Clase No. 11

1. Fundaciones Superficiales.

- Tipos y Usos.
- Capacidad de soporte
- Fórmula de Rotura: efecto del agua, forma de la zapata, correcciones por enterramiento, estratificación del suelo.
- Asentamientos en fundaciones superficiales: tipos de asentamientos, metodologías para la estimación de asentamientos, la constante de balastro, giros de fundación.
- Integración de los conceptos de rotura y asentamientos (giros) admisibles.
- Losas de fundación

Asentamientos instantáneos en suelos No-Cohesivos (Categoría A)

- Debido a la dificultad de obtener una muestra inalterada para someterla a ensayos de laboratorio se utilizan los siguientes procedimientos in situ.
  - SPT
  - CPT
  - Presiómetro
  - Otros.

Método de Alpan (SPT)

$$\rho_i = m'\left[\frac{2B}{1+B}\right]^2 \alpha_0 q$$

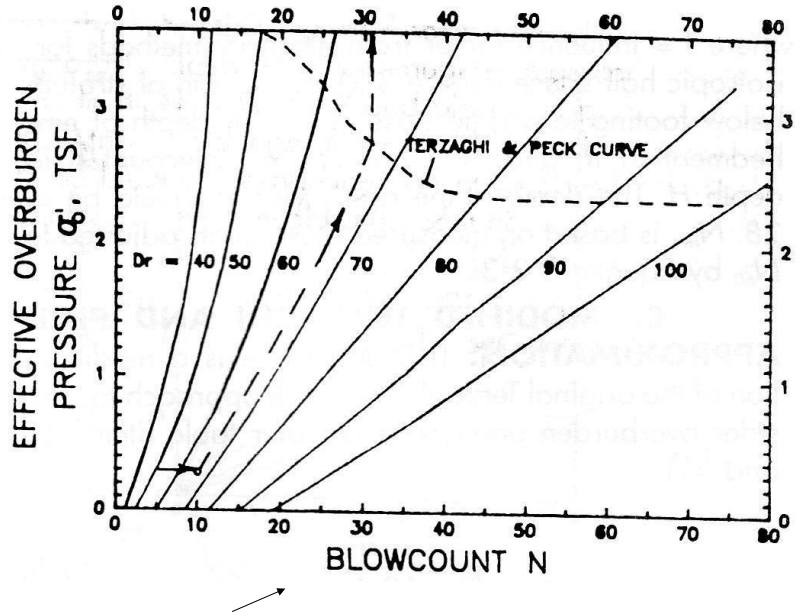
Asentamiento instantáneo [in]
B: ancho zapata [ft]

$$m' = (L/B)^{0.39}$$

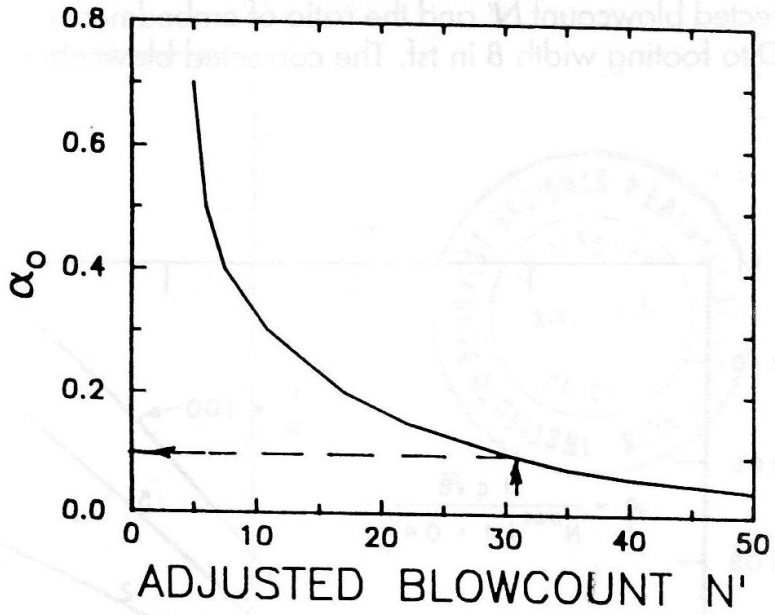
Factor de forma

q: presión promedio de la zapata sobre el suelo [tsf]

1 tsf = 95.76 kPa



Determinar el valor ajustado N'

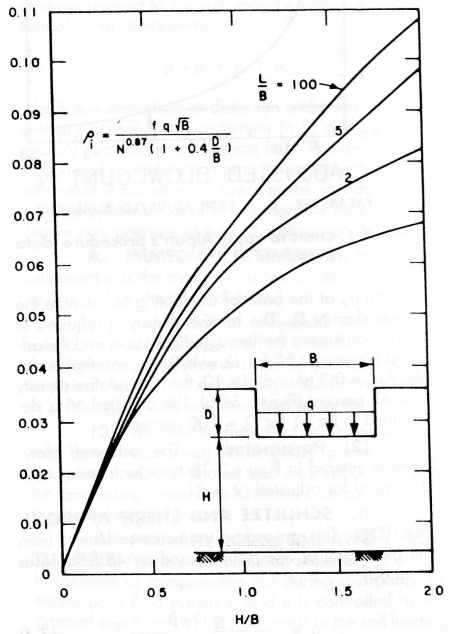


b. PARAMETER α_o FROM ADJUSTED BLOWCOUNT

Aproximación de Schultze y Sherif (SPT)

$$\rho_i = \frac{f \cdot q \cdot \sqrt{B}}{N_{prom}^{0.87} \cdot \left(1 + 0.4\frac{D}{B}\right)} \qquad \text{[ft]}$$

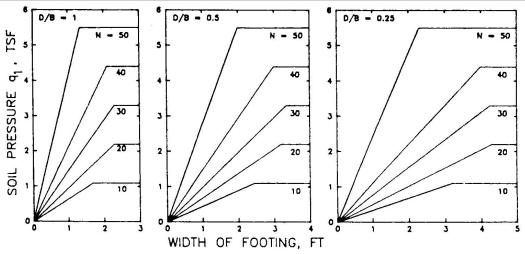
f: factor de influencia
H: Prof. a una capa rígida bajo el sello de fundación [ft]
D: prof. del sello de fundación [ft]
N_{prom}: promedio de N en la profundidad H (Utilizar N_{60})
H < 2B
q: [tsf]



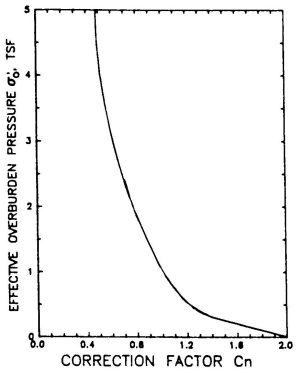
Settlement from the standard penetration test

Aproximación de Terzaghi y Peck (SPT)

$$\rho_i = \frac{q}{1.5 \cdot q_1} \qquad \text{[in]}$$



a. EVALUATION OF SOIL PRESSURE q_1 FROM CORRECTED BLOWCOUNT N' AND EMBEDMENT DEPTH/FOOTING WIDTH RATIO D/B



b. CORRECTION Cn FOR EFFECTIVE OVERBURDEN PRESSURE σ_o'

I/4. An investigation on settlements of direct foundations on sand

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Ejemplo: Ensayos Placa de Carga

Summary

The Paper briefly describes the investigations for a large steel mill complex, founded mainly on micaceous sand, in Brazil. The complete site was well explored by a large number of S.P.T. and Standard Dutch Cone penetration soundings. In view of the lack of settlement observations on existing structures, twelve field load tests on 2.5 meters square plate loaded to 200 ton (1.96 MN) were carried out. A large number of load tests on smaller sized plates, 45 cm square and 1 m square, were also executed to study the size effect on settlement of direct foundations.

A correlation between the estimated 'undisturbed' value of the modulus of elasticity, E, and the Dutch Cone penetration resistance, Ckd, was obtained from the results of a number of *in situ* load tests on 25 cm and 30 cm diameter screw plates. The settlements from all plate load tests have been compared with those obtained from various analytical methods.

Finally, a brief literature review is undertaken on settlements of direct foundations of large widths. This suggests that the settlements are grossly overestimated because the effective depth of strain influence is probably much smaller than the customarily assumed depth equal to twice the width of the foundation. Incomplete settlement observations on two slab foundations with widths equal to 22 m are presented which tend to corroborate this finding. A tentative semi-empirical method based on Gibson (1967) and Som (1968) to evaluate the effective depth of strain influence is suggested.

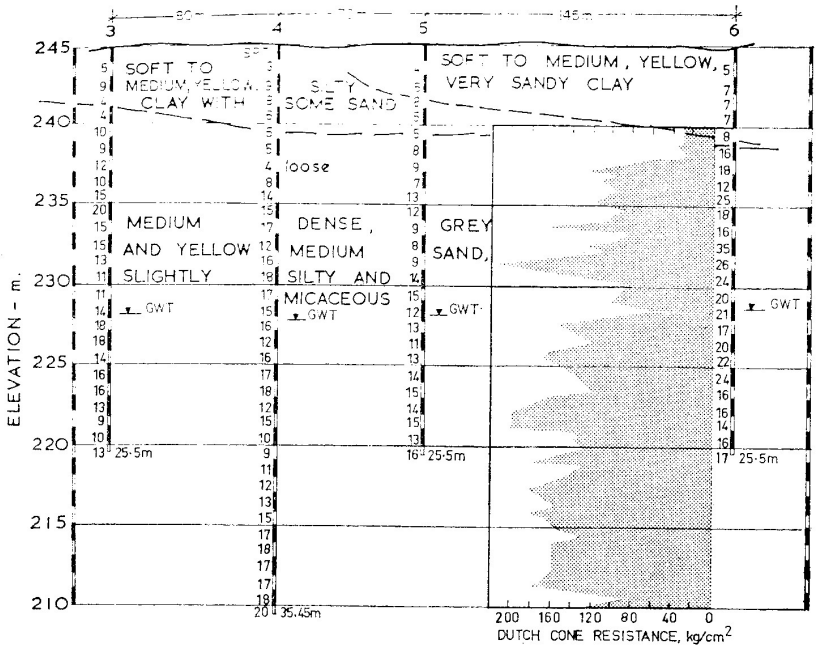


Fig. 1. Typical soil profile of the site

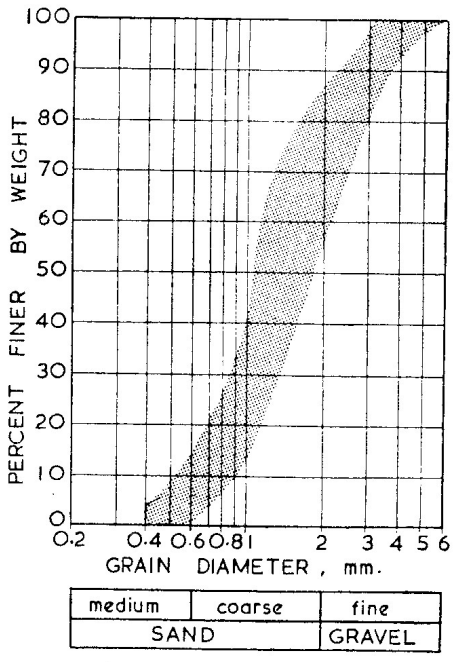
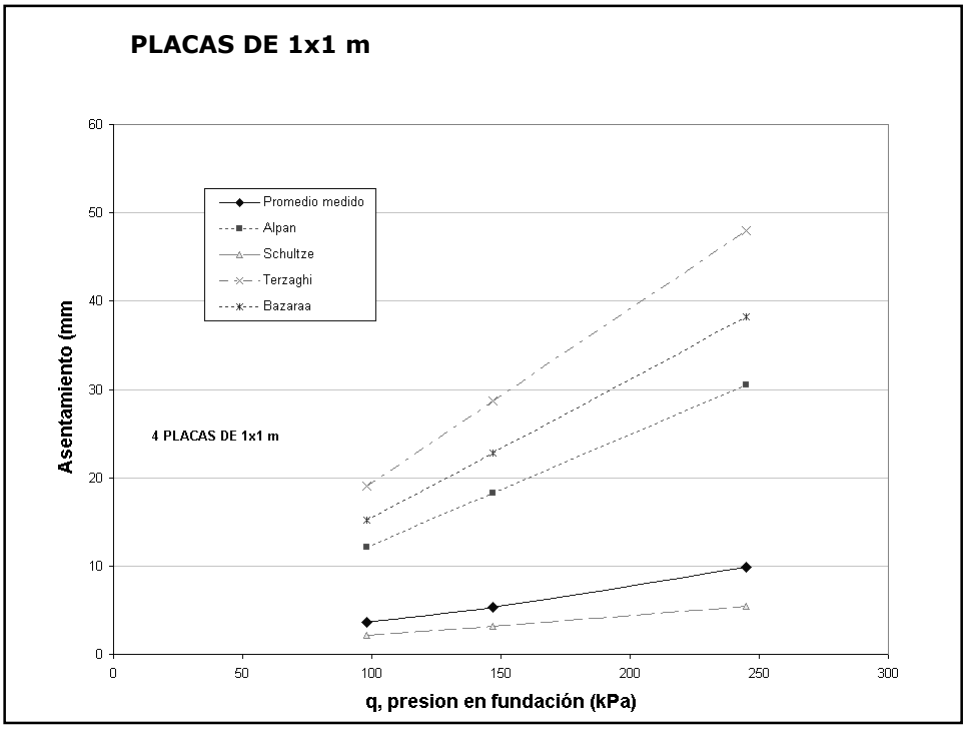
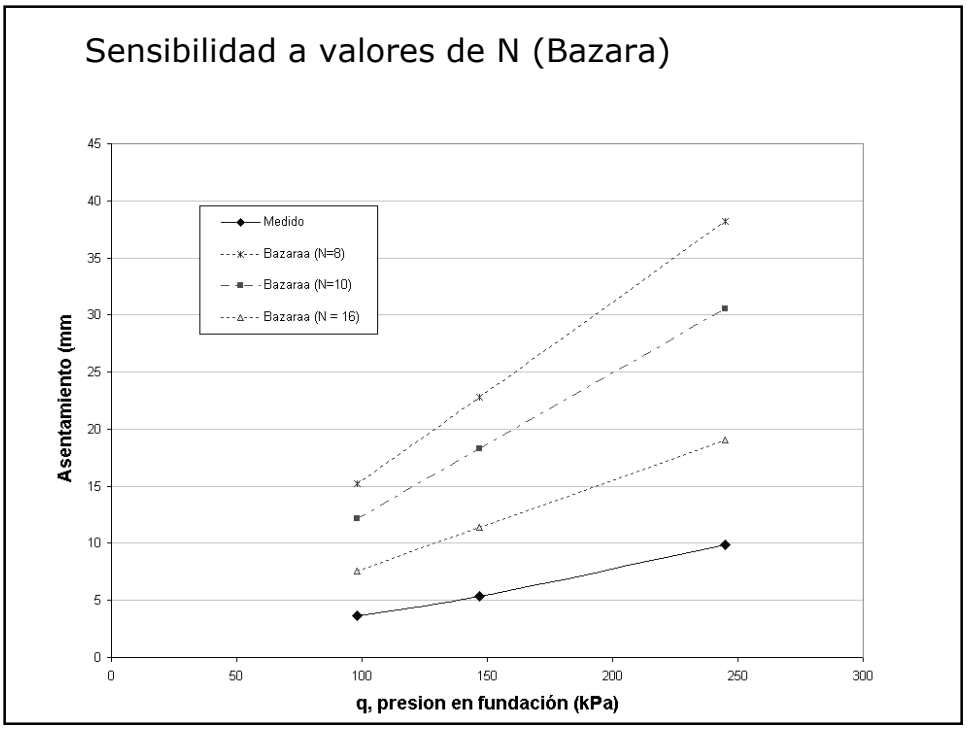
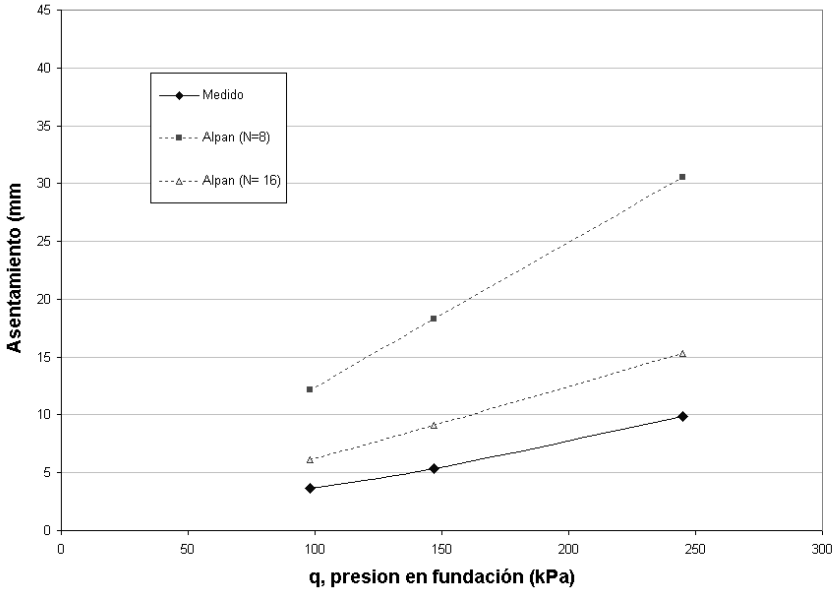


Fig. 2. Grain size variation from depths between 3 m and 40 m for a typical boring

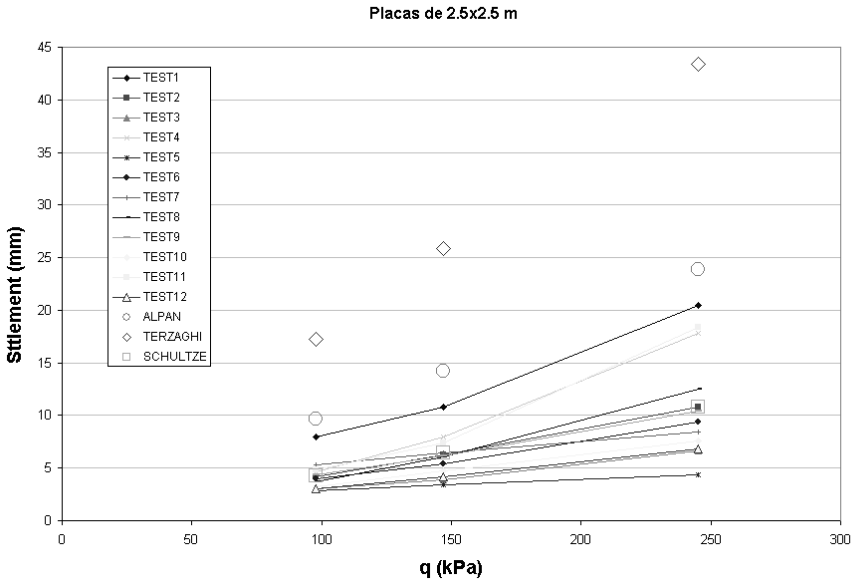

PLACAS DE 1x1 m
Promedio medido
Alpan
Schultze
Terzaghi
Bazaraa
4 PLACAS DE 1x1 m
Asentamiento (mm
q, presion en fundación (kPa)
0
10
20
30
40
50
60
0
50
100
150
200
250
300


Sensibilidad a valores de N (Bazara)
Medido
Bazaraa (N=8)
Bazaraa (N=10)
Bazaraa (N = 16)
Asentamiento (mm
q, presion en fundación (kPa)
0
5
10
15
20
25
30
35
40
45
0
50
100
150
200
250
300

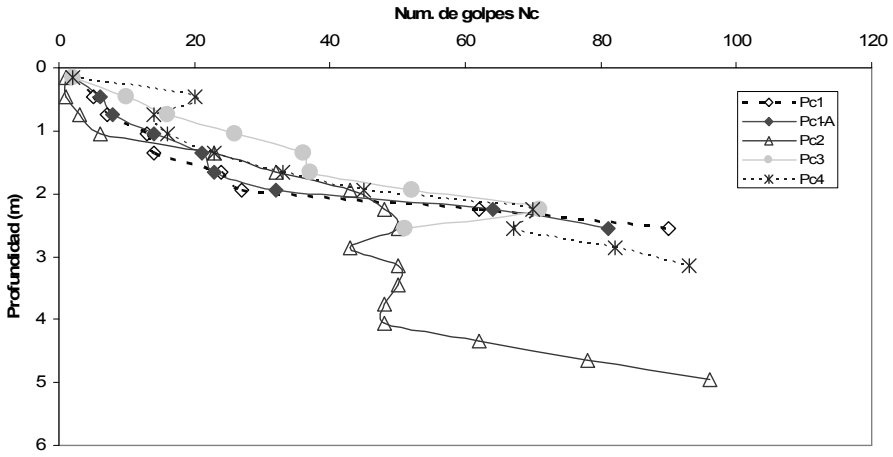
Sensibilidad a valores de N (Alpan)



Placas de 2x2 m



Ejemplo 2



Indice de penetración con cono dinámico