



February 2, 2023

Mr. Mark Uphus, P.E.
Senior Civil Engineer
CITY OF GARDEN GROVE
11222 Acacia Parkway
P.O. Box 3070
Garden Grove, CA 92842

GMU Proposal P-23015

Subject: Proposal to Provide On-Call Geotechnical Services, City of Garden Grove, California

Reference: "Request for Proposal for On-Call Geotechnical Services", dated January 9, 2023

Dear Mr. Uphus:

GMU is pleased to submit our proposal to provide On-Call Geotechnical Services. With over 55 years of experience in the Southern California area and as a small business enterprise (SBE), GMU is able to reliably, efficiently, and effectively provide the scope of work described in the referenced RFP. GMU possesses extensive experience in the design and construction of numerous public works projects including geotechnical/pavement evaluation & design, laboratory testing, and construction observation/testing services.

GMU currently serves as a Geotechnical/Pavement Engineering Consultant and provides services to the Cities of:

- Aliso Viejo
- Chino Hills
- Dana Point
- El Monte
- El Segundo
- Fountain Valley
- Garden Grove
- Irvine
- Laguna Niguel
- Lake Forest
- Mission Viejo
- Newport Beach
- Rancho Santa Margarita
- San Fernando
- San Juan Capistrano
- Santa Fe Springs
- Torrance
- Yorba Linda
- Whittier

We also provide on-call services for the County of Orange and the County of Los Angeles.

Our website, www.gmugeo.com, offers a virtual tour of GMU and an overview of some of GMU's projects.

We have reviewed the attachments to the RFP, including the sample insurance documents and are prepared to provide insurance information per these requirements. In addition, we have reviewed the Sample Agreement and have the following comments:

Mr. Mark Uphus, CITY OF GARDEN GROVE
Proposal for On-Call Geotechnical Services

- Paragraph 2 – Replace “warrants” with “acknowledges.”
- Paragraph 19 – Add at end of first paragraph: “Consultant’s indemnity and defense obligations set forth above are subject to and to be construed in accordance with the provisions of Civil Code Section 2782.8.”

We appreciate the opportunity to provide this proposal and look forward to future opportunities to work with the City of Garden Grove. Please do not hesitate to call if you have any questions regarding this proposal.

Respectfully submitted,


Roger Schlierkamp, M.Sc., P.E.
Director of Pavement Engineering
rschlierkamp@gmugeo.com
949-546-0017


Gregory Silver, M.Sc., PE, GE
President / CEO
Principal Engineer
gsilver@gmugeo.com
949-546-0080



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Introduction

GMU is a Small Business Enterprise (SBE) with over **55 years of experience**. Previously known as GMU Geotechnical, Inc., GMU has established a reputation for reliability, innovation, accuracy, efficiency, and excellent service resulting in reduced costs, reduced man-hours spent on scheduling or project coordination, and reduced risks for our clients. These clients choose to maintain long-term relationships with us because of the benefits of our reputation and experience. Our clients include City, County, and other public agencies in addition to private owners, developers, and contractors. Shareholders of GMU consist of two Engineers and one Geologist who are active in the daily operations of the company, including performing and managing geotechnical and pavement design or construction projects.



GMU is a full-service geotechnical engineering firm offering a variety of geotechnical engineering services as well as a list of specialty services that complement our geotechnical engineering capabilities, outlined as follows:

- **Geotechnical Engineering and Engineering Geology**
 - *4 Registered Geotechnical Engineers and 4 Certified Engineering Geologists, supported by numerous Senior Staff and Staff Engineers and Geologists.*
 - *Experience ranging from master planned communities to landslides to bridges and public works structures to roadways to high rise structures.*
- **Structural Engineering for Retaining Structures and Shoring**
 - *Structural and geo-structural designs for conventional retaining walls, soil nail walls, soldier pile walls, and MSE walls.*
- **Soils and Materials Laboratory Testing**
 - *Certified by County of Orange, Caltrans, AASHTO/AMRL, DSA*
- **Geotechnical (Soils) Inspection / Special Inspection**
 - *Geotechnical Engineering technicians dedicated to Public Works-related projects with experience ranging from 10 to 25 years and Caltrans-Certified.*

- Full range of special inspection capabilities (see Statement of Services).
- Most of our geotechnical inspectors possess multi special-inspection capabilities.

- **Pavement Engineering**

- Pavement Engineering group led by Roger Schlierkamp, M.Sc., PE, Director of Pavement Engineering.
- Our Pavement Division includes 4 Senior Staff and Staff Pavement Engineers.



- **Construction Management and Monitoring**

- Group led by Mike Moscrop, M.Sc., PE, GE, Vice President
- Includes: Construction vibration monitoring, construction monitoring, and construction management advisory.
- 30+ year history with monitoring hillside land movement.

- **Forensic Engineering and Expert Witness Consultation**

- 30+ year history of providing forensic engineering and expert witness consultations.

- **Geotechnical Instrumentation**

GMU is an award-winning firm recognized by ASCE, CELSOC, and CalGeo. Please see our website (www.gmugeo.com/awards) for a summary.

General City/Municipality Experience

GMU and its staff have a long history providing services to Cities and various municipalities throughout Southern California.

Select List of Current City/Municipality Work

- County of Orange – Consistently ranked either the top or one of the top three geotechnical firms in Orange County.
- City of Huntington Beach – GMU is currently providing pavement evaluation services for the 2023 CIP, including arterial roadway segments such as Hamilton, Heil, and Bolsa.
- City of Mission Viejo – Providing pavement design and construction observation/testing services, including for the City's annual residential slurry seal project, annual arterial rehabilitation project, and geotechnical reviews.
- City of Laguna Niguel – City's geotechnical consultant for over 20 years, including observation and testing services during construction.

- City of Lake Forest – *City QA/QC services and consultation on public works projects.*
- City of Rancho Santa Margarita – *City’s geotechnical and pavement engineering consultant since 2005 for both reviews and public works projects.*
- City of Dana Point – *Public works projects and pavement engineering/testing.*
- City of Aliso Viejo – *Public works projects and pavement engineering/testing.*
- City of Garden Grove – *City’s geotechnical/pavement consultant providing public works design consulting.*
- City of Chino Hills – *City pavement management planning, and geotechnical services providing both plan check and design level services as well as inspection services.*
- City of Newport Beach – *City geotechnical consultant providing geotechnical design, pavement engineering, pavement testing and inspections, forensic/expert witness consulting, and QA/QC services for major public works projects.*

Scope of Services

GMU understands that the City of Garden Grove is seeking various professional consulting services.

A brief overview of our proposed services is summarized as follows. **All work is supervised by a registered geotechnical engineer, civil engineer, and/or a registered engineering geologist, depending on the work being performed.**

Our duties will be performed in a manner that promotes the cost-effective execution and progress during construction projects.

Clear invoicing will be submitted and will include the following information:

- Project name and identification number;
- Purchase order number;
- Invoice date and work dates; and
- Work performed.

Construction Observation and Testing Services

During construction, GMU’s Senior Engineering Technicians (Soil Technicians) will perform field observations and testing of materials being constructed. Soil technicians performing observation, testing, and sampling are certified by Caltrans.

Geotechnical support will be provided during the full-depth reclamation and cement treatment process, including performing the City of Garden Grove’s Block Cracking Mitigation Procedures.

Plant technicians will perform asphalt concrete plant inspections and materials sampling to verify conformance of the material with the mix design, and in accordance with the City’s Asphalt Batch Plant Inspection Policy.

Proper field safety practices and procedures will be maintained, especially when working near streets and intersections.

A sample list of certifications for select technicians that we expect to perform work for this on-call is presented in **Appendix C**.

Geotechnical Engineering for Public Works Projects

GMU currently provides services to the Cities of Laguna Niguel, Garden Grove, Dana Point, Rancho Santa Margarita, Irvine, Newport Beach, Mission Viejo, Buena Park, Aliso Viejo, Westminster, Torrance, Santa Fe Springs, Chino Hills, and more which have included geotechnical investigation, design, and report services for vertical, horizontal, and underground City capital improvement projects.

These projects range from civic center complexes and pedestrian bridges to lift stations with supporting underground utility pipelines. Evaluations include the review of existing geotechnical maps and reports, initial investigation, lab testing, geotechnical analysis, and report preparation with recommendations for grading, earthwork, settlement, surface and subsurface drainage, foundation/column/slab design, slope stability, pavement design, trench backfill, retaining wall design, environmental concerns, removal of unsuitable materials and more.

Throughout the design process, GMU will review project plans and specifications with consideration of geotechnical issues, such as suitability of existing soils and materials testing.

Pavement Engineering - Rehabilitation and Design

GMU offers specialized technical expertise and experience in performing pavement evaluations and developing *cost-effective* pavement repair recommendations. GMU's typical approach to pavement evaluation generally consists of the following procedures:

- **Visual Pavement Surface Condition Assessment** – Identification of pavement distress types, severity levels, and extent in order to assess deterioration mechanisms and develop pavement repair recommendations. GPS-referenced photographs are taken to show representative and/or select pavement surface conditions.
- **Field Exploration** – Investigate and analyze existing pavement conditions through performing pavement corings, soil borings, and sampling. Samples will be logged, including location, depth, material type(s) encountered, visual soil classification, thickness, and more.

Prior to performing field exploration, GMU will obtain necessary permits. Coring and/or boring locations will be marked in the field and Underground Service Alert (Dig Alert) will be notified. Traffic control plans, if required, will be prepared and submitted to the City for review and approval.

- **Non-Destructive Pavement Testing and Analysis**

Falling-Weight Deflection Testing

GMU offers in-house non-destructive pavement deflection testing performed in accordance with California Test 356. Deflection testing involves applying an impact load (simulating truck traffic) and measuring the corresponding deflection response. Generally, lower deflection readings indicate a stronger pavement section whereas higher deflection measurements indicate weaker pavement section. Benefits of deflection testing include:

- Allowing the in-place structural capacity to be determined and analyzed.
- Identification of potential weak areas that visual surface inspection cannot.
- Compared to pavement repair recommendations derived primarily from coring data and subgrade R-value tests, performing deflection testing and analysis of deflection data often allows more cost-effective pavement repair recommendations to be developed.



Photo 1: GMU's falling-weight deflectometer in action on a City of Irvine pavement evaluation project (2022).

Ground-Penetrating Radar Testing

GMU offers in-house Ground Penetrating Radar (GPR) testing services. GPR testing involves emitting a series of radar waves from an antenna and into the pavement structure while traveling at traffic speeds. The data collection will be carried out using a 2GHz antenna system. This antenna focuses on the upper 1.5 to 2 feet of the pavement structure. The GPR system for this work includes a GSSI SIR-30 radar control and data acquisition unit, an electronic distance measuring instrument (DMI), and a high-resolution differential. RADAN software is used to analyze the GPR data gathered and estimate the various materials' dielectric constants and



Photo 2: GMU's 2GHz and 400Mhz GPR antennas attached to the rear of the FWD.

identify pavement layer types. The depths to the bottom of each pavement layer is estimated based on round-trip travel time of the GPR signal and an estimated velocity, which are determined by comparing and matching computed GPR depths to the available coring data.

- **Laboratory Testing** - Laboratory testing will be performed in our Caltrans-certified pavement and soils materials laboratory to evaluate various engineering properties of the collected materials, including R-value, moisture content, in-place density, maximum density and optimum moisture, direct shear, consolidation, sulfate content, soil classification (Atterberg limits and particle size), mix design development tests, and other tests that may be needed to evaluate or characterize the collected materials.
- **Engineering Analysis** - Perform pavement engineering analysis of new and existing pavements in accordance with the California Highway Design Manual or mechanistic empirical methods. GMU will consider construction cost, production rate, and even greenhouse gas emissions in our analysis.
- **Pavement Report** – The pavement report will present a summary of our work, findings, conclusions, and recommendations, including:
 - Scaled plans showing coring or boring locations, project limits, and project location;
 - Summary of pavement surface condition assessment (pavement distress types, severity levels, and extent);
 - Results of deflection and GPR testing data, if collected;
 - Logs of subsurface exploration (boring logs or AC coring summary tables);
 - Results of laboratory testing;
 - Summary of analysis methodology and procedures;
 - Pavement repair recommendations including replacement structural section thicknesses, overlay thickness, and/or rehabilitation repair strategy. Typically, at least two repair recommendations are provided (10- and 20-year design lives utilizing traffic indices assumed or provided to us).
 - When overlay recommendations are provided (or other recommendations that may change the surface elevations), there will be consideration given to street profile, cross section, and/or surface drainage.

GMU possesses extensive experience in developing cost-effective pavement repair recommendations, including the following:

- Cold in-place (CIR) or cold central plant recycled (CCPR) asphalt concrete (AC) pavement;
- Cement stabilized pulverized base (CSPB) as part of the pavement structural section;
- Cement- or lime-stabilized soils (CSS or LSB) for subgrade stabilization and/or as part of the pavement structural section;

- Fiber-reinforced asphalt concrete (FRAC) to improve reflective cracking resistance and/or reduce required AC thickness;
- Rubberized hot-mix asphalt (RHMA or ARHM overlays);
- Geogrid/geotextiles to reduce required aggregate base thickness or to stabilize subgrade conditions; and more.

The procedures described above and our extensive experience in design and construction of these strategies allow us to recommend cost-effective alternative pavement repair strategies. The final report will be signed and stamped by a California registered geotechnical engineer.

Geotechnical and Pavement Laboratory Testing Services

GMU's laboratory is certified by the County of Orange, Caltrans, AMRL, and AASHTO and can provide testing of various construction, soils, and pavement materials for construction or design projects in accordance with the procedures, policies, regulations, requirements, and formats of the given test method. Laboratory testing will be performed to test various construction materials for specification compliance purposes. Additionally, laboratory testing can be performed to evaluate various engineering properties for geotechnical and/or pavement design or investigation projects. A select list of laboratory tests performed by GMU includes:

- Asphalt binder content
- Testing for backfill material, aggregate base, sand bedding, etc.
- Compaction testing
- Core density
- Hveem stability
- Wet track abrasion
- R-value
- Maximum dry density and optimum moisture content
- Corrosion series
- Mix moisture content
- Durability index
- Direct shear
- Atterberg limits
- Consolidation
- Permeability
- Concrete compressive strength
- Sand equivalent

Structural Engineering for Retaining Structures and Shoring

GMU provides full design and construction observation services for many types of retaining walls, including MSE walls, soil nail walls, and tieback walls, as well as conventional block walls. Design services include geotechnical and structural calculations and development of plans for bidding.

Offering both structural and geotechnical engineering design services under one roof in-house allows GMU to develop cost-effective retaining wall design services and eliminates the discontinuity and fragmented communication often encountered when structural and geotechnical services are performed by separate companies.

Review and/or Forensic Investigations of Retaining Walls/Slope Failures

We have provided forensic investigations, engineering services, and third-party review services related to large landslides, retaining wall stability, settlement and subsidence, and many other projects. Slope failures, including landslides, and retaining wall instability has occurred in several of the Cities we consult to, and GMU has provided review and/or forensic investigation for these projects. Select GMU personnel are experienced in deposition and court testimony.

The typical turnaround time varies depending on the size, complexity, and demands of the particular project. GMU will coordinate with the City at the start of the project to discuss a timeline that will meet the City's deadlines.

Review of Slope and Drainage Conditions As Needed

Our geotechnical engineers and geologists are experienced in analyzing both the static and dynamic stability of existing and proposed slopes, and developing recommendations to stabilize slopes. Analyses are performed using appropriate stability methods and state-of-the-art computer software. Dynamic analytical methods range from pseudo-static analyses to slope deformation analyses.

In addition, our professional staff is experienced in evaluating existing and proposed drainage conditions for adequacy, and are adept at providing recommendations to improve existing drainage conditions as well as planned improvements.

The typical turnaround time varies depending on the size, complexity, and demands of the particular project. GMU will coordinate with the City at the start of the project to discuss a timeline that will meet the City's deadlines.

Geologic and Geotechnical Site Reconnaissance

Our geotechnical engineers and geologists are experienced in providing site reconnaissance for a variety of projects, including capital improvement projects and emergency situations.

Independent Review of Geologic Hazard Areas

Our geologists and geotechnical engineers have extensive experience in detailed review of geologic/geotechnical hazard areas of sites with special considerations such as liquefaction, compressible and collapsible soils, landslides, expansive soils, fill/bedrock transitions, and deep fills. GMU engineers and geologists can perform detailed and comprehensive liquefaction, seismic settlement estimates, and both probabilistic and deterministic ground motion analyses. We utilize state-of-the-art techniques implementing the latest technology (i.e., cone penetration testing, seismic refraction, in-situ energy calibration for SPT testing, etc.). Probabilistic as well as deterministic based analyses can be performed. Our company is uniquely qualified in geotechnical studies and planning for hillside development. Our engineering geologists are very well trained in identifying landslides, assessing their impact on the development, and providing mitigating measures.

We provide both geologic and geotechnical site reconnaissance services to assist in preparing site evaluations, geotechnical analysis, and recommendations for project grading and design.

Wall Design Review

Whether for a capital improvement project or a private project as part of a permit review, GMU can provide review of retaining wall design for all types of walls, including CMU block retaining walls, MSE walls, etc. GMU also has extensive experience in designing retaining walls, particularly those with a geo-structural element.

Personnel

A diverse and wide range of qualified professionals will be assigned to this contract, ranging from principal engineers to engineering technicians. All services provided to the City of Garden Grove will be overseen by GMU's President/CEO, **Mr. Gregory P. Silver**, who is both a licensed Civil and Geotechnical Engineer with over 37 years of experience and extensive work with numerous cities throughout Southern California.

Gregory P. Silver, M.Sc., PE, GE, has extensive experience since 1989 working for numerous Cities serving in the capacity as the City's Geotechnical Engineer. A sampling of these Cities includes Laguna Niguel, Chino Hills, Mission Viejo, Newport Beach, Dana Point, Malibu, Moorpark, Rancho Palos Verdes, Vista, Agoura Hills, Palos Verdes Estates, and Hidden Hills. Mr. Silver's experience with these municipalities includes review work, policy establishment, geotechnical design for City projects, management of inspection and testing for public works projects, landslide disaster response, coordination with FEMA and other state and federal agencies, and legal/forensic representation.



Roger Schlierkamp, M.Sc., PE, has over 13 years of diversified pavement engineering experience and is GMU's Director of Pavement Engineering. For this contract, Mr. Schlierkamp will provide pavement engineering services, including pavement evaluations, design, observation, testing, inspection, and mix design development. Mr. Schlierkamp has provided pavement engineering services for Caltrans, Orange County, Los Angeles County, numerous local municipalities, and more.

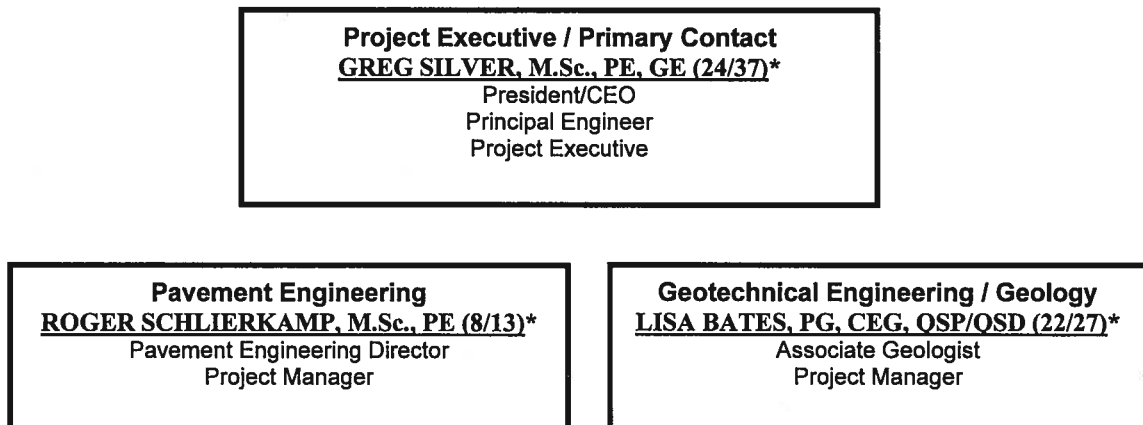


Please refer to **Appendix A** for complete resumes of key staff. In addition, **Appendix B** includes certifications for field and laboratory personnel.

Staffing and Availability

GMU's staffing for City of Garden Groves' projects will consist of a diverse team of professionals, ranging from Geotechnical and Pavement Engineers to Engineering Geologists. All services for the City will be provided by GMU employees who *are registered professionals*. These services will be overseen by **Mr. Greg Silver**, a licensed Civil and Geotechnical Engineer with over 37 years of experience and extensive work with numerous cities throughout Southern California. Additional professional support will be provided by **Mr. Roger Schlierkamp** as noted below. Both Mr. Silver and Mr. Schlierkamp possess extensive experience managing design services projects on a variety of small to large public works projects. They will manage GMU's crew of professional staff and lab technicians to deliver the geotechnical and pavement engineering services needed on each project. The staff organization chart below illustrates the staff that will be utilized for the City of Garden Grove and their availability. Resumes for GMU's management team are provided in Appendix A. Note that additional qualified personnel are also available and additional resumes will be provided if needed.

STAFF ORGANIZATIONAL CHART



*Years with GMU/Total years of experience are denoted in parenthesis

References and Project Profiles

Project profiles and associated references are provided below. Additional references are available upon request.

City of Huntington Beach

GMU is currently providing pavement evaluation services for various arterial street segments within the City of Huntington Beach, including Hamilton Avenue, Heil Avenue, and Bolsa Avenue. GMU's services include:

- Subsurface exploration (coring)
- Laboratory testing
- Deflection testing
- Analysis
- Development of cost-effective pavement reconstruction recommendations (full-depth reclamation with cement treatment).

Summary of Project Information:

- Typical Project Budget: \$86,292
- Contract Increase: None
- On-time: Yes

Reference:

Mr. Joe Fuentes
Senior Civil Engineer
714-374-1750 (o)
jfuentes@surfcity-hb.org

Address: 2000 Main Street, 1st Floor, Huntington Beach, CA 92648



Photo 3: Coring performed on Hamilton Avenue, City of Huntington Beach.

City of Mission Viejo

Since 2016, GMU has provided pavement observation and testing services for City of Mission Viejo's annual residential and annual arterial paving projects.

The City's residential roadway network is divided into multiple zones. The City rotates through the zones each year and performs either slurry sealing (using rubberized slurry seal such as RPMS) or a patch and AC overlay repair, depending on the condition of the roadway. For arterial streets, which are scheduled based on condition and funding factors, the City typically performs localized patch repairs and constructs a rubberized asphalt concrete overlay.

For residential and arterial pavement projects, GMU's scope of work typically includes the following:

- During the design phase, GMU will provide feedback on the project's specifications in order to incorporate lessons-learned and challenges faced from the previous year's project.
- Review pavement-related project submittals.
- Attend pre-construction meeting.
- During construction, GMU will coordinate with the City Inspector and schedule GMU's Engineering Technician to perform field and/or plant observations and tests of pavement, soils, slurry seal, base, and concrete materials.
- At the completion of the project, GMU will prepare a Quality Assurance (QA) final report, summarizing our test results, observations, certifications, and more.

Summary of Project Information:

- Typical Project Budget: \$30,000 to \$60,000 each year
- Typical Construction Schedule: July to October of each year
- Contract Increase: None
- On-time: Yes

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References:

Mr. Rich Schlesinger (PM for most residential paving projects)
City Engineer
949-470-3079 (o)
RSchlesinger@cityofmissionviejo.org

Mr. Randy VanCott
City Inspector (on both residential and arterial paving projects typically)
714-742-7100 (c)

Address: 200 Civic Center Drive, Mission Viejo, CA 92691



Photo 4: GMU performing observation and testing for Mission Viejo's 2020 Residential Paving project.

City of Aliso Viejo

Since 2009, GMU has provided pavement evaluation and construction observation & testing services to the City of Aliso Viejo.

GMU's recent relevant projects include:

Citywide Pavement Evaluation Project (design): GMU is currently performing a limited pavement evaluation of the City's entire roadway network, including coring, laboratory testing, and development of conceptual pavement repair recommendations. The City is interested in identifying streets with and without an underlying aggregate base layer beneath the AC section and learning whether or not this impacts pavement performance. The conclusions, findings, and recommendations will help enhance pavement repair strategies for future public works projects for the City of Aliso Viejo.

Summary of Project Information:

- Project Budget: \$49,000
- Schedule: 2021 (Phase 1) and 2022 (Phase 2), on-going
- Contract Increase: None
- On-time: Yes

Pacific Park from Aliso Viejo Parkway to Aliso Creek Road: GMU provided pavement observation and testing services for this project, including compaction and lab testing of aggregate base beneath reconstructed crosswalk pavers and fiber-reinforced asphalt rubberized overlay (ARHM) material. GMU deployed field and plant technicians for this project and returned samples to our laboratory for various specification compliance tests.

Summary of Project Information:

- Project Budget: \$16,000
- Schedule: November 2020 to December 2020
- Contract Increase: None
- On-time: Yes

Windsong, Cedarbrook, and Park Avenue Road (November – December 2020): GMU provided pavement observation and testing services for this project, including compaction and lab testing of fiber-reinforced asphalt concrete (AC) material. GMU deployed field and plant technicians for this project and returned samples to our laboratory for various specification compliance tests.

Summary of Project Information:

- Project Budget: \$11,000
- Schedule: November 2020 to December 2020
- Contract Increase: None
- On-time: Yes

References:

Mr. Quang Le
Associate Engineer
949-425-2531 (o)
QLe@avcity.org

Mr. Shaun Pelletier
City Engineer
949-425-2533 (o)
spelletier@cityofaliso Viejo.com

Address: 12 Journey, Suite 100, Aliso Viejo, CA 92656



**Photo 5: Coring location C-19 on Enterprise in Aliso Viejo.
Pavement contains alligator cracking, depression, and potholes.**

City of Newport Beach

Bonita Canyon and Ford Road (design and construction): GMU performed a pavement evaluation of Ford Road and Bonita Canyon Drive between Jamboree Road and SR-73 in the City of Newport Beach. An evaluation was performed to assess the existing condition of the roadway and to develop pavement repair recommendations to improve its condition. Information such as the pavements' current surface condition, coring data, deflection testing data, and laboratory testing results were evaluated and analyzed to develop pavement repair recommendations to meet a 20-year design life. Pavement repair recommendations consisted of performing isolated AC repairs at areas containing medium- and high-severity alligator cracking and a mill-and-overlay with asphalt rubberized hot mix (ARHM) material.

During construction, GMU deployed field and plant technicians for this project and returned samples to our laboratory for various specification compliance tests.

Summary of Project Information:

- Project Budget: \$36,000 (design) and \$42,000 (construction)
- Schedule: March 2019 to August 2020
- Contract Increase: None
- On-time: Yes



Photo 6: Pavement deflection testing being performed at coring location C-2 within an area of medium-severity alligator cracking on Ford Road, Newport Beach.

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Cameo Highlands (construction): GMU deployed field and plant technicians for this project and returned samples to our laboratory for various specification compliance tests. This project faced challenges with unstable subgrade conditions, and GMU provided support to evaluate the unstable conditions and assisted the City in identifying areas of instability for remedial measures.

Summary of Project Information:

- Project Budget: \$39,000 (construction)
- Schedule: April 2020 to November 2020
- Contract Increase: None
- On-time: Yes

References:

Mr. Andy Tran
Senior Civil Engineer
949-644-3315
Atran@newportbeachca.gov
100 Civic Center Drive, Newport Beach, CA 92660



Photo 7: Condition of the pavement within Cameo Highlands, Newport Beach, prior to improvement.

Geotechnical City On-Call Contract References

City of Laguna Niguel

Contact: Mr. John Morgan, Community Development Services Manager
30111 Crown Valley Parkway
Laguna Niguel, CA 92677
jmorgan@cityoflagunaniguel.org
949-362-4332

Project Description: Geotechnical review/plan check services, attendance at applicant and project team meetings, Planning Commission and Council meetings, teleconferences with City Staff on complex projects, emergency services for landslides and slope issues.

Key GMU Staff: Lisa Bates, Greg Silver

City of Chino Hills

Contact: Mr. Winston Ward, Assistant Community Development Director/Building Official
14000 City Center Drive
Chino Hills, CA 91709
wward@chinohills.org
909-364-2781

Project Description: Geotechnical review/plan check services, attendance at applicant and project team meetings, Planning Commission and Council meetings, teleconferences with City Staff on complex projects, emergency services for slope issues.

Key GMU Staff: Lisa Bates, Greg Silver

City of Mission Viejo

Contact: Mr. Rich Schlesinger, City Engineer
200 Civic Center
Mission Viejo, CA 92691
rschlesinger@cityofmissionviejo.org
949-470-3079

Project Description: Geotechnical services for Public Works projects, geotechnical review/plan check services, attendance at applicant and project team meetings, teleconferences with City Staff on complex projects, emergency response services.

Key GMU Staff: Lisa Bates, Greg Silver

Additional references are available upon request.

Proposed Fee Schedule

Our current fee schedule for each position classification required to provide the services described in the scope of work, and all reimbursable fees and expenses, are provided in **Appendix C**.

Appendix A
Key Staff Resumes



GREGORY SILVER, M.SC., PE, GE
President/CEO



PROFESSION

Geotechnical Engineer
Civil Engineer

REGISTRATIONS

Registered Civil Engineer,
State of California

Registered Geotechnical Engineer,
State of California

Registered Civil Engineer, State of
Nevada

Registered Civil Engineer, State of
Utah

EDUCATION

M.S. Civil Engineering, California
State University, Long Beach

B.A. Geological Sciences,
University of California, Santa
Barbara, Goleta

PROFESSIONAL AFFILIATIONS

ASCE
ACEC
BIA
CalGeo, Past President

Greg. has over 36 years of progressively responsible engineering and management experience in a wide variety of geotechnical engineering projects. He has worked successfully for and with industrial, residential, and commercial developers, master community planners, and governmental agencies. He has extensive experience in landslide evaluation and remediation design, geotechnical instrumentation, residential and commercial development, public works projects, municipality consultation, mechanically stabilized earth walls, and forensic projects. In addition, he has served as an expert witness in regard to numerous geotechnical issues over the last 25 years. Over the period of 1988 to 1997, Greg was City Geotechnical Engineer for numerous cities throughout Southern California. He currently serves as President and Principal Engineer of GMU.

Selected types of projects representative of Mr. Silver's experience are listed below:

- Commercial Development Projects
- High-rise Structures
- Landslides
- Residential Development Projects/Master Planned Communities
- Major Roadways
- Bridges
- Water Resource Projects
- Dewatering Projects
- Miscellaneous Public Works Projects
- Government/Civic Centers
- Sports Parks
- Mechanically Stabilized Earth (MSE) Walls
- Soil Nail Walls
- Geotechnical Instrumentation
- Tie-back Slope Reinforcement
- Pavement Engineering and Design
- City Geotechnical Engineer/Consultant
- Legal Consultation
- Special Studies

GEOTECHNICAL ENGINEERING

COMMERCIAL DEVELOPMENT PROJECTS:

20/40 Pacifica Office Towers – Irvine, CA, Lead Geotechnical Engineer – Two high-rise office buildings and one 5 story parking structure. Design involved foundation systems consisting of driven piles and geopiers.

520 Newport Center Drive Office Tower – Newport Beach, CA: Principal-in-charge – one 20-story high-rise office building and adjacent 6-story parking structure. Design involved mat and spread footing foundation design and analyses, shoring design, and permanent retaining wall design

650 Newport Center Drive Office Tower – Newport Beach, CA: Principal-in-charge – one 20-story high-rise office building and two adjacent multi-story parking structures with up to 2-story subterranean sections. Design included mat foundation design, spread footing design, shoring design, and permanent retaining wall design.

200 Spectrum Center Drive Office Tower – Irvine, CA- Principal-in-charge – 21 story office building and one adjacent 6 story parking structures. Design included driven pile foundation design, spread footing design, shoring design, and permanent retaining wall design.

400 Spectrum Center Drive Office Tower– Irvine, CA - Principal-in-charge – one 21 story office building and one adjacent 6-story parking structures with up to 2-story subterranean sections. Design included mat foundation design, spread footing design, shoring design, and permanent retaining wall design.

Irvine Spectrum Marriott Hotel – Irvine, CA – Irvine CA – Principal-in-charge – one 15 story hotel building with adjacent 2 story event center. Design included mat foundation design, spread footing design, and permanent retaining wall design.

Sand Canyon Business Park – Irvine, CA: Principal-in-charge/Lead Geotechnical Engineer – multi-story campus masonry block buildings on highly expansive soils with associated parking, walkways, etc. Geotechnical design included innovative partial mat/partial conventional slab to minimize expansive soil movements.

Discovery Business Center – Irvine, CA: Principal-in-charge/Lead Geotechnical Engineer – multi-story campus masonry block buildings on highly expansive soils with associated parking, walkways, etc. Geotechnical design included innovative partial mat/partial conventional slab to minimize expansive soil movements.

Capitol Group Office Campus – Irvine, CA: Lead Geotechnical Engineer – Large office campus on highly expansive soils. Project involved geopier and select soil replacement subgrade improvement strategies.

Spectrum 5, Spectrum 7, Spectrum 1 – Irvine, CA: Principal Geotechnical Engineering oversight of investigation design and construction.

Bridgepark Plaza, Mercantile East, Mercantile West, and Corporate Terrace – Ladera Ranch, CA: Principal Geotechnical Engineering oversight of investigation design and construction.

University Research Park Office Development - Irvine, CA: Principal Geotechnical Engineering oversight of investigation design and construction.

LANDSLIDES:

Poppy Trail Landslide - Palos Verdes, CA: Lead Engineer and Investigator. Detailed geotechnical engineering analyses of landslide that resulted in damage to an existing home and Poppy Trail Drive. Determined causation and led forensic team to a legal settlement. Developed stabilization plan that involved creating two lots where only one had existed before to create an economically viable repair. Repair consisted of buttress grading, temporary stabilization measures, deep-seated and surficial geogrid stabilization and MSE walls. GMU performed the geotechnical engineering, civil engineering, structural engineering and construction management for the project..

Philemon Landslide – Dana Point, CA: lead engineer and Investigator. Detailed geotechnical engineering analyses of a deep seated geologically controlled landslide that resulted in the demolition of several homes. Evaluated and determined causation and developed innovative and award winning stabilization plan using high strength aggregate cement slurry. The stabilization approach is documented in a paper published by the ASCE Geo-Institute.

China Cove Slope Stabilization – Newport Beach, CA: Lead engineer and investigator. Developed aesthetically pleasing soil nail Slope stabilization to mitigate years of surficial slumping and shallow slumping on slope face. Evaluated and determined geotechnical characteristics of the failures, developed the repair methodology and developed complete structural plans for bidding.

Palos Verdes Drive Roadway Stabilization – Palos Verdes, CA: Lead engineer and investigator. Developed 50 year road stabilization plan to protect roadway from adjacent deep seated landslide movement. Performed geotechnical and structural engineering for the stabilization plan consisting a mut-tier tie-back wall.

Sunset Crossing Landslide - City of Diamond Bar, CA: Lead Engineer and Investigator. Working with the Slope remediation contractor, the City and several private landowners. Developed landslide repair for deep seated landslide where several other groups failed. Repair involved using tie-backs and multi-tied slot grading.

Brancato Landslide, Gill Properties, San Jose, CA: Lead Engineer. Provided detailed geotechnical engineering analysis of large, deep-seated landslide including shear strength determination, static and pseudo-static analyses, seismic deformation analyses, and development of geotechnical mitigation schemes.

Horseshoe Landslide – Anaheim Hills, CA: Lead Investigator – Comprehensive geological and geotechnical engineering evaluation of re-activated ancient landslide. Development of remediation scheme consisting of horizontal drains, buttress grading, and tie-backs.

Voyager Lane Landslide – Laguna Niguel, CA: Lead Investigator – Detailed evaluation of long-term monitoring data leading to the development of an innovative long-term repair consisting of a horizontal drain system, a surface water infiltration mitigation system, and roadway stabilization and subgrade strengthening.

Rambla Pacifico Landslide Stabilization - Malibu, CA: Project Director on one million dollar landslide stabilization design. Involved working with FEMA and OES and within NEPA/CEQUA guidelines.

Calle Montecillo Roadway Stabilization - Agoura Hills, CA: Project Director - Evaluation and design of roadway slope stabilization. Design, plans, and specifications.

Big Rock Mesa Landslide Area - County of Los Angeles, CA: Project Engineer - Large-scale geotechnical investigation and evaluation, deep dewatering and horizontal drain installation, pump tests, and geotechnical instrumentation and monitoring.

Montellano Landslide - Hacienda Heights, CA: Project Manager/Engineer - Pump tests, geotechnical monitoring, and long-term surface drainage improvement design with plans and specifications.

Mystic Hills Landslide, City of Laguna Beach, CA: Project Geotechnical Engineer. Third party geotechnical evaluation of the stability of an ancient landslide for the City of Laguna Beach.

Kanan Dume Road Landslide - Malibu, CA: Project Director - Monitoring, geotechnical evaluation, geological evaluation, remediation design for a 100-foot roadway embankment failure.

Via Estoril Landslide – Laguna Niguel, CA – Emergency response to large landslide which endangered numerous residential structures, emergency geotechnical recommendations, review of interim and final repairs.

South Facing Slope Landslide, BRM Landslide Assessment District/City of Malibu Public Works, Malibu, CA: Project Director. Provided detailed geotechnical engineering evaluation of an ancient landslide. Investigation included specialty laboratory testing including ring shear testing and x-ray diffraction, two- and three-dimensional stability analyses, and parametric groundwater and seismic evaluation.

Tract 33410 Slope Failures - Agoura Hills, CA: Project Director - Detailed geotechnical evaluation of one deep-seated and two surficial slope failures. Tasks included preparation of plans and specifications for repair and expert witness-related consultation.

RESIDENTIAL DEVELOPMENT PROJECTS/MASTER PLANNED COMMUNITIES:

Santaluz – City of San Diego, CA. Principal Geotechnical Engineering Oversight – Project direction and oversight for complex geotechnical engineering issues including: hard rock, blasting, rock fills and utility over-excavation.

Sendero Development – County of Orange, CA: Principal Geotechnical Engineering Oversight – Project direction and oversight for complex geotechnical engineering issues including: time delayed settlement and resulting solutions involving surcharge and wick drain design and debris flow evaluation and mitigation and slope stability.

Banning Ranch Development – Newport Beach, CA: Project Director – Comprehensive geotechnical and fault evaluation study for proposed residential and hotel development. Fault investigation included thousands of lineal tests of fault trench through the Newport-Inglewood fault zone.

Ladera Ranch Planned-Community Development - Rancho Mission Viejo Company, County of Orange, CA: Project Engineer - Geotechnical investigation and design for portions of major master planned community.

Crystal Cove Planned Development – ICDC, Newport Coast/County of Orange, CA. Principal in charge of oversight of geotechnical engineering for mass grading, public works improvements, and residential development.

Talega Planned-Community Development – San Clemente, CA: Principal – Oversight of geotechnical engineering for mass grading, public works improvements, and residential development.

Rancho Santa Margarita Planned-Community Development - Rancho Santa Margarita, CA: Project Engineer/Manager - Geotechnical investigation, grading and foundation design, and construction observation for a number of planning areas in a major residential planned community development.

Edgewater Development – Chino, CA: Project Director – Geotechnical investigation and design for large residential development area with recreational lake network.

Planning Area 19A Feasibility Study, City of Irvine, CA: Project Engineer - Geotechnical investigation to advise on planning-related issues for roadway and general development in a marsh/soft clay site environment.

Various Foundation Investigations 1984-88 - Single-family residences, large tracts, commercial/industrial structures and high-rise buildings throughout Los Angeles County.

MAJOR ROADWAYS:

Ortega Highway Widening, County of Orange/City of San Juan Capistrano, CA. Lead Geotechnical Engineer/Principal-in-Charge – Geotechnical investigation and development of design recommendations.

Irvine Center Drive, Lake Forest Drive, and Sand Canyon Boulevard Street Widening, ICOP, Irvine, CA Principal Geotechnical Engineering oversight of design and construction.

Avenida Vista Hermosa, Avenida La Pata, Avenida Fresas, Avenida Saluda, and Avenida Talega, City of San Clemente/Talega Associates, San Clemente, CA: Principal Geotechnical Engineering oversight of design and construction.

La Pata Avenue Extension, City of San Juan Capistrano/City of San Clemente/ County of Orange, CA: Principal Geotechnical Engineering oversight and project management for planning, EIR and design.

BRIDGES:

Ortega Bridge Widening – County of Orange, CA: Project Director – Geotechnical investigation and development of design recommendations for Caltrans bridge.

Cow Camp Bridges – County of Orange, CA: Project Director – Geotechnical investigation and development of design recommendations for two bridges crossing complex geotechnical environs.

San Juan Creek Bridge Widening, Orange County Public Works, County of Orange, CA: Project Director. Geotechnical investigation, detailed geotechnical evaluation of seismic retrofit, and development of widening foundation recommendations.

Wildlife Crossing Bridge Widening – County of Orange/Ladera, CA: Principal Geotechnical Engineer - Oversee widening project of existing bridge.

Las Flores Bridge - Malibu, CA: Project Engineer/Manager - Evaluation of bridge design and alternatives for the City of Malibu.

Crown Valley Parkway Bridge – County of Orange, CA: Lead Geotechnical Engineer for 238-meter-long, 27-meter-high bridge. Detailed geotechnical analysis for pile foundation design, abutment design, and geotechnical input to bedrock scour design.

Oso Parkway Pedestrian Bridge - County of Orange, CA: Project Engineer - Geotechnical design for 65-foot span pedestrian bridge.

“A” Street Bridge at Barranca Parkway, City of Irvine, CA. Project Engineer/Manager - Geotechnical investigation and design for new bridge over San Diego Creek.

“Los Angeles Avenue Bridge” - Moorpark, CA: Project Engineer/Manager - Geotechnical assessment of proposed bridge expansion and retrofit. Development of preliminary design recommendations.

Tustin Avenue Bridge Widening – Anaheim, CA: Principal Geotechnical Engineering oversight for widening project of existing bridge.

Washington Boulevard Bridge, Moorpark Public Works/CAA Los Angeles County, CA: Project Engineer. Provided geotechnical investigation and design for seismic retrofit of existing bridge.

WATER RESOURCE PROJECTS:

Tesoro Reservoirs, Zone II and B, Santa Margarita Water District/RMV, County of Orange, CA: Principal Geotechnical Engineer. Provided geotechnical evaluation of 2-3MG reservoirs.

Horno Basin Detention Basin, RMV/Orange County Public Works, County of Orange, CA: Project Director for the geotechnical investigation and design of a detention basin, spillway, bio-filtration system, and sub-drainage recapture system.

Oso Creek Geotechnical Scour Study, RMV/Orange County Public Works, Mission Viejo, CA: Project Director. Provided geotechnical evaluation of in-situ geotechnical materials for scour evaluation and revetment study.

Various Water Lines, Sewer Lines, Talega Lift Station, South Ranch Lift Station, San Juan Creek Lift Station, and Ladera Zone 2 Reservoir, Talega Zone 1 Reservoir and Covenant Hills Reservoir and Lift Station - Santa Margarita Water District, Rancho Santa Margarita, Las Flores, Coto de Caza, and Ladera Ranch, CA: Principal Geotechnical Engineering oversight.

Las Flores Canyon Sedimentation - Debris Flow Study, City of Malibu Public Works, Malibu, CA: Project Manager/Engineer for the geotechnical and geological input for hydraulic analyses.

Northwood Reservoir - Irvine, CA: Project Geotechnical Engineer - Evaluation of foundation design and settlement potential for 4.5 MG reservoir.

Hicks Canyon Detention Basin, Irvine, CA. Geotechnical Consultant for the geotechnical analysis and design of two large detention basins.

San Diego Creek Channel Improvements, Orange County Public Works, Irvine, CA: Project Manager/Engineer for the geotechnical investigation of proposed channel improvements consisting of soil cement and “keystone” geogrid-type revetments.

Trampas Canyon Dam, Santa Margarita Water District, Orange County, CA. Provided geotechnical engineering support and oversight during construction of 1.6 billion gallon earth dam reservoir for the Santa Margarita Water District.

Various Reservoirs, Santa Margarita Water District, Ladera Ranch, CA. Lead Geotechnical engineer for numerous steel tank reservoirs throughout the master planned community of Ladera Ranch for the Santa Margarita Water District

San Diego Clean Water Project, City of San Diego, CA. Geotechnical engineer for portions of the Clean Water project. Tasks included field drilling, and geotechnical design.

MISCELLANEOUS PUBLIC WORKS PROJECTS:

Marina Park Project, City of Newport Beach, CA. Geotechnical Project Manager of geotechnical and Materials Inspections. Project involved stone columns for liquefaction remediation, concrete sheet pile walls with tie-backs and specialty foundation design

City of Laguna Niguel - Metrolink Station - Laguna Niguel, CA: Principal Geotechnical Engineering oversight for a regional OCTA-funded commuter rail station.

BRM Storm Drain Replacement Project - Malibu, CA: Project Manager/Engineer - Evaluation of storm drain pipe design in landslide and erosion prone area following destruction of system by fire.

Metro-Rail Vibration Testing - Los Angeles, CA: Project Engineer - Geotechnical exploration and input for vibration study.

Big Rock Mesa Dewatering Well Project - Malibu, CA: Project Engineer/Manager - Design, plan and specification preparation, installation and construction oversight for six dewatering wells to 350 feet and four horizontal drains.

Montellano Winterization - Hacienda Heights, CA: Project Engineer/Manager - Design and construction oversight of long-term, multi-year landslide winterization.

Pavement Evaluation - Pomona, CA: Project Manager/Engineer - Pavement evaluation for 4000 lineal feet of distressed pavement.

GOVERNMENT/CIVIC CENTERS:

Chino Hills Government Center Complex – Chino Hills, CA: Project Director – Geotechnical investigation, development of recommendations and plans for multi-faceted government center consisting of multi-story government buildings and a four-story parking structure.

Vista Civic Center – Vista, CA: Project Director – Development of final geotechnical design recommendations for Vista Civic Center.

Lake Forest Civic Center, City of Lake Forest, CA: Principal Geotechnical engineer. Design oversight for geotechnical engineering aspects of the project including: Geotechnical Foundation Design, Slope Stability, and MSE wall design.

Laguna Niguel Civic Center, City of Laguna Niguel, CA Lead Geotechnical Engineer. Geotechnical design oversight for investigation and design recommendation development.

SPORTS PARKS:

La Paz Sports Park, City of Laguna Niguel, CA: Project Director. Geotechnical design for sports park complex with synthetic fields. Infiltration design of subsurface field drainage system.

Chino Hills Sports Park – Chino Hills, CA: Project Director – Geotechnical investigation and design for large Sports Park complex with numerous synthetic fields.

Long Beach Sports Park – Long Beach, CA: Project Director – Geotechnical investigation and design for planned regional Sports Park in oil fields operation area. Developed unique design recommendations for proposed facilities to be placed on top of buried rubble and debris.

Jarupa Water Park – Jarupa, CA: Project Director – Geotechnical investigation and design for multi-acre water park facility.

GEOTECHNICAL INSTRUMENTATION:

Monitoring and evaluation of slope inclinometers and piezometers for various select projects:

- Poppy Trail Landslide, Palos Verdes, CA
- Horseshoe Landslide, Anaheim, CA
- Cyprus Shores Landslide, San Clemente, CA
- South Shores Landslide, Rancho Palos Verdes, CA
- La Paz Road Movement, Laguna Niguel, CA
- Palos Verdes Drive Roadway Distress, Palos Verdes Estates, CA
- Canyon Wren Slope/Street Deformation, Aliso Viejo, CA
- Philemon Landslide, Dana Point, CA
- Suncrest Landslide, San Jose, CA
- Sierra Road Landslide, San Jose, CA

Ladera Residential Development – County of Orange, CA: Principal Geotechnical Engineering Oversight of “real time” monitoring system for electrical towers above temporary slopes during grading.

La Paz Road Monitoring Project – City of Laguna Niguel, CA: Project Manager. Long-term monitoring of on-going slope movements. Monitoring program enables City of Laguna Niguel to implement roadway stabilization projects incrementally and cost-effectively on an as-needed basis. Instrumentation includes slope inclinometers, multi-stage piezometers, and survey.

Crystal Cove – Newport Coast, CA: Project Director – Long-term evaluation of surface and subsurface survey network and slope inclinometers to evaluate deep fill/fill slope performance.

Oceanside Dewatering - Oceanside, CA: Project Engineer - Construction overview and monitoring of dewatering tunnel, horizontal drain, and tie-back installation.

Port of Los Angeles, Pier 300 Expansion - POLA, CA: Project Manager/Engineer - Design, installation, and monitoring of specialty geotechnical instrumentation for port expansion.

Big Rock Mesa - Malibu, CA: Project Manager/Engineer- Managed monitoring and dewatering district consisting of dewatering wells, horizontal drains, slope inclinometers, piezometers, multi-position extensometer, survey network, and groundwater discharge analysis.

Calle del Barco - Malibu, CA: Project Manager/Engineer - Managed monitoring and dewatering district consisting of dewatering wells, horizontal drains, slope inclinometers, piezometers, and crack gauges.

Malibu Road - Malibu, CA: Project Manager/Engineer - Managed monitoring and dewatering district consisting of piezometers, horizontal drains, and crack gauges.

Latigo Canyon - Malibu, CA: Project Manager/Engineer - Managed monitoring and dewatering district consisting of slope inclinometers, piezometers, horizontal drains, dewatering wells, and crack gauges.

Rambla Pacifico Landslide - Malibu, CA: Project Engineer - Installation and monitoring of slope inclinometers and multi-stage pneumatic piezometers.

La Conchita Landslide - Ventura County, CA: Project Engineer/Manager - Design, installation, and monitoring of a system of slope inclinometers and multi-stage piezometers.

Hope Church - Rancho Bernardo, CA: Project Engineer/Manager - Design, installation, and monitoring of complex monitoring array consisting of tiltmeters, survey network, slope inclinometers, and multi-stage pneumatic piezometers.

DEWATERING DESIGN & MANAGEMENT PROJECTS:

Dewatering Remediation, CZ Master Association, Coto de Caza, CA. Project Engineer/Manager . Hydrogeologic modeling and Modeling design of dewatering cut-off trench to lower groundwater below home foundations.

Dewatering District Oversight (Big Rock, Latigo Canyon, Malibu Road), Malibu, CA: Engineer/Manager. Work included: dewatering district management, hydrogeologic modeling, well design and maintenance, horizontal drain design as well as maintenance and monitoring.

Montellano Landslide Dewatering – Hacienda Heights, CA: Project Engineer/Manager – Pump tests, dewatering wells design and construction, design and construction oversight of horizontal drains.

CITY GEOTECHNICAL ENGINEER/CONSULTANT:

City of Mission Viejo (2016 – Present) Review of geotechnical reports, general geotechnical consultation, Public works project design and geotechnical and materials inspection.

Geotechnical Report Reviews, City of Laguna Niguel, CA. (1997-Present): Review of geotechnical reports, preparation of guidelines, public works projects, geotechnical hazards analysis including testimony in front of state legislative committees, emergency response and legal consultation.

Various Projects, City of Newport Beach, CA. (2009-Present) Public Works projects including street rehabilitation, construction observations and testing, marina construction, and legal consultation.

Geotechnical Consultation, City of Chino Hills. CA. (1992-97 & 2002-Present) Review of geotechnical reports, preparation of guidelines for report submittal and grading procedure requirements, public works projects, and general geotechnical consultation.

City of Dana Point (2001-2014; 2015-Present): Review of complex geotechnical projects, emergency and litigation consultation, and public works projects.

City of Vista (2000-2005): Review of geotechnical reports and general geotechnical consultation.

City of Rancho Palos Verdes (2004-2006): Alternate member of Geotechnical Appeals Board.

City of Malibu (1991-97): Review of geotechnical reports, preparation of guidelines, policy and standards for report submittal, public works projects, geotechnical hazards analysis, emergency response, planning evaluation, legal consultation.

City of Moorpark (1995-97): Review of geotechnical reports, preparation of guidelines, policy and standards for report submittal.

City of Agoura Hills (1988-97): Review of geotechnical reports, preparation of guidelines, policy and standards for report submittal, public works projects, geotechnical hazards analysis, emergency response, planning evaluation, legal consultation.

City of Palos Verdes Estates (1992-97): Review of geotechnical reports, preparation of guidelines, policy and standards for report submittal, public works projects, geotechnical hazards analysis, emergency response, planning evaluation, legal consultation.

City of Hidden Hills (1992-97): Review of geotechnical reports, preparation of guidelines, policy and standards for report submittal.

Additional Geotechnical Consultation to Cities: Cities of Lake Forest, La Habra Heights, and Laguna Beach.

PAVEMENT ENGINEERING AND DESIGN

Various Projects, City of Irvine Public Works Department, CA. (2012-2014). Principal-in-Charge. Various projects including: Irvine Center Drive, Campus Drive, Jamboree Boulevard, and Jeffrey Road pavement rehabilitations.

Street Widening and Overlays, Cities of Irvine and Lake Forest, CA. (1997-2010). Principal-in-Charge. Geotechnical Engineering oversight of design and construction for various projects including: Irvine Center Drive, Lake Forest Drive, Bake Parkway, Portola Parkway, and Sand Canyon Boulevard street widening and overlays.

City of Dana Point – Dana Point, CA (2002-2014). Principal-in-Charge. Various projects including: Street of the Golden Lantern, Stonehill Drive, Del Obispo Street, Camino Capistrano, Pacific Coast Highway, Del Prado overlays, and miscellaneous residential street overlays and slurry seals.

City of Aliso Viejo – Aliso Viejo, CA (2012-2014). Principal-in-Charge. Various projects including: Aliso Creek Road, Pacific Park Drive, Moulton Parkway, Oso Parkway, La Paz Road overlays.

City of Laguna Niguel – Laguna Niguel, CA (2002-2014). Principal-in-Charge. Various projects including: Street of the Golden Lantern, Camino del Avion, Niguel Road, Cabot Road, Paseo de las Colinas, Camino Capistrano, Aliso Creek Road, La Paz Road rehabilitation and overlays, and miscellaneous residential street overlays and slurry seals.

City of Newport Beach – Newport Beach, CA (2009-2014). Principal-in-Charge. Various projects including: Newport Center Drive, Balboa Avenue, River Avenue, Mesa Drive, Bayside Drive overlays, and miscellaneous residential street overlays and slurry seals.

City of Rancho Santa Margarita – Rancho Santa Margarita, CA (2011-2014). Principal-in-Charge. Various projects including: Santa Margarita Parkway, Antonio Parkway, Robinson Ranch Road overlays and slurry seals (2006-2014); and miscellaneous residential street overlays and slurry seals.

City of Laguna Niguel – Laguna Niguel, CA (2002-2014). Principal-in-Charge. Various projects including: Street of the Golden Lantern, Camino del Avion, Niguel Road, Cabot Road, Paseo de las Colinas, Camino Capistrano, Aliso Creek Road, La Paz Road rehabilitation and overlays, and miscellaneous residential street overlays and slurry seals.

County of Orange Ortega Highway Widening – San Juan Capistrano, CA (2009-2011). Principal-in-Charge. Pavement design for Phase 1 widening of Ortega Highway from the City of San Juan Capistrano border to Antonio Parkway. Design involved pavement rehabilitation of existing roadway and widening of both roadway shoulders.

GEO-STRUCTURAL ENGINEERING

MECHANICALLY STABILIZED EARTH (MSE) WALLS:

The Irvine Company Development Areas 2C4 and 5 - County of Orange, Newport Coast, CA: Design and construction oversight of numerous Loffel walls throughout the Newport Coast development area for The Irvine Company. Wall heights range up to 25 feet in height.

Ladera Development, County of Orange, CA:: Design and construction oversight of 50-foot-high “Loffel”-type MSE wall at the entrance to the Ladera Development in South Orange County. The wall was the highest wall permitted in the County of Orange to date. Due to the wall’s height, it involved an extensive design and review process. In addition, the wall was instrumented with slope inclinometers and an array of specially designed survey points integrated into the block facing. An abstract for a paper describing the wall design and instrumentation results was accepted to the ASCE GEO-DENVER 2000 Conference.

Distressed “Keystone” Wall Evaluations: 1) Placentia, Forensic evaluation of distressed “Keystone” wall for Shea Homes, 2) Agoura Hills, Forensic evaluation of distress behind “Keystone” wall for Oaks Christian School, 3) Rancho Bernardo, CA: Comprehensive forensic evaluation of severely distressed “Keystone” Wall at the Legacy/Toshiba development.

Crystal Cove Access Road, The Irvine Company, Orange County, CA: Design of up to 40-foot-high “Loffel”-type MSE wall to support a major access road to a detention basin and recreation area. Special design considerations included: High seismic area, use of select backfill in both reinforced and retained zones, and erosion protection at the toe of the wall.

Spectrum 5 Commercial Development Area - Irvine, CA: Design and construction oversight for over 1700 lineal feet of a “Loffel”-type MSE wall.

San Dimas Residential Development (Tract 52717) – San Dimas, CA: Development of design plans and specifications for over 30 MSE walls incorporated into rough grading plans for a large residential development.

SOIL NAIL AND TIE-BACK WALLS/SLOPES:

China Cove Soil Nail Wall/Slope, City of Corona Del Mar, CA: Structural and geotechnical design and construction oversight for soil nail wall and slope with “boulderscape” facing. Design done to mitigate long-term surficial failure problem and upgrade the look of a high profile slope.

Placentia Slope Stabilization – Placentia, CA: Structural design for soil nail wall at the rear of several homes in residential development. Wall was designed to stabilize slope while minimizing space impacts in rear yard.

HOA Tie-back Slope Stabilization, City of Orange, CA: Structural and geotechnical design and construction oversight for tie-back slope stabilization project. Complete design plans and specifications were provided. Geotechnical and special inspections performed during construction. Services also included construction management.

MASONRY RETAINING WALLS:

Masonry Wall Design – Sendero Development of Rancho Mission Viejo, CA: Complete geotechnical and structural design for masonry walls for level ground, toe-of-slope and top-of-slope conditions. Includes complete structural plans and details. Designs for miscellaneous structures such as pilasters, monuments also provided.

Masonry Wall Design – Esencia Development of Rancho Mission Viejo, CA: Complete geotechnical and structural design for masonry walls for level ground, toe-of-slope and top-of-slope conditions. Includes complete structural plans and details. Designs for miscellaneous structures such as pilasters, monuments also provided.

CAISSON WALLS:

Palos Verdes Drive Roadway Stabilization – Palos Verdes Estates, CA: Performed geotechnical and structural design and construction oversight for caisson tie-back wall to provide lateral support to a portion of Palos Verdes Drive North. Complete plans and specifications were developed.

Berquist Residence Caisson Supported Retaining Wall – Dana Point, CA: Performed structural engineering for caisson supported top of slope retaining wall. Complete plans and specifications were developed.

LEGAL CONSULTATION

Mr. Silver has provided geotechnical consultation for litigation on a wide variety of projects for over 20 years in the States of CA and Nevada. He has been deposed numerous times and testified in court on a number of occasions. The type of litigation cases that Mr. Silver has been involved in include:

- Landslides
- Foundation distress due to expansive soils and settlement
- Settlement adjacent multi-story buildings.
- Concrete corrosion/sulfate damage
- MSE walls/retaining walls
- Dewatering/groundwater issues
- Public works failures
- Site drainage

SPECIAL STUDIES

Residential Foundation Deterioration Study for the Cities of Lakewood, La Palma, and Cypress, CA: Staff Engineer - Regional evaluation of concrete corrosion performed for CDMG. Study included: analysis of soil and groundwater conditions, review of construction practice and code requirements and other geotechnical/geological contributing factors.

RECENT PROJECT AWARDS

The following project awards are for projects where Mr. Silver served a primary role in either the geotechnical engineering design or management of the project.

Outstanding Geotechnical Project – CalGeo 2019

Inn at the Mission

Project Awards – ASCE 2018

Lido House Hotel

Outstanding Geotechnical Project – ASCE 2016

Emerald Bay Widening

Outstanding Structural Engineering Project – ASCE 2016

400 Spectrum Center Drive Soil Nail wall

Project Awards – APWA 2016

Marina Park

Oso Creek Multi-use Trail

La Pata Extension

Geotechnical Project of the Year – 2016 – OC/LA ASCE

Cow Camp Road Design – Phases 1A & 1B

Geotechnical/Structural Project of the Year Award – 2015 – OC/LA ASCE

650 Newport Center Drive Office Tower and 670 Newport Center Drive Parking Structure

Airport and Ports Award – OC ASCE 2015

Marina Park

Community Improvement Project Award – OC ASCE 2015

PCH/Del Prado Bridge and Street Improvements

PUBLICATIONS

Sandri, D., Silver, G., Trazo, R., 2000, “Design, Construction, and Monitoring of a 14.9M High Geosynthetic Reinforced Segmental Retaining Wall in a Seismically Active Region”, ASCE Geotechnical Special Publication (GSP) “Advances in Transportation and Geoenvironmental Systems using Geosynthetics”.

Silver, G., Van Thiel, D., 2006, “Permanent Deflection and Performance Study of Drivable Grass”, Published in Stormwater Magazine 2007 and Stormwater Solutions Magazine – 2008.

Shlemon, Roy J., Davis, Paul, and Silver, Gregory, 2008, “Relative Activity of North Branch Splays (NBS) of the Newport-Inglewood Fault Zone, West Newport Oil Field, Newport Beach, CA”.

Silver, Gregory, Bates, Lisa, 2013, “Landslide Stabilization Using High Strength Aggregate-Cement Slurry”, ASCE/Geo Institute 2013 Geo-Congress: Stability and Performance of Slopes and Embankments III, Geotechnical Special Publication No. 231.

Bastani, A., Silver, G., Atkinson, D., 2014, “CPT Based Settlement Prediction Over CA Soft Rock, CPT-14 – 3rd International Symposium on Cone Penetrometer Testing.

Bastani, A., Silver G., 2017, “CPT Based Settlement Prediction Over CA Soft Rock, Stiff Alluvium and Soft Alluvium Sites” – International Foundation Congress and Equipment Expo (IFCEE) 2018.

ROGER W. SCHLIERKAMP, MSc, PE
Principal Pavement Engineer / Director of Pavement Engineering



PROFESSION

Civil Engineer

REGISTRATION

Registered Civil Engineer C81529
State of California

EDUCATION

M.S. Civil Engineering
(Pavement/Materials Engineering),
University of Nevada, Reno
B.S. Civil Engineering
University of Nevada, Reno

PROFESSIONAL EXPERIENCE

GMU Geotechnical, Inc.

(2014 – Present)
Director of Pavement Engineering
Rancho Santa Margarita, California

Twining, Inc.

(2011 – 2014)
Pavement Engineer
Long Beach, California

University of Nevada, Reno

(2009 – 2011)
Graduate Researcher, Pavement /
Materials
Reno, Nevada

PROFESSIONAL AFFILIATIONS

- California Asphalt Pavement Association (CalAPA)
- ASCE Orange County - Engineers without Borders
- American Society of Civil Engineer (ASCE)
- AGC
- American Public Works Association (APWA)
- Santiago Canyon College – Part Time Instruction (Construction Materials)

Roger possesses 12 years of experience in pavement engineering and construction projects, including pavement observation, testing, construction management, evaluation/design, pavement condition index, specification development, and mix design development projects. His experience includes working with local agencies, private sector clients, civil engineering firms, paving contractors, and pavement material producers. He has also served as a Quality Control/ Quality Assurance (QA/QC) Manager. Roger's engineering experience includes pavement evaluations, developing cost-effective pavement design recommendations, performing pavement mix designs, and managing testing/observation services of pavement-focused construction projects. His experience as a QC Manager provides him a thorough understanding of various pavement construction specifications. Roger's proficiency in both pavement construction and design allows him to support his clients in achieving quality and cost-effective pavement solutions. His experience in pavement design and construction includes:

- Pavement engineering evaluation, structural analysis, design expert
- Pavement condition index assessments
- Non-destructive testing, including deflection testing & ground-penetrating radar (GPR) testing
- Pavement smoothness testing
- Pavement mix designs, including hot-mix asphalt (HMA), rubberized hot-mix asphalt (RHMA), warm-mix asphalt (WMA) following Marshall, Hveem, and Superpave design methods, soil-stabilization, and cold recycled asphalt
- Pavement preservation strategies, including fog seals, slurry seals, scrub seals, micro-surfacing seals, and chip seals
- Pavement rehabilitation strategies, such as rubberized pavement overlays, cold recycling, full-depth reclamation, cement/lime base, and subgrade stabilization
- In-depth knowledge of various pavement construction specifications, including Caltrans, Greenbook, Airport, and Ports.
- Quality control / assurance laboratory testing expertise, including Hveem Stability, Hamburg Wheel Track, Moisture Susceptibility, Maximum Density, Wet Track Abrasion, and more.

Select Pavement Evaluation and Design Projects – Local Municipalities and Agencies

2022 Zone F Slurry Seal Project, City of Lake Forest, CA: Managed quality assurance observation and testing services for the 2022 City of Lake Forest Zone F Slurry Seal Project. Slurry seal laboratory tests included moisture content, emulsion content, residual binder content, gradation, sand equivalent, and wet-track abrasion test.

Trampas Dam, Santa Margarita Water District, Rancho Mission Viejo, CA: Roger managed and oversaw the asphalt concrete (AC) materials testing component of the Trampas Dam Project, including pavement laboratory acceptance tests, such as asphalt concrete binder content, gradation, and Hveem Stability value.

Los Monteros Homeowners Association Pavement Repair Project, South Coast Water District, Dana Point, CA: Unstable subgrade conditions were exposed during waterline repairs. Roger performed and managed pavement surface condition assessments, pavement corings, dynamic cone penetrometer testing, laboratory testing, and development of cost-effective pavement repair recommendations (geogrid subgrade stabilization and full-depth reclamation with cement treatment recommendation strategies) to address unstable subgrade conditions. During construction, Roger managed quality assurance observation and testing services, including compaction testing.

Irvine Center Dr., Trabuco Rd., Irvine Blvd., and Walnut Ave. Pavement Evaluation Projects, City of Irvine, Irvine, CA, January 2022. Pavement design engineer overseeing the evaluation of 4 major arterial segments located throughout the city of Irvine, including pavement surface condition assessment, corings, falling weight deflectometer testing, laboratory testing, analysis, and development of pavement rehabilitation recommendations.

Harbor Blvd., Frontera St., and Nohl Ranch Road Ave. Pavement Evaluation Projects, City of Anaheim, Anaheim, CA: October 2021. Pavement design engineer overseeing the evaluation of 3 arterial segments located throughout the City of Anaheim, including pavement surface condition assessment, corings, falling weight deflectometer testing, laboratory testing, analysis, and development of pavement rehabilitation recommendations.

Various Pavement Improvement Projects, Orange County, CA: January 2021. Pavement design engineer overseeing pavement condition assessment, coring, lab testing, analysis, and development of pavement design recommendations for various OCPW projects, including Carbon Canyon Regional Park Pavement Rehabilitation Project and Strands Beach at Salt Creek Parking Lot Pavement Evaluation Project.

Glenn Ranch Road Pavement Evaluation, City of Lake Forest, CA: January 2021 Pavement evaluation and design, including deflection testing analysis, coring, lab testing of Glenn Ranch Road arterial street.

2020 “Phase 1” Citywide Pavement Evaluation Project, City of Aliso Viejo, CA, December 2020 to January 2021: Pavement design engineer overseeing pavement condition assessments, corings, laboratory testing, analysis, and pavement repair recommendations of arterial and residential street segments. One of the primary objects was to address concerns regarding lack of aggregate base beneath most of the city streets and how its absence could impact pavement performance.

East Coast Highway (MacArthur Blvd. to Newport Coast Dr.) Pavement Evaluation Project, City of Newport Beach, Newport Beach, CA: Pavement design engineering overseeing the evaluation of the busy arterial roadway East Coast Highway (a.k.a. Pacific Coast Highway), including falling weight deflectometer (FWD or deflection) testing to evaluate the roadway's current structural capacity and ground-penetrating radar (GPR) testing to evaluate location of underlying PCC pavement.

Market Street (LA River to Cherry Avenue) Pavement Evaluation Project, City of Long Beach, Long Beach, CA: Evaluated PCC and AC pavement, developed PCC and AC pavement rehabilitation recommendations.

Colima Road Rehabilitation, City of Whittier, Whittier, CA: Pavement evaluation of Colima Road, from Lambert Road to Mar Vista Street, and developed pavement reconstruction recommendations to achieve 20-year design life.

City of Torrance, Plaza Del Amo at Western Mobility Enhancement Project, April 2019: Performed pavement evaluation / design of existing roadway as well as widened roadway.

FY 2018-19 Pavement Maintenance/Repair Project, City of Dana Point, CA: Winter 2018-May 2019 Performed pavement surface condition assessments of various streets throughout City of Dana Point, prioritized streets for maintenance/repair, recommended maintenance/repair strategies, reviewed/developed pavement-related specifications, oversaw quality assurance observation/testing services during construction phase.

Annual Residential Slurry Seal FY 2021-22 Project, City of Dana Point, CA: Oversight and management of rubberized polymer-modified slurry (RPMS) seal observation and testing services.

Bonita Canyon Drive and Ford Road Pavement Evaluation, City of Newport Beach, CA: March 2019 – June 2019 Performed pavement evaluation consisting of pavement surface condition assessments, corings, deflection testing, lab testing, analysis, and development of pavement rehabilitation recommendations.

Bison Avenue, San Joaquin Hills Road, San Nicolas Pavement Evaluation, City of Newport Beach, CA: November 2018-May 2019 Performed pavement evaluation consisting of pavement surface condition assessments, corings, deflection testing, lab testing, analysis, and development of pavement rehabilitation recommendations.

City of Torrance, Crenshaw Boulevard Rehabilitation Project, April 2019 Performed pavement evaluation to develop pavement rehabilitation repair recommendations.

Various Pavement Evaluation Project, City of Lake Forest, CA. Performed pavement evaluation for various pavement CIP projects, including Portola Parkway (2015), Dimension Drive (2015), Civic Center Drive (2016), etc.

El Toro Road, Bake Parkway, Lake Forest Drive, City of Lake Forest, CA: Managed the pavement evaluation of nearly 9 centerline miles of arterial streets within the City of Lake Forest, including coring, deflection testing, mapping of localized AC repairs, pavement engineering analysis, and development of pavement rehabilitation recommendations.

Jamboree R. (Michelle Dr. to RR Tracks) Pavement Evaluation Project, City of Irvine, CA: November 2018 Performed pavement evaluation consisting of deflection testing, corings, surface condition assessment, laboratory testing, analysis, and development of pavement rehabilitation repair recommendations.

Aliso Creek Trail Pavement Repair Project, Trabuco Canyon Water District, Lake Forest, CA: (2018) TCWD performed water infrastructure improvements along this trail, which required restoration and improvement of the pavement along the trail. Roger performed and managed pavement evaluation to construction services of a segment of Aliso Creek Trail maintained by TCWD, including pavement surface condition assessments, preparation of plans/specifications, and construction quality assurance observation and testing services.

Mayfair and Raintree Pavement Repair Project, Trabuco Canyon Water District, Rancho Santa Margarita, CA: (2018) A waterline break occurred and lifted the asphalt concrete roadway surface. Roger performed and managed pavement evaluation to construction services of Mayfair Dr and Raintree Ln, including pavement surface condition assessments, preparation of plans/specifications, and construction quality assurance observation and testing services to help restore the pavement's condition and elevation.

Access Road Pavement Reconstruction Project, Trabuco Canyon Water District Wastewater Treatment Plant, Trabuco Canyon, CA: (2017) The existing road that provides access to TCWD's Waste Water Treatment Plant was in very poor condition and drained poorly at certain locations. Roger performed and managed this project from evaluation through construction, including pavement surface condition assessments, corings, laboratory testing, developing cost-effective pavement reconstruction recommendations (full-depth reclamation with cement treatment), preparation of plans/specifications, and construction quality assurance observation and testing services. Slurry seal was applied a year later as a pavement preservation treatment to extend the life of the newly reconstructed roadway.

Califia Neighborhood, Santa Margarita Water District, Mission Viejo, CA: (2016) Roger managed quality assurance observation and testing services of waterline trench backfill and asphalt concrete paving, including compaction testing and laboratory testing of the pavement materials used during construction.

City of Santa Fe Springs, Santa Fe Springs and Painter Avenue Pavement Reconstruction Project, October 2018 Performed pavement evaluation and developed pavement reconstruction repair recommendations, including full-depth reconstruction repair.

City of Aliso Viejo, Glenwood Terrace Neighborhood Pavement Evaluation Project, January 2018: Performed pavement evaluation to develop rehabilitation repair recommendations for the residential neighborhood of Glenwood Terrace.

City of Santa Fe Springs, "South Residential 1" Pavement Evaluation Project, October 2017: Performed pavement evaluation and developed pavement reconstruction repair recommendations, including full-depth reconstruction repair. Provided observation and testing services during construction phase (April 2019).

Pavement Evaluation Project, City of San Juan Capistrano (SJC), SJC, CA: April 2017 AC pavement evaluation of different streets throughout the City of San Juan Capistrano.

City of San Juan Capistrano, Camino Capistrano, March 2017: AC pavement evaluation and rehabilitation design.

City of Stanton Sunshine Village Tract, Concrete Alley, and Cerritos Avenue, Stanton, CA (February 2017): AC and PCC pavement evaluation of neighborhood streets and alleys.

Los Patrones Parkway, 2015 to Present: Pavement design of new alignment of Los Patrones Parkway using cement-treated soil.

San Gabriel Trench Pavement Value Engineering, Alameda Corridor East Construction Authority, San Gabriel, CA: (August 2016) Developed alternative pavement recommendations using in-place materials.

Ocean Boulevard and Poppy Avenue, Newport Beach, California, June 2016: PCC and AC pavement evaluation and reconstruction design.

Crown Valley Parkway Pavement Evaluation & Design Project, Laguna Niguel, CA: April 2016. AC pavement evaluation and rehabilitation design.

Alicia Parkway Slurry Seal Investigation, Laguna Niguel, California, 2014: Slurry seal evaluation.

Irvine Avenue, Newport Beach, California, November 2014: AC pavement evaluation and rehabilitation design.

Pavement Reflective Cracking Investigation Project, Mission Viejo, California, August 2015.

MacArthur Boulevard Rehabilitation, Newport Beach, California, September 2015: AC pavement evaluation and rehabilitation design.

Palm Avenue Grade Separation Project, San Bernardino, California, July 2015: Pavement surface distress evaluation.

Various Streets and Parking Lots, San Juan Capistrano, California, July 2015: AC pavement evaluation and reconstruction design of 7 sites.

Metro Blue Line Artesia Park N Ride Parking Lot, Compton, California, October 2013: AC pavement evaluation and repair recommendations for recently constructed bus parking lot.

Cherry Avenue and Myrtle Street, Long Beach, California, 2013: AC pavement evaluation and reconstruction design.

San Antonio Street, Long Beach, California, 2013: PCC pavement evaluation reconstruction design.

190th Street, Torrance, California, 2013: AC pavement evaluation and rehabilitation design.

Pickett Avenue, Garden Grove, California, 2012: AC pavement evaluation and reconstruction design.

Alondra Boulevard, Norwalk, California, 2011: AC pavement evaluation and rehabilitation design.

Select Quality Assurance Testing and Observation Projects

City of Dana Point - FY 19-20 Annual Roadway Resurfacing Project, Winter 2020: Pavement construction observation and testing services, including submittal reviews and engineering support during construction.

Annual Roadway Resurfacing FY 20-21 Project, City of Buena Park, CA: November 2020: Rubberized Emulsion Aggregate Slurry (REAS) slurry seal observation and testing.

City of Aliso Viejo – Windsong, Carbrook, and Park Avenue, December 2020-January 2021: Project involved use of fiber-reinforced AC mixture.

City of Aliso Viejo – Pacific Park Drive, November-December 2020: Quality assurance manager. Project involved use of fiber-reinforced rubberized AC mixture.

Annual Residential Slurry Seal FY 20-21 Project, City of Rancho Santa Margarita, CA: November 2020: Periodic observation and testing services of crack repairs and rubberized polymer-modified slurry (RPMS) seal.

2020 Residential Slurry Seal and Paving Projects, City of Mission Viejo, CA: July-November 2020. Oversight and management of crack repairs and rubberized polymer-modified slurry (RPMS) seal observation and testing services.

City of Mission Viejo – Alicia, Jeronimo, and Marguerite Rehab (CIP 20837), September-October 2020: Localized AC repairs & ARHM overlay rehabilitation of arterial streets.

Residential Slurry Seal FY 2019 Project, City of Mission Viejo, CA: (CIP 20838), August-October 2019: Quality assurance manager for pavement-related materials, including localized AC repairs and Type I rubberized polymer modified slurry seal.

City of Mission Viejo - Felipe Road and Olympiad Road Pavement Rehabilitation Project (CIP 19837), June-July 2018: Localized AC repairs and ARHM overlay quality assurance observation & testing.

City of Chino Hills - 2018-19 Slurry Seal Project, Chino Hills, CA: (June-July 2019) Type I emulsion aggregate slurry seal (EAS) quality assurance observation & testing.

Las Flores Slurry Seal Project, City of Rancho Santa Margarita, CA: June 2019: Type II emulsion aggregate slurry seal (EAS) quality assurance observation & testing.

Residential Slurry Seal FY 2018-19 Project, City of Buena Park, CA: June, 2019: Type I Rubberized Emulsion Aggregate Slurry (REAS) quality assurance observation & testing.

City of Newport Beach, MacArthur Boulevard & University Pavement Rehabilitation Project, April-October 2019.

City of Dana Point, FY 2018-19 Pavement Maintenance & Repair Project, April 2019.

City of San Juan Capistrano, Del Obispo & Ortega Parking Lot Project, May-June 2019.

City of Rancho Santa Margarita, FY 2018-19 Slurry Seal Project, January 2019.

City of Mission Viejo, On-Call Encroachment Permit Inspection Projects, 2017 to Present: As-needed, various EP projects.

City of Newport Beach, Marguerite Avenue and Hospital Road Pavement Rehabilitation Project, November 2018.

City of Mission Viejo, FY 2018 Residential Slurry Seal and Overlay Project, October 2018.

City of Aliso Viejo, Aliso Creek Road Pavement Rehabilitation Project, October 2018.

City of Laguna Niguel, FY 2017-18 Arterial Pavement Rehabilitation Project, September 2018.

City of Mission Viejo, Trabuco Road and Marguerite Parkway Pavement Rehabilitation Project, June 2018: Performed quality assurance observation/testing services to comply with Federally-funded project requirements.

City of Mission Viejo, FY 2017 Residential Slurry Seal and Overlay Project, October 2017.

Los Patrones Parkway (New Alignment), Rancho Mission Viejo, August 2017-October 2019.

City of Rancho Santa Margarita, FY 2017-18 Slurry Seal Project, June 2018.

2017 ARAM and ARHM Overlay, Laguna Niguel, California, November 2016.

Aliso Viejo Parkway Pavement Rehabilitation Project, Aliso Viejo, California, July 2017.

2016 AC Repairs Project, Laguna Niguel, California, November 2016.

Pacific Park Pavement Rehabilitation, Aliso Viejo, California, November 2016.

Del Obispo Pavement Rehabilitation, Dana Point, California, October 2016.

Chino Hills Parkway Pavement Repairs, Chino Hills, California October 2016.

Susana Road Pavement Reconstruction, County of Los Angeles, Compton, California, October 2016: Cement-treated base testing/observation.

2016 Various Locations Pavement Repairs Project, San Juan Capistrano, California, October 2016: AC, AB, subgrade, geogrid, cement-treated materials.

Irvine Avenue Rehabilitation, Newport Beach, California, Fall/Winter 2016-17: AC, base, subgrade, concrete materials.

Residential AC Repairs and Slurry Seal Projects, City of Mission Viejo, CA: September 2016: AC, base, subgrade, slurry seal, tack, and pavement interlayer materials testing/observation.

Annual Residential Slurry Seal, Newport Beach, California, Summer 2015.

Palma Neighborhood, Santa Margarita Water District, Mission Viejo, California, Summer 2016:
AC trench paving.

Saint Christopher Neighborhood, Laguna Niguel, California, August 2015.

2015-16 Annual Overlay, Rancho Santa Margarita, California, July 2016.

Los Serranos Infrastructure Improvements, Chino Hills, California, April 2016.

Peyton Widening, Chino Hills, California, February 2016.

Reagan and Peterson Park Parking Lot Rehabilitation, Diamond Bar, California, October 2015.

Del Prado Phase 2A, Dana Point, California, August, 2015.

2014/15 Annual Overlay, Dana Point, California, April 2015.

2014/15 Annual Residential Overlay and Slurry Seal Projects, Rancho Santa Margarita, California, Summer 2015.

Trabuco/Monroe Intersection Improvements, Irvine, California, February 2015: Federally-funded project, observation/testing of pavement materials.

Antonio Parkway Pavement Rehabilitation, Rancho Santa Margarita, Rancho Santa Margarita, California, July 2014: Observation/testing of pavement materials.

Canwood Street Phase I Pavement Recycling, Agoura Hills, California 2013: Cold recycled AC materials observation/testing.

Main Street, Garfield Avenue, and Springdale Street Pavement Rehabilitation, Huntington Beach, California, 2013.

Escalona Road Pavement Rehabilitation, La Mirada, California, 2012.

Willow Street Rehabilitation, Long Beach, California, 2011.

Wilcox Avenue Pavement Rehabilitation, Cudahy, California, 2011.

Select Private Street/Parking Lot Pavement Engineering and Evaluations

Los Patrones Parkway, Rancho Mission Viejo, CA Pavement design engineer for 5-mile long, new alignment for Los Patrones Parkway between Oso Parkway and Cow Camp Road. Various alternative designs were evaluated and the selected pavement design involved use of cement stabilized soil (CSS) to reduce pavement construction costs by approximately 40%. During construction, Roger provided engineering support and reviewed QC/QA test results of CSS, aggregate base, AC, and PCC roadway.

Cow Camp Road, Rancho Mission Viejo, CA: Pavement design services to support Project Report and final design PS&E for a 4-mile arterial roadway between Antonio Pkwy and Ortega Hwy on the north side of San Juan Creek.

3075 & 3151 Imperial Highway, City of Brea, Brea, CA: (July 2020) Pavement evaluation and repair recommendations to meet 10- and 20-year design lives, including full-depth reclamation with cement treatment.

Tapatio Foods – Parking Lot Evaluation, July 2020: Evaluation of recently repaved parking lot, including coring and laboratory compaction testing.

Irvine Company Office Properties (ICOP), Parking Lot Maintenance and Repair Projects, 2018 to Present: Performing pavement evaluation, bid document preparation, bid solicitation, construction management advisory, and construction observation/testing services for 15+ parking lots maintained by ICOP for FY 2018-19 and FY 20 projects.

Crystal Cove, Irvine Company, Newport Coast, Newport Beach, California, 2016- 2018.

UCI Lot 36 Bus Parking Lot, Irvine, California, October 2016.

UCI California Avenue Parking Lot Study, Irvine, California, March 2016.

Alcoa Parking Lot Pavement Evaluation, Alcoa Fastening Systems, Industry, California, February 2015.

Covey Project, AC Cap Pavement Evaluation, Buena Park, California, January 2016.

Edwards Life Sciences Parking Lot, Irvine, California, January 2016.

Class I Bike Trail, Rancho Mission Viejo, Orange County, California, 2015.

Pepperdine University Pavement Evaluation, Malibu, California, 2013.

Koll Center Newport Parking Lots, CBRE, Newport Beach, California, 2013.

Select Pavement Mix Designs

Dove Canyon Homeowners Association – 2020 Pavement Rehabilitation Project: Developed cement-treatment mix design consisting of existing asphalt concrete, aggregate base, and subgrade materials.

Cement Stabilized Pulverized Base Mix Design Development, Leffingwell Road Street Rehabilitation Project, City of La Mirada, La Mirada, CA: Developed cement-treatment mix design consisting of existing asphalt concrete, aggregate base, and subgrade materials to satisfy Greenbook CSPB mix design requirements.

Cement Stabilized Pulverized Base Mix Design Development, Painter Avenue and Santa Fe Springs Road Pavement Reconstruction Projects, City of Santa Fe Springs: Developed two

cement-treatment mix designs consisting of existing subgrade materials to satisfy Greenbook CSPB mix design requirements.

Cement Stabilized Pulverized Base Mix Design Development, “Residential 1” Pavement Reconstruction Projects, City of Santa Fe Springs: Developed two cement-treatment mix designs consisting of existing subgrade materials to satisfy Greenbook CSPB mix design requirements.

2018 Greenbook (2018 spec) All American Asphalt, Corona, California, December 2016: Developed AC Hveem mix designs for ½” and ¾” mixtures.

2016 Greenbook (2015 spec) All American Asphalt, Corona, California, December 2016.

Runway 6R-24L Extension Project, Soil-Cement Mix Design, LAX, February 2016.

Runway 7L-25R Safety Area Improvements, Soil-Cement Mix Design, LAX October 2016.

Plum Canyon Road Soil-Cement Mix Design, Santa Clarita, California, August 2016.

2014 Greenbook (2012 spec) All American Asphalt, Corona, California, December 2014.

Soil-Cement Mix Design for Corporate Yard Facility, Buena Park, California December 2014.

Cold Recycled Asphalt Concrete and Soil-Cement Mix Designs, County of Los Angeles, California, 2011-2014.

Thermal Club Racetrack Marshall Mix Design, Skanska, La Quinta, California, 2013.

As-Needed Mix Designs, Granite Construction Company, Santa Barbara and Bakersfield, California, 2011-2013.

Greenbook Mix Designs, All American Asphalt, San Fernando, California, 2012.

Caltrans Route 405 RHMA Superpave Mix Design, Torrance, California, 2012.

As-Needed Mix Designs, Griffith Company, Bakersfield, California, 2014.

Pickett Avenue, Garden Grove, California, 2012.

Select Quality Control Testing/Observation Projects

Route 5, CT 12-0F96C4 Widening, Flatiron Corporation, 2015-2016.

Route 405 Sepulveda Pass Widening, Kiewit Construction, Los Angeles, California, 2012-2013.

Route 5 CT 07-121844 and 07-21594, Security Paving, Los Angeles, California, 2014.

Route 710 CT 07-202144, Shimmick Construction, Long Beach, California, 2014.

Route 65 CT 06-0E0604, Granite Construction, Bakersfield, California, 2011.

Route 405 CT 07-3Y9404, All American Asphalt, Torrance, California, 2012.

Select Airport and Port Pavement Projects

Los Angeles World Airports, LAWA Utilities & LAMP Enabling Projects, 2017 to Present: Providing pavement evaluation and repair recommendations for various parking lots.

Runway 6R-24L Extension Project, LAX, February 2016.

Runway 7L-25R Safety Area Improvements, LAX, October 2016.

Port of Long Beach Pier E Wharf Phase 1 Stage 2, Long Beach, California, 2014.

Taxilane J Improvements, Long Beach Airport, Long Beach, California, 2014.

Naval Air Weapons Station Runway 14/32, Hal Hays Construction, China Lake, California, 2013.

Select Pavement/Geotechnical Projects

Phase 1 Trail Improvements, Southern California Edison Corridor, Buena Park, October 2016: Decomposed granite path recommendations for vehicular loads, concrete flatwork, and concrete pavement design.

UCI Lot 36 Bus Yard, Irvine, California, October 2016: Evaluation of existing parking lot for use as bus parking lot area, retaining wall geotechnical design, pole foundation geotechnical design, and concrete flatwork.

Jamboree and Main Intersection Widening, Irvine, California, February 2016: Design of new pavements for widening and retaining wall geotechnical design.

Cerritos Avenue Sidewalk Gap Closure, Anaheim, California, July 2016: Pavement design, concrete flatwork design, and free-standing wall geotechnical design recommendations.

Select Homeowner Association Pavement Projects

Kite Hill Homeowners Association - Community Center Parking Lot, January 2021: Evaluation and repair recommendations of recent parking lot overlay paving.

Whisler Ridge Homeowners Association – 2020 Pavement Evaluation, November 2020: Performed evaluation to assess condition of the roadway given its age.

Dove Canyon Homeowners Association – 2020 Pavement Rehabilitation Project: Performed pavement evaluation/design, prepared plans/specs, performed construction management advisory, and managed materials testing/observation during construction. The repair recommendation implemented on this project saved approximately 40% (~\$400k) in construction costs.

Groves at Orchard Hills Homeowners Association – 2019 sealcoat project: Prepared plan/specs.

Northridge Country Community Association – 2019 Pavement Reconstruction Project, July-October 2019: Prepared plans, specs, and estimates for pavement full-depth reclamation with cement treatment reconstruction for the 2019 phase of work.

Columbus Grove HOA, Tustin/Irvine, August-September 2019: Evaluation of pavement seal coat distresses on recently applied seal coating and developing pavement repair recommendations.

Rancho Capistrano HOA, July-September 2019: Pavement management plan study of all streets within HOA.

Newport Coast Community Association - 2019 Coastal Canyon Parking Lot Improvement Projects, 2019: Performed pavement evaluation and prepared plans, specs, and estimates to improve various parking lots managed by Newport Coast Community Association.

San Joaquin Hills HOA, FY 2019 Pavement Maintenance and Repair Project.

Ladera Ranch Maintenance Corporation (LARMAC), Orange County, CA 2017 to Present: Providing as-needed pavement engineering and construction support services for streets & parking lots maintained by LARMAC.

Bay Harbour HOA, 2016 Pavement Rehabilitation Project and 2018 Pavement Reserve Budget Advisory Services, Long Beach, California.

Crystal Cove HOA Pavement Rehabilitation Project, Newport Coast, California, December 2016 to Present: Providing pavement maintenance/repair budget advisory, maintenance/repair design, and construction support services for each year's pavement project.

2017 Pelican Hill HOA Pavement Rehabilitation Project, Newport Coast, California, January 2017 to Present: Providing pavement maintenance/repair budget advisory, maintenance/repair design, and construction support services for each year's pavement project.

Casta del Sol, City of Mission Viejo, CA: July 2017 to Present. Management and oversight of project that consisted of pavement distress surveys, distress data collection, PAVER analysis, and development of Maintenance and Rehabilitation (M&R) recommendations.

2017 Pacifica HOA Pavement Rehabilitation Project, San Clemente, California, Summer 2016.

Ritz Cove HOA Vehicular Paver Design and Construction Monitoring, Dana Point, California, July 2015.

2014 Niguel Shores HOA Seal Coating Project, Dana Point, California, 2014.

2015-16 Pavement Rehabilitation Project, Montego HOA, Rancho San Clemente, California, Summer 2016.

2016 Pavement Rehabilitation Project, Bay Harbour HOA, Long Beach, California, Summer 2016.

2016 Pavement Reconstruction Project, Northridge County Community Association (Porter Ranch), Northridge, California, April 2016.

Select Pavement Management Plan (PMP) Projects

City of Chino Hills – 2021 Citywide Pavement Management Plan Updates, January 2021 to Present: Helping the City re-establish an up-to-date pavement management system since their last update in 2005. Performing pavement condition index (PCI) assessment of all city-maintained streets consisting of a total of approximately 193 centerline miles of streets.

City of Laguna Niguel - 2020, 2022, and 2024 Citywide Pavement Management Plan Updates, 2020 to Present: Pavement condition index (PCI) assessment of all city-maintained streets consisting of a total of approximately 141.5 centerline miles of streets and budget scenario analysis to help optimize the City's pavement maintenance and rehabilitation schedule and budget (approximately \$2M per year typically).

Crystal Cove Community Association – 2016 to Present: Established a pavement management inventory in 2016 and performing yearly pavement management plan updates since to help the community cost-effectively maintain and optimize their roadway network condition.

Groves at Orchard Hills Homeowners Association – 2019 to Present: Established a pavement management inventory in 2019 and performing pavement management plan updates.

Casta Del Sol Community Association – 2017 to Present: Established a pavement management system in 2017 for approximately 22 centerline miles of streets managed by the HOA with a yearly street improvement budget of approximately \$800k to \$1.2M per year. Performing periodic reviews and updates to the community's pavement management plan each year.

Lake Forest II Master HOA – 2020 to Present: Established a pavement management system in 2020 for approximately 12 centerline miles of streets managed by the HOA with a yearly street improvement budget of approximately \$1.0M per year. Performing periodic reviews and updates of the community's pavement management plan each year.

Emerald Bay Community Association – 2019 to Present: Established a pavement management system in 2019 for approximately 6 centerline miles of streets managed by the HOA with a yearly street improvement budget of approximately \$300k per year. Performing periodic reviews and updates of the community's pavement management plan each year.

Ocean Ranch HOA – 2014 to Present: Established a pavement management system in 2014 for approximately 5 centerline miles of streets managed by the HOA with a yearly street improvement budget of approximately \$600k per year. Performing periodic reviews and updates of the community's pavement management plan each year.

Litigation and Expert Witness Testimony Projects

Can be provided on an as-requested basis due to the nature of these types of projects.

LISA L. BATES, PG, CEG

Associate Geologist

Director of Municipal Geotechnical and Engineering Services



PROFESSION

Engineering Geologist

REGISTRATIONS

Certified Engineering Geologist,
State of California

Professional Geologist,
State of California

CERTIFICATIONS

Qualified SWPPP Practitioner,
State of California

Qualified SWPPP Designer,
State of California

EDUCATION

B.S., Geological Sciences,
University of California, Santa
Barbara

Summer Field Studies, Oregon
State University

AFFILIATIONS

National Association of Women In
Construction, Orange County
Chapter – Past Chapter President
(NAWIC)

South Coast Geological Society

Lisa has over 26 years of experience in various aspects of the geotechnical field. She has worked successfully with homeowners' associations, residential and commercial developers, master community planners, and governmental agencies on both private and public works projects. She has extensive experience in a wide variety of projects including: residential and commercial development, public works projects, hillside grading, landslide investigation and mitigation, and forensic investigations. Ms. Bates excels at landslide and slope failure investigations and repairs, and has worked with many homeowners' associations on slope issues. In addition, she has served as an expert witness for several legal matters. She is also the Reviewing Geologist for several public agencies. Her goal is to provide an outstanding product to her clients in a timely and cost efficient manner, while upholding the high standards and mission of GMU. Selected project categories representative of Ms. Bates' experience are described below:

- Landslide/Slope Failure Investigation and Repair
- Construction Management
- Geotechnical Review/Consulting Services for Multiple Cities
- Public Works Projects
- Fault Studies
- Legal Consultation
- Residential/Commercial Projects
- Single Family Residential Custom Developments

Additional information and notable projects from Lisa's portfolio are summarized on the following pages.

CONSULTANT TO PUBLIC AGENCIES

Lisa has over 26 years' experience working with various governing agencies, including 20 years providing on-call geotechnical services to a variety of agency clients. A chronological list of Ms. Bates' experience is described below:

- **City of Aliso Viejo (2011 to 2012):**
 - Construction Observation
 - Emergency Services (Slope Failures)
- **City of Rancho Santa Margarita (2008 to current):**
 - Development Reviews
 - Geotechnical Investigation and Design
- **City of Laguna Niguel (2002 to current):**
 - Development Reviews (Building, Grading, and Planning/Entitlement)
 - Geotechnical Investigation and Design
 - Construction Observation
 - Emergency Services (Landslides, Public Safety, "Red Tagging", etc.)
 - Geotechnical Monitoring
- **City of Chino Hills (2002 to current):**
 - Development Reviews (Building, Grading, and Planning/Entitlement)
 - Geotechnical Investigation and Design
 - Construction Observation
 - Emergency Services (Landslides, Public Safety, etc.)
 - Geotechnical Monitoring
- **City of Dana Point (2008 to current):**
 - Geotechnical Investigation and Design
 - Construction Observation
 - Emergency Services (Slope Failures, Blufftop Failures, Public Safety, etc.)
 - Geotechnical Monitoring
- **City of Laguna Hills (2010 to 2020):**
 - Development Reviews (Grading, Planning, and Entitlement)
 - Geotechnical Investigation and Design
- **City of Mission Viejo (2016 to current):**
 - Development Reviews (Engineering)
 - Geotechnical Investigation and Design
 - Construction Observation
 - Emergency Services (Landslides, Public Safety, etc.)
 - Geotechnical Monitoring
- **City of Anaheim (2021 to current):**
 - Development Reviews (Engineering)
- **City of Laguna Beach (2022 to present):**
 - Development Reviews (Hydrology and WQMP)

PUBLIC WORKS PROJECTS

- **Lower Curtis Park Expansion Project, City of Mission Viejo** – Geotechnical investigation for proposed park expansion to include 4 new sports fields and associated improvements. Project included study of multiple large landslides and impacts of proposed development on landslide stability. Project is currently under construction, including landslide removal, mass grading, and import of over 1 million cubic yards of fill soil.
- **Tier 1, Tier 2, and Tier 3 Improvement Projects, Crown Valley Community Park, City of Laguna Niguel** – Three phases of improvements at the City’s largest park included: New tot lot, splashground, amphitheater, parking lots, bridge, and community building, as well as retaining walls, and other non-structural elements. Scope included geotechnical investigations and design support for these improvements, as well as construction geotechnical observations, testing, special inspection, non-destructive testing, and materials testing.
- **La Pata Avenue Gap Closure, South, County of Orange** – Geotechnical investigation for proposed alignments of widening and extension of La Pata Avenue from Ortega Highway to San Clemente. Project included study of multiple large landslide complexes, fault alignments, and complex geology.
- **La Pata Interim Widening for New High School, San Juan Capistrano** – Capistrano Unified School District: Project included geotechnical investigation and construction observation during widening and re-paving of existing roadway.
- **Reclaimed and Domestic Water Reservoirs, City of Chino Hills** – Geotechnical investigation for proposed water reservoirs in semi-developed areas. Project included subsurface investigation for reservoir sites and access roadways as well as review of proposed plans. Scope during construction of reservoirs included geotechnical observation and testing, and special inspection.
- **Dana Point Harbor, City of Dana Point** – Geotechnical investigation for redevelopment of existing harbor facilities, including new parking structure, retail, restaurants, boat storage and supporting improvements.
- **Long Beach Sports Park, Long Beach** – Geotechnical investigation for planned recreational sports complex including artificial turf soccer and baseball fields, clubhouse/concessions, office building and skate park to be constructed on property used for oil field operations and debris disposal. Project included complex investigation to evaluate buried alluvial channel and marshland overlain by debris and fill soils, and development of geotechnical recommendations for corrective grading and design of structures.
- **Sports Park, Chino Hills, City of Chino Hills** – Project included geotechnical investigation, input on design, and construction observations during rough and precise grading, including paving and construction of artificial grass fields.
- **City Hall, City of Laguna Niguel** – Geotechnical investigation for proposed City Hall site on existing graded area. Project included subsurface investigation, design support, and grading observations.
- **Portuguese Bend Beach Club, Rancho Palos Verdes** – Army Corps of Engineers: Geotechnical investigation for proposed seawall and buttress at toe of active Portuguese Bend landslide. Investigation included design and analysis of alternative methods to preserve coastal environment.
- **Government Center, City of Chino Hills** – Geotechnical investigation, design recommendations, plan

review, and observation of construction of new civic center. Center includes new parking structure, City Hall, fire, and police buildings as well as residential development.

- **Ortega Highway (State Route 74) Widening between San Juan Creek and Orange/Riverside County Line, Orange County, Private Contractor** – Project included providing on-call geotechnical services to general contractor, including evaluation of temporary slope stability in hard rock and rock fill.

LANDSLIDE/SLOPE FAILURE INVESTIGATION AND/OR REPAIR

Ms. Bates' experience investigating and/or repairing landslides, slope failures, and erosion includes dozens of projects. The list below includes highlights of her project experience, including high-profile or complex landslides.

- **Hacienda Road, La Habra Heights** - City of La Habra Heights: Project included geotechnical investigation of a portion of roadway with steep natural slopes and existing distress. Investigation included large and small diameter borings, installation and monitoring of a slope inclinometer, geologic analyses, and development of repair options. Project also included development of design repair plans and specifications, as well as coordination with bidders and impacted agencies.
- **Poppy Trail Landslide, Rolling Hills** – California Joint Powers Insurance Authority: Project included geotechnical investigation and design of repair of a large landslide within a hillside residential area. Challenges included steep terrain, adjacent properties, and complex geology. Duties included geologic investigation and grading observations, project oversight, and construction management advisor services.
- **Philemon Landslide, Dana Point** – Private Developer: Project included geotechnical investigation and design of repair of a landslide impacting four residential structures. Challenges included existing residences and adjacent properties, adverse geologic structure, and poor shear strengths for onsite soils. Repair design included innovative slurry backfill of keyway excavation. Duties included geologic investigation, project oversight, and grading observations. Project won 2014 CalGeo Project Award and was presented at 2013 Geo-Congress in San Diego.
- **Horseshoe Landslide, Anaheim Hills** – Homeowners Association: Project included emergency geotechnical services after re-activation of ancient landslide within developed area. Duties included geotechnical investigation, construction management advisor services, long-term monitoring, groundwater monitoring, development of repair plan, coordination with the Association and their legal counsel, and communication with public agencies. Landslide is underlain by complex geology, and crosses City boundary.
- **Portuguese Bend Landslide Complex, Rancho Palos Verdes** – Various Clients: Multiple projects within the ancient landslide complex included investigations of:
 - Active Portuguese Bend Landslide
 - “Parcel 4” Landslide
 - Abalone Cove LandslideTasks included coordinating complex geologic field investigations with multiple drilling methodologies, analyzing data collected to prepare maps and geologic cross-sections, creation of a structure contour map of the entire landslide complex, and development of mitigation measures to stabilize the landslides.

- **South Shores Landslide, Rancho Palos Verdes** – Harris & Associates: Project included study of the inactive landslide’s potential impact on a new storm drain system, including large diameter and continuous core drilling, analyses, and development of conceptual designs.

RESIDENTIAL/COMMERCIAL DEVELOPMENT

- **Cielo Vista Residential Development, County of Orange** – Residential development planned on undeveloped land required fault studies, geotechnical investigation, and foundation investigation for entrance bridge. Tasks included developing recommendations for rough grading, retaining wall, bridge, and residential structure design and providing design input during plan preparation. Provided project management for structural design of retaining and MSE walls. Project required approval from MWD for geotechnical impacts to existing Lower Feeder pipeline, involving detailed analyses, multiple meetings with MWD staff, and coordination of responses to MWD requirements and comments. Project is currently under construction, with GMU providing geotechnical observation and testing, materials testing, and Special Inspection services, as well as vibration monitoring services.
- **Talega, San Clemente** – Geotechnical investigation and geotechnical design recommendations for master planned community, including landslide and slope stability mitigation for hillside development. Investigation included drilling and logging numerous bucket auger and hollow stem borings.
- **Geotechnical Investigation, Grading & Observations, Rancho Mission Viejo/DMB Ladera, LLC, Ladera Ranch** – Geotechnical investigation and grading/construction observations of 8000+ unit master planned community. Tasks include drilling numerous bucket auger and hollow stem borings and geologic mapping and observation during mass and rough grading.

FAULT STUDIES

- **Cielo Vista Residential Development, County of Orange, North County BRS Project, LLC** – Supplemental fault study of site crossed by Whittier Fault. Included excavation and detailed logging of over 500 feet of trench. Fault study analyses methodologies included fracture mechanics, physical characteristics, geomorphology, and datable sediments. Fault study reviewed and approved by County of Orange as part of development approval.
- **The Ranch Plan, Orange County** – Rancho Mission Viejo: Fault investigation of Mission Viejo fault located within proposed development bubble.
- **Seacliff Shopping Center, Huntington Beach** - Shea Homes: Fault investigation of branch of Newport-Inglewood fault zone located within Alquist-Priolo Earthquake Studies Zone for proposed shopping center. Investigation included extensive trenching and design review.
- **Hoag Hospital, Newport Beach** - Hoag Hospital: Fault investigation of Newport-Inglewood fault zone and observation during grading of additional parking area and proposed structures.
- **Foothill Transportation Corridor, CP Alignment, Orange County** - Transportation Corridor Agencies: Fault investigation of branch of Cristianitos fault crossing proposed toll road alignment.

LEGAL CONSULTATION

Ms. Bates has provided geotechnical consultation for litigation on a variety of projects for over 17 years in the State of California. She has been deposed, testified at trial, and participated in mitigation for several cases, including the following issues:

- Landslides
- Slope failure
- Construction dispute
- Slope repair
- Concrete type/source

PUBLICATIONS:

Silver, Gregory, Bates, Lisa, 2012, "Landslide Stabilization Using High Strength Aggregate-Cement Slurry".

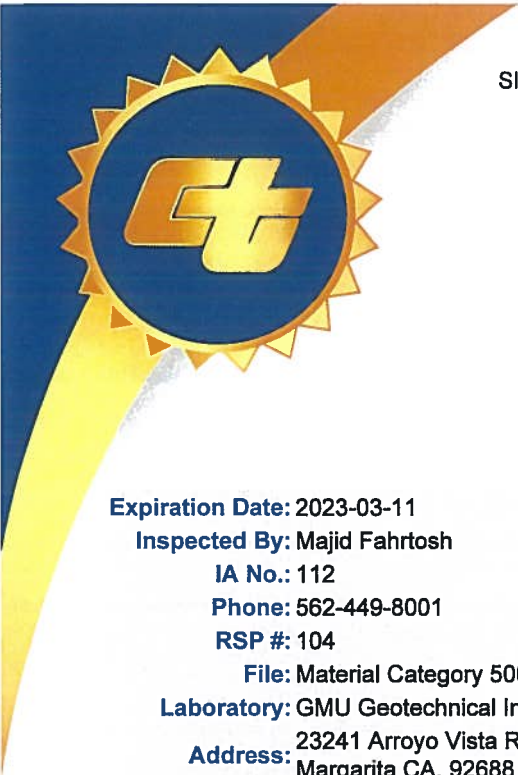
Appendix B

Certifications



STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

CALTRANS ACCREDITATION LABORATORY INSPECTION REPORT



Expiration Date: 2023-03-11
Inspected By: Majid Fahrtoosh
IA No.: 112
Phone: 562-449-8001
RSP #: 104
File: Material Category 500
Laboratory: GMU Geotechnical Inc.
Address: 23241 Arroyo Vista Rancho Santa
Margarita CA, 92688
Lab QC Mgr.: Mike Moscrop
E-mail: mmoscrop@gmugeo.com
Telephone: 949-888-6513
Fax #.: 949-888-1380

A certified Independent Assurance (IA) visited this laboratory on 2022-03-01

Only the equipment to be used on Caltrans Construction projects and/or local construction projects on the National Highway System was checked for qualification. At the time of Caltrans Accreditation, this laboratory had all necessary equipment to perform the test methods indicated below.

Testing personnel shall be Caltrans Qualified and possess a current Caltrans Certification Form TL-0111 or AASHTO Proficiency Form TL-0115 prior to performing any sampling or testing.

CT 105	CT 106	CT 125 ADMIX	CT 125 AGG	CT 125 BIT
CT 125 CEM	CT 125 GEN	CT 125 HMA	CT 201	CT 202
CT 204	CT 205	CT 206	CT 207	CT 209
CT 216	CT 217	CT 226	CT 227	CT 231
CT 301	CT 304	CT 308	CT 309	CT 366
CT 370	CT 375	CT 382	CT 504	CT 518
CT 533	CT 539	CT 540	CT 541	CT 556
CT 557				

A visual check was performed and documents provided as necessary for the following items:

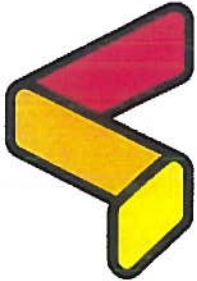
- | | |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Facility Safety Manual | <input checked="" type="checkbox"/> Copies of current applicable test procedures |
| <input checked="" type="checkbox"/> Laboratory Procedures Manual | <input checked="" type="checkbox"/> Calibration and service documentation |
| <input checked="" type="checkbox"/> Laboratory Quality Control Manual | <input checked="" type="checkbox"/> Calibration stickers affixed to test equipment |
| <input checked="" type="checkbox"/> Proper test equipment | (dated within the 12 months) |

On 2022-03-11, this laboratory was Caltrans Qualified by:

Majid Fahrtoosh - IA112
(Printed name of IA person)

Majid Fahrtoosh
(Signature of IA person)





**AASHIO
ACCREDITED**

**CERTIFICATE OF
ACCREDITATION**

AMERICAN ASSOCIATION
OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

AASHIO

GMU Geotechnical, Inc.

in

Rancho Santa Margarita, California, USA

has demonstrated proficiency for the testing of construction materials and has conformed to the requirements established in AASHTO R 18 and the AASHTO Accreditation policies established by the AASHTO Committee on Materials and Pavements.

The scope of accreditation can be viewed on the Directory of AASHTO Accredited Laboratories (aashtoresource.org).

**Jim Tymon,
AASHTO Executive Director**

**Moe Jamshidi,
AASHTO COMP Chair**

This certificate was generated on 04/05/2022 at 7:03 PM Eastern Time. Please confirm the current accreditation status of this laboratory at aashtoresource.org/aap/accreditation-directory



AASHTO
ACCREDITED

SCOPE OF AASHTO ACCREDITATION FOR:

GMU Geotechnical, Inc.

in Rancho Santa Margarita, California, USA

Quality Management System

Standard:		Accredited Since:
R18	Establishing and Implementing a Quality System for Construction Materials Testing Laboratories	07/02/2015
D3666 (Aggregate)	Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials	09/19/2017
D3740 (Soil)	Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction	10/07/2019
E329 (Aggregate)	Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction	09/19/2017
E329 (Soil)	Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction	10/07/2019



AASHTO
ACCREDITED

SCOPE OF AASHTO ACCREDITATION FOR:

GMU Geotechnical, Inc.

in Rancho Santa Margarita, California, USA

Soil

Standard:	Accredited Since:
R58 Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test	09/19/2017
R74 Wet Preparation of Disturbed Soil Samples for Test	09/19/2017
T88 Particle Size Analysis of Soils by Hydrometer	07/02/2015
T89 Determining the Liquid Limit of Soils (Atterberg Limits)	07/02/2015
T90 Plastic Limit of Soils (Atterberg Limits)	07/02/2015
T99 The Moisture-Density Relations of Soils Using a 5.5 lb [2.5 kg] Rammer and a 12 in. [305 mm] Drop	09/19/2017
T100 Specific Gravity of Soils	07/02/2015
T134 Moisture-Density Relations of Soil-Cement Mixtures	07/02/2015
T180 Moisture-Density Relations of Soils Using a 10 lb [4.54 kg] Rammer and an 18 in. [457 mm] Drop	07/02/2015
T190 Resistance R-Value and Expansion Pressure of Compacted Soils	07/02/2015
T236 Direct Shear Test of Soils Under Consolidated Drained Conditions	07/02/2015
T265 Laboratory Determination of Moisture Content of Soils	09/19/2017
T310 In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)	07/02/2015
D421 Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test	09/19/2017
D422 Particle Size Analysis of Soils by Hydrometer	07/02/2015
D558 Moisture-Density Relations of Soil-Cement Mixtures	07/02/2015
D698 The Moisture-Density Relations of Soils Using a 5.5 lb [2.5 kg] Rammer and a 12 in. [305 mm] Drop	09/19/2017
D854 Specific Gravity of Soils	09/19/2017
D1557 Moisture-Density Relations of Soils Using a 10 lb [4.54 kg] Rammer and an 18 in. [457 mm] Drop	07/02/2015
D2216 Laboratory Determination of Moisture Content of Soils	09/19/2017
D2844 Resistance R-Value and Expansion Pressure of Compacted Soils	07/02/2015
D3080 Direct Shear Test of Soils Under Consolidated Drained Conditions	07/02/2015
D4318 Determining the Liquid Limit of Soils (Atterberg Limits)	07/02/2015



AASHTO
ACCREDITED

SCOPE OF AASHTO ACCREDITATION FOR:

GMU Geotechnical, Inc.

in Rancho Santa Margarita, California, USA

Soil (Continued)

Standard:

D4318 Plastic Limit of Soils (Atterberg Limits)

D6938 In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Accredited Since:

07/02/2015

07/02/2015



SCOPE OF AASHTO ACCREDITATION FOR:

GMU Geotechnical, Inc.

in Rancho Santa Margarita, California, USA



Aggregate

Standard:	Accredited Since:
R76 Reducing Samples of Aggregate to Testing Size	07/02/2015
T11 Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing	07/02/2015
T27 Sieve Analysis of Fine and Coarse Aggregates	07/02/2015
T84 Specific Gravity (Relative Density) and Absorption of Fine Aggregate	07/02/2015
T85 Specific Gravity and Absorption of Coarse Aggregate	07/02/2015
T210 Aggregate Durability Index	07/02/2015
T255 Total Moisture Content of Aggregate by Drying	09/19/2017
C117 Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing	07/02/2015
C127 Specific Gravity and Absorption of Coarse Aggregate	07/02/2015
C128 Specific Gravity (Relative Density) and Absorption of Fine Aggregate	07/02/2015
C136 Sieve Analysis of Fine and Coarse Aggregates	07/02/2015
C566 Total Moisture Content of Aggregate by Drying	09/19/2017
C702 Reducing Samples of Aggregate to Testing Size	07/02/2015
D3744 Aggregate Durability Index	07/02/2015

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Ronald Allen

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2025-05-03	Majid Fahrtoosh	Lab 1
CT 125 GEN	2025-03-03	Majid Fahrtoosh	Lab 1
CT 125 HMA	2025-03-03	Majid Fahrtoosh	Lab 1
CT 231	2023-05-12	Majid Fahrtoosh	Lab 1
CT 375	2023-03-03	Majid Fahrtoosh	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Majid Fahrtoosh IA #112

Certified Independent Assurance (IA)

Date issued: 03/01/2022

Tester ID: 05006

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Jasdeep Bains

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2025-07-14	Majid Fahrtoosh	Lab 1
CT 231	2023-07-14	Majid Fahrtoosh	Lab 1
CT 375	2023-07-14	Majid Fahrtoosh	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Majid Fahrtoosh IA 112

Certified Independent Assurance (IA)

Date issued: 07/18/2022

Tester ID: 05741

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Jonathan Basalla

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2023-03-03	Brandt Houchen	(No lab)
CT 125 CEM	2023-03-03	Brandt Houchen	Lab 1
CT 125 GEN	2023-03-03	Brandt Houchen	Lab 1
CT 125 HMA	2023-03-03	Brandt Houchen	(No lab)
CT 231	2023-03-03	Brandt Houchen	Lab 1
CT 375	2023-03-03	Brandt Houchen	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

No Lab: Laboratory associated with the tester is not accredited to perform the test method identified. Testers must be associated with an accredited laboratory.

Brandt Houchen

Brandt Houchen IA 117

Certified Independent Assurance (IA)

Date issued: 03/22/2021

Tester ID: 01361

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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TL-0111 LIVE Version

CALIFORNIA DEPARTMENT OF TRANSPORTATION*Presents this***CERTIFICATE***to***Norman Biehn****who is certified to perform the following tests:**

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 504	2023-03-17	Biplab Bhattacharya	Lab 1
CT 518	2023-03-17	Biplab Bhattacharya	Lab 1
CT 539	2023-03-17	Biplab Bhattacharya	Lab 1
CT 540	2023-03-17	Biplab Bhattacharya	Lab 1
CT 543	2023-03-17	Biplab Bhattacharya	(No lab)
CT 556	2023-03-17	Biplab Bhattacharya	Lab 1
CT 557	2023-03-17	Biplab Bhattacharya	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Biplab Bhushan Bhattacharya

IA#125

Certified Independent Assurance (IA)

Date of download: 08/16/2018

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans' Independent Assurance Program Manual.

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Joshua Cuda

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2023-03-03	Brandt Houchen	(No lab)
CT 125 CEM	2023-03-03	Brandt Houchen	Lab 1
CT 125 GEN	2023-03-03	Brandt Houchen	Lab 1
CT 125 HMA	2023-03-03	Brandt Houchen	(No lab)
CT 231	2023-03-03	Brandt Houchen	Lab 1
CT 375	2023-03-03	Brandt Houchen	Lab 1
CT 504	2024-01-19	Jasdeep Sandhu	Lab 1
CT 518	2024-01-19	Jasdeep Sandhu	Lab 1
CT 539	2024-01-19	Jasdeep Sandhu	Lab 1
CT 540	2024-01-19	Jasdeep Sandhu	Lab 1
CT 543	2024-01-19	Jasdeep Sandhu	(No lab)
CT 556	2024-01-19	Jasdeep Sandhu	Lab 1
CT 557	2024-01-19	Jasdeep Sandhu	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

No Lab: Laboratory associated with the tester is not accredited to perform the test method identified. Testers must be associated with an accredited laboratory.

Brandt Houchen Brandt Houchen IA 117

Certified Independent Assurance (IA)

Date issued: 03/22/2021

Tester ID: 01364

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Royce Gould

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 ADMIX	2025-03-10	Majid Fahrtosh	Lab 1
CT 125 AGG	2023-03-03	Brandt Houchen	Lab 1
CT 125 BIT	2025-03-10	Majid Fahrtosh	Lab 1
CT 125 CEM	2023-03-03	Brandt Houchen	Lab 1
CT 125 GEN	2023-03-03	Brandt Houchen	Lab 1
CT 125 HMA	2023-03-03	Brandt Houchen	Lab 1
CT 231	2024-03-10	Majid Fahrtosh	Lab 1
CT 375	2023-03-03	Brandt Houchen	Lab 1
CT 504	2024-01-19	Jasdeep Sandhu	Lab 1
CT 518	2024-01-19	Jasdeep Sandhu	Lab 1
CT 539	2024-01-19	Jasdeep Sandhu	Lab 1
CT 540	2024-01-19	Jasdeep Sandhu	Lab 1
CT 543	2024-01-19	Jasdeep Sandhu	(No lab)
CT 556	2024-01-19	Jasdeep Sandhu	Lab 1
CT 557	2024-01-19	Jasdeep Sandhu	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

No Lab: Laboratory associated with the tester is not accredited to perform the test method identified. Testers must be associated with an accredited laboratory.

Majid Fahrtosh IA #112

Certified Independent Assurance (IA)

Date issued: 03/03/2022

Tester ID: 01367

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Jeffrey Matsushita

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 ADMIX	2025-03-01	Majid Fahrtoosh	Lab 1
CT 125 AGG	2025-03-01	Majid Fahrtoosh	Lab 1
CT 125 BIT	2025-03-01	Majid Fahrtoosh	Lab 1
CT 125 CEM	2025-03-01	Majid Fahrtoosh	Lab 1
CT 125 GEN	2025-03-01	Majid Fahrtoosh	Lab 1
CT 125 HMA	2025-07-07	Majid Fahrtoosh	Lab 1
CT 231	2023-03-01	Majid Fahrtoosh	Lab 1
CT 375	2023-03-01	Majid Fahrtoosh	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Majid Fahrtoosh IA 112

Certified Independent Assurance (IA)

Date issued: 07/07/2022

Tester ID: 04892

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Russell Price

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 ADMIX	2025-03-03	Majid Fahrtoosh	Lab 1
CT 125 AGG	2025-03-03	Majid Fahrtoosh	Lab 1
CT 125 BIT	2025-03-03	Majid Fahrtoosh	Lab 1
CT 125 CEM	2023-03-03	Brandt Houchen	Lab 1
CT 125 GEN	2023-03-03	Brandt Houchen	Lab 1
CT 125 HMA	2025-03-03	Majid Fahrtoosh	Lab 1
CT 231	2024-03-10	Majid Fahrtoosh	Lab 1
CT 375	2023-03-03	Brandt Houchen	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Majid Fahrtoosh IA #112

Certified Independent Assurance (IA)

Date issued: 03/03/2022

Tester ID: 01368

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Scott Seabold

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2023-03-03	Brandt Houchen	(No lab)
CT 125 CEM	2023-03-03	Brandt Houchen	Lab 1
CT 125 GEN	2023-03-03	Brandt Houchen	Lab 1
CT 125 HMA	2023-03-03	Brandt Houchen	(No lab)
CT 231	2023-03-03	Brandt Houchen	Lab 1
CT 375	2023-03-03	Brandt Houchen	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

No Lab: Laboratory associated with the tester is not accredited to perform the test method identified. Testers must be associated with an accredited laboratory.

Brandt Houchen Brandt Houchen IA 117

Certified Independent Assurance (IA)

Date issued: 03/22/2021

Tester ID: 01370

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Michel El Sebaaly

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2025-05-12	Ashley Shaw	Lab 1
CT 125 BIT	2025-05-12	Ashley Shaw	Lab 1
CT 125 CEM	2025-05-12	Ashley Shaw	Lab 1
CT 125 GEN	2025-05-12	Ashley Shaw	Lab 1
CT 125 HMA	2025-05-12	Ashley Shaw	Lab 1
CT 231	2023-05-12	Ashley Shaw	Lab 1
CT 375	2023-05-12	Ashley Shaw	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Brandt Houchen Brandt Houchen IA 117

Certified Independent Assurance (IA)

Date issued: 08/09/2021

Tester ID: 05136

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Jade Sill

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 ADMIX	2025-03-10	Majid Fahrtosh	Lab 1
CT 125 AGG	2025-03-10	Majid Fahrtosh	Lab 1
CT 125 BIT	2025-03-10	Majid Fahrtosh	Lab 1
CT 125 CEM	2025-03-10	Majid Fahrtosh	Lab 1
CT 125 GEN	2025-03-10	Majid Fahrtosh	Lab 1
CT 125 HMA	2025-03-10	Majid Fahrtosh	Lab 1
CT 231	2024-03-10	Majid Fahrtosh	Lab 1
CT 375	2023-03-03	Brandt Houchen	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Majid Fahrtosh IA #112

Certified Independent Assurance (IA)

Date issued: 03/03/2022

Tester ID: 01371

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

John Strauss

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2025-07-07	Majid Fahrtosh	Lab 1
CT 125 HMA	2025-07-07	Majid Fahrtosh	Lab 1
CT 231	2022-07-20	Ashley Shaw	Lab 1
CT 375	2023-03-03	Brandt Houchen	Lab 1
CT 504	2024-08-03	Sarbjit Grewal	Lab 1
CT 518	2024-08-03	Sarbjit Grewal	Lab 1
CT 533	2024-03-10	Majid Fahrtosh	Lab 1
CT 539	2024-08-03	Sarbjit Grewal	Lab 1
CT 540	2024-08-03	Sarbjit Grewal	Lab 1
CT 541	2024-03-10	Majid Fahrtosh	Lab 1
CT 543	2024-08-03	Sarbjit Grewal	(No lab)
CT 556	2024-08-03	Sarbjit Grewal	Lab 1
CT 557	2024-08-03	Sarbjit Grewal	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

No Lab: Laboratory associated with the tester is not accredited to perform the test method identified. Testers must be associated with an accredited laboratory.

Majid Fahrtosh IA 112

Certified Independent Assurance (IA)

Date issued: 07/18/2022

Tester ID: 01372

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Aaron Yett

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2023-06-01	Ashley Shaw	Lab 1
CT 125 GEN	2023-06-01	Ashley Shaw	Lab 1
CT 125 HMA	2023-06-01	Ashley Shaw	Lab 1
CT 231	2023-07-18	Majid Fahrtoosh	Lab 1
CT 375	2023-07-18	Majid Fahrtoosh	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Majid Fahrtoosh IA 112

Certified Independent Assurance (IA)

Date issued: 07/18/2022

Tester ID: 01376

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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CALIFORNIA DEPARTMENT OF TRANSPORTATION

Presents this CERTIFICATE to

Ali Zalghout

who is certified to perform the following tests:

Test Method	Expiration Date	IA Responsible	Associated Laboratory
CT 125 AGG	2023-05-12	Brandt Houchen	Lab 1
CT 125 CEM	2023-05-12	Brandt Houchen	Lab 1
CT 125 GEN	2023-05-12	Brandt Houchen	Lab 1
CT 125 HMA	2023-05-12	Brandt Houchen	Lab 1
CT 231	2023-05-12	Brandt Houchen	Lab 1
CT 375	2023-05-12	Brandt Houchen	Lab 1

Lab 1: GMU Geotechnical Inc., 23241 Arroyo Vista, Rancho Santa Margarita

Brandt Houchen Brandt Houchen IA 117

Certified Independent Assurance (IA)

Date issued: 08/06/2021

Tester ID: 04401

Note: This certificate is valid as long as the Tester complies with applicable requirements in Caltrans Independent Assurance Program Manual.

Please verify tester certifications by visiting the SIAD website at <https://sia.dot.ca.gov/>

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