

## Our Clients

Our clients include owners of commercial and industrial facilities, engineering consultants, contractors, and public agencies. Among them are the following:

Aerojet General Corporation  
Aetna Insurance Company  
Alyeska Pipeline Service Co.  
American Airlines  
Ameron Concrete & Steel Pipes  
S.J. Amoroso Construction  
Arizona Highway Department  
Atlantic Richfield Hanford Co.  
Ball, Ball and Brosamer, Inc.  
Berkeley Unified School District  
Bethlehem Steel Corporation  
Blackhawk Corporation  
Browning-Ferris Industries  
Calif. State Automobile Assn.  
Calif. Water Service Co.  
CalTrans  
Carnation Milk Company  
Chevron U.S.A., Inc.  
City of Pasadena  
Contra Costa Water District  
Dan Caputo Company  
Del Monte Corporation  
Devcon Construction, Inc.  
Dillingham Construction Co.  
Dinwiddie Construction Co.  
Disneyland  
Dow Chemical Company  
East Bay Municipal Utilities Dist.  
E.I. DuPont de Nemours & Co.  
Essex Realty  
Foremost Foods  
Freeport-McMoRan resource Ptnrs.  
General Electric Co.  
General Motors Co.  
Granite Construction Co.  
Hewlett Packard Co.  
The Home Depot  
IBM Corporation  
Intel Corporation  
Irvine Land Management Co.  
Jacobs Construction  
Kaiser Aluminum and Chemical Co.  
Kaiser Hospitals  
Kaufman & Broad  
Kiewit Pacific Company  
Lawrence Livermore Laboratories

Liberty High School  
Sebastopol School District  
Lockheed Missiles & Space Co.  
Long Beach Unified School Dist.  
L.A. Dept Water & Power  
MCM Construction Co.  
Modern Continental  
Morrison-Knudsen Co.  
Nevada Highway Dept.  
Nordic Industries  
Novato Hospital  
Oceaneering International, Inc  
Homer J. Olsen Co.  
Oregon Highway Dept.  
Pacific Cement & Aggregates  
Pacific Gas and Electric Co.  
Perini Building Company  
Philips Petroleum Co.  
PK Contractors, Inc.  
Plant Construction  
Port of Los Angeles  
Port of San Francisco  
Public Service Co. of Colorado  
Pulte Homes  
Ragu Foods, Inc.  
Ranger Pipelines  
Riverside Cement Co.  
Rudolf & Sletten, Inc.  
San Francisco Int'l Airport  
Santa Cruz Metropolitan Transit  
Shell Oil Company  
Shimmick Construction Co., Inc.  
Standard Pacific Homes  
Swinerton & Walberg  
Tico Construction  
Trans World Airlines  
USS Posco  
U.S. Army Corps of Engineers  
U.S. Coast Guard  
U.S. Navy  
Alameda N.A.S.  
Mare Island  
Moffett Field  
Pearl Harbor  
Port Hueneme  
U.S. Steel Corporation  
Underground Construction Co.  
United Airlines  
Unocal  
Vadnais Corp.  
Vallejo Sanitation District  
Washoe County, Nevada  
West Coast Contractors, Inc.  
Williams+Burrows, Inc.

## Engineering Consultants

AGS, Inc.  
Berlogar Geotechnical Consultants  
Bromwell & Carrier, Inc.  
Brown and Caldwell  
CH2M Hill  
Converse Consultants  
Dames and Moore  
Diaz Yourman & Associates  
H.J. Degenkolb & Assoc.  
DeLeuw, Cather & Co.  
Earth Mechanics Inc.  
GeoLabs, Inc.  
Harding-Lawson & Assoc.  
Haro, Kasunich & Associates  
Harza  
Jacobs Engineering  
Kaiser Engineers  
Kleinfelder, Inc.  
Kennedy-Jenks Engineers  
Krazan & Associates Inc.  
Law/Crandall, Inc.  
Leighton & Associates  
Moffatt & Nichols Engineering  
James M. Montgomery Cons. Engrs., Inc.  
Parsons-Brinckerhoff-Quade-Douglas  
Parsons-Brinckerhoff-Tudor-Douglas  
PRA Group  
SEA Engineers  
Tudor Engineers  
Treadwell & Rollo  
URS  
Wahler Associates  
Western Technologies  
Woodward-Clyde Consultants



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# CHEMICAL GROUTING

*The injection of near-water-viscosity liquids into a cohesionless soil to react chemically and create an impervious solid mass, comparable to sandstone.*

For

- ▲ Solidifying sandy soil
- ▲ Controlling erosion of sand cliffs
- ▲ Stabilizing slopes and excavations
- ▲ Stabilizing foundations and tunnel headings
- ▲ Reducing the liquefaction potential of sandy soils
- ▲ Controlling or shutting off groundwater seepage
- ▲ Sealing interlocks of sheet piling

*The*  
**PRESSURE GROUT COMPANY**

**Chemical grouting** is the injection of one or more near-water-viscosity liquids into a cohesionless soil to create an impervious sandstone-like mass, as shown in Figure 1. Because chemical grouting literally creates "instant sandstone" as tough as that of mother nature, it is one of the most successful techniques available today for stabilizing soils and controlling groundwater. The applications of chemical grouting are almost endless, and new uses are documented almost daily.

In many cases, chemical grouting offers substantial advantages over other techniques for stabilizing soils or controlling groundwater, e.g., economy, simplicity, flexibility, risk reduction, less noise, and minimal accessibility requirements.

The successful use of the technique requires knowledge and skill to analyze the soil and determine the optimum chemical system, pressure, gel time, and other variables. For more than 45 years, The Pressure Grout Company has provided chemical grouting services. We have designed our own specialized mixing and grouting equipment, conducted research on numerous chemical combinations, and developed more than 15 different chemical systems for a wide range of applications.

## Applications

Chemical grouting is used for stabilizing foundations, underpinning structures, plugging tunnel leaks, creating impervious grout curtains, and other applications where the control or shutoff of groundwater or the solidification of sand or fissured rock is required above or below the water table in fresh-water or saltwater environments.

The Pressure Grout Company has successfully used chemical grouting for applications, such as

### Solidification of sandy soils and fissured rock for

- ▲ Underpinning foundations
- ▲ Providing support for excavations
- ▲ Stabilizing tunnel headings
- ▲ Preventing surface settlement
- ▲ Stabilizing slopes
- ▲ Controlling erosion
- ▲ Reducing liquefaction potential
- ▲ Creating sandstone anchors for tiebacks and tiedowns

### Groundwater shutoff for

- ▲ Structures
- ▲ Excavations
- ▲ Fissured rock
- ▲ Tunnels and tunnel linings
- ▲ Pipelines and sheet piling
- ▲ Dams and landfills

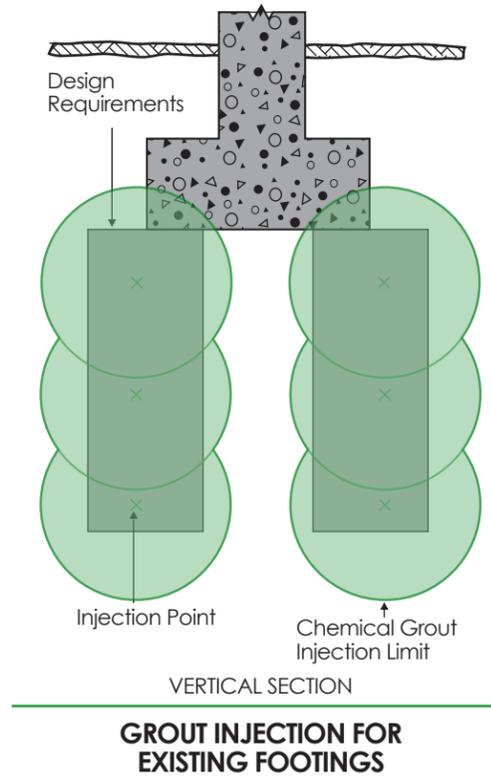
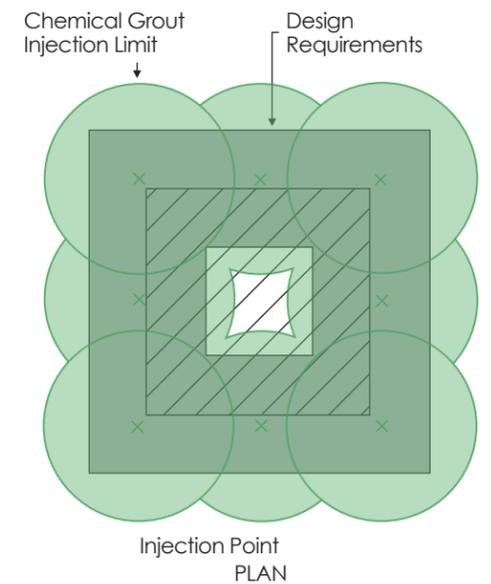


Figure 1

## Underpinning Foundations

For existing foundations, chemical grouting can be used to increase the load-bearing capacity of an underlying soil, prevent settlement, or reduce the potential for soil liquefaction during a seismic event. The injected chemical grout combines with the soil to form a "sandstone" footing or a pier capable of transferring loads to lower strata, as shown in Figure 2. Such injections can form columnar piers, 3 to 5 feet in diameter, thereby underpinning existing foundations.

## Anchoring Tiebacks

Chemical grouting is used to form "sandstone" masses that provide the necessary anchorage requirements for tiebacks or tiedowns in cohesionless soils. The technique is also highly effective in producing large bulkheads that provide the load-carrying capacity for tiebacks.

## Supporting Excavations

There are at least three general ways in which chemical grouting can be used to support excavations, i.e., by providing a gravity wall of solidified soil, by solidifying soil in conjunction with another method of lateral support, and through minimal grouting to prevent sand sloughing and/or water seepage through the lagging, as shown in Figure 2. If conditions permit, the sides of an excavation can be cut back to a suitable slope, and a grout blanket produced on the surface of the slope to prevent erosion and surface sloughing.

## Controlling Groundwater

Chemical grouting has been successfully used to shutoff the seepage of groundwater into tunnels, basements, excavations, and pipelines. Permanent or temporary shutoffs can be accomplished by using different chemical systems. The Pressure Grout Company has been involved in hundreds of water shutoff jobs, involving a wide spectrum of applications and conditions.

## Other Applications

There are numerous other applications of chemical grouting, including a reduction in the liquefaction potential of sandy soils, seating interlocks of sheet piling, controlling erosion of sand cliffs, and seepage.

## Equipment

The Pressure Grout Company has designed and built specialized mixing, pumping, and injection

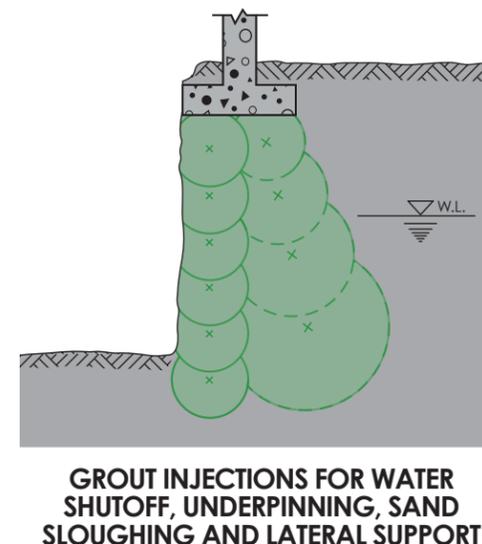


Figure 2

equipment for chemical grouting. This equipment can be operated at distances several hundred feet from the injection site. The work of The Pressure Grout Company on a chemical grouting assignment



Figure 3

## The Pressure Grout Company

The Pressure Grout Company can provide solutions to your soil and groundwater problems. If your project requires a unique application, our staff can help find a suitable grouting method and develop effective field applications. Our ideas, experience, and chemical systems can make the difference.

We have extensive experience in all types of chemical grouting for site development, new construction, and the stabilization of existing structures. We work closely with owners, engineering firms, contractors, and public agencies throughout the United States. We

- ▲ Build, operate, and maintain our own equipment
- ▲ Have one of the few research and development laboratories for grout materials and mixes
- ▲ Have a staff that includes engineers with extensive knowledge and experience in soils engineering
- ▲ Are licensed contractors and members of the Associated General Contractors
- ▲ Have broad, in-depth grouting experience that extends over a period of more than 45 years

We know and understand your problems, and welcome your inquiries:

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