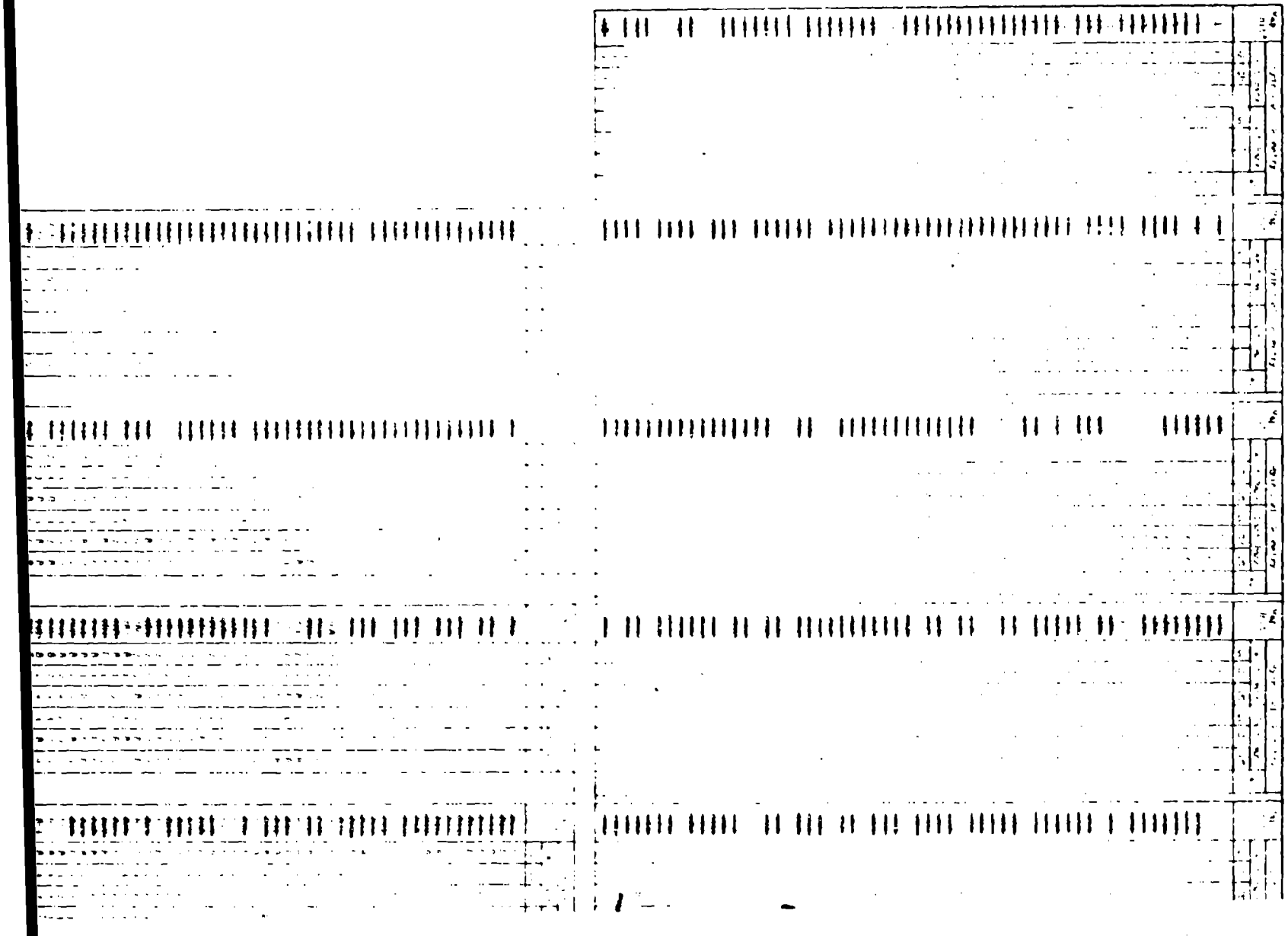
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

KHON KAEN STUDY AREA

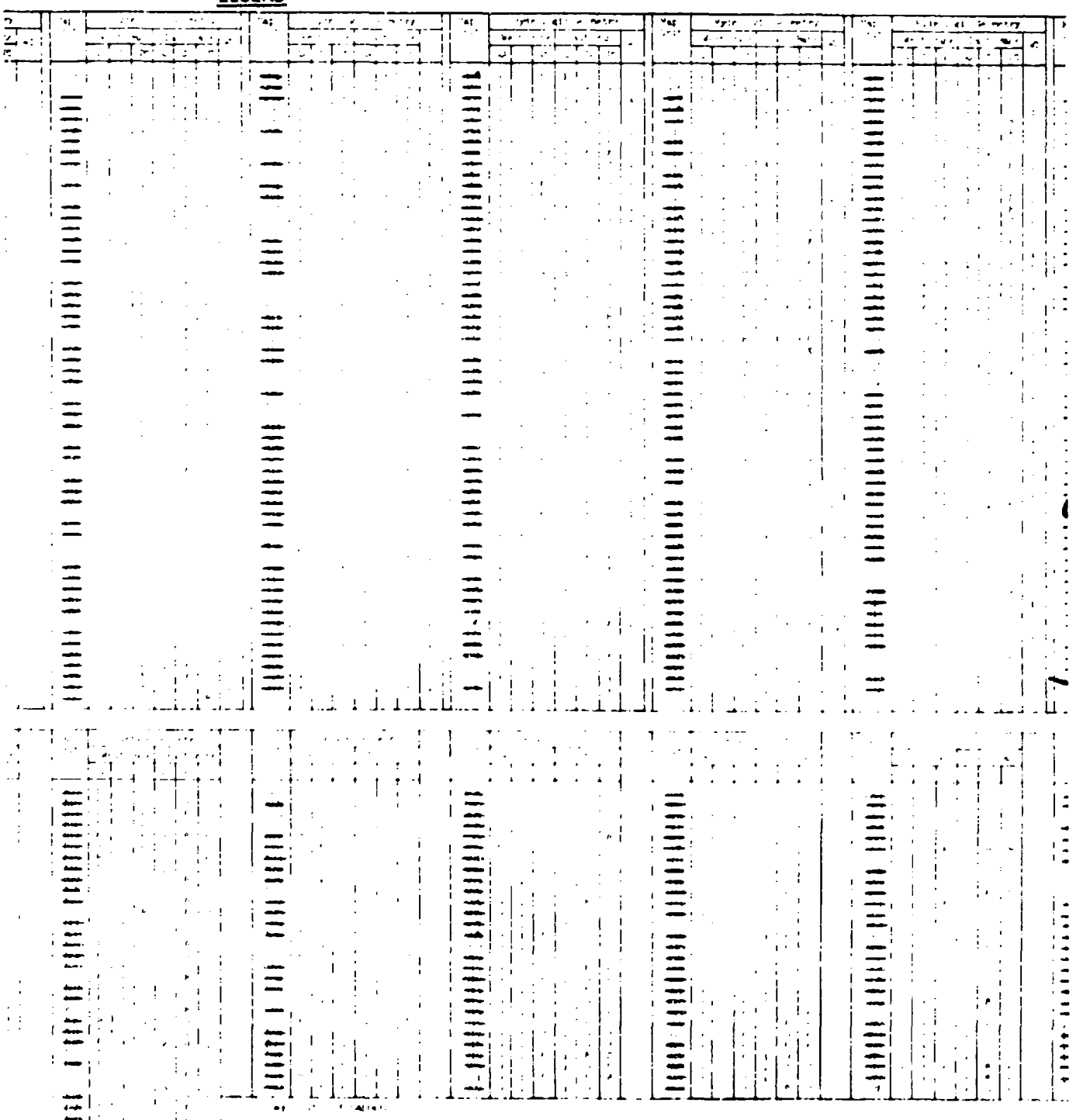
SHEET KK II

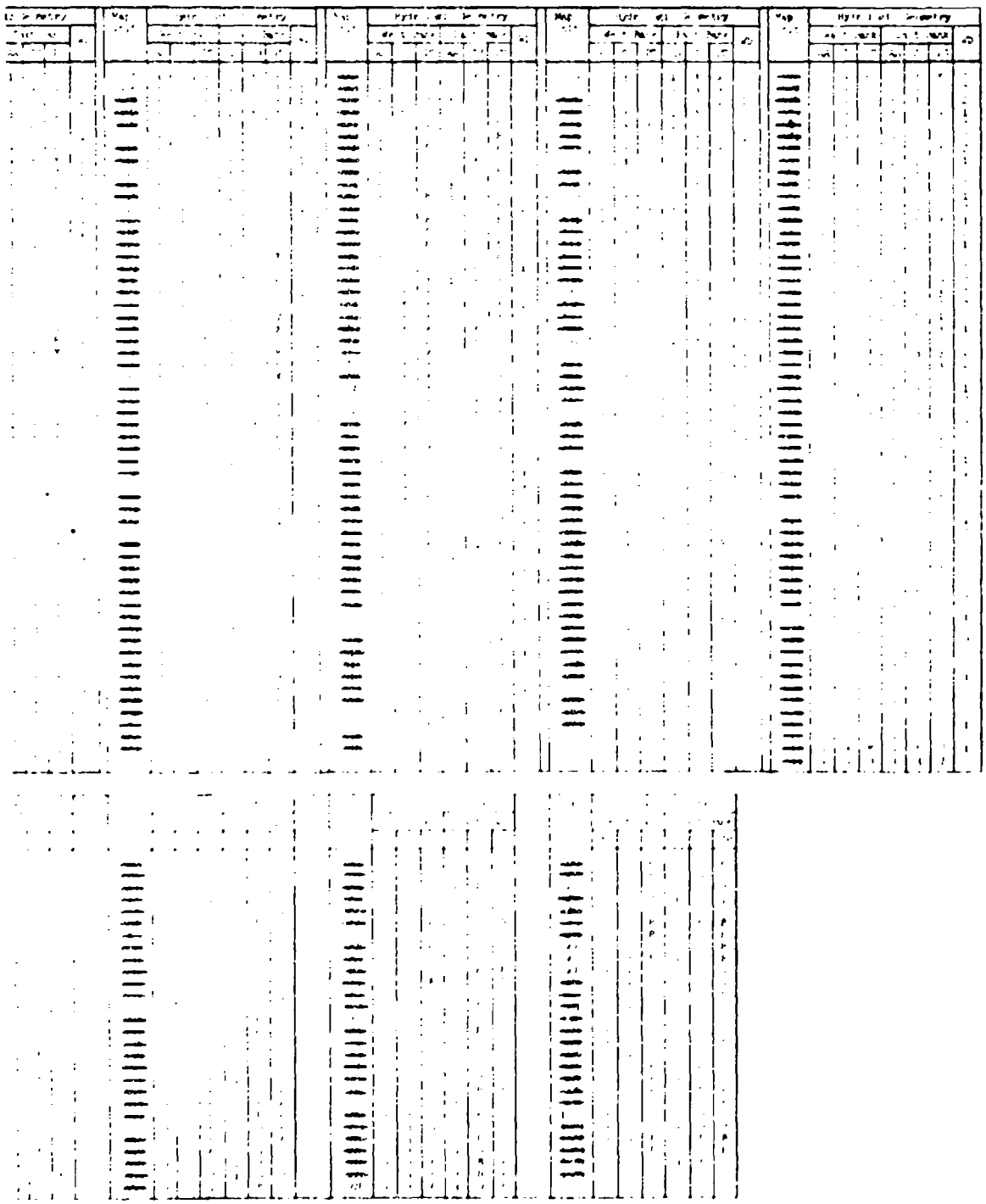
PLATE 5.2c

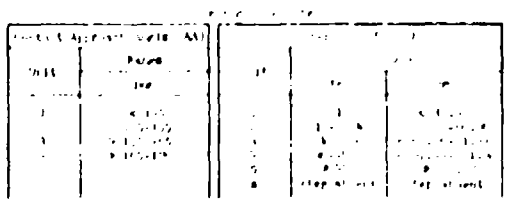


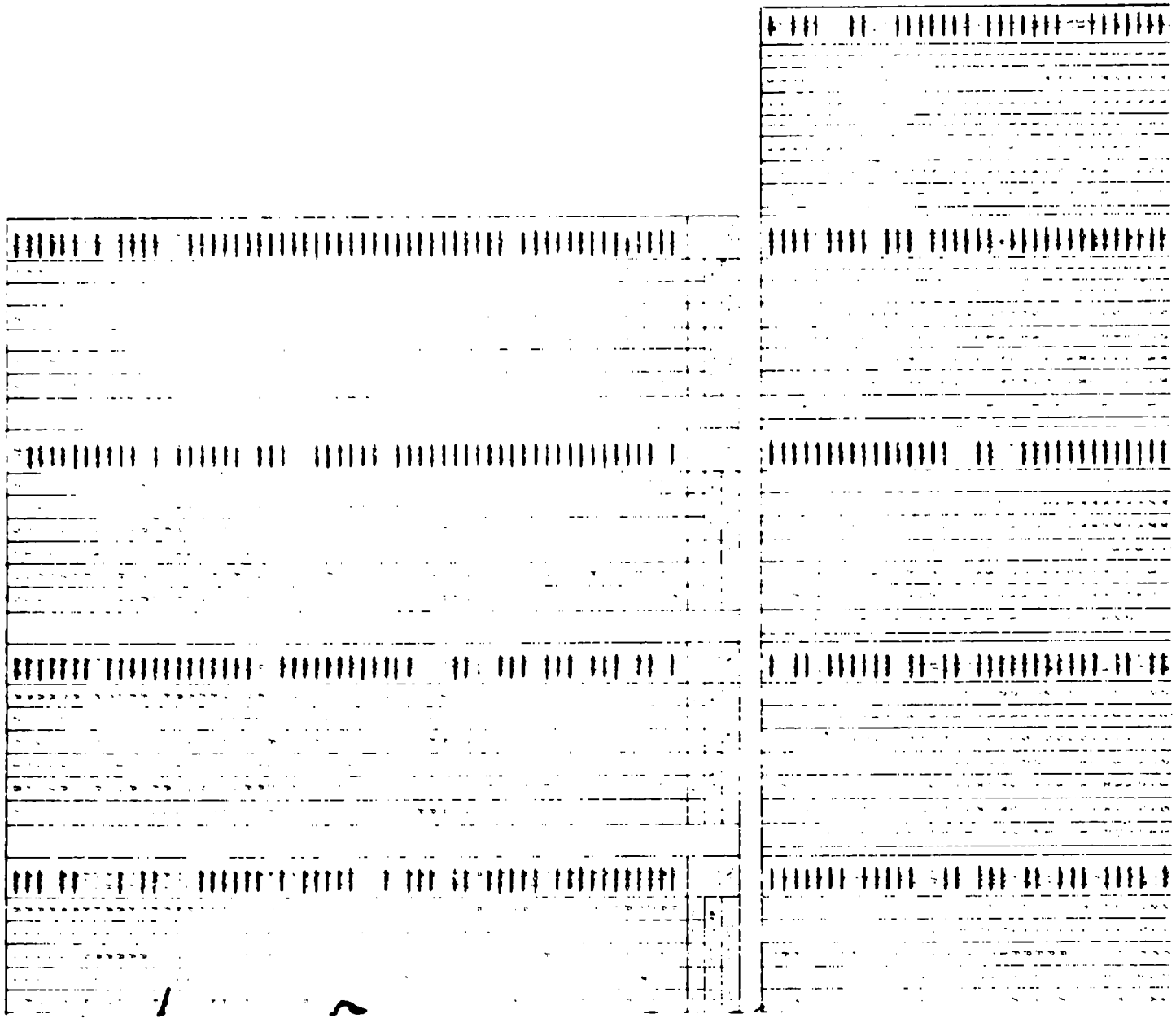
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LEGEND

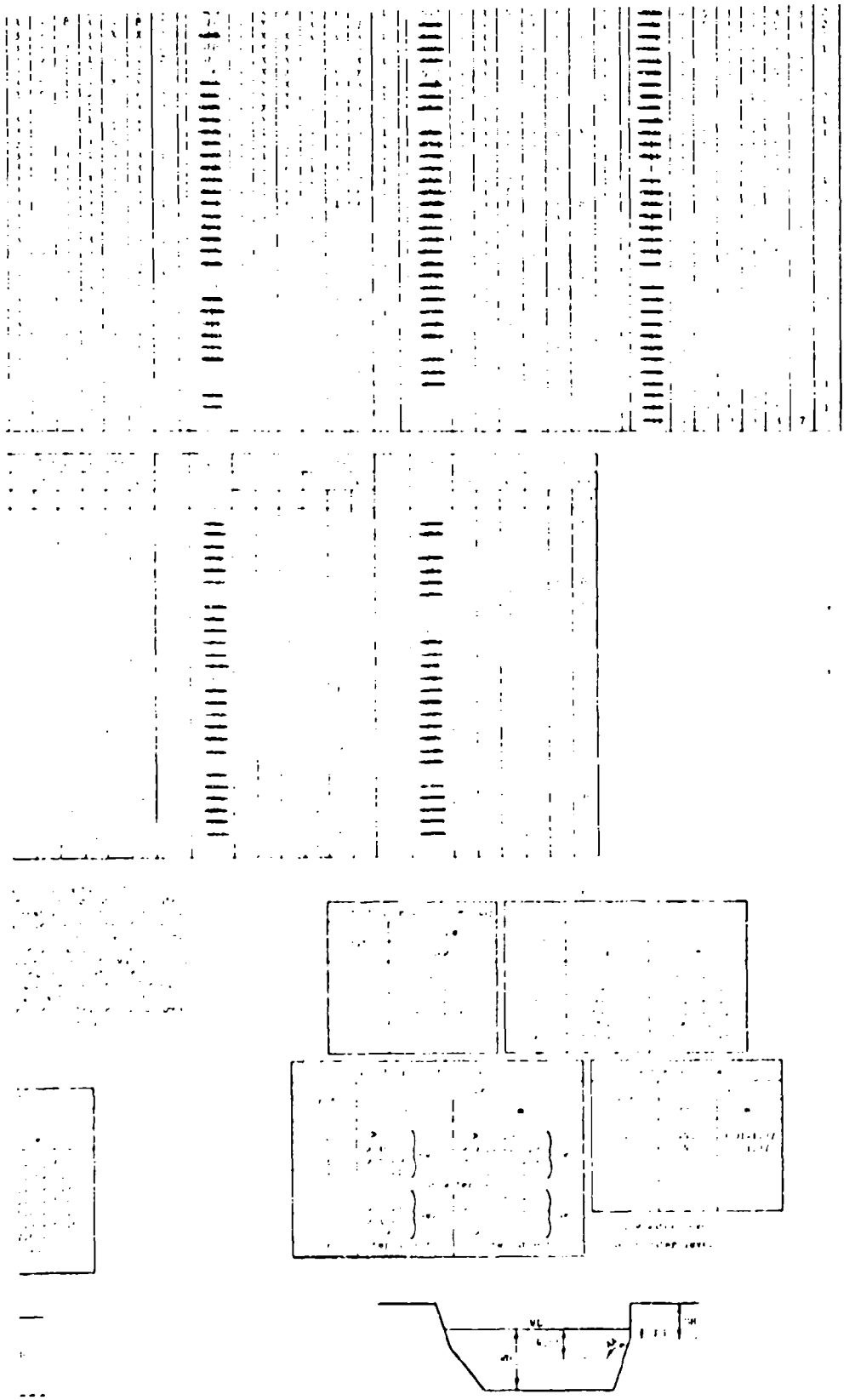


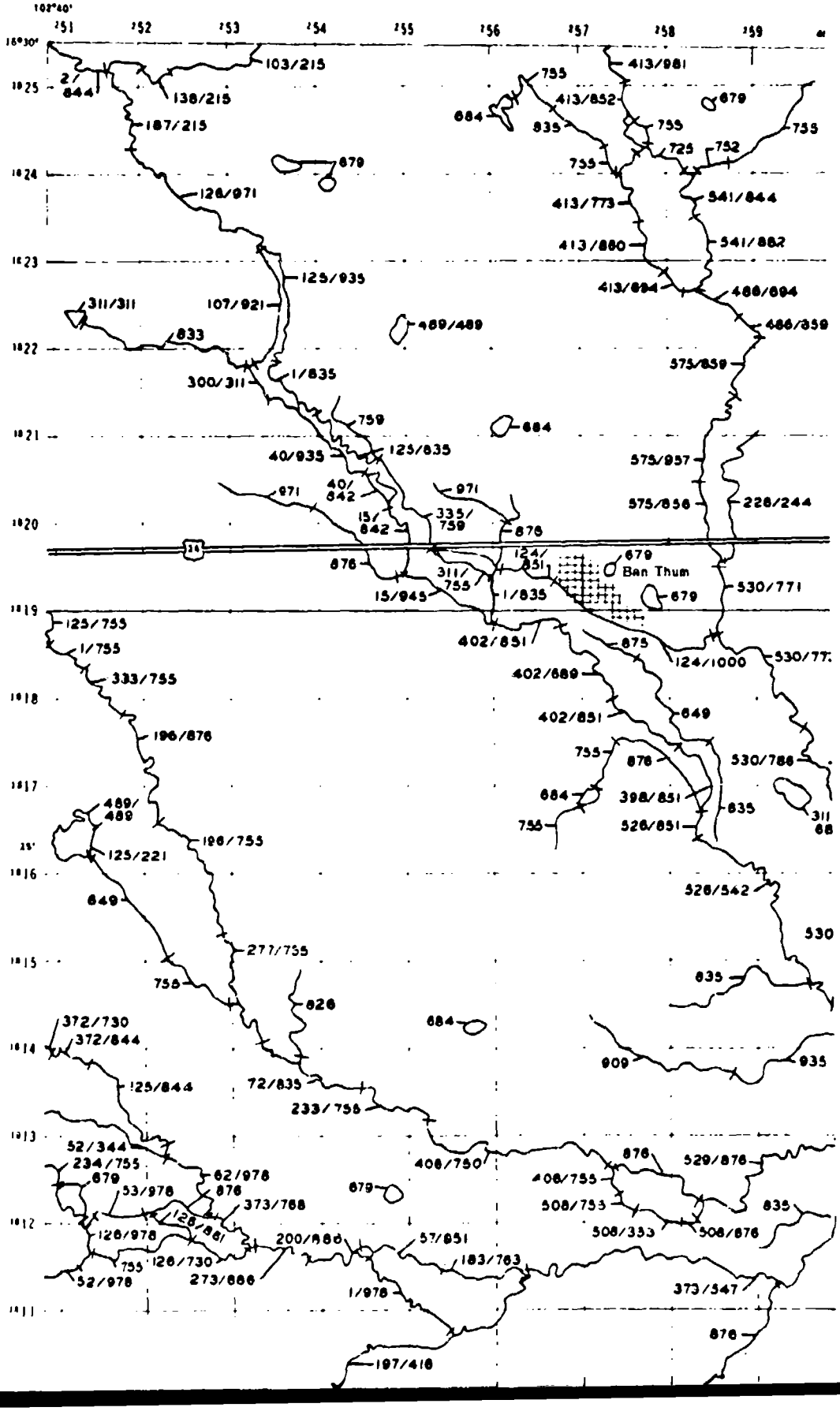






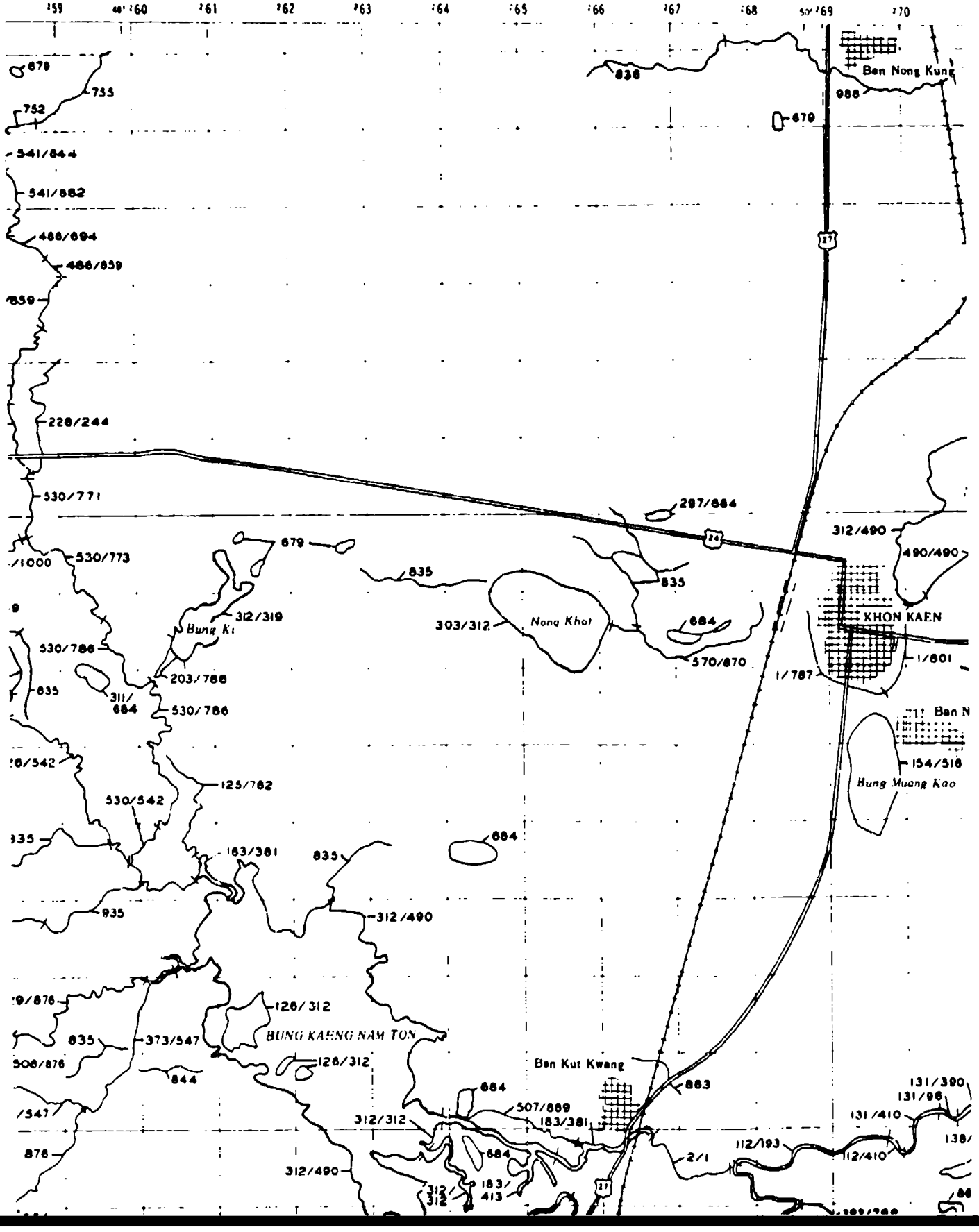
5




102°40'
251
252
253
254
255
256
257
258
259
18°30'
1825
1824
1823
1822
1821
1820
1819
1818
1817
1816
1815
1814
1813
1812
1811
Ban Thum
103/215
2/844
138/215
187/215
679
126/971
125/935
311/311
107/921
833
489/489
300/311
1/835
759
684
40/935
125/835
971
40/642
15/642
335/759
876
124/851
311/755
15/945
1/835
679
125/755
1/755
333/755
196/876
489/489
196/755
125/221
649
277/755
756
826
372/730
372/844
125/844
72/835
233/756
52/344
234/755
679
62/978
53/978
876
373/768
126/978
126/861
200/886
126/730
755
52/978
273/886
57/851
183/763
1/978
197/416
413/981
755
413/852
684
835
755
725
752
755
413/773
541/844
413/880
541/882
413/894
486/894
486/859
575/859
575/957
575/856
226/244
530/771
402/851
875
124/1000
530/77
402/889
402/851
649
755
876
530/786
684
398/851
835
755
526/851
311
68
526/542
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935
684
408/750
679
408/755
876
529/876
508/753
835
508/333
508/876

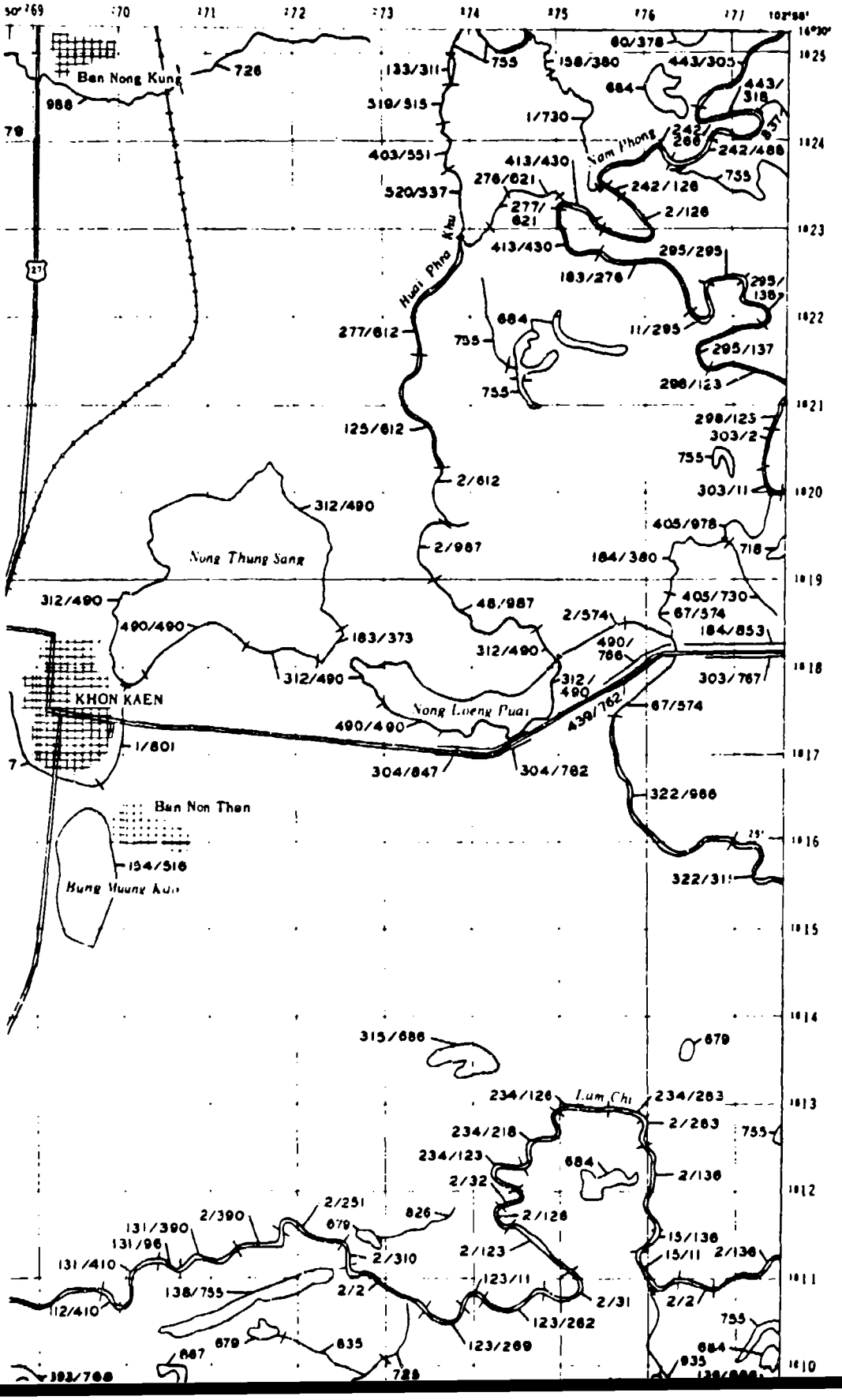
2

KHON KAEN

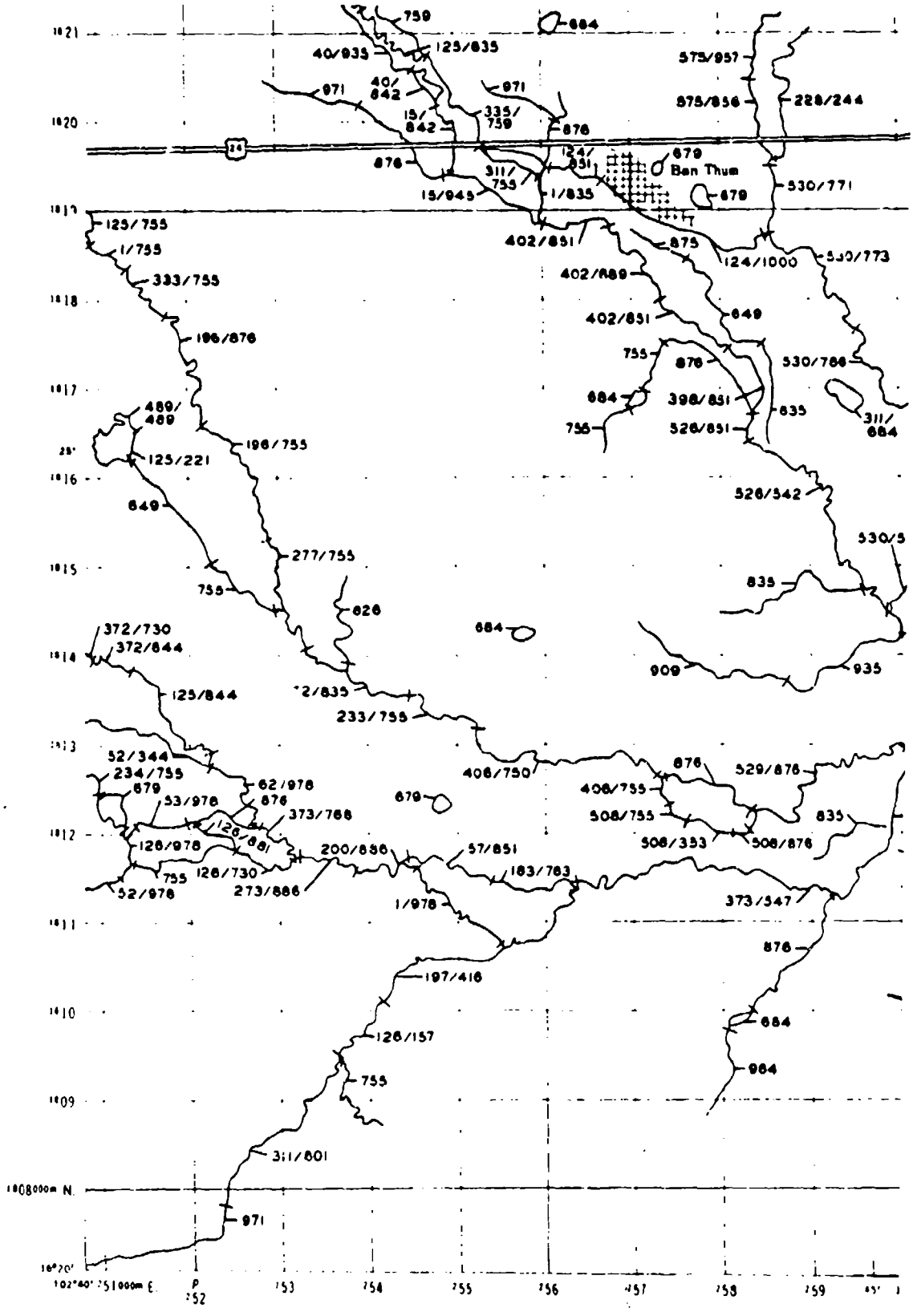

Ban Nong Kung
KHON KAEN
Nong Khot
Bung Ki
BUNG KAENG NAM TON
Ban Kut Kwang
Bung Muang Kao
679
755
752
541/844
541/882
486/694
486/859
859
228/244
530/771
530/773
1000
530/786
635
311/
684
530/542
125/782
935
183/381
312/490
126/312
373/547
844
876
312/312
507/869
183/381
884
883
2/1
112/193
112/410
131/410
131/96
131/300
303/312
570/870
287/884
312/490
490/490
1/801
1/787
154/516
Ban N

3

SHEET KK II

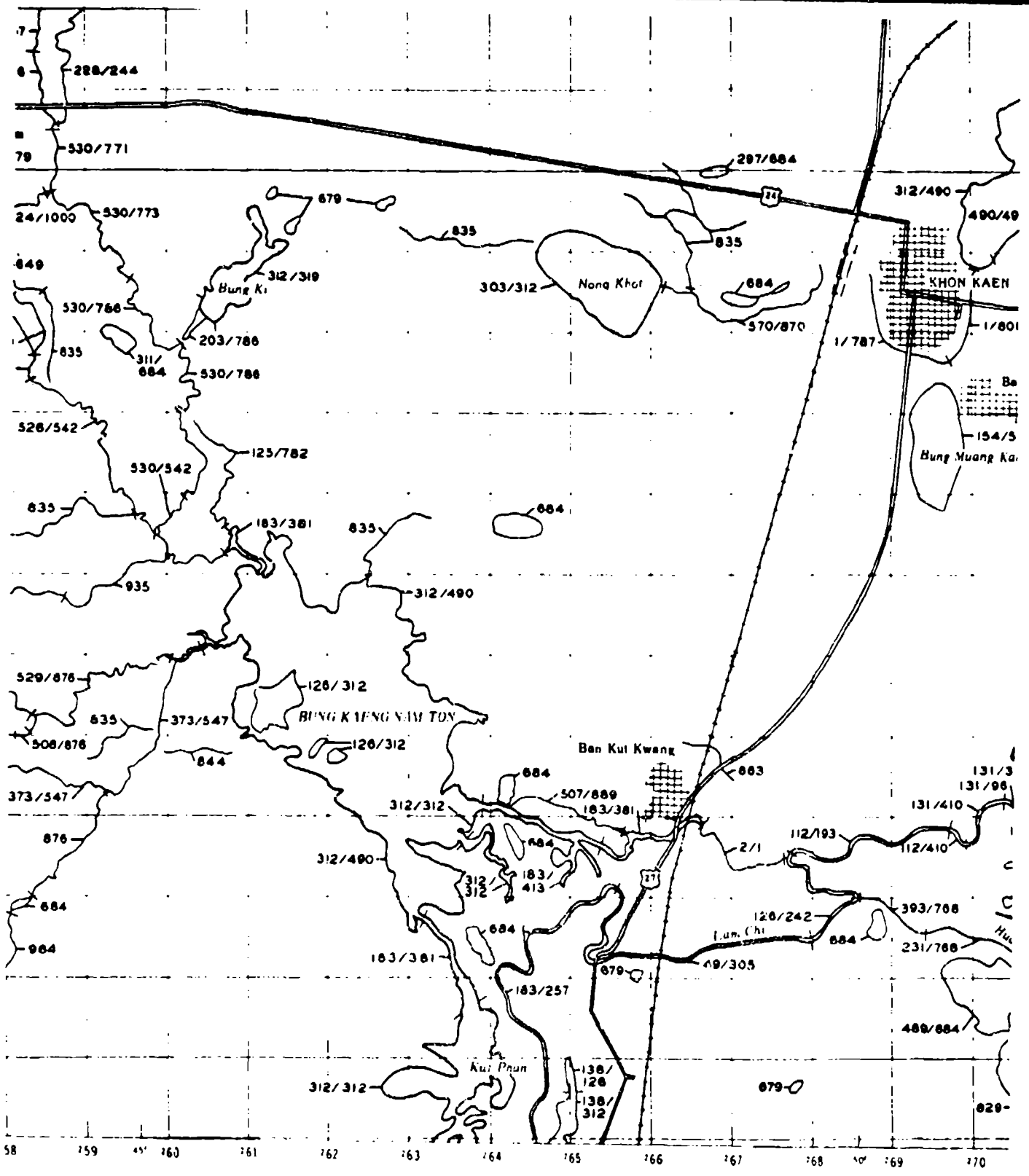


INDEX

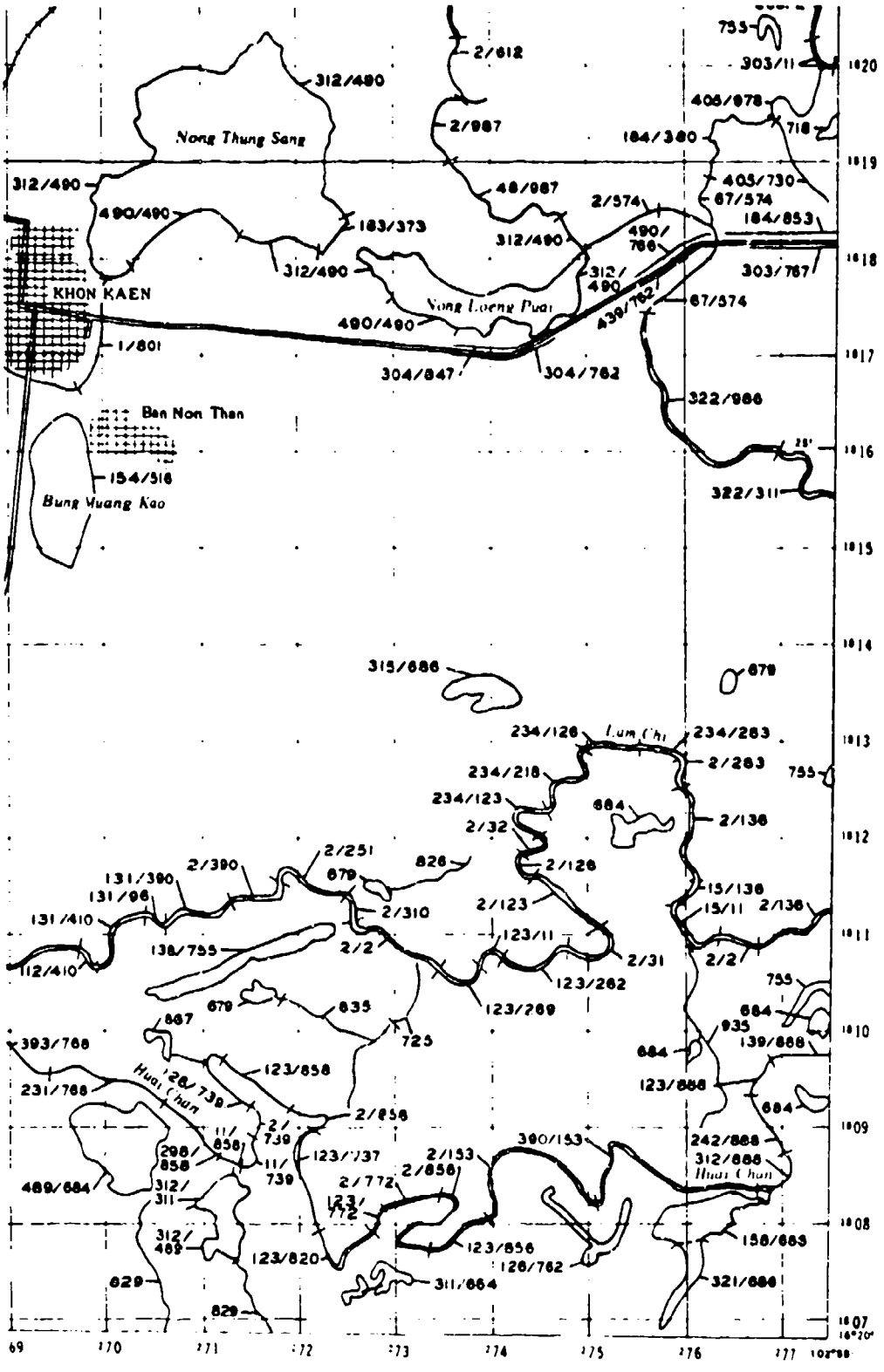


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48Q

4


KHON KAEN
Nong Khot
Bung Ki
BUNG KUENG NAM TON
Ban Kut Kwang
Kut Phun
Bung Muang Ka
SCALES
Statute Miles
Meters
Yards

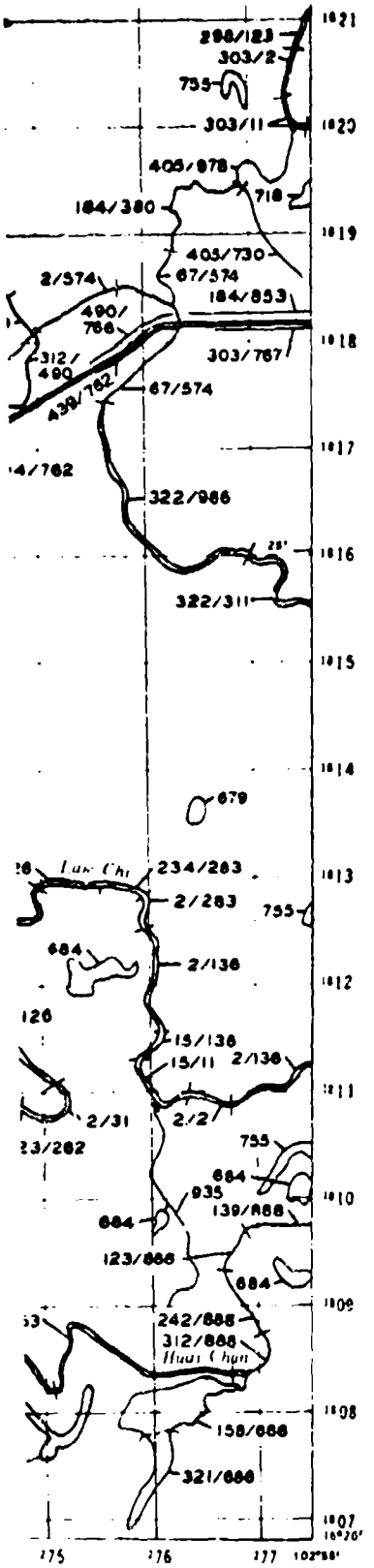
5



INDEX TO
KK I

A QUANTITATIVE ME
TERRAIN FOR (
HYDROLOG
KHON KAE
SHE

6



INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

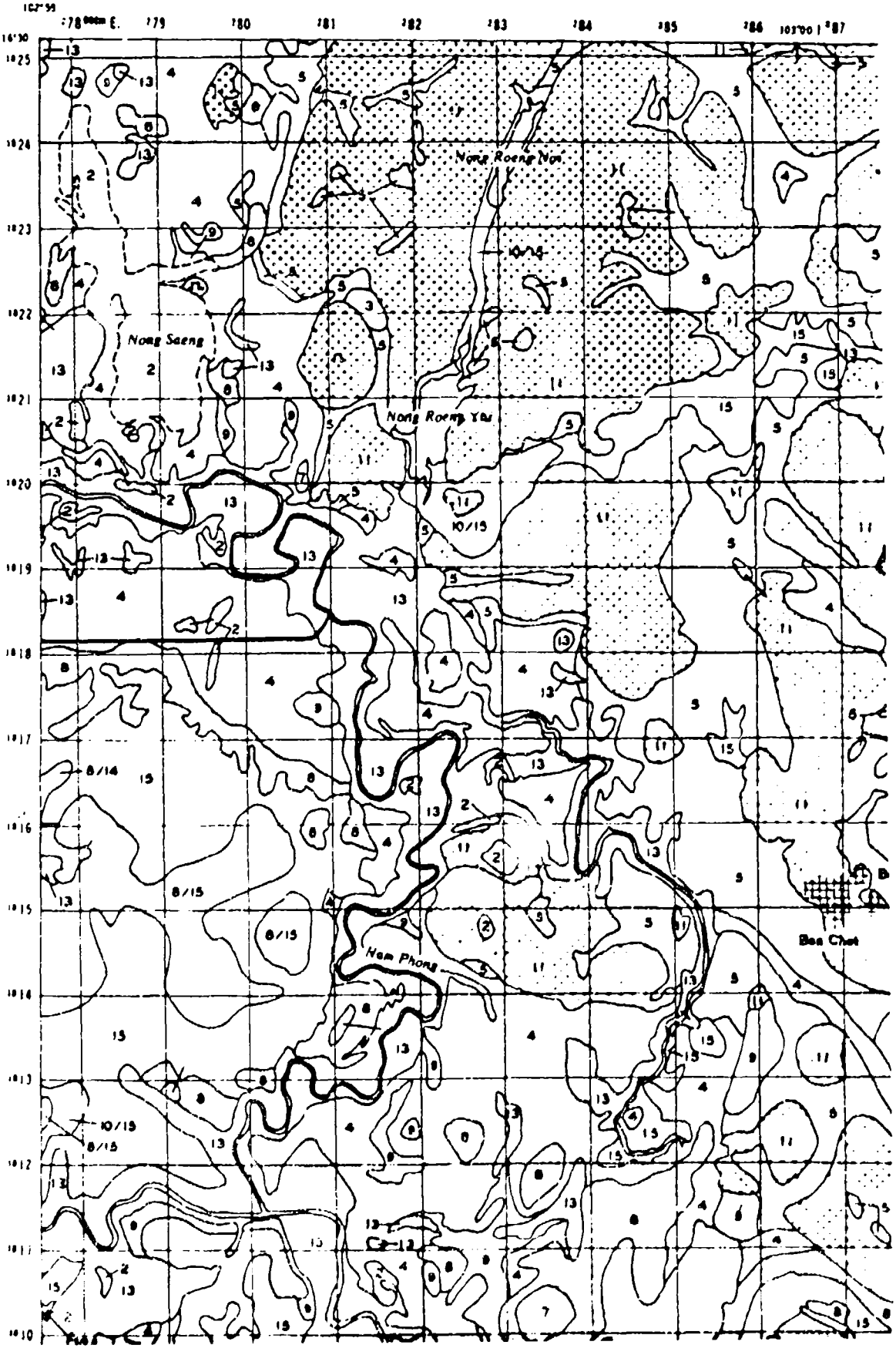
HYDROLOGIC GEOMETRY

KHON KAEN STUDY AREA

SHEET KK II

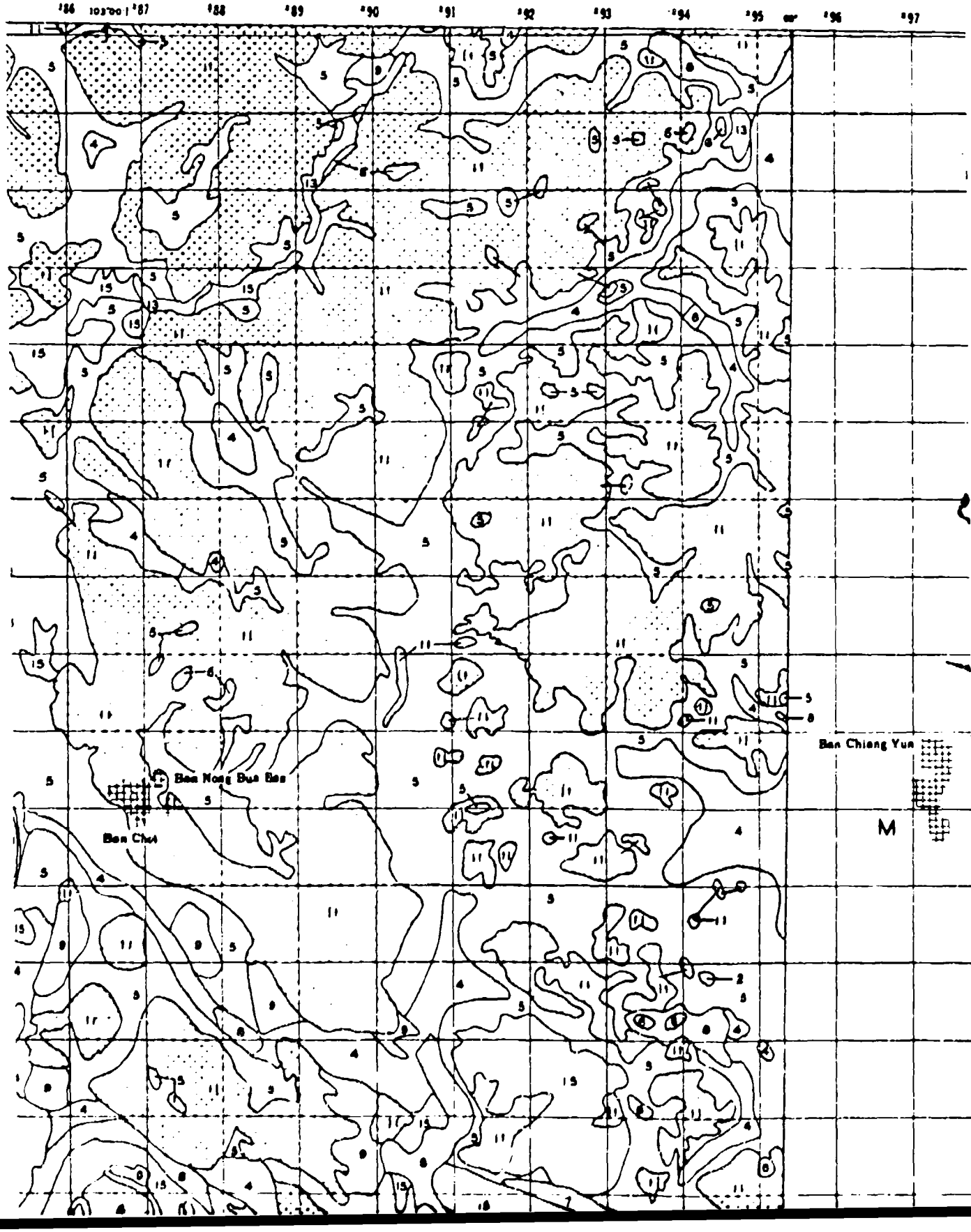
PLATE 5.2d

7


Nong Saeng
Nong Roeng Nok
Nong Roeng Yai
Nam Phong
Bua Chet

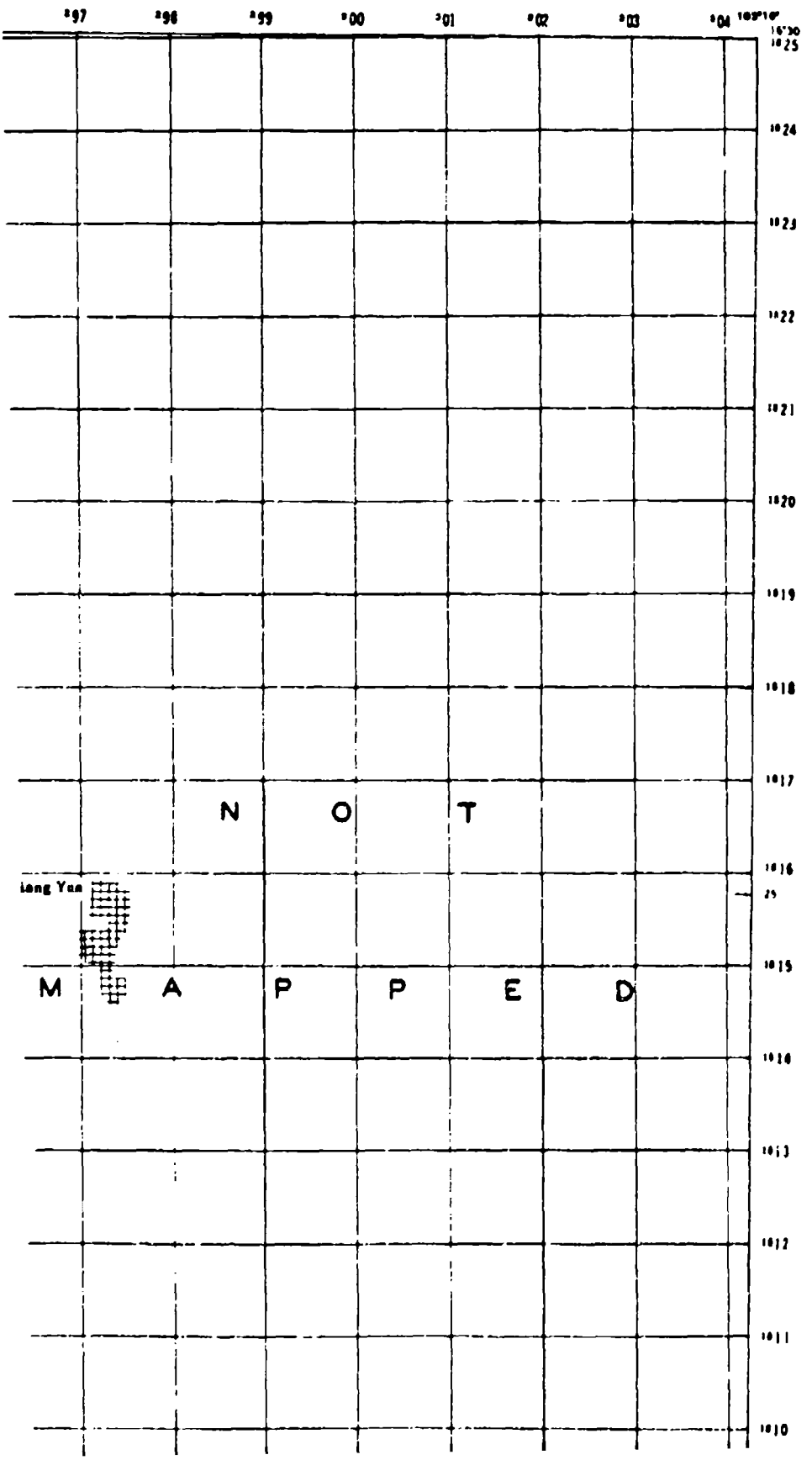
2

KHON KAEN



8

SHEET KK III



LEGE

Units	Soil Mass Strength: Minimum Moisture (KN)	Soil Mass Strength: Minimum Moisture (KC)	Maximum Moisture: ϕ_{cw} (pcf)	Maximum Moisture: c_{uw} (kg/cm²)	Maximum Moisture: ϕ_{uw} (deg)	
	10-25	25-60	0-1	0-0.07	0-10	1
2	25-60	60-100	0-1	0-0.07	0-10	2
3	25-60*	60-100	0-1	0-0.07	10-20	2
4	25-60	>100	0-1	0-0.07	0-10	0
5	25-60*	>100	0-1	0-0.07	10-20	0
6	60-100	60-100	0-1	0-0.07	0-10	2
7	60-100	60-100	0-1	0-0.07	10-20	0
8	60-100	>100	0-1	0-0.07	0-10	0
9	60-100	>100	0-1	0-0.07	0-10	0
10	60-100	>100	0-1	0-0.07	10-20	0
11	60-100*	>100	0-1	0-0.07	10-20	0
12	>100	>100	0-1	0-0.07	0-10	0
13	>100	>100	0-1	0-0.07	10-20	0
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0
15	Complex of 40-100 and >170	>100	0-1	0-0.07	10-20	0

Notes: Blank areas are water bodies.

ϕ_{cw} Shear strength at zero normal load.

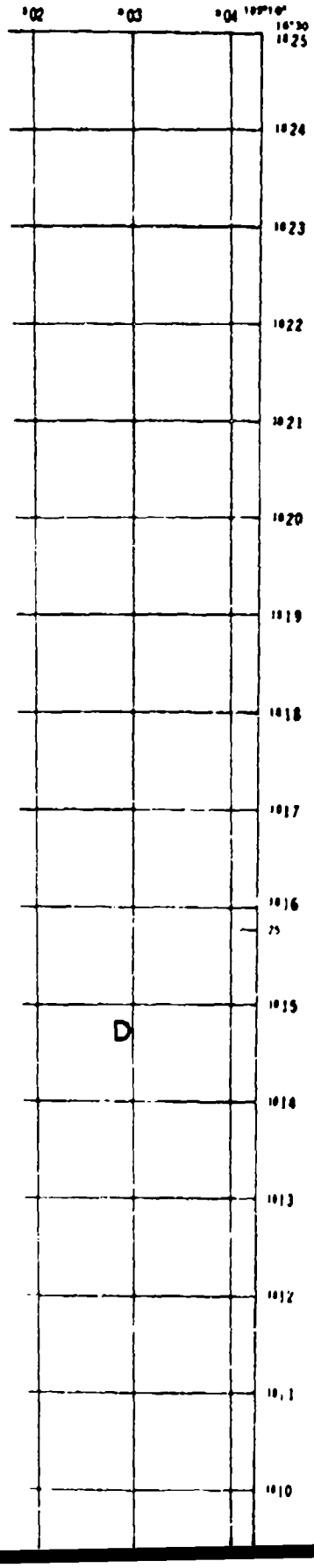
ϕ_{uw} Angle of internal friction.

* Maximum soil mass has less than 50 percent probability of strengths commonly observed are 60-100 for Units 3 a

Units do not occur on this map.

INDEX TO ADJOINING

SHEET KK III



LEGEND

Unit	Soil Shear Strength: Minimum Moisture: c_{uw} psi	c_{uw} kg/cm²	ϕ_{uw} deg	Soil Surface Strength: Minimum Moisture: c_{uw} psi	c_{uw} kg/cm²	ϕ_{uw} deg	Conditions where minimum c_{uw} occurs: c_{uw} psi	c_{uw} kg/cm²	ϕ_{uw} deg
[X]	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
[X]	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Unit	Soil Shear Strength: Minimum Moisture	Maximum Moisture
	RCI	RCI
[X]	10-25	25-60
2	25-60	60-100
3	25-60*	60-100
4	25-60	>100
5	25-60*	>100
6	60-100	60-100
7	60-100	60-100
8	60-100	>100
9	60-100	>100
10	60-100	>100
11	60-100*	>100
[X]	>100	>100
13	>100	>100
14	Complex of 60-100 and >100	>100
15	Complex of 60-100 and >100	>100

Notes: Black areas are water bodies.

c_{uw} Shear strength at zero normal load.

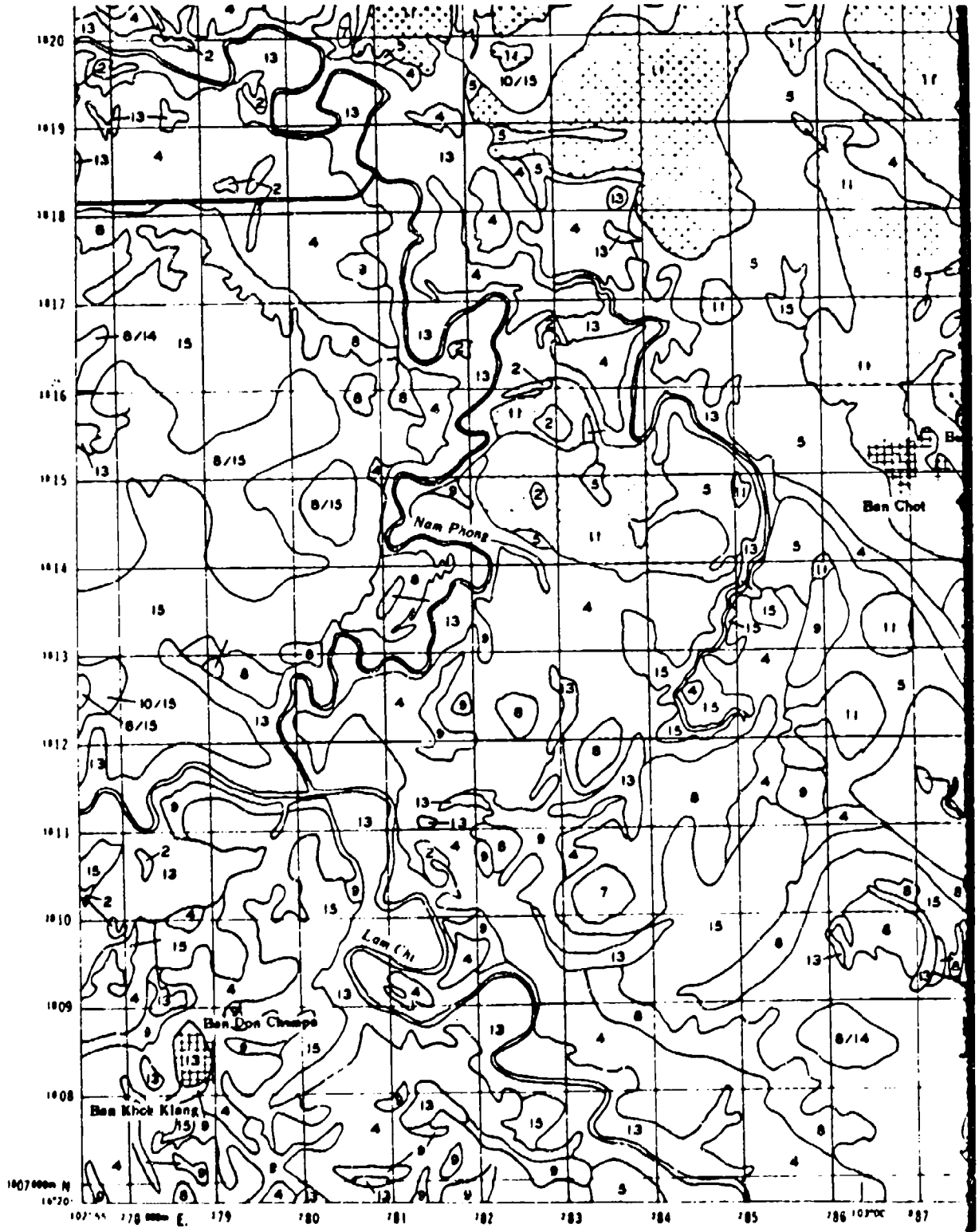
ϕ_{uw} Angle of internal friction.

* Minimum moisture has less than 50 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; zero than 100 for Unit 13.

[X] Units do not occur on this map.

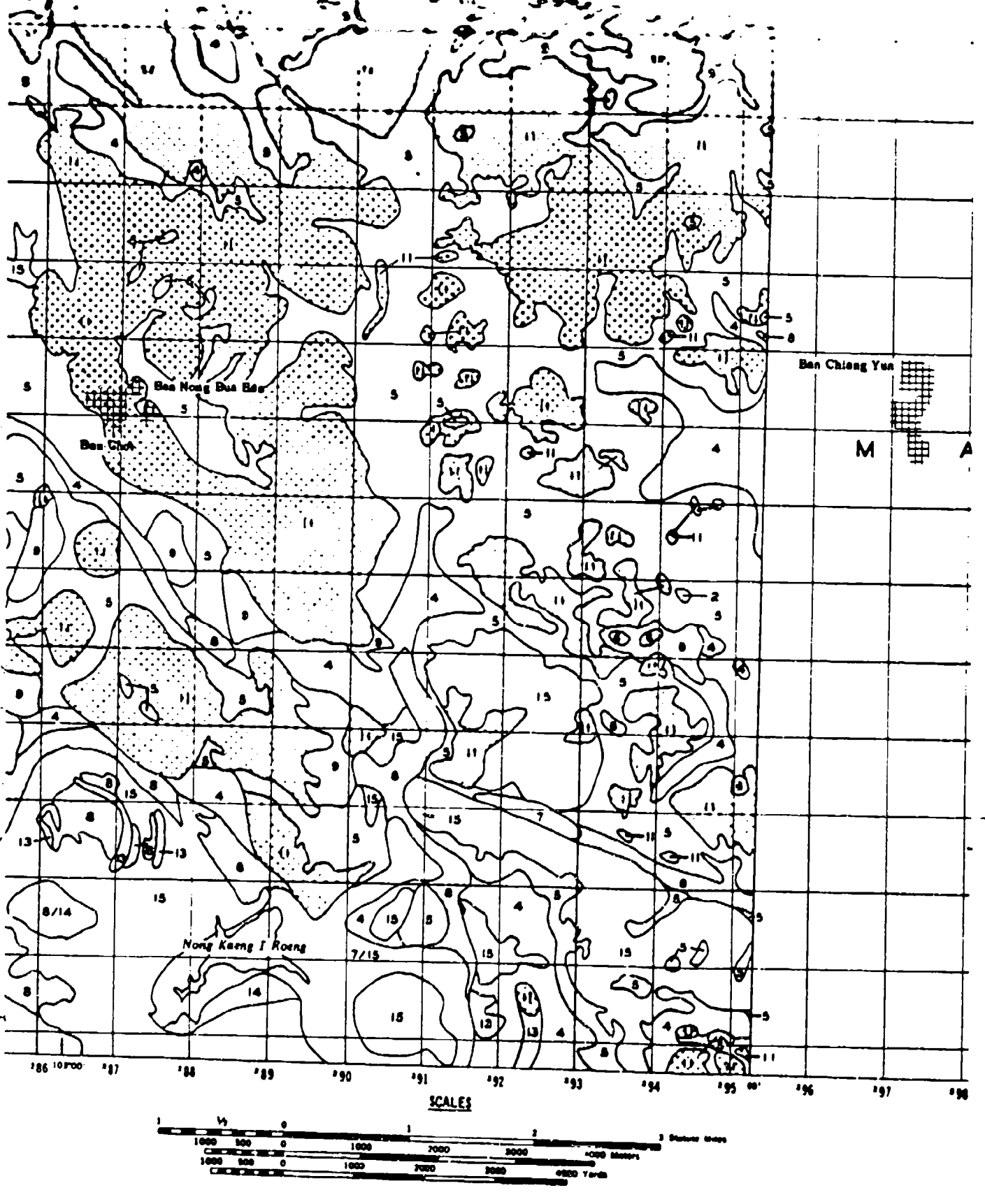
INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

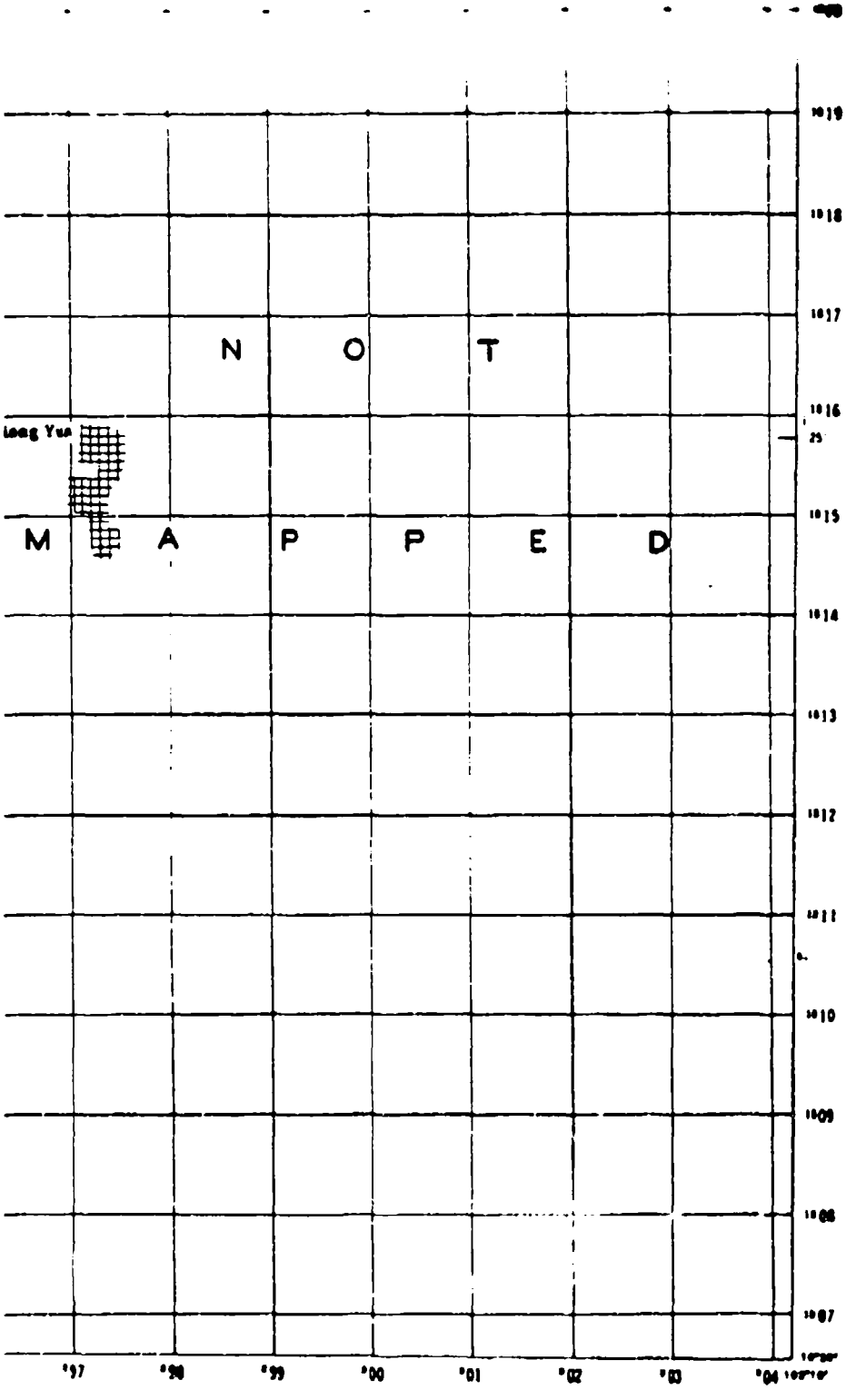


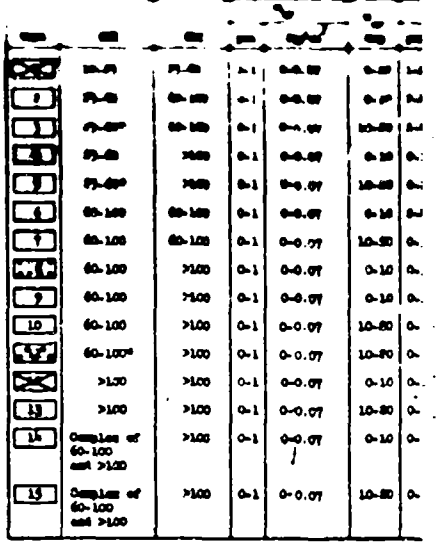
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48Q

5


Ban Nong Bua Ban
Ban Chiang Yun
Nong Kaeng I Roeng
7/15
8/14
SCALES

6





Notes: Shaded areas are water bodies.

c_{up} Shear strength of core normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent probabili... strengths normally observed are 60-100 for Units 3 a...

Units do not occur on this map.

INDEX TO ADJOINING

KK I	KK II

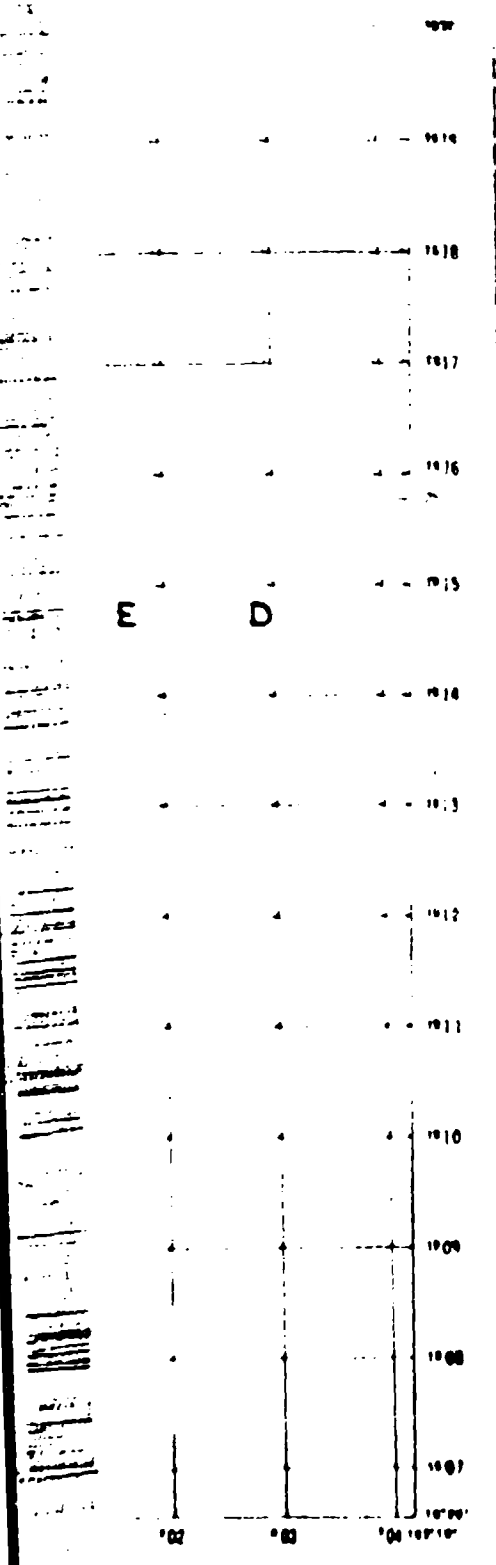
A QUANTITATIVE METHOD
TERRAIN FOR GROU...

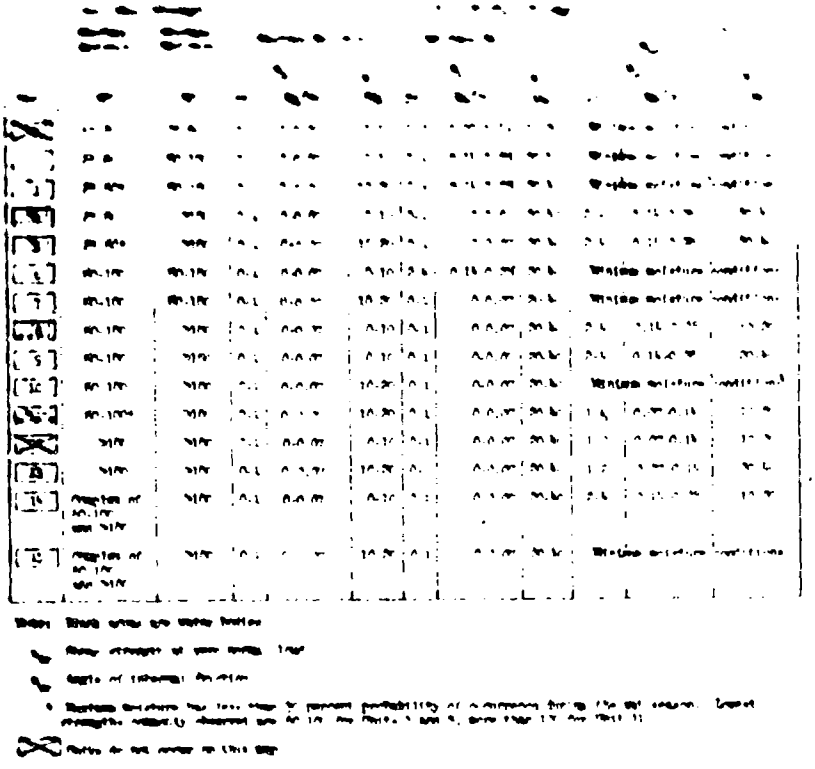
SURFACE COM

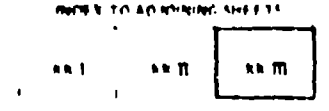
KHON KAEN STI

SHEET KJ

7







A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

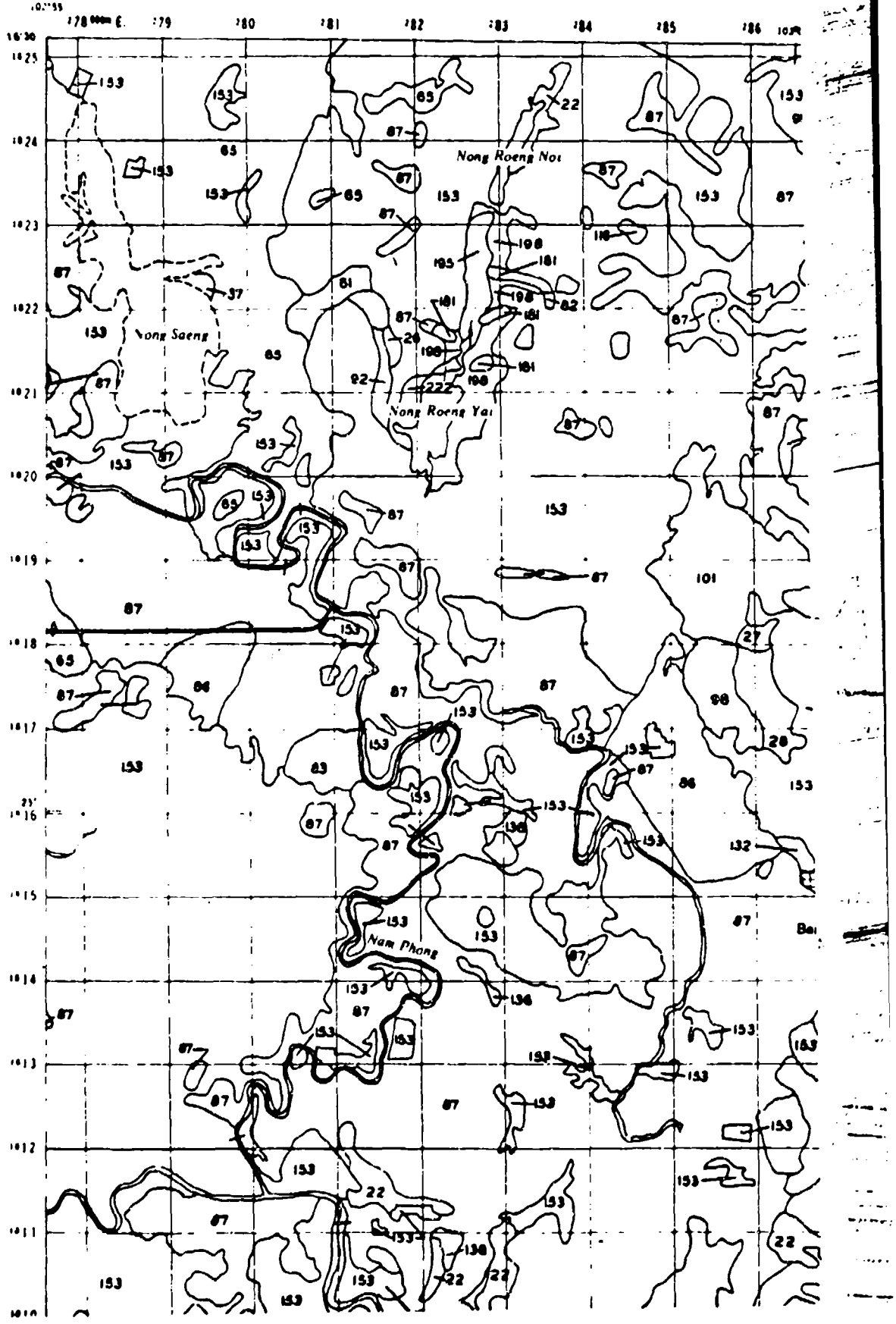
SURFACE COMPOSITION

KHON KAEN STUDY AREA

SHEET KK III

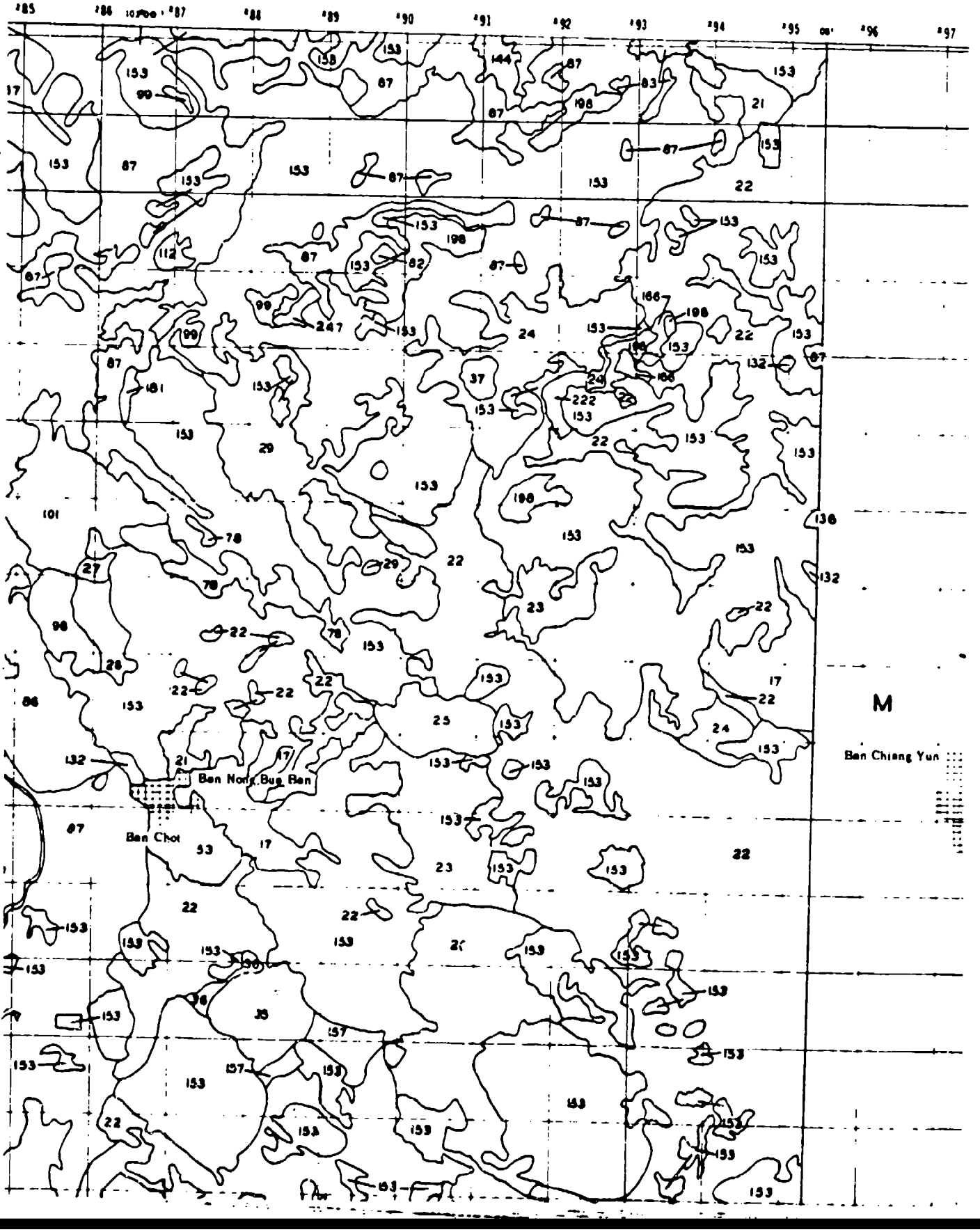
PLATE 5.3a

8


Nong Roeng Noi
Nong Saeng
Nong Roeng Yai
Nam Phong

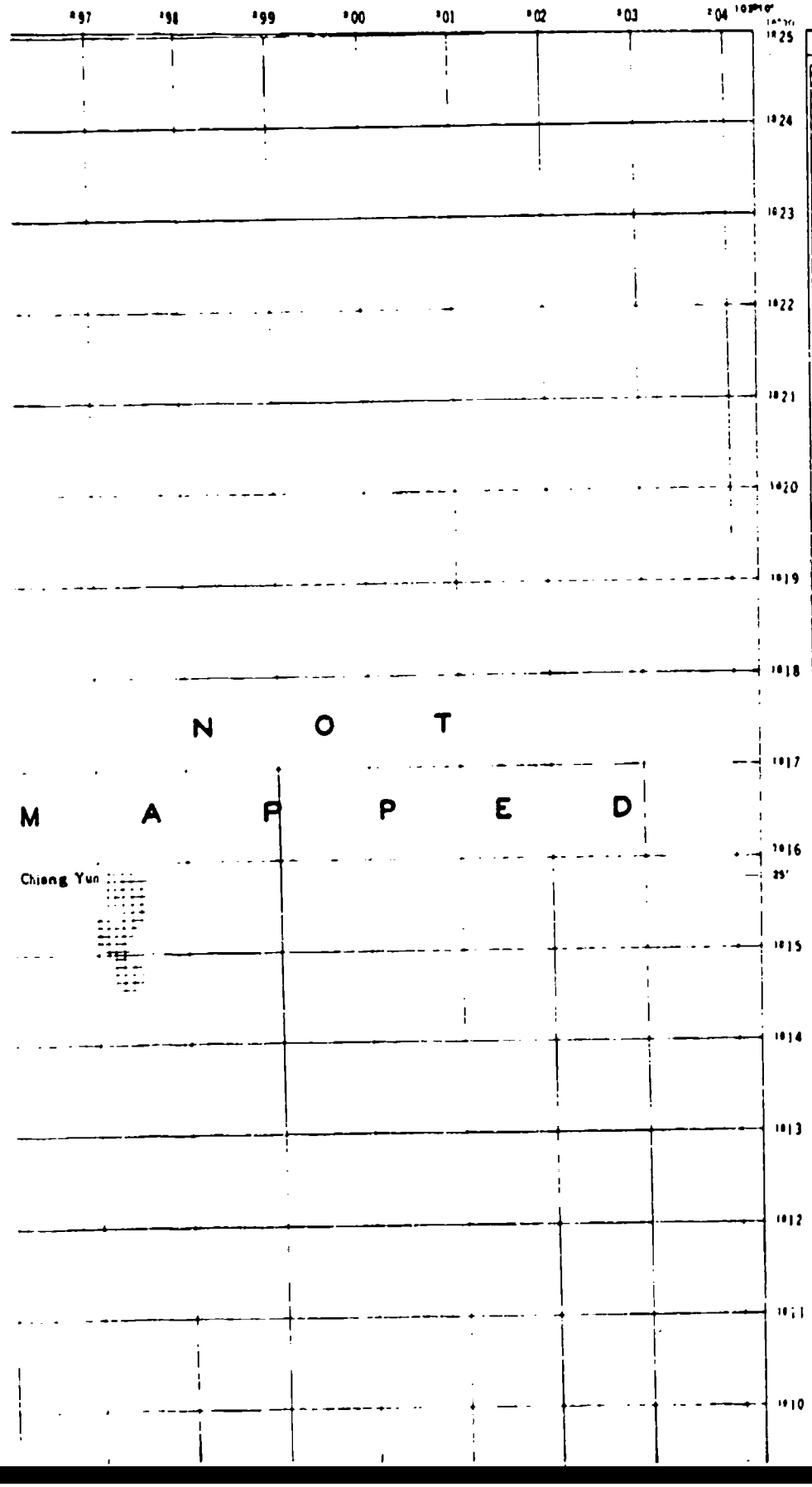
2

KHON KAEN



3

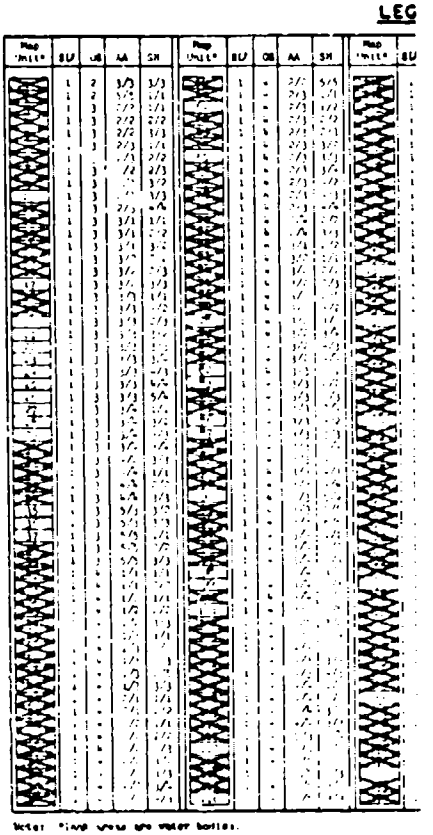
SHEET KK III



N O T

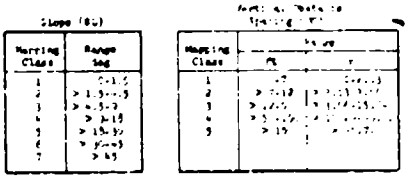
M A P P E D

Chiang Yun

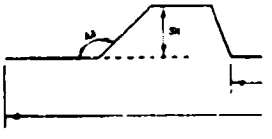


LEG

Water level where are water bottles.



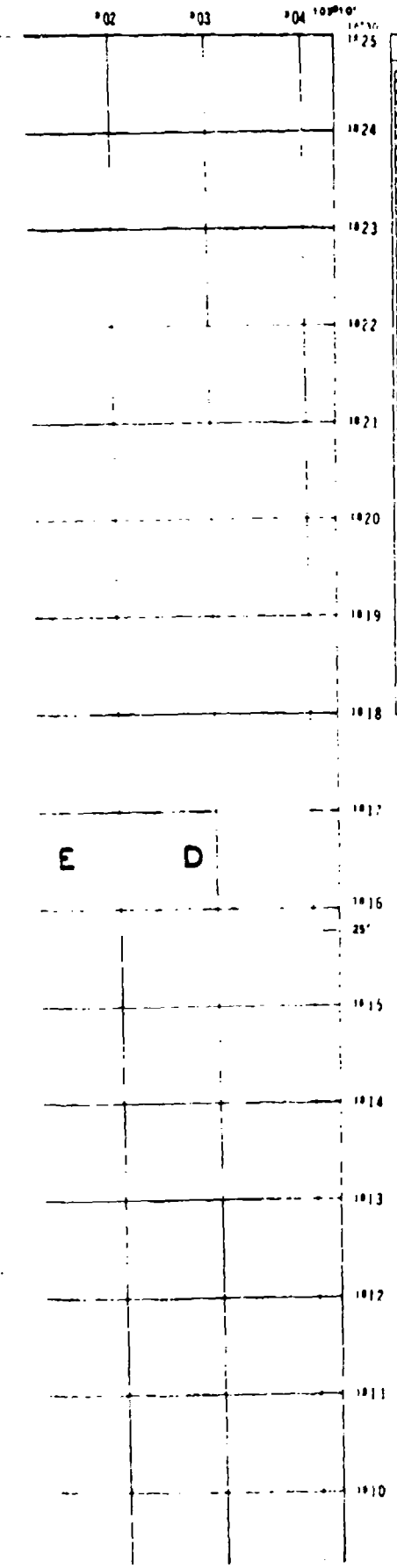
Walls do not occur on this map.



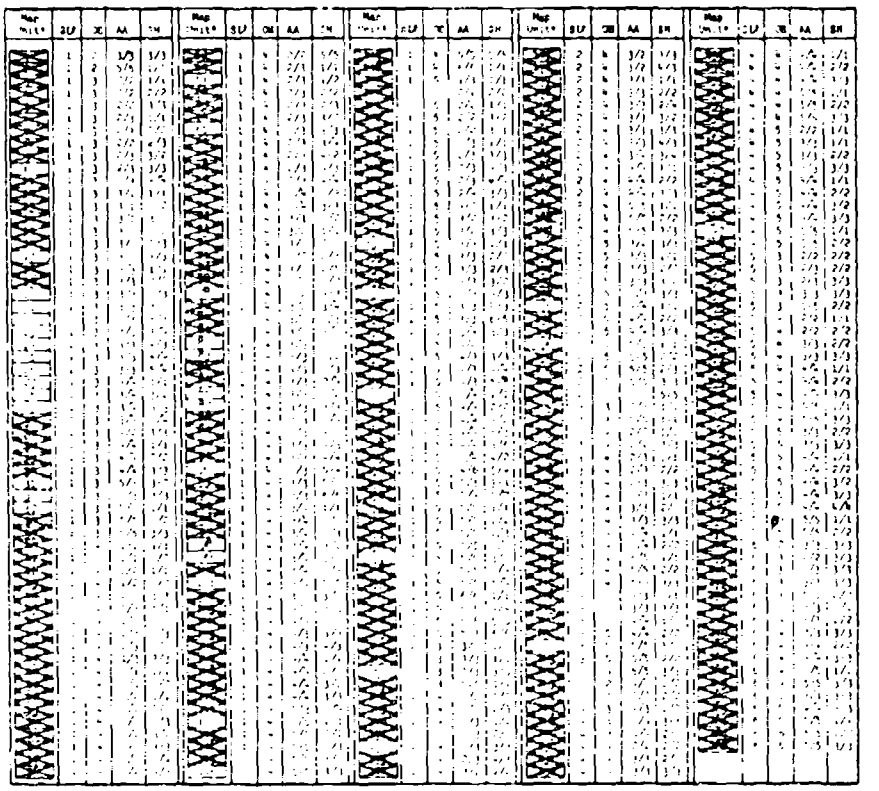
INDEX TO ADJ

4

SHEET KK III



LEGEND



Retaining wall, sheet pile and water bodies.

* Each map unit represents an array of four symbols (i.e. 1/1, 1/2, 1/3, 1/4) indicating mapping classes of slope (SL) (see diagram below), width of bench (BW) and angle of bench face (AA) and step height (SH). Project cut to contour = indicate that bench slopes were mapped. The numeral 0 (i.e. bench width less than unit) will be omitted while interpreting a map (i.e. 10/0 = 10/-).

* Mapping class ranges of each symbol vary for each

Slope (SL)

Mapping Class	Range (deg)
1	<5
2	> 5 <15
3	> 15 <25
4	> 25 <35
5	> 35 <45
6	> 45

Width of Bench (BW)

Mapping Class	Range	
	m	ft
1	<7	<23
2	> 7 <12	> 23 <39
3	> 12 <15	> 39 <49
4	> 15 <25	> 49 <82
5	> 25	> 82

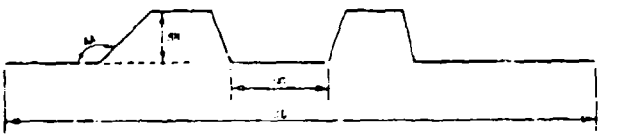
Azimuth Angle (AA)

Mapping Class	Range (deg)
1	< 11.25
2	> 11.25 < 33.75
3	> 33.75 < 56.25
4	> 56.25 < 78.75
5	> 78.75 < 101.25
6	> 101.25 < 123.75
7	> 123.75 < 146.25
8	> 146.25 < 168.75
9	> 168.75

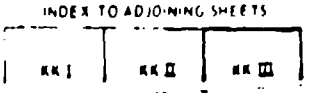
Step Height (SH)

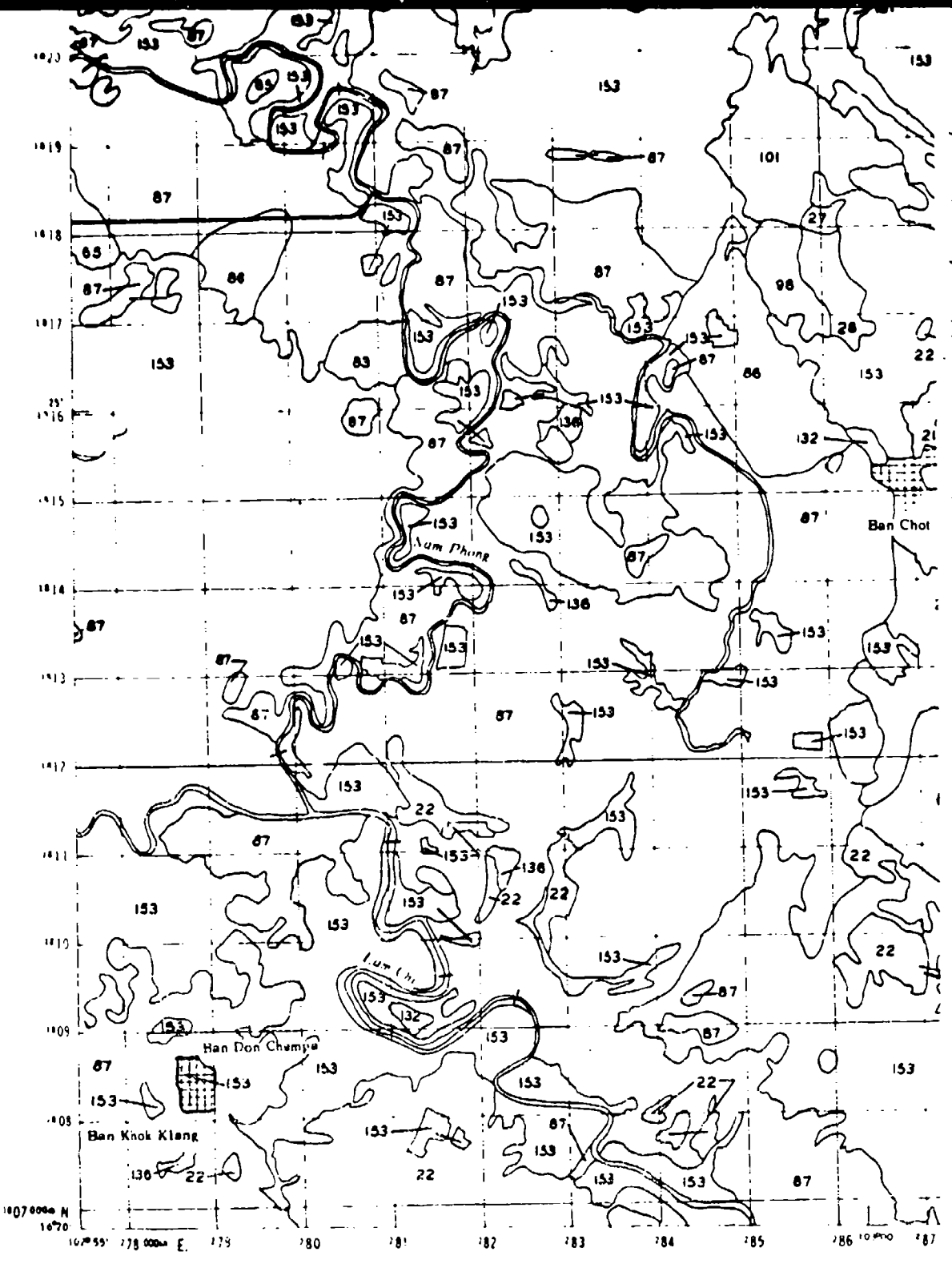
Mapping Class	Range	
	m	ft
1	<5	<16
2	> 5 <10	> 16 <33
3	> 10 <15	> 33 <49
4	> 15 <20	> 49 <66
5	> 20 <25	> 66 <82
6	> 25 <30	> 82 <98
7	> 30 <35	> 98 <115
8	> 35	> 115

Units to not occur on this map.



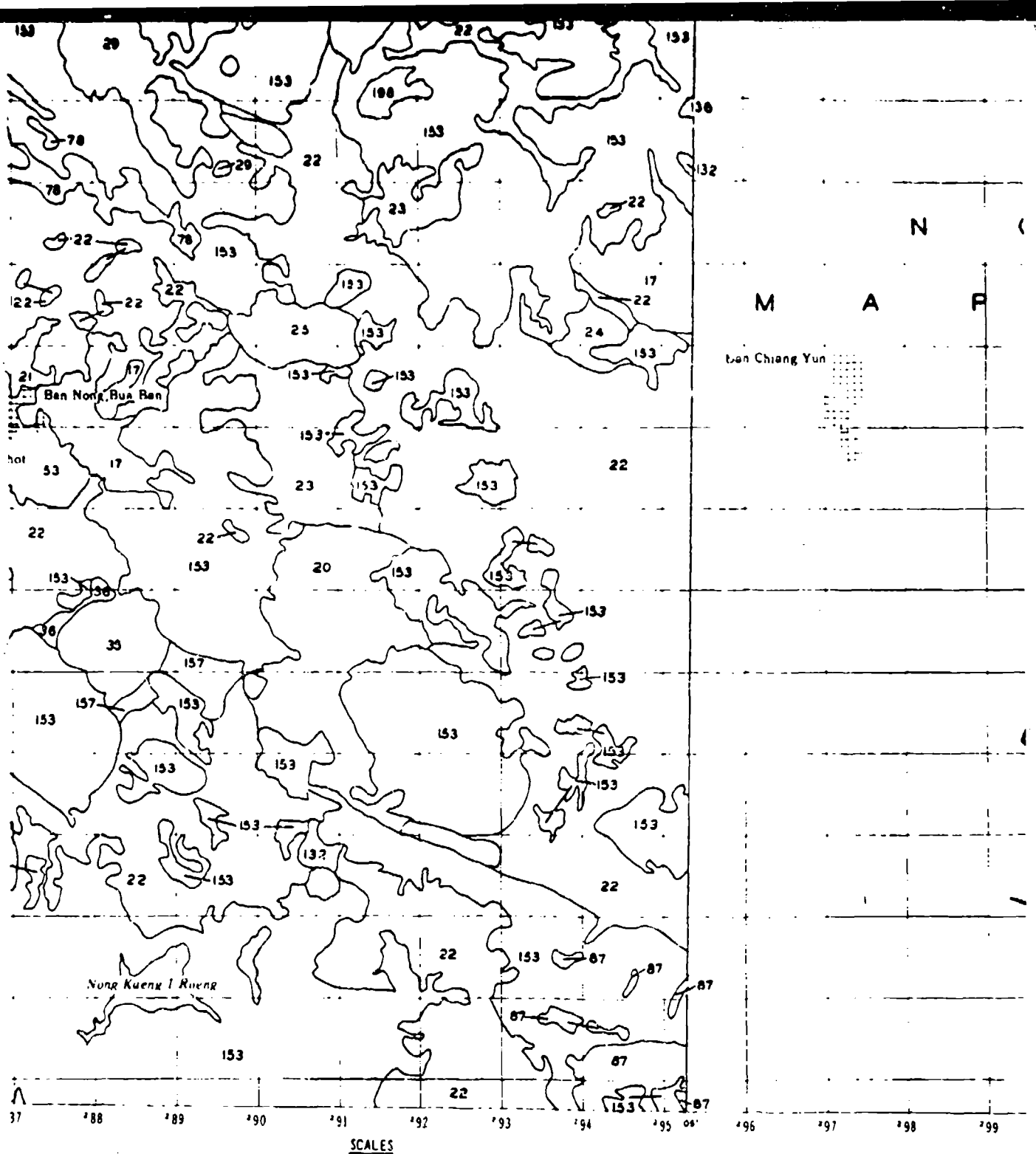
INDEX TO ADJOINING SHEETS



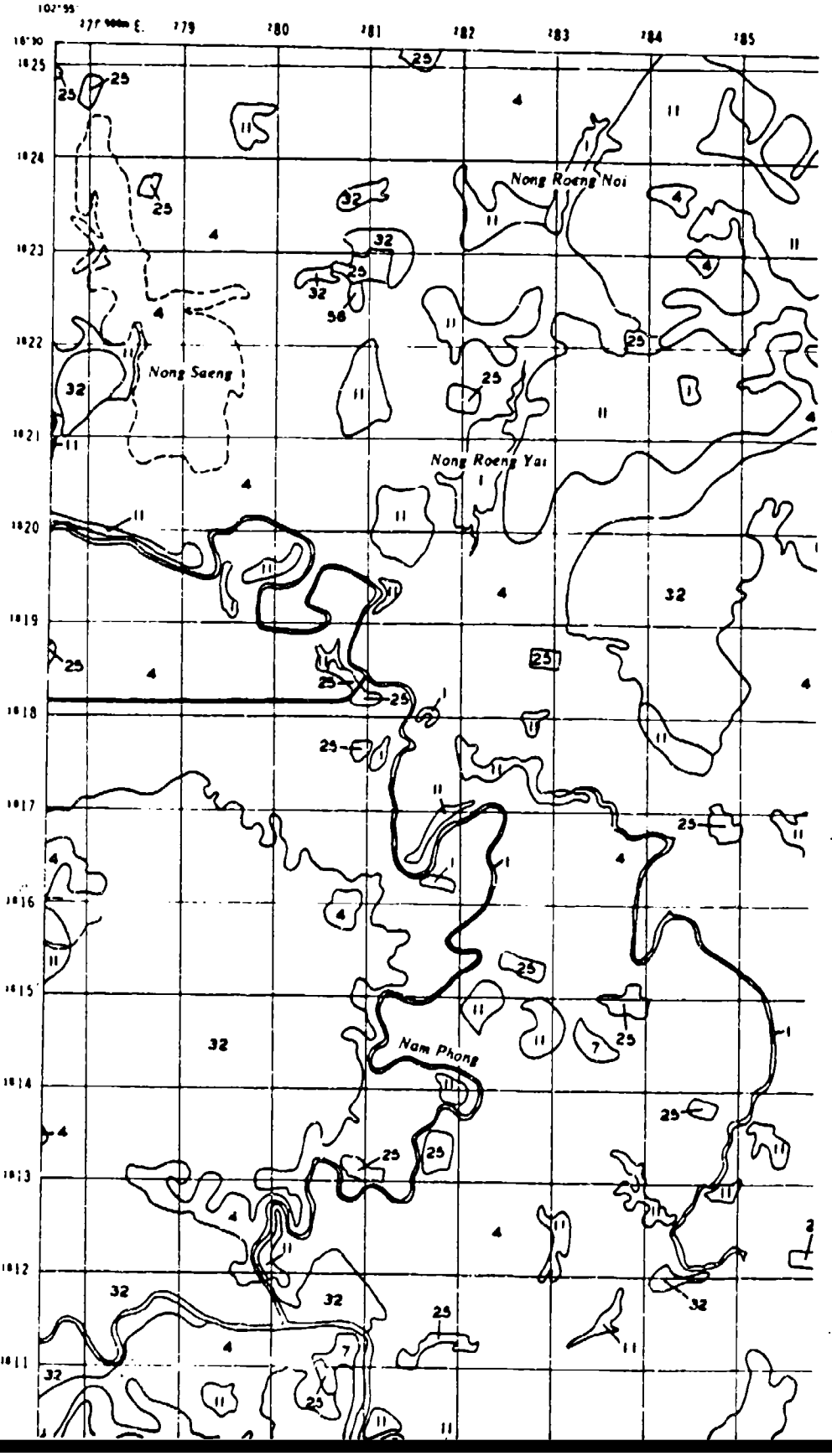


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION 48Q

5

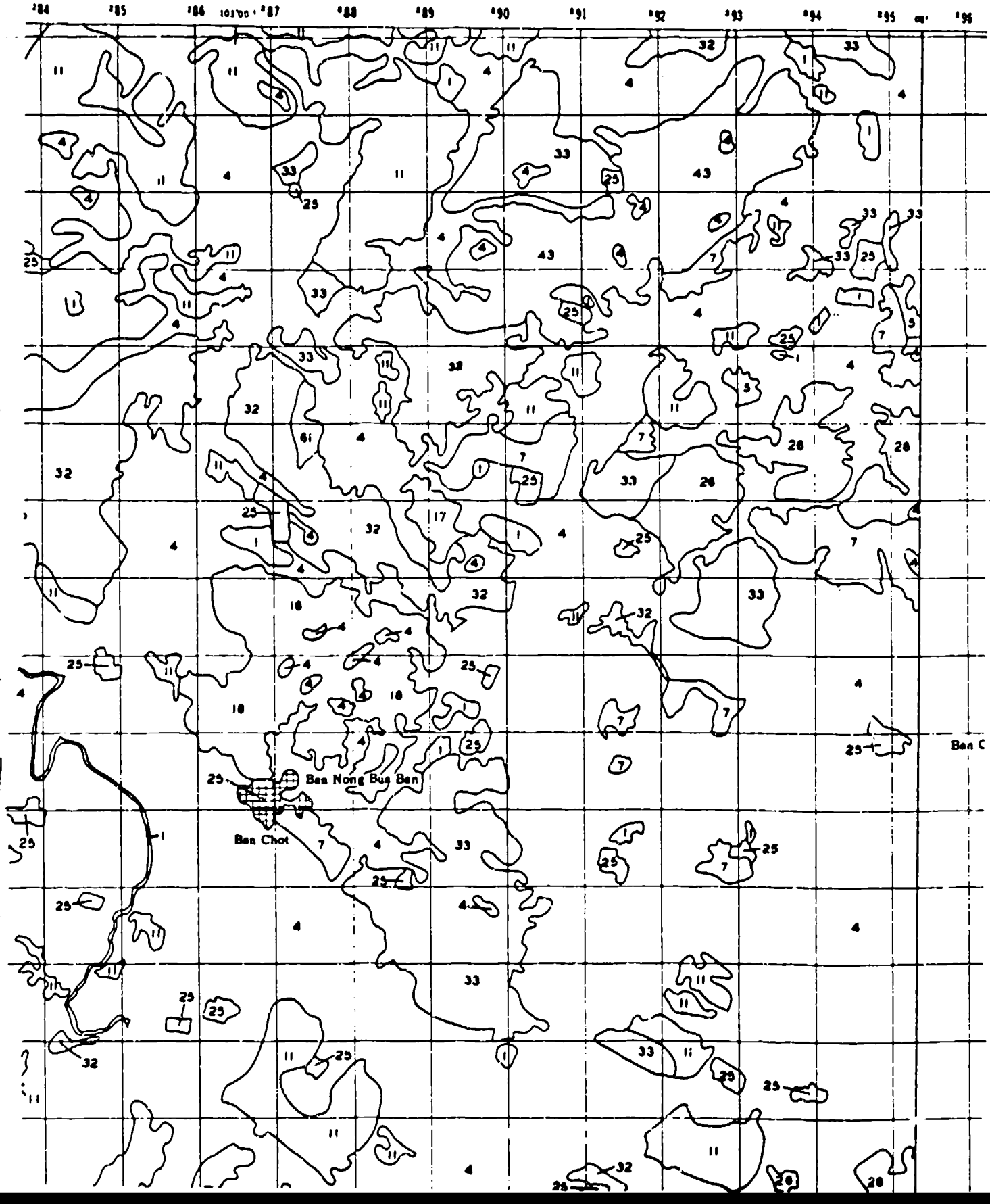


6


Nong Roeng Noi
Nong Saeng
Nong Roeng Yai
Nam Phong

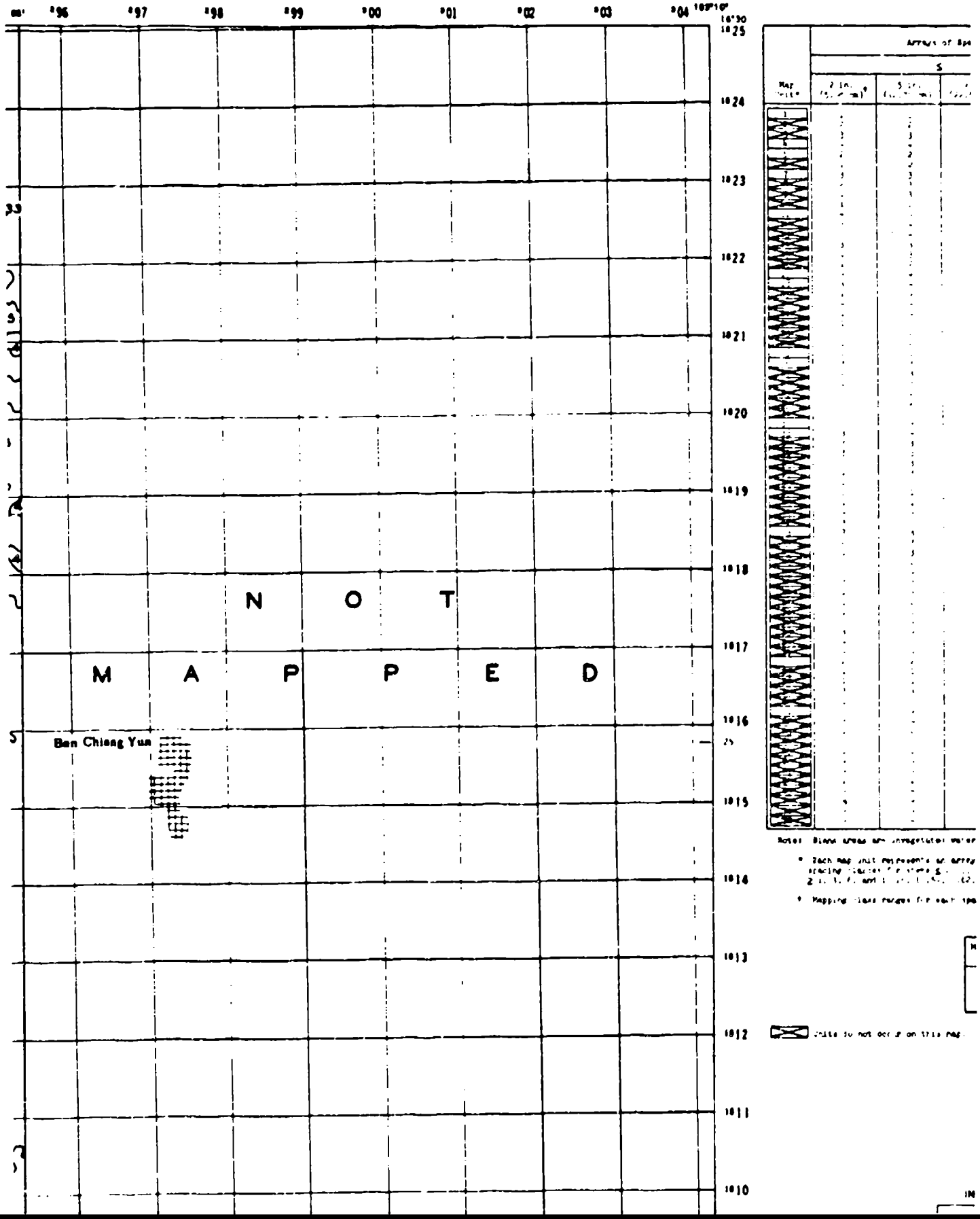
2

KHON KAEN



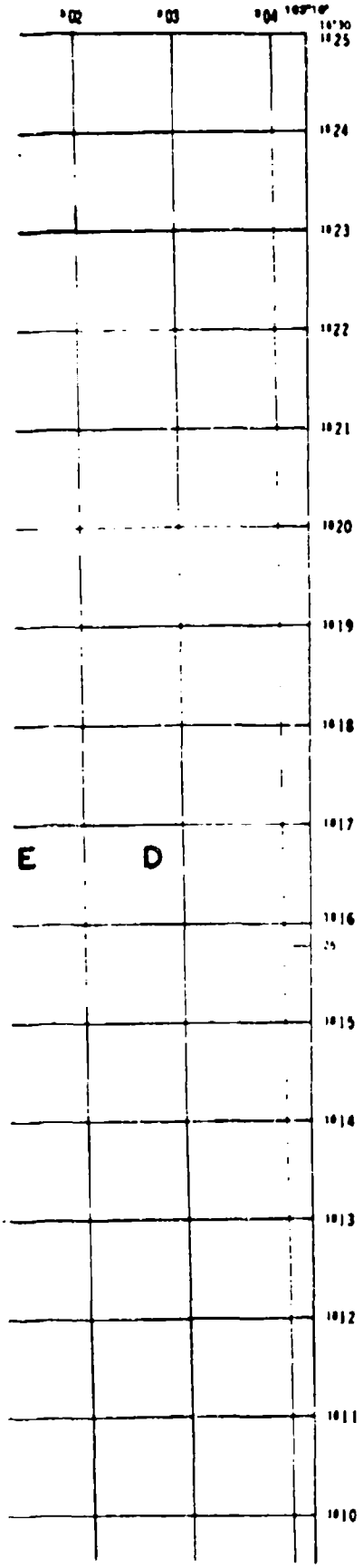
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SHEET KK III

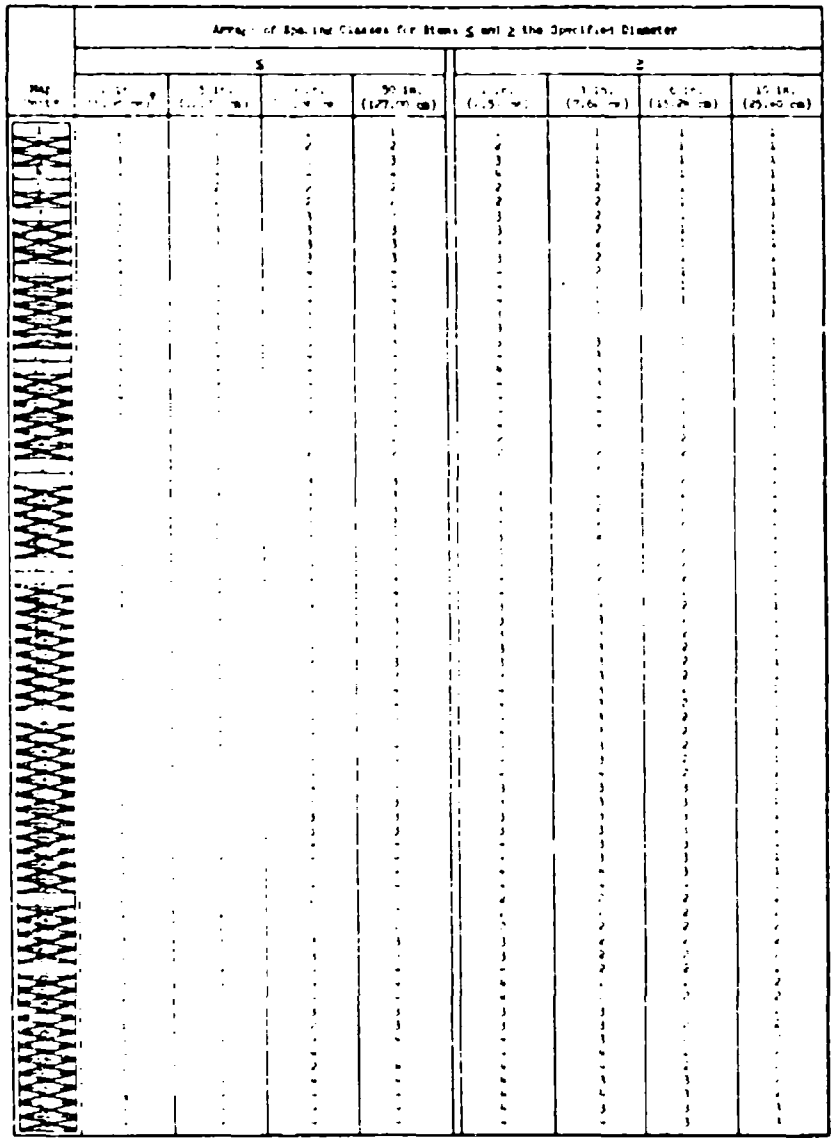


4

SHEET KK III



LEGEND



Note: Blank areas are of negligible water bodies

* Each map unit represents an array of eight symbols (i.e., 1, 1, 1, 1, 1, 1, 1, 1) indicating spacing classes for items ≤ and ≥ 1/2 in. (1.3, 2.5, 5.1, 7.6, 12.7, 20.3, 30.5, and 127.0 cm) and 2 in. (5.1, 7.6, 12.7, 20.3, 30.5, 45.7, 61.0, and 127.0 cm).

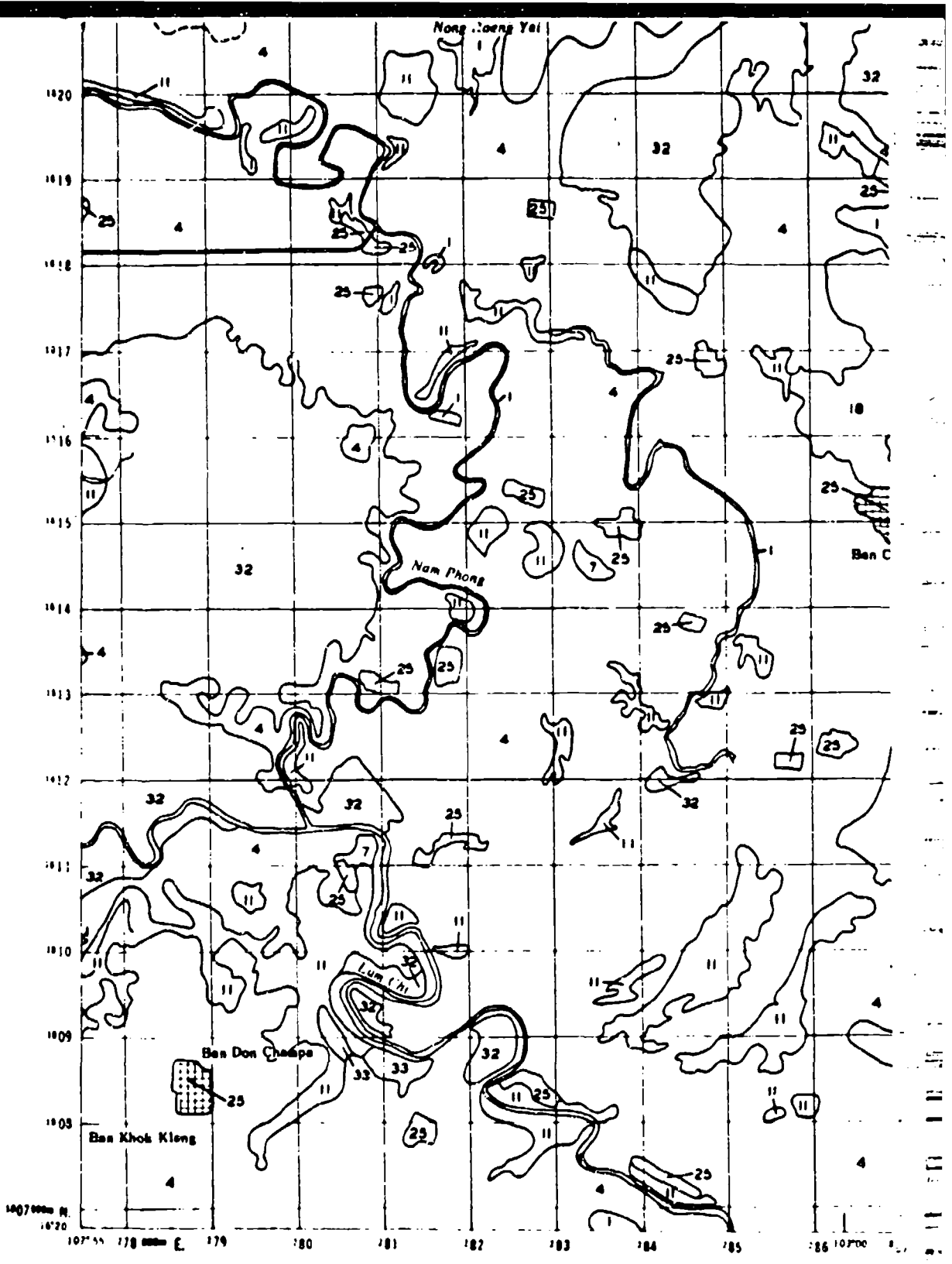
† Mapping unit numbers for each spacing class map

Item Spacing

Mapping Class	Range	
	ft	m
1	> 3	> 0.91
2	> 1.5-3	> 0.46-0.91
3	> 0.5-1.5	> 0.15-0.46
4	0-0.5	0-0.15

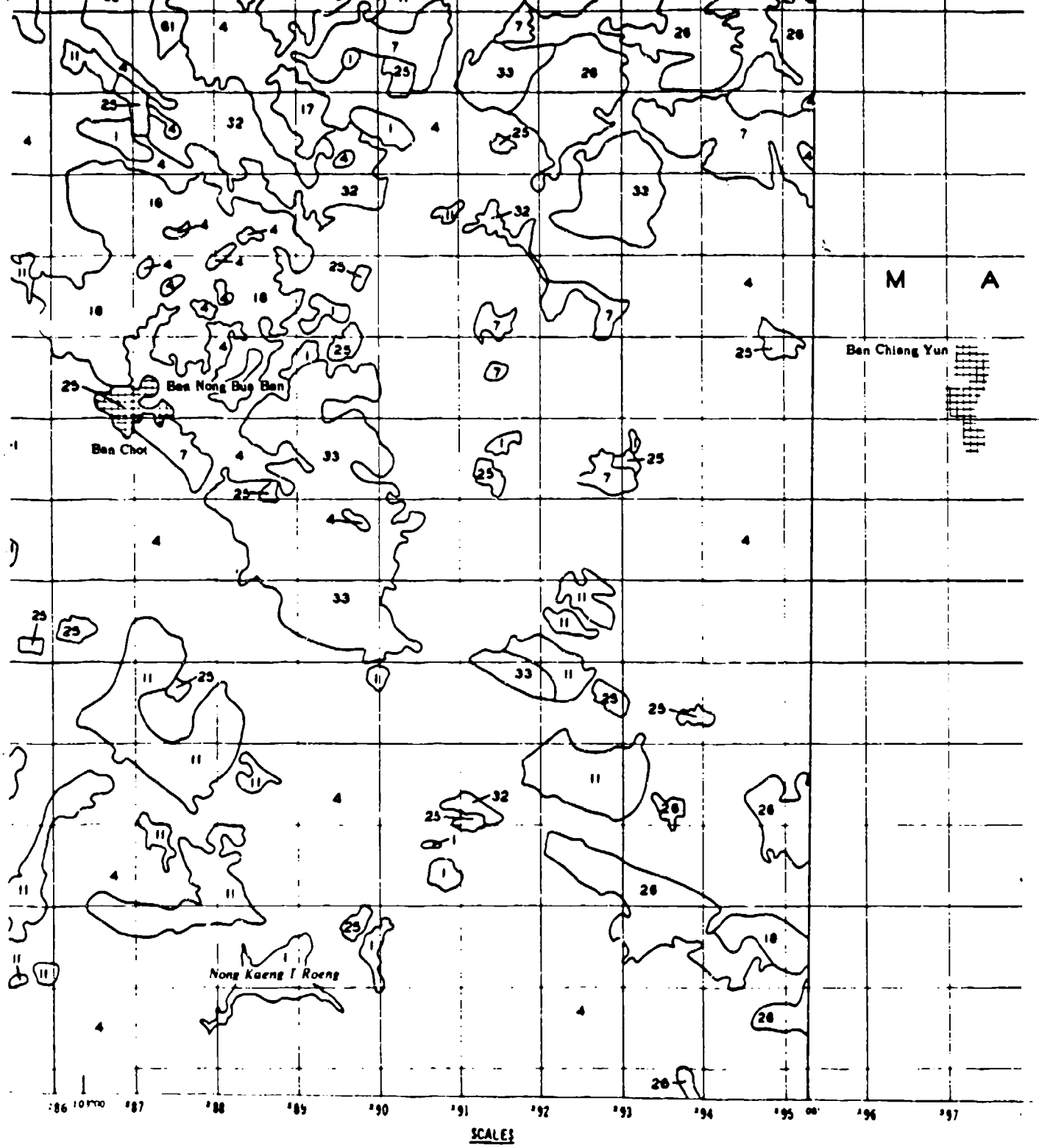
Lines do not close on this map

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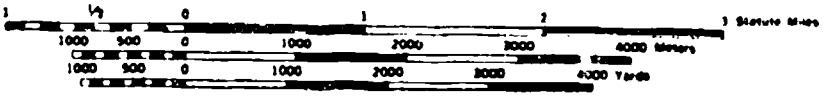


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48Q

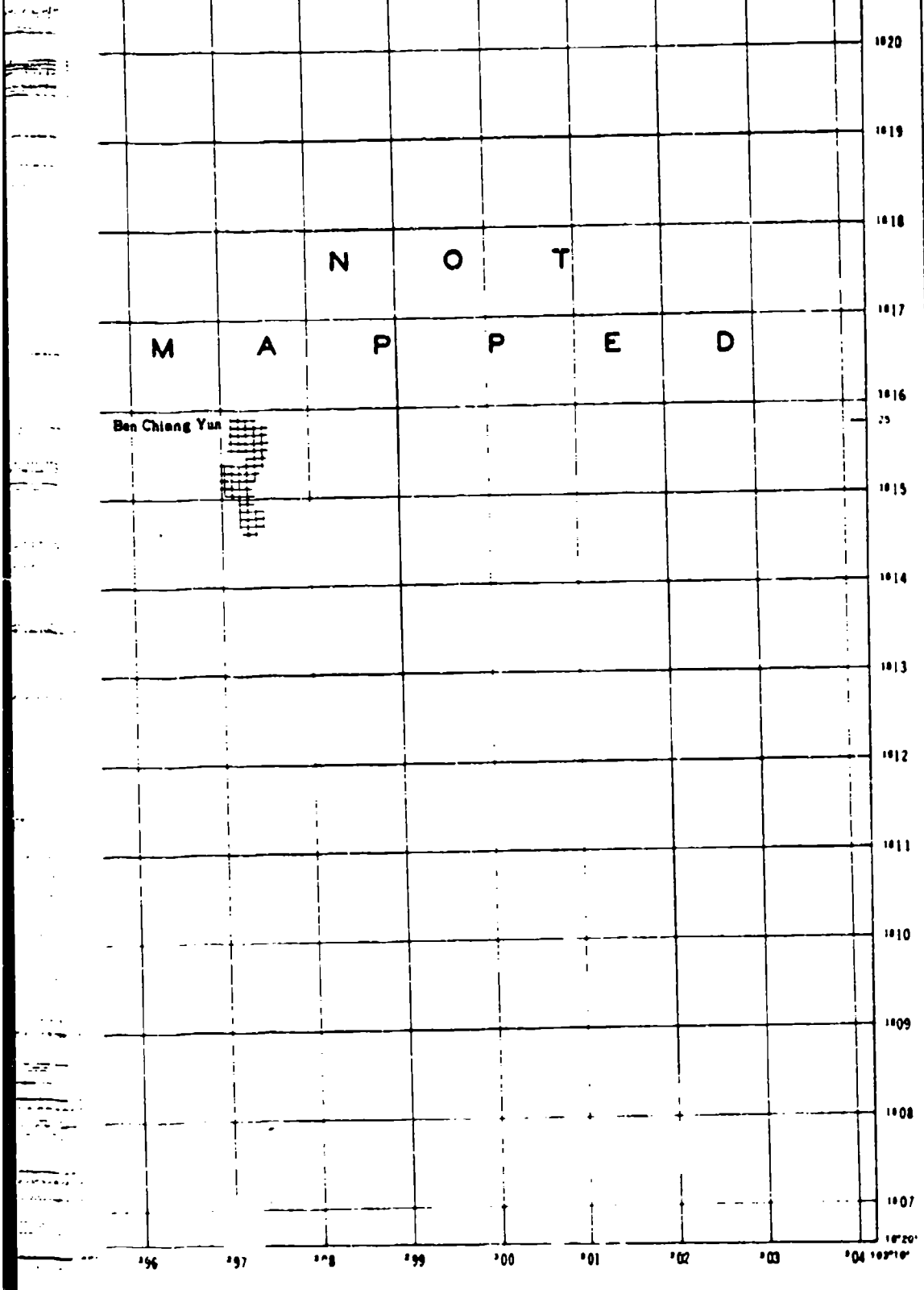
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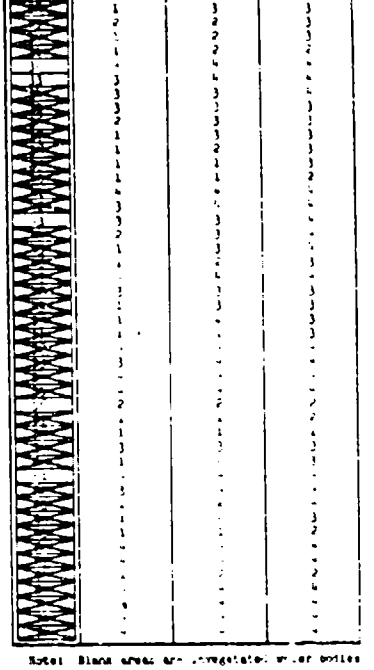

M A
Ban Chieng Yun
Ban Nong Bua Ban
Ban Chot
Nong Kaeng T Roeng
86
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97

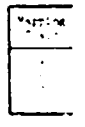
SCALES



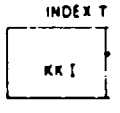
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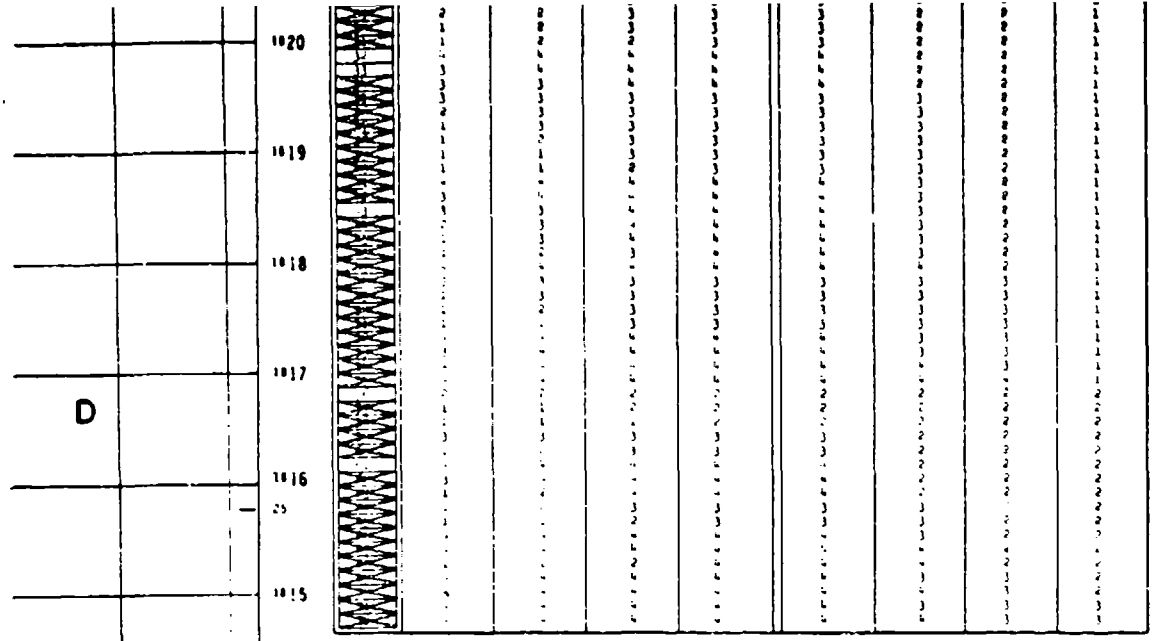




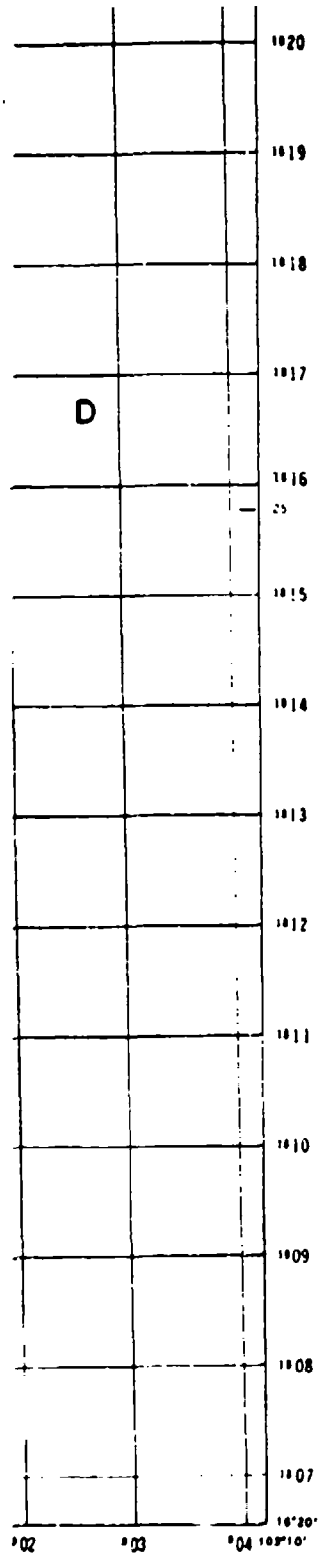


A QUANTITATIVE M
TERRAIN FOR
VEG
KHON KAI
SHE

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Note: Black areas are inundated water bodies.



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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

KHON KAEN STUDY AREA

SHEET KK III

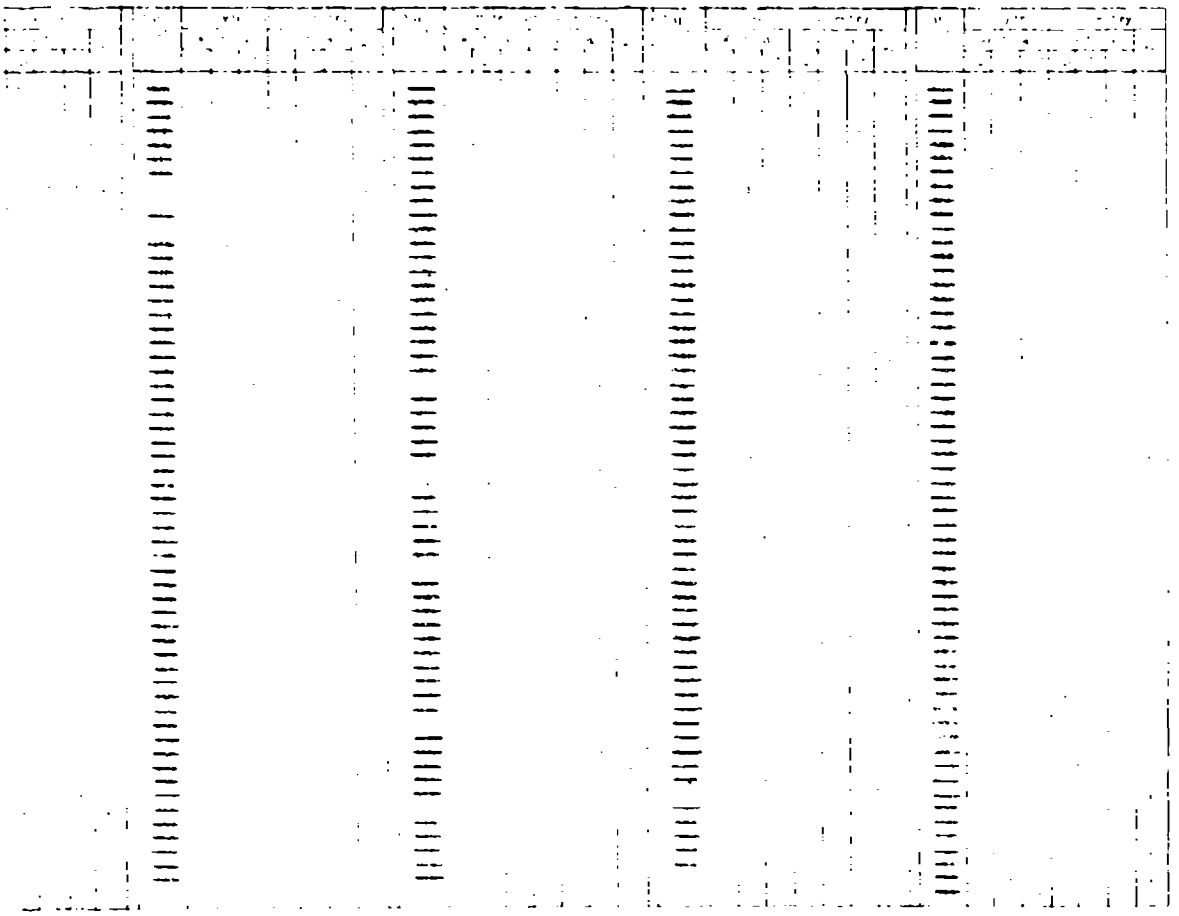
PLATE 5.3c

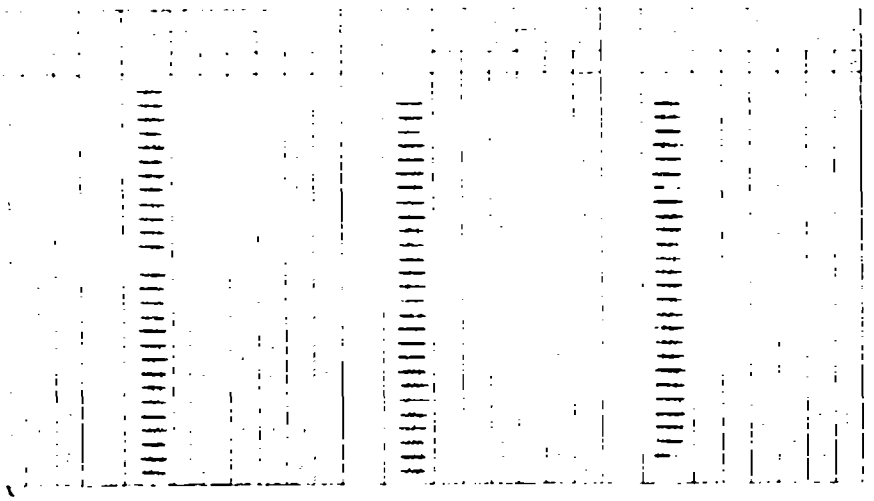
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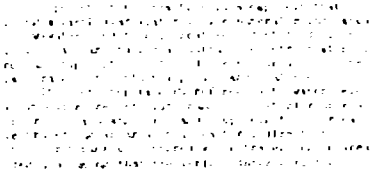
LEGEND

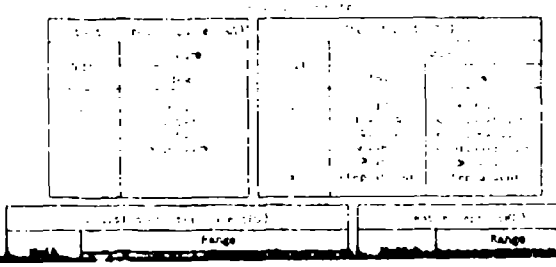


† Class ranges for each factor map

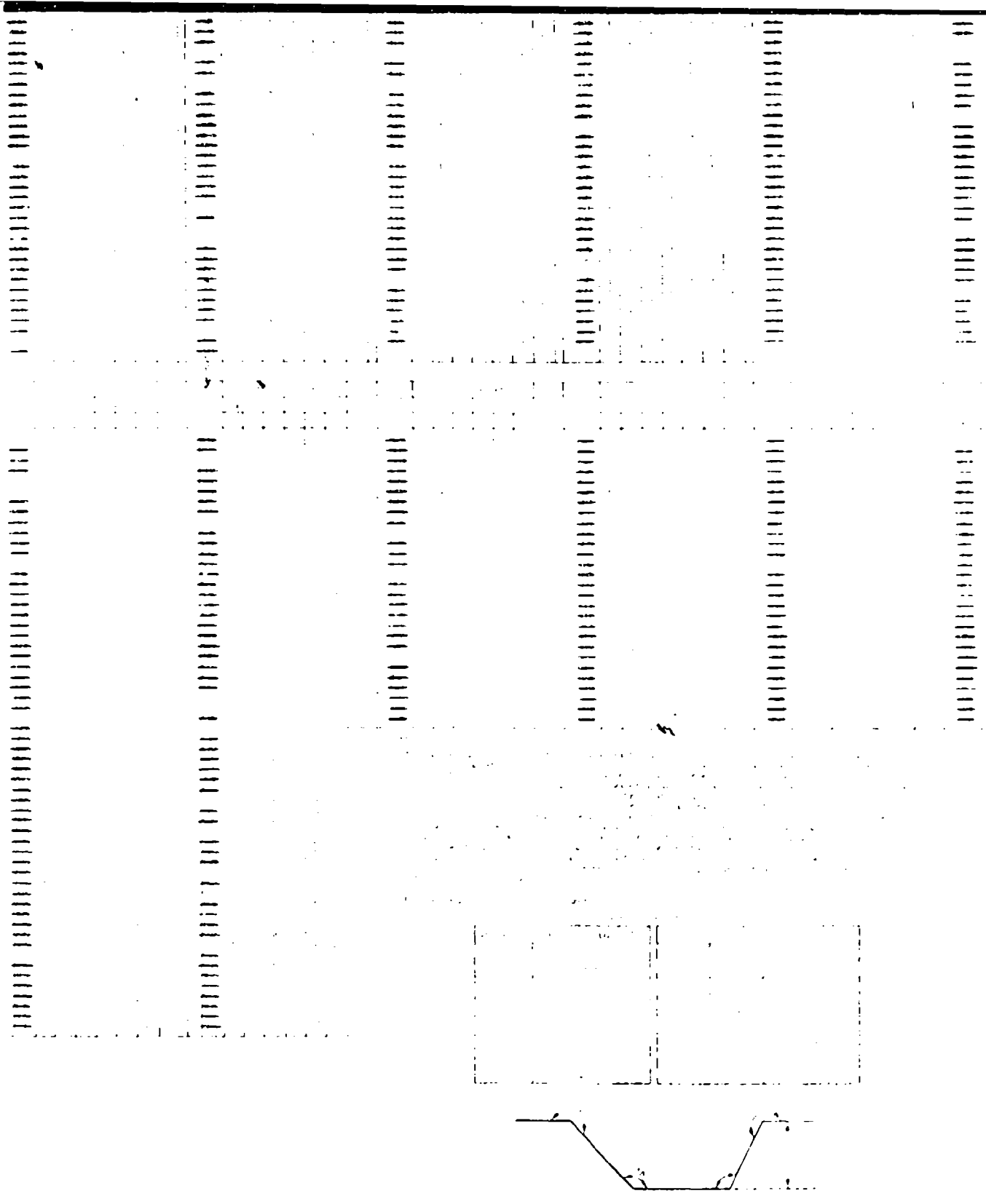


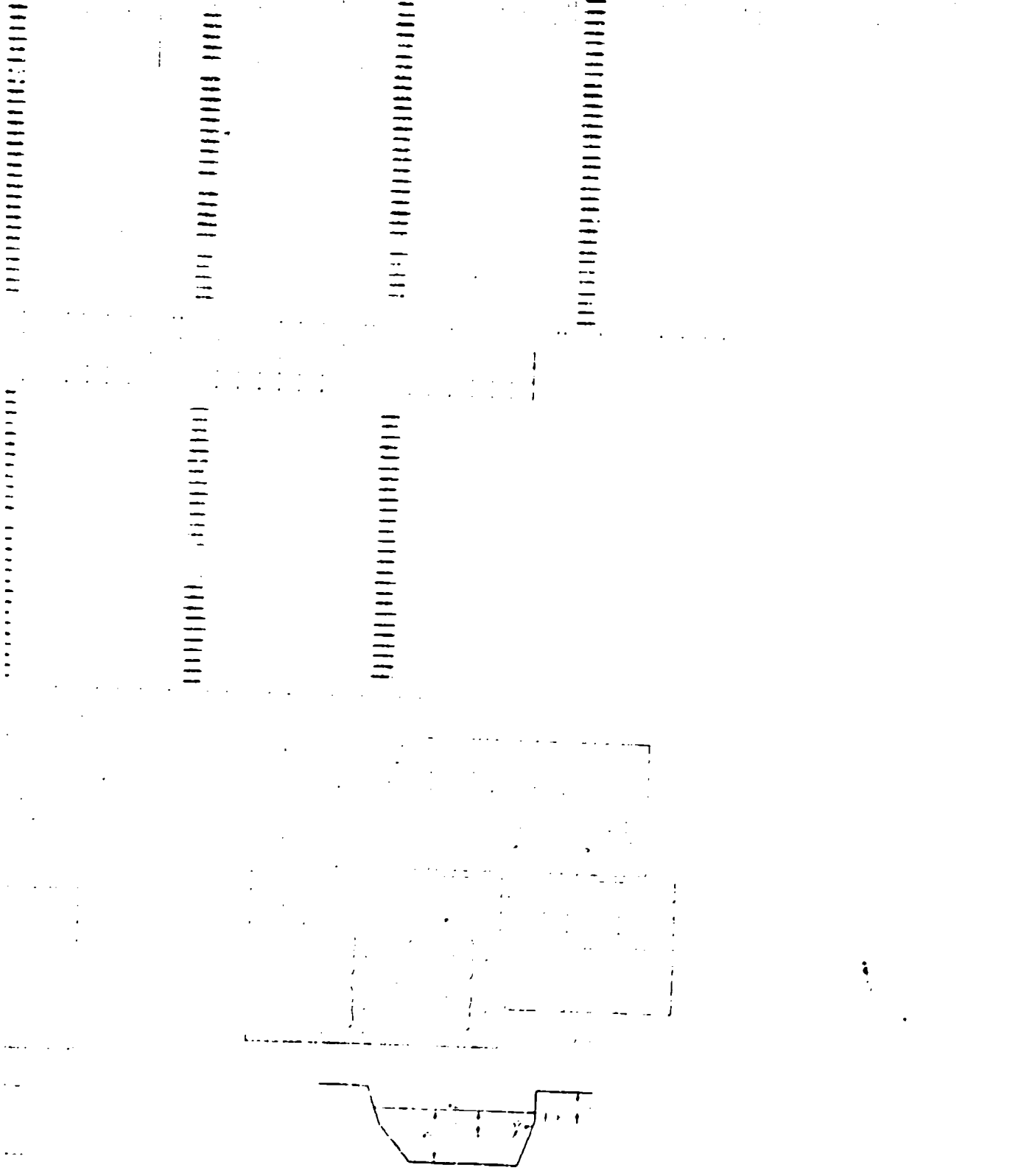


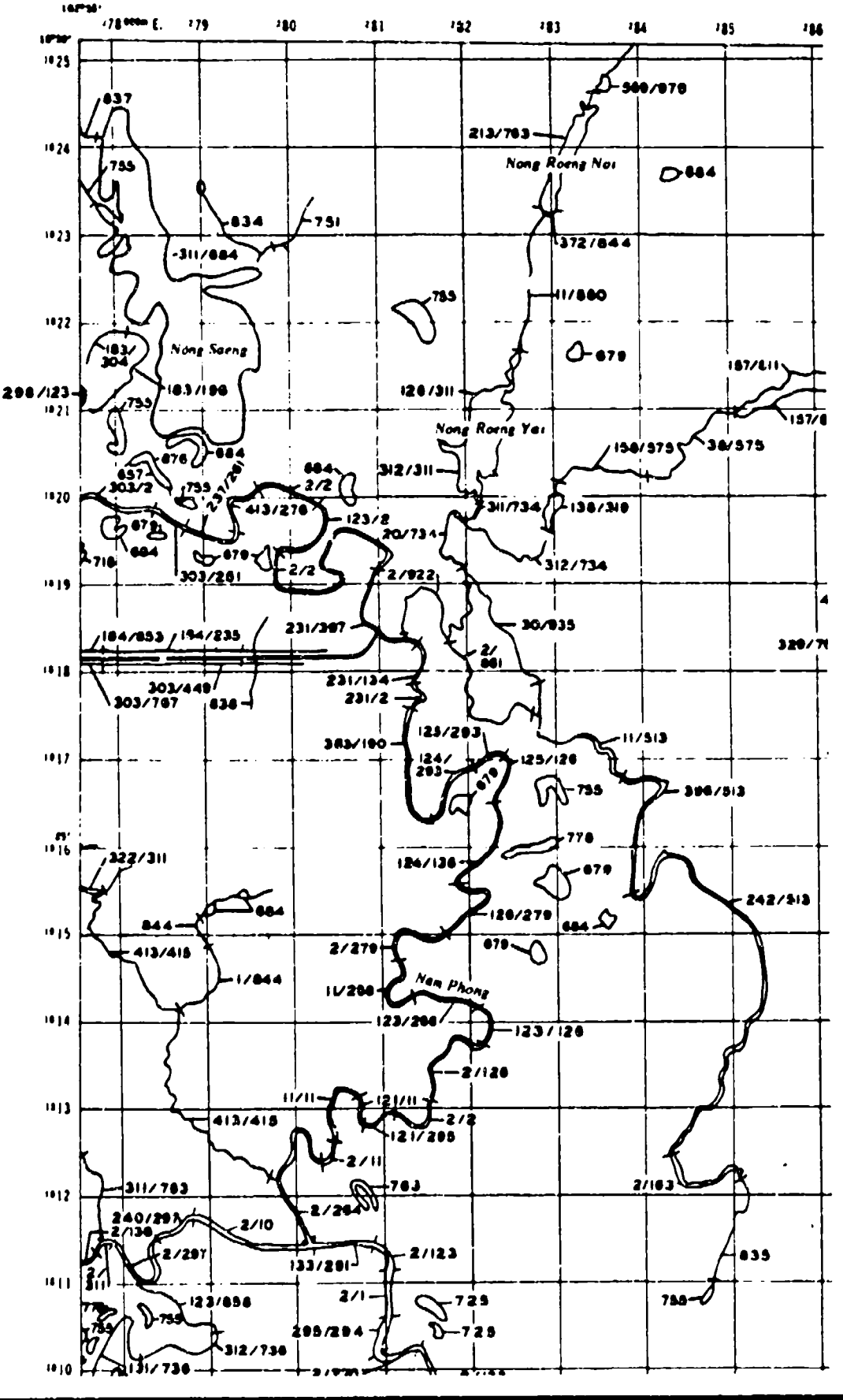




Step Height (AM)

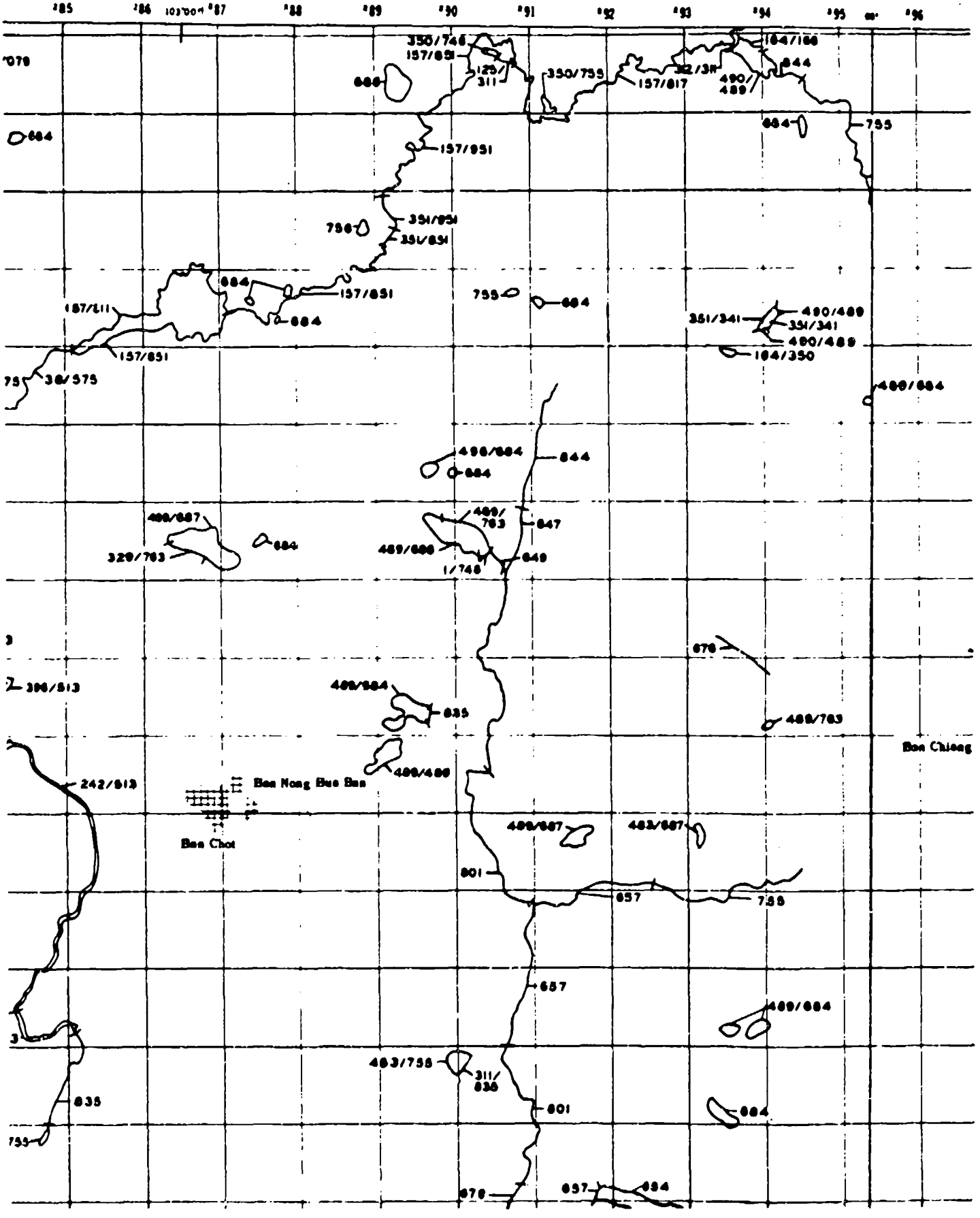





Nong Roeng Nai
Nong Saeng
Nong Roeng Yai
Nam Phong

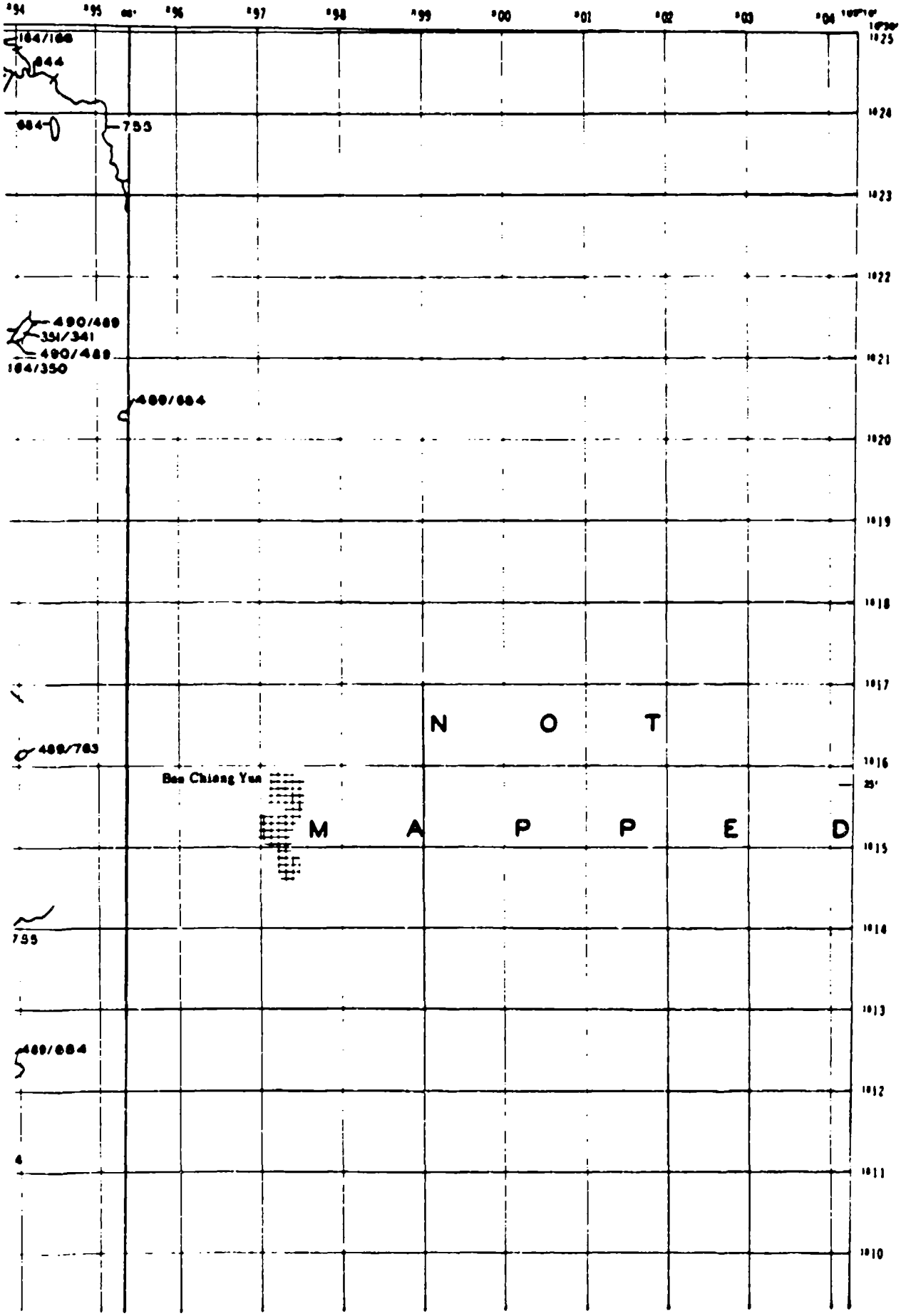
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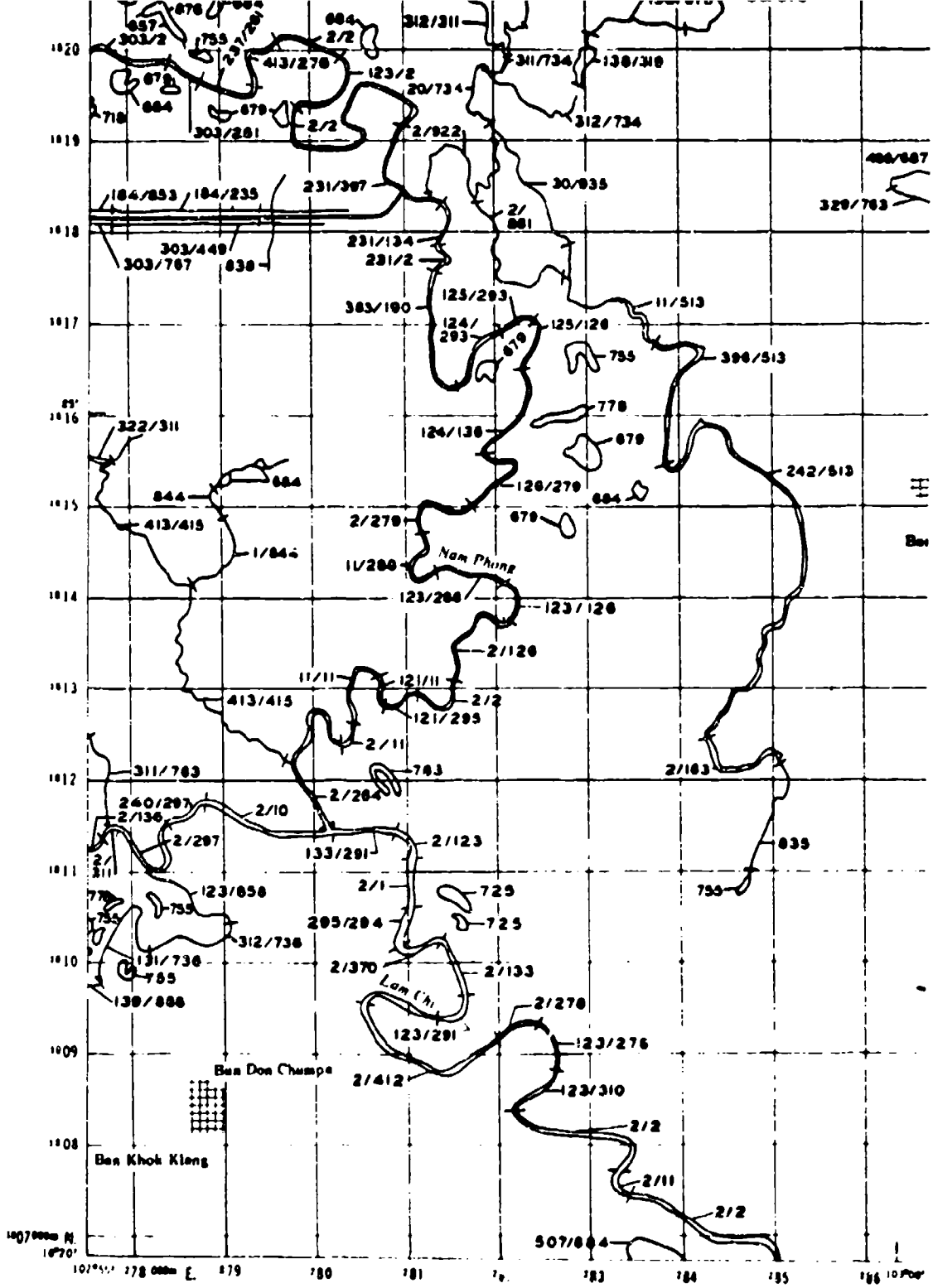
KHON KAEN



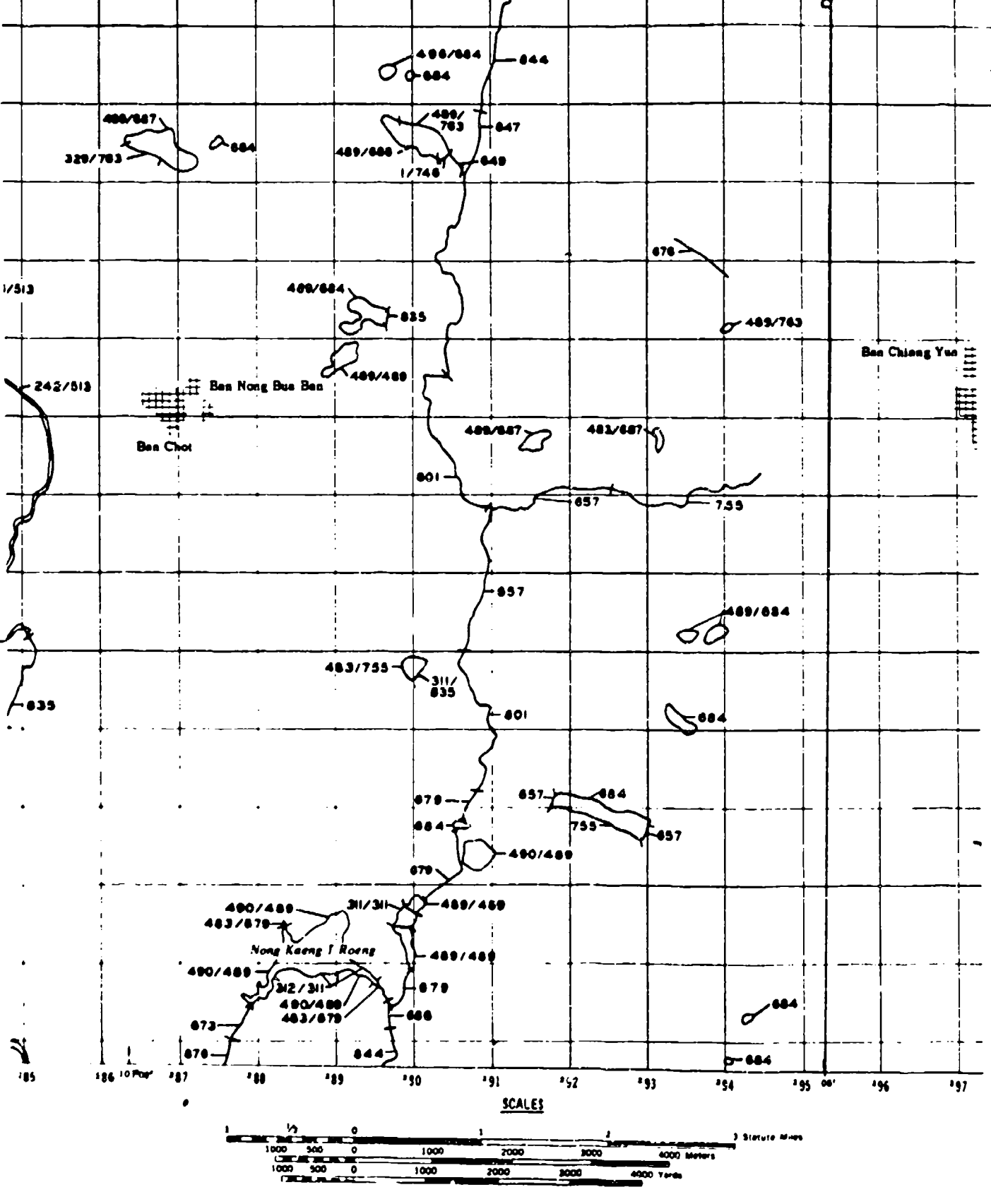
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SHEET KK III

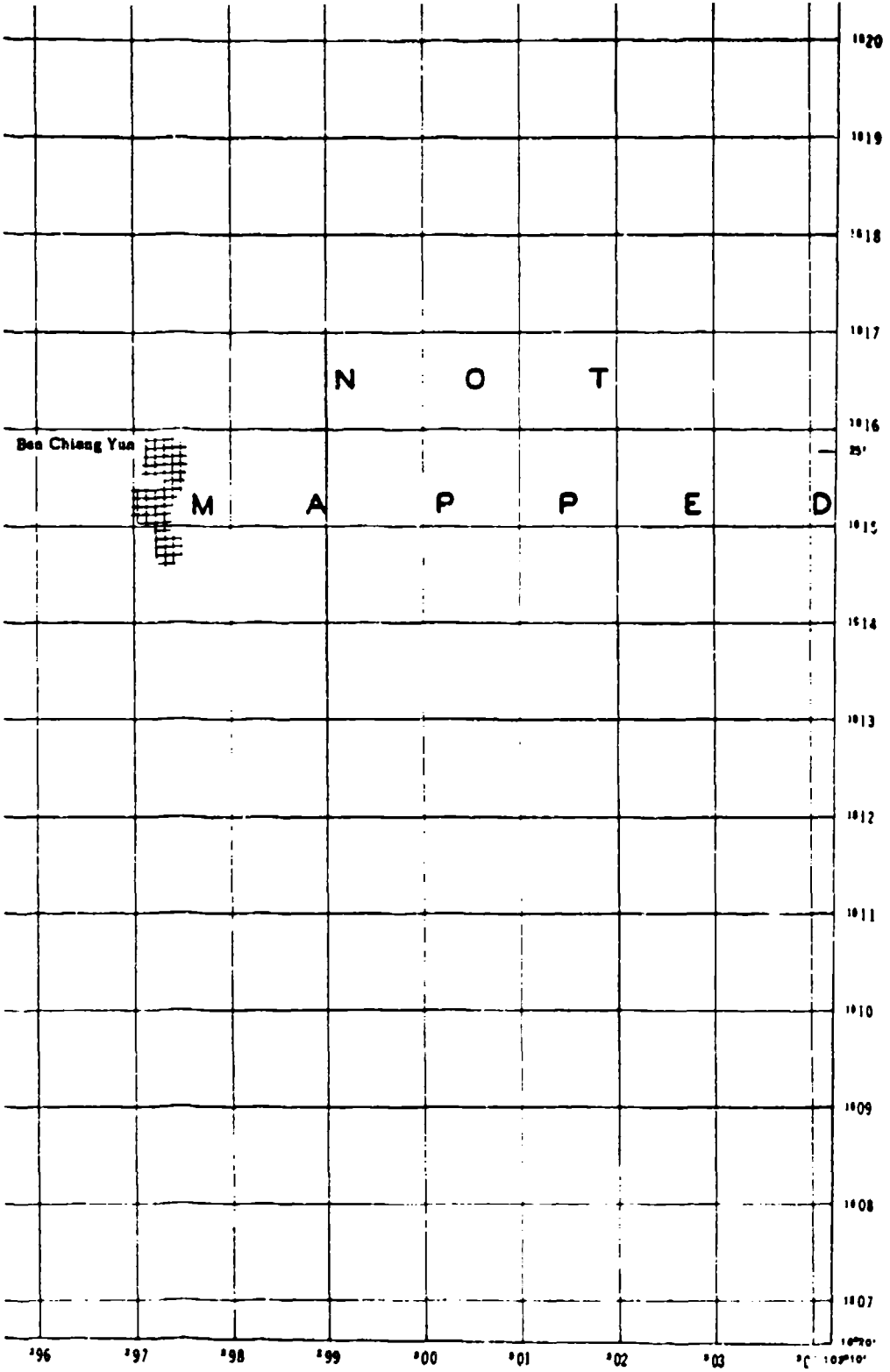




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION. 48Q


Ban Nong Bua Ban
Ban Chot
Ban Chiang Yun
Nong Kaeng I Roeng
SCALES

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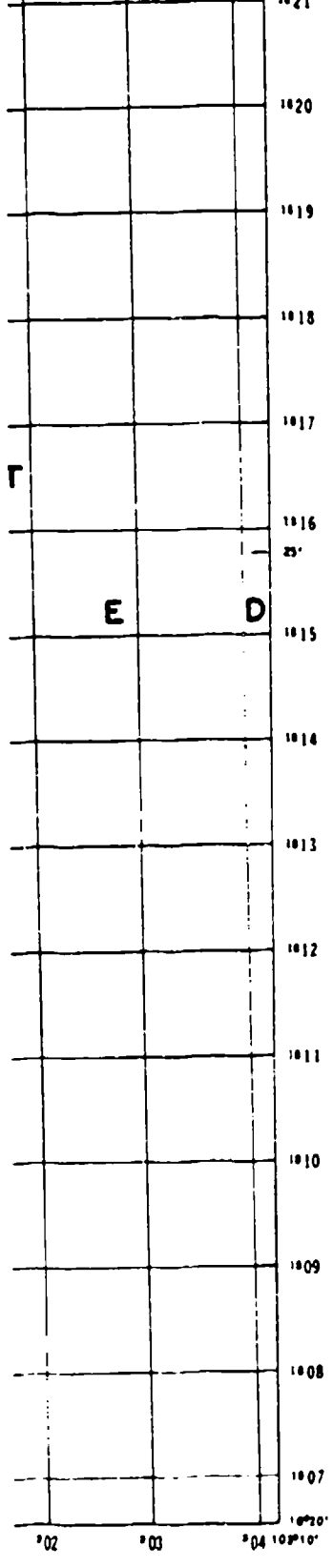


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TERRAIN FOR
HYDROLOG
KHON KAE
SHE

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INDEX TO ADJOINING SHEETS

KK I	KK II	KK III

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

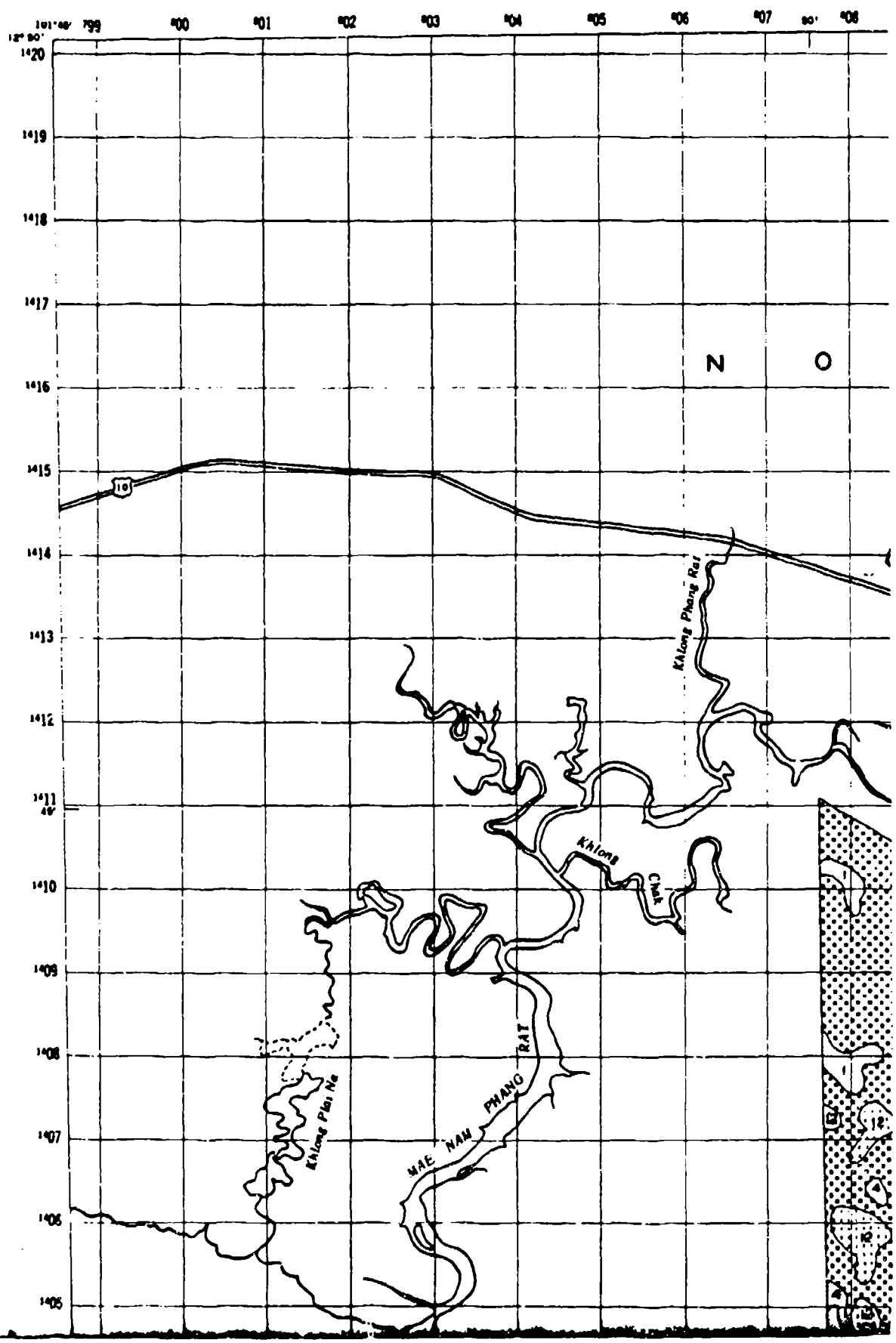
HYDROLOGIC GEOMETRY

KHON KAEN STUDY AREA

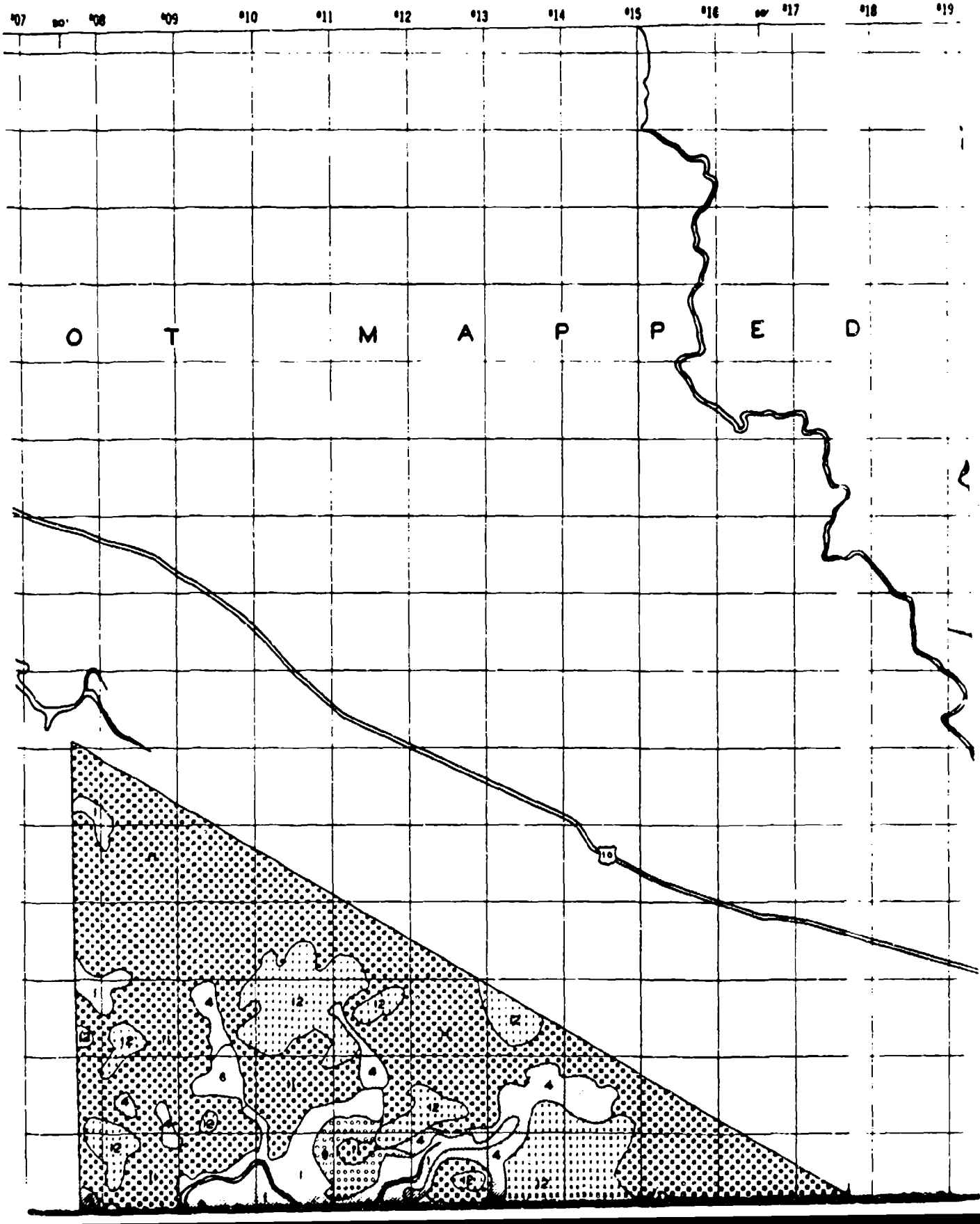
SHEET KK III

7

PLATE 5.3d

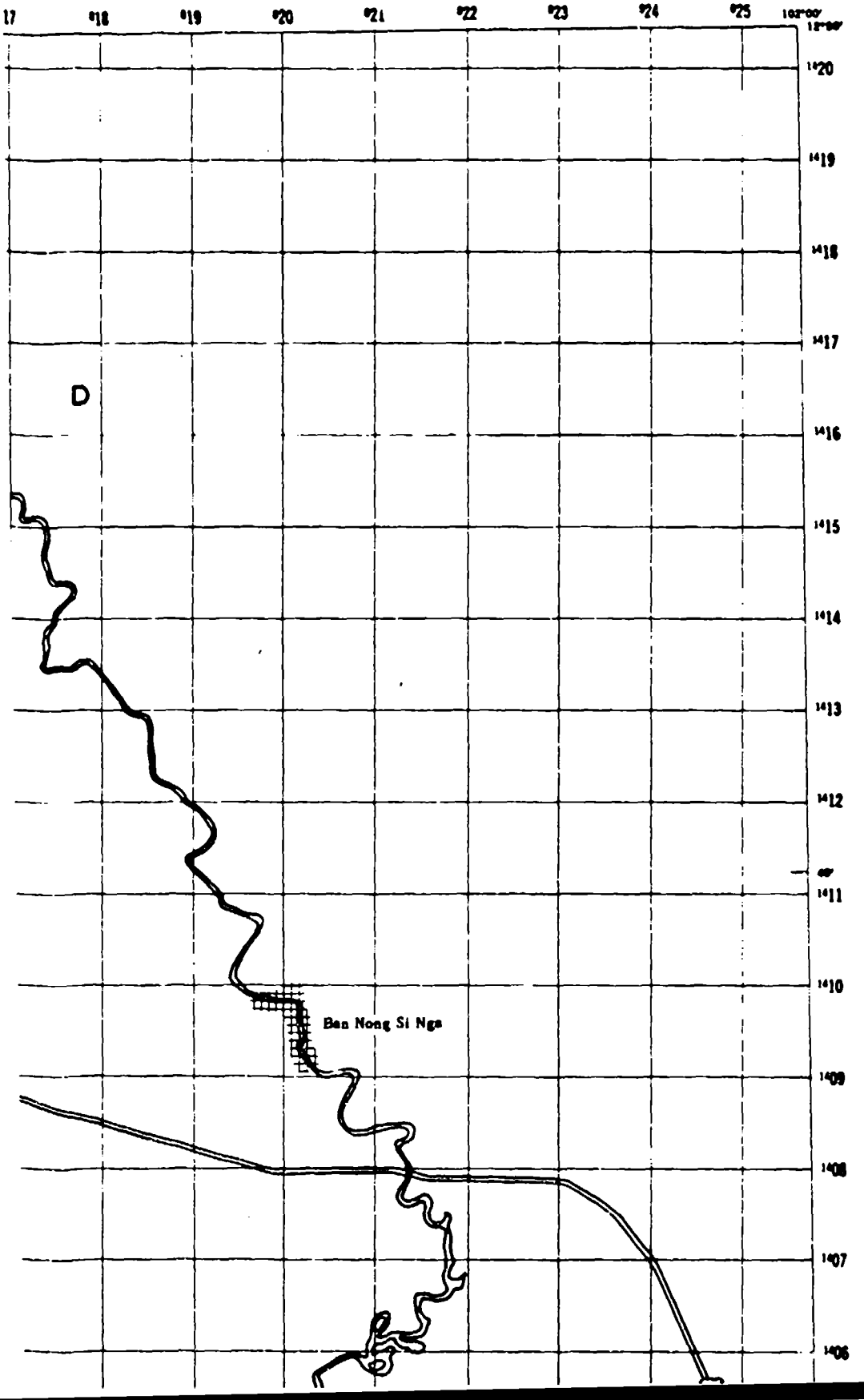

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N
O
10
Khlong Phang Rai
Khlong Chak
Khlong Plai Ha
MAE NAM PHANG RAT

2 CHANTHABURI



3

SHEET C I



Unit	Soil Mass Strength: Maximum Moisture — MCI	Soil Mass Strength: Minimum Moisture — MCI	Maximum Rot: c_{up} psi	Maximum Rot: c_{up} kg/cm²
1	10-25	25-60	0-1	0-0.07
2	25-60	60-100	0-1	0-0.07
3	25-60*	60-100	0-1	0-0.07
4	25-60	>100	0-1	0-0.07
5	25-60*	>100	0-1	0-0.07
6	60-100	60-100	0-1	0-0.07
7	60-100	60-100	0-1	0-0.07
8	60-100	>100	0-1	0-0.07
9	60-100	>100	0-1	0-0.07
10	60-100	>100	0-1	0-0.07
11	60-100*	>100	0-1	0-0.07
12	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07
	Complex of 60-100 and >100	>100	0-1	0-0.07

Note: Blank areas are water bodies.

c_{up} Shear strength at zero normal load.

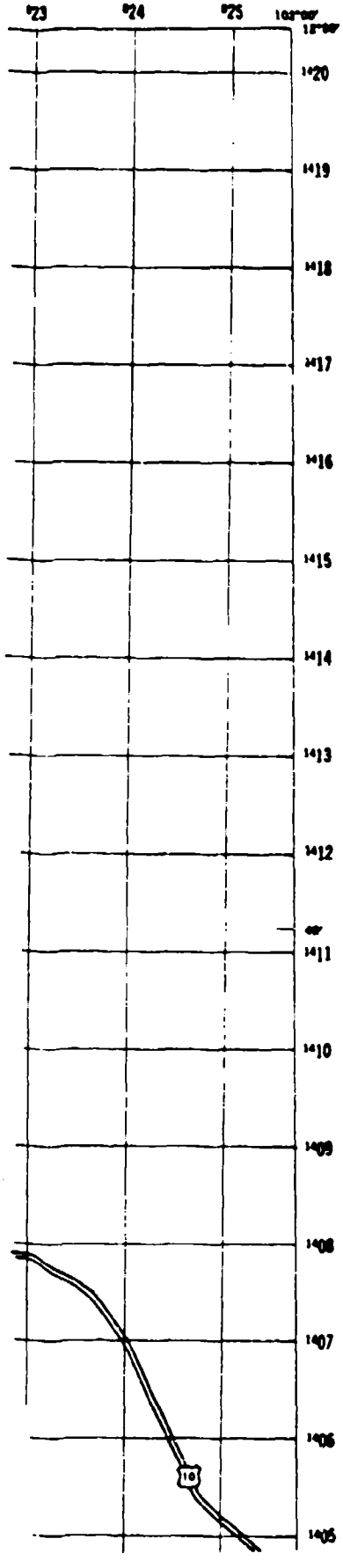
ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 30 percent strengths commonly observed are 60-100 f

Units do not occur on this map.

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SHEET C I



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture c_{uf} psi	Soil Surface Strength: Maximum Moisture c_{uf} kg/cm²	Soil Surface Strength: Maximum Moisture ϕ_{uf} deg	Soil Surface Strength: Minimum Moisture c_{uf} psi	Soil Surface Strength: Minimum Moisture c_{uf} kg/cm²	Soil Surface Strength: Minimum Moisture ϕ_{uf} deg	Conditions where maximum c_{uf} occurs: c_{uf} psi	Conditions where maximum c_{uf} occurs: c_{uf} kg/cm²	Conditions where maximum c_{uf} occurs: ϕ_{uf} deg
1	15-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

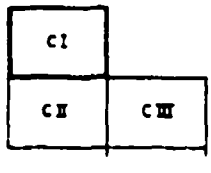
c_{uf} Shear strength at zero normal load.

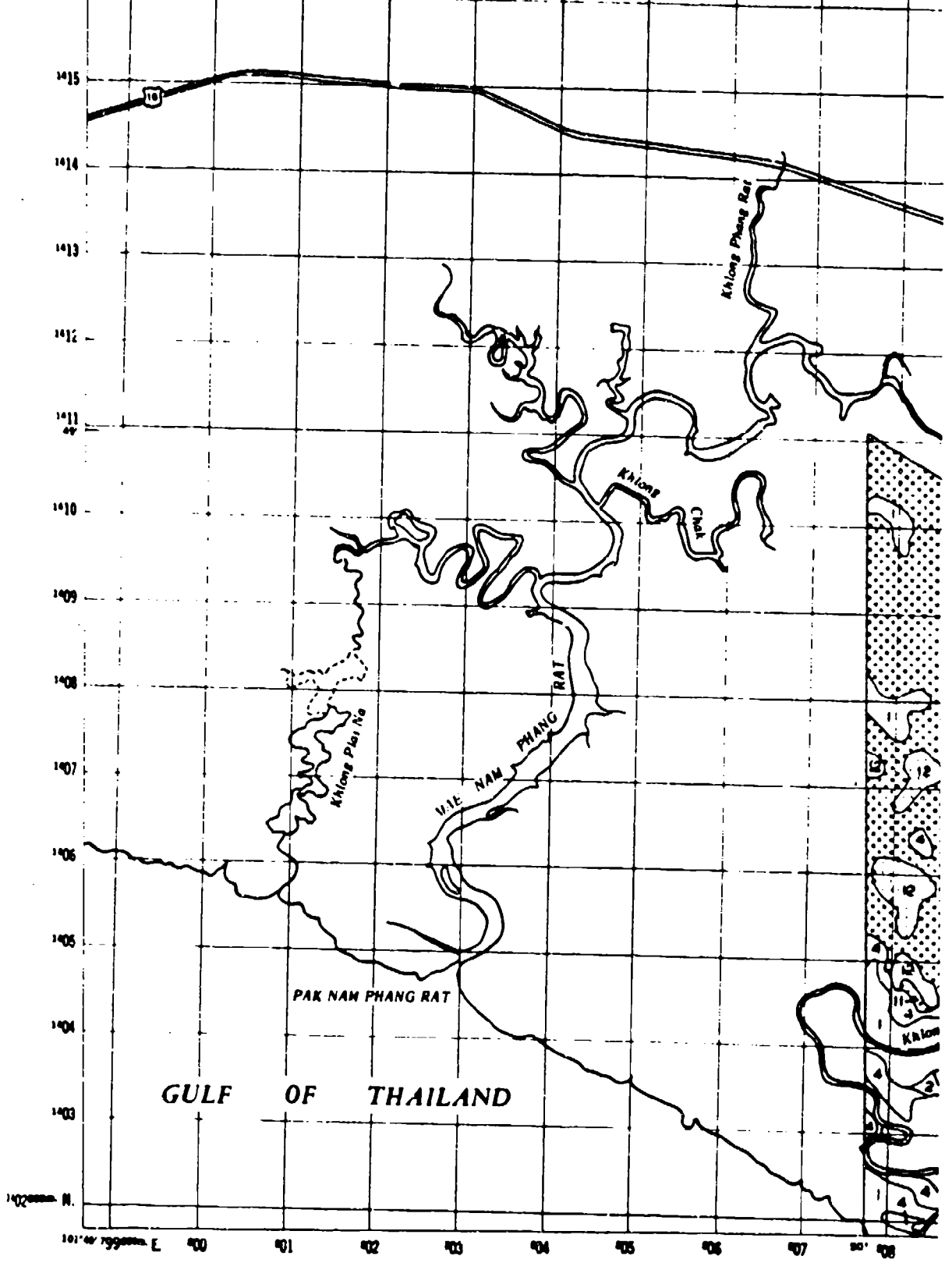
ϕ_{uf} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

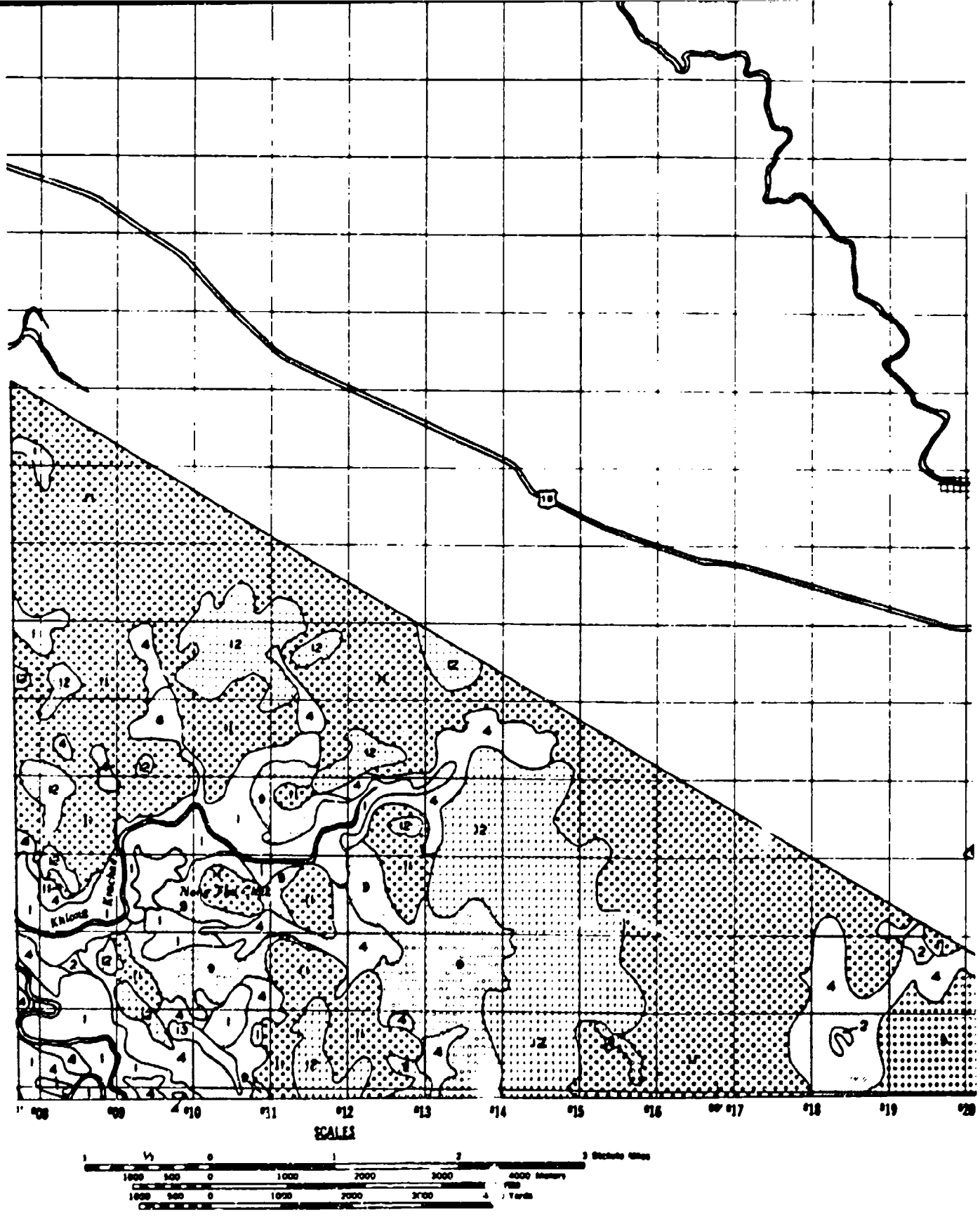
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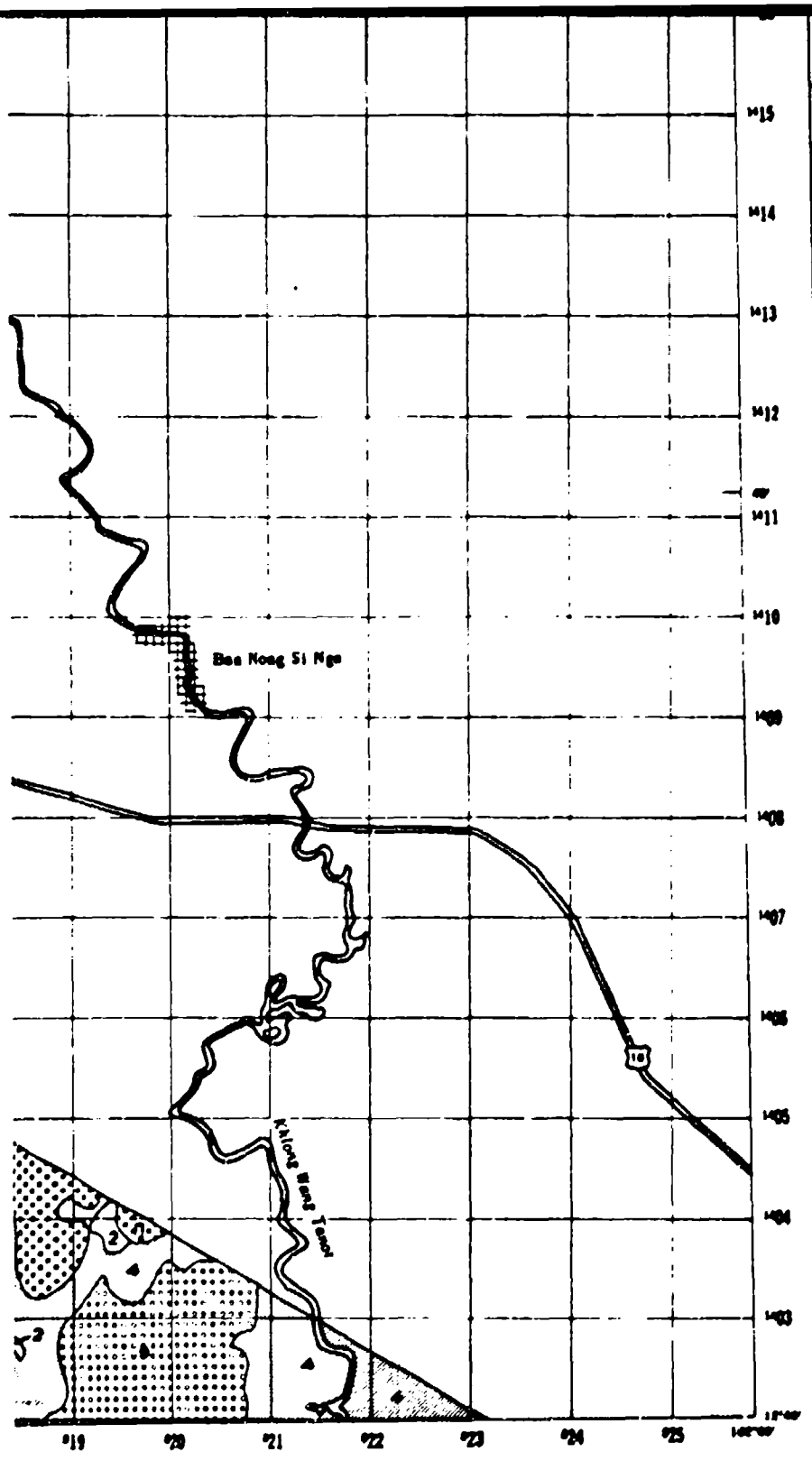


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5



6



Unit	Structure	Structure	Pressure Resistance			Elevation	
			q_{up}		q_{up}	q_{up}	
	MRT	MRT	psi	kg/cm²	ksf	psi	kg/cm²
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0

Notes: Blank areas are water bodies.

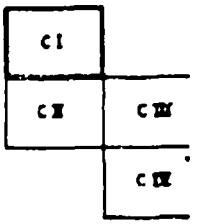
q_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

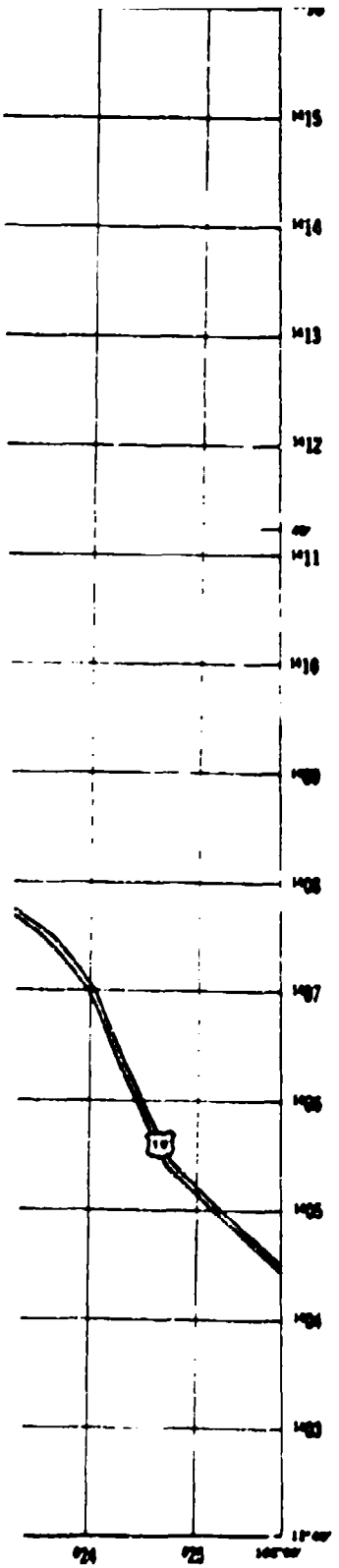
* Moisture content has less than 3% percent probability of exceeding strengths commonly observed are 60-100 for Units 3 and 5; zero

Units do not occur on this map.

INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD F
TERRAIN FOR GROUND
SURFACE COMP
CHANTHABURI STU
SHEET C I



Unit	Maximum RMI-value	Minimum RMI-value	Maximum Moisture: c_{uw} psi	Maximum Moisture: c_{uw} kg/cm²	Maximum Moisture: ϕ_{uw} deg	Maximum Moisture: c_{uw} psi	Maximum Moisture: c_{uw} kg/cm²	Maximum Moisture: ϕ_{uw} deg	Conditions where maximum c_{uw} occurs: c_{uw} psi	Conditions where maximum c_{uw} occurs: c_{uw} kg/cm²	Conditions where maximum c_{uw} occurs: ϕ_{uw} deg
1	15-75	75-80	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	75-80	80-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	75-80*	80-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	75-80	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	75-80*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	80-100	80-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	80-100	80-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	80-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	80-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	80-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	80-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Notes: Blank areas are water bodies.

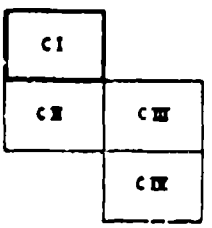
c_{uw} Shear strength at zero normal load.

ϕ_{uw} Angle of internal friction.

* Minimum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; above that 100 for Unit 11.

Units do not occur on this map.

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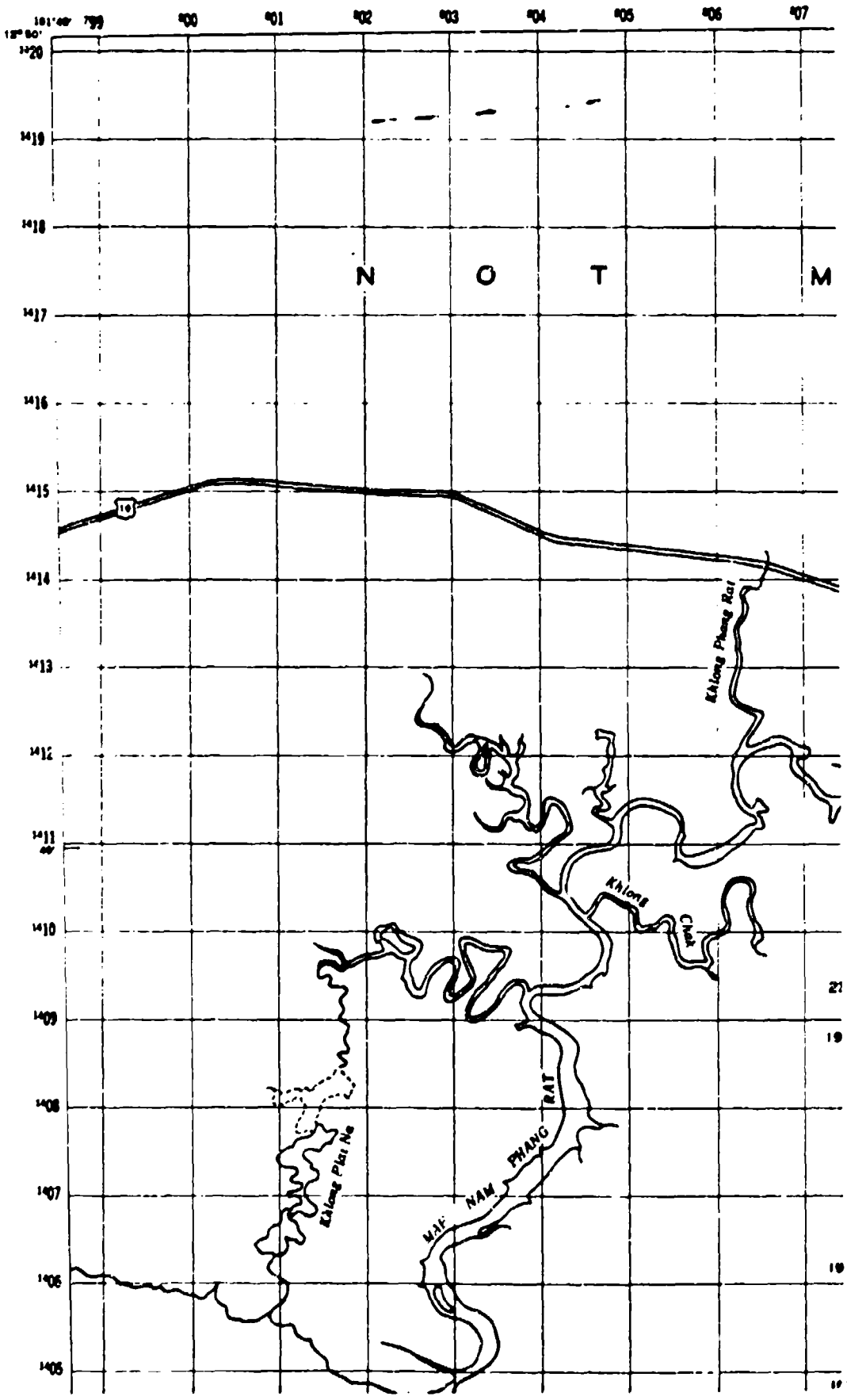
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

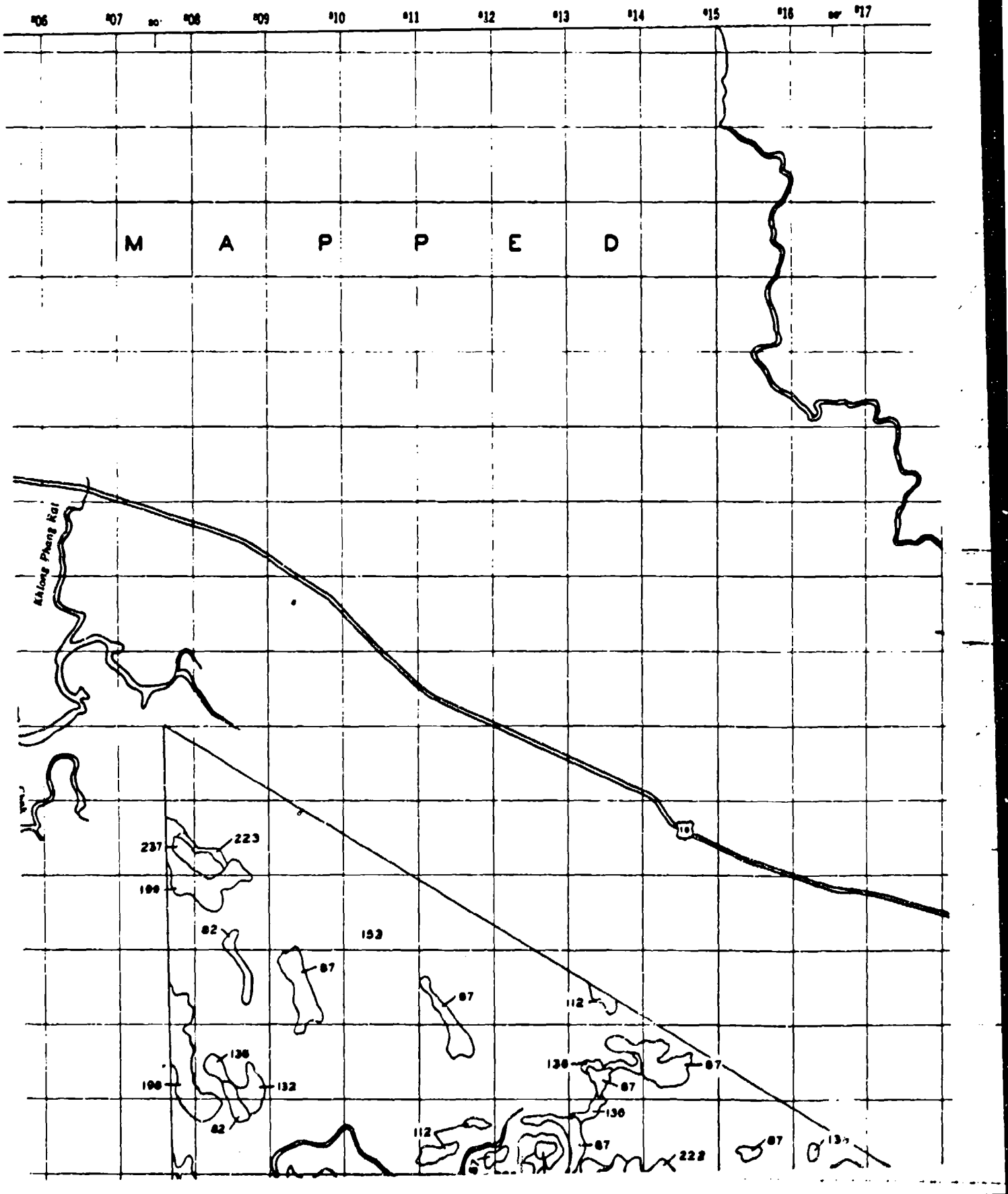
CHANTHABURI STUDY AREA

SHEET C I

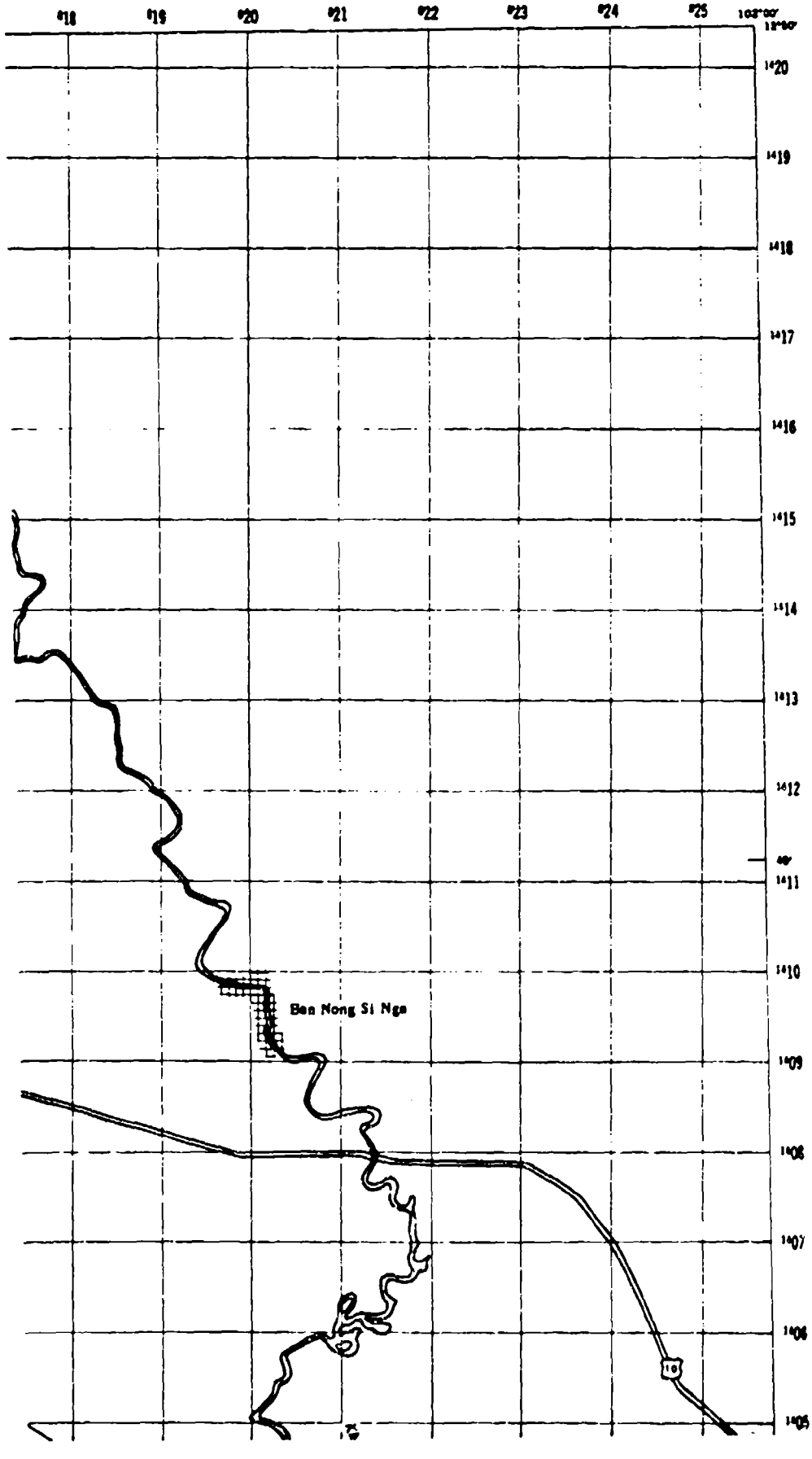
PLATE 6.1a

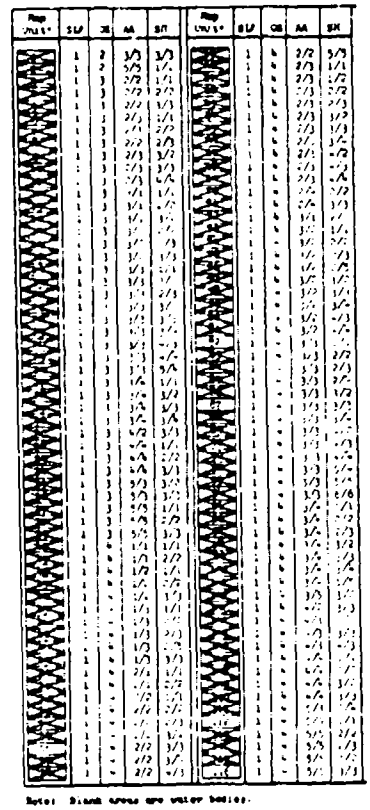

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1405
N O T M
10
Khlong Phang Rai
Khlong Chak
Khlong Plai Na
MAE NAM PHANG RAT

2 CHANTHABURI



SHEET C I





Note: Blank areas are water bodies.

* Each map unit represents an array of four symbols (as below), vertical obstacle spacing (S), approach angle (A) were mapped. The numerator of the fraction indicates quarterly direction (i.e. azimuth from > to <90 > 90 to 180 > 180 to 270 > 270 to 360) denoting that the vertical info

* Mapping class ranges of each surface geometry f

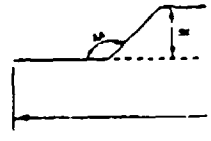
Slope (SL)

Mapping Class	Range deg
1	... - <1.5
2	> 1.5 - <3
3	> 3 - <7
4	> 7 - <15
5	> 15 - <30
6	> 30 - <45
7	> 45

Vertical Obstacle Spacing (S)

Mapping Class	Range m	
1	>7	
2	> 7 - 12	> 2
3	> 12 - <5	> 3
4	> 5 - <15	> 15
5	> 15	>

Units do not occur on this map.

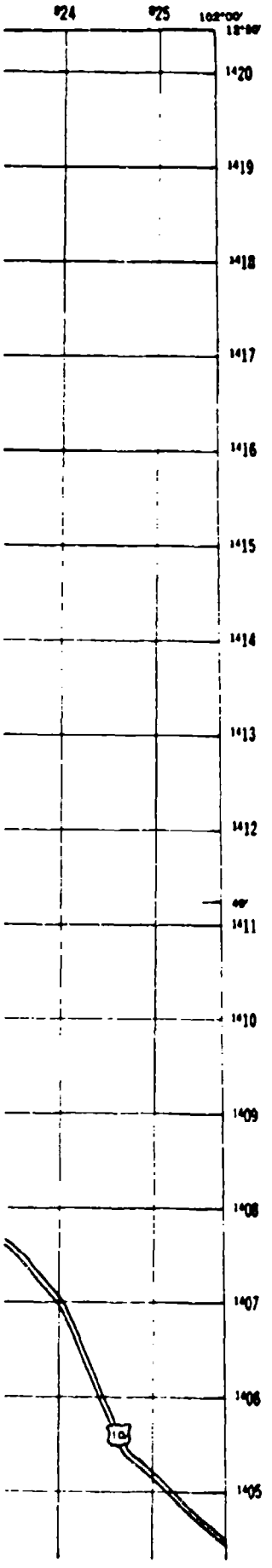


INDEX TO AI

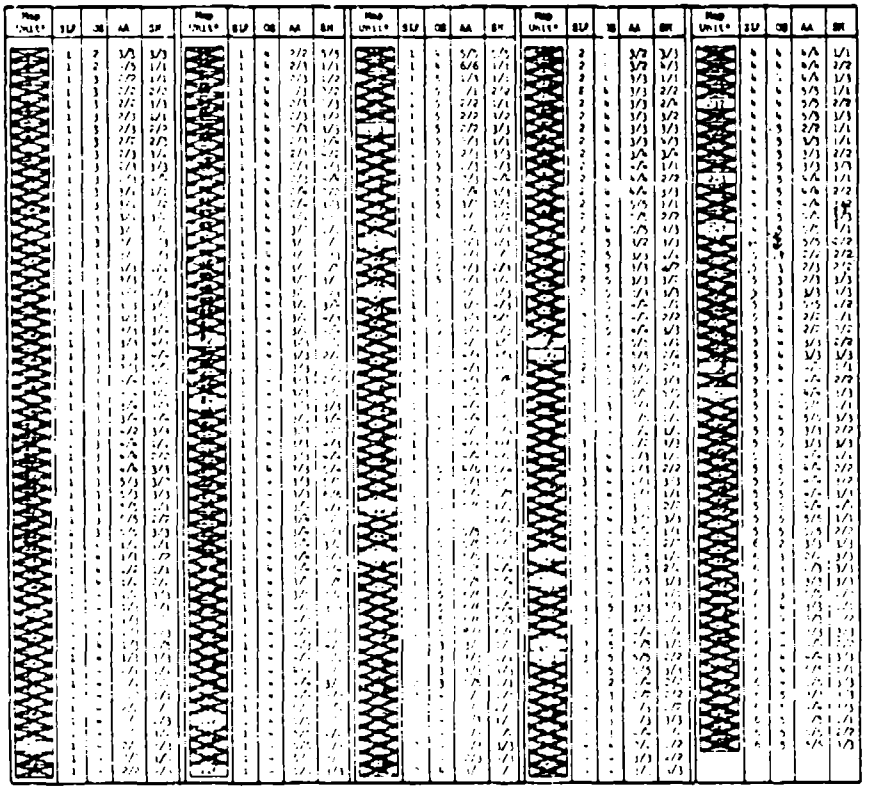
C I
C II

4

SHEET C I



LEGEND



Note: Blank areas are water bodies.

* Each map unit symbol consists of four symbols (i.e., 1, 2, 3/1, 3/2) indicating mapping classes of slope SL (see diagram below), vertical spacing VS, apparent angle AA, and step height SH. Preferred map orientation is true north. Strike lines were mapped. The numerator of the fraction indicates mean range that will be encountered in the traversing an area in an easterly direction (i.e. azimuth from > 0° to < 90° and 270° to < 360°) and the denominator refers to a westerly direction (i.e. azimuth from > 90° to < 270°) assuming that the vehicle intervals the bisector of a right angle.

* Mapping class ranges of each surface geometry factor are:

Slope (SL)

Mapping Class	Range deg
1	[illegible]
2	[illegible]
3	[illegible]
4	[illegible]
5	[illegible]
6	[illegible]
7	[illegible]

Vertical Obstacle Spacing (VS)

Mapping Class	Range	
	m	ft
1	[illegible]	[illegible]
2	[illegible]	[illegible]
3	[illegible]	[illegible]
4	[illegible]	[illegible]
5	[illegible]	[illegible]

Azimuth Angle (AA)

Mapping Class	Range deg
1	[illegible]
2	[illegible]
3	[illegible]
4	[illegible]
5	[illegible]
6	[illegible]
7	[illegible]
8	[illegible]

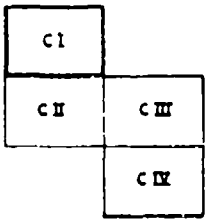
Step Height (SH)

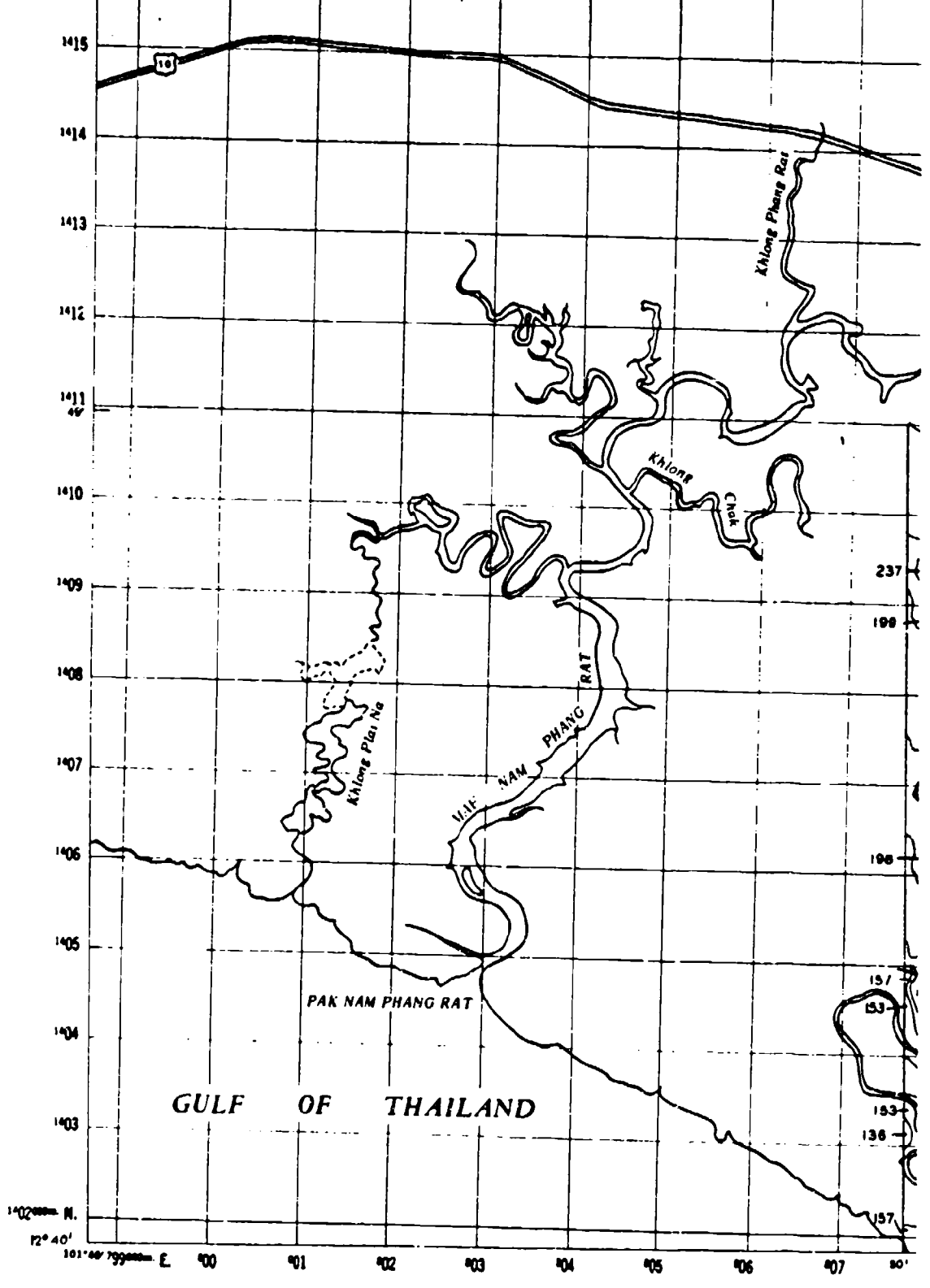
Mapping Class	Range	
	in	cm
1	[illegible]	[illegible]
2	[illegible]	[illegible]
3	[illegible]	[illegible]
4	[illegible]	[illegible]
5	[illegible]	[illegible]
6	[illegible]	[illegible]
7	[illegible]	[illegible]
8	[illegible]	[illegible]

Units do not occur on this map.



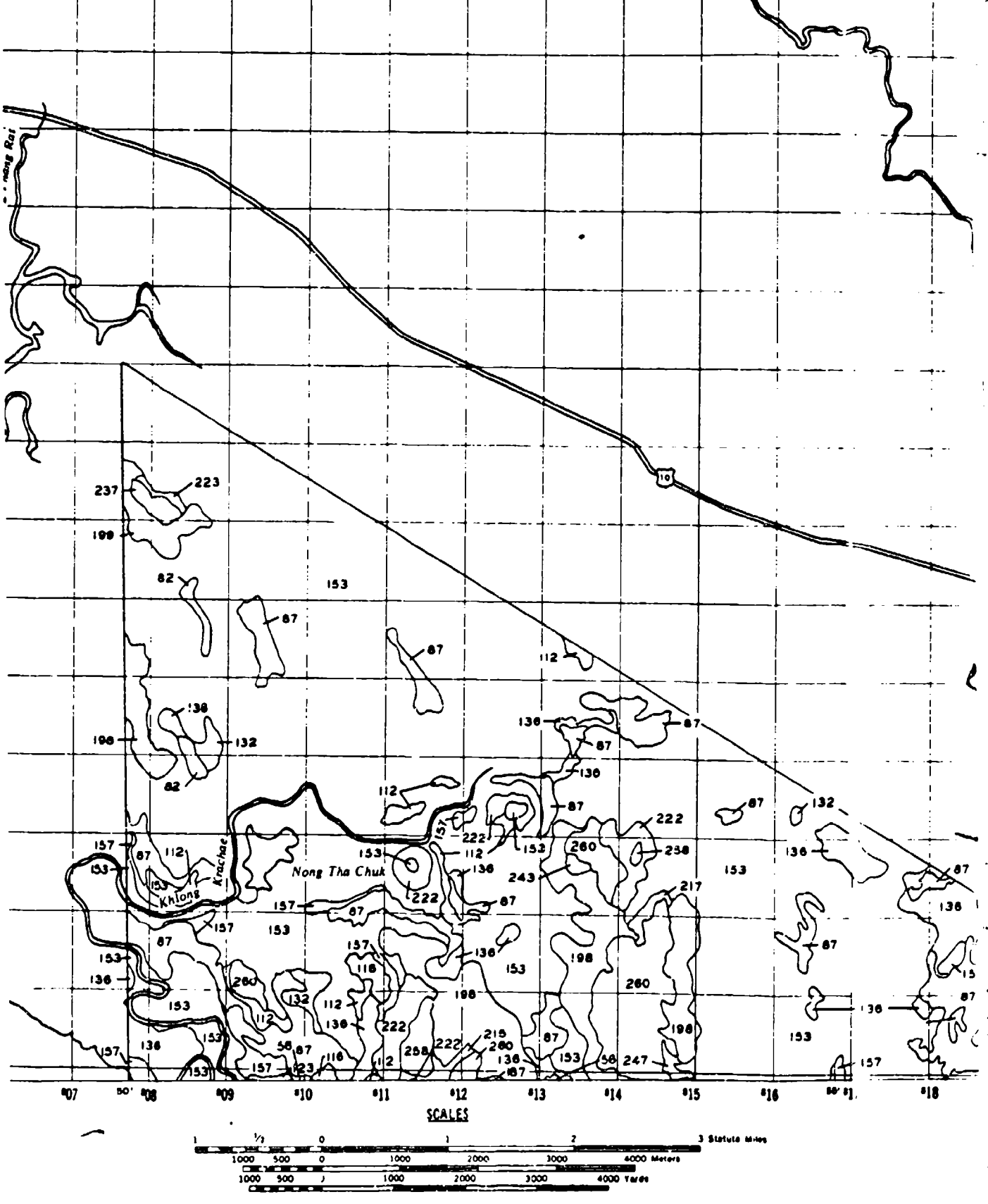
INDEX TO ADJOINING SHEETS



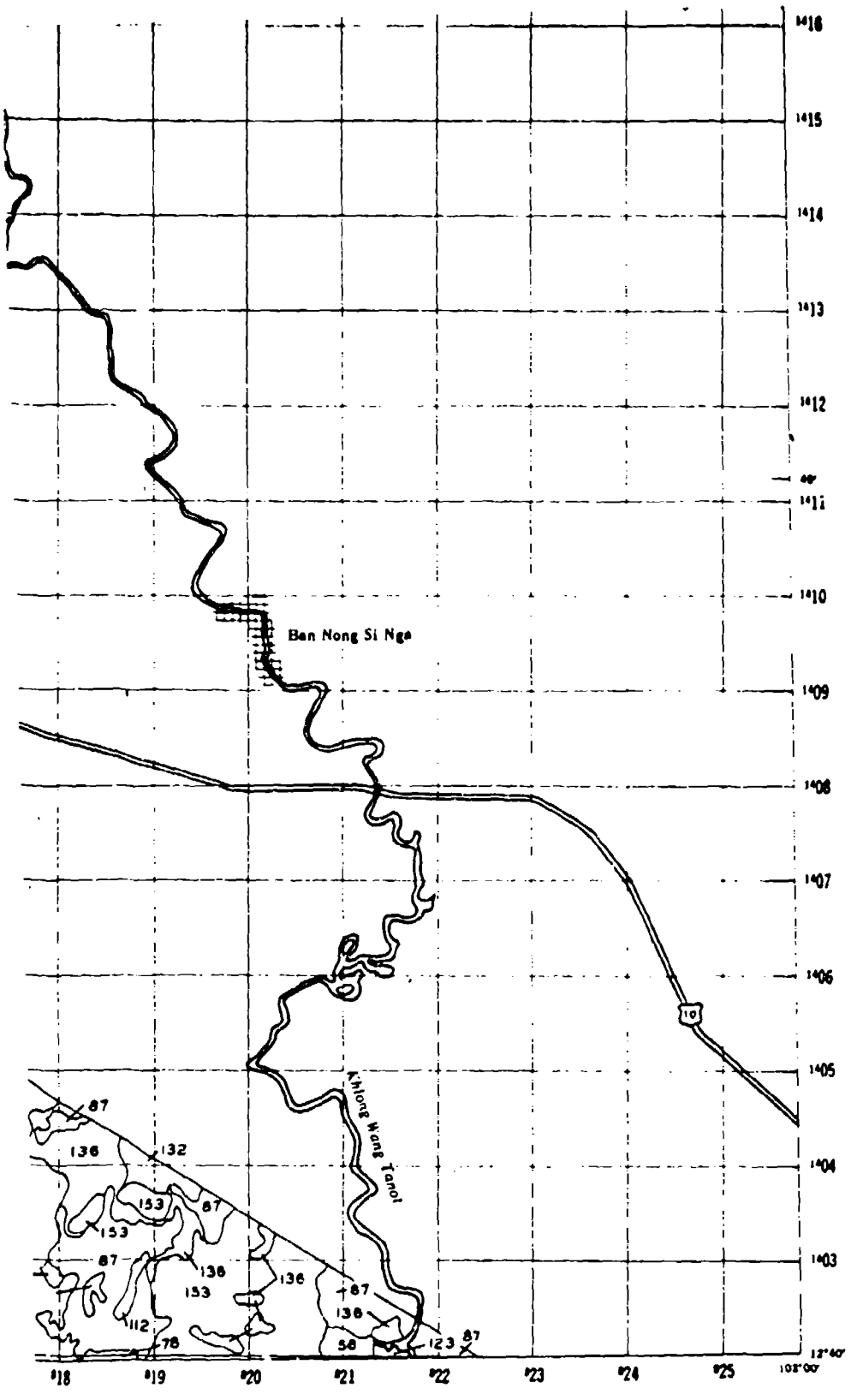


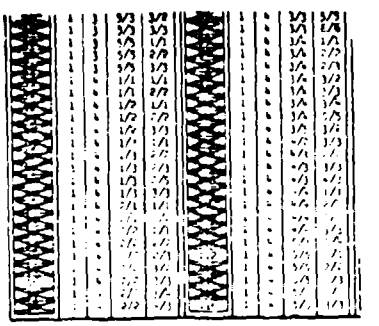
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

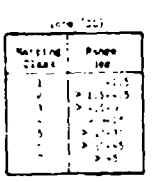
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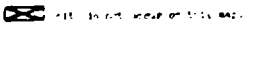

Khlong Krachae
Nong Tha Chuk
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815
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817
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SCALES
3 Statute Miles
4000 Meters
4000 Yards

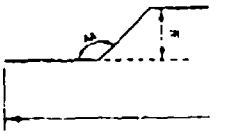
6











INDEX TO ADJ

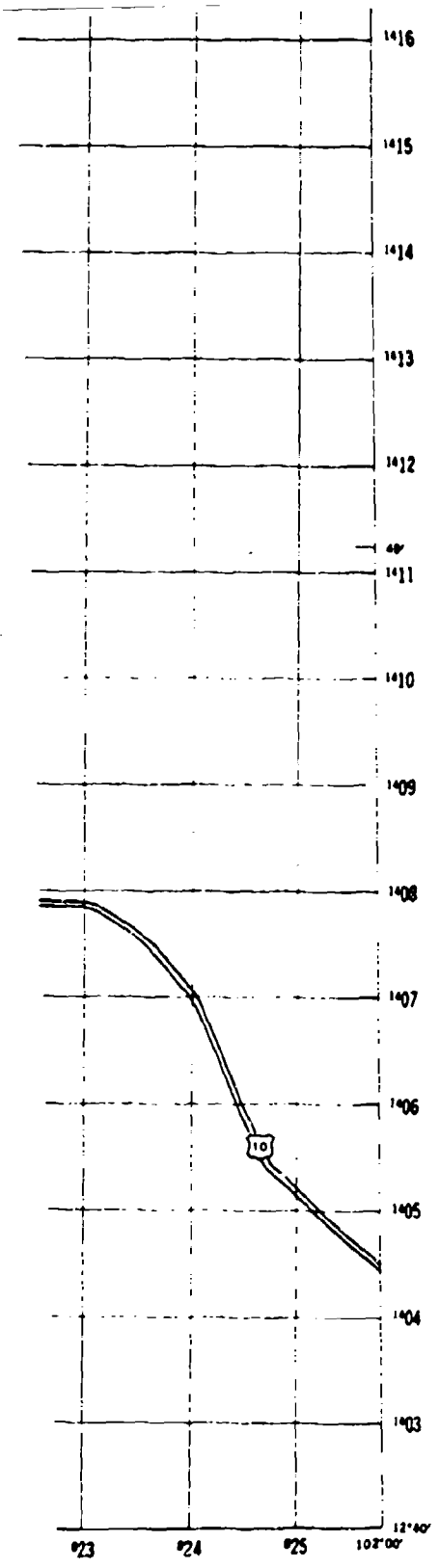
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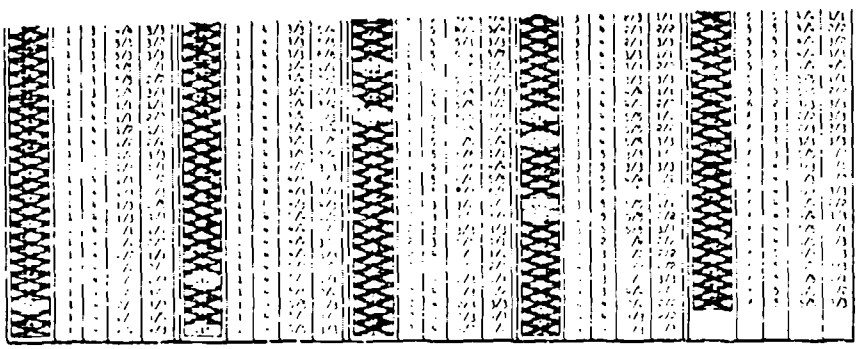
C II

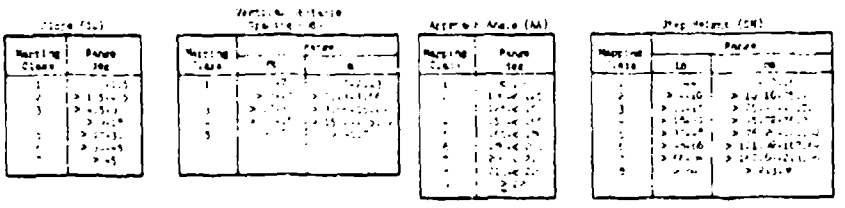
A QUANTITATIVE METI
TERRAIN FOR GR

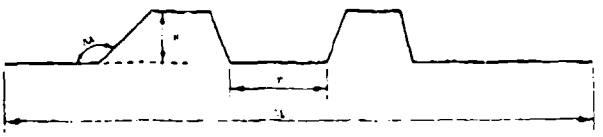
SURFACE (
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SHEE

7

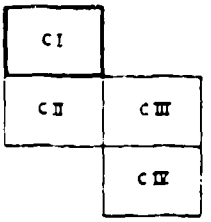








INDEX TO ADJOINING SHEETS



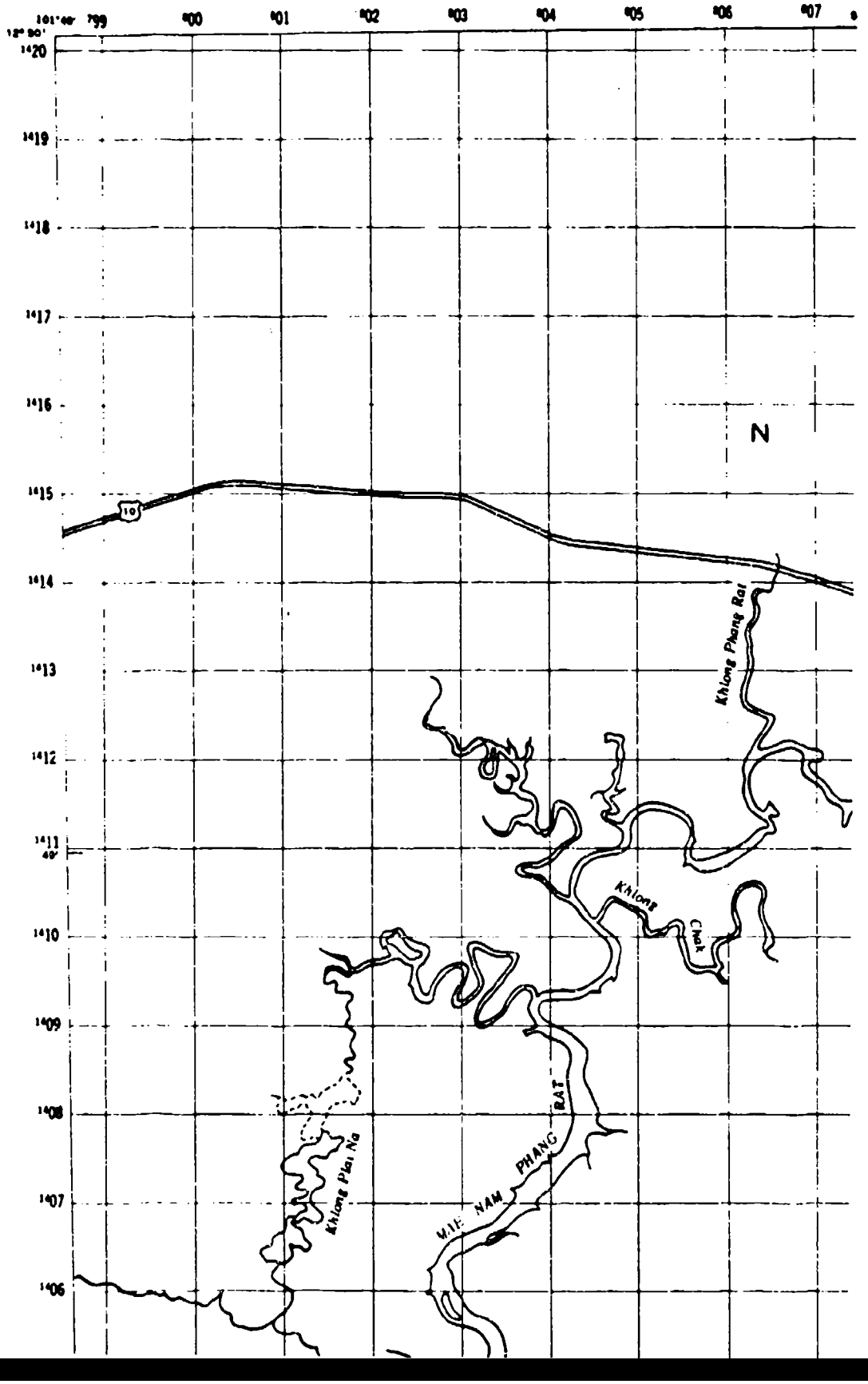
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

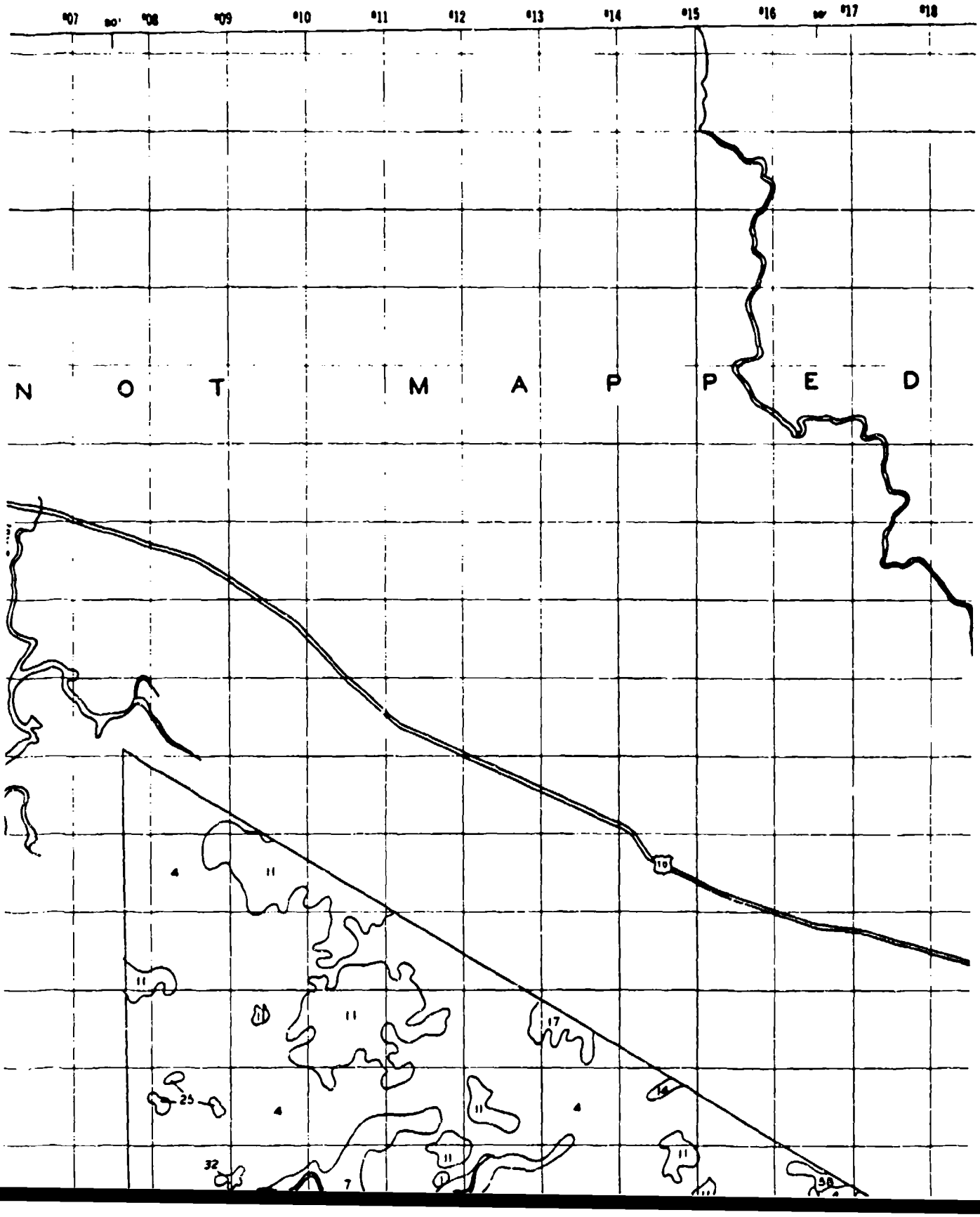
CHANTHABURI STUDY AREA

SHEET C I

PLATE 6.1b

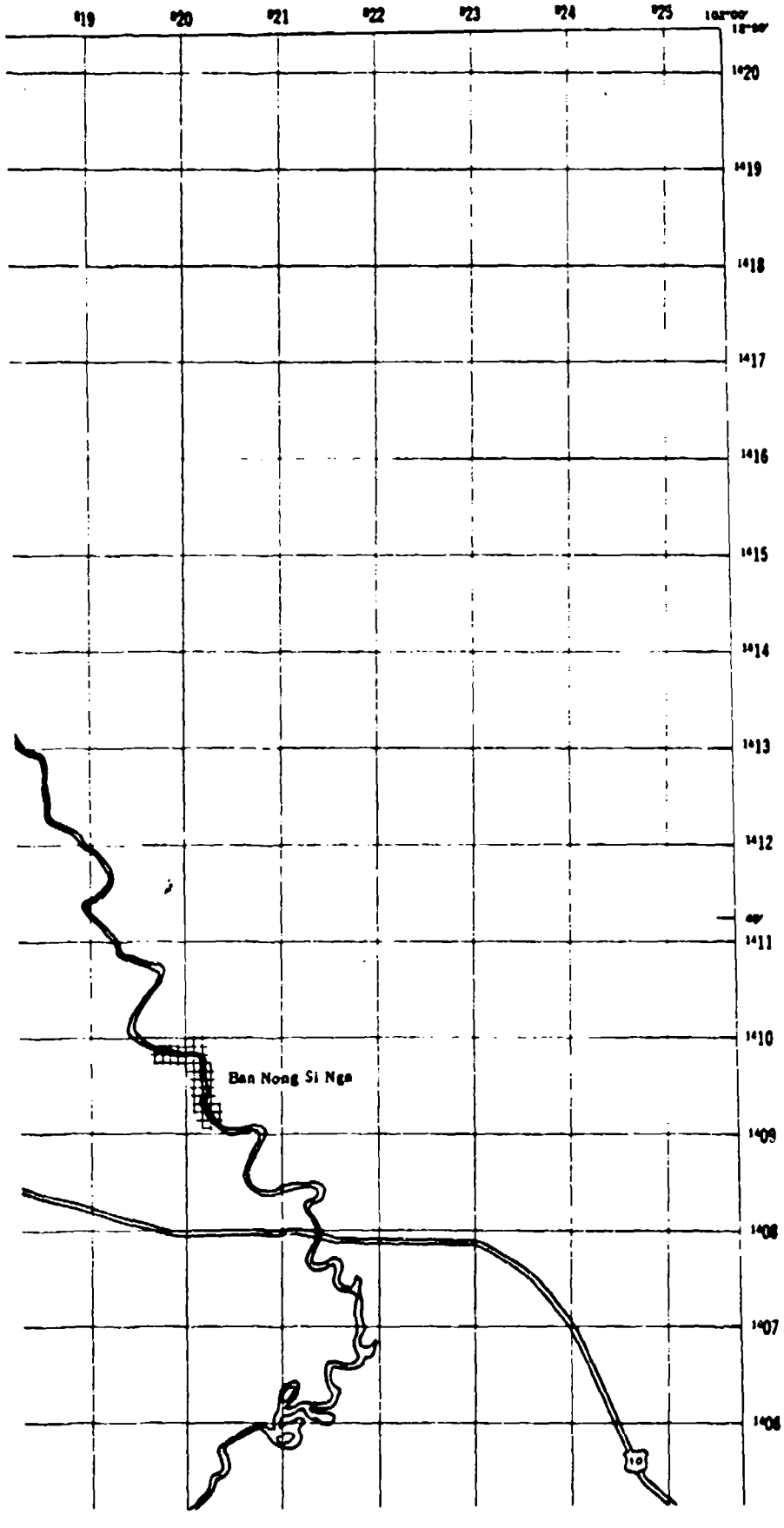

101°45'
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Khlong Phang Rat
Khlong Chak
PHANG RAT
NAM
Khlong Plai Na

2 CHANTHABURI

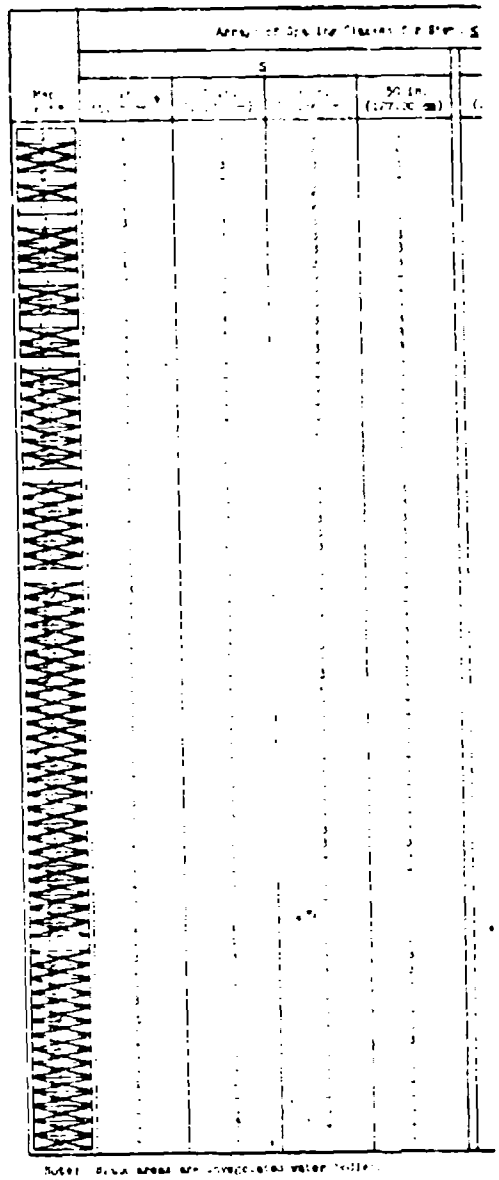


3

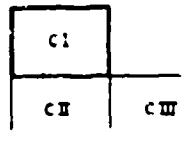
SHEET C I



LEGEND

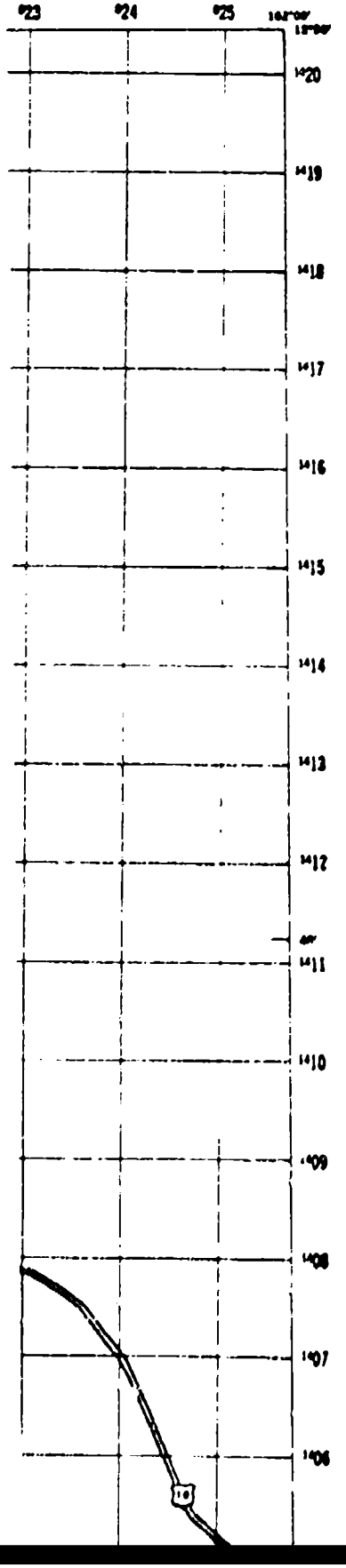


INDEX TO ADJOINING SH

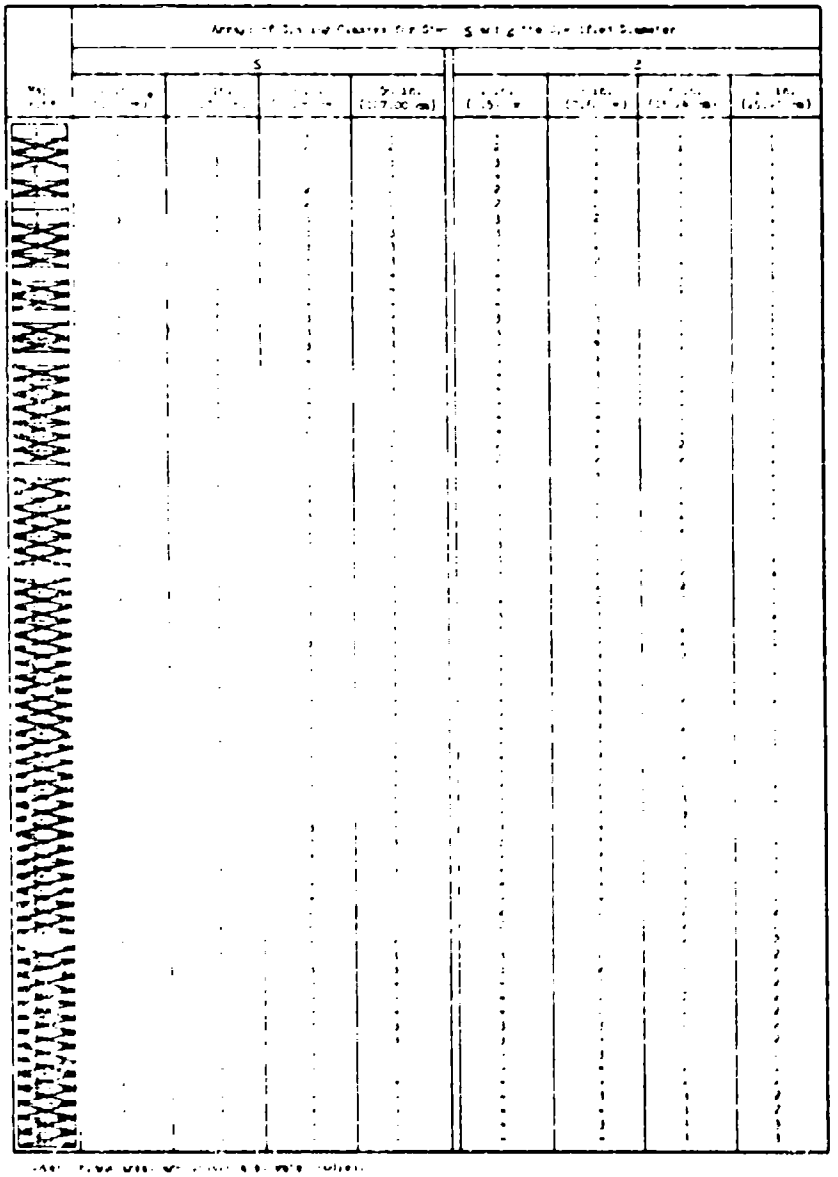


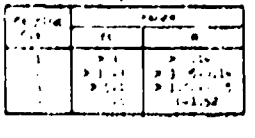
4

SHEET C I

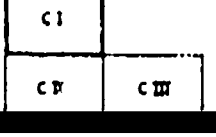


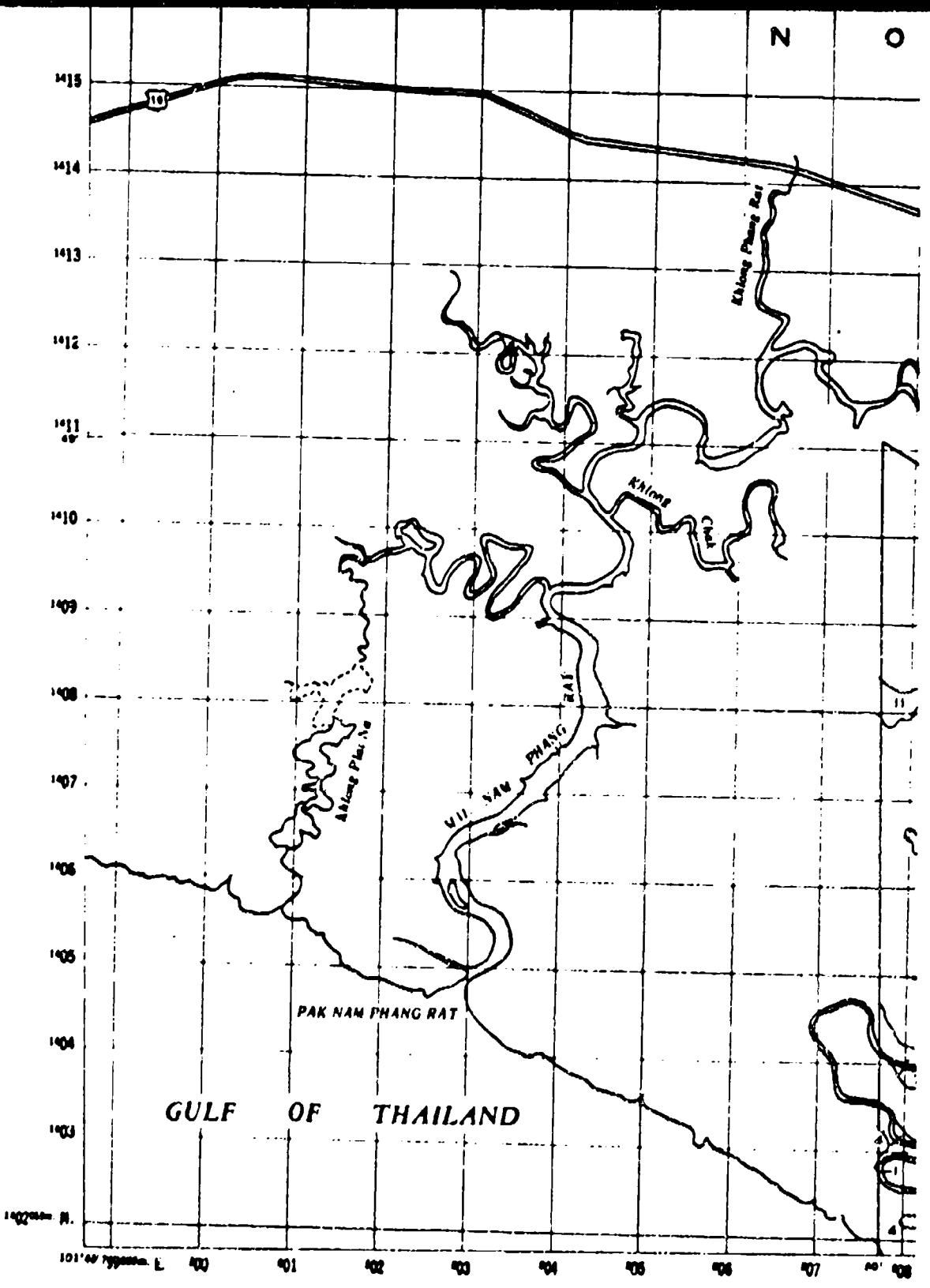
LEGEND





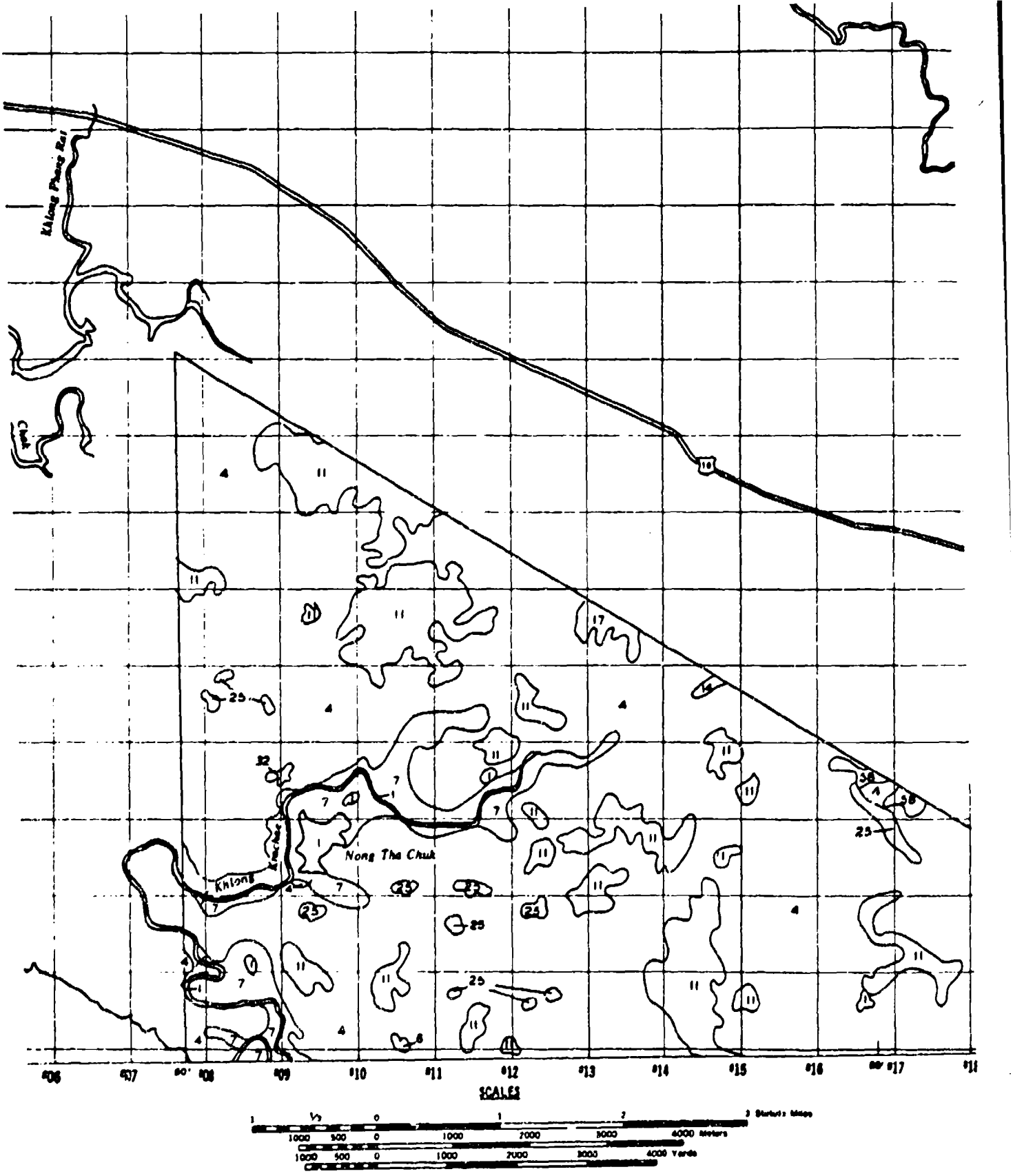
INDEX TO ADJOINING SHEETS



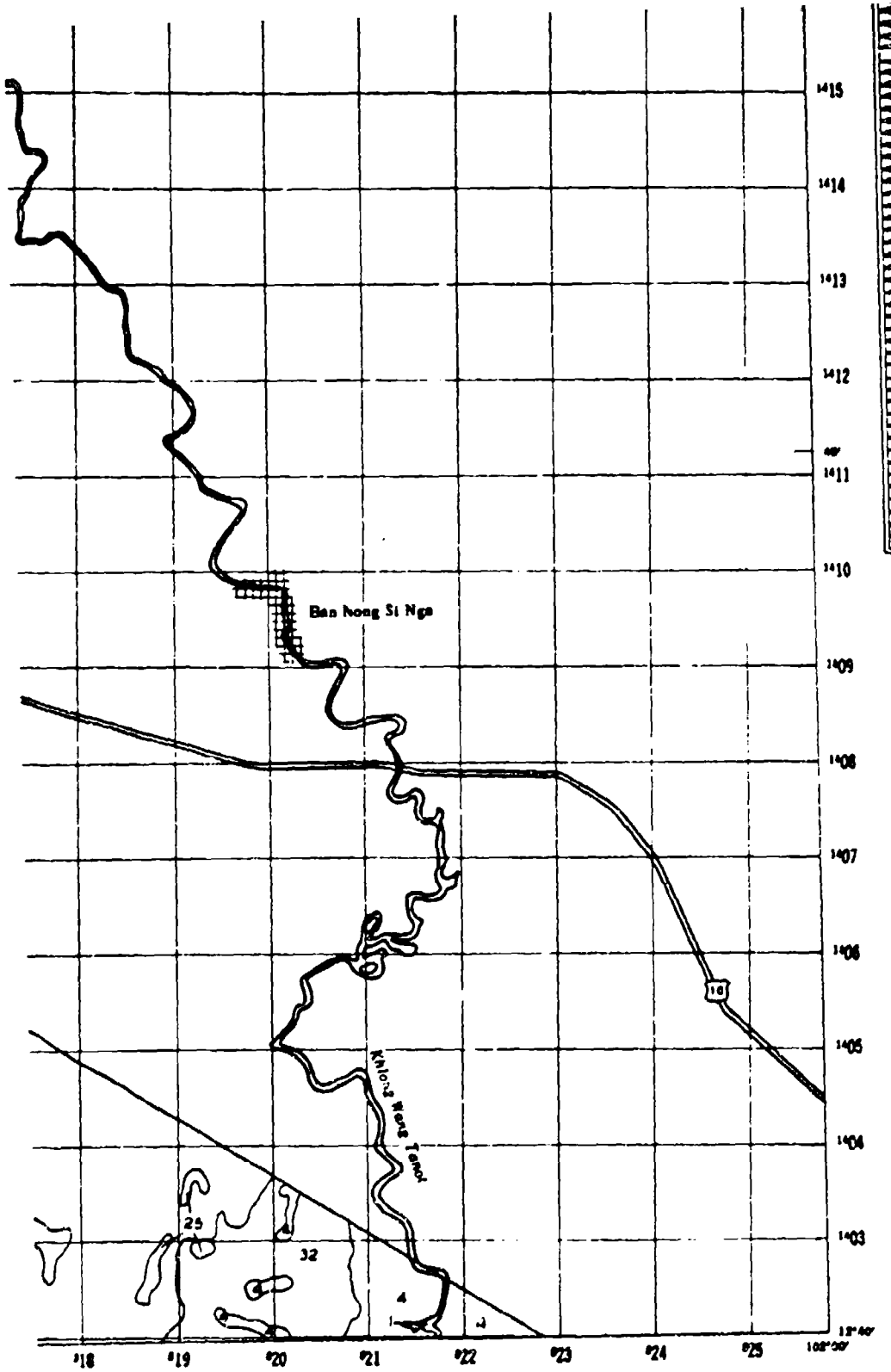


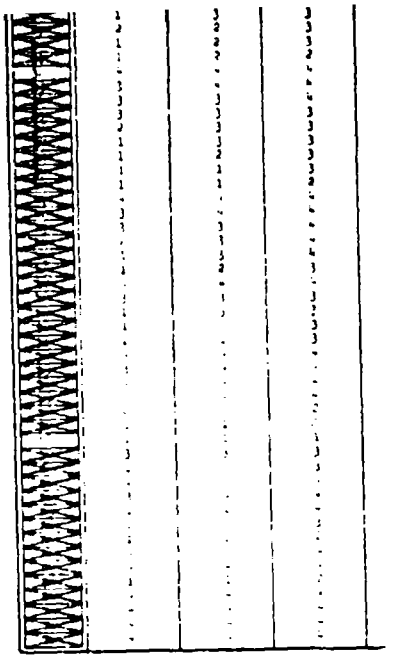
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

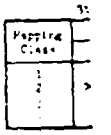
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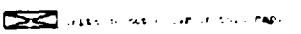


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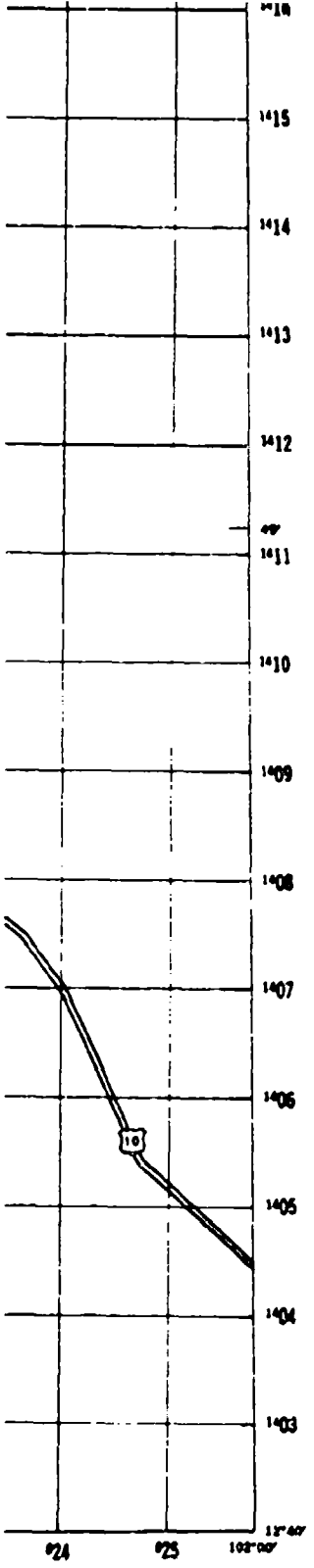
A QUANTITATIVE ME
TERRAIN FOR G

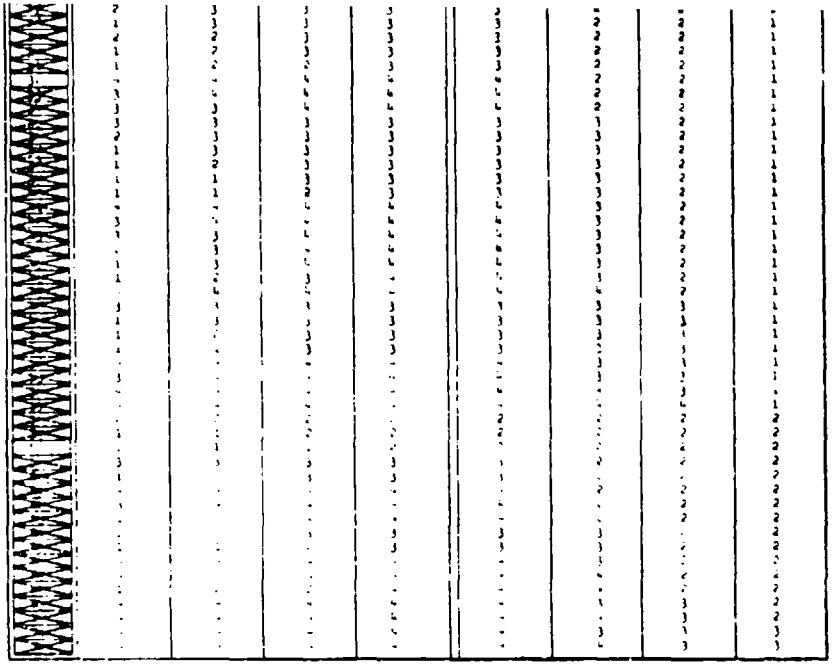
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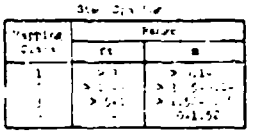
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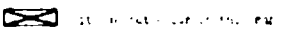
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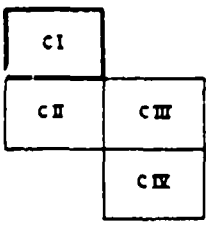








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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

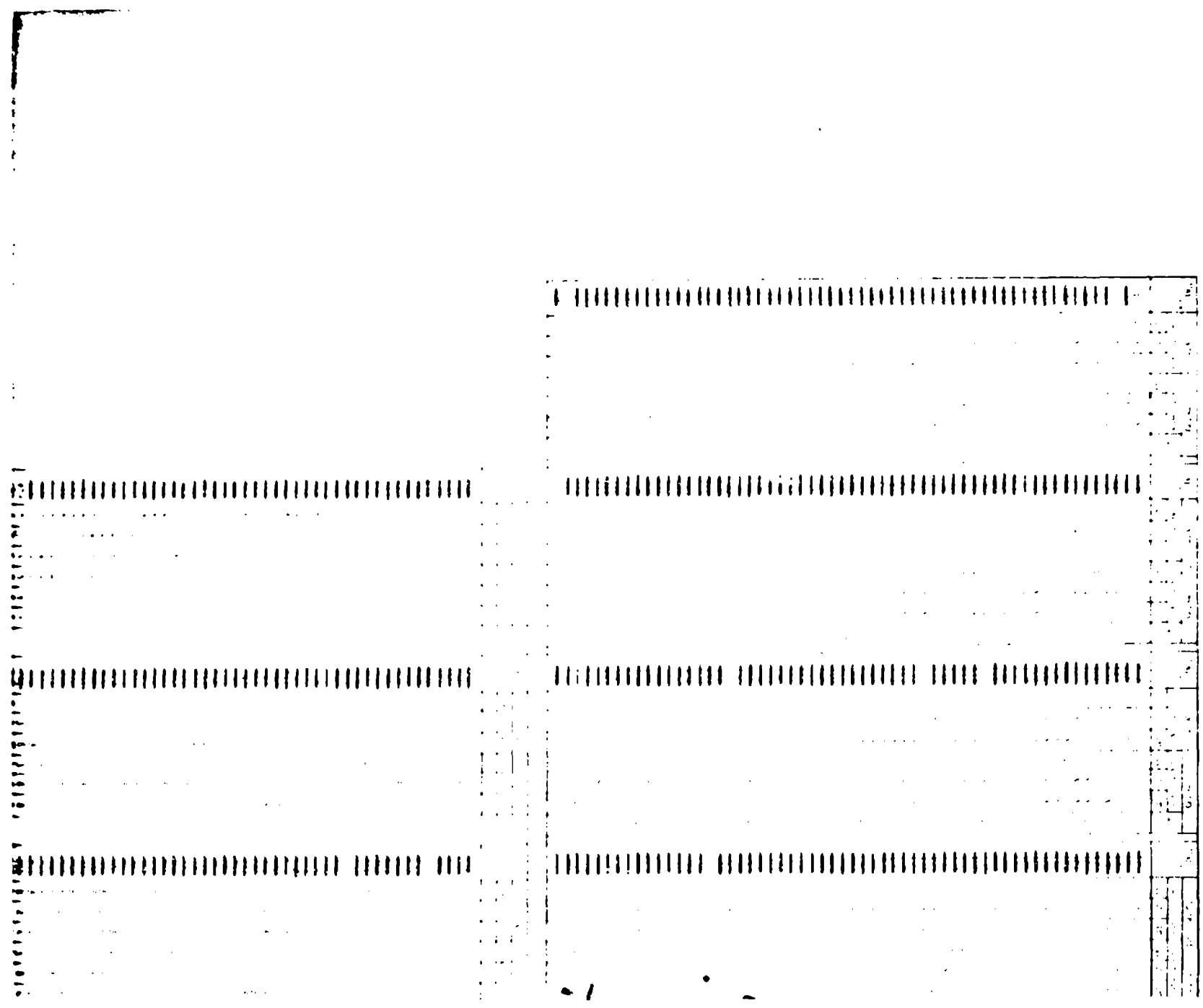
VEGETATION

CHANTHABURI STUDY AREA

SHEET C I

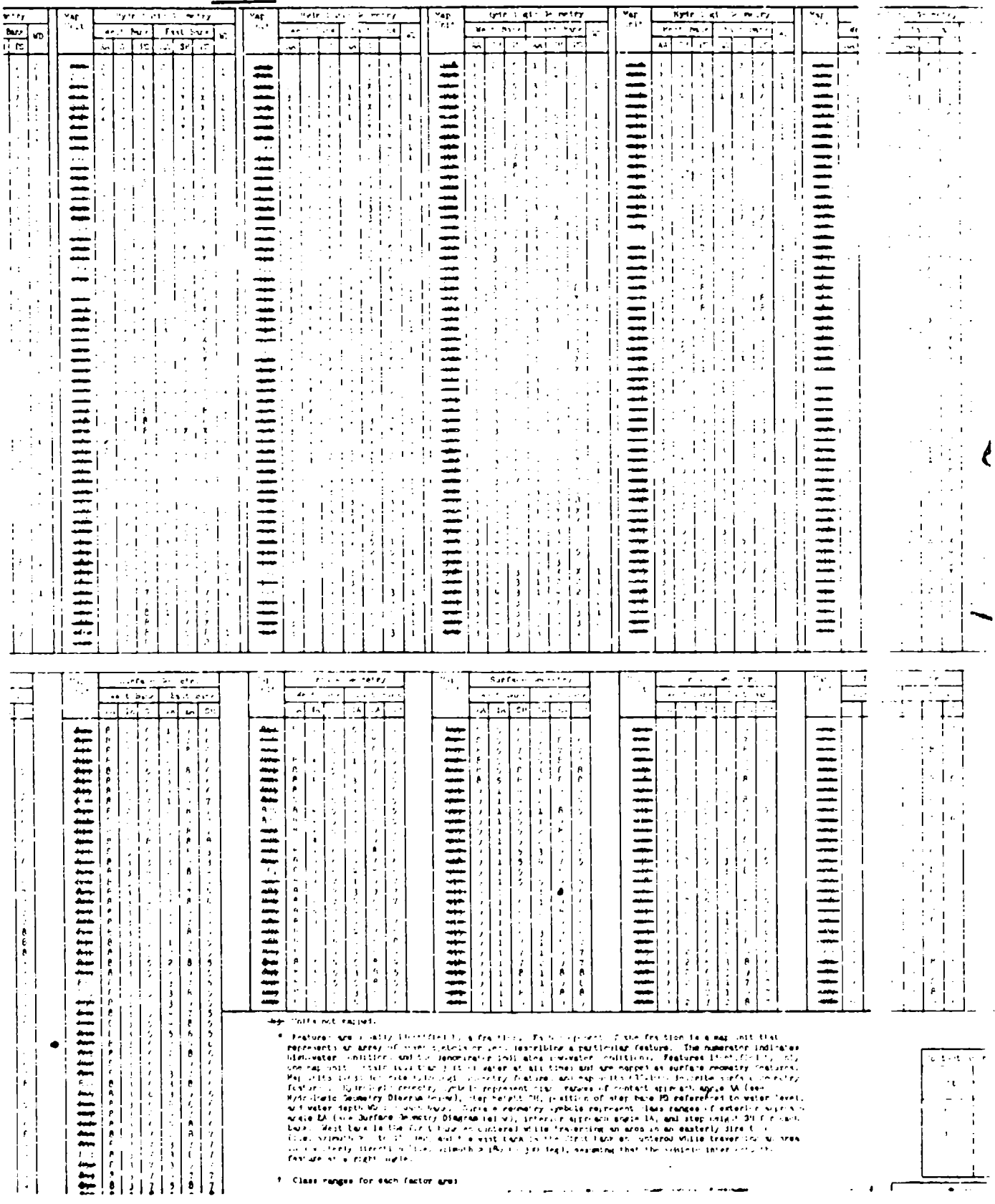
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PLATE 6.1c



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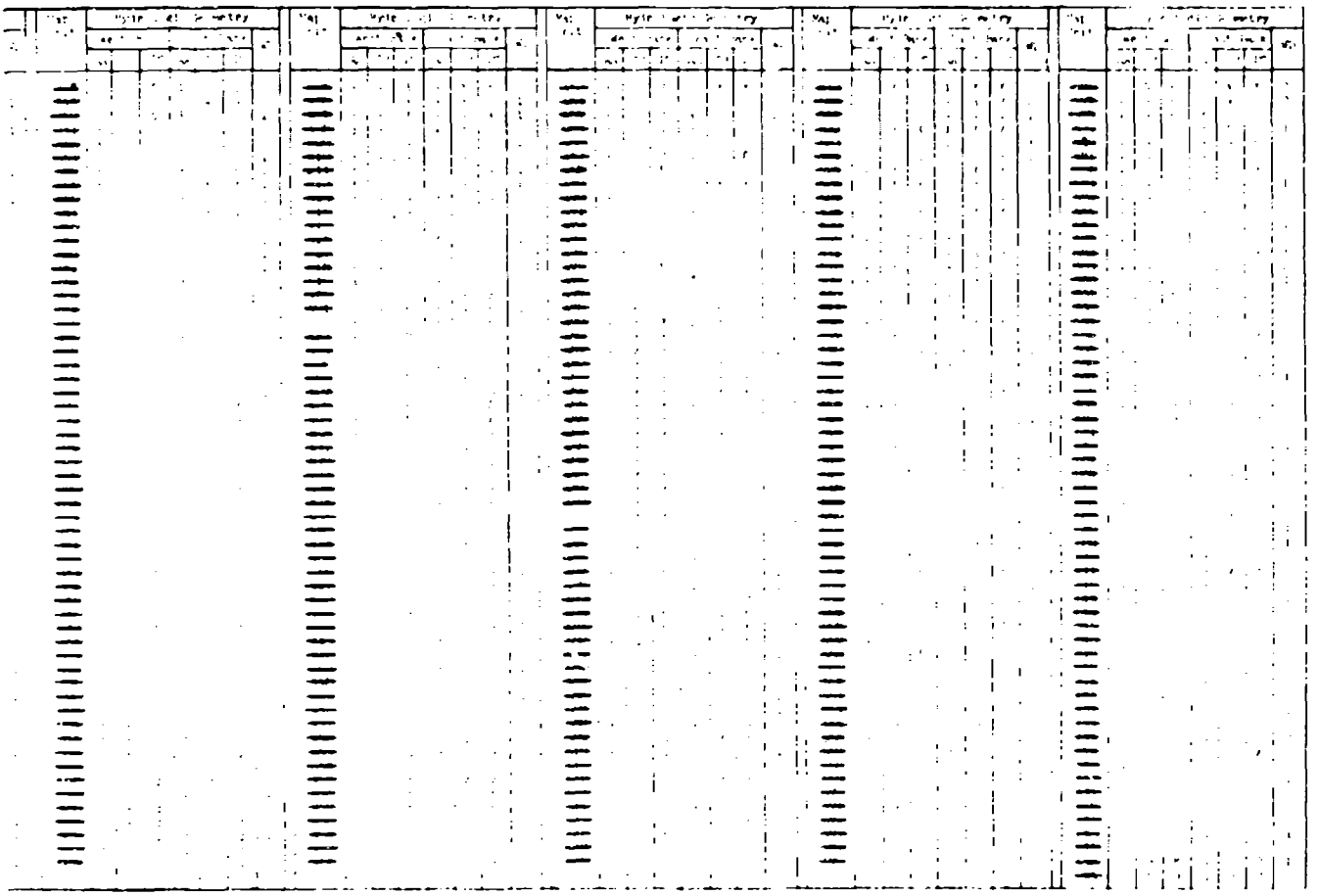
LEGEND

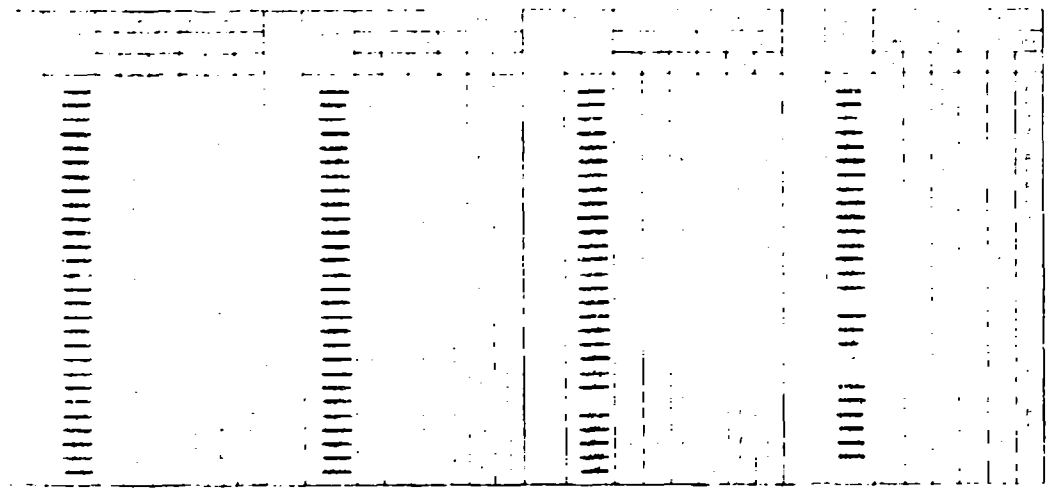


* Features are spatially identified by a fraction. Each represents a size fraction of a map unit that represents an array of hydrographic or land describing a particular feature. The numerator indicates high-water conditions and the denominator indicates low-water conditions. Features identified by only one map unit exist below water at all times and are mapped as surface geometry features. Map units identified by more than one geometry feature are mapped as [illegible] geometry features. Hydrographic geometry symbols represent class values of contact approach angle VA (see Hydrographic Geometry Diagram below), step height PH, position of step base PD referenced to water level, and water depth WD. Surface geometry symbols represent class ranges of exterior approach angle EA (see Surface Geometry Diagram below), interior approach angle IA, and step height PH for exit edges. Exit edge is the [illegible] edge encountered while traversing an area in an easterly direction. Azimuth = 90° (east) and the exit edge is the first edge encountered while traversing an area in a clockwise direction. Azimuth = 180° (south), and so forth. Azimuth = 0° (north) assuming that the vehicle interacts with features on a right angle.

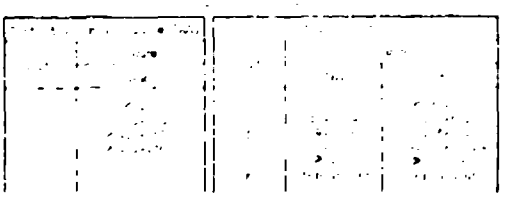
† Class ranges for each factor are:

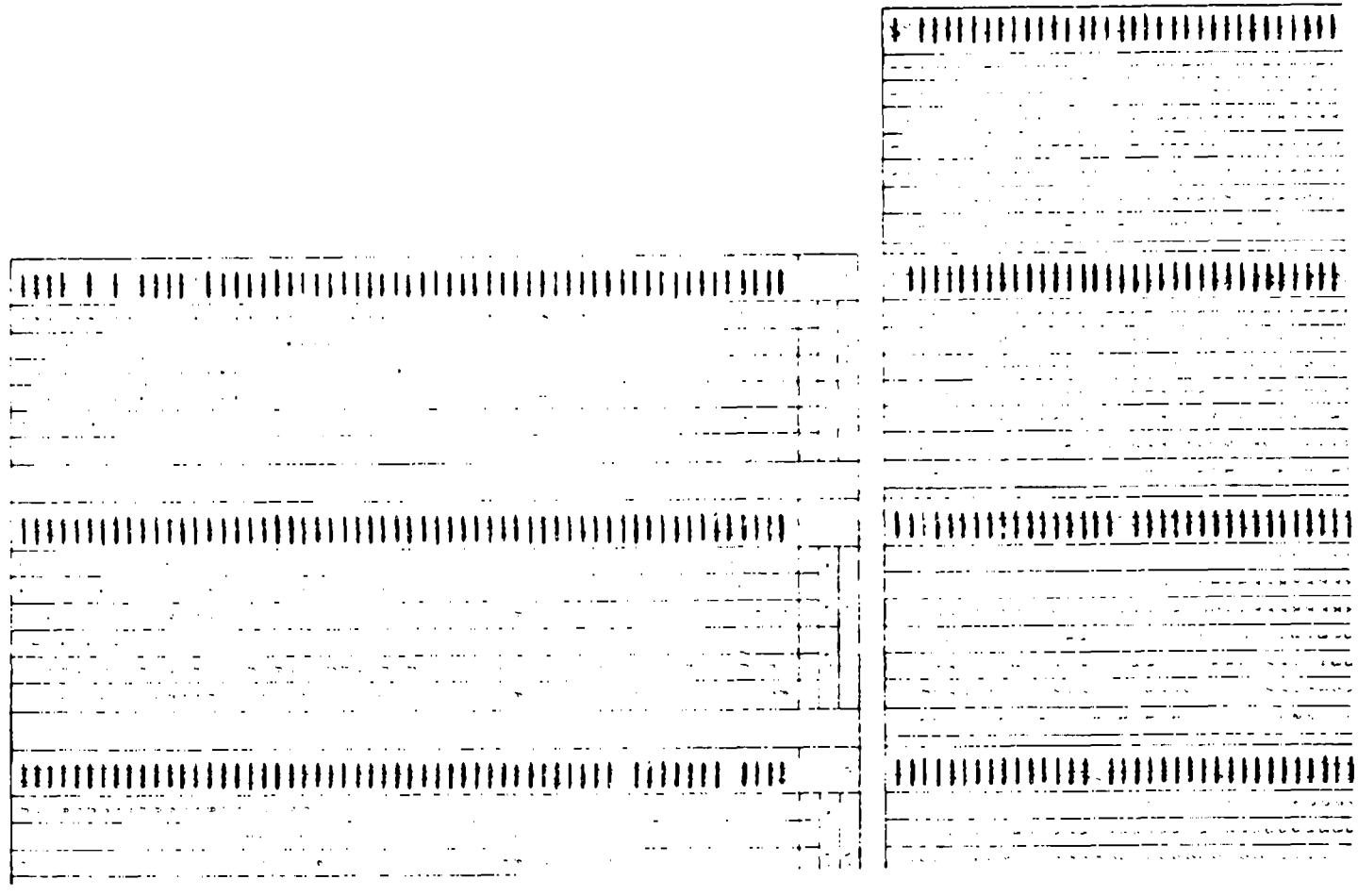
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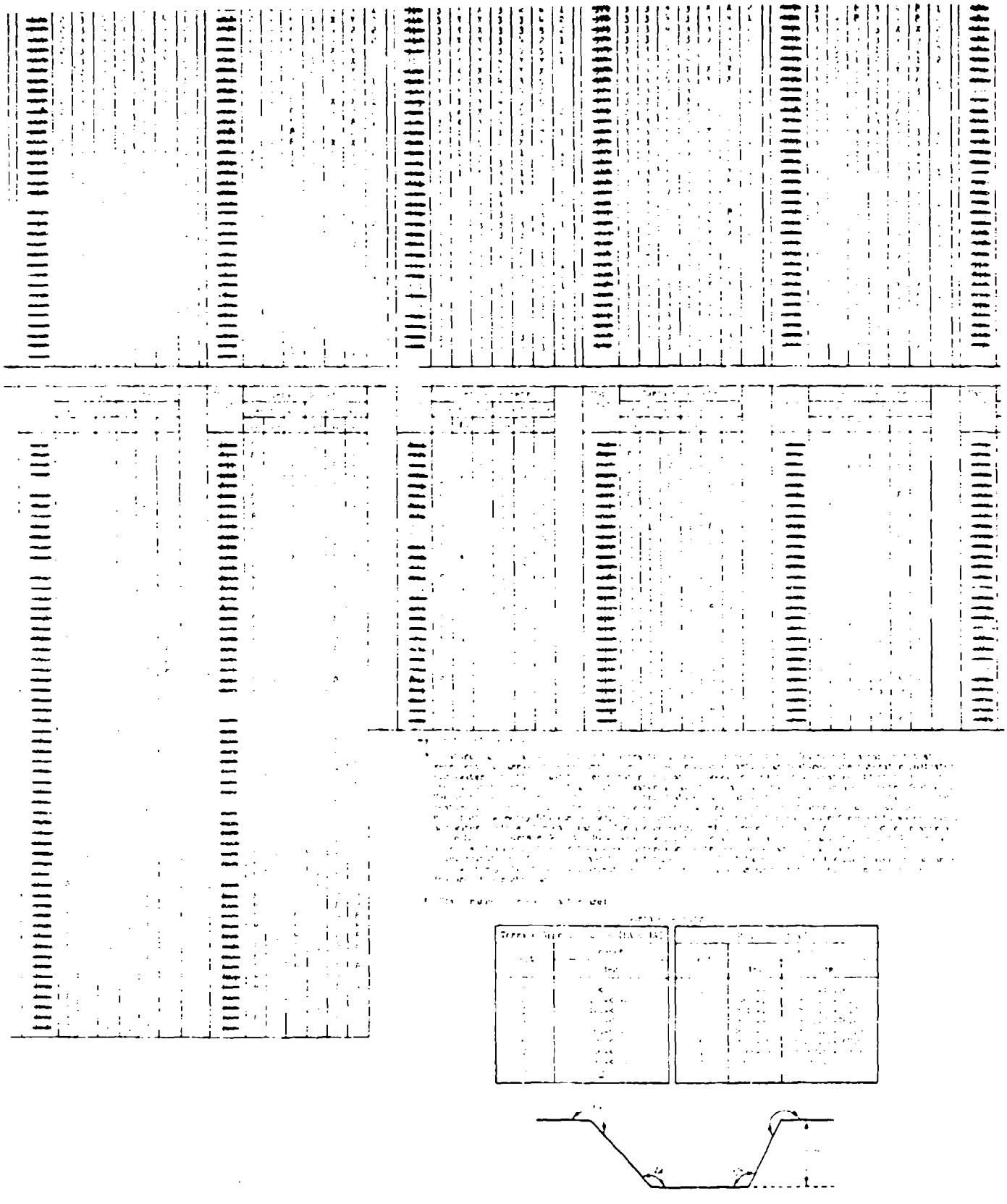




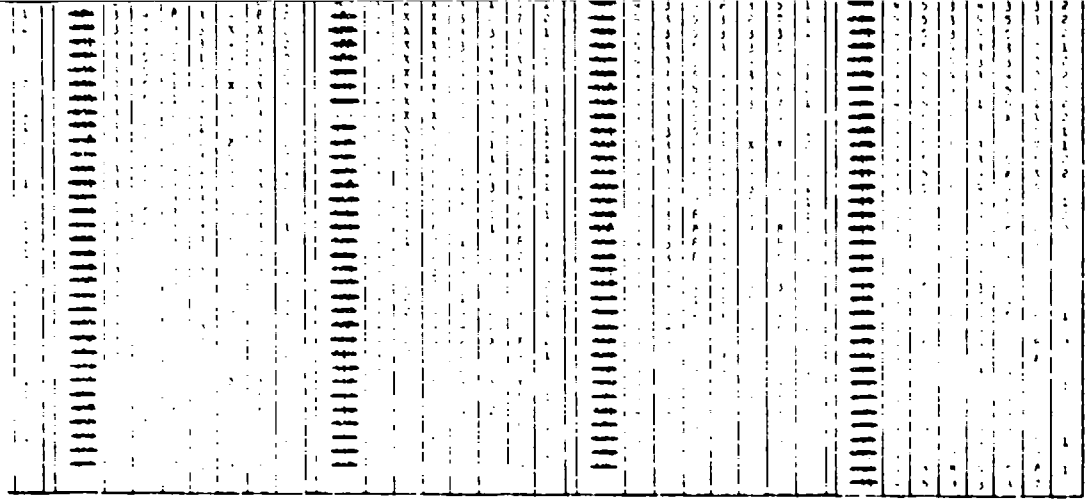


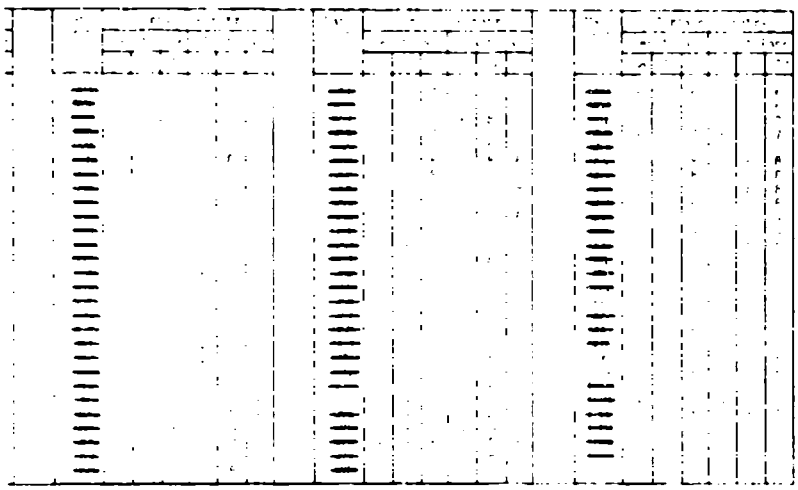


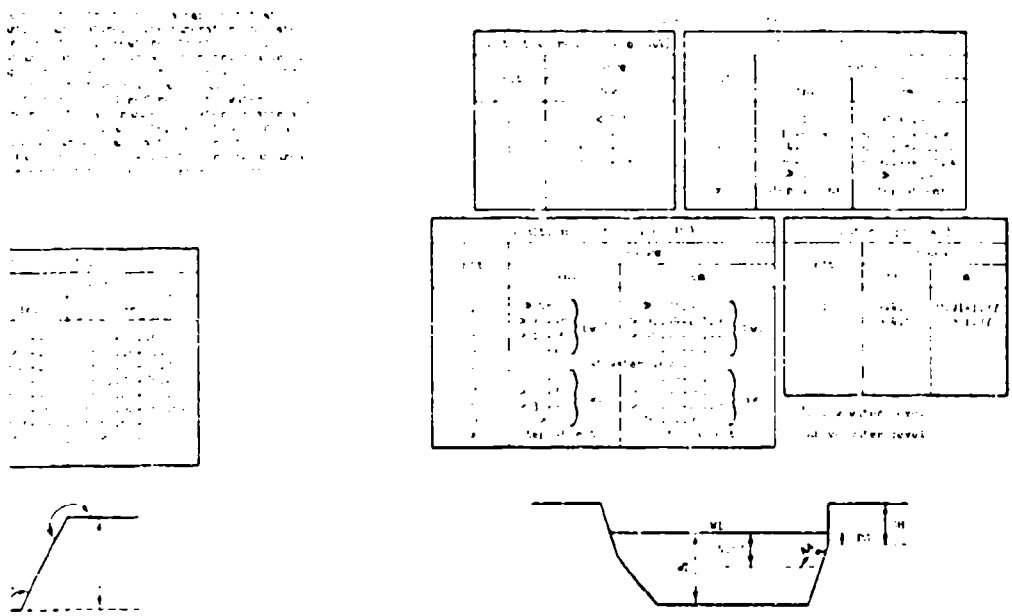


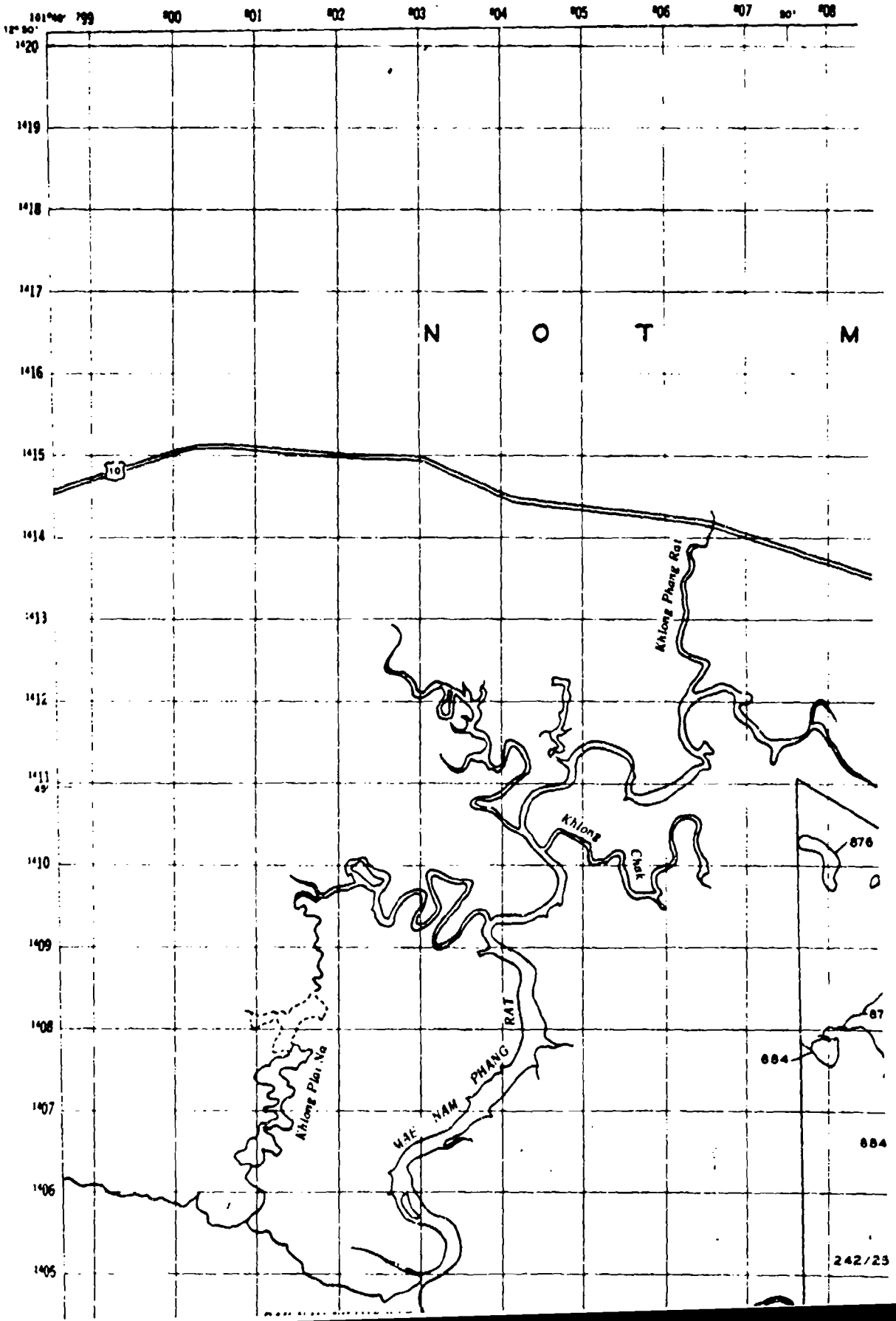


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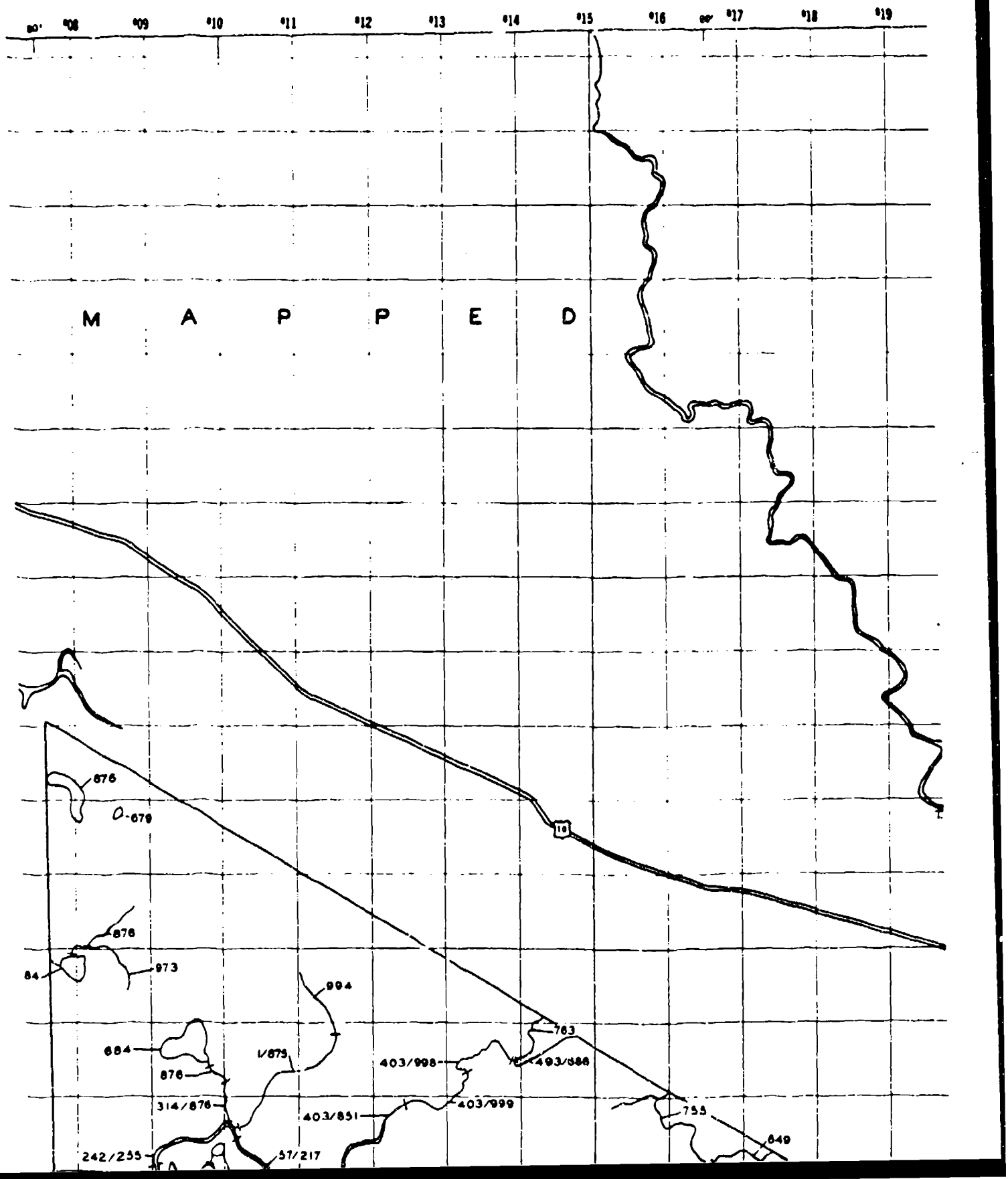





N O T M
10
Khlong Phang Rat
Khlong Chak
Khlong Plai Na
MAE NAM PHANG RAT
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884
884
242/23

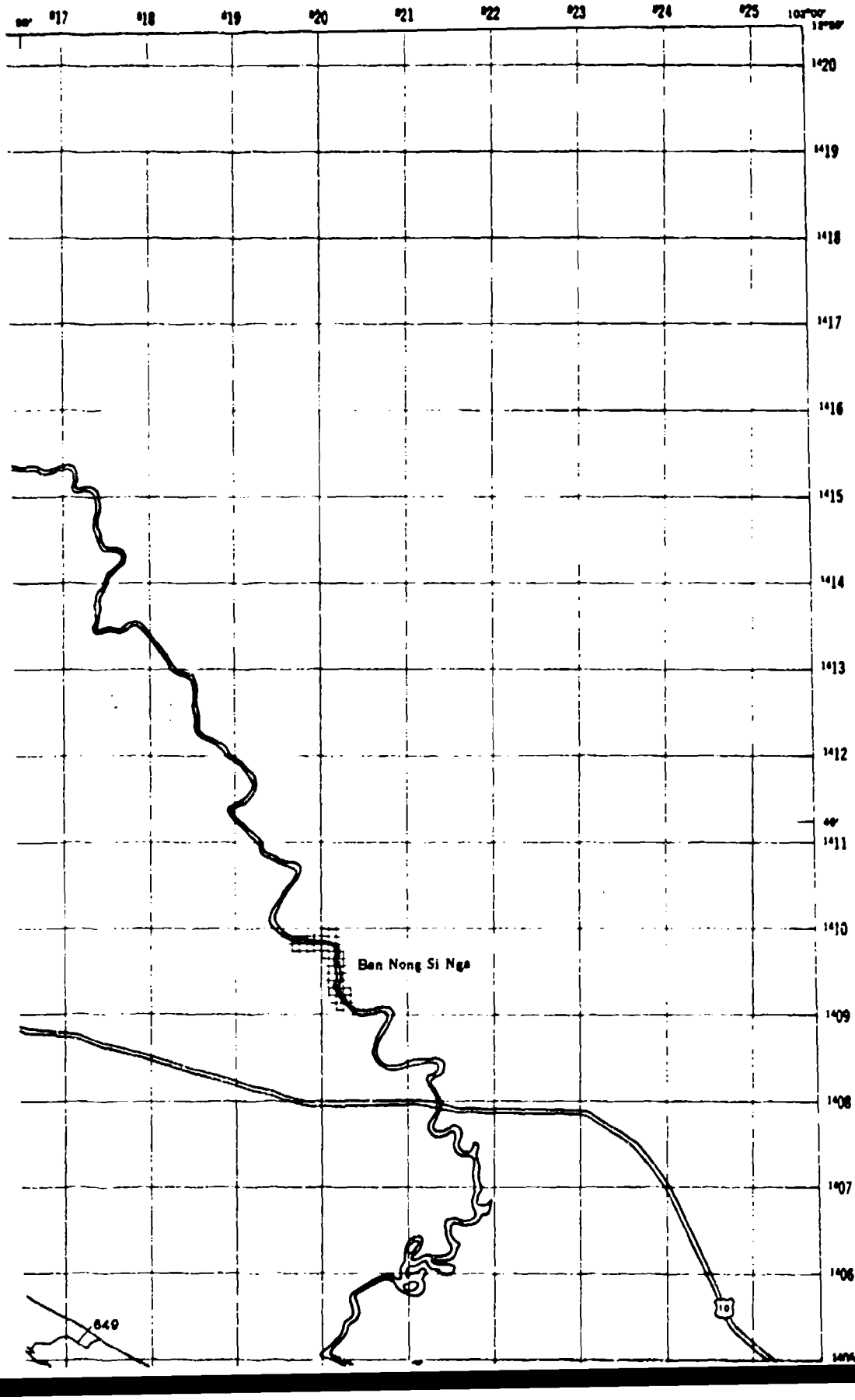
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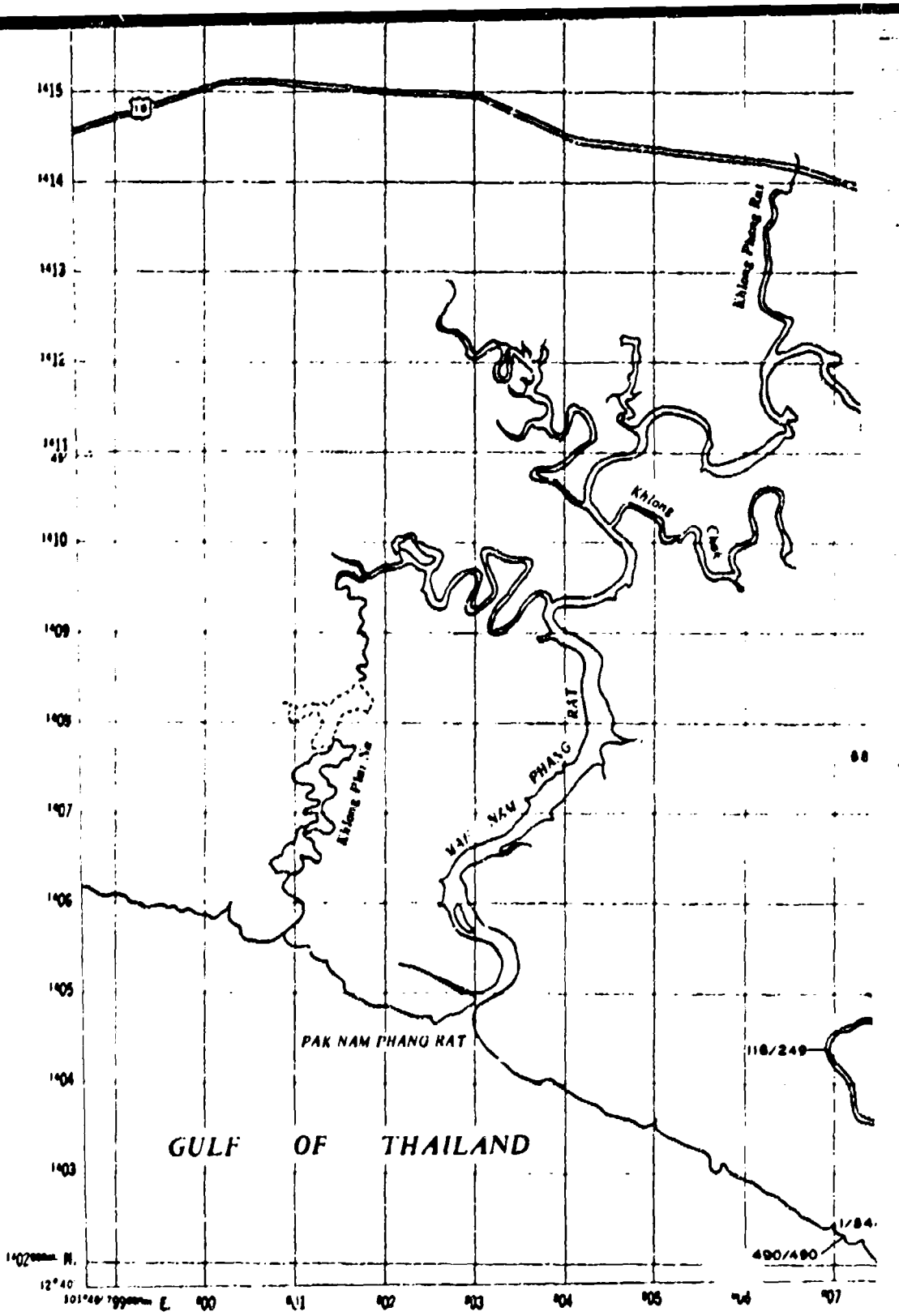
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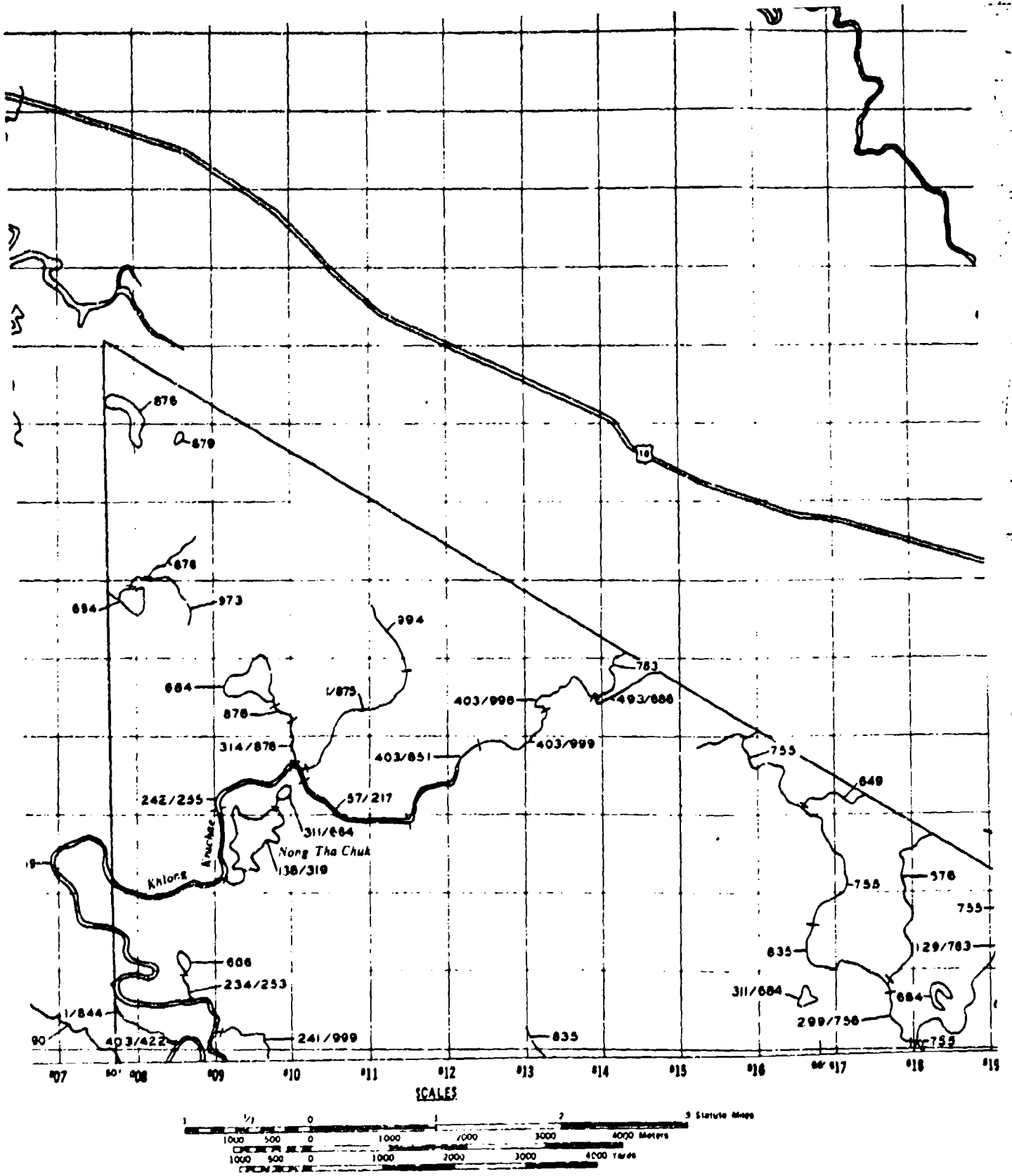
SHEET C I



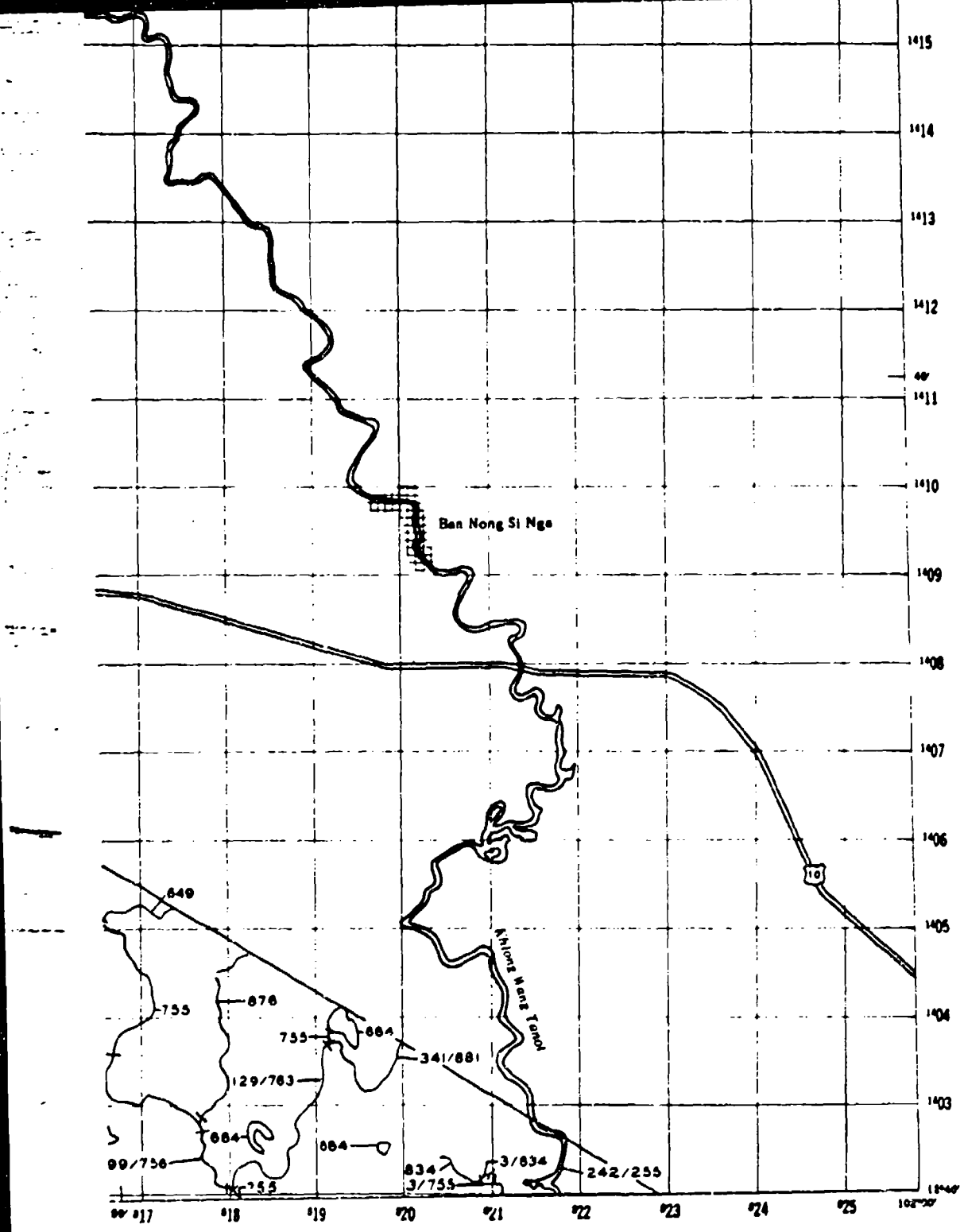


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

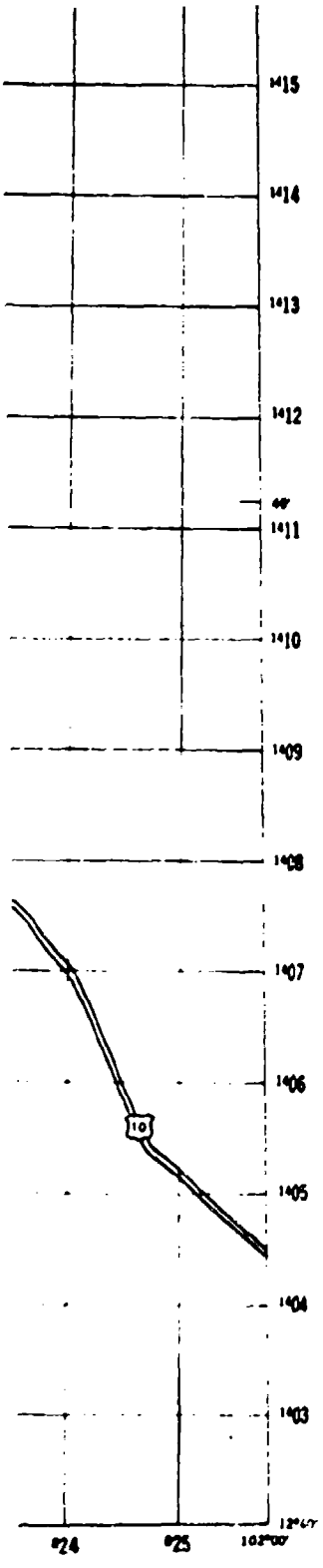
4


876
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394
684
876
1/875
314/876
403/851
403/998
403/999
783
493/686
755
649
242/255
57/217
311/684
Nong Tha Chuk
138/319
Khlong Anuchat
606
234/253
1/844
403/422
241/999
835
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129/763
299/756
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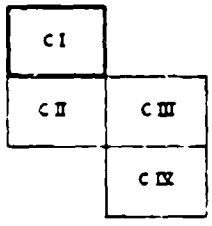
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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

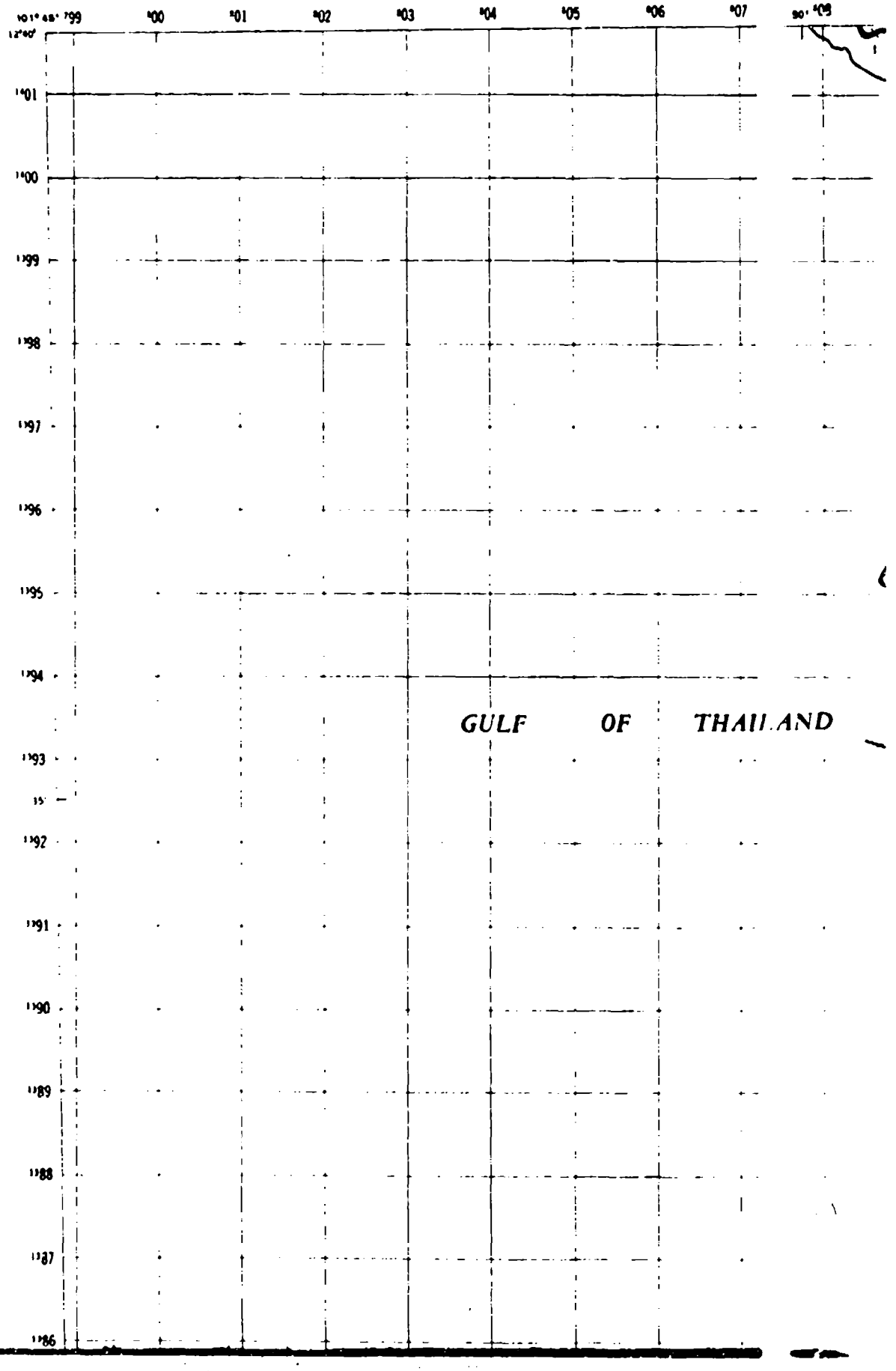
HYDROLOGIC GEOMETRY

CHANTHABURI STUDY AREA

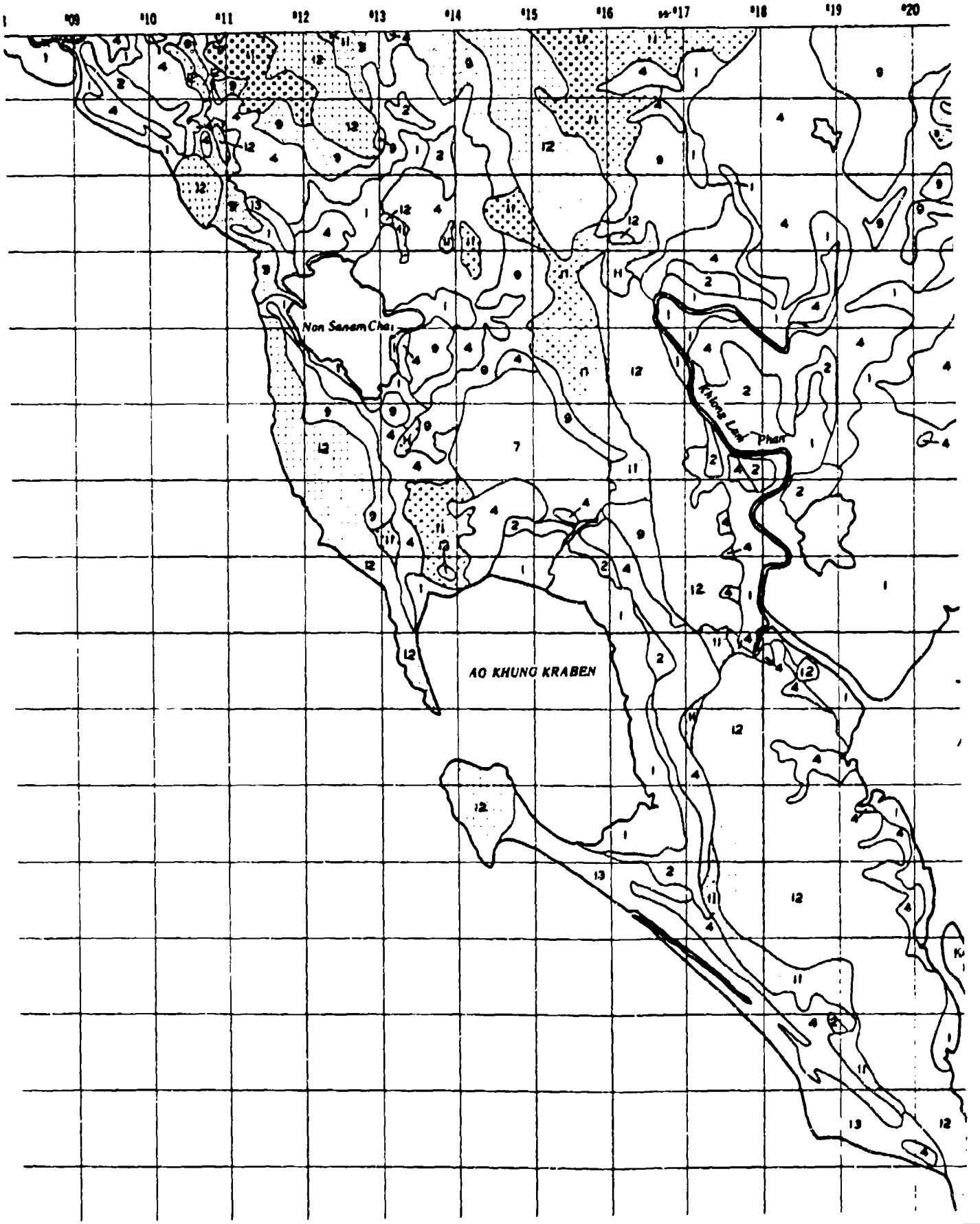
SHEET C I

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PLATE 6.1d

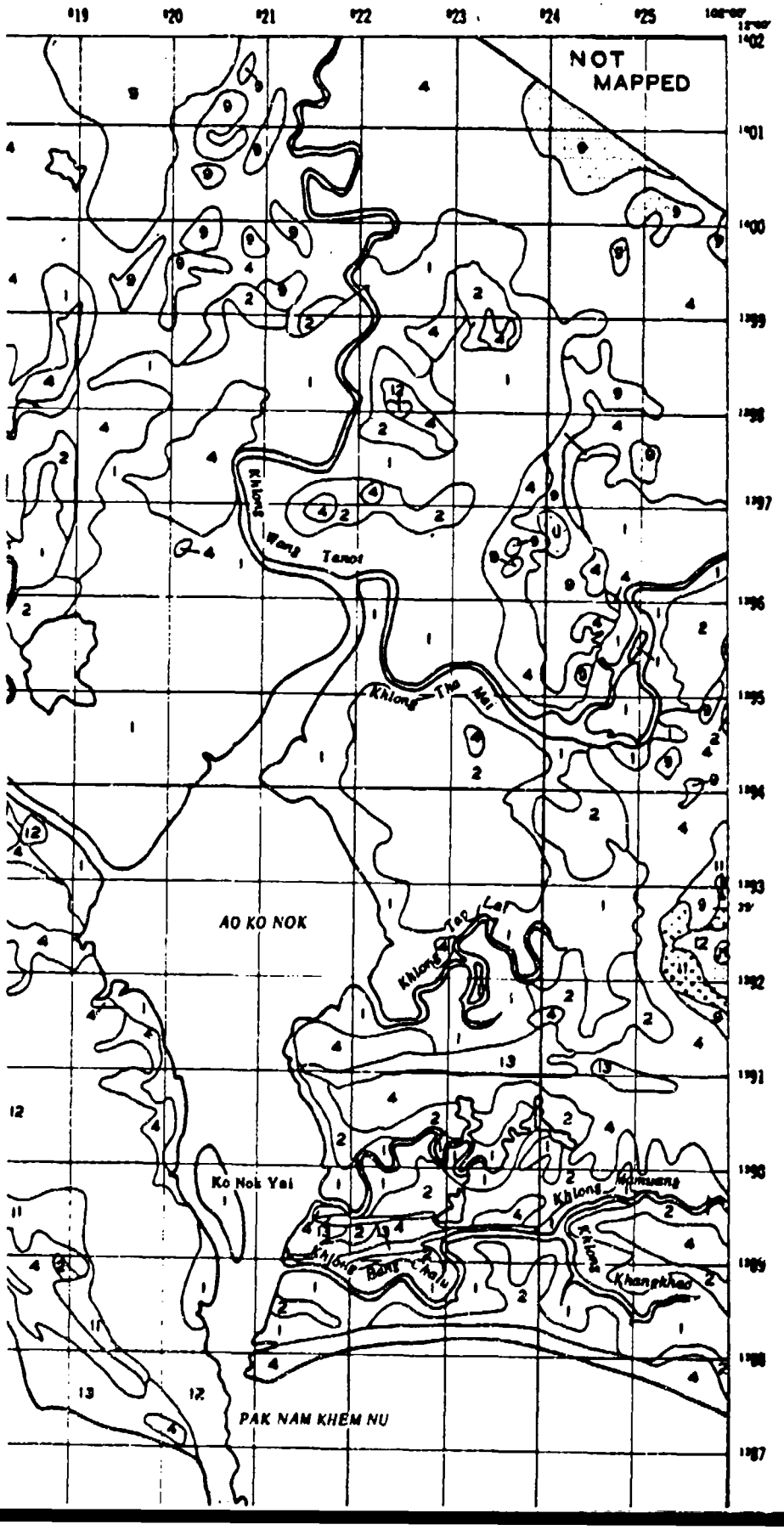

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GULF OF THAILAND

2 CHANTHABURI



3

SHEET C II



LEGEND

Unit	Undrained Shear Strength: Maximum Moisture Criterion (MCI)	Undrained Shear Strength: Maximum Moisture Criterion (MCI)	Maximum Moisture Criterion: c_{up} psi	Maximum Moisture Criterion: c_{up} kg/cm²	Maximum Moisture Criterion: ϕ_{up} deg	Plas
1	10-25	25-60	0-1	0-0.07	0-10	1-4
2	25-60	60-100	0-1	0-0.07	5-10	2-4
	25-60*	60-100	0-1	0-0.07	10-20	2-4
6	25-60	>100	0-1	0-0.07	0-10	0-1
	25-60*	>100	0-1	0-0.07	10-20	0-1
	60-100	60-100	0-1	0-0.07	0-10	2-4
7	60-100	60-100	0-1	0-0.07	10-20	0-1
	60-100	>100	0-1	0-0.07	0-10	0-1
9	60-100	>100	0-1	0-0.07	0-10	0-1
	60-100	>100	0-1	0-0.07	10-20	0-1
11	60-100*	>100	0-1	0-0.07	10-20	0-1
10	>100	>100	0-1	0-0.07	0-10	0-1
13	>100	>100	0-1	0-0.07	10-20	0-1
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1

Notes: Blank areas are water bodies.

c_{up} Shear strength at zero confining load.

ϕ_{up} Angle of internal friction.

* Maximum moisture may be less than 30 percent probability strengths commonly observed are 60-100 for Units 3 and

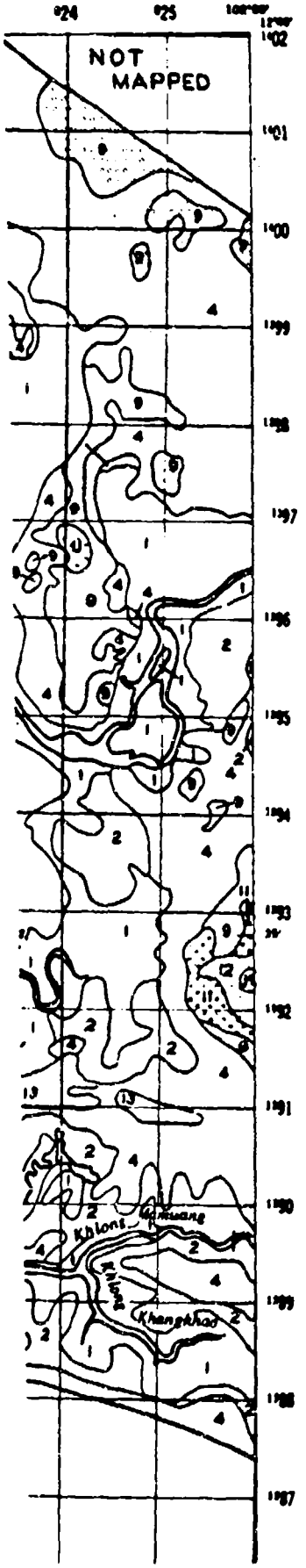
Units do not occur on this map.

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C I	
C II	C

4

SHEET C II



LEGEND

Unit	Soil Base Strength: Maximum Moisture (PI)	Soil Base Strength: Minimum Moisture (PI)	Soil Surface Strength: Maximum Moisture c_w psi	Maximum Moisture c_w kg/cm²	Maximum Moisture ϕ_w deg	Minimum Moisture c_w psi	Minimum Moisture c_w kg/cm²	Minimum Moisture ϕ_w deg	Conditions where maximum c_w occurs: c_w psi	c_w kg/cm²	ϕ_w deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

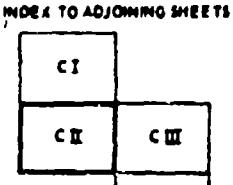
c_w Shear strength at zero normal load.

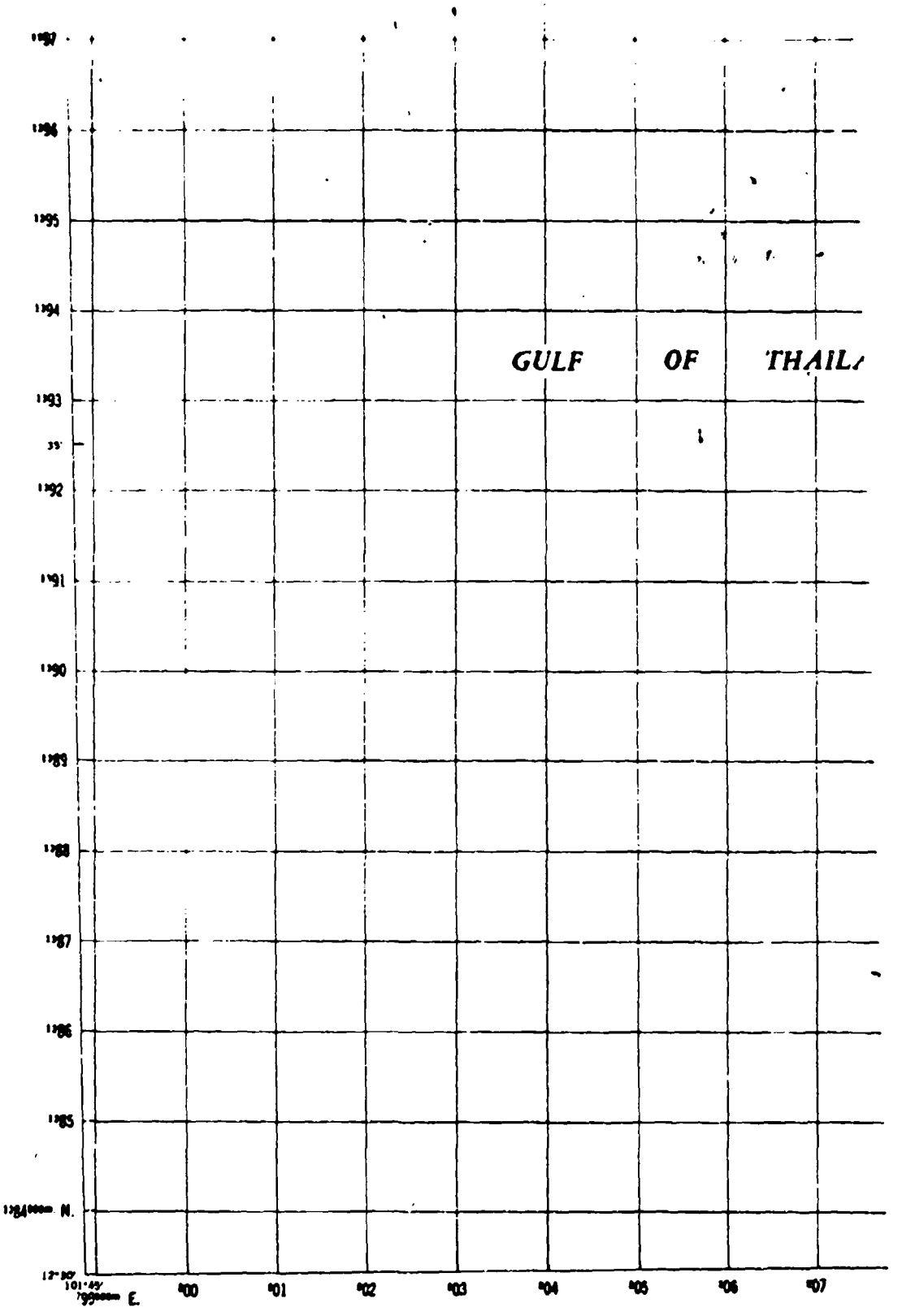
ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

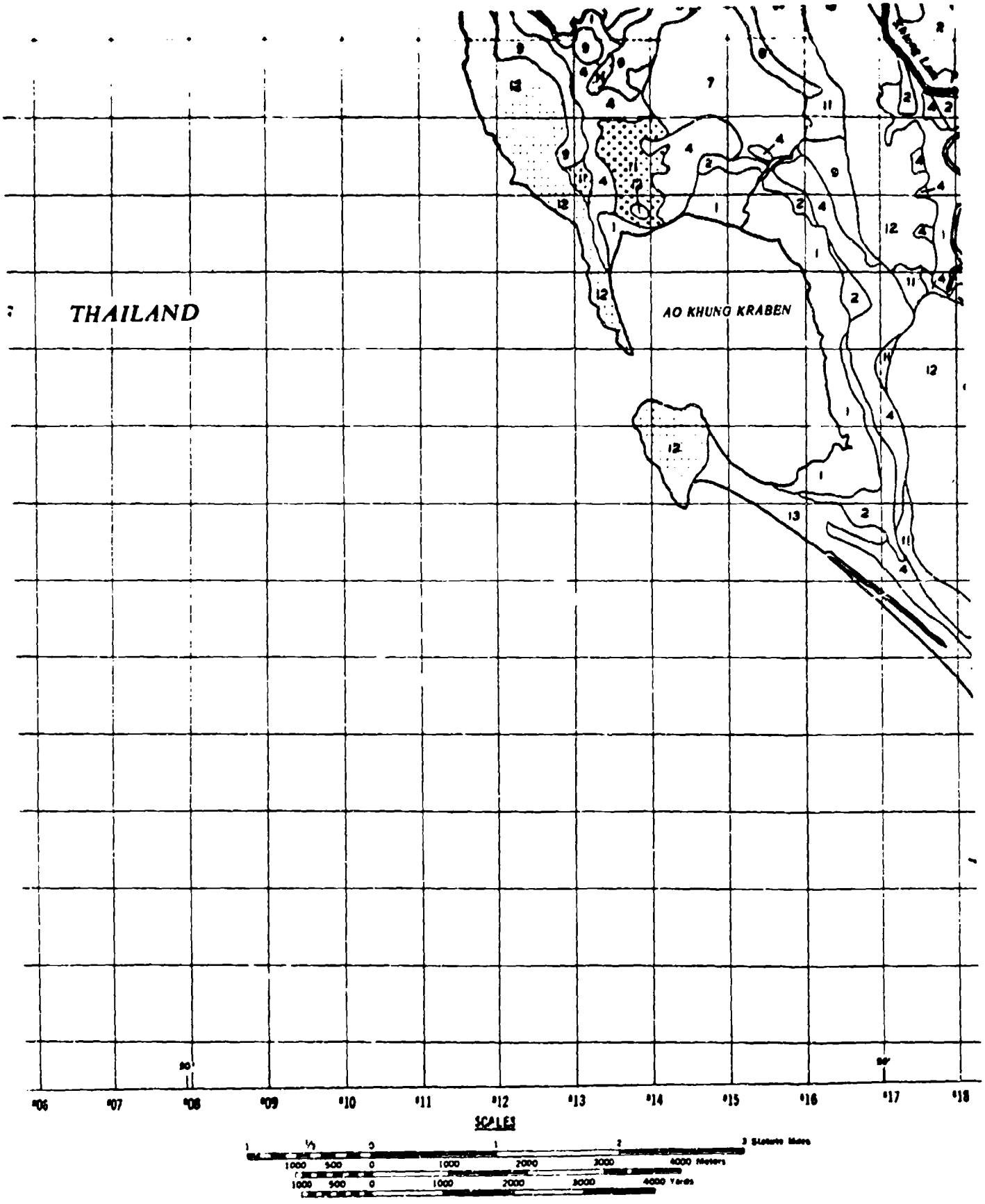
INDEX TO ADJOINING SHEETS

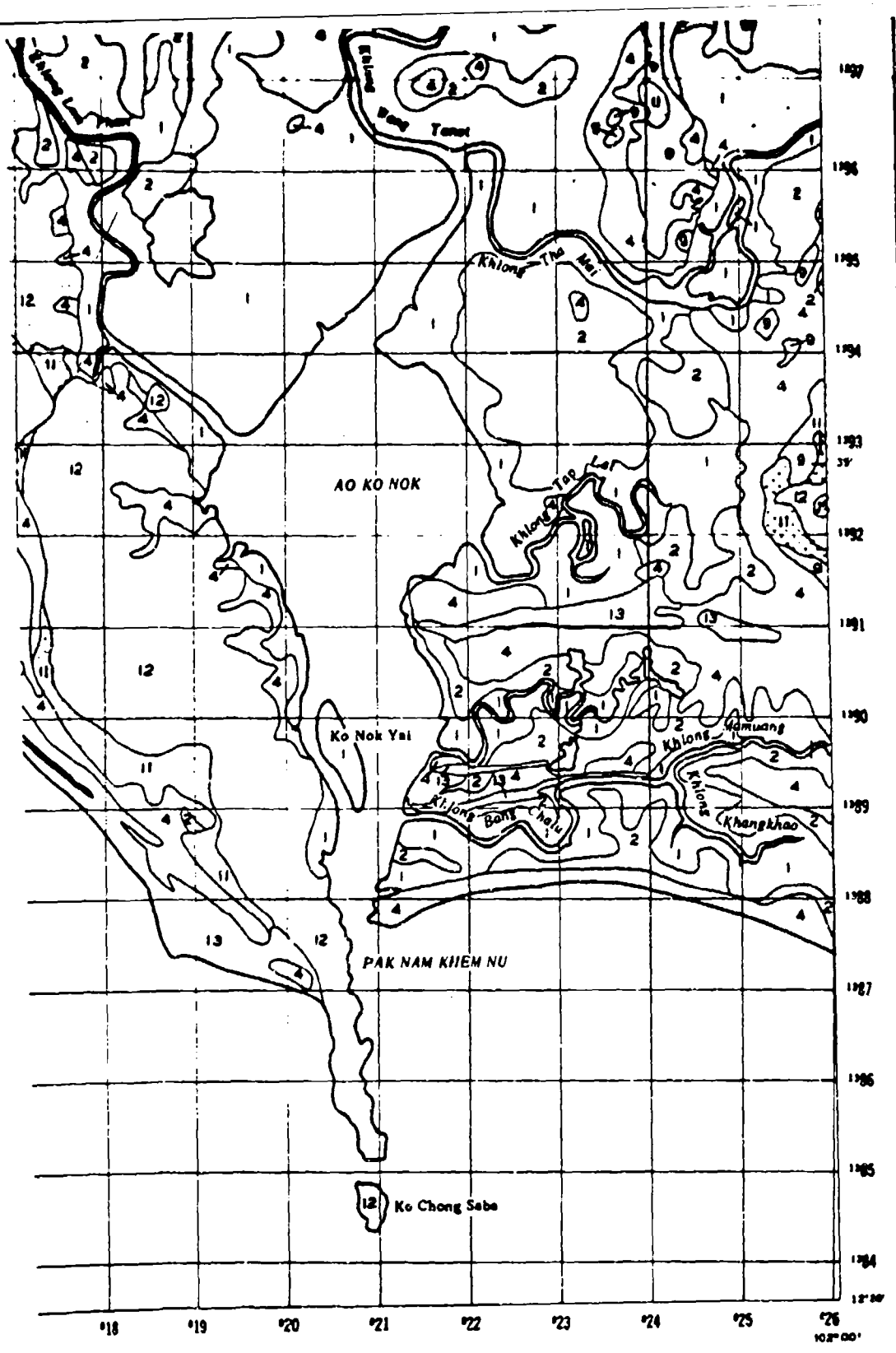




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

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AO KHUNG KRABEN
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SCALES
1 ½ 0 1 2 3 Statute Miles
1000 500 0 1000 2000 3000 4000 Meters
1000 500 0 1000 2000 3000 4000 Yards



Unit	Cohesion (kg/cm²)	Shear strength (kg/cm²)	γ_{wet}	γ_{sat}
1	10-25	25-50	0-1	0-1
2	25-50	50-100	0-1	0-1
3	25-50*	50-100	0-1	0-1
4	25-50	>100	0-1	0-1
5	25-50*	>100	0-1	0-1
6	50-100	50-100	0-1	0-1
7	50-100	50-100	0-1	0-1
8	50-100	>100	0-1	0-0
9	50-100	>100	0-1	0-0
10	50-100	>100	0-1	0-0
11	50-100*	>100	0-1	0-0
12	>100	>100	0-1	0-0
13	>100	>100	0-1	0-0
	Complex of 50-100 and >100	>100	0-1	0-0
	Complex of 50-100 and >100	>100	0-1	0-0

Notes: Blank areas are water bodies.

γ_{wet} Shear strength at zero normal load

γ_{sat} Angle of internal friction.

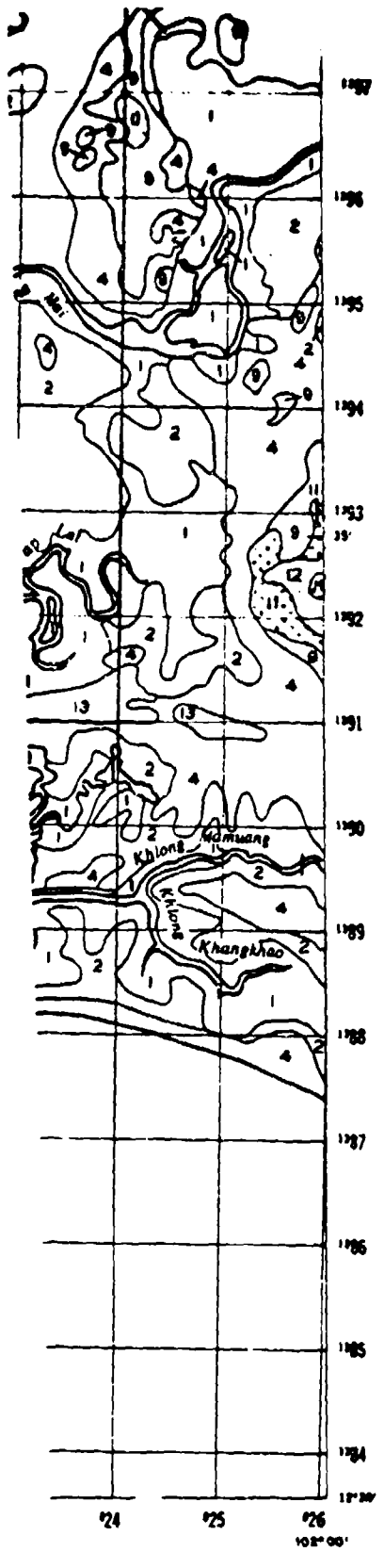
* Maximum moisture has less than 30 strengths commonly observed are 60-

Units do not occur on this map.

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Unit	USB	USCS	Cohesion (lb/in²)	Shear strength (kg/cm²)	Angle of internal friction (deg)	Cohesion (lb/in²)	Shear strength (kg/cm²)	Angle of internal friction (deg)	Cohesion (lb/in²)	Shear strength (kg/cm²)	Angle of internal friction (deg)
1	10-75	75-CH	>1	0-0.07	0-10	1-4	0.07-0.14	10-20	Minimum moisture conditions		
2	75-90	CH-MH	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	75-90*	CH-MH	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	75-90	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	75-90*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

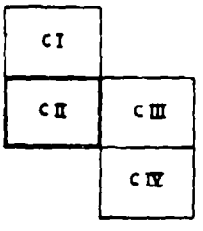
c_{ss} Shear strength at zero normal load.

ϕ_{ss} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Unit. do / s cover on this map.

INDEX TO ADJOINING SHEETS



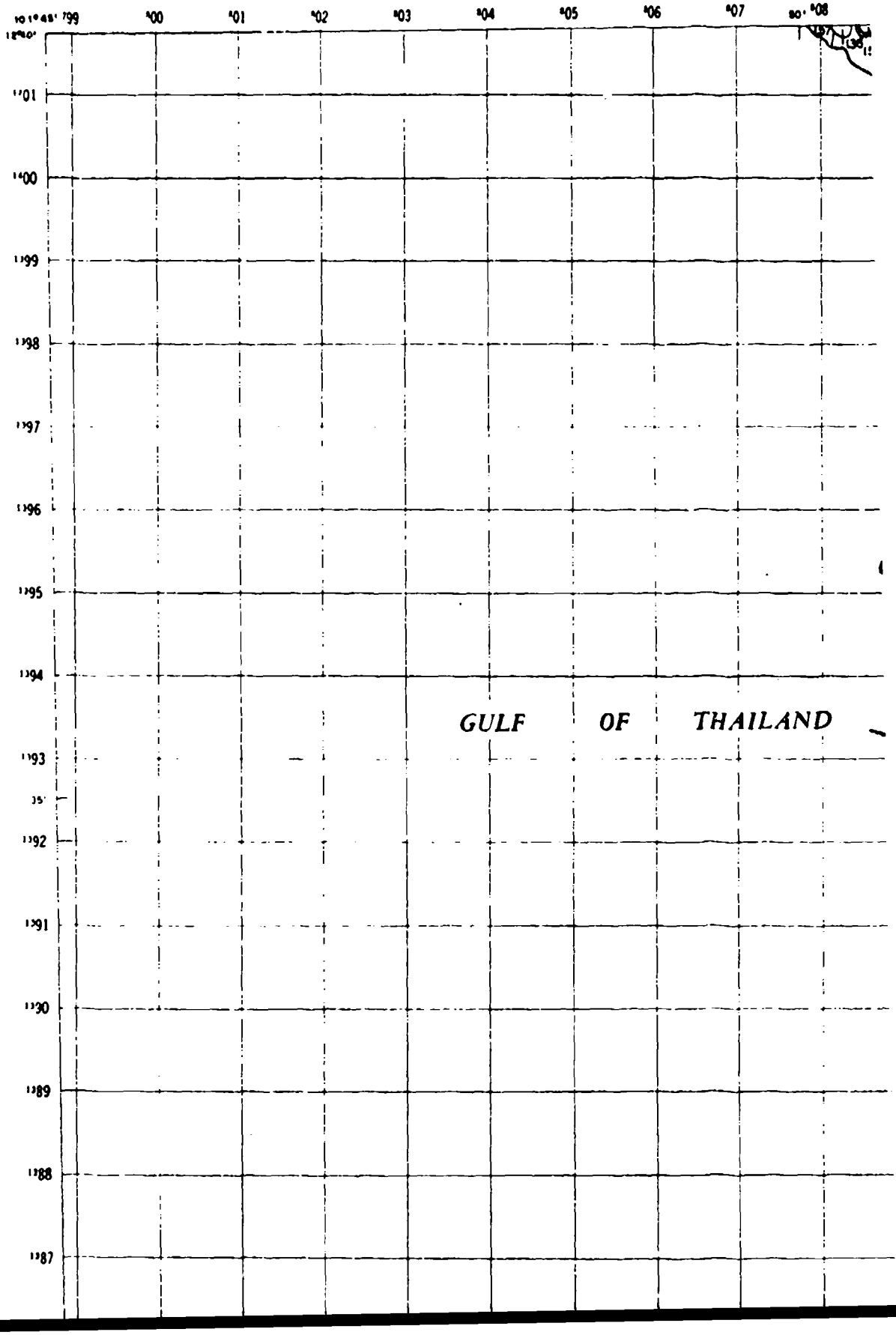
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

CHANTHABURI STUDY AREA

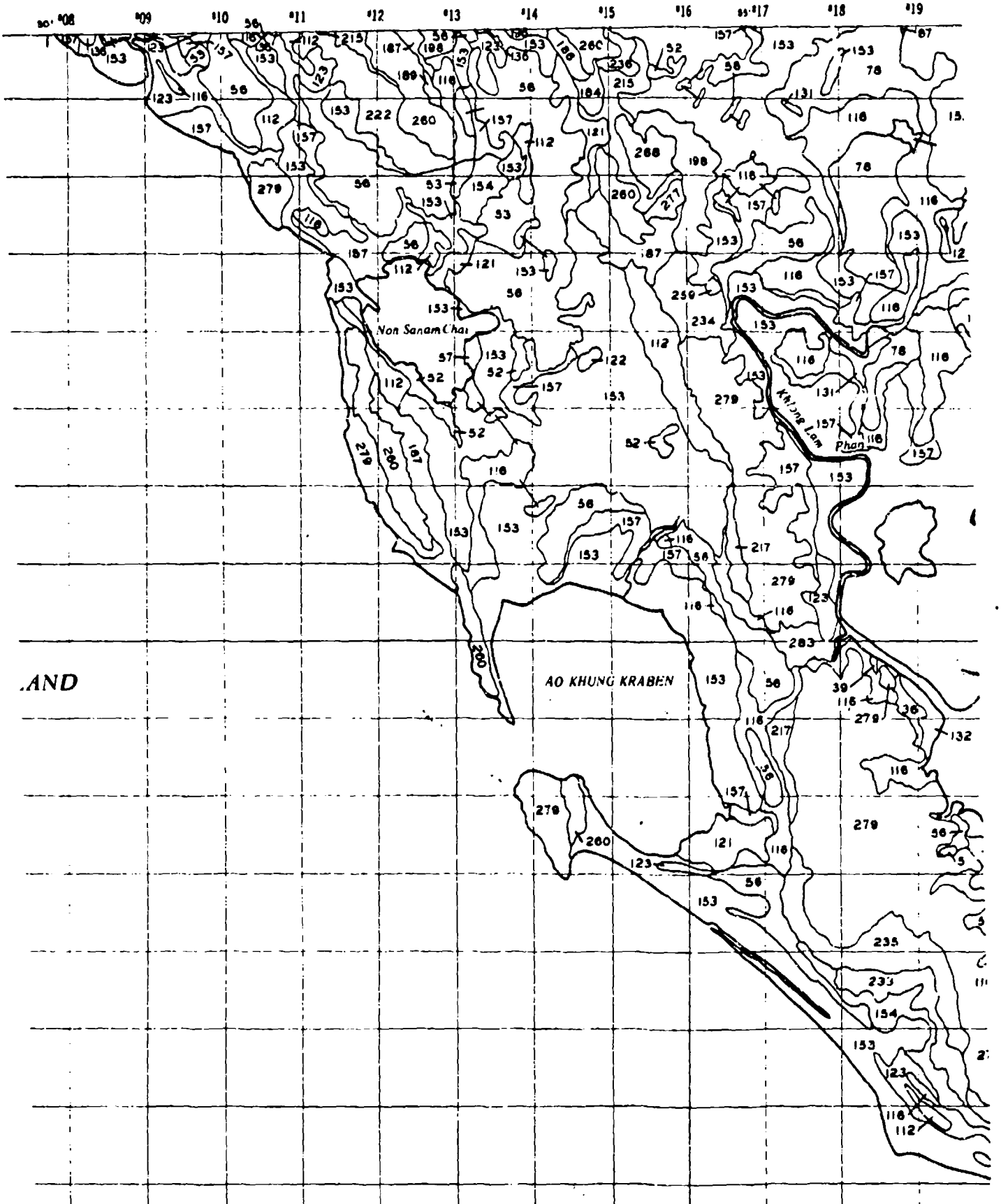
SHEET C II

PLATE 6.2a


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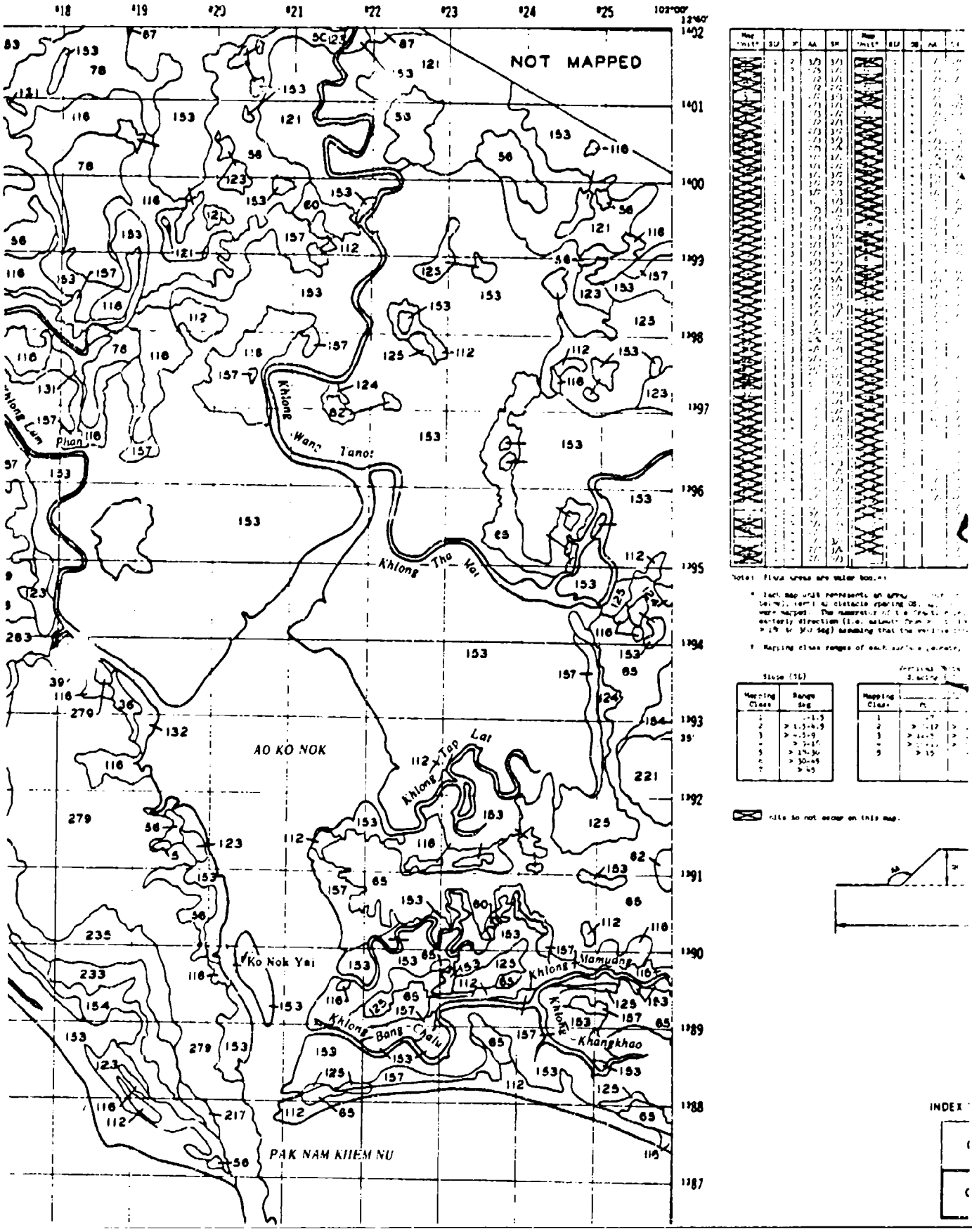
2

CHANTHABURI



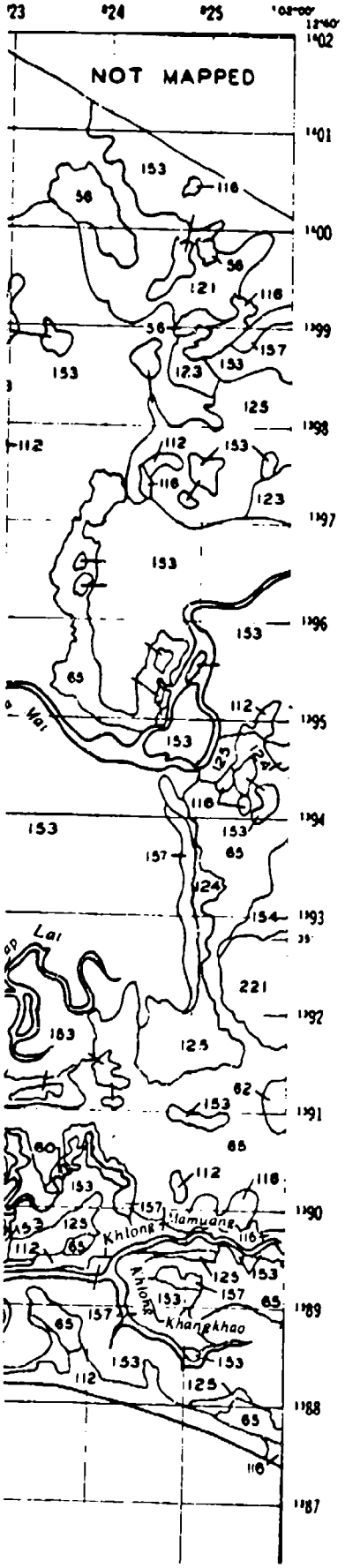
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SHEET C II

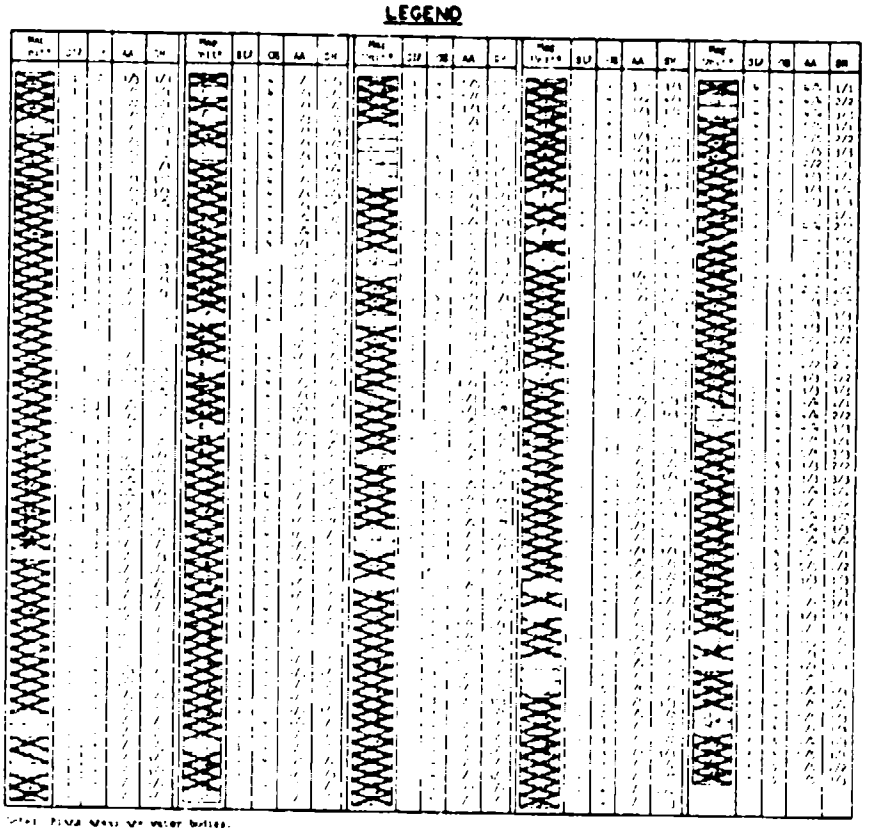


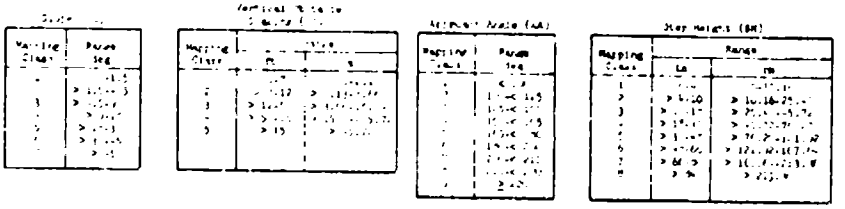
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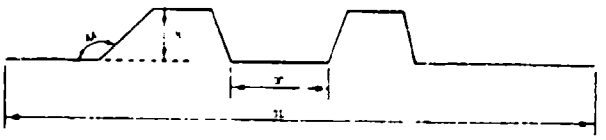
SHEET C II



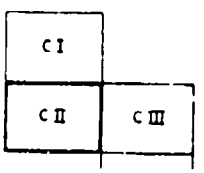
LEGEND

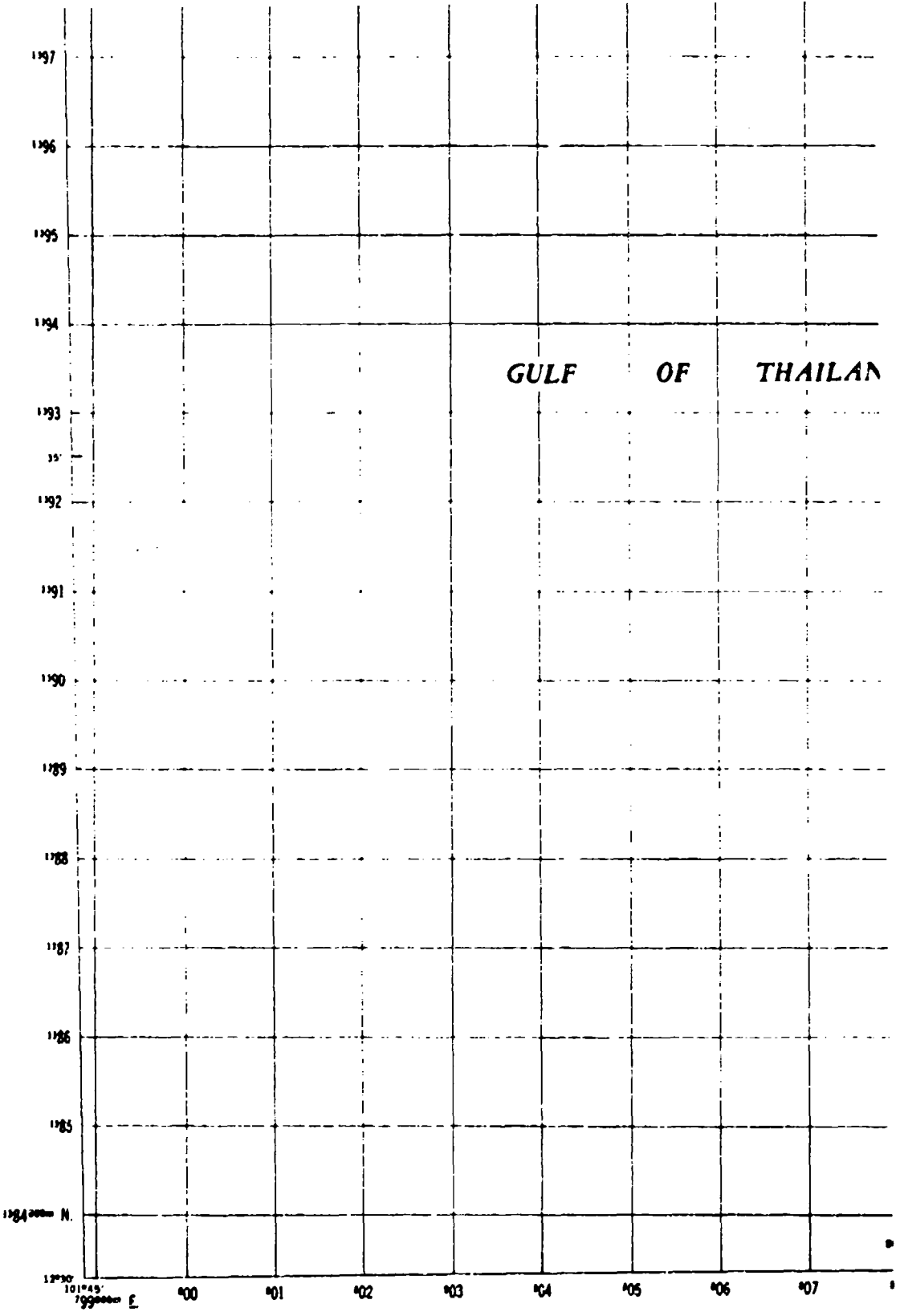






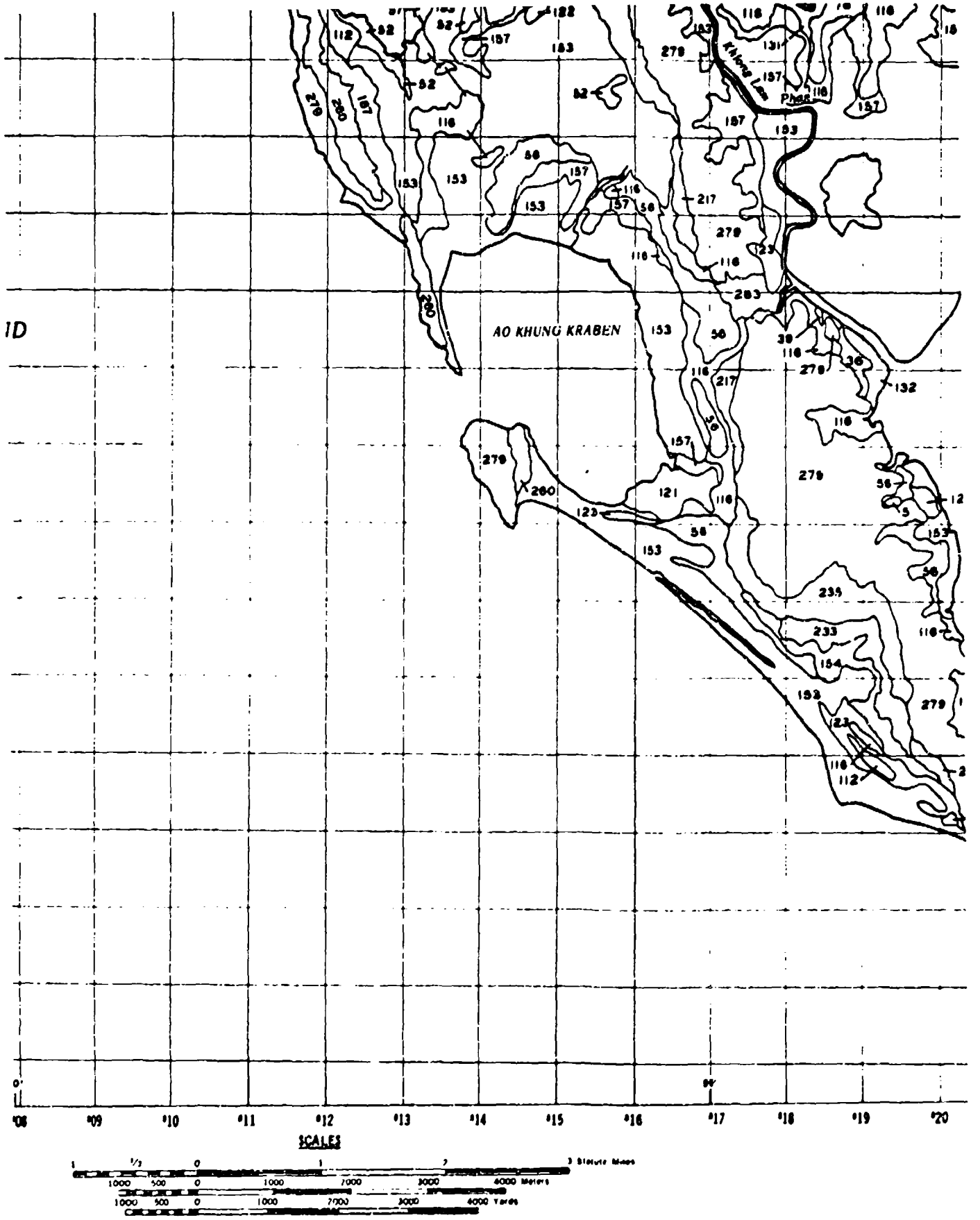
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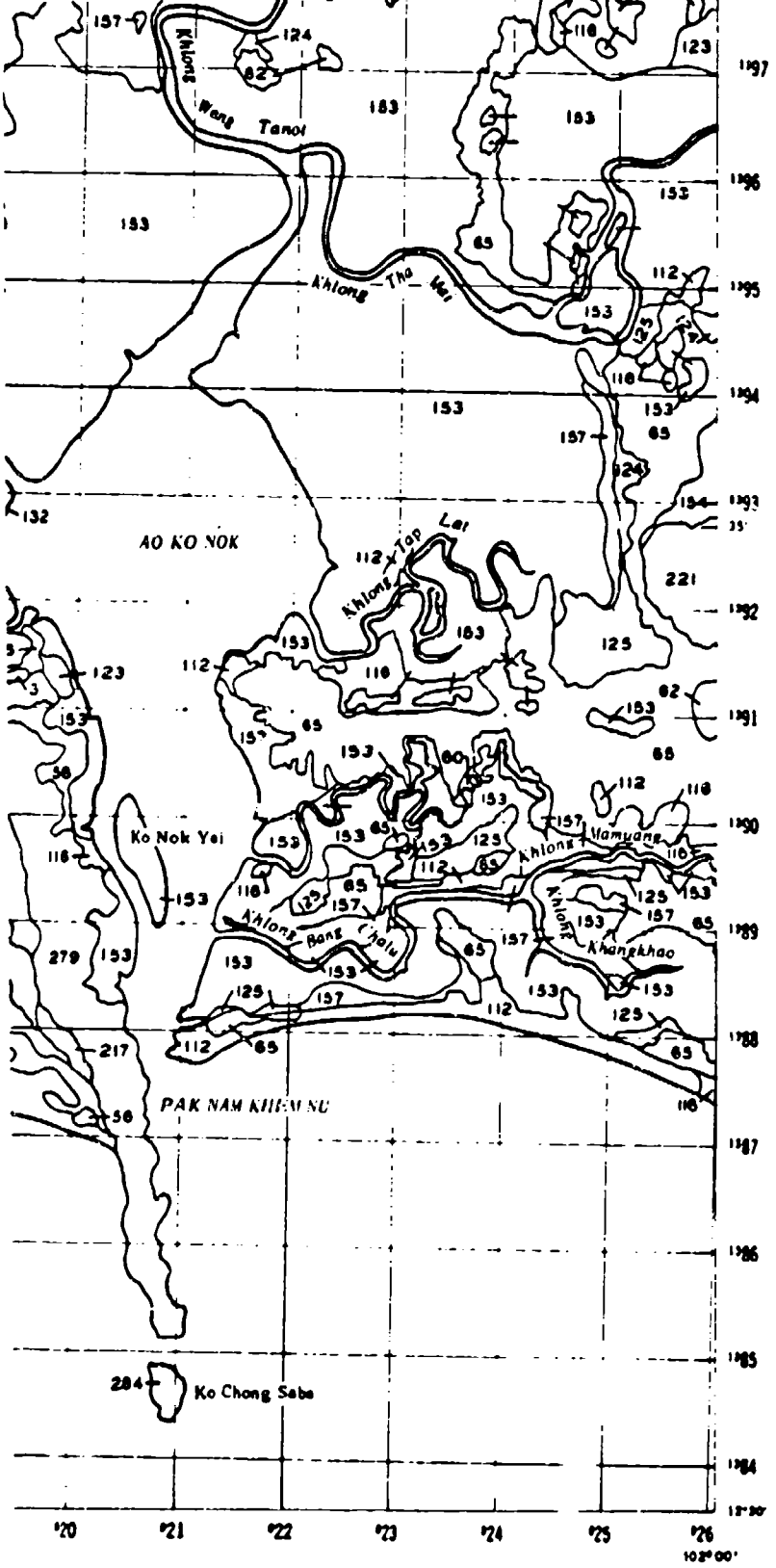


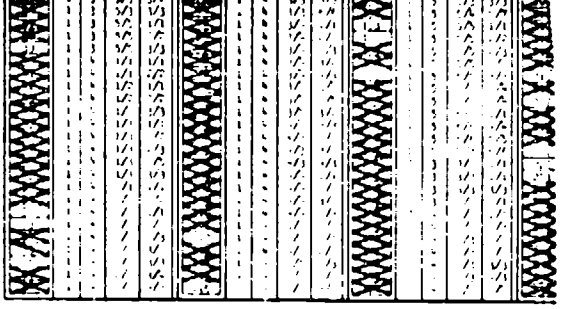
ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

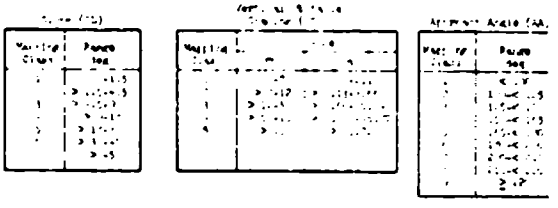
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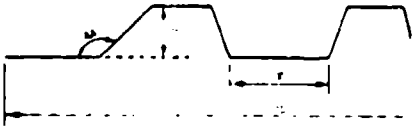


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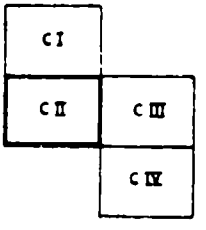






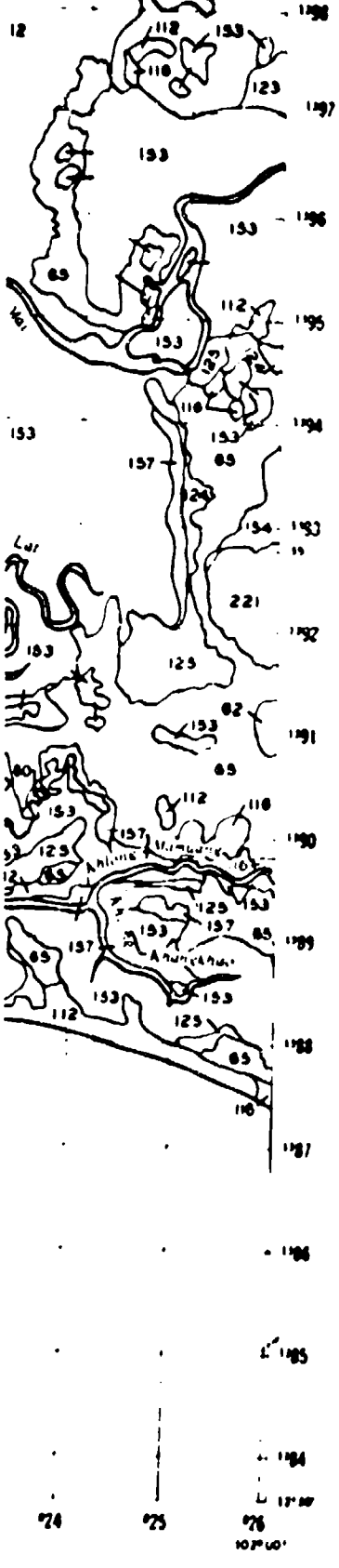


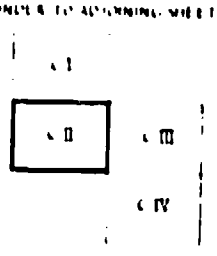
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A QUANTITATIVE METHOD FOR DES
TERRAIN FOR GROUND MOBIL

SURFACE GEOMETR
CHANTHABURI STUDY AF
SHEET C II





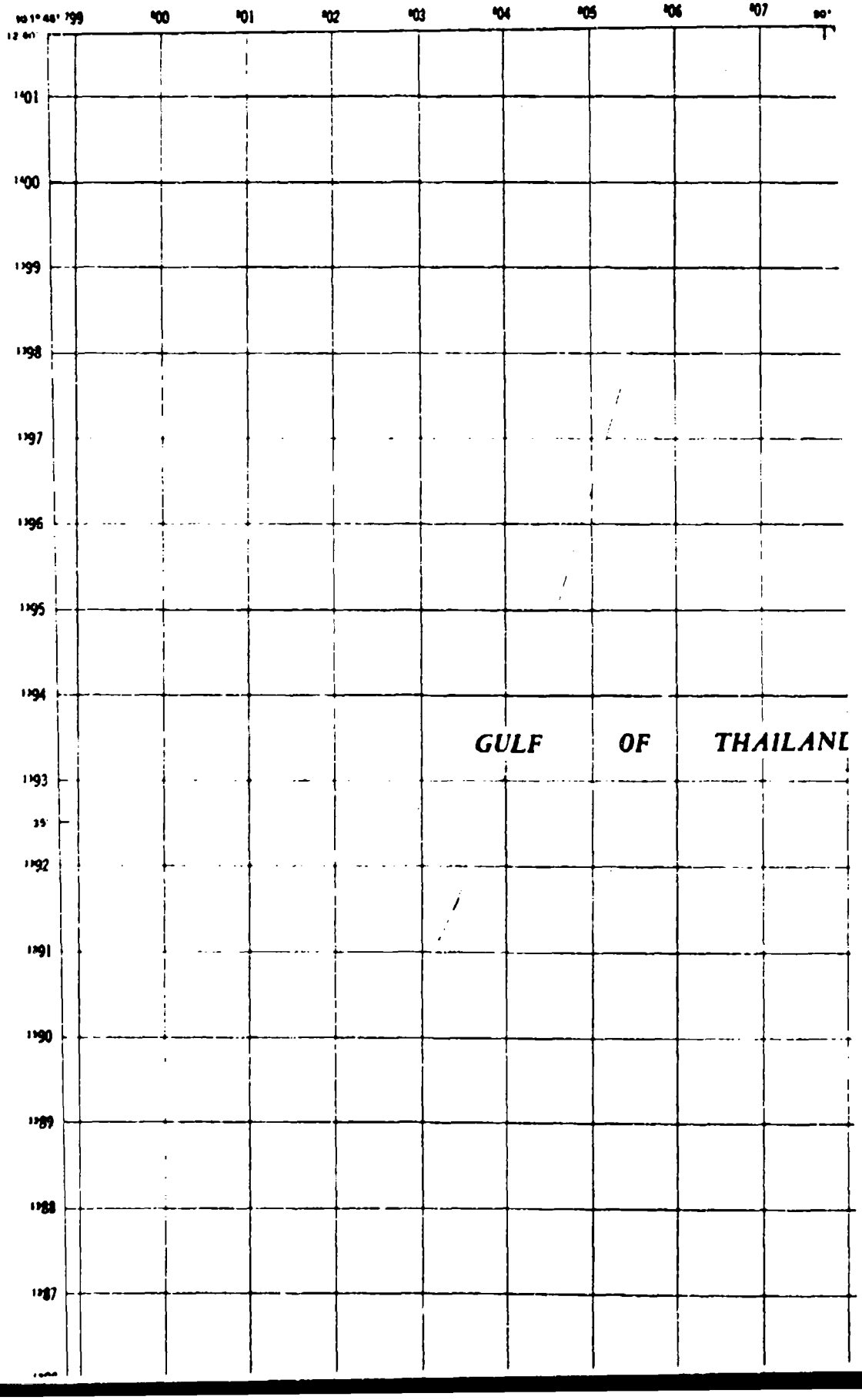
A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

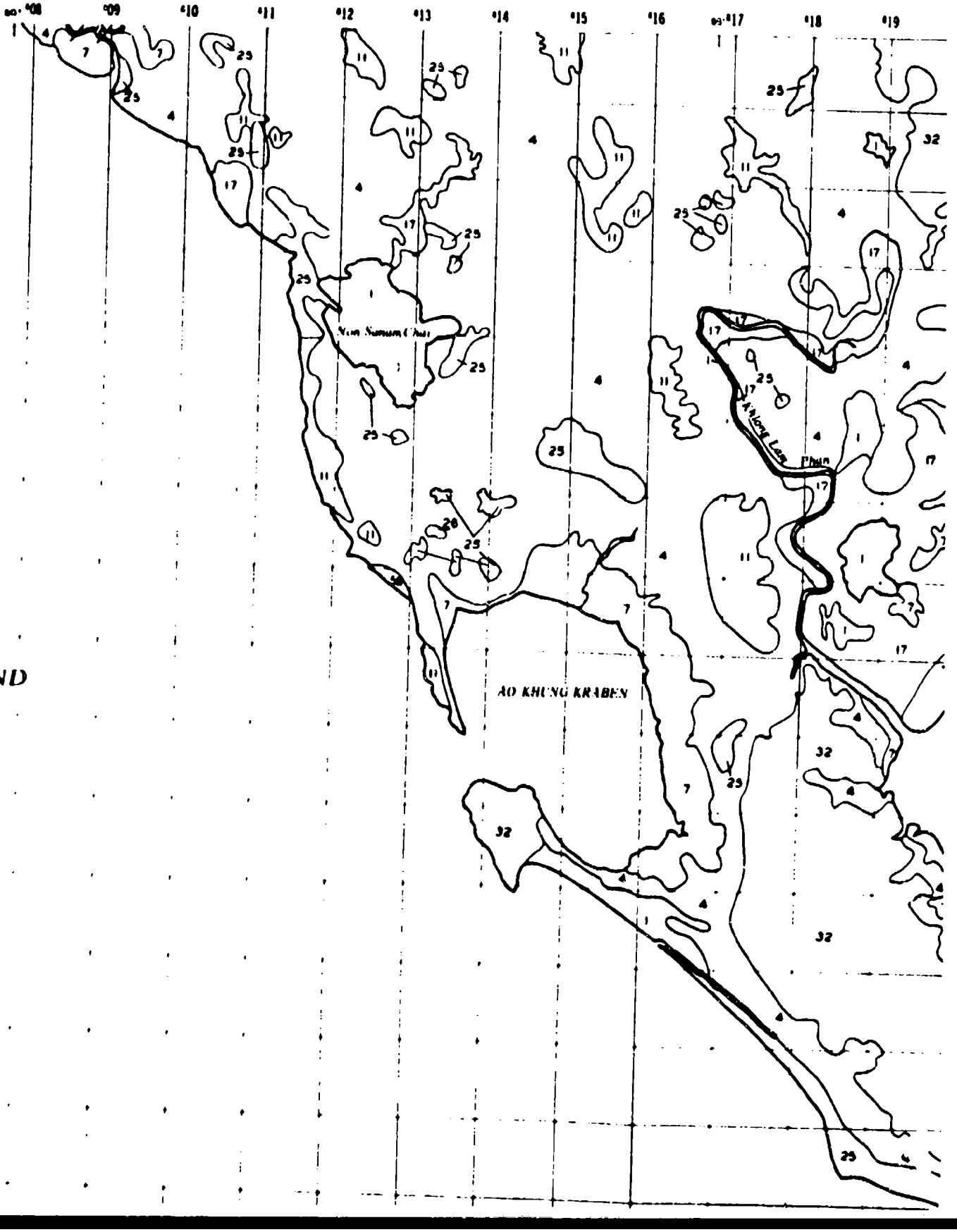
CHANTHABURI STUDY AREA

SHEET C II

PLATE 6.2b


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GULF OF THAILAND
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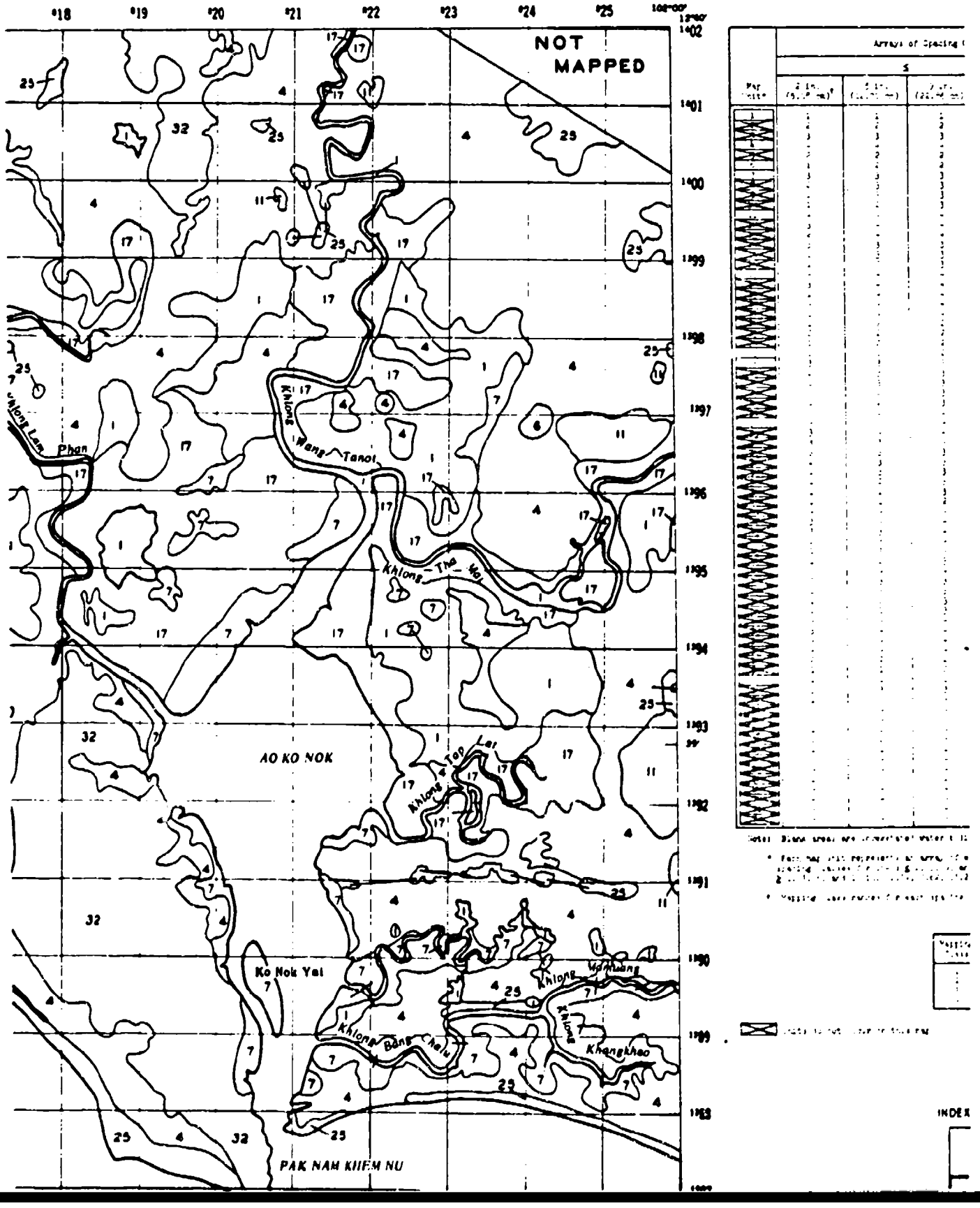
2 CHANTHABURI



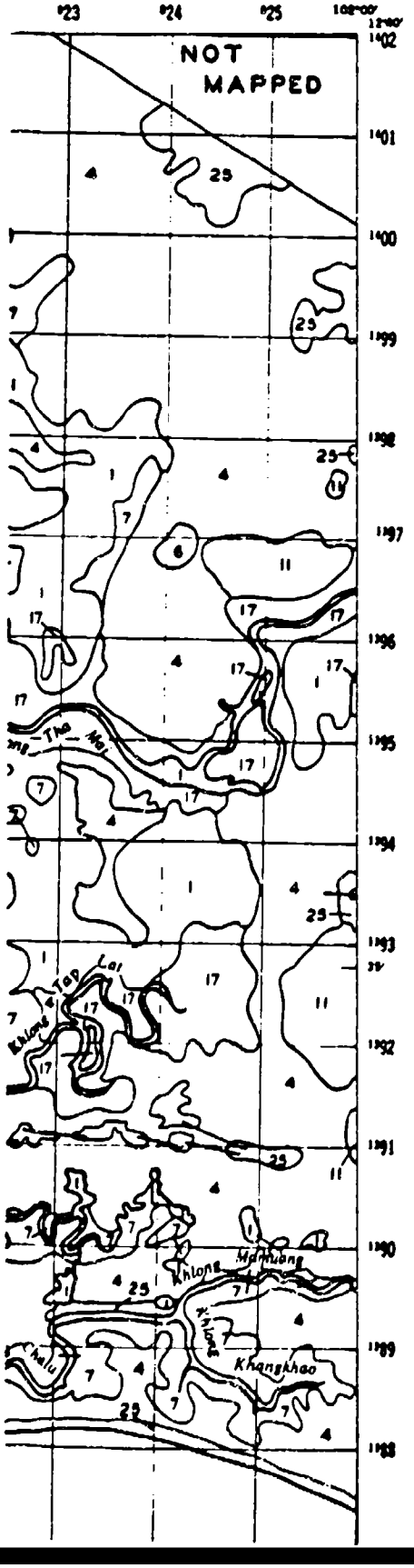
AND

3

SHEET C II


NOT MAPPED
AO KO NOK
Ko Nok Yai
PAK NAM KHEM NU
Khlong Wang Tanot
Khlong Tha Mai
Khlong Top Lai
Khlong Ban Nalu
Khlong Khangkhao
INDEX

SHEET C II



LEGEND

Map Unit*	Arrays of Spacing Classes for Stems ≤ and ≥ the Specified Diameter							
	≤				≥			
	2 in. (5.08 cm)†	5 in. (12.70 cm)	7 in. (17.80 cm)	30 in. (127.00 cm)	1 in. (2.54 cm)	3 in. (7.62 cm)	6 in. (15.24 cm)	10 in. (25.40 cm)
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	1	1	1
3	3	3	3	3	3	2	1	1
4	4	4	4	4	4	3	2	1
5	5	5	5	5	5	4	3	2
6	6	6	6	6	6	5	4	3

Note: Blank areas are interpreted water bodies.

* Each map unit represents an array of eight symbols (i.e. 1, 1, 1, 1, 1, 1, 1, 1,) indicating spacing classes for stems ≤ 2, 5, 7, and 30 in. (≤ 5.08, 12.70, 17.80, and 127.00 cm) and ≥ 1, 3, 6, and 10 in. (2.54, 7.62, 15.24, and 25.40 cm).

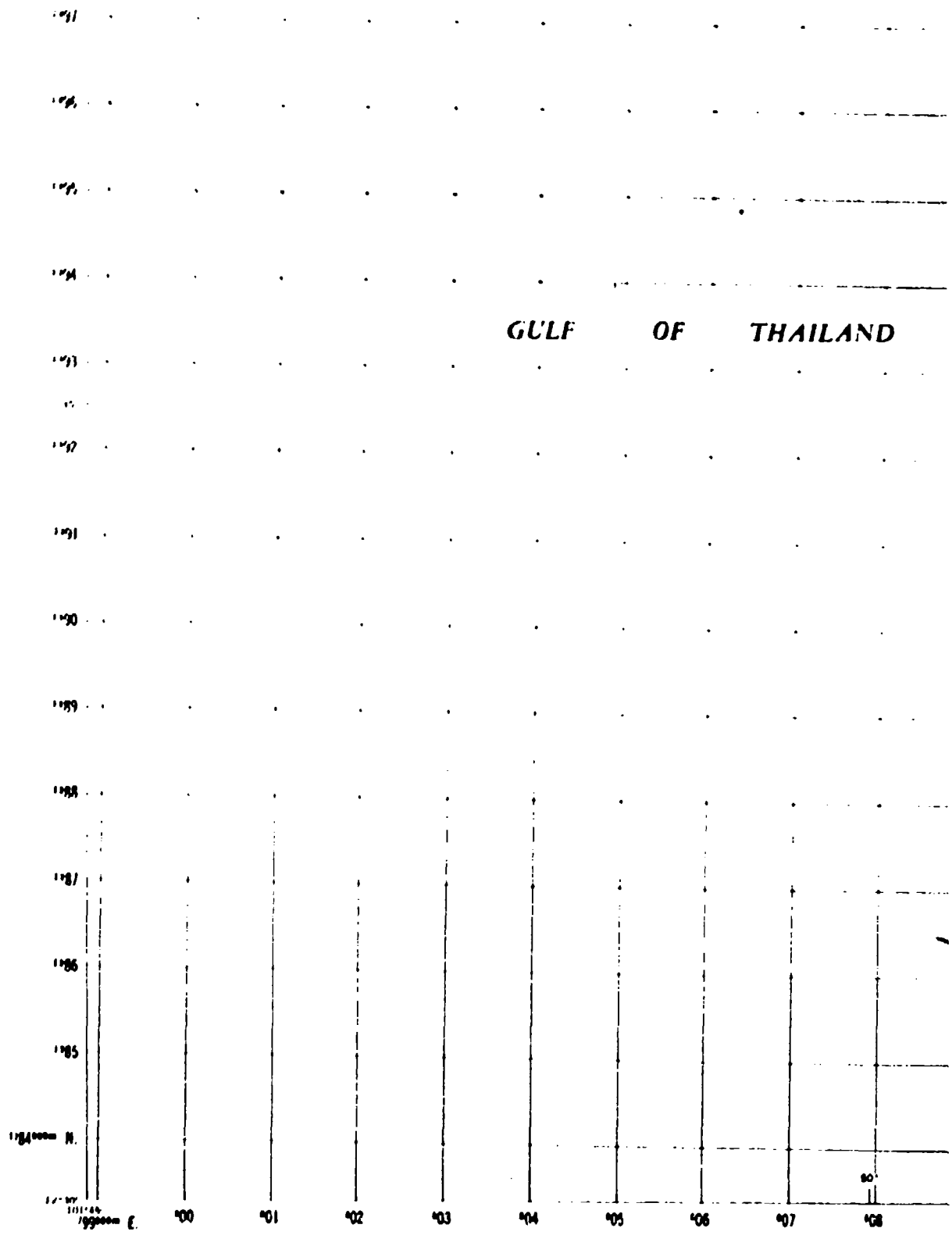
† Mapping class ranges for each spacing class are:

Mapping Class	Stem Spacing Range	
	ft	m
1	> 37	> 7.14
2	> 17-30	> 3.05-9.14
3	> 9-10	> 1.52-3.05
4	0-9	0-1.52

Units do not occur on this map.

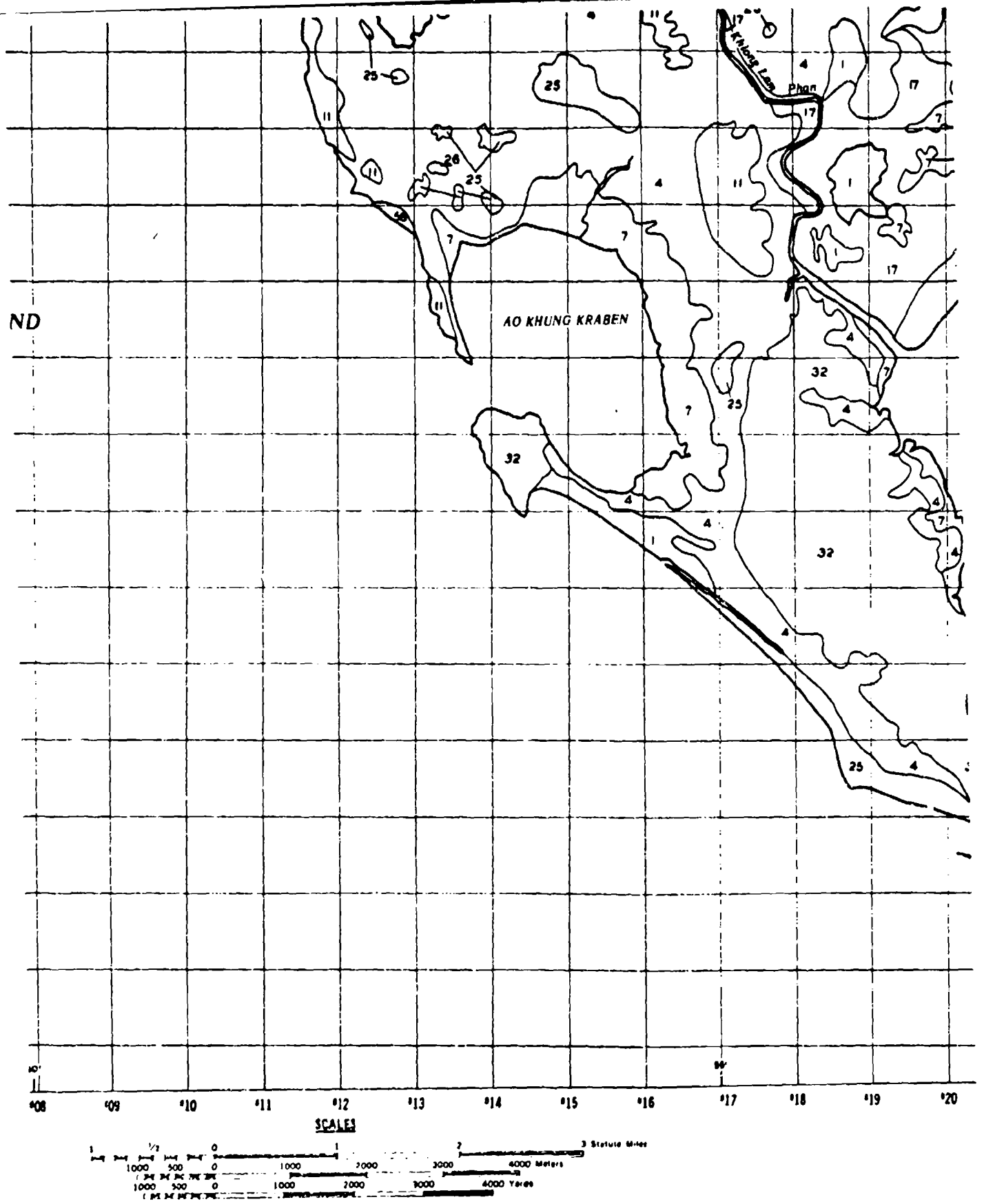
INDEX TO ADJOINING SHEETS



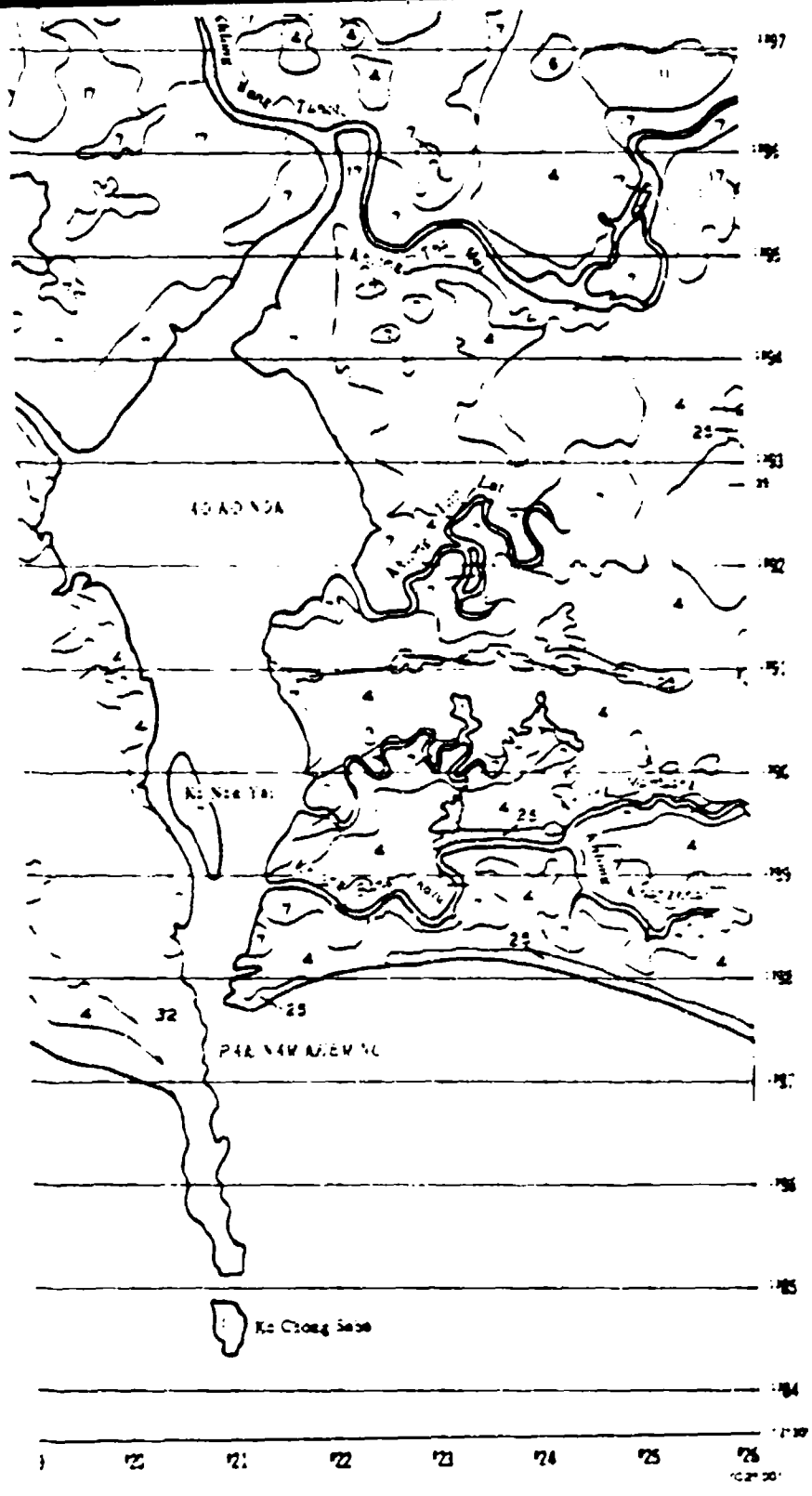


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

5


ND
AO KHUNG KRABEN
Khlong Lam Phan
11
17
25
4
1
7
26
32
99°
100°
98°
08
09
10
11
12
13
14
15
16
17
18
19
20
SCALES
1
½
0
1
2
3 Statute Miles
1000
500
0
1000
2000
3000
4000 Meters
1000
500
0
1000
2000
3000
4000 Yards

6

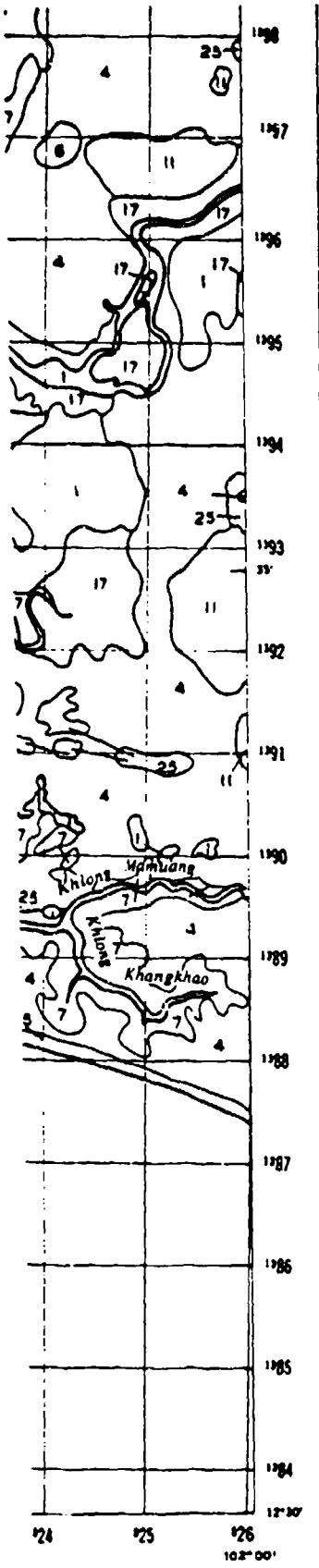


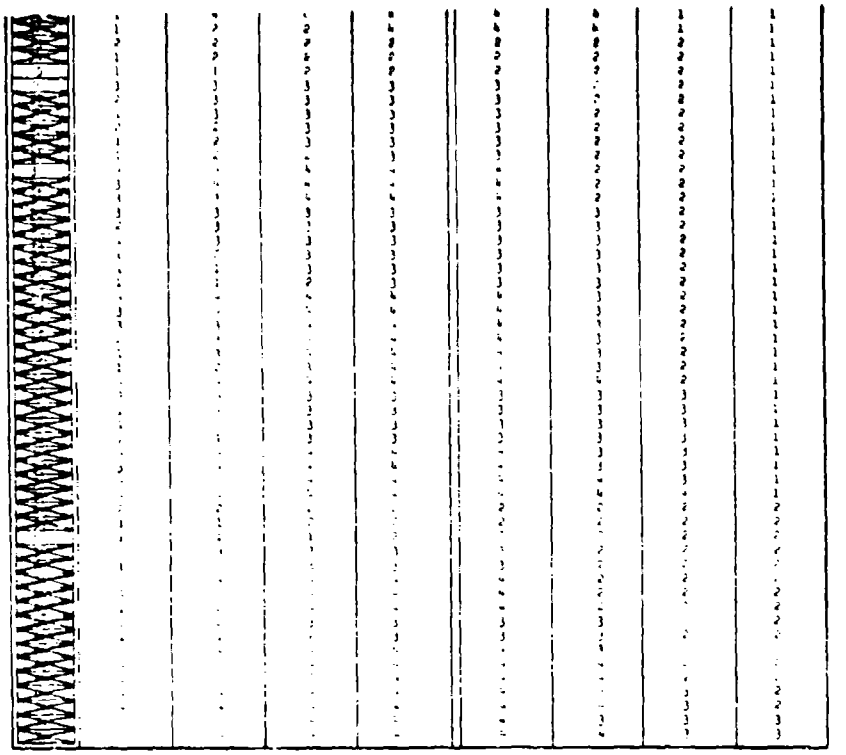
A QUANTITATIVE METHOD FOR
TERRAIN FOR GROUND MO

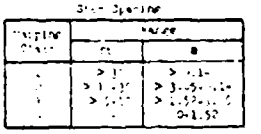
VEGETATION

CHANTHABURI STUDY

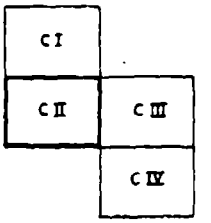
SHEET C II







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8

A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

VEGETATION

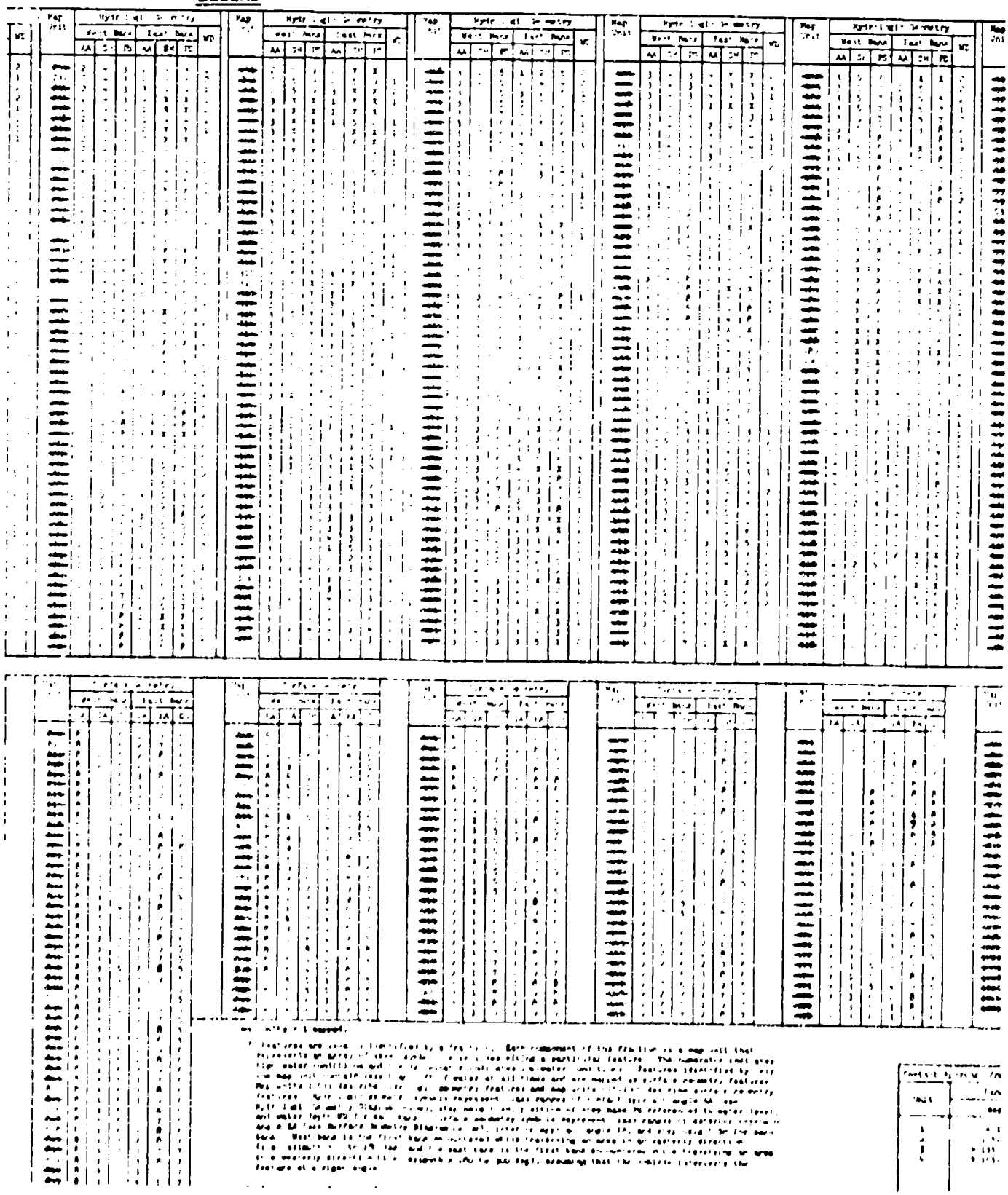
CHANTHABURI STUDY AREA

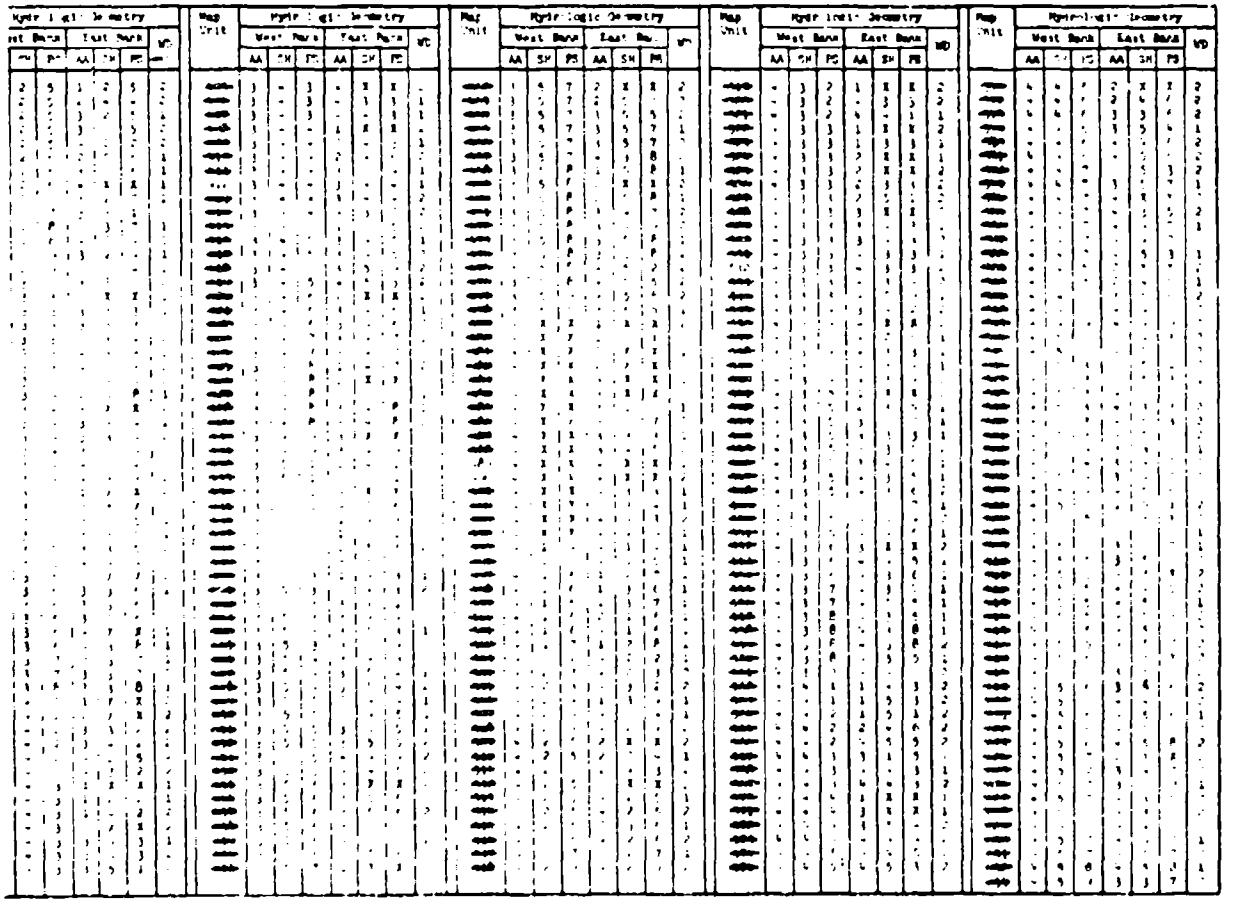
SHEET C II

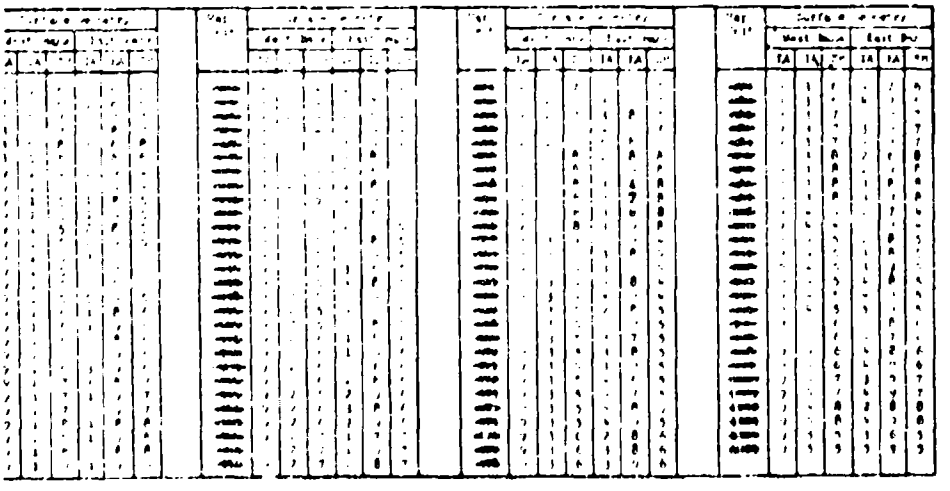
PLATE 6.2c

2

LEGEND

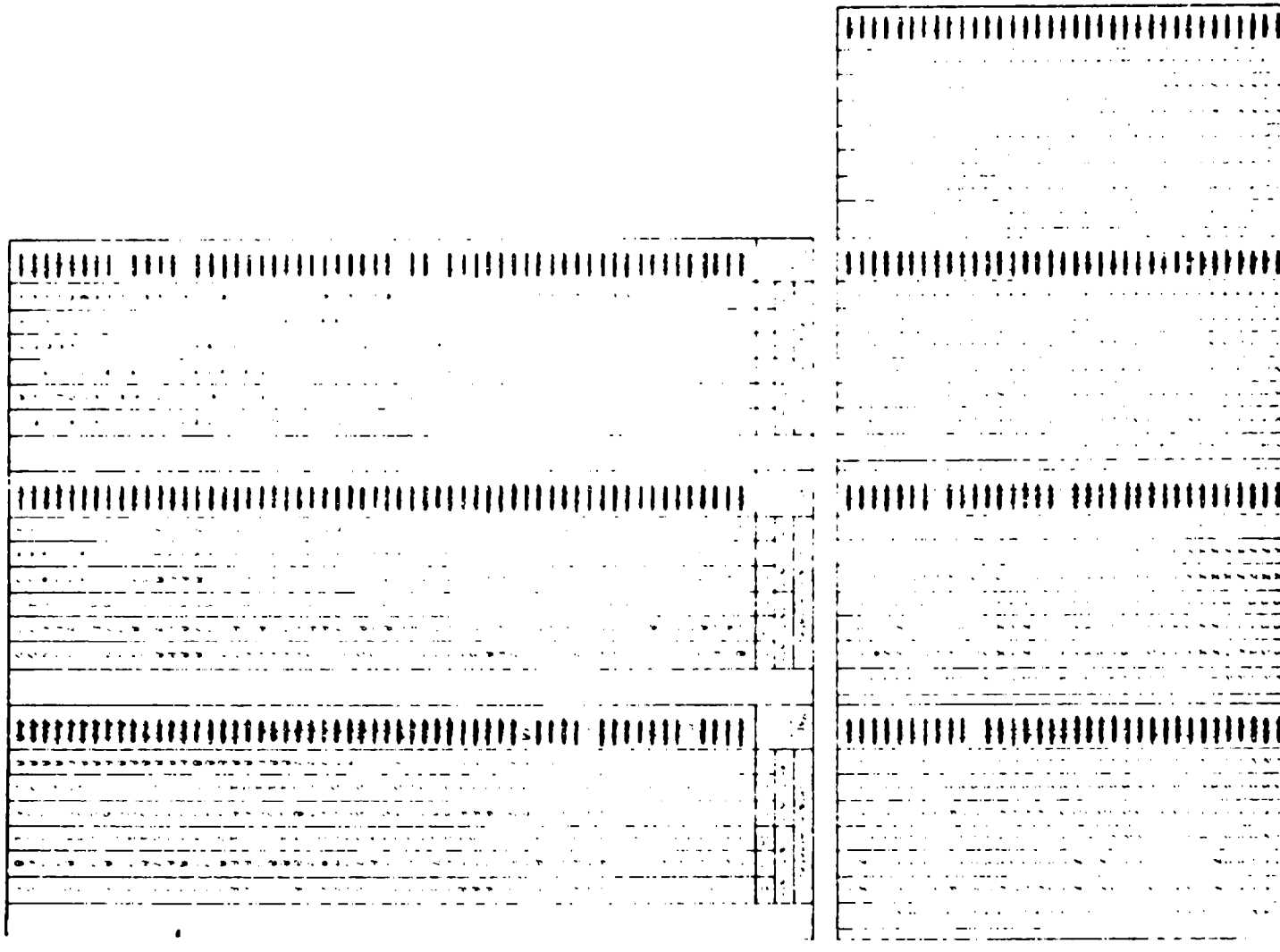


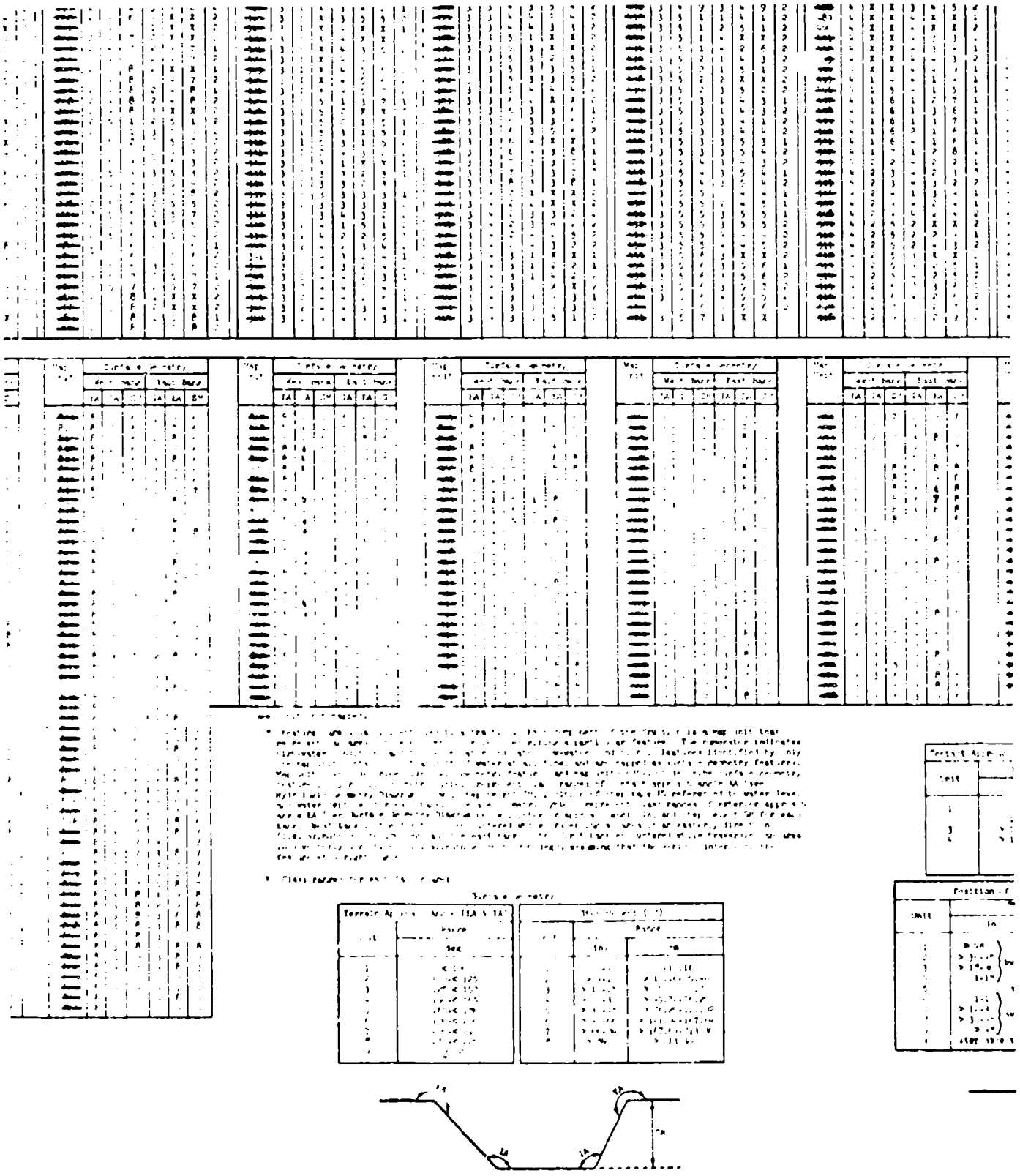




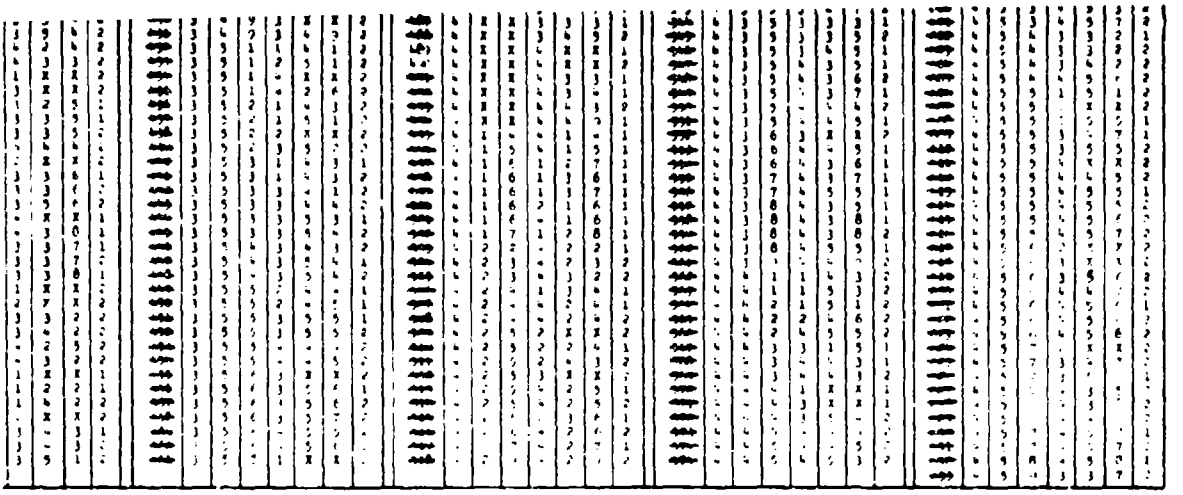
Hydrologic Geometry

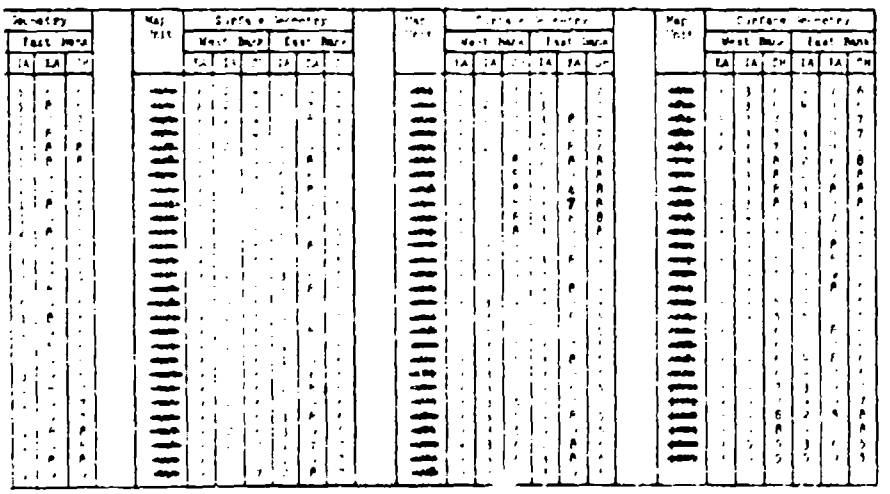
Constant Northeast Angle (AA)		Step Height (SH)	
Units	Range	Units	Range
	deg		ft
1	< 45	1	< 12
2	45-135	2	12-25
3	135-165	3	25-50
4	> 165	4	50-75
		5	> 75
		6	step absent

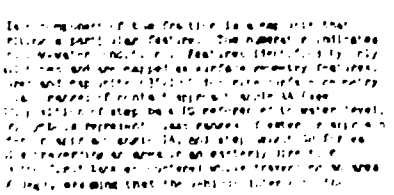




5







Hysteretic symmetry

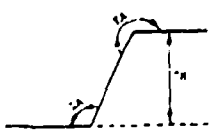
Contact Azimuth Angle (AA)	
Units	Azimuth
	deg
1	< 135
2	135-155
3	> 155-175
4	> 175-195

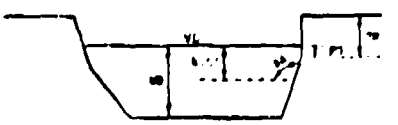
Step Symmetry (SY)		
Units	Azimuth	
	in	cm
1	< 1.5	< 3.5
2	1.5-3.5	3.5-8.5
3	3.5-6.5	8.5-16.5
4	6.5-11.5	16.5-29.5
5	> 11.5	> 29.5
6	step absent	step absent

Position of Step Base (PB)		
Code	Range	
	in	cm
1	> 24	> 61
2	> 12-24	> 30.5-61
3	> 6-12	> 15.5-30.5
4	1-6	2.5-15.5
5	at water level	
6	1-6	2.5-15.5
7	> 6-12	> 15.5-30.5
8	> 12-24	> 30.5-61
9	> 24	> 61
A	step absent	step absent

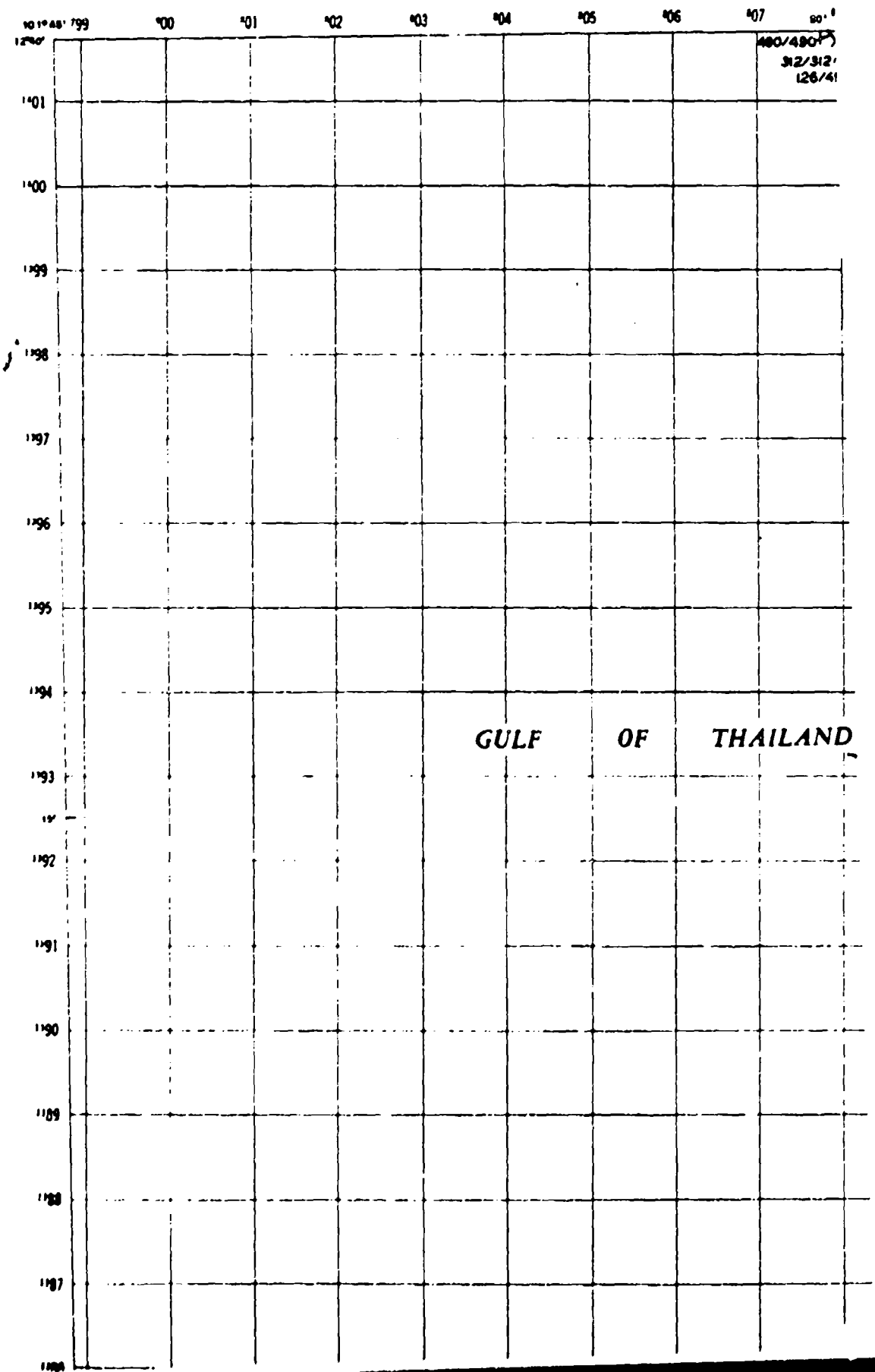
Water Depth (WD)		
Units	Range	
	ft	m
1	1-6	0.3-1.77
2	> 6	> 1.77

[1] Below water level
[2] Above water level

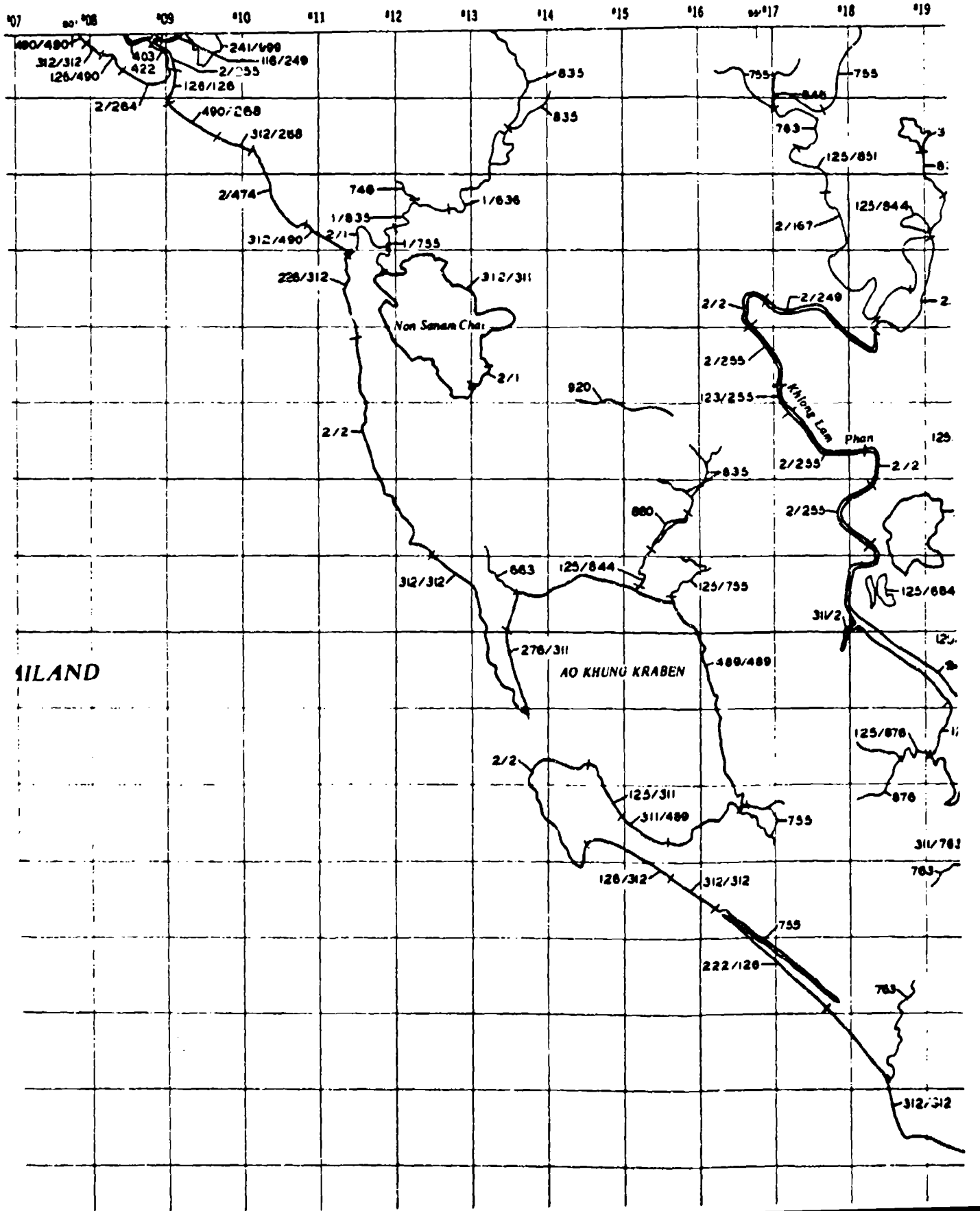




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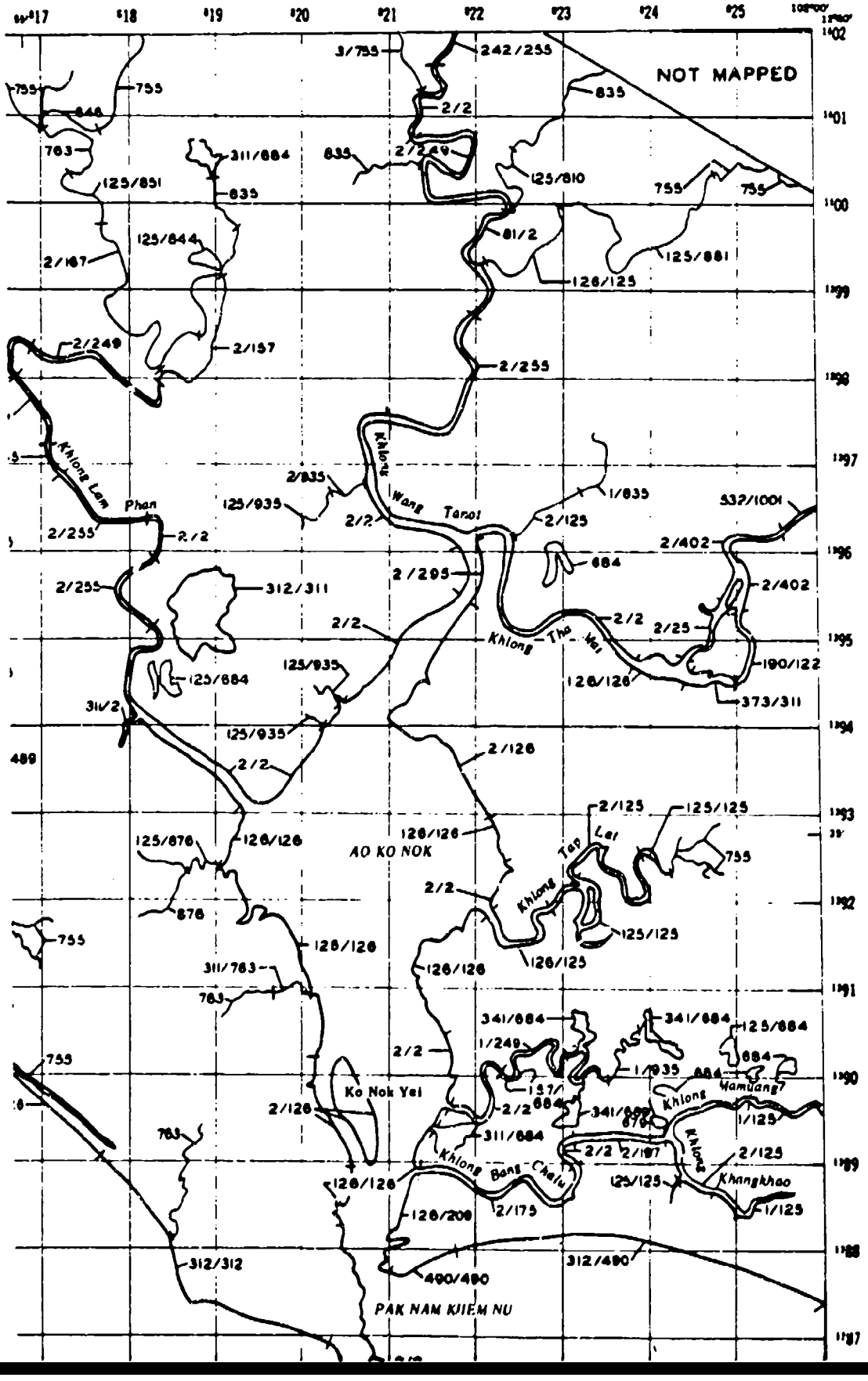

GULF OF THAILAND

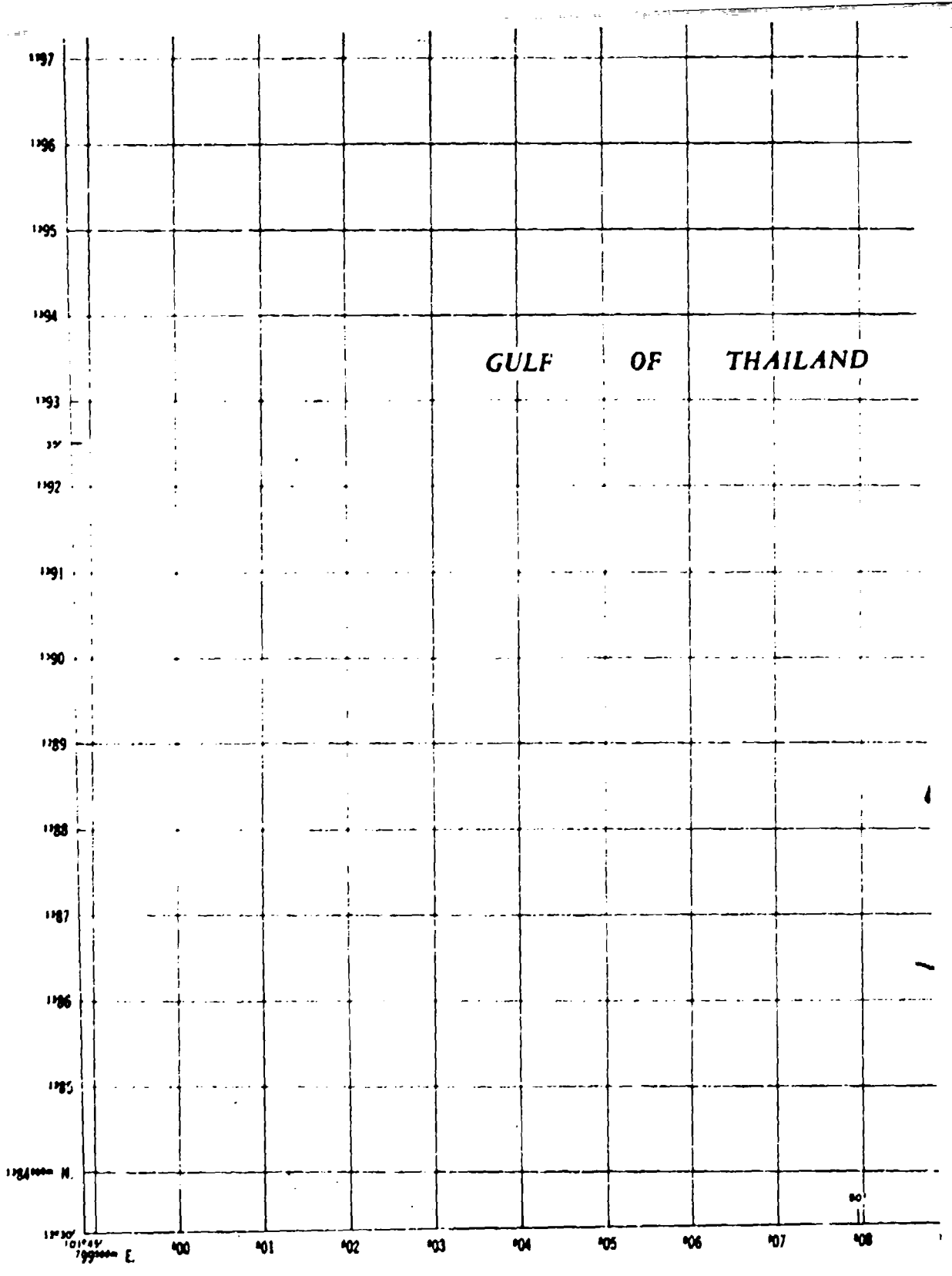
2 CHANTHABURI



3

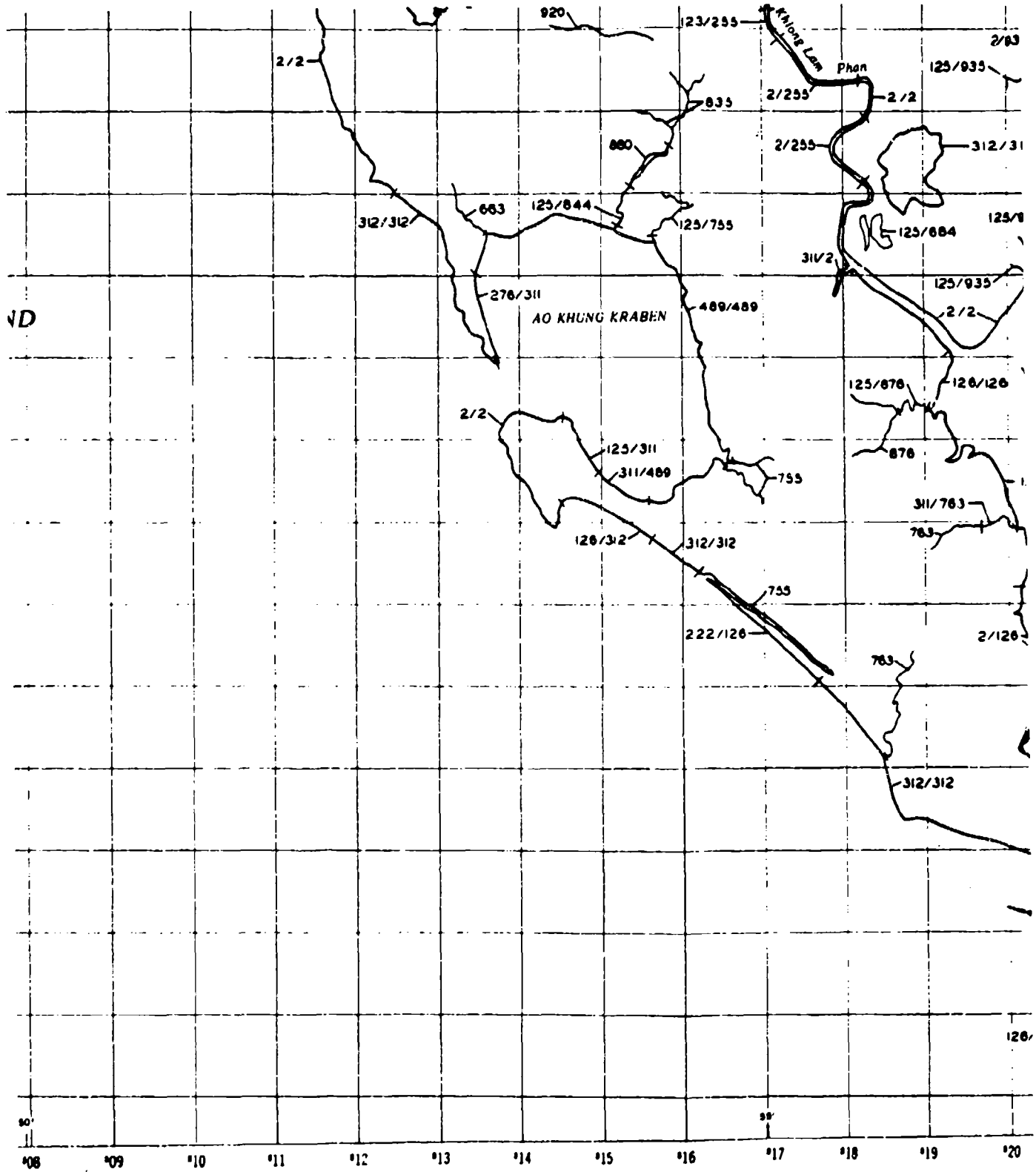
SHEET C II


NOT MAPPED
Khlong Lam Phan
Khlong Wang Tanot
Khlong Tha Wat
AO KO NOK
Khlong Top Lei
Ko Nok Yai
Khlong Bang Chalu
Khlong Hamuang
Khlong
Khangkhao
PAK NAM KHIEM NU

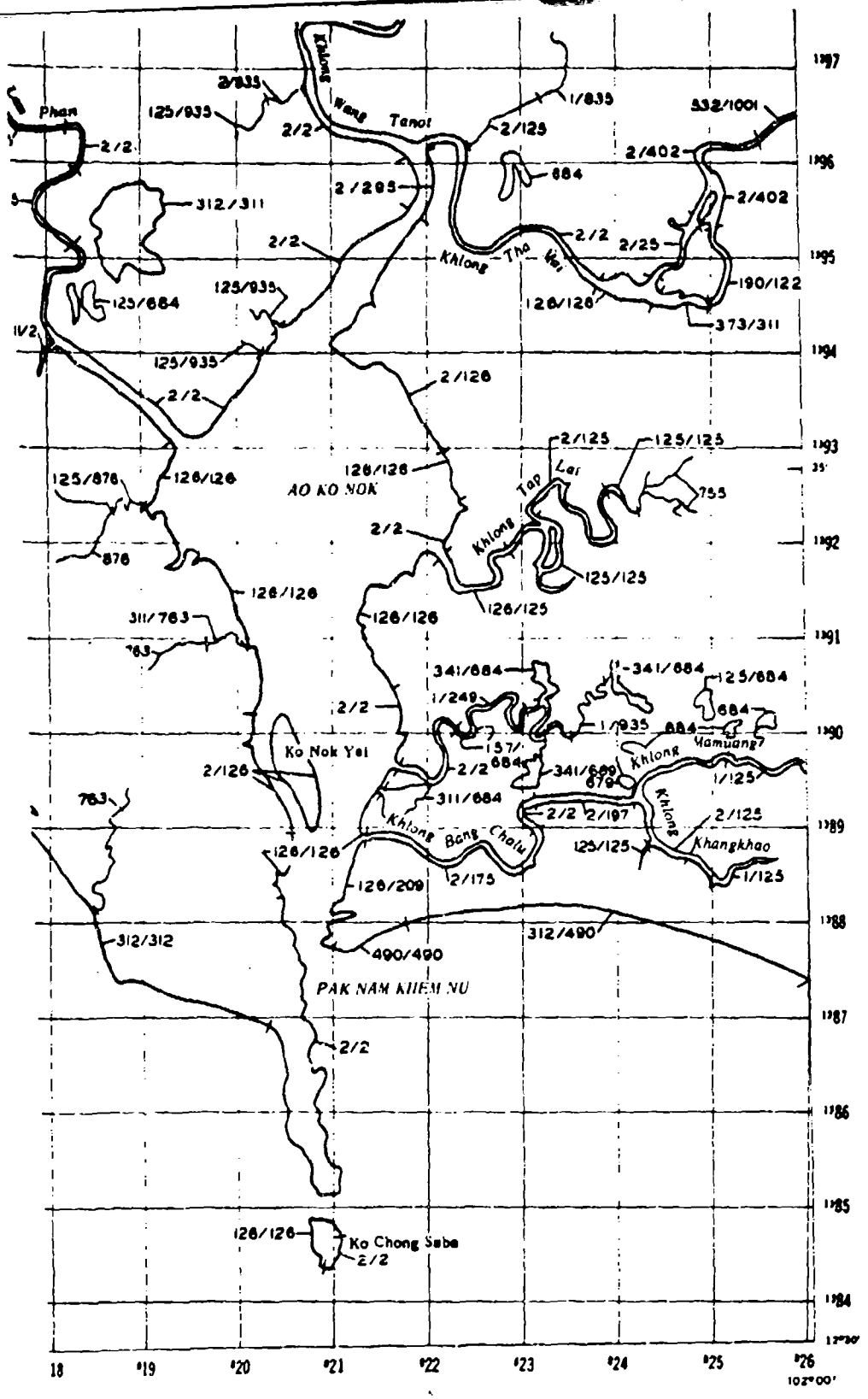


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 47 P

4


920
123/255
Khlong Lan
Phan
2/83
125/935
2/2
835
2/255
880
312/31
663
125/844
312/312
125/755
125/884
311/2
276/311
AO KHUNG KRABEN
489/489
125/935
2/2
125/876
126/126
2/2
125/311
311/489
755
876
311/763
763
126/312
312/312
755
222/126
2/126
763
312/312
90'
99'
108
109
110
111
112
113
114
115
116
117
118
119
120
SCALES
3 Statute Miles
4000 Meters
4000 Yards

5



INDEX TO AC

CI

C II

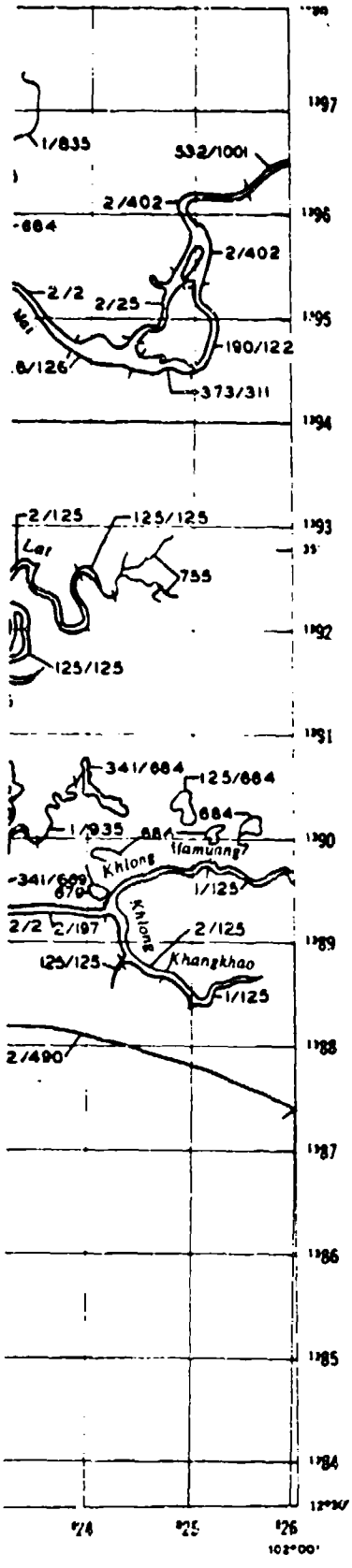
A QUANTITATIVE MET
TERRAIN FOR GI

HYDROLOGI

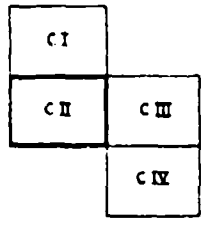
CHANTHABURI

SHEE

6



INDEX TO ADJOINING SHEETS



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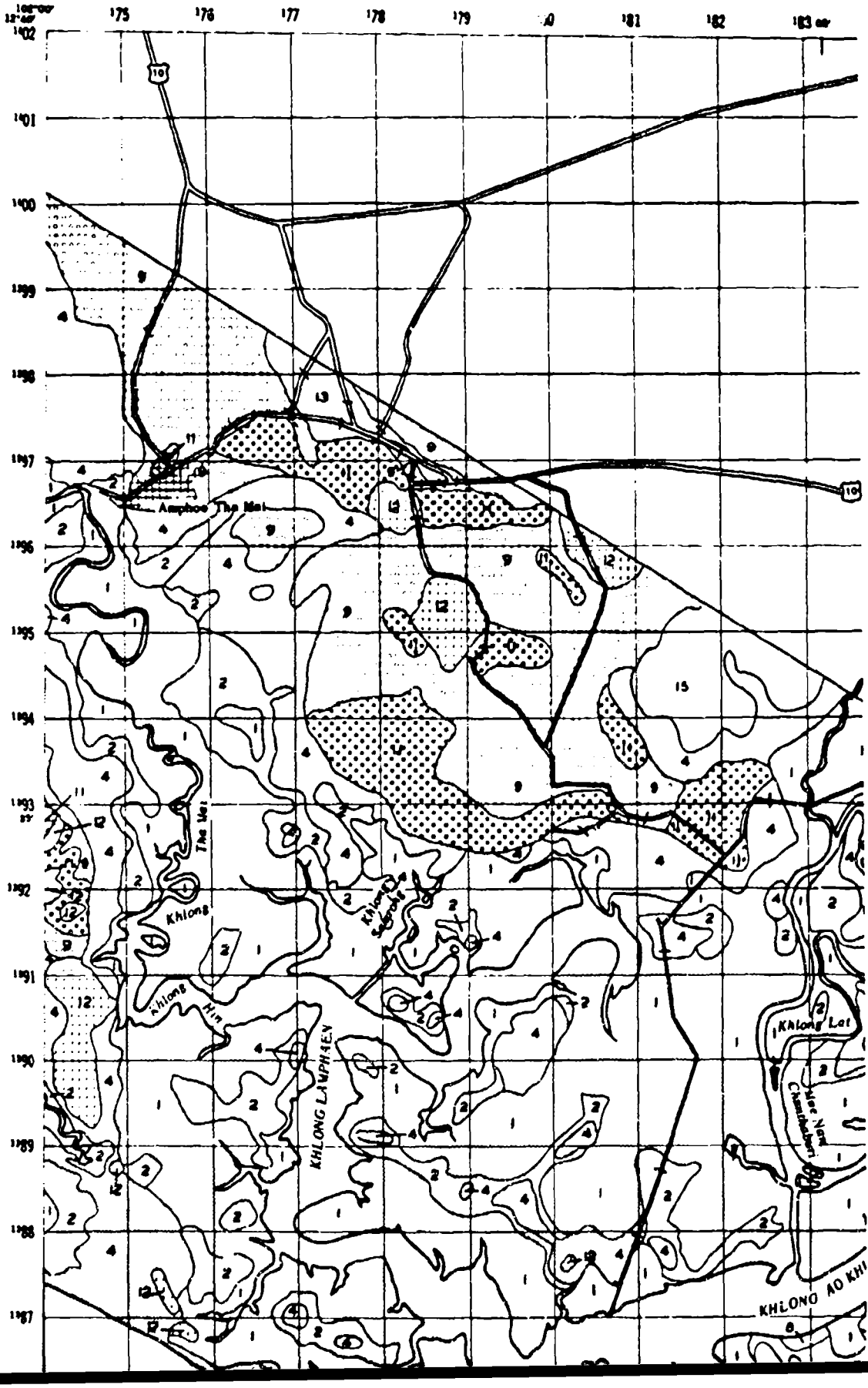
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

CHANTHABURI STUDY AREA

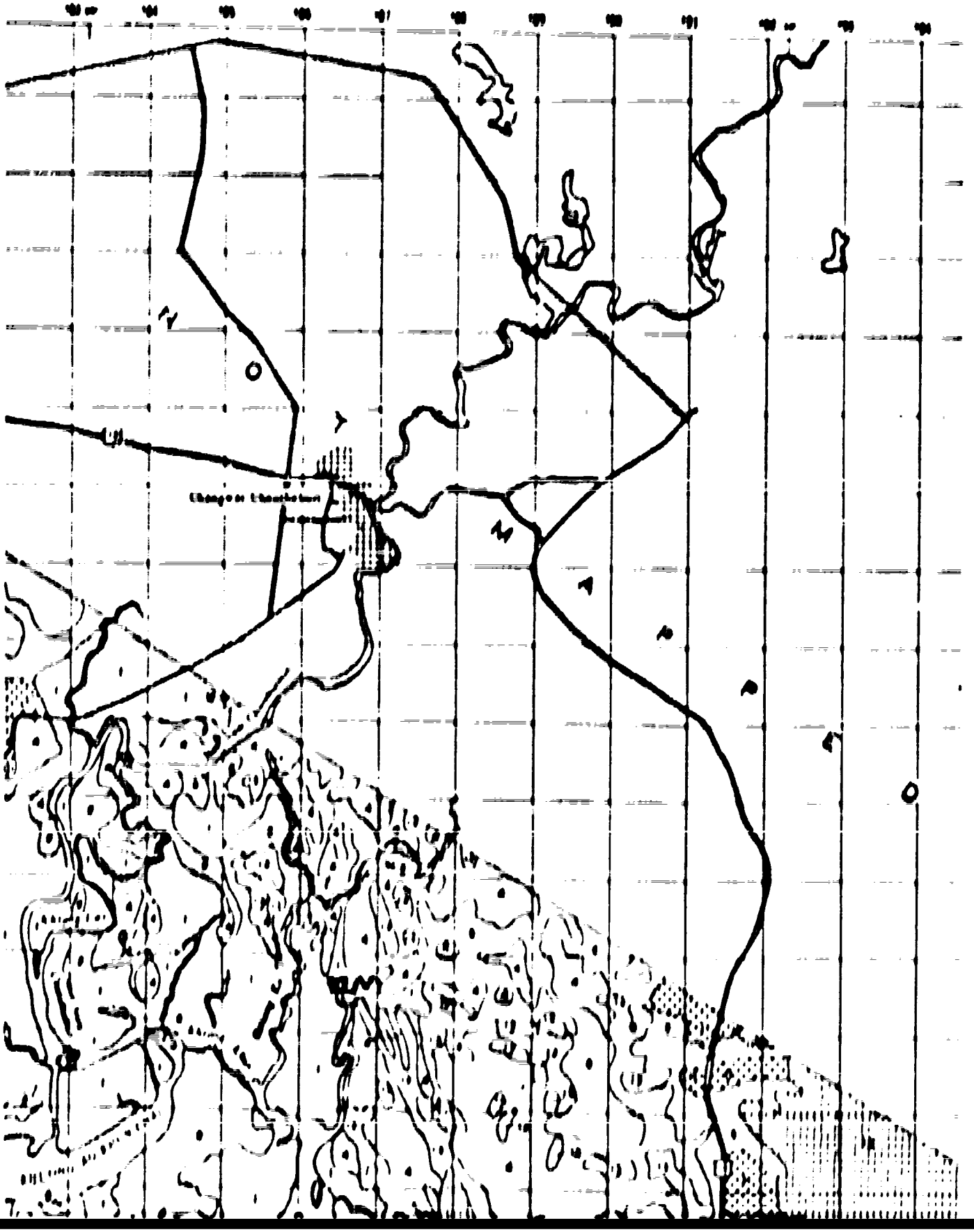
SHEET C II

PLATE 6.2d


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10
10
Amphoe Tha Mai
Khlong
Khlong Hin
KHLONG LAMPHAEN
Khlong Lar
KHLONG AO KHI

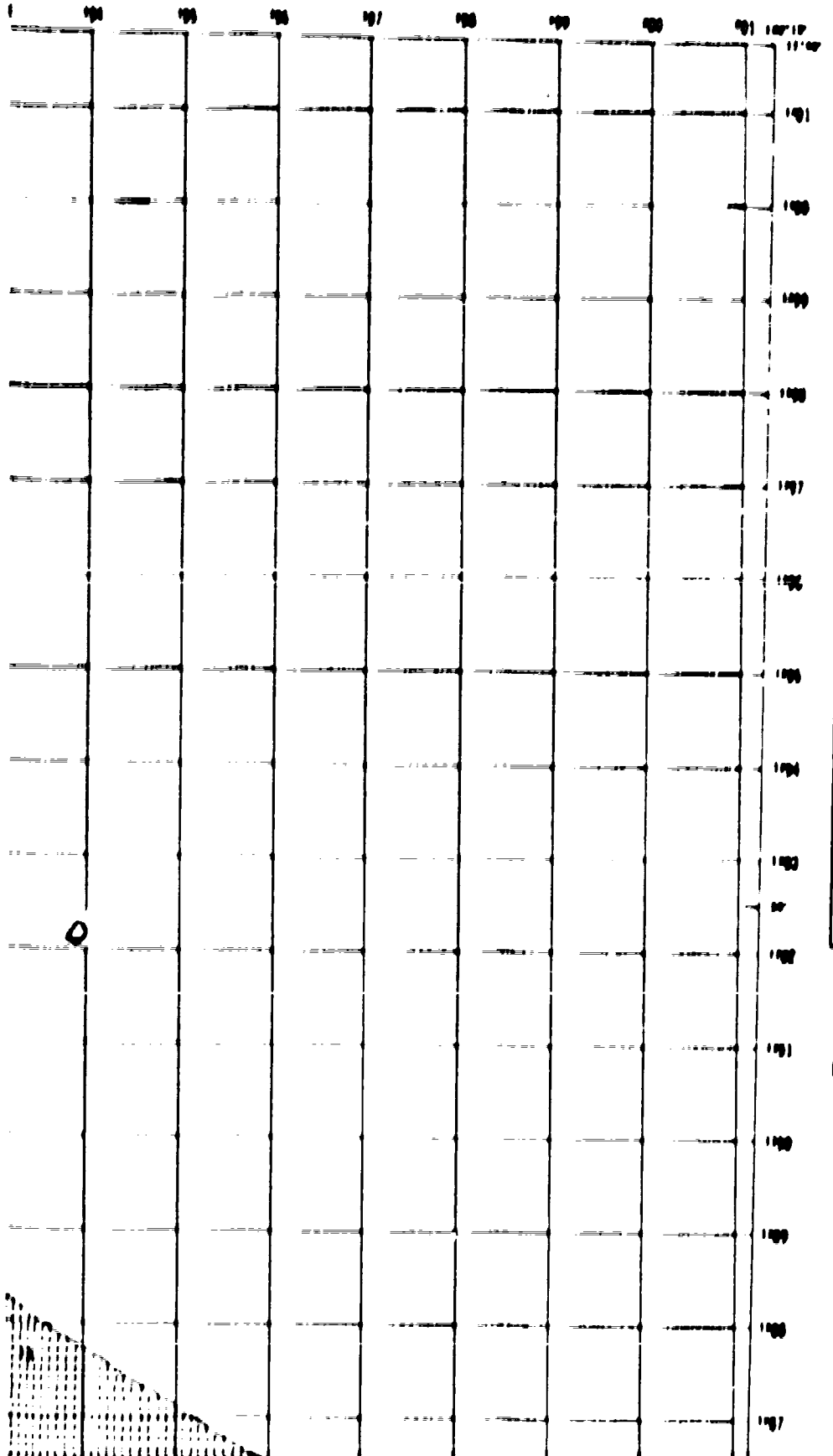
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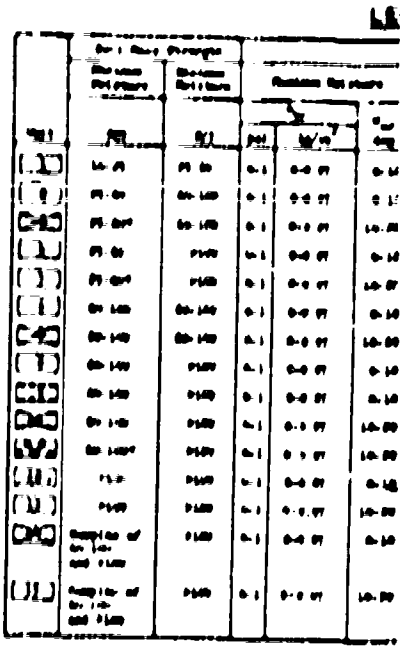
CHANTHABURI



3

SHEET C III



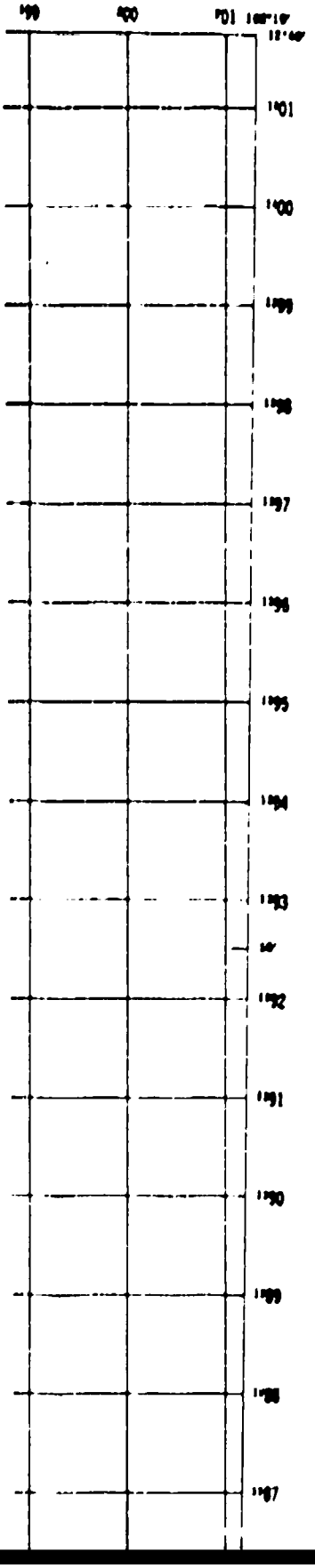


INDEX TO ADJO

C1

4

SHEET C III



LEGEND

Unit	Soil Rock Strength		Soil Surface Strength						Conditions where maximum c_w occurs		
	Maximum Moisture	Minimum Moisture	Maximum Moisture			Minimum Moisture					
			c_w		ϕ_w	c_w		ϕ_w	c_w		ϕ_w
	RCI	RCI	psi	kg/cm²	deg	psi	kg/cm²	deg	psi	kg/cm²	deg
1	10-75	75-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	75-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	75-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	75-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	75-60*	> 10	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
10	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
14	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

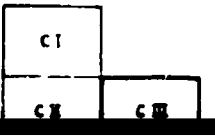
c_w Shear strength at zero normal load.

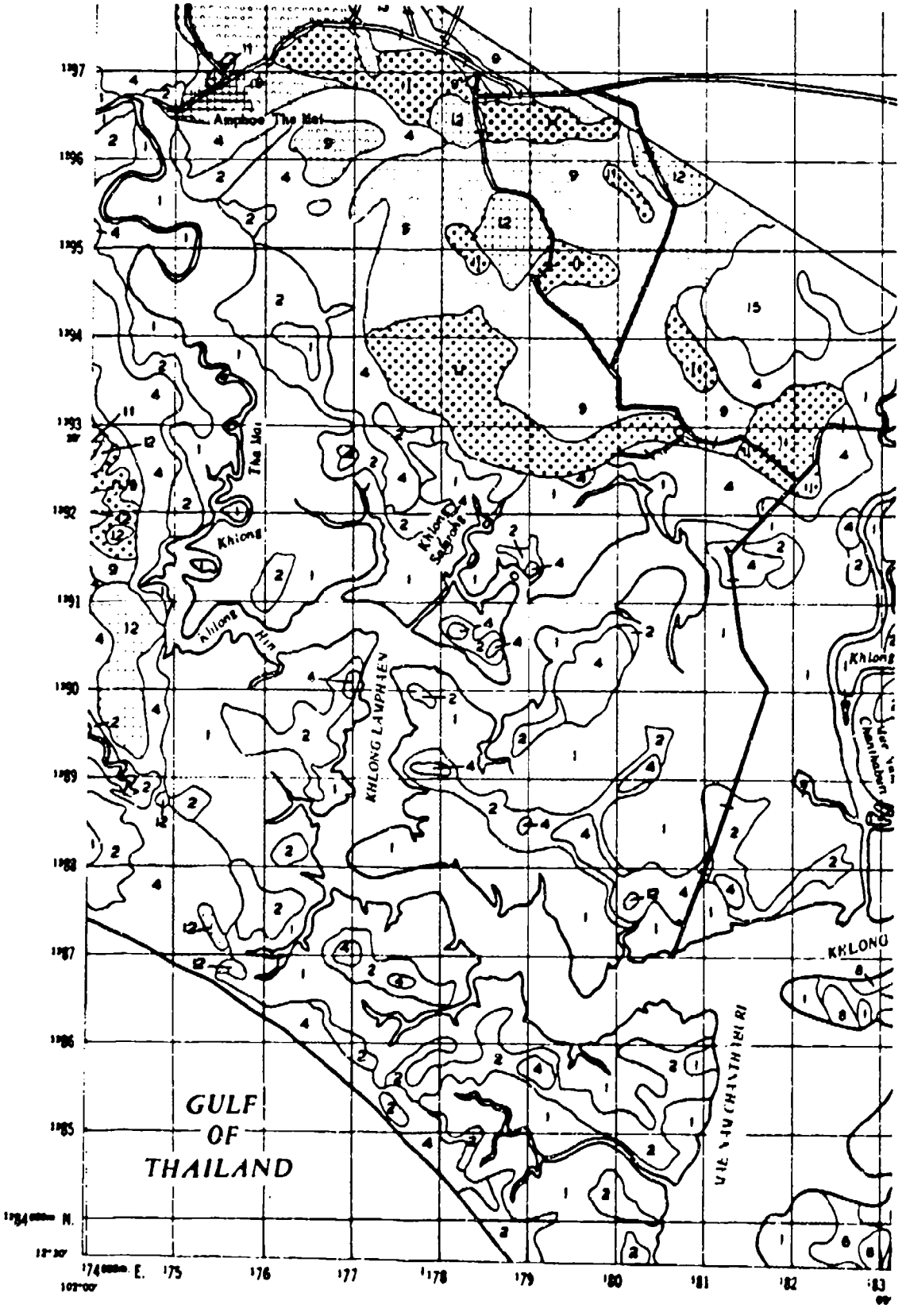
ϕ_w Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

Units do not occur on this map.

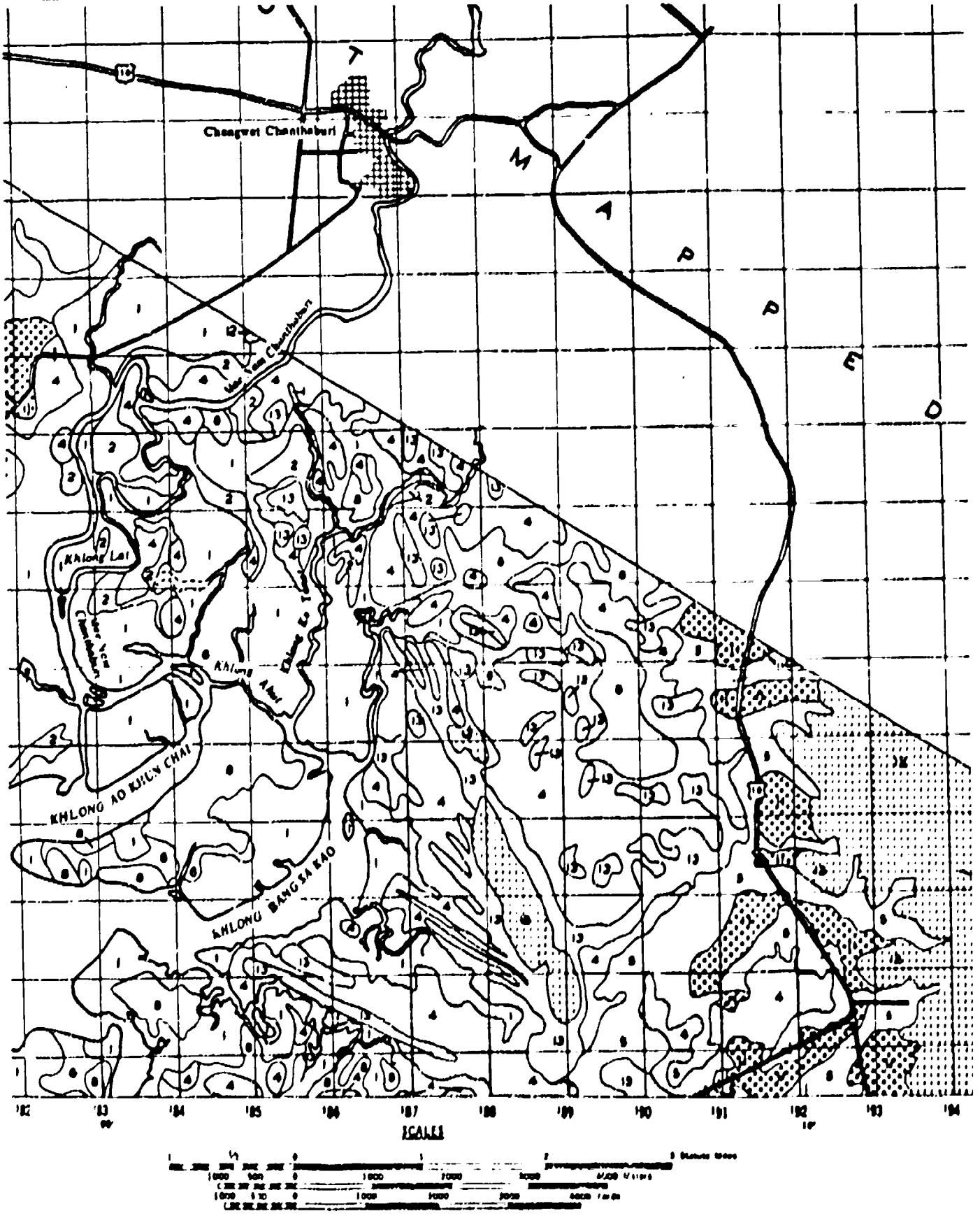
INDEX TO ADJOINING SHEETS

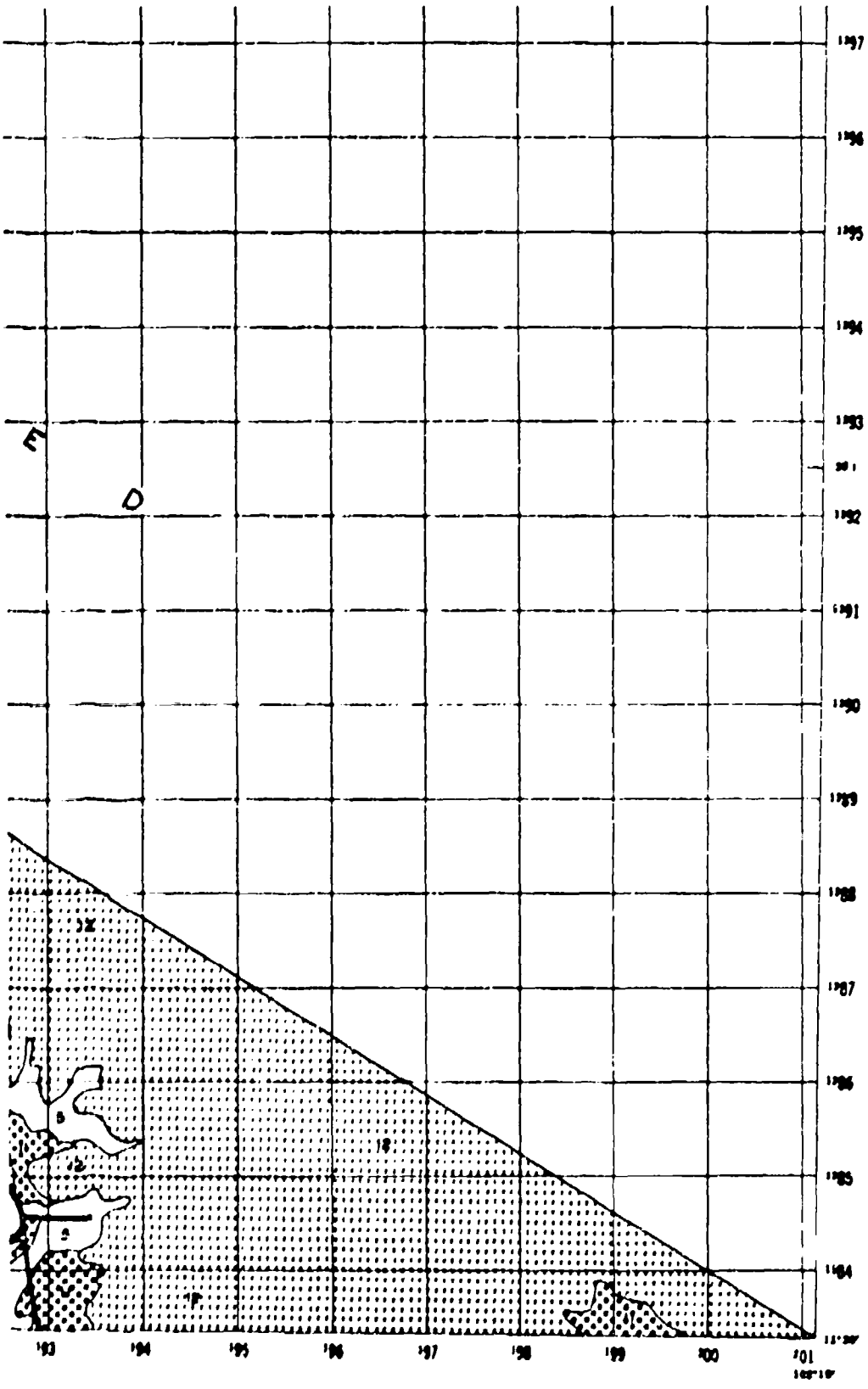




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATON GRID
GRID ZONE DESIGNATION: 48 P

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Chaogwat Chanthaburi
KHLONG AO KHUN CHAI
KHLONG BANG SA KAO
SCALES



Unit	Soil Shear Strength: Maximum Moisture (PCF)	Soil Shear Strength: Maximum Moisture (PCF)	Maximum c_{ur}: psi	Maximum c_{ur}: kg/cm
1	10-25	25-60	0-1	0-0.07
2	25-60	60-100	0-1	0-0.07
3	25-60*	60-100	0-1	0-0.07
4	25-60	>100	0-1	0-0.07
5	25-60*	>100	0-1	0-0.07
6	60-100	60-100	0-1	0-0.07
7	60-100	60-100	0-1	0-0.07
8	60-100	>100	0-1	0-0.07
9	60-100	>100	0-1	0-0.07
10	60-100	>100	0-1	0-0.07
11	60-100*	>100	0-1	0-0.07
12	>100	>100	0-1	0-0.07
13	>100	>100	0-1	0-0.07
14	Complex of 60-100 and >100	>100	0-1	0-0.07
15	Complex of 60-100 and >100	>100	0-1	0-0.07

Symbol: Blank areas are water bodies.

c_{ur} Shear strength at zero normal load.

ϕ_{ur} Angle of internal friction.

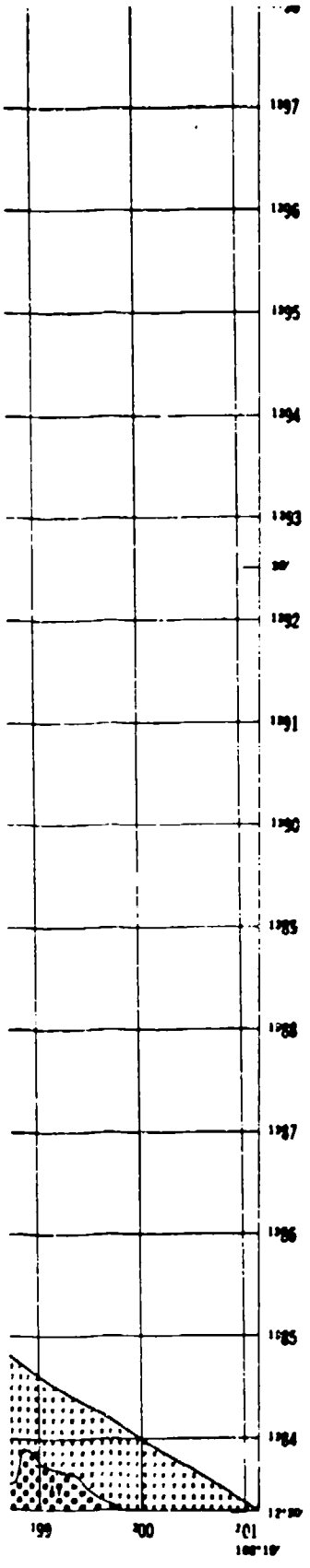
* Maximum moisture has less than 30 psi/cm strengths commonly observed are 60-100 [illegible]

Units do not occur on this map.

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A QUANTITATIVE
TERRAIN FO
SURFACE
CHANTHAB
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LEGEND

Unit	Soil Mass Strength: Maximum Moisture (PCI)	Soil Mass Strength: Minimum Moisture (PCI)	Soil Surface Strength: Maximum Moisture c_{up} (psi)	Soil Surface Strength: Maximum Moisture c_{up} (kg/cm^2)	Soil Surface Strength: Maximum Moisture ϕ_{up} (deg)	Soil Surface Strength: Minimum Moisture c_{up} (psi)	Soil Surface Strength: Minimum Moisture c_{up} (kg/cm^2)	Soil Surface Strength: Minimum Moisture ϕ_{up} (deg)	Conditions where maximum c_{up} occurs: c_{up} (psi)	Conditions where maximum c_{up} occurs: c_{up} (kg/cm^2)	Conditions where maximum c_{up} occurs: ϕ_{up} (deg)
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
X	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
4	25-60	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
6	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
X	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
9	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
X	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
10	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
11	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
X	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
15	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Blank areas are water bodies.

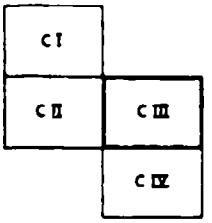
c_{up} Shear strength at zero normal load.

ϕ_{up} Angle of internal friction.

* Maximum moisture has less than 10 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

X Units do not occur on this map.

INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

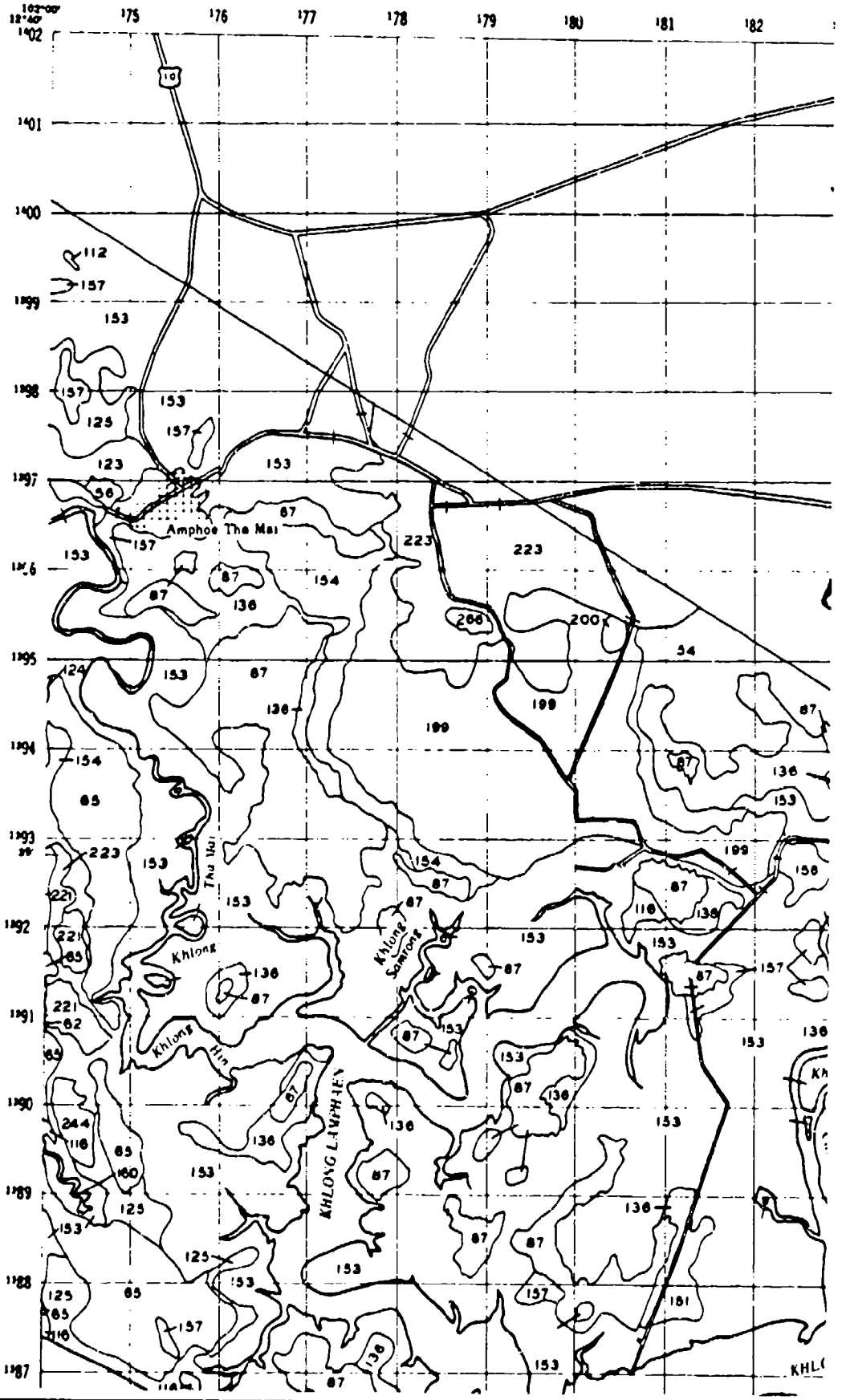
SURFACE COMPOSITION

CHANTHABURI STUDY AREA

SHEET C III

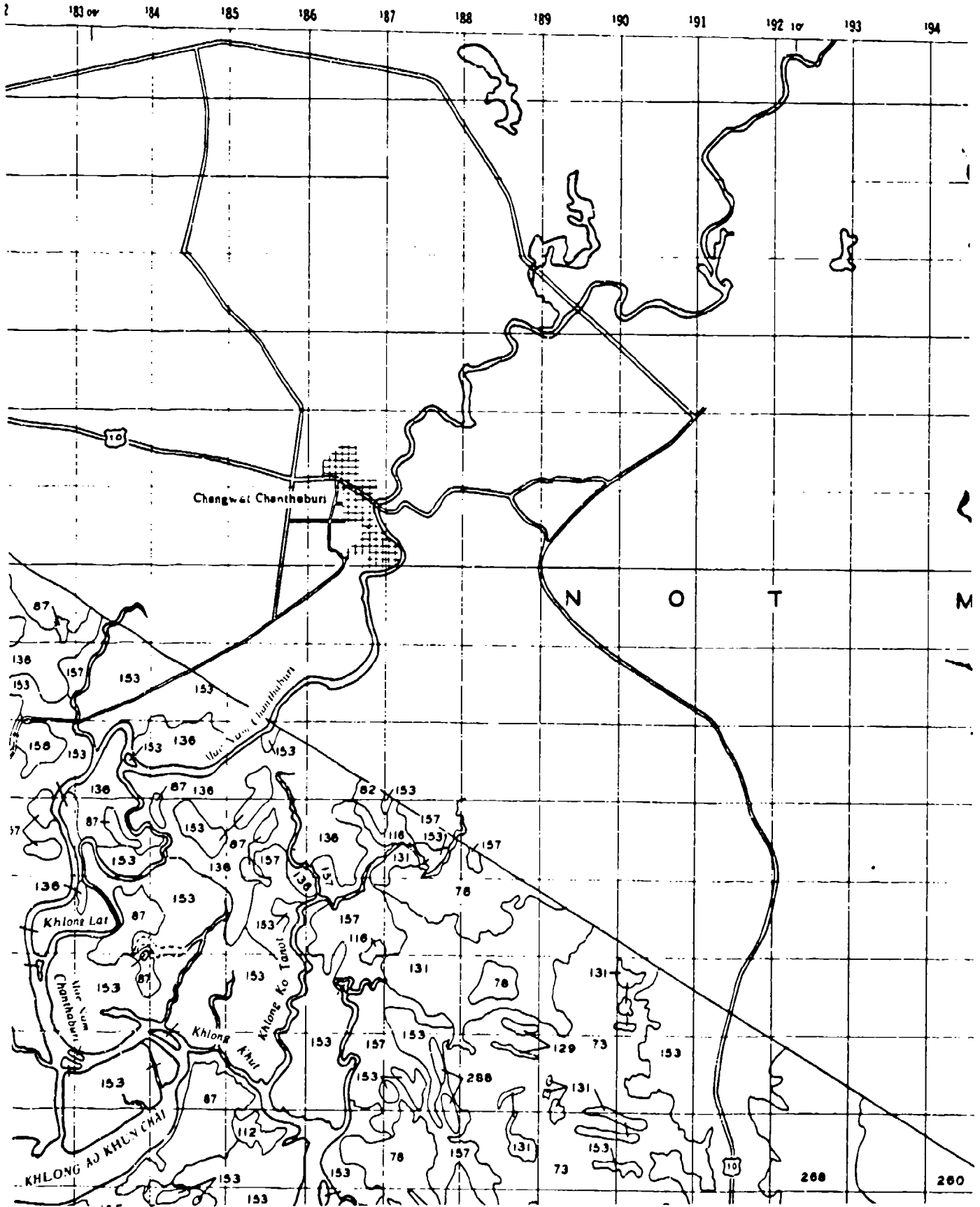
8

PLATE 6.3a


102°00'
12°40'
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Amphoe The Mai
Khlong
Khlong Hin
Khlong Samrong
KHLONG LAMPHIEN
KHL

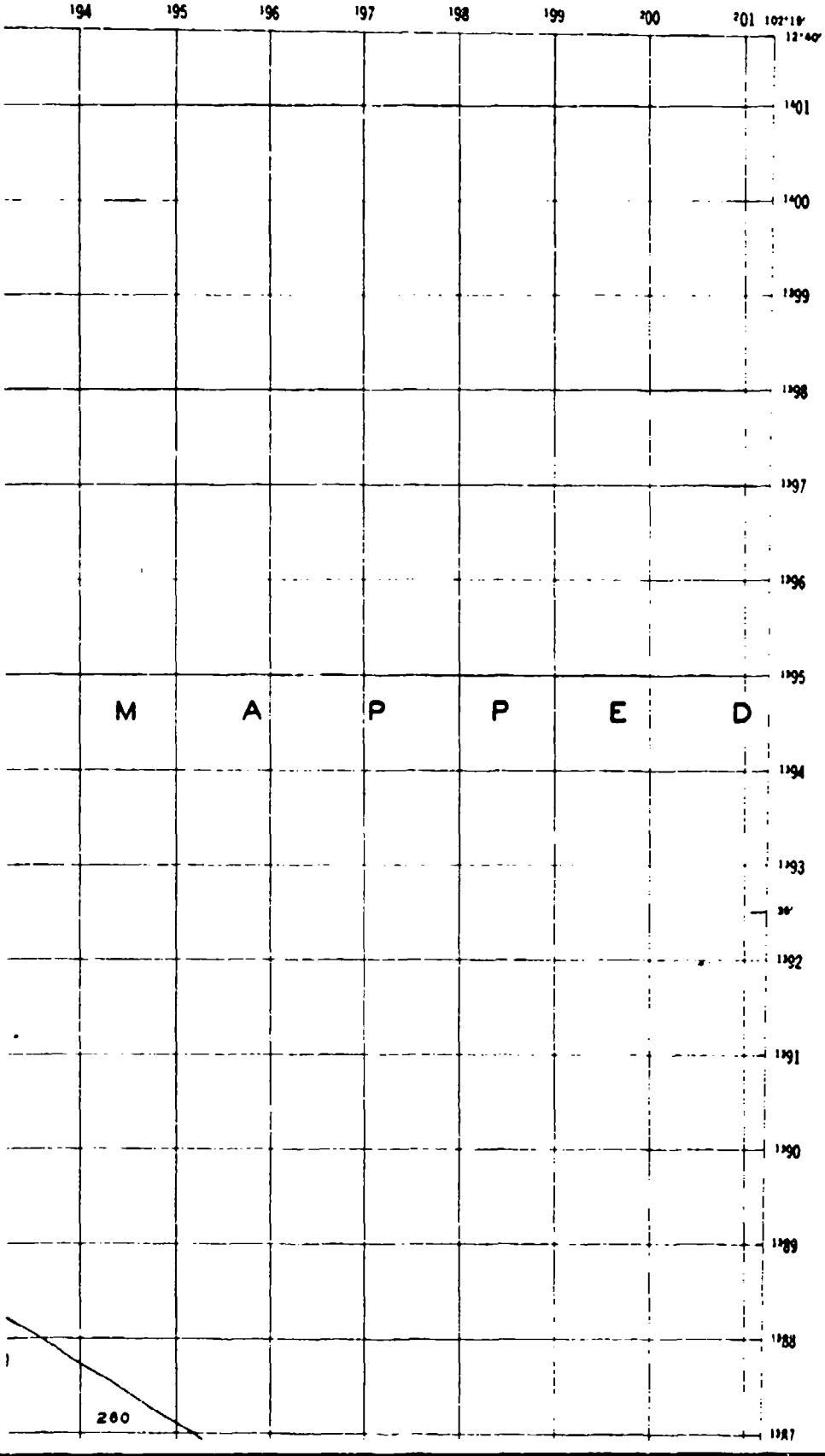
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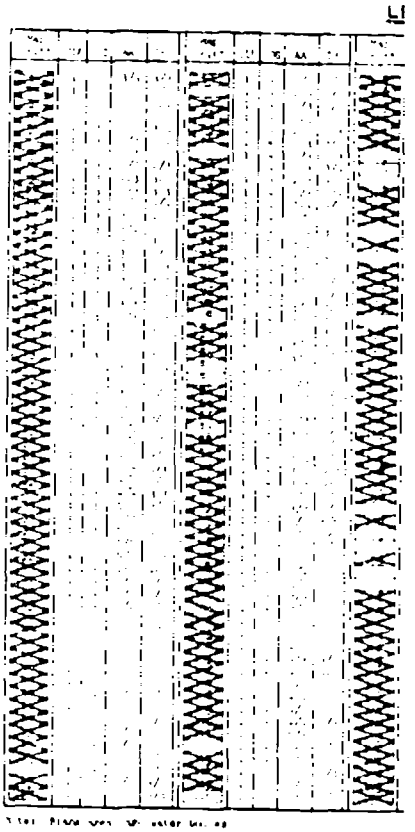
CHANTHABURI

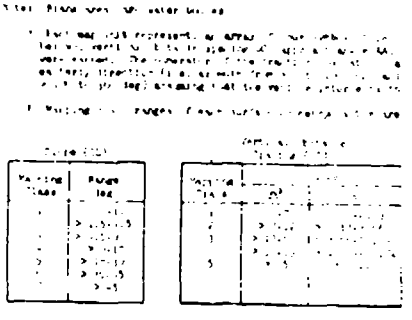


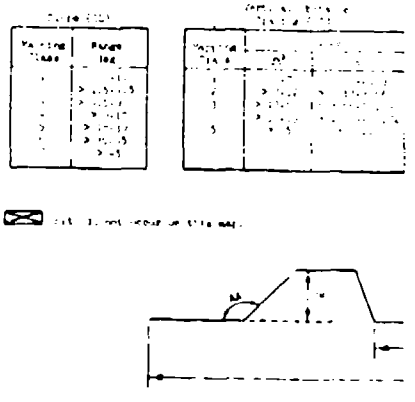
3

SHEET C III









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C I

4

SHEET C III

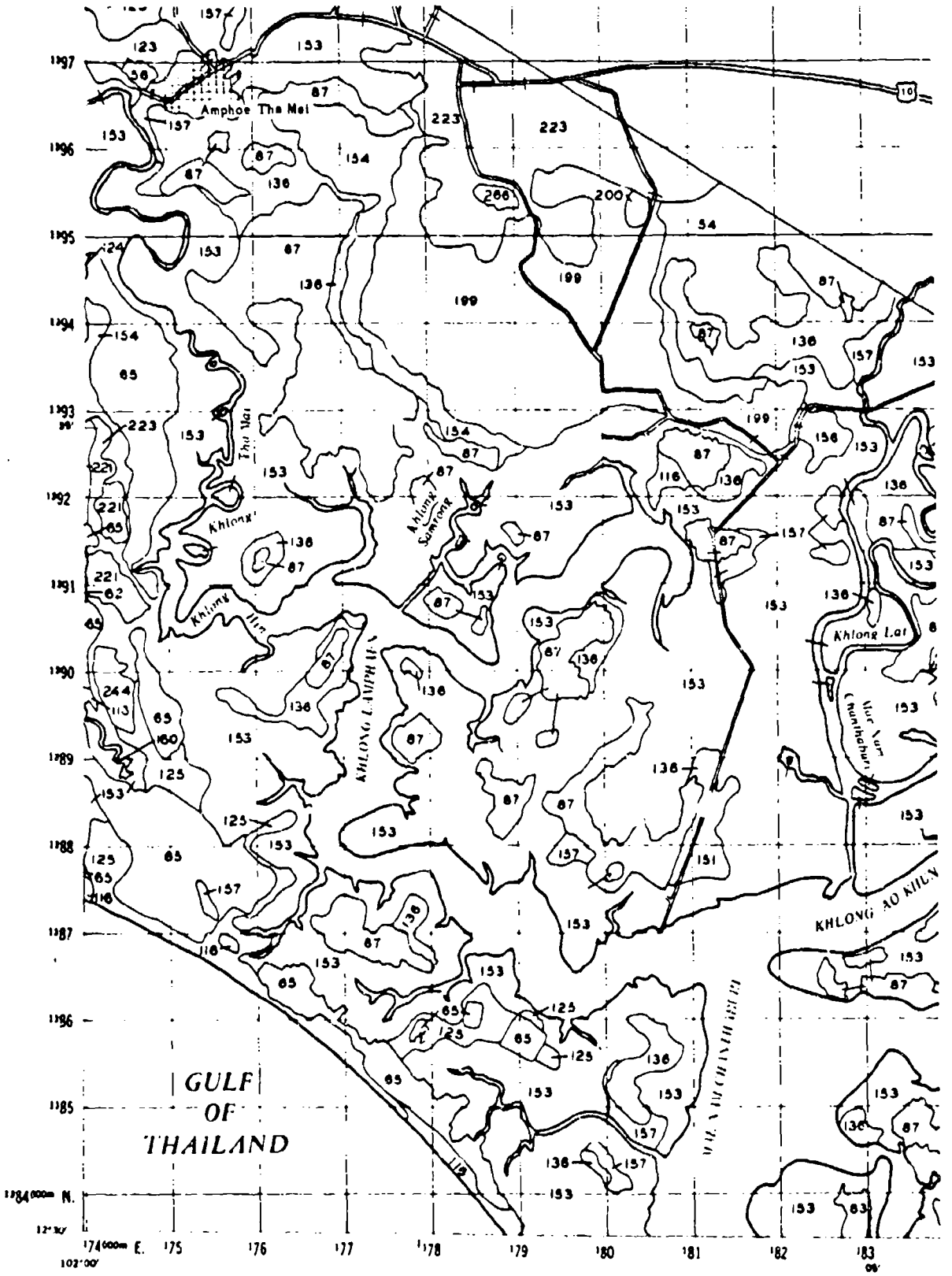
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LEGEND

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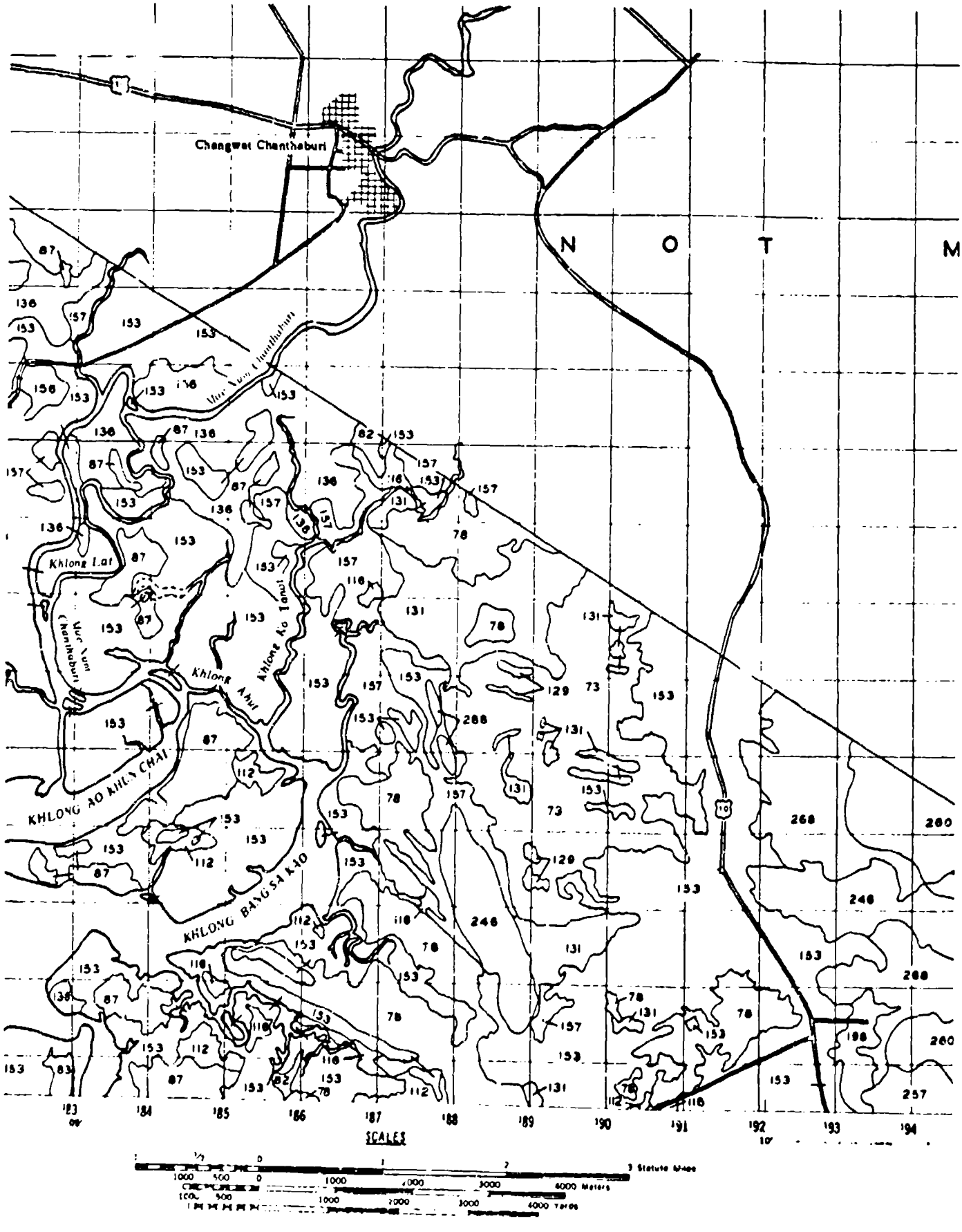
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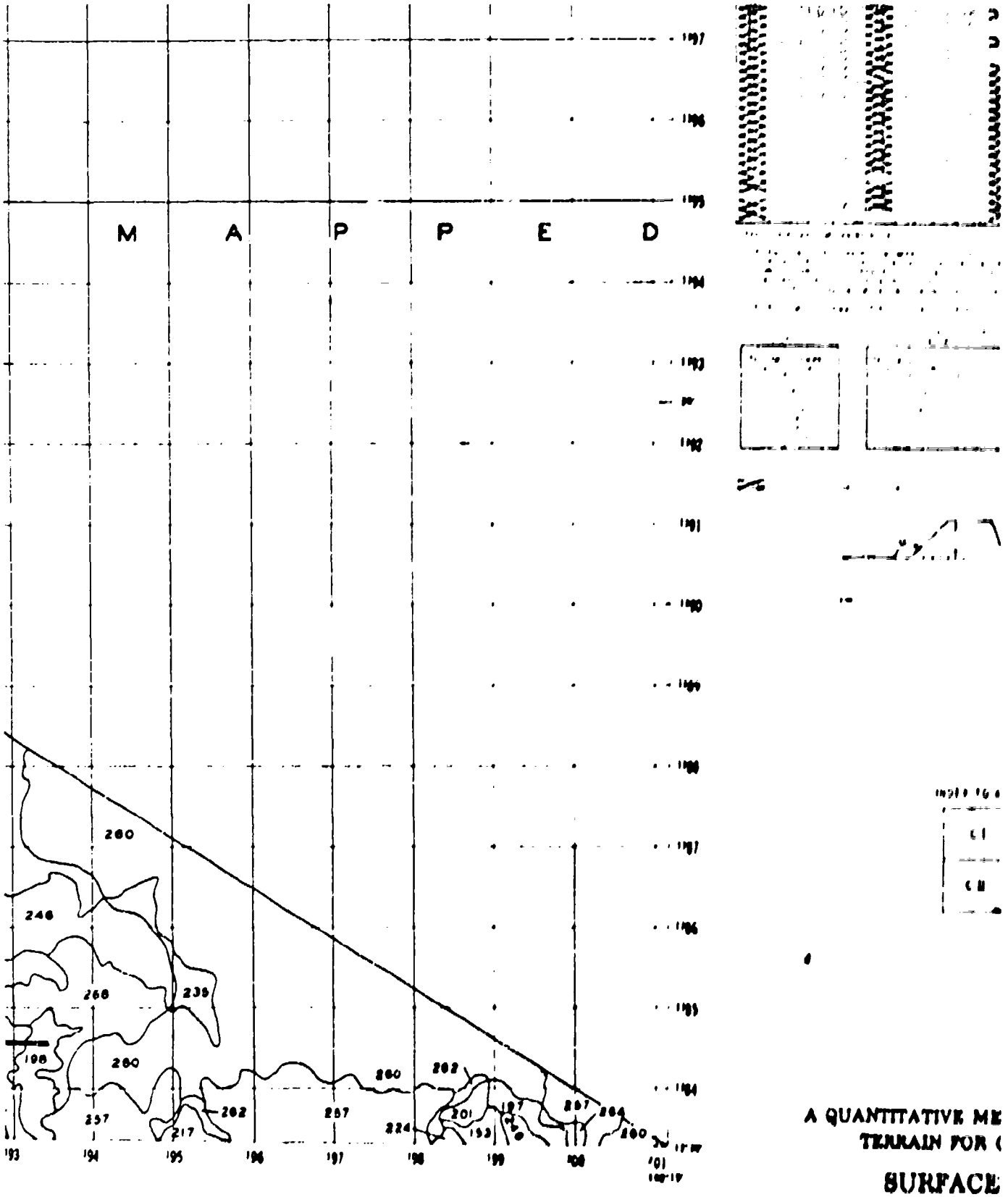
C II C III



ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48 P

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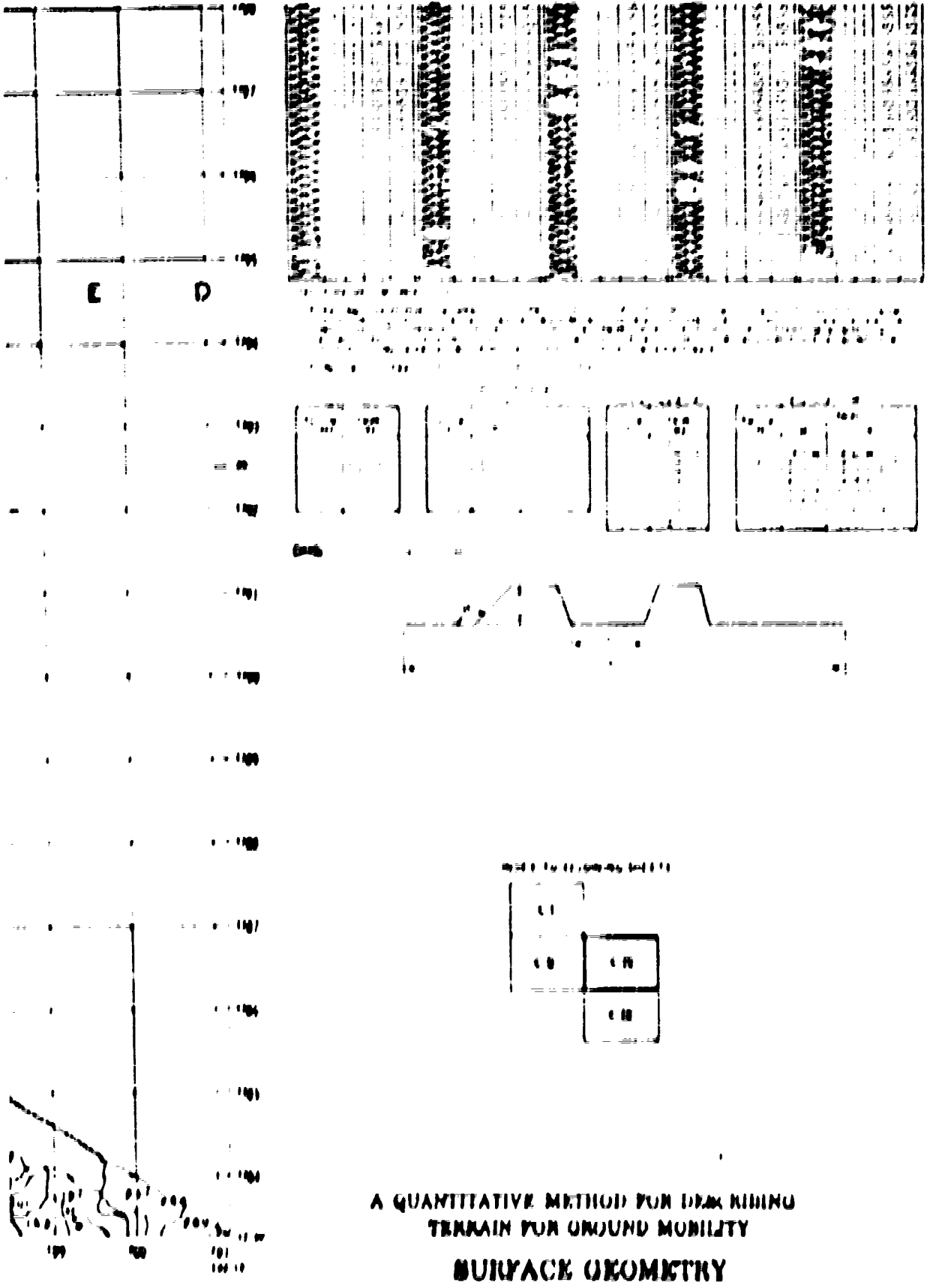

Changwat Chanthaburi
N O T M
Khlong Lat
Khlong Anui
Khlong Ao Tanot
KHLONG AO KHLEN CHAI
KHLONG BANG SA KAO
SCALES



A QUANTITATIVE ME
TERRAIN FOR (

SURFACE
CHANTHABUI
SHE

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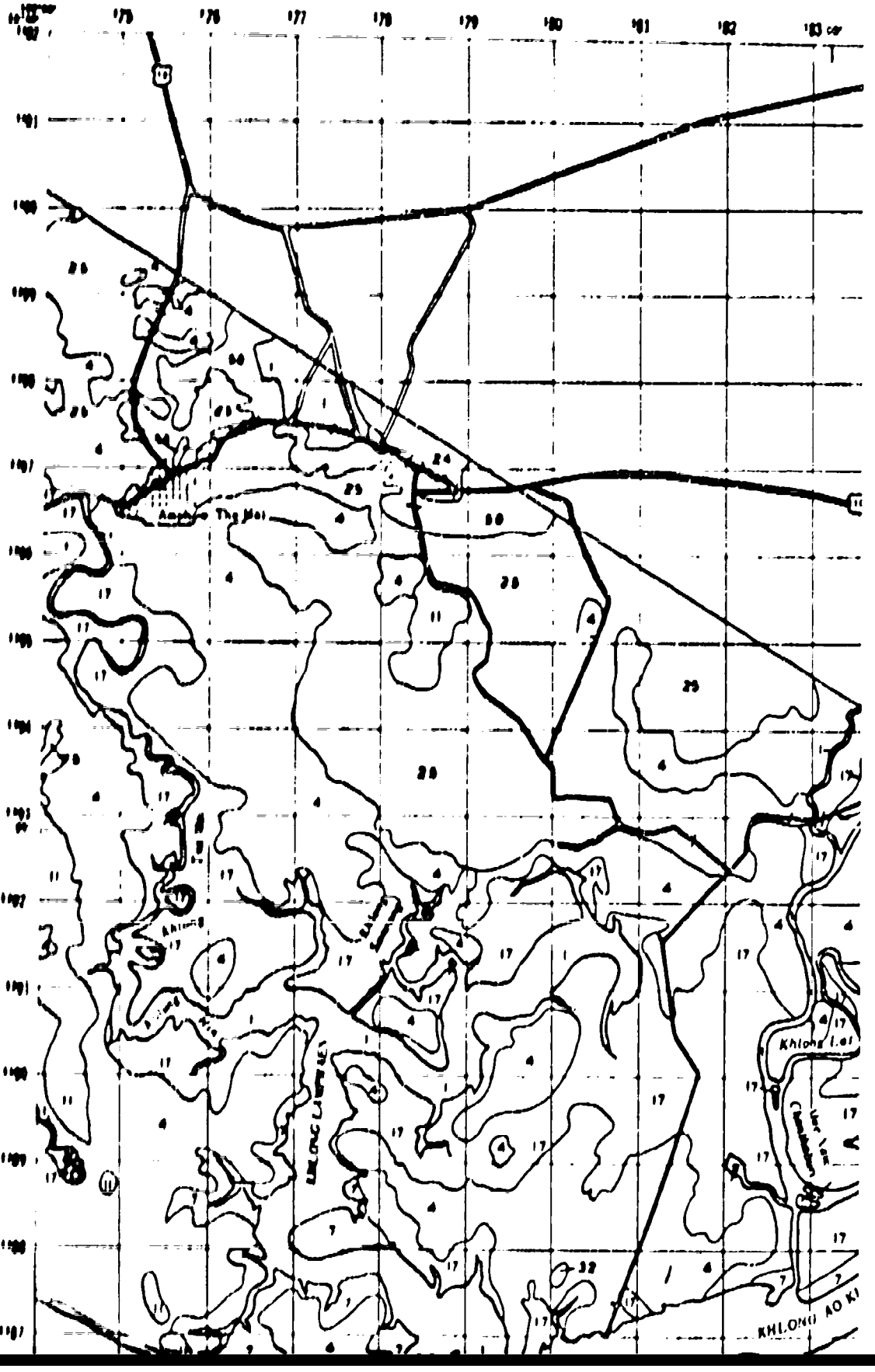
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE GEOMETRY

CHANTILLY, VA. STUDY AREA

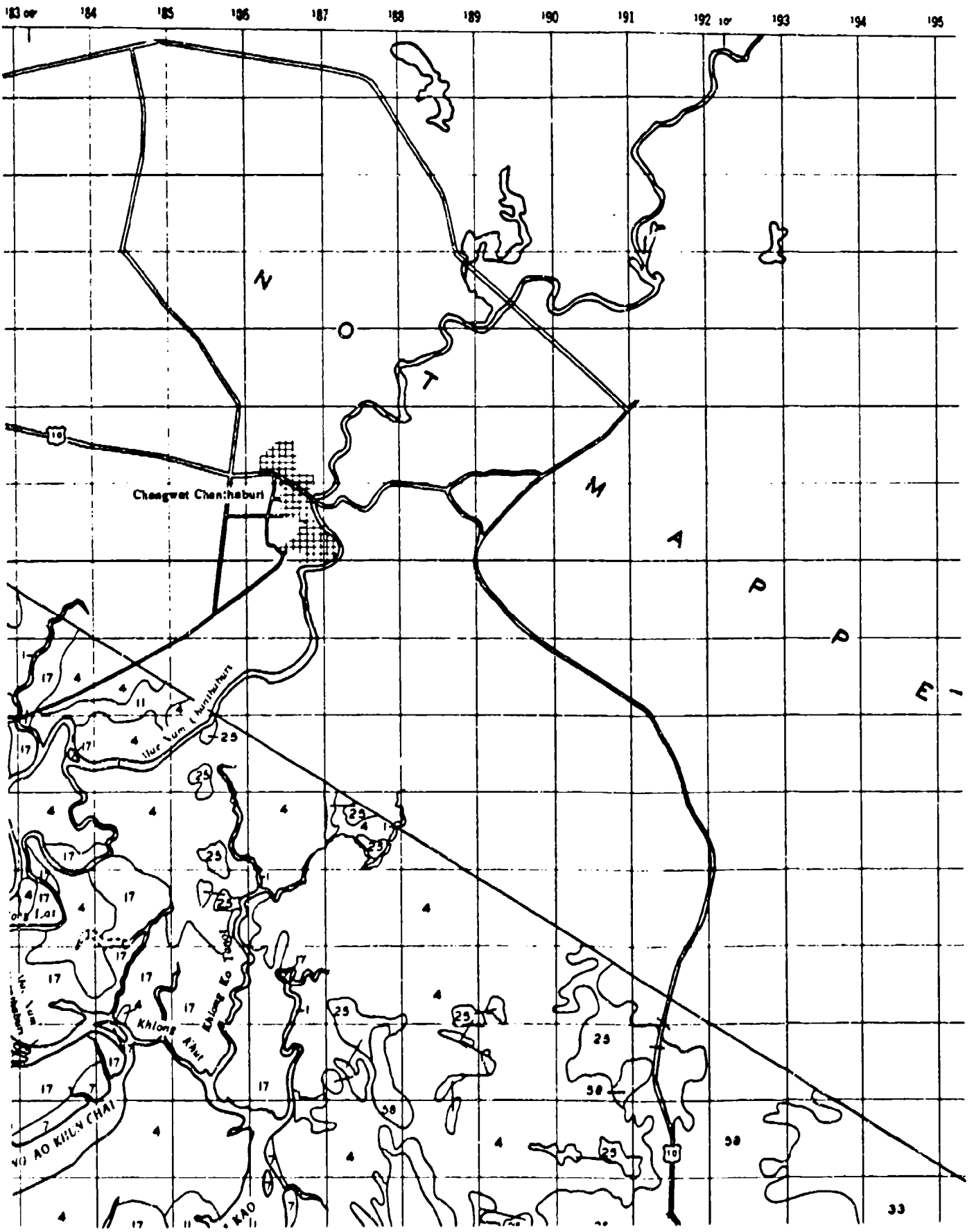
SHEET C III

PLATE 8 36



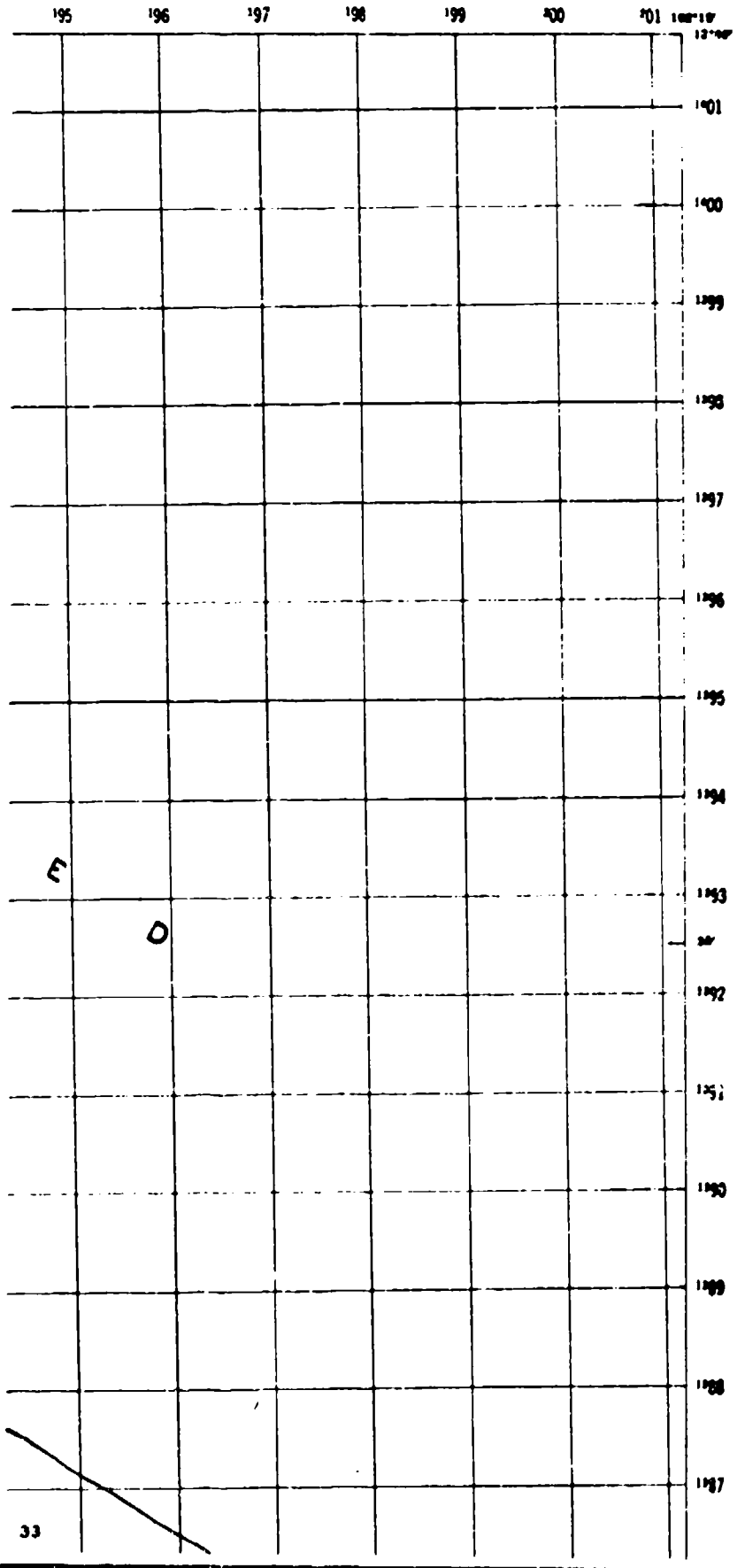
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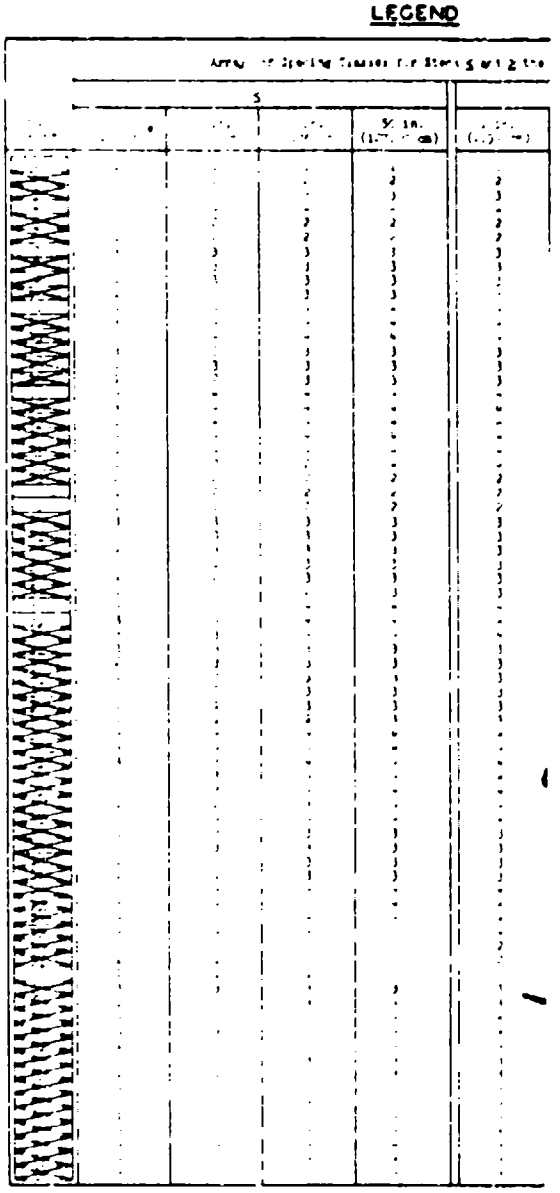
CHANTHABURI



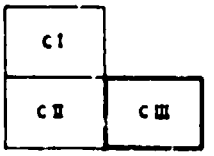
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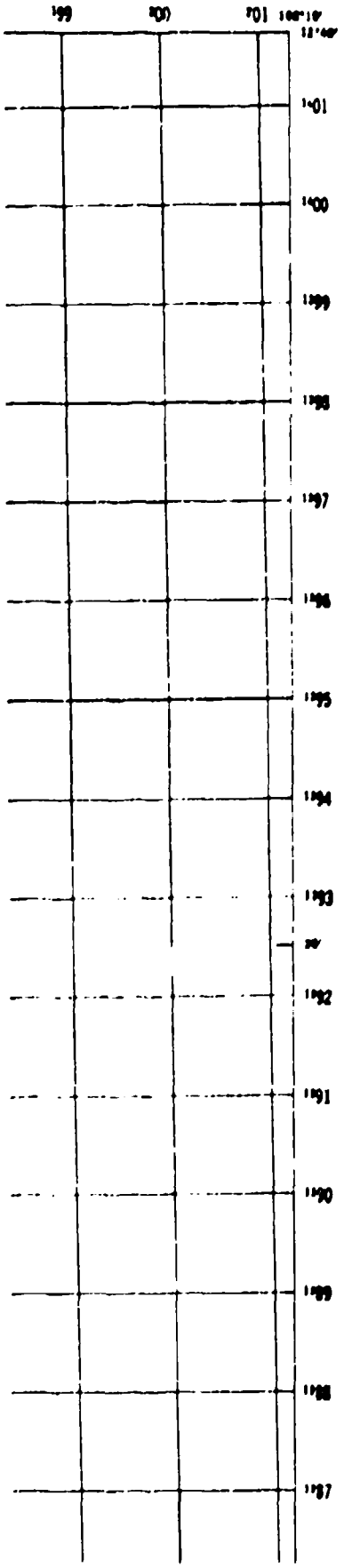




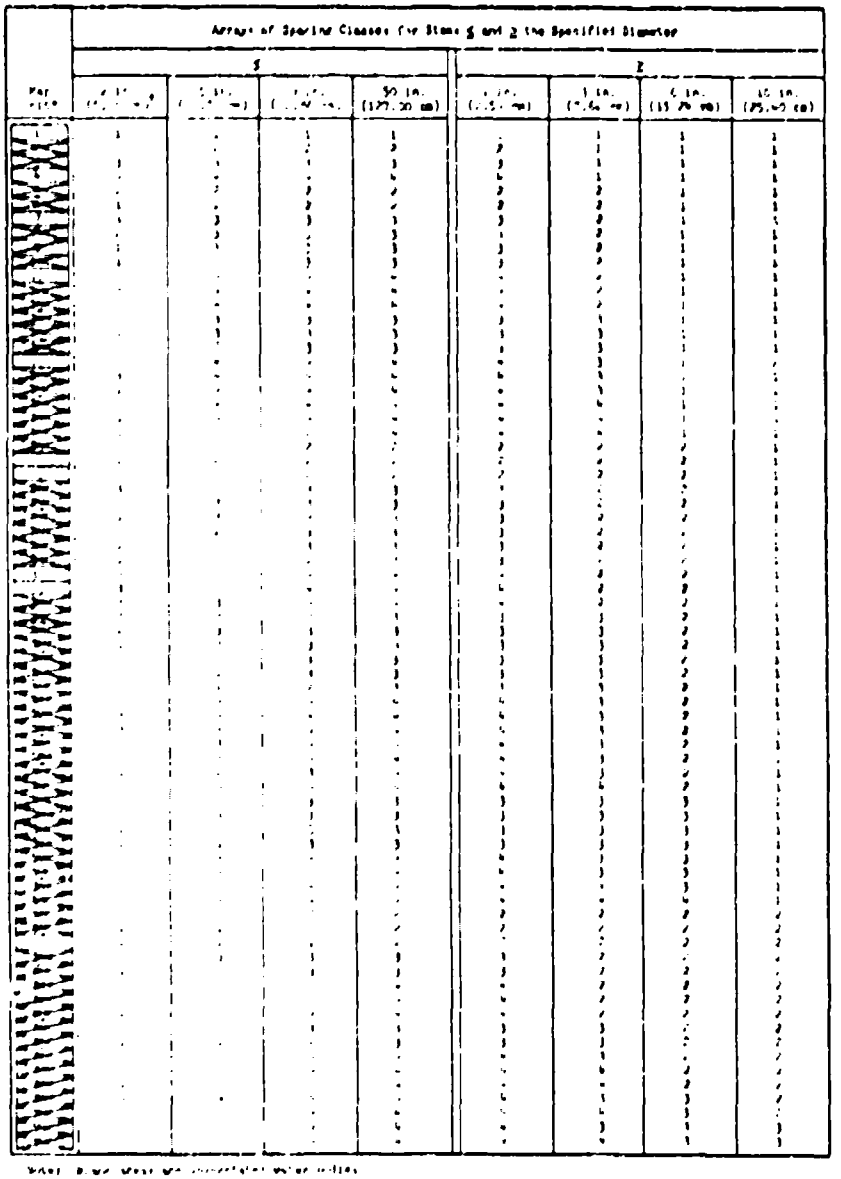
INDEX TO ADJOINING SHEETS



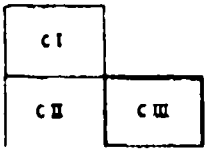
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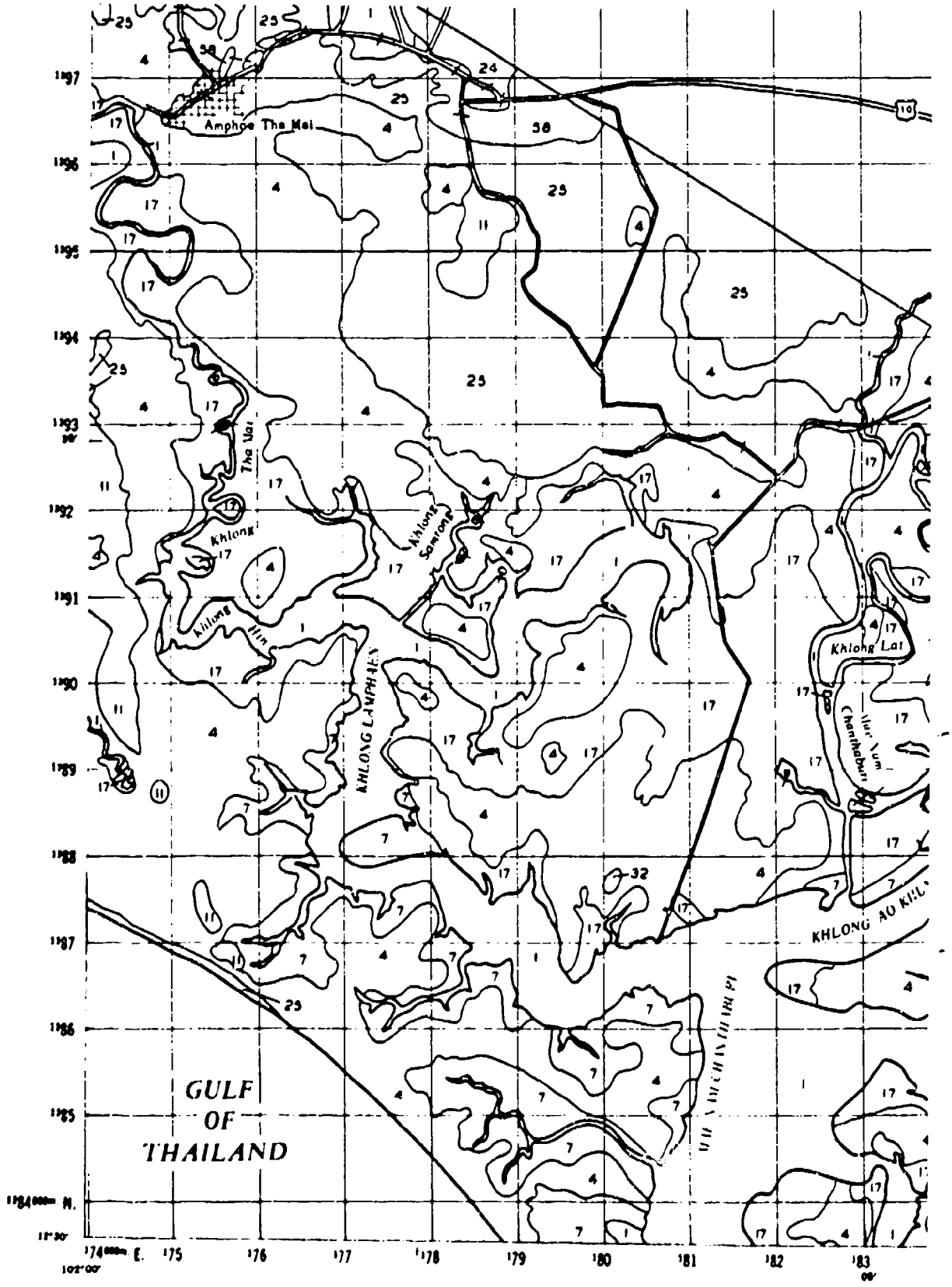


LEGEND



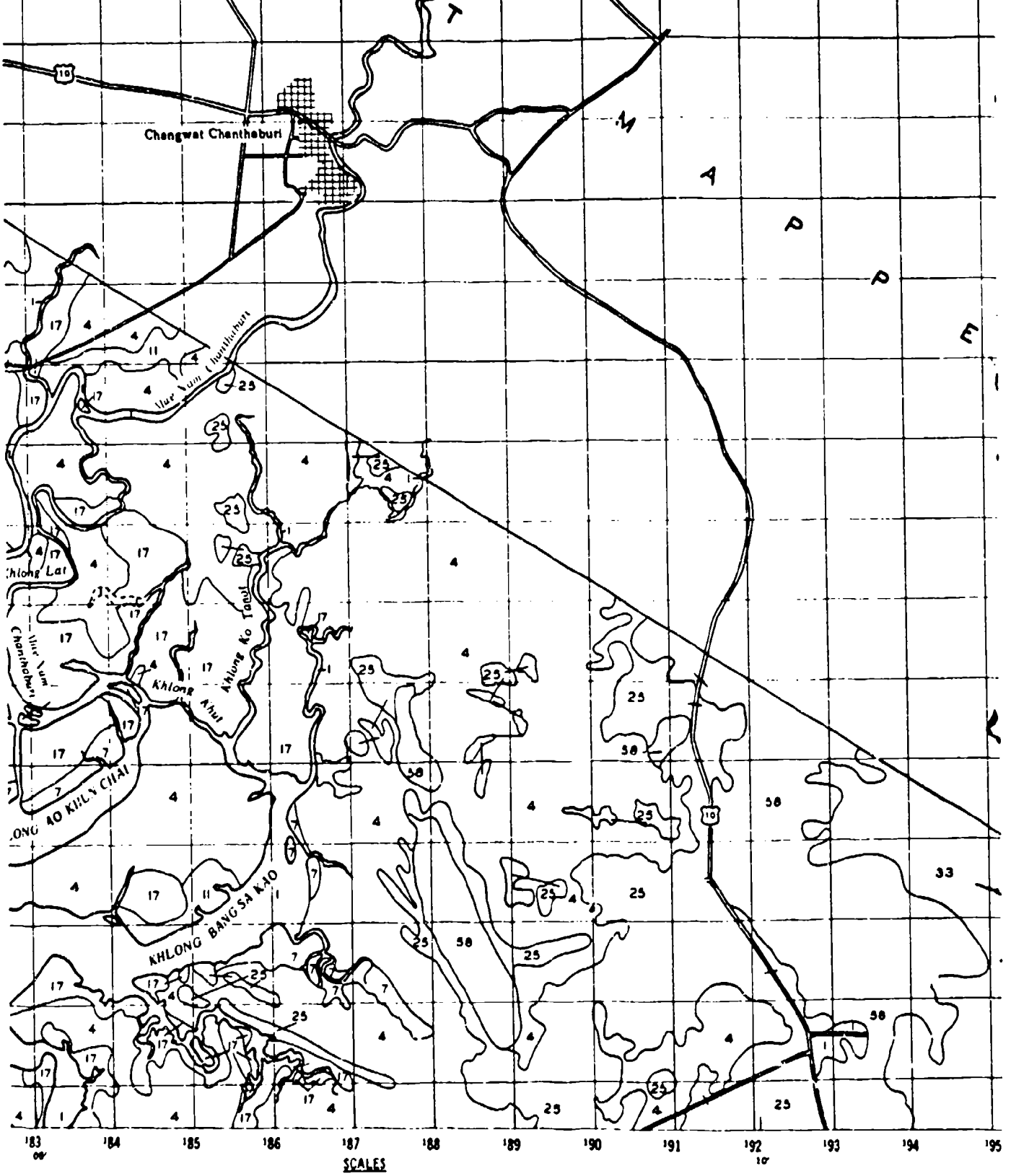
INDEX TO ADJOINING SHEETS



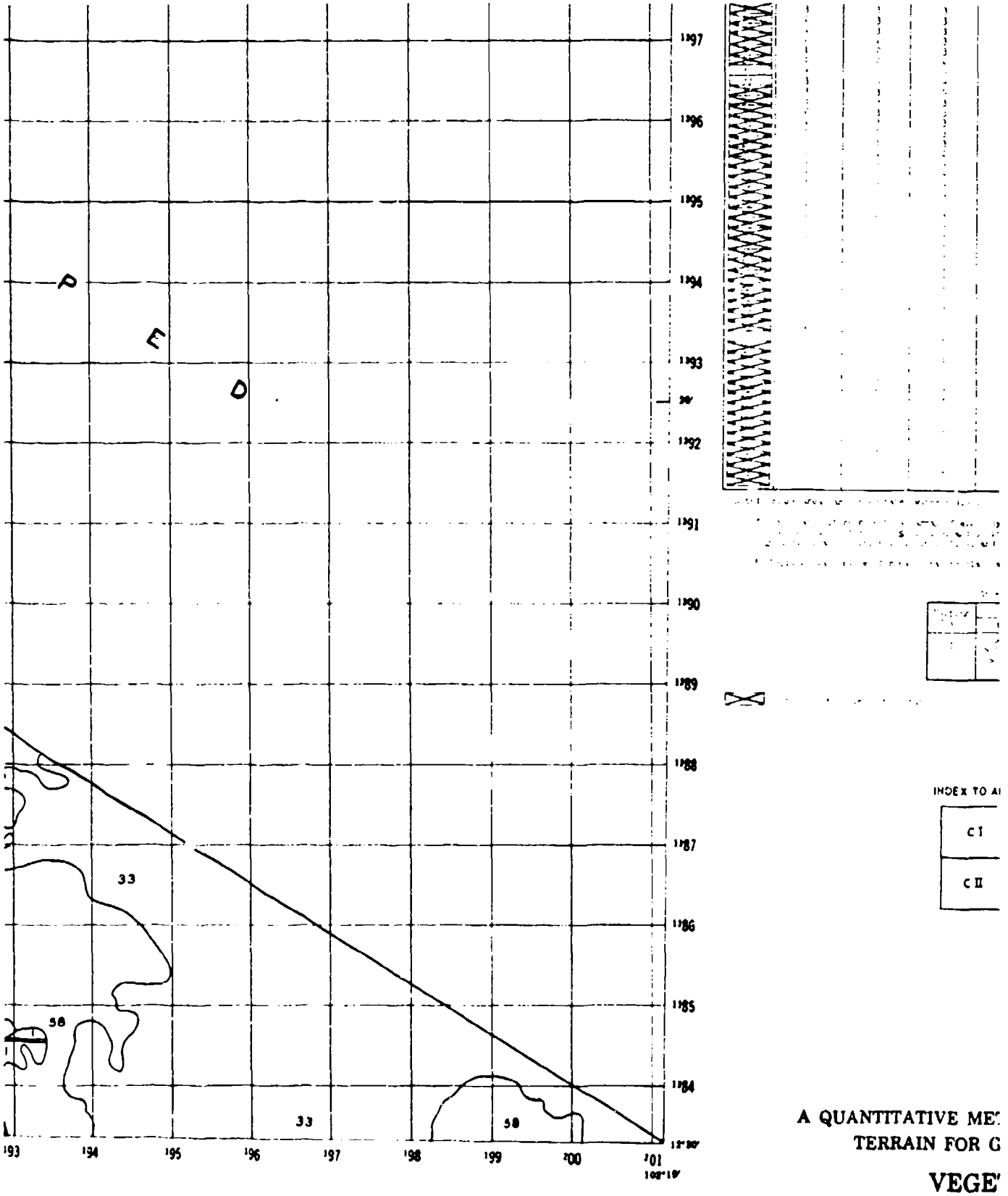


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48 P

5


Changwat Chantheburi
Khlong Lat
Khlong Ahui
Khlong Ko Taeul
KHLONG BANGSA KAO
183
184
185
186
187
188
189
190
191
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193
194
195
SCALES
1 0 1 2 3 Statute Miles
1000 500 0 1000 2000 3000 4000 Meters
1000 500 0 1000 2000 3000 4000 Yards

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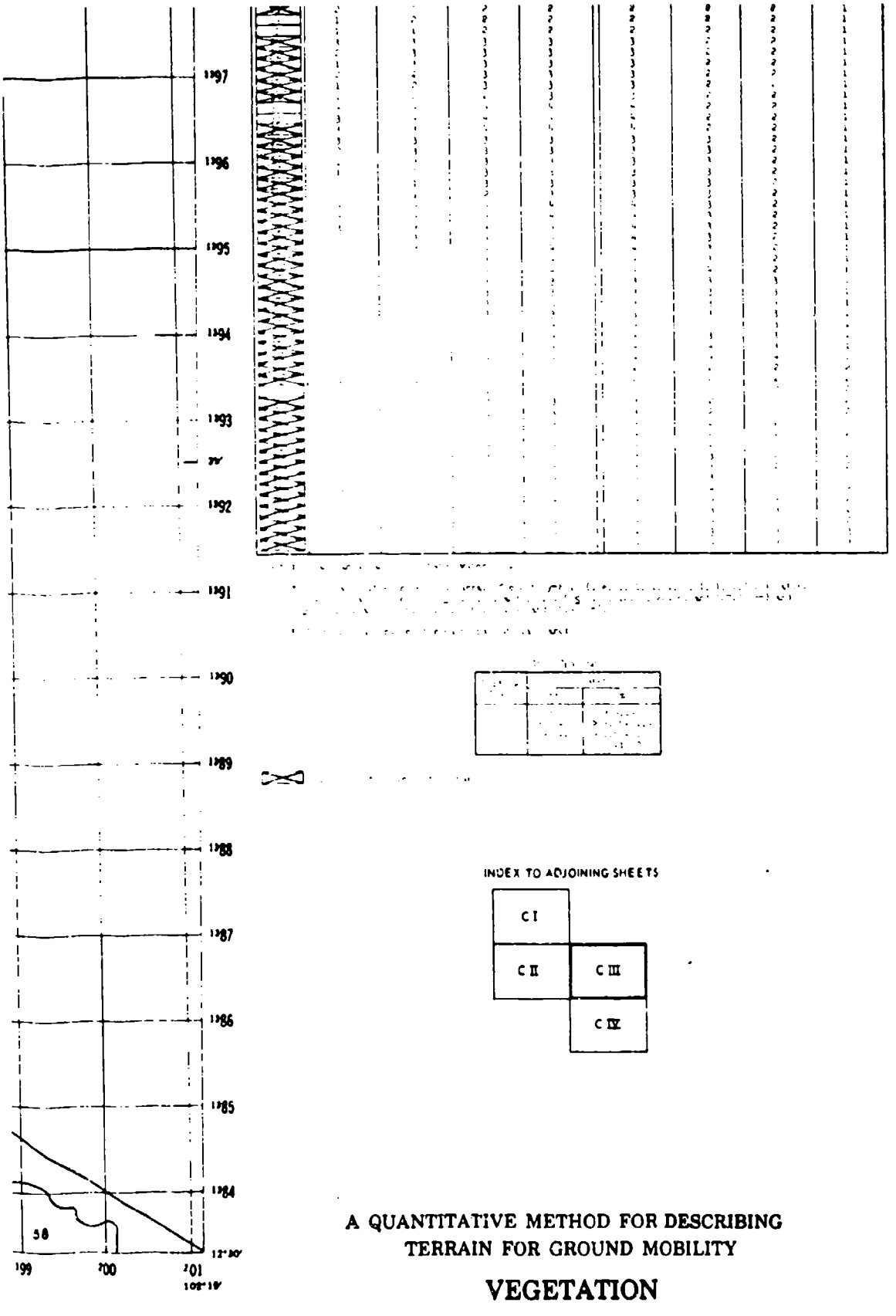
A QUANTITATIVE ME
TERRAIN FOR G

VEGE

CHANTHABUI

SHEE

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INDEX TO ADJOINING SHEETS

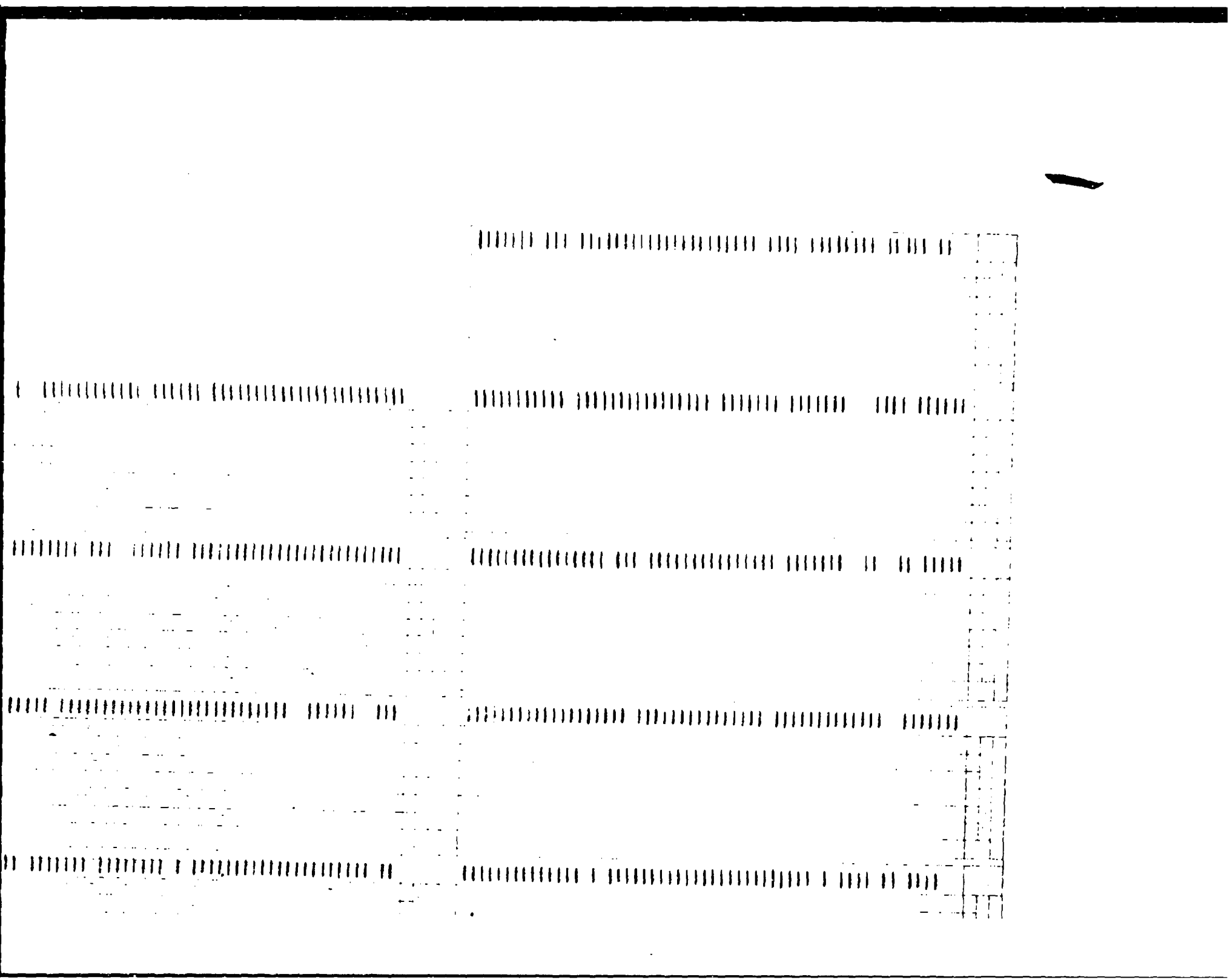
A QUANTITATIVE METHOD FOR DESCRIBING
TERRAIN FOR GROUND MOBILITY

VEGETATION

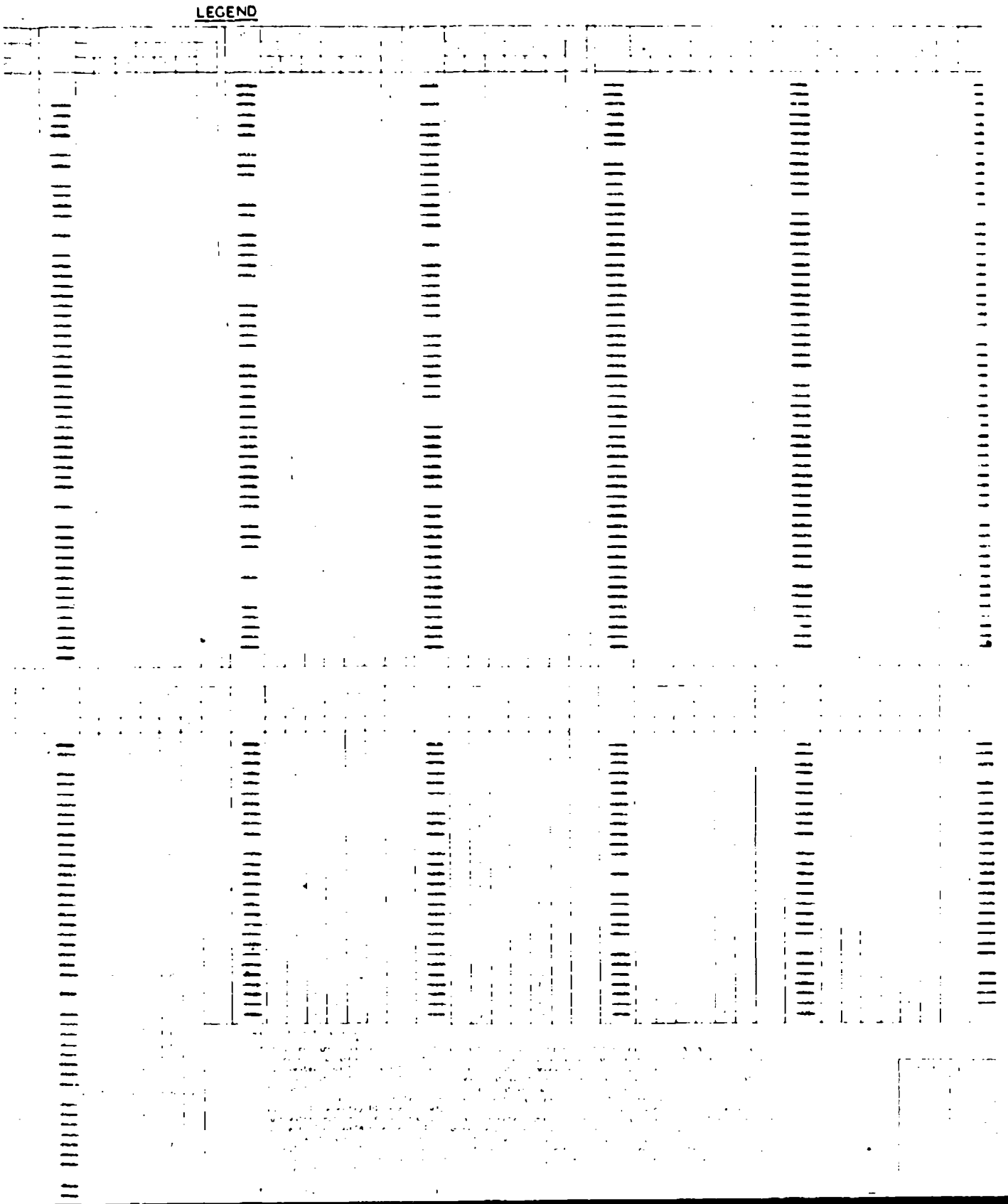
CHANTHABURI STUDY AREA

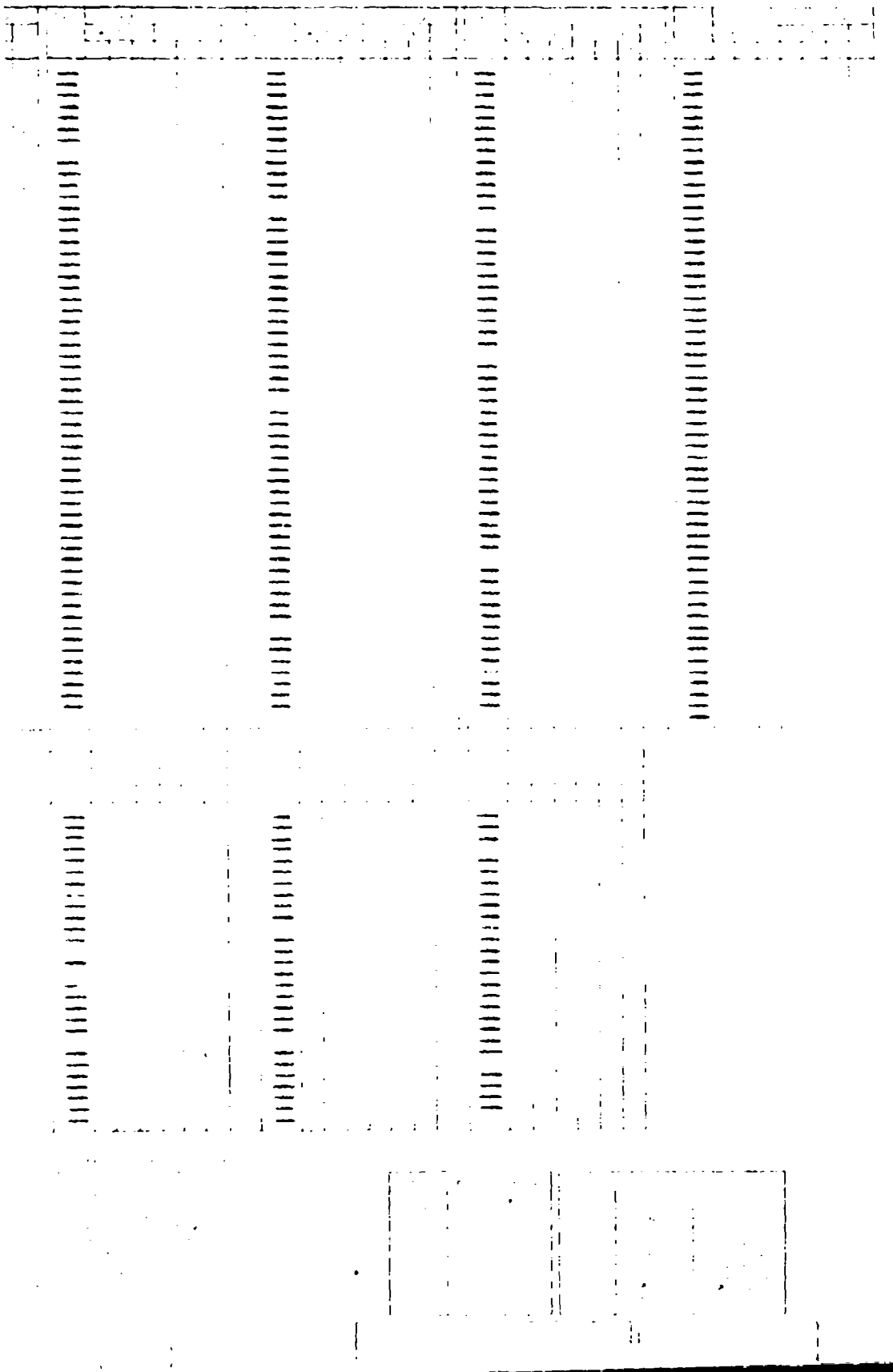
SHEET C III

PLATE 6.3c

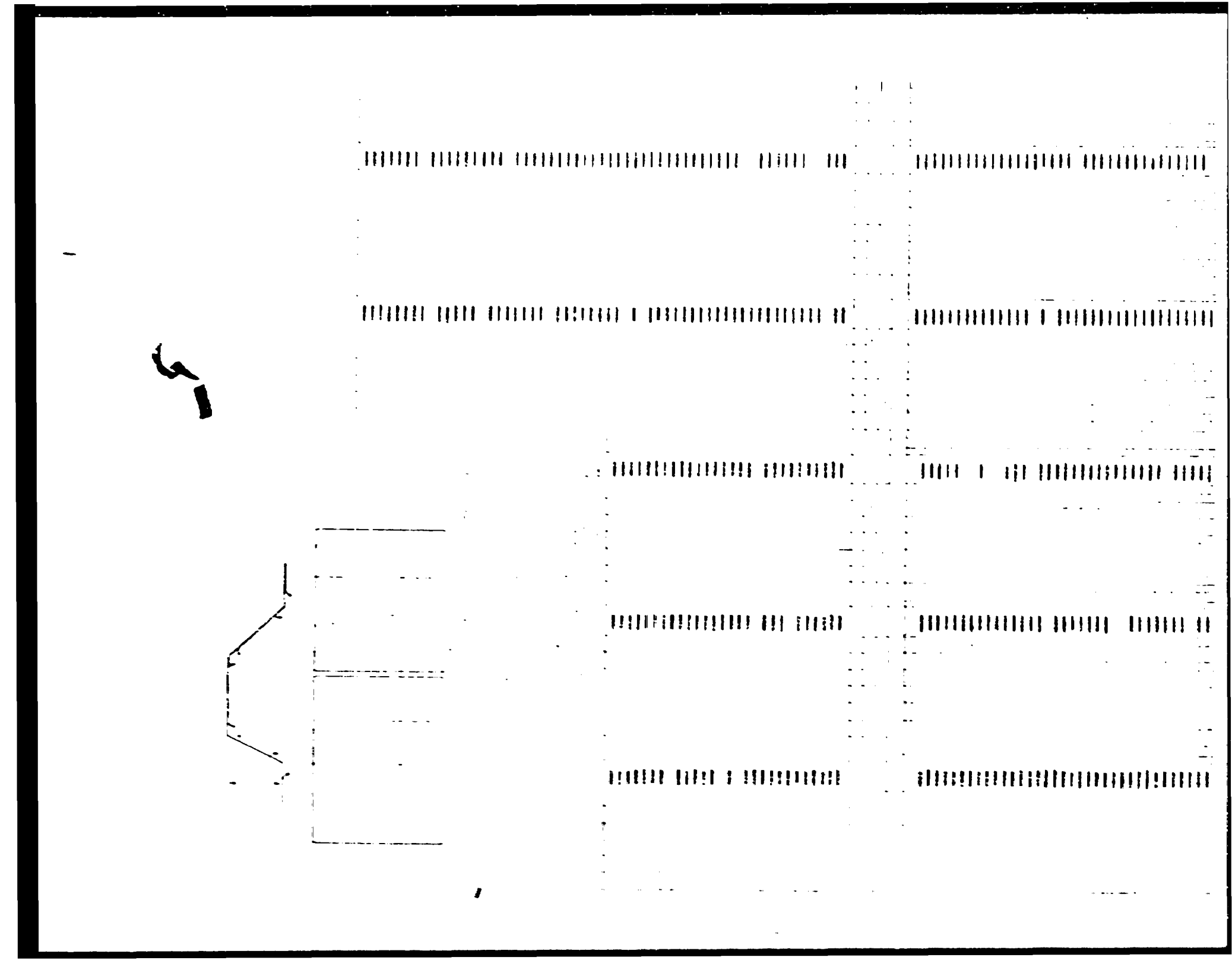


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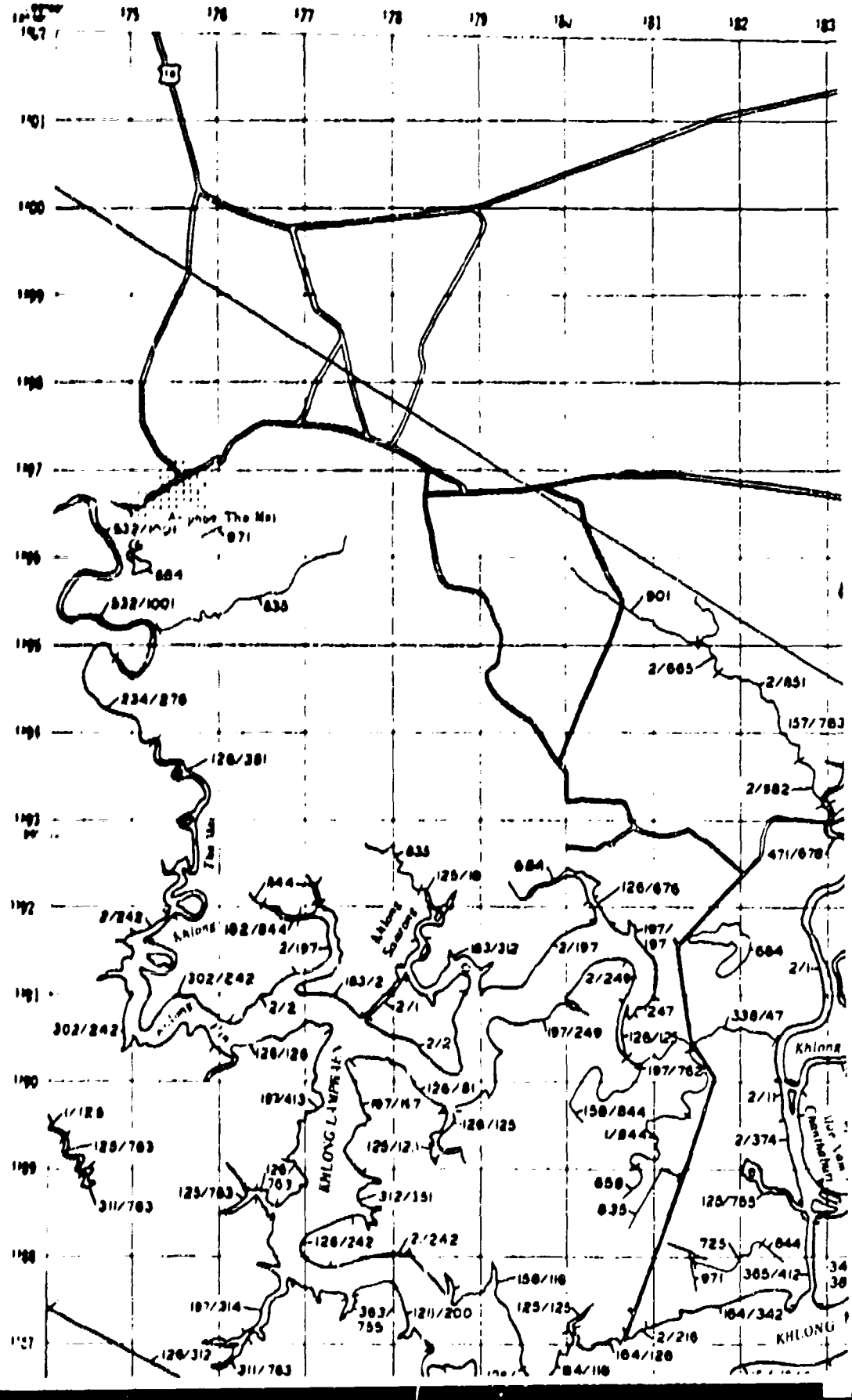




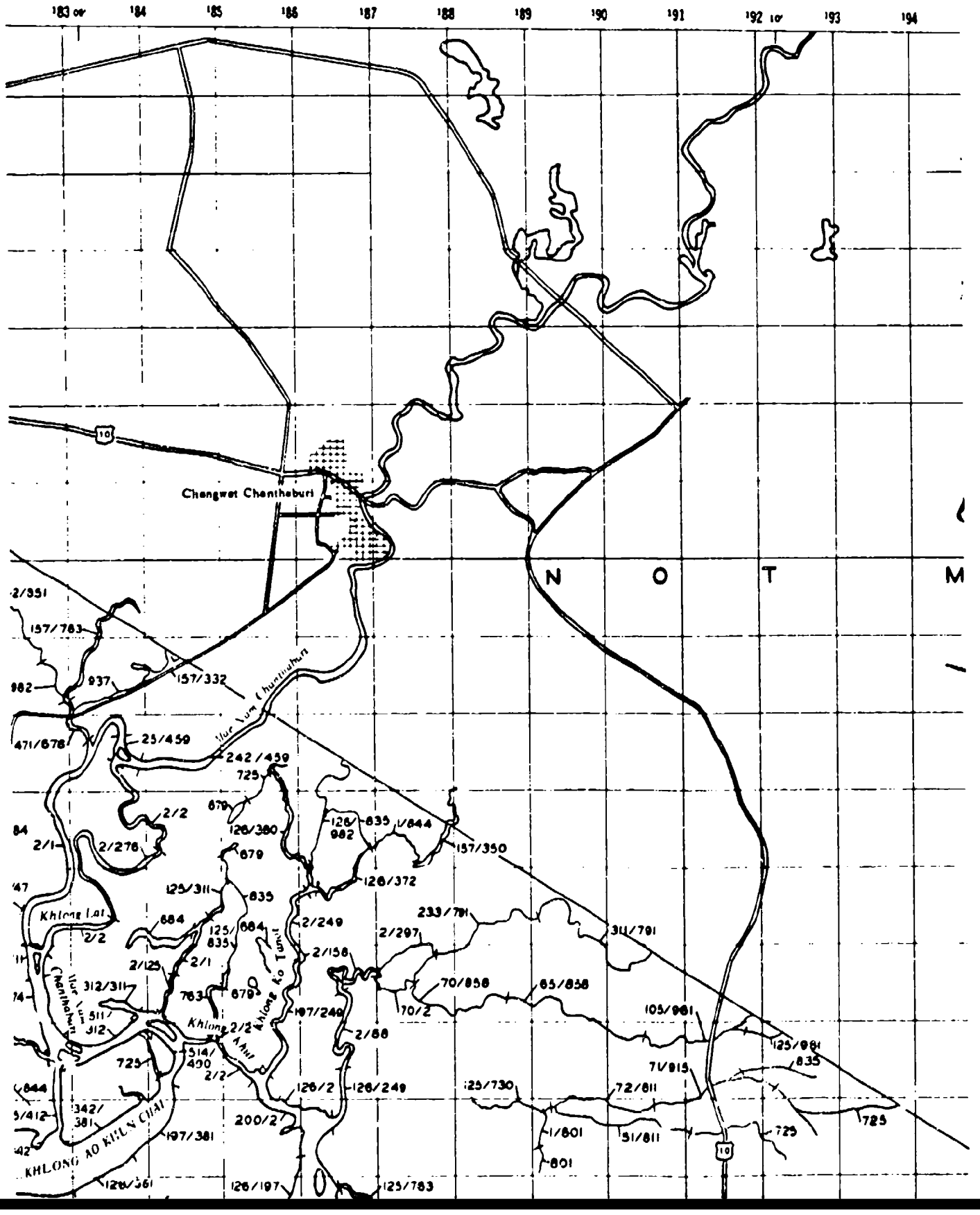
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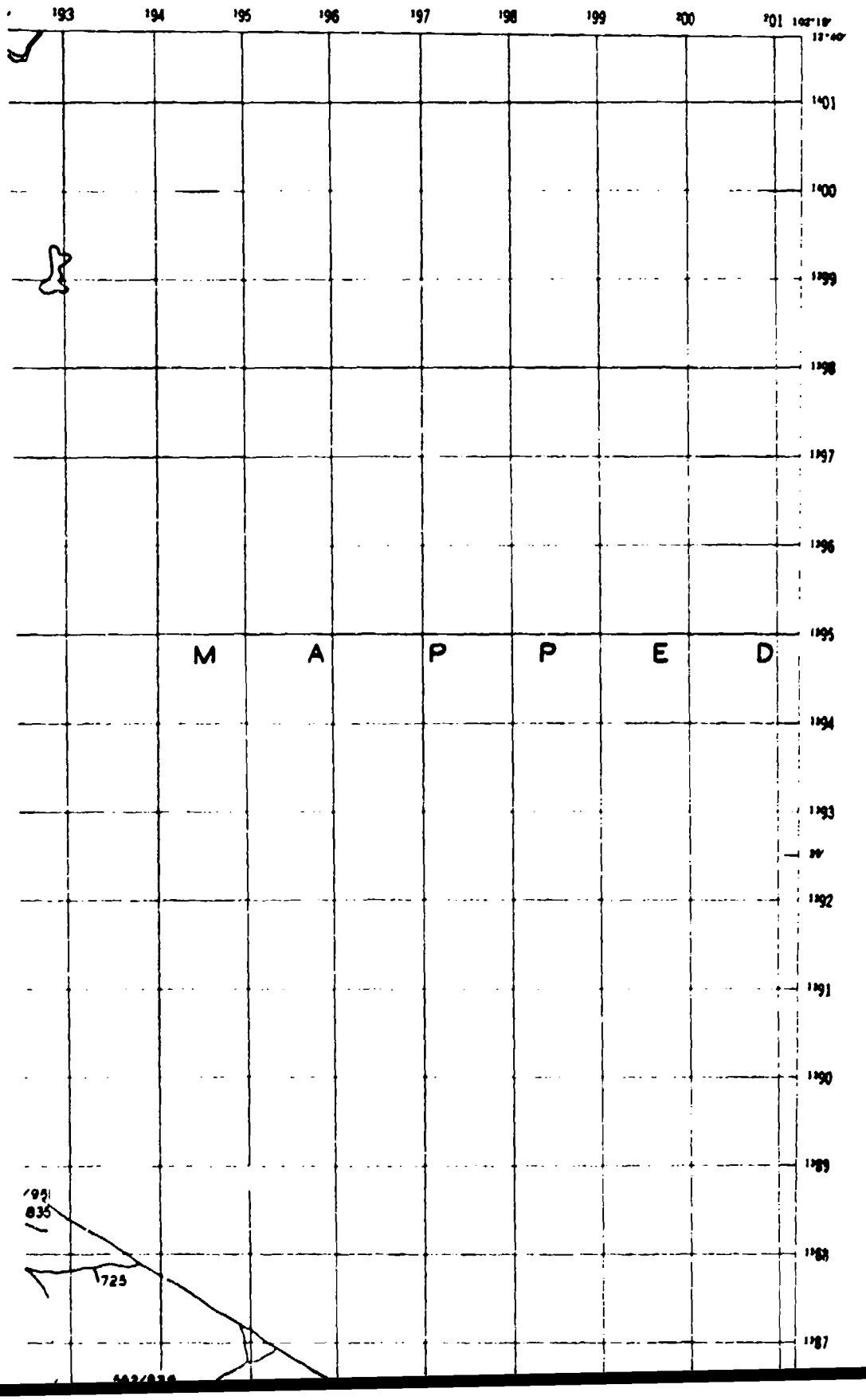

175
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177
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182
183
Khlong
KHLONG LAMPHLI
KHLONG
884
835
901
2/665
2/851
2/882
471/678
126/676
197/197
2/249
247
338/47
197/249
197/782
2/374
725
644
971
365/412
164/342
2/216
164/126
84/118
150/110
125/125
1211/200
383/755
126/242
2/242
312/151
125/783
311/763
126/312
197/314
197/413
126/81
129/125
125/121
126/126
302/242
2/2
2/1
183/2
183/312
2/197
102/844
844
126/381
234/876
532/1001
871

2 CHANTHABURI

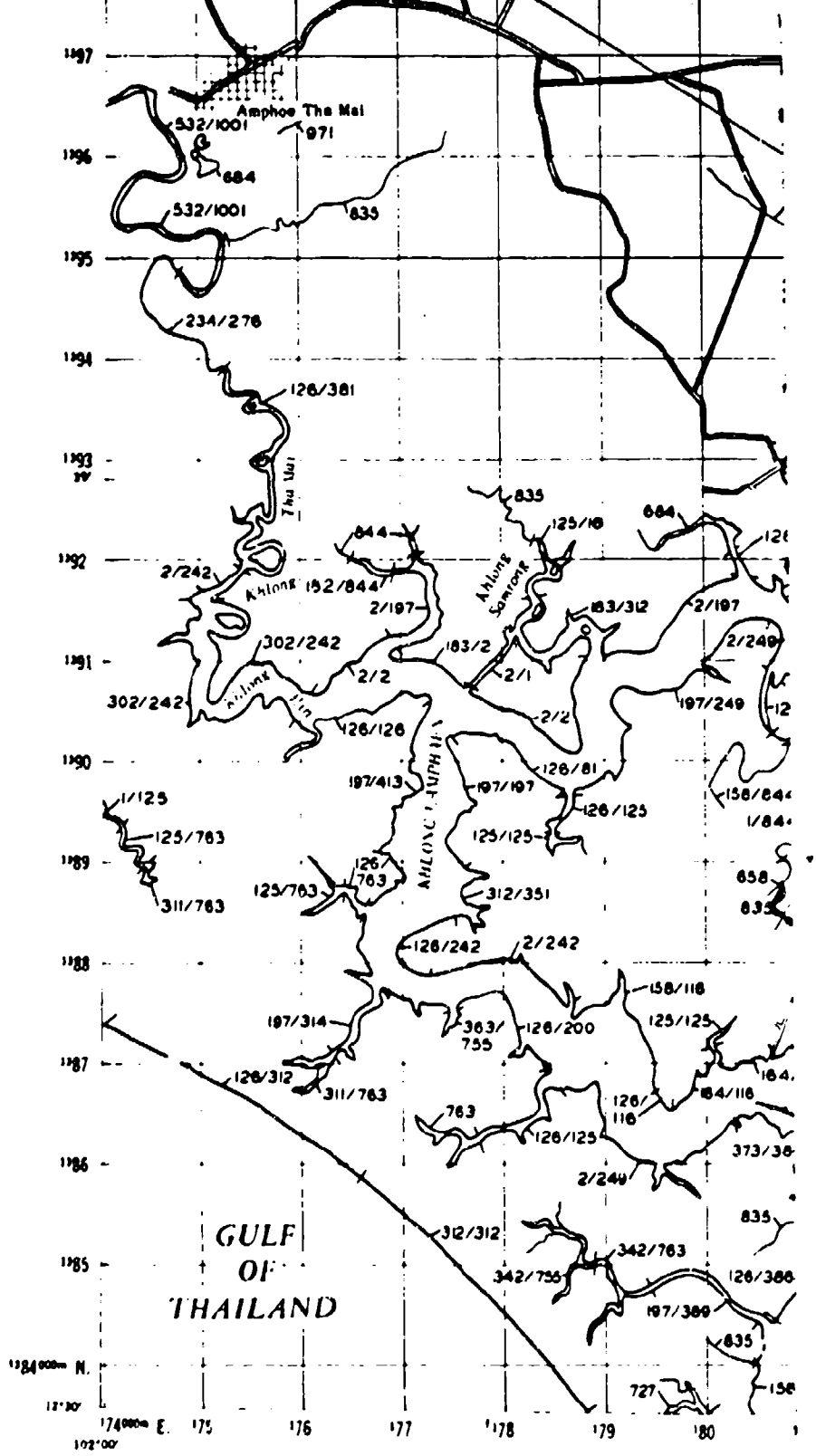


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SHEET C III

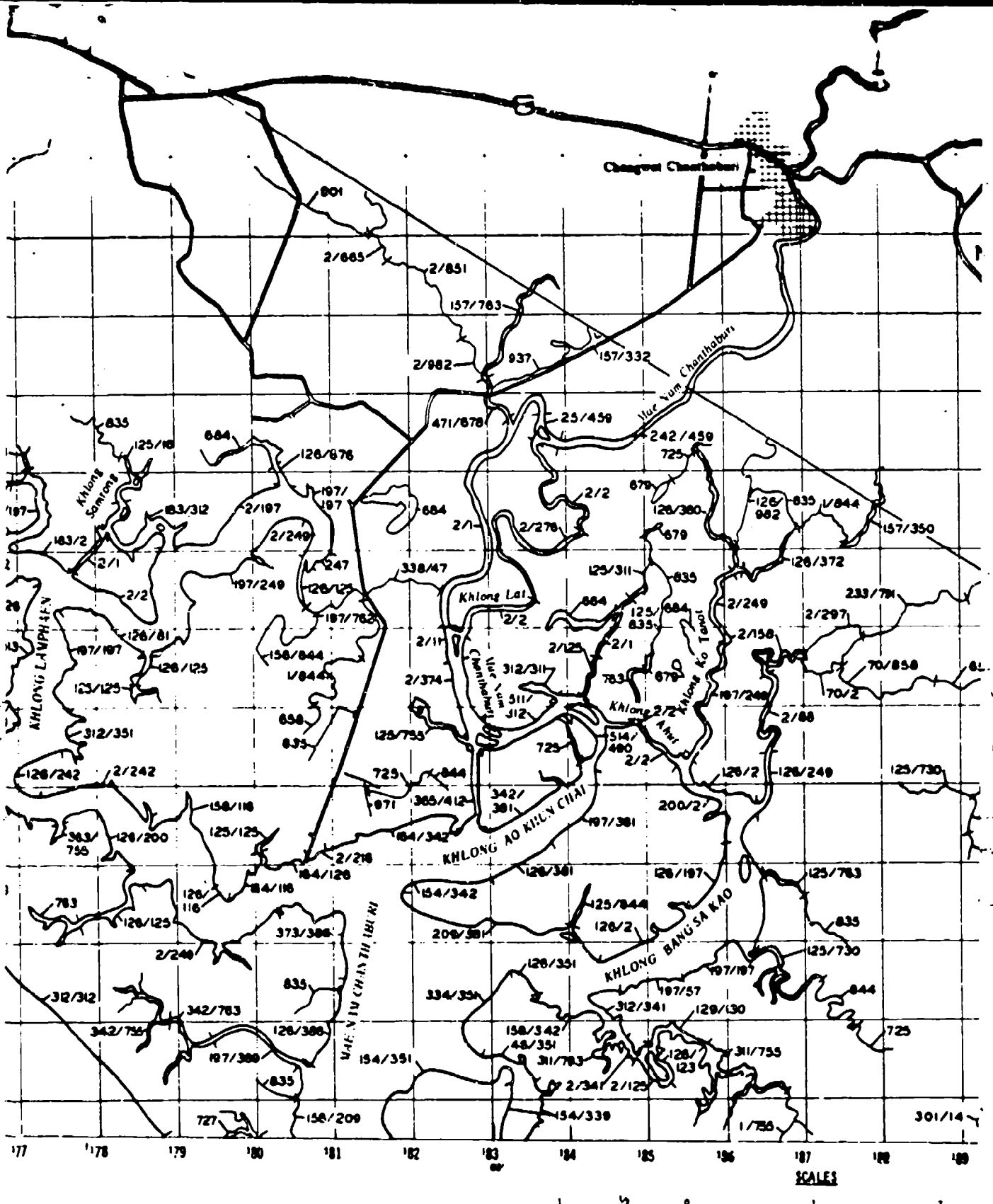


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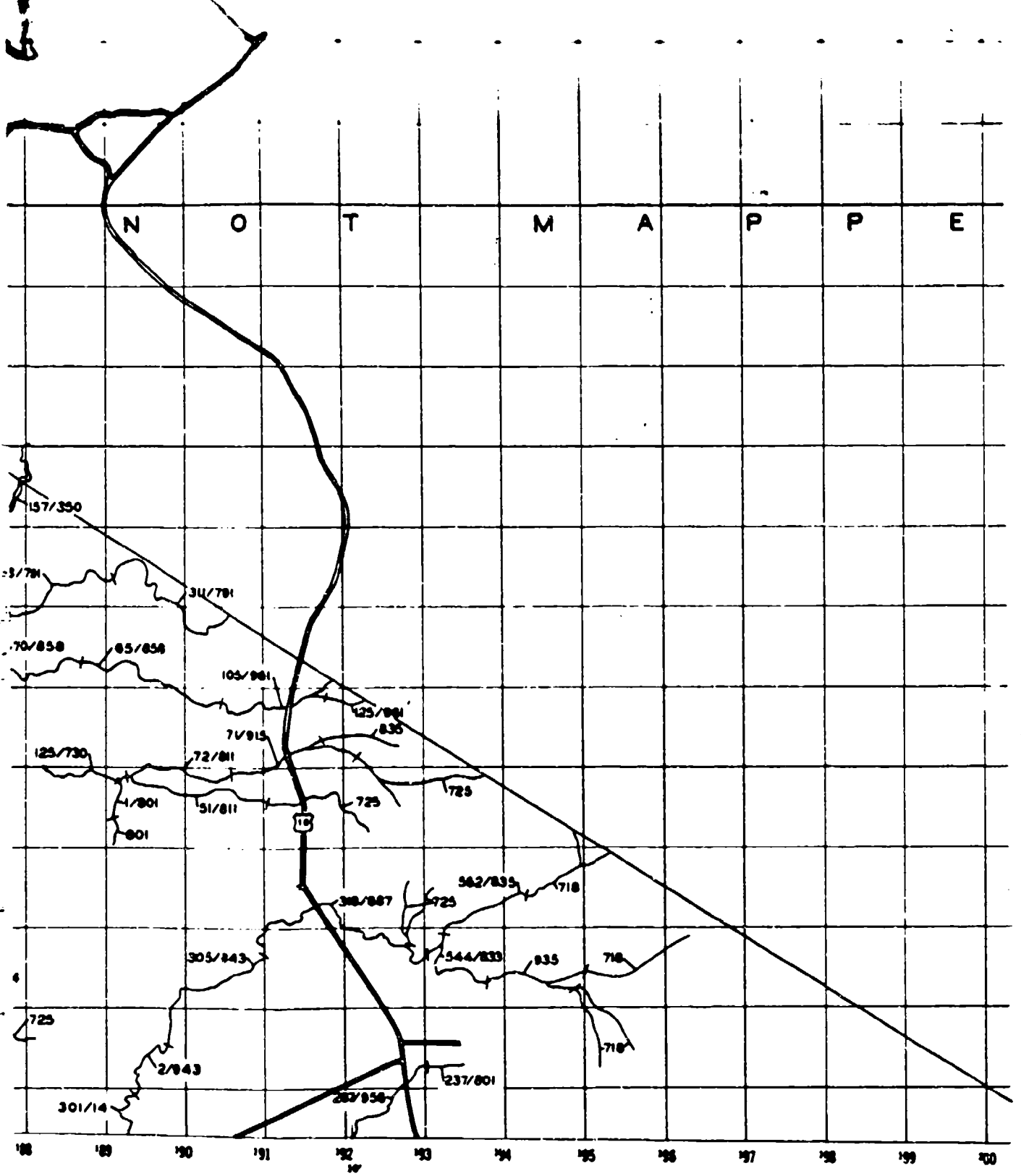


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION. 48 P

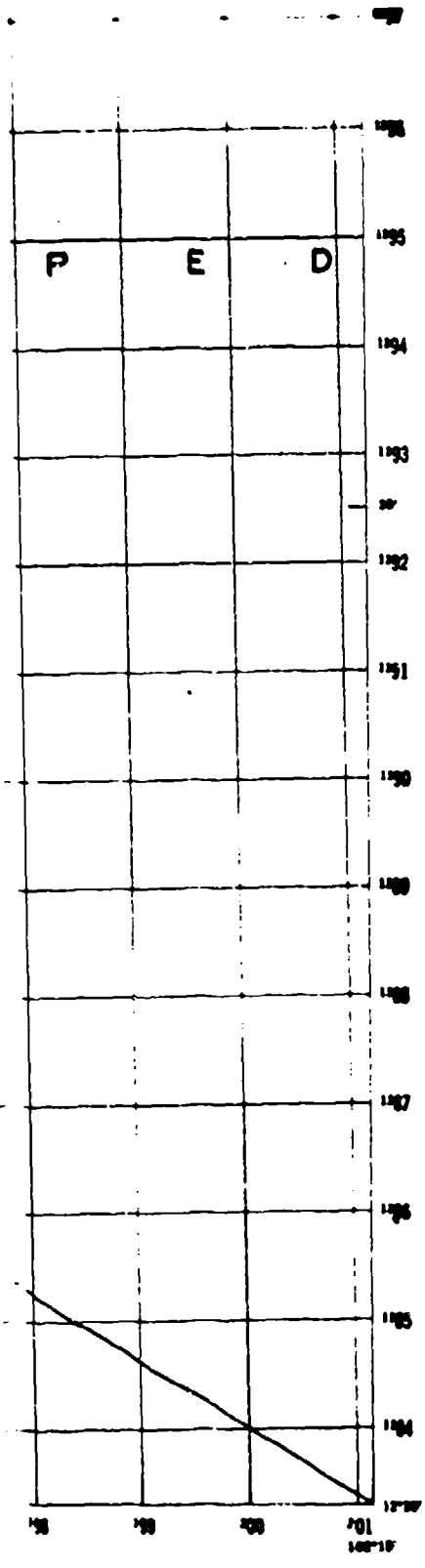
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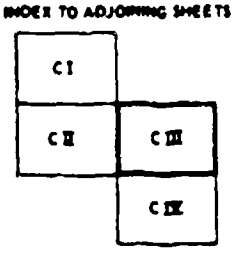

Chaiyaphum Chanthaburi
Khlong Somlong
Khlong Lai
Khlong Ao Khlong Chai
Khlong Bang Sa Kao
Khlong Ko Tawai
Khlong Amat
Mae Nam Chanthaburi
Mae Nam Chanthaburi
SCALES
TRANSVERSE MERCATOR GRID
ZONE: 48 P

5


N O T M A P P E
157/350
314/791
70/858
65/858
105/961
125/961
835
71/915
125/730
72/811
725
1/801
51/811
801
562/835
718
318/887
725
305/843
544/833
835
718
725
718
2/843
237/801
301/14
280/956
188
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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

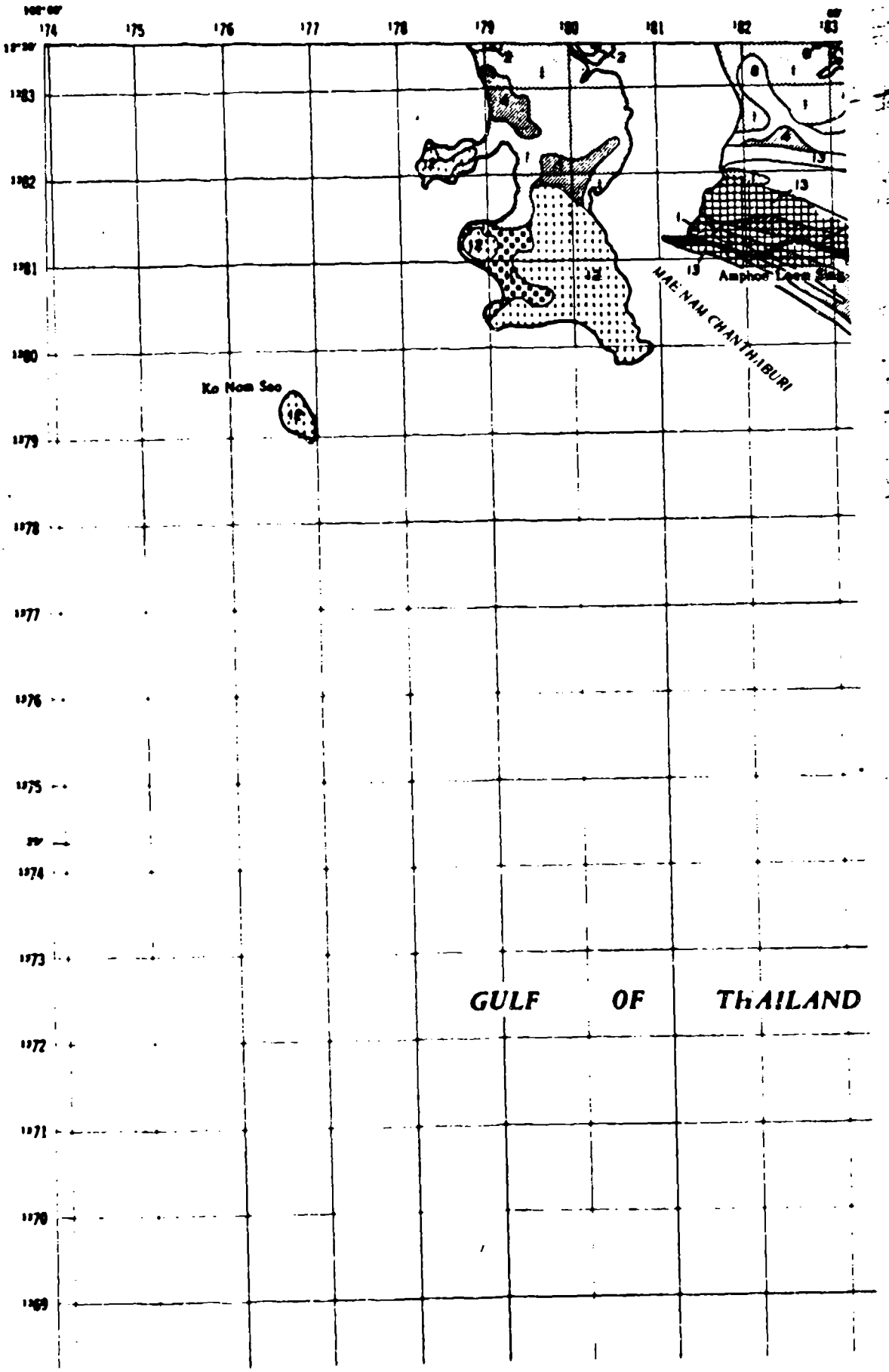
HYDROLOGIC GEOMETRY

CHANTHABURI STUDY AREA

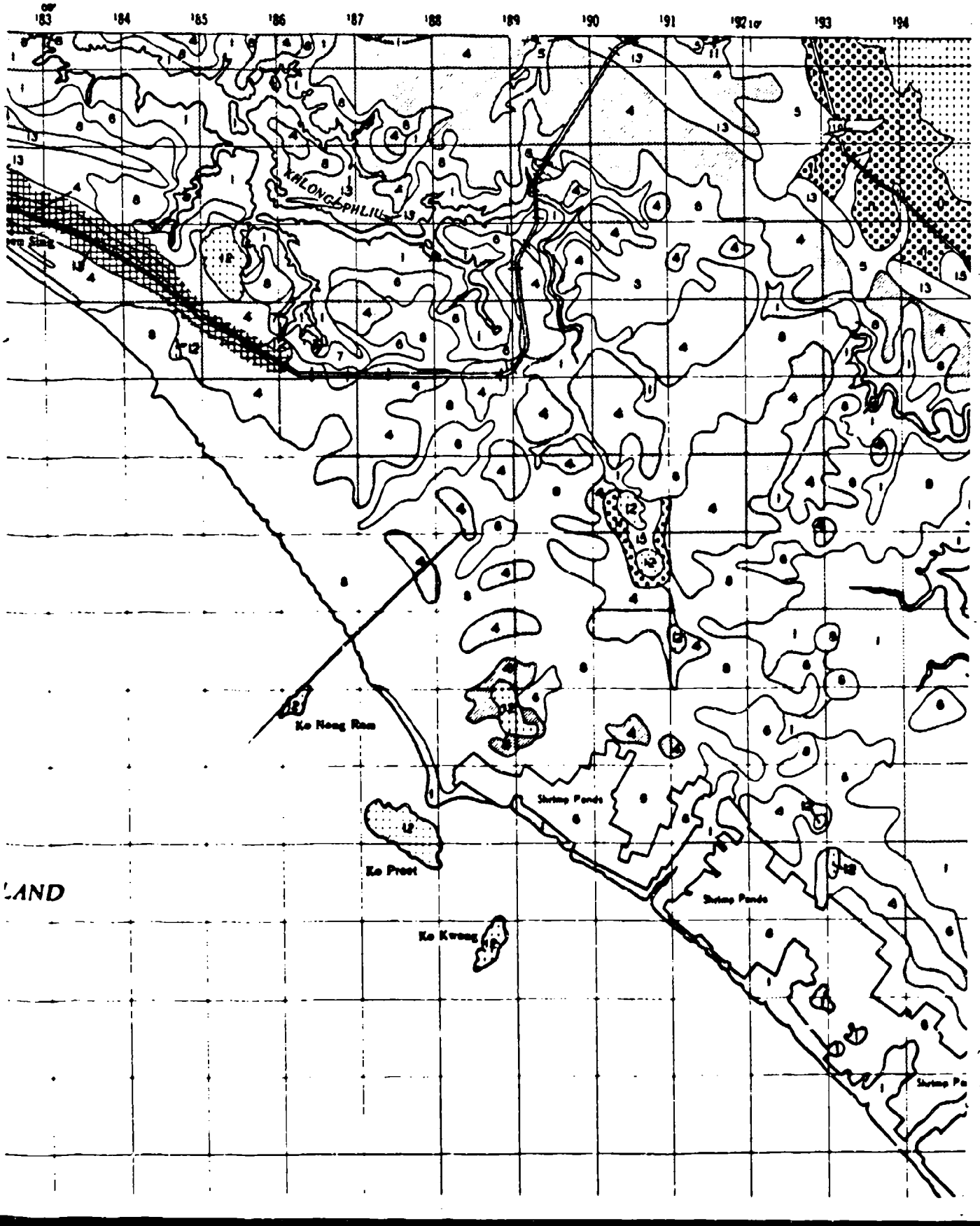
SHEET C III

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PLATE 6.3d

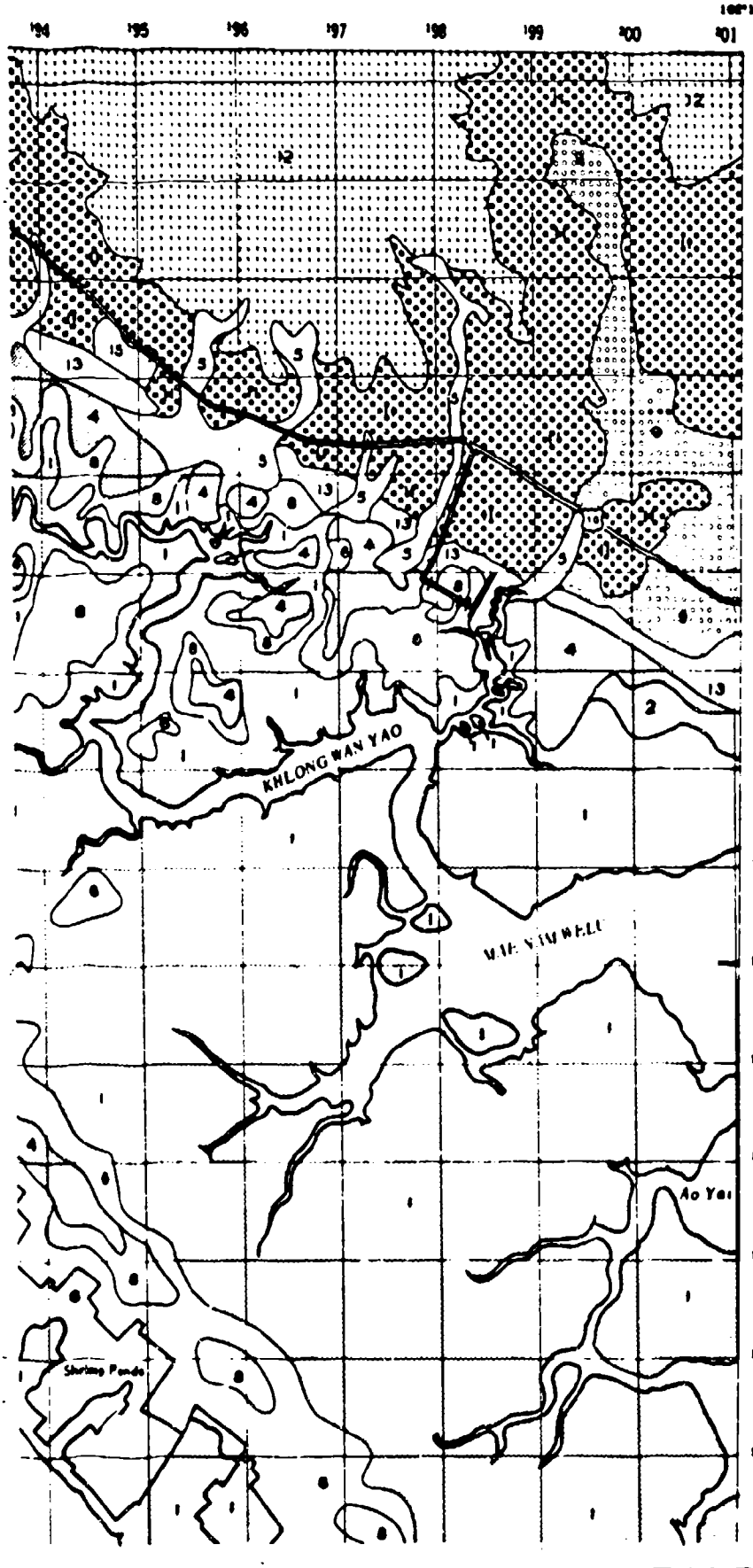

Ko Nom Soo
MAE NAM CHANTHABURI
GULF OF THAILAND

2 CHANTHABURI



3

SHEET C IV



LEGEND

Unit	Soil Mass Strength: Maximum Moisture (PCF)	Soil Mass Strength: Maximum Moisture (PCF)	Maximum Moisture: c_{uu} (psi)	Maximum Moisture: c_{uu} (kg/cm²)	Maximum Moisture: ϕ_{uu} (deg)	Minimum: c_{uu} (psi)	Minimum: c_{uu} (kg/
1	10-75	75-80	0-1	0-0.07	0-10	1-8	0.07
2	75-80	80-100	0-1	0-0.07	0-10	8-14	0.14
3	75-80*	80-100	0-1	0-0.07	0-10	8-14	0.14
4	75-80	>100	0-1	0-0.07*	0-10	0-1	0
5	75-80*	>100	0-1	0-0.07	10-20	0-1	0
6	80-100	80-100	0-1	0-0.07	0-10	8-14	0.14
7	80-100	80-100	0-1	0-0.07	10-20	0-1	0
8	80-100	>100	0-1	0-0.07	0-10	0-1	0
9	80-100	>100	0-1	0-0.07	0-10	0-1	0
10	80-100	>100	0-1	0-0.07	10-20	0-1	0
11	80-100*	>100	0-1	0-0.07	10-20	0-1	0
12	>100	>100	0-1	0-0.07	0-10	0-1	0
13	>100	>100	0-1	0-0.07	10-20	0-1	0
	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0
	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0

Notes: Blank areas are water bodies.

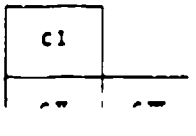
c_{uu} Shear strength at zero normal load.

ϕ_{uu} Angle of internal friction.

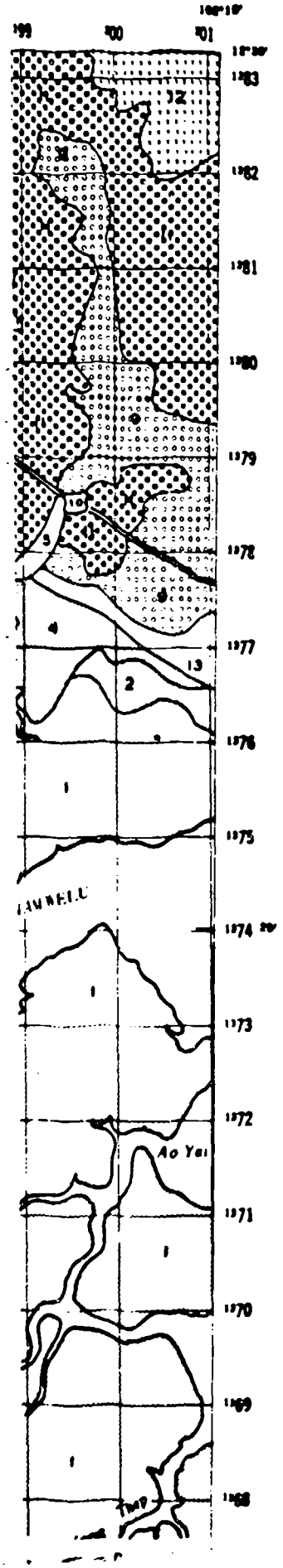
* Maximum moisture has less than 30 percent probability of exceeding strengths normally observed are 60-100 for Units 3 and 5; see

Units do not occur on this map.

INDEX TO ADJOINING SHEE



SHEET C IV



LEGEND

Unit	Soil Mass Strength: Maximum Moisture RCI	Soil Mass Strength: Minimum Moisture RCI	Soil Surface Strength: Maximum Moisture s_{ur} psi	s_{ur} kg/cm²	c_{ur} deg	Soil Surface Strength: Minimum Moisture s_{ur} psi	s_{ur} kg/cm²	c_{ur} deg	Conditions where maximum s_{ur} occurs: s_{ur} psi	s_{ur} kg/cm²	c_{ur} deg
1	10-25	25-60	0-1	0-0.07	0-10	1-2	0.07-0.14	10-20	Minimum moisture conditions		
2	25-60	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
[X]	25-60*	60-100	0-1	0-0.07	10-20	2-4	0.14-0.28	20-40	Minimum moisture conditions		
3	25-60	>100	0-1	0-0.07*	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
4	25-60*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
5	60-100	60-100	0-1	0-0.07	0-10	2-4	0.14-0.28	20-40	Minimum moisture conditions		
7	60-100	60-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
8	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.1--0.28	10-20
9 10	60-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	20-40
[X]	60-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		
11	60-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
12	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
13	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
[X]	Complex of 60-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	2-4	0.14-0.28	10-20
[X]	Complex of 60-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Minimum moisture conditions		

Note: Water areas are water bodies.

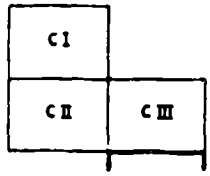
s_{ur} Shear strength at zero normal load.

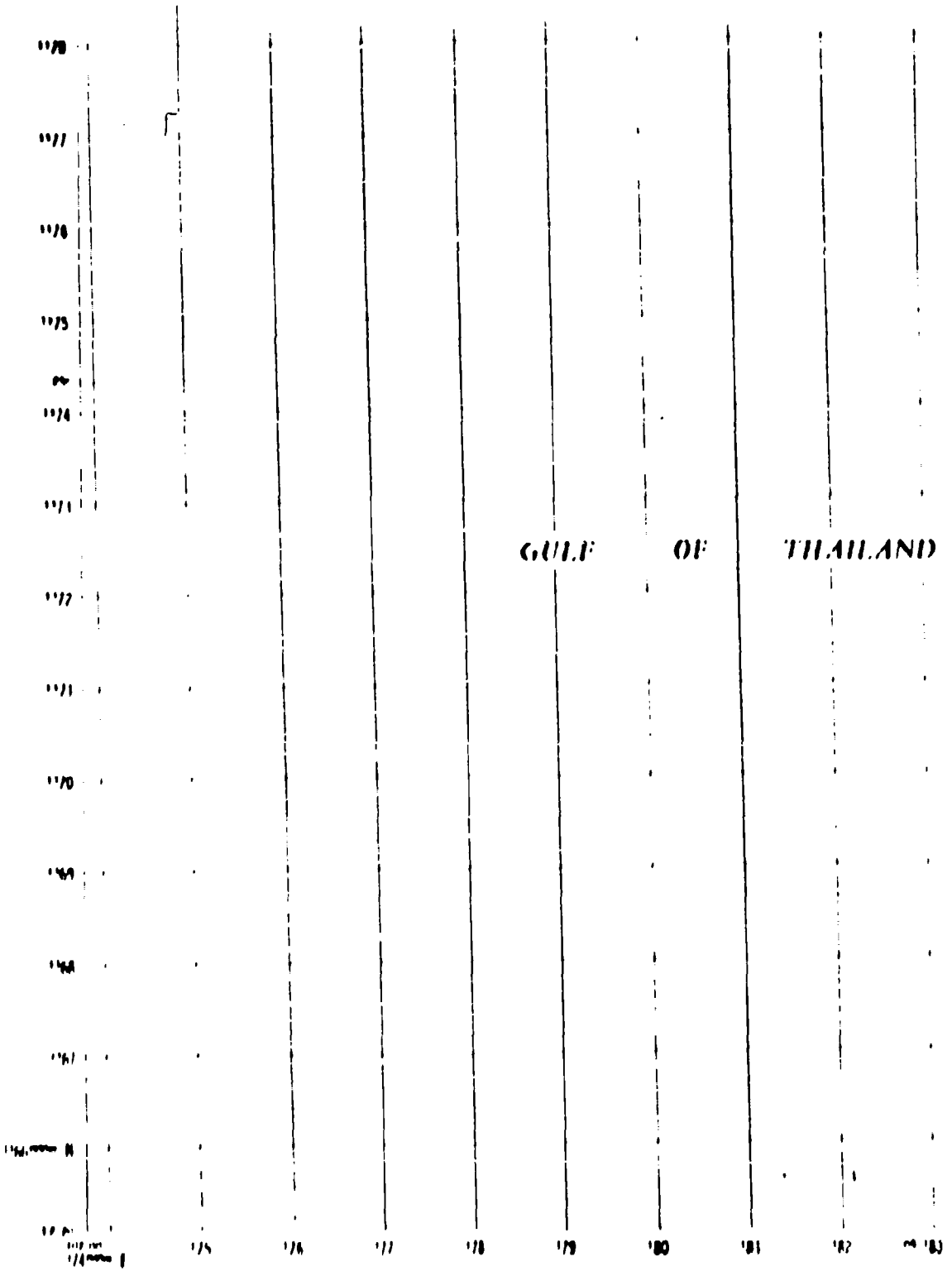
c_{ur} Angle of internal friction.

* Maximum moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths ordinarily observed are 60-100 for Units 3 and 5; more than 100 for Unit 11.

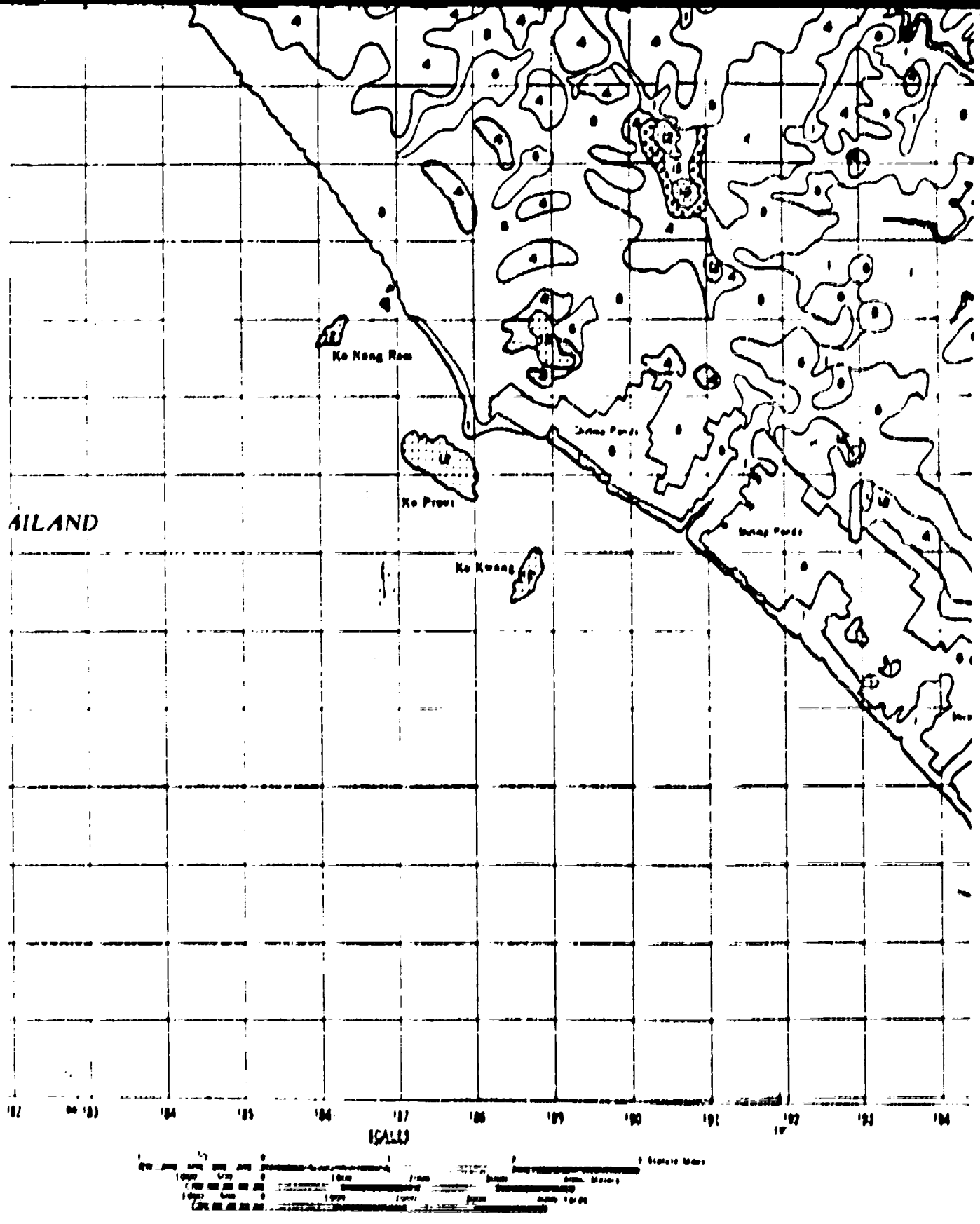
[X] Units do not occur on this map.

INDEX TO ADJOINING SHEETS

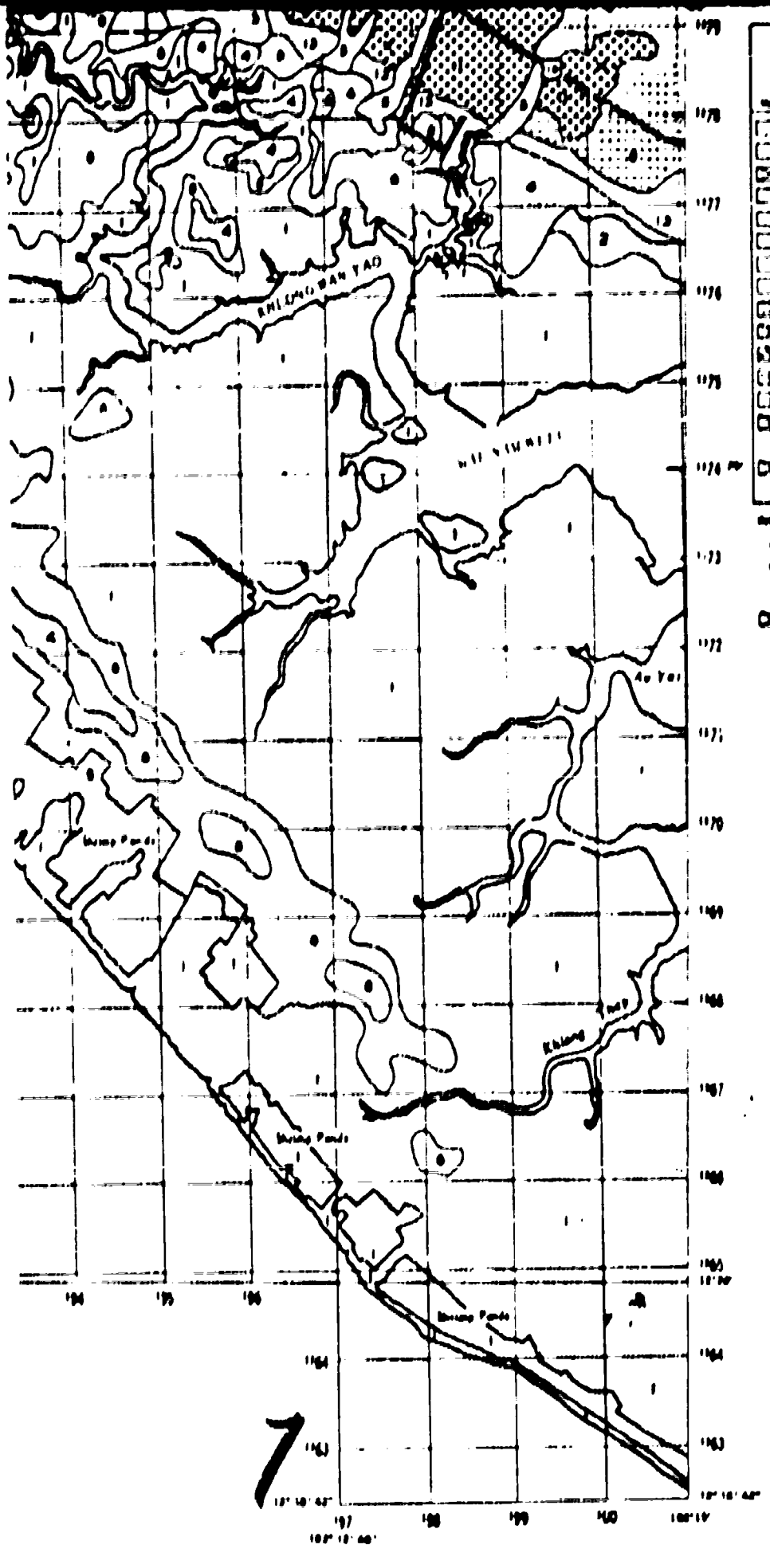


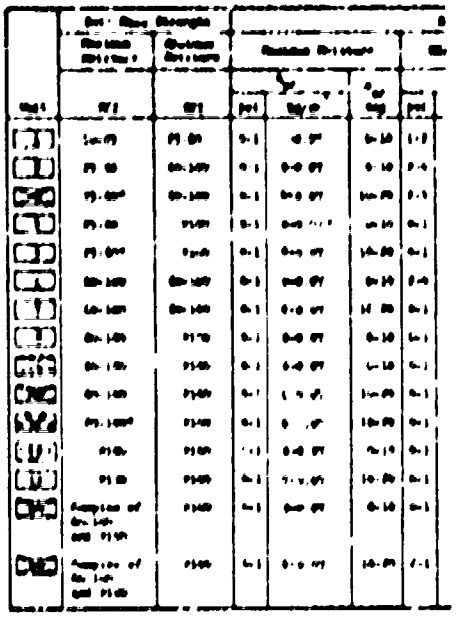


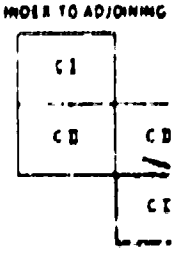
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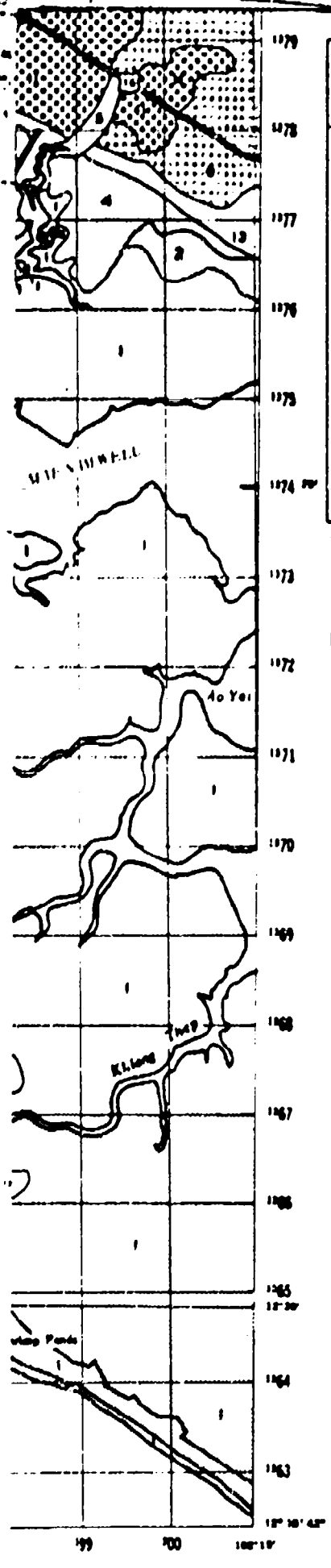
A QUANTITATIVE METHOD
TERRAIN FOR GROU

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LEGEND

Unit	Soil Mass Strength: Residual Moisture (RMS)	Soil Mass Strength: Residual Moisture (RMS)	Soil Surface Strength: Residual Moisture — c_{sur} (psf)	Soil Surface Strength: Residual Moisture — c_{sur} (kg/cm²)	Soil Surface Strength: Residual Moisture — ϕ_{sur} (deg)	Soil Surface Strength: Saturation (SMS) — c_{sur} (psf)	Soil Surface Strength: Saturation (SMS) — c_{sur} (kg/cm²)	Soil Surface Strength: Saturation (SMS) — ϕ_{sur} (deg)	Soil Surface Strength: Conditions where moisture exceeds SMS — c_{sur} (psf)	Soil Surface Strength: Conditions where moisture exceeds SMS — c_{sur} (kg/cm²)	Soil Surface Strength: Conditions where moisture exceeds SMS — ϕ_{sur} (deg)
	10-25	25-50	>1	0-0.07	1-10	1-2	0.07-0.14	10-20	Flooded conditions		
	25-50	50-100	0-1	0-0.07	1-10	0-1	0.14-0.28	20-40	Flooded conditions		
	25-50*	50-100	0-1	0-0.07	10-20	0-1	0.14-0.28	20-40	Flooded conditions		
	25-50	>100	0-1	0-0.07*	0-10	0-1	0-0.07	20-40	0-1	0.14-0.28	20-40
	25-50*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	0-1	0.14-0.28	20-40
	50-100	50-100	0-1	0-0.07	0-10	0-1	0.14-0.28	20-40	Flooded conditions		
	50-100	50-100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Flooded conditions		
	50-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	0-1	0.14-0.28	10-20
	50-100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	0-1	0.14-0.28	20-40
	50-100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Flooded conditions		
	50-100*	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
	>100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	1-2	0.07-0.14	10-20
	>100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	1-2	0.07-0.14	20-40
	Complex of 50-100 and >100	>100	0-1	0-0.07	0-10	0-1	0-0.07	20-40	0-1	0.14-0.28	10-20
	Complex of 50-100 and >100	>100	0-1	0-0.07	10-20	0-1	0-0.07	20-40	Flooded conditions		

Notes: Blank areas are water bodies

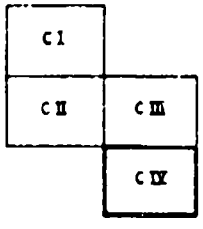
c_{sur} Shear strength at zero normal load.

ϕ_{sur} Angle of internal friction.

* Residual moisture has less than 30 percent probability of occurrence during the wet season. Lowest strengths commonly observed are 50-100 for Units 3 and 5; zero kgs 100 for Unit 11.

Units do not occur on this map.

INDEX TO ADJOINING SHEETS



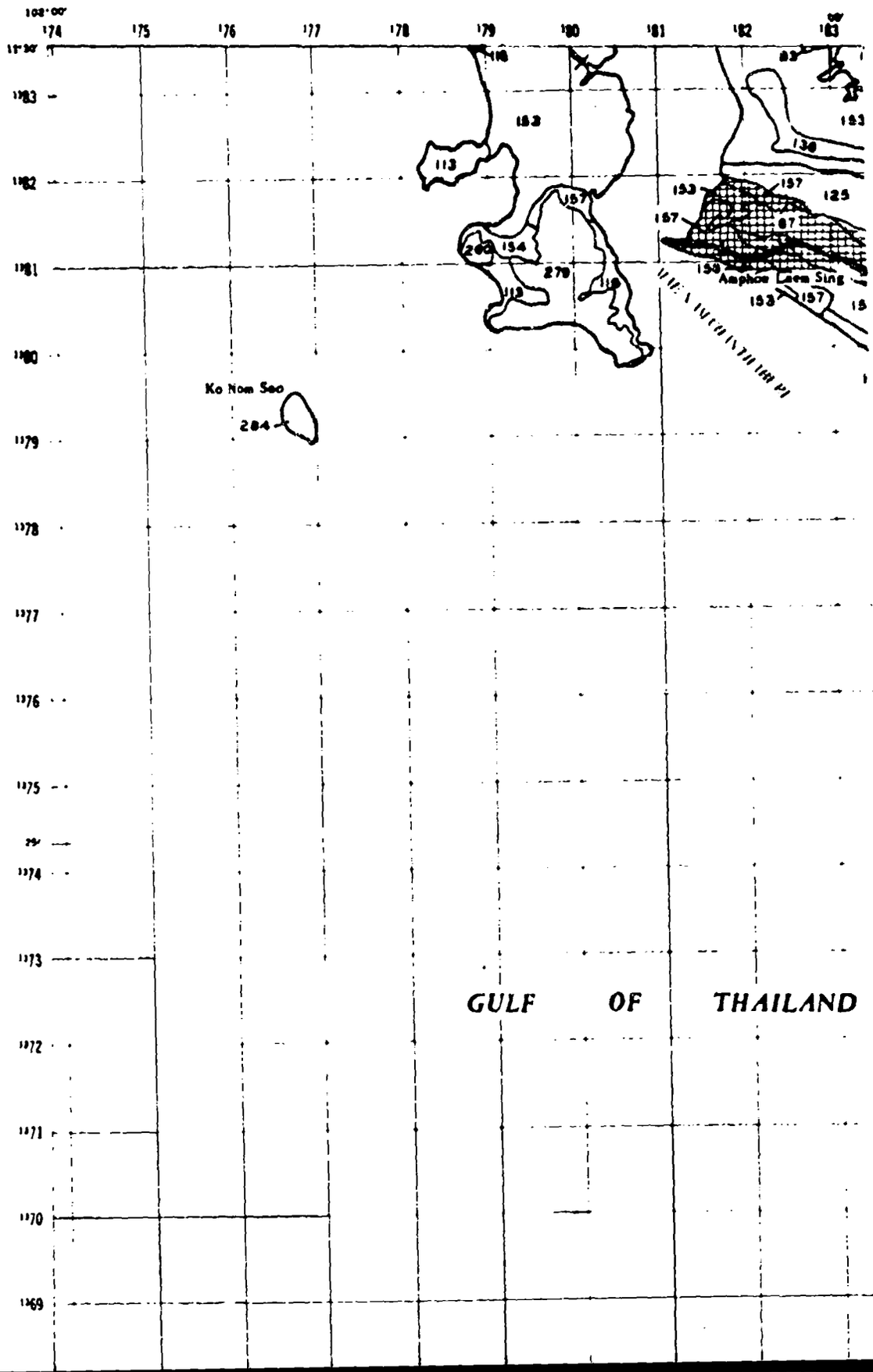
A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

SURFACE COMPOSITION

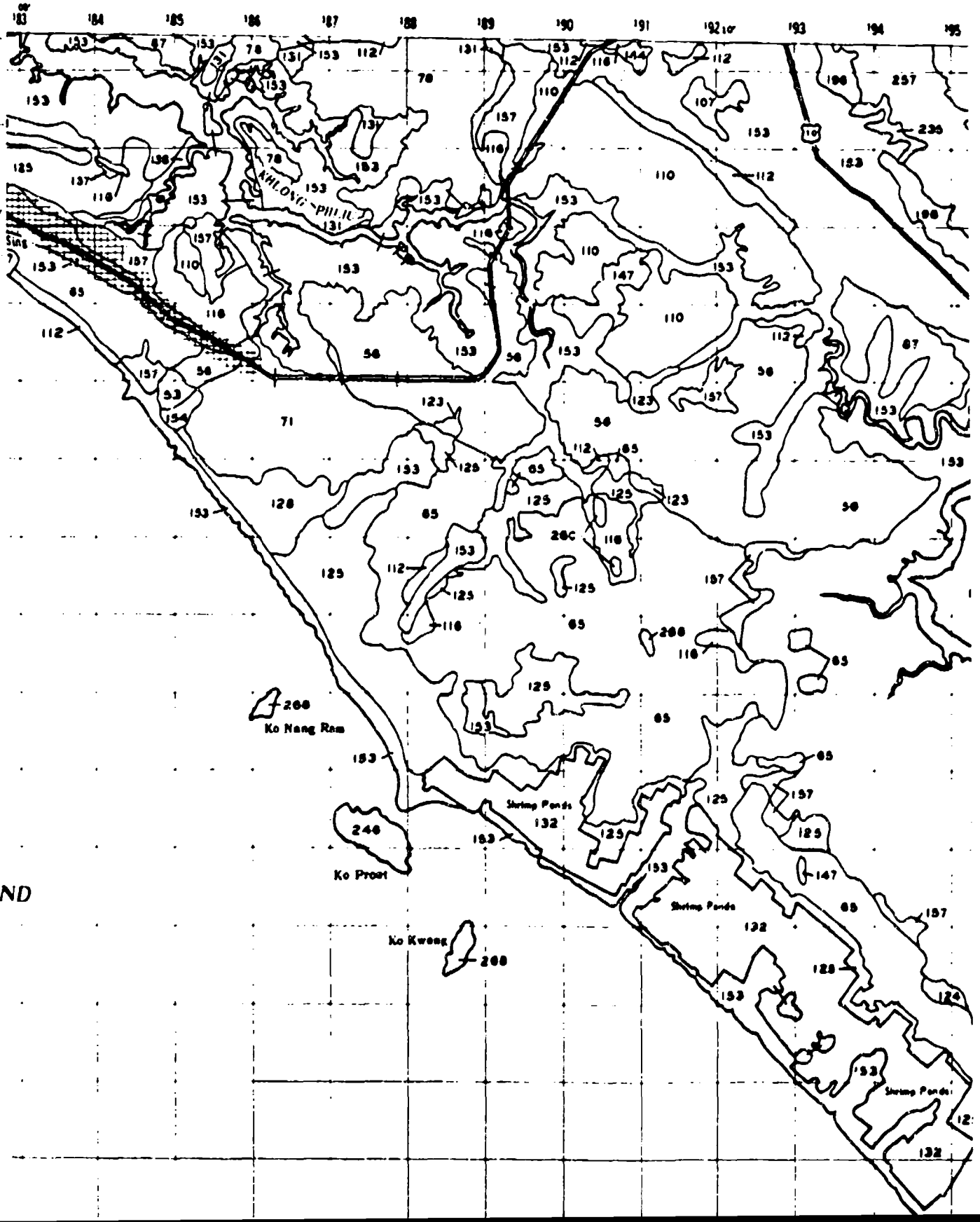
CHANTHABURI STUDY AREA

SHEET C IV

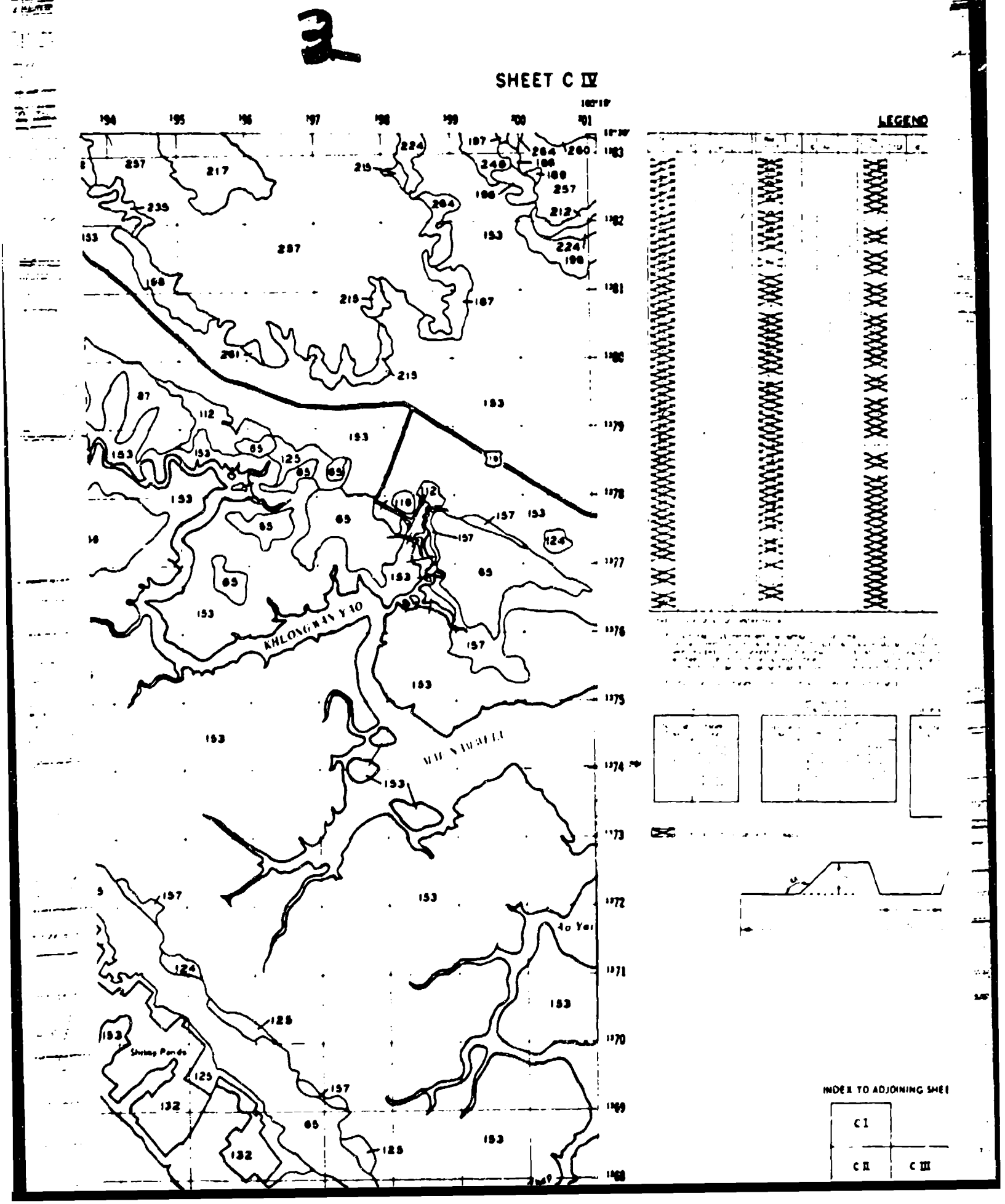
PLATE 6.4a


108°00'
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157
154
279
284
Ko Nom Sao
Amphoe Laem Sing
GULF OF THAILAND

2 CHANTHABURI

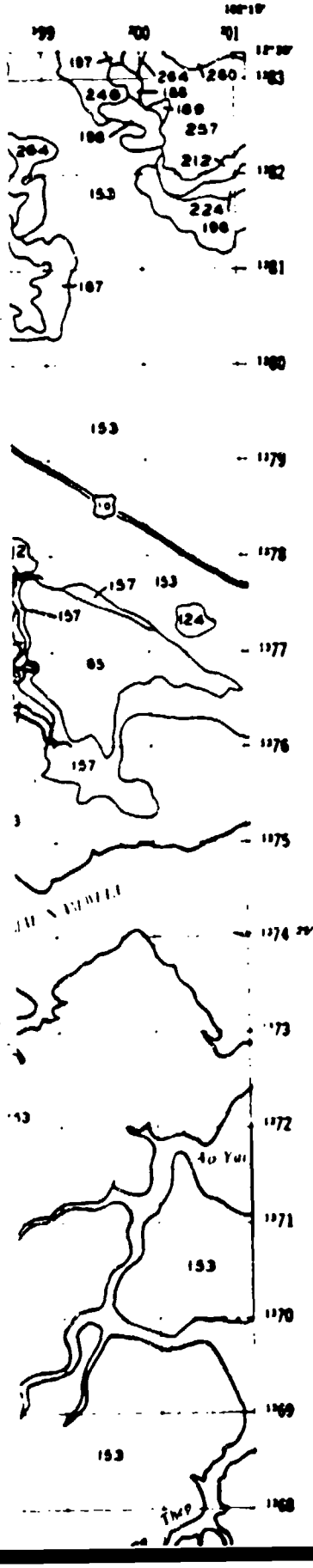


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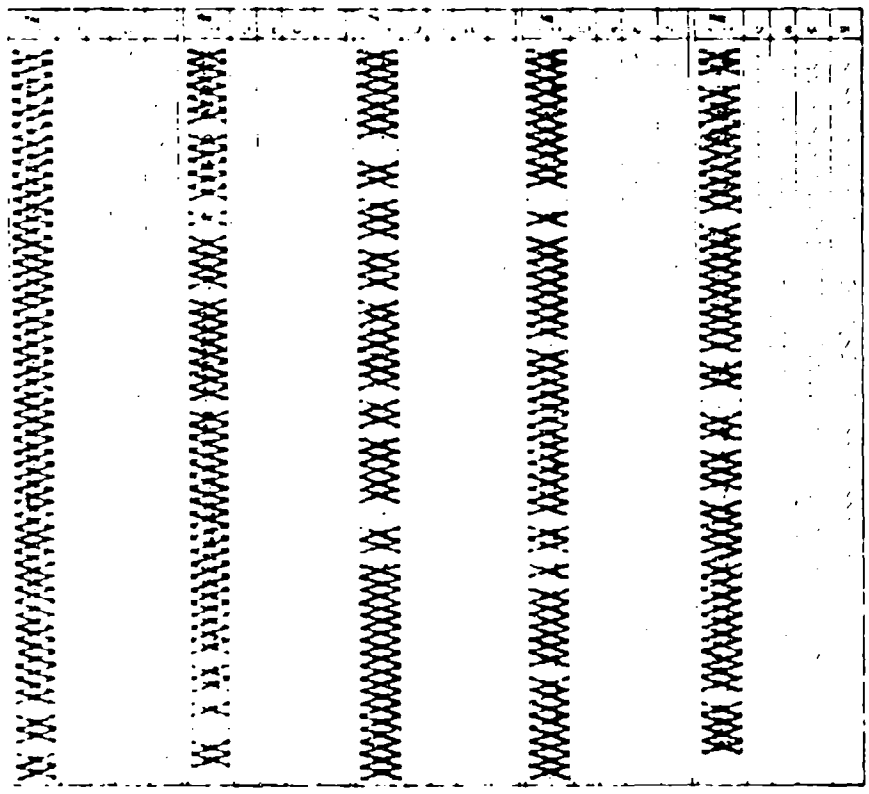

SHEET C IV
LEGEND
INDEX TO ADJOINING SHEET
C I
C II
C III

4

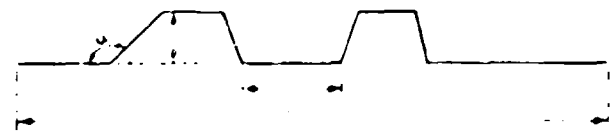
SHEET C IV



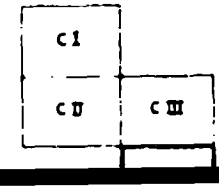
LEGEND







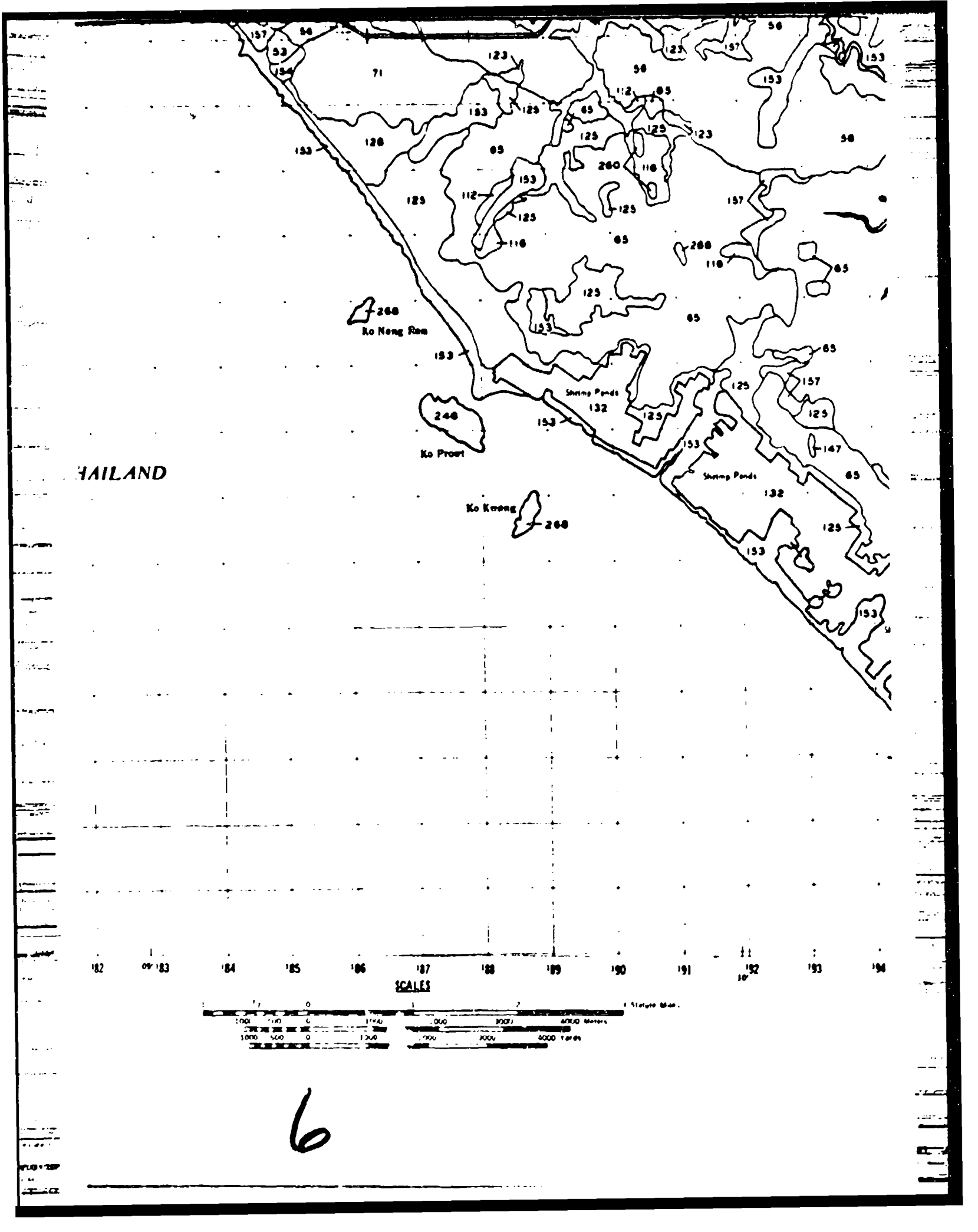
INDEX TO ADJOINING SHEETS



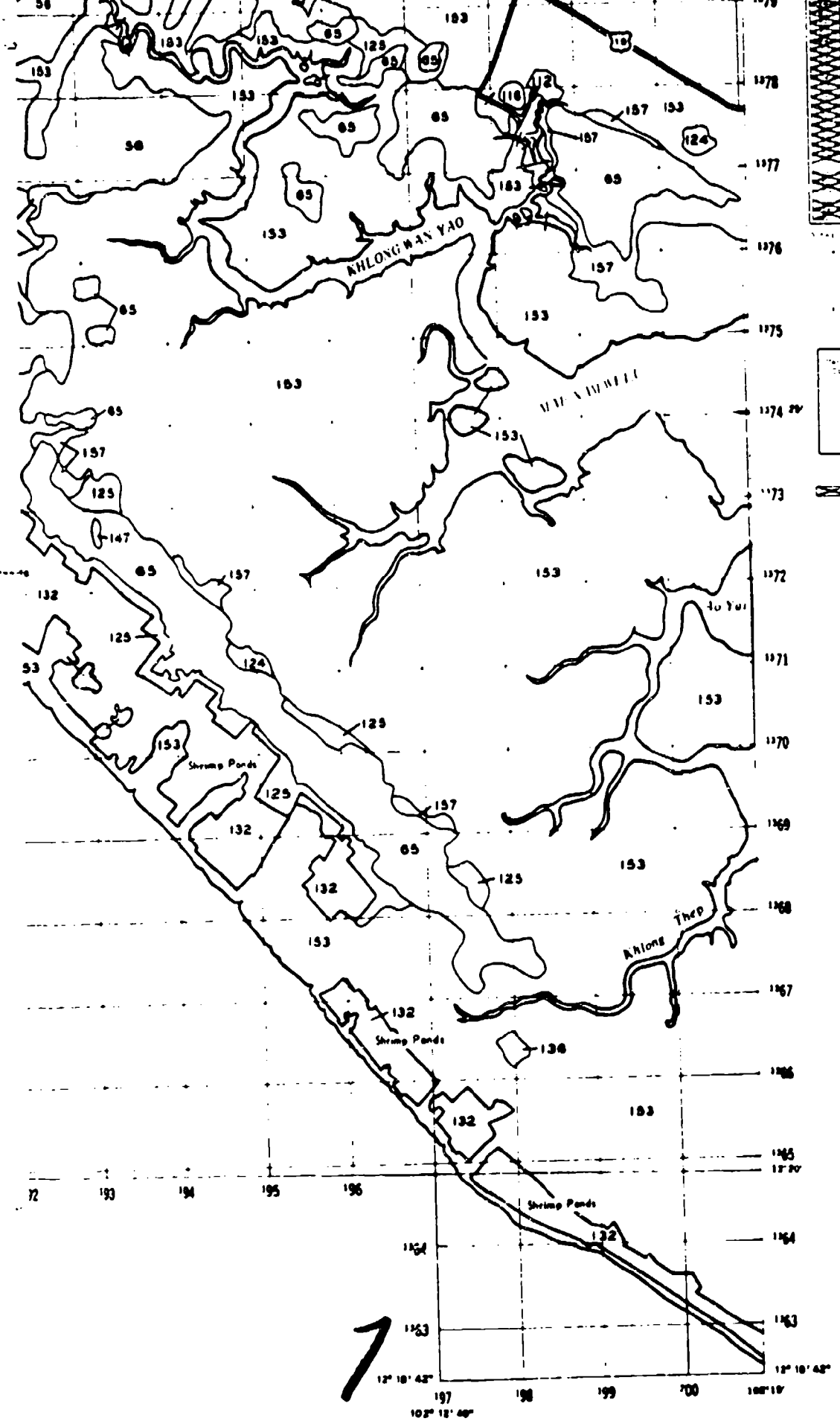


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48 P

5


HAILAND
Ko Nang Ram
Ko Prom
Ko Kwang
Shrimp Ponds
Shrimp Ponds
82
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84
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86
87
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89
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92
93
94
SCALES

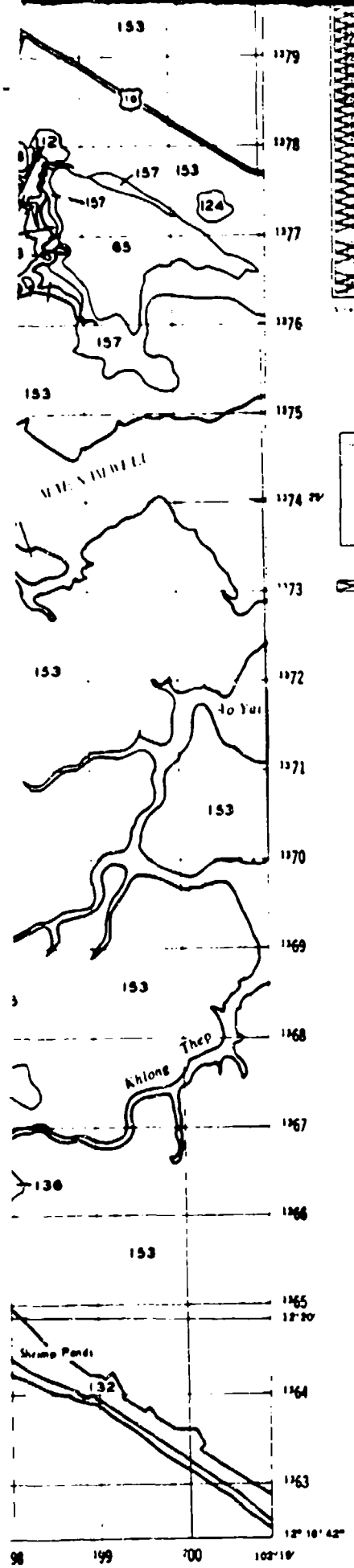
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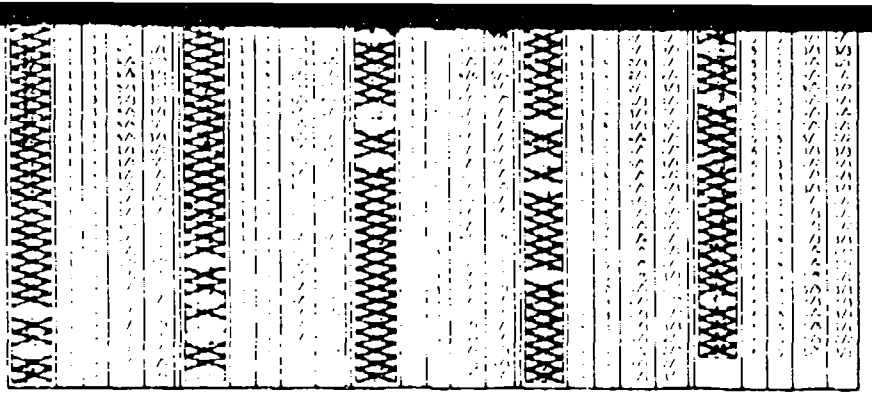


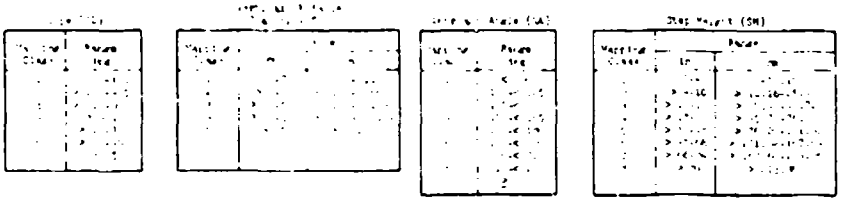
A QUANTITATIV
TERRAIN

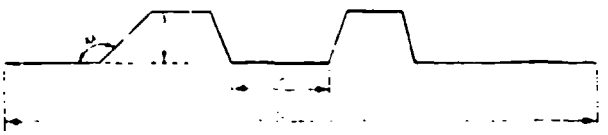
SURF

CHANTH

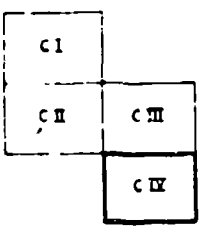








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A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

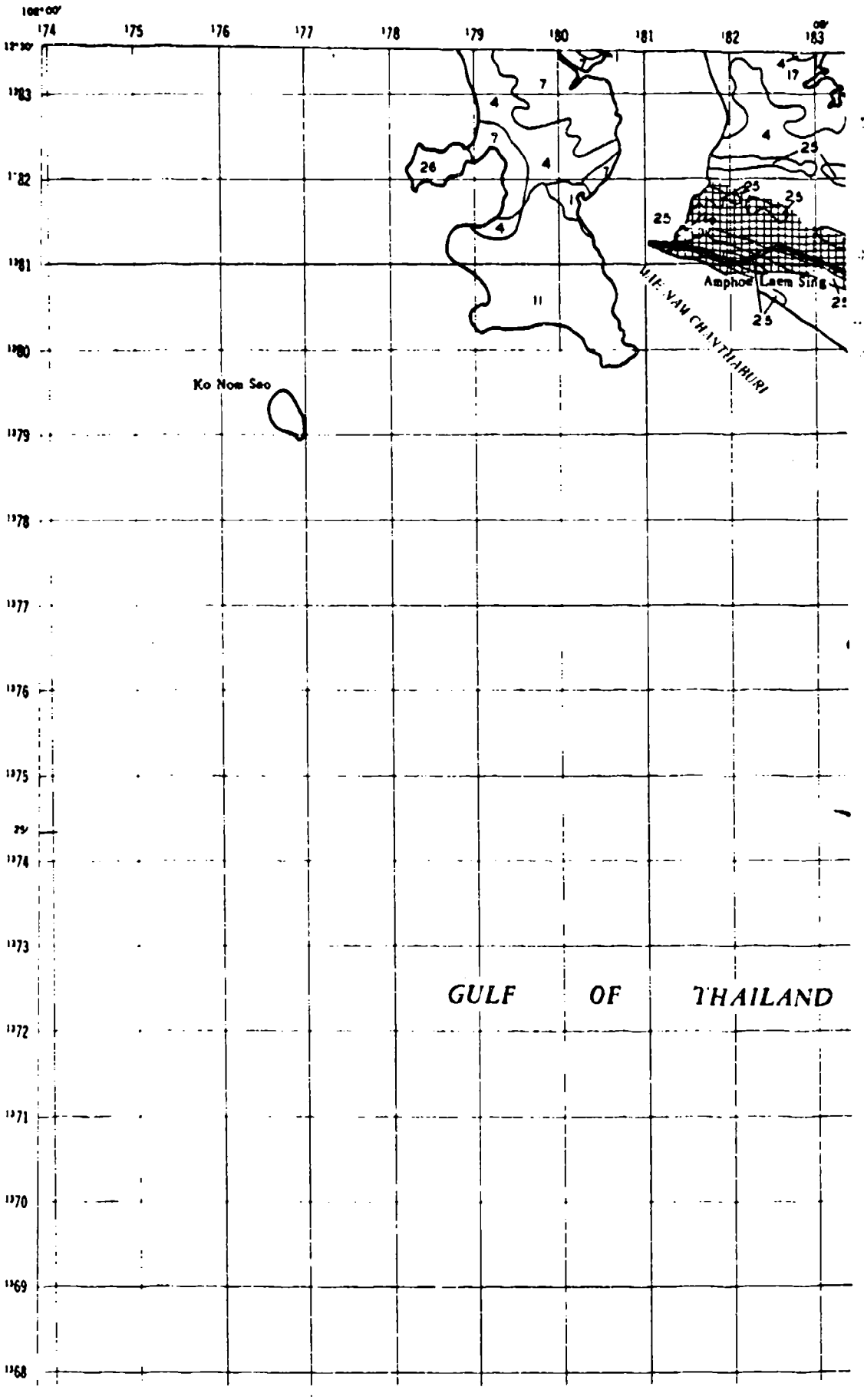
SURFACE GEOMETRY

CHANTHABURI STUDY AREA

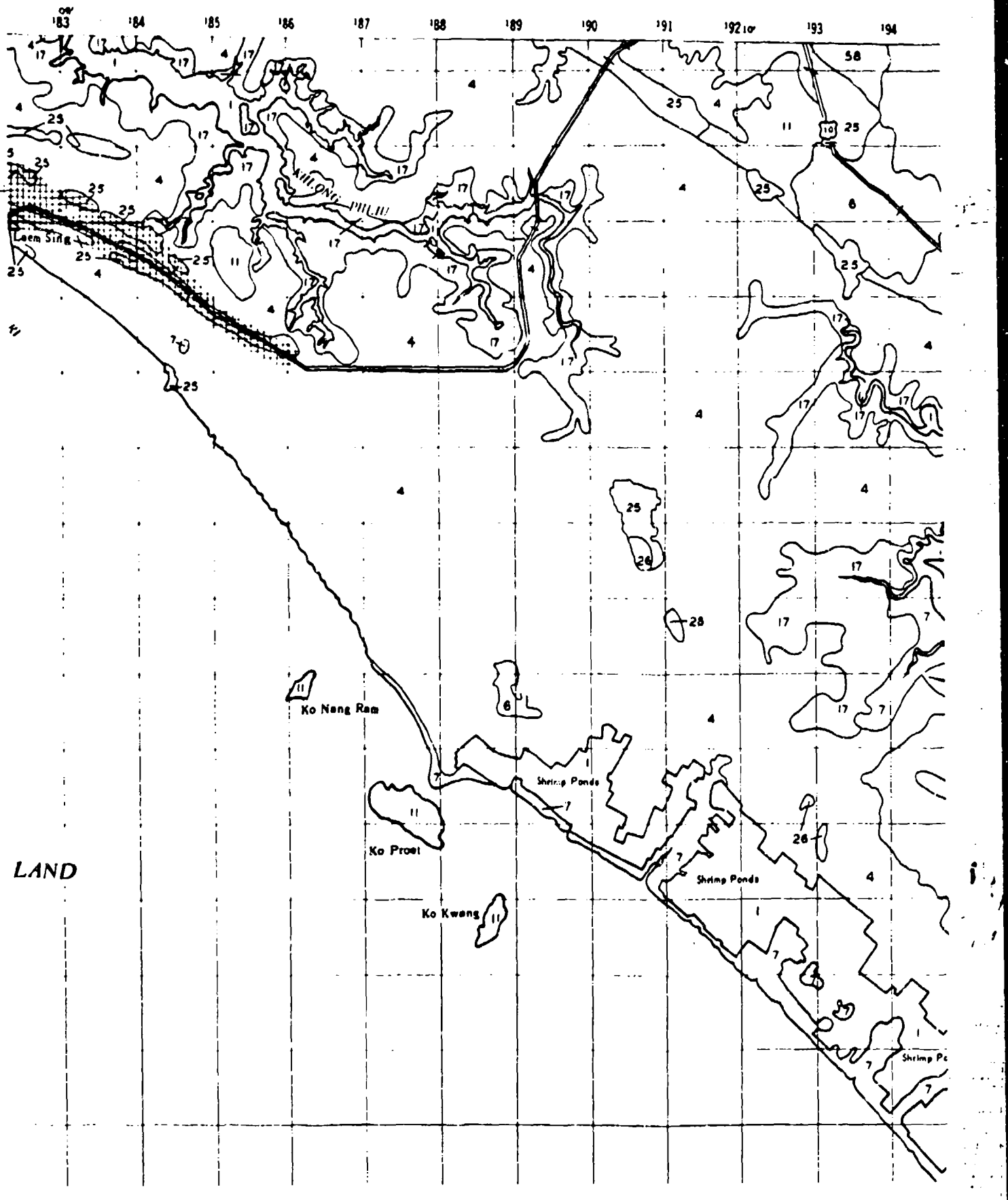
SHEET C IV

8

PLATE 6.4b

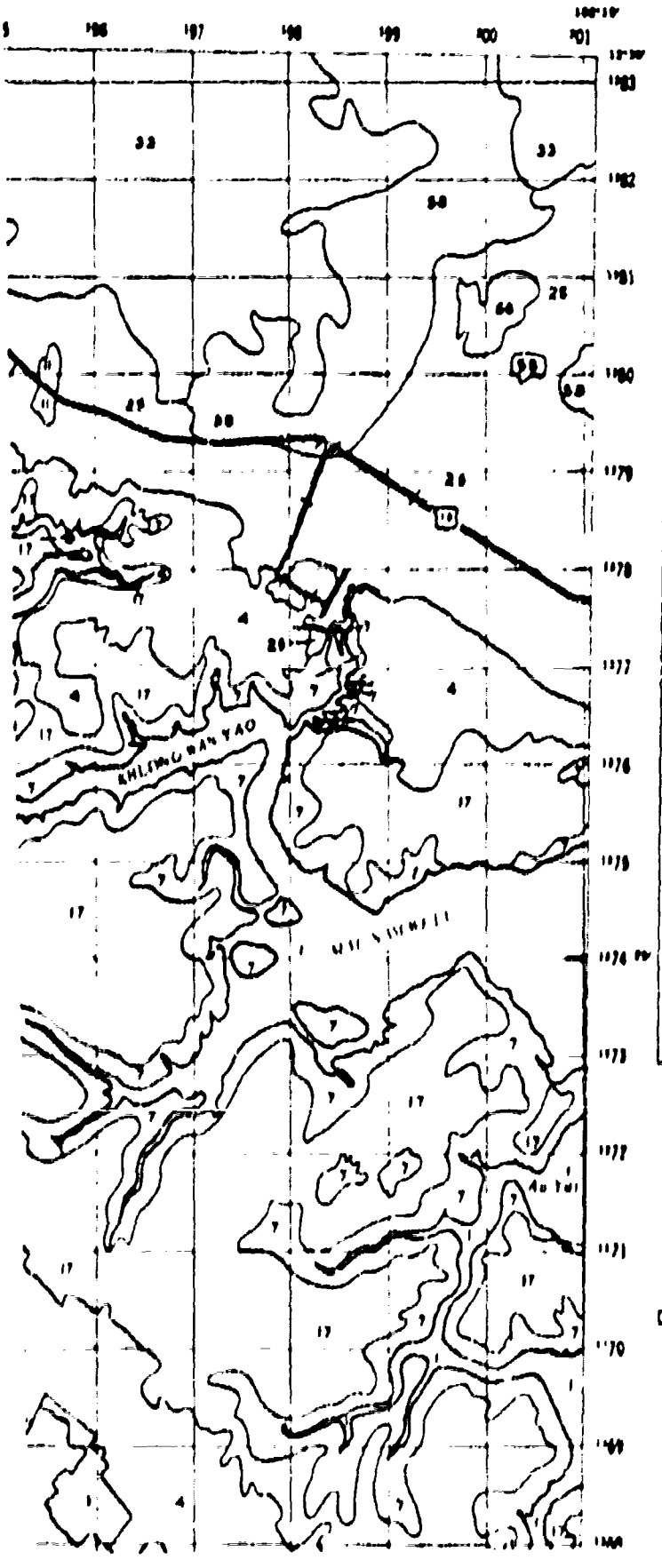

100°00'
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1371
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1368
Ko Nom Seo
Amphoe Laem Sing
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26
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11
17
GULF OF THAILAND

2 CHANTHABURI



3

SHEET C IV



LEGEND

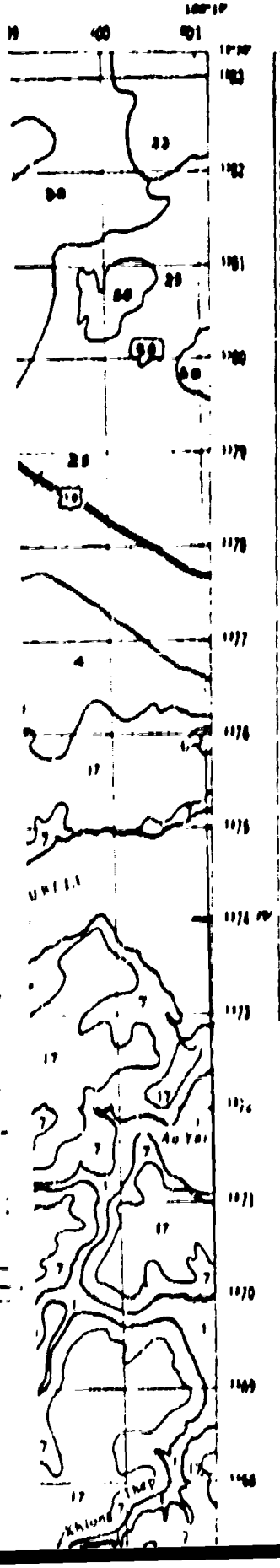
INDEX TO ADJOINING SHEETS

C I

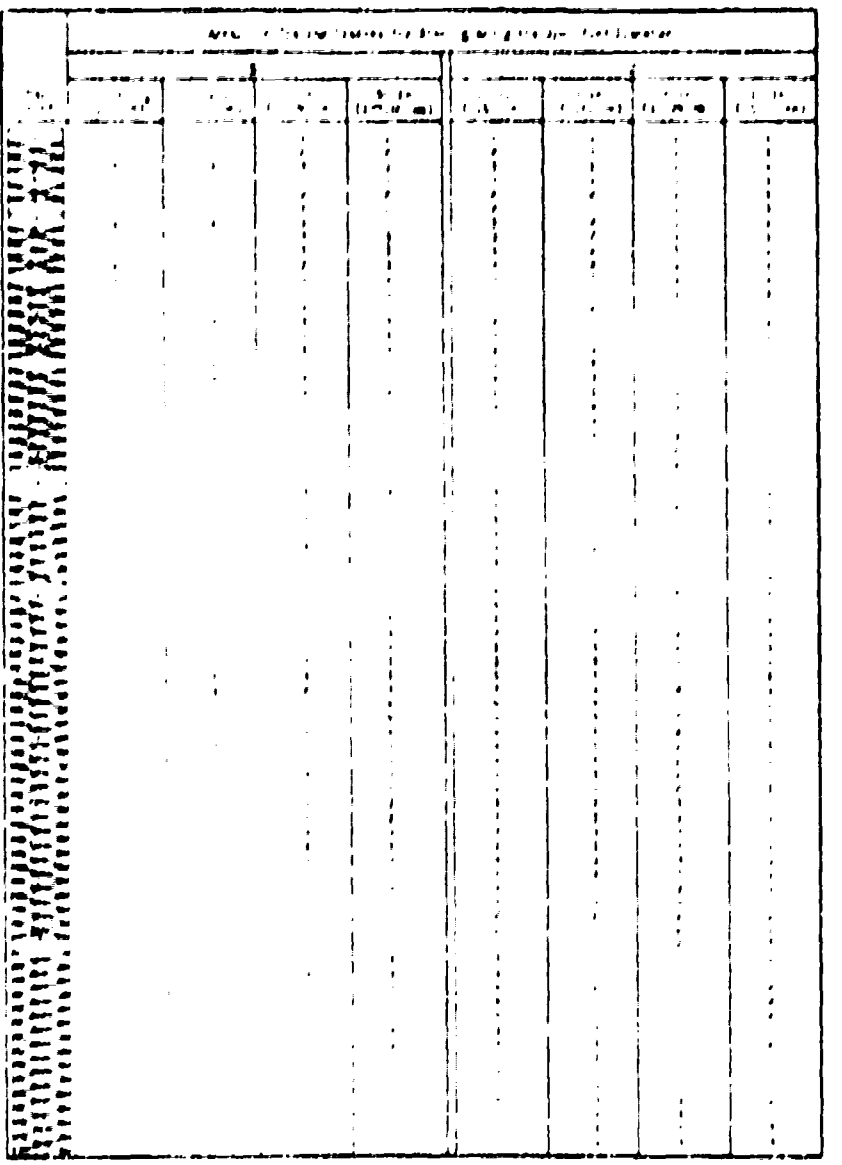
C II C III

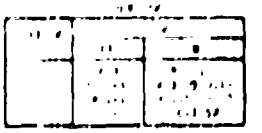
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SHEET C IV

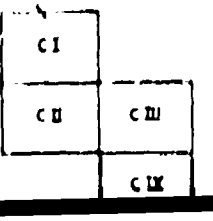


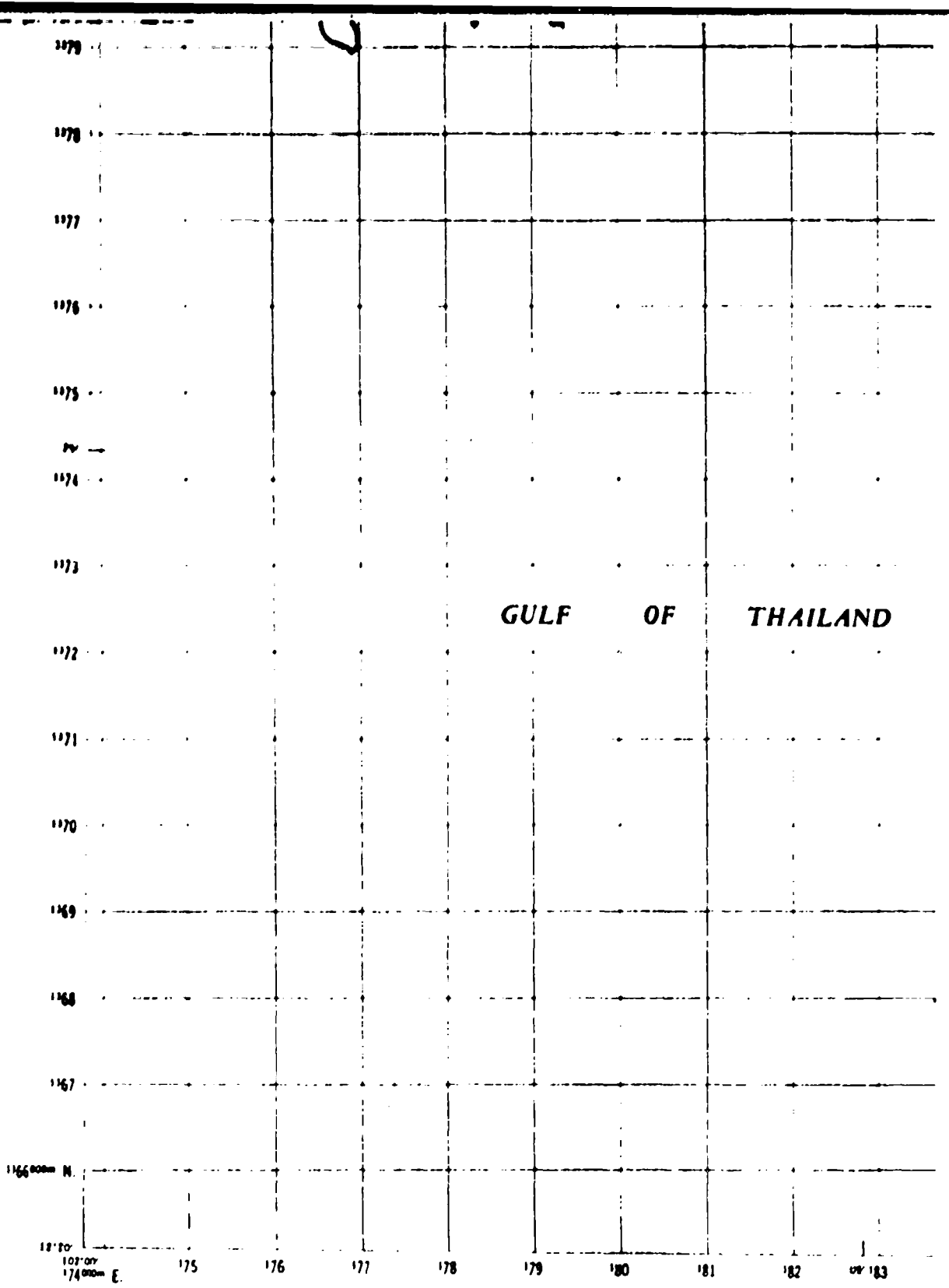
LEGEND



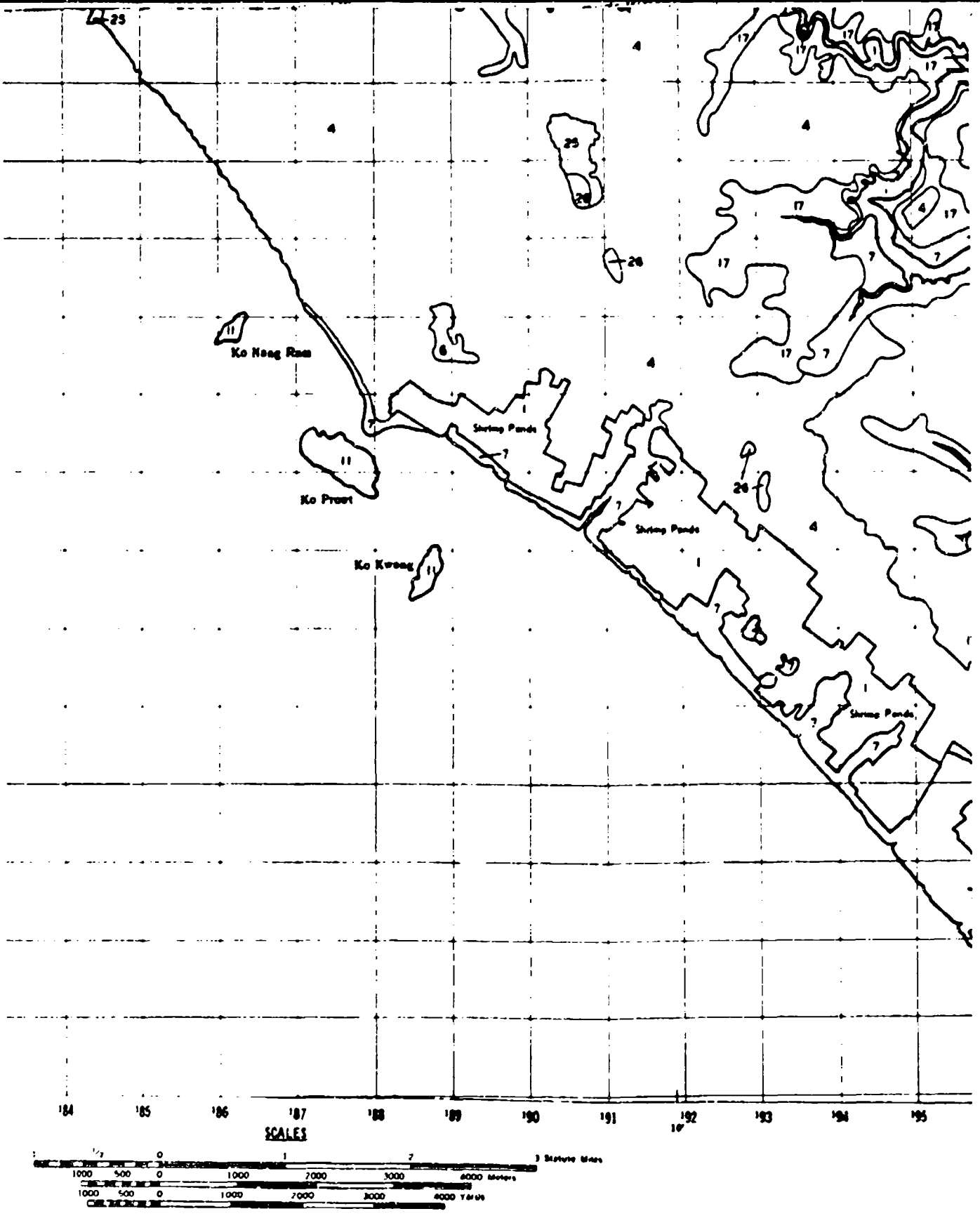


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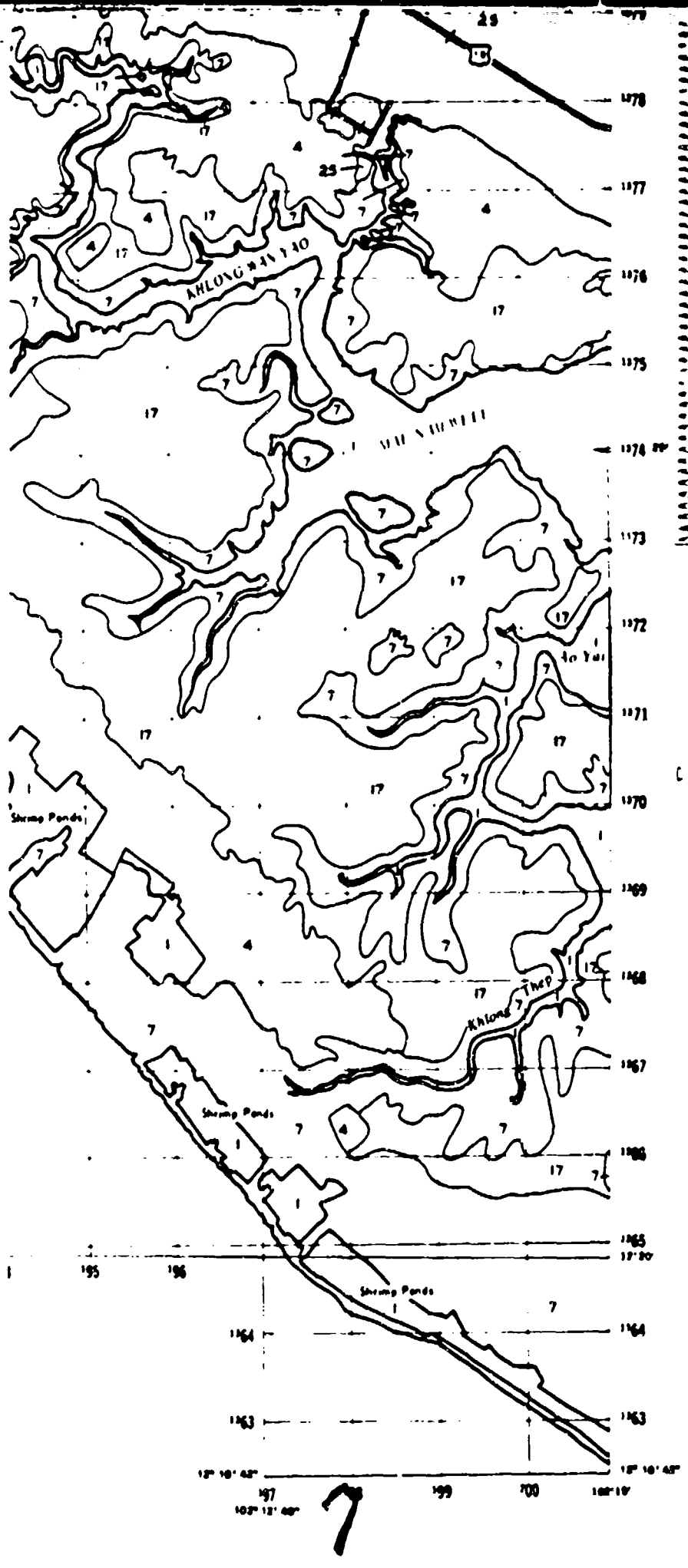




ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48 P


Ko Nang Ram
Ko Prue
Ko Kwang
Shrimp Ponds
Shrimp Ponds
Shrimp Ponds
184
185
186
187
188
189
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191
192
193
194
195
SCALES

6



INDEX TO ADJOINING SHEETS

C I

C II | C III

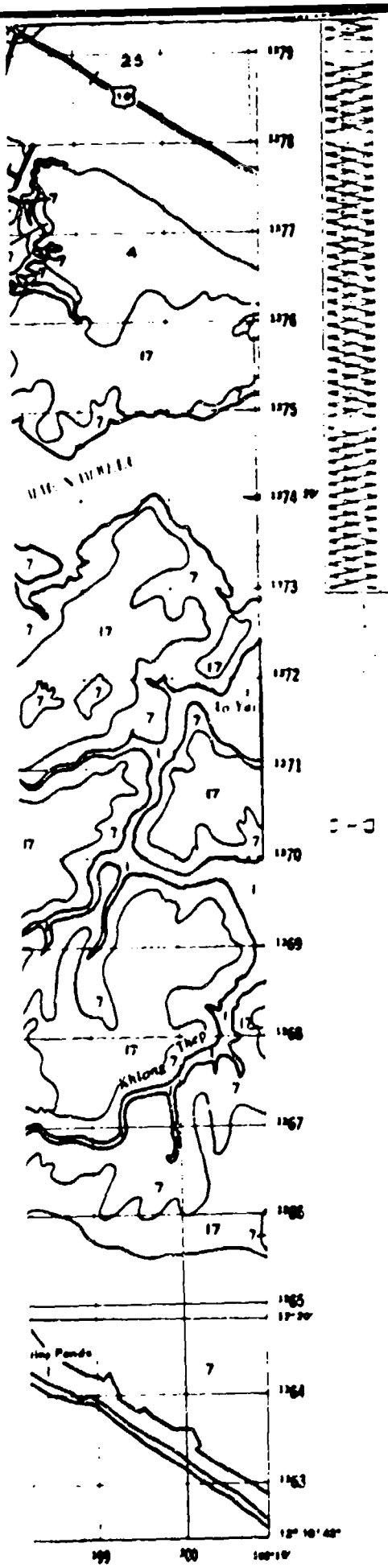
C IV

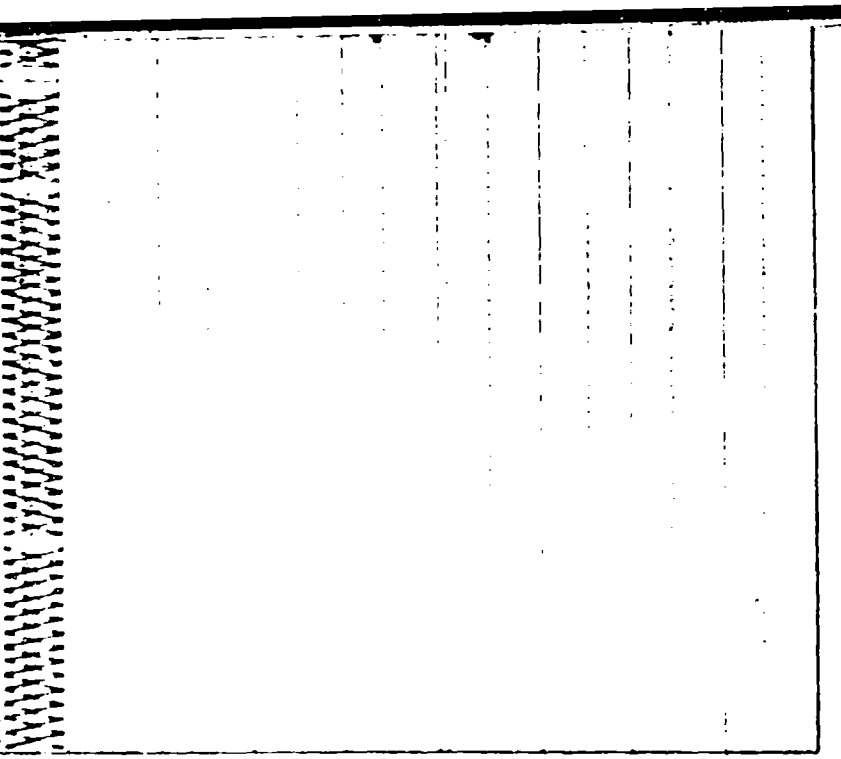
A QUANTITATIVE METHOD FOR D
TERRAIN FOR GROUND MOI

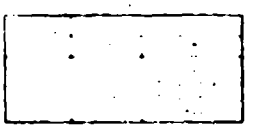
VEGETATION

CHANTHABURI STUDY .

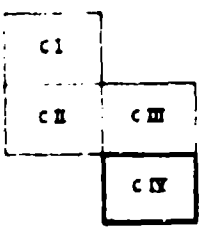
SHEET C IV







INDEX TO ADJOINING SHEETS



A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

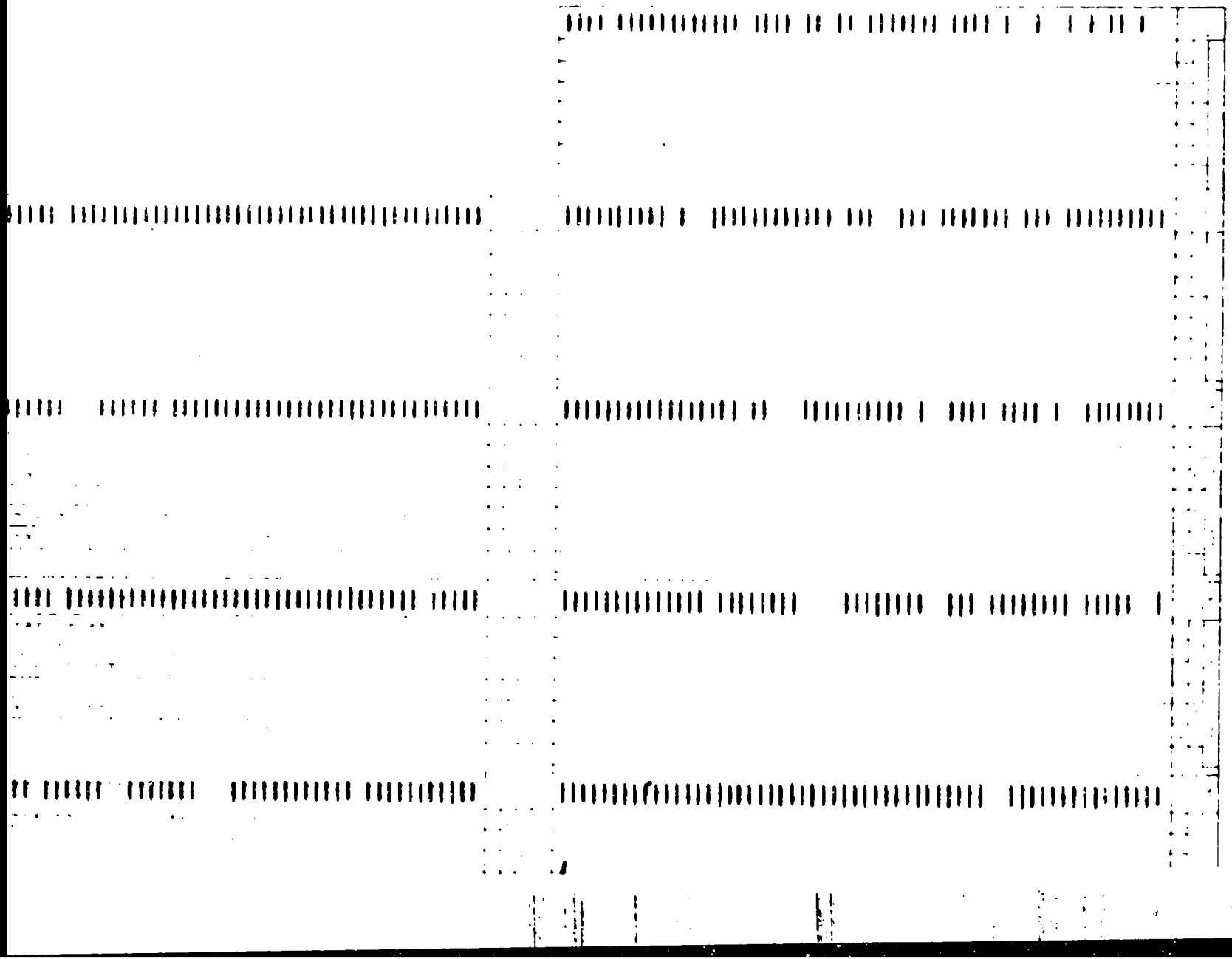
VEGETATION

CHANTHABURI STUDY AREA

SHEET C IV

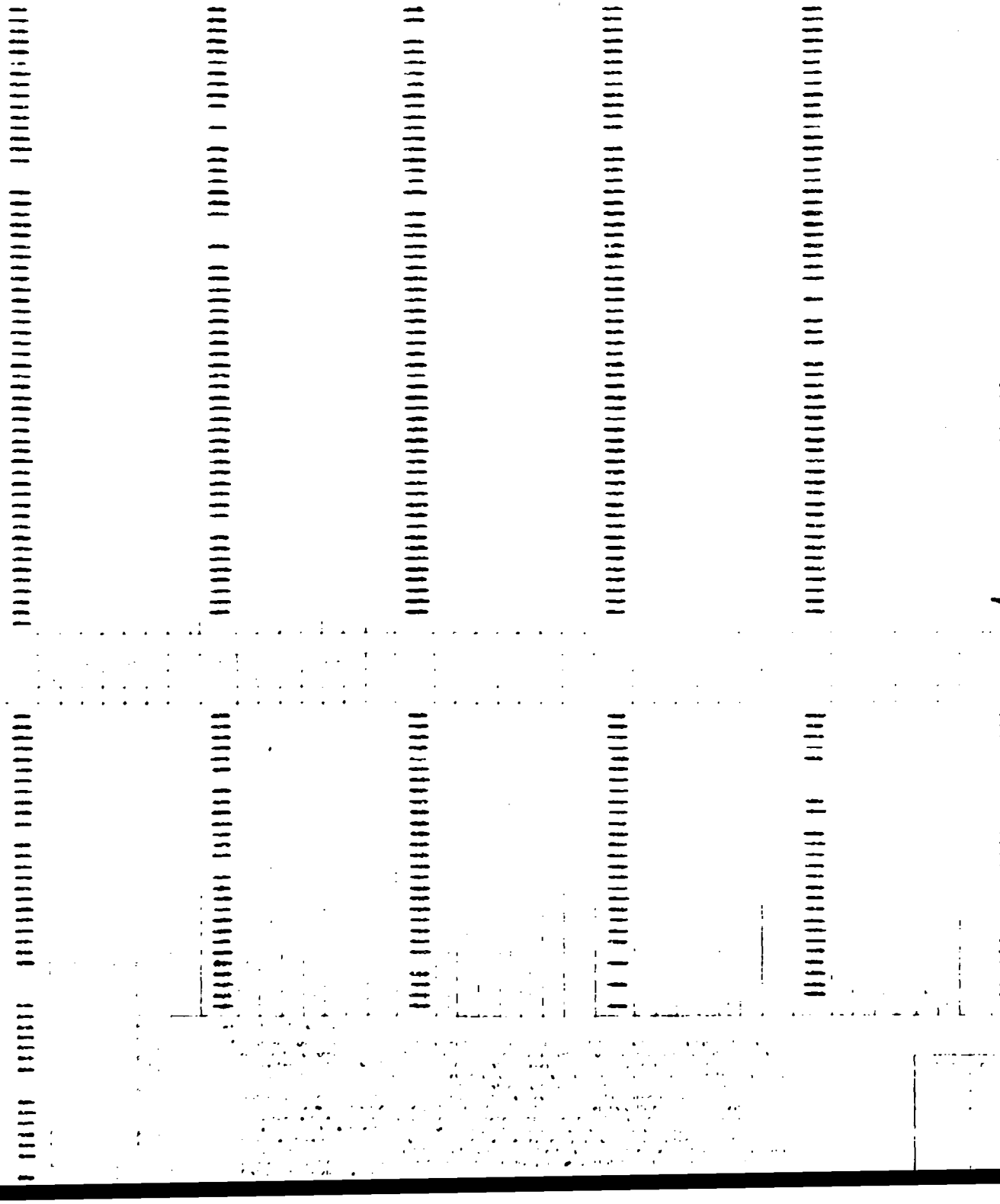
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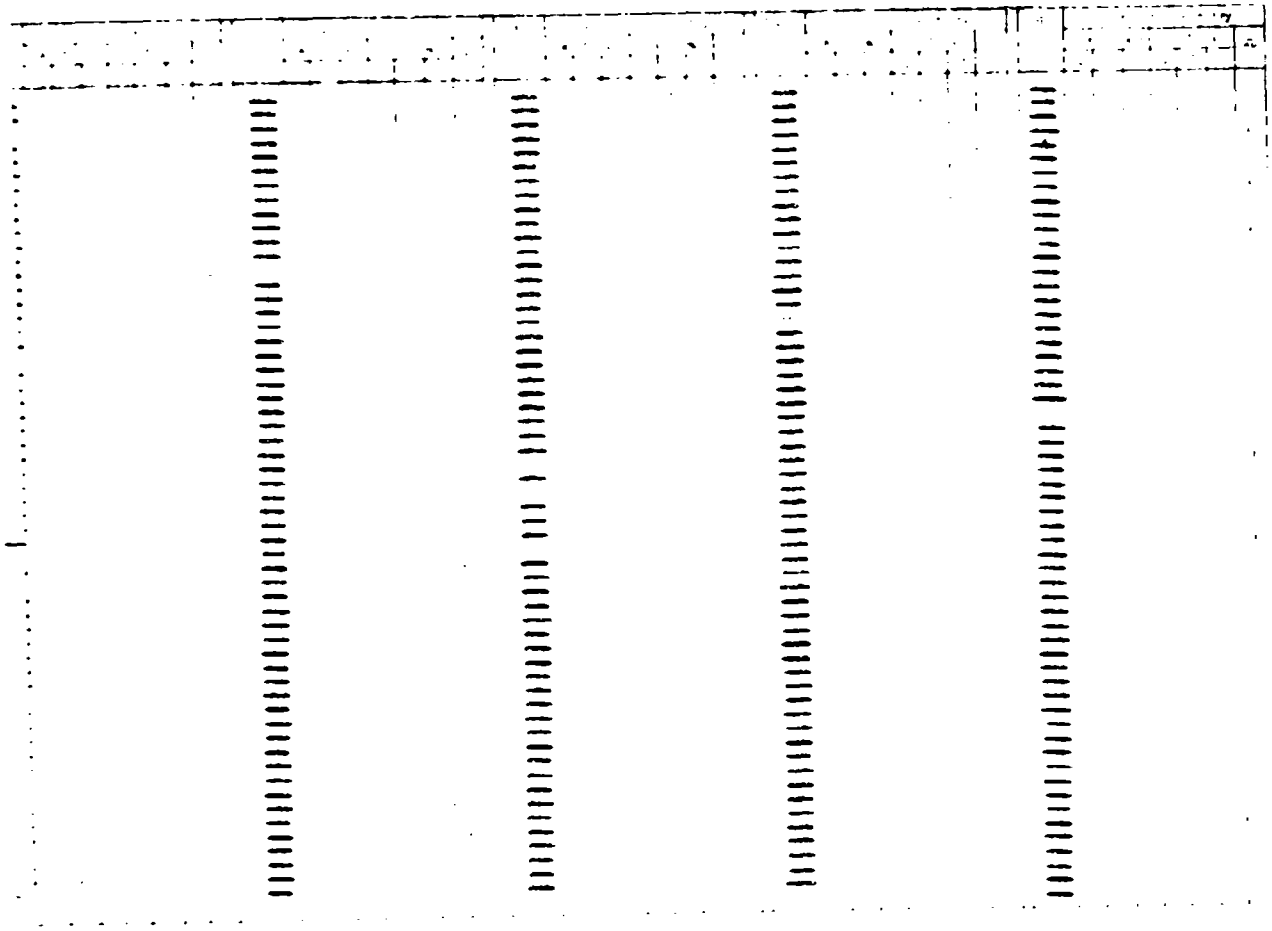
PLATE 6.4c

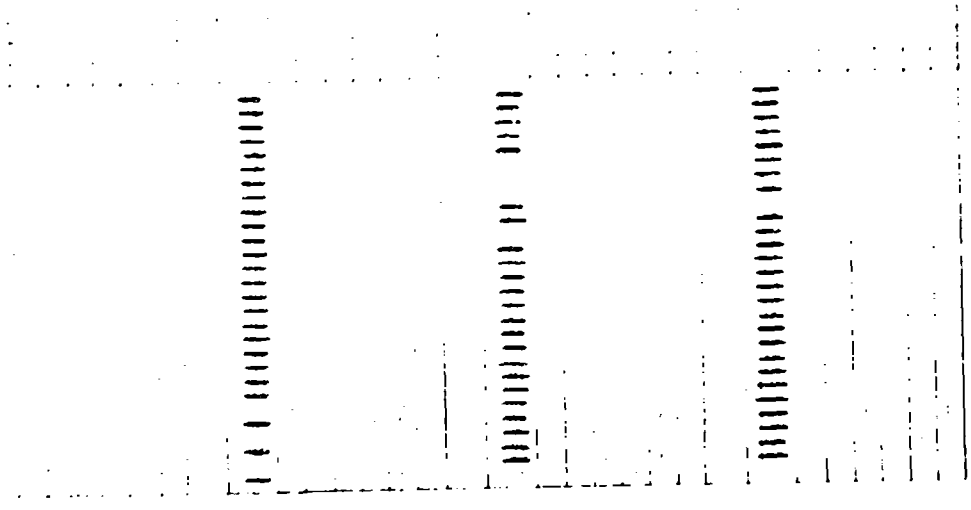


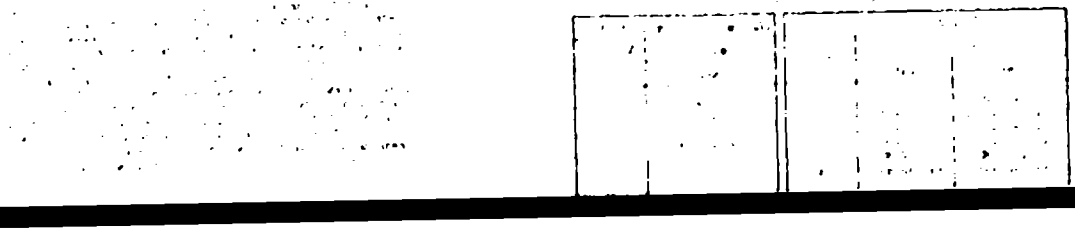
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LEGEND



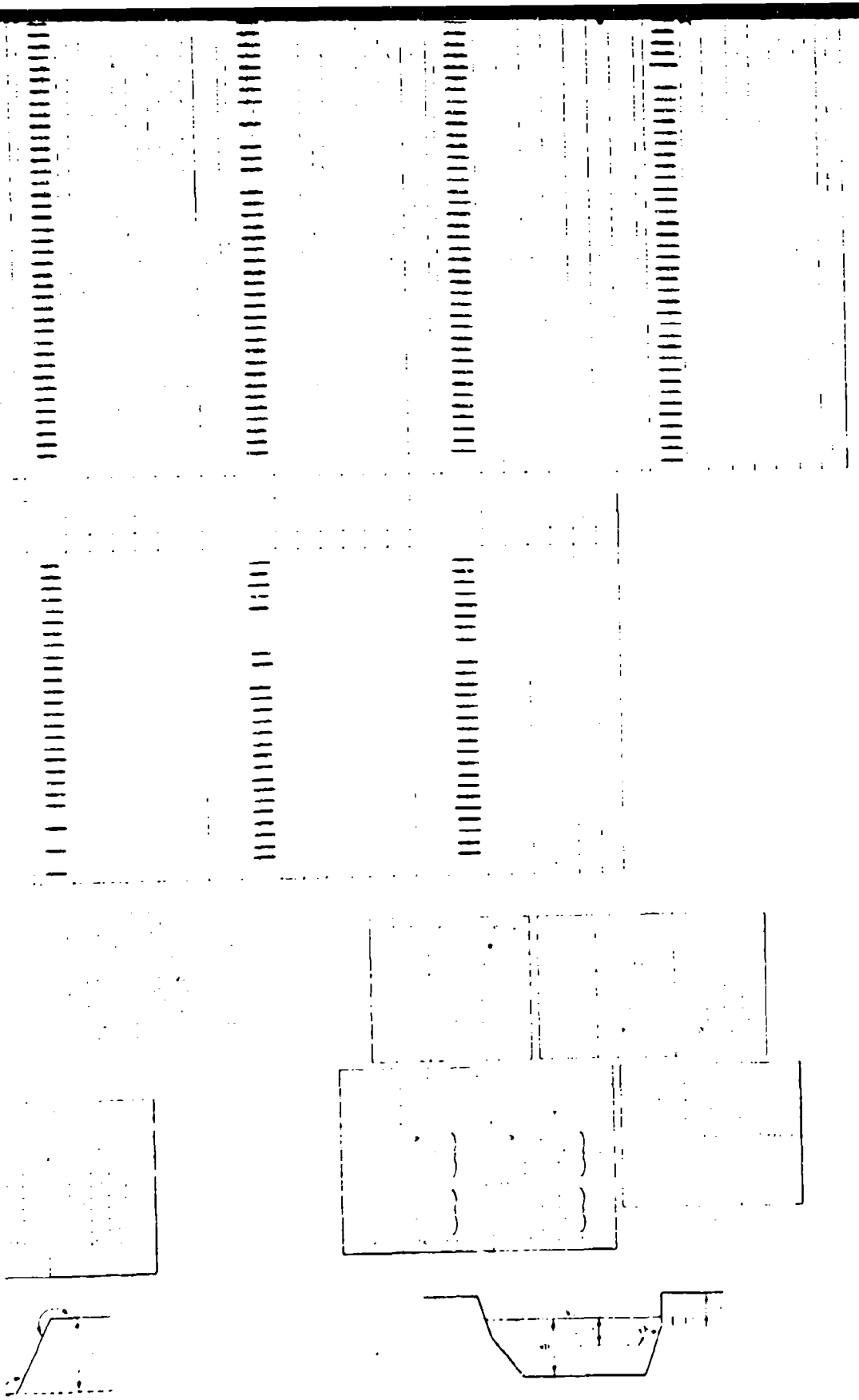


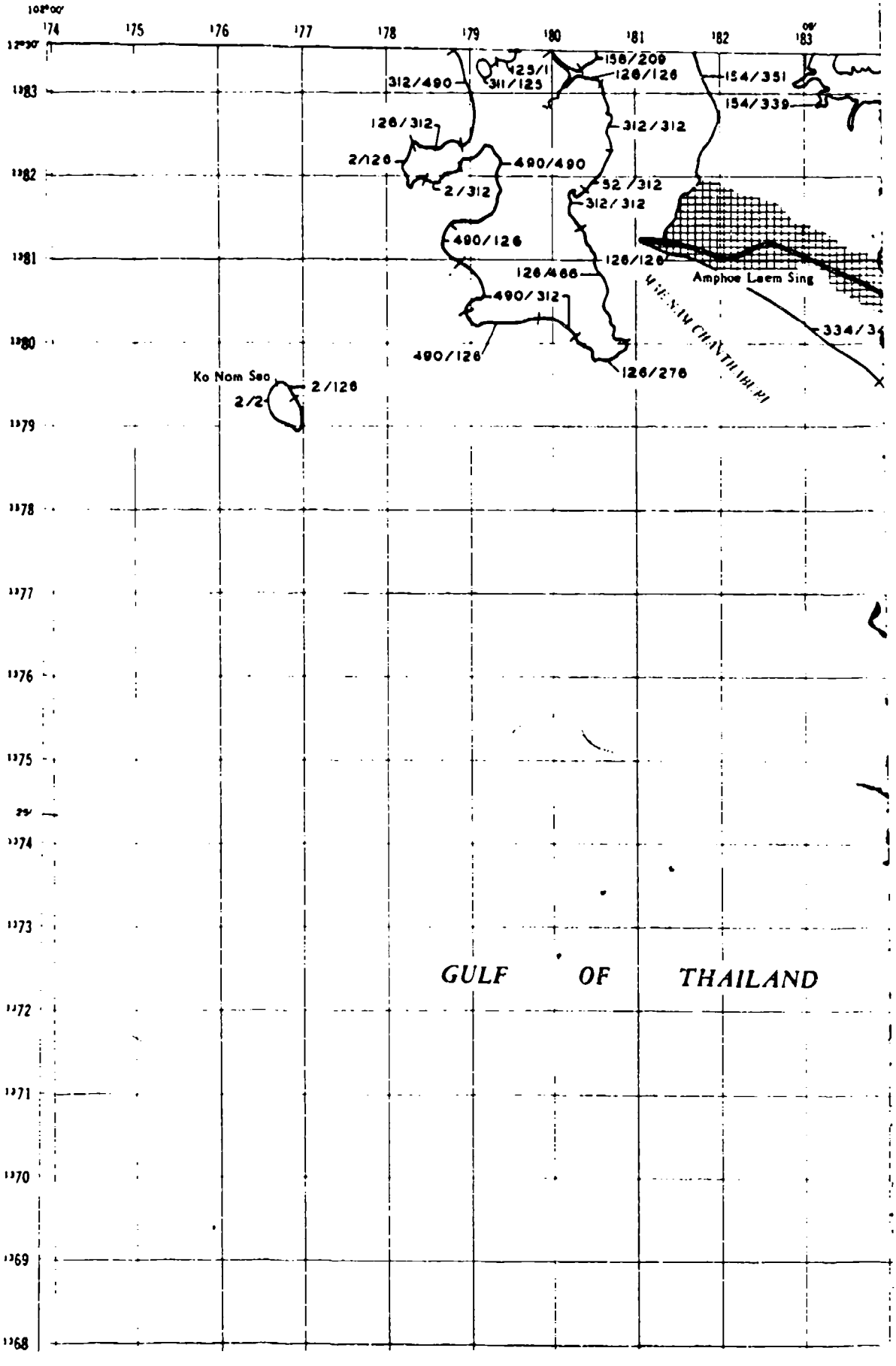




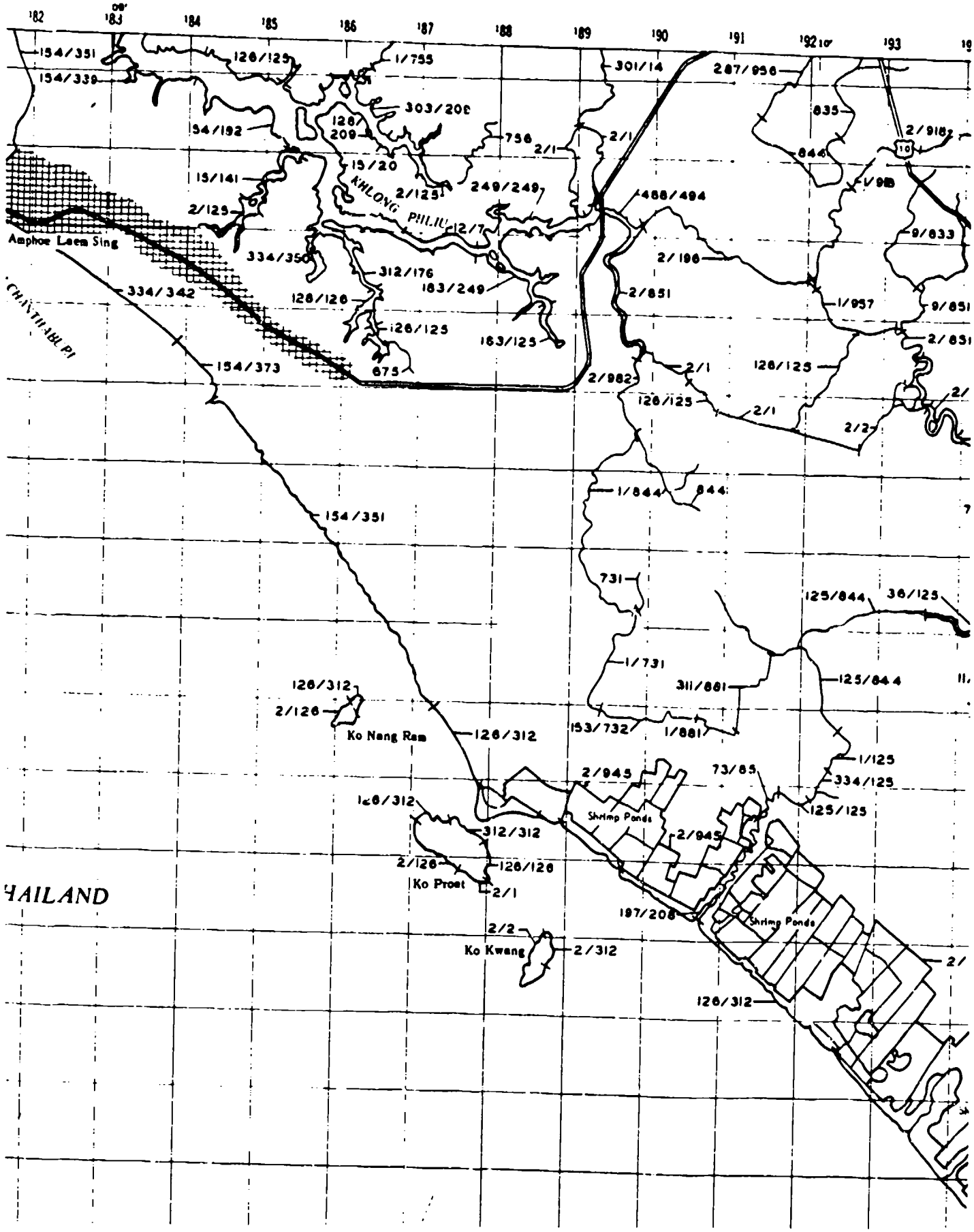
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5'



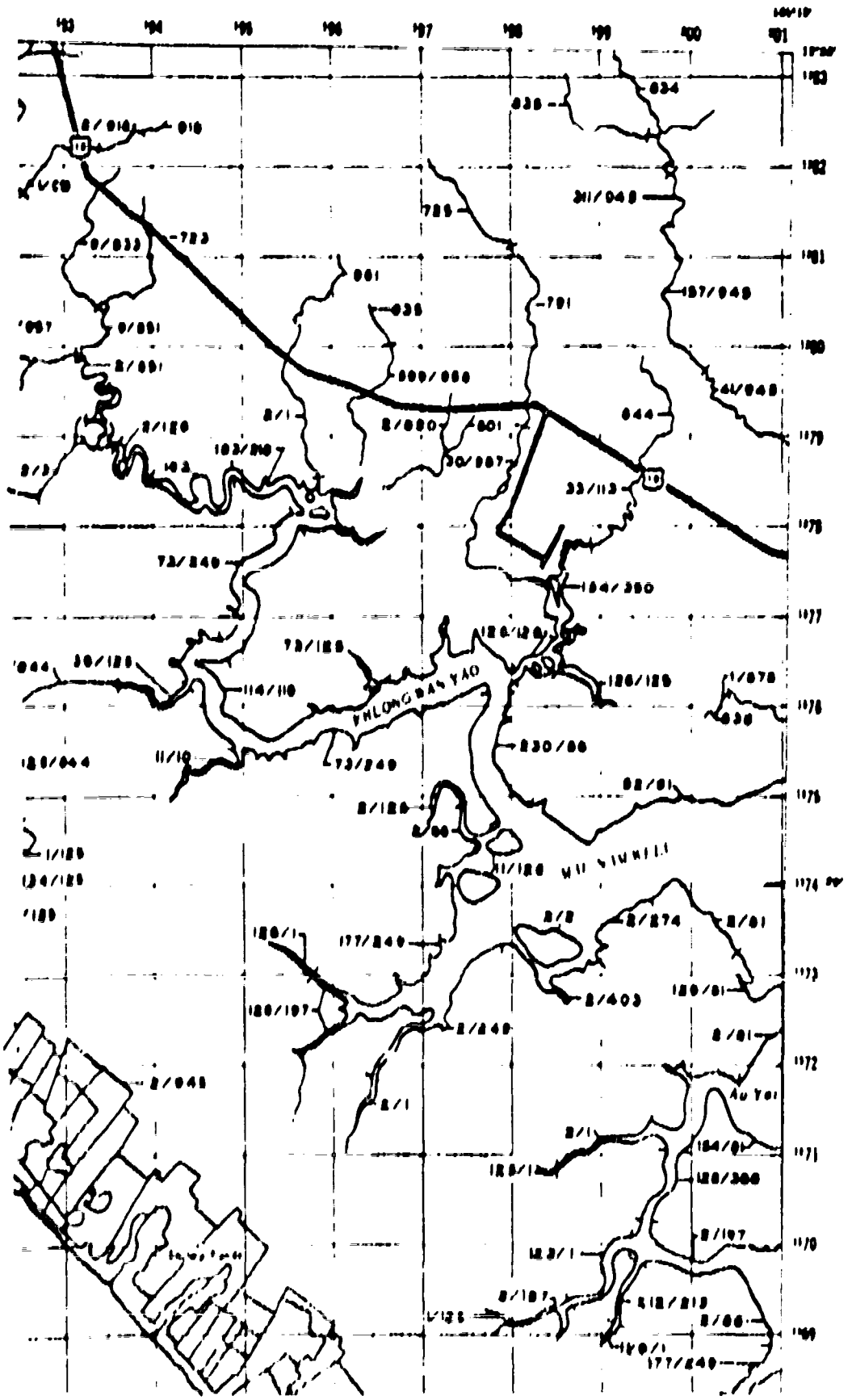

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311/125
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126/126
154/351
154/339
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312/312
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490/490
2/312
52/312
312/312
490/126
126/126
126/466
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490/126
126/276
Amphoe Laem Sing
334/3
Ko Nom Sao
2/126
2/2
GULF OF THAILAND

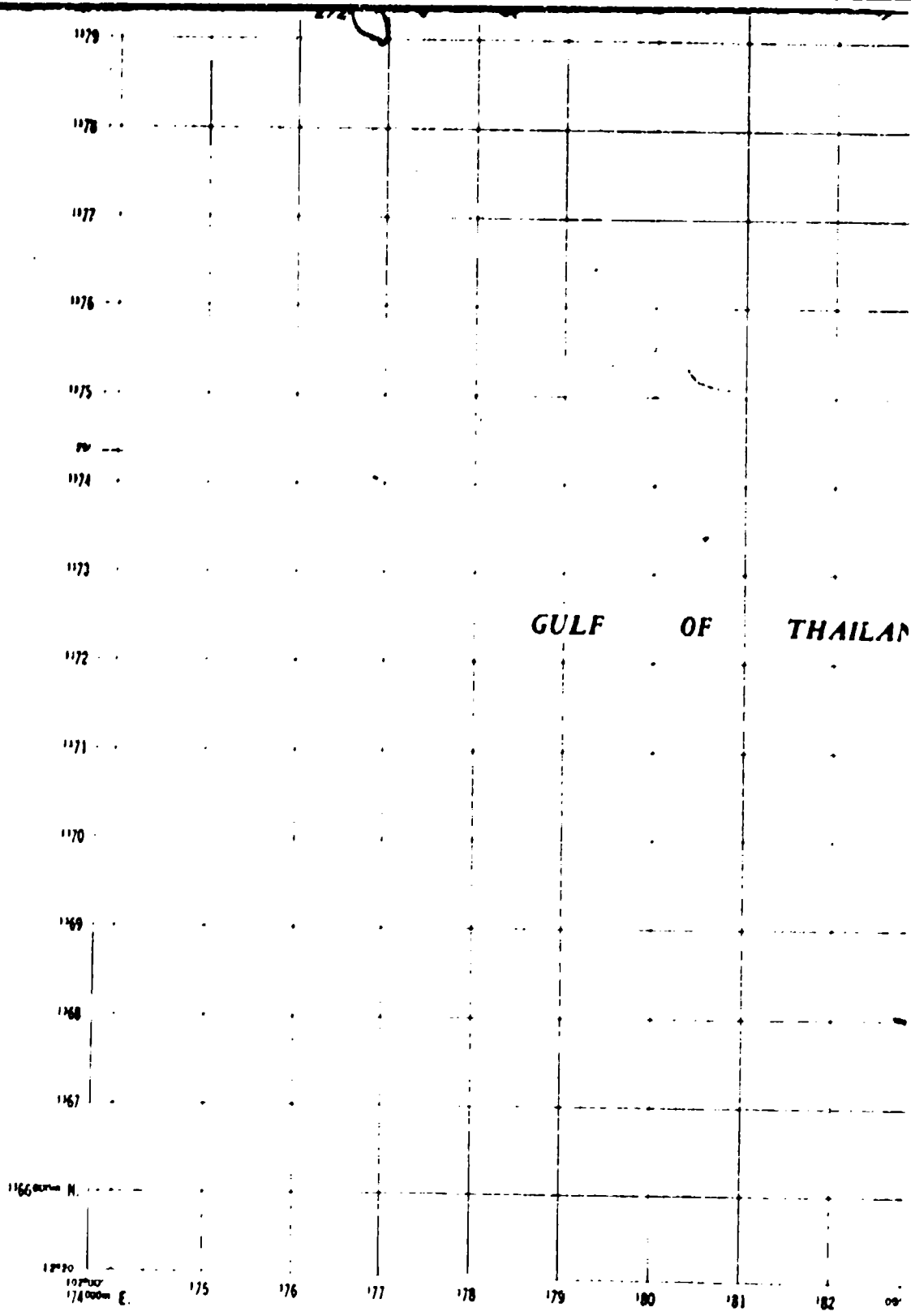
2 CHANTHABURI



3

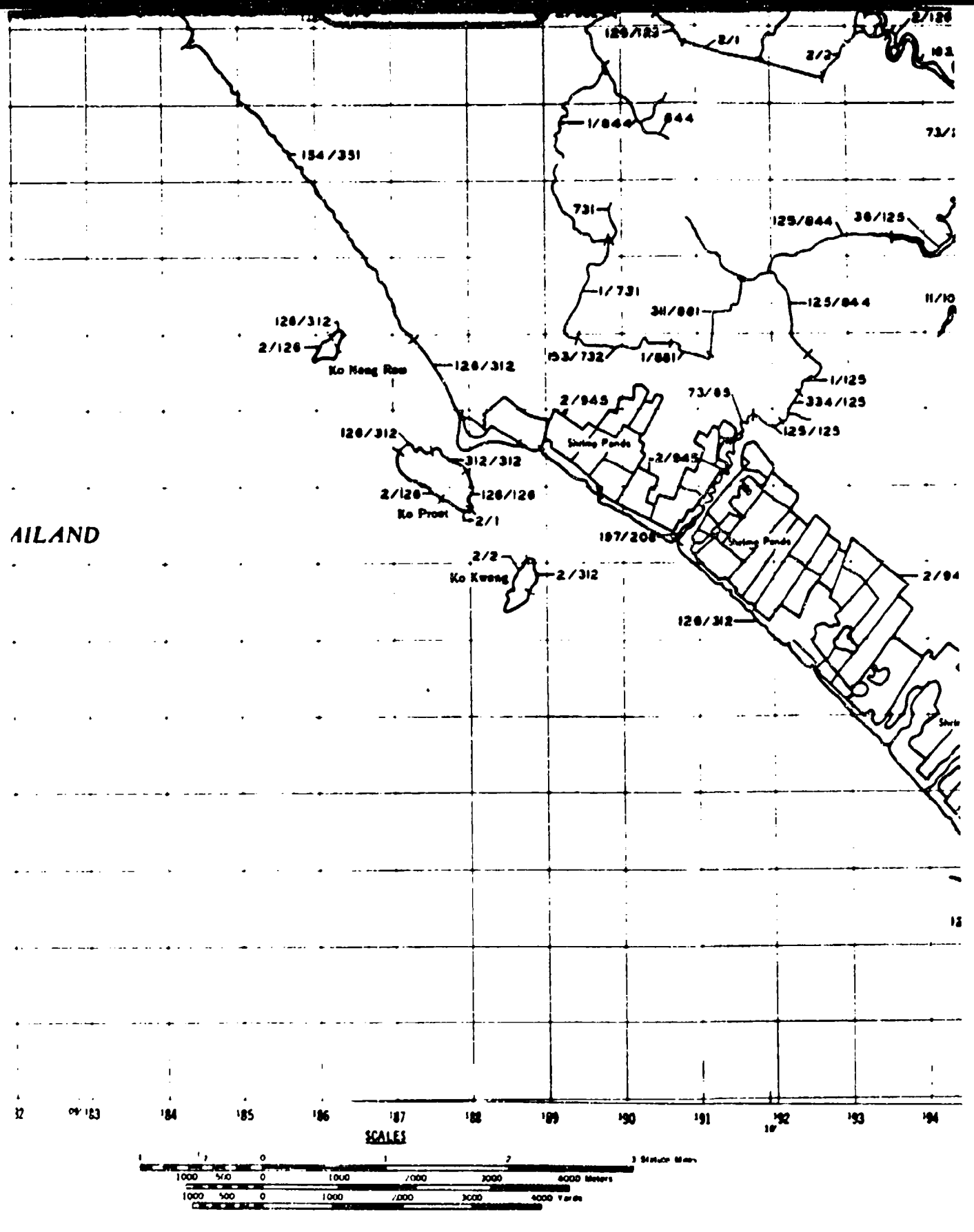
SHEET C IV



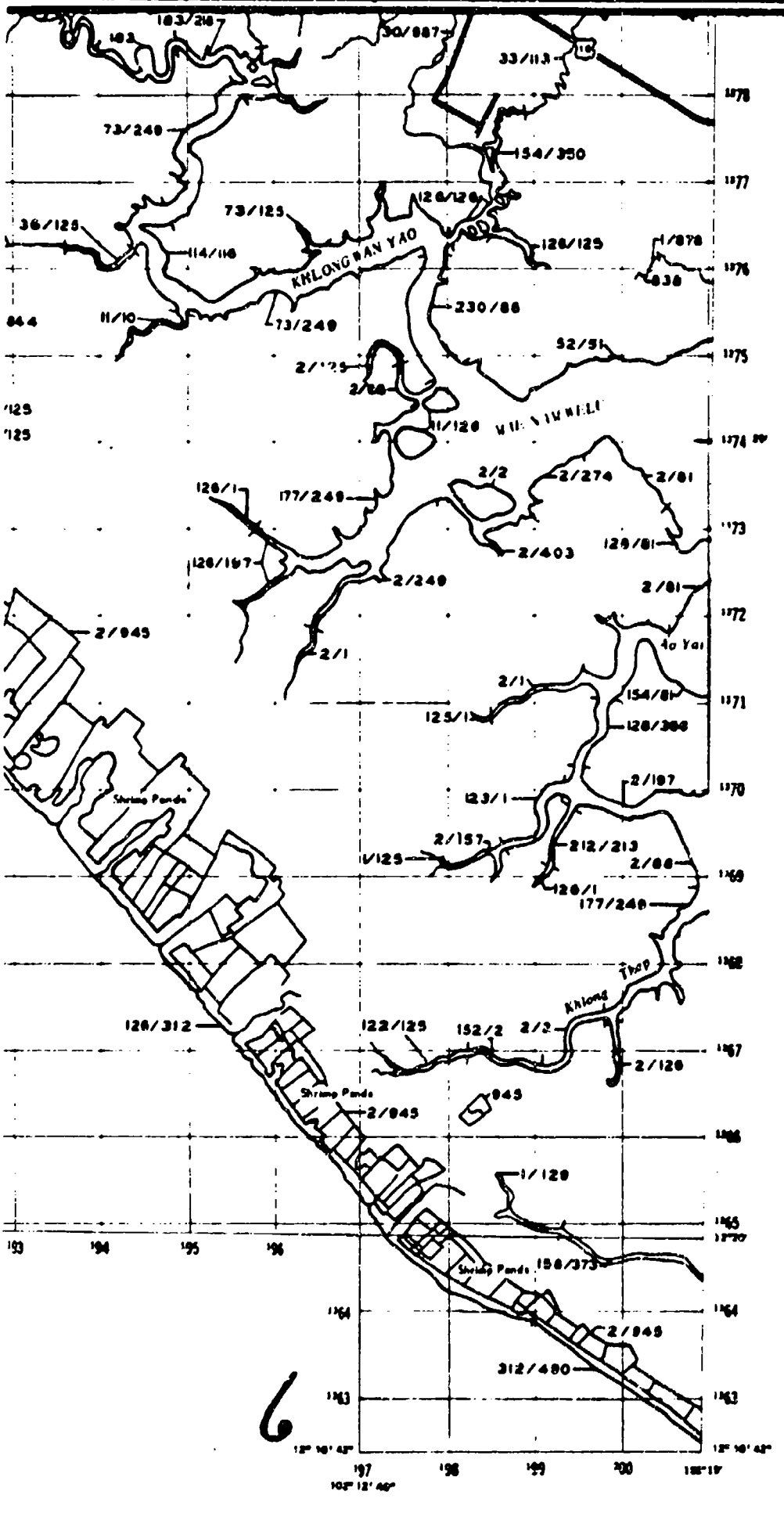


ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR GRID
GRID ZONE DESIGNATION: 48 P

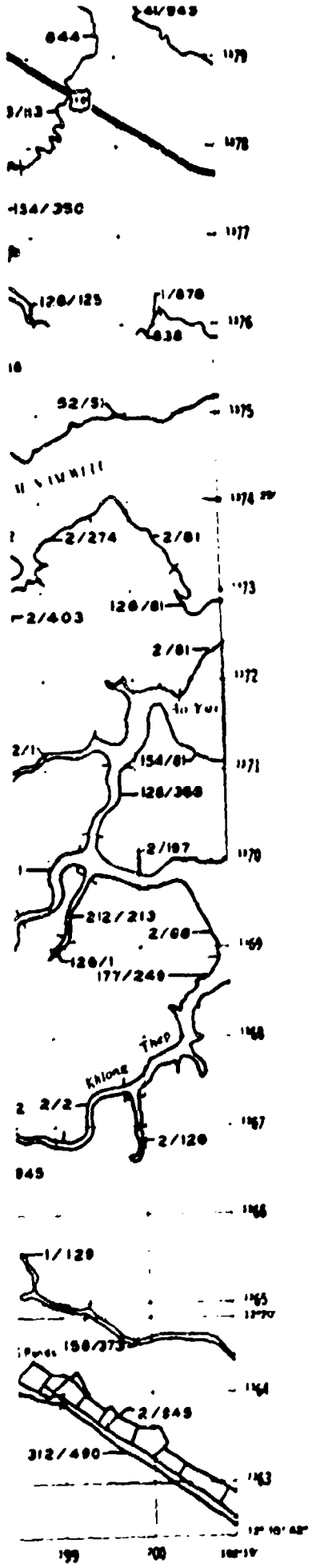
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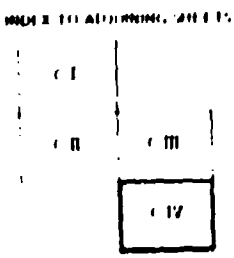

AILAND
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126/312
2/126
Ko Nang Rong
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126/312
312/312
2/126
126/126
Ko Proet
2/1
2/2
Ko Kwang
2/312
731
1/731
341/881
153/732
1/881
125/844
36/125
1/125
334/125
125/125
73/85
2/945
Shrimp Ponds
187/208
126/312
2/94
SCALES

5



A QUANTITATIVE METH
TERRAIN FOR GE
HYDROLOGIC
CHANTHABURI
SHEE





A QUANTITATIVE METHOD FOR DESCRIBING TERRAIN FOR GROUND MOBILITY

HYDROLOGIC GEOMETRY

CHANTHABURI STUDY AREA

SHEET C IV

7

PLATE 6.46