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## Depth at which GSHP are installed

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The deeper the system is installed, the more stable the ground temperature and therefore greater efficiency.

Horizontal systems are usually installed at a depth of 1-1.8 meters with pipes of 150-160mm diameter. Pipes need to be 0.3 meters apart in the case of multiple pipes laid in a single trench and between adjacent trenches there should be a 3 meter distance. These systems are more common in rural areas where properties are larger. Trenches can be straight or curved and laid in any direction according to the site.

Generally 120-180 meters of pipe are required per ton of heat pump capacity.

Straight horizontal layout requires significant land area and is ideally laid beneath a house before building. Alternatively there is the spiral horizontal (slinky coil) which is laid in trench of only about 10m in length and can be installed in shallower depths if the soil is too hard to trench, this is appropriate for a smaller, back yard installment.

Vertical (borehole) systems are generally installed at depths of 18-60 meters where temperature are more constant throughout the year, depending on soil conditions.

Pipes of 150mm in diameter are placed in boreholes which are 5 meter apart, in the case of multiple boreholes. Usually about 80-120 meters of piping is needed for every ton (3.5KW) of heat capacity.

The piping layout must be carefully considered in order to keep a dynamic hydraulic pressure across the GSHP.

The horizontal installation requires for the site to be trenched rather than drilled and is therefore less expensive than vertical which would cost approximately \$80AUD per meter drilled.

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