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Incorporating Corrigendum No.1



BSI Standards Publication

Methods of test for soils for civil engineering purposes – Part 1: General requirements and sample preparation

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 48, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 July 2016. 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 these committees can be obtained on request to their secretary.

Supersession

This British Standard supersedes BS 1377-1:1990, which is withdrawn.

Information about this document

This new edition of BS 1377-1 incorporates technical changes only. It does not represent a full review or revision of the standard, which will be undertaken in due course.

Text introduced or altered by Corrigendum No.1 is indicated in the text by tags C1 C1. Minor editorial corrections are not tagged.

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.

Requirements in this standard are drafted in accordance with *Rules for the structure and drafting of UK standards*, subclause J.1.1, which states, "Requirements should be expressed using wording such as: 'When tested as described in Annex A, the product shall ...'". This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

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.

0 Introduction

This British Standard consists of nine Parts. Part 1 contains general information relevant to all the other Parts. Parts 2 to 8 describe methods of test on soils for civil engineering purposes for which samples need to be taken for testing in a laboratory. The laboratory test procedures are grouped under the following headings.

- *Part 2: Classification tests;*
- *Part 3: Chemical and electro-chemical tests;*
- *Part 4: Compaction-related tests;*
- *Part 5: Compressibility, permeability and durability tests;*
- *Part 6: Consolidation and permeability tests in hydraulic cells and with pore pressure measurement;*
- *Part 7: Shear strength tests (total stress);*
- *Part 8: Shear strength tests (effective stress).*

Part 9 specifies methods of test which are carried out directly on the soil in-situ.

Part 1: General requirements and sample preparation. Part 1 of this British Standard contains general information relating to the tests, common calibration and specification requirements and general requirements for testing laboratories and field work. It also includes details of procedures for the preparation of disturbed and undisturbed samples, where these are common to more than one type of test. The main changes introduced by this new edition are as follows.

- a) Extend the maximum period between recalibration of balances from six months to one year.
- b) Amend the requirements for calibration certificates of reference equipment to be in accordance with BS EN ISO 17025.
- c) Include references to the BS EN ISO 17892 series of standards, where these have been published and the equivalent tests in BS 1377-2 have been superseded.
- d) Amend “moisture content” to “water content” in accordance with BS EN ISO 17892-1.
- e) Remove references to withdrawn British Standards, and replace with references to the current BS, EN or ISO replacements.

Part 2: Classification tests. Part 2 describes tests for the classification of soils according to Atterberg limits and particle size distribution. No changes in principle have been made in the test procedures. Note that the water content, density and particle density tests have been superseded by tests in the BS EN ISO 17892 series.

Part 3: Chemical and electro-chemical tests. Part 3 describes chemical tests on soils and on water.

Test procedures include for the determination of the following.

- a) Loss on ignition.
- b) Carbonate content.
- c) Chloride content.
- d) Total dissolved solids.

Tests also include for the assessment of the corrosivity of soils; these are the determination of the electrical resistivity and of the redox potential. In-situ methods of these two tests are given in Part 9.

Part 4: Compaction-related tests. Part 4 describes those tests that refer in some way to the compaction of soils. These include procedures for determining compaction parameters; additional tests for measurement of the limiting densities of non-cohesive soils; and tests which are related to the control and behaviour of soil placed in-situ as fill, comprising the CBR test, the moisture condition test and the chalk crushing value test. Attention is given to several methods of sample preparation appropriate to different soil types prior to compaction tests and the compaction of samples for the CBR test.

Part 5: Compressibility, permeability and durability tests. Part 5 describes test procedures in which the presence or drainage or flow of water within the pore spaces of the soil is the significant factor, but without requiring the measurement of pore water pressure. These include the one-dimensional oedometer consolidation test, and tests for determining the swelling and collapsing characteristics. Further additional test procedures are as follows.

- a) Determination of soil permeability (constant-head method).
- b) Determination of erodibility and dispersive characteristics of fine-grained soils.
- c) Determination of potential frost heave for which reference is made to BS 812-124.

Part 6: Consolidation and permeability tests in hydraulic cells and with pore pressure measurement. Part 6 describes tests for the determination of consolidation and permeability parameters using equipment in which the measurement of pore water pressure is an essential feature. These comprise the following.

- a) Determination of consolidation properties in a hydraulic consolidation cell. For samples of large diameter, either vertical or horizontal (radial) drainage can be used.
- b) Determination of consolidation properties in a triaxial cell under isotropic conditions.

Part 7: Shear strength tests (total stress). Part 7 describes methods for the determination of the shear strength of soils in terms of total stress, or (in the case of drained direct shear tests) in terms of effective stress when equal to total stress. These comprise the following.

- a) The unconsolidated, undrained triaxial compression test, which includes a multi-stage method which is appropriate under certain conditions.
- b) A test for determining unconfined compressive strength using standard laboratory apparatus.
- c) The laboratory vane test for very soft soils.
- d) Direct shear tests using the shear box and the ring shear apparatus, including the determination of drained and drained-residual shear strength parameters.

Part 8: Shear strength tests (effective stress). Part 8 describes the determination of effective stress shear strength parameters in the consolidated-drained and consolidated-undrained triaxial compression tests.

Part 9: In-situ tests. The methods described in this Part have been formed into groups, according to either the purpose of the test or the mode of execution. These groups are as follows.

- a) In-situ density tests.
- b) In-situ penetration tests.
- c) In-situ vertical deformation and strength tests.
- d) In-situ corrosivity tests.

1 Scope

This part of BS 1377 specifies general requirements for the testing of soils for civil engineering purposes and describes methods for the calibration of equipment and the preparation of test samples.

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 410-1, *Test sieves – Technical requirements and testing – Part 1: Test sieves of metal wire cloth*

BS 593, *Specification for laboratory thermometers*

BS 1377-2:1990, *Methods of test for soils for civil engineering purposes – Part 2: Classification tests*

BS 1377-3, *Methods of test for soils for civil engineering purposes – Part 3: Chemical and electro-chemical tests*

BS 1377-4:1990, *Methods of test for soils for civil engineering purposes – Part 4: Compaction-related tests*

BS 1377-5, *Methods of test for soils for civil engineering purposes – Part 5: Compressibility, permeability and durability tests*

BS 1377-6, *Methods of test for soils for civil engineering purposes – Part 6: Consolidation and permeability tests in hydraulic cells and with pore pressure measurement*

BS 1377-7, *Methods of test for soils for civil engineering purposes – Part 7: Shear strength tests (total stress)*

BS 1377-8, *Methods of test for soils for civil engineering purposes – Part 8: Shear strength tests (effective stress)*

BS 1377-9, *Methods of test for soils for civil engineering purposes – Part 9: In-situ tests*

BS 4311, *Gauge blocks manufactured to imperial specification*

BS 5930, *Code of practice for ground investigations*

BS EN 837-1, *Pressure gauges – Part 1: Bourdon tube pressure gauges – Dimensions, metrology, requirements and testing*

BS EN 61010-2-020, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-020: Particular requirements for laboratory centrifuges*

BS EN ISO 4787, *Laboratory glassware – Volumetric instruments – Methods for testing of capacity and for use*

BS EN ISO 7500-1, *Metallic materials – Calibration and verification of static uniaxial testing machines – Part 1: Tension/compression testing machines – Calibration and verification of the force-measuring system*

BS EN ISO 10012, *Measurement management systems – Requirements for measurement processes and measuring equipment*

BS EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

BS EN ISO 17892-1, *Geotechnical investigation and testing – Laboratory testing of soil – Part 1: Determination of water content*

BS ISO 3310 (all parts), *Test sieves – Technical requirements and testing*

3 Terminology, definitions, symbols and units

3.1 Terminology

For the purposes of this British Standard the following terminology applies.

3.1.1 soil

an assemblage of discrete particles in the form of a deposit, usually of mineral composition but sometimes of organic origin, which can be separated by gentle mechanical means and which includes variable amounts of water and air (and sometimes other gases). A soil commonly consists of a naturally occurring deposit forming part of the earth's crust, but the term is also applied to made ground consisting of replaced natural soil or man-made materials exhibiting similar behaviour, e.g. crushed rock, crushed blast-furnace slag, fly-ash

3.1.2 cohesive soil

soil which because of its fine-grained content will form a coherent mass at suitable water contents

3.1.3 cohesionless soil

granular soil consisting of particles which can be identified individually by the naked eye or with the aid of a hand lens, e.g. gravel, sand

3.2 Definitions

For the purposes of this British Standard the following definitions apply.

3.2.1 sample

a portion of soil taken as being representative of a particular deposit or stratum

3.2.2 specimen

a portion of a sample on which a test is carried out

3.2.3 sampling

the selection of a representative portion of a material

3.2.4 quartering

the reduction in quantity of a large sample of material by dividing a circular heap, by diameters at right angles, into four more or less equal parts, removing two diagonally opposite quarters, and thoroughly mixing the two remaining quarters together so as to obtain a truly representative half of the original mass. The process is repeated until a sample of the required size is obtained

3.2.5 riffling

the reduction in quantity of a large sample of material by dividing the mass into two approximately equal portions by passing the sample through an appropriately sized sample divider. The process is repeated until a sample of the required size is obtained

3.2.6 dry soil

soil that has been dried to constant mass at a temperature of 105 °C to 110 °C, unless specified otherwise

3.2.7 water content (w)

the mass of water which can be removed from the soil, usually by heating at 105 °C, expressed as a percentage of the dry mass. The term “moisture content” is also widely used

3.2.8 liquid limit (w_L)

the water content at which a soil passes from the liquid to the plastic state, as determined by the liquid limit test

3.2.9 plastic limit (w_p)

the water content at which a soil becomes too dry to be in a plastic condition, as determined by the plastic limit test

3.2.10 plasticity index (I_p)

the numerical difference between the liquid limit and the plastic limit of a soil:

$$I_p = w_L - w_p$$

3.2.11 non-plastic

a soil with a plasticity index of zero or one on which the plastic limit cannot be determined

3.2.12 liquidity index (I_L)

the ratio of the difference between water content and plastic limit of a soil, to the plasticity index:

$$I_L = \frac{w - w_p}{I_p}$$

3.2.13 shrinkage limit

the water content at which a soil on being dried ceases to shrink

3.2.14 shrinkage ratio (R_s)

the ratio of the change in volume to the corresponding change in water content above the shrinkage limit

3.2.15 linear shrinkage

the change in length of a bar sample of soil when dried from about its liquid limit, expressed as a percentage of the initial length

3.2.16 bulk density (ρ)

the mass of material (including solid particles and any contained water) per unit volume including voids

3.2.17 dry density (ρ_d)

the mass of the dry soil contained in unit volume of undried material:

$$\rho_d = \frac{100\rho}{100+w}$$

3.2.18 particle density (ρ_s)

the average mass per unit volume of the solid particles in a sample of soil, where the volume includes any sealed voids contained within the solid particles

3.2.19 particle size distribution

the percentages of the various grain sizes present in a soil as determined by sieving and sedimentation

3.2.20 test sieve

woven wire sieve complying with BS 410-1 or a perforated metal plate sieve complying with BS ISO 3310-2

3.2.21 cobble fraction

solid particles of sizes between 200 mm and 63 mm

3.2.22 gravel fraction

the fraction of a soil composed of particles between the sizes of 63 mm and 2 mm. The gravel fraction is subdivided as follows:

Coarse gravel	63 mm to 20 mm
Medium gravel	20 mm to 6.3 mm
Fine gravel	6.3 mm to 2 mm

3.2.23 sand fraction

the fraction of a soil composed of particles between the sizes of 2.0 mm and 0.063 mm. The sand fraction is subdivided as follows:

Coarse sand	2.0 mm to 0.63 mm
Medium sand	0.63 mm to 0.2 mm
Fine sand	0.2 mm to 0.063 mm

3.2.24 silt fraction

the fraction of a soil composed of particles between the sizes of 0.063 mm and 0.002 mm. The silt fraction is subdivided as follows:

Coarse silt	0.063 mm to 0.02 mm
Medium silt	0.02 mm to 0.0063 mm
Fine silt	0.0063 mm to 0.002 mm

3.2.25 clay fraction

the fraction of a soil composed of particles smaller in size than 0.002 mm

3.2.26 fines fraction

the fraction of a soil composed of particles passing a 63 μ m test sieve

3.2.27 voids

the spaces between solid particles of soil

3.2.28 void ratio (*e*)

the ratio between the volume of voids (air and water) and the volume of solid particles in a mass of soil:

$$e = \frac{\rho_s}{\rho_d} - 1$$

3.2.29 porosity (*n*)

the volume of voids (air and water) expressed as a percentage of the total volume of a mass of soil:

$$n = \frac{e}{1+e} \times 100(\%)$$

3.2.30 saturation

the condition in which all the voids in a soil are completely filled with water

3.2.31 degree of saturation (*S_r*)

the volume of water contained in the void spaces between soil particles, expressed as a percentage of the total voids:

$$S_r = \frac{w\rho_s}{e} (\%)$$

3.2.32 compaction

the process of packing soil particles more closely together by rolling or other mechanical means, thus increasing the dry density of the soil

3.2.33 optimum water content

the water content at which a specified amount of compaction will produce the maximum dry density

3.2.34 maximum compacted dry density

the dry density obtained using a specified amount of compaction at the optimum water content

3.2.35 relative compaction

the percentage ratio of the dry density of the soil to the maximum compacted dry density of a soil when a specified amount of compaction is used

3.2.36 dry density/water content relationship

the relationship between dry density and water content of a soil when a specified amount of compaction is employed

3.2.37 percentage air voids (*V_a*)

the volume of air voids in the soil expressed as a percentage of the total volume of the soil:

$$V_a = \left[1 - \frac{\rho_d}{\rho_w} \left(\frac{\rho_w}{\rho_s} + \frac{w}{100} \right) \right] 100(\%)$$

3.2.38 air voids line

a line on a graph showing the dry density/water content relationship for soil containing a constant percentage of air voids. The line can be calculated from the equation:

$$\rho_d = \rho_w \left[\left(1 - \frac{V_a}{100} \right) \left(\frac{1}{\rho_s} + \frac{w}{100} \right) \right]$$

where

- ρ_d is the dry density of the soil (Mg/m³);
- ρ_w is the density of water (Mg/m³);
- V_a is the volume of air voids in the soil, expressed as a percentage of the total volume of the soil;
- ρ_s is the particle density (Mg/m³);
- w is the water content, expressed as a percentage of the mass of dry soil.

3.2.39 saturation line (zero air voids line)

a line on a graph showing the dry density/water content relationship for soil containing no air voids. It is obtained by putting $V_a = 0$ in the equation given in 3.2.38

3.2.40 limiting densities

the dry densities corresponding to the extreme states of packing (loosest and densest) at which the particles of a granular soil can be placed

3.2.41 maximum density ($\rho_{d:\max.}$)

the maximum dry density at the densest practicable state of packing of particles of a granular soil

3.2.42 minimum density ($\rho_{d:\min.}$)

the minimum dry density at the loosest state of packing of dry particles which can be sustained in a granular soil

3.2.43 maximum (minimum) porosity or void ratio

the porosity or void ratio corresponding to the minimum (maximum) dry density as defined above

3.2.44 density index (I_D)

the ratio of the difference between the maximum and actual void ratio of a soil, to the difference between the maximum and minimum void ratios:

$$I_D = \left(\frac{e_{\max.} - e}{e_{\max.} - e_{\min.}} \right) = \left(\frac{\rho_d - \rho_{d:\min.}}{\rho_{d:\max.} - \rho_{d:\min.}} \right) \left(\frac{\rho_{d:\max.}}{\rho_d} \right)$$

3.2.45 California bearing ratio (CBR)

the ratio (expressed as a percentage) of the force required to cause a circular piston of 1 935 mm² cross-sectional area to penetrate the soil from the surface at a constant rate of 1 mm/min, to the force required for similar penetration into a standard sample of crushed rock. The ratio is determined at penetrations of 2.5 mm and 5.0 mm, and the higher value is used

3.2.46 penetration resistance

the force required to maintain a constant rate of penetration of a probe, e.g. a CBR piston, into the soil

3.2.47 consolidation

the process whereby soil particles are packed more closely together over a period of time by application of continued pressure. It is accompanied by drainage of water from the voids between solid particles

3.2.48 pore water pressure (u_w)

the pressure of the water in the voids between solid particles

3.2.49 excess pore pressure

the increase in pore water pressure due to the application of an external pressure or stress

3.2.50 degree of consolidation (U)

a measure of consolidation at a given time, expressed as a percentage defined by the equation:

$$U = \frac{u_1 - u_w}{u_1 - u_0} 100(\%)$$

where

u_w is the pore pressure at the time considered;

u_1 is the initial pore pressure;

u_0 is the final equilibrium pore pressure when consolidation is complete

3.2.51 coefficient of volume compressibility (m_v)

the change in volume per unit volume, per unit pressure change, as a result of consolidation due to that pressure change:

$$m_v = \left(\frac{1}{1 + e} \right) \left(\frac{\delta e}{\delta p} \right)$$

where

δe is a change in void ratio produced by a change in pressure;

δp is a change in pressure;

e is the void ratio.

3.2.52 coefficient of consolidation (c_v)

the parameter which relates the change in excess pore pressure with respect to time, to the amount of water draining out of the voids of a soil prism during that time, due to consolidation:

$$c_v = \frac{k}{m_v \rho_w g}$$

3.2.53 time factor (T_v)

the dimensionless parameter which is related to time, t , the coefficient of consolidation, c_v , and the length of drainage path, H , used for defining the theoretical rate of consolidation curve:

$$T_v = \frac{c_v t}{H^2}$$

3.2.54 coefficient of secondary compression (C_{sec})

the ratio of the change in height to the initial height of a consolidation test specimen over one $\log_{10}$ cycle of time during the secondary compression phase:

$$C_{sec} = \frac{(\delta H)_s}{H_o}$$

3.2.55 normally consolidated soil

a soil which has never been subjected to an effective pressure greater than the present effective overburden pressure

3.2.56 over-consolidated soil

a soil which has been consolidated under effective pressures greater than that due to the present effective pressure

3.2.57 swelling

the process opposite to consolidation, i.e. expansion of a soil on reduction of pressure due to water being drawn into the voids between particles

3.2.58 swelling pressure

the pressure required to maintain constant volume, i.e. to prevent swelling, when a soil has access to water

3.2.59 permeability

the ability of a material to allow the passage of a fluid (also known as hydraulic conductivity)

3.2.60 hydraulic gradient (i)

the ratio of the difference in total head of water, δh , on either side of a layer of soil, to the thickness of the layer measured in the direction of flow, L :

$$i = \frac{\delta h}{L}$$

3.2.61 coefficient of permeability (k)

the mean discharge velocity of flow of water in a soil under the action of a unit hydraulic gradient:

$$k = \frac{Q}{A i t}$$

where Q is the quantity of water discharged in time t through a cross-sectional area A normal to the direction of flow, under hydraulic gradient, i

3.2.62 piping

movement of soil particles carried by water eroding channels through the soil, leading to sudden collapse of soil

3.2.63 erosion

removal of soil particles by the movement of water

3.2.64 dispersive (erodible) clays

clays from which individual colloidal particles readily go into suspension in practically still water

3.2.65 total stress (σ)

the actual stress in a soil mass the application of a pressure or force

3.2.66 effective stress (σ')

the difference between the total stress, σ , and the pore water pressure, u_w :

$$\sigma' = \sigma - u_w$$

3.2.67 shear resistance

the resistance offered to deformation by a soil when it is subjected to stress

3.2.68 shear strength

the maximum shear resistance which a soil can offer under defined conditions of effective stress and drainage

3.3 Symbols and units

The following symbols are used in this British Standard. The symbols generally conform to international usage. The units are those generally used. An asterisk indicates that no unit is used.

Term	Symbol	Unit
Water content	w	%
Liquid limit	w_L	%
Plastic limit	w_p	%
Shrinkage limit	w_s	%
Plasticity index	I_p	%
Liquidity index	I_L	*
Shrinkage ratio	R_s	*
Bulk density	ρ	Mg/m ³
Dry density	ρ_d	Mg/m ³
Particle density	ρ_s	Mg/m ³
Density of water	ρ_w	Mg/m ³
Void ratio	e	*
Porosity	n	%
Degree of saturation	S_r	%
Percentage air voids	V_a	%
Maximum dry density	$\rho_{d:\max.}$	Mg/m ³

Term	Symbol	Unit
Minimum dry density	$\rho_{d:\min.}$	Mg/m ³
Maximum void ratio	$e_{\max.}$	*
Minimum void ratio	$e_{\min.}$	*
Density index	I_D	*
California bearing ratio	CBR	%
Mean particle diameter	D	mm or μm
Particle size such that n% of the particles by weight are smaller than that size	D_n	%
Percentage by mass finer than D	K	%
Elapsed time	t	minutes or seconds
Dynamic viscosity of water	η	mPa s
Hydraulic gradient	i	*
Coefficient of permeability	k	m/s
Degree of consolidation	U	%
Coefficient of volume compressibility (one dimensional)	m_v	m ² /MN
Coefficient of consolidation (one dimensional)	c_v	m ² /sec
Theoretical time factor	T_v	*
Coefficient of secondary compression	C_{sec}	*
Coefficient of volume compressibility (isotropic)	m_{vi}	m ² /MN
Coefficient of consolidation (isotropic)	c_{vi}	m ² /sec
Coefficient of consolidation (radial outward drainage)	c_{ro}	m ² /sec
Coefficient of consolidation (radial inward drainage)	c_{ri}	m ² /sec
Total major principal stress	σ_1	kPa
Total minor principal stress	σ_3	kPa
Normal stress	σ_n	kPa
Effective major principal stress	σ_1'	kPa
Effective minor principal stress	σ_3'	kPa
Principal stress difference	$(\sigma_1 - \sigma_3)$	kPa
Maximum principal stress difference	$(\sigma_1 - \sigma_3)_f$	kPa
Pore water pressure	u_w	kPa
Shear resistance	T	kPa
Maximum shear resistance	T_f	kPa
Undrained shear strength	c_u	kPa
Unconfined compressive strength	q_u	kPa
Cohesion intercept (effective stresses)	c'	kPa
Angle of shear resistance (effective stresses)	ϕ'	degrees
Residual cohesion intercept	c'_R	kPa

Term	Symbol	Unit
Residual angle of shear resistance	ϕ'_R	degrees
Strain	ε	%
Remoulded shear strength	c_r	kPa
Sensitivity	S_t	*
Stress path parameters: $\frac{1}{2}(\sigma'_1 + \sigma'_3)$	s'	kPa
$\frac{1}{2}(\sigma'_1 - \sigma'_3)$	t'	kPa
Theoretical 100% consolidation	t_{100}	minutes
Calculated time to failure	t_f	minutes
Pore pressure coefficient $\frac{\delta u_w}{\delta \sigma_3}$ (when $\sigma_1 = \sigma_2 = \sigma_3$)	B	*
Pore pressure coefficient $\frac{\delta u_w}{\delta(\sigma_1 - \sigma_3)}$ (for the condition $B = 1$)	A	*
Cone resistance (static cone test CPT)	q_c	MPa
Local unit side friction resistance (CPT)	f_s	kPa
Friction ratio (CPT)	R_f	%
Penetration resistance (SPT): Test with drive shoe	N	*
Test with solid cone	$SPT(C)$	*
Ultimate bearing capacity	q_u	kPa
"Apparent" resistivity	r_s	Ωm
Redox potential	E_h	mV
Specific conductance of water	—	$\mu S/mm$
Incremental changes of ...	δ	
Cumulative changes of ...	Δ	

4 Classification of soils

4.1 Grouping of soils

For the purposes of the tests described in this British Standard, soils shall be grouped as *cohesive* or *cohesionless*, as defined in 3.1. Each of these types shall be grouped as follows.

- Fine-grained soils*. Soils containing not more than 10% retained on a 2 mm test sieve;
- Medium-grained soils*. Soils containing more than 10% retained on a 2 mm test sieve but not more than 10% retained on a 20 mm test sieve;
- Coarse-grained soils*. Soils containing more than 10% retained on a 20 mm test sieve but not more than 10% retained on a 37.5 mm test sieve.

NOTE Soils with more than 10% of material retained on a 37.5 mm test sieve cannot usefully be examined by the laboratory tests of this British Standard except for the particle size analysis (sieving), and the water content and plasticity tests on the fine fraction if present. Some of these materials would be classed as aggregates, which are covered by BS EN 933 (all parts).

Very coarse materials such as rockfill are not covered by this British Standard.