



STATEMENT OF QUALIFICATIONS GEOTECHNICAL AND CIVIL ENGINEERING SERVICES

Copper State - TEAM, Inc. (CSET) provides civil, geotechnical and forensic engineering services throughout Arizona. We are located east of the 101 Freeway and south of Bell Road, at 16621 N. 91st street, in Suite 104, Scottsdale, Arizona. We are pleased to submit this Statement of Qualifications and appreciate consideration of our firm for your geotechnical and civil engineering needs. We provide timely and cost-effective services from our McDowell Mountain Business Park offices in Scottsdale, Arizona. Our capabilities include:

ENGINEERING SERVICES

- Forensic Civil/Geotechnical Engineering Investigation Services
- Expert Witness Services - Mediation, Arbitration and Trial Deposition and Testimony
- Geotechnical Soil and Foundation Investigations
- Sink Hole Investigation and Mitigation Design
- Earth Fissure Investigation and Mitigation Design
- Expansive and Collapsing Soil Assessments
- Foundation Systems (Push Pier, Helical Pier, Micropile and H Pile) Design and Construction Testing
- Soil Nail/Rock Anchor Retaining Wall Design and Testing
- Landfill Groundwater, Leachate and Gas Well Design and Monitoring
- Pavement Condition Survey and Roadway Base Design
- Static and Seismic Slope Stability Analyses
- Slope Movement Instrumentation and Monitoring
- Embankment, Impoundment and Diversion Siting and Design
- Filter and Drainage System Design
- Geomembrane (liner) and Geotextile (fabric) Geotechnical Applications
- Construction Monitoring and Testing
- Storm Water Hydrology and Hydraulic Design
- Stormwater Retention and Septic Infiltration (Percolation) Testing

WATER AND WASTE WATER SERVICES

- Industrial Process and Wastewater Sampling, Testing and Reporting
- Liquid and Solid Waste Containment Design
- Field Monitoring of Radon, LEL, Methane, Oxygen, and Hydrogen Sulfide
- Ground-water Well Installation and Monitoring (Electric and Pneumatic)
- Soil, Water and Gas Sampling and Testing

MISSION STATEMENT

Copper State - TEAM Provides Experienced and Cost Effective Geotechnical and Civil Engineering Services for Select Clients Throughout the Western Hemisphere.

Our professionals have provided professional services ranging from design of tailings dams in the Peruvian Andes to settlement estimates for Alumina tank farms near Kingston, Jamaica. We are quality-focused such that each project is performed in a technically sound, timely and economical manner. Management tools include a structured accounting and project review system lead by the firm's senior engineers, J. David Deatherage and Moges Gebregiorgis. Our leadership for projects is based on the concepts of client satisfaction and constant work product improvement. We believe that timely communications are key to providing successful services.

KEY INDIVIDUALS

J. David Deatherage, P.E. is the President and senior civil/geotechnical engineer. He is a licensed professional civil engineer with a MSE degree in civil engineer and 45 years of geotechnical and civil engineering related experience in Arizona. He has supervised thousands of geotechnical projects involving the investigation, design and construction of foundations and earth structures. Mr. Deatherage is responsible for work product quality, office management, and leads geotechnical investigation, civil, forensic and expert witness projects.

Moges Gebregiorgis, P.E. is a senior civil/geotechnical engineer. He is a licensed professional civil engineer with MS degrees in both civil engineering and engineering geology. His 32 years of professional expertise include investigation, design and construction of foundations and earth structures, forensic geotechnical and civil engineering investigations, shallow subsurface geophysics, geological mapping, and geographic information systems (GIS).

Tyler Baumgartner is our geotechnical technician responsible for environmental and construction sampling and testing. He has current Arizona Technical Testing Institute (ATTI) and American Concrete Institute (ACI) field technician certifications for soils and concrete. He has worked with the firm since early 2018. He has completed the OSHA 40-hour HazWopper Certification and MSHA 24-hour new miner training. Tyler is the Radiation Safety Officer.

Our key team members have worked together on over 6,300 projects since 1996, and we pride ourselves in producing timely and economical civil and geotechnical engineering services.

OFFICE FACILITIES

Our offices are located in the McDowell Mountain Business Park, at 16621 N. 91st Street, Suite 104, Scottsdale, Arizona, 85260. Our offices contain networked computer work stations, cell phones and e-mail. Computer software applications include Microsoft

Project, Microsoft Office, Stabl 5N, REAME 2014, and DrFlow hydraulic software. Our offices house a basic geotechnical testing laboratory with the following soil testing capabilities:

- Particle size distribution/Hydrometer
- Atterberg Limits
- Consolidation/Collapse Potential
- Expansion Index/Remolded Swell
- Moisture and Density
- Standard and Modified Proctor
- Direct Shear
- Specific Gravity
- Concrete, Mortar, Grout Strength

ENGINEERING SERVICES

Geotechnical Services: With experience on thousands of soil and foundation investigations across the Southwest, CSET works on a diverse range of commercial, industrial and infrastructure projects. Single and multi-story buildings, bridges, water treatment plants, parking structures, roadways, retaining walls and impoundments are typical geotechnical projects. Common to the Southwest are expansive and collapsing moisture sensitive soils. These soils are an important consideration for site development, and we have extensive experience in both identifying and developing mitigation alternatives for these problem soils. Pavement condition surveys are used to identify problem soil areas under existing pavements, and we specify mitigation through special construction such as lime stabilization. Our in-house geotechnical testing capabilities allow rapid evaluation of recovered soil samples. Our pier and micropile designs consider both the moisture sensitive soils and the variable sand-gravel-cobble (SGC) strata that underlay much of the greater Phoenix area.

Soil Nail/Rock Anchor Retaining Walls: CSET performs geotechnical and geologic investigations to characterize site conditions and then uses the REAME (Rotational Equilibrium Analysis of Multilayer Earthworks) slope stability program to design soil nail and rock anchor reinforced self-supporting retaining walls for fills and cuts into soil and rock. Our soil nail retaining wall designs have been used by ADOT and NASA in Arizona and New Mexico. We have designed numerous soil nail walls for other clients in Prescott, Fountain Hills, Tucson, and Mesa and in and around hillside developments in Scottsdale, Paradise Valley and Phoenix.

Embankments: Embankments and impoundment siting, design and construction monitoring are one of our specialties. We have worked on over 70 embankments and impoundments in the southwest, including eight that were within the Arizona Department of Water Resources regulatory jurisdiction. Other reviewing agencies include the Office of Surface Mining, MSHA, Bureau of Land Management, Soil Conservation Service, Corps of Engineers and the Flood Control District of Maricopa County. Our services include seepage, slope stability and settlement analyses. We perform seismic reviews and slope movement monitoring. We strive to locate and incorporate local borrow materials into embankment construction to reduce construction costs. Many clients use process solutions that require containment within lined impoundments, and we have designed and monitored the construction of dozens of single and double lined containment facilities. Geomembrane and geotextile designs by CSET are used in applications ranging from seepage control to dust suppression.

Construction and Demolition Engineering: Construction observation, testing and compliance documentation are performed by our field technicians. Earthwork compaction testing, concrete and mortar sampling, aggregate property, special structural inspections, and general fill monitoring are provided on a call out or continuous basis. Demolition assessments and planning for closure or rebuilding on large industrial facilities require a significant multidiscipline effort for a successful and safe program that meet the regulatory needs.

Hydrology and Hydraulic Engineering: Storm water runoff estimates, flood routing and dam break studies are performed using local county jurisdiction methods. Hydraulic designs for pipe systems are optimized using DrFlow (Archon Engineering) programs. We perform insitu double-ring permeability and percolation testing for basin seepage, infiltration and septic disposal applications.

Pile Foundation Design and Construction Engineering: We have extensive experience with lateral and vertical testing of steel pile systems used as foundations for photovoltaic solar arrays. We have installed a variety of W6 and C section piles to depths of 3 to 12 feet, monitoring pile drive times and installation energy. We use our custom steel load frame to load the piles both laterally and vertically with loads up to 10 kips, and we measure the resultant vertical and horizontal deflections to confirm structural requirements. We have designed dozens of push pier, helical pier and micropile foundation stabilizing projects. We also provide forensic geotechnical engineering services to investigate failures in pile foundation systems.

Analytical Testing: We subcontract analytical soil chemistry testing to Motzz Laboratories, Inc. and water chemistry testing to Orange Coast Analytical, Inc. These laboratories are licensed by the Arizona Department of Health Services (ADHS) and use approved EPA standard methods.

We invite you to visit our web site at:
<https://www.copperstateengineering.com>

Please e-mail us with questions or comments at:
david@copperstate-eng.com.