HYDRONIC HEATING SYSTEM WORKSHEET

CERTIFICATE OF COMPLIANCE	CF1R-PLB-01-E
Hydronic Heating System Worksheet - For Non-HERS Registered Projects	(Page 1 of 2)

Project Name:	Date Prepared:

A. Pipe Heat Loss Worksheet

01	02	03	04
Pipe Diameter (inches)	Pipe Heat Loss Factor (kBtu/year/ft)	Pipe Length (ft)	Pipe Heat Loss (kBtu/year)

05	Sum of All Pipe Heat Losses (kBtu/year)	
06	Average Hourly Pipe Heat Loss (Btu/hr)	

B. Hydronic System Calculations for Large Storage Gas

01	Recovery Efficiency/AFUE of the Water Heater or Boiler (unitless)	
02	Average Hourly Pipe Heat Loss (Btu/hr)	
03	Rated Input of Water Heater or Boiler (Btu/hr)	
04	Standby Loss—Percentage (if known)	
05	Standby Loss—Power (Btu/hr) (from appliance database, if known)	
06	Pump Watts (Watts) (if applicable)	
07	Pump Energy (Btu/hr)	
08	Effective AFUE	

CERTIFICATE OF COMPLIANCE	CF1R-PLB-01-E
Hydronic Heating System Worksheet - For Non-HERS Registered Projects	(Page 2 of 2)

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Documentation Author's Declaration Statement	
1. I certify that this Certificate of Compliance documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

Responsible Person's Declaration Statement

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. That the energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a registered copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company:	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CF1R-PLB-01-E User Instructions

A. Pipe Heat Loss Worksheet

01 Pipe Diameter (inches): Enter all the different pipe diameters of the system.
02 Pipe Heat Loss Factor (kBtu/year/ft): Using the table below, determine the pipe heat loss factor for the corresponding pipe diameter.
03 Pipe Length (ft): Enter the pipe length.
04 Pipe Heat Loss (kBtu/year): Multiply line B02 by B03, this is the pipe heat loss.
05 Sum of All Pipe Heat Losses (kBtu/year): Enter the sum of all pipe heat loss.
06 Average Hourly Pipe Heat Loss (Btu/hr): Divide line B05 by 8760 times 1000.

Pipe Heat Loss Factor Lookup Table

Pipe Nominal Diameter	Pipe Heat loss factor
.75	66.6
1.0	78.8
1.5	100.3

B. Hydronic System Calculations for Boiler or Large Storage Gas

01 Recovery Efficiency/AFUE of the Water Heater or Boiler: Enter the Recovery Efficiency/AFUE from manufacturer's literature or the appliance database.
02 Average Hourly Pipe Heat Loss (Btu/hr): Enter average hourly pipe heat loss sum A06.
03 Rated Input of Water Heater or Boiler (Btu/hr)Enter the rated input from manufacturer's literature or the appliance database.
04 Standby Loss – Percentage: Enter the standby loss percent from manufacturer's literature or the appliance database. For example, enter 0.02 if the standby loss is 2%. Can be skipped if unknown
05 Standby Loss – Power: Standby loss energy (from appliance database) is used if standby loss percent is not known. Enter the standby loss energy from manufacturer's literature or the appliance database.
06 Pump Watts (Watts): Enter the pump watts
07 Pump Energy (Btu/hr): Pump energy is line A06 times 3.414. If unknown then default value is 85.
08 Effective AFUE: Effective AFUE is [line A01 – (line A02+ line A05 + (line A07 / line A03)].