

Non-Destructive Testing NDT Guide for Deep Foundations

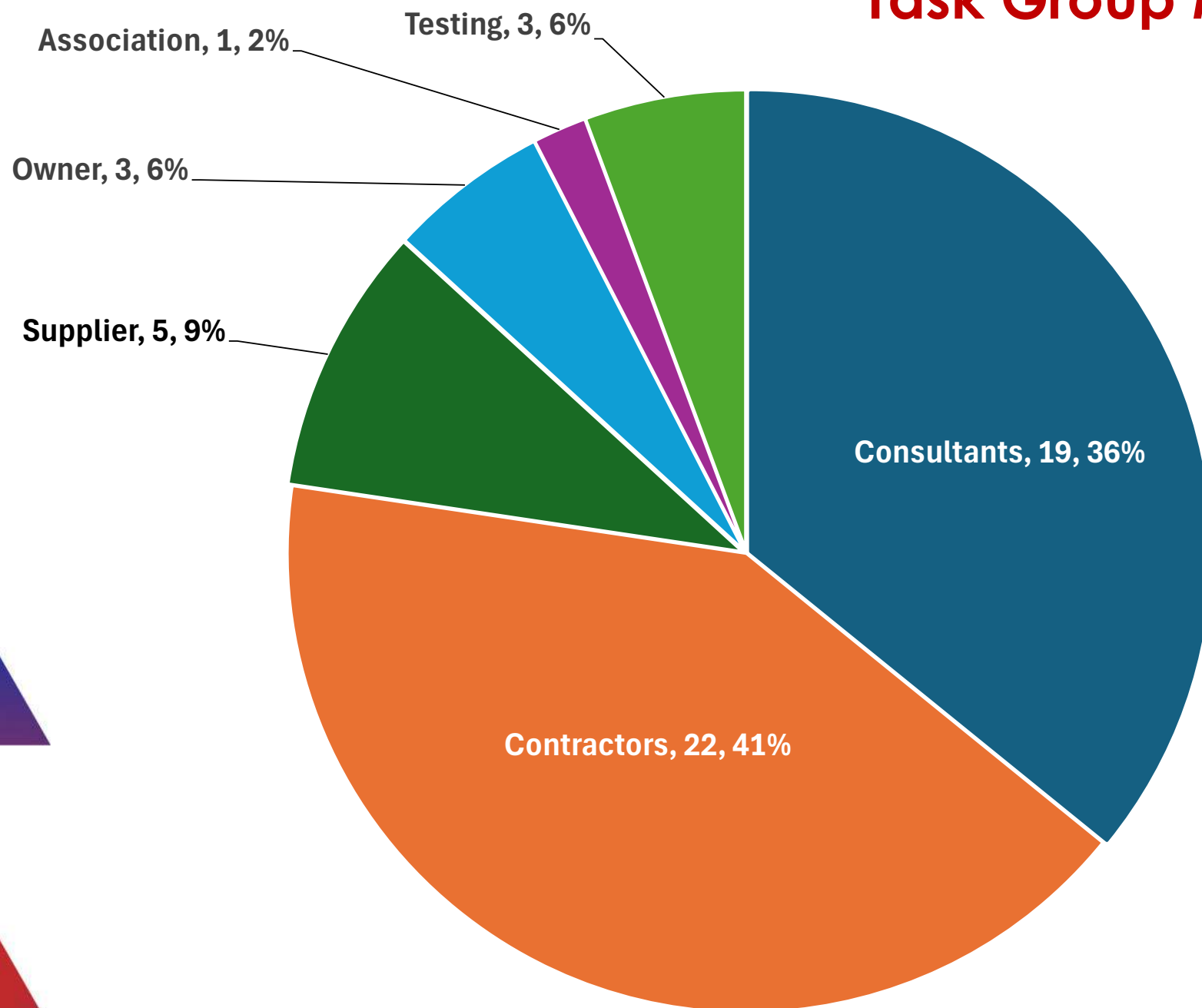


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Task Group Members...



Why does the industry need an NDT Guide focused on Deep Foundations?

- Improve the selection, specification, undertaking, and understanding of results of NDT testing methods.
- Minimize the false positive NDT results.
- Reduce potential for defects in deep foundations (long-term effect)
- Improve awareness and acceptance for NDT
- Evaluate, check, and analyze conditions prior to abandoning a deep foundation with identified defects.

FIGURE D.2
EXAMPLES OF INCLUSIONS OF A DIAPHRAGM WALL PANEL AND PILES



Future Tremie Guide refers to the NDT Guide
and adapt accordingly

Sections = Subgroups

1. Purpose and Scope – Karsten Beckhaus
2. Design Considerations – David Graham
3. Principles of basics in non-destructive testing – Ryan Allin
4. NDT Applications – Travis Coleman
5. Evaluation and Assessment – Chris Barker
6. Acceptance Plan and Consequent Actions – Paul Axtel



Purpose and Scope (section 1)

- All essential Know-How in one practical Guide
- Focusing on relevant NDT methods
- Explaining the structure
- Stating responsibilities of stakeholders
- Going beyond present State of the Art
 - By proposing an action plan how to deal with “virtual defects”



Progress on NDT Guide 1st ed

- All subgroups shall bring complete drafts by end of October
- Chairs will check for gaps and chase individual members
- The aim is to have a first complete draft by January 2026
- An in-person task group meeting in early 2026
 - Finalizing the draft
- Final draft for approval by May 2026
 - If demanded, revision by chairmen plus review by the group

Why do we need a 2nd ed of the **NDT Guide** and a fundamental **R&D project** for this?

- The “Action Plan” how to deal with virtual defects is not complete
 - It will not find common ground due to lacking scientific proof
 - It can't answer what the share from the safety factor can be for a redesign?
- R&D is in the hand of geotechnical & material Professors.
- They shall do a complete “cycle” from review to NDT's probabilistic use
- We should start now to prepare a 2nd ed by 1 ½ years later
- The 2nd ed of the NDT Guide has the potential be to a **game changer**
- It's EUR 120k

A fundamental R&D project on NDT

WP	Title	Content	Project Month	Team
1	Investigations on the reliability and significance of NDT methods	Literature review. Presentation of the state of the art, focusing on the reliability and sensitivity of NDT methods and the significance of anomalies. Identification and quantification of systematic and accidental influences on the testing results. Identification of further research needs.	1.-3.	IGS NDT
2	Variability of material properties and effect on NDT methods	Evaluation of the inherent variability of material properties and identification of influencing factors (e.g., impact of concrete composition, strength, maturity, etc.). Assessment of the influence of this variability on the investigated measurement methods and results of the NDT methods.	1.-3.	IMABS
3	Evaluation of available field tests	Compilation of field tests regarding test boundary conditions, execution, and results. Evaluation in terms of reliability of conclusions, i.e., sensitivity and “relevance thresholds.” Selection of suitable field tests for numerical back-analysis (see item 4).	1.-3.	IGS NDT
		DRAFT REPORT by IGS & IMABS	3	NDT

A fundamental R&D project on NDT

WP	Title	Content	Project Month	Team
4	Numerical Study	Use of multi-physics methods capable of simulating the spatial case of a defective element in the ground using both, transient thermal processes (possibly coupled with hydraulic processes such as groundwater flow) and wave propagation processes. Numerical simulation and back-analysis of selected, particularly well-documented field tests for validation of the numerical model(s). Use of different numerical models (FEM, DEM, etc.) to eliminate the influence of the chosen modeling approach on the investigation results (to be discussed). Sensitivity analysis of the influence of material-specific, geometric, and geotechnical boundary conditions/variability of all parameters (probabilistic approach via Monte Carlo simulations) on NDT measurements, using the previously validated numerical model and representing selected/varied anomalies in the foundation element. Presentation of results in the form of diagrams, nomograms, or similar.	4.÷ 9.	IGS IMABS
5	Acceptance criteria	Sensitivity analysis of NDT methods as a function of relevant boundary conditions (scenarios). Development of acceptance criteria for each NDT method, based on a holistic evaluation of the results from WP 1) to 4).	10.÷ 12.	NDT IGS IMABS

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WP	Title	Content	Project Month	Team
6	NDT result assessment	Specification of minimum additional required information to assess NDT test results (construction record, geotechnical information).	10.-12.	NDT IGS IMABS
7	Sophisticated probabilistic design approach	Recommendations for a probabilistic durability design approach based on NDT test results under consideration of design safety concepts.	10.-12.	IMABS IGS
		FINAL REPORT by IGS & IMABS	12	NDT

A fundamental R&D project on NDT

Project cost

The cost of the project (EURO, excluding VAT) is summarized in the following table.

Work package	Project Month	IGS	IMABS	
1	1-3	10.500.-	-	
2	1-3	-	13,500.-	
3	1-3	8,500.-	-	
4	4-9	27,500.-	26,200.-	
5	10-12	8,500.-	4,500.-	
6	10-12	5,500.-	4,500.-	
7	10-12	3,300.-	7,500.-	
Total		63,800.-	56,200.-	120.000.-
VAT			10,678	