

# Floor Type Installations

*Insulation Considerations*  
*Floor Types*  
*Guidelines*  
*Tubing Layouts*

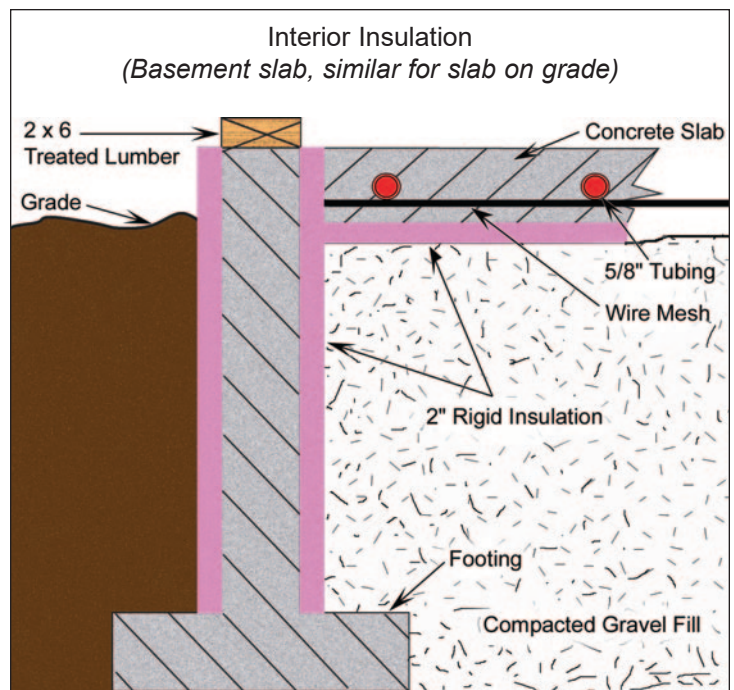
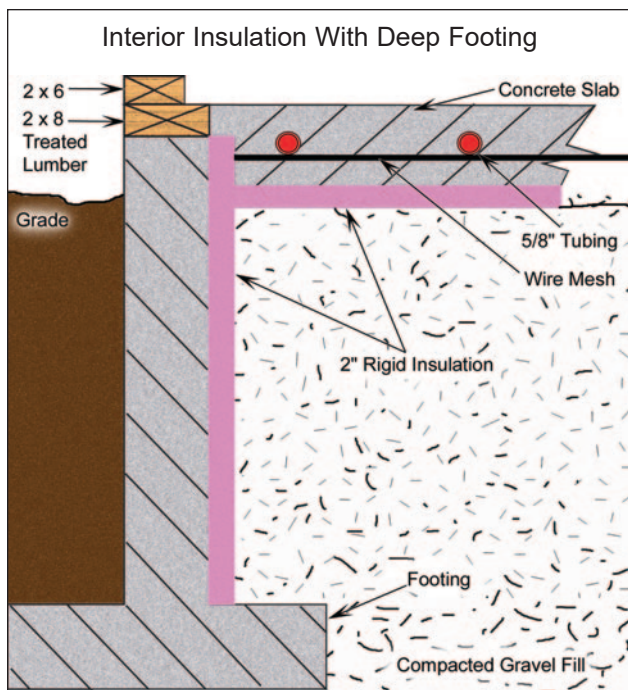
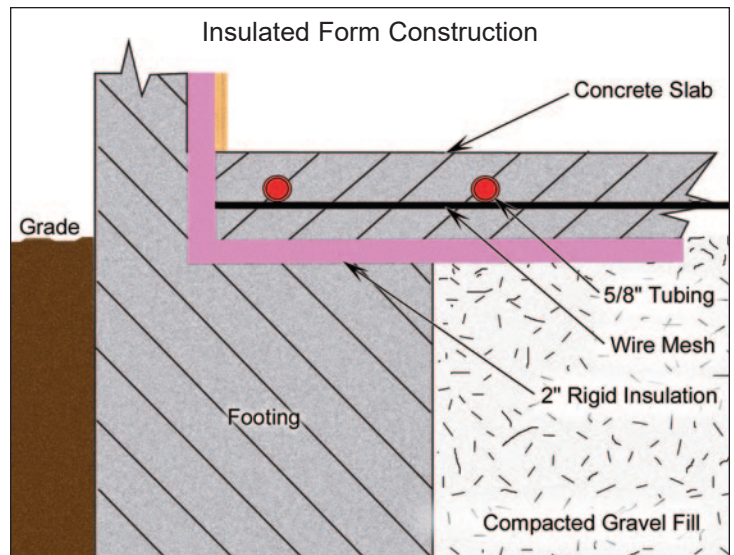
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HYDRONIC RADIANT FLOOR HEATING

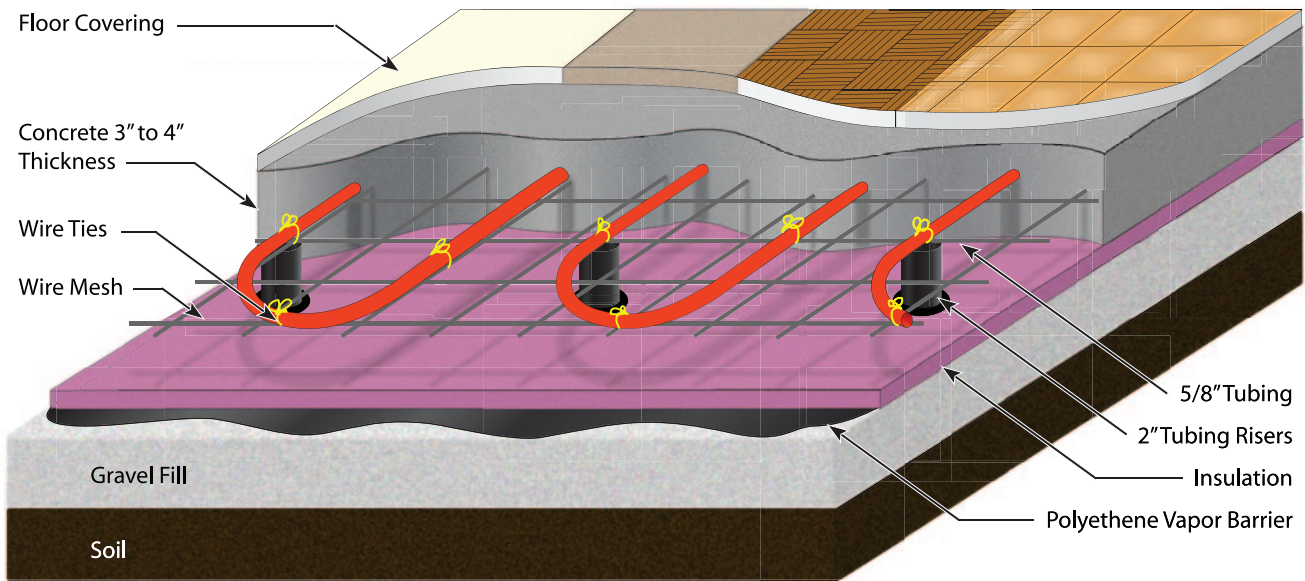
## Insulation Considerations

A well insulated building will magnify the efficiency and comfort of Radiant Floors. Important areas to consider are the sidewalls and perimeter. Ceiling insulation levels recommended are R 28 to R 40, sidewall insulation recommended 6" batts or R 19 and up. Perimeter insulation recommended; 2" rigid styrofoam installed as shown below. All other insulation installed using conventional methods.



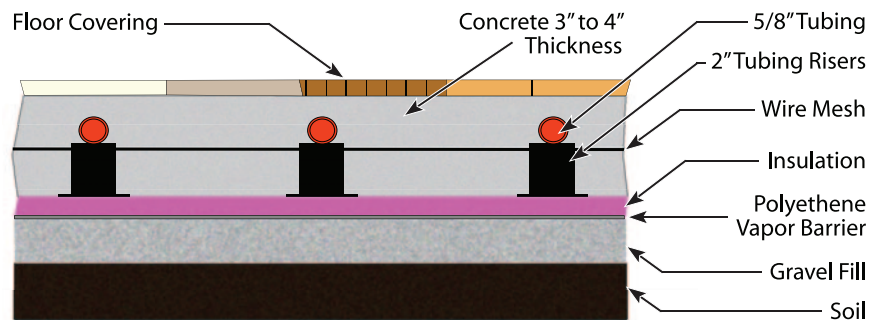
## Ground Slab Residential Construction

This type of installation is best suited for slab buildings such as ranch homes, condominiums, nursing homes, factories and shopping centers. Other structures with high ceilings such as churches, auditoriums and aircraft hangers are also ideally suited.



### The recommended installation procedure:

- Install perimeter insulation.
- Place gravel on top of soil.
- Place insulation on top of gravel.
- Place flat mesh.
- Layout tubing according to design.
- Tie tubing to mesh with cable ties.
- Place Mesh Risers (WFM-5220-C) two feet apart under wire mesh (recommended).
- Terminate tubing in PVC Elbow Tube Holder (WFM-9023) where ever tubing exits the concrete.
- Pouring 4" of concrete over mesh and tubing is recommended.  
(Observe structural and code requirement for slab thickness.)



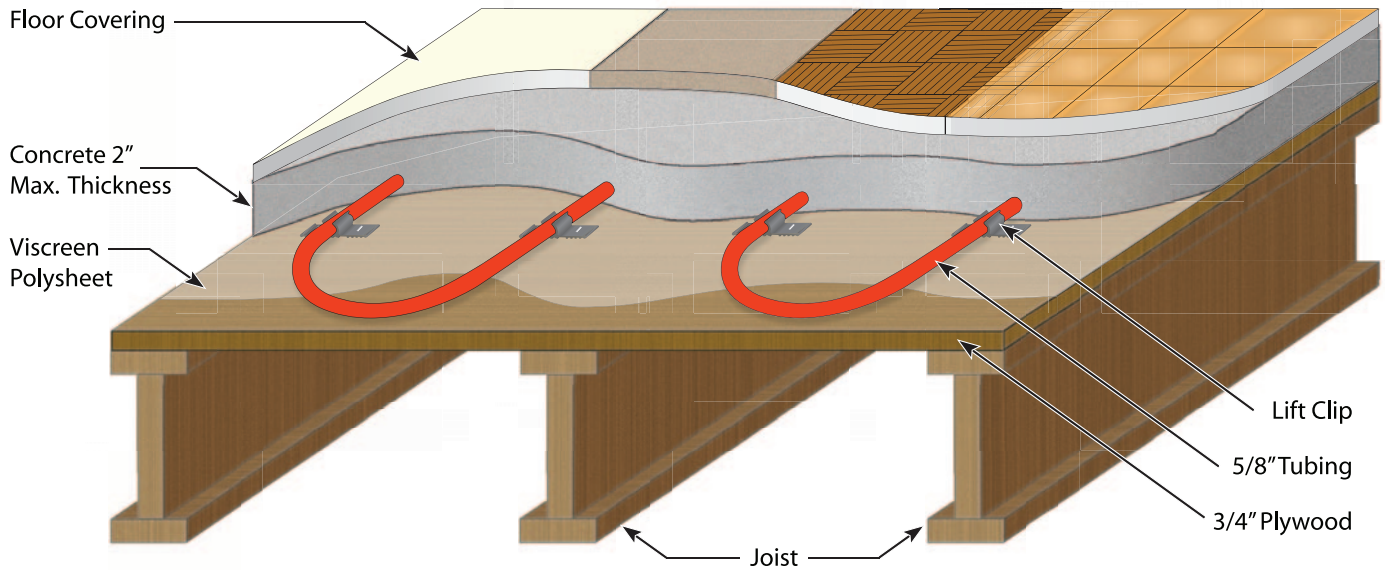
After insulation has been installed, backfill, grade and compact as per job specifications. Pay close attention to grade as incorrect (shallow) concrete depth may cause tubing to be misplaced within the concrete slab. After grade has been re-checked for correct depth, deploy any optional underslab insulation and lay optional 6 mil polyethylene vapor barrier as per plan. Place wire mesh over entire floor area.

The polybutylene heat tubing is fastened to steel reinforcing mesh with cable ties. Standard pea-gravel aggregate concrete and troweling methods are used. No tubes should be spliced within the concrete where they are not accessible. Tubing should be brought out in protected areas with Elbow Tube Holders.

(closes cell polybutylene recommended where tubing is terminated from the concrete.  
See page 2-12).



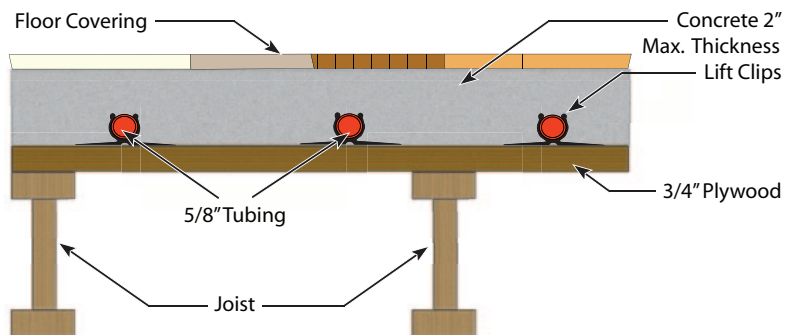
## Suspended Light Weight Concrete



With suspended floor installations, door frames and windows must be raised to accommodate the additional subflooring material. In addition, the bearing loads must be accommodated for.

### For applications on wood subfloors

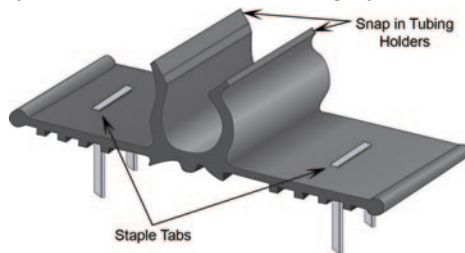
- Sweep (vacuum if possible) floor surface.
- Snap chalk lines as per tubing layout..
- Place Lift Clip on center of chalk line, in the direction of the tubing layout and staple both tabs using the WFR-1500 air staple gun.
- Snap tubing in place to fit pattern of tubing layout.
- Pour Gyp-crete or light weight concrete over tubing.
- Any floor covering can be used as desired, however, the best performance can be achieved with concrete tile, vinyl, and carpet respectively.



Type of Material	Weight at 2" per sq. ft.	Specific Heat Btu / (lb • °F) at 85°
Concrete	25 lbs.	.200
Lightweight concrete	19 lbs.	
Gyp-Crete	17 lbs.	.223 4.75

## Lift Clips

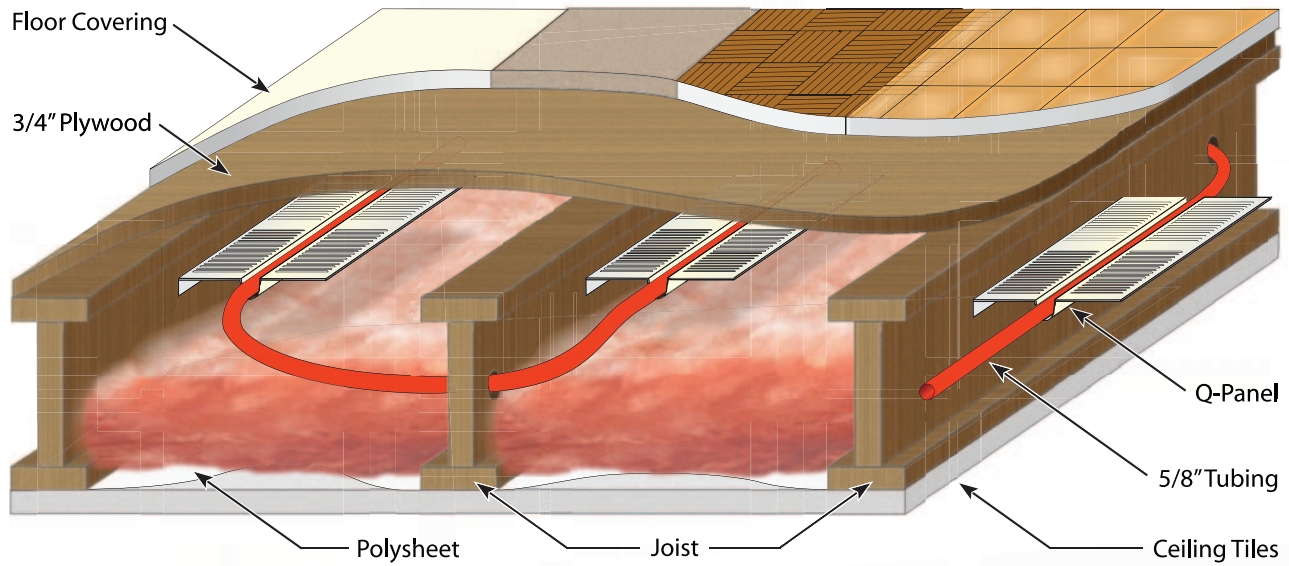
*The WarmmFloors Lift Clip is designed for 5/8" OD tubing in poured floor radiant heating systems.*



5/8" Tubing installed on top of plywood floor.



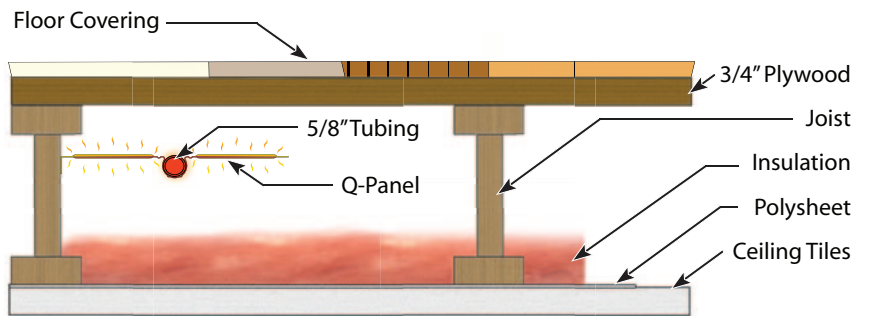
## Suspended Convection with Q-Panels



Any floor covering can be used as desired, however, the best performance can be achieved with vinyl, tile, parquet and carpet respectively.

### The recommended installation procedure:

- Determine the number of Q-Panels used by the heat loss calculation.
- Snap chalk line approx 1/3 down from floor allowing space between the Q-Panels and the insulation.
- Drill holes on end through joists.
- Attach end of tube to supply Manifold and secure with a tube clamp. Proceed on looping all tubing into each section and terminate through a Staple Tube Clamp (WFM-5050-C) and attach to return Manifold.
- Snap panel clips on Q-Panels.
- Staple Q-Panels to joists with air staple gun. Q-Panel spacing is determined by the heat loss calculation.
- Snap tubing into the Q-Panel.



## Recommended Tools



**Staple Gun**  
 BOSTITCH - Model: SX-150  
 Weight 2.5 lbs, 1.13 kilos  
 Driving Power 170  
 Magazine Capacity 135 to 185



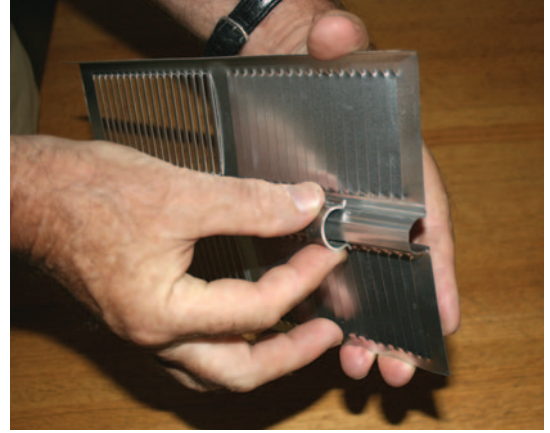
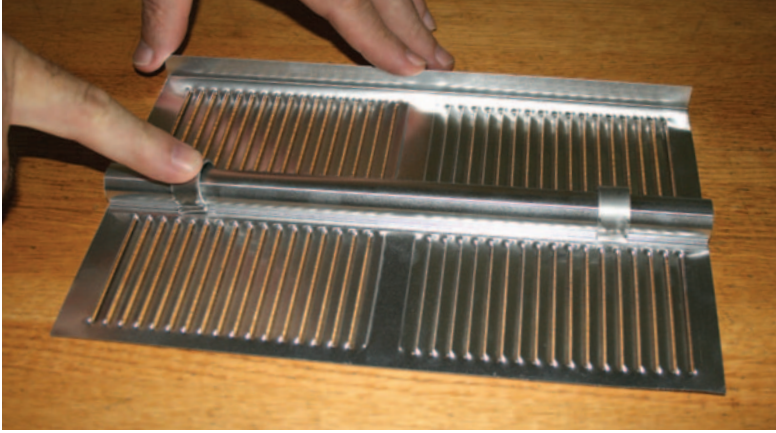
**Staples**  
 5/8" Length - 1/4" Crown Galv.  
 Qty 1200 per box



**Balloon Air Compressor**  
 Power 1/4 H/P  
 120 V

Use a air compressor with a minimum supply pressure of 100 psi

## Q-Panel Installation Procedure



Push Panel Clip to snap on the Q-Panel or squeeze the Q-Panel to slide on.  
Or lay Q-Panel on flat surface and push clip into position



The Q-Panel is installed with a staple gun  
3 inches below the floor on the joists.



Snap tubing into the Q-Panels



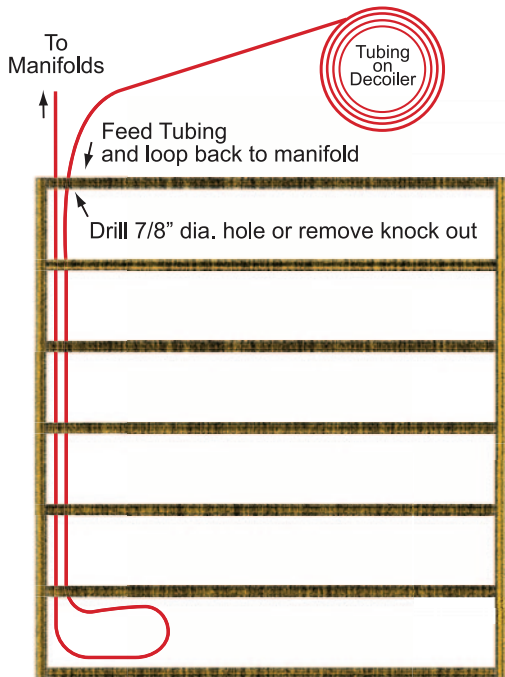
The Q-Panel spacing is determined by  
the heat loss calculation.

*This installation offers a great amount  
of flexibility to route the tubing  
around other trades.*

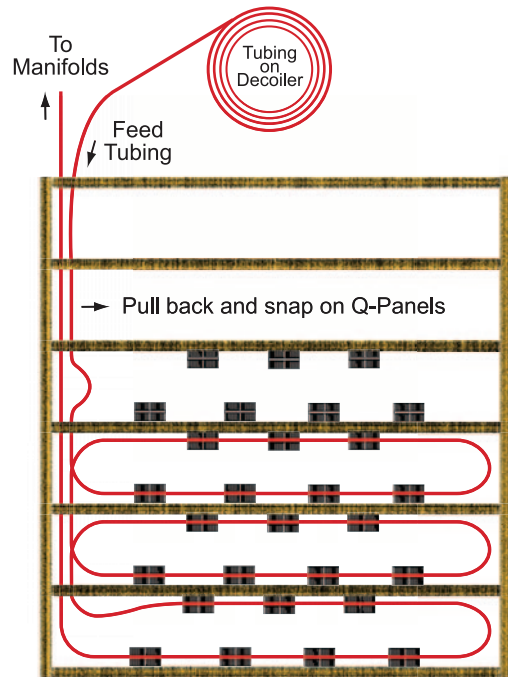
*The ceiling may be insulated and  
finished with ceiling tile.*



# Tubing Considerations

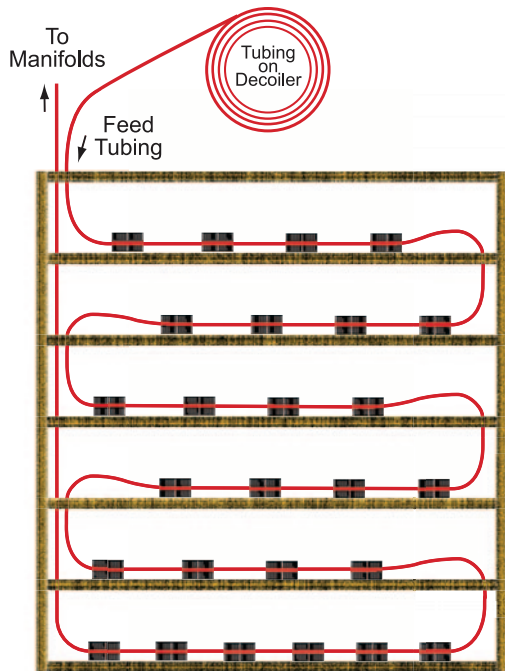


Step 1 - Drill 7/8" dia. hole  
Step 2 - Feed tubing and loop back to manifold

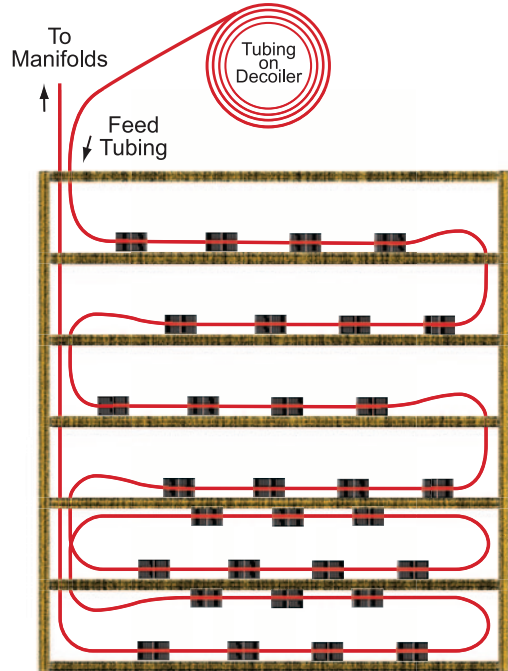


Step 3 - Staple Q-Panels to joists  
Step 4 - Feed tubing and snap into Q-Panels

*Two lines of tubing per joist.  
Most amount of tubing needed.*



*One line of tubing per joist.  
Most amount of tubing needed.*



*One line of tubing per joist or two lines of  
tubing per joist, only outside joists.*

**Note:** More Q-Panels may be applied in areas where the rooms need to be warmer (Bathrooms) and less Q-Panels may be applied in areas where lower relative temperatures are desired (bedrooms).

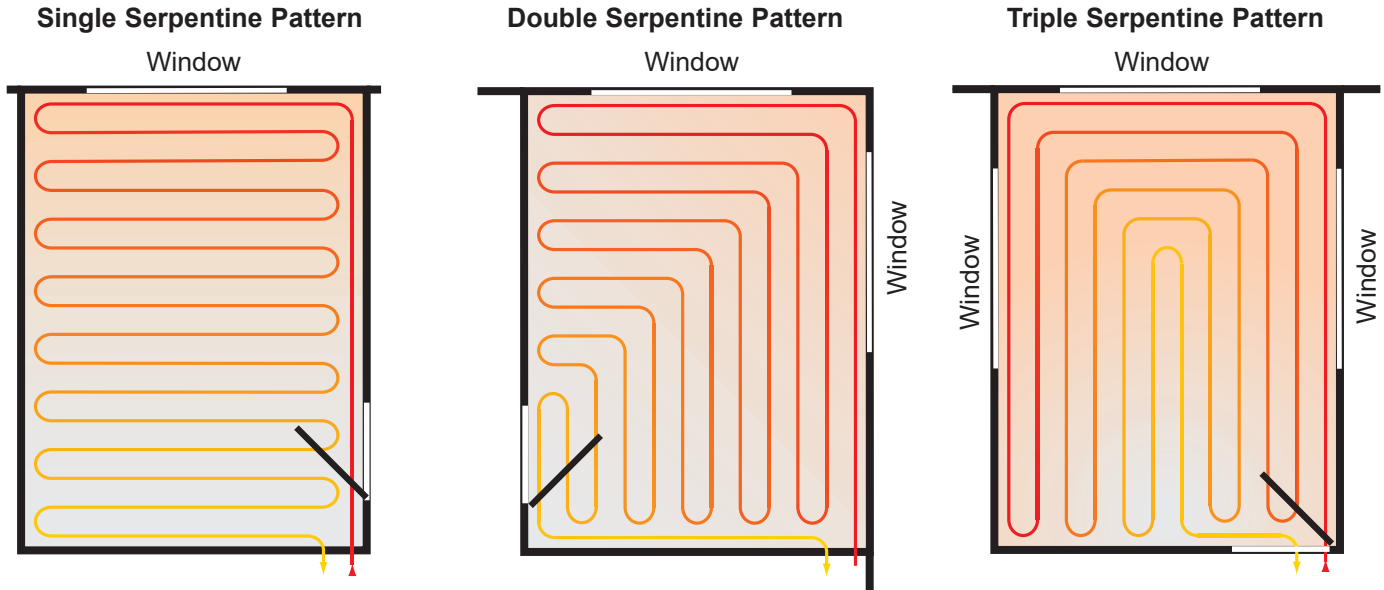
Keep the Tubing installation to a minimum of reverse turns  
(This will provide a higher flow velocity for better heat delivery).



## Tubing Layout and Flow Direction

Proper tubing layout will enhance a systems performance. By using the correct spacing and following a few simple guidelines, tubing layout is easily accomplished.

**Basic Rule:** Always supply the warmest water to the coldest areas of the room where the most heat loss will occur (outside walls and windows). If there are areas within a zone with greater heat loss, tubing spacing should be decreased to accommodate the additional heat loss. A shorter loop will provide more flow (heat) for areas. An example would be a bathroom under the bathtub, greatly increasing the “heating area.”

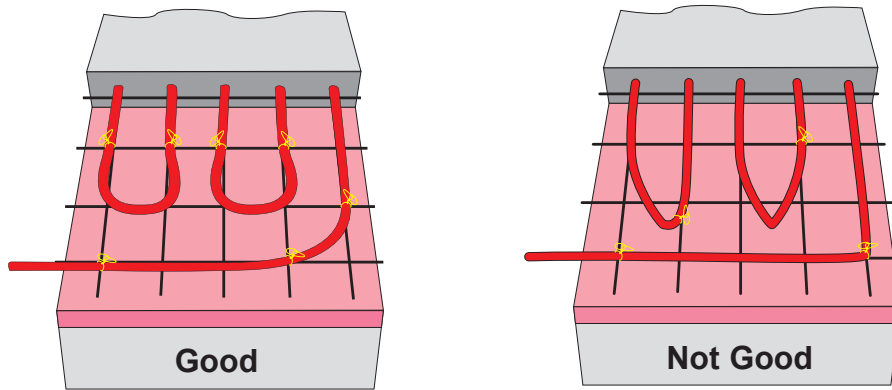


The serpentine pattern, as shown above, is the primary tubing pattern. Advantages are good performance and ease of installation.

Use this Pattern for a room that has two exterior walls or windows.

Use this Pattern for a room that has three exterior walls or windows.

## Tubing Radius



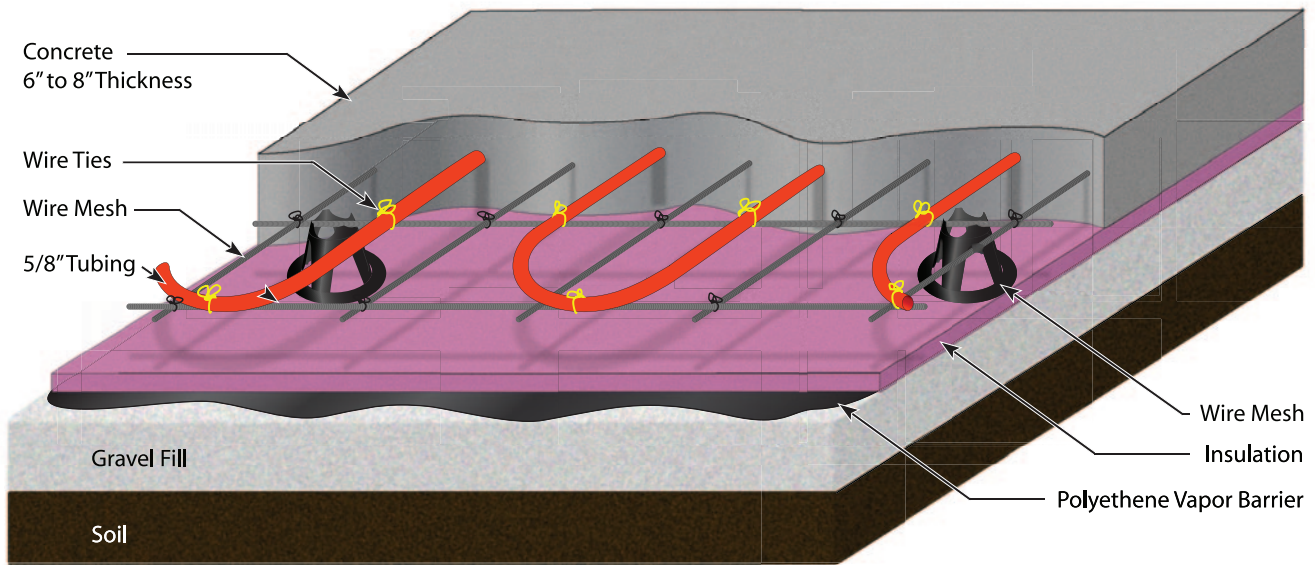
The minimum bend radius of the tubing **MUST BE OBSERVED.**

**DO NOT KINK OR PINCH TUBING!**

Tubing Size	Min. Radius
1/2" ID	4" or greater
3/4" ID	6" or greater

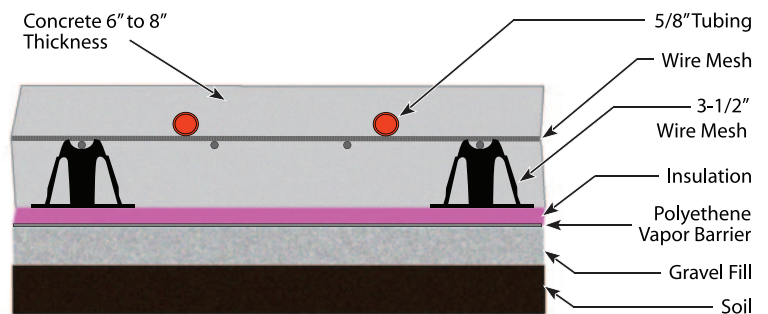
## Ground Slab Commercial Construction

This type of installation is best suited for Commercial buildings such as factories.



### The recommended installation procedure:

- Install perimeter insulation.
- Place gravel on top of soil.
- Place Viscreen on top of gravel.
- Place insulation on top of Viscreen Polysheet
- Place Mesh Risers (WF-5080) two feet apart (recommended).
- Place mesh on top of Risers
- Layout tubing according to design.
- Tie tubing to mesh with cable ties.
- Terminate tubing in PVC Elbow Tube Holder (WFM-9023) where ever tubing exits the concrete.
- Pouring 6" to 8" of concrete over mesh and tubing is recommended.  
(Observe structural and code requirement for slab thickness.)



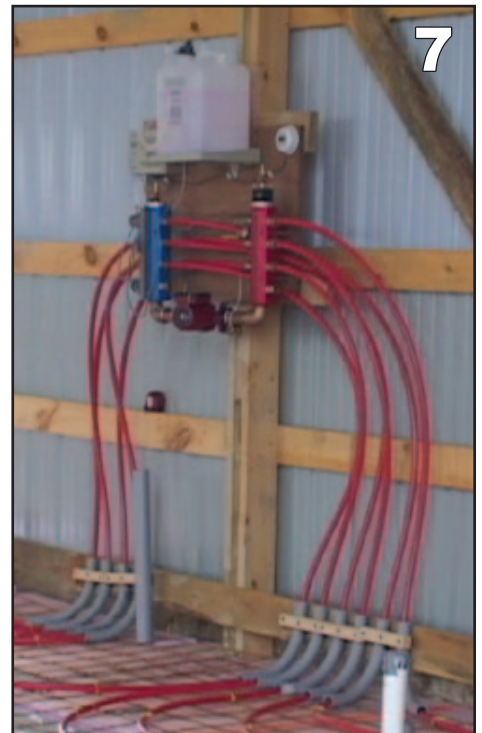
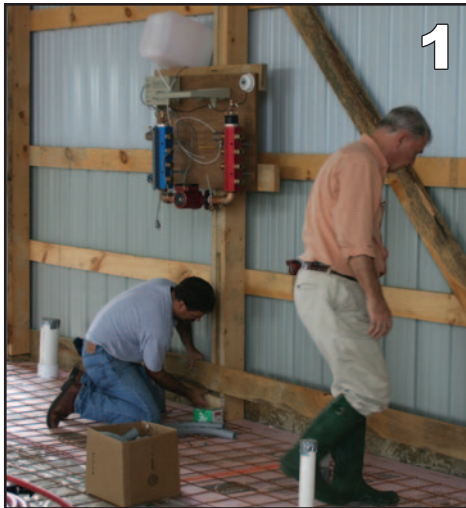
After insulation has been installed, backfill, grade and compact as per job specifications. Pay close attention to grade as incorrect (shallow) concrete depth may cause tubing to be misplaced within the concrete slab. After grade has been re-checked for correct depth, deploy any optional underslab insulation and lay optional 6 mil polyethylene vapor barrier as per plan. Place Mesh Risers on top of Insulation and Viscreen.

The polybutylene heat tubing is fastened to steel mesh with cable ties. Standard pea-gravel aggregate concrete and troweling methods are used. No tubes should be spliced within the concrete where they are not accessible. Tubing should be brought out in protected areas with Elbow Tube Holders.

(closes cell polybutylene recommended where tubing is terminated from the concrete. See page 2-12).



## Recommended Installation Procedure





## Recommended Installation Procedure

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1. Mount WarmmFloor control panel approximately 36" from the ground.
2. Secure PVC Elbow support blocks to wall for even spacing.
3. Install tubing through PVC Elbows
4. Secure tubing to fitting and tighten firmly with 1 hex rotation beyond seating.
5. Layout tubing according to design and keep loops in a sweeping arc.  
***\*Do not kink tubing\****
6. Install tube holders to secure tubing in position using cable ties before pouring concrete.  
*DO NOT install spliced tubing in concrete or in any unaccessible area.*
7. Make all tube connection and pressure test installation.  

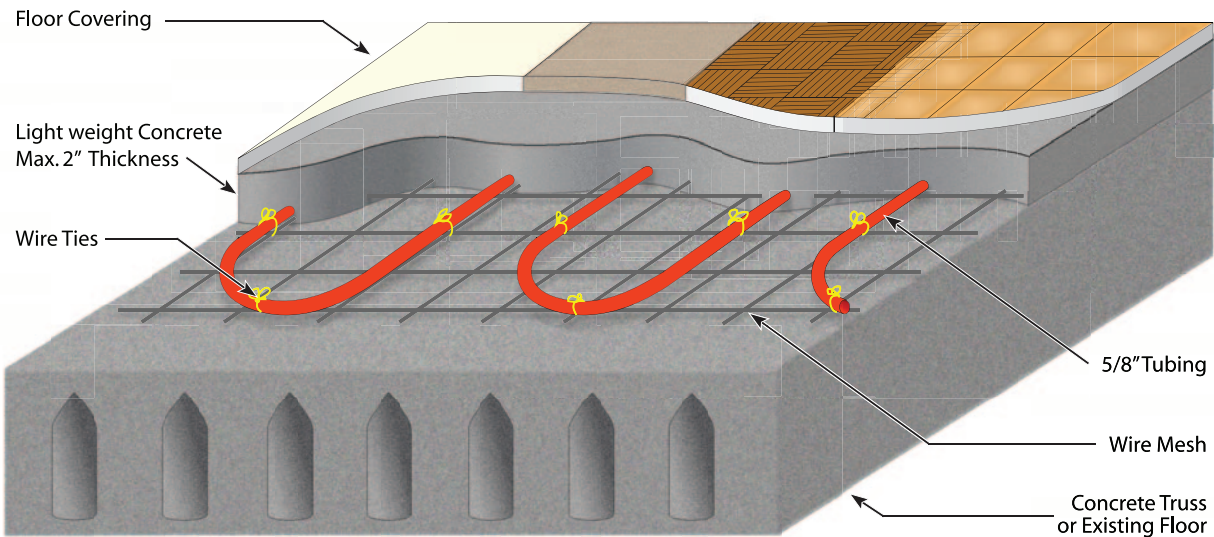
To pressure test the installation, the entire system may be pressurized with compressed air.

A pressure gauge will show a pressure change over an extended time period due to temperature changes.

During the pour, air bubbles will show where the tubing is leaking in the cement slurry.
8. Bleed off pressure, as to not expand the tubing, before the concrete sets up to provide best contact between the tubing and the concrete.
9. Cover and wrap all exposed tubing ends to keep clean during construction.

## Suspended Concrete with Wire Mesh

This type of installation is best suited for Commercial buildings such as factories.

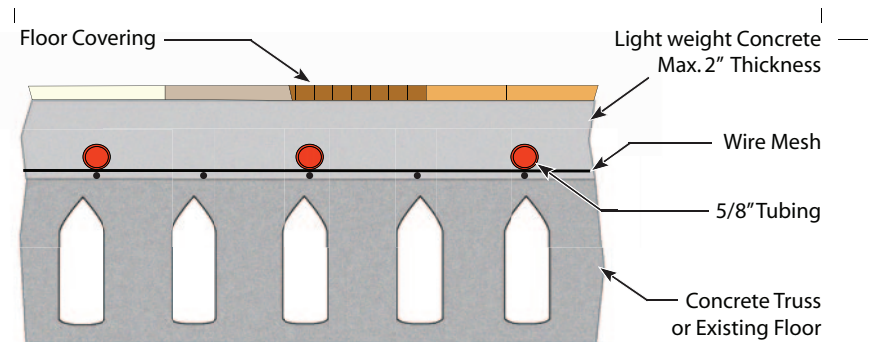


Any floor covering can be used as desired, however, the best performance can be achieved with uncovered concrete tile, vinyl, and carpet respectively.

### The recommended installation procedure:

- Lay out 6 mil polyethylene vapor barrier.
- Place flat wire mesh.
- Layout tubing according to design.
- Tie tubing to mesh with cable ties.
- Terminate tubing in PVC Elbows where ever tubing exits the concrete.
- Pouring 2" of concrete over mesh and tubing is recommended.

- **No tubing should be spliced within the concrete** or where it is not accessible.



## Stress Tubing Sleeves

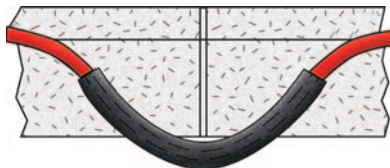
*Tubing Sleeves are recommended when tubing is installed between 2 concrete slabs or you may anticipate a shift in elevation. The sleeves will protect the PEX tubing from being pinched off.*

### Slab to Slab



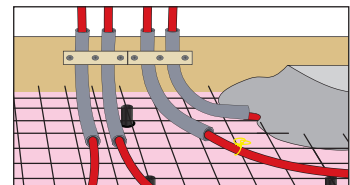
Route tubing through protective sleeve.

### Slab on Grade



Route tubing through insulated protective sleeve in sand under grade.

### Slab Exiting Protection



Tubing should be brought out in protective sleeves (rigid PVC elbows or pipe insulation tubing is recommended where ever tubing exits the concrete).