

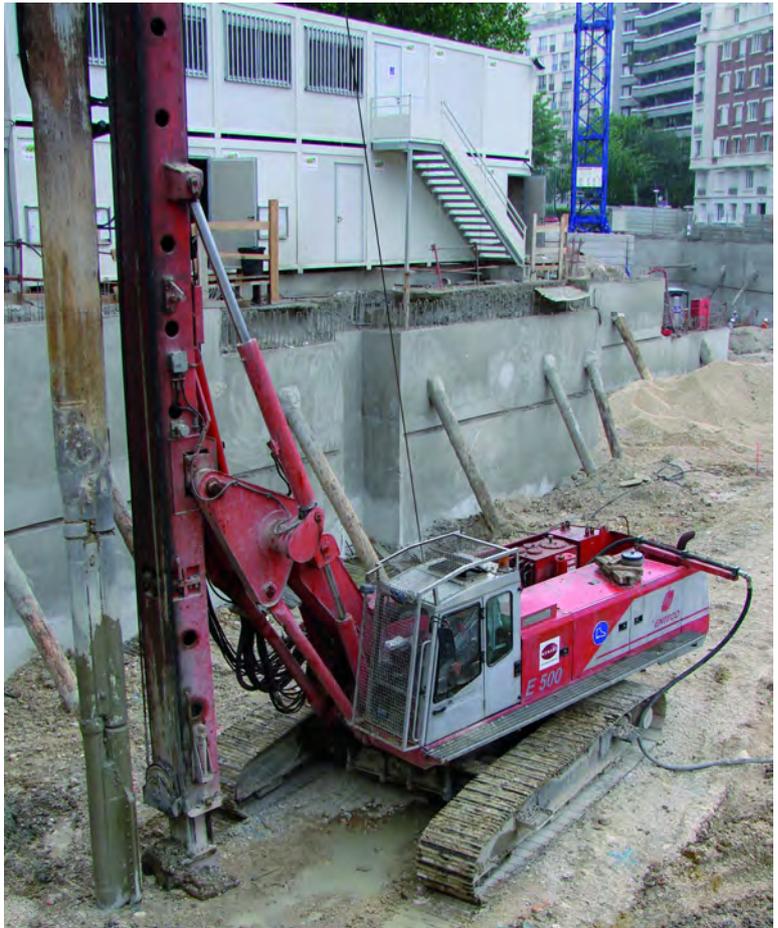
Vibro Stone Columns

Introduction

Vibro Stone Columns are designed to improve the load bearing capacity of insitu soils and fills and to reduce differential settlements of non-homogeneous and compressible soils, allowing the use of shallow footings and thinner base slabs.

Stone Columns are formed by inserting a vibrating probe to incorporate granular aggregate into the ground via the resulting void. This is followed by the re-compaction of granular aggregate. Both Top and Bottom feed techniques are available, depending on the stability of the insitu soils and water level. The Stone Columns are typically installed under uniformly loaded structures, such as building slabs and embankments, on a regular grid spacing. A load transfer platform can then be designed to spread the load from the structure to the improved ground.

This technology is well suited for the improvement of soft soils such as silty sand, silts, clays and non homogeneous fills. Due to their lack of lateral confinement organic soils, peat and very soft clays are not suitable for this method, and other ground improvement methods need to be considered.



Installation of Vibro Stone Columns by Vibroflot

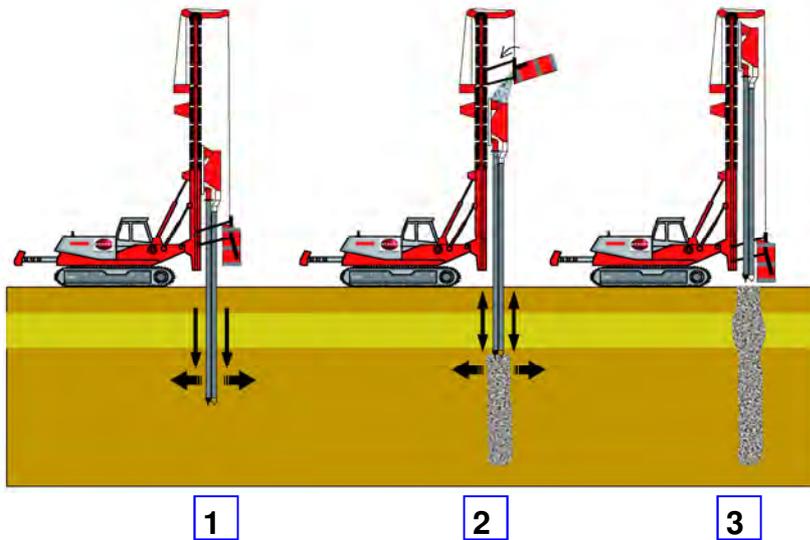
Advantages :

- **Increased bearing capacity**
- **Reduced total and differential settlements**
- **Expedites consolidation settlement**
- **Mitigates the risk of liquefaction**

Applications :

- **Up to 4 storey residential buildings**
- **Industrial & Commercial buildings**
- **Reinforced Soil Retaining Walls**
- **Road & Rail Embankments**

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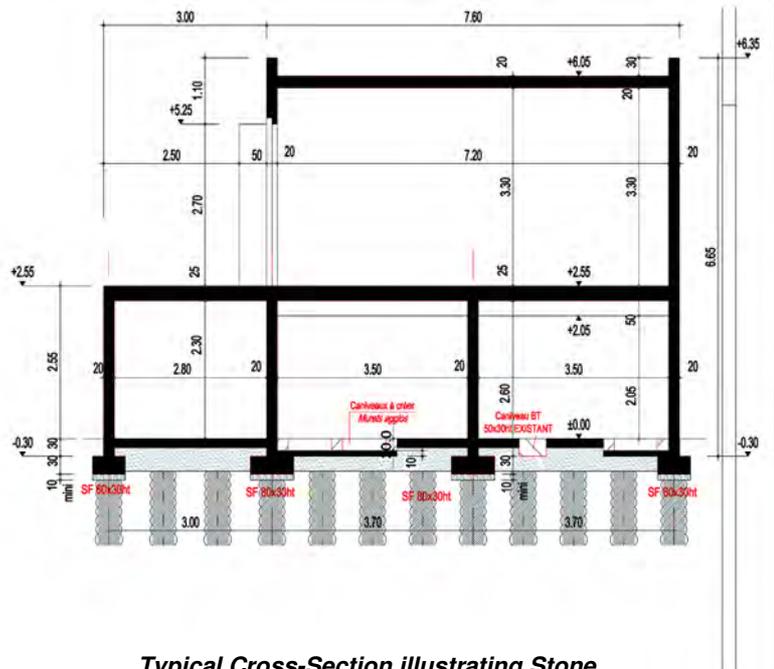


Method

1. Stone columns are formed by inserting a 130kW hydraulic or electric vibroflot using air as a jetting fluid, equipped with a pressure chamber facility. This combination gives the best results for the incorporation of the granular column backfill to the bottom of the column and delivers the continuity and optimum compaction required. The vibrating probe penetrates the soil to the design depth or refusal, and as a result the soil is displaced laterally without producing any spoil.
2. As the probe is lifted the granular fill is deposited into the void by gravity and assisted by the injection of compressed air. The aggregate is then compacted by repeated re-insertion of the vibrating probe, in lifts of 30-50cm, until the aggregates reach the surface.
3. The final diameter of the Stone Column depends on the properties of the surrounding soils and may vary with depth in non-homogeneous soils.



Marine Stone Columns at Dunkirk Harbour



Typical Cross-Section illustrating Stone Column/Footing connection