



HOWARD COUNTY HEALTH DEPARTMENT

64840

DATE
4/12/19

WS

Received From

Chesapeake
Gas Systems

PHONE #

410 419-5020

For

Well Permit/10813
Graddock Rd.

CASH

CHECK

NO.

2933B

One hundred sixty

Dollars

\$ 160.00

Received By

J King

C 1 -53258

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

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

COUNTY NUMBER

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

ST/CO USE ONLY DATE RECEIVED

DATE WELL COMPLETED

Depth of Well 370 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" HO 18-0035

OWNER: COX last name; GRACIACH RD first name; TOWN: Laurel; SUBDIVISION: Hammond Park; SECTION: ; LOT: 10

WELL LOG table with columns: DESCRIPTION, FEET (FROM, TO), check if water bearing. Includes entries for Moist Brown-M-F Sand-Mica, Weathered Rock, and Rock.

GROUTING RECORD: WELL HAS BEEN GROUTED (Y), TYPE OF GROUTING MATERIAL (CM), CEMENT, BENTONITE CLAY (BC), NO. OF BAGS (12), NO. OF POUNDS (600), GALLONS OF WATER (288), DEPTH OF GROUT SEAL (0 to 52 ft)

CASING RECORD: MAIN CASING TYPE (ST), Nominal diameter top (main) casing (nearest inch), Total depth of main casing (nearest foot)

OTHER CASING (if used) table with columns: diameter inch, depth (feet) from, to

SCREEN RECORD: screen type or open hole (ST, BR, HO), insert appropriate code below

DEPTH (nearest ft.) table with columns: E, A, C, H, S, R, E, N and rows for well depth intervals

PUMPING TEST: HOURS PUMPED (8), PUMPING RATE (11), METHOD USED TO MEASURE PUMPING RATE, WATER LEVEL (distance from land surface) BEFORE PUMPING (17 to 20 ft), WHEN PUMPING (22 to 25 ft), TYPE OF PUMP USED (A, P, T, C, R, O, J, S)

PUMP INSTALLED: DRILLER INSTALLED PUMP (YES), 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 (31 to 35), PUMP HORSE POWER (37 to 41), PUMP COLUMN LENGTH (49 to 47), CASING HEIGHT (circle appropriate box and enter casing height), LAND SURFACE (nearest foot)

NUMBER OF UNSUCCESSFUL WELLS: 0; WELL HYDROFRACTURED (Y)

CIRCLE APPROPRIATE LETTER: A (well abandoned and sealed), 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...

DRILLERS LIC. NO. 1 M 4D 580; DRILLERS SIGNATURE; LIC. NO. 1 D

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

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

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER): T, W, Q, 70, 72, 74, 75, 76

LATITUDE 39.153127; LONGITUDE 76.888452 (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 26.04.04. Failure to provide the info. may result in this form not being processed...

B 1 64114

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND APPLICATION FOR PERMIT TO DRILL WELL

STATE PERMIT NUMBER HO-18-0035

1 2 3 6

564840 please type

fill in this form completely

OWNER INFORMATION: Date Received (APA) 04/12/19, Last Name Cox, First Name Karl, Street or RFD 10813 Graeclach Rd, Town Laurel, State MD, Zip 20723

LOCATION OF WELL: COUNTY Howard, SUBDIVISION Hemmond Park, SECTION 44, LOT 10, NEAREST TOWN Laurel

DRILLER INFORMATION: Driller's Name Ed Goss, License No. MW D 580, Firm Name Chesapeake Ecosystems, Address 6720 Fort Smallwood Rd, Baltimore MD 21226, Date 4/10/19

SOURCES OF DRILLING WATER: 1. Public, 2. 10813 Graeclach Rd, 11 STREET ADDRESS, ON WHICH SIDE OF ROAD (CIRCLE APPROPRIATE BOX) NORTH, DISTANCE FROM ROAD 34 15 37 FT, ENTER FT OR MI, TAX MAP: 41, BLK: 23, PARCEL 297

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): [D] DOMESTIC POTABLE SUPPLY & RESIDENTIAL IRRIGATION, [F] FARMING (LIVESTOCK WATERING & AGRICULTURAL IRRIGATION), [I] INDUSTRIAL, COMMERCIAL, DEWATERING, [P] PUBLIC WATER SUPPLY WELL, [T] TEST, OBSERVATION, MONITORING, [O] OPEN LOOP GEOTHERMAL, [C] CLOSED LOOP GEOTHERMAL 2x Geothermal

NOT TO BE FILLED IN BY DRILLER HEALTH DEPARTMENT APPROVAL: COUNTY NAME Howard, COUNTY NO., STATE SIGNATURE, DATE ISSUED 4/24/19, CO SIGNATURE, EXP. DATE 4/24/20

APPROXIMATE DEPTH OF WELL 320 FEET, APPROXIMATE DIAMETER OF WELL 6 INCH, NEAREST INCH

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): [N] THIS WELL WILL NOT REPLACE AN EXISTING WELL, [Y] THIS WELL WILL REPLACE A WELL THAT WILL BE ABANDONED AND SEALED, [S] THIS WELL WILL REPLACE A WELL THAT WILL BE USED AS A STANDBY-CONTACT LOCAL APPROVING AUTHORITY FOR POLICY ON STANDBY WELLS, [D] THIS WELL WILL DEEPEAN AN EXISTING WELL, PERMIT NUMBER OF WELL TO BE REPLACED OR DEEPEMED (IF AVAILABLE) 41

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.

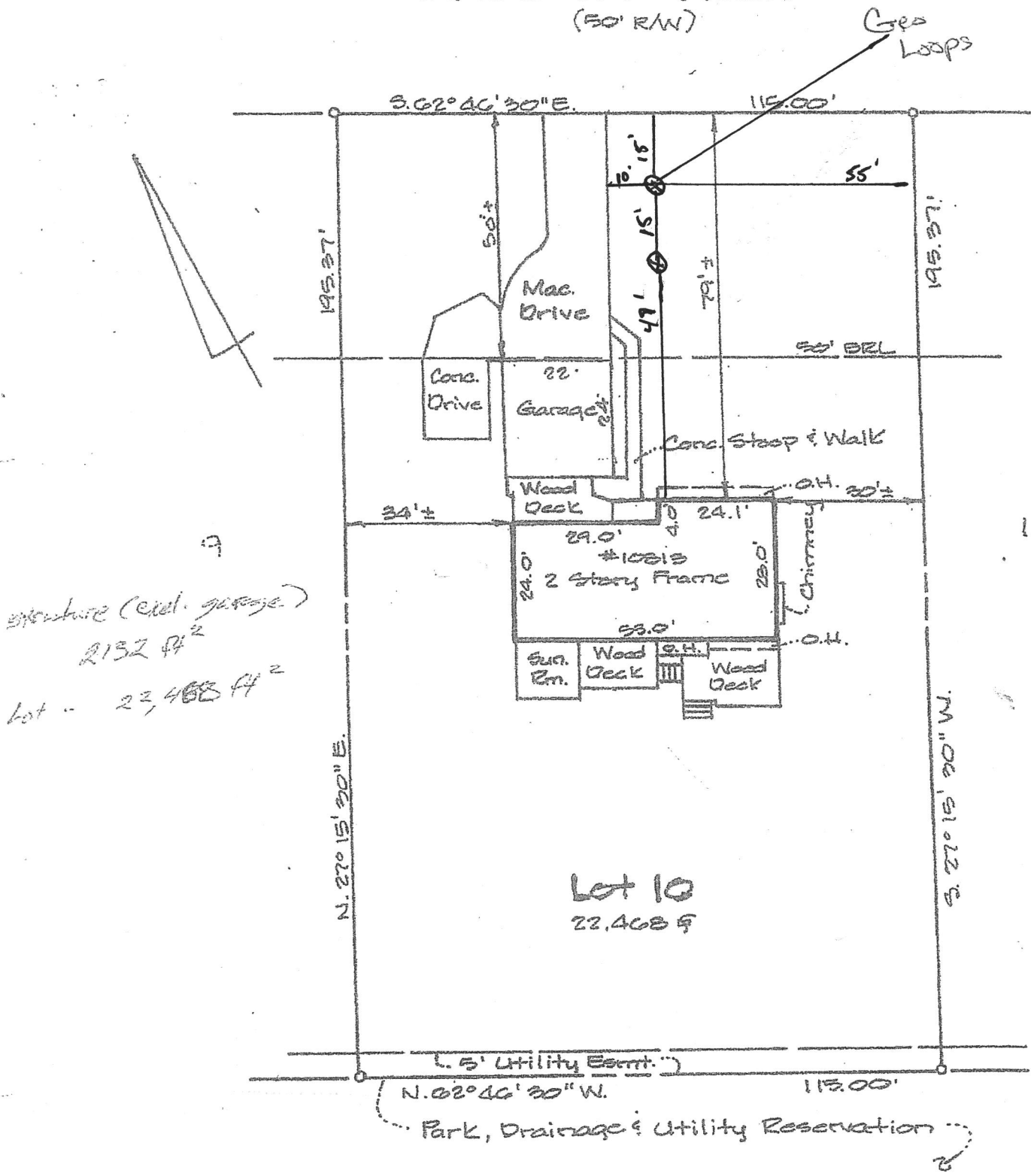
Not to be filled in by driller (MDE OR COUNTY USE ONLY): APPROP. PERMIT NUMBER G, PERMIT No. HO-18-0035

SPECIAL CONDITIONS NOTE APPROVING AUTHORITIES SHOULD USE SEPARATE SHEET IF NEEDED-

PROPERTY KNOWN AS: Lot 10
 Hammond Park
 Section 7
 7th Election District
 Howard County, MD.
 Platbook 9/24

THIS PLAT CAN NOT BE USED TO ESTABLISH
 PROPERTY LINES OR CORNERS.

GRAELOCH ROAD
 (50' R/W)



structure (incl. garage)
 2132 sq ft
 lot - 23,468 sq ft

Lot 10
 22,468 sq ft

L. 5' Utility Easmt. (")

N. 62° 46' 30" W.

Park, Drainage & Utility Reservation

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 # **M1900082**
 BUILDING PERMIT #

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: **Karl Cox**
 ADDRESS: **10813 Graelock Road**
 CITY: **Laurel**
 STATE: **MD** ZIP CODE: **20723**
 HOME PHONE: **301-996-3011** WORK PHONE:

	<u>CHECK ONE</u>	<u>HOW MANY</u>	
SINGLE FAMILY DWELLING	<input checked="" type="checkbox"/>	<u>1</u>	ZONES
SINGLE FAMILY TOWNHOUSE	<input type="checkbox"/>	___	ZONES
MULTI-FAMILY / HOTEL/MOTEL	<input type="checkbox"/>	___	ROOMS
ASSISTED LIVING HOMES (16 OR FEWER RESIDENTS)	<input type="checkbox"/>	___	ROOMS

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**

- New
 Heating and Air Conditioning
 Geo Thermal System
 Heating System Only
 Ductless Mini Splits
 Other Work (Describe):
 Thru The Wall Systems
- Replacement
 Heating
 Air Conditioning
 Heating and Air Conditioning
- EQUIPMENTS: **NDV049**
WATER FURNACE 4-TON
- Additions and Alterations
 Heating
 Air Conditioning
 Heating and Air Conditioning

****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 = 40.00
 Technology Fee (10% of Permit Fee) = 4.00
 Plus Application Fee \$50.00
 Total Fees Due = 94.00

Rooms
 Permit Fee = # of Rooms x \$80 = ___
 Technology Fee (10% of Permit Fee) = ___
 Plus Application Fee \$50 \$50.00
 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.

Michael Cullum 3/13/19
 SIGNATURE OF LICENSEE DATE

MICHAEL CULLUM
 PRINT NAME OF LICENSEE
linda@groundloop.com
 Email Address

Make check payable to: DIRECTOR OF FINANCE OF HOWARD COUNTY

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

Validation
 Check Number: 25404
 Cash: _____
 Receipt Number: 568610

RECEIVED

MAR 19 2019

LICENSES & PERMITS
 DIVISION

APPROVED
 CITY WATER & SEWER
 WALK-THRU BUILDING PERMIT
 # M1900082 OR # N/A
 APP. SAN J. CO. 001997 DATE: 04/29/2019
 DESC. OF WORK: **VERTICAL GEO WELL 2 LOOPS**

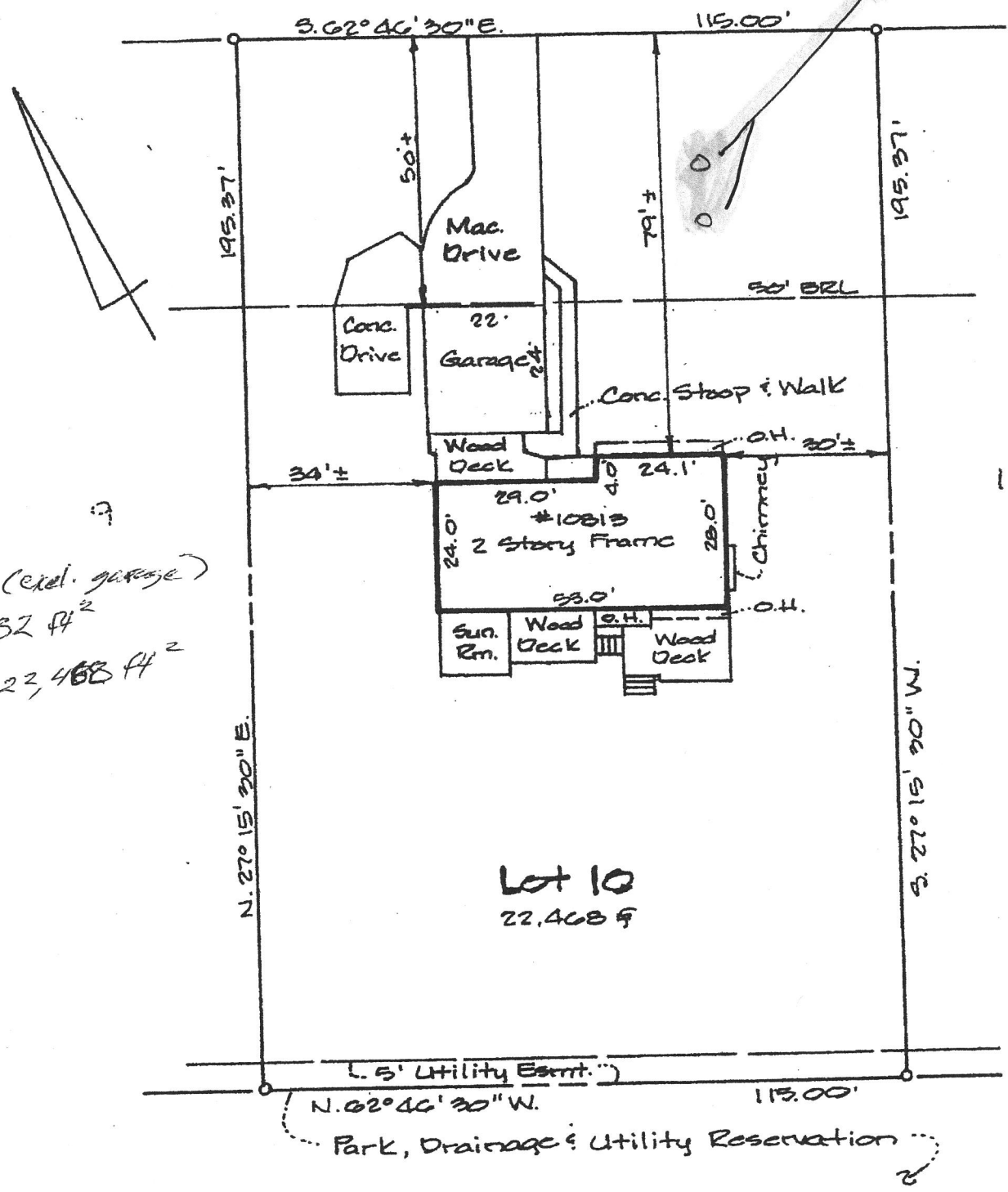
PROPERTY KNOWN AS: Lot 10
 Hammond Park
 Section 7
 10th Election District
 Howard County, MD.
 Platbook 9/24

THIS PLAT CAN NOT BE USED TO ESTABLISH
 PROPERTY LINES OR CORNERS.

M19000183

GRAELOCH ROAD
 (50' R/W)

Geothermal
 Loops



Structure (excl. garage)
 2132 ft²
 Lot - 22,468 ft²

Lot 10
 22,468 sq

5' Utility Easmt.
 N. 62° 46' 30" W.
 Park, Drainage & Utility Reservation

Project Information

For: Karl Cox

Design Information

	Htg	Clg	Infiltration	Simplified
Outside db (°F)	12	94	Method	Average
Inside db (°F)	72	70	Construction quality	
Design TD (°F)	60	24	Fireplaces	0
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 2065 cfm
Air flow factor 0.040 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 2065 cfm
Air flow factor 0.061 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.93

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
Base	850	19256	15073	778	919
1st fl	868	15124	8929	611	544
2nd fl	850	16749	9886	677	602
Entire House	2568	51129	33888	2065	2065
Other equip loads		0	0		
Equip. @ 1.00 RSM			33888		
Latent cooling			2726		
TOTALS	2568	51129	36614	2065	2065

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

Project Information

For: Karl Cox

Design Conditions

Location:

Baltimore, MD, US
Elevation: 154 ft
Latitude: 39°N

Outdoor:

Dry bulb (°F)
Daily range (°F)
Wet bulb (°F)
Wind speed (mph)

Heating

12
-
-
15.0

Cooling

94
19 (M)
75
7.5

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

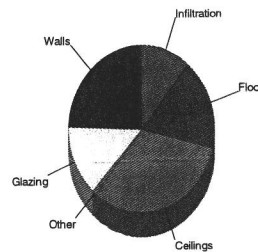
Infiltration:

Method
Construction quality
Fireplaces

Simplified
Average
0

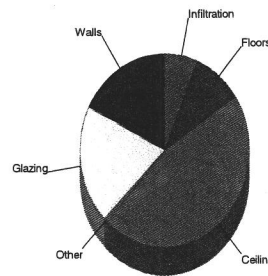
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	4.8	12492	24.4
Glazing	34.0	7044	13.8
Doors	23.3	489	1.0
Ceilings	6.4	16402	32.1
Floors	3.5	9104	17.8
Infiltration	2.4	5598	10.9
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		0	0
Adjustments		0	0
Total		51129	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	2.3	5986	17.7
Glazing	32.2	6658	19.6
Doors	13.9	293	0.9
Ceilings	6.1	15540	45.9
Floors	1.2	3198	9.4
Infiltration	0.9	2213	6.5
Ducts		0	0
Ventilation		0	0
Internal gains		0	0
Blower		0	0
Adjustments		0	0
Total		33888	100.0



Latent Cooling Load = 2726 Btuh
Overall U-value = 0.117 Btuh/ft²-°F

Data entries checked.

Project Information

For: Karl Cox

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 ft ²	U-value Btu/h/ft ² -°F	Insul R ft ² -°F/Btu/h	Htg HTM Btu/h/ft ²	Loss Btu/h	Clg HTM Btu/h/ft ²	Gain Btu/h
Walls								
12B-0sw: Frm wall, wd ext, 3/8" wood shth, r-11 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud								
	n	350	0.097	11.0	5.79	2027	3.23	1132
	e	520	0.097	11.0	5.79	3011	3.23	1682
	s	329	0.097	11.0	5.79	1905	3.23	1064
	w	508	0.097	11.0	5.79	2942	3.23	1643
	all	1707	0.097	11.0	5.79	9885	3.23	5522
15B11-8wc-4: Bg wall, heavy damp soil, 2"x4" wood int frm, concrete wall, r-10 ins, 8" thk, 1/2" gypsum board int fnsh								
	n	165	0.043	19.0	2.85	470	0.43	71
	e	272	0.043	19.0	2.93	796	0.55	148
	s	192	0.043	19.0	2.91	559	0.52	100
	w	268	0.043	19.0	2.92	783	0.54	144
	all	897	0.043	19.0	2.91	2607	0.52	464
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	39	0.570	0	34.0	1327	24.4	950
	n	35	0.570	0	34.0	1191	24.4	852
	n	35	0.570	0	34.0	1191	24.4	852
	s	39	0.570	0	34.0	1327	35.9	1399
	s	35	0.570	0	34.0	1191	35.9	1256
	s	8	0.570	0	34.0	272	35.9	287
	w	12	0.570	0	34.0	408	66.4	797
	w	4	0.570	0	34.0	136	66.4	266
	all	207	0.570	0	34.0	7044	32.2	6658
Doors								
11D0: Door, wd sc type								
	s	21	0.390	0	23.3	489	13.9	293
Ceilings								
16B-28ad: Attic ceiling, asphalt shingles roof mat, r-28 ceil ins, 1/2" gypsum board int fnsh								
		850	0.034	28.0	2.03	1725	2.01	1712
18A-30ad: Rf/clg ceiling, asphalt shingles roof mat, frm cons, 1/2" gypsum board int fnsh, 10" thkns, r-30 ceil ins								
		868	0.034	30.0	2.03	1762	1.16	1011

C part ceiling, : C part ceiling, hrd wd flr fnsh, frm flr, 10" thkns, 1/2" gypsum board int fnsh	850	0.255	1.0	15.2	12915	15.1	12817
Floors							
19A-0bswp: Part floor, hrd wd flr fnsh, frm flr, 10" thkns, 1/2" gypsum board int fnsh	850	0.295	0	6.62	5624	2.62	2223
19A-13cswp: Flr floor, frm flr, 6" thkns, hrd wd flr fnsh, r-13 cav ins, tight crvl ovr	868	0.065	13.0	2.84	2465	1.12	975
21A-32t: Bg floor, heavy damp soil, 4' depth	850	0.020	0	1.19	1015	0	0

Project Information

For: Karl Cox

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/h/ft²-°F	Insul R ft²-F/Btu/h	Htg HTM Btu/h/ft²	Loss Btu/h	Clg HTM Btu/h/ft²	Gain Btu/h
Walls								
15B11-8wc-4: Bg wall, heavy damp soil, 2"x4" wood int frm, concrete wall, r-10 ins, 8" thk, 1/2" gypsum board int fnsh								
	n	165	0.043	19.0	2.85	470	0.43	71
	e	272	0.043	19.0	2.93	796	0.55	148
	s	192	0.043	19.0	2.91	559	0.52	100
	w	268	0.043	19.0	2.92	783	0.54	144
	all	897	0.043	19.0	2.91	2607	0.52	464
Partitions								
(none)								
Windows								
1D-c2owd: 2 glazing, clr outr, air gas, wd frm mat, clr innr, 1/4" gap, 1/4" thk; 6.67 ft head ht								
	n	35	0.570	0	34.0	1191	24.4	852
	s	8	0.570	0	34.0	272	35.9	287
	w	4	0.570	0	34.0	136	66.4	266
	all	47	0.570	0	34.0	1599	29.9	1405
Doors								
(none)								
Ceilings								
C part ceiling,: C part ceiling, hrd wd flr fnsh, frm flr, 10" thkns, 1/2" gypsum board int fnsh								
		850	0.255	1.0	15.2	12915	15.1	12817
Floors								
21A-32t: Bg floor, heavy damp soil, 4' depth								
		850	0.020	0	1.19	1015	0	0

Project Information

For: Karl Cox

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 ft ²	U-value Btu/ft ² ·°F	Insul R ft ² ·°F/Btu	Htg HTM Btu/ft ²	Loss Btu	Clg HTM Btu/ft ²	Gain Btu
Walls								
12B-0sw: Fm wall, wd ext, 3/8" wood shth, r-11 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood frm, 16" o.c. stud								
	n	174	0.097	11.0	5.79	1008	3.23	563
	e	248	0.097	11.0	5.79	1436	3.23	802
	s	153	0.097	11.0	5.79	886	3.23	495
	w	248	0.097	11.0	5.79	1436	3.23	802
	all	823	0.097	11.0	5.79	4766	3.23	2662
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	15	0.570	0	34.0	510	24.4	365
	n	35	0.570	0	34.0	1191	24.4	852
	s	15	0.570	0	34.0	510	35.9	538
	s	35	0.570	0	34.0	1191	35.9	1256
	all	100	0.570	0	34.0	3403	30.1	3011
Doors								
11D0: Door, wd sc type								
	s	21	0.390	0	23.3	489	13.9	293
Ceilings								
18A-30ad: Rf/clg ceiling, asphalt shingles roof mat, frm cons, 1/2" gypsum board int fnsh, 10" thkns, r-30 ceil ins								
		868	0.034	30.0	2.03	1762	1.16	1011
Floors								
19A-13cswp: Flr floor, frm flr, 6" thkns, hrd wd flr fnsh, r-13 cav ins, tight cowl ovr								
		868	0.065	13.0	2.84	2465	1.12	975

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Design Conditions

Location:		Indoor:		Heating	Cooling
Baltimore, MD, US		Indoor temperature (°F)		72	70
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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	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 Btuh/ft²·°F	Insul R ft²·°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12B-0sw: Fm wall, wd ext, 3/8" wood shth, r-11 cav ins, 1/2" gypsum board int fnsh, 2"x4" wood fm, 16" o.c. stud	n	176	0.097	11.0	5.79	1019	3.23	569
	e	272	0.097	11.0	5.79	1575	3.23	880
	s	176	0.097	11.0	5.79	1019	3.23	569
	w	260	0.097	11.0	5.79	1506	3.23	841
	all	884	0.097	11.0	5.79	5119	3.23	2860
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	24	0.570	0	34.0	817	24.4	584
	s	24	0.570	0	34.0	817	35.9	861
	w	12	0.570	0	34.0	408	66.4	797
	all	60	0.570	0	34.0	2042	37.4	2242
Doors (none)								
Ceilings								
16B-28ad: Attic ceiling, asphalt shingles roof mat, r-28 ceil ins, 1/2" gypsum board int fnsh		850	0.034	28.0	2.03	1725	2.01	1712
Floors								
19A-0bswp: Part floor, hrd wd flr fnsh, frm flr, 10" thkns, 1/2" gypsum board int fnsh		850	0.295	0	6.62	5624	2.62	2223

Project Information

For: Karl Cox

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 51129 Btuh
Ducts 0 Btuh
Central vent (0 cfm) 0 Btuh
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 51129 Btuh

Sensible Cooling Equipment Load Sizing

Structure 33888 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 33888 Btuh

Infiltration

Method Simplified
Construction quality Average
Fireplaces 0

Latent Cooling Equipment Load Sizing

Structure 2726 Btuh
Ducts 0 Btuh
Central vent (0 cfm) 0 Btuh
Equipment latent load 2726 Btuh
Equipment total load 36614 Btuh
Req. total capacity at 0.70 SHR 4.0 ton

	Heating	Cooling
Area (ft²)	2568	2568
Volume (ft³)	17144	17144
Air changes/hour	0.30	0.30
Equiv. AVF (cfm)	86	86

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 2065 cfm
Air flow factor 0.040 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 2065 cfm
Air flow factor 0.061 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.93

Bold/italic values have been manually overridden

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

Project Information

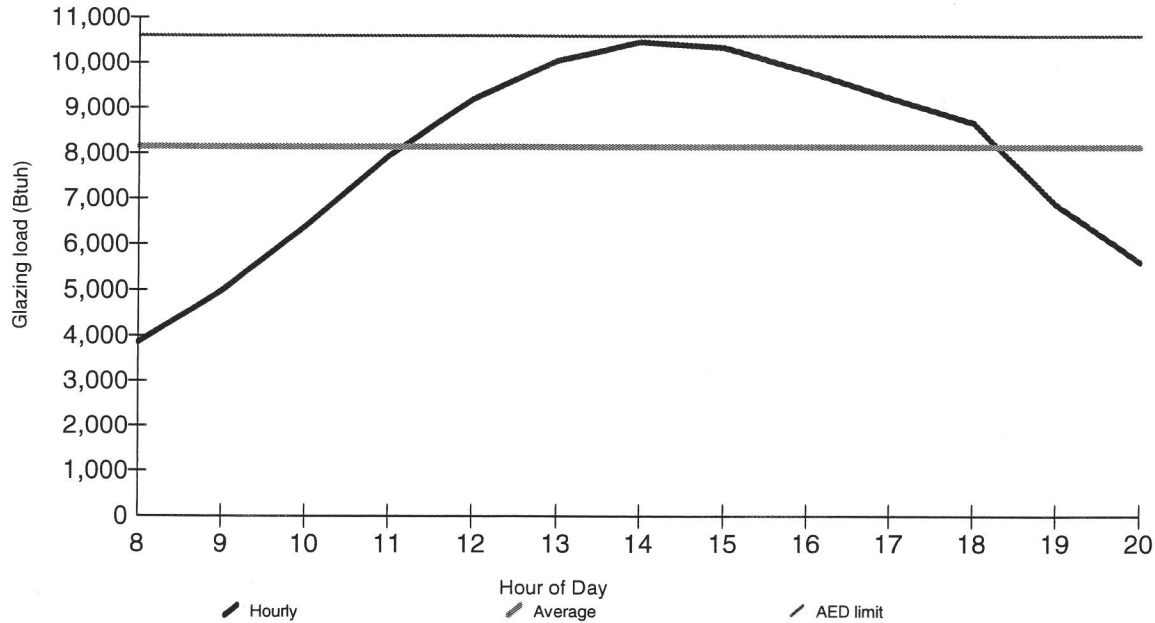
For: Karl Cox

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			

Test for Adequate Exposure Diversity

Hourly Glazing Load



Maximum hourly glazing load exceeds average by 28.5%.

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:

1 Room name		Entire House		Base										
2 Exposed wall		354.0 ft		118.0 ft										
3 Room height		8.0 ft		8.0 ft										
4 Room dimensions		2568.0 ft²		25.0 x 34.0 ft										
5 Room area				850.0 ft²										
6	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12B-0sw	0.097	n	5.79	3.23	424	350	2027	1132	0	0	0	0
	G	1D-c2ow	0.570	n	34.03	24.35	39	0	1327	950	0	0	0	0
11	G	1D-c2owd	0.570	n	34.03	24.35	35	0	1191	852	0	0	0	0
	W	15B11-8wc-4	0.055	n	2.85	0.43	200	165	470	71	200	165	470	71
11	G	1D-c2owd	0.570	n	34.03	24.35	35	0	1191	852	35	0	1191	852
	W	12B-0sw	0.097	e	5.79	3.23	520	520	3011	1682	0	0	0	0
11	W	15B11-8wc-4	0.055	e	2.93	0.55	272	272	796	148	272	272	796	148
	W	12B-0sw	0.097	s	5.79	3.23	424	329	1905	1064	0	0	0	0
11	G	1D-c2ow	0.570	s	34.03	35.87	39	0	1327	1399	0	0	0	0
	G	1D-c2owd	0.570	s	34.03	35.87	35	0	1191	1256	0	0	0	0
11	D	11D0	0.390	s	23.28	13.94	21	21	489	293	0	0	0	0
	W	15B11-8wc-4	0.055	s	2.91	0.52	200	192	559	100	200	192	559	100
11	G	1D-c2ow	0.570	s	34.03	35.87	8	0	272	287	8	0	272	287
	W	12B-0sw	0.097	w	5.79	3.23	520	508	2942	1643	0	0	0	0
11	G	1D-c2ow	0.570	w	34.03	66.39	12	0	408	797	0	0	0	0
	W	15B11-8wc-4	0.055	w	2.92	0.54	272	268	783	144	272	268	783	144
11	G	1D-c2ow	0.570	w	34.03	66.39	4	0	136	266	4	0	136	266
	C	16B-28ad	0.034	-	2.03	2.01	850	850	1725	1712	0	0	0	0
11	C	18A-30ad	0.034	-	2.03	1.16	868	868	1762	1011	0	0	0	0
	C	C part ceiling	0.255	-	15.19	15.08	850	850	12915	12817	850	850	12915	12817
11	F	19A-0bswp	0.295	-	6.62	2.62	850	850	5624	2223	0	0	0	0
	F	19A-13cswp	0.065	-	2.84	1.12	868	868	2465	975	0	0	0	0
11	F	21A-32t	0.020	-	1.19	0.00	850	850	1015	0	850	850	1015	0
	6	c) AED excursion								0				-56
Envelope loss/gain									45531	31675			18136	14630
12	a)	Infiltration							5598	2213			1120	443
	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)									51129	33888			19256	15073
14	Less external load								0	0			0	0
	Less transfer								0	0			0	0
14	Redistribution								0	0			0	0
	Subtotal								51129	33888			19256	15073
15	Duct loads							0%	0%	0	0	-0%	0%	0
Total room load									51129	33888			19256	15073
Air required (cfm)									2065	2065			778	919

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 Exposed wall Room height Room dimensions Room area				1st fl 118.0 ft heat/cool 8.0 ft 28.0 x 31.0 ft 868.0 ft²				2nd fl 118.0 ft heat/cool 8.0 ft 25.0 x 34.0 ft 850.0 ft²					
	Ty	Construction number	U-value (Btuh/ft²-F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12B-0sw	0.097	n	5.79	3.23	224	174	1008	563	200	176	1019	569
	G	1D-c2ow	0.570	n	34.03	24.35	15	0	510	365	24	0	817	584
	G	1D-c2owd	0.570	n	34.03	24.35	35	0	1191	852	0	0	0	0
	W	15B11-8wc-4	0.055	n	2.85	0.43	0	0	0	0	0	0	0	0
11	G	1D-c2owd	0.570	n	34.03	24.35	0	0	0	0	0	0	0	0
	W	12B-0sw	0.097	e	5.79	3.23	248	248	1436	802	272	272	1575	880
	W	15B11-8wc-4	0.055	e	2.93	0.55	0	0	0	0	0	0	0	0
	W	12B-0sw	0.097	s	5.79	3.23	224	153	886	495	200	176	1019	569
	G	1D-c2ow	0.570	s	34.03	35.87	15	0	510	538	24	0	817	561
	G	1D-c2owd	0.570	s	34.03	35.87	35	0	1191	1256	0	0	0	0
	D	11D0	0.390	s	23.28	13.94	21	21	489	293	0	0	0	0
	W	15B11-8wc-4	0.055	s	2.91	0.52	0	0	0	0	0	0	0	0
	G	1D-c2ow	0.570	s	34.03	35.87	0	0	0	0	0	0	0	0
	W	12B-0sw	0.097	w	5.79	3.23	248	248	1436	802	272	260	1506	841
	G	1D-c2ow	0.570	w	34.03	66.39	0	0	0	0	12	0	408	797
	W	15B11-8wc-4	0.055	w	2.92	0.54	0	0	0	0	0	0	0	0
	G	1D-c2ow	0.570	w	34.03	66.39	0	0	0	0	0	0	0	0
	C	16B-28ad	0.034	-	2.03	2.01	0	0	0	0	850	850	1725	1712
	C	18A-30ad	0.034	-	2.03	1.16	868	868	1762	1011	0	0	0	0
	C	C part ceiling,	0.255	-	15.19	15.08	0	0	0	0	0	0	0	0
	F	19A-0bswp	0.295	-	6.62	2.62	0	0	0	0	850	850	5624	2223
	F	19A-13cswp	0.065	-	2.84	1.12	868	868	2465	975	0	0	0	0
	F	21A-32t	0.020	-	1.19	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion									92				-36
	Envelope loss/gain								12885	8044			14510	9001
12	a) Infiltration								2239	885			2239	885
	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)								15124	8929			16749	9886
14	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
15	Subtotal								15124	8929			16749	9886
	Duct loads								0	0			0	0
	Total room load								15124	8929			16749	9886
	Air required (cfm)								611	544			677	602

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

Project Information

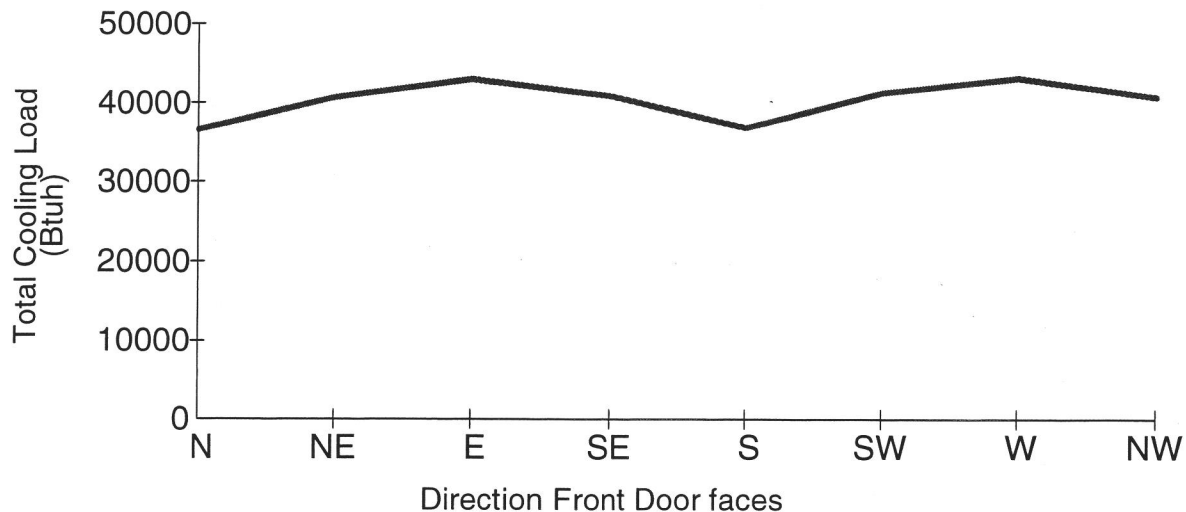
For: Karl Cox

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)	33888	37974	40299	38214	34214	38692	40496	38116
Latent Load (Btuh)	2726	2726	2726	2726	2726	2726	2726	2726
Total Load (Btuh)	36614	40700	43025	40940	36940	41418	43222	40842
Heating AVF (cfm)	2065	2314	2456	2329	2085	2358	2468	2323
Cooling AVF (cfm)	2065	2314	2456	2329	2085	2358	2468	2323

Building Orientation Cooling Load



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

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

Project Information

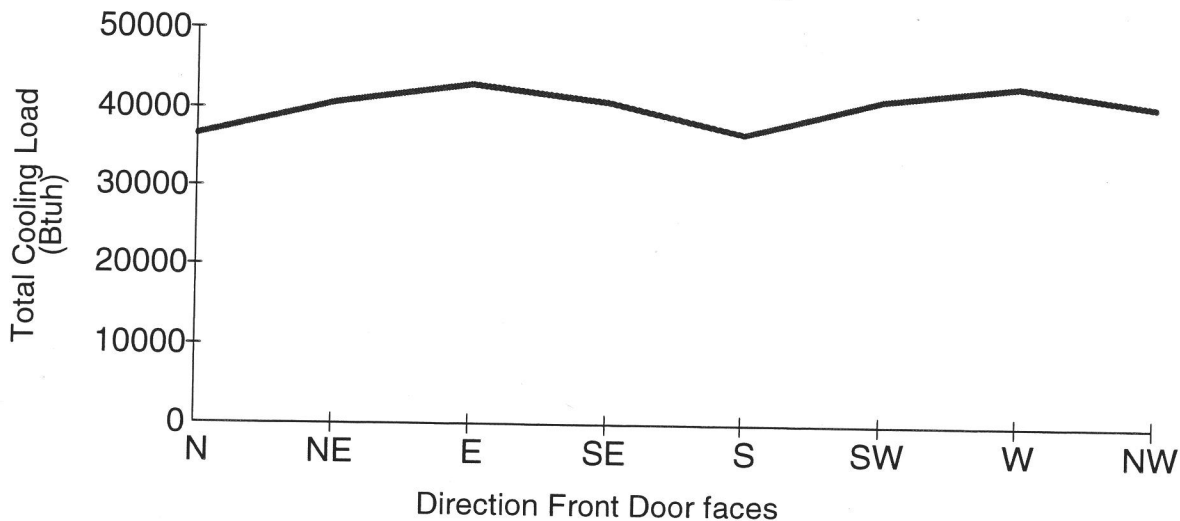
For: Karl Cox

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:	Heating	Cooling		Moisture difference (gr/lb)	26.8	47.0
Dry bulb (°F)	12	94		Infiltration:		
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)	33888	37974	40299	38214	34214	38692	40496	38116
Latent Load (Btuh)	2726	2726	2726	2726	2726	2726	2726	2726
Total Load (Btuh)	36614	40700	43025	40940	36940	41418	43222	40842
Heating AVF (cfm)	2065	2314	2456	2329	2085	2358	2468	2323
Cooling AVF (cfm)	2065	2314	2456	2329	2085	2358	2468	2323

Building Orientation Cooling Load



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

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