SAMPLE: SCOPE OF GEOTHERMAL DESIGN SERVICES

1. Ground heat exchanger requirements – configuration and total linear footage for closed loop heat exchanger options, including number of circuits, subfield determination, pipe schedule, etc.; based upon provided loads, estimated host source conditions, and other site requirements
    a. Pre-design for any of the following potential Ground Heat Exchanger (GHX) options, to determine best configuration option most compatible with the site variables:
        i. Surface water configuration
        ii. Horizontal configuration
        iii. Vertical configuration (anticipated)
        iv. Thermal conductivity test parameters (if applicable)
        v. Final specification
        vi. Final design parameters
2. Specify thermal conductivity test parameters, if required, horizontal and vertical (cost does not include actual thermal conductivity testing, if required, this will be an additional cost)
3. HDPE piping standards and DR schedule
4. Grout minimum specifications, for vertical loop
5. Manifolding specifications
6. Installation recommendations & quality control checks as required
7. Piping layout to mechanical room, internal manifolding, purge/charge valving configuration
8. CAD drawings; ground loop layout, headering detail, internal manifolding configuration
9. Pressure drop analysis for peak flow rate – pure water, and adjusted for temperature and antifreeze - ground heat exchanger to mechanical room
10. Verify minimum Reynolds number for positive turbulence in heat exchanger (cold loop conditions)
11. Antifreeze type and capacity
12. Minimum purge pump performance calculation
13. Charge and purge procedure
14. Specifications for GHX installation (Division 23)
15. Mechanical contractor installer minimum requirements
16. Looping contractor installer minimum requirements
17. Mechanical and ground loop specifications, relevant to the ground heat exchanger and as required for the internal heat pump system, as needed
18. QA/QC Site Visits; Pre-construction meeting with our selected looping contractor and key personnel to verify they understand the installation parameters, applicable local, state or other requirements and quality control checks. On-site inspection at start-up of looping operations (closed loop). On-site inspection, final headering and backfill, witness pressure testing, verify proper header configuration for transition in mechanical room, verify applicable local, state or military documentation is completed (closed loop).