

# Foundation Specialties, Inc. Geo-Support Construction

*Foundation Specialties, Inc.*

## Foundation Specialties GEOCON Division: Meeting the needs of customers with a wide range of excavation support methods

Foundation Specialties has recently completed our latest project at the Garland Street parking deck project for the University of Arkansas. Initial brought in by Baldwin and Shell Construction to install a timber lagging wall for support against a sewer line, we were asked to provide additional services to facilitate construction progress. FSI-GC installed an anchored steel mesh/ geotextile rock fall protection system using our Beretta T41 track drill. The mesh and fabric will protect workers below a 20 foot rock face during construction. In the elevator area, installation of a temporary soil nail wall installed with hollow bar soil nails to was used to support the 20 foot high excavation during the installation of the elevator shaft walls.



After finding a very hard rock layer, FSI GEOCON predrilled the caissons with our Beretta T41 ahead of the larger drilling rig of the drilled shaft contractor. In the accompanying picture all of the methods of excavation support installed on this project are visible.

## Micropier brackets and micropiles in Branson

Due to slope erosion caused by increased water levels in Lake Taneycomo above Table Rock Dam the stability of the condominium building foundation became a concern, hence the City of Branson temporarily condemned the building. FSI-GC along with Palmerton & Parrish and ARS Engineering chose to underpin the building with micropiles. Drilling would penetrate the sandy gravelly clays and weathered dolomite so the piles could bond into the moderately hard dolomite at a depth of 23 feet. FSI-GC and James L Burke Engineering submitted a plan using 23 each 38mm Williams Form Engineering geo-drill hollow bar micropiles with ECP (Earth Contact Products) brackets connected to the foundation to transfer the building loads to the piles.



## New Construction Micropiles



Micropiles are a small diameter replacement pile capable of supporting compression, tension, and lateral loading. The load capacity of a micropile is generated by the large cross-sectional area of reinforcing steel. Transfer of the load to the surrounding material is via the ground grout bond. This load transfer mechanism allows micropiles to be used in geologic conditions that would prove very diffi-

cult for any other deep foundation system.

One of the major advantages of micropiles are the speed of installation. When difficult ground conditions exist, achieving a required load resistance is often faster with micropiles than with traditional drilled caissons.

Unlike traditional drilled caissons, micropiles can be easily installed in low headroom—limited access situa-

tions calling for remedial support. In point of fact, micropiles can be used to underpin and support foundations and slabs in areas where no other system can be used.

## Post Tensioned Ground Anchors

Ground anchors are used to control strong uplift forces by providing an active post tensioned downward pull on a structure. One of the most common uses of these anchors are bridge abutments. Bridges have high rotational or eccentric forces on the abutments which are counter-acted by the down pull of the tensioned anchors.



## Soil Nails and Anchored Earth Retention Systems

Soil nails are fully grouted steel reinforcing rods drilled into a slope designed to penetrate a failure plane and retain the nailed materials. The nails are typically covered with a shotcrete retaining wall. These retaining structures can be either temporary or permanent. An anchored earth retention system is very similar to a soil nail wall in that the anchors are drilled and grouted with a subsequent application of a wall structure to hold back the slope. The difference between the two is in the way loads are transferred to the system. Soil nails are fully grouted bars, and as a result the loads are transferred along the entire length of the bar. However, in order to mobilize resistance, the wall must begin to move, thus a soil nail wall is a passive retention system. In contrast, an anchored earth retention system utilizes partially grouted bar or strand anchors that are subsequently post tensioned to pre-load the retention system creating an active retention system.



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## Helical Tie-Backs and Piles

Helical anchors can be used as temporary tie back anchors in multiple configurations. As light retaining walls, excavation support, and permanent deep foundations for lightly loaded structures, helical anchors are used as an alternative to micropiles. These systems consist of a pipe with flights which enter the soil like a screw and torque into a bearing layer. The installation time is significantly reduced as there is no grout to cure. This allows the anchors to be loaded immediately.



## FSI GEOCON and Earth Contact Products Underpinning System



Foundation Specialties has been working with ECP for several years to develop an under footing bracket that can be used with small diameter micropiles. The ECP model 350 steel pier bracket can be installed and our MP250 drill feed used to install either hollow bar micropiles, or using a combination of continuous flight augers and down hole hammers a small diameter solid bar and cased micropile can be installed. The bracket allows for the structure loads to be directly transferred to the bracket.

This system has been used on several projects by Foundation Specialties with great success.

## Excavation Support and Underpinning

Vertical excavation and structural support during construction are an increasing requirement of construction projects in urban settings. The stabilization of these conditions requires a diverse tool set of techniques which will allow for the most effective support possible. Micropiles, soil nails, resistance piers, helical pier tie-backs,

micropiers, and ground anchors can be combined in various combinations to provide the required support for any project. Cost factors such as time savings, difficulty of access, staged construction in lifts to provide continued support for adjacent construction and restrictions on noise or vibration can all be addressed using our





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*Foundation Specialties, Inc. is a full service concrete company that has been doing business in Northwest Arkansas for over 35 years. In addition to our geotechnical construction capabilities, we can also provide complete foundation systems from geotechnical foundations to grade beams, walls and suspended slabs. We also offer a full range of foundation repair techniques, water infiltration control, and crawl space encapsulation with the Clean-Space system.*

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We have further information on the web  
at: <http://www.foundationspecialties.com>

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## Drilling Equipment to Facilitate Geotechnical Investigations

Foundation Specialties can also utilize any of our drilling equipment to facilitate geotechnical investigations. Our limited access drills can be used for auger, core, or DTH drilling up to 60 feet deep in spaces with limited head room or when access is limited to man portable equipment. Our larger rotary drills can be used in rough terrain and are can drill with either hollow stem auger or DTH systems to depths of up to 150 feet. We also provide a full range of load testing capabilities for all anchor and foundation systems that we install.

