TIN 201

Definition of Engineering Terms Relating to Piling, Excavations and Temporary Works Design

Term	***Definition***
ACoP	Approved Code of Practice.
AIP Certificate	Approval in Principle certificate. This document is part of a technical approval procedure put in place by the Highways Agency. It is applicable to the design, construction and alteration of all highway structures.
AMP	Asset Management Programme.
Abutment	A support to an arch or bridge that resists horizontal and lateral forces as well as vertical forces.
Abutment Wall	A wall in an abutment, or a wall serving the purpose of an abutment.
Action	Eurospeak for load - see ***characteristic load.***
Acrow	Standard prop.
Acrow Strut	Standard trench strut. ***NOTE****: Can also be known as 'Acrows'.*
Active Pressure	Minimum soil pressure generated by the active side of the excavation.
Active Side	Retained earth side of an excavation.
Adhesion	Friction value between a wall surface and a cohesive soil material, modelled in undrained (total stress) analyses.
Agent	The person in charge of a site - works for the Contractor. Also known as the ***site agent***.
Aggregate	Collective name for sand, gravels & crushed rock.
Air Hammer	Type of piling hammer. An impact type hammer, driven by a compressor. Ideally used to drive trench sheets or piles in hard, dense or cohesive soils.
Air Test	Test using air under pressure to prove a pipe connection is properly sealed.
Allowable Load	See ***Safe Working Load.***
Aluminium Beams	Formwork shutter beam.
Angle of Repose	The steepest angle to the horizontal that a heaped granular soil will stand in stated conditions. See also ***batter***.
Angle of Shearing Resistance	Effective stress parameter of a soil defined by the angle of inclination of a mohr coulomb failure line that intercepts a seires of mohr columb circles, plotted by recording the change in shear stress vs the change in normal stress on an undisturbed sample of soil.
Attenuation Scheme	Drainage scheme designed to spread the peak flow in a storm drain or sewer system. This is achieved by introducing storage tanks or detention tanks, which are known as attenuation tanks. See also ***Tubosider, egg crate, soakaway*** and ***culvert.***
Attenuation Tank	Storm water attenuation tank. Storage tank used to reduce the flow of storm water. See also ***Tubosider, egg crate, soakaway*** and ***culvert.***
Auger	A boring tool with a long shaft and a corkscrew end that pulls soil up from the hole it makes in the ground. Can be used for bored piles.
Axial Load	An externally applied force along the length of a structure, such as a bracing strut.
Back Shutter	When excavation supports such as ***trench sheets*** or ***piles*** are used to form the rear ***shutter*** of formwork, so that the concrete is poured directly against them, this is known as a back ***shutter***.
Backacter	An excavator fitted with a hinged arm to which is rigidly attached a bucket that is drawn toward the machine in operation. Also known as a ***backhoe***.
Backdrop Manhole	Manhole with a connection, by means of a vertical pipe, at or just above ***invert***, from a drain or ***sewer*** at a higher level.

TIN 201

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Backfill	Loose material, such as rocks, soil or aggregate, used to cover over a pipe in a trench or fill an excavation.
Backhoe Loader	A wheeled JCB type excavator with a backacter excavator at the rear and loading shovel at the front.
Backpropping	Propping installed at levels below the concrete slab that support the ***falsework*** in order to distribute the load on the uppermost slab to suitable supports, such as lower slabs or the foundations.
Banksman	Person who guides machine (excavator) driver to raise, lower or swing the jib. (also known as slinger, signaller, signalman, spotter).
Barrel	That portion of a pipe throughout which the internal diameter and cross-section remain substantially uniform.
Base Plate	Rigid plate used for spreading the load in a ***standard***, ***raker*** or other load-bearing member over a greater area.
Batter	An earthwork slope, such as the side of an excavation. ***NOTE:*** *To be effective the slope should be 45 degrees or less*
Baulks	A hardwood piece of timber, often 12" by 12," often used as a stop block to prevent vehicles driving into an excavation.
Bay Length	The distance between the centres of two adjacent sets of ***walers*** or ***trench boxes***. In simple terms, the number of bay lengths defines how much trench is supported at one time.
Beam	A structural member that resists loading by bending. May be wood, steel, light alloy or ***reinforced***, ***pre-stressed*** or ***post tensioned*** concrete.
Bearer	Typically, a piece of timber that carries a load.
Bearing Pile	A pile that transmits downward loads from structures to the ground by bearing directly onto a firm ***stratum*** in the ground. See also ***piles*** and ***load bearing piles***.
Bedding	Aggregate placed in the bottom of a trench on which the pipes are laid.
Bell Hole	***Manhole*** excavation dug in an existing trench, to allow access for welding a steel pipe around its circumference.
Bench Mark	Permanent ‘mark’ (often chiselled into a building or wall) of precise known height above ordinance ***datum*** (sea level) for the purpose of setting out ***levels.***
Benching	A surface at the base of a chamber with the dual purpose of confining the flow of sewage to avoid the accumulation of deposits and of providing a safe working surface.
Bending Moment	The force in a structural element (e.g. a ***trench sheet***) that is bending it. A bending moment exists in a structural element when a moment is applied to the element so that the element bends.
Bentonite	A natural clay that, when mixed with water, swells and forms a gel. It can be used to support trenches or ***bored pile*** holes that are to be ***backfilled*** or concreted.
Berm	A mound of earth used to support an excavation, usually in a temporary condition.
Bill of Quantities	Forming part of the contract documentation, this schedule details descriptions, quantities and unit rates for all items of construction work.
Biomass	Plant material or animal waste used as fuel. New government buildings have to have green energy sources. Biomass boilers are becoming very popular. Biomass boilers are constructed inside large pits. Large pits require shoring.
Biscuit	A ***pre-cast*** cover slab for ***pre-cast manholes*** which has an access opening.

TIN 201

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Bison Units	***Pre-cast*** concrete floor - usually used in a steel frame building.
Black Top	A popular term for tarmac.
Blinding	Thin layer of concrete covering the bottom of an excavation. Usually 50mm or 75mm, used to act as a level surface and seal to prevent ingress of mud and form a clean bed for laying reinforcement.
Boiling	A soil and water flow into an excavation, created by water and air under pressure. It results from unbalanced hydrostatic pressure due to the removal of the ***overburden*** (the layers of soil that have been excavated), or a rise in the water table. See also ***piping***.
Boom	The boom of an excavator is the arm that extends from the main body of the excavator, to which is attached the ***dipper arm*** and then the bucket.
Bored Piles	Also cast-in-situ ***pile*** or bored cast-in-situ ***pile***. A concrete ***pile*** that is cast within a bored hole in the ground. Usually a cage of ***reinforcement*** is inserted and the hole filled with concrete.
Borehole	A hole bored into the ground to collect soil samples for analysis.
Borehole Log	A detailed description of the layers of soil found in the borehole
Boulder Clay	Clay containing many large stones formed by deposition from large glaciers.
Bowser	A towed trailer used for supplying water or refuelling.
Box Culvert	See ***culvert.***
Box out	A shutter constructed inside a wall ***shutter***, in order to form an opening in the wall, so that obstructions can be avoided, or to allow later access in newly constructed concrete walls.
Brace	A horizontal frame supporting the sheeting and applying ground pressure in an excavation
Breaker	A hand operated jack hammer, or large hydraulic machine operated percussive tool for breaking up rock or concrete. See also ***pick***.
Bridge Abutment	See ***abutment.***
Brothers	Lifting sling/chain - two, four or multi-leg.
Bulk Density	The natural in situ density of a material (partially saturated). Also called 'bulk unit weight'.
Bulk Earth Works	Excavation of soils on a large scale i.e. for a motorway cutting etc
Bund	(Protective) barrier often constructed in soil, or bank of soil left in the excavation to provide additional support to the excavation wall.
Bungs	Pipe stoppers.
Butt Pipe	Small lengths of pipe, either ***spigot*** or socket protruding, built into a manhole wall to provide a flexible joint as close as possible to the outside of the manhole.
CDM Regulations	The Construction (Design and Management) Regulations 2007 are aimed at improving health, safety and welfare at all stages of a construction project.
CECA	The Civil Engineering Contractors Association - most civil engineering contractors are members. Represents their voice in the construction industry.
CHS	Circular hollow section (steel tube)
CIRIA	Construction Industry Research and Information Association.
CITB	Construction Industry Training Board.

TIN 201 — Definition of Engineering Terms Relating to Piling, Excavations and Temporary Works Design

Term	***Definition***
CL	See ***cover level***.
COSHH	Control Of Substances Hazardous to Health Regulations 2002 (as amended).
COW	Clerks Of Works, usual from a trade background. The C.O.W. inspects work on behalf of the Client.
CPA	Construction Plant-hire Association (www.cpa.uk.net).
CSO chamber	A combined sewer overflow (CSO) structure. "Combined" means the chamber routes both excess sewage and flood water during storms, in order to prevent flooding. However, this excess may be dumped directly into the sea or into rivers. Water companies claim this prevents backups that would cause flooding in streets or homes. See also ***U.I.D.***
Cable Ducts	Pipes laid in ground to provide a conduit for laying cables.
Caisson	A large watertight case or chamber, normally built to enable dry working on a foundation. Built above ground and sunk below ground by digging out the soil inside.
Cantilever Propped	Singly braced, propped or tied wall, achieving stability by sharing the load between brace and soil.
Cantilever Wall	Wall or structure that is entirely dependent upon its embedment in the ground for stability.
Cat & Genny	A CAT detector is used for locating underground services prior to excavation; The GENNY (Generator) is used for inducting a signal into a pipe so it can be located by the CAT.
Cat Three/ Category Three Check	Independent design check required by Network Rail, when the consequences of a design failure would be catastrophic.
Centres	The spacing of objects measured from centreline to centreline of each object.
Characteristic Load	A load that has a defined low probability (usually 5%) of being exceeded in the lifetime of a structure.
Characteristic Resistance	The value of resistance/strength or a component or assemble of components that has a specific probability (usually 95%) of being achieved.
Check Valve	A non-return valve on the support cylinder of an excavator ***boom*** which prevents the boom from collapsing during lifting operations due to leakage in the ***hydraulic*** system.
Cladding	Outer fabric of a building - could be brick, glass, metal etc
Claim	A method by which the contractor requests more money because something changed on the job and therefore cost more.
Clear Opening	Usually refers to a ***shoring*** scheme using ***hydraulic frames*** that do not require ***cross braces***.
Client	Any person for whom work is being carried out.
Closure Pile	Special fabricated ***pile*** to close a ***cofferdam*** wall.
Clutch	The shaped edged of a steel sheet ***pile*** that enables adjacent piles to be ***interlocked***.
Cofferdam	Generic name for a sheet piled, usually water retaining, excavation.
Cohesion	A measure of the shear strength of a (cohesive) soil. Its ability to 'remain' or 'stick' together.
Cohesion intercept	Effective stress parameter of a soil defined by the intercept of a mohr columb failure line with the shear stress axis when recording the changes in shear stress in a material during the change in normal stress on an undisturbed sample of soil.
Cohesionless soils	See ***granular soils.***

Term	***Definition***
Cohesive soils	Soils that exhibit cohesion. Typically having a significant proportion of clayey materials. Bonding between the very small particles results from their lamellar shape and being densely packed restricting the movement of air and water. Cohesive soils tend to lose their internal strength following excavation.
Combined Sewer	A ***sewer*** designed to carry both wastewater and surface water in the same pipeline.
Commencement Level	The ground level at which the contractor begins work.
Compacted	Process where stress on a soil has reduced the air voids between soil particles causing a reduction in volume.
Compaction	The packing together of particles of soil, by rolling, ramming or vibrating, which results in a decrease in air ***voids*** and an increase in the density of the soil.
Competent Person	A person having the knowledge, ability, training and experience of the type of work to recognise the risks and the means to minimise them.
Compressive Load	An inward load applied to the ends of a member.
Compressor	Air compressor. A machine in which air is compressed and used to power pneumatic tools on site.
Concrete Surround	Standard method of protecting manholes (or pipes in shallow or bad ground). See also ***manhole shutters*** in the *Shoring Equipment Brochure*.
Confined Space	A confined space is a place which is substantially enclosed (though not always entirely), and where serious injury can occur from hazardous substances or conditions within the space or nearby (e.g. lack of oxygen). This includes trenches and other excavations.
Consolidated	Process where a soil had undergone a decrease in water content causing in a reduction in volume.
Construction Phase	The period of time beginning when construction work in a project starts and ending when the construction work in this project is completed.
Construction Phase Plan	A plan drawn up under regulations 12 and 15 of CDM 2015
Contiguous Piles	A line of bored cast in-situ piles whose outer edges just touch.
Contractor	Any person (including a non-domestic client) who, in the course or furtherance of a business, carries out, manages or controls construction work.
Corbel	A projection from a wall for carrying a load. In shoring, corbels may be required in order to provide satisfactory connections to the permanent works for bracing ***struts***.
Corner Piles	Used to close a piled cofferdam - Three main types: 1. Bent. 2. Cut longitudinally and intermittently welded. 3. Cut longitudinally and intermittently welded to a plate or spacer. Both ‘open’ and ‘closed’ piles are available.
Cover Level	Level, usually that of a manhole or chamber cover, above a ***datum.***
Cover Slab	A pre-cast cover slab for pre-cast manholes which has an access opening. Also known as a ***Biscuit.***
Critical state shear strength	The shear stress that causes soil to distort at constant effective stress and constant volume.
Cross Brace	A ***strut*** between ***walings***, used as extra support.

Term	***Definition***
Cross Strut	See ***cross brace***.
Crossing Services	***Services***, such as gas, electric, water or telephones that run across the line of a trench.
Crowding	Rotating the bucket of an excavator inwards, towards the underside of the ***dipper arm***. This movement is either used in digging, or to adjust the position of a chain or ***shackle*** hanging from the hook of the excavator bucket.
Crown	The highest point of the external surface of pipe barrel at any cross section.
Cube Test	A test for new concrete, this usually involves casting specimens from fresh concrete and testing them for various properties as the concrete matures. The 'concrete cube test' is the most familiar test and is used as the standard method of measuring compressive strength for quality control purposes.
Culvert	A culvert is a conduit used to enclose a flowing body of water. It may be used to allow water to pass underneath a road, railway, or embankment for example. The word "culverts" usually refers to rectangular, pre-cast concrete sections. A culvert pipe may be heavy gauge galvanized steel, corrugated steel used for highway drainage. A culvert, or a bank of culverts can form part of an ***attenuation scheme***.
Culvert Puller	A machine used for pulling culvert sections or pipes together.
Curing	Refers to the process of concrete hardening correctly. When concrete has cured correctly is said to have 'gone off'.
DG5	One of a number of checks on the performance of a Water company. The DG5 Register is a report to the Director General of *OFWAT* concerning the number of properties at risk of sewer flooding. When contractors refer to DG5 it means the construction work required to solve sewer flooding.
DPC	Damp Proof Course. A bitumen based membrane used on bricks and blockwork, to prevent damp rising through the wall.
DPM	Damp Proof Membrane. An impervious membrane (usually Visqueen) placed under concrete slabs to prevent moisture rising through it.
Datum	Any level taken as a reference point for levelling.
Deadman Anchor	A buried plate, wall or block, some distance from a ***sheet pile*** or other retaining wall which serves to anchor back the wall through a tie between the two.
Deflection	The distance a structural element moves when loaded. A ***brace*** or ***waler*** that bends under load may be said to '*deflect*'.
Demurrage	A haulage charge, levied when the customer has taken an unreasonably long time to unload the delivered goods. Hauliers will usually charge an hourly rate for each hour after the allowed time.
Design	Includes drawings, design details, specifications and bills of quantities (including specification of articles or substances) relating to a structure, and calculations prepared for the purpose of a design.
Design and Build	Method of construction where the contractor both designs and builds a project.
Design Load	The characteristic load multiplied by a partial (load) factor. See ***partial factor***.
Design Resistance	The characteristic resistance of a component or assembly of components divided by a partial material factor. See ***partial factor***.

Term	***Definition***
Designer	Any person (including a client, contractor or other person referred to in these Regulations) who in the course or furtherance of a business: (a) prepares or modifies a design; or (b) arranges for, or instructs, any person under their control to do so.
Dewatering	To remove water from an excavation. Two main methods: ***Sump Pump*** and ***Well Point***
Diameter	Largest dimension across a circle through the centre. See **O.D**. and **I.D**.
Diaphragm Wall	A technique for constructing deep walls for basements - a trench is dug and back filled with ***bentonite*** (clay) slurry to support the trench walls, the ***bentonite*** is then displaced by pumped concrete.
Digging Platform	Ground built up next to an excavation used as a platform for an excavator. This allows the excavator to lift ***trench sheets*** that would normally be longer than its ***reach*** into position and drive them into the ground.
Digging Window	A section of an excavation wall with shorter sheets, that allows the ***dipper arm*** of the excavator access to dig.
Dipper Arm	The dipper arm is attached to the ***boom*** of an excavator. The excavator bucket is attached to the dipper arm. A hydraulic ram connects the ***boom*** and the dipper arm, allowing the bucket to dig towards the excavator.
Divi or Whirly Bar	See ***Dywidag Bar***
Dolly	Driving Cap
Double Acting Hammer	Impact type piling hammer. See also ***air hammer***
Double Acting Manhole Brace	A manhole brace with hydraulic rams that can be pumped out and back in, as opposed to a ***Single Acting Manhole Brace*** that can only be pumped out.
Drag Box	Shield used to protect pipelayers when laying pipes. A trench box adapted for being dragged by an excavator into position in the trench.
Drag Line	A type of excavator, consisting of a bucket operated by steel hawsers (as opposed to hydraulics). Often used in marine works.
Drained	A state in soil when the pore water pressures have equalised after a change in loading and the strength of a soil is governed by effective stress parameters - see effective stress.
Driveability	The measure by which a pile can be forced into the ground by a hammer. Note, the *SPT value* of the soil is a good indication of driveability.
Drop Hammer	See ***impact hammer***.
Duck	See ***rubber duck***.
Duckbill Anchor	A ***ground anchor***, often used for tying back sheet pile walls.
Dywidag Bar	Pronounced "Dividag." Proprietary threaded tie-bar system.
EC	Euro Codes. Design codes used throughout Europe. See ***EC3*** and ***EC7***.
EC3	Euro Codes. Design codes used throughout Europe. EC3 covers the design of steel structures.

Term	***Definition***
EC7	Euro Codes. Design codes used throughout Europe. EC7 is wide-ranging and provides, in outline, all the requirements for the design of geotechnical structures, e.g. approaches to geotechnical design, ground investigation, design aspects of construction and design of specific elements.
EGL	Existing Ground Level. Level before any reduction or deposition of material.
EGRS	Euro Ground Release Shackle. See also ***quick release shackle***.
ERRS	Euro Ratchet Release Shackle. See also ***quick release shackle***.
EMV	Excavator mounted vibrating ***piling hammer***.
EQU	A type of limit state defined in Eurocode practice as the loss of equilibrium of the structure and ground as a rigid body (e.g. boiling, heave).
Earth Pressure at Rest	Lateral pressure exerted by a mass of soil where no movement has taken place.
Edge Protection	System used to prevent falls from heights. In shoring, attached to the tops of ***box panels***, ***trench sheets*** and ***piles***.
Effective Stress	Soil Condition: Represents the stress transmitted through the soil skeleton only (effective stress is total stress minus pore water pressure). Applies predominantly to saturated granular soils in both short and long term timescales. (symbol Φ)
Egg Crate	Plastic crate that resembles an egg box. Used as a modular (stackable) system to form a water ***attenuation tank***. Can be used for storage of water or as a ***soakaway***. Often seen as part of a *SUDS* system. In order to build these, a large pit has to be dug, which will require ***shoring***.
Ekki Mats	Timber mats used to form a temporary site roadway for excavators.
Elastomeric Joint Ring	An ring of circular or other cross section used to provide a watertight seal between pipe ***spigot*** and socket in a flexibly jointed pipeline.
Embedment Length	See ***penetration.***
End Bearing Piles	A bearing ***pile*** which carries its full load down to hard ground at its point.
Enforcement Notice	Notice served on a particular site by the Health & Safety Executive to either improve safety within a specified time scale or to prohibit further work until specified measures have been put in place.
Engineer (Resident)	See ***R.E.***
Engineer (Site)	Person on site responsible for setting out.
Engineer (Temp)	Responsible for temporary works on site. Could be site based but more likely office based. Works for the Contractor.
Escape Set	Breathing equipment (usually 10 minutes) used in emergency to exit a hazardous area.
Estimator	Person who calculates how much a job will cost i.e. Completes the ***tender*** document.
Excavation	Includes any earthwork, trench, well, shaft, tunnel or underground working.
Excavator Mounted Hammer	Vibrating type of hammer that attached to the ***dipper arm*** of an excavator, once the bucket is removed, and is powered by the excavator's ***hydraulics***.
Extractor	See ***trench sheet extractor*** and ***piling extractor***.
FFL	Finished floor level.
FL	See ***Formation (Level)***.

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Term	***Definition***
FOS	See ***factor of safety***.
Façade	The outer wall of a building, particularly the front wall.
Factor of Safety	In permissible stress terms the Factor of Safety is the failure load divided by a design load or working load.
Fall	The vertical distance between upper and lower end of gravity pipeline. The fall per metre is often referred to.
Falsework	Temporary structure (usually scaffold) to support ***formwork.***
Fill	Material used to raise the level of an area e.g. ash, rubble, etc.
Fines	The small particles in the mechanical analysis of a soil. 'Loss of fines' can be a problem when ***sump pumping***. The removal of the fines with the water, from the soil surrounding the excavation, may cause instability in the soil and the formation of ***voids*** behind the ***shoring***. This can lead to a collapse of the excavation.
Finished Slab Level	Level of finished concrete.
Fixed Earth Support	A method of analysing a sheet piled retaining wall where fixity of the ***pile*** toes below ***formation*** is assumed.
Fixity (of a pile)	The natural support given to a ***pile*** driven to sufficient depth below formation that it is able to act in cantilever, to partially or wholly support the retained soil - *see* ***cantilever*** and ***propped cantilever walls***.
Fork Head	U-Head. U shaped housing used to support ***bearers***, ***beams***, joists or similar.
Form 003	A page from Network Rail's 'Certificate for Design and Checking of Temporary Works'. We may be asked to complete one of these by the contractor if the excavation is close to a railway line, or on Network Rail land.
Formation (level)	The surface of the ground in its final shape, before concreting, but after earthworks.
Formwork	Temporary structure/mould to contain wet concrete.
Formwork Soldier	*See* ***soldier***.
Foundation	The base on which a structure sits.
Free Earth Support	A method of analysing a sheet piled retaining wall where fixity of the ***pile*** toes below ***formation*** level is not assumed.
Free Standing Time	Refers to the length of time that unsupported ground in an excavation will stand up before it collapses.
French Drain	A type of drain that allows water to run through clean (single size) stone, surrounded by 'Terram' - used along motorways, etc.
Frodingham Pile	A type of *sheet pile* with a '*Z section'* profile, as opposed to a 'U' profile. Can be supplied singly or ***interlocked*** in pairs. See also ***Larssen pile***.
GEO	A type of limit state defined in Eurocode practice as the failure or excessive deformation of the ground.
GF	General Foreman - the most senior level of foreman.

Term	***Definition***
GL	Ground Level.
GMS	Galvanised Mild Steel.
GRP	Glass Reinforced Plastic (fibre glass) - light weight material sometimes used for pipes.
Gabions	Gabions are large wire baskets filled with a local stone and linked together to form terracing to retain river banks and support earth banks etc.
Galvanize	Process of coating iron or steel with zinc, essentially by hot dipping, to give protection against corrosion by rust.
Ganger	A person in charge of a 'gang' of men on a site, he will report to the foreman
Geofabric	See ***geo-textile.***
Geo-textile	A textile that is used to stabilise ground and spread load, which will let water through, but not soil particles.
Gradient	The slope of a pipe can be expressed as a ratio or a percentage i.e. a gradient of 1:4 is 4m horizontal to 1m vertical or 25%.
Granular Soils	Soils predominantly with relatively large angular grains such as sands and gravels whose strength is determined by the matrix being held together under its own weight (or applied load).
Grinder	Tool used for grinding or cutting pipes, can be air or electric driven. Uses carborundum cutting disks.
Ground Anchor	An anchor used to tie back a retaining wall.
Ground Release Shackle	Shackle for ***pitching trench sheets*** or ***piles***. See also ***quick release shackle***.
Groundwater	Water that has infiltrated the ground surface and penetrated to the underlying ***strata*** and in particular, the water that is contained in the soil or rocks below the water table. See also ***water table, standing water*** and ***perched water***.
Groundworks	A general term covering open excavations for drainage, foundations and underground structures, but not covered works such as tunnels.
Gully	A chamber used in road construction to collect water.
Gully Run	The pipeline that runs from a gully to the main pipe run.
HASAW	*Health And Safety At Work etc. Act 1994* - Primary legislation applying to health and safety in the work place.
HSE	Health & Safety Executive.
Half Barrel	Where half the barrel of the pipe is back-filled with concrete. See also ***haunching***.
Hard Core	Low grade granular material usually to provide a stable/clean working surface.
Harvester Tank	Rainwater storage tank.
Hatch Box	Telecoms box connecting motorway gantries.
Haunching	Concrete support to the sides of a pipe. See also ***half barrel***.
HD Bolts	Holding Down bolts - bolts cast into concrete to secure, say, a steel frame.
Heading	A tunnel, especially one of relatively small cross-section e.g. a short tunnel under a road.

Term	***Definition***
Headwall	A headwall is a retaining wall at the end of a culvert, drain or storm water pipe. It is a reinforced concrete structure that allows surface water to filter into a water system in a slow-flow manner. It is also a ***retaining wall***, designed to support a structure such as a bridge. In this case it will be found at the ***bridge abutment***, where the bridge meets the earth.
Heave	An uplift in the ***formation*** surface following excavation, which can occur in very compressed underlying soils.
Helibore Pipe	Helibore pipe is a helically wound, corrugated galvanised drainage pipe, produced from pre-galvanised steel coil.
Hiab	A small crane mounted on the back of a lorry for loading and unloading. Also known as a 'lorry loader'.
Hit and Miss	Refers to the practice of leaving out intermittent trench sheets when ground conditions allow.
Hogback Struts	Struts usually used in a ***drag box*** which project above the box in order to give a high clearance. Used for laying large diameter pipes.
H-pile	See ***H-section.***
H-Section	A universal section of steel with an 'H' profile, used as an H-column or an H-pile.
Hy Load	A type of scaffold used mainly for supporting formwork from bridge decks.
Hydraulic	Concerning the flow of fluids. In shoring the term 'hydraulics' refers to hydraulically operated equipment, such as manhole braces, ***walers, tank brace*** etc.
Hydraulic Frame	Can mean a manhole brace or larger type of frame, such as 203, 254 or 406 rail. May also be used to mean trench ***walers***.
Hydro-Brake	May be a concrete chamber or series of concrete pipes, going from larger to smaller diameters, used to store storm water temporarily in order to prevent flash flooding and allow the water to drain in a controlled manner.
Hydrostatic Head	A measure of pressure equivalent to a height of water.
Hydrostatic Test	Test undertaken to determine the watertightness of pipes.
ID	Inside Diameter
IL	See ***invert level***.
ICE	Institution of Civil Engineers
Impact Hammer	In shoring, a piling hammer or hydraulic piling hammer. Uses impact, rather than vibration. See also ***vibrating hammer***.
Impervious	Not able to be penetrated by water.
Imported	Usually refers to ***fill*** brought from outside the site boundary.
Infiltration	Ingress of groundwater into a drain or sewer system.
Inlet	A means of entry, such as an inlet pipe or inlet valve, or any structure or part of a structure, such as an intake, through which water is admitted.
in-situ	Means 'in place' - concrete cast 'in-situ' means it is cast where it is used, rather than pre-cast, off site.
Inspection Chamber	Structure similar to a manhole, but without access for personnel.

Term	***Definition***
Interceptor	Interceptor tank - underground tank used to separate oil and fuel from surface water and prevent pollutants entering the water course. Usually made of fibreglass. Required on all developments with car parks, often requiring ***shoring*** to install them.
Interlock	To join together adjacent ***piles*** or interlocking trench sheets, by sliding one ***clutch*** inside the other. The word 'interlock' can also be used as shorthand for an interlocking trench sheet.
Invert	See ***invert level***.
Invert Level	The lowest visible surface of a pipe, culvert, drain, channel or tunnel at any cross-section.
Jacks	See ***struts*** and ***props***.
Jib	A ***boom*** - the lifting member of a crane.
Joist	Timber, steel or concrete ***beam***, usually directly supporting a floor.
Junction Piles	Consists of a half ***pile*** welded longitudinally to a full ***pile*** to form a 'T' junction.
Ka	Coefficient of active pressure for ***cohesionless soils***. It is a measure of how much pressure soil will apply to the active side of an excavation.
Kp	Coefficient of passive pressure for soils. The ratio of horizontal pressure that the ground will apply to the passive side of the excavation as a function of the vertical stress within the ground.
Kelly Block	Dead weights, normally concrete, often associated with piling frames.
Kentledge	Material such as concrete or steel, placed on a structure to provide stability by the action of its dead weight.
Kicker	A small concrete plinth, typically 100 mm high, formed on top of a concrete slab as a starting point for a concrete wall or column. It provides both a line and a fixing for the first ***lift*** of wall shutters. See ***formwork***.
Kicking in	When the width between two sides of a trench support, comprising ***trench sheets***, or ***piles***, or ***trench box panels,*** is significantly narrower at the bottom of an excavation, compared to the top, the ***shoring*** is said to have 'kicked in'. The equipment has either been driven incorrectly, or is giving insufficient support for the ground conditions.
King Post System	In shoring, vertical steel ***H-Sections*** are driven into the ground at pre-determined ***centres*** and steel panels (***trench box panels*** or road crossing plates), or horizontal ***trench sheets***, are placed between the H-Sections to form a wall supporting the embankment.
Klargester	Manufacturer of glass reinforced plastic tanks.
Knee Braces	Struts used at the corners of excavations to add extra support to the ***walings***.
Krings	A term sometimes used to mean ***trench boxes***, named after the German manufacturer.
LOLER	The *Lifting Operations and Lifting Equipment Regulations 1998*. Legal requirements relating to the use of lifting equipment.
Larssen Pile	Rolled steel sections to provide support in excavations, has a 'U' profile, as opposed to 'Z' profile.

Term	***Definition***
Laser	An optical instrument that uses a laser beam of light to assist an engineer in setting out. Two main types: 1. Pipe Laser - set at the correct gradient and shone down the bore of the pipe to ensure they are laid to the correct line and level; 2. Rotating Laser.
Launch Pit	Also known as 'launch shaft'. Pit or shaft from which a ***microtunnel*** is driven towards a ***reception pit***. See also ***pipe jacking*** and ***micro-tunnelling***.
Lead Drain	A drain similar to a ***french drain*** for draining fields.
Lean Mix	A general term used for weak, dryish concrete, having low cement content.
Leptospirosis	See ***Weil's Disease***.
Level	A surveyor uses a level to determine elevation i.e. the height of a landform above sea level.
Lift	(In ***formwork***) the vertical section of ***formwork*** for e.g. a wall or column or shaft erected in one stage, or of concrete poured in a wall in one stage.
Lift Plan	A document used to plan the sequence of actions and associated risks in using a crane, excavator etc to move a heavy load. Site personnel may need to draw up a lift plan in order to handle a delivery of shoring equipment, for example. See also ***method statement.***
Lighthouse Club	A club formed by the construction industry to carry out charity work to support families of construction workers killed or injured.
Limit State	The limiting state of a design beyond which the member or structure no longer satisfies the design requirements.
Lintel	A structural element that spans over an opening i.e. over a door in a brickwork wall.
Liquid Limit	The moisture content of a cohesive soil when the soil no longer behaves plastically and behaves as a liquid.
Load	See ***action.***
Loading Bay	Any facility for loading or unloading.
Luffing	The raising or lowering of the jib of a crane. A luffing jib is a crane jib that is fixed at its base and supported by cables to control its angle of inclination.
mAOD	A level in metres relative to Ordinance ***Datum***.
MHSW	The *Management of Health & Safety at Work Regulations 1999.*
MOT	Common term for 'type 1' sub base
Made Ground	Term usually used to describe an area of ***fill*** i.e. ground built up using debris or rubble, rather than in a natural state.
Magnum Box	Generic name for a large 4 metre high ***trench box***.
Main Contractor	The contractor who has been awarded the contract - he may sub-contract all the work but he has overall responsibility for the contract.
Management Contractor	The principle contractor on a management contract. He will not do work with his own labour but sub contract all work out in packages and manages them

Term	***Definition***
Manhole	A chamber, usually of brickwork or pre-cast concrete rings, that allows access usually to a pipeline.
Marine Works	Civil engineering works associated with the sea or rivers.
Method Statement	Documents setting out exactly how a particular activity is to be done. Often used in tender proposals for dealing with aspects of the work for which clients have set no specifications. Method statements are important in site safety since they set out who is in charge, the safe means of access, specific details of lifting gear, details of storage and any hazardous substances, communications, equipment and protective clothing. No deviation is allowed without referring back to the writer of the statement and the issuing of a revised statement.
Micro-tunnelling	Process for constructing tunnels that are too small for a person to work in by using machines. Starts at a ***launch pit*** and ends at a ***reception pit***.
Mini Box	Mini ***trench box.***
Mixed Soils	Combination of ***granular*** and ***cohesive*** soils such as sandy clay.
Mobile Crane	A crane that can travel from site to site usually on tyres, rather than tracks.
Modular	Designed with standardised units or dimensions, as for easy assembly and repair or flexible arrangement and use.
Muck Shift	Removal of topsoil and alterations to ground level, undertaken at an early stage in the construction process.
Mudstone	A common rock found throughout the UK, often associated with coal measures.
Multi-propped	Multiple braced or tied wall, achieving stability by sharing support between ***braces*** and soil (if embedment available)
N Value	See ***Standard Penetration Test*** *(SPT).*
Net Pressure	The resultant sum of active and passive pressures acting against both faces of a piled wall.
No Dig Techniques	General term for the techniques for installing or repairing pipes, that does not involve ***open-cut*** excavation, e.g. ***micro-tunnelling*** and ***pipe jacking***.
No Fines Concrete	Concrete mix without any sand. It is often used as a vertical drain.
No Toe	Zero ***trench sheet*** or ***pile*** embedment in an excavation. Only possible when several frames are used.
Nominal Diameter	A designation used to specify the size of a pipe, bolt, rivet, reinforcing steel bar, or rod; not necessarily equal to the exact diameter.
Non Return Valve	A valve in a pipeline that only allows flow in one direction.
Numerical modelling	A process of mathematical modelling in engineering design that can be used to solve a complex problem (such as modelling of non-linear differential equations) when analytical methods may be too time consuming. Using numerical modelling, a complex analysis can be broken down into a very large series of simple operations using a computer software to give approximate solutions.
OD	Outside Diameter.
Ofwat	The economic regulator of the water and sewerage sectors in England and Wales. Put in place to make sure that Water Companies provide household and business customers with a good quality service and value for money. Ofwat sets the budgets for Water Companies.
OL	Original Ground Level - the level of the existing ground before any work takes place.

Term	***Definition***
OPC	Ordinary Portland Cement.
Observational method	A process of design that can be used when a prediction of geotechnical behaviour is difficult and involves reviewing the design during construction. Acceptable limits of geotechnical behavour are defined prior to construction and monitoring processes are used during the construction to ensure that the behaviour lies within the acceptable limits. Previously defined modifications can be incorporated rapidly during or after construction, when monitoring processes show that the geotechnical behaviour falls outside of the acceptable limits. The observational method is recognised as a design method in EC7.
Open Cut	General name given to a trench excavation.
Outfall (water)	A place where, e.g. a river or drain discharges into the sea or river or a sewer pipe discharges into a treatment works. In shoring terms, it usually refers to the excavation required to construct an outfall chamber.
Over Pumping	A technique used to divert a flow in a pipe or channel by a pump, so an area can be worked upon.
Overburden	1. Loose, poor quality material overlying rock in a quarry 2. Term for weight of soil when calculating pressure 3. Layers of earth and rock that have to be removed to get to formation level.
Oxy Acetylene	Two gases, oxygen and acetylene, that when mixed, burn with a very hot flame, used for cutting steel, etc.
PFA	Pulverised Fuel Ash, power station waste, often used as fill material.
PUWER	The *Provision and Use of Work Equipment Regulations 1998*. Sets out legal requirements for the use of equipment at work, intended to ensure that work equipment is suitable, safe, adequately maintained and used by those who have received adequate information, instruction and training.
PWD	Permanent Works Designer.
Pan	The 'pan' of a ***trench sheet*** or ***pile*** refers to the deepest part of the profile. This dimension is important because it tells the contractor how much wider the excavation will have to be to accommodate the trench sheets or piles. The width of the pan can also be an important dimension because it is this part of the profile that accommodates the clamp of the ***piling hammer***.
Pans	Usually steel panels, small enough to be lifted by hand, used for formwork Can also sometimes be used to refer to ***roadforms.***
Partial Factor	Limit state terminology to denote a factor applied to a characteristic load, action or material strength to achieve a design value.
Passive Pressure	Soil pressure generated by a wall moving towards a soil mass i.e. at the front face of a sheet wall toe.
Passive Softening	Softening of unprotected ***cohesive formation***, usually limited to the first metre below **formation**. Consequent reduction in resistance offered to the ***pile*** toe by soil.
Peak shear strength	The maximum shear stress (or ratio of shear stress to normal stress) a soil can resist prior to failure.
Pecker	Common name for a ***hydraulic*** rock breaking chisel, mounted on a excavator. Also known as a ***pick*** or ***breaker***.
Penetration	The length of sheet or ***pile*** embedded into the ground.
Perched Water Table	A water table which is artificially high and separated from the main water table, because of an impervious ***stratum*** e.g. where pockets of water can be found in voids in the ground.

Term	***Definition***
Permanent Works	The permanent works to be constructed and completed in accordance with the contract.
Permeability	A measure of the rate of flow of fluid (***groundwater***) through a soil under the influence of a hydraulic head.
Permissible Stress	***Stress*** that can be sustained safely by a structural material for the particular condition of service or loading.
Permit to Dismantle	Certificate issued to indicate that the ***permanent works*** have gained sufficient strength to be self-supporting and that the ***temporary works*** may safely be removed or dismantled to an agreed procedure.
Permit to Load	Certificate issued to indicate that the ***temporary works*** may safely be put to its designed use.
Permit to Strike	See ***Permit to Dismantle***.
Phi	Ø – symbol used for a soil's internal angle of resistance (pronounced 'Fy').
Pick	Hydraulic or pneumatic ***breaker*** for breaking through concrete or breaking rock.
Pier	A column, usually used to support a bridge.
Piezometer	In-situ device for measuring ***groundwater*** depth and pressure.
Pig	An object that is forced through a pipeline usually by air, to clean the bore of the pipeline. 'Pigs' can also be used to separate 2 products going down a line or be used for x-raying welds
Pile Breaker	***Hydraulic*** tool used to crop concrete piles to required length.
Pile Crusher	See ***Pile Breaker.***
Pile Cutter	See ***Pile Breaker.***
Pile/Piling Extractor	Equipment used for extracting ***Larssen piles***, or similar. This term is also used to mean a ***Trench Sheet Extractor.***
Piles	A structural member that is driven into the ground to support a structure. Two types exist: 1. Load bearing piles i.e. those used to support a vertical load. 2. Sheet piles i.e. those used to retain a lateral load.
Piling	Can mean the act of piling i.e. driving ***piles*** into the ground, or the ***piles*** themselves, such as ***Larssen*** *or* ***Froddingham***.
Piling Gate	See ***Piling Guide.***
Piling Guide	Guide frame to enable ***piles*** or ***trench sheets*** to be held vertical for ***pitching*** and driving.
Piling Hammer	A mechanical hammer used to drive in ***piles***. May be vibrating or impact type.
Piling Shackle	See ***quick release shackle***.
Piling Trestle	See ***piling guide***.
Pipe Jacking	A technique used to install a pipeline in the ground without trenching. Pipes are 'pushed' through the ground from a ***thrust pit***.
Pipe Laser	A laser that shines down the bore of a pipeline, at a pre-set gradient, to assist the pipelayers to lay the pipeline to line and level.
Pipe Puller	A device used to pull one pipe to another in order to join them.
Piping	See ***boiling***.
Pitching	The positioning of a ***pile*** or ***trench sheet***, ready for driving.

Term	***Definition***
Pitching Shackle	See ***Quick Release Shackle.***
Plant - Mechanical	Mobile equipment used for construction e.g. an excavator or JCB
Plant - Non-mechanical (NMP)	Non mechanical equipment such as ***formwork, scaffolding*** and ***shoring*** used for construction.
Plasticity	A property of cohesive soils where a soil can be deformed without rupture. Related to the moisture content of a soil and defined by the plasticity index (liquid limit - plastic limit).
Plastic Limit	The moisture content of a cohesive soil when it attains plasticity - see plasticity
Plate & Spinner	Tie plate and wing nut - normally combined.
Poker	A common term used to describe the tool used for vibrating concrete.
Pole Ladder	Wooden one piece ladder.
Pore water	Pore water is the free water that surrounds soil particles. In granular soils this equates to the ground water.
Pore Water Pressure	The pressure of water filling the voids between soil particles, more applicable to clay soils
Post Tensioned Concrete	Concrete that has wires running through it in ducts. These are tensioned after the concrete is cured, which gives it a very high strength (used mostly on bridge decks).
PPE	Personal Protective Equipment e.g. safety boots, safety helmets, hi-viz jackets, fall arrest harnesses.
Pre-auger	A rotary excavator mounted tool used to loosen ground to a depth prior to driving sheets or piles.
Pre-cast	A concrete item which is made into a particular form before being used e.g. concrete pipe, concrete manhole ring.
Pre-construction information	Information in the client's possession or which is reasonably obtainable by or on behalf of the client, which is relevant to the construction work and is of an appropriate level of detail and proportionate to the risks involved, including: (a) information about: (i) the project; (ii) planning and management of the project; (iii) health and safety hazards, including design and construction hazards and how they will be addressed; and (b) information in any existing health and safety file.
Pre-drive	The practice of driving the trench sheets or piles to full depth, before installing the ***braces*** or ***walings***.
Press Box	***Piling machine*** manufactured by Krings/Emund & Staudinger of Germany. Used for supporting trenches, this ***sheet pile*** machine has ***piles*** integrated in the machine, which it drives, extracts and carries to the next section of trench. In soft ground, the machine has a tendency to sink and in hard ground, it can lift itself up, rather than drive the sheets into the ground. Rarely used in the UK now.
Press-stressed	Concrete that is cast around tensioned wires, which when cured give the concrete very high strength in bending.
Pressure Line	A pipeline that does not use gravity to move fluid and relies on pumping.
Pressure Test	Test to determine if a pipeline has been laid correctly - usually pipeline is filled with water, pumped up to a pressure and monitored for leaks using pressure gauges

Term	***Definition***
Primary	Principal bearing member transferring load to the ***falsework***.
Principal Contractor	The contractor appointed under regulation 5(1)(b) of CDM 2015 to perform the specified duties in regulations 11 and 12 of CDM 2015.
Principal Designer	The designer appointed under regulation 5(1)(a) of CDM 2015 to perform the specified duties in regulations 11 and 12 of CDM 2015.
Project Manager	1. The contractor's most senior site manager, usually only found on large jobs. He is senior to the Site Agent. 2. A person appointed by the Client to manage a project for him.
Prop	Support to prevent something failing, sagging or falling.
Proprietary	Manufactured and supplied only by the owner of the patent, brand name, or trademark associated with the product.
Pumping Main	Pipe through which sewage or effluent is pumped and running full and at a pressure greater than atmospheric, to a final destination.
Pumping Station	Usually underground structure containing pumps, to which sewerage is discharged, before being pumped to its destination.
Puncheon	In shoring, a vertical ***strut***, usually timber, used to support ***walings*** at different levels.
Purlin	A structural section on a roof, used to fasten the roof covering to the roof trusses
QA	Quality Assurance. This is any systematic process of checking to see whether a product or service being developed is meeting specified requirements.
QS	Quantity Surveyor - person who looks after the financial and commercial side of a construction project i.e.submits valuations and measures the works. Sometimes responsible for placing orders.
Quarry Waste	Ungraded stone often used as ***fill*** material (usually ***fines***).
Quick Release Shackle	Shackle for ***pitching trench sheets*** or ***piles***. Not to be used as a trench sheet or piling extractor.
RB 22	A small crawler crane used for lifting on site, commonly used on tunnelling jobs.
RC Frame	Reinforced concrete frame i.e. the main structural support of the building. An alternative would be a steel frame.
RE	Resident Engineer - engineer employed by the Client, who is site based, ensures the contractor maintains quality and attends to technical design problems
Rebar	See ***reinforcement.***
RHS	Rectangular hollow section (includes ***SHS***)
RL	*See **reduced level**.*
RLD	Reduce Level Dig. An excavation down to ***formation*** level
RMD	Often used to mean a formwork soldier (named after the supplier, RMD).

Term	***Definition***
RQD	Rock Quality Designation is based on rock core recovery and is a rough measure of the number of fractures and discontinuities in the rock mass as a percentage.
RSJ	Rolled steel joist.
Raker	An inclined ***prop*** or ***strut.***
Raking Props	*See* ***Raking struts*** and ***raker****.*
Raking Struts	For transferring forces from ***walings*** in deep excavations to the ground. See also ***waler****.*
Ramex	A type of compacting tool which uses vibratory sheep's foot drum roller - for use with clayey soils.
Rapid Tie Bar	See ***Dywidag Bar***
Reach	The distance the ***boom*** arm of an excavator can usefully extend.
Rebound	Rebound occurs when a large portion of a ***piling hammer's*** energy is 'bounced' back up into the **pile** as a result of force reflection at the ***pile*** tip, due to the ***pile*** hitting an impenetrable layer or obstruction. See also ***refusal.***
Reception Pit	A pit excavated directly across the ***launch pit*** of a ***micro-tunnel*** or ***pipe jacking*** operation.
Reduced Level	The level at a construction site after excavation, usually with respect to a given ***datum***.
Refurbish	To strip out and re-fit a building to improve its use.
Refusal	A ***pile*** or ***trench sheet*** that cannot reasonably be driven any further into the ground is in refusal. *See also* ***rebound****.*
Reinforcement	Ribbed steel bars cast within concrete to cater for tensile loads.
Reinforcing	The steel bars that are fixed inside concrete to give it additional strength.
Release Agent	Used as a lubricant so the concrete does not stick to the shutter. See also ***soap oil****.*
Residual shear strength	The shear strength of a soil after it has undergone large displacements or failure (such as land slips).
Retained Height	Height of material retained by a wall or structure.
Retaining Wall	A retaining wall is a stabilizing structure used to hold sloping ground in place and to prevent the erosion and the movement of soil.
Retention Tank	See ***attenuation tank.***
Rising Main	See ***pumping main.***
Risk Assessment	Judging and calculating the likelihood of risks and their potential impact on the achievement of objectives and prioritizing them. Sites are required to carry out written risk assessments for various activities. Within the workplace, owners of a business are legally required to assess the risks of injury and ill health affecting employees. Risk assessment is the careful examination of the diverse factors that can bring about these risks. Risk assessment should also make sure that enough precautions are implemented in order to prevent harm coming to an employee.
Roadform	Steel formwork shutter used to form concrete kerb bases or floor slabs. Usually 3 metres long and 100 mm to 300 mm deep.
Rocker Pipe	A short length of pipe jointed to butt pipes to provide for differential settlement at ***manholes***. Also known as a 'rocker'.
Rolling Strut Box	A type of ***trench box*** with two large ***struts***, which 'roll' up and down the box, or allow the box panels to be moved independently. Used for large or long pipes, or dual pipe runs. Box panels are 4 metres deep and 3.45 metres long.
Rubber Duck	Excavator with wheels and tyres, rather than caterpillar tracks.

Term	***Definition***
SCR	Solid Core Recovery is the amount of solid rock pieces (as a percentage) recovered from a rotary drilling core run.
SHS	Square Hollow Section.
SLS	Serviceability Limit State. A structure is deemed to satisfy the serviceability ***limit state*** when the constituent elements do not deflect by more than certain limits laid down in the building codes.
SPT	See ***Standard Penetration Tes***t.
SRPC	Sulphate Resisting Portland Cement.
STR	A type of limit state defined in Eurocode practice as the internal failure or deformation of a structure.
STW	Sewage Treatment Works.
SUDS	Sustainable Urban Drainage Systems. The control and treatment of urban and highway water runoff. Government standards, together with existing planning restrictions, make it a top priority for developers and specifiers to install the most effective form of storm water attenuation, so that all new developments collect, treat and re-use storm water where it falls. Part H3 of Building Regulations and PPS 23 Government standards apply.
SWL	See ***Safe Working Load***.
Safe Working Load	See ***Working Load Limit***.
Safe Working Load/Stress	An allowable load/***stress*** which incorporates a ***factor of safety*** i.e. the load which a structure is expected to sustain and for which it is designed.
Scaffolding	Temporary framework used for access.
Scheme	A ***temporary works*** design.
Screed	Usually a thin layer (50-75mm) of sand cement mix used as a topping to floors.
Secant Piles	A line of bored cast in-situ piles whose outer edges interlock
Serviceability Limit State	Often abbreviated to 'SLS'. A condition at which the member or structure is in the verge of ceasing to satisfy the limit state imposed functional requirements. E.g. maximum permitted deflection. ***NOTE:*** *serviceability is usually assessed with a load factor of 1.*
Services	Pipes and cables close to or crossing an excavation e.g. gas/water pipes, electricity cables.
Set Out	To mark out dimensions and levels so work can be carried out to the correct design.
Sewer	Usually a large diameter foul water pipeline.
Sewer Rehabilitation	General term for upgrading existing sewers.
Shackle	Usually refers to a ***quick release*** or ***ground release shackle***, used for placing (**not** extracting) ***piles*** or ***trench sheets***. Sometimes confused with a ***trench sheet extractor***.
Shear	The force in a structural element which is usually perpendicular to the main axis of that element.
Shear Stop	In shoring, a device attached to the ***waling*** that stops the lateral movement of a ***knee brace***.
Shear Strength	The ability of a material to withstand shear ***stress***, or ***stress*** at which a material fails in ***shear***.
Sheet Pile	Rolled steel sections to provide support in excavations. See also ***Larssen pile***.
Sheet Puller	***Trench sheet*** extractor.

Term	***Definition***
Sheeter	See ***Trench Sheet***
Shields	***Drag boxes***, or possibly ***trench boxes***.
Shorco	***Trench box*** (named after Shorco, a shoring company that was bought out by Groundforce in 2004).
Shoring	Temporary support to a structure or an excavation. Also means the equipment used for this process, which can be ***trench sheets***, ***piling, props***, ***struts***, ***hydraulic frames***, ***walers***, ***slide rail***, ***trench boxes***, ***drag boxes*** etc.
Shutter	Typically a timber face to ***formwork*** that is in contact with the concrete. Can also mean a ***manhole*** shutter.
Shuttering	Technically, ***formwork***, however some site personnel use ***shuttering*** to mean trench shoring.
Sill	See ***sole plate***.
Single Acting Manhole Brace	A manhole brace with hydraulic rams that can only be pumped out and not back in, as opposed to ***double acting manhole brace*** that can be pumped out and back in.
Single Frame Solution	Shoring design that uses only one level of ***waling***.
Single-sided Support	***Raking struts***, rails/beams and ***trench sheets*** or ***piles***, used to support the single face of an excavation, which could be a retaining wall, for example.
Site Agent	See ***agent***.
Site Investigation	Process by which information is learnt about soil conditions - can be by drilling.
Skill Saw	Popular term for a circular saw used for cutting timber.
Skin Friction Piles	***Piles***, which rely on the frictional force of the surrounding soil against their sides to bear load.
Slewing	The turning of an excavator or crane superstructure about a vertical axis.
Slewing Zone	The area an excavator cab, counterweight or crane jib covers as it rotates about its vertical axis. Do not stand in this area and always be aware of a machine's slewing zone when working on site.
Slide Rail	A trench shoring system that uses steel frames and panels. Used for deep and wide trenches.
Slimlining	A technique by which a plastic pipe is pulled inside an old pipe to upgrade or 'rehabilitate' it.
Slimshore	A ***prop*** made from ***formwork soldiers***. 'Slimshore' is RMD's proprietary name for their own particular ***formwork soldier prop***.
Slip Circle	A surface of failure in an arc that is assumed will occur in typically in a clay embankment under certain conditions.
Slipforming	Method of pouring high symmetrical structures (e.g. chimneys) with a constantly moving shutter.
Soakaway	A pit into which surface water drains. It may be either empty or filled with large stones and possibly lined, but not sealed. The water then drains away into the ground. See also ***attenuation scheme*** & ***attenuation tank.***
Soap Oil	Used as a lubricant so the concrete does not stick to the shutter. See also ***release agent***.
Soffit	The highest point of the internal surface of a pipe barrel or chamber at any cross-section.
Soffit Formwork	The face contact material and its immediate backing forming the mould for the concrete.
Soffit Level	The highest part of an arch shape (inside of drain or ***sewer***).
Soil Parameters	The numerical measurements of a soils engineering properties.

Term	***Definition***
Soldier	A vertical timber or steel section taking thrust from horizontal sheeting or ***walers*** and supported by ***struts*** across the excavation.
Sole Plate	Timber, concrete or metal spreader used to distribute the load from a standard or ***baseplate*** to the ground.
Spacer Blocks	Blocks tied to reinforcing to give correct cover to a ***shutter***.
Span	The horizontal distance between two supports of a structure. The 'clear' span is the unobstructed distance between the inside surfaces of two supports. The 'effective' span is the distance between the centres of two supports.
Speedform Rod	See **Dywidag Bar.**
Spigot	End part of a pipe which is formed to insert into a socket.
Spillway	A spillway is a structure used to provide for the controlled release of flows from a reservoir dam or levee into a downstream area, typically being the river that was dammed. Spillways release floods so that the water does not overtop and damage or even destroy the dam or reservoir.
Spoil	Excavated material.
Spoil Heap	Excavated material in a heap.
Spreader Beam	A beam suspended from a crane hook which ensures that the load being lifted is suspended vertically, avoiding excessive compressive and bending forces in the load.
Spreader Plate	See ***base plate***.
Springing Level	The level of a pipe barrel midway between soffit and invert.
Stability	The resistance of a structure to sliding, overturning or collapsing.
Standard	Vertical tube or member.
Standard Penetration Test	A penetration test of the in-situ shear strength of a non-cohesive soil. The result is expressed as the number of blows to drive a standard sized tube a given distance into the soil. See also S.P.T. and N value.
Standing Water Level	The level that ***groundwater*** reaches in a hole in the ground left for a few days. Below this level all soil pores are filled with water. Also known as the ***water table***.
Starters/Starter Bars	***Reinforcement*** protruding from a concrete pour to provide continuity to an adjacent pour.
Steel Grade	Classification based on strength and material content.
Stepped Excavation	A method of making safe the side of an excavation so that ground support equipment is not required.
Stihl Saw	Petrol driven saw using carborundum disks for cutting steel and masonry.
Stop Ends	The closure piece at the end of a shutter (or a trench).
Stoppers	Common term for pipe test plugs.
Strata	Layers.
Stratum	Layer.
Stress	The force per unit area on an element of material resulting from a combination of bending, shear, axial or torsion loads
Striking Formwork	To loosen formwork from cured concrete. See also ***curing***.

Term	***Definition***
Stringing Out	The process of placing pipes from a stack or lorry alongside the line of the trench ready for laying.
Strip Shutter	To take down ***shutters*** from a concrete pour once the concrete has cured sufficiently.
Strongback	See ***formwork soldier***.
Strut	A structural element to provide support - always in compression.
Stub Pipe	See ***butt pipe.***
Sub Agent	Person employed by contractor in a position below ***Agent***. Usually more than one Sub Agent would be on site.
Sub Base	Graded, crushed stone, often known as 'Type 1', placed below a concrete slab or tarmac road to provide a foundation.
Sub Contractor	A company that carries out work for the main contractor.
Submerged Density	The apparent density of a submerged material.
Substation	See ***pumping station***.
Sump	A recess at the lowest part of an excavation, in which water is collected for removal.
Sump Pump	A pump set up to draw water from a recess at the lowest part of an excavation.
Super Box	Generic name for a large 4m high ***trench box.***
Super Slim	A ***formwork soldier***. 'Super Slim' is RMD's proprietary name for their own particular ***formwork soldier***.
Superimposed Loads	Linear/area/strip/point to model more specific loading.
Surcharge	1. An applied load on or below the surface of a soil. 2. Condition in which wastewater and/or surface water is held under pressure within a gravity drain or sewer system, but does not escape to the surface to cause flooding.
Surface Water	Water from precipitation, which has not seeped into the ground and which is discharged to the drain or sewer system directly from the ground or from exterior building surfaces.
Surround	See also ***concrete surround***. Aggregate or concrete used to protect and hold in place drainage pipes or manholes.
Surveyor	Person who carries out topographic surveys.
Suspended Slab	Slab that does not rest on the ground i.e. is in an elevated position.
Sway	Horizontal displacement at the top of the ***falsework*** in relation to the bottom, under application of the load.
TBM	Temporary Bench Mark. A level mark for the purpose of setting out. Could be an assumed value or transferred from a true ***bench mark***.
TCR	Total Core Recovery is the amount of rock core (as a percentage) recovered from a rotary drilling core run.
TWC	See ***Temporary Works Co-ordinator***
TWS	See ***Temporary Works Supervisor***
Tamping	The process of compaction, using hand or mechanical means, applied to ***bedding*** and ***backfill*** material around a buried pipeline.

Term	***Definition***
Tapered Piles	Special fabricated ***pile*** to correct a wall of piling that has moved out of vertical.
Temporary Works	Parts of the works that allow or enable construction of, protect, support or provide access to, the permanent works and which might or might not remain in place at the completion of the permanent works. Examples of temporary works are scaffold structures, formwork and falsework, structural propping of existing elements of buildings, cofferdams, earthworks and construction access. Temporary works can also form part of the permanent works.
Temporary Works Design	Related to earthwork support, this is the design for the arrangement of the shoring equipment. Also known as the 'Temporary Works Scheme'.
Temporary Works Co-ordinator	Competent person with responsibility for the co-ordination of all activities related to the ***temporary works.***
Temporary Works Supervisor	Site based competent person with responsibility for enacting the instructions of the ***Temporary Works Co-ordinator*** on site.
Tender	The tender document is the contractors' quote for the cost of the project. It is usually completed by an ***Estimator***.
Tensile Load	'Stretching' force in a member.
Tension Crack	Occurs in ***cohesive soils***. Release of lateral loading (e.g. from drying out) to form vertical cracks or fissures which can fill with surface water.
Terram	The most popular ***geo-textile*** Looks like a grey blanket.
Test Pit	See ***trial hole/trial pit.***
Theodolite	A surveying instrument for measuring angles.
Three Sixty Machine	An excavator whose dipper arm can swing through 360º As opposed to a JCB 3C type machine that can only swing through 180º.
Thro' Tie	See ***Dywidag Bar.***
Thrust Block	A heavy anchorage e.g. concrete block, to prevent movement.
Thrust Pit	A working shaft at the start of a ***pipe-jacking*** or ***micro tunnelling*** job, from which the muck is extracted and the pipes inserted.
Thrustbore	A technique of installing a pipe underground by pushing pipes into the ground and removing the soil with an ***auger***.
Tie	Member in tension. See also ***thro' tie***, ***tie rod*** and ***tie bar***.
Tie Rod or Tie Bar (Groundwork)	A steel rod connecting a ***waling*** to a restraining member outside the excavation (e.g. anchor pile) to restrain the applied ground pressures
Tie Rod or Tie Bar (Formwork)	A steel rod connecting two opposite faces of wall ***formwork*** to restrain the applied concrete pressures.
Timber Insert	***Shutter*** beam - literally, the timber part of the ***shutter*** beam.
Toe-in	The length of ***pile*** or ***trench sheet*** driven below ***formation level***.
Tolerance	The variance from a specification allowed e.g. the thickness of plaster on a wall should be 13mm ± 2mm i.e. 2mm is the tolerance.
Top Restraint	Method by which the stability of ***falsework*** is provided by the surrounding permanent works or specifically designed ***temporary works***.
Total Stress (Soil Condition)	Total ***stress*** = ***effective stress*** plus pore water pressure. Associated with ***cohesive soils***. Initial soil parameters taken to be ***cohesive*** before ***pore water*** drains away whereby ***cohesion*** reduces with time. See ***effective stress***.

Term	***Definition***
Tower	Tall composite structure, used principally to carry vertical loading.
Trail Hole/Trial Pit	A small excavation to investigate soil and water conditions. Method used when no ***borehole logs*** exist.
Trench Box	A steel box used in trench work to provide ground support.
Trench Liners/Linings	See ***Trench boxes*** or ***slide rail***.
Trench Sheet	Light steel section used to support the sides of trenches and excavations. On site, may also be called a ***trench sheeter*** or a ***pile***.
Trench Sheet Extractor	Purpose made ***shackle*** used for extracting ***trench sheets***. Not to be used for ***pitching*** sheets.
Trench Sheeter	See ***trench sheet***.
Trenchless Technology	See **no dig** techniques.
Tri-Shore	Push-Pull ***prop*** made by RMD.
Tube & Fitting	The most common form of ***scaffolding***.
Tubosider	Corrugated steel pipe used as a storm water ***attenuation tank***. The word 'Tubosider' is a company name. See www.tubosider.co.uk for more details.
Tuff Tie	See ***Dywidag Bar.***
UB	See ***universal beam***.
UC	See ***universal column***.
UID	Unsatisfactory Intermittent Discharges (of sewage and storm water combined). Occurs when the drainage system cannot cope with the volume of water entering it. The term U.I.D. is often used to refer to the construction work required to remedy these occurrences, which may be the replacement of the ***CSO chamber***.
Ultimate Limit State	Usually abbreviated to ULS. A condition at which a member or structure is in a state of incipient collapse.
Ultimate Stress	The ***stress*** at which a material will fail.
Undrained	A state in cohesive soil where porewater is confined between soil particles and a change in loading results in a change in porewater pressure as the porewater cannot drain in the short term. The strength of an undrained soil is governed by total stress parameters (see total stress).
Undrained shear strength	Defines the strength of a clay soil usually measured in an undrained triaxial test on a soil sample (symbol - Cu)
Universal Beam	A standard shape of rolled steel beam.
Universal Column	A standard shape of rolled steel column.
U-profile	Refers to a type of ***sheet pile*** section, as opposed to a 'Z section'. See also ***Larssen pile***.
Upstand	In ***shoring***, that section of a line of ***trench sheets*** standing a half a metre or a metre above ground, which serves the purpose of preventing objects falling into the excavation and providing a base for ***edge protection***.
Utilities	Gas, electric, water & telephones - contractors who undertake the work involved in laying these services.

Term	***Definition***
Vibrating Hammer	A ***piling hammer*** with a vibrating motor. Vibrations are transferred to the ***piles*** or ***trench sheets*** and the soil, and this combined with the weight of the hammer, and the ***pile***, forces the ***pile*** into the ground. The machine is relatively quiet compared to an ***impact hammer*** and is particularly appropriate for piling in ***non-cohesive*** soils. Vibrating hammers do not work well in ***cohesive soils***, however.
Vibrator	Vibrating tool used for compacting concrete. See ***poke***r.
Vibro	See ***vibrating hammer***.
Visqueen	Trade name for large rolls of polythene to be used as 'Damp Proof Membrane'. See ***D.P.M.***
Void	An open, empty space. Usually used to refer to gaps left behind trench supports during installation - a practice that should be avoided.
Volume Bucket	Hand pump used for hydraulic ***walers*** or ***braces***.
WAHR	The *Work at Height Regulations 2005*.
WLL	Working Load Limit. The maximum load which may be applied to a given product or component.
WTW	Water Treatment Works
Waler	A horizontal support used to retain a ***sheet piled*** wall or ***trench sheets*** in an excavation.
Walings	Horizontal beams supporting the ***trench sheets*** or ***piles*** along the side of an excavation. Usually used in pairs.
Wall Friction	The friction between the surface of a wall and a cohesionless soil
Washer & Wing Nut	Tie plate & wing nut. Normally combined into one unit
Water Bar	PVC strip, usually 200mm wide, placed in joints or behind joints on 'water retaining structures' to make joints waterproof.
Water Retaining Structures	Usually referred to as concrete structures that retain water e.g. a reservoir. The concrete and joints have to be of a high standard to prevent leaks.
Water Stop	See ***water bar.***
Water Table	A term used to describe the level of ***groundwater***. The level below which the ground is saturated with water.
Water Test	A test carried out to check pipes if have been laid correctly. The pipeline is filled with water and the level in the feeder pipe is monitored for leaks.
Wearing Course	Top course on a tarmac road usually about 50mm thick.
Weil's Disease	Acute form of leptospirosis infection, which results in jaundice. Leptospirosis is usually caused by contact with stagnant or slow water, contaminated with rat urine. Ponds, lakes, canals, sewers and construction sites can all harbour a source of infection. Mild symptoms of leptospirosis are similar to a cold, flu or stomach bug, but in some cases this can develop into Weil's disease, which can lead to organ failure and death. People working on sites, or visiting sites are therefore at risk from leptospirosis and Weil's disease and if they develop flu-like symptoms should advise their GP that they visit construction sites.
Well pointing	A system of wells sunk into the ground to enable ***dewatering***. Water is pumped from the wells and the groundwater level is lowered over the area.
Whirly Bar	See ***Dywidag bar***.
Whirly Bar Nuts	Wing Nuts

Term	***Definition***
Working Load	Is the maximum weight or load that a piece of equipment is designed to withstand in Limit (WLL) service (or unfactored) conditions. ***NOTE:*** *this has replaced the term* ***Safe Working Load*** *or* ***SWL****.*
Yield Stress	The stress beyond which a material deforms in a non-elastic (plastic) manner.
Youngman	A wide plank used for access, usually on scaffolding. It is strengthened by a tensioned wire
Z profile/Z Pile	Describes a type of ***sheet pile****.* See also ***Larssen pile***.