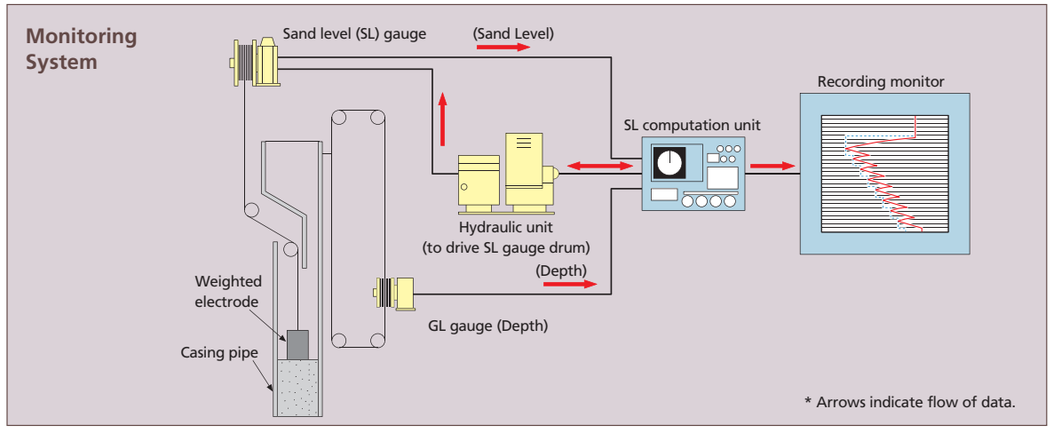
Compozer is carried out under the integrated quality control system.

- A depth (GL) gauge, to indicate the depth of a casing pipe, and a sand level (SL) gauge, to indicate the sand level in the casing pipe, are used for monitoring and quality control.
- The GL gauge consists of a drum that rotates as the casing pipe moves up and down. Its rotation is converted into an electrical signal that records the pipe depth on the monitor.The SL gauge records the sand level in the casing pipe using a weight electrode, and a computer calculates the volume of sand discharged at each point as the pipe is gradually extracted.
- Use of Compozer Numerical Operation System (CONOS) has made possible more precise operations, simpler monitoring, and faster, more accurate data processing.

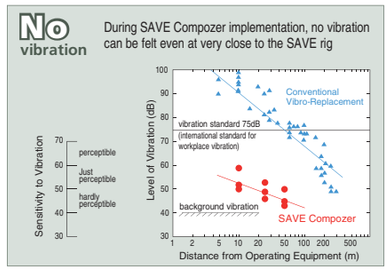


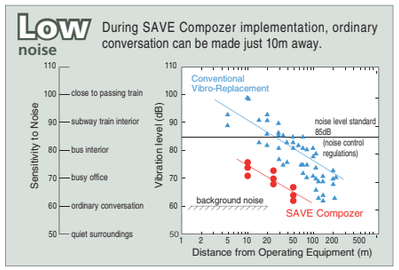
SAVE COMPOZER

Silent Sand Compaction Pile Method

Proximity of construction in built-up areas

1. No Negative Impact to Surrounding Environment
2. Wider Application Range
3. Same Densification as Vibro-Replacement is Obtainable
4. Interactive Operation Management Device
5. Finer Filling Materials are Usable
6. Cost Effective





FUDO TETRA
Fudo Tetra Corporation
ISO 9001
ISO14001

INTERNATIONAL DEPARTMENT
7-2, Nihonbashi-koamicho, Chuo-ku, TOKYO, 103-0016 JAPAN
Tel: +81-3-5644-8535 / Fax: +81-3-5644-8537
http://www.fudotetra.co.jp
E-mail : geo@fudotetra.co.jp

2012 10-202

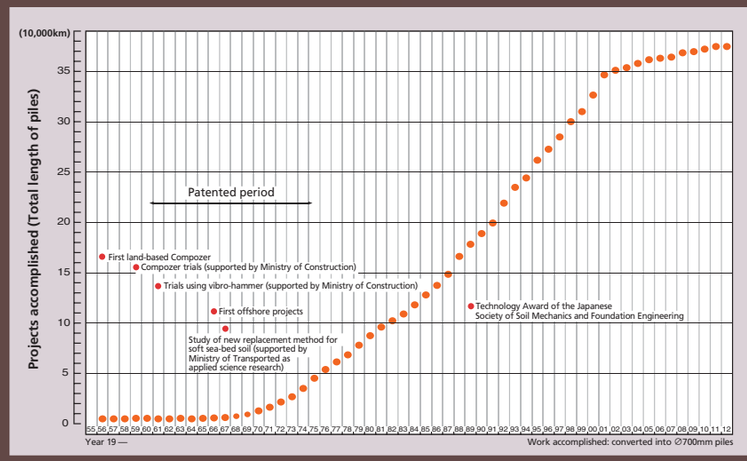
For Onshore Construction Projects

Re-Drive Type Sand Compaction Pile Method

COMPOZER

Re-Drive Type Sand Compaction Pile Method

Compozer is the method to stabilize the soft ground by installing well compacted sand piles of large diameters through the process to repeat the driving down and extracting motion of a vibrating steel pipe. Compozer, the world first soil improvement method based on sand compaction pile principle, was developed and put into use by Fudo Construction Co., Ltd. since 1956, and has been used to install sand piles totalling 380,000 km in length by 2012.



Applicable to a variety of ground

This method is applicable to the various soils such as sandy, clayey, peaty, gravelly, volcanic ash and industrial wastes grounds, etc.

Wide-ranging ground improvement objectives

For sandy soils, compaction of the ground aims to increase bearing capacity, prevent compression settlement, and improve horizontal resistance. For clayer soils, the transformation into a compound ground of clay and pile sand aims to increase bearing capacity, prevent slippage, and reduce consolidation time and consolidation settlement.

Reliable monitoring and quality control

Monitoring devices ensure the precision of Compozer operations and consistent quality of sand pile.

High performance in sand pile formation

A powerful vibro-hammer is used to drive a casing pipe to the required depth, and a well compacted sand pile is formed by repeatedly extracting and driving down the casing pipe as the sand is properly discharged. By designing pile spacing to suit the particular site objectives, ground improvement that satisfies the required replacement ratio can be readily accomplished.

Countermeasure for liquefaction

This method is widely applied as an economical means to prevent liquefaction which causes problems at waterfront development.

Wide adaptability

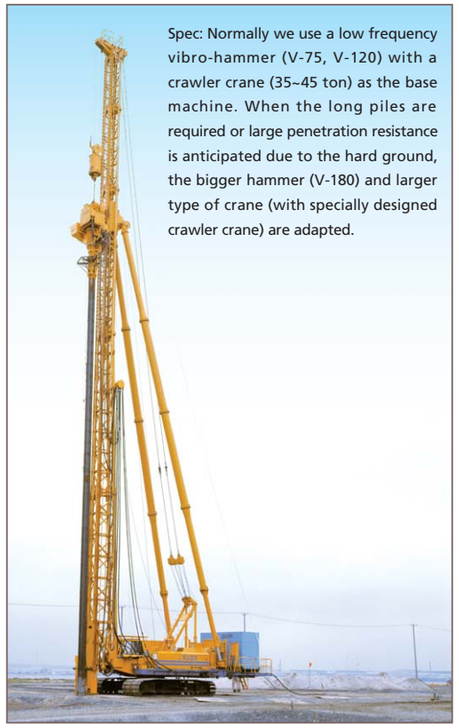
Such material like crushed stone, gravel or slug can also be used for this method. Moreover one machine, on its installation process, can easily alter diameters of a sand pile at any optional points, and thus can form a compound pile of a sand drain and sand compaction pile.

Compozer is a typical method having created the history of soil improvement technology.

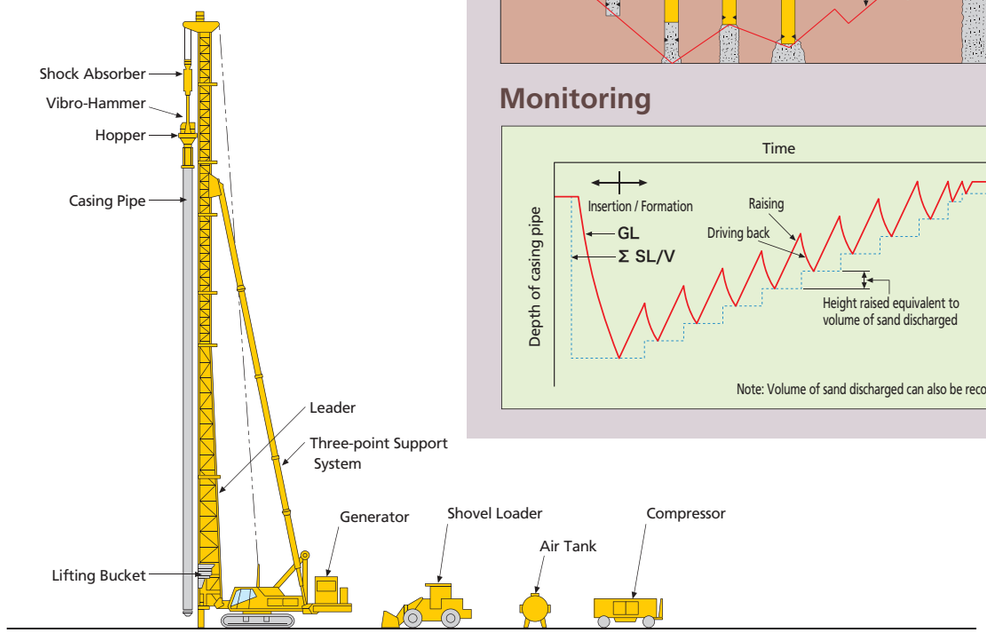
FUDO TETRA

COMPOZER

Compozer is carried out under the integrated quality control system.



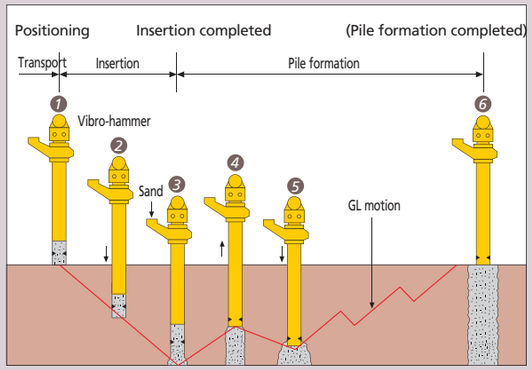
Spec: Normally we use a low frequency vibro-hammer (V-75, V-120) with a crawler crane (35~45 ton) as the base machine. When the long piles are required or large penetration resistance is anticipated due to the hard ground, the bigger hammer (V-180) and larger type of crane (with specially designed crawler crane) are adapted.



This method stabilizes soft ground by forming large-diameter, well compacted sand piles in the ground. This is done by driving a vibrating casing pipe down to the required depth and repeatedly extracting and driving back the pipe as it discharges sand.

Operating procedure

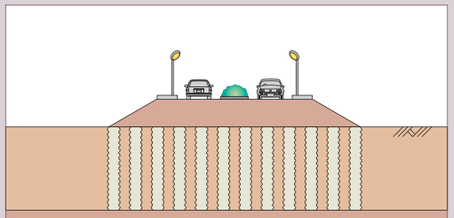
1. The casing pipe is correctly positioned.
2. The casing pipe is driven into the ground using a vibro-hammer.
3. When it reaches the required depth, the casing pipe is charged with a specified volume of sand.
4. As the casing pipe is raised by a specified margin, the sand is discharged into the ground using compressed air.
5. The sand pile is compacted and widened by driving the pipe back down into the sand.
6. The pipe-raising, sand discharge and re-driving procedure is repeated numerous times as the pipe is gradually removed, forming a complete compacted sand pile.



Monitoring

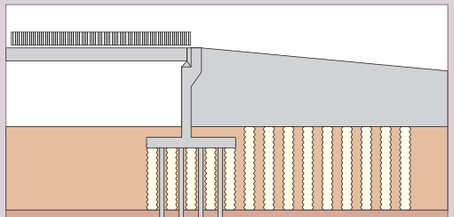
The pioneering Compozer method has a wide range of applications. Embankments for roads, railways or housing.

High Embankment for Roads, Railways and Housing



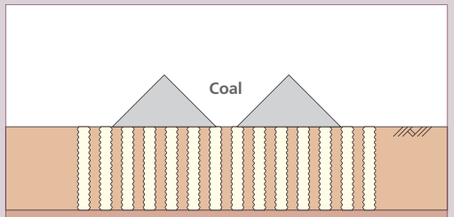
Objectives: Stability, Increasing Bearing Capacity, Reducing Settlement

Abutment, Approach Fill



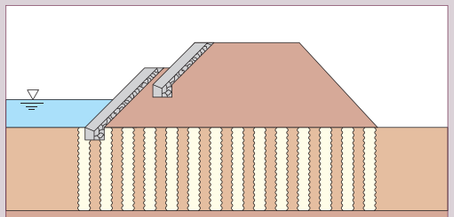
Objectives: Stability, Increasing Bearing Capacity, Preventing liquefaction, Increasing K-value

Storage Yard at Power Station, etc.



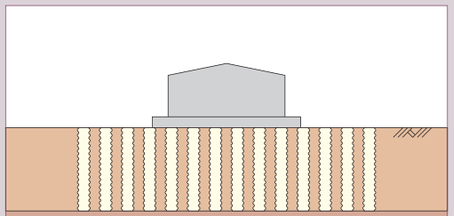
Objectives: Stability, Increasing Bearing Capacity, Reducing Settlement

River Dikes



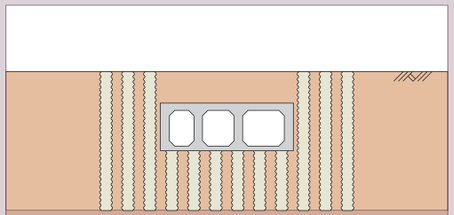
Objectives: Stability, Increasing Bearing Capacity, Reducing Settlement, Preventing liquefaction

Tanks, Silos and Retaining Walls, etc.



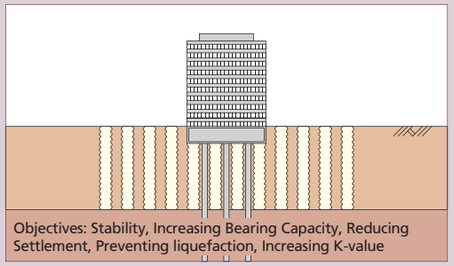
Objectives: Stability, Increasing Bearing Capacity, Reducing Settlement, Preventing Liquefaction, Increasing K-value

Underground Structures



Objectives: Increasing Bearing Capacity, Preventing liquefaction, Reducing Earth Pressure, Increasing K-value

Buildings and Factories

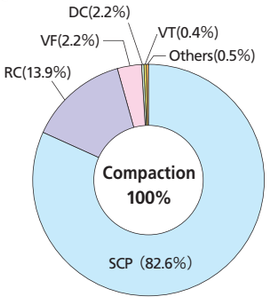


Objectives: Stability, Increasing Bearing Capacity, Reducing Settlement, Preventing liquefaction, Increasing K-value

Measures against Liquefaction.

Sand Compaction Pile method represented by Compozer is highly rated as a typical countermeasure for liquefaction, resulting in the largest market share over 80% of the whole anti-liquefaction projects.

SCP : Sand Compaction Pile
RC : Rod Compaction
VF : Vibro-Floatation
DC : Dynamic Consolidation
VT : Vibro-Tamper



Percentage of Anti-liquefaction methods based on Compaction

Sources: "Paper presented at the symposium for the measures against liquefaction" . The Japanese Society of Soil Mechanics and Foundation Engineering, Jan. 1991