REPUBLIQUE POPULAIRE REVOLUTIONNAIRE DE GUINEE
MINISTERE DE L'AGRICULTURE, DES EAUX ET FORETS
ET DES FAPA

# RAPPORT DE L'ETUDE DE FAISABILITE SUR LE PROJET DE DEVELOPPEMENT AGRICOLE A KANKAN

## TOME IV

## DONNEES ⅓

Août 1980

AGENCE JAPONAISE DE COOPERATION INTERNATIONALE

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# DATA BOOK I.

## TOPOGRAPHIC SURVEY

## LIST OF DATA BOOKS

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| DATA BOOK I. | TOPOGRAPHIC SURVEY |
| DATA BOOK II. | SOIL |
| DATA BOOK III. | SOIL MECHANIC |
| DATA BOOK IV. | METEOROLOGY |
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## Table and Figure

# I. TOPOGRAPHIC SURVEY

## I.1 Available Data on Topographic Survey

### (1) Topographic Maps

The following two kinds of topographic maps are available in the project area:

i) 1/200,000-scale maps with a contour interval of 50 m, prepared by Geographic Service in 1953.

ii) 1/5,000-scale maps with a contour interval of 1.0 m (supplemental contour 0.5 m), covering an area of about 250 $km^2$. The maps were prepared in 1978 under the technical cooperation of Japanese Government.

### (2) Bench Marks

The bench mark networks established by the D.G.J. in 19 cover the whole land of Guinea, including the project area. The curved elevation of the bench marks located in and around the project area are as listed in Table I-1, and their exact locations are shown in Fig. I-1.

Two new bench marks are established in the proposed pilot farm sites located in the Guirilan and Foussein sub-areas. The curved elevation and location of the new bench marks are shown in Fig. I-2, Fig. I-3.

## I.2 Topographic Survey for Major Facility Sites

The plane table survey was carried out for the proposed sites of pilot farm and major irrigation structures, and detailed topographic maps on a scale of 1/1,000 to 1/2,500 with 1 to 0.25 m conter intervals were prepared. Total area mapped is about 280 ha. (see Fig. I-4 to Fig. I-12)

Table I-1 List of Bench Marks in and around the Project Area

| Bench Mark | Elevation (m) |
|---|---|
| DGJ 9 | 397,407 |
| DGJ 130 | 362,431 |
| DGJ 131 | 362,176 |
| DGJ 133 | 359,808 |
| DGJ 137 | 365,493 |
| DGJ 138 | 370,385 |
| BM 1 | 366,515 |
| BM 2 | 371,427 |
| TBM 1 | 384,517 |
| TBM 2 | 377,000 |
| TBM 3 | 365,098 |
| TBM 4 | 376,622 |
| TBM 5 | 371,772 |
| TBM 6 | 362,981 |
| TBM 7 | 363,163 |
| TBM 8 | 369,619 |
| TBM 9 | 368,923 |
| TBM 10 | 359,098 |
| TBM 11 | 362,044 |
| TBM 12 | 362,740 |
| TBM 13 | 384,275 |
| TBM 14 | 373,673 |
| TBM 15 | 360,506 |
| TBM 16 | 381,389 |
| TBM 17 | 358,099 |
| TBM 18 | 367,310 |

Fig. I - 1 Location of Bench Marks in and around the Project Area.

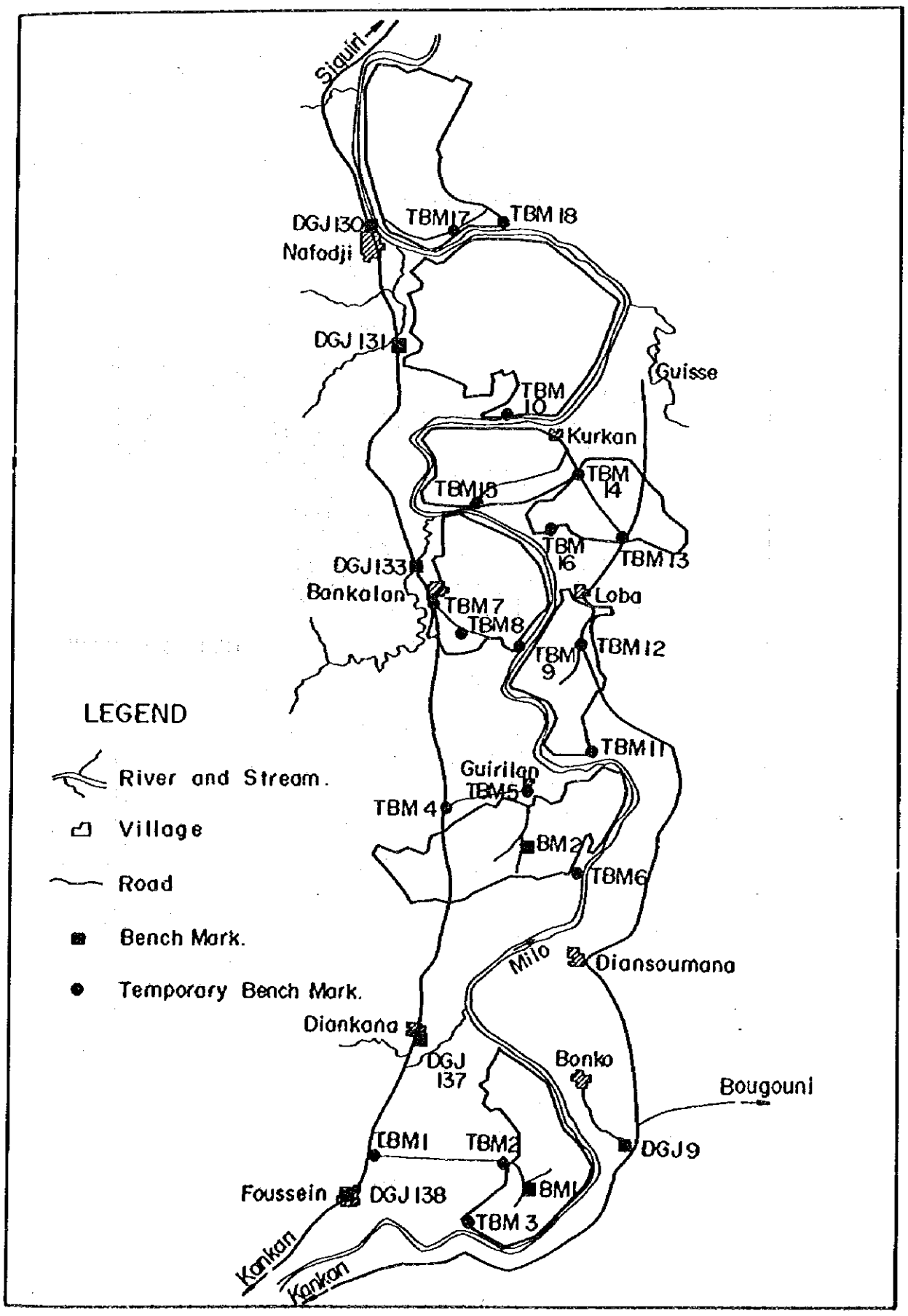


Fig. I-2 Location of Bench Mark. I.

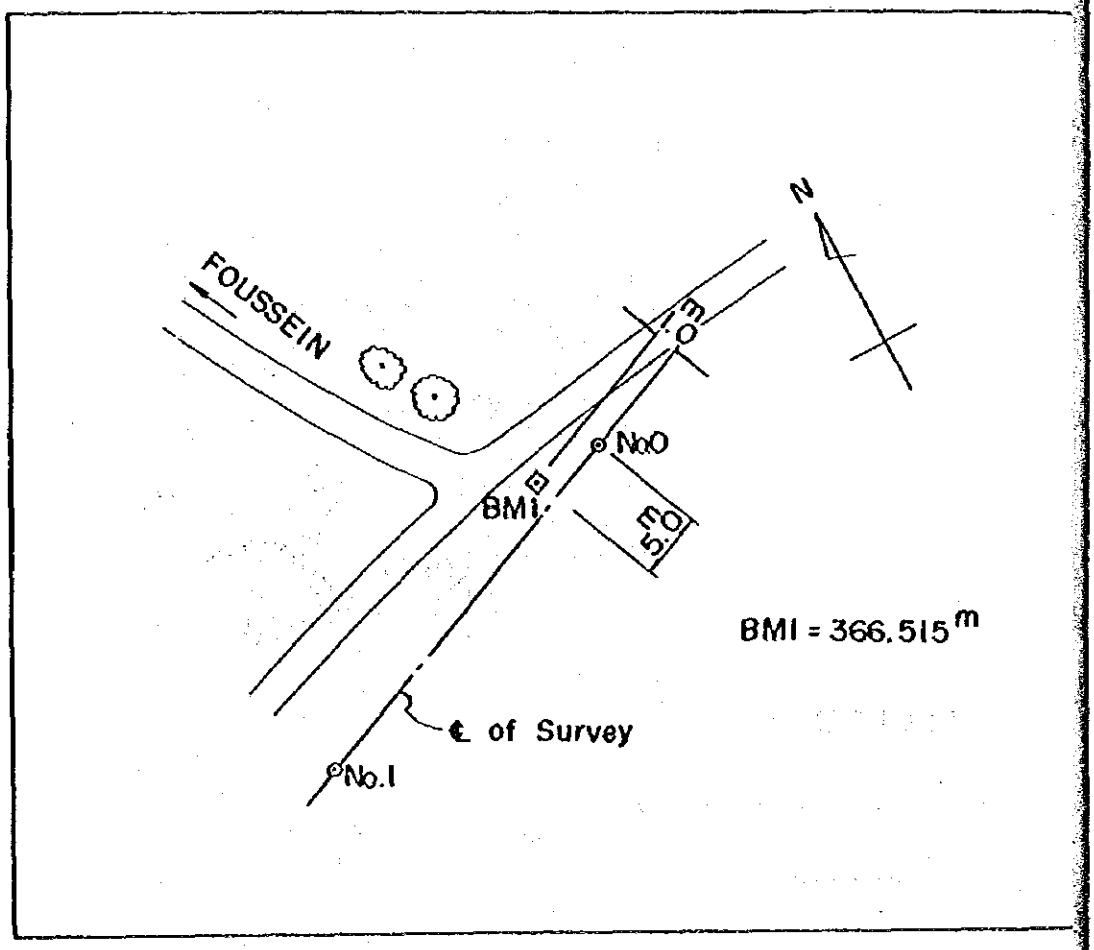


Fig I-3 Location of Bench Mark. 2.

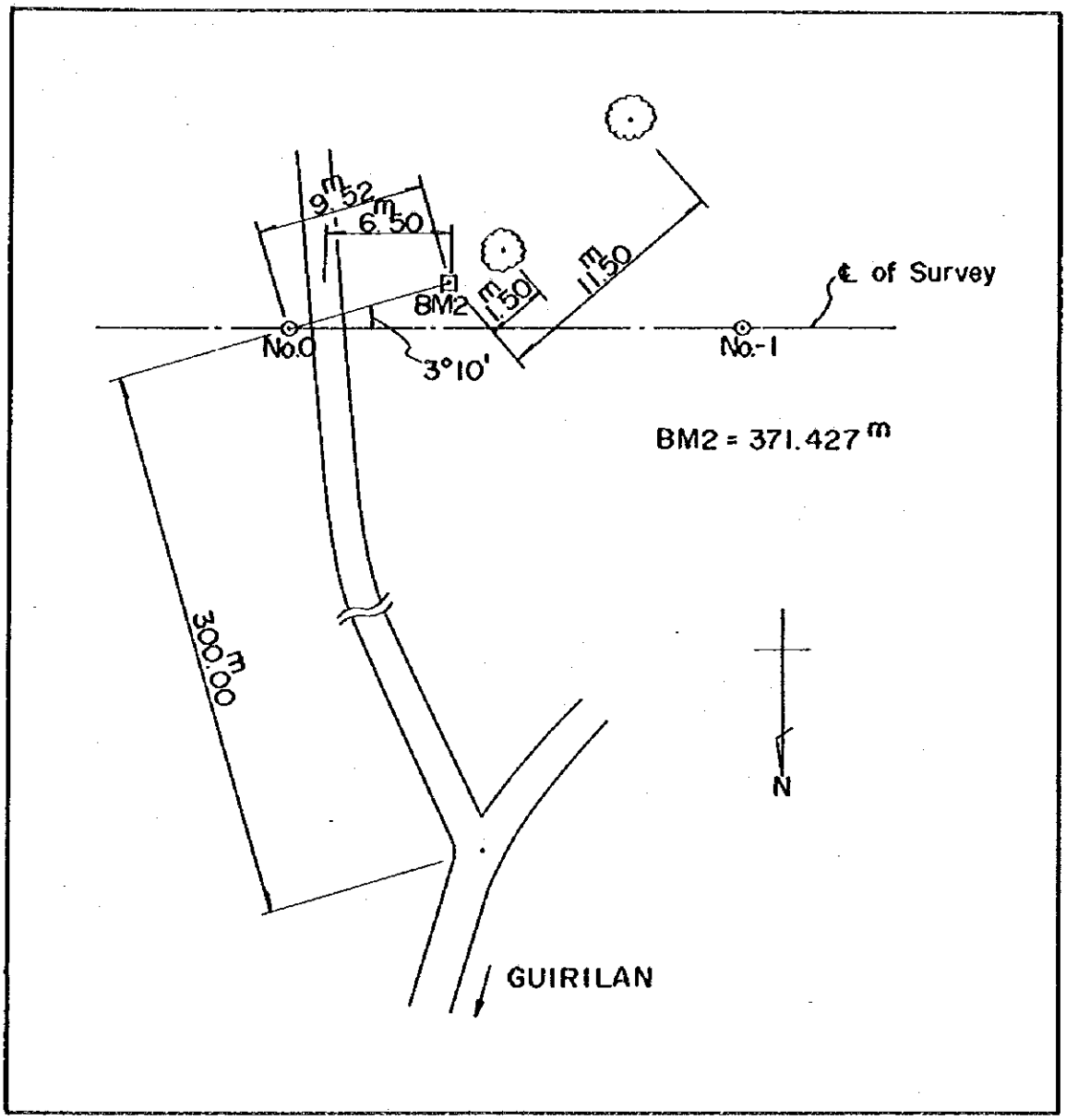


Fig.I-4 EMPLACEMENT DE LA STATION DE POMPAGE A FUSSEIN

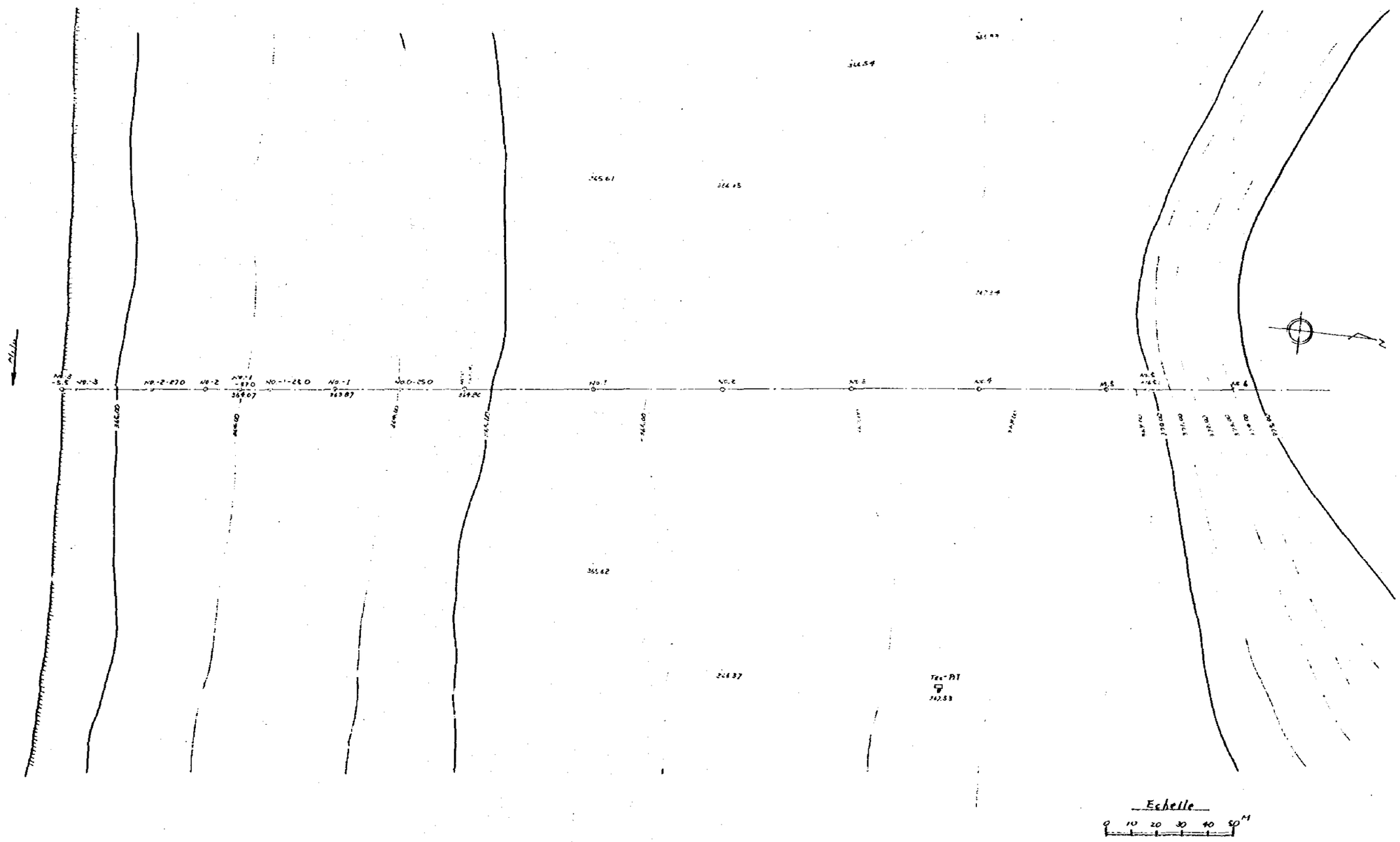
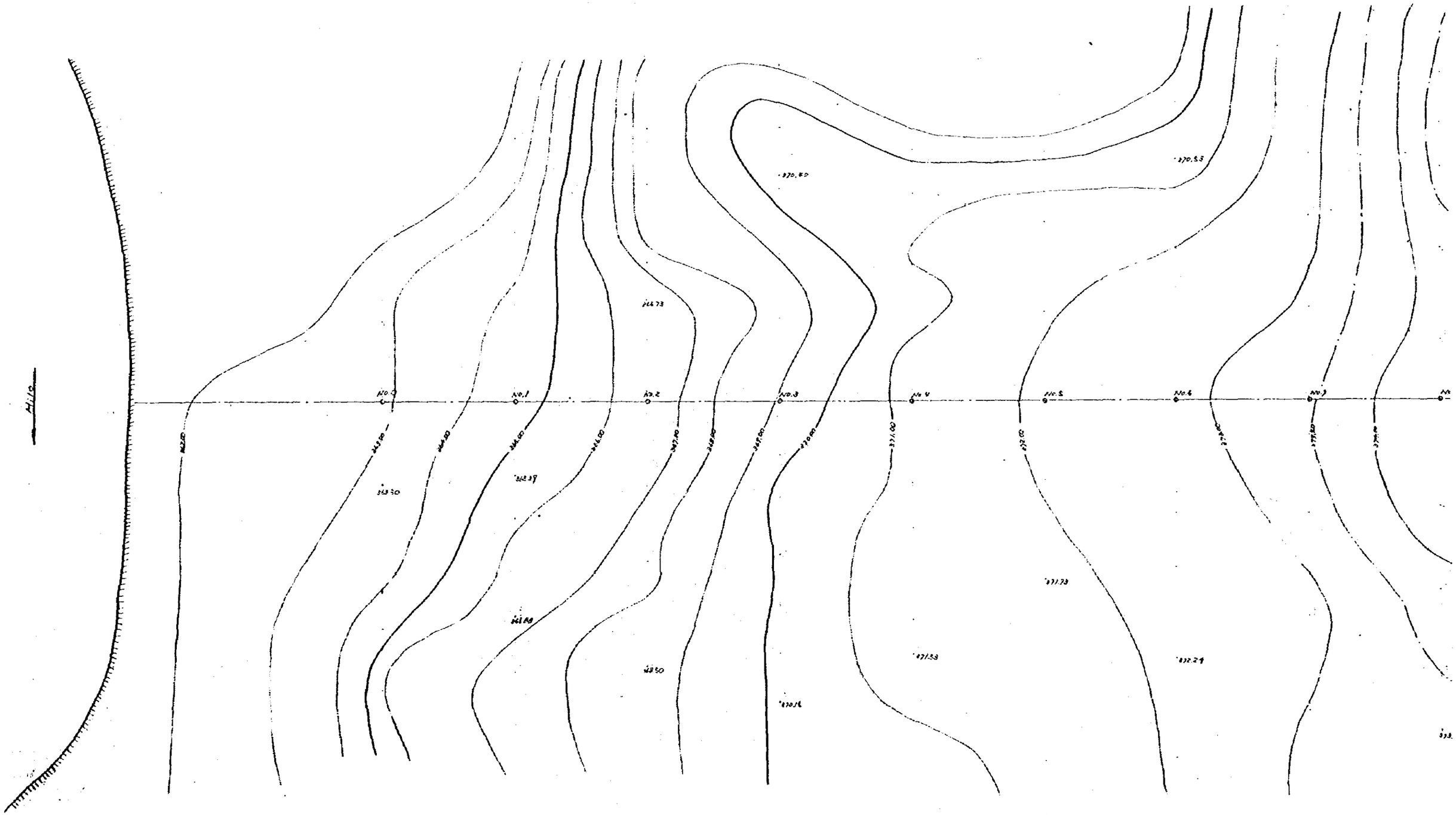


Fig. I-5 EMPLACEMENT DE LA STATION DE POMPAGE A GUIRILAN



LACEMENT DE LA STATION DE POMPAGE A GUIRILAN

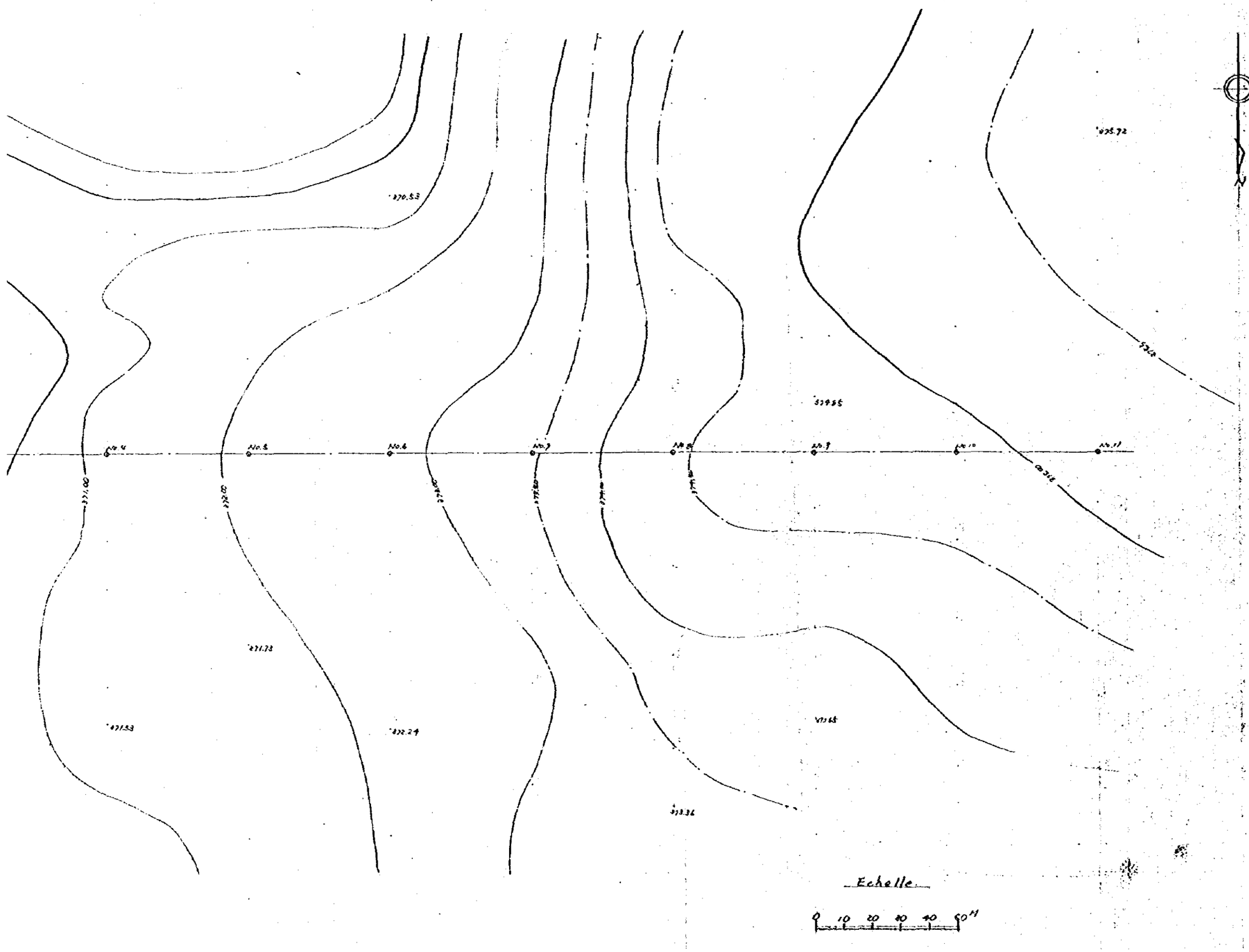


Fig.I-6 EMPLACEMENT DE LA STATION DE POMPAGE A BANKALAN

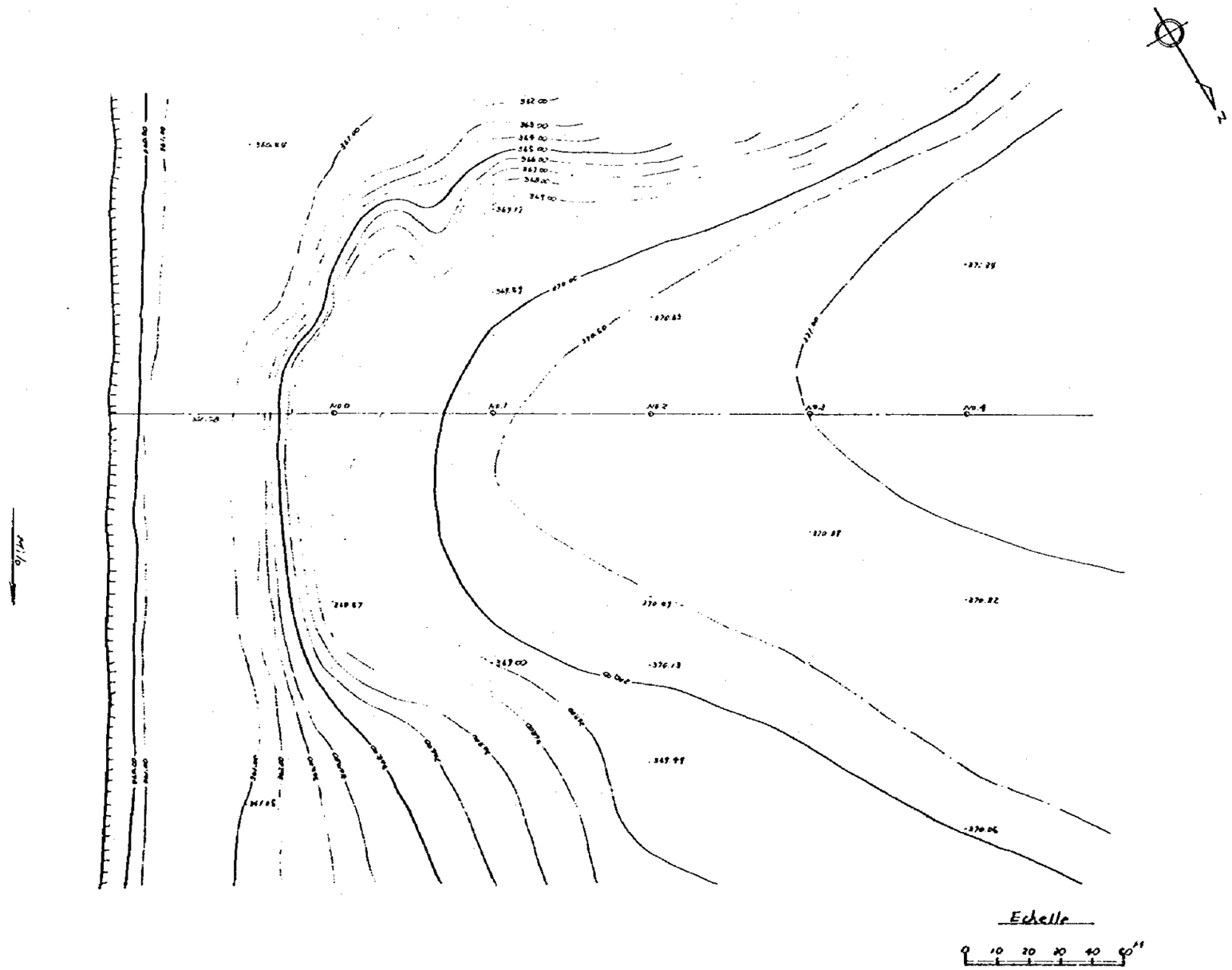


Fig.I-7 EMPLACEMENT DE LA STATION DE POMPAGE(No1) A NAFADJI SUD

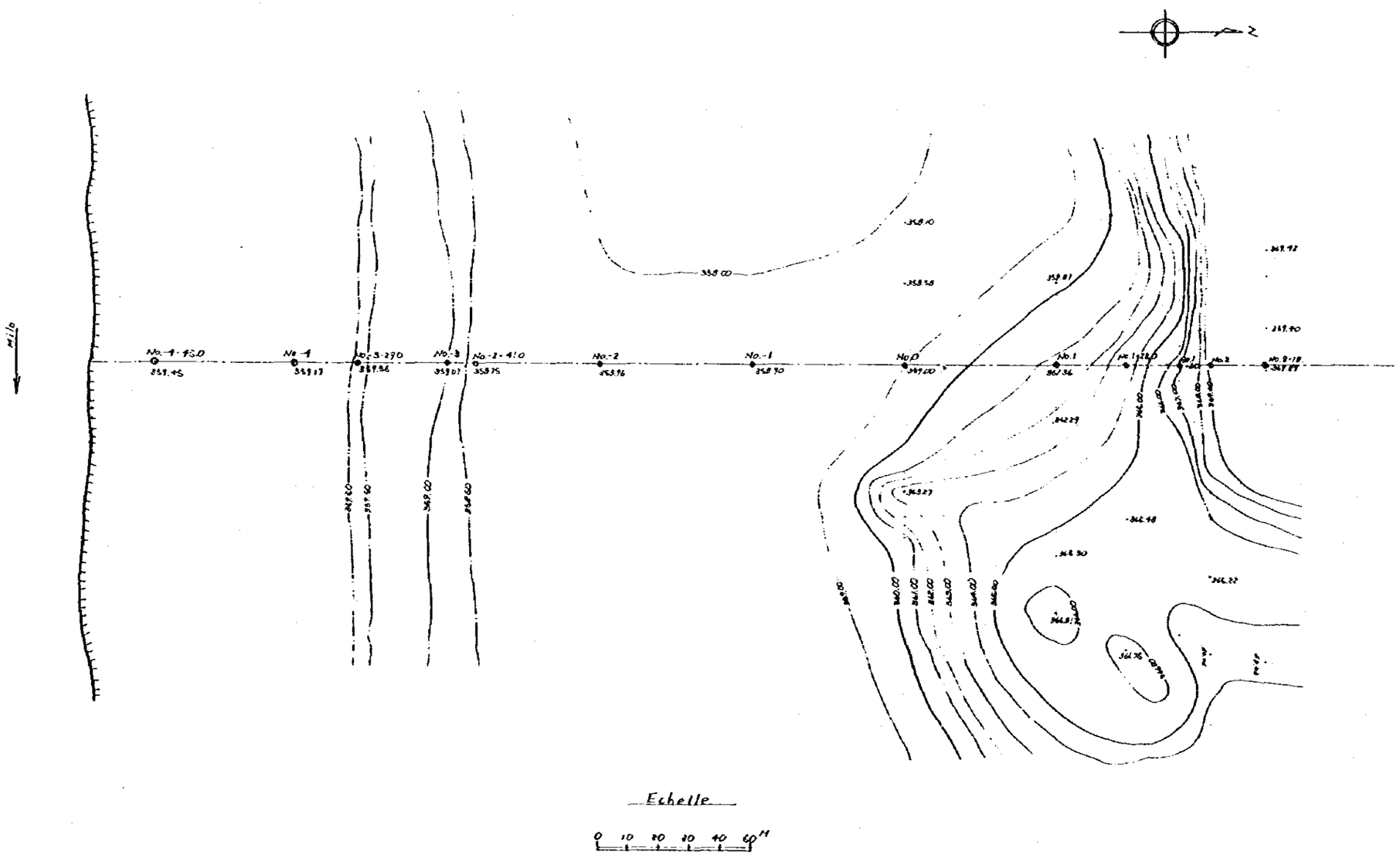


Fig.I-8 EMPLACEMENT DE LA STATION DE POMPAGE (No.2) A NAFADJI SUD

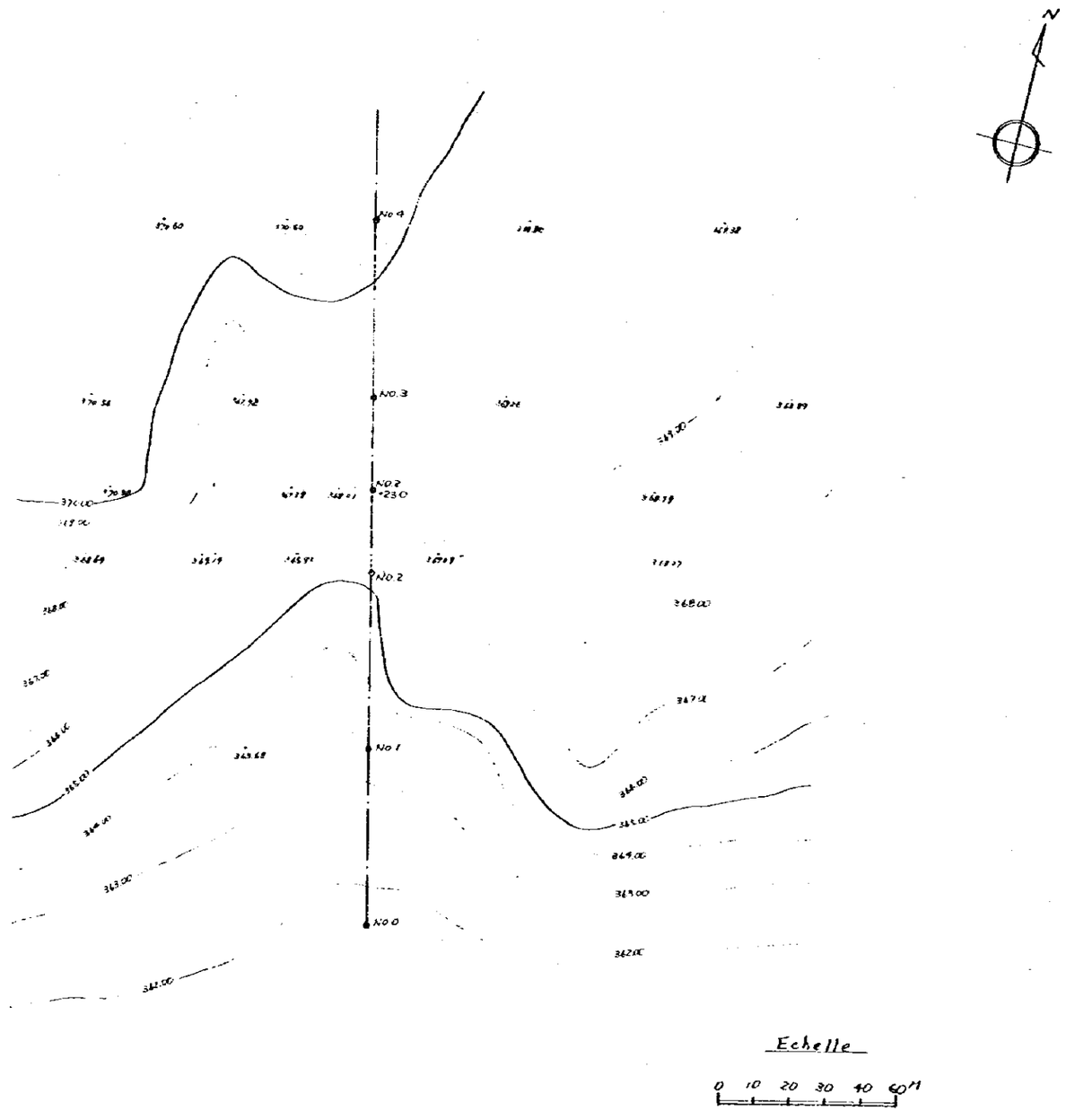


Fig.I-9 EMPLACEMENT DE LA STATION DE POMPAGE A FARAKO

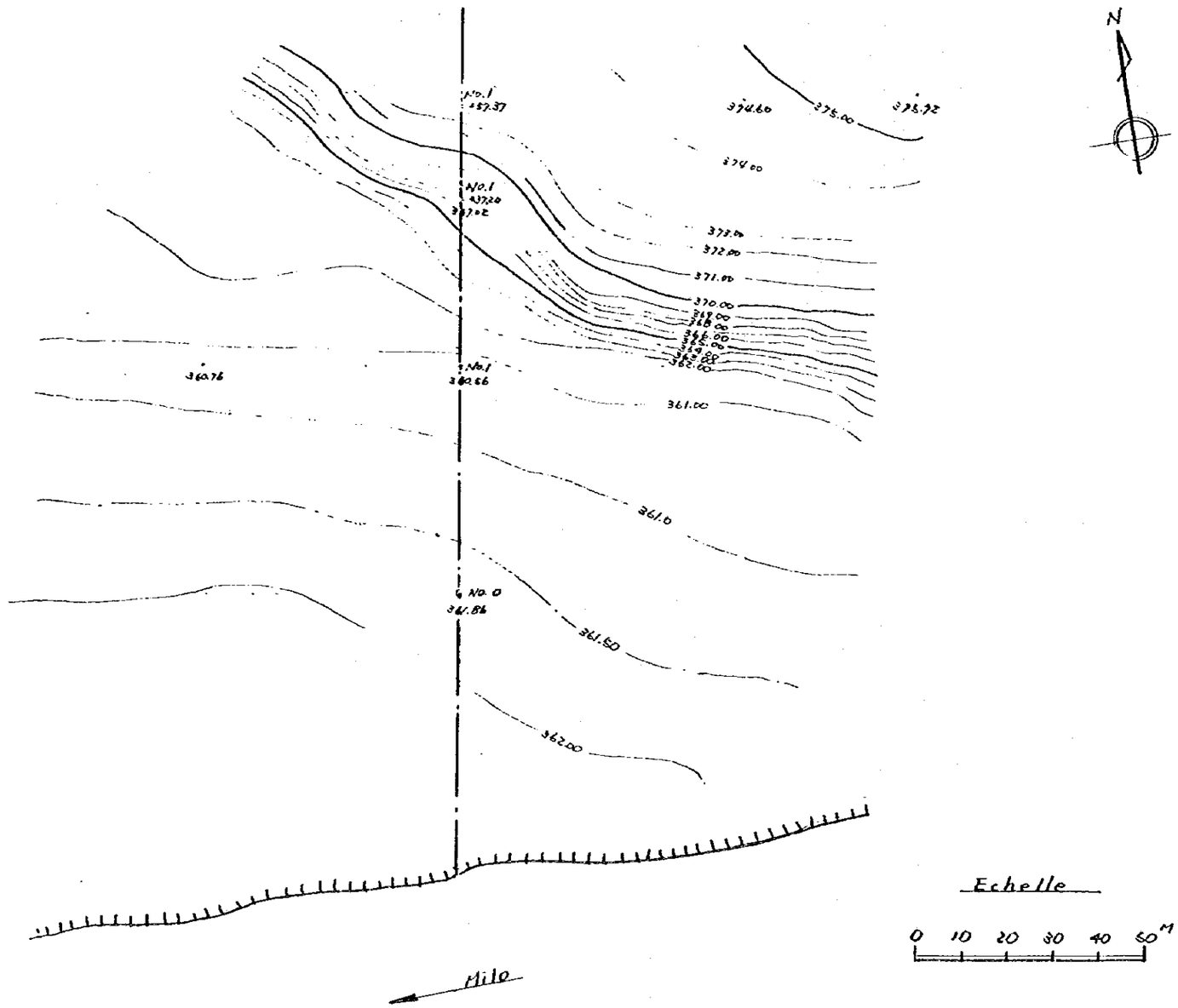


Fig.I-10 EMPLACEMENT DE STATION DE POMPAGE A LOBA

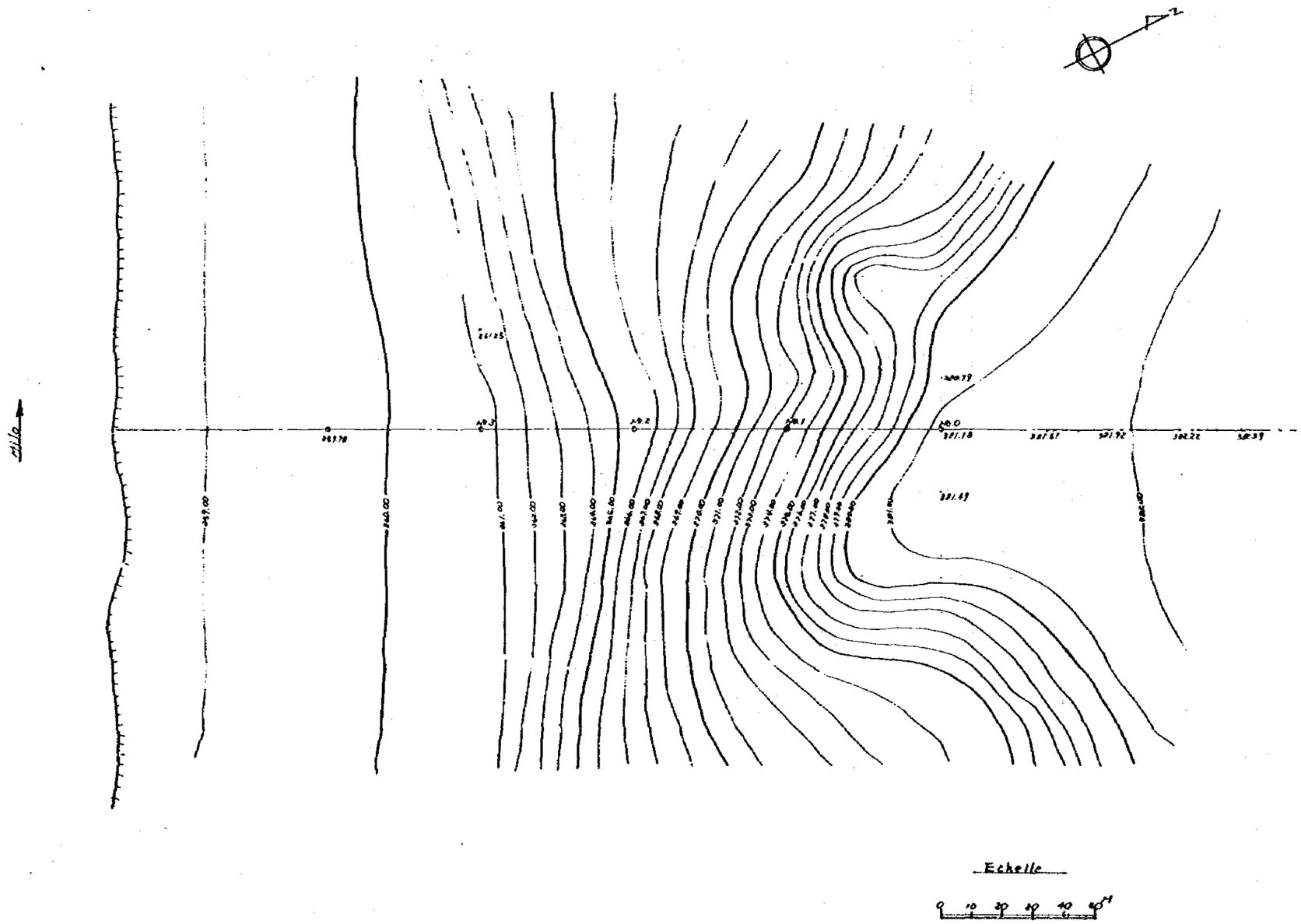


Fig.I-11 EMPLACEMENT DE LA STATION DE POMPAGE A KURKAN

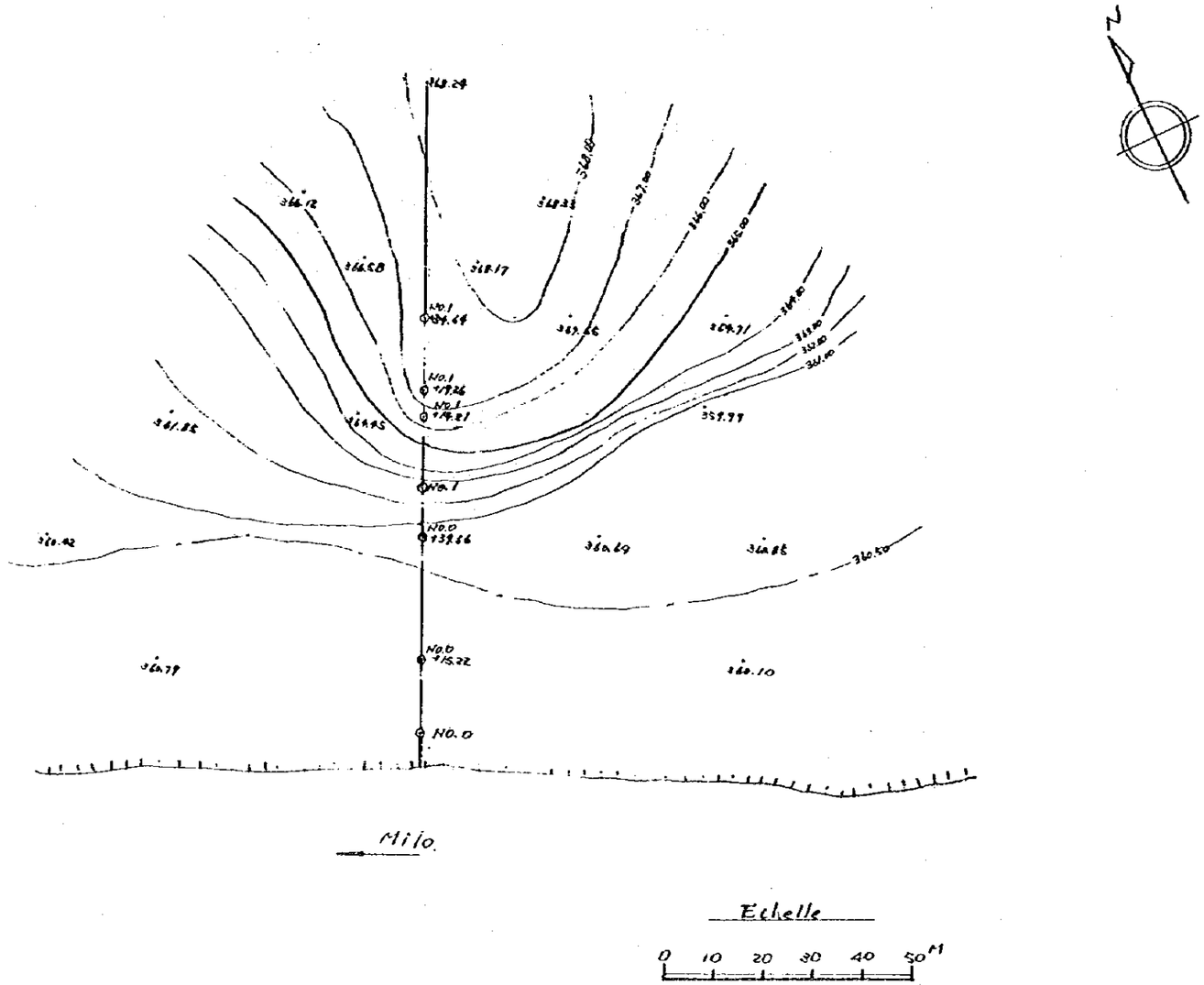


Fig.I-12 EMPLACEMENT DE LA STATION DE POMPAGE A NAFADJI NORD

# DATA BOOK II.

# S O I L

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Table II-1 Results of Water Quality Test

Sample : River Water of the Milo

Place : Kankan

Date : 4th November, 1979

| Item | Unit | Result |
|---|---|---|
| pH | | 7.30 |
| EC | μU/cm | 3.64 x 10 |
| $Na^{+}$ | meq/ℓ<br>(ppm) | 0.09<br>(2.05) |
| $K^{+}$ | meq/ℓ<br>(ppm) | 0.02<br>(0.83) |
| $Ca^{+2}$ | meq/ℓ<br>(ppm) | 0.16<br>(3.25) |
| $Mg^{+2}$ | meq/ℓ<br>(ppm) | 0.07<br>(0.88) |
| Alkalinity | meq/ℓ | 0.24 |
| $Cl^{-}$ | meq/ℓ<br>(ppm) | 0.14<br>(4.84) |
| $SO_4^{2-}$ | meq/ℓ<br>(ppm) | 0.04<br>(2.00) |
| $SiO_2$ | (ppm) | 21.73 |
| Total Cation | meq/ℓ | 0.35 |
| Total Anion | meq/ℓ | 0.42 |
| Total Ion | meq/ℓ | 0.76 |
| $NH_3$-N | ppm | 0.13 |
| $NO_2$-N | ppm | 0.008 |
| $NO_3$-N | ppm | 0.058 |
| COD | ppm<br>(meq/ℓ) | 7.08<br>(0.22) |
| $PO_4^{3-}$ | ppm | 0.15 |
| Total Fe | ppm | 0.52 |
| Cu | ppm | 0.007 |
| Zn | ppm | 0.004 |
| Pb | ppm | 0.003 |

Table II-2 Results of Soil Analysis (1/2)

| Sample No. | Pit No. & Horison | Depth (cm) | Gravel (%) | Particle Size (%) Coarse sand | Fine sand | Silt | Clay | Soil Texture | Bulk Density | Humus (%) | Total Carbon (%) | Total Nitrogen (%) | C/N Ratio | pH $H_2O$ | Kcl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 049-1 | 25 | 0 | 76.5 | 11.2 | 5.0 | 7.3 | LS | 1.42 | 0.8 | 0.46 | 0.05 | 9 | 5.8 | 5.1 |
| 2 | -2 | 45 | 0 | 67.4 | 19.1 | 2.2 | 11.3 | LS | 1.32 | 0.5 | 0.29 | 0.05 | 6 | 6.1 | 4.9 |
| 3 | -3 | 75 | 0.3 | 51.2 | 9.3 | 6.3 | 33.2 | SC | 1.06 | 0.2 | 0.12 | 0.03 | 4 | 5.1 | 4.2 |
| 4 | -4 | 105 | 2.2 | 58.1 | 10.6 | 9.5 | 21.8 | SCL | 1.07 | 0.2 | 0.12 | 0.02 | 6 | 5.1 | 4.4 |
| 5 | -5 | | 36.1 | 52.5 | 21.4 | 11.0 | 15.1 | SCL | 1.11 | 0.5 | 0.29 | 0.03 | 10 | 5.4 | 4.5 |
| 6 | 009-1 | 10 | 0.3 | 70.0 | 18.8 | 4.6 | 6.6 | LS | 1.44 | 0.8 | 0.46 | 0.05 | 9 | 5.6 | 4.6 |
| 7 | -2 | 25 | 0.4 | 58.2 | 26.3 | 5.1 | 10.5 | SL | 1.29 | 0.6 | 0.35 | 0.05 | 7 | 5.5 | 4.4 |
| 8 | -3 | 60 | 1.7 | 47.1 | 25.4 | 8.3 | 19.2 | SCL | 1.19 | 0.5 | 0.29 | 0.04 | 7 | 5.1 | 4.3 |
| 9 | -4 | 90 | 57.2 | 51.5 | 20.4 | 10.1 | 18.0 | SCL | 1.37 | 0.3 | 0.17 | 0.03 | 6 | 5.0 | 4.2 |
| 10 | 525-1 | 15 | 1.9 | 73.8 | 14.7 | 3.9 | 7.6 | LS | 1.45 | 0.7 | 0.41 | 0.04 | 10 | 5.5 | 4.5 |
| 11 | -2 | 35 | 0.4 | 66.0 | 19.8 | 6.4 | 7.8 | LS | 1.40 | 0.5 | 0.29 | 0.04 | 7 | 5.3 | 4.4 |
| 12 | -3 | 50 | 0 | 69.3 | 18.0 | 1.5 | 11.2 | LS | 1.40 | 0.2 | 0.12 | 0.02 | 6 | 5.0 | 4.4 |
| 13 | -4 | 75 | 9.1 | 57.8 | 25.8 | 3.5 | 12.9 | SL | 1.34 | 0.2 | 0.12 | 0.02 | 6 | 5.0 | 4.3 |
| 14 | 004-1 | 15 | 1.4 | 24.7 | 42.5 | 7.1 | 25.7 | SC | 1.27 | 2.7 | 1.39 | 0.15 | 9 | 5.3 | 4.4 |
| 15 | -2 | 25 | 25.7 | 39.6 | 29.4 | 8.0 | 23.0 | SCL | 1.01 | 2.0 | 1.04 | 0.08 | 13 | 5.1 | 4.4 |
| 16 | -3 | 45 | 80.7 | 27.7 | 28.0 | 11.1 | 38,0 | SC | 1.12 | 2.1 | 1.16 | 0.11 | 10 | 5.4 | 4.3 |
| 17 | -4 | 80 | 59.6 | 26.1 | 21.2 | 3.5 | 49.2 | HC | 0.78 | 1.3 | 0.64 | 0.07 | 9 | 5.1 | 4.2 |
| 18 | 070-1 | 20 | 66.0 | 46.4 | 26.2 | 7.5 | 19.9 | SCL | 1.07 | 4.4 | 2.44 | 0.15 | 16 | 6.0 | 5.1 |
| 19 | -2 | 40 | 66.0 | 18.6 | 23.5 | 11.3 | 46.6 | HC | 0.92 | 1.3 | 0.70 | 0.07 | 10 | 5.5 | 4.2 |
| 20 | -3 | 85 | 70.8 | 22.4 | 19.6 | 20.8 | 37.2 | LiC | 0.89 | 1.0 | 0.52 | 0.05 | 10 | 5.3 | 4.4 |
| 21 | 058-1 | 15 | 0 | 48.5 | 20.5 | 9.2 | 21.8 | SCL | 1.20 | 1.1 | 0.64 | 0.07 | 9 | 5.3 | 4.3 |
| 22 | -2 | 30 | 7.2 | 42.9 | 8.8 | 7.2 | 41.1 | LiC | 0.82 | 1.1 | 0.58 | 0.06 | 10 | 5.5 | 4.2 |
| 23 | -3 | 55 | 3.6 | 38.1 | 15.3 | 9.7 | 36.9 | SC | 0.95 | 1.0 | 0.52 | 0.04 | 13 | 5.4 | 4.4 |
| 24 | 518-1 | 10 | 0 | 32.4 | 28.3 | 29.6 | 9.7 | L | 1.33 | 1.1 | 0.64 | 0.06 | 11 | 5.7 | 4.4 |
| 25 | -2 | 20 | 0 | 24.1 | 26.8 | 33.3 | 15.8 | CL | 1.25 | 0.7 | 0.41 | 0.04 | 10 | 5.7 | 4.3 |
| 26 | -3 | 35 | 1.0 | 31.2 | 27.2 | 11.3 | 30.3 | SC | 1.19 | 0.5 | 0.29 | 0.04 | 7 | 5.4 | 4.1 |
| 27 | -4 | 50 | 64.5 | 23.0 | 21.1 | 17.2 | 38.7 | LiC | 1.07 | 1.0 | 0.52 | 0.04 | 13 | 5.3 | 4.0 |
| 28 | 509-1 | 10 | 1.0 | 21.2 | 27.3 | 29.5 | 22.0 | CL | 1.18 | 1.9 | 1.04 | 0.09 | 12 | 5.4 | 4.2 |
| 29 | -2 | 20 | 2.4 | 22.4 | 24.4 | 27.9 | 25.3 | LiC | 1.21 | 0.8 | 0.46 | 0.04 | 12 | 5.3 | 4.1 |
| 30 | -3 | 45 | 29.0 | 34.3 | 10.3 | 22.9 | 32.5 | LiC | 0.86 | 0.6 | 0.29 | 0.02 | 15 | 5.4 | 4.0 |
| 31 | 059-1 | 15 | 1.6 | 63.2 | 19.1 | 10.1 | 7.6 | SL | 1.22 | 1.0 | 0.58 | 0.06 | 10 | 6.0 | 4.6 |
| 32 | -2 | 30 | 2.0 | 40.9 | 16.4 | 13.1 | 29.6 | SC | 0.88 | 0.8 | 0.46 | 0.07 | 7 | 5.3 | 4.0 |
| 33 | -3 | 50 | 24.8 | 27.7 | 15.1 | 10.2 | 47.0 | LiC | 0.67 | 0.8 | 0.46 | 0.05 | 9 | 5.3 | 4.0 |
| 34 | -4 | 75 | 17.9 | 25.5 | 16.1 | 7.1 | 51.3 | HC | 0.84 | 1.0 | 0.46 | 0.03 | 15 | 5.1 | 4.1 |

Table II-2 Results of Soil Analysis (2/2)

| Sample No. | Pit No. & Horison | Depth (cm) | CEC (me/100g) | Exchangeable Base (mg/100g) | | | | | Basic Saturation (%) | Free Iron Oxides (%) | $P_2O_5$ Abso. Coefficient | Available (mg/100g) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ca | Mg | K | N | Total (me) | | | | N | P | K | $SiO_2$ |
| 1 | 049-1 | 25 | 2.4 | 20.7 | 7.0 | 2.3 | Tr. | 1.68 | 70 | 0.10 | 132 | 1.0 | 0.7 | 1.2 | 2.8 |
| 2 | -2 | 45 | 2.0 | 10.7 | 6.3 | 1.6 | Tr. | 1.10 | 55 | 0.12 | 132 | 1.0 | 0.2 | 1.9 | 3.7 |
| 3 | -3 | 75 | 9.9 | 9.8 | 4.0 | 2.3 | Tr. | 0.88 | 9 | 0.29 | 353 | 0.4 | 0.3 | 0.3 | 15.9 |
| 4 | -4 | 105 | 7.0 | 5.4 | 2.7 | 1.6 | Tr. | 0.54 | 8 | 0.31 | 349 | - | 0.2 | 0.2 | 19.2 |
| 5 | -5 | | 4.0 | 10.6 | 3.8 | 1.7 | Tr. | 0.89 | 22 | 0.45 | 208 | - | 0.1 | 0.1 | 22.4 |
| 6 | 009-1 | 10 | 1.5 | 8.1 | 2.3 | 2.6 | Tr. | 0.66 | 44 | 0.06 | 65 | 1.1 | 0.7 | 0.8 | 2.2 |
| 7 | -2 | 25 | 2.1 | 5.6 | 1.0 | 1.5 | Tr. | 0.41 | 20 | 0.10 | 66 | 0.9 | 0.5 | 0.6 | 3.6 |
| 8 | -3 | 60 | 2.8 | 3.6 | 0.5 | 1.0 | Tr. | 0.26 | 9 | 0.10 | 93 | 0.4 | 0.7 | 0.2 | 6.1 |
| 9 | -4 | 90 | 3.6 | 2.1 | 0.7 | 1.3 | Tr. | 0.20 | 6 | 0.26 | 160 | - | 0.6 | 0.2 | 17.9 |
| 10 | 525-1 | 15 | 1.8 | 4.5 | 2.1 | 2.0 | Tr. | 0.46 | 26 | 0.08 | 50 | 0.6 | 0.8 | 0.9 | 2.7 |
| 11 | -2 | 35 | 1.8 | 1.5 | 1.2 | 1.5 | Tr. | 0.22 | 12 | 0.07 | 50 | 0.2 | 0.5 | 0.9 | 3.9 |
| 12 | -3 | 50 | 1.8 | 2.0 | 1.0 | 0.8 | Tr. | 0.20 | 11 | 0.07 | 51 | - | 0.4 | 0.2 | 5.7 |
| 13 | -4 | 75 | 2.2 | 1.5 | 0.7 | 1.0 | Tr. | 0.28 | 13 | 0.07 | 52 | - | 0.6 | 0.2 | 5.5 |
| 14 | 004-1 | 15 | 5.1 | 5.6 | 0.6 | 3.4 | Tr. | 0.42 | 8 | 0.18 | 219 | 1.8 | 0.7 | 0.8 | 6.1 |
| 15 | -2 | 25 | 4.1 | 2.7 | 0.2 | 2.3 | Tr. | 0.22 | 5 | 0.24 | 212 | 1.8 | 0.5 | 0.7 | 5.4 |
| 16 | -3 | 45 | 6.3 | 1.6 | 0.2 | 2.6 | Tr. | 0.17 | 2 | 0.23 | 480 | - | 0.5 | 0.5 | 7.2 |
| 17 | -4 | 80 | 14.4 | 1.8 | 0.2 | 2.9 | Tr. | 0.19 | 1 | 0.58 | 536 | - | 0.6 | 0.5 | 16.5 |
| 18 | 070-1 | 20 | 5.9 | 37.5 | 4.7 | 5.1 | Tr. | 2.39 | 41 | 0.39 | 327 | 2.1 | 0.5 | 0.9 | 9.5 |
| 19 | -2 | 40 | 11.8 | 9.1 | 1.6 | 4.4 | Tr. | 0.70 | 6 | 0.50 | 599 | 0.9 | 0.6 | 0.7 | 15.0 |
| 20 | -3 | 85 | 14.2 | 8.1 | 2.6 | 2.4 | Tr. | 0.69 | 5 | 0.47 | 587 | - | 0.4 | 0.3 | 22.3 |
| 21 | 058-1 | 15 | 4.9 | 14.8 | 3.8 | 4.7 | Tr. | 1.19 | 24 | 0.09 | 150 | 1.6 | 1.3 | 1.9 | 4.7 |
| 22 | -2 | 30 | 10.2 | 25.1 | 7.1 | 4.6 | Tr. | 0.82 | 8 | 0.31 | 632 | 1.4 | 0.6 | 0.5 | 21.7 |
| 23 | -3 | 55 | 10.8 | 19.9 | 6.4 | 4.2 | Tr. | 1.64 | 15 | 0.44 | 763 | 0.4 | 0.6 | 0.4 | 32.1 |
| 24 | 518-1 | 10 | 2.8 | 11.3 | 3.3 | 2.4 | Tr. | 0.89 | 32 | 0.03 | 118 | 1.2 | 0.6 | 1.2 | 3.5 |
| 25 | -2 | 20 | 3.1 | 8.8 | 2.4 | 2.2 | Tr. | 0.70 | 23 | 0.04 | 109 | 0.5 | 0.6 | 1.4 | 3.5 |
| 26 | -3 | 35 | 6.5 | 7.8 | 3.3 | 2.6 | Tr. | 0.73 | 11 | 0.05 | 203 | 0.5 | 0.7 | 0.5 | 5.2 |
| 27 | -4 | 50 | 12.0 | 6.6 | 3.4 | 2.7 | Tr. | 0.68 | 6 | 0.13 | 240 | - | 0.8 | 0.5 | 5.2 |
| 28 | 509-1 | 10 | 5.3 | 17.2 | 4.3 | 2.4 | Tr. | 1.29 | 24 | 0.04 | 68 | 1.9 | 1.5 | 0.7 | 4.6 |
| 29 | -2 | 20 | 7.0 | 6.4 | 2.1 | 2.0 | Tr. | 0.55 | 8 | 0.03 | 191 | 1.2 | 0.8 | 0.4 | 13.4 |
| 30 | -3 | 45 | 16.3 | 8.2 | 2.7 | 2.4 | Tr. | 0.70 | 4 | 0.28 | 200 | - | 0.7 | 0.2 | 14.6 |
| 31 | 059-1 | 15 | 3.2 | 12.7 | 5.7 | 2.4 | Tr. | 1.17 | 37 | 0.12 | 290 | 0.7 | 0.8 | 1.7 | 2.8 |
| 32 | -2 | 30 | 8.6 | 6.3 | 2.2 | 2.1 | Tr. | 0.56 | 7 | 0.27 | 371 | 1.1 | 0.3 | 1.6 | 8.0 |
| 33 | -3 | 50 | 12.8 | 8.5 | 1.8 | 2.4 | Tr. | 0.63 | 5 | 0.33 | 475 | - | 0.5 | 0.7 | 18.2 |
| 34 | -4 | 75 | 14.5 | 4.7 | 0.9 | 2.0 | Tr. | 0.36 | 3 | 0.41 | 532 | - | 0.5 | 0.5 | 20.9 |

Table II-3 Results of Buffer Test

| Sample No. | Pit No. & Horison | pH ($H_2O$) for $CaCO_3$ added to 100g of soil | | | | |
|---|---|---|---|---|---|---|
| | | None | 10 mg | 25 mg | 50 mg | 100 mg |
| 10 | 525-1 | 5.5 | 6.8 | 7.5 | 7.7 | 7.8 |
| 11 | -2 | 5.3 | 7.1 | 7.7 | 7.8 | 7.9 |
| 12 | -3 | 5.0 | 6.9 | 7.7 | 7.8 | 7.9 |
| 13 | -4 | 5.0 | 7.0 | 7.7 | 7.7 | 7.8 |
| 21 | 058-1 | 5.3 | 7.1 | 7.3 | 7.5 | 7.8 |
| 22 | -2 | 5.5 | 6.2 | 7.4 | 7.6 | 7.7 |
| 23 | -3 | 5.4 | 6.2 | 7.4 | 7.6 | 7.7 |
| 31 | 059-1 | 6.0 | 7.3 | 7.7 | 7.8 | 7.8 |
| 32 | -2 | 5.3 | 6.5 | 7.0 | 7.5 | 7.6 |
| 33 | -3 | 5.3 | 5.9 | 6.7 | 7.3 | 7.4 |
| 34 | -4 | 5.1 | 5.7 | 6.7 | 7.2 | 7.3 |

# DATA BOOK III.

## SOIL MECHANIC

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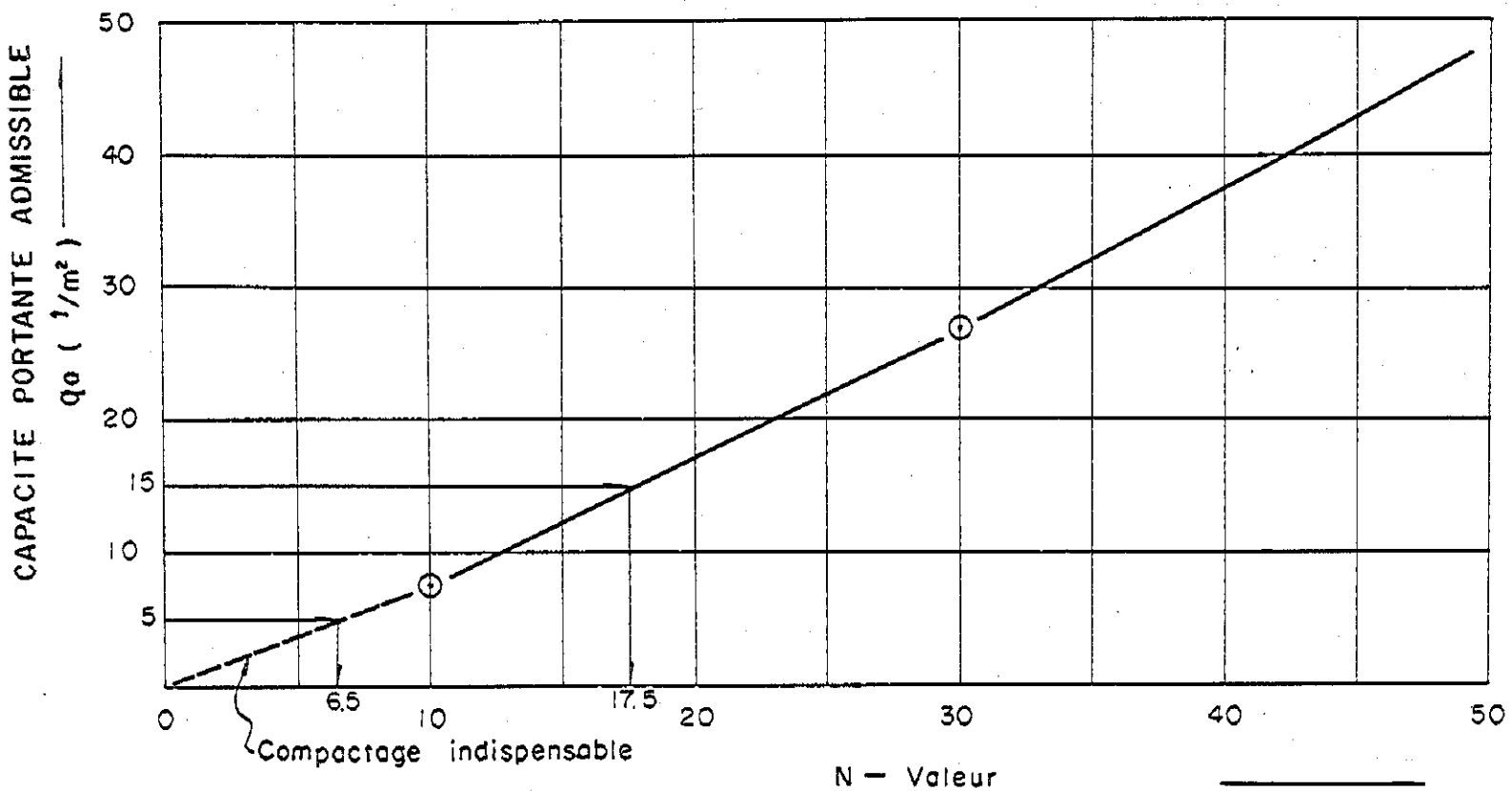
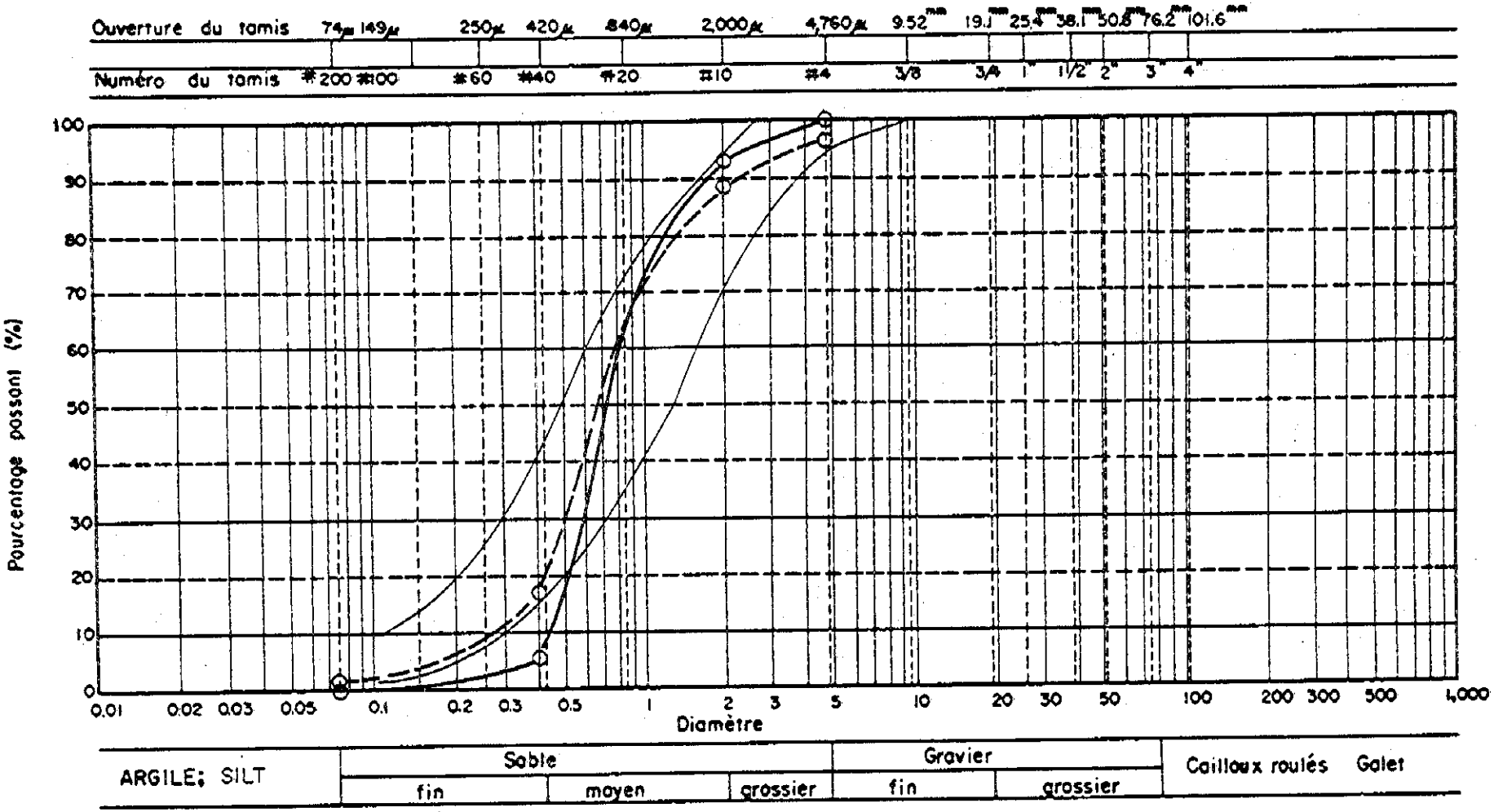
Fig. III-1 LA CAPACITE PORTANTE ADMISSIBLE PROPOSEE POUR LA FONDATION SUR RADIER SUR LE SABLE




| Densité relative du sable | Lâche | Intermédiare | Dense | Plus dense |
|---|---|---|---|---|

Fig. III-2 ANALYSE GRANULOMETRIQUE SUR SABLE



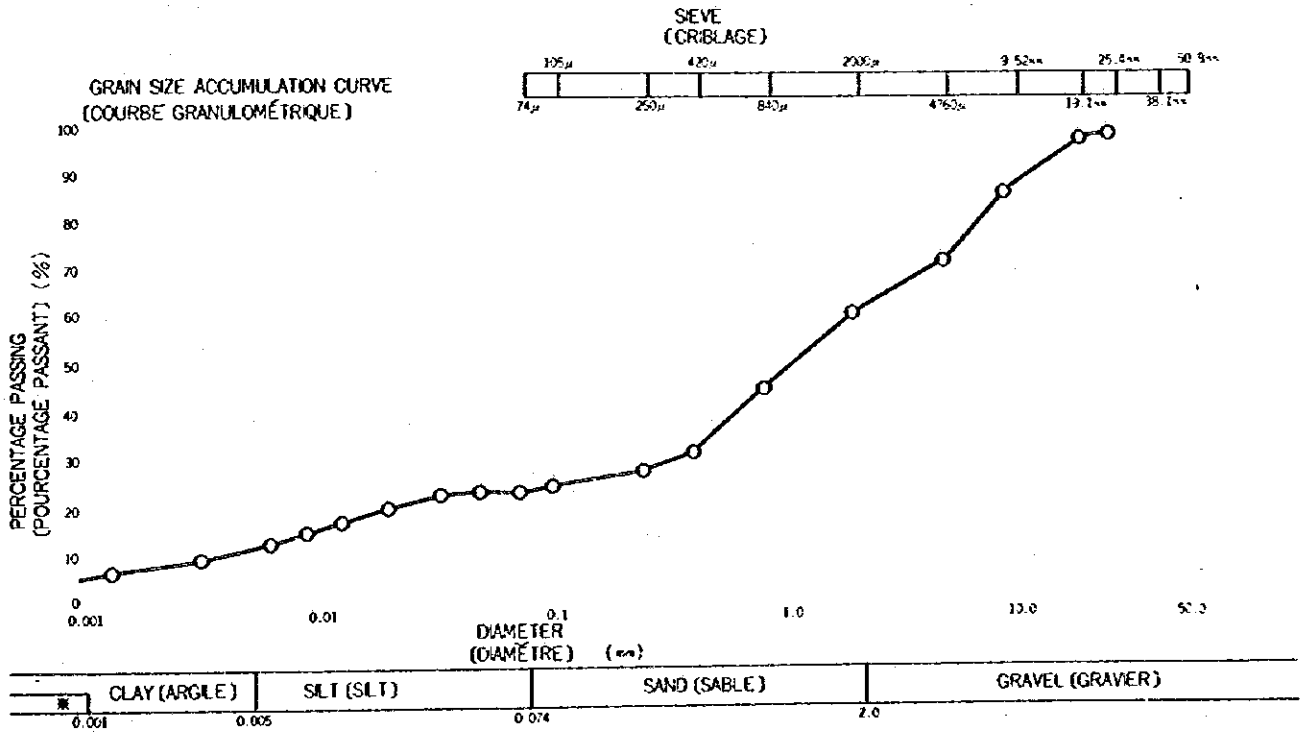
| Fig. Ⅲ - 3 | GRADATION ANALYSIS (ANALYSE GRANULOMÉTRIQUE) | FOR REPORTING (POUR LE RAPPORT) |
|---|---|---|

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | ( m ~ m ) | TESTED BY (ESSAI PAR) | |

PARTICLE SIZE & WEIGHT PERCENTAGE OF PARTICLES UNDER THE SIZE
(DIMENSION DES PARTICULES ET POURCENTAGE DE POIDS DES PARTICULES DE DIMENSION INFÉRIEURE AUX PRÉCÉDENTES)

SPECIFIC GRAVITY
(POIDS SPÉCIFIQUE) Gs 2,661

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SIEVE (CRIBLAGE) | GRAIN SIZE (mm) (GRANUROMÉTRIE) | 50.8 | 38.1 | 25.4 | 19.1 | 9.52 | 4.76 | 2.00 | 0.84 | 0.42 | 0.25 | 0.105 | 0.074 |
| | TOTAL PASSING(%) (TOTAL PASSANT) | | | 100 | 99,4 | 87,7 | 73,1 | 62,0 | 45,8 | 33,4 | 28,8 | 26,4 | 25,2 |
| HYDROMETER (ARÉOMÉTRIE) | GRAIN SIZE(mm) (GRANULOMÉTRIE) | 0,0475 | 0,0339 | 0,0217 | 0,0128 | 0,0092 | 0,0066 | 0,0034 | 0,0014 | | | | |
| | TOTAL PASSING(%) (TOTAL PASSANT) | 24,8 | 23,7 | 21,6 | 18,3 | 16,2 | 14,1 | 11,0 | 7,8 | | | | |




✱ COLLOID
(COLLOÏDE)

| | | | | | |
|---|---|---|---|---|---|
| PROPORTION (PROPORTION) | 4.76mm< | 27 | % | MAXMUM DIAMETER (DIAMÈTRE MAXIMUM) | 25,4 mm |
| | 4.76~2.00mm | 11 | % | 60% DIAMETER (DIAMÈTRE 60%) | 1,8 mm |
| | 2.00~0.42mm | 29 | % | 30% DIAMETER (DIAMÈTRE 30%) | 0,3 mm |
| | 0.42~0.074mm | 8 | % | 10% DIAMETER (DIAMÈTRE 10%) | 0,0026 mm |
| | 0.074~0.005mm | 13 | % | COEFFICIENT OF UNIFORMITY (COEFFICIENT D'UNIFORMITÉ) | 690 |
| | 0.005mm> | 12 | % | COEFFICIENT OF CURVATURE (COEFFICIENT DE COURBURE) | 19 |



N. K. FORM NO. 002 (1975)

| Fig. II −4 | COMPACTION TEST (ESSAI DE COMPACTAGE) | FOR REPORTING (POUR LE RAPPORT) |
|---|---|---|

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | ( m ~ m ) | TESTED BY (ESSAI PAR) | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MOULD (MOULE) | No | WEIGHT (POIDS) g | INSIDE DIAMETER (DIAMÈTRE INT.) | 10 cm | CAPACITY (CAPACITÉ) | 1,000 cm³ |
| RAMMER (PILON) | WEIGHT (POIDS) | 2,500 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 PREPARÉ POUR L'ESSAI) . AIR DRIED·NOT DRIED (SÉCHÉ À L'AIR LIBRE·NON SÉCHÉ)

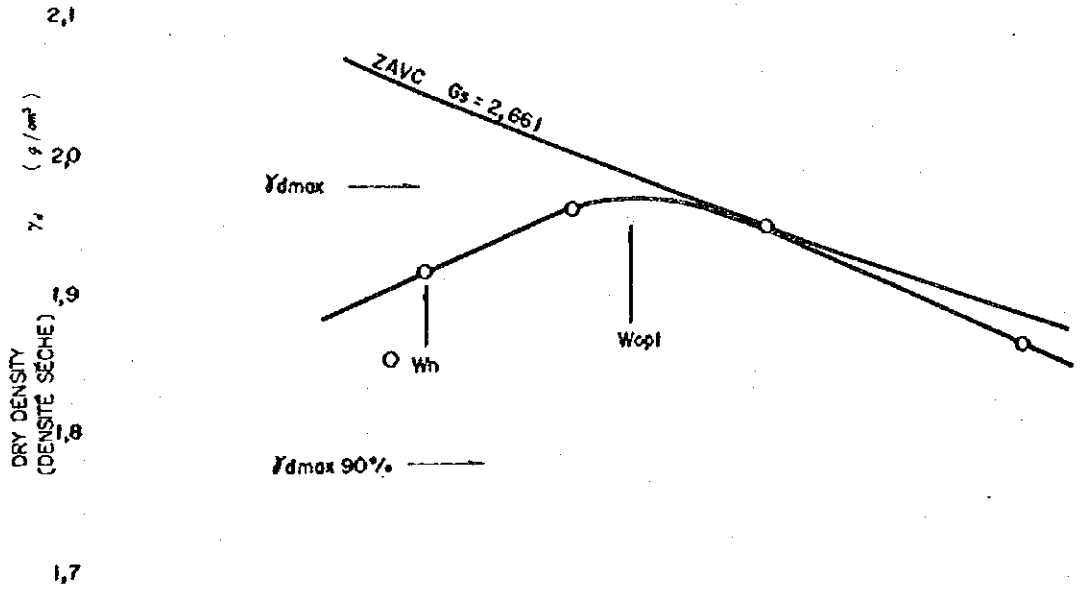
NATURAL WATER CONTENT (TENEUR NATURELLE EN EAU) $w_n$ 11,42 % . WATER CONTENT AFTER AIR-DRY (TENEUR EN EAU APRÈS SÉCHAGE À L'AIR LIBRE) — % . SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) 2,661

MAX. GRAIN SIZE ALLOWED (GRANULOMÉTRIE MAXIMUM ADMISE) 25,4 mm . % OF MATERIAL OVER THE MAX GRAIN SIZE ALLOWED (% DE MATÉRIAU DE GRANULOMÉTRIE SUPÉRIEURE À CELLE ADMISE) 0 %

| TEST NO (N° DE L'ESSAI) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| DRY DENSITY (DENSITÉ SÈCHE) $\gamma_d$ (g/cm³) | 1,851 | 1,912 | 1,956 | 1,942 | 1,854 | | | |
| MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) $w$ (%) | 11,17 | 11,42 | 12,48 | 13,88 | 15,72 | | | |

MAXIMUM DRY DENSITY (DENSITÉ SÈCHE MAXIMUM) $\gamma_{d\,max}$ 1,965 g/cm³

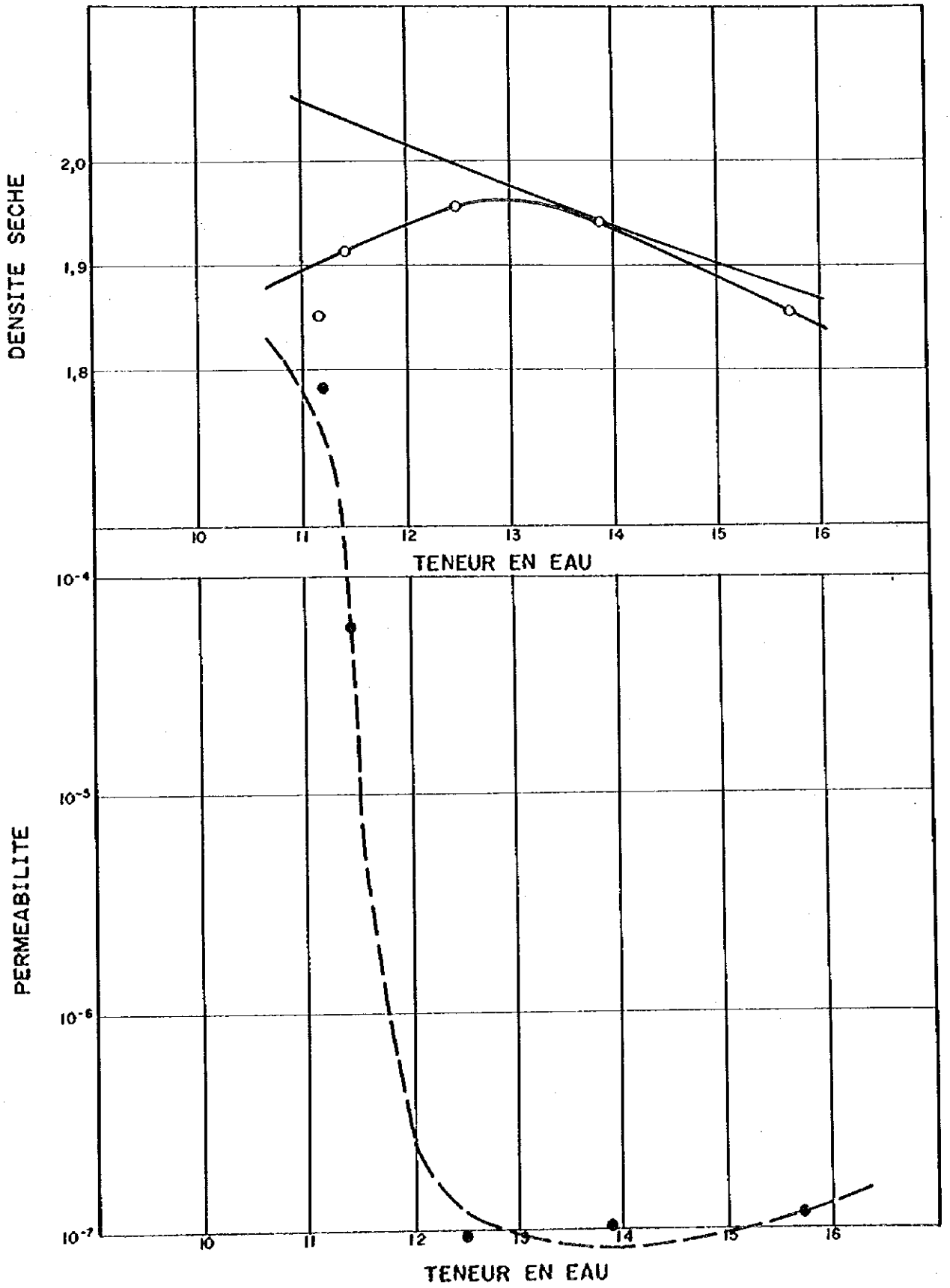
OPTIMUM WATER CONTENT (TENEUR EN EAU OPTIMUM) $w_{opt}$ 12,9 %






N.K.FORM NO. 016(1975)

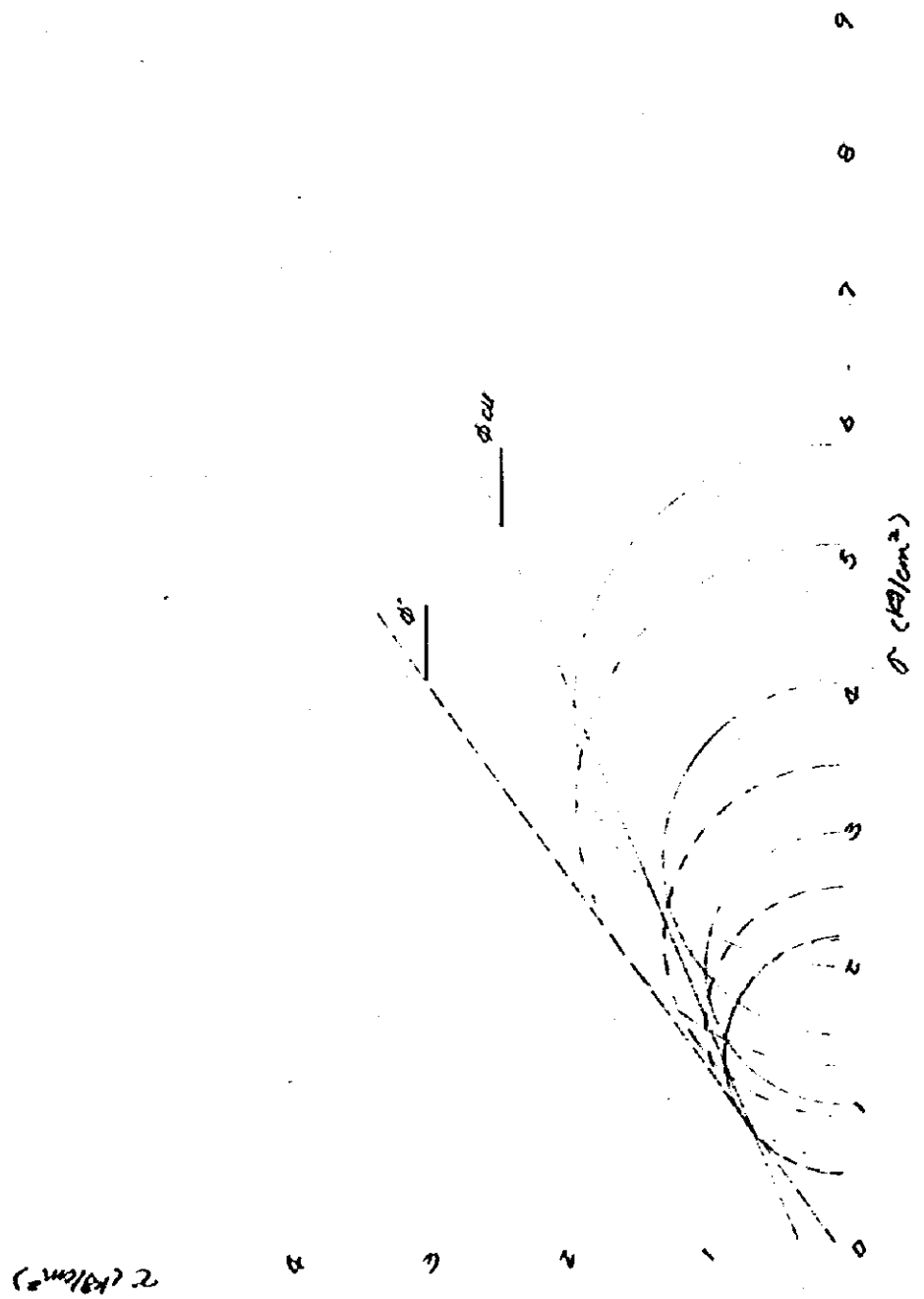
## I-5 RELATIONS DE LA TENEUR EN EAU AVEC LA DENSITE SECHE ET LA PERMEABICITE



| TRIAXIAL COMPRESSION TEST (MOHR'S STRESS DIAGRAM)<br>(ESSAI DE COMPRESSION TRIAXIALE (DIAGRAMME DES EFFORTS DE MOHR)) | UU CU<br>(CU) CD | FOR REPORTING<br>(POUR LE RAPPORT) |
|---|---|---|

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY<br>(DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE<br>(DATE) | |
| SAMPLE NO. & DEPTH<br>(N° DE L'ÉCHANTILLON ET PROFONDEUR) | ( m ~ m ) | TESTED BY<br>(ESSAI PAR) | |

| | | | |
|---|---|---|---|
| SCOPE (ETENDU) | NORMALLY CONSOLIDATED (CONSOLIDÉE NORMALEMENT) | Cu = 0.34 kg/cm², φu = 22.0° | C' = 0.08 kg/cm², φ' = 35.3° |
| | OVER-CONSOLIDATED (SUR-CONSOLIDÉ) | C = kg/cm², φ = ° | C' = kg/cm², φ' = ° |



## Fig.III-7 SPECIFIC GRAVITY TEST

No.

LOCATION DATE

SAMPLE NO. TESTED BY

| Determination NO. | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| No. of Pycnometer | | 80 | 35 | 90 | |
| Wt. of Pycnometer $W_f$ in g | | 44.142 | 42.926 | 43.543 | |
| Wt. (Pycnometer + water) $W'_a$ in g | | 146.569 | 148.112 | 146.067 | |
| Temperature of calibration (corresponding with $W'_a$) T' °C | | 13 | 13 | 14 | |
| Wt. (Pycnometer + soil + water) $W_b$ in g | | 152.478 | 156.340 | 155.898 | |
| Temperature of Calibration (corresponding to $W_b$) T °C | | 16 | 16 | 16 | |
| Weight of dry Soil $W_0$ | No. of Container | 80 | 35 | 90 | |
| | Wt. (Container + dry soil) in g | 45.129 | 47.939 | 50.838 | |
| | Wt. Container in g | 35.558 | 34.704 | 35.080 | |
| | $W_0$ in g | 9.571 | 13.234 | 15.758 | |
| Deflocculating agent and its amount | | 0.999566 | 0.999566 | 0.999699 | |
| *Wt. (Pycnometer + water) calculated for T°C $W_a$ in g | | 146.525 | 148.066 | 146.036 | |
| $W_0+(W_a-W_b)$ in g | | ——— | ——— | ——— | |
| Deflocculant correction | | ——— | ——— | ——— | |
| $W_0+(W_a-W_b)$ corrected | | 3.618 | 4.961 | 5.896 | |
| Specific Gravity at T°C $G_{(T°C)}=\frac{W_0}{W_0+(W_a-W_b)}$ | | 2.645 | 2.668 | 2.673 | |
| Coefficient for temperature correction K | | 0.9998 | 0.9998 | 0.9998 | |
| Specific Gravity at 15°C $G_{(15°C)}=K\times G_{(T°C)}$ | | 2.644 | 2.667 | 2.672 | |
| Mean value | | Specific gravity (15°C) = 2.661 | | | |

*"$W_a$" is determined from the diagram peculiar to each pycnometer.

Remarks:

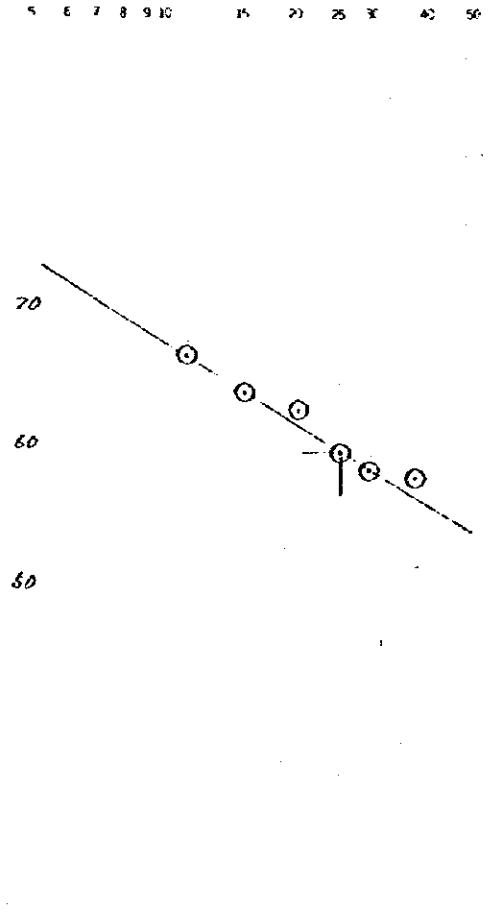
N.K. Form No. 3132

# Fig.III-8 LIQUID LIMIT & PLASTIC LIMIT TEST
## (ESSAI DE LIMITE DE LIQUIDITÉ ET DE LIMITE DE PLASTICITÉ)

FOR REPORTING (POUR LE RAPPORT)

| | |
|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | |
| DATE (DATE) | TESTED BY (ESSAI PAR) |

FLOW CURVE
(COURBE DE DÉTERMINATION DE LA LIMITE DE LIQUIDITÉ)




| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | No. ( m ~ m ) |
|---|---|

| LIQUID LIMIT TEST (LIMITE DE LIQUIDITÉ) | | | PLASTIC LIMIT TEST (LIMITE DE PLASTICITÉ) | |
|---|---|---|---|---|
| TEST. NO (N° DE L'ESSAI) | NO OF BLOWS (NOMBRE DE COUP) | WATER CONTENT (TENEUR EN EAU) | TEST. NO (N° DE L'ESSAI) | WATER CONTENT (TENEUR EN EAU) |
| 1 | 37 | 57.35 % | 1 | 24.70 % |
| 2 | 29 | 57.78 % | 2 | 24.86 % |
| 3 | 25 | 59.03 % | 3 | 24.72 % |
| 4 | 20 | 62.26 % | | |
| 5 | 15 | 63.42 % | | |
| 6 | 11 | 66.08 % | MEAN VALUE (VALEUR MOYENNE) | 24.76 |

| LIQUID LIMIT (LIMITE DE LIQUIDITÉ) | PLASTIC LIMIT (LIMITE DE PLASTICITÉ) | PLASTICITY INDEX (INDICE DE PLASTICITÉ) |
|---|---|---|
| $w_L$ 59.0 % | $w_P$ 25.5 % | $I_P$ 33.5 |

| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | No. ( m ~ m ) |
|---|---|

| LIQUID LIMIT TEST (LIMITE DE LIQUIDITÉ) | | | PLASTIC LIMIT TEST (LIMITE DE PLASTICITÉ) | |
|---|---|---|---|---|
| TEST. NO (N° DE L'ESSAI) | NO OF BLOWS (NOMBRE DE COUP) | WATER CONTENT (TENEUR EN EAU) | TEST NO (N° DE L'ESSAI) | WATER CONTENT (TENEUR EN EAU) |
| 1 | | % | 1 | % |
| 2 | | % | 2 | % |
| 3 | | % | 3 | % |
| 4 | | % | | |
| 5 | | % | | |
| 6 | | % | MEAN VALUE (VALEUR MOYENNE) | |

| LIQUID LIMIT (LIMITE DE LIQUIDITÉ) | PLASTIC LIMIT (LIMITE DE PLASTICITÉ) | PLASTICITY INDEX (INDICE DE PLASTICITÉ) |
|---|---|---|
| $w_L$ % | $w_P$ % | $I_P$ |



N. K. FORM NO. 003 (1975)

# Fig. III-9 PERMEABILITY TEST (ESSAI DE PERMÉABILITÉ)

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | | TESTED BY (ESSAI PAR) | |

| | | | | | |
|---|---|---|---|---|---|
| APPARATUS NO. (N° DE L'APPAREIL) | 1. | CONTAINER NO. (N° DU RÉCIPIENT) | | SAMPLE (ÉCHANTILLON) | UNDISTURBED · DISTURBED (INTACT · REMANIÉ) |

| | | | |
|---|---|---|---|
| BURETTE (BURETTE) | DIAMETER (DIAMÈTRE) (cm) | 0.885 | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $a$ (cm²) | 0.6291 | |
| SPECIMEN (SPÉCIMEN) | DIAMETER (DIAMÈTRE) (cm) | 10.0 | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $A$ (cm²) | 78.54 | |
| | LENGTH (LONGUEUR) $L$ (cm) | 12.73 | |
| | VOLUME (VOLUME) $V=AL$ (cm³) | 1000 | |
| WEIGHT OF CONTAINER (POIDS DU RÉCIPIENT) | $W_c$ (g) | 2268 | |
| SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) | $G_s$ | 2.661 | |

| CONDITIONS OF SPECIMEN (CONDITIONS DU SPÉCIMEN) | | BEFORE TEST (AVANT ESSAI) | AFTER TEST (APRÈS ESSAI) |
|---|---|---|---|
| WEIGHT (CONTAINER+SPECIMEN) (POIDS (RÉCIPIENT + SPÉCIMEN) | $W'$ (g) | 4326 | 4405 |
| WEIGHT OF SPECIMEN (POIDS DU SPÉCIMEN) | $W_t=W'-W_c$ (g) | 2058 | 2137 |
| WET DENSITY (DENSITÉ HUMIDE) | $\gamma_t=W_t/V$ (g/cm³) | 2.058 | 2.137 |
| DEGREE OF SATURATION (DEGRÉ DE SATURATION) | $S_r$ (%) | 71.1 | 95.3 |
| WATER CONTENT (TENEUR EN EAU) | $w$ (%) | 11.17 | 14.68 |
| DRY DENSITY (DENSITÉ SÈCHE) | $\gamma_d=\gamma_t/(1+\frac{w}{100})$ (g/cm³) | 1.851 | 1.851 |
| VOID RATIO (INDICE DES VIDES) | $e$ | 0.41 | 0.41 |

| TEST NO. (N° DE L'ESSAI) | | 1 | 2 | 3 |
|---|---|---|---|---|
| TIME OF INITIAL OBSERVATION (MOMENT OÙ L'OBSERVATION COMMENCE) | $t_1$ | 0" | 0" | 0" |
| TIME OF FINAL OBSERVATION (MOMENT OÙ L'OBSERVATION FINNIT) | $t_2$ | 2' 5.2" | 2' 10.8" | 2' 16.5" |
| ELAPSED TIME (TEMPS ÉCOULÉ) | $t_2-t_1$ (sec) | 125.2 | 130.8 | 136.5 |
| CONSTANT HEAD METHOD (MÉTHODE DES NIVEAUX CONSTANTS) | * HEAD (DIFFÉRENCE DE NIVEAU) $h$ (cm) | | | |
| | $A\cdot(t_2-t_1)$ | | | |
| | $L/h$ | | | |
| | VOLUME OF DISCHARGE IN $t_2-t_1$ (VOLUME D'ÉPANCHEMENT EN $t_2-t_1$) $Q$ (cm³) | | | |
| | $Q/A\cdot(t_2-t_1)$ | | | |
| | $k_T=\frac{L}{h}\cdot\frac{Q}{A(t_2-t_1)}$ (cm/sec) | | | |
| FALLING HEAD METHOD (MÉTHODE DES NIVEAUX VARIABLES) | * HEAD AT $t_1$ (DIFF. DE NIVEAU À $t_1$) $h_1$ (cm) | 80.5 | 80.5 | 80.5 |
| | * HEAD AT $t_2$ (DIFF. DE NIVEAU À $t_2$) $h_2$ (cm) | 30.5 | 30.5 | 30.5 |
| | $h_1/h_2$ | 2.639 | 2.639 | 2.639 |
| | $\log_{10}(h_1/h_2)$ | 0.4215 | 0.4215 | 0.4215 |
| | $a\cdot L$ | 8.009 | 8.009 | 8.009 |
| | $aL/A$ | 0.1020 | 0.1020 | 0.1020 |
| | $2.3/(t_2-t_1)$ | $1.837\times10^{-2}$ | $1.758\times10^{-2}$ | $1.685\times10^{-2}$ |
| | ** $k_T=\frac{aL}{A}\cdot\frac{2.3}{(t_2-t_1)}\cdot\log_{10}\frac{h_1}{h_2}$ (cm/sec) | $7.898\times10^{-4}$ | $7.558\times10^{-4}$ | $7.244\times10^{-4}$ |
| WATER TEMPERATURE (TEMPÉRATURE DE L'EAU) | $T$ (℃) | 15.0 | 15.0 | 15.0 |
| *** | $\mu_T/\mu_{15}$ | 1.0 | 1.0 | 1.0 |
| ** | $k_{15}=k_T\frac{\mu_T}{\mu_{15}}$ | $7.90\times10^{-4}$ | $7.56\times10^{-4}$ | $7.24\times10^{-4}$ |
| MEAN VALUE OF $k_{15}$ (VALEUR MOYENNE DE $k_{15}$) | | $7.57\times10^{-4}$ cm/sec | | |

WATER CONTENT BEFOR TEST (TENEUR EN EAU AVANT ESSAI)

| | | | |
|---|---|---|---|
| | | No. | A-39 |
| $W_c$ | 198.7 | $W_b$ | 190.0 |
| $W_b$ | 190.0 | $W_s$ | 112.8 |
| $W_w$ | 8.7 | $W_s$ | 77.2 |
| | | $w$ = | 11.27 % |
| | | No. | A-27 |
| $W_c$ | 230.4 | $W_b$ | 220.8 |
| $W_b$ | 220.8 | $W_s$ | 134.1 |
| $W_w$ | 9.6 | $W_s$ | 86.7 |
| | | $w$ = | 11.07 % |

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) $w$ = 11.17 %

WATER CONTENT AFTER TEST (TENEUR EN EAU APRÈS ESSAI)

| | | | |
|---|---|---|---|
| | | No. | A-11 |
| $W_c$ | 264.7 | $W_b$ | 245.7 |
| $W_b$ | 245.7 | $W_s$ | 122.2 |
| $W_w$ | 19.0 | $W_s$ | 123.5 |
| | | $w$ = | 15.38 % |
| | | No. | A-51 |
| $W_c$ | 260.0 | $W_b$ | 243.7 |
| $W_b$ | 243.7 | $W_s$ | 127.0 |
| $W_w$ | 16.3 | $W_s$ | 116.7 |
| | | $w$ = | 13.97 % |

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) $w$ = 14.68 %

* DIFFERENCE BETWEEN HEAD WATER AND TAILWATER (DIFFÉRENCE ENTRE LE NIVEAU D'EAU EN TÊTE DE COLONNE ET LE NIVEAU D'ÉPANCHEMENT)

*** $\mu_T$ IS THE COEFFICIENT OF VISCOSITY OF THE WATER AT T ℃. ($\mu_T$ EST LE COEFFICIENT DE VISCOSITÉ DE L'EAU À T ℃.

** COEFFICIENT OF PERMEABILITY AT T ℃ OR 15℃ (COEFFICIENT DE PERMÉABILITÉ À T ℃ OU 15℃)



N. K. FORM NO. 017(1975)

# PERMEABILITY TEST
# (ESSAI DE PERMÉABILITÉ)

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | | TESTED BY (ESSAI PAR) | |

| | | | | | |
|---|---|---|---|---|---|
| APPARATUS NO. (N° DE L'APPAREIL) | 2 | CONTAINER NO. (N° DU RÉCIPIENT) | | SAMPLE (ÉCHANTILLON) | UNDISTURBED · DISTURBED (INTACT · REMANIÉ) |

| | | | |
|---|---|---|---|
| BURETTE (BURETTE) | DIAMETER (DIAMÈTRE) (cm) | 0.895 | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $a$ (cm²) | 0.6291 | |
| SPECIMEN (SPÉCIMEN) | DIAMETER (DIAMÈTRE) (cm) | 10.0 | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $A$ (cm²) | 78.54 | |
| | LENGTH (LONGUEUR) $L$ (cm) | 12.73 | |
| | VOLUME (VOLUME) $V = AL$ (cm³) | 1000 | |
| WEIGHT OF CONTAINER (POIDS DU RÉCIPIENT) | $W_c$ (g) | 2275 | |
| SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) | $G_s$ | 2.661 | |

| CONDITIONS OF SPECIMEN (CONDITIONS DU SPÉCIMEN) | BEFORE TEST (AVANT ESSAI) | AFTER TEST (APRÈS ESSAI) |
|---|---|---|
| WEIGHT (CONTAINER + SPECIMEN) (POIDS (RÉCIPIENT + SPÉCIMEN) $W'$ (g) | 4405 | 4458 |
| WEIGHT OF SPECIMEN (POIDS DU SPÉCIMEN) $W_s = W' - W_c$ (g) | 2130 | 2183 |
| WET DENSITY (DENSITÉ HUMIDE) $\gamma_t = W_s/V$ (g/cm³) | 2.130 | 2.183 |
| DEGREE OF SATURATION (DEGRÉ DE SATURATION) $S_r$ (%) | 76.4 | 88.4 |
| WATER CONTENT (TENEUR EN EAU) $w$ (%) | 11.42 | 12.96 |
| DRY DENSITY (DENSITÉ SÈCHE) $\gamma_d = \gamma_t/(1+w)$ (g/cm³) | 1.912 | 1.912 |
| VOID RATIO (INDICE DES VIDES) $e$ | 0.39 | 0.39 |

| TEST NO. (N° DE L'ESSAI) | | 1 | 2 | 3 |
|---|---|---|---|---|
| TIME OF INITIAL OBSERVATION (MOMENT OÙ L'OBSERVATION COMMENCE) $t_1$ | | 0" | 0" | 0" |
| TIME OF FINAL OBSERVATION (MOMENT OÙ L'OBSERVATION FINNIT) $t_2$ | | 9'59.25" | 9'44.0" | 10'42.7" |
| ELAPSED TIME (TEMPS ÉCOULÉ) $t_2 - t_1$ (sec) | | 599.25 | 584.0 | 642.7 |
| CONSTANT HEAD METHOD (MÉTHODE DES NIVEAUX CONSTANTS) | * HEAD (DIFFÉRENCE DE NIVEAU) $h$ (cm) | | | |
| | $A \cdot (t_2 - t_1)$ | | | |
| | $L/h$ | | | |
| | VOLUME OF DISCHARGE IN $t_2 - t_1$ (VOLUME D'ÉPANCHEMENT EN $t_2 - t_1$) $Q$ (cm³) | | | |
| | $Q/A \cdot (t_2 - t_1)$ | | | |
| | $k_T = \frac{L}{h} \cdot \frac{Q}{A(t_2 - t_1)}$ (cm/sec) | | | |
| FALLING HEAD METHOD (MÉTHODE DES NIVEAUX VARIABLES) | * HEAD AT $t_1$ (DIFF. DE NIVEAU À $t_1$) $h_1$ (cm) | 94.5 | 94.5 | 94.5 |
| | * HEAD AT $t_2$ (DIFF. DE NIVEAU À $t_2$) $h_2$ (cm) | 67.5 | 68.5 | 66.5 |
| | $h_1/h_2$ | 1.400 | 1.380 | 1.421 |
| | $\log_{10}(h_1/h_2)$ | 0.1461 | 0.1397 | 0.1526 |
| | $a \cdot L$ | 8.008 | 8.008 | 8.008 |
| | $aL/A$ | 0.1020 | 0.1020 | 0.1020 |
| | $2.3/(t_2 - t_1)$ | $3.838 \times 10^{-3}$ | $3.938 \times 10^{-3}$ | $3.579 \times 10^{-3}$ |
| | ** $k_T = \frac{aL}{A} \cdot \frac{2.3}{(t_2 - t_1)} \cdot \log_{10} \frac{h_1}{h_2}$ (cm/sec) | $5.719 \times 10^{-5}$ | $5.611 \times 10^{-5}$ | $5.571 \times 10^{-5}$ |
| WATER TEMPERATURE (TEMPÉRATURE DE L'EAU) $T$ (°C) | | 13.5° | 13.6° | 13.9° |
| *** $\mu_T/\mu_{15}$ | | 1.040 | 1.037 | 1.029 |
| ** $k_{15} = k_T \frac{\mu_T}{\mu_{15}}$ | | $5.95 \times 10^{-5}$ | $5.82 \times 10^{-5}$ | $5.73 \times 10^{-5}$ |
| MEAN VALUE OF $k_{15}$ (VALEUR MOYENNE DE $k_{15}$) | | $5.83 \times 10^{-5}$ cm/sec | | |

**WATER CONTENT BEFOR TEST (TENEUR EN EAU AVANT ESSAI)**

| No | | | |
|---|---|---|---|
| $W_c$ | 341.8 | $W_3$ | 321.1 |
| $W_3$ | 319.1 | $W_c$ | 127.8 |
| $W_w$ | 22.7 | $W_s$ | 193.3 |

$w$ = 11.87 %

| No | | | |
|---|---|---|---|
| $W_c$ | 343.2 | $W_3$ | 321.7 |
| $W_3$ | 321.7 | $W_c$ | 125.8 |
| $W_w$ | 21.5 | $W_s$ | 195.9 |

$w$ = 10.97 %

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU)

$w$ = 11.42 %

**WATER CONTENT AFTER TEST (TENEUR EN EAU APRÈS ESSAI)**

| No | | | |
|---|---|---|---|
| $W_c$ | 303.3 | $W_3$ | 282.8 |
| $W_3$ | 282.8 | $W_c$ | 128.5 |
| $W_w$ | 20.5 | $W_s$ | 154.3 |

$w$ = 13.29 %

| No | | | |
|---|---|---|---|
| $W_c$ | 296.2 | $W_3$ | 277.9 |
| $W_3$ | 277.9 | $W_c$ | 133.1 |
| $W_w$ | 18.3 | $W_s$ | 144.8 |

$w$ = 12.64 %

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU)

$w$ = 12.96 %

* DIFFERENCE BETWEEN HEAD WATER AND TAILWATER (DIFFÉRENCE ENTRE LE NIVEAU D'EAU EN TÊTE DE COLONNE ET LE NIVEAU D'ÉPANCHEMENT)

*** $\mu_T$ IS THE COEFFICIENT OF VISCOSITY OF THE WATER AT T °C. ($\mu_T$ EST LE COEFFICIENT DE VISCOSITÉ DE L'EAU À T °C.

** COEFFICIENT OF PERMEABILITY AT T °C OR 15°C (COEFFICIENT DE PERMÉABILITÉ À T °C OU 15°C)



N. K. FORM NO. 017 (1975)

# PERMEABILITY TEST
# (ESSAI DE PERMÉABILITÉ)

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | | TESTED BY (ESSAI PAR) | |

| | | | | | |
|---|---|---|---|---|---|
| APPARATUS NO. (N° DE L'APPAREIL) | 3 | CONTAINER NO. (N° DU RÉCIPIENT) | | SAMPLE (ÉCHANTILLON) | UNDISTURBED · DISTURBED (INTACT · REMANIÉ) |

| | | | | | |
|---|---|---|---|---|---|
| BURETTE (BURETTE) | DIAMETER (DIAMÈTRE) (cm) | 0.895 | CONDITIONS OF SPECIMEN (CONDITIONS DU SPÉCIMEN) | BEFORE TEST (AVANT ESSAI) | AFTER TEST (APRÈS ESSAI) |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $a$ (cm²) | 0.6291 | WEIGHT (CONTAINER+SPECIMEN) (POIDS (RÉCIPIENT + SPÉCIMEN) $W'$ (g) | 4475 | 4484 |
| SPECIMEN (SPÉCIMEN) | DIAMETER (DIAMÈTRE) (cm) | 10.0 | WEIGHT OF SPECIMEN (POIDS DU SPÉCIMEN) $W_s = W' - W_s$ (g) | 2200 | 2209 |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $A$ (cm²) | 78.54 | WET DENSITY (DENSITÉ HUMIDE) $\gamma_t = W_s/V$ (g/cm³) | 2.200 | 2.209 |
| | LENGTH (LONGUEUR) $L$ (cm) | 12.73 | DEGREE OF SATURATION (DEGRÉ DE SATURATION) $S_r$ (%) | 98.7 | 100 |
| | VOLUME (VOLUME) $V = AL$ (cm³) | 1000 | WATER CONTENT (TENEUR EN EAU) $w$ (%) | 12.48 | 13.31 |
| WEIGHT OF CONTAINER (POIDS DU RÉCIPIENT) $W_c$ (g) | | 2275 | DRY DENSITY (DENSITÉ SÈCHE) $\gamma_d = \gamma_t/(1+w/100)$ (g/cm³) | 1.956 | 1.956 |
| SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) $G_s$ | | 2.661 | VOID RATIO (INDICE DES VIDES) $e$ | 0.33 | 0.33 |

| | | | | |
|---|---|---|---|---|
| TEST NO. (N° DE L'ESSAI) | | 1 | 2 | 3 |
| TIME OF INITIAL OBSERVATION (MOMENT OÙ L'OBSERVATION COMMENCE) $t_1$ | | 1日 17h 30min | 2日 11h 30min | 3日 13h 00min |
| TIME OF FINAL OBSERVATION (MOMENT OÙ L'OBSERVATION FINNIT) $t_2$ | | 2日 11h 30min | 3日 13h 00min | 4日 15h 22min |
| ELAPSED TIME (TEMPS ÉCOULÉ) $t_2 - t_1$ (sec) | | 64,800 | 91,800 | 94920 |
| CONSTANT HEAD METHOD (MÉTHODE DES NIVEAUX CONSTANTS) | * HEAD (DIFFÉRENCE DE NIVEAU) $h$ (cm) | | | |
| | $A \cdot (t_2 - t_1)$ | | | |
| | $L/h$ | | | |
| | VOLUME OF DISCHARGE IN $t_2 - t_1$ (VOLUME D'ÉPANCHEMENT EN $t_2 - t_1$) $Q$ (cm³) | | | |
| | $Q/A \cdot (t_2 - t_1)$ | | | |
| | $k_T = \frac{L}{h} \cdot \frac{Q}{A(t_2 - t_1)}$ (cm/sec) | | | |
| FALLING HEAD METHOD (MÉTHODE DES NIVEAUX VARIABLES) | * HEAD AT $t_1$ (DIFF. DE NIVEAU À $t_1$) $h_1$ (cm) | 97.2 | 91.1 | 84.0 |
| | * HEAD AT $t_2$ (DIFF. DE NIVEAU À $t_2$) $h_2$ (cm) | 91.1 | 84.0 | 78.2 |
| | $h_1/h_2$ | 1.067 | 1.085 | 1.074 |
| | $\log_{10}(h_1/h_2)$ | 0.028 | 0.035 | 0.031 |
| | $a \cdot L$ | 8.009 | 8.009 | 8.009 |
| | $aL/A$ | 0.1020 | 0.1020 | 0.1020 |
| | $2.3/(t_2 - t_1)$ | $3.549 \times 10^{-5}$ | $2.505 \times 10^{-5}$ | $2.423 \times 10^{-5}$ |
| | ** $k_T = \frac{aL}{A} \cdot \frac{2.3}{(t_2 - t_1)} \cdot \log_{10} \frac{h_1}{h_2}$ (cm/sec) | $1.014 \times 10^{-7}$ | $8.943 \times 10^{-8}$ | $7.662 \times 10^{-8}$ |
| WATER TEMPERATURE (TEMPÉRATURE DE L'EAU) $T$ (℃) | | 14.3 | 14.2 | 12.6 |
| *** $\mu_T/\mu_{15}$ | | 1.018 | 1.021 | 1.045 |
| ** $k_{15} = k_T \frac{\mu_T}{\mu_{15}}$ | | $1.03 \times 10^{-7}$ | $9.13 \times 10^{-8}$ | $8.16 \times 10^{-8}$ |
| MEAN VALUE OF $k_{15}$ (VALEUR MOYENNE DE $k_{15}$) | | $9.20 \times 10^{-8}$ cm/sec | | |

**WATER CONTENT BEFOR TEST (TENEUR EN EAU AVANT ESSAI)**

| | | | |
|---|---|---|---|
| | | No. | A-25 |
| $W_c$ | 217.5 | $W_1$ | 207.6 |
| $W_1$ | 207.6 | $W_2$ | 128.3 |
| $W_w$ | 9.9 | $W_s$ | 79.3 |
| | | $w$ = | 12.48 % |
| | | No. | A-52 |
| $W_c$ | 236.9 | $W_1$ | 224.8 |
| $W_1$ | 224.8 | $W_2$ | 127.8 |
| $W_w$ | 12.1 | $W_s$ | 97.0 |
| | | $w$ = | 12.47 % |

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) $w$ = 12.48 %

**WATER CONTENT AFTER TEST (TENEUR EN EAU APRÈS ESSAI)**

| | | | |
|---|---|---|---|
| | | No. | |
| $W_c$ | 435.6 | $W_1$ | 398.5 |
| $W_1$ | 398.5 | $W_2$ | 124.1 |
| $W_w$ | 37.1 | $W_s$ | 274.4 |
| | | $w$ = | 13.52 % |
| | | No. | |
| $W_c$ | 473.5 | $W_1$ | 433.6 |
| $W_1$ | 433.6 | $W_2$ | 129.3 |
| $W_w$ | 39.9 | $W_s$ | 304.3 |
| | | $w$ = | 13.11 % |

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU) $w$ = 13.31 %

* DIFFERENCE BETWEEN HEAD WATER AND TAILWATER
(DIFFÉRENCE ENTRE LE NIVEAU D'EAU EN TÊTE DE COLONNE ET LE NIVEAU D'ÉPANCHEMENT)
*** $\mu_T$ IS THE COEFFICIENT OF VISCOSITY OF THE WATER AT T ℃.
($\mu_T$ EST LE COEFFICIENT DE VISCOSITÉ DE L'EAU À T ℃.

** COEFFICIENT OF PERMEABILITY AT T ℃ OR 15℃
(COEFFICIENT DE PERMÉABILITÉ À T ℃ OU 15℃)



N. K. FORM NO. 017(1975)

# PERMEABILITY TEST
# (ESSAI DE PERMÉABILITÉ)

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | | TESTED BY (ESSAI PAR) | |

| | | | | | |
|---|---|---|---|---|---|
| APPARATUS NO. (N° DE L'APPAREIL) | 4 | CONTAINER NO. (N° DU RÉCIPIENT) | | SAMPLE (ÉCHANTILLON) | UNDISTURBED · DISTURBED (INTACT · REMANIÉ) |

| | | | | BEFORE TEST (AVANT ESSAI) | AFTER TEST (APRÈS ESSAI) |
|---|---|---|---|---|---|
| BURETTE (BURETTE) | DIAMETER (DIAMÈTRE) | (cm) | 0.905 | | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) | $a$ (cm²) | 0.6433 | | |
| SPECIMEN (SPÉCIMEN) | DIAMETER (DIAMÈTRE) | (cm) | 10.0 | | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) | $A$ (cm²) | 78.54 | | |
| | LENGTH (LONGUEUR) | $L$ (cm) | 12.73 | | |
| | VOLUME (VOLUME) | $V=AL$ (cm³) | 1000 | | |
| WEIGHT OF CONTAINER (POIDS DU RÉCIPIENT) | | $W_c$ (g) | 2273 | | |
| SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) | | $G_s$ | 2.661 | | |
| CONDITIONS OF SPECIMEN (CONDITIONS DU SPÉCIMEN) | | | | | |
| WEIGHT (CONTAINER+SPECIMEN) (POIDS (RÉCIPIENT + SPÉCIMEN) | | $W'$ (g) | | 4484 | 4485 |
| WEIGHT OF SPECIMEN (POIDS DU SPÉCIMEN) | | $W_t=W'-W_c$ (g) | | 2211 | 2212 |
| WET DENSITY (DENSITÉ HUMIDE) | | $\gamma_t=W_t/V$ (g/cm³) | | 2.211 | 2.212 |
| DEGREE OF SATURATION (DEGRÉ DE SATURATION) | | $S_r$ (%) | | 100. | 100 |
| WATER CONTENT (TENEUR EN EAU) | | $w$ (%) | | 13.88 | 13.09 |
| DRY DENSITY (DENSITÉ SÈCHE) | | $\gamma_d=\gamma_t/(1+\frac{w}{100})$ (g/cm³) | | 1.942 | 1.942 |
| VOID RATIO (INDICE DES VIDES) | | $e$ | | 0.34 | 0.34 |

| TEST NO. (N° DE L'ESSAI) | | 1 | 2 | 3 |
|---|---|---|---|---|
| TIME OF INITIAL OBSERVATION (MOMENT OÙ L'OBSERVATION COMMENCE) | $t_1$ | 1日 17h 30min | 2日 11h 30min | 3日 13h 00min |
| TIME OF FINAL OBSERVATION (MOMENT OÙ L'OBSERVATION FINNIT) | $t_2$ | 2日 11h 30min | 3日 13h 00min | 4日 15h 23min |
| ELAPSED TIME (TEMPS ÉCOULÉ) | $t_2-t_1$ (sec) | 64,800 | 91,800 | 94980 |
| CONSTANT HEAD METHOD (MÉTHODE DES NIVEAUX CONSTANTS) | | | | |
| * HEAD (DIFFÉRENCE DE NIVEAU) | $h$ (cm) | | | |
| $A\cdot(t_2-t_1)$ | | | | |
| $L/h$ | | | | |
| VOLUME OF DISCHARGE IN $t_2-t_1$ (VOLUME D'ÉPANCHEMENT EN $t_2-t_1$) | $Q$ (cm³) | | | |
| $Q/A\cdot(t_2-t_1)$ | | | | |
| $k_T=\frac{L}{h}\cdot\frac{Q}{A(t_2-t_1)}$ | (cm/sec) | | | |
| FALLING HEAD METHOD (MÉTHODE DES NIVEAUX VARIABLES) | | | | |
| * HEAD AT $t_1$ (DIFF. DE NIVEAU À $t_1$) | $h_1$ (cm) | 97.5 | 91.1 | 83.7 |
| * HEAD AT $t_2$ (DIFF. DE NIVEAU À $t_2$) | $h_2$ (cm) | 91.1 | 83.7 | 77.3 |
| $h_1/h_2$ | | 1.070 | 1.088 | 1.083 |
| $\log_{10}(h_1/h_2)$ | | 0.029 | 0.037 | 0.035 |
| $a\cdot L$ | | 8.189 | 8.189 | 8.189 |
| $aL/A$ | | 0.1043 | 0.1043 | 0.1043 |
| $2.3/(t_2-t_1)$ | | $3.549\times10^{-5}$ | $2.505\times10^{-5}$ | $2.422\times10^{-5}$ |
| ** $k_T=\frac{aL}{A}\cdot\frac{2.3}{(t_2-t_1)}\cdot\log_{10}\frac{h_1}{h_2}$ | (cm/sec) | $1.073\times10^{-7}$ | $9.667\times10^{-8}$ | $8.842\times10^{-8}$ |
| WATER TEMPERATURE (TEMPÉRATURE DE L'EAU) | $T$ (°C) | 14.3 | 14.2 | 12.6 |
| *** $\mu_T/\mu_{15}$ | | 1.018 | 1.021 | 1.065 |
| ** $k_{15}=k_T\frac{\mu_T}{\mu_{15}}$ | | $1.09\times10^{-7}$ | $9.87\times10^{-8}$ | $9.42\times10^{-8}$ |
| MEAN VALUE OF $k_{15}$ (VALEUR MOYENNE DE $k_{15}$) | | $1.01\times10^{-7}$ | | cm/sec |

**WATER CONTENT BEFOR TEST (TENEUR EN EAU AVANT ESSAI)**

| No. | | No. | |
|---|---|---|---|
| $W_a$ | 227.8 | $W_b$ | 216.2 |
| $W_b$ | 216.2 | $W_c$ | 133.0 |
| $W_w$ | 11.6 | $W_s$ | 83.2 |

$w$ = 13.94 %

| No. | | No. | |
|---|---|---|---|
| $W_a$ | 229.9 | $W_b$ | 215.7 |
| $W_b$ | 215.7 | $W_c$ | 112.9 |
| $W_w$ | 14.2 | $W_s$ | 102.8 |

$w$ = 13.81 %

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU)

$w$ = 13.88 %

**WATER CONTENT AFTER TEST (TENEUR EN EAU APRÈS ESSAI)**

| No. | | No. | |
|---|---|---|---|
| $W_a$ | 463.7 | $W_b$ | 426.8 |
| $W_b$ | 426.8 | $W_c$ | 137.3 |
| $W_w$ | 36.9 | $W_s$ | 289.5 |

$w$ = 12.75 %

| No. | | No. | |
|---|---|---|---|
| $W_a$ | 440.6 | $W_b$ | 403.7 |
| $W_b$ | 403.7 | $W_c$ | 128.8 |
| $W_w$ | 36.9 | $W_s$ | 274.9 |

$w$ = 13.42 %

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU)

$w$ = 13.09 %

* DIFFERENCE BETWEEN HEAD WATER AND TAILWATER
(DIFFÉRENCE ENTRE LE NIVEAU D'EAU EN TÊTE DE COLONNE ET LE NIVEAU D'ÉPANCHEMENT)

*** $\mu_T$ IS THE COEFFICIENT OF VISCOSITY OF THE WATER AT T °C.
($\mu_T$ EST LE COEFFICIENT DE VISCOSITÉ DE L'EAU À T °C.

** COEFFICIENT OF PERMEABILITY AT T °C OR 15°C
(COEFFICIENT DE PERMÉABILITÉ À T °C OU 15°C)



N. X. FORM NO. 017(1975)

# PERMEABILITY TEST
# (ESSAI DE PERMÉABILITÉ)

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | | TESTED BY (ESSAI PAR) | |

| | | | | | |
|---|---|---|---|---|---|
| APPARATUS NO. (N° DE L'APPAREIL) | 5 | CONTAINER NO. (N° DU RÉCIPIENT) | | SAMPLE (ÉCHANTILLON) | UNDISTURBED · DISTURBED (INTACT · REMANIÉ) |

| | | | |
|---|---|---|---|
| BURETTE (BURETTE) | DIAMETER (DIAMÈTRE) (cm) | 0.895 | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $a$ (cm²) | 0.6921 | |
| SPECIMEN (SPÉCIMEN) | DIAMETER (DIAMÈTRE) (cm) | 10.0 | |
| | CROSS SECTIONAL AREA (SURF. DE LA SECTION) $A$ (cm²) | 78.54 | |
| | LENGTH (LONGUEUR) $L$ (cm) | 12.73 | |
| | VOLUME (VOLUME) $V=AL$ (cm³) | 1000 | |
| WEIGHT OF CONTAINER (POIDS DU RÉCIPIENT) $W_c$ (g) | | 2270 | |
| SPECIFIC GRAVITY (POIDS SPÉCIFIQUE) $G_s$ | | 2.661 | |

| CONDITIONS OF SPECIMEN (CONDITIONS DU SPÉCIMEN) | BEFORE TEST (AVANT ESSAI) | AFTER TEST (APRÈS ESSAI) |
|---|---|---|
| WEIGHT (CONTAINER + SPECIMEN) (POIDS (RÉCIPIENT + SPÉCIMEN) $W'$ (g) | 4415 | 4421 |
| WEIGHT OF SPECIMEN (POIDS DU SPÉCIMEN) $W_s=W'-W_c$ (g) | 2145 | 2151 |
| WET DENSITY (DENSITÉ HUMIDE) $\gamma_t=W_s/V$ (g/cm³) | 2.145 | 2.151 |
| DEGREE OF SATURATION (DEGRÉ DE SATURATION) $S_r$ (%) | 95.1 | 98.1 |
| WATER CONTENT (TENEUR EN EAU) $w$ (%) | 15.72 | 16.22 |
| DRY DENSITY (DENSITÉ SÈCHE) $\gamma_d=\gamma_t/(1+\frac{w}{100})$ (g/cm³) | 1.854 | 1.854 |
| VOID RATIO (INDICE DES VIDES) $e$ | 0.44 | 0.44 |

| TEST NO. (N° DE L'ESSAI) | | 1 | 2 | 3 |
|---|---|---|---|---|
| TIME OF INITIAL OBSERVATION (MOMENT OÙ L'OBSERVATION COMMENCE) $t_1$ | | 1B 16h 45min | 2B 18h 00min | 3B 17h 40min |
| TIME OF FINAL OBSERVATION (MOMENT OÙ L'OBSERVATION FINNIT) $t_2$ | | 2B 17h 45min | 3B 17h 20min | 4B 17h 40min |
| ELAPSED TIME (TEMPS ÉCOULÉ) $t_2-t_1$ (sec) | | 90000 | 84000 | 86400 |
| CONSTANT HEAD METHOD (MÉTHODE DES NIVEAUX CONSTANTS) | * HEAD (DIFFÉRENCE DE NIVEAU) $h$ (cm) | | | |
| | $A\cdot(t_2-t_1)$ | | | |
| | $L/h$ | | | |
| | VOLUME OF DISCHARGE IN $t_2-t_1$ (VOLUME D'ÉPANCHEMENT EN $t_2-t_1$) $Q$ (cm³) | | | |
| | $Q/A\cdot(t_2-t_1)$ | | | |
| | $k_T=\frac{L}{h}\cdot\frac{Q}{A(t_2-t_1)}$ (cm/sec) | | | |
| FALLING HEAD METHOD (MÉTHODE DES NIVEAUX VARIABLES) | * HEAD AT $t_1$ (DIFF. DE NIVEAU À $t_1$) $h_1$ (cm) | 100.6 | 101.1 | 100.3 |
| | * HEAD AT $t_2$ (DIFF. DE NIVEAU À $t_2$) $h_2$ (cm) | 92.7 | 92.3 | 93.5 |
| | $h_1/h_2$ | 1.085 | 1.095 | 1.073 |
| | $\log_{10}(h_1/h_2)$ | 0.0355 | 0.0395 | 0.0305 |
| | $a\cdot L$ | 8.009 | 8.009 | 8.009 |
| | $aL/A$ | 0.1020 | 0.1020 | 0.1020 |
| | $2.3/(t_2-t_1)$ | $2.556\times10^{-5}$ | $2.738\times10^{-5}$ | $2.662\times10^{-5}$ |
| | ** $k_T=\frac{aL}{A}\cdot\frac{2.3}{(t_2-t_1)}\cdot\log_{10}\frac{h_1}{h_2}$ (cm/sec) | $9.25\times10^{-8}$ | $1.10\times10^{-7}$ | $8.28\times10^{-8}$ |
| WATER TEMPERATURE (TEMPÉRATURE DE L'EAU) $T$ (℃) | | 8.0 | 8.0 | 8.0 |
| *** $\mu_T/\mu_{15}$ | | 1.211 | 1.211 | 1.211 |
| ** $k_{15}=k_T\frac{\mu_T}{\mu_{15}}$ | | $1.05\times10^{-7}$ | $1.34\times10^{-7}$ | $1.00\times10^{-7}$ |
| MEAN VALUE OF $k_{15}$ (VALEUR MOYENNE DE $k_{15}$) | | $1.13\times10^{-7}$ cm/sec | | |

**WATER CONTENT BEFOR TEST (TENEUR EN EAU AVANT ESSAI)**

| No. | | | |
|---|---|---|---|
| $W_c$ | 332.7 | $W_1$ | 306.3 |
| $W_1$ | 306.3 | $W_2$ | 128.8 |
| $W_s$ | 26.4 | $W_w$ | 177.5 |

$w$ = 14.87 %

| No. | | | |
|---|---|---|---|
| $W_c$ | 355.2 | $W_1$ | 323.3 |
| $W_1$ | 323.3 | $W_2$ | 130.8 |
| $W_s$ | 31.9 | $W_w$ | 192.5 |

$w$ = 16.57 %

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU)

$w$ = 15.72 %

**WATER CONTENT AFTER TEST (TENEUR EN EAU APRÈS ESSAI)**

| No. | | | |
|---|---|---|---|
| $W_c$ | 318.5 | $W_1$ | 292.2 |
| $W_1$ | 292.2 | $W_2$ | 127.4 |
| $W_s$ | 26.3 | $W_w$ | 164.8 |

$w$ = 15.93 %

| No. | | | |
|---|---|---|---|
| $W_c$ | 339.8 | $W_1$ | 310.0 |
| $W_1$ | 310.0 | $W_2$ | 129.3 |
| $W_s$ | 29.8 | $W_w$ | 180.7 |

$w$ = 16.51 %

MEAN WATER CONTENT (TENEUR MOYENNE EN EAU)

$w$ = 16.22 %

* DIFFERENCE BETWEEN HEAD WATER AND TAILWATER
(DIFFÉRENCE ENTRE LE NIVEAU D'EAU EN TÊTE DE COLONNE ET LE NIVEAU D'ÉPANCHEMENT)
*** $\mu_T$ IS THE COEFFICIENT OF VISCOSITY OF THE WATER AT T℃.
($\mu_T$ EST LE COEFFICIENT DE VISCOSITÉ DE L'EAU À T℃.

** COEFFICIENT OF PERMEABILITY AT T℃ OR 15℃
(COEFFICIENT DE PERMÉABILITÉ À T℃ OU 15℃)



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Fig. III - 10

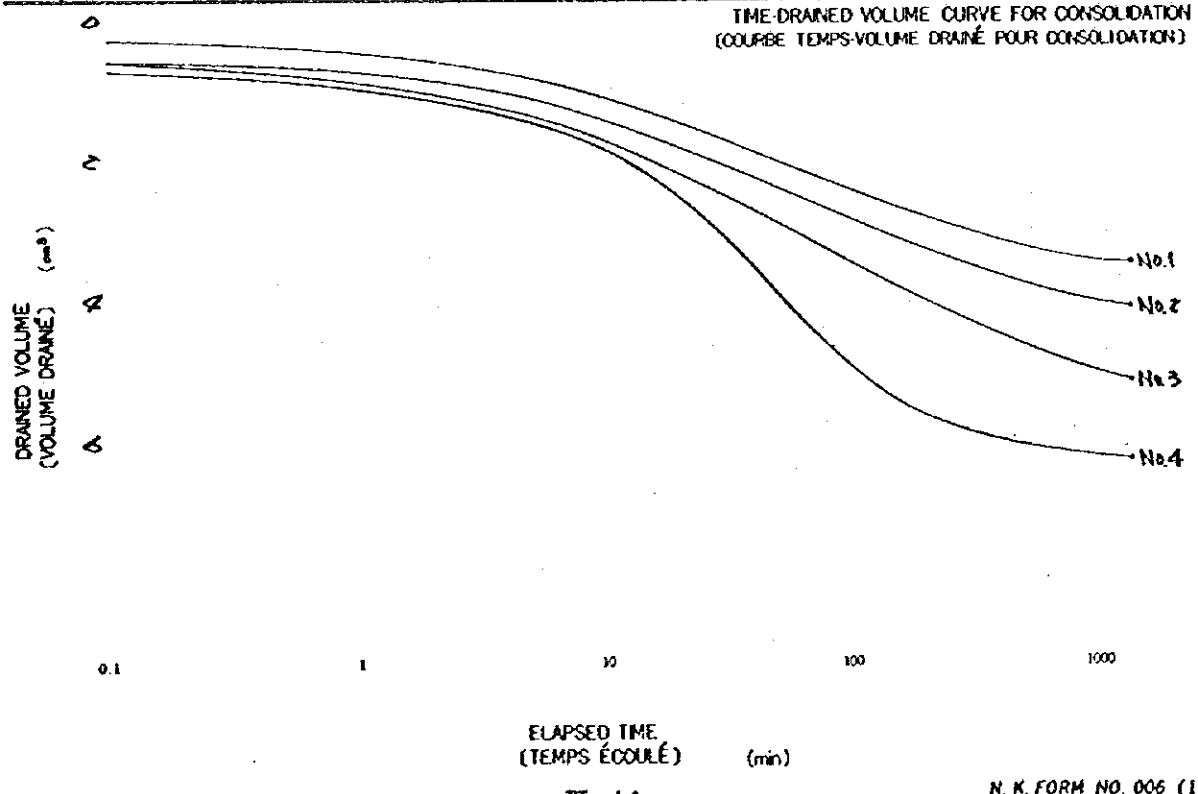
| TRIAXIAL COMPRESSION TEST (INITIAL CONDITION : CONSOLIDATION DATA)<br>(ESSAI DE COMPRESSION TRIAXIAL (CONDITION INITIALE; DONNÉES DE CONSOLIDATION)) | UU CU<br>CÜ CD | FOR REPORTING<br>(POUR LE RAPPORT) |
|---|---|---|

| | | | |
|---|---|---|---|
| NAME OF SURVEY & LOCALITY<br>(DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE<br>(DATE) | |
| SAMPLE NO. & DEPTH<br>(N° DE L'ÉCHANTILLON ET PROFONDEUR) | ( m ~ m ) | TESTED BY<br>(ESSAI PAR) | |

| | | | |
|---|---|---|---|
| SAMPLE<br>(ÉCHANTILLON) | ~~UNDISTURBED~~ · DISTURBED<br>(INTACT · REMANIÉ) | TYPE OF APPARATUS<br>(TYPE DE L'APPAREIL) | |
| SHAPED WITH<br>(MISE EN FORME PAR) | ~~TRIMMER~~ · OTHER( )<br>(TRANCHEUSE · AUTRE( ) ) | CONDITION OF DRAINAGE DURING CONSOLIDATION<br>(CONDITION DE DRAINAGE PENDANT LA CONSOLIDATION) | SINGLE DRAINAGE, ~~DOUBLE DRAINAGE~~, ~~PAPER DRAIN~~<br>(DRAINAGE SIMPLE, DRAINAGE DOUBLE, DRAIN EN PAPIER) |
| PROPERTIES<br>(PROPRÉTÉS) | CLASSIFICATION<br>(CLASSIFICATION) | $G_s$ 2.661 | $w_L$ 59.0 % $w_p$ 25.5 % |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SPECIMEN NUMBER (NUMÉRO DU SPÉCIMEN) | | | No 1 | No 2 | No 3 | No 4 | No |
| CONSOLIDATION PRESSURE (PRESSION DE CONSOLIDATION) | | (kg/cm²) | 0.5 | 1.0 | 1.5 | 2.0 | |
| INITIAL CONDITIONS OF SPECIMEN (CONDITIONS INITIALES DU SPÉCIMEN) | HEIGHT (HAUTEUR) | $H_0$ (cm) | 10.0 | 10.0 | 10.0 | 10.0 | |
| | DIAMETER (DIAMETRE) | D (cm) | 5.0 | 5.0 | 5.0 | 5.0 | |
| | VOLUME (VOLUME) | $V_0$ (cm³) | 196.3 | 196.3 | 196.3 | 196.3 | |
| | WEIGHT (POIDS) | $w_0$ (g) | 392.3 | 392.0 | 392.5 | 392.5 | |
| | WET DENSITY (DENSITÉ HUMIDE) | $\gamma$ (g/cm³) | 1.998 | 1.997 | 1.999 | 1.999 | |
| | WATER CONTENT (TENEUR EN EAU) | $w_0$ (%) | 12.8 | 12.8 | 12.8 | 12.8 | |
| | VOID RATIO (INDICE DES VIDES) | $e_0$ | 0.502 | 0.503 | 0.502 | 0.502 | |
| | DEGREE OF SATURATION (DEGRÉ DE SATURATION) | $S_r$ (%) | 67.9 | 67.7 | 67.9 | 67.9 | |
| CONSOL. DATA (DONNÉES DE CONSOL.) | CONSOLIDATION TIME (TEMPS DE CONSOLIDATION) | (hr) | 24 | 24 | 24 | 24 | |
| | DRAINED VOLUME (VOLUME DU DRAIN) | $\Delta V$ (cm³) | 3.5 | 4.1 | 5.2 | 6.3 | |
| | VOID RATIO AFTER CONSOLIDATION (INDICE DES VIDES APRÈS CONSOLIDATION) | e | 0.475 | 0.472 | 0.461 | 0.453 | |
| | ROOM TEMPERATURE (TEMPÉRATURE DU LOCAL) | (℃) | | | | | |

TIME-DRAINED VOLUME CURVE FOR CONSOLIDATION
(COURBE TEMPS-VOLUME DRAINÉ POUR CONSOLIDATION)




N. K. FORM NO. 006 (1975)

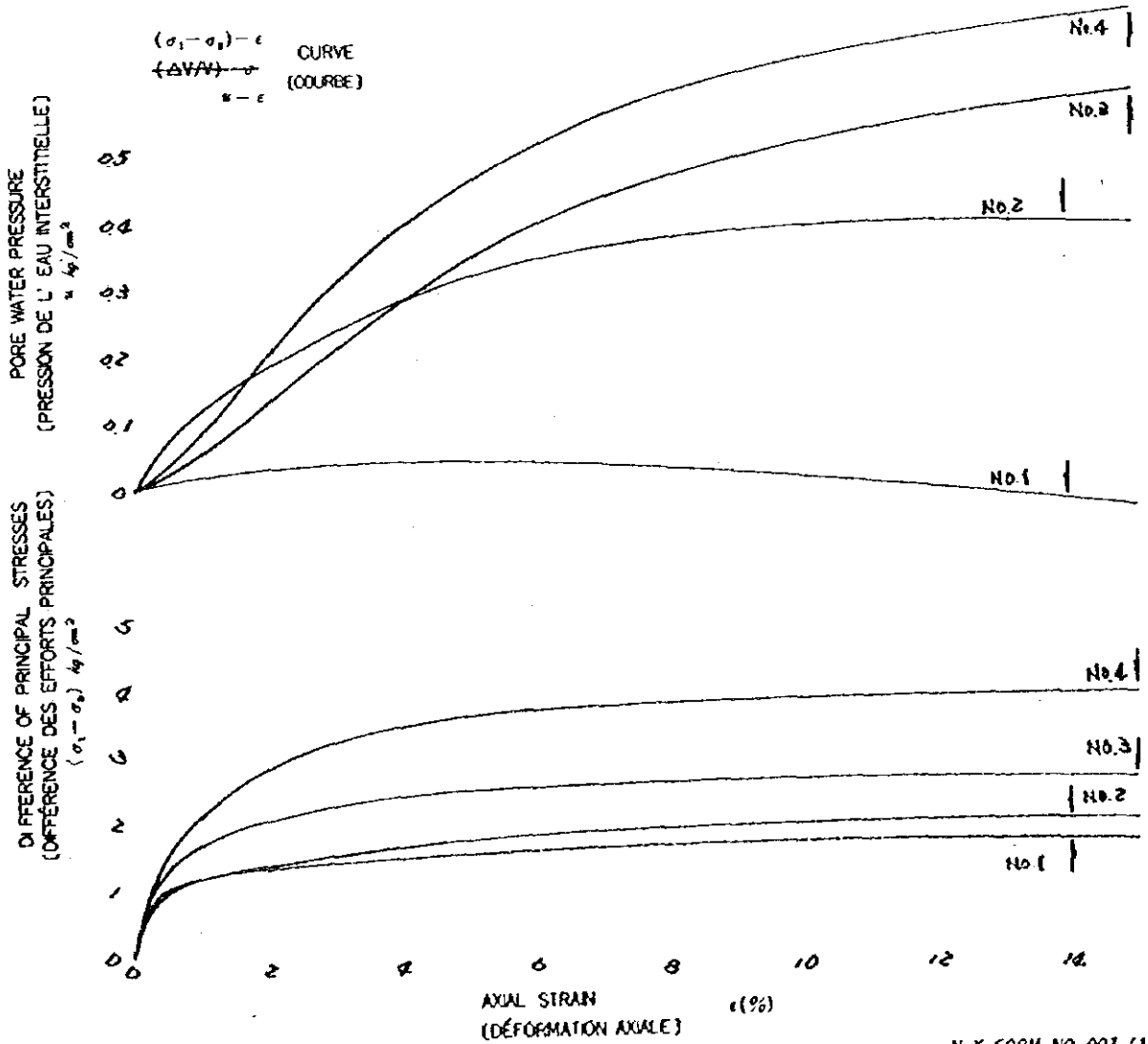
Fig. III-11

| TRIAXIAL COMPRESSION TEST (LOADING DATA) (ESSAI DE COMPRESSION TRIAXIALE (DONNÉES DE CHARGEMENT)) | UU CU (CU̅) CD | FOR REPORTING (POUR LE RAPPORT) |
|---|---|---|

| | | | |
|---|---|---|---|
| NAME OF SUVEY & LOCALITY (DÉNOMINATION DE L'ENQUÊTE ET LOCALITÉ) | | DATE (DATE) | |
| SAMPLE NO. & DEPTH (N° DE L'ÉCHANTILLON ET PROFONDEUR) | ( m ~ m ) | TESTED BY (ESSAI PAR) | |

| | | |
|---|---|---|
| LOADING METHOD (MÉTHODE DE CHARGEMENT) | STRAIN CONTROL · ~~STRESS CONTROL~~ (CONTRÔLE DES DÉFORMATION · CONTRÔLE DES CONTRAINTES) RATE OF COMPRESSIN (TAUX DE COMPRESSION) 0.2 % /min | PROVING RING CAPACITY (CAPACITÉ DE L'ANNEAU DYNAMOMÉTRIQUE) 150 kg |

| | | | | | | |
|---|---|---|---|---|---|---|
| SPECIMEN NUMBER (NUMÉRO DU SPÉCIMEN) | | No 1 | No 2 | No 3 | No 4 | No |
| CONSOLIDATION PRESSURE (PRESSION DE CONSOLIDATION) (kg/cm²) | | 0.5 | 1.0 | 1.5 | 2.0 | |
| AT PEAK (AU SOMMET) | $(\sigma_1-\sigma_3)_f$ (kg/cm²) | 1.68 | 1.98 | 2.60 | 3.87 | |
| | $u_f$ (kg/cm²) ~~$\sigma_f$~~ | -0.02 | 0.40 | 0.59 | 0.72 | |
| | $A_f$ ~~$(\Delta V/V)_f$ (%)~~ | -0.012 | 0.202 | 0.227 | 0.186 | |
| | $\varepsilon_f$ (%) | 14.0 | 14.0 | 15.0 | 15.0 | |
| | ELAPSED TIME TO FAILURE (TEMPS DE RUPTURE) (min) | 70 | 70 | 75 | 75 | |
| MODULUS OF ELASTICITY (MODULE D'ÉLASTICITÉ) $E_{50}$ (kg/cm²) | | 263 | 247 | 283 | 242 | |
| ROOM TEMPERATURE (TEMPÉRATURE DU LOCAL) (°C) | | | | | | |




N. K. FORM NO. 007 (1975)

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