LGC Geotechnical, Inc.

STATEMENT OF QUALIFICATIONS TO PROVIDE PROFESSIONAL GEOTECHNICAL CONSULTING SERVICES

Prepared For:

Ms. Nicole Jules

City of Rancho Palos Verdes – Department of Public Works

Dated: December 1, 2014

131 Calle Iglesia, Suite 200, San Clemente, CA 92672 (949) 369-6141 www.lgcgeotechnical.com

LGC Geotechnical, Inc.

Stipulations

- All professional rates are accrued from portal to portal.
- Expert witness testimony, depositions, or mediation conferences, will be billed at 2.0 times the professional billing rate.
- All geologists, engineers, and technicians will be billed at time-and-a-half for overtime. Overtime is defined as more than 8 hours in one day and any time worked on weekends, state holidays or night shifts. Double time will be billed when more than 12 hours are worked in one day or more than 8 hours on weekends, state holidays or night shifts.
- Invoices are rendered monthly, payable upon receipt.
- Proposals are valid for 30 days, unless otherwise stated.
- Heavy equipment, subcontractor fees and expenses, supplemental insurance, travel, shipping, outside reproduction, and other reimbursable expenses will be invoiced at cost, plus 20 percent.
- Prior to initiating our field work, client agrees to provide all information in client's possession about actual or possible presence of underground utilities and/or hazardous materials on the site. Client agrees to reimburse LGC Geotechnical for all costs related to unanticipated discovery of utilities and/or hazardous materials.
- Prior to initiating our field work, client agrees to provide all information in client's possession with regard to restricted entry and/or exploration areas, such as areas of environmental contamination, hazardous soils, sensitive habitat areas, etc. Client agrees to reimburse LGC Geotechnical for all costs related to environmental contamination, hazardous soils, sensitive habitat areas, etc.
- Client is responsible for providing safe and legal access to the site at all times.
- LGC Geotechnical will not be liable for any loss, damage or liability to persons or property arising out of performance of our service that is not covered and paid for by our insurance. For any other loss, damage or liability which is not covered by insurance, our liability will be limited to the lessor of either $10,000 or the total amount paid by client to LGC Geotechnical on the project in question.
- These rates are based on standard insurance coverage. If higher insurance limits are required client should discuss these limits, and the associated cost, with LGC Geotechnical prior to the initiation of our services.
- LGC Geotechnical's services will be performed in accordance with generally accepted standards of care and diligence normally practiced by geotechnical consulting firms performing services of a similar nature in Southern California. No other warranty, either expressed or implied, is included or intended in LGC Geotechnical's proposals, contracts, reports, etc.

LGC Geotechnical, Inc.

December 1, 2014

Ms. Nicole Jules
City of Rancho Palos Verdes – Department of Public Works
30940 Hawthorne Boulevard
Rancho Palos Verdes, California 92075

Subject: ***Statement of Qualifications for LGC Geotechnical, Inc.***

LGC Geotechnical, Inc. is very interested in providing the City of Rancho Palos Verdes Department of Public Works with professional geotechnical consulting services. LGC Geotechnical is a Southern California based firm located in San Clemente. We provide quality, full service geotechnical consulting services to some of Southern California's largest land developers, residential builders, engineers, architects, school districts, utility companies, insurance companies, commercial builders, and numerous public agencies. We have recently provided, or are currently providing, professional consulting services for the South Coast Water District, Laguna Beach County Water District, the Irvine Ranch Water District, City of Oceanside Water and Utilities Department, and various Cities including: Pomona, Chino Hills, Anaheim, San Clemente, San Juan Capistrano, Dana Point, Carlsbad, Irvine, Lake Forest, and Rancho Palos Verdes. Our services for the aforementioned public agencies include, but are not limited to, geotechnical design reports for public improvements including wet utilities, pavement design and analysis, landslide evaluations, liquefaction analysis, observation and testing during grading and construction, and third-party review. We provide professional geotechnical services throughout San Diego, Riverside, Los Angeles, and Orange Counties.

We have prepared this statement of qualifications to provide you with an overview of our firm and our experience. Our goal at LGC Geotechnical is simple: extraordinary product quality and superior customer service. We accomplish this by observing our clients needs and utilizing our technical knowledge and extensive experience to address them with a prompt and efficient approach. LGC Geotechnical is a certified California Small Business, a Small Business Enterprise and a Very Small Business Enterprise recognized by the Ports of Los Angeles and Long Beach and the San Diego County Water Authority.

Please consider LGC Geotechnical for your next project!

Should you have any questions regarding this letter, please do not hesitate to contact our office.

Respectfully submitted,

LGC Geotechnical, Inc.

Kevin B. Colson, CEG
Vice President

KBC/kmb

Distribution: (4) Addressee

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Firm Background

LGC Geotechnical, Inc. was founded in San Clemente, California to provide innovative solutions to complex geotechnical problems. We strive to combine our broad experience in the geotechnical industry with our modern approaches to provide our clients effective and efficient geotechnical consulting. The LGC Geotechnical team includes highly educated and licensed professionals including registered geotechnical engineers (G.E.) and certified engineering geologists (C.E.G.). We draw on our technical knowledge and extensive industry experience to efficiently serve our client's needs. We provide straightforward, cost-effective engineering solutions to complex engineering problems. Our senior and management level personnel have a long history within the industry and over the years have gained the respect of our clients and professional members within the geotechnical community.

Our clients include municipalities, utility companies, public agencies, local governments, school districts, insurance companies, residential developers, architects, lawyers, commercial developers, design professionals, and individuals. We have provided professional consulting services for various public agencies including: the South Coast Water District, the Laguna Beach County Water District, the Irvine Ranch Water District, City of Oceanside Water and Utilities Department, and the Cities of Pomona, Chino Hills, Anaheim, San Clemente, San Juan Capistrano, Dana Point, Carlsbad, Irvine, Lake Forest, and Rancho Palos Verdes. The majority of our clients come from referrals or repeat business.

LGC Geotechnical has extensive experience with hillside grading from standard earth moving techniques such as shear keys and earth buttresses, to state of the art techniques such as dewatering systems, tiebacks, soil nail walls, and caisson shear pins. LGC Geotechnical is a premier geotechnical consultant in slope stabilization design and understands how to design and implement successful engineering solutions to mitigate adverse geologic conditions. As experts in this field, we have also provided third-party geotechnical review services for numerous companies and local agencies.

Our continued involvement with some of Southern California's largest developers is a testament to the quality of our staff and level of service we provide. In the last 5 years, our personnel have been responsible for the geotechnical aspects in the development of over 5,000 residential units, 1,000,000 square feet of commercial and retail structures, 25 miles of private and public streets, and over 100 miles of utility improvements.

LGC Geotechnical's corporate philosophy combines commitment, motivation, and teamwork to provide our clients with quality work in a timely and professional manner.

Summary of Services Provided by LGC Geotechnical, Inc.

LGC Geotechnical provides a complete range of geotechnical consulting services. Our major categories of services include: subsurface geotechnical evaluations, landslide evaluations/stabilizations, feasibility evaluations, settlement analysis, geotechnical instrumentation, construction observation and testing, geologic mapping and geologic hazard evaluations. We have our own in-house state-of-the-art geotechnical laboratory and we own and operate twelve state-licensed nuclear gauges.

LGC Geotechnical also offers an experienced staff of field geologists and technicians for geotechnical observation and testing services during grading and construction. Our field personnel are experienced in projects ranging from geologically complicated landslide stabilizations to expansive flat-land grading. They are also experienced in infrastructure improvements, such as utility backfill, street and sidewalk preparation, paving, and foundation observation.

The following is a summary of some of the services we provide.

Geotechnical Engineering

- Site Reconnaissance
- Plan Checking (Third Party Review)
- Feasibility Investigations
- Ground Improvement
- Geotechnical Hazard Evaluations
- Landslide Investigations/Stabilizations
- Hillside Grading
- Ground Water Investigations
- Liquefaction Assessments/Mitigation
- Settlement Analysis
- Dewatering Design
- Drainage Design
- Flexible Pavement Design
- Lateral Spreading
- Retaining Walls
- Mechanically Stabilized Earth Walls
- Distress Investigations
- Geotechnical Peer Review
- Mediation and Arbitration Support
- Expert Witness Consultation/Testimony
- Expert Panel Participation
- Foundation Engineering
- Geotechnical Instrumentation
- Construction Observation and Testing
- Infiltration Testing
- Analysis of Temporary Excavations
- Erosion Studies
- In-house Laboratory Testing

Engineering Geology

- Site Reconnaissance
- Subsurface Exploration
- Geologic Mapping
- Geologic Hazard Evaluations
- Fault Investigations
- Rock Fall Potential
- Seismic Evaluations
- Seismic Response Spectrum
- Air Photo Interpretation
- Rippability Evaluations
- Flood Hazard Potential
- Debris Flow Evaluations

Project Experience

Experience with Geotechnical Challenges

Our personnel are well suited and experienced in addressing and adapting to the complexity that the Southern California geologic climate can present. We are relied upon by several cities and agencies with geotechnical hazards such as:

- ✓ landslide mitigation;
- ✓ landfill mitigation;
- ✓ liquefaction assessment; and
- ✓ slope stabilization.

LGC Geotechnical has extensive experience with hillside and coastal bluff stabilization from standard earth moving techniques such as shear keys and earth buttresses, to state of the art techniques such as dewatering systems, tieback and soil nail walls, mechanically stabilized earth (MSE) walls, and caisson shear pins. LGC Geotechnical is a premier geotechnical consultant in slope stabilization design and understands how to design and implement successful engineering solutions to mitigate adverse geologic conditions. Our staff has designed and provided our geotechnical services during construction of numerous nail walls, tieback walls, caisson walls, MSE walls, and walls using various combinations of these stabilization methods as well as other mechanical shoring and stabilization systems. We have been involved in stabilization projects from San Diego to San Francisco. Our projects have included stabilizing coastal bluffs below residential communities, providing shoring for construction of multi-story underground parking for high-rise structures, and stabilizing numerous landslides and slope stability issues of various sizes.

Experience with Environmental Challenges

As Southern California grows, development has been pushed deeper into environmentally sensitive areas. Through our work on various large land development projects, the staff at LGC Geotechnical has been exposed to and is familiar with environmental issues that come up during development. We have successfully addressed several environmental challenges, including:

- ✓ Natural wetlands;
- ✓ Blue line streams;
- ✓ Ground water quality;
- ✓ Surficial water flow regimes;
- ✓ Vegetative habitats;
- ✓ Wildlife habitats;
- ✓ Groundwater infiltration rates; and
- ✓ Deleterious materials associated with landfills.

As a result of working with sites affected by environmental issues, we have been involved with the following regulatory agencies:

- ✓ State Water Resources Control Board;
- ✓ California Regional Water Quality Control Board;
- ✓ San Diego Regional Water Quality Control Board;
- ✓ Department of Environmental Health, County of Orange;
- ✓ County of Orange Integrated Waste Management Department;
- ✓ California Coastal Commission; and
- ✓ Orange County Health Care Agency.

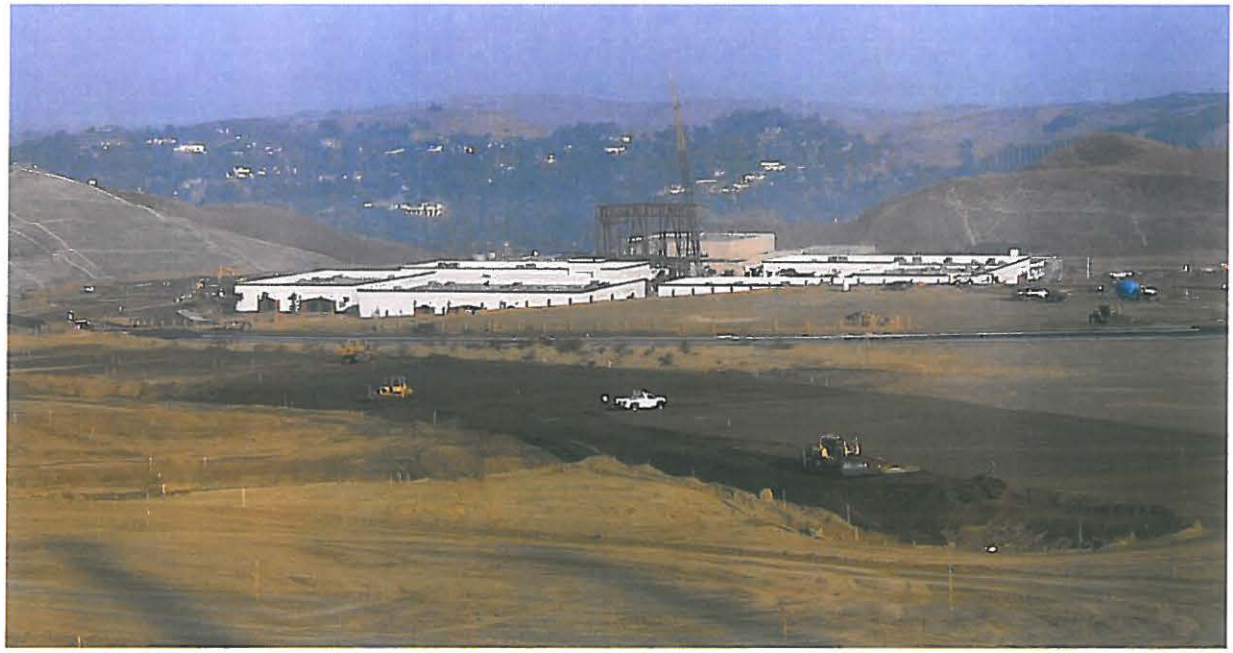
The Following Projects Have Been Worked On By LGC Geotechnical Personnel

SAN JUAN HILLS HIGH SCHOOL

City of San Juan Capistrano

Geotechnical Quality Control on behalf of the City

Client: Mr. Sam Shoucair, City of San Juan Capistrano, (949) 443-6355



Project Highlights and Geotechnical Challenges

- Geotechnical review of design and earthwork construction of San Juan Hills High School for the City of San Juan Capistrano in conjunction with review by the Department of State Architect (DSA).

- LGC performed daily site review of geologic conditions and interim report review during grading in order to facilitate design-build element of the earthwork construction portion of highly complex project.

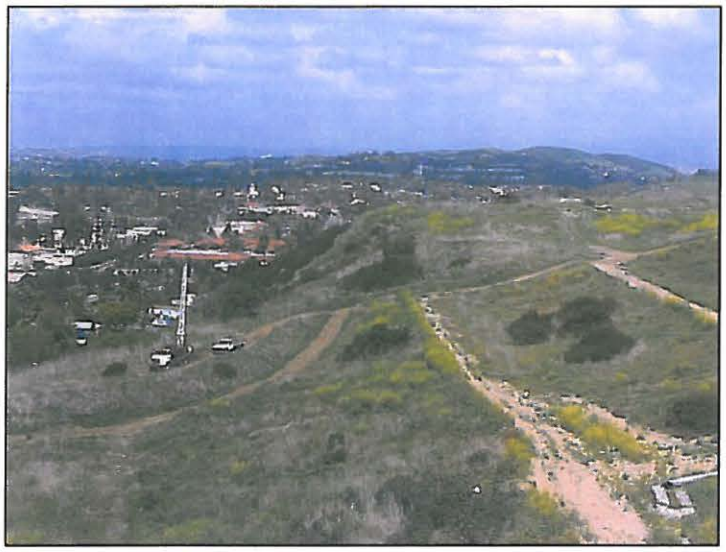
Geotechnical Issues

- In-grading design changes for several large keyway buttresses with geogrid-reinforced fill slopes;
- Over-excavation of earthwork cut for school buildings;
- Temporary shoring requirements for protection of existing perimeter structures;
- In-grading mitigation of several large landslides;
- Installation of hydro-auger system to increase slope stability;
- Settlement of deep fills with surcharge stockpile and monitoring; and
- Establishment of setback zones based on in-grading geologic conditions.

THE MEADOWS
San Juan Capistrano, California

Residential Development and Landslide Stabilization

Client: Mr. Steve Sukut, Advanced Group 99, (949) 595-5900



Project Highlights and Geotechnical Challenges

- Stabilization of the 350-acre Forster Canyon Landslide.
- Closure of the 50-acre Forster Canyon Landfill.
- Over 10 Million cubic yards of rough grading.
- Monitoring piezometers and inclinometers during ongoing dewatering of the landslide in order to increase the stability of the site.

CALLE SONORA SLOPE FAILURE
Laguna Hills, California

Stabilization of large landslide failure of graded slope between existing Calle Sonora and Home Depot strip mall

Client: Mr. Doug Koller, Professional Community Management, Laguna Woods Village, (949) 597-4615

Project Highlights and Geotechnical Challenges

- Site investigation with large diameter borings down-hole logged by an engineering geologist, small diameter borings, and installation/monitoring of inclinometer.
- Stabilization included installation of 50, 70-foot long, 4-foot diameter caissons, four rows of grade beams with 100-foot long tiebacks at 8-foot centers, removal of the majority of the landslide, and reconstruction of the slope.

MEADOW VIEW LANDSLIDE
City of Pomona, California

Landslide Evaluation

Client: City of Pomona c/o Law Offices of Robert Gokoo
(714) 568-6610

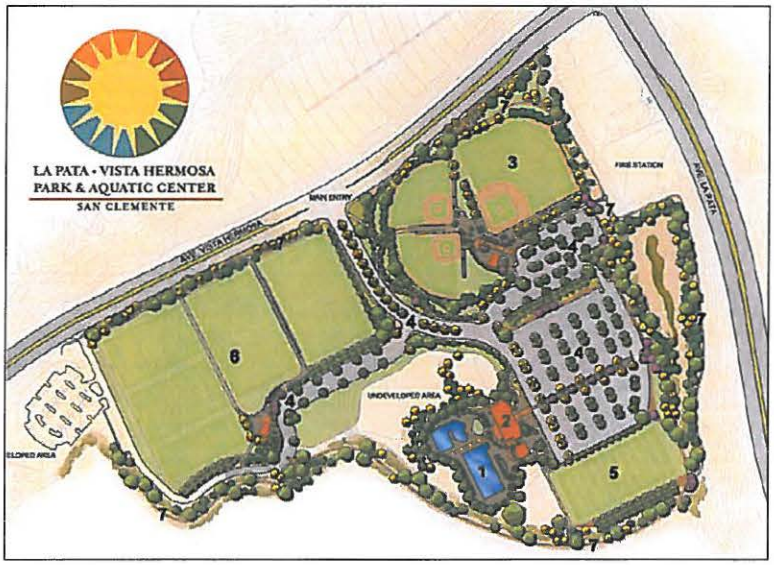
Project Highlights and Geotechnical Challenges

- Site investigation, including large diameter borings downhole-logged by engineering geologist, small diameter borings, and installation/monitoring of two inclinometers.
- Provided consulting services to the City staff for monitoring and documentation of distress to nearby residential structures.

LA PATA VISTA HERMOSA PARK & AQUATIC CENTER

San Clemente, California

Client: Mr. Tim Shaw, City of San Clemente Beaches, Parks & Recreation
(949) 361-8267



Project Highlights and Geotechnical Challenges

- Part of a 45-acre development by the City of San Clemente's Beaches, Parks & Recreation division. Lighted sports park including soccer, baseball and football fields plus aquatic center featuring an Olympic size swimming pool.
- Development includes formation of new environmentally friendly wetland areas within drainage basins.
- Phase 1A (recently completed) involved the installation of wet and dry utilities throughout the site plus grading and paving of parking and various hardscape areas.
- Avenida Vista Hermosa was also widened in an effort to relieve possible congestion caused by traffic entering/exiting from the park.
- Geotechnical challenges include:
  - Expansive soils;
  - Differential settlement; and
- Remedial grading of poor quality surficial soils.

JTM UNIT 1, REACHES 1 & 2 60" CML&C TRANSMISSION MAIN RELOCATION

Irvine, California

Client: Ms. Marissa Potter, South Coast Water District
(949) 499-4555

Project Highlights and Geotechnical Challenges

- Field geologic mapping of the conditions exposed during the grading of Lake Forest Drive along the proposed relocation alignment;
- Field geologic mapping during excavation, backfill and construction of the up to approximately 30-foot-deep, 48-inch storm drain line within Lake Forest Drive along the proposed relocation alignment;
- Observation and testing of grading operations for the extension of Lake Forest Drive between Romano and Bake Parkway;
- Observation and testing of excavation, construction and backfill of the up to approximatley 25-foot-deep, 60-inch diameter water line within Lake Forest Drive between Romano and Bake Parkway; and
- Provided deputy inspection services for high strength concrete used in vault vault and manway structures.

LAGUNA BEACH SEWER INTERCEPTOR TUNNEL

South Coast Water District

Geotechnical Assessment of Coastal Bluff Impact on Sewer Line

Client: Mr. Joseph McDivitt, South Coast Water District
(949) 499-4555

Project Highlights and Geotechnical Challenges

- Geotechnical review of sewer tunnel rehabilitation plans, geologic and geotechnical reports, geologic maps, and aerial photos;
- Performed geologic field mapping of accessible outcrops along the bluff face and in portions of the sewer tunnel and adits;
- Modeling of structural geology and slope stability evaluation; and
- Recommendations for temporary and permanent geotechnical hazard mitigation during proposed tunnel rehabilitation.

TERMINAL RESERVOIR No. 3
San Juan Capistrano, California

Underground Reservoir Construction

Client: Mr. Eric Bauman, City of San Juan Capistrano
(949) 443-6366

Project Highlights and Geotechnical Challenges

- Site investigation included large diameter borings down-hole logged by engineering geologist, small diameter borings, installation/monitoring of four inclinometers, two water-monitoring wells, and vibration monitor.
- Temporary stabilization of surrounding slopes during tank construction requiring two massive retaining walls. Stabilization included installation of 126 45-to-78-foot-long soldier piles, wood lagging, three hundred and twenty three 60-to-160-foot-long tiebacks installed and tested in up to 4 rows, and ten 30-foot-long, 4-foot-diameter caissons with attached I-Beam rakers.

LGC Geotechnical provided field recommendations, observation, and testing services during site grading, retaining wall and tank construction, and for storm drain and tank backfill.

KRUM RESERVOIR
San Juan Capistrano, California

Emergency Landslide Stabilization and Krum Reservoir Pipeline Rehabilitation

Client: Mr. Eric Bauman, City of San Juan Capistrano
(949) 443-6366

Project Highlights and Geotechnical Challenges

Excavation of 4 large diameter borings, installation/monitoring of piezometers and inclinometers up to 294 ft in depth.

Mitigating effects of a large landslide on nearby residences and the adjacent Krum Reservoir, which included the following:

- Grading the landslide to decrease movement and constructing stabilization buttress fills to prohibit a deeper failure that could potentially impact nearby residences;
- Installation of 24 caissons to a depth of 60 feet with grade beam between the landslide and Krum Reservoir; and
- Installation of 66 tiebacks up to 125 feet in length in two rows between the landslide and Krum Reservoir.

THE IRVINE COMPANY

SANTIAGO HILLS II
City of Orange, California

Development of Residential, Commercial, Park, and Natural Preservation Sites

Client: Mr. Jamie Yoshida, Irvine Community Development Company, (949) 720-2702

Project Highlights and Geotechnical Challenges

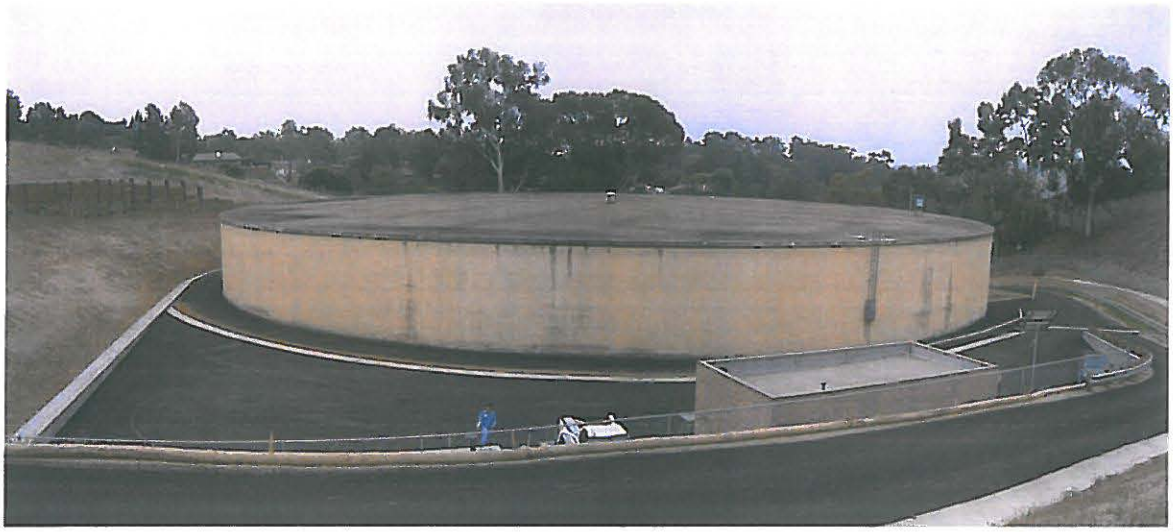
- Over 16 million cubic yards of rough grading, covering 440-acres of land;
- Improving Caltrans right-of-way on adjacent portions of State Route 241/261;
- Landslide remediation and slope stabilization;
- LGC Geotechnical designed extensive wick drain ground improvement system for areas of deep saturated alluvium, avoiding extremely costly and extensive wet removals or decades of surcharging;
- Geogrid reinforcement for 60-foot-high 1.5:1 (horizontal to vertical) fill slope for bridge abutment;
- Micro-tunneling for 54-inch water line realignment; and
- Jack and bore of new storm drain lines below State Route 241/261.

TERMINAL No. 2 RESERVOIR REHABILITATION

San Juan Capistrano, California

Geotechnical Evaluation and Repair Recommendations for the Rehabilitation of the Terminal No. 2 Reservoir

Client: Mr. Joe Mankawich, City of San Juan Capistrano
(949) 443-6366



Project Highlights and Geotechnical Challenges

- Provided geotechnical evaluation of distressed water reservoir including review of previous geotechnical reports and drilling a small diameter exploratory boring;
- The evaluation indicated that the distress was caused by differential settlement from grading during reservoir construction;
- Provided repair options and geotechnical designs for the City of San Juan Capistrano in order to repair existing reservoir; and
- Included designs for micropile and caisson systems in order to stabilize the differential settlement of the reservoir.

DEL AVION LANDSLIDE

City of Dana Point, California

Mitigation and Relocation of 36-inch Water Main Ruptured by Landslide

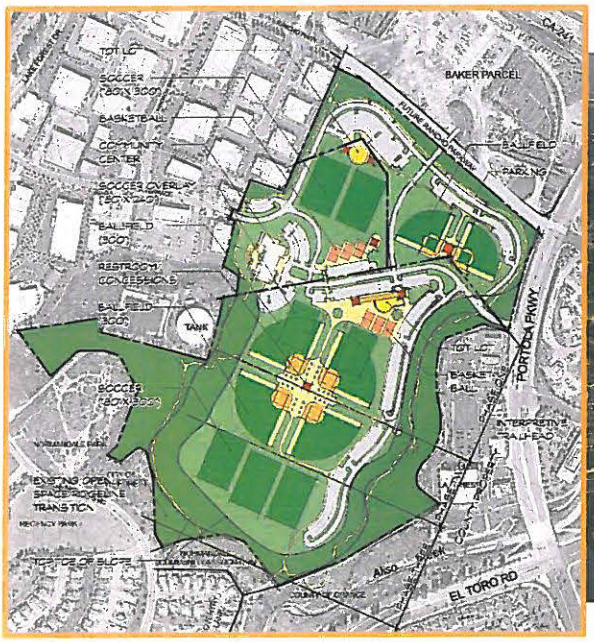
Client: Mr. Joseph McDivitt, South Coast Water District, (949) 499-4555

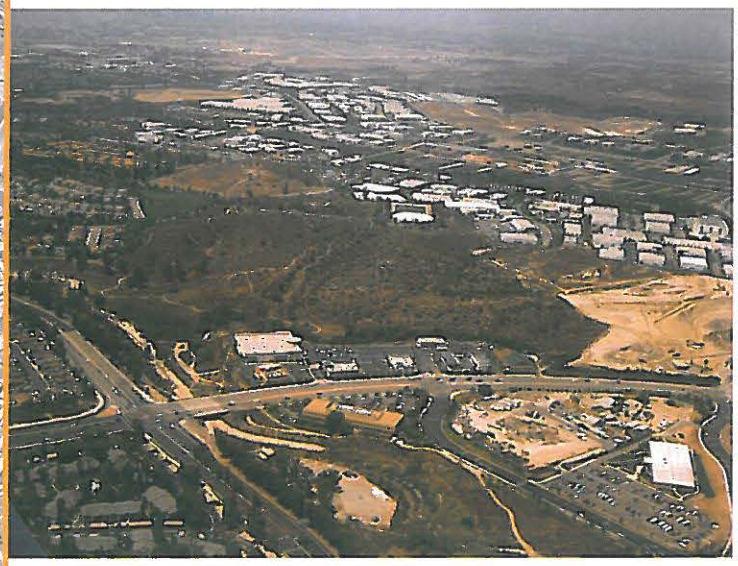
Project Highlights and Geotechnical Challenges

- Large diameter borings down-hole logged by geologist, core sampling, and installation/monitoring of inclinometers and pore pressure transducer;
- Modeling of structural geology and slope stability evaluation;
- Recommendations for temporary mitigation during investigation and design of permanent stabilization and realignment; and
- Coordinated with FEMA and OES as part of emergency funding sought by tri-cities operating joint transmission main.

LAKE FOREST SPORTS PARK
Lake Forest, California

Client: Mr. Angel Fuertes, City of Lake Forest (949) 461-3490





Project Highlights and Geotechnical Challenges

- 76-acre sports park located immediately south of the Ranch Parkway extension.
- 1.5 million cubic yards rough grading.
- Future Amenities include: tot lot, soccer fields, basketball court, community center, baseball diamonds, restrooms, concession area, parking lots, interior streets, connection to Portola Parkway, and associated utilities.
- Global stability of off-site slopes. These slopes currently support a 7.5 million gallon water tank, a residential community, or commercial/industrial buildings.
- A balance area to reduce the impact of import or export once grading has been completed.
- Potential for undocumented fill within the Baker Parcel due to active mining.
- A 16-inch IRWD transmission line is buried within the existing slope which descends from the reservoir.

THE IRVINE COMPANY

PLANNING AREA 39, LAKE FOREST DRIVE, PHASE 2 ROUGH GRADING, STORM DRAIN, WILDLIFE CROSSINGS and RECLAIMED WATER INVASION LINE

Irvine, California

Geotechnical Observation and Testing / Vibration Monitoring During Grading and Construction

Client: Mr. Martin Leon, Irvine Community Development Company, (949) 720-2000

Project Highlights and Geotechnical Challenges

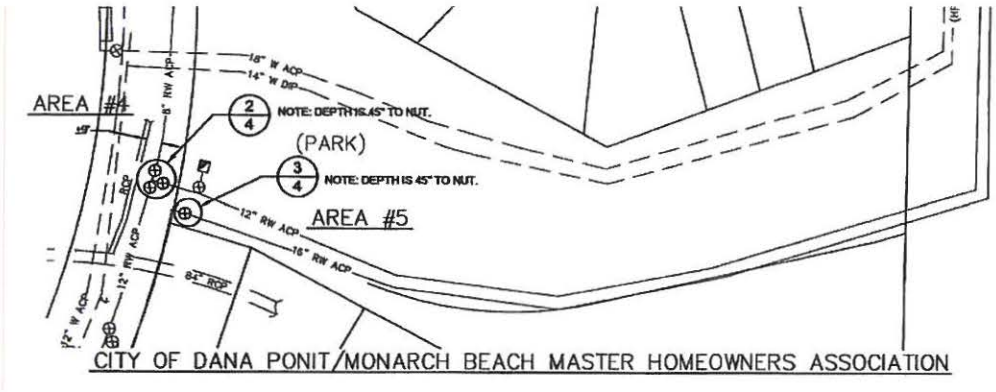
- Observation and testing of grading operations for the extension of Lake Forest Drive between Romano and Bake Parkway;
- Observation and testing of excavation, construction and backfill of the up to approximatley 30-foot-deep 48-inch diameter storm drain line within Lake Forest Drive between Romano and Bake Parkway; and
- Provided deputy inspection services for high strength concrete used in storm drain vaults and box sections.

VALVE REPLACEMENT PROJECT

City of Dana Point, City of Laguna Beach, and City of San Clemente, California

Geotechnical Observation and Testing Services During Replacement of Water Line Valves at 16 Locations

Client: Ms. Marissa Potter, South Coast Water District, (949) 499-4555



Project Highlights and Geotechnical Challenges

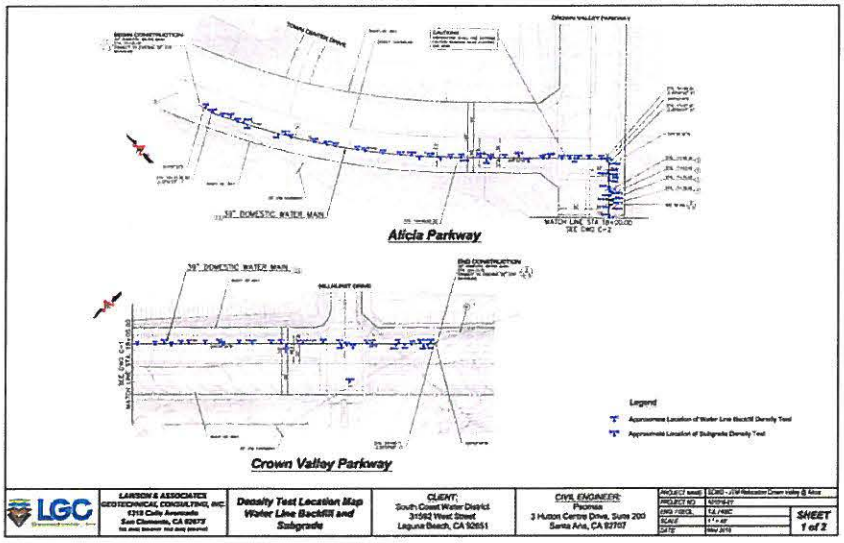
- Provision of geotechnical consulting for the project including observation and testing of the compaction of pipeline trench and associated excavation backfill, curb and gutter and sidewalk replacement subgrade, and base placement and compaction;
- For reconstruction of the overlying pavement section we observed and tested placement and compaction of aggregate base and asphaltic concrete. Asphalt temperature, mix designs, and placement timing were checked and documented by our office;
- Our services also included laboratory testing of the backfill and pavement section materials including sand equivalent, maximum dry density and moisture content, and sieve analysis;
- The results of each day's observation and testing were summarized in our Daily Field Reports; and
- Preparation of one "As-Built" geotechnical report at the conclusion of construction.

JOINT TRANSMISSION MAIN RELOCATION at CROWN VALLEY PARKWAY & ALICIA PARKWAY

Laguna Niguel, California

Geotechnical Observation and Testing Services During Joint Transmission Main Relocation

Client: Ms. Marissa Potter, South Coast Water District, (949) 499-4555



Project Highlights and Geotechnical Challenges

- Provision of geotechnical consulting for the project including observation and testing of the water line excavation bottom, shading of pipe zone and trench backfill for the approximately 1,314 feet of 39-inch domestic water line along Crown Valley Parkway and Alicia Parkway;
- For reconstruction of the overlying pavement section we observed and tested placement and compaction of aggregate base and asphaltic concrete. Asphalt temperature, mix designs, and placement timing were checked and documented by our office;
- Our services also included laboratory testing of the backfill and pavement section materials including sand equivalent, maximum dry density and moisture content, and sieve analysis;
- The results of each day's observation and testing were summarized in our Daily Field Reports; and
- Preparation of one "As-Built" geotechnical report at the conclusion of construction.

SALT CREEK LIFT STATION
Dana Point, California

Geotechnical Evaluation and Design Recommendations for the Rehabilitation of Lift Station No. 4 Located at Salt Creek Beach

Client: Mr. Joseph McDivitt, South Coast Water District, (949) 499-4555

Project Highlights and Geotechnical Challenges

- Site evaluation including reviewing pertinent geotechnical data for the subject area and excavating a small diameter exploratory boring in order to collect soil samples for in house laboratory testing;
- Geotechnical recommendations and design of the constructed soil nail wall that replaced the existing retaining wall were provided;
- Onsite observation and testing of construction operations including:
  - Installation and monitoring of a slope inclinometer;
  - Soil nail installation;
  - Shotcrete placement;
  - Footing inspections; and
  - Miscellaneous backfill operations.

RESERVOIR NO. 4 OUTLET PIPELINE REPLACEMENT

Avenida Salvador, San Clemente, CA

Geotechnical Evaluation for Horizontal Directional Drilling of Approximately 800 Linear Feet of New Water Line

Clients: Mr. Ross Bergholz, Dudek (760) 479-4107

Mr. Ken Knatz, City of San Clemente (949) 369-6139

Project Highlights and Geotechnical Challenges

Project required a limited subsurface evaluation to provide geotechnical recommendations for replacement of a deteriorating asbestos cement water line serving the 500,000 gallon capacity Reservoir No. 4. The city's primary choice of replacement method was by horizontal directional drilling in place of conventional cut-and-cover.

- Geotechnical evaluation of existing subsurface geologic conditions, including four hollow stem borings;
- Geotechnical laboratory testing to determine the engineering characteristics of the underling materials; and
- Geotechnical assessment and design recommendations for the proposed horizontal directional drilling, including soil loads on pipes, temporary excavation stability, potential for loss of drilling fluid, potential for encountering hard and/or oversized material and preliminary corrosion recommendations.

MILL CREEK AVENUE & CHINO AVENUE EXTENSION
Ontario, CA

Geotechnical Design, Observation and Testing during Construction of Mill Creek Avenue and Chino Avenue Extension

Client: Mr. Glen Land, Brookfield Homes, (714) 200-1671

Project Highlights and Geotechnical Challenges

Grading for approximately 2,300 feet of roadway to extend and complete portions of Mill Creek Avenue and Chino Avenue serving the Edenglen residential development in the city of Ontario.

- Designed appropriate street sections based on predicted loading and future use;
- Provided geotechnical recommendations for grading and utility construction in accordance with City of Ontario requirements; and
- Geotechnical observation and testing of grading operations including engineered fill placement, utility trench (sewer, storm drain & dry utilities) excavation and backfill, placement and compaction of asphalt concrete pavement section and base material.

NMC UTILITY IMPROVEMENTS
City of Ontario, California

Observation and Testing of Underground Utility Improvements in the Edenglen Area of Ontario, California

Client: Mr. Kevin Rhodes, Sukut Construction, (714) 460-1083

Project Highlights and Geotechnical Challenges

LGC provided geotechnical observation and testing for NMC East Phase 1 Construction Improvements in the Edenglen area of Ontario California.

Improvements included installation of multiple utilities along Mill Creek Avenue and Riverside Drive.

Mill Creek Avenue

- 12 inch sanitary sewer line up to 22 feet deep
- 48 inch storm drain up to 13 feet deep, with temporary shoring
- 8 inch recycled water line up to 8 feet deep

Riverside Drive

- 18 inch domestic water line up to 6 feet deep
- 48 inch storm drain up to 15 feet deep, with temporary shoring
- 8 inch recycled water line up to 6 feet deep

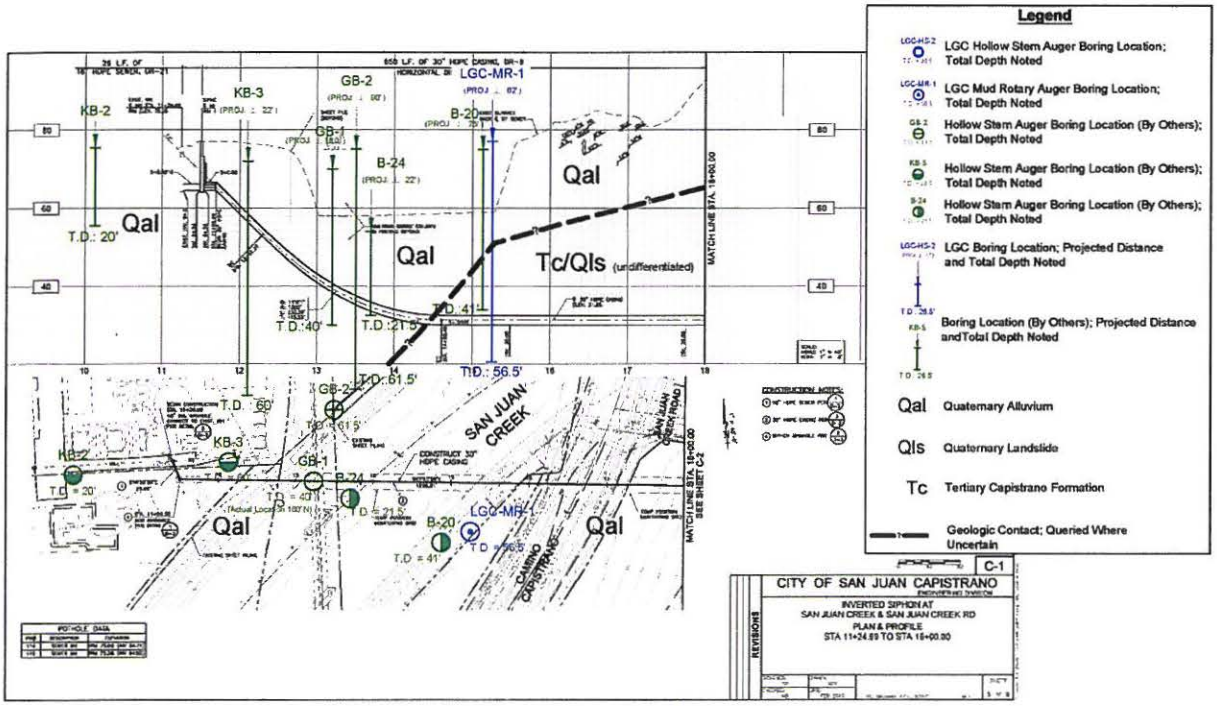
Other dry utilities and street improvements including subgrade, aggregate base, and asphalt placement were observed and tested by LGC Geotechnical.

INVERTED SIPHON AT SAN JUAN CREEK & SAN JUAN CREEK ROAD

City of San Juan Capistrano, California

Geotechnical Subsurface Evaluation for Proposed Sewer Siphon

Client: Mr. Joe Mankawich, PE City of San Juan Capistrano, (949) 443-6366



Project Highlights and Geotechnical Challenges

- Approximately 1,270 feet of directional drilling will be done below the 5 Freeway to construct a 30-inch diameter HDPE pipe to house one 10-inch & two 8-inch sewer lines. Depth of sewer siphon was up to 60 feet below existing Freeway grade. The sewer siphon ties into approximately 1,400 feet of conventional cut and cover sewer line.
- A subsurface geotechnical evaluation including 2 conventional hollow stem borings and 1 mud rotary boring to provide supplemental geotechnical information along the proposed pipeline alignment. Soil samples were analyzed for volatile organic vapors and gas levels.
- Characterization of the subsurface soil and groundwater conditions including geotechnical analysis of liquefaction and surcharge loads from existing deep foundation system which supports the freeway undercrossing. Geotechnical design recommendations including temporary shoring, backfilling and horizontal directional drilling (HDD) of the sewer siphon.

TAMARACK AVENUE SEWER REPLACEMENT
City of Carlsbad, California

Geotechnical Subsurface Evaluation for Sewer Line Replacement

Client: Mr. Jacob Moeder, PE City of Carlsbad, (760) 602-2736

Project Highlights and Geotechnical Challenges

- A subsurface geotechnical evaluation including 12 hollow stem borings to evaluate the geotechnical conditions along the approximately 5,000 linear foot 10-inch gravity sewer replacement project.
- Design sewer depths were up to between 5 and 25 feet below existing grade.

Characterization of the subsurface soil and groundwater conditions including geotechnical recommendations for temporary shoring and horizontal directional drilling (HDD) in the deeper portions of the proposed sewer alignment.

RESUMES OF KEY PERSONNEL

TIMOTHY LAWSON, GE, PE, CEG, PG

EDUCATION

- M.S. (equiv) Engineering Geology and Geotechnics, University of Portsmouth, England, 1985

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

- 2003/Geotechnical Engineer/California/GE 2626
- 1995/Registered Civil Engineer/California/RCE 53388
- 1992/Certified Engineering Geologist/California/CEG 1821
- 1991/Professional Geologist/California/PG 5336

PROFESSIONAL SUMMARY

Mr. Lawson's education and work experience combine both engineering and geology to give him a unique perspective in the geological profession. He has been involved in numerous projects throughout California including: fault studies, numerous residential projects, reservoir construction, high-rise construction, individual landslide investigations, distress evaluations, construction defect analysis, and expert testimony.

Mr. Lawson is one of only a select few individuals, dually registered as both a civil engineer and a certified engineering geologist. With these credentials, he is able to accurately and efficiently review a broad range of geotechnical projects, which would normally take the expertise of two professionals. Mr. Lawson is the President and Founder of Lawson & Associates Geotechnical Consulting, Inc. providing geotechnical services to Developers and Public Agencies throughout Southern California. During his professional career, Mr. Lawson has made presentations to numerous groups, including; homeowner associations, city councils, professional associations, clients, and legal teams. Over the last few years Mr. Lawson has been a member of the PTI Slab-on-Ground Committee working extensively on the performance of residential post-tension foundation systems in Southern California. The following is a list of representative projects:

PROJECT EXPERIENCE

- Geotechnical Evaluation of Verde Canyon Landslide and Verde Canyon Development Located in San Clemente, California. Responsibilities for this project included complete geotechnical evaluation of the landslide, as well as the stability of the surrounding area.
- Expert Witness San Clemente, California. Provided expert witness services during dispute of potential landslide damage to bluff top homes.
- Expert Witness Laguna Beach, California. Provided expert witness services associated with the distress of a residence in Laguna Beach due to subsurface conditions. Services included subsurface investigation, preparation of repair recommendations, and participation in arbitration.
- Colony Cove Bluff Stabilization Located in San Clemente, California. This project consisted of the remediation of an unstable bluff along Pacific Coast Highway below the residential community of Colony Cove. Responsible for all geotechnical issues and project management during construction of an approximately 800-foot composite tie back retaining wall and soil-nail diaphragm. This project required extensive construction monitoring and testing, as well as field modification during construction.

- Forensic Geotechnical Investigation of Distressed Houses Located in San Juan Capistrano, California. This initially included a detailed study of previous geology reports on the area, and detailed geologic mapping of ancient landslides from stereographic aerial photographs. Subsequently, a thorough field investigation was performed including surface mapping, drilling, and downhole logging of 15 large-diameter boreholes, and installation and monitoring of 12 slope inclinometers and pneumatic pore-pressure transducers. From this investigation, it was possible to determine accurate geological conditions at the site. Subsequent to this investigation, Mr. Lawson was responsible for the design and implementation of unique remediation methods.
- Top of the World Reservoir Located in Laguna Beach, California. Responsible for the geotechnical issues relating to the design and construction of a 2-million-gallon buried reservoir, which included several miles of 16-inch transmission line. Due to the relatively unique post-tension design of the tank, as well as the reservoirs' location, geotechnical issues and construction inspection played an important role in the successful completion of the project.
- Construction of 65 Single-Family Homes Residential Hillside Community Located in San Juan Capistrano, California. Geotechnical investigation through construction of major residential development in San Juan Capistrano. This site had approximately 13 major landslides that were delineated throughout the project. Responsibilities on this project included stratigraphic correlation of discrete clay beds that formed the basal rupture surfaces of the landslides, analysis of previous geotechnical reports, and writing a geotechnical 40-scale grading plan review. Challenges mitigated with geotechnical design included slope stabilization buttresses, dewatering of saturated alluvium concurrent with fill placement, and foundation design for highly expansive and corrosive soils.
- Geotechnical Evaluation of Distressed Sewer Line Located in San Clemente, California. This project entailed review of geotechnical conditions at the Pier Bowl area of San Clemente to evaluate the possible causes of the observed distress to an ancient sewer line adjacent to the railroad tracks.
- Geotechnical Stabilization of a Major Ancient Landslide Located in Laguna Niguel, California. This included mapping of the excavation as it took place, and making recommendations to the contractor on the method of excavation. It also included monitoring the continued stability of the landslide by reading and analysis of slope inclinometer data.
- Geotechnical Remediation of La Ventana Landslide Located in Dana Point, California. The project involved remediation of a major landslide that failed across Pacific Coast Highway. Remediation included construction of a tieback retaining wall, earth grading and concrete sculpting.
- Geotechnical Reviewer for the City of San Juan Capistrano, California. Mr. Lawson and LGC provide geotechnical review services for the City of San Juan Capistrano. Work has included both reviews of other geotechnical consultant's work, as well as work performed directly for the City. Reviews have included; multi-million cubic yard residential developments, school sites, reservoir sites, slope distress projects, as well as a multitude of miscellaneous geotechnical issues. Work performed for the City has included grading plan review of Public Works projects, evaluation of slope distress threatening City land, and construction observation and testing.
- Principal Engineer/Geologist for the Development of Forster Highlands, a Residential Development Located in San Clemente, California. Mr. Lawson was in charge of all geotechnical aspects of this project, which involved the development of approximately 419 homes and 11 million cubic yards of grading.
- Principal Engineer/Geologist for the emergency remediation plan for storm activated major landslides in City of San Juan Capistrano, California during winter 2004-2005. Work involved development of emergency grading plans and caisson and tieback repairs, protection of existing homes, and working with various agencies to maintain utilities services during repairs.
- Geotechnical Reviewer for the City of San Clemente, California. Mr. Lawson has provided geotechnical review services on an on-call basis for the City of San Clemente as well as providing direct geotechnical services for the City, including San Clemente Ocean Trail, San Clemente Waste Water Treatment Plant, and several local parks. Reviews in general relate to major landslides that exist through the City. Mr. Lawson has performed review of proposed repair plans by various consultants.

- Geotechnical Consultant for "The Great Park" at the former El Toro Marine Air Corps Station, El Toro, California. This ongoing project includes the excavation of a canyon, construction of six bridges, a tunnel and numerous other improvements.
- Principal Engineer/Geologist for Marblehead Coastal Development, City of San Clemente, California. Mr. Lawson is the Geotechnical Consultant for the development of a 250-acre residential community in the coastal zone. The project includes the geotechnical challenges of protected natural canyons transecting the project, major road bridges, groundwater maintenance, and segmental wall construction. The project included interaction with agencies such the California Coastal Commission, and coordination with Caltrans for construction of walls and bridges within their right-of-way.

PROFESSIONAL HISTORY

2011- Present:	Independent Geotechnical Consultant
2001-2011:	President, Lawson & Associates Geotechnical Consulting, Inc., San Clemente,
2000-2001:	Independent Geotechnical Consultant
2000:	Engineering Geology Lecturer, Saddleback College, Mission Viejo, California
1998-2000:	Vice President, Principal Engineer/Geologist, Leighton and Associates, Inc., Orange County Office, Irvine, California
1996-1998	Principal Engineer/Geologist, Leighton and Associates, Inc., Orange County Office, Irvine, California
1994-1996:	Project/Senior Project Engineer/Geologist, Leighton and Associates, Inc., Orange County Office, Irvine, California
1989-1994:	Staff/Senior Staff Engineer/Geologist, Project Manager, Leighton and Associates, Inc., Orange County Regional Center, Irvine, California
1988-1989:	Site Engineer, J & L Construction, Colorado
1985-1986:	Engineering Geologist, Barrie Fielder, Portsmouth, England

HONORS AND PROFESSIONAL SOCIETIES

- Member of Association of Engineering Geologists
- Member of American Society of Civil Engineers

Selected Landslide Experience

- Terrabay South Landslide – San Francisco
- Verde Canyon Landslide – Orange County
- Placita Landslide – Orange County
- Forster Highlands Development (Multiple Landslides) – Orange County
- Pacific Pointe Development (Multiple Landslides) – Orange County
- San Juan Meadows – Orange County
- Pomona – Los Angeles County
- Blue Bird Canyon – Orange County
- Loma San Juan Development (Multiple Landslides) – Orange County
- Camino Del Avion Landslide– Orange County
- Kite Hill Landslide – Orange County
- Sea View Estates – Orange County

Selected Legal/Expert Experience

- Geotechnical Expert for RBF Soil Nail and Tieback Wall, Vallejo, CA
- Geotechnical Expert for RBF Top of Slope Soil Movement, Mission Viejo, CA
- Geotechnical Expert for RBF Geogrid Wall Movement, San Diego, CA
- Geotechnical Expert for City of San Juan Capistrano Slope Instability, San Juan Capistrano, CA
- Geotechnical Expert for City of Pomona Landslide Stability, Pomona, CA
- Geotechnical Expert for South Coast Water District Landslide Stability, Orange County, CA
- Geotechnical Expert for Various Residential Developer Reviewing Top of Slope Ground Movement, Orange County, CA

KEVIN B. COLSON, CEG, PG

EDUCATION

- M.S., Geological Sciences, San Diego State University, San Diego, California, 1996
- B.S., Geological Sciences, San Francisco State University, San Francisco, California, 1993

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

- California, Certified Engineering Geologist, CEG 2210
- California, Professional Geologist, PG 7119

PROFESSIONAL SUMMARY

As a Vice President of and Director of Geology for LGC Geotechnical, Mr. Colson has over 17 years of experience in the geotechnical industry in Southern California. He has been involved in numerous projects in Southern California including: residential, commercial, retail, transportation, and public works.

Mr. Colson's expertise includes: fault investigations; landslide mitigations and slope stabilizations (by both mechanical and earthen stabilization methods); hillside grading; flat land grading; hard rock rippability studies; liquefaction studies; distress evaluations; and reviews. Mr. Colson has been the lead on several of our most complex projects including: design and construction of a major landslide stabilization with tie-backs and grade beams beneath occupied multi-storied residential structures; slope stabilizations via nail and tieback walls below active roadways; design of earthen stabilizations for several hundred foot high slopes; fault trench investigations of active and potentially active faults; and mitigation of unstable rock slopes. Mr. Colson, his wife and three children reside in San Clemente.

PROJECT EXPERIENCE

- Project geologist for the approximately 440-acre Santiago Hills II development for the Irvine Community Development Company in the City of Orange, California. The project will ultimately include over 17 million cubic yards of grading to be performed over an approximately 2-year span. The site presents several complicated geotechnical issues to consider including: mirco-tunneling for realignment of a 54-inch water line beneath the active lanes of Chapman Avenue; installation of new storm drain lines via "jack and bore" methods beneath the active lanes of State Route 241/261; grading with the Caltrans right-of-way directly adjacent to active lanes of State Route 241/261; proposed over-steepened slopes; deep saturated alluvium; numerous faults; slope stability issues; landslides; dense volcanic rock; very highly expansive soils; and shallow ground water. Mr. Colson and his LGC team successfully addressed these issues on an extremely tight time frame and were essential and getting the project approved for development through city, county and state jurisdictions. Particular LGC contributions to the success of the project, included: design of an extensive wick drain ground improvement system for areas of deep saturated alluvium; design for geogrid reinforcement for 60-foot-high 1.5:1 fill slope for bridge abutment; and design of landslide remediation and slope stabilizations for the project slopes.

- Project Geologist for the Coventry Court Senior Apartments in Tustin, California. The project included grading and construction for ten three-story, twenty-four unit senior residential housing structures, two clubhouse/pool structures and associated utilities, roadways, parking and improvements.

- Project Geologist for the 148-acre Village of Porto Romano development in Lake Elsinore, California. This master planned community includes 1,860 housing units, 100,000 square feet of neighborhood business and retail opportunities, a community center, four primary neighborhood parks, several mini parks, a localized trail system and interior roadways. Evaluation of the site included excavation of backhoe and excavator pits, air percussion borings to depths of up to 80 feet below the surface and performance of seismic refraction surveys. The project geologic constraints included difficult excavation of hard rock metamorphic and igneous materials and special handling of generated rock in fill areas.

- Project Geologist for landslide stabilization at The Fountains at Sea Bluffs Retirement Community in Dana Point, California. The stabilization project included construction of four rows of grade beams and installation of 248, 180-foot long tieback anchors and a dewatering system. The project was further complicated by the presence of an existing and occupied retirement community directly above the landslide and proposed stabilization system. This project required extensive construction monitoring and testing, as well as field modification during construction. Mr. Colson was in charge of all geotechnical aspects of this project as well as coordination of the design team and construction operations.

- Project Geologist from evaluation phase through grading and construction for University Commons project in San Marcos, California. This project included grading and construction of 10 multi-story apartment structures and surrounding infrastructure including construction of an up to 90-foot tall 1.5:1 cut slope. The project included blasting of the native granitic material to reach design elevations, special handling of generated rock in fill areas, rock fall mitigation fences, and special design considerations.

- Coordinated and performed a subsurface fault evaluation of a proposed residential development within and adjacent to the State of California Fault Rupture Hazard Zone for the San Jacinto Fault, in San Jacinto, California. The evaluation included detailed research, aerial photographic review, fault lineament mapping, and excavation and detailed trench logging of approximately 900 feet of 20 foot deep fault trenches across multiple strands of the San Jacinto Fault. Mr. Colson supervised all geologic aspects of the project including coordination of the excavation, detailed logging of the excavations and overseeing the backfill of the excavations

- Project geologist for Laguna Beach Sewer Interceptor Tunnel rehabilitation, Laguna Beach, California. The project included geologic mapping and evaluation of approximately two miles of coastal bluff along the tunnel alignment. Mapping was performed both within the unlined portions of the existing tunnel and adits and along the bluff face. The study included analysis of the stability of the bluff to assess the geotechnical conditions along the coastal bluff in an effort to identify areas of potential concern for the tunnel and associated adits and portals and to evaluate the potential impact of the proposed tunnel rehabilitation on the stability of the bluff. To avoid potential impact on the multi-million dollar residences above, LGC aided in designing the new engineered structural liner for the tunnel rehabilitation to replicate the strength lost due to the increased diameter of the tunnel.

- Third-party geotechnical reviewer for geotechnical evaluations for development of the Imperial Solar Energy Center South and West on approximately 2,000 acres of undeveloped and agricultural land in Imperial County, California. The project would ultimately include development of two photovoltaic arrays and associated electrical transmission lines capable of producing 500 megawatts of power.

PROFESSIONAL HISTORY

July 2010-Present:	Vice President, LGC Geotechnical, Inc., San Clemente, California
2006-July 2010:	Vice President, Lawson & Associates Geotechnical Consulting, Inc., San Clemente, California
2002-2006:	Associate Geologist, Lawson & Associates Geotechnical Consulting, Inc., San Clemente, California
2001-2002:	Project Geologist, Lawson & Associates Geotechnical Consulting, Inc., San Clemente, California
1994-2001:	Project Geologist, Staff Geologist, and Technical Illustrator, Leighton and Associates, Inc., San Diego, California

PUBLICATIONS

Colson, K.B., and Grove, K., 1994, Stratigraphy and Structure of the Pleistocene Olema Creek Formation, Marin County, California: Geological Society of America Abstracts with Programs, Vol. 26, No. 2, p. 45.

Colson, K.B., Rockwell, T.K., Thorup, K.M., and Kennedy, G.L., 1995, Neotectonics of the left-Lateral Santa Rose Island Fault, Western Transverse Ranges, Southern California: Geological Society of America Abstracts with Programs, Vol. 27, No. 5, p. 11.

Grove, K., Colson, K.B., Binkin, M., Dull, R., and Garrison, C., 1995, Stratigraphy and Structure of the Late Pleistocene Olema Creek Formation, San Andreas Fault Zone North to San Francisco, California, in Sanagines, E.M., Anderson, D.W., and Buising, A.V., eds., Recent Geological Studies in the San Francisco Bay Area: S.E.P.M., Vol. 76, p 55-76.

DENNIS BORATYNEC, GE, PE

EDUCATION

- M.Sc. in Geoenvironmental Engineering, University of Alberta, Edmonton, Alberta, Canada, 2003
- B. Sc. in Civil Engineering, University of Alberta, Edmonton, Alberta, Canada, 1995

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

- California, Geotechnical Engineer, GE 2770
- California, Registered Civil Engineer, PE 60716

SELECTED PROJECT EXPERIENCE

- Project Manager/Engineer, Reservoir #4, San Clemente. Performed a subsurface geotechnical evaluation to assess the onsite geotechnical conditions as they relate to replacing the existing main line with a new mainline which will be installed via directional drilling.
- Project Manager/Engineer, Eastern Wells 16-inch Water Pipeline, San Juan Capistrano, Performed geotechnical observation and testing during construction of approximately 6,820 linear feet of approximately 16-inch PVC pipeline, 200 linear feet of 200 linear feet of 20-inch fused PVC casing and 900 linear feet of 20-inch steel casing.
- Project Manager/Engineer, Geotechnical Evaluation and Recommendations for the Proposed Hydraulic Capacity Project No. 6 (CIP No. 07703), Inverted Siphon at San Juan Creek and San Juan Creek Road, San Juan Capistrano, California. Performed a subsurface geotechnical evaluation to assess the onsite geotechnical conditions as they relate to replacing approximately 1,400 linear feet of the sewer line via directional drilling.
- Project Manager/Engineer, Lake Forest Sports Park, Lake Forest. A proposed 76-acre Sports Park located immediately south of the Rancho Parkway extension, which involves up to 1.5 million cubic yards of rough grading. Performed a subsurface geotechnical evaluation to assess global stability of off-site slopes which support a 7.5 million gallon water tank, a residential community, or commercial/industrial buildings.
- Project Manager/Engineer for Tustin Field I and II, an approximately 70-acre master planned community located in Tustin, CA, featuring approximately 126 multi-family units, 445 single family dwellings, a recreation area including a clubhouse and swimming pools, and associated roadways and underground utilities.
- Project Manager/Engineer for Edenglen (including The Cottages, Veranda, Gatehouse, Belcourt, and Portico), an approximately 61-acre master planned community located in Ontario, CA, featuring approximately 542 homes, a recreation area including a clubhouse swimming pool, roadways, underground utilities, and sewer lift station.
- Project Manager/Engineer for Ralph's Plaza at Brookhurst/Adams in Huntington Beach, CA for approximately 7.5 acres of retail development. Development included over 100,000 ft2 of retail space and associated parking lots. Project was underlain by relatively loose sandy soils and shallow groundwater and relatively high ground motions were predicted based on the design earthquake.
- Project Manager/Engineer for Colony Park, an approximately 19-acre development located in Anaheim, CA, featuring 350 multifamily units, a recreation area including a club house and pool. Successfully completed a subsurface geotechnical evaluation using hollow stem augers and Cone Penetration Tests (CPT). Provided and implemented recommendations including removal and recompaction of near surface soils which were unsuitable for foundation support, fill placement criteria, seismic analysis, potential for dry sand settlement, determined geotechnical design parameters for an approximately 15-foot high by 700-foot long sound wall adjacent to the existing railroad tracks.

LGC Geotechnical, Inc.

2015 PROFESSIONAL FEE SCHEDULE
GEOTECHNICAL SERVICES

Professional Billing Rate (per hour)

Word Processing	$ 60.00
CAD Operator	70.00
Junior Field Technician	70.00
Senior Field Technician	90.00
Field Technician/Prevailing Wage	100.00
Staff Engineer/Geologist	95.00
Senior Staff Engineer/Geologist/Scientist	110.00
Field Supervisor/Operations Manager	90.00
Project Engineer/Geologist	140.00
Associate Engineer/Geologist	160.00
Principal Engineer/Geologist	210.00

Engineering Equipment

Field Vehicle Usage	$ 10.00/per hour
Vehicle Mileage	included in vehicle usage
Nuclear Soil Gauge, Tiltmeter, Inclinometer, Vibration Monitor	included in hourly rate
Other Monitoring Equipment	*Upon Request*

Laboratory Tests

Moisture Content	$ 15.00
Moisture and Density (ring samples)	25.00
Maximum Dry Density (optimum moisture content)	265.00
Maximum Density Checkpoint	80.00
Sieve Analysis	100.00
Hydrometer Analysis	110.00
Sieve and Hydrometer Analysis	185.00
Percent Passing No. 200 Sieve	60.00
Liquid Limit and Plastic Limit	150.00
Liquid Limit – Non Plastic (1pt)	85.00
Sand Equivalent	100.00
Expansion Index	150.00
Direct Shear (shear rate of 0.05 in./min.)	345.00
Direct Shear (shear rate of lower than 0.05 in./min.)	415.00
Single Point Shear	125.00
Consolidation (w/o time rate)	200.00
w/time rate, add (per increment)	45.00
w/extra load, add (per load)	40.00
Collapse Test	100.00
R-Value (untreated)	375.00
R-Value (treated)	410.00
CBR (untreated) per point	225.00
Sulfate Content	85.00
Chloride Content	85.00
pH and Resistivity	155.00
Corrosive Suite (minimum resistivity, pH, sulfate and chloride)	295.00
Caltrans 216 Compaction	300.00