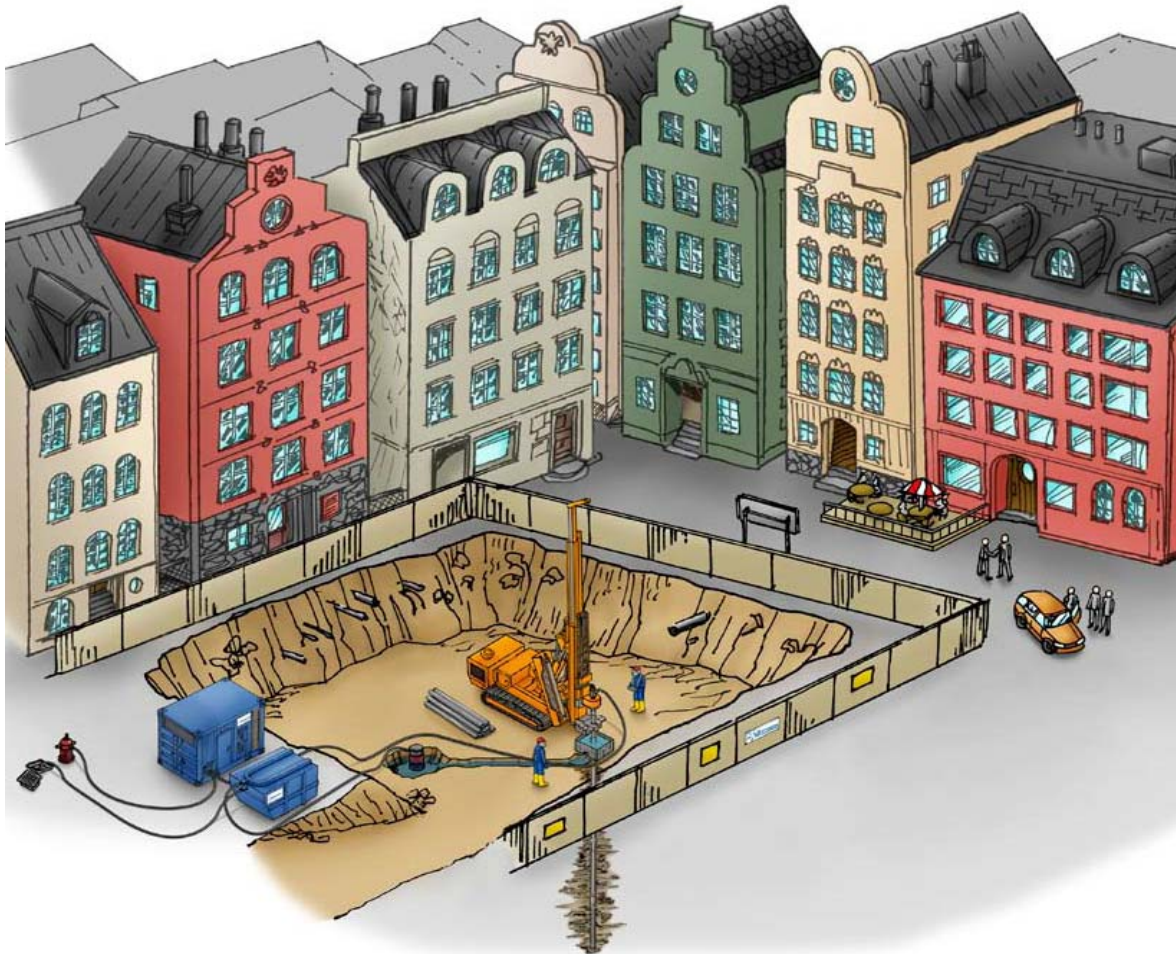


# Wassara Casing System - Construction

## Key components



# Wassara Casing System - Construction

## W-REX



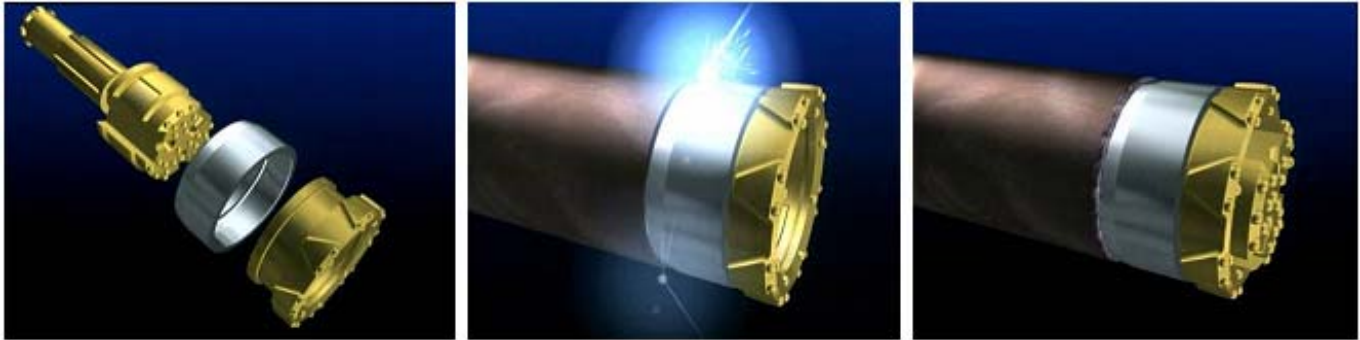
### **W-REX Optimized for Wassara water hammers**

Is a patented system comprised of an ingeniously simple concentric method of drilling through overburden with casing. W-REX can drill straight holes at any angle (including horizontal) and to depths beyond 100 meters.

Working together as one efficient drill bit, the components are made up of:

- A pilot bit with large internal flushing holes and external flushing grooves
- W-REX ring bit (reamer) with internal bayonet coupling
- Casing shoe for driving of casing The pilot bit is attached to Wassara driver sub.

# Wassara Casing System - Construction W-REX



## **W-REX Working principle**

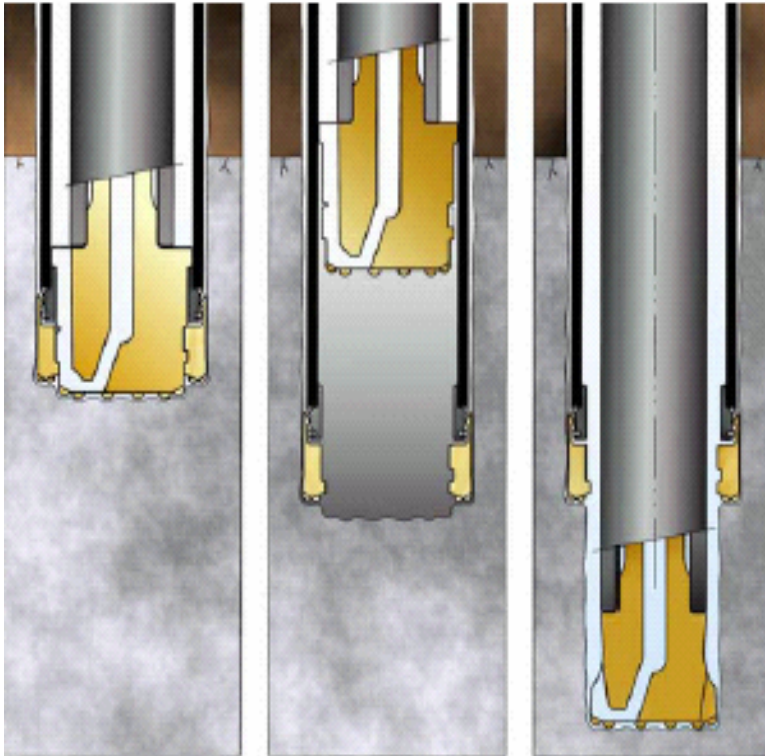
The casing shoe is welded to the casing.

The pilot bit and ring bit are locked together by the bayonet coupling.

Together they drill a hole large enough to allow the casing to be pulled into the hole. The pilot bit and ring bit rotate with the drill string while the casing shoe and casing do not rotate.

After completing the hole, the pilot bit is unlocked by a slight reverse rotation of the drill string. The drill string and pilot bit are then retrieved through the casing.

# Wassara Casing System - Construction W-REX

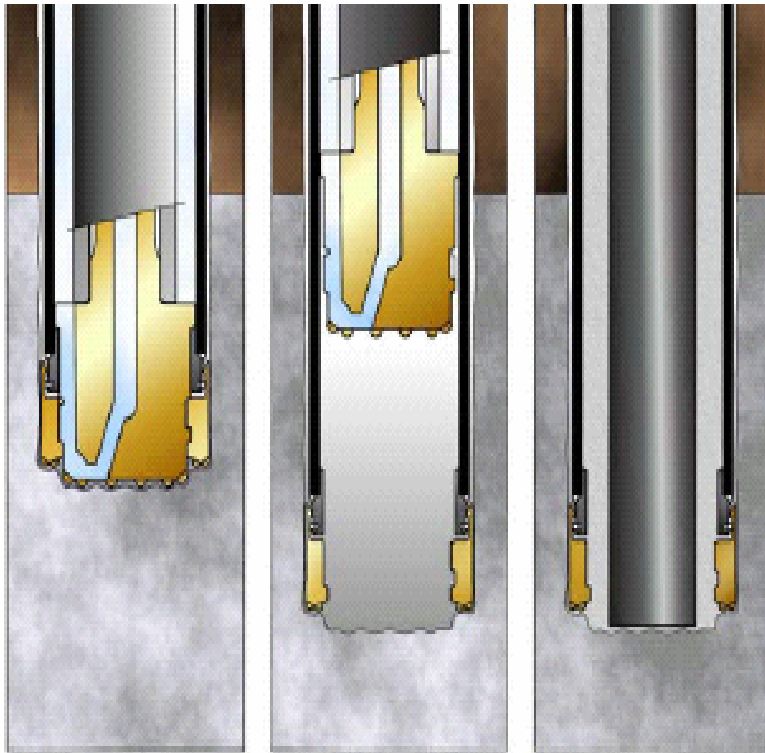


**Wassara W-REX STD** System for drilling medium to deep holes with permanent or temporary casing. In both cases the ring bit is left in the hole.

Casing is drilled through overburden into bed rock, drilling is then continued with normal rock bit ( e.g. water wells, rock socketed piles and rock anchors). Casing is not pulled out.

# Wassara Casing System - Construction

## W-REX



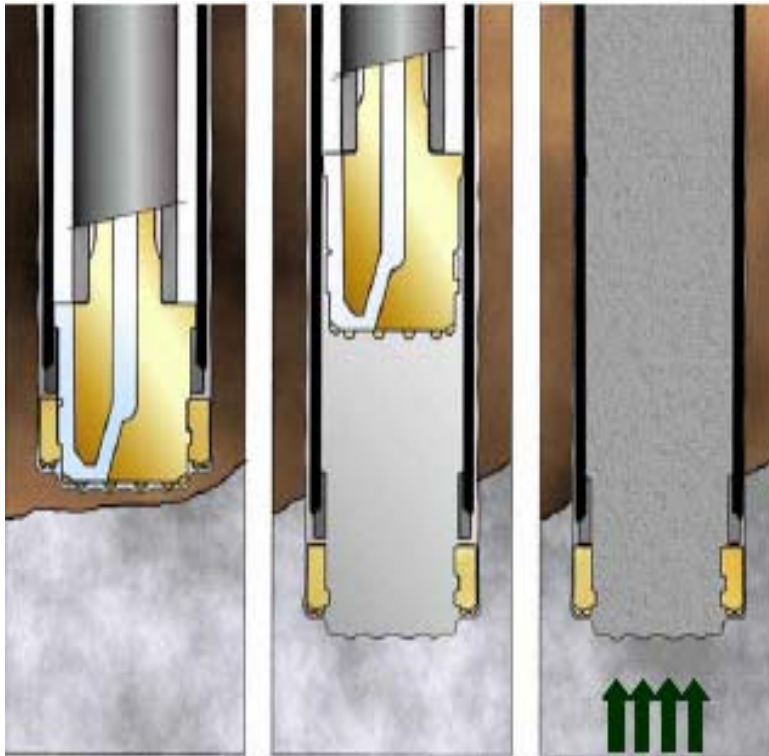
**Wassara W-REX STD** System for drilling medium to deep holes with permanent or temporary casing. In both cases the ring bit is left in the hole.

Casing is drilled through overburden into bed rock, thick wall casing with concrete or thin wall casing with reinforcement and concrete is inserted and used as a pile( e.g. piles with end bearing capacity). Casing is not pulled out



# Wassara Casing System - Construction

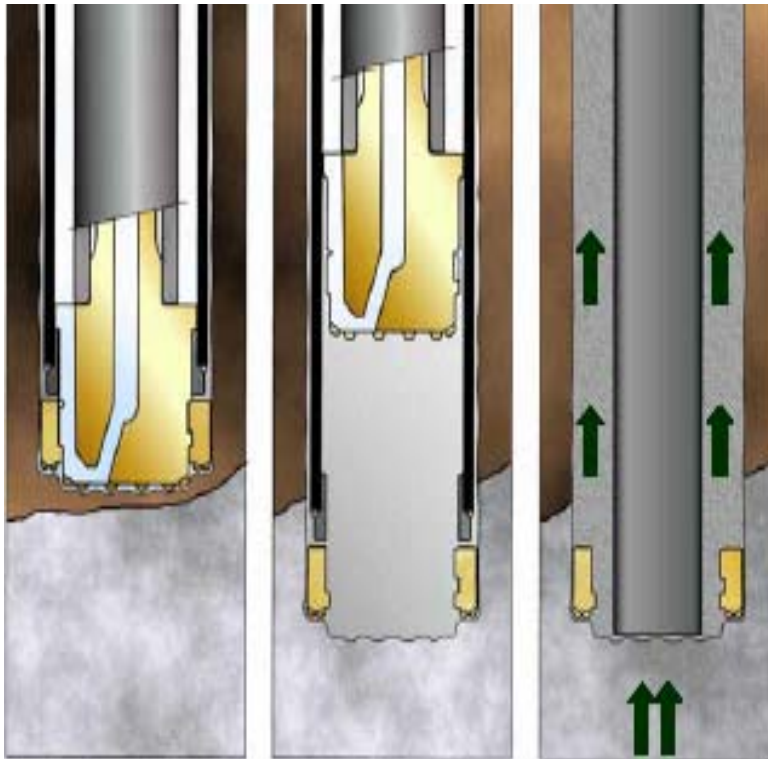
## W-REX



**Wassara W-REX E** System for drilling shallow holes with permanent or temporary casing. In both cases the ring bit is left in the hole.

Casing is drilled through overburden into firm stratum like till or bed rock, casing is filled with concrete and, if needed, with reinforcement ( e.g. short drilled casings, used as end bearing piles).

# Wassara Casing System - Construction W-REX



**Wassara W-REX E** System for drilling shallow holes with permanent or temporary casing. In both cases the ring bit is left in the hole.

Casing is drilled through overburden into firm stratum, in broken rock also several meter rock socketing is possible, reinforcement bar or H-beam is inserted with concrete to form a pile, casing is lifted out (e.g. Skin friction piles).

# Wassara Casing System - Construction Hammers



**The Wassara hammer is the heart of the Wassara Casing System, patented worldwide.**

## **High efficiency**

The water-powered Wassara hammer assures rapid, efficient and environmentally friendly drilling.

## **Drills long straight holes**

The hammer is delivered with a stabilized piston case. The result is maximum hole straightness and superior precision drilling.

## **Low energy consumption**

Powered by water, the Wassara hammer uses less energy and can strike at roughly double the frequency rate of a conventional DTH pneumatic hammer.

All components in the Wassara hammer are available as spare parts and can be replaced easily



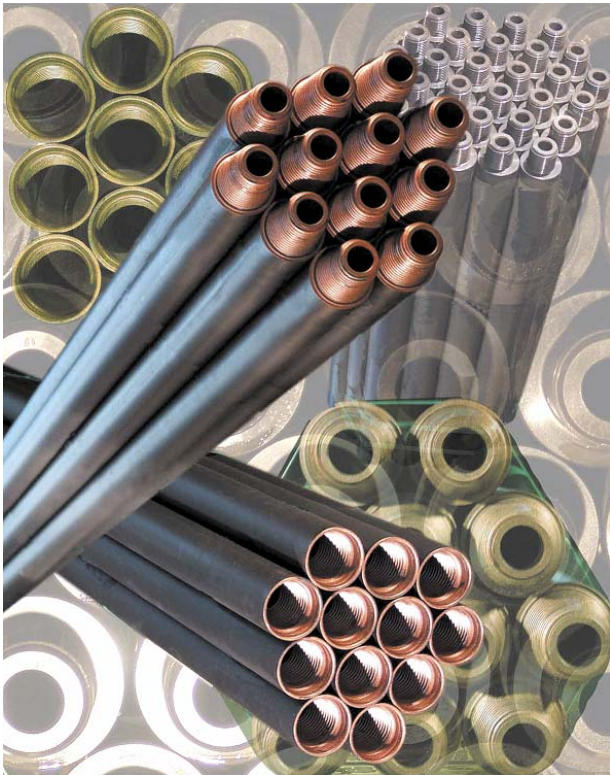
# Wassara Casing System - Construction Check valves



**The check valves is designed to prevent cutting to enter the hammer**

Wassara check valves are available in different dimensions, for drilling both upwards and downwards.

# Wassara Casing System - Construction Drill tubes



## **Outstanding Precision**

Precision manufacturing assures drill tubes of uniform superior quality.

## **High strength**

The material thickness of the tubes is adapted to drilling with water under high pressure.

## **High stiffness**

Straighter holes, thanks to stiffer tube design

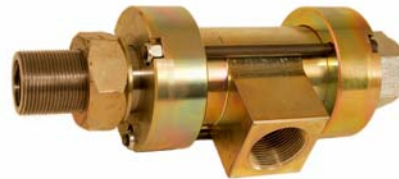
All Wassara drill tubes are tight since equipped with O-rings

Wassara drill tubes are friction-welded in lengths of 1000, 1500, 2000 and 3000 mm.

# Wassara Casing System - Construction Swivel



**From the hose of high-pressure pump to the drilling rig, water is conducted through a Wassara Swivel. The swivel transfers the water to the drill string.**



Stenberg 600 Swivel, is mounted above the rotary head.



2 3/8 API Reg Swivel, is mounted below the rotary head.

# Wassara Casing System – Construction High Pressure Hoses-EN856 4SP



## **Construction:**

Inner tube: Synthetic oil resistant rubber

Cover: Abrasion, weather, and heat resistant rubber

Reinforcement: Four spirals of high tension steel wire

Safety factor: 1:4

Temperature: -40°C - + 100°C

Design: Yellow label, wrapped

## **Applications/Characteristics:**

A hose with pressure performance equivalent to EN956 4SP.

**The hose is MSHA-approved.**

# Wassara Casing System - Construction Pump Unit



WASP – Wassara high pressure water pump units.				
Pump model	Max flow	Max pressure	Required power	Diesel engine power
WASP 50 Diesel	137 l/min	170 bar	43 kW	76 kW
WASP 80 Diesel	219 l/min	200 bar	80 kW	110 kW
WASP 150 Diesel	476 l/min	200 bar	173 kW	183 kW



# Wassara Casing System - Construction Service equipment and training



Wassara hammer service equipment



Training of drillers and service people



# Wassara Casing System - Construction

## Additional Key Advantages

### **Environment friendly, only pure water**

- High productivity due to hydrostatic head and water lubrication of the hole walls
- Low flushing velocity and "0-pressure"
- Straight holes always without deviation due to changing ground formations
- Less torque required
- Simple fool proof design
- Easy unlock - Easy relock
- Drilling at any angle
- Effective internal flushing
- Safety
- Economic