



Statement of Qualifications

Southern California Port Experience



Pier J, POLB



Terminal Island Interchange



Pier S Backlands



C Street & SR-47

Prepared By:

Group Delta Consultants, Inc.

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Please visit us on the web at www.GroupDelta.com

Company Profile

Company Profile

Geotechnical Engineering

Geology

Earthquake Engineering

*Materials Testing and
Inspection*

Forensic Services



Group Delta Consultants, Inc. (GDC) is a consulting engineering firm with offices located in the counties of Los Angeles, Orange, and San Diego. The firm has 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 City of Los Angeles, 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



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

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

Construction Phase Services



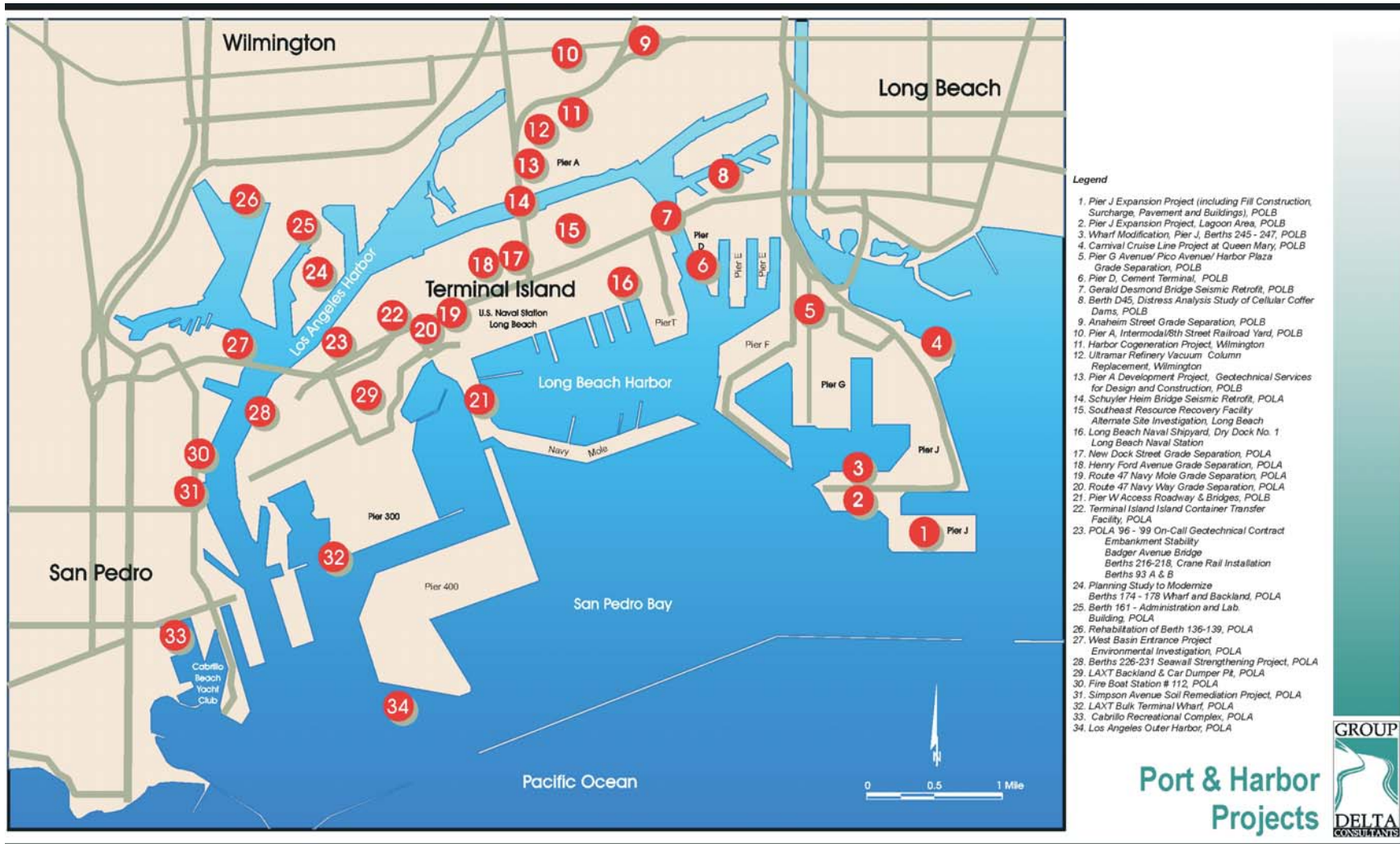
Construction Inspection & Materials Testing Services

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
- Prisms
- Vapor Emissions Testing

Relevant Project Experience



Representative Experience of GDC Staff
Figure 1



Port & Harbor
Projects

Pier S Backlands

Long Beach, California

Geotechnical Engineering

Geology

Earthquake Engineering

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Pier S Backland area is being developed by the Port of Long Beach for use as a container terminal. Group Delta Consultants (GDC) was retained to perform geotechnical investigations for five buildings, pavements, and a number of retaining walls. GDC performed an investigation and developed geotechnical recommendations for design and construction of a maximum 25-ft high welded wire mesh MSE wall. The wall has a total length of about 2500-ft, and runs along the east and southeastern boundaries of the Pier S Backland site. Subsurface conditions consist of compacted fills overlying compressible fills, hydraulic fills, and bay deposits, which are in turn underlain by dense sands of the Gaspar aquifer.

Groundwater is shallow at approximately 5-ft below the ground surface. Key geotechnical issues addressed were settlement and static / seismic stability of the embankment. GDC performed analyses and provided recommendations for anticipated settlements, lateral earth pressures, wall backfill, wall drainage, dimensioning the wall for bearing capacity, sliding, and overturning, seismic and static global stability, and construction considerations. GDC also assisted in development of specifications and review of shop drawing submittals. GDC also performed a geotechnical investigation along the proposed wharf.

Pier J Wharf Modifications

Berths 245-247, Long Beach

Geotechnical Engineering

Geology

Earthquake Engineering

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The project included dredging in front of the existing pierhead line from El. -36 ft. to El. -48 ft. We performed both offshore borings and cone penetration tests to develop recommendations for pile design and the stability of the dike slopes both during construction and in the final configuration.

The scope of work consisted of drilling two rotary borings and two cone penetration tests to depths of El. -106 ft., performing laboratory tests and developing recommendations for pile design and slope stability. During the construction phase, six additional cone penetration tests were performed to assess the driveability of the piles and need for jetting to reach the design penetrations below the weak layers between El. -83 ft., and El. -93 ft.

Special Geotechnical Considerations

- Potential for refusal of 24-inch octagonal prestressed concrete piles in dense sand layers above the design tip.
- Stability of the slope during construction while deepening the channel to El. -48 feet.
- Dynamic pile analyzer measurements and CAPWAP analyses during the indicator pile program to assess driveability and need for jetting

LAXT Berth and Site Preparation

Los Angeles, California

Geotechnical Engineering

Geology

Earthquake Engineering

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The project consists of a modern, one berth dry bulk terminal berthing facility, and preparation of the terminal's backland site for a dry bulk terminal at the Port of Los Angeles. The facility will be designed to handle coal, petroleum coke, copper concentrates, and other dry bulk commodities at an ultimate, throughput capacity of 20 million tons per year.

The scope of work for the soil data report included: a review of existing soil, geologic, and seismic reports; drilling a total of 37 borings and performing 51 cone penetrometer tests; performing laboratory testing program to develop the soil classification, strength, compressibility, pavement design, and corrosivity properties, and making recommendations for pile design, slope stability, wharf construction, dredging, liquefaction, seismic design criteria, pavements and other infrastructures, settlement due to coal piles, and railroad ballast design.

The project includes a unique freestanding wharf in 72 ft of water with 54 in. pipe piles supporting the wharf. About 200 54 in. diameter piles with lengths of up to 145 ft will be driven with hammers delivering over 350,000 ft-lb. energy.

San Nicholas Island Pier

Santa Barbara, California

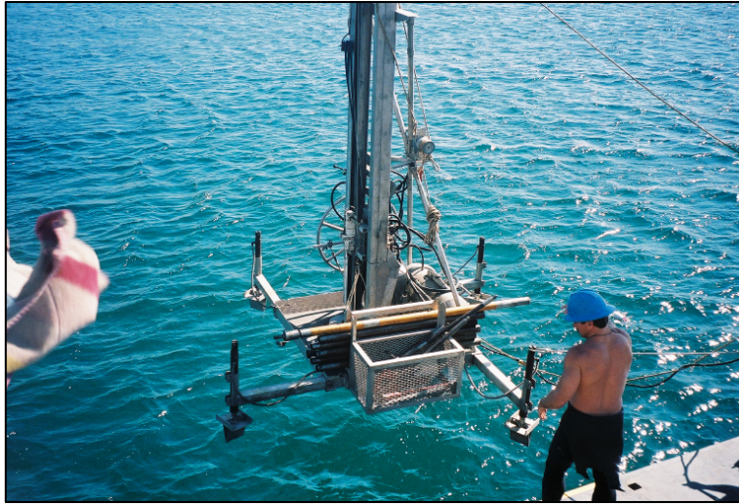
Geotechnical Engineering

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Underwater rock coring rig off San Nicolas Island

Group Delta Consultants (GDC) conducted a Marine Geotechnical Survey for the US Navy design for the preliminary design of an open ocean pier at San Nicolas Island in the Santa Barbara channel offshore the Southern California coast. The proposed pier will extend about 750 ft from the shoreline in about 45 ft of water. Subsurface exploration consisted of drilling a total of five borings drilled by using a submersible seafloor-supported rock coring drill rig operated by divers. The sedimentary siltstone / sandstone bedrock was encountered at a depth of about 1 to 3 feet below the seafloor, underlying a thin veneer of sandy sediments. The measured unconfined compression strength ranges between 276 psi and 719 psi. The area is of low to moderate seismicity with a peak bedrock acceleration of 0.2 g.

GDC performed drivability studies for steel pipe pile and concluded that 24-in. pipe piles may be driven 15 to 20 ft with a large hammer such as Delmag D-80 or D-100. GDC provided an alternative consisting of driving a temporary casing a few feet into the rock, drilling an oversize hole say 30 inch diameter, and install a 24-inch octagonal pre-stressed concrete pile in the hole and grout the pile in the rock. This option avoids the issue of steel corrosion, and a smaller pile hammer would be needed for the temporary casing than for a driven steel pile.

Key benefits provided by GDC:

- Use of underwater rock coring rig saved the Navy over \$100,000 compared to the use of a normal drill ship
- GDC provided two alternatives piles for foundation design in the shallow bedrock area

Terminal Island Interchange

Port of Long Beach, California

Geotechnical Engineering

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The Port of Long Beach, in cooperation with the California Department of Transportation (Caltrans), proposed to construct a new traffic interchange to replace the existing Ocean Boulevard / Terminal Island Freeway intersection on Terminal Island in the City of Long Beach. The project consisted of elevating Ocean Boulevard as much as 10 meters above existing grades to facilitate grade separations at Henry Ford Avenue, Terminal Island Freeway, and a connector road between future Pier S and Pier T container terminals in the Port. More than 2,700 meters of Mechanically Stabilized Embankment (MSE) Walls up to 11 meters in height will retain most of the new roadway fill embankment. The three grade separations will be accomplished with five single-span bridge structures supported on driven piles.

Scope of Work:

- Field investigation consisting of 12 borings and 17 cone penetration tests
- Laboratory testing and characterization of subsurface conditions
- Seismic and geologic hazard assessment and recommendations,
- Geotechnical recommendations for roadway, retaining wall, and embankment construction
- Liquefaction potential and resulting settlement and lateral spreading potential
- Magnitude and time rate of anticipated consolidation settlement,
- Liquefaction mitigation at bridge abutments by ground improvements with stone columns

Key Staff

Technical Staff

QUALIFICATIONS AND EXPERIENCE			
NAME	FUNCTION	REGISTRATION	YRS OF EXP.
Dr. Kul Bhushan	Principal Geotechnical Engineer	RCE, GE	40
Tom Swantko	Principal Geotechnical Engineer	RCE, GE	35
Mike Reader	Principal Geotechnical Engineer	RCE, GE	23
Shah Ghanbari	Principal Engineer	RCE	25
Curt Scheyhing	Senior Geotechnical Engineer	RCE, GE	14
Eugene Lewis	Senior Geologist	CEG	10
Chris Guesnon	Geologist	CEG	17
Joe Barr	Engineer / Geologist	RCE, CEG	10
Eric Holliday	Geologist		3
Opjit Ghuman	Environmental Engineer	RCE, GE	33
Vesna Glisic	Project Engineer	RCE	8
Nava Navaratnarajah	Field Engineer	RCE	5
Dr. Ying Liu	Seismic Engineer	RCE	12
Ray Basilio	Senior Field Engineer	ACI	25
Konrad Fernandes	CADD Manager	-	15
Jeanette Moreno	CADD Designer		5
Ray Green	Materials Testing Manager	ME	30
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
Ray Basilio	Senior Geotechnical Technician	Deputy Inspector	25
Mike Jacobs	Senior Geotechnical Technician	Deputy Inspector	20
Arnold Ramirez	Senior Geotechnical Technician	Deputy Inspector	15
Pool of Technicians (25)	Inspectors	ICBO, DSA, City of Los Angeles & Caltrans	5 to 25
Support Personnel (11)	Support	-	2 to 20