



วัตถุประสงค์ของการติดตั้งเครื่องมือตรวจวัดลาดดิน

- เพื่อตรวจสอบการออกแบบ (Design Verification)
- เพื่อควบคุมงานก่อสร้าง (Construction Control)
- เพื่อควบคุมคุณภาพ (Quality Control)
- เพื่อความปลอดภัย (Safety)

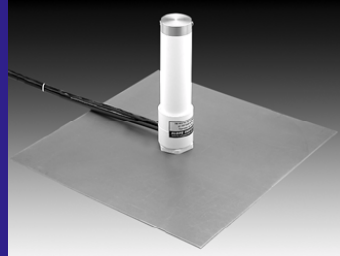
Instrumentation



Inclinometer



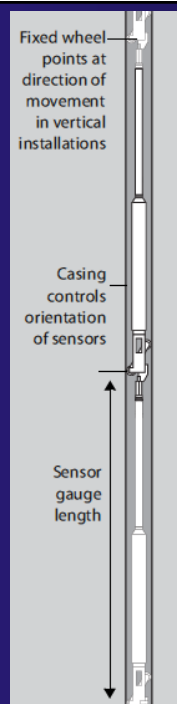
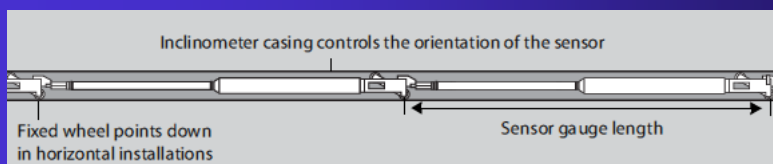
Vibrating Wire Piezometer



Settlement Cell

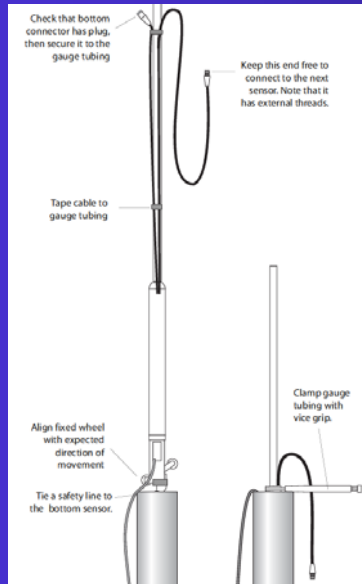
In-place inclinometer sensors

In-place inclinometer sensors are ideal for data logging and real-time monitoring.

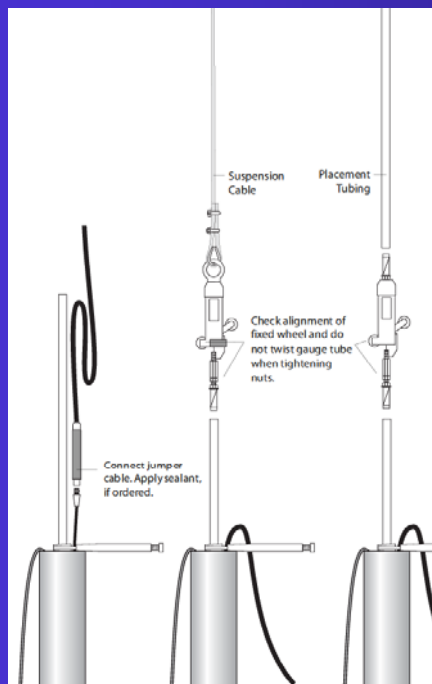
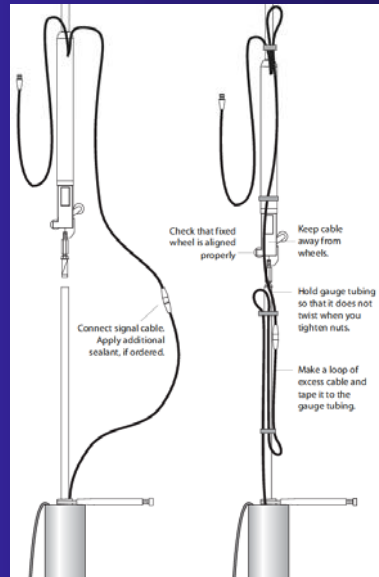


การติดตั้ง In-place inclinometer

First Sensor

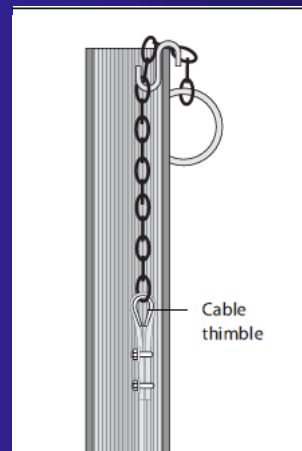


Next Sensor

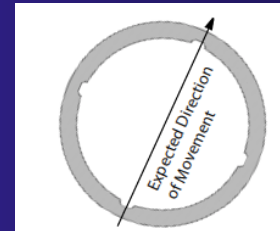
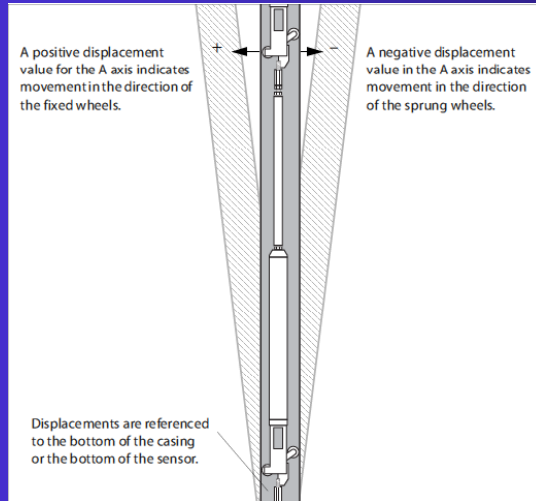


Install Top Wheel

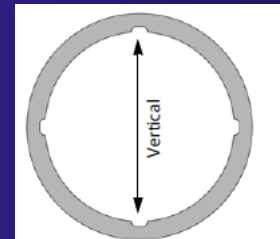
Terminate with Suspension Kit



Direction of Movement

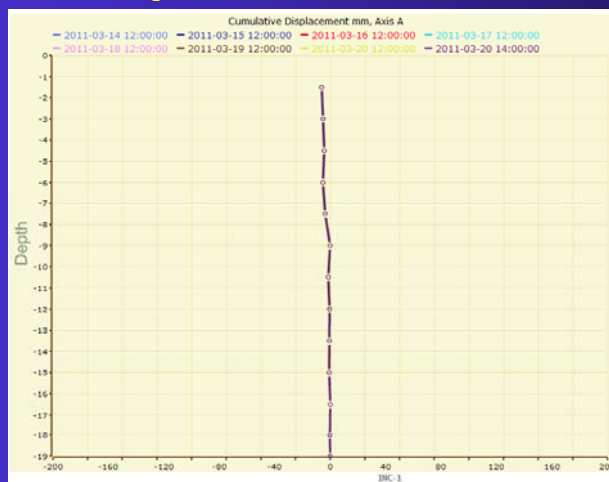


In vertical installations, one pair of casing grooves should be aligned with the expected direction of movement.



In horizontal installations, one pair of casing grooves must be aligned to vertical.

การแสดงผล In-place inclinometer ที่อ่านแบบ Real-time



Additional Information: The data offset is taken from 3:30am, 13 August 2010

Date \ Depth	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19
2011-03-14 12:00:00	-6.46	-5.09	-4.3	-5.15	-3.48	0.03	-1.31	-0.29	-0.49	-0.63	0.06	-0.13	0
2011-03-15 12:00:00	-6.23	-5.02	-4.23	-5.16	-3.49	0.02	-1.4	-0.38	-0.49	-0.71	0.06	-0.13	0
2011-03-16 12:00:00	-6.15	-5.1	-4.31	-5.24	-3.57	-0.06	-1.48	-0.46	-0.57	-0.71	0.06	-0.13	0
2011-03-17 12:00:00	-6.31	-5.34	-4.47	-5.32	-3.65	-0.14	-1.48	-0.46	-0.57	-0.71	0.06	-0.13	0
2011-03-18 12:00:00	-6.15	-5.1	-4.31	-5.24	-3.57	-0.06	-1.4	-0.38	-0.49	-0.71	0.06	-0.13	0
2011-03-19 12:00:00	-6.15	-5.02	-4.23	-5.16	-3.49	0.02	-1.32	-0.3	-0.41	-0.63	0.06	-0.13	0
2011-03-20 12:00:00	-6.23	-5.26	-4.47	-5.4	-3.73	-0.22	-1.56	-0.54	-0.57	-0.71	0.06	-0.13	0
2011-03-20 13:30:00	-6.07	-5.1	-4.31	-5.24	-3.57	-0.06	-1.4	-0.38	-0.49	-0.71	0.06	-0.13	0

Multi-Level VW Piezometer

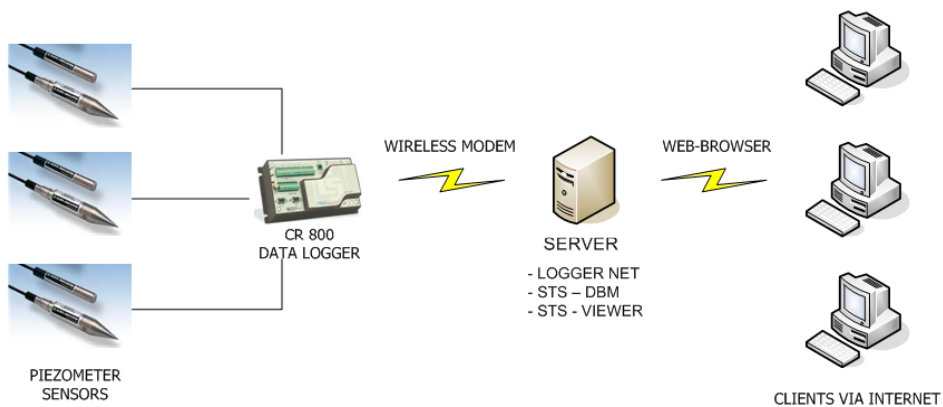
Multi-Level VW Piezometers are used to monitor pore-water pressure at different zones in the borehole.

VW Settlement Cells

Settlement cells provide settlement measurements with no interference to construction activities.

Remote Monitoring System

Automatic Data Acquisition System



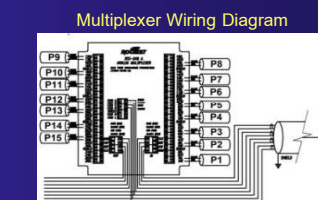
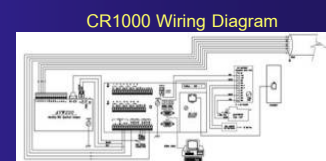
Data Acquisition



Terminal Box



Multiplexer



System work flow

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graph TD; Datalogger[Datalogger CR800] -- RS232 --> LoggerNet_PC[LoggerNet software<br/>Config by<br/>LoggerNet on PC<br/>via serial port<br/>(first time only)]; Datalogger -. wireless .-> LoggerNet_Server[LoggerNet software<br/>Retrieve data by LoggerNet on Server via Wireless modem<br/>using auto schedule connection command]; LoggerNet_Server --> STS_DMS[STS DMS Software<br/>Use STS DBM to set up project information, sensor ID,<br/>reference location and calibration factor. STS DBM<br/>import log data and convert into Project Database and<br/>Upload data to Web server]; STS_DMS --> STS_WebViewer[STS WebViewer Software<br/>STS WebViewer use for presenting data thru web browser<br/>in table or graph form or export in excel];
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The diagram illustrates the system work flow for data collection and presentation. It begins with a **Datalogger CR800** connected via **RS232** to **LoggerNet software** (pink box) for configuration. The datalogger is also connected **wireless** to **LoggerNet software** (pink box) to retrieve data. The data is then processed by **STS DMS Software** (green box) to set up project information and upload data to the web server. Finally, **STS WebViewer Software** (green box) is used to present the data through a web browser or export it to Excel.

Data Communication

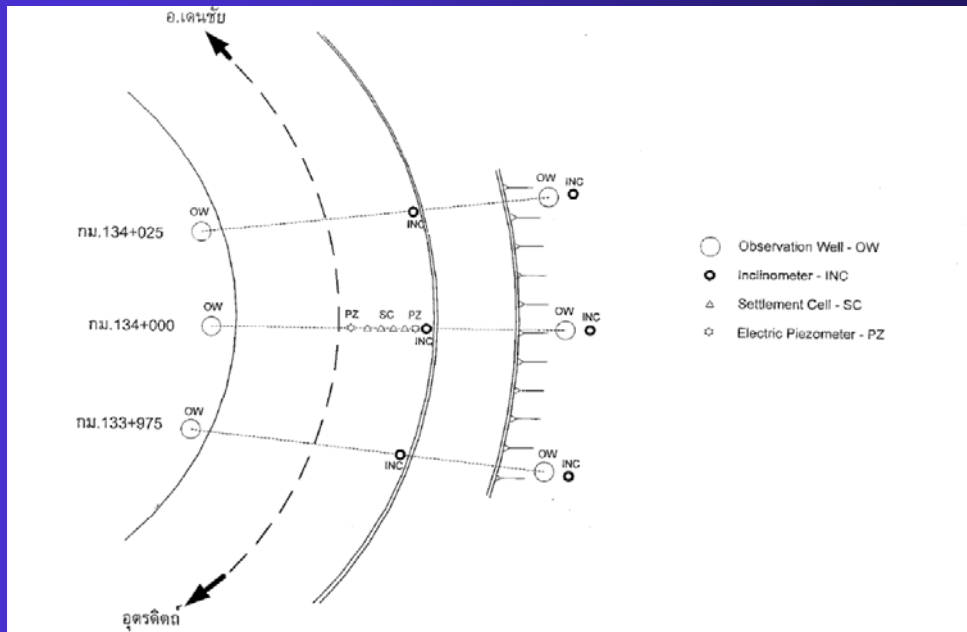
AP2
192.168.5.12
Device Name: UBNT
Network mode: Bridge
Wireless mode: Access point WDS
SSID : AP2
Ch.36 , 5180MHz
Channel width 40MHz
ACK/distance : 33/0.6 mile (0.9km)
Tx/Rx chains : 2x2
WLAN MAC: 00:15:6D:F2:2E:F2 (On cover)
LAN MAC: 00:15:6D:F3:2E:F2
AP MAC: 00:15:6D:F2:2E:F2 (On cover)
WDS peers : 00:15:6D:F2:2F:00 (AP1)

AP3
192.168.5.13
MAC: 00:15:6D:7A:95:24
CamBell : 192.168.5.23

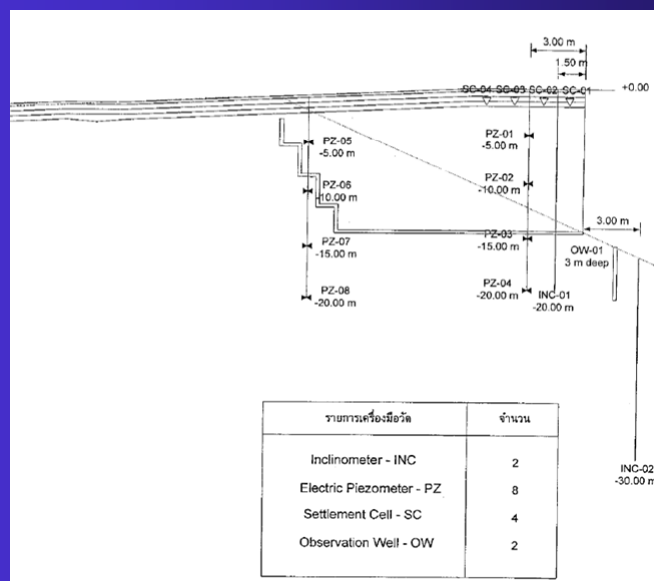
AP1
192.168.5.11
Device Name: UBNT
Network mode: Bridge
Wireless mode: Access point WDS
SSID : AP1
Ch.36 , 5180MHz
Channel width 40MHz
ACK/distance : 33/0.6 mile (0.9km)
Tx/Rx chains : 2x2
WLAN MAC: 00:15:6D:F2:2F:00 (On cover)
LAN MAC: 00:15:6D:F3:2F:00
AP MAC: 00:15:6D:F2:2F:00 (On cover)
WDS peers : 00:15:6D:7A:95:24 (AP3)
00:15:6D:F2:2E:F2 (AP2)

Office
192.168.5.11
MAC: 00:15:6D:F2:2F:00
Server : 192.168.21

ตัวอย่างการติดตั้งเครื่องมือฯ ของงานทาง



ตัวอย่างการติดตั้งเครื่องมือของงานทาง



ตัวอย่างการสไลด์ของลาดดินและการติดตั้งเครื่องมือ



แปลนตำแหน่งเครื่องมือวัดความปลอดภัยของลาดดิน

