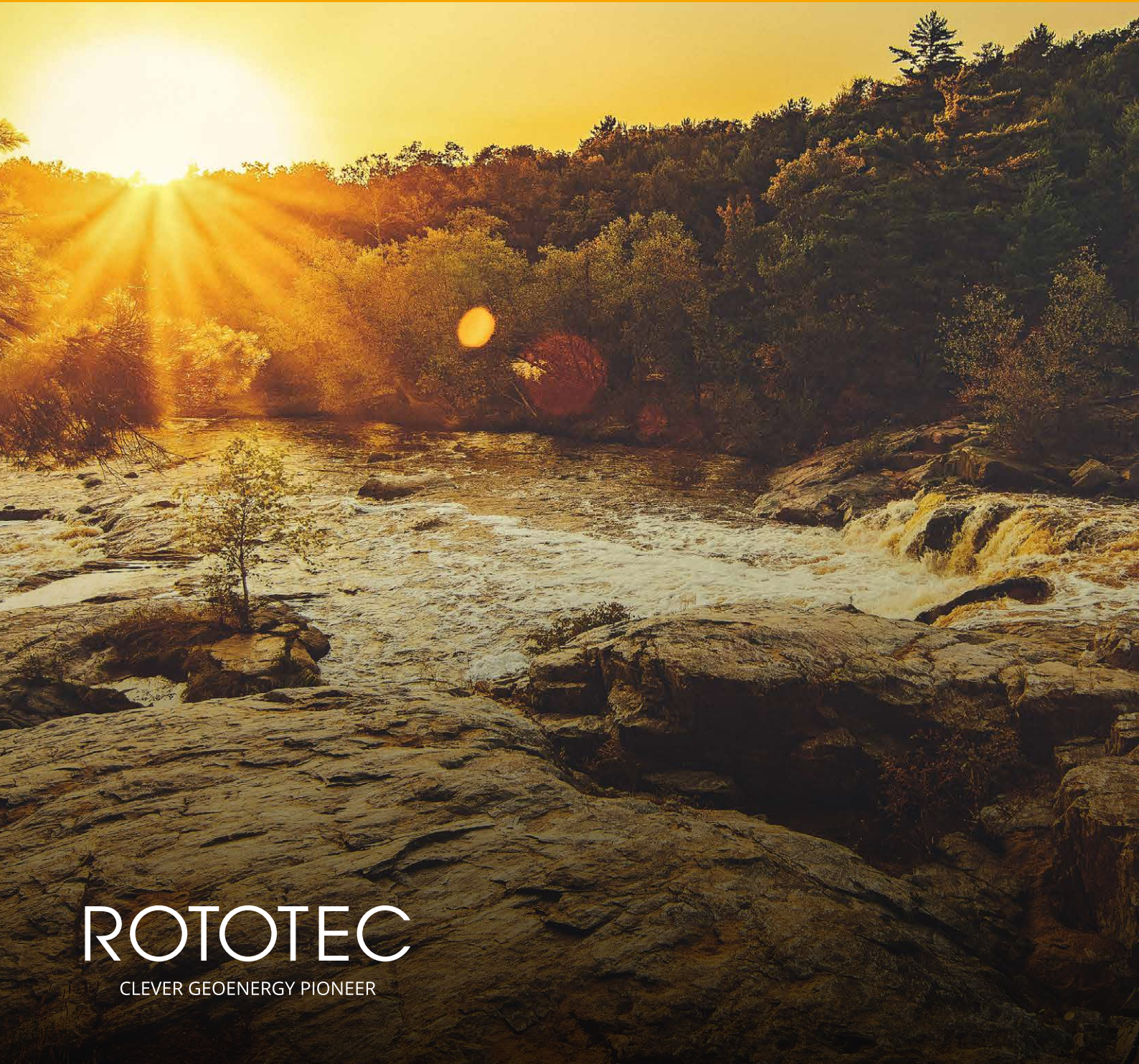


CHOOSE THE BEST ENERGY.

# Guide to drilling for residential

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ROTOTEC

CLEVER GEOENERGY PIONEER

# Quick, easy and safe installation

Thank you for your environmentally friendly and cost-effective choice! With Rototec's geenergy solutions, you will be able to harness the energy under your feet and significantly reduce your carbon footprint. In this way, you will contribute to a better environment every day.

In addition, ground source heat pumps are highly efficient, allowing for lower heating costs. Your investment is several times better than keeping the money on your bank account or the cost of the geothermal loan.

With over 70,000 drilled energy wells, Rototec is a reliable supplier of geothermal wells. One of our most important goals during installation is that your daily life is affected as little as possible. You can remain in your home during the work, but for safety reasons some areas outside often need to be cordoned off. We will use our long experience to ensure that the work is carried out as quickly, smoothly and safely as possible.

## This is how it works:

### STEP 1 - DUMPSTER DELIVERED TO SITE

Before drilling, we deliver a dumpster to the site. The dumpster collects stone cuttings, stone dust and water from the geothermal drilling. The dumpster is 12 feet long, 7 feet wide and 6 feet high and should be placed no further than 60 feet from the borehole. The dumpster is delivered by truck, which means that the street outside the property must be kept clear of obstacles during delivery. If water is present during drilling, it will be pumped onto the site for natural infiltration into the ground. In case of large amounts of water, it may need to be directed to the municipal stormwater network, in which case a RotoCont or similar water treatment system may need to be used.



A few days before drilling, the dumpster arrives at your site.



#### DUMPSTER SIZE GUIDE

Length: 12 feet  
Width: 7 feet  
Height: 6 feet

**RotoCont**  
Length: 14 feet  
Width: 7 feet  
Height: 7 feet



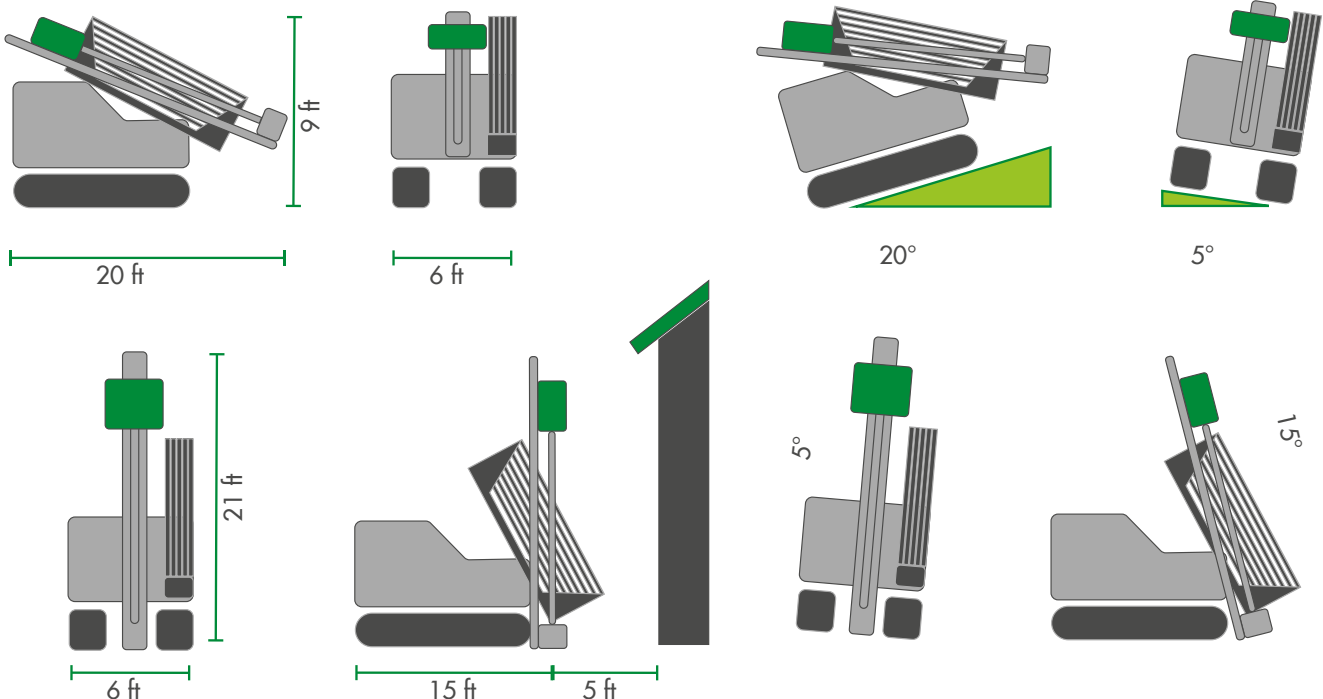
## STEP 2 - DRILLING

Drilling a well normally takes one day. The driller arrives at the site in a truck with a trailer equipped with a drilling rig. The truck with trailer is 57 feet long and weighs 60,000 pounds. The drilling rig weighs 16,000 pounds, is 20 feet long, 6 feet wide and 9 feet high during transport. The rig moves around with caterpillar feet and can therefore cause marks in lawns or similar surfaces. In most cases, the marks are temporary. When erected for drilling, the drilling rig is 21 feet high. Make sure there is a clear path and plenty of space around the drilling site. Also inform neighbors about the work well ahead of time, especially if the road will be blocked during transport. The truck needs to get within 150 feet of the borehole location. The location of the borehole is determined in advance. During drilling, the driller needs ample space for equipment and, for safety reasons, it is forbidden to be in the immediate vicinity. The driller also needs access to electricity and pressurized water.

When moving around, the drilling rig is capable of driving on a 20-degree uphill gradient with a 5-degree sideways gradient. The machine operator needs about 5 feet of free space in front of the rig to work.



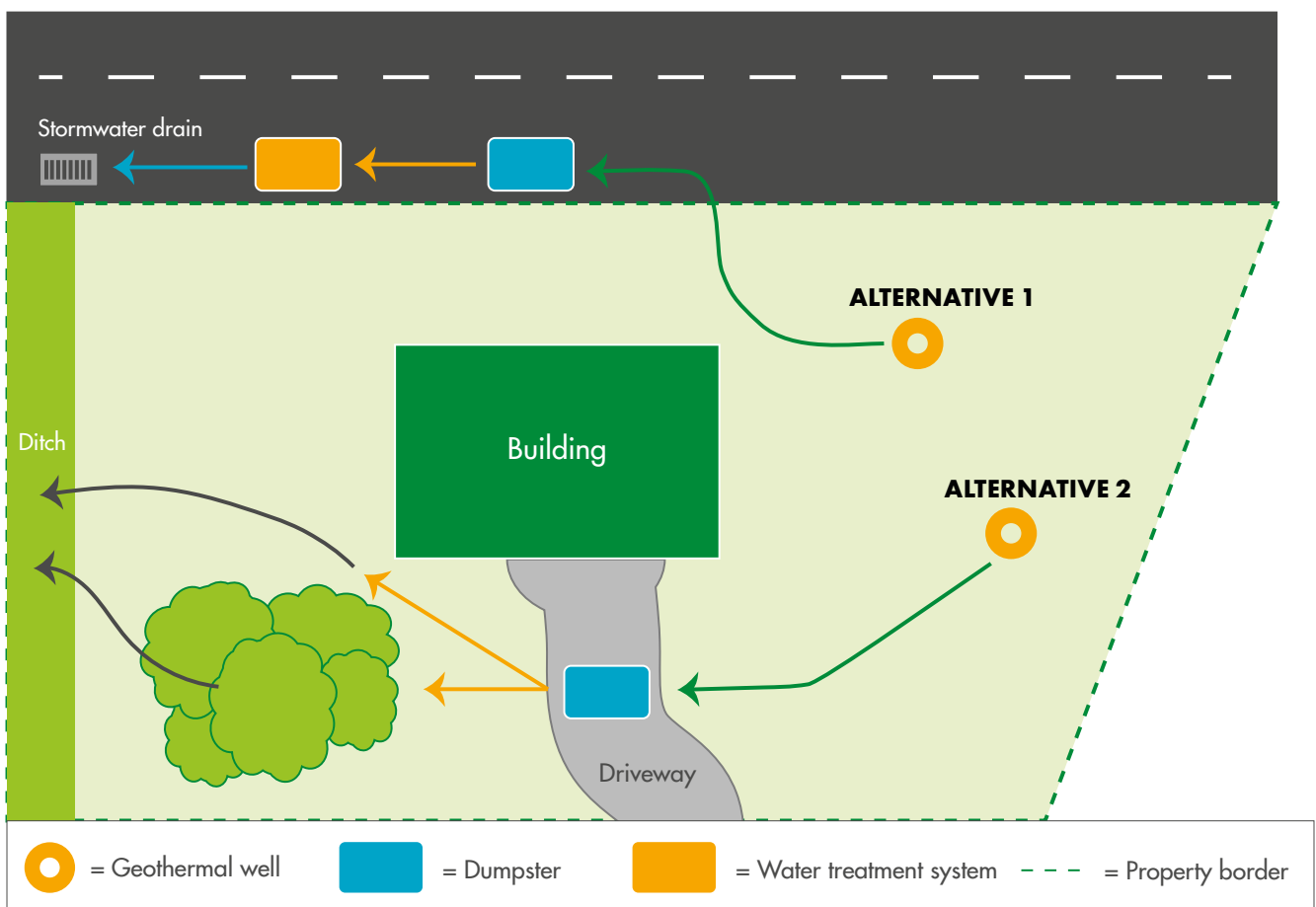
Be prepared that drilling will be noisy in the immediate vicinity of the machinery, so inform nearby neighbors of the work well in advance. Drilling an geothermal well normally takes one working day.



# Water handling during drilling

During the drilling of a geothermal well, the driller needs access to pressurized water to bind the stone dust from the drilling. Usually, water containing stone dust is also pumped up from the bedrock and out through the borehole. The water

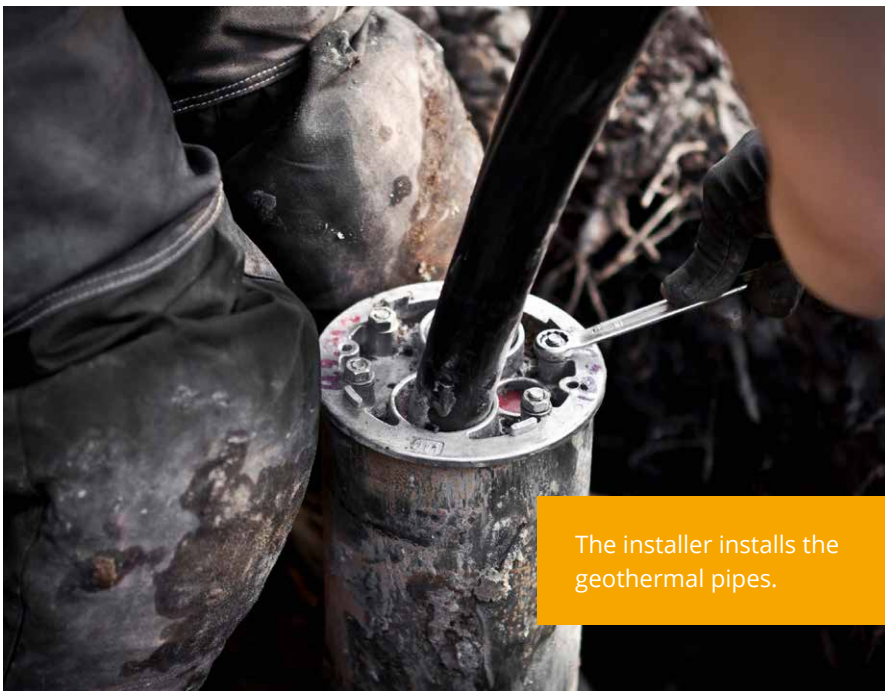
must be treated before it is pumped onto the site, which is done in a dumpster that separates water from stone cuttings. During the drilling, the dumpster should be placed on the road or driveway.



The colored water is pumped in to the dumpster where the stone cuttings sink to the bottom. The purified water is then pumped out to the plot and absorbed by the soil. If it is not possible to pump the water out on the site, we direct it outside the boundaries of the property, for example to a ditch or a forest, for which permission from the local authorities is required. The water can also be pumped to a stormwater drain, in which case we need to filter it through our RotoCont water treatment system.

### STEP 3 – PIPE INSTALLATION

After drilling is completed, our pipe installer arrives on site and installs geothermal pipes in the borehole and horizontal pipes to the property. Depending on the workload, this normally takes place approximately 3-10 working days after drilling. The horizontal pipes are usually buried about 1,5 feet below surface. We then core drill through the foundation with a diamond drill for pipe penetration. The pipes are normally cut about 1 feet inside the wall where the plumber takes over and connects them to the heat pump. If the property is a newbuild, the pipes can be routed to the heat pump via pre-drawn pipes, if these pipes are fitted with elbows these must not exceed 15 degrees.



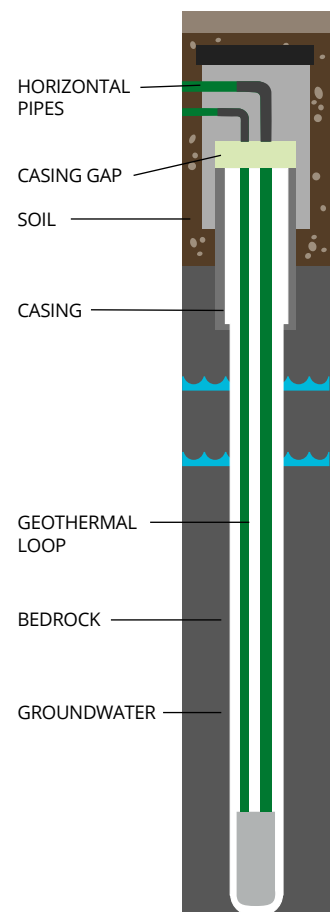
The installer installs the geothermal pipes.

### GEOTHERMAL WELL IN A NUTSHELL

- Diameter in bedrock is 4.5"
- Casing diameter is 5.5"
- The length of the casing pipes is 10 feet and they are welded together. The pipes are anchored into solid rock and sealed with grouting
- Geothermal pipes are factory made
- A casing cap is installed on the casing

### ALL OUR GEOTHERMAL WELLS INCLUDE

- Grouting
- Horizontal piping and electrofusion of pipe joints
- Casing cap to prevent radon rising from the well
- Expanded rubber seals for a radonsafe and watertight penetration of the building wall
- Excavation and backfilling of pipe trenches and installation of trench tape
- Marking plate on the wall



# FAQ

## **What affects the depth of the well and the size of the heat pump?**

- The size of the building and the need for heating and cooling
- The heat distribution system of the building
- The geographical location of the building

## **What are the benefits of geothermal heat pumps?**

Low operational cost, renewable, reliable, fossil free and it increases property value. In addition, you own your own energy and can get both heating and cooling.

## **Can you stay in the property during the work?**

Yes, only certain outdoor areas may need to be cordoned off. However, there will be a lot of noise during the drilling.

## **Can the geothermal well site be on a steep slope?**

No, the drilling site should be level so that the drilling rig can stand fairly straight during drilling.

## **What is the process for installing the horizontal pipes?**

We excavate with a mini excavator, install horizontal pipes and penetrate the foundation of the property for the pipes. Wall seals for the pipes are installed and pipe trenches are backfilled.

## **What will my yard look like after drilling and pipe installation?**

We do everything we can to make as little impact as possible. The installation will leave some visible but temporary marks on the yard. We will clean and rough grade the site after the work is done.

### **CHECKLIST**

- Ensure that the truck can access the site and park and that there is a clear path for the drilling rig to the borehole location
- Plan where the dumpster can be placed during the drilling
- The drilling rig needs electricity
- Provide access to pressurized water for the driller
- Designate a place where excess water from the dumpster can be pumped, e.g. a ditch, green area or forest.
- Inform neighbors well in advance of the drilling

## **Soon you will also be contributing to a better environment**

Installing a geothermal heating system is not only easy and economically viable, it is also a major step towards sustainable energy production. Geothermal heating and cooling is renewable, increases your energy self-sufficiency and significantly reduces your emissions.

The most important thing for us is always that the installation goes quickly, smoothly and safely. If you have any questions or concerns, don't hesitate to contact us.

We at Rototec would like to thank you once again for investing in the energy of the future!

# ROTOTEC

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