



Central Association for the Blind and Visually Impaired

## 2021 Top Job Presentation

John D. Manning, PE

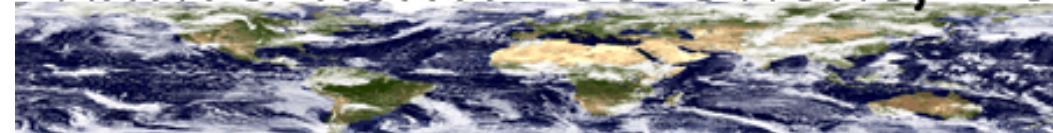
April 27, 2021



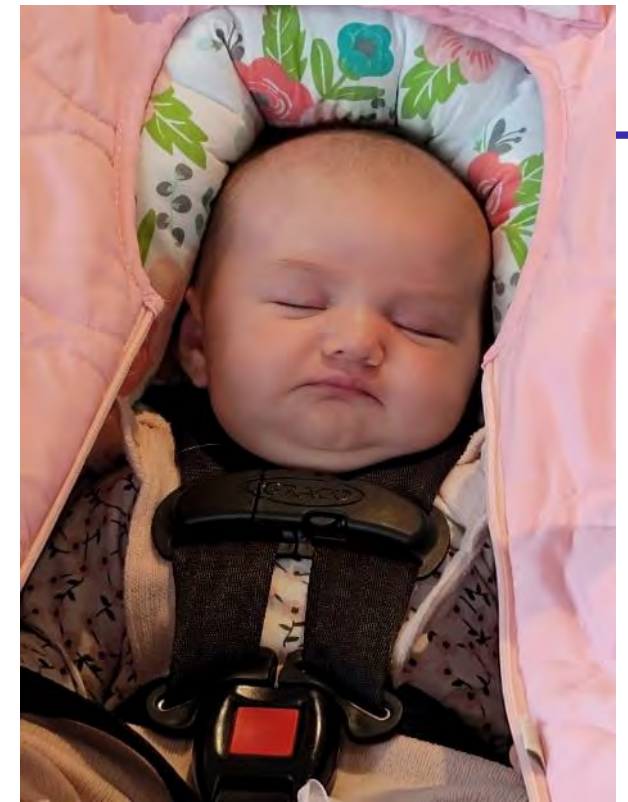
AFFORDABLE RENEWABLE CLEAN



## EARTH SENSITIVE SOLUTIONS, LLC





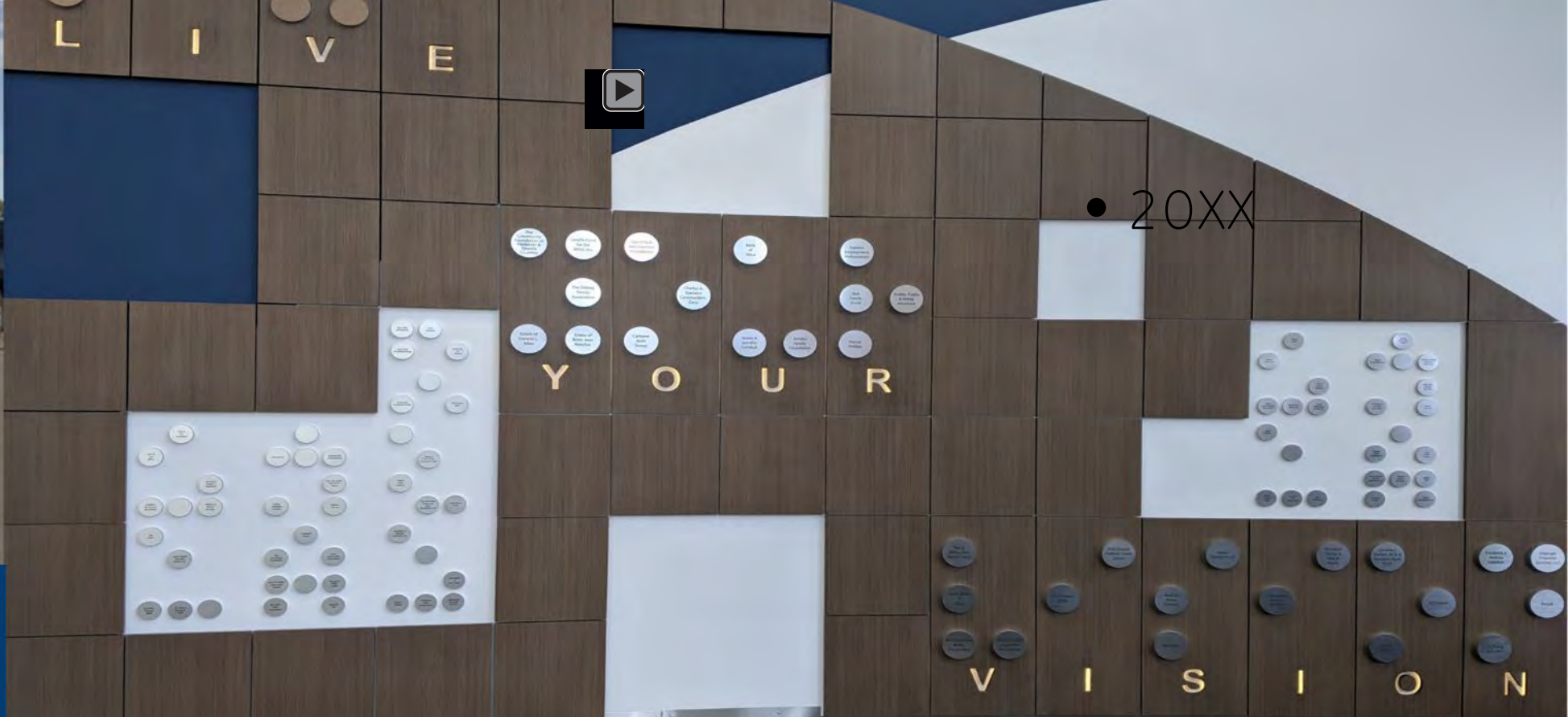


# PRESENTING MY GRANDAUGHTERS



# JARED FORTNA, Geothermal System Engineer





# HELPING THOSE WHO HELP OTHERS

Central Association for the Blind and Visually Impaired



# IT TAKES A TEAM

The Team



## THE CLIENT

Rudy D'Amico  
CABVI

## ARCHITECT

David P. Colegrove, AIA  
Harmony Architectural Associates, PC

## ENGINEER

Jared Fortna  
Earth Sensitive Solutions, LLC

## MECHANICAL CONTRACTOR

Steve Tallman  
Comfort Systems USA

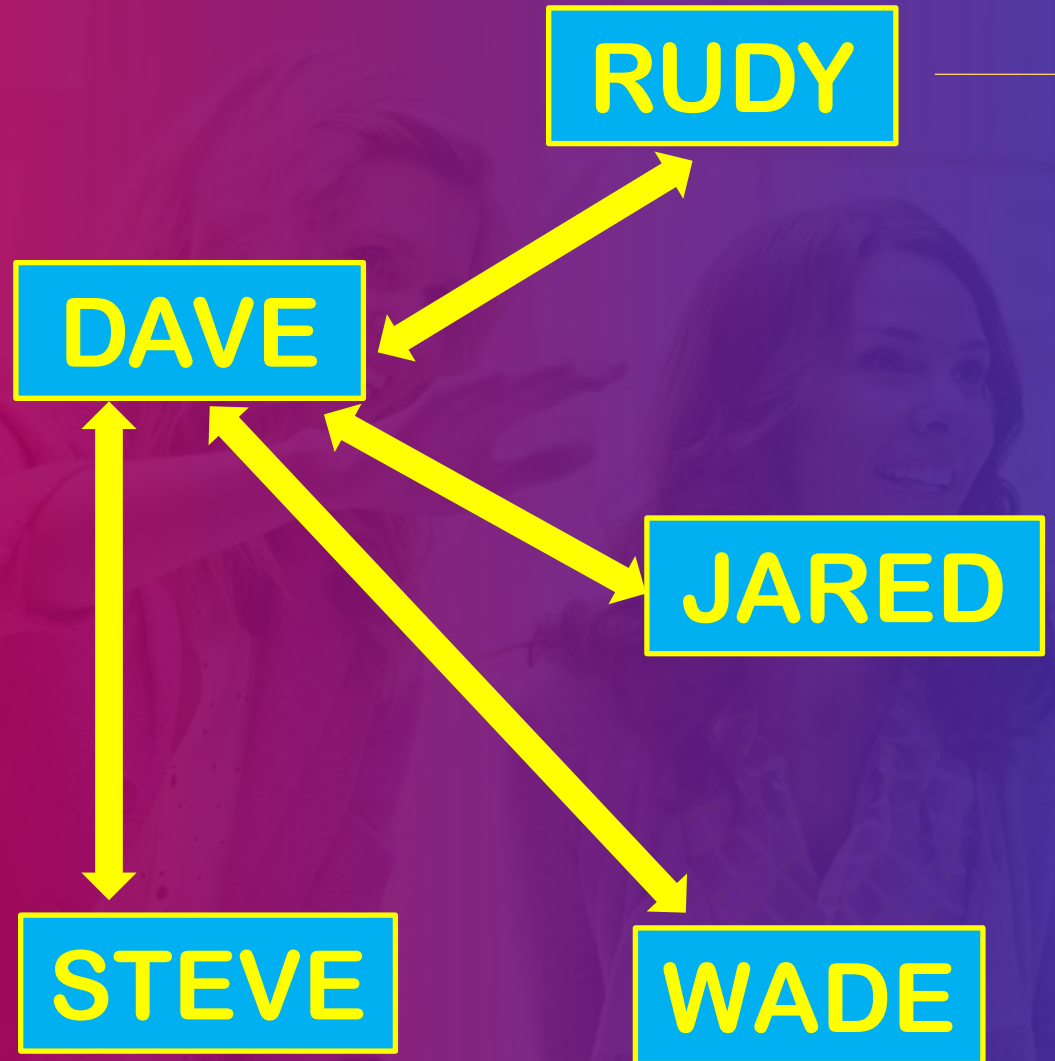
## LOOP INSTALLER

Wade Barney  
Barney & Sons Well Drilling, Inc.



# IT TAKES A TEAM

The Team





# THE VALUE OF LISTENING

Know Your Client



## KICK-OFF MEETING

Rudy brought his Key Staff people together to express their thoughts about their New Building

- Gained insight into how the facility would be used
- They were very excited about having a pool to better serve their clientele
- Also expressed desire to serve the local community by making the pool available for recreational use
- Temperature control of the pool became an unexpected opportunity that was a perfect fit for geothermal



# THE POOL



## Pool Analysis

### The Opportunity

To be able to offer Therapeutic water temperatures (91°F) for 3-4 days per week and open pool to recreational swimming (86°F) for 3-4 days per week.

Had to determine feasibility and associated economics.

	Time (hrs)	Cost
<b>INITIAL HEATING (50 F --&gt; 91 F)</b>	<b>71.2</b>	<b>\$118.10</b>
<b>OVERNIGHT COOLING (91 F --&gt; 86 F)</b>	<b>7.67</b>	<b>\$12.85</b>
<b>OVERNIGHT HEATING (86 F --&gt; 91 F)</b>	<b>8.7</b>	<b>\$17.46</b>





# SYNERGIES ARE GOLD

Integrate All Thermal Loads



## THERMAL LOADS

Using the Loop Field as a “Thermal Flywheel” allows for all thermal loads to be integrated

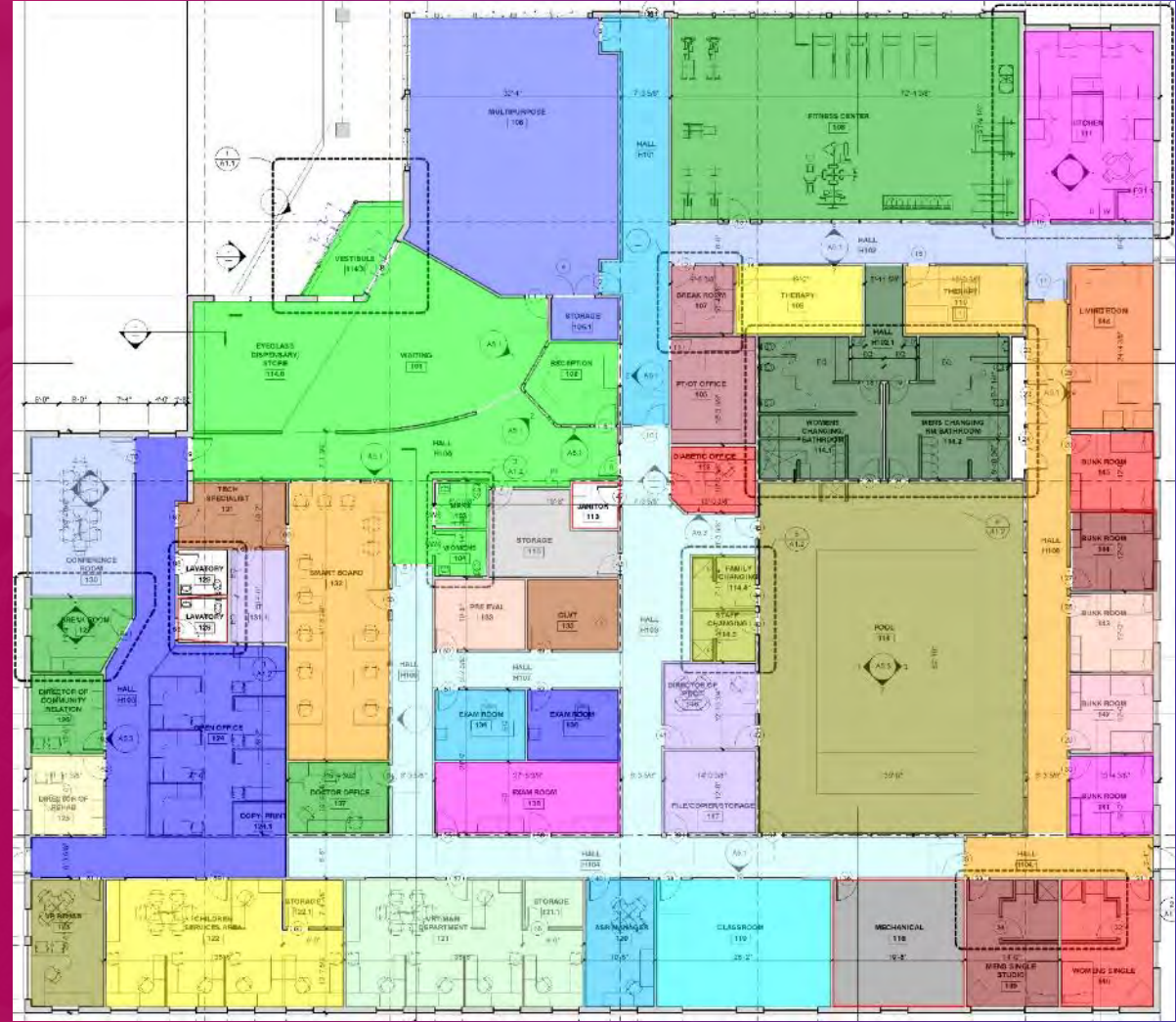
- Pool Heating
- Pool Cooling
- Pool Room Radiant Heat
- Pool Room Dehumidification
- Space Heating
- Space Cooling
- IT Equipment Cooling
- Snow Melting
- Heating “Outbuilding”





# ZONING

Understanding the internal opportunities





# EQUIPMENT

Use what is right to meet the need





# EQUIPMENT

Use what is right to meet the need





# EQUIPMENT

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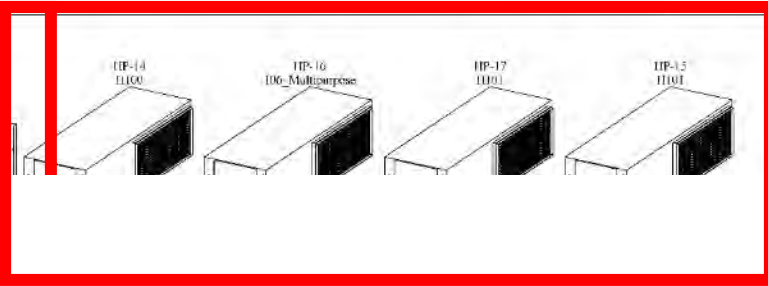
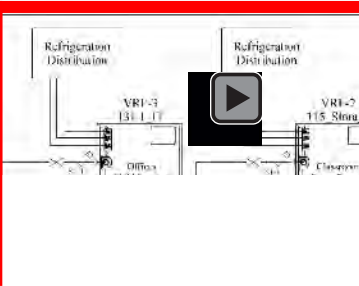
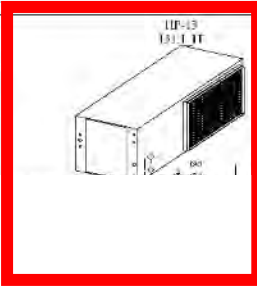
Use what is right to meet the  
need

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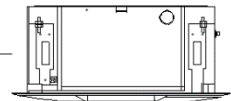
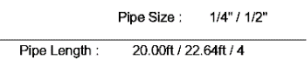
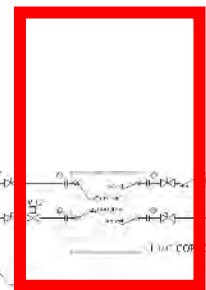
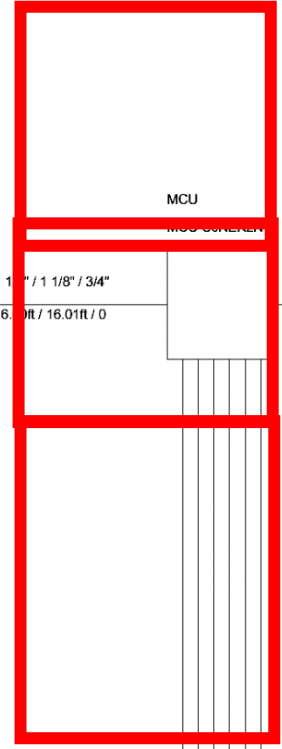
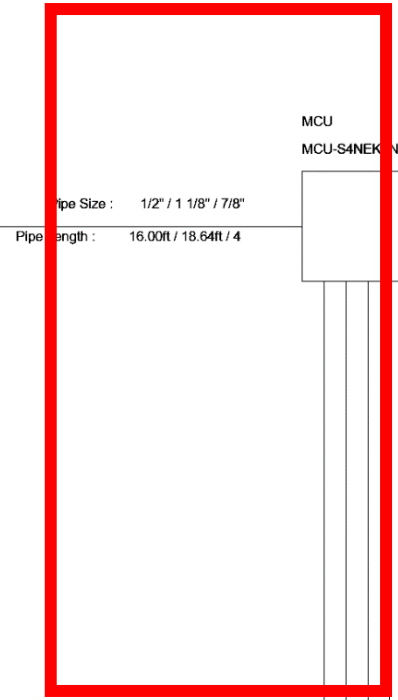


- SHUT OFF VALVE
- 2-WAY CONTROL VALVE
- UNION
- FLT X CONNECTORS
- Y-STRAINER
- CHECK VALVE

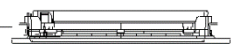
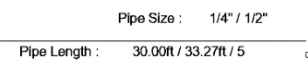


SMITH SENSITIVE SOLUTIONS, LLC  
 10000 10th Street  
 Houston, TX 77036  
 Tel: 281-252-1111  
 Email: info@smithsensitive.com

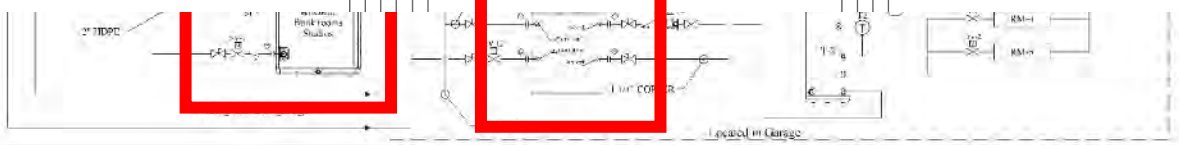
Central Unit (AM120HXWAFR/AA)  
 Cooling Capa / Heating Capa  
 120000(0)BTU/h / 135000(0)BTU/h



138 Exam (AM009FNDCH/AA)  
 Cooling Capa / Heating Capa  
 9500(0)BTU/h / 10500(0)BTU/h



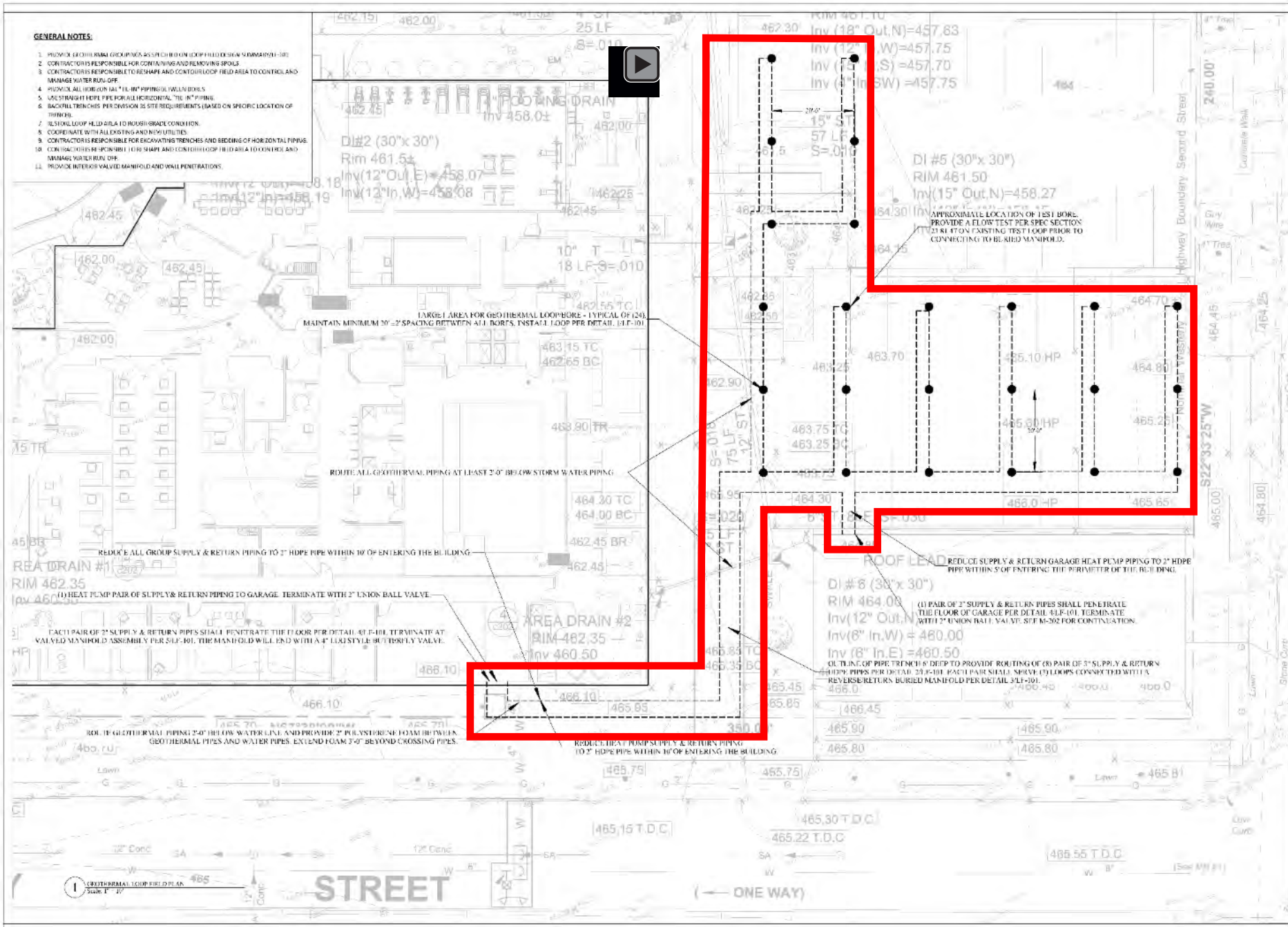
H104 (AM007NN1DCH/AA)  
 Cooling Capa / Heating Capa  
 7500(0)BTU/h / 8500(0)BTU/h



REHAB CENTER  
 SCHEMATIC  
 M-500

**GENERAL NOTES:**

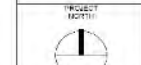
1. PROVIDE GEO THERMAL CIRCUITS AS PER FOUNDATION FIELD DESIGN SUMMARY (01-10)
2. CONTRACTOR IS RESPONSIBLE FOR CONTAINING AND REMOVING SOILS
3. CONTRACTOR IS RESPONSIBLE TO RESHAPE AND CONTIGUOUS FIELD AREA TO CONTROL AND MANAGE WATER RUN OFF
4. PROVIDE ALL HORIZONTAL 1/2" HDPE PIPING IN WALL BOXES
5. USE STRAIGHT HOPE PIPE FOR ALL HORIZONTAL 1/2" HDPE PIPING
6. BACKFILL TRENCHES PER DIVISION 35 SITE REQUIREMENTS (BASED ON SPECIFIC LOCATION OF TRENCH)
7. ALL LOOP HELD AREA TO ROUGH GRADE CONDITION
8. COORDINATE WITH ALL EXISTING AND NEW UTILITIES
9. CONTRACTOR IS RESPONSIBLE FOR EXCAVATING TRENCHES AND BEDDING OF HORIZONTAL PIPES
10. CONTRACTOR IS RESPONSIBLE FOR SHARP AND CONTIGUOUS FIELD AREA TO CONTROL AND MANAGE WATER RUN OFF
11. PROVIDE INTERIOR VALVED MANIFOLD AND WALL PENETRATIONS



EARTH SENSITIVE SOLUTIONS, LLC  
 P.C. BOX 1  
 160405 BLDG 201  
 160011 PERMIT SET  
 info@earth-sensitive.com



REHABILITATION CENTER  
 LABYRINTH



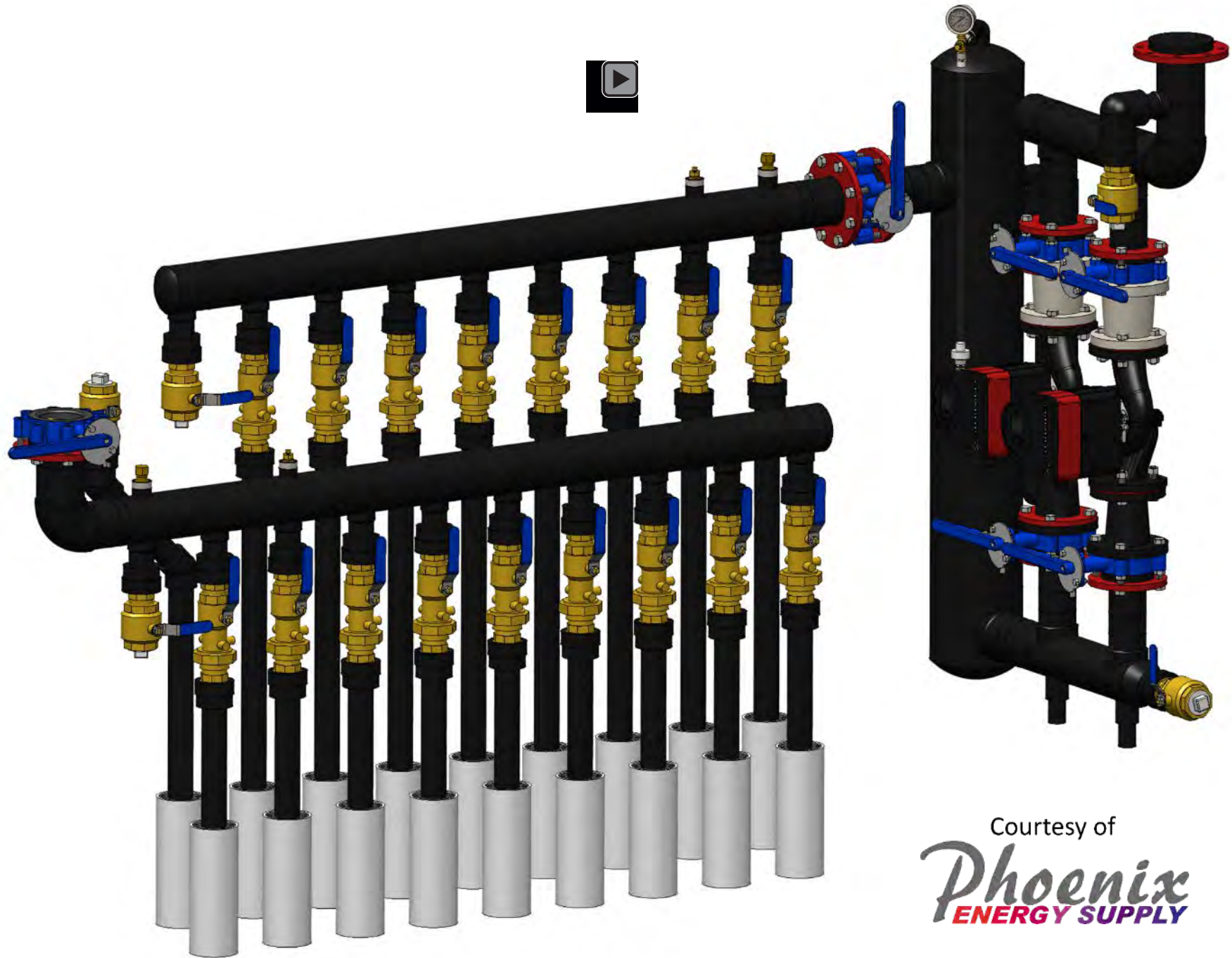
REVISION HISTORY  
 100401 INITIAL RELEASE  
 100405 BLDG SET  
 160011 PERMIT SET

DATE  
 JUNE 11, 2018

SHEET TITLE  
 REHAB CENTER  
 GEOTHERMAL  
 LOOP FIELD  
 PLAN

LF-100





Courtesy of  
*Phoenix*  
ENERGY SUPPLY

**Project Information**

Customer: CABVI  
 Contact: Dave Colegrove  
 Phone:   
 email:   
 Project Name & Location: Rehab Center

Pricing Multiplier: 0.500

**System Characteristics**

Nominal Tonnage:   
 Flow (gpm): 1.98  
 Antifreeze: Freeze  
 Number of Heat Pumps:   
 GV Pumping Style: Stacked  
 Interior Piping: Minimum

**Loop Field Description**

Loops:   
 Number of Groups: 8  
 Length: 1000  
 Group/Loop Buried Manifold:   
 Manifold Length:   
 Spacing Between Taps: 20 Ft  
 Supply/Return Piping for:   
 Length (one way):   
 S/R Pipe Diameter:   
 Main Pipe (all Com): will handle Full System Flow  
 Length (total): Ft Main Pipe Diameter:

**Heat Pump Distribution**

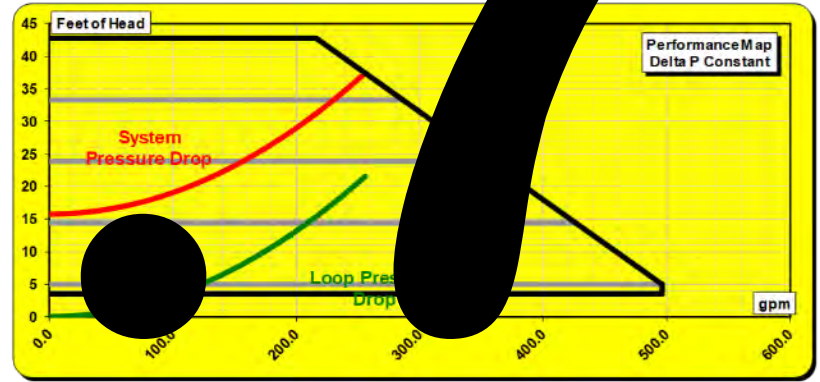
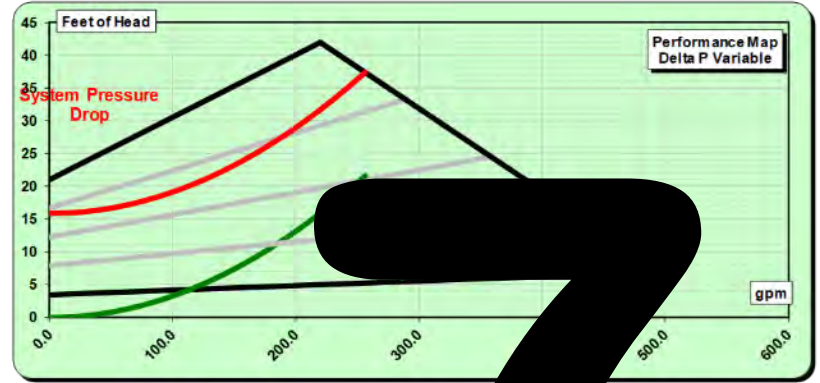
Tag	#	Capacity	Primary DP	Secondary DP	Flow
A	7	3795.0 gal	21.0	15.8	256.0 gpm
B	2	Antifreeze Est	Secondary DP		
C	3	701.3 gal			
<b>Total</b>					<b>37.4 Feet</b>

- Stratos 1.25x3-5 (GV/GP06)
- Stratos 1.5x3-4 (GV/GP15)
- Stratos 3x3-30 (GV/GP30)
- GM3 40-80
- GM3 40-180
- GM3 50-150
- GM3 65-150
- GM3 100-120
- Stratos 1.25x3-30
- Stratos 2x3-3 (GV/GP20)
- Stratos 3x3-40
- GM3 40-120
- GM3 50-80
- GM3 65-120
- GM3 80-100

**Heat Pump (Flow Circuits)**

Total Specified Flow: 325.3 2.96 gpm/Ton = 2.33 adjusted 256.0

Tag	Model	gpm	FOH	Pipe Diam & Length	ID	ZV Cv	BV Cv	Mnfl	Flow Adjust Factor	Flow ft/sec	Feet	ZV DP	HP DP	Man DP	BV DP	TTL DP
HP-5	GTW180	48.0	16.4	40	2.067	52	30.0	A	77%	37.0	3.5	1.05	1.18	9.72	0.47	12.43
HP-6	GTW180	48.0	16.4	40	2.067	52	30.0	A	<	<	<	<	1.15	9.47	0.76	12.42
HP-7	N	20.8	11.2	1 1/2	1.61	30.0	30.0	A	<	<	<	<	0.57	9.48	1.21	12.27
HP-8	N	13.5	9.7	1 1/2	1.38	30.0	30.0	A	96%	13.5	1.15	1.15	0.89	8.94	1.10	12.36
HP-9	N	13.5	9.7	1 1/2	1.38	30.0	30.0	A	95%	12.7	1.13	1.13	0.89	8.94	1.10	12.48
HP-10	N	13.5	9.7	1 1/2	1.38	30.0	30.0	A	92%	12.7	1.06	1.06	0.89	8.94	1.10	12.30
VR-11	120H	15.0	6.7	1 1/4	2.067	30.0	30.0	A	70%	21.0	0.35	0.35	0.75	7.50	0.00	12.22
HP-12	15-060	9.7	6.5	1	1.38	30.0	30.0	A	89%	12.7	1.0	1.0	0.25	2.50	0.00	12.47
HP-13	15-060	9.7	6.5	1	1.38	30.0	30.0	B	84%	11.4	0.91	0.91	0.22	2.20	0.00	12.42
VR-14	120H	15.0	6.7	1 1/4	2.067	30.0	30.0	A	66%	19.5	0.35	0.35	0.75	7.50	0.00	12.42
VR-15	120H	15.0	6.7	1 1/4	2.067	30.0	30.0	A	63%	18.8	0.35	0.35	0.75	7.50	0.00	12.50
HP-16	142-048	10.5	6.7	1 1/4	1.38	30	30.0	C	88%	9.2	2.0	1.90	0.22	5.19	5.10	12.41
HP-17	142-060	13.5	9.5	1 1/4	1.38	37	30.0	C	76%	10.3	2.2	0.95	0.18	5.47	5.78	12.38
HP-18	142-048	10.5	6.7	1 1/4	1.38	37	30.0	C	90%	9.5	2.0	0.66	0.15	5.43	6.13	12.37
HP-19	GBH-026	6.0	6.5	1	1.049	30	30.0	C	86%	5.2	1.9	0.84	0.07	4.78	6.71	12.40
HP-20	142-048	10.5	6.7	1 1/4	1.38	37	30.0	C	85%	8.9	1.9	0.60	0.14	4.84	6.86	12.43



**watts/ton**





# THANK YOU!

Central Association for the Blind and Visually Impaired