GEOTHERMAL

Old Coal-converted-to-Oil Furnace

Drilling Two 300 Foot Wells

Climate Master Heat Pump: well-insulated air ducts required

Closed-loop Ground-source Heat Pump

Geothermal Performance Data

Season	Heat $	Cool $	Total $	Comment	Deg days 1/
9-10	$208	$19	$227	Ave winter	5859
10-11	$252	$13	$265	Colder	6066
11-12	$183			Warmer	4941

1/ deg days summed from Oct 1 through April 30 at University Park Airport station. Ten year average = 5136 degree days (from CDT, which may not be same as Univ Park)

2/ Main contractor: Del Shadow, Port Matilda, 692-4416, installed a Climate Master, 2.5 tons

3/ Drilling contractor (working under Del Shadow): NE Geothermal Services, Dave Scovern, 867-0508

Air-Tightness/Ventilation

Standard house of 1,500 sq.ft. w 7.5' ceilings	CFM50	ACH50
Passive House Standard for new housing	113	0.6
Passive House Standard for retrofits	283	1.5
Canadian R-200 program	283	1.5
New homes in Minnesota	471	2.5
New homes in Wisconsin (study of 24 homes)	735	3.9
Maine Cohousing prototype w 4-5 occupants	70	0.33
A typically tight house	500-1,500	2.7-8.0
Threshold rule-of-thumb below which one should install whole-house mechanical ventilation 2/	***1,000***	***5.3***
Older houses	6,500-8,500	4/
Passive House standard for our house 3/	420	1.5
Actual blower door test results for our house	**1910**	**6.9**
ASHRAE 1/ with 4 occupants	45	0.24

1/ American Society of Heating, Refrigeration and Air Conditioning Engineers. This is a ventilation standard, not an air-tightness standard.

2/ Holladay article

3/ Our house is 1,780 sq.ft. to which we must add the cellar (another 451 sq.ft.) giving a total of 2,231 sq.ft., or 420 cfm using the PH standard for retrofits.

4/ Without knowing the volume of an older house, we cannot determine ACH.

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