

**ENGINEERED  
SOLUTIONS**

*o f G e o r g i a*

**G E O T E C H N I C A L S E R V I C E S**



# Proposal

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**ML Property Group**  
Brookstone Grove Apts  
3526 Buford Highway



*A Lifetime of Support*

2260 Northwest Parkway Suite H Marietta, GA 30067  
ofc. 678.290.1325 fax 770.956.7403 www.esogrepair.com

August 3, 2017

Dear Kory ,

I would like to take this opportunity to thank you for choosing Engineered Solutions to provide you with a quote for your foundation repair needs.

Jay Eastland, Luis Cuevas, and I have a combined 50 years of experience in the foundation and waterproofing business. We have many products at our disposal, which allow us to customize a repair to your specific need. We are accustomed to working with engineers in our area and will be glad to furnish some recommendations should the need arise.

Engineered Solutions of Georgia strives to make it as easy as possible for you to do business with us, we accept most major credit cards, offer six months same as cash and several 100% financing options. Once you have made the decision to work with ESOG on your project we will do everything in our power to insure your satisfaction.

We are committed to being very accessible through the repair process and the bid process as well. We very much look forward to working with you in the near future and would be glad to answer any questions. Please feel free to contact either one of us at the office or try the cell numbers listed below. We also invite you to visit us on the web <http://www.esogrepair.com> , see our reviews on Kudzu.com ([click here](#)) , our third party customer service audit conducted by guild quality ([click here](#)) and our A rating with the Better Business Bureau ([click here](#))

Yours truly,

Chuck Irby

Jay Eastland  
404-754-4689  
Luis Cuevas  
678-654-4244



# The ESOG Advantage

click on each icon to see more information



Guildmaster Award 2014, 2015  
Service Excellence Award 2012, 2013  
Best of Awards 2011, 2012, 2013, 2014



Contractor Award  
Best of 2012, 2013, 2014, 2015



Super Service Award  
2010, 2011, 2012, 2013, 2014



Verified Foundation Repair Contractor  
2010, 2011, 2012, 2013, 2014, 2015



Five Star Rated Contractor  
2010, 2011, 2012, 2013, 2014, 2015



Preferred Contractor  
2010, 2011, 2012, 2013, 2014, 2015



Customer Information

Name: **Kory Solomon M L Property Group**  
Address: **4237 North Shallowford Road**  
City: **Atlanta** State: **GA** Zip: **30341**  
Phone:  
Cell: **(404) 454-0671**  
Fax:  
Email: **ksolomon@mlproppgroup.com**

Jobsite Information

Contact Name: **Kory Solomon M L Property Group**  
Address: **Brookstone Grove 3538 Buford Hwy**  
City: **Atlanta** State: **GA** Zip: **30329**  
Phone:  
Cell: **(404) 454-0671**  
Fax:  
Email: **ksolomon@mlproppgroup.com**

**ENGINEERED SOLUTIONS OF GEORGIA PROPOSES TO FURNISH AND INSTALL THE FOLLOWING SCOPE OF WORK:**

**Budget Proposal – Pending Final Design**

To perform a Design/Build Structural Repair Program for the purpose of Stabilizing the Settlement and Lateral Movement conditions occurring on Building 3534. This process shall require the combination of Foundation Underpinning, Tieback Anchors and Pressure Grouting for subgrade improvement technologies.

**DESIGN FOUNDATION REPAIR PLAN AND PRODUCTION OF CONSTRUCTION DOCUMENTS**

**INSTALL FOUNDATION PIERS:**

1. Have utilities marked by locating service. Locating service marks from street to meter. If any private utilities are suspected in the work area, a private locating service must be contracted by owner. ESOG may provide recommendation upon request.
2. Excavate area to expose existing concrete footing.
3. Prep footing and attach galvanized foundation brackets for each pier under center load of footing.
4. Drive foundation piers up to 21' through poor soil to load bearing strata (additional charges assessed if piers advance past 21' shall be billed at \$28.00 per foot beyond 21').
5. Transfer load to piers to stabilize foundation against any further settlement.
6. Secure piers and backfill holes.

**DRILL AND GROUTED ANCHORS**

1. Using a mini excavator and drill, drill 3" holes through or beneath footing wall or core drill if necessary
2. Drill threaded 40/20 titan bar anchor through each hole to the specified depth per engineering
3. Pressure inject neat cement grout through the center of the threaded titan bar to lock anchor in place
4. Place lateral foundation bracket and nut to each anchor and tension to tie back wall.
5. Cut end of each anchor and paint to match

Payment Schedule	
Deposit	\$30,613.00
Due Upon Completion	\$91,837.00

**Total Contract Amount \$122,450.00**

Quotation valid for 30 days from the date of issue. Contract subject to terms and conditions printed on the accompanying addenda.

**Presented by ESOG**

**Accepted by the Customer**

ESOG Signature

Date

Customer Signature

Date

**Chuck Irby**

Print Name

**Kory Solomon M L Property Group**

Print Name



2260 Northwest Parkway • Suite H • Marietta, GA 30067 • 678-290-1325

## Commercial Extended Project Description

Date of Issue: **8/2/17**

### Customer Information

Name: **Kory Solomon M L Property Group**  
Address: **4237 North Shallowford Road**  
City: **Atlanta** State: **GA** Zip: **30341**  
Phone:  
Cell: **(404) 454-0671**  
Fax:  
Email: **ksolomon@mlpropgroup.com**

### Jobsite Information

Contact Name: **Kory Solomon M L Property Group**  
Address: **Brookstone Grove 3538 Buford Hwy**  
City: **Atlanta** State: **GA** Zip: **30329**  
Phone:  
Cell: **(404) 454-0671**  
Fax:  
Email: **ksolomon@mlpropgroup.com**

### **PRESSURE GROUT**

1. Drill a series of 1.5" diameter holes 5-feet on-center throughout the affected area of interior floor.
2. Drive the injection rods through the slab and through poor soil to suitable load bearing strata (estimated average depth of 10'-0").
3. Force grout under pressure in 12" lifts to compact soil, build grout columns and fill any voids.
4. Estimated grout take is 1100 cu. ft. based on industry standard calculations. Additional grout, if required shall be billed at \$24.50 per cubic foot beyond the estimated grout total. The minimum daily charge is \$2,900.
5. Apply pressure at the upper lifts and attempt to return slab to a more level position.
6. Patch holes using non- shrink grout.
7. Clean all construction related debris.

### **OTHERS TO PROVIDE THE FOLLOWING**

1. Relocate current residents as required
2. Provide interior and exterior cosmetic repairs after foundation work is complete
3. Provide plumbing repairs as needed
4. Provide permits if/as required
5. Removal and replacement of interior finishes (bath tub, cabinets, etc.) as required

\_\_\_\_\_  
Customer Signature

## Terms & Conditions of This Contract

Customer: Kory Solomon M L Property Group Jobsite Address: Brookstone Grove 3538 Buford Hwy, Atlanta, GA 30329

Date of Issue: 8/2/17

### PAYMENT TERMS

Payment terms shall be as stated in this proposal. Payment is due in the form of cash, check, credit card or money order. The customer hereby expressly agrees and consents to ESOG's presentation of and request for payment of any check or other payment order issued to ESOG by the customer by any commercially reasonable electronic means in accordance with applicable provisions of the Uniform Commercial Code and the customer further authorizes any bank or other financial institution on which any such order is drawn or through which such order is payable to make payment pursuant to such order directly to ESOG or for credit to ESOG's account by electronic funds transfer. ESOG may apply the customer's payment against any open charges at ESOG's sole discretion. The customer agrees to pay ESOG on past due accounts a monthly interest charge equal to the maximum interest charge permitted by the law governing the account between the customer and ESOG. The customer and ESOG further agree that, where required by law to specify such rate, a rate of one and one-half percent (1.5%) per month shall apply. The interest rate provided hereby shall continue to accrue after ESOG obtains a judgment against the customer. The customer agrees to pay ESOG all costs, expenses of collection, suit or other legal action, including all actual attorney's and paralegal fees incurred pre-suit, through the trial, on appeal or in any administrative proceedings brought about as a result of the commercial relationship between them. Any cause of action which ESOG may have against the customer may be assigned by ESOG or any affiliate thereof without the consent of the customer.

### CONTRACT TIME

It is understood that the work is to be performed in one continuous operation unless otherwise specifically agreed.

### PERMITS

The customer shall provide permits for all work.

### CLEAR WORK AREA

This includes removal by the customer of any and all obstructions and/or impediments in the work area. This includes but is not limited to: carpet, floor covering, stairs, counters, counter tops, cabinets, shelves, plumbing, appliances, furniture and fixtures. A workspace of at least 36" from each wall and a clear path of ingress and egress for personnel and equipment to and from the work area shall be provided.

### ACCESS TO WORKSITE, WATER AND ELECTRICAL POWER

The customer shall provide access to the work area, water for mixing concrete (if necessary) and cleanup and electricity. If no power is provided, the customer will be responsible for any cost incurred in providing power. In the event of circuit overload, access to the fuse or circuit breaker box (electrical service) must be provided. In the case of fuses, the customer must provide an ample supply of replacement fuses in the event of circuit overload. If pumps are required, the customer shall be responsible for providing an electrical outlet within 25 feet of the pump.

### PRE-BID INFORMATION

Information used in planning the work covered in this proposal has been furnished by the customer and ESOG assumes no responsibility for its accuracy. If conditions are not in accordance with the information furnished to ESOG by the customer or others, the recommended procedures and scope of work in this proposal may not be accurate and any additional expenses incurred by ESOG as a result of this difference will be reimbursed to ESOG by the customer at cost plus 15%.

### PRIOR NEGOTIATIONS

All prior negotiations, proposals, correspondence and memoranda between the customer and ESOG are superseded by this proposal. This proposal, in its entirety, shall be made an integral part of and incorporated into any purchase order, proposal or contract agreement resulting from it. This proposal is subject to revision in scope, price and terms if not accepted in writing by the customer within 30 days.

### TERMINATION OF CONTRACT

If conditions beyond ESOG's control make it impossible for ESOG to perform as specified and the customer elects to terminate the contract, ESOG will be entitled to reimbursement in full for all ESOG's costs including mobilization, labor, materials and overhead plus a reasonable profit for all work performed up to the date of written notification of termination by the buyer.

### LIEN RIGHTS

It is mutually agreed that ESOG shall retain any and all rights conferred upon it by the lien statutes of the state in which the jobsite is located and of the federal or territorial government.

### SURVEYS AND UTILITY LOCATE

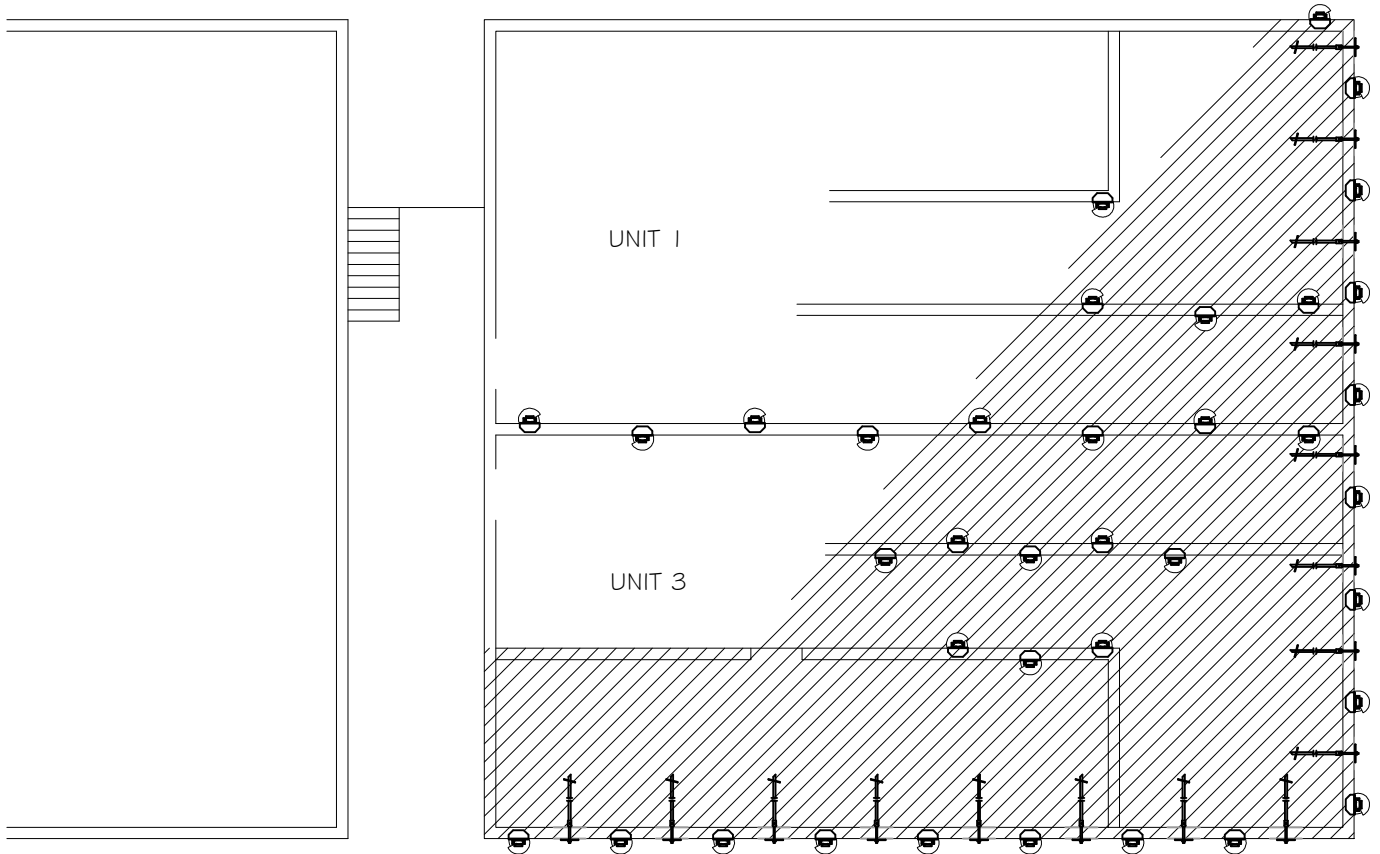
The customer shall provide surveys to locate and stake for all pile locations and top of pier elevations and shall locate all underground utilities.


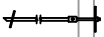

### NORMAL CONSTRUCTION

This contract assumes normal construction, concrete thickness and footing depth (no more than three feet below interior slab) and further assumes compliance with applicable building codes. If unforeseen subsurface conditions are encountered additional charges may be levied (at the contractor's option) to prepare the area for install

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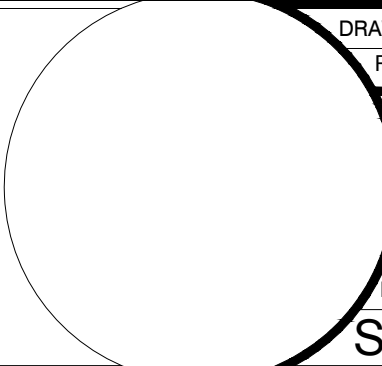
Customer Signature




LEGEND	
	INDICATES LOCATION OF FOUNDATION PIER w/ FOUNDATION BRACKET
	INDICATES LOCATION OF TIE-BACK w/ WALL PLATE
	INDICATES AREA TO RECEIVE PRESSURE GROUT

# REPAIR PLAN

3538 Buford Highway  
Atlanta, GA 30329



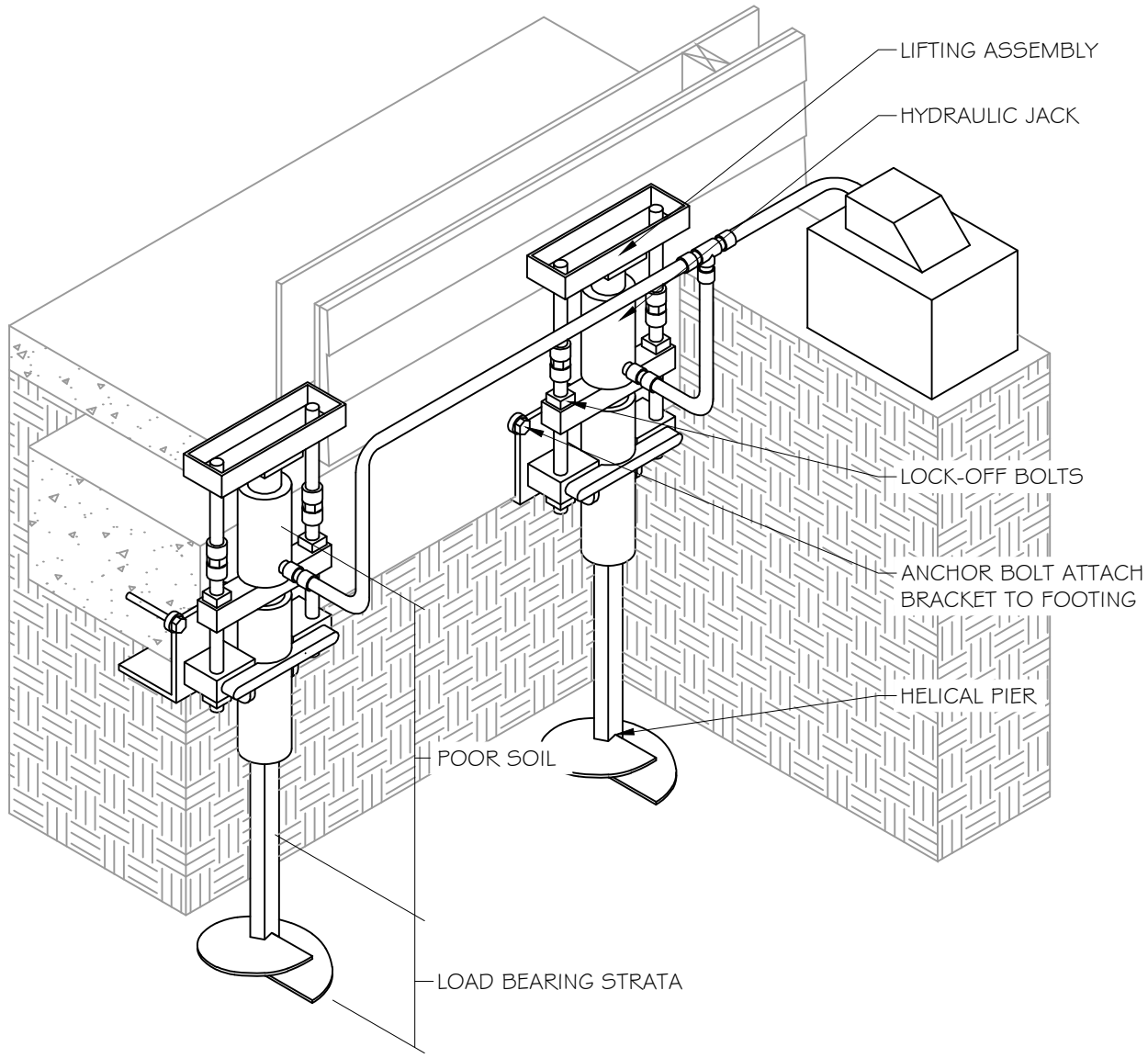
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DATE	8/2/2017
DRAWING NUMBER	SK-1



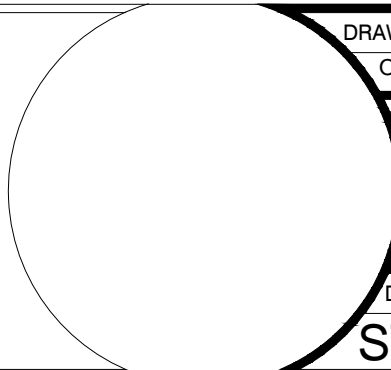
**ENGINEERED SOLUTIONS**  
of Georgia  
Foundation Repair & Waterproofing

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**RETROFIT  
PIER**



DRAWN BY  
OC

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SCALE  
N.T.S.

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DATE  
3/27/15

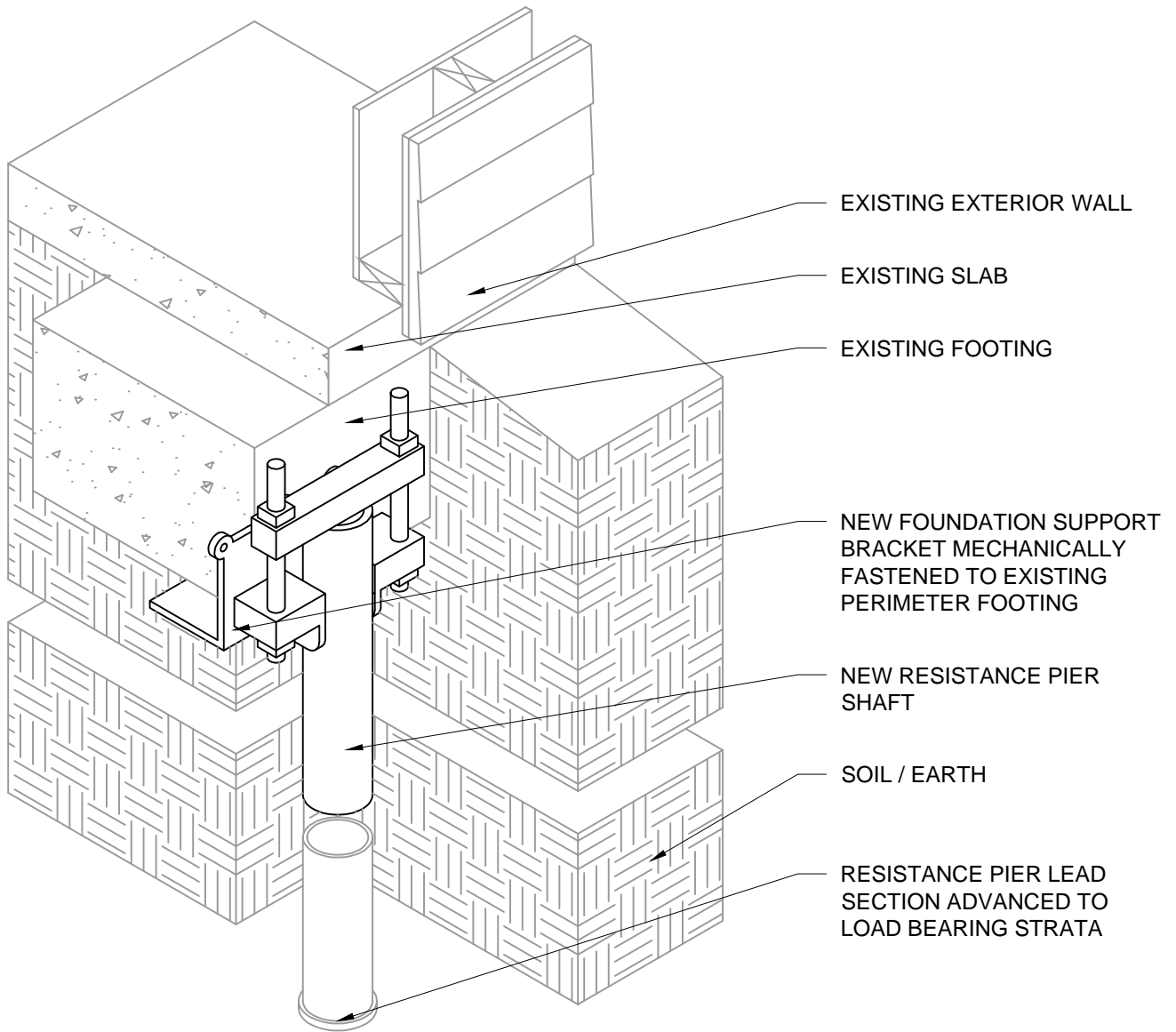
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**ST-1**

**ENGINEERED SOLUTIONS**  
of Georgia  
Foundation Repair & Waterproofing

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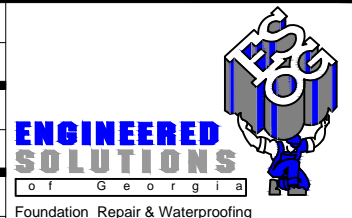
# RESISTANCE PIER

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OC

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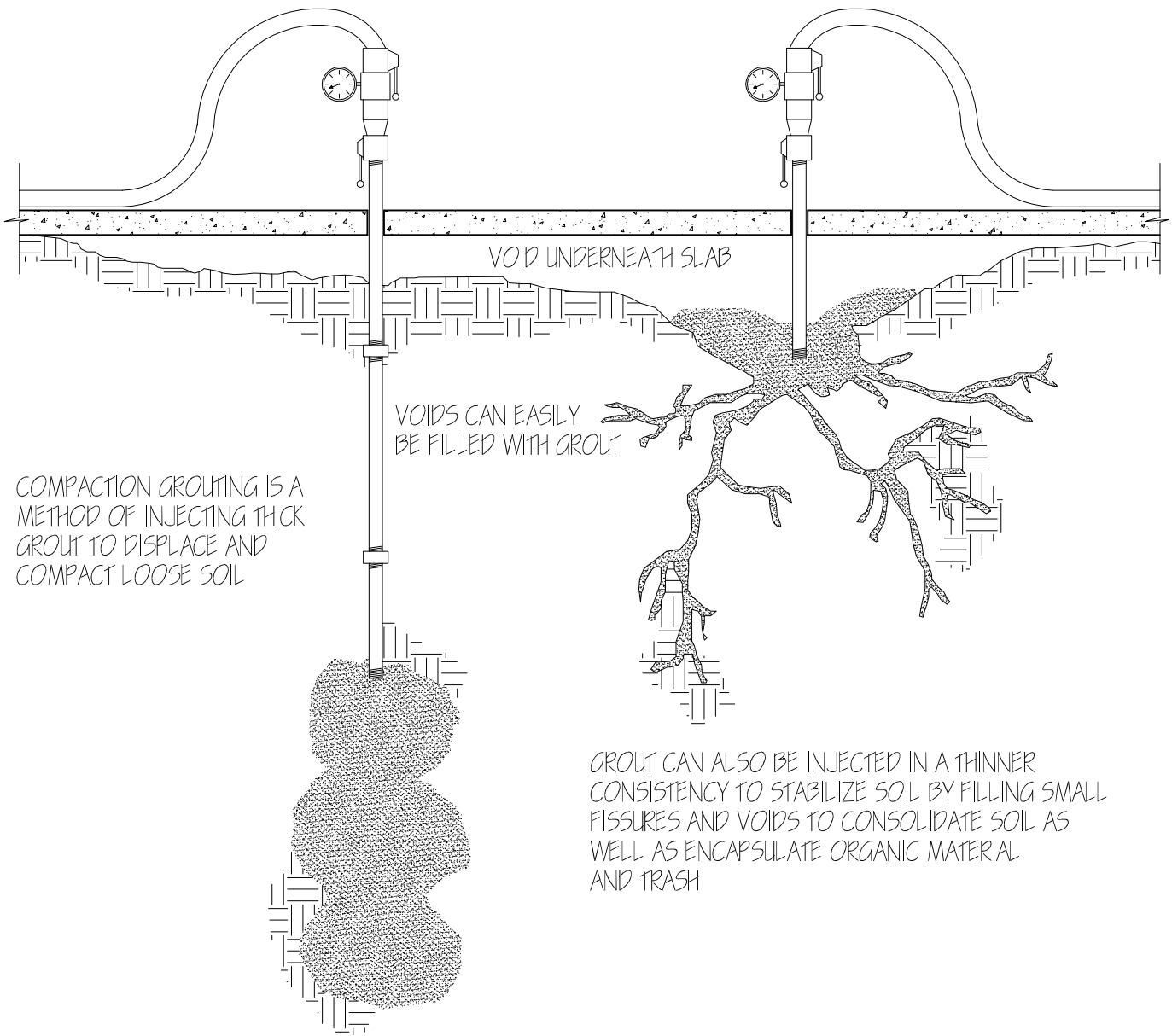
DATE  
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**ST-4**



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PRESSURE IS MONITORED THROUGH GAUGES



COMPACTION GROUTING IS A METHOD OF INJECTING THICK GROUT TO DISPLACE AND COMPACT LOOSE SOIL

VOIDS CAN EASILY BE FILLED WITH GROUT

GROUT CAN ALSO BE INJECTED IN A THINNER CONSISTENCY TO STABILIZE SOIL BY FILLING SMALL FISSURES AND VOIDS TO CONSOLIDATE SOIL AS WELL AS ENCAPSULATE ORGANIC MATERIAL AND TRASH

COMPACTION GROUTING  
SOIL STABILIZATION  
VOID FILL

DRAWN BY

KS

SCALE

N/A

DATE

10/23/06

DRAWING #

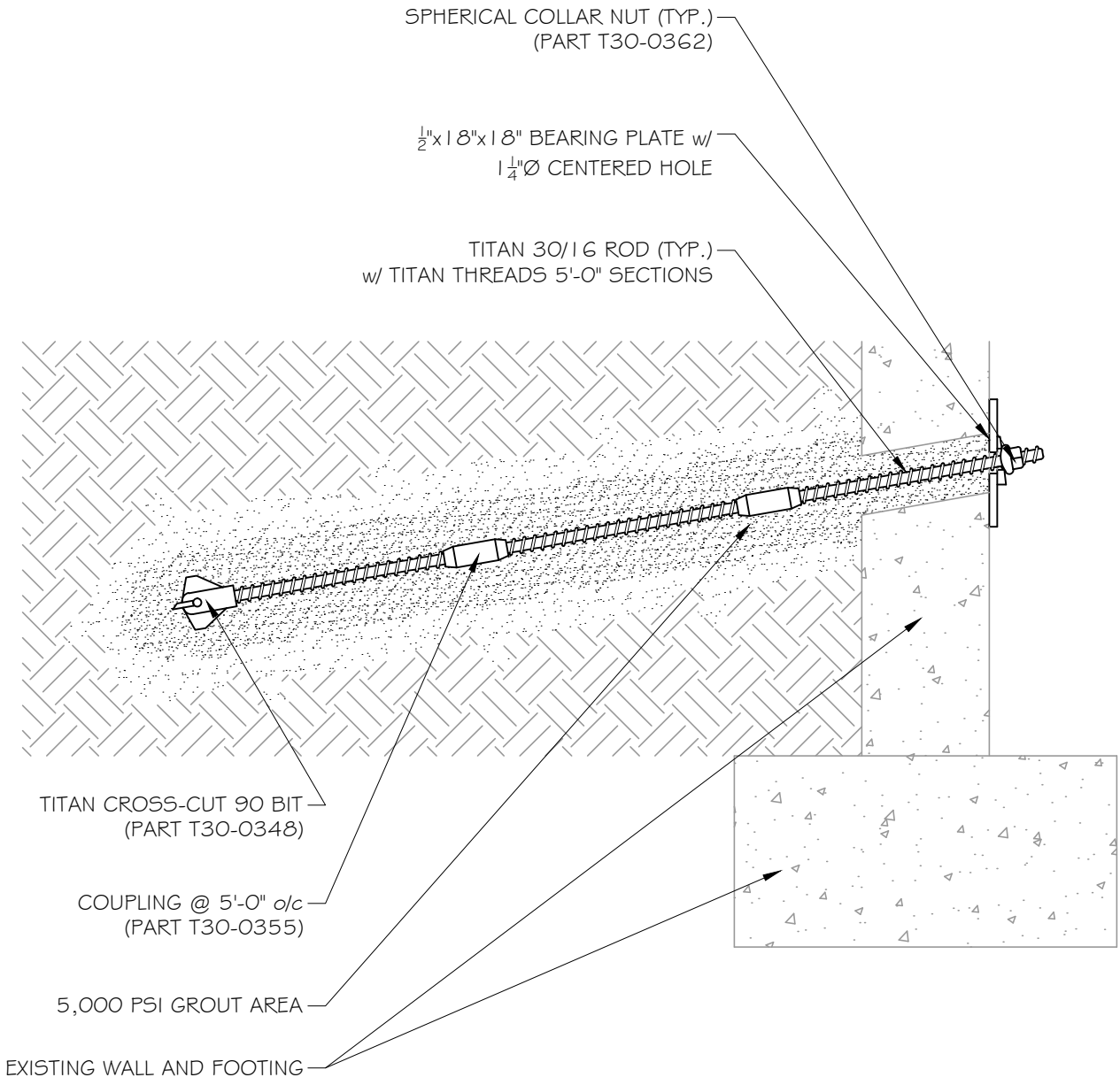
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**ENGINEERED**  
**SOLUTIONS**

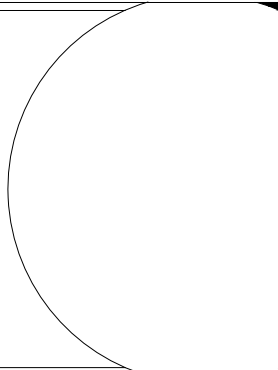
o f G e o r g i a

Foundation Repair & Waterproofing





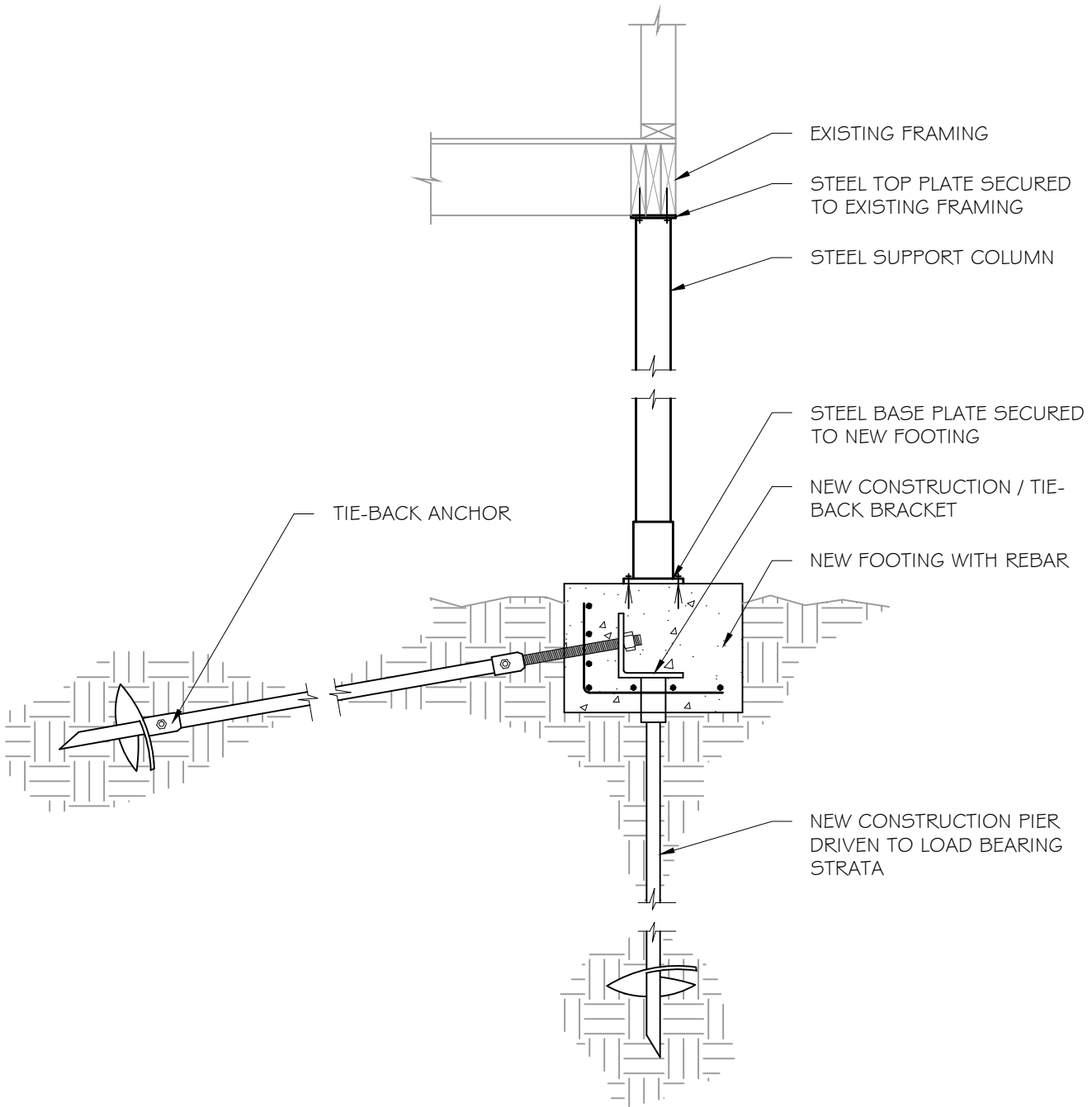
**DRILLED AND  
GROUTED  
TIEBACKS**



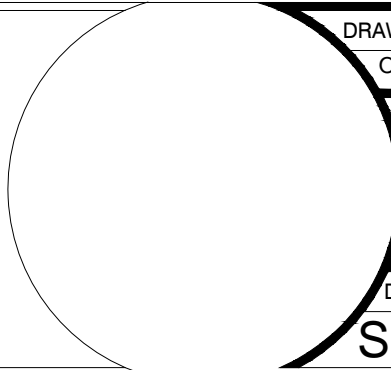
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DATE	2/9/15
DRAWING NUMBER	SK-1

**ENGINEERED SOLUTIONS**  
of Georgia  
Foundation Repair & Waterproofing

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**SUPPORT COLUMN w/  
NEW CON. & TIE-BACK**

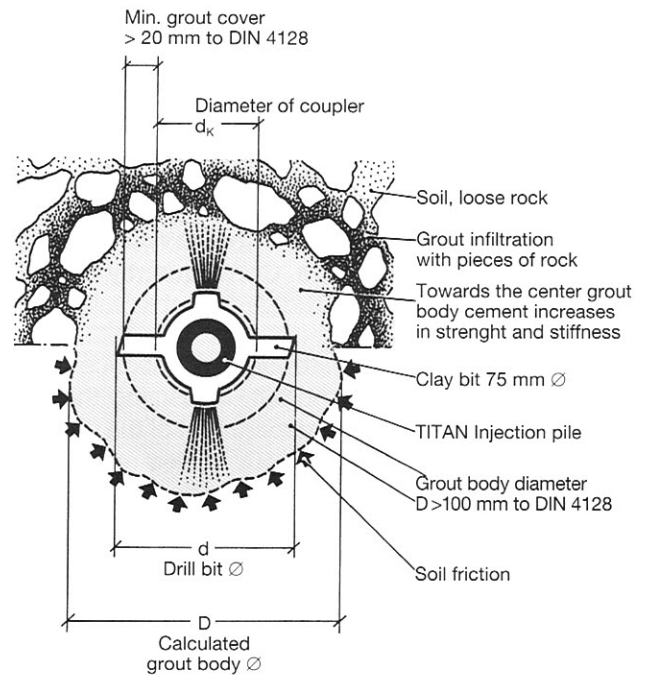
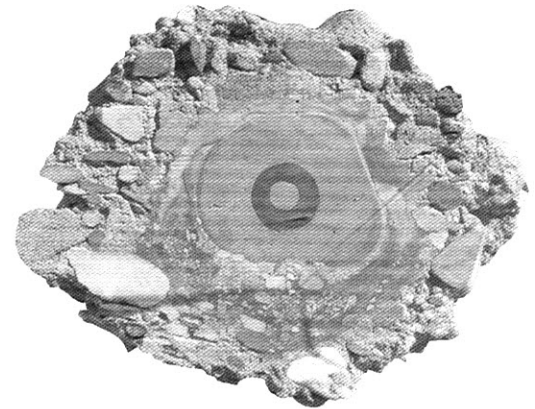
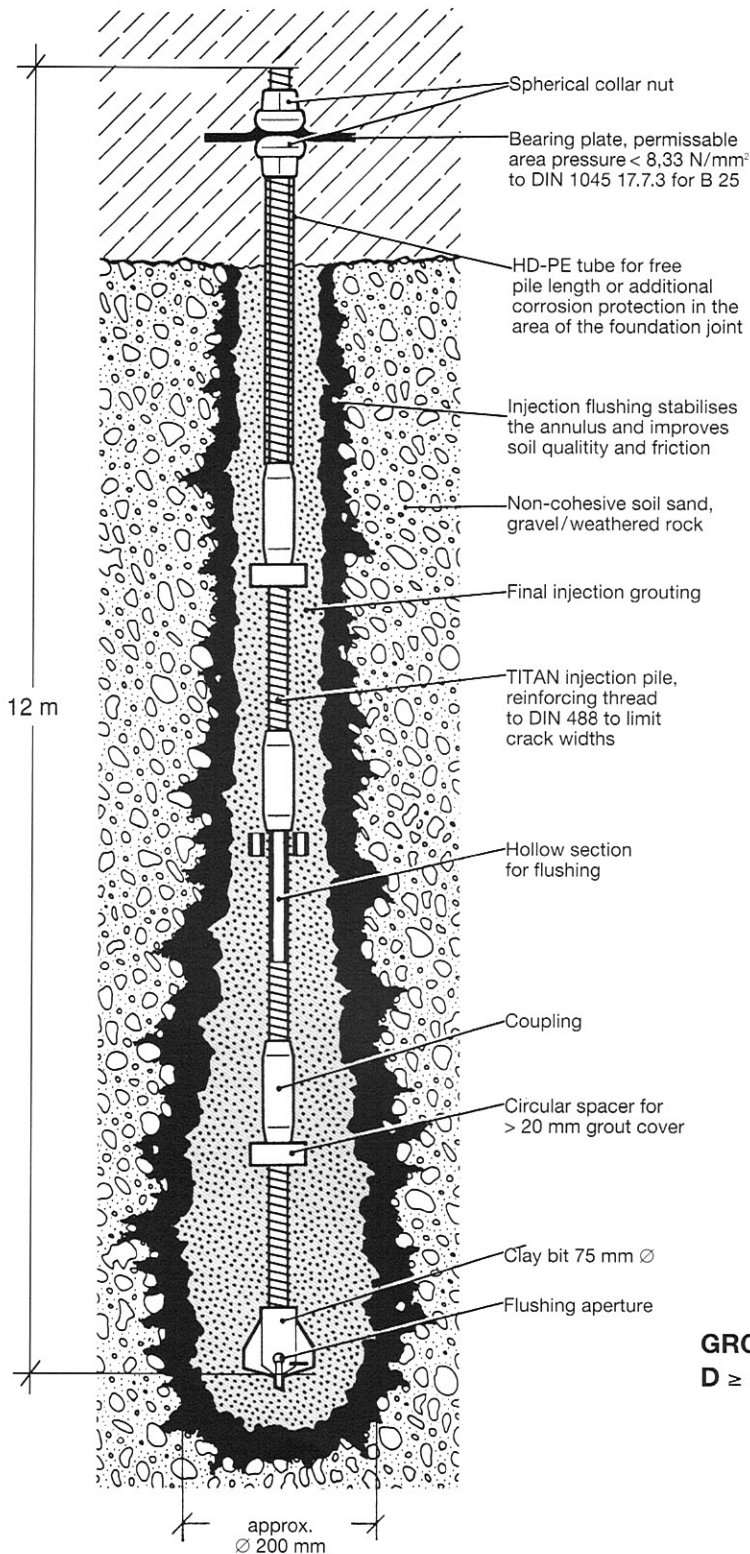


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DATE	3/17/16
DRAWING NUMBER	SK-1

**ENGINEERED SOLUTIONS**  
of Georgia  
Foundation Repair & Waterproofing

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**Drilled and pressure grouted  
TITAN Micro Piles**



**GROUT BODY DIAMETERS:**

- $D \geq 2,0 \times d$  for medium + coarse cobbles
- $1,5 \times d$  for sand and gravelly sand
- $1,4 \times d$  for cohesive soil (clay, marl)
- $1,0 \times d$  for weathered sandstone, phyllite, slate



# IDEAL

Group



HELICAL PILES FOR LOADS  
**UP TO 700 TONS**





Our team is often called on to fabricate custom brackets and load transfer devices. Below are examples of brackets which are manufactured by IDEAL. Give us a call if you don't see what you're looking for and we can design the perfect bracket to meet project requirements.



PIPELINE BRACKET



BOARDWALK BRACKET



CLEARSPAN BRACKET

# GET FAMILIAR

The unit is called a **helical pier** if it resists compressive loads, which are usually downward. It is called a **helical anchor** if it resists tensile loads, which are usually upward or inclined. Many helical units function as both piers and anchors.

A helical unit is installed by simply screwing it into the ground. The central shaft may be round or square and it may be hollow or solid. Hollow (pipe shafts) are often preferred, because they provide a greater section modulus for the same cross-sectional area of steel. Pipe shafts, as compared to solid shafts, generally provide greater resistance to installation torques and buckling under compressive loads.

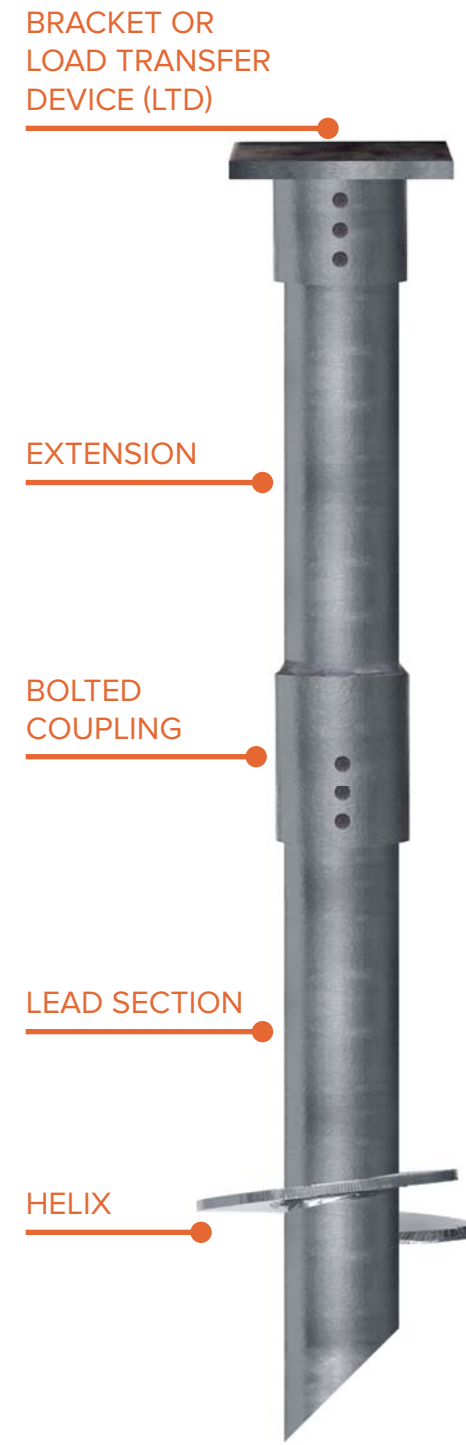
A typical helical unit is shown to the left. It consists of a central steel shaft, to which can be attached one or more steel helices. The central shaft can be lengthened by adding extension pieces as necessary.

Pipe shafts range anywhere from 2 7/8" to 36" in diameter, and helices range anywhere from 5" to 48" in diameter and are seldom less than 3/8" thick.

Experience and theory have combined to suggest that the preferred spacing between multiple helices is equal to 3 helix diameters of the preceding helix.

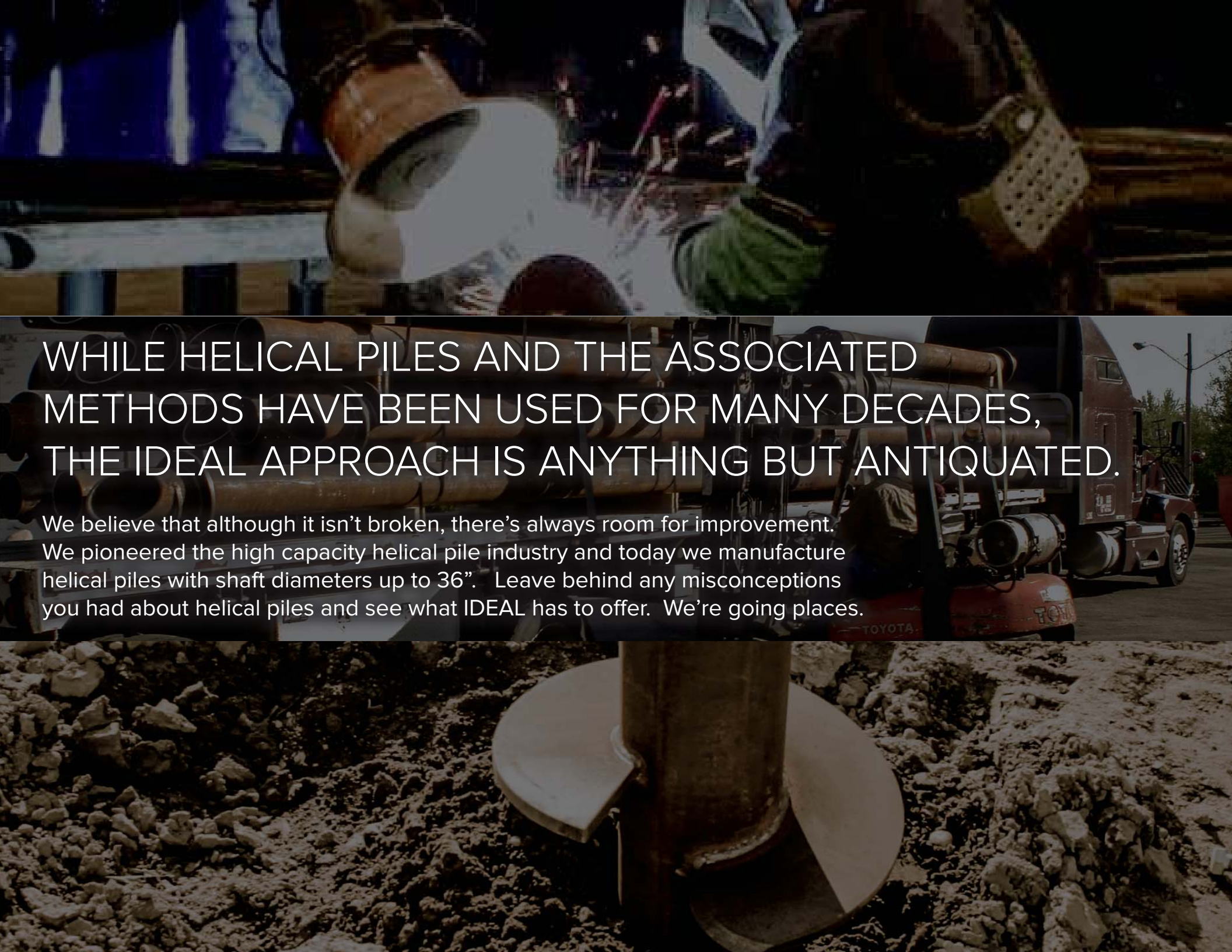
The final component to the helical unit is the Load Transfer Device (LTD). This is used to transfer the tension or compression load from the structure to the helical unit.

Simply put, the helical unit transfers tension or compression load to competent soil strata below incompetent soils.



WHILE HELICAL PILES AND THE ASSOCIATED METHODS HAVE BEEN USED FOR MANY DECADES, THE IDEAL APPROACH IS ANYTHING BUT ANTIQUATED.

We believe that although it isn't broken, there's always room for improvement. We pioneered the high capacity helical pile industry and today we manufacture helical piles with shaft diameters up to 36". Leave behind any misconceptions you had about helical piles and see what IDEAL has to offer. We're going places.





# APPLICATIONS

A helical pier is a deep foundation. Its purpose is to transfer a structural load to deeper, stronger, and less compressible materials bypassing any weaker and more compressible materials that would be unsuitable for the support of conventional shallow foundations.

As a deep foundation, a helical pier should be considered for most applications that would call for a driven pile, drilled pier, or mini pile.

Helical piles and anchors are usually a great foundation solution to any of the applications below whether it's a new build or existing structure.

**COMMERCIAL BUILDING REMEDIATION**

**SUBSTATIONS**

**TIE-BACKS/ANCHORS/RETAINING WALLS**

**SANITARY PIPELINE SUPPORT**

**LIGHTING <50FT**

**BULKHEADS**

**TILT-UP WALL ANCHORS**

**SOUND WALLS**

**SHORING PIPELINE**

**WORK CAMP FOUNDATIONS**

**BRIDGES/BOARDWALKS/DOCKS**

**GUY LINES/WIRES**

**TOWERS – QUAD BASE**

**ROADWAY SIGNAGE TRAFFIC SIGNALS**

**TANKS AND SILOS**

**TOWERS – MONOTUBE**

**BILLBOARD/SIGNAGE GENERATOR BASES**

**UNDERWATER SUPPORT**

**UTILITY ANCHORING**

**TIE-DOWNS/MOORINGS**

**MACHINE BASES**



**CELLULAR TOWERS**



**PIPE RACK SUPPORT**



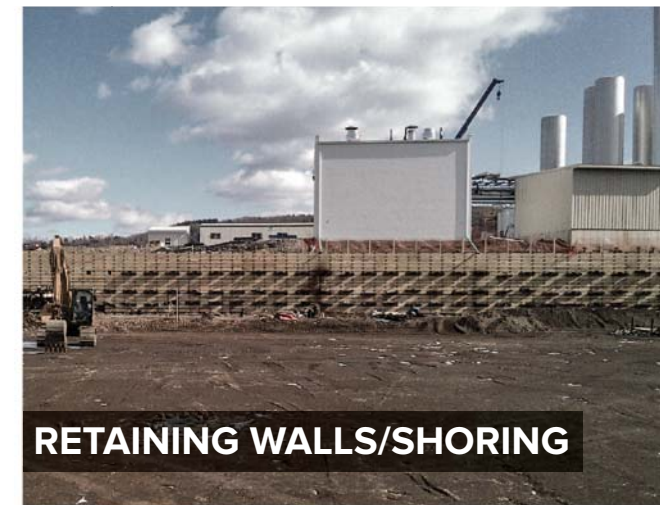
**COMMERCIAL UNDERPINNING**



**BRIDGE REMEDIATION**



**MUNICIPAL BOARDWALKS**



**RETAINING WALLS/SHORING**



**NEW CONSTRUCTION**



**INTERIOR NEW CONSTRUCTION**



**RETAINING WALLS**



**CLEARSPAN STRUCTURES**



**MACHINE BASES**



**SANITARY PIPELINE SUPPORT**



# ADVANTAGES

For many applications helical units may offer significant advantages over other systems. Some of these include:

## WIDE RANGE OF LOADS

A wide range of allowable loads. Anywhere from 10-700 tons to be exact.

## VERSATILE INSTALLATION ANGLES

Adaptability to a variety of installation angles to accommodate compression, tension, lateral, and overturn.

## LESS DEPTH = MORE MONEY

Lower cost than driven or drilled piles. While the cost per foot may be higher, piles can be installed to lesser depths and reach the same required capacities.

## RAPID INSTALLATION

Not quite lightning fast, but it's hard to beat the ease and speed of installation.

## MINIMAL EQUIPMENT

Minimal support equipment is needed for installation. A drive head, torque indicator, and a few other components and you're up and running. Just by the way, IDEAL offers the most complete drive head packages in the industry.

## GREAT FOR LIMITED ACCESS

Helical piles are great for low-headroom and other limited-access areas inside, underneath, and in between existing structures.

## SIMPLE CUTOFFS

With a band saw or torch, on-site cut-offs are a breeze.

## NO CONCRETE DELAYS

No concrete-related delays, and we all know time is money...

## INSTALL IN EXTREME WEATHER

Helical piles can be installed in any weather except thunderstorms and whatnot. We play it safe, and you should too.

## LIMITED EARTHWORK AND NO SPOILS

Little or no earthwork or spoil material is created during helical pile installation. This is a huge advantage when working at contaminated sites.

## MINIMAL VIBRATION AND NOISE

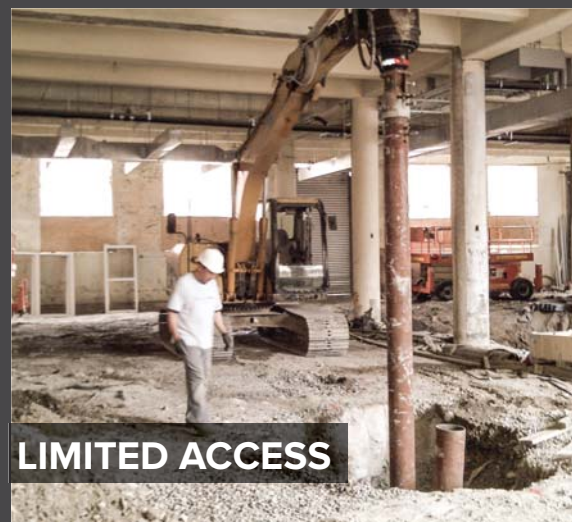
With minimal vibration and noise, helical piles are a perfect fit for historic structures and other urban projects surrounded by fragile people and buildings.

## TEMPORARY INSTALLATIONS

Easily removed and reused in temporary applications such as shoring and movable structures.

## LOW MOBILIZATION COST

Very low mobilization and demobilization costs. Look at the real costs of installing alternates and you might be as surprised as we were when we did the math.

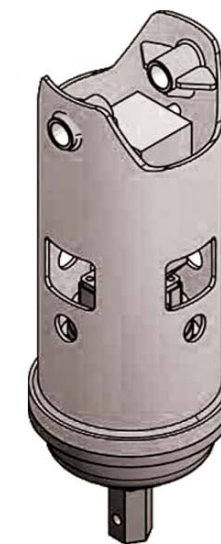


# INSTALLING

A helical screw pile is rotated into the ground by using a hydraulic drive head, powered by an excavator, pile driving rig, or any other equipment with hydraulic capability. IDEAL requires installers to monitor installation torque and pile alignment during the installation process. This is required for a few reasons.

First, it is important to have a qualitative assessment of the soils being penetrated at various depths. Using a graph, the recorded installation torque and depth is interpreted against the existing soil data to obtain a correlation that enables a simple verification strategy to be determined.

The soil data is interpreted against the installation torque and a correlation is obtained to maintain the integrity of the helical screw pile during installation as well as mitigate damage by exceeding the allowed torsional strength to any of the pile's components. Every helical screw pile has a maximum stress level that must not be exceeded in order to avoid compromising the structural integrity of the helical screw pile unit.



# THE HISTORY



The first helical screw pile was invented in the 1830's by a blind Irish marine construction engineer named Alexander Mitchell. His design proved to be a major improvement over traditional straight pile designs, so Mitchell and his son promptly patented the cast iron screw pile. In 1840 the first screw piles were installed to support the Maplin Sands lighthouse at the mouth of the Thames River. This innovative design caught on and made its way across the pond quickly and before long most of the lighthouses in the Mid-Atlantic region were being built on helical pile foundations. There were more lighthouses built on helical pile foundations in Chesapeake Bay than anywhere else in the world. A total of Forty-two helical screw pile lighthouses were built on Chesapeake Bay between 1850 and 1900.

The helical screw pile technology didn't stay on the east coast. Over the next few years, helical screw pile lighthouses could also be found in the Great Lakes Region and the Gulf of Mexico.

The foundation of a typical screw pile lighthouse consisted of one central pile installed in the center and then flanked by another six or eight piles around the perimeter. This design increased the anchoring properties and the bearing power of the helical screw piles. These early helical screw piles were often installed by using large torque bars and the power of men, horses, or oxen.

Alexander Mitchell's helical screw pile design is just as effective today as it was in the late 18th century and continues to be installed around the world.







# OUR MISSION

To provide our clients and associates with proprietary technology, products, equipment, and support, ensuring excellence in the design and performance of deep foundation and earth anchoring projects.

# Micropiles

ISCHEBECK®

**TITAN**



- ❖ **IBO®: Injection BOring**
- ❖ **The piling solution for difficult ground conditions**
- ❖ **No harmful vibrations or noise**
- ❖ **Easily installed in confined spaces**
- ❖ **Micropiles with capacities up to 1169 kips (5200 kN)**



**Con-Tech** Systems Ltd.



CTS/TITAN IBO® (Injection Bore) piles are ideally suited as micropiles, otherwise known as anchor piles, mini piles or root piles (pali radice).

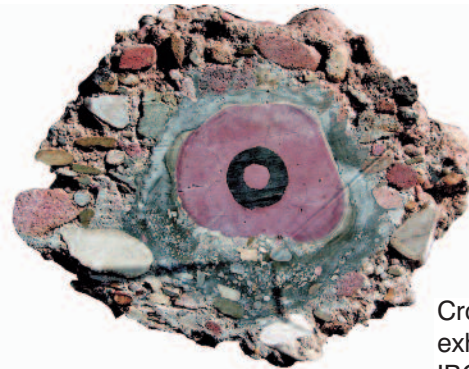
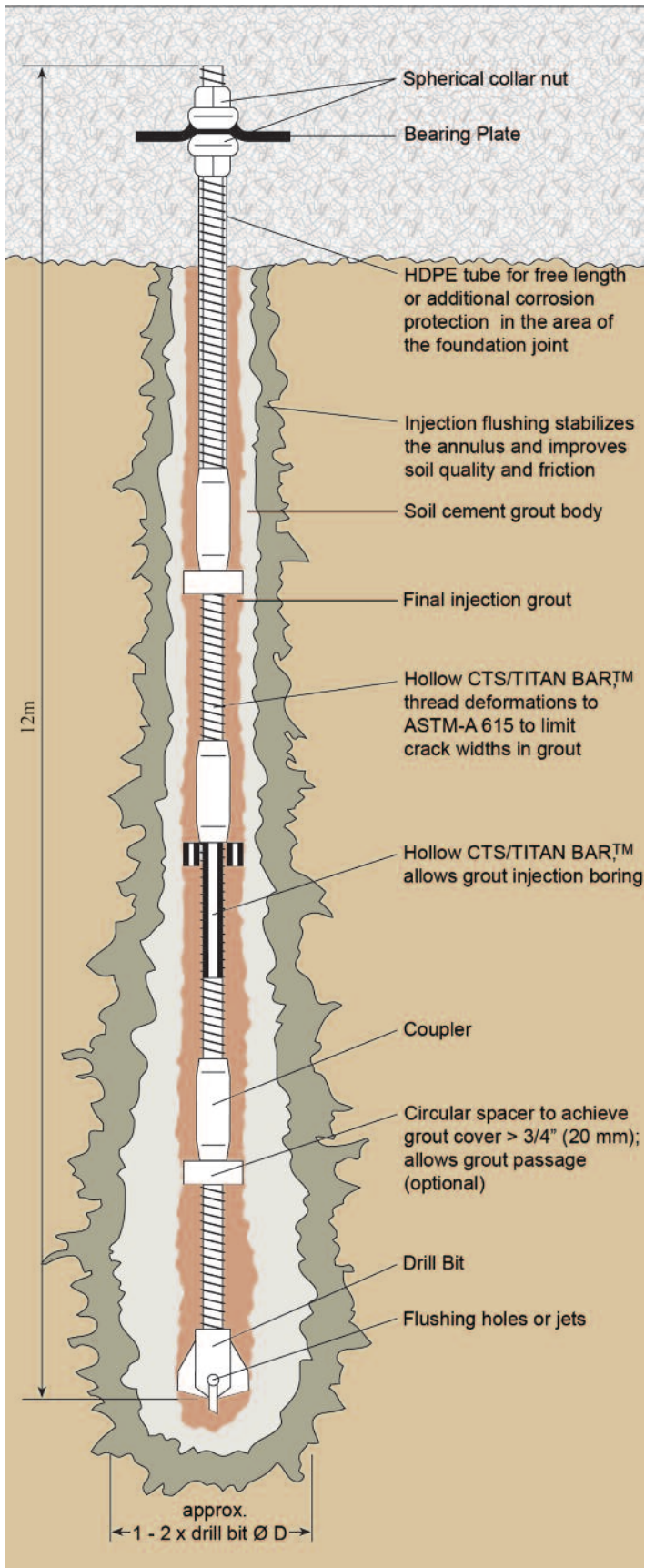
CTS/Titan IBO® micropiles consist of a continuously threaded, hollow bar as reinforcement tendon, combined with a Portland Cement grout body of a minimum 3.63 ksi (25 N/mm<sup>2</sup>) strength. The rough, profiled surface of the grout body transfers tension and/or compression loads to the ground.

CTS/TITAN micropiles comply in Europe with DIN 4128, EAU E 28 and final draft CEN/TC288/WG/8 specifications and in North America with FHWA recommendations FHWA-SA-97-070. The material of the hollow bar, as well as the thread deformations comply with **ASTM A-615**.

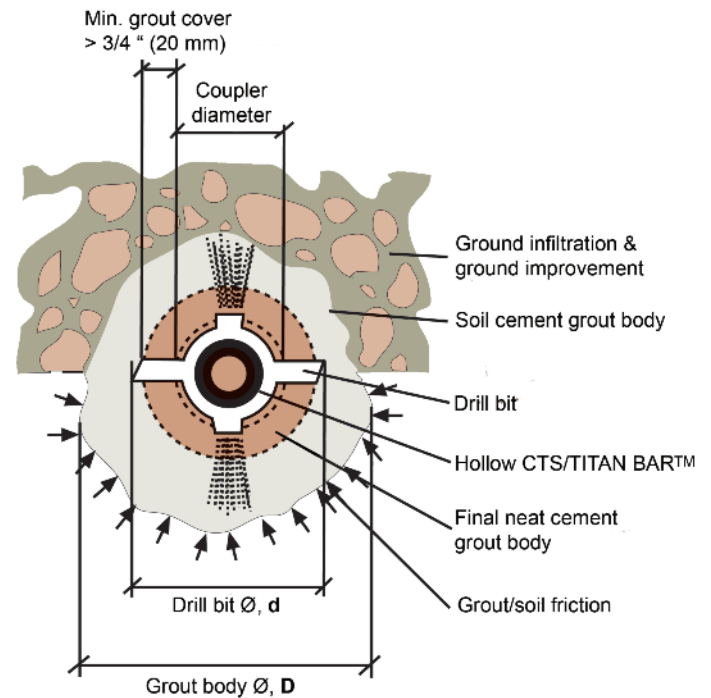
## Advantages over conventional piles

- Works in compression and tension
- Does not require temporary casing
- Improved mechanical ground/grout interaction reduces overall depth
- Dramatically increased production rates
- Lightweight rotary percussive drilling equipment
- Easily installed in confined spaces
- Permits top down mini jet grouting in saturated clays and silts complete with rebar
- Perfect for structural repairs and underpinning
- Remote de-coupling unit facilitates underwater piling from barges or drill platforms
- Injection bored CTS/TITAN micropiles provide a range of working loads from 29.7 kips (132 kN) to 1,169 kips (5,200 kN)
- No harmful vibrations or noise
- Minimal spoil





Cross section of exhumed CTS/TITAN IBO® micropile



### Grout Body Diameter, D, in different Soils

- $D \geq 2.0 \times d$  for medium & coarse gravel
- $1.5 \times d$  for sand & gravelly sand
- $1.4 \times d$  for cohesive soil (clay, marl)
- $1.0 \times d$  for weathered rock

d: Drill bit diameter

### Please Note:

The above illustration is based on actual tests and experiences using the CTS/TITAN IBO® system installed with appropriate drilling and grouting equipment.



## Reticulated Micropile Wall

Owner: CN Rail  
Contractor: Geo-Foundations Contractors Inc.  
Location: Ontario, Canada

Installation of an array of 125 micropiles 39.4' (12 meters) deep, with half of them vertical while the other half are inclined towards the core of the embankment. The piles are then tied into a 203' (62 meter) long reinforced concrete beam. Project was completed without interruption to the rail traffic.



## Phoenix Sky Harbor Airport Terminal 4 Expansion

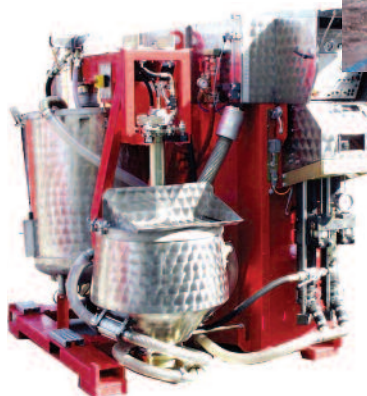
Contractor: Scheffler Nevada Corp.  
Location: Phoenix, AZ

CTS/TITAN IBO® micropile foundation



## Obermann Grouting Stations

VS 110 (left) and VS 63 grouting stations for flushing and grouting of micropiles





## The White Sands of La Jolla

Owner: Southern California  
Presbyterian Home  
Owners  
Contractor: Condon Johnson, San  
Diego, CA  
Location: La Jolla, CA

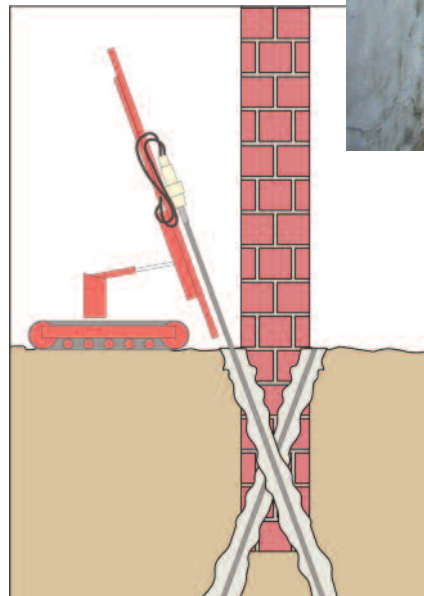
Underpinning of soil nail shoring wall



## Titan Micropiles for Underpinning

General Cont.: Levine Builders  
Engineer: Mueser Rutledge  
Consulting Engineers  
Found. Cont.: Moretrench  
Location: New York City, NY

Moretrench installed hollow CTS/TITAN BARST<sup>™</sup> 40/16 at 28 locations for micropiles. The 55' (17 m) long micropiles, underpin a turn of the century, two story, brick warehouse. The underpinning was necessary because of excavation work for the construction of a new building adjacent to the existing warehouse.



**Utah State Capitol Building**

Contractor: Becho Inc.  
Engineers: Geotechnical Design Services INC.  
Location: Salt Lake City, Utah

Largest micropile installation in the USA (over 3000) for seismic base-isolation and restoration.



**LDS Church Temple Square**

Owner: LDS Church  
Contractor: Becho Inc.  
Engineers: Geotechnical Design Services INC.  
Location: Salt Lake City, Utah

Tabernacle seismic upgrading and renovation using CTS/TITAN IBO® micropiles.



## Wind Turbine Tower Foundations

Contractor: Pacific Industrial Electric, Brea CA

Wind turbine foundations for NEG-MICON 54/950 kW wind turbine generators on 180' (55 m) towers using CTS/TITAN IBO® 52/26 anchors for micropiles.



## Foundation of Blast Resistant Enclosures

Numerous Job-Sites

Security tower bases using CTS/TITAN IBO® 73/45 anchors for micropiles.



## Internal carrying capacity

The internal carrying capacity is influenced by friction behavior, crack width limitation and corrosion protection. The reinforcement type thread of the hollow CTS/TITAN BAR™ conforms to ASTM A-615 and other international standards. The related rib area of 0.13 is very close to the maximum values for reinforcing bars. Consequently, optimum bond is achieved as in reinforced concrete. **This is a unique feature of the CTS/TITAN IBO® micropile.**

## Corrosion protection

As with reinforced concrete these ribs induce a uniform crack distribution in the grout. Investigations by the University of Munich on excavated grout bodies reinforced with hollow CTS/TITAN BARS™ 30/11 have shown that up to 125% of the design load (according to DIN) the characteristic crack widths are below the permissible value of 0.004" (0.1 mm) as required by ASTM A-615 and other international standards. This proves that the system complies with DIN 4128 9.2 and that the corrosion protection with minimum grout cover of 3/4" (20 mm), as with reinforced concrete, is sufficient for permanent piles

## Internal carrying capacity fully utilized

The internal carrying capacity derived from the yield load can be fully utilized for permanent tension piles.

## External carrying capacity

For the dimensioning of the load bearing length,  $L$ , of a pile with grout body diameter,  $D$ , the external carrying capacity is critical. It is determined by the ultimate soil friction,  $q_{sk}$ , the surface area of the grout body and a safety factor, according to DIN 4128 table 2.

End bearing capacity of the CTS TITAN IBO® micropile can be ignored.

Ultimate skin friction values should be derived from site investigations and tests. DIN (German Industrial Standard) V 1054-100 table F1 offers conservative  $q_{sk}$  values for some soil types:

Type of soil	Ultimate skin friction $q_{sk}$	
	psi	kN/m <sup>2</sup>
Medium to coarse gravel <sup>1)</sup>	29	200
sand and gravelly sand <sup>1)</sup>	21.75	150
cohesive soil <sup>2)</sup>	14.5	100
<sup>1)</sup> $D \geq 0.4$ resp. $q_{ck} \geq$		1.45 ksi (10MN/m <sup>2</sup> )
<sup>2)</sup> $l_c \approx 0.1$ resp. $c_{uk}$		14.5 psi (100 kN/m <sup>2</sup> )

## Buckling

According to DIN 4128 9.3 calculations for buckling have only to be done if the undrained shear strength of the soil  $C_u$  is below 1.45 psi (10 kN/m<sup>2</sup>). Critical cohesive soils according to E9 EAU are:

Type of Soil	Shear Strength $C_u$	
	psi	kN/m <sup>2</sup>
clay, soft & easily kneadable	1.45 - 3.6	10 - 25
loam, soft	1.45 - 3.6	10 - 25
chalk	1.45 - 7.25	10 - 50
clay	1.45 - 2.9	10 - 20
peat	0.73 - 1.45	5 - 10

For references on standards and principal tests performed, please contact us or visit our Web-Site at [www.micro-piles.com](http://www.micro-piles.com).



## Load bearing length, L, for tension or compression piles

$$L = \frac{F_w \cdot S}{\pi \cdot D \cdot q_{sk}}$$

F <sub>w</sub>	Safe working load
S	Safety factor
π	3.142
D	Grout body diameter
q <sub>sk</sub>	Ultimate skin friction

### Example:

Required load:	22.5 kips
Material:	sand
Drill bit diameter, d:	4.4"
Ultimate skin friction q <sub>sk</sub>	21 psi

1) Grout body diameter, D:  
 $D = d \cdot (\text{enlargement factor for sand})$   
 The enlargement factor for sand is 1.5 (please see page 3).

2) Load bearing length, L:

$$L = \frac{(22.5 \text{ kips} \cdot 1000) \cdot 3}{\pi \cdot (4.4 \text{ inch} \cdot 1.5) \cdot 21 \text{ psi}}$$

$$L \geq 155 \text{ inch} = 12.9 \text{ ft}$$

## Load bearing capacity, F<sub>CP</sub>, of compression only piles

Compression only piles have the ability to spread the load over the steel section and the grout body as a composite pile.

### Example:

CTS/TITAN BAR™	52/26
Outer bar diameter	2"
Ultimate strength of bar, F <sub>U</sub>	209 kips
Drill bit diameter, d	6.9"
Enlargement factor for ground (conservative estimate)	1
Grout compressive strength G <sub>C</sub> after 28 days	5.8 ksi

## Load taken on grout (conservative estimate)

$$F_G = A_G \cdot \frac{G_C}{4}$$

F <sub>G</sub>	Load taken on grout
A <sub>G</sub>	Grout area
G <sub>C</sub>	Grout compressive strength

The area of the grout is calculated as the area of the grout body minus the steel area. (In the example, the grout body diameter is assumed to be the same as the drill bit diameter):

$$A_G = ((6.9)^2 - 2^2) \cdot \frac{\pi}{4} = 10.9 \cdot \pi \text{ inch}^2$$

Consequently, the load taken by the grout is

$$F_G = 10.9 \cdot \pi \cdot \frac{5.8}{4} \text{ kips}$$

$$F_G \approx 50 \text{ kips}$$

## The Design Load taken on steel, F<sub>S</sub>

$$F_S = F_U \cdot 0.6$$

becomes, with the ultimate strength F<sub>U</sub> of the CTS/TITAN BAR™ 52/26,

$$F_S = 125 \text{ kips}$$

The total working load, F<sub>CP</sub>, of the pile in this conservative estimate is

$$F_{CP} = F_G + F_S \approx 50 + 125 \text{ kips or}$$

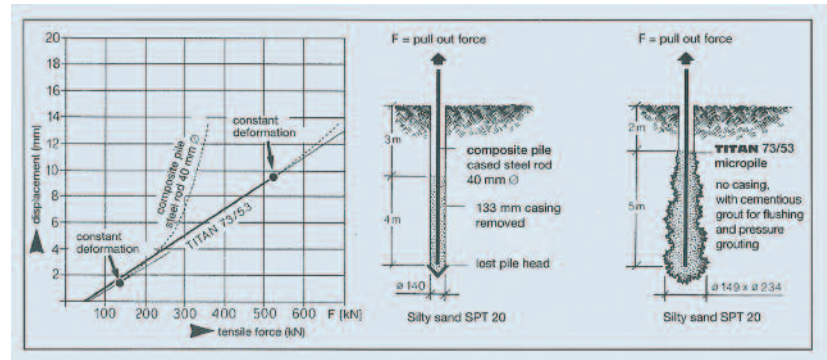
$$F_{CP} \approx 175 \text{ kips}$$

**Please Note:** These examples are applicable to CTS/TITAN IBO® micro piles only. Design requirements and safety factors may vary.



## Load deformation chart of 7m (23 ft) long grouted piles

Load deformations are compared in the same silty sand for a solid steel bar 40 mm (1 1/2") diameter with cased hole and a CTS/TITAN IBO® 73/53 (2 7/8" / 2 1/8") micropile with grout flushing W/C ratio 0.7 and final grout W/C 0.4 pressure grouted at max. 60 bar (870 psi).



## Installation procedure for CTS/TITAN IBO® micropiles

To utilize the CTS/TITAN IBO® micropiles to their full potential, it is essential that they are installed properly. We do not advise using air instead of grout while drilling, as it will potentially lead to reduced skin friction of the finished pile.

Please contact Con-Tech Systems Ltd. for best practices when installing CTS/TITAN IBO® micropiles.

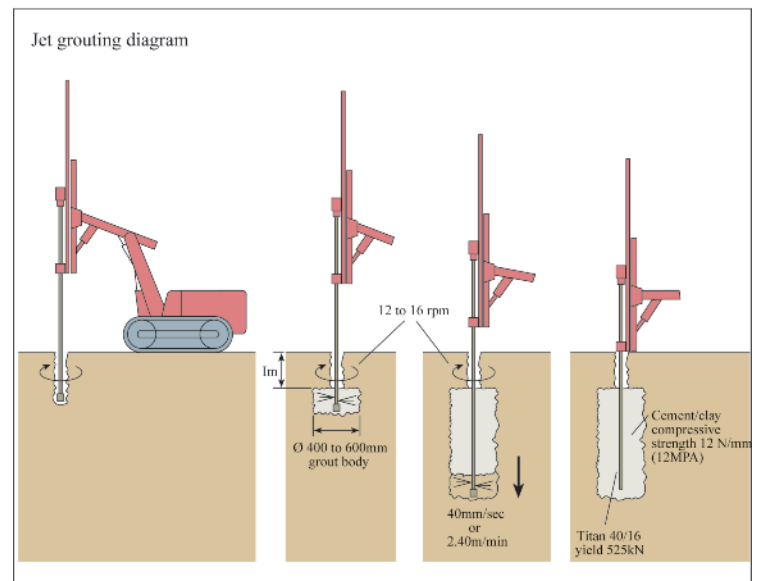
## Mini jet grouting

In order to install a working micropile in plastic clays and/or silty (SPT 3-4) conditions, Ischebeck Titan mini jet grouted micropiles can be used.

The system involves installing the pile without grout for the first 3 feet (1 meter) and then injecting a grout mix with a W/C ratio in the range of 0.8, at a grout pump pressure of up to 2900 psi (200 bar).

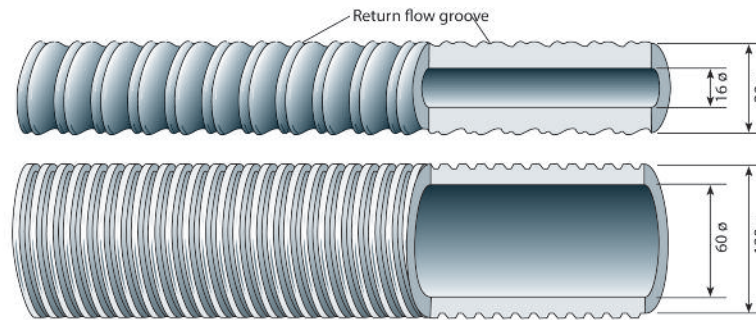
A grout body in the order of 15 3/4" (400 mm) to 23 5/8" (600 mm), with a compressive strength of 1.7 ksi (12 MPa) can be achieved in these ground conditions.

The 40/16 CTS/Titan IBO® micropile, together with a 4 3/8" (110 mm) hardened clay drill bit with adapted nozzles, is used for this application.



## Product specifications

Ischebeck hollow CTS/TITAN BAR™ type denotes external diameter of bar followed by its internal diameter. For example, a Titan 30/16 bar has an external diameter of 30mm and an internal diameter of 16mm.



Bar Type	Unit	30/16	30/14	30/11	40/20	40/16	52/26	73/56	73/53	73/45	73/35	103/78	103/51	127/111	130/60
Nom. outside dia.	mm	30	30	30	40	40	52	73	73	73	73	103	103	127	130
Nominal Inside dia.	mm	16	14	11	20	16	26	56	53	45	35	78	51	111	60
Ultimate load	kN	220	260	320	539	660	929	1194	1160	1630	1980	2282	3460	2400	7940
Yield Point	kN	180	220	260	430	525	730	785	970	1180	1355	1800	2750	1810	5250
Yield Stress	N/mm <sup>2</sup>	471	557	583	592	597	546	555	594	522	500	572	500	603	550
Cross Section	mm <sup>2</sup>	382	395	446	726	879	1337	1414	1631	2260	2710	3146	5501	3000	9540
Weight	kg/m	2.7	2.9	3.3	5.6	7	10	11.1	12.3	17.8	21.2	24.9	43.4	23.5	75
Thread direct.	-	left	left	left	left	left	left	right	right	right	right	right	right	right	right
Lengths	m	3/4	3/4	3/4	3	3	3	6.25	3	3	3	3	3	3	3

The ultimate load at yield (or the corresponding load which occurs at a constant elongation of 0.2%) was tested by MPA, (the material testing institute of the state of Northrhine Westfalia, Dortmund/Germany). This also applies to the cross sections. Above figures are valid for INOX anchors as well. The stresses mentioned were calculated from the load and cross section values of MPA.

## Key features

- Utilization of a steel hollow bar as the tendon** From the static point of view, a hollow bar is superior to a solid rod of the same cross sectional area with respect to bending moment, shear resistance and surface bond/friction.
- Hollow TITAN BAR™ is manufactured from high yield micro alloy high quality structural steel offering** high notch toughness > 39J. This steel is not affected by hydrogen embrittlement or by stress crack corrosion.
- The threads on hollow TITAN BAR™ are formed much like the ribs on a reinforcing bar fabricated according to DIN 488 & ASTM-A 615.** The deep Titan threads result in 2.4 times higher bond friction compared to standard drill steel coil-threads of R 32 (1¼") or R 38 (1½")
- Continuous threads guarantee the TITAN BAR™ can be cut or coupled anywhere along its length.** Cutting, extending, pre-stressing and load releasing on the tendon are possible. A thread pitch of 6° eliminates the need for locking nuts at each coupling.



# Contacts



## **Con-Tech Systems Ltd.**

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**East Stroudsburg, PA USA**

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Cell: (570) 807-9617

**Charlotte, NC USA**

Toll Free: 1-866-848-6800

Cell: 704 506-8472

Cell: 727 992-4142

**Plants:** Elizabethtown, ON &  
Charlotte, NC

Tom Miller Dam, Texas, USA

Owner: Lower Colorado River Authority

Engineer: Freese and Nichols

Contractor: Nicholson Construction

CTS/TITAN IBO® 40/20 Stitch Anchors , installed under Water

## **World Wide Web**

[www.contechsystems.com](http://www.contechsystems.com)

## **E-Mail**

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[ctswest@contechsystems.com](mailto:ctswest@contechsystems.com)

Eastern Division

[ctseast@contechsystems.com](mailto:ctseast@contechsystems.com)



# Con-Tech Systems Ltd.





**Engineered Solutions of Georgia**  
★★★★★ 159 Reviews  
(678) 905-1499  
[www.esogrepair.com](http://www.esogrepair.com) »

**CONTACT THIS BUSINESS**

## What your neighbors are saying

★★★★★

Very Helpful, 8/11/2015

I was having difficulty trying to find out where my basement was leaking. I contacted Engineered Solutions based on the reviews I read on line. Allan came to my house and not only gave me a detailed...

★★★★★

Very honest company, 3/25/2015

Allan Waite came and consulted on a sidewalk which was pulling away from our house. He presented the options, and told me about how much each option would cost. The lesser cost was one that I could...

**Larry F.**  
Posted on 2016-03-21

**Todd was very knowledge and**

Todd was very knowledge and the prices were cheaper. They did a really good and they absolutely fixed everything. They made us happy and I have recommended them and I will again.

OVERALL ★★★★★  
QUALITY ★★★★★  
SERVICE ★★★★★  
VALUE ★★★★★

**Joe S.**  
Posted on 2016-03-10

**the experience was extraordinary... starting**

the experience was extraordinary... starting with the follow-up from Samantha to the delightful initial call from Luis to the highly-professional skills and professional decorum and sterling work ethics of Shane, Alex, Jonathan, and Cruz. This is not an empty gesture of just wanting to be "nice." As a business man and one conversant with construction, this outfit and team are absolutely first-rate. FIVE STARS for sure!

OVERALL ★★★★★  
QUALITY ★★★★★  
SERVICE ★★★★★  
VALUE ★★★★★

**Nick W.**  
Posted on 2015-10-17

**ESoG provided a solid engineered**

ESoG provided a solid engineered solution to my structural problems around my home. This consisted of a combination of screw anchors and driven piles. Reaching a good load bearing soil required depths over 20 feet. Their solution was well thought out and all alternatives discussed. The work was carried out on time by professionals who were no strangers to what they were doing. And they were neat! Tarps were used to store the dirt that they had to move, and everything thoroughly cleaned up when they left. They took pride in their work and seemed to delight in showing off what they had accomplished. Well pleased!

OVERALL ★★★★★  
QUALITY ★★★★★  
SERVICE ★★★★★  
VALUE ★★★★★

**John M.**  
Posted on 2015-10-14

**ESOG arrived when they said**

ESOG arrived when they said they would and set up and started work efficiently. My job was a sinkhole under my driveway that was pulling the surrounding soils into it. Allan surveyed the site and presented a proposal based on his best estimate of the job, while emphasizing that a job like mine had many unknowns that could make it a larger job than expected. He was correct, our sinkhole was much bigger than expected, so the crew came back over four days to finish up the job. They cleaned up every day, and at the end, they pressure washed the street to remove all residues. I watched the job over most of the time they were here and was quite satisfied that they were able to fill the sinkhole and solve my problem. I would definitely use them again.

OVERALL ★★★★★  
QUALITY ★★★★★  
SERVICE ★★★★★  
VALUE ★★★★★

**Pat S.**  
Posted on 2015-10-08

**This was the best contractor**

This was the best contractor I have dealt with in a long time. They did exactly what they contracted to do, worked in the hot crawl space by going thru a basement window, and the cellar looked better after they left than before. And I feel it is structurally ready for 50 more years. It was a relief to find them for cellar/pier work. There are some fast operators out there! Chris's report went a bit overboard, included speculation, and included the attic—which has stood up there for 100 years with one small plaster incident. My entire objective was improving the main floor and the cellar. That attic photo/commentary caused a lot of anxiety when I gave his report to the prospective buyers, as I was required to do legally. When asked he did remove the speculative comments. The rest of his report was specific and told just what to do. I would use him again, but give directions! Overall the company was terrific. I wish they would advertise under "crawl space". I did not know the magic word 'pier' and it took me months to find them after trying out some other, jackleg operations.

OVERALL ★★★★★  
QUALITY ★★★★★  
SERVICE ★★★★★  
VALUE ★★★★★



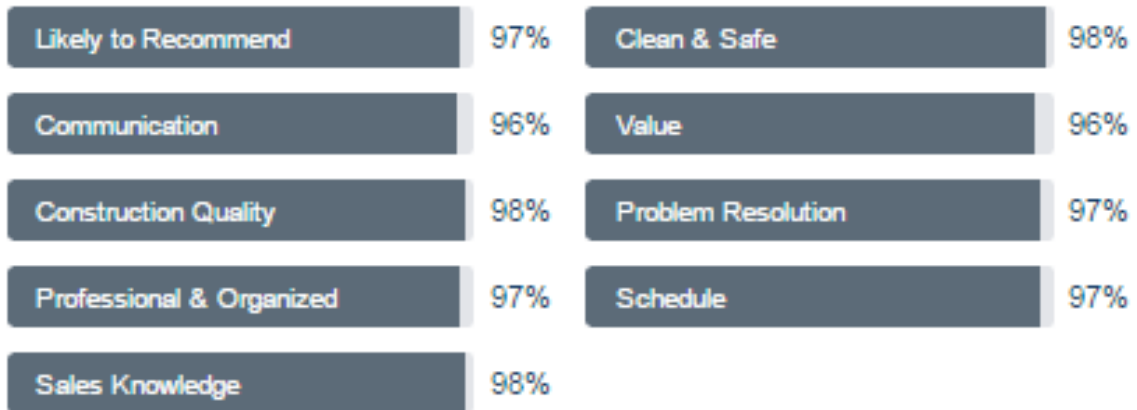




## Engineered Solutions of Georgia

2260 Northwest Parkway Suite H · Marietta, GA 30062 · (678) 290-1325  
www.esogrepair.com

★★★★★ 178 ratings



Review by Paul A. of Atlanta, GA

Mar 24, 2016



The company exceeded my expectations.

Did you find this helpful? [Yes](#)

Review by Anthony A. of Atlanta, GA

Mar 21, 2016



These guys are honest, knowledgeable, professional, and solve problems.

Did you find this helpful? [Yes](#)

Review by Joe S. of Duluth, GA

Mar 10, 2016



the experience was extraordinary... starting with the follow-up from Samantha to the delightful initial call from Luis to the highly-professional skills and professional decorum and sterling work ethics of Shane, Alex, Jonathan, and Cruz. This is not an empty gesture of just wanting to be "nice." As a business man and one conversant with construction, this outfit and team are absolutely first-rate. FIVE STARS for sure!

Did you find this helpful? [Yes](#)

Review by Dave R. of Fayetteville, GA

Mar 09, 2016



Extremely knowledgable and great company!

Did you find this helpful? [Yes](#)

Review by Charles M. of Lilburn, GA

Feb 22, 2016



I am impressed by the work done by Engineered Solutions of Georgia.

Did you find this helpful? [Yes](#)

Review by Matt B. of Smyrna, GA

Feb 20, 2016



Excellent service from beginning to end. Hands down the best experience I've ever had with a contractor.

Did you find this helpful? [Yes](#)

Review by Richard P. of Douglasville, GA

Feb 20, 2016



Did what they promised on time and on budget

Did you find this helpful? [Yes](#)



# CORE VALUES

## UNDERSTANDING

- It is important to us that our customers fully understand the issues they are having with their home and why the problems have occurred.
- We will create a customized plan that will fully address the issues and insure that our customers completely understand what we will be doing and how it will be done.

## TRUST

We want to earn the trust of our customer in three ways:

- **COMMUNICATION** – From the first phone call to the last we will keep our customers informed of their project status and changes as we work together.
- **EXECUTION** – From the project design to the completion of the work we will do exactly what we have contracted together to accomplish.
- **WORKMANSHIP** – Every project is custom designed to correct the issues and we will stand behind it with a warranty that is stated in the contract. We will also send out warranty certificates that are transferable with the property.

## RESPECT

We consider our customers friends and family and we treat them that way. We will respect their time by confirming all appointments and arriving on time. We will treat their home like our own while performing all work and we will dress and speak professionally at all times. We ensure that all work related debris is removed when the job is completed.



## CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

11/6/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).


<b>PRODUCER</b> Insurance Office of America, Inc. 2839 Paces Ferry Road Suite 1200 Atlanta, GA 30339	<b>CONTACT NAME:</b> Ashley Strickland <b>PHONE (A/C, No, Ext):</b> (678) 919-1150 <b>FAX (A/C, No):</b> (678) 919-1151 <b>E-MAIL ADDRESS:</b> Ashley.Strickland@ioausa.com																					
<b>INSURED</b>  Engineered Solutions of Georgia, Inc. 2260 Northwest Pkwy Suite H Marietta, GA 30067	<table border="1"> <thead> <tr> <th colspan="2">INSURER(S) AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> </thead> <tbody> <tr> <td>INSURER A:</td> <td>Admiral Insurance Company</td> <td>24856</td> </tr> <tr> <td>INSURER B:</td> <td>Nationwide Mutual Insurance Company</td> <td>23787</td> </tr> <tr> <td>INSURER C:</td> <td>RSUI Indemnity Company</td> <td>22314</td> </tr> <tr> <td>INSURER D:</td> <td>Kinsale Insurance Company</td> <td>38920</td> </tr> <tr> <td>INSURER E:</td> <td></td> <td></td> </tr> <tr> <td>INSURER F:</td> <td></td> <td></td> </tr> </tbody> </table>	INSURER(S) AFFORDING COVERAGE		NAIC #	INSURER A:	Admiral Insurance Company	24856	INSURER B:	Nationwide Mutual Insurance Company	23787	INSURER C:	RSUI Indemnity Company	22314	INSURER D:	Kinsale Insurance Company	38920	INSURER E:			INSURER F:		
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INSURER F:																						

<b>COVERAGES</b>	<b>CERTIFICATE NUMBER:</b>	<b>REVISION NUMBER:</b>
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.		

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSD WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC <input type="checkbox"/> OTHER:		CA00001977602	07/27/2015	07/27/2016	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 50,000 MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMPIOP AGG \$ 2,000,000 \$
B	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS		BA -00000055557U	07/27/2015	07/27/2016	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
C	<input type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION \$		NHA069574	07/27/2015	07/27/2016	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000 \$
	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input type="checkbox"/> N/A				PER STATUTE OTH-ER E L EACH ACCIDENT \$ E L DISEASE - EA EMPLOYEE \$ E L DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

EXCESS IS OVER GENERAL LIABILITY AND EMPLOYERS LIABILITY ONLY

<b>CERTIFICATE HOLDER</b>  Engineered Solutions of Georgia, Inc. 2260 Northwest Pkwy Suite H Marietta, GA 30067	<b>CANCELLATION</b>  SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  <b>AUTHORIZED REPRESENTATIVE</b> 
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