

Typical Applications for Cementitious Grout

Soil Stabilization, Groundwater Control, Soil Strengthening Applications

LARGE-SCALE CIVIL PROJECTS

Cementitious grouts are used for a wide variety of civil-scale construction projects. To stabilize soil or control groundwater, such substantial constructs require a significant amount of grout, and cost efficiencies mean cementitious grouts are typically the first consideration.



Soil Stabilization

With the grand scope and significant costs embraced by large-scale civil undertakings, the condition of the soil around and beneath the project is a critical component that demands careful consideration. Improving the performance of the soil with injectable grouts is a common solution for a variety of geotechnical needs. In the case of levees, earthen dams, and in-place waste encapsulation, the soil itself serves as the structural media. In other projects, such as subway and mining tunnels, vertical shafts, below-ground structures, and waste and settlement ponds, injected grout serves to stabilize, strengthen, and curtain-off groundwater, rendering such projects viable in almost any soil type or soils-structure condition. (CONTINUES)

Sealing Fissures in Rock and Concrete Structures

LARGE-SCALE CIVIL PROJECTS

Cementitious grouts are used for a wide variety of civil-scale construction and repair projects to meet the demands of cost, longevity, strength, performance, and ease of use.

Waste Containment Vaults—Whether naturally occurring or as the result of closure forces from the relentless weight above, cracks in the walls of waste containment vaults need to be completely and permanently filled.

Underground Liquid Storage Vaults—What is pumped into such vaults—petroleum or otherwise—needs to stay there, untouched by infiltrates.

Aprons Beside and Beneath Concrete Dams—The integrity of concrete dam is only as good as the surrounding and supporting rock into which it was built.

Concrete Infrastructure—It's just good chemistry: using cementitious grout to seal cracks in concrete structures such as dams, bridges, seawalls, retaining walls, support structures.

Tunnels—Whether using grout-and-blast construction methods or adding a water-denying grout curtain behind the walls of a bore, the nirvana of tunnel engineering is “tight and dry.”

Roadway Cuts—Keep the water out of the rock cracks and the relentless freeze-thaw cycle is short-circuited.

COMMERCIAL CONSTRUCTION PROJECTS

Some of the rehabilitate-and-repair uses for a deep-penetrating, microfracture-sealing, high-performance, easy-to-use cementitious grout:

Groundwater Inflow in Mines, Tunnels and Vertical Shafts

Retaining Walls

Bridge Abutments

Concrete Pylons and Footings

Canal Linings and Control Gates

Concrete Seawall and Levees

Water Treatment Facilities—Concrete pond linings, tanks and oxidation ditches.

Parking Structures

Masonry Block Walls and Foundations

In-Ground Storage Vaults, Ponds and Silos

Containment Domes

In the cases of concrete-meets-soil structures, the soil behind and beneath over-stressed concrete structures can be stabilized and solidified by the direct injection of cementitious grout ■

Soil Stabilization, Groundwater Control, Soil Strengthening Applications

COMMERCIAL CONSTRUCTION PROJECTS

No matter the size of a construction project, the cost of buying both in-soil performance and performance longevity matters. US Grout Microfine and Ultrafine cementitious grouts are economical, permanent, environmentally low-impact, safe to use, and geologically effective in a wide range of soil types.

Improving Soil Structure and Geotechnical Performance

Junk and Indiscriminate Fills in Building Lots—Rather than removal and replacement—or even piling—it is often more economical to permeation grout poorly-infilled building sites to achieve the necessary stability and bearing capacity.

Settlement Control for Foundations and Pipelines—Bridges, building foundations, support piles, pipelines and cables, retaining walls...all are subject to failure if the soils supporting their massive weight shift. Cementitious grouts can be injected into the surrounding soils to prevent such problems—especially important in the presence of weak soil zones.

Sidewall and Slope Stabilization—Why de-water, lag, or sheet when you can stabilize the soil with grout? And the stabilization can be done anywhere from a few hours to months in advance.

Stabilize Soil Movement for Excavation—When soils are soft and prone to collapse, low-strength cementitious grouts can be economically used to provide the necessary “support of excavation.”

Stabilize Soil for Tunnel Excavation—When cut-and-cover is not a viable option, a tunneling operation is necessary. If the tunnel passes beneath canals, pipelines, rail or road beds, stabilizing the soil beneath is absolutely critical. Ground stabilization grouting before driving the tunnel is a proven method, providing stability and controlling water and erosion into the tunnel bore.

Protect Buried Utilities—Establish protective grout curtains around underground utilities to control settling and shifting problems resulting from soft soils or groundwater seepage.

Groundwater Control

Controlling Leachate when Rehabilitating Brownfield Sites—A permanent cementitious grout can be utilized to deny water infiltration and lock down the contaminated soils of a brownfield site. (For projects seeking LEED certification, there are points available for reclaiming a brownfield site).

Settling Ponds, Sewage Ponds, Waste Ponds—Tightening the soils around and beneath holding ponds will solve a host of exfiltration problems.

REHABILITATION PROJECTS

Cementitious Grouts are also used extensively to help stabilize and extend the life of deteriorating infrastructure.

Sanitary Sewer Systems—Seal against infiltration of groundwater from without and exfiltration of sewage into surrounding soil and groundwater.

Pipeline Flow—Reestablish support and bearing capacity of soil around stressed pipelines.

Levees—Improve flood control infrastructure by strengthening hold-back capacity and mitigating erosion forces that attack levees. Mitigate destructive seepage by injecting a wall of cementitious grout directly into the core of the levee.

Earthen Dams—Seal against water seepage at the structure's base with a cementitious grout curtain.

Foundations and Support Footers—Strengthen and/or fix in place surrounding soils to stabilize movement and add bearing capacity.

Catch Basins—Contain runoff-borne contaminants.

Squeeze Cement Oil and Gas Wells—Repair casing leaks, seal lost-circulation zones, remedy deficient primary cements, shut-off breakthrough points.

Erosion Control—A strong cementitious grout binding with erosion-prone soils will help hold it in place.

Seepage Cutoff Walls through Complicated Encroachments—When obstructions exist above and below ground that prevent the construction of traditional seepage cutoff walls, a cementitious grout curtain can be precisely injected around these complicated encroachments—bridges, power lines, pipelines, rail lines, roads, and various utilities.

Seepage Cutoff Barriers for Canals—Both seepage control and embankment stability are the benefits of injecting a strong cementitious grout to form curtain zones along canal ways. Even problems resulting from mixed and random embankment materials can be successfully grouted.

Sink Holes and Voids—Whether the cause is naturally-occurring or caused by improper construction practices or broken utility lines, below-grade or -structure voids are best handled by pumpable cementitious grouts. Not only are the existing voids filled, but the grout pushes into weak areas, compacting and strengthening the soil. The grout also establishes a protective cap and curtain to prevent further destabilization ■



**Ultrafine and
Microfine
Cementitious
Grouts**

Have specific questions on grout performance or availability? Contact Avanti International.



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