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 nonresidential, hotel/motel and high-rise residential occupancies.

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

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							
□	Dry System (Airside) Equipment	□	Ventilation	□	System Controls	□	Ductwork
□	Boiler	□	Pumps	□	Terminal Box Controls	□	Piping
□	Chiller	□	Fans and Air Economizers	□	Heat Rejection Equipment (cooling towers, condensers, waterside economizers)	□	Electric Resistance Heating

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	INSTALLED FEATURES EXACTLY MATCH DESIGN ON PERMITTED CERTIFICATE OF COMPLIANCE

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.

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.

Dry System Equipment Schedule

01		02	03	04	05	06	07	08	09	10	11	12	13
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	Rated Output (kBtu/h)	Efficiency	Efficiency Unit	Efficiency	Efficiency Unit	
Per C of C													
As-built Conditions													

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													

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
Tag/Plan Detail ID		Model #	Equipment Type	Quantity	Rated Input (Btu/h)	Rated Efficiency	Efficiency Unit	Controls		Equipment Compliance
								Isolation Valve	Temperature Reset	
Per C of C										
As-built Conditions										

Chiller 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												

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					

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
System Name		Quantity	Delivered Directly To The Space	DOAS Fan Control	Multi-Zone DOAS with Cooling	Multifamily DOAS	System Compliance
Per C of C							
As-built Conditions							

H. Fan Energy Index (FEI)

01		02	03	04
Fan System Name or Item Tag		Name or Item Tag	FEI Exception	FEI
Per C of C				
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
Per C of C					NA		
As-built Conditions							

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
System Name	Thermostats	Shut-Off Controls	Isolation Zone Controls	Demand Response	Supply Air Temp. Reset	Window Interlocks	Direct Digital Control (DDC)	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				

Multifamily Dwelling Unit Ventilation Systems

01		02	03	04	05	06	07
Space Name		Outside Air CFM	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 HERS Program on the Energy Commission website here: https://www.energy.ca.gov/programs-and-topics/programs/home-energy-rating-system-hers-program

01

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·ft²·°F)	Mean Rating Temperature (°F)		< 1	1 to <1.5	1.5 to < 4	4 to < 8	8 and larger
Space heating and Service Water Heating Systems (Steam, Steam Condensate, Refrigerant, Space Heating, Service Hot Water)				Minimum Pipe Insulation Required (Thickness in inches or R-value)				
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

Fluid Operating Temperature Range (°F)	Insulation Conductivity			Nominal Pipe Diameter (in inches)									
	Conductivity (in Btu·in/h·ft2·°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)[1]						
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

G. ACCEPTANCE TESTS & FIELD VERIFICATION

The following Acceptance Tests and HERS 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-04b-A - Must be submitted for Air Distribution Duct Leakage.	
NRCA-MCH-05-A - Must be submitted for Air Economizer 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.	

Certificates of Verification

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

NRCA-MCH-04a-H - Must be completed by installer and submitted for Air Distribution Duct Leakage.	
NRCV-MCH-04-H Duct Leakage Test	
NRCV-MCH-24 Enclosure Air Leakage Worksheet	
NRCV-MCH-27 High-rise Residential	
NRCV-MCH-32 Local Mechanical Exhaust	

There are no Acceptance Tests or HERS verifications indicated on the permitted Certificate of Compliance related to the systems or materials documented on this Certificate of Installation.

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.

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/HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

2. 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 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 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 accomplish 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, and I will take the necessary steps to accomplish 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:

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

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 NRCI 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.