

# Geothermal Heat Pump Installation

This playbook provides a step-by-step guide to the installation of a geothermal heat pump, which is a sustainable system for heating and cooling a property. The process includes preparation, drilling, loop installation, heat pump connection, and system testing.

## Step 1: **Site Assessment**

Evaluate the property to determine the feasibility of installing a geothermal heat pump, including soil conditions, available space, and heating and cooling load requirements.

## Step 2: **Design System**

Design the geothermal system according to the assessment findings. This includes specifying the type of loop system (horizontal, vertical, pond/lake), the heat pump size, and the layout of the system.

## Step 3: **Permit Acquisition**

Obtain all necessary permits from local authorities for drilling and construction. Adhere to all building codes and environmental regulations.

## Step 4: **Preparation**

Prepare the site for drilling or excavation. This includes clearing the area, setting up access for equipment, and marking the locations for drilling or trenches.

## Step 5: **Drilling/Excavation**

Drill boreholes for vertical loops or excavate trenches for horizontal loops. Ensure that proper depth and spacing are achieved as per design specifications.

## Step 6: **Loop Installation**

Install the geothermal loop system within the boreholes or trenches. The loops are filled with a heat-transfer fluid, usually a mixture of water and anti-freeze.

## Step 7: **Heat Pump Installation**

Install the geothermal heat pump and connect it to the loop system. This also includes connection to the building's ductwork or hydronic system for space heating and cooling.

## Step 8: **System Testing**

Test the geothermal heat pump system to ensure it is functioning correctly. This involves checking for leaks, verifying flow rates, and ensuring that all electrical and mechanical components are working properly.

## Step 9: **Backfilling**

Return the soil to the excavated areas after the loop system is installed and tested. This backfilling should be done carefully to avoid damaging the loops.

## Step 10: **Commissioning**

Final commissioning of the system involves validating performance against design specifications, setting up control systems, and educating the property owner on system operation and maintenance.

## **General Notes**

### **Maintenance Guide**

Provide the property owner with a detailed maintenance guide to ensure longevity and efficiency of the geothermal heat pump system.

### **Warranty Registration**

Ensure all warranty documents for the equipment are filled out and submitted to the manufacturers. This helps in facilitating any future claims or support.

### **Energy Rebates**

Investigate available local, state, or federal energy rebates or incentives for installing a geothermal heat pump and assist the property owner with the necessary paperwork.