

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 # <u>M18000574</u> BUILDING PERMIT #
---	---	--

BUILDING ADDRESS: <u>2720 Wyrfield Rd</u> SUITE/APT: SUBDIVISION: CENSUS TRACT: SECTION: AREA: LOT: TAX MAP: PARCEL: BLOCK: ZONE: PROPERTY ID: MAP COORDINATES: TYPE OF IMPROVEMENTS: USE:	OWNERS NAME: <u>Scott & Sharon Stewart</u> ADDRESS: <u>2720 Wyrfield Rd.</u> CITY: <u>West Friendship</u> STATE: <u>MD</u> ZIP CODE: <u>21794</u> HOME PHONE: <u>410-489-5614</u> WORK PHONE:
--	---

CHECK ONE	HOW MANY	
SINGLE FAMILY DWELLING ☒	<u>2</u>	ZONES
SINGLE FAMILY TOWNHOUSE ☐	—	ZONES
MULTI-FAMILY / HOTEL/MOTEL ☐	—	ROOMS
ASSISTED LIVING HOMES (16 OR FEWER RESIDENTS) ☐	—	ROOMS

COMPANY NAME: <u>Total Comfort Htg & A/C, Inc.</u> LICENSEE NAME: <u>James E. Aaron</u> ADDRESS: <u>12009 Margaret Dr.</u> CITY: <u>Hagerstown</u> STATE: <u>MD</u> ZIP CODE: <u>21742</u> PHONE: HVACR LICENSE NO:	301-745-3700 HVACR <u>S833-01</u>
---	--

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

☒ Replacement

Existing house - installing (2) 3 ton geothermal heat pumps. Re-use existing ductwork. Vertical earth loop installed by Chesapeake Geo Systems.

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 = <u>80.00</u> Technology Fee (10% of Permit Fee) = <u>8.00</u> Plus Application Fee <u>\$50.00</u> Total Fees Due = <u>138.00</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 = _____
---	---

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.

James E. Aaron 6/4/18
 SIGNATURE OF LICENSEE DATE
James E. Aaron
 PRINT NAME OF LICENSEE
Jim@tchvac.net
 Email Address

Validation
Check Number: <u>8235</u> Cash: _____ Receipt Number: <u>539462</u>

Make check payable to: DIRECTOR OF FINANCE OF HOWARD COUNTY

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

Approved: HVAC Plan
 Howard County Health Department
[Signature] 7/11/18
 Signature Date

MDE/WMA/PER.071

Project Information

 For: **SHARON STEWART**
 2720 WYNFIELD RD., WEST FRIENDSHIP, MD 21794

Notes:

Design Information

Weather: Washington National AP, DC, US

Winter Design Conditions

Outside db	17 °F
Inside db	70 °F
Design TD	53 °F

Summer Design Conditions

Outside db	91 °F
Inside db	75 °F
Design TD	16 °F
Daily range	M
Relative humidity	50 %
Moisture difference	35 gr/lb

Heating Summary

Structure	24483 Btuh
Ducts	1494 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	25977 Btuh

Infiltration

Method	Simplified	
Construction quality	Semi-Loose	
Fireplaces	1 (Average)	
	Heating	Cooling
Area (ft²)	1848	1848
Volume (ft³)	14112	14112
Air changes/hour	0.66	0.32
Equiv. AVF (cfm)	155	76

Heating Equipment Summary

Make	WaterFurnace
Trade	ENVISION NZ SERIES DUAL CAPACI...
Model	NDZ038A1
AHRI ref	1296152
Efficiency	4.13 COP
Heating input	8.8 kW
Heating output	29935 Btuh
Temperature rise	33 °F
Actual air flow	835 cfm
Air flow factor	0.032 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

 Backup:
 Input = 8 kW, Output = 25977 Btuh, 100 AFUE

Sensible Cooling Equipment Load Sizing

Structure	16010 Btuh
Ducts	538 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.96
Equipment sensible load	15886 Btuh

Latent Cooling Equipment Load Sizing

Structure	2183 Btuh
Ducts	1218 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	3400 Btuh
Equipment total load	19286 Btuh
Req. total capacity at 0.70 SHR	1.9 ton

Cooling Equipment Summary

Make	WaterFurnace
Trade	ENVISION NZ SERIES DUAL CAPACI...
Cond	NDZ038A1
Coil	NAH036*
AHRI ref	1296152
Efficiency	16.9 EER
Sensible cooling	24384 Btuh
Latent cooling	10450 Btuh
Total cooling	34834 Btuh
Actual air flow	835 cfm
Air flow factor	0.050 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.83
Capacity balance point = 0 °F	

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

Project Information

For: SHARON STEWART
2720 WYNFIELD RD., WEST FRIENDSHIP, MD 21794

Notes:

Design Information

Weather: Washington National AP, DC, US

Winter Design Conditions

Outside db 17 °F
Inside db 70 °F
Design TD 53 °F

Summer Design Conditions

Outside db 91 °F
Inside db 75 °F
Design TD 16 °F
Daily range M
Relative humidity 50 %
Moisture difference 35 gr/lb

Heating Summary

Structure 28991 Btuh
Ducts 78 Btuh
Central vent (0 cfm) 0 Btuh
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 29069 Btuh

Infiltration

Method	Simplified	
Construction quality	Semi-loose	
Fireplaces	1 (Average)	
	Heating	Cooling
Area (ft²)	3156	3156
Volume (ft³)	20448	20448
Air changes/hour	0.55	0.27
Equiv. AVF (cfm)	187	91

Heating Equipment Summary

Make WaterFurnace
Trade 5 SERIES INDOOR SPLITS
Model NSZ036G1
AHRI ref 6660767

Efficiency 4.34 COP
Heating input 8.2 kW
Heating output 27955 Btuh
Temperature rise 31 °F
Actual air flow 828 cfm
Air flow factor 0.028 cfm/Btuh
Static pressure 0 in H2O
Space thermostat

Backup:
Input = 9 kW, Output = 29069 Btuh, 100 AFUE

Sensible Cooling Equipment Load Sizing

Structure 18147 Btuh
Ducts 16 Btuh
Central vent (0 cfm) 0 Btuh
Blower 0 Btuh
Use manufacturer's data n
Rate/sizing multiplier 0.96
Equipment sensible load 17437 Btuh

Latent Cooling Equipment Load Sizing

Structure 2953 Btuh
Ducts 75 Btuh
Central vent (0 cfm) 0 Btuh
Equipment latent load 3028 Btuh
Equipment total load 20465 Btuh
Req. total capacity at 0.70 SHR 2.1 ton

Cooling Equipment Summary

Make WaterFurnace
Trade 5 SERIES INDOOR SPLITS
Cond NSZ036G1
Coil NAH036*
AHRI ref 6660767
Efficiency 19.57 EER
Sensible cooling 22224 Btuh
Latent cooling 9525 Btuh
Total cooling 31749 Btuh
Actual air flow 828 cfm
Air flow factor 0.046 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.86
Capacity balance point = 0 °F

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

Project Information

For: SHARON STEWART
2720 WYNFIELD RD., WEST FRIENDSHIP, MD 21794

Notes:

Design Information

Weather: Washington National AP, DC, US

Winter Design Conditions

Outside db 17 °F
Inside db 70 °F
Design TD 53 °F

Summer Design Conditions

Outside db 91 °F
Inside db 75 °F
Design TD 16 °F
Daily range M
Relative humidity 50 %
Moisture difference 35 gr/lb

Heating Summary

Structure 53474 Btuh
Ducts 1572 Btuh
Central vent (0 cfm) 0 Btuh
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 55046 Btuh

Sensible Cooling Equipment Load Sizing

Structure 34157 Btuh
Ducts 554 Btuh
Central vent (0 cfm) 0 Btuh
Blower 0 Btuh
Use manufacturer's data n
Rate/swing multiplier 0.96
Equipment sensible load 33323 Btuh

Infiltration

Method Simplified
Construction quality Semi-Loose
Fireplaces 1 (Average)

	Heating	Cooling
Area (ft²)	5004	5004
Volume (ft³)	34560	34560
Air changes/hour	0.59	0.29
Equiv. AVF (cfm)	343	167

Latent Cooling Equipment Load Sizing

Structure 5136 Btuh
Ducts 1293 Btuh
Central vent (0 cfm) 0 Btuh
Equipment latent load 6429 Btuh
Equipment total load 39752 Btuh
Req. total capacity at 0.70 SHR 4.0 ton

Heating Equipment Summary

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	0 Btuh
Heating output	0 °F
Temperature rise	0 cfm
Actual air flow	0 cfm/Btuh
Air flow factor	0 in H2O
Static pressure	n/a
Space thermostat	

Cooling Equipment Summary

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

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

Project Information

For: SHARON STEWART
2720 WYNFIELD RD., WEST FRIENDSHIP, MD 21794

Design Information

	Htg	Clg	Infiltration	
Outside db (°F)	17	91	Method	Simplified
Inside db (°F)	70	75	Construction quality	Semi-loose
Design TD (°F)	53	16	Fireplaces	1 (Average)
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	44	35		

HEATING EQUIPMENT

Make	WaterFurnace
Trade	ENVISION NZ SERIES DUAL CAPACI...
Model	NDZ038A1
AHRI ref	1296152
Efficiency	4.13 COP
Heating input	8.8 kW
Heating output	29935 Btuh
Temperature rise	33 °F
Actual air flow	835 cfm
Air flow factor	0.032 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

COOLING EQUIPMENT

Make	WaterFurnace
Trade	ENVISION NZ SERIES DUAL CAPACI...
Cond	NDZ038A1
Coil	NAH036*
AHRI ref	1296152
Efficiency	16.9 EER
Sensible cooling	24384 Btuh
Latent cooling	10450 Btuh
Total cooling	34834 Btuh
Actual air flow	835 cfm
Air flow factor	0.050 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.83
Capacity balance point = 0 °F	

Backup:

Input = 8 kW, Output = 25977 Btuh, 100 AFUE

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
2ND FLOOR	1512	19088	13982	613	705
ABOVE GARAGE	336	6888	2565	221	129
2ND FLOOR AHU	1848	25977	16548	835	835
Other equip loads		0	0		
Equip. @ 0.96 RSM			15886		
Latent cooling			3400		
TOTALS	1848	25977	19286	835	835

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

Project Information

For: SHARON STEWART
2720 WYNFIELD RD., WEST FRIENDSHIP, MD 21794

Design Information

	Htg	Clg	Infiltration	Simplified Semi-loose
Outside db (°F)	17	91	Method	
Inside db (°F)	70	75	Construction quality	
Design TD (°F)	53	16	Fireplaces	1 (Average)
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	44	35		

HEATING EQUIPMENT

Make WaterFurnace
Trade 5 SERIES INDOOR SPLITS
Model NSZ036G1
AHRI ref 6660767
Efficiency 4.34 COP
Heating input 8.2 kW
Heating output 27955 Btuh
Temperature rise 31 °F
Actual air flow 828 cfm
Air flow factor 0.028 cfm/Btuh
Static pressure 0 in H2O
Space thermostat

Backup:
Input = 9 kW, Output = 29069 Btuh, 100 AFUE

COOLING EQUIPMENT

Make WaterFurnace
Trade 5 SERIES INDOOR SPLITS
Cond NSZ036G1
Coil NAIH036*
AHRI ref 6660767
Efficiency 19.57 EER
Sensible cooling 22224 Btuh
Latent cooling 9525 Btuh
Total cooling 31749 Btuh
Actual air flow 828 cfm
Air flow factor 0.046 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.86
Capacity balance point = 0 °F

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
OPEN TO BELOW	132	1114	377	32	17
1ST FLOOR	1512	17552	15239	500	695
BASEMENT	1512	10403	2547	296	116
1ST FLOOR/BASE	3156	29069	18164	828	828
Other equip loads		0	0		
Equip. @ 0.96 RSM			17437		
Latent cooling			3028		
TOTALS	3156	29069	20465	828	828

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

Project Information

For: SHARON STEWART
2720 WYNFIELD RD., WEST FRIENDSHIP, MD 21794

Design Information

	Htg	Clg		Infiltration	
Outside db (°F)	17	91	Method		Simplified
Inside db (°F)	70	75	Construction quality		Semi-loose
Design TD (°F)	53	16	Fireplaces		1 (Average)
Daily range	-	M			
Inside humidity (%)	50	50			
Moisture difference (gr/lb)	44	35			

HEATING EQUIPMENT

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	n/a

COOLING EQUIPMENT

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

ROOM NAME	Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
1ST FLOOR/BASE	3156	29069	18164	828	828
2ND FLOOR/AHU	1848	25977	16548	835	835
Entire House	5004	55046	34712	1663	1663
Other equip loads		0	0		
Equip. @ 0.96 RSM			33323		
Latent cooling			6429		
TOTALS	5004	55046	39752	1663	1663

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

Stewart Residence

2120 Wynfield Rd.

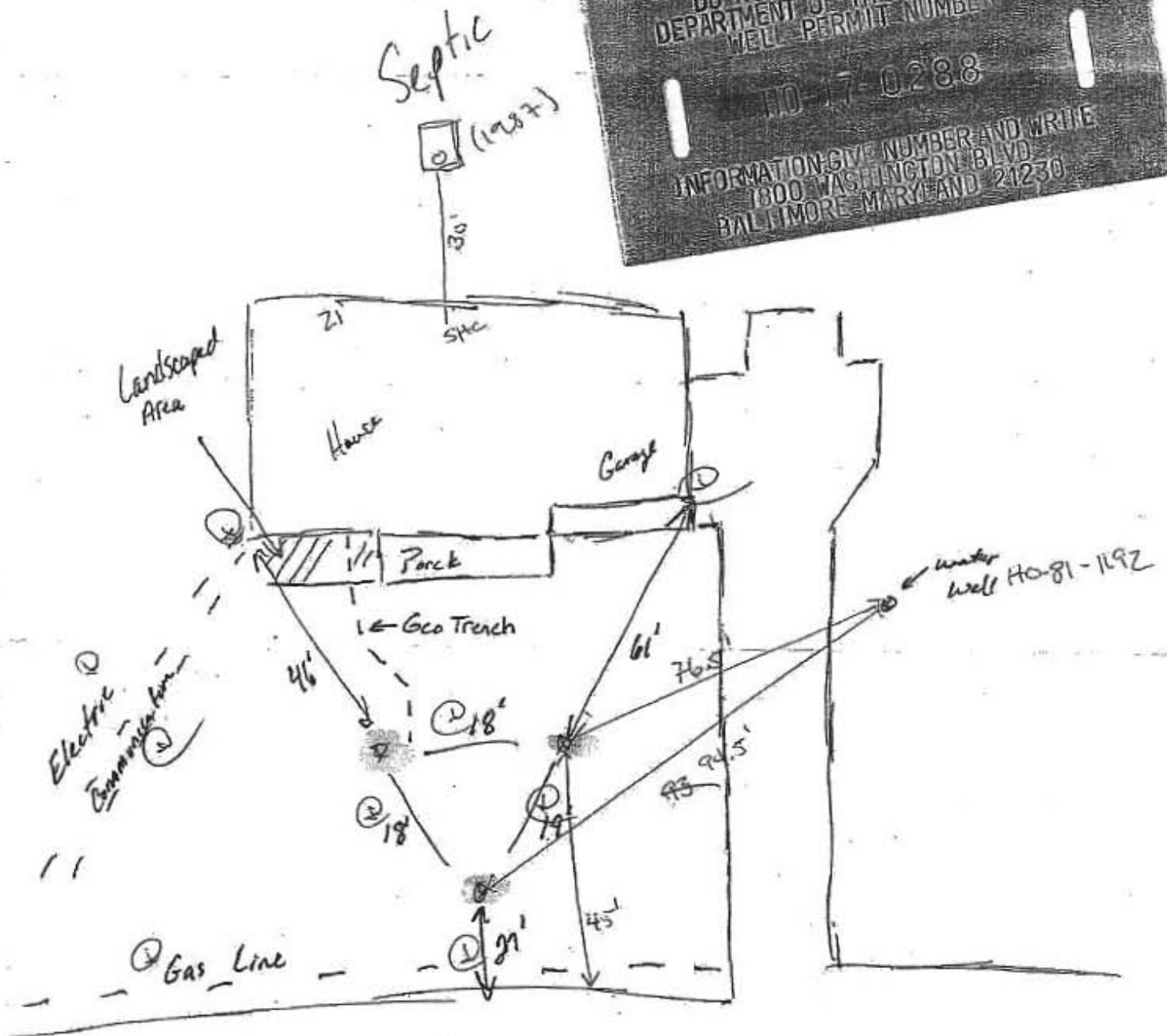
West Friendship Md 21794

3 geo bores

Staked by Chesapeake geo.

SI by CABAHUB 1997 on 4/26/2018

3 wells @ 320' ca
1.25" closed loop Geoterm.



Project Information

For: SHARON STEWART
2720 WYNFIELD RD., WEST FRIENDSHIP, MD 21794

Cooling Equipment

Design Conditions

Outdoor design DB:	91.0°F	Sensible gain:	18161	Btuh	Entering coil DB:	75.0°F
Outdoor design WB:	74.0°F	Latent gain:	3020	Btuh	Entering coil WB:	62.5°F
Indoor design DB:	75.0°F	Total gain:	21181	Btuh		
Indoor RH:	50%	Estimated airflow:	828	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	GSHP		
Manufacturer:	WaterFurnace	Model:	NSZ036G1+NAH036*
Actual airflow:	828	cfm	
Sensible capacity:	0	Btuh	0% of load
Latent capacity:	0	Btuh	0% of load
Total capacity:	0	Btuh	0% of load SHR: 0%

Heating Equipment

Design Conditions

Outdoor design DB:	17.0°F	Heat loss:	29059	Btuh	Entering coil DB:	70.0°F
Indoor design DB:	70.0°F					

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	GSHP		
Manufacturer:	WaterFurnace	Model:	NSZ036G1+NAH036*
Actual airflow:	828	cfm	
Output capacity:	31749	Btuh	109% of load
Supplemental heat required:	0	Btuh	
			Capacity balance: 4.4 °F

Backup equipment type:	Elec strip		
Manufacturer:		Model:	
Actual airflow:	828	cfm	
Output capacity:	8.5	kW	100% of load Temp. rise: 0 °F

Meets all requirements of ACCA Manual S.