KELLER

Curriculum Vitae

Gregory Ziegler, P.E.

Executive Vice President

Mr. Ziegler has 25 years of geotechnical contracting experience. In addition to fulfilling a corporate role as Executive Vice President, he has responsibility for Moretrench's Groundwater Control Division which handles Keller Foundations' national dewatering and ground freezing operations, and also oversees the Grouting Division. He has extensive experience in ground freezing, construction dewatering using deep wells, wellpoints and ejector systems for dam remediation and structural applications; groundwater and potable water treatment plant installation; landfill gas well system installations; and slurry trenching.

EDUCATION:

M.S. Engineering Management, University of Missouri-Rolla, MO, 1999

B.S. Environmental Engineering, United States Military Academy, West Point, NY, 1994

CONTINUING EDUCATION:

Advanced Management Program, Association of General Contractors, 2016
Finance & Accounting for the Non-Financial Manager Certification, University of Pennsylvania Wharton School, 2015
Grouting Fundamentals and Current Practice, Colorado School of Mines, 2008
Construction Project Managers Course, Associated General Contractors, 2005

LICENSES:

Professional Engineer, State of Missouri

YEARS OF EXPERIENCE:

Since 1994

PROFESSIONAL HISTORY:

2018 to Present:	**Executive Vice President, Moretrench**
2017 to 2018:	**Senior Vice President, Moretrench**
2012 to 2017	**Vice President, Moretrench**
2004 to 2012:	**Project Manager, Moretrench**
2000 to 2004:	**Layne Christensen Company, Bridgewater, NJ**
1994 to 2000:	**U.S. Army Corps of Engineers**

HEALTH AND SAFETY:

OSHA 40-Hour HAZWOPER Training
OSHA 8-Hour HAZWOPER Refresher
OSHA 10-hour Construction
Corporate Drug and Alcohol Testing program
Annual Medical Monitoring program

PROFESSIONAL AFFILIATIONS:

Member, American Society of Civil Engineers.
Member, The Moles
Member, UCA of SME
Member, Refrigeration Engineers & Technicians Association (RETA)

SELECTED PROJECT EXPERIENCE:

GROUND FREEZING

Boeing Future 4-86 Dinol Booth, Renton WA: Project Executive for installation and operation of a ground freezing system for ground water cut-off and support of excavation for a future ventilation air plenum of a paint booth.

Seattle Sound Transit Northgate Link Extension, Contract N125, Seattle, WA: Project Executive for installation and operation of six ground freezing systems to support cross passage installation between two light rail tunnels. The system at each cross passage included over 1000 feet of horizontal drilling, a freeze plant in each tunnel, pumps and piping for chilled brine distribution, and a data acquisition system to ensure satisfactory system performance.

Shaft DST-1, Dugway Storage Tunnel, Cleveland, OH: Project Executive for ground freezing to provide groundwater control and excavation support to allow completion of a 48-foot diameter water tunnel access shaft. During excavation of the shaft, repeated soil and groundwater ingress under the liner plate excavation support had occurred that other remediation methods attempted over time had failed to rectify. The scope of the ground freezing contract included design and furnishing of the 63-pipe freeze system; provision of field engineering and on-site supervision during freeze pipe installation; and monitoring of ground freezing operations through excavation.

First Street Tunnel, Washington, D.C.: Project Executive for installation of three frozen shafts, three frozen tunnel connections, and one frozen SOE for the First Street Tunnel, which will serve as a CSO for District of Columbia Water. The project involved drilling of over 300 freeze pipes and installation of two 12-inch Supply/Return headers and three freeze plants. The overall scope of Moretrench's work also included installation of a dewatering well system for the client's main TBM launch shaft; installation of a well and battered wellpoint system to dewater a deep open cut excavation from the main shaft to existing infrastructure on First Street; and several weeks of polyurethane grouting, requested by the JV team, in different areas of the cast-in-place adit tunnel linings.

Access Shaft #3, Buenos Aires, Argentina: Project Manager for ground freezing to provide groundwater control and excavation support to allow completion of a 35.4-foot diameter water tunnel access shaft. During excavation of the shaft repeated soil and groundwater ingress between the slurry panel excavation support had occurred that other remediation methods attempted over time had failed to rectify. The scope of the ground freezing contract included design and furnishing of the freeze system; provision of field engineering and on-site supervision during freeze pipe installation by the owner's drilling subcontractor; and monitoring of ground freezing operations through final concrete liner installation. The project was successfully completed without further issues.

South West Pipeline Project, Beulah, North Dakota: Project Executive for ground freezing to allow construction of a concrete segmented liner shaft, 26.5 feet in excavated diameter and 160 feet deep, for water intake from a large reservoir. This project required a frozen bottom plug to provide water cut off. Concrete liner segments were installed top down.

Port Mann TBM Rescue, Vancouver, British Columbia Canada: Project Executive for a liquid nitrogen ground freezing program to permit repairs to a 3.5-m diameter TBM that developed mechanical issues 900 m into a 1300 m drive below the Fraser River. Ten freeze pipes were installed in front of the TBM to freeze the soil mass, providing the groundwater cut-off and soil stability required to allow repairs to take place.

Fort Hills Basal Aquifer Trials, Fort McMurray, Alberta, Canada: Project Manager for a ground freezing system composed of over 75 freeze pipes installed to a depth of over 500 feet to test the viability of freezing a deep aquifer. Design challenges included a 480-ton freeze system, a 1,500 gpm brine pumping system, specialized freeze pipes and temperature monitoring wells, and a custom instrumentation and SCADA system.

Northern Boulevard Crossing, East Side Access, Queens, NY: Project Manager for a program of horizontal ground freezing to create a canopy of stabilized soil above the tunnel crown for mining of a 125-foot long tunnel through difficult ground beneath a pile-supported elevated New York City transit rail line, a 5-track subway tunnel, and the heavily travelled Northern Boulevard.

Woonasquatucket CSO Interceptor Main, Narragansett Bay Commission, Providence, RI: Project Manager for ground freezing of a 30-ft diameter shaft to a depth of 200 ft.

Southeast Collector Trunk, Sewer Shaft 11, Toronto Canada: Project Manager for ground freezing to provide excavation support and groundwater control for the sinking of a 180-feet deep access shaft for TBM maintenance.

Southeast Collector Trunk, Sewer Shaft MS-1, Toronto, Canada: Project Manager for ground freezing to provide excavation support and groundwater control for sinking of a 100-feet deep shaft with launch block for TBM.

Safe Haven, East Side Access Project, New York, NY: Project Manager for the installation of a mass freeze to allow tunnel boring machines a “safe haven” to allow inspection and cutter head changes. The frozen mass was 50 ft by 50 ft in plan and more than 100 ft deep. A total of 110 freeze pipes were drilled on compound angles due to surface location access issues. All pipes within the alignment were heated and pulled as the TBM entered the frozen mass.

Gibson County Coal, Princeton, IN: On-site engineer/manager during the installation/layout/survey of all freeze pipes, instrumentation wells and piezometer wells for a ground freezing system to allow the construction of a 550-foot deep mine access shaft.

City Water Tunnel #3, New York, NY: Project Engineer for ground freezing to provide groundwater control and excavation support during construction of shafts 28 and 29.