BRITISH STANDARD

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Glossary of

Mining terms —

Section 11: Strata control

Confirmed January 2011

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Foreword

In preparing this glossary the object has been to standardize and to co-ordinate the technical terms in current use in mining in the United Kingdom. Although the majority of the terms are necessarily concerned with coal mining, account has been taken of certain terms used in other forms of mining and of quarrying.

During the long period which has elapsed since the publication of the last authoritative mining glossary[1)], many new terms have come into use. The need for the present glossary has arisen from the widely varying interpretation and use of such new terms, and the prevalent use of more than one synonym, some purely local in origin, to indicate specific meanings.

The glossary will initially be issued in a number of sections, according to subject matter, and will include terms relevant to the following fields of mining:

Planning and Surveying; Ventilation; Boring and Exploration; Drainage; Geology; Drilling and Blasting; Electrical Engineering and Lighting; Winning and Working; Transport; Shafts and Associated Equipment; Strata Control.

i) Where two or more terms are in use the term which is favoured is given first and printed in heavy type.

It is hoped that such preferred terms will gradually displace the non-preferred terms. Where the use of any term is considered to be undesirable it is marked "deprecated".

ii) Taking a broad view of the various sections of this glossary, only terms which have a specific meaning in mining have been included and, generally, where a technical term has an accepted meaning in other fields of engineering it has been omitted; the few exceptions are terms which are of particular and fundamental importance in mining.

iii) Purely local terms are not defined, but those of sufficient importance are included as non-preferred terms alongside the preferred synonyms.

iv) Obsolete terms are excluded.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1) "A glossary of the mining and mineral industry" by A.H. Fay, U.S. Bureau of Mines, Washington, 1920.

Section 11. Strata control

Term	Definition
abutment	The region adjoining an excavation which is normally subjected to increased stress as a consequence of the redistribution of load. This may be at the front of, or at the sides or rear of a working face.
advance pack BUTTRESS PACK	A small pack built in advance of the gate side pack to limit the spreading of the adjoining caved waste towards the roadway in a longwall face.
anti-flushing shields	A curtain of bars, plates or chains on the waste side of powered supports to hold back the material which flushes or falls from the caved waste.
anti-slewing struts	Bars fitted between powered supports to prevent slewing of the supports on gradients.
arch girder RING, *deprecated*	A rolled steel section bent into the form of an arch and normally in two or more lengths joined together to form a support for the roof and sides of a roadway.
articulated arch	An arch in which the component lengths are hinged together.
articulated bar	See *link bar*.
backfill	1. Material which is used to fill the void following extraction of mineral. 2. Overburden replaced after opencast extraction of mineral. 3. Loose material placed behind the shaft wall or the lining of any other excavation.
backward hading breaks	Breaks whose planes are inclined from the normal to the plane of the seam, towards the goaf.
bar	A support set parallel to the roof.
barrier pillars	Pillars or strips of coal or other mineral suitably dimensioned and disposed, left unworked for the purpose of dividing a seam or mine into separate working panels or districts.
bar slide bracket system	A system of support in which roof bars are slid forward on brackets attached to adjacent parallel bars, props being then set to the newly advanced bars.
bar slide head	A device at the top of a support enabling the support to remain set to the roof while the bar above it is released and slid forward to a new setting position.
bar slide head system	A system of support in which roof bars are moved forward through bar slide heads, the props continuing to carry load.
bed separation	The moving apart of stratified beds caused by excavation.
breaking-off line	The support line at the rear edge of a longwall face along which the roof is induced to break.
breaking-off props	Props set alongside the edge of the intended goaf or of a ripping, to determine the line of break.
breaks	The fractures that develop in the roof, floor or sides of an excavation, due to deformation of the surrounding strata.
bump CRUMP	A sudden and heavy release of strain energy in the major body of rock surrounding a mine working, resulting in displacement of the strata.
buttress pack	See *advance pack*.
cambered girder	A curved roof bar set in a roadway with its convex surface to the roof.
cantilever bar	A roof bar projecting forward to support the roof beyond the propped area.
cap	See *lid*.
capsule	See *hydraulic load cell*.
catch prop JACK PROP, *deprecated*	A supplementary prop not forming part of the planned support system.

Term	Definition
caving	The process of permitting the roof or hanging wall to collapse into the space from which coal or mineral has been excavated.
chock	Strong roof support consisting of layers of hardwood or a steel structure. (See also *hydraulic chock*.)
chock prop	A heavy duty prop normally erected to induce caving or to provide additional support in a roadhead.
cleavage	1. In a crystalline material one or more series of parallel planes along which the mineral tends to split. 2. In a rock, definite parallel closely spaced planes along which it may split, and which may be highly inclined to the bedding planes.
cog	A roof support built from interlaced layers of wood and usually filled with dirt.
competent beds	Beds which have physical characteristics such that they respond to tectonic forces by folding and faulting, rather than by crushing and flowing. (Competent beds are relatively strong and incompetent beds relatively weak.)
convergence	Movement of roof and floor towards each other after removal of mineral. The rate of convergence is measured as either: 1) the convergence for a given advance of the face, or 2) the convergence in a given time.
convergence recorder	A device for measuring and/or recording the amount by which roof and floor approach each other.
coupled bar	See *link bar*.
creep	The property of certain rocks of undergoing progressive deformation with time when subjected to sufficiently high constant stress.
crown	The top of a roadway or arch girder.
crump	See *bump*.
crush block	A block of soft material inserted between a support and the roof, or floor, between two members of a support system, or incorporated within a brick wall, to permit yield and so reduce deformation of the support.
depth pressure SUPERINCUMBENT LOAD	An assumed pressure due to the overlying strata. In Coal Measures strata normally taken as 1 lbf/in^2 (0.007 kgf/mm^2) per foot of depth.
dint	1. A place where material is removed from the floor of a roadway to increase height. 2. To cut away the floor to make height.
dome theory	The theory of rock mechanics which suggests that a wide excavation underground produces a surrounding dome shaped region within which the rock is broken.
draw roof	See *following roof*.
drummy	The hollow sound emitted when loose rock forming part of the roof, floor or sides of an excavation is struck.
dummy gate DUMMY ROAD, *deprecated*	A road which is formed but not maintained behind a long-wall face, to provide material for building intermediate packs.
dynamometer prop	A prop which is capable of indicating or recording the load which it is carrying.
early bearing prop	A yielding prop which is designed to accept its maximum load soon after it is set (cf. *late bearing prop*).
epicentre	In mining, the place of origin of a rock burst.
fall	Loose material which has fallen from the roof or sides of an excavation.

Term	Definition
flat jack	A hydraulic pressure device used to impose measured load on a support or rock in situ.
floor bolt	See *rock bolt*.
floor penetration	The penetration of loaded supports into the floor of the seam.
floor strength	See *load bearing capacity*.
flushing	1. The displacement of loose material from the waste to the supported area. 2. The crumbling of the roof or sides around the supports in an excavation.
following roof DRAW ROOF RAMBLE, *deprecated*	A layer of roof which falls as coal is excavated, or soon after.
forepoling	The use of girders or bars projecting forward in cantilever as temporary supports beneath newly exposed roof.
forepoling bracket HORSEHEAD BRACKET	A bracket used for the attachment of a forepole to a permanent support, and designed to permit a girder to be slid forward as excavation proceeds.
forward (front) abutment	Pressure abutment in advance of a working face. (See *abutment*.)
forward hading breaks	Breaks whose planes are inclined from the normal to the plane of the seam, towards the face.
frame support	A support consisting of a base frame, two or more legs and a roof bar.
friction cap	A replaceable cap, made of material having a high coefficient of friction, which is fitted to the prop head.
friction prop	A roof support, the yield of which is controlled by a device depending for its operation upon friction between parts of the prop.
front abutment pressure	See *abutment*.
goaf	See *Winning and Working* section.
goal post support	A frame support having two legs set usually at the ends of the bar.
gutter	The narrow extension in height of a roof fall.
harmonic extraction	The working of one or more coal seams by means of a special layout and time sequence of extraction, the aim being to lower the overlying surface with minimum of flexure, causing thereby a minimum of damage.
head tree	See *lid*.
heave	1. Upward movement of the floor. 2. See *Geology* section.
holing sprag	See *nog*.
horsehead bracket	See *forepoling* bracket.
horsehead girder	A girder used for forepoling in a roadway.
hydraulic chock	A large diameter hydraulic prop for heavy duty.
hydraulic load cell CAPSULE, *deprecated*	A load measuring device with a hydraulic system of load indication.
hydraulic prop	A roof support dependent for its erection and yield under load on a hydraulic system embodying a hydraulic pump and relief valve.
hydraulic stowing	Filling or partly filling of a goaf with waste material transported underground in a hydraulic suspension.
immediate roof	In coal mining, the roof immediately above an excavation which is carried by the supports (cf. *nether roof*).
jack prop	See *catch prop*.
key supports	Special supports installed at intervals and used to regulate the position of other powered supports on an inclined longwall face.

Term	Definition
lagging	Concrete, steel or timber, etc., placed between or behind permanent roadway supports.
lamellar prop	Friction prop with a number of laminated members affording several friction surfaces.
lateral roof movement	Relative movement along the plane of the seam, between the roof and floor in longwall working.
late bearing prop	A yielding prop which is designed to accept its maximum load late in its loading cycle.
leg	1. A prop in a powered support unit. 2. The lower member of a roadway arch.
lid CAP HEAD TREE, *deprecated*	A compression piece usually of wood placed between a prop and the roof, or between a prop and a bar.
link bar COUPLED BAR ARTICULATED BAR, *deprecated*	A roof bar which is capable of being coupled in line to another bar and is held in position against the roof by means of a wedge or a shoe.
load bearing capacity (1) FLOOR STRENGTH ROOF STRENGTH	The inherent resistance of the mine floor or roof to penetration by supports.
load bearing capacity (2)	The resistance offered by a roof support at its point of yield or failure.
load shedding	In a support, a sudden and unintentional loss of resistance to load.
mechanical stowing	Filling or partly filling the goaf with waste material projected by high speed belt or paddle wheel, or carried and compacted by a scraper bucket.
natural arch	The shape taken by an unsupported excavation as the roof breaks down.
nether roof	The stratum immediately above a coal seam (cf. *immediate roof*).
nog HOLING SPRAG	A steel or wooden wedge inserted in the cut to delay convergence and/or to prevent spalling of coal from the face.
overriding	The breaking down of the roof at a waste edge over the supports and in advance of the designed breaking-off line.
packing	The systematic use of dirt in underground excavations for the purpose of roof support and control.
pneumatic stowing	The filling or partial filling of the goaf with waste material blown through pipes by compressed air.
powered support SELF ADVANCING SUPPORT WALKING SUPPORT, *deprecated*	A support which can be lowered, advanced and re-erected by mechanical energy.
pressure arch	An arch of relaxed strata which is created when any excavation is made, resulting in the redistribution of the normal strata pressures on to the abutments.
prop	An individual straight support member set between the roof and the floor.
prop density	The number of props supporting a unit area of roof in a system of supports.
prop-free front	A system of supports in a longwall face in which props are not normally set between the conveyor and the coal. The roof above and in advance of the conveyor is supported by cantilever bars set on props on the goaf side of the conveyor.
prop spacing	The distance between the sides of adjacent props in a support system.
ramble	See *following roof*.
rear abutment pressure	See *abutment*.
ring	See *arch*.

Term	Definition
ripping lip	The edge of a tipping. (See *Winning and Working* section.)
rock bolt FLOOR BOLT ROOF BOLT	Tensioned rod or rope anchored in a hole drilled into the rock to increase the inherent strength of a bed or beds.
rock burst	The violent and sudden release of strain energy in the major body of rock surrounding a mine working which results in displacement of the strata. (See also *bump*.)
romometer	A device for measuring relative lateral displacement between roof and floor.
roof bolt	See *rock bolt*.
roof strength	See *load bearing capacity*.
self-advancing support	See *powered support*.
servo-lowering	The technique employed in the operation of a powered support by which the support is advanced with the minimum of lowering from the roof. NOTE The term is a misnomer since the lowering is not assisted but is only controlled, in as much as the degree of lowering is limited by the pressure required in the ram advancing the support.
setting device	The means provided to enable supports to be erected at their normal setting loads.
setting load	The load at which a support is designed to be set.
side abutment pressure	See *abutment*.
sill	1. The lower bar of a square timber frame. 2. See *Geology* section.
slide bar bracket	See *bar slide bracket system*.
slide bar system	See *bar slide head system*.
sliding arch	A yielding arch girder designed to accommodate strata movement by means of sliding connections at the joints between the component lengths.
slope	The inclination, measured from the horizontal, of the sides of a subsidence basin.
slusher packing	A form of mechanical packing in which a rope hauled bucket is used to move and compact material in a goaf.
solid stowing	The process of completely filling the goaf with material.
sprag	A prop set to secure the sides of a working place or cavity.
stilt	A yield mechanism designed to accommodate convergence in the leg of a roadway support.
stowing	The disposal of material in a goaf by pneumatic, mechanical or hydraulic means.
strip pack	A continuous pack of limited width having a waste on either side, built behind a longwall face and extended as the face advances.
superincumbent load	See *depth pressure*.
support pillar	A suitably dimensioned and positioned pillar left to support underground workings and/or surface features.
support rules	Rules appertaining to the systematic disposition and setting of supports in a particular working area.
support system	The orderly pattern or arrangement of supports.
timber set	A wooden frame used as a support, comprising two props and two horizontal members, a bar and a sill.
tip load	The maximum resistance to roof load offered by the forward end of a cantilever bar.
track	The space between two adjacent rows of props or between the front row of props and a longwall face.

Term	Definition
Trompeter zone	Zone of broken ground surrounding an excavation.
walking support	See *powered support*.
weighting	The release of energy which occurs on or about a longwall face as the main roof collapses behind it.
yield	1. The convergence accommodated by a support. 2. The maximum convergence which a support is designed to accommodate.
yielding arch	An arch designed to accommodate convergence of the strata without distortion.
yield load	The load at which a yielding support begins its designed yield.
yielding support	A support which is designed to accommodate convergence between roof and floor.
yield valve	The mechanism in a hydraulic support which allows the support to begin to close at a pre-determined pressure.

Terms and definitions concerned with subsidence

(See Figure 1)

angle of break	The angle of inclination of a line connecting a point at the edge of the workings and the point of maximum tensile strain at the surface, measured from the normal to the seam.
angle of draw	See *limit angle*.
area of influence	See *critical area*.
critical area (of extraction) AREA OF INFLUENCE, *deprecated*	That area the working of which causes the complete subsidence of *one* point on the surface.
critical width	The width of a critical area.
half-subsidence point	The point in a subsidence profile where the subsidence is half the maximum amplitude. (See also *transition point*.)
lateral displacement	The horizontal displacement of a point caused by any working.
limit angle ANGLE OF DRAW	The angle of inclination of a line connecting the edge of the workings and the edge of the observable subsidence area, measured from the normal to the seam.
longitudinal subsidence profile	A curve depicting subsidence on a section drawn parallel to the direction of advance of an underground excavation.
residual subsidence development	The time dependent part of subsidence movement, i.e. that which occurs after completion of extraction.
slope TILT	The gradient, caused by subsidence, between any two points on a subsidence profile.
sub-critical area (of extraction)	An area of working smaller than the critical area. (When a sub-critical area is being worked, the point on the surface under examination does not undergo complete subsidence.)
subsidence	The vertical displacement of a point anywhere within the subsidence trough.
subsidence development	The manner in which the rate of subsidence changes in relation to the position of the moving face of an underground excavation.
subsidence factor	The ratio of complete subsidence to the thickness of the seam(s) extracted.
subsidence profile	See *longitudinal subsidence profile and transverse subsidence profile*.
subsidence trough	The depression formed by strata subsiding into an excavation.

Term	Definition
super-critical area (of extraction)	An area of working greater than a critical area (i.e. which causes an *area* on the surface to undergo complete subsidence).
tilt	See *slope*.
time/subsidence curve	The values of subsidence of a given point on the surface plotted against time as base.
transition point	The point of transition between concave and convex curvature of a subsidence profile. NOTE This coincides with the half-subsidence point on the subsidence profile.
transverse subsidence profile	A curve depicting subsidence on a section drawn at right angles to the direction of advance of an underground excavation.

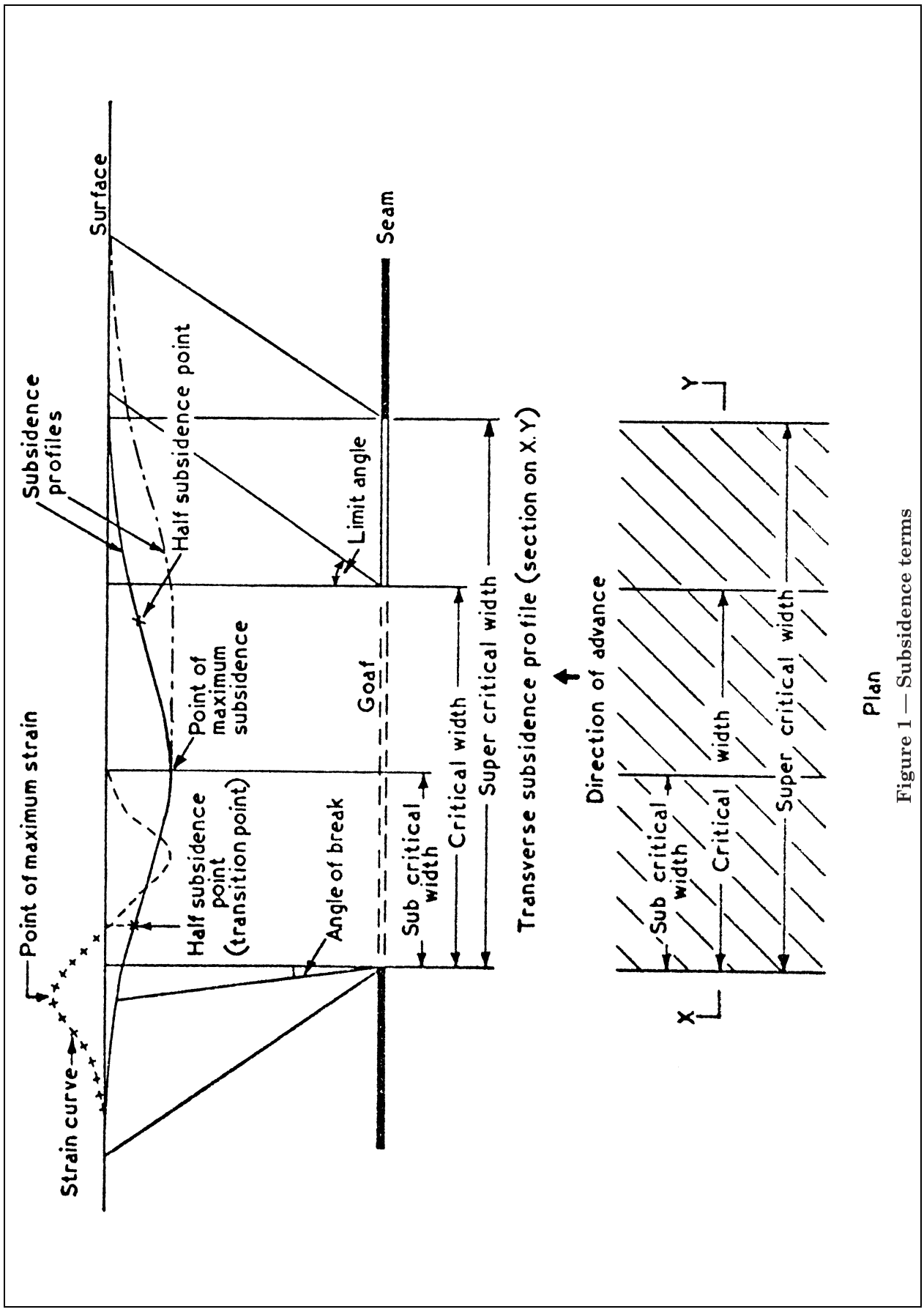

Figure 1 — Subsidence terms

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