



AGS

ADVANCED GEOTECHNICAL SOLUTIONS, INC.

Scope of Services

Geotechnical Engineering
Engineering Geology
Construction Observation & Testing Services
Fault Investigations
Laboratory Testing
QA/QC

Expertise

Infrastructure
Commercial
Institutional
Hospitals
Schools
Military
Residential

Orange/LA Counties

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1.0 COMPANY PROFILE

Advanced Geotechnical Solutions, Inc. (AGS) is a recently created, privately held geotechnical engineering and engineering geology consulting firm serving predominantly California. The principals of the firm have university degrees and professional licenses in Civil Engineering, Geotechnical Engineering, or Engineering Geology. The principals collectively have over 80 years of experience throughout California consulting to the construction industry. To supplement our key personnel dependent upon the ebb and flow of projects AGS's has a key group of highly experienced sub-consultants which we can utilize as projects require. By utilizing these consultants on an as needed basis AGS can reduce overhead cost but maintain the quality of services we are known for. This also allows our key consultants to pursue their research and studies in their various fields of expertise.

The strength of the AGS organization is built upon proactive client service, value-engineered solutions and the "hands on" involvement of the principals on all projects. AGS's service focus is client response, reality-based design, and value engineering. AGS' management structure is designed to meet the needs of our clients by using the project team approach for the execution of all projects. The project team structure is centered on the Project Manager who is the primary point of contact with the client and is responsible for managing the performance of the project team. The Project Manager reviews every critical aspect of assigned projects including detailed review of documents and budget tracking. The Project Manager is fully authorized to administer every aspect of the contract. The AGS corporate organization, including technical staff, administrative services, financial services, and human resources serve to support the Project Manager in the execution of his/her duties.

2.0 CAPABILITIES

Throughout their over 80 years of consulting practice, the principals of AGS have provided a full range of site development and construction services to satisfied clients throughout California. AGS's employs registered civil, geotechnical, and engineering geologists, and construction inspectors for both private and public sector clients to address a wide variety of engineering and construction concerns. Our capabilities include the following expertise:

- Simple to complex residential, commercial, and industrial developments
- Public and private infrastructure design and construction
- Schools and hospitals
- Bridges and roadways
- Geological and geotechnical hazard mitigation
- Military infrastructure
- Earthwork observation and testing
- Engineering services for contractors
- Legal support and expert witness
- Customer service support
- Forensic engineering
- Construction management
- QA/QC services for military projects

The success of AGS's principal engineers and geologists has resulted in part from our reputation for value engineering in design and from the practical and timely solutions we offer during design and construction. AGS's philosophy is to support the technical field personnel with professional engineers who provide a broad variety of clients with expert knowledge, advanced capabilities, and outstanding service.

3.0 QUALIFICATIONS

3.1 Soils and Foundation Investigations

AGS's capabilities include the full range of geotechnical and geological field investigation and sampling programs. Through participation on some of the largest private-sector and infrastructure projects in California, AGS personnel have gained extensive experience evaluating subsurface site conditions and predicting soil and rock behavior for many different types of projects.

AGS is capable of designing and implementing a wide range of field investigation programs, including sampling and laboratory testing of soil and rock. AGS is capable of performing deep exploration borings where soil and rock cores are retrieved and studied, the permeability of the soil and rock mass is evaluated by water pressure testing, and the seismic wave velocity is determined by performing down-hole geophysical studies.

AGS personnel have experience with difficult site access. Limited access and portable drilling equipment has been employed for many difficult access locations such as landslide and slope stability investigations, and the interior of residential and commercial structures. In some instances, cranes and helicopters were utilized to provide personnel and to lower skid-mounted drilling rigs into position. Each project presents a separate challenge to properly sample the soil and rock materials encountered to appropriately characterize the subsurface materials and the site. AGS personnel have extensive experience sampling soils with numerous types of samplers including the Standard Penetration Test (SPT) split-spoon sampler, the California and Modified California Samplers, Shelby-tube sampler, various sizes of Pitcher Samplers, and Fixed-Piston Samplers. Bedrock sampling has been performed using conventional core-barrels, with and without split inner tubes, and wire-line coring and sampling with triple-tube core barrels. To supplement the subsurface information gathered during drilling and sampling programs, cone-penetrometer soundings (CPT) have been used extensively for projects ranging from liquefaction studies for existing earth structures to deep foundation explorations for high-rise buildings to be constructed over soft soils. AGS engineers design laboratory testing programs to characterize subsurface conditions such as compressible soils beneath proposed structures, weak bedrock foundations, and weak soil and rock slopes. To predict soil behavior under proposed construction conditions, we evaluate shear strength, compressibility, expansion potential, gradation, moisture content, and density.

AGS's affiliated laboratories have the capability of determining dynamic soil properties using cyclic triaxial and cyclic simple shear testing, settlement properties by performing consolidation tests on sensitive soils, and index properties using gradation, Atterberg Limits, UBC Expansion Index, moisture content, and dry density testing. For our pavement design and construction projects, R-value, as well as other qualification tests, are employed. We have developed state-of-the-art design parameters and construction recommendations for foundations of various privately and publicly-owned structures, including:

- Low to High-Rise Buildings
- Parking Structures
- Military Support Facilities
- Elementary to University Schools
- Large Scale Land Development Projects
- Neighborhood to Regional Shopping Centers
- Highways and Bridges
- Residential Developments
- Golf Courses
- Pipelines
- Transmission Line Towers
- Water and Wastewater Treatment Plants
- Airport Facilities
- Port Facilities
- Hospitals

3.2 Earthwork Observation and Testing

For the past 80 cumulative years, AGS engineers and geologists have been intimately involved with construction observation and testing services during earthwork operations, including placement and compaction of fills, over-excavation and reconstruction of unstable slopes, earthen buttresses, installation of subdrains, placement of utility trench backfill, and placement of structural backfill behind retaining walls and foundations. A staff of trained technicians also performs nuclear and sand cone density testing, as necessary.

Our engineers have conducted pier and pile load tests and plate bearing tests, and have provided consultations and recommendations for excavations, ground water control, wet weather grading techniques, and other project issues. We also provide geotechnical engineering services during construction including inspection of foundation excavation operations for shallow footings and deep piers, and performing observation and engineering consultations during pile driving operations, including wave equation analysis for prediction of pile performance. In the event of unusual conditions, our geotechnical engineers can provide immediate consultation in order to keep the project on schedule and under budget.

3.3 Slope Stability and Landslide Analysis

In conducting slope stability and landslide analysis, AGS engineers and geologists determine the mass behavior of slopes in soil and rock, and provide recommendations for stabilizing techniques. We undertake studies of existing landslides, including analysis of causative factors and remediation or repair recommendations. We also provide instrumentation of slopes and excavations to monitor stability. AGS engineers and geologists also have experience installing slope indicator monitoring systems for potentially unstable hillsides and steep construction excavations, evaluating shored excavations, and conducting vibration monitoring during pile driving or blasting operations. AGS can also evaluate cost estimates for potential slope stabilization methods.

3.4 Site Improvement and Ground Stabilization

AGS engineers have decades of experience providing site improvement recommendations for a variety of structures and conditions. We have a proven ability to provide innovative and cost effective solutions for our clients. AGS engineers have performed extensive site remediation and foundation stabilization prior to construction on marginally stable, saturated, and liquefiable soils. AGS engineers use state-of-the-art technology to determine placement and improvement criteria of soils and waste materials for support of pavements, and for use in marginal lands and reclamation of disposal areas. Based on project requirements, we have used the following ground improvement methods:

- Vibro-compaction and vibro-displacement compaction
- Grouting and chemical injection
- Lightweight structural fills
- Wick drains
- Stone columns
- Cement and lime stabilization
- Preloading and surcharging
- Various forms of pre-compression, reinforcement, and thermal stabilization
- Geotextile fabrics

AGS engineers provide analysis and solutions for unstable ground and slope issues caused by ground water conditions, including the use of geosynthetics and lime-cement additives. We are familiar with innovative uses of geosynthetics in various types of construction, such as building support, roads, highways, parking lots, structural fills, drainage systems, retained earth walls, and storage ponds. Recommended solutions have included ground stabilization, layer separation, filtration, soil reinforcement, and erosion control.

3.5 Instrumentation

Often times the precise measurement of ground or structure movement is required, and AGS has implemented a variety of instrumentation techniques. To monitor vertical ground and structure movements, we have used vibrating wire extensometers with Borros anchors as well as conventional level surveys. Lateral deflection has been monitored using inclinometers and ground water levels have been monitored using piezometers as well as manual measurement.

3.6 Earthquake Engineering/Geologic Hazards Investigations

Earthquake and geologic hazards can have a potentially devastating effect on facilities, and should be properly characterized early in the design phase in order to provide cost-effective mitigation and design solutions. AGS's geologic hazard study capabilities include fault location assignments, and generally involve evaluations of the following:

- Soil liquefaction
- Slope stability
- Fault rupture hazard
- Fault trenching
- Potential for ground deformation, slope failure and liquefaction
- Seismic design criteria

- Analysis of tectonic geomorphology
- Earthquake time history design
- Paleoseismic studies (dating past earthquakes, recurrence intervals, and slip rates)
- Lateral spreading
- Seismically induced settlement
- Strong ground motions
- Erosion
- Flooding
- Groundwater Seepage

AGS conducts fault investigations to characterize a fault's past behavior and to quantify the level of hazard posed to existing or proposed projects. These investigations are designed to acquire the information most pertinent to the project. For example, there may be a need to focus on fault location identification as well as the width and type of fault. Or there may be a need to determine which faults are the principal strands within a zone. In some cases, fault setbacks have been determined to define buildable limits. AGS offers clients considerable expertise in evaluating anticipated ground surface displacements and potential earthquake magnitude.

At AGS, we emphasize quality data and sound interpretation in conducting fault studies. The many years of experience our principal engineers and certified engineering geologists allow us to conduct all phases of an investigation efficiently and accurately. The several components of a fault investigation often include:

- Data and literature review
- Air photo and geomorphic analysis
- Geologic mapping
- Geophysical surveys
- Borings
- Trenching

3.7 Site/Structure Seismic Response Analyses

AGS engineers and geologists have performed many probabilistic seismic hazard analyses (PSHA), in which the site-specific ground motions (usually peak ground acceleration or equal hazard spectra) are expressed in terms of a probability of exceedance. This approach involves defining the locations and geometrics of earthquake sources (faults); estimating the rate of occurrence of earthquakes on each source; and using attenuation relations to predict the site ground motions from the magnitudes and distances of these earthquakes. AGS has extensive experience analyzing earthquake ground motions for both proposed and existing facilities. For certain structures, such as pipelines, and bridges, deterministic response spectra and time histories are typically required. Establishing the ground motions for a specific site involves a thorough evaluation of the seismic sources in the surrounding region (including possible blind thrust faults); estimation of maximum magnitudes; calculation of peak horizontal and vertical ground accelerations and response spectra; and generation of acceleration time histories to represent the earthquake scenario.

3.8 Forensic Analyses and Expert Testimony

AGS performs geotechnical and geological forensic analyses for numerous clients on completed projects throughout California. Our expertise is related to issues such as groundwater, seepage, drainage, ground settlement, landslides and other slope movements, and foundation, slab-on-grade and pavement distress. Our scope of work typically involves review of as-built plans and specifications, unpublished and published literature review, analysis of site geomorphology using stereoscopic, aerial photographs, geologic and geotechnical mapping, performing subsurface explorations, performing computer aided analyses, and as-needed reporting. We consult with our clients throughout our forensic investigation to support their decision making process. As necessary, we have provided expert testimony in legal cases. Our experience in the legal system as experts has allowed us to develop an expertise in establishing loss prevention practices for our clients. These loss prevention practices are incorporated in all of AGS's design work and construction activities. Our clients use our forensic expertise to support customer service, construction repair and maintenance, dispute resolution, and legal actions.

3.9 Communication

AGS understands the complexities associated with projects comprised of interdisciplinary teams, especially when geotechnical and geological field investigations are the primary focus. These projects require effective communication between the various members of the team so that project efficiency is enhanced and necessary modifications can be implemented in a timely manner.

The past assignments of our engineers and engineering geologists have required expeditious investigation and critical evaluation of sites adversely affected by slope failures, problematic soils, and ground movement. In most cases, sites affected by these conditions will possess a highly chaotic physical nature; therefore the ability to modify the approach to adequately address site conditions in a cost effective manner is important. AGS has the ability to successfully complete these projects, and understands that effective communication with our clients and the project team during the design and construction phases is crucial for successful projects.

4.0 SELECT PROJECTS

Infrastructure-

- *Foothill Transportation Corridor*
- *San Joaquin Hills Transportation Corridor*
- *Jamboree Road A.T.&S.F. Railroad Bridge*
- *Foothill Bridge over Hagador Creek, Corona*
- *Del Mar Blue Line Station, Pasadena*
- *Universal Terrace Overcrossing of US-101*
- *North Oceanside Annexation Area (NOAA)*
- *McBean Transfer Station, Santa Clarita*
- *Rancho California Water District Water Treatment Plant, Temecula*
- *Rancho California Water District Reclaimed Water Storage Ponds, Temecula*
- *Calle de Oso Oro Bridge, Murrieta*
- *John Wayne Airport High Speed Taxiway and Aprons, Irvine*
- *SDG&E ECO-Boulevard Power Line Project- Southeast San Diego County*

Military-

- *Hangar 6 Modifications – MCAS Miramar*
- *Combined Child Care and Youth Center – NAF El Centro*
- *Tactical Site Exploitation Facility – Camp Pendleton Marine Corps Base*
- *Fitness Center – USMC Mountain Warfare Training Facility*
- *Child Development Center – MCAS Miramar*
- *Pack Truck Trail Primary Border Fence- County of San Diego*
- *Yuma Proving Grounds, Yuma, Arizona*
- *Indoor Fitness Center– Camp Pendleton Marine Corps Base*
- *Various Projects MCCC 29 Palms*

Master Planned Communities-

- *City of Aliso Viejo*
- *City of Mission Viejo*
- *Coto de Caza*
- *City of Aliso Viejo*
- *Eastlake –Chula Vista*
- *San Elijo Hills- San Marcos*
- *Ocean Ranch- Oceanside*

Hospitals and Schools-

- *Orange Coast Memorial Medical Center*
- *Providence Saint Joseph Medical Plaza, Burbank*
- *UCLA / Santa Monica Hospital, Santa Monica*
- *Olive View Medical Center, Sylmar*
- *Stonegate Elementary School, Irvine Unified School District*
- *John Burroughs High School Modernization and Reconstruction, Burbank*
- *Caltech Broad Center, Pasadena*
- *San Diego Jewish Academy*
- *University of California, San Diego – Pharmaceutical Sciences Building*

Structures-

- *Aperture – San Diego*
- *La Jolla Indian Casino- County of San Diego*
- *Radisson Hotel, Los Angeles*
- *Pechanga Resort and Casino-Riverside County*
- *Genentech Research Facility- Oceanside*
- *Hawthorne Police Department, Hawthorne*

5.0 RESUMES

Attached are brief resumes for the principals of Advanced Geotechnical Solutions, Inc. More detailed resumes can be prepared at your request, including lists and descriptions of past projects pertinent to your business.