



***equip<sup>e</sup>***

***“Without site investigation, ground is a hazzard”  
but  
Without competent and trained staff,  
Site investigation is a hazzard***

**Peter Reading  
Director Equipe Training**



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# Engineers – understanding specification

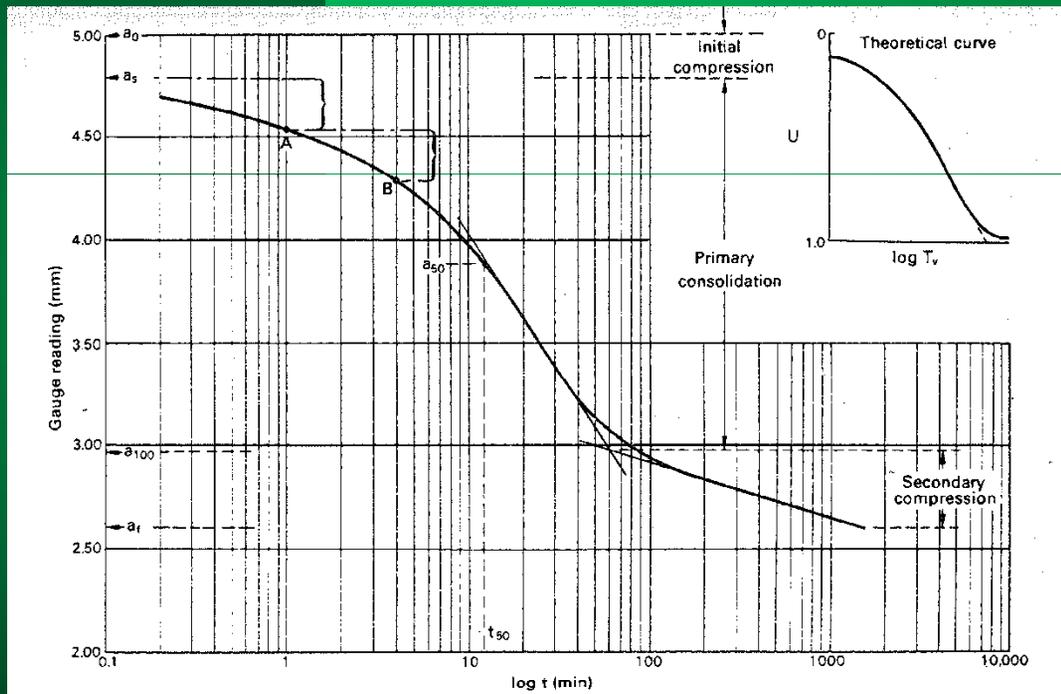


Figure 7.20 The log time method.

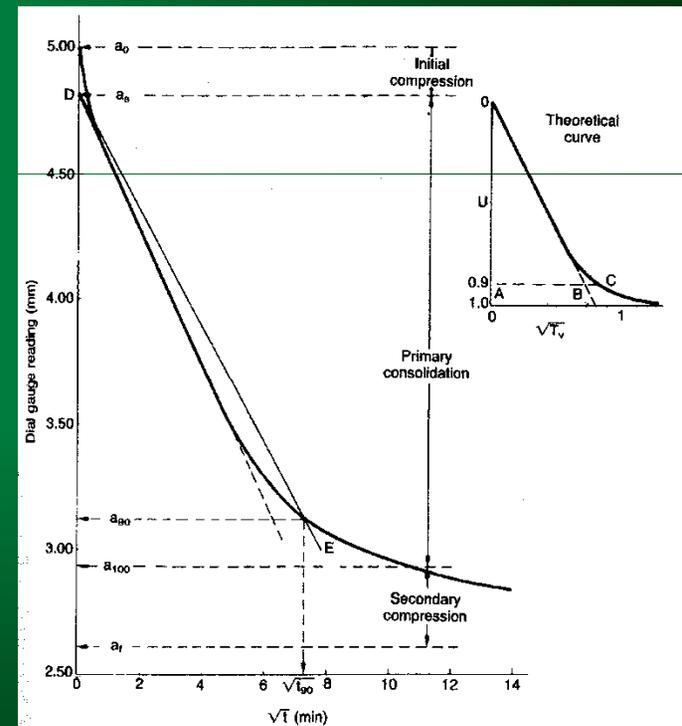


Figure 7.21 The root time method.

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# Engineers - Specification for site investigation

- It is proposed to demolish the existing end terrace property and construct a new property with two levels of basement and five storeys load bearing masonry structure over.
- The scope of the investigation will comprise the following:-
  - 4 No 6m deep window samples two from the existing basement level and 2 from existing ground level.
  - Insitu testing as required to advise on the engineering characteristics for foundation design which will include the underpinning of existing foundations (including Atterberg limits)
  - Contamination screening (4 per window sample )
  - Investigation into groundwater and ground gasses and contamination levels (1 Return visit will suffice)
  - Testing to advise on sulphate levels for concrete specification
  - The report should include Foundation Design; Retaining walls; concrete specification and excavations.

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## The structure of Eurocodes

The Eurocode will encompass all stages of design for a structure.

The code is in eleven sections of which part 8 deals with Geotechnical processes.

All sections are subject to the underlying assumptions.

“A design which employs the Principles and Application Rules is deemed to meet the requirements of EN 1990 provided the accompanying assumptions are satisfied” (*BS EN 1990 C1.3*)



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## The six assumptions behind CI 1.3

1. The choice of the structural system and design of a structure is made by **appropriately qualified and experienced persons.**
2. Execution is carried out by personnel having the **appropriate skill and experience.**
3. **Adequate supervision and quality control** is provided during the execution of the works, i.e. in design offices, factories, plants and **on site.**
4. The construction materials and products are used as specified in EN1990 and EN1991 to 1999, or in the relevant supporting material or product specification.
5. The structure will be adequately maintained.
6. The structure will be used in accordance with the design assumptions.

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## TS 22475 parts 2 and 3

- ✓ TS 22475 deals with sampling methods and groundwater measurements.
- ✓ Part 2 Qualification criteria for enterprises and personnel  
Roles

Enterprise

Qualified operator

Responsible expert

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## What do the individuals need to do? - Enterprise

The enterprise must be able to demonstrate adequate competence and have:-

Experienced personnel and facilities.

A health and safety system.

A quality assurance system.

Ensure specified equipment complies to technical specifications, is maintained and used in accordance with specifications etc.

Shall ensure a qualified operator is present at all times and is responsible for drilling installations measurement and recording at the drill rig.

Shall appoint a responsible expert for each project.

Will comply with bylaws, H & S regs and technical rules.

Shall carry PL.

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# Qualified Operator

Should have documented proof of competence including :-

A basic knowledge of the purpose of geotechnical ground investigation, geological soil and rock , mechanical and hydrogeological principles.

Specified parts of ISO 22475 -1 including borehole backfill, handling storage and transport of samples.

Completion of records

Be able to undertake basic soil and rock description.

Understand the relevant H & S and environmental regulations.

Safe operation and maintenance of the equipment .

Understand the Quality assurance system.

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# Responsible Expert

Shall hold a degree in a relevant subject and have at least 3 years experience in an enterprise carrying out sampling and groundwater measurement.

OR

Have completed vocational training and have at least 5 years experience in the same.

The expert shall also have proven knowledge of

Health and safety regs, technical rules, and standards

The purpose of ground investigation, geological, soil and rock mechanical and hydrogeological principles.

Sampling procedures as 322475 part 1

Reporting results of sampling

Identification and description of soil and rock.

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## Competence – Responsible expert.

In addition the expert shall :-

- have knowledge of the Quality assurance system

- be able to understand the aims of the investigation programme

- supervise the work of the qualified operator

- be able to ensure the completeness and quality of the report, and to recognise incorrect or anomalous results.

- To call for further expertise if required.

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## Who else requires to be Competent – qualified and experienced

Engineers both for the contractor and the Engineer.

Field Technicians

Drillers support operatives

Laboratory technicians

What competences do these individuals need?

What is adequate experience?

The underlying assumptions would suggest the same rules apply to everyone engaged in site investigation

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# What Training is available?

## For operatives

- BDA Land Drilling Specialist sector training scheme
- NVQ Land drilling for Driller and support operatives.

## For technicians

- NVQ Laboratory and Associated Technical Activities

## For engineers

A plethora of private training companies with courses some more focused than others on the issues of geotechnical sites.

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# Where are we now?



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