As Mechanical Contractor for the Chippewa Nature Center of Midland, Michigan, Answer Heating & Cooling, Inc. (AHC) provided complete Mechanical Installation and post-construction system optimization.

The scope of work included:

- The *ClimateMaster*-TMW170 water to water 10-ton geothermal heat pump achieves a 12.5 EER rating, exceeding the 11.3 EER required by design. Unit has a COP of 3.52 and a 50 degree EWT. The TMW170 maintains a 500 gallon storage tank at 105 degrees for heating and 45 degrees for cooling.

- Loop field, located outside the north side of the pre-school consists of 16 vertical bores that are 150’ deep. Each bore contains 300’ of 3/4” black plastic water line, for a total 4800’ of pipe.

- 13 Variable frequency drive pumps, installed in the mechanical room and the mezzanine, that provide increased energy savings that result in additional electrical savings.

- Air handler located in the mezzanine distributes air from the energy recovery unit.

- Energy recovery unit located in the mezzanine preheats outside air with air being exhausted from building.

- Underground duct work, is a plastic “Blue” duct work system that is durable, non-corrosive, water- and air-tight with a R-10 insulation value.

- In-floor heating & cooling system located in the concrete consists of 3400’ of 5/8” *Wirsbo* tubing. The tubing is stapled to 4” foam insulation and the system is sectioned into 13 zones.

- 5 *CHROMAGEN* all-copper solar collectors are located on the roof that provide hot water via a drain back system filled only with distilled water.

- 48 electric photovoltaic solar panels to generate up to 10kw of energy. During unoccupied times it puts the excess electricity back into the existing electrical grid to be used at a later time.

- Custom built Temperature Control System by *Honeywell*, that is operated by computer featuring full integration with remote access.

**Type of construction** / New Construction  
**Physical size of project** / 5,753 sq. ft.  
**Contract value** / $538,585  
**Calendar length of project** / 17 months  
**Percentage of labor that is self-performed** / 36%

**Evaluation of Trade Contractors:**
AHC evaluated competitive sealed proposals from trade contractors based upon past experiences and the ability to meet project specifications.

**Merit Shop / ABC Members Involved in the Project:**
Fisher Contracting; G.E. Insulation; Helger Construction; Metal Arts; Rockford Construction; SPACE, Inc.