

Appendix B — Radiant Design Worksheets

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 Tubing size										
I Floor covering R-value										
J Differential temp. (°F)										
K Tubing 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										

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 ADS printout (upward load).
- E** Enter the "Floor Unit Load" value from ADS 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 tubing 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** Tubing 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 tubing installed within the room (i.e., active loop).
- N** Enter the length of the tubing from the room being heated to the respective manifold.
- 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.
- S** Enter highest temperature from **Row L**.
- T** Add and enter all values from **Row P**.
- U** Enter highest value from **Row Q**.

Appendix B — Radiant Design Worksheets

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 (ft ²)										
E Upward load (BTU/h/ft ²)										
F Total load (BTU/h/ft ²)										
G Floor surface temp. (°F)										
H Tubing size										
I Floor covering R-value										
J Differential temp. (°F)										
K Tubing 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 ADS printout (upward load).
- F** Enter the "Floor Unit Load" value from ADS printout (total load).
- G** $(\text{Row E}/2) + \text{Row B}$ = floor surface temperature. Do not exceed 87.5°F for all floors (exception: wood floor limit is 80°F).
- H** The only tubing size available for Quik Trak is 3/16" Wirisbo hePEX.
- I** Refer to **Appendix D** for floor covering information.

- J** Indicate differential temperature (20°F for Quik Trak).
- K** Tubing 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 tubing installed within the room (i.e., active loop).
- N** Enter the length of the tubing from the room being heated to the respective manifold.
- O** Use formula: $(\text{Row M} + \text{Row N}) = \text{total loop length}$.
- 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.
- 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

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/ft ²										
G Active square footage										
H Ceiling surface temp. (°F)										
I Tubing size										
J Differential temp. (°F)										
K Tubing 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										
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 ADS 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 F divided by 1.6 plus the value in Row B 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 tubing for project (½" Wirsbo hePEX tubing).
- J** Use 10°F differential temperature for all radiant ceiling applications.
- K** Tubing 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** Multiply the all-inclusive distance from loop in the room to the respective manifold by 2.
- 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.
- S** Enter highest temperature from Row L.
- T** Add all values in Row P.
- U** Enter highest value from Row Q.

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B Room setpoint temp. (°F)										
C Zone number										
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E Total load (BTU/h/ft²)										
F Floor surface temp. (°F)										
G Installation method										
H Tubing size										
I Floor covering R-value										
J Differential temp. (°F)										
K Tubing 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										

Manifold Totals

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

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- 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 ADS printout (upward load).
- E** Enter the "Floor Unit Load" value from ADS 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 tubing 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** Tubing o.c. distance is 12" for residential. Do not exceed 9" o.c. under tile or linoleum.
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- M** Enter the length of tubing installed within the room (i.e., active loop).
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- 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.
- S** Enter highest temperature from **Row L**.
- T** Add and enter all values from **Row P**.
- U** Enter highest value from **Row Q**.