

<b>DOCKETED</b>	
<b>Docket Number:</b>	24-BSTD-03
<b>Project Title:</b>	2025 Energy Code Compliance Software, Manuals and Forms
<b>TN #:</b>	264161
<b>Document Title:</b>	2025 Low-Rise Certificates of Installation (LMCI)
<b>Description:</b>	** This document supersedes document TN #263761. ** This draft Low-Rise Certificates of Installation (LMCI) will be subject for vote during an Energy Commission Business Meeting. 2025 Energy Code compliance documents to record compliance with the 2025 Energy Code.
<b>Filer:</b>	Christina C. Ubaldo
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	6/10/2025 8:57:58 AM
<b>Docketed Date:</b>	6/10/2025



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of electrical power distribution system features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for low-rise residential and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):		05	Authority Having Jurisdiction:	
02	Zip Code:		06	Building Permit #:	
03	Date of Permit Set used for construction:		07	Date of As-built Set:	
04	Name of Permit Set used for construction:		08	Name of As-built Set:	

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01			
<input type="checkbox"/>	Electric Service Meter(s)	<input type="checkbox"/>	Voltage Drop to feeders
<input type="checkbox"/>	Separation of load downstream of meter(s)	<input type="checkbox"/>	Voltage Drop to branch circuits
<input type="checkbox"/>	120V Receptacle (Outlet) Control(s)		

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance to be revised accordingly to demonstrate compliance.*

01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact requirements documented on the Certificate of Compliance.*



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*

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**F. INSTALLATION DETAILS**

*The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.*

**Service Electrical Metering**

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Rating (kVA)	Required Metering Capabilities				Metering Compliance
		Instantaneous Demand (kW)	Historical Peak Demand (kW)	Tracking kWh for user-defined period	kWh per rate period	
Per C of C						
As-built Conditions						

<sup>1</sup> FOOTNOTES: Service is defined as "the conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premise served" in §100.1 of the Energy Standards. 'Electrical Services' applies to the building service-entrance rating or to the submetering service. For a building with submetering, this applies to the submetering service size to the common use areas.

<sup>2</sup> Feeder is defined as "all circuit conductors between the service equipment, the source of a separately derived system, or other power supply source and the final branch-circuit overcurrent device," in Article 100 of the California Electrical Code.

**Separation of Electrical Circuits for Energy Monitoring**

*Submetered electrical power distribution systems that provide power to dwelling units/common living areas only in multifamily occupancies do not need to be included.*

**Electrical Service Designation/ Description:**

01	02	03	04
Load Type <sup>1</sup>	Minimum Required Separation of Load	Separation Method <sup>2</sup>	Compliance
Per C of C			
As-built Conditions			



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Feeder and Branch Circuit Conductor Voltage Drop**

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method	Voltage Drop Calculations	Voltage Drop to the Feeder(s) (%)	Voltage Drop After the Feeder(s) (%)	Total Voltage Drop (%)	Voltage Drop Compliance
Per C of C						
As-built Conditions						

**Circuit Controls and Controlled Receptacles**

01	02	03	04	05	06
Room Name or Description	Location/ Type of Controlled Receptacles <sup>1,2</sup>	Shut-Off Controls	Demand Response Controls	Permanent Marking is Used	Compliance
Per C of C					
As-built Conditions					

<sup>1</sup> FOOTNOTES: Office areas, lobbies, conference rooms, kitchen areas in office spaces, and copy rooms must meet controlled receptacle requirements

<sup>2</sup> Plug-in strips and other plug-in devices shall not be used to comply with the requirements of section 130.5(d)

**Electric Ready for Multifamily Occupancies**

**Gas/ Propane Furnaces Serving Individual Dwelling Units (Heat Pump Space Heater Ready)**

Requirement
A dedicated 240 volt branch circuit shall be installed within 3 feet from the furnace and accessible to the furnace with no obstructions. The branch circuit shall be rated at 30 amps minimum. The blank cover shall be identified as “240V ready”. All electrical components shall be installed in accordance with the California Electrical Code.
The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future heat pump space heater installation. The reserved space shall be permanently marked as “For Future 240V use”.

**Gas/ Propane Cooktops Serving Individual Dwelling Units**

Requirement
A dedicated 240 volt branch circuit shall be installed within 3 feet from the cooktop and accessible to the cooktop with no obstructions. The branch circuit shall be rated at 50 amps minimum. The blank cover shall be identified as “240V ready”. All electrical components shall be installed in accordance with the California Electrical Code.
The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future electric cooktop installation. The reserved space shall be permanently marked as “For Future 240V use”.





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Gas/ Propane Clothes Dryers Serving Individual Dwelling Units**

Requirement
A dedicated 240 volt branch circuit shall be installed within 3 feet from the clothes dryer and accessible to the clothes dryer with no obstructions. The branch circuit shall be rated at 30 amps minimum. The blank cover shall be identified as “240V ready”. All electrical components shall be installed in accordance with the California Electrical Code.
The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future electric clothes dryer installation. The reserved space shall be permanently marked as “For Future 240V use”.

**Gas/ Propane Clothes Dryers In Common Areas**

Requirement
<p>Conductors or raceway shall be installed with termination points at the main electrical panel, via subpanels panels if applicable, to a location no more than 3 feet from each gas outlet or a designated location of future electric replacement equipment. Both ends of the conductors or raceway shall be labelled “Future 240V Use.” Gas flow rates shall be determined in accordance with the California Plumbing Code. Capacity shall be one of the following:</p> <ul style="list-style-type: none"> <li>- 24 amps at 208/240 volts per clothes dryer;</li> <li>- 2.6 kVA for each 10,000 Btu per hour of rated gas input or gas pipe capacity; or</li> <li>- The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated by the responsible person.</li> </ul>

**Gas/Propane Water Heaters Serving Individual Dwelling Units**

Requirement
<p>A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor branch circuit rated to 30 amps minimum, within 3 feet from the water heater and accessible to the water heater with no obstructions. In addition, all the following:</p> <ul style="list-style-type: none"> <li>- Both ends of the unused conductor shall be labeled with the word “spare” and be electrically isolated; and</li> <li>- A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above and labeled with the words “Future 240V Use”</li> </ul>
The construction drawings shall designate a space at least 39 inches by 39 inches and 96 inches tall for the future location of heat pump water heater

**Gas/Propane Water Heaters Serving Multiple Dwelling Units**

Requirement
<p>Physical space shall be reserved on the bus system of the main switchboard or on the bus system of a distribution board to serve the future heat pump water heater system including the heat pump and temperature maintenance tanks. In addition, the physical space reserved shall be capable of providing adequate power to the future heat pump water heater in accordance with the following:</p> <ul style="list-style-type: none"> <li>- Heat Pump. Meet one of the following: <ul style="list-style-type: none"> <li>- The electrical power required to power a heat pump water heater system heat pump that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>- The electrical power required that meets the requirements specified for the heat pump in Joint Appendix JA15.2.5.</li> </ul> </li> <li>- Temperature Maintenance Tank. Meet one of the following: <ul style="list-style-type: none"> <li>- The electrical power required to power a heat pump water heater system temperature maintenance tank that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>- The electrical power required that meets the requirements specified for the temperature maintenance tank in Joint Appendix JA15.2.5.</li> </ul> </li> </ul>



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-ELC-E
Electrical Power Distribution	(Page 1 of 2)

### A. General Information

1. Enter the City the project is located in.
2. Enter the zip code.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

### B. Project Scope

1. Select all applicable construction systems and materials documented.

### C. Compliance Results

1. This table is automatically filled with uneditable comments based on data entered in Section F.

### D. Exceptional Conditions

1. This table is auto filled with uneditable comments because of selections made or data entered in tables throughout the form.

### E. Additional Remarks

1. Enter any notes or comments for the AHJ.

### F. Installation Details

#### Service Electrical Metering

1. This field is filled out automatically.
2. Enter the Rating (kVA).
3. Instantaneous Demand (kW): Select from dropdown.
4. Historical Peak Demand (kW): Select from dropdown.
5. Tracking kWh for user-defined period: Select from dropdown.
6. kWh per rate period: Select from dropdown.
7. This field is filled out automatically.

#### Separation of Electrical Circuits for Energy Monitoring

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Separation Method: Select from Dropdown.
4. This field is filled out automatically.

#### Feeder and Branch Circuit Conductor Voltage Drop

1. This field is filled out automatically.
2. Combined Voltage Drop. Conductors Compliance Method: Select from Dropdown.
3. Voltage Drop Calculations: Select from Dropdown.
4. Voltage Drop to the Feeder(s) %: Select from Dropdown.
5. Voltage Drop After the Feeder(s) %: Select from Dropdown.
6. This field is filled out automatically.

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-ELC-E
Electrical Power Distribution	(Page 2 of 2)

7. This field is filled out automatically.

**Circuit Controls and Controlled Receptacles**

1. This field is filled out automatically.
2. Location/type of controlled receptacles: Select from Dropdown.
3. Shut-off Controls: Select from Dropdown.
4. Demand Response Controls: Select from Dropdown.
5. Permanent Durable Marking is Used: Select from Dropdown.
6. This field is filled out automatically.

**Electric Ready for Multifamily Occupancies Requirements**

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FINAL BUT NOT READY FOR USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of envelope features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for low-rise residential and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):		05	Authority Having Jurisdiction:	
02	Zip Code:		06	Building Permit #:	
03	Date of Permit Set used for construction:		07	Date of As-built Set:	
04	Name of Permit Set used for construction:		08	Name of As-built Set:	

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01		02		03		04		05	
Roofs		Walls		Fenestration		Doors		Floors	
<input type="checkbox"/>	Above Deck Insulation	<input type="checkbox"/>	Assembly type	<input type="checkbox"/>	Vertical/ Glazed Doors	<input type="checkbox"/>	New solid doors	<input type="checkbox"/>	Assembly type
<input type="checkbox"/>	Below Deck Insulation	<input type="checkbox"/>	Insulation	<input type="checkbox"/>	Skylights	<input type="checkbox"/>	Vestibules	<input type="checkbox"/>	Insulation
<input type="checkbox"/>	Surface Material								

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance to be revised accordingly to demonstrate compliance.*

01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.	
The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact requirements documented on the Certificate of Compliance.*



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*

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**F. INSTALLATION DETAILS**

*The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.*

**Roof Insulation**

01	02	03	04	05
Tag/Plan Detail ID	Assembly/ Framing Type	Cavity Insulation R-Value	Continuous Insulation R-Value	Assembly Compliance
Per C of C				
As-built Conditions				

**Roof Surface Material**

01	02	03	04	05	06
Tag/Plan Detail ID	Roof Material	Roof Slope	Material Performance Specifications	Cool Roof Rating Council Certification #	Assembly Compliance
Per C of C			Reflectance <sup>1</sup>		
			Emittance		
			SRI		
As-built Conditions			Reflectance		
			Emittance		
			SRI		

**Walls**

01	02	03	04	05	06	07
Tag/Plan Detail ID	Wall Type	Wall Material	Wall Thickness (in)	Core/Cavity Insulation R-value	Continuous Insulation R-value	Assembly Compliance
Per C of C						
As-built Conditions						



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Floors**

01	02	03	04	04	05	06	07
Tag/Plan Detail ID	Floor Type	Floor/Spline Material	Insulation Location	Insulation Orientation	Core/Cavity Insulation R-value	Continuous Insulation R-value	Assembly Compliance
Per C of C							
As-built Conditions							

**Exterior Doors**

01	02	03	04	05
Tag/Plan Detail ID	Door Type	Door Insulation	U-factor	Compliance
Per C of C				
As-built Conditions				

**Vestibules**

01	02	03	04	05	06
Tag/Plan Detail ID	Exception to §120.7(e)	Shut Off Controls	Thermostat	Self-Closing Device	Vestibule Compliance
Per C of C					
As-built Conditions					

**Vertical Fenestration, Skylights, and Glazed Doors**

01	02	03	04	05	06	07	08
Tag/Plan Detail ID	Fenestration Type	Calculation Method	Area (ft <sup>2</sup> )	Frame Type	Product Performance per Design	National Fenestration Rating Council (NFRC) Certification ID # <sup>1</sup>	Assembly Compliance
Per C of C					U-factor		
					(R)SHGC		
					VT		
As-built Conditions					U-factor		
					SHGC		
					VT		



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**G. ACCEPTANCE TESTS & FIELD VERIFICATION**

*The following Acceptance Tests related to the systems or materials documented on this LMCI have been indicated on the permitted Certificate of Compliance as being required to comply with Title 24, Part 6. Envelope Acceptance Tests are not required to be completed by a certified Acceptance Test Technician and may be completed by a field technician (which may be the installer). The Certificate of Acceptance forms indicated below will be required by the Authority Having Jurisdiction to demonstrate compliance.*

Form/Title	Systems to be Field Verified
NRCA-ENV-02-F - Must be submitted for all new, added or altered fenestration.	
NRCA-ENV-03-F - Must be submitted for Daylighting Power Adjustment Factor (PAF) for indoor lighting.	
<i>There are no Acceptance Tests indicated on the permitted NRCC related to the systems or materials documented on this NRCI.</i>	

*A copy of this Certificate of Installation should be distributed to the Field Technician(s) who will perform the acceptance test(s). Title 24, Part 6 Section 10-103(a)3F also requires this Certificate of Installation be posted or made available to the Authority Having Jurisdiction for all applicable inspections.*





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-ENV-E
Envelope Component Approach	(Page 1 of 2)

## A. General Information

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

## B. Project Scope

1. Select all applicable Roof systems and materials documented.
2. Select all applicable Wall systems and materials documented.
3. Select all applicable Fenestration systems and materials documented.
4. Select if New Solid Door materials documented.
5. Select all applicable Floor systems and materials documented.

## C. Compliance Results

1. Results in this table are automatically calculated from data input and calculations in Tables F.

## D. Exceptional Conditions

1. This table is auto filled with uneditable comments because of selections made or data entered in tables throughout the form.

## E. Installer Notes

1. Enter any notes or comments for the AHJ.

## F. Installation Details

### Roof Insulation

1. This field is filled out automatically.
2. Select: True or False.
3. Enter Cavity Insulation R-Value.
4. Enter Continuous Insulation R-Value.
5. This field is calculated automatically.

### Roof Surface Material

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Select: True or False.
4. Enter Reflectance, Emittance, SRI.
5. Enter Cool Roof Rating Council Certification #.
6. This field is calculated automatically.

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-ENV-E
Envelope Component Approach	(Page 2 of 2)

### **Walls**

1. This field is filled out automatically.
2. Select: True or False.
3. Select: True or False.
4. Enter Wall Thickness.
5. Enter Core/Cavity Insulation R-Value.
6. Enter Continuous Insulation R-Value.
7. This field is calculated automatically.

### **Floors**

1. This field is filled out automatically.
2. Select: True or False.
3. Select: True or False.
4. Select: True or False.
5. Enter Core/Cavity Insulation R-Value.
6. Enter Continuous Insulation R-Value.
7. This field is calculated automatically.

### **Exterior Doors**

1. This field is filled out automatically.
2. Door Type: Select from Dropdown.
3. Door Insulation: Select from Dropdown.
4. Enter U-factor.
5. This field is calculated automatically.

### **Vertical Fenestration, Skylights, and Glazed Doors**

1. This field is filled out automatically.
2. Fenestration Type: Select from Dropdown.
3. Calculation Method: Select from Dropdown.
4. Enter Area.
5. Enter Frame Type.
6. Enter U-factor, SHGC, and VT.
7. Enter National Fenestration Rating Council (NFRC) Certification ID #.
8. This field is calculated automatically.

### **Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of indoor lighting features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for low-rise residential and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):		05	Authority Having Jurisdiction:	
02	Zip Code:		06	Building Permit #:	
03	Date of Permit Set used for construction:		07	Date of As-built Set:	
04	Name of Permit Set used for construction:		08	Name of As-built Set:	

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01		02		03					
Luminaires		Space Types		Controls <sup>1</sup>					
<input type="checkbox"/>	General Lighting	<input type="checkbox"/>	Conditioned	<input type="checkbox"/>	Time-switch	<input type="checkbox"/>	Occupancy Sensors	<input type="checkbox"/>	Dimmers
				<input type="checkbox"/>	Daylighting	<input type="checkbox"/>	Interlocked Systems	<input type="checkbox"/>	Shut-off
<input type="checkbox"/>	Decorative/ Accent	<input type="checkbox"/>	Unconditioned	<input type="checkbox"/>	Area Controls	<input type="checkbox"/>	Demand Response	<input type="checkbox"/>	Videoconferencing Studio Controls
				<input type="checkbox"/>	Multi-level	<input type="checkbox"/>	Institutional Tuning		



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance to be revised accordingly to demonstrate compliance.*

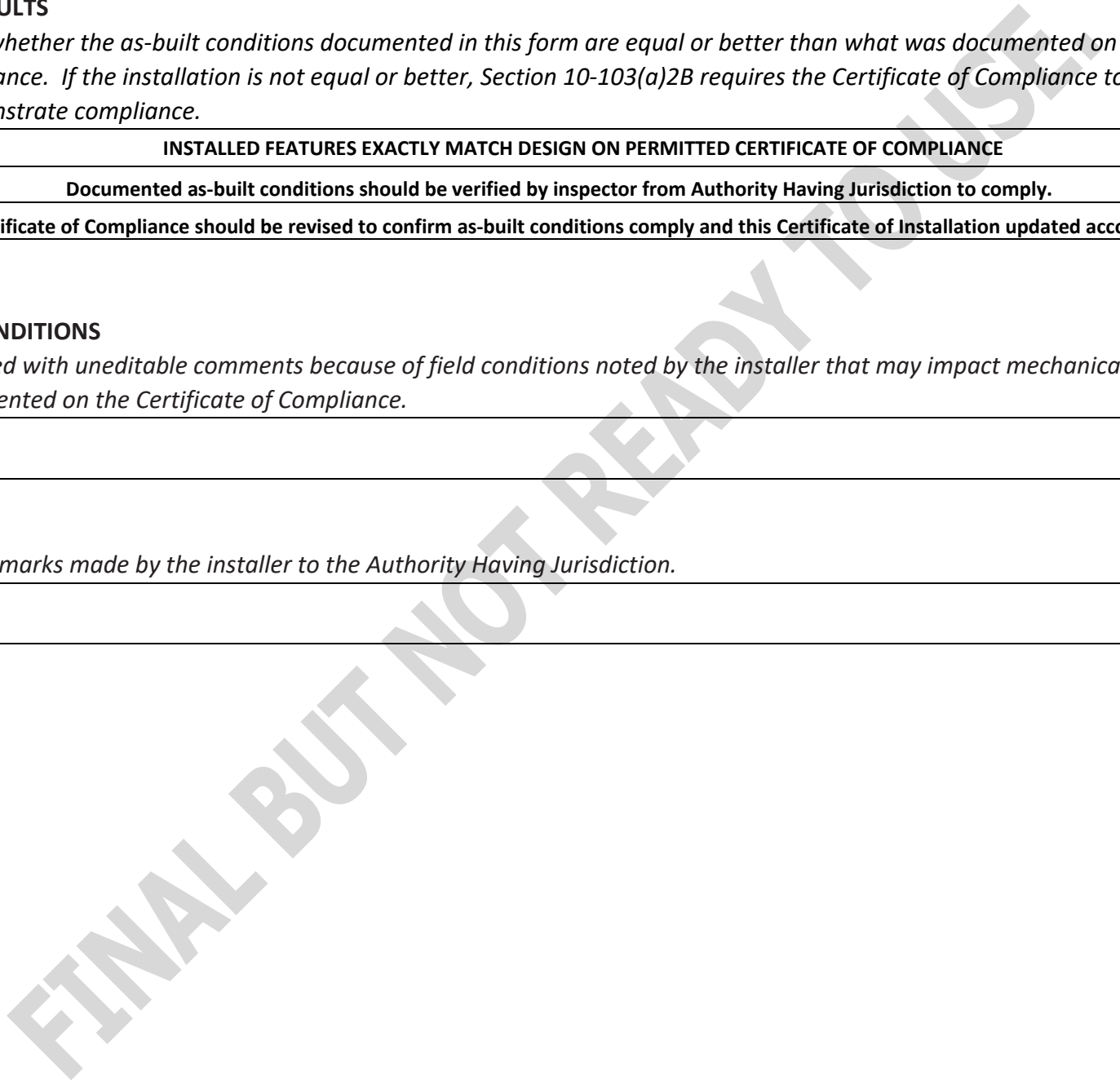
01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact mechanical controls requirements documented on the Certificate of Compliance.*

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. INSTALLATION DETAILS**

The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.

Indoor Lighting Fixture Schedule for Spaces Other Than Dwelling Units/ Hotel Rooms/ Motel Rooms.

01	02	03	04	05	06	07	08	09	10	11	12	13
Name or Item Tag	Fixture Within Scope?	Luminaire Description	Used in Conditioned or Unconditioned Space?	Fixture Type	Linear FT2 of Track	VA of Current Limiter	Voltage of Branch Circuit	Sum of Ampere Rating <sup>1</sup>	Maximum Rated Input Wattage	Rated Wattage per Luminaire	Total Number of Luminaires	Fixture Compliance
Per C of C												
As-built Conditions												

<sup>1</sup> Sum of the ampere rating of all the current protection devices on the panel

<sup>2</sup> Maximum rated input wattage of the driver, power supply or transformer published in the manufacturers catalogs.

<sup>3</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.

**Residential Dwelling Unit or Hotel/ Motel Room Luminaire Efficacy Requirements**

Residential dwelling unit and hotel/motel room lighting fixtures must be installed according the following requirements.

The following light sources are not required to comply with Title 24, Part 6 Joint Appendix 8 requirements:

A.	Pulse-start metal halide light sources.
B.	High pressure sodium light sources.
C.	Luminaires with hardwired high frequency generator and induction lamp.
D.	LED light sources installed outdoors.
E.	Inseparable solid state LED (SSL) luminaires containing colored light sources that are installed to provide decorative lighting.
F.	Lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, and garage door openers, and ceiling fan kits that are subject to DOE's Appliance and Equipment Standards Program
G.	Navigation lighting rated less than five watts, such as night lights, step lights, and path lights
H.	Lighting with an efficacy of 45 lumens per watt or greater and located internal to drawers, cabinetry, and or linen closets with an efficacy of 45 lumens per watt or greater

All other light sources shall be marked with "JA8-2025" or "JA8-2025-E" to meet the requirements of JA8. Light sources not marked with "JA8-2025" or "JA8-2025-E" do not meet the efficacy requirements.

**Indoor Lighting Controls**



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

01	02	03	04	05	06	07	08	09	10
Area Description	Primary Function Area	Demand Response	Manual Controls	Multi-Level Controls	Shut-Off Controls	Primary/Skylit Daylighting	Secondary Daylighting	Interlocked Systems	Controls Compliance
Per C of C									
As-built Conditions									

<sup>1</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.

**Controls for Additional Wattage Credit (Power Adjustment Factor)**

Controls in spaces listed in this table were designed to allow additional wattage as part of the strategy to comply with the Energy Code.

01	02	03	04	05	06	07	
Area Description	Control(s) for Wattage Credit	Luminaires Controlled				Lighting Controlled (Watts)	Controls for Credit Compliance
		Luminaire Name or Item Tag	Watts per Luminaire	Number of Luminaires			
Per C of C							
As-built Conditions							

<sup>1</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**G. ACCEPTANCE TESTS & FIELD VERIFICATION**

The following Acceptance Tests related to the systems or materials documented on this LMCI have been indicated on the permitted Certificate of Compliance (LMCC) as being required to comply with Title 24, Part 6.

Lighting Acceptance Tests must be completed by a certified Acceptance Testing Technician and LMCA forms completed through an approved Acceptance Test Technician Certification Provider database. The Certificate of Acceptance (LMCA) forms indicated below will be required by the Authority Having Jurisdiction to demonstrate compliance.

Form/Title	Systems to be Field Verified
NRCA-LTI-02-A - Must be submitted for all new, added or altered shut-off lighting controls	
NRCA-LTI-03-A - Must be submitted for all new, added or altered automatic daylighting controls	
NRCA-LTI-04-A - Must be submitted for all new, added or altered demand responsive lighting controls	
NRCA-LTI-05-A - Must be submitted for Institutional Tuning Power Adjustment Factor (PAF)	
<i>There are no Acceptance Tests indicated on the permitted LMCC related to the systems or materials documented on this LMCI.</i>	

A copy of this Certificate of Installation should be distributed to the Field Technician(s) who will perform the acceptance test(s). Title 24, Part 6 Section 10-103(a)3F also requires this Certificate of Installation be posted or made available to the Authority Having Jurisdiction for all applicable inspections.





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-LTI-E
Indoor Lighting	(Page 1 of 3)

#### A. General Information

1. Enter the City the project is located in.
2. Enter the zip code.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

#### B. Project Scope

1. Select applicable luminaires.
2. Select applicable space type.
3. Select applicable controls.

#### C. Compliance Results

1. This table is automatically filled with uneditable comments based on data entered in Section F.

#### D. Exceptional Conditions

1. This table is auto filled with uneditable comments because of selections made or data entered in tables throughout the form.

#### E. Installer Notes

1. This table is automatically filled with uneditable comments by the installer.

#### F. INSTALLATION DETAILS

##### Indoor Lighting Fixture Schedule

1. This field is filled out automatically.
2. Fixture Within Scope: Select from dropdown.
3. Enter luminaire description.
4. This field is filled out automatically.
5. Fixture type: Select from dropdown.
6. Enter linear FT2 of track.

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-LTI-E
Indoor Lighting	(Page 2 of 3)

7. Enter VA of current limiter.
8. Enter voltage of branch circuit.
9. Enter sum of Ampere rating.
10. Enter maximum rated input.
11. Enter rated wattage per luminaire.
12. Enter total number of luminaires.
13. This field is filled out automatically.

#### **Residential Dwelling Unit or Hotel/Motel Room Luminaire Efficacy Requirements**

1. This table covers the dwelling unit efficacy requirements for multifamily & hotel/motel projects.

#### **Indoor Lighting Controls**

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Demand Response: Select from Dropdown.
4. Manual Controls: Select from Dropdown.
5. Multi Area Controls: Select from Dropdown.
6. Shut off Controls: Select from Dropdown.
7. Primary/skylit Daylighting: Select from Dropdown.
8. Secondary daylighting: Select from Dropdown.
9. Interlocked systems: Select from Dropdown.
10. This field is filled out automatically.

#### **Controls for Additional Wattage Credit**

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Luminaire Item or Item Tag: Select from Dropdown.
4. This field is filled out automatically.
5. Enter number of luminaires.
6. This field is filled out automatically.
7. This field is filled out automatically.

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-LTI-E
Indoor Lighting	(Page 3 of 3)

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FINAL BUT NOT READY TO USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of outdoor lighting features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for low-rise multifamily and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):		05	Authority Having Jurisdiction:	
02	Zip Code:		06	Building Permit #:	
03	Date of Permit Set used for construction:		07	Date of As-built Set:	
04	Name of Permit Set used for construction:		08	Name of As-built Set:	

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01		02	
<input type="checkbox"/>	Luminaires	<input type="checkbox"/>	Controls

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance to be revised accordingly to demonstrate compliance.*

01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact mechanical controls requirements documented on the Certificate of Compliance.*

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*

**F. INSTALLATION DETAILS**

*The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.*

**Outdoor Lighting Fixture Schedule for Nonresidential Buildings, Parking Garages and Common Service Areas in Multifamily Buildings**

01	02	03	04	05	06	07	08	09
Name or Item Tag	Fixture Within Scope?	Luminaire Description	Fixture Type	Rated Wattage per Luminaire <sup>1</sup>	Total Number of Luminaires	Total Watts	Outdoor Luminaire ≥ 6,200 Lumens	Fixture Compliance
Per C of C								
As-built Conditions								

<sup>1</sup> For linear luminaires, wattage is in W/lf instead of Watts/luminaire. Total linear feet for the luminaire is indicated in column 06 instead of number of luminaires.

<sup>2</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Shielding Requirements (BUG)**

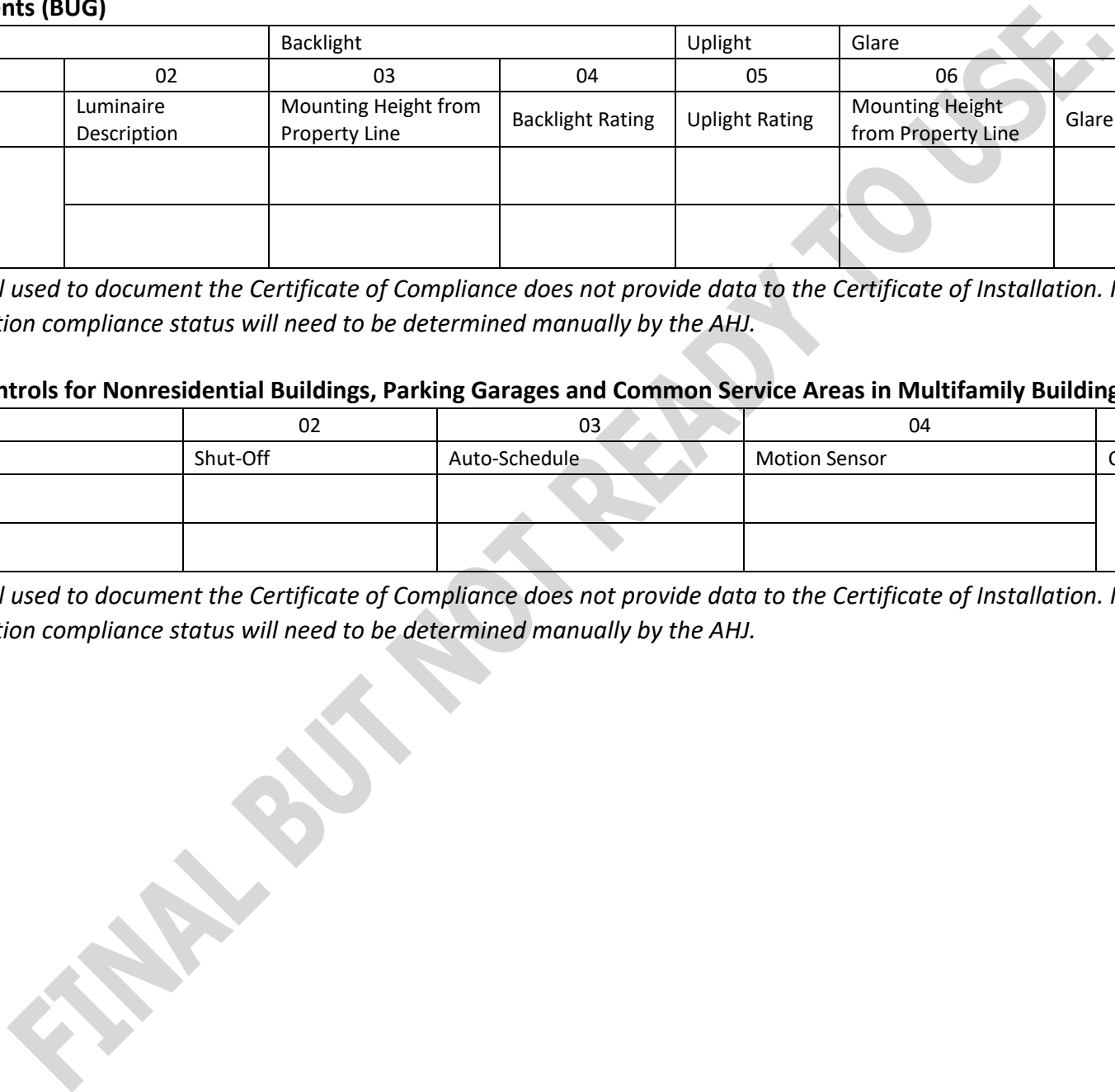
01		02		Backlight		Uplight		Glare		08	
Name or Item Tag		Luminaire Description		Mounting Height from Property Line		Backlight Rating		Uplight Rating		Mounting Height from Property Line	
Per C of C											
As-built Conditions											

<sup>1</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.

**Outdoor Lighting Controls for Nonresidential Buildings, Parking Garages and Common Service Areas in Multifamily Buildings**

01		02		03		04		05	
Area Description		Shut-Off		Auto-Schedule		Motion Sensor		Controls Compliance	
Per C of C									
As-built Conditions									

<sup>1</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Outdoor Lighting Controlled from Inside Multifamily Dwelling Units**

01	02	03	04
Space Name	Compliant Light Sources <sup>1,2</sup> §160.5(a)1	Mandatory Controls §160.5(a)  Shut-Off	Recessed Downlights <sup>3</sup> §160.5(a)1C
C of C			<i>i. Shall not contain screw base lamp sockets; and</i>
As-built Conditions			<i>ii. Have a label that certifies the luminaire is airtight with air leakage less than 2.0 cfm at 75 Pascals when tested in accordance with ASTM E283. An exhaust fan housing with integral light shall not be required to be certified airtight; and</i>
C of C			<i>and</i>
As-built Conditions			<i>iii. Be sealed with a gasket or caulk between the luminaire housing and ceiling, and have all air leak paths between conditioned and unconditioned spaces sealed with a gasket or caulk, or be installed per manufacturer’s instructions to maintain airtightness between the luminaire housing and ceiling; and</i>
C of C			
As-built Conditions			<i>iv. Meet the clearance and installation requirements of California Electrical Code Article 410.116 for recessed luminaires; and</i> <i>v. Lamps and other separable light sources in enclosed or recessed luminaires shall be in compliance with the JA8 elevated temperature requirements, including marking requirements.</i>

<sup>1</sup> FOOTNOTE: Text has been abbreviated, please refer to Section 160.5(a)1A to confirm compliance with the specific light source technologies listed.

<sup>2</sup> Authority having jurisdiction may ask for cutsheets or other documentation to confirm compliance of light source.

<sup>3</sup> Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings are excepted from ii and iii.





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

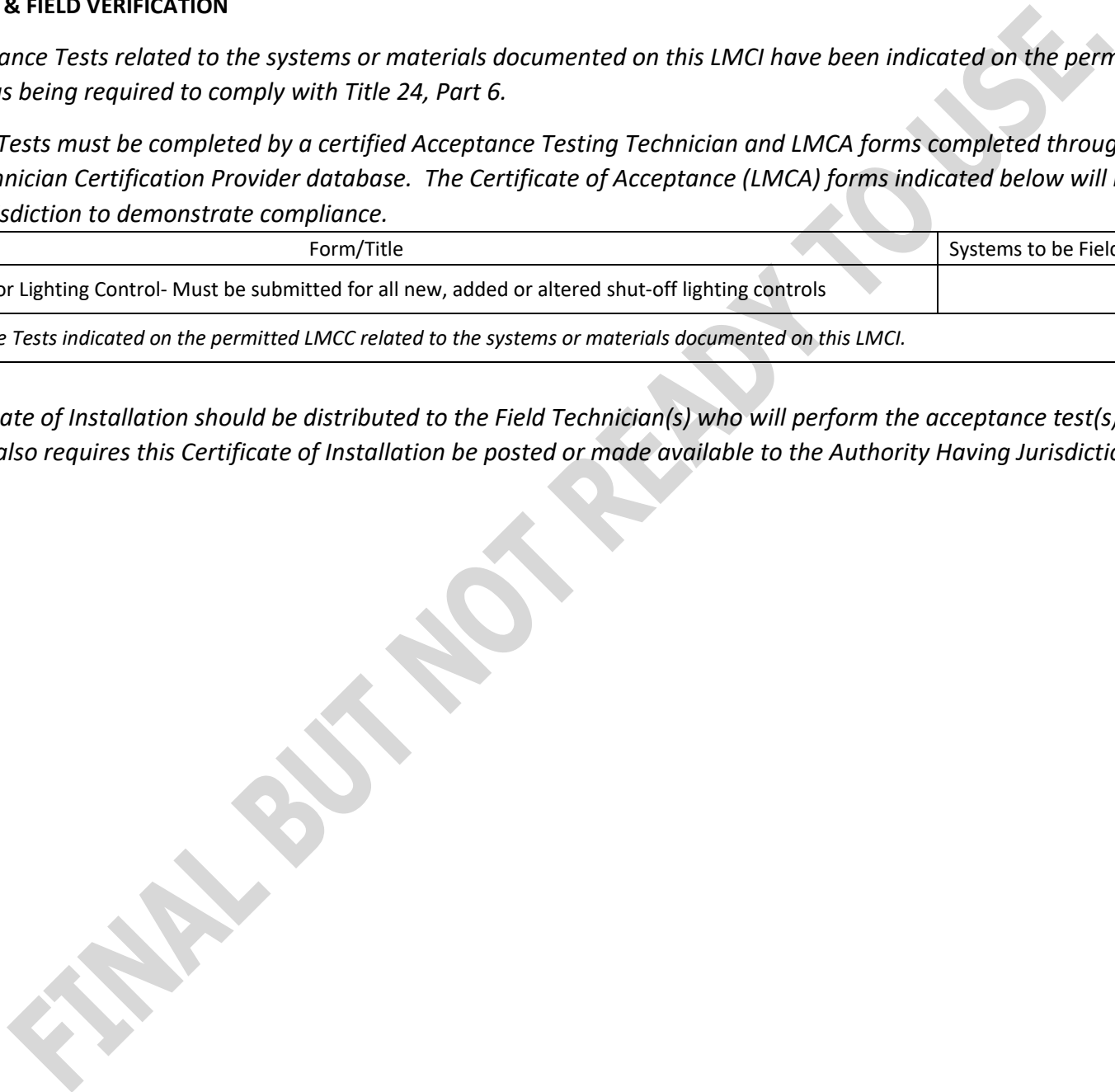
**G. ACCEPTANCE TESTS & FIELD VERIFICATION**

The following Acceptance Tests related to the systems or materials documented on this LMCI have been indicated on the permitted Certificate of Compliance (LMCC) as being required to comply with Title 24, Part 6.

Lighting Acceptance Tests must be completed by a certified Acceptance Testing Technician and LMCA forms completed through an approved Acceptance Test Technician Certification Provider database. The Certificate of Acceptance (LMCA) forms indicated below will be required by the Authority Having Jurisdiction to demonstrate compliance.

Form/Title	Systems to be Field Verified
NRCA-LTO-02-A: Outdoor Lighting Control- Must be submitted for all new, added or altered shut-off lighting controls	
<i>There are no Acceptance Tests indicated on the permitted LMCC related to the systems or materials documented on this LMCI.</i>	

A copy of this Certificate of Installation should be distributed to the Field Technician(s) who will perform the acceptance test(s). Title 24, Part 6 Section 10-103(a)3F also requires this Certificate of Installation be posted or made available to the Authority Having Jurisdiction for all applicable inspections.





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-LTO-E
Outdoor Lighting	(Page 1 of 2)

#### A. General Information

1. This field is filled out automatically with data from the NRCC.
2. This field is filled out automatically with data from the NRCC.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

#### B. Project Scope

1. Select all applicable construction systems and materials documented for luminaires.
2. Select all applicable construction systems and materials documented for controls.

#### C. Compliance Results

This table is automatically filled with uneditable comments based on data entered in Section F.

#### D. Exceptional Conditions

This table is automatically filled with uneditable comments because of selections made or data entered in tables throughout the form.

#### E. Additional Remarks

Enter any notes or comments for the AHJ.

#### F. Installation Details

##### Fixtures

1. This field is filled out automatically.
2. Fixture Within Scope: Select from dropdown.
3. Enter the Luminaire Description.
4. Fixture Type: Select from dropdown.
5. Enter the Rated Wattage per Luminaire.
6. Enter the Total Number of Luminaires.
7. This field is filled out automatically.

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-LTO-E
Outdoor Lighting	(Page 2 of 2)

8. Outdoor Luminaire  $\geq$  6,200 Lumens: Select from the dropdown.
9. This field is filled out automatically.

#### **Shielding Requirements (BUG)**

1. This field is filled out automatically.
2. Shut-Off: Select from dropdown.
3. Auto-Schedule: Select from dropdown.
4. Motion Sensor: Select from dropdown.
5. This field is filled out automatically.

#### **Outdoor Lighting Controls for Nonresidential Buildings, Parking Garages and Common Service Areas in Multifamily Buildings**

1. This field is filled out automatically.
2. Shut-Off: Select from dropdown.
3. Auto-Schedule: Select from dropdown.
4. Motion Sensor: Select from dropdown.
5. This field is filled out automatically.

#### **Outdoor Lighting Controlled from Inside Multifamily Dwelling Units**

1. This field is filled out automatically.
2. Compliant Light Sources: Select from dropdown.
3. Mandatory Controls Shut-Off: Select from dropdown.
4. This field covers additional requirements for recessed downlights.

#### **Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of sign lighting features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for low-rise residential and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):		05	Authority Having Jurisdiction:	
02	Zip Code:		06	Building Permit #:	
03	Date of Permit Set used for construction:		07	Date of As-built Set:	
04	Name of Permit Set used for construction:		08	Name of As-built Set:	

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01		02					
Luminaires		Controls					
<input type="checkbox"/>	Sign Lighting Luminaires	<input type="checkbox"/>	Shut-Off	<input type="checkbox"/>	Dimming	<input type="checkbox"/>	Demand Response



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance to be revised accordingly to demonstrate compliance.*

01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact mechanical controls requirements documented on the Certificate of Compliance.*

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*

FINAL BUT NOT READY FOR USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. INSTALLATION DETAILS**

The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.

**Sign Lighting Compliance.**

01	02	03	04	05	06	07
Name or Sign Tag	Sign Description	Watts Per Luminaire	Total Number of Luminaires	Total Watts	Compliant Light Sources	Sign Compliance
Per C of C						
As-built Conditions						

<sup>1</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.

**Sign Lighting Controls**

01	02	03	04	05	06
Name or Sign Tag	Sign Description	Mandatory Controls			Controls Compliance
		Shut-Off	Dimming	Demand Response	
Per C of C					
As-built Conditions					

<sup>1</sup> The compliance tool used to document the Certificate of Compliance does not provide data to the Certificate of Installation. In these scenarios, certificate of installation compliance status will need to be determined manually by the AHJ.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:



CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-LTS-E
Sign Lighting	(Page 1 of 2)

#### A. General Information

1. This field is filled out automatically with data from the LMCC.
2. This field is filled out automatically with data from the LMCC.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

#### B. Project Scope

1. Select all applicable construction systems and materials documented for luminaires.
2. Select all applicable construction systems and materials documented for controls.

#### C. Compliance Results

1. This table is automatically filled with uneditable comments based on data entered in Section F.

#### D. Exceptional Conditions

1. This table is automatically filled with uneditable comments because of selections made or data entered in tables throughout the form.

#### E. Additional Remarks

1. Enter any notes or comments for the AHJ.

#### F. Installation Details

##### Sign Lighting Compliance

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Enter the Watts Per Luminaire.
4. Enter the Total Number of Luminaires.
5. This field is filled out automatically.
6. Compliant Light Sources: Select from dropdown.
7. This field is filled out automatically.

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-LTS-E
Sign Lighting	(Page 2 of 2)

### Sign Lighting Controls

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Mandatory Controls Shut-Off: Select from dropdown.
4. Mandatory Controls Dimming: Select from dropdown.
5. Mandatory Controls Demand Response: Select from dropdown.
6. This field is filled out automatically.

### Documentation Declaration Statements

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FINAL BUT NOT READY TO USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of mechanical features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for low-rise residential and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):	02	Zip Code:
03	Date of Permit Set used for construction:	04	Name of Permit Set used for construction:
05	Authority Having Jurisdiction:	06	Building Permit #:
07	Date of As-built Set:	08	Name of As-built Set:

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01							
<input type="checkbox"/>	Dry System (Airside) Equipment	<input type="checkbox"/>	Ventilation (including DOAS, ERV and HRV)	<input type="checkbox"/>	System Controls	<input type="checkbox"/>	Ductwork
<input type="checkbox"/>	Boiler	<input type="checkbox"/>	Pumps	<input type="checkbox"/>	Terminal Box Controls	<input type="checkbox"/>	Piping
<input type="checkbox"/>	Chiller	<input type="checkbox"/>	Fans and Air Economizers	<input type="checkbox"/>	Heat Rejection Equipment (cooling towers, condensers, waterside economizers)	<input type="checkbox"/>	Electric Resistance Heating



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance form to be revised accordingly to demonstrate compliance.*

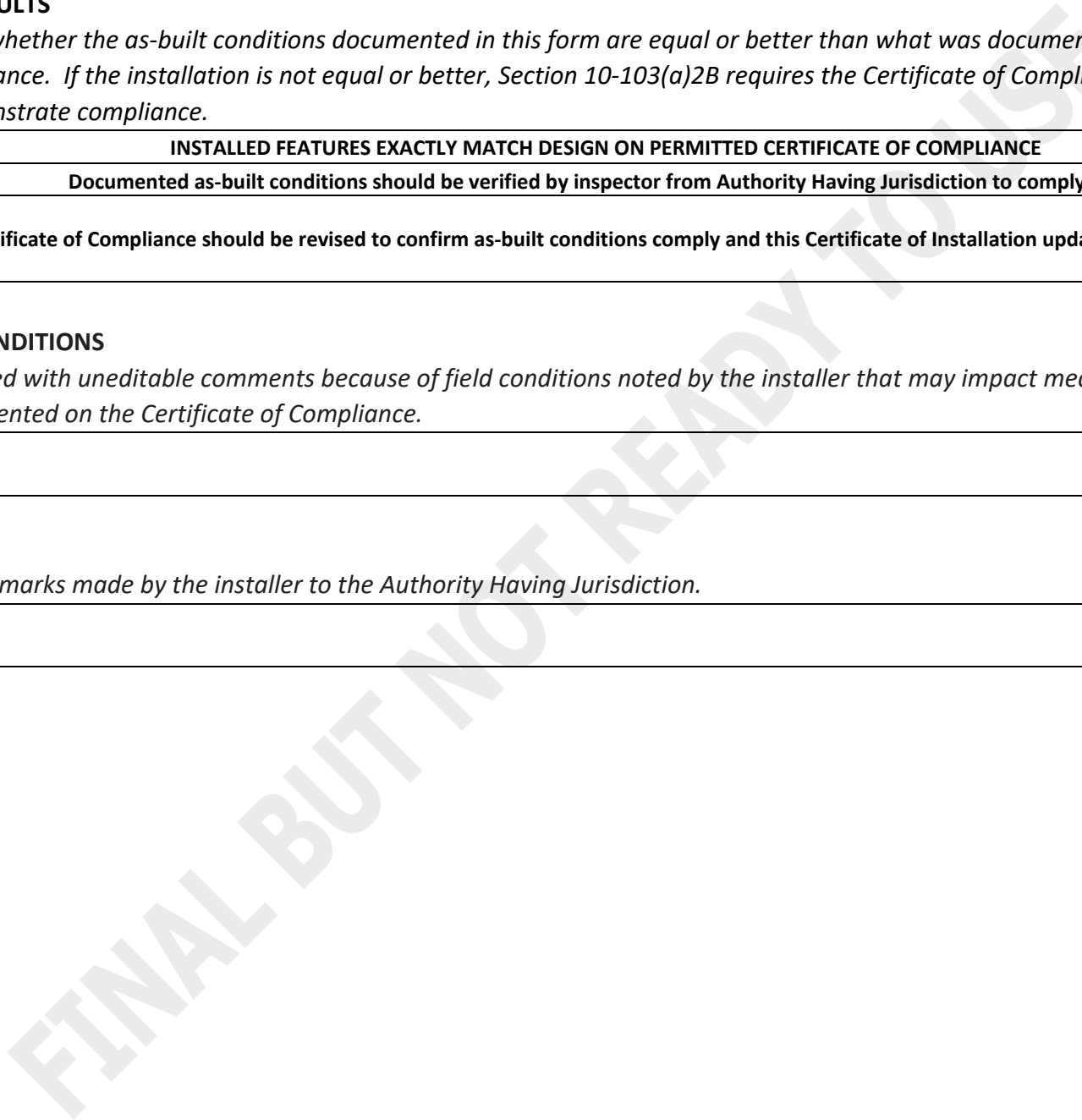
01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact mechanical controls requirements documented on the Certificate of Compliance.*

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. INSTALLATION DETAILS**

The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.

**Dry System Equipment Schedule**

01		02	03	04	05	06	07	08	09	10	11	12	13	14
Name or Item Tag	Model #	Equipment Type	Heating Mode				Cooling Mode					Equipment Compliance		
			Rated Output (kBtu/h)	Supplemental Heating Output (kBtu/h)	Efficiency	Efficiency Unit	Refrigerant Loop Heat Recovery	Rated Output (kBtu/h)	Efficiency	Efficiency Unit	Efficiency		Efficiency Unit	
Per C of C														
As-built Conditions														

**Dual Fuel Heat Pump Equipment Schedule**

01		02	03	04	05	06	07	08	09	10	11	12	13
Name or Item Tag	Model #	Heating Mode				Cooling Mode					Equipment Compliance		
		System Category	Size Category (Btu/h)	Efficiency	Efficiency Unit	System Category	Size Category (Btu/h)	Efficiency	Efficiency Unit	Efficiency		Efficiency Unit	
Per C of C													
As-built Conditions													



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DX DOAS Schedule**

01		02	03	04	05	06	07	08	09	10
Name or Item Tag		Model #	Equipment Type	Energy Recovery	Rating Condition	Efficiency	Efficiency Unit	Efficiency	Efficiency Unit	Equipment Compliance
Per C of C							ISMRE		ISCOP	
As-built Conditions										

**Boiler Efficiency and Controls**

01		02	03	04	05	06	07	08	09	10	11
Tag/Plan Detail ID		Model #	Equipment Type	Quantity	Rated Input (Btu/h)	Rated Efficiency	Efficiency Unit	Controls		Hot Water Supply Temperature	Equipment Compliance
								Isolation Valve	Temperature Reset		
Per C of C											
As-built Conditions											

**Chiller & Air to Water Heat Pump Efficiency and Controls**

01		02	03	04	05	06	07	08	09	10	11	12
Tag/Plan Detail ID		Model #	Equipment Type	Quantity	Size (tons)	Rated Efficiency #1	Efficiency Unit #1	Rated Efficiency #2	Efficiency Unit #2	Controls		Equipment Compliance
										Isolation Valve	Temperature Reset	
Per C of C												
As-built Conditions												



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Mechanical Heat Recovery**

01		02	03
Name or Item Tag		Simultaneous Mechanical Heat Recovery	Heat Recovery Systems Shall: - Transferring the lesser of the following from spaces in cooling to spaces in heating: - 25% of the peak heat rejection of the cooling system - 25% of design capacity of all service water heating systems + design capacity of all space heating systems - Heat or preheat the service water heating to the smaller of: - 30% of the peak heat rejection of the cooling system; or - 30% of design capacity of all service water heating systems
Per C of C			
As-built Conditions			

**Heat Rejection Equipment (Cooling Towers, Condensers, Waterside Economizers) Efficiency and Controls**

01	02	03	04	05	06	07	08	09	10	11	12
Tag/Plan Detail ID	Model #	Equipment Type	Quantity	Rated Performance	Performance Unit	Controls					Equipment Compliance
						Fan Speed Control	Tower Flow Turndown	Fan Control in Multiple Cell Equipment	Economizer Control	Condenser Water Temp. Reset	
Per C of C											
As-built Conditions											

**Electric Resistance Heating**

01	02	03	04	05
Name or Tag ID	Model #	Equipment Description	Output Capacity (kW)	Equipment Compliance
Per C of C				
As-built Conditions				



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Pumps**

01		02	03	04	05	06	07	08	09
Name or Tag ID		Type	Quantity	Horsepower (HP)	Controls				Equipment Compliance
					Variable Flow Controls	Hydronic Heat Pump Isolation	VSD on Pumps > 5HP	Differential Pressure Sensor	
Per C of C									
As-built Conditions									

**Fans and Air Economizers**

01		02	03		04	05	06
Name or Tag ID		Quantity	Fan Function		Economizer	Fan Electrical Input Power (W)	System Compliance
Per C of C							
As-built Conditions							

**Dedicated Outdoor Air System (DOAS)**

01		02	03	04	05	06	07	08	09	10	11
System Name		Quantity	Delivered Directly To The Space	Fan System Power (kW)	Fan System Airflow (CFM)	Watts/CFM	DOAS Fan Control	Multi-Zone DOAS with Cooling	Economizer	Multifamily DOAS	System Compliance
Per C of C							>=3 speeds				
As-built Conditions											

**Exhaust Air Heat Recovery**

01	02	03		04	05	06	07
Fan System Name	Required?	Type of Heat Recovery Rating		Required Recovery Ratio	Installed Recovery Ratio	Energy Recovery Bypass	System Compliance





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Dwelling Unit Fan Efficacy & Energy/Heat Recovery**

01		02	03	04	05	06	07
Fan System Name or Item Tag		System Airflow (cfm)	Input Power (kW)	Watts/CFM	Energy/Heat Recovery Ventilation	Sensible Recovery/Effectiveness	System Compliance
Per C of C							
As-built Conditions							

**System Controls**

01		02	03	04	05	06	07	08	09	10
System Name		Thermostats	Shut-Off Controls	Isolation Zone Controls	Demand Response	Supply Air Temp. Reset	Window Interlocks	Direct Digital Control (DDC)	Heat Pump Defrost	System Compliance
Per C of C										
As-built Conditions										

**Nonresidential, Hotel/Motel and Multifamily Common Use Ventilation Systems**

01		02		03		04			
System Name		System Design OA CFM Airflow		System Design Transfer Air CFM		Air Filtration			
05		06		07		08		09	
Space Name		Exhaust Ventilation		Occupant Sensor Controls		Demand Control Ventilation		System Compliance	
Per C of C									
As-built Conditions									



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Multifamily Dwelling Unit Ventilation Systems**

01		02	03	04	05	06	
Space Name		Supply Air CFM	Exhaust CFM	Local Exhaust	Air Filtration	Space Compliance	
Per C of C							
As-built Conditions							

**Terminal Box Controls**

01		02	03	04	05	06	07	08	09
Zone/System/VAV Box Name or Item Tag		Zonal Control Strategy	Design			Reheated, Recooled, Mixed Air Compliance			Zone/ Box/ System Compliance
			Peak Primary Airflow CFM	Primary Air in Deadband CFM	Reheated Recooled Mixed Airflow CFM	Outside Air CFM	1st Stage Modulates <95°F and Maintains DB Rate?	2nd Stage Modulates from DB Flow to Heating Max Flow?	
Per C of C									
As-built Conditions									

**Ducts**

The following duct systems require duct leakage testing by a certified Mechanical Acceptance Test Technician or a HERS Rater.

Learn more about the Acceptance Testing Program on the Energy Commission website here: <https://www.energy.ca.gov/programs-and-topics/programs/acceptance-test-technician-certification-provider-program>.

Learn more about the ECC Program on the Energy Commission website here: <https://www.energy.ca.gov/programs-and-topics/programs/energy-code-compliance-program>.

01
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Pipe Insulation**

Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service. Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall have a Class I or Class II vapor retarder. All penetrations and joints of which shall be sealed.

Insulation thickness (in) or R-value shall be per the following Title 24, Part 6 Table 120.3-A/ 160.3-D.

Fluid Operating Temperature Range (°F)	Insulation Conductivity			Nominal Pipe Diameter (in inches)				
	Conductivity (in Btu-in/h-ft <sup>2</sup> -°F)	Mean Rating Temperature (°F)		< 1	1 to <1.5	1.5 to < 4	4 to < 8	8 and larger
<b>Space heating and Service Water Heating Systems (Steam, Steam Condensate, Refrigerant, Space Heating, Service Hot Water)</b>				<b>Minimum Pipe Insulation Required (Thickness in inches or R-value)</b>				
Above 350	0.32-0.34	250	Inches	4.5	5.0	5.0	5.0	5.0
			R-value	R 37	R 41	R 37	R 27	R 23
251-350	0.29-0.32	200	Inches	3.0	4.0	4.5	4.5	4.5
			R-value	R 24	R 34	R 35	R 26	R 22
201-250	0.27-0.30	150	Inches	2.5	2.5	2.5	3.0	3.0
			R-value	R 21	R 20	R 17.5	R 17	R 14.5
141-200	0.25-0.29	125	Inches	1.5	1.5	2.0	2.0	2.0
			R-value	R 11.5	R 11	R 14	R 11	R 10
105-140	0.22-0.28	100	Inches	1.0	1.5	1.5	1.5	1.5
			R-value	R 7.7	R 12.5	R 11	R 9	R 8



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

Fluid Operating Temperature Range (°F)	Insulation Conductivity			Nominal Pipe Diameter (in inches)						
	Conductivity (in Btu·in/h·ft <sup>2</sup> ·°F)	Mean Rating Temperature (°F)		< 1	1 to <1.5	1.5 to < 4	4 to < 8	8 and larger		
Space cooling systems (chilled water, refrigerant and brine)				Minimum Pipe Insulation Required (Thickness in inches or R-value) <sup>1</sup>						
40-60	0.21-0.27	75	Inches	Nonres 0.5	Res 0.75	Nonres 0.5	Res 0.75	1.0	1.0	1.0
			R-value	Nonres R 3	Res R 6	Nonres R 3	Res R 5	R 7	R 6	R 5
Below 40	0.20-0.26	50	Inches	1.0		1.5		1.5	1.5	1.5
			R-value	R 8.5		R 14		R 12	R 10	R 9

FINAL BUT NOT RE...



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**G. ACCEPTANCE TESTS & FIELD VERIFICATION**

The following Acceptance Tests and ECC Verifications related to the systems or materials documented on this Certificate of Installation have been indicated on the permitted Certificate of Compliance as being required to comply with Title 24, Part 6.

**Certificates of Acceptance**

Mechanical Acceptance Tests must be completed by a certified Acceptance Testing Technician and Certificate of Acceptance forms completed through an approved Acceptance Test Technician Certification Provider database. The Certificate of Acceptance forms indicated below will be required by the Authority Having Jurisdiction to demonstrate compliance.

Form/Title	Systems to be Field Verified
NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.	
NRCA-MCH-03-A - Must be submitted for Constant Volume Single Zone HVAC.	
NRCA-MCH-04-A - Must be submitted for Air Distribution Duct Leakage.	
NRCA-MCH-05-A - Must be submitted for Air Economizer, DOAS, HRV and ERV Controls.	
NRCA-MCH-06-A - Must be submitted for Demand Control Ventilation.	
NRCA-MCH-07-A - Must be submitted for Supply Fan Variable Flow Controls.	
NRCA-MCH-08-A - Must be submitted for Valve Leakage Test.	
NRCA-MCH-09-A - Must be submitted for Supply Water Temperature Reset Controls.	
NRCA-MCH-10-A - Must be submitted for Hydronic System Variable Flow Controls.	
NRCA-MCH-11-A - Must be submitted for Automatic Demand Shed Controls.	
NRCA-MCH-12-A-FDD-F - Must be submitted for Packaged Direct Expansion Units.	
NRCA-MCH-13-A-FDD - Must be submitted for Air Handling Units and Zone Terminal Units.	
NRCA-MCH-14-A - Must be submitted for Distributed Energy Storage DX-AC Systems.	
NRCA-MCH-15-A - Must be submitted for Thermal Energy Storage.	
NRCA-MCH-16-A - Must be submitted for Supply Air Temperature Reset Controls.	
NRCA-MCH-17-A - Must be submitted for Condenser Water.	
NRCA-MCH-18-A - Must be submitted for Energy Management Control Systems.	
NRCA-MCH-19-A - Must be submitted for Occupancy Sensor Controls.	
NRCA-MCH-20-H - Must be submitted for Multifamily Ventilation.	
NRCA-MCH-21-H - Must be submitted for Multifamily Envelope.	
NRCA-MCH-22-A - Must be submitted for Multifamily Duct Leakage.	
NRCA-MCH-23-A - Must be submitted for Multifamily HRV/ERV Verification.	
NRCA-MCH-24-A - Cooling Tower Conductivity Controls	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Certificates of Verification**

*ECC verifications must be completed by an ECC Rater and NRCV forms completed through an approved ECC Provider database. The Certificate of Verification forms indicated below will be required by the Authority Having Jurisdiction to demonstrate compliance.*

Form/Title	Systems to be Field Verified
LMCV-MCH-24 Enclosure Air Leakage Test	
LMCV-MCH-27 High-rise Residential	
LMCV-MCH-32 Local Mechanical Exhaust	
<i>There are no Acceptance Tests or ECC verifications indicated on the permitted Certificate of Compliance related to the systems or materials documented on this Certificate of Installation.</i>	

Title 24, Part 6 Section 10-103(a)3F requires this Certificate of Installation be posted or made available to the Authority Having Jurisdiction for all applicable inspections.

FINAL BUT NOT READY TO USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-MCH-E
Mechanical Systems	(Page 1 of 6)

### A. General Information

1. This field is filled out automatically.
2. Enter the zip code of the construction project.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

### B. Project Scope

1. Select all applicable equipment, systems and materials documented.

### C. Compliance Results

Results in this table are automatically calculated from data input and calculations in Tables F.

### D. Exceptional Conditions

1. This table is auto filled with uneditable comments because of selections made or data entered in tables throughout the form.

### E. Installer Notes

1. Enter any notes or comments for the AHJ.

### F. INSTALLATION DETAILS

#### Dry System Equipment Schedule

1. This field is filled out automatically.
2. Enter the model # of the equipment being installed.
3. Select: True or False.
4. Enter the heating mode Rated Output of the equipment in kBtu/h.
5. Enter the Supplemental Heating Output of the equipment in kBtu/h.
6. Enter the efficiency of the equipment while in heating mode.
7. This field is filled out automatically.
8. Enter the cooling mode Rated Output of the equipment in kBtu/h.
9. Enter the efficiency of the equipment while in cooling mode.



10. This field is filled out automatically.
11. If a second efficiency is required, enter the efficiency of the equipment while in cooling mode.
12. This field is filled out automatically.
13. This field is calculated automatically.

#### **Heat Pump Equipment Schedule**

1. This field is filled out automatically.
2. Enter the model # of the equipment being installed.
3. Select: True or False.
4. Select: True or False.
5. Enter the efficiency of the heat pump while in heating mode.
6. This field is filled out automatically.
7. Select: True or False.
8. Select: True or False.
9. Enter the efficiency of the heat pump while in cooling mode.
10. This field is filled out automatically.
11. If a second efficiency is required, enter the efficiency of the heat pump while in cooling mode.
12. This field is filled out automatically.
13. This field is calculated automatically.

#### **DX DOAS Schedule**

1. This field is filled out automatically.
2. Enter the model # of the equipment being installed.
3. Select: True or False.
4. Select: True or False.
5. Select: True or False.
6. Enter the ISMRE efficiency of the DOAS equipment.
7. This field is static text showing the efficiency unit is ISMRE.
8. Enter the ISCOP efficiency of the DOAS equipment.
9. This field is static text showing the efficiency unit is ISCOP.
10. This field is calculated automatically.

**Boiler**

1. This field is filled out automatically.
2. Enter the model # of the equipment being installed.
3. Select: True or False.
4. Enter the quantity of identical equipment being installed.
5. Enter the Rated Input of the boiler in Btu/h.
6. Enter the Rated Efficiency of the equipment.
7. This field is automatically filled out.
8. Isolation Valve: Select from Dropdown.
9. Temperature Reset Controls: Select from Dropdown.
10. This field is calculated automatically.

**Chiller**

1. This field is filled out automatically.
2. Enter the model # of the equipment being installed.
3. Select: True or False.
4. Enter the quantity of identical equipment being installed.
5. Select: True or False.
6. Enter the efficiency while in cooling mode.
7. This field is filled out automatically.
8. If a second efficiency is required, enter the efficiency while in cooling mode.
9. This field is filled out automatically.
10. Isolation Valve: Select from Dropdown.
11. Temperature Reset Controls: Select from Dropdown.
12. This field is calculated automatically.

**Heat Rejection Equipment (Cooling Towers, Condensers, Waterside Economizers) Efficiency and Controls**

1. This field is filled out automatically.
2. Enter the model # of the equipment being installed.
3. Select: True or False
4. Enter the quantity of identical equipment being installed.
5. Enter the Rated Performance of the equipment being installed.
6. This field is filled out automatically.

7. Fan Speed Control: Select from Dropdown.
8. Tower Flow Turndown: Select from Dropdown.
9. Fan Control in Multiple Cell Equipment: Select from Dropdown.
10. Economizer Control: Select from Dropdown.
11. Condenser Water Temperature Reset: Select from Dropdown.
12. This field is calculated automatically.

#### **Electric Resistance Heating**

1. This field is filled out automatically.
2. Enter the model # of the equipment being installed.
3. This field is filled out automatically.
4. Enter the Output Capacity in kW.
5. This field is calculated automatically.

#### **Pumps**

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Enter the quantity of identical equipment being installed.
4. Enter the Horsepower of the pump.
5. Variable Flow Controls: Select from Dropdown.
6. Hydronic Heat Pump Isolation Control: Select from Dropdown.
7. Variable Speed Drive on pumps greater than 5 horsepower: Select from Dropdown.
8. Differential Pressure Sensor Control: Select from Dropdown.
9. This field is calculated automatically.

#### **Fans and Air Economizers**

1. This field is filled out automatically.
2. Enter the quantity of identical equipment being installed.
3. Fan Function: Select from Dropdown.
4. Economizer: Select from Dropdown.
5. Enter the Electrical Input Power of the fan in Watts.
6. This field is calculated automatically.

**Dedicated Outdoor Air Systems (DOAS)**

1. This field is filled out automatically.
2. Enter the quantity of identical equipment being installed.
3. Delivered Directly to the Space: Select from Dropdown.
4. Enter the fan system power in kilowatts.
5. Enter the fan system airflow in cubic feet per minute.
6. This field is calculated automatically.
7. This field is static text that says less than or equal to 3 speeds.
8. Multizone DOAS with cooling: Select from Dropdown.
9. Select: Yes or No.
10. Multifamily DOAS: Select from Dropdown.
11. This field is calculated automatically.

**System Controls**

1. This field is filled out automatically.
2. Thermostat Controls: Select from Dropdown.
3. Shut-off Controls: Select from Dropdown.
4. Isolation Zone Controls: Select from Dropdown.
5. Demand Response Controls: Select from Dropdown.
6. Supply Air Temperature Reset Controls: Select from Dropdown.
7. Window Interlock Controls: Select from Dropdown.
8. Direct Digital Controls: Select from Dropdown.
9. This field is calculated automatically.

**Nonresidential, Hotel/Motel and Multifamily Common User Ventilation Systems**

1. This field is filled out automatically.
2. Enter System Designed Outside Air Airflow in cubic feet per minute.
3. Enter System Designed Transfer Air Airflow in cubic feet per minute.
4. Air Filtration: Select from Dropdown.
5. This field is filled out automatically.
6. Enter Exhaust Ventilation for the space.
7. Occupant Sensor Controls: Select from Dropdown.
8. Demand Control Ventilation: Select from Dropdown.

9. This field is calculated automatically.

#### **Multifamily Dwelling Unit Ventilation Systems**

1. This field is filled out automatically.
2. Enter System Designed Outside Air Airflow in cubic feet per minute.
3. Enter System Designed Supply Air Airflow in cubic feet per minute.
4. Enter Exhaust Air Airflow in cubic feet per minute.
5. Local Exhaust: Select from Dropdown.
6. Air Filtration: Select from Dropdown.
7. This field is calculated automatically.

#### **Terminal Box Controls**

1. This field is filled out automatically.
2. Zonal Control Strategy: Select from Dropdown.
3. Enter the Peak Primary Airflow for the zone or system in cubic feet per minute.
4. Enter the Primary Air in Deadband Airflow for the zone or system in cubic feet per minute.
5. Enter the Reheated, Recooled or Mixed Airflow for the zone or system in cubic feet per minute.
6. Enter the Outside Air Airflow for the zone or system in cubic feet per minute.
7. Confirm the first stage modulates and maintains the drybulb rate.
8. Confirm the second stage modulates from drybulb flow to heating max flow.
9. This field is calculated automatically.

#### **Ducts**

1. This field is filled out automatically.

#### **Pipe Insulation**

1. This table includes required pipe insulation values from Part 6 and does not require user entry.

### **G. Acceptance Tests and Field Verification**

1. This field is filled out automatically.

#### **Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of service water heating features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for nonresidential spaces with water heating systems in low-rise mixed-use buildings. Low-rise multifamily buildings which are not mixed-use should document water heating systems on the LMCI-PLB-01-E for Central Water Heating systems in Dwelling Units and the LMCI-PLB-02-E for Single Dwelling Unit Water Heating Systems through ECC Providers Registries.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):		05	Authority Having Jurisdiction:	
02	Zip Code:		06	Building Permit #:	
03	Date of Permit Set used for construction:		07	Date of As-built Set:	
04	Name of Permit Set used for construction:		08	Name of As-built Set:	

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01		02		03		04	
<input type="checkbox"/>	Water Heating Equipment	<input type="checkbox"/>	Distribution (piping, valves, insulation, etc.)	<input type="checkbox"/>	Controls	<input type="checkbox"/>	Pool/Spa



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance to be revised accordingly to demonstrate compliance.*

01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact mechanical controls requirements documented on the Certificate of Compliance.*

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*

FINAL BUT NOT READY FOR SUBMISSION



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. INSTALLATION DETAILS**

The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.

**Domestic Hot Water Equipment Efficiency**

01	02	03	04	05	06	07	08	11
Name or Item Tag	Model #	Space Type	Equipment Type	Volume (gal)	Rated Input Capacity (Btu/h)	Capacity Unit	Rated Efficiency	DHW Equipment Compliance
Per C of C								
As-built Conditions								

**Domestic Hot Water Equipment Additional Requirements**

The following requirements have been included on the permitted Certificate of Compliance (NRCC) to comply with Title 24, Part 6. Installed equipment shall meet these requirements or the Certificate of Compliance shall be modified to demonstrate compliance.

System Name:	
Unfired storage tank insulation shall have Internal + External ≥ R-16 OR External ≥ R-12. Label required per Title 24, Part 6 §110.3(c)3	
Isolation valves installed for instantaneous water heater with input rating > 6.8 kBTUH or 2 kW per Title 24, Part 6 §110.3(c)6.	
Backup heat is required when inlet air is unconditioned unless the compressor cut-off temperature is below the Heating Winter Median of Extremes for the closest location listed in Table 2-3 from Reference Joint Appendix JA2.	
Consumer integrated HPWHs shall meet the following requirement:	
The primary storage tank temperature setpoint shall be at least 135°F - §170.2(d)2Aiv	
The minimum heat pump water heater compressor cut-off temperature shall be equal to or lower than 40°F ambient air temperature	





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Electric Ready Requirements**

System Name:	
A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance	
<p>A ventilation method meeting one of the following:</p> <ul style="list-style-type: none"> <li>- The designated space for the future heat pump water heater shall have a minimum volume of 700 cubic feet; or</li> <li>- The designated space for the future heat pump water heater shall vent to a communicating space in the same pressure boundary via permanent openings with a minimum total NFA of 250 square inches., so that the total combined volume connected via permanent openings is 700 cubic feet or larger. The permanent openings shall be: <ul style="list-style-type: none"> <li>- Fully louvered doors with fixed louvers; or</li> <li>- Two permanent fixed openings located within 12 inches from the enclosure top and bottom;</li> </ul> </li> <li>- The designated space for the future heat pump water heater shall include two 8 inches capped ducts, venting to the building exterior: <ul style="list-style-type: none"> <li>- All ducts, connections, and building penetrations shall be sealed.</li> <li>- Exhaust air ducts and all ducts which cross pressure boundaries shall be insulated to a minimum insulation level of R-6.</li> <li>- Airflow from termination points shall be diverted away from each other.</li> </ul> </li> </ul>	
<p>Space shall be reserved for a Heat Pump. The minimum space reserved shall include space for service clearances and air flow clearances and shall meet one of the following:</p> <ul style="list-style-type: none"> <li>- The space reserved shall be the space required for a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project; or</li> <li>- The space reserved shall meet the requirements specified in Joint Appendix JA15.2.1.</li> </ul>	
<p>Space shall be reserved for Tanks. The minimum space reserved shall include space for service clearances and shall meet one of the following:</p> <ul style="list-style-type: none"> <li>- The space reserved shall be the space required for a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project; or</li> <li>- The space reserved shall meet the requirements specified in Joint Appendix JA15.2.2.</li> </ul>	
<p>Ventilation shall be provided by meeting one of the following:</p> <ul style="list-style-type: none"> <li>- Physical space reserved for the heat pump shall be located outside; or</li> <li>- A pathway shall be reserved for future routing of supply and exhaust air via ductwork from the reserved heat pump location to a suitable outdoor location. Penetrations through the building envelope for louvers and ducts shall be planned and identified for future use. The reserved pathway and penetrations through the building envelope shall be sized to meet one of the following: <ul style="list-style-type: none"> <li>- The reserved pathway and penetrations shall be sized to serve a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>- The reserved pathway and penetrations shall be sized to meet the requirements specified in Joint Appendix JA15.2.3.</li> </ul> </li> </ul>	
<p>Condensate drainage piping. An approved receptacle that is sized per the California Plumbing Code for condensate drainage shall be installed within 3 feet of the reserved heat pump location, or piping shall be installed from within 3 feet of the reserved heat pump location to an approved discharge location that is sized in accordance with the California Plumbing Code, and meet one of the following:</p> <ul style="list-style-type: none"> <li>- Condensate drainage shall be sized to serve a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>- Condensate drainage piping shall be sized to meet the requirements specified in Joint Appendix JA15.2.4.</li> </ul>	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOMESTIC HOT WATER DISTRIBUTION REQUIREMENTS**

The following requirements have been included on the permitted Certificate of Compliance to comply with Title 24, Part 6. Installed equipment shall meet these requirements or the Certificate of Compliance shall be modified to demonstrate compliance.

**Recirculation Loops in Central Systems Serving Dwelling Units or Nonresidential Spaces**

System Name:	
Automatic air release valve no more than 4 feet from pump or vertical pump installation	
Check valve or similar located between recirculation pump and water heating equipment to prevent backflow	
Hose bibb installed between pump and equipment and isolation valve between hose bibb and equipment	
Isolation valves on both sides of the pump	
Cold water and recirculation loop piping is not connected to the hot water storage tank drain port	
Check valve is installed on cold water supply between hot water system and next closest tee on cold water supply	
DWELLING UNITS ONLY: For heat pump water heating systems, the hot water return from the recirculation loop shall connect to a recirculation loop tank and shall not directly connect to the primary heat pump water heater inlet or the primary thermal storage tanks per §170.2(d)2Aii.	
DWELLING UNITS ONLY: For heat pump water heating systems, the fuel source for the recirculation loop tank shall be electricity per §170.2(d)2Aiii.	
DWELLING UNITS ONLY: The recirculation loop tank temperature setpoint shall be at least 10°F lower than the primary thermal storage tank temperature setpoint - §170.2(d)2Av	
DWELLING UNITS ONLY: All hot water distribution piping shall be sized in accordance with the California Plumbing Code Appendix M per §170.2(d)2C.	
DWELLING UNITS ONLY: A recirculation system with mechanical or digital thermostatic master mixing valve on each distribution supply and return loop and meet the requirements in Reference Appendix RA4.4, unless building has ≤ 8 dwelling units	

**Distribution of Individual System(s) serving Dwelling Units**

System Name:	
Single 240-volt heat pump water heaters serving dwelling units must also include systems with:	
	- Compact hot water distribution system as specified in Reference Appendix RA4.4.16 in climate zone 1 & 16; AND
	- A drain water heat recovery system that is field verified by an ECC Rater per Reference Appendix RA3.6.9 in climate zone 16.
A drain water heat recovery system that is field verified by an ECC Rater per Reference Appendix RA3.6.9 in climate zone 16.	
For recirculation distribution systems serving individual dwelling units, only Demand Recirculation Systems with manual on/off control as specified in the Reference Appendix RA4.4.9 shall be used.	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Mandatory Pipe Insulation Requirements**

System Name:	
<p>For systems serving dwelling units and common areas, pipe insulation must meet the minimum insulation requirements in Table 160.4-A (see below) except:</p> <ul style="list-style-type: none"> <li>- Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration. Piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall abut securely against all framing members.</li> <li>- Piping installed in interior or exterior walls shall not be required to have pipe insulation if all of the requirements are met for compliance with Quality Insulation Installation (QII) as specified in the Reference Residential Appendix RA3.5.</li> <li>- Piping surrounded with a minimum of 1 inch of wall insulation, 2 inches of crawlspace insulation, or 4 inches of attic insulation, shall not be required to have pipe insulation.</li> </ul>	
<p>For systems serving nonresidential spaces, pipe insulation for the following applications must comply with the following:</p> <ul style="list-style-type: none"> <li>- Recirculating system piping, including supply and return piping of the water heater</li> <li>- The first 8 ft of hot and cold outlet piping, including between storage tank and heat trap, for a nonrecirculating storage system</li> <li>- Pipes that are externally heated</li> </ul>	
<p>Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service per §120.3(b)/ §160.4(f). Pipe insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.</p>	

FINAL BUT NOT READY FOR USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Domestic Hot Water System Controls**

The following requirements have been included on the permitted Certificate of Compliance to comply with Title 24, Part 6. Installed equipment shall meet these requirements or the Certificate of Compliance shall be modified to demonstrate compliance.

Manufacturers must certify that service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use as listed in Table 3, Chapter 50 of the ASHRAE Handbook, HVAC Applications Volume or Table 613.1 of the California Plumbing Code for healthcare facilities.
On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed- in the ASHRAE Handbook, Applications Volume, shall have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature unless covered by California Plumbing Code Section 613.0.
Controls for circulating pumps or electrical heat trace systems are capable of automatically turning off the system unless system serves healthcare facility.
For recirculation systems serving multiple dwelling units, design includes a mechanical or digital thermostatic master mixing valve on each distribution supply and return loop per §170.2(d), or §180.1(b)3 for additions or alterations.
For recirculation systems serving individual dwelling units, design includes manual on/off controls as specified in Reference Appendix RA 4.4.9 per §150.1(c)8 §170.2(d).
Combustion air positive shut-off shall be provided per §160.4(e) on all newly installed commercial boilers as follows: <ul style="list-style-type: none"> <li>- Boiler with input capacity &gt;= 2.5 MMBtu/h, in which the boiler is designed to operate with a nonpositive vent static pressure</li> <li>- Boilers where one stack serves two or more boilers with a total combined input capacity per stack of 2.5 MMBtu/h.</li> </ul>
Boiler combustion air fans with motors >= 10 hp shall meet one of the following for newly installed boilers: <ul style="list-style-type: none"> <li>- The fan motor shall be driven by a variable speed drive OR</li> <li>- The fan motor shall include controls that limit the fan motor demand to &lt;= 30% of the total design wattage at 50% of the design air volume.</li> </ul>
Newly installed boilers with an input capacity >= 5 MMBtu/h and a steady state full-load combustion efficiency < 90% shall maintain excess (stack-gas) oxygen concentrations <= 5% by volume on a dry basis over firing rates of 20-100%. Combustion air volume shall be controlled with respect to firing rate or flue gas oxygen concentration. Use of a common gas and combustion air control linkage or jack shaft is prohibited.

**Pool & Spa**

01	02	03	04	05	06	07	08	09	10
Pool/ Spa Description	Pool/Spa Service Type	On/Off Control	Instructions	Covers	Electric Resistance Heating Equipment	Heating Source Sizing	Piping	Pool Directional Inlets & Pump Control	Compliance
Per C of C									
As-built Conditions									



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Additional Requirements For Pool/ Spa Serving One Tenant §150.0(P)**

Pool/Spa Description:	
Dedicated-purpose pool pumps and replacement dedicated-purpose pump motors subject to State or Federal appliance standards shall be listed in the Commission's directory of certified equipment. - Dedicated-purpose pool pumps shall meet 20 CCR § 1605.1(g)(7) of the Appliance Efficiency Regulations. - Replacement dedicated-purpose pool pumpmotors shall meet 20 CCR § 1605.3 of the Appliance Efficiency Regulations.	
Filtration pumps shall be sized, or if programmable, shall be programmed, so that the filtration flow rate is not greater than the rate needed to turn over the pool water volume in 6 hours or 36 gpm, whichever is greater.	
Dedicated-purpose pool pumps with more than one speed shall have: - Controls that default to the filtration flow rate when no auxiliary pool loads are operating, and; - Controls that default to the filtration flow rate setting within 24 hours and shall have an override capability for servicing.	
System Piping must meet the following requirements: - A length of straight pipe that is greater than or equal to at least 4 pipe diameters shall be installed before the pump; and - Pool piping shall be sized so that the velocity of the water at maximum flow for auxiliary pool loads does not exceed 8 feet per second in the return line and 6 feet per second in the suction line; and - All elbows shall be sweep elbows or of an elbow-type that has a pressure drop of less than the pressure drop of straight pipe with a length of 30 pipe diameters.	
Filters shall be at least the size specified in NSF/ANSI 50 for public pool intended applications.	
Minimum diameter of backwash valves shall be 2 inches or the diameter of the return pipe, whichever is greater.	

**G. ACCEPTANCE TESTS & FIELD VERIFICATION**

*The following Acceptance Tests and ECC Verifications related to the systems or materials documented on this Certificate of Installation have been indicated on the permitted Certificate of Compliance as being required to comply with Title 24, Part 6.*

**Certificates of Acceptance**

*There are no Certificates of Acceptance applicable to service water heating requirements.*

**Certificates of Verification**

*ECC verifications must be completed by an ECC Rater and LMCV forms completed through an approved ECC Provider database. The Certificate of Verification forms indicated below will be required by the Authority Having Jurisdiction to demonstrate compliance.*

Form/Title	Systems to be Field Verified
LMCV-PLB-21-H Central Hot Water Distribution Verification	
LMCV-PLB-22-H Individual Dwelling Unit Hot Water Distribution Verification	

*There are no Acceptance Tests or ECC verifications indicated on the permitted LMCC related to the systems or materials documented on this LMCI.*

*A copy of this Certificate of Installation should be distributed to the Field Technician(s) who will perform the acceptance test(s). Title 24, Part 6 Section 10-103(a)3F also requires this Certificate of Installation be posted or made available to the Authority Having Jurisdiction for all applicable inspections.*



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-PLB-E
Domestic Water Heating System	(Page 1 of 3)

#### A. General Information

1. This field is filled out automatically with data from the NRCC.
2. This field is filled out automatically with data from the NRCC.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

#### B. Project Scope

1. Select water heating equipment if applicable.
2. Select distribution (piping, valves, insulation, etc.) if applicable.
3. Select controls if applicable.

#### C. Compliance Results

This table is automatically filled with uneditable comments based on data entered in Section F.

#### D. Exceptional Conditions

This table is automatically filled with uneditable comments because of selections made or data entered in tables throughout the form.

#### E. Additional Remarks

Enter any notes or comments for the AHJ.

#### F. Installation Details

##### Domestic Hot Water Equipment Efficiency

1. This field is filled out automatically.
2. Enter the Model # of the equipment installed.
3. Individual or Central System: Select from dropdown.
4. Equipment Type: Select from dropdown.
5. Enter the Volume (gal) of the equipment installed.
6. Enter the Rated Input Capacity (Btu/h) of the equipment installed.
7. Enter the Capacity Unit of the equipment installed.

8. Enter the Rated Efficiency of the equipment installed.
9. This field is filled out automatically.
10. This field is automatically calculated.
11. This field is filled out automatically.

**Domestic Hot Water Equipment Requirements**

1. This table covers the requirements for domestic hot water equipment.

**Electric Ready Requirements**

1. This table covers the requirements for Electric Ready.

**Domestic Hot Water Distribution Additional Requirements**

1. This table covers the additional requirements for domestic hot water distribution.

**Distribution of Individual System(s) serving Dwelling Units**

1. This table covers the requirements for Distribution of Individual System(s) serving Dwelling Units.

**Mandatory Pipe Insulation Requirements**

1. This table covers the requirements for Mandatory Pipe Insulation Requirements.

**Domestic Hot Water System Controls**

1. This table covers the requirements for domestic hot water system controls.

**Pool & Spa**

1. This table covers the requirements for Pool & Spa.

**Additional Requirements For Pool/Spa Serving One Tenant §150.0(P)**

1. This table covers the additional requirements for Pool/Spa Serving One Tenant.



CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-PLB-E
Domestic Water Heating System	(Page 3 of 3)

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FINAL BUT NOT READY TO USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of process system features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):		05	Authority Having Jurisdiction:	
02	Zip Code:		06	Building Permit #:	
03	Date of Permit Set used for construction:		07	Date of As-built Set:	
04	Name of Permit Set used for construction:		08	Name of As-built Set:	

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01					
<b>Electrical</b>					
<input type="checkbox"/>	Elevator Lighting				
<b>HVAC</b>					
<input type="checkbox"/>	Commercial Kitchen Ventilation	<input type="checkbox"/>	Parking Garage Exhaust	<input type="checkbox"/>	Elevator Ventilation Controls
<b>Specialty</b>					
<input type="checkbox"/>	Commercial Kitchen Hood				



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance form to be revised accordingly to demonstrate compliance.*

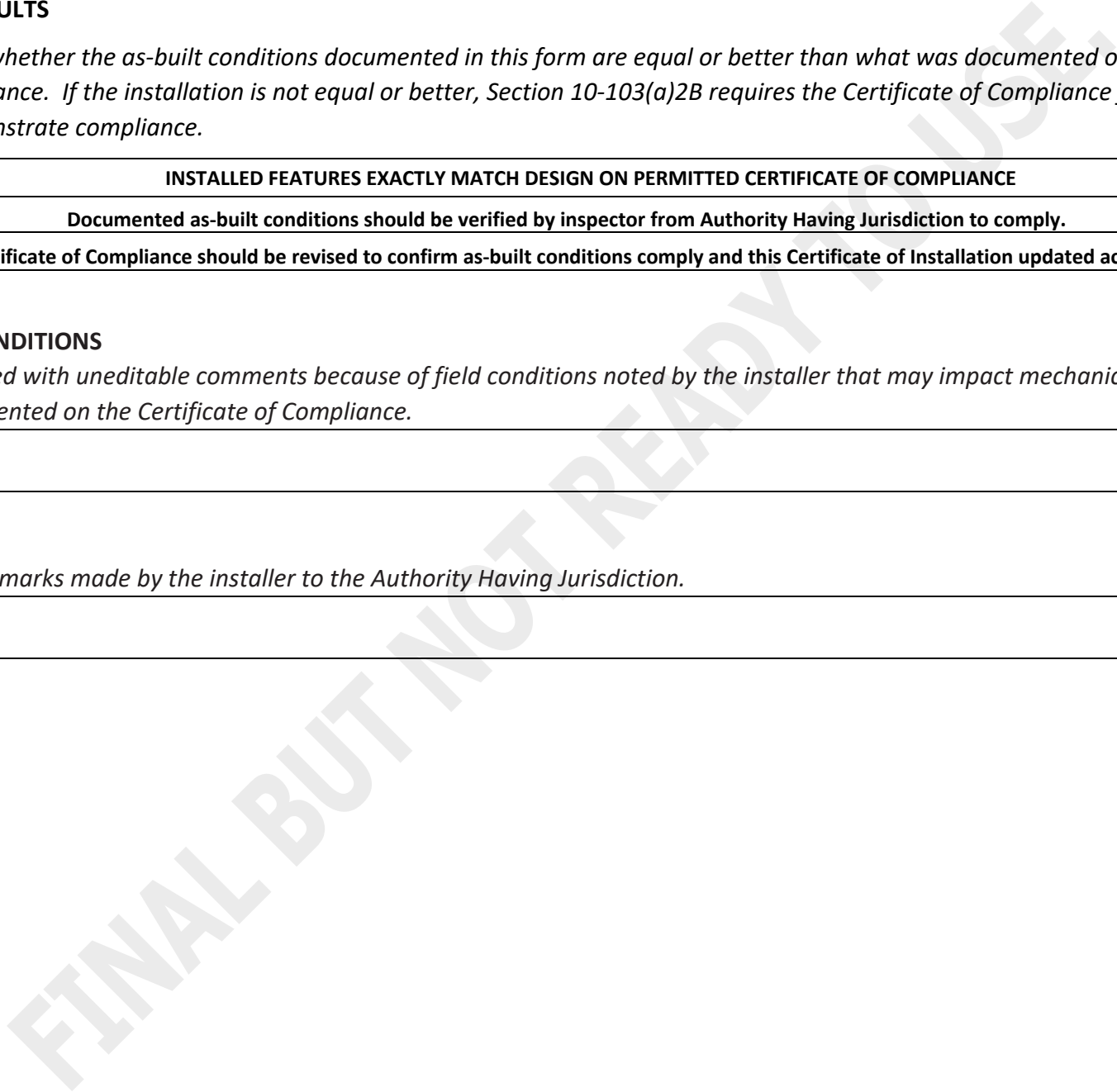
01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact mechanical controls requirements documented on the Certificate of Compliance.*

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. INSTALLATION DETAILS**

The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.

**Enclosed Parking Garage Exhaust Controls**

	Per C of C	As-built	Exceptions
01	<input type="checkbox"/>	<input type="checkbox"/>	Garage is expected to have vehicles with non-gasoline combustion engines for > 20% of the parked vehicles per Exception 1 to §120.6(c)
02	<input type="checkbox"/>	<input type="checkbox"/>	Project scope includes an addition or alteration to an existing garage where < 10,000 cfm of new exhaust capacity is being added Exception 2 to §120.6(c)
			Requirements
03	<input type="checkbox"/>	<input type="checkbox"/>	Exhaust fan control modulates airflow rates <= 50% design capacity when contaminant levels are maintained per §120.6(c)1
04	<input type="checkbox"/>	<input type="checkbox"/>	Fan control or device allows fan motor demand ≤ 30% design wattages at 50% of design airflow per §120.6(c)2
05	<input type="checkbox"/>	<input type="checkbox"/>	Design includes monitoring CO with a sensor density >= 1 per 5,000 ft <sup>2</sup> per §120.6(c)3
06	<input type="checkbox"/>	<input type="checkbox"/>	CO sensors are located in the highest expected concentration locations, with at least two per proximity zone per §120.6(c)3
07	<input type="checkbox"/>	<input type="checkbox"/>	Design CO sensor setpoint <= 25 ppm per §120.6(c)4
08	<input type="checkbox"/>	<input type="checkbox"/>	Occupied garage design maintains negative pressurization per §120.6(c)6
09	<input type="checkbox"/>	<input type="checkbox"/>	Designed occupied total ventilation rate >= 0.15 CFM/ ft <sup>2</sup> §120.6(c)5

CO Sensors shall be:

- A. Certified by the manufacturer to be accurate within plus or minus 5% of measurement.
- B. Factory calibrated
- C. Certified by the manufacturer to drift no more than 5% per year.
- D. Certified by the manufacturer to require calibration no more frequently than once a year.
- E. Monitored by a control system. The system shall have logic that automatically checks for sensor failure by the following means. Upon detection of a failure, the system shall reset to design ventilation rates and transmit an alarm to the facility operators.
  - i. If any sensor has not been calibrated according to the manufacturer's recommendations within the specified calibration period, the sensor has failed.
  - ii. During unoccupied periods the system compares the readings of all sensors, e.g., if any sensor is more than ppm above or below the average of all sensors for longer than 4 hrs, the sensor has failed.
  - iii. During unoccupied periods the system compares the readings of sensor in the same proximity zone, e.g. if the 30 minute rolling average for any sensor in a proximity zone is more than 15 ppm above or below the 30 minute rolling average for other sensor(s) in that proximity zone, the sensor has failed.

**Enclosed Parking Garage Exhaust**



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

01	02	03	04
Fan Name or Item Tag	Parking Garage Area (ft2)	Ventilation Fan Rate (CFM)	Exhaust Compliance
Per C of C			
As-built Conditions			

**Elevator Lighting and Ventilation**

**Lighting**

01	02	03	04	05	06
Elevator Name or Item Tag	Fixture Name or Item Tag	Number of Fixtures	Watts per Fixture	Total Power	Elevator Lighting Compliance
Per C of C					
As-built Conditions					

**Ventilation**

07	08	09	10	11	12
Name or Item Tag	Fan Power (Watts)	Airflow (CFM)	Watts per CFM	Controls	Elevator Ventilation Compliance
Per C of C					
As-built Conditions					

**Commercial Kitchen Exhaust & Ventilation**



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Kitchen Ventilation**

The following ventilation requirements have been included on the permitted Certificate of Compliance to comply with Title 24, Part 6. Installed equipment shall meet these requirements or the Certificate of Compliance shall be modified to demonstrate compliance.

Providing replacement air directly to the hood(s) that does not exceed 10% of the hood(s) exhaust rate.
Not providing replacement air directly to the hood(s).
Mechanically cooled or heated makeup air delivered to any space with a kitchen hood does not exceed the supply flow required to meet the space heating and cooling load.
Mechanically cooled or heated makeup air delivered to any space with a kitchen hood does not exceed the hood exhaust flow minus the available transfer air from adjacent spaces.
The kitchen /dining facility has a total Type I and Type II kitchen hood exhaust airflow rate > 5000 cfm and at least 50% of all replacement air is transferred air that would otherwise be exhausted.
The kitchen /dining facility has a total Type I and Type II kitchen hood exhaust airflow rate > 5000 cfm and demand ventilation system(s) on at least 75% of the exhaust air.
The kitchen /dining facility has a total Type I and Type II kitchen hood exhaust airflow rate > 5000 cfm and listed energy recovery devices with a sensible heat recovery effectiveness of > 40 on at least 50% of the total exhaust airflow.
The kitchen /dining facility has a total Type I and Type II kitchen hood exhaust airflow rate > 5000 cfm and a minimum of 75% of makeup air volume having a total of no more than 60°F and uncooled or cooled without the use of mechanical cooling.

**Kitchen Hood**

01	02	03	04	05	06	07
Name or Item Tag	Hood Type	Hood Style	Equipment Duty	Hood Length (ft)	Hood Exhaust Rate (CFM)	Kitchen Exhaust Compliance
Per C of C						
As-built Conditions						



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Electric Ready Commercial Kitchens**

1		2	3
System Name		Dedicated Branch Wiring	Electrical Panel Sizing
Per NRCC		Includes a dedicated branch circuit wiring and outlet accessible to cookline appliances and meets the following requirements:  a) The branch circuit conductors shall be rated at 50 amps minimum. b) The electrical service panel shall have a minimum capacity of 800 connected amps.	The electrical service panel shall be sized to accommodate an additional either 208v or 240v 50-amp breaker.
As-built			

**G. ACCEPTANCE TESTS & FIELD VERIFICATION**

*The following Acceptance Tests related to the systems or materials documented on this Certificate of Installation have been indicated on the permitted Certificate of Compliance as being required to comply with Title 24, Part 6. Process System Acceptance Tests are not required to be completed by a certified Acceptance Test Technician and may be completed by a field technician (which may be the installer). The Certificate of Acceptance forms indicated below will be required by the Authority Having Jurisdiction to demonstrate compliance.*

Form/Title	Systems to be Field Verified
NRCA-PRC-02-F Kitchen Exhaust	
NRCA-PRC-03-F Garage Exhaust	
NRCA-PRC-12-F Elevator Lighting & Ventilation Controls	
<i>There are no Acceptance Tests indicated on the permitted Certificate of Compliance related to the systems or materials documented on this Certificate of Installation.</i>	

*A copy of this Certificate of Installation should be distributed to the certified Acceptance Test Technician(s) who will perform the acceptance test(s). Title 24, Part 6 Section 10-103(a)3F also requires this Certificate of Installation be posted or made available to the Authority Having Jurisdiction for all applicable inspections.*



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:



CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-PRC-E
Process System	(Page 1 of 3)

#### A. General Information

1. This field is filled out automatically.
2. Enter the Zip Code.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

#### B. Project Scope

1. Select applicable electrical components.
2. Select applicable HVAC components.
3. Select applicable specialties.

#### C. Compliance Results

This table is automatically filled with uneditable comments based on data entered in Section F.

#### D. Exceptional Conditions

This table is automatically filled with uneditable comments because of selections made or data entered in tables throughout the form.

#### E. Installer Notes

Enter any notes or comments for the AHJ.

#### F. Installation Details

##### Enclosed Parking Garage Exhaust Controls

1. Select the As-built box if the Exception applies.
2. Select the As-built box if the Exception applies.
3. Select the As-built box if the Requirement is met.
4. Select the As-built box if the Requirement is met.
5. Select the As-built box if the Requirement is met.

6. Select the As-built box if the Requirement is met.
7. Select the As-built box if the Requirement is met.
8. Select the As-built box if the Requirement is met.
9. Select the As-built box if the Requirement is met.

**Enclosed Parking Garage Exhaust**

1. This field is filled out automatically.
2. Enter the Parking Garage Area (ft<sup>2</sup>).
3. Enter the Ventilation Fan Rate (CFM).
4. This field is filled out automatically.

**Elevator Lighting and Ventilation**

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Enter the Lighting Number of Fixtures.
4. Enter the Lighting Watts per Fixture.
5. This field is filled out automatically.
6. This field is filled out automatically.
7. This field is filled out automatically.
8. Enter the Ventilation Fan Power (Watts).
9. Enter the Ventilation Airflow (CFM).
10. This field is filled out automatically.
11. Controls: Select from dropdown.
12. This field is filled out automatically.

**Commercial Kitchen Ventilation**

1. This table covers commercial kitchen ventilation requirements.

**Commercial Kitchen Hood**

1. This field is filled out automatically.
2. Hood Type: Select the dropdown.
3. Hood Style: Select the dropdown.
4. Equipment Duty: Select the dropdown.
5. Enter the Hood Length (ft).

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-PRC-E
Process System	(Page 3 of 3)

6. Enter the Hood Exhaust Rate (CFM).
7. This field is filled out automatically.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FINAL BUT NOT READY FOR USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

*This Certificate of Installation documents the installation of solar and battery features, materials, components, and manufactured devices required to demonstrate compliance with Title 24, Part 6 per §10-103(a)3 for low-rise multifamily and low-rise mixed-use occupancies.*

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

**A. GENERAL INFORMATION**

01	Project Location (city):	05	Authority Having Jurisdiction:
02	Zip Code:	06	Building Permit #:
03	Date of Permit Set used for construction:	07	Date of As-built Set:
04	Name of Permit Set used for construction:	08	Name of As-built Set:

**B. INSTALLER SCOPE**

*This table indicates construction systems and materials documented on this Certificate of Installation.*

01							
<input type="checkbox"/>	Allocated Solar Zone	<input type="checkbox"/>	Photovoltaics	<input type="checkbox"/>	Solar Water Heater	<input type="checkbox"/>	Smart Thermostat
<input type="checkbox"/>	Home Automation System	<input type="checkbox"/>	Greywater Irrigation	<input type="checkbox"/>	Rainwater Catchment System	<input type="checkbox"/>	Electric Vehicle Charging Space
<input type="checkbox"/>	Energy Star Dishwasher and Energy Star Refrigerator	<input type="checkbox"/>	Energy Star Dishwasher F w/Electronically Communicated Mower	<input type="checkbox"/>	Battery Storage System		



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**C. COMPLIANCE RESULTS**

*This table indicates whether the as-built conditions documented in this form are equal or better than what was documented on the permitted Certificate of Compliance. If the installation is not equal or better, Section 10-103(a)2B requires the Certificate of Compliance form to be revised accordingly to demonstrate compliance.*

01	<b>INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE</b>
<b>Documented as-built conditions should be verified by inspector from Authority Having Jurisdiction to comply.</b>	
<b>The Certificate of Compliance should be revised to confirm as-built conditions comply and this Certificate of Installation updated accordingly.</b>	

**D. EXCEPTIONAL CONDITIONS**

*This table is auto-filled with uneditable comments because of field conditions noted by the installer that may impact mechanical controls requirements documented on the Certificate of Compliance.*

**E. INSTALLER NOTES**

*This table includes remarks made by the installer to the Authority Having Jurisdiction.*

FINAL BUT NOT READY FOR USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. INSTALLATION DETAILS**

The following tables indicate performance requirements as documented on the permitted Certificate of Compliance for all systems and components included in Table B. Installer Scope. Also indicated are the as-built conditions documented by the installer/ documentation author.

**Allocated Solar Zone on Roof for Future Use**

01	02	03	04	05	06	07
Subarea Name	Building Plan Reference Showing Solar Zone	Solar Zone Free from Obstructions? <sup>1</sup>	Location reserved for inverters and metering and a pathway reserved for routing of conduit from solar zone to point of interconnection?	Main electrical service panel has a minimum busbar rating of 200 amps?	Main electrical service panel has a reserved space for the installation of a circuit breaker for future solar electric installation that is labeled?	Solar Zone Compliance
Per C of C						
As-built Conditions						

**Permanently Installed Solar Photovoltaic (PV) System**

<input type="checkbox"/>	The system meets the installation requirements of Joint Appendix JA11.								
01	02	03	04	05	06	07	08	09	10
PV Array ID or Name	Installed DC Power Rating (kW)	Module Type	Azimuth (deg)	Tilt Input (deg/pitch)	Angle/Tilt	Annual Solar Access (%)	Inverter Efficiency (%)	Array Type	Module Level Power Electronics
As-built Conditions									
As-built Conditions									
11	Total As-built DC System Size (kW)		12	Total DC System Size per C of C (kW)		13		PV Compliance	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Battery Energy Storage System**

<input type="checkbox"/>	The system meets the installation requirements of Joint Appendix JA12.						
01	02	03	04	05	06	07	08
Manufacturer	Model #	Rated Usable Energy Capacity of BESS (kWh)	Rated Power Capacity of BESS (kW <sub>dc</sub> )	Control	Rated Single Charge-Discharge AC Efficiency	Battery System Certified by CEC?	Battery Compliance
Per C of C							
As-built Conditions							

**Permanently Installed Solar Hot Water System**

01	02	03	04	05	06
SRCC # or IAPMO File #	Certification Number	System Type	Solar Savings Fraction	Drainwater Heat Recovery	SHW Compliance
Per C of C					
As-built Conditions					



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**Smart Thermostats and Additional Efficiency Measure in Multifamily Dwelling Units**

*The following requirements have been included on the permitted Certificate of Compliance to comply with Title 24, Part 6. Installations shall meet these requirements or the Certificate of Compliance shall be modified to demonstrate compliance.*

<p>1. All thermostats in each dwelling unit comply with the following requirements from Title 24, Part 6 §110.12(a) and all requirements in Joint Appendix 5: All demand responsive controls shall be either:</p> <ul style="list-style-type: none"> <li>A. A certified OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification; or a certified Baseline Profile Open ADR 3.0 Virtual End Node; or</li> <li>B. Certified by the manufacturer to the Energy Commission as being capable of responding to a demand response signal from a certified OpenADR 2.0b or a certified Baseline Profile OpenADR 3.0 Virtual End Node by automatically implementing the control functions requested by the Virtual End Node for the equipment it controls.</li> </ul> <p>2. All demand responsive controls shall be capable of communicating using one or more of the following: Wi-Fi, ZigBee, BACnet, Ethernet, or hard-wiring.</p> <p>3. Demand responsive controls may incorporate and use additional protocols beyond those specified in Sections 110.12(a)1 and 2.</p> <p>4. When communications are the demand response signal is disabled or unavailable, all demand responsive controls shall continue to perform all other control functions provided by the control.</p>
Dwelling units include an ENERGY STAR dishwasher AND EITHER an ENERGY STAR refrigerator OR a whole house fan driven by an electronically commutated motor.
Dwelling units include a home automation system that is capable of, at a minimum, controlling the appliances and lighting of the dwelling and responding to demand response signals.
Dwelling units include alternative plumbing piping to permit the discharge from the clothes washer and all showers and bathtubs to be used for an irrigation system in compliance with the California Plumbing Code and any applicable local ordinances.
Dwelling units include a rainwater catchment system designed to comply with the California Plumbing Code and any applicable local ordinances, and that uses rainwater flowing from at least 65% of the available roof area.
Project complies with Title 24, Part 11, §A4.106.8.2 requirements for electric vehicle charging spaces.





**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building. shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Responsible Person Scope		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-SAB-E
Solar and Battery	(Page 1 of 2)

#### A. General Information

1. Enter the City the project is located in.
2. Enter the zip code.
3. Enter the Date of Permit Set used for construction.
4. Enter the Name of Permit Set used for construction.
5. Enter the Authority Having Jurisdiction.
6. Enter the Building Permit #.
7. Enter the Date of As-Built Set.
8. Enter the Name of As-Built Set.

#### B. Project Scope

1. Select all applicable construction systems and materials documented.

#### C. Compliance Results

1. This table is auto filled based on selections made in section F.

#### D. Exceptional Conditions

1. This table is auto filled with uneditable comments because of selections made or data entered in tables throughout the form.

#### E. Installer Notes

1. Enter any notes or comments for the AHJ.

#### F. Installation Details

##### Allocated Solar Zone

1. This field is filled out automatically.
2. This field is filled out automatically.
3. Solar Zone Free of Obstructions: Select from dropdown.
4. This field is calculated automatically.

##### Permanently Installed Solar Photovoltaic (PV) System

1. Enter Installed DC Power Rating.
2. This field is calculated automatically.

CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS	LMCI-SAB-E
Solar and Battery	(Page 2 of 2)

### **Battery Storage System**

1. Enter Rated Energy Capacity of Battery.
2. Enter Rated Power Capacity of Battery.
3. This field is calculated automatically.

### **Permanently Installed Solar Hot Water System**

1. SRCC/IAPMO#: Select from Dropdown.
2. Enter Certification Number.
3. This table is auto filled with uneditable text.
4. Enter Solar Savings Fraction.
5. This field is filled out automatically.
6. This field is calculated automatically.

### **Smart Thermostats and Additional Efficiency Measure in Multifamily Dwelling Units Requirements**

#### **Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Field Name, Value. Fields include Project Name, Enforcement Agency, Dwelling Address, Permit Number, City and Zip Code, Permit Application Date.

A. General Information

Table with 2 columns: ID, Description. Row 01: Project Scope

B. Heat Pump Space Heater Ready

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID, Requirement. Rows 01-05 detailing requirements for heat pump space heater installation.

C. Electric Cooktop Ready

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID, Requirement. Rows 01-05 detailing requirements for electric cooktop installation.

D. Electric Clothes Dryer Ready – Systems Serving Individual Dwelling Units

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID, Requirement. Rows 01-05 detailing requirements for electric clothes dryer installation.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

E. Electric Clothes Dryer Ready – Systems in Common Areas

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 4 rows (01-04) detailing conductor installation, labeling, capacity requirements, and demand factors for electric clothes dryer systems.

F. Individual Heat Pump Water Heater Ready

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 4 rows (01-04) detailing electrical receptacle requirements, condensate drain, ventilation space, and HPWH space requirements for individual heat pump water heaters.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**G. Central Heat Pump Water Heater Ready**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	The system input capacity of the gas or propane water heating system shall be determined as the sum of the input gas or propane capacity of all water heating devices associated with each gas or propane water heating system.
02	<p>Space reserved shall include:</p> <p>A. Heat Pump. The minimum space reserved shall include space for service clearances and air flow clearances and shall meet one of the following:</p> <ul style="list-style-type: none"> <li>i. The space reserved shall be the space required for a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project; or</li> <li>ii. The space reserved shall meet the requirements specified in Joint Appendix JA15.2.1.</li> </ul> <p>B. Tanks. The minimum space reserved shall include space for service clearances and shall meet one of the following:</p> <ul style="list-style-type: none"> <li>i. The space reserved shall be the space required for a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project; or</li> <li>ii. The space reserved shall meet the requirements specified in Joint Appendix JA15.2.2.</li> </ul>
03	<p>Ventilation shall be provided by meeting one of the following:</p> <p>A. Physical space reserved for the heat pump shall be located outside; or</p> <p>B. A pathway shall be reserved for future routing of supply and exhaust air via ductwork from the reserved heat pump location to a suitable outdoor location. Penetrations through the building envelope for louvers and ducts shall be planned and identified for future use. The reserved pathway and penetrations through the building envelope shall be sized to meet one of the following:</p> <ul style="list-style-type: none"> <li>i. The reserved pathway and penetrations shall be sized to serve a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>ii. The reserved pathway and penetrations shall be sized to meet the requirements specified in Joint Appendix JA15.2.3.</li> </ul>
04	<p>Condensate drainage piping. An approved receptacle that is sized per the California Plumbing Code for condensate drainage shall be installed within 3 feet of the reserved heat pump location, or piping shall be installed from within 3 feet of the reserved heat pump location to an approved discharge location that is sized in accordance with the California Plumbing Code, and meet one of the following:</p> <ul style="list-style-type: none"> <li>i. Condensate drainage shall be sized to serve a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>ii. Condensate drainage piping shall be sized to meet the requirements specified in Joint Appendix JA15.2.4.</li> </ul>
05	<p>Electrical</p> <p>A. Physical space shall be reserved on the bus system of the main switchboard or on the bus system of a distribution board to serve the future heat pump water heater system including the heat pump and temperature maintenance tanks. In addition, the physical space reserved shall be capable of providing adequate power to the future heat pump water heater in accordance with the following:</p> <ul style="list-style-type: none"> <li>i. Heat Pump. Meet one of the following. <ul style="list-style-type: none"> <li>A. The electrical power required to power a heat pump water heater system heat pump that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>B. The electrical power required that meets the requirements specified for the heat pump in Joint Appendix JA15.2.5.</li> </ul> </li> <li>ii. Temperature Maintenance Tank. Meet one of the following. <ul style="list-style-type: none"> <li>A. The electrical power required to power a heat pump water heater system temperature maintenance tank that meets the total building hot water demand as calculated and documented by the responsible person associated with the project.</li> <li>B. The electrical power required that meets the requirements specified for the temperature maintenance tank in Joint Appendix JA15.2.5.</li> </ul> </li> </ul>



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this Certificate of Installation is true and correct.
- I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
- I understand that a registered 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, and I will take the necessary steps to ensure this requirement is accomplished.
- I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to ensure this requirement is accomplished.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

**LMCI-ELC-01-E User Instructions****A. General Information**

1. Project Scope: User selects all that apply: Heat Pump Space Heater Ready, Electric Cooktop Ready, Electric Clothes Dryer Ready and None of these.

**B. Heat Pump Space Heater Ready**– Optional table based on user selection in cell A01:

**C. Electric Cooktop Ready**– Optional table based on user selection in cell A01.

**D. Electric Clothes Dryer Ready – Systems serving Individual Dwelling Units**– Optional table based on user selection in cell A01.

**E. Electric Clothes Dryer Ready – Systems in Common Areas** – Optional table based on user selection in cell A01.

**F. Individual Heat Pump Water Heater Ready**– Optional table based on user selection in cell A01.

**G. Central Heat Pump Water Heater Ready**– Optional table based on user selection in cell A01.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Field Name and Value. Fields include Project Name, Enforcement Agency, Dwelling Address, Permit Number, City and Zip Code, and Permit Application Date.

A. Air Barrier Materials

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Note:

SPF insulation is an acceptable air barrier and sealant when installed to a minimum thickness of 2 inches for closed cell and 5.5 inches for open cell, except where not allowed by manufacturer (e.g., flues, vents, can lights, etc.).

Table with 2 columns: ID and Description. Row 01 describes requirements for a continuous sealed exterior air barrier. Row 02 is for Method of Compliance.

B. Raised Floor Adjacent to Unconditioned Space or Separate Dwelling Units

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID and Description. Rows 01-04 describe sealing requirements for raised floors, chases, holes, and subfloor sheathing.

C. Walls Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID and Description. Rows 01-09 describe sealing requirements for exterior walls, including penetrations, stud bays, electrical boxes, openings, bottom plates, windows, doors, rim joist gaps, fan exhaust ducts, and knee walls.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

D. Ceiling Air Barrier Adjacent to Unconditioned Space

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 10 rows detailing requirements for ceiling air barriers, such as sealing openings, fire sprinklers, lighting fixtures, and chimneys.

E. Roof Air Barrier – Unvented Attics Adjacent to Unconditioned Space

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 3 rows detailing requirements for roof air barriers, including sealing roof decks, chimneys, and penetrations.

F. Conditioned Space Above or Adjacent to Garage Air Barrier

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 rows detailing requirements for conditioned space above garages, including infiltration prevention methods like sealing edges and joists.

G. Cantilevered Floor Air Barrier

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 3 rows detailing requirements for cantilevered floor air barriers, including airtight blocking, exterior sheathing, and sealing gaps.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**H. Walls for Attached Porch, Attic, Double Wall Air Barrier**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	An exterior wall air barrier is required at the intersection of the porch and exterior wall when there is conditioned space on the other side. The exterior wall includes an air barrier where the attic attaches to the conditioned space.
02	Truss framing blocking is used at the top and bottom of each wall/roof section.

**I. Air Barriers in Multifamily Dwellings**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Each dwelling unit must be sealed to stop air movement between dwelling units. Treat adjacent dwelling units as unconditioned space for air sealing.
02	All penetrations through the floor and ceiling of each dwelling unit are sealed, including electric and gas utilities, water pipes, drain pipes, fire protection service pipes, and communication wiring.
03	Elevator penthouse, mechanical penthouse, stairwell doors, roof access hatches, and plumbing stacks that separate conditioned and unconditioned space are all sealed.
04	Vertical chases for garbage chutes, elevator shafts, HVAC ducting and plumbing shall be treated as unconditioned space for sealing.
05	Common hallways shall be treated as unconditioned space for sealing.

**J. Special Requirements for SIPs**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	SIPs are considered an air barrier when properly sealed at top, bottom, sides, and all penetrations.
02	Air barrier is continuous across all surfaces, including between SIPs and non-SIP sections.

**K. Special Requirements for ICF**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	ICF sections are considered an air barrier when properly sealed at top, bottom, sides, and all penetrations.
02	Air barrier is continuous across all surfaces, including between ICF and non-ICF sections.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

## LMCI-ENV-21 User Instructions

Quality Insulation Installation (QII) applies to the entire building (roof/ceiling, walls, and floor) for new construction and requires field verification by a third-party ECC Rater. For Alterations to existing buildings, compliance credit can only be taken when the “existing, plus addition, plus alteration” approach is used, but credit will only apply to the new surfaces in the new zone.

### A. Air Barrier Materials

- Using the drop-down menu, indicate which method is being used to comply with the continuous air barrier requirements [e.g., Method 1 (Individual Materials), Method 2 (Assemblies of Materials), Method 3 (Complete Building)].

### B. Raised Floor Adjacent to Unconditioned Space or Separate Dwelling Unit

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### C. Walls Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### D. Ceiling Air Barrier Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### E. Roof Air Barrier – Unvented Attics Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### F. Conditioned Space Above or Adjacent to Garage Air Barrier

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### G. Cantilevered Floor Air Barrier

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### H. Walls for Attached Porch, Attic, Double Wall Air Barrier

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### I. Air Barrier in Multifamily Dwellings

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### J. Special Requirements for SIPs

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**K. Special Requirements for ICF**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Field Name, Value. Fields include Project Name, Enforcement Agency, Dwelling Address, Permit Number, City and Zip Code, Permit Application Date.

A. Insulation Materials Installed

Table with 3 columns: ID, Material Name, Description. Lists 5 types of insulation materials.

B. All Surfaces

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID, Requirement. Lists 7 specific requirements for surface insulation.

C. Raised Floor Adjacent to Unconditioned Space

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID, Requirement. Lists 5 specific requirements for raised floor insulation.





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**D. Wall Adjacent to Unconditioned Space**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation quality was verified prior to the installation of the interior air barrier (typically gypsum board).
02	Loose-fill and batt insulation is in contact with all six sides of wall cavities (top, bottom, back, left, right, front [to be installed later]) with no gaps, voids, or compression. Special Situation: Where framing depth is greater than required insulation thickness (e.g., double walls or framed bump-outs) a secondary air barrier shall be installed and in contact with the insulation, so that the insulation fills the cavity formed by the additional air barrier.
03	Insulation fits snugly around obstructions (e.g., electrical boxes, plumbing and wiring) with no gaps, voids, or compression.
04	Structural metal tie-downs and shear panels are insulated between exterior air barrier and metal.
05	Hard to access wall stud cavities, such as corner channels or wall intersections, are insulated to the proper R-value prior to the installation of exterior sheathing or exterior stucco lathe.
06	Insulation and interior air barrier are installed behind tub, shower, fireplace enclosures and stairwells to the R-value listed on the Certificate of Compliance when located against exterior walls.
07	All single-member window and door headers shall be insulated to a minimum of R-3 for a 2x4 framing, or equivalent width, and a minimum of R-5 for all other assemblies. No header insulation is required for single-member headers that are the same width as the wall, provided that the entire wall has at least R-2 insulation.
08	After insulation is installed: All insulated walls have interior and exterior air barriers, including kneewalls and walls of skylight wells. Exception: Rim joists. Interior air barrier (typically gypsum board) is sealed to top plate.

**E. Ceiling Adjacent to Unconditioned Space**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation extends to the outside surface of the exterior wall.
02	Insulation is in direct contact with the ceiling air barrier so there are no gaps, voids, or compression.
03	Chimneys and flues (except zero clearance) have a sheet metal collar at the ceiling level to prevent contact with the insulation. The collar is at least as tall as the depth of the insulation. There is a minimum 1-inch clearance between the collar and the chimney/flue for double wall vent, and 6-inches for single wall vent, unless manufacturer's instructions require otherwise. The collar is sealed to the ceiling with high temperature sealant to prevent air leakage. The insulation is in contact with the sheet metal collar.
04	Recessed can lights penetrating the ceiling air barrier are covered with insulation to the depth needed to meet the ceiling R-value specified on the Certificate of Compliance.
05	External surfaces of steel studs, steel-framed kneewalls, skylight shafts, and gable ends are covered with insulation.

**F. Ceiling Insulation in Vented Attics**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Required eave ventilation shall not be obstructed. The net-free ventilation area of the eave vent is maintained.
02	Eave vent baffles and dams are installed to prevent air movement under or into the ceiling insulation.
03	Attic access is insulated to the same R-value required by the Certificate of Compliance for ceiling insulation and the insulation is permanently attached using adhesive or mechanical fasteners.
04	Attic access must have a dam around the access to at least the same depth as the insulation.
05	Attic rulers specified to the installed loose-fill material (brand and type) are installed and evenly distributed throughout the attic to verify depth (one ruler for every 250 square feet (ft <sup>2</sup> )). The rulers are clearly readable and scaled to read inches of insulation and the R-value installed.

**G. Insulation in Unvented Attics**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	The roof sheathing is the air barrier and is sealed to prevent air movement to the outside.
02	Insulation is in full contact with the air barrier (roof sheathing).
03	If insulated using air permeable insulation, gable end walls are sealed and insulated the same as exterior walls, including interior air barrier.





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**H. Insulation in Vented Attics (High Performance Vented Attics)**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation is in full contact with roof sheathing and firmly supported to prevent sagging.
02	Batt insulation between roof trusses is acceptable with minimal gaps and voids caused by roof truss members.
03	Insulation is not required on gable end walls.
04	Required roof deck insulation over any conditioned space, or HVAC ducts, is installed on the entire attic roof deck; even over unconditioned spaces (e.g., garage, covered porch). Roof deck of attic over unconditioned space without HVAC ducts and separated from other attics by a sealed air barrier do not need to be insulated.

**I. Special Requirements for Skylight Shafts and Attic Knee Walls**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation must meet all the requirements for walls and insulation is in contact with the air barrier on all six sides unless SPF is used.
02	Insulation shall be in full contact with the interior wall finish. Batt insulation must be cut to fit around 2x4’s that are laid flat.
03	Skylight shafts and attic knee walls shall be completely enclosed by vertical and horizontal framing, including horizontal plates at the top and bottom of the insulation.

**J. Special Requirements for Floors Above Garages**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	If the air barrier is at the perimeter of the garage below the conditioned subfloor, then the insulation may be placed on the garage ceiling. The perimeter of the subfloor must also be insulated.
----	---

**K. Special Requirements for Cantilevered Floors**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Sealed blocking shall be installed between joists where the wall rim joist would have been located in the absence of a cantilever. Insulation shall be placed on both sides of the block.
----	---

**L. Special Requirements for Attached Porches**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Exterior wall at the intersection of the porch roof is fully insulated above, below and behind the roof line.
02	Where truss framing is used, airtight blocking is used at the top and bottom of each wall/roof section and is insulated.



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**M. Special Requirements for SPF Insulation**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Installed product meets the claimed R-value per inch. The total R-value may be calculated based on the thickness of insulation multiplied by the “tested R-value per inch” as certified by the Department of Consumer Affairs, Bureau of Household Goods and Services.
02	Installed thickness meets the required R-value from the Certificate of Compliance. Verified in at least 6 random places for each surface type: floors, walls, and ceilings.
03	Insulation is spray applied to fully adhere to structural assembly framing, floor and ceiling joists, and other framing surfaces within the construction cavity.
04	If multiple layers are applied, each foam lift (e.g., spray application) adheres to the substrate and foam interfaces.
05	Closed cell SPF: In areas where an air barrier is required the foam is at least 2-inches thick.
06	Open cell SPF: In areas where an air barrier is required the foam is at least 5.5-inches thick.
07	Open cell SPF: Depressions in the foam insulation surface are not greater than ½-inch of the required thickness provided these depressions do not exceed 10% of the surface area being insulated.
08	Open cell SPF: Insulation completely fills cavities of 2x4 framing.
09	SPF insulation is not applied directly to recessed lighting fixtures unless specifically allowed by manufacturer’s instructions. When not allowed, can lights are: A. Covered with a minimum of 1.5-inches of mineral fiber insulation; or B. Enclosed in a manufacturer’s approved box fabricated from an approved material, such as 18 gauge sheet metal or ½-inch gypsum board.

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SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Table with 2 columns: Documentation Author Name, Documentation Author Signature, Documentation Author Company Name, Date Signed, Address, CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code...
3. The constructed or installed features, materials, components or manufactured devices...
4. I understand that an ECC Rater will check the installation to verify compliance...
5. I understand that a registered copy of this certificate of installation shall be posted...
6. I understand that a registered copy of this certificate of installation is required to be included...

Table with 3 columns: Responsible Builder/Installer Name, Responsible Builder/Installer Signature, Company Name, Position With Company (Title), Address, CSLB License, City/State/Zip, Phone, Date Signed, Third Party Quality Control Program (TPQCP) Status, Name of TPQCP (if applicable).

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

## LMCI-ENV-22 User Instructions

Quality Insulation Installation (QII) applies to the entire building (roof/ceiling, walls, and floor) for new construction and requires field verification by a third-party ECC Rater. For additions to existing buildings, compliance credit can only be taken when the “existing, plus addition, plus alteration” approach is used, but credit will only apply the new surfaces in the new zone.

### A. Insulation Materials Installed

1. Roof Deck Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
2. Ceiling Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
3. Exterior Wall Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
4. Raised Floor Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
5. Slab Edge Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).

### B. All Surfaces

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### C. Raised Floor Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### D. Wall Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### E. Ceiling Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### F. Ceiling Insulation in Vented Attics

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### G. Insulation in Unvented Attics

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### H. Insulation in Vented Attics (High Performance Vented Attics)

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**I. Special Requirements for Skylight Shafts and Attic Knee Walls**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

**J. Special Requirements for Floors Above Garage**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

**K. Special Requirements for Cantilevered Floors**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

**L. Special Requirements for Attached Porches**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

**M. Special requirements for SPF Insulation**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



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CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

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

A. General Information

- Notes:
- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
  - The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.

01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads (See Section 160.3(b)1).	
07	Outdoor Design Condition Source (See Section 160.3(b)2)		08	Cooling Outdoor Design Temperature Selected (°F)	
09	Heating Outdoor Design Temperature Selected (°F)		10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)	
11	Calculated Dwelling Unit Heating Load (Btu/h)		12	Dwelling Unit Number of Bedrooms	

MCH-01a – Space Conditioning Systems Ducts and Fans - For use with Performance Certificate of Compliance



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B. Design Space Conditioning (SC) System Component Specifications from LMCC

This table reports the space conditioning system features that were specified on the registered LMCC-PRF compliance document for this project.

Table with 10 columns: 01 SC System ID/Name from LMCC, 02 SC System Type, 03 Heating System Type, 04 Cooling System Type, 05 Distribution System Type, 06 Required Thermostat Type, 07 Low Leakage Air-Handling Unit Status, 08 Bypass Duct Status, 09 Cooling Zoning Type, 10 Cooling System Compressor Speed Type. Includes a Notes row at the bottom.

C. Design Space Conditioning (SC) System Compliance Requirements from LMCC

This table reports the space conditioning system features that were specified on the registered LMCI-PRF compliance document for this project.

Table with 11 columns: 01 SC System ID/Name from LMCC, 02 Heating Efficiency Type, 03 Minimum Heating Efficiency Value, 04 Heat Pump Heating Capacity @ 47°F, 05 Heat Pump Heating Capacity @ 17°F, 06a Cooling Efficiency Type, 06 Minimum Cooling Efficiency SEER/SEER2, 07 Minimum Cooling Efficiency EER/EER2/CEER, 08 Minimum Cooling System Airflow Rate (CFM/ton), 09 Maximum SC System Fan Efficacy (W/CFM), 10 Modeled Duct R-Value. Includes a Notes row at the bottom.

D. Installed Space Conditioning (SC) System Component Information

Table with 10 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Conditioned Floor Area Served by the System (ft²), 04 Heating System Type, 05 Cooling System Type, 06 Number of Indoor Units for this System, 07 Distribution System Type, 08 SC System Thermostat Type, 09 Cooling Zoning Type, 10 Cooling System Compressor Speed Type. Includes a Notes row at the bottom.



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E. Installed Heating Equipment Information (not heat pumps)

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Duct Status	Heating Efficiency Type	Heating Efficiency Value (%)	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity, Output (Btu/h)

Notes:

F. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from LMCC	SC System Description of Area Served	Cooling Efficiency SEER/SEER2	Cooling Efficiency EER/EER2/CEER	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)	Condenser Rated Cooling Capacity (Btu/h)

Notes:

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G. Installed Split System Indoor Unit (Coil or Fan Coil) Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units.

Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units.

Table with 10 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Indoor Unit Name or Description of Area Served, 04 Indoor Unit Type, 05 Indoor Unit Duct Status, 06 Does Indoor Unit Provide CFI IAQ Ventilation?, 07 Indoor Unit Manufacturer, 08 Indoor Unit Model Number, 09 Indoor Unit Serial Number, 10 Indoor Unit Nominal Cooling Capacity (ton)

Notes:

H. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information

Table with 5 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Condenser or Package Unit Manufacturer, 04 Condenser or Package Unit Model Number, 05 Condenser or Package Unit Serial Number

Notes:

I. Installed Heat Pump System – Efficiency and Performance Compliance Information

Table with 10 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Heating Efficiency Type, 04 Heating Efficiency Value, 05 System Rated Heating Capacity at 47°F, 06 System Rated Heating Capacity at 17°F, 07 System Rated Cooling Efficiency SEER/SEER2, 08 System Rated Cooling Efficiency EER/EER2/CEER, 09 System Cooling Capacity at Design Conditions (Btu/h), 10 Condenser Nominal Cooling Capacity (ton)

Notes:



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

J. Installed Duct System information

01	02	03	04	05	06	07	08	09	10	11	12	13	14
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Supply Duct Location	Supply Duct R-Value	Return Duct Location	Return Duct R-Value	Exception from Min R-Value	Method of compliance with Airflow and Fan Efficacy Req's in 160.3(b)5L	Bypass Duct Status	Number of Air Filter Devices on Indoor Unit	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this system?	Total Duct Length

Notes:

K. Installed Air Filter Device Information

Mandatory requirements for air filter devices are specified Section 160.2(b)1. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

01	02	03	04	05	06	07	08	09	10	11	12	13
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Air Filter Name or Description of Location	Air Filter Rack Type	Design Airflow Rate for Air Filter Device (cfm)	Air Filter Nominal Depth (inch)	Air Filter Nominal Length (inch)	Air Filter Nominal Width (inch)	Air Filter Calculated Nominal Face Area (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)

Notes:



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

L. Air Filter Device Requirements

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Mandatory Air Filter Device Requirements can be found in Section 160.2(b)1. Some mandatory requirements may apply in addition to those listed below.

Table with 2 columns: ID (01-06) and Description of requirements for air filter devices.

M. ECC Verification Requirements for Duct Systems

Table with 9 columns (01-09) for ECC verification requirements including SC System ID, Description, Indoor Unit Name, Duct Leakage Test, Duct Location Verification, AHU Fan Efficacy, AHU Airflow Rate, Return Duct Design, and Supply Duct Surface Area R-Value.

Notes:



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N. ECC Verification Requirements for Space Conditioning Equipment

Table with 5 columns: 01, 02, 03, 04, 05. Headers: SC System ID or Name from CF1R, SC System Description of Area Served, Refrigerant Charge, Rated SC System Equipment Verification, VCHP Compliance Credit.

O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Additional mandatory requirements from Section 160.3 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

Heating Equipment

Table with 2 columns: ID, Description. Rows 01-05 detailing heating equipment requirements like efficiency, controls, sizing, furnace temperature rise, and standby losses.

Cooling Equipment

Table with 2 columns: ID, Description. Rows 06-10 detailing cooling equipment requirements like efficiency, refrigerant line insulation, condensing unit location, liquid line filter drier, and sizing.



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Cooling and Heating Equipment (Additional Requirement)

11	<p><b>Defrost:</b> See section 160.3(b)7</p> <p>A. If a heat pump is equipped with an installer adjustable defrost delay timer, the delay timer shall be set to greater than or equal to 90 minutes.</p> <p>B. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure in the LMCI.</p> <p><b>Exception to 160.3(b)7.</b> Dwelling units in Climate Zones 1, 6 through 10, 15, and 16 shall not be required to comply with the 90 minute delay timer requirements.</p>
12	<p><b>Capacity variation with third-party thermostats:</b> See section 160.3(b)8</p> <p>Variable or multi-speed systems shall comply with the following requirements:</p> <p>A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed.</p>

Air Distribution System Ducts, Plenums and Fans

13	<p><b>Insulation:</b> The minimum duct insulation value is R-6 or ducts can be uninsulated if the duct system is located entirely in conditioned space. Note that higher values may be required by the prescriptive or performance requirements. See Section 160.3(b)5Aii for exceptions.</p>
14	<p><b>Connections and Closures:</b> All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006.</p>

Heat Pump Thermostat

15	<p>A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).</p>
16	<p>The thermostat shall be installed in accordance with the manufacturers published installation specifications.</p>
17	<p>First stage of heating shall be assigned to heat pump heating.</p>
18	<p>Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.</p>

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P. Test of Defrost Delay Timer Setting (Section 160.3(b)7)

The installing contractor shall confirm that a heat pump’s installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	Test Applicability. Select the statement describing test applicability for this project: <ol style="list-style-type: none"> <li>1. The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions.</li> <li>2. The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost.</li> <li>3. The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies.</li> <li>4. The test does not apply because Exception 2 . Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.</li> </ol>	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump’s Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (fo example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this Certificate of Installation is true and correct.
- I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
- I understand that a registered 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, and I will take the necessary steps to ensure this requirement is accomplished.
- I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to ensure this requirement is accomplished.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

**LMCI-MCH-01a-E User Instructions****Section A. General Information**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the LMCC-PRF may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit. This field is filled out automatically using the default value from the LMCC-PRF for performance compliance, and is user entry for prescriptive compliance. The default value from the LMCC-PRF may be overwritten in this



document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

### **Section B. Design Space Conditioning (SC) System Component Specifications from LMCC**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
7. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.
8. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.
9. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.
10. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.

### **Section C. Design Space Conditioning (SC) System Compliance Requirements from LMCC**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.

5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
- 6a. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
9. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
10. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.

#### **Section D. Installed Space Conditioning (SC) System Component Information**

1. Select System name from the list of systems identified in previous sections and originally specified on the LMCC.
2. Briefly describe the area served by this system. Examples: entire house, upstairs, downstairs, sleeping area, north wing, etc.
3. Enter the conditioned floor area served by the system described in this row. The total value of this column for all rows must equal the total dwelling unit conditioned floor area as shown in Section A.
4. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
6. If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
7. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

8. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
10. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

### Section E. Installed Heating Equipment Information (not heat pumps)

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc
4. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes.
5. Enter the description of the duct system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. This field is filled out automatically. It is referenced from the same row and column in Section C.
7. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
9. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
10. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
11. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.

### Section F. Installed Cooling System Outdoor Unit or Package Unit Equipment Information (not heat pump)

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.

4. Enter the certified cooling efficiency (EER/EER2/CEER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour. This information is found in the system performance information on the manufacturer's published documentation for the installed system.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.
10. Enter the *installed* Condenser Rated Cooling Capacity in BTU/h. Note that this is based on the condenser, not the coil or air handler.

**Section G. Installed Split System Indoor Unit Coil or Fan Coil Equipment information - applicable to DX or hydronic, heating or cooling, coils or fan coil units)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the type of indoor unit or air handling unit installed by selecting one of the choices from the list.
5. Enter the description of the ducts system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes.
7. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Manufacturer as shown on the equipment nameplate.
8. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Model Number as shown on the equipment nameplate.
9. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Serial Number as shown on the equipment nameplate.
10. Enter the indoor unit cooling capacity if the indoor unit is one of the ducted variable capacity heat pumps types, otherwise this field is not needed.

**Section H. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter the name of the *installed* Heat Pump Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
4. Enter the name of the *installed* Heat Pump Condenser or Package Unit Model Number as shown on the equipment nameplate.

5. Enter the name of the *installed* Heat Pump Condenser or Package Unit Serial Number as shown on the equipment nameplate.

### Section I. Installed Heat Pump System – Efficiency and Performance Compliance Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row in Section C.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the certified heating capacity at 47F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
6. Enter the certified heating capacity at 17F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
7. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the certified cooling efficiency (EER/EER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
9. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour.
10. Enter the *installed* Condenser Rated Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. Can usually be determined by the condenser model number.

### Section J. Installed Duct System Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
6. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

7. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
8. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
9. For newly constructed systems taking the performance credit for better than default air flow or fan efficacy, field verification of these criteria is required and this field is filled out automatically. Otherwise, the user may pick the appropriate choice. Refer to section 160.3(b)5L and Nonresidential Compliance Manual Chapter 11 for more information.
10. This field is filled out automatically. It appears in Section B, and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
11. Specify the number of air filter devices installed in this indoor unit's duct system. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
12. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
13. If the system is of a type that can use the approved protocol protocols for verifying the indoor unit's fan efficacy, then answer yes. Otherwise answer no
14. This field is filled out automatically for some system types. Otherwise select the value that describes the length of the duct system.

### Section K. Installed Air Filter Device Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2022 standards encourages use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.

11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 160.2(b)1. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

#### **Section L. Air Filter Device Requirements**

This table is a list of requirements for air filter devices.

#### **Section M. ECC Verification Requirements for Duct Systems**

1. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
7. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
8. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
9. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

#### **Section N. ECC Verification Requirements for Space Conditioning Equipment**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

#### **Section O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

This table is a list of mandatory measures and additional requirements for space conditioning systems, ducts and fans.

**Section P. Test of Defrost Delay Timer Setting** (Section 160.3(b)7)

This table is certification requirements for Test of Defrost Delay Timer Setting

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

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SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

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

A. General Information

- Notes:
- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
  - The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.

01	Dwelling Unit Name	02	Climate Zone
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )	04	Number of Space Conditioning Systems in this Dwelling Unit
05	Certificate of Compliance Type	06	Method Used to Calculate HVAC Loads (See Section 160.3(b)1).
07	Outdoor Design Condition Source (See Section 160.3(b)2)	08	Cooling Outdoor Design Temperature Selected (°F)
09	Heating Outdoor Design Temperature Selected (°F)	10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)
11	Calculated Dwelling Unit Heating Load (Btu/h)	12	Dwelling Unit Number of Bedrooms

MCH-01b - Space Conditioning Systems Ducts and Fans - Prescriptive Alterations



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**B. Space Conditioning (SC) System Information**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from LMCC	SC System Description of Area Served	CFA served by this SC System (ft <sup>2</sup> ):	Is the SC system a ducted system?	Does work include installing a refrigerant containing component?	Does work include installing new SC System components?	Does work include installing more than 25 feet of ducts?	Does work include installing entirely new duct system?	Does work include installing entirely new SC system?	Alteration Type

Notes:

**C. Space Conditioning (SC) System Alterations Compliance Information**

01	02	03	04	05	06	07	08	09	10	10b	11	12	13	14
SC System ID/Name from LMCC	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEER2	Cooling Minimum Efficiency Value EER/EER2/CEER	Required Thermostat Type	Number of Indoor Units for this System	Number of Ducted Indoor Units for this System	Central Fan Integrated (CFI) Ventilation System Status

Notes:

**D. Installed Heating Equipment Information for Gas Furnace Indoor Unit, or Heat Pump Indoor Unit, or Packaged Unit (Gas Furnace or Heat Pump)**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from LMCC	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity, Output (Btu/h)	Multi-Split Systems only	
								Indoor Unit Name or Description of Area Served	Indoor Unit Duct Status

Notes:



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**E. Installed Cooling Equipment Information for Outdoor Condenser or Package Unit (Air Conditioner or Heat Pump)**

01	02	03	04	04b	05	06	07	08	09
SC System ID/Name from LMCC	SC System Description of Area Served	Cooling Efficiency Type	Cooling Efficiency Value SEER/SEER2	Cooling Efficiency Value EER/EER2/CEER	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Capacity (tons)

Notes:

**F. Altered Space Conditioning System Duct Information (<75% of duct system is altered; or duct system is not altered)**

01	02	03	04	05	06	07	08	09	10	11	12
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Was Any New Ducting Installed?	Required New Duct R-Value	Installed New Supply Duct Location	Installed New Supply Duct R-Value	Installed New Return Duct Location	Installed New Return Duct R-Value	Exception from Min R-Value	Can Approved Airflow Protocols be used to test this System?	Indoor Unit Nominal Cooling Capacity (tons)

Notes:

**G. Installed New or Complete Replacement Duct System information**

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Total Duct Length	Required New Duct R-Value (Unconditioned Space)	Supply Duct Location	New or Replaced Supply Duct R-Value	Return Duct Location	New or Replaced Return Duct R-Value	Exception from Min R-Value	Method of Compliance with Airflow and Fan Efficacy Req's in 160.3(b)5L	Number of Air Filter Devices on Indoor Unit	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this System?	Indoor Unit Nominal Cooling Capacity (tons)

Notes:



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H. Installed Air Filter Device Information

Mandatory requirements for air filter devices are specified Section 160.2(b)1. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

Table with 13 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Indoor Unit Name or Description of Area Served, 04 Air Filter Name or Description of Location, 05 Air Filter Rack Type, 06 Design Airflow Rate for Air Filter Device (cfm), 07 Air Filter Nominal Depth (inch), 08 Air Filter Nominal Length (inch), 09 Air Filter Nominal Width (inch), 10 Air Filter Calculated Nominal Face Area (inch²), 11 Air Filter Required Minimum Face Area (inch²), 12 Face Area Compliance, 13 Design Allowable Pressure Drop for Air Filter Device (inch W.C.)

Notes:

I. Air Filter Device Requirements

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Mandatory Air Filter Device Requirements can be found in Section 160.2(b)1. Some mandatory requirements may apply in addition to those listed below.

Table with 2 columns: ID (01-06) and Description of requirements for air filter devices, including airflow rate, pressure drop, efficiency, and gasketing.



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**J. ECC Verification Requirements for Duct Systems**

01	02	03	04	05	06	07	08	09
				MCH-20	MCH-21	MCH-22	MCH-23	MCH-28
SC System Identification or Name	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Exemption From Duct Leakage Requirements	Duct Leakage Test	Duct Location Verification	AHU Fan Efficacy (W/cfm)	AHU Airflow Rate (cfm/ton)	Return Duct Design - Table 160.3-A or B
Notes:								

**K. ECC Verification Requirements for Space Conditioning Equipment**

01	02	03
		MCH-25
SC System ID/Name from LMCC	SC System Description of Area Served	Refrigerant Charge
Notes:		

**L. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

***The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.***

Additional mandatory requirements from Section 160.3 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

**Heating Equipment**

01	Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
02	Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 160.3(a), 110.2(b).
03	Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 160.3(b)1 and 2.
04	Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 160.3(b)4.
05	Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d).



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Cooling Equipment

06	Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
07	Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 160.3(b)5I, and Section 160.3(b)6.
08	Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 160.3(b)3A.
09	Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer’s specifications 160.3(b)3B.
10	Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 160.3(b)1 and 2.

Cooling and Heating Equipment (Additional Requirement)

11	<p><b>Defrost:</b> See section 160.3(b)7</p> <p>A. If a heat pump is equipped with an installer adjustable defrost delay timer, the delay timer shall be set to greater than or equal to 90 minutes.</p> <p>B. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure in the LMCI.</p> <p><b>Exception to 160.3(b)7.</b> Dwelling units in Climate Zones 1, 6 through 10, 15, and 16 shall not be required to comply with the 90 minute delay timer requirements.</p>
12	<p><b>Capacity variation with third-party thermostats:</b> See section 160.3(b)8</p> <p>Variable or multi-speed systems shall comply with the following requirements:</p> <p>A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed.</p>

Air Distribution System Ducts, Plenums and Fans

13	Insulation: The minimum duct insulation value is R-6 or ducts can be uninsulated if the duct system is located entirely in conditioned space. Note that higher values may be required by the prescriptive or performance requirements. See Section 160.3(b)5Aii for exceptions.
14	Connections and Closures: All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006.

Heat Pump Thermostat

15	A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).
16	The thermostat shall be installed in accordance with the manufacturers published installation specifications.
17	First stage of heating shall be assigned to heat pump heating.
18	Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.



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M. Test of Defrost Delay Timer Setting (Section 160.3(b)7)

The installing contractor shall confirm that a heat pump’s installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	<p>Test Applicability. Select the statement describing test applicability for this project:</p> <ol style="list-style-type: none"> <li>1. The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions.</li> <li>2. The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost.</li> <li>3. The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies.</li> <li>4. The test does not apply because Exception 2 . Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.</li> </ol>	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump’s Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (fo example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this Certificate of Installation is true and correct.
- I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
- I understand that a registered 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, and I will take the necessary steps to ensure this requirement is accomplished.
- I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to ensure this requirement is accomplished.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300



### LMCI-MCH-01b-E User Instructions

Minimum requirements for prescriptive HVAC installation compliance can be found in Building Energy Efficiency Standards Section 180.2(b). Completing these documents will require that you have the Reference Appendices for the 2025 Building Energy Efficiency Standards. This document contains the Joint Appendices which are used to determine climate zone and to complete the section for opaque surfaces. When the term LMCI is used it means the LMCI-MCH-01-H. Instructions for sections with column numbers and row numbers are given separately.

#### Section A. General Information

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the LMCC may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems (see definition in Section 9.6.9 of the RCM) must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out), then load calculations are not required. Select N/A.

11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out), then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit.

### Section B. Space Conditioning (SC) System Information

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the LMCC to match is recommended and may be required.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the LMCC to match is recommended and may be required.
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4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the LMCC to match is recommended and may be required.
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9. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the LMCC to match is recommended and may be required.
10. This field is filled out automatically based on the entries in the previous columns.

### Section C. Space Conditioning (SC) System Alterations Compliance Information

1. This field is filled out automatically. It is referenced from the previous section.
2. This field is filled out automatically. It is referenced from the previous section.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the LMCC to match is recommended and may be required.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the LMCC to match is recommended and may be required.
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- 10b This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the LMCC to match is recommended and may be required
11. This field is filled out automatically. It is calculated based on entries in previous columns.
12. If the space conditioning system is a multiple-split system, then enter the total number of indoor units (ducted and ductless) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
13. If the space conditioning system is a multiple-split system, then enter the number of ducted indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
14. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Select CFI System if the system is used to provide IAQ ventilation.

#### Section D. Installed Heating Equipment Information

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. This field is filled out automatically. It is referenced from a previous section
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.

7. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
8. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.
9. Enter text to provide a name for multi-split indoor units if prompted to do so, otherwise the field is filled out automatically.
10. Select the description that best describes the distribution system if prompted to do so (allowed values are 1:[Ductless] 2:[Ducted >10ft length] 3:[Ducted ≤10ft length], otherwise the field is filled out automatically.

#### Section E. Installed Cooling Equipment Information:

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. This field is filled out automatically. It is referenced from Section C.
4. Enter the certified cooling efficiency of the *installed* equipment that corresponds to the type shown in the previous column. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.

#### Section F. Extension of Existing Duct System, Greater Than 25 Feet

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc.
4. If any lengths of new ducts were installed, answer yes, otherwise if new ducts were not installed, answer no.
5. This field is filled out automatically based on values referenced from other sections.
6. Select the choice that best describes the predominant location of the supply ducts for this system
7. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value required by the standards. The installed R-value must be greater than or equal to the required minimum R-value.
8. Select the choice that best describes the predominant location of the return ducts for this system
9. Enter the R-value of the installed return ducts. This value is verified against the minimum value required by the standards. The installed R-value must be greater than or equal to the required minimum R-value
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification. If the system is of a type that can use one of the approved

protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. A “No” response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.

11. Enter the indoor unit nominal cooling capacity (tons) if the indoor unit is a multiple-split system type, otherwise this field is not needed.

### G. Installed Duct System information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the description of the total combined length of the supply and return ducts on this indoor unit. The possible choices are: >10ft length, and ≤10ft length.
5. This field is filled out automatically. This is the minimum R-value for new ducts in this climate zone.
6. Select the choice that best describes the predominant location of the supply ducts for this system.
7. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value in G05. The installed R-value must be greater than or equal to the minimum R-value.
8. Select the choice that best describes the predominant location of the return ducts for this system.
9. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
11. Pick the appropriate choice. Refer to section 160.3(b)5L of the 2025 Building Energy Efficiency Standards, and Chapter 11 of the 2025 Nonresidential Compliance Manual for more information.
12. Specify the number of air filter devices installed on this indoor unit. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
13. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. A “No” response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
14. If the system is of a type that can use one of the approved protocols for testing the fan efficacy, then enter yes. Otherwise enter no.
15. Enter the indoor unit cooling capacity if the indoor unit is a multiple-split system type, otherwise this field is not needed.

### Section H. Installed Air Filter Device Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2025 standards encourage use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 160.0(b)1. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

### Section I. Air Filter Device Requirements

This table is a list of requirements for air filter devices.

### Section J. ECC Verification Requirements

1. This field is filled out automatically. It references previous sections in this document.
2. This field is filled out automatically. It references previous sections in this document.
3. This field is filled out automatically. It references previous sections in this document.
4. If applicable, select from the available exemptions listed. Exemptions will be flagged and may subject the system to additional enforcement scrutiny.
5. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
7. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

8. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
9. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

**Section K. ECC Verification Requirements for Space Conditioning Equipment**

1. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

**Section L. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

This table is a list of mandatory measures and additional requirements for space conditioning systems, ducts and fans.

**Section M. Test of Defrost Delay Timer Setting (Section 160.3(b)7)**

This table is certification requirements for Test of Defrost Delay Timer Setting

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNLESS REGISTERED WITH AN ECC PROVIDER.





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CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

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

A. General Information

- Notes:
- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
  - The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.

01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads (See Section 160.3(b)1).	
07	Outdoor Design Condition Source (See Section 160.3(b)2)		08	Cooling Outdoor Design Temperature Selected (°F)	
09	Heating Outdoor Design Temperature Selected (°F)		10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)	
11	Calculated Dwelling Unit Heating Load (Btu/h)		12	Dwelling Unit Number of Bedrooms	

MCH-01c - Space Conditioning Systems Ducts and Fans - Prescriptive, Newly Constructed Buildings



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**B. Design Space Conditioning (SC) System Component Specifications from LMCC**

This table reports the space conditioning system features that were specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06	07	07b	08	09	10	11	12
SC System ID/Name from LMCC	Heating System Type	Heating Efficiency Type	Heating Efficiency Value	Cooling System Type	Cooling Efficiency Type	Cooling Efficiency Value SEER/SEER2	Cooling Efficiency Value EER/EER2/CEER	Distribution System Type	Duct Location	Duct R-value	Thermostat Type	Comments

**C. Installed Space Conditioning (SC) System Component Information**

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from LMCC	SC System Description of Area Served	Conditioned Floor Area Served by the System (ft <sup>2</sup> )	Heating System Type	Cooling System Type	Distribution System Type	Duct Location	SC System Thermostat Type	Cooling Zoning Type	Cooling System Compressor Speed Type	Number of Indoor Units for this System
Notes:										

**D. Installed Heating Equipment Information (not heat pumps)**

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Duct Status	Heating Efficiency Type	Heating Efficiency Value	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity Output (Btu/h)
Notes:										



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E. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)

01	02	03	04	04b	05	06	07	08	09
SC System ID/Name from LMCC	SC System Description of Area Served	Cooling Efficiency Type	Cooling Efficiency value SEER/SEER2	Cooling Efficiency Value EER/EER2/CEER	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)

Notes:

F. Installed Split System Indoor Unit (Coil or Fan Coil) Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units

Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units.

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Type	Indoor Unit Duct Status	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Manufacturer	Indoor Unit Model Number	Indoor Unit Serial Number	Indoor Unit Nominal Cooling Capacity (ton)

Notes:

G. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information

01	02	03	04	05
SC System ID/Name from LMCC	SC System Description of Area Served	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number

Notes:



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**H. Installed Heat Pump System – Efficiency and Performance Compliance Information**

01	02	03	04	05	06	07	08	08b	09	10
SC System ID/Name from LMCC	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	System Rated Heating Capacity at 47°F (Btu/h)	System Rated Heating Capacity at 17°F (Btu/h)	System Cooling Efficiency Type	System Rated Cooling Efficiency Value SEER/SEER2	System Rated Cooling Efficiency Value EER/EER2/CEER	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)
Notes:										

**I. Installed Duct System Information**

01	02	03	04	05	06	07	08	09	10	11	12	13	14
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Supply Duct Location	Supply Duct R-Value	Return Duct Location	Return Duct R-Value	Exception from Min R-Value for Ducts In Conditioned Space	Method of compliance with Airflow and Fan Efficacy Req's in 160.3(b)5L	Number of Air Filter Devices on System	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this System?	Total Duct Length	Required New Duct R-Value
Notes:													

**J. Installed Air Filter Device Information**

Mandatory requirements for air filter devices are specified Section 160.2(b)1. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

01	02	03	04	05	06	07	08	09	10	11	12	013
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Air Filter Name or Description of Location	Air Filter Rack Type	Design Airflow Rate for Air Filter Device (cfm)	Air Filter Nominal Depth (inch)	Air Filter Nominal Length (inch)	Air Filter Nominal Width (inch)	Air Filter Calculated Nominal Face Area (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)
Notes:												



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**K. Air Filter Device Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Mandatory Air Filter Device Requirements can be found in Section 160.2(b)1. Some mandatory requirements may apply in addition to those listed below.

01	All recirculated air and all outdoor air (including make up air) supplied to the occupiable space is filtered before passing through the system's thermal conditioning components.
02	The space conditioning system shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter device(s). The design airflow rate and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter device shall be determined by the system designer. The system installer shall affix a sticker/label to each system air filter grille/rack locations that discloses the filter's design airflow rate and the filter's maximum allowable clean-filter pressure drop at the design airflow rate. The sticker/label shall be permanently affixed to the air filter device, readily legible, and visible to a person replacing the air filter.
03	All system air filters shall be located and installed in such a manner as to allow access and regular service by the system owner.
04	The system shall be provided with air filter media having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50% in the 0.30-1.0 µm range and equal to or greater than 85 percent in the 1.0-3.0 µm range when tested in accordance with AHRI Standard 680.
05	The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks.
06	Filter racks or grilles shall use gaskets, sealing, or other means to close gaps around inserted filters and prevent air from bypassing the filter.

**L. ECC Verification Requirements for Duct Systems**

01	02	03	04	05	06	07	09
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	MCH-20 Duct Leakage Test	MCH-21 Duct Location Verification	MCH-22 AHU Fan Efficacy (W/cfm)	MCH-23 AHU Airflow Rate (cfm/ton)	MCH-28 Return Duct Design Table 160.3-A or B
Notes:							

**M. ECC Verification Requirements for Space Conditioning Equipment**

01	02	03
SC System ID or Name from CF1R	SC System Description of Area Served	MCH-25 Refrigerant Charge
Notes:		



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**N. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

Additional mandatory requirements from Section 160.3 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

**Heating Equipment**

01	Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
02	Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 160.3(a), 110.2(b).
03	Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 160.3(b)1 and 2.
04	Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 160.3(b)4.
05	Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d).

**Cooling Equipment**

06	Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
07	Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 160.3(b)5I, and Section 160.3(b)6.
08	Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 160.3(b)3A.
09	Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer’s specifications 160.3(b)3B.
10	Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 160.3(b)1 and 2.

**Cooling and Heating Equipment (Additional Requirement)**

11	<b>Defrost:</b> See section 160.3(b)7 A. If a heat pump is equipped with an installer adjustable defrost delay timer, the delay timer shall be set to greater than or equal to 90 minutes. B. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure in the LMCI. <b>Exception to 160.3(b)7.</b> Dwelling units in Climate Zones 1, 6 through 10, 15, and 16 shall not be required to comply with the 90 minute delay timer requirements.
12	<b>Capacity variation with third-party thermostats:</b> See section 160.3(b)8 Variable or multi-speed systems shall comply with the following requirements: A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed.

**Air Distribution System Ducts, Plenums and Fans**

13	Insulation: The minimum duct insulation value is R-6 or ducts can be uninsulated if the duct system is located entirely in conditioned space. Note that higher values may be required by the prescriptive or performance requirements. See Section 160.3(b)5Aii for exceptions.
14	Connections and Closures: All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006.



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Heat Pump Thermostat

15	A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).
16	The thermostat shall be installed in accordance with the manufacturers published installation specifications.
17	First stage of heating shall be assigned to heat pump heating.
18	Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.

O. Test of Defrost Delay Timer Setting (Section 160.3(b)7)

The installing contractor shall confirm that a heat pump’s installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	<p>Test Applicability. Select the statement describing test applicability for this project:</p> <ol style="list-style-type: none"> <li>The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions.</li> <li>The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost.</li> <li>The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies.</li> <li>The test does not apply because Exception 2 . Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.</li> </ol>	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump’s Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (fo example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	



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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this Certificate of Installation is true and correct.
- I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
- I understand that a registered 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, and I will take the necessary steps to ensure this requirement is accomplished.
- I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to ensure this requirement is accomplished.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300



**LMCI-MCH-01c-E User Instructions****Section A. General Information**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the LMCC- may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document, but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out), then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit

**Section B. Design Space Conditioning (SC) System Component Specifications from LMCC**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
- 7b. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
9. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
10. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
11. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
12. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.

**Section C. Installed Space Conditioning (SC) System Component Information**

1. Select System name from the list of systems identified in previous sections and originally specified on the LMCC.
2. Briefly describe the area served by this system. Examples: entire house, upstairs, downstairs, sleeping area, north wing, etc.
3. Enter the conditioned floor area served by the system described in this row. The total value of this column for all rows must equal the total dwelling unit conditioned floor area as shown in Section A.

4. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document, but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
6. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
8. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
10. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
11. If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).

#### **Section D. Installed Heating Equipment Information (not heat pumps)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc
4. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes.

5. Enter the description of the duct system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. This field is filled out automatically. It is referenced from the same row and column in the previous section
7. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
9. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
10. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
11. Enter the rated heating capacity (output) of the *installed* Heating Unit in Btu/h.

**Section E. Installed Cooling System Outdoor Unit or Package Unit Equipment Information** (not heat pumps).

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter the certified cooling efficiency type for the installed equipment. Select a type from the list provided.
4. Enter the certified cooling efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section B. The installed efficiency must be greater than or equal to the required minimum efficiency.
- 4b. Enter the certified cooling efficiency of the installed equipment. This value is verified against the minimum value shown in Section B. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in Btu/h. This information is found in the system performance information on the manufacturer's published documentation for the installed system.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.

**Section F. Installed Split System Indoor Coil or Fan Coil Unit Equipment Information** (applicable to DX or hydronic heating/cooling coils or fan coil units)

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the type of indoor unit or air handling unit installed by selecting one of the choices from the list.
5. Enter the description of the ducts system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.

6. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes.
7. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Manufacturer as shown on the equipment nameplate.
8. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Model Number as shown on the equipment nameplate.
9. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Serial Number as shown on the equipment nameplate.
10. If there are multiple indoor units connected to the outdoor unit, enter the nominal cooling capacity (ton) from the nameplate of the indoor unit.

### **Section G. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter the name of the *installed* Heat Pump Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
4. Enter the name of the *installed* Heat Pump Condenser or Package Unit Model Number as shown on the equipment nameplate.
5. Enter the name of the *installed* Heat Pump Condenser or Package Unit Serial Number as shown on the equipment nameplate.

### **Section H. Installed Heat Pump System – Efficiency and Performance Compliance Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row in Section C.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the certified heating capacity at 47°F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
6. Enter the certified heating capacity at 17°F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
7. Enter the certified cooling efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the certified cooling efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
- 8a. Enter the certified cooling efficiency of the installed equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.

9. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in Btu/h.
10. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. Can usually be determined by the condenser model number.

### Section I. Installed Duct System Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field is filled out automatically. It appears in Section B and C, and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
6. This field is filled out automatically. It appears in Section B and C, and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
8. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
9. For newly constructed systems taking the performance credit for better than default air flow or fan efficacy, field verification of these criteria is required and this field is filled out automatically. Otherwise, the user may pick the appropriate choice. Refer to section 160.3(b)5L and Nonresidential Compliance Manual Chapter 11 for more information.
10. Specify the number of air filter devices installed in this indoor unit's duct system. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
11. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Note: the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
12. If the system is of a type that can use the approved protocol protocols for verifying the indoor unit's fan efficacy, then answer yes. Otherwise answer no.
13. This field is filled out automatically for some system types. Otherwise select the value that describes the length of the duct system.
14. This field is filled out automatically.

**Section J. Installed Air Filter Device Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
  
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2025 Standards encourage use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 160.2(b)1. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter labe. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

**Section K. Air Filter Device Requirements.**

This table is a list of requirements for air filter devices.

**Section L. ECC Verification Requirements for duct systems**

1. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

7. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
8. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

**Section M. ECC Verification Requirements for Space Conditioning Equipment**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections
3. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

**Section N. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

This table is a list of mandatory measures and additional requirements for space conditioning systems, ducts and fans.

**Section O. Test of Defrost Delay Timer Setting (Section 160.3(b)7)**

This table is certification requirements for Test of Defrost Delay Timer Setting

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

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

A. General Information

- Notes:
- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
  - The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.

01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads (See Section 160.3(b)1).	
07	Outdoor Design Condition Source (See Section 160.3(b)2)		08	Cooling Outdoor Design Temperature Selected (°F)	
09	Heating Outdoor Design Temperature Selected (°F)		10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)	
11	Calculated Dwelling Unit Heating Load (Btu/h)		12	Dwelling Unit Number of Bedrooms	

MCH-01d - Space Conditioning Systems Ducts and Fans - For use with Performance E+A+A Certificate of Compliance



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B. Design Space Conditioning (SC) System Component Specifications from LMCC

This table reports the space conditioning system features that were specified on the registered LMCC-PRF compliance document for this project.

Table with 11 columns: 01 SC System ID/Name from LMCC, 02 SC System Type, 03 Heating System Type, 04 Cooling System Type, 05 Distribution System Type, 06 Required Thermostat Type, 07 Cooling Zoning Type, 08 Cooling System Compressor Speed Type, 09 Low Leakage Air-Handling Unit Status, 10 SC System Status, 11 Duct System Status.

C. Design Space Conditioning (SC) System Compliance Requirements from LMCC

This table reports the space conditioning system features that were specified on the registered LMCC-PRF compliance document for this project.

Table with 10 columns: 01 SC System ID/Name from LMCC, 02 Heating Efficiency Type, 03 Minimum Heating Efficiency Value, 04 Heat Pump Heating Capacity @ 47°F, 05 Heat Pump Heating Capacity @ 17°F, 06a Cooling Efficiency Type, 06 Minimum Cooling Efficiency SEER/SEER2, 07 Minimum Cooling Efficiency EER/EER2/CEER, 08 Minimum Cooling System Airflow Rate (CFM/ton), 09 Maximum SC System Fan Efficacy (W/CFM), 10 Modeled Duct R-Value.

D. Installed New, Altered, and Existing Space Conditioning (SC) System Component Information

Table with 13 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Conditioned Floor Area Served by the System (ft²), 04 Heating System Type, 05 Cooling System Type, 06 Number of Indoor Units for this System, 07 Distribution System Type, 08 SC System Thermostat Type, 09 Cooling Zoning Type, 10 Cooling System Compressor Speed Type, 11 SC System Status, 12 Duct System Status, 13 Number of Ducted Indoor Units Connected to the System's Outdoor Unit.



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E. Space Conditioning (SC) System Alteration Type Determination

Table with 11 columns (01-11) for SC System Alteration Type Determination. Headers include SC System ID/Name from LMCC, SC System Description of Area Served, Is the SC system a ducted system?, Does work include installing refrigerant containing component?, Does work include installing new SC System component?, Does work include installing more than 25 feet of ducts?, Does work include installing entirely new duct system?, Does work include installing entirely new SC system?, Alteration Type, Altered Heating Components, Altered Cooling Components.

Notes:

F. Installed Heating System Equipment Information (not heat pumps)

Table with 11 columns (01-11) for Installed Heating System Equipment Information. Headers include SC System ID/Name from LMCC, SC System Description of Area Served, Indoor Unit Name or Description of Area Served, Does Indoor Unit Provide CFI IAQ Ventilation?, Indoor Unit Duct Status, Heating Efficiency Type, Heating Efficiency Value (%), Heating Unit Manufacturer, Heating Unit Model Number, Heating Unit Serial Number, Rated Heating Capacity, Output (Btu/h).

Notes:

G. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)

Table with 10 columns (01-10) for Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information. Headers include SC System ID/Name from LMCC, SC System Description of Area Served, Cooling Efficiency SEER/SEER2, Cooling Efficiency EER/EER2/CEER, Condenser or Package Unit Manufacturer, Condenser or Package Unit Model Number, Condenser or Package Unit Serial Number, System Cooling Capacity at Design Conditions (Btu/h), Condenser Nominal Cooling Capacity (ton), Condenser Rated Cooling Capacity (Btu/h).

Notes:



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H. Installed Split System Indoor Unit Coil or Fan Coil Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units

Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units.

Table with 9 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Indoor Unit Name or Description of Area Served, 04 Indoor Unit Type, 05 Indoor Unit Duct Status, 06 Does Indoor Unit Provide CFI IAQ Ventilation?, 07 Indoor Unit Manufacturer, 08 Indoor Unit Model Number, 09 Indoor Unit Serial Number

Notes:

I. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information

Table with 5 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Condenser or Package Unit Manufacturer, 04 Condenser or Package Unit Model Number, 05 Condenser or Package Unit Serial Number

Notes:

J. Installed Heat Pump System – Efficiency and Performance Compliance Information

Table with 10 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Heating Efficiency Type, 04 Heating Efficiency Value, 05 System Rated Heating Capacity at 47°F, 06 System Rated Heating Capacity at 17°F, 07 System Rated Cooling Efficiency SEER/SEER2, 08 System Rated Cooling Efficiency EER/EER2, 09 System Cooling Capacity at Design Conditions (Btu/h), 10 Condenser Nominal Cooling Capacity (ton)

Notes:



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K. Altered Space Conditioning System Duct Information (<75% of duct system is altered; or duct system is not altered)

01	02	03	04	05	06	07	08	09	10	11	12
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Were New Ducts Installed?	Required New Duct R-Value	Installed New Supply Duct Location	Installed New Supply Duct R-Value	Installed New Return Duct Location	Installed New Return Duct R-Value	Exception from Min R-Value	Can Approved Airflow Protocols be used to test this System?	Indoor Unit Nominal Cooling Capacity (ton)

Notes:

L. Installed New or Replacement Duct System Information

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Total Duct Length	Required New Duct R-Value	Supply Duct Location	New or Replaced Supply Duct R-Value	Return Duct Location	New or Replaced Return Duct R-Value	Exception from Min R-Value	Method of compliance with Airflow and Fan Efficacy Req's in 160.3(b)5L	Number of Air Filter Devices on Indoor Unit	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this system?	Indoor Unit Nominal Cooling Capacity (ton)

Notes:



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M. Installed Air Filter Device Information

Mandatory requirements for air filter devices are specified Section 160.2(b)1. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

Table with 13 columns: 01 SC System ID/Name from LMCC, 02 SC System Description of Area Served, 03 Indoor Unit Name or Description of Area Served, 04 Air Filter Name or Description of Location, 05 Air Filter Rack Type, 06 Design Airflow Rate for Air Filter Device (cfm), 07 Air Filter Nominal Depth (inch), 08 Air Filter Nominal Length (inch), 09 Air Filter Nominal Width (inch), 10 Air Filter Calculated Nominal Face Area (inch²), 11 Air Filter Required Minimum Face Area (inch²), 12 Face Area Compliance, 13 Design Allowable Pressure Drop for Air Filter Device (inch W.C.)

N. Air Filter Device Requirements

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Mandatory Air Filter Device Requirements can be found in Section 160.2(b)1. Some mandatory requirements may apply in addition to those listed below.

Table with 2 columns: ID (01-06) and Description of requirements for air filter devices, including airflow rate, pressure drop, efficiency, and gasketing.



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O. ECC Verification Requirements for Duct Systems

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from LMCC	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Exemption from Duct Leakage Requirements	MCH-20 Duct Leakage Test	MCH-21 Duct Location Verification	MCH-22 AHU Fan Efficacy (W/cfm)	MCH-23 AHU Airflow Rate (cfm/ton)	MCH-28 Return Duct Design - Table 160.3-A or B	MCH-29 Supply Duct Surface Area R-Value Buried Ducts

Notes:

P. ECC Verification Requirements for Space Conditioning Equipment

01	02	03	04	05
SC System ID/Name from LMCC	SC System Description of Area Served	MCH-25 Refrigerant Charge	MCH-26 Rated SC System Equipment Verification	MCH-33 VCHP Compliance Credit

Notes:

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



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O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Additional mandatory requirements from Section 160.3 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

Heating Equipment

Table with 5 rows (01-05) detailing heating equipment requirements such as efficiency, controls, sizing, furnace temperature rise, and standby losses.

Cooling Equipment

Table with 6 rows (06-10) detailing cooling equipment requirements such as efficiency, refrigerant line insulation, condensing unit location, liquid line filter drier, and sizing.

Cooling and Heating Equipment (Additional Requirement)

Table with 2 rows (11-12) detailing additional requirements for defrost and capacity variation with third-party thermostats.

Air Distribution System Ducts, Plenums and Fans

Table with 2 rows (13-14) detailing requirements for duct insulation and connections/closures.





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

Heat Pump Thermostat

15	A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).
16	The thermostat shall be installed in accordance with the manufacturers published installation specifications.
17	First stage of heating shall be assigned to heat pump heating.
18	Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.

S. Test of Defrost Delay Timer Setting (Section 160.3(b)7)

The installing contractor shall confirm that a heat pump’s installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	<p>Test applicability. Select the statement describing test applicability for this project:</p> <ol style="list-style-type: none"> <li>The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions.</li> <li>The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost.</li> <li>The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies.</li> <li>The test does not apply because Exception 2 . Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.</li> </ol>	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump’s Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (for example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this Certificate of Installation is true and correct.
- I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
- I understand that a registered 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, and I will take the necessary steps to ensure this requirement is accomplished.
- I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to ensure this requirement is accomplished.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

**LMCI-MCH-01d-E User Instructions****Section A. General Information**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the LMCC-PRF may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems (see definition in Section 9.6.9 of the RCM) must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit. This field is filled out automatically using the default value from the LMCC-PRF for performance compliance, and is user entry for prescriptive compliance. The default value from the LMCC-PRF may be overwritten in this

document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

### **Section B. Design Space Conditioning (SC) System Component Specifications from LMCC**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
9. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.
10. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.
11. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.
12. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (LMCC), which must be completed prior to this document.

### **Section C. Design Space Conditioning (SC) System Compliance Requirements from LMCC**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.

3. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
- 6a. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
9. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
10. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
11. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
12. This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.

#### **Section D. Installed New, Altered, and Existing Space Conditioning (SC) System Component Information**

1. Select System name from the list of systems identified in previous sections and originally specified on the LMCC.
2. Briefly describe the area served by this system. Examples: entire house, upstairs, downstairs, sleeping area, north wing, etc.
3. Enter the conditioned floor area served by the system described in this row. The total value of this column for all rows must equal the total dwelling unit conditioned floor area as shown in Section A.
4. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

6. If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
7. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
8. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
10. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
11. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
12. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
13. This field may be filled out automatically, otherwise enter the number of ducted indoor units connected to this system's outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).

#### **Section E. Space Conditioning (SC) System Alteration Type Determination**

1. SC System Identification or Name: Enter a unique identifier for this system that will readily distinguish it from other systems in the dwelling unit, such as "HVAC1," "upstairs system," etc. It is recommended to mark the system with this identifier using a permanent marker for ease of identification in the field. For single-system dwelling units, enter a simple name such as "HVAC."
2. SC System Description of Area Served: Enter a unique description of the portion of dwelling unit served by this system, such as "entire second floor," "bedroom wing," etc. For single-system dwelling units, enter a simple description such as "entire house."
3. Is the altered or installed system a ducted system? Select "**YES**" if the system has a central air handler (package or split) that is connected to one or more supply air outlets via ducting of any shape or material. Select "**NO**" for nonducted systems such as ductless mini-splits, through-the-wall systems, package terminal air conditioners, etc.

4. Altering or installing a refrigerant containing component? Select “YES” if the project includes installing or replacing a component that contains refrigerant; otherwise select “NO.” Refrigerant containing components include compressors, condensing coils, evaporator coils, refrigerant metering devices or refrigerating lines.
5. Installing new components? Select “YES” if new HVAC components such as a packaged unit, condensing unit, cooling/heating coil, or air-handling unit (e.g. furnace), etc. are being installed in the system; otherwise select “NO.”
6. Installing more than 25 linear feet of new or replacement ducts? This field may be filled out automatically. If required, Select “YES” if the project involves installing more than 25 linear feet of new or replacement ducts; otherwise select “NO.”
7. Is the entire duct system accessible for sealing and is more than 75% of the duct system new or replaced? Select “YES” when, upon completion of the project, more that 75% of the ducts will be new ducts and/or replaced ducts, AND if at any time during the project all of the ducts are accessible for duct sealing; otherwise select “NO.” “Accessible” is defined in Joint Appendix JA1 of the 2013 Reference Appendices (glossary).
8. Are all of the system's components and ducts new (entirely new system) or replaced? Select “YES” if the duct system meets the definition of an “Entirely New or Replacement Duct System” and all of the heating and cooling components (furnace, condenser, coil, etc.) are all new or replaced; otherwise select “NO.”
9. Alteration Type: This field is calculated automatically based on the information entered in previous fields. Alteration types are defined in Joint Appendix JA1 of the 2025 Reference Appendices. The alteration type will determine which of the following sections are required by this document.
10. Altered Heating Components. select all that are applicable
11. Altered Cooling Components. select all that are applicable

#### **Section F. Installed Heating System Information (not heat pumps)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc.
4. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes.
5. Enter the description of the duct system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length
6. This field is filled out automatically. It is referenced from the same row and column in Section C.
7. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
9. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
10. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
11. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.

**Section G. Installed Cooling System Outdoor Unit or Package Unit Equipment Information (not heat pump)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
4. Enter the certified cooling efficiency (EER/EER2/CEER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour. This information is found in the system performance information on the manufacturer's published documentation for the installed system.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.
10. Enter the installed Condenser Rated Cooling Capacity in BTU/h. Note that this is based on the condenser, not the coil or air handler.

**Section H. Installed Split System Indoor Unit Coil or Fan Coil Equipment information - applicable to DX or hydronic, heating or cooling, coils or fan coil units)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the type of indoor unit or air handling unit installed by selecting one of the choices from the list.
5. Enter the description of the ducts system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes
7. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Manufacturer as shown on the equipment nameplate.
8. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Model Number as shown on the equipment nameplate.
9. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Serial Number as shown on the equipment nameplate.

**Section I. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.



3. Enter the name of the *installed* Heat Pump Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
4. Enter the name of the *installed* Heat Pump Condenser or Package Unit Model Number as shown on the equipment nameplate.
5. Enter the name of the *installed* Heat Pump Condenser or Package Unit Serial Number as shown on the equipment nameplate.

#### Section J. Installed Heat Pump System – Efficiency and Performance Compliance Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row in Section C.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the certified heating capacity at 47F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
6. Enter the certified heating capacity at 17F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
7. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the certified cooling efficiency (EER/EER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
9. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour.
10. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. Can usually be determined by the condenser model number.

**Section K. Extension of Existing Duct System, Greater Than 25 Feet**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field may be filled out automatically. If required, select yes or no.
5. This field is filled out automatically.
6. Select the supply duct location from the list.
7. Enter the R-value of the installed supply ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.
8. Select the return duct location from the list.
9. Enter the R-value of the installed return ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
11. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. A "No" response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
12. If required, enter the indoor unit nominal cooling capacity, otherwise this field is not applicable.

**Section L. Installed Duct System Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field may be filled out automatically. If required, select the description of the duct length. Choices are >10ft and ≤10ft.
5. This field is filled out automatically.
6. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.

8. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the LMCC are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
11. For entirely new duct systems taking the performance credit for better than default air flow or fan efficacy, field verification of these criteria is required and this field is filled out automatically. Otherwise, the user may pick the appropriate choice. Refer to section 160.3(b)5L and Nonresidential Compliance Manual Chapter 11 for more information.
12. Specify the number of air filter devices installed on this indoor unit. Air filter devices installed in completely new duct systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
13. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. A "No" response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
14. If the system is of a type that can use the approved protocols for testing the fan efficacy, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure.
15. If required, enter the indoor unit nominal cooling capacity, otherwise this field is not applicable.

#### Section M. Installed Air Filter Device Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2025 Standards encourages use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.

11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 160.2(b)1. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

#### **Section N. Air Filter Device Requirements**

This table is a list of requirements for air filter devices.

#### **Section O. ECC Verification Requirements**

1. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
7. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
8. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
9. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
10. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

#### **Section P. ECC Verification Requirements for Space Conditioning Equipment**

1. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the LMCC and from previous sections in this document.

**Section Q. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

This table is a list of requirements for space conditioning systems.

**Section S. Test of Defrost Delay Timer Setting (Section 160.3(b)7)**

This table is certification requirements for Test of Defrost Delay Timer Setting

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Project Name, Dwelling Address, City and Zip Code; Enforcement Agency, Permit Number, Permit Application Date.

A. System Information

Table with 2 columns: ID (01-09), Description of system information items.

B1. Duct Leakage Diagnostic Test for Completely New Duct System

Table with 2 columns: ID (01-12), Description of diagnostic test parameters and compliance statement.



**B2. Duct Leakage Diagnostic Test for Low Leakage Ducts in Conditioned Space**

01	System compliance with visual inspection per RA3.1.4.1.3?	
02	Duct Leakage Test Conditions	
03	Duct Leakage Test Method	
04	Target Allowable Duct Leakage Rate (cfm)	
05	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
06	Compliance Statement:	

**B3. Duct Leakage Diagnostic Test for Low Leakage Air-Handling Unit (LLAHU)**

01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft <sup>2</sup> )	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Air-Handling Unit Manufacturer Name	
13	Air-Handling Unit Model Number	
14	Compliance Statement:	

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



**B4. Duct Leakage Diagnostic Test for Complete Replacement or Altered Duct System**

01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft <sup>2</sup> )	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Compliance Statement:	

**B5. Duct Leakage Diagnostic Test for Replacement or Alteration Using Smoke Test**

01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft <sup>2</sup> )	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Compliance Statement:	





**C. Ducts Located in Garage Spaces**

01	Duct Leakage Test Method	
02	Leakage Factor	
03	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
04	Measured AHU Airflow (cfm)	
05	Calculated Target Allowable Duct Leakage Rate (cfm)	
06	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
07	Compliance Statement:	

**D. Additional Requirements for Compliance**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	System was tested in its normal operation condition. No temporary taping allowed.
02	Outside air (OA) duct connections to the central forced air duct system shall not be sealed/taped off during duct leakage testing. OA ducts used for Central Fan Integrated (CFI) Indoor Air Quality ventilation systems, or Central Fan Ventilation Cooling Systems, that utilize dampers that open only when OA is required and automatically close when OA is not required, may configure the OA damper to the closed position during duct leakage testing.
03	All supply and return register boots were sealed to the drywall.
04	Building cavities were not used as plenums, or platform returns, in lieu of ducts.
05	If cloth backed tape was used it was covered with Mastic and draw bands.
06	All connection points between the air handler and the supply and return plenums are completely sealed.
07	For completely new systems visual inspection at final construction stage (applicable if system was tested at rough-in): For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.
08	For completely new systems visual inspection at final construction stage (applicable if system was tested at rough-in): If the house rough-in duct leakage test was conducted without an air handler installed, inspect the connection points between the air handler and the supply and return plenums to verify that the connection points are properly sealed.
09	For completely new systems visual inspection at final construction stage (applicable if system was tested at rough-in): Inspect all joints to ensure that no cloth backed rubber adhesive duct tape is used.
10	For Duct Systems with Low Leakage Air-Handling Unit (LLAHU): The Low Leakage Air-handling Unit Model identified on this compliance document is included in the list of certified Low Leakage Air-Handling Units published on the Energy Commission Website at: <a href="https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency/manufacture-certification-building-equipment/low">https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency/manufacture-certification-building-equipment/low</a>
11	For Replacement or Alteration Duct Systems: If the system complies using the Smoke Test method, the smoke test was conducted in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.6. Systems that comply using the smoke test shall not be included in sample groups for ECC verification compliance.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Table with 2 columns: Documentation Author Name, Documentation Author Signature, Documentation Author Company Name, Date Signed, Address, CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code...
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations...
4. I understand that an ECC-Rater will check the installation to verify compliance...
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s)...
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Table with 2 columns: Responsible Builder/Installer Name, Responsible Builder/Installer Signature, Company Name, Position With Company (Title), Address, CSLB License, City/State/Zip, Phone, Date Signed, Third Party Quality Control Program (TPQCP) Status, Name of TPQCP (if applicable).

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

## LMCI-MCH-20-H User Instructions

### A. System Information

1. *HVAC System Identification or Name*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. *HVAC System Location or Area Served*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. *Indoor Unit Name*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
4. *Building Type*: This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
5. *Verified Low Leakage Ducts in Conditioned Space (VLLDCS)*: This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
6. *Verified Low Leakage Air-Handling Unit (VLLAHU) Credit*: This field is filled out automatically. It is referenced from the Certificate of Compliance (LMCC), which must be completed prior to this document.
7. *Duct System Compliance Category*: Choose from New, Replacement, Alteration, Replacement Using Smoke Test, Alteration Using Smoke Test.
  - a. **New**: Use this choice for newly constructed buildings, additions with all-new systems dedicated to the addition, or new systems installed in existing homes where the equipment is newly installed and the ducts are at least 75% or more newly installed duct material (up to 25% of the finished system may consist of reused parts from the dwelling unit's previously existing duct system, such as registers, grilles, boots, air handler, coil, plenums, duct material).
  - b. **Replacement**: For existing buildings where the equipment is not newly installed but the ducts are at least 75% or more newly installed duct material (up to 25% of the finished system may consist of reused parts from the dwelling unit's previously existing duct system, such as registers, grilles, boots, air handler, coil, plenums, duct material). Sometimes referred to as a "re-ducted" system.
  - c. **Alteration**: For existing buildings where any of the following are newly installed or replaced as part of the project and the system does not meet one of the other compliance categories:
    1. 25 feet of space-conditioning system ducts are installed in unconditioned space or indirectly conditioned space.
    2. Air conditioning or heat pump condenser
    3. Heating or cooling coil
    4. Air handler (e.g., furnace, fan coil, package unit)
  - d. **Replacement using Smoke Test**: Similar to "Replacement" but the target leakage could not be met due to the equipment not being new. Smoke is used to show that leaks are only coming from the previously existing equipment. All accessible leaks visible by smoke must be sealed.
  - e. **Alteration using Smoke Test**: Similar to "Alteration" but the target leakage could not be met due to the equipment not being new or due to inaccessible leaks. Smoke is used to show that leaks are only coming from the previously existing equipment or are inaccessible. All accessible leaks visible by smoke must be sealed.
8. *Any portions of Duct Located in Garage*: User select from Yes or No.

**B1. Duct Leakage Diagnostic Test for Completely New Duct System**

1. *Air-Handling Unit Airflow (AHU Airflow) Determination Method*: User will select from the following options:
  - a. *Default Airflow Method*: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - b. *Cooling System Method*: For systems with air conditioning, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer
  - c. *Heating System Method*: For heating only systems the nominal air-handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - d. *Measured Airflow Method*: The measured system airflow can be used as the air-handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - e. *Indoor Unit Method*
2. *Condenser Nominal Cooling Capacity (ton)*: Same data given on MCH-01.
3. *Indoor Unit Nominal Cooling Capacity*: Same data given on MCH-01.
4. *Heating Capacity (kBtu/h)*: Same data given on MCH-01;
5. *Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>)*: User must input CFA for the space. Should be consistent with the LMCC input value.
6. *Measured AHU Airflow (CFM)*: If “Measured Airflow Method” is selected, user must input measured airflow.
7. *Duct Leakage Test Conditions*: User must select :
  - a. *Test Final*: Test conducted at “final”, i.e. all equipment, ducts, and registers are installed and the system is essentially in its final operating condition. (rough-in no longer an option. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. *Duct Leakage Test Method*: Select from the following options: Leakage to the Outside (house is pressurized simultaneously with the ducts such that only leakage going outside of the pressurized conditioned shell is measured, see RA3.1.4.3.4), or Total Leakage.
9. *Leakage Factor*: This field is automatically filled out based on choices in previous fields.
10. *Calculated Target Allowable Duct Leakage Rate (cfm)*: This value will be automatically calculated based on values entered in previous fields.
11. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: Input the duct leakage rater taken from actual test measurements.
12. *Compliance Statement*: If Actual Duct Leakage Rate from leakage test (B10) is less than or equal to Calculated Target Allowable Duct Leakage Rate, “System passes leakage test” will automatically populate. If not, “System fails leakage test” will automatically populate.

**B2. Duct Leakage Diagnostic Test - Low Leakage Ducts in Conditioned Space**

1. *System compliance with visual inspection per RA3.1.4.1.3*: This field will be automatically filled. A visual inspection confirms the space conditioning system is located entirely in conditioned space in accordance with RA3.1.4.1.3. If any part of the duct system is outside of conditioned space, the system does not pass.

2. *Duct Leakage Test Conditions*: This field will be automatically filled. The entire duct system shall be included in the total leakage test. The air handler, supply and return plenums and all the connectors, transition pieces, duct boots and registers must be installed and tested to total system leakage. All supply registers shall be taped so that the tape goes over the grills and attaches to the surrounding drywall. All return grilles except for one large centrally located return grille or the air handler cabinet access panel shall be taped up.
3. *Duct Leakage Test Method*: This field will be automatically filled. Leakage to outside shall be verified by pressurizing the dwelling and the ducts to 25 Pa (0.1 inches of water) with respect to outside. A full description of these procedures can be found in RA3.1.4.3.4.
4. *Target Allowable Duct Leakage Rate (cfm)*: This field will be automatically filled. In order to pass this test duct leakage must be equal to or less than 25 cfm when the dwelling and ducts are pressurized to 25 Pa with respect to outside.
5. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: Input the duct leakage rate taken from actual test measurements.
6. *Compliance statement*: This field will be automatically filled. The test passes if actual leakage rate is less than or equal to 25 cfm and a MCH-21 has been registered.

### **B3. Duct Leakage Diagnostic Test - Low Leakage Air-Handling Unit (LLAHU)**

1. *Air-Handling Unit Airflow (AHU Airflow) Determination Method*: User will select from the following options:
  - a. *Cooling System Method*: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer or the heating only value, whichever is greater (See Section RA3.1.4.2.2 of the 2025 Reference Appendices).
  - b. *Heating System Method*: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - c. *Measured Airflow Method*: The system airflow can be used as the air-handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - d. *Default Airflow Method*: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - e. *Indoor Unit Method*
2. *Condenser Nominal Cooling Capacity (ton)*: Same data given on MCH-01.
3. *Indoor Unit Nominal Cooling Capacity*: Same data given on MCH-01.
4. *Heating Capacity (kBtu/h)*: Same data given on MCH-01;
5. *Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>)*: User will input CFA for zone which should be consistent with the value from the LMCC. User will have the option to leave this field blank because the zone CFA is only required for the default airflow calculation.
6. *Measured AHU Airflow (cfm)*: If "Measured Airflow Method" is selected, user must input measured airflow.
7. *Duct Leakage Test Conditions*: User must select from the following options:
  - a. *Test Final*: Test conducted at final inspection (testing at rough is not an option with this test. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. *Duct Leakage Test Method*: User will select from the following options: Total Leakage.
9. *Leakage Factor*: Value will be automatically populated from in LMCC.

10. *Calculated Target Allowable Duct Leakage Rate (cfm)*: This value will be automatically populated depending on values in B06, B07, and B08.
11. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: User will input this value from actual measurements from leakage test.
12. *Air-Handling Unit Manufacturer Name*: This will be automatically populated from information entered in the MCH-01.
13. *Air-Handling Unit Model Number*: This will be automatically populated from information entered in the MCH-01.
14. *Compliance Statement*: If Actual Duct Leakage Rate from leakage test is less than or equal to Calculated Target Allowable Duct Leakage Rate, "System passes leakage test" will automatically populate. If not, "System fails leakage test will automatically populate.

#### **B4. Duct Leakage Diagnostic Test - Complete Replacement or Altered Duct System**

1. *Air-Handling Unit Airflow (AHU Airflow) Determination Method*: User will select from the following options:
  - a. *Default Airflow Method*: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - b. *Cooling System Method*: For systems with air conditioning, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer (Note: the heating only value may be used, if higher, See Section RA3.1.4.2.2 of the 2025 Reference Appendices).
  - c. *Heating System Method*: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - d. *Measured Airflow Method*: The measured system airflow can be used as the air handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - e. *Indoor Unit Method*
2. *Condenser Nominal Cooling Capacity (ton)*: Same data given on MCH-01.
3. *Indoor Unit Nominal Cooling Capacity*: Same data given on MCH-01.
4. *Heating Capacity (kBtu/h)*: Same data given on MCH-01.
5. *Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>)*: User must input CFA for the space. Should be consistent with the LMCC input value.
6. *Measured AHU Airflow (CFM)*: If "Measured Airflow Method" is selected, user must input measured airflow.
7. *Duct Leakage Test Conditions*: Select from the following options:
  - a. *Test Rough-in AHU*: Installers may determine duct leakage in new construction by using diagnostic measurements at rough-in building construction stage prior to installation of interior finishing (See Section RA3.1.4.3.2 of the 2025 Reference Appendices). In this case the air handling unit (AHU) is installed at the time of test.
  - b. *Test Rough-in No AHU*: Same as "Test Rough-in" except air handling unit is not yet installed (See Section RA3.1.4.3.2 of the 2025 Reference Appendices).

- c. **Test Final:** Test conducted at “final”, i.e. all equipment, ducts, and registers are installed and the system is essentially in its final operating condition. (rough-in no longer an option. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. **Duct Leakage Test Method:** Select from the following options: Leakage to the Outside (house is pressurized simultaneously with the ducts such that only leakage going outside of the pressurized conditioned shell is measured, see RA3.1.4.3.4), or Total Leakage.
9. **Leakage Factor:** This field is automatically filled out based on choices in previous fields.
10. **Calculated Target Allowable Duct Leakage Rate (cfm):** This value will be automatically calculated based on values entered in previous fields.
11. **Actual Duct Leakage Rate from Leakage Test Measurement (cfm):** Input the duct leakage rate taken from actual test measurements.
12. **Compliance Statement:** If Actual Duct Leakage Rate from leakage test is less than or equal to Calculated Target Allowable Duct Leakage Rate, “System passes leakage test” will automatically populate. If not, “System fails leakage test” will automatically populate.

#### **B5. Duct Leakage Diagnostic Test - Sealing All Accessible Leaks using Smoke Test**

1. **Air-Handling Unit Airflow (AHU Airflow) Determination Method:** User will select from the following options:
  - a. **Default Airflow Method:** The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - b. **Cooling System Method:** For systems with air conditioning, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer (Note: the heating only value may be used, if higher, See Section RA3.1.4.2.2 of the 2025 Reference Appendices).
  - c. **Heating System Method:** For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - d. **Measured Airflow Method:** The measured system airflow can be used as the air handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - e. **Indoor Unit Method**
2. **Condenser Nominal Cooling Capacity (ton):** Same data given on MCH-01.
3. **Indoor Unit Nominal Cooling Capacity:** Same data given on MCH-01.
4. **Heating Capacity (kBtu/h):** Same data given on MCH-01.
5. **Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>):** User must input CFA for the space. Should be consistent with the LMCC input value.
6. **Measured AHU Airflow (CFM):** If “Measured Airflow Method” is selected, user must input measured airflow.
7. **Duct Leakage Test Conditions:** Select from the following options:
  - a. **Test Rough-in AHU:** Installers may determine duct leakage in new construction by using diagnostic measurements at rough-in building construction stage prior to installation of interior finishing (See Section RA3.1.4.3.2 of the 2025 Reference Appendices). In this case the air-handling unit (AHU) is installed at the time of test.

- b. Test Rough-in No AHU: Same as “Test Rough-in” except air handling unit is not yet installed (See Section RA3.1.4.3.2 of the 2025 Reference Appendices).
  - c. Test Final: Test conducted at “final”, i.e. all equipment, ducts, and registers are installed and the system is essentially in its final operating condition. (rough-in no longer an option. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. *Duct Leakage Test Method*: Select from the following options: Leakage to the Outside (house is pressurized simultaneously with the ducts such that only leakage going outside of the pressurized conditioned shell is measured, see RA3.1.4.3.4), or Total Leakage.
  9. *Leakage Factor*: This field is automatically filled out based on choices in previous fields.
  10. *Calculated Target Allowable Duct Leakage Rate (cfm)*: This value will be automatically calculated based on values entered in previous fields.
  11. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: Input the duct leakage rate taken from actual test measurements.
  12. *Compliance Statement*: If *Actual Duct Leakage Rate* is less than or equal to *Calculated Target Allowable Duct Leakage Rate*, “system passes - system complies with Allowable Duct Leakage Rate Criterion” will automatically populate.

If measured leakage is greater than allowable duct leakage rate, then the following will automatically populate:

“System passes using smoke test of an altered HVAC system in an existing building

- No visible smoke exits the accessible portions of the duct system.
- Smoke is only emanating from air handler unit (AHU cabinet and non-accessible portions of the duct system.

Note: Accessible is defined as having access thereto, but which first may require removal or opening of access panels, doors, or moving similar obstructions. If access to the ducts requires an object to be demolished or deconstructed, then sealing of those ducts is not required.

### C. Ducts Located in Garage Spaces

1. *Duct Leakage Test Method*: This field is automatically filled out based on choices in previous fields.
2. *Leakage Factor*: This field is automatically filled out based on choices in previous fields.
3. *Air-Handling Unit Airflow (AHU Airflow) Determination Method*: This field is automatically filled out based on choices in previous fields.
4. *Measured AHU Airflow (CFM)*: This field is automatically filled out based on choices in previous fields.
5. *Calculated Target Allowable Duct Leakage Rate (cfm)*: This value will be automatically calculated based on values entered in previous fields
6. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: This field is automatically filled out based on choices in previous fields
7. *Compliance Statement*: If Actual Duct Leakage Rate from leakage test is less than or equal to Calculated Target Allowable Duct Leakage Rate, passes message will automatically populate. If not, “System fails leakage test” will automatically populate.

### D. Additional Requirements for Compliance

1. This field must be a true statement (or not applicable) for the system to comply.



2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.
8. This field must be a true statement (or not applicable) for the system to comply.
9. This field must be a true statement (or not applicable) for the system to comply.
10. This field must be a true statement (or not applicable) for the system to comply.
11. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

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

**A. General Information**

**Note:** Submit one Installation Certificate for each duct system that is taking credit for duct location.

01	SC System Identification or Name	
02	SC System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Status – Less than 12 ft Ducts in Conditioned Space Performance Credit	
05	Status – Ducts Located In Conditioned Space Performance Credit	
06	Status – Duct System Located Entirely in Conditioned Space, No Insulation Requirement	
07	Status – Portions of Ducts Located in Conditioned Space, R-6 Exception	

**B. 12 Linear Feet or Less of Duct Located Outside of Conditioned Space - RA3.1.4.1.2**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A visual inspection shall confirm space conditioning systems with air handlers located outside the conditioned space have 12 linear feet or less of duct located outside the conditioned space including air handler and plenum.
----	--

**C. Ducts Located In Conditioned Space - RA3.1.4.1.3**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A visual inspection shall confirm the space conditioning duct system is located entirely in conditioned space.
----	--

**D. All Ducts Located Entirely in Directly Conditioned Space, No Insulation Requirement - RA3.1.4.3.8**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A Visual Inspection Shall Confirm the Space Conditioning Distribution System Location as specified by Section RA3.1.4.1.3	
02	Actual System Duct Leakage Rate (cfm) Measured Using RA3.1.4.3.4 Duct Leakage to Outside from Fan Pressurization of Ducts	
03	Compliance Statement:	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**E. Portions of Ducts Located in Conditioned Space, R-6 Exception**

***The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.***

*The following shall be confirmed by visual inspection when applicable.*

01	Portions of the duct system with no insulation (or with insulation less than minimum R-6) are located in conditioned space below the ceiling separating the occupiable space from the attic.
02	Portions of the duct system with no insulation (or with insulation less than minimum R-6 ) are located entirely inside the building’s thermal envelope.
03	At all locations where portions of the duct system with no insulation (or with insulation less than minimum R-6) penetrate into unconditioned space, the penetrations are draft stopped compliant with CFC sections 703.1 and 704.1 and air-sealed to the construction materials that are penetrated, using materials compliant with CMC sections E502.4.2 to prevent air infiltration into the cavity. All connections in unconditioned space are insulated to a minimum of R-6.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

## LMCI-MCH-21-H User Instructions

### Section A. General Information

1. *HVAC System Identification or Name*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. *HVAC System Location or Area Served*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. *Indoor Unit Name*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
4. *Status – Less than 12 ft Ducts in Conditioned Space Performance Credit*: This field is automatically filled based on the information given on the LMCC. If “True” appears here, it means that this credit was taken in the performance calculations, is required for compliance and must be field verified.
5. *Status – Ducts Located in Conditioned Space Performance Credit*: This field is automatically filled based on the information given on the LMCC. If “True” appears here, it means that this credit was taken in the performance calculations, is required for compliance and must be field verified.
6. *Status – Duct Systems Located Entirely in Conditioned Space, No Insulation Requirement*– This field is automatically filled based on the information given on the LMCC. If “True” appears here, it means that the duct system is located entirely in conditioned space and is allowed to be installed with insulation less than the minimum R-Value or no insulation.
7. *Status – Portions of Ducts Located in Conditioned Space, R-6 Exception* – This field is automatically filled based on the information given on the LMCC. If “True” appears here, it means that portions of the duct system are located in conditioned space and are allowed to be installed with insulation less than the minimum R-Value or no insulation.

### Section B. 12 Linear Feet or Less of Duct Located Outside of Conditioned Space

1. This field is automatically filled.

### Section C. Ducts Located in Conditioned Space

1. This field is automatically filled.

### Section D. All Ducts Located Entirely in Directly Conditioned Space, No Insulation Requirement

1. *A Visual Inspection Shall Confirm the Distribution System is in Conditioned Space*: If a visual inspection confirms that the ducts are entirely within directly conditioned space, then select “entirely in directly conditioned space”, otherwise select “not entirely in directly conditioned space”. The latter selection means that the system does not meet the requirements and the LMCC will have to be revised or the system will need to be modified such that the ducts are located entirely within directly conditioned space.
2. *Actual System Duct Leakage Rate (cfm) Measured using RA3.1.4.3.4 Duct Leakage to Outside from Fan Pressurization of Ducts*: Enter the measured duct leakage rate (cfm) using the procedures found in RA3.1.4.3.4.
3. *Compliance Statement*: This field is automatically filled.

**Section E. Portions of Ducts Located in Conditioned Space, R-6 Exception**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA  
COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Project Name, Dwelling Address, City and Zip Code; Enforcement Agency, Permit Number, Permit Application Date.

A. Ducted Cooling System Information

Table with 2 columns: ID (01-11), System Identification or Name, System Location or Area Served, Indoor Unit Name or Description of Area Served, System Installation Type, Nominal Cooling Capacity (tons) of Condenser, Condenser Speed Type, Cooling System Zonal Control Type, Central Fan Integrated (CFI) Ventilation System Status, System Bypass Duct Status, Date of System Airflow Rate Measurement, Airflow Rate Protocol Utilized.

B. Fan Watt Measurement Apparatus and Procedure Information

Instrument Specifications are given in RA3.3.1, and system fan watt measurement apparatus information is given in RA3.3.2.2.

Table with 2 columns: ID (01), Fan Watt Verification Device Used.

C1. Forced Air System Fan Efficacy Measurement – Newly Installed Non-Zoned Systems or Zoned Multi-Speed Compressor

The procedures for System Fan Watt Verification are specified in Reference Residential Appendix RA3.3.

Table with 2 columns: ID (01-05), Actual Tested Watts, Actual Tested Airflow from MCH-23 (cfm), Required Fan Efficacy (watts/cfm), Actual Fan Efficacy (watts/cfm), Compliance Statement.

C2. Forced Air System Fan Efficacy Measurement – All Zones Calling

The procedures for System Fan Watt Verification are specified in Reference Residential Appendix RA3.3.

Table with 2 columns: ID (01-05), Actual Tested Watts, Actual Tested Airflow from MCH-23 (cfm), Required Fan Efficacy (watts/cfm), Actual Fan Efficacy (watts/cfm), Compliance Statement.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

D. Forced Air System Fan Efficacy Measurement – All Zonal Control Modes

The procedures for System Fan Efficacy Verification are specified in Reference Residential Appendix RA3.3.

Note: For compliance with verification in all zonal control modes, it is sufficient to verify fan efficacy for operation of each individual zone when the individual zone is the sole zone calling for conditioning. It is not necessary to verify fan efficacy for combinations of 2 or more zones that are less than all zones calling (e.g., 2 out of three zones calling).

Table with 6 columns: 01 (Number of Independently Controlled Zones), 02 (Required Fan Efficacy in All Zonal Control Modes), 03 (Zone Name), 04 (Zone Description), 05 (Measured Watt Draw with all Other Zones Off), 06 (Measured Airflow with all Other Zones Off), 07 (Calculated Fan Efficacy), 08 (Zone Compliance Status), and 09 (Compliance Statement).

E. Additional Requirements

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID (01-07) and Description of requirements for fan efficacy measurement.





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

## LMCI-MCH-22-H User Instructions

### Section A. Ducted Cooling System Information

1. System Identification or Name: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
3. Indoor Unit Name: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
4. System Installation Type: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
5. Nominal Cooling Capacity (tons) of Condenser: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
6. Condenser Speed Type: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
7. Cooling System Zonal Control Type: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
8. Central Fan Integrated (CFI) Ventilation System Status: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
9. System Bypass Duct Status: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
10. Date of System Airflow Rate Measurement: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
11. Airflow Rate Protocol utilized: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.

### Section B. Fan Watt Measurement Apparatus and Procedure Information

1. Fan Watt Verification Device Used: If the device used to measure fan watts was a portable watt meter then select “Portable Watt Meter”. This can include plug-in devices such as a “Watts-Up” meter, or a “Kill-a-Watt” meter, or a clamp-on type meter that reads true power watts directly (must account for power factor – multiplying amps x volts is not adequate).

### Section C1. Forced Air System Fan Efficacy Measurement

(This section title is for systems that are Non-Zoned or have Zoned Multi-Speed Compressor) and

### Section C2. Forced Air System Fan Efficacy Measurement – All Zones Calling

(This section title is for zonally controlled systems) Both C1 and C2 have the same fields and instructions:

1. Actual Tested Watts: Enter the number of watts tested using the device specified in section B.
2. Actual Tested Airflow from MCH-23 (cfm): This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
3. Required Fan Efficacy (Watts/cfm): This field is filled out automatically and referenced from MCH-01. Values below are used unless higher efficacy values are specified on the LMCC for performance compliance.
  - a. 0.62 watts/cfm for small duct high velocity HP or AC systems
  - b. 0.45 watts/cfm for central gas furnace or packaged gas furnace systems
  - c. 0.58 watts/cfm for all other systems

4. Actual Fan Efficacy (watts/cfm): This field is filled out automatically. It is calculated by dividing the actual tested watts by the actual tested airflow.
5. Compliance Statement: This field is filled out automatically based on whether or not the actual fan efficacy meets the required fan efficacy.

#### **Section D. Forced Air System Fan Efficacy Measurement – All Zonal Control Modes**

(This section is required for zonally controlled systems)

1. Number of Independently Controlled Zones: Enter the number of independently controlled zones.
2. Required Fan Efficacy (Watts/cfm): This field is filled out automatically and referenced from MCH-01. Values below are used unless higher efficacy values are scheduled on the LMCC for performance compliance.
  - a. 0.62 watts/cfm for small duct high velocity HP or AC systems
  - b. 0.45 watts/cfm for central gas furnace or packaged gas furnace systems
  - c. 0.58 watts/cfm for all other systems
3. Zone Name: Enter a unique name for each independent zone.
4. Zone Description: Enter a description of the zone (e.g. upstairs, downstairs).
5. Measured Watt Draw with All Other Zones Off: Enter the number of watts tested using the device specified in Section B and tested with all other zones off.
6. Measured Airflow with All Other Zones Off: This field is filled out automatically. It is referenced from the LMCI-MCH-23, which must be completed prior to this document.
7. Calculated Fan Efficacy: This field is filled out automatically. It is calculated by dividing the measured watt draw by the measured airflow.
8. Zone Compliance Status: This field is filled out automatically. The result is based on whether or not the actual fan efficacy meets the required fan efficacy for this zone.
9. Compliance Statement: This field is filled out automatically. The result is based on whether or not the actual fan efficacy meets the required fan efficacy for all zones tested.

#### **Section E. Additional Requirements**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.

#### **Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Project Name, Dwelling Address, City and Zip Code; Enforcement Agency, Permit Number, Permit Application Date.

A. Ducted Cooling System Information

Table with 3 columns: ID (01-11), Description (Space Conditioning System Identification or Name, Description of Area Served, Indoor Unit Name, etc.), and empty cell.

B. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum

Procedures for installing HSPP or PSPP are specified in RA3.3.1.1.

Table with 3 columns: ID (01), Method Used to Demonstrate Compliance with the HSPP/PSPP Requirement, and empty cell.

C. Airflow Rate Measurement Apparatus and Procedure Information

Instrument Specifications are given in RA3.3.1.1, and system airflow rate measurement apparatus information is given in RA3.3.2.

Table with 3 columns: ID (01-04), Description (Airflow Rate Measurement Type Used for this Airflow Rate Verification, Manufacturer of Airflow Measurement Apparatus, etc.), and empty cell.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

D. Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

The installer shall attempt to correct non-compliant system airflow rates by performing the following remedial actions as specified in RA3.3.3.1.5

Table with 2 columns: ID and Description. Rows include: 01 Determine that the air filter media is clean... 02 Open all registers and dampers... 03 Replace/Repair all accessible crushed, blocked, restricted... 08 Clean the evaporator coil... 05 Air handler fan speed set to high... 06 If determined to be too small, replace the return duct... 07 If determined to be too small, replace the return grille... 08 If any of the above were not completed list the Action Required...

E1. Forced Air System Airflow Rate Measurement

Complete this section with Airflow Rate Measurement Data for Newly Installed Non-Zoned Systems or Zoned Multi-Speed Compressor

Table with 2 columns: ID and Description. Rows include: 01 Actual System Airflow Rate Measurement (cfm) 02 Required Minimum System Airflow Rate (cfm/ton) 03 Required Minimum System Airflow Target (cfm) 04 Compliance Statement:

E2. Forced Air System Airflow Rate Measurement - All Zones Calling

Complete this section with Airflow Rate Measurement Data for Newly Installed Zoned Single-Speed Compressor Systems

Table with 2 columns: ID and Description. Rows include: 01 Actual System Airflow Rate Measurement (cfm) 02 Required All Zones Calling Minimum System Airflow Rate (cfm/ton) 03 Required All Zones Calling Minimum System Airflow Target (cfm) 04 Compliance Statement:

E3. Forced Air System Airflow Rate Measurement - Best Airflow Rate Attainable

Complete this section with Airflow Rate Measurement Data for Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems

Table with 2 columns: ID and Description. Rows include: 01 Actual System Airflow Rate Measurement (cfm) 02 Required Minimum System Airflow Rate (cfm/ton) 03 Required Minimum System Airflow Target (cfm) 04 Compliance Statement: 05 ECC Sample Group Eligibility



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

E4. Forced Air System Airflow Rate Measurement – Heating Only

Complete this section with Airflow Rate Measurement Data for Newly Installed Heating Only Non-Zoned Systems or Zoned Multi-Speed Compressor Measurement Only – No Minimum Target Requirement

Table with 1 row: 01 Actual System Airflow Rate Measurement (cfm)

F. Forced Air System Airflow Rate Measurement – All Other Zonal Control Modes

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3. For compliance with verification in all zonal control modes, it is sufficient to verify airflow rate for operation of each individual zone when the individual zone is the sole zone calling for conditioning. It is not necessary to verify airflow rate for combinations of 2 or more zones that are less than all zones calling (e.g., 2 out of three zones calling).

Table with 8 rows and 4 columns: 01 Number of Independently Controlled Zones, 02 Required Minimum Cooling System Airflow Rate, 03 Required Minimum Airflow in all Zonal Control Modes, 04-07 Zone Name, Description, Measured Airflow, and Compliance Status, 08 Compliance Statement.

G. Additional Requirements

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 9 rows: 01 Air filters, 02 Airflow rate measurement apparatus, 03 Bypass ducts, 04 Registers, 05 System fan, 06 Fresh air duct, 07 Airflow rate and fan watt draw, 08 Multi-speed compressor, 09 Altered systems.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300



## LMCI-MCH-23-H User Instructions

### Section A. Ducted Cooling System Information

1. System Identification or Name: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. Indoor Unit Name: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
4. System Installation Type: Select the appropriate System Installation Type from the following choices:
  - a. New: Use this choice for newly constructed buildings, additions with all-new systems dedicated to the addition, or new systems installed in existing homes where the equipment and ducts are all newly installed (aka, "Cut-in").
  - b. Replacement: Use this choice if the system is a complete replacement space-conditioning system installed as part of an alteration, and includes all the system heating or cooling equipment plus a replacement duct system (150.2(b)1Diia) where the ducts are at least 75% or more newly installed duct material (up to 25% of the finished system may consist of reused parts from the dwelling unit's previously existing duct system, such as registers, grilles, boots, air handler, coil, plenums, duct material); plus a replacement air handler.
  - c. Alteration: Use this choice for existing buildings where any of the following are newly installed or replaced as part of the project and the system does not meet one of the other compliance categories above.:
    - i. 40 feet or more of space-conditioning system ducts are installed in unconditioned space or indirectly conditioned space.
    - ii. Air conditioning or heat pump condenser
    - iii. Heating or cooling coil
    - iv. Air handler (e.g., furnace, fan coil, package unit)
5. Nominal Cooling Capacity (tons): This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document. If the number of indoor units connected to the outdoor unit is equal to one or the system is a packaged system then this field is equal to the nominal cooling capacity of the condenser. If the number of indoor units connected to the outdoor unit is greater than one this field is equal to the indoor unit nominal cooling capacity.
6. Condenser Speed Type: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
7. Cooling System Zonal Control Type: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
8. Central Fan Integrated (CFI) Ventilation System Status: If the system has Central Fan Integrated System, then select "CFI System", otherwise select "Not a CFI system".
9. System Bypass Duct Status: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
10. Date of System Airflow Rate Measurement: Enter the date that the airflow test was performed.
11. Airflow Rate Protocol Utilized: If the system installation type is "New" or "Replacement" then only the RA3.3 airflow methods may be used. If the system installation type is "Alteration", the RA3.3 airflow methods may be used, but the Alternative to Compliance with Minimum System Airflow Requirements ("Best I Can Do" Airflow) is an option for existing systems that may require substantial modification to improve the airflow.



**Section B. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum**

1. A hole for a static pressure probe (HSPP) or a permanent static pressure probe (PSPP) is required when system airflow verification is required, whether the airflow test method used requires one or not. Select the appropriate choice from the following options using a dropdown box, the Static Pressure Measurement Method:
  - a. If an Hole Static Pressure Probe is installed then select “HSPP Installed”
  - b. If a Permanent Static Pressure Probe is installed then select “PSPP Installed”
  - c. If the system is configured such that an HSPP nor PSPP can be installed, an alternate location that provides access for making supply plenum pressure measurement may be used. Select “An alternative location has been provided and clearly labeled.”
  - d. If the system is such that an HSPP or PSPP is not applicable, select “HSPP/PSPP are not applicable to this system”.

**Section C. Airflow Rate Measurement Apparatus and Procedure Information**

1. Airflow Rate Measurement Type Used for this Airflow Rate Verification: Select the appropriate airflow test procedure from the following options for the method used to determine actual fan airflow:
  - a. Diagnostic Fan Flow Using Fan Flow Meter (aka Plenum Pressure Matching) according to the procedures in RA3.3.3.1.1
  - b. Diagnostic Fan Flow Using Flow Grid Measurement according to the procedures in RA3.3.3.1.2
  - c. Diagnostic Fan Flow Using Powered Flow Capture Hood according to the procedures in RA3.3.3.1.3
  - d. Diagnostic Fan Flow Using Traditional Flow Capture Hood according to the procedures in RA3.3.3.1.4
2. Manufacturer of Airflow Measurement Apparatus: Enter the name of the manufacturer of the airflow measurement tool used to measure the airflow for this test.
3. Model number of Airflow Measurement Apparatus: Enter the model number of the airflow measurement tool used to measure the airflow for this test.
4. Certification Status of the Airflow Measurement Apparatus Accuracy: The measurement apparatus used to perform an airflow verification measurements must appear on the CEC list of approved devices found at [http://www.energy.ca.gov/title24/equipment\\_cert/ama\\_fas/index.html](http://www.energy.ca.gov/title24/equipment_cert/ama_fas/index.html), if this is true, select “Certified”, otherwise select “Not Certified”. The latter choice will not allow the system to pass until a certified device is used.

**D. Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems***Procedures for Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems*

These fields are required for alteration project compliance

1. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
2. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
3. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
4. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
5. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
6. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
7. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
8. If any of the above items could not be completed due to inaccessibility or significant cost, provide an explanation here.

**Section E1. Forced Air System Airflow Rate Measurement** (This section is required for non-zoned systems or zoned systems with multi-speed systems)

1. Required Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the LMCI-MCH-01.
2. Required Minimum System Airflow Target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target.

**Section E2. Forced Air System Airflow Rate Measurement – All Zones Calling** (This section is required if system is zonally controlled)

1. Required All Zones Calling Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the LMCI-MCH-01.
2. Required All Zones Calling Minimum System Airflow target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target.

**Section E3. Forced Air System Airflow Rate Measurement - Best Airflow Rate Attainable** (This section is required for altered systems using alternative compliance)

1. Required Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is always 300 cfm/ton for this option.
2. Required Minimum System Airflow Target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target, however if the criteria of RA3.3.3 is met the best attainable airflow rate will suffice.
5. ECC Sample Group Eligibility: This field is filled out automatically. If the minimum airflow rate cannot be met and the criteria of RA3.3.3 is used, the system cannot be included in a ECC sample group.

**Section E4. Forced Air System Airflow Rate Measurement** (This section is required if system is heating only)

1. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.

**Section F. Forced Air System Airflow Rate Measurement – All Other Zonal Control Modes**

(This section is required for systems with single speed compressor and zonally controlled).

1. Number of Independently Controlled Zones: Enter the number of zones in this system that are independently controlled, i.e., that can call for cooling while other zones can be fully or mostly shut off from system airflow. This usually corresponds to the number of thermostats or zone sensors.
2. Required Minimum Cooling System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the LMCI-MCH-01.
3. Required Minimum Airflow in all Zonal Control Modes (cfm): This field is filled out automatically. If a value other than 350 cfm was claimed in the performance calculations, it will be referenced from the CF1R, otherwise the target is 350 cfm.
4. Zone Name: Enter a unique name for each zone on this system. Examples: Zone 1, Z1, Zone A, etc.
5. Zone Description: Enter a brief description of each zone that is detailed enough allow someone to distinguish it from the others in the field. Examples: upstairs, first floor, east wing, bedrooms only, (list rooms served), etc.
6. Measured Airflow with All Other Zones Off: This test must be performed with only one independently controlled zone calling for cooling (Note: if fan watt verification is required, it must be performed simultaneously to the corresponding airflow from this test). All other zones must not be calling during this test. The zone dampers for the other zones must be in their normal closed position. Enter the airflow value measured for the zone that is calling. This test must be performed for each and every independently controlled zone.
7. Zone Compliance Status: This field is filled out automatically. The result is based on whether or not the actual airflow meets the required airflow for this zone.
8. Compliance Statement: This field is filled out automatically. The result is based on whether or not the actual airflow meets the required airflow for all zones

**Section G. Additional Requirements**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.
8. This field must be a true statement (or not applicable) for the system to comply.
9. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

# BUILDING AIR LEAKAGE DIAGNOSTIC TEST

## BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES



CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-24-H

### SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

#### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

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

#### A. Enclosure Air Leakage – General Information

01	Test Procedure used	
02	Date of the Diagnostic Test for this Dwelling	
03	Is ECC verification of building enclosure air leakage to outside required by MCH-27?	
04	Is ECC verification of dwelling compartmentalization leakage $\leq 0.3$ CFM <sub>50</sub> /ft <sup>2</sup> of enclosure area required by MCH-27?	
05	Default Enclosure Air Leakage	
06	Indoor temperature during test (°F)	
07	Outdoor temperature during test (°F)	
08	Blower Door Location	
09	Building Elevation Above Sea Level (ft)	
10	Total dwelling unit floor area (ft <sup>2</sup> )	
11	Total dwelling unit ceiling area (ft <sup>2</sup> )	
12	Total dwelling unit exterior wall area (ft <sup>2</sup> )	
13	Total dwelling unit wall area shared with other dwelling units (ft <sup>2</sup> )	
14	Total dwelling unit enclosure area (ft <sup>2</sup> )	
15	Dwelling Unit Volume	
16	Target dwelling unit compartmentalization leakage (CFM50)	

#### B. Diagnostic Equipment Information

01	Number of Manometers Used to Measure Home Pressurization				
	02	03	04	05	06
	Manometer Make	Manometer Model	Manometer Serial Number	Manometer Calibration Date	Manometer Calibration Status
07	Number of Fans Used to Pressurize Home				
	08	09	10	11	
	Fan Make	Fan Model	Fan Serial Number	Fan Configuration (rings)	

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026

# BUILDING AIR LEAKAGE DIAGNOSTIC TEST

## BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES



CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-24-H

### SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

#### C1. Enclosure Air Leakage Diagnostic Test for Single Point Air Tightness Test with Manual Meter

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Unadjusted Enclosure Pressure Target (Pa)	
05	Unadjusted Enclosure Pressure Measured (Pa) (Pressurization is positive; Depressurization is negative)	
06	Induced Enclosure Pressure Difference (Pa) Goal = $50 \pm 3$ or $-50 \pm 3$ (Pressurization is positive; Depressurization is negative)	
07	Induced Enclosure Pressure Check	
08	Measured Nominal Fan Flow at Above Fan Pressure (cfm) at the Induced Enclosure Pressure Difference (in C06 above)	
09	Calculated Nominal CFM50	

#### C2. Enclosure Air Leakage Diagnostic Test for Single Point Air Tightness Test with Automatic Meter

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Induced Enclosure Pressure from Manometer (Pa) Goal = $50 \pm 3$ or $-50 \pm 3$ (Pressurization is positive; Depressurization is negative)	
05	Induced Enclosure Pressure Check	
06	Nominal CFM50	

#### C3. Enclosure Air Leakage Diagnostic Test for a Multi-Point Test

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Unadjusted Enclosure Pressure Target (Pa)	
05	Unadjusted Enclosure Pressure Measured (Pa) (Pressurization is positive; Depressurization is negative)	
06	Induced Enclosure Pressure from Manometer (Pa) Goal = $60 \pm 3$ or $-60 \pm 3$ (Pressurization is positive; Depressurization is negative)	
07	A minimum of five readings were taken spaced evenly between 10 Pa and 60 Pa (or highest attainable pressure)	
08	Post-Test Baseline Enclosure Pressure (Pa)	
09	Name and Version of ASTM E779 Compliant Software used for Multi-Point Test	
10	Corrected Nominal CFM50 (from software)	

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026

# BUILDING AIR LEAKAGE DIAGNOSTIC TEST

## BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES



CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-24-H

### SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

#### D1. Altitude and Temperature Correction for Single Point Test

01	Altitude and Temperature Correction Factor	
02	Corrected CFM50	
03	ACH50	

#### D2. Altitude and Temperature Correction for Multi-Point Test Data

Performed by blower door software For Multi-Point Test

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#### E1. Accuracy Adjustment for Single Point Test

01	Adjusted CFM50 (measured air leakage rate)	
----	--	--

#### E2. Accuracy Adjustment for Multi-Point Test Data

01	Percent Uncertainty @ 95% Confidence Level (from software)	
02	Accuracy Level	
03	Accuracy Adjustment Factor	
04	Adjusted CFM50 (measured air leakage rate)	

#### F. Measured Enclosure Air Leakage Rate

01	
----	--

#### G. Additional Requirements for Test Compliance

01	The procedure for preparing the enclosure for testing is detailed in RESNET 380-2019 Section 4.2.
02	When multifamily attached dwelling units must comply with the maximum dwelling unit enclosure air leakage specified in Standards Section 160.2(b)2Aivb2, the test shall be conducted with the dwelling unit as if it were exposed to the outdoor air on all sides, top and bottom by opening doors and windows of adjacent dwelling units as specified by RA3.8.3.
03	The procedure for installation of the test apparatus, and preparations for measurement shall conform to RESNET 380-2019 Section 4.3
04	The procedure for the conduct of the enclosure air leakage test shall conform to the One-Point Airtightness Test specified in RESNET 380-2019 Section 4.4.1.
05	The procedure for the conduct of the enclosure air leakage test shall conform to the Multi-Point Airtightness Test specified in RESNET 380-2019 Section 4.4.1.

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026

# BUILDING AIR LEAKAGE DIAGNOSTIC TEST

## BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES



CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-24-H

### **SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

#### DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026

## LMCI-MCH-24-H User Instructions

### Section A. Enclosure Air Leakage – General Information

1. Select the appropriate test procedure. This selection will determine which sections of this document will be required. Note that newer manometers have automatic functions for compensating baseline (automatic baseline) and compensating for house pressures other than the target (50 Pa). It is preferable to use these when available.
2. Enter the date that the enclosure air leakage test data was collected.
3. This field is automatically filled from the MCH-27 which determines if a  $2ACH_{50}$  value is required.
4. This field is automatically filled from the MCH-27 which determines if a  $0.3CFM/ft^2$  value is required.
5. This field displays the  $2ACH_{50}$  default enclosure air leakage.
6. Enter the indoor temperature measured at the time that the enclosure air leakage test was performed.
7. Enter the outdoor temperature measured at the time that the enclosure air leakage test was performed.
8. Provide a brief description of the location where the blower door was installed for the test. Examples: "front entry door on west side of house", "door between house and garage", "large window in family room".
9. Enter the building elevation above sea level. Use the value for the closest city found in Joint Appendix JA2.2.
10. Enter the total dwelling unit floor area if ECC verification of dwelling compartmentalization leakage is required.
11. Enter the total dwelling unit ceiling area if ECC verification of dwelling compartmentalization leakage is required.
12. Enter the total dwelling unit exterior wall area if ECC verification of dwelling compartmentalization leakage is required.
13. Enter the total dwelling unit wall area shared with other dwelling units if ECC verification of dwelling compartmentalization leakage is required.
14. This field is automatically calculated as the sum of the total dwelling unit surface area if ECC verification of dwelling compartmentalization leakage is required.
15. This field is automatically calculated unless the LMCC is an NCB or ADD.
16. This field is automatically calculated as the target dwelling unit compartmentalization leakage value if ECC verification of dwelling compartmentalization leakage is required.

### Section B. Diagnostic Equipment Information

1. Enter the number of manometers used to measure the enclosure pressurization. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
2. Enter the make (brand) of the manometer used to collect the enclosure air leakage data. Examples: Retrotec, Energy Conservatory.
3. Enter the model of the manometer used to collect the enclosure air leakage data. Examples: DM-2 Mark II, DG700.
4. Enter the serial number of the manometer used to collect the enclosure air leakage data.
5. Enter the most recent date that the manometer was calibrated by following manufacturer's calibration specifications.
6. This field is automatically filled. If the calibration date was more than 12 months prior to the test date entered in Row A02 above, an error will appear.



7. Enter the number of blower door fan systems required to run simultaneously to pressurize the enclosure for the enclosure air leakage test. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
8. Enter the make (brand) of the fan used to collect the enclosure air leakage data. Examples: Retrotec, Energy Conservatory.
9. Enter the model of the fan used to collect the enclosure air leakage data. Examples: US1000, Q46, BD3, BD4.
10. Enter the serial number of the fan used to collect the enclosure air leakage data.
11. Enter the fan configuration shown on the meter. This is sometimes referred to as “range configuration”, “CONFIG” or “rings”. Examples: Open, A, B, C8.

**Section C1. Enclosure Air Leakage Test** (This section is required if A01 test procedure is single point manual)

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. This field is automatically calculated. This is the enclosure pressure target value the enclosure needs to achieve during the test.
5. Enter the unadjusted enclosure pressure measured. This value is read from the manual manometer during the test.
6. This field is automatically calculated. This value is the difference of the unadjusted enclosure pressure measured and the pre-test baseline enclosure pressure. The goal is to achieve  $50 \pm 3$  Pa.
7. This field is automatically calculated. This field determines if the pressure achieved is acceptable to proceed with the enclosure air leakage test.
8. Enter the measured nominal fan flow at above fan pressure from the manometer that corresponds to the induced enclosure pressure difference.
9. This field is automatically calculated. The induced enclosure pressure difference is converted to a nominal airflow at 50 Pa.

**Section C2. Enclosure Air Leakage Test** (This section is required if A01 test procedure is single point automatic)

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. Enter the induced enclosure pressure from the automatic manometer. The goal is to achieve  $50 \pm 3$  Pa.
5. This field is automatically calculated. This field determines if the pressure achieved is acceptable to proceed with the enclosure air leakage test.
6. Enter the measured nominal CFM50 from the automatic manometer.

**Section C3. Enclosure Air Leakage Test** (This section is required if A01 test procedure is multi-point)

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).

3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. This field is automatically calculated. This is the enclosure pressure target value the enclosure needs to achieve during the test.
5. Enter the unadjusted enclosure pressure measured. This value is read from the manual manometer during the test.
6. This field is automatically calculated. This value is the difference of the unadjusted enclosure pressure measured and the pre-test baseline enclosure pressure. The goal is to achieve  $50 \pm 3$  Pa.
7. When using the software for a multi-point test, a minimum of five measures must be taken over a range of pressures. This is where the user acknowledges that this was done.
8. Enter the Post Test Baseline Enclosure Pressure from the manometer
9. Multi-Point procedure requires use of an ASTM E779-19 compliant software, typically provided by the blower door manufacturer. Confirm with the software vendor that it is compliant. Enter the name and version here.
10. Enter the final Corrected CFM50 reading from the software.

**Section D1. Altitude and Temperature Correction** (This section is required if A01 test procedure is single point manual or automatic )

1. This field is automatically calculated. This factor is determined based on the altitude and temperature of the building location using equation 4 in Section 9 of ASTM E779-19.
2. This field is automatically calculated. The corrected CFM50 is the nominal CFM50 from Section C multiplied by the altitude and temperature correction factor.

**Section D2. Altitude and Temperature Correction** (If A01 test procedure is multi-point corrections are performed by the blower door software)

### **Section E1. Accuracy Adjustment**

(This section is required if A01 test procedure is single point manual or automatic )

1. This field is automatically calculated. This value is determined from equation 5a from ANSI/RESNET/ICC 380-2019.

### **Section E2. Accuracy Adjustment**

(This section is required if A01 test procedure is multi-point)

1. The software will provide a "Percent Uncertainty" value based on the readings taken. Enter that value here
2. This field is automatically calculated. If the Percent Uncertainty level is 10% or less, the Accuracy Level is "Standard". If the Percent Uncertainty level is greater than 10%, the Accuracy Level is "Reduced".
3. This field is automatically calculated:
  - a. If the Accuracy Level is "Standard", the Accuracy Adjustment Factor will be 1 (no adjustment)
  - b. If the Accuracy Level is "Reduced", the Accuracy Adjustment Factor will be adjusted by the Percent Uncertainty.
4. This field is automatically calculated. The Adjusted CFM50 is the Corrected CFM50 multiplied by the Accuracy Adjustment Factor.

### **Section F. Measured Enclosure Air Leakage Rate**

1. This field is automatically calculated. A check is performed to make sure that the meter has been properly calibrated.

**Section G. Additional Requirements for Test Compliance**

1. This statement must be true (or not applicable) for the test to conform to the protocols.
2. This statement must be true (or not applicable) for the test to conform to the protocols.
3. This statement must be true (or not applicable) for the test to conform to the protocols.
4. This statement must be true (or not applicable) for the test to conform to the protocols.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

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

A. System Information

Each system requiring refrigerant charge verification will be documented on a separate certificate.

01	Space Conditioning System Identification or Name	
02	Space Conditioning System Location or Area Served	
03	Condenser (or package unit) Make or Brand	
04	Condenser (or package unit) Model Number	
05	Nominal Cooling Capacity (tons) of Condenser	
06	Condenser (or package unit) Serial Number	
07	Refrigerant Type	
08	Other Refrigerant Type (if applicable)	
09	Liquid Line Filter Drier Installed According to Manufacturer's Specifications (if applicable)	
10	System Installation Type	
11	Fault Indicator Display (FID) Status (Note: Even systems with a FID must have refrigerant charge verified by installer)	
12	Is the system of a type that the minimum airflow can be verified for all indoor units using an approved measurement procedure (RA3.3 or RA3.3.3)?	
13	Is the system of a type that approved refrigerant charge verification procedures can be used to verify compliance with the refrigerant charge verification requirements when temperatures are ≥ 55°F (RA3.2.2, or RA1)?	
14	Date of Refrigerant Charge Verification for this System	
15	Refrigerant Charge Verification Method Used	
16	Person Who Performed the Refrigerant Charge Verification Reported on this Certificate of Installation	
17	ECC Verification Compliance Requirement Status	



**B1. Metering Device Verification**

Superheat Method can only be used on systems that do not have a variable metering device.

01	Refrigerant Metering Device	
02	Superheat Method Applicability Status	

**B2. Metering Device Verification**

Subcooling Method can only be used on systems that have a variable metering device.

01	Refrigerant Metering Device	
02	Subcooling Method Applicability Status	

**C. Instrument Calibration**

Procedures for instrument calibration are given in Reference Residential Appendix RA3.2.2 and RA3.2.2.2

01	Date of Digital Refrigerant Gauge Calibration	
02	Date of Digital Thermocouple Calibration	
03	Digital Refrigerant Gauge Calibration Status	
04	Digital Thermocouple Calibration Status	

**D. Measurement Access Hole (MAH) Verification**

Procedures for installing MAH are specified in Reference Residential Appendix RA3.2.2.3

01	Method Used to Demonstrate Compliance with the Measurement Access Hole (MAH) Requirement	
----	--	--

**E. Minimum System Airflow Rate Verification**

Procedures for verifying minimum system airflow are specified in Reference Residential Appendix RA3.3.3.

01	02	03
Indoor Unit Name or Description of Area Served	Minimum Required System Airflow Rate (cfm)	System Airflow Rate Verification Status
04	Compliance Statement:	
Notes:		



F1. Data Collection for Superheat Method

Procedures for determining Refrigerant Charge using the Standard Charge Verification Procedure are given in Reference Residential Appendix RA3.2.2 and RA3.2.2.2

Table with 11 rows for Superheat Method data collection, including fields for temperatures, pressures, and a compliance statement.

F2. Data Collection and Calculations for Subcooling Method

Procedures for determining Refrigerant Charge using the Standard Charge Verification Procedure are given in Reference Residential Appendix RA3.2.2

Table with 9 rows for Subcooling Method data collection, including fields for temperatures, pressures, and a compliance statement.



**G. Metering Device Verification for Subcooling Method**

Procedures for the verification of proper metering device operation are specified in RA3.2.2.6.2

01	Measured Suction Line Temperature ( $T_{\text{suction}}$ ) (°F)	
02	Measured Suction Line Pressure ( $P_{\text{suction}}$ ) (psig)	
03	Evaporator Saturation Temperature ( $T_{\text{evaporator, sat}}$ ) from Digital Gauge or P-T Table using line G02 (°F)	
04	Measured Superheat (Line G01 – Line G03) (°F)	
05	Measured Superheat (Line G04) is between 4°F and 25°F (inclusive)	
06	Measured Superheat (Line G04) is within Manufacturer’s Specifications (if known)	
07	Compliance Statement:	

**H. Weigh In Charge Procedure**

Procedures for Refrigerant Charge using the Weigh-in Charging Procedure are given in Reference Residential Appendix RA3.2.2.2 and RA3.2.3

01	Measured Condenser Air Entering Dry-bulb Temperature ( $T_{\text{condenser, db}}$ ) (°F)	
02	Specify the Method of Weigh-in	
03	Manufacturer’s Standard Charge for Condenser (lbs, oz.)	
04	Manufacturer’s Standard Liquid Line Length (ft)	
05	Manufacturer’s Standard Liquid Line Diameter (in)	
06	Manufacturer’s Standard Indoor Coil Size (tons)	
07	Installed Liquid Line Length (ft)	
08	Installed Liquid Line Diameter (in)	
09	Installed Indoor Coil Size (tons)	
10	Charge Adjustment to Standard Charge from Manufacturer’s Specifications (ounces, positive = add, negative = remove)	
11	Refrigerant Required to be Weighed in by the Installer (lbs, oz)	
12	Refrigerant Weighed in by Installer (lbs, oz)	
13	Compliance Statement:	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**I. Weigh In Charge Procedure – Additional Requirements**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	If refrigerant line connections require welding, the system is braised with dry nitrogen in the lines and indoor coil.
02	<ul style="list-style-type: none"> <li>i. In all cases where the OEM instructions call for checking for gas leaks with vacuum, prior to introducing refrigerant, system is evacuated to 500 microns or less and, when isolated, has risen no more than 300 microns after 5 minutes.</li> <li>ii. In all cases where the OEM instructions call for checking for gas leaks with nitrogen gas, the system was pressurized to the manufacturer’s specified pressure and if the pressure could not be maintained, leaks were located and fixed.</li> </ul>
03	Observation and documentation of the vacuum and pressurization tests are not required if no fittings (other than the fitting to the compressor) are compression or flare fittings.
04	The calculated weight adjustment for lineset length is based on the length and diameter of the lineset.
05	The calculated weight adjustment for coil size is based on manufacturer instructions.
06	The actual total weight adjustment is equal to the sum of the calculated weight adjustments for lineset and coil size.
07	The calculated and actual total weights of refrigerant in the system are recorded on or near the nameplate label, in indelible ink or other permanent means.
08	When applicable and if necessary to avoid delay of approval of dwelling units completed when outside temperatures are below 55°F, the enforcement agency may approve compliance with the refrigerant charge verification requirements based on registration of this CF2R-MCH-25, documenting use of the RA3.2.3.1 HVAC Installer Weigh-In Charging Procedure when the optional Section RA3.2.3.2 ECC Rater Observation of Weigh-In Charging Procedure is not used. As condition for such enforcement agency approval, the responsible person’s signature on this compliance document affirms the installer agrees to return to correct refrigerant charge if a ECC Rater determines at a later time, when the outside temperature is 55°F or greater, that refrigerant charge correction is necessary.

**J. Verification of New Package Unit Factory Charge**

Note: There is no ECC verification requirement for New Package Unit Factory Charge. The Enforcement Agency has responsibility for this verification.

01	The responsible person's signature on this document affirms that this new package unit has correct refrigerant charge as provided by the manufacturer prior to shipment from the factory, and no modifications have been made to this packaged unit that would result in a change to the amount of refrigerant in the unit.
----	---





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Table with 2 columns: Documentation Author Name, Documentation Author Signature, Documentation Author Company Name, Date Signed, Address, CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code...
3. The constructed or installed features, materials, components or manufactured devices...
4. I understand that an ECC-Rater will check the installation to verify compliance...
5. I understand that a registered copy of this certificate of installation shall be posted...
6. I understand that a registered copy of this certificate of installation is required to be included...

Table with 3 columns: Responsible Builder/Installer Name, Responsible Builder/Installer Signature, Company Name, Position With Company (Title), Address, CSLB License, City/State/Zip, Phone, Date Signed, Third Party Quality Control Program (TPQCP) Status, Name of TPQCP (if applicable).

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

**LMCI-MCH-25b-H User Instructions****Section A. System Information**

1. This information is automatically pulled from the Certificate of Installation (MCH-01).
2. This information is automatically pulled from the Certificate of Installation (MCH-01).
3. This information is automatically pulled from the Certificate of Installation (MCH-01).
4. This information is automatically pulled from the Certificate of Installation (MCH-01).
5. This information is automatically pulled from the Certificate of Installation (MCH-01).
6. This information is automatically pulled from the Certificate of Installation (MCH-01).
7. Choose the type of refrigerant used by the system being verified. R-454, R-22 and R-410A are the most common, but other types may occasionally be encountered.
8. If "Other" is chosen in A07, then indicate the type of refrigerant being used. Documentation of refrigerant may be requested.
9. If applicable, a liquid line filter drier shall be installed according to the manufacturer's specifications.
10. Indicate whether the HVAC system is Completely New, Replacement or an Alteration. These are defined in detail the Residential Compliance Manual.
11. N/A.
12. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. Selecting "No" here may subject the project to additional scrutiny by enforcement personnel.
13. Most ducted split systems and package systems are of the type that approved refrigerant charge verification procedures detailed in Residential Appendix RA3.2.2 or RA1 can be used (i.e., Standard Charge Verification procedures). Examples of systems that may not meet this description are "mini splits" or variable refrigerant flow systems that may only be charged using weigh-in procedures. Selecting "No" here may subject the project to additional scrutiny.
14. Specify the date the refrigerant charge verification was performed by the installer.
15. Select the refrigerant charge verification method used from the choices provided:
  - Superheat (outdoor temperature must be  $\geq 55^{\circ}\text{F}$ ); this verification method can only be used when the outdoor temperature is at or above  $55^{\circ}\text{F}$ . It is only used on systems with fixed orifice refrigerant metering devices (non-variable metering devices). This method is detailed in Reference Appendix RA3.2.2.6.1. Systems verified using this method may be eligible for ECC verification compliance using Group Sampling.
  - Subcooling (outdoor temperature must be  $\geq 55^{\circ}\text{F}$ ); this verification method can only be used when the outdoor temperature is at or above  $55^{\circ}\text{F}$ . It is only used on systems with variable metering devices (TXV or EXV). This method is detailed in Reference Appendix RA3.2.2.6.2. Systems verified using this method may be eligible for ECC verification compliance using Group Sampling.
  - Weigh-in; this verification method can be used at any outdoor temperature allowed by the equipment manufacturer. This method is detailed in Reference Appendix RA3.2.3. Systems verified using this method are NOT eligible for ECC verification compliance using Group Sampling.
  - New Package Unit Factory Charge; Choose this option when a new package unit is being installed that has an AHRI rating. This helps ensure that the unit was properly charged at the factory. ECC verification of refrigerant charge may not be required in this case.
16. Identify who will be performing the verification that is documented on this Certificate of Installation, select from the two options. Note that ECC verification compliance by Group Sampling requires that the installer perform their own refrigerant charge verification as part of the installation of the

equipment prior to the system being put into a sample group for possible selection by a ECC rater for verification. If Group Sampling is not intended, the ECC Rater may perform the refrigerant charge verification on behalf of the Installing Contractor (applies to any method but Weigh-In) and the Rater will enter same results on both the LMCI and LMCV.

17. The Group Sampling status is automatically displayed based on the input results of A14 and A15. Group Sampling procedures are detailed Residential Appendix RA2.6.3.

### **Section B1 and B2. Metering Device Verification** (This section is required if A15 equals Superheat – B1 Or Subcooling – B2)

1. Select the correct metering device used on the system being verified. This will check against the refrigerant charge verification method selected in A15. An error message will appear in B02 if the wrong verification method has been selected. Superheat verification can only be used on systems with fixed orifice and Subcool verification can only be used on systems with variable metering devices (TXV or EXV).
2. An error message here indicates that the wrong verification method may have been selected. Superheat verification can only be used on systems with fixed orifice and Subcool verification can only be used on systems with variable metering devices (TXV or EXV).

### **Section C. Instrument Calibration**

(This section is required for all verification methods selected in A15 except New Package Unit Factory Charge)

1. Enter the date of most recent Digital Refrigerant Gauge Calibration Field Check. Analog gauges are not allowed for verification purposes under the 2025 Standards. Specification for pressure gauges is found in Residential Appendix RA3.2.2.2.3. Procedures for the field check procedure are detailed in RA3.2.2.4.2. Calibration field check must happen at least once every 30 days.
2. Enter the date of the most recent Digital Thermocouple Calibration. Specifications for thermocouples and temperature sensors can be found in Residential Appendix RA3.2.2.2.2. Procedures for calibration are detailed in RA3.2.2.4.1. Calibration must happen at least once every 30 days.
3. Digital Refrigerant Gauge Calibration status will appear automatically. If the date entered in C01 is more than 30 days prior to date of verification this row will indicate that calibration is required and you will not be allowed to continue filling out this document until calibration is performed.
4. Digital Thermocouple Calibration status will appear automatically. If the date entered in C02 is more than 30 days prior to date of verification this row will indicate that calibration is required and you will not be allowed to continue filling out this document until calibration is performed.

### **Section D. Measurement Access Hole (MAH) Verification**

1. Indicate the method used to demonstrate compliance with the MAH requirement by selecting the appropriate method from the drop down list. Procedures for installing MAH's are detailed in RA3.2.2.3. Selecting that the MAH cannot be installed consistent with Figure 3.2-1 may result in additional scrutiny by enforcement personnel. For Weigh-in verification methods only If A12 = NO, then system is exempt from the MAH requirement and a special message will show up here.

### **Section E. Minimum System Airflow Rate Verification**

1. This information is automatically calculated based on the information given in A10. This is the target minimum system airflow required for the system being verified.
2. This information is automatically calculated based on the MCH-23 or MCH-28, which documents the measured airflow (or alternative method) of the system being verified. If the measured airflow is not

adequate it will not comply with the airflow requirements and refrigerant charge verification cannot be performed until the airflow meets the requirement. For Weigh-in verification methods only If A12 = NO, then system is exempt from the airflow rate requirement and a special message will show up here.

### Section F1. Superheat Charge Verification Method – Data Collection

(This section is required if A15 equals Superheat)

1. Measure and record the lowest return air dry-bulb temperature that occurred during the refrigerant charge procedure in degrees F. This temperature must remain above 70°F during the verification procedure. This requirement is detailed in Residential Appendix RA3.2.2.5.
2. Measure and record the condenser air dry-bulb temperature ( $T_{\text{condenser}}$ ) in degrees F. This value is used to determine the target superheat from table RA3.2-2. This value must be at least 55°F and no more than 115°F to use the Superheat Charge Verification Method.
3. If a value less than 55°F or greater than 115°F is entered in F02 the Superheat Method cannot be used.
4. Measure and record the return air dry-bulb temperature ( $T_{\text{return,db}}$ ) in °F. This measurement is taken at the MAH (or alternate location specified in F01. This procedure is detailed in RA3.2.2.5.
5. Measure and record the return air wet-bulb temperature ( $T_{\text{return,wb}}$ ) in °F. This measurement is taken at the MAH (or alternate location specified in F01. This procedure is detailed in RA3.2.2.5. This value is used to determine the target superheat from table RA3.2-2.
6. Measure and record the suction line temperature ( $T_{\text{suction}}$ ) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured superheat.
7. Measure and record the suction line pressure ( $P_{\text{suction}}$ ) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into F08.
8. Enter the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from the digital gauge or a separate pressure-temperature chart that corresponds to the suction line pressure entered in F07, in °F.
9. Measured superheat is automatically calculated as the difference between the suction line temperature (F06) and the evaporator saturation temperature (F08)
10. Enter target superheat from Table RA3.2-2. This table requires values for the condenser air dry-bulb temperature (F02) and the return air wet-bulb temperature (F05)
11. System passes superheat method when F10 is within plus or minus 5°F of F09.

### Section F2. Subcooling Charge Verification Method – Data Collection

(This section is required if A15 equals Subcooling)

12. Measure and record the lowest return air dry-bulb temperature that occurred during the refrigerant charge procedure in °F. This temperature must remain above 70°F during the verification procedure. This requirement is detailed in Residential Appendix RA3.2.2.5.
13. Measure and record the condenser air dry-bulb temperature ( $T_{\text{condenser}}$ ) in °F. This value must be at least 55°F and no more than 115°F to use the Subcooling Charge Verification Method.
14. If a value less than 55°F or greater than 115°F is entered in F02 the Subcooling Method cannot be used.
15. Measure and record the liquid line temperature ( $T_{\text{liquid}}$ ) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured subcool temperature.
16. Measure and record the liquid line pressure ( $P_{\text{liquid}}$ ) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the condenser saturation temperature ( $T_{\text{condenser,sat}}$ ) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into F06.

17. Enter the condenser saturation temperature ( $T_{\text{condenser,sat}}$ ) from the digital gauge or a separate pressure-temperature chart that corresponds to the liquid line pressure entered in F05, in °F.
18. Measured Subcooling is automatically calculated as the difference between the liquid line temperature (F04) and the condenser saturation temperature (F06)
19. Enter target subcooling from manufacturer. This may be a challenge to find for older equipment. Internet searches can sometimes result in archived equipment specifications for the equipment in question, or sometimes a very similar model. If the manufacturer's target cannot be found the Commission's Executive Director may provide additional guidance for compliance.
20. System passes Subcooling method when F08 is within plus or minus 3°F of F07.

### Section G. Metering Device Verification for Subcooling Method

(This section is required if A15 equals Subcooling)

1. Measure and record the suction line temperature ( $T_{\text{suction}}$ ) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured superheat.
2. Measure and record the suction line pressure ( $P_{\text{suction}}$ ) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into G03.
3. Enter the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from the digital gauge or a separate pressure-temperature chart that corresponds to the suction line pressure entered in G02, in °F.
4. Measured superheat is automatically calculated as the difference between the suction line temperature (G01) and the evaporator saturation temperature (G03)
5. There are two possible criteria for passing. If the manufacturer's specification is known it should be used, otherwise the CEC requirement is that the superheat be between 4°F and 25°F, inclusive. This row checks the CEC requirement.
6. If the manufacturer's target superheat for ensuring proper metering device operation is known, it supersedes the CEC requirement of being between 4°F and 25°F. If "Yes, documentation to be provided upon request." is selected, the installer should be prepared to provide documentation for the target values used.
7. There are two possible criteria for passing. If the manufacturer's specification is known it should be used, otherwise the CEC requirement is that the superheat be between 4°F and 25°F, inclusive. If "Yes, documentation to be provided upon request." is selected in G06, the installer should be prepared to provide documentation for the target values used.

### Section H. Weigh In Charge Procedure

(This section is required if A15 equals Weigh-in with installer Or Weigh-in with ECC Rater observation)

1. Measure and record the outside air dry-bulb temperature in °F. This will affect the procedures that may be used for ECC verification. If the installer opts to use the weigh-in method when the outside air dry-bulb temperature is above 55°F, ECC verification may only utilize the standard charge procedure (super heat or subcool) if the system is conducive to that procedure.
2. Specify the method of weigh-in. There are two options that may be used. One is to add or remove a small, weighed portion of refrigerant from a factory charged unit (Charge Adjustment). The other is to weigh the entire charge of refrigerant before introducing it into the system (Total Charge). Select either one. Note: The amount of refrigerant in systems that are not newly installed cannot be assumed to be the factory charge. Altered systems using existing refrigerant must use the Total Charge method. Only new, factory installed equipment can utilize the Charge Adjustment method.

3. Enter the Manufacturer's Standard Charge for condenser in pounds and ounces. This is the amount of refrigerant that the manufacturer specifies for a "standard" installation (typical coil match, typical line set size and length). For the Charge Adjustment method, this is the amount of refrigerant that factory charges the system to. Be prepared to provide manufacturer's documentation to support this value.
4. The Manufacturer's Standard Charge, specified in H03 is based on a standard liquid line length, typically 25 feet. Enter the value here, in feet. Be prepared to provide manufacturer's documentation to support this value.
5. The Manufacturer's Standard Charge, specified in H03 is based on a standard liquid line diameter. Enter the value here, in inches (for example: 1/4", 3/8", etc.). Be prepared to provide manufacturer's documentation to support this value.
6. The Manufacturer's Standard Charge, specified in H03 is based on a standard indoor (evaporator) coil size. Enter the value here, in tons. Be prepared to provide manufacturer's documentation to support this value.
7. Enter the length of the liquid line installed on the system being verified, in feet. This value must be compared to the standard liquid line length entered in H04 and used to determine if the Manufacturer's Standard Charge entered in H03 is appropriate.
8. Enter the diameter of the liquid line installed on the system being verified, in inches (for example: 1/4", 3/8", etc.). This value must be compared to the standard liquid line diameter entered in H05 and used to determine if the Manufacturer's Standard Charge entered in H03 is appropriate.
9. Enter the size of the indoor (evaporator) coil installed on the system being verified, in tons. This value must be compared to the standard coil size entered in H06 and used to determine if the Manufacturer's Standard Charge entered in H03 is appropriate.
10. Enter the Charge Adjustment to Standard Charge, in ounces. This is the amount of refrigerant that the manufacturer specifies to add to, or remove from, the Manufacturer's Standard Charge entered in H03. This value must come from manufacturer's specifications using the standard values entered in H04 through H06 to the installed values entered in H07 through H09. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed, this value should be a negative number. Be prepared to provide manufacturer's documentation to support this value.
11. This value is calculated automatically. If "Charge Adjustment" was specified in H02, then the value shown here will be the same as the value shown in H10. This is the amount of weighed refrigerant that will be added or removed from the factory charged unit. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed, this value should be a negative number. If "Total Charge" was specified in H02, then the value shown here will be the value in H03 added to the value in H10. This is the total amount of refrigerant that will be in the system, all of which must be weighed before introducing into the system.
12. Enter the amount of refrigerant weighed and added to, or removed from, system. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed from a factory charged system, this value should be a negative number. This value must match the value in H11 for the system to pass.
13. If the value in H11 equals the value in H12, a statement will appear here indicating that the system passes the weigh-in method. Otherwise, a statement will appear here indicating that the system does not pass.

**Section I. Weigh-In Charge Verification – Additional Requirements** (This section is required if A15 equals Weigh-in with installer Or Weigh-in with ECC Rater observation)

1. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that

all of these additional requirements have been met. If refrigerant line connections require welding, the requirement for brazing lines charged with dry nitrogen is specified in Residential Appendix RA3.2.3.1.5.

2. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The requirement for checking refrigerant lines for leaks with nitrogen gas by pressurized to the manufacturer's specified pressure and if the pressure cannot be maintained, leaks shall be located and fixed is specified in Residential Appendix RA3.2.3.1.5.
3. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met.
  - i. The requirement for checking refrigerant lines for leaks by evacuating to 500 microns or less and rising by no more than 300 microns after 5 minutes is specified in Residential Appendix RA3.2.3.1.5.
  - ii. The requirement for checking refrigerant lines for leaks with nitrogen gas, the system was pressurized to the manufacturer's specified pressure and if the pressure could not be maintained, leaks were located and fixed.
4. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. Observation and documentation of the vacuum and pressurization tests are not required if no fittings (other than the fitting to the compressor) are compression or flare fittings is specified in Residential Appendix RA3.2.3.1.5.
5. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The calculated weight adjustment for lineset length is based on the length and diameter of the lineset is specified in Residential Appendix RA3.2.3.1.5.
6. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The calculated weight adjustment for coil size is based on manufacturer instructions is specified in Residential Appendix RA3.2.3.1.5.
7. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The actual total weight adjustment is equal to the sum of the calculated weight adjustments for lineset and coil size is specified in Residential Appendix RA3.2.3.1.5.
8. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The calculated and actual total weights of refrigerant in the system are recorded on or near the nameplate label, in indelible ink or other permanent means is specified in Residential Appendix RA3.2.3.1.5.

**Section J. Verification of New Package Unit Factory Charge** (This section is required if A15 is New Package Unit Factory Charge)

1. By signing the Declaration Statement at the bottom of this form, the installer is declaring that the package unit was an AHRI certified unit and that no modifications were made to the unit to change the factory charge.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Field Name (Project Name, Dwelling Address, City and Zip Code) and Agency/Permit Info (Enforcement Agency, Permit Number, Permit Application Date).

A. System Information

Procedures for verification of High SEER2 and EER2 Equipment are described in Reference Appendix RA3.4. Each HVAC system requiring verification must use a separate form.

Table with 2 columns: ID (01-11) and Description (Space Conditioning System Identification, Description, Efficiency Metric, Status checks for SEER, EER, Heat Pump, HSPF, Directory, AHRI, and specific requirements).

B. Rated Space Conditioning System Equipment Information from Nameplate of the Installed System

The data on the nameplate of the installed component shall conform to the data for the component as shown in the Directory used to certify product performance in order to demonstrate compliance.

Table with 10 columns: 01-04 (System ID, Description, Indoor Unit, Installed Indoor Unit Type) and 05-10 (Data from nameplate: Outdoor Condenser, Indoor Unit, Installed Furnace, Manufacturer Name, Model Number).



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

C. Rated Space Conditioning System Equipment Information from Directory of Certified Product Performance

The data on the nameplate of the installed component shall conform to the data for the component as shown in the Directory used to certify product performance in order to demonstrate compliance.

Table with 10 columns: 01 (SC System ID/Name from CF1R), 02 (SC System Description of Area Served), 03 (Indoor Unit Name or Description of Area Served), 04 (Installed Indoor Unit Type), 05 (Outdoor Condenser or Package Unit - Installed Manufacturer Name), 06 (Outdoor Condenser or Package Unit - Installed Model Number), 07 (Indoor Unit - Installed Manufacturer Name), 08 (Indoor Unit - Installed Model Number), 09 (Installed Furnace Manufacturer Name), 10 (Installed Furnace Model Number).

D. Verified Cooling System SEER/SEER2

Signature by responsible person on this compliance document certifies that the installed cooling equipment meets or exceeds the required value listed on the CF1R.

Table with 3 rows: 01 (Required Minimum SEER/SEER2), 02 (Installed SEER/SEER2), 03 (Compliance Statement).

E. Verified Cooling System EER/EER2

Signature by responsible person on this compliance document certifies that the installed heat pump equipment meets or exceeds the required value listed on the CF1R.

Table with 3 rows: 01 (Required Minimum EER/EER2), 02 (Installed EER/EER2), 03 (Compliance Statement).

F. Verified Heat Pump Heating Output

Signature by responsible person on this compliance document certifies that the installed heat pump equipment meets or exceeds the required value listed on the CF1R.

Table with 5 rows: 01 (Required Heating BTU Output at 47 Degrees F), 02 (Installed Heating BTU Output at 47 Degrees F), 03 (Required Heating Output at 17 Degrees F), 04 (Installed Heating Output at 17 Degrees F), 05 (Compliance Statement).

G. Verified Heat Pump HSPF/HSPF2

Signature by responsible person on this compliance document certifies that the installed heat pump equipment meets or exceeds the required value listed on the CF1R.

Table with 3 rows: 01 (Required Minimum HSPF/HSPF2), 02 (Installed HSPF/HSPF2), 03 (Compliance Statement).

H. Verified Space Conditioning System Air Handler, Furnace or Fan Coil

Table with 1 row: 01 (If a specific air handler, furnace or fan coil is required by the directory used to certify product performance, the responsible person certifies by signing this compliance document that the installed air handler/furnace matches the equipment specified by the Directory of Certified Performance).



**I. Verified Space Conditioning System Time Delay Relay**

01	If a Time Delay Relay is specified by the Directory of Certified Product Performance, the responsible person certifies by signing this compliance document that the Time Delay Relay is installed and has been tested to operate correctly according to the protocols of RA3.4.3.
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**J. Verified Space Conditioning System TXV**

01	If a TXV is specified by the Directory of Certified Product Performance, the responsible person certifies by signing this compliance document that the TXV is properly installed and has been visually verified, including proper placement of the sensing bulb.
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FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

## LMCI-MCH-26-H User Instructions

### Section A. System Information

1. System Name or Identification/Tag: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
- 3a. Efficiency Metric: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. Status: SEER/SEER2 performance compliance credit check: This field is filled out automatically. It is referenced from the LMCC.
4. Status: EER/EER2 performance compliance credit check: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
5. Status: Heat Pump Heating Output Performance Compliance Check: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
6. Status: HSPF/HSPF2 performance compliance credit check: This field is filled out automatically. It is referenced from the LMCC.
7. Directory Used to Certify Product Performance: User to select from dropdown list the certification database used to document equipment efficiency. Choices are AHRI, CEC and DOE.
8. AHRI Certification Number for the Installed Space Conditioning System: If the directory used is not AHRI, “N/A” will automatically be entered. Otherwise, enter the complete AHRI Certification Number for the Installed Space Conditioning System. This number represents a specific piece of equipment (e.g., package units) or combination of equipment (e.g., split systems) that must match the installed equipment.
9. Does the directory used to certify product performance require a specific air handler, furnace or fan coil make and model?: If not using AHRI, user has the option to select “N/A.” Note that when using AHRI, this does not apply to package units. Sometimes, for split systems, a specific model air handler/furnace will be called out in addition to the condenser and coil. When it is, it must be installed and verified for the AHRI certificate to be valid for the installed system. Sometimes, the AHRI certificate only calls out the condenser and coil model numbers. In this case the furnace make/model need not be verified. If not, select “No”.
10. Does the directory used to certify product performance require a time delay relay (+TDR)?: If not using AHRI, user has the option to select “N/A.” If the AHRI certificate specifies that a TDR was on the system when it was tested, then the TDR is required for the system to achieve its certified efficiency and it must be verified. If not, select “No”. The indication for a TDR usually consists of a “+TDR” at the end of the model number. Sometimes it may just be a “+D” (delay).
11. Does the directory used to certify product performance require a TXV (+TXV)?: If not using AHRI, user has the option to select “N/A.” If the AHRI certificate specifies that a TXV was on the system when it was tested, then the TXV is required for the system to achieve its certified efficiency and it must be verified. If not, select “No”. The indication for a TXV usually consists of a “+TXV” at the end of the model number. Sometimes it may just be a “+V” (valve).

### Section B. Rated Space Conditioning System Equipment Verification from Nameplate

1. System Name or Identification/Tag: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. Indoor unit Name: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.

4. Installed indoor unit type is automatically filled out.
5. Outdoor Condenser or Package Unit - Installed Manufacturer Name, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
6. Outdoor Condenser or Package Unit - Installed Model Number, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
7. Indoor Coil - Installed Manufacturer Name, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
8. Indoor Coil - Installed Model Number, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document. For systems where there is no separate inside coil “N/A” will be automatically entered.
9. Installed Furnace Manufacturer Name, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
10. Installed Furnace Model Number, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document

### **Section C. Rated Space Conditioning System Equipment Verification from Directory**

1. System Name or Identification/Tag: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. Indoor unit Name: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
4. Installed indoor unit type is automatically filled out
5. Outdoor Condenser or Package Unit - Installed Manufacturer Name, Data from the Directory used to certify product performance for the rated system component: Enter the Manufacturer’s name for the condenser as it appears in the Directory. For Package units, this will be the only Manufacturer’s name.
6. Outdoor Condenser or Package Unit - Installed Model Number, Data from the Directory used to certify product performance for the rated system component: Enter the Manufacturer’s model number for the condenser as it appears in the Directory. For Package units, this will be the only model number required.
7. Indoor Coil - Installed Manufacturer Name, Data from the Directory used to certify product performance for the rated system component: Enter the Manufacturer’s name for the inside coil (aka, indoor coil, evaporator coil) as it appears in the Directory. For system types that don’t have separate inside coils or if the directory rating does not include this information, like package units, fan coil units and multi-split variable capacity heat pumps, user may enter “N/A”.
8. Indoor Coil - Installed Model Number, Data from the Directory used to certify the rated system component: Enter the Manufacturer’s model number for the inside coil (aka, indoor coil, evaporator coil) as it appears in the Directory. For system types that don’t have separate inside coils or if the directory rating does not include this information (package units, fan coil units, multi-split variable capacity heat pumps), user may enter “N/A”.
9. Installed Furnace Manufacturer Name, Data from the directory used to certify product performance for the rated system component: If not using AHRI, user has the option to select “N/A.” Enter the Manufacturer’s name for the air handler/furnace as it appears in the directory. For package units there is

no separate air handler, so enter “N/A”. Also enter “N/A” if a specific furnace or air handler is not called out in the directory, as indicated in Section A, above.

10. Installed Furnace Model Number, Data from the directory used to certify product performance for the rated system component: If not using AHRI, user has the option to select “N/A”. Enter the Manufacturer’s model number for the air handler/furnace as it appears in the directory. For package units there is no separate air handler, so enter “N/A”. Also enter “N/A” if a specific furnace or air handler is not called out in the directory, as indicated in Section A, above.

#### **Section D. Verified Cooling System SEER/SEER2**

1. Required Minimum SEER/SEER2: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. Installed SEER/SEER2: Enter the exact SEER value shown in the Directory used to certify the equipment shown in Section A, above.
3. Compliance Statement: This field is filled out automatically. Compliance requires that the installed SEER meet the required minimum SEER.

#### **Section E. Verified Cooling System EER/EER2**

1. Required Minimum EER/EER2: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. Installed EER/EER2: Enter the exact EER value shown on in the Directory used to certify the equipment shown in Section A, above.
3. Compliance Statement: This field is filled out automatically. Compliance requires that the installed EER meet the required minimum EER.

#### **Section F. Verified Heat Pump Heating Output**

1. Required Heating BTU Output at 47 Degrees F: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. Installed Heating BTU Output at 47 Degrees F: Enter the exact Heating BTU Output at 47 Degrees F value shown on in the Directory used to certify the equipment shown in Section A, above.
3. Required Heating BTU Output at 17 Degrees F: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
4. Installed Heating BTU Output at 17 Degrees F: Enter the exact Heating BTU Output at 17 Degrees F value shown on in the Directory used to certify the equipment shown in Section A, above. N/A entry is allowed if heat pump system output is not rated at 17 degrees F in any directory
5. Compliance Statement: This field is filled out automatically. If both rating points are available compliance requires that the installed Heating BTU Output at 47 Degrees and Heating BTU Output at 17 Degrees meet the required minimum from LMCI-MCH-01 or if the high temperature is available compliance requires that the installed Heating BTU Output at 47 Degrees meet the required minimum from LMCI-MCH-01.

#### **Section G. Verified Heat Pump System HSPF/HSPF2**

1. Required Minimum HSPF/HSPF2: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. Installed HSPF/HSPF2: Enter the exact HSPF value shown on in the Directory used to certify the equipment shown in Section A, above.
3. Compliance Statement: This field is filled out automatically. Compliance requires that the installed HSPF meet the required minimum EER.

**Section H. Verified Space Conditioning System Air Handler/Furnace**

1. This statement must be true for the system to comply.

**Section I. Verified Space Conditioning System Time Delay Relay**

1. This statement must be true for the system to comply.

**Section J. Verified Space Conditioning System TXV**

1. This statement must be true for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Field Name (Project Name, Dwelling Address, City and Zip Code) and Value (Enforcement Agency, Permit Number, Permit Application Date)

Title 24, Part 6, Section 160.2(b)2 Ventilation and Indoor Air Quality for Attached Dwelling Units. All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2022 Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified by Title 24, Part 6, Section 160.2(b)2A

A. Whole-Dwelling Mechanical Ventilation - General Information

Table with 2 columns: ID (01-08) and Description (Dwelling Unit Name, Building Type, Project Scope, Total Conditioned Floor Area, Number of Bedrooms, Ventilation System Type, Ventilation Operation Schedule, Fault Indicator Display Status)

B. Ventilation - Total Ventilation Rate

A mechanical supply system, exhaust system, or combination thereof shall provide whole-dwelling ventilation with outdoor air each hour at no less than the rate in 160.2(b)2Aiv

Table with 2 columns: ID (01) and Description (Total Required Ventilation rate, Qtot)

C. Installed Ventilation - Total Ventilation Rate

A mechanical supply system, exhaust system, or combination thereof shall provide whole-dwelling ventilation with outdoor air each hour at no less than the rate in 160.2(b)2Aiv

Table with 5 columns: ID (01-05) and Description (Fan Name, Fan Location, Runtime, Installed Mechanical Ventilation Rate, Equivalent Continuous Ventilation) and a summary row (06) for Total Installed Equivalent Continuous Ventilation

D. HRV or ERV serving Individual Dwelling Unit

- Heat or Energy Recovery Systems must have a fan efficacy of ≤ 1.0 W/cfm in all climate zones (Section 160.2(b)2Biii).
Heat or Energy Recovery Systems must prescriptively have a fan efficacy of ≤ 0.6 W/cfm and a minimum sensible heat recovery of 67% in climate zones 1, 2, 4, 11-14 and 16 (Section 170.2(c)3Biva)

Table with 4 columns: ID (01-04) and Description (Manufacturer Make, Manufacturer Model Number, Fan Efficacy Performance Rating, Sensible Recovery Efficiency)



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

E. Additional Envelope Requirements

01	Envelope Leakage	
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F. Additional Central Ventilation System Balancing Requirements

01	Maximum Ventilation Flow (CFM)	
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G. Requirements for balanced and supply only ventilation systems (160.0(b)2Axi)

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Balanced and supply ventilation component accessibility. Balanced and supply ventilation systems shall meet the following requirements for accessibility:

01	IAQ filter and HRV/ERV accessibility. System air filters and HRV/ERV heat/energy recovery cores shall be located such that they are accessible for service from within occupiable spaces, basements, garages, balconies, mechanical closets or accessible rooftops. Filters and heat/energy recovery cores behind access panels, access doors, or grilles located no more than 10 feet above a walking surface inside a space specified above comply with this requirement. <b>Exception to Section 160.2(b)2Axi:</b> Systems that require servicing from inside the attic shall have the following: <ol style="list-style-type: none"> <li>1. A Fault Indicator Display (FID) meeting the requirements of Reference Appendix JA17; and</li> <li>2. An attic access door located in a wall or, where attic access is provided through a ceiling, an attic access hatch that includes an integrated ladder; and</li> <li>3. A walkway from the attic access door to the HRV/ERV.</li> </ol>
02	IAQ system component accessibility. Fans, motors, heat exchangers, filters and recovery cores shall meet all applicable requirements of California Mechanical Code 304.0 accessibility of service.

H. Fault Indicator Display

Qualification Requirements for Ventilation System Fault Indicator Displays are detailed in in Appendix JA17.

01	FID Manufacturer Name/Make	
02	FID Model Number	
03	The display module is mounted adjacent to the system thermostat.	
04	The manufacturer has certified to the Energy Commission that the FID model meets the requirements of Reference Joint Appendix JA17 (make and model found on CEC list of approved FID devices).	
05	The system has operated for at least 15 minutes and the FID reports that the system is operating within acceptable parameters.	

I. Fault Indicator Display – Additional Requirements

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

01	Fault Indicator Display devices shall either be factory installed by the space-conditioning system manufacturer, or field installed according to the space-conditioning system manufacturer's requirements and the FID manufacturer’s specifications.
02	The installer shall ensure that a copy of the FID manufacturer's user instructions documentation has been made available to the building owner.

J. Compliance Statement

01	
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SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

K. Other Requirements

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

The items listed below (6.1 through 6.6 and 6.8) correspond to the information given in ASHRAE 62.2 Section 6 "Other Requirements". Refer also to Chapter 4.6 of the Residential Compliance Manual (Section 4.6.8) for information describing these "Other Requirements". The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements specified in ASHRAE 62.2 Section 6.1 through 6.6 and 6.8 if applicable.

Table with 2 columns: Item ID and Description. Rows include: 01 6.1 Adjacent Spaces and Transfer Air, 02 6.2 Labeling, 03 6.3 Clothes Dryers, 04 6.4 Combustion and Solid-Fuel Burning Appliances, 05 6.5 Ventilation Opening Area.



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L. Air Moving Equipment

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

The items listed below (7.1 through 7.5) correspond to the information given in ASHRAE 62.2 Section 7 "Air-Moving Equipment". Refer also to Chapter 11 of the Non-Residential Compliance Manual (Section 11.4) for information describing these requirements in more detail. The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements specified in ASHRAE 62.2 Section 7.1 through 7.5 if applicable.

Table with 5 rows (01-05) detailing requirements for air moving equipment, including ratings, installation, sound ratings for fans, exhaust ducts, and supply ducts.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Table with 2 columns: Documentation Author Name, Documentation Author Signature, Documentation Author Company Name, Date Signed, Address, CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code...
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations...
4. I understand that an ECC-Rater will check the installation to verify compliance...
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s)...
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Table with 2 columns: Responsible Builder/Installer Name, Responsible Builder/Installer Signature, Company Name, Position With Company (Title), Address, CSLB License, City/State/Zip, Phone, Date Signed, Third Party Quality Control Program (TPQCP) Status, Name of TPQCP (if applicable).

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300



## LMCI-MCH-27-H User Instructions

### Section A. General Information

1. Building Unit Name: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document. This is the unique identifier for this dwelling unit. Needed mostly for multifamily dwelling units. Ventilation is calculated and provided for each dwelling unit individually.
2. Building Type: This field is filled out automatically. It is referenced from the LMCC. Values are "Multifamily".
3. Project Scope: This field is filled out automatically. It is referenced from the LMCC.
  - If parent document is the LMCC-PRF-01, values are "Newly Constructed", "Newly Constructed (Addition Alone)" and "Addition and /or Alteration"
  - If parent document is CF1R-NCB-01, values are "Newly Constructed" and "Newly Constructed (Addition Alone)"
  - If parent document is CF1R-ADD-01, values are "ADU Addition < 300 ft<sup>2</sup>," "ADU Addition > 300 to < 400 ft<sup>2</sup>," "ADU Addition > 400 to < 700 ft<sup>2</sup>" and "ADU Addition > 700 to < 1000 ft<sup>2</sup>".
4. Total Conditioned Floor Area of Dwelling Unit: This field is filled out automatically. It is referenced from the LMCI-MCH-01.
5. Number of Bedrooms in Dwelling Unit: This field is filled out automatically. It is referenced from the LMCI-MCH-01.
6. Ventilation system Type: This may be filled out automatically or be user input.
  - If parent document is the LMCC-PRF-01, the value will be filled out automatically.
  - If parent document is the CF1R-NCB or CF1R-ADD, user selects from list of Supply, Exhaust, Balanced, Balanced – ERV, Balanced – HRV, Central Fan Integrated (CFI), Central Ventilation System – Supply and Central Ventilation System – Exhaust and Central Ventilation System Balanced.
7. Ventilation operation schedule: This may be filled out automatically or be user input.
  - User selects from list of Continuous, Short-Term Average, Scheduled and Real-time Control.
  - Note if "Ventilation System Type" (A11) = Central Fan Integrated & "Ventilation Operation Schedule" (A12) = Continuous; then user will not be allowed to proceed.

### Section B. Whole Building Continuous Ventilation – Total Ventilation Rate Method

1. This value is automatically calculated using equation 160.2-B from the Energy Standards.

### Section C. Installed Ventilation – Total Ventilation Rate Method

1. User input text identifying the fan name for each installed ventilation fan.
2. User input text identifying the fan location for each installed ventilation fan.
3. Runtime (Min/Hr): This value may be filled out automatically or be user input.
  - If ventilation operation schedule from section A = "continuous", then value of 60 will be automatically entered.
  - If ventilation operation schedule from section A = "short term average", then user enter value of less than or equal to 60 for each installed ventilation fan.
4. User to enter CFM value from test procedures described in RA3.7.4 for each installed ventilation fan.
5. Equivalent continuous ventilation CFM is automatically calculated for each ventilation fan.
6. Total installed equivalent continuous ventilation CFM is automatically calculated based on the installed ventilation fans.

**Section D. HRV or ERV serving Individual Dwelling Unit**

1. User input manufacturer make of the installed equipment from the manufacturer nameplate.
2. User input model number of the installed equipment from the manufacturer nameplate.
3. User input the fan efficacy performance rating (W/CFM) for the installed equipment as determined by RA3.7.4.4.
4. User input the sensible recovery efficiency performance rating (%) for the installed equipment as determined by RA3.7.4.4.

**Section E. Additional Envelope Requirements**

1. Envelope Leakage: This field is filled out automatically. It is referenced from the LMCI-MCH-24, which must be completed prior to this document.

**Section F. Additional Central Ventilation System Balancing Requirements**

1. Maximum Ventilation Flow (CFM): This field is filled out automatically calculated.

**Section G. Requirements for balanced and supply only ventilation systems**

1. This statement must be true (or not applicable) for the test to conform to the protocols.
2. This statement must be true (or not applicable) for the test to conform to the protocols.

**Section H. Fault Indicator Display**

1. Enter the manufacturer name or make of the approved Fault Indicator Display. Must match name shown on the list of approved devices kept by the Commission.
2. Enter the manufacturer model number of the approved Fault Indicator Display. Must match name shown on the list of approved devices kept by the Commission.
3. The installer must confirm that the FID display module is mounted adjacent to thermostat that controls the system being verified. This requirement is detailed in Residential Appendix JA17.
4. The installer must confirm that the installed FID is approved and appears the list of approved devices kept by the Commission. This requirement is detailed in Residential Appendix JA17.
5. The installer must confirm that the system has operated for at least 15 minutes and that they system is operating within acceptable parameters as specified by the FID and equipment manufacturers. This requirement is detailed in Residential Appendix JA17.

**Section I. Fault Indicator Display – Additional Requirements**

1. This statement must be true (or not applicable) for the test to conform to the protocols.
2. This statement must be true (or not applicable) for the test to conform to the protocols.

**Section J. Compliance Statement**

1. Compliance Statement: This field is filled out automatically

**Section K Additional Requirements for Compliance**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply
6. This field must be a true statement (or not applicable) for the system to comply
7. This field must be a true statement (or not applicable) for the system to comply
8. This field must be a true statement (or not applicable) for the system to comply

9. This field must be a true statement (or not applicable) for the system to comply

**Section L Additional Requirements for Compliance**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

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**RETURN DUCT DESIGN AND AIR FILTER DEVICE SIZING  
ACCORDING TO TABLES 160.3 A OR B**



CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-28-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

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

**A. System Information**

01	System Identification or Name	
02	System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Nominal Cooling Capacity (tons) of Condenser	
05	Number of Return Ducts Used for Compliance	
06	Number of Additional Return Ducts (Not Used for Compliance)	

**B. One Return Duct**

01	Return Duct Minimum Nominal Diameter (inches)	
02	Installed Return Duct Nominal Diameter (inches)	
03	Minimum Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
04	Installed Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
05	Compliance Statement:	

**C. Two Return Ducts**

01	Minimum Return Duct1 Nominal Diameter (inches)	
02	Installed Return Duct1 Nominal Diameter (inches)	
03	Minimum Return Duct2 Nominal Diameter (inches)	
04	Installed Return Duct2 Nominal Diameter (inches)	
05	Minimum Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
06	Installed Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
07	Compliance Statement:	

**D. Additional Requirements for Compliance**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Qualification for the Alternative to Section 160.3(b)5Lii and iv requires that the ducted space conditioning system shall not use zoning dampers. Systems that use zoning dampers shall comply with the requirements of Section 160.3(b)5Liii.
02	The return duct length for each return air filter grille shall not exceed 30 linear feet.
03	The return duct(s) shall not contain more than a total of 180° of bend.
04	If the return duct contains more than 90° of bend, one of the bends shall be a metal elbow.
05	Return grille devices shall be labeled in accordance with the requirements in section 160.2(b)1Biv to disclose the grille's design airflow rate and a maximum allowable clean-filter pressure drop of 25 Pa (0.1 inches water) for the air filter when tested using ASHRAE Standard 52.2, or as rated in accordance with AHRI Standard 680 for the design airflow rate for the return grille.

**E. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum**

Procedures for installing HSPP or PSPP are specified in RA3.3.1.1.

01	Method Used to Demonstrate Compliance with the HSPP/PSPP Requirement	
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Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026

RETURN DUCT DESIGN AND AIR FILTER DEVICE SIZING  
ACCORDING TO TABLES 160.3 A OR B



CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-28-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. Additional Return Ducts (Not Used for Compliance)**

01	02
Installed Return Duct Nominal Diameter (inches)	Installed Total Return Filter Grille Nominal Area (inch <sup>2</sup> )

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.

**RETURN DUCT DESIGN AND AIR FILTER DEVICE SIZING  
ACCORDING TO TABLES 160.3 A OR B**



CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-28-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

## LMCI-MCH-28-H User Instructions

### Section A. System Information

1. System Identification or Name: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. Indoor Unit Name: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
4. Nominal Cooling Capacity (tons) of Condenser: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
5. Number of Return Ducts: Select the number of return ducts from the options given in the pull down list, either one or two return ducts. Those are the only options for this compliance approach. Other configurations will require that airflow and fan watt draw be verified by diagnostic testing.

### Section B. One Return Duct

1. Minimum Return Duct Nominal Diameter: This field is automatically calculated based on A03. Refer to Table 160.3-A.
2. Installed Return Duct Nominal Diameter: Enter the installed return duct nominal diameter (inches).
3. Minimum Total Return Filter Grille Nominal Area: This field is automatically calculated based on A03. Refer to Table 160.3-A.
4. Installed Total Return Filter Grille Nominal Area: Enter the installed return filter grille nominal area (inch<sup>2</sup>). The nominal grille area is equal to the length (inches) multiplied by the width (inches) of the return grille.
5. Compliance Statement: This field is automatically populated based on the inputs to rows B02 and B04. Compliance requires that the installed duct nominal diameter meet or exceed the required duct nominal diameter AND the installed filter grille nominal area meet or exceed the required filter grille nominal area.

### Section C. Two Return Ducts

1. Minimum Return Duct1 Nominal Diameter: This field is automatically calculated based on A03. Refer to Table 160.3-B.
2. Installed Return Duct1 Nominal Diameter: Enter the nominal diameter (inches) for the first return duct run.
3. Minimum Return Duct2 Nominal Diameter: This field is automatically calculated based on A03. Refer to Table 160.3-B.
4. Installed Return Duct2 Nominal Diameter: Enter the nominal diameter (inches) for the second return duct run.
5. Minimum Total Return Filter Grille Nominal Area: This field is automatically calculated based on A03. Refer to Table 160.3-B.
6. Installed Total Return Filter Grille Nominal Area: Enter the total return filter grille nominal area by summing up the two grille areas. The nominal area of each grille is equal to the length (inches) multiplied by the width (inches) of the return grille.
7. Compliance Statement: This field is automatically populated based on the inputs to C02, C04 and C06. Compliance requires that the installed duct nominal diameters meet or exceed the required duct nominal diameters AND the total installed filter grille nominal area meet or exceed the total required filter grille nominal area.

**Section D. Additional Requirements for Compliance**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.

**Section E. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum**

1. A hole for a static pressure probe (HSPP) or a permanent static pressure probe (PSPP) is required when system airflow verification is required, whether the airflow test method used requires one or not. Select the appropriate choice from the following options using a dropdown box, the Static Pressure Measurement Method:
  - A. If an Hole Static Pressure Probe is installed then select “HSPP Installed”
  - B. If a Permanent Static Pressure Probe is installed then select “PSPP Installed”
  - C. If the system is configured such that an HSPP nor PSPP can be installed, an alternate location that provides access for making supply plenum pressure measurement may be used. Select “An alternative location has been provided and clearly labeled.”
  - D. If the system is such that an HSPP or PSPP is not applicable, select “HSPP/PSPP are not applicable to this system”.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



# DUCT SURFACE AREA REDUCTION; R-VALUE, BURIED DUCTS COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-29-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

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

*Note: Submit one Certificate of installation for each duct system that must demonstrate compliance in the dwelling.*

### A. Duct System Information

01	Space Conditioning System Name or Identification/Tag	
02	Space Conditioning System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Status - Duct Surface Area Reduction And R-Value Compliance Credit	
05	Status - Buried Ducts Compliance Credit	
06	Status - Deeply Buried Ducts Compliance Credit	

### B. Duct Surface Area Reduction and R-value Compliance Credit

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Credit is available for supply duct systems with reduced surface area in unconditioned space with varying combinations of higher performance insulation if the system complies with the following requirements:

01	The duct system design shall be detailed in the special features section of the LMCC-PRF-01-E approved by the enforcement agency.
02	A duct design layout that conforms to the duct system design details in the special features section of the LMCC-PRF-01-E shall be documented on the building design plans approved by the enforcement agency.
03	The duct system installation, including duct sizes, R-values, and lengths, and locations of supply & return registers shall conform to the duct system design layout approved by the enforcement agency.
04	The duct system installation shall be verified by an ECC rater according to the requirements in RA3.1.4.1.4.
05	The duct system installation shall not have severely twisted or compressed sections that would restrict required operating airflow.

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026



# DUCT SURFACE AREA REDUCTION; R-VALUE, BURIED DUCTS COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-29-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### C. Buried Ducts Compliance Credit

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

Ducts partly or completely buried in blown attic insulation in dwelling units meeting the requirements for verified quality insulation installation may take credit for increased effective duct insulation if the system complies with the following requirements:

01	The duct system design shall be detailed in the special features section of the LMCC-PRF-01-E approved by the enforcement agency.
02	A duct design layout that conforms to the duct system design details in the special features section of the LMCC-PRF-01-E shall be documented on the building design plans approved by the enforcement agency.
03	The installed duct system and attic insulation shall conform to the design details in the enforcement agency approved LMCC-PRF-01-E. These installation details include, duct nominal diameter, R-value, and length of each segment, ceiling insulation depth, type (i.e. fiberglass or cellulose), and R-value, and supply and return register locations.
04	The duct system installation shall be verified by an ECC rater according to the requirements in RA3.1.4.1.5. Verification of duct system installation shall be completed prior to burial of ducts. Verification of insulation installation shall be completed by a second ECC inspection after ducts are buried.
05	Ducts shall not have severely twisted or compressed sections that would restrict required operating airflow.
06	Ducts shall be buried by a uniform level of insulation (i.e. no mounding attic insulation to achieve burial level), lay directly or within 3.5 inches of ceiling gypsum board, and have at least 6 inches of space between the duct outer jacket and the roof sheathing.
07	The dwelling shall comply with all Quality Insulation Installation requirements as documented on the applicable CF2R and LMCV.

### D. Deeply Buried Ducts Compliance Credit

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

Duct segments meeting the requirements for buried ducts and covered by at least 3.5 inches of insulation can take credit for effective duct insulation levels greater than buried ducts. Deeply buried ducts have the option of using lowered portions of the ceiling or durable containment systems to achieve burial depth greater than the overall attic insulation level. Deeply buried duct systems must comply with the following requirements:

01	The duct system design shall be detailed in the special features section of the LMCC-PRF-01-E approved by the enforcement agency.
02	A duct design layout that conforms to the duct system design details in the special features section of the LMCC-PRF-01-E shall be documented on the building design plans approved by the enforcement agency.
03	The installed duct system and attic insulation shall conform to the design details in the enforcement agency approved LMCC-PRF-01-E. These installation details include, duct nominal diameter, R-value, and length of each segment, ceiling insulation depth, type (i.e. fiberglass or cellulose), and R-value, lowered chase or containment system locations, and supply and return register locations.
04	The duct system installation shall be verified by an ECC rater according to the requirements in RA3.1.4.1.6. Verification of duct system installation shall be completed prior to burial of ducts. Verification of insulation installation shall be completed by a second ECC inspection after ducts are buried.
05	Ducts shall not have severely twisted or compressed sections that would restrict required operating airflow.
06	Ducts shall be buried by a uniform level of insulation (i.e. no mounding attic insulation to achieve burial level), lay directly or within 3.5 inches of ceiling gypsum board, and have at least 6 inches of space between the duct outer jacket and the roof sheathing.
07	The dwelling shall comply with all Quality Insulation Installation requirements as documented on the applicable LMCI and LMCV.
08	Containment systems shall have walls at least 7 inches wider than the duct outer diameter, extend at least 3.5 inches above the duct jacket, be filled completely with blown insulation, and have the duct centered between the containment walls.

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026



**DUCT SURFACE AREA REDUCTION; R-VALUE, BURIED DUCTS COMPLIANCE CREDIT**

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-29-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**E. Duct System Design Details**

01	02	03	04	05	06	07	08	09
Duct Segment Identification	Nominal Diam. (in)	Duct R-value	Length (ft)	Attic Insulation R-value	Attic Insulation Depth (in)	Attic Insulation Type	Containment System or Lowered Chase	Duct Burial Level

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.

Registration Number:

Registration Date/Time:

ECC Provider:





# DUCT SURFACE AREA REDUCTION; R-VALUE, BURIED DUCTS COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-29-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-rise Multifamily Compliance

January 1, 2026

## LMCI-MCH-29-H User Instructions

### Section A. Duct Information

1. *System Identification or Name*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
2. *System Location or Area Served*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
3. *Indoor Unit Name*: This field is filled out automatically. It is referenced from the LMCI-MCH-01, which must be completed prior to this document.
4. *Status – Duct Surface Area Reduction and R-Value Compliance Credit*: This field is auto-filled from the LMCC-PRF-01-E indicating if the credit is being used. If not, then N/A will be displayed.
5. *Status – Buried Ducts Compliance Credit*: This field is auto-filled from the LMCC-PRF-01-E indicating if the credit is being used. If not, then “N/A” will be displayed.
6. *Status – Deeply Buried Ducts Compliance Credit*: This field is auto-filled from the LMCC-PRF-01-E indicating if the credit is being used. If not, then “N/A” will be displayed.

### Section B. Supply Duct Surface Area Reduction and R-value Compliance Credit

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.

### Section C. Buried Ducts Compliance Credit

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.

### Section D. Deeply Buried Ducts Compliance Credit

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.
8. This field must be a true statement (or not applicable) for the system to comply.

### Section E. Duct System Design Details

This table is a calculated field: table copied from LMCC-PRF-01

1. Reference information from LMCC-PRF-01, which must be completed prior to this document.
2. Reference information from LMCC-PRF-01, which must be completed prior to this document.
3. Reference information from LMCC-PRF-01, which must be completed prior to this document.
4. Reference information from LMCC-PRF-01, which must be completed prior to this document.

5. Reference information from LMCC-PRF-01, which must be completed prior to this document.
6. Reference information from LMCC-PRF-01, which must be completed prior to this document.
7. Reference information from LMCC-PRF-01, which must be completed prior to this document.
8. Reference information from LMCC-PRF-01, which must be completed prior to this document.
9. Reference information from LMCC-PRF-01, which must be completed prior to this document.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

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

Title 24, Part 6, Section 160.2(b)2 **Ventilation and Indoor Air Quality for Attached Dwelling Units.** All dwelling units shall meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings, subject to the amendments specified in Section 160.2(b)2A.

**A. Local Mechanical Exhaust - General Information**

01	Dwelling Unit Name	
02	Building Type	
03	Total Kitchen Floor Area	
04	Kitchen Average Ceiling Height	
05	Kitchen Total Conditioned Volume	
06	Kitchen Type	
07	Dwelling Unit Total Floor Area	
08	Kitchen Range (Cooking Stove) Fuel Type	

**B. Local Mechanical Exhaust System (Section 160.2(b)2Avi) – Fan Selection and Duct Design Criteria for Compliance**

Local mechanical exhaust fans shall be installed in each kitchen and bathroom in accordance with Section 160.2(b)2Avi. Systems shall be rated for airflow in accordance with ASHRAE 62.2 section 7.1. Delivered local ventilation rates:

- *All local ventilation rates have been measured using a flow hood, flow grid, or other airflow measuring device and meet the requirements of Tables 160.2-E, 160.2-F, or 160.2-G; OR*
- *The airflow rating at a pressure of 0.25 in. w.c. of a certified fan is assumed because the local ventilation system duct sizing meets the prescriptive requirements of Table 160.2-H.*



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

Table 150.0-E Demand-Controlled Local Ventilation Exhaust Airflow Rates and Capture Efficiency	
Application	Airflow
Enclosed Kitchen or Nonenclosed Kitchen	Vented range hood, including appliance-range hood combinations shall meet either the capture efficiency (CE) or the airflow rate specified in Table 150.0-G as applicable.
Enclosed Kitchen or Nonenclosed Kitchen	Other kitchen exhaust fans, including downdraft: 300 cfm (150 L/s)
Bathroom	50 cfm (25 L/s)

Table 150.0-F Continuous Local Ventilation Exhaust Airflow Rates	
Application	Airflow
Enclosed kitchen	5 ach, based on kitchen volume
Bathroom	20 cfm (10 L/s)

Table 150.0-G Kitchen Range Hood Airflow Rates (cfm) and ASTM E3087 Capture Efficiency (CE) Ratings According to Dwelling Unit Floor Area and Kitchen Range Fuel Type		
Dwelling Unit Floor Area (ft <sup>2</sup> )	Hood Over Electric Range	Hood Over Natural Gas Range
>1500	50% CE or 110 cfm	70% CE or 180 cfm
>1000 - 1500	50% CE or 110 cfm	80% CE or 250 cfm
750 - 1000	55% CE or 130 cfm	85% CE or 280 cfm
<750	65% CE or 160 cfm	85% CE or 280 cfm

Table 150.0-H Prescriptive Ventilation System Duct Sizing													
Fan Airflow Rating, CFM at minimum static pressure of 0.25 in. water	≤50 (25)	≤80 (40)	≤100 (50)	≤125 (60)	≤150 (70)	≤175 (85)	≤200 (95)	≤250 (120)	≤350 (165)	≤400 (190)	≤450 (210)	≤700 (330)	≤800 (380)
Duct Type	Minimum Duct Diameter, in. (mm) <sup>a,b</sup>												
Rigid duct	4 <sup>e</sup> (100)	5 (125)	5 (125)	6 (150)	6 (150)	7 (180)	7 (180)	8 (205)	9 (230)	10 (255)	10 (255)	12 (305)	12 <sup>d</sup> (305)
Flex duct <sup>c</sup>	4 (100)	5 (125)	6 (150)	6 (150)	7 (150)	7 (180)	8 (205)	8 (205)	9 (230)	10 (255)	NP	NP	NP

- a. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.
- b. NP = application of the prescriptive table is not permitted for this scenario.
- c. Use of this table for verification of flex duct systems requires flex duct to be fully extended and any flex duct elbows to have a minimum bend radius to duct diameter ratio of 1.0.
- d. For this scenario, use of elbows is not permitted.
- e. For this scenario, 4 in. (100 mm) oval duct shall be permitted, provided the minor axis of the oval is greater than or equal to 3 in. (75 mm)
- f. When a vented range hood utilizes a capture efficiency rating to demonstrate compliance with 150.0(o)1Giiib, a static pressure greater than or equal to 0.25 in. of water at the rating point shall not be required, and the airflow listed in the approved directory corresponding to the compliant capture efficiency rating point shall be applied to Table 150.0-H for determining compliance.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

C. Kitchen Exhaust Systems

Table with 12 columns: 01 System Name, 02 Manufacturer Name, 03 System Type, 04 HVI or AHAM Directory Listed Model Number, 05 HVI or AHAM Directory Listed Rated Airflow, 06 HVI or AHAM Directory Listed Sound Rating, 07 Minimum Airflow (defaults to rated airflow), 08 Operation Schedule, 09a Method of Compliance, 09 Required Minimum Ventilation Rate, 10a Exception to Maximum Sound Rating, 10 Maximum Sound Rating, 11 Compliance Statement for Airflow, 12 Compliance Statement for Sound

D. Continuous Kitchen Exhaust

Table with 3 rows: 01 Total Continuous Ventilation Airflow, 02 Required Minimum Continuous Ventilation Airflow, 03 Compliance Statement

E. Kitchen Range Hood Capture Efficiency Option

Table with 5 rows: 01 Manufacturer Name, 02 CEC-Approved Directory Listed Model Number, 03 CEC-Approved Directory Listed Rated Capture Efficiency, 04 Required Minimum Capture Efficiency (Table 150.0-G), 05 Compliance Statement

F. Other Requirements

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

The items listed below correspond to the information given in Section 160.2(b)2Avi. Refer also to Chapter 4.6 of the Residential Compliance Manual for information describing these requirements in more detail. The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements if applicable.

Table with 5 rows: 01 Demand control exhaust systems shall be provided with at least one of the following: 1. A readily accessible occupant-controlled on-off control. 2. An automatic control that does not impede occupant on control. 02 Nonenclosed kitchens shall be provided with a demand-controlled mechanical exhaust system. 03 Each continuous mechanical exhaust system shall be provided with a readily accessible manual on-off control. (Multifamily dwellings are exempt from readily accessible requirement.) 04 Continuous mechanical exhaust systems shall be designed to operate during all occupiable hours. 05 Exhaust fans in separate dwelling units shall not share a common exhaust duct. Exhaust inlets from more than one dwelling unit may be served by a single exhaust fan downstream of all the exhaust inlets if the fan is designated and intended to run continuously or if each inlet is equipped with a back-draft damper to prevent cross-contamination when the fan is not running.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

## LMCI-MCH-32-H User Instructions

### Section A. Local Mechanical Exhaust - General Information

1. Dwelling Unit Name: This field is filled out automatically and referenced from the MCH-01
2. Building Type: This field is filled out automatically and referenced from the LMCC.
3. Total Kitchen Floor Area: Enter the total floor area for an enclosed kitchen or N/A for a non-enclosed kitchen.
4. Kitchen Average Ceiling Height: Enter the kitchen ceiling height for an enclosed kitchen or N/A for a non-enclosed kitchen.
5. Kitchen Total Conditioned Volume: This field is filled out automatically and calculated based on the kitchen area and ceiling height.
6. Kitchen Type: Enter the type of kitchen (enclosed or non-enclosed).
7. Dwelling Unit Total Floor Area: This field is filled out automatically and referenced from the MCH-01.
8. Kitchen Range Fuel Type: Select the fuel type of the kitchen range.

### Section C. Kitchen Exhaust System

1. System Name: Enter a unique name for the kitchen exhaust system
2. Manufacturer Name: Enter manufacturer name for the kitchen exhaust system.
3. System Type: Select the type of kitchen exhaust system. Options are vented range hood, downdraft, and other.
4. HVI or AHAM Directory Listed Model Number: Enter the kitchen exhaust system model number matching the installed equipment and HVI or AHAM directory.
5. HVI or AHAM Directory Listed Rated Airflow: Enter the rated airflow listed in the HVI or AHAM directory for the above model number.
6. HVI or AHAM Directory Listed Sound Rating: Enter the sound rating listed in the HVI or AHAM directory for the above model number.
7. Minimum Airflow (defaults to rated airflow): Defaults to rated airflow from HVI directory, but editable if exhaust system minimum airflow rate is less than HVI listed value.
8. Operation Schedule: Select the kitchen exhaust system operation schedule. Options are demand control and continuous.
- 9a. Method of Compliance: Select the method of compliance. Options are airflow and capture efficiency.
9. Required Minimum Ventilation Rate (if demand controlled): This field is filled out automatically and is calculated based on the system operation schedule and type, and kitchen type and volume, and Table 160.2-E and Table 160.2-G. This field is only used for demand control exhaust systems. Continuous exhaust required minimum ventilation rate is determined in Section D.
- 10a. Exception to Maximum Sound Rating: User select: No Exception or Remote mounted fan with min. 4-ft of duct between fan and intake grille.
10. Maximum Sound Rating: This field is filled out automatically and is calculated based the system operation schedule and minimum airflow.
11. Compliance Statement for Airflow: This field is filled out automatically based on the installed system listed airflow rate and minimum required ventilation rate. This field only determines compliance using airflow ratings for demand-controlled kitchen exhaust systems. Continuous system ventilation rate compliance is determined in Section D. Vented range hoods utilizing the capture efficiency rating for compliance is determined in Section E.
12. Compliance Statement for Sound. This field is filled out automatically based on the installed system listed sound rating and maximum sound rating allowed.

### Section D. Continuous Kitchen Exhaust



1. Total Continuous Ventilation Airflow: This field is filled out automatically and is equal to the sum of the listed airflow for all continuously operated kitchen exhaust systems.
2. Required Minimum Continuous Ventilation Airflow: This field is filled out automatically and is equal to five times the enclosed kitchen volume.
3. Compliance Statement: This field is filled out automatically and is based on the total installed continuous ventilation airflow and the required minimum continuous ventilation airflow.

#### Section E. Kitchen Range Hood Capture Efficiency Option

**Note: This table is used only when complying with local exhaust requirements by utilizing the capture efficiency rating instead of the airflow rating.**

1. Manufacturer Name: Enter manufacturer name for the kitchen range hood.
2. CEC-Approved Directory Listed Model Number: Enter the kitchen range hood model number matching the installed equipment and a CEC-approved directory listing.
3. CEC-Approved Directory Listed Rated Capture Efficiency: Enter the rated capture efficiency in the CEC-approved directory for the above model number.
4. Required Minimum Capture Efficiency: This field is filled out automatically and is determined by the dwelling unit square footage, kitchen range fuel type, and Table 160.2-G.
5. Compliance Statement. This field is filled out automatically based on the installed system listed capture efficiency rating and required minimum capture efficiency.

#### Section F. Other Requirements

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.

#### Documentation Declaration Statements

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Field Name (Project Name, Dwelling Address, City and Zip Code) and Value (Enforcement Agency, Permit Number, Permit Application Date)

A. VCHP System Information

Procedures for verification of VCHP compliance credit eligibility are described in the Energy Code Reference Appendices Section RA3.4.4.3.

Table with 2 columns: ID (01-05) and Description (SC System ID/Name, SC System Description, Conditioned Floor Area, Status: Refrigerant charge verification, Verification: Is conditioned airflow supplied...)

B. VCHP Indoor Unit Information

Ducted indoor units are required to be certified to the Energy Commission as low static systems, and included in the list of certified indoor units published on the Energy Commission website at the following URL:

https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency/manufacture-certification-building-equipment.

Table with 9 columns: 01-09 (Indoor Unit Name, Installed Indoor Unit Type, Indoor Unit Duct Status, Conditioned Floor Area Served, Number of Air Filter Devices, Indoor Unit Required Minimum System Airflow Rate, Status: Airflow Rate Verification, Is Field Verification of Default Non-Continuous Fan Operation Required?, Verification: Is Ducted Low Static Indoor Unit Certified to CEC?)

Notes:



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

C. Verification: Ducted Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.3.8

Ducted indoor units shall be verified in accordance with the Verified Low Leakage Ducts in Conditioned Space procedure in Section RA3.1.4.3.8.

01	02	03	04
Indoor Unit Name or Description of Area Served	A Visual Inspection Shall Confirm the Space Conditioning Distribution System Location(RA3.1.4.1.3)	Measured Duct Leakage to Outside (cfm) Using RA3.1.4.3.4	Compliance Statement:
Notes:			

D. Verification: Ductless Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.1.8

A visual inspection shall confirm that ductless indoor units are located entirely in conditioned space in accordance with the procedures of RA3.1.4.1.8.

01	02	03
Indoor Unit Name or Description of Area Served	Indoor Unit Installation Location Verification	Compliance Statement:
Notes:		

E. Verification: Wall Mounted Thermostats - RA3.4.5

Field verification according to the procedure in RA3.4.5 shall confirm that VCHP space conditioning zones that are greater than 150 ft<sup>2</sup>, are controlled by a permanently installed wall-mounted thermostat.

01	02	03	04	05
Indoor Unit Name or Description of Area Served	Is a Wall-mounted Thermostat Installed in the Zone Served by the Indoor Unit?	Does the Thermostat Control the Zone's Indoor Unit?	Is the Thermostat Mounted Permanently to the Wall?	Compliance Statement:
Notes:				



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F. Verification: Non-Continuous Fan Operation - RA3.4.6

If the certificate of compliance indicates non-continuous indoor unit fan operation was specified for compliance credit, then the system shall be field verified in accordance with the procedures in RA3.4.6 to confirm that the installed system's indoor unit + outdoor unit combination does not operate the fan continuously when the system thermostat is not calling for conditioning.

Table with 5 columns: 01, 02, 03, 04, 05. Headers: Indoor Unit Name or Description of Area Served, Is Non-Continuous Default Fan Operation Shown in CEC Certification Listings?, Does Indoor Unit Air Distribution Fan Operate When There Is No Call For Heating?, Does Indoor Unit Air Distribution Fan Operate When There Is No Call For Cooling?, Compliance Statement:.

G. Verification: Installed Air Filter Sizing and Pressure Drop - RA3.1.4.7 and RA3.1.4.8

Nominal 2-inch or greater depth air filters shall be sized by the system designer to accommodate a maximum allowable clean-filter pressure drop of 0.1 inch W.C. at the air filter's design airflow rate as verified according to the procedures in RA3.1.4.8. Nominal one-inch minimum depth air filters shall be allowed if the filter face area is sized based on a maximum face velocity of 150 ft per minute at the air filter design airflow rate according to the procedures in RA3.1.4.7. In order to inform the occupant of the airflow and clean filter pressure drop performance required for replacement air filters, the installer shall place a sticker in or near the filter grille displaying the air filter design airflow rate and the maximum allowed clean filter pressure drop at the design airflow rate as required by Standards Section 160.2(b)1Biv.

Table with 12 columns: 01-12. Headers: Indoor Unit Name or Description of Area Served, Air Filter Name or Description of Location, Air Filter Device Type, Design Airflow Rate for Air Filter Device (cfm), Air Filter Nominal Depth (inch), Air Filter Nominal Length (inch), Air Filter Nominal Width (inch), Air Filter Calculated Nominal Face Area (inch²), Air Filter Required Minimum Face Area (inch²), Face Area Compliance, Air Filter Rated Pressure Drop at Design Airflow Rate (inch W.C.), Air Filter Pressure Drop Compliance.

H. VCHP System Compliance Statement

Table with 2 columns: 01, [Empty]



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this certificate of installation is true and correct.
- I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
- I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
- I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
- I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

Registration Number:

Registration Date/Time:

ECC Provider:

## LMCI-MCH-33-H User Instructions

### Section A. VCHP System Information

1. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the LMCI-MCH-25 which must be completed prior to this document.
5. Perform the verification specified by RSC3.1.4.1.7 and select the value that describes the result of the verification.

### Section B. VCHP Indoor Unit Information

1. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
4. Enter the conditioned floor area served by the indoor unit - a value in ft<sup>2</sup>.
5. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the LMCI-MCH-23 which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the LMCI-MCH-23 which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance which must be completed prior to this document.
9. Navigate to the URL for the Manufacturer certification listings and determine whether the installed system is included in the CEC listing, then select the value that describes the result of the verification.

### Section C. Verification: Ducted Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.3.8

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Select the statement that best describes the location of the ducted distribution system.
3. Enter the leakage to outside airflow determined from the RA3.1.4.3.8
4. This field is filled out automatically

### Section D. Verification: Ductless Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.1.8

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Select the statement that best describes the indoor unit installation location as determined according to RA3.1.4.1.8.
3. This field is filled out automatically

**Section E. Verification: Wall Mounted Thermostats - RA3.4.5**

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Answer yes or no to the question: Is a wall-mounted thermostat installed in the zone served by the indoor unit?
3. Answer yes or no to the question: Does the thermostat control the zone's indoor unit?
4. Answer yes or no to the question: Is the thermostat mounted permanently to the wall?
5. This field is filled out automatically

**Section F. Verification: Non-Continuous Fan Operation RA3.4.6**

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Select the best response to the question: Is non-continuous default fan operation shown in CEC certification listings?
3. Select the best response to the question: Does indoor unit air distribution fan operate when there is no call for heating?
4. Select the best response to the question: Does indoor unit air distribution fan operate when there is no call for cooling?
5. This field is filled out automatically

**Section G. Verification: Installed Air Filter Sizing and Pressure Drop - RA3.1.4.7 and RA3.1.4.8**

1. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from another section on this document, or from the LMCI-MCH-01 which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the LMCI-MCH-01 which must be completed prior to this document.
8. This field is filled out automatically by calculating the product of air filter length and air filter width.
9. This field is filled out automatically based on the depth of the filter.
10. This field is filled out automatically
11. Input the pressure drop at the design airflow rate from the performance data information published on the air filter label.
12. This field is filled out automatically

**Section H. VCHP System Compliance Statement**

1. This field is filled out automatically.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.





SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns: Project Name, Dwelling Address, City and Zip Code; Enforcement Agency, Permit Number, Permit Application Date.

A. General Information

Table with 2 columns: 01 Building Name

B. Design Central Water Heating Systems Information (other than CHPWH)

This table reports features of the water heating system other than CHPWH system that were specified on the registered LMCC compliance document for this project.

Table with 12 columns: 01 Water Heating System ID or Name, 02 Water Heating System Type, 03 Water Heater Type, 04 # of Water Heaters in System, 05 Water Heater Storage Volume (gal), 06 Fuel Type, 07 Rated Input Type, 08 Rated Input Value, 09 Heating Efficiency Type, 10 Heating Efficiency Value, 11 Standby Loss (%), 12 Exterior Insul. R-Value.

B2. Design CHPWH System Information

This table reports the water heating systems specified on the registered LMCC compliance document for this project.

Table with 12 columns: 01 Water Heating System ID or Name, 02 Modeled Equipment Make and Model, 03 # of Water Heaters/ Compressors, 04 Primary Tank Location, 05 Primary Tank Volume, 06 Primary Tank Total Insulation, 07 Loop Tank Location, 08 Loop Tank Volume, 09 Loop Tank Total Insulation, 10 Loop Pipe Insulation Thickness, 11 Loop Tank Type, 12 Simulated Equipment Make and Model.

C. Installed Central Water Heating Systems Information

This table reports features of the water heating system other than CHPWH system that were specified on the registered LMCC compliance document for this project.

Table with 12 columns: 01 Water Heating System ID or Name, 02 Water Heating System Type, 03 Water Heater Type, 04 # of Water Heaters in System, 05 Water Heater Storage Volume (gal), 06 Fuel Type, 07 Rated Input Type, 08 Rated Input Value, 09 Heating Efficiency Type, 10 Heating Efficiency Value, 11 Standby Loss (%), 12 Exterior Insul. R-Value. Row 13: Compliance Statement.



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C2. Installed CHPWH System Information

This table reports the water heating system features that were specified on the registered LMCC compliance document for this project.

Table with 11 columns: 01 Water Heating System ID or Name, 02 Modeled Equipment Make and Model, 03 # of Water Heaters/Compressors, 04 Primary Tank Location, 05 Primary Tank Volume, 06 Primary Tank Insulation, 07 Loop Tank Location, 08 Loop Tank Volume, 09 Loop Tank Insulation, 10 Loop Pipe Insulation Thickness, 11 Loop Tank Type.

D. Design Central Water Heating Distribution Systems Information

This table reports the water heating distribution types specified on the registered LMCC compliance document for this project.

Table with 5 columns: 01 Water Heating System ID or Name, 02 Central DHW System Distribution Type, 03 Dwelling Unit DHW System Distribution Type, 04 California Plumbing Code Appendix M, 05 Thermostatic Master Mixing Valve.

E. Installed Central Water Heating Distribution Systems Information

This table reports the water heating distribution types specified on the registered LMCC compliance document for this project.

Table with 5 columns: 01 Water Heating System ID or Name, 02 Central DHW System Distribution Type, 03 Dwelling Unit DHW System Distribution Type, 04 California Plumbing Code Appendix M, 05 Thermostatic Master Mixing Valve.

F. Installed Water Heater Manufacturer Information

Table with 3 columns: 01 Water Heating System ID or Name, 02 Manufacturer, 03 Model Number.



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G. Mandatory Requirements for All Central Domestic Hot Water Systems

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID and Description. Rows 01-07 detailing requirements for hot water systems, including capacity, pumps, insulation, and piping standards.



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07	<p><b>1. Insulation Thickness:</b> All piping for multifamily domestic hot water systems shall meet the insulation thickness requirements specified in of Table 160.4-A.</p> <ol style="list-style-type: none"> <li>a. For insulation conductivity in the range shown in Table 160.4-A for the applicable fluid temperature range, the insulation shall have the applicable minimum thickness or R-value shown in Table 160.4-A.</li> <li>b. if the insulation conductivity falls outside the range provided in Table 160.4-A applicable fluid temperature range, the insulation shall meet a minimum R-value as indicated in Table 160.4-A. Or, it can have a thickness determined using Equation 160.4-A.</li> <li>c. Insulation conductivity shall be determined in accordance with ASTM C335 at the mean temperature listed in Table 160.4-A, and shall be rounded to the nearest 1/100 Btu-inch per hour per square foot per °F.</li> </ol> <p><b>2. Insulation Protection:</b> Pipe Insulation shall be protected from damage due to sunlight, moisture, equipment maintenance and wind. Protection shall, at minimum, include the following:</p> <ol style="list-style-type: none"> <li>a. Pipe and appurtenance insulation exposed to weather shall be protected by a cover suitable for outdoor service. The cover shall be water retardant and provide shielding from solar radiation that can cause degradation of the material. Appurtenance insulation covers shall be removable and able to be reinstalled. Adhesive tape shall not be used to provide this protection.</li> <li>b. Pipe insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall include, or be protected by, a Class I or Class II vapor retarder. All penetrations and joints shall be sealed.</li> <li>c. Pipe insulation buried below grade must be installed in a waterproof and noncrushable casing or sleeve.</li> </ol>
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H. California Plumbing Code Appendix M

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

01	All distribution piping shall be sized according to the methodology specified in the California Plumbing Code Appendix M.
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I. Thermostatic Master Mixing Valve

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

For central systems with hot water piping serving multiple dwelling units, the master mixing valves (MMV) shall meet the following minimum specification, installation, and startup requirements specified in RA4.4.19:

01	<p><b>Plumbing Plans:</b> The plumbing plans shall include the following MMV specification at a minimum:</p> <ol style="list-style-type: none"> <li>a. Manufacturer's installation and commissioning instructions and plumbing drawings.</li> <li>b. MMV conforms to the American Society of Sanitation Engineers (ASSE) 1017-2009 standard, Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems.</li> <li>c. Water mixing parameters and associated values: <ol style="list-style-type: none"> <li>1. Input parameters A. Recirculation pump flow rate <ol style="list-style-type: none"> <li>A. Recirculation pump flow rate</li> <li>B. Mixing valve outlet water temperature</li> <li>C. Recirculation return water temperature</li> <li>D. Mixing valve hot inlet water temperature</li> </ol> </li> <li>2. Calculated parameters A. Percentage of water flow returning to cold side of MMV <ol style="list-style-type: none"> <li>A. Percentage of water flow returning to hot side of MMV</li> <li>B. Percentage of water flow returning to hot side of MMV</li> </ol> </li> <li>3. Manufacturer's operating parameter <ol style="list-style-type: none"> <li>A. Maximum water mixing ratio</li> </ol> </li> </ol> </li> </ol>
02	<p><b>Installation:</b> Installation of MMV shall meet manufacturer's instruction and the following requirements at a minimum:</p> <ol style="list-style-type: none"> <li>a. The MMV shall be installed on the central heating plant hot water supply outlet header leading to the recirculation loop.</li> <li>b. Check valves installed on the recirculation return line and cold-water line to inlet cold connection of MMV and on recirculation return piping leading back to storage tank or water heater.</li> <li>c. Isolation valves installed on the inlet cold water, inlet recirculation return, inlet hot and outlet connections to MMV and on recirculation return piping connection to storage tank or water heater.</li> <li>d. Balancing valve installed on the recirculation return piping to the water heater for MMVs that cannot 100% close the hot inlet port during operation.</li> <li>e. Thermometers installed on the outlet of the MMV and on the recirculation return line next the water pump.</li> </ol>



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03	<p><b>Startup:</b></p> <ul style="list-style-type: none"> <li>a. Startup testing of MMV during recirculation only operation. <ul style="list-style-type: none"> <li>1. Close all hot fixtures in the domestic water system.</li> <li>2. Ensure that the water heater is operational and idling with storage tank plumbed to the mixing valve and meeting the hot inlet temperature specified in the plumbing plans.</li> <li>3. Start the recirculation pump and set mixed outlet temperature or setpoint temperature on the MMV. Start the circulation pump at the specified water flow rate and adjust as needed to meet recirculation return temperature specified in the plumbing plans.</li> <li>4. Let distribution system warm up and stabilize for 30 minutes and adjust mixing parameters as needed to realign with values in plumbing plans.</li> <li>5. Let the recirculation pump operate for three hours without any water draws to ensure there is no temperature creep.</li> <li>6. If during or after the three-hour period the MMV outlet and return temperature stays elevated by greater than 2°F and doesn't return back to the specified temperature, then make necessary adjustments to the MMV. If temperature creep persists with mechanical MMV, adjust the balancing valve as necessary on the recirculation return line leading back to the water heater to ensure average MMV outlet temperature meets the specified temperature.</li> <li>7. If adjustments are made to MMV or balancing valve in Step 6, then repeat Step 5.</li> </ul> </li>   <li>b. Startup testing of MMV for a combination of recirculation and hot water draws. <ul style="list-style-type: none"> <li>1. Once the MMV is operational in a closed loop, make a water draw for 10 minutes using one of the following options: <ul style="list-style-type: none"> <li>A. With a shower operating at full flow at every: three dwelling units in a building with 15 or fewer dwelling units, five dwelling units in a building with 16 to 30 dwelling units, eight dwelling units in a building with 31 to 60 dwelling units, ten dwelling.</li> <li>B. The hot water valve on a hose bib, mop sink, or other fixture on the branch line or location on the hot water distribution line is opened to a draw volume of 1 gpm for every: three dwelling units in a building with 15 or fewer dwelling units, five dwelling units in a building with 16 to 30 dwelling units, eight dwelling units in a building with 31 to 60 dwelling units, ten dwelling units in a building than 60 to 200 dwelling units, twenty dwelling units in a building with more than 200 dwelling units.</li> </ul> </li> <li>2. Monitor recirculation return temperature on the thermometer during the 10-minute draw period and ensure design return water temperature is maintained at the specified temperature documented in the plumbing plans.</li> <li>3. If the recirculation return temperature falls more than 5°F below the specified temperature during the draw period, then adjust MMV setup to ensure compliance.</li> </ul> </li> </ul>
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FOR INFORMATION ONLY. NOT VALID FOR SUBMISSION WITH AN ELECTRICIAN.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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:

- The information provided on this Certificate of Installation is true and correct.
- I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
- The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
- I understand that a registered 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, and I will take the necessary steps to ensure this requirement is accomplished.
- I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to ensure this requirement is accomplished.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300

## LMCI-PLB-01-E User Instructions

### A. General Information

This table reports the building location as specified on the Registered LMCC.

### B. Design Central Water Heating Systems Information

This table reports features of the water heating system other than **CHPWH** system that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

#### B2. Design CHPWH System Information

This table reports the water heating systems specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

### C. Installed Central Water Heating Systems Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Water Heating System ID or Name – Reference information from LMCC.
2. Water Heating System Type – Reference information from LMCC. The different kinds of water heating system type are DHW or Combined Hydronic.
3. Water Heater Type – Information from LMCC. The different kinds of water heaters are Large/Commercial Storage, Small/Consumer Storage, Residential-Duty Commercial Storage, Heat Pump, Boiler, Large/Commercial Instantaneous, Small/Consumer Instantaneous, Residential-Duty Commercial Instantaneous or Indirect.
4. # of Water Heaters in System – Reference information from LMCC.
5. Water Heater Storage Volume (gal) – User input. Value may be N/A if water heater type is instantaneous with zero storage.
6. Fuel Type – Reference information from LMCC. The different kinds of fuel types are natural gas, propane, oil, or electricity.
7. Rated Input Type – Reference information from LMCC. For natural gas, propane and oil fuel type the input type is Btu/hr. For electric the input type is kW.
8. Rated Input Value – User input. Numerical value of the rated input. Must be equal to or less than value indicated on the LMCC.
9. Heating Efficiency Type – Reference information from LMCC. Different efficiency types are Energy Factor: AFUE, UEF and Thermal Efficiency.
10. Heating Efficiency Value – User input. Numerical value of the Heating Efficiency. Must be equal to or higher efficiency than value indicated on the LMCC.
11. Standby Loss – User input. Must be equal to or less than value indicated on the LMCC. Value may be N/A if LMCC value is N/A.
12. Exterior Insulation. R-Value – User input. Must be equal to or higher than value indicated on the LMCC. Value may be N/A if LMCC value is N/A.



**C2. Installed CHPWH System Information**

This table reports the water heating system information that is being installed. Require one line for each installed water heater. Require one line for each installed water heater.

1. Water Heating System ID or Name – Reference information from Table B2.
2. Modeled Equipment Make and Model – User input must be equal to the value indicated on Table B2 as default and allow user to override with an equivalent system based on the simulated equipment in Table B2.
3. Number of Water Heaters/ Compressors – User input, must be equal to the value indicated on table B2.
4. Primary Tank Location – Reference information from Table B2.
5. Primary Tank Volume – User input, must be equal to or higher than the value indicated on table B2.
6. Primary Tank Insulation – User input, must be equal to or higher than value indicated on table B2.
7. Loop Tank Location – Reference information from Table B2.
8. Loop Tank Volume – User input, must be equal to or higher than the value indicated on table B2.
9. Loop Tank Insulation – User input, must be equal to or higher than value indicated on table B2.
10. Loop Pipe Insulation Thickness – User input, must be equal to or higher than the value indicated on table B2.
11. Loop Tank – Reference information from Table B2.

**D. Design Central Water Heating Distribution Systems Information**

This table reports the water heating distribution types specified on the registered LMCC compliance document for this project.

**E. Installed Central Water Heating Distribution Systems Information**

1. Water Heating System ID or Name – Reference information from LMCC.
2. Central DHW System Distribution Type = Reference information from LMCC.
3. Dwelling Unit DHW System Distribution Type = Reference information from LMCC.

**F. Installed Water Heater Manufacturer Information**

This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater

1. Water Heating System ID or Name – Reference information from LMCC.
2. Manufacturer – User input. Enter the name of the water heater manufacturer.
3. Model Number – User input. Enter the model number of the water heater.

**G. Mandatory Requirements for All Central Domestic Hot Water Recirculation Systems**

This table lists the requirements for all central recirculation systems. Installer must ensure all the requirements in this table are met.



**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



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CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Table with 2 columns and 3 rows: Project Name, Dwelling Address, City and Zip Code; Enforcement Agency, Permit Number, Permit Application Date.

A. Design Dwelling Unit Water Heating Systems Information (other than HPWH)

This table reports features of the water heating system(s) other than HPWH systems specified on the registered LMCC compliance document for this project.

Table with 10 columns: Dwelling Unit Name, Water Heating System ID or Name, Water Heating System Type, Water Heater Type, # of Like (or Identical) Water Heaters in System, Fuel Type, Rated Input Type, Rated Input Value, Dwelling Unit DHW System Distribution Type, Compact Distrib.

A2. Design Dwelling Unit HPWH System Information

This table reports the HPWH water heating system(s) that were specified on the registered LMCC compliance document for this project.

Table with 9 columns: Dwelling Unit Name, Water Heating System ID or Name, Modeled Equipment Make and Model, # of Like (or Identical) Water Heaters in System, Tank Location, Exterior Tank Insulation R-value, Dwelling Unit DHW System Distribution Type, Compact Distribution, Simulated Equipment Make and Model.

B. Installed Dwelling Unit Water Heating Systems Information

This table reports features of the water heating system other than HPWH systems installed in this project.

Table with 10 columns: Dwelling Unit Name, Water Heating System ID or Name, Water Heating System Type, Water Heater Type, # of Like (or Identical) Water Heaters in System, Fuel Type, Rated Input Type, Rated Input Value, Dwelling Unit DHW System Distribution Type, Compact Distrib.



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B2. Installed Dwelling Unit HPWH System Information

This table reports the water heating system(s) installed in this project.

Table with 8 columns: 01 Dwelling Unit Name, 02 Water Heating System ID or Name, 03 Modeled Equipment Make and Model, 04 # of Like (or Identical) Water Heaters in System, 05 Tank Location, 06 Exterior Tank Insulation R-value, 07 Dwelling Unit DHW System Distribution Type, 08 Compact Distribution

C. Design Dwelling Unit Water Heating Efficiency Information

This table reports the water heater(s) efficiency features specified on the registered LMCC compliance document for this project.

Table with 7 columns: 01 Water Heating System ID or Name, 02 Heating Efficiency Type, 03 Heating Efficiency Value, 04 Standby Loss (%), 05 Exterior Insulation R-Value, 06 Water Heater Storage Volume (gal), 07 Tank Location

D. Installed Dwelling Unit Water Heating Efficiency Information

This table reports the water heater(s) efficiency features installed in this project.

Table with 7 columns: 01 Water Heating System ID or Name, 02 Heating Efficiency Type, 03 Heating Efficiency Value, 04 Standby Loss (%), 05 Exterior Insulation R-Value, 06 Water Heater Storage Volume (gal), 07 Tank Location

E. Installed Water Heater Manufacturer Information

Table with 3 columns: 01 Water Heating System ID or Name, 02 Manufacturer, 03 Model Number



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F. Mandatory Measures for Single Dwelling Systems

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

Table with 2 columns: ID and Description. Rows include requirements for equipment efficiency (01), storage tank insulation (02), domestic hot water piping insulation (03), designated space for water heaters (04), and general domestic hot water piping insulation requirements (05).



**INDIVIDUAL DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION**

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05	<p><b>2. Insulation Thickness:</b> All piping for multifamily domestic hot water systems shall meet the insulation thickness requirements specified in of Table 160.4-A.</p> <ul style="list-style-type: none"> <li>a. For insulation conductivity in the range shown in Table 160.4-A for the applicable fluid temperature range, the insulation shall have the applicable minimum thickness or R-value shown in Table 160.4-A.</li> <li>b. if the insulation conductivity falls outside the range provided in Table 160.4-A applicable fluid temperature range, the insulation shall meet a minimum R-value as indicated in Table 160.4-A. Or, it can have a thickness determined using Equation 160.4-A.</li> <li>c. Insulation conductivity shall be determined in accordance with ASTM C335 at the mean temperature listed in Table 160.4-A, and shall be rounded to the nearest 1/100 Btu-inch per hour per square foot per °F.</li> </ul> <p><b>3. Insulation Protection:</b> Pipe Insulation shall be protected from damage due to sunlight, moisture, equipment maintenance and wind. Protection shall, at minimum, include the following:</p> <ul style="list-style-type: none"> <li>a. Pipe and appurtenance insulation exposed to weather shall be protected by a cover suitable for outdoor service. The cover shall be water retardant and provide shielding from solar radiation that can cause degradation of the material. Appurtenance insulation covers shall be removable and able to be reinstalled. Adhesive tape shall not be used to provide this protection.</li> <li>b. Pipe insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall include, or be protected by, a Class I or Class II vapor retarder. All penetrations and joints shall be sealed.</li> <li>c. Pipe insulation buried below grade must be installed in a waterproof and noncrushable casing or sleeve.</li> </ul>
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**G. Compact Hot Water Distribution (RA4.4.6)**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.

01	02	03	04	05	06	07	08	09
Dwelling Name	Number of Stories	Master Bath distance of furthest fixture to Water Heater in feet	Kitchen distance from furthest fixture to Water Heater in feet	Furthest Third furthest fixture to Water Heater in feet (Avg for multiple water heaters)	Weighted Distance	Qualification Distance	Design Compactness Factor	Calculated Compactness Factor

**H. Central Parallel Piping Requirements (RA4.4.4)**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize this distribution type shall comply with these requirements.

01	Each central manifold has 15 feet or less of pipe between manifold and water heater.
02	For manifolds that include valves, the manifold must be readily accessible in accordance with the plumbing code.
03	Hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. For instance, piping from a second story manifold cannot supply the first floor.
04	The hot water distribution piping must be separated by at least 2 inches from any other hot water supply piping, and at least 6 inches from any cold water supply piping. Alternatively, the hot water supply piping must be insulated to the thicknesses shown in TABLE 120.3-A-1.



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**I. Point of Use Requirements (POU) (RA4.4.5)**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize this distribution type shall comply with these requirements

01	<p>All hot water supply pipe run lengths are equal to or less than the maximum values shown below, based on the pipe diameter. If a combination of piping is used in a single run, then one half the allowed length of each size is the maximum installed length. The maximum allowed length of piping for the longest run terminating in:</p> <p>3/8 inch - For only one pipe size - max length allowed is 15 feet  For combination pipe sizes the max allowed length of 3/8-inch piping is 7.5 feet, of 1/2 inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.</p> <p>1/2 inch - For only one pipe size – max length allowed is 10 feet  For combination pipe sizes the allowed length of 1/2-inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.</p> <p>3/4 inch - For only one pipe size = 5 feet</p>
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**J. Mandatory Requirements for all Recirculation Systems (RA4.4.7)**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize a recirculation system shall comply with these requirements.

01	A check valve located between the recirculation pump and the water heater to prevent unintentional recirculation.
02	Piping must take the most direct path between water heater and fixtures.
03	Insulation is not required on the cold water line when it is used as the return.
04	If more than one loop is installed, each loop shall have its own pump and controls.

**K. Recirculation Non-Demand Controls Requirements (RA4.4.8)**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize this distribution type shall comply with these requirements.

01	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.
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**L. Demand Recirculation Manual Control (RA4.4.9)/Sensor Control (RA4.4.10) Requirements**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize either of these distribution types shall comply with these requirements.

01	The system operates “on-demand”, meaning that the pump begins to operate shortly before or immediately after hot water draw begins, and stops when the return water temperature reaches a certain threshold value. For Demand Recirculation Manual Control, the pump shall be turned on using a manual switch system. For Demand Recirculation Sensor Control, the pump shall be turned on using a sensor system.
02	The controls shall be located in the kitchen, bathroom, and any hot water fixture location that is at least 20 feet from the water heater.
03	Manual controls may be activated by wired or wireless mechanisms. Each control shall have standby power of 1 Watt or less.
04	Sensor controls may be activated by wired or wireless mechanisms, including buttons, motion sensors, door switches and flow switches. Each control shall have standby power of 1 Watt or less.
05	Pump and control placement shall meet one of the following criteria: <ul style="list-style-type: none"> <li>• When a dedicated return line has been installed the pump, controls and thermo-sensor are installed at the end of the supply portion of the recirculation loop; or</li> <li>• The pump and controls are installed on the dedicated 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; or</li> <li>• When the cold water line is used as the return, the pump, demand controls and thermo-sensor shall be installed in an accessible location at the end of supply portion of the hot water distribution line (typically under a sink).</li> </ul>
06	After the pump has been activated, the controls shall allow the pump to operate until the water temperature at the thermo-sensor rises to one of the following values: <ul style="list-style-type: none"> <li>• Not more than 10°F (5.6°C) above the initial temperature of the water in the pipe; or</li> <li>• Not more than 102°F (38.9°C).</li> </ul>
07	Controls shall limit operation to no more than 5 minutes following activation.



SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Table with 2 columns: Documentation Author Name, Documentation Author Signature, Documentation Author Company Name, Date Signed, Address, CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code...
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations...
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building...
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy...

Table with 2 columns: Responsible Builder/Installer Name, Responsible Builder/Installer Signature, Company Name, Position With Company (Title), Address, CSLB License, City/State/Zip, Phone, Date Signed, Third Party Quality Control Program (TPQCP) Status, Name of TPQCP (if applicable).

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300



## LMCI-PLB-02-E User Instructions

### A. Design Dwelling Unit Water Heating Systems Information

This table reports the water heating system features that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

#### A2. Design Dwelling Unit HPWH System Information

This table reports the water heating system features that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

### B. Installed Dwelling Unit Water Heating Systems Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Dwelling Unit Name - Reference information from Table A.
2. Water Heating System ID or Name – Reference information from Table A.
3. Water Heating System Type – Reference information from Table A. The different kinds of water heating system type are DHW, or Combined Hydronic.
4. Water Heater Type – Reference information from Table A. The different kinds of water heaters are Large/Commercial Storage, Small/Consumer Storage, Residential-Duty Commercial Storage, Heat Pump, Boiler, Large/Commercial Instantaneous, Small/Consumer Instantaneous, Residential-Duty Commercial Instantaneous or Indirect.
5. # of Like (or Identical) Water Heaters in system – Reference information from Table A.
6. Fuel Type – Reference information from Table A. The different kinds of fuel types are heat pump, electric resistance, natural gas, and propane.
7. Rated Input Type – Reference information from Table A. For natural gas and propane, the input type is Btu/hr. For heat pump and electric resistance the input type is kW.
8. Rated Input Value – User input. Numerical value of the rated input. Must be equal to or less than value indicated on the LMCC.
9. Dwelling Unit DHW System Distribution Type - Reference information from Table A.
10. Compact Distribution - Reference information from Table A.

#### B2. Installed Dwelling Unit HPWH System Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater. Not applicable for central systems.

1. Dwelling Unit Name – Reference information from Table A2.
2. Modeled Equipment Make and Model – User input must be equal to the value indicated on Table A2 as default and allow user to override with an equivalent system based on the simulated equipment in Table A2. A2 as default and allow user to override with an equivalent system based on the simulated equipment in Table A2.04
3. Water Heating System ID or Name – Reference information from Table A2.
4. # of Like (or Identical) Water Heaters in System – Reference information from Table A2.

5. Tank Location – User input. Must be equal to value indicated in Table A2.
6. Exterior Tank Insulation R-value – User input. Must be equal to or higher than value indicated in Table A2.
- 6a. Tank Volume – User input must equal reference information on Table A2.
7. Dwelling Unit DHW System Distribution Type – Reference information from Table A2.
8. Compact Distribution – Reference information from Table A2.
9. Uniform Energy Factor (UEF) - Reference information from Table A2.

### C. Design Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system features that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

### D. Installed Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system efficiency features installed in this project.

1. Water Heating System ID or Name – Reference information from Table C.
2. Heating Efficiency Type – Reference information from Table C. Different efficiency types are: AFUE, UEF and Thermal Efficiency.
3. Heating Efficiency Value – User input must be equal to or higher efficiency than value indicated on Table C.
4. Standby Loss – User input. Must be equal to or less than value indicated in Table C. Value may be N/A if LMCC value is N/A.
5. Exterior Insulation R-Value – User input. Must be equal to or higher than value indicated in Table C. Value may be N/A if LMCC value is N/A.
6. Water Heater Storage Volume (gal) – User input. Must be equal to the value indicated in Table C. Value may be N/A if water heater type is instantaneous with zero storage.
7. Tank location – User input. Must be equal to value indicated in Table C.

### E. Installed Water Heater Manufacturer Information

This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater. Not applicable for central systems.

1. Water Heating System ID or Name – Reference information from Table B or B2.
2. Manufacturer – User input. Enter the name of the water heater manufacturer.
3. Model Number – User input. Enter the model number of the water heater.

### F. Mandatory Measures for all Single Dwelling Systems

This table lists the requirements for all DHW systems. Installer must ensure all the requirements on this table are met.

### G. Compact Hot Water Distribution

If performance compliance is used, this table lists the values used in the performance calculation and require no user input.

If prescriptive compliance is used, fill out this table.

1. Dwelling Name. Reference information from Table A2.
2. Enter the master bath distance of furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.

3. Enter the kitchen distance from furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.
4. Enter furthest third fixtures from fixture to water heater in feet. For multiple water heaters, enter the average of the furthest distance of each water heater.
5. Weighted Distance - Calculated value – no user input required.
6. Qualification Distance - Calculated value – no user input required.

#### **H. Central Parallel Piping Requirements**

This table only applies to systems indicated as Central **Parallel Piping**. In addition to the mandatory requirements in Table J, the installer must ensure the requirements in this table are met.

#### **I. Point of Use Requirements**

This table only applies to systems indicated as **Point of Use**. In addition to the mandatory requirements in Table J, the installer must ensure the requirements in this table are met.

#### **J. Mandatory Requirements for all Recirculation System**

The requirements of this table apply to all recirculation systems listed below.

#### **K. Recirculation Non-Demand Controls Requirements**

This table only applies to systems indicated as **Recirculation Non-demand Controls**. In addition to the mandatory requirements in Table J and M, the installer must ensure the requirements in this table are met.

#### **L. Demand Recirculation Manual Control/Sensor Control Requirements**

This table only applies to systems indicated as **Demand Recirculation Manual Control** or **Demand Recirculation Sensor Control**. In addition to the mandatory requirements in Table H and K, the installer must ensure the requirements in this table are met.

#### **Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

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

**A. Pool and Spa System Type**

01	Pool and Spa System Type	
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**B. Pool and Spa Systems and Equipment Requirements (Section 110.4(a) and 110.5)**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A pool or spa heating system or equipment subject to State or federal appliance efficiency standards shall comply with the applicable provisions of Section 110.1A.
02	A readily accessible on-off switch is mounted on the outside of the heater, which allows the heater to be shut off without the user adjusting the thermostat setting.
03	A weatherproof plate or card providing the energy efficiency rating and instructions for the energy-efficient operation of the pool and/or spa heater is permanently mounted and easily readable.
04	Heating system has no pilot light.

**C. Pool and Spa System Installation Requirements (Section 110.4(b))**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	Equipment installed to heat water for pools and/or spas shall be selected from equipment meeting the standards shown in Table 110.4-A.
02	At least 18inches of horizontal or vertical pipe shall be installed between the filter and the heater or dedicated suction and return lines, or built-in or built-up connections shall be installed to allow for future solar heating equipment are provided.
03	Outdoor pools and/or spas with electric or gas heating equipment shall be installed with a pool cover.
04	Pool system has directional inlets to adequately mix the pool water.
05	Pool system has a permanent time switch that allows all pumps to be set or programmed to run during off-peak periods only, and for the minimum time necessary to maintain the water in the condition required by applicable public health standards



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**D. Pool and Spa System Heating Source Sizing Requirements (Section 110.4(c))**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Total Pool or Spa surface area (ft <sup>2</sup> )	
02	Method of Compliance	
03	Qualifying Exceptions to Section 110.4(c)	
04	This project requires a solar pool heating system with a solar collector surface area that is equivalent to 60 percent or greater of the pool and/or spa surface area. The minimum solar collector surface area required.	
04	Additional Requirement	
04a	Minimum solar collector surface area	

**E. Controls for Heat Pump Pool Heaters with Supplementary Heating Requirements (Section 110.4(c))**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Supplementary heater shall not operate when the heating load can be met by the heat pump pool heater alone; and
02	The cut-on temperature for heat pump heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for heat pump heating is higher than the cut-off temperature for supplementary heating

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. Pool Pump Sizing and Flow Rate Specification for System Serving Single Tenant Only (Section 150.0(p))**

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	Dedicated-purpose pool pumps and replacement dedicated-purpose pump motors subject to State or federal appliance efficiency standards shall be listed in the CEC's directory of certified equipment. Dedicated-purpose pool pumps shall meet the applicable standards set forth in 20 CCR § 1605.1(g)(7) of the Appliance Efficiency Regulations. Replacement dedicated-purpose pool pump motors shall meet the applicable standards set forth in 20 CCR § 1605.3 of the Appliance Efficiency Regulations		
02	The pool pump flow rate shall not exceed the maximum pump flow rate calculated based on pool sizing in the table below. The return pipe diameter, suction pipe diameter, and filter area shall be at least as large as the required minimums shown in the table. Alternatively, a flow calculation or flow test result shall be provided to demonstrate that the pump flow rate is less than 6 hour filtration turnover, and the return pipe flow rate does not exceed 8 fps and that the suction pipe flow rate does not exceed 6 fps.		
03	An alternative compliance calculation or a flow test result is provided for this pool or spa use (must attach flow calculation or flow test result to this form)		
04	Dedicated-purpose pool pumps with more than one speed shall have controls which default to the filtration flow rate when no auxiliary pool loads are operating.		
05	For dedicated-purpose pool multispeed pumps with more than one speed, the controls shall default to the filtration flow rate setting within 24 hours and shall have an override capability for servicing.		
06	Volume of Pool (gallons)		
07	Filter Type (Cartridge, Sand, DE)		
	08a	08b	08c
	Required Min Return Pipe Diameter (inches)	Required Min Suction Pipe Diameter (inches)	Required Min Filter Area (ft <sup>2</sup> )
			08d
			Required Max Pump Flow (gpm)
09	Return Pipe Diameter (inches)		
10	Suction Pipe Diameter (inches)		
11	Filter Surface Area (ft <sup>2</sup> )		
12	Max Pump Flow Rate (gpm)		
13	Measured Flow Rate Return Line (fps)		
14	Measured Flow Rate Suction Line (fps)		
15	Compliance Statement:		



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**G. Pool System Piping (Section 150.0(p)2)**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	The suction side pipe is straight for at least 4 pipe diameters before entering the pump (See table below for the required straight run lengths for various pipe sizes).
02	All elbows are sweep elbows, or an elbow type that has a pressure drop that is less than the pressure drop of a straight pipe with a length of 30 pipe diameters.

**H. Pool Filters and Valves (Section 150.0(p)3 and 4)**

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	If a filter is used in a pool intended for public use: The size of the filter is at least the size specified in NSF/ANSI 50.
02	If a backwash valve is used: The diameter of the backwash valve is at least 2 inches, or the diameter of the return pipe, whichever is greater.

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered 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, and I will take the necessary steps to ensure this requirement is accomplished.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to ensure this requirement is accomplished.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**



**LMCI-PLB-03-E User Instructions****A. Pool and Spa System Type**

Pick from Pool only, Spa only, or Pool and Spa

**B. Pool and Spa Systems and Equipment Requirements (Section 110.4(a) and 110.5)**

Before any pool or spa heating system or equipment may be installed, the manufacturer must certify to the Energy Commission that the system or equipment complies with §110.4 and §110.5. The requirements include minimum heating efficiency according to Appliance Efficiency Regulations, an on-off switch outside the heater, permanent and weatherproof operating instructions, no continuous pilot light.

**C. Pool and Spa System Installation Requirements (Section 110.4(b))**

A permanent time switch or similar control mechanism must be installed as part of the pool water circulation control system that will allow all pumps to be set or programmed to run only during the off-peak electric demand period and for the minimum time necessary to maintain the water in the condition required by applicable public health standards.

**D. Pool and Spa System Heating Source Sizing Requirements (Section 110.4(c))**

This table lists the requirements for Pool and Spa System Heating Source Sizing. Pick from Method of Compliance list and Qualifying Exceptions to Section 110.4(c) list.

**E. Controls for Heat Pump Pool Heaters with Supplementary Heating Requirements (Section 110.4(d))**

This table lists the requirements for Controls for Heat Pump Pool Heaters with Supplementary Heating. Installer must ensure all the requirements on this table are met.

**F. Pool Pump Sizing and Flow Rate Specification (Section 150.0(p))**

The pool filtration flow rate may not be greater than the rate needed to turn over the pool water volume in 6 hours or 36 gpm, whichever is greater. Calculate Max Flow Rate using the following equation:

$$\text{Max Flow Rate (gpm)} = \frac{\text{Pool Volume (gallons)}}{360\text{min.}}$$

Pool piping must be sized according to the maximum flow rate needed for all auxiliary loads. Show work to calculate return and suction line flow rate, minimum filter area, and the maximum pump flow rate correspond to the pool volume in accordance to section 150.0(p), or refer to Table C below for the prescriptive values. The maximum velocity allowed is 8 fps in the return line and 6 fps in the suction line, and the maximum pump flow rate is less than 6 hour filtration turnover.

3. Select whether the alternative calculation is used.

6. Enter the Pool Volume (gal).
7. Enter Filter Type (Cartridge, Sand, DE).
- 8a Enter the Required Minimum Return Pipe Diameter (inches).
- 8b Enter the Required Minimum Suction Pipe Diameter (inches).
- 8c Enter the Required Minimum Filter Area (ft<sup>2</sup>).
- 8d Enter the Required Maximum Pump Flow (gpm).
9. Enter Return Pipe Diameter (inches).
10. Enter Suction Pipe Diameter (inches).
11. Enter Filter Surface Area (ft<sup>2</sup>).
12. Enter the Maximum Pump Flow Rate (gpm).
13. Enter the Measured Flow Rate of the Return Line in fps. This is only used if the alternative calculation is used.
14. Enter the Measured Flow Rate of the Return Line in fps. This is only used if the alternative calculation is used.
15. Automatically completed Compliance Statement.

#### **G. Pool System Piping** (Section 150.0(p)2)

There must be a length of straight pipe that is greater than or equal to at least 4 inches pipe diameters installed before the pump. Refer to Table D below for the required pipe length. Traditional hard 90° elbows are not allowed. All elbows must be sweep elbows or a type of elbow that has a pressure drop less than the pressure drop of straight pipe with a length of 30 pipe diameters.

#### **H. Pool Filters and Valves** (Section 150.0(p)3 and 4)

Backwash valves must be sized to the diameter of the return pipe or 2 inches, whichever is greater. Multiport backwash valves have a high pressure drop and are discouraged.

**Table C**

**Pool sizing (Values are based on a maximum allowable turnover rate of 6- hours)**

Note: For pumps greater than 1 hp. The maximum Pump Flow is the lowest speed default filtration

Max Pool Volume (gallons)	Min Pipe D or Greater (inches)		Min Filter Area or more (square feet)			Max Pump Flow (gpm)
	Return	Suction	Cartridge	Sand	DE	
13,000	1.5	1.5	100	2.4	20	36
17,000	1.5	2	130	3.1	25	47
21,000	2	2	160	3.9	30	58
28,000	2	2.5	210	5.2	40	78
42,000	2.5	3	320	7.8	60	117
48,000	3	3	360	8.9	70	133

**Table D**

**Pipe Diameter/Pipe Length**

Pipe Diameter (inch)	Required Pipe Length leading into pump (inch)
1.5	6
2	8
2.5	10
3	12

**Documentation Declaration Statements**

1. The person who prepared the CF2R will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.



# VERIFIED MULTIFAMILY CENTRAL HOT WATER SYSTEM DISTRIBUTION

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-PLB-21-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

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

### A. General Information

01	Building Name	
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### B. Design Verified Central Water Heating Systems Information (other than CHPWH)

This table reports features of the water heating system other than **CHPWH** system that were specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11	12
Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Water Heaters in System	Water Heater Storage Volume (gal)	Fuel Type	Rated Input Type	Rated Input Value	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insul. R-Value

### B2. Design Verified CHPWH System Information

This table reports the water heating systems specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11	12
Water Heating System ID or Name	Modeled Equipment Make and Model	# of Water Heaters/ Compressors	Primary Tank Location	Primary Tank Volume	Primary Tank Total Insulation	Loop Tank Location	Loop Tank Volume	Loop Tank Total Insulation	Loop Pipe Insulation Thickness	Loop Tank Type	Simulated Equipment Make and Model

### C. Installed Verified Central Water Heating Systems Information

This table reports features the water heating system other than **CHPWH** systems that were specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11	12
Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Water Heaters in System	Water Heater Storage Volume (gal)	Fuel Type	Rated Input Type	Rated Input Value	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insul. R-Value
13	Compliance Statement										

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-Rise Multifamily Compliance

January 1, 2026



# VERIFIED MULTIFAMILY CENTRAL HOT WATER SYSTEM DISTRIBUTION

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-PLB-21-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### C2. Installed Verified CHPWH System Information

This table reports the water heating systems specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11
Water Heating System ID or Name	Modeled Equipment Make and Model	# of Water Heaters/ Compressors	Primary Tank Location	Primary Tank Volume	Primary Tank Insulation	Loop Tank Location	Loop Tank Volume	Loop Tank Insulation	Loop Pipe Insulation Thickness	Loop Tank Type

### D. Design Verified Central Water Heating Distribution Systems Information

This table reports the water heating distribution types specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06
Water Heating System ID or Name	Central DHW System Distribution Type	Dwelling Unit DHW System Distribution Type	California Plumbing Code Appendix M	Master Mixing Valve	Insulation Verification

### E. Installed Verified Central Water Heating Distribution Systems Information

This table reports the water heating distribution types specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06
Water Heating System ID or Name	Central DHW System Distribution Type	Dwelling Unit DHW System Distribution Type	California Plumbing Code Appendix M	Master Mixing Valve	Insulation Verification

### F. Installed Verified Water Heater Manufacturer Information

01	02	03
Water Heating System ID or Name	Manufacturer	Model Number

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Low-Rise Multifamily Compliance

January 1, 2026



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**G. Mandatory Requirements for All Central Domestic Hot Water Systems**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook have separate remote heaters, heat exchangers, or boosters to supply the outlet with the higher temperature. (Section 110.3 (c)1)
02	Systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system. (Section 110.3(c)2).
03	Unfired storage tanks are insulated with: <ul style="list-style-type: none"> <li>• External insulation of R-3.5, or</li> <li>• Internal insulation of R-16, or</li> <li>• The heat loss of the tank surface based on an 80°F water-air temperature difference shall be less than 6.5 Btu/ft<sup>2</sup>. (Section 110.3(c)4).</li> </ul>
04	Recirculation loops shall meet the following requirements: <ul style="list-style-type: none"> <li>• The recirculation pump is mounted on a vertical section of the return line, OR an automatic air release valve is installed on a riser at least 12 inches in length, on the inlet side of the recirculation pump, no more than 4 feet from the pump. (Section 110.3(c) 4A).</li> <li>• A check valve or similar device shall be located between the recirculation pump and the water heating equipment to prevent water from flowing backwards though the recirculation loop. (Section 110.3(c) 4B).</li> <li>• A hose bib is installed between the pump and the water heating equipment with an isolation valve between the hose bib and the water heating equipment. (Section 110.3(c) 4C).</li> <li>• Isolation valves shall be installed on both sides of the pump, of which the valve required in 110.3(c)4C can be one. (Section 110.3(c)4D).</li> <li>• The cold water piping and the recirculation loop piping shall not be connected to the hot water storage tank drain port. (Section 110.3(c)4E).</li> <li>• A check valve shall be installed on the cold water supply line between the hot water system and the next closest tee on the cold water supply line. (Section 110.3(c) 4F).</li> </ul>
05	Instantaneous water heaters with an input greater than 6.8 kBtu/hr. (2kW) shall have isolation valves on both the cold water supply and the hot water line. (110.3 (c) 6).
06	Domestic hot water piping insulation requirements (Section 150(J)): <ul style="list-style-type: none"> <li>• All domestic hot water piping shall be insulated as specified in Section 609.12 of the California Plumbing Code. Insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.</li> <li>• Pipe insulation shall fit tightly and all elbows and tees shall be fully insulated.</li> <li>• Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.</li> <li>• Piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall butt securely against all framing members.</li> <li>• Piping surrounded with a minimum of 1 inch of wall insulation, 2 inches of crawlspace insulation, or 4 inches of attic insulation shall not be required to have pipe insulation.</li> <li>• Insulation is not required on the cold water line when it is used as the return.</li> </ul>
07	<b>Domestic hot water piping insulation requirements:</b> See the exceptions to Section 160.4(e) All piping for multifamily domestic hot water systems shall be insulated and meet the applicable requirements below: <b>1. General Requirements:</b> <ol style="list-style-type: none"> <li>a. The first 8 feet of inlet cold water piping from the storage tanks, including piping between a storage tank and a heat trap shall be insulated.</li> <li>b. Insulation on the piping and domestic hot water system appurtenances shall be continuous.</li> <li>c. Pipe supports, hangers, and pipe clamps shall be attached on the outside of rigid pipe insulation to prevent thermal bridges.</li> <li>d. All pipe insulation seams shall be sealed.</li> <li>e. Insulation for pipe elbows shall be mitered, preformed, or site fabricated with PVC covers.</li> <li>f. Insulation for tees shall be notched, preformed, or site fabricated with PVC covers.</li> <li>g. Extended stem isolation valves shall be installed.</li> <li>h. All plumbing appurtenances on hot water piping from a heating source to heating plant, at the heating plant, and distribution supply and return piping shall be insulated to meet the following requirements: <ol style="list-style-type: none"> <li>i. Where the outer diameter of the appurtenance is less than the outer diameter of the insulated pipe that it is attached to, the appurtenance shall be insulated flush with the insulation surrounding the pipe.</li> <li>ii. Where the outer diameter of the appurtenance is greater than the outer diameter of the insulated pipe that it is attached to, the appurtenance shall be insulated with a minimum thickness of 1 inch.</li> <li>iii. The insulation shall be removable and re-installable to ensure maintenance or replacement services can be completed.</li> <li>iv. Valves shall be fully functional without impediment from the insulation.</li> </ol> </li> </ol>



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

07	<p><b>2. Insulation Thickness:</b> All piping for multifamily domestic hot water systems shall meet the insulation thickness requirements specified in of Table 160.4-A.</p> <p>a. For insulation conductivity in the range shown in Table 160.4-A for the applicable fluid temperature range, the insulation shall have the applicable minimum thickness or R-value shown in Table 160.4-A.</p> <p>b. if the insulation conductivity falls outside the range provided in Table 160.4-A applicable fluid temperature range, the insulation shall meet a minimum R-value as indicated in Table 160.4-A. Or, it can have a thickness determined using Equation 160.4-A.</p> <p>c. Insulation conductivity shall be determined in accordance with ASTM C335 at the mean temperature listed in Table 160.4-A, and shall be rounded to the nearest 1/100 Btu-inch per hour per square foot per °F.</p> <p><b>3. Insulation Protection:</b> Pipe Insulation shall be protected from damage due to sunlight, moisture, equipment maintenance and wind. Protection shall, at minimum, include the following:</p> <p>a. Pipe and appurtenance insulation exposed to weather shall be protected by a cover suitable for outdoor service. The cover shall be water retardant and provide shielding from solar radiation that can cause degradation of the material. Appurtenance insulation covers shall be removable and able to be reinstalled. Adhesive tape shall not be used to provide this protection.</p> <p>b. Pipe insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall include, or be protected by, a Class I or Class II vapor retarder. All penetrations and joints shall be sealed.</p> <p>c. Pipe insulation buried below grade must be installed in a waterproof and noncrushable casing or sleeve.</p>
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**H. California Plumbing Code Appendix M**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	All distribution piping shall be sized according to the methodology specified in the California Plumbing Code Appendix M.
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**I. Multiple Dwelling Units Master Mixing Valves Installation Requirements**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

For central systems with hot water piping serving multiple dwelling units master mixing valves (MMV) shall meet the following minimum specification, installation, and startup requirements specified in RA4.4.19.

01	<p><b>Plumbing Plans:</b>  The plumbing plans shall include the following MMV specification at a minimum:</p> <p>a. Manufacturer’s installation and commissioning instructions and plumbing drawings.</p> <p>b. MMV conforms to the American Society of Sanitation Engineers (ASSE) 1017-2009 standard, Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems.</p> <p>c. Water mixing parameters and associated values:</p> <ol style="list-style-type: none"> <li>1. Input parameters A. Recirculation pump flow rate <ol style="list-style-type: none"> <li>A. Recirculation pump flow rate</li> <li>B. Mixing valve outlet water temperature</li> <li>C. Recirculation return water temperature</li> <li>D. Mixing valve hot inlet water temperature</li> </ol> </li> <li>2. Calculated parameters A. Percentage of water flow returning to cold side of MMV <ol style="list-style-type: none"> <li>A. Percentage of water flow returning to hot side of MMV</li> <li>B. Percentage of water flow returning to hot side of MMV</li> </ol> </li> <li>3. Manufacturer’s operating parameter <ol style="list-style-type: none"> <li>A. Maximum water mixing ratio</li> </ol> </li> </ol>
02	<p><b>Installation:</b>  Installation of MMV shall meet manufacturer’s instruction and the following requirements at a minimum:</p> <p>a. The MMV shall be installed on the central heating plant hot water supply outlet header leading to the recirculation loop.</p> <p>b. Check valves installed on the recirculation return line and cold-water line to inlet cold connection of MMV and on recirculation return piping leading back to storage tank or water heater.</p> <p>c. Isolation valves installed on the inlet cold water, inlet recirculation return, inlet hot and outlet connections to MMV and on recirculation return piping connection to storage tank or water heater.</p> <p>d. Balancing valve installed on the recirculation return piping to the water heater for MMVs that cannot 100% close the hot inlet port during operation.</p> <p>e. Thermometers installed on the outlet of the MMV and on the recirculation return line next the water pump.</p>



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

03	<p><b>Startup:</b></p> <ul style="list-style-type: none"> <li>a. Startup testing of MMV during recirculation only operation.             <ul style="list-style-type: none"> <li>1. Close all hot fixtures in the domestic water system.</li> <li>2. Ensure that the water heater is operational and idling with storage tank plumbed to the mixing valve and meeting the hot inlet temperature specified in the plumbing plans.</li> <li>3. Start the recirculation pump and set mixed outlet temperature or setpoint temperature on the MMV. Start the circulation pump at the specified water flow rate and adjust as needed to meet recirculation return temperature specified in the plumbing plans.</li> <li>4. Let distribution system warm up and stabilize for 30 minutes and adjust mixing parameters as needed to realign with values in plumbing plans.</li> <li>5. Let the recirculation pump operate for three hours without any water draws to ensure there is no temperature creep.</li> <li>6. If during or after the three-hour period the MMV outlet and return temperature stays elevated by greater than 2°F and doesn't return back to the specified temperature, then make necessary adjustments to the MMV. If temperature creep persists with mechanical MMV, adjust the balancing valve as necessary on the recirculation return line leading back to the water heater to ensure average MMV outlet temperature meets the specified temperature.</li> <li>7. If adjustments are made to MMV or balancing valve in Step 6, then repeat Step 5.</li> </ul> </li> <li>b. Startup testing of MMV for a combination of recirculation and hot water draws.             <ul style="list-style-type: none"> <li>1. Once the MMV is operational in a closed loop, make a water draw for 10 minutes using one of the following options:                 <ul style="list-style-type: none"> <li>A. With a shower operating at full flow at every: three dwelling units in a building with 15 or fewer dwelling units, five dwelling units in a building with 16 to 30 dwelling units, eight dwelling units in a building with 31 to 60 dwelling units, ten dwelling units in a building with more than 60 to 200 dwelling units.</li> <li>B. The hot water valve on a hose bib, mop sink, or other fixture on the branch line or location on the hot water distribution line is opened to a draw volume of 1 gpm for every: three dwelling units in a building with 15 or fewer dwelling units, five dwelling units in a building with 16 to 30 dwelling units, eight dwelling units in a building with 31 to 60 dwelling units, ten dwelling units in a building than 60 to 200 dwelling units, twenty dwelling units in a building with more than 200 dwelling units.</li> </ul> </li> <li>2. Monitor recirculation return temperature on the thermometer during the 10-minute draw period and ensure design return water temperature is maintained at the specified temperature documented in the plumbing plans.</li> <li>3. If the recirculation return temperature falls more than 5°F below the specified temperature during the draw period, then adjust MMV setup to ensure compliance.</li> </ul> </li> </ul>
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**J. Verified Pipe Insulation for Central System**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	<p>The heating plant and recirculation system piping insulation installation quality shall be field verified by a ECC-rater. The ECC-rater shall inspect the heating plant and horizontal supply header and return piping in accordance with mandatory requirements in Title 24 Part 6 section 160.4. The rater shall use a sampling approach that one in seven DHW recirculation pipe risers and associated branches be inspected to verify the pipe insulation meet with the following requirements:</p> <ul style="list-style-type: none"> <li>(a) All piping for multifamily domestic hot water systems shall be insulated to the thickness specified in Table 160.4-A, including the first 8 feet of inlet cold water piping to the heating plant. Insulation on the piping and appurtenances shall be continuous.</li> <li>(b) All appurtenances at the heating plant, from a heating source to storage tank(s), or in between storage tanks and storage water heaters, and recirculation supply and return loop shall meet the following:             <ul style="list-style-type: none"> <li>1. Insulation to be flush with pipe insulation or have minimum of one inch if appurtenance is bulkier.</li> <li>2. Removable and re-installable for maintenance or replacement.</li> <li>3. Pipe supports, hangers, and clamps shall be attached on the outside of rigid pipe insulation.</li> </ul> </li> <li>(c) All pipe insulation seams shall be sealed along the length of the pipe and between adjacent sections of insulation material.</li> <li>(d) Insulation for pipe elbows shall be mitered, and insulation for tees shall be notched. Alternatively, tees and elbows may be pre-formed, or site fabricated with PVC covers.</li> <li>(e) Isolation valves shall be fully functional. Extended stem isolation valves shall be installed on hot water piping or where pipe insulation is required.</li> </ul>
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

## A. General Information

This table reports the building name as specified on the Registered LMCC.

## B. Design Verified Central Water Heating Systems Information

This table reports features of the water heating system other than **CHPWH** system that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

### B2. Design Verified Dwelling Unit CHPWH System Information

This table reports the water heating system features that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

## C. Installed Verified Central Water Heating Systems Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Water Heating System ID or Name – Reference information from LMCC.
2. Water Heating System Type – Reference information from LMCC. The different kinds of water heating system type are DHW or Combined Hydronic.
3. Water Heater Type – Information from LMCC. The different kinds of water heaters are Large/Commercial Storage, Small/Consumer Storage, Residential-Duty Commercial Storage, Heat Pump, Boiler, Large/Commercial Instantaneous, Small/Consumer Instantaneous, Residential-Duty Commercial Instantaneous or Indirect.
4. # of Water Heaters in system – Reference information from LMCC.
5. Water Heater Storage Volume (gal) – User input. Value may be N/A if water heater type is instantaneous with zero storage.
6. Fuel Type – Reference information from LMCC. The different kinds of fuel types are natural gas, propane, oil, or electricity.
7. Rated Input Type – Reference information from LMCC. For natural gas, propane and oil fuel type the input type is Btu/Hr. For electric the input type is kW.
8. Rated Input Value – User input. Numerical value of the rated input. Must be equal to or less than value indicated on the LMCC.
9. Heating Efficiency Type – Reference information from LMCC. Different efficiency types are AFUE, UEF and Thermal Efficiency.
10. Heating Efficiency Value – User input. Numerical value of the Heating Efficiency. Must be equal to or higher efficiency than value indicated on the LMCC.
11. Standby Loss – User input. Must be equal to or less than value indicated on the LMCC. Value may be N/A if LMCC value is N/A.
12. Exterior Insul. R-Value – User input. Must be equal to or higher than value indicated on the LMCC. Value may be N/A if LMCC value is N/A.

**C2. Installed Verified Dwelling Unit CHPWH System Information**

1. This table reports the water heating system information that is being installed. Require one line for each installed water heater. Require one line for each installed water heater.
2. Water Heating System ID or Name – Reference information from Table B2.
3. Modeled Equipment Make and Model – User input must be equal to the value indicated on Table B2 as default and allow user to override with an equivalent system based on the simulated equipment in Table B2.
4. Number of Water Heaters/ Compressors – User input, must be equal to the value indicated on table B2.
5. Primary Tank Location – Reference information from Table B2.
6. Primary Tank Volume – User input, must be equal to or higher than the value indicated on table B2.
7. Primary Tank Insulation – User input, must be equal to or higher than value indicated on table B2.
8. Loop Tank Location – Reference information from Table B2.
9. Loop Tank Volume – User input, must be equal to or higher than the value indicated on table B2.
10. Loop Tank Insulation – User input, must be equal to or higher than value indicated on table B2.
11. Loop Pipe Insulation Thickness – User input, must be equal to or higher than the value indicated on table B2.
12. Loop Tank – Reference information from Table B2.

**D. Design Verified Central Water Heating Distribution Systems Information**

1. This table reports the water heating distribution types specified on the registered LMCC compliance document for this project.

**E. Installed Verified Central Water Heating Distribution Systems Information**

1. Water Heating System ID or Name – Reference information from LMCC.
2. Central DHW System Distribution Type = Reference information from LMCC.
3. Dwelling Unit DHW System Distribution Type = Reference information from LMCC.

**F. Installed Verified Central Water Heater Manufacturer Information**

1. This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater.
2. Water Heating System ID or Name – Reference information from LMCC.
3. Manufacturer – User input. Enter the name of the water heater manufacturer.
4. Model Number – User input. Enter the model number of the water heater.

**G. Mandatory Requirements for All Central Domestic Hot Water Recirculation Systems**

1. This table lists the requirements for all central recirculation systems. ECC rater must ensure all the requirements in this table are met.

**H. California Plumbing Code Appendix M**

This table lists the requirements for California Plumbing Code Appendix M. ECC rater must ensure all the requirements in this table are met.

**I. Multiple Dwelling Units Master Mixing Valves Installation Requirements**

This table lists the requirements for multiple Dwelling Units Master Mixing Valves. ECC rater must ensure all the requirements in this table are met.

**J. Verified Pipe Insulation for Central System**

This table lists the requirements for Verified Pipe Insulation for Central System. ECC rater must ensure all the requirements in this table are met.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER



# VERIFIED INDIVIDUAL DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-PLB-22-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

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

### A. Design Verified Dwelling Unit Water Heating Systems Information (other than HPWH)

This table reports features of the water heating system(s) other than **HPWH** system specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11	12
Dwelling Unit Name	Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Like (or Identical) Water Heaters in System	Fuel Type	Rated Input Type	Rated Input Value	Central DHW System Distribution	Dwelling Unit DHW System Distribution Type	Compact Distrib.	Drain Water Heat Recovery

### A2. Design Verified Dwelling Unit HPWH System Information

This table reports the water heating system(s) that were specified on the registered LMCC compliance document for this project.

01	02	03	04	05	06	07	08	09	10
Dwelling Unit Name	Water Heating System ID or Name	Modeled Equipment Make and Model	# of Like (or Identical) Water Heaters in System	Tank Location	Exterior Tank Insulation R-value	Dwelling Unit DHW System Distribution Type	Compact Distribution	Drain Water Heat Recovery	Simulated Equipment Make and Model

### B. Installed Verified Dwelling Unit Water Heating Systems Information (other than HPWH)

This table reports features of the water heating system other than **HPWH** systems installed in this project.

01	02	03	04	05	06	07	08	09	10	11	12
Dwelling Unit Name	Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Like (or Identical) Water Heaters in System	Fuel Type	Rated Input Type	Rated Input Value	Central DHW System Distribution	Dwelling Unit DHW System Distribution Type	Compact Distrib.	Drain Water Heat Recovery

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# VERIFIED INDIVIDUAL DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CALIFORNIA ENERGY COMMISSION

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## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### B2. Installed Verified Dwelling Unit HPWH System Information

This table reports the water heating system(s) installed in this project.

01	02	03	04	05	06	07	08	09
Dwelling Unit Name	Water Heating System ID or Name	Modeled Equipment Make and Model	# of Like (or Identical) Water Heaters in System	Tank Location	Exterior Tank Insulation R-value	Dwelling Unit DHW System Distribution Type	Compact Distribution	Drain Water Heat Recovery

### C. Design Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heater(s) efficiency features specified on the registered LMCC compliance document for this project. (Not needed for central systems)

01	02	03	04	05	06	07
Water Heating System ID or Name	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Water Heater Storage Volume (gal)	Tank location

### D. Installed Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heater(s) efficiency features installed in this project. (Not needed for central systems)

01	02	03	04	05	06	07
Water Heating System ID or Name	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Water Heater Storage Volume (gal)	Tank Location

### E. Installed Water Heater Manufacturer Information

01	02	03
Water Heating System ID or Name	Manufacturer	Model Number

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### F. Mandatory Measures for all Domestic Hot Water Distribution Systems

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)1).
02	Unfired storage tanks are insulated with an external R-3.5 or combination of R-16 internal and external Insulation. (Section 110.3(c)3).
03	<p>Domestic hot water piping insulation requirements (Section 150(J)):</p> <ul style="list-style-type: none"> <li>All domestic hot water piping shall be insulated as specified in Section 609.12 of the California Plumbing Code. Insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.</li> <li>Pipe insulation shall fit tightly and all elbows and tees shall be fully insulated.</li> <li>Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.</li> <li>Piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall butt securely against all framing members.</li> <li>Piping surrounded with a minimum of 1 inch of wall insulation, 2 inches of crawlspace insulation, or 4 inches of attic insulation shall not be required to have pipe insulation.</li> <li>Insulation is not required on the cold water line when it is used as the return.</li> </ul>
04	<p>a. A designated space at least 2.5 feet by 2.5 feet and 7 feet tall <b>within 3 feet</b> from the water heater</p> <ul style="list-style-type: none"> <li>A dedicated 125V, 20A electrical receptacle connected to the electric panel with a 120/240V 3 conductor, branch circuit rated at 30 amps minimum, within 3 feet from the water heater and is accessible with no obstructions.</li> <li>The conductor shall be labeled with the word "Spare" on both ends; and</li> <li>A reserved single pole circuit breaker space next to the circuit breaker next to the branch circuit labeled "Future 240V use" shall be provided.</li> <li>A condensate drain no more than 2 inches higher than the base of the water heater, and allows for natural draining without pump assistance.</li> </ul> <p>b. A designated space at least 2.5 feet by 2.5 feet and 7 feet tall <b>more than 3 feet</b> from the water heater</p> <ul style="list-style-type: none"> <li>A dedicated 240 volt branch circuit shall be installed within 3 feet from the designated space. The branch circuit shall be rated at 30 amps minimum. The blank cover shall be identified as "240V ready"; and</li> <li>The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future HPWH installation. The reserved space shall be permanently marked as "For Future 240V use"; and</li> <li>Either a dedicated cold water supply, or the cold water supply shall pass through the designated HPWH location just before reaching the gas or propane water heater; and</li> <li>The hot water supply pipe coming out of the gas or propane water heater shall be routed first through the designated HPWH location before serving any fixtures; and</li> <li>The hot and cold water piping at the designated HPWH location shall be exposed and readily accessible for future installation of a HPWH; and</li> <li>A condensate drain no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance.</li> </ul>
05	<p><b>Domestic hot water piping insulation requirements:</b> See the exceptions to Section 160.4(e) All piping for multifamily domestic hot water systems shall be insulated and meet the applicable requirements below:</p> <p><b>1. General Requirements:</b></p> <ol style="list-style-type: none"> <li>The first 8 feet of inlet cold water piping from the storage tanks, including piping between a storage tank and a heat trap shall be insulated.</li> <li>Insulation on the piping and domestic hot water system appurtenances shall be continuous.</li> <li>Pipe supports, hangers, and pipe clamps shall be attached on the outside of rigid pipe insulation to prevent thermal bridges.</li> <li>All pipe insulation seams shall be sealed.</li> <li>Insulation for pipe elbows shall be mitered, preformed, or site fabricated with PVC covers.</li> <li>Insulation for tees shall be notched, preformed, or site fabricated with PVC covers.</li> <li>Extended stem isolation valves shall be installed.</li> <li>All plumbing appurtenances on hot water piping from a heating source to heating plant, at the heating plant, and distribution supply and return piping shall be insulated to meet the following requirements: <ol style="list-style-type: none"> <li>Where the outer diameter of the appurtenance is less than the outer diameter of the insulated pipe that it is attached to, the appurtenance shall be insulated flush with the insulation surrounding the pipe.</li> <li>Where the outer diameter of the appurtenance is greater than the outer diameter of the insulated pipe that it is attached to, the appurtenance shall be insulated with a minimum thickness of 1 inch.</li> <li>The insulation shall be removable and re-installable to ensure maintenance or replacement services can be completed.</li> <li>Valves shall be fully functional without impediment from the insulation.</li> </ol> </li> </ol>

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

05	<p><b>2. Insulation Thickness:</b> All piping for multifamily domestic hot water systems shall meet the insulation thickness requirements specified in of Table 160.4-A.</p> <ul style="list-style-type: none"> <li>a. For insulation conductivity in the range shown in Table 160.4-A for the applicable fluid temperature range, the insulation shall have the applicable minimum thickness or R-value shown in Table 160.4-A.</li> <li>b. if the insulation conductivity falls outside the range provided in Table 160.4-A applicable fluid temperature range, the insulation shall meet a minimum R-value as indicated in Table 160.4-A. Or, it can have a thickness determined using Equation 160.4-A.</li> <li>c. Insulation conductivity shall be determined in accordance with ASTM C335 at the mean temperature listed in Table 160.4-A, and shall be rounded to the nearest 1/100 Btu-inch per hour per square foot per °F.</li> </ul> <p><b>3. Insulation Protection:</b> Pipe Insulation shall be protected from damage due to sunlight, moisture, equipment maintenance and wind. Protection shall, at minimum, include the following:</p> <ul style="list-style-type: none"> <li>a. Pipe and appurtenance insulation exposed to weather shall be protected by a cover suitable for outdoor service. The cover shall be water retardant and provide shielding from solar radiation that can cause degradation of the material. Appurtenance insulation covers shall be removable and able to be reinstalled. Adhesive tape shall not be used to provide this protection.</li> <li>b. Pipe insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall include, or be protected by, a Class I or Class II vapor retarder. All penetrations and joints shall be sealed.</li> <li>c. Pipe insulation buried below grade must be installed in a waterproof and noncrushable casing or sleeve.</li> </ul>
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**G. Verified Compact Hot Water Distribution Expanded Credit (CHWDS-H-EX) (RA3.6.5)**

*The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.*

For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.

01	02	03	04	05	06	07	08	09
Dwelling Name	Number of Stories	Master Bath distance of furthest fixture to Water Heater in feet	Kitchen distance from furthest fixture to Water Heater in feet	Furthest Third furthest fixture to Water Heater in feet (Avg for multiple water heaters)	Weighted Distance	Qualification Distance	Design Compactness Factor	Calculated Compactness Factor
10	No hot water piping >1 inch diameter is allowed.							
11	Length of 1 inch diameter piping is limited to 8 feet or less.							
12	Two and three story buildings cannot have hot water distribution piping in the attic, unless the water heater is also located in the attic.							
13	Eligible recirculating systems must be Verified Demand Recirculation: Manual Control conforming to RA4.4.17.							

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**H. Compact Hot Water Distribution (RA4.4.6)**

For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	02	03	04	05	06	07	08	09
Dwelling Name	Number of Stories	Master Bath distance of furthest fixture to Water Heater in feet	Kitchen distance from furthest fixture to Water Heater in feet	Furthest Third furthest fixture to Water Heater in feet (Avg for multiple water heaters)	Weighted Distance	Qualification Distance	Design Compactness Factor	Calculated Compactness Factor

**I. Verified Drain Water Heat Recovery System (DWHR-H) (RA3.6.9)**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

DWHR devices shall comply with these requirements.

**Design DWHR System Information**

01	02	03	04
System ID/Name	Rated Effectiveness	Installation Configuration	Percent of shower served by the DWHR device

**Installed DWHR System Information**

05	06	07	08	09	10	11
System ID/Name	Manufacturer	Model Number	Rated Effectiveness	Installation Configuration	Percent of shower served by the DWHR device	DWHR System Certified by CEC (Yes/No)
12	For water heating system serving a single dwelling, the DWHR system shall, at the minimum, recover heat from the master bathroom shower and must transfer that heat either back to the respective shower(s) or the water heater.					
13	For central water heating system serving multiple dwellings, the DWHR system shall, at the minimum, recover heat from half the showers located above the first floor and must transfer that heat either back to all the respective showers or the water heater.					
14	The DWHR unit(s) shall be installed within 1 degree of the rated slope. Sloped DWHR shall have a minimum lengthwise slope of 1 degree. The lateral level tolerance shall be within plus or minus 1 degree.					

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### J. Verified Pipe Insulation for Central Systems (RA3.6.2)

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Systems that utilize this distribution type shall comply with these requirements.

01	ECC rater shall inspect the heating plant and horizontal supply header and return piping in accordance with the requirements in Title 24 Part 6 section 170.2(d).
02	<p>The rater shall use a sampling approach that one in seven DHW recirculation pipe risers and associated branches be inspected to verify the pipe insulation meet with the following requirements:</p> <ol style="list-style-type: none"> <li>All piping for multifamily domestic hot water systems shall be insulated to the thickness specified in Table 160.4-A, including the first 8 feet of inlet cold water piping to the heating plant. Insulation on the piping and appurtenances shall be continuous.</li> <li>All appurtenances at the heating plant, from a heating source to storage tank(s), or in between storage tanks and storage water heaters, and recirculation supply and return loop shall meet the following: <ol style="list-style-type: none"> <li>Insulation to be flush with pipe insulation or have minimum of one inch if appurtenance is bulkier.</li> <li>Removable and re-installable for maintenance or replacement.</li> <li>Pipe supports, hangers, and clamps shall be attached on the outside of rigid pipe insulation.</li> </ol> </li> <li>All pipe insulation seams shall be sealed along the length of the pipe and between adjacent sections of insulation material.</li> <li>Insulation for pipe elbows shall be mitered, and insulation for tees shall be notched. Alternatively, tees and elbows may be pre-formed, or site fabricated with PVC covers.</li> <li>Isolation valves shall be fully functional. Extended stem isolation valves shall be installed on hot water piping or where pipe insulation is required.</li> </ol>

### K. Verified Central Parallel Piping Requirements (PP-H) (RA3.6.4)

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Systems that utilize this distribution type shall comply with these requirements.

01	Each central manifold has 5 feet or less of pipe between manifold and water heater.
02	For manifolds that include valves, the manifold must be readily accessible in accordance with the plumbing code.
03	Hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. For example, piping from a second story manifold cannot supply the first floor.
04	The hot water distribution piping must be separated by at least 2 inches from any other hot water supply piping, and at least 6 inches from any cold water supply piping. Alternatively, the hot water supply piping must be insulated to the thicknesses shown in Table 120.3-A-1.

### L. Central Parallel Piping Requirements (RA4.4.4)

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Systems that utilize this distribution type shall comply with these requirements.

01	Each central manifold has 15 feet or less of pipe between manifold and water heater.
02	For manifolds that include valves, the manifold must be readily accessible in accordance with the plumbing code.
03	Hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. For instance, piping from a second story manifold cannot supply the first floor.
04	The hot water distribution piping must be separated by at least 2 inches from any other hot water supply piping, and at least 6 inches from any cold water supply piping. Alternatively, the hot water supply piping must be insulated to the thicknesses shown in Table 120.3-A-1.



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### M. Point of Use Requirements (POU) (RA4.4.5)

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize this distribution type shall comply with these requirements.

01	All hot water supply pipe run lengths are equal to or less than the maximum values shown below, based on the pipe diameter. If a combination of piping is used in a single run, then one half the allowed length of each size is the maximum installed length. The maximum allowed length of piping for the longest run terminating in:
	3/8 inch - For only one pipe size - max length allowed is 15 feet For combination pipe sizes the max allowed length of 3/8-inch piping is 7.5 feet, of 1/2 inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.
	1/2 inch - For only one pipe size – max length allowed is 10 feet For combination pipe sizes the allowed length of 1/2inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.
	3/4 inch - For only one pipe size = 5 feet

### N. Mandatory Requirements for all Recirculation Systems (RA4.4.7)

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize a recirculation system shall comply with these requirements.

01	A check valve located between the recirculation pump and the water heater to prevent unintentional recirculation.
02	Piping must take the most direct path between water heater and fixtures.
03	Insulation is not required on the cold water line when it is used as the return.

### O. Recirculation Non-Demand Controls Requirements (RA4.4.8)

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize this distribution type shall comply with these requirements.

01	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.
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### P. Demand Recirculation; Manual Control (RA4.4.9)/Sensor Control (RA4.4.10) Requirements

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize either of these distribution types shall comply with these requirements.

01	The system operates "on-demand", meaning that the pump begins to operate shortly before or immediately after hot water draw begins, and stops when the return water temperature reaches a certain threshold value. For Demand Recirculation Manual Control, the pump shall be turned on using a manual switch system. For Demand Recirculation Sensor Control, the pump shall be turned on using a sensor system.
02	The controls shall be located in the kitchen, bathroom, and any hot water fixture location that is at least 20 feet from the water heater.
03	Manual controls may be activated by wired or wireless mechanisms. Each control shall have standby power of 1 Watt or less.
04	Sensor controls may be activated by wired or wireless mechanisms, including buttons, motion sensors, door switches and flow switches. Each control shall have standby power of 1 Watt or less.
05	Pump and control placement shall meet one of the following criteria: <ul style="list-style-type: none"> <li>When a dedicated return line has been installed the pump, controls and thermo-sensor are installed at the end of the supply portion of the recirculation loop; or</li> <li>The pump and controls are installed on the dedicated 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; or</li> <li>When the cold water line is used as the return, the pump, demand controls and thermo-sensor shall be installed in an accessible location at the end of supply portion of the hot water distribution line (typically under a sink).</li> </ul>
06	After the pump has been activated, the controls shall allow the pump to operate until the water temperature at the thermo-sensor rises to one of the following values: <ul style="list-style-type: none"> <li>Not more than 10°F (5.6°C) above the initial temperature of the water in the pipe; or</li> <li>Not more than 102°F (38.9°C).</li> </ul>
07	Controls shall limit operation to no more than 5 minutes following activation.

### Q. Verified Demand Recirculation Manual Control (RDRmc-H) (RA3.6.6)/Sensor Control (RDRsc-H) (RA3.6.7) Requirements

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Systems that utilize this distribution type shall comply with these requirements.

01	ECC - rater shall perform a visual inspection to verify that the demand pump, manual/sensor controls and thermo-sensor are present and operating properly consistent with the applicable requirements of RA4.4.9 and RA4.4.10
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## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300**

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Registration Date/Time:

ECC Provider:

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**LMCI-PLB-22-H User Instructions****A. Design Verified Dwelling Unit Water Heating Systems Information (other than HPWH)**

This table reports features of the water heating system(s) other than **HPWH** system that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

**A2. Design Verified Dwelling Unit HPWH System Information**

This table reports the water heating system(s) that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

**B. Installed Verified Dwelling Unit Water Heating Systems Information**

This table reports features of the water heating system(s) other than HPWH systems that is being installed. Require one line for each installed water heater.

1. Dwelling Unit Name - Reference information from Table A.
2. Water Heating System ID or Name – Reference information from Table A.
3. Water Heating System Type – Reference information from Table A. The different kinds of water heating system type are DHW, or Combined Hydronic.
4. Water Heater Type – Reference information from Table A. The different kinds of water heaters are Large/Commercial Storage, Small/Consumer Storage, Residential-Duty Commercial Storage, Heat Pump, Boiler, Large/Commercial Instantaneous, Small/Consumer Instantaneous, Residential-Duty Commercial Instantaneous or Indirect.
5. # of Like (or Identical) Water Heaters in system – Reference information from Table A.
6. Fuel Type – Reference information from Table A. The different kinds of fuel types are heat pump, electric resistance, natural gas, and propane.
7. Rated Input Type – Reference information from Table A. For natural gas and propane, the input type is Btu/hr. For heat pump and electric resistance, the input type is kW.
8. Rated Input Value – User input. Numerical value of the rated input. Must be equal to or less than value indicated on the LMCC.
9. Central DHW System Distribution - Reference information from Table A.
10. Dwelling Unit DHW System Distribution Type - Reference information from Table A.
11. Compact Distribution - Reference information from Table A.
12. Drain Water Heat Recovery - Reference information from Table A.

**B2. Installed Verified Dwelling Unit HPWH System Information**

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Dwelling Unit Name – Reference information from Table A2.
2. Water Heating System ID or Name – Reference information from Table A2.
3. Modeled Equipment Make and Model – User input must be equal to the value indicated on Table A2 as default and allow user to override with an equivalent system based on the simulated equipment in Table A2.
4. # of Like (or Identical) Water Heaters in System – Reference information from Table A2.
5. Tank Location – User input. Must be equal to value indicated in Table A2.

6. Exterior Tank Insulation R-value – User input. Must be equal to or higher than value indicated in Table A2.
7. Dwelling Unit DHW System Distribution Type – Reference information from Table A2.
8. Compact Distribution – Reference information from Table A2.

### C. Design Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system features that were specified on the registered LMCC compliance document for this project. This section is for information/verification purposes only and requires no user input.

### D. Installed Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Water Heating System ID or Name – Reference information from Table A.
2. Heating Efficiency Type – Reference information from Table C. Different efficiency types are AFUE, UEF and Thermal Efficiency.
3. Heating Efficiency Value – User input must be equal to or higher efficiency than value indicated on the LMCC.
4. Standby Loss – User input. Must be equal to or less than value indicated in Table C. Value may be N/A if LMCC value is N/A.
5. 05 Exterior Insulation R-Value – User input. Must be equal to or higher than value indicated in Table C. Value may be N/A if LMCC value is N/A.
6. Water Heater Storage Volume (gal) – User input. Value may be N/A if water heater type is instantaneous with zero storage.
7. Tank location – User input. Must be equal to system type indicated in Table C.

### E. Installed Water Heater Manufacturer Information

This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater

1. Water Heating System ID or Name – Reference information from LMCC.
2. Manufacturer – User input. Enter the name of the water heater manufacturer.
3. Model Number – User input. Enter the model number of the water heater.

### F. Mandatory Measures for all Domestic Hot Water Distribution Systems

This table lists the requirements for all DHW systems. ECC rater must ensure all the requirements in this table are met.

### G. Verified Compact Hot Water Distribution Expanded Credit and H. Compact Hot Water Distribution Basic

If performance compliance is used, this table lists the values used in the performance calculation and require no user input.

If prescriptive compliance is used, fill out this table.

1. Reference information from LMCC
2. Enter the master bath distance of furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.
3. Enter the kitchen distance from furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.

4. Enter furthest third fixtures from fixture to Water Heater in feet. For multiple water heaters, enter the average of the furthest distance of each water heater.
5. Weighted Distance - Calculated value – no user input required.
6. Qualification Distance - Calculated value – no user input required.

#### **I. Verified Drain Water Heat Recovery System**

This table lists the requirements for all drain water heat recovery systems. ECC rater must ensure all the requirements in this table are met.

1. Reference information from LMCC.
2. Reference information from LMCC.
3. Reference information from LMCC.
4. Reference information from LMCC.
5. Drain Water Heat Recovery Manufacturer’s Name- Enter the name of the manufacturer.
6. Drain Water Heat Recovery Manufacturer’s Model Number – Enter the model number.
7. Rated Effectiveness – Enter the rated effectiveness of the DWHR device.
8. Installation Configuration – Enter type of configuration. Available options are: Equal flow, unequal to shower, and unequal to water heater
9. Percent of showers served by the DWHR device – Enter the percent of showers served by this DWHR device.
10. DWHR System Certified by CEC – Enter “Yes” if certified or else enter “No”.

#### **J. Verified Pipe Insulation for Central Systems**

This table only applies to systems indicated as Verified Pipe Insulation Credit. In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

#### **K. Verified Central Parallel Piping Requirements**

This table only applies to systems indicated as Verified Central Parallel Piping. In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

#### **L. Central Parallel Piping Requirements**

This table only applies to systems indicated as Central Parallel Piping. In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

#### **M. Point of Use Requirements**

This table only applies to systems indicated as Point of Use In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

#### **N. Mandatory Requirements for all Recirculation Systems**

The requirements of this table apply to all recirculation systems listed below.

#### **O. Recirculation Non-Demand Controls Requirements**

This table only applies to systems indicated as Recirculation Non-demand Controls. In addition to the mandatory requirements in Table F and N, the installer must ensure the requirements in this table are met.



**P. Demand Recirculation Manual Control/Sensor Control Requirements**

This table only applies to systems indicated as Demand Recirculation Manual Control, Demand Recirculation Sensor Control, Verified Demand Recirculation Manual Control or Verified Demand Recirculation Sensor Control. In addition to the mandatory requirements in Table F and N, the installer must ensure the requirements in this table are met.

**Q. Verified Demand Recirculation Manual Control/Sensor Control Requirements**

This table only applies to systems indicated as Verified Demand Recirculation Manual Control or Verified Demand Recirculation Sensor Control. In addition to the mandatory requirements in Table F and N, the installer must ensure the requirements in this table are met.

**Documentation Declaration Statements**

1. The person who prepared the LMCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.

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