COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept. 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TP ~ 0 L (0.5 m ~ 1.2 m	TESTED BY (ESSAI PAR)	Bina Murgu L.

MOULD (MOULE)	No 1	WEIGHT (POIDS)	2015 g	INSIDE DIAMETER (DIAMÈTRE INT.)	10.2 cm	CAPACITY (CAPACITÉ)	942 cm³
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE)	30 cm	BLOWS PER LAYER (NOMBRE DE COUPS PAR COUCHE)	25	NUMBER OF LAYERS (NOMBRE DE COUCHE)	3

MATERIAL USED FOR SPECIMENS (MATÉRIAU CHOISI POUR DU LES SPÉCIMENS) REPROCESSING-DIFFERENT (RECONDITIONNÉ-AUTRE)

SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI) AIR DRIED-NOT DRIED (SÉCHÉ À L'AIR LIBRE-NON SÉCHÉ)

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w_n 27.9 %

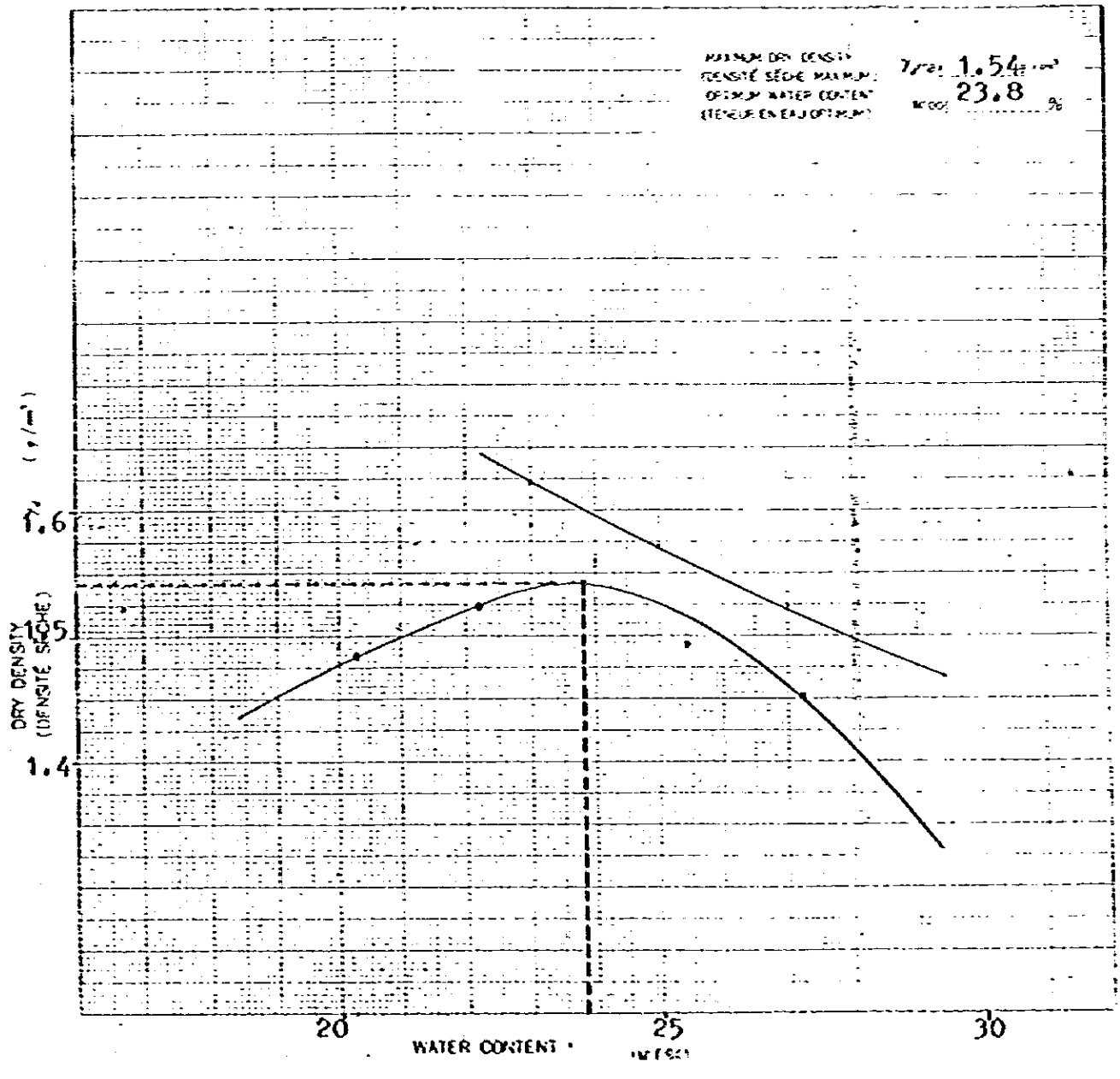
WATER CONTENT AFTER AIRDRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) - %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.59

MAX GRAIN SIZE ALLOWED (GRANULOMÉTRE MAXIMUM ADMIS) 4.76 mm

% OF MATERIAL OVER THE MAX GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRE SUPÉRIEURE À CELLE ADMISE) %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d g/cm³	1.483	1.522	1.542	1.492	1.453			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w_m (%)	20.3	22.2	23.8	25.4	27.2			



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept , 1981
SAMPLE NO & DEPTH (N°DE L'ÉCHANTILLON ET PROFONDEUR)	TP - 1 (0.5 m - 2.5 m)	TESTED BY (ESSAI PAR)	Bina Marga L.

MOULD (MOULE)	No 1	WEIGHT (POIDS) 2015 g	INSIDE DIAMETER (DIAMÈTRE INT.) 10.2 cm	CAPACITY (CAPACITÉ) 942 cm³	
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE) 30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE) 25	NUMBER OF LAYERS (NOMBRE DE COUCHE) 3	
MATERIAL USED FOR SPECIMENS (MATÉRIAU UTILISÉ POUR DU LES SPÉCIMENS)	REPROCESSED-DIFFERENT (RECONDITIONNÉ-AUTRE)	SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI)	AIR DRIED-NOT DRIED (SÉCHÉ À L'AIR LIBRE-NON SÉCHÉ)		

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w_n 36.7 %

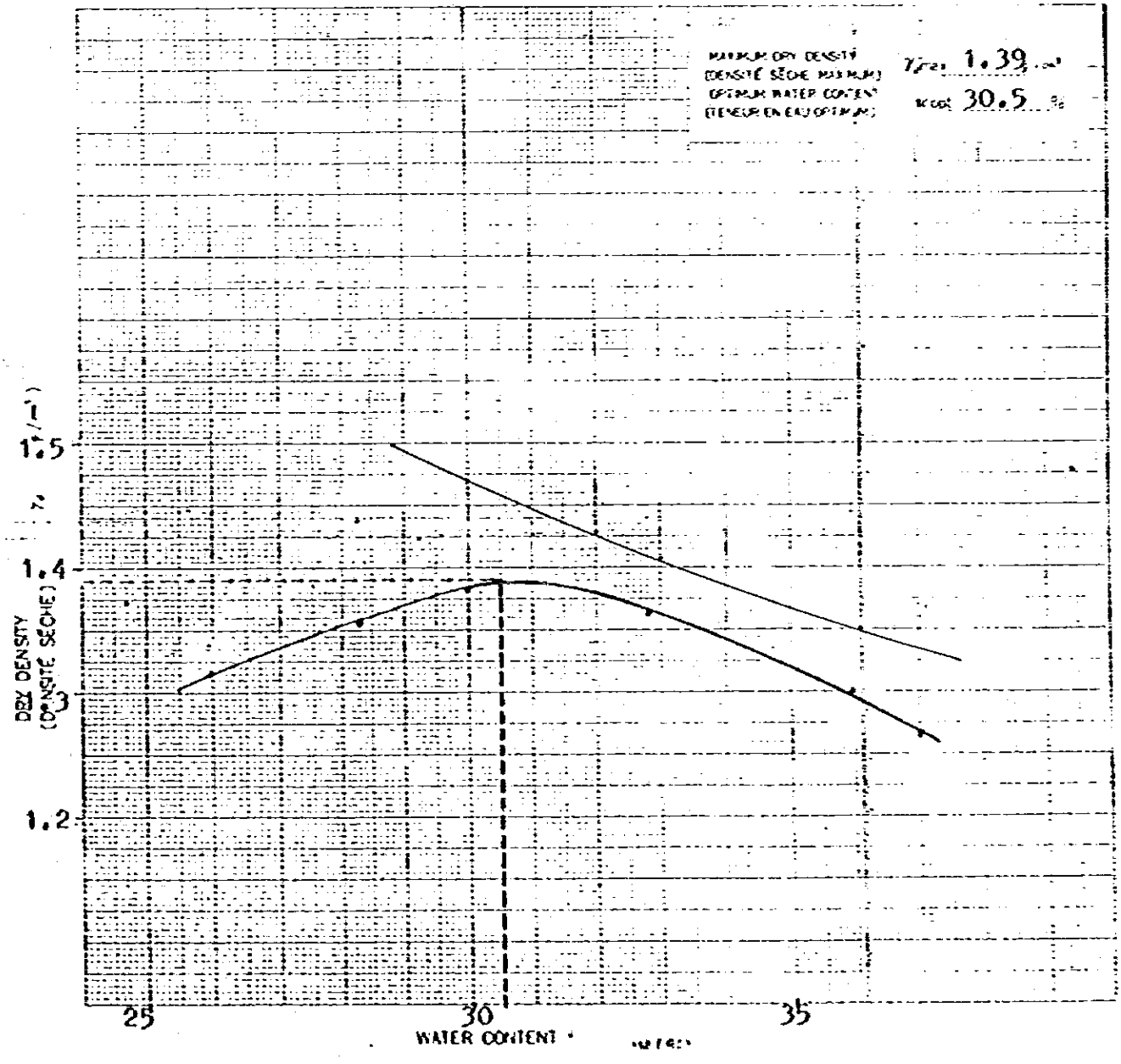
WATER CONTENT AFTER AIR DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) - %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.63

MAX. GRAIN SIZE ALLOWED (GRANULOMÉTRIE MAXIMUM ADMISE) 4.76 mm

% OF MATERIAL OVER THE MAX. GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRIE SUPÉRIEURE À CELLE ADMISE) - %

TEST NO (N°DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d (g/cm³)	1.315	1.355	1.384	1.365	1.305	1.267		
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w (%)	25.95	28.30	30.04	32.83	35.98	37.07		



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DENOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept , 1981
SAMPLE NO & DEPTH (N°DE L'ÉCHANTILLON ET PROFONDEUR)	TP - 2 (0.3 m - 1.4 m)	TESTED BY (ESSAI PAR)	Bina Barga L.

MOULD (MOULE)	No 1	WEIGHT (POIDS) 2015 g	INSIDE DIAMETER (DIAMÈTRE INT.) 10.2 cm	CAPACITY (CAPACITÉ) 942 cm³	
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE) 30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE) 25	NUMBER OF LAYERS (NOMBRE DE COUCHE) 3	
MATERIAL USED FOR SPECIMENS (MATÉRIAU UTILISÉ POUR DU LES SPÉCIMENS)	REPROCESSING-DIFFERENT (RECONDITIONNÉ-AUTRE)	SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI)	AIR DRIED NATURAL (SÉCHÉ À L'AIR LIBRE NON SÉCHÉ)		

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w_n 40.04 %

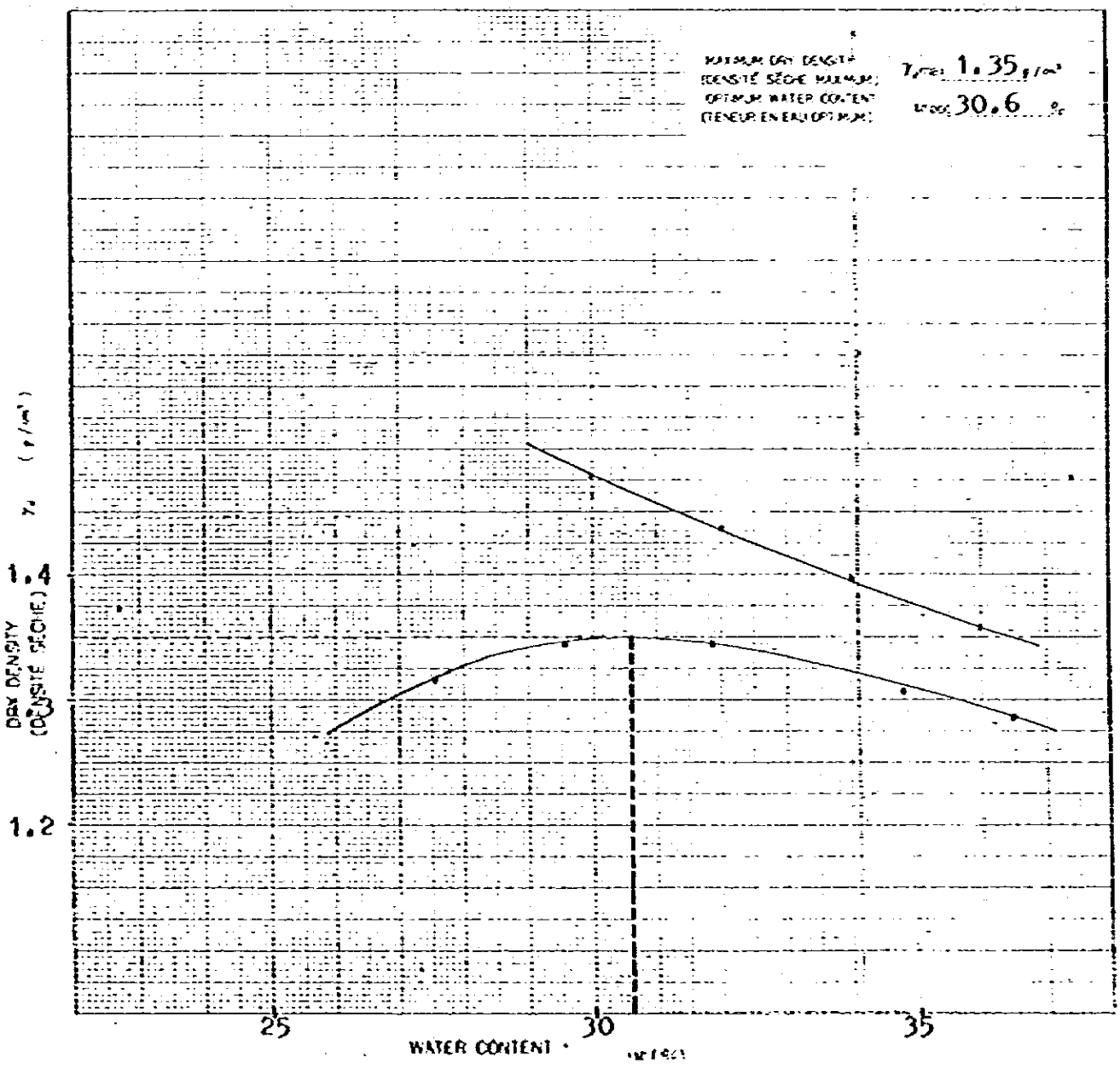
WATER CONTENT AFTER AIR DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.66

MAX GRAIN SIZE ALLOWED (GRANULOMÉTRIE MAXIMUM ADMISE) 4,76 mm

% OF MATERIAL OVER THE MAX GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRIE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d g/cm³	1.316	1.345	1.345	1.306	1.286			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w (%)	27.58	29.54	31.84	34.81	36.50			



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept , 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TP - 3 (0.8 m - 1.4 m.	TESTED BY (ESSAI PAR)	Bina Marga I.

MOULD (MOULE)	No 2	WEIGHT (POIDS) 1970 g	INSIDE DIAMETER (DIAMÈTRE INT.) 10.2 cm	CAPACITY (CAPACITÉ) 942 cm³			
RAMMER (PILON)	WEIGHT (POIDS) 250 g	DROP (HAUTEUR DE CHUTE) 30 cm	BLOWS PER LAYER (NOMBRE DE COUPS PAR COUCHE) 25	NUMBER OF LAYERS (NOMBRE DE COUCHES) 3			
MATERIAL USED FOR SPECIMENS (MATÉRIAU CHOISI POUR DU LES SPÉCIMENS)	REPROCESSED-DIFFERENT (RECONDITIONNÉ-AUTRE)	SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI)	AIR-DRIED-NOT-DRIED (SÉCHÉ À L'AIR LIBRE-NON SÉCHÉ)				

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w. 35.0 %

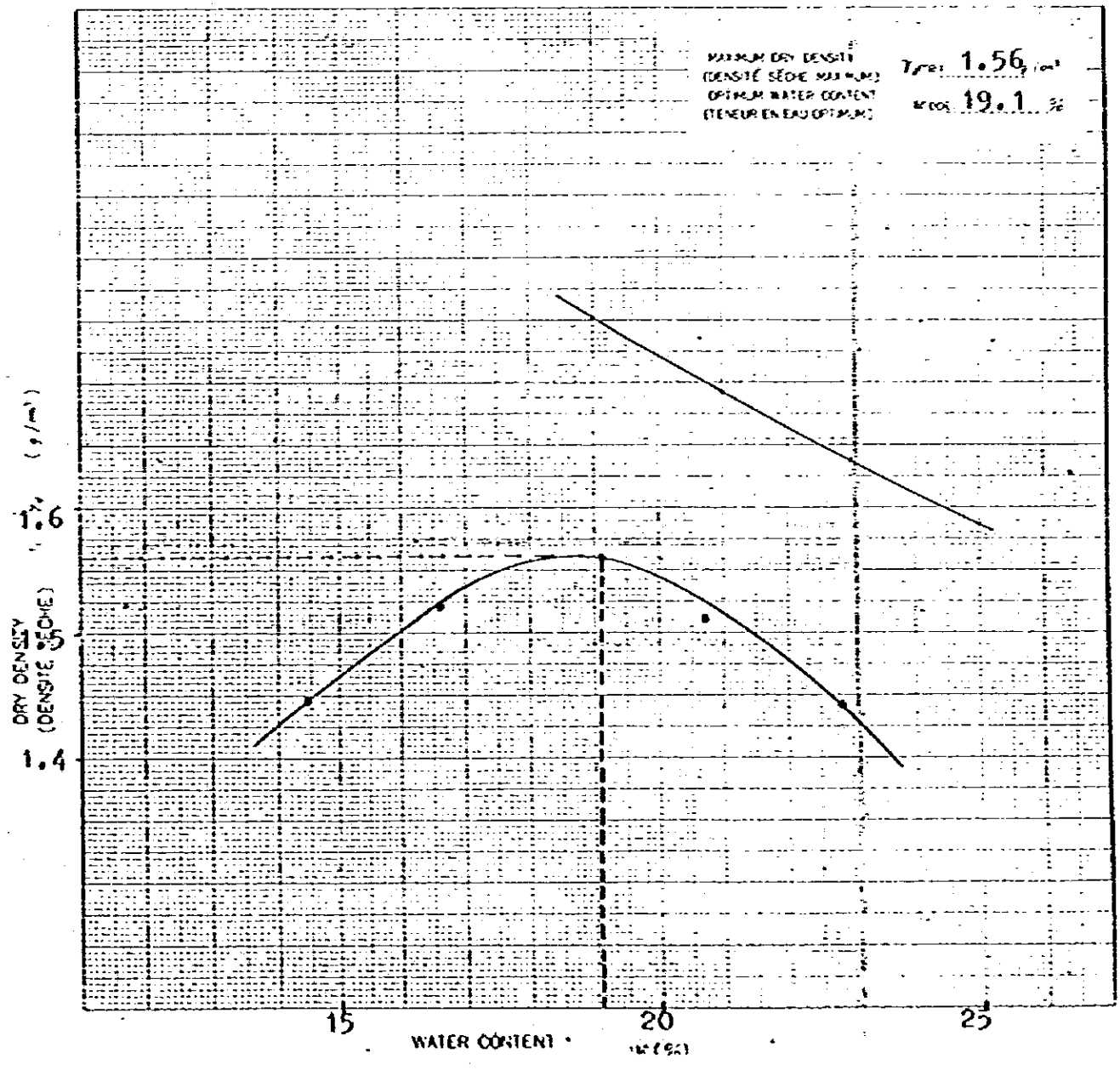
WATER CONTENT AFTER AIRDRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.63

MAX. GRAIN SIZE ALLOWED (GRANULOMÉTRE MAXIMUM ADMISE) 4.76 mm

% OF MATERIAL OVER THE MAX. GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d g/cm³	1.463	1.522	1.561	1.512	1.443			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w(%)	14.48	16.60	19.10	20.70	22.79			



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept , 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TP ~ 4 (1.0 m ~ 1.8 m	TESTED BY (ESSAI PAR)	Bina Marga L.

MOULD (MOULE)	No	1	WEIGHT (POIDS)	2015 g	INSIDE DIAMETER (DIAMÈTRE INT.)	10.2 cm	CAPACITY (CAPACITÉ) 942 cm³
RAMMER (PILON)	WEIGHT (POIDS)	250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE)	30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE)	25	NUMBER OF LAYERS (NOMBRE DE COUCHES) 3

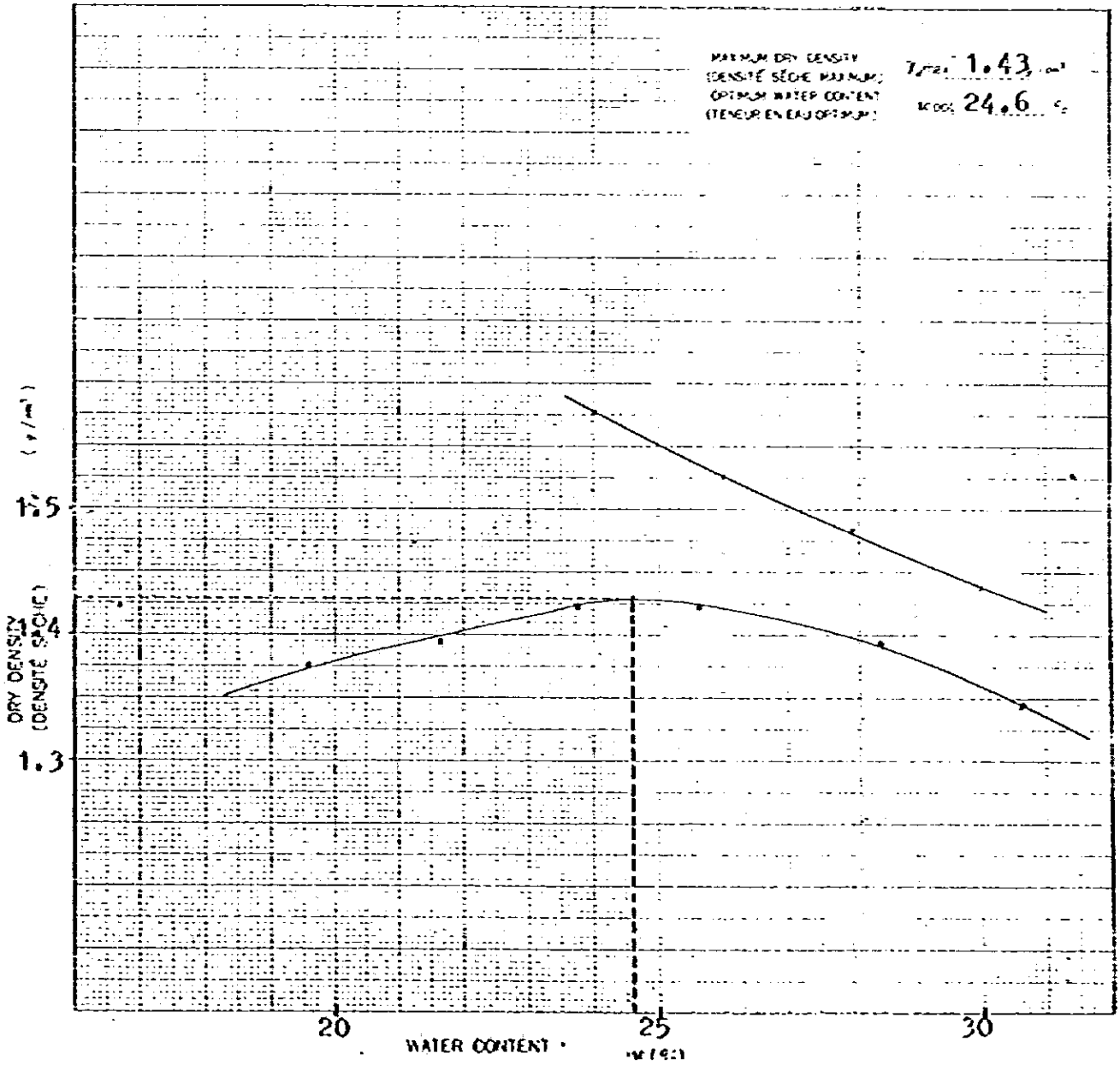
MATERIAL USED FOR SPECIMENS (MATÉRIAU UTILISÉ POUR LES SPÉCIMENS) REPROCESSING-DIFFERENT (RECONDITIONNÉ-AUTRE)

SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI) AIR-DRIED NOT-DRIED (SÉCHÉ À L'AIR LIBRE-NON SÉCHÉ)

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w. 33.50 % WATER CONTENT AFTER AIR-DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... % SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.54

MAX. GRAIN SIZE ALLOWED (GRANULOMÉTRIE MAXIMUM ADMISE) 4.76 ~ % OF MATERIAL OVER THE MAX. GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRIE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d (g/cm³)	1.375	1.394	1.424	1.424	1.394	1.345		
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w (%)	19.55	21.65	23.72	25.59	28.43	30.60		



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr, (Canal Route)	DATE (DATE)	Sept , 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TP - 5 (1.5m - 2.0 m)	TESTED BY (ESSAI PAR)	Bina Marga L.

MOULD (MOULE)	No 1	WEIGHT (POIDS)	2015 g	INSIDE DIAMETER (DIAMÈTRE INT.)	10.2 cm	CAPACITY (CAPACITÉ)	942 cm³
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE)	30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE)	25	NUMBER OF LAYERS (NOMBRE DE COUCHES)	3

MATERIAL USED FOR SPECIMENS (MATÉRIAU UTILISÉ POUR DU LES SPÉCIMENS): REPROCESSING-DIFFERENT (RECONDITIONNÉ-AUTRE)

SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI): AIR DRIED NOT SIEVED (SÉCHÉ À L'AIR LIBRE-NON SASSÉ)

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w_n 33.1 %

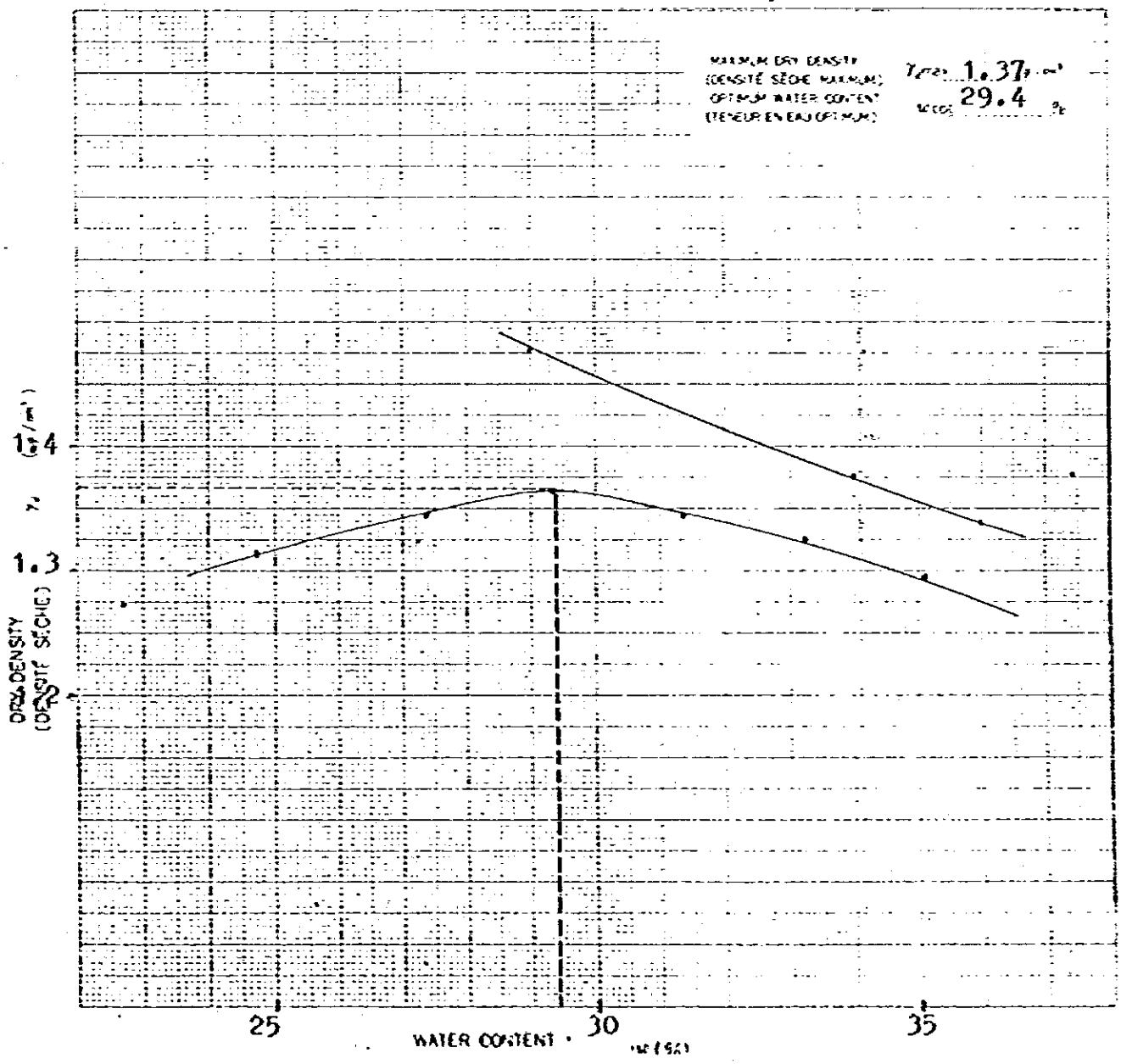
WATER CONTENT AFTER AIR DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.59

MAX GRAIN SIZE ALLOWED (GRANULOMÉTRIE MAXIMUM ADMISE) 4.76 mm

% OF MATERIAL OVER THE MAX GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRIE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d (t/m³)	1.316	1.345	1.365	1.345	1.326	1.296		
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w (%)	24.71	27.37	29.30	31.38	33.24	35.12		



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept. , 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TP - 6 (0.6 m ~ 1.4 m	TESTED BY (ESSAI PAR)	Bina Marga L.

MOULD (MOULE)	No 1	WEIGHT (POIDS)	2015 g	INSIDE DIAMETER (DIAMÈTRE INT.)	10.2 cm	CAPACITY (CAPACITÉ)	942 cm³
RAMMER (PILON)	WEIGHT (POIDS)	250	HEIGHT OF DROP (HAUTEUR DE CHUTE)	30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE)	25	NUMBER OF LAYERS (NOMBRE DE COUCHES) 3

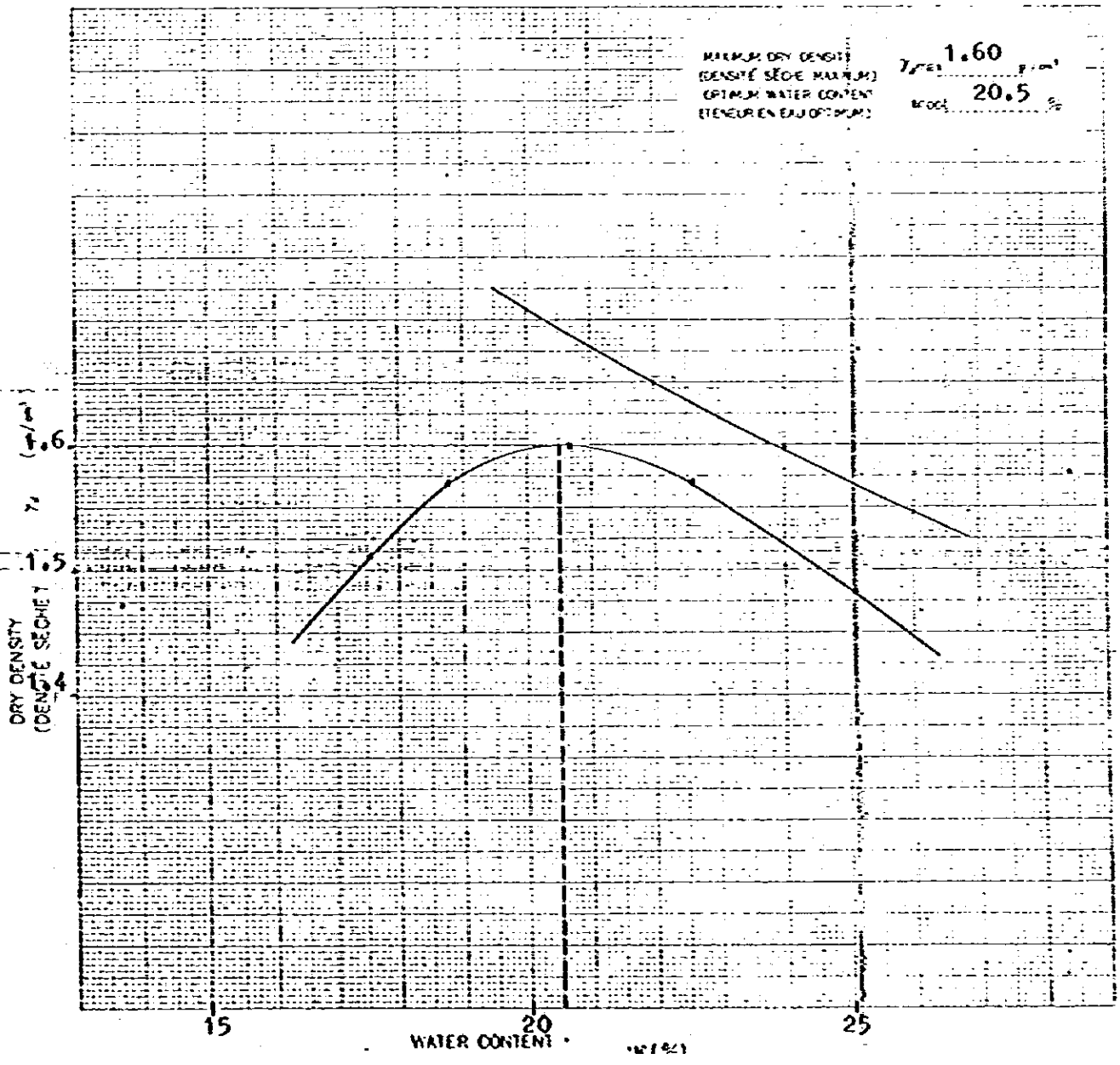
MATERIAL USED FOR SPECIMENS (MATÉRIAU CHOISI POUR DU LES SPÉCIMENS) . REPROCESSED-DIFFERENT (RECONDITIONNÉ-AUTRE)

SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI) . AIR-DRIED-NOT-DRIED (SÉCHÉ À L'AIR LIBRE-NON SÉCHÉ)

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w = 20.3 % WATER CONTENT AFTER AIR-DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... % SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.58

MAX. GRAIN SIZE ALLOWED (GRANULOMÉTRE MAXIMUM ADMIS) 4.76 mm % OF MATERIAL OVER THE MAX. GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d (g/cm³)	1.512	1.571	1.600	1.571	1.483			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w (%)	17.55	18.75	20.65	22.56	25.10			



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept. , 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TP - 7 (1.6 m ~ 2.0 m)	TESTED BY (ESSAI PAR)	Bina Marga L.

MOULD (MOULE)	No 2	WEIGHT (POIDS)	1970 g	INSIDE DIAMETER (DIAMÈTRE INT.)	10.2 cm	CAPACITY (CAPACITÉ)	942 cm³
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE)	30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE)	25	NUMBER OF LAYERS (NOMBRE DE COUCHE)	3

MATERIAL USED FOR SPECIMENS (MATÉRIAU CHOISI POUR DU LES SPÉCIMENS) — REPROCESSING: DIFFERENT (RECONDITIONNÉ: AUTRE)

SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI) — AIR DRIED: NOT USED (SÉCHÉ À L'AIR LIBRE: NON SÉCHÉ)

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w_n 35.6 %

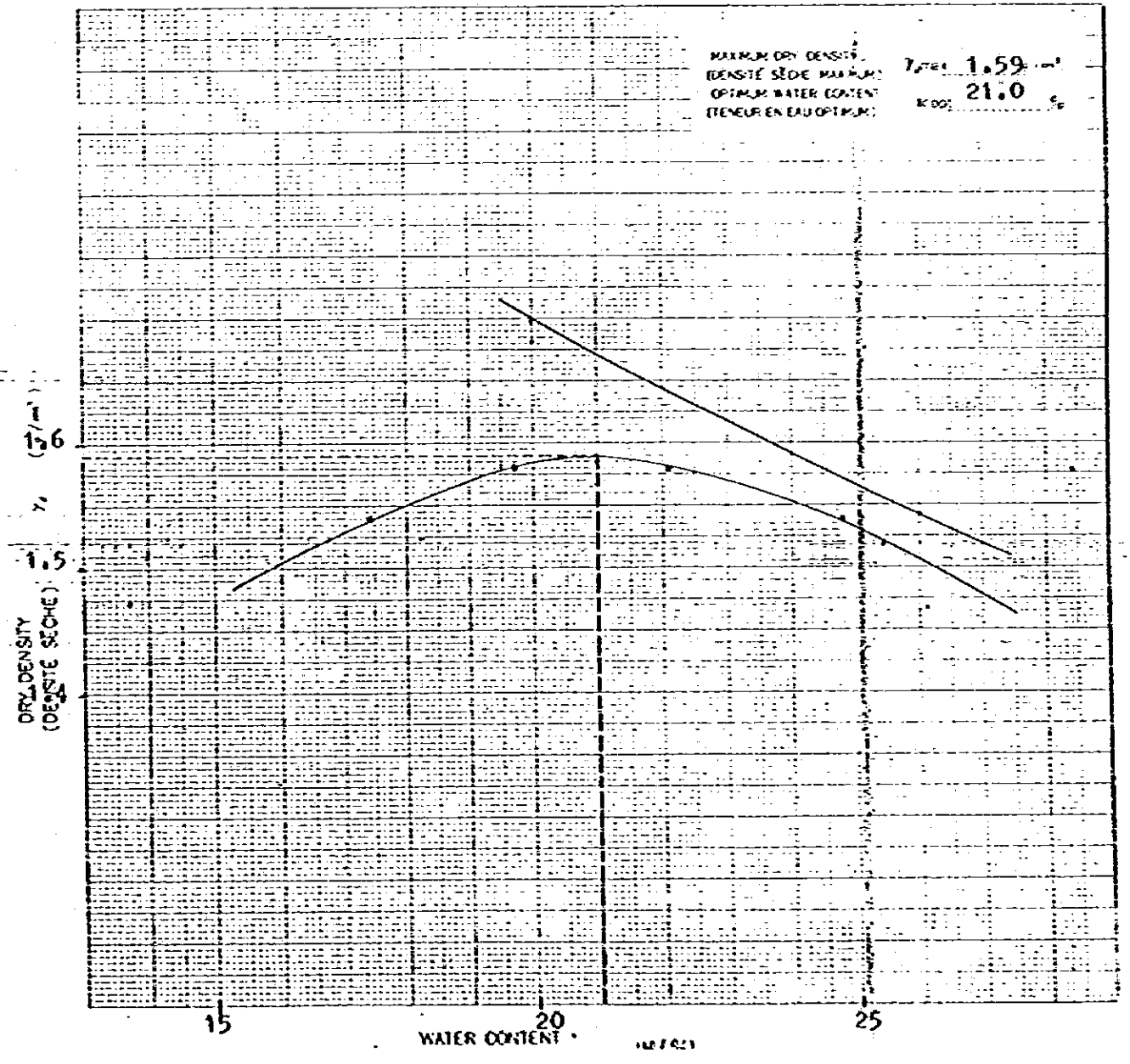
WATER CONTENT AFTER AIR DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.58

MAX. GRAIN SIZE ALLOWED (GRANULOMÉTRE MAXIMUM ADMISE) 4.76 mm

% OF MATERIAL OVER THE MAX. GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d g/cm³	1.542	1.581	1.581	1.542	1.522			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w(%)	17.47	19.69	22.08	24.75	25.41			



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Canal Route)	DATE (DATE)	Sept. , 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	TP - 8 (1.4 m - 2.0 m)	TESTED BY (ESSAI PAR)	Bina Narga L.

MOULD (MOULE)	No 2	WEIGHT (POIDS) 1970 g	INSIDE DIAMETER (DIAMÈTRE INT.) 10.2 cm	CAPACITY (CAPACITÉ) 942 cm³
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE) 30 cm	BLOWS PER LAYER (NOMBRE DE COUPS PAR COUCHE) 25	NUMBER OF LAYERS (NOMBRE DE COUCHES) 3

MATERIAL USED FOR SPECIMENS (MATÉRIAU CHOISI POUR DU LES SPÉCIMENS) REPROCESSING-DIFFERENT (RECONDITIONNÉ-AUTRE)

SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI) AIR-DRIED NOT-DRIED (SÉCHÉ À L'AIR LIBRE NON SÉCHÉ)

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w_n 22.8 %

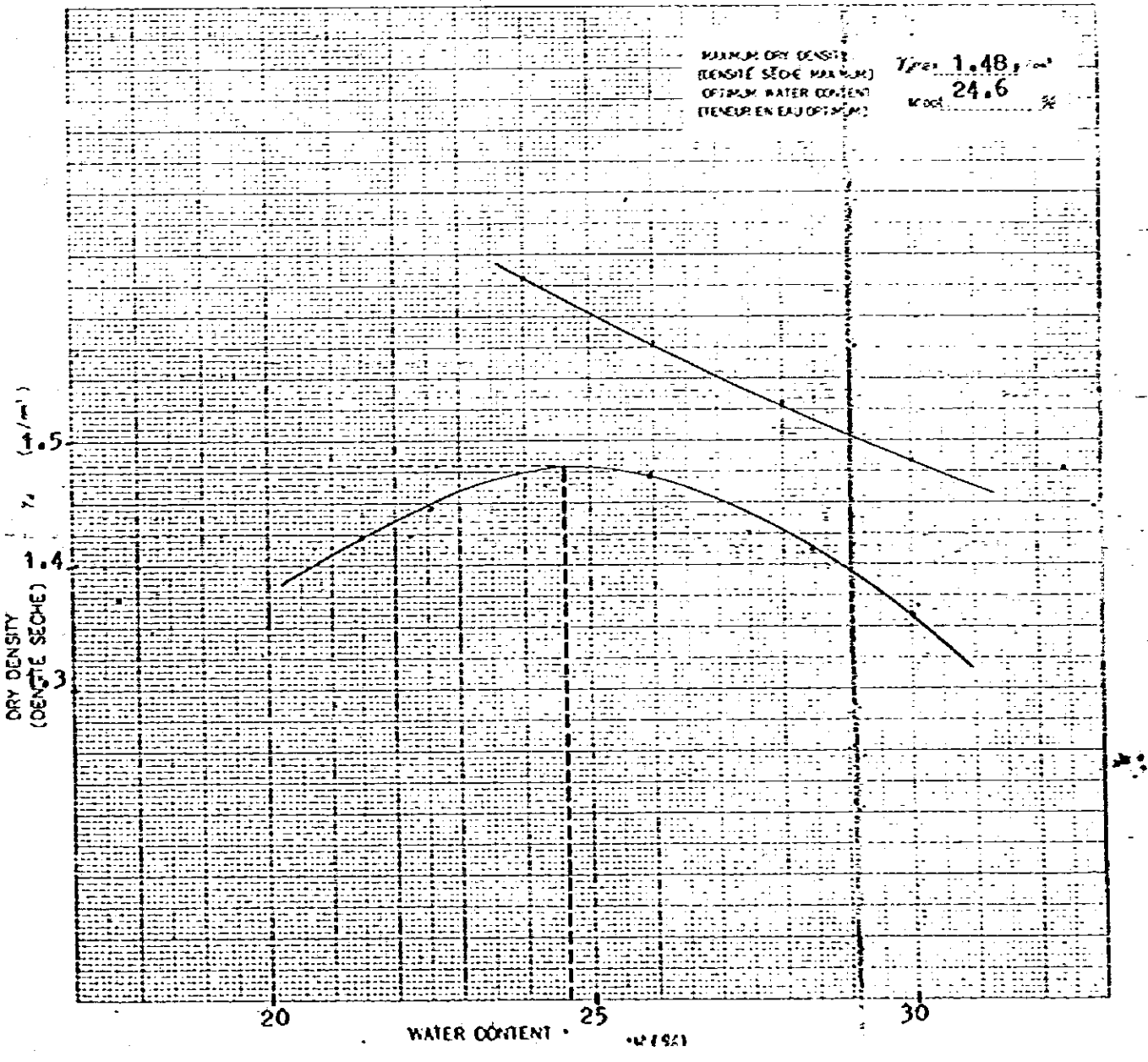
WATER CONTENT AFTER AIR-DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.68

MAX GRAIN SIZE ALLOWED (GRANULOMÉTRE MAXIMUM ADMISE) 4.76 mm

% OF MATERIAL OVER THE MAX GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d (g/cm³)	1.424	1.453	1.473	1.414	1.385			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w(%)	21.50	22.54	25.95	28.46	29.98			



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Flood Dike)	DATE (DATE)	Sept. , 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	PW - 1 (0.5 m - m.	TESTED BY (ESSAI PAR)	Bina Marga L.

MOULD (MOULE)	No 1	WEIGHT (POIDS)	2015 g	INSIDE DIAMETER (DIAMÈTRE INT.)	10.2 cm	CAPACITY (CAPACITÉ)	942 cm³
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE)	30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE)	25	NUMBER OF LAYERS (NOMBRE DE COUCHES)	3

MATERIAL USED FOR SPECIMENS (MATÉRIAU CHOISI POUR DU LES SPÉCIMENS) REPROCESSED-DIFFERENT (RECONDITIONNÉ-AUTRE)

SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI) AIR-DRIED NOT-DRIED (SÉCHÉ À L'AIR LIBRE NON SÉCHÉ)

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w_n 43.9 %

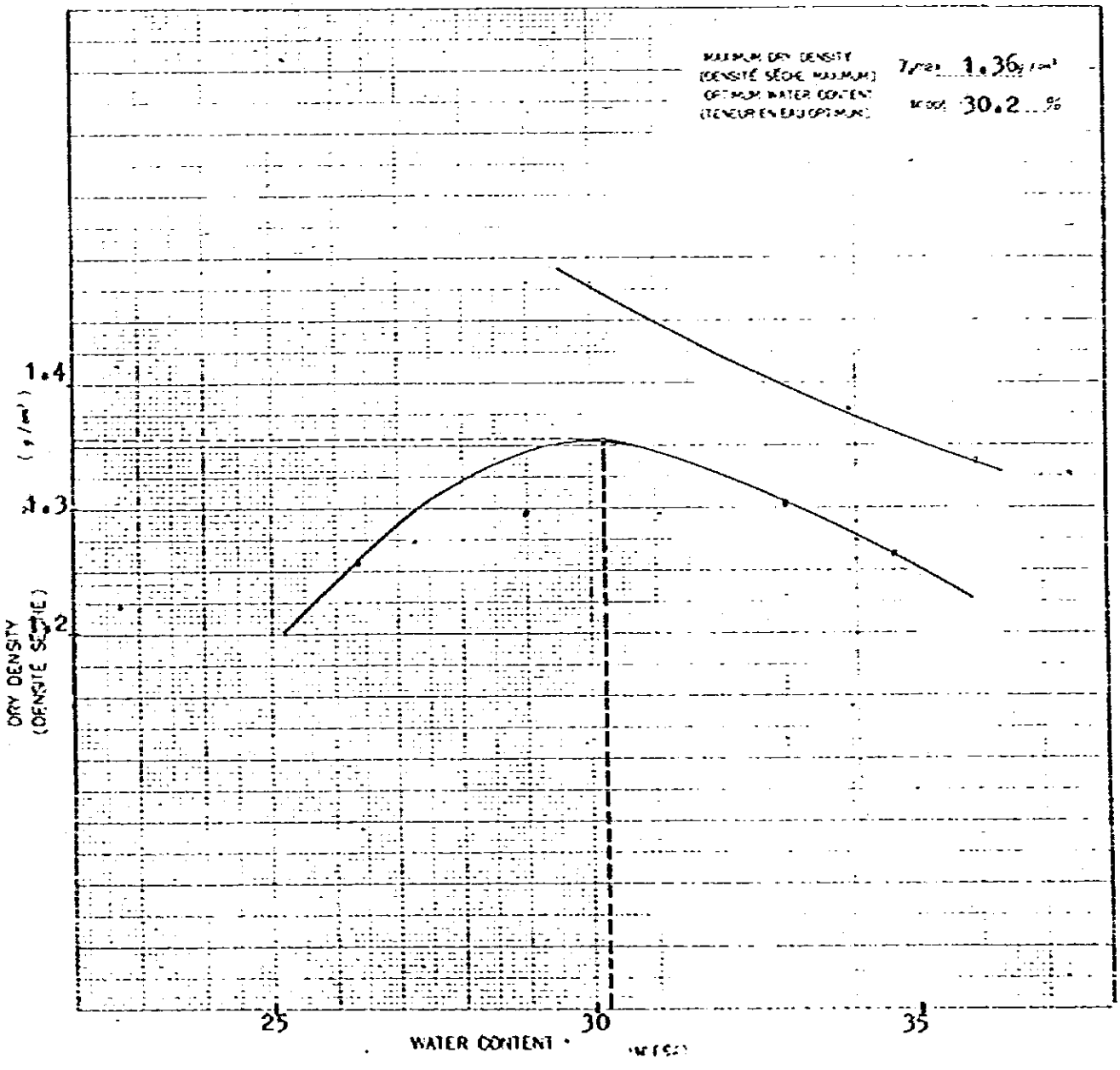
WATER CONTENT AFTER AIR-DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... %

SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.60

MAX GRAIN SIZE ALLOWED (GRANULOMÉTRE MAXIMUM ADMISE) 4.76 mm

..... % OF MATERIAL OVER THE MAX GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d (g/cm³)	1.257	1.296	1.355	1.305	1.266			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w (%)	26.37	28.96	30.19	33.01	34.67			



COMPACTION TEST
(ESSAI DE COMPACTAGE)

FOR REPORTING (POUR LE RAPPORT)

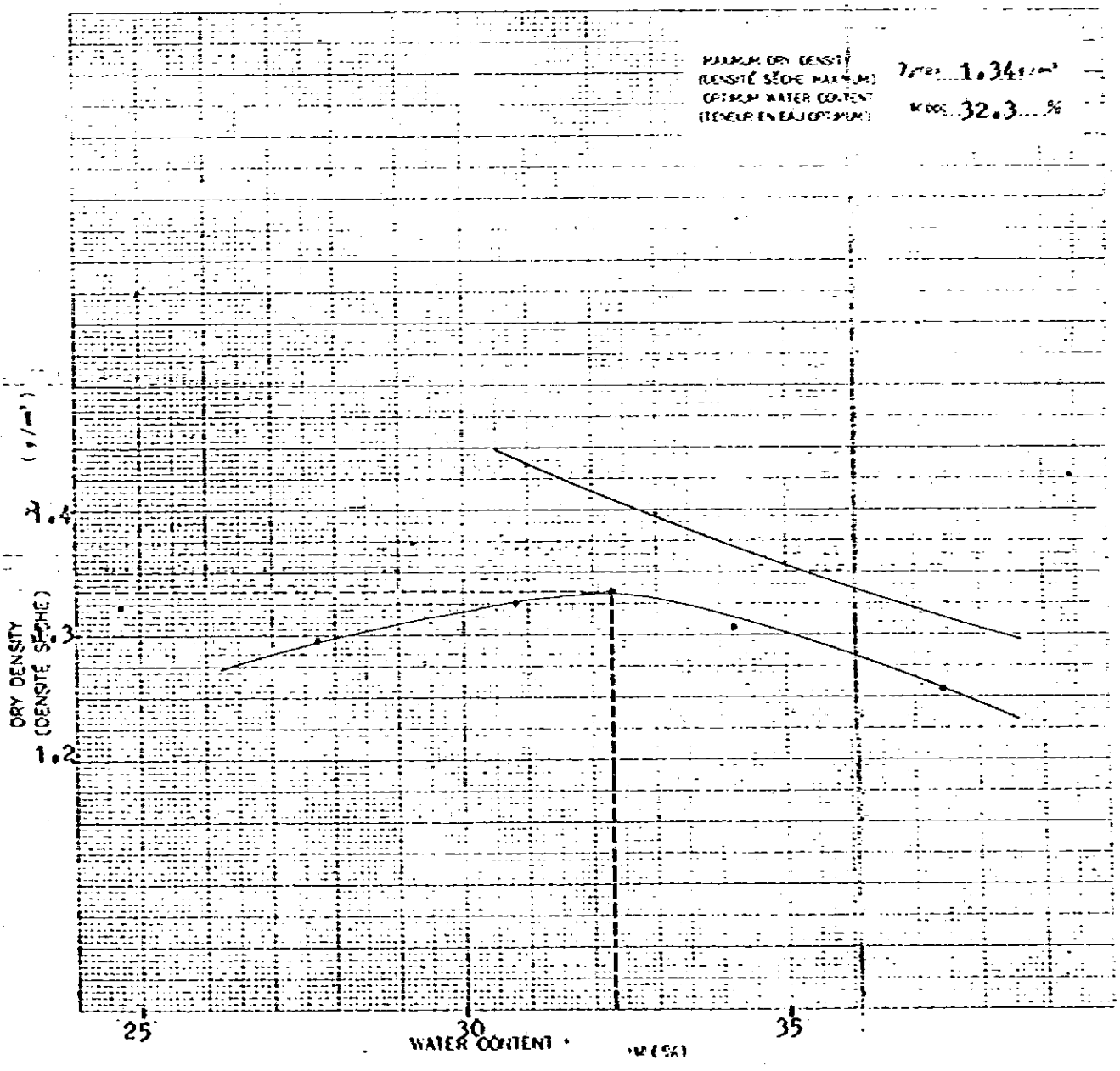
NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ)	Bila Irr. (Flood Control)	DATE (DATE)	Sept, 1981
SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR)	ER - 4 (0.5 m - m	TESTED BY (ESSAI PAR)	Bina Marga L.

MOULD (MOULE)	No 1	WEIGHT (POIDS) 2015 g	INSIDE DIAMETER (DIAMÈTRE INT.) 10.2 cm	CAPACITY (CAPACITÉ) 942 cm³
RAMMER (PILON)	WEIGHT (POIDS) 250 g	HEIGHT OF DROP (HAUTEUR DE CHUTE) 30 cm	BLOWS PER LAYER (NOMBRE DE COUPS POUR CHAQUE COUCHE) 25	NUMBER OF LAYERS (NOMBRE DE COUCHE) 3
MATERIAL USED FOR SPECIMENS (MATÉRIAU CHOISI POUR DU LES SPÉCIMENS) REPROCESSING-DIFFERENT (RECONDITIONNÉ-AUTRE)		SOIL PREPARED FOR TEST (SOL PRÉPARÉ POUR L'ESSAI) AIR-DRIED NOT-DRIED (SÉCHÉ À L'AIR LIBRE-NON SÉCHÉ)	

NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) w = 39.1 % WATER CONTENT AFTER AIR-DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) ..... % SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2.59

MAX. GRAIN SIZE ALLOWED (GRANULOMÉTRE MAXIMUM ADMISE) 4.76 mm % OF MATERIAL OVER THE MAX. GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRE SUPÉRIEURE À CELLE ADMISE) ..... %

TEST NO (N° DE L'ESSAI)	1	2	3	4	5	6	7	8
DRY DENSITY (DENSITÉ SÈCHE) γ_d (g/cm³)	1.296	1.326	1.335	1.306	1.257			
MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) w (%)	27.69	30.81	32.32	34.22	37.48			



SHRINKAGE CONSTANT TEST

No. _____

LOCATION Canal Route _____, Date Sept. 81 _____

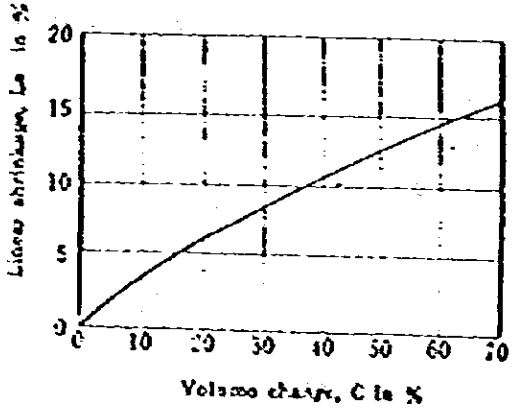
SAMPLE No. TP-2 (0.3 - 1.4M) _____, Test by Bina Marga Laboratory

No.		No.		No.	
WW 37.72	DW 26.44	WW 37.53	DW 26.32	WW _____	DW _____
DW 26.44	TW 9.83	DW 26.32	TW 9.17	DW _____	TW _____
W_o 11.28	W_s 16.61	W_o 11.21	W_s 17.15	W_o _____	W_s _____
w = 67.9 %		w = 65.4 %		w = _____ %	

	SPECIMEN No.	1	2	3
SHRINKAGE LIMIT	Wet soil volume (V cm³) (Volume of mercury filled in dish)	18	18.2	
	Dry soil volume (V_o cm³) (Volume of mercury evaporated)	10	10.02	
	Shrinkage volume ($V - V_o$) cm³	8	8.18	
	$\frac{V - V_o}{W_o} \gamma_w \times 100\%$	48.2	47.7	
	Shrinkage limit $S = w - \left(\frac{V - V_o}{W_o}\gamma_w \times 100\right)\%$	19.7	17.7	
	$\frac{1}{R} - \frac{1}{G}$	0.16	0.17	
	Shrinkage limit obtained from R & G $w_s = \left(\frac{1}{R} - \frac{1}{G}\right) \times 100\%$	16.0	17.0	
SHRINKAGE RATIO	Dry soil volume V_o cm³	10.0	10.02	
	Dry Soil weight W_o g	16.61	17.15	
	Shrinkage ratio $R = \frac{W_o}{V_o} \cdot \frac{1}{\gamma_w}$	1.66	1.71	
VOLUME CHANGE	Initial water content w_o %	67.9	65.4	
	Shrinkage limit w_s %	19.7	17.7	
	Volume change $C = (w_o - w_s) R$	80	81.5	
Liner Shrinkage	$L = 100\left(1 - \sqrt[3]{\frac{100}{C + 100}}\right)\%$	17.8	18.0	
SPECIFIC GRAVITY OF SOIL	$\frac{1}{R} - \frac{w_s}{100}$	0.44	0.41	
	Specific gravity of soil $G = \frac{1}{1/R - w_s/100}$	2.27	2.44	
	Specific gravity of soil obtained by pycnometer method	2.66	2.66	

[Remarks] γ_w : Unit weight of water

Curve for determining linear shrinkage



Note : Test is made on soil sample passing 0.4mm sieve

R. K. Form No. 3143

SHRINKAGE CONSTANT TEST

No. _____

LOCATION Canal Route, Date Sept. 81

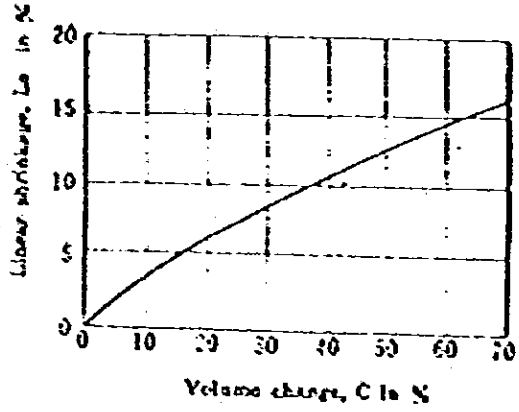
SAMPLE No. TP-4 (1.0 - 1.8M), Test by Bina Karya Laboratory

No.		No.		No.	
WW 36.01	DW 23.80	WW	DW	WW	DW
DW 23.80	TW 9.82	DW	TW	DW	TW
W_o 12.21	W_s 13.98	W_o	W_s	W_o	W
w = 87.34 %		w = %		w = %	

	SPECIMEN No.	1	2	3
SHRINKAGE LIMIT	Wet soil volume (Volume of mercury filled in dish) V cm³	18.00		
	Dry soil volume (Volume of mercury overflow) Vo cm³	7.20		
	Shrinkage volume (V−Vo) cm³	10.80		
	$\frac{V-V_o}{W_o}\gamma_w\times100\%$	77.25		
	Shrinkage limit $S=w-\left(\frac{V-V_o}{W_o}\gamma_w\times100\right)\%$	10.09		
	$\frac{1}{R}-\frac{1}{G}$	0.139		
	Shrinkage limit obtained from R & G $w_s=\left(\frac{1}{R}-\frac{1}{G}\right)\times100\%$	13.90		
SHRINKAGE RATIO	Dry soil volume Vo cm³	7.20		
	Dry Soil weight W_o g	13.98		
	Shrinkage ratio $R=\frac{W_o}{V_o}\cdot\frac{1}{\gamma_w}$	1.94		
VOLUME CHANGE	Initial water content w_1 %	87.34		
	Shrinkage limit w_s %	10.09		
	Volume change $C=(w_1-w_s)R$	148.9		
Liner Shrinkage	$L=100\left(1-\sqrt[3]{\frac{100}{C+100}}\right)\%$	26.2		
SPECIFIC GRAVITY OF SOIL	$\frac{1}{R}-\frac{w_s}{100}$	0.37		
	Specific gravity of soil $G=\frac{1}{1/R-w_s/100}$	2.66		
	Specific gravity of soil obtained by pycnometer method	2.56		

[Remarks] γ_w : Unit weight of water

Curve for determining linear shrinkage



Note : Test is made on soil sample passing 0.4mm sieve

N. K. Form No. 3145

SHRINKAGE CONSTANT TEST

No. _____

LOCATION Canal Route, Date Sept. 81

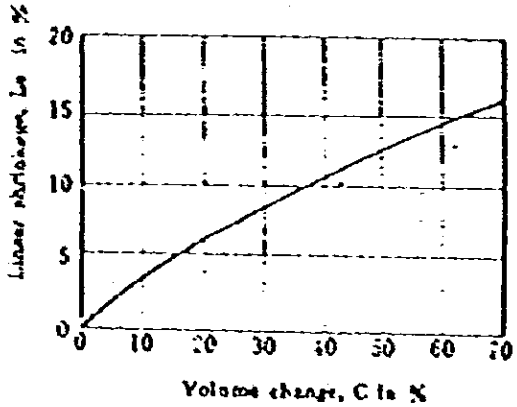
SAMPLE No. TP-7(1.6 - 2.0M), Test by Bina Marga Laboratory

No.		No.		No.	
WW 38.65	DW 28.20	WW	DW	WW	DW
DW 28.20	TW 9.08	DW	TW	DW	TW
W. 10.45	W 19.12	W.	W	W.	W
w = 54.6 %		w = %		w = %	

	SPECIMEN No.	1	2	3
SHRINKAGE LIMIT	Wet soil volume (Volume of mercury filled in dish) V cm³	18.0		
	Dry soil volume (Volume of mercury overflows) Vo cm³	9.8		
	Shrinkage volume (V−Vo) cm³	8.2		
	$\frac{V-V_o}{W_s}\gamma_w\times 100\%$	42.9		
	Shrinkage limit $S=w-\left(\frac{V-V_o}{W_s}\gamma_w\times 100\right)\%$	11.7		
	$\frac{1}{R}-\frac{1}{G}$	0.192		
	Shrinkage limit obtained from R & G $w=\left(\frac{1}{R}-\frac{1}{G}\right)\times 100\%$	19.2		
SHRINKAGE RATIO	Dry soil volume Vo cm³	9.8		
	Dry Soil weight Ws g	19.12		
	Shrinkage ratio $R=\frac{W_s}{V_o}\cdot\frac{1}{\gamma_w}$	1.95		
VOLUME CHANGE	Initial water content w_i %	54.6		
	Shrinkage limit w_s %	11.7		
	Volume change $C=(w_i-w_s)R$	83.6		
Liner Shrinkage	$L=100\left(1-\sqrt[3]{\frac{100}{C+100}}\right)\%$	18.3		
SPECIFIC GRAVITY OF SOIL	$\frac{1}{R}-\frac{w_s}{100}$	0.32		
	Specific gravity of soil $G=\frac{1}{1/R-w_s/100}$	3.09		
	Specific gravity of soil obtained by pycnometer method			

(Remarks) γ_w : Unit weight of water

Curve for determining linear shrinkage



Note : Test is made on soil sample passing 0.4mm sieve

N. K. Form No. 3143

SPECIFIC GRAVITY & WATER ABSORPTION OF SAND

LOCATION : Bila Irrigation Project (River Material) DATE : September, 1981.

TESTED BY : Bina Marga Laboratory of P.U.

	Sample No.	RM 1	RM 2	RM 4	
	Test No.	1	2	3	4
(1)	Wt. of Flask + Water	669.7	668.7	352.2	
(2)	Wt. of Flask	169.7	168.7	102.2	
(3) =(1)-(2)	Vol. of Flask	500	500	250	
(4)	Wt. of Flask + SSD Sand	425.8	452.3	313.7	
(5) =(4)-(2)	Wt. of SSD Sand	256.1	283.6	211.5	
(6)	Wt. of Flask+Water+SSD Send	822.3	840.2	482.4	
(7) =(1)-(6)+(5)	Vol. of sand	103.5	112.1	81.3	
(8) =(5)/(7)	Specific Gravity of SSD Sand	2.47	2.53	2.60	
	Mean Value	2.47	2.53	2.60	
(9)	Wt. of Dry Sand	250.4	277.9	208.7	
(10) =(5)-(9) / (9)	Water Absorption %	2.2	2.0	1.3	
	Mean Value	2.2	2.0	1.3	

SPECIFIC GRAFITY & WATER ABSORPTION OF GRAVEL

LOCATION : BILA IRRIGATION PROJECT (RIVER MATERIAL) DATE : SEPTEMBER 1981

TESTED BY : BINA MARGA LABORATORY OF P.U.

SAMPLE No.:	BRM	BRM
TEST No. :		
OVENDRY WEIGHT OF SAMPLE (A)	6114	
SATURATED SURFACE-DRY WEIGHT OF SAMPLE (B)	6202	
WEIGHT OF SAMPLE IN WATER (C)	3930	
APPARENT SPECIFIC GRAVITY $= \frac{A}{A-C} =$	2.79	
BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY) $= \frac{B}{B-C} =$	2.73	
BULK SPECIFIC GRAVITY (OVEN DRY) $= \frac{A}{B-C} =$	2.69	
PERCENTAGE OF ABSORBTION (SATURATED SURFACE-DRY BASIS) $= \frac{B-A}{A} \times 100\% =$	1.44	

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Bila Intake Site (Right Bank) Place Paddy Field

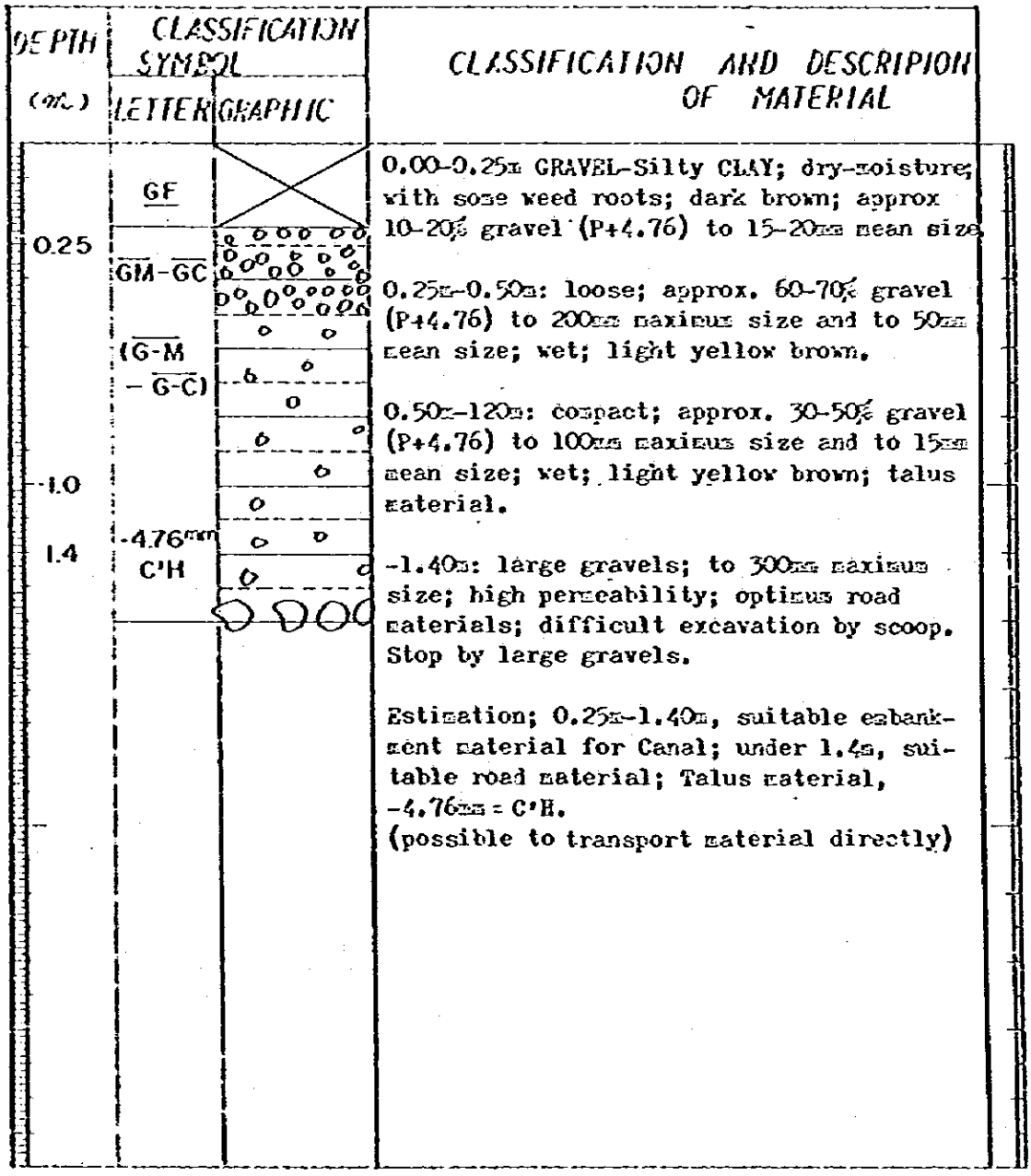
HOLE NO. TP - 0 (R) EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
0.2	CF		Lean CLAY , With some weed root ; black ; moisture .
			CLAYEY SAND , loose ; wet and moist ; terrace material ; black-dark brown ; very weak layer ; no mixture with gravel ; SAND is an infinitesimal grain .
1.0	SC		Estimation : Low bearing capacity ; foundation layer 4 or 5 m ; core material for fill-dam ; easy excavation by scoop ; terrace material . (impossible to transport material directly)
2.0			Stopped

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Bila Intake Site (Left Bank) Place Side of Hill

HOLE NO. TP - 0(L) EL.



P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal Place Side of Hill

HOLE NO. TP - 1 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
	CF		Lean CLAY, with some weed roots; black; dry.
0.3	CL		Silty CLAY, medium plasticity, high dry strength; without gravel; wet condition; light brown.
0.6	G-F		0.1-0.7m GRAVEL-SAND; 50mm maximum size; small amount of nonplastic fines.
0.7			-0.7m: SILT, SILTY CALY MIXTURE with GRAVEL well compacted; light yellow; a ratio of gravel (P-4.76mm) is 40% (maximum), 10-20% mean P-4.76mm; 50mm maximum size, 15mm mean size; wet condition; space of gravel is well compacted with silt or clay or silty clay; Partly light brown; -4.76mm soil CH (CLAY).
1.0	GM ∫ GC ⌒ GM ∫ GC ⌒		Estimation; optimum embankment materials; high bearing capacity; difficult excavation by scoop; high natural water content but moderately water content after excavated materials; Talus material. (possible to transport material directly)
2.0	-4.76mm CH		
▽			not ground water, after rain.
3.0			Stopped.

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal route Place Boundary of paddy and hill

HOLE NO. TP - 2 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
	CF		Lean CLAY , with some weed root ; black ; wet .
0.3	CL		Silty CLAY , highly weathered silt-stone ; partly sand , weathered sand-stone ; moist ; light yellow brown ; no gravel .
0.9			
1.0 ▽	Sis	.....	Siltstone - Sandstone , moderately weathered ; light grey ; low cementation .
	I		- 1.10 m ground water .
	Ss	.....	Stopped by hard layer .
1.4			Estimation ; - 1.40 m high bearing capacity ; 0.9 - 1.4 m high slaking by dry shrinkage and wet expansion ; moderately embankment material after slaking with water ; difficult excavation by scoop . 0.3 - 0.9 m , Molasse soil material . (If not dry , possible to transport directly)

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal Route Place Paddy

HOLE NO. TP - 3 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
	CF		CLAY , with some paddy's root ; black wet .
0.2			Clayey SAND , highly weathered siltstone ; high clayey and silty ; medium dry strength ; moist ; light yellow brown ; no gravel .
			Estimation ; suitable material for embankment , if sprinkle with water . Alluvial material (surface) ; Molasse soil material , (If not dry , possible to transport material directly)
1.0	SC		
▽			1.6 m ground water .
1.9	Sis-Ss		Stopped by hard layer
2.0			1.9m - 2.0m , Siltstone-Sandstone , moderately weathered and cementation light grey ; moderate bearing capacity ; difficult excavation by scoop .

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal route Place Side of the hill

HOLE NO. TP - 4 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
	CF		Silty CLAY ; with some weed root ; black ; dry .
0.4			CLAY , high clayey and dry strength ; high dry shrinkage ; light blue grey; highly weathered siltstone .
1.0	CH		Estimation ; moderately suitable embankment material , but need sprinkling with water . Molasse soil material ; impossible to transport material directly)
2.0	S-M (S-C)		SAND mixture with SILT Stopped by hard layer .
2.2			2.0 m - 2.2 m ; mixed with gravel - maximum size 10 - 30 mm ; moderately compact with silt and silty sand ; difficult excavation by scoop ; Muddy soil material .

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal Route Place Terrace deposit (Kalola R. Right Bank)

HOLE NO. TP - 5 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
0.2	CF		CLAY , with some weed roots ; black ; moist .
1.0	CH		CLAY ; high plasticity - medium plasticity ; moist ; black-dark brown ; very weak layer ; no mixture with gravel ; easy excavation by scoop .
2.0			Estimation ; moderately siutable embenkment material for core zone of fill dam ; terrace material (= alluvial material) - flood plain ; high bearing capacity layer is over 4 m or 5 m ; imposible to transport material direotly .
3.0			Stopped

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal Place Boundary of Paddy and Hill.

HOLE NO. TP - 6 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
	CF		Lean CLAY; with some weed roots; dark brown; dry.
0.4	(G-M)		0.4-0.8m:SILT MIXTURE WITH GRAVEL;clayey silt moist; space of gravels is moderately compacted by silt; light brown; approx. 30-50% gravel (P+4.76) to 15cm mean size.
0.8	SC		0.8-1.0m: Clayey SAND (mixture with gravel) space of gravels compacted by silt clay; approx. 30% gravel (P+4.76) to 20-30cm maximum size; blue grey; moist.
1.0			
			1.5m, ground water.
			Estimation; difficult excavation by scoop; suitable embankment material; under 2.4m highly bearing capacity; Talus material. (possible to transport material directly)
2.0			
2.4			Stopped by hard layer.

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal Route Place Paddy

HOLE NO. TP - 7 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
0.2	CF		CLAY , with some paddy's roots ; black ; wet .
			Clayey SOIL (CLAY) ; high or medium plasticity ; moist ; dark brown mixture with light blue and yellow brown ; without gravel .
1.0	CL		Estimation ; easy excavation by scoop; moderately cracks at wall ; moderately suitable embankment material ; impossible to transport material directly ; Alluvial deposit .
2.0			
▽			2.5 m , ground water
2.8			Stopped

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal Route Place Boundary of Paddy and Hill

HOLE NO. TP - 8 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
	SF		Silty SAND ; with some weed roots ; brown ; dry .
0.3			CLAY ; partly with silty sand ; well compacted ; partly with clayey silt ; dry shrinkage ; light brown ; moist ; high dry strength .
1.0	CH		Estimation ; moderate bearing capacity ; difficult excavation ; suitable embankment material after sprinkling with water ; impossible to transport material directly ; Molasse soil material .
2.0			
2.1	(CH)		CLAY ; high plasticity ; well compacted ; dry shrinkage ; high dry strength ; light grey ; moist .
			Estimation ; 0.3 m - 2.1 m layer same .
2.8			Stopped by moderately hard layer .

P

LOG OF TEST PIT
FOR BORROW AND FOUNDATION INVESTIGATIONS

Location Canal Place Paddy

HOLE NO. TP - 9 EL.

DEPTH (m)	CLASSIFICATION SYMBOL LETTER	GRAPHIC	CLASSIFICATION AND DESCRIPION OF MATERIAL
0.2	CF		CLAY; with some rice roots; dark brown; moist.
1.0	CH		CLAY (mixture with B); high plasticity; low dry shrinkage; high dry strength; high clayely brown dark grey; moist. Estimation; hard weathered siltstone; moderately suitable embankment material; impossibility directly transportation of material; easy excavation; mollase soil material. Stopped by hard layer.
1.5			1.5m, moderately cementation siltstone; dark grey; impossibility excavation by scoop; moist; highly bearing capacity.

SWEDISH SOUNDING TEST

Location Bila Intake Site (Right Bank) Place Paddy

Surface Condition Dry ~ Moisture

-LOG OF TEST PIT-

Depth (m)	Classification Letter	Classification Graph
	CF	
0.5		
1.0	SC	
1.5		
2.0		
2.5		
3.0		

Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (Kg/cm²)	Remarks
100	3.8	0.25	25	15	4	0.56	
"	4.0	0.50	"	16	"	0.57	
"	3.5	0.75	"	14	"	0.55	
"	3.5	1.00	"	14	"	0.55	
"	3.5	1.25	"	14	"	0.55	
"	3.0	1.50	"	12	"	0.54	
"	2.5	1.75	"	10	3	0.52	
"	4.0	2.00	"	16	4	0.57	
"	6.0	2.20	20	30	"	0.67	
"	4.0	2.50	30	13	"	0.55	
"	3.0	2.75	25	12	"	0.54	
"	2.5	3.00	"	10	3	0.52	
"	4.5	3.25	"	18	4	0.58	
"	17.0	3.50	"	68	6	0.96	Partly Sandy Soil
"	11.0	3.75	"	44	5	0.78	
"	2.5	4.00	"	10	3	0.52	
"	6.5	4.25	"	26	4	0.64	
"	17.0	4.38	13	131	11	1.43	gravelly soil
	Penetration is impossibility						

Where W_{sw} : Load

N_a : Number of times of half turn

D : Penetrated depth

L : Penetrated length

N_{sw} : Half turning numbers per meter ($N_{sw} = \frac{N_a}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.067 N_{sw}$

(clay or cohesive soil) $N = 3 + 0.05 N_{sw}$

q_u : Unconfined compressive strength

$q_u = 0.0045 W_{sw} + 0.0075 N_{sw}$

SWEDISH SOUNDING TEST

Location Bila Intake Site (left bank) Place Side of the Hill

Surface Condition Dry - Moisture

-LOG OF TEST PIT-

Depth (m)	Classification Letter	Classification Graph
0.5	GF	
	GM-GC	
	(G-M-G-C)	
1.0	-4.76 cm	
	CH	
1.5		
2.0		
2.5		
3.0		

Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (Kg/cm²)	Remarks
100	16	0.25	25	64	6	0.93	
"	14	0.50	"	56	"	0.87	
"	5	0.75	"	20	3	0.60	
"	6	1.00	"	24	4	0.63	
"	8	1.25	"	32	"	0.69	
"	5	1.50	"	20	3	0.60	
"	8	1.75	"	32	4	0.69	
"	78	1.95	20	390	28	3.37	Partly gravel
	Penetration is impossibility						
Another Place							
100	12	0.25	25	48	5	0.81	
"	16	0.50	"	64	6	0.93	
"	5	0.75	"	20	3	0.60	
"	5	1.00	"	20	"	"	
"	6	1.25	"	24	4	0.63	
"	8	1.50	"	32	"	0.69	
"	8	1.75	"	32	"	"	
"	59	2.00	"	236	18	2.22	Partly gravel
"	30	2.03	3	999	69	7.90	
	impossibility						

Where Wsw : Load

Na : Number of times of half turn

D : Penetrated depth

L : Penetrated length

Nsw : Half turning numbers per meter ($N_{SW} = \frac{Na}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.067 N_{SW}$

(clay or cohesive soil) $N = 3 + 0.05 N_{SW}$

qu : Unconfined compressive strength

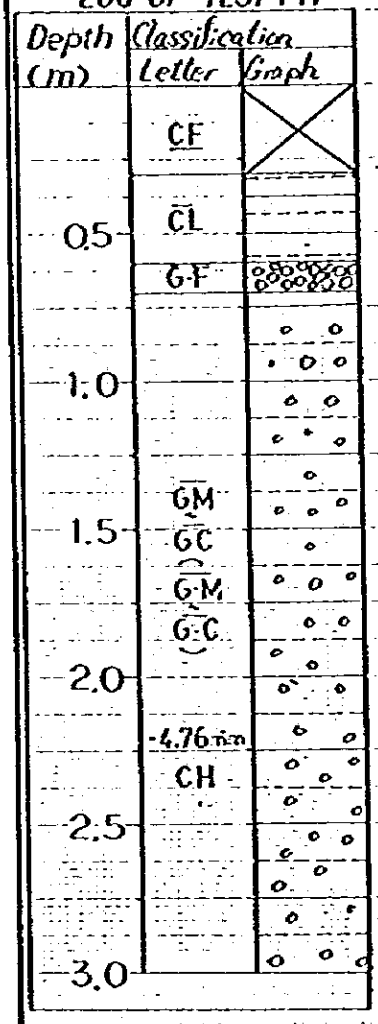
$qu = 0.0045 W_{SW} + 0.0075 N_{SW}$

SWEDISH SOUNDING TEST

Location Canal (TP-1) Place Side of the hill

Surface Condition Moisture

—LOG OF TEST PIT—



Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (kg/cm²)	Remarks
100	13	0.25	25	52	5	0.84	Partly gravel
"	43	0.45	20	215	16	2.06	and Sand
	Penetration is impossibility						
※							
Another Place							
100	22	0.25	25	88	8	1.11	
"	33	0.50	"	132	11	1.44	Partly gravel
"	66	0.73	23	284	21	2.58	and sand
	Penetration is impossibility						

Where W_{sw} : Load

N_a : Number of times of half turn

D : Penetrated depth

L : Penetrated length

N_{sw} : Half turning numbers per meter ($N_{sw} = \frac{N_a}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.067 N_{sw}$

(clay or cohesive soil) $N = 3 + 0.05 N_{sw}$

q_u : Unconfined compressive strength

$q_u = 0.0045 W_{sw} + 0.0075 N_{sw}$

SWEDISH SOUNDING TEST

Location Canal (TP-2) Place Boundary of Paddy end Hill

Surface Condition Moisture

—LOG OF TEST PIT—

Depth (m)	Classification Letter	Classification Graph
0.5	CF	
	CL	
1.0	SiS	
	Ss	
1.5		
2.0		
2.5		
3.0		

Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (kg/cm²)	Remarks
100	0	0.02	2	0	0	0.45	
"	4	0.25	23	17	4	0.58	
"	8	0.50	25	32	5	0.69	
"	7	0.75	"	28	3	0.66	
"	18	1.00	"	72	6	0.99	
"	38	1.25	"	152	10	1.59	
"	72	1.50	"	288	21	2.61	
"	60	1.60	10	600	42	4.95	
	↓ impossibility						

Where W_{SW} : Load

N_a : Number of times of half turn

D : Penetrated depth

L : Penetrated length

N_{SW} : Half turning numbers per meter ($N_{SW} = \frac{N_a}{L} \times 100$)

N : N-value (gravel sand or sandy soil) $N = 2 + 0.057 N_{SW}$

(clay or cohesive soil) $N = 3 + 0.05 N_{SW}$

q_u : Unconfined compressive strength

$q_u = 0.0045 W_{SW} + 0.0075 N_{SW}$

SWEDISH SOUNDING TEST

Location Canal (TP-3) Place Paddy

Surface Condition Moisture

--LOG OF TEST PIT--

Depth (m)	Classification Letter	Classification Graph
	CF	
0.5		
1.0	SC	
1.5	V	
2.0	SiS-Ss	
2.5		
3.0		

Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (kg/cm²)	Remarks
100	0	0.05	5	0	0	0.45	
"	5	0.25	20	25	4	0.64	
"	9	0.50	25	36	5	0.72	
"	5	0.75	"	20	4	0.60	
"	7	1.00	"	28	"	0.66	
"	15	1.25	"	60	6	0.90	
"	12	1.50	"	48	5	0.81	
"	28	1.75	"	112	8	1.29	
"	32	2.00	"	128	10	1.41	
"	19	2.25	"	76	7	1.02	
"	50	2.50	"	200	15	1.95	
"	38	2.75	"	152	12	1.59	
"	52	3.00	"	208	16	2.01	
		Impossibility					

Where W_{sw} : Load

N_a : Number of times of half turn

D : Penetrated depth

L : Penetrated length

N_{sw} : Half turning numbers per meter ($N_{sw} = \frac{N_a}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.067 N_{sw}$

(clay or cohesive soil) $N = 3 + 0.05 N_{sw}$

q_u : Unconfined compressive strength

$q_u = 0.0045 W_{sw} + 0.0075 N_{sw}$

SWEDISH SOUNDING TEST

Location Canal (TP-4) Place side of Hill

Surface Condition Dry

-LOG OF TEST PIT-

Depth (m)	Classification Letter	Classification Graph
0	CF	
0.5		
1.0	CH	
1.5		
2.0	SM (SC)	
2.5		
3.0		

Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (kg/cm²)	Remarks
100	8	0.25	25	32	5	0.69	
"	3						
75	0	1.43	118	0	0	0.34	
100	0	1.59	16	0	"	0.45	
"	2.5	1.75	"	16	4	0.57	
"	5	2.00	25	20	"	0.60	
"	6	2.25	"	24	"	0.63	
"	11	2.50	"	44	5	0.78	
"	14.5	2.75	"	58	6	0.88	
"	16	3.00	"	64	"	0.93	
"	24	3.25	"	96	8	1.17	
"	24	3.50	"	"	"	1.17	
"	31	3.75	"	124	9	1.38	
"	21	4.00	"	84	7	1.08	
"	50	4.14	14	355	21	3.11	
"	30	4.19	5	600	33	4.95	
	impossibility						

Where W_{sw} : Load

N_a : Number of times of half turn

D : Penetrated depth

L : Penetrated length

N_{sw} : Half turning numbers per meter ($N_{sw} = \frac{N_a}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.067 N_{sw}$

(clay or cohesive soil) $N = 3 + 0.05 N_{sw}$

q_u : Unconfined compressive strength

$q_u = 0.0045 W_{sw} + 0.0075 N_{sw}$

SWEDISH SOUNDING TEST

Location Canal (TP-5) Place Kalola Dam site Down Stream Right Bank

Surface Condition Moisture

--LOG OF TEST PIT--

Depth (m)	Classification Letter	Classification Graph
	CF	
0.5		
1.0		
1.5	CH	
2.0		
2.5		
3.0		

Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (Kg/cm²)	Remarks
100	7	0.25	25	28	4	0.66	
"	8.5	0.50	"	34	5	0.70	
"	7	0.75	"	28	4	0.66	
"	"	1.00	"	"	"	0.66	
"	7.5	1.25	"	30	"	0.67	
"	9	1.50	"	36	5	0.72	
"	7	1.75	"	28	4	0.66	
"	5	2.00	"	20	"	0.60	
"	6	2.25	"	24	"	0.63	
"	6	2.50	"	"	"	"	
"	7	2.75	"	28	"	0.66	
"	6	3.00	"	24	"	0.63	
"	6.5	3.25	"	26	"	0.64	
"	5	3.50	"	20	"	0.60	
"	4.5	3.75	"	18	"	0.58	
"	11	4.00	"	44	5	0.78	
"	70	4.20	20	350	25	3.07	
	↓						
	impossibility						

Where Wsw : Load

Na : Number of times of half turn

D : Penetrated depth

L : Penetrated length

Nsw : Half turning numbers per meter ($N_{sw} = \frac{Na}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.067 N_{sw}$

(clay or cohesive soil) $N = 3 + 0.05 N_{sw}$

qu : Unconfined compressive strength

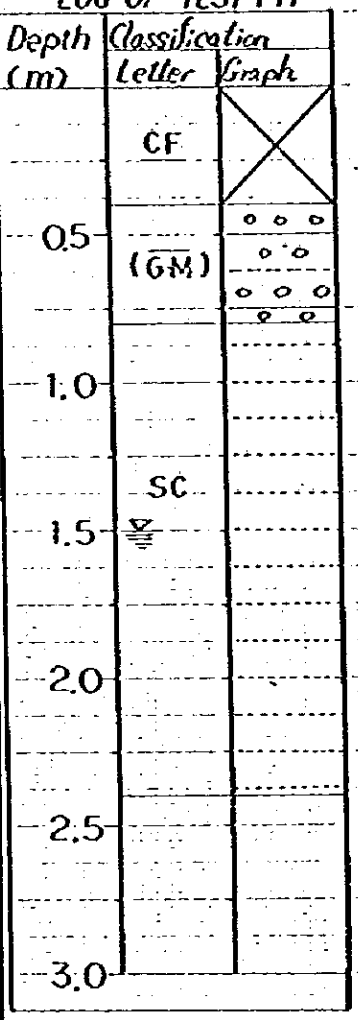
$q_u = 0.0045 W_{sw} + 0.0075 N_{sw}$

SWEDISH SOUNDING TEST

Location Canal (TP-6) Place boundary of Paddy and Hill

Surface Condition Dry

-LOG OF TEST PIT-



Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (kg/cm²)	Remarks
100	41	0.25	25	164	11	1.68	
"	19	0.50	"	76	7	1.02	
"	18	0.75	"	48	5	0.81	
"	14	1.00	"	56	6	0.87	
"	23	1.25	"	92	8	1.14	
"	33	1.50	"	132	10	1.44	
"	32	1.75	"	128	9	1.41	
"	13.5	2.00	"	54	6	0.85	
"	50	2.20	20	250	15	2.32	
	↓ impossibility						

Where Wsw : Load
Na : Number of times of half turn
D : Penetrated depth
L : Penetrated length
Nsw : Half turning numbers per meter ($N_{SW} = \frac{Na}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.05 N_{SW}$
(clay or adhesive soil) $N = 3 + 0.05 N_{SW}$

qu : Unconfined compressive strength
$q_u = 0.0015 W_{SW} + 0.0075 N_{SW}$

SWEDISH SOUNDING TEST

Location Canal (TP-8) Place boundary of Paddy and Hill

Surface Condition Dry - Moisture

--LOG OF TEST PIT--

Depth (m)	Classification Letter	Classification Graph
0	SF	
0.5		
1.0	CH	
1.5		
2.0		
2.5	(CH)	
3.0		

Wsw (Kg)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (kg/cm²)	Remarks
100	4	0.25	25	16	4	0.57	
"	6	0.50	"	24	"	0.63	
"	15	0.75	"	60	6	0.90	
"	26	1.00	"	104	8	1.23	
"	33	1.25	"	132	10	1.44	
"	27	1.50	"	108	8	1.26	
"	21	1.75	"	84	7	1.08	
"	33	2.00	"	132	10	1.44	
"	26	2.25	"	104	8	1.23	
"	15	2.50	"	60	6	0.90	
"	14	2.75	"	56	"	0.87	
"	8	3.00	"	32	5	0.69	
"	10	3.25	"	40	"	0.75	
"	18	3.50	"	72	7	0.99	
"	16	3.75	"	64	6	0.93	
"	17	4.00	"	68	"	0.96	
"	29	4.25	"	116	9	1.32	
"	28	4.50	"	112	"	1.29	
"	15	4.75	"	60	6	0.90	
"	60	5.00	"	240	15	2.25	
	impossibility						

Where Wsw : Load
Na : Number of times of half turn
D : Penetrated depth
L : Penetrated length
Nsw : Half turning numbers per meter ($N_{SW} = \frac{Na}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.057 N_{SW}$
(clay or cohesive soil) $N = 3 + 0.05 N_{SW}$

qu : Unconfined compressive strength
$qu = 0.0045 W_{SW} + 0.0075 N_{SW}$

SWEDISH SOUNDING TEST

Location Canal (TP-7) Place Paddy

Surface Condition Dry ~ Moisture

--LOG OF TEST PIT--

Depth (m)	Classification Letter	Classification Graph
	CF	
0.5		
1.0	CL	
1.5		
2.0		
2.5	▽	
3.0		

Wsw (KJ)	Na (times)	D (m)	L (cm)	Nsw (times/m)	N	qu (kg/cm²)	Remarks
75	0	0.36	36	0	0	0.34	
100	1.5	0.50	14	11	4	0.53	
"	4	0.75	25	16	"	0.57	
"	3.5	1.00	"	14	"	0.55	
"	0	1.13	13	0	0	0.45	
"	2	1.25	12	16	4	0.57	
"	3.5	1.50	25	14	"	0.55	
"	"	1.75	"	"	"	"	
"	"	2.00	"	"	"	"	
"	"	2.25	"	"	"	"	
"	4	2.50	"	16	"	0.57	
"	"	2.75	"	"	"	"	
"	"	3.00	"	"	"	"	
"	"	3.25	"	"	"	"	
"	5	3.50	"	20	"	0.60	
"	6	3.75	"	24	"	0.63	
"	7	4.00	"	28	"	0.66	
"	8	4.25	"	32	5	0.69	
"	9.5	4.50	"	38	5	0.73	
"	6.5	4.75	"	26	4	0.64	
"	9	5.00	"	36	5	0.72	
"	8	5.25	"	32	"	0.69	
"	12	5.50	"	48	"	0.81	

Where W_{sw} : Load
N_a : Number of times of half turn
D : Penetrated depth
L : Penetrated length
N_{sw} : Half turning numbers per meter ($N_{sw} = \frac{N_a}{L} \times 100$)

N : N-Value (gravel sand or sandy soil) $N = 2 + 0.067 N_{sw}$
(clay or cohesive soil) $N = 3 + 0.05 N_{sw}$

q_u : Unconfined compressive strength
$q_u = 0.0045 W_{sw} + 0.0075 N_{sw}$

CONE PENETRATION TEST

Location Canal (TP-9, Paddy) Location Canal (No. 10, Paddy)

No ____ Date ____ No ____ Date ____

Elevation ____ by Elevation ____ by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark	Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	7	0.9	0.1	0		0.1	62	7.8	1.5	2	
0.2	12	1.5	0.3	0		0.2	41	5.2	1.0	1	
0.3	19	2.4	0.4	1		0.3	37	4.7	0.9	"	
0.4	22	2.7	0.5	"		0.4	41	5.2	1.0	"	
0.5	27	3.3	0.6	"		0.5	44	5.5	1.1	2	
0.6	43	5.5	1.1	2		0.6	59	7.5	1.5	"	
0.7	54	6.8	1.3	"		0.7	61	7.7	1.5	"	
0.8	48	6.1	1.2	"		0.8	74	9.4	1.8	3	
0.9	60	7.7	1.5	3		0.9	90	11.4	2.2	"	
1.0	85	10.8	2.1	"		1.0	150	19.1	3.8	5	
1.1	124	15.7	3.1	4		1.1					
1.2						1.2					
1.3						1.3					
1.4						1.4					
1.5						1.5					
	impossibility						impossibility				

qc : Cone bearing capacity = 5 qu = 10 C = 3.5 N

qu : Allowable soil pressure C : cohesion kg/cm², N : N - value

CONE PENETRATION TEST

Location ER-1 (Bila R. L.B) No ..... Date .....

Elevation ..... by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	77	9.8	1.9	3	
0.2	130	16.5	3.3	5	
0.3	117	14.8	2.9	4	
0.4	117	"	"	"	
0.5	100	12.6	2.5	"	
0.6	102	12.9	"	"	
0.7	115	14.6	2.9	"	
0.8	109	13.8	2.7	"	
0.9	90	11.4	2.2	3	
1.0	89	11.3	"	"	
1.1	88	11.1	"	"	
1.2	82	10.3	2.0	"	
1.3	77	9.8	1.9	"	
1.4	74	9.4	1.8	"	
1.5	67	8.6	1.7	2	
1.6	75	9.6	1.9	3	
1.7	91	11.4	2.2	"	
1.8	110	14.0	2.8	4	
1.9	145	18.5	3.7	5	
2.0	↓				
	impossibility				

※ At the another place (-10m) cone can not be penetrated until 0.9 m.

Location ER-2 (Boya R. L.B) No ..... Date .....

Elevation ..... by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	25	3.2	0.6	1	
0.2	26	"	"	"	
0.3	24	"	"	"	
0.4	24	"	"	"	
0.5	30	3.8	0.7	"	
0.6	34	4.3	0.8	"	
0.7	39	4.9	0.9	"	
0.8	38	"	"	"	
0.9	40	"	"	"	
1.0	40	"	"	"	
1.1	39	"	"	"	
1.2	64	8.0	1.6	2	
1.3	40	4.9	0.9	1	
1.4	23	3.2	0.6	"	
1.5	44	5.5	1.1	2	
1.6	70	8.9	1.7	3	
1.7	74	9.4	1.8	"	
1.8	175	23.9	4.7	7	
1.9	↓				
2.0					
	impossibility				

※ At the another place (-10m) cone can not be penetrated until 0.5 m

qc : Cone bearing capacity = 5 qu = 10 C = 3.5 N

qu : Allowable soil pressure C : cohesion kg/cm². N : N - value

※ Remarks : Tested by Portable Penetrometer

: L.B.= Left Bank

CONE PENETRATION TEST

Location ER-3(Bila R. L.B) Location (another place) (-10m)

No 1 Date No 2 Date

Elevation by Elevation by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	50	6.4	1.2	2	
0.2	30	3.8	0.7	1	
0.3	30	"	"	"	
0.4	59	7.5	1.5	2	
0.5	44	5.5	1.1	"	
0.6	92	11.5	2.3	3	
0.7	150	19.1	3.8	5	
0.8					
0.9					
1.0					
impossibility					

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	25	3.2	0.6	1	
0.2	50	6.4	1.2	2	
0.3	32	4.0	0.8	1	
0.4	31	"	"	"	
0.5	37	4.7	0.9	"	
0.6	100	12.6	2.5	4	
0.7	117	14.9	2.9	"	
0.8	135	17.3	3.4	5	
0.9	165	20.9	4.1	6	
1.0	180	22.8	4.5	7	
1.1					
1.2					
1.3					
impossibility					

qc : Cone bearing capacity = 5 qu = 10 C = 3.5 N

qu : Allowable soil pressure C : cohesion kg/cm², N : N - value

CONE PENETRATION TEST

Location ER-4(Bila R. R.B) No 1 Date ____ Elevation ____ by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	150	19.1	3.8	5	
0.2	200	25.4	5.0	7	
0.3	180	22.8	4.5	"	
0.4	200	25.4	5.0	"	
0.5	↓				
	impossibility				

Location (Another place) (-10m) No 2 Date ____ Elevation ____ by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	65	8.0	1.6	2	
0.2	57	7.3	1.4	"	
0.3	61	7.7	1.5	"	
0.4	67	8.4	1.6	"	
0.5	55	7.0	1.4	"	
0.6	60	7.7	1.5	"	
0.7	84	10.6	2.1	3	
0.8	100	12.6	2.5	4	
0.9	120	15.2	3.0	"	
1.0	105	13.4	2.6	"	
1.1	110	14.0	2.8	"	
1.2	112	14.1	"	"	
1.3	82	10.3	2.0	3	
1.4	75	9.6	1.9	"	
1.5	75	"	"	"	
1.6	110	14.0	2.8	4	
1.7	110	"	"	"	
1.8	135	17.3	3.4	5	
1.9	↓				
2.0					
	impossibility				

qc : Cone bearing capacity = 5 qu = 10 C = 3.5 N

qu : Allowable soil pressure C : cohesion kg/cm², N : N - value

CONE PENETRATION TEST

Location ER-5 (Bila R. R.B)

No ..... Date .....

Elevation ..... by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	87	11.1	2.2	3	
0.2	77	9.8	1.9	"	
0.3	90	11.4	2.2	"	
0.4	95	12.0	2.4	"	
0.5	90	11.4	2.2	"	
0.6	67	8.6	1.7	2	
0.7	42	5.2	1.0	1	
0.8	22	2.7	0.5	"	
0.9	20	2.5	0.4	"	
1.0	23	2.9	0.5	"	
1.1	54	6.7	1.3	2	
1.2	75	9.6	1.9	3	
1.3	77	9.8	"	"	
1.4	97	12.3	2.4	4	
1.5	90	11.4	2.2	3	
1.6	63	8.0	1.6	2	
1.7	71	8.9	1.7	3	
1.8	90	11.4	2.2	"	
1.9	87	11.1	"	"	
2.0	90	11.4	"	"	
2.1	87	11.1	"	"	
2.2	70	8.9	1.7	"	
2.3	87	11.1	2.2	"	
2.4	102	12.9	2.5	4	
2.5	97	12.3	2.4	"	
2.6	77	9.8	1.9	3	
2.7	70	8.9	1.7	"	
2.8					
2.9					
3.0					
	impossibility				

※At the Another place (-10m), cone can not be penetrated until 0.9m

Location ER-6 (Kalola R. L.B)

No 1 Date .....

Elevation ..... by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	95	12.0	2.4	3	
0.2	97	12.3	"	"	
0.3	77	9.8	1.9	"	
0.4	76	9.7	"	"	
0.5	110	14.0	2.8	4	
0.6	60	7.6	1.5	2	
0.7	55	7.0	1.4	"	
0.8	52	6.4	1.2	"	
0.9	47	6.1	"	"	
1.0	42	5.2	1.0	1	
1.1	86	11.0	2.2	3	
1.2	82	10.3	2.0	"	
1.3	77	9.8	1.9	"	
1.4	40	5.0	1.0	1	
1.5	45	5.7	1.1	2	
1.6	40	5.0	1.0	1	
1.7	47	6.1	1.2	2	
1.8	46	5.8	1.1	"	
1.9	54	6.9	1.4	"	
2.0	42	5.2	1.0	1	
2.1	40	5.0	1.0	"	
2.2	60	7.6	1.5	2	
2.3	82	10.3	2.0	3	
2.4	55	7.0	1.4	2	
2.5	115	14.6	2.9	4	
2.6					
2.7					
2.8					
2.9					
3.0					
	impossibility				

qc : Cone bearing capacity = 5 qu = 10 C = 3.5 N

qu : Allowable soil pressure C : cohesion kg/cm², N : N - value

CONE PENETRATION TEST

Location ER-6 (Kalola R. R.B) , Location ER-7 (Kalola R. L.B)

No 2 Date No Date

Elevation by Elevation by

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	100	12.6	2.5	4	
0.2	125	15.8	3.1	5	
0.3	150	19.1	3.8	"	
0.4	110	14.0	2.8	4	
0.5	115	14.6	2.9	"	
0.6	60	7.7	1.5	2	
0.7	60	"	"	"	
0.8	60	"	"	"	
0.9	60	"	"	"	
1.0	60	"	"	"	
1.1	70	8.9	1.7	3	
1.2	80	10.1	2.0	"	
1.3	82	10.3	"	"	
1.4	75	9.6	1.9	"	
1.5	77	9.8	"	"	
1.6	105	13.4	2.6	4	
1.7	150	19.1	3.8	5	
1.8	↓				
1.9					
2.0					
	impossibility				

Penetrated Depth m	Gauge Value	qc kg/cm²	qu kg/cm²	N Value	Remark
0.1	42	5.2	1.0	1	
0.2	60	7.7	1.5	2	
0.3	57	7.4	1.4	"	
0.4	52	6.4	1.2	"	
0.5	47	6.1	1.2	"	
0.6	52	6.4	"	"	
0.7	47	6.1	"	"	
0.8	40	5.0	1.0	1	
0.9	47	6.1	1.2	2	
1.0	55	7.0	1.4	"	
1.1	40	5.0	1.0	1	
1.1	60	7.7	1.5	2	
1.3	87	11.1	2.2	3	
1.4	45	5.7	1.1	2	
1.5	55	7.0	1.4	"	
1.6	62	7.8	1.5	"	
1.7	52	6.4	1.2	"	
1.8	35	4.4	8.8	1	
1.9	42	5.2	1.0	"	
2.0	50	6.4	1.2	2	
2.1	45	5.7	1.1	"	
2.2	55	7.0	1.4	"	
2.3	62	7.8	1.5	"	
2.4	57	7.4	1.4	"	
2.5	52	6.4	1.2	"	
2.6	52	"	"	"	
2.7	77	9.8	1.9	3	
2.8	70	8.9	1.7	"	
2.9	82	10.3	2.0	"	
3.0	85	10.8	2.1	"	
3.1	89	11.8	2.2	"	
3.2	88	11.1	"	"	
3.3	122	15.4	3.0	4	
3.4	122	"	"	"	
3.5	160	20.3	4.0	6	
3.6					
3.7					
3.8					
	↓				
	impossibility				

*At the Another Place, Cone can not be penetrated until 1.0 m

qc : Cone bearing capacity = 5 qu = 10 C = 3.5 N

qu : Allowable soil pressure C : cohesion kg/cm², N : N - value

TOPOGRAPHY

TABLE OF CONTENTS

TOPOGRAPHY

(1) SDS (Installed by the Government of Indonesia)

No. of Bench Mark	Elevation (m)
A.T.G.S	0.0000
S.D.S 1	10.5670
S.D.S 2	3.2450
S.D.S 3	13.0920
S.D.S 4	45.2487
S.D.S 5	47.1777
S.D.S 6	90.2898
S.D.S 7	168.3444
S.D.S 8	371.0997
S.D.S 9	448.5060
S.D.S 10	355.3865
S.D.S 11	203.0478
S.D.S 12	113.4622
S.D.S 13	83.5466
S.D.S 14	100.2414
S.D.S 15	94.4508
S.D.S 16	94.0611
S.D.S 17	117.8054
S.D.S 18	100.3077
S.D.S 19	110.1779
S.D.S 20	169.5722
S.D.S 21	106.9714
S.D.S 22	49.9517
S.D.S 24	32.2230
S.D.S 25	100.4778
S.D.S 26	78.3220
S.D.S 27	123.4609
S.D.S 28	43.3828
S.D.S 29	30.5218
S.D.S 30	24.1827

No. of Bench Mark	Elevation (m)
S.D.S 31	13.4356
S.D.S 32	27.7766
S.D.S 33	44.1856
S.D.S 34	55.4246
S.D.S 35	18.2575
S.D.S 36	23.2094
S.D.S 37	13.2814
S.D.S 38	12.5951
S.D.S 39	23.4880
S.D.S 40	15.2549
S.D.S 41	13.9869
S.D.S 42	17.8478
S.D.S 44	22.9218
S.D.S 45	27.4898
S.D.S 46	21.5427
S.D.S 47	11.1317
S.D.S 48	9.9165
S.D.S 49	15.9011
S.D.S 50	11.3865
S.D.S 51	13.5917
S.D.S 52	25.4389
S.D.S 53	28.8862
S.D.S 54	32.1824
S.D.S 55	112.4037
S.D.S 56	111.9408
S.D.S 57	109.3027
S.D.S 58	118.7548
S.D.S 59	122.3049
S.D.S 60	147.7449
S.D.S 61	134.1020

/

No. of Bench Mark	Elevation (m)
S.D.S 62	151.9171
S.D.S 63	115.4602
S.D.S 64	97.0473
S.D.S 65	36.8354
S.D.S 66	82.6855
S.D.S 67	3.7656
S.D.S 68	2.7296
S.D.S 69	5.7167
S.D.S 70	20.0288
S.D.S 71	1.8899
S.D.S 72	4.8780
S.D.S 73	3.0401
S.D.S 74	7.5120
S.D.S 75	10.6038
S.D.S 76	23.4349
S.D.S 77	35.9890
S.D.S 78	31.5781
S.D.S 79	30.9124
S.D.S 80	26.0605
S.D.S 81	27.7715
S.D.S 82	124.1612
S.D.S 83	121.5972
S.D.S 84	201.2562
S.D.S 85	263.9072
S.D.S 86	295.4062
S.D.S 87	437.6382
S.D.S 88	224.3242
S.D.S 89	360.4512
S.D.S 90	341.0062
S.D.S 91	356.7692
S.D.S 92	77.1411
S.D.S 93	59.0939

No. of Bench Mark	Elevation (m)
S.D.S 94	17.6377
S.D.S 95	6.6689
S.D.S 96	9.9334
S.D.S 97	10.5887
S.D.S 98	4.7417
S.D.S 99	3.3087
S.D.S 100	2.8135
S.D.S 101	2.9074
S.D.S 102	10.2704
S.D.S 103	27.9966
S.D.S 104	31.6545
S.D.S 105	22.5044
S.D.S 106	20.8215
S.D.S 107	23.5084
S.D.S 108	35.3132
S.D.S 109	42.4243
S.D.S 110	72.6315
S.D.S 111	114.0239
S.D.S 112	164.3582
S.D.S 113	148.4972
S.D.S 114	131.0339
S.D.S 115	53.4962
S.D.S 116	32.8220
S.D.S 117	16.2215
S.D.S 118	1.5992
S.D.S 119	1.5152
S.D.S 120	1.3122
S.D.S 121	12.7290
S.D.S 122	21.4834
S.D.S 123	14.6122
S.D.S 124	16.8427
S.D.S 125	24.7632

No. of Bench Mark	Elevation (m)	No. of Bench Mark	Elevation (m)
S.D.S 126	21.5587	S.D.S 145	9.7469
S.D.S 127	31.3951	S.D.S 146	12.6499
S.D.S 128	32.9879	S.D.S 147	139.5329
S.D.S 129	39.8012	S.D.S 148	146.0929
S.D.S 130	101.7336	S.D.S 149	162.4969
S.D.S 131	51.7043	S.D.S 150	264.5219
S.D.S 132	19.8698	S.D.S 151	466.1229
S.D.S 133	15.8798	S.D.S 201	20.7286
S.D.S 134	10.9258	S.D.S 202	28.3439
S.D.S 135	37.5498	S.D.S 203	59.4959
S.D.S 136	45.0198	S.D.S 204	77.1339
S.D.S 137	12.7878	S.D.S 205	73.3399
S.D.S 138	22.8348	S.D.S 206	34.1509
S.D.S 139	34.7468	S.D.S 207	34.5459
S.D.S 140	11.8628	S.D.S 208	29.1879
S.D.S 141	4.2788	S.D.S 210	9.3829
S.D.S 142	28.6668	S.D.S 211	22.2901
S.D.S 143	18.5799	S.D.S 212	26.8251
S.D.S 144	8.4029	S.D.S 213	68.2551

(2) S.B.M (Installed JICA MAPPING TEAM in 1978)

No. of Bench Mark	Elevation (m)	No. of Bench Mark	Elevation (m)
I.S.B.M 1	23.8544	I.S.B.M 8	4.6162
I.S.B.M 2	24.7067	I.S.B.M 9	3.5795
I.S.B.M 3	35.8172	I.S.B.M 10	2.7679
I.S.B M 4	25.9589	I.S.B.M 11	4.7842
I.S.B.M 5	21.8899	I.S.B.M 12	4.6809
I.S.B.M 6	35.7001	I.S.B.M 13	82.1944
I.S.B.M 7	24.0557	I.S.B.M 14	22.6260

No. of Bench Mark	Elevation (m)
I.S.B.M 15	20.2782
I.S.B.M 16	26.2635
I.S.B.M 17	26.4684
I.S.B.M 18	19.8115
I.S.B.M 19	105.8302
I.S.B.M 20	116.2114
I.S.B.M 21	78.2943
I.S.B.M 22	23.5972
I.S.B.M 23	21.5702
I.S.B.M 24	34.0039
I.S.B.M 25	40.2050
I.S.B.M 26	16.4160
I.S.B.M 27	13.0639
I.S.B.M 28	27.0359
I.S.B.M 29	22.1829
I.S.B.M 30	18.9689
I.S.B.M 31	13.1029
I.S.B.M 32	26.3931
I.S.B.M 33	28.4089
I.S.B.M 34	32.8999
I.S.B.M 35	59.4999
I.S.B.M 36	64.1119
II.S.B.M 1	34.1772
II.S.B.M 2	42.6917
II.S.B.M 3	77.8992
II.S.B.M 4	98.6375
II.S.B.M 5	118.6065
II.S.B.M 6	118.8414
II.S.B.M 7	109.2191
II.S.B.M 8	16.4218
II.S.B.M 9	108.9374
II.S.B.M 10	158.2722

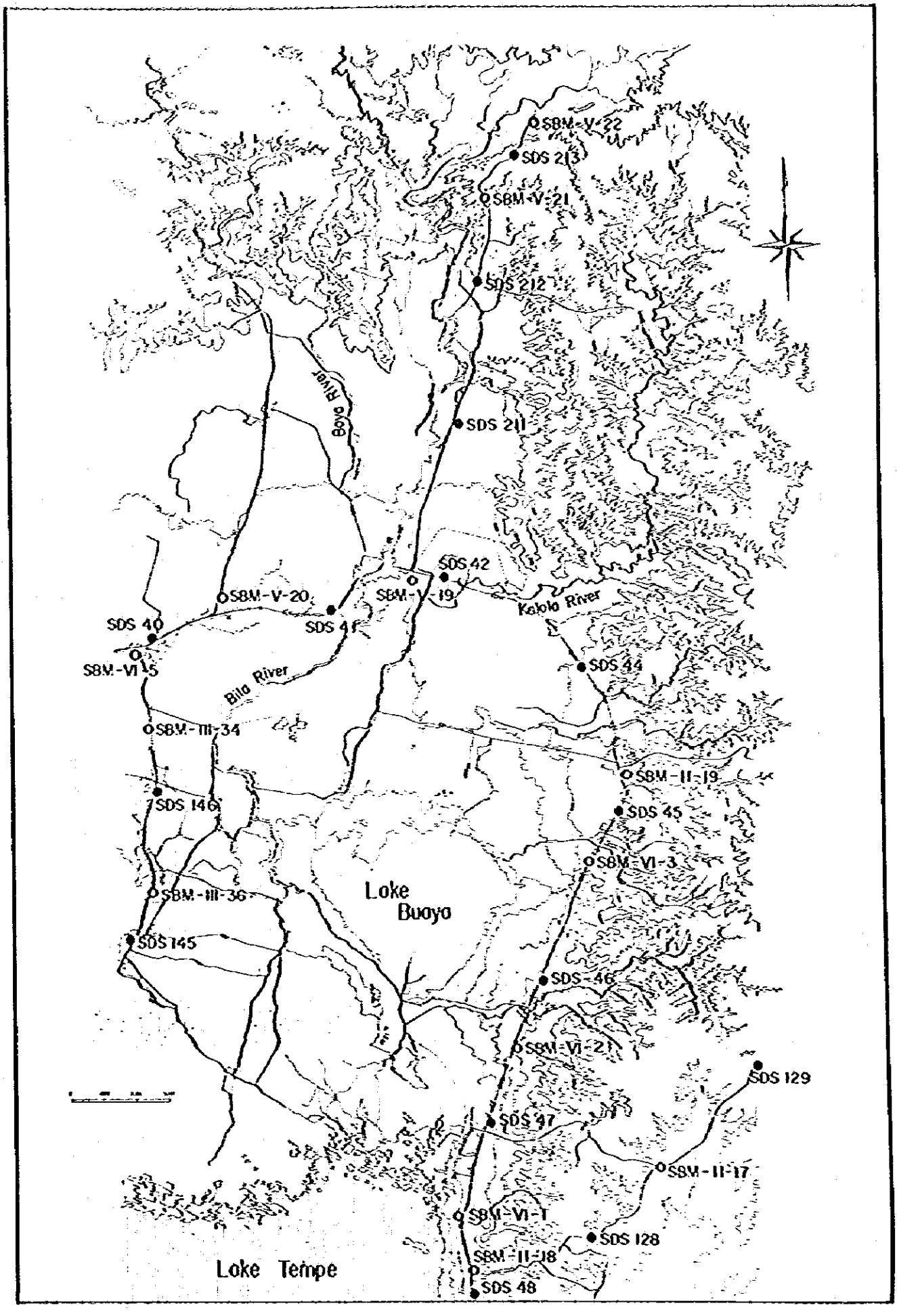
No. of Bench Mark	Elevation (m)
II.S.B.M 12	10.9630
II.S.B.M 13	12.4940
II.S.B.M 14	14.6711
II.S.B.M 15	42.6138
II.S.B.M 16	83.4885
II.S.B.M 17	38.3276
II.S.B.M 18	11.1997
II.S.B.M 19	40.2381
II.S.B.M 20	34.8628
II.S.B.M 21	18.0548
II.S.B.M 22	16.3298
III.S.B.M 1	266.1945
III.S.B.M 2	323.8043
III.S.B.M 3	416.8488
III.S.B.M 4	420.9797
III.S.B.M 5	455.2086
III.S.B.M 6	459.7916
III.S.B.M 7	389.1531
III.S.B.M 8	248.4694
III.S.B.M 9	226.7951
III.S.B.M 10	176.6381
III.S.B.M 11	82.1454
III.S.B.M 12	108.1257
III.S.B.M 13	75.0642
III.S.B.M 14	103.9502
III.S.B.M 15	73.3030
III.S.B.M 16	115.5502
III.S.B.M 17	116.5184
III.S.B.M 18	5.0026
III.S.B.M 19	141.4693
III.S.B.M 20	148.2170
III.S.B.M 21	74.8282

No. of Bench Mark	Elevation (m)
III.S.B.M 22	30.9794
III.S.B.M 23	70.8343
III.S.B.M 24	64.3002
III.S.B.M 25	26.3283
III.S.B.M 26	70.5663
III.S.B.M 27	101.0515
III.S.B.M 28	14.5061
III.S.B.M 29	20.8673
III.S.B.M 30	28.0762
III.S.B.M 31	13.5033
III.S.B.M 32	13.4982
III.S.B.M 33	12.8171
III.S.B.M 34	15.8809
III.S.B.M 35	18.4429
III.S.B.M 36	10.8229
III.S.B.M 37	35.1279
III.S.B.M 38	30.6349
III.S.B.M 39	32.9249
III.S.B.M 40	24.5459
III.S.B.M 41	29.0059
IV.S.B.M 0	163.2947
IV.S.B.M 1	203.5545
IV.S.B.M 2	217.4444
IV.S.B.M 3	244.9027
IV.S.B.M 4	221.5397
IV.S.B.M 5	172.8864
IV.S.B.M 6	167.6390
IV.S.B.M 7	163.5218
IV.S.B.M 8	75.0537
IV.S.B.M 9	64.8473
IV.S.B.M 10	35.3399
IV.S.B.M 11	13.2226

No. of Bench Mark	Elevation (m)
IV.S.B.M 12	5.2912
IV.S.B.M 13	4.8844
IV.S.B.M 14	17.9684
IV.S.B.M 15	3.6169
IV.S.B.M 16	5.3984
IV.S.B.M 17	12.1443
IV.S.B.M 18	22.9578
IV.S.B.M 19	20.1121
IV.S.B.M 20	82.8672
IV.S.B.M 21	97.0939
IV.S.B.M 22	109.2173
IV.S.B.M 23	31.0431
IV.S.B.M 24	41.7844
IV.S.B.M 25	21.6380
IV.S.B.M 26	30.7593
IV.S.B.M 27	37.6125
V.S.B.M 1	2.4680
V.S.B.M 2	19.7980
V.S.B.M 3	23.0432
V.S.B.M 4	28.3558
V.S.B.M 5	32.5817
V.S.B.M 6	31.2107
V.S.B.M 7	32.3351
V.S.B.M 8	11.0852
V.S.B.M 9	140.5799
V.S.B.M 10	138.7585
V.S.B.M 11	11.8882
V.S.B.M 12	6.0952
V.S.B.M 13	11.8516
V.S.B.M 14	10.1229
V.S.B.M 15	7.2057
V.S.B.M 16	5.1928

No. of Bench Mark	Elevation (m)
V.S.B.M 17	20.9979
V.S.B.M 18	4.7968
V.S.B.M 19	19.1271
V.S.B.M 20	17.8125
V.S.B.M 21	71.1531
V.S.B.M 22	55.6811
V.S.B.M 23	60.8234
V.S.B.M 24	58.6313
V.S.B.M 25	36.4221
VI.S.B.M 1	10.2461
VI.S.B.M 2	21.8572

No. of Bench Mark	Elevation (m)
VI.S.B.M 3	22.2964
VI.S.B.M 4	32.3654
VI.S.B.M 5	15.2511
VI.S.B.M 6	2.2422
VI.S.B.M 7	1.4312
VI.S.B.M 8	1.7552
VI.S.B.M 9	11.8653
VI.S.B.M 10	15.0742
VII.S.B.M 1	416.5862
VII.S.B.M 2	365.3082
VII.S.B.M 3	286.0812

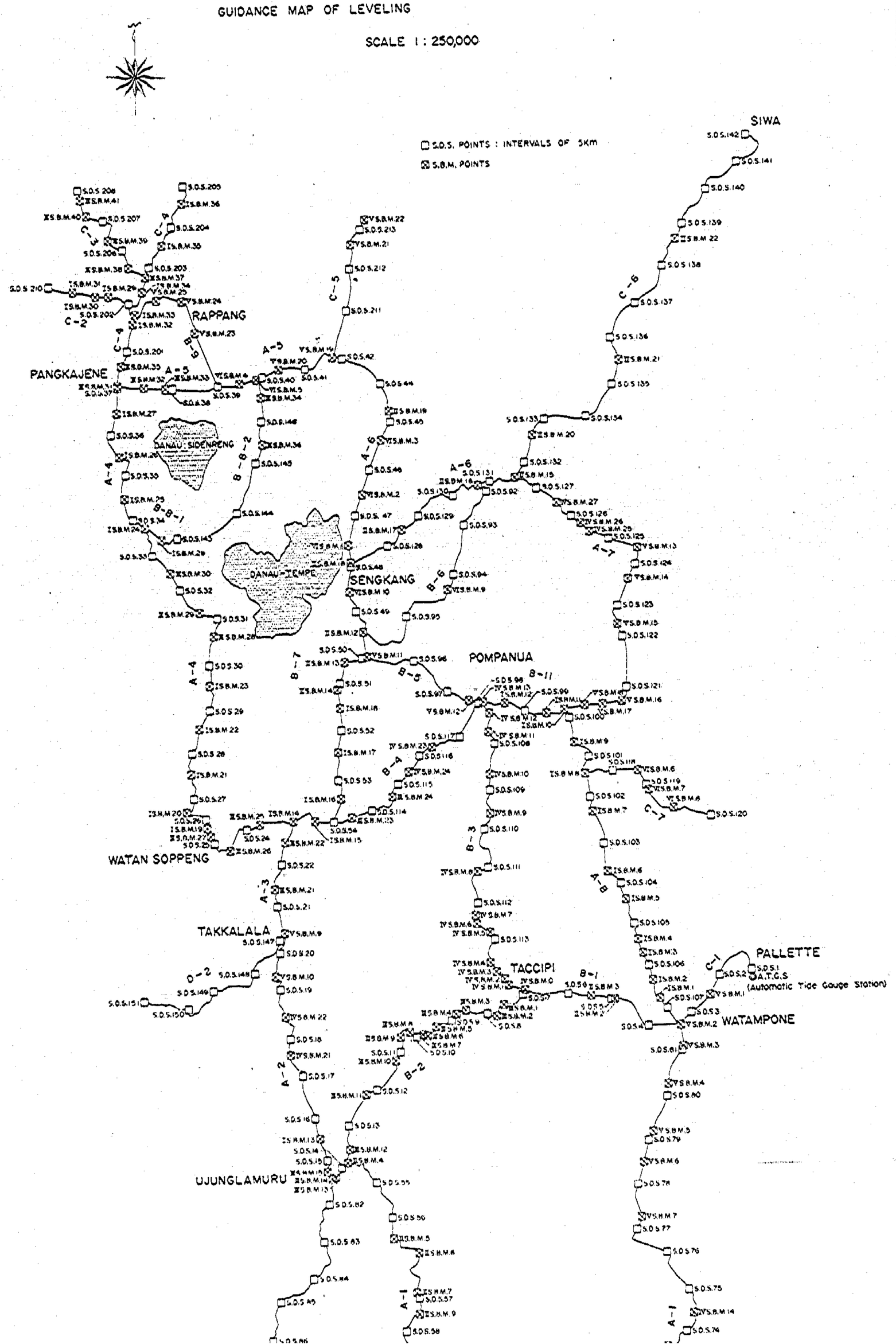


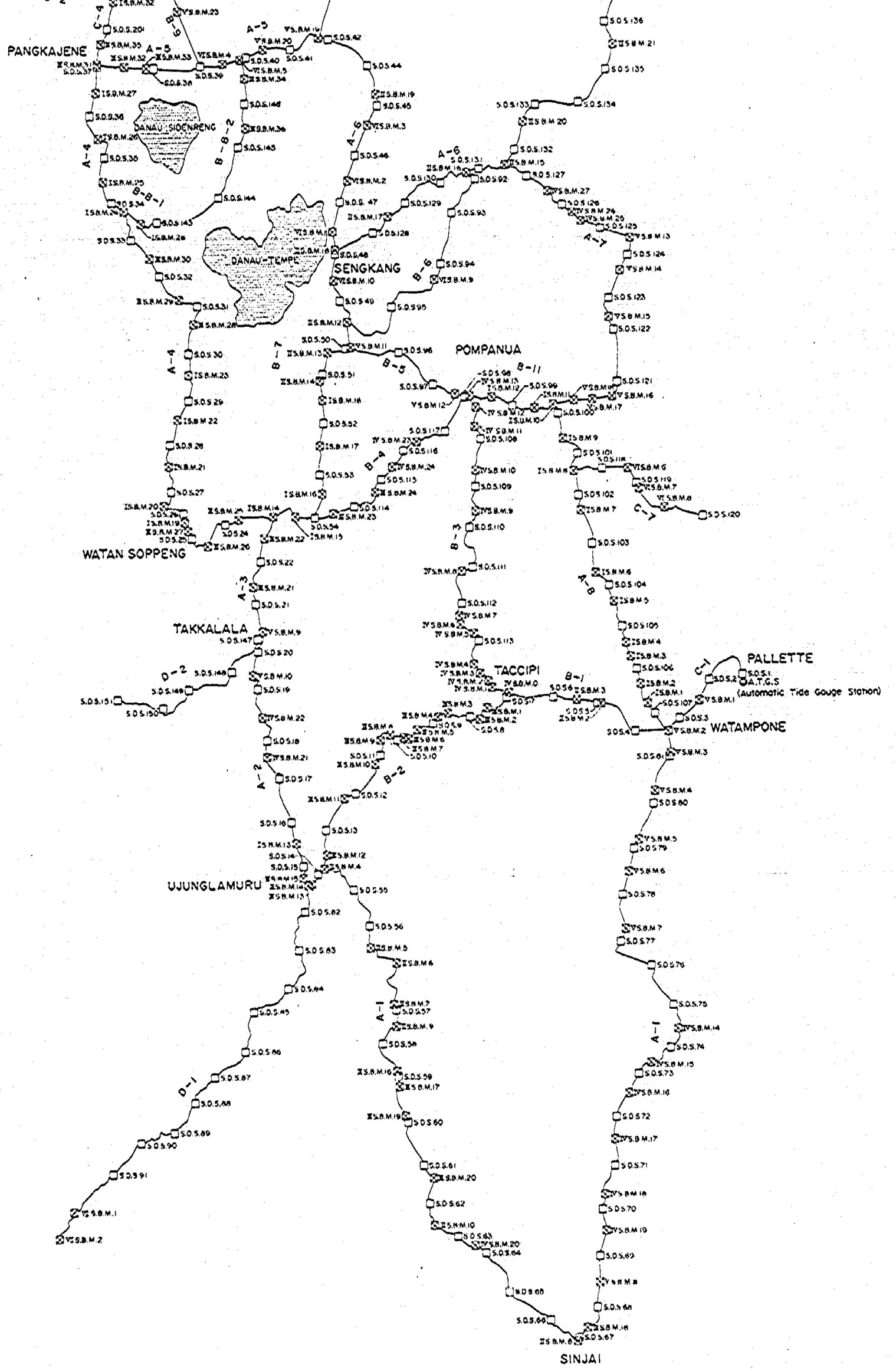
Bench Marks in the Study Area

MAPPING WORK(PART2) FOR MASTER PLAN OF THE CENTRAL SOUTH SULAWESI WATER RESOURCES DEVELOPMENT PROJECT IN INDONESIA

GUIDANCE MAP OF LEVELING

SCALE 1 : 250,000




PANGKAJENE
DANAU SIDENRENG
DANAU TEMPE
SENGKANG
POMPANUA
WATAN SOPPENG
TAKKALALA
TACCIPI
PALLETTE
A.T.G.S
(Automatic Tide Gauge Station)
WATAMPONE
UJUNGLAMURU
SINJAI