

## Compaction Grouting Services

Low mobility grouting is a displacement method of improving the bearing capacity of soil. Where low strength, low capacity or unstable soil does not have the required bearing capacity for a specified load, a high density, very low slump grout is injected into the soil. The grout is injected at designed depths and locations in a grid pattern at high pressure. As a result, the viscous grout forms into a bulb or column at the desired depth, displacing the soil, densifying or "compacting" it, resulting in improved bearing capacity.

Compaction grouting is a proven method of foundation grouting with a long history of successfully completed projects. With the correct soil conditions, it is an advantageous technique for new construction and as a means of correcting soil failure under an existing structure where unacceptable settlement is occurring or has occurred.



Figure 1. Judy Company providing compaction grouting services inside a building.

## Advantages

- Precautionary measure under new construction
- Remediation measure to stabilize and, if necessary, raise existing structures
- Using precision instrumentation, raising is done within specified tolerance
- Improves the bearing capacity of weak soils
- Irregular fills or varying native soils become more uniform
- The low slump grout has the tendency to improve the weakest soils
- Completed without or with very little disturbance to landscape, floors, roads, or nearby structures
- Portable equipment is available for limited access. Hand carried drivers and extractors can be used with low headroom limitations of 6 feet (2M)
- Grout can be pumped up to 200 feet also reducing disturbance and damage near the soil or structure requiring remediation
- Inexpensive & rapid compared to other soil stabilization techniques
- A proven technique with a long history of successfully completed projects

## How it works

Injection pipes are installed into soil at design locations to desired depths. The pipes are driven, jettted, or drilled to the bottom of the



zone needing improvement. A low volume, high-pressure pump is used to place the grout. Very low slump, paste consistency grout is injected at low pumping rates. The grout forms into a bulb shape exerting radial forces in all directions as it displaces and compacts the adjacent soil. The low pumping rate is employed to prevent both soil fracturing and uplift by allowing excess water to dissipate. Injection continues until a pre-determined refusal pressure is reached or uplift occurs at the surface.

The injection pipes are then raised to a shallower depth and the process is repeated. The ability of the soil to resist surface uplift or heaving usually limits the degree to which compaction grouting can effectively compact the soil. Precise instrumentation is used to detect upward movement in the soil or in a building. Buildings, structures or pavement that has settled can be stabilized and, if desired, precisely raised as needed to within exacting tolerances. Soils applicable for compaction grouting are fine-grained with sufficient permeability to allow excess water to flow and dissipate.

Figure 2. Injection pipe used for compaction grouting.

The effective radius of an injection hole varies with the soil type. For this reason, a split-spacing method is generally used. Where large areas are being treated, the primary hole pattern is either rectangular or diamond shaped. Holes are often on 5-10 foot centers (1.5-3 meters). Secondary check holes are placed in the center of the primary pattern.

### **The soils**

Best suited to compaction grouting are fine grained with sufficient permeability to allow excess water to dissipate. The process has also been used successfully in a wide variety of soils and fills. Irregular fills or varying native soils will become more uniform with compaction grouting. An advantage of compaction grouting is the tendency to improve the weakest soils. The effective radius of the grout hole varies with the type of soil being treated.

Limited Access

**Equipment and procedures** have been designed for limited access. Hand carried casing drivers and extractors can be used with head room limitations as little as six feet (2 meters). Grout can be pumped distances of up to 200 feet (60 meters) in extreme cases. The process can be completed with only minor disturbance to the landscape, floors, roads, or nearby structures.

The portable equipment can be quickly mobilized if needed. A project was recently completed under an emergency contract when a state highway required closing because of settlement.

Are you looking for a **compaction grouting services company** of experts? **Call us now at 913-422-5111**

