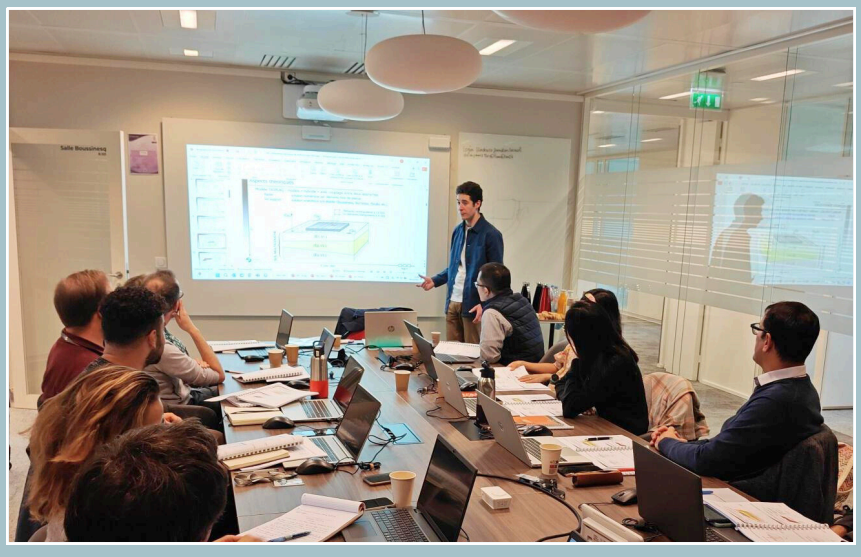
GEOTECHNICAL TRAINING COURSES

PROGRAMME



2026

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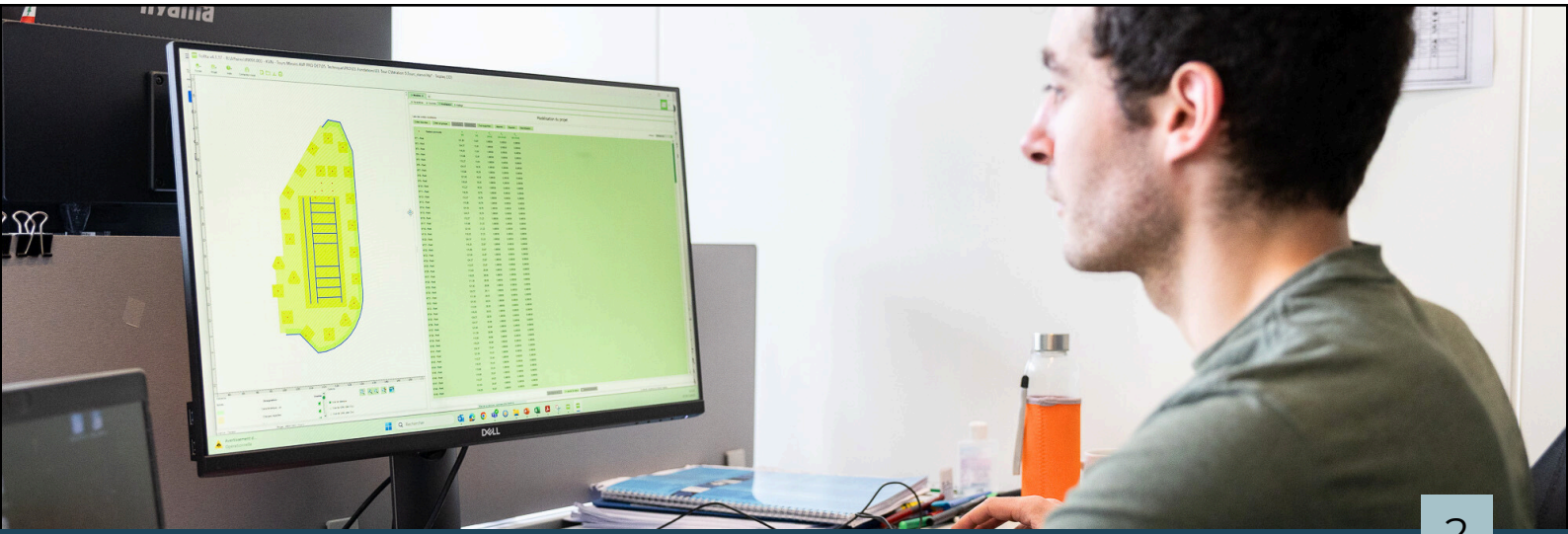
TABLE OF CONTENTS

Our Training Courses



INTRODUCTION

A recognized leader in geotechnical engineering in France and worldwide, Terrasol leverages nearly 50 years of expertise to support its clients.
For almost 20 years, Terrasol has also been delivering dedicated training programmes, initially focused on engineering software (TALREN, FOXTA, K-RÉA and PLAXIS), and gradually expanded to cover a broader range of geotechnical design and modelling topics.
Our training programmes combine cutting-edge technical expertise with practical applications based on real-world projects, ensuring immediate operational value.

Over the years, our training offer has continuously evolved to meet the growing needs of engineers and organisations.
Programmes can be adapted or co-developed with clients, addressing specific challenges such as foundation design, interpretation of geotechnical parameters, or application of international standards.

Terrasol delivers training programmes worldwide, in French, English, Spanish and Portuguese.
Sessions are organised in collaboration with local partners or international experts, ensuring adaptation to local practices and contexts.
Training activities have been conducted across Europe, Africa, the Middle East, Asia and South America.

The key figures presented below illustrate the strong momentum of this activity. Knowledge transfer is more than ever a core component of our business, actively involving Terrasol's technical and scientific management as well as its engineering teams.

Quality Certifications

Terrasol is committed to continuous improvement, ensuring excellence in its geotechnical training services.

As a training provider, Terrasol is Qualiopi-certified, the official French quality certification for training organizations.

Qualiopi
processus certifié
RÉPUBLIQUE FRANÇAISE
La certification qualité a été délivrée au titre de la catégorie d'action suivante :
ACTION DE FORMATION

Terrasol is also AFNOR-certified in accordance with international standards ISO 9001, ISO 14001 and ISO 45001, reflecting its commitment to quality, environmental responsibility, and occupational health and safety.

afaq
QSE
Qualité Sécurité Environnement
AFNOR CERTIFICATION
ISO 9001 - ISO 45001
ISO 14001

These certifications reflect the reliability of Terrasol's processes and its commitment to meeting regulatory requirements and supporting skills development.

Key Figures 2025

394 Engineers Trained

47 Training Sessions

34 Committed Trainers

AVAILABLE TRAINING FORMATS

Open Training Courses

These training courses offer a unique opportunity to exchange with other professionals and to benefit from high-value programmes focused on a specific geotechnical topic or on the discovery and practical use of dedicated software tools. Designed by experienced geotechnical engineers, each course combines technical expertise with real-world applications.
Sessions are scheduled based on demand and participant availability.

In-house Training

In-house training sessions are organised upon request and tailored to the specific topics and challenges identified by the client. All training courses presented in the catalogue can be delivered as open and in-company sessions.
In addition, fully customised training programmes can be jointly developed to meet specific needs, such as foundation and structural design issues, selection and interpretation of geotechnical parameters, or application of standards and codes. Training can be delivered on-site at the client's premises or remotely, depending on requirements.

Worldwide Training

For many years, Terrasol has been delivering its geotechnical training programmes worldwide, in French, English, Spanish and Portuguese.
Leveraging a strong international network, training sessions may be organised in collaboration with local partners (Setec Maroc, Amedic, AGTS Sénégal, Setec Gómez Cajiao Colombia, etc.) or international geotechnical experts, ensuring both technical excellence and adaptation to local practices.
Terrasol regularly conducts both open and in-company training sessions across a wide range of regions, including North Africa, Sub-Saharan Africa, the Middle East, Asia and South America.

Interested in an international training programme?
Contact us at formations.terrasol@setec.com

OUR TRAINING COURSES

Discover our geotechnical training programmes, designed to provide in-depth expertise on specific geotechnical topics, combining theoretical principles and practical applications, with or without the use of dedicated software tools.

SOIL-STRUCTURE INTERACTION AND FOUNDATION DESIGN
From In-Situ Tests to Subgrade Reaction Coefficient for Design

DESIGN OF RIGID INCLUSION SYSTEMS

DESIGN OF RETAINING WALLS USING THE SUBGRADE REACTION METHOD

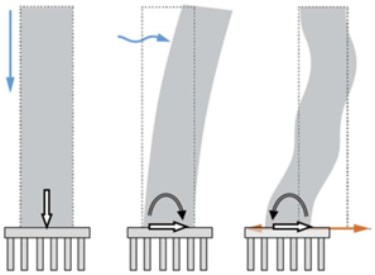
SEISMIC DESIGN OF GEOTECHNICAL STRUCTURES AND MODELLING OF SOIL-STRUCTURE INTERACTION EFFECTS

INTERPRETATION OF PRESSUREMETER TESTS
Testing Protocols and Interpretation

SOIL-STRUCTURE INTERACTION AND FOUNDATION DESIGN

From In-situ Tests to Subgrade Reaction Coefficient for Design

This training course provides a comprehensive understanding of soil–structure interaction (SSI) principles and their practical implementation in foundation design. It focuses on the characterization of ground deformability, the interaction between ground and structural models, and the use of in-situ testing (with focus on pressuremeter and CPT) for design purposes. Static loadings only are considered.
The course combines theoretical background and practical applications in line with current geotechnical practice.



Key Benefits

- Strengthen understanding of SSI mechanisms
- Improve reliability of foundation design
- Enhance ability to interpret in-situ test results
- Bridge the gap between geotechnical investigations and structural design

About the Training

Duration

1 day – 8 hours

Available languages

🇫🇷 French | 🇬🇧 English | 🇵🇹 Portuguese | 🇪🇸 Spanish

Learning Objectives

- Understand the fundamental principles of soil–structure interaction under static loading
- Identify the key parameters governing SSI behaviour in foundation systems
- Apply practical methods to incorporate SSI into structural and geotechnical models
- Characterize ground deformability using in-situ tests
- Perform foundation design considering both bearing capacity and settlement
- Estimate the coefficient of subgrade reaction to ensure consistency between geotechnical and structural design

Target Audience

This training is designed for geotechnical and civil engineering design engineers.

Prerequisites

- Basic knowledge of soil mechanics and foundation engineering
- Familiarity with geotechnical investigation data

Training Methods

- The training course is delivered either on-site at the client's premises or remotely via Microsoft Teams. For remote sessions, the use of two screens is recommended. Training documentation is provided in advance.
- It combines theoretical presentations, practical case studies based on real projects
- Interactive discussions

All trainers are experienced geotechnical design engineers, actively involved in Terrasol's engineering and scientific development activities.

Assessment & Validation

- Knowledge assessment (quiz or case study)
- Training evaluation questionnaire
- Training attendance certificate delivered at the end of the course

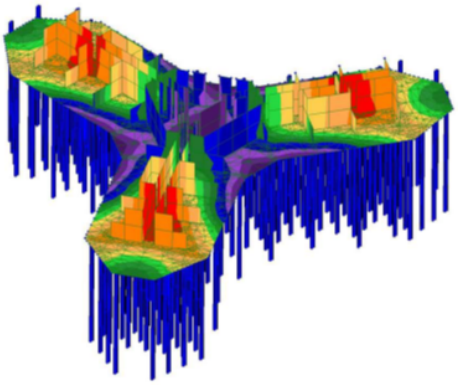
SOIL-STRUCTURE INTERACTION AND FOUNDATION DESIGN

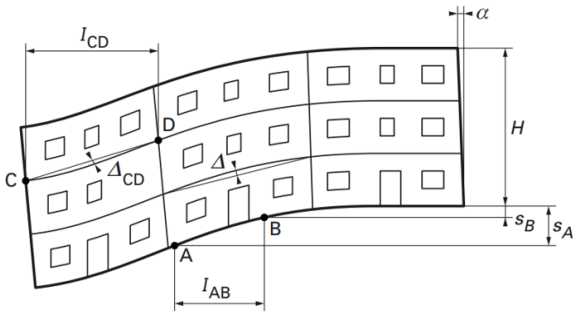
From In-situ Tests to Subgrade Reaction Coefficient for Design

PROGRAMME OUTLINE

1 Fundamentals of Soil–Structure Interaction under Static Loading

- Key challenges and critical aspects to be addressed in SSI
- Concept of relative soil–structure stiffness
  - Definition and engineering interpretation
  - Influence on load distribution and settlements



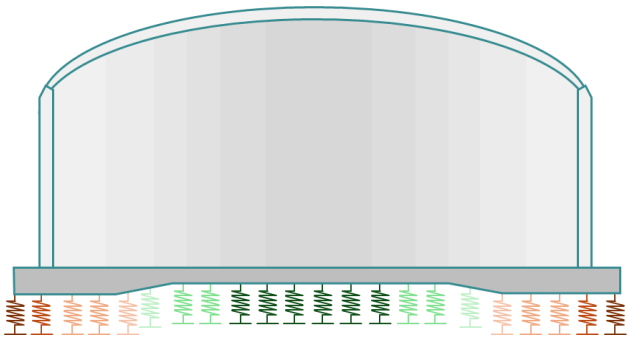


2 Practical Implementation of Soil–Structure Interaction

- Interaction procedures with the supported structure
  - Coupling geotechnical and structural models
  - Iterative approaches

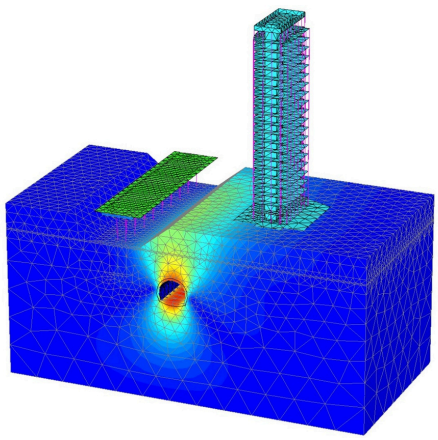
- Stiffness of foundations: theoretical basis
  - Isolated footings
  - Pile foundations and group effects
  - Raft foundations

- Link with in situ geotechnical tests
  - Interpretation of test results
  - Determination of ground deformation modulus and soil-structure interaction parameters (subgrade reaction coefficient, t-z and p-y parameters)
  - Specific challenges in soft soils (non-linearity, consolidation effects)



3 Foundation Design and Serviceability Performance Assessment

- Bearing capacity calculation based on pressuremeter (PMT) and cone penetration tests (CPT)
- Case studies on the integration into structural design: coefficient of subgrade reaction



DESIGN OF RIGID INCLUSIONS

Rigid inclusions ground improvement has gained large recognition worldwide for a broad range of structures. The ASIRI recommendations (2012), edited by a panel of French experts, set out several simplified design methods for these reinforcement systems, in line with the Eurocode standards. This training focuses on the practical implementation of these design methods for applications such as rafts or slabs, isolated or strip footings, and large embankments. The course alternates between practical guidelines (parameter selection, interpretation of results, consistency with ASIRI) and hands-on exercises using semi-analytical approaches (using Foxta software developed by Terrasol) and finite element approaches.

Key Benefits

- Recognised design methods for standard and complex geotechnical applications
- Greater consistency and reliability in design assumptions and interpretation
- Extended expertise in seismic aspects of rigid inclusion design

About the Training

Duration :

1 day – 8 hours

Available Languages

🇫🇷 French | 🇬🇧 English | 🇪🇸 Spanish

Learning Objectives

- Ability to design rigid inclusions beneath rafts and slabs
- Ability to design rigid inclusions beneath embankments and platforms
- Ability to design rigid inclusions beneath footings, taking into account inclined loads and moments

Target Audience

This training is designed for geotechnical and civil engineering design engineers.

Prerequisites

Basic understanding of the design of deep and shallow foundations

Training Methods

- The training course is delivered either on-site at the client's premises or remotely via Microsoft Teams. For remote sessions, the use of two screens is recommended. Training documentation is provided in advance.
- It combines theoretical presentations, practical case studies based on real projects
- Interactive discussions

All trainers are experienced geotechnical design engineers, actively involved in Terrasol's engineering and scientific development activities.

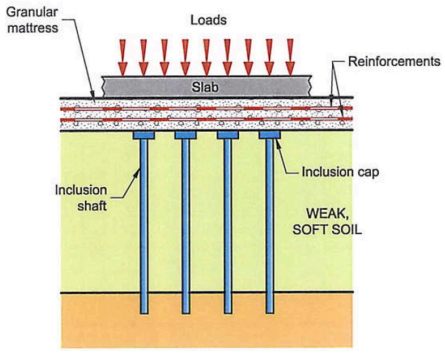
Assessment & Validation

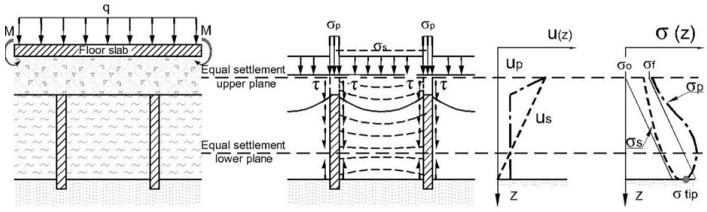
- Knowledge assessment (quiz or case study)
- Training evaluation questionnaire
- Training attendance certificate delivered at the end of the course

PROGRAMME OUTLINE

1 Understand the Fundamentals of Rigid Inclusion Design

- Overview of the fundamental design principles governing rigid inclusion systems
- Identification of the main application areas of this ground improvement technique





2 Understanding the ASIRI Guidelines

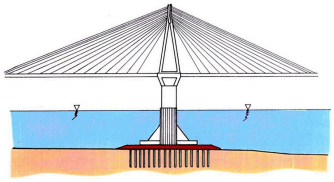
- Overview of the main ASIRI recommendations for rigid inclusion design
- Key principles for interpreting and using the guidelines in engineering practice

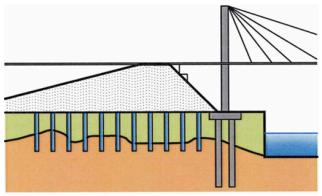
3 Choosing the Right Soil Parameters for Reliable Design

- Selecting soil moduli consistent with the expected strain levels
- Defining the relevant soil models and shear parameters for the ground and bedding layer

4 Rafts and Embankments: Description and Implementation of the Unit-Cell Model

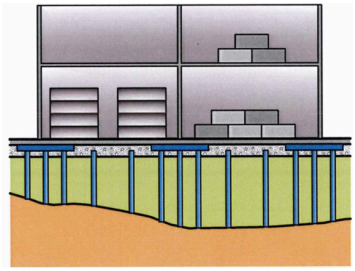
- Presentation of the unit-cell approach for raft and embankment design
- Key justification principles and consistency checks in practice

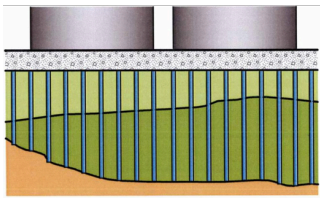




5 Footings Under Complex Loading

- Design approach for footing cases subjected to inclined and eccentric loads
- Concept and practical use of the stability diagram





6 Seismic Design of Rigid Inclusions

- Key principles governing the behaviour of rigid inclusions under seismic actions
- Practical design considerations for seismic conditions

DESIGN OF RETAINING WALLS
Using the Subgrade Reaction Method

Based on France's extensive experience in the design of retaining walls using the soil subgrade reaction method, we are offering an advanced training course to capitalise on the lessons learnt and further develop the potential of this design method. One of its key advantages is that it produces wall behaviour comparable to empirical measurements, provided the soil is properly characterized mechanically. This advanced training session offers a comprehensive overview of the design of retaining structures (diaphragm walls, sheet pile walls, soldier pile walls), based on the soil subgrade reaction method.

Key Benefits

- Master a proven method for retaining wall design
- Improve design accuracy with realistic wall behavior
- Apply advanced calculations to real engineering projects
- Work in compliance with Eurocodes

About the Training

Duration
2 days – 16 hours

Available Languages
🇫🇷 French | 🇬🇧 English | 🇪🇸 Spanish

Learning Objectives

- Develop a thorough understanding of soil-structure interaction assumptions and limitations
- Master the calculation of earth pressures and wall displacements
- Determine internal forces (bending moments, shear forces, reactions)
- Interpret results for real-world projects (excavations, urban retaining systems, geotechnical structures)
- Processing of additional checks following the equilibrium calculation: passive earth pressure check, vertical equilibrium, and verification of the stability of the anchor block (Kranz)
- Post-calculation structural checks in accordance with the Eurocodes 2 and 3
- Highlight the potential of K-Réa v6 (2D and 3D models)

Target Audience
This training is designed for geotechnical and civil engineering design engineers.

Prerequisites
Basic knowledge of soil mechanics and structural analysis

Training Methods

- The training course is delivered either on-site at the client's premises or remotely via Microsoft Teams. For remote sessions, the use of two screens is recommended. Training documentation is provided in advance.
- It combines theoretical presentations, practical case studies based on real projects
- Interactive discussions

All trainers are experienced geotechnical design engineers, actively involved in Terrasol's engineering and scientific development activities.

Assessment & Validation

- Knowledge assessment (quiz or case study)
- Training evaluation questionnaire
- Training attendance certificate delivered at the end of the course

DESIGN OF RETAINING WALLS
Using the Subgrade Reaction Method

PROGRAMME OUTLINE

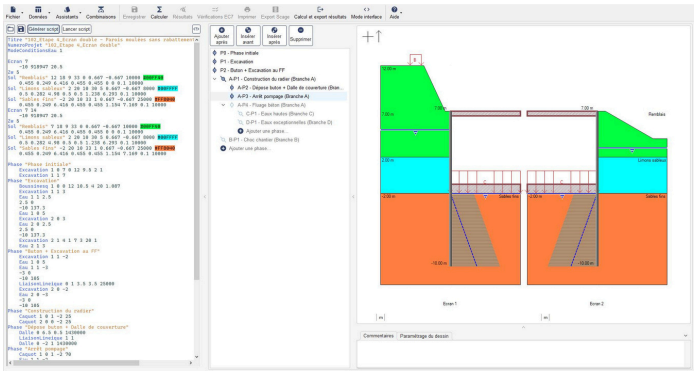
1 Fundamentals in Geotechnical Engineering
- Soil behavior models (elastic, elasto-plastic)
- Key geotechnical parameters (c, φ, subgrade reaction modulus)

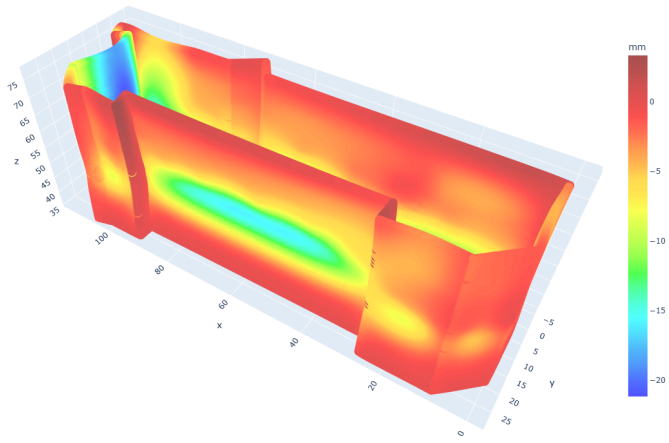
2 Principles of the Subgrade Reaction Method
- Modeling the soil as independent springs
- Definition and calibration of the subgrade reaction modulus (kh)
- Soil-structure interaction: assumptions, advantages and limitations

3 Design of Retaining Sructures
- Free-head and fixed-head wall conditions
- The continuous and discontinuous nature of retaining walls
- Consideration of construction stages (excavation phases)
- Boundary conditions and support systems (anchors, struts)

4 Standard Codes
- Approaches 1, 2 and 3 from Eurocode 7
- BSI approach
- US approach

5 Practical Applications
- Case studies
- Evaluation of the active/passive earth pressure for an arbitrary multilayer soil
- Comparison with alternative methods (manual calculation or finite elements)
- Critical analysis and engineering recommendations
- 3D excavation modeling





SEISMIC DESIGN OF GEOTECHNICAL STRUCTURES AND MODELLING OF SOIL-STRUCTURE INTERACTION EFFECTS

This training provides a comprehensive overview of both theoretical and practical approaches to the seismic design and assessment of geotechnical structures.
Topics include rafts, shallow foundations (isolated and strip footings), deep foundations, and retaining structures under seismic loading.
The course alternates between theory and practical guidance, including parameter selection, result interpretation, and alignment with relevant codes and standards, complemented by applied exercises.

Key Benefits

- Develop high-level expertise in seismic geotechnical design
- Strengthen your use of advanced soil–structure interaction principles
- Translate international code requirements into confident engineering practice

About the Training

Duration
3 days – 24 hours

Available Languages
🇫🇷 French | 🇬🇧 English | 🇪🇸 Spanish

Learning Objectives

- Review the fundamentals of soil and structural dynamics
- Understand the behavior of shallow and deep foundations, as well as retaining structures under dynamic loading
- Master dynamic soil–structure interaction issues
- Benefit from practical experience and case studies from real projects

Target Audience
Geotechnical and structural engineers from consulting and design offices, certification firms and construction companies.

Prerequisites
Fundamental knowledge of geotechnical engineering

Training Methods

- The training course is delivered either on-site at the client's premises or remotely via Microsoft Teams. For remote sessions, the use of two screens is recommended. Training documentation is provided in advance.
- It combines theoretical presentations, practical case studies based on real projects
- Interactive discussions

All trainers are experienced geotechnical design engineers, actively involved in Terrasol's engineering and scientific development activities.

Assessment & Validation

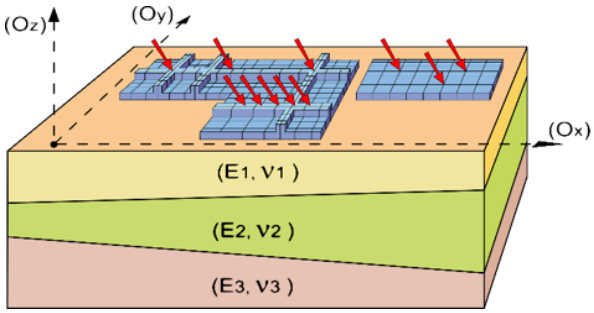
- Knowledge assessment (quiz or case study)
- Training evaluation questionnaire
- Training attendance certificate delivered at the end of the course

SEISMIC DESIGN OF GEOTECHNICAL STRUCTURES AND MODELLING OF SOIL-STRUCTURE INTERACTION EFFECTS

PROGRAMME OUTLINE

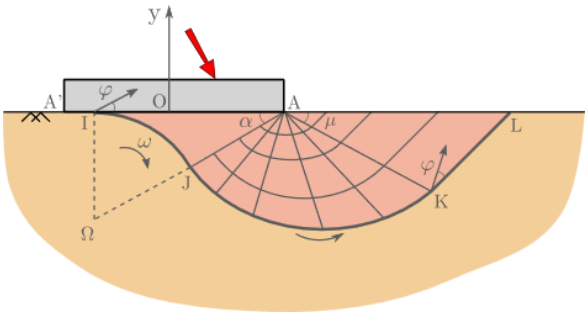
1 Fundamentals and Preliminary Concepts

- Review of fundamental concepts in soil and structural dynamics
- Orders of magnitude in seismic response of soil and structures

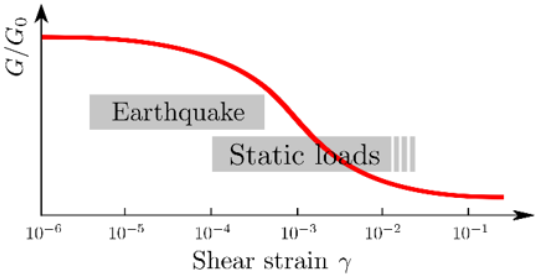


2 Soil Behavior Under Seismic Loading (Excluding Liquefaction)

- Soil response under seismic loading
- Soil testing and common correlations
- 1D site response analysis and definition of the equivalent linear soil profile

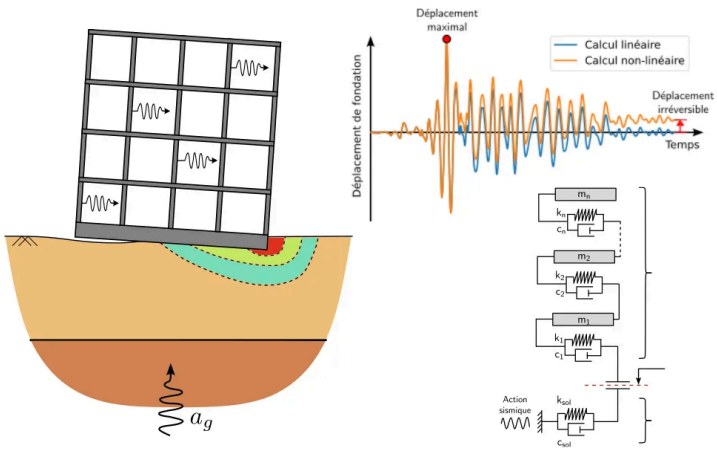


3 Seismic Hazard and Definition of Design Earthquake According to Eurocode 8 (or Equivalent Standard)



4 Design and Verification of Shallow Foundations

- Stability checks: bearing capacity, overturning, sliding



SEISMIC DESIGN OF GEOTECHNICAL STRUCTURES AND MODELLING OF SOIL-STRUCTURE INTERACTION EFFECTS

PROGRAMME OUTLINE
(continued)

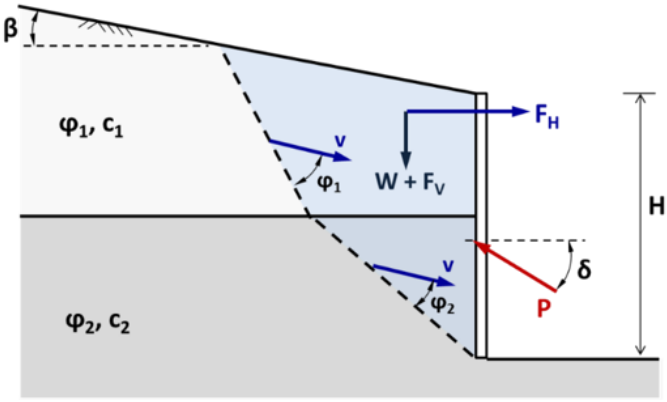
5 Soil-structure Interaction (SSI) under dynamic loading
- Key issues in SSI under seismic loading
- Simplified (analogical) modelling of inertial interaction
- Case study
- Estimation of dynamic SSI stiffness
- Practical evaluation and use of impedance functions
- Case study (bis)
- Kinematic interaction effects: embedded and elevated structures

6 Design and Verification of Deep Foundations
- Inertial and kinematic loading effects
- Calculation methods and load combinations
- Code-based design checks and detailing provisions

7 Non-linear Soil-structure Interaction
- Benefits and implications of nonlinear SSI
- Energy dissipation and “fuse” effects
- Case study

8 Retaining Structures Under Seismic Loading
- Theoretical background and calculation approaches
- Seismic earth pressures (active and passive)
- Consideration of groundwater effects

9 Liquefaction risk assessment
- Theoretical background
- Semi-empirical approaches (e.g. NCEER) and deterministic methods
- Liquefaction hazard assessment

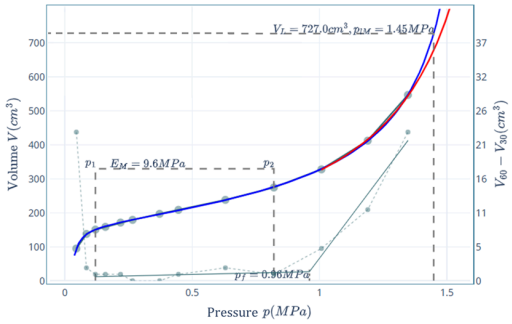


10 Liquefaction Mitigation Techniques
- Ground improvement methods and associated design approaches: soil grouting, stone columns, rigid inclusions, deep soil-mixing, etc.

INTERPRETATION OF PRESSUREMETER TESTS

Testing Protocols and Interpretation

This course provides a detailed overview of the equipment and execution protocols associated with Menard pressuremeter testing. It then introduces the fundamental principles for interpreting pressuremeter test results, including the identification of key parameters and their relevance to geotechnical design. The course also includes practical application sessions based on real data, allowing participants to apply interpretation methods and develop a critical understanding of test quality, limitations and appropriate use.



Key Benefits

- Master pressuremeter test execution and interpretation
- Reliably derive key geotechnical parameters for design
- Understand test limitations and ensure data quality
- Apply results to real geotechnical structures through case studies

About the Training

Duration

1 day – 8 hours

Available Languages

🇫🇷 French | 🇬🇧 English | 🇵🇹 Portuguese

Learning Objectives

- Review Ménard pressuremeter testing equipment and testing procedures
- Present the key principles for interpreting Menard pressuremeter test results
- Practice pressuremeter test interpretation through practical examples
- Develop a critical understanding of the limitations and validity of pressuremeter tests
- Select appropriate Ménard pressuremeter parameters for geotechnical design
- Understand methods for determining deformation moduli adapted to the geotechnical problem considered (advanced testing methods, direct methods, etc.)

Target Audience

This training is designed for geotechnical and civil engineering design engineers.

Prerequisites

Basic knowledge of geotechnics and in-situ testing

Training Methods

- The training course is delivered either on-site at the client's premises or remotely via Microsoft Teams. For remote sessions, the use of two screens is recommended. Training documentation is provided in advance.
- It combines theoretical presentations, practical case studies based on real projects
- Interactive discussions

All trainers are experienced geotechnical design engineers, actively involved in Terrasol's engineering and scientific development activities.

Assessment & Validation

- Knowledge assessment (quiz or case study)
- Training evaluation questionnaire
- Training attendance certificate delivered at the end of the course

INTERPRETATION OF PRESSUREMETER TESTS

Testing Protocols and Interpretation

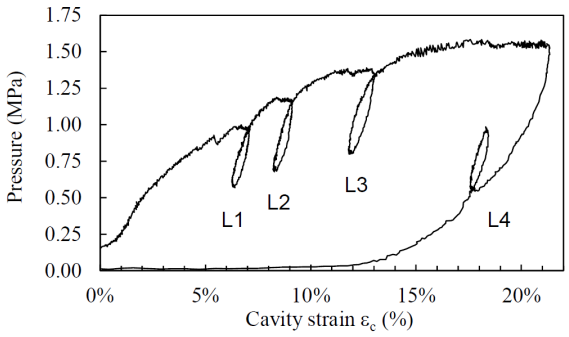
PROGRAMME OUTLINE

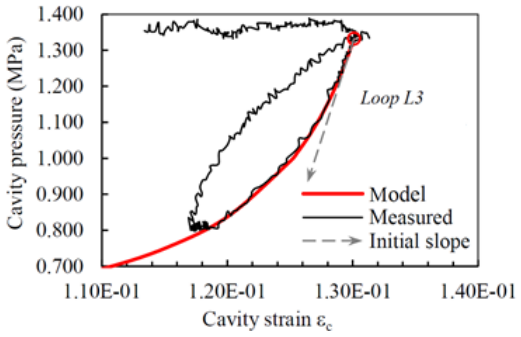
1 Overview of Testing Equipment and Procedures

- Pressuremeter equipment
- Applicable standards
- Testing programmes and calibration

2 Interpretation of Menard Pressuremeter Tests and Applicability Limits

- Use of calibration data
- Determination of Menard pressuremeter parameters: Menard pressuremeter limit pressure, Menard pressuremeter modulus, creep pressure
- Practical case study
- Critical analysis of Menard pressuremeter results: test quality and correlations

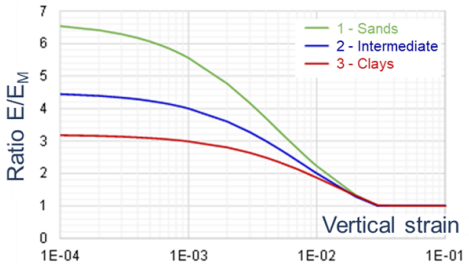




3 Application to Geotechnical Design

- Selection of Menard pressuremeter parameters within the geotechnical model
  - Structural resistance of geotechnical structures (bearing capacity and settlement of shallow and deep foundations, transversal behaviour of deep foundations, ground anchors, soil nails, embedded walls)
  - Practical case study

- Displacements of geotechnical structures and selection of appropriate deformation moduli
  - Advanced pressuremeter testing
  - Direct determination of deformation moduli
  - Practical case study



TRAINING REGISTRATION FORM

Contact details

Name / First name:

Company:

Position:

Email *(required)*:

Phone *(required)*:

Training needs

Number of participants:

Preferred format:
(in-person / remote)

Training location:

Training language:

Billing information

Company / Legal entity:

Billing address:

Company registration number (if applicable):

VAT number (if applicable):

Invoice delivery

- ☐ Send the invoice by email to:
- ☐ Submit the invoice via platform (please specify):

Please select the session(s) you would like to register for on the following page.

Our training sessions are delivered from 9:00 AM to 6:00 PM, combining expert insights with practical applications. Each session is designed for optimal interaction, with a minimum of 6 participants required and a maximum of 12 participants to ensure high-quality exchanges. Terrasol reserves the right to adjust group sizes to maintain the best learning experience.

TRAINING REGISTRATION FORM

Requested training(s)

Please indicate the training topic(s) of interest:

☐	**Soil–Structure Interaction and Foundation Design** *From In-situ Tests to Subgrade Reaction Coefficient for Design*	1 day - 8 hours	In person / remote
☐	**Design of Rigid Inclusion Systems**	1 day - 8 hours	In person / remote
☐	**Design of Retaining Walls Using the Subgrade Reaction Method**	2 days - 16 hours	In person / remote
☐	**Seismic Design of Geotechnical Structures and Modelling of Soil-Structure Interaction Effects**	3 days - 24 hours	In person / remote
☐	**Interpretation of Pressuremeter Tests** *Testing Protocols and Interpretation*	1 day - 8 hours	In person / remote

This registration form, once duly completed, dated and signed, constitutes a firm commitment from the participant and/or the participant's company.

Only duly completed and signed forms will be considered valid.

Date:

Name of the signatory:

Position of the signatory:

Signature and Company stamp:

We look forward to supporting your training needs — please return this form to:
formations.terrasol@setec.com

CUSTOM TRAINING REQUEST FORM

Contact details

Company:

Name / First name:

Position:

Email:

Phone:

Your training needs

Training period and duration :

Number of participants :

Preferred format :
(in-person / remote)

Training location :

Training language :

Programme or topics to be addressed:

Please return this form to
formations.terrasol@setec.com

terrasol

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