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JUL 28 2015

Department of Water Resources
Eastern Region

Well Water Flow Calculation

Heat Load for Residence: 139,083 BTU/H (calcs per Trane Trace Software – see attached report)

(3) Heat Pumps provided to meet heating load

Capacity of each heat pump and required flow: 52,377 BTU/H, 16.1 GPM @ 36°F entering water
(capacity and flow requirements are per manufacturer of Heat Pump)

Total Capacity and Flow required: 157,131 BTU/H, 48.3 GPM

Flow required from well to Heat Exchanger to allow 48.3 GPM @ 36°F to Heat Pumps: 46.4 GPM @ 38°F (flow per manufacturer of Heat Exchanger)

System Checksums

By Engineering System Solutions

HEAT PUMP

Fan Coil

COOLING COIL PEAK					CLG SPACE PEAK			HEATING COIL PEAK					TEMPERATURES			
Peaked at Time:		Mo/Hr: 9 / 13			Mo/Hr: Sum of		Mo/Hr: Heating Design					Cooling			Heating	
Outside Air:		OADB/WB/HR: 82 / 57 / 39			OADB: Peaks		OADB: -15					SADB			55.0	100.3
Space	Plenum	Net	Percent	Space	Percent	Space Peak	Coil Peak	Percent	Space Peak	Coil Peak	Percent	Ra Plenum	75.0		72.0	
Sens. + Lat.	Sens. + Lat.	Total	Of Total	Sensible	Of Total	Space Sens	Tot Sens	Of Total	Space Sens	Tot Sens	Of Total	Return	76.4		73.7	
Btu/h	Btu/h	Btu/h	(%)	Btu/h	(%)	Btu/h	Btu/h	(%)	Btu/h	Btu/h	(%)	Ret/OA	76.4		73.7	
Envelope Loads																
Skylite Solar	0	0	0	0	0	0	0	0.00	Skylite Solar	0	0	0.00	Fn MtrTD	0.0		0.0
Skylite Cond	0	0	0	0	0	0	0	0.00	Skylite Cond	0	0	0.00	Fn BldTD	0.0		0.0
Roof Cond	-2,058	0	-2,058	-2	3,424	3	-20,795	14.95	Roof Cond	-20,795	-20,795	14.95	Fn Frict	0.0		0.0
Glass Solar	63,594	0	63,594	65	77,359	69	0	0.00	Glass Solar	0	0	0.00				
Glass/Door Cond	637	0	637	1	602	1	-50,149	36.06	Glass/Door Cond	-50,149	-50,149	36.06				
Wall Cond	5,487	0	5,487	6	11,274	10	-26,216	18.85	Wall Cond	-26,216	-26,216	18.85				
Partition/Door	0	0	0	0	0	0	0	0.00	Partition/Door	0	0	0.00				
Floor	624	0	624	1	624	1	-9,463	6.80	Floor	-9,463	-9,463	6.80				
Adjacent Floor	0	0	0	0	0	0	0	0.00	Adjacent Floor	0	0	0.00				
Infiltration	605	0	605	1	1,867	2	-32,461	23.34	Infiltration	-32,461	-32,461	23.34				
Sub Total ==>	68,890	0	68,890	71	95,150	85	-139,083	100.00	Sub Total ==>	-139,083	-139,083	100.00				
Internal Loads																
Lights	1,513	378	1,892	2	1,513	1	0	0.00	Lights	0	0	0.00				
People	24,000	0	24,000	25	12,000	11	0	0.00	People	0	0	0.00				
Misc	580	0	580	1	580	1	0	0.00	Misc	0	0	0.00				
Sub Total ==>	26,093	378	26,472	27	14,093	13	0	0.00	Sub Total ==>	0	0	0.00				
Ceiling Load	0	0	0	0	0	0	0	0.00	Ceiling Load	0	0	0.00				
Ventilation Load	0	0	0	0	0	0	0	0.00	Ventilation Load	0	0	0.00				
Adj Air Trans Heat	0	0	0	0	0	0	0	0.00	Adj Air Trans Heat	0	0	0.00				
Dehumid. Ov Sizing	0	0	0	0	0	0	0	0.00	Ov/Undr Sizing	0	0	0.00				
Ov/Undr Sizing	2,327	-152	2,327	2	2,327	2	0	0.00	Exhaust Heat	0	0	0.00				
Exhaust Heat	0	0	0	0	0	0	0	0.00	OA Preheat Diff.	0	0	0.00				
Sup. Fan Heat	0	0	0	0	0	0	0	0.00	RA Preheat Diff.	0	0	0.00				
Ret. Fan Heat	0	0	0	0	0	0	0	0.00	Additional Reheat	0	0	0.00				
Duct Heat Pkup	0	0	0	0	0	0	0	0.00	Underflr Sup Ht Pkup	0	0	0.00				
Underflr Sup Ht Pkup	0	0	0	0	0	0	0	0.00	Supply Air Leakage	0	0	0.00				
Supply Air Leakage	0	0	0	0	0	0	0	0.00	Grand Total ==>	-139,083	-139,083	100.00				
Grand Total ==>	97,310	227	97,537	100.00	111,570	100.00	-139,083	100.00	Grand Total ==>	-139,083	-139,083	100.00				

AIRFLOWS		
	Cooling	Heating
Diffuser	5,500	5,500
Terminal	5,500	5,500
Main Fan	5,500	5,500
Sec Fan	0	0
Nom Vent	0	0
AHU Vent	0	0
Infil	387	387
MinStop/Rh	0	0
Return	5,886	5,886
Exhaust	387	387
Rm Exh	0	0
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS		
	Cooling	Heating
% OA	0.0	0.0
cfm/ft²	0.65	0.65
cfm/ton	676.62	
ft³/ton	1,045.86	
Btu/hr-ft²	11.47	-16.36
No. People	46	

COOLING COIL SELECTION										AREAS			HEATING COIL SELECTION				
Total Capacity ton	MBh	Sens Cap. MBh	Coil Airflow cfm	Enter DB/WB/HR °F °F gr/lb	Leave DB/WB/HR °F °F gr/lb	Gross Total			Glass ft² (%)	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F				
Main Clg	8.1	97.5	87.3	5,500	76.4 56.4	47.5	55.0 48.1	47.5	Floor	8,501	-139.1	5,500	73.7	100.3			
Aux Clg	0.0	0.0	0.0	0	0.0 0.0	0.0	0.0 0.0	0.0	Part	0	0.0	0	0.0	0.0			
Opt Vent	0.0	0.0	0.0	0	0.0 0.0	0.0	0.0 0.0	0.0	Int Door	0	0.0	0	0.0	0.0			
Total	8.1	97.5							ExFlr	5,439	0.0	0	0.0	0.0			
										Roof	8,667	0	0.0	0.0			
										Wall	6,556	1,521	23	0.0			
										Ext Door	120	0	0	0.0			
										Total	-139.1						

Project Name:
Dataset Name: FLEMING.TRC

TRACE® 700 v6.2.10 calculated at 08:25 AM on 07/28/2015
Alternative - 1 System Checksums Report Page 2 of 2

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JUL 27 2015
Department of Water Resources
Eastern Region

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ELECTRICITY CONSUMPTION									
DATE	TIME	METER NO.	METER TYPE	METER READING				METER TYPE	METER TYPE
				1	2	3	4		
01	00	100	000	10	10	10	10	10	10
02	00	100	000	10	10	10	10	10	10
03	00	100	000	10	10	10	10	10	10
04	00	100	000	10	10	10	10	10	10
05	00	100	000	10	10	10	10	10	10
06	00	100	000	10	10	10	10	10	10
07	00	100	000	10	10	10	10	10	10
08	00	100	000	10	10	10	10	10	10
09	00	100	000	10	10	10	10	10	10
10	00	100	000	10	10	10	10	10	10
11	00	100	000	10	10	10	10	10	10
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16	00	100	000	10	10	10	10	10	10
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18	00	100	000	10	10	10	10	10	10
19	00	100	000	10	10	10	10	10	10
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41	00	100	000	10	10	10	10	10	10
42	00	100	000	10	10	10	10	10	10
43	00	100	000	10	10	10	10	10	10
44	00	100	000	10	10	10	10	10	10
45	00	100	000	10	10	10	10	10	10

[illegible]

ELECTRICIAN'S REPORT									
DATE	TYPE	CIRCUIT		FUSE	WIRE	VOLTAGE	AMPERES	WATTAGE	REMARKS
		NO.	TYPE						
1941	120/240	1	120/240	15	14	115	15	115	1
1. PROVIDED WITH REARF LIGHTS									

[illegible][illegible][illegible][illegible]

CHEMICALS									
		ELECTRICAL		OIL		MET		GAS	
		ELECTRICAL		OIL		MET		GAS	
NAME	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
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42	42	42	42	42	42	42	42	42	42
43	43	43	43	43	43	43	43	43	43
44	44	44	44	44	44	44	44	44	44
45	45	45	45	45	45	45	45	45	45
46	46	46	46						

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FLEMING RESIDENCE
IRWIN
BONNEVILLE COUNTY, IDAHO

MECHANICAL SCHEDULES



ENGINEERING SYSTEM SOLUTIONS
4941 NORTH 29TH EAST STE A
DIAO FALLS, UTAH 81401
Phone: (208) 552-0874
Fax: (208) 552-0882



M6.1

RECEIVED
JUL 27 2015
Department of Water Resources
Eastern Region

A. POSTAL ADDRESS

[illegible]

STANDARD OPERATING PROCEDURES

[illegible]

MEDICALS

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NOVEL
SAMOLISM

अनुसंधान

SHEET NO.		SHEET NO.	
SHEET NO.		SHEET NO.	
NO. 2	MECHANICAL LEAD AND NOTES AND GENERAL OBSERVATIONS		
NO. 1	MECHANICAL FLOORING FIRST LEVEL		
NO. 2	MECHANICAL FLOORING SECOND LEVEL		
NO. 1	MECHANICAL FLOORING FIRST LEVEL		
NO. 2	MECHANICAL FLOORING SECOND LEVEL		
NO. 1	MECHANICAL DETAILS		
NO. 2	MECHANICAL DETAILS		

MECHANICAL LEGEND, NOTES, AND GENERAL ABBREVIATIONS

FLEMING RESIDENCE
IRWIN
BONNEVILLE COUNTY, IDAHO



EMMENTRAC SYSTEMS, INC.
4941 MORRIS AVENUE, STE. A
ELIZABETH, N.J. 07201
Phone: (201) 512-0874
Fax: (202) 512-0102



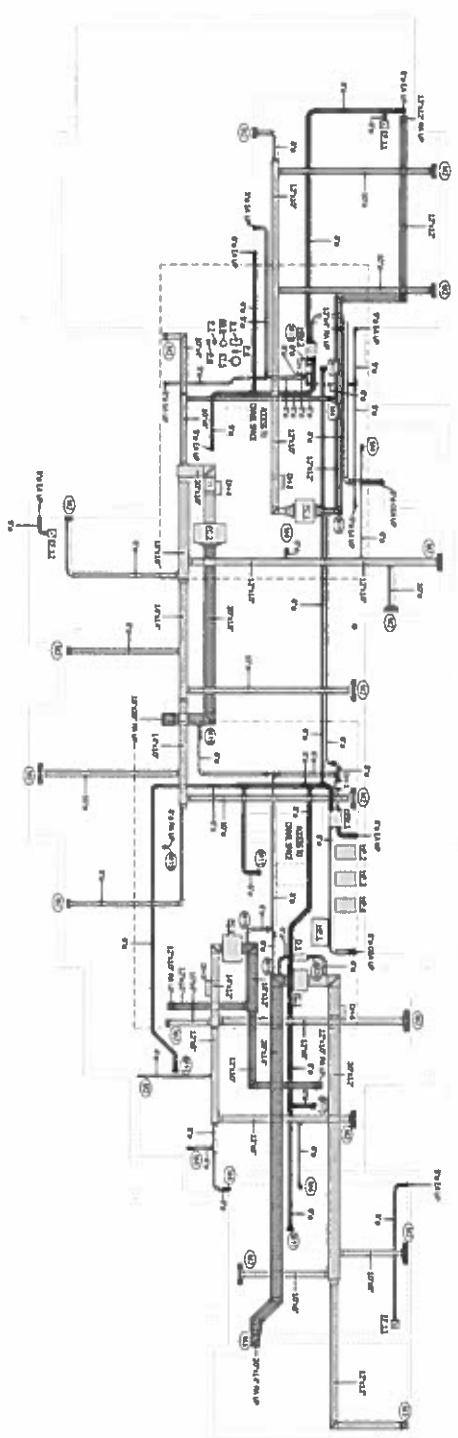
MO.1

GENERAL NOTES

1. SEE ALL DIMENSIONS AND REQUIREMENTS.
2. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
3. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
4. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
5. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
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8. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
9. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
10. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.

LEGEND

- 1. 1" = 1' SCALE
- 2. 1" = 1' SCALE
- 3. 1" = 1' SCALE
- 4. 1" = 1' SCALE
- 5. 1" = 1' SCALE
- 6. 1" = 1' SCALE
- 7. 1" = 1' SCALE
- 8. 1" = 1' SCALE
- 9. 1" = 1' SCALE
- 10. 1" = 1' SCALE



MECHANICAL FLOOR PLAN - CRAWL SPACE

M1.0

MECHANICAL FLOOR PLAN - CRAWL SPACE

FLEMING RESIDENCE

IRWIN

BONNEVILLE COUNTY, IDAHO

ENGINEER: SYSTEMS SOLUTIONS

401 NORTH WILSON STREET

BOZEMAN, MONTANA 59717

PHONE: (406) 552-4674

FAX: (406) 552-4675

DATE: 11/11/11

BY: [Signature]

MECHANICAL FLOOR PLAN - CRAWL SPACE

11/11/11

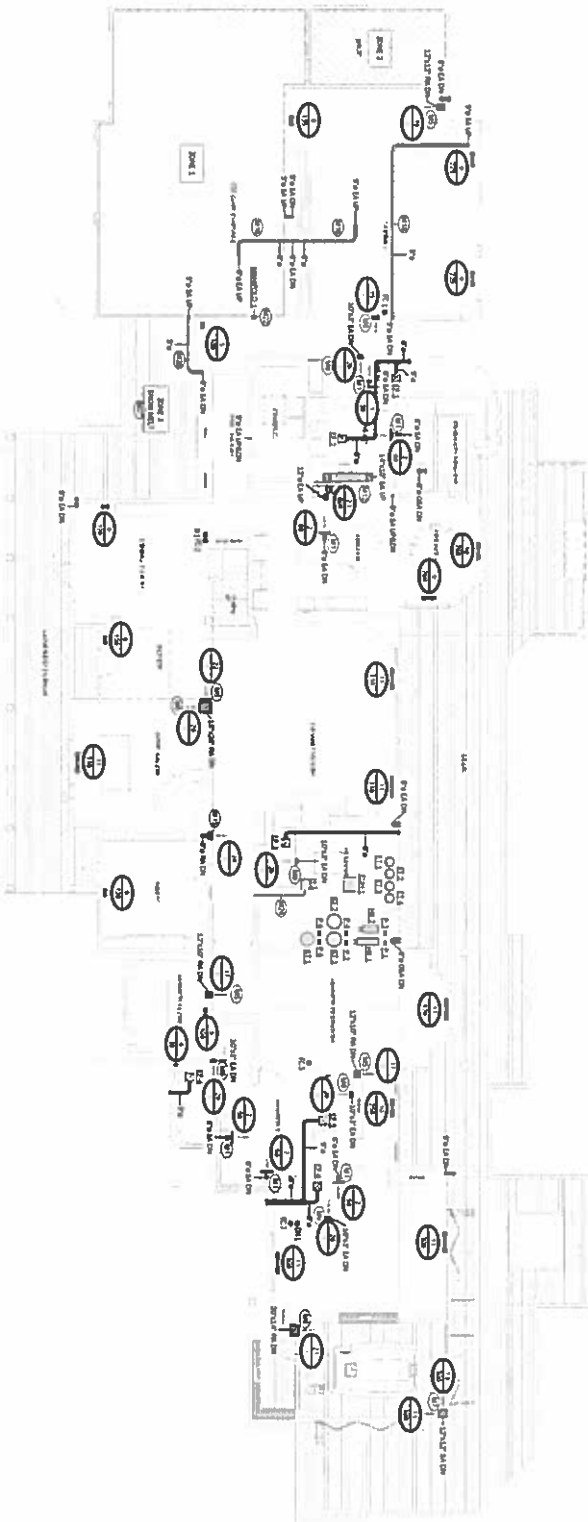
11/11/11

ROOM TO BE BUILT					
Zone #	Room #	Room Name	Room Area (sq ft)	Room Volume (cu ft)	Room Height (ft)
1	101	Garage	1,000	10,000	10
2	102	Garage	1,000	10,000	10
3	103	Garage	1,000	10,000	10

GENERAL NOTES

1. All work shall be in accordance with the latest editions of the International Building Code and the International Mechanical Code.
2. The owner shall provide all necessary permits and approvals for the proposed work.
3. The contractor shall be responsible for obtaining all necessary permits and approvals for the proposed work.
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5. The contractor shall be responsible for obtaining all necessary permits and approvals for the proposed work.
6. The contractor shall be responsible for obtaining all necessary permits and approvals for the proposed work.
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8. The contractor shall be responsible for obtaining all necessary permits and approvals for the proposed work.
9. The contractor shall be responsible for obtaining all necessary permits and approvals for the proposed work.
10. The contractor shall be responsible for obtaining all necessary permits and approvals for the proposed work.

MECHANICAL FLOOR PLAN - FIRST LEVEL



M1.1

DATE: 01/15/14
BY: [Signature]

PROJECT: FLEMING RESIDENCE
SHEET: 1 OF 1

MECHANICAL FLOOR PLAN - FIRST LEVEL

1513

2014 08 10

ES

ENGINEERING SYSTEMS, INC.

4040 S. 1000 E. SUITE 100
TAMPA, FL 33610
Phone: (813) 552-9774
Fax: (813) 552-9775

FLORIDA PROFESSIONAL ENGINEER
No. 1513
Exp. 12/31/14

PROJECT: FLEMING RESIDENCE
SHEET: 1 OF 1

MECHANICAL FLOOR PLAN - FIRST LEVEL

1513

2014 08 10

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MECHANICAL FLOOR PLAN - FIRST LEVEL

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MECHANICAL FLOOR PLAN - FIRST LEVEL

1513

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MECHANICAL FLOOR PLAN - FIRST LEVEL

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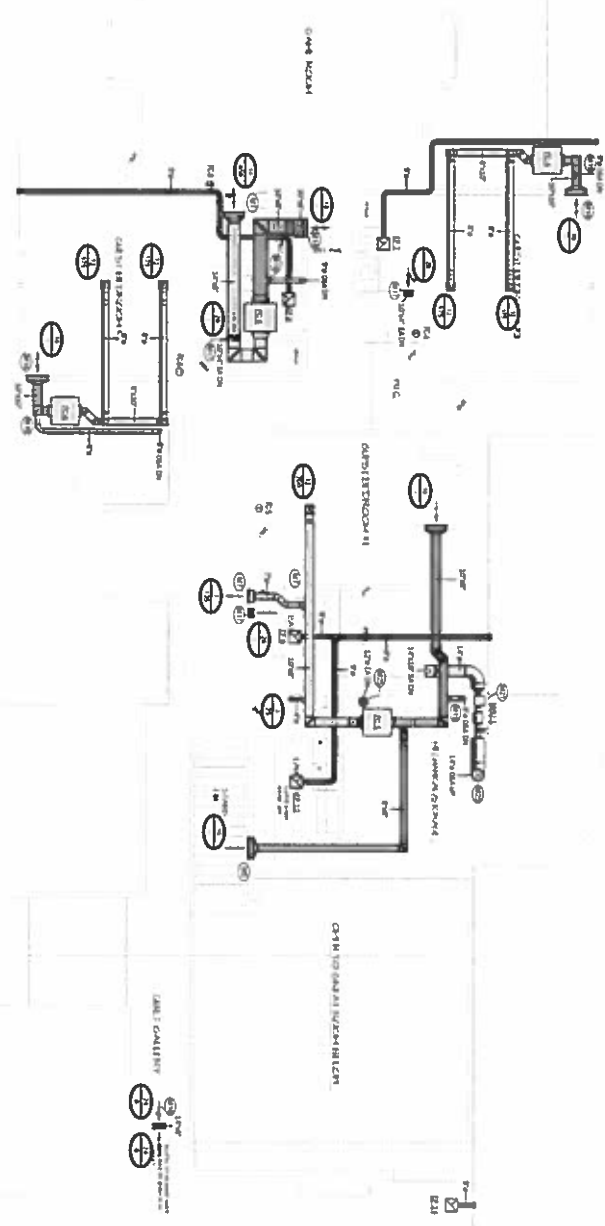
FLORIDA PROFESSIONAL ENGINEER
No. 1513
Exp. 12/31/14

PROJECT: FLEMING RESIDENCE
SHEET: 1 OF 1

MECHANICAL FLOOR PLAN - FIRST LEVEL

GENERAL NOTES

1. REFER TO SHEETS 11513.1, 11513.2, 11513.3, 11513.4, 11513.5, 11513.6, 11513.7, 11513.8, 11513.9, 11513.10, 11513.11, 11513.12, 11513.13, 11513.14, 11513.15, 11513.16, 11513.17, 11513.18, 11513.19, 11513.20, 11513.21, 11513.22, 11513.23, 11513.24, 11513.25, 11513.26, 11513.27, 11513.28, 11513.29, 11513.30, 11513.31, 11513.32, 11513.33, 11513.34, 11513.35, 11513.36, 11513.37, 11513.38, 11513.39, 11513.40, 11513.41, 11513.42, 11513.43, 11513.44, 11513.45, 11513.46, 11513.47, 11513.48, 11513.49, 11513.50, 11513.51, 11513.52, 11513.53, 11513.54, 11513.55, 11513.56, 11513.57, 11513.58, 11513.59, 11513.60, 11513.61, 11513.62, 11513.63, 11513.64, 11513.65, 11513.66, 11513.67, 11513.68, 11513.69, 11513.70, 11513.71, 11513.72, 11513.73, 11513.74, 11513.75, 11513.76, 11513.77, 11513.78, 11513.79, 11513.80, 11513.81, 11513.82, 11513.83, 11513.84, 11513.85, 11513.86, 11513.87, 11513.88, 11513.89, 11513.90, 11513.91, 11513.92, 11513.93, 11513.94, 11513.95, 11513.96, 11513.97, 11513.98, 11513.99, 11513.100.



MECHANICAL FLOOR PLAN - SECOND LEVEL

M1.2	FLEMING RESIDENCE IRWIN BONNEVILLE COUNTY, IDAHO	MECHANICAL FLOOR PLAN - SECOND LEVEL	ES²	ENVIRONMENTAL SYSTEMS SOLUTIONS 4041 NORTH 29TH EAST, STE. A BOISE, IDAHO 83713 Phone: (208) 352-0674 Fax: (208) 352-0102	11513
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NOTES:
1. PROVIDE AIRFLOW AND PRESSURE LOSS DATA ON THE SECOND LINE.
2. PROVIDE AIRFLOW AND PRESSURE LOSS DATA ON THE SECOND LINE.



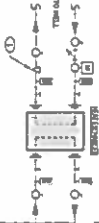
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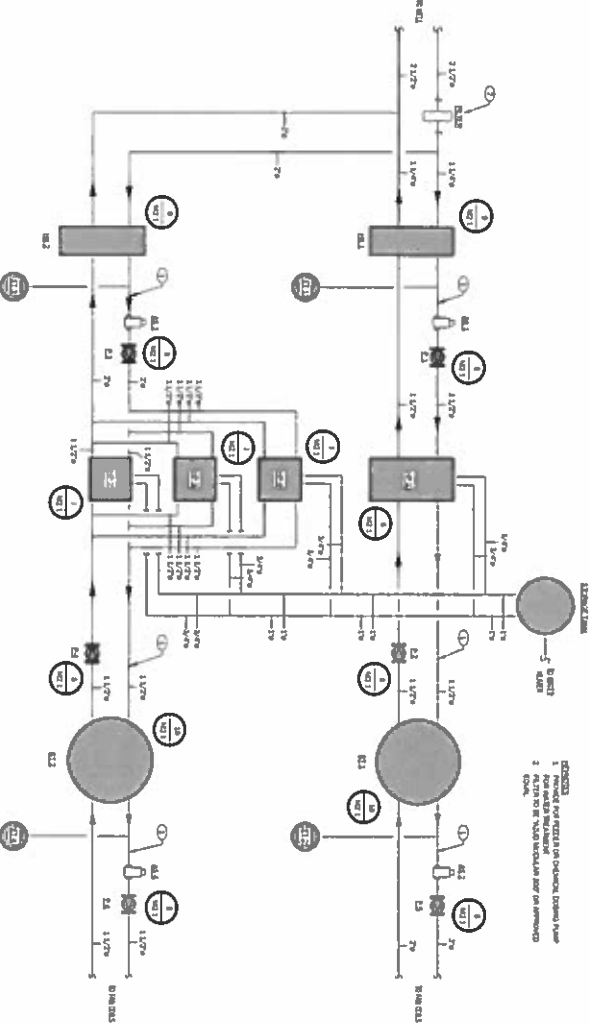
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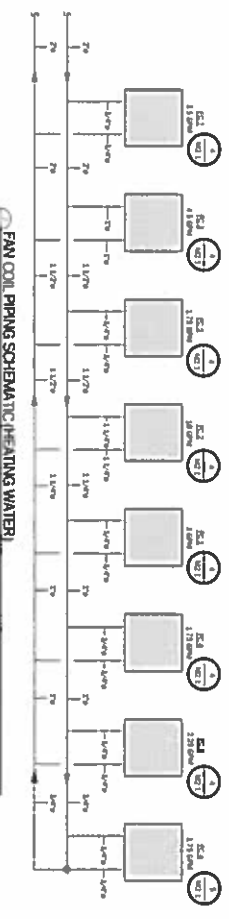
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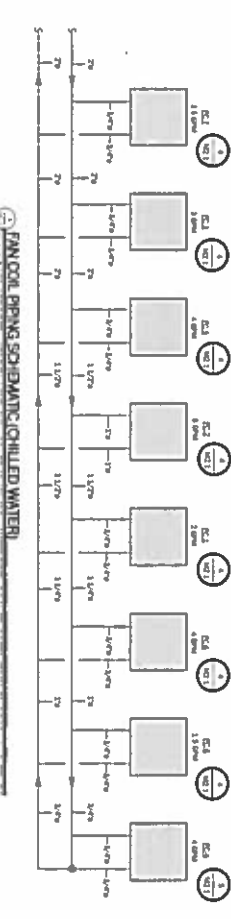
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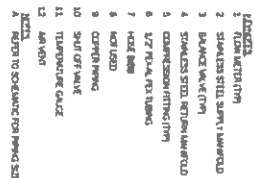
FLEMING RESIDENCE
IRWIN
BONNEVILLE COUNTY, IDAHO



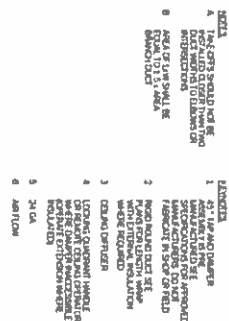
FLEET SYSTEMS SOLUTIONS
4001 NORTH 20TH ST. A
BLISS, IDAHO 83401
Phone: (208) 552-9674
Fax: (208) 552-9672

M2.1

NO.	DATE	BY	CHKD.
1	10/1/11	W	
2	10/1/11	W	
3	10/1/11	W	
4	10/1/11	W	
5	10/1/11	W	
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9	10/1/11	W	
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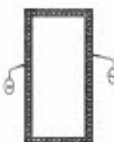
SINGLE ZONE MANIFOLD
no flow



BRANCH DUCT AND GRILL - HARD LID

TRANSVERSE REDUCED-SCALE										
AT 2000										
DESIGNATION OF LANE(S) SEE PLAN	90-017 IN 1/4" SCALE PLAN VIEW ONLY	1/4" HORIZONTAL SCALE NOT TO SCALE VERTICAL SCALE NOT TO SCALE	1/4" HORIZONTAL SCALE							
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13 90-13	24	1/4" HORIZONTAL SCALE	1	24	24	24	24	24	24	24

DUCT CONSTRUCTION
no. 1041



DUCT LINER

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JUL 27 2015

Department of Water Resources
Eastern Region

Well Specifications

Shane Fleming Geothermal Wells

These specifications are for drilling the two wells. Both wells are designed to pump/inject at 50 gpm. The geology is poorly defined. A drillers log for a nearby well is attached.

Well Drilling and Testing

The air rotary drilling method will be used to drill both wells. The general approach for drilling is described as below.

Wells 1 and 2

1. Purchase IDWR drilling permits
2. Drill and drive 12-inch casing to 18 feet.
3. Drill and drive 8-inch casing to 40 feet, while carefully evaluating cuttings and water flow and bagging cuttings. If the formation and water flow is deemed sufficient to yield 50 gallon per minute.
4. Install 20 feet of 8-inch telescopic well screen, 0.030" slot, continuously wrapped, stainless steel, Johnson high flow or equivalent. The screen will be outfitted with a neoprene K-packer to seal between the 8-inch casing and the well screen.
5. Pull the 8-inch casing up 20 ft to expose the screen to the formation.
6. Install the bentonite surface seal consisting of bentonite chips while simultaneously pulling the 12-inch casing.
7. Develop the well with rig air.
8. Conduct a pumping test of the well to determine production characteristics.

General Requirements

The driller shall not start construction until an IDWR drilling permit has been obtained and has been formally notified by the owner to proceed. The Driller shall notify the Geologist and DEQ at least 72 hours prior to starting construction. The geology is poorly known; therefore, the final construction of the wells will depend upon the subsurface conditions encountered during drilling. In order to determine the thickness and nature of all materials penetrated, the location of the water bearing strata, and other subsurface information the driller shall comply with the following:

1. Adhere to and follow all applicable IDWR rules and regulations for drilling and construction and keep a copy of this plan on site.
2. Collect and archive samples in 1-quart sealable bags at a minimum of 5 ft intervals and more closely when formation boundaries are encountered. Record changes in water level elevations or pressures between water bearing zones.



3. Maintain a clean drilling operation, maintain adequate temporary well cover during drilling to prevent vandalism and tampering, disinfect down hole materials with 500 ppm chlorine solution (per IDWR rules), use only NSF approved drilling additives (or equivalent with prior approval of geologist), and clean up the site after the well is drilled. This well will be drilled using compressed air as the drilling fluid; the Geologist must approve any deviation from this in advance.
4. Fully penetrating welded joints shall be used for joining casing so that the resulting joint shall have the same structural integrity as the casing itself. Welding will meet IDWR standards for well drilling.
5. An 8-INCH stainless steel well screen (Johnson Well Screen or equivalent) will be installed based on sieve analysis of the drill cuttings. It is anticipated that 0.030" slot size will be appropriate.
6. The filter pack material will consist of well round, washed pea gravel with a nominal diameter of 1/4 Inch. The filter pack material must be approved in advance by the geologist. The filter pack will be installed by gravity. The driller will have on site a minimum of 50% excess seal material prior to the start of filter pack emplacement. The volume and type of material will be recorded and checked against engineering specifications every 10 feet. Temporary casing shall be removed simultaneously with filter pack placement.
7. The bentonite seal will be installed by gravity. The driller will have on site a minimum of 50% excess seal material prior to the start of seal emplacement. The volume and type of material will be recorded and checked against engineering specifications every 10 feet. Temporary casing shall be removed simultaneously with seal placement. All temporary casing shall be removed and the driller shall ensure that the temporary casing does not separate during extraction.
8. The wells shall be developed prior to the start of test pumping using methods appropriate for the specific conditions that exist at the site, as determined by the driller and approved by the Geologist. During development, a preliminary production test will be conducted using rig air to estimate final well production. The well shall be pumped and sampled for sand content. If sand is visually present or there is an increase in specific capacity, development shall continue until the water is free from sand, silt, and turbidity (sand content is less than 5 ppm) and/or until no further increase in specific capacity is measured. The final depth of the well will be tagged and sediment and slough removed prior to pump testing.
9. The static water level in the wells shall be allowed to recover for a time equal to the pumping development time before start of the well test pumping. The desired well yield for both wells is 50 gpm the well will be pumped 6 consecutive hours



or longer after drawdown has stabilized. The Geologist shall be notified at least 72 hours in advance of the start of the test pumping and will be present during the test. The driller must provide an approved means for measuring flow rate (orifice plate, flow meter, or similar), a means of varying and controlling the flow rate (e.g., gate valve), equipment to measure the depth to water, and all other equipment incidental to the pumping test. A 1/4" NPT port will be tapped into the discharge manifold, as directed by the Geologist, for the sand-testing meter. The pump shall be blocked up approximately 12 inches, at the direction of the Geologist, to allow a 3/4-inch by 10-inch electronic water level probe to be inserted into a 1-inch PVC water level tube. The driller shall record flow, time, and depth to water during drawdown and recovery.

10. Specific requirements for water level measurements during aquifer pumping and recovery tests are as follows. Groundwater levels will be measured using both manual measurements and electronic pressure transducers provide by the Geologist during the tests.
11. The Driller will maintain adequate facilities and/or equipment for collection of drill cuttings and will not allow any produced water or cuttings to leave the site boundary or enter surface waters. It is the contractor's responsibility to control the pumped water and drilling wastewater. The driller is required to ensure all holes, pits, equipment, and chemicals are safely stored on the site per OSHA standards.
12. The driller shall file with the Idaho Department of Water Resources, and provide copies to the Engineer, the necessary log and record on forms obtainable from that department.
13. The proposed well construction features shown may be modified based on the information collected during drilling. If modified, the selected Driller shall be required to negotiate with the owner for the construction costs for the modified well design in advance. All depths shown are estimates; final payment footages will be based on the actual materials installed.
14. For the final completion of the well, the casing shall extend a minimum of 18 inches above ground surface and shall be sealed with a well cap to prevent water from entering the well. The well shall be vented (1 1/2 diameter), with the open end of the vent screened and terminated downward at least 18 inches above the final ground service.

Drilling Subcontractor Agreement

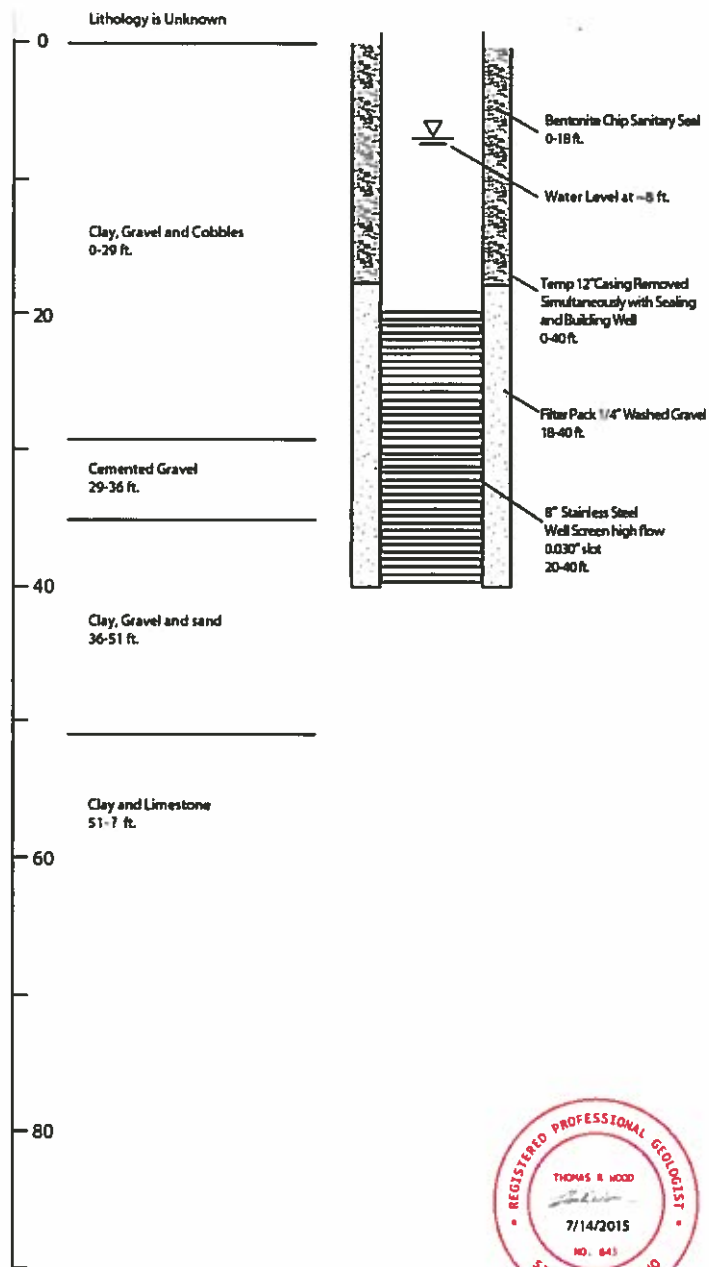
Signature

Date

Company and Title



Clearwater Geosciences, LLP
Ground Water Development and Exploration



Not to Scale



Client: Shane Fleming
Location: County: Bonneville State: Idaho
Township: 1 N Range: 44 E
Section: 25 SE 1/4 NE 1/4 AND SW 1/4 NW 1/4
Project Geologist: T. Wood
Revision Number: 1 - 7/15/2015
Well Tag No.:

Clearwater Geosciences, LLP
groundwater scientists serving industry since 1994
1818 E. 49th S Idaho Falls, ID 83404
Phone: 208-589-5555

**Fleming Injection/Extraction
Well Design Diagram for Geothermal**



Clearwater Geosciences, LLP
Ground Water Development and Exploration

Item Number and Description Unit Price Written in Words	Quantity		Total Amount	
	Unit Price			
	Dollars	Cts	Dollars	Cts
Fleming Geothermal Wells				
1 - MOBILIZATION/DEMOBILIZATION	1	LS		
	\$		\$	
2 - DRILL FOR, FURNISH, INSTALL TEMPORARY 12 INCH CASING	84	LF		
	\$		\$	
3 - DRILL NOMINAL 12-INCH DIAMETER BOREHOLE	80	LF		
	\$		\$	
4 - FURNISH AND INSTALL 8-INCH STEEL 0.25" WALL WELL CASING	44	LF		
	\$		\$	
5 - 12-INCH DRIVE SHOE	2	EA		
	\$		\$	
6 - FURNISH AND INSTALL 8-INCH S. S. WELL SCREEN - JOHNSON OR EQUAL	40	LF		
	\$		\$	
7 - PULL 12-INCH CASING	80	LF		
	\$		\$	
8 - NOMINAL 1/4 WASHED PEA GRAVEL	30	CF		
	\$		\$	
9 - SANITARY SEAL - BENTONITE CHIPS	30	BG		
	\$		\$	
10 - WELL DEVELOPMENT W/RIG	4	HOUR		
	\$		\$	
11 - PUMP TEST MOBILIZATION/DEMOBILIZATION	1	LS		
	\$		\$	
12 - TEST PUMPING/DEVELOPMENT	12	HOUR		
	\$		\$	
13 -	0	0 0		
	\$		\$	
14 -	0	0 0		
	\$		\$	
15 -	0	0 0		
	\$		\$	
TOTAL BID AMOUNT			\$	

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JUL 27 2015

Department of Water Resources
Eastern Region

Mathews, Kerrie

From: Kristin Moore [kristin.rmea@gmail.com]
Sent: Monday, July 27, 2015 11:34 AM
To: Mathews, Kerrie
Subject: fleming permit no. 23-11456
Attachments: 2014.09.10_Fleming Residence_Mech.pdf; Flemming Geothermal Well Design.pdf

Kerrie,

Attached are the engineers specs for the heat pump and the well design from Clearwater Geosciences. Let me know if you need anything else.

Please copy me on all correspondence regarding this permit.

Thank you,

Kristin Moore
Water Rights Analyst
482 Constitution Way, Ste 303, Idaho Falls, ID 83402
E-Mail: kmoores@rockymountainenvironmental.com
VOICE: 208-524-2353 ||| FAX: 208-524-1795



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