

**Professional Registrations**

Civil Engineer, California No. C22766

Geotechnical Engineer, California
No. 144

Education

PhD, Geotechnical Engineering,
Duke University, Durham, North
Carolina

MS, Highway Engineering, Panjab
University, Chandigarh, India

BS, Geotechnical Engineering,
Panjab University, Chandigarh, India

Years of Experience: 40

SUMMARY

Dr. Bhushan has more than 40 years diverse geotechnical experience which includes over 200 bridge and seismic retrofit projects, 30 offshore and harbor projects, 60 petrochemical/heavy industrial plants, 50 seismic hazard studies, two nuclear power plants, three solar power plants, 150 medium and high-rise buildings, six airport projects, and a large number of other projects such as schools, hospitals, commercial, industrial and residential structures, airports, highway bridges, embankments, and transmission lines. Responsibilities consisted of complete geotechnical investigations and analyses including earthwork and site preparation, deep and shallow foundation bearing capacity and settlement, deep excavation and shoring, slope stability, seismicity, liquefaction, earthquake design, development of recommendations, report preparation, and construction supervision. Dr. Bhushan has provided in-depth geotechnical recommendations for major transportation projects, including sound walls, throughout southern California.

MAJOR PROJECT EXPERIENCE

Gerald Desmond Bridge Replacement Project, Port of Long Beach, California: At nearly \$1 billion, the Gerald Desmond Bridge replacement Design-Build project will ensure the safety of commuters and truck drivers and protect Southern California's important role as a major trading hub. Dr. Bhushan is a Senior Principal Engineer responsible for performance of the geotechnical investigation, which included more than 150 mud-rotary borings to depths of up to 250 feet and more than 100 Cone Penetration Tests to depths up to 150 feet. In addition, Dr. Bhushan was part of the team responsible for design engineering of the foundations which are groups of large diameter Cast-in-Drilled-Hole (CIDH) ranging from 5 to 8 feet in diameter with lengths up to 230 feet, and for engineering of approach embankments and retaining walls.

State Route 22 Design-Build Improvement Project, Garden Grove/Orange County, California: Dr. Bhushan provided quality assurance/quality control oversight for the geotechnical investigation and the preparation of preliminary geotechnical reports for 34 bridges along the recently completed SR-22 improvements project which included construction of auxiliary lanes, car pool lanes, retaining walls, sound walls, and bridge widening and new bridge construction.

SR-22 West County Connector Project, 405/22 HOV Segment, Orange County, California: Senior Principal Geotechnical Engineer responsible for the subsurface investigation, Geotechnical Design Report, Materials Report, Foundation Reports for replacement of two existing bridges and for a new 5-span HOV connector bridge.

I-110 / Freeway John S. Gibson Ramp Improvements, San Pedro, California: For this Port of Los Angeles project, Dr. Bhushan directed the preparation of and reviewed the following reports which were submitted to the Port and Caltrans and approved.

SR-91 Design Build Corridor Improvement, Riverside County, California: Senior Geotechnical Engineer providing QA/QC for the SR-91 Corridor Improvement Project which is focused on the existing 14-miles of congestion on SR-91 and a 6-mile boundary that runs from the SR-241 Toll Road in Yorba Linda to Pierce Street in Riverside. Additional project areas include the I-15 between Cajalco Road and Hidden Valley Parkway in Norco. The proposed improvements will ease movement of people and goods between Riverside County and Orange County.

MTA Goldline Iconic Bridge, Los Angeles County, California: Senior Geotechnical Engineer for this long span light rail bridge over Caltrans SR-210 right-of-way. Bridge consists of 13 ft. diameter piles and is the first design-build project for the Gold Line Authority.

Los Angeles to Pasadena Gold Line Project, Los Angeles, California: 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. For this project, Dr. Bhushan was Senior Geotechnical Engineer for all geotechnical work for the design-build team including 10 segments, 13 stations, 2 seismic retrofit reports, two box structures, and one pedestrian overcrossing.

Hyatt Regency Grand Resort, Huntington Beach, California: Senior Geotechnical Engineer for this project which consists of a 504-room hotel complex and associated facilities, including 2-levels of subterranean parking, a four-story hotel building, ballrooms and conference rooms, courtyards, retail facilities, tennis courts, landscaping and irrigation, walkways, pedestrian bridges, retaining walls, and other hardscape features.

Central Park West Project, Irvine, California: Senior Geotechnical Engineer for this project which consists of a mixed residential and commercial development of mid and high-rise buildings with 2 and 3-levels of subterranean parking, and at-grade buildings. Due to the highly variable soil conditions at the site and thick layers of compressible soils the initial recommendations by previous Lennar consultant included use of piles.

San Sebastian Senior Housing, 24299 Paseo de Valencia, Laguna Woods, California: Senior Geotechnical Engineer for this development that consists of two to four story senior housing with a total of 134 residential units and accompanying facilities including pool, outdoor lounge and courtyard, over two-level parking structure with one subterranean level and one level at-grade above the subterranean level.

University Link, Seattle, Washington: Senior Geotechnical Engineer for the geotechnical instrumentation (installation and monitoring) for the tunnels and the University of Washington station for Traylor Frontier-Kemper JV. Geotechnical instrumentation will monitor soil and groundwater movements around University of Washington station excavation and along the alignment of both light rail tunnels.

Santa Ana River Rubber Dams, Riverside and Orange Counties, California: Senior Geotechnical Engineer for the geotechnical investigation and, geotechnical services were provided for three inflatable rubber dams and associated bypass structures along the Santa Ana River. Sites for the rubber dams were immediately upstream of the existing drop structures located near Imperial Highway, Lakeview Avenue, and Five Coves.

Northeast Interceptor Sewer (NEIS), & North Outfall Sewer – East Central Interceptor Sewer (NOS-ECIS) City of Los Angeles, California: Senior Geotechnical Engineer for a geotechnical instrumentation program of an 5.2 miles long sewer pipeline extending northward from the east terminus of the NOS-ECIS sewer located just east of the Los Angeles River near Mission Road to the intersection of San Fernando Road and Eagle Rock Boulevard. The overall budget for the geotechnical instrumentation exceeded \$1.4 million.



Pier S Backland, Port of Long Beach, California: Senior Geotechnical Engineer for the Pier S Backland area developed by the Port of Long Beach for use as a container terminal. Group Delta was retained to perform geotechnical investigations for five buildings, pavements, and a number of retaining walls. Group Delta 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.

TRAPAC Terminal Berths 134-147, Port of Los Angeles, California: For the Trapac Terminal in the Port, Dr. Bhushan directed the geotechnical investigation and was responsible for preparation of reports. For the Longshore Toilet Building, Kul worked with the City of Los Angeles Department of Building and Safety reviewers to allow of shallow foundations.

Newport Mesa Unified School District (NMUSD) Measure F School Facility Improvement Program, Orange County, California: Senior Geotechnical Engineer for the geotechnical services provided during construction for the approved improvements at Corona Del Mar High School (CDMHS) and Costa Mesa High School (CMHS). Responsibilities include review of previous geotechnical reports, performing site investigations, geologic seismic evaluations, laboratory testing and construction phase geotechnical services and take over as geotechnical engineer of record and assume responsibility for the geotechnical phase of the project.

Robert F. Kennedy Learning Center, Former Ambassador Hotel Site, Los Angeles, California: Senior Geotechnical Engineer for the redevelopment of the original Ambassador Hotel / Coconut Grove site, located west of downtown Los Angeles. The 23.8-acre property was graded to accommodate a \$575 million integrated campus to be named Robert F. Kennedy Community Schools.

Haynes Generating Station Units 3 & 4, Long Beach, California. Senior Geotechnical Engineer (for Los Angeles Department of Water and Power /Kiewit Industrial Company) evaluation of twin 60-in. diameter intake pipelines supported on 99 30- and 36-in. diameter drilled piles. Group Delta performed 17 Cone Penetration Test (CPT) soundings and four rotary borings to develop subsurface conditions along the alignment.

John Wayne Airport, Costa Mesa, California: As Senior Geotechnical Project Engineer, was responsible for the geotechnical investigation for evaluation of the main runways, taxiways, and blast pads. Soil borings were completed to characterize subsurface soil conditions.

PUBLICATIONS:

“Design of Shallow Foundations for a Large Polysilicon Plant in China,” with Dr. Ken Choudhary, Proceedings: 7th International Conference on Case Histories in Geotechnical Engineering, Chicago, Paper No. 1.17c, April 29-May 4, 2013.

“Design & Installation of Large Diameter Pipe Piles for LAXT Wharf,” Geotechnical Special Publication No. 125, Current Practices and Future Trends in Deep Foundations, Jerry A. DiMaggio and Mohammad H. Hussein, Ed., The Geo-Institute of ASCE, in Honor of George G. Goble, 2004, pp. 370-389.

“Ground Improvement by Stone Columns and Surcharge at a Tank Site,” with Ashok Dhingra, Curt Scheyhing, and Endi Zhai. Proceedings: Fifth International Conference in Case Histories in Geotechnical Engineering, New York, N.Y. Paper No. 8-36, April 13-17, 2004.



"Lateral Load Tests on Drilled Piers in San Diego Area Residual and Formational Soils," with Curt Scheyhing. Proceedings of the DFI 27th Annual Conference on Deep Foundations, Oct. 9-11, 2002, San Diego, California.

"Soil Improvement by precompression at a tank farm site in Central Java, Indonesia," with C. V. Amante and R. Saaty. Proceedings, 3rd International Conference on Ground Improvement Techniques, 25-26 September, 2000, Singapore.

"Dynamic Testing of Large Capacity Precast Concrete Piles in the Port of Long Beach," with Dr. Alain E. Holeyman. Fifth International Conference on Piling and Deep Foundations, Bruges, Belgium, June 1994.

"Settlement of a ring foundation using cone data," with F. Boniadi. Proceedings of The First International Symposium on Penetration Testing/ISOPT-1/Orlando, Vol. 2, 20-24 March 1988, pp. 681-696.

"Lateral Load Tests on Drilled Pier Foundations for Solar Plant Heliostats," with Shahen Askari. Laterally Loaded Deep Foundations: Analysis and Performance, ASTM Special Technical Publication 835, Philadelphia, Pennsylvania, September 1984, pp. 140-156.

"Friction Capacity of Piles Driven into Clay," discussion of a paper by Leland M. Kraft, Jr., John A. Focht, Jr., and Srinath Amerasinghe (Proc. Paper 16663), Journal of the Geotechnical Engineering Division, ASCE, Vol. 109, No. 5, Proc. Paper 17924, May 1983, pp. 761-762.

"New Design Correlations for Piles in Sands," discussion of a paper by Harry M. Coyle and Reno R. Castello (Proc. Paper 16379), Journal of the Geotechnical Engineering Division, ASCE, Vol. 108, No. GT 11, Proc. Paper 17435, November 1982, pp. 1508-1510.

"Lateral Load Tests on Drilled Piers in Sand," with Louis J. Lee and Donald B. Grime, proceedings of a session on drilled piers and caissons sponsored by the Geotechnical Division at the ASCE Fall Convention, St. Louis, Missouri, October 28, 1981.

"Lateral Load Tests of Drilled Piers in Stiff Clays," with S.C. Haley and Patrick T. Fong, Journal of the Geotechnical Engineering Division, ASCE, Vol. 105, No. GT 8, Proc. Paper 14789, August 1979, pp. 969-985.

"Stress Distribution for Heavy Embedded Structures," with S.C. Haley, Journal of the Geotechnical Engineering Division, ASCE, Vol. 102, No. GT 7, Proc. Paper 12227, July 1976, pp. 807-810.

"Resistance of Ocean Sediments to Sampler Penetration," with Arshud Mahmood and R. L. Allen, OTC Paper No. 2624, Offshore Technology Conference, Houston, Texas, May 3-6, 1976.

"Experience in Settlement Analysis and Related Geostatic Considerations for the Foundation Design of Heavy Reactor Structures," with R. L. McNeill, B.C. Yen, and S. C. Haley, proceedings of International Conference on Experience in the Design, Construction and Operation of Prestressed Concrete Pressure Vessels and Containments for Nuclear Reactors, University of York, England, September 8-12, 1975, pp. 75-81.

"An Experimental Investigation into Expansion of Spherical and Cylindrical Cavities in Sand," Ph.D. dissertation, Department of Civil Engineering, Duke University, Durham, North Carolina, 1970.

