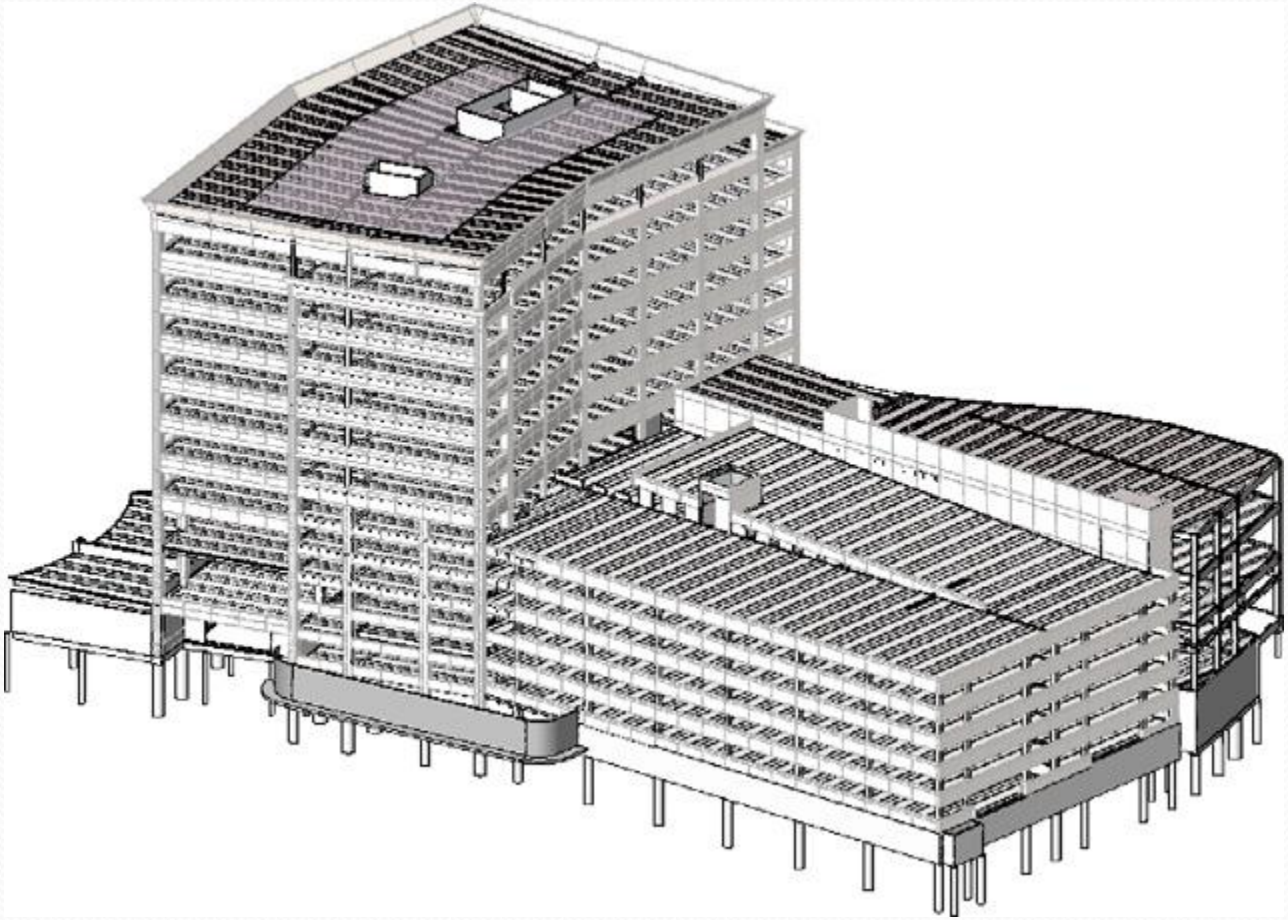
Teknik Instrumentasi dan Monitoring Geoteknik pada Bangunan Sipil

Pertemuan ke 14

Bangunan Tekinik Sipil



Pondasi Dalam

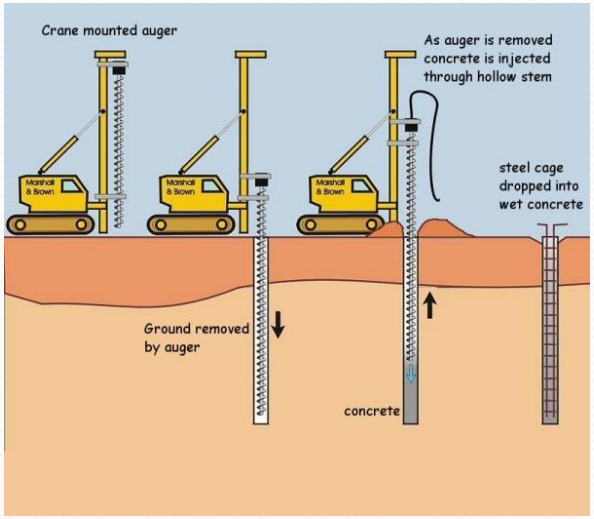
a. Pondasi tiang pancang

(driven pile foundation)

A pile driver sets the stage for construction.

b. Pondasi tiang bor

(bored pile foundation)

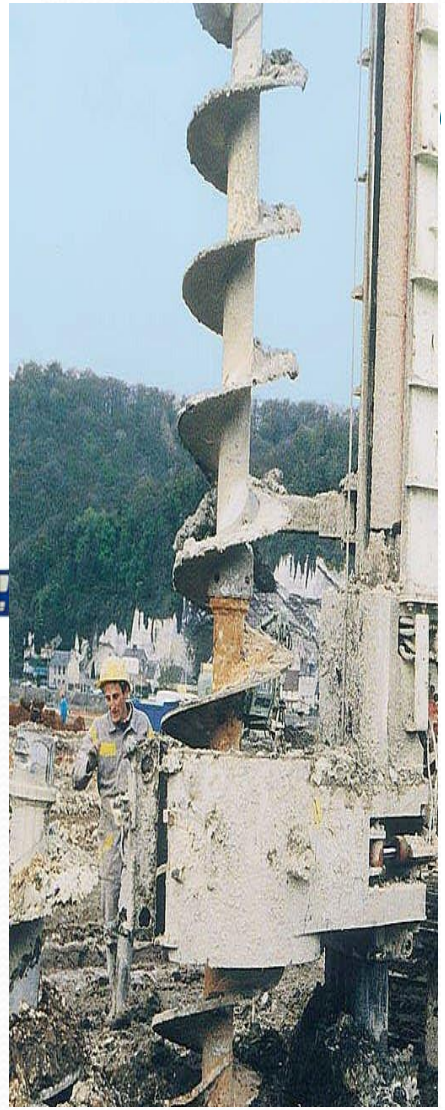


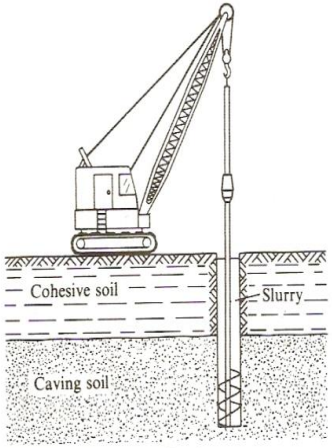
E400M-R180

PONDASI TIANG PANCANG

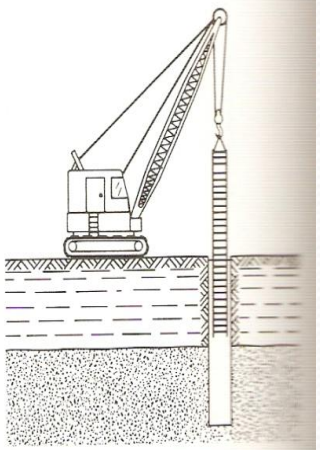
Pelaksanaan Pondasi Tiang Pancang (*DRIVEN PILE*)

E400M-R180

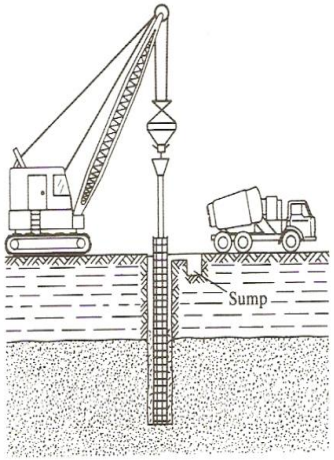




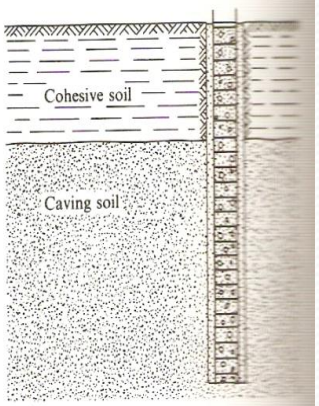
(*a*) Drill into caving soil and add slurry as necessary for adequate head and to required depth.



(*b*) Pull drill and insert rebar cage.

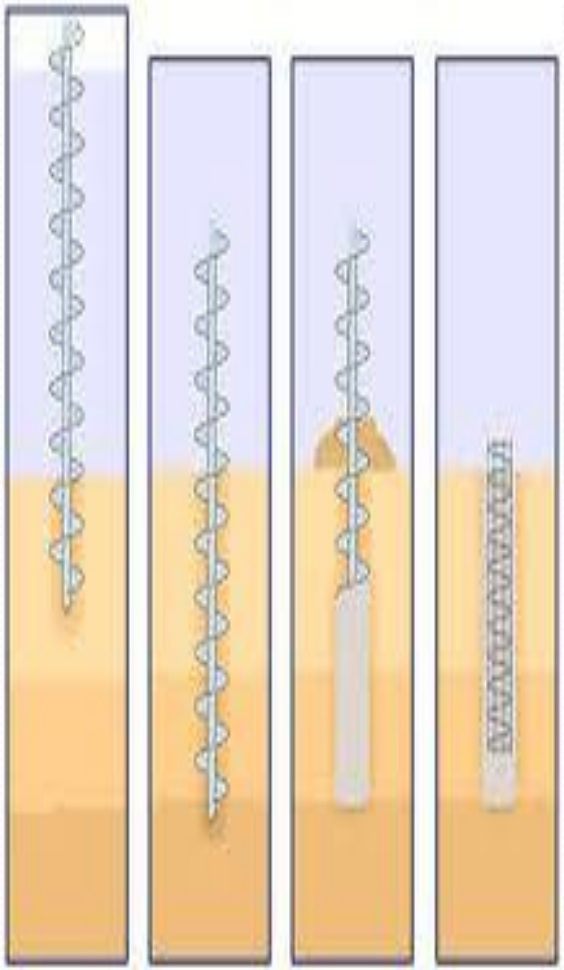


(*c*) Add tremie and pump cement. Catch displaced slurry in sump pit.



(*d*) Completed shaft.

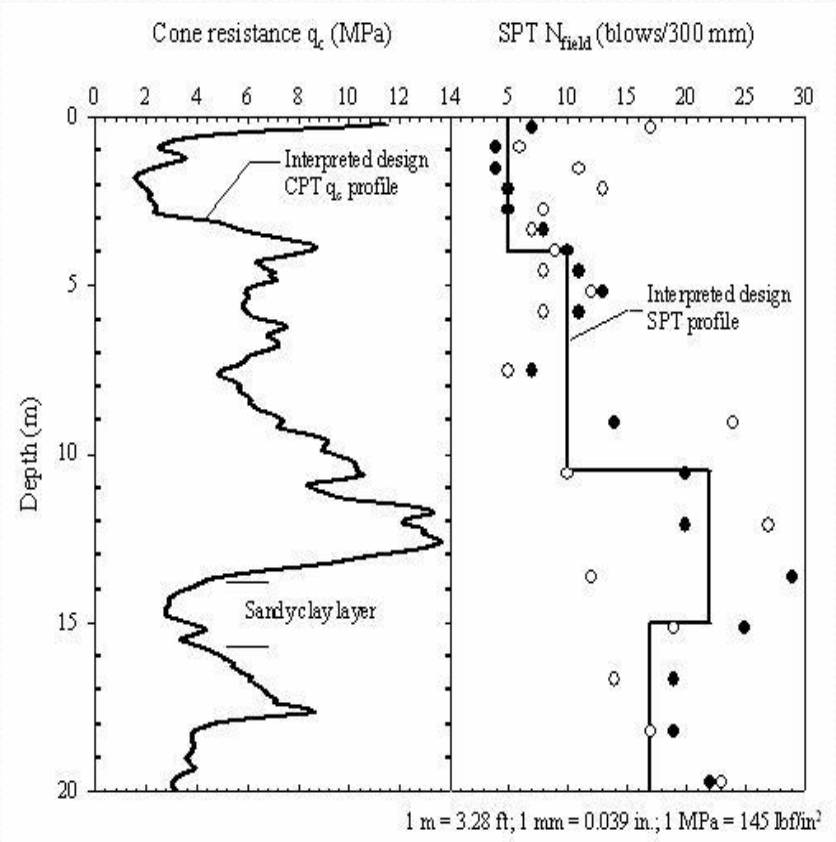
Pelaksanaan PONDASI Tiang Bor *(bored pile)*

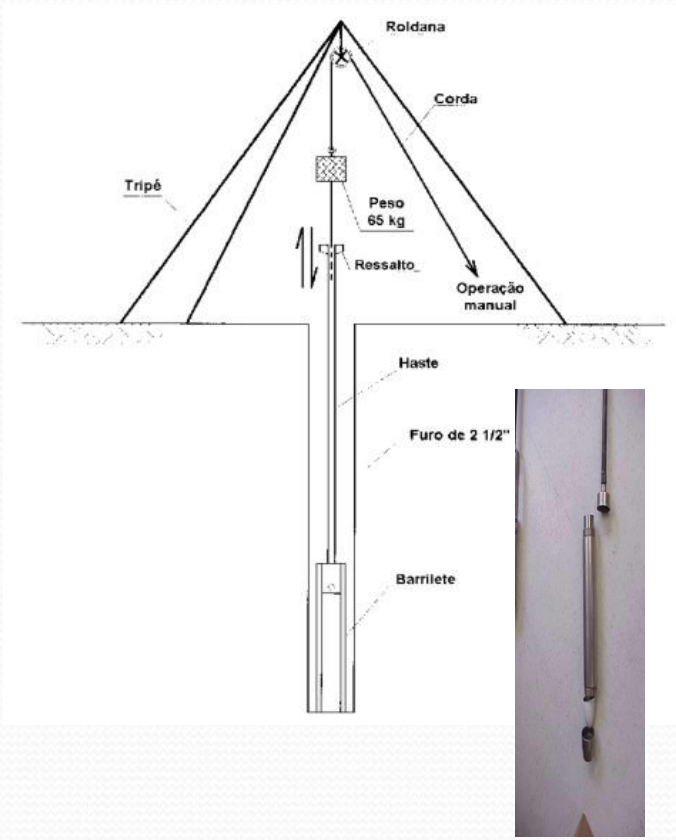



01/01/2005 23:49:53

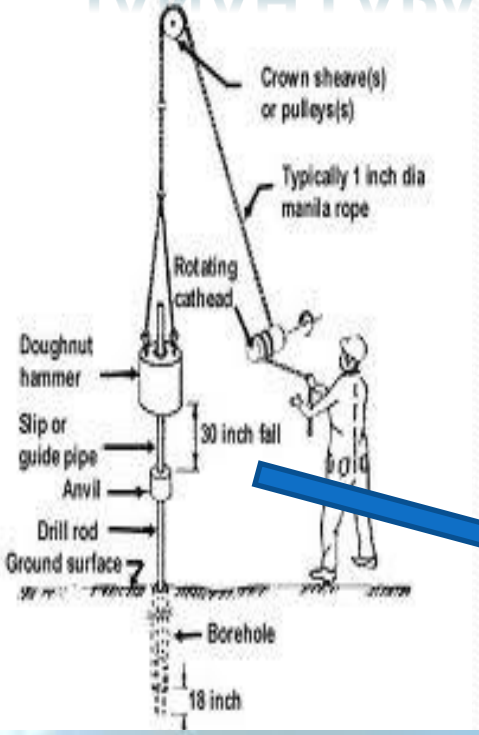
Kapasitas *ultimate* tiang berdasarkan uji tanah lapangan

Uji tanah lapangan dalam bentuk data CPT (*cone penetration test* /sondir) dan data SPT (*standard penetration test*)





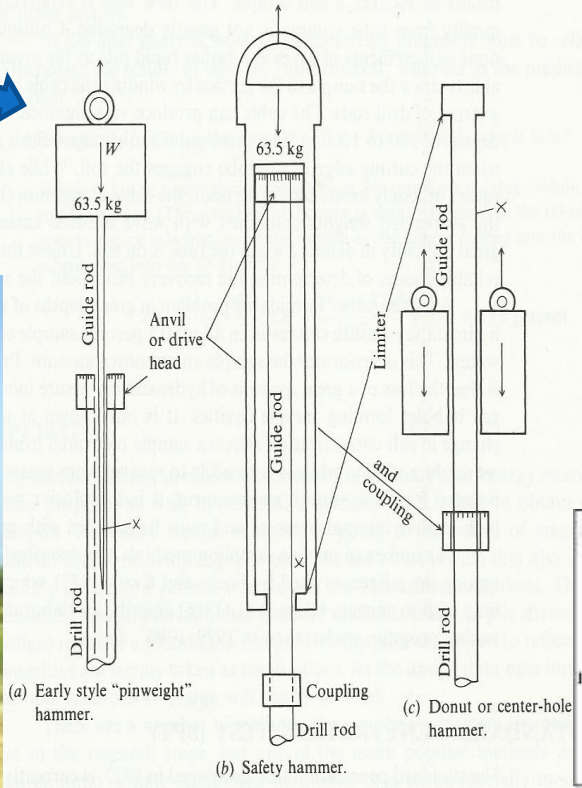
KAPASITAS *ULTIMATE* TIANG BERDASARKAN UJI TANAH LAPANGAN

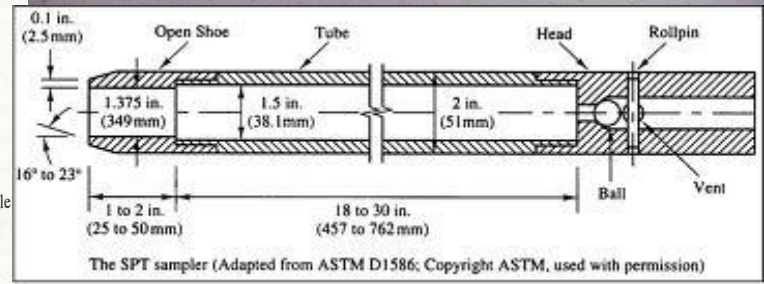


Standard Penetration Test (SPT)

Uji SPT akan menginformasikan kekerasan lapisan tanah dan menentukan posisi lapis keras tanah yang sebenarnya

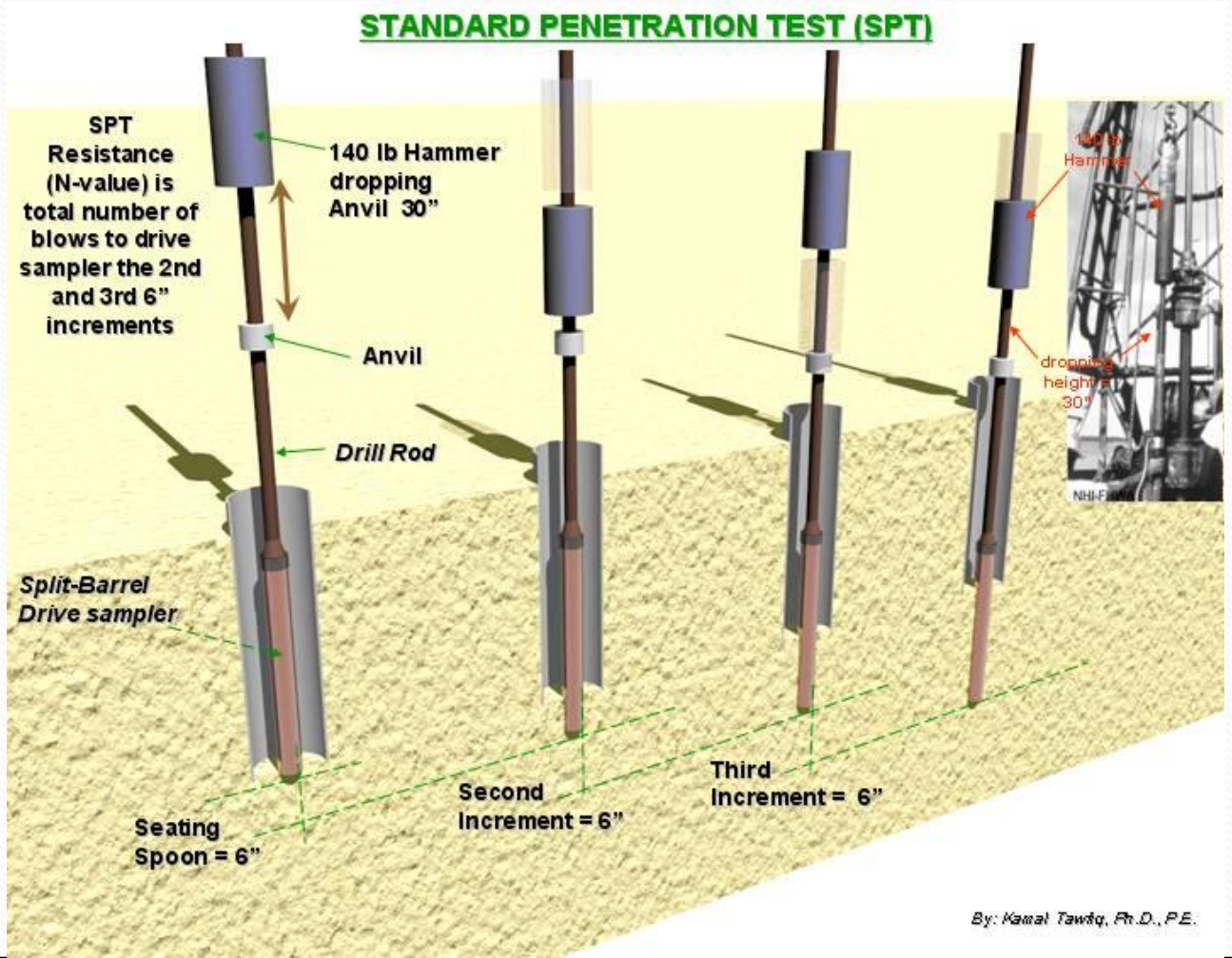
Metode pengujian SPT mengacu pada ASTM D 1586

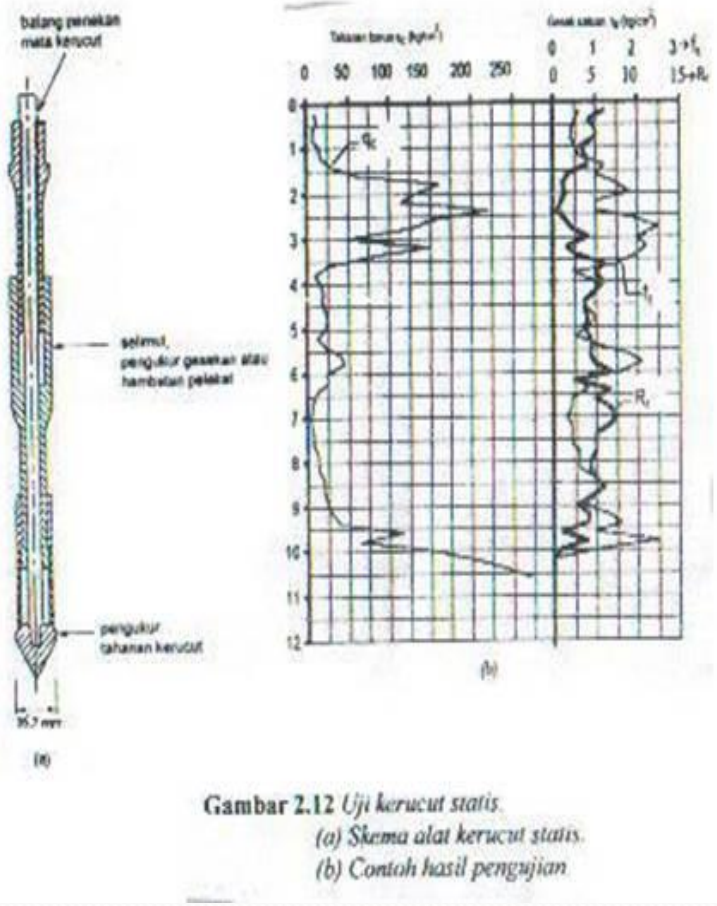




KAPASITAS *ULTIMATE* TIANG BERDASARKAN UJI TANAH LAPANGAN

Prosedur pengujian SPT





Gambar 2.12 *Uji kerucut statis.*
(a) Skema alat kerucut statis.
(b) Contoh hasil pengujian

Loading Test

- **Uji Beban Statik**

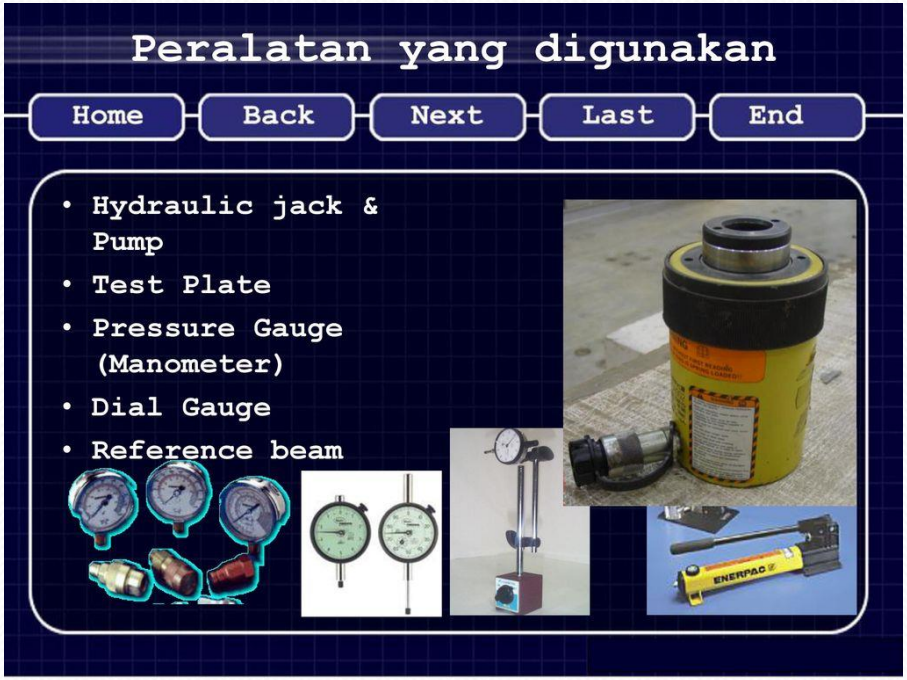
Sering digunakan pada pondasi dengan kapasitas daya dukung yang besar

Hasilnya sangat handal

Biaya relatif mahal

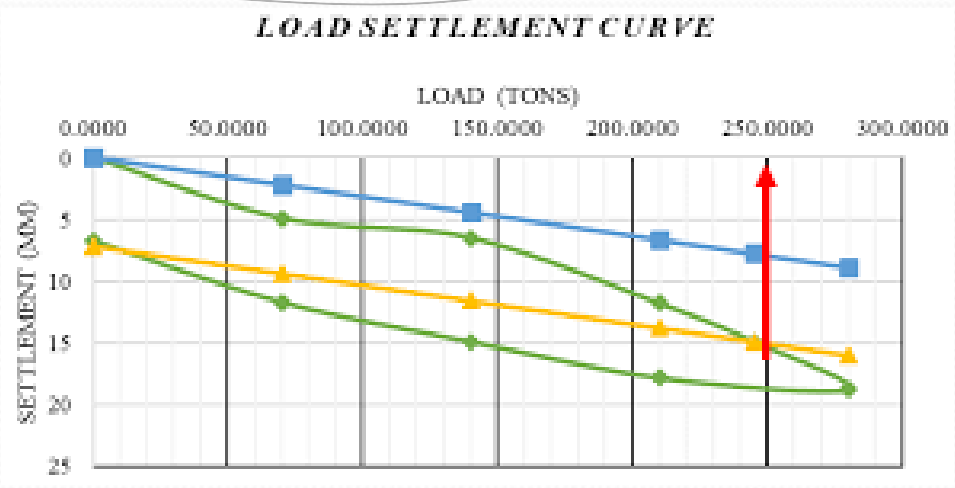
Kurang praktis dalam instalasi beban dan alat uji

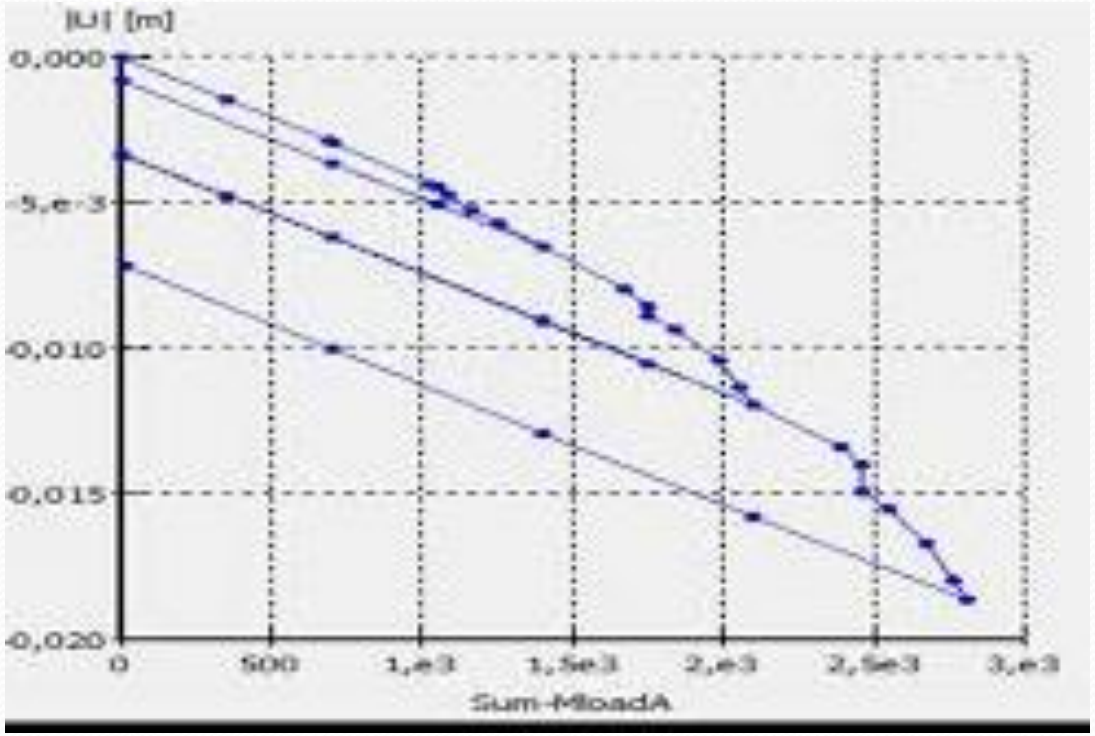
Peralatan


Peralatan yang digunakan
Home
Back
Next
Last
End
• Hydraulic jack & Pump
• Test Plate
• Pressure Gauge (Manometer)
• Dial Gauge
• Reference beam
ENERPAC

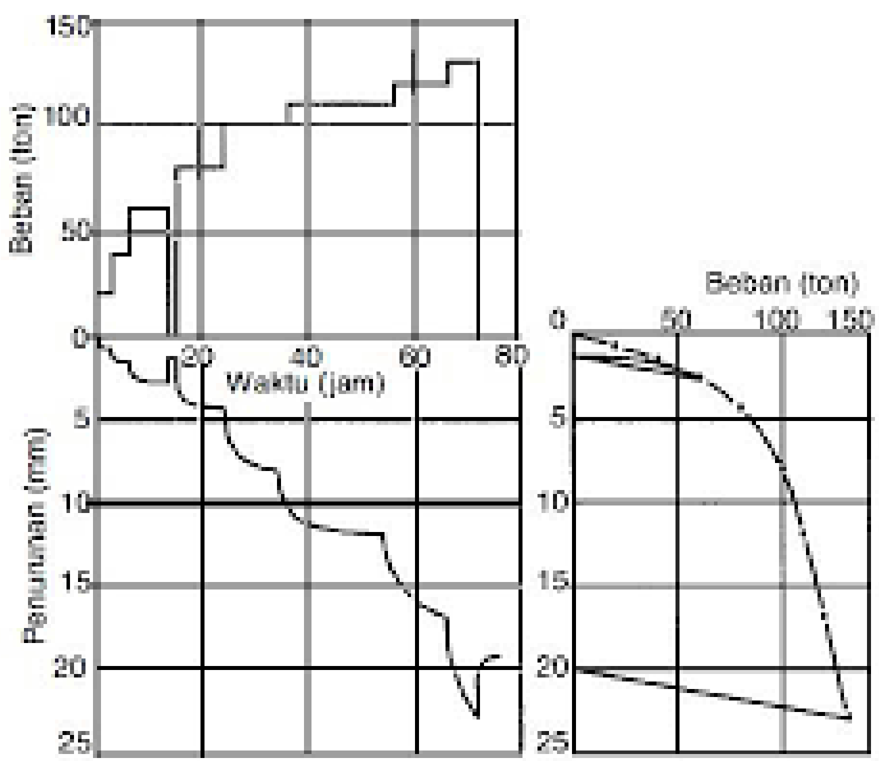
Lateral Load Test

Data hasil uji





Grafik pembacaan

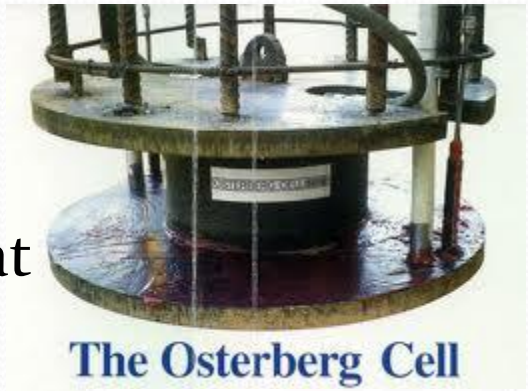


Kedalaman (m)	Jenis Tanah	N-SPT	Cu (kN/m2)	α	Skin Friction (ton) Local	Cumm	End Bearing ton	Qult ton	Qijin ton
0,00	Paling paling material	0	0,000	1,00	0,00	0,00	0,00	0,00	0,00
2,00	Silty Clay	7	46,67	0,86	15,20	15,20	32,97	58,17	23,27
4,00	Clayey Silt	9	60,00	0,75	28,28	33,48	42,39	91,81	36,54
6,00	Clayey Silt	9	60,00	0,75	28,28	81,72	42,39	124,11	49,65
8,00	Clayey Silt	11	73,33	0,64	29,47	111,29	51,81	163,01	65,20
10,00	Clayey Silt	17	113,33	0,50	35,59	146,78	80,07	226,85	90,74
12,00	Clayey Silt	21	140,00	0,50	43,96	190,74	98,91	289,65	115,86
14,00	Clayey Silt	22	146,67	0,50	48,05	238,80	103,62	342,42	136,17
16,00	Clayey Silt	28	186,67	0,50	58,61	297,41	131,88	427,29	170,92
18,00	Silty Sand	23		–	48,22	341,65	12,64	354,27	141,71
20,00	Silty Sand	29		–	58,28	399,86	158,38	558,27	223,31
22,00	Silty Sand	11		–	62,34	462,21	170,33	633,55	253,42
24,00	Silty Sand	22		–	44,23	506,42	120,88	627,31	250,92
26,00	Sand	60		–	120,58	627,00	314,00	941,00	376,40
28,00	Sand	60		–	120,58	747,57	314,00	1061,57	424,63
30,00	Clayey Silt	29	193,33	0,50	36,42	784,00	136,59	920,59	368,23
32,00	Sandy Clayey Silt	38	253,33	0,50	47,73	831,72	178,98	1010,70	404,28
34,00	Sandy Clayey Silt	27	180,00	0,50	33,92	865,64	127,17	992,81	397,12
36,00	Clayey Silt	34	226,67	0,50	42,70	908,34	160,14	1068,48	427,39
38,00	Clayey Silt	25	166,67	0,50	31,40	939,74	117,75	1057,49	423,00
40,00	Clayey Silt	26	173,33	0,50	32,66	972,40	122,46	1094,86	437,94

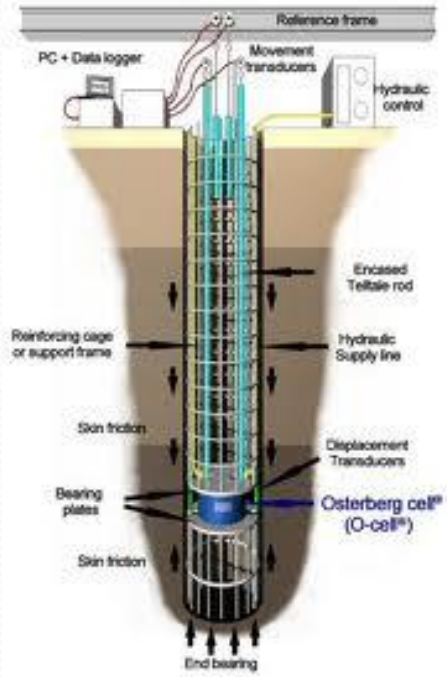
PENGUJIAN PONDASI TIANG

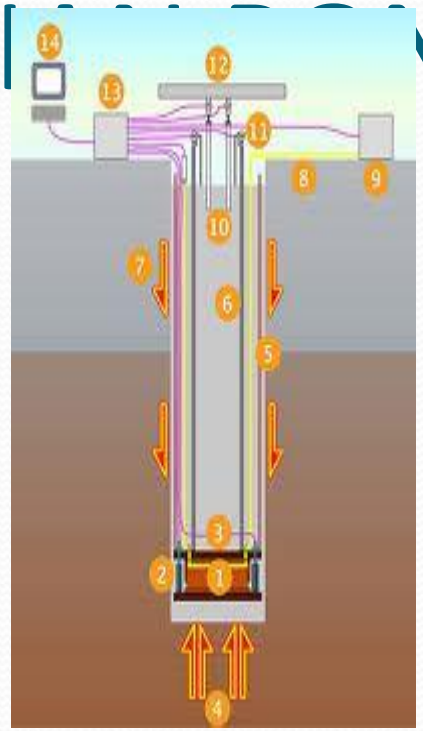
- **Uji Beban Osterberg Cell**

  Biayanya mahal, namun sangat bermanfaat



Di Indonesia, pernah digunakan di Proyek Jembatan Suramadu




14
12
13
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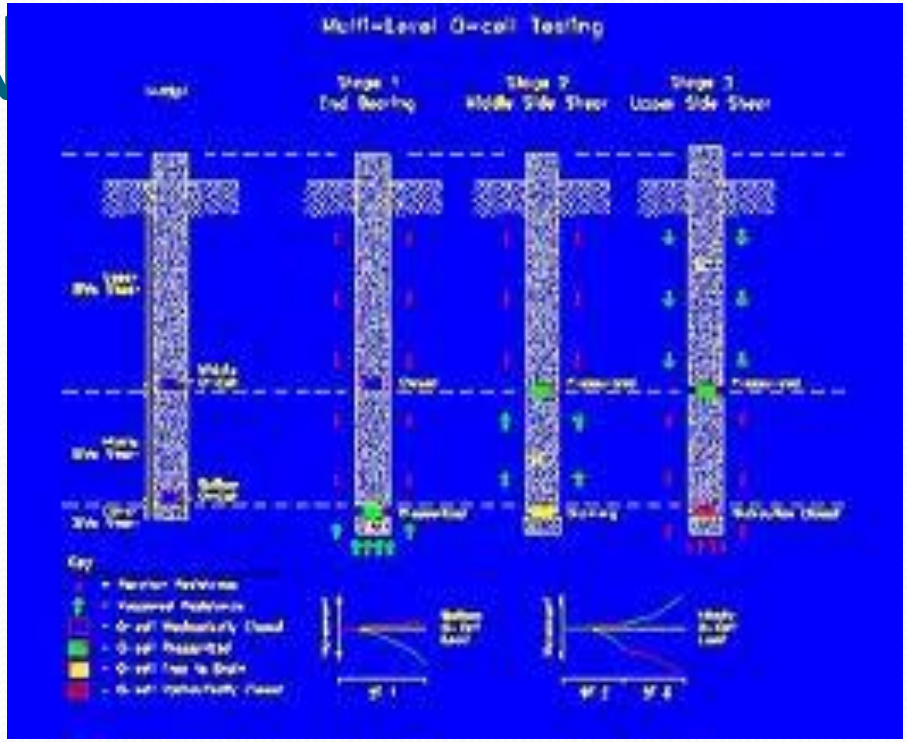
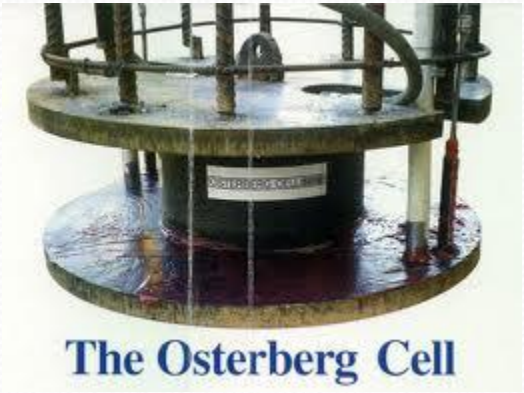

Multi-Level O-cell Testing
Stage 1
End Bearing
Stage 2
Middle Side Shear
Stage 3
Upper Side Shear
Key


The Osterberg Cell


O-cell

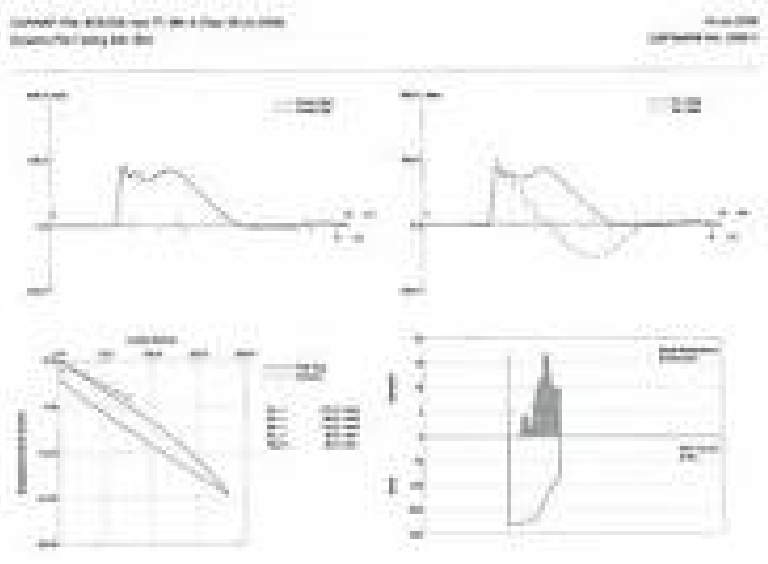
PENGUJIAN PONDASI TIANG

- **Uji Beban Dinamik (*PDA, Pile Driving Analyzer*)**

Sangat populer di Indonesia.
Praktis penggunaannya, hasilnya cukup handal dan biaya pengujiannya tergolong murah

Pengujian pondasi tiang

Uji Beban Dinamik (*PDA, Pile Driving Analyzer*)



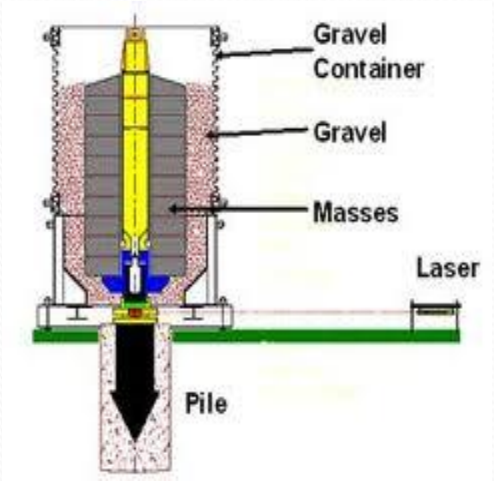
PENGUJIAN PONDASI TIANG

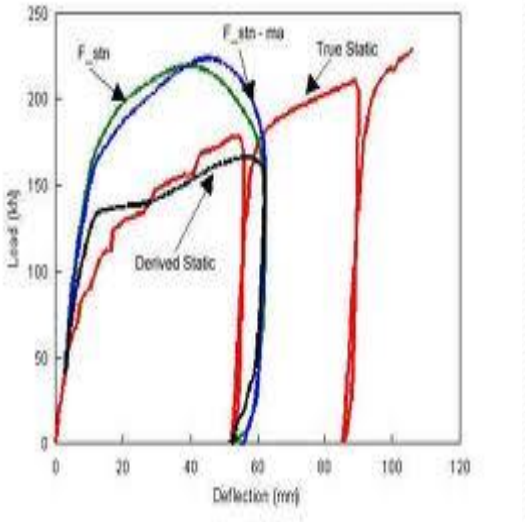
Pile integrity test

Uji integritas tiang (terutama untuk tiang bor) untuk memeriksa kekompakan /keutuhan hasil pengecoran beton dan kemungkinan tiang yang patah

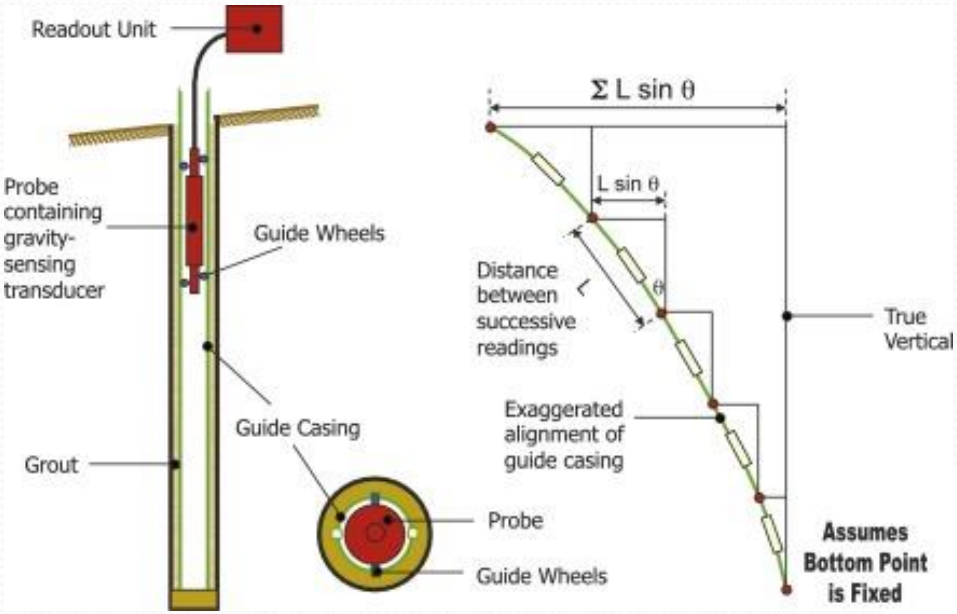
PENGUJIAN PONDASI TIANG

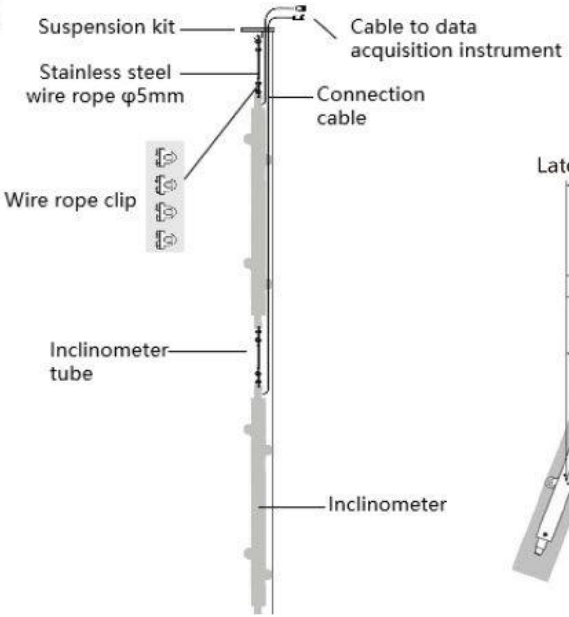
Uji beban Statnamic (*static and dynamic*)

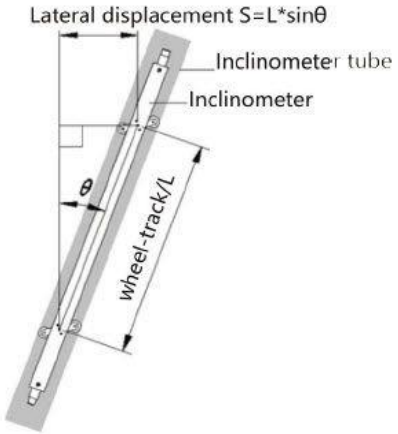




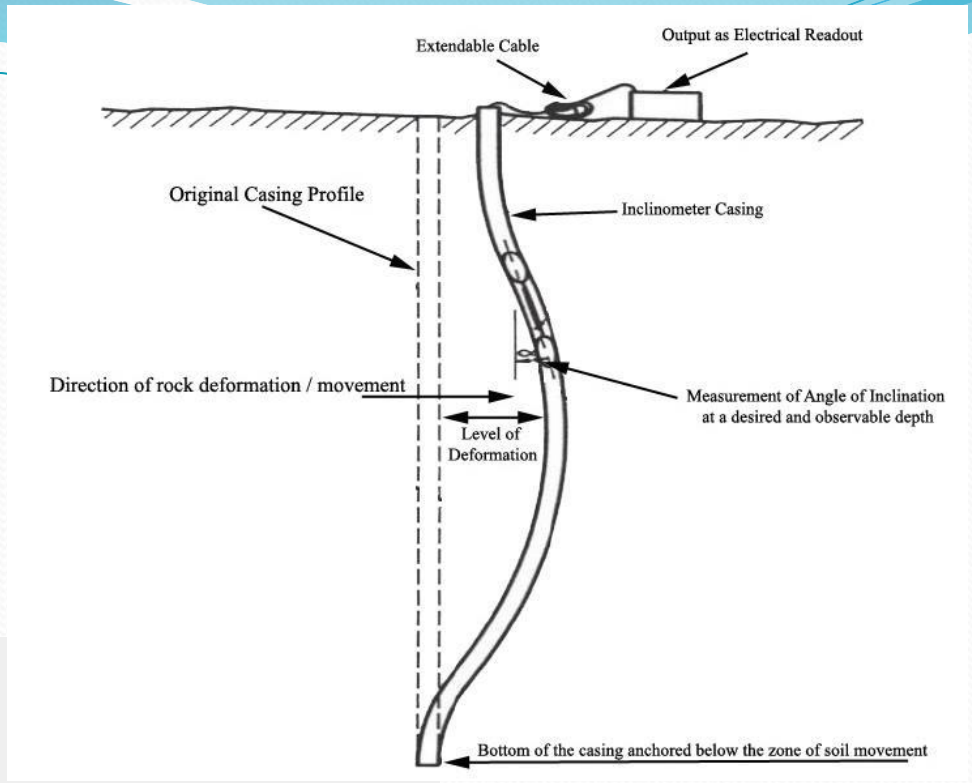
Inclinometer

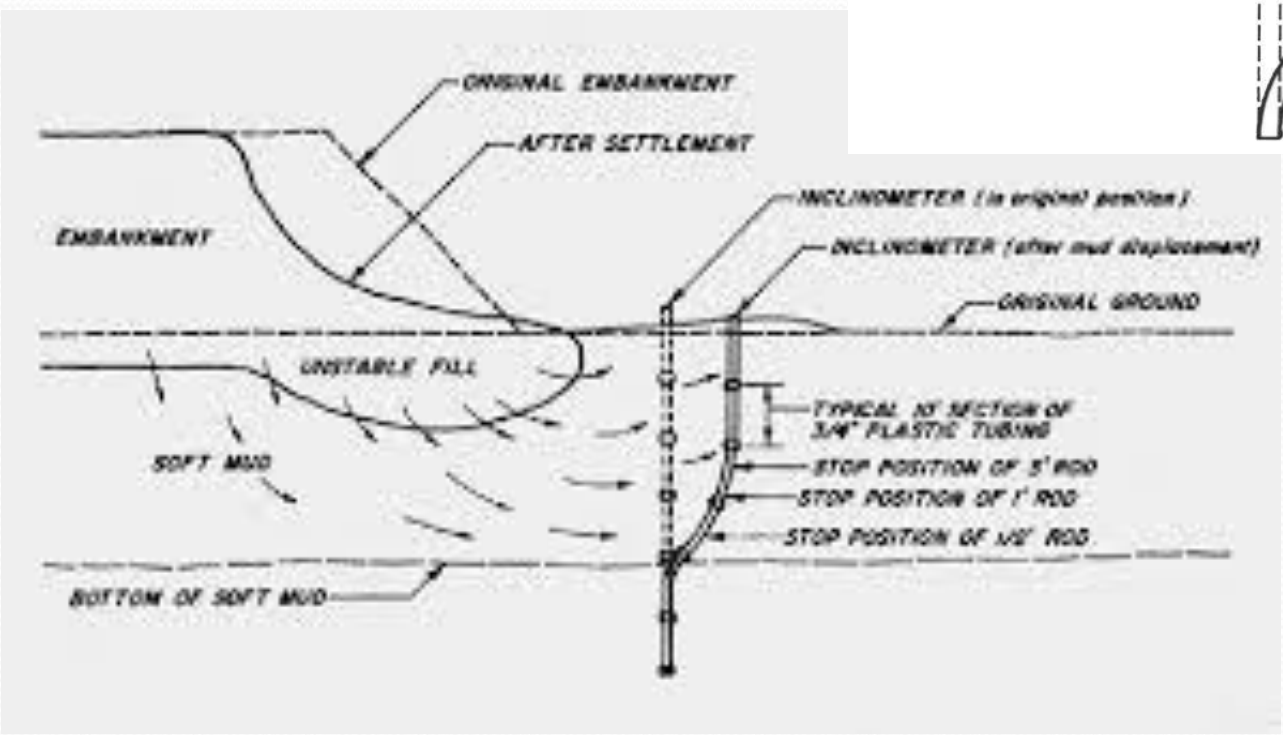






Inclinometer





Site works

Terima Kasih

Selamat berkarya dan cepat lulus menjadi Magister Teknik Sipil yang handal