

ISO 22475-1:2021-10 (E)

Geotechnical investigation and testing - Sampling methods and groundwater measurements - Part 1: Technical principles for the sampling of soil, rock and groundwater

| Contents | | Page |
|-----------------|---|-------------|
| Foreword | | v |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms, definitions and abbreviated terms | 2 |
| 3.1 | Ground investigation methods | 2 |
| 3.2 | Drilling rigs and equipment | 3 |
| 3.3 | Sampling | 4 |
| 3.4 | Rock and soil properties | 9 |
| 3.5 | Abbreviated terms | 9 |
| 4 | Equipment | 10 |
| 4.1 | Requirements for the drilling rigs and equipment | 10 |
| 4.2 | Drilling parameters | 10 |
| 4.3 | Safety and special requirements | 10 |
| 5 | Procedures | 11 |
| 5.1 | General requirements for sampling | 11 |
| 5.2 | Selection of techniques and methods | 11 |
| 5.3 | Sampling categories for soil | 11 |
| 5.3.1 | General | 11 |
| 5.3.2 | Sample disturbance | 12 |
| 5.3.3 | Category A sampling | 12 |
| 5.3.4 | Category B sampling | 13 |
| 5.3.5 | Category C sampling | 13 |
| 5.3.6 | Category D sampling | 13 |
| 5.3.7 | Category E sampling | 13 |
| 5.4 | Sampling categories for rock | 13 |
| 5.4.1 | General | 13 |
| 5.4.2 | Sampling disturbance | 14 |
| 5.4.3 | Category A sampling | 14 |
| 5.4.4 | Category B sampling | 14 |
| 5.4.5 | Category C sampling | 15 |
| 5.4.6 | Category D sampling | 15 |
| 5.4.7 | Category E sampling | 15 |
| 5.5 | Sampling in trial pits, other excavations, headings and shafts | 15 |
| 5.6 | Requirements for ground investigation sites and points | 15 |
| 5.7 | Preliminary information needed before starting sampling | 16 |
| 5.8 | Backfilling and site reinstatement | 16 |
| 6 | Soil sampling methods | 17 |
| 6.1 | General | 17 |
| 6.2 | Sampling by drilling (continuous sampling) | 17 |
| 6.2.1 | General | 17 |
| 6.2.2 | Sampling by rotary drilling | 26 |
| 6.2.3 | Sampling by use of hammer driving methods | 28 |
| 6.2.4 | Sampling by cable percussion drilling | 28 |
| 6.2.5 | Sampling by hollow stem auger drilling | 28 |
| 6.2.6 | Sampling by grab drilling | 28 |

| | | |
|-----------------------|--|-----|
| 6.2.7 | Soil sampling by small diameter drilling | 29 |
| 6.2.8 | Sampling by resonance drilling | 29 |
| 6.3 | Sampling using samplers | 29 |
| 6.3.1 | General | 29 |
| 6.3.2 | Sampling using the open-tube sampler and the piston sampler | 33 |
| 6.3.3 | Sampling using the standard penetration test sampler | 38 |
| 6.3.4 | Sampling by using the window sampler | 38 |
| 6.3.5 | Sampling using the windowless sampler | 38 |
| 6.4 | Block sampling | 38 |
| 6.4.1 | Sampling from trial pits | 38 |
| 6.4.2 | Sampling using large samplers | 39 |
| 7 | Rock sampling methods | 39 |
| 7.1 | General | 39 |
| 7.2 | Sampling by drilling | 43 |
| 7.2.1 | General | 43 |
| 7.2.2 | Sampling by rotary dry core drilling | 43 |
| 7.2.3 | Sampling by rotary core drilling | 43 |
| 7.2.4 | Sampling by wireline core drilling | 44 |
| 7.2.5 | Sampling of cuttings by rotary open hole drilling | 44 |
| 7.3 | Block sampling | 44 |
| 8 | Groundwater sampling methods for geotechnical purposes | 44 |
| 8.1 | General | 44 |
| 8.2 | Equipment | 45 |
| 8.3 | Techniques of groundwater sampling | 45 |
| 8.3.1 | General | 45 |
| 8.3.2 | Extraction by pumping | 45 |
| 8.3.3 | Extraction by water sampler | 46 |
| 8.3.4 | Extraction by vacuum bottles | 46 |
| 9 | Preservation,labelling,transportandstorageofsamples | 46 |
| 9.1 | General | 46 |
| 9.2 | Preservation of samples | 46 |
| 9.3 | Labelling of samples | 47 |
| 9.4 | Transport and storage of samples | 48 |
| 9.4.1 | General considerations | 48 |
| 9.4.2 | Sampling category A | 48 |
| 9.4.3 | Sampling category B to E | 49 |
| 9.4.4 | Transport of water samples | 49 |
| 10 | Report | 50 |
| 10.1 | Field report | 50 |
| 10.1.1 | General | 50 |
| 10.1.2 | Summary log | 50 |
| 10.1.3 | Drilling record | 51 |
| 10.1.4 | Sampling record | 51 |
| 10.1.5 | Record of identification and description of soil and rock | 52 |
| 10.1.6 | Backfilling record | 53 |
| 10.1.7 | Record of groundwater measurements during drilling and sampling | 53 |
| 10.1.8 | Daily record | 53 |
| 10.2 | Report of the results | 53 |
| Annex A (informative) | Example of a form for the preliminary information on the intended sampling | 55 |
| Annex B (informative) | Field reports | 57 |
| Annex C (informative) | Drilling and sampling equipment for soil and rock | 65 |
| Annex D (informative) | Examples of commonly used samplers and sample types | 127 |

| | |
|---|------------|
| Annex E (informative) Vacuum bottles for groundwaters sampling | 130 |
| Annex F (informative) Sealing and securing samples | 132 |
| Annex G (informative) Sampling of coarse soils by drilling | 133 |
| Annex H (informative) Sample quality | 134 |
| Bibliography | 141 |