



Ref: Timintoul 12.10.12 GSHP

CKD Galbraith
Lynedoch House,
Barossa Place
Perth PH1 5EP

12th October 2012

Dear Calum

Ground Source Heat Pump

Please find below requirements for the ground collector loops for Timintoul Croft and Timintoul House.

Ground conditions

Soil type is Moraine with heat extraction rate of 3.1w/mK.

Trench Requirements

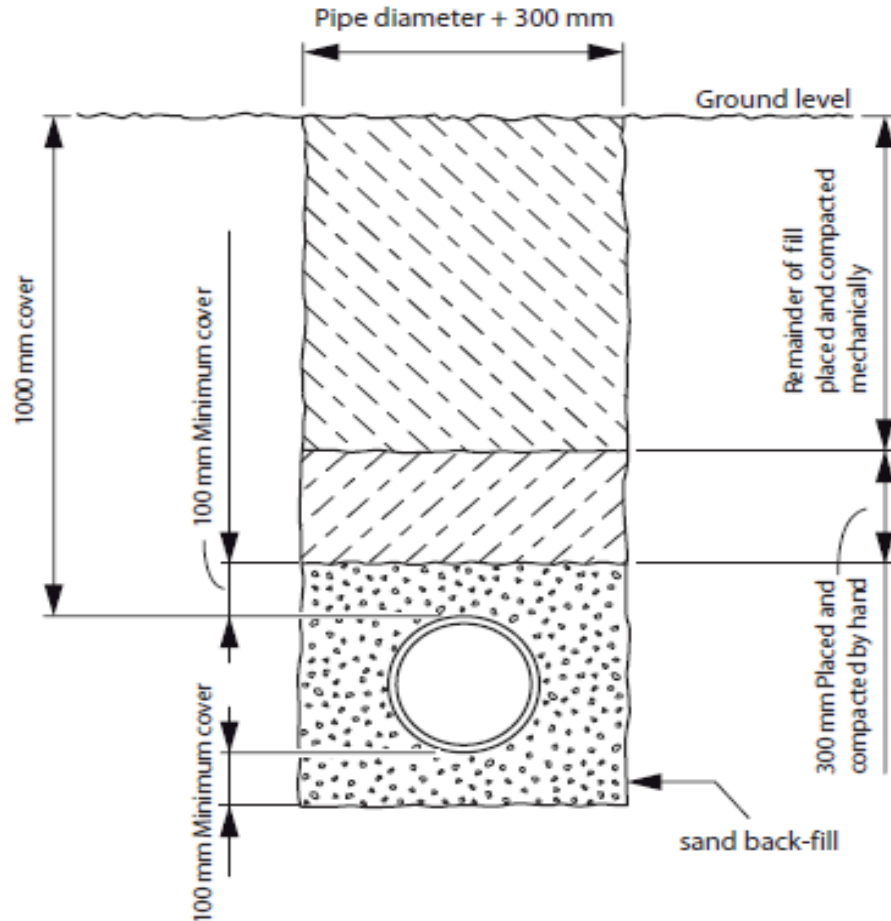
Trenches are to be a min. of 0.8mW x 1.2 deep x 60m long, with 120m loop running up one side and returning down the other of a single 60m trench, to a common manifold chamber. Loops are to run on a continuous gradient with the manifold positioned at the high point. Tails from the manifold will run back to the building penetration point, with a maximum total pipe run of 20m.

Spacing between trenches must be sufficient for the area covered by the loops to meet the specified square meterage for each system, below.

Back filling must prevent damage to the collector loops and may necessitate a covering of sand depending on the conditions., as per the drawing below:

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Manifold Chamber

A manhole type pre-assembled manifold with integrated flow meter is recommended and can be supplied by Glendevon Energy. Dimensions (5-12) below:

Circuits	Diameter of the manhole (mm)	High (mm)	Circuit connection (mm)	Connection to heat pump (mm)
2 - 4	400	600	d 40	d 63
5 - 12	600	800	d 40	d 63

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This specification is based on the following assumptions:

Croft

Internal heated floor area of 56sqm with an average ventilated heat loss of 100W/sqm, including heat losses to the ground via underfloor heating (min 100mm Kingspan floor insulation 0.21W/sqmK) at 20 degC internal and -5degC external temperatures, and 2.5kW hot water demand. This equates to a total heat demand of 8.1kW. A max flow temperature of 35deg C to the UFH will be required.

5x 120m collector loops in 60m trenches 1m apart.

House

Internal heated floor area of 189.54sqm with an average ventilated heat loss of 50W/sqm, including heat losses to the ground via underfloor heating (min 100mm Kingspan floor insulation 0.21W/sqmK) at 20 degC internal and -5degC external temperatures, and 3.5kW hot water demand. This equates to a total heat demand of 8.1kW. A max flow temperature of 35deg C to the UFH will be required.

8 x 120m collector loops in 60m trenches 1m apart.

Yours sincerely,

Jamie Adams

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