Group Delta Consultants, Inc.

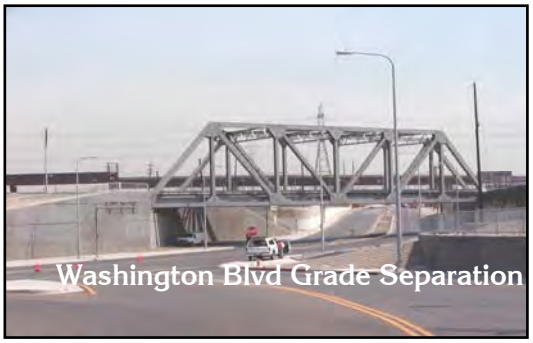
Statement of Qualifications

Rail and Grade Separations


LA to Pasadena Gold Line


Mission Valley East LRT


Redlands Metrolink First Mile


Washington Blvd Grade Separation

Prepared By:

Group Delta Consultants, Inc.

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Company Profile

GROUP
DELTA
CONSULTANTS

Company Profile

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

Group Delta Consultants, Inc. (GDC) is a consulting engineering firm with seven certified laboratories and offices located in the counties of Orange, Los Angeles, San Bernardino, San Diego and Imperial. The firm has a staff of 106 highly skilled professionals consisting of civil and geotechnical engineers, engineering geologists, laboratory and field technicians, deputy inspectors, drafting/CADD, and drilling and support personnel specialized in their respective fields. We offer a broad range of services to serve the needs of our clients. Our capabilities and services include geotechnical feasibility study, geotechnical field investigation, in-situ testing, foundation design, construction monitoring and materials testing, ground improvement and design, slope stability investigation and analyses, preparation of plans and specifications, coastal engineering, instrumentation, seismic studies and earthquake engineering.

We have established a record of completing projects on schedule and within budget for major clients in the public and private sectors since 1986. Our laboratories are licensed as an approved testing facility by various agencies including AASHTO and Caltrans. The involvement of our principals and senior managers in each project and particularly our focus on developing innovative design solutions to reduce overall construction cost has resulted in repeat business. The evidence of our work indicating the unique benefits of our approach and methodologies are provided in various awards and recommendations from well-known organizations in the public and private sectors.

Corporate Summary

Firm's Name:	Group Delta Consultants, Inc.
Firm Type:	California Corporation
Year Established:	1986
Small Business:	(SBE) State of California
Minority Business:	(MBE) City of Los Angeles

Services

GROUP DELTA CONSULTANTS

Geotechnical Services

Geotechnical Engineering – Our services include:

- Feasibility Study
- Field Investigation
- Laboratory Testing
- Shallow Foundation Design
- Pile Foundation Design
- Settlement Analyses
- Ground Improvement & Design
- Slope Stability Investigation & Analyses
- Preparation of Plans & Specifications
- Earthwork & Grading Specifications
- Pavement Design
- Pile Drivability & Load Tests
- Instrumentation & Monitoring
- Forensic Engineering

Geologic and Seismic Hazard Evaluation - Our services include:

- Geologic Mapping
- Landslide Studies & Mitigation
- Groundwater Investigations
- Fault Hazard Investigations
- Geophysical Investigations
- Deterministic/Probabilistic Ground Motion Analyses
- Liquefaction & Lateral Spreading Analyses

Earthquake Engineering - Our services include:

- Liquefaction & Lateral Spreading Analyses
- Seismic Earth Pressure
- Seismic Deformation Analysis
- Seismically Induced Settlement
- Liquefaction Mitigation Measures
- Design Recommendations for New And Retro-fit Projects
- Seismic Design Criteria
- Earthquake Response Spectra

GROUP DELTA CONSULTANTS

Laboratory Services

Laboratory Testing Services

Group Delta Consultants, Inc. has in-house geotechnical and materials testing laboratory facilities to conduct a variety of testing on soils and other building materials. Our laboratories are equipped with state-of-the-art equipment to perform tests in accordance with the American Society of Testing and Materials (ASTM) and other applicable standards. Our laboratories are certified by Caltrans and the City of Los Angeles. Our service capabilities in geotechnical and materials laboratory testing include the following:

Materials Testing & Special Inspection

- Moisture Content
- Dry Density
- Maximum Density & Optimum Moisture Content
- Specific Gravity
- Atterberg Limits
- Sieve Analysis
- Hydrometer Analyses
- Sand Equivalent
- Corrosion Potential (pH, Sulfate, Chloride, and Resistivity)
- Consolidation/Collapse
- R-Value
- California Bearing Ratio (CBR)
- Los Angeles Abrasion
- Shear Shrinkage
- Swell Expansion Index
- Direct Shear
- Asphaltic Concrete (AC)
- Concrete
- Epoxy
- Masonry
- Structural Steel
- Reinforcing Steel
- Welding
- Fireproofing
- Batch Plant
- FRP

GROUP DELTA CONSULTANTS

Laboratory Services (Continued)

Asphalt Concrete Testing

- Stripping test
- Ash Content
- Asphalt Concrete density tests (nuclear)
- Density of asphalt cores
- Index of retained strength
- Hveem mix design and laboratory testing
- Marshall density
- Theoretical maximum specific gravity (Rice)
- Stability and Flow
- Moisture content
- Stabilometer value
- Swell
- Moisture-Vapor susceptibility
- Extraction (Ignition oven, vacuum, reflux, hot solvent)
- Extracted sample sieve analysis

GROUP DELTA CONSULTANTS

Construction Phase Services

Construction Inspection & Materials Testing Services

Group Delta offers a full range of construction phase inspection and materials testing services. Our services during the construction phase are directed towards strict compliance of regulatory guidelines. Adherence to specifications is monitored and documented by registered geotechnical engineers, licensed inspectors and certified laboratories. Our service capabilities in construction monitoring and materials testing areas include:

Materials Testing

- Concrete & Masonry
- Beams
- Blocks
- Cubes
- Cylinders
- Grout/Mortar
- Asphalt
- Prisms
- Vapor Emissions Testing

GROUP DELTA CONSULTANTS

Project Experience

GROUP DELTA CONSULTANTS

Los Angeles to Pasadena Gold Line

Los Angeles County, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

The Los Angeles to Pasadena Gold Line Extension project consisted of a 13.7-mile extension of the Blue Line beginning at Union Station in Los Angeles and ending east of Sierra Madre Villa Avenue in Pasadena. This light rail transit (LRT) line consists of a double tracked system using electric current overhead wire. The project is primarily at-grade following the abandoned Atchison Topeka & Santa Fe (ATSF) Railroad right-of-way. There are a total of 13 stations. The extension includes an aerial structure in Chinatown, and depressed box sections in Highland Park and in the Old Town area of Pasadena. Near the southern portion of the alignment, a new yard and shop was developed. The overall project had been divided into 10 segments by the design-build Contractor.

Group Delta Consultants, Inc. (GDC) was a subconsultant to the Joint Venture of Parsons, Washington, and Kiewit, the design-build Contractor.

GDC provided 10 segment reports, 13 station reports, two seismic retrofit reports, and one new pedestrian overcrossing report. Reports for Segments 4 and 8 included the Figueroa and Colorado boxes, which are being constructed using cut-and-cover method. The reports provided recommendations for retaining walls, MSE walls, stations and platforms, track design, excavation and shoring, probabilistic seismic hazard assessment, static and seismic earth pressures for temporary shoring and permanent walls, racking displacement of the tunnel sections during seismic event, slope stability, Caltrans Structure Foundation reports, etc.

GROUP DELTA CONSULTANTS

SANBAG Redlands Metrolink First Mile

San Bernardino, CA

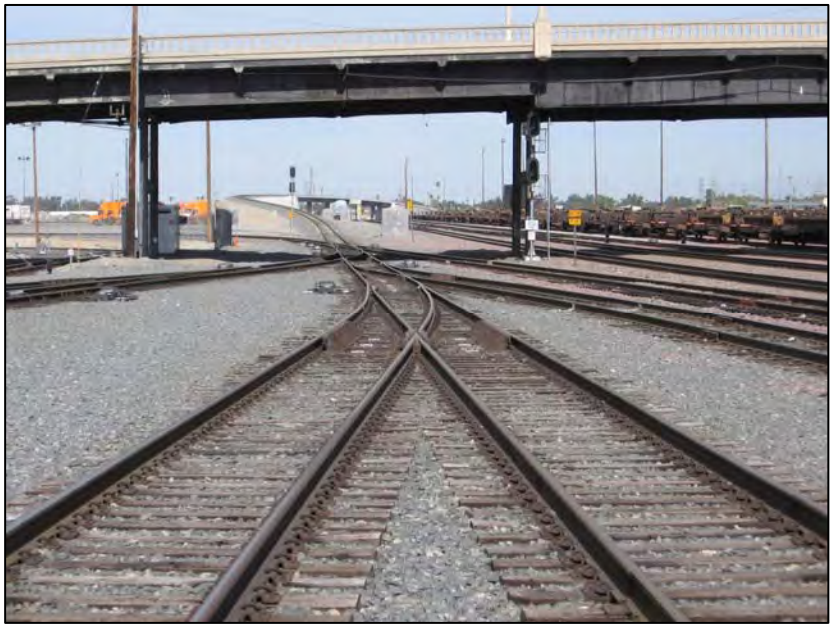
Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services



Client:

HDR

Contact:
Rob Klovsky
Irvine, CA

Team Members Involved:
Mike Reader, GE
James Cunneen, PE

GDC Project Completion:
2011

GDC Project Fees
$80,000

The Project, "Metrolink First Mile", involves extending Metrolink service from the San Bernardino Depot to a proposed station at Rialto and E Streets, right-of-way services for the Subdivision to Redlands, assistance to the cities of San Bernardino, Loma Linda, and Redlands in support of Transit Oriented Development, and on-call services.

Group Delta Consultants, Inc. (GDC) is providing a geotechnical scope of work consisting of a paper study to support the environmental document and geotechnical field and laboratory investigation for the PS&E level study. The paper study consisted of a review of the existing as-built plans and reports for the project. Existing subsurface information for the projects areas were collected, including geologic maps published by the California Division of Mines and Geology, geologic maps published by the United States Geological Survey, and ground water well information.

Once a final alternative has been selected by SANBAG in early 2011, GDC will next provide a design level geotechnical investigation providing a formal Geotechnical/Foundation Report. Our proposed scope of work is aimed at providing geotechnical information for the design of the proposed project alternative and will consist of field exploration, laboratory testing, geotechnical engineering analyses, and report preparation.

GROUP DELTA CONSULTANTS

Mission Valley East Light Rail Transit

San Diego, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

Award of Excellence, ASCE

The Mission Valley East Light Rail Transit (MVELRT) consisted of design and construction, connecting the existing "Blue Line" near San Diego Qualcomm Stadium in the City of San Diego to the existing "Orange Line" near Grossmont Center in the City of La Mesa. The total length of the extension is about 9.3 km. The overall project was divided into three segments: Grantville Segment (3.5 km), SDSU Segment (1.1 km), and La Mesa Segment (4.7 km).

Group Delta Consultants was responsible for the geotechnical investigation and design of the Grantville and La Mesa Segments. Our responsibilities included geotechnical investigation and foundation design for seven bridge structures and over 4,000 m of retaining walls. This included the 1.58–km–long Grantville Viaduct, supported on 34 large diameter CIDH piles with span lengths up to 80 meters.

Key geotechnical issues:

- Axial and lateral design of large diameter single cast-in-drilled-hole (CIDH) piles for soil conditions including liquefiable alluvium, formational soils, and hard rock. GDC conducted lateral and axial pile load tests to develop design parameters for the formational soils which resulted in significant reductions in the required pile lengths
- Liquefaction of the San Diego River alluvial soils and potential for lateral spreading and downdrag loads on the piles
- Retaining wall design

GROUP DELTA CONSULTANTS

Mission Valley West Light Rail Transit

San Diego, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

The Mission Valley West Extension of the San Diego "Trolley" extends along the San Diego River Valley, from San Diego's "Old Town" area to Qualcomm Stadium. The 6+ mile project included nine bridges and /or elevated rail sections, four on-grade stations, and two major elevated stations.

Conditions along the alignment included saturated, unconsolidated, and liquefiable flood plain deposits to depths of up to 120 feet, potential settlement of unconsolidated river deposits, water table at or near the ground surface and undocumented fill areas with abundant oversize construction debris. Portions of the site are considered environmentally sensitive and site access requires coordination with appropriate regulatory agencies.

Group Delta Consultants provided geotechnical engineering services for 6+ miles of light rail trolley traversing unconsolidated sediments of San Diego River Valley. Services included field exploration, drilled shaft design, seismic criteria, and various geotechnical studies.

Key geotechnical issues:

- Special geotechnical considerations
- The alignment crosses Rose Canyon Fault
- Potential for liquefaction to depths of more than 80 feet
- Highly compressible soils and large settlement under embankment fills
- Scour at bridge sites
- Use of stone columns to mitigate liquefaction potential

GROUP DELTA CONSULTANTS

BNSF 60 Miles of 3rd Track

Needles, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

Group Delta Consultants performed the geotechnical investigation for the addition of 30-miles of new track for the BNSF Needles Subdivision 60 miles of 3rd track.

Project elements included:

- 30 Miles of new track in remote desert locations
- 60 new structures
- Slope stability geologic evaluations
- Pile foundation recommendations for driven H-piles for all new structures
- Seismic evaluation of ground shaking along the alignment

GROUP DELTA CONSULTANTS

San Clemente Rail Corridor

San Clemente, California

Geotechnical Engineering

Geology

Hydrogeology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

The project consists of 2.37 mile long pedestrian/bike trail, extending from North Beach to Calafia Beach along the OCTA railroad corridor in the City of San Clemente. Over most of the alignment the trail will be at grade while a 1060 ft section will be elevated where the space between the railroad and the existing bluffs is limited. The project also consists of construction of pedestrian bridges at Trafalgar, Riviera, and Montalvo Canyons and at grade rail crossings at five locations.

Group Delta Consultants, Inc.'s (GDC) scope included performing six Dynamic Cone Penetration Tests due to limited access for a drill rig. Based on the interpretation of the DCPTs and engineering analyses GDC provided recommendations for seismic hazards, site grading, foundation support for the elevated boardwalk and retaining walls, and pile foundations for the bridges. GDC also mapped the mud slides which occurs during the 2004-2005 rainy season and provided recommendations for the free-board of the walkway above potential future slides. The drilled and cast-in-place piles for the elevated boardwalk were designed for lateral pressures from the mud slide debris from the existing bluffs.

Key Project Issues:

GDC performed field investigation in a very restricted and difficult access area and provided recommendations for the construction of the trail, the bridges, and the supports for the elevated boardwalk.

GROUP DELTA CONSULTANTS

AT&SF Flyover, Metrolink Phase II

San Bernardino, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

Group Delta Consultants performed geotechnical investigations for various phases of the MetroLink Phase II Program. The program included the MetroLink San Bernardino Yards AT&SF Flyover which included two heavy rail structures, 400 feet and 600 feet long, as well as 2,500 feet of rail embankment.

GROUP DELTA CONSULTANTS

Henry Ford Grade Separation

Port of Los Angeles, California

Geotechnical Engineering

Geology

Hydrogeology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

Group Delta Consultants, Inc., directed geotechnical studies for materials and bridge reports for the two grade separations within the Port of Los Angeles. The project includes:

- New Dock Street and Henry Ford Avenue Grade Separations carrying 5 tracks over a depressed roadway
- Over 3,000 ft of MSE walls with maximum height of 22 ft, and over 8,000 of railroad track.
- Since the depressed roadway at Henry Ford Avenue Undercrossing is below the groundwater, a seal slab was originally designed to keep the water out.

A slurry wall is proposed along the outer boundary of the project to dewater the excavation for foundation construction. Due to the potential for liquefaction, 3.5 ft diameter 45 ft long stone columns are proposed at the site under the bridge and retaining walls. Original design called for pile supported walls. Final design includes the use of MSE walls supported on stone column strengthened soil

GROUP DELTA CONSULTANTS

Grove Avenue/UPRR Grade Separation

Ontario, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

The Grove Avenue/UPRR Grade Separation Project included road improvements along Grove Avenue which extend about 3,000 feet. Project also included the relocation of water, gas, electricity and telephone lines. The primary feature is a four-span open abutment heavy rail structure approximately 168 feet long.

GROUP DELTA CONSULTANTS

Henry Ford Grade Separation

Port of Los Angeles, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

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GROUP DELTA CONSULTANTS

Redondo Junction Grade Separation

Los Angeles County, California

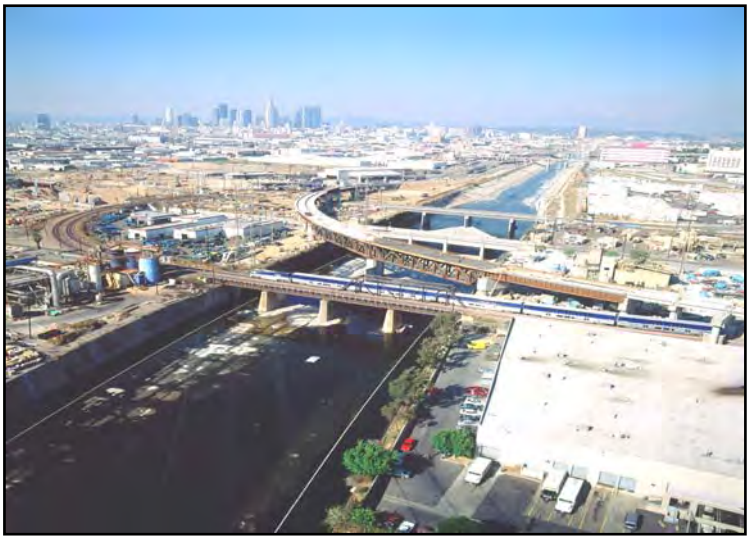
Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services



GDC performed the geotechnical investigation for the Redondo Junction Grade Separation project for the Alameda Corridor in Los Angeles, California

- Mid-Speed" alignment, approximately 3,000 feet in length
- Structure is supported on 6 and 8 foot CIDH pile-columns.
- 4,000 feet of approach retaining walls.
- Mechanically stabilized earth (MSE) walls, up to 27 feet hight, were used to retain the approach fill.
- GDC developed recommendations that included site-specific response spectra; vertical and lateral capacity of large diameter-drilled piles; retaining walls; and approach embankments.

During constrruction, GDC provided inspection during installation of piles within the City of Los Angeles right-of-way.

GROUP DELTA CONSULTANTS

Washington Blvd. Grade Separation

Los Angeles, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

GDC provided the geotechnical foundation design for this Alameda Corridor project. The project included two new grade separations that replaced at-grade crossings for the lowering of Washington Boulevard at the north end of the Alameda Corridor.

Project elements included:

- Site specific response spectra
- Vertical and lateral capacity of large diameter drilled piles (up to 5 ft.)
- Retaining wall recommendations

GDC provided inspection during installation of all piles.

GROUP DELTA CONSULTANTS

Alameda Corridor East

Los Angeles County, California

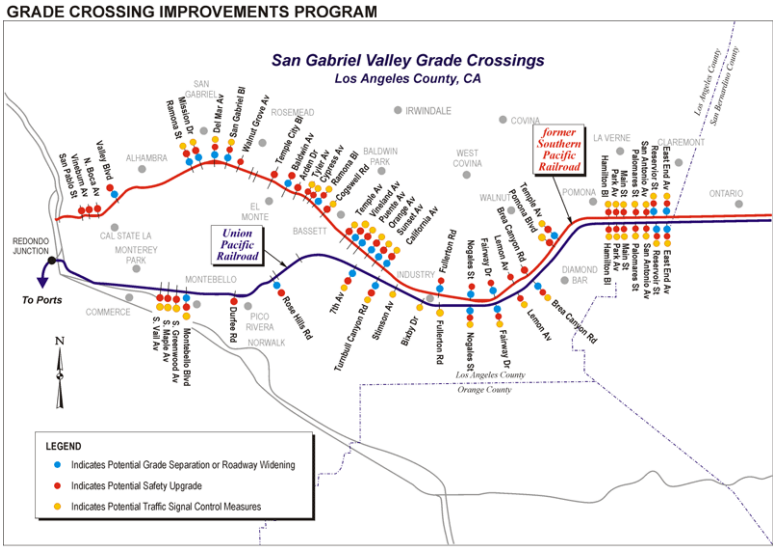
Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services



GDC provided geotechnical engineering services pertaining to the environmental impact report for the Alameda Corridor East (ACE) railroad project. The ACE project includes two railroad alignments extending form Los Angeles to Pomona through the San Gabriel Valley. Improvement along the two corridors includes 25 grade separation and bridge projects in the Cities of Pomona (3), Los Angeles (1), Industry (12), San Gabriel (4), El Monte (2), Montebello (1), and the County of Los Angeles (2). Group Delta's work included evaluation of geotechnical conditions, groundwater, earthquakes and seismicity, and flood hazards, at each of the 25 sites.

GROUP DELTA CONSULTANTS

Eastside LRT

Los Angeles County, California

Geotechnical Engineering

Geology

Earthquake Engineering

Materials Testing and Inspection

Forensic Services

The Eastside LRT is a southeasterly extension of the Pasadena Gold Line from Union Station passing through the cities of Los Angeles and East Los Angeles, and is 5.8 miles long. The project consists of at-grade alignment, four existing bridges, and one 456-ft long new bridge across US 101, and a tunnel section (1.8 miles).

In addition to geotechnical evaluation for the at-grade section, GDC provided PFRs for the bridges, plus an SFR and ISA for the 101 bridge. The proposed bridge (332.51 meter long, 9-span bridge over US101), will be a cast-in-place pre-stressed concrete box girder with span lengths ranging from 26 to 47 meters. Each bend consists of a single column supported on a large diameter Cast-in-Drilled-Hole (CIDH) pile. Abutment 1 and 10 will be supported on groups of several smaller diameter CIDH piles. The geotechnical design was performed in accordance with Caltrans standards.

GDC completed a Preliminary Foundation Report (which provides preliminary geotechnical design information for the seismic evaluation of the existing structures) for the following bridges:

- The First Street Viaduct Bridge was built in 1927 and consists of a 10-segment, 28-span concrete structure that carries traffic along First Street and runs across the Los Angeles River and A.T. & S.F. railroads. The bridge is about 70 ft wide and 1,290 ft long.
- Third Street Overcrossing. The bridge site is located along Third Street in Los Angeles, California. The Third Street Overcrossing was built in 1959 and consists of two-span concrete box girder structure that carries traffic along Third Street and crosses over the I-710 Freeway. The bridge is about 82 ft wide and 265 ft long

GROUP DELTA CONSULTANTS

Key Staff

GROUP DELTA CONSULTANTS

GROUP DELTA CONSULTANTS
TECHNICAL STAFF QUALIFICATIONS AND EXPERIENCE

NAME	FUNCTION	REGISTRATION	YRS OF EXP.
Mike Reader	Principal Geotechnical Engineer	RCE, GE	23
Shah Ghanbari	Principal Engineer	RCE	25
Dr. Kul Bhushan	Principal Geotechnical Engineer	RCE, GE	40
Tom Swantko	Principal Geotechnical Engineer	RCE, GE	35
Lee Vanderhurst	Associate Geologist	CEG	25
Opjit Ghuman	Associate Environmental Engineer	RCE, GE	33
Curt Scheyhing	Senior Geotechnical Engineer	RCE, GE	14
John Theissen	Senior Geotechnical Engineer	RCE,GE	30
Dick Roberts	Senior Geologist		25
James Cunneen	Senior Project Engineer	JD, RCE, REA 1	21
Matthew Fagan	Senior Geotechnical Engineer	RCE, GE	16
Vesna Petrilla	Senior Project Engineer	RCE	8
John Thune	Field Services Manager	Caltrans Certified	24
Jim Sanders	Project Geologist	PG, CEG	10
Eugene Lewis	Project Geologist	CEG	10
Dr. Ying Liu	Project Seismic Engineer	RCE	12
Nava Navaratnarajah	Project Engineer	RCE	5
Salvador Ortiz	Project Engineer	RCE	7
Vesna Glisic	Project Engineer	RCE	8
Thomas Canady	Project Engineer	RCE	21
Anthony Belfast	Project Engineer	RCE	32
Eric Holliday	Staff Geologist		5
Richard Reed	Staff Engineer	RCE	4
Raymund Frigillana	Staff Geologist	EIT	10
Sean Prenovost	Staff Engineer	EIT	1
Erek Deutscher	Staff Engineer		2
Richard Mahoney	Manager of Soils Testing	Deputy Inspector	15
Eric Ycoy	Soils Lab Manager-Torrance	Caltrans Certified	15
Henry Kim	Soils Lab Manager-Irvine	Caltrans Certified	34
Ronnie Schmitz	Laboratory-Ontario	Caltrans Certified	5
Janice Krehbiel	Laboratory Mgr – San Diego	Caltrans Certified	21
Douglas Gamblin	Senior Field Technician	Soil/ACI Technician	10
Ray Basilio	Senior Geotechnical Technician	Deputy Inspector	25

GROUP DELTA CONSULTANTS

GROUP DELTA CONSULTANTS
TECHNICAL STAFF QUALIFICATIONS AND EXPERIENCE

NAME	FUNCTION	REGISTRATION	YRS OF EXP.
Mike Jacobs	Senior Geotechnical Technician	Deputy Inspector	20
Arnold Ramirez	Senior Geotechnical Technician	Deputy Inspector	15
Howard Kuzminski	Senior Geotechnical Technician	NICET/ACI	16
Linwood Hayman	Special Inspector	Deputy Inspector	6
Thomas Estes	Special Inspector	Deputy Inspector	35
Daniel Ferguson	Field Technician	NICET/ACI/ICBO	10
Garry Harris	Field Technician		32
Felipe Cisneros	Field Technician	ACI/ICBO/Caltrans	9
Michael Redela	Field Technician	ACI	12
Robert Clevenger	Laboratory Technician	NCMA	3
Tony Echeverria	Laboratory Technician		7
George Stanton	Field Technician	ACI	9
Jason Barron	Field Technician	ACI	9
Jerry Jimenez	CAD-Technical Illustrator		5
Marty Fountain	Field Technician	ACI	12
Support Personnel (50)	Technicians, Inspectors, CADD		5-20