VDW Procedure
Double Auger Head System

Method description

VDW procedure

A good solution for inner city shoring

What is VDW?

VDW stands for „in front of the wall = **V**or **D**er **W**and“ drilling procedure. It is a vibration free and low noise procedure used for installation of single piles, as well as contiguous, tangential or secant pile walls.

In the city centres space is precious and for this reason e.g. parking lots are moved under the earth's surface or even small gaps between buildings are filled. Featuring efficiency and environmentally friendliness is the VDW procedure well suitable for such projects.

Due to the high flexibility of the ABI telescopic leader mast or DELMAG drilling rig and the characteristics of the VDW procedure enables its direct application next to adjacent buildings. It is used not only for new projects but also for restoration, e.g. for propping up existing buildings.

The advantages

Low noise - the noise emissions are reduced to those of the carrier and the concrete pump.

Economically - through the possibility working directly on adjacent buildings no place is lost and at the same time the installed wall serves as foundation for the new building.

Vibration free - vibrations are hardly present. No damaging vibrations are transferred to the neighbouring or adjacent buildings.

Soil conditions

The VDW procedure is suitable for all middle dense cohesive and non-cohesive soils.

The typical applications

Pile walls (contiguous, tangential or secant type)
Drilling with casing for pile foundations
Well drillings
Injection drilling and ground improvement
Part or full displacement drilling

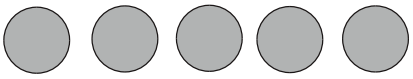
Shoring variations

The VDW procedure is mainly used for retaining wall of excavations. An excavation represents a stability problem. The arising loads can be intercepted with a VDW secant pile wall. The selection of the method depends on whether the construction is for temporarily or long term securing purposes.

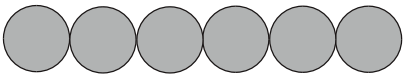
VDW procedure

Contiguous pile wall

Contiguous pile wall is installed by positioning the piles next to each other, whereby the distance depends on the ground conditions. In firm cohesive soils the distance can be increased. As additional safety measure anchors between the pile gaps can be added. The contiguous pile wall is an alternative to the secant or diaphragm wall. This type of wall can be used in different soils most often where dewatering is not necessary.



A special form of the contiguous pile wall is the tangential pile wall. In this variant the piles tangent each other, water tightness is not given.



The drilling sequence for a contiguous pile wall is depending on the distances between the piles. With sufficient distances the piles can be bored successively. By smaller distances and tangential pile walls first the piles 1 - 3 - 5 - 7 etc. are installed and about two hours later the piles 2 - 4 - 6 - 8 etc.

Secant pile wall

The secant pile wall comprises piles, which have positive overlapping with each other. In the first step the primary piles are manufactured. The secondary piles are cut about two days later into the primary piles. The size of the distance between the primary piles depends on the pile diameter and the desired overlapping. An optimal overlapping amounts approx. 10 cm. The drilling sequences can vary, depending on site conditions.

For the selection of the concrete the country-specific standards must be considered. In order to reach higher bearing capacity, the piles can be strengthened with reinforcement. The VDW procedure can be used also in combination with soil mixing procedure WSM. The primary piles are installed by WSM and the secondary piles by using VDW double auger head system.

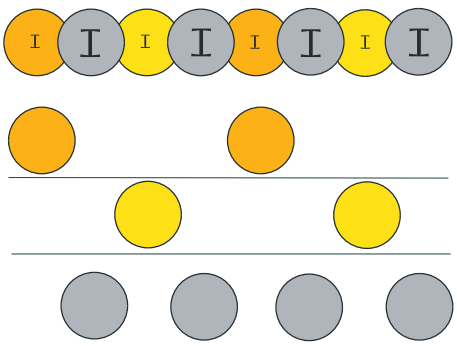
The use of a ABI MOBILRAM-System or DELMAG drilling rig in connection with the VDW double auger head system provides a high degree on vertical control and a good positioning of the piles. The system is also ideal for irregular wall patterns. The secant pile wall can also be used as cut-off wall.

Finished secant pile wall
with reinforcement

Primary piles with drilling sequence
1 - 5 - 9 - 13 - 17 etc.

Primary piles with drilling sequence
3 - 7 - 11 – 15

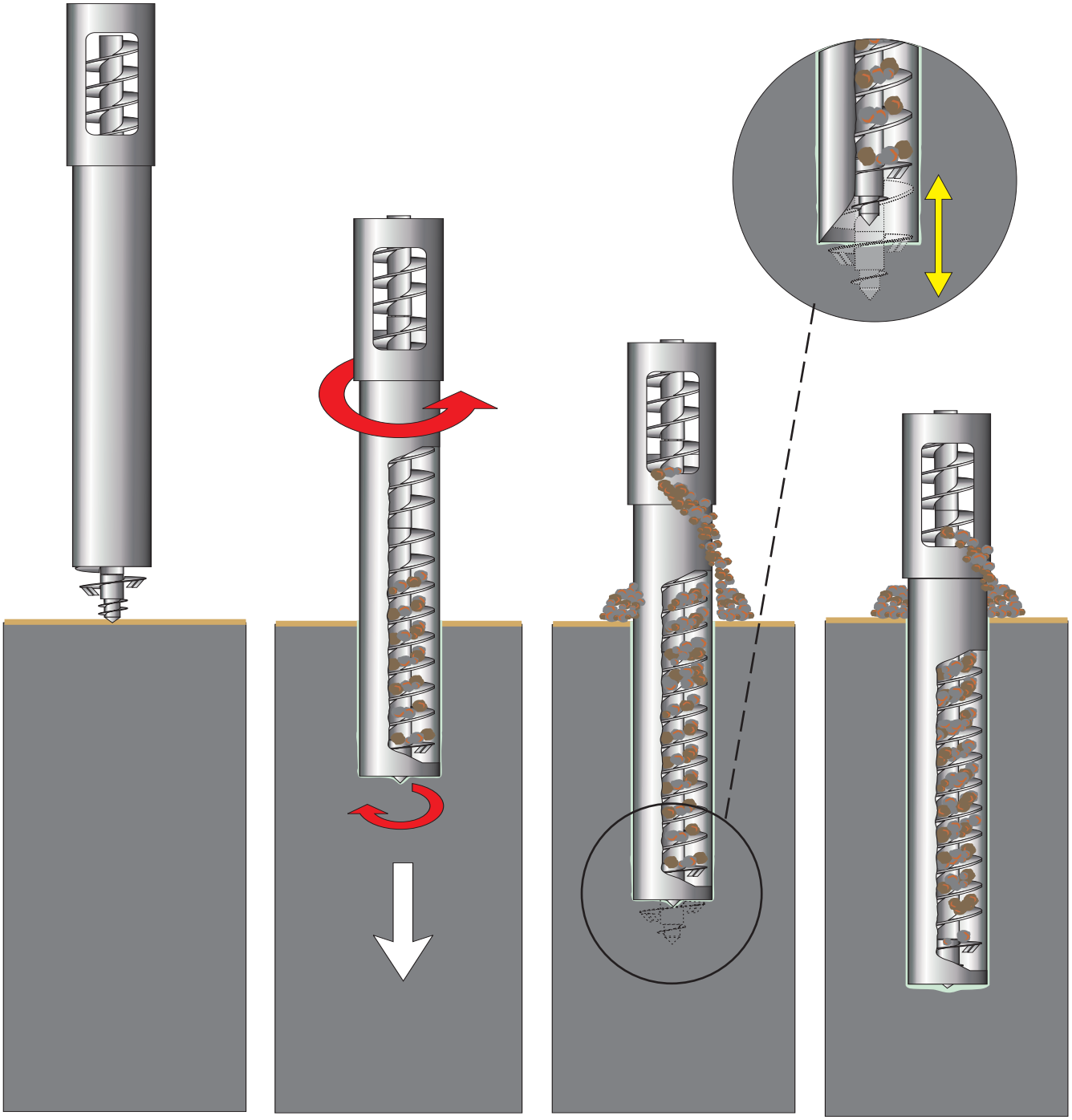
Secondary piles 2 - 4 - 6 - 8 – 10



VDW procedure

The installation process

Depending on ground conditions, motorisation of the carrier, usable length and the power of auger drive the VDW method can be used for piles with diameter of 350 to 620 mm and length of approx. 20 m can be installed. The double auger head system VDW is operated with high revolutions. The right choice of the carrier is enormously important.



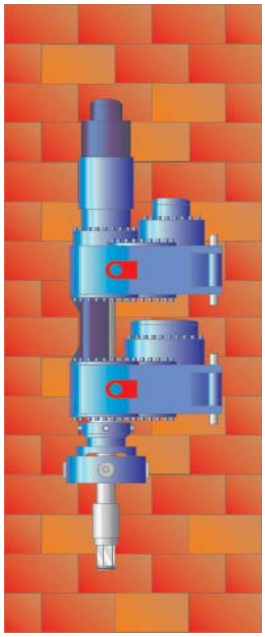
Vertical aligning of auger and casing.

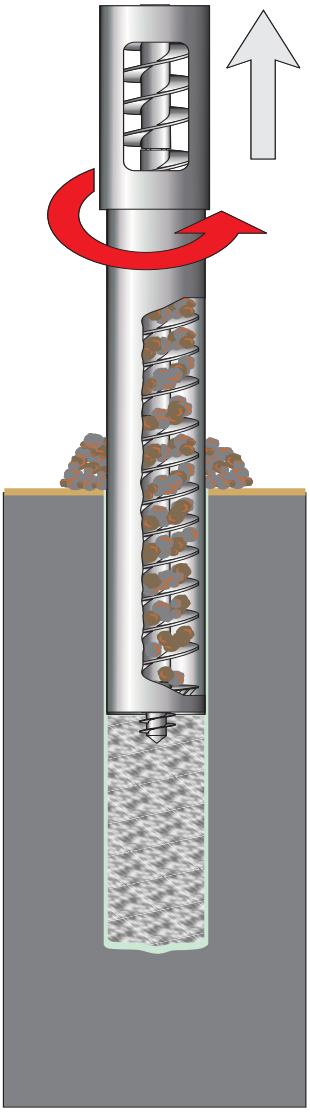
The auger is rotating clockwise while the casing turns counter clockwise. The positioning of the auger head to the casing is depending an the soil conditions.

The auger head is drilled down to the required depth. The spoil is ejected through openings on the upper end of the casing.

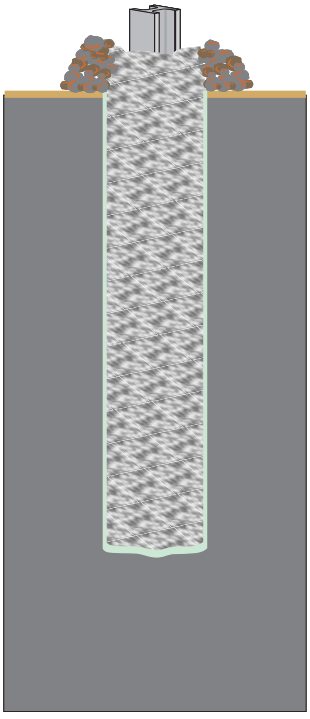
A hydraulic cylinder allows the positioning of the auger head to achieve a clean pile footing.

VDW procedure





While retracting auger and casing simultaneously the concrete is being pumped in the excavation.



The finished pile. For higher bearing capacity the fresh pile can be reinforced.

The double auger head system VDW can be mounted on an ABI MOBILRAM-System or DELMAG drilling rig. A 90 degrees picking up and lay down device makes the set up procedure easier, so that no installation aids are necessary. Casing and auger string are pulled together upward with the VDW double auger head system.

The double auger head system VDW consists of two vertically arranged auger drives. The upper auger drive propels the auger, while the lower one turns the casing in opposite direction. The casing and auger string can be adjusted approx. 300 mm to each other with a hydraulic cylinder. The length of the casing and the auger must be matched to each other, so that an optimal use of the hydraulic cylinder for positioning of the auger head is possible. In cohesive soils or when drilling in old foundations, for primary piles and by the risk of soil collapsing, the casing is advancing the auger. In dense soils structures the drilling head is advancing the casing tube.

The spoil is ejected by openings at the upper end of the casing. Through rotation in opposite directions the ejection of the discharge is accelerated. The bore hole is filled with concrete, which is pumped by a separate concrete pump through the swivel of the auger head. The auger head and the casing are pulled simultaneously during the concreting. The result is a better connection to the adjacent soil as with other methods.

VDW procedure

Site examples

Ground release drilling in Rannersdorf, Austria

An atypical application example for the VDW procedure, but a good presentation of the interaction of the ABI MOBILRAM-System and the attachments.

The ground release drillings in Rannersdorf were made with the ABI MOBILRAM-System TM 14/16 B equipped with the VDW 6035. On this site a high verticality of the drillings had to be ensured. For this reason the VDW procedure was selected.

In the middle picture the lifting of the casing with the auger is to be seen. The double auger head system is equipped with an picking up and lay down device, which makes the set up of auger tools from the horizontal into the vertical position possible. Thus the set up times are reduced and the safety is increased.

Bottom left shows the casing guide. This provides a good guidance and an accurate verticality. On the bottom right, the casing with its auger inside is reaching nearly the required depth of 15 m. The diameter of the ground release drilling was 508 mm.

Preparations for the Cinemax in Padova, Italy

After the pattern of the wall was set a template for precise positioning was installed. Pieces of Styrofoam in a plan view form of the secant pile wall were fixed with a frame and poured in concrete.

The positioning device is recommended, so that reinforcement can be positioned later on accurately. In addition it serves as guidance for the casing.

Finished secant pile walls

Above all, the flexibility of the procedure is to be emphasized. With the VDW system all kind of wall patterns - should it be the classical square type or the most unusual form – could be installed.

To be able to build in the city centres new buildings often an old one must be torn off. The old foundation walls were in former times a problem. They could not be removed because of collapse danger . The new foundation wall had to be installed in front of the old one and thus resulted space loss. With the VDW procedure existing brick-work can be replaced by a secant pile wall without collapse danger for the neighbouring buildings. The wall is perforated and the material is removed. When concreting, the porous wall material connects with the concrete, so that the secant pile wall shows a brick pattern.

The finished piles can be reinforced with H-beams for a higher load bearing capacity.

ABI Gruppe

ABI · BANUT · DELMAG

For further information please contact your ABI sales assistant. Or you visit us on the Internet at www.abi-gmbh.de. Design subject to modifications. The details in this leaflet have to be regarded as approximate. The illustrations also can contain special outfits which are not part of the standard scope of supply. Not represented equipment variants can lead to modifications of the technical data.

ABI Maschinenfabrik
und Vertriebsgesellschaft mbH
Am Knückel 4
D-63843 Niedernberg
Germany

Telefon: +49 (0) 6028 123-101, -102
Telefax: +49 (0) 6028 123-109
eMail: info@abi-gmbh.de

www.abi-group.com