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British Standard Glossary of

Building and civil engineering terms

Part 2. Civil engineering

Section 2.2 Substructures. Earthworks. Foundations. Tunnels

Subsection 2.2.1 Earthworks

Glossaire de la construction et des travaux publics

Partie 2. Travaux publics

Section 2.2 Infrastructures, travaux de terrassement,
fondations, tunnels

Sous-section 2.2.1 Travaux de terrassement

Begriffe für den Hoch- und Tiefbau

Teil 2. Tiefbau

Abschnitt 2.2 Unterbau, Erdbau, Fundamente, Tunnel

Unterabschnitt 2.2.1 Erdbau

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Foreword

This Subsection of Part 2 of BS 6100 has been prepared under the direction of the Basic Data and Performance Criteria for Civil Engineering and Building Structures Standards Policy Committee. This Subsection covers that branch of civil engineering concerned with the planning, design and construction of earthworks.

As far as possible the definitions in this Subsection of BS 6100 are technically equivalent to those in BS 8004 'Code of practice for foundations', which has recently been published, BS 6031 'Earthworks' and BS 1377 'Methods of test for soils for civil engineering purposes'*. It also includes a number of terms that were included in BS 892 which has been withdrawn. However, it has been necessary to change some terms and definitions to ensure that they are acceptable for general use and are in accordance with current practice. The definitions of terms in group 9 'Explosives and blasting' are consistent with BS 5607 'Code of practice for the safe use of explosives in the construction industry' and are technically equivalent, though in some cases there have been minor stylistic changes.

The need for consistency in style and format throughout the glossary has also involved changes to terms and definitions included in other existing British Standards.

Only a few basic terms for ground anchorages have been included. More specific and detailed terms and definitions are given in DD 81 'Recommendations for ground anchorages'.

The general introduction to and explanation of this glossary is given in Part 0 of BS 6100 which itemizes the Parts and Sections into which this glossary is divided and provides a general alphabetical index of all the terms in the Sections and Subsections already published. Those using individual Sections of this glossary are urged to consult Part 0 when doing so.

The other Sections of this Part are as follows.

- 2.1 Structural design and elements
- 2.3 Superstructures. Bridges. Large span structures
- 2.4 Highway and railway engineering

- 2.5 Hydraulic engineering and construction work
- 2.6 Natural waters. Inland. Coastal. Marine
- 2.7 Public health. Environmental engineering
- 2.8 Pipelines. Ducts

The other Subsections in this Section are as follows.

- 2.2.2 Substructures and foundations
- 2.2.3 Tunnels

Terms are listed alphabetically in the index and are referred to by numbers which are found against the term in the body of the Subsection. They are arranged in a classified order, each term having an individual number consisting of seven digits in two parts, the first of three digits, the second of four. The first three digits represent the number of the Part, section and subsection. The fourth digit represents the group of terms, the fifth digit represents the subgroup of terms and the last two digits represents the place within the subgroup.

Alternative terms are given (in medium type) below the preferred term with their status indicated, e.g. 'deprecated', 'non-preferred'. These terms are not individually numbered, but are included in the index with a reference to the preferred term. Terms of more than one word, e.g. 'cohesive soil' are written in a direct style, not as 'soil, cohesive'. The inverted term is included in the index with a reference to the direct term.

It is to be noted that, while this Subsection deals with the more basic terms connected with civil engineering, many of the head terms relating to more specific aspects will occur only in the other, relevant Sections. Conversely it has been considered necessary to repeat in this Subsection certain terms from Section 1.0 'General'. Where this occurs the definitions of such terms are preceded by an asterisk (*). Italicized words in definitions indicate terms that are defined elsewhere in this Subsection.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

* Under revision.

221 1 Base terms

No.	Term	Definition
221 1001	earthwork	Work of excavating or raising of ground.
221 1002	earthworks	Result of <i>earthwork</i> .
221 1003	excavation	Result of digging, lifting and removing earth, <i>fill</i> or other materials in the ground.
221 1004	soil	Any naturally occurring loose or soft deposit, usually readily excavatable by hand, that results from the breakdown of <i>rock</i> or from the decay of vegetation.
221 1005	rock	Relatively hard naturally occurring part of the earth's crust that has not been broken down into loose material that can be readily excavated by hand. NOTE. A geological definition for rock is given in BS 6316 as 'A natural mass of one or more minerals that may be consolidated or loose (excluding top soil)'.
221 1006	stratum strata <i>plural</i>	Naturally occurring layer of a single <i>soil</i> or <i>rock</i> type.
221 1007	retaining wall	*Wall providing lateral support to the ground or to resist pressure from a mass of other material.
221 1008	ground anchorage ground anchor <i>deprecated</i>	Installation to transmit an applied tensile load to loadbearing <i>strata</i> .
221 1009	drainage	*System for the removal of surface water, waste water or foulwater and from an appliance to a point of disposal or sewerage system or for the removal of <i>ground water</i> .
221 1010	dewatering	Procedure to lower the level of <i>ground water</i> locally.

221 2 Soils**221 21 Soil types and strata**

221 2101	topsoil	<i>Soil</i> , naturally occurring at ground surface, that by its humus content can support the growth of vegetation.
221 2102	subsoil	<i>Soil</i> immediately below <i>topsoil</i> .
221 2103	peat	Dark, usually fibrous, spongy <i>soil</i> of vegetable origin and characterized by a high degree of compressibility.
221 2104	clay	<i>Soil</i> that consists of particles less than 0.002 mm in size.
221 2105	clay puddle pug <i>deprecated</i>	<i>Clay</i> that has been remoulded with water to such a consistency that it is pliable under hand pressure.
221 2106	cohesive soil	<i>Soil</i> that, by virtue of its <i>clay</i> content and moisture, will form a coherent mass.
221 2107	non-cohesive soil	<i>Soil</i> that will not form a coherent mass.
221 2108	overconsolidated clay	<i>Clay</i> that still retains some of the imposed stress from a previous greater <i>overburden</i> (1).

* Repeated from Section 1.0.

No.	Term	Definition
221 2109	colluvial deposit	<i>Rock</i> deposited by gravity from its place of formation.
221 2110	drift	<i>Soil</i> deposited as a result of glacial action.
221 2111	aeolian deposit wind deposit <i>deprecated</i>	<i>Soil</i> deposited as a result of wind action.
221 2112	alluvial deposit	<i>Soil</i> deposited by a stream or river, in its channel or on its flood plain.
221 2113	silt	<i>Soil</i> composed of particles between 0.06 mm and 0.002 mm in size.
221 2114	granular soil	<i>Non-cohesive soil</i> the particle size of which is greater than 0.06 mm.
221 2115	sand	Non-cohesive granular material that results from natural disintegration of <i>rock</i> and consists of particles between 2.00 mm and 0.06 mm in size.
221 2116	running sand	<i>Sand</i> that exhibits flow characteristics similar to liquid due to lack of confinement or water flow.
221 2117	gravel shingle <i>deprecated</i>	Non-cohesive granular material that results from natural disintegration of <i>rock</i> and consists of particles between 60 mm and 2 mm in size.
221 2118	cobble	Rounded to sub-angular <i>rock</i> fragment between 200 mm and 60 mm in size.
221 2119	boulder	Rounded to sub-angular <i>rock</i> fragment greater than 200 mm in size.
221 2120	hoggin	Naturally occurring material that consists mainly of <i>gravel</i> and <i>sand</i> and contains sufficient <i>clay</i> to bind the mixture together when compacted.
221 2121	loam	Fertile <i>soil</i> , chiefly of <i>clay</i> , <i>silt</i> and <i>sand</i> , often containing decayed vegetable matter.
221 2122	marl	Calcareous <i>clay</i> or mudstone.
221 2123	non-plastic soil	<i>Soil</i> with a <i>plasticity index</i> of zero or one on which the <i>plastic limit</i> cannot be determined.
221 2124	overburden(1)	<i>Soil</i> or <i>rock</i> that overlies other material.
221 2125	overburden(2)	<i>Soil</i> that overlies material required to be extracted.
221 2126	heavy ground	Ground that, when excavated, requires support relatively quickly.
221 2127	saturated soil	<i>Soil</i> in which all <i>voids</i> are filled with water.
221 2128	stabilized soil	<i>Soil</i> that has been modified to improve and maintain its load-carrying capacity and resistance to weathering.
221 2129	spoil	Excavated material that is unsuitable or surplus to the requirements of the works.
221 2130	hardcore	Hard lumps of stone, brick, furnace slag, old concrete etc. suitable for filling ground under a foundation, floor slab or under a road.
221 2131	aquifer	<i>Soil</i> or <i>rock</i> that contains sufficient saturated permeable material to yield water in significant quantities.

221 22 Characteristics and testing

No.	Term	Definition
221 2201	bulk density	Mass per unit volume of an in situ material or deposit, including <i>voids</i> and liquids.
221 2202	dry density	Mass of material, dried to constant mass at 105 °C, per unit volume of undried materials.
221 2203	maximum dry density	<i>Dry density</i> of soil obtained by a specified amount of <i>compaction</i> at the <i>optimum moisture content</i> .
221 2204	relative compaction	Ratio of the <i>dry density</i> of a soil to its <i>maximum dry density</i> .
221 2205	moisture content of a soil	Mass of water that can be removed from a soil, usually by heating at 105 °C, expressed as a percentage of the dry mass.
221 2206	optimum moisture content	<i>Moisture content</i> of a soil at which a specified amount of <i>compaction</i> will produce the greatest <i>dry density</i> .
221 2207	liquid limit	<i>Moisture content</i> of a soil at which it becomes too wet to be in a plastic condition. NOTE. This is determined by the liquid limit test given in BS 1377.
221 2208	Atterberg limits	Limits of <i>moisture content</i> of a soil below which a <i>cohesive soil</i> is no longer plastic and above which it is liquid (i.e. plastic limit and liquid limit).
221 2209	plastic limit	<i>Moisture content</i> of a soil at which it becomes too dry to be in a plastic condition. NOTE. This is determined by the plastic limit test given in BS 1377.
221 2210	liquidity index	Ratio of the difference between <i>moisture content</i> of a soil and <i>plastic limit</i> to <i>plasticity index</i> . NOTE. The liquidity index (I_L) is determined from the equation: $I_L = \frac{W - W_p}{W_L - W_p}$ where W is the <i>moisture content</i> of a soil W_p is the <i>plastic limit</i> W_L is the <i>liquid limit</i>
221 2211	plasticity index	Numerical difference between the <i>liquid limit</i> and the <i>plastic limit</i> of a soil.
221 2212	dry density/moisture content relationship	Relationship between <i>dry density</i> and <i>moisture content</i> of a soil when a given amount of <i>compaction</i> is applied.
221 2213	clay fraction	Fraction of a soil composed of particles smaller in size than 0.002 mm.
221 2214	gravel fraction	Fraction of a soil composed of particles between 60 mm and 2 mm in size.
221 2215	sand fraction	Fraction of a soil composed of particles between 2.00 mm and 0.06 mm in size.
221 2216	silt fraction	Fraction of a soil composed of particles between 0.06 mm and 0.002 mm in size.

No.	Term	Definition
221 2217	uniformity coefficient	Ratio of the particle size of a graded <i>soil</i> below which 60 % by mass of the <i>soil</i> sample passes, to the particle size below which 10 % by mass of the <i>soil</i> sample passes.
221 2218	particle size distribution	Percentage of prescribed grain sizes present in a <i>soil</i> .
221 2219	voids	Spaces filled with fluids, unusually air or water, between particles.
221 2220	voids ratio	Ratio of the volume of <i>voids</i> to the volume of solid particles in a mass of material.
221 2221	porosity	Ratio of <i>voids</i> to the total of a mass of material.
221 2222	water table phreatic surface <i>deprecated</i>	Surface of a <i>groundwater</i> body at which the water pressure is atmospheric.
221 2223	perched water table	<i>Water table</i> maintained, usually by an impervious <i>stratum</i> , above the general standing water level in the ground below.
221 2224	groundwater	Sub-surface water contained within the saturated zone.
221 2225	pore water pressure	Pressure of water contained in <i>soil</i> or <i>rock</i> .
221 2226	total stress	Combination of all stresses acting at a point in a <i>soil</i> or <i>rock</i> mass.
221 2227	total pressure	Pressure, at any horizon in the ground, principally from the weight of <i>overburden</i> (1).
221 2228	effective stress	Difference between <i>total stress</i> and <i>pore water pressure</i> . NOTE. For most purposes effective stress is that part of the <i>total stress</i> that is borne by inter-particle contact.
221 2229	boiling blowing <i>deprecated</i>	Displacement of <i>soil</i> at the base of an <i>excavation</i> or adjacent to the toe of an <i>embankment</i> caused by pressure of water.
221 2230	pore pressure ratio	Ratio of the <i>pore water pressure</i> to the <i>total pressure</i> .
221 2231	internal erosion	Removal of <i>soil</i> particles caused by flow of water through a <i>soil</i> .
221 2232	pipng	<i>Internal erosion</i> that leads to sudden collapse.
221 2233	artesian	Condition existing in an <i>aquifer</i> in which its head of water is sufficient to cause the water to rise above the surface of the ground.
221 2234	cryoturbation	Disturbance of a <i>soil</i> structure by the action of ground ice.
221 2235	permeability	Characteristic of a material that determines the rate at which fluids pass through it under the influence of differential pressure.
221 2236	degree of saturation	Ratio of the volume of water contained in <i>voids</i> to the total volume of <i>voids</i> in a material.
221 2237	isotropic soil	<i>Soil</i> that has identical properties in all directions, usually applied to <i>permeability</i> .
221 2238	ravelling	Failure of exposed <i>cohesive soil</i> by fracturing.
221 2239	bulking	Increase in volume resulting either from the disturbance of <i>soil</i> or by a granular material absorbing moisture.

No.	Term	Definition
221 2240	heave	Upward displacement of the ground that may arise as a result of excavating, surcharging or installing displacement piles.
221 2241	frost heave	Swelling of <i>soil</i> due to expansion of water in conditions of frost.
221 2242	shrinkage	Reduction in volume due to decreased <i>moisture content of a soil</i> .
221 2243	swelling	Increase in volume of a cohesive material due to moisture absorption or stress relief.
221 2244	percentage air voids	Volume of air <i>voids</i> in a <i>soil</i> expressed as a percentage of the total volume of that <i>soil</i> .
221 2245	skin friction	Frictional resistance of surrounding <i>soil</i> on the surface of structural elements below ground level.
221 2246	internal angle of friction	In granular <i>soils</i> , the angle whose tangent, when multiplied by the force normal to the assumed sliding surface, is equal to the shearing resistance of the <i>soil</i> .
221 2247	creep (1)	Barely perceptible movement of a <i>soil</i> or <i>rock</i> mass.
221 2248	slickensides	Polished surfaces on the faces of cracks in <i>rocks</i> , or <i>fissures</i> in <i>cohesive soils</i> , formed by movement along them.
221 2249	settlement	Downward movement of a <i>soil</i> or of a structure that it supports.
221 2250	subsidence	Downward movement of the ground surface that results from collapse, removal or displacement of the underlying material.
221 2251	angle of repose	Angle to the horizontal at which the sides of a heap of granular material will be at rest.
221 2252	dip	Angle of maximum <i>slope of strata of rock</i> , measured from the horizontal at a given point.
221 2253	batter	Inclination of a plane surface to the vertical, expressed as one horizontal linear unit to the number of vertical linear units.
221 2254	strike	Horizontal line at right angles to <i>dip</i> .
221 2255	fault	Fracture in <i>rock</i> with vertical and/or horizontal displacement.
221 2256	cleavage	Ability of a <i>rock</i> to split along definite parallel closely spaced planes.
221 2257	fissure	Plane of natural discontinuity in a <i>soil</i> or <i>rock</i> .
221 2258	cambering	Downwarping of a hard <i>rock stratum</i> in an escarpment valley side or <i>excavation</i> due to extrusion of a soft underlying <i>stratum</i> such as <i>clay</i> .
221 2259	slip landslip, shear slide <i>deprecated</i>	Movement of a mass of <i>soil</i> or <i>rock</i> caused by gravity, often as a rotational displacement.
221 2260	slip surface	Surface of the <i>soil</i> on which a <i>slip</i> occurs.
221 2261	slip circle	Circular <i>slip surface</i> .
221 2262	slip plane	<i>Slip surface</i> in one plane.

No.	Term	Definition
221 2263	rotational slide	Rotation of a mass of <i>soil</i> along a curved <i>slip surface</i> . (See figure 1.)
221 2264	circular slide	<i>Rotational slide</i> on a <i>slip surface</i> which is approximately circular. (See figure 1.)
221 2265	non-circular slide	<i>Rotational slide</i> in which the <i>slip surface</i> is not wholly circular. (See figure 1.)
221 2266	translational slide	Movement of a shallow mass of <i>soil</i> in a plane roughly parallel to the <i>slope</i> due to a weakness on the plane.
221 2267	flow slide mud flow <i>deprecated</i>	<i>Translational slide</i> in <i>saturated soils</i> , caused by sudden increase in <i>pore water pressure</i> , in which the <i>soil</i> flows as a viscous fluid.
221 2268	slab slide	<i>Translational slide</i> , usually occurring in the weathered surface of a <i>slope</i> , in which the sliding mass remains more or less intact. (See figure 2.)
221 2269	block slide	<i>Translational slide</i> in which a block of relatively strong <i>rock</i> or stiff to hard <i>clay</i> moves down a <i>slope</i> as a unit. (See figure 2.)
221 2270	debris slide	<i>Translational slide</i> of debris, forming a mantle on a <i>slope</i> or the disturbed material at the toe of a <i>rotational slide</i> , when rainfall or diverted surface water causes downward movement of the debris.
221 2271	compound slide	Movement of <i>soil</i> mass that combines the characteristics of a <i>rotational slide</i> and a <i>translational slide</i> .
221 2272	landslide landslip <i>deprecated</i>	Large scale <i>slip</i> or <i>flow slide</i> .
221 2273	toppling failure	Failure of a <i>rock slope</i> where steeply inclined discontinuities cause individual <i>rock</i> masses to overbalance. (See figure 3.)
221 2274	wedge failure	Failure by sliding of a wedge of <i>rock</i> or stiff <i>clay</i> due to the intersection of two or three well defined joint planes or <i>fissures</i> behind a <i>slope</i> . (See figure 4.)
221 2275	site investigation	Determination of physical characteristics of sites as they affect design and construction of building and civil engineering works and stability of neighbouring structures.
221 2276	ground investigation soil survey <i>deprecated</i>	Exploration and recording of the location and characteristics of <i>soils</i> and <i>rocks</i> , and ground conditions.
221 2277	undisturbed sample	<i>Soil</i> sample obtained by specialist methods so that its content and structure are not appreciably altered by the operation of sampling.
221 2278	borehole	Hole, usually vertical, sunk to determine ground conditions or for extraction of water.
221 2279	plate bearing test	Test to assess bearing characteristics of ground by loading a plate in contact with undisturbed ground and observing the effect.
221 2280	standard penetration test (<i>abbrev. SPT</i>)	Test in which a <i>penetrometer</i> is driven into the <i>soil</i> a standard distance by standard blows, the number of blows required then being used to estimate <i>soil</i> behaviour.

No.	Term	Definition
221 2281	vane test	In situ test of <i>cohesive soil</i> by means of an instrument with a blade of cruciform shape that is rotated to measure the shear strength of the <i>soil</i> .
221 2282	triaxial compression test	Laboratory test in which a cylindrical specimen of <i>soil</i> or <i>rock</i> is subjected to simultaneous axial loading and radial confining pressure to determine its shear strength.
221 2283	unconfined compression tests	Compression test on a cylindrical sample of <i>cohesive soil</i> without lateral restraint.
221 2284	Proctor test	One of a number of tests to determine the <i>dry density/moisture content relationship</i> .
221 2285	sedimentation test	Test to determine sizes of fine particles by measuring their rates of fall through a liquid at rest.

221 3 Loadings

221 31 Earthworks and foundations

221 3101	surcharge	Material or load above <i>formation</i> that is either supported by a retaining structure or used to increase the rate of <i>consolidation</i> .
221 3102	earth pressure at rest	Value of lateral pressure in a <i>soil</i> mass, with a horizontal upper surface, completely at rest and undisturbed by any external forces.
221 3103	active earth pressure	Minimum value of lateral pressure in a <i>soil</i> confined by a smooth vertical wall as the wall moves away from the <i>soil</i> mass, thus allowing the <i>soil</i> to expand until it reaches a state of equilibrium.
221 3104	passive earth pressure	Maximum value of lateral pressure in a <i>soil</i> confined by a smooth vertical wall as the wall is moved towards the <i>soil</i> mass thus causing the <i>soil</i> to compress until it reaches a limiting state when <i>soil</i> failure occurs.
221 3105	gross loading intensity	Intensity of vertical loading on the ground at the base of a foundation due to all loads above that level.
221 3106	ultimate bearing capacity	Value of the <i>gross loading intensity</i> for a particular foundation at which the resistance of the <i>soil</i> to displacement of the foundation is fully mobilized.
221 3107	net loading intensity	Increase or decrease in intensity of vertical loading at the base of a foundation due to <i>excavation</i> or the weight of the new structure including <i>earthworks</i> .
221 3108	presumed bearing value	<i>Net loading intensity</i> , usually obtained from a table, considered appropriate to the particular type of ground for preliminary design purposes.
221 3109	allowable net bearing pressure	<i>Net loading intensity</i> taking into account the <i>ultimate bearing capacity</i> , an appropriate factor of safety, the amount and kind of <i>settlement</i> expected and the ability of the given structure to accommodate this <i>settlement</i> .
221 3110	creep (2)	Increase in strain with time under sustained load.