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Patents

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Revision 7 (20.08.10)

Auger Cleaner
(Applies to: CFA)

Description
The tool includes a central shaft on which are mounted a number of removal radially projecting elements in a helical formation. The elements may take the form of blades, cutting tools, digging tools or brushes. In use, the tool is rotated as the auger is withdrawn from the ground, with the elements passing between adjacent flights, so removing any locked-in soil. Rotation of the tool, by a mechanical linkage or by an independent electric or hydraulic motor and is synchronized with the rotation and the lifting of the auger.

Advantage
Allows the auger to be cleaned without continuous rotation upon extraction.

Country:	Patent Number:
UK	2332689
USA	6189681

Withers & Rogers LLP

CEMCLEAN2 Auger Cleaner
(Applies to: CFA)

Description
An auger cleaner device has a number of cleaning elements mounted on a conveyer which forms an endless path about which the cleaning elements move. The tips of the cleaning elements are able to move relative to its point of attachment on the conveyor and are mounted so as to project substantially 90° to the plane of the conveyor. The radius of the curvature at the ends of the conveyor is small enough to sure that cleaning elements can enter the appropriate flight hole in the auger to be cleaned.

Country:	Patent Number:
UK	2414998

Withers & Rogers LLP

AUTO-CFA® (Computer Controlled Penetration & Extraction System)
(Applies to: CFA)

Description
A flight auger rig uses an auger to penetrate the ground and then withdraw while concrete flow to the auger tip is controlled so that sufficient concrete is supplied to keep at least the auger tip immersed in concrete. Flow control and measuring involve an electronic computer fed with data relating to ground conditions derived e.g. from speed, penetration and torque during boring, auger geometry, and subsequent withdrawal rate.

Advantage
Penetration parameters relative to ground conditions are balanced giving improved digging efficiency, reduced soil disturbance, improved skin friction and reduced concrete vol. requirement. Auger advance can be advantageously arrested for soil shearing around the bore wall. Auger sticking can be eliminated.

Country:	Patent Number:
UK	2303868
UK (Div)	2328700
USA	6116819
Europe (Ireland)	0842329

Withers & Rogers LLP

Automatic Load Testing
(Applies to: Testing)

Description
The method of testing the static load-bearing capacity of a pile involves a test load being applied to the top of the pile by way of a jack braced against a reaction member. The magnitude of the test load is determined by a measuring device and communicated to an electronic computer. The resulting displacement of the pile is measured by at least one displacement sensor and communicated to the electronic computer. The electronic computer issues control signals to the jack in response to the measured magnitude of the test load so as to apply a predetermined regime of test loads to the top of the pile. The magnitude of the test load is determined by an electronic load cell.

Advantage
Reduces the risk of errors being introduced into the data by manual analysis.

Country:	Patent Number:
UK	2323174
Ireland	1007793
US	6311567

Withers & Rogers LLP

Capping Beam (CEMRAILBEAM®)
(Applies to: Secant Rotary CFA)

Description
A precast capping beam element comprises a parallel pair of concrete retaining panels connected together by reinforcing rods cast into both panels and projecting into the space therebetween. One panel may be larger than the other. A method is also disclosed for forming a capping beam of a pile wall by placing the capping beam element over a line of piles so that the reinforcing rods of the piles project into the space, and filling the space with concrete.

Patent Name: Pile wall capping - Beam capping.

Country:	Patent Number:
UK	2356647
Ireland	EP1103663

Withers & Rogers LLP

Capping Beam Formers
(Applies to: Secant Rotary CFA)

Description
A method and apparatus for forming a capping beam across two or more cast-in-situ piles, wherein a precast or preformed guide wall structure having holes for receiving and guiding a piling auger is placed into an excavation, forming a number of cast-in-situ piles by applying a piling auger to the ground through the holes in the guide wall structure, removing the guide wall structure and filling the excavation with concrete so as to form a capping beam. This results in much improved construction times, since it is not necessary to remove excess hardened concrete before forming the capping beam, and also results in less waste, since the guide wall structure can be reused.

Patent Name: Guide wall structure and use thereof in joining a capping beam across a plurality of piles - Capping beam formers.

Country:	Patent Number:
UK	2349395
Europe (SE, FR, NL)	1090189
Germany	60002810

Withers & Rogers LLP

Cast-in-Situ Enlarged Pile Head (Precast)
(Applies to: Driven precast)

Description
Disclosed is a method of installing a pre-cast concrete pile in the ground, which involves applying an enlarged head forming tool, which has a central aperture, which is attached to the hammer and driven into the ground to form a void. The pile is driven into the ground to a pre-determined depth below the void, through the void forming tool. Before the void is filled with concrete or grout a number of reinforcement bars can be dowelled into the pile such that they extend into the void thereby strengthening the head once cast.

Country:	Patent Number:
USA	6641333

Withers & Rogers LLP

Cemloc®-IM (Monitoring Element Placement)

(Applies to: Piling using Cemloc®-IM)

Description

A method of measuring the difference in alignment between a first plan position of an element and a second plan position of an element. The method comprises the use of: i) at least one rigid or taut connection extending between a first point at the level of the first plan position and a second point at the level of the second plan position, the first and second points being at an identical displacement from the element; and ii) one or more electrolevel gauges provided on the or each rigid or taut connection, so as to measure the inclination of the rigid or taut connection. A system is also disclosed for positioning an element within a borehole to adjust its alignment using upper and lower positioning means.

Country:	Patent Number:
UK	2399413
Europe	In Application Publication No: 1604068: 04718348.8
US	7530176

Withers & Rogers LLP

Cemloc®-VL (Placing Elements in Piles)

(Applies to: Piling using Cemloc®-VL)

Description

An apparatus and method for placing an element, such as a steel column or concrete section, into a pile shaft during top-down construction techniques. The apparatus is provided with an upper and lower positioning means which allow the plan position of the element at upper and lower levels respectively to be adjusted. The advantage of the invention is that the positioning means are joined by means of a non-rigid connection which allows the length of the apparatus to be adjusted so as to suit the specific requirements of a particular operation.

Country:	Patent Number:
UK	2399376
Europe (AT, BE, BG, CY, CZ, DE, DK, ES, FI, FR, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SK, SI, ES, SE, CH/LI, TR and GB)	In Application - Application No. 04718335.5
US	7484913

Withers & Rogers LLP

Cemspot
(Applies to: CFA Rotary Driven)

Description
The method involves using a vehicle or rig, and at least three reflective targets disposed at various locations. Provided with the vehicle is an optical transmitter/receiver, a computer which calculates the position of the receiver/transmitter relative to the three targets, and a remote sensor device having a reflective target, a tilt sensor, and a level sensor.
Light from the receiver/transmitter is transmitted to the three targets and reflected light is analysed. The position of the pile is then determined relative to the transmitter/receiver by the remote sensor device.

Advantage
Setting out with steel pegs is no longer required since position of pile or process tip is determinable at any preselected time. Can allow position of transmitter/receiver to be determined to within 5mm.

Country:	Patent Number:
UK	2301185
Hong Kong	1011152

Withers & Rogers LLP

CEMSTAND

Description
A stand for supporting a pile foundation auger in storage when disconnected from a drilling rig

Country:	Patent Number:
UK	In Application no: 1001382.9

Withers & Rogers Attorneys ref P750007

CFA-LC® (Continuous Flight Auger Low Cut-off)
(Applies to: CFA)

Description
A method of forming piles with a pile top level below ground level. The insertion of a casing into the ground so that the base of the casing is just below the desired pile top level, and the subsequent insertion of a continuous flight auger through the casing to form a pile below this point by boring and injecting concrete in the conventional way. If required reinforcement may be inserted into the concrete prior to the stage of filling the bore above the pile with soil. Further a means to trap material on the auger when it is being withdrawn above the pile top is described. This consists of a closure such as a rotating plate or hinged flaps at its lower end whereby the soil within the auger is trapped within the auger. The reinforcement being subsequently introduced through the casing. Where no reinforcement is required, the injection of concrete may be halted and

the rotation of the auger reversed once the pile has been formed to the desired pile top level, in order to backfill the hole above the pile top with soil during withdrawal of the auger. The casing may be removed together with or subsequent to the auger.

Patent Name: Pile forming below surface.

Country:	Patent Number:
UK	2356659

Withers & Rogers LLP

CFA-PL® (CFA using Permanent Liners)
(Applies to: CFA)

Description
A pile is constructed by boring into the soil with a continuous flight auger and inserting into the soil a liner which is held against rotation as the auger is rotated. The liner is coupled at its top end to the auger for lowering through the soil and uncoupled there from at ground level, thus allowing the auger to be removed whilst pumping concrete through the hollow shaft to form the pile. The liner can consist of a liner extension and a main liner which are separated from each other during removal of the auger. The liner and auger can be coupled using a device including a ring bearing mounted on the top of the liner and a means of locking the coupling device to the auger, which can be in the form of a pin and corresponding holes.

Patent Name: Forming piles using CFA and a Permanent Casing/Liner.

Country:	Patent Number:
UK	2358211

Withers & Rogers LLP

CFA-TC® (CFA using Temporary Casing)
(Applies to: CFA)

Description
A method is for forming piles through soil having an unstable upper layer. This is achieved by having a casing that can be coupled and uncoupled from an auger. The coupling arrangement is such that the casing does not rotate with the auger but rather is restrained to move along a straight line. Thus, during initial drilling the auger and casing are coupled together. This means that the casing is pushed into the soil until it has travelled through the unstable layer. The auger is then stopped and the casing uncoupled from the auger which is then allowed to complete the drilling to the required depth. Concrete is then pumped through the hollow shaft of the auger as the auger is removed. When the auger reaches the point where it had been disengaged from the casing, pumping of concrete is stopped and the casing is reengaged with the auger. Withdrawal of the auger and pumping of the concrete is then restarted.

Patent Name: Forming piles using CFA and a Temporary Casing.

Country:	Patent Number:
UK	2355750

Withers & Rogers LLP

Composite CFA Piling (Bigfoot)
(Applies to: CFA)

Description
A method of forming a cast-in-situ pile having a shaft, and a base of greater cross-sectional area than the shaft, by using an auger. The auger is first bored into the ground until its tip reaches a given depth. The auger is then lifted by a predetermined distance while concrete or grout is supplied to the tip, whilst still rotating in the forward digging direction, so as to form the base of the pile. The auger is then backscrewed out of the ground while continuing to supply concrete or grout to the tip so as to form a shaft of smaller cross sectional area that the base of the pile.

Country:	Patent Number:
UK	2345715

Withers & Rogers LLP

Composite Pile-Soil Element: Construction and Design of Foundation Elements (Pile Groups)
(Applies to: CFA)

Description
A method of designing and forming a foundation element involves consideration of the interaction of a concrete pile with an associated volume of earth material. Factors considered include the degree of disturbance of the soil at the soil/pile interface, the separation of the piles, and the shape of the piles; all of which can effect skin friction. Foundation elements are described where piles are formed with ribs, and where piles are placed relatively close together such that the entrained soil contributes to the bearing capacity of the foundation element,

Country:	Patent Number:
Europe (AT, BE, CH/LI, DK, ES, FR, UK, GR, IE, IT, LU, MC, NL, PT, SE, FI, CY, TR, BG, CZ, EE, HU, SI, SK, DE)	In Application: 03700872.9

Withers & Rogers LLP

Crowd Force
(Applies to: CFA)

Description
A pile drilling rig for forming cast-in-situ piles by means of a continuous flight auger, includes a platform, which is movable up and down a mast and on which is mounted an auger driving unit. There is also a crowd mechanism for applying a crowd (downward) force to the platform, the crowd mechanism being mounted on the platform and including mast gripping means and force application means for exerting a force between the mast gripping means and the platform (i.e. the auger). Preferably the force application and mast gripping means are operated by a hydraulic ram and an interlock, for example a limit switch, may also be provided.

Patent Name: Applying crowd force in piling rigs - Crowd force.

Country:	Patent Number:
UK	2362912

Withers & Rogers LLP

Earth Boring Apparatus

Description
The present application describes earth boring tools having a cutting means for enlarging a portion of an underground shaft. The tool may be provided with means to control the rate at which the cutting means is operable to perform a cutting action on the walls of the bore. The cutting means may be provided on one or more digging arms of the tool and means may be provided for controlling the extent of the radial projection of the digging arm from the tool.
A detachable base plate is also described.

Country:	Patent Number:
UK	In Application: 0622068.5

Withers & Rogers LLP

Enhanced Capacity Rotary
(Applies to: CFA)

Description
The continuous flight piling auger includes a retractable element which may be extended beyond the circumference of the flight of the auger. In use the auger is rotated and allowed to penetrate the ground so as to define a bore hole. The retractable element is extended so as to cut or displace a region of soil surrounding the auger thus forming a void, and the auger is withdrawn whilst concrete is supplied to the auger tip, so as to fill the bore hole and the void.

Patent name: Capacity Enhancement Tool.

Advantage
Significantly reduces length of pile required to bear a given load. Integrity of completed pile is not reduced because borehole walls are not disturbed.

Country:	Patent Number:
UK	2316700

Withers & Rogers LLP

Enhanced CFA (Submarine Fin)
(Applies to: Piling)

Description
The device has a tapered collar, with a generally conical configuration, adapted to be releasable fitted to a lower end of a piling tool. The device is attached by sliders adapted to engage recesses provided in the auger flight. The underside of the collar is tapered and has cutting tools. The piling auger comprises of a screw thread formed on a central shaft that forms the auger flight. At the base of the auger, a fixed mounted element that extends beyond the flight of the auger. This has the effect of sweeping a volume of soil bore away during first insertion of the piling auger. As the auger is retracted, a second volume is swept away that has a greater volume than the first thus forming a helical grout/concrete projection.
An INDEPENDENT CLAIM is included for a method of forming a cast-in-situ pile.

Use
Piling auger for use in the formation of foundation piles. The device is designed to be used for enlarging the head of cast-in-situ piles.

Advantage
The taper of the underside of the collar results in less concrete or grout being required. The auger enables the formation of a concrete or grout projection without disturbing the surrounding or underlying soil.

Country:	Patent Number:
UK	2348654
Europe (Germany, Ireland, Netherlands, Sweden)	1169519

Withers & Rogers LLP

Enlarged Pile Head Forming
(Applies to: CFA Driven cast-in-situ)

Description
A method of forming a cast-in-situ pile with a enlarged head comprises using a piling tool with a collar releasably attached to the lower end of the piling tool. The piling tool and collar are driven to a first depth to form a frustoconical depression. The collar is released from the piling tool which is then driven to the required depth; the piling tool passes freely through a central aperture of the collar which remains at the first depth. The piling tool is then withdrawn, and concrete or grout is supplied to the lower end of the piling tool so as to form a cast-in-situ pile. When the lower end of the piling tool

again reaches the first depth, the collar is lifted from the ground and concrete or grout is supplied into the void left thereby so as to form a pile with an enlarged head. Alternatively, the collar could be releasably attached to a continuous flight auger. For CFA piling applications, the collar is initially rotated with the auger, and is provided with one or more cutting tools on its lower surface which are adapted to cut into the soil. The collar may be tapered, as before, or may have a substantially flat lower surface. The piling tool passes freely through a central aperture of the collar which remains at the first depth and the pile is constructed as described above.

Country:	Patent Number:
UK (CFA)	2363152
UK (DCIS)	2334543
Ireland	083774
USA	6168350

Withers & Rogers LLP

Geothermal Foundations

Description
The present application relates to techniques for installing a fluid circulation means, such as geothermal pipe-work, in a foundation element such as a concrete pile. The techniques utilise a coupling means which allows a longitudinal installation member to be coupled to the fluid circulation means and plunged into wet concrete so as to install the fluid circulation means to a required depth. The disclosed techniques are particularly useful for forming geothermal piles utilising CFA piling techniques.

Country	Patent Number:
UK	Application no. 0606293.9
Ireland	Application no. 2007/0192

LightStop™

Description
The present invention relates a safety system for a drilling rig. An optoelectronic boundary delimits a safety zone remote from the drill at a distance which is considered to provide a degree of operator safety when the drill is in operation. In use, the safety system is intended to detect operator movement across the optoelectronic boundary and generate a cut-off signal to immobilise operation of the drill in response thereto.

Country:	Patent Number:
UK	In Application: 1006594.4

Withers & Rogers LLP

Lime Encased Soil Nails

Description
A method of reinforcing a soft clay soil comprising the steps of boring at least one hole in the soil, introducing a nail bar into the hole, and filling the space between the nail bar and the sides of the hole with lime.

Country:	Patent Number:
UK	2289078

Withers & Rogers LLP

Millennium Pile
(Applies to: Piling in soft soils)

Description
A method and apparatus for installing a load bearing pile or column in the ground wherein a non-percussive force is applied to the top of a hole-forming tool or pile so as to push the tool or pile in a substantially continuous motion to a first depth. The tool or pile is then pushed in a non-percussive manner to a second depth whilst being simultaneously rotated. The magnitude and direction of the applied force and the rotation may be monitored and controlled by electronic computer means. The rotation may be continuous in either direction and/or back and forth. The non-percussive rotational force may be applied using a ram, where the ram may be used in conjunction with a suspended weight and/or a winch arrangement and/or a vibrator. ln a further method concrete or grout may be pumped along or through the body of the hole forming tool to form a cast in situ pile. The hole forming tool may be provided with fins so that soil is displaced as the tool rotates. The rate of rotation and/or withdrawal of the hole forming tool may be controlled as a function of concrete or grout flow.

Patent Name: Improved methods and apparatus for boring and piling – Millennium.

Country:	Patent Number:
UK	2331318
UK (Div)	2354276
International	PCT/GB98/03419

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Pile Boring Tools (Digging Buckets)
(Applies to: Large diameter rotary)

Description
The boring apparatus comprises a hollow vessel with a fixed base and a rotatable base. The rotatable base is provided, at its circumference, with at least one side cutter which is rotatable with the rotatable base. The cutter rotates from a first position, in which the side cutter serves to cover a respective opening provided in the vessel wall, to a second position, in which the opening in the vessel wall is exposed. The apparatus has further cutters on the lower side of the rotatable base. A method of excavating ground material is also described. The side cutter(s) provide accurate dimensioning of the hole and contain soil in the vessel when it is lifted. A method of excavating ground material is also described.

Country:	Patent Number:
UK	2373801
Ireland	1394352
USA	6739412

Withers & Rogers LLP

Pile Testing with Hydraulic Cylinder
(Applies to: Testing)

Description
A concrete structural foundation element, such as a pile, includes a load bearing capacity testing means comprising two sets of reinforcing columns embedded respectively in upper and lower portions of the element and a jacking means, having a small transverse cross section, forming a coupling between the two sets of reinforcing columns. The jacking means may include a number of small diameter hydraulic jacks or cylinders. Also a means for promoting a break between the upper and lower portions of the pile may be included such as a blade connected to a twisted bar. In an embodiment hydraulic fluid is fed to the hydraulic cylinders of the jack via a channel in the reinforcing column and the pile includes cage sections connected to the reinforcing columns. The movement of the cylinders can be measured by extensometers fixed to the cage. The concrete element can be split by applying a load via the jacks once it has gained sufficient strength.

Patent Name: Testing foundation load bearing capacity - Pile testing with hydraulic cylinder.

Country:	Patent Number:
UK	2363153

Withers & Rogers LLP

Reamer for Pile Shaft (ECR Enhanced Capacity Rotary)
(Applies to: Small diameter rotary)

Description
An Under-reaming tool has a collecting mechanism with an adjustable size to allow a spoil volume, which may be accommodated by the collecting mechanism, to be varied. An under-reaming tool comprises a cylindrical body portion that defines an axis of rotation; a blade for performing a cutting action on surrounding ground material when the tool is rotated about the axis of rotation; and a collecting mechanism attached to, or forming part of the cylindrical body portion. The collecting mechanism is located below the blade such that, in use, spoil generated by the blade is collected. The size of the collecting mechanism is adjustable to allow the spoil volume accommodated by the collecting mechanism to be varied.

Use
For enlarging a portion of an underground shaft.

Advantage
The tool preferably allows a ream to be constructed in an underground pile shaft in a single operation. By choosing the optimum size of the collecting mechanism, by consideration of, for e.g., the soil characteristics, the spoil can advantageously be accommodated in the collecting mechanism. The adjustability of the collecting mechanism, allows the position of the ream to be determined without being restricted by the dimensions of the collecting mechanism.

Country:	Patent Number:
UK	2372056
Europe (IE)	1444404
International (EP, US)	PCT/GB02/00136
USA	6854536

Withers & Rogers LLP

Removable Anchors
(Applies to: Ground Anchors)

Description
A removable anchor has a fixed length formed from a rigid threaded bar having a non-stick surface. The bar may be solid or hollow and can have a left-hand machine thread. The fixed length can be coupled to a free length by couplers having a thread opposite to that on the fixed length. The free length can be formed from at least one steel strand.

Patent Name: Grouted mechanical anchors - Removable anchors.

Country:	Patent Number:
UK	2360047

Withers & Rogers LLP

Rotary Pile Boring Rigs (Low Headroom Rig)

(Applies to: Rotary LHR)

Description

The present invention relates to a method and apparatus for forming a hole in the ground particularly in areas of restricted headroom. A hole-forming tool comprising an auger mounted inside a longitudinal casing is described in which the tool is provided with a means to exert a downward crowd force to the top of the auger. The tool is also configured such that the auger may rotate independently of the casing. The present invention allows a hole to be formed in a number of incremental stages and excavated soil is retained within the casing and after the tool is withdrawn from the hole, can be discharged by back screwing the auger.

Country:	Patent Number:
UK	2365037

Withers & Rogers LLP

Steering Teeth

(Applies to: Diaphragm Walling)

Description

A method of excavating soil from the ground to form a hole or trench, the method comprising of steps of i) applying to the ground an excavation tool have a plurality of excavation members; and ii) causing the plurality of excavation members to penetrate the ground in order that the soil may be excavated, wherein the direction of the excavation of the tool may be adjusted by the use of one or more steering members, the steering member comprising a steering element which is disposed, or is operable to be disposed, such that the initial point of contact of the steering element with the ground allows the direction of the excavation to be adjusted. The method also includes a method of monitoring the direction of the tool by measuring the plan position and or the inclination of the tool so that the direction of the excavation of the tool is adjusted in response to detecting a deviation in plan position or verticality of the tool.

Country:	Patent Number:
UK	2417942
US	In Application: 11/574866

Withers & Rogers LLP

Telescopic Extension (Telly Kelly)
(Applies to: CFA)

Description
A Continuous Flight Auger (CFA) comprises a hollow shaft having a continuous main helical blade around it. An extension shaft is attached to its top end, including a floating helical blade with the same pitch as the main blade, the surface of said extension blade overlapingly engaged with the surface of the main blade. The extension shaft may be fixed to the end of the main shaft of the auger, and the floating blade is movable between a position in which it is fully overlapingly engaged with the main blade and a position in which it is extends over the full length of the extension shaft. Alternatively, the extension shaft may be telescopically mounted in the main shaft of the auger. There may be a plurality of telescopically mounted extension shafts and a plurality of floating helical blades. The floating helical blade may be directly coupled to the rotary table of the rig, or to an auxiliary element which is rotatably coupled to the rotary table of the rig.
Patent Name: Pile forming - Telescopic extension.

Country:	Patent Number:
UK	2362665

Withers & Rogers LLP

Under-ream Tool
(Applies to: Diaphragm Walling)

Description
A device for recovering a detachable base of a soil working tool from the bottom of a hole, the device comprising a releasable clamping tool which is adapted to engage a pin formed on the base when the clamping tool is lowered on to the base. The invention also relates to a detachable base per se, and a method of operating a soil working tool including clamping and withdrawal of the detachable base form a bore hole by means of a clamping tool.

Country:	Patent Number:
UK	In Application: 0804136.0

Withers & Rogers LLP

Under-reamed Diaphragm Walls
(Applies to: Diaphragm Walling)

Description
A method of stabilising soil is disclosed comprising a diaphragm wall whose lower end is anchored in an under-reamed cavity filled with concrete, together with an under-reaming tool for constructing the cavity. The under-reaming tool comprises a hydraulically operated, circular cutting tool mounted on the end of a supporting arm. The supporting arm pivots about the end of a long positioning arm by means of a hydraulic arm acting on a plate fixed to the supporting arm in the same plane as its pivotal movement.

Country:	Patent Number:
UK	2351752
Europe (Ireland)	EP1109973
International	PCT/GB00/02507

Withers & Rogers LLP

Waterbar (Hydrophilic Waterbar for Diaphragm walls)
(Applies to: Diaphragm Walling)

Description
A waterbar for use between adjacent panels in a diaphragm wall, the waterbar comprising a first member in the form of an elongate strip provided along a first longitudinal edge with a hydrophilic material and along the opposite longitudinal edge with a retaining channel, and a second member in the form of an elongate strip provided along a first longitudinal edge with a hydrophilic material and along the opposite longitudinal edge with a keying projection. The retaining channel of the first member is shaped so as to slidably retain the keying projection of the second member, and either the retaining channel or the keying projection is provided along its length with a hydrophilic material, which serves to seal the joint between the first and second members. The first member is installed when casting the first of the adjacent panels of the diaphragm wall, whereas the second member is installed when casting the second of the adjacent panels. In this way, prolonged exposure of the hydrophilic material to water during installation is reduced, and the integrity of the joint is improved.

Patent Name: Hydrophilic waterbar for diaphragm wall joints - Waterbar.

Country:	Patent Number:
UK	2325262
Europe (Ireland)	0981672
USA	6276106
International (CA, US, EP)	PCT/GB98/01351
India	*In Application: 1234/Del/98

Withers & Rogers LLP

Waterstop System

(Applies to: Diaphragm Walling)

Description

A method of installing a waterstop for resisting the flow of water along the interface between adjacent foundations involves using a waterstop formed from longitudinal strips of hydrophilic material. To install the waterstop a bore is excavated near each of the foundation elements and the waterstop is lowered into the bore such that it extends vertically from the top to the bottom of the bore. Concrete is then pumped into the bore to form a secondary foundation element and this acts to push the waterstop towards the adjacent foundation elements thus forming a seal. The strips of hydrophilic material forming the waterstop may be supported by a geotextile material.

Use

For installing waterstop to foundation element.

Advantage

Prevents or restricts water flow across joints of foundation elements.

Country:	Patent Number:
UK	2371069
USA	6739805

Withers & Rogers LLP