DEEP FOUNDATIONS | SHORING | GROUND IMPROVEMENT

BERKEL

SINCE1959

100% EMPLOYEE OWNED | An ESOP Company

Berkel & Company Contractors has provided service to our customers since 1959.

We are a 100% ESOP/Employee-owned company. The Berkel Employee Stock Ownership Plan (ESOP) started years before most companies considered the concept. With employees participating in the ownership of the company, they have a vested interest in the organization and work hard to continue the legacy of exceeding customers' expectations through quality and innovation.

Berkel and Company Contractors, Inc. was incorporated in the State of Kansas on September 21, 1959 by Charles J. Berkel for the purpose of performing specialty foundation work throughout the continental United States. Mr. Berkel's prior experience was with Intrusion-Prepakt starting in 1947. While at Intrusion-Prepakt, he was the project engineer for the first commercial project in the U.S. that was supported on APG piles. Since its founding in 1959, Berkel has grown to become one of the largest piling contractors in the U.S. Our work consists of specialized foundation and construction services such as installing Auger Pressure Grouted (APG) piles and Auger Pressure Grouted Displacement (APGD) piles, Shoring and Earth Retention and Ground Improvement and Stabilization.

From International Olympians to U.S. Presidents, most people at some point in their life have set foot on a Berkel foundation. The company's entrepreneurial spirit and employee-driven passion for exceeding customers' expectations have made Berkel the leader in the deep foundation industry. This continued success is rooted in its people, who strive each and every day to make Berkel the best at what it does. Projects include many stadiums throughout the country, the Pentagon, the World Trade Center site, entertainment venues, hotel resorts, casinos, power plants, and high-rise buildings in almost every major city in the United States.

The world's largest and most successful engineering firms and contractors continue to partner with Berkel to ensure safety and high quality of work for each project. State of the art equipment and processes are a key competitive advantage for Berkel and the organization currently holds several patents. The majority of equipment used by Berkel is invented and manufactured in-house. With this expertise, the equipment can be quickly replaced or repaired giving the company an edge over competitors.

In addition to the corporate headquarters in Kansas City, regional offices are located in Atlanta, Baltimore/D.C., Houston, Louisville, Orlando and San Francisco. Outside of the United States, Berkel is involved with a number of projects in the Caribbean and continues to expand its growth globally.

Berkel takes great pride in giving back to the community. Most people never see the superior work of Berkel because it is well beneath the ground. Like the nature of its work, Berkel supports the community by quietly providing a strong foundation to a number of charitable and nonprofit organizations.

BERKEL DESIGN / BUILD

BERKEL REGIONAL OFFICE LOCATIONS

Berkel has seven regional offices through which it contracts to provide deep foundation, ground improvement, earth retention, shoring and underpinning services. The engineering group provides guidance and support to the regional offices in the pursuit and execution of projects in these areas. This includes technical support to project teams during budgetary phases, analysis and design of Berkel products for project application and full project design documentation and drawing/plan submittal. The group also leads Berkel's technical marketing directed to client-specific and general industry events.

GROUP CAPABILITIES

Structural Modeling

- Determine foundation loads and optimum foundation systems

Geotechnical Site Characterization

- Evaluate project conditions for suitability for Berkel's various deep foundation and ground improvement systems
- Develop and supervise geotechnical site characterizations

Deep Foundation and Ground Improvement Analysis and Design

- Extensive database of deep foundation and ground improvement performance across North America
- Numerous in-house developed software applications
- Commercially available software for analysis of structural pile design, lateral and axial pile and group performance, pile and group settlement, liquefaction potential, slope stability analysis and Building Information Modeling (BIM).
- Direct test foundation installations and produce final designs of deep foundation and ground improvement systems for production installation

Berkel's engineers are licensed to provide design-build Professional Engineering services in almost all states. Contact the Engineering Group at 770-941-5100 (Atlanta, GA) or 717-993-8512 (Stewartstown, PA)

AUGER PRESSURE GROUTED PILING






Auger Pressure Grouted (APG) piles are a specific system within the industry-termed Auger Cast-in-Place (ACIP) pile family (also referred to as Auger Cast Piles or Augercast Piles). APG piles are constructed by advancing a hollow-stem continuous flight auger into the ground and pumping grout through the hollow shaft of the auger, producing shafts of grout in the soil. The auger is slowly withdrawn, still rotating in the same direction as when drilling. After the tool is withdrawn, center bars and reinforcing cages may be installed as required to resist tension and lateral loads.

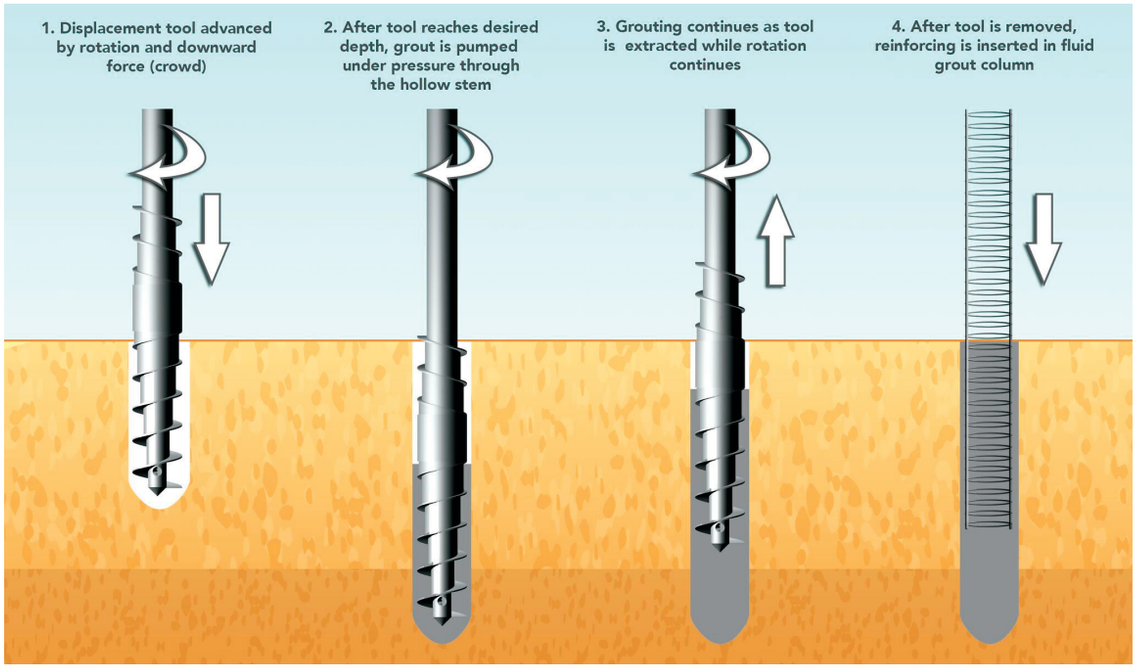
APG piles have been installed to depths up to 180 ft. Diameters typically vary from 12-in to 24-in in even increments and 30-in to 48-in x 6-in increments. Berkel installs APG piles in most geologies across North America and more APG piles than any other installer in North America. Our APG piles have been load tested to over 2000 tons and have been used to support compressive loads of over 1000 tons.

AUGER PRESSURE GROUTED DISPLACEMENT PILING









Berkel displacement (APGD) piles are bored, cast in-place, grouted piles installed by advancing our unique displacement tool (see Figure) into the ground typically with fixed-mast, rotary drilling platforms capable of applying high torque and downward force (crowd) to the displacement tool. In loose to medium dense soils, the displacement can lead to increased shaft friction so shorter or higher capacity piles may be installed compared to other pile types. When the desired pile-toe level is reached, the downward travel of the tool is stopped and pumping of the grout begins while tool rotation continues. The tool withdrawal rate is varied to maintain grout pressure appropriate for the soils penetrated and any soil that has entered the annular space behind the displacement tool is again forced into the sides of the pile wall.

As virtually no spoils are generated by the process, the piles are also often well-suited for sites with contaminated soils or in urban areas where spoil removal may be costly. Berkel typically offer APGD piles in 12-in to 18-in diameter. In dense soils, Berkel offers partial-displacement piles that laterally displace some soil, while excavating some soil to the ground surface. Partial displacement piles are typically 14-in to 24-in in diameter.

LIMITED ACCESS PILING

Limited access construction sites may be inside, next to or under existing buildings or in any facility where space is not available for a full-sized system. Berkel has a variety of pile options to install foundations in these conditions. Specialty track equipment with a gear box, rails, and shorter segmental auger lengths may be utilized to install low-head or limited access APG piles, bored piles or micropiles, which are deep foundations that are less than 12-in diameter. Berkel constructs micropiles with steel casing and/or threaded bar and high-strength cement grout and also with hollow-bar systems, which are stabilized with pressure grouting in lieu of casing. Berkel can design and install both APG piles and micropiles to resist compression, uplift and lateral loads and to support and underpin a variety of facilities.

Cast-in-place Ground-improvement Elements

CGEs are vertical grout columns for ground improvement and ground reinforcement that are installed below shallow foundations. Installation is accomplished by displacement of soil using the Berkel displacement tool (Figure 1) or partial displacement and excavation of soil using the Berkel partial displacement tool (Figure 2) and the placement of fluid cement grout within the evacuated volume. Ground penetration by the tools is made possible by the use of a fixed-mast rig capable of generating significant torque and crowd (Figure 3).

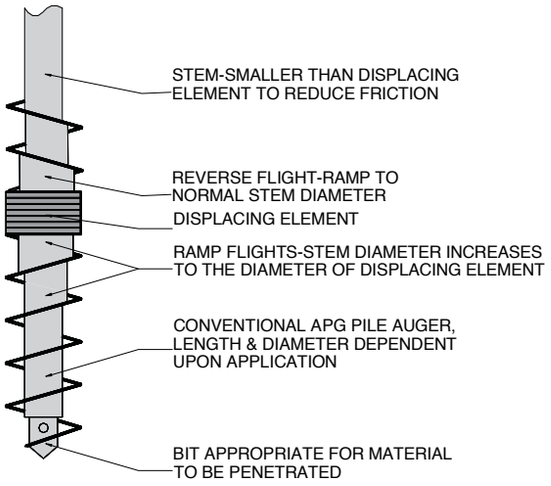


FIGURE 1
Berkel Displacement Tool

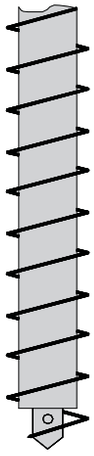


FIGURE 2
Berkel Intermediate Displacement Tool

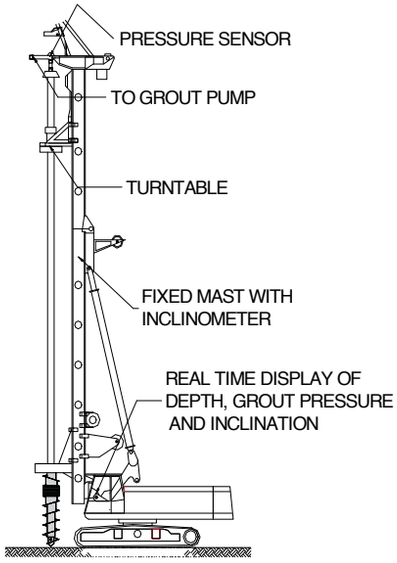


FIGURE 3
Installation Platform

CGEs are designed to improve granular soil and reinforce both granular and fine-grained soil below shallow foundations and floor slabs. Installation is continuously monitored and recorded using Berkel's Automated Monitoring Equipment.

Berkel can design a cost-effective subgrade improvement or reinforcement system for all soil types including fills and clays. Site specific ground and foundation conditions are explicitly considered in developing the appropriate spacing and depth of CGEs using our proprietary methodology.

PRESSURE AND COMPACTION GROUTING

Pressure grouting involves pumping a cement or chemical grout into soft or weak soil layers or voids. The grout fills these voids and stabilizes or strengthens the surrounding soil.

Small diameter grout pipes are installed to the target improvement depth. High pressure grout is pumped through the small diameter pipes. After grout is pumped at the target depth, the pipes are withdrawn a specific length and the grout pumping resumes. This process is repeated as required throughout the target zone of improvement.

Pressure grouting is used to stabilize soils under existing footings and slabs to alleviate settlement, to fill voids or cavities below ground level without excavating and to control water seepage and has been used for railroad track and bridge stabilization, and as well as filling voids around drainages pipes and culverts.

Compaction grouting involves placing a specific volume of grout at discrete intervals in the ground to densify granular soil or reinforce fine-grained soil. The technique is also commonly used to stabilize sinkholes and other voids/cavities in the subsurface.

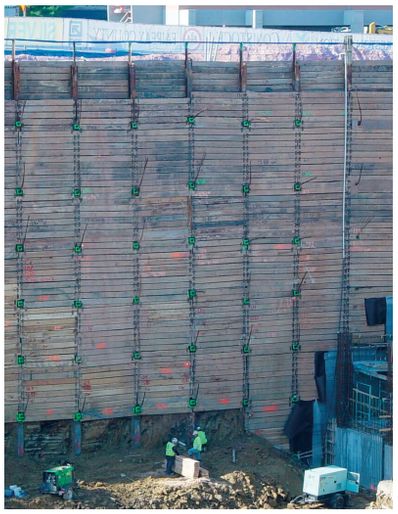
A small diameter steel pipe is installed to the lowest level of the target improvement zone. A low-slump grout is placed to a pre-determined pressure or volume of grout. The casing is then raised at specific increments with the grout placed to the same pressure/volume at each increment. The result is a column of grout through the improvement zone. This is repeated at planned injection points across a project site.

Berkel has also developed an augered compaction grouting process for sites with very deep improvement requirements. Compaction grouting increases allowable bearing pressures and decreases settlement for shallow foundations and to mitigate liquefaction potential.

EARTH RETENTION SYSTEMS



Berkel designs and constructs a variety of earth retention systems, which are constructed from the top down to protect surrounding facilities during deep excavation. Berkel offers the following for soil and rock retention:



Soldier Piles and Wood Lagging – vertical piles are driven or drilled at intervals along proposed wall location; wood lagging placed between the soldier piles as excavation proceeds; an economical method when groundwater is not present

Sheet Piles – an earth (or liquid) retention system where steel sheets with interlocking edges are installed to greatly reduce groundwater flow into the excavation

For stiffer wall support or to provide axial as well as lateral support, Berkel installs the following:

Secant Pile Walls - formed by installing a series intersecting drilled and reinforced concrete piles; water resistant and can provide significant vertical as well as lateral support

Tangent Pile Walls – formed by installing a series of drilled and reinforced concrete piles either flush to, or with a very small clear space between, adjacent piles; more economical than secant walls when ground water is not present.

Walls may be cantilevered or reinforced with drilled tiebacks or bracing to provide additional lateral resistance for deeper excavations. Tiebacks are constructed of thread bars or steel strands which are inserted into a small-diameter drilled hole which is grouted to encase the steel and bond to the surrounding ground. The steel is stressed to a design load and locked-off to maintain the load on the tie-back. Tie-backs are installed in as many rows as required to support the excavation height.

Where easements are not available, or when underground utilities or structural conflicts prohibit the use of anchors, internal wales or braces can be used to provide lateral support of high retaining walls. Where stiff soils or rock is present, Berkel installs soil nails or rock anchors through mesh facing into the earth to pin it back. Nails/anchors are installed as the earth is excavated and typically shotcrete is sprayed over the final mesh grid to provide the finished wall.

UNDERPINNING AND FACADE RETENTION SYSTEMS

Berkel provides underpinning and facade-retention systems to strengthen or support an existing facility, often in conjunction with new, adjacent construction or after a significant natural hazard event (e.g. earthquake). Underpinning may consist of hand-dug pits filled with concrete, piles with brackets supporting below the foundation, micropiles and bracing. With façade-retention, existing exteriors are stabilized to allow internal renovation. The historic aspects of a building may be preserved while interior layouts can be constructed.

MICROPILES - HELICAL PILES - ANCHORS

Micropiles are high capacity small diameter deep foundations that are typically less than 12-inches in diameter with 5-in to 10-in diameters being most common. They are generally made up of high strength steel casing and rebar, but can also be installed in some conditions with hollow-bar systems, which are stabilized with pressure grouting in lieu of casing. Installation can be achieved by rotary drilling, augering, driven or vibratory methods. Micropiles are particularly efficient where natural or man-made obstructions occur, in limited access or low-headroom conditions and in karst geology where rock surfaces are erratic and large voids are typically present. Berkel can tailor installation techniques to ensure minimal damage to existing foundations and to allow facility operations to continue during construction. Berkel often installs micropiles to support very large capacities with little or no movement of the foundation.

Helical piles are deep foundations that includes a central shaft with bearing plates welded on as required depending on pile size and capacity requirements. to a central steel shaft. The helices screw into the ground so that no soil is removed. They are installed in segments that are bolted together and screwed in until a target installation torque is reached that correlates to the required pile capacity.

Berkel also installs high capacity vertical rock and soil anchors to resist large temporary or permanent uplift loads (often due to hydrostatic forces from a very high ground water level).

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