

C1 60764

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

1-2-3-6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

COUNTY NUMBER

ST/CO USE ONLY DATE RECEIVED

DATE WELL COMPLETED 11-4-19 APPROVED 12/15/19 Depth of Well 320

PERMIT NO. FROM "PERMIT TO DRILL WELL" HO-18-0115

OWNER Ruff, Andrew last name 8649 Blue Sea Dr first name TOWN Columbia SUBDIVISION SECTION LOT 22

WELL LOG

Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

Table with columns: DESCRIPTION, FEET (FROM, TO), check if water bearing. Rows: Brown Clay (0-18), Bin Rock (18-22), Gray Rock (22-320).

GRROUTING RECORD

WELL HAS BEEN GROUTED (Y/N) TYPE OF GROUTING MATERIAL (Cement CM, Bentonite Clay BC) NO. OF BAGS 22 NO. OF POUNDS 1100

CASING RECORD

MAIN CASING TYPE (Steel ST, Concrete CO, Plastic PL, Other OT) Nominal diameter top (main) casing (nearest inch) Total depth of main casing (nearest foot)

OTHER CASING (if used)

Table for other casing with columns: diameter inch, depth (feet) from, to

SCREEN RECORD

screen type or open hole (Steel ST, Brass BR, Bronze PL, Open Hole HO, Plastic PL, Other OT)

DEPTH (nearest ft.)

Table for depth with columns: E, A, C, H, S, R, E, N and rows for slot size and diameter of screen.

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q

70 72 74 75 76 TELESCOPE CASING LOG INDICATOR OTHER DATA

C 3

PUMPING TEST

HOURS PUMPED (nearest hour) 8 9 PUMPING RATE (gal. per min.) 11 15 METHOD USED TO MEASURE PUMPING RATE WATER LEVEL (distance from land surface) BEFORE PUMPING 17 20 ft. WHEN PUMPING 22 25 ft. TYPE OF PUMP USED (for test) A air P piston T turbine C centrifugal R rotary O other J jet S submersible

PUMP INSTALLED

DRILLER INSTALLED PUMP (CIRCLE) (YES OR NO) IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS. TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31 35 PUMP HORSE POWER 37 41 PUMP COLUMN LENGTH (nearest ft.) 43 47 CASING HEIGHT (circle appropriate box and enter casing height) + above - below LAND SURFACE (nearest foot) 49 51

LATITUDE 39.17056 LONGITUDE 76.85791 (DEFAULT COORD. WGS 84)

Pursuant to §10-624 of the State Govt. Article of the Maryland Code personal info. requested on this form is used in processing this form pursuant to COMAR 26.01.04. Failure to provide the info. may result in this form not being processed.

NUMBER OF UNSUCCESSFUL WELLS: 0

WELL HYDROFRACTURED (Y/N)

- CIRCLE APPROPRIATE LETTER A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED E ELECTRIC LOG OBTAINED P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. MSD 106 Marshal Anette DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. D

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

B 1 SEQUENCE NO. (MDE USE ONLY) **66184** STATE OF MARYLAND APPLICATION FOR PERMIT TO DRILL WELL please type **51663104** STATE PERMIT NUMBER **110-18-0115** fill in this form completely

B 2 OWNER INFORMATION
 Date Received (APA) **07/06/19**
 8 **RD** **13**
 15 **Ruet Andrew + Jackson Alice**
 Last Name Owner First Name 34
 36 **8849 Blue Sea Drive**
 Street or RFD 55
Columbia MD 21046
 Town State Zip 76

B 3 LOCATION OF WELL
Howard
 8 COUNTY 21
Vill Kings Cont
 23 SUBDIVISION 42
 SECTION **22** LOT **22**
 44 46 48 50
Columbia
 52 NEAREST TOWN 71

B 4 DRILLER INFORMATION
 Driller's Name **Marshal Arnette M SD 106** License No. 81
 Firm Name **Allied Well Drilling**
 Address **PO Box 129 Annapolis Junction MD 20701**
 Signature **Marshal Arnette** Date **09/05/19**

B 4 SOURCES OF DRILLING WATER
 1. **Public**
 2. **Grout 10/21/19**
 3. **WYO DEN 09/12/12 Lot#**
 11 **8849 Blue Sea Dr** 30
 STREET ADDRESS
 ON WHICH SIDE OF ROAD (CIRCLE APPROPRIATE BOX)
 NORTH EAST
 WEST SOUTH
 34 **22** 37
 DISTANCE FROM ROAD **FL**
 ENTER FT OR MI **38 39**
 TAX MAP: **0042** BLK: _____ PARCEL **0461**

B 2 WELL INFORMATION
 APPROX. PUMPING RATE (GAL. PER MIN.) **8** 12
 AVERAGE DAILY QUANTITY NEEDED (GAL. PER DAY) **14** 20

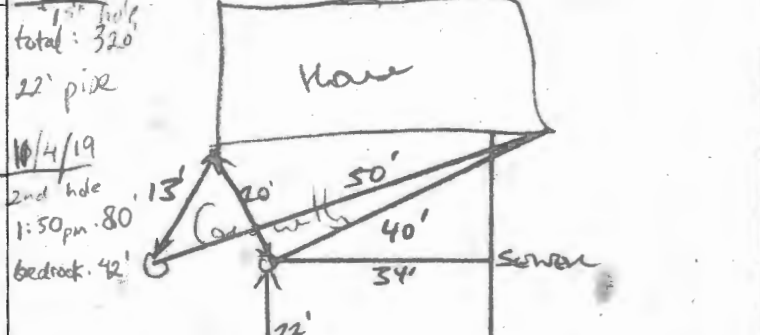
USE FOR WATER (CIRCLE APPROPRIATE BOX)
 DOMESTIC POTABLE SUPPLY & RESIDENTIAL IRRIGATION
 FARMING (LIVESTOCK WATERING & AGRICULTURAL IRRIGATION)
 INDUSTRIAL, COMMERCIAL, DEWATERING
 PUBLIC WATER SUPPLY WELL
 TEST, OBSERVATION, MONITORING
 OPEN LOOP GEOTHERMAL
 CLOSED LOOP GEOTHERMAL **2 loops**

NOT TO BE FILLED IN BY DRILLER HEALTH DEPARTMENT APPROVAL
Howard COUNTY NAME COUNTY NO. **X11**
 STATE SIGNATURE _____ INSERT S →
 DATE ISSUED **10/10/2019** 41
 43 MM DD YY 48 CO SIGNATURE _____ EXP. DATE
DN: 10/18/19 DGT: 10/21/19 DGT: N/A

APPROXIMATE DEPTH OF WELL **320** FEET
 24 28
 APPROXIMATE DIAMETER OF WELL **6** INCH
 NEAREST

PROPOSED LOCATION OF WELL ON LOT
 SHOW PERMANENT STRUCTURES SUCH AS BUILDINGS, SEPTIC SYSTEM, ROADS AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCE MEASUREMENTS TO WELL

METHOD OF DRILLING (circle one)
 BORED (or Augered) JETTED Jetted & DRIVEN
 AIR-ROTARY AIR-PERCussion ROTARY (Hydraulic Rotary)
 CABLE REVERSE-ROTARY DRIVE-POINT
 other _____



REPLACEMENT OR DEEPEMED WELLS (CIRCLE APPROPRIATE BOX)
 THIS WELL WILL NOT REPLACE AN EXISTING WELL
 THIS WELL WILL REPLACE A WELL THAT WILL BE ABANDONED AND SEALED
 THIS WELL WILL REPLACE A WELL THAT WILL BE USED AS A STANDBY-CONTACT LOCAL APPROVING AUTHORITY FOR POLICY ON STANDBY WELLS
 THIS WELL WILL DEEPEM AN EXISTING WELL
 PERMIT NUMBER OF WELL TO BE REPLACED OR DEEPEMED (IF AVAILABLE) 41 _____ 52

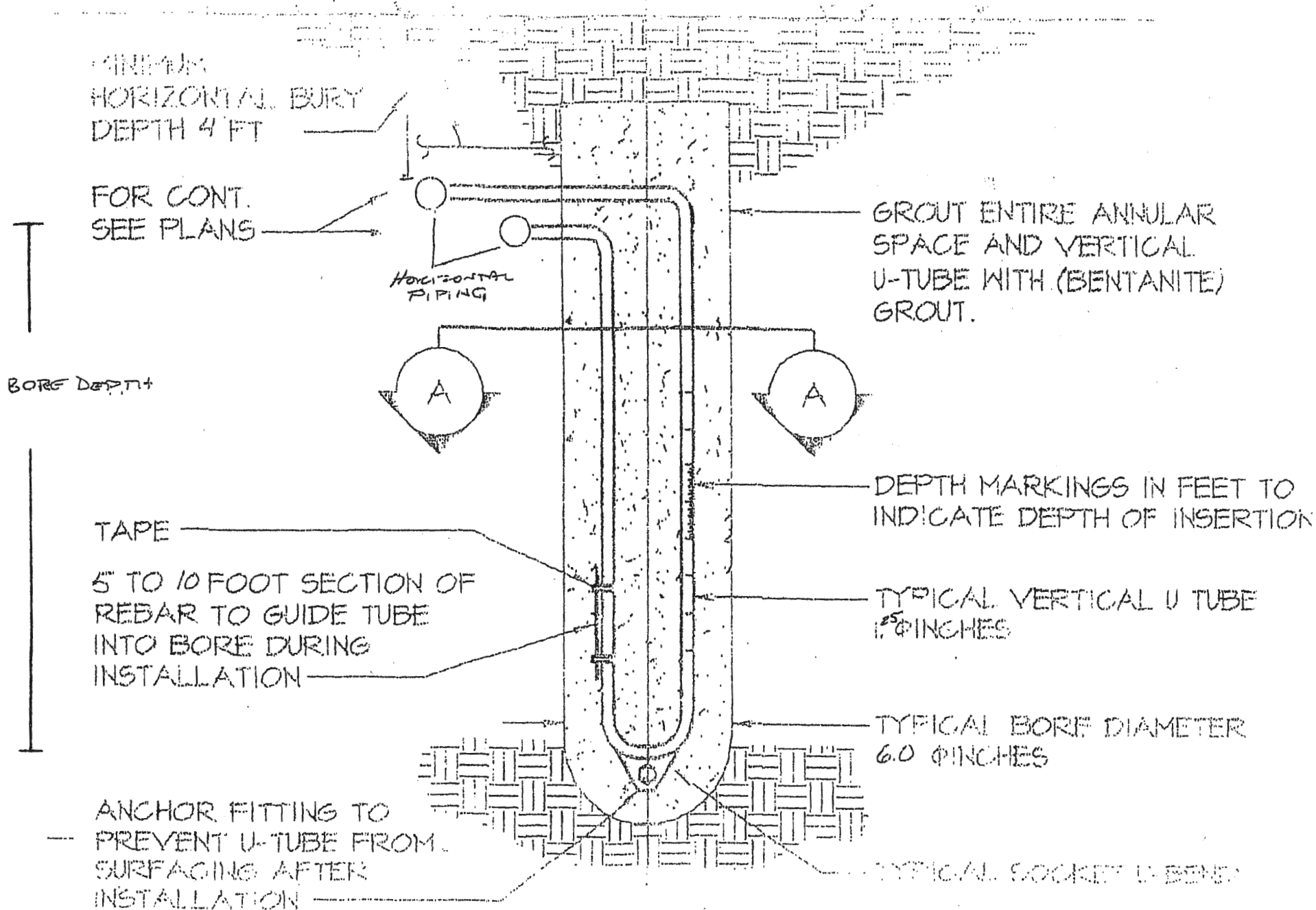
Pursuant to § 10-624 of the State Govt. Article of the Maryland Code, personal info requested on this form is used in processing this form pursuant to COMAR 26.04.04. Failure to provide the info may result in this form not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment is subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State Law.

Not to be filled in by driller (MDE OR COUNTY USE ONLY)
 APPROP. PERMIT NUMBER _____ **G** _____
 PERMIT No. **110-18-0115**
 70 71 72 73 74 75 76 77 78 79

SPECIAL CONDITIONS
 NOTE APPROVING AUTHORITIES SHOULD USE SEPARATE SHEET IF NEEDED
CALL IN DRILLING ACTIVITY SEE ATT MEMO

GRADE

EACH BORE HOLE (TYP.)



MINIMUM
HORIZONTAL BURY
DEPTH 4 FT

FOR CONT.
SEE PLANS

HORIZONTAL
PIPING

BORE DEPTH

TAPE

5' TO 10 FOOT SECTION OF
REBAR TO GUIDE TUBE
INTO BORE DURING
INSTALLATION

ANCHOR FITTING TO
PREVENT U-TUBE FROM
SURFACING AFTER
INSTALLATION

GROUT ENTIRE ANNULAR
SPACE AND VERTICAL
U-TUBE WITH (BENTANITE)
GROUT.

DEPTH MARKINGS IN FEET TO
INDICATE DEPTH OF INSERTION

TYPICAL VERTICAL U TUBE
1.25 INCHES

TYPICAL BORE DIAMETER
6.0 INCHES

TYPICAL SOCKET U-BEND

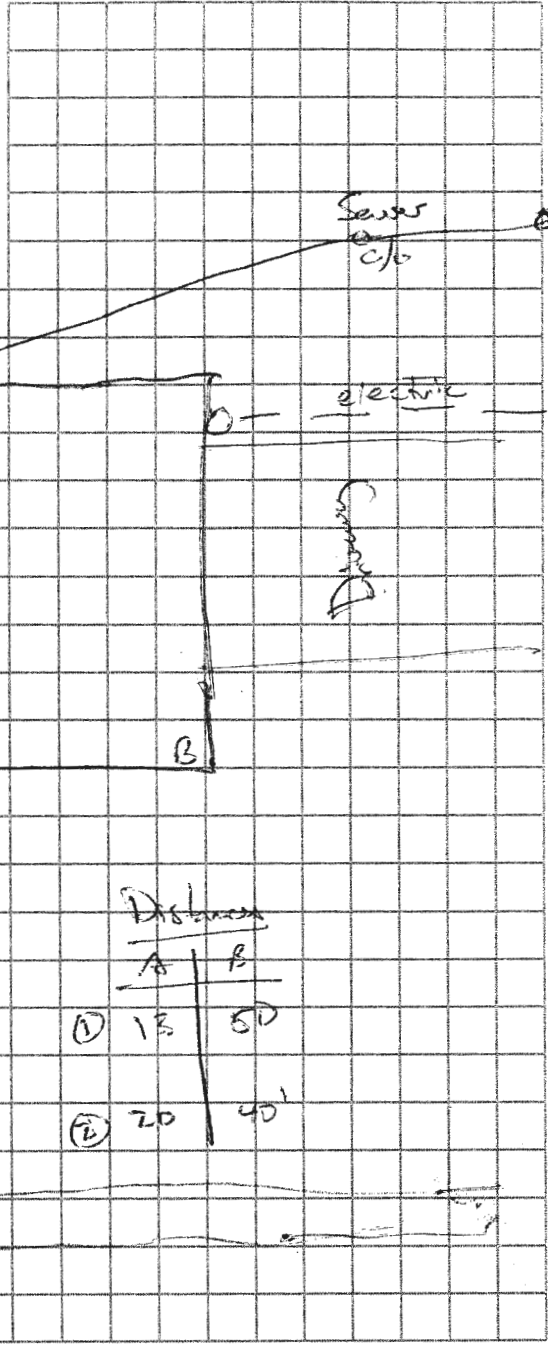
HOWARD COUNTY GROUTING PROCEDURE

Boreholes will be grouted from the bottom to the top via a tremie pipe and positive displacement pump. Bentonite grout, known as Quik-Grout will be used according to the manufacturer's specifications to achieve a consistency of at least 20% solids (24 gallons potable water/50 lb. sack of grout) and a permeability no more than $2.5 \text{ E}(-08) \text{ cm/sec}$. Grouting will be completed immediately after installing the geothermal loop and no later than twenty-four(24) hours after installing the geothermal loop. Open boreholes/annular space will be protected as necessary to prevent the entry of surface water or pollutants.

Bliss Sea



Bliss Sea WELL DRILLING SITE PLAN



	Distances	
	A	B
①	13	50
②	20	40

APPROVED 10/10/2019
STAKED BY DALLER

Sediment Control Protocol: silt bag

Distance From House: 13'
 From Septic: _____
 From Sewer: 50'
 From Property Line: 10'
 From Street: 15'

Trees Nearby: yes
 Utility Issues: no
 Mats Needed: yes
 Access For H/U: N/A
 Neighboring Tags: _____

Comments: _____

Person Completing Form: _____

DEPARTMENT OF INSPECTIONS, LICENSES & PERMITS 3430 COURT HOUSE DRIVE ELLICOTT CITY, MD 21043 PERMITS (410) 313-2455 INSPECTIONS (410) 313-1850	HOWARD COUNTY RESIDENTIAL HEATING-VENTILATION-AIR CONDITIONING AND REFRIGERATION PERMIT APPLICATION	HVACR PERMIT # M19600778 BUILDING PERMIT #
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BUILDING ADDRESS: _____ SUITE/APT: _____ SUBDIVISION: _____ CENSUS TRACT: _____ SECTION: _____ AREA: _____ LOT: _____ TAX MAP: _____ PARCEL: _____ BLOCK: _____ ZONE: _____ PROPERTY ID: _____ MAP COORDINATES: _____ TYPE OF IMPROVEMENTS: _____ USE: _____	OWNERS NAME: Andrew Ruel ADDRESS: 8849 Blue Sea Drive CITY: Columbia STATE: MD ZIP CODE: 21046 HOME PHONE: 540-226-1523 WORK PHONE: _____
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<u>CHECK ONE</u>	<u>HOW MANY</u>	COMPANY NAME: Ground Loop Heating & Air Cond., Inc.
SINGLE FAMILY DWELLING <input type="checkbox"/>	<u>1</u> ZONES	LICENSEE NAME: Michael E. Cullum
SINGLE FAMILY TOWNHOUSE <input type="checkbox"/>	_____ ZONES	ADDRESS: 1701 Whiteford Road
MULTI-FAMILY / HOTEL/MOTEL <input type="checkbox"/>	_____ ROOMS	CITY: Darlington
ASSISTED LIVING HOMES (16 OR FEWER RESIDENTS) <input type="checkbox"/>	_____ ROOMS	STATE: MD ZIP CODE: 21034 PHONE: 410-836-1706 HVACR LICENSE NO: 6539

New

Heating and Air Conditioning Heating System Only Other Work (Describe):

Geo Thermal System Ductless Mini Splits Thru The Wall Systems

Replacement

Heating Heating and Alterations

Air Conditioning Heating

Heating and Air Conditioning Heating and Air Conditioning

**EQUIPMENTS: 1 Unit
WATER FURNACE 4-TON
NVV048**

****Replacement Geo Thermal Systems are not required; However, if a tax credit is being sought a permit is required****

Zones Permit Fee = # of Zones x \$40 = <u>\$40.00</u> Technology Fee (10% of Permit Fee) = <u>\$4.00</u> Plus Application Fee <u>\$50.00</u> Total Fees Due = <u>\$94.00</u>	Rooms Permit Fee = # of Rooms x \$80 = _____ Technology Fee (10% of Permit Fee) = _____ Plus Application Fee \$50 <u>\$50.00</u> Total Fees Due = _____
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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.

Michael Cullum 9/5/19
 SIGNATURE OF LICENSEE DATE

Validation
Check Number: <u>25783</u>
Cash: _____
Receipt Number: <u>588832</u>

MICHAEL CULLUM
 PRINT NAME OF LICENSEE

tina @groundloop.com
 Email Address

CITY WATER & SEWER

Approved System Plan
Howard County Health Department

[Signature] 10/10/2019
 Signature Date

RECEIVED

SEP 06 2019

LICENSES & PERMITS
 DIVISION

Make check payable to: DIRECTOR OF FINANCE OF HOWARD COUNTY

Word doc: T:\Updated Forms\hvac application
 Rev:10.2009

M19000778



**Load Short Form
Entire House**

Job:
Date: May 15, 2014
By:

Project Information

For: Ruef

Design Information

	Htg	Clg	Method	Infiltration	Simplified
Outside db (°F)	12	94	Construction quality		Average
Inside db (°F)	72	70	Fireplaces		
Design TD (°F)	60	24			
Daily range	-	M			
Inside humidity (%)	30	50			
Moisture difference (gr/lb)	27	47			

HEATING EQUIPMENT

Make
Trade
Model
AHRI ref

Efficiency 80 AFUE
Heating input 0 Btuh
Heating output 0 Btuh
Temperature rise 0 °F
Actual air flow 1563 cfm
Air flow factor 0.039 cfm/Btuh
Static pressure 0 in H2O
Space thermostat

COOLING EQUIPMENT

Make
Trade
Cond
Coil
AHRI ref

Efficiency 0 SEER
Sensible cooling 0 Btuh
Latent cooling 0 Btuh
Total cooling 0 Btuh
Actual air flow 1563 cfm
Air flow factor 0.061 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.91

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Base	816	17147	12325	666	751
1st fl	360	7143	4413	277	269
2nd fl	1080	15942	8904	619	543
Entire House	2256	40232	25642	1563	1563
Other equip loads		0	0		
Equip. @ 1.00 RSM			25642		
Latent cooling			2540		
TOTALS	2256	40232	28182	1563	1563

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Project Information

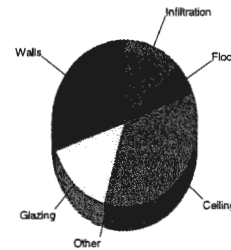
For: Ruef

Design Conditions

Location:		Indoor:		Heating	Cooling
Baltimore, MD, US		Indoor temperature (°F)		72	70
Elevation: 154 ft		Design TD (°F)		60	24
Latitude: 39°N		Relative humidity (%)		30	50
		Moisture difference (gr/lb)		26.8	47.0
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	12	94	Method	Simplified	
Daily range (°F)	-	19 (M)	Construction quality	Average	
Wet bulb (°F)	-	75	Fireplaces	0	
Wind speed (mph)	15.0	7.5			

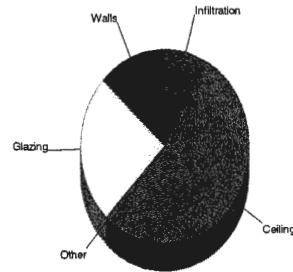
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	4.1	12226	30.4
Glazing	34.0	6091	15.1
Doors	23.3	489	1.2
Ceilings	6.3	13690	34.0
Floors	1.2	2519	6.3
Infiltration	2.1	5216	13.0
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		0	0
Adjustments		0	0
Total		40232	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	1.1	3364	13.1
Glazing	35.4	6335	24.7
Doors	13.9	293	1.1
Ceilings	6.3	13587	53.0
Floors	0	0	0
Infiltration	0.8	2062	8.0
Ducts		0	0
Ventilation		0	0
Internal gains		0	0
Blower		0	0
Adjustments		0	0
Total		25642	100.0



Latent Cooling Load = 2540 Btuh
Overall U-value = 0.073 Btuh/ft²·°F

Data entries checked.

Project Information

For: Ruef

Design Conditions

Location:		Indoor:		Heating	Cooling
Baltimore, MD, US		Indoor temperature (°F)		72	70
Elevation: 154 ft		Design TD (°F)		60	24
Latitude: 39°N		Relative humidity (%)		30	50
		Moisture difference (gr/lb)		26.8	47.0
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	12	94	Method	Simplified	
Daily range (°F)	-	19 (M)	Construction quality	Average	
Wet bulb (°F)	-	75	Fireplaces	0	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btu/hft²·°F	Insul R ft²·°F/Btu/h	Htg HTM Btu/hft²	Loss Btu/h	Cig HTM Btu/hft²	Gain Btu/h
Walls								
15B-10sfc-2: Bg wall, light dry soil, concrete wall, r-10 ins, 8" thk	n	577	0.061	10.0	4.63	2670	1.29	742
	e	411	0.061	10.0	4.65	1913	1.32	543
	s	543	0.061	10.0	4.61	2501	1.26	684
	w	411	0.061	10.0	4.65	1913	1.32	543
	all	1942	0.061	10.0	4.63	8998	1.29	2513
15B11-8wc-2: Bg wall, heavy damp soil, 2"x4" wood int fm, concrete wall, r-10 ins, 8" thk, 1/2" gypsum board int fnsh	n	384	0.043	19.0	3.10	1192	0.82	314
	e	136	0.043	19.0	3.10	422	0.82	111
	s	384	0.043	19.0	3.10	1192	0.82	314
	w	136	0.043	19.0	3.10	422	0.82	111
	all	1040	0.043	19.0	3.10	3229	0.82	852
Partitions								
(none)								
Windows								
1D-c2ow: 2 glazing, clr outr, air gas, wd frm mat, clr innr, 1/4" gap, 1/4" thk; 6.67 ft head ht	n	71	0.570	0	34.0	2416	24.4	1729
	e	12	0.570	0	34.0	408	66.4	797
	s	84	0.570	0	34.0	2858	35.9	3013
	w	12	0.570	0	34.0	408	66.4	797
	all	179	0.570	0	34.0	6091	35.4	6335
Doors								
11D0: Door, wd sc type	s	21	0.390	0	23.3	489	13.9	293
Ceilings								
16B-30ad: Attic ceiling, asphalt shingles roof mat, r-20 roof ins, r-30 cell ins		1440	0.032	30.0	1.91	2751	1.90	2730
C part ceiling.: C part ceiling, hrd wd flr fnsh, frm flr, 10" thkns, 1/2" gypsum board int fnsh		720	0.255	1.0	15.2	10939	15.1	10857
Floors								
21A-20c: Bg floor, heavy damp soil, 2' depth, carpet flr fnsh		816	0.027	0	1.61	1315	0	0
21B-28t: Bg floor, light dry soil, prm int ins cov, 6.5' depth, r-3 ins		1344	0.015	3.0	0.90	1204	0	0

Project Information

For: Ruef

Design Conditions

Location:		Indoor:		Heating	Cooling
Baltimore, MD, US		Indoor temperature (°F)		72	70
Elevation:	154 ft	Design TD (°F)		60	24
Latitude:	39°N	Relative humidity (%)		30	50
Outdoor:		Moisture difference (gr/lb)		26.8	47.0
	Heating	Cooling	Infiltration:		
Dry bulb (°F)	12	94	Method		
Daily range (°F)	-	19 (M)	Construction quality		
Wet bulb (°F)	-	75	Fireplaces		
Wind speed (mph)	15.0	7.5	Simplified		
			Average		
			0		

Construction descriptions

	Or	Area ft²	U-value Btu/ft²·°F	Insul R ft²·°F/Btu	Htg HTM Btu/ft²	Loss Btu	Clg HTM Btu/ft²	Gain Btu
Walls								
15B11-8wc-2: Bg wall, heavy damp soil, 2"x4" wood int frm, concrete wall, r-10 ins, 8" thk, 1/2" gypsum board int fnsh								
	n	384	0.043	19.0	3.10	1192	0.82	314
	e	136	0.043	19.0	3.10	422	0.82	111
	s	384	0.043	19.0	3.10	1192	0.82	314
	w	136	0.043	19.0	3.10	422	0.82	111
	all	1040	0.043	19.0	3.10	3229	0.82	852
Partitions								
(none)								
Windows								
(none)								
Doors								
(none)								
Ceilings								
C part ceiling.: C part ceiling, hrd wd flr fnsh, frm flr, 10" thkns, 1/2" gypsum board int fnsh								
		720	0.255	1.0	15.2	10939	15.1	10857
Floors								
21A-20c: Bg floor, heavy damp soil, 2' depth, carpet flr fnsh								
		816	0.027	0	1.61	1315	0	0

Project Information

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Location:		Indoor:		Heating	Cooling
Baltimore, MD, US		Indoor temperature (°F)		72	70
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	Heating	Cooling	Infiltration:		
Dry bulb (°F)	12	94	Method	Simplified	
Daily range (°F)	-	19 (M)	Construction quality	Average	
Wet bulb (°F)	-	75	Fireplaces	0	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft ²	U-value Btu/h/ft ² -°F	Insul R ft ² -F/Btu	Htg HTM Btu/h/ft ²	Loss Btu/h	Cig HTM Btu/h/ft ²	Gain Btu/h
Walls								
15B-10sfc-2: Bg wall, light dry soil, concrete wall, r-10 ins, 8" thk								
	n	216	0.061	10.0	4.66	1007	1.33	288
	e	135	0.061	10.0	4.66	630	1.33	180
	s	159	0.061	10.0	4.56	725	1.20	190
	w	123	0.061	10.0	4.63	570	1.30	159
	all	633	0.061	10.0	4.63	2932	1.29	818
Partitions								
(none)								
Windows								
1D-c2ow: 2 glazing, clr outr, air gas, wd frm mat, clr innr, 1/4" gap, 1/4" thk; 6.67 ft head ht								
	s	36	0.570	0	34.0	1225	35.9	1291
	w	12	0.570	0	34.0	408	66.4	797
	all	48	0.570	0	34.0	1633	43.5	2088
Doors								
11D0: Door, wd sc type								
	s	21	0.390	0	23.3	489	13.9	293
Ceilings								
16B-30ad: Attic ceiling, asphalt shingles roof mat, r-20 roof ins, r-30 ceil ins								
		360	0.032	30.0	1.91	688	1.90	683
Floors								
21B-28t: Bg floor, light dry soil, prm int ins cov, 6.5' depth, r-3 ins								
		264	0.015	3.0	0.90	236	0	0

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Design Conditions

Location:		Indoor:		Heating	Cooling
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Outdoor:		Moisture difference (gr/lb)		26.8	47.0
	Heating	Cooling	Infiltration:		
Dry bulb (°F)	12	94	Method	Simplified	
Daily range (°F)	-	19 (M)	Construction quality	Average	
Wet bulb (°F)	-	75	Fireplaces	0	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btu/ft²·F	Insul R ft²·F/Btu	Htg HTM Btu/ft²	Loss Btu	Clg HTM Btu/ft²	Gain Btu
Walls								
15B-10sfc-2: Bg wall, light dry soil, concrete wall, r-10 ins, 8" thk								
	n	361	0.061	10.0	4.61	1663	1.26	454
	e	276	0.061	10.0	4.65	1284	1.32	363
	s	384	0.061	10.0	4.63	1777	1.29	494
	w	288	0.061	10.0	4.66	1343	1.33	384
	all	1309	0.061	10.0	4.63	6066	1.29	1695
Partitions								
(none)								
Windows								
1D-c2ow: 2 glazing, clr outr, air gas, wd frm mat, clr innr, 1/4" gap, 1/4" thk; 6.67 ft head ht								
	n	71	0.570	0	34.0	2416	24.4	1729
	e	12	0.570	0	34.0	408	66.4	797
	s	48	0.570	0	34.0	1633	35.9	1722
	all	131	0.570	0	34.0	4458	32.4	4247
Doors								
(none)								
Ceilings								
16B-30ad: Attic ceiling, asphalt shingles roof mat, r-20 roof ins, r-30 ceil ins								
		1080	0.032	30.0	1.91	2063	1.90	2048
Floors								
21B-28t: Bg floor, light dry soil, prm int ins cov, 6.5' depth, r-3 ins								
		1080	0.015	3.0	0.90	967	0	0

Project Information

For: Ruef

Notes:

Design Information

Weather: Baltimore, MD, US

Winter Design Conditions

Outside db 12 °F
Inside db 72 °F
Design TD 60 °F

Summer Design Conditions

Outside db 94 °F
Inside db 70 °F
Design TD 24 °F
Daily range M
Relative humidity 50 %
Moisture difference 47 gr/lb

Heating Summary

Structure 40232 Btuh
Ducts 0 Btuh
Central vent (0 cfm) 0 Btuh
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 40232 Btuh

Sensible Cooling Equipment Load Sizing

Structure 25642 Btuh
Ducts 0 Btuh
Central vent (0 cfm) 0 Btuh
Blower 0 Btuh
Use manufacturer's data y
Rate/swing multiplier 1.00
Equipment sensible load 25642 Btuh

Infiltration

Method Simplified
Construction quality Average
Fireplaces 0

	Heating	Cooling
Area (ft ²)	2256	2256
Volume (ft ³)	14976	14976
Air changes/hour	0.32	0.32
Equiv. AVF (cfm)	80	80

Latent Cooling Equipment Load Sizing

Structure 2540 Btuh
Ducts 0 Btuh
Central vent (0 cfm) 0 Btuh
Equipment latent load 2540 Btuh
Equipment total load 28182 Btuh
Req. total capacity at 0.70 SHR 3.1 ton

Heating Equipment Summary

Make
Trade
Model
AHRI ref

Efficiency 80 AFUE
Heating input 0 Btuh
Heating output 0 Btuh
Temperature rise 0 °F
Actual air flow 1563 cfm
Air flow factor 0.039 cfm/Btuh
Static pressure 0 in H2O
Space thermostat

Cooling Equipment Summary

Make
Trade
Cond
Coil
AHRI ref
Efficiency 0 SEER
Sensible cooling 0 Btuh
Latent cooling 0 Btuh
Total cooling 0 Btuh
Actual air flow 1563 cfm
Air flow factor 0.061 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.91

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Project Information

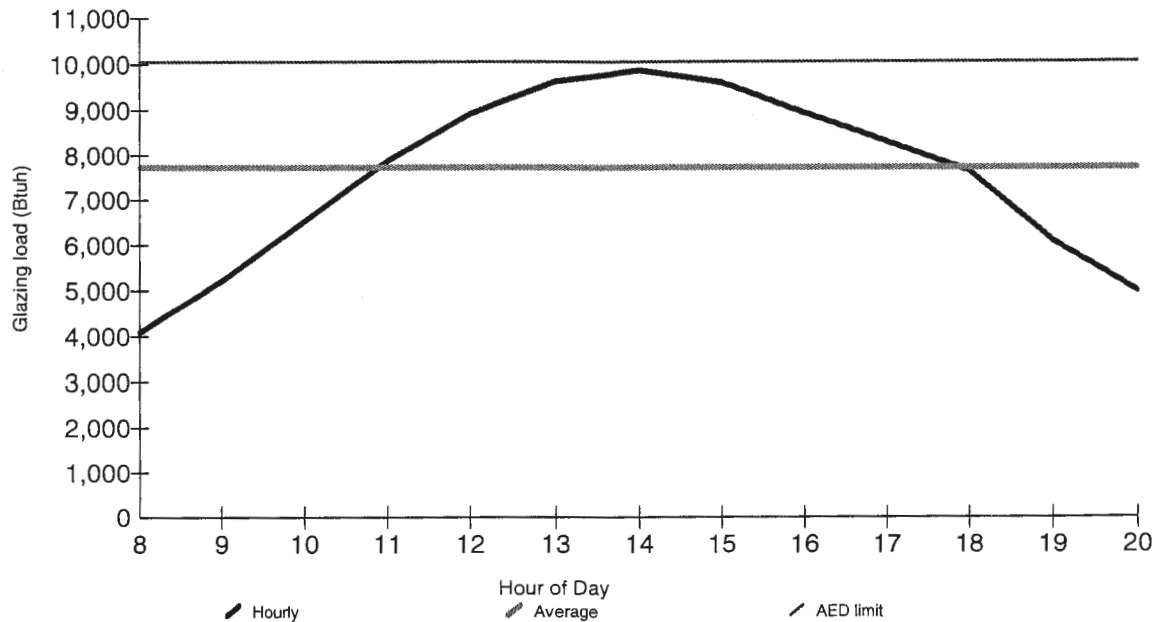
For: Ruef

Design Conditions

Location: Baltimore, MD, US Elevation: 154 ft Latitude: 39°N			Indoor: Indoor temperature (°F) Design TD (°F) Relative humidity (%) Moisture difference (gr/lb)	Heating 72 60 30 26.8	Cooling 70 24 50 47.0
Outdoor: Dry bulb (°F) Daily range (°F) Wet bulb (°F) Wind speed (mph)	Heating 12 - - 15.0	Cooling 94 19 (M) 75 7.5	Infiltration:		

Test for Adequate Exposure Diversity

Hourly Glazing Load



Maximum hourly glazing load exceeds average by 27.7%.

House has adequate exposure diversity (AED), based on AED limit of 30%.

AED excursion: 0 Btuh

Right-J® Worksheet
Entire House

Job:
Date: May 15, 2014
By:

		Room name		Entire House		Base								
		Exposed wall		368.0 ft		130.0 ft								
		Room height		8.6 ft		8.0 ft								
		Room dimensions				48.0 x 17.0 ft								
		Room area		2256.0 ft ²		816.0 ft ²								
	Ty	Construction number	U-value (Btuh/ft ² -°F)	Or	HTM (Btuh/ft ²)		Area (ft ²) or perimeter (ft)		Load (Btuh)		Area (ft ²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	15B-10sfc-2	0.083	n	4.63	1.29	648	577	2670	742	0	0	0	0
	-G	1D-c2ow	0.570	n	34.03	24.35	71	0	2416	1729	0	0	0	0
	W	15B11-8wc-2	0.055	n	3.10	0.82	384	384	1192	314	384	384	1192	314
	W	15B-10sfc-2	0.083	e	4.65	1.32	423	411	1913	543	0	0	0	0
11	-G	1D-c2ow	0.570	e	34.03	66.39	12	0	408	797	0	0	0	0
	W	15B11-8wc-2	0.055	e	3.10	0.82	136	136	422	111	136	136	422	111
	W	15B-10sfc-2	0.083	s	4.61	1.26	648	543	2501	684	0	0	0	0
	-G	1D-c2ow	0.570	s	34.03	35.87	84	0	2858	3013	0	0	0	0
	-D	11D0	0.390	s	23.28	13.94	21	21	489	293	0	0	0	0
	W	15B11-8wc-2	0.055	s	3.10	0.82	384	384	1192	314	384	384	1192	314
	W	15B-10sfc-2	0.083	w	4.65	1.32	423	411	1913	543	0	0	0	0
	-G	1D-c2ow	0.570	w	34.03	66.39	12	0	408	797	0	0	0	0
	W	15B11-8wc-2	0.055	w	3.10	0.82	136	136	422	111	136	136	422	111
	C	16B-30ad	0.032	-	1.91	1.90	1440	1440	2751	2730	0	0	0	0
	C	C part ceiling	0.255	-	15.19	15.08	720	720	10939	10857	720	720	10939	10857
	F	21A-20c	0.027	-	1.61	0.00	816	816	1315	0	816	816	1315	0
	F	21B-28t	0.015	-	0.90	0.00	1344	1344	1204	0	0	0	0	0
6	c) AED excursion									0				-41
	Envelope loss/gain								35016	23580			15483	11667
12	a) Infiltration								5216	2062			1663	658
	b) Room ventilation								0	0			0	0
13	Internal gains:		Occupants @	230			0			0	0			0
			Appliances/other							0				0
	Subtotal (lines 6 to 13)								40232	25642			17147	12325
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								40232	25642			17147	12325
15	Duct loads								0	0	-0%	0%	0	0
	Total room load								40232	25642			17147	12325
	Air required (cfm)								1563	1563			666	751

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Right-J® Worksheet Entire House

Job:
Date: May 15, 2014
By:

1 2 3 4 5	Room name				1st fl 78.0 ft				2nd fl 160.0 ft					
	Exposed wall				9.0 ft 24.0 x 15.0 ft				9.0 ft 1.0 x 1080.0 ft					
	Room height				360.0 ft ²				1080.0 ft ²					
Room dimensions				heat/cool				heat/cool						
Room area														
6	Ty	Construction number	U-value (Btu/h/ft ² -F)	Or	HTM (Btu/h/ft ²)		Area (ft ²) or perimeter (ft)		Load (Btu/h)		Area (ft ²) or perimeter (ft)		Load (Btu/h)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	15B-10stc-2	0.083	n	4.63	1.29	216	216	1007	288	432	361	1663	454
	W	1D-c2ow	0.570	n	34.03	24.35	0	0	0	0	71	0	2416	1729
	W	15B11-8wc-2	0.055	n	3.10	0.82	0	0	0	0	0	0	0	0
	W	15B-10stc-2	0.083	e	4.65	1.32	135	135	630	180	288	276	1284	363
11	W	1D-c2ow	0.570	e	34.03	66.39	0	0	0	0	12	0	408	797
	W	15B11-8wc-2	0.055	e	3.10	0.82	0	0	0	0	0	0	0	0
	W	15B-10stc-2	0.083	s	4.61	1.26	216	159	725	190	432	384	1777	494
	W	1D-c2ow	0.570	s	34.03	35.87	36	0	1225	1291	48	0	1633	1722
	W	11D0	0.390	s	23.28	13.94	21	21	489	293	0	0	0	0
	W	15B11-8wc-2	0.055	s	3.10	0.82	0	0	0	0	0	0	0	0
	W	15B-10stc-2	0.083	w	4.65	1.32	135	123	570	159	288	288	1343	384
	W	1D-c2ow	0.570	w	34.03	66.39	12	0	408	797	0	0	0	0
	W	15B11-8wc-2	0.055	w	3.10	0.82	0	0	0	0	0	0	0	0
	C	16B-30ad	0.032	-	1.91	1.90	360	360	688	683	1080	1080	2063	2048
	C	C part ceiling	0.255	-	15.19	15.08	0	0	0	0	0	0	0	0
	F	21A-20c	0.027	-	1.61	0.00	0	0	0	0	0	0	0	0
	F	21B-28t	0.015	-	0.90	0.00	264	264	236	0	1080	1080	967	0
6	c) AED excursion									71				-30
	Envelope loss/gain								5978	3952			13554	7960
12	a) Infiltration								1164	460			2388	944
	b) Room ventilation								0	0			0	0
13	Internal gains:				Occupants @	230	0			0	0			0
					Appliances/other					0				0
	Subtotal (lines 6 to 13)								7143	4413			15942	8904
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								7143	4413			15942	8904
15	Duct loads						-0%	0%	0	0	-0%	0%	0	0
	Total room load								7143	4413			15942	8904
	Air required (cfm)								277	269			619	543

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Project Information

For: Ruef

Design Conditions

Location:		Indoor:	Heating	Cooling
Baltimore, MD, US		Indoor temperature (°F)	72	70
Elevation: 154 ft		Design TD (°F)	60	24
Latitude: 39°N		Relative humidity (%)	30	50
		Moisture difference (gr/lb)	26.8	47.0
Outdoor:	Heating	Cooling		
Dry bulb (°F)	12	94		
Daily range (°F)	-	19 (M)		
Wet bulb (°F)	-	75		
Wind speed (mph)	15.0	7.5		
		Infiltration:		

Front Door	North	Northeast	East	Southeast	South	Southwest	West	Northwest
Sensible Load (Btuh)	25642	29036	30319	28705	25492	28705	30319	28820
Latent Load (Btuh)	2540	2540	2540	2540	2540	2540	2540	2540
Total Load (Btuh)	28182	31576	32859	31245	28032	31245	32859	31360
Heating AVF (cfm)	1563	1770	1848	1749	1554	1749	1848	1756
Cooling AVF (cfm)	1563	1770	1848	1749	1554	1749	1848	1756

Building Orientation Cooling Load



Current Orientation: Front Door faces North
 Highest Cooling Load: Front Door faces East

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

Project Information

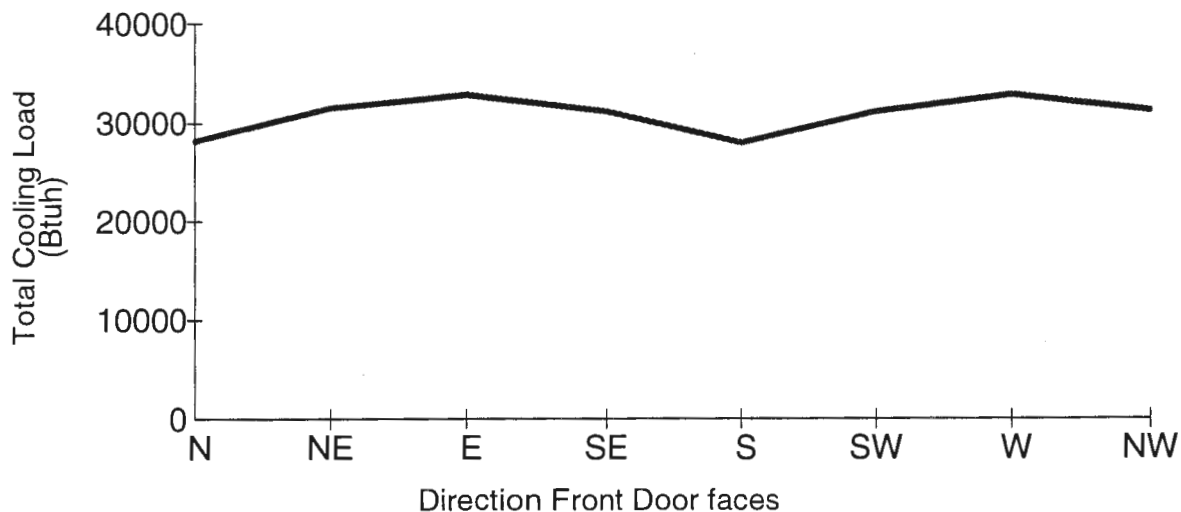
For: Ruef

Design Conditions

Location:		Indoor:	Heating	Cooling
Baltimore, MD, US		Indoor temperature (°F)	72	70
Elevation: 154 ft		Design TD (°F)	60	24
Latitude: 39°N		Relative humidity (%)	30	50
		Moisture difference (gr/lb)	26.8	47.0
Outdoor:	Heating	Cooling	Infiltration:	
Dry bulb (°F)	12	94		
Daily range (°F)	-	19 (M)		
Wet bulb (°F)	-	75		
Wind speed (mph)	15.0	7.5		

Front Door	North	Northeast	East	Southeast	South	Southwest	West	Northwest
Sensible Load (Btuh)	25642	29036	30319	28705	25492	28705	30319	28820
Latent Load (Btuh)	2540	2540	2540	2540	2540	2540	2540	2540
Total Load (Btuh)	28182	31576	32859	31245	28032	31245	32859	31360
Heating AVF (cfm)	1563	1770	1848	1749	1554	1749	1848	1756
Cooling AVF (cfm)	1563	1770	1848	1749	1554	1749	1848	1756

Building Orientation Cooling Load



Current Orientation: Front Door faces North
Highest Cooling Load: Front Door faces East

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



HOWARD COUNTY HEALTH DEPARTMENT

66364

DATE
9/16/19

W5

Received From

Allied Environmental Services

PHONE # 301 778-8370

For

Well Permit (Crotchford)
8849 Blue Sea Dr.

CASH

CHECK

NO.

14845

One hundred sixty

Dollars

\$

160.00

Received By

A Kemp