



# Independent Quality Assurance

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Non Destructive Testing 

# QA Service Portofolio

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Inros Lackner Cambodia is an ***independent*** civil engineering service provider. We offer the following QA services:

1. Quality assurance for deep foundations
  - High-strain dynamic testing by Pile Dynamic Analyzer (PDA)
  - Low-strain dynamic testing by Pile Integrity Tester (PIT)
  - Pile integrity testing by Cross-hole Sonic Logging (CSL)
  - Static pile load tests
  
2. Monitoring of deep excavations and lateral supports
  - Control surveys of ground and building settlement markers
  - Monitoring of movements by inclinometer and tilt meter
  - Monitoring of groundwater levels and pore water pressure
  - Strain monitoring in lateral support struts
  
3. Quality assurance for reinforced concrete works
  - Control surveys
  - Compressive strength testing of concrete
  - Locating of reinforcement bars, ducts and voids
  - Tensile strength testing of concrete, floor finishes and large construction fittings

# 1. QA for Deep Foundation

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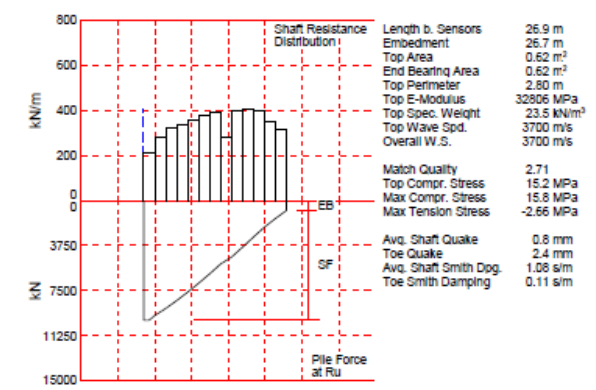
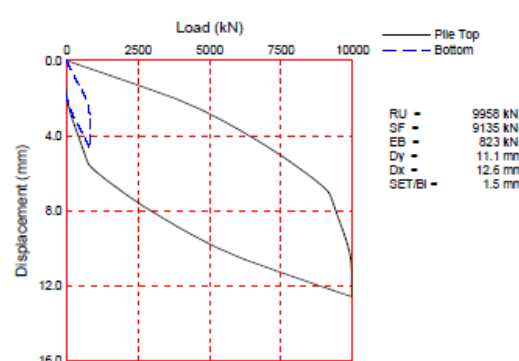
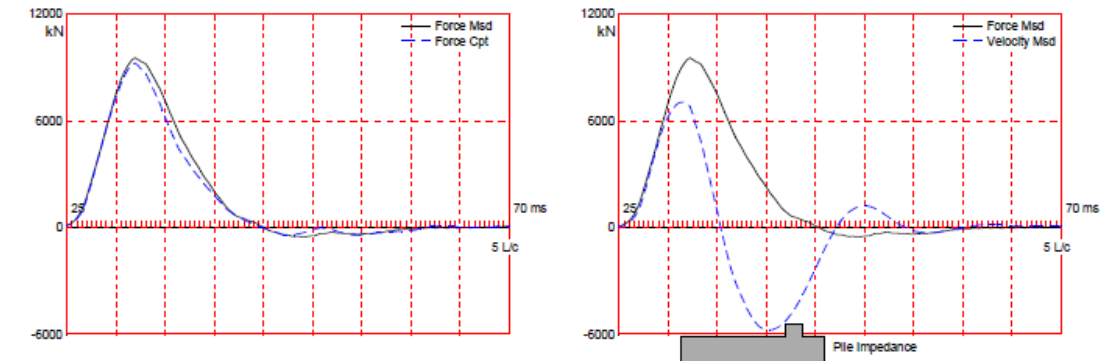


# 1. Quality Assurance for Deep Foundations



16158 PDA URBAN LOFTS PROJECT; Pile: A1-8-1; BP800; Blow: 8 (Test: 12-Jan-2017 12:24:)  
 ILI Consulting Engineers Mekong Ltd

15-Jan-2017  
 CAPWAP(R) 2014-2



A - 3

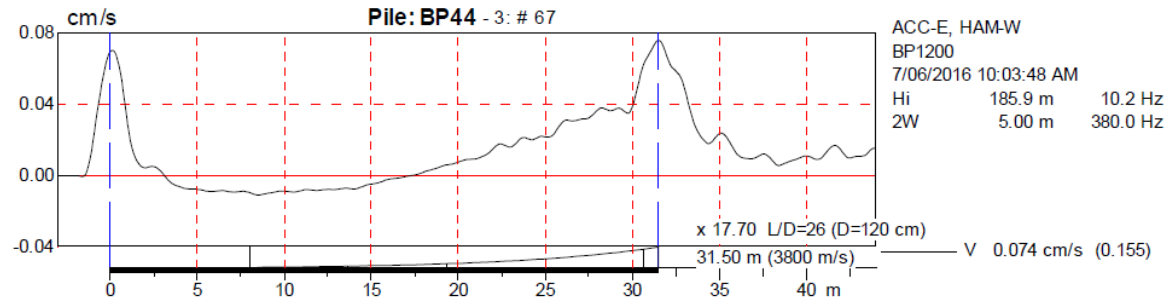
CAPWAP(R) 2014-2 Licensed to ILI Consulting Engineers Mekong Ltd



- Assessment of pile bearing capacity
- Verification of pile integrity

## High strain dynamic testing by Pile Dynamic Analyzer (PDA)

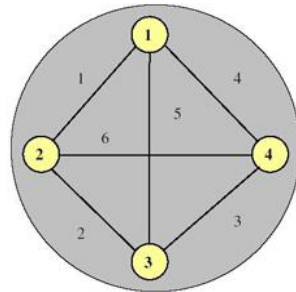
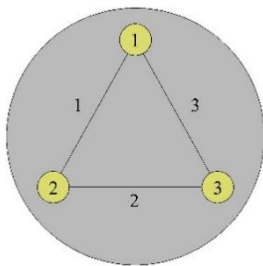
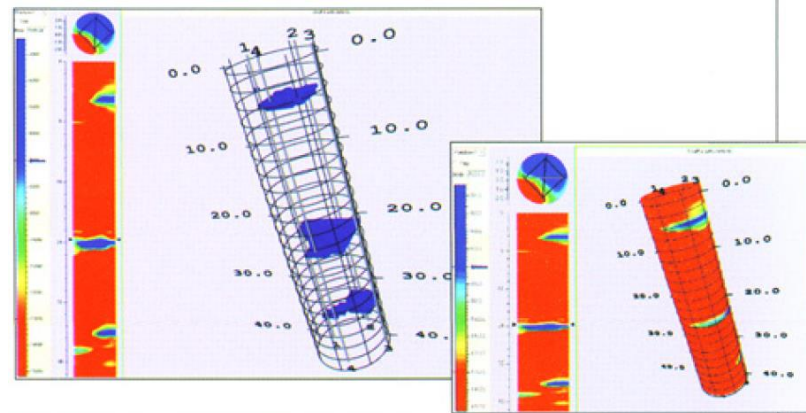
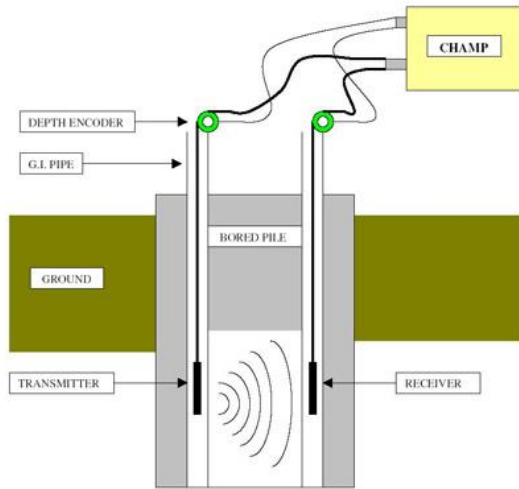
# 1. Quality Assurance for Deep Foundations



Fast verification of pile integrity

Low strain dynamic testing by Pile Integrity Tester (PIT)

# 1. Quality Assurance for Deep Foundations

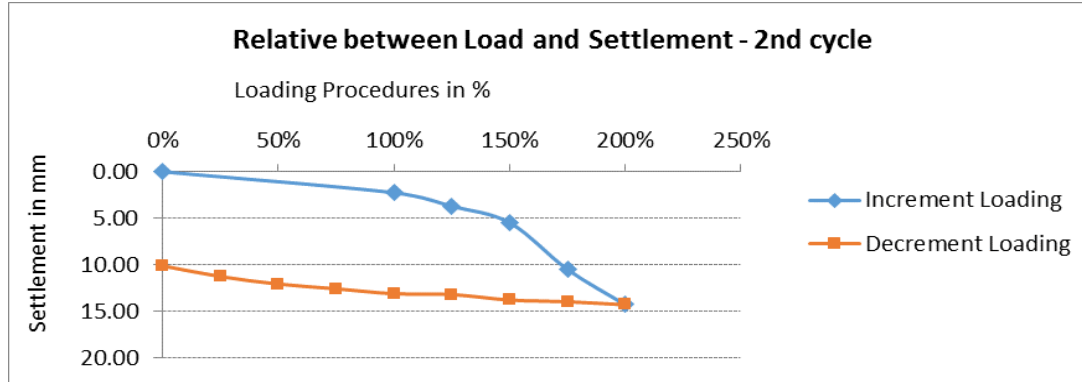


Verification of pile integrity



**Low strain pile integrity testing by Cross-hole Sonic Logging (CSL)**

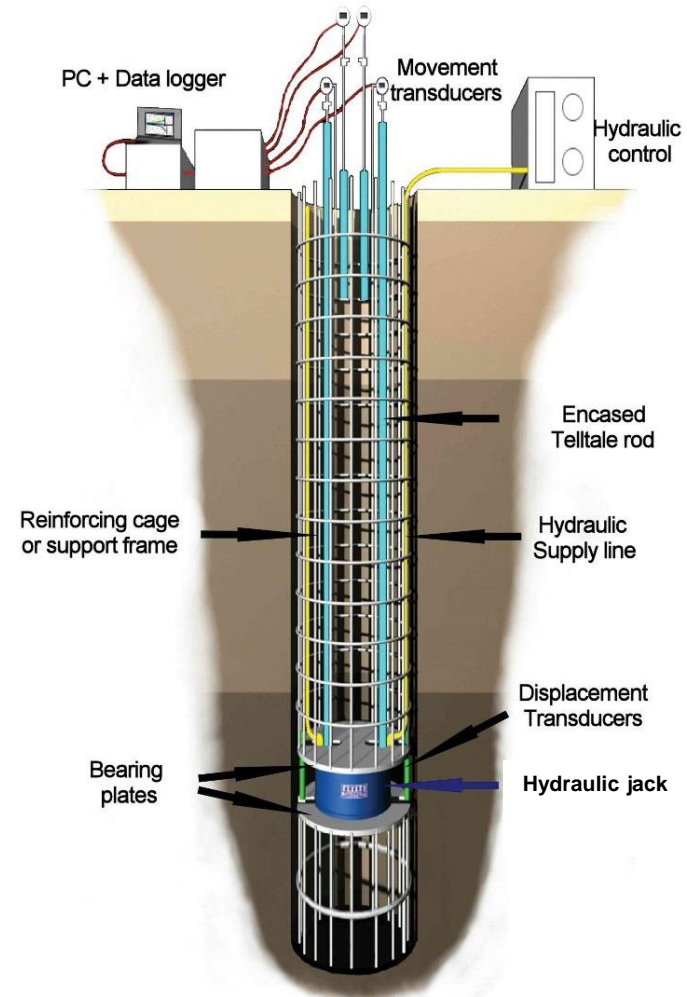
# 1. Quality Assurance for Deep Foundations



**Static pile load tests**



# 1. Quality Assurance for Deep Foundations



**Static pile load tests, Bi-directional tests**

## 2. Monitoring of Deep Excavations and Lateral Supports

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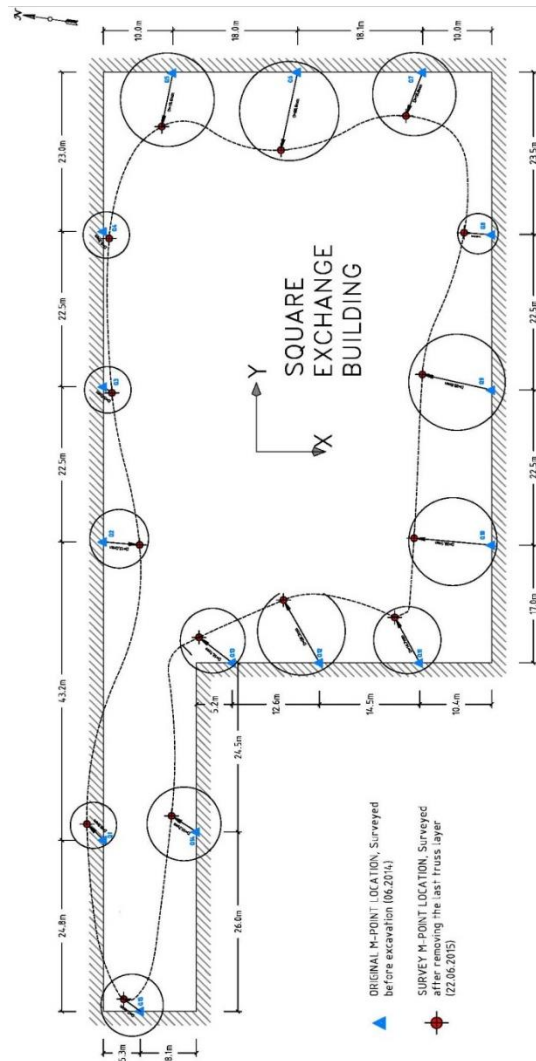


## 2. Monitoring of Deep Excavations and Lateral Supports



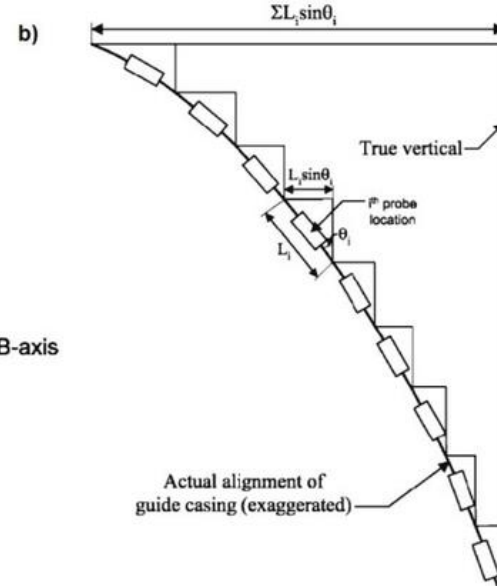
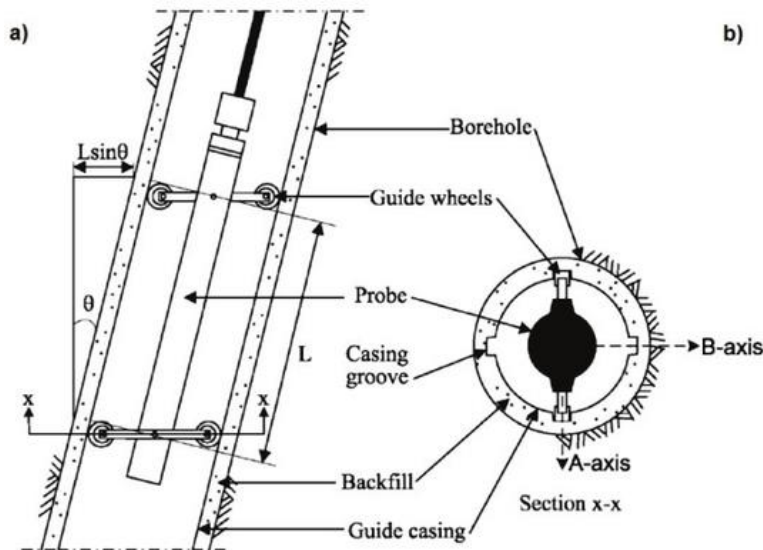
**Control surveys of ground and building movement markers**

## 2. Monitoring of Deep Excavations and Lateral Supports



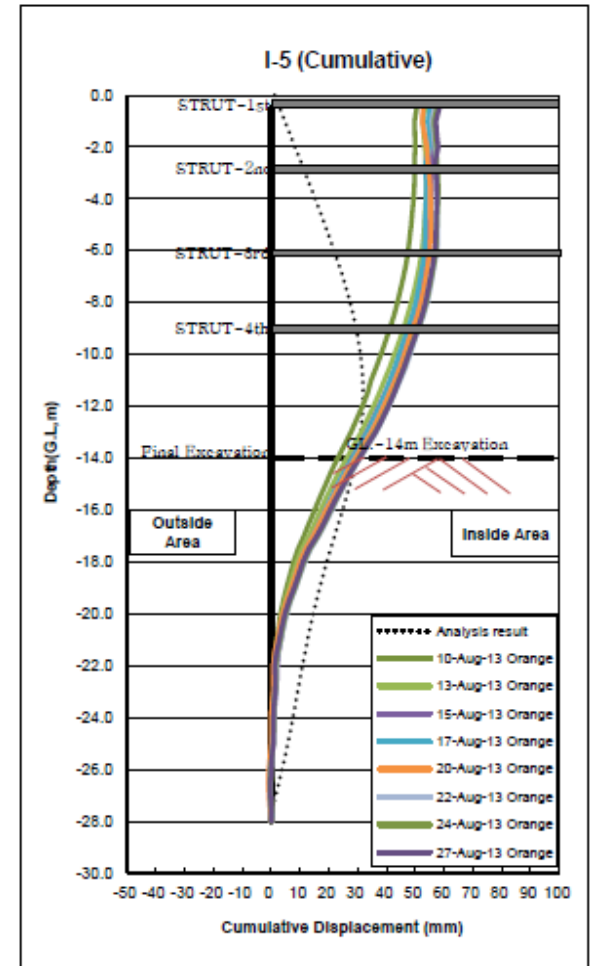
Control surveys of ground and building movement markers

## 2. Monitoring of Deep Excavations and Lateral Supports



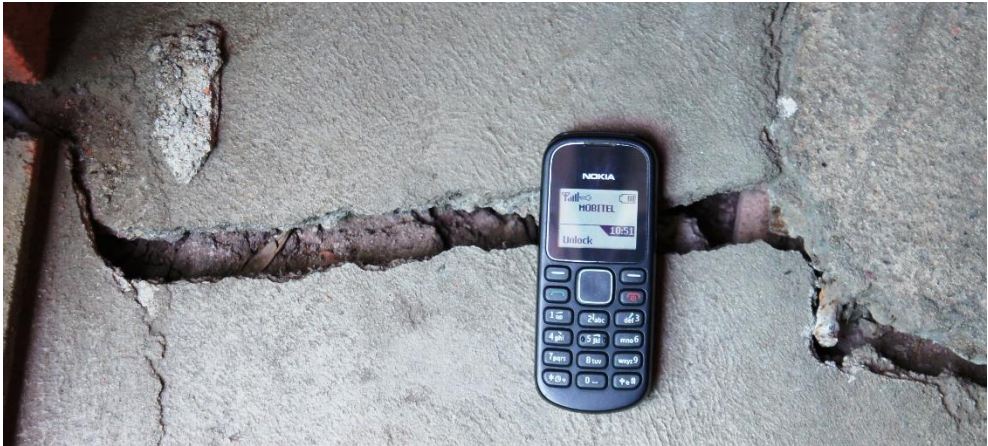
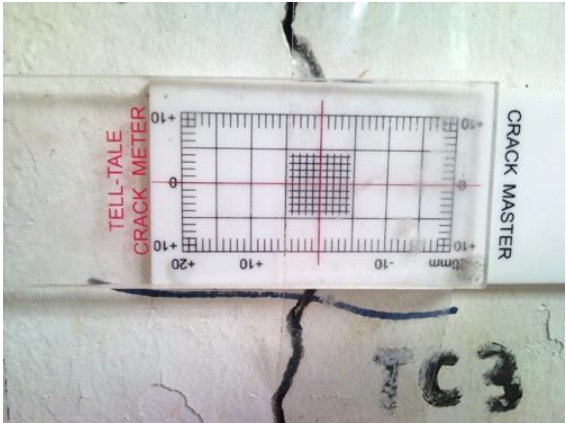
**Monitoring of movements by inclinometer**

## 2. Monitoring of Deep Excavations and Lateral Supports



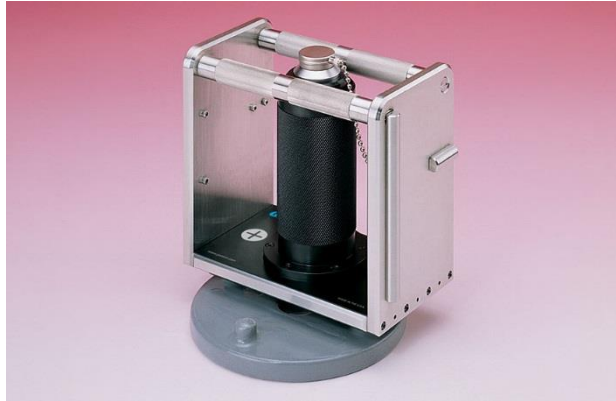
Monitoring of movements by inclinometer

# 2. Monitoring of Deep Excavations and Lateral Supports



Monitoring of movements by inclinometer

## 2. Monitoring of Deep Excavations and Lateral Supports

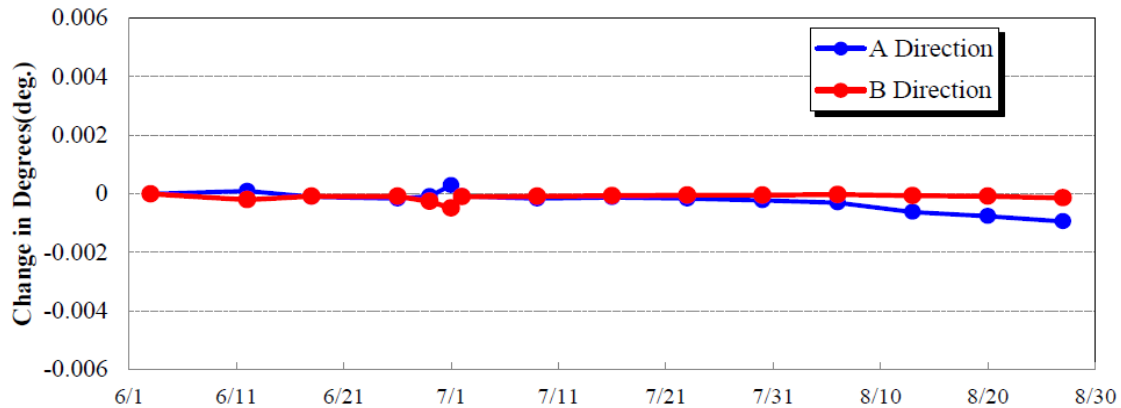


ACLEDA Bank Plc. Headquarters Building Extension Project

Installed Date 2-Jul-13

Location :

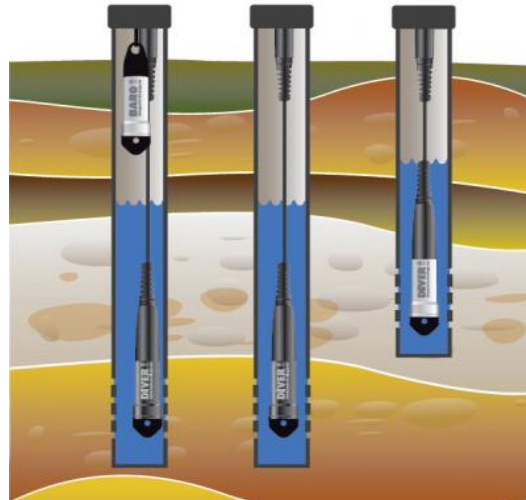
South MOI



**Monitoring of movements by tilt meter**



## 2. Monitoring of Deep Excavations and Lateral Supports



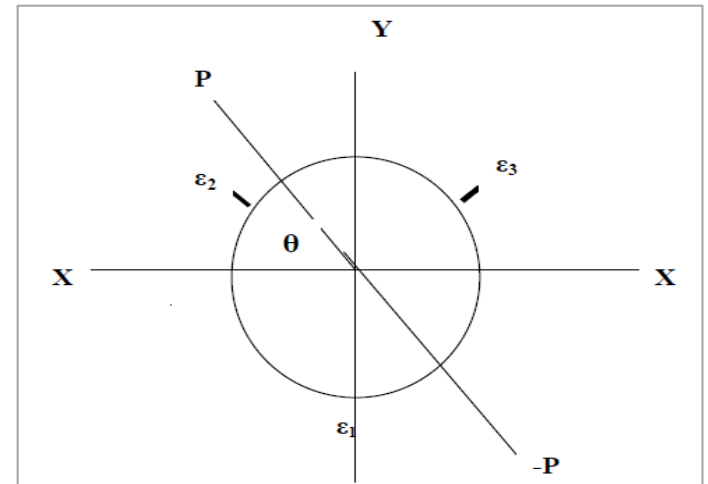
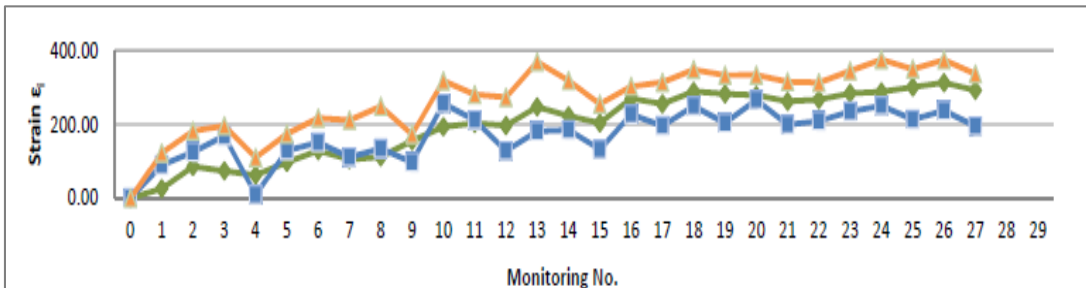
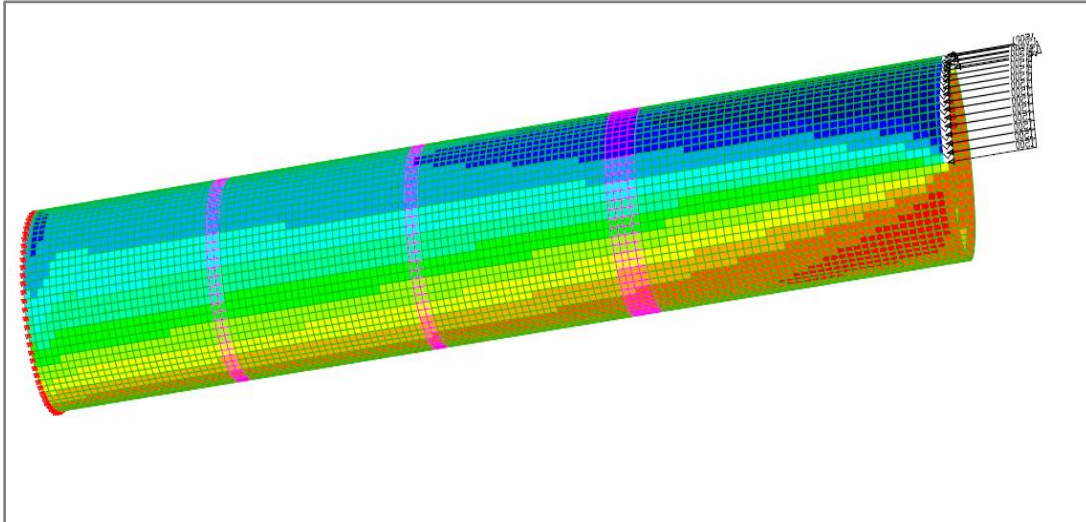
Monitoring of groundwater levels and pore water pressure

## 2. Monitoring of Deep Excavations and Lateral Supports



**Strain monitoring in lateral support struts**

## 2. Monitoring of Deep Excavations and Lateral Supports



**Strain monitoring in lateral support struts**

## 3. QA for Reinforced Concrete Works

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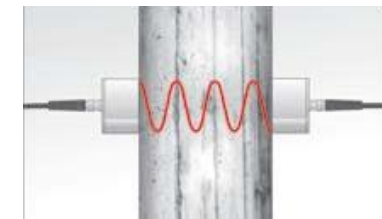
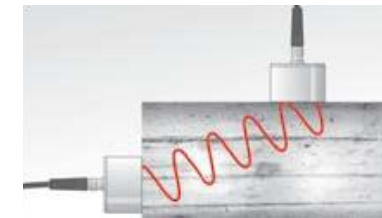
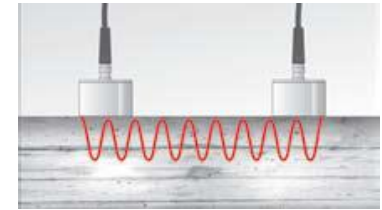


# 3. Quality Assurance of Reinforced Concrete Works



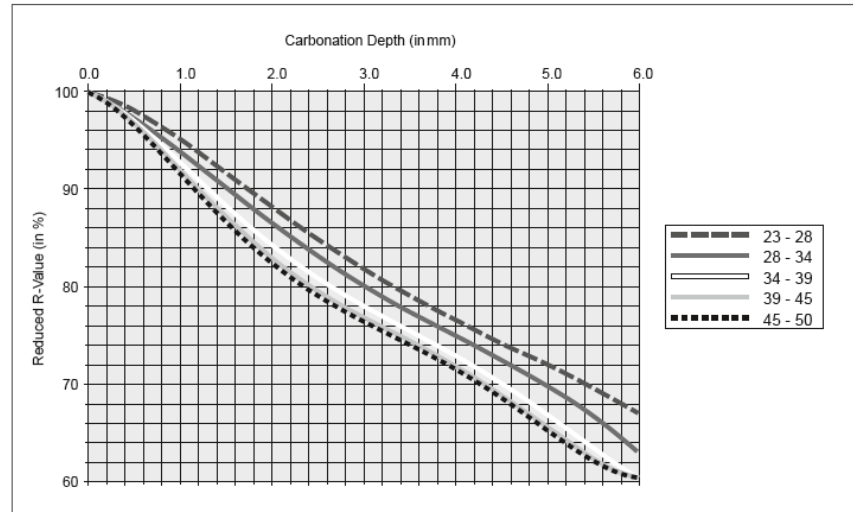
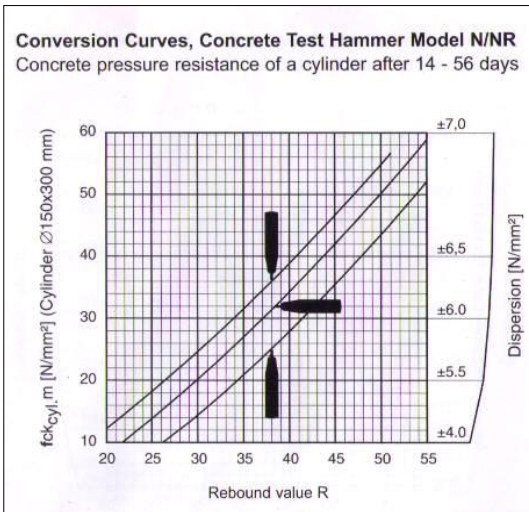
Control surveys for high-rise structures

### 3. Quality Assurance of Reinforced Concrete Works



**Compressive strength testing by Ultra-sonic Pulse Velocity (UPV)**

# 3. Quality Assurance of Reinforced Concrete Works



**Compressive strength testing by rebound hammer**

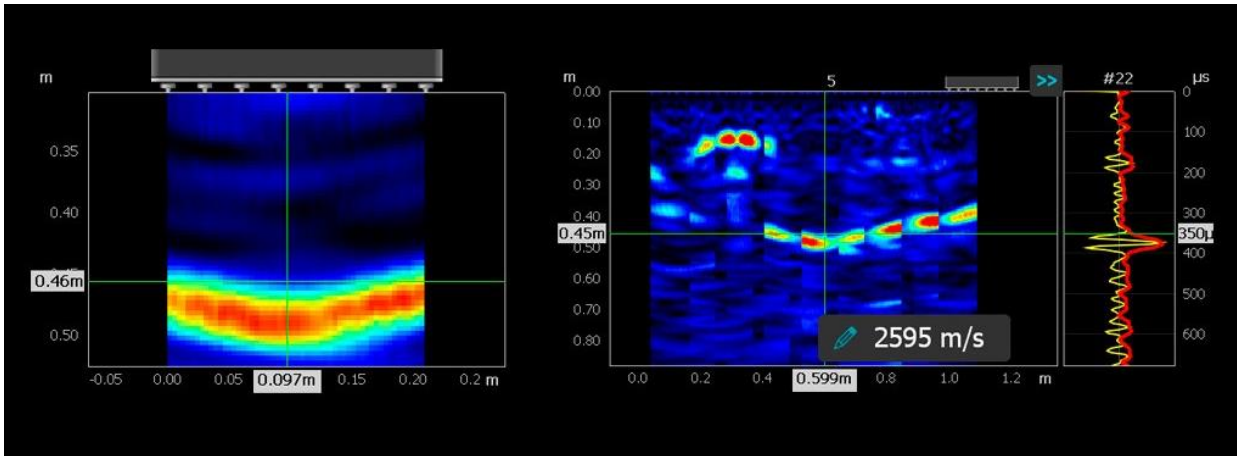
### 3. Quality Assurance of Reinforced Concrete Works



Compressive strength testing by core drilling

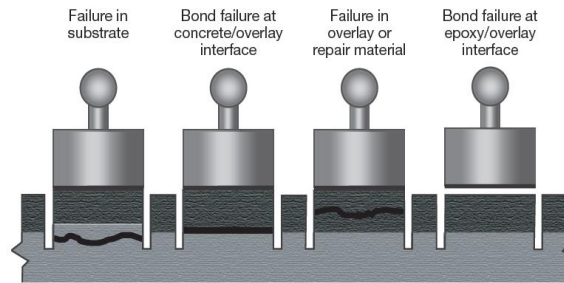
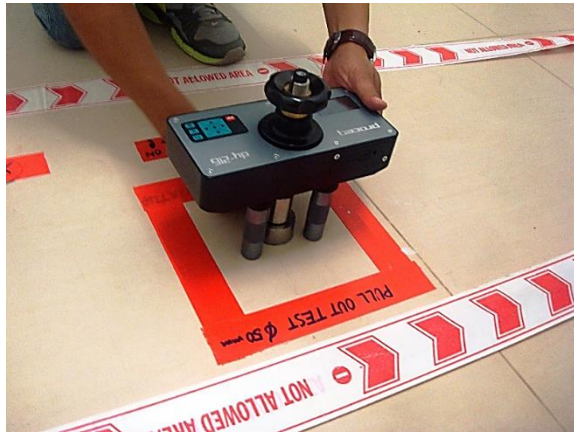


### 3. Quality Assurance of Reinforced Concrete Works

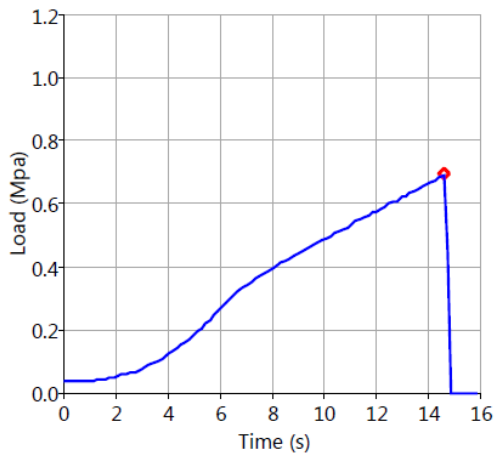


Locating of rebars, ducts and voids

# Tensile Strength Testing



Load Rate Curve



**Measurement**

Peak Load 0.69 Mpa  
Peak Load Time 14.6 s  
Tear-off Time 15.0 s  
Effective Load Rate 0.045 Mpa/s

**Settings**

Unit Mpa  
Load Rate 0.045 Mpa/s  
Load Limit 2.00 Mpa  
Test Disc Area 6648 mm<sup>2</sup>  
Test Disc Diameter 92.0 mm  
Failure Mode 1 A 0%  
Failure Mode 2 AB 0%  
Failure Mode 3 B 0%



Pull-out test setup as per ASTM E488

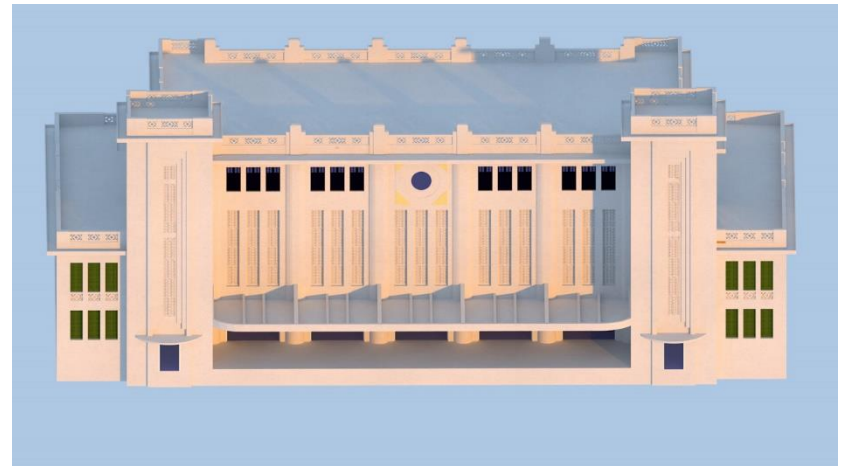
**Pull-out tests for bars and anchors, pull-off tests for tiles**

## 4. Building Surveys and Assessments

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# Building Surveys



# Structural Investigations





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**Thank you.**

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