Inspecting Geothermal trenching, pipe, heat fusion & building tie in.
Retrofits present excavation challenges
Each of two boreholes are trenched back to the house.
For multiple boreholes in one trench, the steel casing is exposed in a 4 ft to 5 ft deep trench.
5 feet of casing is usually removed by torch or sawzall. Work in OSHA safe trench.
As the casing is removed by sliding it up, the grout from the top should “plop out” as shown.
90 degree elbows are heat fused onto the top of each borehole loop just above the cut steel casing.
The Elbows and Tees are connected to horizontal pipe, which runs to the building.
For multiple boreholes, the horizontal pipe is arranged in Reverse Return configuration to maximize pumping efficiency.
Standard connecting manifolds can be purchased or made on site.
Smaller pipe with lesser flows always connect to larger pipe diameters.
Educational tool shows transparent piping, which shows that it can collect air if improperly sized. Air can harm circulator pumps.
20 foot long straight loop “sticks” are butt fused indoors for use in the trench if curved loop is not used.
HDPE High Density Polyethylene Loops are cored into the crawl space wall. Insulation protects the footing drain.
Single 1 ¼” HDPE supply and return from one borehole.
Wet core drill through 10” concrete wall from inside basement.
Core drill from outside in excavated trench. Note marking crosshairs.
Completed loop being pressure tested.

Resting on cores.
When bolted tight, Link Seals prevent water seepage into the basement.
4” diameter core and link seals for 2” HDPE.

3” diameter core and smaller link seals if 1 ¼” HDPE.
Threaded end brass adapters, because inside geothermal piping need not be HDPE, nor Pex like outside buried loop piping.
Brass manifold for inside only. Similar to radiant heat manifold.
A cold ring clamp tool is attached to a heat fused “T” joint, as the proper connection cools.
No glue is allowed underground. All heat fusion should be by IGSHPA* trained and certified technicians.

*(International Ground Source Heat Pump Association)
A butt fusion heating iron that does not require HDPE couplings.
A socket fusion heating iron that does need a coupling for each connection.
A typical socket fusion heating iron kit in sizes: 
3/4", 1", 1 1/4", 1 1/2" & 2"
Electro fusion predating the Triton fuser that had initial leakage problems, which have mostly been resolved.
Heat fusing a manifold in the shop with cold ring clamp.
Loops are pressure tested to 100 psi for 1 hour.
Buried boreholes and trenching can be marked with high tech location spheres.
Or marked with tracer tape, in some cases not aluminum that might chemically deteriorate over time. Sand backfill is optional.
IN THE FALL MY FAMILY LIKES TO PLAY A LITTLE GAME

HOW LONG CAN WE FREEZE BEFORE WE TURN ON THE HEAT FOR THE FIRST TIME
Solution:
Get your heat from the ground!

End segment & presentation