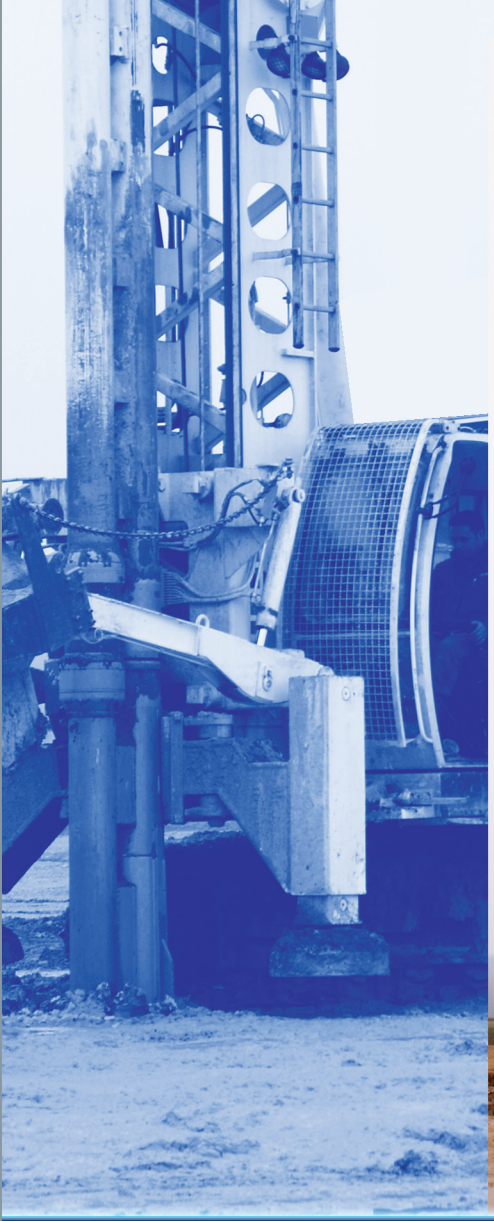


FOR SOIL IMPROVEMENT

STONE COLUMN RIG

Bottom Feed System (BFS)

FAYAT GROUP

Stone columns

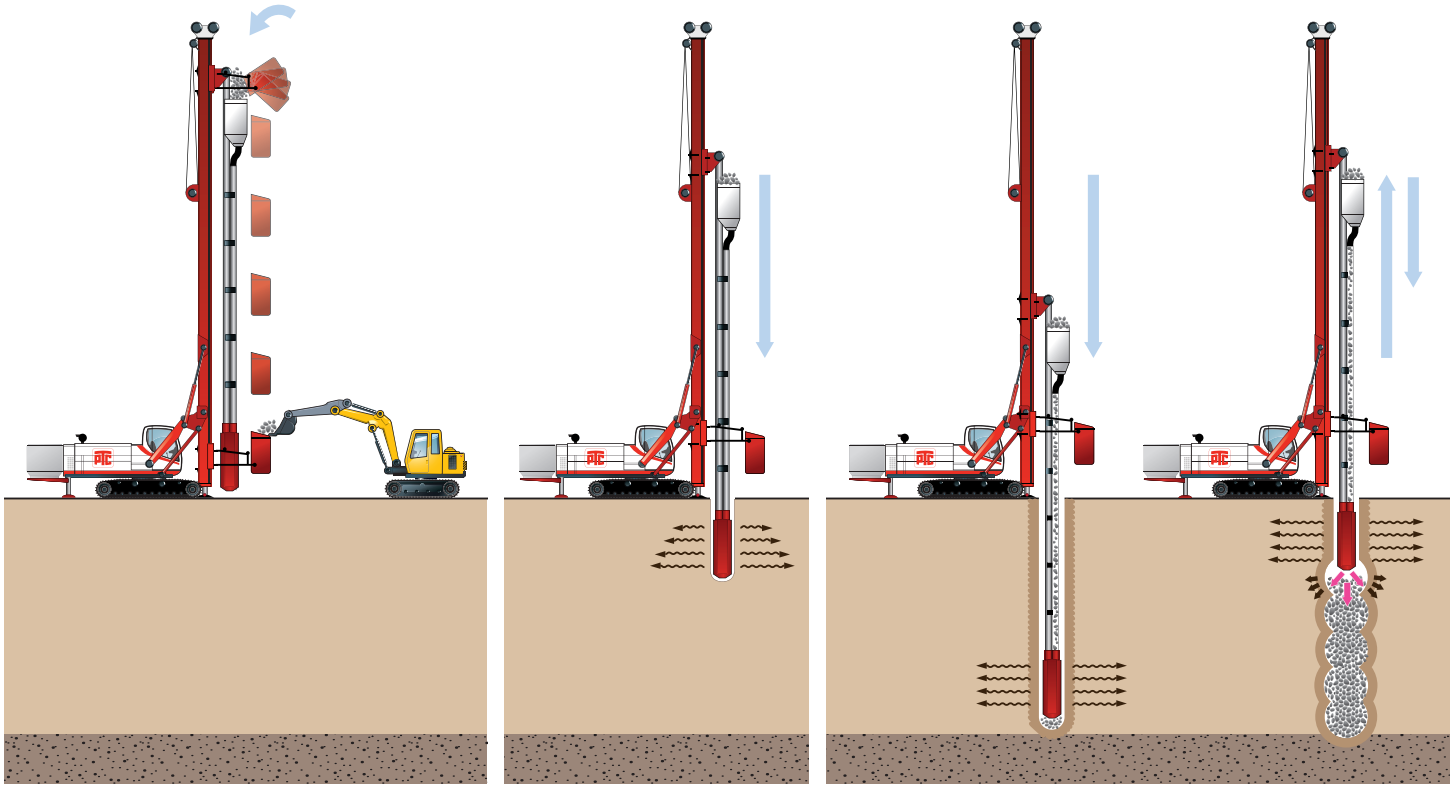
The installation of stone columns is one of the most widely-used ground improvement methods in the world. This technique consists in installing and compacting a pile of stones into the ground, following a grid pattern previously determined by a test trial.

Advantages of the stone column technique:

- Increases soil bearing capacity
- Reduces soil settlement
- Reduces liquefaction risk in seismic zones
- Homogenises variable soil properties, thereby reducing the potential for differential settlement
- Works as vertical drains, accelerating the dissipation of excess pore water and eliminating the interstitial pressure
- Stone columns adapt better to shear strength than rigid piles

Stone columns are used in soft cohesive saturated soils and mixed fills.

Stone columns using the Bottom Feed System (BFS)



1 - Preparation:

The poker Vibrator is positioned and the rig is stabilised. The skip is charged with stone at 1.5 m from the ground, and then it travels up the leader and automatically discharges the stone into the upper tank. Pressurised air pushes the stone through the feeding tube down to the Vibrator tip.

2 - Penetration:

PTC Vibrolance penetrates the ground under the action of its own weight and the lateral vibrations emitted at the poker, and assisted by the pull-down system of the rig.

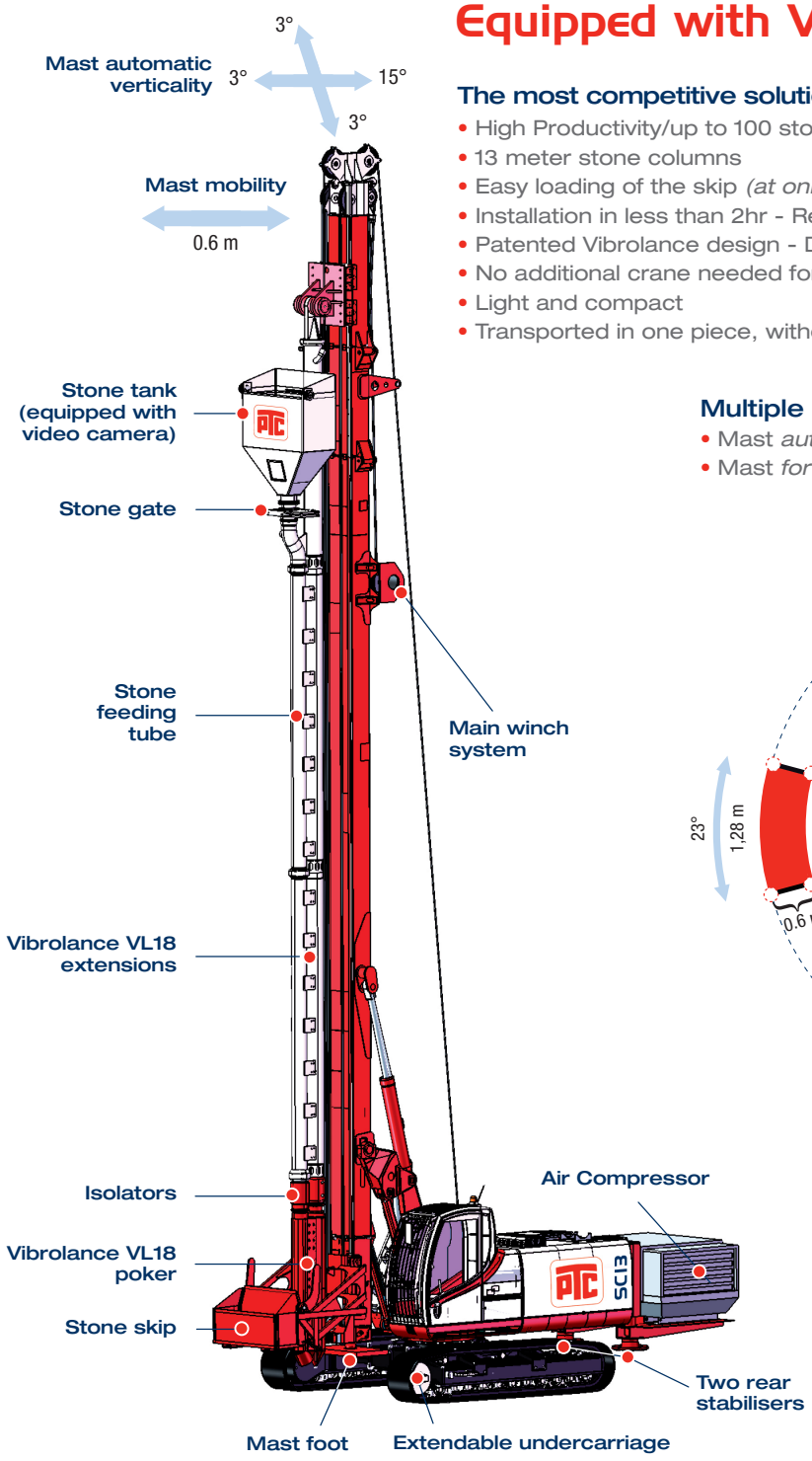
3 - Stone feeding & Compaction:

When the required depth is reached, the Vibrolance does a slight upward movement *(0.5 m approx.)* to create the space where the stone will be released. Pressurized air is blown through the pipe to push the stone into the ground. Afterwards, the Vibrolance does downward movements to compact the stones. This process is repeated at different depth levels until the compacted stone column reaches the surface. The stone column rig is then repositioned to start another stone column, following the grid pattern established by the contractor.

RESPECTING THE ENVIRONMENT

With stone columns the soil is treated with natural materials such as stone or gravel rather than chemical adjuvents (cement and bentonite), or steel used in other soil treatment methods.

STONE COLUMN RIG SC13



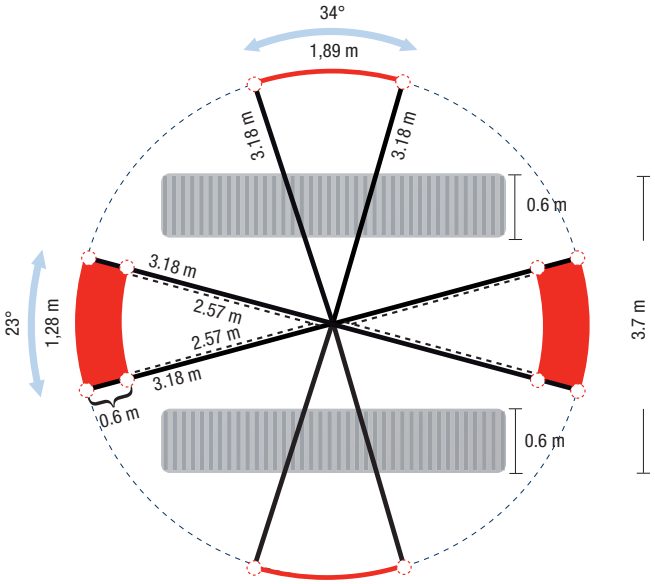
Equipped with Vibrolance VL18 BFS

The most competitive solution for stone columns with bottom feed system:

- High Productivity/up to 100 stone columns/day
- 13 meter stone columns
- Easy loading of the skip *(at only 1.5 m from the ground)*
- Installation in less than 2hr - Ready to use
- Patented Vibrolance design - Dismountable modules for easy on-site maintenance
- No additional crane needed for commissioning
- Light and compact
- Transported in one piece, without having to remove the Vibrolance

Multiple working zones

- Mast *automatic* verticality adjustement *(3° and 15°)*
- Mast *forward/backward* mobility *(0.6 m)*



Main Technical Data	SC13
Max. stone column depth	13 m
Height	20.6 m
Pull-down force	24 t
Operating weight	39,2 t
Engine power	194 kW / 260 HP

Main Technical Data	VL18 BFS
Eccentric moment	1.8 m.kg
Centrifugal force	181 kN
Frequency	50 Hz / 3000 rpm
Hydraulic power	110 kW / 150 HP

A qualitative and economical solution

Quality of the stone column

- Control of the length and diameter of the stone column

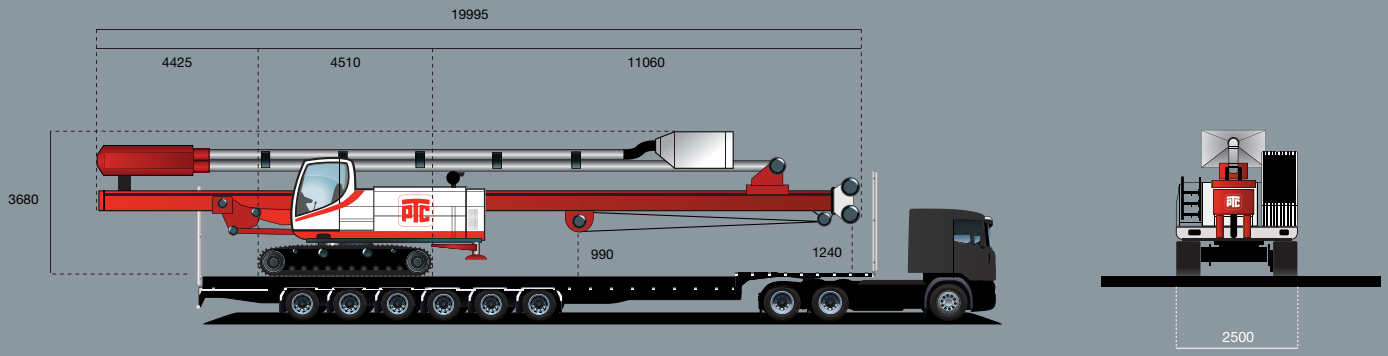
Continuous process:
Vibrator is not withdrawn from the ground until the stone column is finished

- No risk of soil collapse while stone is released, as with other methods
- No interruption of stone feeding

High productivity: Money and time savings

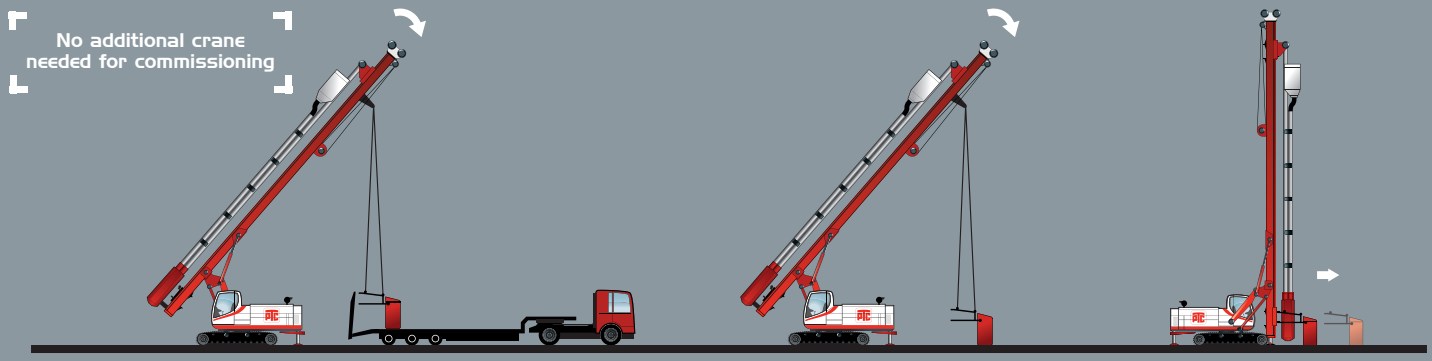
- Cheaper materials: stone *versus* concrete or steel, representing more savings per metre length
- Cheaper equipment: for the entire ground treatment job site
- Faster job site delivery

Transportation in one piece



VL18 BFS is transported mounted on Rig SC13 (39.2 t)

Stone skip easy installation on Rig SC13

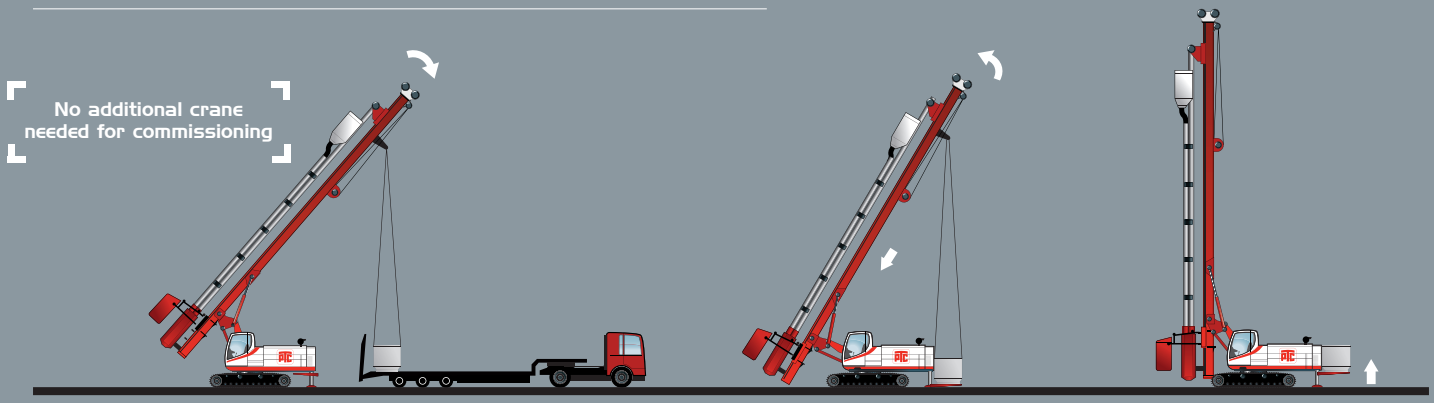


Unloading stone skip from truck
- Incline the mast
- Attach the slings

Floor positiong
- Lower the mast
- Detach the slings

Fixing stone skip on trolley
- Approch the mast in front of the skip
- Attach the skip to the trolley

Air compressor easy installation on Rig SC13



Unloading air compressor from truck
- Incline the mast
- Attach the slings

Positionning on compressor support
- Rise the mast
- Lower the parallelogram

Ready to use
- Lift stabilisers
- Lock compressor with pins

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