

# Maxperm Grouting System

Reinforcement and liquefaction protection of the soft ground

## Development

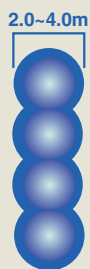
The MaxPerm Grouting System was developed aiming at soft ground reinforcement.

This is a epoch-making permeation grouting method developed from the principles of Dual-tube Double Packer Grouting, the most reliable grouting method, having a track record of tens of thousands of applications. MaxPerm provides a long-term improvement effect by using highly durable grout materials, which permeate into pore spaces and replace pore water without breaking soil structure.

MaxPerm injection is performed at a very low pressure. It allows smooth improvement directly under existing structures (such as oil tank and bridge pier) as well as improvement of soft ground in general.

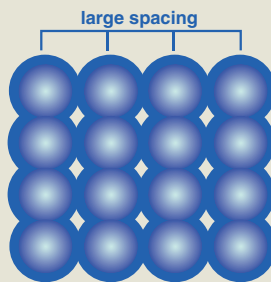
## Advantage

### Large size improvement



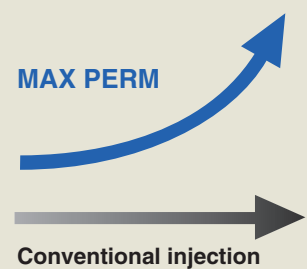
Large size improvement (about dia. 4m) done at one time injection.

### Cost saving



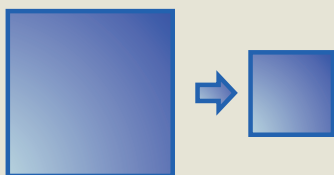
Larger borehole spacing saves the number of drillings.

### Cost saving



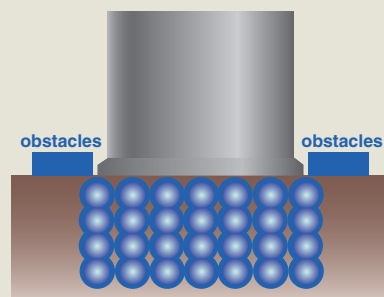
Larger injection rate saves injection time.

### Space saving



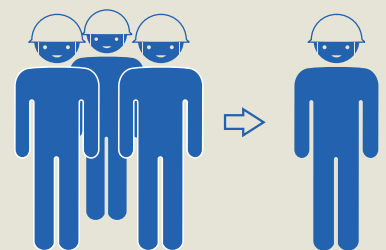
Improvement is performed from a narrow area with small and light weight equipment.

### Workability



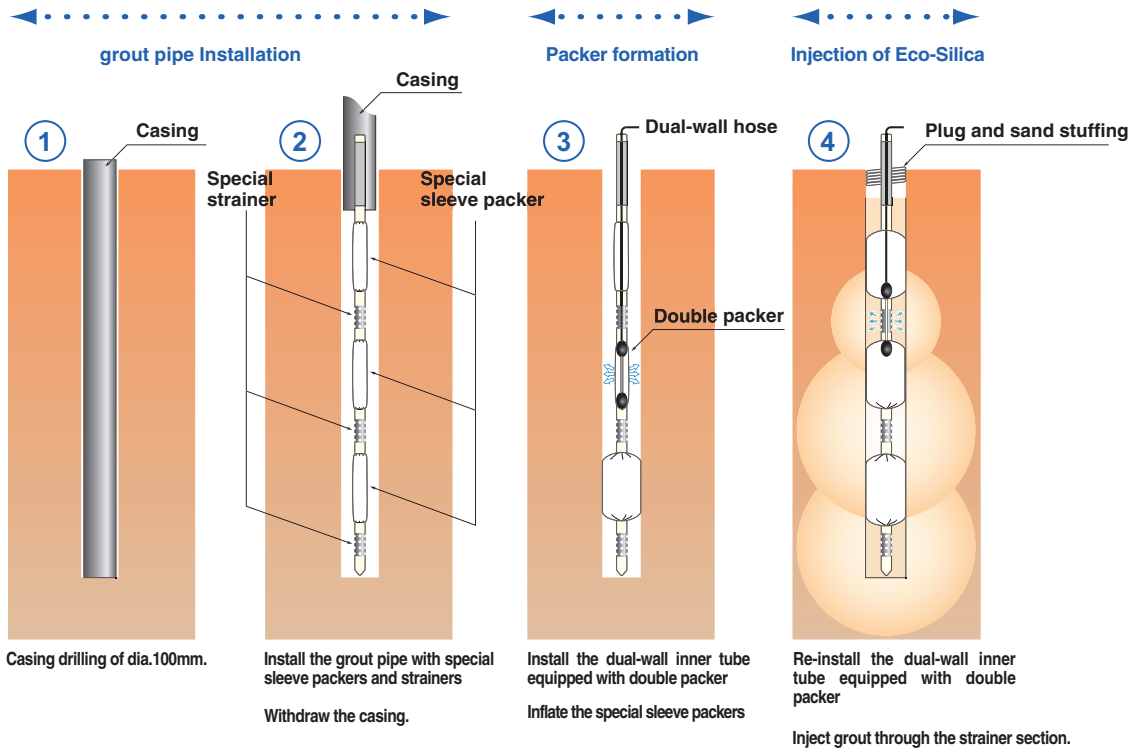
Underground obstacles, such as pipes and utilities, does not affect improvement.

### Labor saving



Computer controlled injection system saves labor.

# Improvement Sequence



# Injection Rate

Standard injection rate is 15L/min to 20L/min. For the soil with fines, the maximum injection rate to allow uniform permeation into pore spaces is determined by water injection test (qcr test).



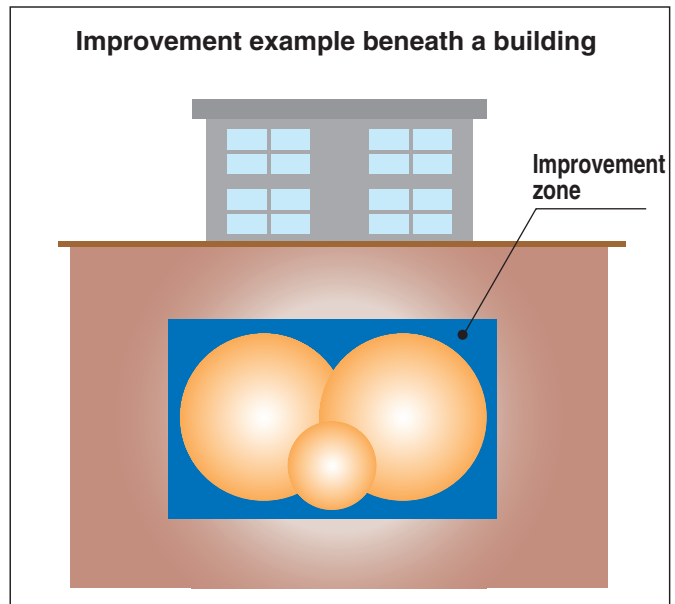
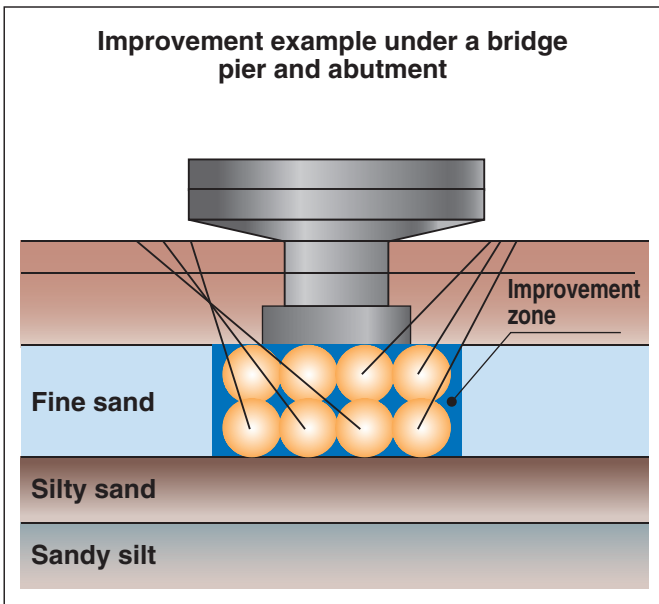
Drilling



Installation

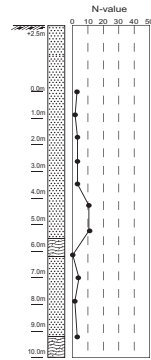


Injection

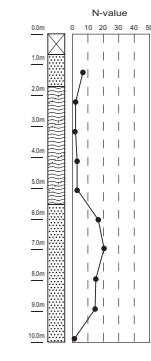


# Large diameter permeation improvement by MaxPerm

## Product diameter: 2.0 to 2.5M



## Product diameter: 3.0M



MaxPerm grout plant for liquefaction prevention work at Tokyo International Airport (Haneda)



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