

Appendix B: Radiant design worksheet (Radiant floor)

Radiant floor design worksheet

Project name: _____ Manifold number: _____

	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10
A	Room name									
B	Room setpoint temp. (°F)									
C	Zone number									
D	Upward load (BTU/h/ft²)									
E	Total load (BTU/h/ft²)									
F	Floor surface temp. (°F)									
G	Installation method									
H	Piping size									
I	Floor covering R-value									
J	Differential temp. (°F)									
K	Piping o.c. distance (in)									
L	Supply water temp. (°F)									
M	Active loop length (ft)									
N	Leader loop length (ft)									
O	Total loop length (ft)									
P	Loop flow in gpm									
Q	Loop head pressure (ft)									
R	Loop balancing turns* (TruFLOW)									

Manifold totals

S	Supply water temp. (°F)									
T	Manifold flow in gpm									
U	Highest pressure head (ft)									

- A** Enter the name of the room. The room may have more than one loop.
- B** Room setpoint temperature is normally 65°F for radiant floor.
- C** Zone is equal to thermostat.
- D** Enter the "Floor Unit Load to Room" value from design program printout (upward load).
- E** Enter the "Floor Unit Load" value from design program printout (total load).
- F (Row D/2) + Row B** = floor surface temperature. Do not exceed 87.5°F for all floors (exception: wood floor limit is 80°F).
- G** Enter the installation method.
- H** Enter the size of PEX piping for project.
- I** Refer to **Appendix D** for floor covering information.
- J** Indicate differential temperature (10°F for residential; 15°F for light commercial; 20°F for commercial).
- K** Maximum piping o.c. distance is 12" for residential. Do not exceed 9" o.c. under tile or linoleum.
- L** Use information from **Rows D, G, I, K** with **Appendix E** to obtain the supply water temperature.
- M** Enter the length of piping installed within the room (i.e., active loop).
- N** Enter the length of the piping from the room being heated to the respective manifold and multiply by 2 to account for both the supply and return.
- O** Use formula: **(Row M + Row N)** = total loop length.
- P** Use the values in **Rows E** and **M** with **Appendix F** to obtain the flow per loop.
- Q** Use the values in **Rows H** and **P** with **Appendix G** to obtain the head pressure per loop. Choose the appropriate solution (water or water/glycol solution). These cells are calculated after the design is completed. Use the formula: (current loop value in **Row O** x 4) / longest loop length on the manifold when using TruFLOW manifolds.
- R** These cells are calculated after the design is completed. Use the formula: (current loop value in **Row O** x 4) / longest loop length on the manifold when using TruFLOW manifolds.
- S** Enter highest temperature from **Row L**.
- T** Add and enter all values from **Row P**.
- U** Enter highest value from **Row Q**.

*When using TruFLOW manifolds

Appendix B: Radiant design worksheet (Quik Trak®)

Quik Trak® design worksheet

Project name: _____ Manifold number: _____

	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10
A Room name										
B Room setpoint temp. (°F)										
C Zone number										
D Net floor area (ft²)										
E Upward load (BTU/h/ft²)										
F Total load (BTU/h/ft²)										
G Floor surface temp. (°F)										
H Piping size										
I Floor covering R-value										
J Differential temp. (°F)										
K Piping o.c. distance (in)										
L Supply water temp. (°F)										
M Active loop length										
N Leader loop length										
O Total loop length										
P Loop flow in gpm										
Q Loop head pressure (ft)										
R Loop balancing turns										
S Quik Trak panels										
T Quik Trak returns										

Manifold totals

U Supply water temp. (°F)	_____
V Manifold flow in gpm	_____
W Highest pressure head (ft)	_____

- A** Enter the name of the room. The room may have more than one loop.
- B** Room setpoint temperature is normally 65°F for radiant floor.
- C** Zone is equal to thermostat.
- D** Enter the amount of square footage used in the room.
- E** Enter the "Floor Unit Load to Room" value from design program printout (upward load).
- F** Enter the "Floor Unit Load" value from design program printout (total load).
- G (Row E/2) + Row B** = floor surface temperature. Do not exceed 87.5°F for all floors (exception: wood floor limit is 80°F).
- H** The only piping size available for Quik Trak is 5/8" Wirsbo hePEX.
- I** Refer to **Appendix D** for floor covering information.

- J** Indicate differential temperature (20°F for Quik Trak).
- K** Piping o.c. distance is 7" for Quik Trak.
- L** Use information from **Rows E, I, K** with **Appendix E** to obtain the supply water temperature.
- M** Enter the length of piping installed within the room (i.e., active loop).
- N** Enter the length of the piping from the manifold and multiply by 2 to account for both the supply and return.
- O** Use formula: **(Row M + Row N)** = total loop length.
- P** Use the values in **Rows F** and **M** with **Appendix F** to obtain the flow per loop.

- Q** Use the values in **Rows O** and **P** with **Appendix G** to obtain the head pressure per loop. Choose the appropriate solution (water or water/glycol solution).
- R** These cells are calculated after the design is completed. Use the formula: (current loop value in **Row O** x 4) / longest loop length on the manifold when using TruFLOW manifolds.
- S** Enter the number of panels. (For 7" o.c., multiply **Row D** by 0.386.)
- T** Enter the number of returns. (For 7" o.c., multiply **Row D** by 0.043.)
- U** Enter highest temperature from **Row L**.
- V** Add and enter all values from **Row P**.
- W** Enter highest value from **Row Q**.

Appendix B: Radiant design worksheets (ceiling)

Radiant ceiling design worksheet

Project name: _____ Manifold number: _____

Note: Ensure insulation between floors is at least R-19. Ensure ceiling exposed to the attic is at least R-38 (higher if required by code).

	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10
A Room name										
B Room setpoint temp. (°F)										
C Zone number										
D BTU/h										
E Ceiling square footage										
F BTU/h/ft²										
G Active square footage										
H Ceiling surface temp. (°F)										
I Piping size										
J Differential temp. (°F)										
K Piping o.c. distance (in)										
L Supply water temp. (°F)										
M Active loop length										
N Leader loop length										
O Total loop length										
P Loop flow in gpm										
Q Feet of head drop per loop										
R Loop balancing turns* (TruFLOW)										

Manifold totals

S Supply water temp. (°F)										
T Manifold flow in gpm										
U Highest pressure head (ft)										

- A** Enter the name of the room. The room may have more than one loop.
- B** Room setpoint temperature is normally 70°F for radiant ceiling.
- C** Zone is equal to thermostat. First zone is 1.
- D** Enter the "Total Unit Load" value from radiant design printout in BTU/h.
- E** Enter the ceiling square footage.
- F** Divide Row D by **Row E**. If value is less than 40 BTU/h/ft², divide **Row D** by 40.

- G** If **Row F** was obtained through dividing by 40, then divide **Row E** by 40. If **Row F** was greater than 40 BTU/h/ft², then enter the value from **Row E**.
- H** **Row B** divided by 1.6 plus the value in **Row F** equals the ceiling surface temperature. Do not exceed 100°F for ceilings at 8 feet or less. Do not exceed 110°F for ceilings greater than 8 feet.
- I** Enter the size of PEX piping for project (½" Wirsbo herPEX piping).
- J** Use 10°F differential temperature for all radiant ceiling applications.

- K** Maximum piping o.c. distance is 12" for all radiant ceiling applications.
- L** Use information from Rows F and J with **Appendix E** to obtain the supply water temperature.
- M** Multiply **Row G** by the on-center factor of 1.5.
- N** Enter the length of the piping from the room being heated to the respective manifold and multiply by 2 to account for both the supply and return.
- O** Use formula: (**Row M** + **Row N**) = total loop length.

- P** Use the values in **Rows F** and **L** with **Appendix F** to obtain the flow per loop.
- Q** Use the values in **Rows I**, **L** and **P** with **Appendix G** to obtain the feet of head pressure drop per foot. Next, multiply this value by **Row O** to obtain the feet of head drop per loop.
- R** These cells are calculated after the design is completed. Use the formula: (current loop value in Row O x 4) / longest loop length on the manifold when using TruFLOW manifolds.
- S** Enter highest temperature from **Row L**.
- T** Add all values in **Row P**.
- U** Enter highest value from **Row Q**.

*When using TruFLOW manifolds

Appendix B: Radiant design worksheet (radiant floor)

Radiant floor design worksheet

Project name: _____ Manifold number: _____

	Loop 1	Loop 2	Loop 3	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10
A Room name										
B Room setpoint temp. (°F)										
C Zone number										
D Upward load (BTU/h/ft ²)										
E Total load (BTU/h/ft ²)										
F Floor surface temp. (°F)										
G Installation method										
H Piping size										
I Floor covering R-value										
J Differential temp. (°F)										
K Piping o.c. distance (in)										
L Supply water temp. (°F)										
M Active loop length (ft)										
N Leader loop length (ft)										
O Total loop length (ft)										
P Loop flow in gpm										
Q Loop head pressure (ft)										
R Loop balancing turns* (TruFLOW)										

Manifold totals

S Supply water temp. (°F)										
T Manifold flow in gpm										
U Highest pressure head (ft)										

- A** Enter the name of the room. The room may have more than one loop.
- B** Room setpoint temperature is normally 65°F for radiant floor.
- C** Zone is equal to thermostat.
- D** Enter the "Floor Unit Load to Room" value from design program printout (upward load).
- E** Enter the "Floor Unit Load" value from design program printout (total load).
- F (Row D/2) + Row B** = floor surface temperature. Do not exceed 87.5°F for all floors (exception: wood floor limit is 80°F).

- G** Enter the installation method.
- H** Enter the size of PEX piping for project.
- I** Refer to **Appendix D** for floor covering information.
- J** Indicate differential temperature (10°F for residential; 15°F for light commercial; 20°F for commercial).
- K** Maximum piping o.c. distance is 12" for residential. Do not exceed 9" o.c. under tile or linoleum.
- L** Use information from **Rows D, G, I, K** with **Appendix E** to obtain the supply water temperature.

- M** Enter the length of piping installed within the room (i.e., active loop).
- N** Enter the length of the piping from the room being heated to the respective manifold and multiply by 2 to account for both the supply and return.
- O** Use formula: **(Row M + Row N)** = total loop length.
- P** Use the values in **Rows E** and **M** with **Appendix F** to obtain the flow per loop.

- Q** Use the values in **Rows H** and **P** with **Appendix G** to obtain the head pressure per loop. Choose the appropriate solution (water or water/glycol solution).
- R** These cells are calculated after the design is completed. Use the formula: (current loop value in **Row O** x 4) / longest loop length on the manifold when using TruFLOW manifolds.
- S** Enter highest temperature from **Row L**.
- T** Add and enter all values from **Row P**.
- U** Enter highest value from **Row Q**.

*When using TruFLOW manifolds