REPUBLIC OF THE PHILIPPINES

NATIONAL IRRIGATION ADMINISTRATION

FEASIBILITY STUDY ON THE ASUE RIVER BASIN AGRICULTURAL DEVELOPMENT PROJECT

VOLUME 5 DETA BOOK

AUGUST 1985

JAPAN INTERNATIONAL COOPERATION AGENCY

FEASIBILITY STUDY

ON

THE ASUE RIVER BASIN

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LIST OF REPORTS

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CONTENTS OF DATA BOOK, VOLUME 5

SOIL AND LAND CLASSIFICATION

ANNEX I

DESCRIPTION OF TYPICAL SOIL PROFILE OF

MAJOR SOIL SERIES

SARA SERIES

1. Profile Characteristic:

Horizon	Depth (cm.)	Description
Ap	0-15	Grayish brown (10YR 4/2) moist; sandy clay loam; weak medium granular to sub-angular blocky structure; presence of reddish streaks; friable when moist; slightly sticky and plastic when wet; common fine to medium roots; abrupt wavy horizon boundary.
A_2	15-40	Gray (10YR 5/1) moist; sandy clay; brittle with red streaks; weak fine sub-angular blocky structure; few fine distinct yellowish brown (10YR 5/6) mottles; no concretion; slightly firm when moist; sticky and slightly plastic when wet; clear irregular horizon boundary.
B_1	40-85	Light gray (10YR 6/1) moist; sandy clay; moderate medium sub-angular blocky structure; many coarse prominent strong brown (7.5YR 5/6) to yellowish brown (10YR 5/4) mottles; no concretion; slightly firm when moist; sticky and slightly plastic when wet; diffuse smooth horizon boundary.
B_2	85-150	Light gray (10YR 7/1) wet; clay slightly compact; strong medium angular to sub-angular blocky structure; many coarse prominent yellowish brown (10YR 5/6) mottles; common medium to coarse soft black concretion; sticky and plastic; water table at 130 centimeters.

2. Range in Characteristics:

Solum depth ranges from 100 to 150 centimeters, with A horizon extending from 15 to 40 centimeters in depth which are sandy clay loam to sandy clay and colors ranging from grayish brown to gray, with hues of 10YR or 2.5Y, values of 4 to 5 and chromes of 2 or less; presence of reddish streaks and fine distinct yellowish brown mottles.

The B horizon with depth of 40 to 150 centimeters is characterized by light gray sandy clay over clay with many coarse prominent yellowish brown to strong brown mottles. Soil color are of hues 10YR, value of 6 to 7 and chroma of 2 or less. Occurence of water table is common in this horizon.

3. Formation and Origin: Recent alluvial deposit

4. Relief: Level to nearly level

5. Drainage: Fair to poor

BANTOG SERIES

1. Profile Characteristics:

Horizon	Depth (cms.)	Description
Ap	0-27	Grayish brown (10YR 5/2) dry; clay; strong medium to coarse sub-angular blocky structure; many brown and reddish streaks; hard when dry; sticky and plastic when wet; clear smooth horizon boundary.
Bt_1	27-105	Gray (10YR 6/1) moist; heavy clay; strong medium sub-angular blocky structure; many coarse prominent yellowish brown (10YR 5/8) to strong brown (7.5YR 5/6) mottles; firm when moist; very sticky and plastic when wet; presence of slicken sides; clear wavy horizon boundary.
Btg2	105-170	Light gray (10YR 7/2) wet; heavy clay; massive structure; common medium distinct olive brown (2.5YR 4/4) and brownish yellow (10YR 6/6) mottles; no concretion; very sticky and very plastic; water table at 155 centimeters.

2. Range in Characteristics:

Solum thickness reaches a depth from 100 to 170 centimeters. The surface soil which extends from 25 to 30 centimeters are clay; grayish brown, with hue of 10YR, values of 5 to 6 and chroma of 2 or less. Contain many brown to reddish streaks.

The subsoil is characterized by heavy clay; gray to light gray with hue of 10YR, values of 7 or less and chromas of 2 or less; many distinct to prominent mottles; massive structure and very sticky and very plastic.

3. Formation and Origin: Old alluvial deposit

4. Relief: Level to nearly level

5. Drainage: Poorly drained

BAROTAC SERIES

1. Profile Characteristics:

Horizon	Depth (cms.)	Description
Ap	0-13	Brown (10YR 5/3) dry; sandy loam; strong fine granular structure; loose when dry; non-sticky and non plastic when wet; pebbles and few gravels present; abrupt smooth horizon boundary.
B_1	13-56	Yellowish brown (10YR 5/4) dry; sandy clay loam; slightly compact; weak fine to medium granular to sub-angular blocky structure; many pebbles and gravels present; clear irregular horizon boundary.
B_2	56-85	Yellowish brown (10YR 5/6) to brown (10YR 5/3) moist; sandy clay loam; weak fine to medium granular to sub-angular blocky structure; common pebbles and gravels; firm when moist; brittle and compacted; diffuse wavy boundary.
C_1	85-126	Mottled gray (10YR 5/1), Red (2.5YR 5/6) and yellowish brown (10YR 5/6) clay loam; moist; strong medium angular to subangular blocky structure; few gravels present; diffuse wavy horizon boundary.
C_2	126-154	Mottled light gray (10YR 6/1) and reddish brown (5YR 5/4) clay; moist; slightly compacted and brittle; sticky and plastic.

2. Range in Characteristics:

Solum depth ranges from 60 to 155 centimeters. It is shallow along the slopes and rather deep at the footslopes. The A horizon is shallow ranging from 10 to 15 centimeters, sandy loam; brown to dark brown with hues of 10YR, values of 3 to 5 and chromas of 3 or less; granular structure; friable to loose; pebbles and gravels are present.

The B horizon of 60 to 85 centimeters deep are yellowish brown to brown, with hues of 7.5 YR or 10YR, values of 5 or less and chromas of 4 to 6; compacted sandy clay loam; granular to sub-angular blocky structure. Gravels and pebbles are common.

The C horizon are mottled gray, light gray, red and yellowish brown compacted clay or sandy clay; with hues of 10YR and 2.5YR, values of 6 or less and chromas of 5 to 6 or even less; with occasional gravels or pebbles.

3. Formation and Origin: Residual from volcanic rocks

4. Relief: Undulating to hilly

5. Drainage: Fair to good

ANNEX II

MASTER PIT SOIL PROFILE DESCRIPTION AND RESULT OF PHYSICAL AND CHEMICAL ANALYSIS

MASTER PIT DESCRIPTION

Described By : MANUEL G. GUIAO

Date : April 26, 1982

A. GENERAL INFORMATION :

Master Pit No. : 1

Project : Asue RIP

Photo No. : 076 Line I

Location : Tanduyan, Ajuy, Iloilo

Landform : Alluvial Fan

Relief : Level to nearly level

Land Use : Paddy Rice, non-irrigated

Elevation : 21 meters above sea level

Slope : 0%1%

Aspect : Approx. 1.5 kms, 85° SW of Servuco Bridge

Surface Drainage : Good

Internal Drainage : Fair

Soil Drainage Class : Moderately well-drained

Soil Parent Material : Alluvial Deposit

Soil Series/Type : Sara Sandy Clay Loam

Land Class : 1R

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 1

Sample No.	Depth (cm.)	Profile Description
A1-1	0∿15	Grayish brown (10 YR 5/2), moist; sandy clay loam; weak fine granular structure; with yellowish to reddish streaks; friable when moist, slightly sticky and slight-plastic when wet; many fine to medium roots; abrupt, smooth horizon boundary.
A1-2	15∿26	Gray (10 YR 5/1), moist; sandy clay loam; medium, moderate granular to subangular blocky structures; slightly compact; common medium distinct dark yellowish brown (10 YR 4/6) mottles; firm when moist; hard when dry; presence of reddish stains along root pores; common fine roots present; abrupt wavy boundary.
A1-3	26∿47	Grayish brown (10 YR 5/2), moist; sandy loam; weak fine granular structure; no mottlings; friable when moist; loose when wet, non-plastic very few fine roots; diffuse smooth horizon boundary.
A1-4	47∿90	Grayish brown to gray (10 YR 5/2∿5/1), wet; sandy clay loam; weak sub-angular blocky structure; loose and non-sticky when wet; penetration; water table present at 75 cms. deep.
		AUGERED LAYER
	90∿150	Gray (2.5 Y n/6), wet; sand; single-grained; loose.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 1
SOIL SERIES: Sara
LOCATION: Tanduyan, Ajuy

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 23, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of 1/3	15	Readily Available Moisture (%)
A1-1	0-15	62	23	15	-	SL	15.62	5.35	10.27
A1-2	15-25	65	22	13	-	SL	11.49	4.45	7.04
A1-3	25-47	61	24	15	-	SL	17.41	7.05	10.36
A1-4	47-90	52	26	22	-	SCL	24.60	10.20	14.40

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A1-1	5.0	0.38	15.7	1.7	0.09	0.31	2.97	1.84	5.94	73.4	4.47
A1-2	5.3	0.10	14.8	1.2	0.11	0.23	2.43	1.33	3.65	112.3	6.30
A1-3	6.0	0.07			0.13	0.25	3.79	2.85	5.06	138.3	4.94
A1-4	6.4	0.07			0.14	0.25	5.58	2.54	8.14	104.4	3.07

MASTER PIT DESCRIPTION

Described By : MANUEL G. GUIAO

Date : April 27, 1982

A. GENERAL INFORMATION :

Master Pit No. : 2

Project : Asue RIP

Photo No. : 020 Line 3

Location : Lanhagan, Ajuy, Iloilo

Landform : Alluvial Fan

Relief : Nearly level

Land Use : Paddy rice, pump-irrigated

Elevation : 5 meters above sea level

Slope : 1~2%

Aspect : About 520 meters, 62°NE of Lanhagan Road Junction

Surface Drainage : Fair

Internal Drainage : Fair

Soil Drainage Class : Moderately well-drained

Soil Parent Material : Old alluvial deposit

Soil Series/Type : Sara Sandy, clay loam

Land Class : 1R

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 2

Sample No.	Depth (cm.)	Profile Description
A2-1	0∿15	Brown to grayish brown (10 YR 5/3 to 10 YR 5/2), moist; sandy clay loam; weak fine granular structure; presence of red streaks; friable when moist; slightly sticky when wet; many fine to medium roots; abrupt, wavy horizon boundary.
A2-2	15∿32	Gray (10 YR 6/1), moist; sandy loam; weak granular structure; common medium distinct yellowish brown (10 YR 5/6) mottles; friable when moist; non-sticky and non plastic when wet; presence of red streaks; few fine root present; clear, smooth horizon boundary.
(A2-3	32∿74)	
A2-4	74∿150	Light gray (10 YR 7/1), moist; sandy clay; weak fine sub-angular blocky structure; many coarse prominent yellowish brown (10 YR 5/6) mottles; no concretions; slightly firm when moist; compacted; sticky and plastic when wet; no root penetration.
		AUGERED LAYERS
	150∿214	Light gray (5 Y 7/1), moist; compacted clay; few medium distinct yellowish brown (10 YR 5/6) mottles; very sticky and plastic when wet; firm when moist.
	214∿250	Very light gray (5 Y 7/1), moist; heavy clay; few fine faint yellowish brown (10 YR 5/8) mottles.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 2
SOIL SERIES: Sara
LOCATION: Lanjangan, Ajuy

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 23, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of 1/3	15	Readily Available Moisture (%)
A2-1	0-15	80	14	6	-	LS	5.31	2.80	2.51
A2-2	15-30	72	15	13	-	LS	10.90	5.57	5.33
A2-3	30-74	75	4	21	-	SCL	15.77	8.22	7.55
A2-4	70-150	59	6	35	-	SCL	26.08	11.44	14.64

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A2-1	4.8	0.13	12.5	1.5	0.11	0.17	1.21	0.99	1.88	127.6	9.04
A2-2	5.0	0.09	11.4	0.9	0.11	0.17	2.17	1.09	2.03	174.3	8.37
A2-3	5.2	0.06			0.13	0.17	1.49	0.99	3.68	75.5	4.52
A2-4	5.4	0.06			0.13	0.22	1.84	1.29	5.80	60.0	3.79

MASTER PIT DESCRIPTION

Described By : MANUEL G. GUIAO

Date : April 28, 1982

A. GENERAL INFORMATION :

Master Pit No. : 3

Project : Asue RIP

Photo No. : 241 Line 4

Location : Pagsanga-an, Concepcion, Iloilo

Landform : Alluvial Terrace

Relief : Level to Nearly Level

Land Use : Paddy Rice Non-irrigated

Elevation : 4 meters above sea level

Slope : 0~2%

Aspect : Approx. 1.2 kms. 75°SW of Concepcion-Ajuy-Sara Road Junction

Surface Drainage : Fair

Internal Drainage : Very poor

Soil Drainage Class : Very poorly drained

Soil Parent Material : Old alluvial deposit

Soil Series/Type : Bantog clay

Land Class : lR

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 3

Sample No.	Depth (cm.)	Profile Description
A3-1	0∿27	Grayish brown (10 YR 5/2), dry; clay; strong coarse sub-angular blocky structure; many reddish streaks; very hard when dry; many fine roots; clear, smooth horizon boundary.
A3-2	27∿105	Gray (10 YR 6/1), moist; heavy clay; strong sub-angular blocky structure; many coarse prominent yellowish brown (10 YR 5/8) to strong brown (7.5 YR 5/6) mottles; firm when moist, sticky and plastic when wet; common fine roots; presence of slicken sides; clear wavy horizon boundary.
A3-3	105∿170	Light gray (10 YR 7/2), wet; heavy clay; compacted; massive structure; common medium distinct olive brown (2.5 Y 4/4) and brownish yellow (10 YR 6/6) mottles; no concretion; very sticky and very plastic when wet; no root penetration; water table at 155 cms.
		AUGERED LAYER
	170∿200	Light gray (10 YR 7/2), wet; heavy clay; few fine faint yellowish brown (10 YR 5/6) and brown (10 YR 5/3) mottlings; very sticky and very plastic.
	200∿260	Gray (10 YR 5/1), wet; heavy clay; few fine faint brown (10 YR 5/3) mottles; sticky and plastic.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 3
SOIL SERIES: Bantog Series
LOCATION: Nagsanga-an, Concepcion

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 23, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of 1/3	15	Readily Available Moisture (%)
A3-1	0-25	13	21	66		C	44.88	23.37	21.51
A3-2	25-105	10	16	74		C	43.33	24.10	19.23
A3-3	105-170	11	16	73		C	44.37	25.24	19.13

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A3-1	5.1	1.43	10.2	3.4	0.13	1.85	15.98	8.05	25.33	102.6	7.30
A3-2	6.4	1.41	9.1	1.5	0.24	3.40	16.90	9.38	26.62	112.3	12.77
A3-3	7.2	2.02			0.18	4.50	17.95	10.26	32.89	100.0	13.68

MASTER PIT DESCRIPTION

Described By : ALEJANDRO S. CANTOR

Date : April 28, 1982

A. GENERAL INFORMATION :

Master Pit No. : 4

Project : Asue RIP

Photo No. : 024 Line 3

Location : Sitio Tuboq, Salcedo, Sara, Iloilo

Landform : Alluvial Fan

Relief : Level to nearly level

Land Use : Paddy rice non-irrigated

Elevation : 11.5 meters above sea level

Slope : 0~1%

Aspect : About 550 m., 16°NE of Salcedo Elem. School

Surface Drainage : Good

Internal Drainage : Fair

Soil Drainage Class : Somewhat poorly drained

Soil Parent Material : Old alluvial deposit

Soil Series/Type : Sara sandy clay loan

Land Class : 1R

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 4

Sample No.	Depth (cm.)	Profile Description
A4-1	0~15	Dark grayish brown (10 YR 4/2), moist; sandy clay loam; weak medium angular blocky structure; many red streaks; friable when moist, slightly sticky and slightly plastic when wet; common fine to medium roots; abrupt wavy boundary.
A4-2	15~40	Gray (10 YR 5/1), moist; clay loam; weak fine sub-angular blocky structure; few fine distinct yellowish brown (10 YR 5/8) mottles; no concretion; slightly firm when moist, slightly sticky and slightly plastic when wet; very few fine roots present; clear irregular horizon boundary.
A4-3	40~85	Light gray (10 YR 6/1), moist; sandy clay; moderate medium sub-angular blocky structure; many coarse prominent strong brown (7.5 YR 5/6) mottles; slightly firm when moist, sticky and slightly plastic when wet; no concretion; very few fine roots; diffused smooth horizon boundary.
A4-4	85~130	Light gray (10 YR 7/1), wet; clay; slightly compact; strong medium angular to sub-angular blocky structure; many coarse prominent yellowish brown (10 YR 5/6) mottles; common coarse soft black concretion; sticky and plastic when wet; no root penetration; water table present at 115 cms.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 4
SOIL SERIES: Sara Series
LOCATION: Sitio Tubog, Salcedo, Sara, Iloilo

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 23, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of 1/3	15	Readily Available Moisture (%)
A4-1	0-15	52	18	30		SCL	21.90	10.31	11.59
A4-2	15-40	68	14	18		SL	14.45	6.69	7.76
A4-3	40-85	53	11	36		SC	27.56	12.41	15.15
A4-4	85-150	47	13	40		SC	28.10	12.44	15.66

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A4-1	5.1	0.30	14.8	3.4	0.19	0.32	5.32	2.81	9.55	90.4	3.35
A4-2	6.0	0.12	12.5	0.9	0.09	0.20	2.86	1.20	4.45	97.7	4.49
A4-3	6.4	0.18			0.11	0.25	5.39	2.19	7.23	109.8	3.46
A4-4	6.7	0.17			0.13	0.23	5.89	2.42	9.74	89.0	2.26

MASTER PIT DESCRIPTION

Described By : ALEJANDRO S. CANTOR

Date : April 29, 1982

A. GENERAL INFORMATION :

Master Pit No. : 5

Project : Asue RIP

Photo No. : 185 Line 5

Location : Santol, San Dionisio, Iloilo

Landform : Alluvial Terrace

Relief : Level to Nearly level

Land Use : Paddy Rice Non-irrigated

Elevation : 15 meters above sea level

Slope : 0\2%

Aspect : About 600 meters, 5°NW of San Dionesio High School

Surface Drainage : Fair

Internal Drainage : Poor

Soil Drainage Class : Poorly drained

Soil Parent Material : Old alluvial deposit

Soil Series/Type : Bantog clay

Land Class : 1R

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 5

Sample No.	Depth (cm.)	Profile Description
A5-1	0∿12	Light gray (10 YR 7/1), to brown (10 YR 5/3), dry; clay; strong medium angular blocky structure; presence of red streaks, slightly hard and brittle when dry, slightly sticky and slightly plastic when wet; common fine to medium roots; clear smooth horizon boundary.
A5-2	12∿55	Gray (10 YR 5/1), moist; clay; strong medium angular to sub-angular blocky structures; many medium distinct strong brown (7.5 YR 5/6) mottles; firm when moist, sticky and plastic when wet; presence of few fine roots; cutans and slickenside present; clear irregular horizon boundary.
A5-3	55∿110	Light gray (5 Y 7/1), moist; clay; moderate fine angular to sub-angular blocky structure; many mottles; firm when moist, sticky and plastic when wet; very few fine roots present; diffused, wavy horizon boundary.
A5-4	110∿150	Light gray (5 Y 7/1), moist; clay; weak fine granular to sub-angular blocky structure; many coarse prominent reddish yellow (7.5 YR 6/8) mottles; few medium black concretion; moderately friable when moist, sticky and plastic when wet.
		AUGERED LAYER
	150∿240	Light brownish gray, (10 YR 6/2), moist; clay; many coarse prominent reddish yellow (7.5 YR 6/8) mottles; presence of medium size soft black concretion.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 5
SOIL SERIES: Bantog Series
LOCATION: Santol, Dionisio, Iloilo

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 24, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of 1/3	15	Readily Available Moisture (%)
A5-1	0-12	11	17	72		C	44.13	22.79	21.34
A5-2	12-55	15	13	72		C	44.22	21.47	22.75
A5-3	55-110	12	15	73		C	45.45	21.54	23.91
A5-4	110-150	17	41	42		C	33.17	16.40	16.77

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A5-1	4.7	0.61	10.2	3.7	0.42	0.54	11.35	7.67	21.23	94.2	2.54
A5-2	5.3	1.05	10.2	1.9	0.26	0.78	14.69	9.16	23.43	106.2	3.33
A5-3	4.9	1.92			0.24	1.05	12.33	8.10	24.79	87.6	4.24
A5-4	5.2	1.36			0.15	0.60	8.23	5.59	13.55	107.5	4.43

MASTER PIT DESCRIPTION

Described By : ALEJANDRO S. CANTOR

Date : May 3, 1982

A. GENERAL INFORMATION :

Master Pit No. : 6

Project : Asue RIP

Photo No. : 235 Line 4

Location : Dugman, San Dionisio, Iloilo

Landform : Old Alluvial Terrace

Relief : Nearly level

Land Use : Paddy rice, non-irrigated

Elevation : 21 meters above sea level

Slope : 1~2%

Aspect : 650 meters, 56°NW of Pangi Road Junction

Surface Drainage : Good

Internal Drainage : Fair

Soil Drainage Class : Moderately well-drained

Soil Parent Material : Old alluvial deposit

Soil Series/Type : Sara sandy clay loam

Land Class : 1R

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 6

Sample No.	Depth (cm.)	Profile Description
A6-1	0∿7	Grayish brown (10 YR 5/2), moist; sandy clay loam; moderately medium granular to sub-angular blocky; structure; many reddish streaks present; friable when moist; slightly sticky and slightly plastic when wet; many fine to medium roots; clear irregular horizon boundary.
A6-2	7∿46	Grayish brown (10 YR 5/2), moist; clay loam; moderate medium angular blocky structure; common medium distinct reddish brown (5 YR 5/4) to yellowish brown (10 YR 5/8) mottles; no concretions; friable when moist, sticky and plastic when wet; common fine roots; clear wavy horizon boundary.
A6-3	46∿95	Grayish brown to brown (10 YR 5/2∿5/3), moist; clay; moderate medium to coarse angular blocky structure; many coarse prominent yellowish brown (10 YR 5/6) mottles; no concretion; slightly firm when moist; sticky and plastic, wet; few fine root present; clear smooth horizon boundary.
A6-4	95∿168	Dark gray (10 YR 4/1), moist; clay; weak fine to medium angular blocky structure; common medium distinct strong brown (7.5 YR 5/6) mottles; common fine to medium block soft concretion; very sticky and very plastic when wet, firm when moist; no root penetration.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 6
SOIL SERIES: Sara Series
LOCATION: Dugman, San Dionisio, Iloilo

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 24, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of: 1/3	15	Readily Available Moisture (%)
A6-1	0-7	21	50	29		CL	35.34	13.68	21.66
A6-2	7-46	20	52	28		CL	29.79	12.13	17.66
A6-3	46-95	18	46	36		SiCL	31.54	15.39	16.15
A6-4	95-165	24	34	42		C	31.93	16.71	14.68

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A6-1	5.1	0.61	12.5	2.7	0.30	0.26	7.82	4.63	14.00	91.0	1.86
A6-2	6.6	0.16	11.4	1.2	0.11	0.15	7.85	4.34	11.84	105.1	1.27
A6-3	6.6	0.09			0.11	0.29	7.11	5.92	12.50	107.4	2.32
A6-4	6.7	0.08			0.13	0.34	9.40	7.75	16.79	104.9	2.03

MASTER PIT DESCRIPTION

Described By : MANUEL G. GUIAO

Date : April 30, 1982

A. GENERAL INFORMATION :

Master Pit No. : 7

Project : Asue RIP

Photo No. : 009 Line 1

Location : Alibayog, Sara, Iloilo

Landform : Recent alluvial terrace

Relief : Nearly level

Land Use : Paddy Rice Non-irrigated

Elevation : 27 meters above sea level

Slope : 1~2%

Aspect : About 1.1 km; 73°SW of Alibayag Road Junction

Surface Drainage : Good

Internal Drainage : Fair

Soil Drainage Class : Somewhat poorly drained

Soil Parent Material : Recent alluvial deposit

Soil Series/Type : Sara sandy clay loam

Land Class : 1R

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 7

Sample No.	Depth (cm.)	Profile Description
A7-1	0∿15	Dark grayish brown (10 YR 4/2) moist; sandy clay loam; strong fine granular structure; common medium prominent dark yellowish brown (10 YR 4/6) mottles; red streaks present; moderately friable when moist, slightly sticky and slightly plastic when wet; many fine to medium roots; abrupt, wavy horizon boundary.
A7-2	15∿65	Grayish brown (10 YR 5/2), moist; clay loam; weak moderate fine granular to sub-angular blocky structure; many coarse prominent yellowish brown (10 YR 5/6) mottles; common fine soft black concretion; slightly sticky and slightly plastic when wet; fine roots present; clear smooth horizon boundary.
A7-3	65∿150	Gray (5 Y 6/1), moist; clay loam; moderate medium angular to sub-angular blocky structure; very few fine roots present up to 90 cms; few fine faint yellowish brown (10 YR 5/8) mottles; sticky and slightly plastic when wet; firm when moist.
		AUGERED LAYER
	150∿240	Light gray (5 Y 7/1), wet; clay; few fine faint yellowish brown (10 YR 5/8) mottles; few fine soft black concretion; sticky and plastic.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 7
SOIL SERIES: Sara Series
LOCATION: Alibayog, Sara, Iloilo

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 24, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of 1/3	15	Readily Available Moisture (%)
A7-1	0-15	47	33	20		L	22.20	9.82	12.38
A7-2	15-65	57	28	15		SL	18.73	7.52	11.21
A7-3	65-150	30	35	35		CL	31.68	14.46	17.22

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percent-age (%)
A7-1	4.8	0.22	14.8	2.7	0.17	0.23	4.94	1.91	8.86	81.8	2.60
A7-2	7.0	0.10	12.5	0.6	0.13	0.26	6.94	2.49	8.14	120.6	3.19
A7-3	6.9	0.09			0.16	0.33	9.71	5.24	14.25	108.3.	2.32

MASTER PIT DESCRIPTION

Described By : ALEJANDRO S. CANTOR

Date : April 29, 1982

A. GENERAL INFORMATION :

Master Pit No. : 8

Project : Asue

Photo No. : 074 Line 2

Location : Fabriaga, Sara, Iloilo

Landform : Rolling Upland

Relief : Sloping to slightly undulating

Land Use : Sugarcane

Elevation : 22 meters

Slope : 3~5%

Aspect : 600 meters, 56°NE of Sara Town

Surface Drainage : Good to excessive

Internal Drainage : Fair

Soil Drainage Class : Moderately well drained

Soil Parent Material : Residual from volcanic rocks

Soil Series/Type : Barotac Sandy loam

Land Class : 2 Rst

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 8

Sample No.	Depth (cm.)	Profile Description
A8-1	0∿13	Brown (10 YR 5/3) dry; sandy loam; strong fine granular structure; loose when dry, non-sticky and non-plastic when wet; pebbles and few gravels are present; many fine to medium roots; abrupt smooth horizon boundary.
A8-2	13∿56	Yellowish brown (10 YR 5/4) dry; sandy clay loam; slightly compact; weak fine to medium granular to sub-angular blocky structure; many pebbles and gravels present; common fine roots; clear irregular horizon boundary.
A8-3	56∿85	Yellowish brown (10 YR 5/6) to brown (10 YR 5/3) moist; sandy clay loam; weak fine to medium granular to sub-angular blocky structure; common pebbles and gravels; firm when moist; britle and compacted; very few fine roots; diffuse wavy horizon boundary.
A8-4	85∿126	Mottled gray (10 YR 5/1), Red (2.5 YR 5/6) and yellowish brown (10 YR 5/6) clay loam; moist; strong medium angular to sub-angular blocky structure; few gravels and stone present; very few fine roots; diffused wavy horizon boundary.
A8-5	126∿154	Mottled light gray (10 YR 6/1) and reddish brown (5 YR 5/4) clay; moist; slightly compact and brittle; sticky and plastic when wet.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 8
SOIL SERIES: Barotac Series
LOCATION: Fabriaga, Sara, Iloilo

Date Samples Submitted: June 2, 1985
Date Tests Completed: June 25, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of 1/3	15	Readily Available Moisture (%)
A8-1	0-13	78	13	9		SL	10.00	4.13	5.87
A8-2	13-56	66	13	21		SCL	15.15	5.81	9.34
A8-3	56-85	57	11	32		SCL	24.42	11.99	12.43
A8-4	85-126	42	15	43		C	33.99	17.42	16.57
A8-5	126-154	40	16	44		C	34.49	17.93	17.10

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phosphorous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A8-1	4.8	0.08	10.2	1.1	0.16	0.10	1.08	0.86	2.01	109.4	4.98
A8-2	5.0	0.03	10.2	0.7	0.11	0.11	0.81	0.49	2.73	55.6	4.03
A8-3	5.0	0.02			0.11	0.15	1.36	1.01	3.89	67.6	3.86
A8-4	5.0	0.02			0.11	0.13	1.28	1.17			
A8-5	5.0	0.02			0.13	0.14	1.25	1.02			

MASTER PIT DESCRIPTION

Described By : MANUEL G. GUIAO

Date : May 3, 1982

A. GENERAL INFORMATION :

Master Pit No. : 9

Project : Asue RIP

Photo No. : 022 Line 3

Location : Pinay-Espinosa, Ajuy, Iloilo

Landform : Alluvial Fan

Relief : Nearly level

Land Use : Paddy rice, non-irrigated

Elevation : 9.5 meters above sea level

Slope : 1~2%

Aspect : 200 meters, 80°SE of Brgy. Pinay

Surface Drainage : Good

Internal Drainage : Fair

Soil Drainage Class : Somewhat Poorly Drained

Soil Parent Material : Old alluvial deposit

Soil Series/Type : Sara sandy clay loam

Land Class : 1R

B. SOIL PROFILE DESCRIPTION:

Master Pit No. : 9

Sample No.	Depth (cm.)	Profile Description
A9-1	0∿15	Brown (10 YR 4/3), dry; sandy clay loam; moderate, granular to sub-angular blocky structure; common, medium distinct brownish yellow (10 YR 6/8) mottles; presence of red streaks; slightly hard when dry; slightly sticky and slightly plastic when wet; common fine and medium roots; abrupt, irregular horizon boundary.
A9-2	15∿50	Light brownish gray (10 YR 6/2), moist; compacted clay loam; moderate medium sub-angular blocky structure; common medium distinct yellowish brown (10 YR 5/6) mottles; few fine iron coated mn concretion; firm when moist, sticky and plastic when wet; few fine and medium roots; clear smooth horizon boundary.
A9-3	50∿100	Light gray (5 Y 7/1) moist; clay loam; moderate fine granular to sub-angular blocky structure; common medium distinct yellowish brown (10 YR 5/6) mottles; common fine to medium iron coated Mn concretion; moderately friable when moist; very few fine roots; diffused irregular horizon boundary.
A9-4	100∿160	Light gray (5 Y 7/1), moist; silty clay; weak fine granular to sub-angular structure; common coarse prominent yellowish brown (10 YR 5/8) mottles; few fine soft black concretion; moderately friable when moist; sticky and plastic when wet.
		AUGERED LAYER
	160∿300	Mottled gray (5 Y 5/1), and strong brown (7.5 YR 5/6) silty clay loam.

SOIL PROFILE LABORATORY ANALYSIS SHEET

MASTER PIT NO.: 9
SOIL SERIES: Sara Series
LOCATION: Pinay-Espinosa,Ajuy, Iloilo

Date Samples Submitted: June 2, 1982
Date Tests Completed: June 25, 1982

(PHYSICAL CHARACTERISTICS)

Lab. No.	Depth (cm.)	Particle Size Distribution (%) Sand	(%) Silt	(%) Clay	(%) Gravel	Textural Class	Percent Moisture Retention of Metric Tension in Bars of: 1/3	15	Readily Available Moisture (%)
A9-1	0-15	59	23	18		SL	15.28	7.44	7.84
A9-2	15-50	55	21	24		SCL	16.24	7.35	8.89
A9-3	50-100	46	19	35		SCL	27.80	14.47	13.33
A9-4	100-160	42	20	38		CL	31.41	15.55	15.55

(CHEMICAL CHARACTERISTICS)

Lab. No.	pH H_2O (1:1)	$EC_{25} \times 10^3$ H_2O (1:1) (MS/cm.)	Avail. Phospho-rous (ppm)	Organic Matter (%)	Exchangeable Cations (meq./100 g.) K^+	Na^+	Ca^{++}	Mg^{++}	Cation Exchange Capacity (meq./100 g.)	Base Saturation Percentage (%)	Exchange Sodium Percentage (%)
A9-1	4.6	0.18	14.8	2.0	0.13	0.16	1.89	0.84	4.80	62.9	3.33
A9-2	6.4	0.11	12.5	0.78	0.11	0.20	3.38	1.96	5.69	99.2	3.51
A9-3	6.6	0.10			0.14	0.31	4.35	3.10	7.11	111.1	4.36
A9-4	6.8	0.10			0.14	0.31	4.49	3.50	7.14	118.2	3.81

ANNEX III

RESULT OF SOIL FERTILITY TEST

FERTILITY TESTS AND NUTRIENT REQUIREMENT
CROP AND VARIETY: LOWLAND RICE HTV

Lab. No.	LOCATION	Texture	RESULT OF ANALYSIS				NUTRIENT REQUIREMENT, Kg/Ha			
			pH 1:1 Soil Water Ratio	Organic Matter %	Phosphorus ppm (Olsen)	Potassium ppm (Cold) H_2SO_4	N Wet Season	N Dry Season	P	K
1	San Luis Sara		6.2	2.3	10.2	30	50	60	0	30
2	Alibayog, Sara		5.6	2.0	12.5	38	60	80	0	30
3	Aspera, Sara		4.4	2.9	13.6	125	50	60	0	0
4	Serruco, Ajuy		5.5	1.9	14.8	21	60	80	0	45
5	Tanduyan, Ajuy		5.6	2.4	14.8	45	50	60	0	30
6	Apologista, Sara		4.7	1.3	9.1	14	60	80	20	60
7	Sara		6.2	2.0	10.2	30	60	80	0	45
8	Aposaga, Sara		6.1	3.0	11.4	80	50	60	0	0
9	Lanhagan, Ajuy		4.8	3.3	15.7	75	40	50	0	0
10	Lanhagan, Ajuy		5.4	2.2	14.8	75	50	60	0	0
11	Salcedo, Sara		5.0	2.8	12.5	38	50	60	0	30
12			No Sample							

FERTILITY TESTS AND NUTRIENT REQUIREMENT
CROP AND VARIETY: LOWLAND RICE HTV

Lab. No.	LOCATION	Texture	RESULT OF ANALYSIS				NUTRIENT REQUIREMENT, Kg/Ha			
			pH 1:1 Soil Water Ratio	Organic Matter %	Phosphorus ppm (Olsen)	Potassium ppm (Cold) H_2SO_4	N Wet Season	N Dry Season	P	K
13	Salcedo, Sara		6.4	1.1	10.2	21	60	80	0	45
14	De Vera, Sara		6.1	1.2	15.7	38	60	80	0	30
15	Aldeguer, Sara		4.5	1.6	10.2	45	60	80	0	30
16	Pangi,San Dionisio		5.7	2.0	10.2	14	60	80	0	60
17	Aguire, Sara		4.6	3.6	11.4	30	40	50	0	45
18	Bunglas Fuente, Ajuy		4.3	1.9	9.1	45	60	80	0	30
19	Aldeguer, Sara		5.4	1.4	12.5	30	60	80	0	45
20	Tuble, San Dionisio		6.3	2.2	10.2	14	50	60	0	60
21	San Dionisio Proper		No Sample							
22	Siempre Viva, San Dionisio		4.0	1.8	11.4	38	60	80	0	30
23	Nagsanga-an, Concepcion		6.4	1.6	9.1	30	60	80	20	45

FERTILITY TESTS AND NUTRIENT REQUIREMENT
CROP AND VARIETY: LOWLAND RICE HTV

Lab. No.	LOCATION	Texture	RESULT OF ANALYSIS				NUTRIENT REQUIREMENT, Kg/Ha			
			pH 1:1 Soil Water Ratio	Organic Matter %	Phosphorus ppm (Olsen)	Potassium ppm (Cold) H_2SO_4	N Wet Season	N Dry Season	P	K
24	Bondolan, San Dionisio		4.3	4.6	8.1	30	40	50	20	45
25	Apologista, Sara		6.6	1.5	9.1	21	60	80	20	45
26			No	Samp	le					
27	Bacabac, Sara		4.1	2.8	9.1	21	50	60	20	45

ANNEX IV

LABORATORY METHODS AND PROCEDURES

LABORATORY METHODS AND PROCEDURES

The laboratory analysis includes a simple screening tests routinely saved from the field borings and fairly complete laboratory analysis for master pit samples to characterize the soils in the project area and later used in correlation of the different land classes.

PHYSICAL AND CHEMICAL ANALYSES FOR MASTER PIT SAMPLES

Tests were made on 35 master pit samples to gather relevant information on the physical and chemical constituents of the soils in the area. The methods employed for these tests are as follows:

PARTICLE SIZE ANALYSIS

The method recommended by Kilmer and Alexander was followed in this test. Sand and clay separates were hydrometrically measured.

	Diameter (mm)
Sand	2.0 - 0.05
Silt	0.05 - 0.002
Clay	below 0.002

METRIC TENSION OR MOISTURE RETENTION

This is determined at two pressures (1/3 bat and 15 bar) to approximate the percent moisture at field capacity and wilting point using pressure plate and pressure membrane extractor.

HYDRAULIC CONCITIVITY

The method outlined by the U.S Bureau of Reclamation was followed. This was done on fragmented samples with a regular tamping device and a set-up using 3 centimeters glass tubing.

SOIL REACTION

This is an indicative of the hydrogen ion activity in a soil solution. It is measured with a standard pH meter in a 1:1 soil-water solution and at saturated paste condition.

ELECTRICAL CONDUCTIVITY

An aliquot from 1:1 soil-water suspension was used in the measurement of electrical conductivity with a conductivity bridge.

EXCHANGEABLE CATION

Calcium (Ca^{++}) and magnesium (Mg^{++}) were determined using EDTA Titration Method as Outlined by Walter R. Heald in the Methods of Soil Analysis Agronomy Monograph, Part 2 pp. 999. Samples from NH_4AC extraction was read in a Flame Photometer to test for sodium and potassium as recommended by Pratt, P.T.

AVAILABLE PHOSPHOROUS

This test was performed using the sodium bicarbonate method prescribed by Olsen and Dean.

CATION EXCHANGE CAPACITY

This is estimated by the summation of exchangeable bases. In the methods of Soil Analysis Section 57-4, it was clearly presented that in non calcareous soils, the sum of exchangeable

hydrogen as determined by the Barium Chloride ($BaCl_2$) - triethanolamine procedure, the exchangeable bases provides the most accurate estimate of CEC.

ORGANIC CARBON

This was done using the modification of Walkey's rapid method (1935-47). Organic matter was derived by multiplying the percentage of organic carbon by 1.72. This procedure is outlined in Handbook 60 page 106.

BASE SATURATION PERCENTAGE

The base saturation percentage (BSP) was calculated by the following formula;

$$BSP\ (\%) = \frac{\text{Sum of exchangeable cations}}{C\ E\ C} \times 100$$

EXCHANGEABLE SODIUM PERCENTAGE

The exchangeable sodium percentage (ESP) was calulated as below;

$$ESP\ (\%) = \frac{\text{Exchangeable } Na^+}{C\ E\ C} = x\ 100$$

SOIL FERTILITY TESTS

Twenty-seven samples were collected from topsoils to determine the natural soil fertility and nutrient requirement.

- Organic matter content (Walkey's Rapid Method)
- Available Phosphorous (Olsen's Extraction)
- Available potassium (Cold H_2SO_4 Extraction)
- Soil pH (1:1 Soil-Water Suspension)

The contents of available nutrients were evaluated to estimate the nutrient requirement according to the standards in the Philippines Recommends for Soil Fertility Management (1979).

ANNEX V

RESULT OF SOIL DRAINAGE INVESTIGATION

Soil Drainage

(1) Existing Drainage Conditions

The present drainage system in the Project Area is provided by a series of well-incised rivers and creeks draining naturally to the Ajuy Bay and Bacagay Bay. The main drainage channels are Asue, Alibayog, Serruco, Pinantang, and Gubatan Rivers draining southward to Ajuy Bay. The northeastern section is being drained by Hasohoy and Tabagay Rivers having its way out to Bacagay Bay. These natural drainage systems are adequate to drain the Project Area under the prevailing conditons. There are minor drainage problems in small depressions, low erosional remnants, and in localized valleys where the lands are mostly the passage ways of excessive run-off water during heavy rainfall. Therefore, additional drainage systems are required for the area having such a problem when full irrigation is provided. Generally, the surface flooding is insignificant in the Project Area as a whole.

The surface drainage is considered fair to good in the alluvial plain, and excessive in some portions in the upland especially those on steep slopes. On the other hand, the internal drainage is generally fair to poor. This is attributed by soil texture which are medium to heavy. The permeability is low to moderate, and the depth of groundwater table is considered moderate to high. In most portions of the Project Area, rice production in both first and second cropping seasons is recommended and because of the unfavorable internal drainage and the shallow groundwater table, some areas are not suited to most diversified crops.

(2) Soil DrainageInvestigation

To determine the water transmitting properties of the Project Area soils, infiltration test, deep percolation test and hydraulic conductivity test were conducted by the NIA.

(a) Infiltration Test

Infiltration test was carried out to determine the rate of water intake into the surface soil during water application. TABLE V-2 shows the results of 13 tests made in the Project Area. The average infiltration rates (Iave) range from 0.006 to 0.12 cm/min.

(b) Deep Percolation Test

Deep percolation refers to the vertical movement of water per unit of time through a horizontal area in a saturated soil. The result of 10 tests conducted in the Project Area are presented in TABLE V-3 The percolation rates range from0.5 mm/day in sandy clay loam and clay soils to 1.1 mm/day in sandy loam soils.

(c) Hydraulic Conductivity

The hydraulic conductivity (k) represents the average water transmitting property of homogeneous and layered soils. The conductivity (k) was measured at 13 sites by the inverted auger-hole method above the groundwater table, and the results are presented in TABLE V-4 Considering the arithmetic, geometric means and the median of the observed hydraulic conductivity (k) in the fine-textured soil layers, the average k is 0.03 m/day or 3.4×10^{-5} cm/sec.

(3) Depth of Groundwater Table

Excessive soil moisture at saturated condition adversely affect the production of a variety of diversified crops. The introduction of irrigation the future might build-up the groundwater table considering the present depth which is moderate to high.

As shown in FIG. V-1 , 23 bore wells were used to observe the depth of water table in the Project Area. TABLE V-5 summarizes the groundwater table observed during the dry season.

TABLE V-1

SUMMARY OF PERMEABILITY TESTS [1/]

Soil Type	Infiltration Rate cm/min	Deep Percolation mm/day	Hydraulic Conductivity m/day
SaA	0.006 (SCL/C)-0.06 (SCL/SiC)	0.5 (SCL/C)-1.0 (SCL)	0.01 (C) - 0.24 (FSCL)
SaB	0.03 (CL/C)	0.7 (SCL/SCL)	0.01 (C)
BtA	0.04 (C/C)- 0.12 (SiC/SiC)	0.5 (C/C) - 0.6 (SC/C)	0.01 (C)
BaB	0.05 (SL/SCL)	1.1 (SL/SCL)	0.04 (SCL)

Note: 1/ Conducted from April to May 1982

RESULTS OF SOIL INFILTRATION TEST

LOCATION	LAND CLASS	LAND USE	SOIL TYPE	SOIL SURFACE/ SUB-SOIL	INFILTRATION RATE (cm/min) CUMULATIVE (Icum)	INSTANTANEOUS (I ins)	AVERAGE 2/ (Iave)	CLASS
1. Labigan, Sara	1R/1D	Pr	Sara A	SCL/C	$0.11t^{0.50}$	$0.06t^{-0.50}$	0.006	very slow
2. Apologista, Sara	1R/1D	Pr	Sara A	SC/SCL	$0.80t^{0.40}$	$0.32t^{-0.60}$	0.03	medium
3. Bato, Sara	1R/1D	PrI	Sara A	SCL/SC	$0.25t^{0.40}$	$0.10t^{-0.60}$	0.008	very slow
4. Pinay-Espinosa, Ajuy	1R/1D	PrI	Sara A	SCL/SiC	$1.10t^{0.30}$	$0.33t^{-0.70}$	0.02	very slow
5. Casa-Mata, Ajuy	1R/1D	Pr	Sara A	SCL/SiC	$1.0t^{0.50}$	$0.50t^{-0.50}$	0.06	medium
6. Aldeguer, Sara	2R/1D	Sc	Barotac B	SL/SCL	$0.80t^{0.50}$	$0.40t^{-0.50}$	0.05	medium
7. Tanduyan, Sara	1R/1D	Pr	Sara A	SCL/SiC	$0.70t^{0.50}$	$0.35t^{-0.50}$	0.04	medium
8. Agnaga, Concepcion	1R/3D	Pr	Bantog A	SiC/SiC	$1.30t^{0.60}$	$0.80t^{-0.40}$	0.12	very rapid 3/
9. Macalbang, Concepcion	1R/1D	Pr	Sara A	SCL/SiCL	$0.80t^{0.60}$	$0.48t^{-0.40}$	0.08	rapid
10. Siempre-Viva, Sn. Dionisio	2R/1D	Pr	Sara B	CL/C	$0.22t^{0.60}$	$0.13t^{-0.40}$	0.03	medium
11. Bondulan, Sn. Dionisio	1R/3D	Pr	Bantog A	C/C	$0.70t^{0.50}$	$0.35t^{-0.50}$	0.04	medium
12. Dugman, Sn. Dionisio	2R/1D	Pr	Sara B	SCL/C	$0.50t^{0.30}$	$0.15t^{-0.70}$	0.009	very slow
13. Alibayog, Sara	1R/1D	Pr	Sara A	SCL/SC	$0.10t^{0.80}$	$0.08t^{-0.20}$	0.03	medium

Notes: 1/ Conducted from April to May 1982 - (dry season)
2/ Average infiltration at t=300 minutes
3/ test sites with developed soil series

TABLE V-2

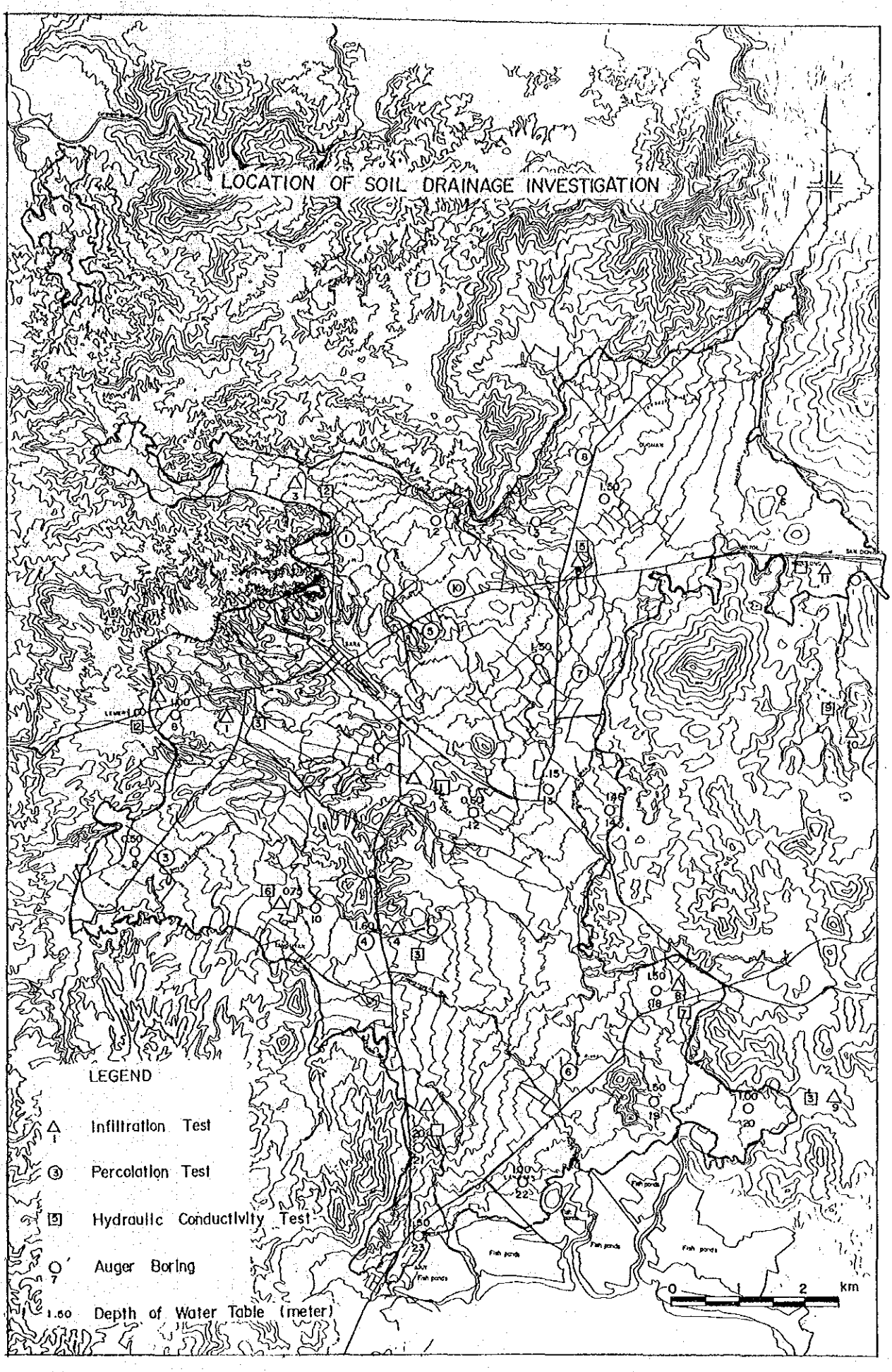

LOCATION OF SOIL DRAINAGE INVESTIGATION
LEGEND
Infiltration Test
Percolation Test
Hydraulic Conductivity Test
Auger Boring
1.60 Depth of Water Table (meter)
0 1 2 km

TABLE V-3

RESULTS OF DEEP PERCOLATION TEST

LOCATION	LAND CLASS	LAND USE	SOIL TYPE	SOIL SURFACE/SUB-SOIL	PERCOLATION RATE (mm/day)
1. Pasig, Sara	1R/1D	PrI	Sara A	SCL/C	0.50
2. Aguire, Sara	1R/1D	PrI	Sara A	SCL/SC	0.60
3. San Luis, Sara	1R/1D	PrI	Sara A	SCL/SCL	0.90
4. Pinay-Espinosa, Ajuy	1R/1D	PrI	Sara A	SCL/SiC	0.80
5. Nangka, Sara	2R/1D	PrI	Barotac B	SL/SCL	1.10
6. Lanjagan, Ajuy	1R/3D	PrI	Bantog A	C/C	0.50
7. Crespo, Sara	1R/3D	PrI	Bantog A	SC/C	0.60
8. Dugman, San Dionisio	2R/1D	PrI	Sara B	SCL/SCL	0.70
9. Tubli, San Dionisio	1R/1D	PrI	Sara A	SCL/SiCL	0.80
10. De Vera, Sara	1R/1D	PrI	Sara A	SCL/C	1.00
				Mean	0.80

1/ Conducted from April to May, 1982 - (dry season)

TABLE V-14

RESULTS OF HYDRAULIC CONDUCTIVITY TEST

LOCATION	LAND CLASS	LAND USE	SOIL TYPE	TEST ZONE (Soil Layer, cm)	K (meter per day)
1. Padios, Sara	1R/1D	Pr	Sara A	70-85 SC/85-100 SCL	0.04
2. Bato, Sara	1R/1D	Pr	Sara A	70-80 SCL	0.05
3. Pinay-Espinosa, Ajuy	1R/1D	Pr	Sara A	70-90 SCL/90-100 SC	0.02
4. Casa-Mata, Ajuy	1R/1D	Pr	Sara A	70-90 FSCL/90-100 SC	0.24
5. Aldeguer, Sara	2R/1D	Sc	Barotac B	70-100 SCL	0.04
6. Tanduyan, Sara	1R/1D	Pr	Sara A	70-100 SCL	0.04
7. Agnaga, Concepcion	1R/3D	Pr	Bantog A	70-100 SC	0.01
8. Macalbang, Concepcion	1R/1D	Pr	Sara A	70-100 SCL	0.02
9. Siempre-Viva, San Dionisio	1R/1D	Pr	Sara A	70-100 SC	0.01
10. Bondulan, San Dionisio	1R/3D	Pr	Bantog A	70-80 SC/80-100 C	0.01
11. Dugman, San Dionisio	2R/1D	Pr	Sara B	70-100 C	0.01
12. Alibuyog, Sara	1R/1D	Pr	Sara A	70-100 C	0.01
13. Amante, Sara	1R/1D	Pr	Sara A	70-100 C	0.01

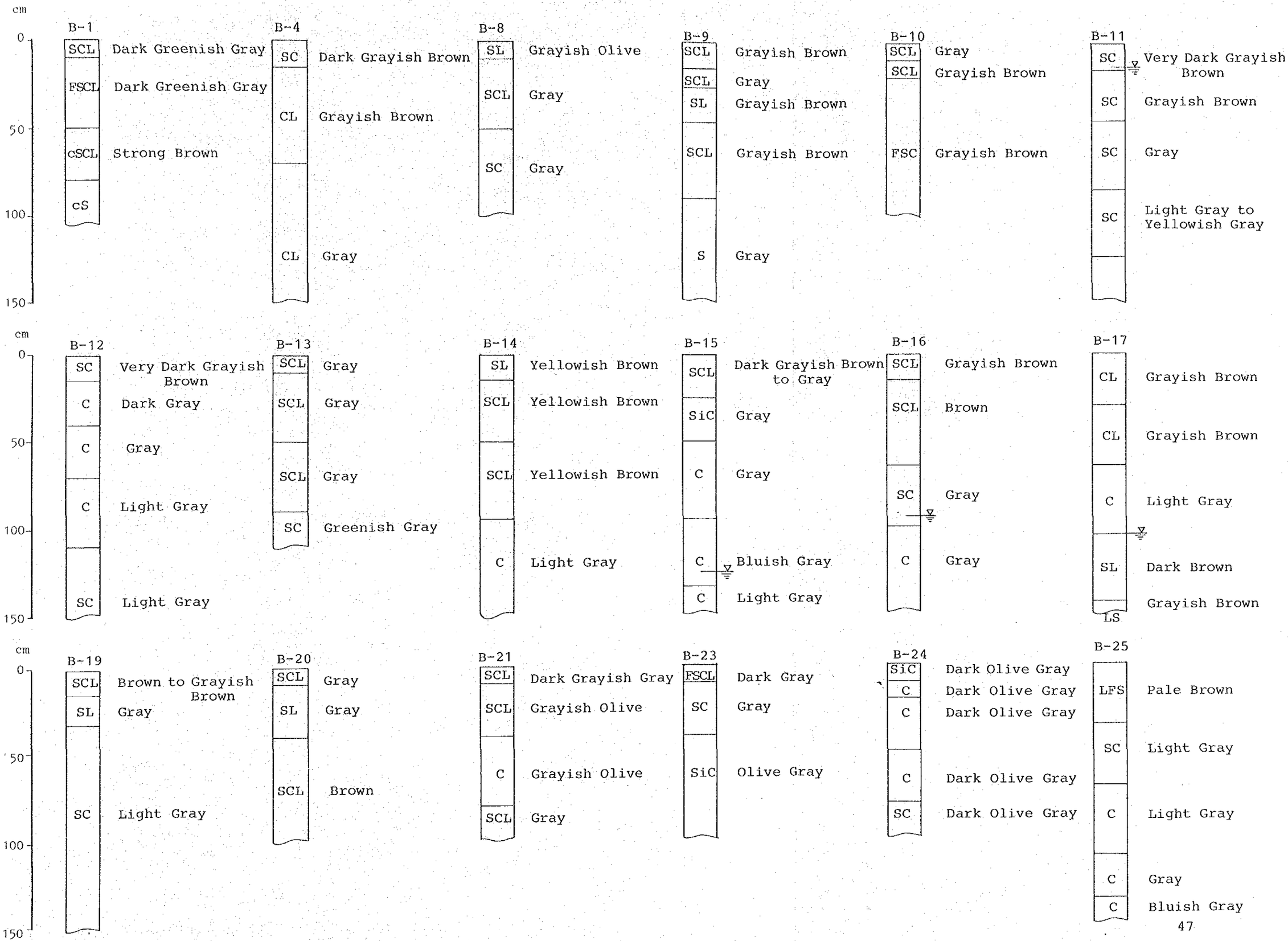
1/ Conducted from April to May, 1982 (dry season)

GROUNDWATER TABLE DEPTH

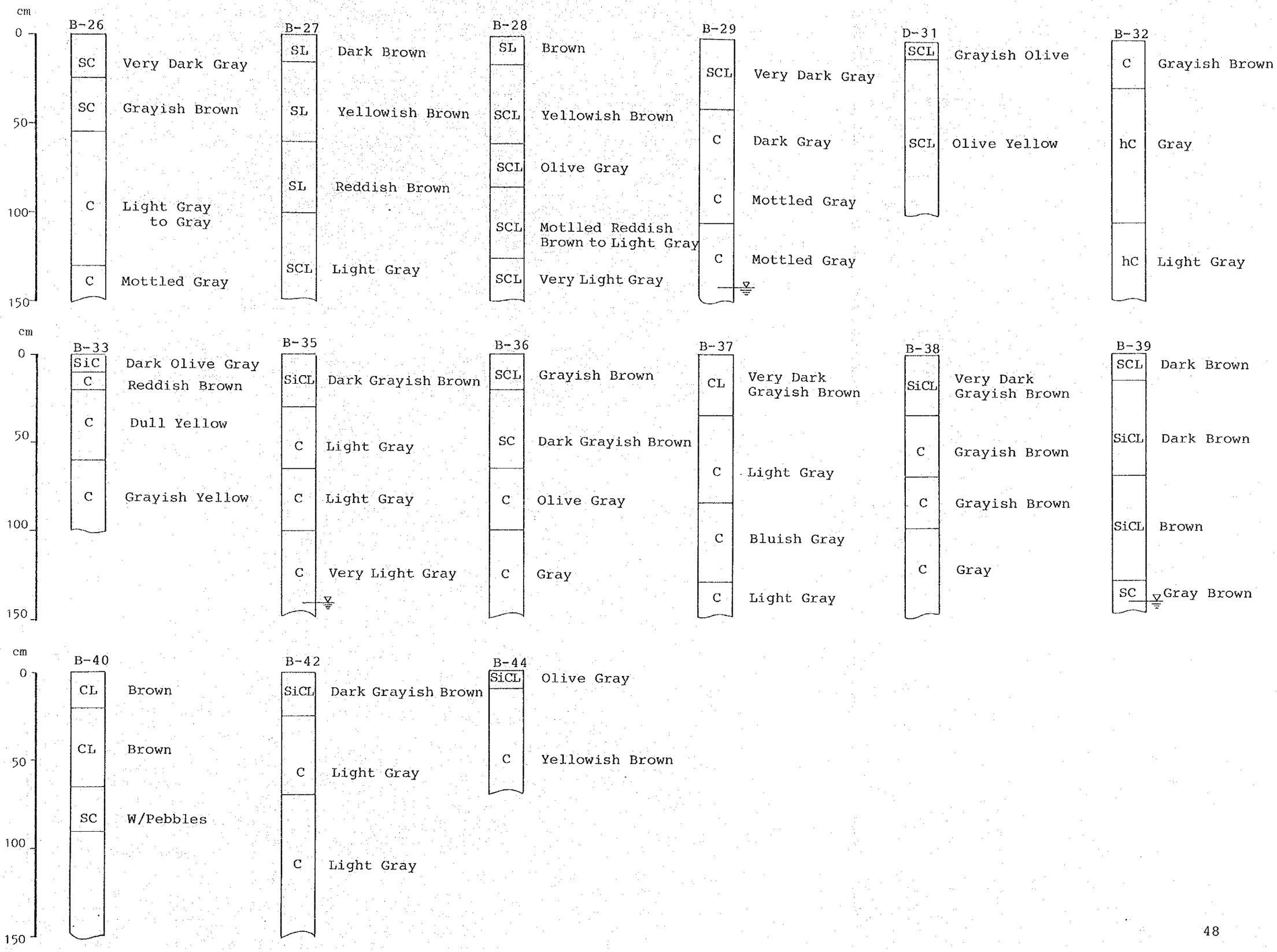
LOCATION	BORED WELL NUMBER	DEPTH (meters) from ground surface
1. Apologista, Sara	11	0.14
2. San Luis, Sara	9	0.50
3. Padios, Sara	12	0.60
4. Tanduyan, Sara	10	0.75
5. Bato, Sara	1	0.95
6. Alibuyog, Sara	8	1.00
7. Bunglas-Fuente, Ajuy	20	1.00
8. Lanjagan, Ajuy	22	1.00
9. Salcedo, Sara	13	1.15
10. Casa-Mata,Ajuy	21	1.20
11. Bato, Sara	2	1.25
12. Dugman, San Dionisio	3	1.40
13. Capinang, San Dionisio	4	1.40
14. Bondulan, San Dionisio	6	1.40
15. Salcedo, Sara	14	1.45
16. Dugman, San Dionisio	5	1.50
17. Crespo, Sara	15	1.50
18. Siempre-Viva, San Dionisio	16	1.50
19. Agnaga, Concepcion	18	1.50
20. Macalbang, Concepcion	19	1.50
21. Poblacion, Ajuy	23	1.50
22. Bondulan, San Dionisio	7	1.60
23. Pinay-Espinosa, Ajuy	17	1.20
MEAN		1.20

Measured April-May, 1982 (dry season)

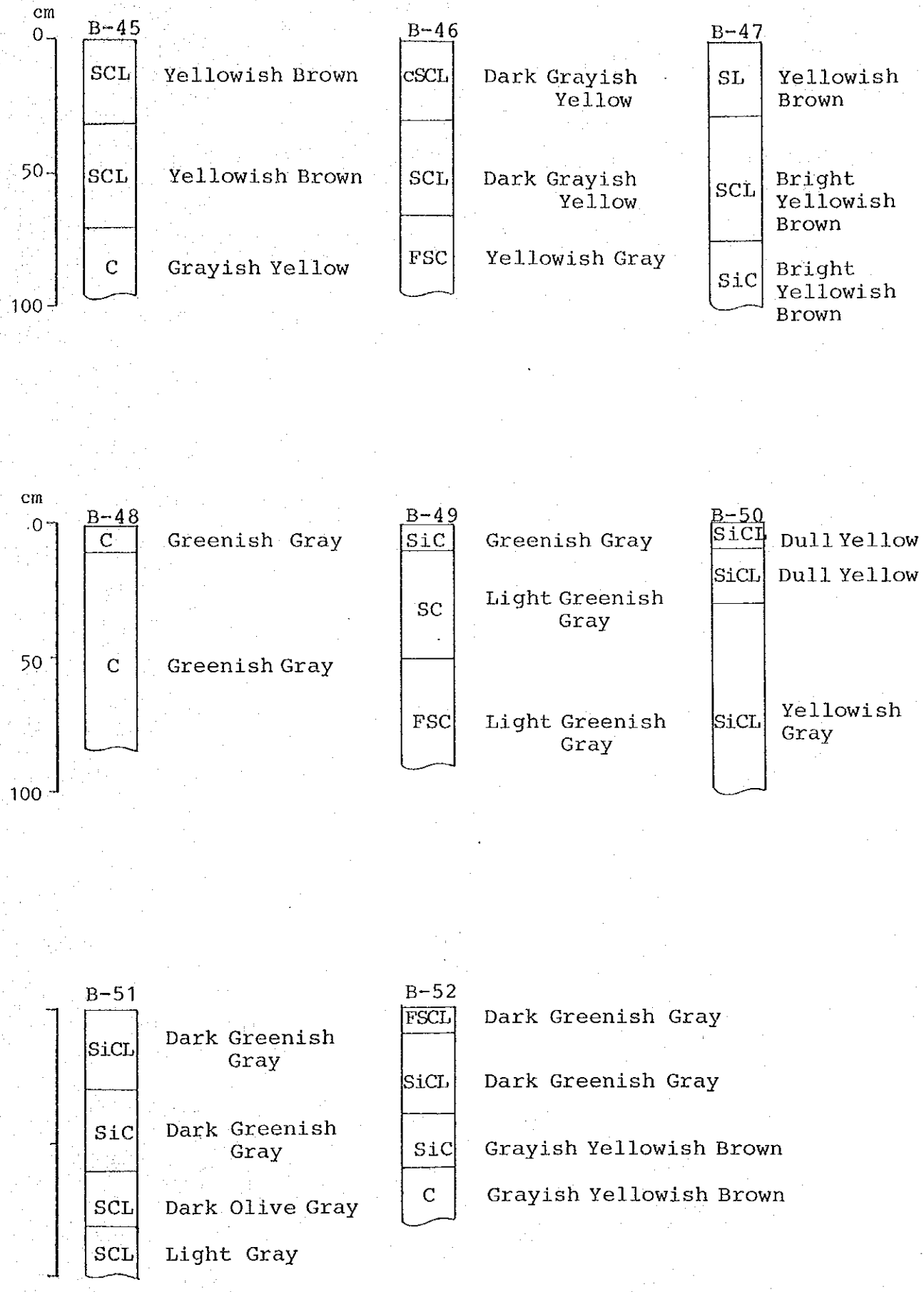
COLUMNAR SECTIONS OF SOIL PROFILES (1)



COLUMNAR SECTION OF SOIL PROFILES (2)



COLUMNAR SECTIONS OF SOIL PROFILES (3)



HYDROLOGY

Republic of the Philippines
Ministry of Health
Field Operations
Regional Health Office No. 6
REGIONAL HEALTH LABORATORY
Iloilo City

Deep Well

BACTERIOLOGICAL ANALYSIS

Date Collected 11-23-83
Time Collected 5:15 A.M.

Lab. No. 279
Date Rec'd 11/28

Source of Samples	Bacteria per cc Parasal at 37°C	Colon Aerogenes Group		Confirmatory Test	Completed Test Gram Stain	Residual Chlorine ppm	Time and Date Examined	Date Reported	Time Collected
		Presumptive Test 5-10 cc Lactose Broth							
Artesian well	58	Pos.	Pos.	Pos.	Pos. (+)	0.0	8:30	12/2	5:15 P.M.
Owner: Sara Municipal Waterworks System (Collected at Sara Public Market)							11/26		
Sara, Iloilo									

Remarks: The specimen is positive for intermediate coliform organisms. Bacterial count is within allowable number. Food & Drug Law, P.D. Intermediate coliform organisms are normally found in soil & water. Correlate results with physical situation of the source of specimen to evaluate its fitness for human consumption.

Collected by: L. Moreno PSI

J. Marin
(Examiner)

Noted:

ALICIA TAYAG SALDAÑA, M.D.
Pathologist

Shallow Well

Republic of the Philippines
Ministry of Health
Field Operations
Regional Health Office No. 6
REGIONAL HEALTH LABORATORY
Iloilo City

BACTERIOLOGICAL ANALYSIS

Date Collected 4-23-84
Time Collected 4:25A.M.

Lab. No. 445
Date Rec'd 4/23

Source of Samples	Bacteria per cc Paragar at 37°C	Colon Aerogenes Group: Presumptive Test 5-10 cc Lactose Broth	Colon Aerogenes Group: Confirmatory Test	Completed Test	Gram Stain	Residual Chlorine ppm	Time and Date Examined	Date Reported	Time Collected
Drilled pump well	418	Pos.	Pos.	Pos.	Gm.(-)	0.0	4/23 8:35A.M.	4/27	4:25A.M.
Owner: c/o Elmo Escrupulo									
Brgy. Aspera									
Sara, Iloilo									

Remarks: The specimen is positive for intermediate coliform organisms.

Collected by: E.Escrubalo

E.Marin
(Examiner)

Noted: By: AM.
ALICIA TAYAG SALDAÑA, M.D.
Pathologist

Shallow Well

Republic of the Philippines
Ministry of Health
Field Operations
Regional Health Office No. 6
REGIONAL HEALTH LABORATORY
Iloilo City

BACTERIOLOGICAL ANALYSIS

Date Collected 4-23-84
Time Collected 4:11A.M.

Lab. No. 444
Date Rec'd 4/23

Source of Samples	Bacteria per cc Paragar at 37°C	Colon Aerogenes Group: Presumptive Test 5-10 cc Lactose Broth	Colon Aerogenes Group: Confirmatory Test	Completed Test Gram Stain	Residual Chlorine ppm	Time and Date Examined	Date Reported	Time Collected
Drilled pump well	211	Pos. Pos.	Pos.	Gm.(-)	0.0	4/23 8:30A.M.	4/27	4:11A.M.
Owner: Simplicio Billones								
Brgy. Aspera								
Sara, Iloilo								

Remarks: The specimen is positive for intermediate coliform organisms.

Collected by: E.Escrupolo

E.Marin
(Examiner)

Noted:
ALICIA TAYAG SALDAÑA, M.D.
Pathologist

Republic of the Philippines
Ministry of Health
Field Operations
Regional Health Office No.6
REGIONAL HEALTH LABORATORY
Iloilo City

Sara Town

BACTERIOLOGICAL ANALYSIS

Date Collected 10-25-82

Lab. No 280
Date Rec'd 10-25-82

Source of Samples	Bacteria per cc Paragar at 37°C	Colon Aerogenes Group: Presumptive Test 5 - 10 cc Lactose Broth	Confirmatory Test	Completed Test Gram Stain	Residual Chlorine ppm	Date Examined	Date Reported	Time Collected
Spring water (Kitchen sink)	44	Neg. Neg.	None	None	0.0	10/25	10/27	4:51A.M.
Owner: c/o Elmo Escrupulo								
Water Service No. 18								
Mabini St.								
Sara, Iloilo								

Remarks The specimen is negative for coliform organisms.

Collected by Elmo Escrupulo
Water Works Supervisor

E.Marin
(Examiner)

NOTED:
ALICIA TAYAG SALDAÑA, M.D.
Pathologist

Ministry of Health
Field Operations
Regional Health Office, No.6
REGIONAL HEALTH LABORATORY
Iloilo City

BACTERIOLOGICAL ANALYSIS

Date Collected 3-21-83

Lab.No. 583
Date Rec'd 3-21-83

Source of Samples	Bacteria per cc Paragar at 37°C	Colon Aerogenes Group: Presumptive Test 5 - 10 cc Lactose Broth	Confirmatory Test	Completed Test Gram Stain	Residual Chlorine ppm	Date Examined	Date Reported	Time Collected
Spring water(S) (Treated)	95	Neg. Neg.	None	None	0.0	3/21	3/23	4:30A.M.
Owner: Water Service No. 383								
Sara Municipal Waterworks System								
Mabini St.								
Sara, Iloilo								

Remarks The specimen is negative for coliform organisms.

Collected by Mr. Elmo S. Escrupulo
Water Works Supervisor

E.Marin
(Examiner)

Noted: ALICIA TAYAG SALDAÑA, M.D.
Pathologist

Republic of the Philippines
Department of Health
Field Operations
Regional Health Office No.6
REGIONAL HEALTH LABORATORY
Iloilo City

Sara Town

BACTERIOLOGICAL ANALYSIS

Date Collected 10-27-80 Lab.No. 587
Date Rec'd 10-27-80

Source of Samples	Bacteria per cc Paragar at 37°C	Colon Aerogenes Group: Presumptive Test 5-10 cc Lactose Broth	Confirmatory Test	Completed Test Gram Stain	Residual Chlorine ppm	Date Examined	Date Reported	Time Collected
Treated Water	53	Neg. Neg.	None	None	0.0	10/27	10/29	5:30 AM
Owner: Waterworks System								
Sara Mun. Waterworks System								
Sara, Iloilo								

Remarks The specimen is negative for coliform organisms.

Collected by Elma Escampulo

(Examiner)

Noted: ALICIA TAYAG SALDAÑA,M.D.
Pathologist

Pls. see back ..

Republic of the Philippines
Ministry of Health
Field Operations
Regional Health Office No.6
REGIONAL HEALTH LABORATORY
Iloilo City

BACTERIOLOGICAL ANALYSIS

Date Collected 10-5-81 Lab. No. 1201-81
Date Rec'd 10-5-81

Source of Samples	Bacteria per cc Paragar at 37°C	Colon Aerogenes Group: Presumptive Test 5 - 10 cc Lactose Broth	Confirmatory Test	Completed Test Gram Stain	Residual Chlorine ppm	Date Examined	Date Reported	Time Collected
Spring water (Treated)	57	Neg. Neg.	None	None	0.0	10/5	10/7	3:32A.M.
Owner: Fire Hydrant Aspera Mabini junction								
Sara Mun. Waterworks Sys.								
Sara, Iloilo								

Remarks The specimen is negative for coliform organisms.

E.Marin
(Examiner)

Collected by Elma Escampulo

rja/81

NOTED: ALICIA TAYAG SALDAÑA,M.D.
Pathologist

GEOLOGY

soils science laboratory
mtcs, nia-region 6
iloilo city

RF-101-84

SUMMARY OF ROCK TEST
(ASUE PROJECT)

DDH - R_2

Sample Number			SPLE.NO. 1	SPLE.NO. 2	SPLE.NO. 3	
Sample Depth		m.				
Rock Type						
Rock Classification						
Specific Gravity	Bulk (Dry)		2.822	2.785	2.879	
	Bulk (SSD)		2.846	2.814	2.901	
	Apparent		2.892	2.868	2.944	
Coefficient of Absorption		%	2.420	1.044	0.761	
Density	Dry	gm./cm^3	2.753	2.784	2.804	
	Wet	gm./cm^3	2.773	2.797	2.823	
Effective Void Ratio			0.02445	0.02905	0.02189	
Porosity		%	2.417	2.894	2.208	
Water Content		%	0.74	0.46	0.66	
Degree of Saturation		%	98.614	97.554	97.027	
Soundness Test (Na_2SO_4)		% Loss After 5 Test Cycle	6.022	6.973	12.626	

Submitted To:
Engr. Ric Demaculangan
11/18/84

soils science laboratory
mtcs, nia-region 6
iloilo city
F - D - 84

Report No. AP - 05
Sheet 7 of 20
Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUS RIVER PROJECT
Location: SARA, ILOILO
Requested by: ANTONIO SANTOS
Source: CORE RECOVERY MATERIAL
Laboratory Sample No.: AP - ST - 04

Sampled by: ANTONIO SANTOS
Sampled at: JOBSITE, SARA, ILOILO
Sampled on: OCTODER 8,1984
Quarry Designation: DDH - R_2 ; SAMPLE NO. 1
Core Depth:

PURPOSE: TO DETERMINE PERCENT LOSS OF TOTAL SAMPLE AFTER FIVE TEST CYCLE ON Na_2SO_4.
DATE STARTED: OCTOBER 25,1984; DATE CONCLUDED: NOVEMBER 12,1984.

SIEVE SIZE (Mm.)	CYCLE NO.	INITIAL DRY WEIGHT OF TEST FRACTIONS BEFORE TEST (grams)	FINAL DRY WEIGHT OF TEST FRACTIONS AFTER TEST (grams)	LOSS OF WEIGHT, (grms.)	PERCENT LOSS	WEIGHTED PERCENT LOSS	
40	01	1,998.00	1,995.80	2.20	0.1101	0.1101	10/26
to	2	1,995.80	1,994.90	0.90	0.0451	0.1552	10/30
20	3	1,994.90	1,992.40	2.50	0.1253	0.2803	10/31
	4	1,992.40	1,985.40	7.00	0.3513	0.6306	11/7
	5	1,985.40	1,971.70	13.70	0.6900	1.3163	11/12
20	01	501.00	500.00	1.00	0.1996	0.1996	10/26
to	2	500.00	499.80	0.20	0.0400	0.2395	10/30
10	3	499.80	499.00	0.80	0.1601	0.3992	10/31
	4	499.00	496.90	2.10	0.4210	0.8184	11/7
	5	496.90	494.60	2.10	0.423	1.2375	11/12
10	01	100.03	99.82	0.21	0.2099	0.2099	10/26
to	2	99.82	99.53	0.29	0.2905	0.4998	10/30
5	3	99.53	99.20	0.33	0.3316	0.8298	10/31
	4	99.20	99.07	0.13	0.1310	0.9597	11/7
	5	99.07	98.85	0.22	0.2221	1.1796	11/12
5	01	100.00	97.89	2.11	2.11	2.11	10/26
to	2	97.89	96.15	1.74	1.78	3.85	10/30
2.5	3	96.15	95.40	0.75	0.78	4.60	10/31
	4	95.40	93.28	2.12	2.22	6.72	11/7
	5	93.28	92.58	0.70	0.75	7.42	11/12

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iloilo city

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Report No. AP - 05

8 20

Date

TEST FOR SOUNDNESS OF ROCKS

Project: [illegible]
Location: [illegible]
Requested by: [illegible]
Source: [illegible]
Laboratory Sample No.: AP - ST - 04

Sampled by: ANTONIO SANTOS
Sampled at: [illegible], ILOILO
Sampled on: [illegible]
Quarry Designation: [illegible]
Core Depth:

PURPOSE:

SIEVE SIZE (Mm.)	CYCLE NO.	INITIAL DRY WEIGHT OF TEST FRACTIONS BEFORE TEST (grams)	FINAL DRY WEIGHT OF TEST FRACTIONS AFTER TEST (grams)	LOSS OF WEIGHT (grms.)	PERCENT LOSS	WEIGHTED PERCENT LOSS	
2.5	01	100.00	97.51	2.49	2.49	2.49	10/26
to	2	97.51	94.98	2.53	2.59	5.02	10/30
1.2	3	94.98	93.59	1.39	1.46	6.41	10/31
	4	93.59	91.41	2.18	2.33	8.59	11/7
	5	91.41	90.54	0.87	0.95	9.46	11/12
1.2	01	100.00	96.29	3.71	3.71	3.71	10/26
to	2	96.29	94.30	1.99	2.07	5.70	10/30
0.6	3	94.30	92.63	1.67	1.77	7.37	10/31
	4	92.63	91.17	1.46	1.58	8.83	11/7
	5	91.17	90.43	0.74	0.81	9.57	11/12
0.6	01	100.00	95.14	4.86	4.86	4.86	10/26
to	2	95.14	93.08	2.06	2.16	6.92	10/30
0.3	3	93.08	90.85	2.23	2.40	9.15	10/31
	4	90.85	88.96	1.89	2.08	11.04	11/7
	5	88.96	88.03	0.93	1.04	11.97	11/12
		AVERAGE LOSS FOR GRAVEL =		1.244	%		
		AVERAGE LOSS FOR SAND =		9.605	%		
		TOTAL AVERAGE LOSS =		6.022	%		
			— END —				

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iloilo city

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Report No. AP - 05

9 20

Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUE RIVER PROJECT
Sampled by: ANTONIO SANTOS

Location: SARA, ILOILO
Sampled at: JOBSITE, SARA, ILOILO

Requested by: ANTONIO SANTOS
Sampled on: OCTOBER 9,1984

Source: CORE RECOVERY MATERIAL
Quarry Designation: DDH - R_2 ; SAMPLE NO. 2

Laboratory Sample No.: AP - ST - 05
Core Depth:

PURPOSE: TO DETERMINE PERCENT LOSS OF TOTAL SAMPLE AFTER FIVE TEST CYCLE ON Na_2SO_4;
DATE STARTED: OCTOBER 29,1984 ; DATE CONCLUDED: NOVEMBER 12,1984

SIEVE SIZE (Mm.)	CYCLE NO.	INITIAL DRY WEIGHT OF TEST FRACTIONS BEFORE TEST (grams)	FINAL DRY WEIGHT OF TEST FRACTIONS AFTER TEST (grams)	LOSS OF WEIGHT (grms.)	PERCENT LOSS	WEIGHTED PERCENT LOSS	
40	01	2,008.70	2,005.90	2.80	0.1394	0.1394	10/30
to	2	2,005.90	2,002.80	3.10	0.1545	0.2937	10/31
20	3	2,002.80	2,000.70	2.10	0.1048	0.3963	11/7
	4	2,000.70	1.996.30	4.40	0.2199	0.6173	11/8
	5	1,996.30	1,993.00	3.30	0.1653	0.7816	11/12
20	01	500.70	499.50	1.20	0.2397	0.2397	10/30
to	2	499.50	498.70	0.80	0.1602	0.3994	10/31
10	3	498.70	496.90	1.80	0.3609	0.75.89	11/7
	4	496.90	495.40	1.50	0.3019	1.0585	11/8
	5	495.40	494.40	1.00	0.2018	1.2582	11/12
10	01	100.44	99.40	1.04	1.035	1.035	10/30
to	2	99.40	98.36	1.04	1.046	2.0709	10/31
5	3	98.36	97.11	1.25	1.271	3.3154	11/7
	4	97.11	96.67	0.45	0.4531	3.7535	11/8
	5	96.67	96.43	0.24	0.2483	3.9924	11/12
5	01	100.00	93.99	6.01	6.01	6.01	10/30
to	2	93.99	89.69	4.30	4.57	10.31	10/31
2.5	3	89.69	88.08	1.61	1.80	11.92	11/7
	4	88.08	86.10	1.98	2.25	13.90	11/8
	5	86.10	85.99	0.11	0.13	14.01	11/12

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iloilo city

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Report No. AP - 05

10 20

Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUE RIVER PROJECT
Sampled by: ANTONIO SANTOS
Location: SARA, ILOILO
Sampled at: VOLCITE, SARA, ILOILO
Requested by: ANTONIO SANTOS
Sampled on: OCTOBER 8,1984
Source: CORE RECOVERY MATERIAL
Quarry Designation: DDH - R_2 ; SAMPLE NO. 2
Laboratory Sample No.: AP - ST - 05
Core Depth:

PURPOSE:

SIEVE SIZE (Mm.)	CYCLE NO.	INITIAL DRY WEIGHT OF TEST FRACTIONS BEFORE TEST (grams)	FINAL DRY WEIGHT OF TEST FRACTIONS AFTER TEST (grams)	LOSS OF WEIGHT (grms.)	PERCENT LOSS	WEIGHTED PERCENT LOSS	
2.5	01	100.00	97.07	2.93	2.93	2.93	10/30
to	2	97.07	94.89	2.18	2.18	5.11	10/31
1.2	3	94.89	92.74	2.15	2.26	7.26	11/7
	4	92.74	91.61	1.13	1.22	8.39	11/8
	5	91.61	91.21	0.40	0.44	8.79	11/12
1.2	01	100.00	95.62	4.38	4.38	4.38	10/30
to	2	95.62	94.02	1.60	1.67	5.98	10/31
0.6	3	94.02	92.18	1.84	1.96	7.82	11/7
	4	92.18	91.45	0.73	0.79	8.55	11/8
	5	91.45	91.21	0.24	0.26	8.79	11/12
0.6	01	100.00	94.41	5.59	5.59	5.59	10/30
to	2	94.41	92.31	2.10	2.22	7.69	10/31
0.3	3	92.31	90.70	1.61	1.74	9.30	11/7
	4	90.70	89.28	1.42	1.56	10.72	11/8
	5	89.28	88.81	0.47	0.53	11.19	11/12
		AVERAGE LOSS FOR GRAVEL = 2.011 %					
		AVERAGE LOSS FOR SAND =10.695 %					
		TOTAL AVERAGE LOSS = 6.913 %					
			— END —				

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iloilo city

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Report No. AP - 05

11 20

Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUE RIVER PROJECT
Location: SARA, ILOILO
Requested by: ANTONIO SANTOS
Source: CORE RECOVERY MATERIAL
Laboratory Sample No.: AP - ST - 06

Sampled by: ANTONIO SANTOS
Sampled at: JOBSITE, SARA, ILOILO
Sampled on: OCTOBER 8,1984
Quarry Designation: DDH - F_2 ; SAMPLE NO. 3
Core Depth:

PURPOSE: TO DETERMINE PERCENT LOSS OF TOTAL SAMPLE AFTER FIVE TEST CYCLE ON Na_2SO_4.
DATE STARTED: NOVEMBER 6,1984 ; DATE CONCLUDED: NOVEMBER 14,1984.

SIEVE SIZE (Mm.)	CYCLE NO.	INITIAL DRY WEIGHT OF TEST FRACTIONS BEFORE TEST (grams)	FINAL DRY WEIGHT OF TEST FRACTIONS AFTER TEST (grams)	LOSS OF WEIGHT (grms.)	PERCENT LOSS	WEIGHTED PERCENT LOSS	
40	01	2,004.30	2,002.00	2.30	0.1148	0.1148	11/7
to	2	2,002.00	1,984.60	17.40	0.8691	0.9829	11/9
20	3	1,984.60	1,967.30	17.30	0.8717	0.8460	11/12
	4	1,967.30	1,928.60	38.70	0.9672	3.7769	11/13
	5	1,928.60	1,913.40	15.20	0.7881	4.5352	11/14
20	01	509.20	502.40	6.80	0.3354	1.3354	11/7
to	2	502.40	488.90	13.50	2.6871	3.9866	11/9
10	3	486.90	476.92	11.98	2.4504	6.3394	11/12
	4	476.92	462.70	14.22	2.9816	9.1320	11/13
	5	462.70	459.00	3.70	0.7996	9.8586	11/14
10	01	100.31	99.37	0.94	0.9371	0.9371	11/7
to	2	99.37	97.28	2.09	2.1032	3.0206	11/9
5	3	97.28	96.60	0.68	0.6990	3.6985	11/12
	4	96.60	94.98	1.62	1.6770	5.3135	11/13
	5	94.98	94.22	0.76	0.8002	6.0712	11/14
5	01	100.00	94.55	5.45	5.45	5.45	11/7
to	2	94.55	91.09	3.46	3.66	8.91	11/9
2.5	3	91.09	87.96	3.13	3.66	8.91	11/12
	4	87.96	84.89	3.07	3.49	15.11	
	5	84.89	82.92	1.97	2.32	17.08	

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F - D - 84

Report No. AP - 05

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Date

TEST FOR SOUNDNESS OF ROCKS

Project: AGUF RIVER PROJECT
Sampled by: ANTONIO SANTOS
Location: SARA, ILOILO
Sampled at: A JOBSITE, SARA, ILOILO
Requested by: ANTONIO SANTOS
Sampled on: OCTOBER 8,1984
Source: CORE RECOVERY MATERIAL
Quarry Designation: TDH - R_2; SAMPLE NO. 3
Laboratory Sample No.: AP - ST - 06
Core Depth:

PURPOSE:

SIEVE SIZE (Mm.)	CYCLE NO.	INITIAL DRY WEIGHT OF TEST FRACTIONS BEFORE TEST (grams)	FINAL DRY WEIGHT OF TEST FRACTIONS AFTER TEST (grams)	LOSS OF WEIGHT (grms.)	PERCENT LOSS	WEIGHTED PERCENT LOSS	
2.5	01	100.00	91.90	8.10	8.10	8.10	11/7
to	2	91.90	88.53	3.37	3.67	11.47	11/9
1.2	3	88.53	86.39	2.14	2.42	13.61	11/12
	4	86.39	83.93	2.46	2.85	16.07	11/13
	5	83.93	81.76	2.17	2.65	18.24	11/14
1.2	01	100.00	91.58	8.42	8.42	8.42	11/7
to	2	91.58	89.84	1.74	1.90	10.16	11/9
0.6	3	89.84	88.53	1.31	1.46	11.47	11/12
	4	88.53	86.22	2.31	2.61	13.78	11/13
	5	86.22	83.57	2.65	3.07	16.43	11/14
0.6	01	100.00	92.10	7.90	7.90	7.90	11/7
to	2	92.10	90.43	1.67	1.81	9.57	11/9
0.3	3	90.43	88.95	1.48	1.64	11.05	11/12
	4	88.95	86.99	1.96	2.20	13.01	11/13
	5	86.99	83.83	3.16	3.63	16.17	11/14

AVERAGE LOSS FOR GRAVEL = 6.822 %
AVERAGE LOSS FOR SAND = 16.980 %
TOTAL AVERAGE LOSS = 12.626 %

— END —

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F - C - 84

Report No. AP - 05
Sheet 4 of 10
Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUE RIVER PROJECT
Location: SARA , ILOILO
Requested by: ANTONIO SANTOS
Source: CORE RECOVERY MATERIALS
Laboratory Sample No.: AP - ST - 04

Sampled by: ANTONIO SANTOS
Sampled at: JOBSITE, SARA , ILOILO
Sampled on: OCTOBER 8, 1984
Quarry Designation: DDH - R2; SAMPLE NO. 1
Core Depth:

PURPOSE: **Note: Cracking and splitting of sample particles into irriguler slabs was observed on the 4th and 5th sycle fractions (40 mm. to 10 mm.).**

SIEVE SIZE PASSING mm.	SIEVE SIZE RETAINED mm.	TYPICAL GRADING PERCENT	WEIGHT OF TEST FRACTIONS BEFORE TEST, grams	WEIGHT OF TEST FRACTIONS AFTER TEST, grams	DIFFERENCE IN WEIGHT grams	ACTUAL PERCENT LOSS BY DIFFERENCE	WEIGHTED AVERAGE (CORRECTED PERCENT LOSS)
COARSE MATERIAL							
40	20		1,998.00	1,971.70	26.30	1.3163	
20	10		501.00	494.80	6.20	1.2375	
10	5		100.03	98.85	1.18	1.1796	
TOTALS			2,599.03	2,565.35			
FINE MATERIAL							
5	2.5		100.00	92.58	7.42	7.42	
2.5	1.2		100.00	90.54	9.46	9.46	
1.2	0.6		100.00	90.43	9.57	9.57	
0.6	0.3		400.00	88.03	11.97	11.97	
TOTALS			400.00	361.58			

TESTED BY:
HENRY D. DASMARIÑAS
Laboratory Technician

CHECK AND SUPERVISED BY:
ROMIE B. JACORIN
Laboratory In-Charge

NOTED BY:
EDMUNDO B. MEDIAVILLA
Materials Testing Supervisor

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F - C - 84

Report No. AP - 05
Sheet 5 of 10
Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUE RIVER PROJECT
Location: SARA , ILOILO
Requested by: ANTONIO SANTOS
Source: CORE RECOVERY MATERIALS
Laboratory Sample No.: AP - ST - 05

Sampled by: ANTONIO SANTOS
Sampled at: JOBSITE , SARA, ILOILO
Sampled on: OCTOBER 8, 1984
Quarry Designation: TDH - R2 SAMPLE NO. 2
Core Depth:

PURPOSE: Note: Maximum loss of weight was observed commonly on the first cycle.

SIEVE SIZE PASSING mm.	SIEVE SIZE RETAINED mm.	TYPICAL GRADING PERCENT	WEIGHT OF TEST FRACTIONS BEFORE TEST, grams	WEIGHT OF TEST FRACTIONS AFTER TEST, grams	DIFFERENCE IN WEIGHT grams	ACTUAL PERCENT LOSS BY DIFFERENCE	WEIGHTED AVERAGE (CORRECTED PERCENT LOSS)
COARSE MATERIAL							
40	20		2,008.70	1,993.00	15.70	0.7816	
20	10		500.70	494.40	6.30	1.2582	
10	5		100.44	96.43	4.01	3.9924	
TOTALS			2,609.84	2,583.83			
FINE MATERIAL							
5	2.5		100.00	85.99	14.01	14.01	
2.5	1.2		100.00	91.21	8.79	8.79	
1.2	0.6		100.00	91.21	8.79	8.79	
0.6	0.3		100.00	88.81	11.19	11.19	
TOTALS			400.00	357.22			

TESTED BY:
HENRY D. DASMARINAS
Laboratory Technician

CHECK AND SUPERVISED BY:
RONIE B. JAGORIN
Laboratory In-Charge

NOTED BY:
EDMUNDO S. MEDIAVILLA
Materials Testing Supervisor

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Report No. AP - 05
Sheet 6 of 10
Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUE RIVER PROJECT
Location: SARA , ILOILO
Requested by: ANTONIO SANTOS
Source: CORE RECOVERY MATERIALS
Laboratory Sample No.: AP - ST - 06

Sampled by: ANTONIO SANTOS
Sampled at: JOBSITE, SARA, ILOILO
Sampled on: OCTOBER 8, 1984
Quarry Designation: DDH - R2; SAMPLE NO.3
Core Depth:

PURPOSE: **Note: Great loss of weight from cycle no. 1 , 2 and 3 of coarse fractions was attributed to a certain rock making mineral content which ultimately reacted with the solution and become unstable, weakening the sample mass to create gradual splitting.**

SIEVE SIZE PASSING mm.	SIEVE SIZE RETAINED mm.	TYPICAL GRADING PERCENT	WEIGHT OF TEST FRACTIONS BEFORE TEST, grams	WEIGHT OF TEST FRACTIONS AFTER TEST, grams	DIFFERENCE IN WEIGHT grams	ACTUAL PERCENT LOSS BY DIFFERENCE	WEIGHTED AVERAGE (CORRECTED PERCENT LOSS)
COARSE MATERIAL							
40	20		2,004.30	1,913.40	90.90	4.5352	
20	10		509.20	459.00	50.20	9.8586	
10	5		100.31	99.37	0.94	6.0712	
TOTALS			2,613.91	2,471.77			
FINE MATERIAL							
5	2.5		100.00	82.92	17.08	17.08	
2.5	1.2		100.00	91.90	18.24	18.24	
1.2	0.6		100.00	83.57	16.43	16.43	
0.6	0.3		100.00	83.83	16.17	16.17	
TOTALS			400.00	342.22			

TESTED BY:
HENRY D. DASMARIÑAS
Laboratory Technician

CHECK AND SUPERVISED BY:
RONIE B. JACORIN
Laboratory In-Charge

NOTED BY:
EDMUNDO S. MEDIAVILLA
Materials Testing Supervisor

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SUMMARY OF ROCK TEST
(ASUE PROJECT)

DDH - B3

Sample Number			SPLE.NO. 1	SPLE.NO. 2	SPLE.NO. 3	SPLE.NO. 4
Sample Depth		m.				
Rock Type						
Rock Classification						
Specific Gravity	Bulk (Dry)		2.405	2.460	2.570	2.701
	Bulk (SSD)		2.520	2.597	2.636	2.733
	Apparent		2.719	2.725	2.752	2.797
Coefficient of Absorption		%	4.803	3.964	2.569	1.213
Density	Dry	gm./cm^3	2.364	2.512	2.580	2.758
	Wet	gm./cm^3	2.466	2.570	2.641	2.781
Effective Void Ratio			0.11380	0.09653	0.06612	0.03272
Porosity			11.548	9.725	6.577	3.294
Water Content		%	3.46	2.24	1.97	0.85
Degree of Saturation			88.474	90.523	93.778	96.201
Soundness Test (Na_2SO_4)		% Loss After 5 Test Cycle	57.175	55.940	29.143	8.988

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Report No. AP - 05
Sheet 7 of 10
Date

TEST FOR SOUNDNESS OF ROCKS

Project: ASUE RIVER PROJECT
Location: SARA , ILOILO
Requested by: ANTONIO SANTOS
Source: CORE RECOVERY MATERIALS
Laboratory Sample No.: AP - ST - 07

Sampled by: ANTONIO SANTOS
Sampled at: JOBSITE, SARA, ILOILO
Sampled on: OCTOBER 8, 1984
Quarry Designation: DDH - R$_3$; SAMPLE NO. 1
Core Depth:

PURPOSE:

SIEVE SIZE PASSING mm.	SIEVE SIZE RETAINED mm.	TYPICAL GRADING PERCENT	WEIGHT OF TEST FRACTIONS BEFORE TEST, grams	WEIGHT OF TEST FRACTIONS AFTER TEST, grams	DIFFERENCE IN WEIGHT grams	ACTUAL PERCENT LOSS BY DIFFERENCE	WEIGHTED AVERAGE (CORRECTED PERCENT LOSS)
			COARSE MATERIAL				
40	20		2007.60	713.90	1,293.70	64.4401	
20	10		502.30	110.10	392.20	78.0808	
10	5		100.03	24.27	75.76	75.7378	
TOTALS			2,609.93	848.27			
			FINE MATERIAL				
5	2.5		100.00	27.14	72.86	72.86	
2.5	1.2		100.00	50.40	49.60	49.60	
1.2	0.6		100.00	71.75	28.25	28.25	
0.6	0.3		100.00	68.74	31.26	31.26	
TOTALS			400.00	218.03			

TESTED BY:
HENRY D. DASMARIÑAS
Laboratory Technician

CHECK AND SUPERVISED BY:
RONIE B. JAGORIN
Laboratory In-Charge

NOTED BY:
EDMUNDO S. MEDIAVILLA
Materials Testing Supervisor