

BS 22475-3:2011



BSI Standards Publication

# Geotechnical investigation and testing – Sampling methods and groundwater measurements –

Part 3: Conformity assessment of enterprises and personnel by third party

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 10, an inside back cover and a back cover.

## Foreword

### Publishing information

This British Standard is published by BSI and came into effect on 31 January 2011. It was prepared by Subcommittee B/526/3, *Site investigation and ground testing*, under the authority of Technical Committee B/526, *Geotechnics*. A list of organizations represented on this committee can be obtained on request to its secretary.

### Supersession

This part of BS 22475 supersedes DD CEN ISO/TS 22475-3:2007, which is withdrawn.

### Relationship with other publications

BS 22475, *Geotechnical investigation and testing – Sampling methods and groundwater measurements*, is published in two parts:

- BS 22475-2: *Qualification criteria for enterprises and personnel*; and
- BS 22475-3: *Conformity assessment of enterprises and personnel by third party*.

BS 22475 is intended to be read in conjunction with BS EN ISO 22475-1, which specifies the technical principles for the execution of sampling and groundwater measurements in the context of geotechnical investigation and testing.

### Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

### Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

### Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

## 1 Scope

This part of BS 22475 specifies requirements for the conformity assessment by third party control of enterprises, personnel and qualified operators performing specified parts of sampling and groundwater measurements in accordance with BS EN ISO 22475-1 and complying with the technical qualification criteria specified in BS 22475-2.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 22475-2, *Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 2: Qualification criteria for enterprises and personnel*

BS EN ISO 14688-1, *Geotechnical investigation and testing – Identification and classification of soil – Part 1: Identification and description*

BS EN ISO 14689-1, *Geotechnical investigation and testing – Identification and classification of rock – Part 1: Identification and description*

BS EN ISO 22475-1, *Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 1: Technical principles for execution*

BS EN ISO/IEC 17021, *Conformity assessment – Requirements for bodies providing audit and certification of management systems*

BS EN ISO/IEC 17024, *Conformity assessment – General requirements for bodies operating certification of persons*

## 3 Terms and definitions

For the purposes of this part of BS 22475, the terms and definitions given in BS 22475-2 and BS EN ISO 22475-1 and the following apply.

### 3.1 assessor

qualified and competent expert appointed by the conformity assessment body to carry out the conformity assessment

### 3.2 certificate

document issued by a conformity assessment body indicating that an enterprise and/or personnel is competent to perform specified parts of sampling and groundwater measurements in accordance with BS EN ISO 22475-1 and that the personnel meet the qualification criteria in accordance with BS 22475-2

### 3.3 conformity assessment

procedure used to demonstrate that an enterprise and its personnel conform to BS 22475-2 for specified parts of sampling and groundwater measurements

### 3.4 conformity assessment body

independent and competent body that carries out procedures for conformity assessment of enterprises and personnel for specified parts of sampling and groundwater measurements

## 4 Conformity assessment of the enterprise

### 4.1 General

The requirements of BS EN ISO/IEC 17021 shall be included in the assessment, where the work of the enterprise falls within its scope.

### 4.2 Eligibility for conformity assessment

The conformity assessment body shall confirm that enterprises performing specified parts of sampling and/or groundwater measurements in accordance with BS EN ISO 22475-1 meet the technical qualification criteria of BS 22475-2.

*NOTE* An example of conformity assessment is the United Kingdom Accreditation Scheme (UKAS) Land Drilling Sector Accreditation Scheme 24A for Ground Investigation<sup>1)</sup>.

### 4.3 Assessment of the enterprise

#### 4.3.1 Application procedure for assessment

**4.3.1.1** The conformity assessment body shall confirm that the enterprise has submitted:

- a) an application form indicating to which specific elements of BS EN ISO 22475-1 the application relates;
- b) relevant documents and other evidence relating to the experience, training and qualification of the enterprise and its relevant personnel.

**4.3.1.2** The conformity assessment body shall confirm that documents and other evidence submitted by the enterprise contains the following as a minimum:

- a) name of the organization;
- b) number of qualified operators and responsible experts employed by the enterprise, together with their certificates and evidence of relevant education, training and experience;
- c) number and types of drill rigs, machines and equipment and how they correspond to the certificates of the employees;
- d) evidence of maintenance and records for the equipment;
- e) records and procedures for transport and storage of samples, including details of any facilities;
- f) evidence of calibration;
- g) details of quality assurance systems;
- h) details of health and safety systems;
- i) details of system for the presentation of results;
- j) procedures for evaluation and reporting the results;
- k) procedures for handling divergences.

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<sup>1)</sup> In preparation.

**4.3.1.3** Advance arrangements shall be made for the assessor and enterprise to meet at the enterprise office and an investigation site in order for the enterprise to demonstrate its skills, knowledge and safe working practices to the assessor in accordance with the conformity assessment body's established procedures (see **4.3.2**).

## **4.3.2 Assessment procedure**

**4.3.2.1** The assessor shall examine the documentation specified in **4.3.1.1** in the presence of a representative of the applicant enterprise vested with executive authority. The assessor shall make an assessment by observation and questioning.

*NOTE 1 This examination and interview forms part of the assessor's review of the experience and knowledge of the enterprise.*

*NOTE 2 The conformity assessment of an enterprise provides formal recognition of success in units of competence, each unit dealing with a particular sampling method or groundwater measurement procedure. Each unit of competence can be made up of a number of elements. Each element of the conformity assessment can be separately assessed. Units and elements may be assessed in any order and there is no time-limit over which this may take place. All elements of a particular unit should be completed before conformity is considered satisfactory for that unit.*

**4.3.2.2** During a conformity assessment the assessor shall confirm whether or not the applicant enterprise has demonstrated the ability to meet the technical qualification criteria specified in BS 22475-2.

**4.3.2.3** Units of competence to be assessed shall include:

- a) the requirements for the enterprise in accordance with BS 22475-2;
- b) personnel requirements for the personnel in accordance with BS 22475-2.

**4.3.2.4** All evidence shall be collected by the assessor and assembled into a portfolio of the applicant enterprise, together with the assessor's comments and judgements (assessment report). The portfolio shall be examined by the conformity assessment body who award a certificate if it meets all their criteria for award.

**4.3.2.5** When the conformity assessment is judged satisfactory, the conformity assessment body shall issue a certificate to the enterprise.

*NOTE 1 Where the conformity assessment is judged "not satisfactory" the applicant enterprise may submit a new application form after six months.*

*NOTE 2 The certificate is valid for one year.*

**4.3.2.6** The competence of the enterprise in accordance with the technical qualification criteria of BS 22475-2 shall be verified annually by a re-assessment in accordance with **4.3.3**.

**4.3.2.7** The enterprise shall be advised that it is required to inform the conformity assessment body of any significant changes concerning the competence of the enterprise and its personnel. If the conformity assessment body judges that the enterprise does not fulfil the qualification of BS 22475-2 due to these changes, the certificate shall be withdrawn.

*NOTE A complementary assessment for additional units of BS EN ISO 22475-1 may be done at any time.*

### 4.3.3 Re-assessment

#### 4.3.3.1 Application procedure for re-assessment

4.3.3.1.1 The conformity assessment body shall confirm that the enterprise has submitted:

- a) an application form for re-assessment indicating to which specific elements of BS EN ISO 22475-1 the application relates;
- b) relevant documents and other evidence relating to experience, training and qualification during the previous year.

4.3.3.1.2 The conformity assessment body shall confirm that the enterprise has submitted a complete and valid application for re-assessment.

#### 4.3.3.2 Re-assessment procedure

4.3.3.2.1 The assessor shall examine the documentation specified in 4.3.3.1.

4.3.3.2.2 The assessor shall question a representative of the applicant enterprise vested with executive authority.

4.3.3.2.3 When the re-assessment is judged satisfactory, the conformity assessment body shall issue a certificate to the enterprise.

*NOTE The certificate of the re-assessment is valid for one year.*

4.3.3.2.4 The conformity assessment body shall verify the competence of the enterprise by a re-assessment in accordance with 4.3.3.

*NOTE When re-assessment is judged not satisfactory, the enterprise may repeat a full assessment in accordance with 4.3.2 after six months.*

## 5 Conformity assessment of personnel

### 5.1 General

The requirements of BS EN ISO/IEC 17024 shall be included in the assessment, where the work of the enterprise falls within its scope.

### 5.2 Conformity assessment of the responsible expert

#### 5.2.1 Eligibility for conformity assessment

The conformity assessment body shall confirm that applicants being assessed as responsible experts for appropriate parts of sampling and groundwater measurements in accordance with BS EN ISO 22475-1 meet the technical qualification criteria of BS 22475-2.

#### 5.2.2 Assessment of the responsible expert

##### 5.2.2.1 Application procedure for assessment

5.2.2.1.1 The conformity assessment body shall confirm the applicant has submitted:

- a) an application form indicating to which specific elements of BS EN ISO 22475-1 the application relates;



- b) a curriculum vitae and passport photographs of the applicant together with other documents relating to his/her relevant experience, training and qualifications.

**5.2.2.1.2** The conformity assessment body shall confirm that the applicant has submitted a complete and valid application for assessment.

**5.2.2.1.3** Advance arrangements shall be made for the assessor and applicant to meet at one or more sites/facilities in order for the responsible expert to demonstrate his/her skills, knowledge and safe working practices to the assessor in accordance with the conformity assessment body's established procedures.

#### **5.2.2.2 Assessment procedure**

**5.2.2.2.1** The assessor shall examine the documentation specified in 5.2.2.1 in the presence of the applicant at an interview. The assessor shall make an assessment by observation and questioning.

*NOTE 1 The interview constitutes a skills check where the applicant should demonstrate his/her knowledge and experiences. This examination and interview forms part of the assessor's review of the experience and knowledge of the applicant.*

*NOTE 2 The conformity assessment of an applicant provides formal recognition of success in units of competence, each unit dealing with a particular sampling method or groundwater measurement procedure. Each unit of competence can be made up of a number of elements. Each element of the conformity assessment may be separately assessed. Units and elements may be assessed in any order and there is no limitation of time over which this may take place. All elements of a particular unit should be completed before conformity is considered satisfactory for that unit.*

**5.2.2.2.2** During a conformity assessment the assessor shall confirm whether or not the applicant has demonstrated the ability to meet all the technical qualification criteria in BS 22475-2.

**5.2.2.2.3** Units of competence to be assessed shall include:

- a) knowledge of relevant laws and health and safety regulations;
- b) knowledge of technical rules (e.g. operating manuals) and standards;
- c) knowledge of the purpose of geotechnical ground investigations and relevant geological, geomechanical and hydrogeological principles;
- d) knowledge of appropriate parts of sampling methods and groundwater measurements in accordance with BS EN ISO 22475-1;
- e) knowledge of reporting sampling methods and groundwater measurements in accordance with BS EN ISO 22475-1;
- f) knowledge of the identification of soil and rock in each sample in accordance with BS EN ISO 14688-1 and BS EN ISO 14689-1 during the sampling process if relevant;
- g) knowledge of the quality assurance system;
- h) understanding of the importance of competence in ensuring delivery of a quality assured ground investigation;
- i) capability of understanding the aim of the investigation programme;

- j) capability to supervise the work of the qualified operator;
- k) capability to ensure the completeness and quality of the report in accordance with BS EN ISO 22475-1, especially divergences influencing the results of the investigation, e.g. sample quality.

*NOTE* For an applicant who is a member of a relevant competence-based registration scheme such as the UK Register of Ground Engineering Professionals, their competence in relation to some units above may be taken as satisfactory without further assessment.

**5.2.2.2.4** All evidence shall be collected by the assessor and assembled into a portfolio of the applicant, together with the assessor's comments and judgements (assessment report). The assessor shall make a final judgement whether the assessment is satisfactory or not. The portfolio shall be examined by the conformity assessment body who award a certificate if it meets all their criteria for award.

**5.2.2.2.5** When the conformity assessment is judged satisfactory, the conformity assessment body shall issue a certificate to the responsible expert.

*NOTE 1* Where the conformity assessment is judged "not satisfactory", the applicant may submit a new application form after six months.

*NOTE 2* The certificate is valid for three years.

**5.2.2.2.6** The competence of the responsible expert in accordance with the technical qualification criteria of BS 22475-2 shall be verified by a re-assessment in accordance with **5.2.3** after three years.

*NOTE* A complementary assessment for additional units of BS EN ISO 22475-1 may be done at any time.

### **5.2.3 Re-assessment**

#### **5.2.3.1 Application procedure for re-assessment**

**5.2.3.1.1** The conformity assessment body shall confirm that the responsible expert has submitted:

- a) an application form for re-assessment indicating to which specific elements of BS EN ISO 22475-1 the application relates;
- b) an updated curriculum vitae and passport photographs of the applicant, together with other documents relating to his/her relevant experience, training and qualifications.

**5.2.3.1.2** The conformity assessment body shall confirm that the applicant has submitted a complete and valid application for re-assessment.

#### **5.2.3.2 Re-assessment procedure**

**5.2.3.2.1** The assessor shall examine the documentation specified in **5.2.3.1**. The assessor shall confirm whether or not this documentation demonstrates that the responsible expert was put in charge of activities in accordance with BS EN ISO 22475-1 and that he/she still meets the technical qualification criteria in accordance with BS 22475-2.

**5.2.3.2.2** When the re-assessment is judged satisfactory, the conformity assessment body shall issue a certificate to the responsible expert.

*NOTE* The certificate of the reassessment is valid for three years.

**5.2.3.2.3** The conformity assessment body shall verify the competence of the responsible expert in accordance with the technical qualification criteria of BS 22475-2 by a re-assessment in accordance with **5.2.3** after three years.

*NOTE* When re-assessment is judged "not satisfactory", the applicant may repeat a full assessment in accordance with **5.2.2** after six months.

## **5.3 Conformity assessment of the qualified operator**

### **5.3.1 Eligibility for conformity assessment**

The conformity assessment body shall confirm that operators performing specified parts of sampling and groundwater measurements in accordance with BS EN ISO 22475-1 meet the technical qualification criteria specified in BS 22475-2.

### **5.3.2 Assessment of the qualified operator**

#### **5.3.2.1 Application procedure for assessment**

**5.3.2.1.1** The conformity assessment body shall confirm that the applicant has submitted:

- a) an application form indicating to which specific elements of BS EN ISO 22475-1 the application relates;
- b) an updated curriculum vitae and passport photographs of the applicant, together with other documents relating to his/her experience, training and qualifications.

**5.3.2.1.2** The conformity assessment body shall confirm that the applicant has submitted a complete and valid application for assessment.

**5.3.2.1.3** Advance arrangements shall be made for the assessor and the applicant to meet at one or more sites in order for the applicant to demonstrate his/her skills, knowledge and safe working practices to the assessor in accordance with the conformity assessment body's established procedures (see **5.3.2.2**).

#### **5.3.2.2 Assessment procedure**

**5.3.2.2.1** The assessor shall examine the documentation specified in **5.3.2.1** in the presence of the applicant at an interview. The assessor shall make an assessment by observation and questioning.

*NOTE 1* The interview constitutes a skills check where the applicant should demonstrate his/her knowledge and experiences. The examination and interview forms part of the assessor's review of the experience and knowledge of the applicant.

*NOTE 2* The conformity assessment of an applicant provides formal recognition of success in units of competence, each unit dealing with a particular sampling method or groundwater measurement procedure. Each unit of competence can be made up of a number of elements. Each element of the conformity assessment may be separately assessed. Units and elements may be assessed in any order and there is no limitation of time over which this may take place. All elements of a particular unit should be completed before conformity is considered satisfactory for that unit.

**5.3.2.2.2** During a conformity assessment the assessor shall confirm whether or not the applicant has demonstrated the ability to meet all the technical qualification criteria in BS 22475-2.

**5.3.2.2.3** Units of competence to be assessed shall include:

- a) the purpose of geotechnical ground investigation;
- b) basic knowledge of the fundamental principles of geology, soil mechanics, rock mechanics and hydrogeology;
- c) skill and knowledge of specified parts of sampling and groundwater measurements, including borehole back filling, handling, transport and storage of samples in accordance with BS EN ISO 22475-1;
- d) skill and knowledge of completion of records in accordance with BS EN ISO 22475-1;
- e) skill and knowledge of a preliminary identification of soil and/or rock in each sample in accordance with BS EN ISO 14688-1 and BS EN ISO 14689-1 during the sampling process;
- f) skill and knowledge of the functioning, safe operation and maintenance of the equipment (including field checks);
- g) skill and knowledge of the quality assurance system;
- h) capability to contribute to health and safety in the workplace;
- i) capability to operate the equipment correctly and safely in accordance with BS EN ISO 22475-1.

**5.3.2.2.4** The assessor shall confirm that the applicant has provided evidence of work activities which have been or are in the process of being carried out by the applicant, or recorded work activities which have been signed by a trainer, supervisor or employer.

**5.3.2.2.5** The assessor shall confirm that the applicant has completed a work-based assessment where he/she is expected to have demonstrated competence in the assessed tasks over a period of time under normal working conditions.

*NOTE* The work-based assessment is an integral part of the assessment. Evidence obtained by simulation or training only is not sufficient.

**5.3.2.2.6** The assessor shall observe and question the applicant while in the workplace, to determine current competence. All evidence shall be collected by the assessor and assembled into a portfolio of the applicant, together with the assessor's comments and judgements (assessment report). The portfolio shall be examined by the conformity assessment body who award a certificate if it meets all their criteria for award.

**5.3.2.2.7** When the conformity assessment is judged satisfactory, the conformity assessment body shall issue a certificate to the applicant and an identification card that carries a photograph of the qualified operator.

*NOTE 1* The identification card is retained by the qualified operator so that it can be presented on demand when required, e.g. while working on site.

*NOTE 2* Where the conformity assessment is judged "not satisfactory" the applicant may submit a new application form after six months.

*NOTE 3* The certificate of the assessment and the identification card is valid for one year.

**5.3.2.2.8** The competence of the qualified operator in accordance with the technical qualification criteria of BS 22475-2 shall be verified by a re-assessment in accordance with **5.3.3** annually.

*NOTE 1* A complementary assessment for additional units of BS EN ISO 22475-1 may be done at any time.

*NOTE 2* For Lead Drillers an example of conformity assessment may be NVQ Land Drilling and British Drilling Association (BDA) annual audit.

### **5.3.3 Re-assessment**

#### **5.3.3.1 Application procedure for re-assessment**

**5.3.3.1.1** The conformity assessment body shall confirm that the qualified operator has submitted:

- a) an application form for re-assessment indicating to which specific elements of BS EN ISO 22475-1 the application relates;
- b) an updated curriculum vitae and passport photographs of the qualified operator, together with other documents relating to his/her experience, training and qualifications.

**5.3.3.1.2** The conformity assessment body shall confirm that the qualified operator has submitted a complete and valid application for re-assessment.

#### **5.3.3.2 Re-assessment procedure**

**5.3.3.2.1** The assessor shall examine the documentation specified in **5.3.2.1**. The assessor shall confirm that this documentation demonstrates that the qualified operator was performing activities in accordance with BS EN ISO 22475-1 and that he/she still meets the qualification in accordance with BS 22475-2.

**5.3.3.2.2** The assessor shall observe and question the qualified operator while in the workplace, to determine current competence.

**5.3.3.2.3** When the re-assessment is judged satisfactory, the conformity assessment body shall issue a certificate to the qualified operator and an identification card that carries a photograph of the qualified operator.

*NOTE 1* The identification card is retained by the qualified operator so that it can be presented on demand when required, e.g. while working on site.

*NOTE 2* The certificate of the reassessment and the identification card is valid for one year.

**5.3.3.2.4** The conformity assessment body shall verify the competence of the qualified operator in accordance with the technical qualification criteria of BS 22475-2 shall lapse after one year unless verified by a re-assessment in accordance with **5.3.3**.

*NOTE* When re-assessment is judged not satisfactory, the applicant may repeat a full assessment in accordance with **5.3.2** after six months.





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