Various types of Micropile
-Technologies to provide Micropile
with greater friction resistance-

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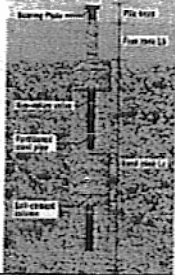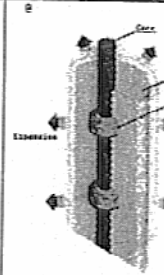[2] Hirose & Co., Ltd.

ABSTRACT

Micropile, which uses small-diameter piles and small boring machine , provides the advantages under constrained work conditions. Compared to conventional pile, pile diameter and circumference are small and their friction resistance to soil makes low bearing capacity.
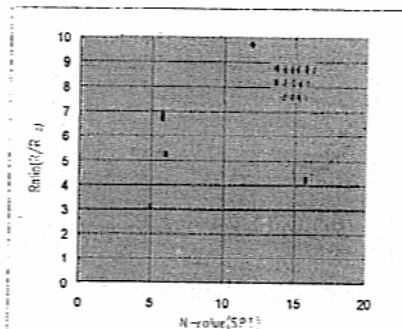To solve this problem, devices were engineered to provide small-diameter piles with greater friction resistance. We report on techniques to increase friction resistance in piles (Table 1), classified based on differences in the following resistance increase mechanisms:
(1) Increasing diameters at the bottom.
(2) Adding protrusions to give piles greater resistance.
(3) Increasing contact pressure in the interface between pile and ground due to pressure during injection and expansion during hardening.

We focus on ST MicroPile, Multi-helix Screw Pile, and Ep Root Pile.
Bearing capacity increase by different procedures are compared in the figure 1.
Micropile with the techniques confirmed results of measures increasing friction resistance.

Table 1 Comparison for each method

Method	STMP	MSP	ERP
Structure of pile			
Principle	Increasing pile diameter by soil improvement	Adding protrusions to give greater resistance	Increasing friction by expansion pressure during hardening
Dimension	Steel pipe ƒ Q165.2 267.4mm Pile diameter ƒ Q000mm	Steel pipe ƒ Q14.3 267.4mm Screw ƒ Q50 650mm	Pile diameter ƒ Q60 135mm
Construction Method	High-pressur cement-milk spray mixing	Installing pile by a rotary auger	Casing boring
Company	Toyo Construction Co., Ltd.	Konoike Construction Co., Ltd.	Hirose & Co., Ltd.

R : Ultimate bearing capacity confirmed in the load test
R_d : Untreated design ultimate bearing capacity,

Figure 1 Effect of increasing bearing capacity of MP