

DEPARTMENT OF INSPECTIONS,  
LICENSES & PERMITS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043  
PERMITS (410) 313-2455  
INSPECTIONS (410) 313-1850

HOWARD COUNTY  
RESIDENTIAL  
HEATING-VENTILATION-AIR  
CONDITIONING AND  
REFRIGERATION PERMIT  
APPLICATION

HVACR PERMIT # M09000997  
BUILDING PERMIT #

BUILDING ADDRESS: SUITE/A T:  
1310 CEDAR BERRY COURT  
SUBDIVISION: MEADOWOOD  
CENSUS TRACT: SECTION: AREA:  
LOT: 54 TAX MAP: 10 PARCEL: 312  
BLOCK: ZONE:

OWNERS NAME: JOE & BARBARA BRADSHAW  
ADDRESS: 1310 CEDAR BERRY COURT  
CITY: MARIOTTSVILLE  
STATE: MD ZIP CODE: 21104-1460  
HOME PHONE: 410-442-4410 WORK PHONE: 410-977-0954

PROPERTY ID: MAP COORDINATES:  
TYPE OF IMPROVEMENTS: REPLACEMENT USE: RES

COMPANY NAME: Ground Loop Heating & Air Cond., Inc.  
LICENSEE NAME: Michael E. Cullum  
ADDRESS: 1701 Whiteford Road  
CITY: Darlington  
STATE: MD ZIP CODE: 21034  
PHONE: 410-836-1706 HVACR LICENSE NO: 6539

<u>CHECK ONE</u>	<u>HOW MANY</u>
SINGLE FAMILY DWELLING ZONES <input checked="" type="checkbox"/>	<u>2</u>
SINGLE FAMILY TOWNHOUSE ZONES <input type="checkbox"/>	<u>—</u>
MULTI-FAMILY / HOTEL/MOTEL UNITS <input type="checkbox"/>	<u>—</u>

- New  
 Heating and Air Conditioning
- Replacement  
 Heating  
 Air Conditioning  
 Heating and Air Conditioning

- EQUIPMENT: WATER FURNACE  
 Heating System Only  
 Other Work (Describe):  
GEOTHERMAL
- Additions and Alterations  
 Heating  
 Air Conditioning  
 Heating and Air Conditioning

Zones  
 Permit Fee = # of Zones x \$40 = 80.00  
 Technology Fee (10% of Permit Fee) = 8.00  
 Plus Application Fee \$50.00  
 Total Fees Due = \$138.00

Units  
 Permit Fee = # of Units x \$80 = —  
 Technology Fee (10% of Permit Fee) = —  
 Plus Application Fee \$50 \$50  
 Total Fees Due = —

I HAVE CAREFULLY EXAMINED AND READ THIS APPLICATION AND KNOW IT IS TRUE AND CORRECT. THE WORK DESCRIBED HEREIN WILL BE PERFORMED BY A STATE HVACR LICENSED PERSON(S), AND ALL WORK WILL BE PERFORMED IN COMPLIANCE WITH APPLICABLE CODES AND STANDARDS OF HOWARD COUNTY THE STATE OF MARYLAND.

SIGNATURE OF LICENSEE

DATE

Michael E. Cullum

11-19-09

PRINT NAME OF LICENSEE

Approved: [Signature] Plan  
Howard County Health Department

Make check payable to: DIRECTOR OF FINANCE OF HOWARD COUNTY

Word doc: HVAC APPLICATION - JUNE 2004

Validation

Check Number: 14417  
Cash: —  
Receipt Number: 1906208

Water = Well & Septic

Date

NOTE: NO CHANGES TO EXISTING LOOPS. THIS WAS A REPLACEMENT OF GEO UNIT WITH GEO UNIT.

12/15/09

[Signature]

M09000997

*HVAC Load Calculations*

for



**RHVAC** RESIDENTIAL  
HVAC LOADS

Prepared By:

Tuesday, November 24, 2009



## Project Report

### General Project Information

Project Title:  
 Project Date: **Tuesday, February 19, 2008**

### Design Data

Reference City: **Baltimore, Maryland**  
 Daily Temperature Range: **Medium**  
 Latitude: **39 Degrees**  
 Elevation: **148 ft.**  
 Altitude Factor: **0.995**  
 Elevation Sensible Adj. Factor: **1.000**  
 Elevation Total Adj. Factor: **1.000**  
 Elevation Heating Adj. Factor: **1.000**  
 Elevation Heating Adj. Factor: **1.000**

	Outdoor Dry Bulb	Outdoor Wet Bulb	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	13	0	30	72	26
Summer:	91	75	50	75	41

### Check Figures

Total Building Supply CFM:	2,146	CFM Per Square ft.:	0.177
Square ft. of Room Area:	12,096	Square ft. Per Ton:	2,255
Volume (ft³) of Cond. Space:	116,928		

### Building Loads

Total Heating Required Including Ventilation Air:	105,765 Btuh	105.765 MBH
Total Sensible Gain:	48,267 Btuh	82 %
Total Latent Gain:	10,911 Btuh	18 %
Total Cooling Required Including Ventilation Air:	59,178 Btuh	4.93 Tons (Based On Sensible + Latent)
		5.36 Tons (Based On 75% Sensible Capacity)

### Notes

Calculations are based on 8th edition of ACCA Manual J.  
 All computed results are estimates as building use and weather may vary.  
 Be sure to select a unit that meets both sensible and latent loads.



### Miscellaneous Report

System 1 Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	13	0	30	72	26.45
Summer:	91	75	50	75	40.76

#### Duct Sizing Inputs

	<u>Main Trunk</u>	<u>Runouts</u>
Calculate:	Yes	Yes
Use Schedule:	Yes	Yes
Roughness Factor:	0.00300	0.00300
Pressure Drop:	0.1000 in.wg./100 ft.	0.1000 in.wg./100 ft.
Minimum Velocity:	650 ft./min	450 ft./min
Maximum Velocity:	900 ft./min	750 ft./min
Minimum Height:	0 in.	0 in.
Maximum Height:	10 in.	6 in.

#### Outside Air Data

	<u>Winter</u>	<u>Summer</u>
Infiltration:	0.280 AC/hr	0.145 AC/hr
Above Grade Volume:	X 116,928 Cu.ft.	X 116,928 Cu.ft.
	32,740 Cu.ft./hr	16,952 Cu.ft./hr
	X 0.0167	X 0.0167
Total Building Infiltration:	546 CFM	283 CFM
Total Building Ventilation:	0 CFM	75 CFM

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier:	17.51	= (1.10 X 0.995 X 16.00 Summer Temp. Difference)
Infiltration & Ventilation Latent Gain Multiplier:	27.57	= (0.68 X 0.995 X 40.76 Grains Difference)
Infiltration & Ventilation Sensible Loss Multiplier:	64.55	= (1.10 X 0.995 X 59.00 Winter Temp. Difference)

#### Duct Load Factor Scenarios for System 1

No.	Type	Description	Location	Attic Ceiling	Duct Leakage	Duct Insulation	Surface Area	From MDD
1	Supply	Main	Basement	-	0.12	6	635	No



*Load Preview Report*



Scope	Has AED	Net Ton	Rec Ton	ft. <sup>2</sup> /Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Cig CFM	Sys Act CFM	Duct Size
Building		4.93	5.36	2,255	12,096	48,267	10,911	59,178	105,765	1,381	2,146	2,146	
System 1	Yes	4.93	5.36	2,255	12,096	48,267	10,911	59,178	105,765	1,381	2,146	2,146	46x10
Ventilation						1,313	2,068	3,380	0				
Duct Latent							1,055	1,055					
Zone 1					12,096	46,954	7,788	54,742	105,765	1,381	2,146	2,146	46x10
1-First Floor					5,040	30,309	3,115	33,424	49,087	641	1,385	1,385	0-0*
2-Second Floor					2,016	10,132	1,558	11,690	20,714	270	463	463	0-0*
3-Basement					5,040	6,513	3,115	9,628	35,965	470	298	298	0-0*
4-Attic					0	0	0	0	0	0	0	0	0-0



### NOTES:

1. THIS PLAT IS OF BENEFIT TO A CONSUMER ONLY INsofar AS IT IS REQUIRED BY A LENDER OR TITLE INSURANCE COMPANY OR ITS AGENT IN CONNECTION WITH CONTEMPLATED TRANSFER, FINANCING, OR REFINANCING.
2. THIS PLAT IS NOT TO BE RELIED UPON FOR THE ESTABLISHMENT OR LOCATION OF FENCES, GARAGES BUILDINGS, POOLS, BUILDING ADDITIONS OR OTHER EXISTING OR FUTURE IMPROVEMENTS.
3. THIS PLAT DOES NOT PROVIDE FOR THE ACCURATE IDENTIFICATION OF PROPERTY BOUNDARY LINES, BUT SUCH IDENTIFICATION MAY NOT BE REQUIRED FOR THE TRANSFER OF TITLE OR SECURING FINANCING OR REFINANCING.
4. ACCURACY OF BUILDING MEASUREMENTS: 0.10'
5. ACCURACY OF SETBACK DIMENSIONS: 0.50'
6. ACCURACY OF ELEVATIONS: 0.10'

THE PROPERTY SHOWN HEREON LIES IN ZONE C AS SHOWN ON FLOOD INSURANCE RATE MAP NO: 240044 0010 B DATED: DEC. 4, 1986

-  DENOTES SEPTIC ESMT. PER PLAT # 10209
-  DENOTES SEPTIC ESMT. PER SITE PLAN

