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 # M18000657
BUILDING PERMIT #

BUILDING ADDRESS: 3513 Rhode Valley Ct Ellicott City 21042
SUITE/APT:
SUBDIVISION:
CENSUS TRACT: SECTION: AREA:
LOT: TAX MAP: PARCEL:
BLOCK: ZONE:
PROPERTY ID: MAP COORDINATES:
TYPE OF IMPROVEMENTS: USE:

OWNERS NAME: Zhang, Jianyue
ADDRESS: 3513 Rhode Valley Trail
CITY: Ellicott City
STATE: MD ZIP CODE: 21042
HOME PHONE: 240-228-4540 WORK PHONE:

	CHECK ONE	HOW MANY
SINGLE FAMILY DWELLING	X	1 ZONES
SINGLE FAMILY TOWNHOUSE	☐	___ ZONES
MULTI-FAMILY / HOTEL/MOTEL	☐	___ ROOMS
ASSISTED LIVING HOMES (16 OR FEWER RESIDENTS)	☐	___ ROOMS

COMPANY NAME: Total Energy Concepts
LICENSEE NAME: Terry Artman
ADDRESS: PO Box 605
CITY: Churchville
STATE: MD ZIP CODE: 21028
PHONE: 410-452-0562 HVACR LICENSE NO: 14202-01

New
- ☐ Heating and Air Conditioning
- X Geo Thermal System
- ☐ Heating System Only
- ☐ Ductless Mini Splits
- ☐ Other Work (Describe):
- ☐ Thru The Wall Systems

Replacement
- ☐ Heating
- ☐ Air Conditioning
- X Heating and Air Conditioning

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		Rooms	
Permit Fee = # of Zones x $40 =	40-	Permit Fee = # of Rooms x $80 =	
Technology Fee (10% of Permit Fee) =	4-	Technology Fee (10% of Permit Fee) =	
Plus Application Fee	$50.00	Plus Application Fee $50	$50.00
Total Fees Due =	94-	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 7/30/18

PRINT NAME OF LICENSEE: Terry L. Artman

Email Address: terry@totalenergyonline.com

Make check payable to: DIRECTOR OF FINANCE OF HOWARD COUNTY

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

HVAC System Plan Approved
Howard County Health Department
8/6/18
Date
Signature

Validation
Check Number: 16757
Cash:
Receipt Number: 542633

RECEIVED
JUL 30 2018
LICENSES & PERMITS DIVISION

M18000657

Zhang Jiangyue
HVAC Load Calculations

for

Jiangyue Zhang
3513 Rhode Valley Court
Ellicott City, MD 21042

Elite Software

RHVAC RESIDENTIAL HVAC LOADS

Prepared By:

Terry Artman
Total Energy Concepts
2620 Dublin Road
Street, MD 21154
410-452-0562
Monday, July 30, 2018

Rhvac is an ACCA approved Manual J and Manual D computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.

Project Report

General Project Information

Project Title:	Zhang Jiangyue
Designed By:	Total Energy Concepts
Project Date:	7/30
Client Name:	Jiangyue Zhang
Client Address:	3513 Rhode Valley Court
Client City:	Ellicott City, MD 21042
Company Name:	Total Energy Concepts
Company Representative:	Terry Artman
Company Address:	2620 Dublin Road
Company City:	Street, MD 21154
Company Phone:	410-452-0562

Design Data

Reference City:		Baltimore, Maryland
Building Orientation:		Front door faces North
Daily Temperature Range:		Medium
Latitude:	39	Degrees
Elevation:	148	ft.
Altitude Factor:	0.995	

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	13	11.86	n/a	n/a	70	n/a
Summer:	91	75	48%	50%	75	41

Check Figures

Total Building Supply CFM:	1,492	CFM Per Square ft.:	0.709
Square ft. of Room Area:	2,103	Square ft. Per Ton:	711
Volume (ft³):	22,536		

Building Loads

Total Heating Required Including Ventilation Air:	46,155	Btuh	46.155	MBH
Total Sensible Gain:	32,648	Btuh	92	%
Total Latent Gain:	2,827	Btuh	8	%
Total Cooling Required Including Ventilation Air:	35,475	Btuh	2.96	Tons (Based On Sensible + Latent)

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.
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 according to the manufacturer's performance data at your design conditions.

Miscellaneous Report

System 1 Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	13	11.86	80%	n/a	70	n/a
Summer:	91	75	48%	50%	75	40.76

Duct Sizing Inputs

	Main Trunk		Runouts	
Calculate:	Yes		Yes	
Use Schedule:	Yes		Yes	
Roughness Factor:	0.00300		0.01000	
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:	0	in.	0	in.

Outside Air Data

	Winter		Summer	
Infiltration Specified:	0.000	AC/hr	0.000	AC/hr
	0	CFM	0	CFM
Infiltration Actual:	0.000	AC/hr	0.000	AC/hr
Above Grade Volume:	X 22,536	Cu.ft.	X 22,536	Cu.ft.
	0	Cu.ft./hr	0	Cu.ft./hr
	X 0.0167		X 0.0167	
Total Building Infiltration:	0	CFM	0	CFM
Total Building Ventilation:	0	CFM	0	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:	62.37	= (1.10 X 0.995 X 57.00 Winter Temp. Difference)

Winter Infiltration Specified: 0.000 AC/hr (0 CFM)
Summer Infiltration Specified: 0.000 AC/hr (0 CFM)

Duct Load Factor Scenarios for System 1

No.	Type	Description	Location	Attic Ceiling	Duct Leakage	Duct Insulation	Surface Area	From [T]MDD
1	Supply		Basement	-	0.06	8	471	No

Load Preview Report

Scope	Net Ton	ft.²/Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Clg CFM	Sys Act CFM	Duct Size
Building	2.96	711	2,103	32,648	2,827	35,475	46,155	603	1,492	1,492	
System 1	2.96	711	2,103	32,648	2,827	35,475	46,155	603	1,492	1,492	16x16
Supply Duct Latent					744	744					
Zone 1			2,103	32,648	2,083	34,731	46,155	603	1,492	1,492	16x16
1-1F Kitchen Addition Area			255	7,497	883	8,380	8,514	111	343	343	4–5
2-2F Stair And Loft Area			576	6,302	0	6,302	7,792	102	288	288	3–6
3-2F Master Bath And WIC			126	2,021	0	2,021	2,811	37	92	92	1–6
4-2F Master Bedroom			210	2,721	400	3,121	3,166	41	124	124	2–5
5-Great Room			384	7,851	400	8,251	12,901	168	359	359	4–6
6-1F Bathroom			96	215	0	215	865	11	10	10	1–4
7-1F Stairs Area			108	241	0	241	973	13	11	11	1–4
8-1F Right Bedroom			180	3,465	200	3,665	5,044	66	158	158	2–5
9-1f Left Bedroom			168	2,335	200	2,535	4,088	53	107	107	1–6

System 1 Room Load Summary

No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
1	1F Kitchen Addition Area	255	8,514	111	4-5	628	7,497	883	343	343
2	2F Stair And Loft Area	576	7,792	102	3-6	489	6,302	0	288	288
3	2F Master Bath And WIC	126	2,811	37	1-6	470	2,021	0	92	92
4	2F Master Bedroom	210	3,166	41	2-5	456	2,721	400	124	124
5	Great Room	384	12,901	168	4-6	457	7,851	400	359	359
6	1F Bathroom	96	865	11	1-4	112	215	0	10	10
7	1F Stairs Area	108	973	13	1-4	126	241	0	11	11
8	1F Right Bedroom	180	5,044	66	2-5	581	3,465	200	158	158
9	1f Left Bedroom	168	4,088	53	1-6	544	2,335	200	107	107
	Duct Latent							744		
	System 1 total	2,103	46,155	603			32,648	2,827	1,492	1,492

System 1 Main Trunk Size:	16x16	in.
Velocity:	839	ft./min
Loss per 100 ft.:	0.086	in.wg

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	2.96	92% / 8%	32,648	2,827	35,475
Actual:	3.35	75% / 25%	30,150	10,050	40,200

Equipment Data

	Heating System	Cooling System
Type:	Two Stage Ground Source HP	Two Stage Ground Source HP
Model:	NDV/NDH038G1*(1,2,4)	NDV/NDH038G1*(1,2,4)
Indoor Model:		
Brand:	5 SERIES	5 SERIES
Description:	Two Stage Ground Source Heat Pump	Two Stage Ground Source Heat Pump
Efficiency:	Hi: 4.1 / Lo: 4.8 COP	Hi: 21 / Lo: 30 EER
Sound:	0	0
Capacity:	26,700 Btuh	40,200 Btuh
Sensible Capacity:	n/a	30,150 Btuh
Latent Capacity:	n/a	10,050 Btuh
AHRI Reference No.:	n/a	5696562