# OMS GROUND IMPROVEMENT EQUIPMENT

**OVF SERIES**
Stone Column Equipment

**WD SERIES**
Prefabricated Vertical Drain (PVD)
Installation Machine

www.omsvibro.com

# POWERFUL GROUND IMPROVEMENT EQUIPMENT BY OMS

## Manufacturer of Pile Driving Equipment for over 35 years!

### Why Choose the OMS?

OMS offers its nature-respecting and sustainable solutions, which are part of our mission to our customers and business partners in the best way with its quality and the environment of trust it provides. Also, OMS is growing rapidly by including new dealers in its structures while continuing to have a say in international trade. These are the top reasons why OMS is preferred and why we are getting closer to our vision of being situated in the most reliable and respected position in the sector and being the **"brand of the future"** day by day.

## OVF Series

### Stone Column Equipment



## WD Series

### Prefabricated Vertical Drain (PVD) Installation Machine

*We support our customers by recommending the best ground improvement equipment solutions. Vibro compaction and vibro replacement (stone columns), as well as vertical drain (wick drain) equipment, of OMS have proved themselves in the global market from Europe to the Middle East, South East Asia and America continent.*

Ground engineering plays an increasingly important role in social and industrial development, especially in connection with major construction projects such as power stations or the expansion of infrastructure systems (railways, harbours, airports, etc.). The objectives of deep **vibro compaction** and **vibro replacement** are to improve the strength and deformation characteristics of problematic soils to a certain degree so that structures can be supported safely and economically on or below the improved ground surface.

Vibro compaction and vibro replacement can be another option as technical methods which is used for unfavourable soil conditions that provide a transition between the deep foundation and soil stabilisation. These methods increase the strength of the weak layer and utilise the benefit of improved resistance.

At this point, the OMS provides the right soil improvement equipment as a solution for its customers. The vibro compaction and vibro replacement (stone columns), as well as vertical drain (wick drain) equipment, of OMS plays a crucial role in the market from Germany to the Middle East, South East Asia, and America continent.

# VIBRO COMPACTION (Top Feed System)

The OMS vibro compaction method is mostly used in granular soils that are at seismic risk and thus, the method itself is suitable for land reclamation projects to mitigate the risk of liquefaction. This technique is for densifying sand-like soils on site by means of an OMS Vibroflotation probe. With the simultaneous vibration and saturation impact, loose sand particles are repacked into a more compact state and lateral confining pressure within the sand mass is increased.

The vibro compaction technique is most suitable for medium to coarse-grained sand with silt content. Cohesive soil consisting of silt and clay material does not respond to vibratory compaction. The following illustration explains the operation:

The typical OMS configurations of the vibro compaction technique:

1. Tandem Free Hanging
2. Single Free Hanging

**The tandem vibro compaction** configuration is consisting of two vibroflotation probes suspending from the same crane. It is mostly preferred in land reclamation, railway, highway projects etc. The quality of the compaction/stone column can be monitored with a data logger supplied by OMS. Hence, the depth, compaction rate, time related compaction and withdrawals as well as gravel volume can be measured and monitored.

**The single free hanging vibroflotation** probe comprises of the same interchangeable parts as the tandem set. The depth of compaction or stone column can be deeper, therefore projects that are medium to small scale are suitable for to be executed with a single free hanging system. Compared to the tandem system, the crane capacity of the vibroflotation probe is slightly smaller. On the other hand, just like a tandem system, the quality of the compaction/stone column can be monitored with a “data logger” so that, depth, compaction rate, time related compaction and withdrawals as well as gravel volume can be measured and monitored.

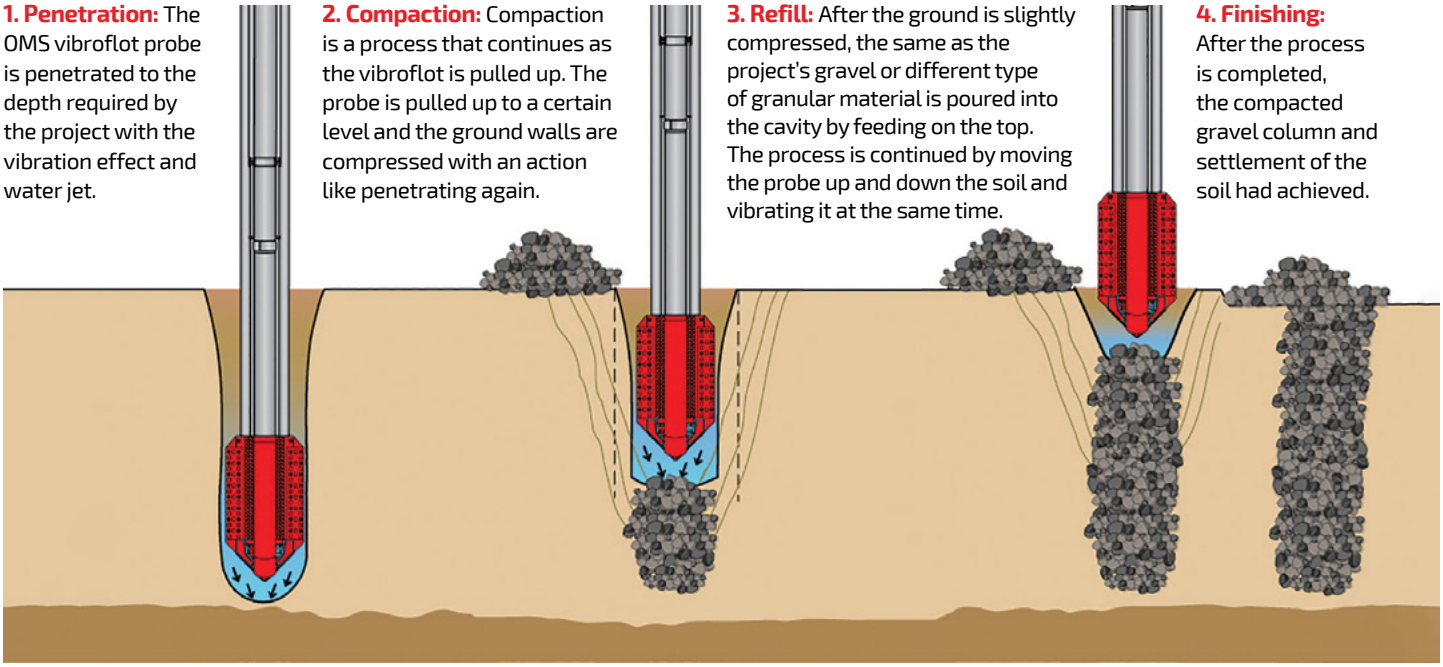
# Operation Procedure of Vibro Compaction

**1. Penetration:** The OMS vibroflot probe is penetrated to the depth required by the project with the vibration effect and water jet.

**2. Compaction:** Compaction is a process that continues as the vibroflot is pulled up. The probe is pulled up to a certain level and the ground walls are compressed with an action like penetrating again.

**3. Refill:** After the ground is slightly compressed, the same as the project's gravel or different type of granular material is poured into the cavity by feeding on the top. The process is continued by moving the probe up and down the soil and vibrating it at the same time.

**4. Finishing:** After the process is completed, the compacted gravel column and settlement of the soil had achieved.

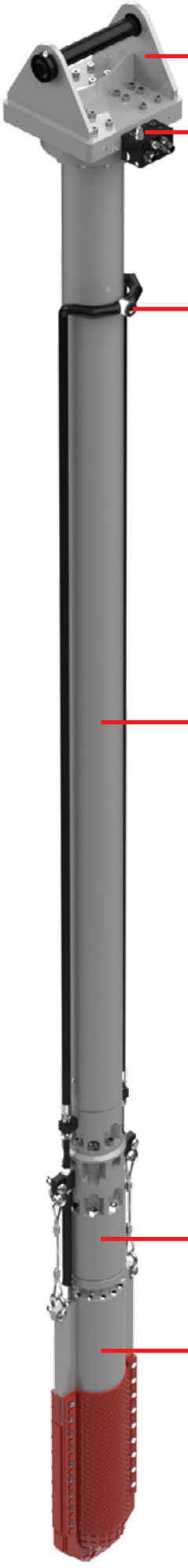


## TANDEM FREE HANGING

The configuration of tandem vibro compaction comprises of two vibroflotation probes suspending from the same crane.

## SINGLE FREE HANGING

The configuration of single free hanging vibroflotation probe consists of the same interchangeable parts as the tandem set.


Connection Fork
Hydraulic Block
Water Pipe
Follower Pipe
Isolator
Vibroflot

# VIBRO REPLACEMENT (Bottom Feed System)

**Vibro Replacement Stone Column** is a soil improvement system by which vertical columns of compacted gravel are placed into soil. This is a technique that builds load-bearing columns made out of gravel or crushed stones in a cohesive soil and granular soil with high fines content.

Vibro replacement stone columns have been used to improve a wide range of soil from very soft clays and peat to materials marginally suitable for the vibro compaction method. The equipment used for the vibro replacement method is (other than for the vibro displacement method) identical to the one used in the vibro compaction method.

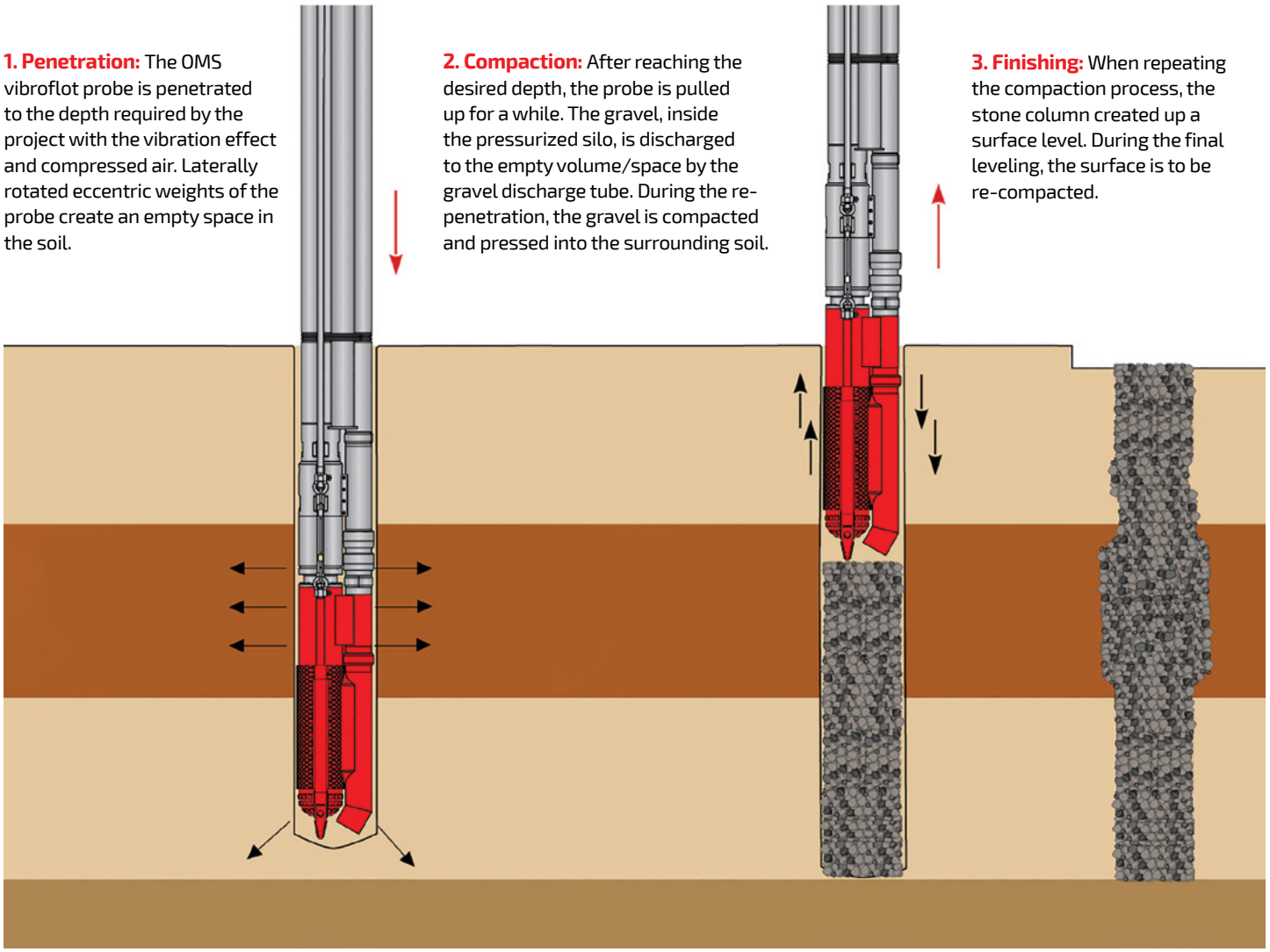
For the operation of vibro replacement columns (stone/gravel columns) “the bottom feed" process feeds gravel to the end of the vibroflotation probe with the aid of pressurised air. For the optimum performance of this process, OMS has developed the vibroflotation probe and gravel hopper with a pressure chamber. These OMS vibroflotation probes can be mounted on an existing drill rig or leader, crane or excavator.

# Operation Procedure of Vibro Replacement

**1. Penetration:** The OMS vibroflot probe is penetrated to the depth required by the project with the vibration effect and compressed air. Laterally rotated eccentric weights of the probe create an empty space in the soil.

**2. Compaction:** After reaching the desired depth, the probe is pulled up for a while. The gravel, inside the pressurized silo, is discharged to the empty volume/space by the gravel discharge tube. During the re-penetration, the gravel is compacted and pressed into the surrounding soil.

**3. Finishing:** When repeating the compaction process, the stone column created up a surface level. During the final leveling, the surface is to be re-compacted.



## The typical OMS configurations of the vibro replacement technique:

1. Drill Rig / Leader Mounted Bottom Feed Vibroflotation
2. Bottom Feed Free Hanging Vibroflotation
3. Excavator Mounted Bottom Feed Vibroflotation

# Typical Configuration of Vibro Replacement

## DRILL RIG / LEADER MOUNTED

Probe is easy to mount on an existing drill rig or a leader.

## BOTTOM FEED FREE HANGING

Probe with a gravel hopper is suspended by a crane.


## EXCAVATOR MOUNTED

Excavator selection is crucial in this configuration.

## 1. Drill Rig / Leader Mounted

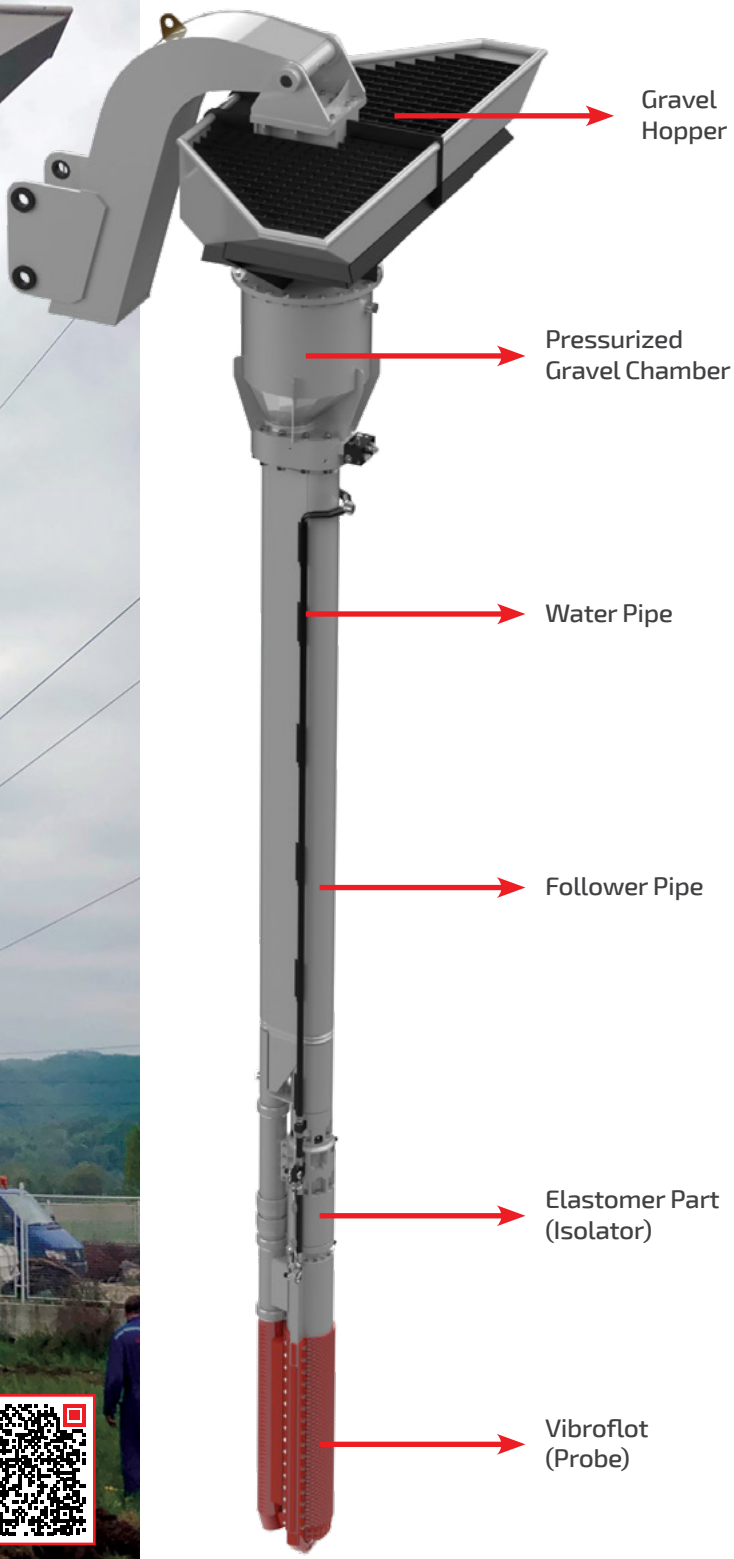
The OMS vibroflotation probe (bottom feed system) with gravel hopper can be easily mounted on an existing drill rig or a leader with a supervisor from OMS technical team. This particular configuration is advantageous since the drill rig or leader is equipped with a pull-down system, thus, allowing additional pull-down pressure to be exerted during penetration and compaction.


## 2. Bottom Feed Free Hanging

The OMS vibroflotation probe (bottom feed system) with a gravel hopper suspended by a crane.
For the configuration, the crane capacity should be suitable to carry on suspended weights.

# 3. Excavator Mounted Bottom Feed Vibroflot

The OMS bottom feed system is easier to mount on a customer's excavator. In any case, the help of the OMS supervision team is needed. Also, it is simpler to operate and cost-friendly. However, stone columns come with limited depth because excavators have certain limits. Excavator selection is crucial in this configuration. Vibroflotation probe is operated with the excavator's hydraulic system. Depending on the excavator's limitation, the depth of the stone column becomes limited.



# Monitoring and Reporting


## Control Panel of Data Loggers

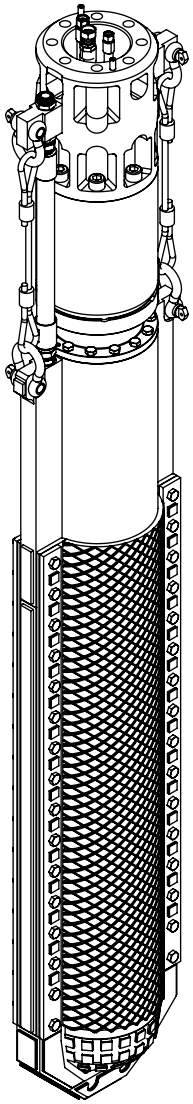
OMS vibro compaction and vibro replacement outputs can be monitored with a OMS "data logger" system. During the vibro compaction and vibro replacement operation numbers of different sites and parameters are automatically recorded. The following parameters can be measured, saved and printed as proof of production and quantities:

- Date
- Site Name
- Depth of Penetration
- Compaction Point Reference Number
- Compaction Rate (Pressure)
- Volume of Gravel

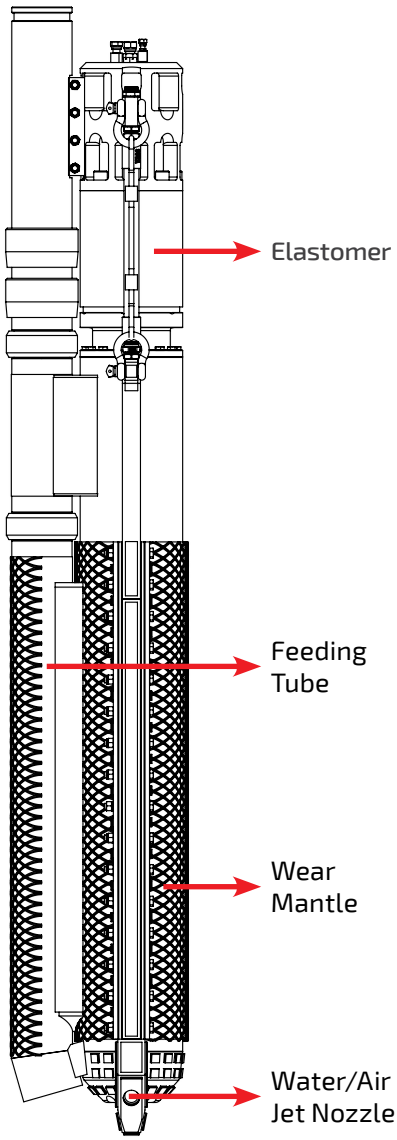
Monitors, which have a membrane keypad and LCD screen, are placed in a waterproof slot. The operator can control the compression process parameters from the screen.

Fast Work | Time Manage | Touch Screen | Search | Settings | Report

**Top Feed Probe**



**Bottom Feed Probe**

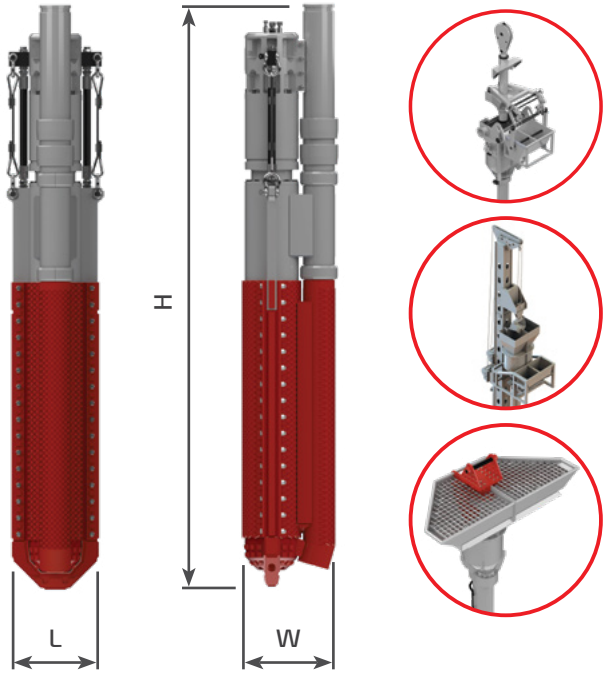


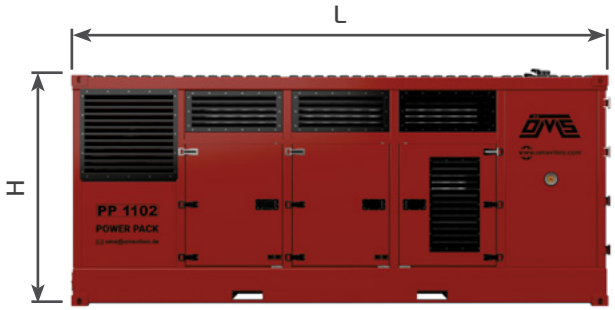
# Technical Specifications

Probe

Probe With Feeding Mechanism

Gravel Reservoirs




| Vibroflot | 300-2 | | 300-4 | |
|---|---|---|---|---|
| **Unit** | **Metric** | **US** | **Metric** | **US** |
| Eccentric Moment (kgm / in.lbs) | 2 | 174 | 4 | 347 |
| Frequency (rpm / Hz) | 3000/50 | 3000 | 3000/50 | 3000 |
| Centrifugal Force (kN / tons) | 200 | 22.5 | 396 | 44.5 |
| Oil Flow (lpm / gpm) | 180 | 48 | 330 | 87 |
| Power (kW / hP) | 105 | 141 | 193 | 259 |
| **Power Pack** | | **PP 218** | | **PP 320** |
| Output (kW / hP) | 160 | 218 | 235 | 320 |

## Top Feed Vibroflot

| Weight and Dimensions | Metric | US | Metric | US |
|---|---|---|---|---|
| Weight (kg / lbs) | 1620 | 3571 | 2250 | 4960 |
| Height / H (mm / in) | 2870 | 113 | 3560 | 140 |
| Width / W (mm / in) | 376 | 15 | 376 | 15 |
| Length / L (mm / in) | 560 | 22 | 560 | 22 |

## Bottom Feed Vibroflot

| Weight and Dimensions | Metric | US | Metric | US |
|---|---|---|---|---|
| Weight (kg / lbs) | 2100 | 4630 | 2812 | 6199 |
| Height / H (mm / in) | 3745 | 147 | 4436 | 177 |
| Width / W (mm / in) | 590 | 23 | 590 | 23 |
| Length / L (mm / in) | 560 | 22 | 560 | 22 |

* Technical specifications are calculated on maximum pressure and oilflow base. Required flow and pressure can be set according to the needs.

| Power Pack | PP 218 | | PP 320 | |
|---|---|---|---|---|
| **Unit** | **Metric** | **US** | **Metric** | **US** |
| Oil Flow Max . (lpm / gpm) | 232 | 61 | 460 | 121.4 |
| Pressure Max. (bar / psi) | 350 | 5000 | 350 | 5000 |
| Oil Capacity (liter / gal) | 450 | 118.8 | 500 | 132 |
| Diesel Tank Capacity (liter / gal) | 450 | 118.8 | 650 | 171.6 |
| Width / W (mm / in) | 1610 | 64 | 1660 | 65 |
| Length / L (mm / in) | 3720 | 147 | 4230 | 166 |
| Height / H (mm / in) | 1740 | 69 | 1750 | 69 |


* Power packs are named according to horse power of its engine. Depending on availability of engine, power pack names can be changed.


The most efficient
results at a low cost!..

# WICK DRAIN (PVD) INSERTER

## Prefabricated Vertical Drain (PVD) Installation Equipment

## *COMBINED WICK POWER!*

- ***STRONG GEAR DRIVER UNIT** installs the PVD material into the soil.*
- ***VIBRO HAMMER** reduces the resistance of the ground with vibration.*

# Advantages of Wick Drain Equipment:

The **OMS Wick Drain Installation Machine** is a soil improvement machine that is used for the quick consolidation of cohesive soils. The machine is consisting of; hydromotors, sprocket gears, a mandrel and a high frequency vibro hammer. It is very useful equipment to drain the water in the cohesive soils, thus, the liquefaction risk is minimal and settlement time is faster than standard procedures.

The difficulties experienced by engineers in the design of structures built on loose and liquid soils have necessitated various improvement methods throughout history. Unpredictable long-term ground settlements cause unnecessary labor and additional costs, as well as a waste of time.

Simple and ordinary ground consolidation works can take quite a long time. This waste of time can be overcome by creating artificial vertical drainage paths through which water flow can be achieved.


*The driving and extracting force of the Wick Drain machine is 276 kN, and the combined force (wick drain + vibro hammer) is 711 kN. Related to the enormous static and dynamic force, the machine is stronger and drives deeper. Depending on the soil condition, the machine is faster due to the operation of the mandrel and its speed up to 100 m/min.*

**Wick drain can be applied in all areas requiring ground consolidation, including the following areas;**

- Highway walls, embankments, impoundment,
- Bridge roads, routes and crossings,
- Dams,
- Railroads,
- Airports and harbors, ports,
- Storage tanks,
- Mining waste ponds.

# Operation Procedure of Installation Wick Drain

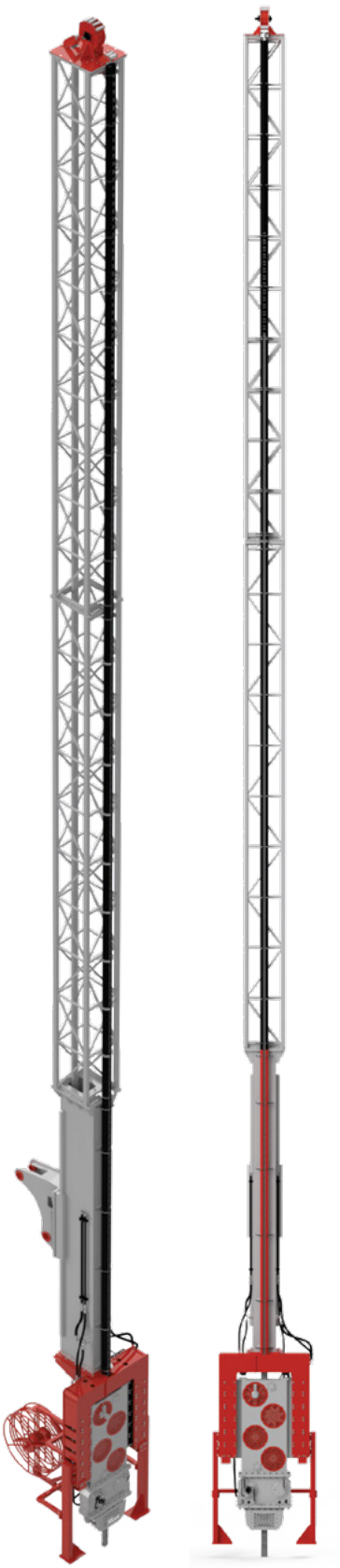
- Wick drains in rolls are installed in the drain drum located on the machine.
- Sand, gravel, or suitable materials are also called drain blankets shortly, are laid on the ground to be placed in the wick drain.
- The system is rigged to a vertical position with the help of an excavator. The product is ready for operation.
- The specially designed button type mandrel is driven to the desired depth by the OMS Wick Drain Installation Machine. After installing the mandrel, PVD material leaves into the ground.
- This operation is repeated at each predetermined drainage. In different areas of application, the depth at which the operation should be performed may vary.
- After the installation of all the drains is completed, the ground should be loaded with earth material required by the project. The groundwater rises to the surface through the drains.

# WD 28 - 43 Technical Specifications

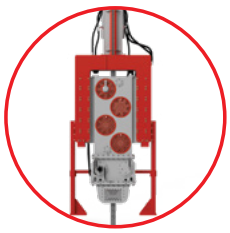
| Technical Data | WD 28 - 43 | |
|---|---|---|
| **Unit** | **Metric** | **US** |
| Static (crowd) Force (kN) (tons) | 276 | 31 |
| Dynamic Force (kN) (tons) | 435 | 49 |
| Combined Force (kN) (tons) | 711 | 80 |
| Operating Frequency (rpm) | 2500 | 2500 |
| Pressure Max. (bar) (psi) | 350 | 5076 |
| Oil Flow Vibro Max. (l/min) (gpm) | 200 | 53 |
| Oil Flow Wick Max. (l/min) (gpm) | 506 | 134 |
| Mandrel Speed Max. (m/min) (ft/min) | 100 | 328 |
| **Recommended Excavator Working Weight (ton)** | | |
| | | 45 - 60 |

## Weights and Dimensions

| Unit | Metric | US |
|---|---|---|
| Suspended Weight (kg) (lbs) | 3077 | 6784 |
| Length / L (mm - in) | 2040 | 80 |
| Height / H1 (mm - in) | 3005 | 118 |
| Height / H2 (mm - in) | 436 | 17 |
| Width / W (mm - in) | 920 | 36 |

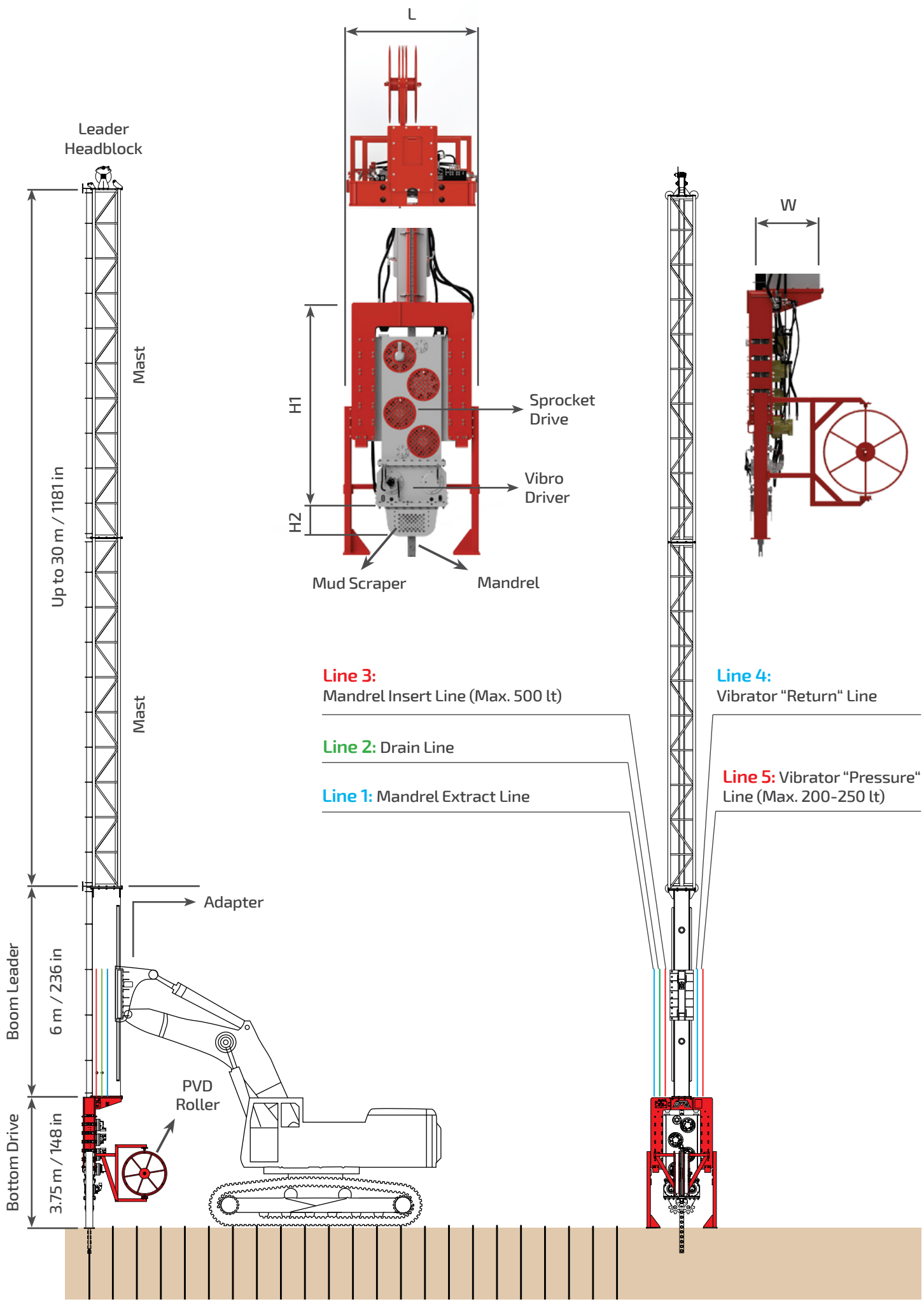


Back View



Front View

Isometric View


L
W
H1
H2
Leader
Headblock
Mast
Mast
Up to 30 m / 1181 in
Sprocket
Drive
Vibro
Driver
Mud Scraper
Mandrel
Line 3:
Mandrel Insert Line (Max. 500 lt)
Line 4:
Vibrator "Return" Line
Line 2: Drain Line
Line 5: Vibrator "Pressure"
Line (Max. 200-250 lt)
Line 1: Mandrel Extract Line
Adapter
Boom Leader
6 m / 236 in
PVD
Roller
Bottom Drive
3.75 m / 148 in

*OMS Vibro Website*

*WD 28-43 Video*

**OMS Pile Driving Equipment**

oms@omsvibro.com

/ omsvibro

**OMS Ground Improvement Equipment - Product Catalog**



ÖZKANLAR GRUP

www.omsvibro.com