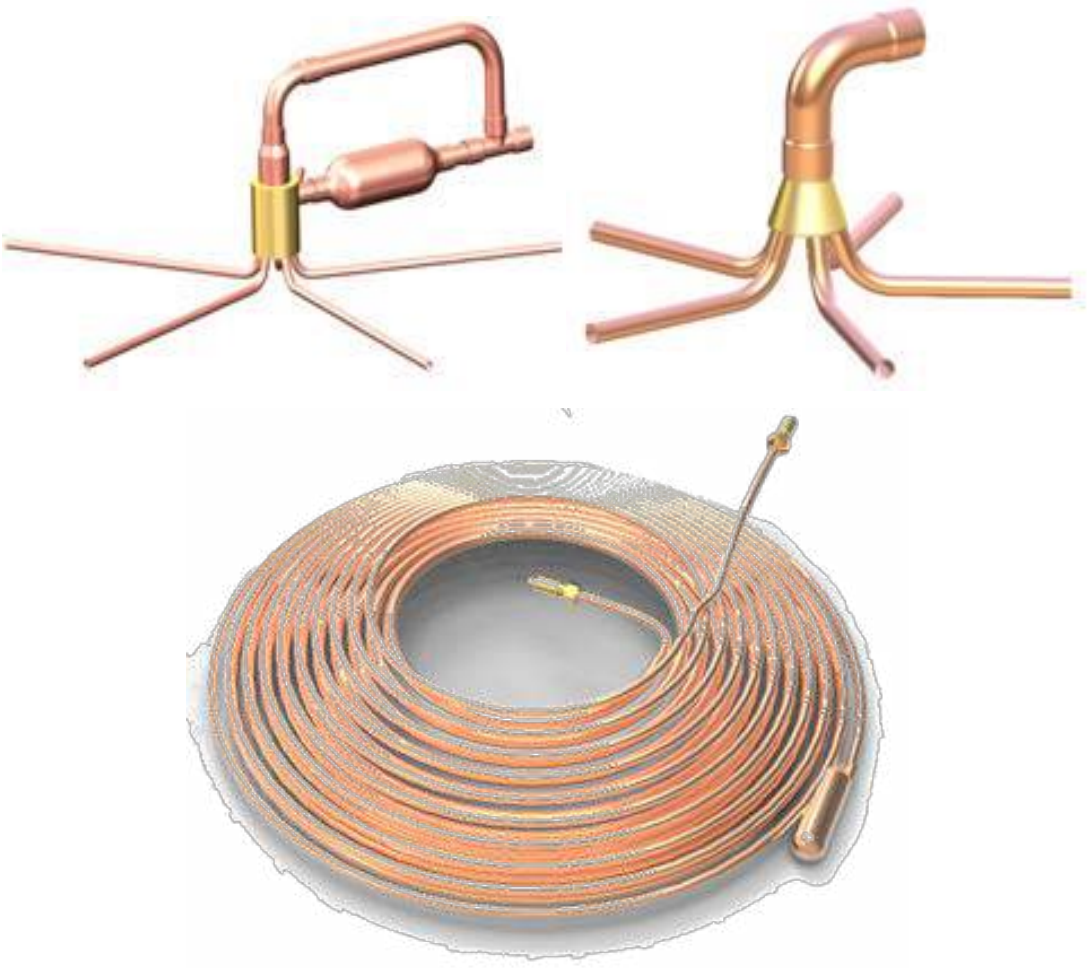
WATERLESS™ GEOTHERMAL

Horizontal Earth Loops



Installation Instructions

Disclaimer

Proper installation of the Total Green Mfg. Earth Loop is essential to its reliable performance. All Total Green Mfg. systems must be installed and serviced by a qualified HVAC contractor. Equipment sizing, selection and installation are the sole responsibility of the installing contractor. Installation must be made in accordance with the instructions set forth in this manual. Failure to provide installation by a qualified HVAC contractor in a manner consistent with this manual will void and nullify the limited warranty coverage for the system.

Total Green Mfg. shall not be liable for any defect, unsatisfactory performance, damage or loss, whether direct or consequential, relative to the design, manufacture, mason, application or installation of any field specified components.

All commissioning and registration paper work must be filled out at start up and returned to Total Green Mfg. for full warranty coverage.

Introduction: Total Green Mfg. has designed the Earth Loop System to function as the underground component of the Waterless Geothermal® Heating and Cooling System. Total Green Mfg. manufactures and sells this system, performance certified under ARI Standard 870-99 and safety certified by ETL under applicable UL Safety Standards.

Waterless Geothermal® systems provide performance and efficiency advantages to the end user consistent with safeguarding the environment, as a result of employing specific design, manufacturing and installation practices.

Total Green Mfg. utilizes ACR Type coiled copper tubing in sizes ranging from 1/4” OD to 3/8” OD in its Horizontal Earth Loop Systems. This ACR Type copper tubing meets the requirements of Standard ASTM B 280.

Table of Contents

Specification, Compliances and Restrictions

This manual addresses the specification and installation of Waterless™ Geothermal Earth Loop Systems with Waterless™ Geothermal Heating and Cooling Systems.

WARNING!

1) **<u>DO NOT</u> install an earth loop system in soils with high concentrations of acids, chlorides, sulfides, sulfates, carbon, coal, cinders or ammonia; or organic soils with anaerobic bacteria, or in coastal areas with brackish water marshes, salt water intrusion or acidic peat bogs. Prior to drilling or excavation for the Earth Loop system, it is the responsibility of the system specifier to determine the presence of these noted concentrations by taking soil samples at appropriate depths below the ground surface and at multiple locations within the intended Earth Loop field. Further, if concerns regarding the above conditions exist, the soil should be sampled, analyzed and documented by a licensed soil testing laboratory.**

2) **It is not recommended to install an Earth Loop system within one half (1/2) mile of a salt water sea shore or any tidal body of water.**

Earth Loop systems installed in any of the above conditions without first consulting Total Green Mfg. for the appropriate installation method will void the Total Green Mfg.'s Limited Warranties for the copper earth loops, manifolds and all equipment connected to the earth loop system.

Should these conditions be encountered, please consult with Total Green Mfg. Technical Support for the appropriate methods for installing an Earth Loop field.

The specification of an earth loop system begins with a Manual "J" load calculation, the correct sizing and selection of the system based on the Manual "J" along with using Total Green Mfg.'s "<u>System Sizing and Selection</u>" manual and, a thorough site evaluation to determine the appropriate loop field type and location.

The following site restrictions apply to drilling or excavation operations relative to all Waterless™ Geothermal earth loop configurations:

- As part of the specification process, verify with appropriate local utilities that there are no other existing underground impressed current protection systems which would electrically interfere with the Waterless™ Geothermal cathodic protection system.
- Before excavating or drilling, the site must be inspected to ensure the absence of electric, gas, water, sewer, irrigation and telephone lines.
- Excavations are subject to OSHA regulations (Federal Register; Volume 54; No. 209; Oct. 31, 1989. Rules and Regulations page 45965 [29 CRF Part 1926]).Earth loop installations are not to be within:
    a. 12 feet off a foundation, water line or drainage zone of a building downspout.
    b. 50 feet off a water well, or below the collection basin of de-icing salts or barnyard runoff.
    c. 75 feet off septic system and leach field.
    d. One-half the branch extremities of a tree or a shrub.

Specification, Compliances and Restrictions

The use of copper in earth loops is compatible with over 90% of the land area in North America.

- **Soil samples are to be tested to determine pH value.** Total Green Mfg. recommends that soil be sampled, analyzed and documented as per your jurisdiction and local code requirements. For soil conditions where the **pH is 6** or lower, encasing the loop is **required**. Should soil pH be 6 or lower, this hozintal field should **not** be considered as only D2 and V/D1P fields are approved for encapsulation. A high quality soil pH tester sold at gardening and farm supply stores can be used as reference.

Pulverized Limestone can be used in place of mason sand for packing manifolds, protecting line sets and loops. Pulverized Limestone can help raise the pH value of aggressive soils. **Please Note**: Pulverized Limestone is **NOT** to be used for mixing grout. Grout should only be mixed with silica sand as per the grout manufacturer's instructions.

IMPORTANT!

Waterless™ Geothermal compressor units that provide space cooling shall be equipped with a Waterless™ Geothermal Hybrid Cooling Module (HCM) when:

(1) System is in a cooling dominant application where soil thermal conductivity is known to be poor. Examples of such soils are light dry soil, dry sand, peat and organic soils, dry clay and hardpan (a layer of soil impervious to water); OR

(2) In any system where the outdoor temperatures have exceeded the outdoor summer design temperature conditions causing a continuous system run time of 4 or more hours in a day; OR

(3) In any system where indoor design conditions have exceeded the designed cooling load and system capacity causing a continuous system run time of 4 or more hours in a day. Examples of such would be offices, classrooms and church environments that see high occupancy during the day but, would otherwise have equipment grossly oversized the rest of the time.

Please refer to Total Green Mfg.'s Waterless™Geothermal Hybrid Cooling Module Manual for more information.

IMPORTANT!

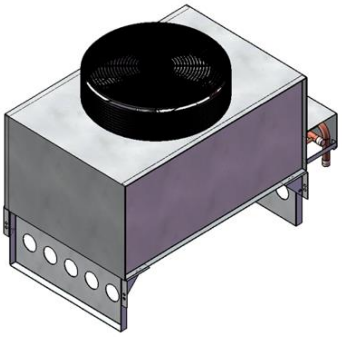
Only Total Green Mfg. factory trained technicians who meet local, state and federal proficiency and licensing requirements are qualified to install and service Earth Loops in accordance with these instructions and the local code authority having jurisdiction.

OPTIONS ADVERSE SOIL CONDITIONS

1. ENCASED LOOP SYSTEM

- For conditions such as salt water, Low pH (6 or lower), and high sulfur soil conditions, we recommend to encase the copper loop in schelude 21 PVC pipe. After encasing the loop inside PVC pipe, grout the inside of the PVC casing with a cementitious grout. This type of grout flows easier and can be pushed through the smaller Tremie pipe needed to fill the PVC pipe from the bottom up. The grout selected and used outside the PVC pipe between it and the earth should be a grout appropriate for the ground conditions, either cementitious or bentonite grouts. Only D2 and V/D1P loop field types are approved for incapsulation. The Horizontal Loop Field covered in this manual should not be considered in conditions as described above. Please refer to the “Encasing Earth Loop Instructions” manual.

2. HYBRID COOLING MODULE



(1) System is in a cooling dominant application where soil thermal conductivity is known to be poor. A Hybrid Cooling Module is required. Examples of such soils are light dry soil, dry sand, peat and organic soils, dry clay and hardpan (a layer of soil impervious to water); **OR**

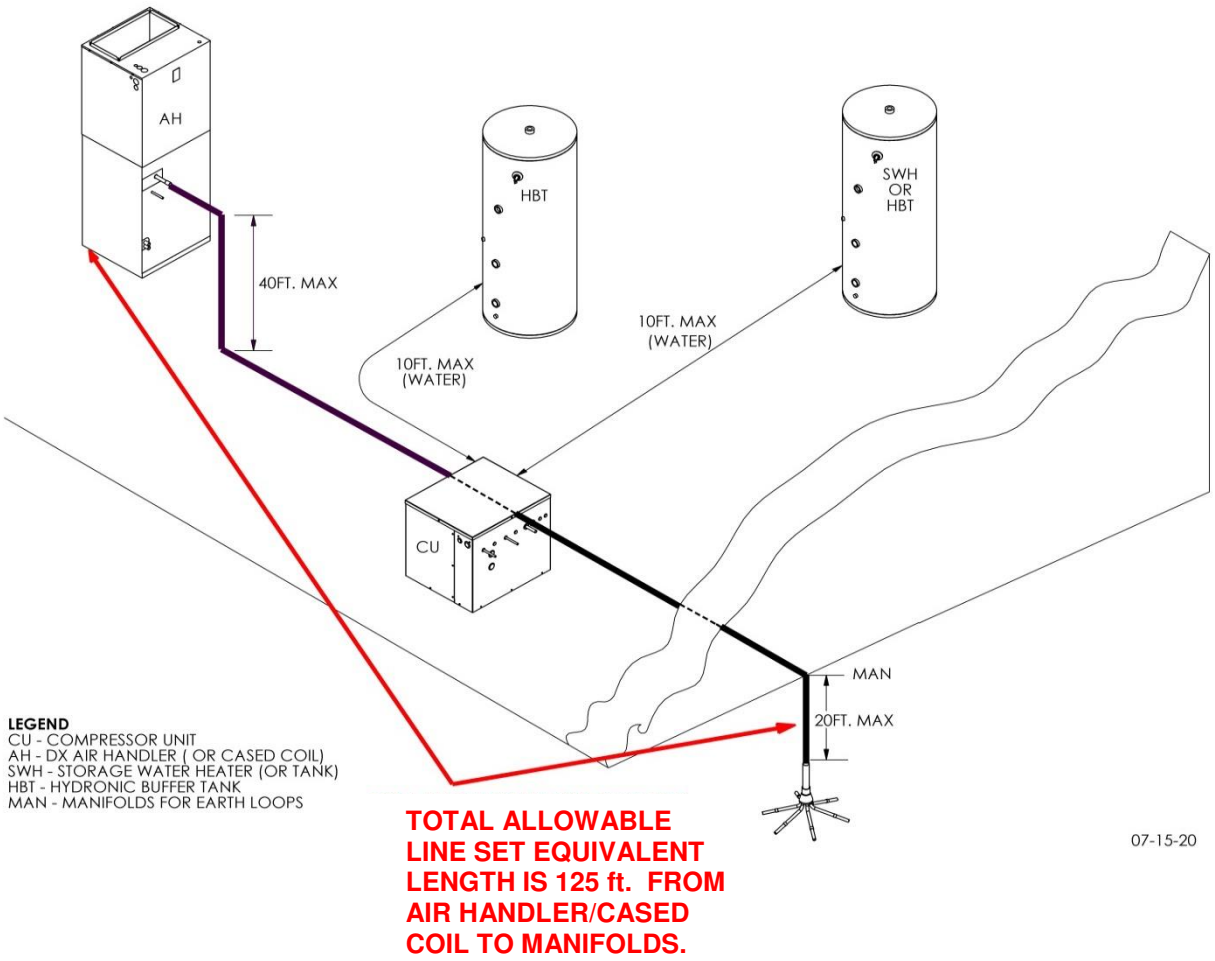
(2) In any system where the outdoor temperatures have exceeded the outdoor summer design temperature conditions causing a continuous system run time of 4 or more hours in a day; **OR**

(3) In any system where indoor design conditions have exceeded the designed cooling load and system capacity causing a continuous system run time of 4 or more hours in a day. Examples of such would be offices, classrooms and church environments that see high occupancy during the day but, would otherwise have equipment grossly oversized the rest of the time.

Please refer to Total Green Mfg.’s Waterless™Geothermal Hybrid Cooling Module Manual for more information.

Line Set Lengths and Elevations

Total equivalent line set lengths and elevations must be strictly followed. Equivalent meaning accounting for frictional loss of fittings and connections. This is **NOT** linear feet. Please carefully review the below illustration when planning a Waterless Geothermal™ installation.



TOTAL ALLOWABLE LINE SET EQUIVALENT LENGTH IS 125 ft. FROM AIR HANDLER/CASED COIL TO MANIFOLDS.

Pipe Fitting Equivalent Lengths

Long Radius 90 = 3 ft. - Coupling = 1 ft. - Swaged Connection = 1 ft.

45 Degree Elbow = 1.5 ft.

Important Note: Short Radius 90° elbows are NOT permitted to be used in any piping.

General Description

H2, Horizontal Earth Loop Systems are comprised of 1/4" and 3/8"copper tubes, 100 ft. in length with bulb ends. Two of these loops are used per unit ton. This loop is designed specifically for horizontal placement. **NOT** vertical nor diagonal. Loops for vertical or diagonal installations, although similar in appearance, are of a different design and are **NOT** to be used in horizontal installations. Please refer to **Figure 1** for loop model and count.

H2 Loop Systems are for use in all climates and load conditions.

Unit Size	No. of Loops	Model No.
2 Ton (24)	4 Loops	H2-024-4
2.5 Ton (30)	5 Loops	H2-030-5
3 Ton (36)	6 Loops	H2-036-6
3.5 Ton (42)	7 Loops	H2-042-7
4 Ton (48)	8 Loops	H2-048-8
4.5 Ton (54)	9 Loops	H2-054-9
5 Ton (60)	10 Loops	H2-060-10
5.5 Ton (66)	11 Loops	H2-066-11
6 Ton (72)	12 Loops	H2-072-12

Figure 1

Minimum depth of the loops must be no less than 5 ft. or, 18 inches below the frost line for the location of the installation, whichever is greater. Please keep in mind that this is the minimum required depth. Deeper is always better. Please refer to **Figure 2** for the minimum land space needed for a horizontal field.

Unit Size	No. of Loops	Min. Space Required in Feet.
2 Ton (24)	4 Loops	105 x 10
2.5 Ton (30)	5 Loops	105 x 18
3 Ton (36)	6 Loops	105 x 18
3.5 Ton (42)	7 Loops	105 x 26
4 Ton (48)	8 Loops	105 x 26
4.5 Ton (54)	9 Loops	105 x 34
5 Ton (60)	10 Loops	105 x 34
5.5 Ton (66)	11 Loops	105 x 42
6 Ton (72)	12 Loops	105 x 42

Figure 2

Horizontal Installation

When using an excavator, each excavated trench should be a minimum of 2 ft. wide. Trench depth is a minimum of 5 ft. or 18" below the frost line, whichever is greater. Deeper is better. Two loops will lay in each trench, one loop on each side. For half ton models, one trench will only have one loop. The spacing between each trench should be a minimum of 6 ft. Please note that trenches should be as level as possible with no deep dips and, all loops levels kept as close to each other as possible. Please refer to **Figure 3A and 3** below as an example. Please refer to the field templates, pages 21 through 24 for each individual field size.

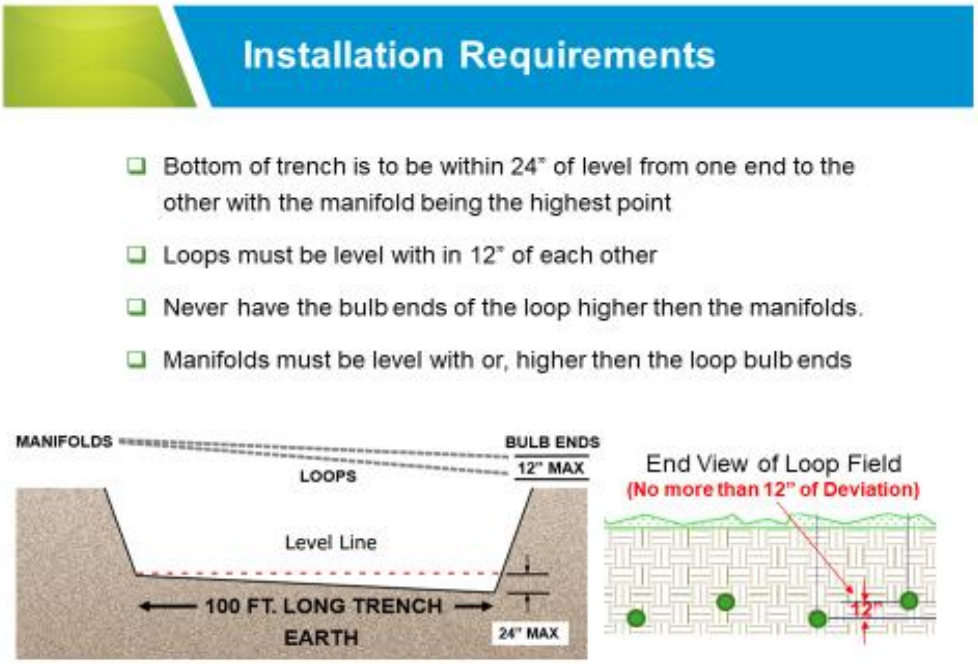


Figure 3A

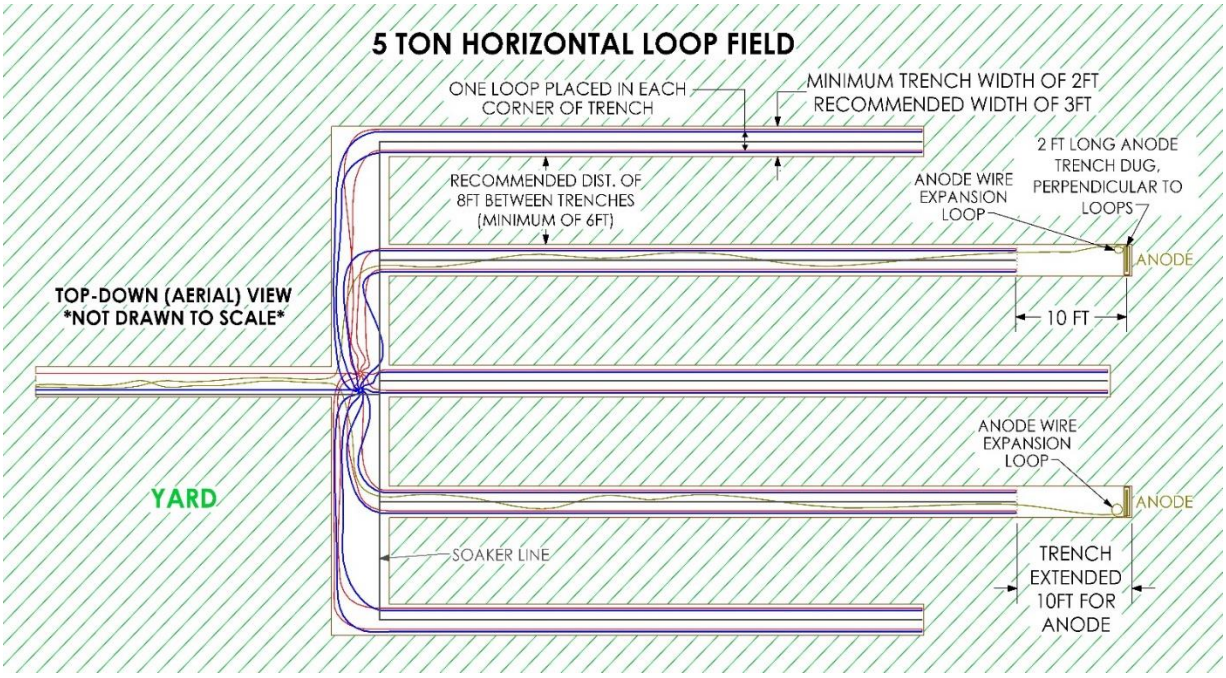
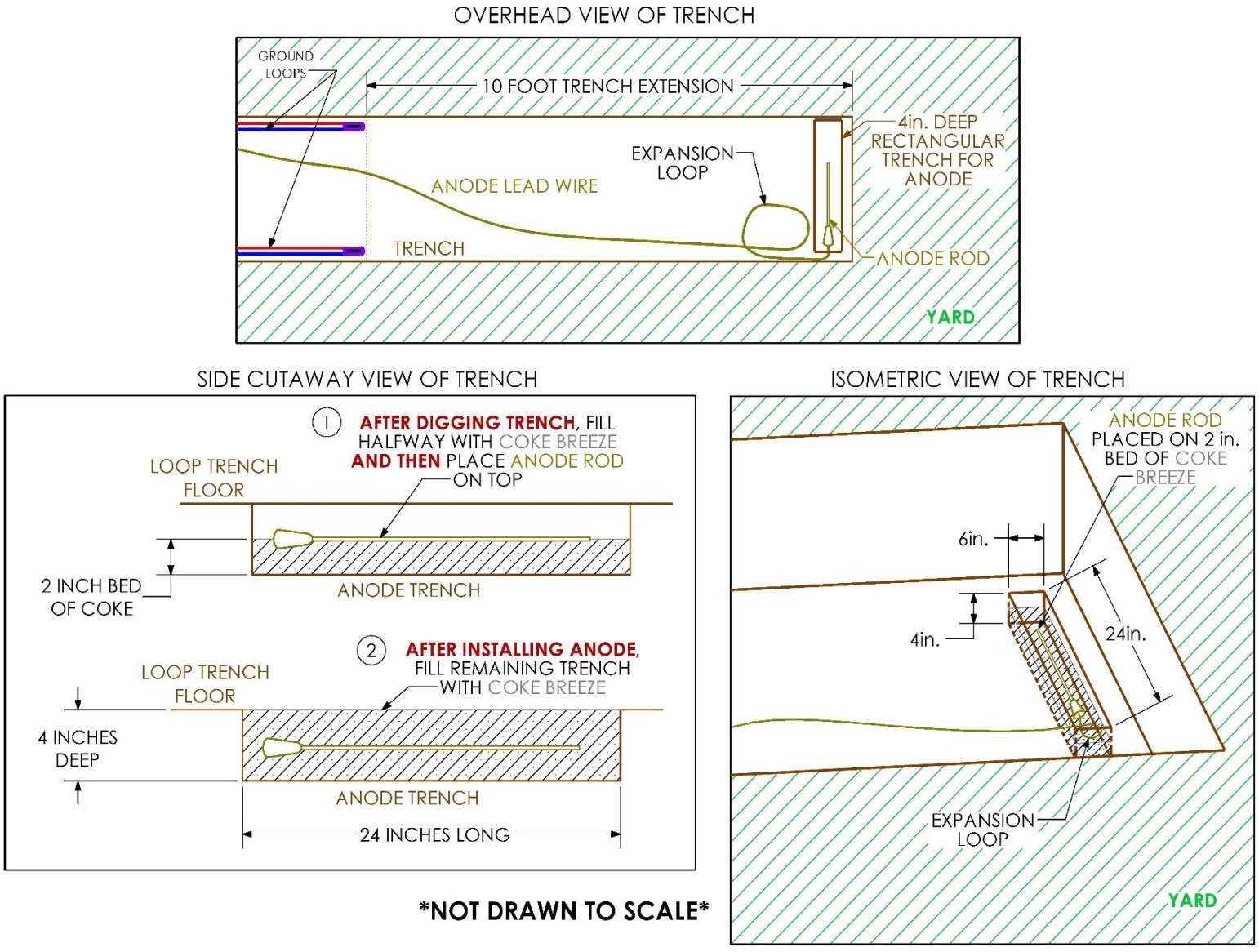


Figure 3B

Anode Installation (Cathodic Protection)

Total Green Mfg. horizontal fields must use impress current cathodic protection. This is, depending on field size, a single or dual rectifier/s and anode/s that must be used to provide coverage and protection of any horizontal field regardless of installation method. Anode installation methods are shown in **Figure 4** below. Please refer to the field templates, pages 21 through 24 for anode count and locations for each individual field size.



NOTES:

1. FOR A 24in. LONG TRENCH (AS SHOWN) WITH A DEPTH OF 4in. AND WIDTH OF 6in., 25LB OF COKE BREEZE WILL FILL THE TRENCH TO THE TOP

2. USE **25LB** OF COKE BREEZE FOR EACH TRENCH (THIS MEANS THAT ONE 50LB BAG OF COKE WILL FILL UP TO TWO TRENCHES)

Figure 4

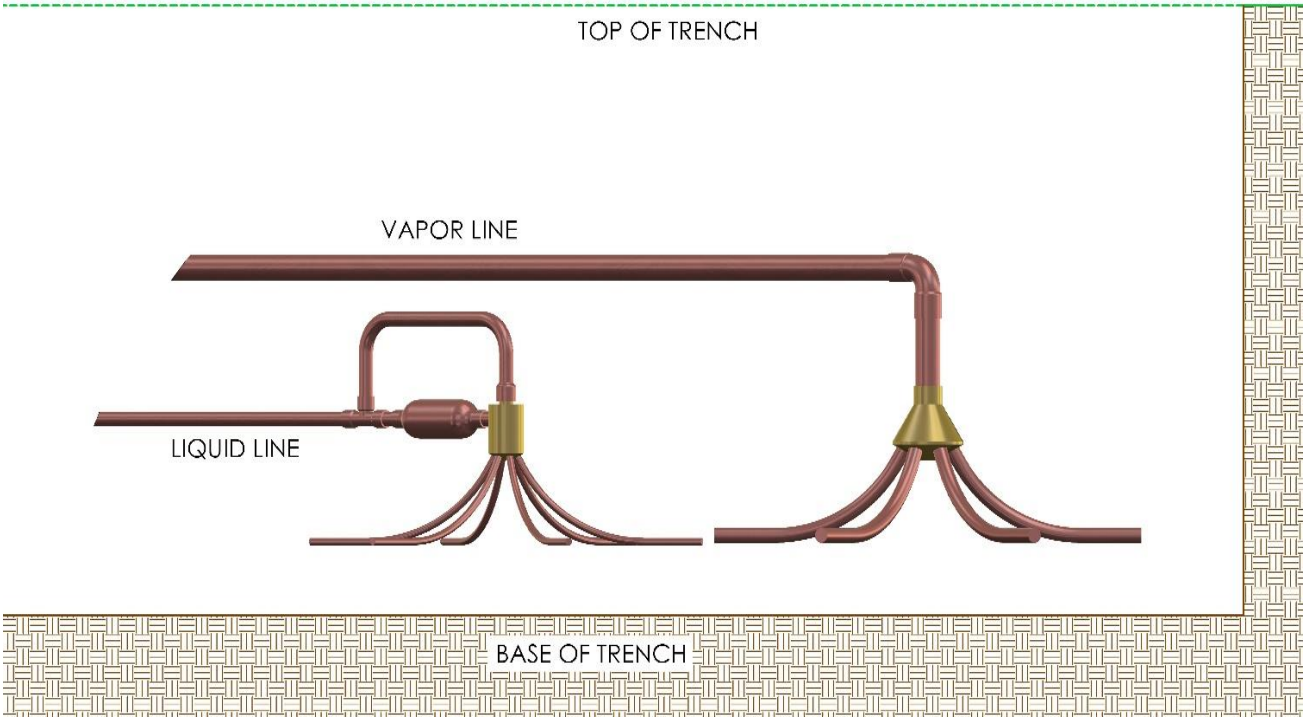
Anode Installation (Cathodic Protection)

As shown in previously in **Figure 4** on page 10, each anode is placed in a trench with the end of the anode in line with the outer loop on each side. The trench for the anode is to be dug 4in. deeper for the anode to accommodate it as well as the coke breeze. Please refer to the templates found on pages 21 through 24 for your specific field. Once the anodes are in place, you must pack the anodes in Cooke Breeze and back fill as per the following steps:

1. Mix water & coke using a paddle mixer.
2. Pour coke slurry into the trench – enough to surround the anode.
3. Fill with enough coke breeze to fully cover the anode.
4. Let all of the water absorb into the ground, allowing the granules to settle around the anode prior to back filling.

The anode wires will follow the loop and line set back to the compressor unit location. Do not pull the anode wire tight out of the trench. Leave some slack to allow for expansion and contraction of the earth without stretching and possibly pulling the anode wire out of its position. It is recommended to follow the liquid line of the line set back to the compressor unit location as the liquid line does not run as warm as the vapor line can. Building entry should be shared with the liquid line of the line set as well.

Manifold Installation



WARNING

DO NOT CUT Earth Loop tubing unless it is first depressurized through the service valve.

Cutting pressurized tubing can cause bodily injury.

First, all tubing ends of the manifolds, earth loops and line set must be cleaned and de-burred after cutting prior to assembly. The ¼" liquid earth loop tubing is fit to the liquid manifold connections. ¼" inch copper couplings may be needed and are field supplied. The liquid line of the field supplied manifold line set is connected to the main port on the liquid manifold. Be sure a sweeping pinwheel type arch is made to allow for expansion and contraction of the copper tubing. Failure to do so will result in leaks. See figure 5 on page 13.

IMPORTANT

All refrigeration piping is to be brazed with 15% silver content brazing alloy utilizing the NITROGEN BRAZING PROCESS.

CAUTION

PURPOSE:

Utilize the **NITROGEN BRAZING PROCESS** on all brazed refrigerant piping connections. This process eliminates oxidation products from inside joint surfaces.

TECHNIQUE:

"Trickle" nitrogen gas at 1-2 psi pressure through the joint area being brazed, to displace the oxygen. When oxygen has been displaced, turn off the nitrogen, and relieve pressure at the joint to atmospheric prior to brazing.

CONSEQUENCES:

Failure to displace oxygen with nitrogen at the brazed joint will result in particulate matter being released into the system. The result is discoloration of refrigerant oil, contamination of the system and possible system failure.

The vapor manifold earth loop terminations and manifold line set connections are done after the liquid connections are brazed. Following the same de-burring and cleaning measures. 1/2" copper couplings may be needed and are field supplied. Be sure a sweeping pinwheel type arch is made to allow for expansion and contraction of the copper tubing. Failure to do so will result in leaks. See **Figure 5**.

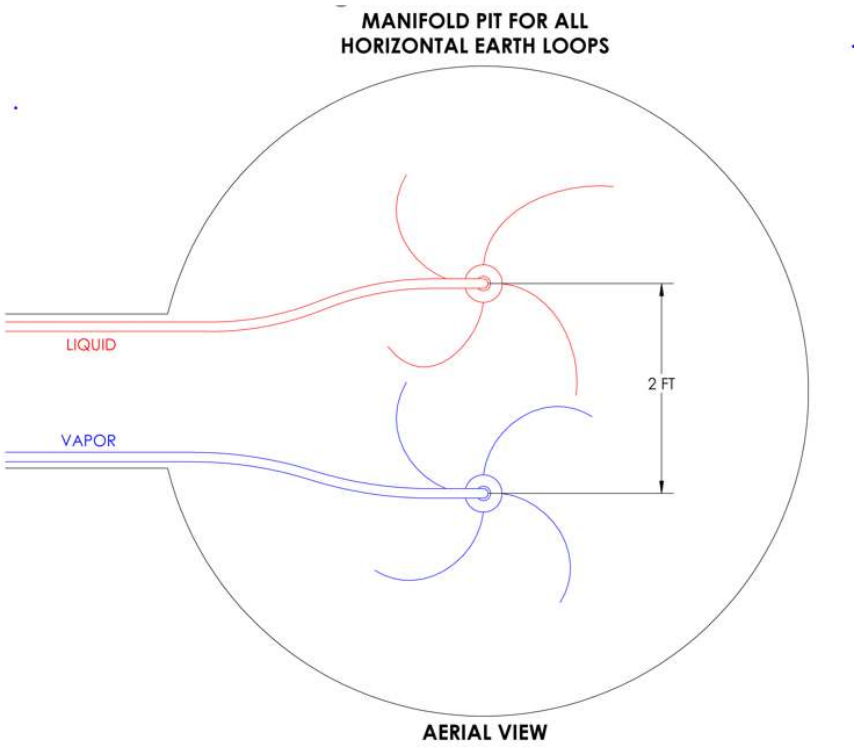


Figure 5

Please note: Any coupling, bushing or reducer to make earth loop to manifolds and line set to manifolds connections are field supplied.

IMPORTANT!

When brazing is completed on all liquid and vapor connections at the manifolds, orient the manifolds and earth loops in the manifold pit and pack with mason sand or pulverized limestone as shown in Figure 6 ensuring that the two manifolds are vertical.

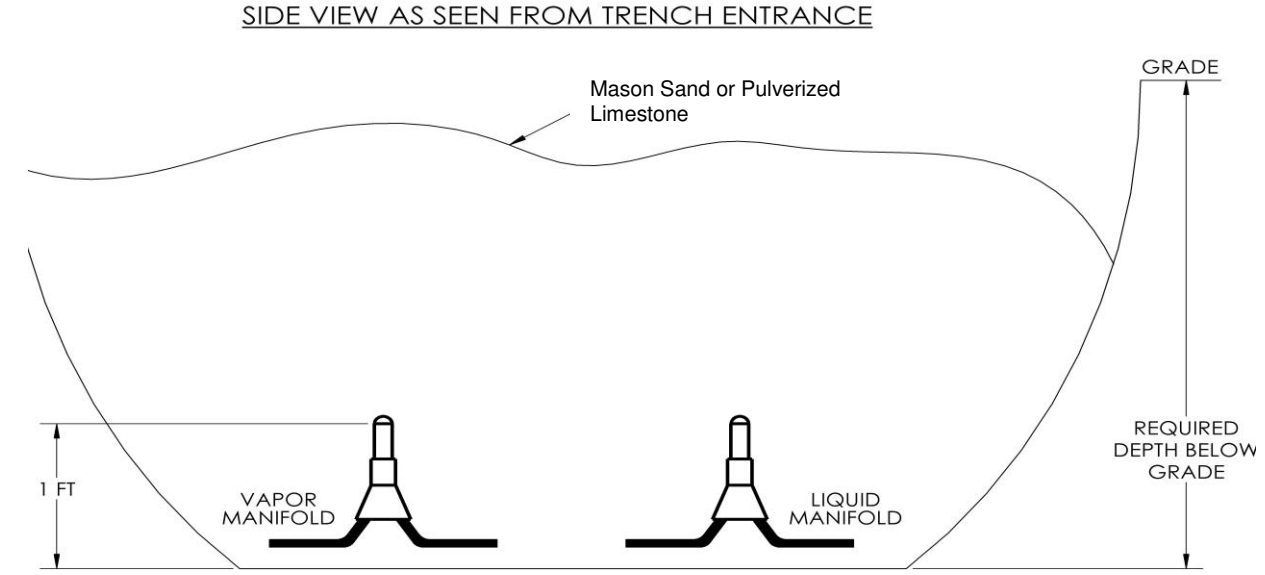
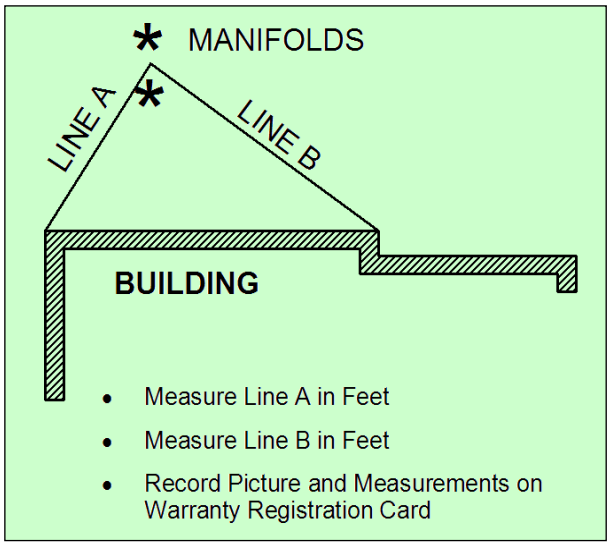


Figure 6



- ❑ Record physical location of Manifolds by triangulation
- ❑ Always measure Lines A & B using permanent structure reference points
- ❑ Record location and submit with startup sheet

Crossover Protection

When H2 earth loops are installed, there will be points where one earth loop crosses over another earth loop.

At each cross over, install polymer tube covers as shown in **Figure 7** on the lower of the two earth loops at the crossover point. Center the crossover protector relative to the upper tube, as shown. This tubing is field supplied and can be purchased at most supply houses and hardware stores. This is the same tubing used on condensate pumps.

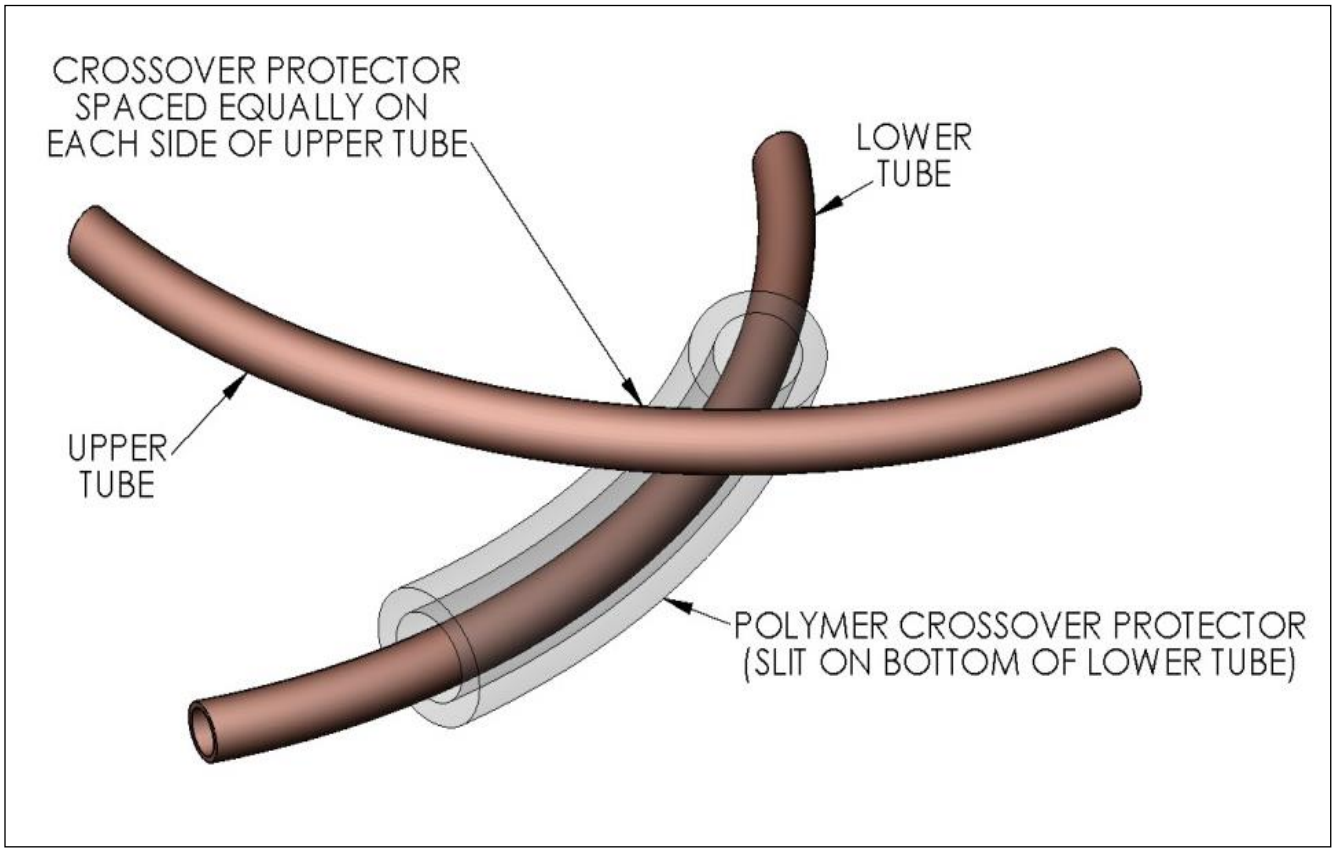


Figure 7

Line Set

IMPORTANT!
WHEN A LINE SET IS RUN ALONG (PARALLEL TO, NOT THROUGH) A FOUNDATION, THE MINIMUM DISTANCE BETWEEN THE LINE SET AND THE FOUNDATION IS 12 FEET.

Manifold/Earth Loop line set sizes are shown the chart below.

R410A EARTHLOOP, AIR HANDLER, CASED COIL LINE SETS		
COMPRESSOR UNIT SIZE	R410A LINE SET O.D., INCHES	
	LIQUID	VAPOR
2.0 Tons (-024)	3/8	3/4
2.5 Tons (-030)	3/8	3/4
3.0 Tons (-036)	3/8	3/4
3.5 Tons (-042)	1/2	7/8
4.0 Tons (-048)	1/2	7/8
4.5 Tons (-054)	1/2	7/8
5.0 Tons (-060)	1/2	7/8
5.5 Tons (-066)	1/2	1-1/8
6.0 Tons (-072)	1/2	1-1/8

Prior to or after brazing the earth loop and line set to the manifolds, the line set should be installed and run to the location of the compressor unit. The methods are shown in **Figure 8**.

- Line set trench should be free of rocks, sharp objects and other foreign debris.
- Tubing bends should have a long radius of at least 12".
- Minimum line set separation is 12".

  (We recommend 24")
- Line set must be insulated when within 12' of the house.
- Insulated the vertical rise. The line set, both liquid and vapor, must be insulated with at least 1/2" wall thickness Armaflex, Insul-Tube or equivalent insulation when within 12 feet. of the building entry. The remaining line set to the manifolds will **NOT** be insulated.

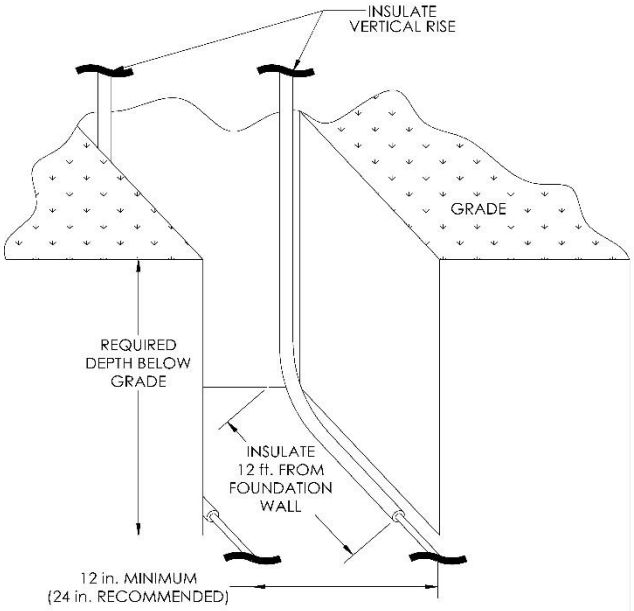


Figure 8

Line Set

If the compressor unit is to be placed outdoors, the line set is brought up through the ground adjacent to the compressor unit backside (nearest the wall), **maintaining separation of the insulated refrigerant lines.**

If the compressor unit is to be placed indoors, the line set must be run through or under an outer wall to the compressor unit location. The following guidelines are to be used in conjunction with **Figure 9** on page 18.

1. Enter the building above grade, if at all possible.
2. Below grade entry is a source for basement wall leakage. Seal with flexible sealant that maintains a tight seal for temperatures from -20°F to +200°F and adheres to all materials involved.

To seal around the outside of the PVC pipe at the building entry shown in **Figure 9** on page 20, any one of the following sealants is recommended:

- Loctite POLYSEAMSEAL Caulk and All Purpose Adhesive Caulk
- DAP DYNAFLEX 230 Premium Interior/Exterior Latex Sealant
- 3M Polyurethane Mason Sealant 525

To foam the insulated line set tubes inside the PVC sleeve, the following airtight and water proof sealant is recommended:

- Dow Insulating Foam Sealant (“Great Stuff”, #7498500154)

IMPORTANT!

It is noted that after the insulated vapor and liquid lines enter the building they must continue to be separated by an air space from the point of building entry to the compressor unit.

After all brazing has been done on the earth loops/manifolds/line set; the line set “compressor unit ends” of the tubes are to be prepared as follows.

Braze a service valve into the vapor line termination and a cap onto the liquid line termination as shown in **Figure 12** on page 20.

Line Set

Penetration above Ground

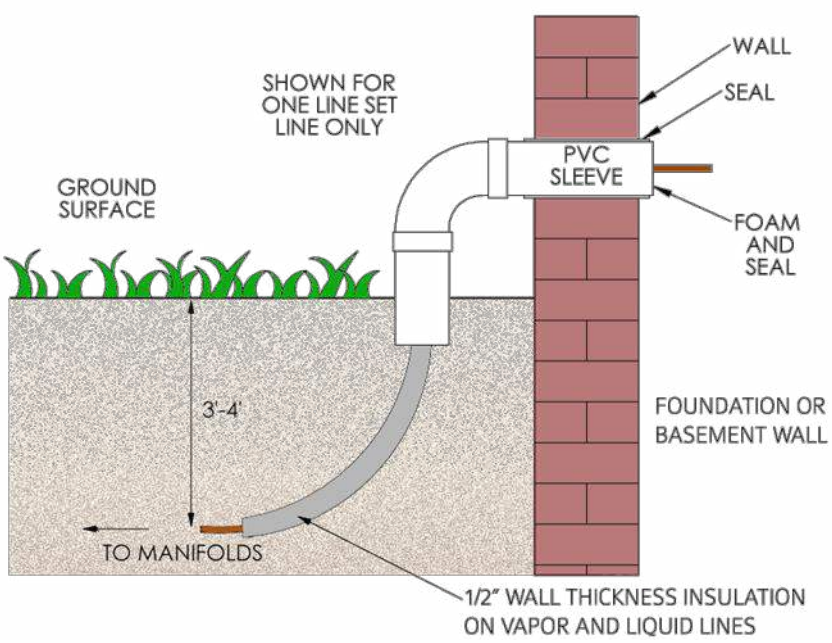


Figure 9A

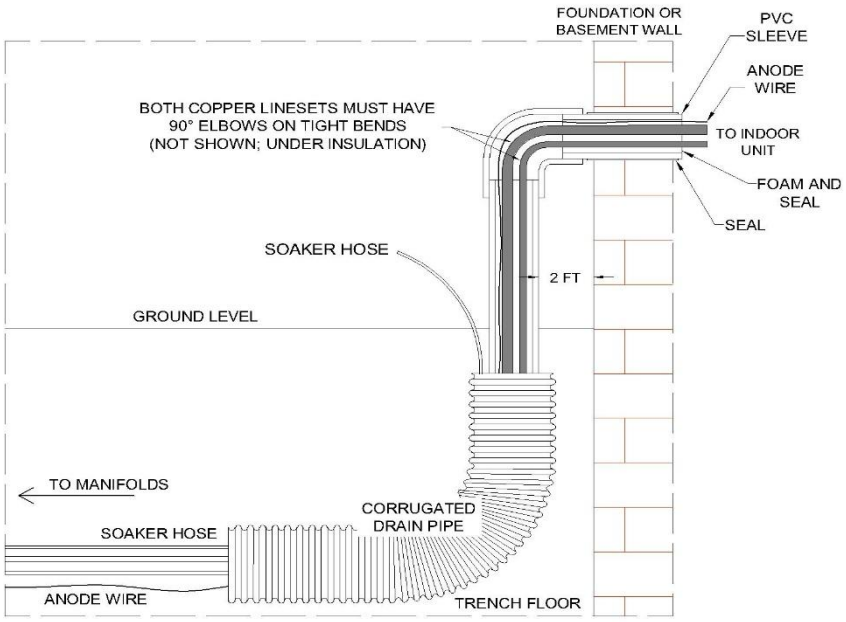


Figure 9B

Note: Corrugated drain pipe can be used as an option for extra protection of the line set if needed for protection against rocks or rocky soil. It should also be used under driveways or slabs to ease removal and/or replacement of line sets if needed without cutting or busting up concrete. Figure 9B on this page and figures 10 and 11 ahead show the optional corrugated drain pipe.

Line Set

Penetration From Below Ground through Floor Joist

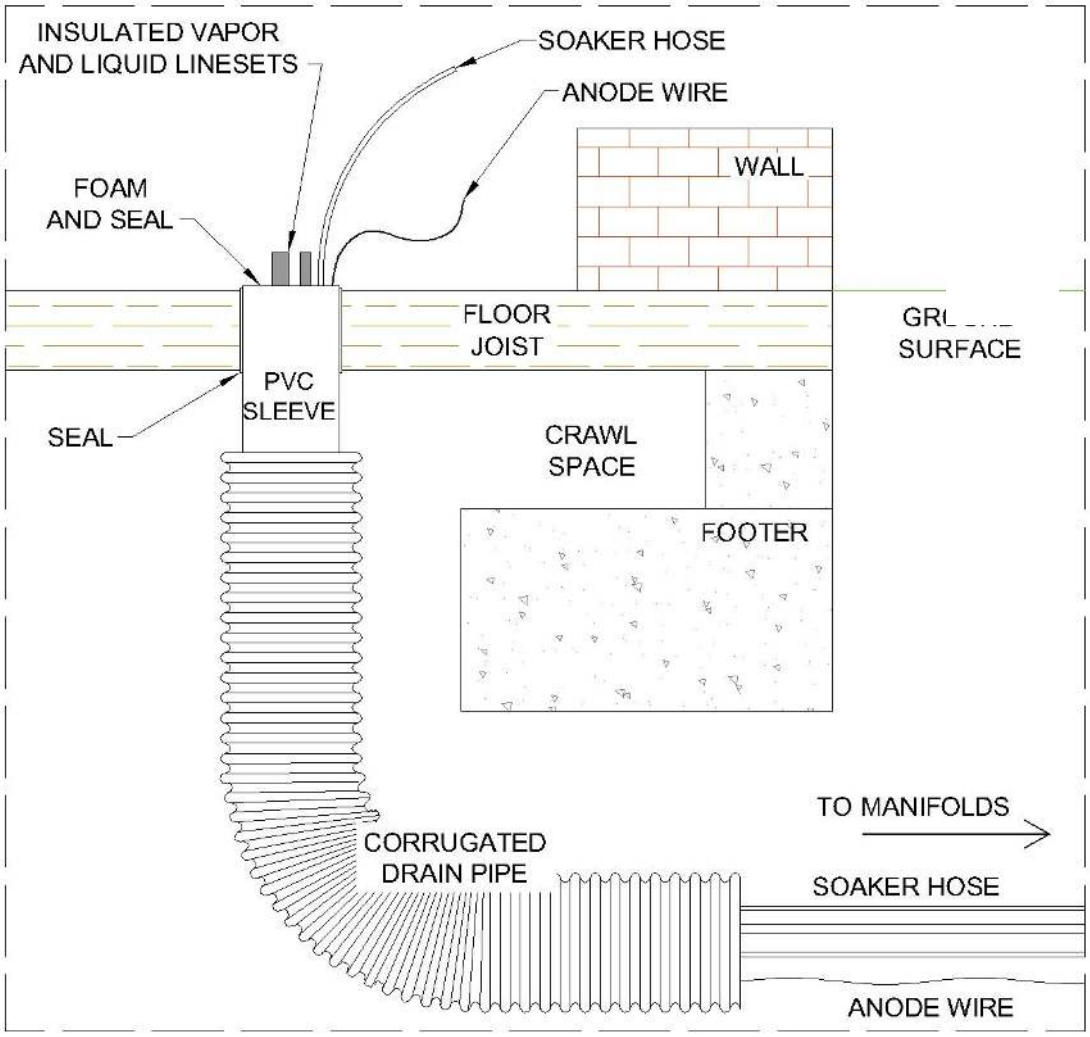


Figure 10

Line Set

Penetration From Below Ground through Slab

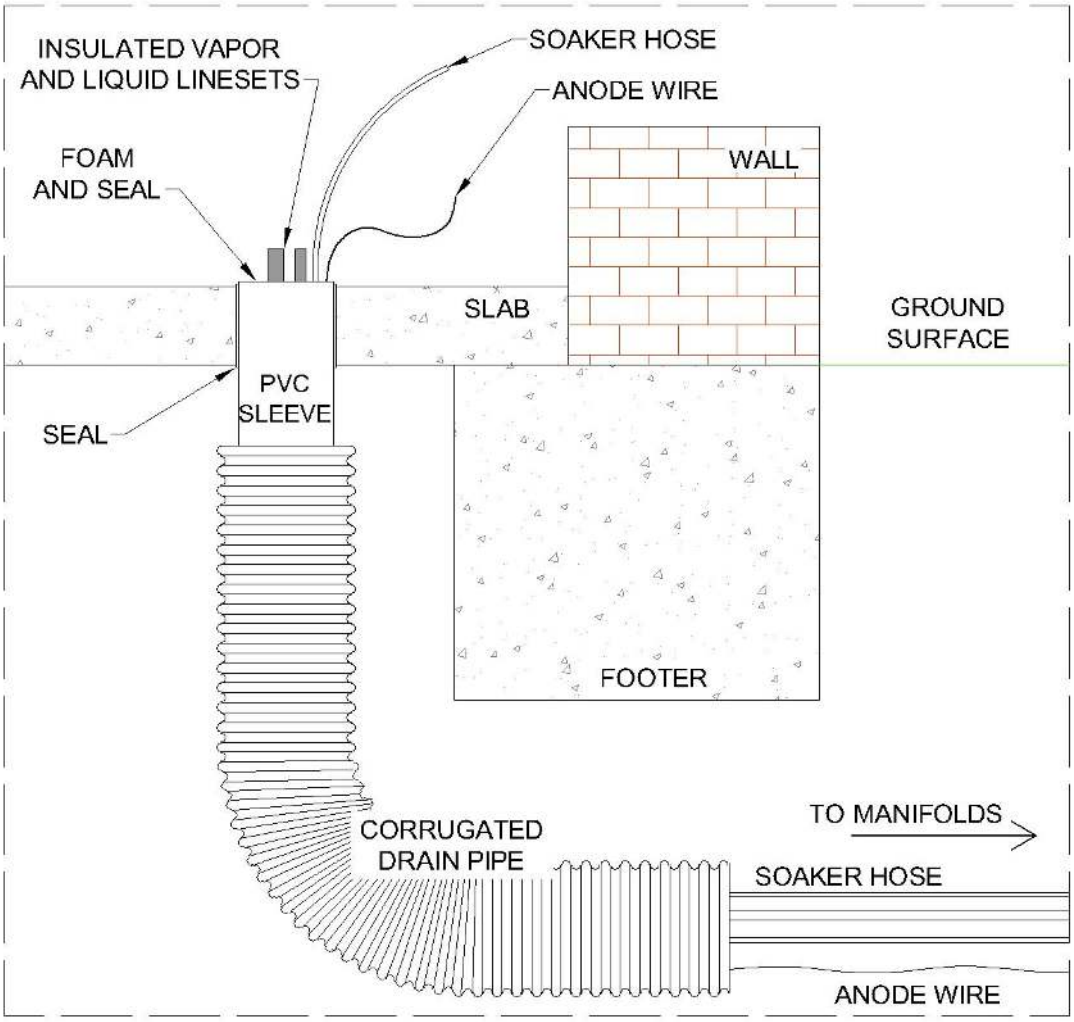


Figure 11

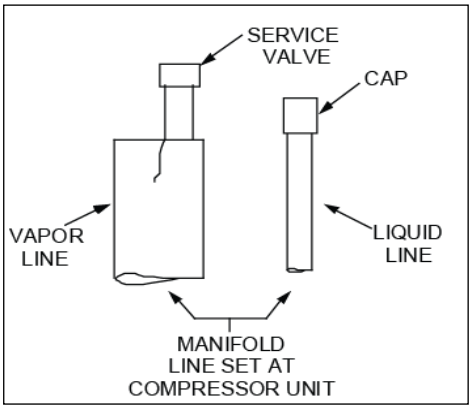


Figure 12

Seal Test

WARNING!

To avoid personal injury and equipment damage, follow all safety procedures set forth by OSHA, in the handling of high pressure gases. Always use a pressure regulator and hoses that are capable of withstanding the pressures prescribed herein. Do not subject system components OTHER than the earth loop/manifold/line set configuration to 400 PSIG nitrogen.

After brazing the earth loop system joints as noted above (includes manifolds, earth loops and earth loop line set, but NOT the compressor unit or any other HVAC refrigeration system component), the complete underground system is to be seal tested with 400 PSIG nitrogen. After connecting a high pressure hose from the regulator on the nitrogen tank to the service valve on the vapor line of the line set, slowly increase the nitrogen pressure to 400 PSIG, checking for any obvious leaks audibly.

If no audible leaks are detected, check all joints to ensure they are sealed, by one of the following methods:

1. Ultrasonic Leak Detector or Bubble Solution Leak Detector
2. Electronic Leak Detector (requires a trace amount of refrigerant in the system)

IMPORTANT – LOOP READINESS

Check for leaks by either of these methods or any other reliable method to ensure that there are no leaks and the earth loop system is sealed! It is absolutely necessary that the earth loop/manifold/line set assembly be completely sealed at 400 psig nitrogen. Recheck all leak detector readings.

When the Earth Loop System (earth loops, manifolds and line set assembly) has been successfully seal tested, **leave 400 psig nitrogen with pressure gauge on the service valve.** This indicates the Earth Loop System has been installed; seal checked and is ready for the compressor unit connection.

When the line set/manifolds/earth loops are deemed leak free and sealed, **valve off the nitrogen source and monitor the pressure on the underground system to ensure that 400psig has been maintained for minimum of 8 hours.**..

Monitor the pressure reading during the backfilling operation to ensure that the earth loop system remains sealed.

Important: Final Whole System Seal Test.

After having tested the field at 400 P.S.I. as stated above, once the remaining equipment such as the compressor unit, air handler or cased coil, ETC, the entire system should be pressurize to 150 P.S.I. and left to stand for a min. of 8 hours for a total system seal test.

Soaker Hoses

For excavated installations, a soaker hose is installed in the trench with the copper earth loop system. This soaker line is use to assure compaction of the earth around the loops after back filling.

The soaker hose is installed after as shown in **Figure 13** for excavated installation. Please refer to the field templates, pages 23 through 26 for each individual field size.

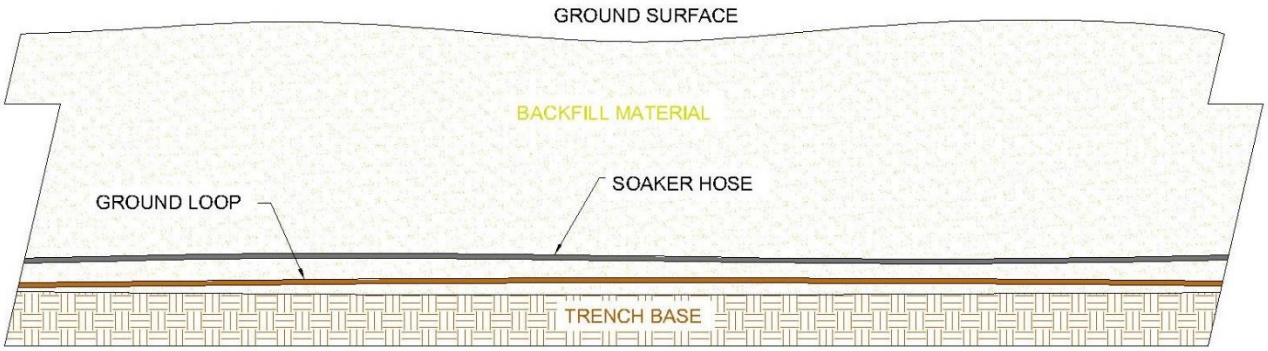


Figure 13

Backfilling

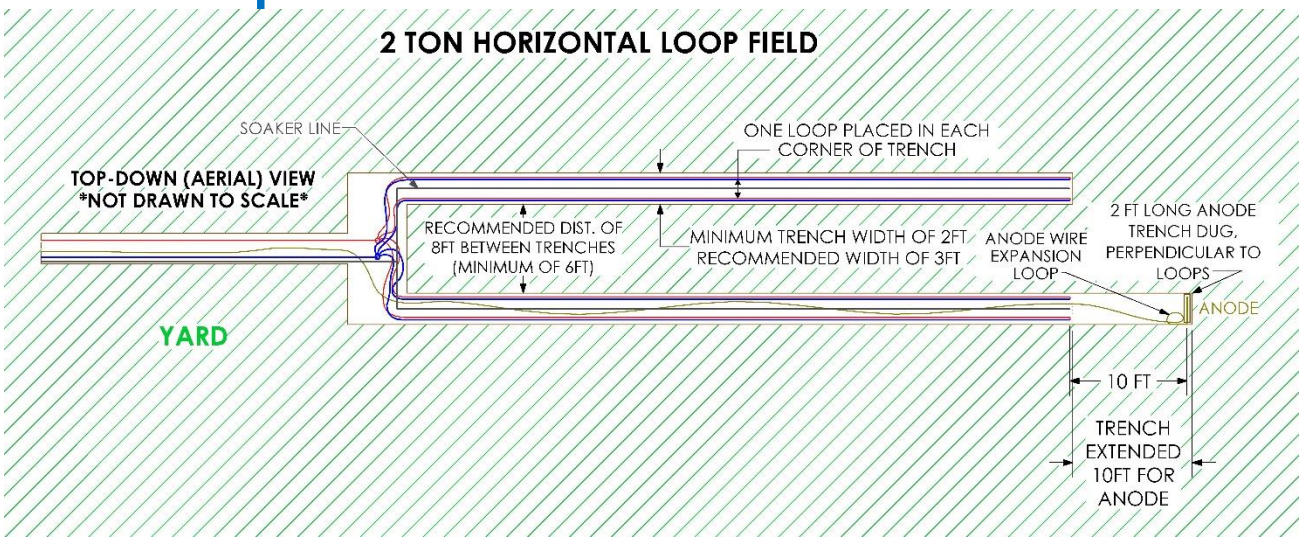
Carefully pack mason sand or pulverized limestone around the manifolds to ensure that the manifolds are firmly set in a vertical orientation. Ensure that enough sand or pulverized limestone is packed around the manifold set that backfilling will not move them from the vertical position.

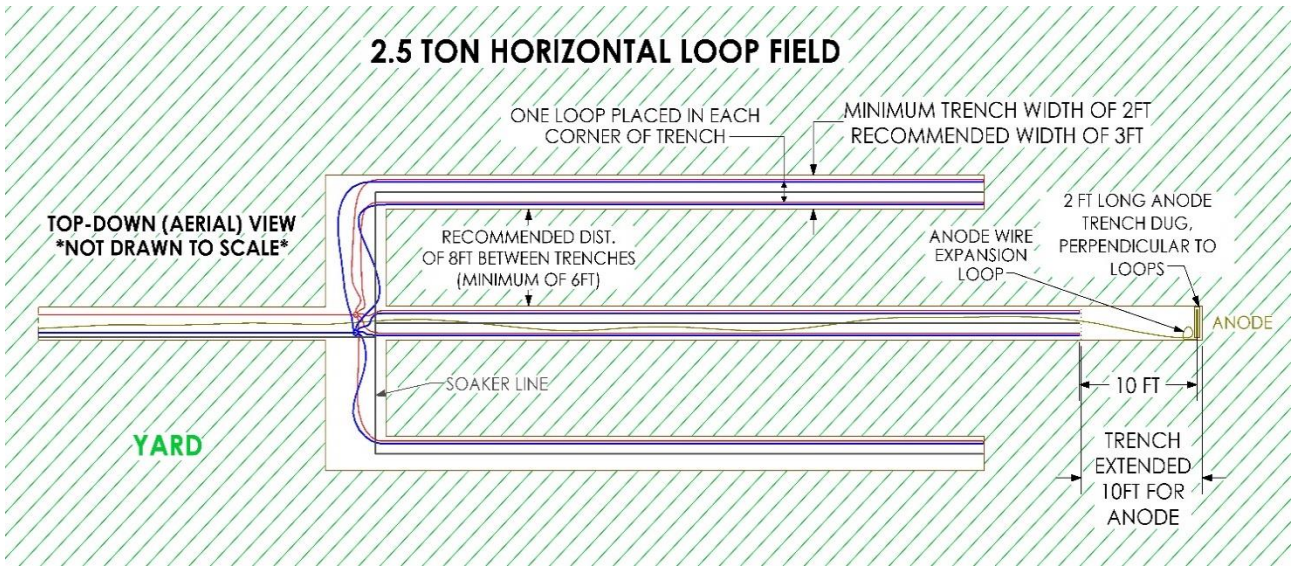
Before back filling, flood the trenches with water. Backfill the trenches with excavated fill if there are no rocks or sharp objects. If the backfill has rocks and/or sharp objects, fill the line set and loop trenches with 2" of mason sand or pulverized limestone under and over the line set and loops, then carefully backfill the excavated trench.

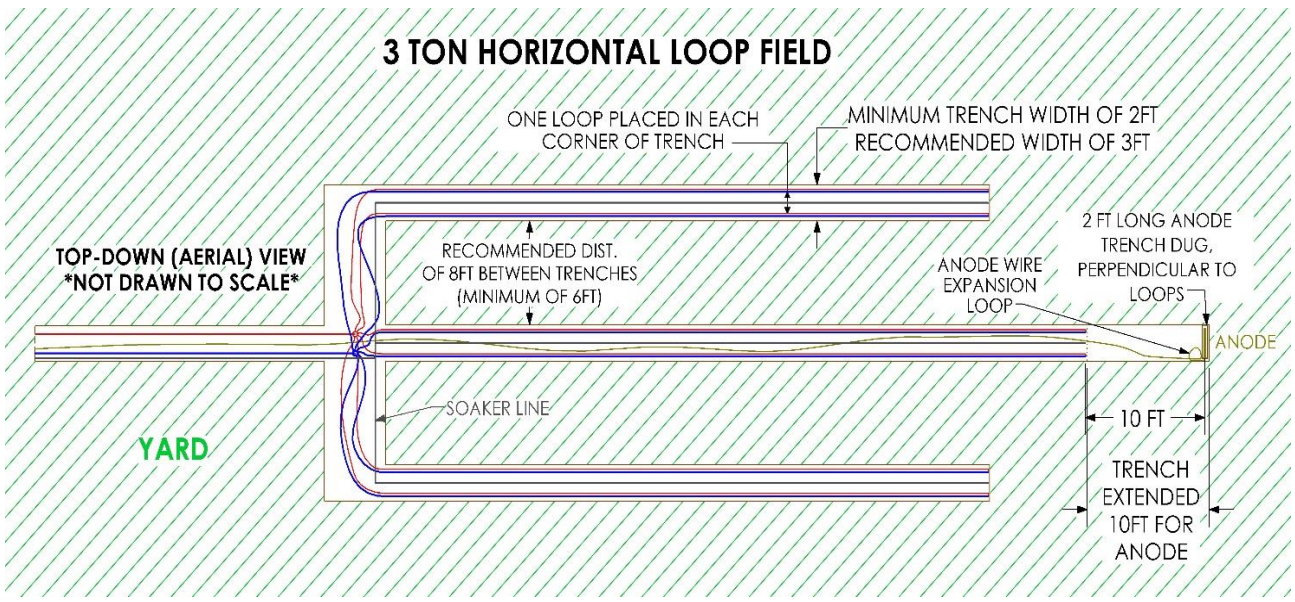
Please Note: The line set needs to be as straight as possible. Dips in the line set could create an unwanted oil trap starving the compressor for oil.

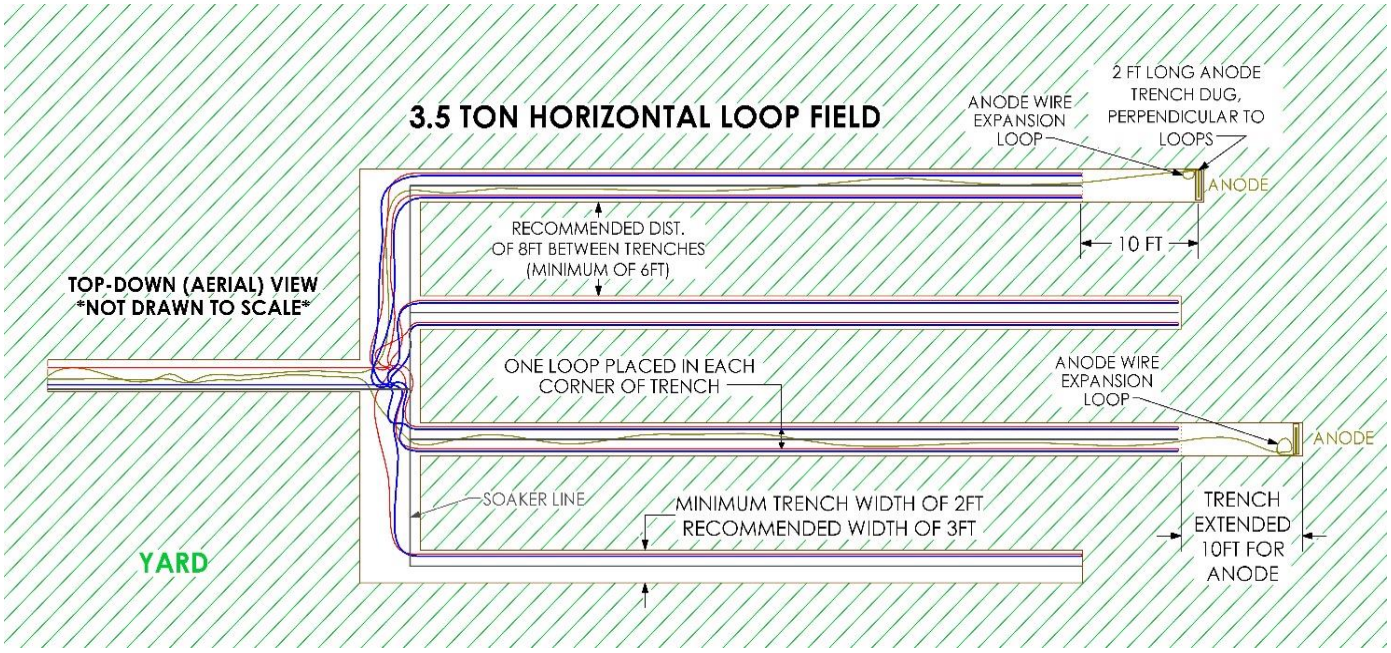
Please call Total Green Mfg. at 419-678-2032 with any questions regarding these procedures.

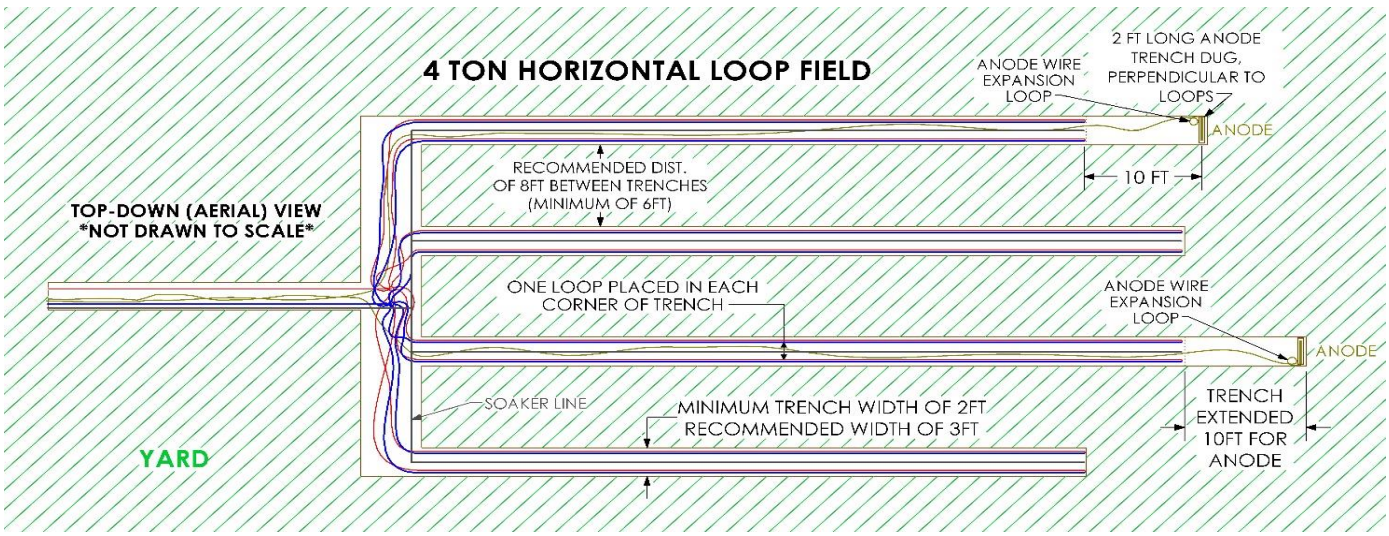
Field Templates








3.5 TON HORIZONTAL LOOP FIELD
ANODE WIRE EXPANSION LOOP
2 FT LONG ANODE TRENCH DUG, PERPENDICULAR TO LOOPS
ANODE
10 FT
RECOMMENDED DIST. OF 8FT BETWEEN TRENCHES (MINIMUM OF 6FT)
TOP-DOWN (AERIAL) VIEW *NOT DRAWN TO SCALE*
ONE LOOP PLACED IN EACH CORNER OF TRENCH
ANODE WIRE EXPANSION LOOP
ANODE
SOAKER LINE
MINIMUM TRENCH WIDTH OF 2FT
RECOMMENDED WIDTH OF 3FT
TRENCH EXTENDED 10FT FOR ANODE
YARD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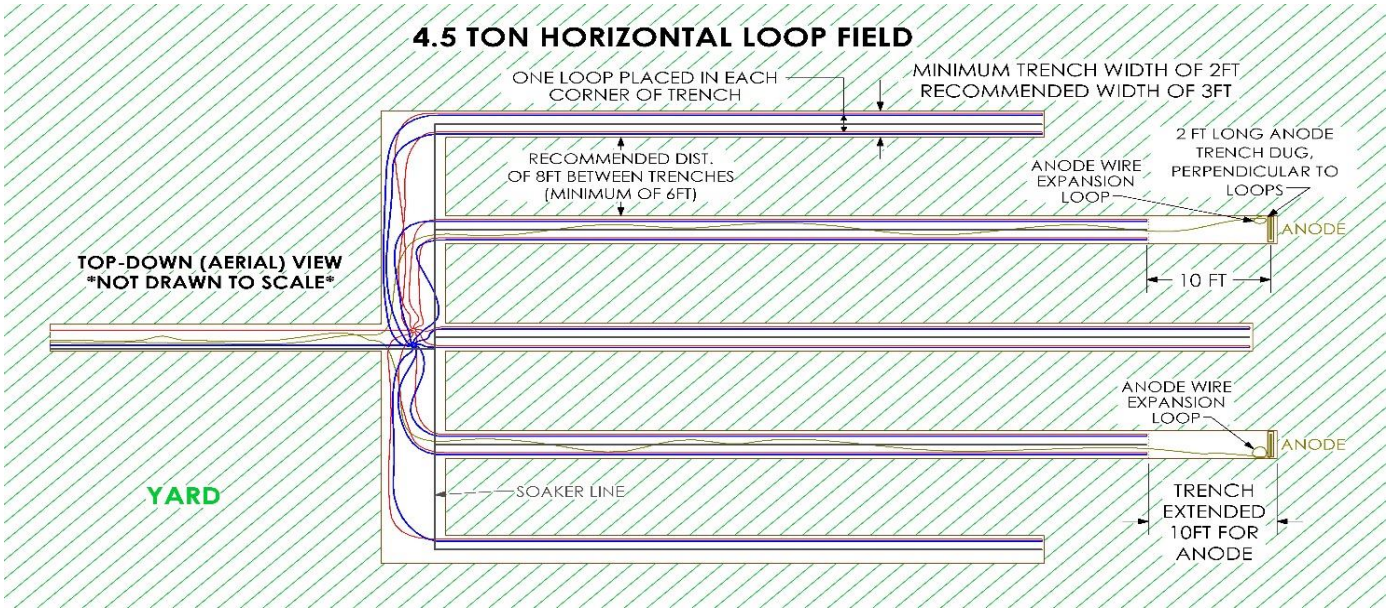
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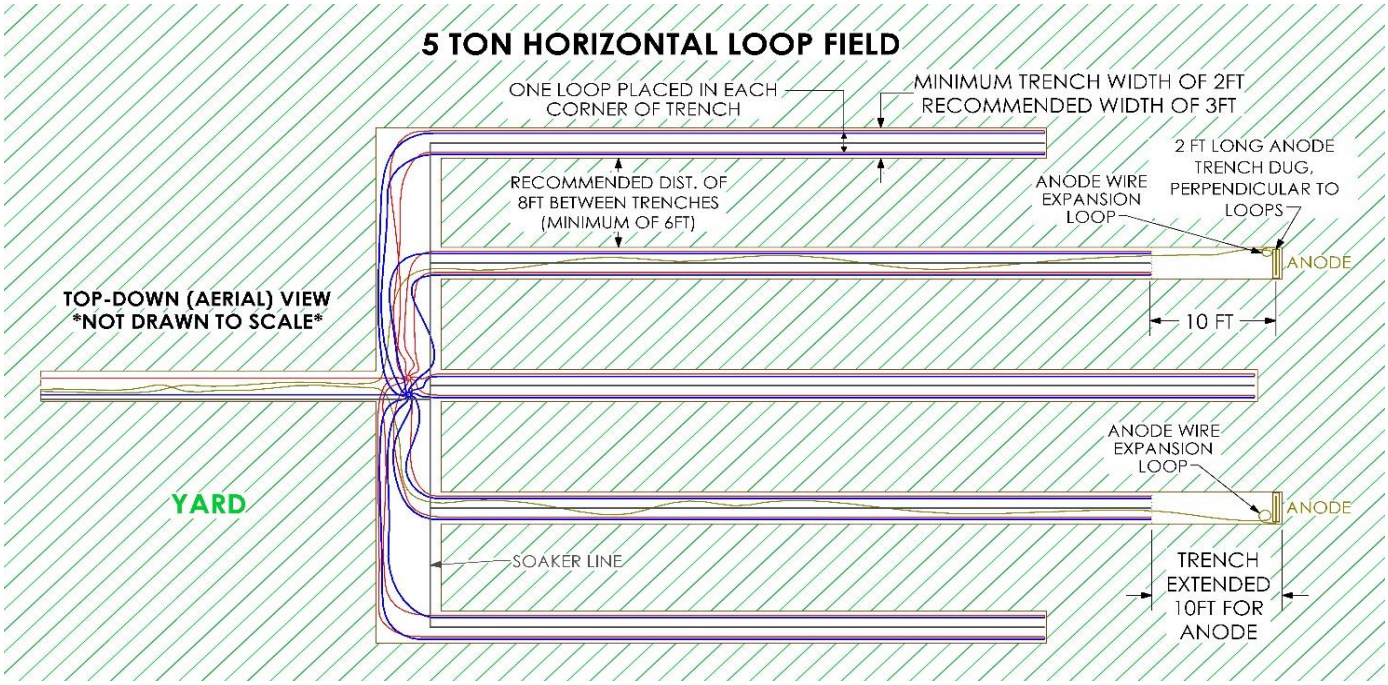
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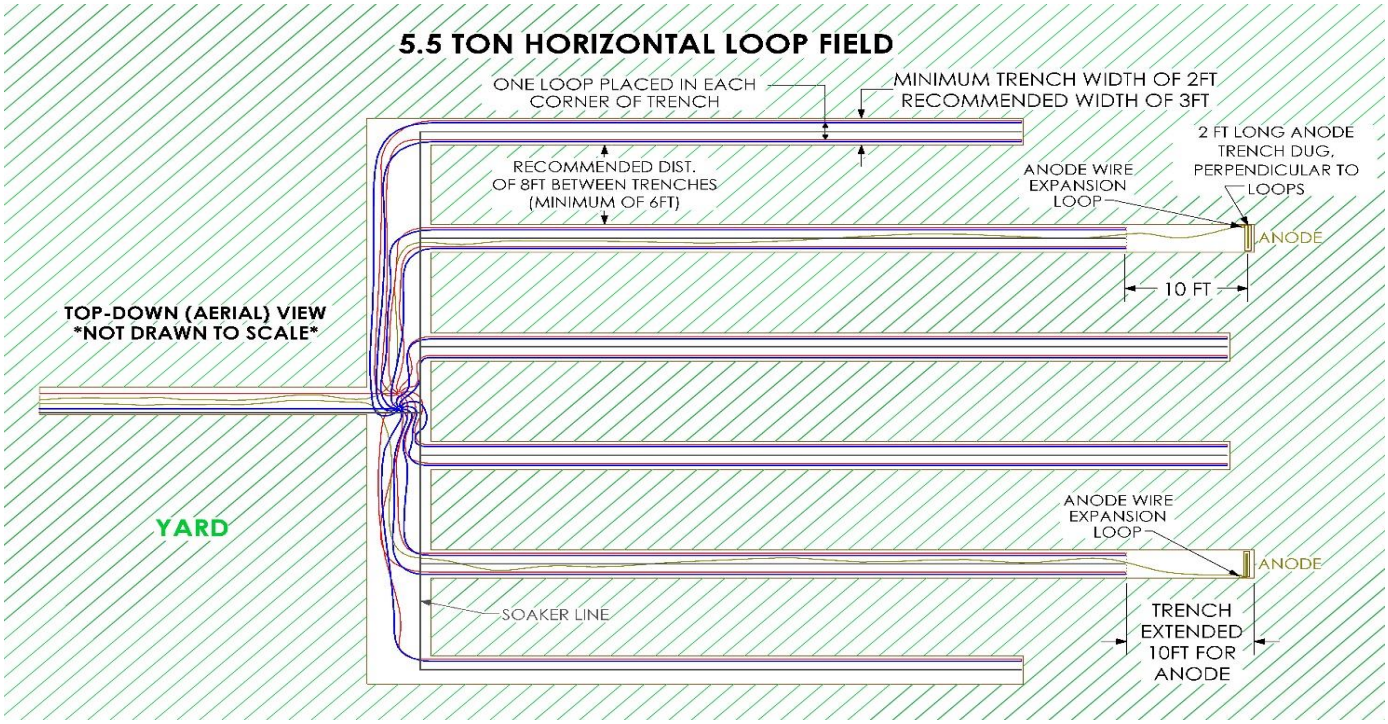
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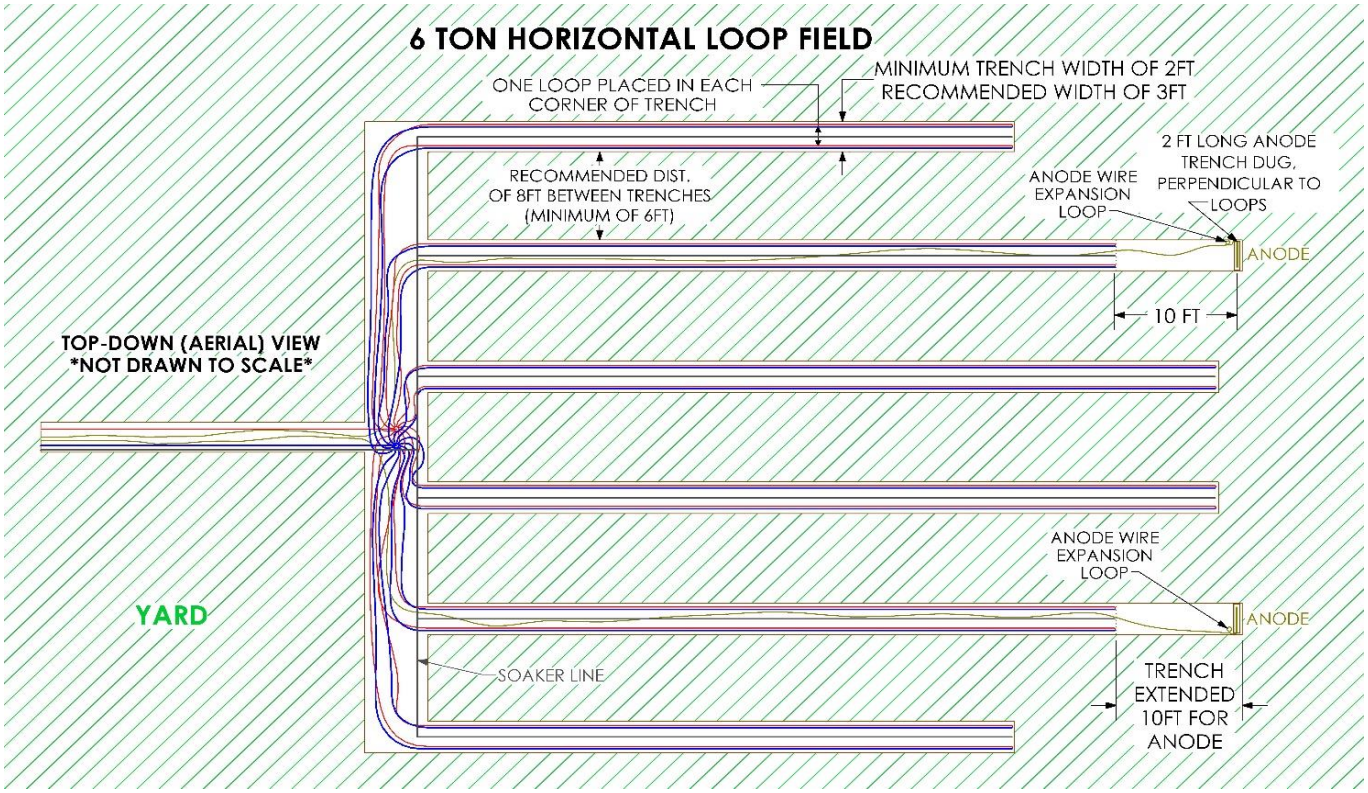
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Horizontal Boring Option

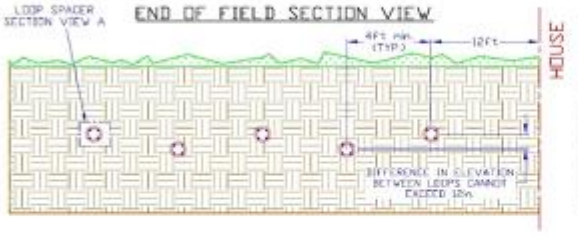
Please contact Total Green Mfg. at 419-678-2032 to discuss horizontal boring proceedures and options.

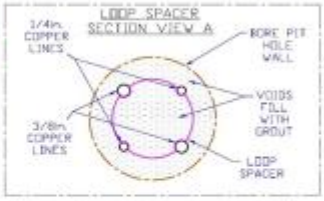
H2 Directional Bore

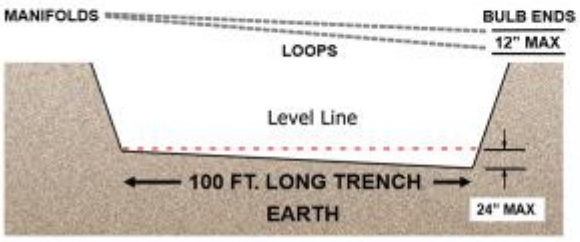
- H2 Loop
- **1/4" & 3/8" Copper, 100ft long loops, bulb ends, 2 loops per Ton**
- Directional Bore - Start at 5' min depth, bore to 10' (maintaining a depth of 10') assuring no more then 1' of variation between boreholes
- 4' min between bores
- 12' min distance away from foundation wall
- Install 2 loops per bore hole with PVC spacer between loops

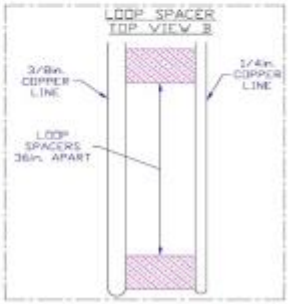
- All bore holes must be grouted
- Contact Total Green Mfg'sTechnical Support with additional questions

H2 Directional Bore Guide Lines









R−410A QUICK REFERENCE GUIDE

• R−410A refrigerant operates at 50% − 70% higher pressures than R−22. Be sure that servicing equipment and replacement components are designed to operate with R−410A.

• R−410A systems should be charged with liquid refrigerant only.

• R−410A is only compatible with POE oil. The oil used in a Waterless® Geothermal system is **Copeland Ultra 32-3 MAF**. Using any other brand or type will void the manufacture's equipment warranty.

• POE oils absorb moisture rapidly. Do not expose oil to atmosphere. Always flow nitrogen anytime a system is open to prevent atmosphere from entering any part of the system.

• Vacuum pumps will not remove moisture from oil.

• Never open system to atmosphere while it is under a vacuum.

• A liquid line filter drier is required on every unit.

• Wrap all filter driers and service valves with wet cloth when brazing.

• When system must be opened for service, break vacuum with dry nitrogen and replace all filter driers.

• Wrap all filter driers and service valves with wet cloth when brazing.

• Do not vent R−410A into the atmosphere.

Please call Total Green Mfg. at 419-678-2032 with any questions regarding these procedures.