

**SECTION 2 :
LONG-TERM MONITORING
OF SKIN FRICTION
ON PILES AT THE
NEW PUBLIC WORKS
CENTRAL LABORATORY**

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FOREWORD

This report forms part of the R & D project PIL4 on the study of skin friction in piles in Hong Kong. It documents the results of a study of positive and negative skin friction which can be developed on driven precast piles in a reclamation. A total of seven working piles were instrumented with a combination of electrical resistance and vibrating wire strain gauges. Three of the instrumented piles were subjected to a static load test shortly after installation. The instrumented piles were monitored regularly for a period of six years to study the development of negative skin friction. Despite some problems with the longevity of some of the strain gauges, particularly the electrical resistance strain gauges, the project has resulted in a fairly comprehensive set of data on long-term monitoring of negative skin friction on piles in Hong Kong and provided an insight into the behaviour of piles founded in a reclamation which was completed more than 20 years ago. This report summarises and interprets the monitoring data.

The project was initiated by Mr G.E. Powell, Mr J.M. Shen and Mr K. Sivaloganathan of the Pile Study Group in GEO. The first phase of the project comprising the design of the instrumentation and interpretation of the static load tests was carried out by Dr J. Premchitt and Dr I. Gray under the supervision of Mr J.B. Massey. Dr T.S.K. Lam assisted in the collation and processing of the long-term monitoring data up to September 1992. Dr H.Y. Wong kindly made available the results of his preliminary literature review of case histories involving field measurements of negative skin friction. The settlement monitoring was carried out by the Survey Division and the strain gauge monitoring was carried out by the Special Projects Division. The assistance of the various individuals together with the Architectural Services Department during the project is gratefully acknowledged.

This final report was prepared by Mr K.K.S. Ho under the supervision of Mr S.H. Mak. The technical reviewer was Mr S.H. Tse.



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1. INTRODUCTION

The development of skin friction on a pile depends on the properties of the surrounding ground, the nature of the pile-soil interface, together with the mobilised relative pile/soil movements. For long and slender piles founded in soils, the bearing capacity and settlement characteristics will be governed primarily by the available skin friction. In the case of piled foundations in reclaimed land where ongoing ground settlement can induce negative skin friction and hence additional loads on the piles, it is important to make adequate allowance for this in the design to ensure satisfactory performance of the foundations in the long term.

There is a dearth of field data on the development of skin friction, both negative and positive, on piles in Hong Kong, particularly for driven concrete piles. In the absence of relevant information, it is difficult to carry out a rational design of piled foundations constructed in a reclamation for possible negative skin friction (downdrag) effects. In the case of a relatively old reclamation where the primary consolidation settlement associated with the filling is likely to have been practically completed, there are major uncertainties on the need to design for possible downdrag forces. In view of the design uncertainties and the lack of field data, it is not uncommon for designers in Hong Kong to make pessimistic design assumptions incorporating allowance for full negative skin friction for piles in a reclamation irrespective of its age. However, this approach could well prove to be overly conservative and expensive, and the piling cost could be substantially reduced if reliable long-term monitoring data reveal a negligible or very small build-up of negative skin friction on piles in similar geological conditions.

The construction of the new four-storey Public Works Central Laboratory (Figure 1) under the direction of the Architectural Services Department (Arch SD) provided a good sponsoring project under the R & D theme PIL4 on the study of skin friction in piles in Hong Kong. The site is located on the Kowloon Bay reclamation which was completed in 1967, almost 20 years ago. The building foundation comprises 172 nos. 500 mm diameter 'Daido' piles which are prestressed, steam-cured spun concrete piles hollow in section. Under the constraints of the project where the Contractor was working to a tight schedule, there were limitations in the instrumentation in that load measurements near the pile tops were not possible. Furthermore, the programme of the works prevented detailed investigation of the ground conditions.

All in all, seven working piles were instrumented, namely, Piles 25A, 26A, 29, 42, 58, 63 and 118. Out of these piles, Piles 26A, 58 and 118 were also subjected to a static load test. The design of the instrumentation and interpretation of the static load tests are given in Premchitt & Gray (1987).

The instrumented piles were monitored regularly since their installation in mid-1987 for about six years or approximately three years after building occupation. This report summarises and interprets the monitoring data. Based on the lessons learnt, recommendations are given for similar future long-term monitoring studies.

2. DESIGN CONSIDERATIONS AND PREVIOUS STUDIES OF NEGATIVE SKIN FRICTION

2.1 Design Considerations

Piles installed through compressible materials (e.g. fill, marine deposits, etc.) can experience negative skin friction or downdrag forces on the portion of the shaft along which the adjacent soil is settling relative to the piles (Figure 2). Ground settlement after pile construction giving rise to negative skin friction can result from consolidation of a soft clay deposit caused by dewatering or the placement of fill. It is important to note that all the soil strata above the settling layer are also likely to move downwards relative to the pile and hence will also give rise to negative skin friction.

In the assessment of downdrag, it is important to establish the neutral point which corresponds to the level where the settlement of the pile equals the settlement of the surrounding ground. The position of the neutral point may vary with time under changing loading conditions. In general, the factors that affect the mobilisation of negative skin friction include the type and flexibility of pile, method of pile construction, ground characteristics (e.g. shear strength, density, and in-situ stresses), groundwater conditions, relative displacement of the pile and the ground, relative timing between commencement of settlement and pile installation. In addition, downdrag on a single pile may not necessarily equal to that in a group, depending on the size and spacing of piles in the group.

In the case of a friction pile embedded in a relatively compressible material, the problem of negative skin friction may be regarded as a settlement problem (Fellenius, 1972; Van Der Veen, 1986) in that the build-up of downdrag can be relieved by additional pile settlement arising from the increased loading on the piles. Indraratna et al (1992) proposed the use of a critical normalised relative settlement (i.e. difference of surface ground settlement and pile top settlement divided by the depth to neutral point) concept based on observations in field monitoring and finite element analyses. In the case of a pile founded on rock where the base settlement is negligible, the problem becomes one of assessing the rock bearing capacity and structural capacity (Canadian Geotechnical Society, 1985).

The assessment of negative skin friction is generally made on the basis of the effective stress method. In this method, the skin friction is related to the average vertical effective stress as follows :

$$\tau = \beta \sigma_v'$$

where τ = skin friction or shear stress on pile shaft
 β = beta factor = $K \tan \delta$
 K = coefficient of horizontal earth pressure ($= \sigma_h'/\sigma_v'$)
 σ_v' = vertical effective stress
 σ_h' = horizontal effective stress
 δ = angle of friction of pile/soil interface

The range of β values suggested by NAVFAC (1982) for preliminary design is shown in Table 1. These recommendations primarily relate to the nature of the settling material and do not distinguish between the type of piles.

There are suggestions in the literature that the positive friction is generally larger than negative friction in cohesionless soils but that they are approximately equal in medium stiff to stiff clays (Broms, 1979; Mey et al, 1985). However, there is insufficient field data in Hong Kong to verify this proposition.

In view of the many variables and uncertainties involved, the best approach to confirm the actual mobilised downdrag forces is to carry out measurements on instrumented working piles. Previous studies involving field measurements of downdrag on piles are summarised in the following as a broad framework for the prediction of negative skin friction on piles in Hong Kong.

2.2 In-situ Measurements of Negative Skin Friction outside Hong Kong

2.2.1 Single Piles

Based on a review of the literature, the results of field measurements of negative skin friction made in other places outside Hong Kong are summarised in Table 2. The majority of the reported case histories relate to measurements on closed-ended driven piles with diameters varying from 300 mm to 700 mm.

A noteworthy observation is that the neutral point is generally above the base of the compressible layer at a distance of between about 60% and 90% of the depth to the compressible layer for friction piles. In the case where the pile is end-bearing on rock which underlies the compressible layers, the neutral point is very close to the rockhead (Bjerrum et al, 1969).

The interpreted β values for the settling materials show a general increasing trend with sand content or with reduction in plasticity index as follows :

For clayey soils : $\beta = 0.11$ to 0.25

For silty and sandy soils : $\beta = 0.25$ to 0.65

In general, a small relative displacement of the order of a few millimetres (or about 0.5% to 1% of the diameter of the instrumented piles) between the pile and the soil will be sufficient to develop practically full negative skin friction. In the case of driven piles, there is also a trend for the β values to increase with the amount of settlement and hence with time. This may be related to the increasing degree of mobilisation of the limiting skin friction on the pile shaft and, in the case of clayey soils, the gradual dissipation of excess pore water pressures with corresponding increase in strength, induced by the pile driving process.

2.2.2 Pile Group

The reduction of negative skin friction due to pile group effect interaction has been studied in Japan. The available case histories are summarised in Table 3. From these measurements, the following trends can be observed :

- (a) The amount of reduction of downdrag relative to that in a

single pile increases with an increase in the number of piles in a group and a decrease in the spacing of piles.

- (b) The amount of reduction of downdrag is larger for the inner piles compared to that for the edge and corner piles.

Kuwabara & Poulos (1989) suggested that the reduction in downdrag forces in a pile group does not depend greatly on the number of piles, provided that the group contains more than about nine piles.

2.3 In-situ Measurements of Negative Skin Friction in Hong Kong

Two documented studies in Hong Kong on the field measurements of downdrag on piles are given in Lee & Lumb (1982) and Yuen & Lam (1993).

Details pertaining to these two cases are summarised in Table 4. The results are shown in Figures 3 and 4. The case described by Lee & Lumb (1982) concerns a driven closed-ended steel pipe pile loaded by a 2m high fill embankment. A settlement of about 500mm was recorded at the ground surface after about one year of loading. In the case of Yuen & Lam (1993), the pile is a steel H-pile loaded by a 7m high embankment. The measured settlement of the ground was about 350 mm after about five months. In both instances, the settlements of the pile tops were not measured.

In the case history reported by Lee & Lumb (1982), the position of the neutral points is slightly obscured as a result of possible problems with the two measuring points near the base of the marine clay layer. However, from interpolation of the data, it appears that the neutral point is below the bottom of the compressible layers and is within the weathered rocks. In the case of Yuen and Lam (1993), the neutral point is similarly found to be below the fill and alluvium, and is about 6m to 10m within the weathered meta-siltstone. It should be noted that in both cases, the pile was not subject to normal foundation loading. If the pile is loaded subsequently, the long-term load distribution may be such that the neutral point will shift upwards to maintain equilibrium.

The β values back analysed from the data by Lee & Lumb (1982) are about 1.6 within the embankment fill, about 0.5 for the fill/marine sand strata and about 0.2 for marine clay. Comparison with a similar pile in their study which was coated with bitumen shows that the coating has reduced the downdrag to about 14% of that for the uncoated pile. The high β value within the embankment fill may have resulted from the settlement of the embankment which gave rise to a 'bending' effect causing high horizontal stresses and hence frictional forces near the top (Bozozuk, 1972).

The β values deduced from the data reported by Yuen & Lam (1993) can be summarised as follows :

Alluvium : maximum β = 0.17
Meta-siltstone : maximum β = 0.19

2.4 Discussion

A review of the available data indicates the absence of relevant case histories of monitoring of driven piles installed in a relatively old reclamation. It may be argued that there could be ongoing settlements in the marine clay due to creep (secondary consolidation), possible changes in the water table, or dissipation of pore pressure built up during pile driving. The load transfer mechanism will be affected by the sequence of load application on the piles and the magnitude of settlement which determines whether full slip occurs at the interface. In addition, it should be noted that negative friction on the potentially smoother surface of a steel pile in most of the reported case histories may be less than that on concrete piles for the present study.

In summary, there are significant design uncertainties in the case of driven piles in a relatively old reclamation which can only be resolved by reliable long-term measurements of instrumented working piles.

3. FIELDWORK

3.1 Site Description

The new Public Works Central Laboratory is located in the Kowloon Bay reclamation area, see Figure 1. Examination of aerial photographs (Buildings and Lands Department Plate no. (11)-1967-5192) revealed that reclamation work at this site was completed in 1967. Thus, the loading arising from the fill on the subsoil strata has been in place for about 20 years at the time of pile installation.

3.2 Ground Investigation

Four boreholes were drilled at this site by the Bachy Soletanche Group in 1983 as part of the ground investigation for foundation design. The borehole locations are given in Figure 5. Geological section A-A and B-B is shown in Figure 6 and Figure 7 respectively. The profiles of SPT N values are summarised in Figure 8.

The site is underlain by fill, marine deposits, alluvium and weathered granite. Each of the first three layers is approximately 10m thick. A brief description of the various types of soils encountered is given in Figure 8. In keeping with common practice at the time, laboratory testing and detailed descriptions of materials from the site were not made during the investigation. Programme and operational constraints of the pile foundation contract dictated that no additional detailed ground investigation was possible.

4. DETAILS OF PILES AND INSTRUMENTATION

4.1 Pile Type

The piles were manufactured by Daido Concrete (HK) Ltd. These are prestressed, spun tubular concrete sections coupled together on site by welding of the steel end-plates. The piles have an external diameter of 500 mm with either a 100 mm or 125 mm thick wall.

Instruments were installed in the piles during the casting process. The dates of casting of the instrumented piles are shown in Table 5.

The general characteristics of Daido piles were discussed by Evans (1987). The concrete was found to have ultimate strength of 78.5 MPa and an allowable stress of 18.3 MPa. The Young's modulus of concrete was determined using bending tests on an instrumented pile section and found to be 37.7 GPa. The hollow centres of all the instrumented piles were filled with cement grout following driving to prevent water ingress. The Young's modulus of the grout was found from compression tests on cylindrical samples to be 11.5 GPa. In the foundation design, the working load of the piles was taken to be not more than 1700 kN per pile.

Seven working piles were instrumented with strain gauges, namely Piles 25A, 26A, 29, 42, 58, 63 and 118 (Figure 5). The first two piles have a 125 mm thick wall whilst the other five piles have a 100 mm thick wall.

4.2 Strain Gauges

A brief summary of the different types of strain gauges installed on the piles is outlined below. Reference should be made to Premchitt & Gray (1987) for details on the different types of gauges together with the method of installation.

Two types of strain gauges, electrical resistance (ER) gauges and vibrating wire (VW) gauges, were used to provide redundancy and an independent cross-check of the results. The ER gauges were considered to be a low cost supplement and back-up to the VW gauges.

The ER gauges consist of resistance gauges from Oyo Measurement Co Ltd (designated ER1 gauges) and foil gauges provided by 'kyowa' Electronic Instrument Co Ltd modified by the then Geotechnical Control Office (designated ER2 gauges). The VW gauges were of type TES/5.5 as manufactured by Gage Technique Ltd. Outline details of the strain gauges in the instrumented piles are shown in Figure 9.

At the time of the foundation contract, there was limited experience with the installation of instrumentation in Daido piles. Piles 25A and 26A were therefore used as trials. Unfortunately, a large proportion of the strain gauges was damaged after casting or driving. Most of the gauges in Pile 26A and about half of those in Pile 25A were either defunct or giving unstable (drifting) readings. It proved necessary to strengthen the wire ties, improve water-proofing of the joints, enhance the temperature rating of the gauges and ensure careful pile handling on site. As a result of these improvements, there were relatively small losses for the remaining five piles and more than about 80% of the strain gauges were still functioning after pile installation.

The positions of the strain gauges on the instrumented piles are summarised in Figure 10.

4.3 Pile Driving

The first few sections of the piles were installed using a 4.5 tonnes diesel hammer with the remaining sections installed using a 6.2 tonnes diesel hammer. The piles were driven to a pre-determined final set in accordance with the Hiley formula. The dates of driving of the instrumented piles are shown in Table 5.

The strains were measured before and after pile driving with the datum of the strain gauges taken to be that when the sections were cast or when they were delivered to site. Hence, the strains recorded during driving did not include those associated with prestressing. It was observed that large strains occurred during driving of each pile section and both axial and bending strains remained 'locked in' after completion of driving. The magnitude of these residual strains varied randomly between different sections in a given pile and between different piles. The causes of these residual strains are complex and are likely to be related to the driving of the various sections at different times which are in somewhat different positions relative to the driving hammer.

5. LOAD TESTS

5.1 Strain Gauges Response

Static load tests were carried out on three of the instrumented piles, namely Pile 25A, 58 and 118. The dates of the tests are shown in Table 5. Details of the tests are given by Premchitt & Gray (1987). A brief summary of the response of the strain gauges during the load tests is presented in the following.

A detailed assessment of the results indicated that the VW and ER2 gauges gave practically identical results, while ER1 gauges consistently registered consistently higher readings. It was concluded by Premchitt & Gray (1987) that the ER1 readings needed to be adjusted by a factor of 1.2.

The interpreted load transfer down the piles during the load tests is shown in Figures 10 and 11 for Pile 58 and Pile 118 respectively. Detailed interpretation of the load distribution in Pile 25A during the load test was not possible due to malfunctioning of a large number of strain gauges.

5.2 Mobilised Resistance

Based on the instrumentation results obtained during the load tests, friction-displacement curves can be derived and the mobilised resistance determined. The results are interpreted with respect to a datum for the strain gauges corresponding to the start of the load tests. Thus, the residual stresses built up in the pile after driving are not accounted for. This is considered reasonable because there is no well-defined displacement or loading causing the residual stresses and the associated skin friction and that, in the present instance, the piles are far from failure and hence it would be unnecessary to consider the absolute strains.

Figures 12 & 13 show the friction-displacement curves for Pile 58 and Pile 118

respectively. The maximum mobilised positive skin friction for the various strata is summarised below :

Stratum	Maximum mobilised friction, τ (kPa)	Pile displacement at max. mobilised friction, δ (mm)	β value at max. mobilised friction	Max mob. τ/N
Fill	110 to 112	12 to 15	1 to 1.2	6 to 11
Marine Deposits	57 to 88	6.5 to 8.5	0.4 to 0.5	4.7 to 8.8
Alluvium	51 to 101	2 to 5	0.2 to 0.55	2.7 to 6.8
Weathered granite	116	≈ 1	0.38	5

The flattening of the curves after an initial steep rise indicates that the friction was approaching full mobilisation at a displacement greater than about 5mm (i.e. 1% pile diameter).

At the maximum test load of 5400 kN, the average skin friction over the full length of the pile was about 75 kPa.

6. LONG-TERM MONITORING

6.1 Building Construction

Construction of the superstructure commenced in March 1988 and was largely completed in November 1988 after which interior finishing and moving-in of machines, etc. was carried out. The building was officially opened in July 1991.

6.2 Settlement Monitoring

Settlement monitoring of the top of five of the instrumented piles, viz. 118, 58, 63, 42 and 29, was carried out between February 1988 and August 1991. This indicated that the pile settlements ranged from about 1 mm in Pile 58 to 13 mm in Pile 29 (Table 6). Two surface settlement points were established to monitor the settlement of the ground (Figure 5). The readings were small and within the resolution of the surveying method. Unfortunately, the stations became obstructed in January 1989 and could not be located from August 1989 onwards and no replacement stations were installed. Therefore, no reliable results could be obtained from these two monitoring points but it appears that the maximum amount of ground settlement during the six months or so after pile driving was of the order of a few millimetres.

6.3 Strain Gauge Results

The strain gauges were read approximately bi-monthly after pile installation and gradually changed to monthly readings after building occupation. The results of the strain gauge monitoring are summarised in Appendix A.

The raw data have been carefully reviewed to assess the general trend of the results

and identify obviously erroneous data. As mentioned previously, the majority of the strain gauges in Piles 25A and 26A became defunct after pile installation. Some of the remaining gauges continued to produce readings during the monitoring period but the results are either drifting or obviously erroneous and cannot be interpreted. The monitoring results in Piles 25A and 26A have therefore been disregarded.

The remaining five instrumented piles were installed between 7 May 1987 and 13 May 1987. Load testing of Piles 58 and 118 was completed on 28 May 1987 and 2 June 1987 respectively. It can be observed from the raw data that typically there is a period after pile installation or load testing during which there are changes in the strains measured at varying depths. This may be related to redistribution of the residual stresses, set-up effects associated with pile driving, ground heave and pile uplift effects arising from driving of adjacent piles, or a combination of these. Additionally, the presence of the kentledge load at ground surface may also have resulted in stress transfer to some of the piles as suggested by Premchitt & Gray (1987).

For the purposes of considering the possible build-up of negative skin friction after pile construction, the 'datum' assumed for calculating the changes in strains experienced by the piles are taken to be that after the initial period of some fairly random changes in strains. Based on a detailed review of the data, the 'datum' has been taken to be that between 5 June 1987 and 23 June 1987 for the instrumented piles.

A review of the raw data indicates that the majority of the ER gauges gave erroneous results which are inconsistent with those from VW gauges. As noted previously, the ER gauges were initially regarded as a low cost supplement and back-up for the VW gauges. The ER gauges have proved to be invaluable during the load tests in providing an independent check; however, their longevity is evidently far inferior compared to VW gauges and reliable results cannot be obtained from them in the long term. As an illustration, Figure 14 shows the changes in strains with time as measured by the various types of gauges in Pile 118. It can be seen that the changes in strains as measured by the different ER gauges, even after allowing for the correction factor for ER1 gauges, are erratic and that the VW gauges generally give readings consistent with the trend of increasing building load. As the majority of the ER gauges do not give meaningful long-term results, a consistent approach has been taken in that all the ER gauges are discarded and the interpretation has been made on the basis of the VW gauges only.

The variations in strains with time as measured by the VW gauges are shown in Figures 15 to 19 for Pile 29, Pile 42, Pile 58, Pile 63 and Pile 118 respectively. It can be seen that, in general, there is a relatively rapid increase in strains during superstructure construction. Typically, this is followed by a more gentle increase in strains corresponding to the period of interior finishing and moving-in of machines. After building occupation, most of the strain readings generally become reasonably steady although there are exceptions in isolated gauges.

7. ANALYSIS OF LONG-TERM MONITORING DATA

7.1 General Considerations

Relative pile/soil movement leads to the development of skin friction along the pile shaft. As an illustration, possible distributions of forces in a pile are shown in Figure 20. This depicts the effect of an applied load at the top of the pile and the behaviour in the long term when downdrag builds up gradually. It should be noted that as the load arising from downdrag develops in the pile, it will settle due to increased elastic compression and movement at the base. This would in turn reduce the magnitude of the relative pile/soil movement and affect the skin friction distribution. Thus, both the pile flexibility and base stiffness will be important factors. Also, the distribution may change with time so long as there is ongoing ground settlement, particularly in a layered deposit with different strata each with different consolidation characteristics.

As shown in the load tests, the shaft response is relatively 'stiff' in that the mobilisation of load with relative displacements is rapid. If the ground settlements are large (for instance, in the case of Lee & Lumb, 1982) such that there is complete pile/soil slip and the friction is fully mobilised, the direction of friction will be well-defined. On the other hand, if both the pile and the ground movements are small and of comparable magnitude, the friction mobilised together with its direction will be sensitive to the actual relative movements and may be less well-defined.

In interpreting the field data, it is important to bear in mind the uncertainties inherent in the results. As the actual skin friction distribution is a function of relative movements, it would be useful, in general, to determine the ground settlement profile. However, it should be noted that the actual sub-surface ground movement profile is not easy to determine where the expected settlements are small and possibly within the accuracy of the instruments. This measurement was not taken for this project because the ground settlements were expected to be small.

Additionally, there is a further complication in the present case with the use of prestressed concrete piles in that compressive strains arising from the applied load and/or downdrag would result in a certain loss of the prestress. Also, possible creep of concrete under sustained loading could also lead to release of the prestress and give rise to difficulties in interpreting the instrumentation results. However, given the fact that the pile concrete is of very high strength with a design ultimate strength of 78.5 MPa, it can be expected that creep would not be significant in general although the grout may exhibit some creep in the long term.

7.2 Mobilised Forces

The strain distribution for the different piles are considered at four key dates, namely, March 1988, November 1988, June 1991 and May 1993. These correspond to the start and completion of the superstructure, practical occupation of the building, and the latest reading in the long term respectively.

In general, the analysis of the long-term monitoring data was hampered by the fact that

the actual applied load at the top of each instrumented pile had not been monitored. The depth of the first VW gauge in the piles vary between 11.4m and 14.9m. This prevented the assessment of load transfer within the fill and in the case of Pile 29 the marine deposit stratum as well. In addition, this deprived a useful double-check of the reasonableness of the results obtained from the strain gauges at depth.

Even though the interpretation is based on a consistent set of readings given by the VW gauges only, there is considerable variation in the apparent mode of load transfer between the piles. These are discussed in turn in the following.

7.2.1 Pile 29

The results shown in Figure 21 indicate the gradual development of apparent downdrag between 14.9m and 22.8m depths in the alluvium over the five months or so since pile driving after which it remained constant. This amounted to about 13 kPa corresponding to a β value of less than 0.1. According to the load test results, the friction has not been fully mobilised and slip condition has not been achieved. It is possible that this corresponds to the cessation of small ground settlement arising from reconsolidation of the ground following pile driving. Since the start of building construction, the apparent downdrag decreases steadily with time which suggests settlement of the pile relative to the ground in response to gradual increase in structural loading.

When the building is occupied, there is positive friction of about 3 kPa between 14.9m and 22.8m, and about 20 kPa between 22.8m and 38.9m depths. However, the gauge at 22.8m depth registered a substantial drop in strain of about 25% in April 1992 while the other gauges did not show corresponding changes (Figure 15). The reason for this is not known and it is likely that this variation is erroneous and should be ignored. If this assumption is made, then it implies that there was little change in the strain readings in the long term. This indicates that practically no downdrag built up in this pile.

Although it was not possible to determine the amount of load transfer over the top 14.9m given the uncertainties in the applied load (the ER1 gauges at 3.2m depth gave erratic and erroneous results and cannot be relied on), it is apparent that the pile behaves essentially as a friction pile in the long term, with less than 150 kN reaching the pile base and no significant build-up of negative skin friction. It appears that some negative skin friction may have been developed after pile driving prior to application of structural loading. It is possible that this is a result of dissipation of excess pore water pressures induced during pile driving. The rate of dissipation is such that the re-consolidation is complete in a few months and thus no long term negative skin friction develops with time after building construction. The initial downdrag is negated as the pile settles relative to the ground upon application of the building loads.

7.2.2 Pile 42

The results shown in Figure 22 indicate that there was substantial load reaching the pile base. This amounted to about 170 kN at the start of construction, reaching over 1000 kN at the time of building occupation and increasing to more than 1100 kN in the two years or so after occupation.

Near the end of superstructure construction in November 1988, the results indicate a negative skin friction of about 11 kPa ($\beta = 0.07$) in the marine deposits which is plausible. Unfortunately, the gauges near the bottom of the marine deposits at 19.4m and 23.4m depths did not work in the long term. If the bottom two strain gauges are giving reliable readings, then it means that downdrag existed within the alluvium and the weathered granite. The downward friction implied by the gauge at 11.4m and the one near the bottom of the pile (at 39.4m depth) implies an overall negative friction of about 20 kPa. The actual pile/soil relative movement is not known and only a small amount of relative movement would be required to build up such skin friction according to the load tests. Nevertheless, it is difficult to reconcile negative skin friction being mobilised along the lower part of the pile given the small measured ground settlements, the likely stiffness of the alluvium and the weathered granite, the sequence of loading with the application of the building load which should have given rise to positive skin friction initially. Furthermore, the gauge at 11.4m depth only shows a load of less than 400 kN while the expected load on the pile top is around 1700 kN. Although the applied load at the top of the pile is not known with certainty, it is most unlikely that substantial positive friction develops in the upper zone of the pile with the rest of the pile subject to downdrag.

In conclusion, the strain gauge readings are considered to be erroneous and the results are inconclusive.

7.2.3 Pile 58

The results shown in Figure 23 indicate that the increase in strain at the three levels of VW gauges is of similar order of magnitude at a given time. According to the results, a load of nearly 880 kN was transferred to near the pile base. Again, without knowing the magnitude of the applied load at the pile top, it is difficult to judge the reasonableness of the results at individual levels. At the time of building occupation, only the strain gauge at 11.8 m depth was still operational. This continued to work for another year during which time no significant changes in strain were recorded.

The results on their own suggest that overall the skin friction mobilised is negligible (about 2 kPa) between 11.8m and 39.8m depth at the time of building occupation. This is considered to be most unlikely to be a true reflection of the internal stresses in the pile.

In summary, no firm conclusions can be made from the monitoring results for this pile.

7.2.4 Pile 63

The results shown in Figure 24 indicate that the gauge reading at 31.5m depth increased substantially during the course of superstructure construction. This implies a negative skin friction of about 50 kPa between 23.5m depth and 31.5m depth in the alluvium, corresponding to a relative movement of about 1 to 2 mm according to the load test. This compares with a maximum mobilised positive friction of 51 to 101 kPa in this stratum during the load tests. Unfortunately, the bottom gauge became defunct shortly after completion of construction and it is not possible to determine the amount of load transferred to the pile

base. In the long term, the readings at depths between 11.5m and 31.5m suggest an average negative skin friction of about 18 kPa. Such localised negative friction below a portion of the pile shaft with positive skin friction is only possible if the alluvium stratum is highly compressible relative to the overlying strata and that the pile flexibility is such that positive skin friction is mobilised in the upper part. This is not consistent with the pile and ground settlement monitoring results and the properties of the various strata.

The strain gauge readings are therefore considered to be erroneous and the results are inconclusive.

7.2.5 Pile 118

The results shown in Figure 25 indicate the gradual development of apparent downdrag between 10.6m and 18.6m depths in the marine deposits over the three months or so since pile driving after which it remained constant. This amounted to about 10 kPa corresponding to a β value of less than 0.1. According to the load test results, the friction has not been fully mobilised and slip condition has not been achieved. It is possible that this corresponds to the cessation of small ground settlement arising from reconsolidation of the ground following pile driving. Since the start of building construction, the apparent downdrag decreases steadily with time which indicates settlement of the pile relative to the ground in response to gradual increase in structural loading.

Some apparent localised negative skin friction developed near the bottom of the alluvium with no corresponding downdrag in the overlying marine deposit in the long term. For reasons given in section 7.2.4 above, this is not considered realistic given the small ground settlement at the surface. The strain gauge results at 30.6m are therefore suspect. If this gauge is disregarded, then the applied load is essentially resisted by positive friction with about 20% of the load supported by the pile base. Shortly after building occupation, the mobilised positive friction is about 32 kPa between 10.6m and 18.6m depths in the marine deposits ($\beta = 0.24$) and about 66 kPa between 18.6m and 22.6m depths in the alluvium ($\beta = 0.37$).

The gauge at 10.6m depth registers a load of more than 1600 kN. This is comparable to the likely maximum loading applied at the top of the pile and implies very little friction mobilised between ground level and 10.6m depth. However, in the absence of strain gauge near the top of the pile, this can only be conjectural.

Overall, the results indicate that there is no significant build-up of negative skin friction on the pile in the long term. It appears that some negative skin friction may have developed after pile driving prior to application of structural loading. It is possible that this is a result of dissipation of excess pore water pressures induced during pile driving. The rate of dissipation is such that the re-consolidation is complete in a few months and thus no long term negative skin friction develops with time after building construction. The initial downdrag is negated as the pile settles relative to the ground upon application of the building loads.

7.3 Discussion

Where piles are installed into settling ground, an estimate of the effect of the relative timing of commencement of settlement and of pile installation and the rate of settlement on the downdrag can be made following the methodology suggested by Poulos & Davis (1980), which requires parameters such as the coefficient of consolidation, drainage path length, pile characteristics, etc. However, in the present case, as the reclamation was completed more than 20 years ago, it may be anticipated that the ground settlement induced by the filling will have largely taken place by the time of pile construction. Any settlement arising from the installation process is likely to be small unless sensitive clay is present.

In general, it will be difficult to separate the strains arising from re-consolidation of the ground due to the pile driving effect alone from the complex variations in stresses associated with other possible mechanisms such as re-distribution of residual stresses with time, set-up effects in the soil, interaction effects during pile installation leading to ground heave and pile uplift. In the long term, there is the added complication of possible changes in the Young's modulus of concrete and grout which constitute an element of uncertainty in the conversion of strains to forces. This will be exacerbated if the concrete or grout is not homogeneous throughout the length of the pile or if the behaviour is non-linear as a function of stress level. This is further complicated by the possible relaxation of the prestress in the long term either on its own or as a result of creep of the concrete although this is not expected to be significant as discussed in section 7.1.

Although there are uncertainties which have to be borne in mind in the interpretation, a number of useful observations can nonetheless be made from the monitoring results. Firstly, the longevity of the vibration wire strain gauges has been demonstrated to be far superior to the electrical resistance strain gauges. The survival rate of the vibration wire strain gauges is about 70% after a period of about six years.

Secondly, apart from Piles 42, 58 and 63 where the validity of the interpreted results is uncertain and questionable, the monitoring results indicate that no significant downdrag builds up in the long term during a monitoring period of about three years after building occupation. The results further suggest the mobilisation of some small negative skin friction shortly after pile driving which may correspond to the dissipation of excess pore pressure set up during pile driving. However, this localised downdrag becomes steady after a few months. During building construction, this becomes relieved gradually due to pile settlement as the load is applied. Given that no significant downdrag builds up on the piles (i.e. it is not fully mobilised as a result of the small ground settlement), it was not meaningful to compare the differences in the magnitude and rate of development of positive and negative skin friction in the various strata. Also, the influence of group effects on the mobilisation of downdrag cannot be determined. It is noted that the two piles, namely Piles 29 and 118, which gave meaningful and consistent results are both single piles whereas the other three with inconsistent results are part of a pile group of three piles. However, this may have been a coincidence and is not considered to have contributed to the observed pattern of the results.

Lastly, the satisfactory performance of the piled foundation is confirmed by the long-term monitoring of settlement and internal stresses of the instrumented piles. It appears that the original pile design with allowance for downdrag in the fill and marine deposits combined with a conservative estimate of the base capacity (which compensates for the neglect of the

possible reduction in effective overburden pressure on the base capacity arising from possible downdrag) is adequate and sufficiently safe.

The long-term monitoring results suggest that no significant downdrag will build up in the case of an old reclamation similar to the Kowloon Bay site. It is considered that important factors for such behaviour include :

- (a) absence of sensitive clays that exhibit pronounced secondary consolidation;
- (b) absence of soft deposits that allow the build-up of large excess positive water pressure during pile driving;
- (c) relatively flexible piles founded in soil;
- (d) no significant changes in effective stresses in the ground after pile installation leading to settlement of the compressible layers.

Situation (d) may arise in the case of placement of additional fill, or where dewatering or pumping from wells is carried out. Pumping from wells in the Mongkok area in the mid 1960's resulted in significant settlement, and in some cases damage, of buildings founded on piles with an inadequate penetration into the completely weathered rocks. This was attributed by Lumb (1964) to the effect of ground settlement inducing negative skin friction on the piles.

Relatively long and slender piles not founded on rock are unlikely to sustain large build-up in internal stresses as the downdrag forces can be relieved by way of small additional pile settlement due to either movement of the base or elastic compression. Thus, it is recommended that full allowance of downdrag is not warranted in such situations. However, with the very limited field data available, it is not possible to give a blanket suggestion on the proportion of negative skin friction to be adopted in routine pile design in old reclamations. In practice, for friction piles founded in a reclamation subject to ongoing or residual settlement, the amount of downdrag to be allowed for should be related to the allowable settlement that can be tolerated by the structure.

8. SUGGESTIONS FOR FUTURE LONG-TERM MONITORING OF PILES

Based on the lessons learnt from this project, it is suggested that attention be paid to measuring the applied load at the top of the piles (or the load in the column or load-bearing element above where practicable) for future similar monitoring projects. For long-term monitoring purposes, at least two vibrating wire strain gauges should be provided at each level. Where practicable, it would be sensible to position these strain gauges at a sufficiently close spacing (say, 3 to 4 m) and at the likely positions of the bases of the various soil strata so as to increase the likelihood of obtaining adequate information in the event of some of the gauges malfunctioning. It would not be advisable to rely on electrical resistance strain gauges for long-term monitoring.

In the case where the ground settlement is expected to be large, it would be advisable

to measure the sub-surface settlement profile in conjunction with measurement of pile settlement in an attempt to determine the likely relative pile-soil displacement in the different strata. In situations where significant changes in the water level is expected, sufficient piezometers should be installed to monitor the changes in water pressures.

Lastly, consideration may be given to undertaking laboratory tests on control cubes or cylinders to investigate the variation, if any, of the Young's modulus of the constituent materials, particularly that of grout and concrete where they are used.

9. CONCLUSIONS

A summary of the findings of this project is given in the following :

- (a) Seven working piles have been instrumented with strain gauges, three of which were subjected to a static load test. Long term monitoring was carried out on the seven instrumented piles for a total period of six years after pile installation or about three years after building occupation. Both the load tests and the long-term monitoring provided valuable insight into the mechanism of load transfer in piles founded in an old reclamation site in Hong Kong.
- (b) The vibrating wire strain gauges have been found to be more robust in the long term compared to the electrical resistance strain gauges although both type of gauges are found to be satisfactory during the load tests.
- (c) Overall, the results of the strain gauges appear to indicate that no significant downdrag builds up on the piles in the long term after building occupation and are consistent with the results of settlement monitoring. This is in line with the general expectation that no significant downdrag would develop in the case of floating piles (i.e. piles not founded on rock) founded in a reclamation where the consolidation settlement associated with the placement of fill is likely to have been complete. It seems that full allowance for negative skin friction is not warranted in similar situations of an old reclamation unless large reductions in the water level are to be expected or sensitive clays are present.
- (d) The monitoring results indicate that the performance of the piled foundation for the new Public Works Central Laboratory is satisfactory.

In view of the fact that the strain gauge readings have practically stabilised and that a detailed interpretation has been carried out, it is recommended that the monitoring be terminated.

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Table 1 - Range of β Values Recommended by NAVFAC

Soil	β Value for Negative Skin Friction
Clay	0.2 - 0.25
Silt	0.25 - 0.35
Sand	0.35 - 0.5

Table 2 - Field Measurements of Negative Skin Friction Undertaken Outside Hong Kong (Sheet 1 of 4)

Reference	Pile			Compressible soil layers			β Value	Founding layer		Neutral Point Depth (m)	Settlement		Period of measurement (year)
	Type	Dia (mm)	Length (m)	Type	Thickness (m)	Properties		Type	Depth (m)		Ground (mm)	Pile (mm)	
Gant et al (1958)	Driven	--	--	Fill Marine mud	15 --	-- Clayey silt	0.19 (for fill)	--	--	--	--	--	--
Johannessen (1965, 1966); Johannessen & Bjerrum (1965)	Steel Driven	--	55	Clay	55	Slightly organic clay 0-20 m $c_u = 20-50$ kPa	0.12-0.2	Rock	= 55	--	1000	--	1.3
Bjerrum et al (1969)	Steel pipe (Driven close-ended)	300	30	Sandy gravel Silty clay	8-10 20	-- Normally consolidated, $c_u = 40-50$ kPa	0.26	Rock	28-30	28	200	33	1.5
	Steel pipe (Driven close-ended)	500	57	Fill	15 40-45	-- Soft marine clay	0.18	Rock	55-60	near pile tip	270	53	2
	Steel pipe (Driven close-ended)	500	41	Fill Clay	13 27	Sanddust, sandy organic mud Soft marine clay	0.23	Rock	40	near pile tip	70	32	2
	Steel pipe (Driven close-ended)	470	53	Fill Clay	> 10 40	-- Normally consolidated, marine clay	0.20	Rock	> 50	near pile tip	2000	100	5
	Steel pipe (Driven, close-ended & concrete filled)	500	32	Fill Soft clay	) 20-30)	--	0.25	Rock	20-30	--	300	--	1.5
Fellenius & Broms (1969); Fellenius (1971); Bjerrum (1977)	Precast Concrete (Driven)	Hexagonal (Area = 800cm ²)	55	Clay Silt	40 13	$c_u = 15-50$ kPa $\gamma = 15.5-17.5$ kN/m ³ --	0.20-0.25	Sand (15m thick)	53	10 m above bottom of silt layer	2-3 per year	--	7.3
Endo et al (1969)	Steel pipe (Driven)	700	43	Fill	2	--	0.20 (open-ended)	--	--	at depth 0.73-0.78 times thickness of compressible layer	172	--	2
		700	43	Silty sand	7	--	0.3-0.35 (close-ended)						
		700	31	Soft silt	30	--							

Table 2 - Field Measurements of Negative Skin Friction Undertaken Outside Hong Kong (Sheet 2 of 4)

Reference	Pile			Compressible soil layers			β Value	Founding layer		Neutral Point Depth (m)	Settlement		Period of measurement (year)
	Type	Dia (mm)	Length (m)	Type	Thickness (m)	Properties		Type	Depth (m)		Ground (mm)	Pile (mm)	
Bozozuk & Labrecque (1969)	Concrete filled steel tube pile	990	82	Silty clay	--	$c_u = 0.25 \sigma_v'$	0.18	--	--	--	370	15	1.5
Bozozuk (1970, 1972)	Steel pipe (Driven & open-ended)	300	49	Fill	9	--	0.33 (average)	Fine sand over-lain by soft clay	73	22 m below pile top (shifting downward with time)	530	470	5
				Fine sand to silty clay	18	$c_u = 15-59$ kPa	--						
				Soft clay	55	$c_u = 59-88$ kPa	--						
Walker & Darvall (1973)	Steel pipe pile	760	30	Fill	2	(Moisture content of silty clay = 60-100%)	0.24 (average)	Dense sand & gravel (8m thick)	27	22 m below pile top	--	--	1
				Medium sand	7		-						
				Silty clay	15		-						
				Sandy silt	3		-						
Garlanger (1974)	Steel H pile	--	--	Fill Sand Clay	7.6 4 15	--	0.20-0.25 (for clay) 0.30-0.40 (for sand)	--	--	--	--	--	--
Grigoryan & Grigoryan (1975); Grigoryan & Vliyanii (1975)	Cast-in-place concrete pile	--	16	Loess	--	Collapsible soil	0.18	--	--	10.6 (15.5 for pile with an enlarged base)	--	--	--
Takashi & Sawaguchi (1975)	--	500	40	--	--	--	0.25	--	--	--	--	--	--
Okabe (1977)	Steel pipe pile (Driven)	600	39-43	Clay & sand	10	SPT < 1 for clay, about 5 for sand	--	Medium Sand/gravel (SPT about 50)	about 40	0.9 pile length with SPT = 50 at pile end 0.8 pile length with SPT = 10 at pile end	--	70	4.6
				Sandy silt/ silty clay	20	SPT 0-5	--						
				Clay/sand	10	SPT 5-10 for clay about 20 for sand	--						

Table 2 - Field Measurements of Negative Skin Friction Undertaken Outside Hong Kong (Sheet 3 of 4)

Reference	Pile			Compressible soil layers			β Value	Founding layer		Neutral Point Depth (m)	Settlement		Period of measurement (year)
	Type	Dia (mm)	Length (m)	Type	Thickness (m)	Properties		Type	Depth (m)		Ground (mm)	Pile (mm)	
Inoue (1979)	Steel pipe pile (Driven & close- ended)	600-700	30-40	Soft alluvium	30-40	Clay & silt (% sand <20%)	0.25-0.35	Dense sand/gravel	30-40	= 0.75 ΣH for friction pile > 0.75 ΣH for end bearing pile	40-80 per year	--	>2
						Sandy clay/ silt (% sand 20-50%)	0.35-0.55						
						Silty sand (SPT 10) (% sand 50- 70%)	0.55-0.65						
						(ΣH = Total thickness of compressible Layers)							
Mohan et al (1981)	Reinforced concrete	430	5	Clay fill	3	CPT 2-12 MPa	0.11 to 0.15	--	--	--	--	--	480 days
				Sand	0.5	CPT 25 MPa	--						
				Very soft clay	14.5	CPT 1-2 MPa	--						
Clemente (1981)	Prestressed concrete	420 (Oct- agonal)	62	Coral/sand fill	4	Medium to compact	0.16	Medium to dense coral sand & firm to stiff silty clay	46-58	42	460	--	6 months
				Very soft silty clay	29	Moisture content 70 % $c_u = 14-60$ kPa	--						
				Soft to firm silty clay	13	$c_u = 60-86$ kPa	--						
Auvinet & Hanell (1981)	Precast concrete	500 (tri- angular)	30.5 (Pile 1) 32 (Pile 2)	Very soft clay	32	$c_u = 10-20$ kPa	0.21 (Pile 1) 0.22 (Pile 2)	Sand (1.5 m thick only underlain by 16 m thick of very soft clay)		20	--	--	--

Table 2 - Field Measurements of Negative Skin Friction Undertaken Outside Hong Kong (Sheet 4 of 4)

Reference	Pile			Compressible soil layers			β Value	Founding layer		Neutral Point Depth (m)	Settlement		Period of measurement (year)
	Type	Dia (mm)	Length (m)	Type	Thickness (m)	Properties		Type	Depth (m)		Ground (mm)	Pile (mm)	
Keanan & Bozozuk (1985)	Steel pipe (Driven & close- ended)	324	32	Sand fill	11	$\gamma = 18 \text{ kN/m}^3$	0.24	Dense gravel	35	20	187 (in 18 months)	80 (in 6.5 year)	6.5
				Organic silty/sand	4	$\gamma = 17 \text{ kN/m}^3$ SPT = 5	--						
				clayey silt	12	$\gamma = 18.5 \text{ kN/m}^3$ SPT = 13-14	--						
				Varved clay/silt	1		--						
				clayey silt	7	$\gamma = 18.5 \text{ kN/m}^3$ SPT = 10	--						
Nomura & Todoroki (1986)	Steel pipe (Driven & close- ended)	610	37.5	Alluvial deposit	37	SPT 1-10	0.26	Dense sand	37	22-30	300	--	31 months
Indraratna et al (1992)	Prestressed spun concrete pile	400	26	Weathered clay soft clay medium stiff to stiff clay	2-4 16 6-8	$C_u = 20-40$ kPa	0.15-0.20 -- --	Medium stiff to stiff clay	20	21	300	--	9 months

Table 3 - Field Tests on Effect of Pile Group on Negative Skin Friction

Stratum			Pile			Pile group geometry			Inner pile		Edge pile		Corner pile		Period of Measurement (year)
Type	Thickness (m)	SPT N value	Type	Dia. (mm)	Length (m)	No. of piles	Pattern	Spacing (m)	NSF (kN)	% of single pile	NSF (kN)	% of single pile	NSF (kN)	% of single pile	
<u>Inoue (1979)</u>															
Top soil	4	1-2	Steel pipe (Driven, close-ended)	711	39	2	+ +	1.8	-	-	-	-	2510	60	> 2.0
Silty sand	4	5-10				2	+ +	1.8	-	-	-	-	2740	65	
Silt	21	0-2				5	+ + +	1.8	1050	25	-	-	2210	52	
Sandy clay	3	2-5													
Hard clay	5	5-10													
Sand	3	20-50													
Sandy gravel		> 50													
Fill	9	5	Steel pipe (Driven, close-ended)	711	47	38	Equilateral triangular pattern	1.5	-	5-12	-	-	-	30-55	> 2.0
Silt	8	0-2													
Sandy silt	19	5													
Silty clay	4	5-10													
Sand	3	10-30													
Gravel		> 50													
<u>Okabe (1977)</u>															
Fill	5	5-20	Steel pipe (Driven, close-ended)	700	40	38	Equilateral triangular pattern	1.5	690 -995	10-14	-	-	3430	49	3.0
Sandy silt/ silty clay	30	2-5													
Sand	5	10-30													
Gravel		> 50													

Table 4 - Field Measurements of Negative Skin Friction in Hong Kong

Reference	Pile			Compressible soil layer			β Value	Founding layer		Neutral point	Loading condition	Period of measurement (year)
	Type	Size	Length (m)	Type	Thickness (m)	SPT N Value		Type	Depth (m)			
Lee & Lumb (1982)	Steel pipe (Driven, close-ended)	609.4 mm	29.6 m	Embankment Fill Fill/Marine sand Marine clay	2 8 14	- 10-14 2	1.6 0.5 0.2	Completely weathered siltstone	22	@ 4 m below bottom of marine clay	Loading by a 2m embankment causing about 500mm settlement	> 1.0
Yuen & Lam (1993)	Steel H-piles	356 x 368 x 174 kg/m	PP1 50.7 m PP2 40.4 m	Fill Alluvium Meta-siltstone	2 18 >30	10-20 6-72 8-100	- 0.19 0.08-0.17	Weathered Meta-siltstone	20	5-10 m below bottom of alluvium	Loading by a 7 m high embankment causing about 350 mm settlement	≈ 1.0

Table 5 - Dates of Casting, Driving and Load Testing of Instrumented Piles

Pile No.	Dates of Casting	Dates of Driving		Dates of Load Testing
		Start	Finish	
25A	1984	30.3.87	15.4.87	N/A
26A	13.3.87	2.4.87	16.4.87	23.6.87 to 26.6.87
29	23.4.87	4.5.87	7.5.87	N/A
42	13.4.87	4.5.87	13.5.87	N/A
58	8.4.87	4.5.87	9.5.87	25.5.87 to 28.5.87
63	16.4.87	4.5.87	13.5.87	N/A
118	22.4.87	4.5.87	8.5.87	30.5.87 to 2.6.87
Note : Pile nos. with indicates 100 mm wall thickness. All others have 125 mm wall thickness.				

Table 6 - Results of Settlement Monitoring

Point Date	29	42	58	63	118	A	B
3.8.87	-3	0	-1	-1	0	-1	+1
8.9.87	-	+1	0	0	+1	-2	-2
21.10.87	-	0	0	-1	+1	-4	-2
22.12.87	-5	+2	-1	0	+1	-6	-4
26.2.88	-	+5	+1	-2	+7	-3	-5
18.4.88	-4	+4	0	-3	+1	-3	-4
21.6.88	-4	Obstructed	Obstructed	Obstructed	+7	Obstructed	Obstructed
8.8.88	-4	Obstructed	0	-5	+6	Obstructed	Obstructed
8.9.88	-6		0	-4	+6	Obstructed	-2
14.10.88	-6	1	-1	-5	+6	-	-2
21.11.88	-7	1	+1	-5	+7	-	-2
27.1.89	-9	Obstructed	0	-5	Obstructed	Obstructed	Obstructed
10.3.89	-10	Obstructed	0	-5	+6	Obstructed	Obstructed
6.6.89	-10	+4	0	-5	+6	Obstructed	Obstructed
15.8.89	-9	+4	0	-4	+6	cannot be located	cannot be located
12.10.89	-10	+4	0	-5	+6	cannot be located	cannot be located
4.12.89	-11	+5	+1	-4	+6	cannot be located	cannot be located
22.2.90	-11	+3	0	-5	+6	cannot be located	cannot be located
3.4.90	-11	+4	+1	-5	+6	cannot be located	cannot be located
13.6.90	-11	+4	+1	-4	+6	cannot be located	cannot be located
29.8.90	-10	+3	-1	-6	+5	cannot be located	cannot be located
30.10.90	-12	+4	0	-5	+6	cannot be located	cannot be located
12.12.90	-11	+4	0	-5	+6		
8.2.91	-12	+2	0	-6	+6		
17.4.91	-10	+2	+2	-9	+5		
21.6.91	-10	+4	-1	-7	+6		
9.8.91	-13	+4	0	-5	+6		

Note : Negative sign denotes settlement in millimetres

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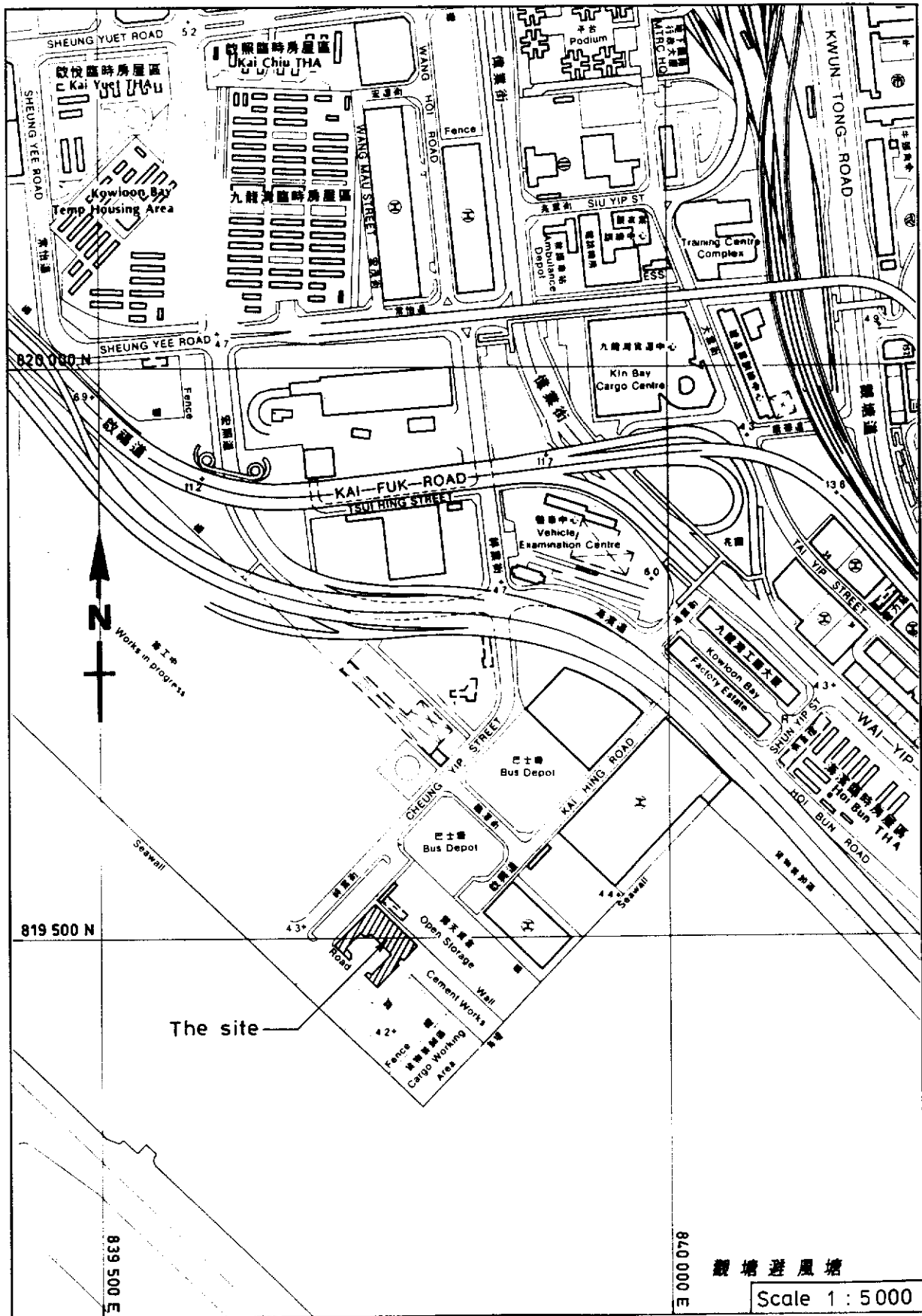


Figure 1 - Location of the New Public Works Central Laboratory

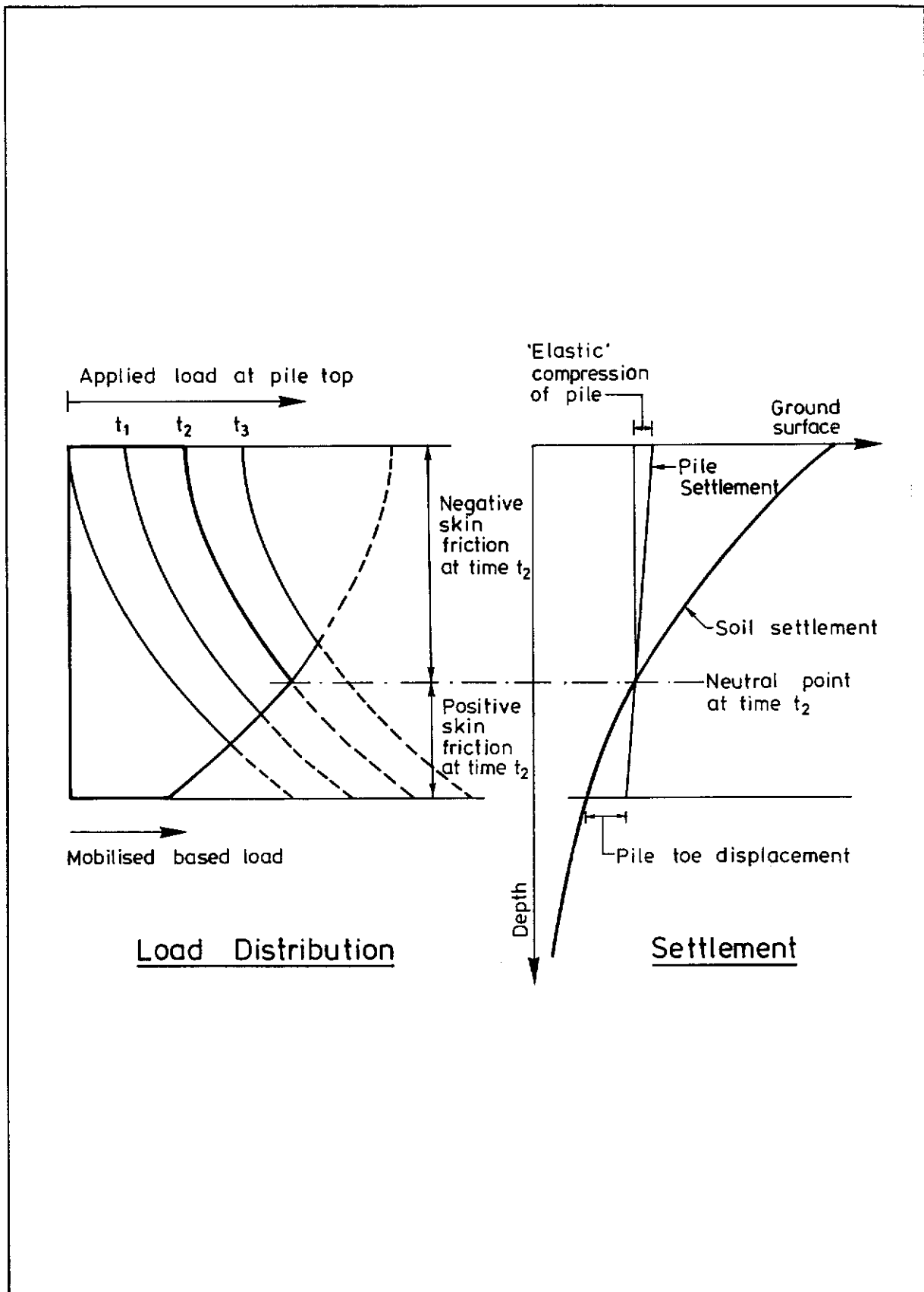


Figure 2 - Schematic Diagram Showing Sense of Skin Friction Corresponding to Ground and Pile Settlement

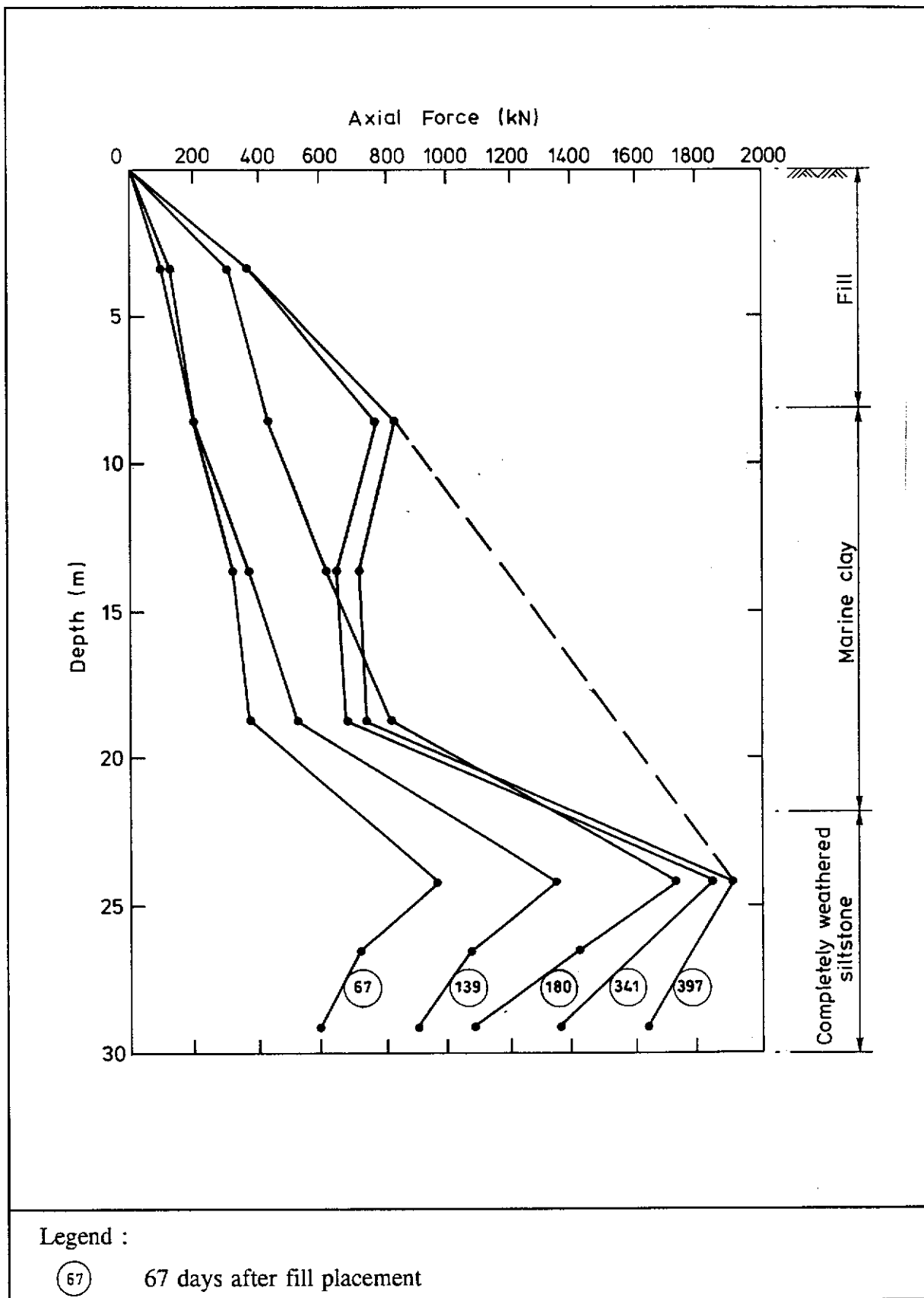
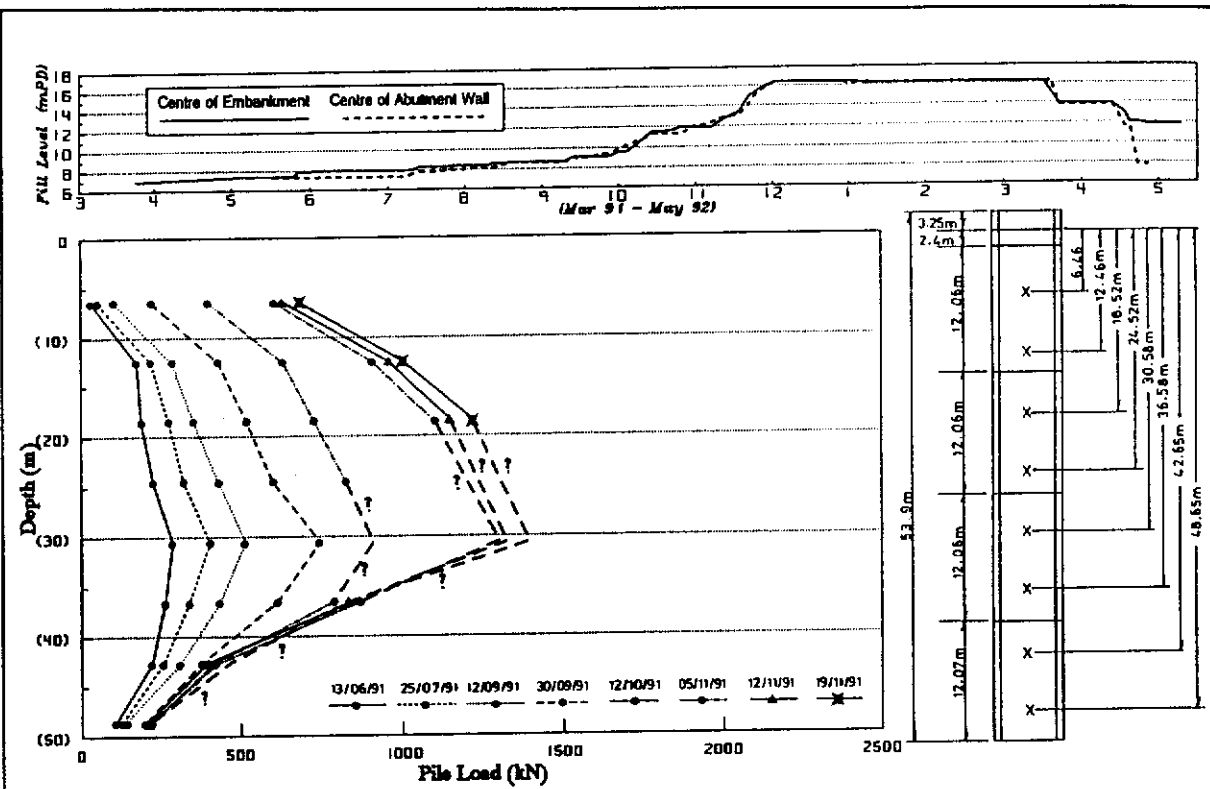
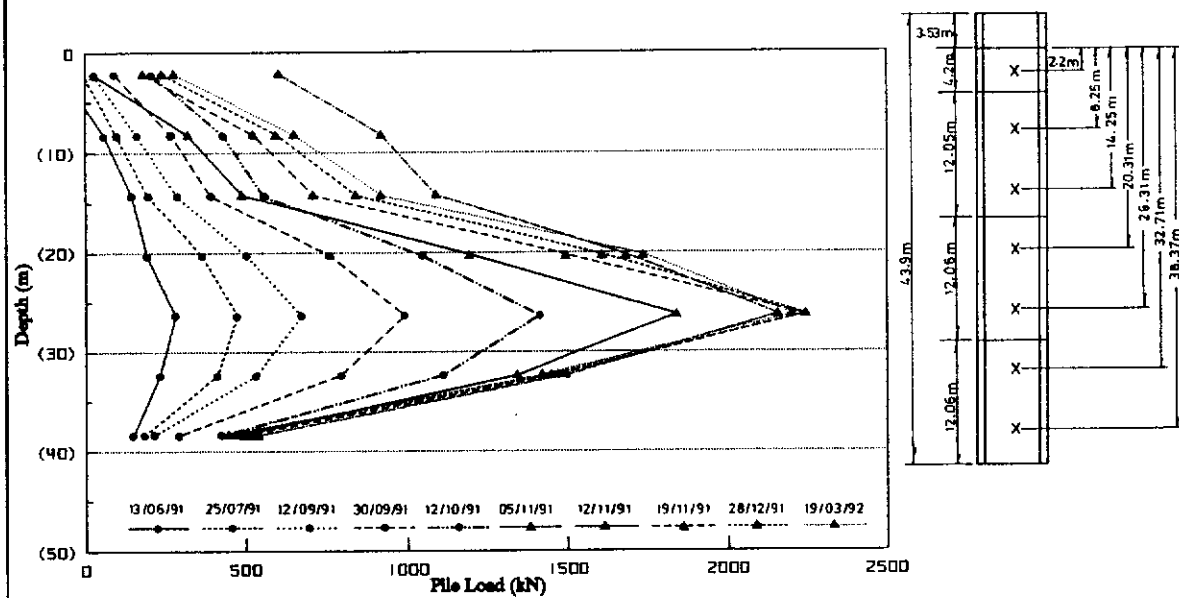


Figure 3 - Summary of Field Measurements of Negative Skin Friction by Lee & Lumb (1982)



(a) Axial Force Distribution along Pile Shaft of PP1 under Preload Embankment



(b) Axial Force Distribution along Pile Shaft of PP2 under Preload Embankment

Figure 4 - Summary of Field Measurements of Negative Skin Friction by Yuen & Lam (1993)

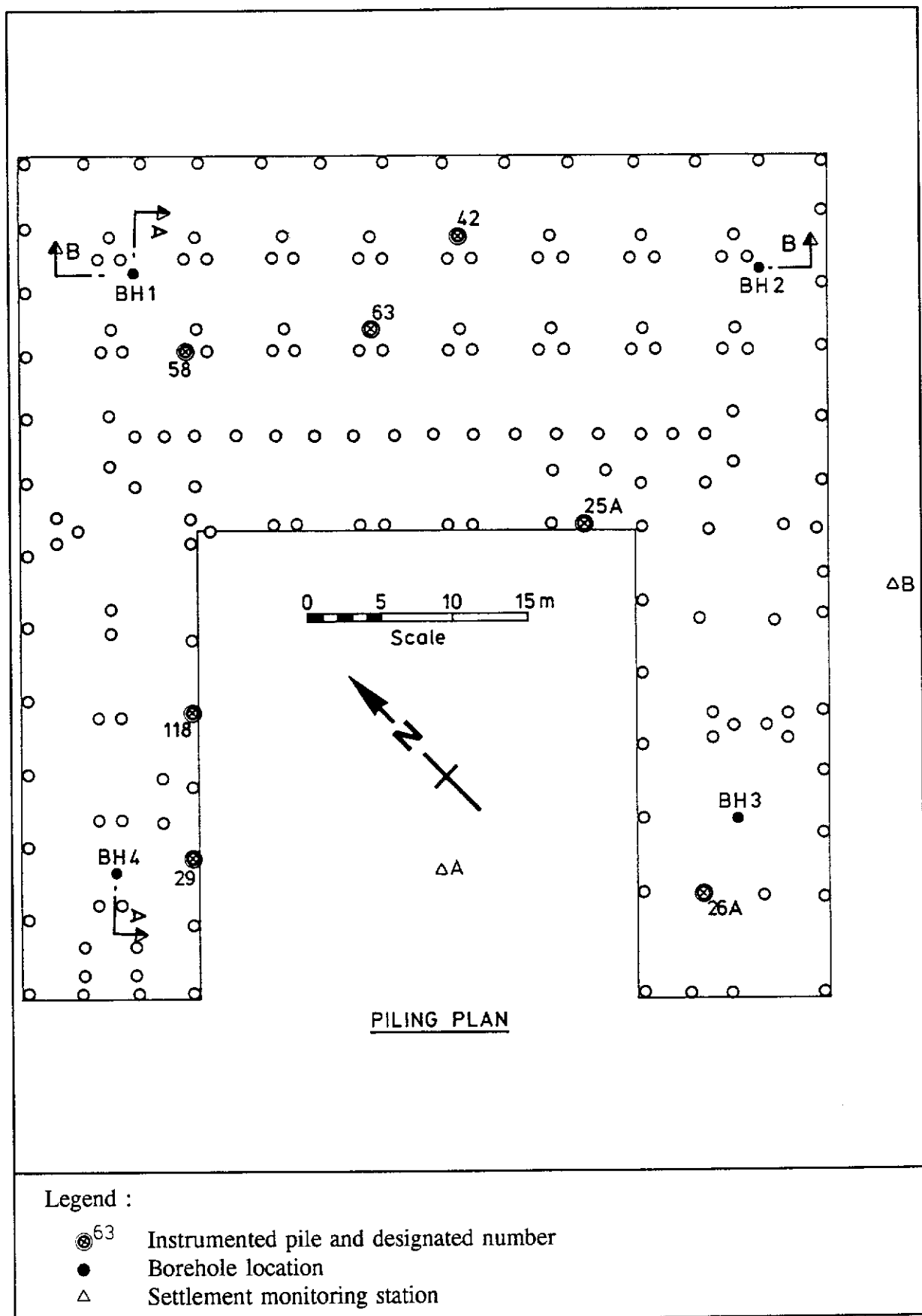
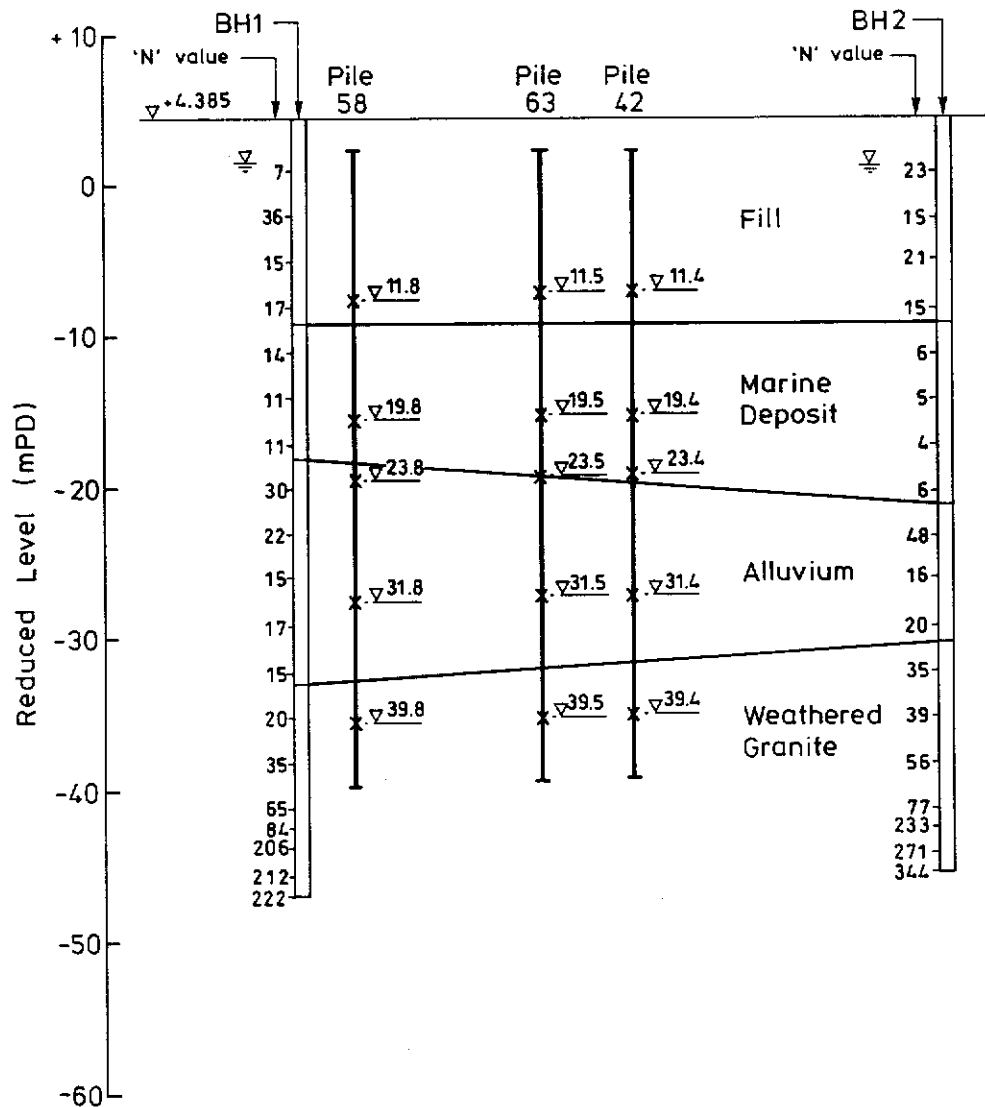


Figure 5 - Locations of Boreholes, Instrumented Piles and Settlement Monitoring Stations

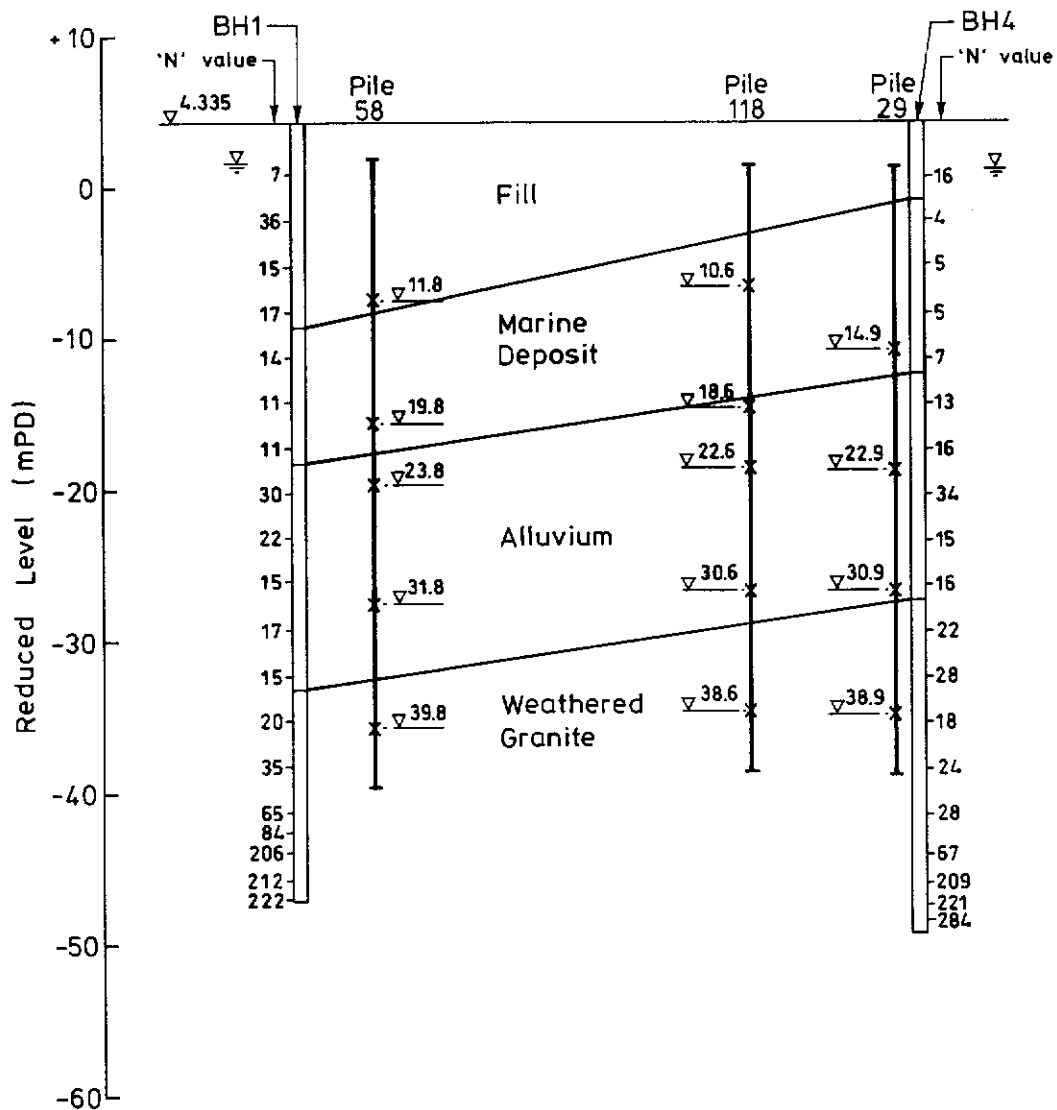


(Scale 1 : 500)

Legend :

∇ 11.8 Strain gauge position with depth below ground surface in metres

Figure 6 - Geological Section A - A



(Scale 1 : 500)

Legend :

$\nabla 11.8$ Strain gauge position with depth below ground surface in metres

Figure 7 - Geological Section B - B

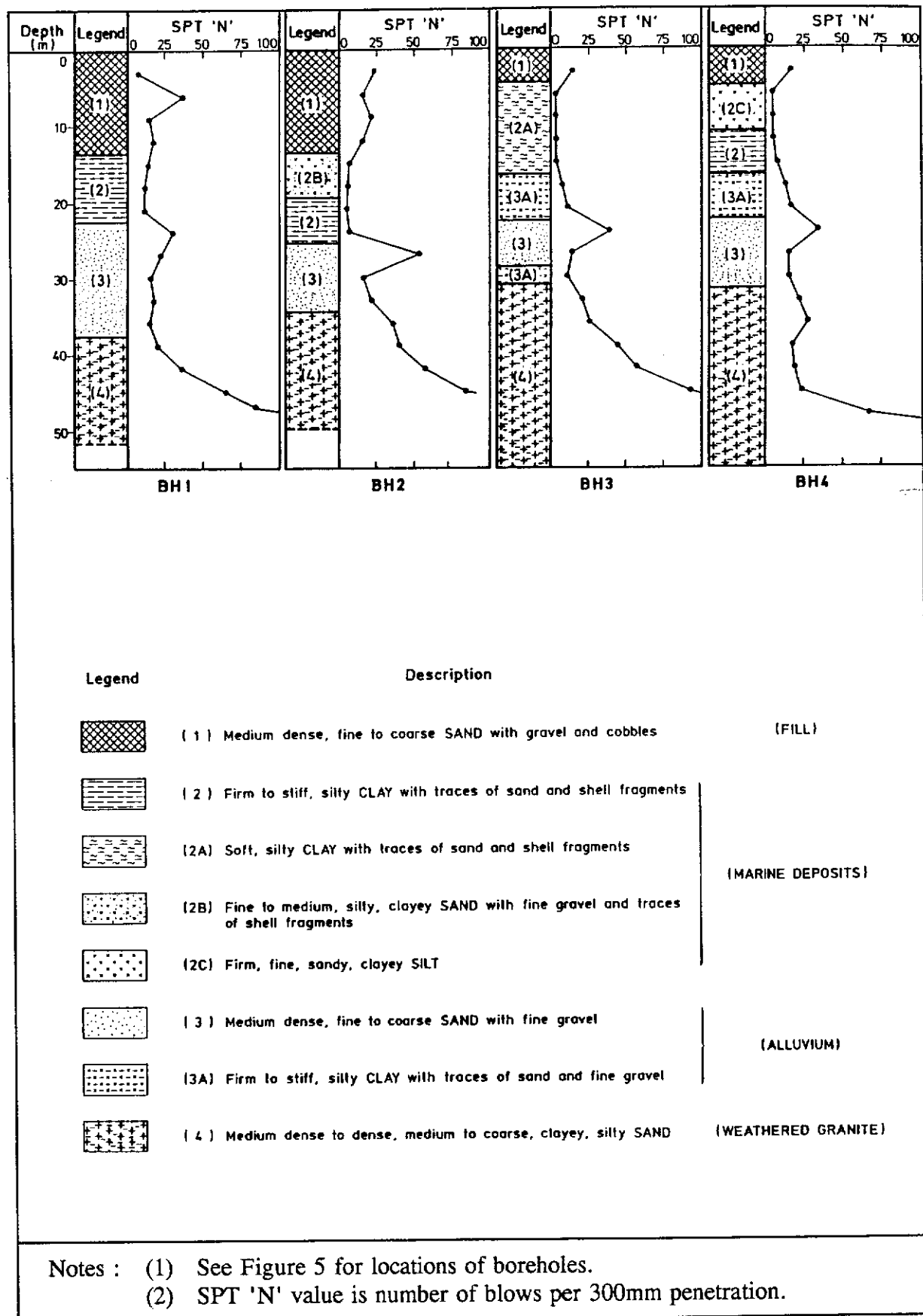


Figure 8 - Borehole Logs and SPT 'N' Values

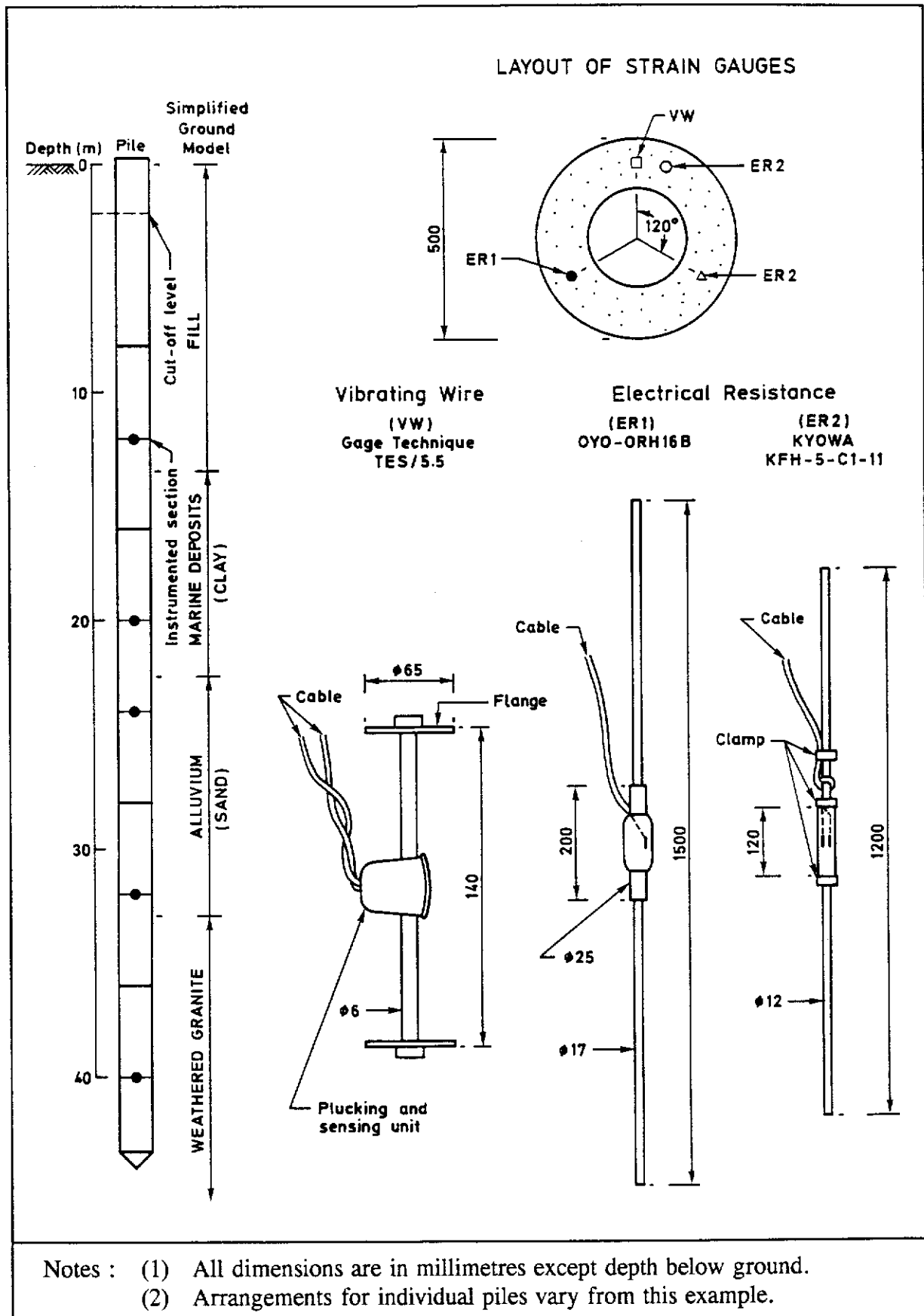


Figure 9 - Outline Details of Strain Gauges in Instrumented Piles

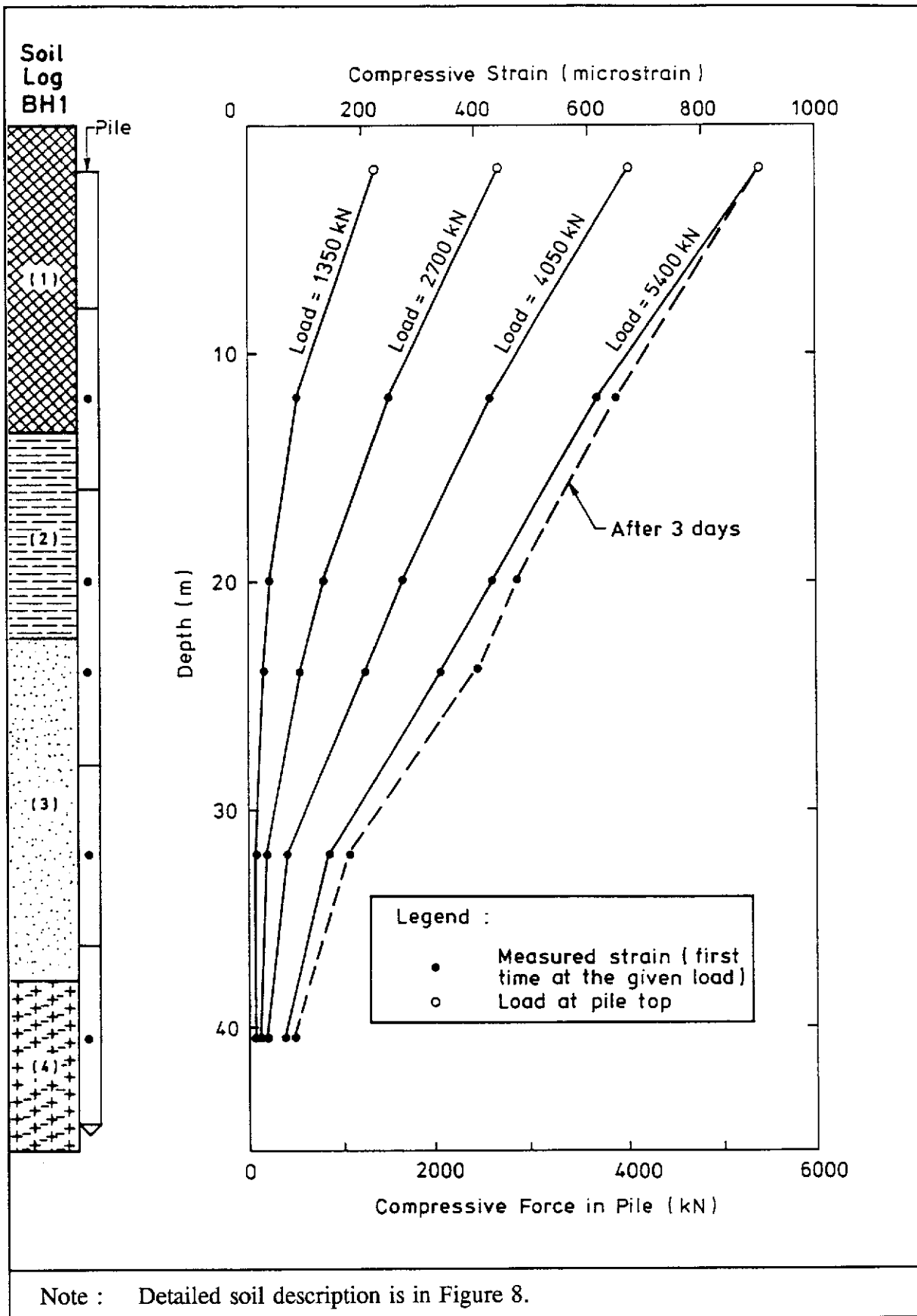


Figure 10 - Load Transfer Down Pile 58 in Load Test

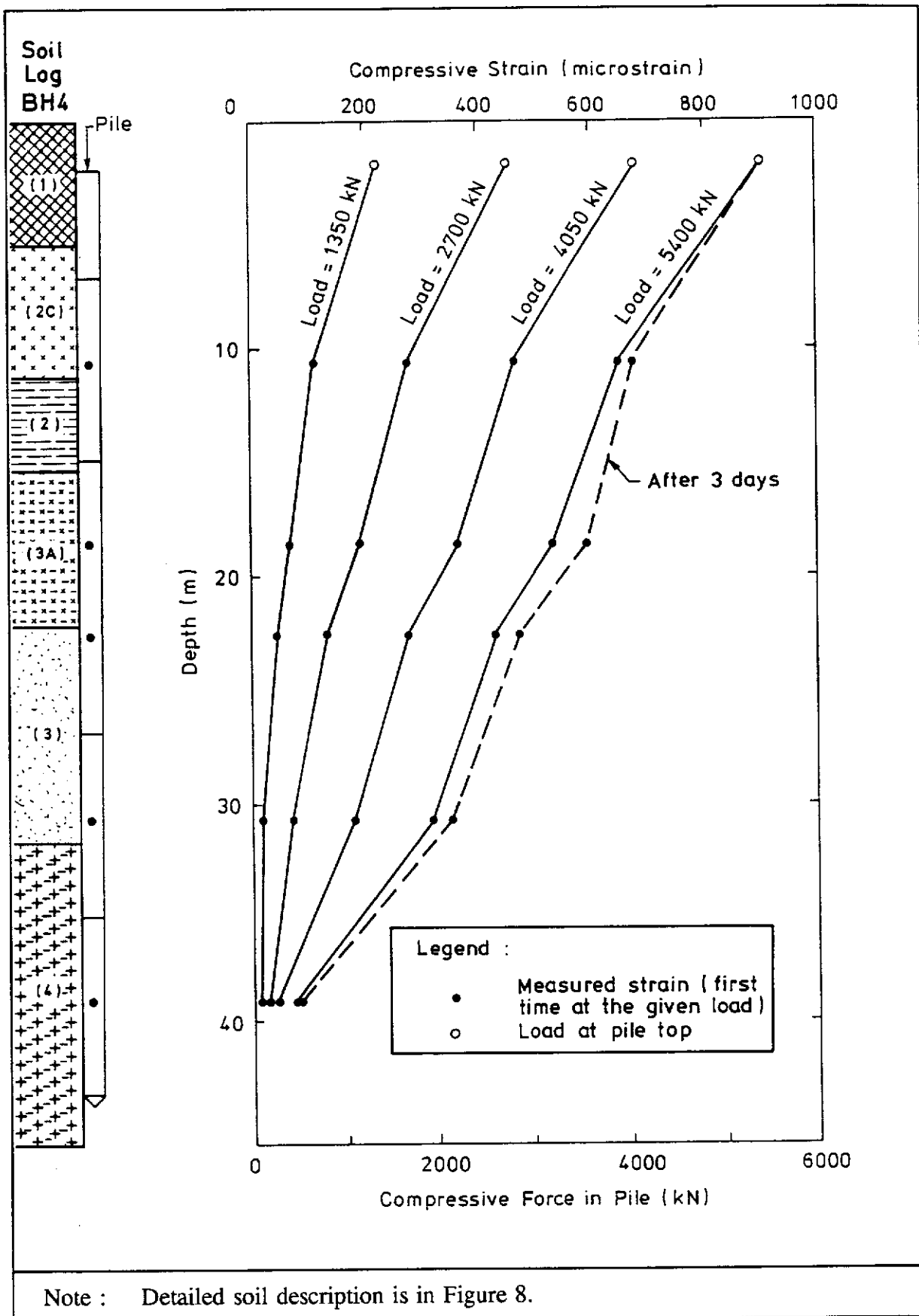
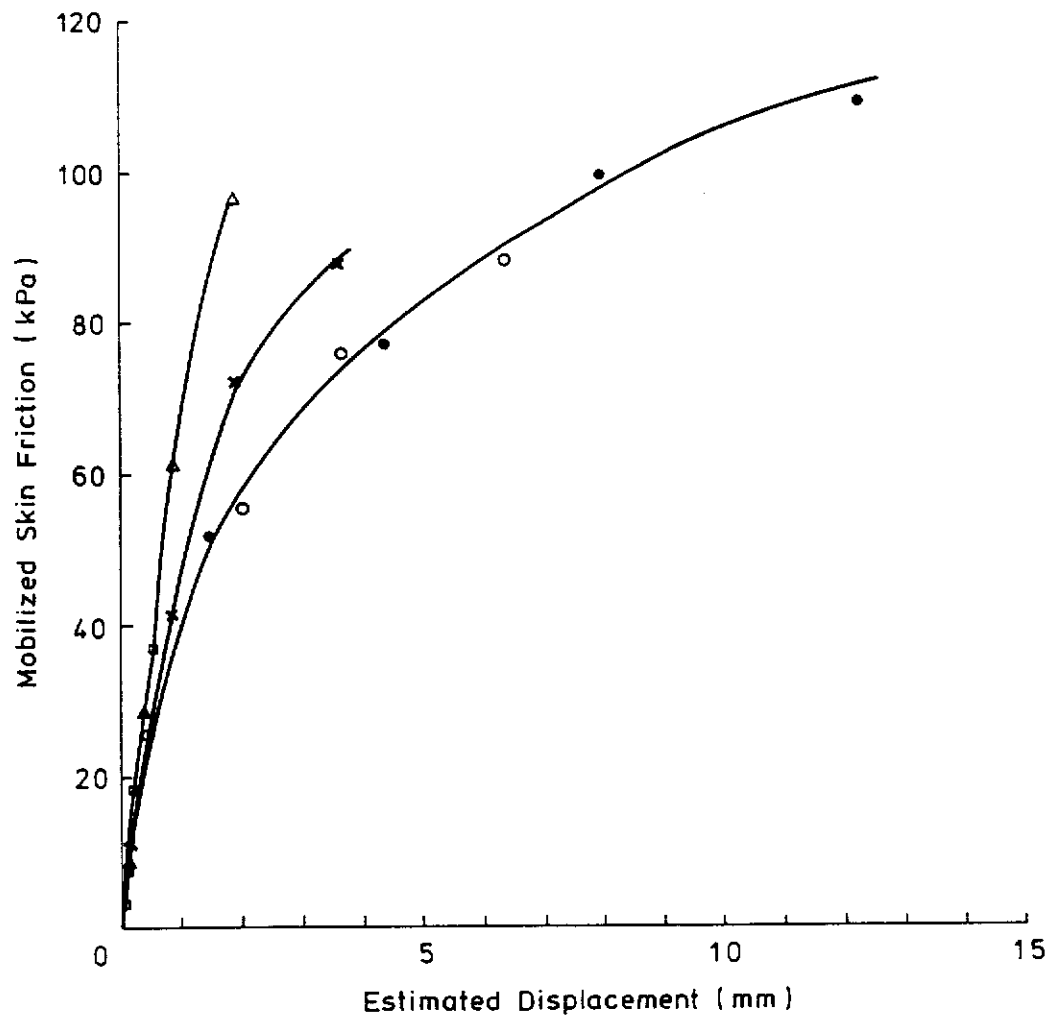


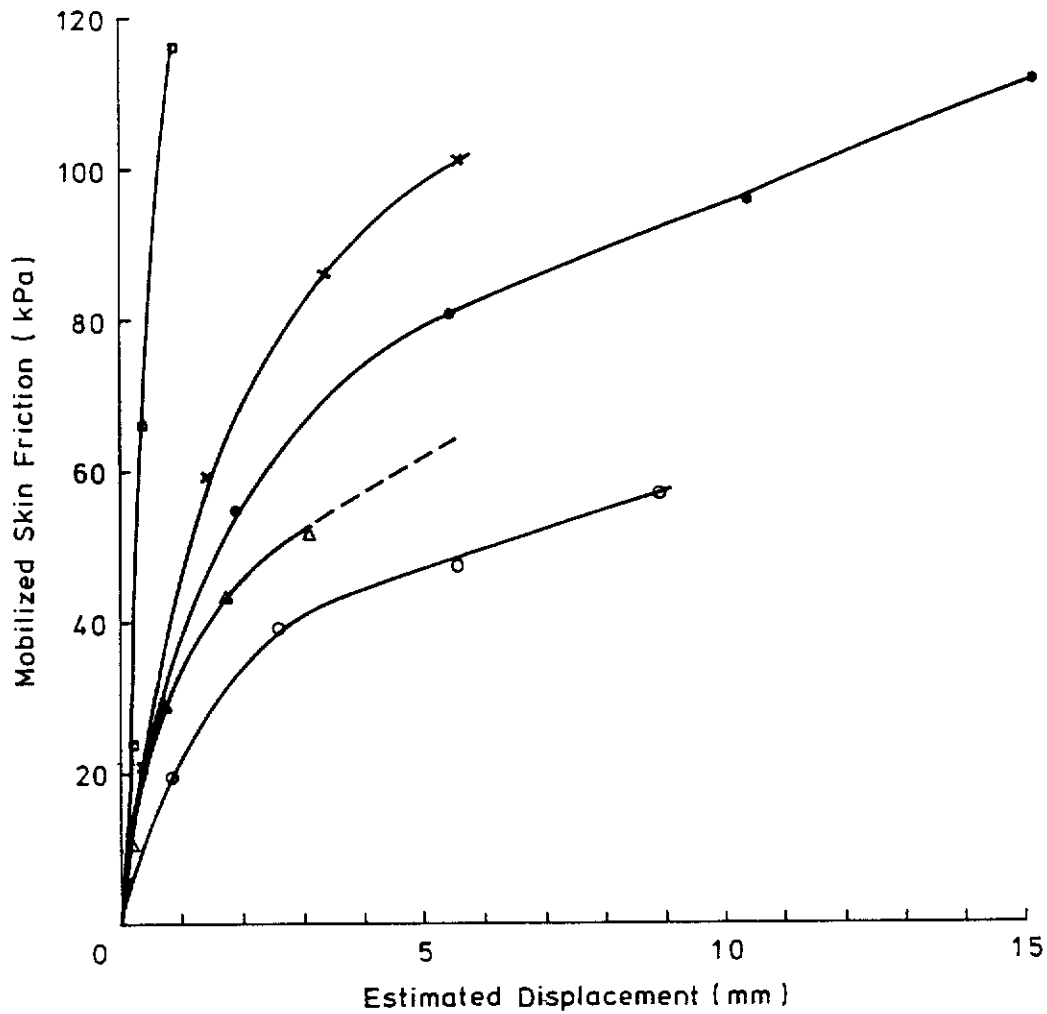
Figure 11 - Load Transfer Down Pile 118 in Load Test



Legend :	Depth (m)	Soil Type
●	2-12	FILL (1)
○	12-20	CLAY (2)
×	20-24	SAND (3) / CLAY (2)
△	24-32	SAND (3)
□	32-40	SAND (3) / WEATHERED GRANITE (4)

Notes : (1) Soil descriptions are given in Figure 8.
 (2) Gauge positions relative to soil strata are shown in Figure 7.

Figure 12 - Skin Friction-Displacement Curves for Pile 58



Legend :	Depth (m)	Soil Type
●	2-11	FILL (1) / SILT (2C)
○	11-19	CLAY (2) / (3A)
×	19-23	CLAY (3A) / SAND (3)
Δ	23-31	SAND (3)
□	31-39	WEATHERED GRANITE (4)

Notes : (1) Soil descriptions are given in Figure 8.
(2) Gauge positions relative to soil strata are shown in Figure 7.

Figure 13 - Skin Friction-Displacement Curves for Pile 118

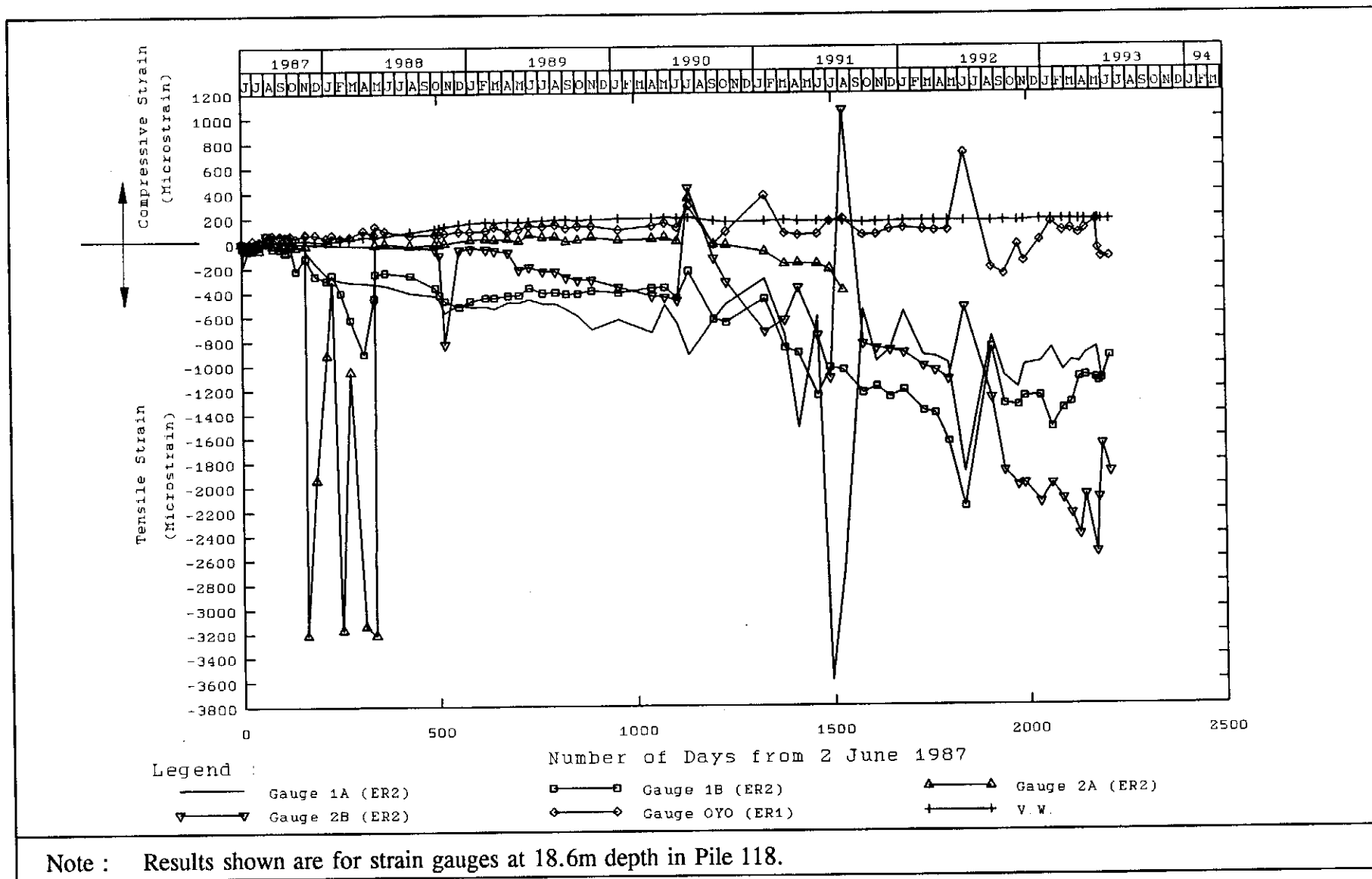


Figure 14 - Comparison of Variation of Strains with Time as Measured by Different Types of Strain Gauges

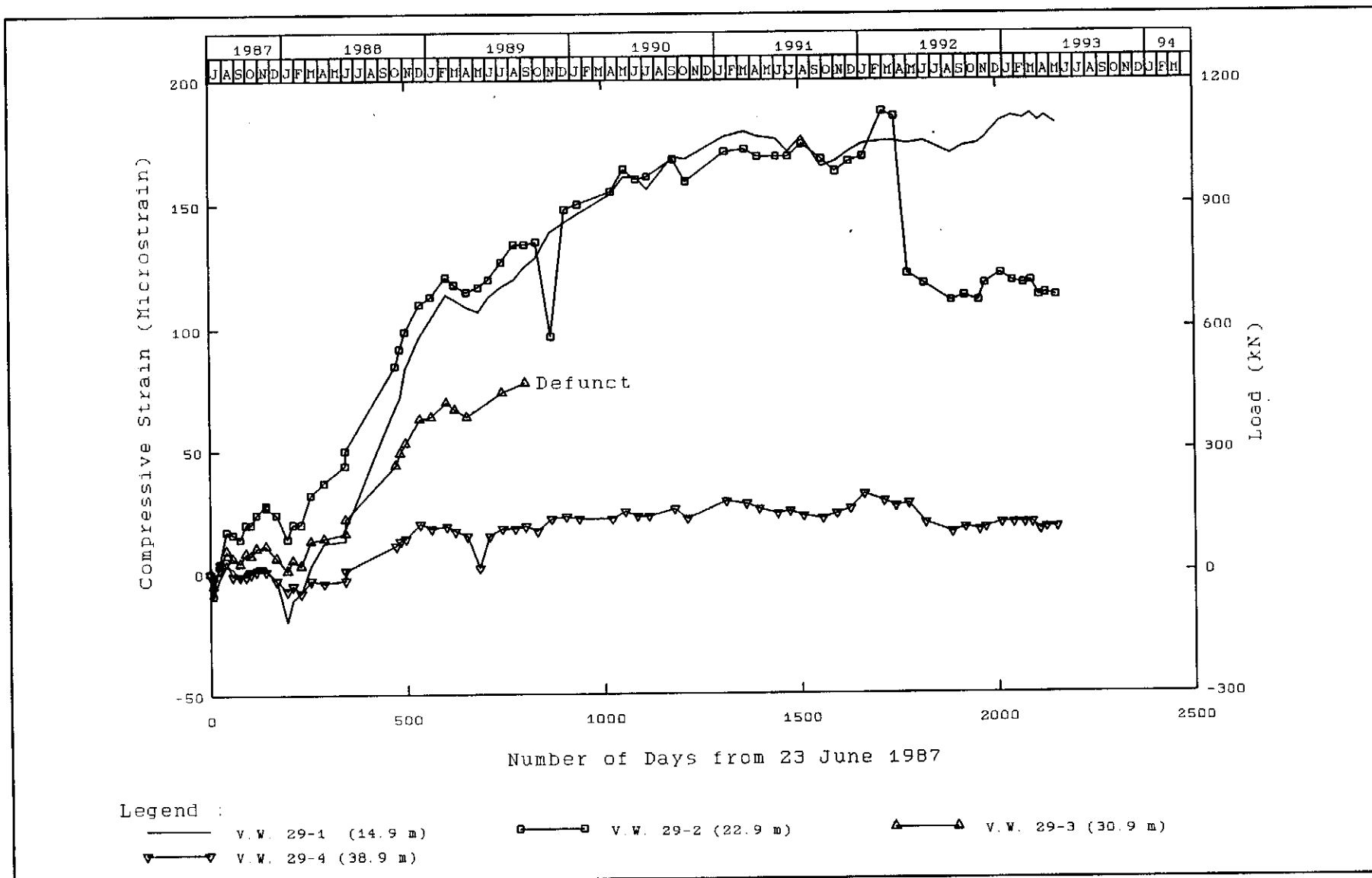


Figure 15 - Variation of Strains with Time in Pile 29

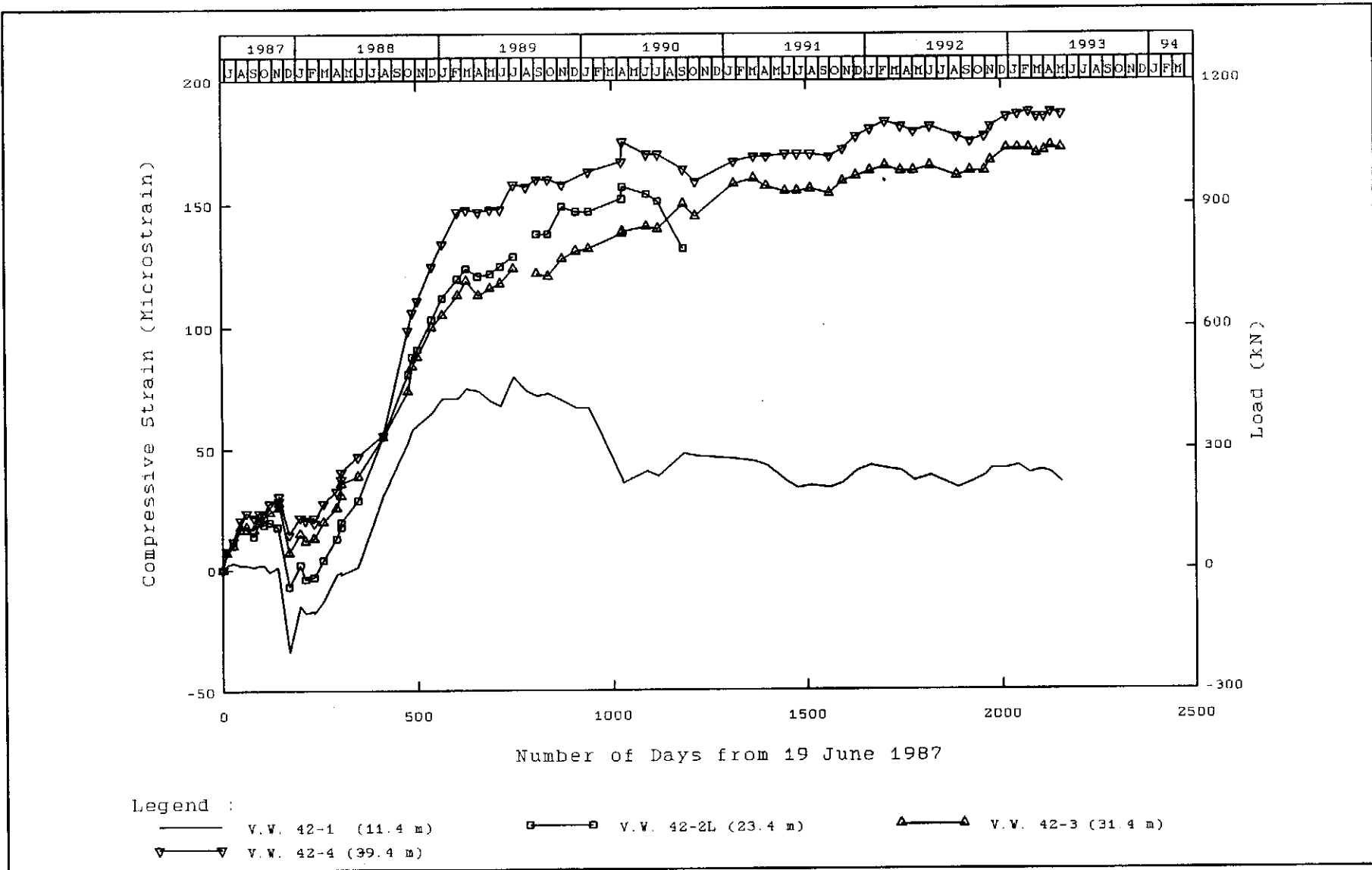


Figure 16 - Variation of Strains with Time in Pile 42

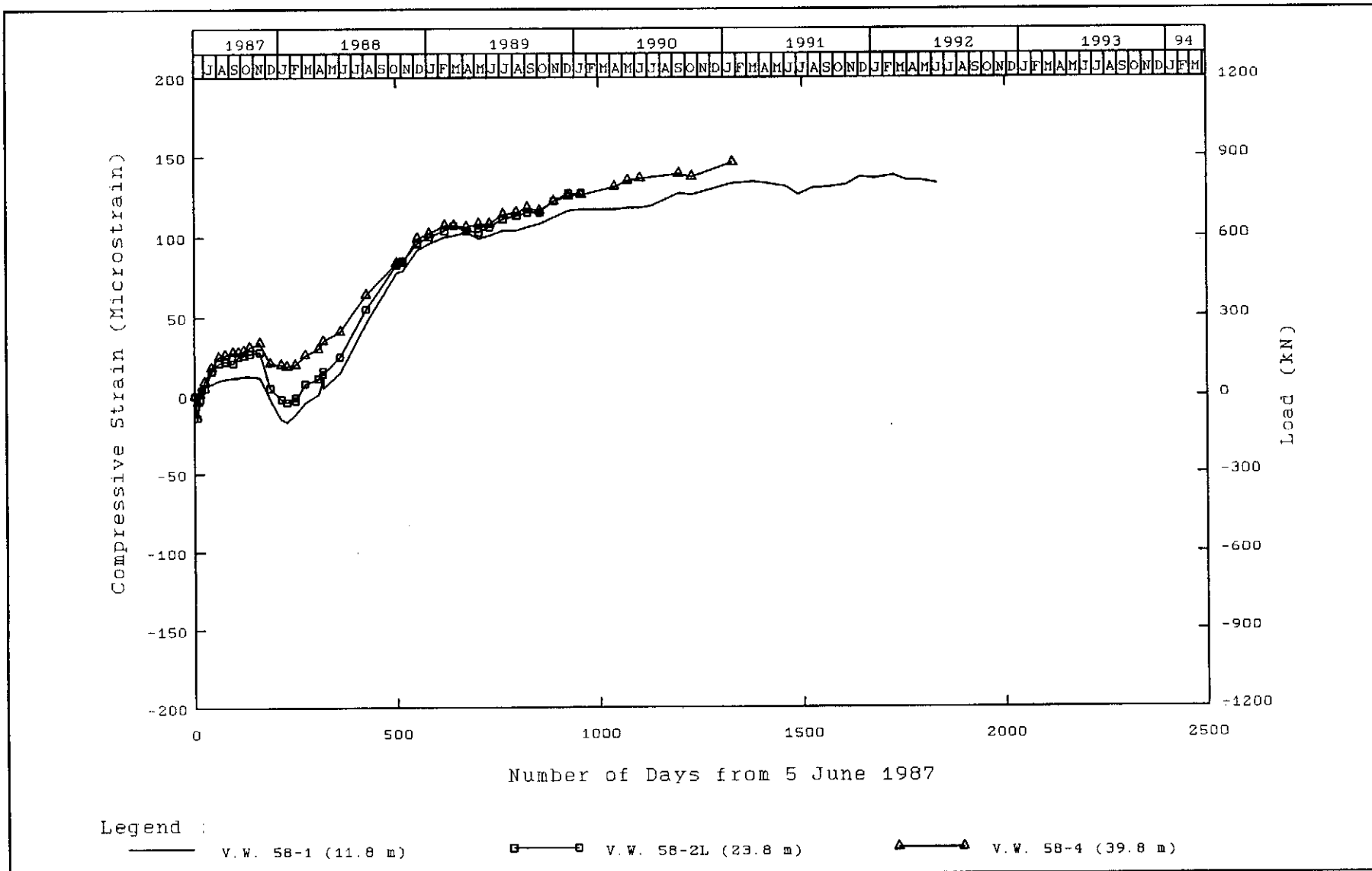


Figure 17 - Variation of Strains with Time in Pile 58

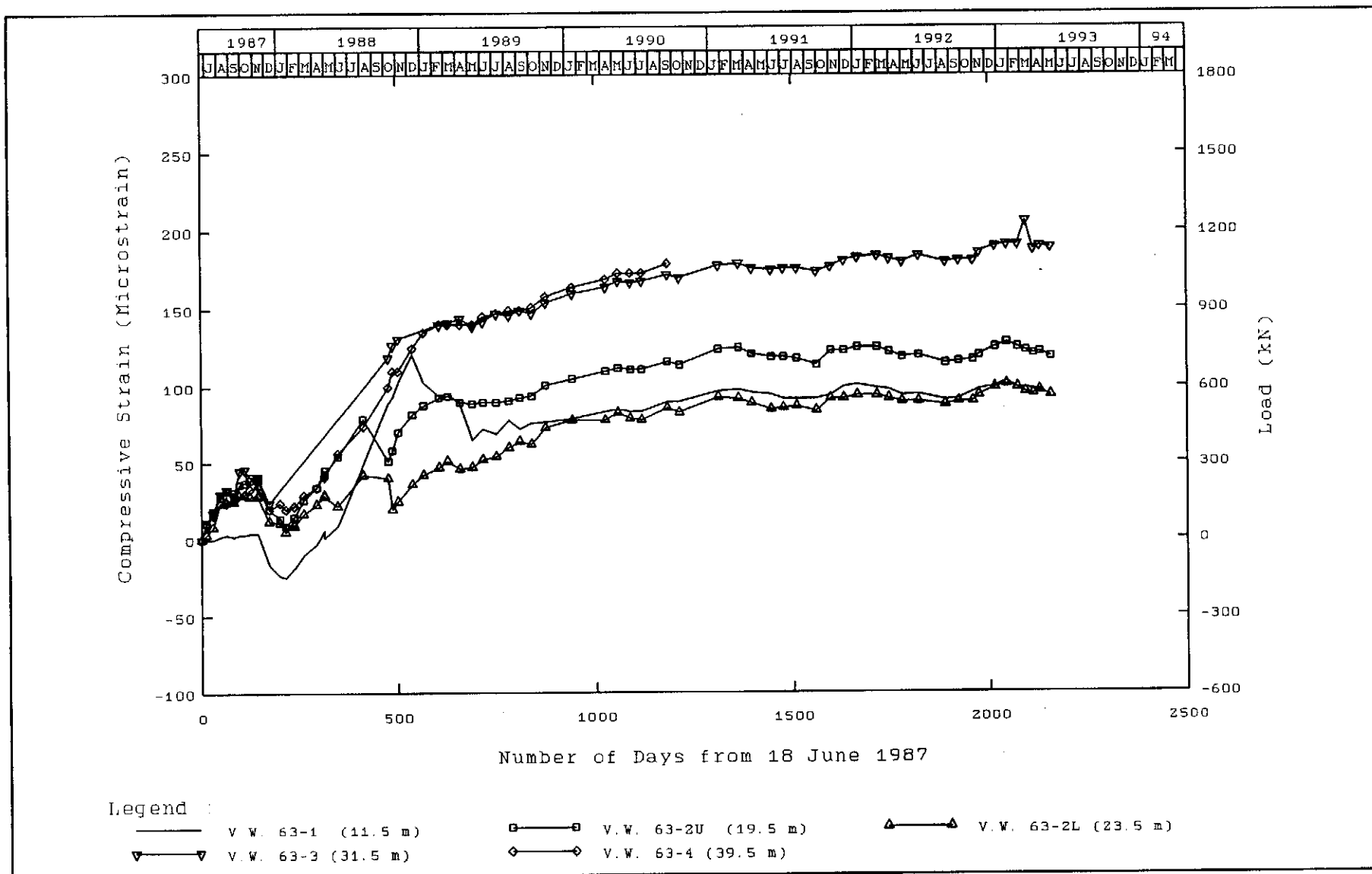


Figure 18 - Variation of Strains with Time in Pile 63

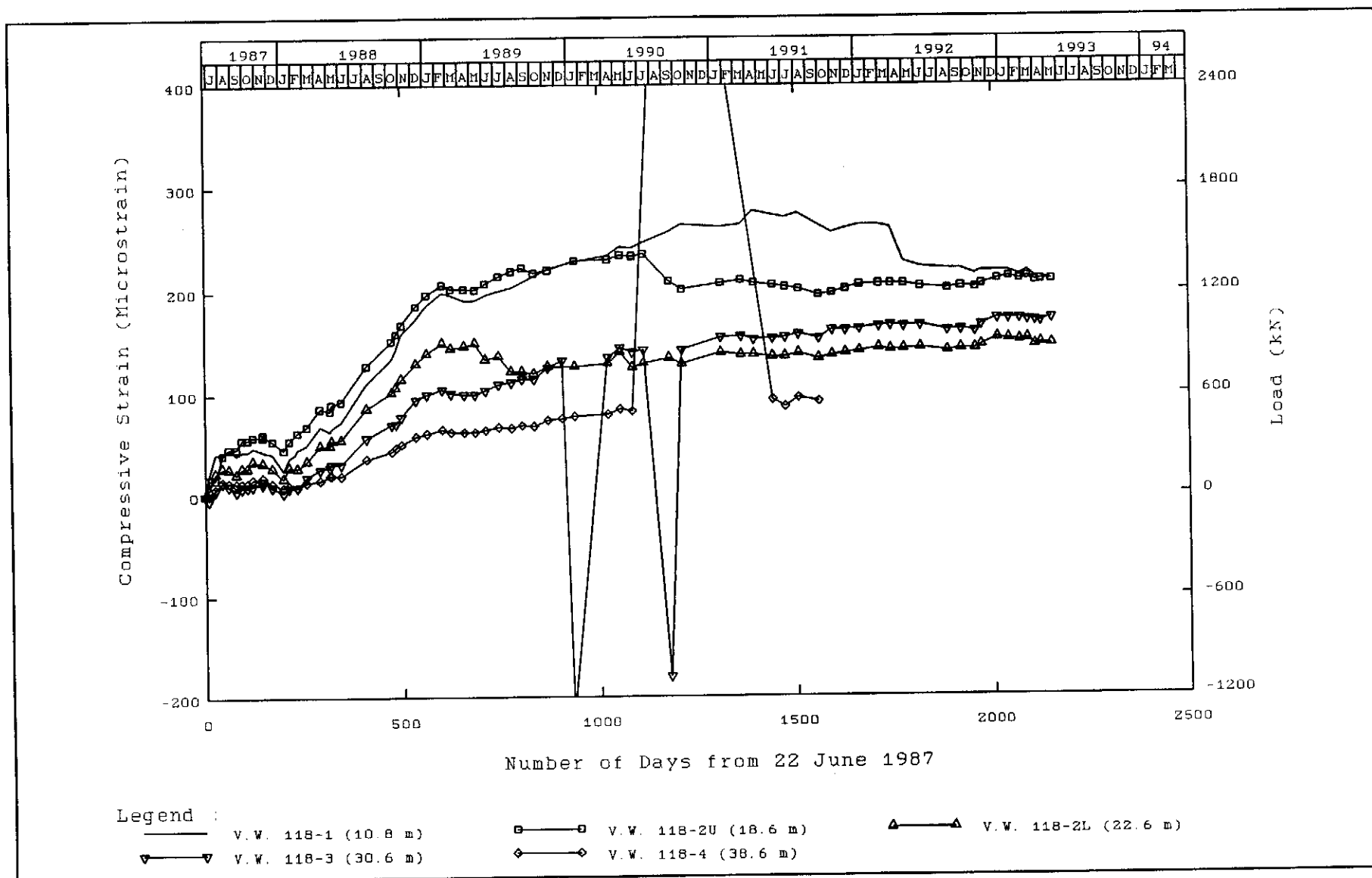
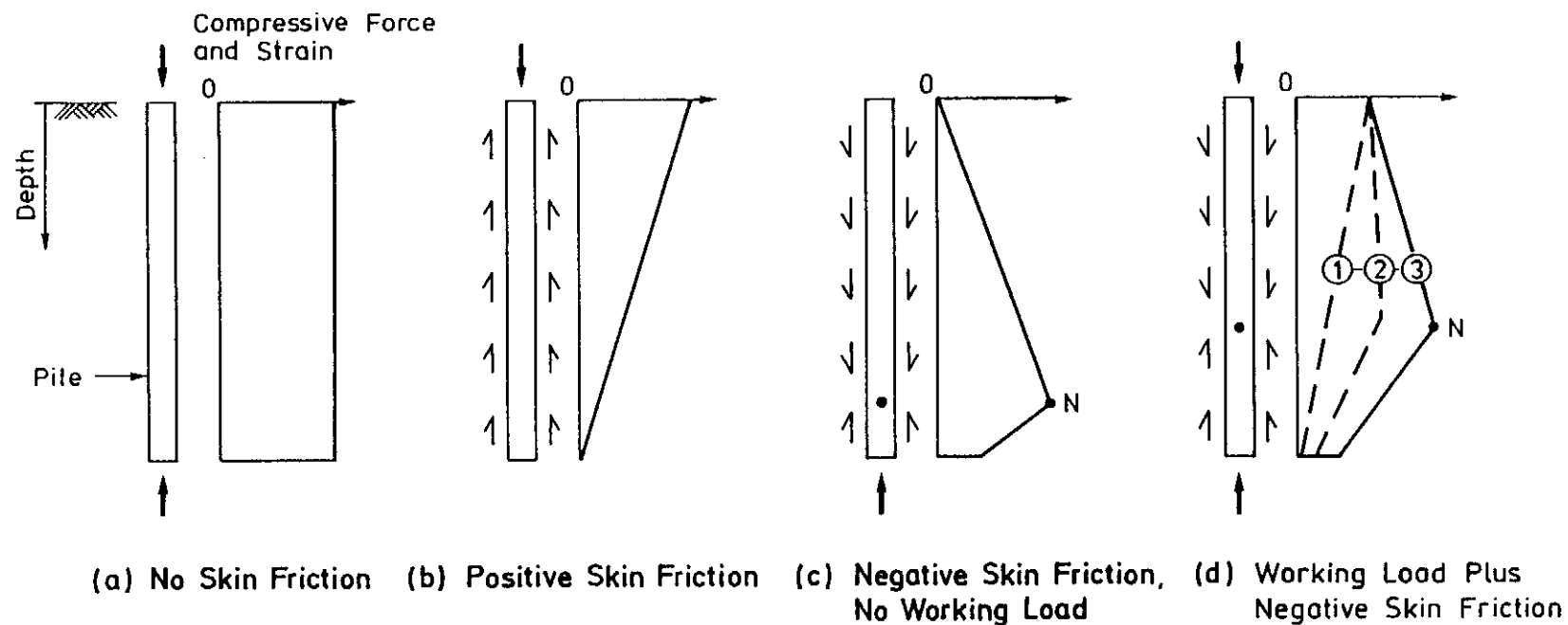
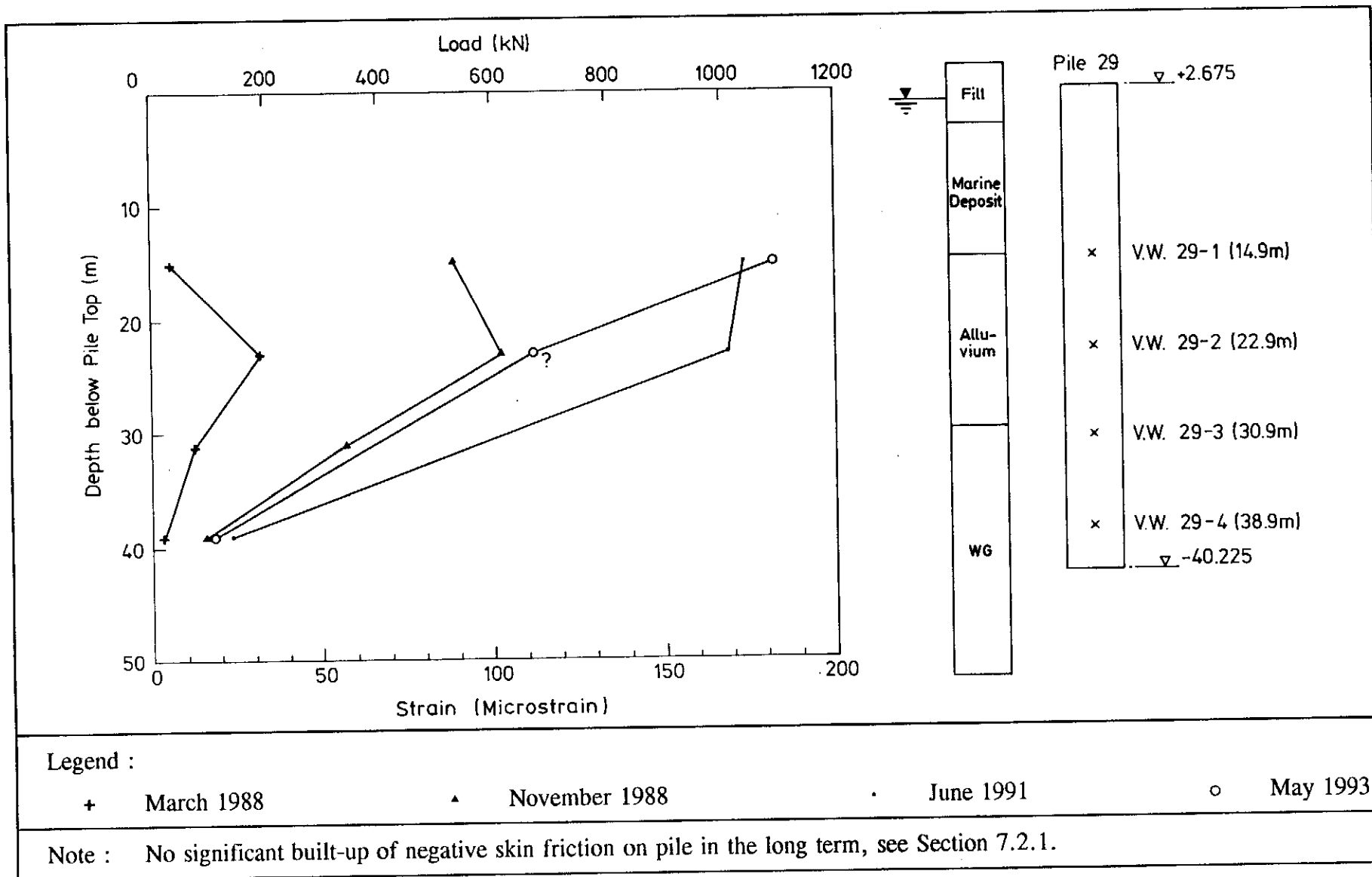


Figure 19 - Variation of Strains with Time in Pile 118



- Notes :
- (1) N is neutral point separating zone of negative friction from zone of positive friction.
 - (2) ① ② ③ indicates expected development of negative friction with time.

Figure 20 - Predicted Simplified Profile of Force Distributions in a Pile with the Mobilisation of Downdrag



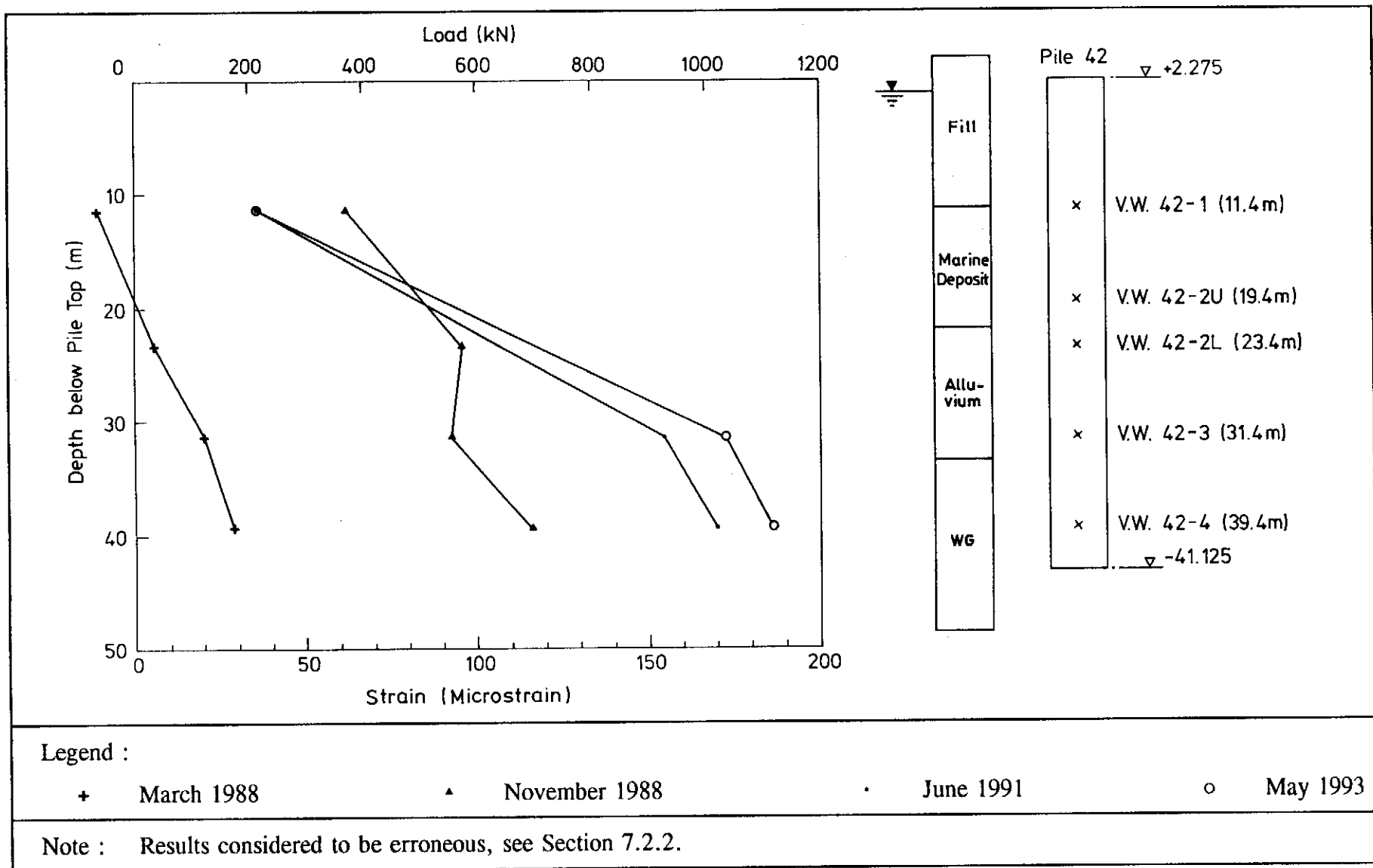


Figure 22 - Distribution of Forces in Pile 42

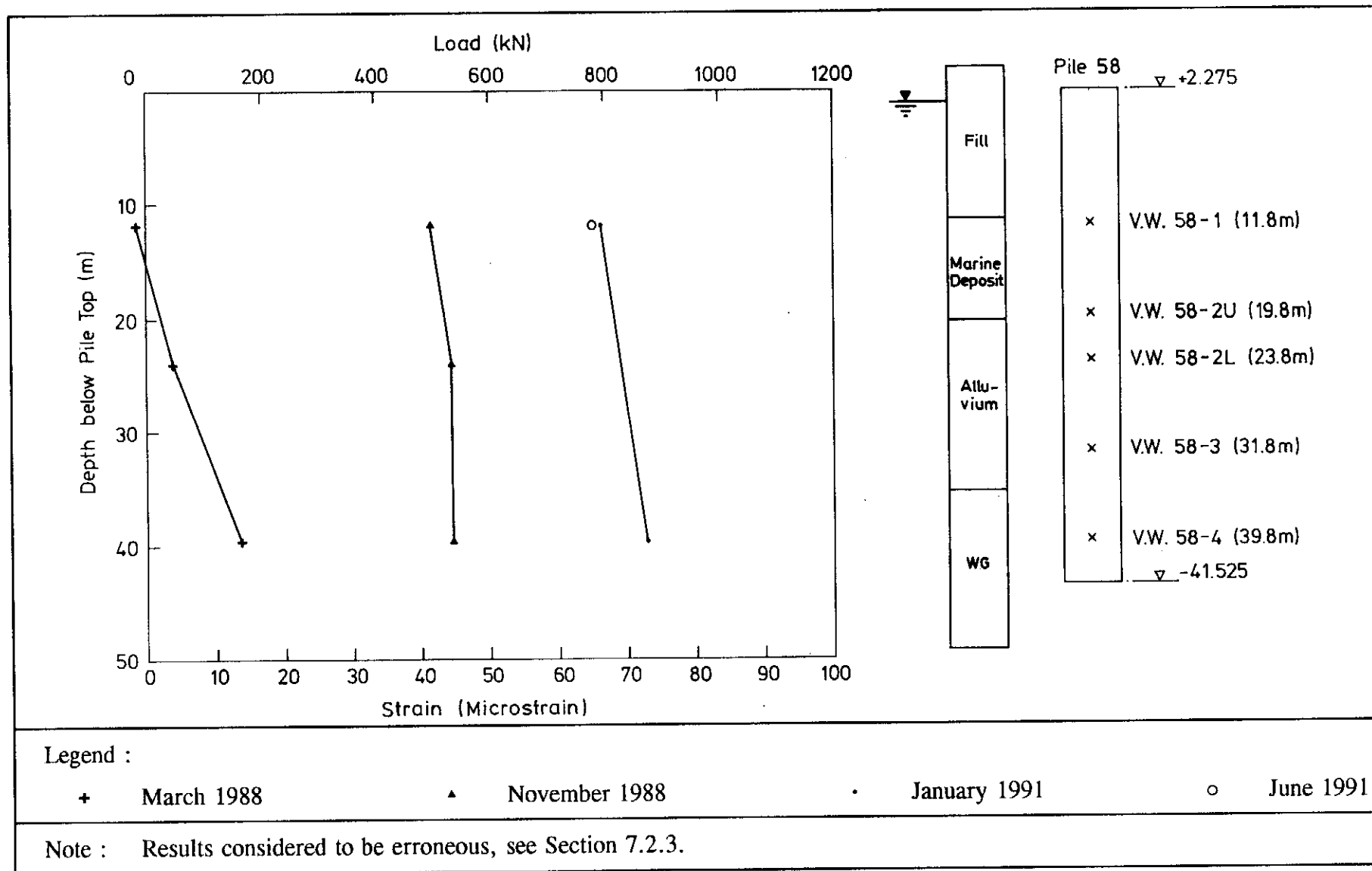


Figure 23 - Distribution of Forces in Pile 58

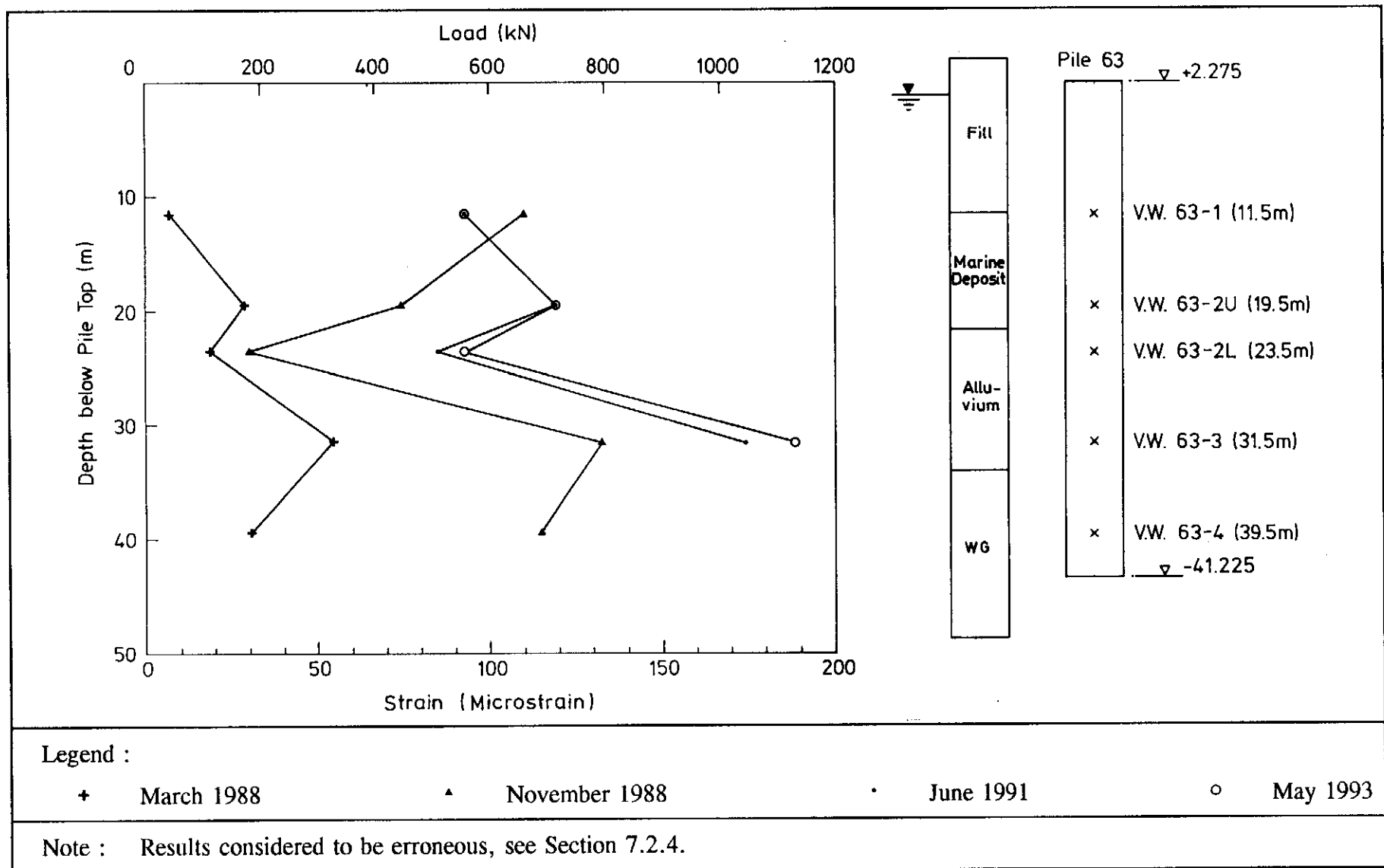


Figure 24 - Distribution of Forces in Pile 63

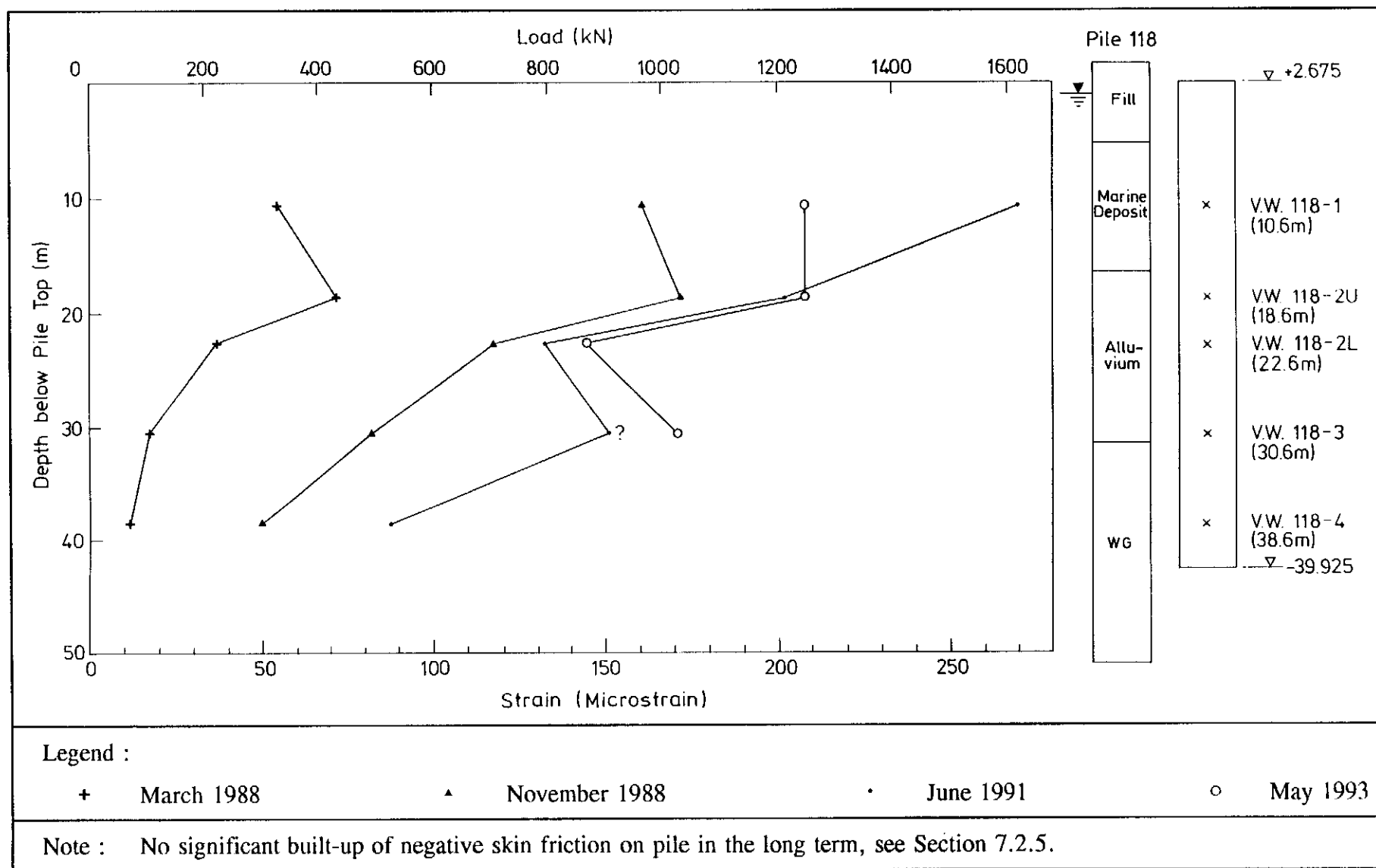


Figure 25 - Distribution of Forces in Pile 118

APPENDIX A
RESULTS OF STRAIN GAUGE MONITORING

PLE 29 - FIELD READINGS

FINAL DEPTH (m) : 42.9

Date printed: 13/07/93

DEPTH (m)	3.2	14.9					22.9					30.9					38.9				
FILE NO	29-0	29-1					29-2					29-3					29-4				
DATE	4 GAUGES	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	GCO 2A	GCO 2B	OYO	4 GAUGES	V.W.	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	OYO	GCO 2A	GCO 2B	4 GAUGES	V.W.
29/04/87	-	1809	2031	2.023	-8078	10888	181	378	-5818	1.280	10887	-	-	-	-	-	-	-	-	-	-
30/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-6302	699	2172	1.783	10677
01/05/87	-	-	-	-	-	-	-	-	-	-	-	1208	683	1.752	-5385	10831	-	-	-	-	-
02/05/87	-	1832	2038	1.983	-8063	10828	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6316	754	2226	1.703	10643
04/05/87	-	-	-	-	-	-	-	-	-	-	-	1190	685	1.732	-5381	10756	-8224	889	2325	1.785	10643
05/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	1.693	-5386	10682	-	-	-	-	-
05/05/87	-	-	-	-	-	-	178	388	-5777	1.284	10800	1194	687	1.695	-5386	10683	-	-	-	-	-
08/05/87	-	-	-	-	-	-	196	415	-5850	1.257	10835	1104	637	2.008	-5081	11550	-6177	777	2214	1.745	10724
07/05/87	-	1866	1971	1.898	-6173	10509	283	483	-6127	1.048	10585	508	-	1.742	-5273	10685	-6096	846	2011	1.728	10632
11/05/87	-	1880	1988	1.771	-6218	10279	164	370	-5759	1.308	10889	1440	-	2.085	-5249	11521	-6308	802	2059	1.824	10419
14/05/87	-	1864	1968	5.420	-6221	10290	157	368	-5770	4.810	10921	-	740	2.130	-5285	11618	-6322	617	2062	1.637	10449
20/05/87	-	1877	1972	5.340	-6217	10283	153	368	-5763	5.670	10893	-	-	2.135	-5283	11600	-6305	629	2087	1.691	10419
25/05/87	-	1890	1947	-	-6233	10285	155	385	-5774	-	10909	-	-	2.141	-5302	11619	-6311	618	2050	2.062	10424
05/06/87	-	1921	2032	4.980	-6318	10270	193	369	-5783	5.140	10944	-	-	2.145	-	11654	-6291	809	2045	2.183	10439
22/06/87	2.448	1938	1982	4.980	-6254	10248	187	349	-5815	5.100	10939	-	-	2.154	-	11626	-518	802	2079	2.280	10430
23/06/87	2.489	1821	1971	5.080	-6310	10280	174	344	-5844	5.140	10953	-	-	2.178	-5700	11637	-6329	573	2048	2.285	10433
26/06/87	2.489	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26/06/87	2.484	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30/06/87	-	1955	2008	5.000	-	10242	202	386	-5795	5.120	10933	-	-	2.197	-	11624	-6303	617	2124	2.311	10428
17/07/87	2.476	1957	1993	5.140	6325	10257	193	365	5828	5.280	10962	-	-	2.174	-	11646	6313	576	2070	2.236	10436
04/08/87	2.484	1818	1858	4.970	-6451	10266	125	606	-5905	5.040	10891	-	-	2.231	-	11662	-6350	555	2048	2.310	10442
20/08/87	2.512	1978	2002	5.000	-6331	10284	184	382	-5829	5.100	10989	-	-	-	-	11654	-6299	-	-	-	10431
06/09/87	2.524	1988	1948	4.880	-6485	10286	202	295	-5882	5.040	10984	-	1513	-	-	11648	-6321	-	-	-	10431
22/09/87	2.533	2012	2004	5.840	-6343	10283	186	348	-5824	5.200	10998	-	1530	-	-	11658	-6308	-	-	-	10432
05/10/87	2.529	1937	1982	5.790	-6376	10263	161	310	-5844	5.330	10998	-	-	-	-	11655	-6435	-	-	-	10433
19/10/87	2.530	1985	2035	5.740	-6349	10266	159	425	-5837	5.320	11006	-	-	-	-	11664	-	-	-	-	10435
12/11/87	-	1901	1978	5.360	-6380	10265	142	278	-5871	5.280	11014	-	-	-	-	11667	-	-	-	6.420	10435
12/11/87	2.528	1920	1998	5.300	-6368	10264	160	317	-5836	5.280	11012	-	-	-	-	11687	-	-	-	-	10435
08/12/87	2.522	1959	2049	5.210	-6323	10254	205	386	-5787	5.180	11007	-	-	-	-	11654	-	-	-	-	10427
05/01/88	2.495	1937	2040	5.540	-6333	10224	181	336	-5814	5.160	10983	-	-	-	-	11640	-	-	-	-	10419
19/01/88	2.511	1934	2033	5.330	-6352	10240	185	368	-5798	5.180	10997	-	-	-	-	11649	-	-	-	-	10424
09/02/88	2.508	1888	2000	5.420	-6385	10245	185	324	-5834	5.240	10998	-	-	-	-	11646	-	-	-	-	10418
04/03/88	2.510	1924	2036	5.440	-6354	10265	183	351	-5813	5.610	11023	-	-	-	-	11670	-6500	-	-	-	10428
07/04/88	2.521	1885	2002	5.450	-6390	10282	159	324	-5840	5.290	11036	-	-	-	-	11673	-6000	-	-	-	10425
31/05/88	2.532	1857	1995	5.340	-6401	10283	142	293	-5854	5.290	11051	-	-	-	-	11678	-	-	-	-	10428
31/05/88	2.532	1873	2008	5.520	-6413	10293	133	295	-5876	5.300	11064	-	-	-	-	11696	-	-	-	-	10434
07/10/88	2.612	1890	2051	5.340	-6480	10384	94	277	-5906	5.070	11145	-	-	-	-	11755	-	-	-	-	10454
18/10/88	2.621	1899	2065	5.320	-6483	10393	97	283	-	5.000	11160	-	-	-	-	11787	-	-	-	-	10457
01/11/88	2.634	1899	2054	5.200	-6388	10414	161	282	-	5.020	11176	1729	-	0.412	-	11779	-	-	-	-	10460
08/12/88	2.642	1937	-	5.170	-6519	10439	79	280	-	4.970	11203	1700	-	0.380	-	11807	-	-	-	-	10471

PILE 29 - FIELD READINGS

FINAL DEPTH (m) : 42.9

Date printed: 13/07/93

DEPTH (m)	3.2	14.9					22.9					30.9					38.9				
PILE NO	29-0	29-1					29-2					29-3					29-4				
DATE	4 GAUGES	GCO2A	GCO 2B	4 GAUGES	OYO	V.W.	GCO2A	GCO 2B	OYO	4GAUGES	V.W.	GCO 2A	GCO 2B	4GAUGES	OYO	V.W.	OYO	GCO 2A	GCO 2B	4GAUGES	V.W.
06/01/89	2.682	1881	2048	5.430	-6527	10453	33	105	-	5.130	11209	1795	-	0.398	-	11809	-	-	-	-	10468
13/02/89	2.648	1871	2061	5.290	-6542	10472	-	-	-	5.020	11226	1828	-	-	-	11824	-	-	-	-	10470
07/03/89	2.654	1890	2078	5.280	-6540	10467	-	-	-	5.100	11222	1860	-	0.148	-	11817	-	-	-	-	10465
07/04/89	-	-	-	-	-	10462	-	-	-	-	11214	-	-	-	-	11808	-	-	-	-	10462
10/04/89	2.647	1874	2118	5.080	-6570	-	-	341	-	5.170	-	1863	-	0.125	-	-	-	-	-	-	-
08/05/89	2.637	1878	2138	5.400	-6569	10458	-	-	-	5.170	11219	1843	-	0.070	-	-	-	-	-	-	10436
03/06/89	2.655	1827	2210	5.410	-6678	10469	-	-	-	5.100	11226	1855	-	0.140	-	-	-	-	-	-	10482
07/07/89	2.641	1879	2268	5.360	-6566	10477	-	-	-	5.100	11242	1850	-	-	-	11837	-	-	-	-	10467
08/08/89	2.652	2054	2269	5.160	-6584	10484	-	413	-	4.910	11259	1840	-	-	-	-	-	-	-	-	10467
04/09/89	2.655	1905	2228	5.010	-6551	10492	-	482	-	4.780	11259	1200	-	-	-	11847	-	-	-	-	10470
04/10/89	2.650	1928	2308	5.000	-6456	10500	-	806	-	4.710	11260	1914	-	-	-	-	-	-	-	-	10465
08/11/89	-	2082	2210	-	-6468	10520	-	-	-	-	11171	1806	-	-	-	-	-	-	-	-	10475
14/12/89	2.674	-	-	4.970	-	10527	-	-	-	4.680	11292	-	-	-	-	-	-	-	-	-	10477
15/01/90	2.626	1957	2402	4.940	-6421	10534	-	-	-	4.720	11296	1853	-	-	-	-	-	-	-	-	10475
08/04/90	2.581	1893	2411	-5.030	-6500	10549	-	-	-	-	11308	1835	-	-	-	-	-	-	-	-	10474
11/05/90	2.290	1886	2436	-5.360	-6609	10562	-	-	-	-	11332	1825	-	-	-	-	-	-	-	-	10481
11/06/90	2.604	2425	2708	-5.370	-6480	10562	-	-	-	-	11322	1653	-	-	-	-	-	-	-	-	10476
10/07/90	2.590	1887	2572	-5.430	-6730	10553	-	-	-	-	11324	1839	-	-	-	-	-	-	-	-	10476
13/09/90	-	2168	2740	-5.310	-6884	10579	-	-	-	-	11340	1965	-	-	-	-	-	-	-	-	10482
15/10/90	2.718	2240	2799	-5.210	-6645	10577	-	-	-	-	11319	1871	-	-	-	-	-	-	-	-	10474
22/01/91	-2.930	2072	2492	-5.250	-6627	10584	-	-	-	-	11348	1714	-	-	-	-	-	-	-	-	10488
14/03/91	2.680	2170	2623	-5.280	-6809	10599	-	-	-	-	11351	1863	-	-	-	-	-	-	-	-	10486
16/04/91	-2.980	2272	2686	-5.290	-6534	10595	-	-	-	-	11344	1872	-	-	-	-	-	-	-	-	10482
03/06/91	-2.850	2158	2642	-5.230	-6650	10593	-	-	-	-	11343	1758	-	-	-	-	-	-	-	-	10478
04/07/91	2.800	2347	2812	5.270	-6638	10583	-	-	-	-	11344	1842	-	-	-	-	-	-	-	-	10480
07/08/91	-	2379	2783	-	-6640	10594	-	-	-	-	11355	1813	-	-	-	-	-	-	-	-	10476
28/09/91	-	2414	2813	-	-6328	10571	-	-	-	-	11340	1763	-	-	-	-	-	-	-	-	10475
31/10/91	-	2387	3190	-	-6553	10574	-	-	-	-	11329	1911	-	-	-	-	-	-	-	-	10478
04/12/91	-	2318	2890	-	-6711	10583	-	-	-	-	11339	1713	-	-	-	-	-	-	-	-	10482
06/01/92	-	2184	2888	-	-6737	10589	-	-	-	-	11343	1897	-	-	-	-	-	-	-	-	10485
26/02/92	0.003	2325	2885	-	-6885	10590	-	-	-	-	11385	1846	-	-	-	-	-	-	-	-	10488
27/03/92	0.940	2334	3050	5.140	-6477	10590	-	-	-	3.500	11381	1905	-	0.260	-	-	-	-	-	-	10484
29/04/92	0.940	2334	3117	5.190	6677	10599	-	-	-	7.200	11230	1769	2126	0.230	-	-	6231	-	-	-	10406
10/05/92	0.940	2308	2825	5.080	-6613	10590	-	-	-	7.320	11220	1848	2386	0.270	-	-	-6969	-	-	-	10472
18/06/92	2.100	3033	4922	4.780	-3396	10580	-	-	-	4.250	11205	1968	1481	0.520	-6208	-	-	-	-	-2.750	10464
21/09/92	2.100	2494	4922	5.25	5756	10507	-	-	-	-	11210	1550	2095	-	-	-	-	-	-	1.50	10467
27/10/92	3.050	2535	2982	5.23	-6588	10588	-	-	-	-	11205	1688	2183	-0.25	-	-	-	-	-	-	10465
12/11/92	3.700	2175	2930	5.03	-6047	10592	-	-	-	-	11222	1707	2195	-0.22	-	-	-	-	-	-	10467
23/12/92	3.700	2560	2903	5.03	6479	10607	-	-	-	-	11231	1019	2499	-	-	-	-	-	-	-	10472
21/01/93	4.360	2208	2940	4.87	-6953	10610	-	-	-	-	11223	1858	2411	-0.05	-	-	-5440	-	-	-	10472
18/02/93	5.140	2222	2915	5.05	-6885	10609	-	-	-	-	11222	1864	2435	-	-	-	-	-	-	-	10471
10/03/93	4.650	2203	2900	5.15	6935	10613	-	-	-	-	11223	1856	2427	-	5603	-	-	-	-	-	10471
30/03/93	5.040	2463	2868	5.17	-6338	10607	-	-	-	-	11209	2130	2410	-	-5580	-	-5300	-	-	-	10465
15/04/93	0.000	2505	2905	4.95	-6651	10610	-	-	-	5.15	11211	1580	-	-	-5800	-	-6060	-	-	-	10467
12/05/93	4.500	2202	2940	4.00	6060	10605	-	-	-	5.46	11209	1700	2410	-	5570	-	4660	-	-	-	10460
18/06/93	0.060	2809	3037	5.00	-6522	10613	-	-	-	4.77	11222	1999	2510	-0.18	-5380	-	-5120	-	-	-	10471
26/06/93	0.020	2830	3083	5.04	-5323	10609	-	-	-	-5.75	11209	1715	2435	-10.05	-5980	-	-4399	-	-	-	10467
15/06/93	5.230	2630	3593	5.02	7350	10609	-	-	-	-	11215	1570	2200	9	4970	-	4400	-	-	-	10469

PILE 29 - CORRECTED STRAIN

FINAL DEPTH (m) : 42.9

Date printed: 13/07/93

DEPTH (m)	3.2	14.9					22.9					30.9					38.9				
PILE NO	29-0	29-1					29-2					29-3					29-4				
DATE	4 GAUGE3	GCO2A	GCO 2B	4 GAUGE3	OYO	V.W.	GCO2A	GCO 2B	OYO	4GAUGE3	V.W.	GCO 2A	GCO 2B	4GAUGE3	OYO	V.W.	OYO	GCO 2A	GCO 2B	4GAUGE3	V.W.
28/04/87	-	1909	2031	2023	-5085	2637	161	376	-4847	1280	2640	-	-	-	-	-	-	-	-	-	-
30/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-5262	699	2172	1783	2632
01/05/87	-	-	-	-	-	-	-	-	-	-	-	1206	683	1752	-4488	2657	-	-	-	-	-
02/05/87	-	1932	2038	1963	-5083	2657	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-5263	754	2226	1703	2648
04/05/87	-	-	-	-	-	-	-	-	-	-	-	1190	685	1732	-4484	2693	-5187	889	2326	1786	2652
06/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06/05/87	-	-	-	-	-	-	176	368	-4814	1264	2672	1194	687	1695	-4485	2629	-	-	-	-	-
08/05/87	-	-	-	-	-	-	198	415	-4875	1267	2655	1104	637	2006	-4234	2349	-5148	777	2214	1748	2609
07/05/87	-	1866	1971	1898	-5144	2716	283	483	-5106	1048	2673	806	-	1742	-4394	2627	-5080	566	2011	1726	2706
11/05/87	-	1880	1968	1771	-5182	2639	164	370	-4799	1308	2630	1440	-	2086	-4374	2260	-5267	602	2069	1624	2764
14/05/87	-	1864	1988	5420	-5184	2633	167	368	-4806	4810	2615	-	740	2130	-4404	2223	-5268	617	2062	1637	2748
20/05/87	-	1877	1972	5340	-5181	2648	163	366	-4803	5670	2626	-	-	2135	-4403	2229	-5264	629	2067	1691	2764
26/05/87	-	1890	1947	-	-5194	2647	165	365	-4812	-	2621	-	-	2141	-4418	2222	-5269	616	2060	2062	2781
06/06/87	-	1921	2032	4960	-5265	2644	193	369	-4819	6140	2606	-	-	2145	-	2209	-5243	609	2046	2183	2753
22/06/87	2449	1936	1992	4960	-5212	2657	187	349	-4846	6100	2607	-	-	2184	-	2220	-430	602	2079	2280	2758
23/06/87	2489	1921	1971	5080	-5258	2650	174	344	-4870	6140	2601	-	-	2178	-4750	2215	-5274	573	2048	2265	2766
26/06/87	2489	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28/06/87	2484	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30/06/87	-	1955	2008	5000	-	2660	202	386	-4829	6120	2610	-	-	2197	-	2220	-5263	617	2124	2311	2759
17/07/87	2476	1957	1963	5140	-5271	2652	193	365	-4857	5280	2497	-	-	2174	-	2212	-5261	576	2070	2236	2755
04/08/87	2484	1818	1858	4970	-5376	2647	126	606	-4921	5040	2483	-	-	2231	-	2206	-5292	555	2048	2310	2751
20/08/87	2512	1978	2002	5000	-5276	2648	184	382	-4858	5100	2484	-	-	-	-	2209	-5249	-	-	-	2757
06/09/87	2524	1968	1948	4660	-5388	2652	202	296	-4902	5040	2487	-	1613	-	-	2211	-5268	-	-	-	2757
22/09/87	2533	2012	2004	5640	-5286	2648	186	348	-4853	5200	2480	-	1630	-	-	2207	-5265	-	-	-	2757
06/10/87	2529	1937	1982	5790	-5313	2648	161	310	-4870	5330	2480	-	-	-	-	2208	-5363	-	-	-	2756
19/10/87	2630	1966	2036	5740	-5291	2647	159	426	-4864	5330	2477	-	-	-	-	2206	-	-	-	-	2755
12/11/87	-	1901	1978	5360	-5317	2647	142	278	-4893	5280	2473	-	-	-	-	2204	-	-	-	6420	2785
12/11/87	2528	1920	1996	5300	-5307	2648	160	317	-4863	5280	2474	-	-	-	-	2204	-	-	-	-	2755
08/12/87	2522	1969	2049	5210	-5269	2653	205	366	-4823	5180	2476	-	-	-	-	2209	-	-	-	-	2759
06/01/88	2496	1937	2040	5640	-5278	2670	181	336	-4845	5180	2487	-	-	-	-	2214	-	-	-	-	2764
19/01/88	2511	1934	2033	5330	-5293	2661	185	366	-4832	5180	2481	-	-	-	-	2211	-	-	-	-	2761
09/02/00	2506	1906	2000	5420	-5321	2650	155	324	-4652	5240	2400	-	-	-	-	2212	-	-	-	-	2764
04/03/88	2510	1924	2036	5440	-5295	2647	183	351	-4844	5610	2469	-	-	-	-	2203	-6417	-	-	-	2759
07/04/88	2521	1885	2002	5450	-5325	2638	159	324	-4867	5290	2463	-	-	-	-	2202	-5000	-	-	-	2760
31/05/00	2532	1957	1995	5340	-5344	2637	142	293	-4870	5290	2457	-	-	-	-	2200	-	-	-	-	2759
31/06/88	2632	1873	2005	5520	-5344	2632	133	295	-4897	5300	2451	-	-	-	-	2193	-	-	-	-	2756
07/10/88	2612	1890	2051	5340	-5400	2782	94	277	-4922	5070	2415	-	-	-	-	2171	-	-	-	-	2745
10/10/00	2621	1999	2065	5320	-5403	2777	97	203	-	5000	2409	-	-	-	-	2167	-	-	-	-	2744
01/11/88	2634	1899	2084	5200	-5323	2766	161	282	-	6020	2402	1729	-	412	-	2162	-	-	-	-	2742
06/12/88	2642	1937	-	5170	-5433	2753	79	260	-	4970	2390	1700	-	360	-	2152	-	-	-	-	2736

PILE 29 - CORRECTED 3TRAIN

FINAL DEPTH (m) : 42.9

Date printed: 13/07/93

DEPTH (m)	3.2	14.9					22.9					30.9					38.9				
PILE NO	29-0	29-1					29-2					29-3					29-4				
DATE	4 GAUGES	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	GCO 2A	GCO 2B	OYO	4 GAUGES	V.W.	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	OYO	GCO 2A	GCO 2B	4 GAUGES	V.W.
05/01/89	2652	1881	2048	5430	-5439	2746	33	106	-	5130	2388	1766	-	396	-	2151	-	-	-	-	2738
13/02/89	2648	1871	2061	5290	-5462	2736	-	-	-	5020	2380	1828	-	-	-	2146	-	-	-	-	2737
07/03/89	2654	1890	2076	5280	-5460	2738	-	-	-	5100	2382	1860	-	146	-	2148	-	-	-	-	2739
07/04/89	-	-	-	-	-	2741	-	-	-	-	2386	-	-	-	-	2152	-	-	-	-	2741
10/04/89	2647	1874	2118	5060	-5475	-	-	341	-	5170	-	1863	-	125	-	-	-	-	-	-	-
08/06/89	2637	1878	2138	5400	-5474	2743	-	-	-	5170	2383	1843	-	70	-	-	-	-	-	-	2756
03/08/89	2655	1827	2210	5410	-5563	2737	-	-	-	5100	2381	1855	-	140	-	-	-	-	-	-	2741
07/07/89	2641	1879	2268	5380	-5472	2733	-	-	-	5100	2374	1850	-	-	-	2141	-	-	-	-	2738
08/08/89	2652	2054	2269	5180	-5470	2729	-	413	-	4910	2367	1840	-	-	-	-	-	-	-	-	2738
04/09/89	2655	1905	2228	5010	-5489	2725	-	482	-	4780	2367	1200	-	-	-	2137	-	-	-	-	2737
04/10/89	2650	1926	2308	5000	-5380	2721	-	608	-	4710	2366	1914	-	-	-	-	-	-	-	-	2739
08/11/89	-	2082	2210	-	-5390	2711	-	-	2082	-	2404	1806	-	-	-	-	-	-	-	-	2734
14/12/89	2674	-	-	4970	-	2707	-	-	-	4680	2363	-	-	-	-	-	-	-	-	-	2733
15/01/90	2626	1957	2402	4940	-5361	2704	-	-	1957	4720	2351	1853	-	-	-	-	-	-	-	-	2734
09/04/90	2581	1893	2411	-5030	-5417	2698	-	-	-	-	2346	1835	-	-	-	-	-	-	-	-	2735
11/05/90	2290	1866	2436	-5380	-5506	2689	-	-	-	-	2338	1826	-	-	-	-	-	-	-	-	2731
11/06/90	2604	2425	2708	-5370	-5400	2689	-	-	-	-	2340	1853	-	-	-	-	-	-	-	-	2734
10/07/90	2590	-	2572	-5430	-5406	2694	-	-	-	-	2339	1839	-	-	-	-	-	-	-	-	2734
13/09/90	-	2168	2740	-5310	-5553	2681	-	-	-	-	2333	1955	-	-	-	-	-	-	-	-	2730
15/10/90	2718	2240	2799	-5210	-5538	2682	-	-	-	-	2342	1871	-	-	-	-	-	-	-	-	2735
22/01/91	-2890	2072	2492	-5260	-5523	2673	-	-	-	-	2330	1714	-	-	-	-	-	-	-	-	2727
14/03/91	2680	2170	2523	-5280	-5674	2670	-	-	-	-	2328	1863	-	-	-	-	-	-	-	-	2728
16/04/91	-2880	2272	2686	-5290	-5445	2673	-	-	-	-	2331	1872	-	-	-	-	-	-	-	-	2730
02/06/91	-2850	2156	2642	-5230	-5542	2674	-	-	2156	-	2332	1758	-	-	-	-	-	-	-	-	2733
04/07/91	2800	2347	2812	5270	-5532	2679	-	-	-	-	2331	1842	-	-	-	-	-	-	-	-	2731
07/08/91	-	2379	2783	-	-5533	2673	-	-	-	-	2327	1813	-	-	-	-	-	-	-	-	2734
26/09/91	-	2414	2813	-	-5273	2685	-	-	-	-	2333	1783	-	-	-	-	-	-	-	-	2734
31/10/91	-	2357	3190	-	-5544	2683	-	-	-	-	2337	1911	-	-	-	-	-	-	-	-	2733
04/12/91	-	2318	2890	-	-5593	2679	-	-	-	-	2333	1713	-	-	-	-	-	-	-	-	2730
06/01/92	-	2184	2696	-	-5614	2678	-	-	-	-	2332	1897	-	-	-	-	-	-	-	-	2724
26/02/92	3	2325	2885	-	-5571	2675	-	-	-	-	2314	1848	-	-	-	-	-	-	-	-	2727
27/03/92	940	2334	3050	5140	-5396	2675	-	-	-	3500	2316	1905	-	260	-	-	-	-	-	-	2729
29/04/92	940	2334	3117	5190	5564	2676	-	-	-	7200	2379	1769	2136	230	-	-	5193	-	-	-	2728
10/06/92	940	2306	2826	5060	-5426	2675	-	-	-	7320	2353	1848	2385	270	-	-	-4966	-	-	-	2736
18/08/92	2100	3033	4822	4780	-2830	2680	-	-	-	4250	2389	1986	1481	520	-5173	-	-	-	-	-2750	2740
21/09/92	2100	2494	4822	5250	4787	2677	-	-	-	-	2307	1560	2085	-	-	-	-	-	-	1500	2738
27/10/92	3050	2535	2982	5230	-5473	2676	-	-	-	-	2389	1868	2183	-250	-	-	-	-	-	-	2739
12/11/92	3700	2175	2930	5030	-5039	2674	-	-	2175	-	2382	1707	2195	-220	-	-	-	-	-	-	2738
23/12/92	3700	2560	2903	5030	5399	2686	-	-	-	-	2370	1819	2489	-	-	-	-	-	-	-	2736
21/01/93	4360	2209	2940	4870	-5794	2685	-	-	-	-	2382	1856	2411	-50	-	-	-4533	-	-	-	2736
18/02/93	5140	2222	2915	5050	-5738	2685	-	-	-	-	2382	1884	2435	-	-	-	-	-	-	-	2736
10/03/93	4660	2203	2008	5150	5779	2663	-	-	-	-	2382	1856	2427	-	4736	-	4579	-	-	-	2736
30/03/93	5040	2463	2888	5170	-5282	2668	-	-	-	-	2388	2130	2410	-	-4850	-	-4417	-	-	-	2738
15/04/93	0	2505	2905	4950	-5543	2666	-	-	-	5150	2387	1590	-	-	-4833	-	-4217	-	-	-	2738
12/05/93	4500	2202	2940	4000	5050	2667	-	-	-	5460	2388	1790	2410	-	4642	-	3083	-	-	-	2738
18/05/93	80	2809	3037	5000	-5435	2663	-	-	-	4770	2382	1989	2510	-180	-4467	-	-4267	-	-	-	2738
28/05/93	20	2830	3093	5040	-4436	2665	-	-	-	-5750	2388	1715	2435	-10050	-4967	-	-3886	-	-	-	2738
15/06/93	5220	2630	3593	5020	6125	2665	-	-	-	-	2385	1570	2200	9000	4142	-	3667	-	-	-	2737

PILE 42 - FIELD READINGS

FINAL DEPTH (m) : 43.4

Date printed: 03/07/93

11.4							19.4					23.4				31.4				39.4						
DEPTH (m)	42-1						42-2U					42-2L				42-3				42-4						
PILE NO	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	GCO 1A	GCO 1B	OYO	V.W.	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.
23/04/87	1881	474	2422	1408	-4283	11281	-	-	-	-	-	-	-	-	-	103	1344	4.77	-5113	11214	-	-	-	-	-	-
24/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2019	2833	-385	1288	-4889	11229
27/04/87	-	-	-	-	-	-	1370	1873	1581	3085	-4654	2143	2283	710	11488	-	-	-	-	-	-	-	-	-	-	-
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2023	2830	-412	1211	-4885	10957
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	1218	4.66	-5127	10948	2068	2832	-412	1211	-4885	10954
05/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	1178	4.80	-5232	10874	1080	2833	-582	1080	-6033	11023
08/05/87	1937	452	2350	1329	-4340	11183	1461	1903	1515	2881	-4645	2088	2165	734	11458	-	-	-	-	-	-	-	-	-	-	-
12/05/87	2014	548	2164	1849	-4357	11288	1817	2418	2898	3808	-4848	2804	2894	328	12179	-31	1115	4.44	-4871	10851	2157	2727	-9831	758	-4817	10309
14/05/87	2021	582	2171	1854	-4354	11278	1813	2301	2493	3820	-4941	2547	2888	238	12319	-133	1002	4.50	-5023	11118	1983	-	-9889	828	-5047	10777
20/05/87	2025	582	2188	1874	-4333	11239	1783	1969	2400	3353	-4987	2531	2877	184	12327	-181	1035	5.80	-5017	11088	1884	-	-9803	631	-5058	10804
25/05/87	2028	595	2180	1870	-4337	11238	1880	1855	2043	3450	-5025	2513	2853	188	12390	-211	1092	-	-4878	11110	1872	-	-9471	815	-5072	10823
19/06/87	2028	608	2187	1882	-4374	11215	-	-	-	-	-	2188	3074	121	12418	-	-	-	-	-	-	-	-	-	-	-
19/06/87	2027	608	2185	1883	-4380	11216	1554	1775	2247	3521	-5116	2188	3085	120	12418	-114	1388	5.25	-4680	11128	-	-	-9390	826	-5119	10835
30/06/87	2008	543	2080	1874	-4489	11220	1448	1828	2148	3310	-5224	2228	3019	81	11438	-185	1374	5.30	-5018	11141	-	-	-9398	597	-5180	10851
17/07/87	2044	704	2169	1888	-4377	11222	1412	1810	2210	-	-5141	-	2810	123	12448	-287	1445	6.58	-4889	11148	-	-	-14501	-10327	-4583	10880
04/08/87	2038	681	2158	1885	-4387	11220	1428	1582	2188	-	-5138	-	2810	88	12470	-359	1380	7.53	-5030	11167	-	-	-9058	592	-5134	10880
20/08/87	1955	690	2140	1870	-4398	11220	1487	1804	2179	-	-5173	-	2470	-	12470	-792	1353	8.57	-4890	11188	-	-	-9111	801	-5155	10947
08/09/87	1900	777	2158	1808	-4378	11218	1744	1855	2185	-	-5145	-	2384	-	12482	-478	1320	8.83	-5100	11188	-	-	-8050	810	-5135	10881
22/09/87	1881	872	2175	1704	-4388	11220	1635	1888	2267	-	-5193	-	2308	-	12481	-418	1328	-	-4889	11178	-	-	-8832	820	-5128	10887
05/10/87	1844	878	2188	1870	-4382	11220	1845	1887	2288	3115	-5087	-	2344	-	12478	-418	1280	11.17	-5013	11178	-	-	-8821	580	-5129	10887
18/10/87	1803	1074	2140	1887	-4385	11213	1878	1874	2258	3133	-5027	-	-	-	12479	-448	1378	11.19	-5038	11182	-	-	-8839	582	-5183	10884
08/11/87	1842	985	2178	1870	-4359	11218	1880	1983	2284	3003	-4853	-	-	-	12475	-	-	-	-	-	-	-	-	-	-	-
08/11/87	1839	984	2175	1875	-4353	11218	1858	1858	2253	2894	-4857	-	-	-	12475	-	-	-	-	-	-	-	-	-	-	-
12/11/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-440	1210	-	-5012	11185	-	-	-8808	574	-5130	10808
12/11/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-488	1187	-	-5028	11190	-	-	-8897	574	-5137	10801
08/12/87	1885	1082	2238	1728	-4278	11137	1808	2088	2357	3324	-4804	-	-	-	12383	-401	1216	9.17	-4855	11141	-	-	-8824	823	-5085	10888
05/01/88	1887	1030	2188	1885	-4370	11180	1848	2050	2323	3478	-4802	-	-	-	12421	-407	985	10.80	-4883	11180	-	-	-8855	588	-5153	10881
19/01/88	1887	1038	2190	1870	-4385	11173	1850	2142	2314	3445	-4802	-	-	-	12404	-385	985	10.05	-4879	11154	-	-	-8823	583	-5130	10880
04/02/88	1843	1083	2205	1701	-4318	11178	1841	2078	2021	3487	-4545	-	-	-	12407	-378	878	10.83	-4888	11155	-	-	-8148	812	-5118	11182
10/02/88	1884	1012	2181	1884	-4348	11175	1702	1005	2370	3458	-4580	-	-	-	12407	-483	857	10.32	-5087	11155	-	-	-8178	480	-5158	10877
04/03/88	1973	1233	2084	1878	-4335	11185	1848	1945	2312	3493	-4532	-	-	-	12428	-388	916	11.20	-4887	11172	-	-	-7853	608	-5124	10885
07/04/88	1931	954	2119	1586	-4427	11211	1430	1578	2280	3453	-4587	-	-	-	12468	-425	980	10.80	-5038	11188	-	-	-7532	575	-5148	10805
18/04/88	1988	985	2128	1896	-4431	11214	-	-	2222	3397	-4589	-	-	-	12475	-484	803	11.22	-5088	11188	-	-	-7485	542	-5188	10918
18/04/88	2002	985	2187	1838	-4417	11212	-	-	2238	3385	-4582	-	-	-	12481	-389	841	11.22	-5088	11210	-	-	-7484	540	-5213	10822
31/05/88	1975	880	2161	1858	-4378	11218	-	-	-	3438	-4578	-	-	-	12508	-281	885	-	-5114	11217	-	-	-7331	587	-5178	10838
04/08/88	1841	885	2300	1718	-4313	11280	-	-	-	-	-4384	-	-	-	-	-127	888	-	-5100	11254	-	-	-7320	851	-5137	10865
07/10/88	1901	938	2182	1717	-4345	11343	-	-	-	-	-	-	-	-	12683	-148	912	8.80	-5138	11300	-	-	-7118	841	-5177	11051
18/10/88	1904	844	2186	1788	-4345	11355	-	-	-	-	-	-	-	-	12707	-155	909	9.20	-5140	11323	-	-	-7085	700	-5185	11088
01/11/88	1882	938	2182	1780	-4352	11381	-	-	-	-	-	-	-	-	12718	-150	907	9.08	-5152	11333	-	-	-7037	875	-5192	11078
08/12/88	1874	930	-	1820	-4389	11371	-	-	-	-	-	-	-	-	12758	-185	888	8.91	-4319	11382	-	-	-8308	488	-5234	11108

PILE 42 - FIELD READINGS

FINAL DEPTH (m) : 43.4

Date printed: 13/07/93

DEPTH (m)	11.4						19.4						23.4						31.4						39.4									
PILE NO	42-1						42-2U						42-2L						42-3						42-4									
DATE	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	OYO	V.W.	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	
05/01/89	1878	917	2183	1707	-4342	11388	-	-	-	-	-	-	-	-	-	12760	-190	848	9.89	-5183	11374	-	-	-6837	640	-5228	11130	-	-	-	-	-	-	
13/02/89	1865	911	2165	1697	-4362	11388	-	-	-	-	-	-	-	-	-	12816	-191	881	9.82	-5181	11365	-	-	-6780	645	-5238	11181	-	-	-	-	-	-	
07/03/89	1868	918	2172	1702	-4403	11397	-	-	-	-	-	-	-	-	-	12831	-180	854	9.85	-5188	11410	-	-	-6885	630	-5295	11183	-	-	-	-	-	-	
07/04/89	1841	922	2170	1703	-4372	11393	-	-	-	-	-	-	-	-	-	12822	-183	858	10.30	-5181	11394	-	-	-6831	638	-	11181	-	-	-	-	-	-	
19/05/89	1834	919	2171	1712	-4379	11395	-	-	-	-	-	-	-	-	-	12824	5	899	10.14	-5187	11402	-	-	-6408	-	-	11184	-	-	-	-	-	-	
03/06/89	1801	922	2188	1733	-4388	11380	-	-	-	-	-	-	-	-	-	12838	-72	838	10.02	-5183	11408	-	-	-6407	-	-	11184	-	-	-	-	-	-	
07/07/89	1878	920	2170	1729	-4391	11408	-	-	-	-	-	-	-	-	-	12848	-51	801	10.74	-5186	11421	-	-	-5320	-	-	11186	-	-	-	-	-	-	
08/08/89	1832	922	2192	1777	-4377	11393	-	-	-	-	-	-	-	-	-	11183	43	833	10.27	-5167	12885	-	-	-5988	-	-	11183	-	-	-	-	-	-	
04/09/89	2040	962	2178	1758	-4383	11390	-	-	-	-	-	-	-	-	-	12882	108	825	10.59	-5189	11418	-	-	-5977	-	-5354	11191	-	-	-	-	-	-	
04/10/89	2038	1005	2182	1777	-4327	11392	-	-	-	-	-	-	-	-	-	12882	108	870	10.80	-5128	11414	-	-	-5935	-	-5345	11192	-	-	-	-	-	-	
09/11/89	1998	917	2220	1791	-4320	11394	-	-	-	-	-	-	-	-	-	12819	-	899	-	-5187	11439	-	-	-5918	-	-5998	11187	-	-	-	-	-	-	
14/12/89	-	-	-	-	-	11377	-	-	-	-	-	-	-	-	-	12815	-	-	0.02	-	11440	-	-	-	-	-	-	-	-	-	-	-	-	
15/01/90	1968	925	2238	1820	-4305	11375	-	-	-	-	-	-	-	-	-	12815	-	1988	9.95	-5488	11441	-	-	-5861	-	-5305	11157	-	-	-	-	-	-	
09/04/90	2017	818	2244	1834	-4344	11307	-	-	-	-	-	-	-	-	-	12830	-	-	-10.01	-	11458	-	-	-5943	-	-5328	11207	-	-	-	-	-	-	
11/04/90	2089	930	2278	1879	-4310	11302	-	-	-	-	-	-	-	-	-	12861	-	-	-9.74	-	11458	-	-	-5980	-	-5318	11228	-	-	-	-	-	-	
11/05/90	1995	910	2303	1894	-4319	11314	-	-	-	-	-	-	-	-	-	12839	-	-	-8.71	-	11464	-	-	-5910	-	-5312	11214	-	-	-	-	-	-	
10/07/90	2140	942	2320	1910	-4300	11310	-	-	-	-	-	-	-	-	-	12827	-	-	-10.17	-	11469	-	-	-5790	-	-5794	11215	-	-	-	-	-	-	
13/08/90	1030	805	2282	1887	-4318	11330	-	-	-	-	-	-	-	-	-	12881	-	-	10.00	-	11487	-	-	-5388	-	-5304	11300	-	-	-	-	-	-	
15/10/90	1909	903	2298	1895	-4331	11328	-	-	-	-	-	-	-	-	-	-	-	-	10.04	-	11475	-	-	-5148	-	-5200	11186	-	-	-	-	-	-	
22/01/91	1980	872	2309	1901	-4334	11325	-	-	-	-	-	-	-	-	-	-	-	-	7.54	-	11507	-	-	-5200	-	-5200	11207	-	-	-	-	-	-	
14/03/91	1987	898	2351	1989	-4342	11323	-	-	-	-	-	-	-	-	-	-	-	-	10.2	-	11512	-	-	-	-	-5140	11213	-	-	-	-	-	-	
15/04/91	1985	874	2301	1989	-4335	11319	-	-	-	-	-	-	-	-	-	-	-	-	9.73	-	11505	-	-	-	-	-5120	11212	-	-	-	-	-	-	
03/09/91	2169	952	2344	1997	-4334	11314	-	-	-	-	-	-	-	-	-	-	-	-	8.88	-	11500	-	-	-	-	-5100	11214	-	-	-	-	-	-	
04/07/91	2102	907	2304	2048	-4357	11207	-	-	-	-	-	-	-	-	-	-	-	-	-10.02	-	11500	-	-	-	-	-	-	-	-	-	-	-	-	
07/08/91	2123	913	2397	2079	-4318	11299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11502	-	-	-2223	2343	-5280	11214	-	-	-	-	-	-	
29/09/91	2063	881	2384	2089	-4344	11298	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11498	-	-	-2341	2198	-5170	11211	-	-	-	-	-	-	
31/10/91	2108	914	2430	2099	-4330	11301	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11509	-	-	-2308	2128	-5040	11220	-	-	-	-	-	-	
04/12/91	2090	881	2372	2105	-4298	11313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11515	-	-	-2284	2126	-4988	11232	-	-	-	-	-	-	
09/01/92	2101	878	2395	2098	-4301	11319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11519	-	-	-2328	2044	-4849	11237	-	-	-	-	-	-	
16/02/92	2080	815	2354	2008	-4330	11317	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11528	-	-	-2171	2127	-4015	11245	-	-	-	-	-	-	
27/03/92	2113	854	2357	2097	-4311	11314	-	-	-	-	-	-	-	-	-	-	-	-	9.71	-	11521	-	-	-2570	1870	-4930	11241	-	-	-	-	-	-	
29/04/92	2111	888	2450	2150	-4238	11305	-	-	-	-	-	-	-	-	-	-	-	-	9.11	-	11519	-	-	-2480	1854	-4895	11238	-	-	-	-	-	-	
10/05/92	2094	813	2547	2154	-4253	11309	-	-	-	-	-	-	-	-	-	-	-	-	-9.72	-	11528	-	-	-2457	1887	-4930	11241	-	-	-	-	-	-	
18/08/92	2183	898	2474	2154	-4247	11297	-	-	-	-	-	-	-	-	-	-	-	-	10.13	-	11518	-	-	-2722	1878	-5018	11232	-	-	-	-	-	-	
21/09/92	2149	940	2471	2205	-4292	11312	-	-	-	-	-	-	-	-	-	-	-	-	8.8	-	11520	-	-	-2472	1910	-4842	11227	-	-	-	-	-	-	
27/10/92	2128	953	2440	2181	-4200	11300	-	-	-	-	-	-	-	-	-	-	-	-	330	1813	-0.88	-5285	11521	-	-2850	1800	-4007	11230	-	-	-	-	-	-
19/11/92	2136	792	2431	2166	-4310	11318	-	-	-	-	-	-	-	-	-	-	-	-	408	1716	-4.7	-6289	11630	-	-2666	1897	-4890	11240	-	-	-	-	-	-
23/12/92	2143	729	2495	2183	-4294	11317	-	-	-	-	-	-	-	-	-	-	-	-	848	1822	-9.2	-5220	11542	-	-2585	1723	-4777	11250	-	-	-	-	-	-
21/01/93	2069	880	2598	2139	-4284	11318	-	-	-	-	-	-	-	-	-	-	-	-	574	2139	-9.5	-5278	11543	-	-2830	1898	-4775	11252	-	-	-	-	-	-
18/02/93	2084	848	2450	2172	-4278	11312	-	-	-	-	-	-	-	-	-	-	-	-	598	2112	-9.65	-5255	11543	-	-2807	1899	-4774	11254	-	-	-	-	-	-
10/03/93	2089	880	2451	2119	-4257	11313	-	-	-	-	-	-	-	-	-	-	-	-	487	2048	-9.87	-5334	11539	-	-2708	1840	-4774	11250	-	-	-	-	-	-
30/03/93	2078	870	2588	2133	-4307	11313	-	-	-	-	-	-	-	-	-	-	-	-	895	2095	-9.9	-5231	11611	-	-2880	1884	-4774	11249	-	-	-	-	-	-
15/04/93	2039	870	3092	2102	-4303	11312	-	-	-	-	-	-	-	-	-	-	-	-	800	2095	-9.7	-5315	11545	-	-2874	1539	-4900	11254	-	-	-	-	-	-
12/05/93	2115	1128	2505	2322	-4304	11301	-	-	-	-	-	-	-	-	-	-	-	-	905	2157	-9.7	-5298	11542	-	-2692	1855	-4980	11252	-	-	-	-	-	-
25/05/93	2077	898	2482	2200	-4320	11299	-	-	-	-	-	-	-	-	-	-	-	-	895	2104	-9.55	-5282	11537	-	-2858	1585	-4950	11248	-	-	-	-	-	-
15/08/93	2072	1058	2528	2193	-4342	11291	-	-	-	-	-	-	-	-	-	-	-	-	603	2252	-9.42	-5239	11547	-	-2830	1501	-5120	11256	-	-	-	-	-	-

PILE 42 - STRAIN READINGS

FINAL DEPTH (m) : 43.4

Date printed: 13/07/83

DEPTH (m)	11.4						19.4						23.4						31.4						39.4								
PILE NO	42-1						42-2J						42-2L						42-3						42-4								
DATE	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	GCO 1A	GCO 1B	OYO	V.W.	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	
23/04/87	1881	474	2422	1408	-3589	2353	-	-	-	-	-	-	-	-	-	-	103	1344	4770	-4261	2398	-	-	-	-	-	-	-	-	-	-	-	
24/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2019	2533	-395	1289	-4058	2379	-	-	-	-	-	-
27/04/87	-	-	-	-	-	-	1370	1873	1681	3085	-3765	2143	2283	598	2282	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2029	2630	-412	1211	-4184	2460	-	-	-	-	-	-
05/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	1216	4990	-4273	2600	2099	2492	-4322	1120	-4199	2642	-	-	-	-	-	-
06/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	1178	4800	-4380	2537	1080	3503	-982	1080	-4180	2480	-	-	-	-	-	-
08/05/87	1937	482	2350	1329	-3817	2395	1481	1903	1515	2981	-3872	2088	2165	612	2285	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12/05/87	2014	548	2184	1849	-3831	2351	1917	2418	2958	3905	-4123	2804	2894	272	2023	-31	1115	4440	-4059	2548	2157	2727	-9831	756	-4014	2780	-	-	-	-	-	-	
14/05/87	2021	582	2171	1854	-3828	2359	1813	2301	2493	3620	-4118	2547	2898	191	1977	-133	1002	4500	-4188	2427	1983	-	-9989	625	-4208	2583	-	-	-	-	-	-	
20/05/87	2025	582	2188	1874	-3811	2375	1783	1999	2400	3353	-4158	2531	2877	182	1974	-181	1035	5800	-4181	2441	1884	-	-9903	631	-4215	2570	-	-	-	-	-	-	
24/05/87	2128	595	2180	1870	-3814	2375	1890	1855	2343	3450	-4188	2513	2953	139	1894	-211	1089	-	-4148	2470	1872	-	-8471	615	-4227	2561	-	-	-	-	-	-	
10/06/87	2038	605	2187	1882	-3845	2385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
19/06/87	2027	608	2188	1883	-3850	2385	1684	1775	2247	3521	-4283	2185	3085	100	1946	-114	1398	5250	-4158	2424	-	-	-9360	626	-4265	2555	-	-	-	-	-	-	
30/06/87	2008	543	2080	1874	-3724	2383	1448	1828	2148	3310	-4353	2228	3019	51	2293	-185	1374	5300	-4182	2417	-	-	-9599	587	-4300	2548	-	-	-	-	-	-	
17/07/87	2044	704	2189	1898	-3848	2382	1412	1810	2210	-	-4284	-	2810	103	1838	-287	1445	6890	-4158	2414	-	-	-14501	-10327	-3819	2644	-	-	-	-	-	-	
04/08/87	2038	691	2158	1885	-3839	2383	1428	1582	2188	-	-4280	-	2810	74	1929	-359	1380	7530	-4192	2408	-	-	-9058	592	-4278	2534	-	-	-	-	-	-	
21/08/87	1955	690	2140	1870	-3855	2383	1497	1804	2179	-	-4711	-	2470	-	1829	-392	1393	8670	-4158	2406	-	-	-8731	601	-4298	2631	-	-	-	-	-	-	
08/09/87	1900	777	2158	1808	-3847	2384	1744	1855	2185	-	-4288	-	2384	-	1032	-478	1320	9830	-4250	2408	-	-	-8050	610	-4270	2534	-	-	-	-	-	-	
22/09/87	1881	872	2175	1704	-3840	2383	1635	1688	2267	-	-4328	-	2305	-	1926	-418	1328	-	-4185	2401	-	-	-8632	620	-4273	2531	-	-	-	-	-	-	
05/10/87	1844	878	2188	1870	-3835	2383	1645	1857	2285	3115	-4248	-	2344	-	1927	-418	1280	11170	-4178	2402	-	-	-8621	590	-4274	2531	-	-	-	-	-	-	
19/10/87	1803	1074	2140	1857	-3854	2388	1678	1874	2255	3133	-4189	-	-	-	1928	-448	1378	11180	-4197	2399	-	-	-8939	582	-4303	2528	-	-	-	-	-	-	
08/11/87	1842	985	2178	1870	-3833	2384	1880	1883	2284	3003	-4044	-	-	-	1928	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
09/11/87	1839	984	2175	1875	-3838	2384	1899	1895	2283	2984	-4048	-	-	-	1928	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12/11/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12/11/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
08/12/87	1895	1092	2238	1728	-3585	2419	1908	2088	2267	3324	-3837	-	-	-	-	1953	-401	1215	9170	-4129	2417	-	-	-8524	623	-4245	2541	-	-	-	-	-	-
05/01/88	1887	1030	2195	1885	-3842	2400	1848	2050	2323	3478	-3835	-	-	-	-	1945	-407	985	10800	-4153	2409	-	-	-8856	588	-4294	2534	-	-	-	-	-	-
19/01/88	1887	1030	2190	1870	-3838	2403	1850	2142	2314	3445	-3835	-	-	-	-	1950	-385	985	10050	-4149	2411	-	-	-8823	593	-4275	2534	-	-	-	-	-	-
09/02/88	1843	1093	2205	1701	-3588	2422	1841	2098	2321	3487	-3788	-	-	-	-	1848	-378	939	10570	-4157	2411	-	-	-8148	612	-4254	2530	-	-	-	-	-	-
10/02/88	1884	1012	2181	1884	-3823	2402	1702	1905	2270	3458	-3824	-	-	-	-	1040	-463	957	10330	-4223	2411	-	-	-8178	480	-4207	2536	-	-	-	-	-	-
04/03/88	1873	1233	2094	1878	-3813	2398	1648	1946	2312	3453	-3777	-	-	-	-	1842	-388	916	11200	-4155	2404	-	-	-7853	609	-4270	2527	-	-	-	-	-	-
07/04/88	1831	954	2119	1898	-3888	2387	1430	1579	2280	3453	-3823	-	-	-	-	1903	-428	960	10800	-4198	2398	-	-	-7532	575	-4288	2522	-	-	-	-	-	-
18/04/88	1988	995	2128	1898	-3853	2388	-	-	-	2222	3397	-3833	-	-	-	1928	-484	803	11220	-4240	2392	-	-	-7485	542	-4330	2518	-	-	-	-	-	-
18/04/88	2002	995	2167	1836	-3881	2388	-	-	-	2238	3395	-3827	-	-	-	1928	-388	841	11220	-4249	2387	-	-	-7494	540	-4344	2515	-	-	-	-	-	-
31/05/88	1875	990	2181	1899	-3847	2383	-	-	-	-	3439	-3755	-	-	-	1917	-281	895	-	-4292	2394	-	-	-7331	597	-4313	2508	-	-	-	-	-	-
04/08/88	1941	985	2200	1718	-3804	2354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/10/88	1901	938	2182	1717	-3821	2332	-	-	-	-	-	-	-	-	-	1865	-148	912	8800	-4282	2349	-	-	-7116	641	-4314	2467	-	-	-	-	-	-
18/10/88	1904	944	2195	1788	-3821	2327	-	-	-	-	-	-	-	-	-	1858	-155	909	9200	-4283	2340	-	-	-7085	700	-4321	2449	-	-	-	-	-	-
01/11/88	1892	938	2182	1780	-3827	2324	-	-	-	-	-	-	-	-	-	1855	-150	907	9080	-4283	2338	-	-	-7037	875	-4327	2445	-	-	-	-	-	-
08/12/88	1874	930	-	1820	-3841	2320	-	-	-	-	-	-	-	-	-	1843	-185	888	8910	-4289	2324	-	-	-6338	488	-4362	2431	-	-	-	-	-	-

PILE 42 - STRAIN READINGS

FINAL DEPTH (m) : 43.4

Date printed: 13/07/00

DEPTH (m)		11.4						19.4						23.4						31.4						39.4					
PILE NO		42-1						42-2J						42-2						42-3						42-4					
DATE		GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO		GCO 1A	GCO 1B	OYO	V.W.	GCO 2A	GCO 2B	4 GAUGES	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.			
05/01/99	1876	917	2183	1707	-3818	2313	-	-	-	-	-	-	-	1834	-190	848	9890	-4319	2319	-	-	-	-	-	-8837	840	-4367	2422			
13/02/99	1895	911	2185	1697	-3835	2313	-	-	-	-	-	-	-	1828	-191	881	9820	-4318	2310	-	-	-	-	-	-8780	845	-4363	2408			
07/03/99	1898	918	2172	1702	-3899	2310	-	-	-	-	-	-	-	1822	-180	854	9850	-4323	2304	-	-	-	-	-	-8895	830	-4413	2407			
07/04/99	1841	922	2170	1703	-3843	2311	-	-	-	-	-	-	-	1825	-183	858	10300	-4318	2311	-	-	-	-	-	-8531	838	-	2408			
09/05/99	1834	919	2173	1712	-3949	2314	-	-	-	-	-	-	-	1824	-5	859	10140	-4309	2309	-	-	-	-	-	-8409	-	-	2407			
03/06/99	1801	932	2185	1733	-3855	2317	-	-	-	-	-	-	-	1821	-72	838	10020	-4310	2308	-	-	-	-	-	-8407	-	-	2407			
07/07/99	1878	920	2170	1729	-3859	2305	-	-	-	-	-	-	-	1817	-61	801	10740	-4322	2300	-	-	-	-	-	-6320	-	-	2308			
08/08/99	1932	982	2192	1777	-3848	2311	-	-	-	-	-	-	-	2399	43	833	10270	-4308	1813	-	-	-	-	-	-5898	-	-	2399			
04/09/99	2040	952	2176	1758	-3853	2312	-	-	-	-	-	-	-	1808	109	825	10890	-4324	2302	-	-	-	-	-	-5877	-	-4492	2305			
04/10/99	2038	1005	2182	1777	-3805	2312	-	-	-	-	-	-	-	1808	108	870	10800	-4272	2303	-	-	-	-	-	-5835	-	-4454	2305			
09/11/99	1899	917	2220	1791	-3900	2315	-	-	-	-	-	-	-	1797	-	892	-	-4329	2305	-	-	-	-	-	-5918	-	-4895	2307			
14/12/99	-	-	-	-	-	2318	-	-	-	-	-	-	-	1700	-	-	9020	-	2302	-	-	-	-	-	-	-	-	-			
15/01/00	1998	925	2239	1820	-3888	2318	-	-	-	-	-	-	-	1799	-	1088	9980	-4573	2292	-	-	-	-	-	-5861	-	-4422	2393			
09/04/00	2017	918	2244	1834	-3820	2347	-	-	-	-	-	-	-	1794	-	-	-10010	-	2286	-	-	-	-	-	-5843	-	-4438	2399			
11/04/00	2099	930	2278	1879	-3892	2349	-	-	-	-	-	-	-	1789	-	-	-9740	-	2285	-	-	-	-	-	-5890	-	-4432	2391			
11/06/00	1995	910	2303	1894	-3899	2344	-	-	-	-	-	-	-	1792	-	-	-9710	-	2283	-	-	-	-	-	-5910	-	-4427	2398			
10/07/00	2140	942	2329	1910	-3993	2345	-	-	-	-	-	-	-	1795	-	-	-10170	-	2303	-	-	-	-	-	-5790	-	-4420	2395			
13/09/00	1030	805	2382	1887	-3808	2337	-	-	-	-	-	-	-	1814	-	-	10000	-	2274	-	-	-	-	-	-5398	-	-4420	2302			
15/10/00	1609	903	2299	1895	-3809	2338	-	-	-	-	-	-	-	-	-	-	10040	-	2278	-	-	-	-	-	-5146	-	-4330	2397			
22/01/01	1980	872	2309	1981	-3812	2339	-	-	-	-	-	-	-	-	-	-	7540	-	2286	-	-	-	-	-	-4000	-	-4330	2399			
14/03/01	1987	898	2351	1989	-3818	2340	-	-	-	-	-	-	-	-	-	-	-	10200	-	2284	-	-	-	-	-	-	-4283	2398			
15/04/01	1985	874	2301	1999	-3813	2342	-	-	-	-	-	-	-	-	-	-	-	9730	-	2285	-	-	-	-	-	-	-4287	2396			
03/05/01	2159	892	2344	1987	-3812	2348	-	-	-	-	-	-	-	-	-	-	-	-	9990	-	2298	-	-	-	-	-	-4290	2399			
04/07/01	2102	907	2304	2048	-3831	2351	-	-	-	-	-	-	-	-	-	-	-	-	-	-10020	-	2398	-	-	-	-	-	2395			
07/08/01	2123	913	2367	2079	-3898	2350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2298	-	-	-2223	2343	-4400	2396			
29/09/01	2093	891	2384	2089	-3820	2351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2269	-	-	-2341	2198	-4308	2397			
31/10/01	2108	914	2430	2099	-3808	2349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2265	-	-	-2308	2129	-4200	2393			
04/12/01	2090	881	2372	2105	-3892	2344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2263	-	-	-2284	2128	-4140	2378			
09/01/02	2101	879	2395	2099	-3901	2342	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2291	-	-	-2028	2044	-4124	2379			
16/02/02	2090	815	2354	2008	-3818	2342	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2368	-	-	-2171	2127	-4008	2372			
27/03/02	2113	854	2357	2087	-3893	2344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9710	-	2280	-	-	-2570	1870	-4108	2374		
29/04/02	2111	899	2450	2150	-3832	2347	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9110	-	2281	-	-	-2480	1854	-4079	2375		
10/05/02	2094	913	2547	2154	-3544	2348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-9720	-	2258	-	-	-2457	1987	-4108	2374		
18/06/02	2183	898	2474	2154	-3839	2351	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10130	-	2282	-	-	-2722	1878	-4180	2378	
21/09/02	2142	940	2431	2295	-3877	2349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	999	1813	-8901	-4415	2291	-	-2472	1910	-4118	2390	
27/10/02	2128	953	2440	2161	-3883	2348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	330	1813	-8880	-4398	2290	-	-2950	1800	-4080	2370	
12/11/02	2136	782	2431	2186	-3892	2343	-	-	-	-	-	-	-	-	-	-	-	-	-	-	408	1719	-8700	-4408	2287	-	-2896	1627	-4076	2376	
23/12/02	2143	729	2495	2183	-3878	2342	-	-	-	-	-	-	-	-	-	-	-	-	-	-	945	1822	-8800	-4350	2292	-	-2595	1723	-3981	2370	
21/01/03	2058	880	2898	2139	-3853	2342	-	-	-	-	-	-	-	-	-	-	-	-	-	-	574	2139	-8900	-4397	2292	-	-2830	1898	-3979	2370	
18/02/03	2094	848	2450	2172	-3863	2344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	598	2112	-8850	-4379	2292	-	-2807	1899	-3978	2369	
10/03/03	2099	880	2451	2119	-3848	2344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	487	2048	-8870	-4445	2293	-	-2708	1640	-3978	2370	
30/03/03	3078	970	2588	2133	-3889	2344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	885	2095	-9000	-4382	2292	-	-3880	1664	-3978	2371	
15/04/03	2039	970	3092	2102	-3898	2344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	2085	-8700	-4429	2291	-	-2874	1539	-4083	2369	
12/05/03	2115	1128	2505	2322	-3887	2349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	505	2157	-8700	-4415	2292	-	-2892	1885	-4150	2370	
25/05/03	2077	908	2462	2200	-3800	2360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	685	2104	-8650	-4402	2294	-	-2868	1665	-4125	2371	
15/06/03	2072	1088	2528	2193	-3818	2363	-	-	-	-	-	-	-	-	-	-	-	-	-	-	693	2262	-9420	-4398	2290	-	-2830	1501	-4287	2368	

PILE 56 - FIELD READINGS

FINAL DEPTH (m) : 43.8

Date printed: 13/07/93

DEPTH (m)	2.8		11.8			19.8				23.8				31.8		39.8			
PILE NO	58-0		58-1			58-2U				58-2L				58-3		58-4			
Date	RED	GREEN	4 GAUGE3	OYO	V.W.	GCO 1	GCO 2	GCO 3	GCO 4	GCO 1	GCO 2	OYO	V.W.	GCO1A	GCO1B	GCO 1	GCO 2	OYO	V.W.
14/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1730	137	-4749	10822
27/04/87	-	-	-	-4280	10721	2890	1038	1234	924	1889	1828	-3806	10714	736	1380	-	-	-	-
29/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1815	161	-4713	10843
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	730	1406	1835	261	-4720	10900
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	756	1378	1961	428	-4786	11157
05/05/87	-	-	-	-	-	2132	1043	1364	1006	1888	1848	-3826	10682	710	1284	1873	186	-4777	11226
05/05/87	-	-	-	-4275	10665	2102	1002	1399	981	1876	1821	-3812	10654	737	1264	1887	253	-4880	11009
08/05/87	-	-	-	-	-	-	-	-	-	1893	1840	-3808	10658	-	-	-	-	-	-
07/05/87	-	-	-	-4483	10811	1878	812	-	-	2085	2070	-3897	11011	867	1281	2530	943	-4829	11885
11/05/87	-	-	-	-4464	10819	1858	778	-	-	1945	1822	-3817	11277	630	1042	2301	744	-4800	12658
14/05/87	-	-	-	-4506	10804	1853	776	-	-	1957	1819	-3836	11313	640	1043	2301	766	-4817	12649
20/05/87	-	-	-	-	10608	1846	774	-	-	1848	1833	-3837	11307	678	1060	2111	418	-4818	12658
25/05/87	-	-	-	-	10725	1800	723	-	-	1700	1848	-3961	11460	598	978	2113	-	-4886	12800
25/05/87	-	-	-	-	12291	1301	276	-	-	1343	1582	-4381	12432	455	838	2191	-	-4965	13009
28/05/87	-	-	-	-	12319	1290	256	-	-	1332	1578	-4380	12447	460	834	2121	-	-4961	13012
28/05/87	-	-	-	-	12365	1274	223	-	-	1315	1582	-4391	12477	464	804	2152	-	-4982	13034
28/05/87	-	-	-	-	10886	-	666	-	-	1616	1838	-4011	-	617	922	2156	-	-4891	-
05/05/87	-	-	-	-	10702	-	764	-	-	1675	1055	3854	11522	620	944	-	-	4091	12023
12/05/87	-	-	-	-	10751	-	657	-	-	1628	1840	-3966	11487	744	929	2413	-	-4933	12808
19/05/87	-	-	-	-	10784	-	648	-	-	1532	1801	-3903	11517	781	989	2506	-	-4904	12828
22/05/87	425	1296	-	-	10785	-	629	-	-	1594	1813	3982	11531	204	986	-	-	-	-
26/05/87	420	1292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26/05/87	420	1270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30/05/87	406	1267	-	-	10794	-	626	-	-	1590	1814	3987	11536	-	992	2577	005	4915	12053
17/07/87	442	1293	-	-	10798	-	631	-	-	1577	1809	-3979	11563	729	1130	-	-	-4949	12887
04/08/87	436	1309	-	-	10803	1824	629	-	-	1516	1873	-3973	11575	-	1236	-	-	-4899	12910
20/08/87	440	1376	-	-	10806	2059	627	-	-	1641	1940	4033	11578	-	1220	2047	1127	4961	12914
08/09/87	438	1338	-	-	10808	2165	620	-	-	-124	2008	-4011	11577	346	-	2558	1046	-4928	12922
22/09/87	463	1391	-	-	10807	-	642	-	-	1494	2219	-3989	11587	-	-	2967	1077	-4550	12924
05/10/87	464	1350	-	-	10810	-	570	-	-	1306	2226	4006	11590	-	-	3003	1041	4946	12926
19/10/87	470	1504	-	-	10809	-	707	-	-	1410	2383	-3978	11591	-	-	3027	-	-4930	12935
13/11/87	-	-	-	-	10808	-	520	-	-	1745	2318	-	11594	-	-	2964	-	-4980	12945
13/11/87	453	1342	-	-	10800	-	536	-	-	1745	2325	-	11593	-	-	2969	-	4973	12944
08/12/87	479	1371	-	-	10777	-	558	-	-	1940	2621	-	11534	-	-	2583	-	-4962	12896
05/01/88	514	1390	-	-	10781	-	582	-	-	1944	2461	-	11518	-	-	1831	-	-4963	12895
19/01/88	516	1416	-	-	10747	-	612	-	-	2057	2906	-	11513	-	-	1606	-	5043	12090
08/02/88	537	1421	-	-	10758	-	504	-	-	1820	-	-	11520	-	-	2524	-	-	12884
08/02/88	500	1383	-	-	10758	-	594	-	-	1783	-	-	11515	-	-	-	-	-	12893
04/03/88	536	1424	-	-	10773	-	342	-	-	-	-	-	11542	-	-	-	-	-	12914
07/04/88	504	1395	-	-	10785	-	516	-	-	-	-	-	11549	-	-	-	-	-	12931
19/04/88	470	1358	-	-	10805	-	597	-	-	-	-	-	11564	-	-	-	-	-	12949
19/04/88	504	1399	-	-	10793	-	504	-	-	-	-	-	11550	-	-	-	-	-	12940
31/05/88	524	1419	-	-	10814	-	620	-	-	-	-	-	11585	-	-	-	-	-	12970
04/06/88	505	1394	-	-	10880	-	649	-	-	-	-	-	11664	-	-	-	-	-	13053
10/10/88	462	1304	-	-	10940	-	680	-	-	-	-	-	11739	-	-	-	-	-	13130
01/11/88	558	1386	-	-	10951	-	717	-	-	-	-	-	11745	-	-	-	-	-	13130
08/12/88	483	1375	-	-	10979	-	737	-	-	-	-	-	11778	-	-	-	-	-	13185

PILE 58 - FIELD READINGS

FINAL DEPTH (m) : 43.8

Date printed: 13/07/93

DEPTH (m)	2.8		11.8			19.8				23.8				31.8		39.8			
PILE NO	58-0		58-1			58-2U				58-2L				58-3		58-4			
Date	RED	GREEN	4 GAUGES	OYO	V.W.	GCO 1	GCO 2	GCO 3	GCO 4	GCO 1	GCO 2	OYO	V.W.	GCO1A	GCO1B	GCO 1	GCO 2	OYO	V.W.
05/01/89	486	1393	-	-	10988	-	744	-	-	-	-	-	11798	-	-	-	-	-	13197
13/02/89	463	1339	-	-	10998	-	768	-	-	-	-	-	11798	-	-	-	-	-	13215
07/03/89	475	1329	-	-	11000	-	764	-	-	-	-	-	11806	-	-	-	-	-	13216
07/04/89	429	1325	-	-	11003	-	788	-	-	-	-	-	11797	-	-	-	-	-	13214
08/05/89	417	1284	-	-	10995	-	788	-	-	-	-	-	11795	-	-	-	-	-	13220
03/06/89	429	1242	-	-	10999	-	802	-	-	-	-	-	11803	-	-	-	-	-	13221
07/07/89	447	1232	-	-	11005	-	-	-	-	-	-	-	11815	-	-	-	-	-	13244
08/08/89	471	1223	-	-	11005	-	558	-	-	-	-	-	11822	-	-	-	-	-	13246
04/09/89	440	1223	-	-	11010	-	-	-	-	-	-	-	11827	-	-	-	-	-	13259
04/10/89	-	1249	-	-	11016	-	-	-	-	-	-	-	11826	-	-	-	-	-	13262
08/11/89	519	1215	-	-	11024	-	-	-	-	-	-	-	11847	-	-	-	-	-	13274
14/12/89	-	-	-	-	11032	-	-	-	-	-	-	-	11859	-	-	-	-	-	13287
15/01/90	555	1289	-	-	11035	-	-	-	-	-	-	-	11859	-	-	-	-	-	13289
09/04/90	630	0	-	-	11036	-	-	-	-	-	-	-	-	-	-	-	-	-	13310
11/05/90	696	1319	-	-	11038	-	-	-	-	-	-	-	-	-	-	-	-	-	13324
11/06/90	750	1304	-	-	11037	-	-	-	-	-	-	-	-	-	-	-	-	-	13326
10/07/90	580	1308	-	-	11040	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13/08/90	553	1369	-	-	11050	-	-	-	-	-	-	-	-	-	-	-	-	-	13342
15/10/90	394	1304	-	-	11056	-	-	-	-	-	-	-	-	-	-	-	-	-	13333
22/01/91	360	1276	-	-	11072	-	-	-	-	-	-	-	-	-	-	-	-	-	13368
14/02/91	260	1274	-	-	11074	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18/04/91	356	1291	-	-	11070	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/06/91	335	1351	-	-	11066	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/07/91	223	1262	-	-	11055	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/08/91	323	1270	-	-	11064	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26/09/91	339	1273	-	-	11066	-	825	-	-	-	-	-	-	-	-	-	-	-	-
31/10/91	332	1497	-	-	11060	-	950	-	-	-	-	-	-	-	-	-	-	-	-
04/12/91	307	1245	-	-	11079	-	825	-	-	-	-	-	-	-	-	-	-	-	-
08/01/92	303	1231	-	-	11077	-	788	-	-	-	-	-	-	-	-	-	-	-	-
26/02/92	293	1226	-	-	11082	-	702	-	-	-	-	-	-	-	-	-	-	-	-
27/03/92	319	1272	-	-	11076	-	880	-	-	-	-	-	-	-	-	-	-	-	-
29/04/92	332	1263	-	-	11075	-	929	-	-	-	-	-	-	-	-	-	-	-	-
10/06/92	295	1411	-	-	11072	-	1006	-	-	-	-	-	-	-	-	-	-	-	-
18/08/92	550	1324	-	-	-	-	1146	-	-	-	-	-	-	-	-	-	-	-	-
21/09/92	538	1510	-	-	-	-	1189	-	-	-	-	-	-	-	-	-	-	-	-
27/10/92	307	1243	-	-	-	-	1104	-	-	-	-	-	-	-	-	-	-	-	-
12/11/92	429	994	-	-	-	-	907	-	-	-	-	-	-	-	-	-	-	-	-
23/12/92	445	1184	-	-	-	-	1072	-	-	-	-	-	-	-	-	-	-	-	-
21/01/93	334	1247	-	-	-	-	1060	-	-	-	-	-	-	-	-	-	-	-	-
18/02/93	329	1295	-	-	-	-	1068	-	-	-	-	-	-	-	-	-	-	-	-
10/03/93	346	1191	-	-	-	-	1028	-	-	-	-	-	-	-	-	-	-	-	-
30/03/93	349	1264	-	-	-	-	1072	-	-	-	-	-	-	-	-	-	-	-	-
18/04/93	270	1480	-	-	-	-	1078	-	-	-	-	-	-	-	-	-	-	-	-
12/05/93	310	1380	-	-	-	-	1302	-	-	-	-	-	-	-	-	-	-	-	-
18/05/93	326	1226	-	-	-	-	1430	-	-	-	-	-	-	-	-	-	-	-	-
25/05/93	307	1131	-	-	-	-	1421	-	-	-	-	-	-	-	-	-	-	-	-
15/06/93	363	1338	-	-	-	-	1278	-	-	-	-	-	-	-	-	-	-	-	-

PILE 68 - CORRECTED 3TRAIN

FINAL DEPTH (m) : 43.8

Date printed: 13/07/93

DEPTH (m)	2.8		11.8			19.8				23.8				31.8		39.8			
PILE NO	58-0		58-1			58-2J				58-2L				58-3		58-4			
Date	RED	GREEN	4 GAUGES	OYO	V.W.	GCO 1	GCO 2	GCO 3	GCO 4	GCO 1	GCO 2	OYO	V.W.	GCO1A	GCO1B	GCO 1	GCO 2	OYO	V.W.
14/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1730	137	-3968	2562
27/04/87	-	-	-	-3580	2610	2690	1036	1234	924	1889	1828	-3173	2613	736	1350	-	-	-	-
28/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1816	161	-3928	2506
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	730	1406	1835	261	-3933	2525
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	756	1378	1901	428	-3968	2410
05/05/87	-	-	-	-	-	2132	1043	1364	1036	1888	1948	-3188	2633	710	1286	1873	185	-3961	2381
05/05/87	-	-	-	-3563	2638	2102	1002	1390	961	1876	1921	-3177	2643	737	1254	1887	253	-4067	2475
06/05/87	-	-	-	-	-	-	-	-	-	1893	1940	-3173	2641	-	-	-	-	-	-
07/05/87	-	-	-	-3719	2664	1876	812	-	-	2065	2070	-3081	2474	867	1281	2630	943	-3774	2124
11/05/87	-	-	-	-3720	2680	1856	776	-	-	1945	1922	-3181	2369	630	1042	2301	744	-4000	1902
14/05/87	-	-	-	-3754	2688	1853	776	-	-	1957	1919	-3197	2344	640	1043	2301	766	-4014	1875
20/05/87	-	-	-	-	2668	1846	774	-	-	1848	1833	-3196	2347	678	1050	2111	415	-4013	1872
25/05/87	-	-	-	-	2608	1800	723	-	-	1700	1846	-3293	2284	599	978	2113	-	-4082	1831
26/05/87	-	-	-	-	1986	1301	276	-	-	1343	1582	-3651	1941	455	838	2191	-	-4138	1773
26/05/87	-	-	-	-	1977	1290	256	-	-	1332	1576	-3650	1936	460	834	2121	-	-4134	1772
26/05/87	-	-	-	-	1982	1274	223	-	-	1315	1582	-3659	1927	464	804	2152	-	-4135	1766
26/05/87	-	-	-	-	2531	-	666	-	-	1616	1839	-3343	-	617	922	2156	-	-4076	-
05/06/87	-	-	-	-	2501	-	764	-	-	1676	1855	3295	2260	620	944	-	-	4076	1024
12/06/87	-	-	-	-	2596	-	657	-	-	1628	1840	-3305	2274	744	929	2413	-	-4111	1829
19/06/87	-	-	-	-	2580	-	648	-	-	1632	1901	-3253	2282	781	989	2506	-	-4087	1823
22/06/87	425	1296	-	-	2579	-	629	-	-	1594	1813	3327	2256	204	966	-	-	-	-
26/06/87	420	1292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26/06/87	420	1270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30/06/87	406	1267	-	-	2575	-	626	-	-	1590	1814	3331	2254	-	982	2677	005	4096	1016
17/07/87	442	1293	-	-	2573	-	631	-	-	1577	1809	-3316	2244	729	1130	-	-	-4124	1806
04/08/87	438	1309	-	-	2571	1824	629	-	-	1518	1873	-3311	2239	-	1236	-	-	-4083	1800
20/08/87	440	1376	-	-	2569	2059	627	-	-	1641	1940	3361	2230	-	1228	2047	1127	4126	1799
06/09/87	438	1336	-	-	2568	2165	620	-	-	-124	2006	-3343	2238	346	-	2858	1046	-4107	1797
22/09/87	463	1381	-	-	2569	-	642	-	-	1494	2219	-3324	2234	-	-	2967	1077	-3792	1796
05/10/87	464	1350	-	-	2567	-	670	-	-	1306	2226	3330	2233	-	-	3003	1041	4122	1796
19/10/87	470	1504	-	-	2568	-	707	-	-	1410	2363	-3315	2233	-	-	3027	-	-4106	1793
13/11/87	-	-	-	-	2568	-	520	-	-	1745	2318	-	2232	-	-	2964	-	-4150	1780
13/11/87	453	1342	-	-	2560	-	536	-	-	1745	2325	-	2232	-	-	2969	-	4144	1791
06/12/87	479	1371	-	-	2583	-	556	-	-	1940	2521	-	2256	-	-	2583	-	-4127	1804
06/01/88	514	1390	-	-	2596	-	582	-	-	1944	2461	-	2261	-	-	1631	-	-4136	1804
19/01/88	516	1416	-	-	2597	-	612	-	-	2057	2906	-	2263	-	-	1606	-	4203	1006
08/02/88	537	1421	-	-	2592	-	504	-	-	1820	-	-	2261	-	-	2624	-	-	1804
08/02/88	500	1383	-	-	2592	-	594	-	-	1763	-	-	2263	-	-	-	-	-	1805
04/03/88	536	1424	-	-	2505	-	342	-	-	-	-	-	2262	-	-	-	-	-	1799
07/04/88	504	1386	-	-	2579	-	515	-	-	-	-	-	2249	-	-	-	-	-	1794
19/04/88	470	1358	-	-	2570	-	597	-	-	-	-	-	2243	-	-	-	-	-	1789
19/04/88	504	1399	-	-	2575	-	504	-	-	-	-	-	2246	-	-	-	-	-	1788
31/05/88	524	1419	-	-	2565	-	620	-	-	-	-	-	2236	-	-	-	-	-	1783
04/06/88	505	1384	-	-	2534	-	649	-	-	-	-	-	2205	-	-	-	-	-	1781
10/10/88	462	1384	-	-	2503	-	690	-	-	-	-	-	2177	-	-	-	-	-	1740
01/11/88	558	1386	-	-	2502	-	717	-	-	-	-	-	2178	-	-	-	-	-	1740
08/12/88	453	1375	-	-	2489	-	737	-	-	-	-	-	2184	-	-	-	-	-	1726

FILE 58 - CORRECTED STRAIN

FINAL DEPTH (m) : 43.8

Date printed: 13/07/93

DEPTH (m)	2.6		11.8			19.8				23.8				31.8		39.8			
PILE NO	58-0		58-1			58-2U				58-2L				58-3		58-4			
Date	RED	GREEN	4 GAUGES	OYO	V.W.	GCO 1	GCO 2	GCO 3	GCO 4	GCO 1	GCO 2	OYO	V.W.	GCO1A	GCO1B	GCO 1	GCO 2	OYO	V.W.
06/01/89	466	1393	-	-	2485	-	744	-	-	-	-	-	2180	-	-	-	-	-	1723
13/02/89	463	1339	-	-	2480	-	765	-	-	-	-	-	2158	-	-	-	-	-	1718
07/03/89	476	1329	-	-	2479	-	764	-	-	-	-	-	2152	-	-	-	-	-	1718
07/04/89	429	1326	-	-	2478	-	786	-	-	-	-	-	2156	-	-	-	-	-	1718
08/05/89	417	1264	-	-	2482	-	788	-	-	-	-	-	2156	-	-	-	-	-	1717
03/06/89	429	1242	-	-	2480	-	802	-	-	-	-	-	2163	-	-	-	-	-	1716
07/07/89	447	1232	-	-	2477	-	-	-	-	-	-	-	2149	-	-	-	-	-	1710
08/08/89	471	1223	-	-	2477	-	558	-	-	-	-	-	2147	-	-	-	-	-	1710
04/09/89	440	1223	-	-	2478	-	-	-	-	-	-	-	2145	-	-	-	-	-	1708
04/10/89	-	1248	-	-	2472	-	-	-	-	-	-	-	2145	-	-	-	-	-	1708
08/11/89	519	1215	-	-	2469	-	-	-	-	-	-	-	2137	-	-	-	-	-	1703
14/12/89	-	-	-	-	2465	-	-	-	-	-	-	-	2133	-	-	-	-	-	1699
15/01/90	565	1269	-	-	2464	-	-	-	-	-	-	-	2133	-	-	-	-	-	1699
09/04/90	630	0	-	-	2463	-	-	-	-	-	-	-	-	-	-	-	-	-	1693
11/06/90	696	1319	-	-	2462	-	-	-	-	-	-	-	-	-	-	-	-	-	1690
11/08/90	750	1304	-	-	2463	-	-	-	-	-	-	-	-	-	-	-	-	-	1689
10/07/90	580	1308	-	-	2461	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/09/90	653	1369	-	-	2453	-	-	-	-	-	-	-	-	-	-	-	-	-	1605
15/10/90	384	1304	-	-	2454	-	-	-	-	-	-	-	-	-	-	-	-	-	1688
22/01/91	350	1278	-	-	2447	-	-	-	-	-	-	-	-	-	-	-	-	-	1679
14/02/91	360	1274	-	-	2446	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16/04/91	356	1291	-	-	2448	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/06/91	335	1351	-	-	2450	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/07/91	323	1262	-	-	2454	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/08/91	323	1270	-	-	2451	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26/09/91	339	1273	-	-	2450	-	825	-	-	-	-	-	-	-	-	-	-	-	-
31/10/91	332	1497	-	-	2449	-	850	-	-	-	-	-	-	-	-	-	-	-	-
04/12/91	307	1245	-	-	2444	-	825	-	-	-	-	-	-	-	-	-	-	-	-
08/01/92	303	1231	-	-	2445	-	788	-	-	-	-	-	-	-	-	-	-	-	-
26/02/92	293	1226	-	-	2443	-	702	-	-	-	-	-	-	-	-	-	-	-	-
27/03/92	319	1272	-	-	2445	-	880	-	-	-	-	-	-	-	-	-	-	-	-
29/04/92	332	1263	-	-	2446	-	929	-	-	-	-	-	-	-	-	-	-	-	-
10/06/92	295	1411	-	-	2447	-	1006	-	-	-	-	-	-	-	-	-	-	-	-
16/08/92	580	1324	-	-	-	-	1146	-	-	-	-	-	-	-	-	-	-	-	-
21/09/92	538	1510	-	-	-	-	1189	-	-	-	-	-	-	-	-	-	-	-	-
27/10/92	307	1243	-	-	-	-	1104	-	-	-	-	-	-	-	-	-	-	-	-
12/11/92	429	994	-	-	-	-	907	-	-	-	-	-	-	-	-	-	-	-	-
23/12/92	445	1184	-	-	-	-	1072	-	-	-	-	-	-	-	-	-	-	-	-
21/01/93	334	1247	-	-	-	-	1060	-	-	-	-	-	-	-	-	-	-	-	-
16/02/93	329	1295	-	-	-	-	1088	-	-	-	-	-	-	-	-	-	-	-	-
10/03/93	348	1191	-	-	-	-	1028	-	-	-	-	-	-	-	-	-	-	-	-
30/03/93	349	1264	-	-	-	-	1072	-	-	-	-	-	-	-	-	-	-	-	-
15/04/93	270	1480	-	-	-	-	1078	-	-	-	-	-	-	-	-	-	-	-	-
12/05/93	310	1380	-	-	-	-	1302	-	-	-	-	-	-	-	-	-	-	-	-
18/06/93	326	1226	-	-	-	-	1430	-	-	-	-	-	-	-	-	-	-	-	-
25/06/93	307	1131	-	-	-	-	1421	-	-	-	-	-	-	-	-	-	-	-	-
15/08/93	363	1338	-	-	-	-	1278	-	-	-	-	-	-	-	-	-	-	-	-

FILE 03 - FIELD READINGS

FINAL DEPTH (m) : 43.5

Data printed: 13/07/93

DEPTH (m)		11.5						19.5						23.5				31.5						39.5					
FILE NO		03-1						03-2U						03-2L				03-3						03-4					
DATE	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	
23/04/87	-	-	-	-	-	-	2008	2203	2008	1498	-3883	10848	2190	-172	-4148	11180	-	-	-	-	-	-	-	-	-	-	-	-	
28/04/87	1882	1382	1384	885	-3828	10847	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
28/04/87	1825	1354	1371	880	-3848	10888	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1777	1722	1525	1130	-4227	11132	
30/04/87	1849	1374	1372	883	-3827	10891	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
01/05/87	1843	1368	1385	877	-3853	10890	-	-	-	-	-	-	-	-	-	-	2126	2042	1907	1901	-2814	11270	1779	1723	1528	1126	-4225	11167	
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2108	2030	1124	1711	2817	11280	1751	1732	1535	1120	-4182	11087	
05/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2058	1888	1105	1745	-2719	11348	1738	1832	1447	1007	-4144	11248	
08/05/87	1879	1375	1372	880	-3831	11003	2208	2207	2078	1549	-3721	10831	2271	-112	-4178	11218	-	-	-	-	-	-	-	-	-	-	-	-	
11/05/87	-	-	-	-	-	-	2254	2084	2158	1822	-3834	11055	2228	-181	-4128	11309	2171	2113	1218	1818	-2835	11040	1788	1858	1448	885	-4111	11330	
12/05/87	1855	1286	1412	908	-3723	11084	2201	2208	1788	1327	-3388	10587	2157	257	-4081	11808	1872	1816	1288	1888	-2715	11884	1704	1880	1327	801	-3824	11812	
14/05/87	-	-	-	-	-	-	2381	-	1781	1333	-3451	10842	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14/05/87	1854	1302	1414	911	-3734	11083	2385	2020	1775	1333	-3451	10842	2088	184	-4111	11745	1871	1788	1158	1751	-2788	12128	1823	1527	1288	735	-4010	11883	
20/05/87	1889	-	1438	908	-	11048	2348	2042	1778	1358	-3458	10830	2122	233	-4111	11741	1788	1787	1145	1735	-2782	12182	1818	1820	1348	782	-4011	12015	
25/05/87	1882	1284	1415	892	-3738	11047	2375	2043	1717	1333	-3450	10874	2105	140	-4143	11784	1778	1774	1118	1704	-2821	12237	1803	1508	1387	841	-4022	12073	
12/06/87	-	-	-	-	-	-	2412	2044	1883	1308	-3484	10743	2139	44	-4172	11818	1784	1724	1078	1888	-	12288	1582	1508	1485	881	-4082	12107	
14/06/87	1849	1282	1438	911	-3778	11070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
18/06/87	1825	1274	1411	888	-3782	11084	2403	-	1852	1287	-3478	10772	2122	32	-4201	11828	-	-	-	-	-	-	-	-	-	-	-		
18/06/87	1835	1300	1430	897	-3774	11084	2421	-	1870	1301	-3478	10771	2145	84	-4215	11842	1771	1733	1088	1888	-	12278	1878	1523	1481	840	-4034	12116	
30/06/87	1827	1182	1307	815	-3835	11084	2405	2010	1884	1283	-3882	10784	2143	-47	-4318	11851	1702	1837	1038	1879	-	12310	1834	1314	1314	791	-4180	12145	
17/07/87	1883	1303	1434	948	-3811	11083	2486	2088	1888	1344	-3810	10810	2230	8	-4247	11885	-	1724	1131	1776	-	12334	1887	1488	1448	848	-4083	12184	
04/08/87	1849	1281	1425	880	-3805	11089	2713	2070	1854	1338	-3830	10830	-	-150	-4385	11910	1729	1804	1075	1874	-	12373	1538	1473	1428	858	-4083	12187	
20/08/87	1850	1234	1395	820	-3824	11081	2840	2101	1848	1318	-3848	10838	2173	-38	-4280	11813	1858	1870	1078	1882	-	12382	1558	1440	1387	838	-4130	12188	
08/09/87	1855	1287	1402	931	-3817	11088	2832	2112	1882	1388	-3832	10837	2188	-37	-2844	11811	1888	8488	1088	1755	-	12385	1540	1474	1433	874	-4110	12188	
22/09/87	1848	1318	1428	880	-3804	11080	2885	2138	1722	1392	-3818	10848	2195	79	-4244	11823	1888	1750	1105	1734	-	12418	1854	1488	1452	885	-4085	12204	
05/10/87	1838	-	1413	924	-	11080	2822	2078	1737	1407	-3828	10848	2175	22	-4278	11824	1872	1700	1037	1714	-	12424	1541	1482	1458	854	-4085	12208	
19/10/87	1598	-	1373	903	-3855	11094	2882	2215	1787	1488	-3848	10853	2147	171	-4280	11920	1830	1873	1050	1728	-	12408	1518	1810	1430	855	-4120	12214	
08/11/87	1598	-8311	1413	927	-3838	11084	2803	2088	1875	1828	-3803	10853	2184	85	-4253	11924	1945	1814	1058	1858	-	12388	-	-	-	-	-		
08/11/87	1874	-8238	1423	833	-3788	11084	2887	2083	1875	1818	-3821	10858	2185	86	-4263	11820	1884	1833	1088	1881	-	12405	1580	1481	1501	888	-4102	12221	
08/12/87	1709	1489	1445	959	-3818	11048	2905	2099	1877	1723	-3804	10813	2223	118	-4228	11874	2010	1889	1087	2080	-	12354	1548	1488	1501	888	-4082	12175	
05/01/88	1822	1438	1470	971	-3784	11030	2900	2114	2008	1740	-3400	10801	2248	151	-4221	11873	2020	1782	1115	2118	-	-	1502	1482	1508	880	-4127	12188	
18/01/88	1885	1447	1470	971	-3782	11028	2825	2115	2178	1757	-3801	10788	2258	171	-4218	11857	2028	-	1270	2128	-	-	1578	1508	1584	908	-4018	12175	
08/02/88	1885	1447	1487	988	-3758	11041	3018	2108	2283	1738	-3478	10802	2283	158	-4231	11888	2084	-	1138	2214	-	-	1588	1488	1582	918	-4088	12183	
10/02/88	1879	1445	1471	888	-3748	11042	3011	2108	2247	1734	-3478	10803	2287	174	-4212	11887	2081	-	1180	2229	-	-	1581	1575	1584	938	-4072	12182	
04/03/88	1888	1480	1489	978	-3752	11081	3030	2088	2283	1723	-3481	10825	2381	185	-4228	11888	2041	-	1148	2278	-	-	1583	1588	1588	958	-4074	12203	
07/04/88	1813	-	1482	881	-3770	11078	3088	2087	2357	1708	-3822	10842	2280	101	-4287	11887	2078	1878	1158	2320	-	-	1580	1745	1820	988	-4073	12201	
27/04/88	1885	-	1523	885	-3758	11087	3018	2083	2304	1721	-3482	10888	2223	112	-4220	11822	2010	1830	1215	2348	-	-	1580	1774	1584	888	-4087	12242	
27/04/88	1885	-	1523	885	-3781	11087	3029	2084	2280	1733	-3481	10881	2205	121	-4224	11818	2021	1745	1222	2385	-	-	1570	1810	1588	984	-4110	12238	
31/05/88	1873	-	1831	1028	-3788	11108	3022	2081	2278	1889	-3478	10885	2202	108	-4243	11804	2007	1720	1248	2375	-	-	1588	1818	1585	984	-4144	12285	
04/06/88	1845	-	1724	1188	-3758	11187	2888	2088	2317	1888	-3418	10838	2208	138	-4225	11880	-	-	1338	2472	-	-	1584	2023	1730	1037	-4088	12343	
07/10/88	1838	-	1744	1212	-3781	11288	3014	2188	2388	1881	-3428	10878	2218	188	-4243	11883	-	-	1375	2617	-	-	1584	2078	-	-	-4108	12428	
18/10/88	1820	-	1783	1400	-3788	11302	3021	2088	2388	1728	-3430	10893	2238	158	-4238	11888	-	-	1443	2502	-	-	1588	2000	-	-	-4120	12457	
01/11/88	1814	-	1788	1802	-3788	11322	3020	2082	2388	2117	-3432	10810	2238	188	-4268	11812	-	-	2168	2803	-	-	1588	2017	-	-	-4118	12485	
08/12/88	1881	-	-	1058	-3778	11388	3008	2082	3881	1478	-3454	10845	2223	148	-2818	11842	-	-	1281	2484	-	-	1538	2028	-	-	-4148	12508	

FILE #3 - FIELD READINGS

FINAL DEPTH (m) : 43.5

Date printed: 13/07/93

DEPTH (m)	11.5						19.5						23.5						31.5						39.5					
HILL NO	63-1						63-2U						63-2L						63-3						63-4					
DATE	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.		
05/01/89	1804	-	1804	1819	-3783	11325	3014	1892	2324	1836	-3468	10859	2225	151	-4289	11980	-	-	1458	2479	-	-	1538	2043	-	-	-4132	12538		
13/02/89	1910	-	1834	1872	-3783	11303	3021	1891	2328	1849	-3448	10871	2236	170	-4289	11975	-	-	1484	2475	-	-	12734	1550	2172	-	-	-4132	12505	
07/03/89	1926	-	1842	1872	-3814	11309	3040	1895	2323	1843	-3465	10873	2237	200	-4277	11967	-	-	1484	2430	-	-	12738	1591	2335	-	-	-4189	12502	
07/04/89	1886	-	1842	1883	-3759	11282	2983	1885	2327	1844	-3445	10864	2212	181	-4278	11970	-	-	1485	2488	-	-	12748	1618	2458	-	-	-4139	12554	
08/05/89	1898	-	1890	1872	-3777	11235	3024	1882	2312	1844	-3480	10861	2223	239	-4268	11874	-	-	1805	2488	-	-	12728	1718	2482	-	-	-	12603	
03/06/89	1912	-	1898	1879	-3777	11230	3038	2000	2330	1847	-3472	10863	2223	225	-4267	11968	-	-	1492	2488	-	-	12742	1898	-	-	-	-	-	12588
07/07/89	1817	-	1804	1880	3785	11244	3024	2006	2332	1842	3483	10863	2238	255	-4260	11004	-	-	1491	2510	-	-	12757	-	-	-	-	-	-	12577
08/08/89	1878	-	1848	1873	-3774	11285	3007	2044	2306	1850	-3400	10868	2289	280	-4278	12011	-	-	-	-	-	-	12754	-	-	-	-	-	-	12684
04/09/89	2003	-	1927	1867	-3787	11251	3005	2042	2304	1831	-3483	10869	2318	284	-4283	12024	-	-	1448	2857	-	-	12764	-	-	-	-	-	-	12584
04/10/89	2057	-	1953	1855	-3782	11280	3088	2185	2345	1855	-3483	10873	2359	325	-4292	12018	-	-	1445	2858	-	-	12759	-	-	-	-	-	-	12589
05/11/89	2021	-	1948	1841	-3787	11282	3037	2188	2321	1848	-3476	10865	2355	280	-4308	12080	-	-	-	-	-	-	12783	-	-	-	-	-	-	12815
15/01/90	2157	-	1981	1858	-3780	11287	3144	2221	2324	1852	-3486	10866	2326	303	-4280	12083	-	-	-	-	-	-	12804	-	-	-	-	-	-	12835
05/04/90	-	-	1980	1845	-3805	11279	3080	2227	2301	1842	-3489	11007	2398	292	-4301	12064	-	-	-	-	-	-	12817	-	-	-	-	-	-	12880
11/05/90	-	-	1992	1823	-3807	11282	2983	2208	2284	1835	-3457	11013	2278	275	-4344	12078	-	-	-	-	-	-	12832	-	-	-	-	-	-	12884
11/08/90	-	-	2035	1888	-3775	11279	3726	2244	2307	1855	-3488	11008	2846	283	-4301	12088	-	-	-	-	-	-	12828	-	-	-	-	-	-	12884
10/07/90	-	-	2108	1893	-3784	11279	-	2270	2368	1743	-3472	11010	2804	314	-4298	12083	-	-	-	-	-	-	12832	-	-	-	-	-	-	12884
13/09/90	2158	1842	2115	1824	-3785	11283	3080	2080	2400	1785	-3584	11029	2988	310	-4298	12088	-	-	-	-	-	-	12845	-	-	-	-	-	-	12883
15/10/90	1983	1728	2105	1842	-3777	11283	2830	2253	2339	1585	-3547	11017	2324	324	-4251	12080	-	-	-	-	-	-	12837	-	-	-	-	-	-	-
22/01/91	1051	1837	2087	1808	3672	11310	2002	2260	2401	1882	3823	11038	2335	207	-4208	12107	-	-	-	-	-	-	12888	-	-	-	-	-	-	-
14/03/91	1855	1828	2035	1783	-3788	11314	2898	2287	2480	1823	-3489	11041	2289	313	-4254	12104	-	-	-	-	-	-	12870	-	-	-	-	-	-	-
18/04/91	1999	1802	2088	1818	-3783	11309	3027	2081	2522	1849	-3478	11032	2282	287	-4301	12098	-	-	-	-	-	-	12881	-	-	-	-	-	-	-
03/06/91	2004	1895	2130	1811	-3789	11305	3000	2348	2489	1853	-3510	11028	2313	337	-4300	12085	-	-	-	-	-	-	12885	-	-	-	-	-	-	-
04/07/91	2003	1840	2188	1804	-3780	11298	3009	2370	2333	1878	-3844	11027	2283	404	-4280	12088	-	-	-	-	-	-	12838	-	-	-	-	-	-	-
07/08/91	2010	1808	2205	1802	-3817	11300	3035	2380	2518	1717	-3813	11025	2320	480	-4288	12089	-	-	-	-	-	-	12861	-	-	-	-	-	-	-
26/09/91	2042	1892	2244	1783	-3790	11289	3028	2395	2581	1713	-3489	11017	2295	488	-4222	12081	-	-	-	-	-	-	12852	-	-	-	-	-	-	-
31/10/91	2025	1821	2191	1787	-3809	11304	3009	2395	2483	1708	-3542	11036	2289	507	-4281	12104	-	-	-	-	-	-	12883	-	-	-	-	-	-	-
04/12/91	2031	1887	2213	1733	-3808	11317	3083	2423	2528	1708	-3528	11038	2308	448	-4211	12104	-	-	-	-	-	-	12878	-	-	-	-	-	-	-
08/01/92	2083	-	2222	1743	-3778	11321	2880	2508	2550	1727	-3828	11042	2380	558	-4248	12110	-	-	-	-	-	-	12883	-	-	-	-	-	-	-
28/02/92	2047	-	2240	1884	-3813	11318	3080	2688	2548	1730	-3818	11041	2344	585	-4286	12112	-	-	-	-	-	-	12888	-	-	-	-	-	-	-
27/03/92	2095	-	2230	1823	-3793	11314	3192	2895	2589	1712	-3518	11034	2345	553	-4322	12104	-	-	-	-	-	-	12881	-	-	-	-	-	-	-
20/04/92	2100	-	2388	1887	3607	11304	3380	2878	2883	1703	3457	11027	2343	288	4181	12030	-	-	-	-	-	-	12875	-	-	-	-	-	-	-
10/06/92	2094	-	2341	1844	-3742	11305	3540	2884	2888	1780	-3523	11028	2380	340	-4238	12100	-	-	-	-	-	-	12888	-	-	-	-	-	-	-
18/08/92	2171	-	2404	1800	-3851	11288	3418	2803	2822	1841	-3468	11018	2424	388	-4161	12093	-	-	-	-	-	-	12878	-	-	-	-	-	-	-
21/09/92	2140	-	2274	1720	-3784	11300	3285	2808	2783	1831	-3489	11021	2034	293	-4988	12100	3385	3481	3283	3532	-	-	12879	-	-	-	-	-	-	-
27/10/92	2158	-	2331	1815	-3754	11308	3318	2713	2815	1848	-3471	11023	2337	380	-4238	12098	3483	3552	2345	3586	-	-	12879	-	-	-	-	-	-	-
12/11/92	2180	-	2350	1817	-3784	11313	3831	2715	2833	2075	-3480	11030	2474	514	-4248	12112	3620	3630	2380	3855	-	-	12885	-	-	-	-	-	-	-
23/12/92	2180	-	2380	1823	-3758	11318	3585	2552	3073	2184	-3485	11041	2410	281	-4234	12125	3633	3683	2432	3880	-	-	12910	-	-	-	-	-	-	-4088
21/01/93	2181	-	2314	1815	-3780	11328	3434	2712	3107	2255	-3471	11047	2447	578	-4248	12133	3443	3608	2283	3585	-	-	12915	-	-	-	-	-	-	-4080
18/02/93	2157	-	2282	1847	-3747	11318	3453	2728	2844	2233	-3478	11041	2434	488	-4383	12125	3000	2878	1738	3117	-	-	12814	-	-	-	-	-	-	-4078
10/03/93	2134	-	2307	1825	-3782	11318	3382	2650	3053	2302	-3470	11037	2472	500	-4284	12118	3048	2841	1855	3010	-	-	12888	-	-	-	-	-	-	-4078
30/04/93	2105	-	1844	1895	-3813	11313	3884	2841	2829	2788	-3475	11033	2478	882	-4517	12115	2805	2827	1820	2875	-	-	12909	-	-	-	-	-	-	-4135
15/04/93	2122	-	2302	1808	-3770	11314	3593	2827	3194	2371	-3449	11034	2510	705	-4248	12120	2880	2810	1595	2550	-	-	12909	-	-	-	-	-	-	-3980
12/05/93	2168	-	2370	1852	3817	11301	3811	3058	3284	2808	3488	11027	2431	702	4244	12110	2802	2005	1800	2872	-	-	12005	-	-	-	-	-	-	4170
18/05/93	2140	-	2300	1843	-3803	11301	3488	2815	3328	3080	-3512	11028	2580	847	-4188	12113	2880	3140	1870	2870	-	-								

FILE 83 - CORRECTED STRAIN

FINAL DEPTH (m) : 43.8

Date printed: 13/07/83

DEPTH (m)	11.8						19.8						23.8				31.8						36.8							
	FILE NO	83-1						83-2U						83-2L				83-3						83-4						
		DATE	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.
23/04/87	-	-	-	-	-	-	-	2308	2203	2008	1488	-3089	2848	2190	-172	-3405	2408	-	-	-	-	-	-	-	-	-	-	-	-	
28/04/87	1882	1382	1384	885	-3188	2880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
28/04/87	1825	1354	1371	880	-3207	2828	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1777	1722	1525	1130	-3523	2421
30/04/87	1849	1374	1372	883	-3188	2828	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
01/05/87	1843	1368	1385	877	-3188	2871	-	-	-	-	-	-	-	-	-	-	-	2128	2049	1107	1201	-2345	2169	1779	1793	1828	1128	-3491	2410	
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2108	2030	1124	1711	2348	2370	1751	1732	1838	1120	3443	2438	
05/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2038	1888	1100	1740	-2288	2328	1738	1832	1447	1007	-3463	2371	
08/05/87	1879	1375	1372	880	-3183	2478	2808	2207	2078	1848	-3101	2884	2271	-112	-3483	2384	-	-	-	-	-	-	-	-	-	-	-	-		
11/05/87	-	-	-	-	-	-	2354	2084	2159	1622	-3028	2455	2228	-181	-3438	2325	2171	2113	1218	1818	-2448	2481	1759	1858	1449	885	-3428	2337		
12/05/87	1855	1288	1412	808	-3103	2451	2831	2208	1788	1327	-2833	2877	2157	257	-3384	2228	1872	1818	1258	1888	-2283	2121	1704	1580	1327	801	-3270	2150		
14/05/87	-	-	-	-	-	-	2381	-	1781	1333	-2878	2848	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
14/05/87	1854	1302	1414	911	-3112	2442	2385	2020	1775	1333	-2878	2848	2088	184	-3428	2175	1871	1788	1158	1751	-2323	2038	1823	1527	1299	735	-3342	2088		
20/05/87	1888	-	1438	838	-	2458	2348	2042	1775	1358	-2888	2855	2122	233	-3428	2178	1788	1787	1145	1735	-2318	2022	1818	1520	1348	782	-3343	2078		
25/05/87	1882	1284	1415	822	-3115	2458	2375	2043	1717	1333	-2875	2833	2105	140	-3453	2180	1778	1774	1118	1704	-2351	2003	1803	1508	1387	841	-3352	2058		
12/08/87	-	-	-	-	-	-	2412	2044	1883	1308	-2812	2889	2138	44	-3477	2148	1784	1724	1075	1858	-	1884	1582	1508	1485	851	-3385	2047		
16/08/87	1848	1282	1438	811	-3148	2448	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
18/08/87	1825	1274	1411	888	-3135	2442	2403	-	1852	1287	-2887	2885	2122	32	-3501	2144	-	-	-	-	-	-	-	-	-	-	-	-		
18/08/87	1838	1300	1430	837	-3148	2442	2421	-	1870	1301	-2887	2888	2148	64	-3513	2130	1771	1733	1088	1888	-	1000	1578	1523	1451	840	-3382	2044		
30/08/87	1827	1182	1307	815	-3278	2442	2405	2010	1884	1283	-2885	2875	2143	-47	-3088	2138	1702	1837	1038	1879	-	1880	1534	1314	1314	781	-3483	2034		
17/07/87	1883	1303	1434	848	-3178	2442	2488	2088	1886	1344	-2828	2887	2220	8	-3838	2131	-	1724	1131	1778	-	1872	1587	1485	1448	848	-3403	2028		
04/08/87	1848	1281	1425	820	-3171	2440	2713	2070	1854	1338	-2842	2858	-	-180	-3883	2115	1729	1804	1075	1874	-	1880	1538	1473	1428	885	-3403	2020		
20/08/87	1850	1234	1385	820	-3187	2438	2840	2101	1848	1318	-2854	2854	2173	-38	-3875	2114	1858	1870	1078	1882	-	1887	1588	1440	1387	838	-3442	2020		
08/08/87	1585	1287	1402	831	-3181	2440	2832	2112	1882	1388	-2843	2854	2188	-37	-2203	2115	1888	1488	1088	1755	-	1882	1540	1474	1433	874	-3428	2017		
22/08/87	1848	1318	1428	880	-3170	2438	2885	2138	1722	1382	-2803	2850	2185	79	-3837	2110	1888	1750	1105	1734	-	1845	1554	1485	1452	885	-3413	2014		
05/10/87	1838	-	1413	824	-	2438	2822	2078	1737	1407	-2840	2848	2175	22	-3885	2110	1872	1700	1037	1714	-	1844	1541	1482	1458	884	-3413	2014		
18/10/87	1588	-	1373	803	-3213	2438	2882	2215	1787	1488	-2885	2847	2147	171	-3875	2111	1830	1873	1050	1728	-	1848	1518	1810	1430	885	-3433	2011		
08/11/87	1588	-8311	1413	827	-3187	2438	2803	2088	1875	1828	-2824	2847	2184	85	-3544	2110	1845	1814	1058	1858	-	1851	-	-	-	-	-	-		
09/11/87	1824	-8238	1423	833	-3183	2438	2887	2083	1875	1818	-2808	2848	2185	88	-3544	2111	1854	1833	1088	1881	-	1850	1500	1481	1801	888	-3418	2008		
08/12/87	1709	1488	1445	959	-2932	2458	2805	2089	1977	1723	-2820	2888	2223	118	-3523	2128	2010	1889	1087	2080	-	1888	1548	1488	1501	888	-3385	2024		
05/01/88	1822	1438	1470	871	-3137	2488	2800	2114	2008	1740	-2818	2872	2248	151	-3518	2128	2020	1782	1115	2118	-	-	1502	1482	1508	880	3430	2020		
18/01/88	1885	1447	1470	871	-3135	2487	2825	2115	2178	1757	-2818	2877	2258	171	-3615	2134	2028	-	1148	2278	-	-	1578	1508	1584	888	-3348	2024		
08/02/88	1885	1447	1487	888	-3104	2481	3018	2109	2883	1738	-2887	2871	2283	158	-3828	2130	2084	-	1135	2214	-	-	1588	1488	1584	918	-3407	2021		
10/02/88	1878	1445	1471	885	-3123	2481	3011	2108	2847	1734	-2888	2871	2257	174	-3510	2130	2081	-	1180	2228	-	-	1581	1585	1584	938	-3383	2022		
04/03/88	1888	1480	1488	878	-3127	2482	3030	2088	2883	1723	-2888	2880	2381	185	-3823	2123	2041	-	1148	2278	-	-	1583	1588	1888	888	-3385	2015		
07/04/88	1913	-	1482	851	-3142	2485	3038	2087	2887	1708	-2835	2882	2280	101	-3888	2118	2078	1878	1158	2280	-	-	1580	1745	1820	988	-3384	2010		
27/04/88	1885	-	1823	888	-3132	2438	3018	2083	2804	1721	-2810	2841	2223	112	-3517	2111	2010	1830	1215	2248	-	-	1580	1774	1584	988	-3388	2002		
27/04/88	1885	-	1823	888	-3134	2441	3029	2084	2880	1733	-2808	2843	2205	121	-3820	2112	2001	1745	1222	2385	-	-	1570	1810	1588	984	-3425	2003		
31/05/88	1873	-	1831	1028	-3185	2433	3022	2051	2878	1889	-2888	2832	2202	108	-3838	2117	2007	1720	1248	2375	-	-	1558	1818	1585	984	-3453	1988		
04/08/88	1945	-	1724	1188	-3130	2383	2886	2058	2817	1888	-2847	2807	2208	138	-3821	2097	-	-	1338	2472	-	-	1584	2023	1730	1037	-3405	1888		
07/10/88	1838	-	1744	1212	-3188	2383	3014	2040	2880	1881	-2888	2838	2218	158	-3838	2100	-	-	1378	2517	-	-	1871	1854	2025	-	-	1843		
18/10/88	1920	-	1783	1400	-3140	2348	3021	2038	2858	1728	-2888	2828	2238	158	-3832	2118	-	-	1443	2502	-	-	1883	1852	2000	-	-	-3433	1933	
01/11/88	1914	-	1788	1802	-3132	2340	3020	2032	2860	2117	-2880	2818	2228	188	-3848	2114	-	-	1488	2503	-	-	1880	1882	2017	-	-	3420	1934	
08/12/88	1881	-	-	1558	-3148	2321	3008	2022	2881	1478	-2878	2804	2223	148	-2432	2104	-	-	1281	2484	-	-	1538	2028	-	-	-	-3407	1918	

FILE 83 - CORRECTED STRAIN

FINAL DEPTH (m): 43.6

Data printed: 13/07/83

DEPTH (m) FILE NO	11.5						19.5						23.5						31.5						39.5					
	83-1						83-2U						83-2L						83-3						83-4					
	DATE	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	
05/01/89	1904	-	1804	1818	-3153	2338	3014	1892	2324	1838	-2882	2488	2225	181	-3554	2387	-	-	1488	2478	-	-	1938	2043	-	-	-3443	1808		
13/02/89	1910	-	1834	1872	-3138	2348	3021	1891	2328	1848	-2874	2492	2238	170	-3555	2382	-	-	1484	2475	-	-	1850	1950	2172	-	-	-3443	1903	
07/03/89	1928	-	1842	1872	-3178	2346	3040	1885	2323	1843	-2913	2482	2337	200	-3584	2388	-	-	1484	2430	-	-	1848	1981	2336	-	-	-3481	1804	
07/04/89	1888	-	1842	1853	-3130	2353	2893	1885	2327	1844	-2871	2486	2212	181	-3588	2384	-	-	1488	2488	-	-	1848	1818	2458	-	-	-3448	1804	
07/05/89	1898	-	1880	1872	-3148	2377	3024	1892	2312	1844	-2885	2487	2221	207	-3588	2382	-	-	1500	2488	-	-	1852	1718	2482	-	-	-	1874	
03/06/89	1912	-	1898	1879	-3148	2370	3038	2000	2330	1847	-2883	2486	2223	225	-3573	2388	-	-	1482	2488	-	-	1848	1898	-	-	-	-	1899	
07/07/89	1817	-	1880	1880	3154	2373	3024	2005	2332	1842	-2900	2408	2238	285	3575	2385	-	-	1401	2810	-	-	1943	-	-	-	-	-	1807	
08/08/89	1878	-	1848	1873	-3140	2384	3007	2044	2355	1885	-2879	2485	2289	280	-3585	2380	-	-	-	-	-	-	1844	-	-	-	-	-	1884	
04/09/89	2003	-	1867	1887	-3158	2370	3005	2042	2304	1831	-2903	2483	2318	284	-3589	2375	-	-	1448	2887	-	-	1841	-	-	-	-	-	1884	
04/10/89	2057	-	1883	1885	-3180	2388	3086	2185	2345	1858	-2888	2482	2358	325	-3577	2378	-	-	1448	2858	-	-	1843	-	-	-	-	-	1893	
08/11/89	2021	-	1848	1841	-3184	2383	3037	2188	2321	1846	-2888	2485	2353	280	-3581	2388	-	-	-	-	-	-	1838	-	-	-	-	-	1885	
15/01/90	2157	-	1881	1858	-3180	2383	3144	2221	2324	1852	-2907	2481	2328	303	-3587	2382	-	-	-	-	-	-	1830	-	-	-	-	-	1879	
08/04/90	-	-	1880	1845	-3171	2358	3080	2227	2301	1842	-2908	2478	2398	282	-3584	2381	-	-	-	-	-	-	1828	-	-	-	-	-	1875	
11/05/90	-	-	1862	1823	-3173	2357	2893	2208	2284	1835	-2888	2473	2278	275	-3620	2057	-	-	-	-	-	-	1822	-	-	-	-	-	1871	
11/06/90	-	-	2035	1886	-3148	2358	3728	2244	2307	1855	-2907	2475	2848	283	-3584	2381	-	-	-	-	-	-	1823	-	-	-	-	-	1871	
10/07/90	-	-	2108	1893	-3137	2358	-	2270	2388	1743	-2883	2475	2804	314	-3548	2382	-	-	-	-	-	-	1822	-	-	-	-	-	1871	
13/08/90	2158	1842	2115	1854	-3164	2362	3280	2280	2400	1895	-2870	2488	2688	310	-3599	2384	-	-	-	-	-	-	1818	-	-	-	-	-	1885	
15/10/90	1983	1728	2105	1842	-3148	2352	2830	2253	2338	1885	-2958	2472	2324	324	-3543	2358	-	-	-	-	-	-	1821	-	-	-	-	-	-	
22/01/91	1881	1837	2087	1808	-3080	2345	2002	2380	2401	1882	-3038	2482	2325	337	-3682	2047	-	-	-	-	-	-	1812	-	-	-	-	-	-	
14/03/91	1856	1828	2035	1783	-3157	2344	2898	2387	2480	1823	-2908	2481	2298	313	-3545	2048	-	-	-	-	-	-	1811	-	-	-	-	-	-	
18/04/91	1888	1802	2088	1818	-3183	2348	3027	2381	2822	1849	-2887	2485	2282	287	-3584	2050	-	-	-	-	-	-	1814	-	-	-	-	-	-	
03/05/91	2004	1888	2130	1811	-3188	2347	3000	2348	2488	1853	-2885	2487	2313	337	-3683	2054	-	-	-	-	-	-	1815	-	-	-	-	-	-	
04/07/91	2033	1840	2188	1804	-3188	2350	3008	2370	2833	1876	-2883	2487	2283	404	-3580	2054	-	-	-	-	-	-	1814	-	-	-	-	-	-	
07/08/91	2010	1908	2205	1802	-3181	2348	3035	2380	2518	1717	-2928	2488	2320	480	-3587	2053	-	-	-	-	-	-	1814	-	-	-	-	-	-	
28/08/91	2042	1882	2244	1783	-3158	2350	3028	2386	2881	1713	-2918	2472	2285	488	-3618	2355	-	-	-	-	-	-	1818	-	-	-	-	-	-	
31/10/91	2029	1821	2181	1787	-3174	2348	3008	2388	2483	1708	-2882	2483	2288	507	-3588	2048	-	-	-	-	-	-	1813	-	-	-	-	-	-	
04/12/91	2031	1887	2213	1733	-3173	2342	3083	2423	2828	1708	-2840	2483	2308	448	-3608	2048	-	-	-	-	-	-	1808	-	-	-	-	-	-	
08/01/92	2083	-	2222	1743	-3148	2341	2880	2508	2550	1727	-2940	2481	2380	588	-3538	2048	-	-	-	-	-	-	1808	-	-	-	-	-	-	
28/02/92	2047	-	2240	1844	-3178	2343	3090	2688	2648	1730	-2930	2481	2344	388	-3578	2045	-	-	-	-	-	-	1808	-	-	-	-	-	-	
27/03/92	2095	-	2230	1823	-3181	2344	3192	2895	2589	1712	-2930	2484	2345	393	-3802	2048	-	-	-	-	-	-	1808	-	-	-	-	-	-	
20/04/92	2100	-	2368	1887	-3081	2348	3080	2878	2883	1703	-2881	2487	2343	288	-3484	2040	-	-	-	-	-	-	1810	-	-	-	-	-	-	
10/06/92	2084	-	2341	1844	-3118	2347	3045	2884	2888	1780	-2938	2488	2385	345	-3030	2048	-	-	-	-	-	-	1808	-	-	-	-	-	-	
18/08/92	2171	-	2404	1800	-3043	2381	3418	2803	2822	1841	-2880	2471	2424	388	-3463	2051	-	-	-	-	-	-	1810	-	-	-	-	-	-	
21/09/92	2140	-	2274	1720	-3137	2348	3285	2808	2783	1831	-2881	2470	2034	283	-3804	2048	-	-	3388	3421	2283	3532	-	-	-	-	-	-	-	
27/10/92	2158	-	2331	1815	-3128	2348	3318	2713	2815	1948	-2883	2488	2337	380	-3832	2050	-	-	3483	3882	2345	3888	-	-	-	-	-	-	-	
12/11/92	2180	-	2350	1817	-3153	2344	3331	2718	2833	2075	-2900	2488	2474	514	-3538	2045	-	-	3820	3830	2380	3855	-	-	-	-	-	-	-	
23/12/92	2180	-	2380	1823	-3130	2342	3588	2882	3073	2184	-2888	2481	2410	281	-3528	2041	-	-	3833	3883	2432	3880	-	-	-	-	-	-3413	-	
21/01/93	2181	-	2314	1815	-3130	2338	3434	2712	3107	2255	-2883	2458	2447	578	-3540	2038	-	-	3443	3808	2283	3888	-	-	-	-	-	-3400	-	
18/02/93	2187	-	2282	1847	-3123	2343	3483	2728	2844	2233	-2888	2481	2434	488	-3838	2041	-	-	3800	2878	1738	3117	-	-	-	-	-	-3388	-	
10/03/93	2134	-	2307	1825	-3135	2343	3382	2850	3053	2302	-2882	2483	2472	580	-3570	2044	-	-	3848	2841	1885	3010	-	-	-	-	-	-3388	-	
30/03/93	2105	-	1844	1888	-3178	2344	3884	2841	2822	2388	-2883	2485	2478	882	-3784	2044	-	-	2888	2827	1875	-	-	-	-	-	-	-3448	-	
15/04/93	2122	-	2302	1809	-3142	2344	3583	2827	3184	2371	-2874	2484	2510	705	-3540	2042	-	-	2880	2810	1885	2950	-	-	-	-	-	-3325	-	
12/05/93	2188	-	2370	1852	-3181	2348	3811	3058	3284	2508	-2907	2487	2431	732	-3837	2048	-	-	2882	2808	1800	2872	-	-	-	-	-	-3475	-	
18/06/93	2140	-	2300	1843	-3188	2348	3488	2815	3328	2388	-2827	2487	2580	847	-3488	2045	-	-	2880	3140	1870	2870	-	-	-	-	-	-3487	-	
25/08/93	2055	-	2317	1883	-3248	2348	3885	3445	3121	2487	-2888	2470	2538	880	-3853	2047	-	-	3005	2838	1885	3010	-	-	-	-	-	-3438	-	
15/08/93	2070	-	2551	1820	-3182	2352	3715	3085																						

Date printed: 13/07/83

DEPTH (m)		3.2		10.6				18.6				22.6				30.6				38.6										
PILE NO		118-0		118-1				118-2U				118-2L				118-3				118-4										
Data	RED	GREEN	GCD 2A	GCD 1A	GCD 1B	GCD 2B	OYO	VW	GCD 1A	GCD 1B	GCD 2A	GCD 2B	OYO	VW	GCD 1A	GCD 1B	OYO	VW	GCD 1A	GCD 1B	GCD 2A	GCD 2B	OYO	VW	GCD 1A	GCD 1B	GCD 2A	GCD 2B	OYO	VW
26/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2198	1859	1204	1502	-4805	11068	1408	928	1013	1111	-8232	11073
30/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2178	1856	1180	1466	-4808	-	-	-	-	-	-	-
01/05/87	-	-	-153	-286	1047	-118	-4008	10807	981	1560	2154	1541	-8464	10881	1478	1533	-3154	10568	-	-	-	-	-	-	-	-	-	-	-	-
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2178	1885	1174	1450	-4750	11011	1348	972	1031	1080	-8238	10898
05/05/87	-	-	-	-	-	-	-	-	988	1528	2128	1516	-8402	10785	1451	1499	-3116	10485	2256	1953	1070	1340	-4752	-	1617	1233	803	920	-8358	9280
06/05/87	-	-	-84	-301	1023	-208	-4035	10732	837	1417	2091	1488	-8325	11052	1585	1585	-2789	11213	2339	2044	1105	1358	-4150	-	1556	1143	903	921	-8180	9518
07/05/87	-	-	-108	-368	982	-66	-4148	10812	600	1228	2203	1610	-8198	11083	1338	1376	-2770	10833	2457	2129	1198	1444	-3689	-	1186	738	1827	2032	-8091	10827
11/05/87	-	-	245	-375	975	38	-4305	10711	949	1498	1849	1283	-8178	10884	1382	1427	-2810	10785	-	-	1397	1638	-4203	11080	1280	808	1140	1249	-8182	10277
14/05/87	-	-	274	-341	1016	-48	-4308	10704	985	1523	1848	1281	-8171	10876	1357	1458	-2802	10838	-	-	1387	1632	-4222	11198	1233	794	1143	1256	-8188	10360
20/05/87	-	-	-	-	-	-	-	-	900	1503	1803	1248	-8187	11033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20/05/87	-	-	280	-358	1002	-151	-4351	10715	908	1478	1814	1227	-8210	11071	1391	1441	-2819	10853	-	-	1368	1638	-4218	11208	1243	808	1151	1283	-8172	10334
26/05/87	-	-	205	-320	1062	-73	-4384	10703	883	1444	1777	1183	-8279	11078	1383	1388	-2879	10880	2358	1971	-	1615	-4270	11228	1204	789	1128	1241	-8168	10338
30/05/87	-	-	182	-374	1020	-35	-4334	10783	858	1425	1758	1140	-8288	11183	740	1340	-3008	11088	1789	1370	-	1551	-4288	11784	1172	738	1075	1188	-8274	10429
30/05/87	-	-	-178	-1082	421	-421	-5087	12617	280	922	1188	589	-8809	12878	488	878	-3552	12198	1889	1042	-	1240	-4810	12806	1102	847				

FILE 118 - FIELD READING

FINAL DEPTH (m) : 42.8

Date printed: 13/07/93

DEPTH (m)	3.2		10.8						18.8						22.8				30.8						38.8					
FILE NO	118-0		118-1						118-2U						118-2L				118-3						118-4					
Data	RED	GREEN	GCO 2A	GCO 1A	GCO 1B	GCO 2B	OYO	VW	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	VW	GCO 1A	GCO 1B	OYO	VW	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	VW	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	VW
05/01/89	-	-401	591	809	1421	-	-4394	11207	1278	1811	1832	1104	-8489	11795	-	-	-3208	11487	-	-	-	-	-4508	12254	-	-	2000	1900	-7600	10566
13/02/89	-	-409	309	922	1542	56	-4408	11208	1273	1781	1823	1109	-8479	11824	-	-	-3214	11513	-	-	-	-	-4524	12289	-	-	2000	1500	-7300	10574
07/03/89	-	-440	304	945	1800	-	-4389	11231	1282	1782	1834	1122	-8515	11811	-	-	-3203	11502	-	-	-	-	-4578	12257	-	-	1500	2000	-7000	10598
10/04/89	-	-457	298	1016	1870	-	-4446	11219	1208	1787	1823	1135	-8487	11813	-	-	-3188	11507	-	-	-	-	-	12253	-	-	-	-	-	10598
08/05/89	-	-392	287	1074	1877	-	-4438	11220	1244	1783	1843	1278	-8483	11810	-	-	-3175	11513	-	-	-	-	-	12255	-	-	-	-	-	10599
03/06/89	-	-471	280	1139	1845	-	-4450	11232	1216	1702	1580	1254	-8523	11827	-	-	-3179	11474	-	-	-	-	-	12287	-	-	-	-	-	10572
07/07/89	-	-509	333	1189	1885	-	-4398	11240	1249	1745	1813	1289	-8519	11844	-	-	-3793	11480	-	-	-	-	-	12284	-	-	-	-	-	10576
08/08/89	-	-	286	1201	1895	-	-4420	11248	1249	1740	1810	1292	-8534	11858	-	-	-3189	11442	-	-	-	-	-	12282	-	-	-	-	-	10576
04/09/89	-	-822	483	1287	1818	88	-4444	11259	1266	1752	1850	1339	-8500	11888	-	-	-3188	11444	-	-	-	-	-	12301	-	-	-	-	-	10583
04/10/89	-	-	307	1250	1812	48	-4335	11273	1382	1751	1837	1384	-8518	11853	-	-	-3148	11438	-	-	-	-	-	12300	-	-	-	-	-	10581
08/11/89	-	-941	278	1384	1802	83	-4320	11291	1482	1727	1813	1381	-8522	11881	-	-	-3200	11458	-	-	-	-	-	12303	-	-	-	-	-	10582
14/12/89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12355	-	-	-	-	-	10587
15/01/90	-	-980	287	1385	1825	48	-4337	11308	1385	1746	1838	1422	-8484	11888	-	-	-3158	11458	-	-	-	-	-	11390	-	-	-	-	-	10589
09/04/90	-	-730	273	-	1548	-	-4173	11323	1480	1708	1829	1486	-8517	11899	-	-	-3122	11483	-	-	-	-	-	12387	-	-	-	-	-	10803
11/05/90	-	-730	286	1399	1520	-	-4381	11342	1287	1704	1817	1505	-8547	11802	-	-	-3173	11480	-	-	-	-	-	12395	-	-	-	-	-	10813
11/06/90	-	-770	389	1412	1553	-118	-4284	11339	1420	1785	1850	1634	-8504	11897	-	-	-3188	11463	-	-	-	-	-	12380	-	-	-	-	-	10810
10/07/90	-	-770	412	1435	1618	-180	-4200	11350	1675	1570	1300	823	-8713	11804	-	-	-3180	11484	-	-	-	-	-	12387	-	-	-	-	-	-
13/08/90	-	-480	240	888	1755	-110	-4481	11375	1384	1983	1875	1188	-8340	11832	-	-	-3217	11475	-	-	-	-	-	11475	-	-	-	-	-	12408
15/10/90	-	-870	243	1046	1809	347	-4531	11393	1258	1981	1880	1383	-8483	11810	-	-	-3128	11480	-	-	-	-	-	12389	-	-	-	-	-	-
22/01/91	-	-880	280	1818	1338	82	-4710	11398	1051	1788	1733	1790	-8812	11828	-	-	-3188	11487	-	-	-	-	-	12426	-	-	-	-	-	-
14/03/91	-	-520	218	1258	1754	422	-2028	11393	1514	2100	1838	1808	-8444	11834	-	-	-3148	11482	-	-	-	-	-	12428	-	-	-	-	-	-
18/04/91	-	-800	201	1483	1424	107	-4541	11425	2275	2239	1827	1430	-8428	11828	-	-	-3097	11482	-	-	-	-	-	12421	-	-	-	-	-	-
03/06/91	-	-880	220	1243	1548	80	-4585	11418	1380	2588	1836	1823	-8437	11821	-	-	-3089	11477	-	-	-	-	-	12422	-	-	-	-	-	10631
04/07/91	-	-830	93	1430	1908	-224	-4345	11409	4350	2381	1878	2170	-8561	11814	-	-	-2525	11477	-	-	-	-	-	12427	-	-	-	-	-	10618
07/08/91	-	-588	280	2500	2000	-80	-4800	11420	3458	2380	2053	0	-8582	11809	-	-	-1200	11488	-	-	-	-	-	12434	-	-	-	-	-	10626
28/09/91	-	-581	245	-	2308	22	-4488	11380	1310	2567	-	1881	-8427	11793	-	-	-3161	11474	-	-	-	-	-	12423	-	-	-	-	-	-
31/10/91	-	-544	210	7052	2841	74	-4818	11374	1729	2520	-	1930	-8431	11797	-	-	-3038	11481	-	-	-	-	-	12447	-	-	-	-	-	-
04/12/91	-	-544	271	2085	2780	-90	-4482	11383	1630	2805	-	1042	-8482	11809	-	-	-3107	11488	-	-	-	-	-	12447	-	-	-	-	-	-
08/01/92	-	-544	278	1983	2183	-65	-4482	11380	1327	2548	-	1983	-8486	11819	-	-	-3125	11481	-	-	-	-	-	12453	-	-	-	-	-	-
28/02/92	-	-541	388	1886	1882	-74	-4452	11380	1882	2719	-	2074	-8480	11823	-	-	-3178	11488	-	-	-	-	-	12458	-	-	-	-	-	-
27/03/92	-	-540	322	1838	1838	-101	-4452	11388	1886	2741	-	2110	-8487	11823	-	-	-3083	11483	-	-	-	-	-	12481	-	-	-	-	-	-
29/04/92	-	-577	358	2258	2578	-72	-4457	11304	1746	2875	-	2185	-8471	11823	-	-	-3158	11488	-	-	-	-	-	12457	-	-	-	-	-	-
10/05/92	-	-828	288	1157	1538	-308	-4283	11283	2843	3505	-	1595	-7213	11815	-	-	-3103	11488	-	-	-	-	-	12481	-	-	-	-	-	-
18/06/92	-	-831	484	2118	2124	118	-4378	11288	1528	2200	-	2338	-8108	11810	-	-	-3111	11480	-	-	-	-	-	12444	-	-	-	-	-	-
21/08/92	-	-580	294	1793	2184	-188	-4416	11289	1854	2884	-	2840	-8040	11814	-	-	-3428	11488	-	-	-	-	-	12446	-	-	-	-	-	-
27/10/92	-	-709	254	2080	2273	-188	-4878	11278	1951	2878	-	3058	-8328	11811	-	-	-3209	11488	-	-	-	-	-	12443	-	-	-	-	-	-
12/11/92	-	-885	345	2215	2548	-70	-4478	11283	1785	2805	-	3043	-8185	11821	-	-	-3154	11503	-	-	-	-	-	12481	-	-	-	-	-	-
23/12/92	-	-898	283	1870	2438	-23	-4481	11283	1741	2801	-	3198	-8370	11835	-	-	-2775	11820	-	-	-	-	-	12482	-	-	-	-	-	-
21/01/93	-	-888	411	2898	3100	9	-4529	11284	1829	2881	-	3048	-8548	11839	-	-	-2828	11519	-	-	-	-	-5128	12482	-	-	-	-	-	-
18/02/93	-	-585	423	2181	2971	-18	-4548	11275	1813	2704	-	3172	-8458	11834	-	-	-3070	11517	-	-	-	-	-	12480	-	-	-	-	-	-
10/03/93	-	-831	423	2442	2538	-44	-4500	11284	1735	2855	-	3291	-8477	11839	-	-	-3003	11519	-	-	-	-	-	12477	-	-	-	-3783	-	-
30/03/93	-	-555	450	2200	2468	-20	-4884	11288	1745	2447	-	3485	-8433	11828	-	-	-3504	11504	-	-	-	-	-	12474	-	-	-	-	-	-
15/04/93	-	-880	310	2870	3230	-288	-4386	11270	1878	2438	-	3138	-8484	11832	-	-	-3510	11509	-	-	-	-	-	12470	-	-	-	-3840	-	-
12/05/93	-	-870	345	2745	3850	-130	-5085	11282	1822	2458	-	3810	-8580	11830	-	-	-3880	11507	-	-	-	-	-	12478	-	-	-	-4178	-	-
18/06/93	-1480	-720	346	2838	3880	-175	-4432	11281	1708	2483	-	3182	-8284	11838	-	-	-2382	11822	-	-	-	-	-	12487	-	-	-	-3807	-	-
28/08/93	-1980	-1111	370	2840	2188	224	-3840	11258	1883	2482	-	2725	-8200	11828	-	-	-3800	11513	-	-	-	-	-	12481	-	-	-	-5880	-	-
15/09/93	-1411	-880	790	2245	2137	-700	-3140	11250	1880	2275	-	2850	-8205	11827	-	-	-4570	11508	-	-	-	-	-	12480	-	-	-	-3170	-	-

Data contact: 13/07/83

DEPTH (m)	3
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FILE NO	118-0								118-1								118-2U								118-2L								118-3								118-4							
	DATE	RED	GREEN	GCO 2A	GCO 1A	GCO 1B	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.	GCO 1A	GCO 1B	GCO 2A	GCO 2B	OYO	V.W.											
28/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2188	1888	1204	1502	-4004	2448	1408	928	1013	1111	-5193	2447																	
30/04/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2178	1888	1180	1486	-4006	-	-	-	-	-	-	-	-	-	-														
01/05/87	-	-	-	-153	-286	1047	-118	-3083	2589	981	1550	2154	1541	-5387	2548	1478	1533	-2828	2888	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2178	1888	1174	1450	-3888	2474	1431	960	905	944	-5181	2548																	
04/05/87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
05/05/87	-	-	-	-	-	-	-	-	-	988	1528	2128	1516	-5306	2548	1461	1499	-2597	2739	2288	1863	1070	1340	-3880	-	1817	1233	863	920	-5288	3488																	
08/05/87	-	-	-	-64	-301	1023	-208	-3083	2805	837	1417	2091	1488	-5271	2456	1585	1585	-2324	2388	2330	2044	1105	1358	-3458	-	1556	1143	903	921	-5150	3312																	
07/05/87	-	-	-	-108	-358	982	-98	-3455	2518	800	1229	2203	1810	-5158	2228	1338	1378	-2308	2558	2457	2128	1198	1444	-3333	-	1185	738	1827	2092	-5078	2858																	
11/05/87	-	-	-	-245	-375	975	38	-3588	2815	948	1488	1848	1263	-5147	2487	1382	1427	-2425	2588	-	-	1387	1838	-3503	2438	1250	808	1140	1248	-5135	2840																	
14/05/87	-	-	-	-274	-341	1016	-48	-3588	2818	985	1523	1848	1281	-5143	2480	1357	1458	-2418	2554	-	-	1387	1832	-3518	2383	1233	784	1143	1255	-5157	2801																	
20/05/87	-	-	-	-	-	-	-	-	-	930	1503	1833	1248	-5156	2485	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-															
20/05/87	-	-	-	-280	-358	1002	-151	-3828	2813	908	1478	1814	1227	-5175	2448	1381	1441	-2433	2547	-	-	1388	1838	-3513	2388	1243	808	1151	1283	-5143	2809																	
28/05/87	-	-	-	-205	-320	1052	-73	-3837	2811	983	1444	1777	1183	-5233	2448	1383	1388	-2483	2534	2388	1871	-	1815	-3558	2388	1243	788	1128	1241	-5183	2808																	
30/05/87	-	-	-	-182	-374	1020	-35	-3812	2571	885	1425	1758	1140	-5240	2389	740	1380	-2507	2480	1788	1370	-	1561	-3883	2157	1172	738	1075	1188	-5228	2758																	
31/05/87	-	-	-	-178	-1082	421	-421	-4239	1915	280	922	1188	588	-5774	1858	488	878	-2880	2018	1888	1042	-	1240	-4008	1821	1102	847	981																				

Data printed: 13/07/23

[illegible]