Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City	Zip Code

A. DHW DISTRIBUTION SYSTEM		
1	Water Heating System Name:	From CF-1R
2	Distribution type:	<<user select from list: C. Standard Distribution System (STD) D. Pipe Insulation Credit (PIC) E. Central Parallel Piping (PP)Compact Hot Water Distribution System (CHWDS) F. Recirculation non demand controls (R-ND) G. Demand Recirculation – Manual Control (R-DRmc) H. Demand Recirculation – Sensor Control (RDRsc)

B. MANDATORY MEASURES FOR ALL DOMESTIC HOT WATER DISTRIBUTION SYSTEMS	
1.	All hot water piping insulated from the water heater to the kitchen fixture or appliance with R3.6 or 1” of insulation
2.	All piping with a nominal diameter of 3/4 inch (19 millimeter) or larger must be insulated with R3.6 or 1” of insulation.
3.	The first 5 feet of hot and cold water pipes shall be insulated from the storage tank with R3.6 or 1” of insulation.
4.	All elbows and tees shall be fully insulated.
5.	Where insulation is required, no piping shall be visible due to insulation voids.
6.	All insulation shall fit tightly to the pipe
7.	All piping associated with a domestic hot water recirculation system regardless of the pipe diameter must be insulated
8.	Piping from the heating source to storage tank or between tanks must be insulated
9.	Piping buried below grade must be installed in a water proof and non-crushable casing or sleeve that allows for installation, removal, and replacement of the enclosed pipe and insulation.
10.	Hot water pipes to kitchen islands insulated
The responsible person’s signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

C. (STD)-Standard Distribution System (trunk and branch systems only) << Table C appears only if (STD)- is selected in A2.>>	
1.	Verification of measures B1 through B10 show compliance for standard distribution system
The responsible person’s signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

D. (PIC)- Pipe Insulation Credit (For trunk and branch Hot Water system) << Table D appears only if (PIC)- is selected in A2.>>	
1	All hot water piping 1” and smaller shall be insulated to R-3.6 and be 1 inch thick. Piping with a diameter larger than 1 inch shall comply with the insulation requirements in Table 120.3-A.
The responsible person’s signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

E. (PP)- Central Parallel Piping<< Table E appears only if (PP)- is selected in A2.>>	
1.	Central manifold have 15 feet or less of pipe between manifold and water heater
2.	Manifolds that include valves the manifold must be readily accessible in accordance with the plumbing code.
3.	Hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. Ex Piping from a second story manifold cannot supply the first floor
4.	The hot water distribution piping must be separated by at least two inches from any other hot water supply piping
5.	Hot and cold water supply piping must be separated by at least six inches or the hot water supply piping must be insulated. with 1" at a minimum R3.6 based (from TABLE 120.3-A.
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

F. (IPBG)- Insulated and Protected Pipe Below Grade<< Table F appears only if (IPBG)- is selected in A2.>>	
1.	Verification of measures B1 through B10
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

G. (R-ND)- Recirculation non demand controls << Table G appears only if (R-ND)- is selected in A2.>>	
1.	If more than one loop installed each loop shall have its own pump and controls
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

H.(RDRmc)-Demand Recirculation – Manual Control << Table H appears only if (RDRmc)- is selected in A2>>	
1.	Verify the controlled recirculation systems operate "on-demand", meaning that pump operation shall be initiated shortly prior to the hot water draw. The controls shall operate on the principal of shutting off the pump with a sensed rise in pipe temperature (Delta-T)
2.	If more than one loop installed each loop shall have its own pump and controls
3.	Verify that the pump, demand controls and thermo-sensor are present
4.	Manual switches are located in the kitchen, all bathrooms, and any hot water use location that is at least 20 feet (measured along the hot water piping) from the water heater
5.	Manual controlled systems may be activated by wired or wireless button mechanisms
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

I. (RDRsc)-Demand Recirculation – Sensor Control << Table I appears only if (RDRsc)- is selected in A2.>>	
1.	Verify the controlled recirculation systems operate "on-demand", meaning that pump operation shall be initiated shortly prior to the hot water draw. The controls shall operate on the principal of shutting off the pump with a sensed rise in pipe temperature (Delta-T)
2.	If more than one loop installed each loop shall have its own pump and controls
3.	Verify that the pump, demand controls and thermo-sensor are present

4.	Sensor controls are located in the kitchen, all bathrooms, and any hot water use location that is at least 20 feet (measured along the hot water piping) from the water heater
The responsible person's signature on this Certificate of Installation indicates the system identified on this Certificate has complied with all applicable requirements specified in this Table.	

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Installation documentation is accurate and complete.	
Name:	Signature:
Company:	Date:
Address:	CEA or CEPE or HERS Certification # If Applicable:
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

1. I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
3. I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance (CF1R) approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF1R that apply to the installation have been met.
5. **I will ensure that a completed, signed copy of this Certificate of Installation shall be posted, or 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 signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.**

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):

CF2R-PLMB-02-E Instructions

A. DHW DISTRIBUTION SYSTEM

1. Water Heating System Name: From Certificate of Compliance
2. Distribute type: Based on the system being installed, pick from one of the following - Standard Distribution System (STD), Pipe Insulation Credit (PIC), Central Parallel Piping (PP)Compact Hot Water Distribution System (CHWDS), Recirculation non demand controls (R-ND), Demand Recirculation – Manual Control (R-DRmc), Demand Recirculation – Sensor Control (RDRsc)

B. MANDATORY MEASURES FOR ALL DOMESTIC HOT WATER DISTRIBUTION SYSTEMS

C. (STD)-Standard Distribution System (trunk and branch systems only)

1. The Standard Distribution System design requires that hot water distribution piping meets the requirements of Proper Installation of Pipe Insulation R4.4.1

D. (PIC)- Pipe Insulation Credit (For trunk and branch Hot Water system)

1. All piping in the hot water distribution system must be insulated from the water heater to each fixture or appliance. Insulation shall be installed in accordance with the provisions of Proper Installation of Pipe Insulation R4.4.1.

E. (PP)- Central Parallel Piping

This hot water distribution system is comprised of one or more manifolds located relatively close to the water heater and pipes running from the manifold to individual fixtures and appliances. The manifolds may have valves for each pipe running from the manifold to individual fixtures and appliances. These valves must be readily accessible in accordance with the plumbing code. The measured length of pipe from the water heater each central manifold shall not exceed 15 feet (measured to the nearest half foot). The hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. For example, in a house with more than 1-story and the water heater in the garage, this requirement would exclude running hot water supply piping from the manifold to the attic, and then running the line back down to a first floor point of use. The hot water distribution piping must be separated by at least two inches from any other hot water supply piping, and at least six inches from any cold water supply piping or the hot water supply piping must be insulated based on the conductivity range in TABLE 120.3-A and the insulation level shall be selected from the fluid temperature range based on the thickness requirements in TABLE 120.3-A. Other hot water piping shall be insulated to a level that meets the requirements of §150.0(j) and be installed in accordance with Proper Installation of Pipe Insulation R4.4.1.

F. (IPBG)- Insulated and Protected Pipe Below Grade

G. (R-ND)- Recirculation non demand controls

All recirculation controls with the exception of demand recirculation control systems fall under this category.

1. More than one circulation loop may be installed. Each loop shall have its own pump and controls.
2. The active control shall be either: timer, temperature, or time and temperature. Timers shall be set to less than 24 hours. The temperature sensor shall be connected to the piping and to the controls for the pump.

H.(RDRmc)-Demand Recirculation – Manual Control

Demand controlled recirculation systems shall operate “on-demand”, meaning that pump operation shall be initiated shortly prior to the hot water draw. The controls shall operate on the principal of shutting off the pump with a sensed rise in pipe temperature (Delta-T). For this measure a manual switch is used to activate the pump.

1. More than one circulation loop may be installed. Each loop shall have its own pump and controls.
2. Manual controls shall be located in the kitchen, bathrooms, and any hot water use location that is at least 20 feet (measured along the hot water piping) from the water heater.
3. Manual controlled systems may be activated by wired or wireless mechanisms, Manual controls shall have standby power of 1 watt or less.

4. Pump and demand control placement meets one of the following criteria.
    - When a dedicated return line has been installed the pump, demand controls and thermo-sensor are installed at the end of the supply portion of the recirculation loop (typically under a sink); or
    - The pump and demand controls are installed on the return line near the water heater and the thermo sensor is installed in an accessible location as close to the end of the supply portion of the recirculation loop as possible (typically under a sink), or
    - When the cold water line is used as the return, the pump, demand controls and thermo-sensor is installed in an accessible location at the end of supply portion of the hot water distribution line (typically under a sink).
5. Insulation is not required on the cold water line when it is used as the return.
6. Demand controls shall be able to shut off the pump in accordance with these three methods:
    - After the pump has been activated, the controls shall allow the pump to operate until the water temperature at the thermo-sensor rises not more than 10ºF (5.6 ºC) above the initial temperature of the water in the pipe, or
    - The controls shall not allow the pump to operate when the temperature in the pipe exceeds 102ºF (38.9 ºC).
    - The controls shall limit pump operation to a maximum of 5 minutes following any activation. This is provided in the event that the normal means of shutting off the pump have failed.

I. (RDRsc)-Demand Recirculation – Sensor Control

Demand controlled recirculation systems shall operate “on-demand”, meaning that pump operation shall be initiated shortly prior to the hot water draw. The controls shall operate on the principal of shutting off the pump with a sensed rise in pipe temperature (Delta-T). For this measure a sensor control is used to activate the pump rather than a manual control.

1. More than one circulation loop may be installed. Each loop shall have its own pump and controls.
2. Sensor controls shall be located in the kitchen, bathrooms, and any hot water use location that is at least 20 feet (measured along the hot water piping) from the water heater.
3. Sensor controlled systems may be activated by wired or wireless mechanisms, including motion sensors, door switches and flow switches. Sensors controls shall have standby power of 1 watt or less.
4. Pump and demand control placement meets one of the following criteria.
    - When a dedicated return line has been installed the pump, demand controls and thermo-sensor are installed at the end of the supply portion of the recirculation loop (typically under a sink); or
    - The pump and demand controls are installed on the return line near the water heater and the thermosensor is installed in an accessible location as close to the end of the supply portion of the recirculation loop as possible (typically under a sink),
    - When the cold water line is used as the return, the pump, demand controls and thermo-sensor is installed in an accessible location at the end of supply portion of the hot water distribution line (typically under a sink).
5. Insulation is not required on the cold water line when it is used as the return.
6. Demand controls shall be able to shut off the pump in accordance with these three methods:
    - After the pump has been activated, the controls shall allow the pump to operate until the water temperature at the thermo-sensor rises not more than 10ºF (5.6 ºC) above the initial temperature of the water in the pipe, or
    - The controls shall not allow the pump to operate when the temperature in the pipe exceeds 102ºF (38.9 ºC).
    - The controls shall limit pump operation to a maximum of 5 minutes following any activation. This is provided in the event that the normal means of shutting off the pump have failed.