

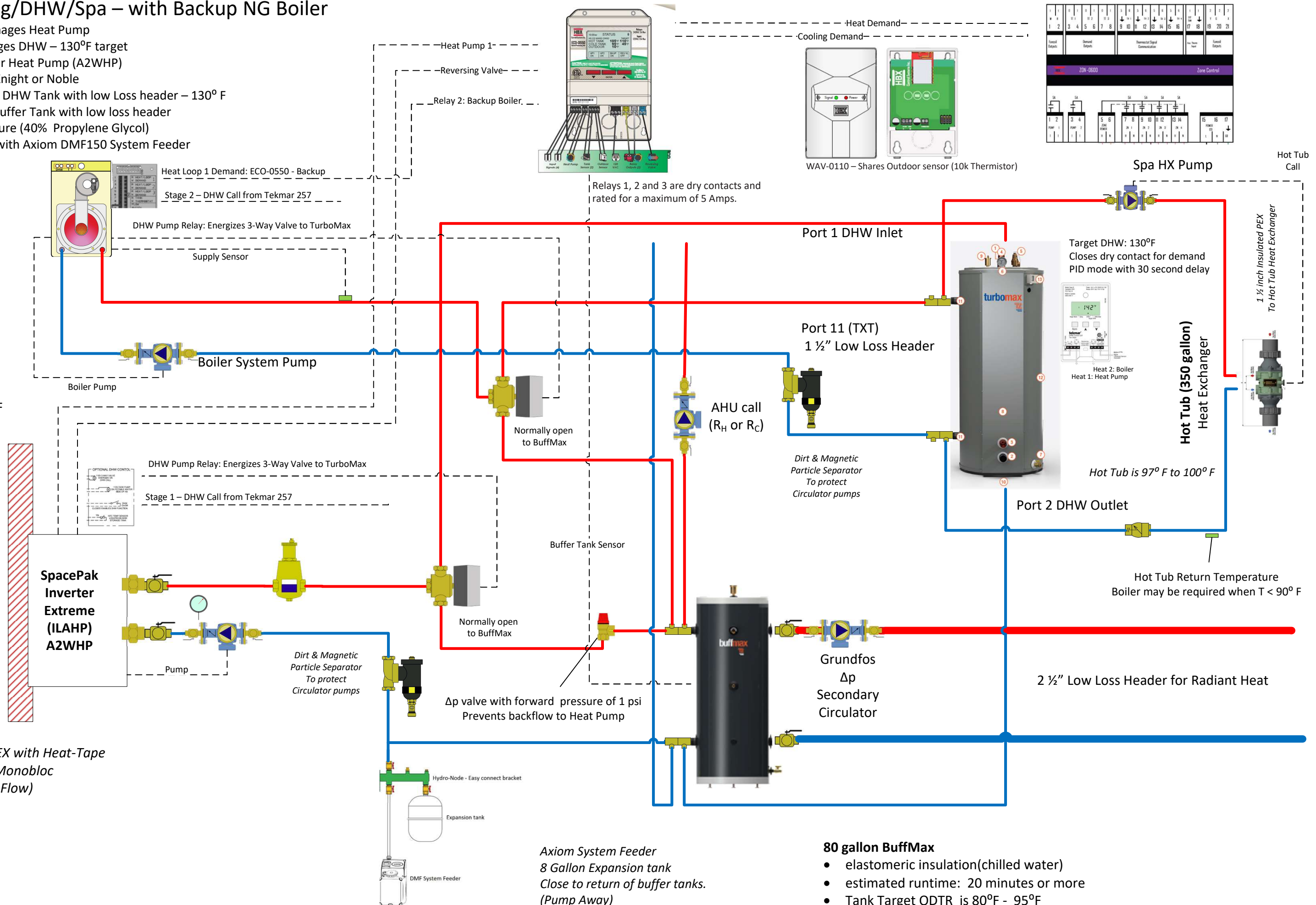
Heating/Cooling/DHW/Spa – with Backup NG Boiler

- HBX Eco 0550 – Manages Heat Pump
- Tekmar 257 – Manages DHW – 130°F target
- Stage 1: Air to Water Heat Pump (A2WHP)
- Stage 2: Lochinvar Knight or Noble
- TurboMax 71 Gallon DHW Tank with low Loss header – 130° F
- BuffMax 80 Gallon Buffer Tank with low loss header
- -30F Burst temperature (40% Propylene Glycol)
- Axiom Hydro-Node with Axiom DMF150 System Feeder

Lochinvar Boiler
Time: 10 minutes
Temp: 49°F
Differential: 5°F

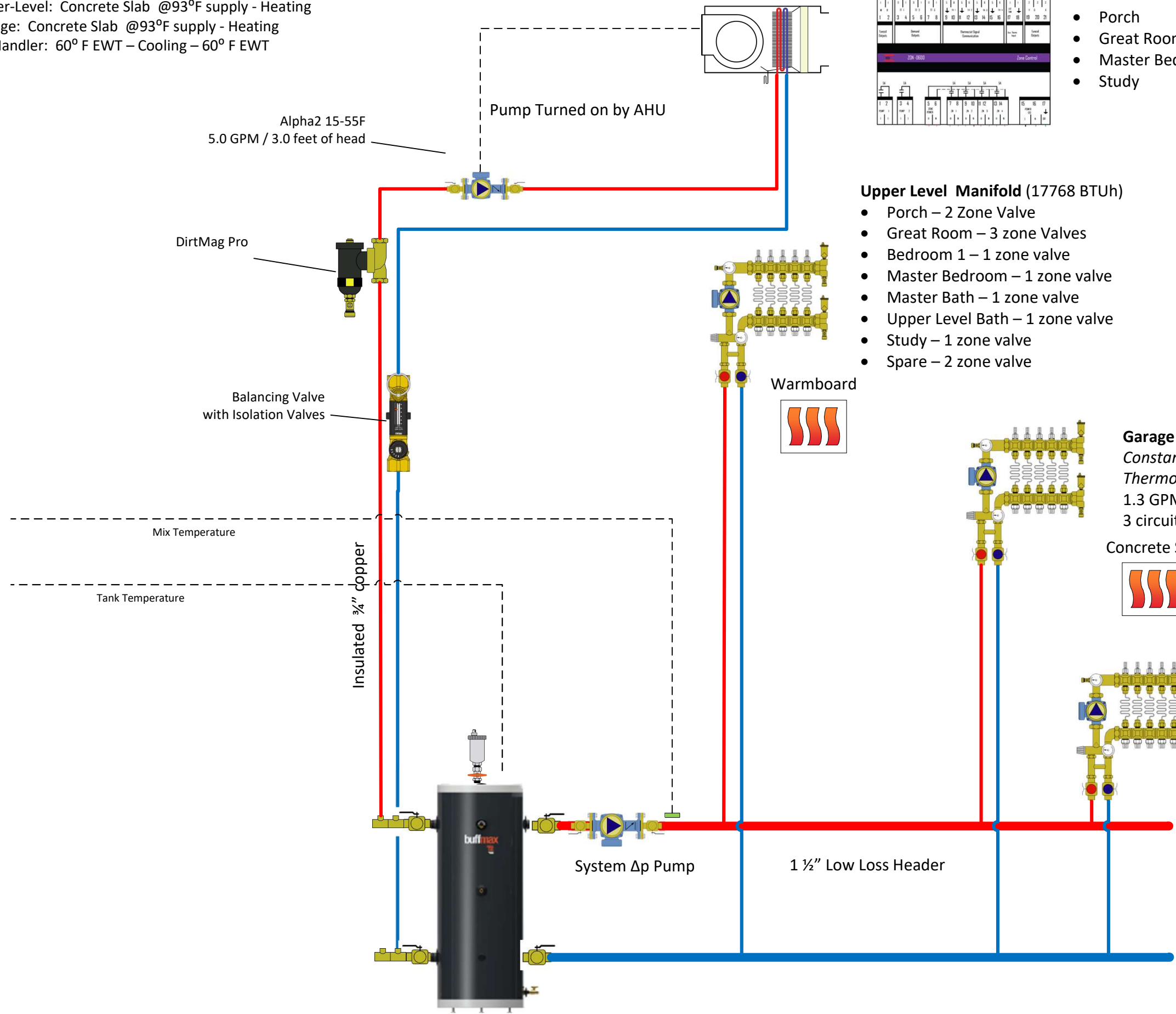
Balance Point is 8° F

1 ½ -inch Insulated PEX with Heat-Tape
To outdoor Monobloc
(10 GPM Flow)



Heat Distribution

- Upper-Level: Warmboard @93° F supply - Heating
- Lower-Level: Concrete Slab @93°F supply - Heating
- Garage: Concrete Slab @93°F supply - Heating
- Air Handler: 60° F EWT – Cooling – 60° F EWT



Alpha2 15-55F
5.0 GPM / 3.0 feet of head

Pump Turned on by AHU

DirtMag Pro

Balancing Valve
with Isolation Valves

Mix Temperature

Tank Temperature

Insulated 3/4" copper

System Δp Pump

1 1/2" Low Loss Header

Warmboard



Garage (12165 BTUh)

Constant circulation
Thermostatic Valve
1.3 GPM
3 circuits

Concrete Slab



Lower Level Manifold (7353 BTUh)

- Mechanical – 1 Zone Valve
- Family Room – 2 Zone Valves
- Bedroom 2 – 1 Zone Valve
- Bedroom 3 – 1 zone valve
- Storage / Library / Bath – 1 Zone Valve
- Spare – 2 Zone Valves

Concrete Slab



Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Zone 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

- Porch
- Great Room
- Master Bedroom
- Study



ESP Zoned Air Handler

500 CFM / 7020 BTUh

- Porch – 125 CFM
- Great Room – 125 CFM
- Bedrooms – 125 CFM
- Bathroom/Study – 125 CFM

Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Zone 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Upper Level Manifold (17768 BTUh)

- Porch – 2 Zone Valve
- Great Room – 3 zone Valves
- Bedroom 1 – 1 zone valve
- Master Bedroom – 1 zone valve
- Master Bath – 1 zone valve
- Upper Level Bath – 1 zone valve
- Study – 1 zone valve
- Spare – 2 zone valve

Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
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Sub-Flooring – Glued and Screwed

- 2060 square feet of sub-flooring
- 65 sheets of Warmboard-S
- Warmboard PEX-Al-PEX tubing

Warmboard S – Upper Level

- Glue Warmboard with Loctite PL Max (Manufacturer recommended).
- Screw with Simpson WSV Sub floor screw (Quik Drive Auto-Feed)
- Warmboard PEX-AL-PEX length is not to exceed 300 feet.
- Tile flooring installed using Schluter uncoupling membrane.
- After PEX tubing is installed, Install Ram Board or equivalent, to help protect the tubing.
- Rockwool ComfortBatt R-19 or BBS insulation under Warmboard (after house is enclosed).

