

“TYPICAL” SCHEDULE - ONE & ONE-HALF DAY SEMINAR
Design of Ground Source Heat Pumps for Commercial and Institutional Buildings

DAY ONE

- 8:00 A.M.** **Introduction - Nomenclature, Overview, Applications**
Ground-Coupled, Ground Water, Surface Water
- 9:00 A.M.** **Advantages: Characteristics of Quality GSHP Installations**
Disadvantages: Limitations and Lessons Learned
- 9:50 A.M.** **Break and Discussion (or Demonstrations)**
- 10:10 A.M.** **Equipment - Water/Air Heat Pumps, Standards, Specifications,**
Factors Effecting Performance
- 11:00 A.M.** **Ground Loop Design Overview, Ground Thermal Property**
Measurement, *GchpCalc* Software for System Design
- Noon** **Lunch**
- 1:00 P.M.** **Ground Loop Design and Equipment Selection - Design Alternatives**
Pipe Size/Spacing, Hybrid Systems, Dealing with Uncertainty and
Liability
- 2:00 P.M.** **Hands-on System Design with *GchpCalc***
- 3:00 P.M.** **Break**
- 3:15 P.M.** **Ground Field Layout, Installation, Piping, Pump Control**
- 4:15 P.M.** **Loop Design with *GHPpipe***
- 4:45 P.M.** **Adjourn**

DAY TWO

- 8:00 A.M.** **Ventilation Air and ASHRAE 62 for GSHPs**
- 9:00 A.M.** **Surface Water and Ground Water**
- 10:00 A.M.** **Break and Discussion (or Demonstrations)**
- 10:20 A.M.** **Performance Comparison with Conventional HVAC Systems**
- 11:10 A.M.** **Economics and the Impact of Design Approach**

NOTE: The intended audience for these seminars is HVAC design engineers. However, subject matter is appropriate for other technical personnel, such as HVAC and drilling contractors, GSHP and HVAC equipment/supply vendors, electric utility specialist, architects, and energy managers.