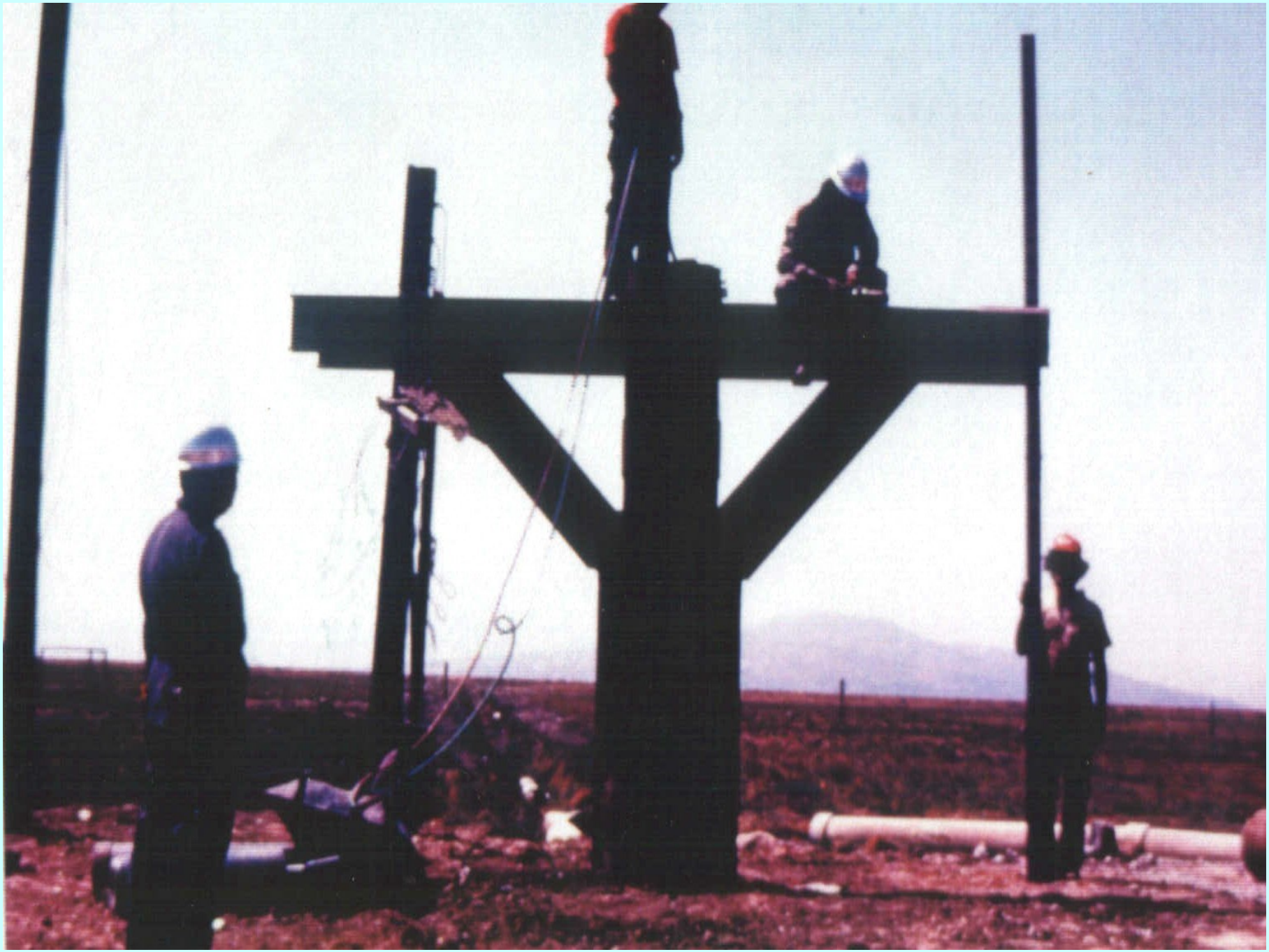
Wednesday-6

Negative Skin Friction

Soft clays– Mexico City

Subsidence



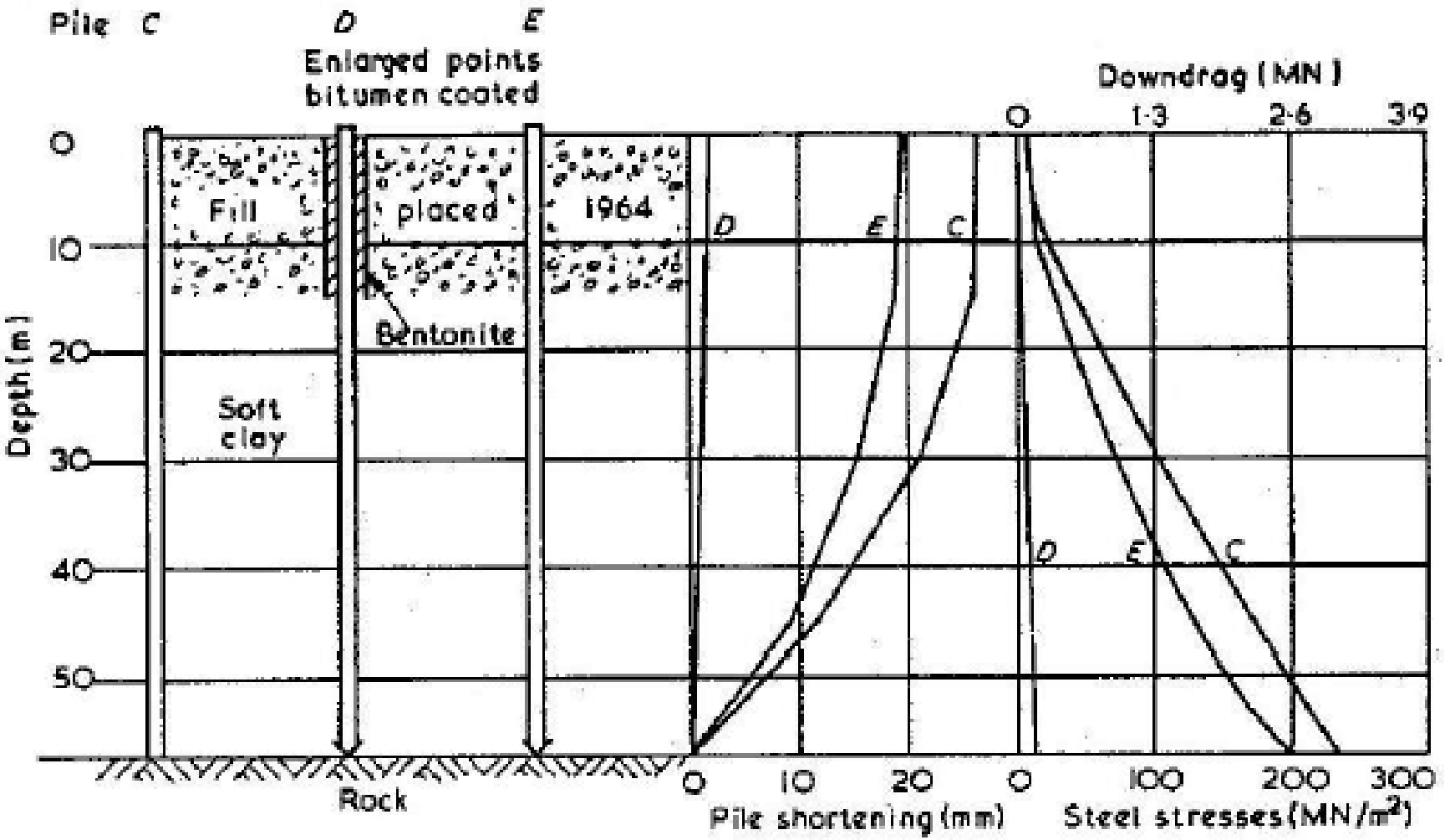
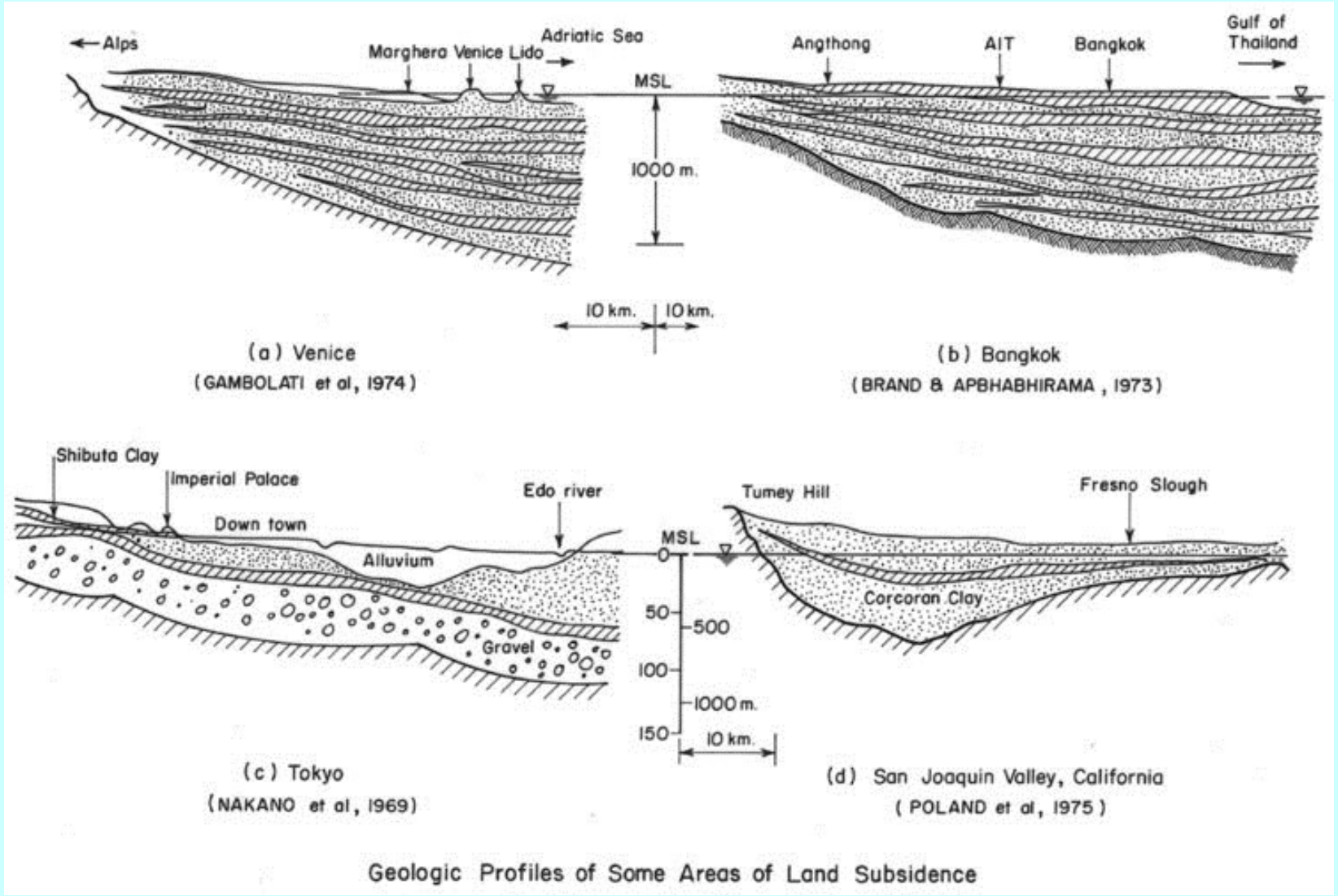
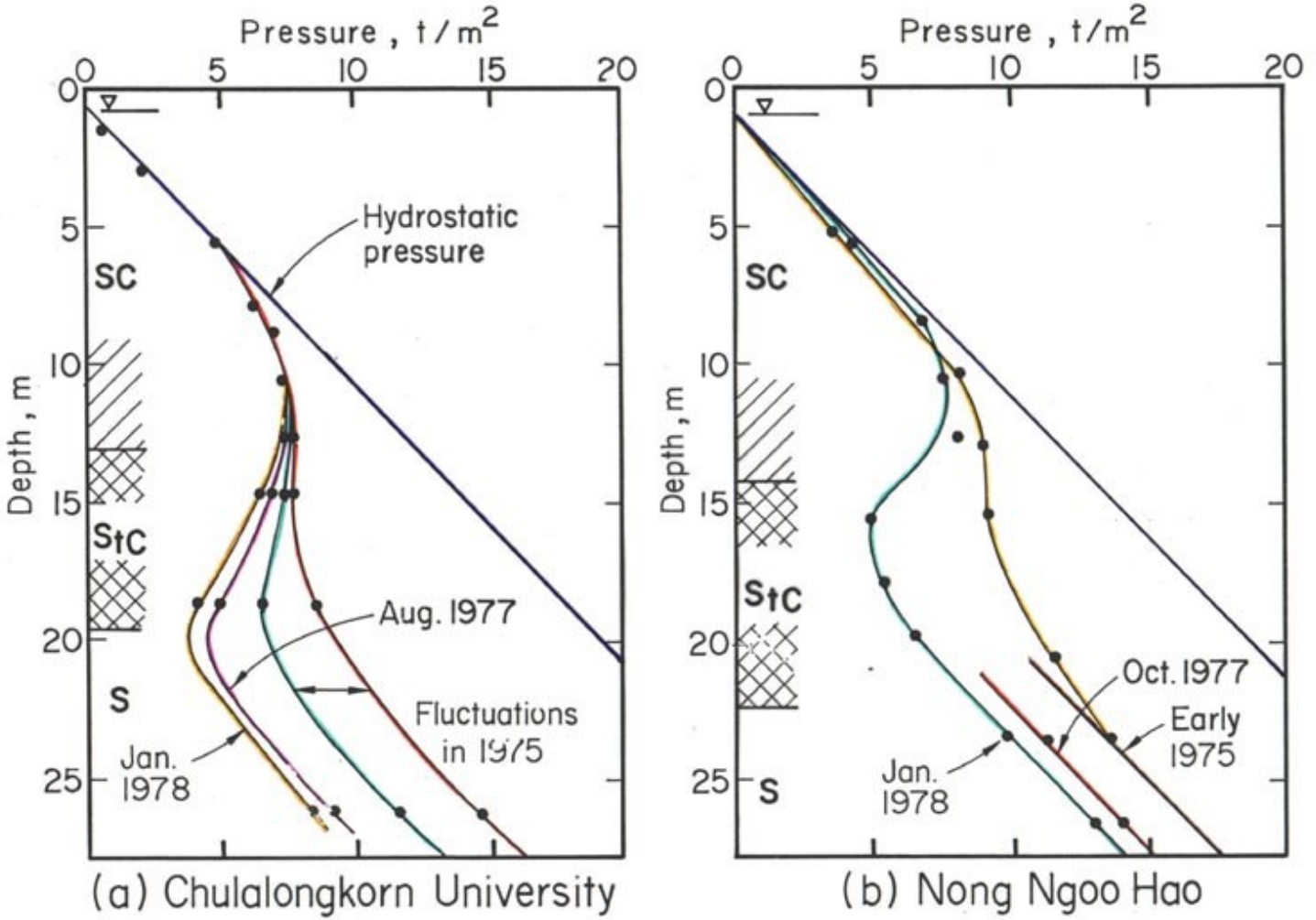


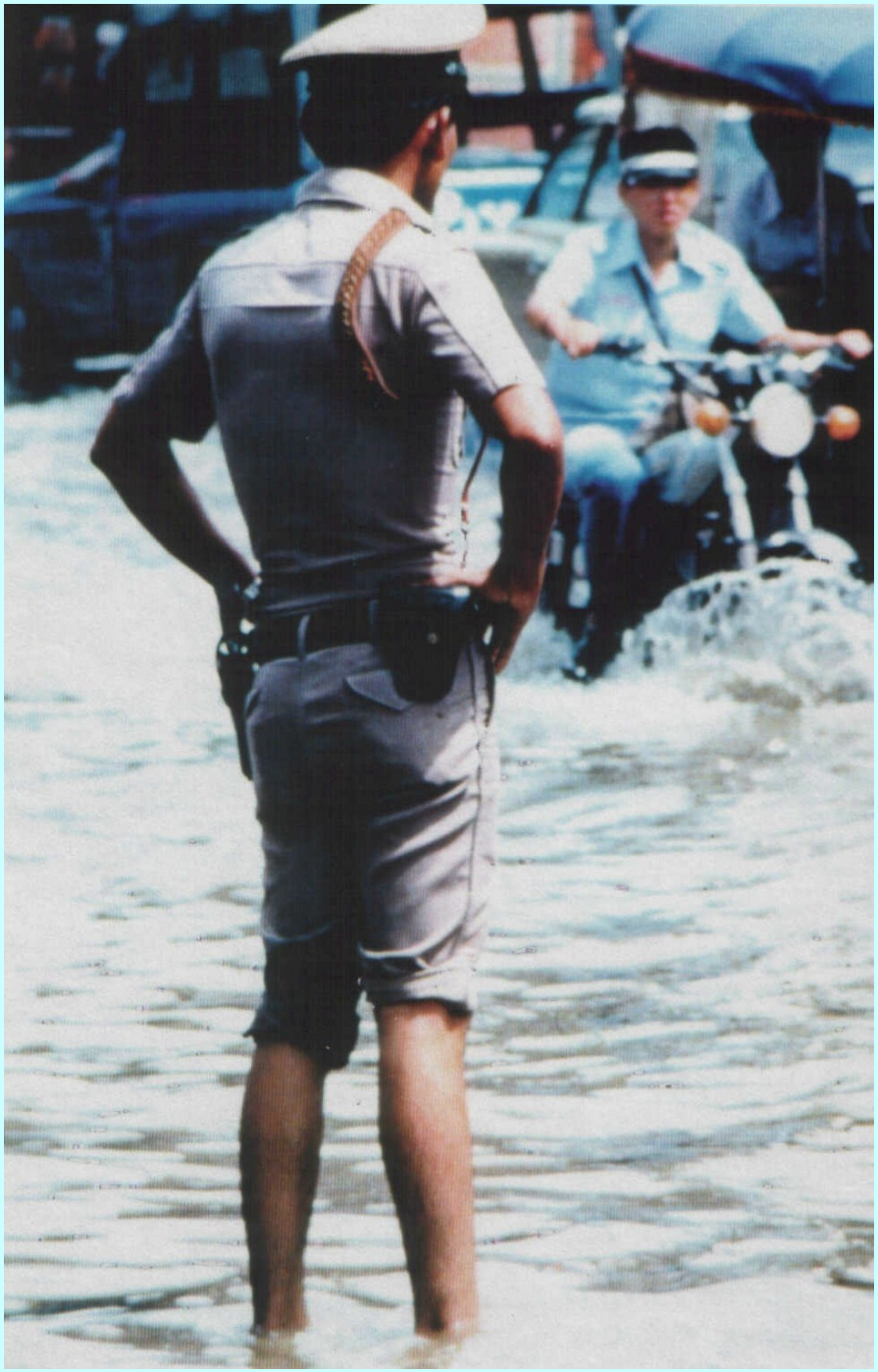
Fig. 4.12 Effect of negative skin friction on piles



Geologic Profiles of Some Areas of Land Subsidence



Water Pressure Declines in Surface Clay Layer



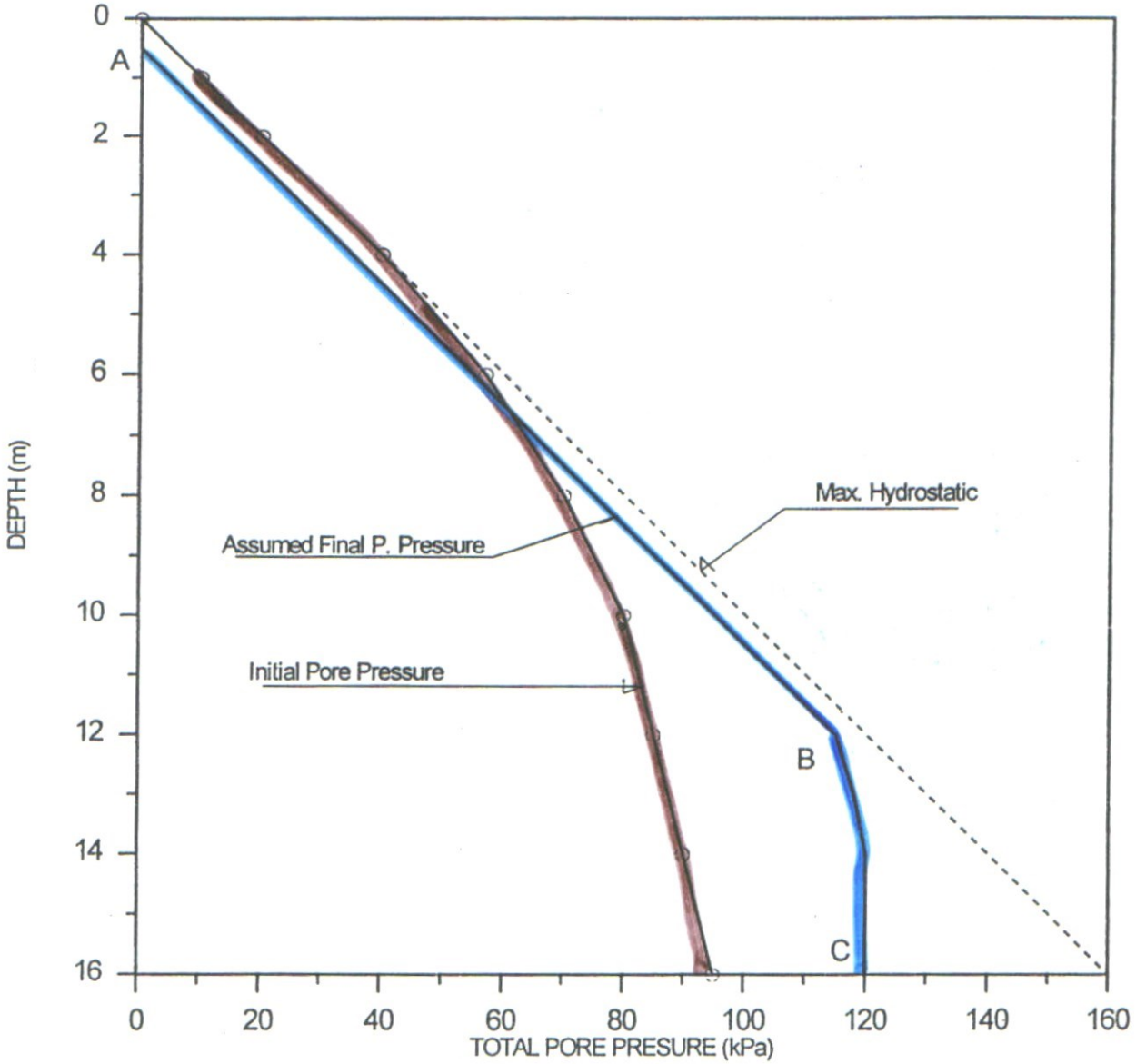
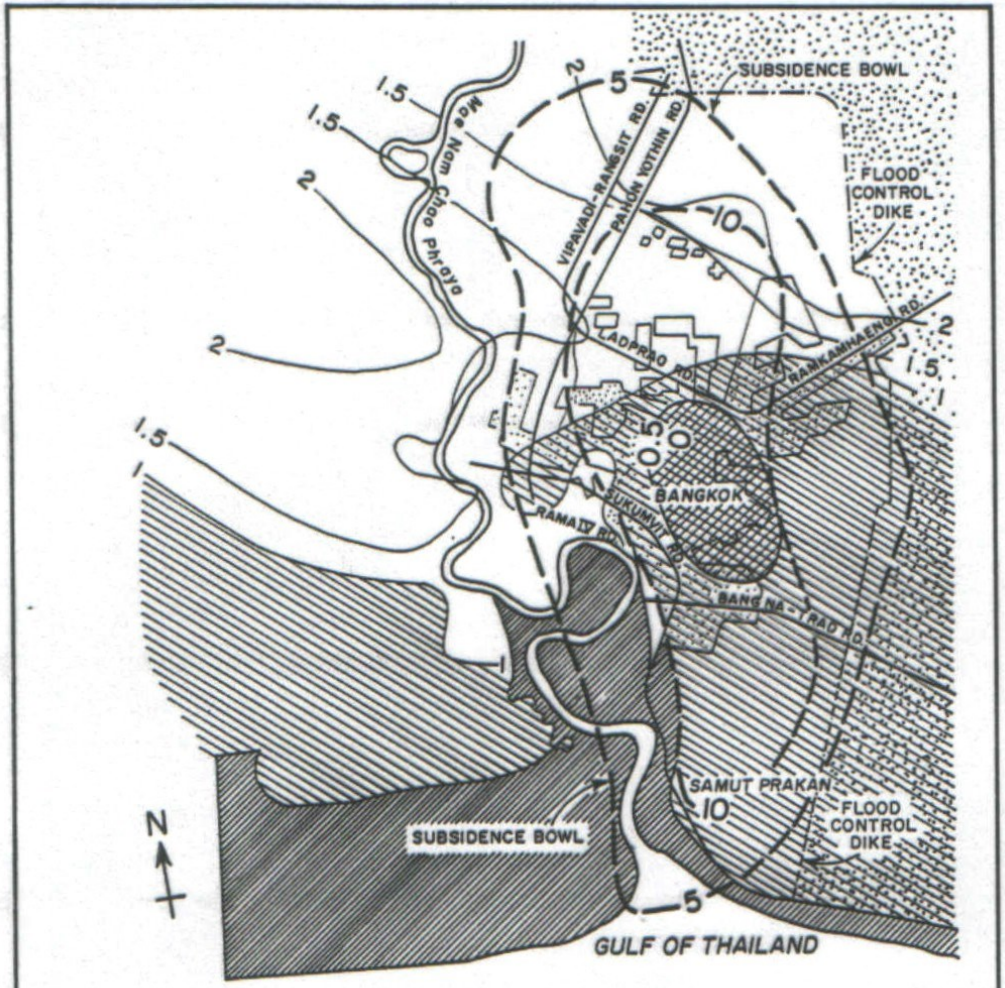
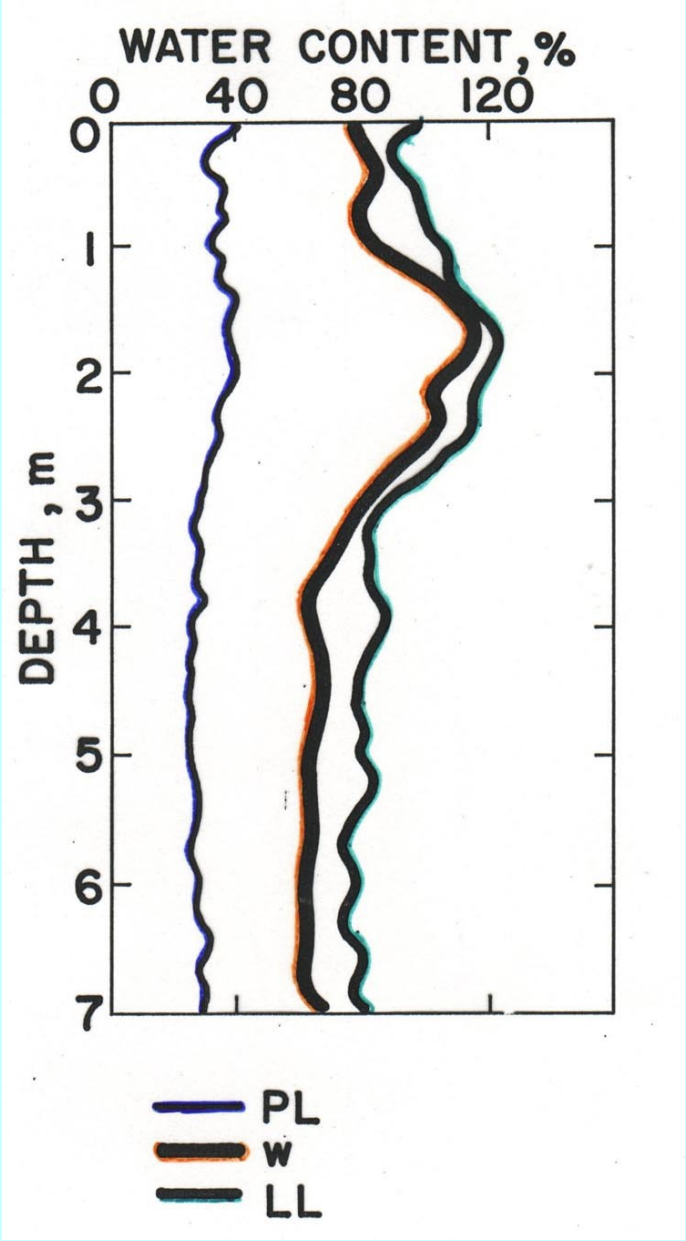


Fig. 6.26: Piezometric Drawdowns (Initial and Assumed Final Values)



Sources : Prinya Nutalaya (AIT), Dept. Mineral Resources, Japan International Cooperation Agency (JICA)

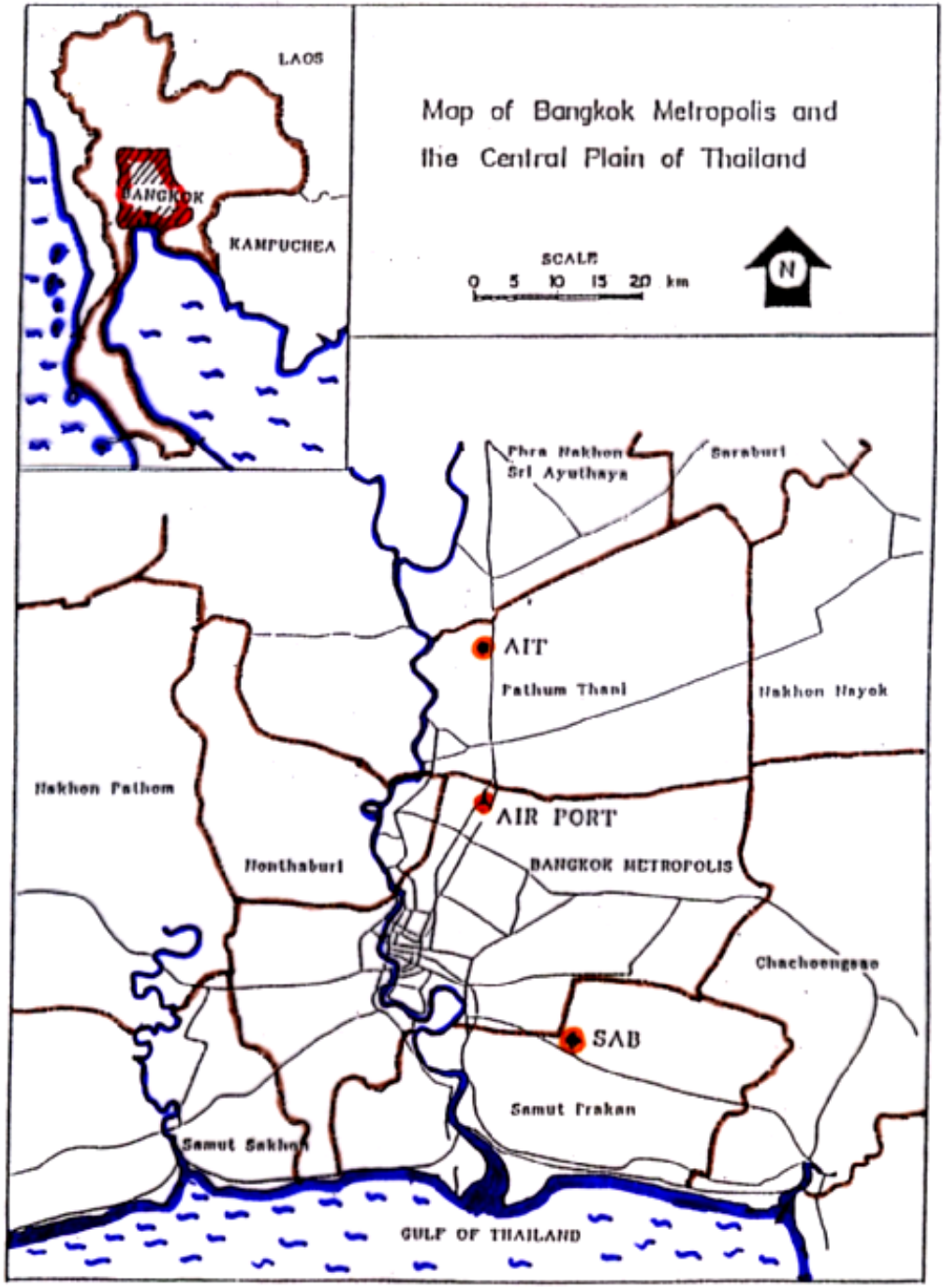

WATER CONTENT, %
0
40
80
120
DEPTH, m
0
1
2
3
4
5
6
7
PL
w
LL

Twenty thousand or more driven piles in one site

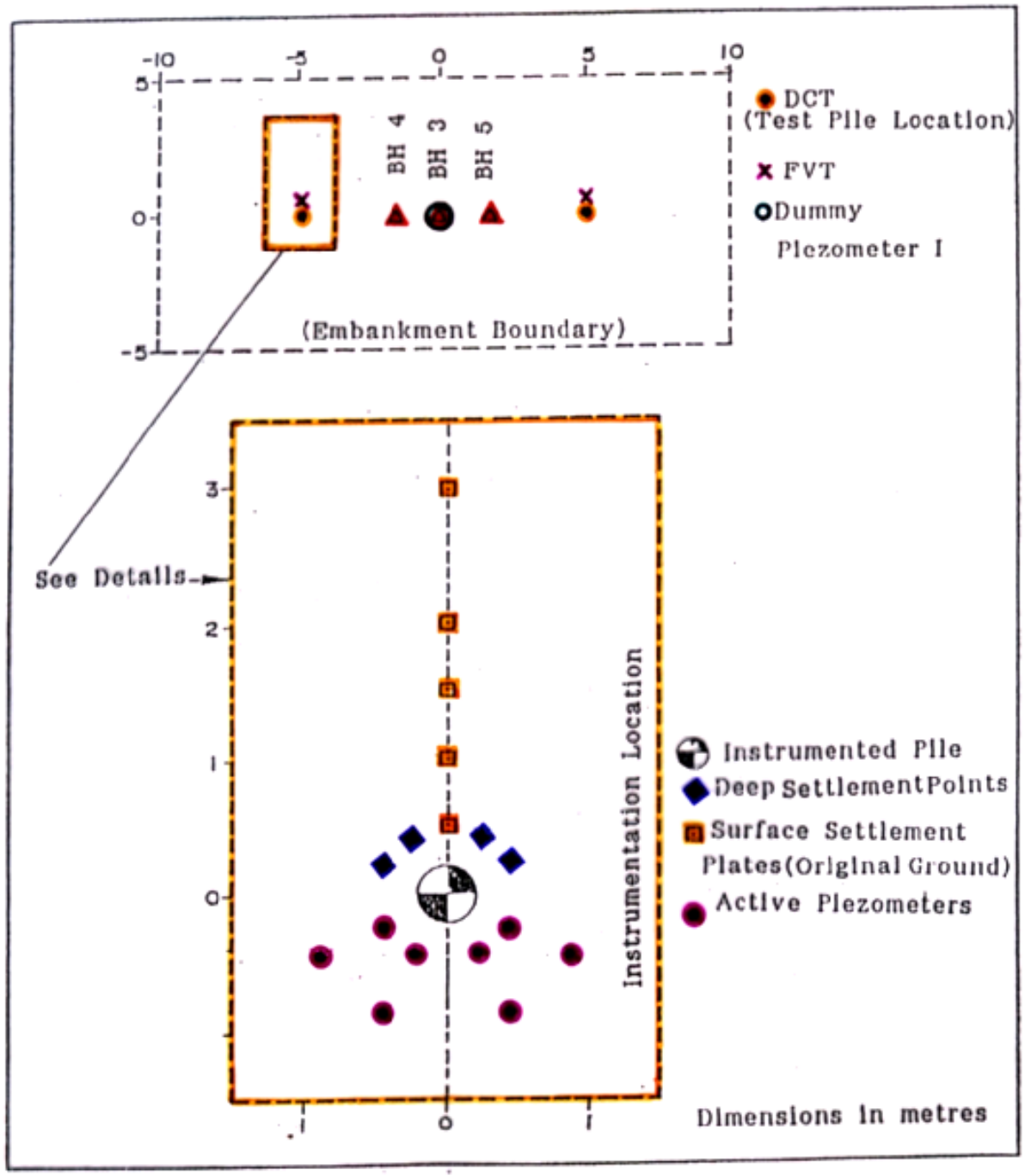
Driven piles in rows

Correcting tilt and raising a building by 500 mm with underpinning techniques.
In-adequate pile capacity

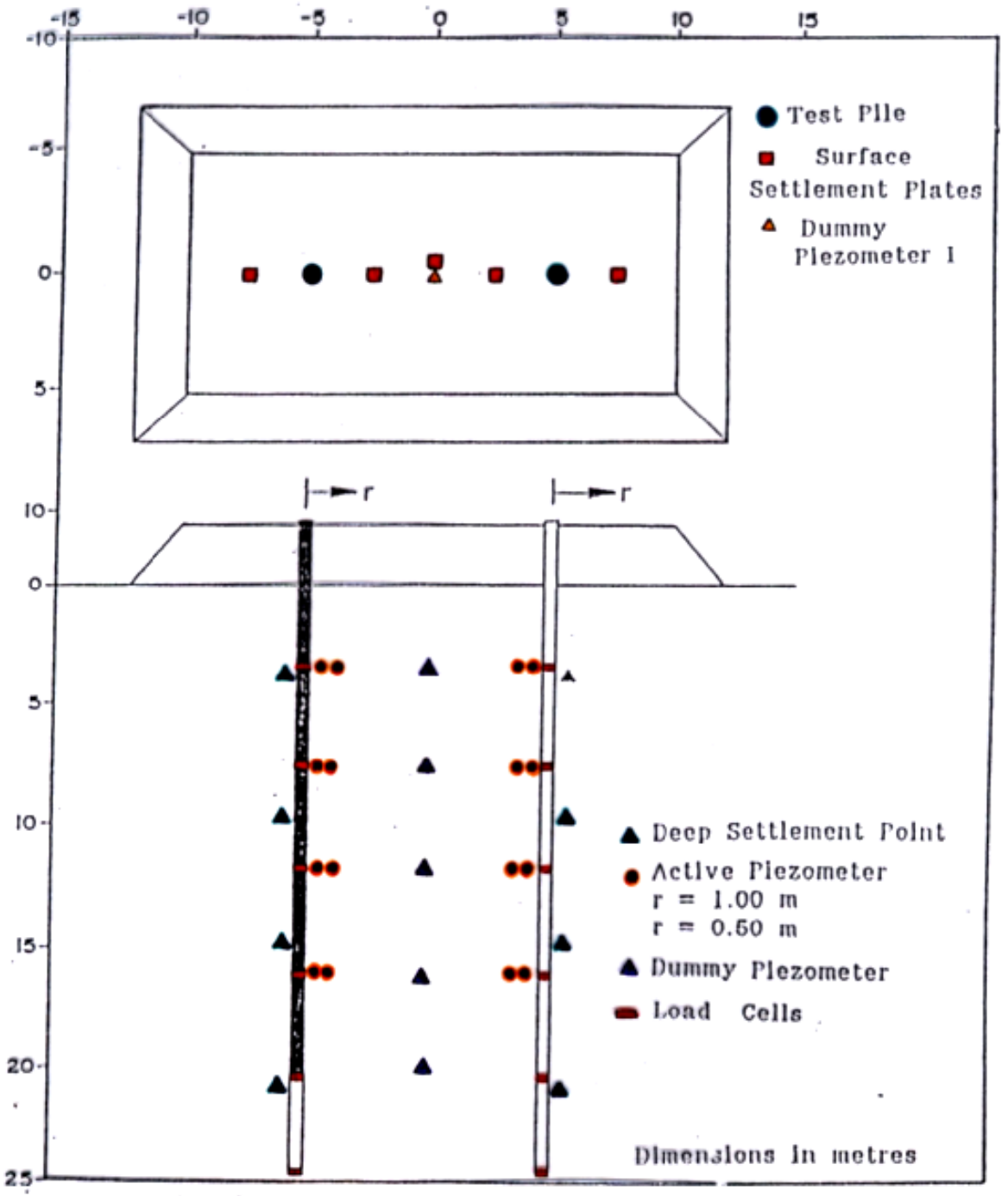
Building on hydraulic jacks and being raised, while the staff are busy working inside



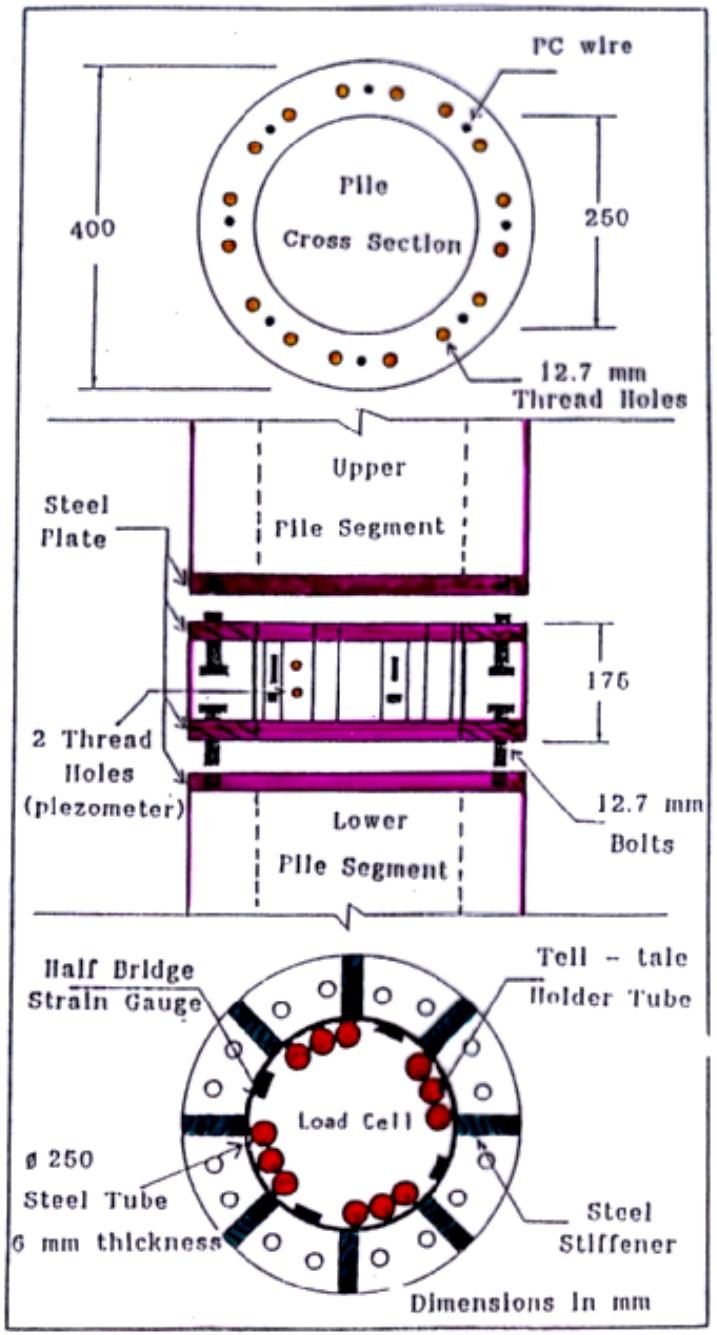
Location of the Experimental Site (SAB)



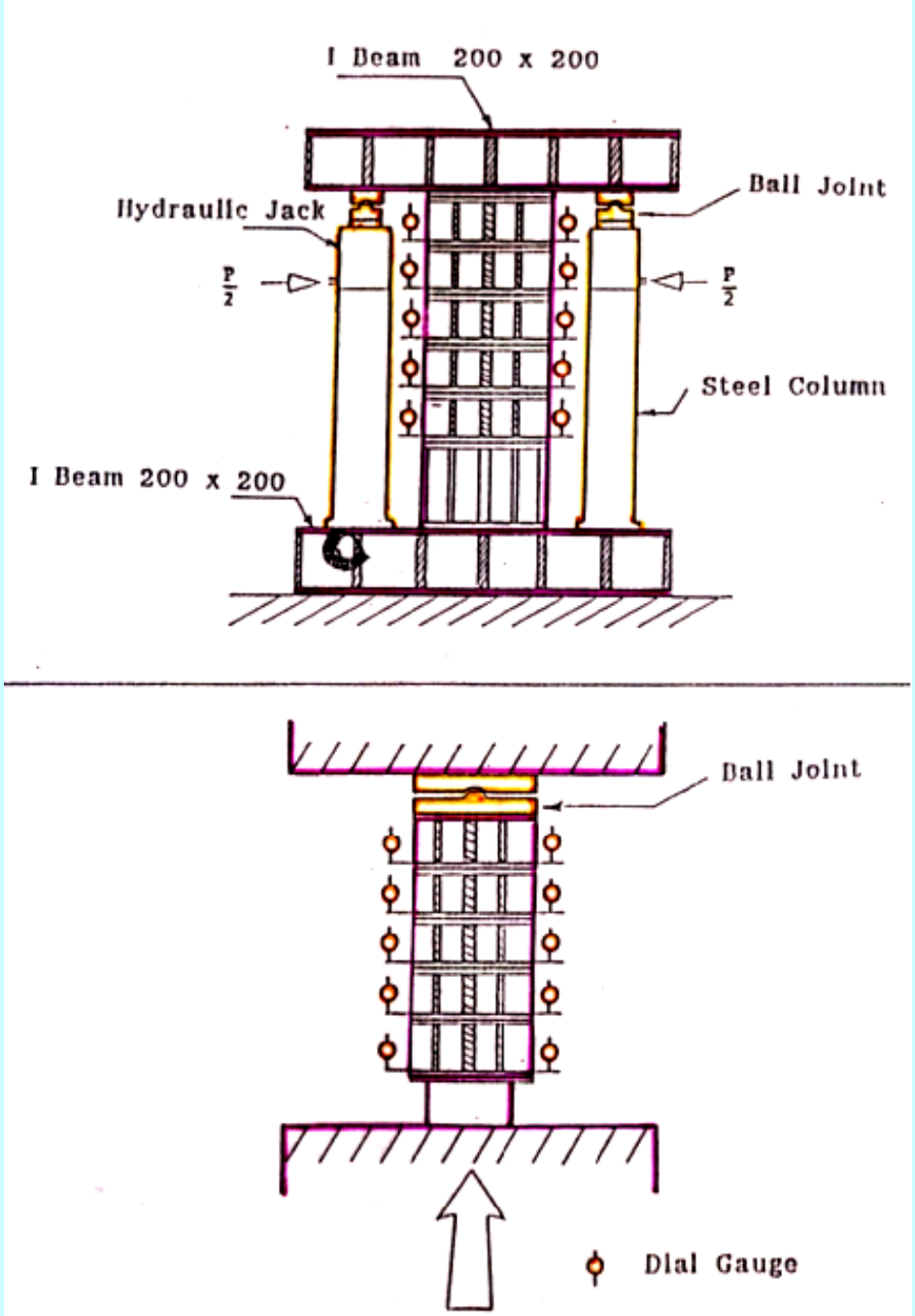
Arrangement of Instruments



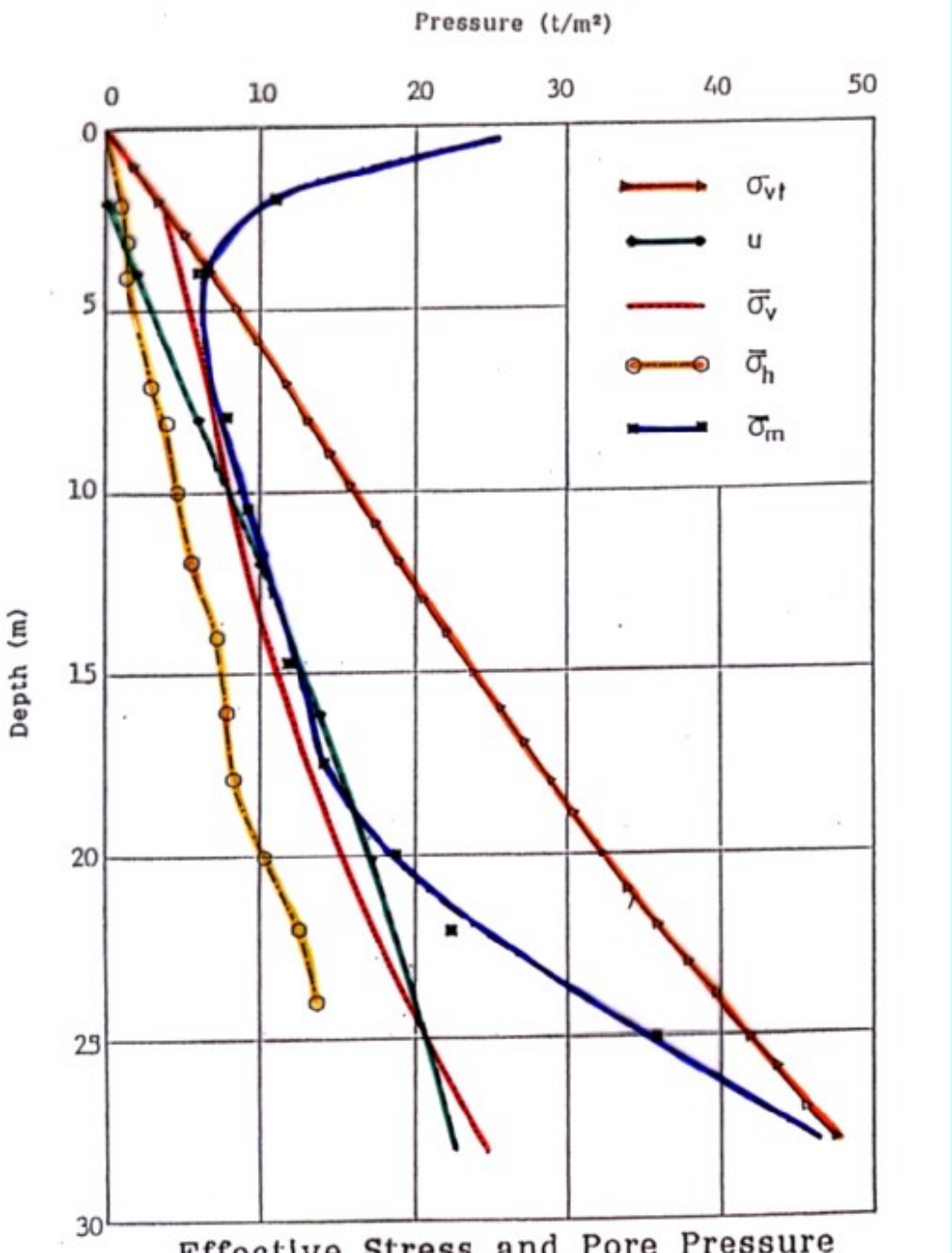
Location of Instruments and Test Piles



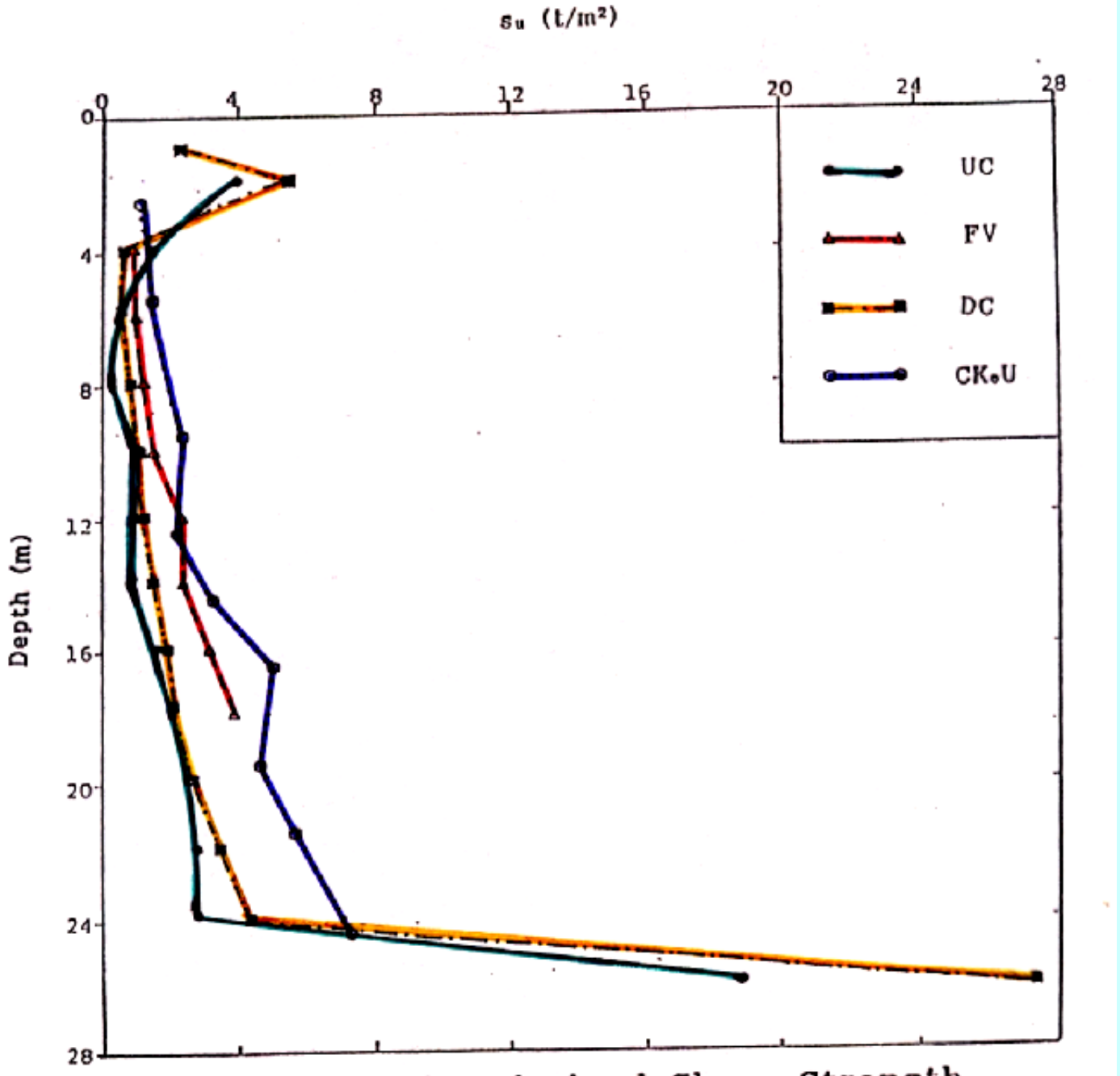
Details of Load Cell at the Base of the Pile



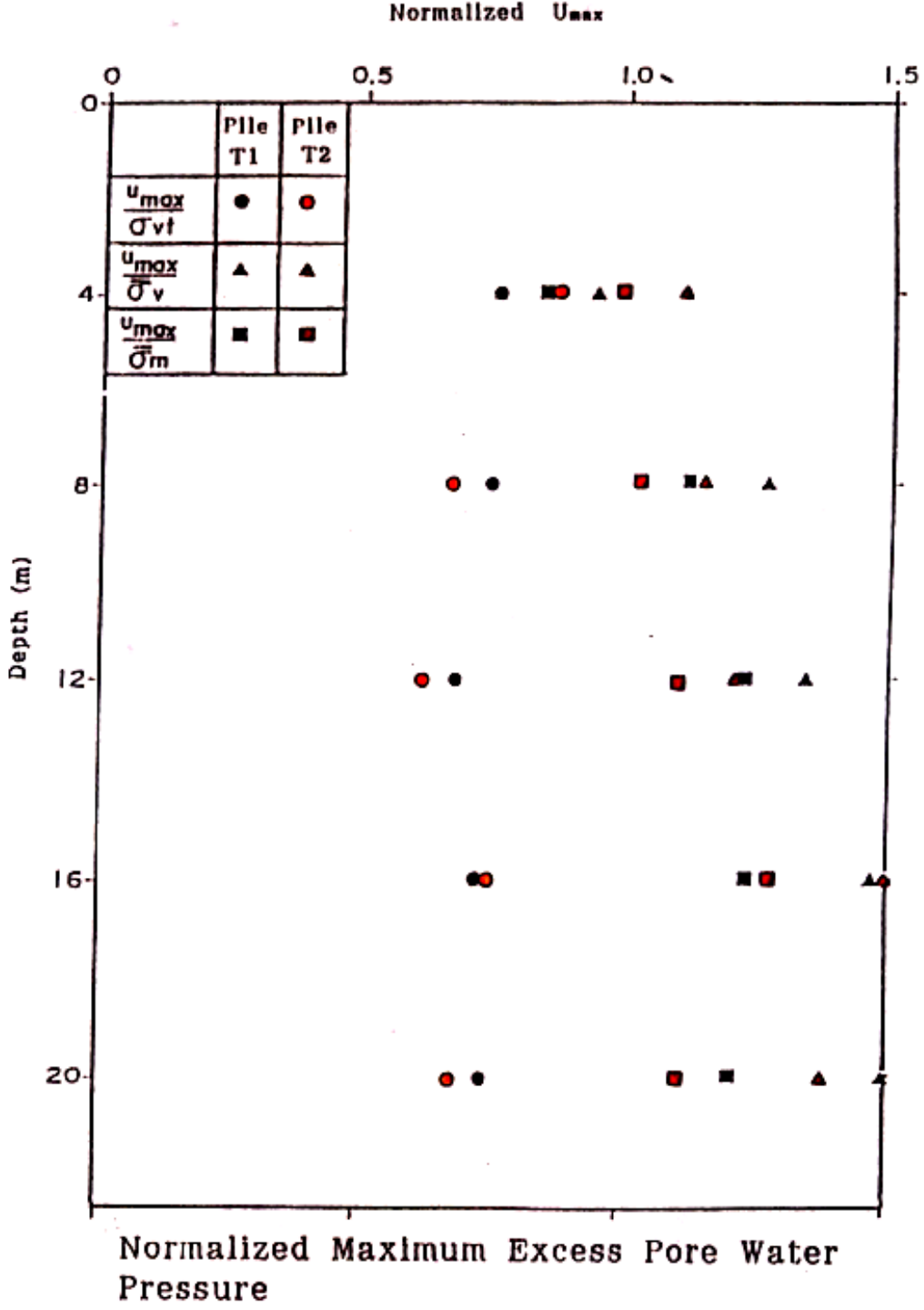
Calibration of Load Cell

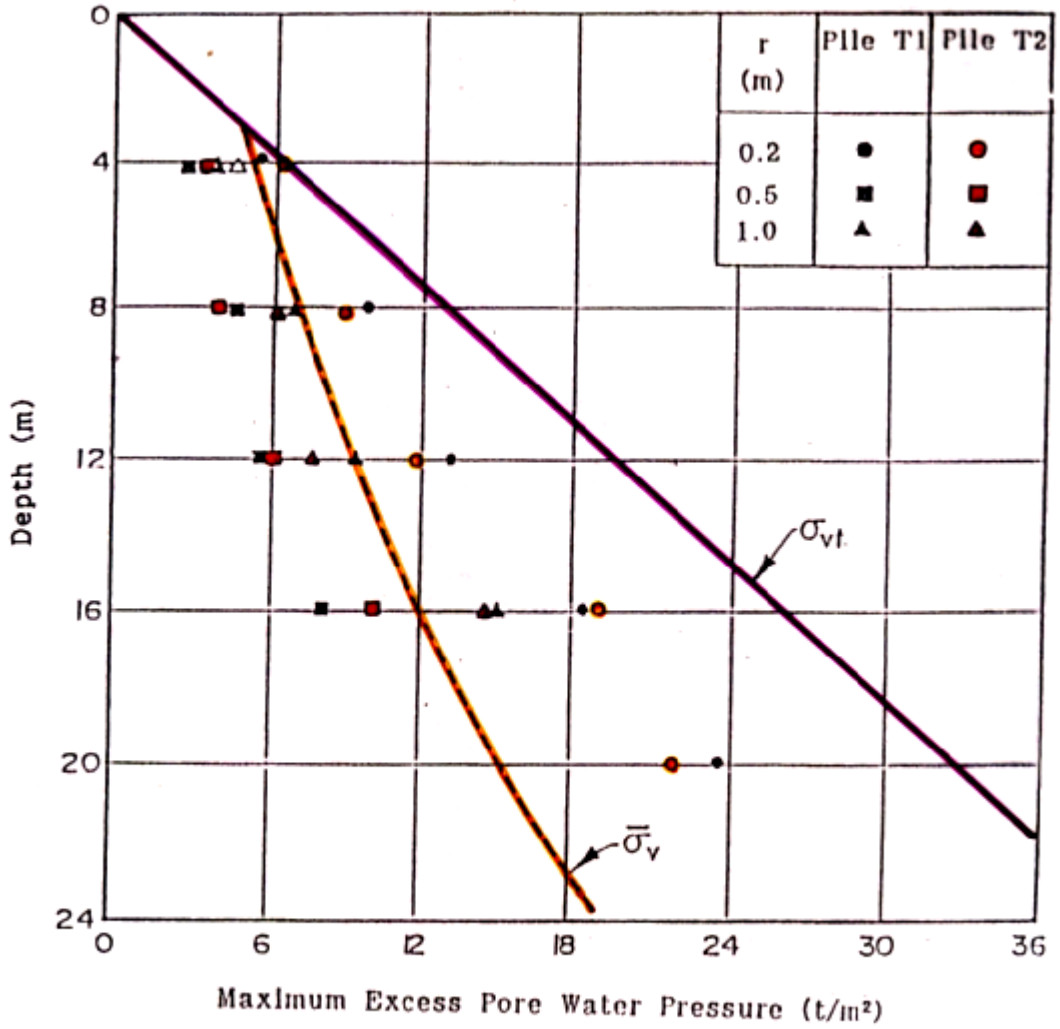


Effective Stress and Pore Pressure Variations with Depth

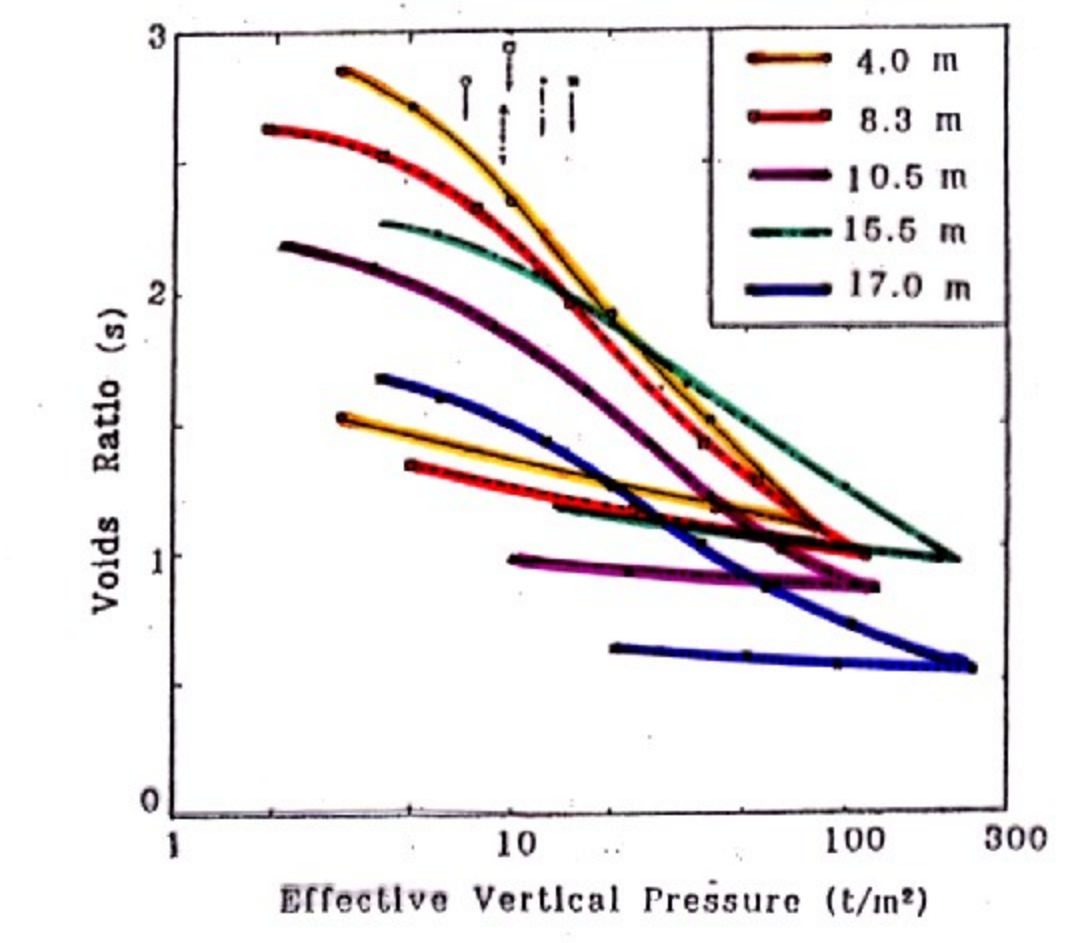


Variation of Undrained Shear Strength with Depth

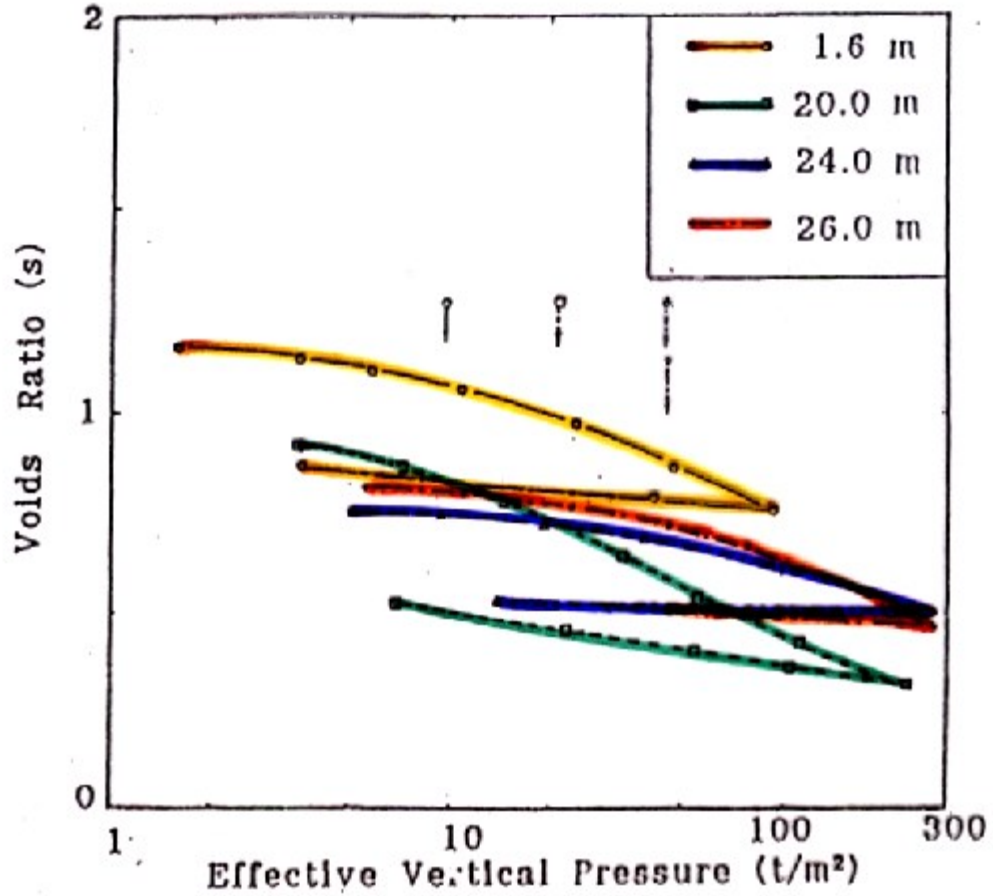

Normalized U_{max}
0
0.5
1.0
1.5
0
4
8
12
16
20
Depth (m)
Pile T1
Pile T2
$\frac{u_{max}}{\sigma_{vt}}$
$\frac{u_{max}}{\bar{\sigma}_v}$
$\frac{u_{max}}{\bar{\sigma}_m}$
Normalized Maximum Excess Pore Water Pressure



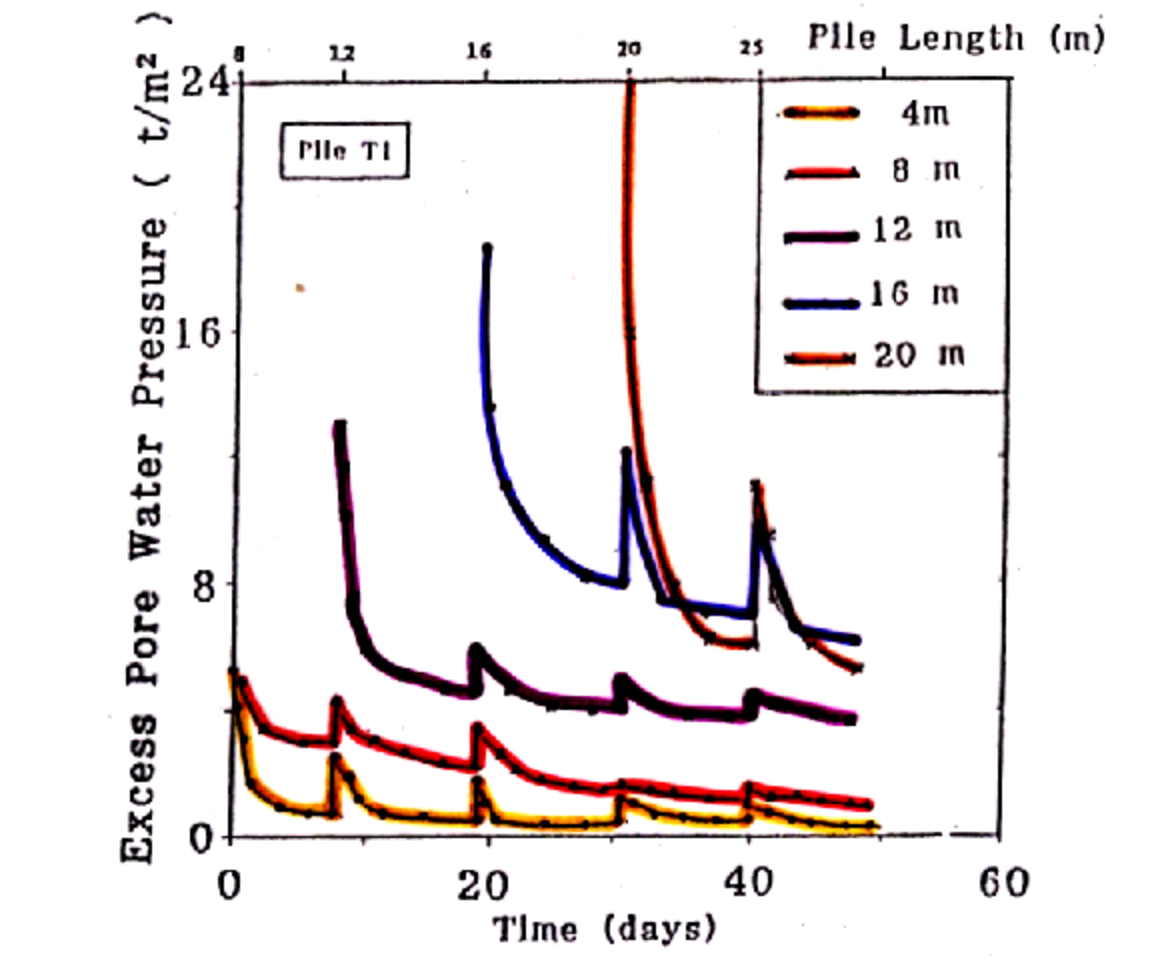
Maximum Pore Water Pressure
at the Pile Surface



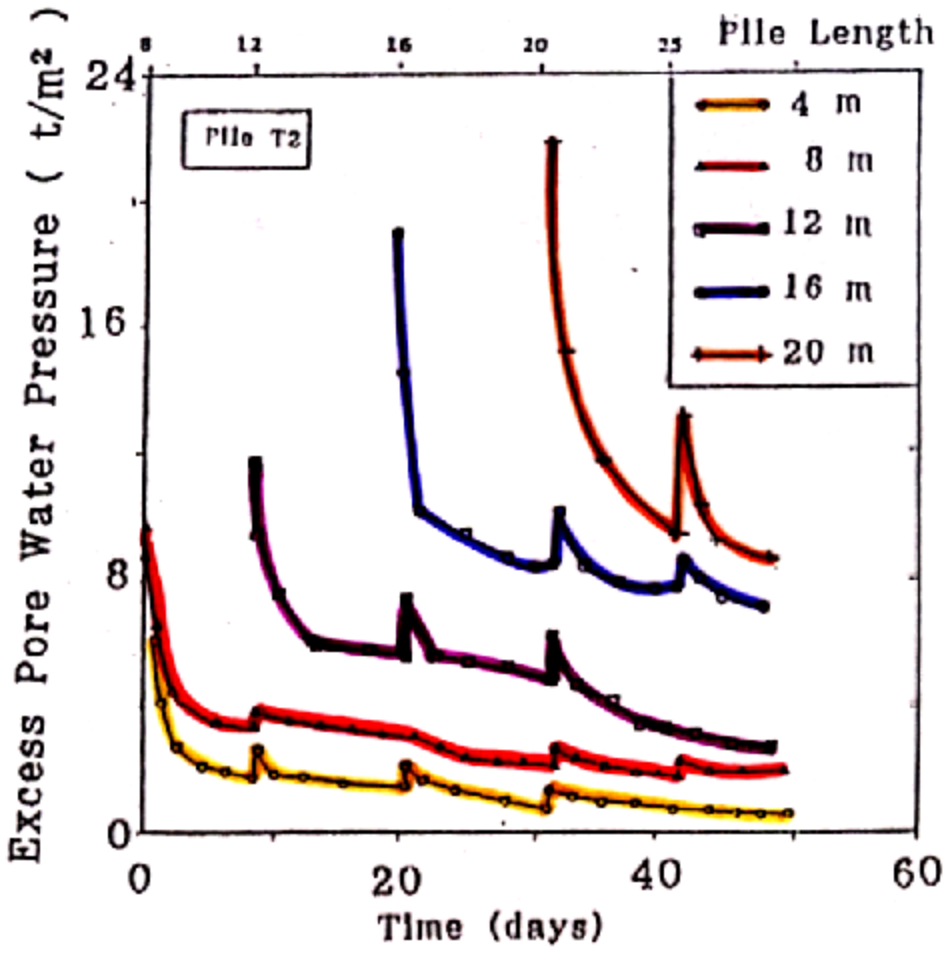
Consolidation Characteristics of Sub-soils



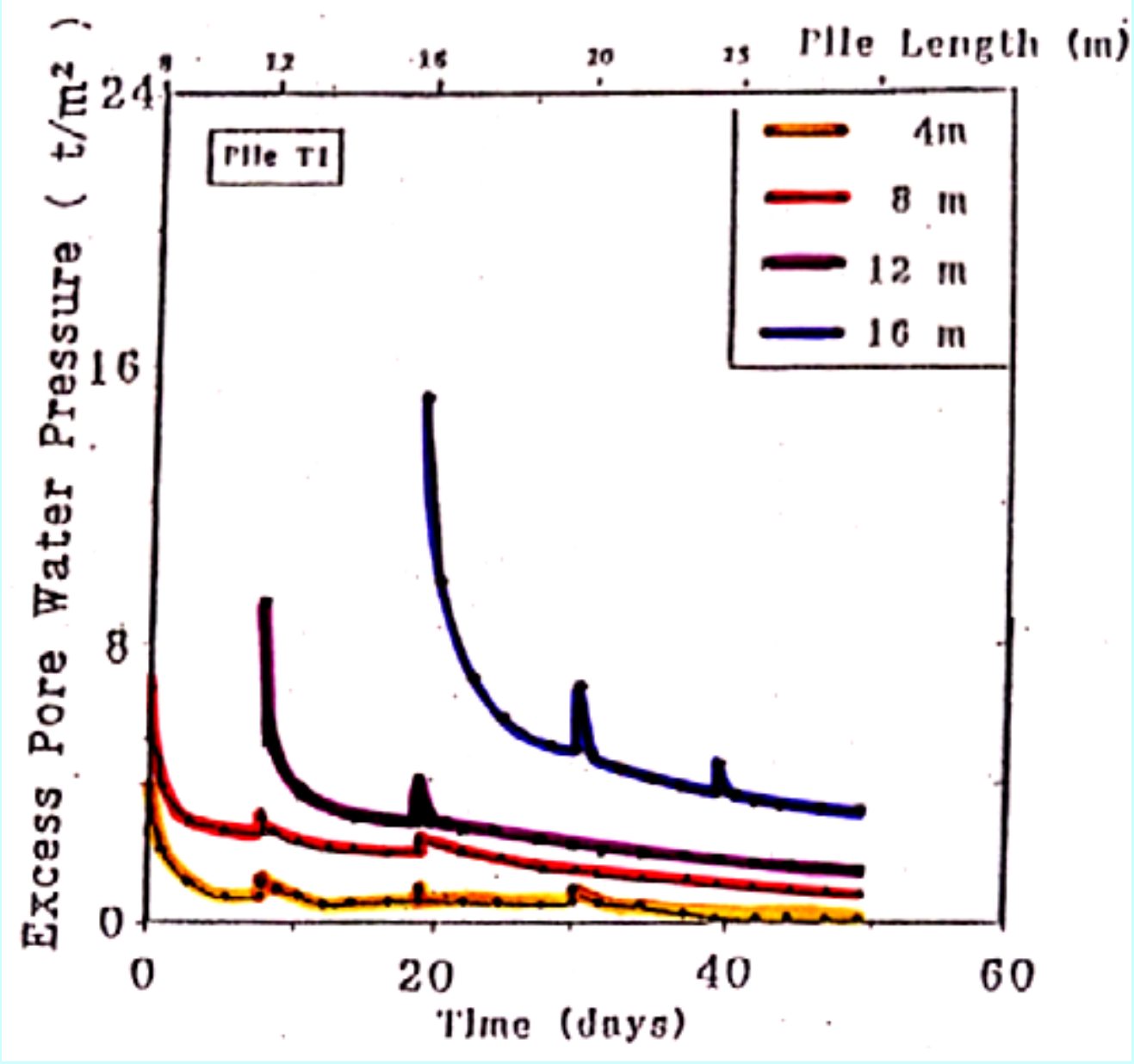
Consolidation Characteristics of Sub-soils



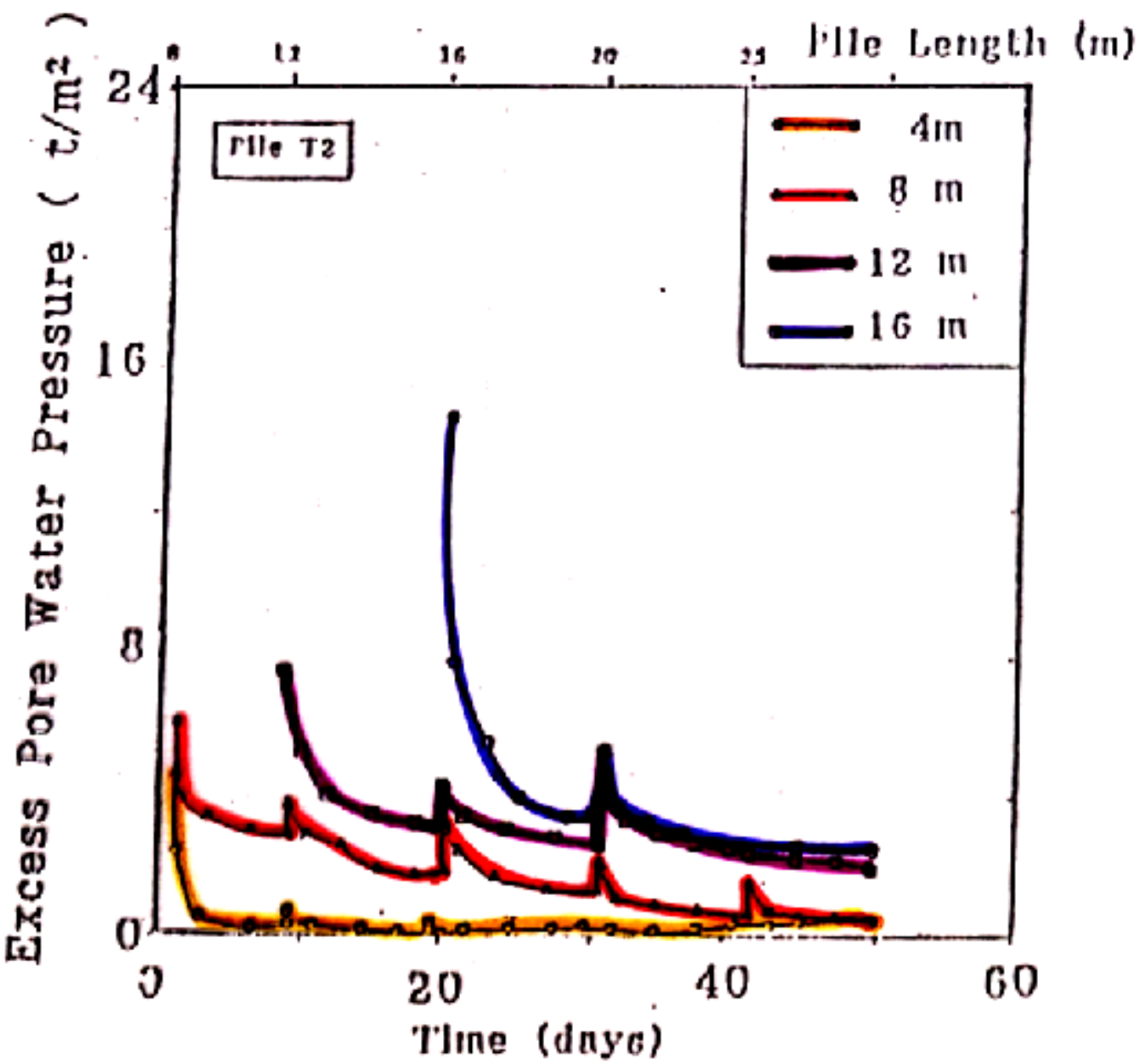
Pore Water Pressure During Pile Driving (r= 0.2m))



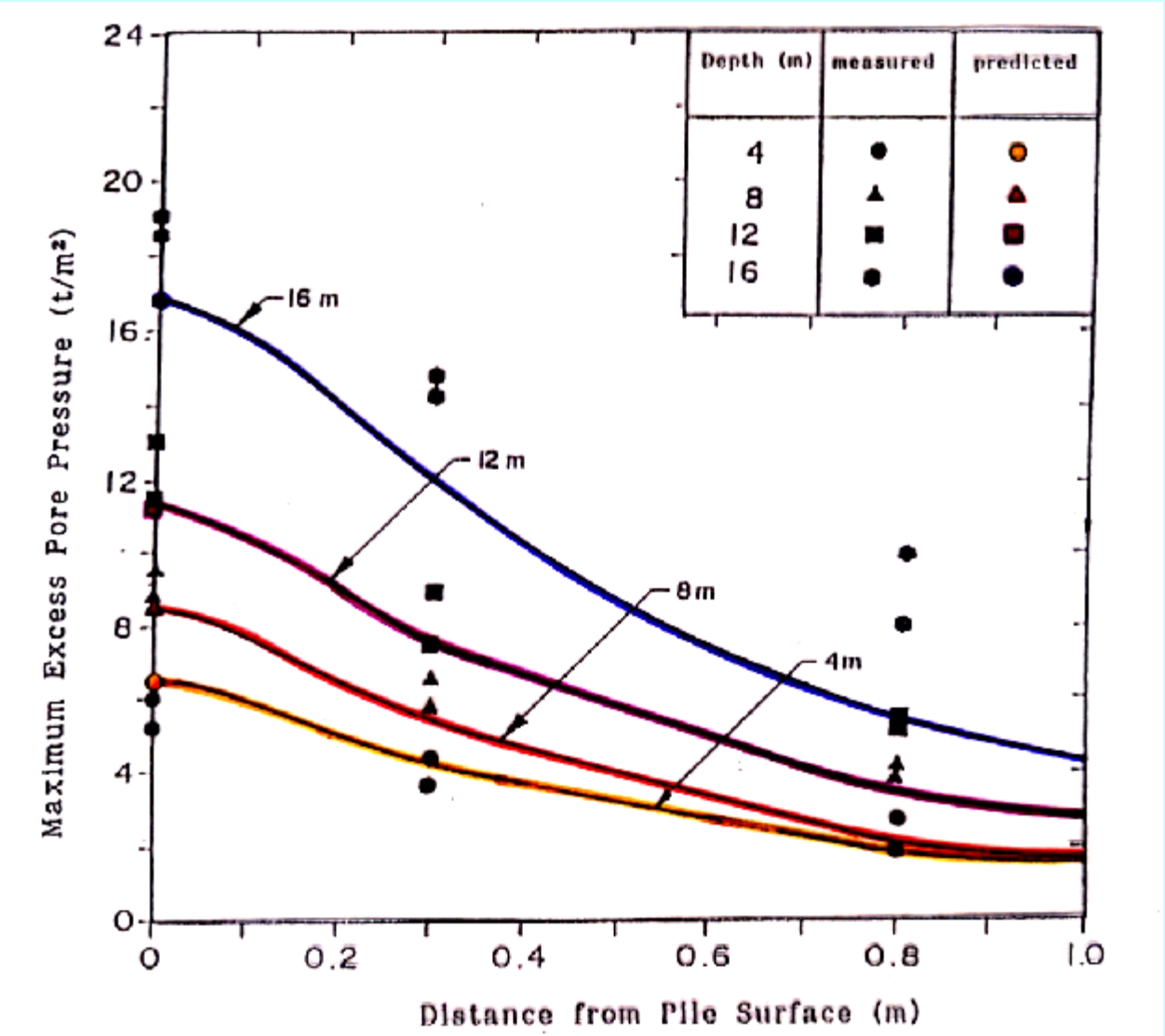
Pore Water Pressure During Pile Driving (r= 0.2m))



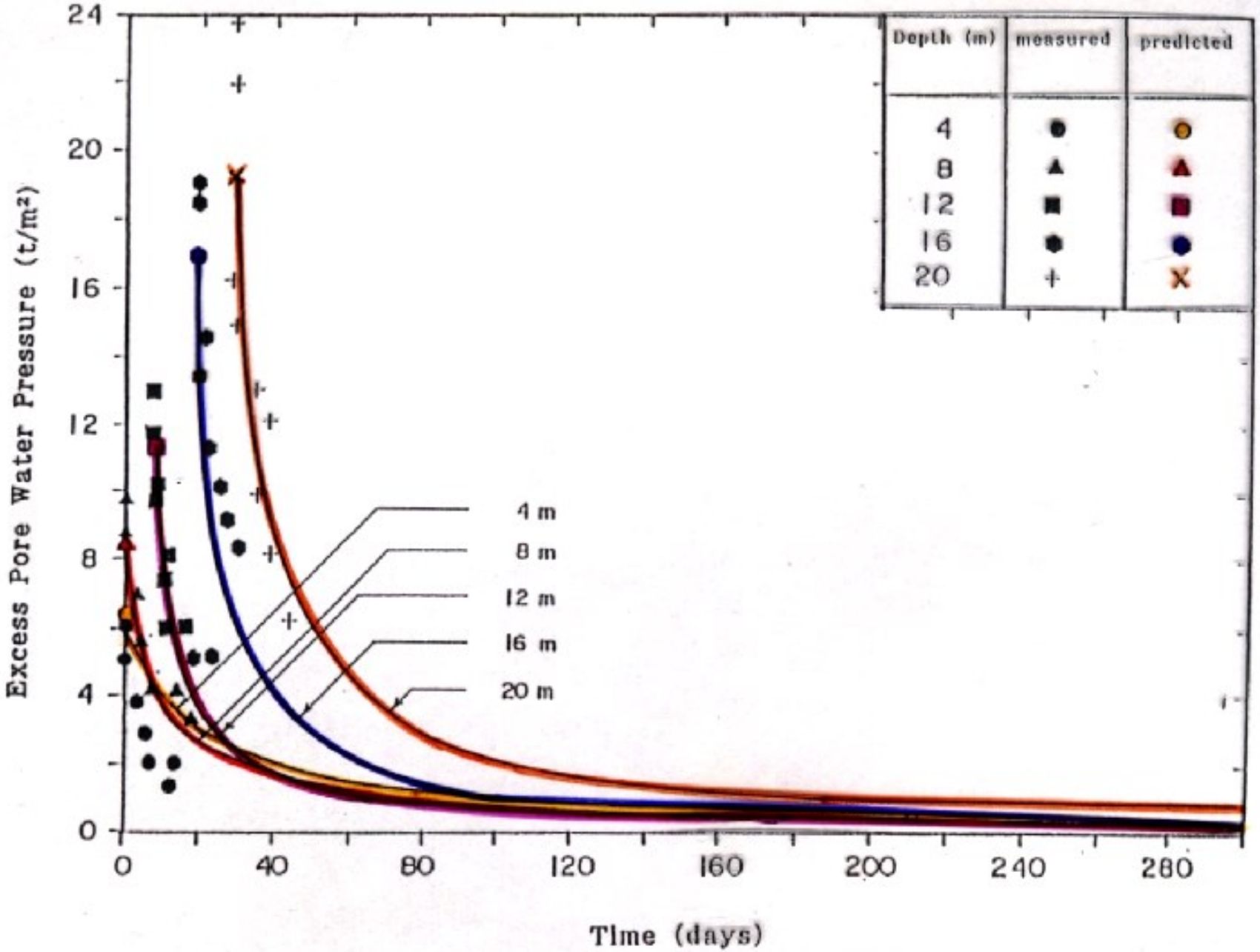
Pore Water Pressure During Pile Driving (r= 0.6m)



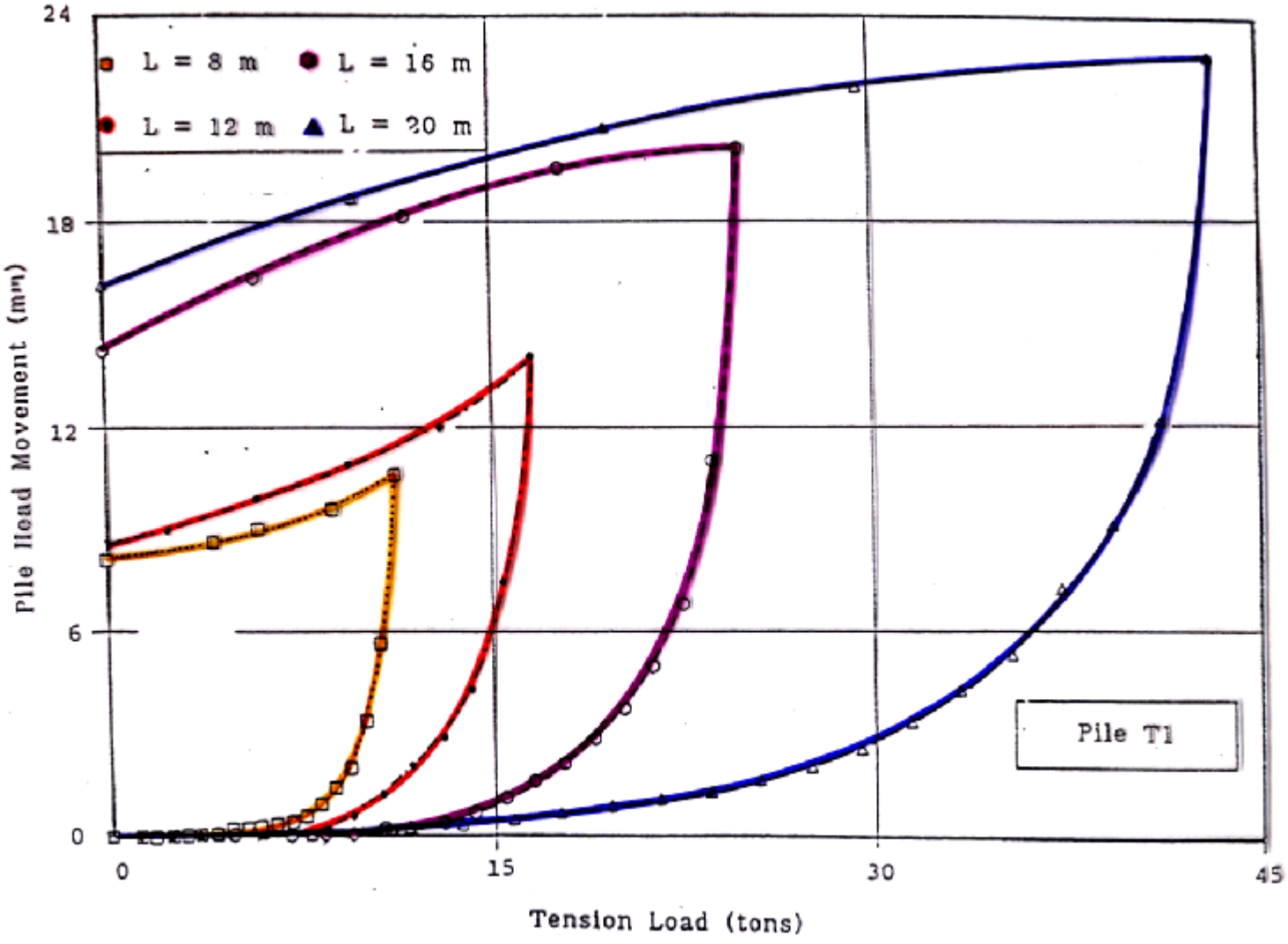
Pore Water Pressure During Pile Driving (r= 0.6m)



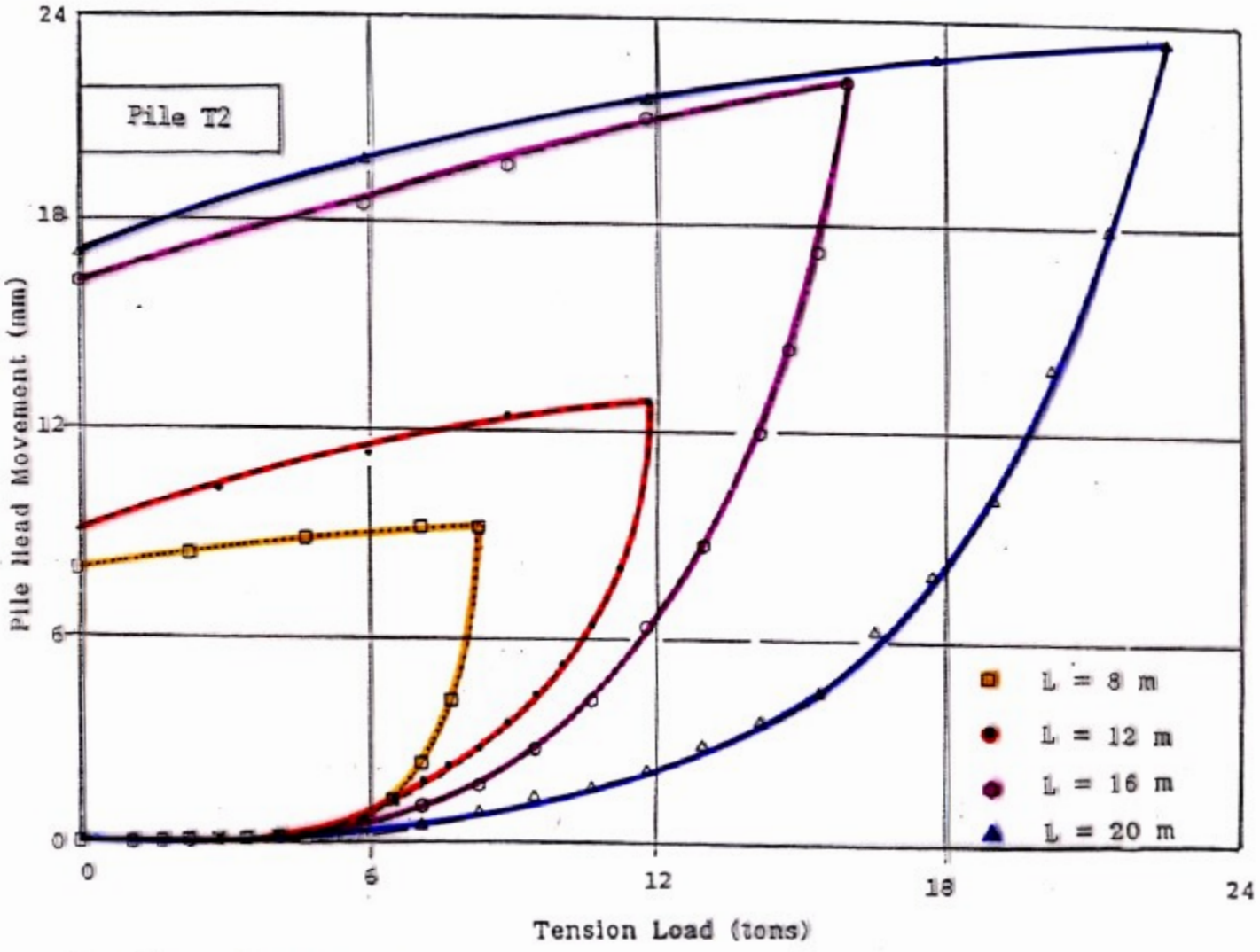
Measured and Predicted Excess Pore Water Pressure



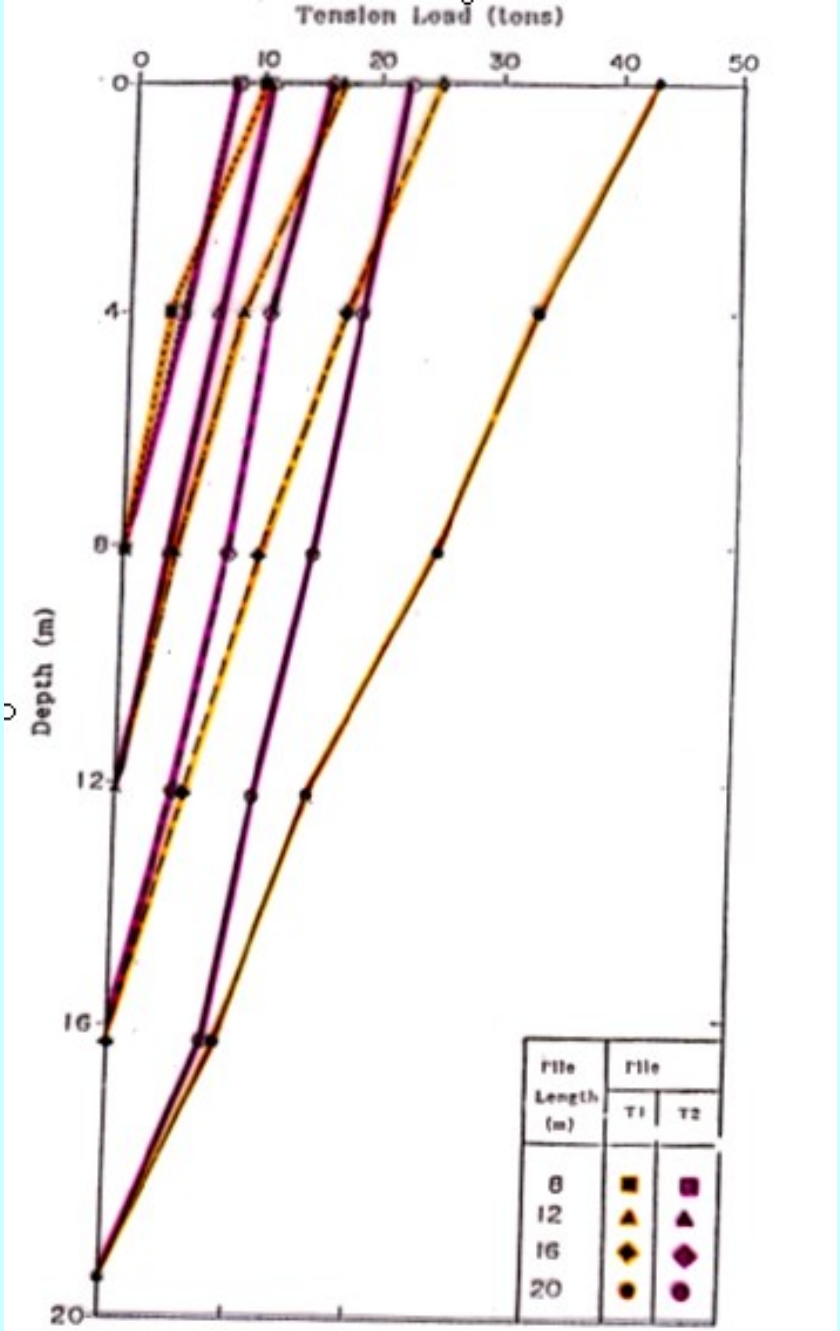
Measured and Predicted Excess Pore Water Pressure at Pile Surface



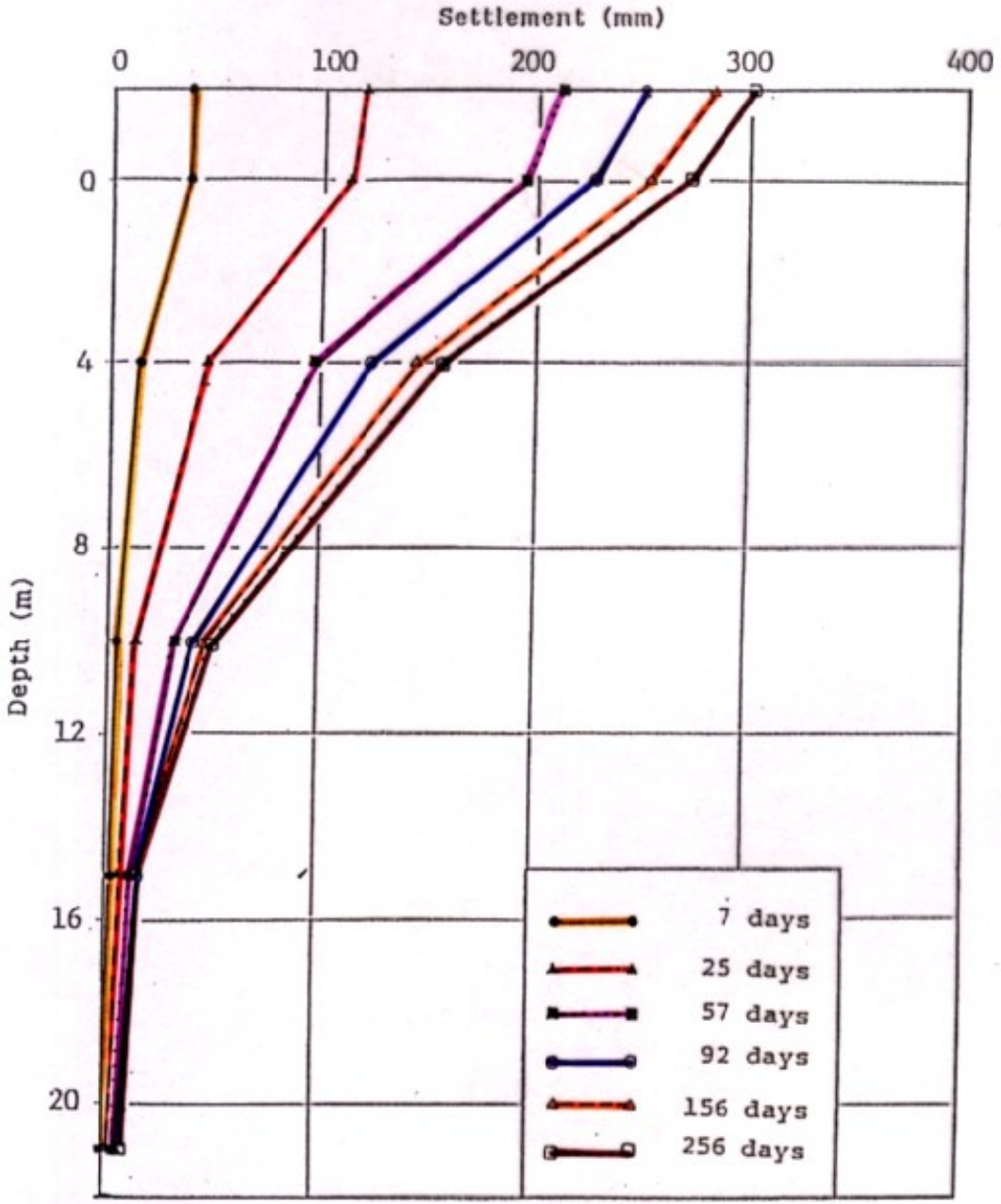
Load - Uplift Curve (Pile T1)



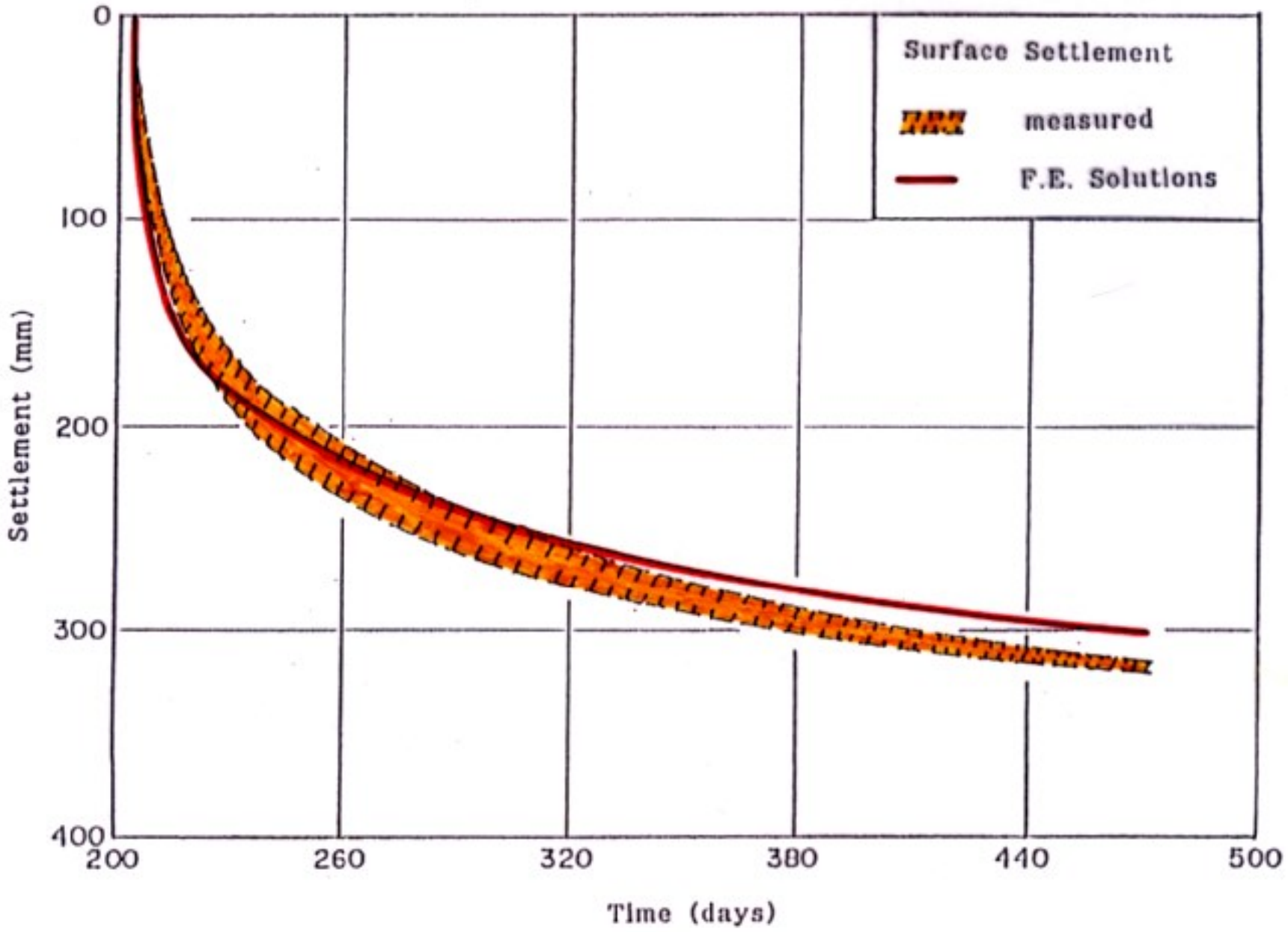
Load - Uplift Curve (Pile T2)



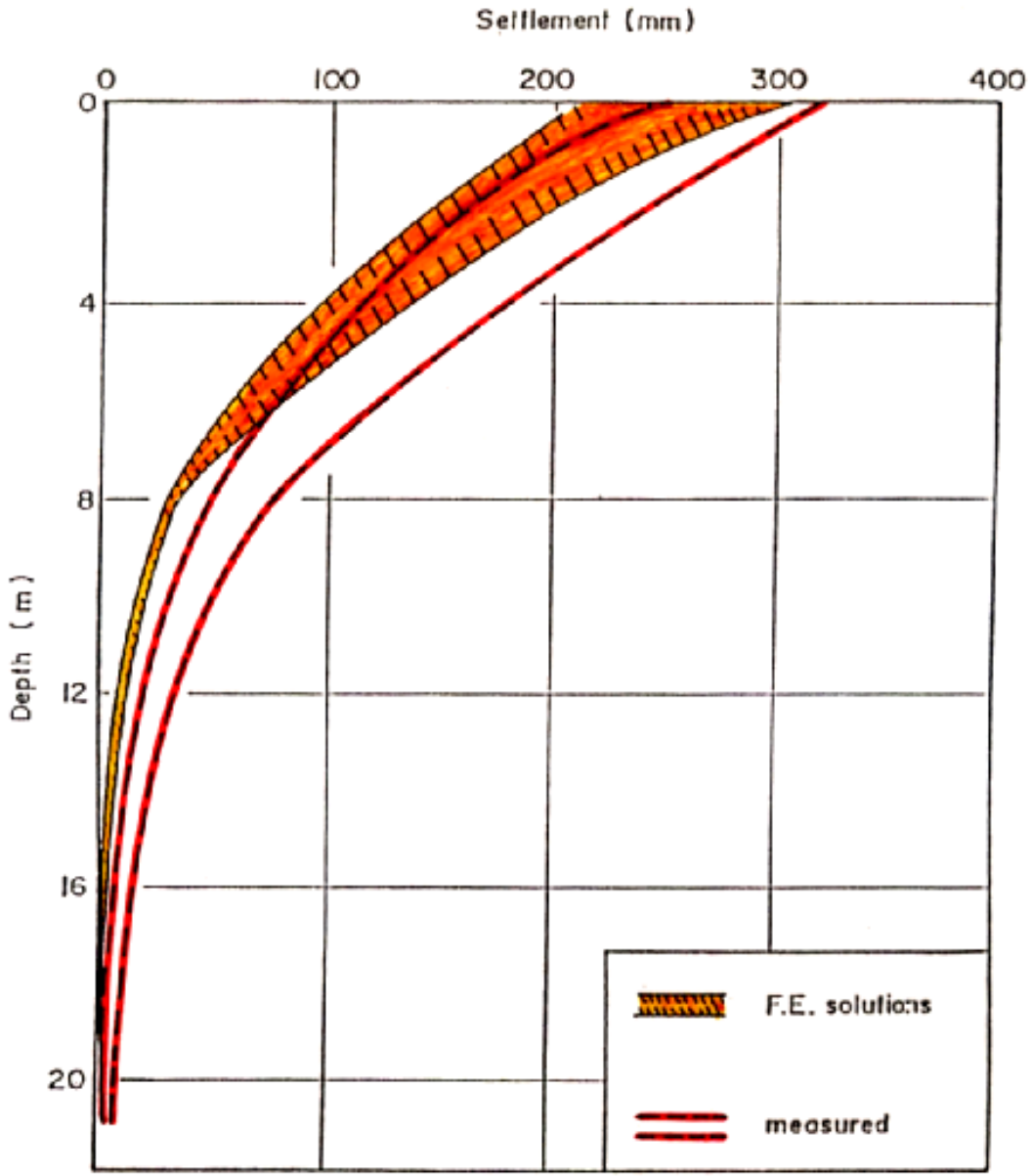
Load Distribution Curves at Maximum Tension Load



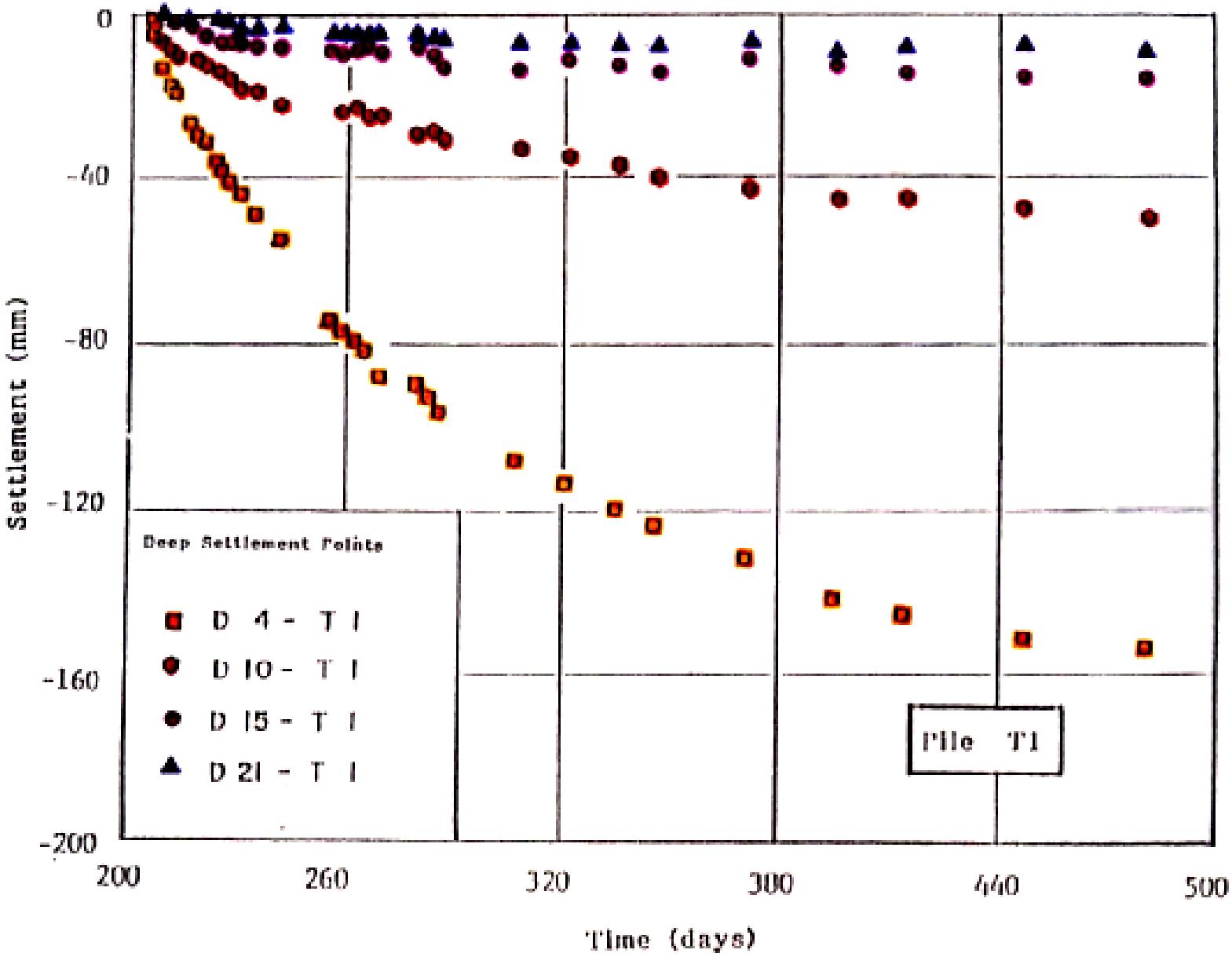
Variation of Settlement with depths
(Pile T1)



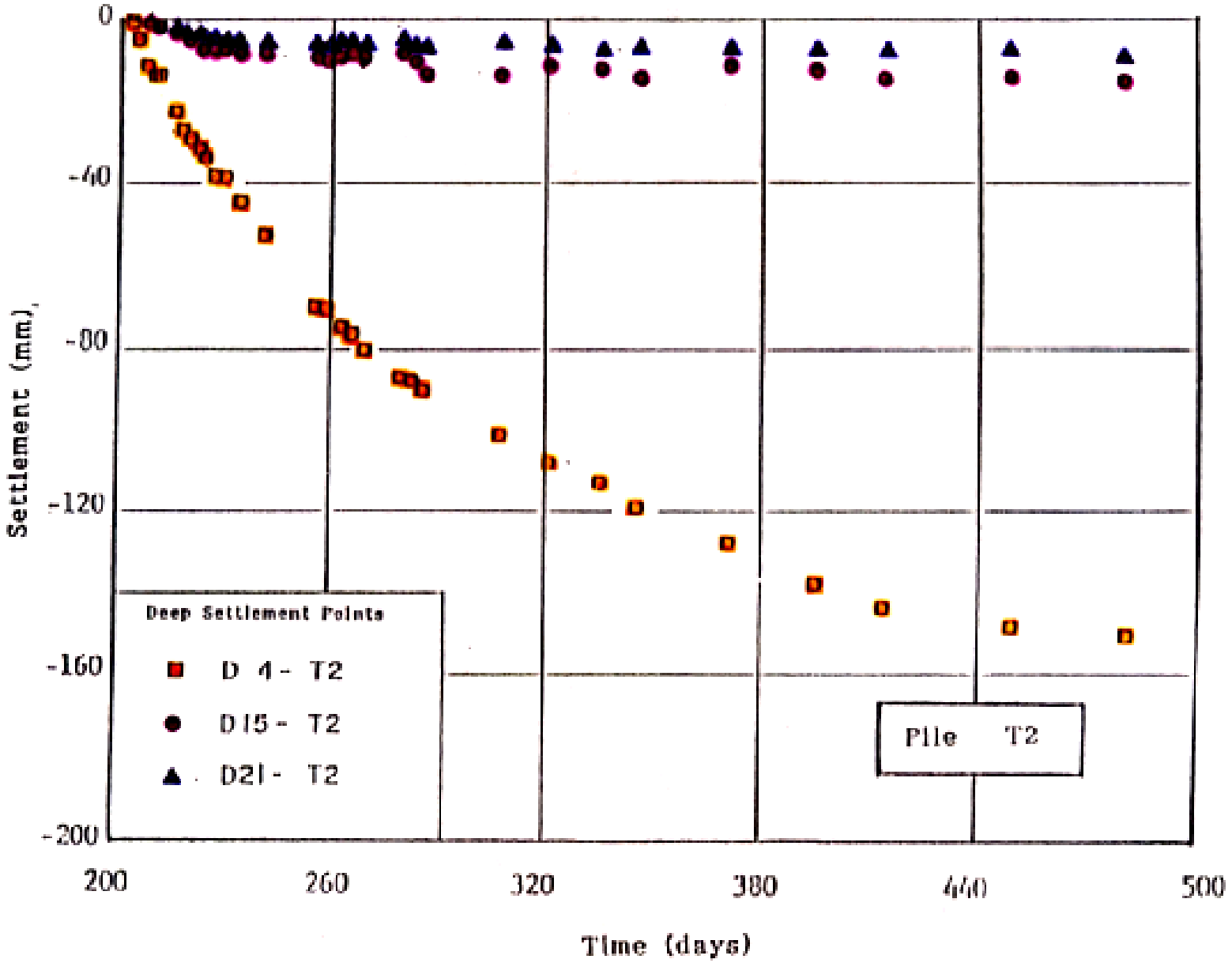
Comparison between Measured and Predicted Ground Settlements



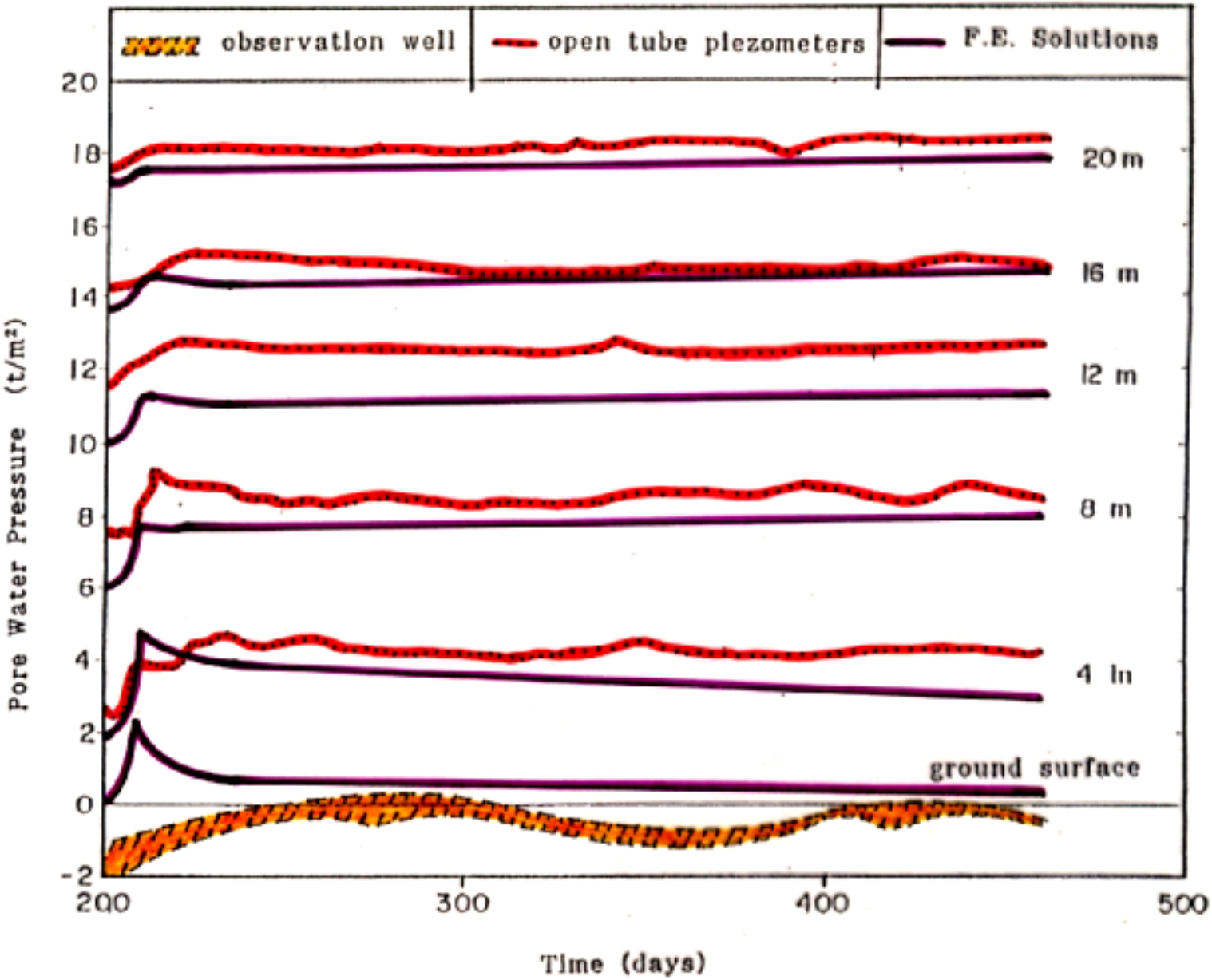
Comparison between Measured and Predicted Ground Settlements along Pile Shaft



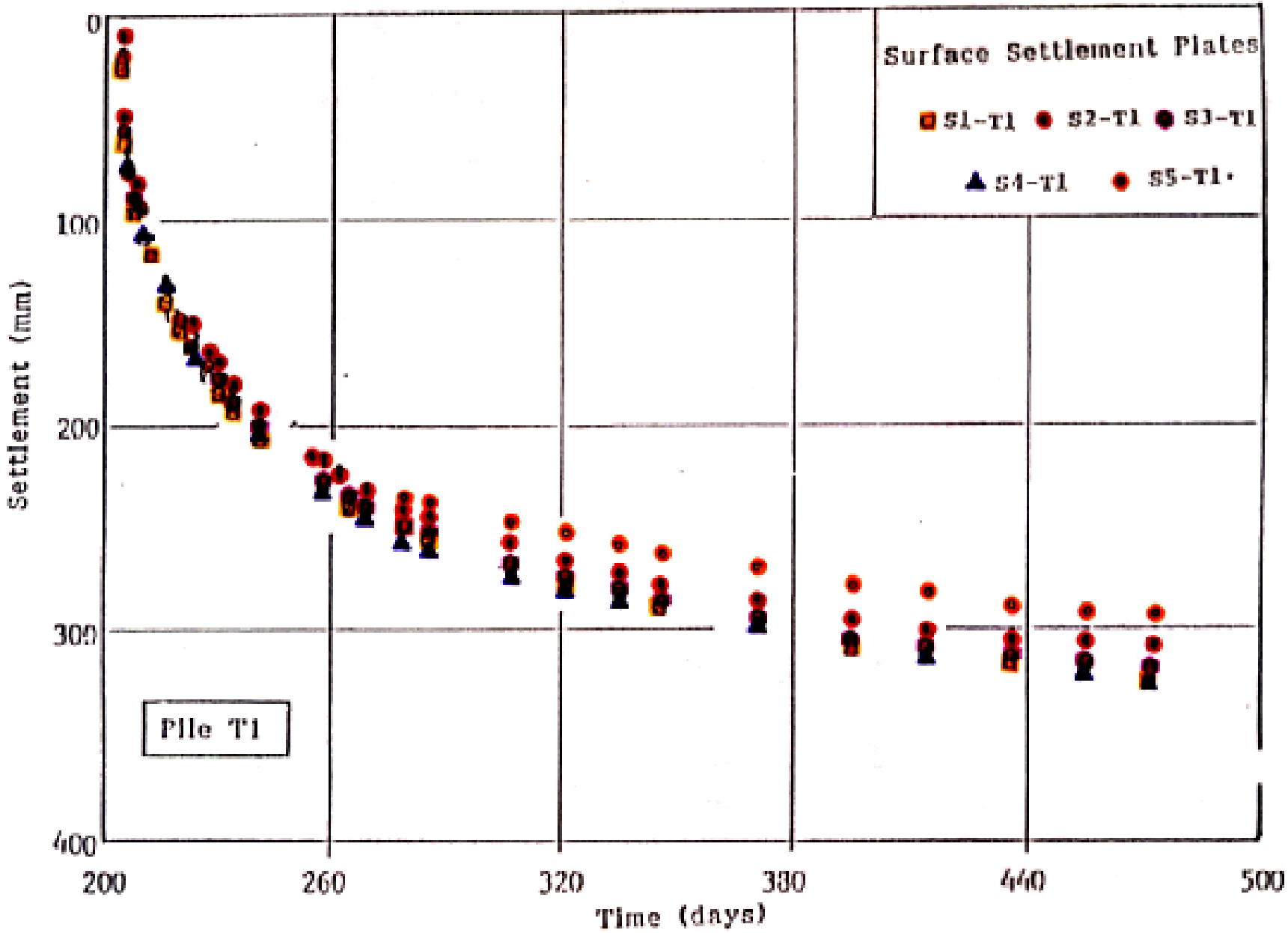
Settlement from Deep Settlement Points
(Pile T1)



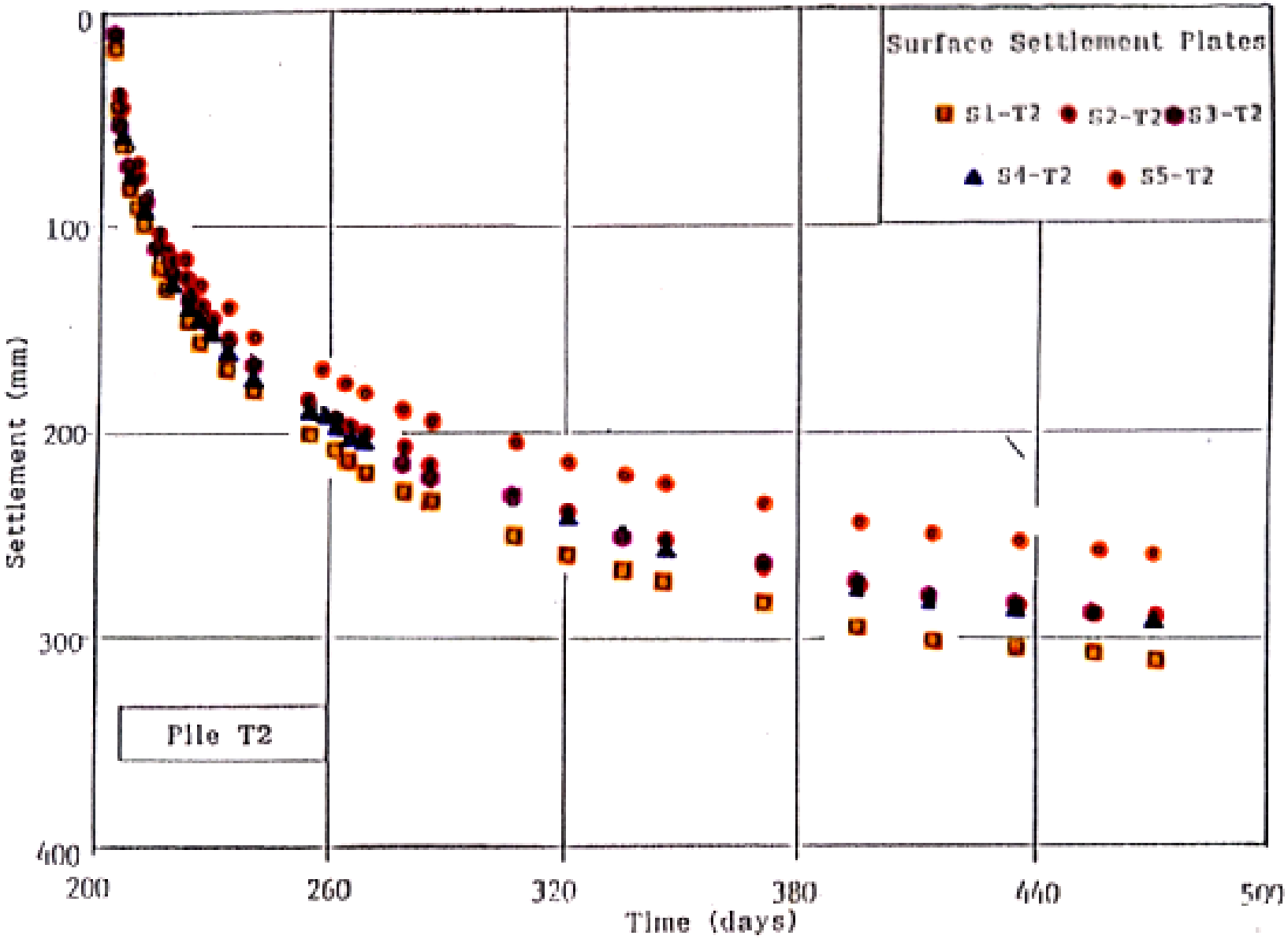
Settlement from Deep Settlement Points
(Pile T2)



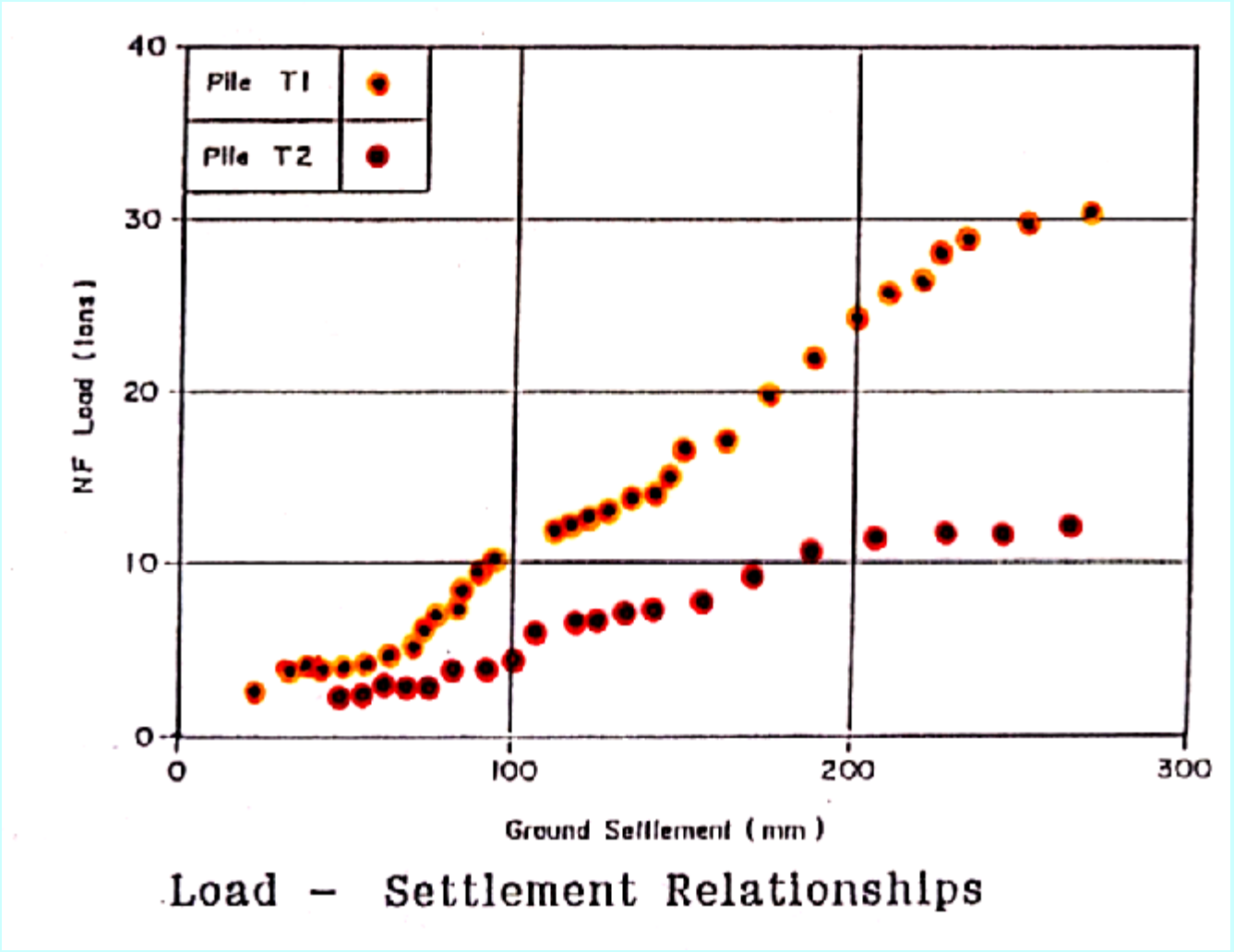
Comparison between Measured and Predicted Pore Water Pressure After the Embankment Surcharge Load



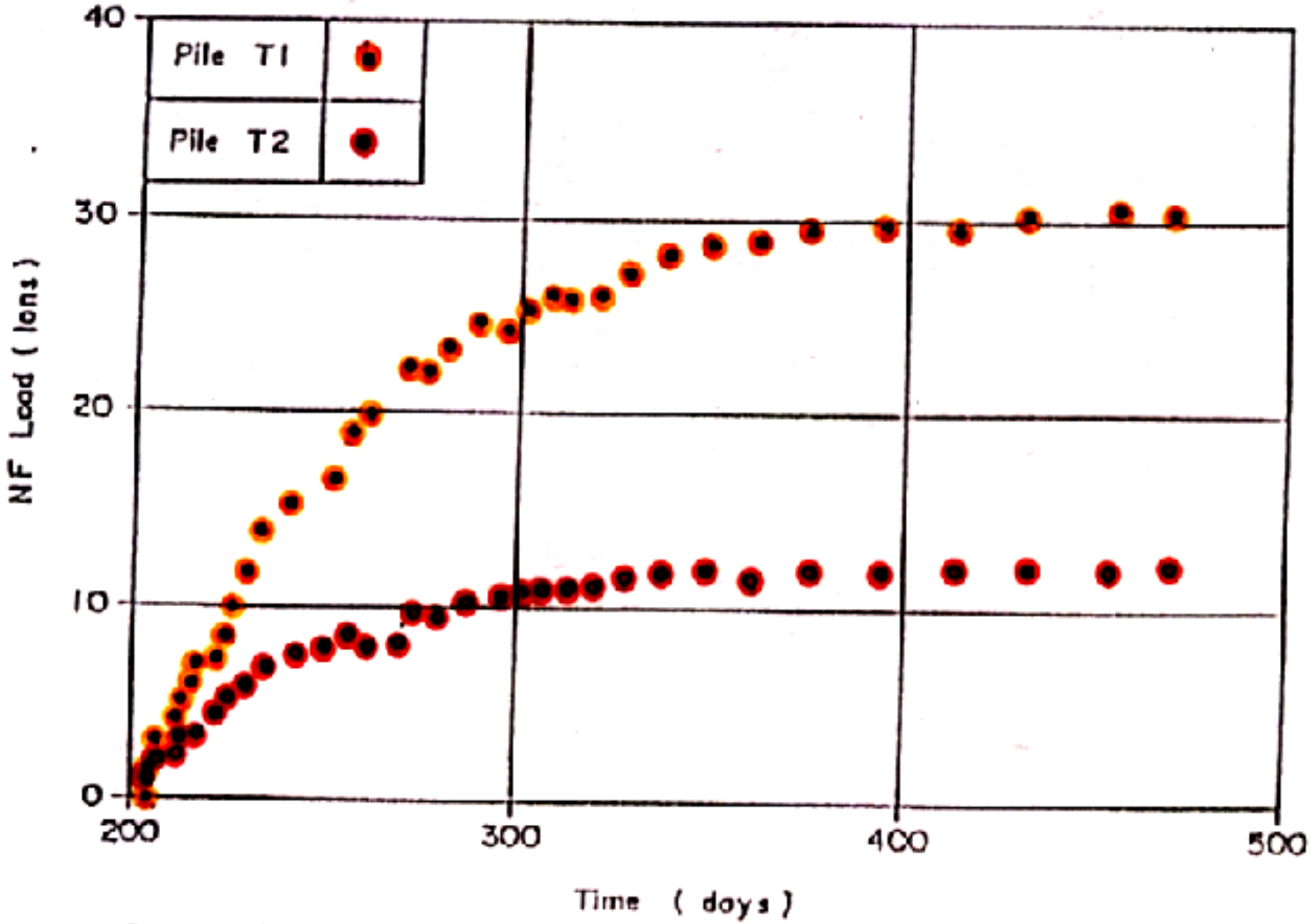
Settlement of Ground Surface around Pile T1



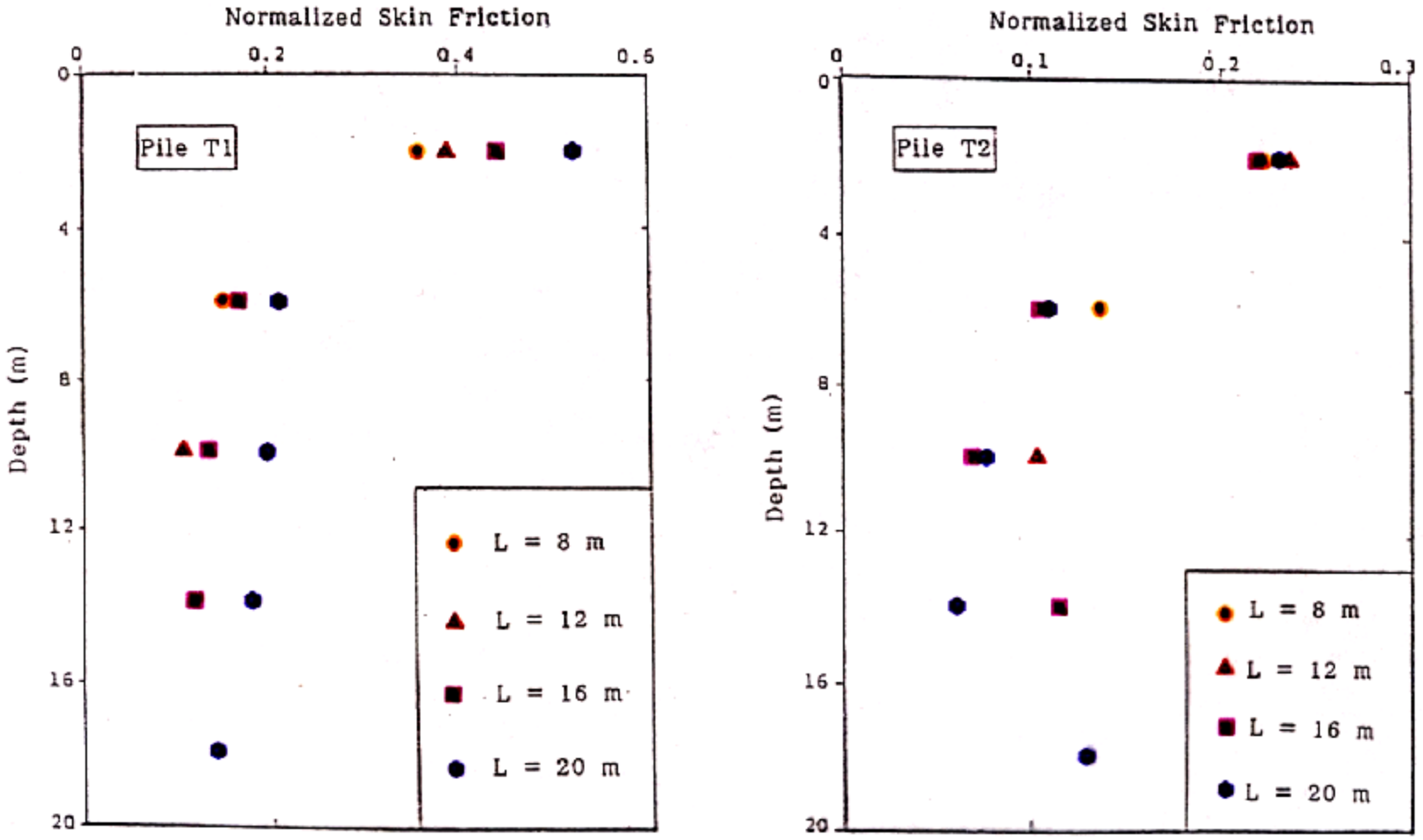
Settlement of Ground Surface around Pile T2



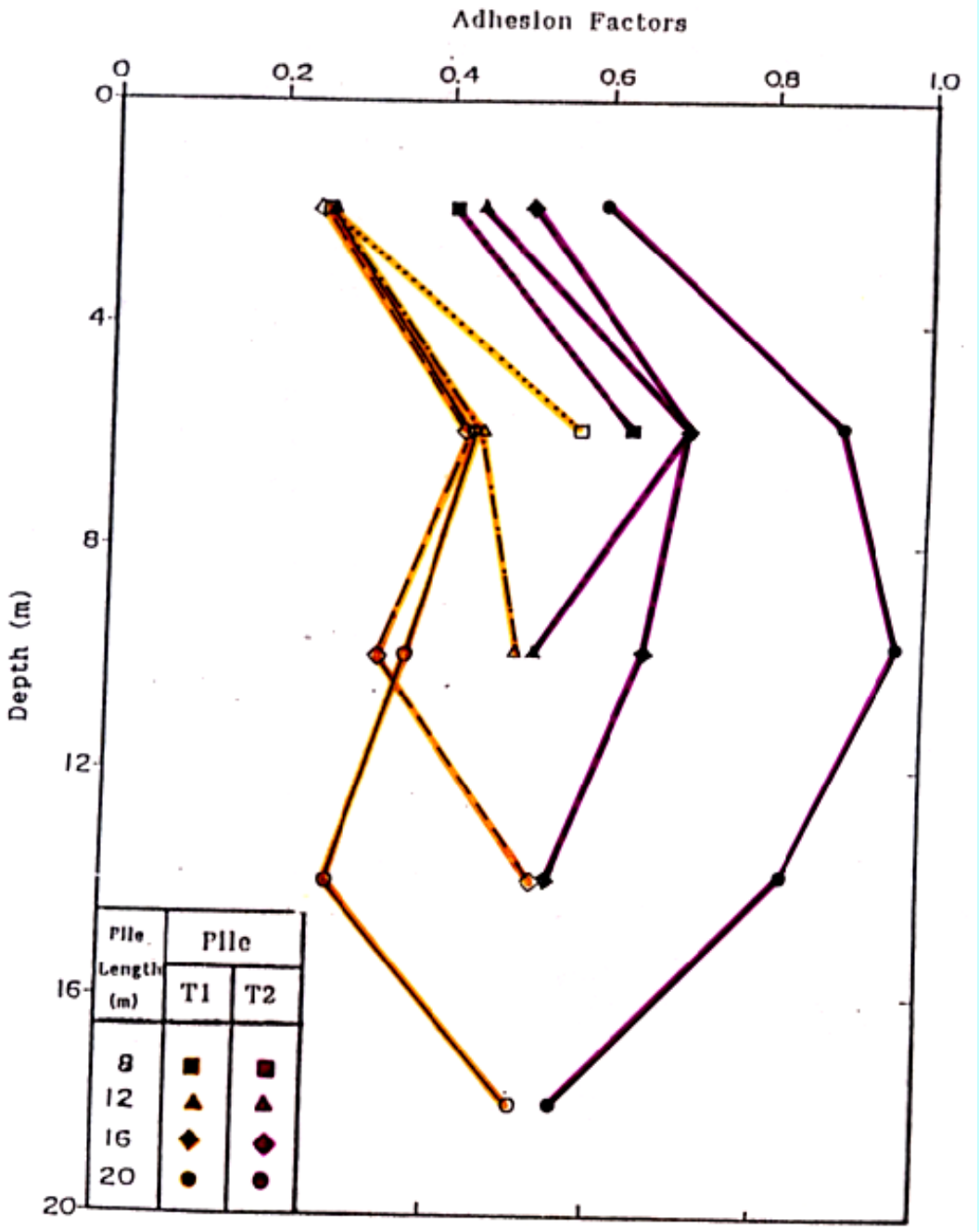
Load – Settlement Relationships



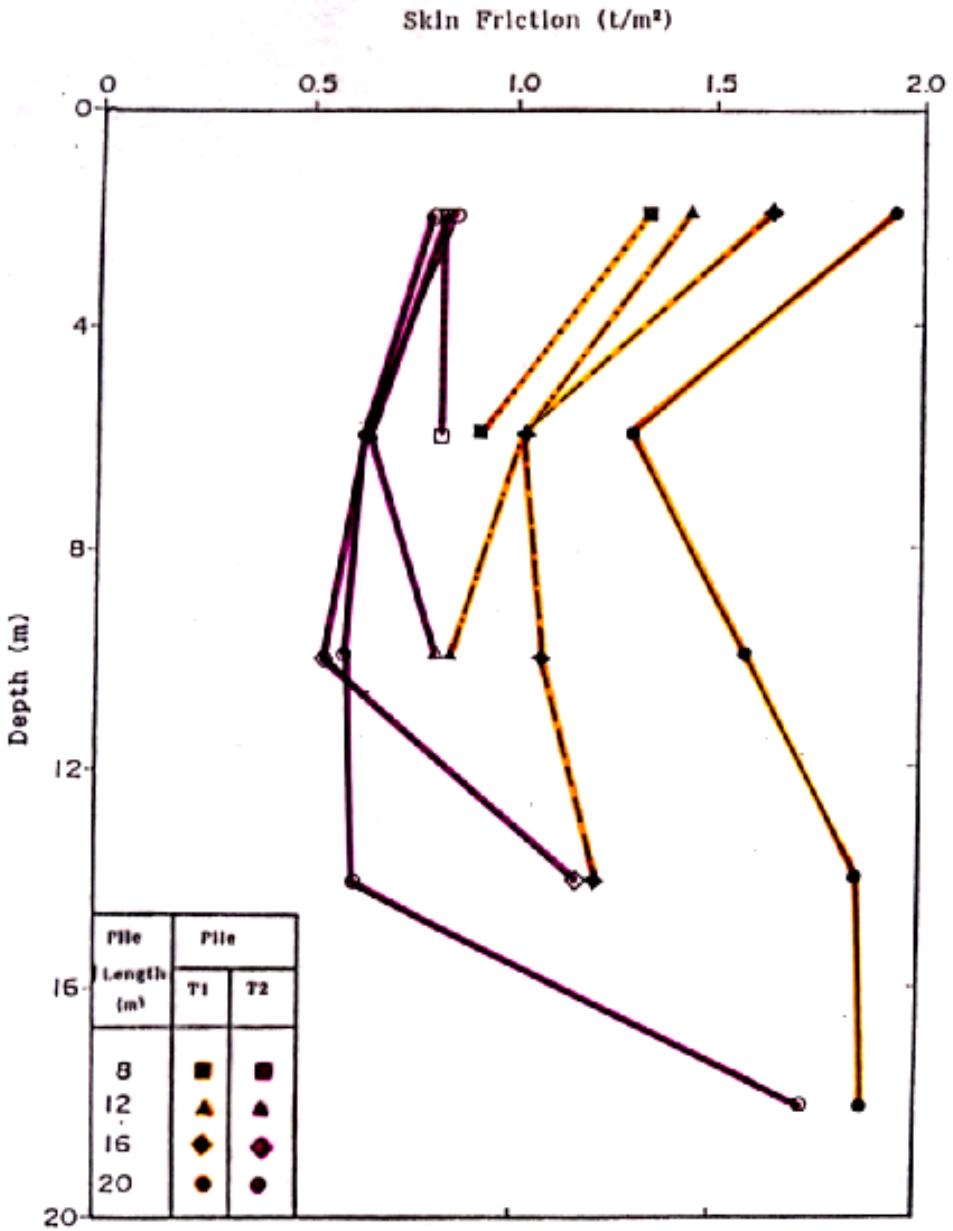
Development of Negative Skin Friction with Time (Piles T1 and T2)



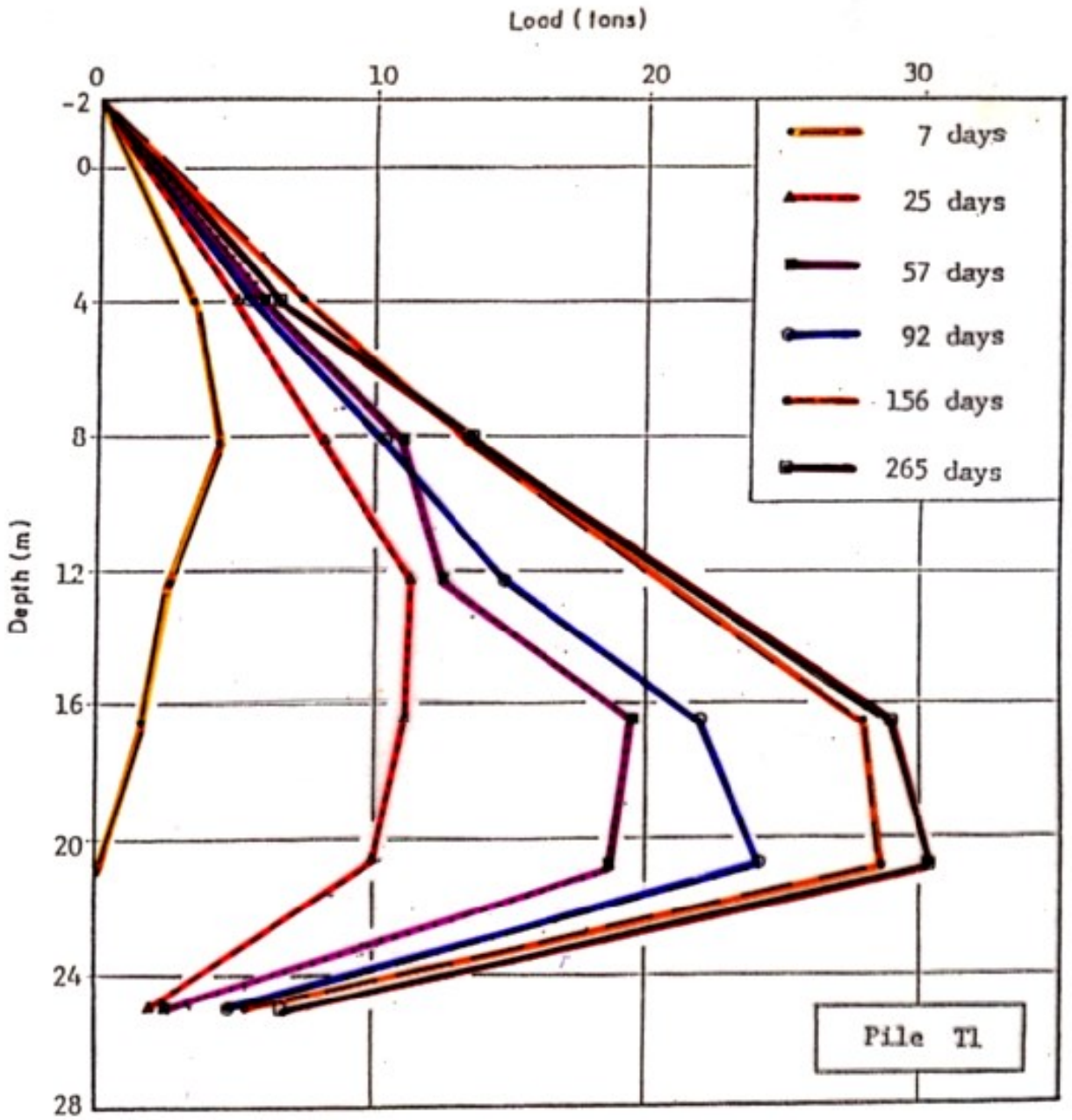
Variation of Normalized Skin Friction with Driven Lengths



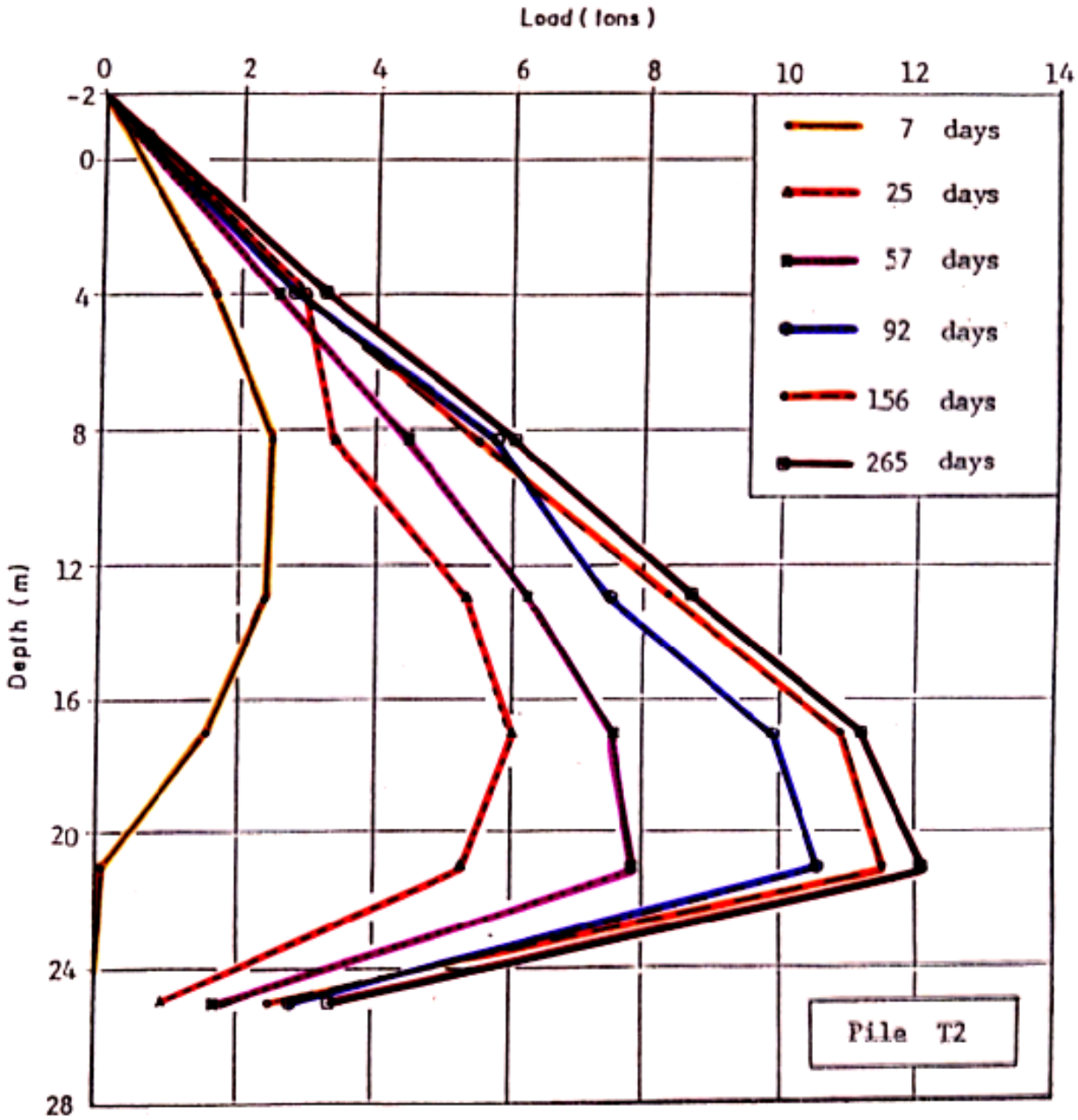
Variation of Adhesion Factor with Driven Lengths



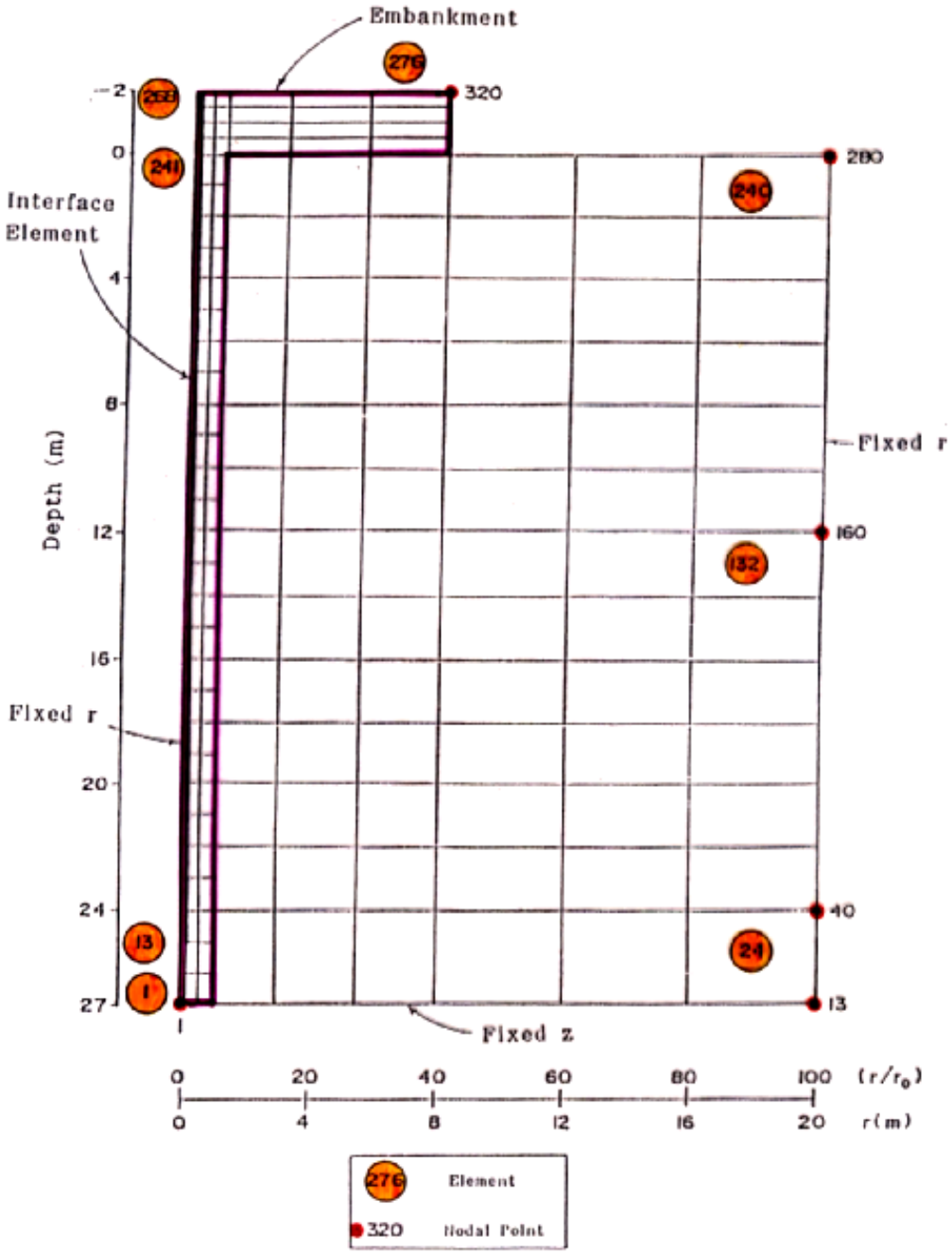
Maximum Skin Friction along Pile Length



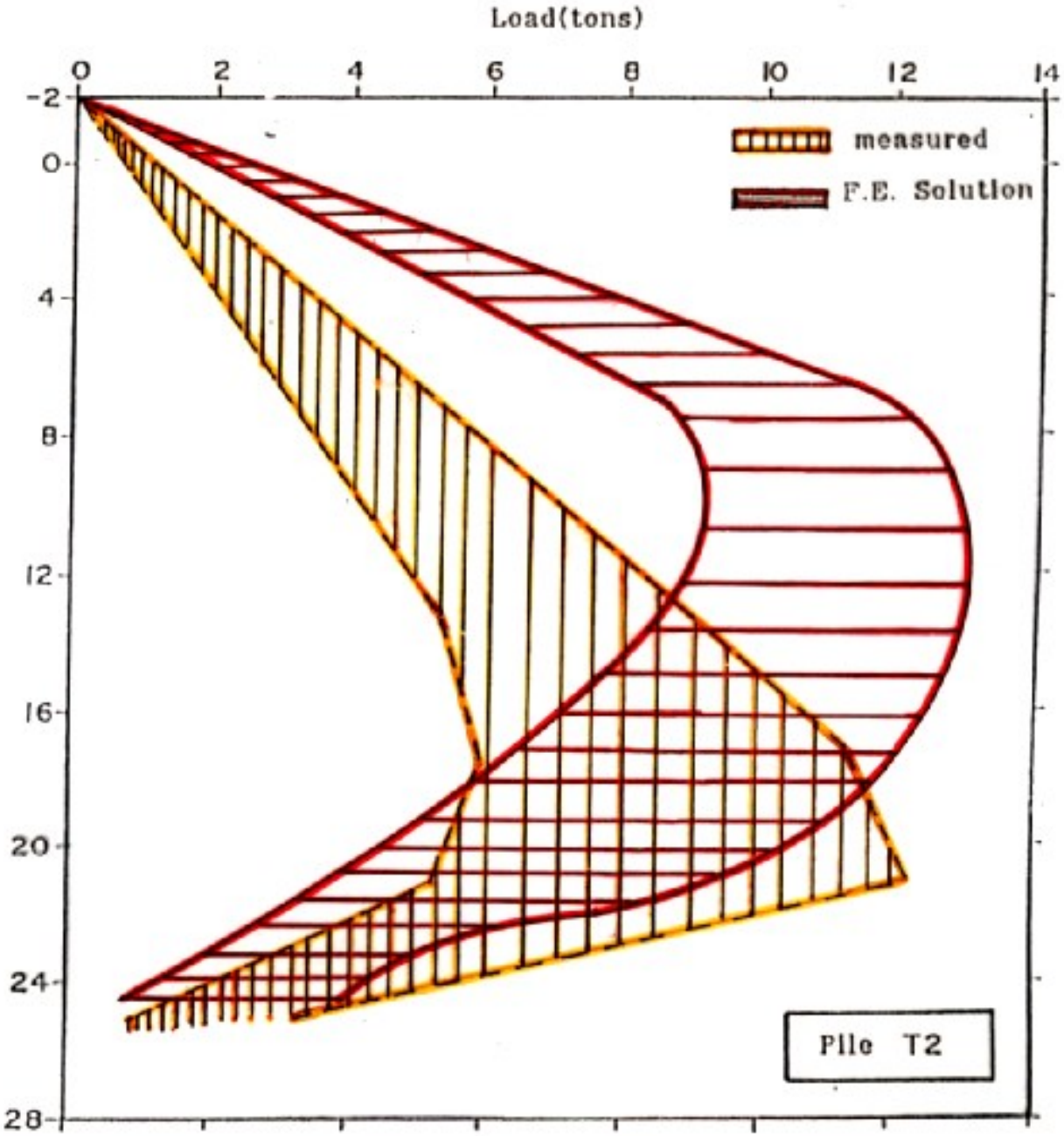
Load Distribution along Pile Shaft
(Pile T1)



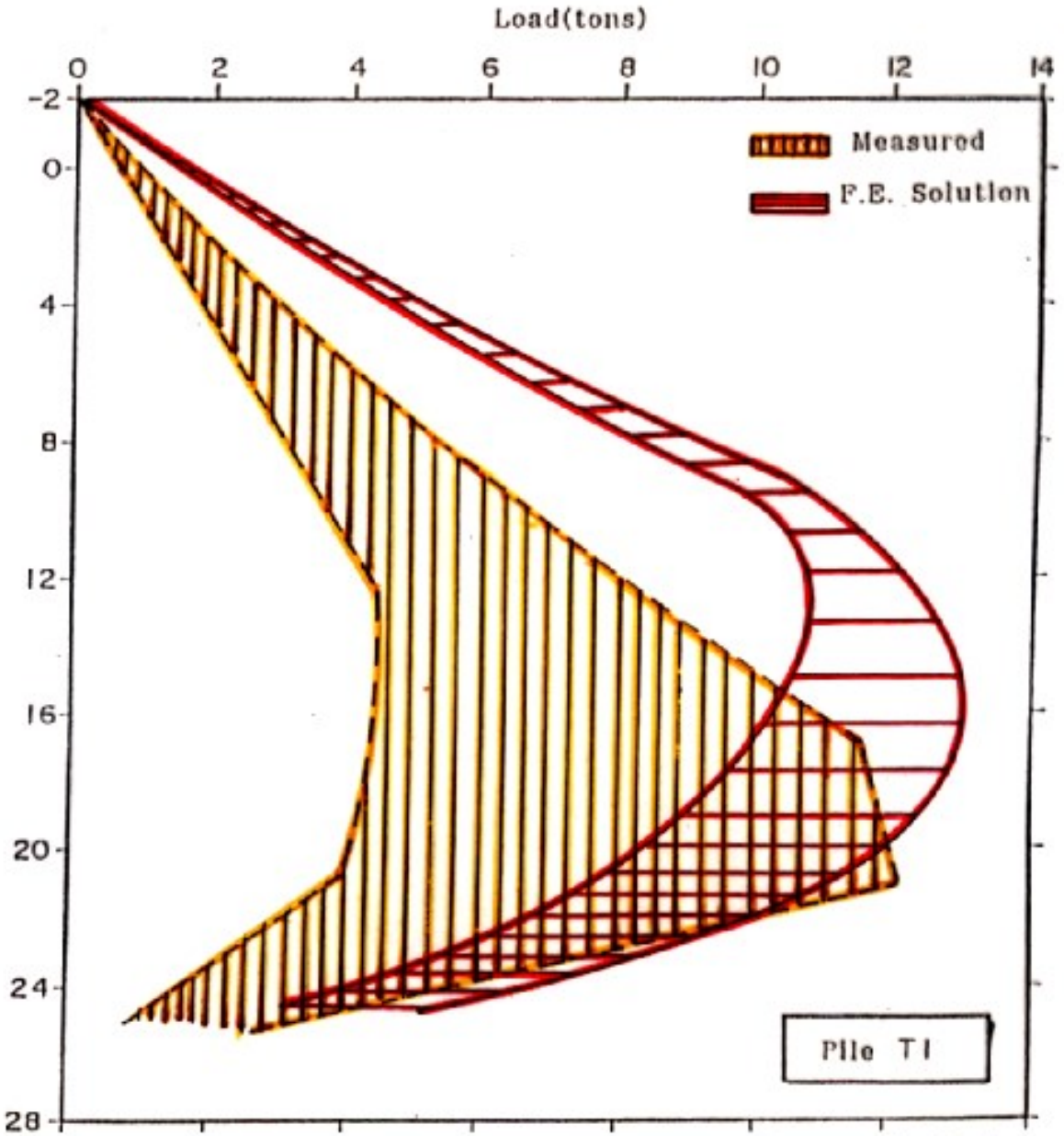
Load Distribution along Pile Shaft
(Pile T2)



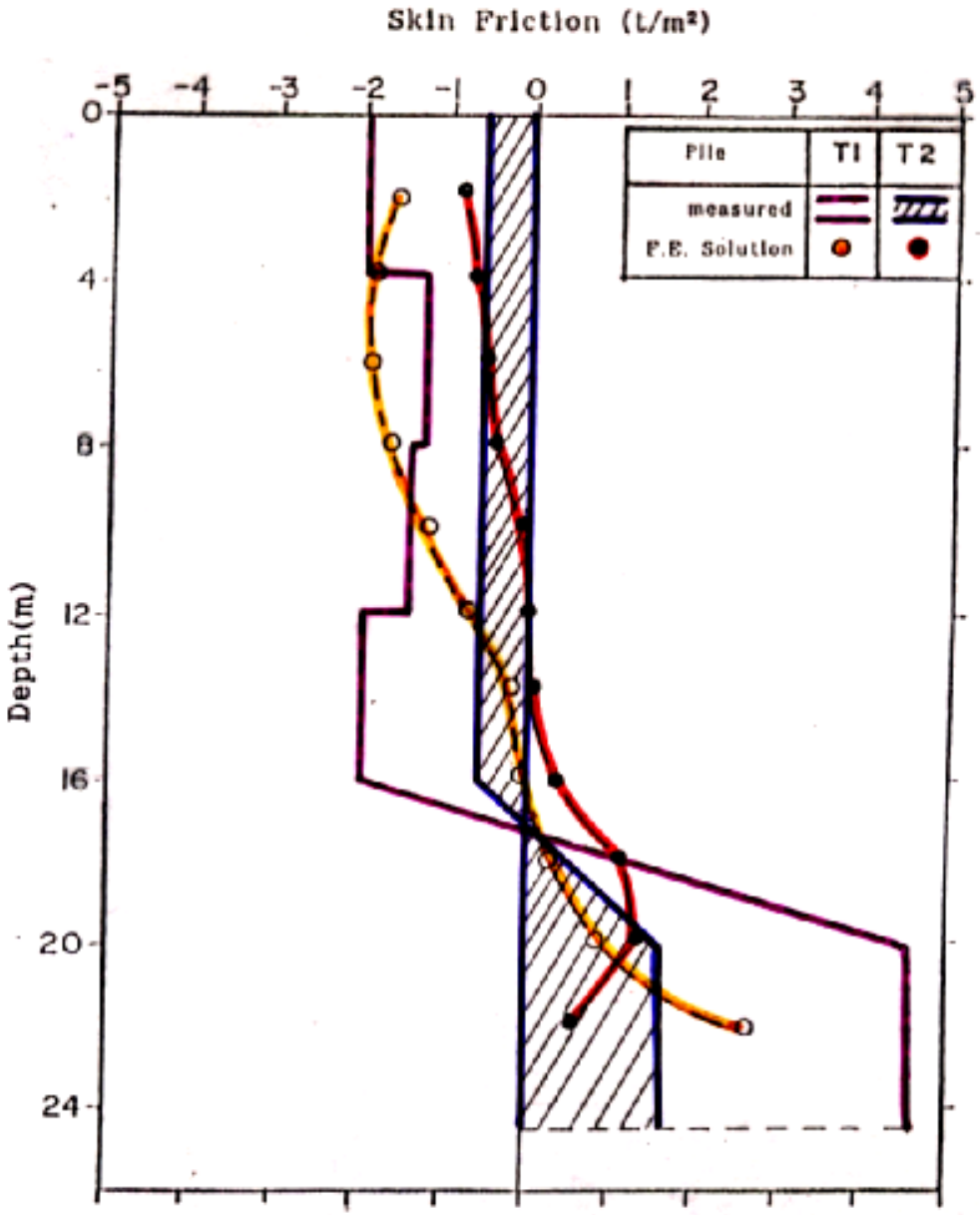
F.E. Mesh for Piles under Embankment Surcharge Load



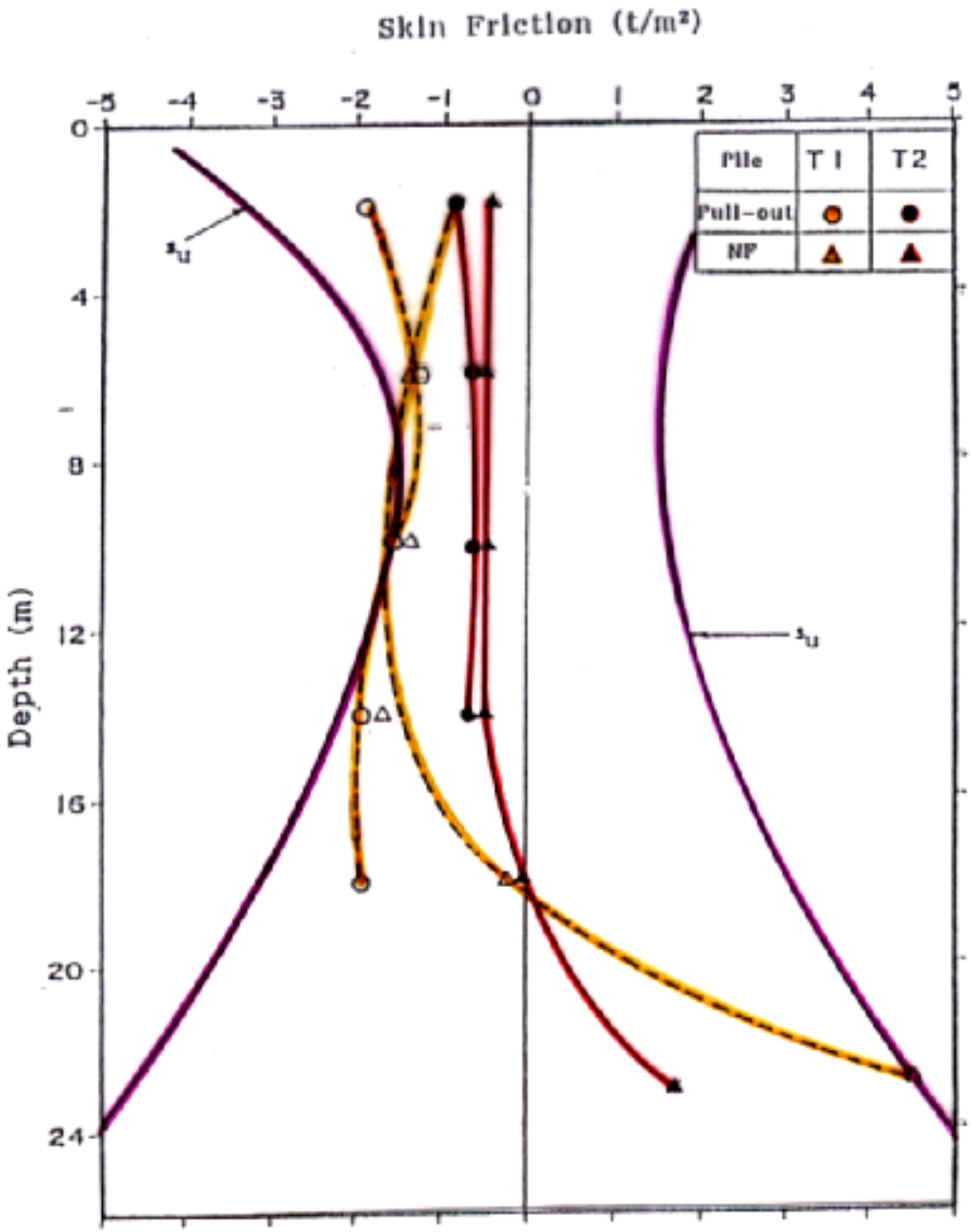
Comparison between Measured and Predicted Load Distributions (Pile T2)



Comparison between Measured and Predicted Load Distributions (Pile T1)



Comparison between Measured and Predicted Skin Friction along Pile Shaft (End of Consolidation Phase)



Estimated Skin Friction with Pile Depth

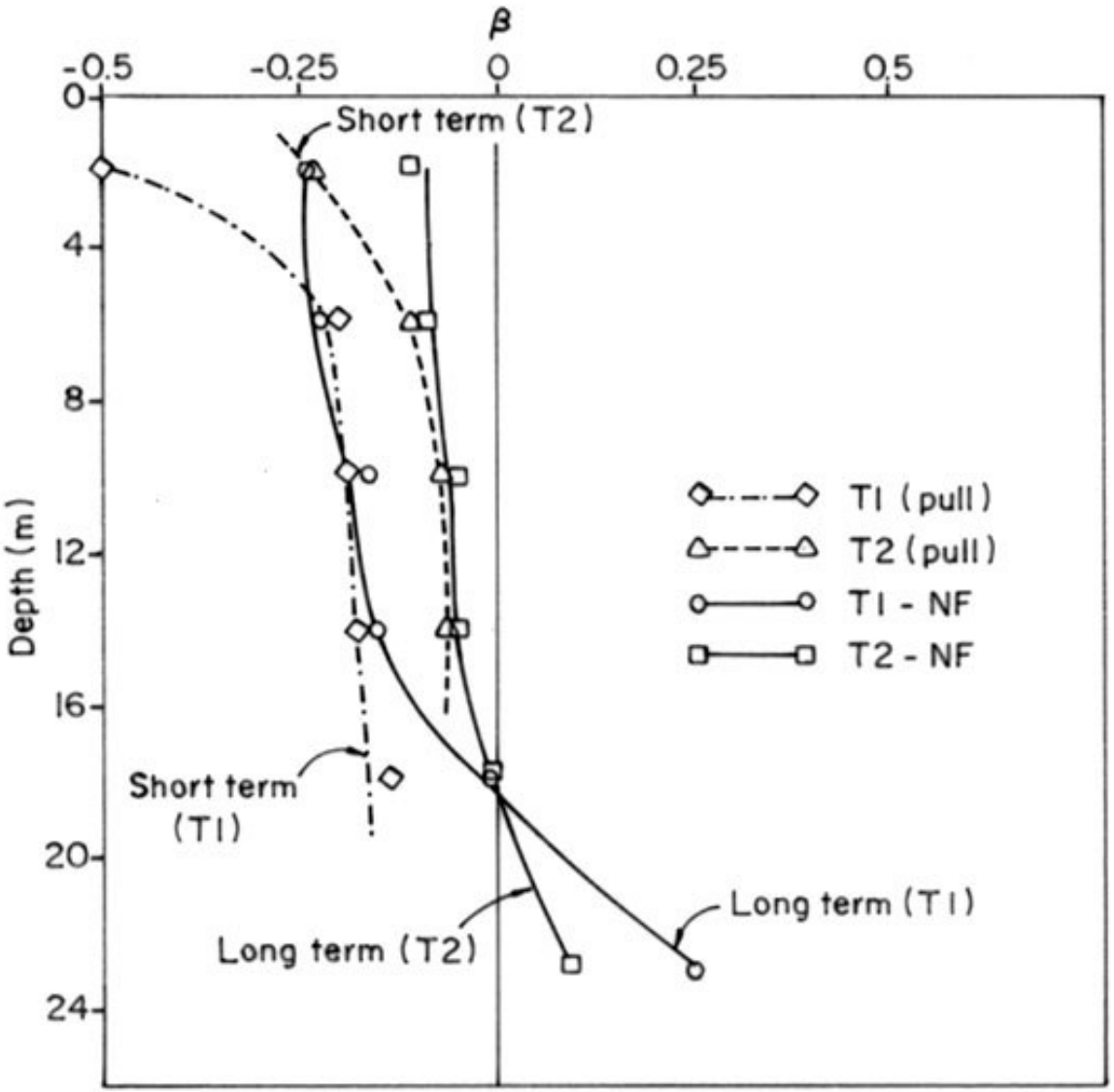


Fig. 11 Estimated β values