



NONRESIDENTIAL HVAC REQUIREMENTS



COMMUNITY DEVELOPMENT DEPARTMENT • 345 N EL DORADO STREET • STOCKTON, CA 95202 • (209) 937-8561
www.stocktonca.gov/buildinginspection

PERMIT REQUIREMENTS:

- A building permit is required for the following nonresidential HVAC projects:
 - New HVAC installation
 - HVAC Changeout
 - Replacement of furnace, coil, FAU, or condenser
 - Relocation of an existing HVAC unit
- A **Fire Department Permit** may also be required for your project, see below for more information.
- Permits are issued to a California licensed **C-20** contractor with a current City of Stockton Business License.
- **Nonresidential HVAC permits are now available to apply, pay, and receive online via our online permit portal at: <https://aca-prod.accela.com/STOCKTON>. A free user account must be created to use this service.**
- Permits can also be obtained at the Community Development Department Permit Center.
 - Located at 345 N. El Dorado St, Stockton, CA 95202
 - Office hours are from 8:00 a.m. to 4:30 p.m. Monday through Friday, closed alternate Fridays.

SUBMITTAL CHECKLIST:

- ☐ A. [Building Permit Application](#)
- ☐ B. [Energy Compliance Forms](#) – See below
- ☐ C. [Gas Pipe Sizing Calculations](#) (if applicable)
- ☐ D. Authorization Letter from the licensed contractor for the individual picking up the permit (if applicable)
- ☐ E. Plans & Structural Analysis – Required for new units

ENERGY CODE COMPLIANCE:

- Refer to the attached document from Energy Code Ace summarizing the requirements for HVAC projects.
- All new or replacement equipment must meet the minimum efficiency requirements of CEC Section 110.2(a)
- Acceptance Testing by a Certified Mechanical Acceptance Test Technician is required for most nonresidential HVAC projects. The required acceptance tests shall be identified on the required energy forms. Refer to the attached document from Energy Code Ace summarizing acceptance testing requirements.

FORMS:

- NRCC-MCH-01-E
 - Required at time of permit application.
 - **It is the contractor's responsibility to provide completed forms at time of application.**
- NRCI-MCH-E
 - Completed and signed by the installing contractor and made available for final inspection by the Building Department.
 - Additional forms may be required depending on the scope of the project and the required acceptance tests and/or HERS verification.
- NRCA-MCH-

- Completed and signed by the acceptance testing technician and made available for final inspection by the Building Department.
- NRCV-MCH-
 - Completed and signed by the HERS certified rater and made available for final inspection by the Building Department.

ADDITIONAL REQUIREMENTS:

Provide equipment specifications from the manufacturer for new or replacement equipment that includes the unit weight (see below for units heavier than the existing unit), electrical requirements, and gas requirements. Below is a sample table that you may use to document the equipment specs:

MECHANICAL EQUIPMENT SCHEDULE									
Manufacturer	Model	Fuel Type	CFM ¹ Rating	Unit ³ Weight	Electrical			Location ²	Gas ⁴ BTUs/Hr
					Voltage	MCA	MOCP		

NOTES:

1. If the new or replacement unit has smoke detection installed, exceeds 2,000 CFM, or serves a room where multiple systems exceed 2,000 CFM, the system must be equipped with duct smoke detection and an automatic shutoff. A **Fire Department Permit will be required** in accordance with the California Fire Code. Contact the City of Stockton Fire department at (209) 937-8271 for more information about this requirement.
2. A Site Plan is required with all submittals for new ground mounted equipment.
3. For new rooftop units or replacement units that are heavier than the existing unit a structural analysis shall be provided with the submittal. Provide a partial roof framing plan, connection details, and structural calculations in accordance with California Building Code Chapter 16.
4. Gas pipe sizing calculations are required for new units or replacement units with a higher gas load demand. If the units will be served by a gas line fed directly from the gas meter, calculations may not be required.



Single-zone, Direct Expansion (DX) — Packaged Units and Split Systems

For Details: Click a code section →	Controls		Equipment					Ventilation		Distribution		
	Thermostat ^A §110.2(c) §120.2(a)	Demand Control Ventilation ^C §120.1(c)3-4 §120.1(d) §141.0(b)2D	Minimum Cooling Efficiency ^D §110.2(a)	Minimum Heating Efficiency Heat Pump Controls ^D §110.2(a)-(b)	Equipment Sizing (per load calculations) §140.4(a) Heating or Cooling Load Calculations §140.4(b)	Fan Energy Index ^E §120.10(a)	Economizer ^I §140.4(e) §141.0(b)2C	Ventilation Calculations ^J (Replaced HVAC system provides ventilation) §120.1	Supply and Exhaust Dampers (HVAC provides ventilation) §120.2(f)	Air Filtration ^K §120.1(c)	Duct Insulation ^L §120.4(a)-(f)	Duct Seal and Test §120.4(g) §141.0(b)2D §141.0(b)2E
Project Scope: ↓ Change this and nothing else	Pre/Occupancy §120.1(d)1-2	Shut-off, Reset and Isolation §120.2(e), (g)	Not Required		Not Required Single Zone Heat Pump Space Heating §140.4(a)2 ; §141.0(b)2C Fault Detection and Diagnostics (FDD) §120.2(i) ; §141.0(b)2							
	Occupancy Sensor Control §120.1(d)5 ; §120.2(e)3											
Whole Package Unit or Split System without Altered Ducts	YES	No	YES	YES ^Q	No ^M	YES	YES	YES	YES	No	No	YES ^N
New or Replacement Whole Package or Split System and New Ducts	YES	YES ^P	YES	YES ^Q	No ^M	YES	YES	YES	YES	YES	YES	YES ^{N, O}
Split System Outdoor Condensing Unit	YES	No	YES	YES ^Q	No	No	No	No	No	No	No	No
Split System, Air Handler, or Cooling or Heating Coil	YES	No	YES	YES ^Q	No	YES ^R	YES ^S	No	No	No	No	YES ^N
Cooling Coil of Packaged System	YES	No	YES	No	No	No	No	No	No	No	No	No
New or Replacement Ducts ^T	No	No	No	No	No	No	No	YES	No	No	YES	YES ^{N, O}
Extended Ducts	No	No	No	No	No	No	No	No	No	No	YES	YES ^N
Repairs (Changing Motors or Compressors, etc.) ^U	No	No	No	No	No	No	No	No	No	No	No	No

Table 1. Single-zone, Direct Expansion (DX) — Packaged Units and Split Systems

 Mandatory Requirement

 Prescriptive Requirement

Trigger Table Footnotes

- (A)** Thermostats also must comply with requirements of [Joint Reference Appendix JA5](#) per [§120.2\(b\)4](#) (Mandatory for single zone air conditioners and heat pumps) and [§141.0\(b\)2Ei](#) (Prescriptive). All heat pumps with supplementary electric resistance heaters must be installed with controls that comply with [§110.2\(b\)](#) Heat Pump Controls.
- (B)** If the altered unit has direct digital control (DDC) to the zone level, the requirements of [§§110.12\(a\)](#), [110.12\(b\)](#) and [120.2\(h\)](#) must be met. Otherwise, the altered unit's thermostatic controls must comply with [Joint Reference Appendix JA5](#), which also includes demand shed control requirements.
- (C)** If the system has an airside economizer, modulating outside air control or a design flow rate > 3,000 CFM and serves a high-density space (≥ 25 people per 1,000 ft²) as supported by Table 402.1 of 2022 *California Mechanical Code*, demand control ventilation (DCV) is required.
- (D)** For minimum efficiency tables $\geq 65,000$ Btuh, see [Table 110.2-A](#): Unitary AC and Condensers, [Table 110.2-B](#): Unitary Heat Pumps and [Table 110.2-I](#): Warm-Air Furnace. If there is a single zone heat pump < 65,000 Btuh or central air conditioner < 65,000 Btuh, see the Energy Code Ace™ *Equipment Minimum Efficiencies: Quick Reference* at energycodeace.com/resources/?itemId=67830.
- (E)** Fan energy index (FEI) requirements in [§120.10\(a\)](#) may apply if each fan or fan array at fan system design conditions either (1) has a combined motor nameplate horsepower is greater than 1 hp (or combined electrical nameplate input power greater than 0.89 kW) and is not listed under [§§110.1](#), [110.2](#) or [120.10\(a\)](#) or (2) has embedded fans or fan arrays > 5 hp. Exceptions may apply.
- (F)** For each fan system that includes at least one fan or fan array with fan electrical input power ≥ 1 kW, fan power requirements of [§140.4\(c\)1](#) may apply. Additional fan power allowances are available for Alterations per [§141.0\(b\)2C](#).
- (G)** Direct expansion (DX) cooling systems with $\geq 65,000$ Btuh cooling capacity require a minimum of two stages of fan control. Systems that include an air-side economizer require a minimum of two stages of fan control during economizer operation. All systems required to control the space temperature by modulating the airflow to the space have fan power limits at 66% speed.
- (H)** For some fan system designs where supply outdoor air is $\geq 2,000$ CFM, exhaust air heat recovery may be required as specified in [§140.4\(q\)](#).
- (I)** For Alterations, an economizer is required if a single package unit is > 33,000 Btuh (about 3 tons). All other replacements of variable refrigerant flow (VRF), split system, or any systems that are not single package units $\geq 54,000$ Btuh and in which the air handler is being replaced, an economizer is required. (Note that this is a CEC-authorized correction to the 2022 Energy Code.) Exceptions may apply if using [Table 140.4-F](#) Economizer Trade-Off Table for Cooling Systems.
- (J)** The ventilation calculation requirement applies only if the system is serving as the mechanical ventilation source.
- (K)** An air-conditioning system requires a minimum 2" MERV 13 filter or 1" MERV 13 filter sized in accordance with [Equation 120.1-A](#). Filter racks or grilles must use gaskets, sealing, or other means to close gaps around inserted filters and prevent air from bypassing the filter.
- (L)** Ducts in indirectly conditioned space require R-4.2 insulation. Ducts outside conditioned space require R-8 insulation. Ducts in directly conditioned space do not require insulation.
- (M)** When the proposed system capacity does not match the existing system capacity, heating or cooling load calculations and system sizing requirements apply.
- (N)** Duct sealing and testing requirements apply if a system is constant air volume (CAV) single-zone and serves < 5,000 ft² of conditioned floor area and > 25% of the duct surface is in unconditioned space. Exceptions may apply.
- (O)** New or completely replaced duct systems and ventilation systems serving facilities not triggered by Footnote **(N)** must instead be sealed and then tested in accordance with the 2022 *California Mechanical Code* §603.9.2.
- (P)** Demand control ventilation (DCV) is required only if the system, ducts and all controls are replaced.
- (Q)** If a split system operates as a heat pump, heating efficiency must meet Mandatory requirements in [§110.2\(a\)](#) plus the supplemental electric resistance heater control requirements of [§110.2\(b\)](#). If gas-fired or oil-fired furnaces are used, standby loss controls requirements of [§110.2\(d\)](#) may apply.
- (R)** Fan control requirements in [§140.4\(m\)](#) do not apply.
- (S)** Economizer requirements in [§§140.4\(e\)](#) and [141.0\(b\)2C](#) must be met if the air handler is replaced.
- (T)** If 75% or more of existing ducts are replaced, it is considered a new duct system.
- (U)** For nonresidential HVAC systems, a change in motors, compressors, condenser coil and other items are considered a Repair and do not trigger the Energy Code. However, Repairs must not increase the pre-existing energy consumption of the repaired component, system or equipment.

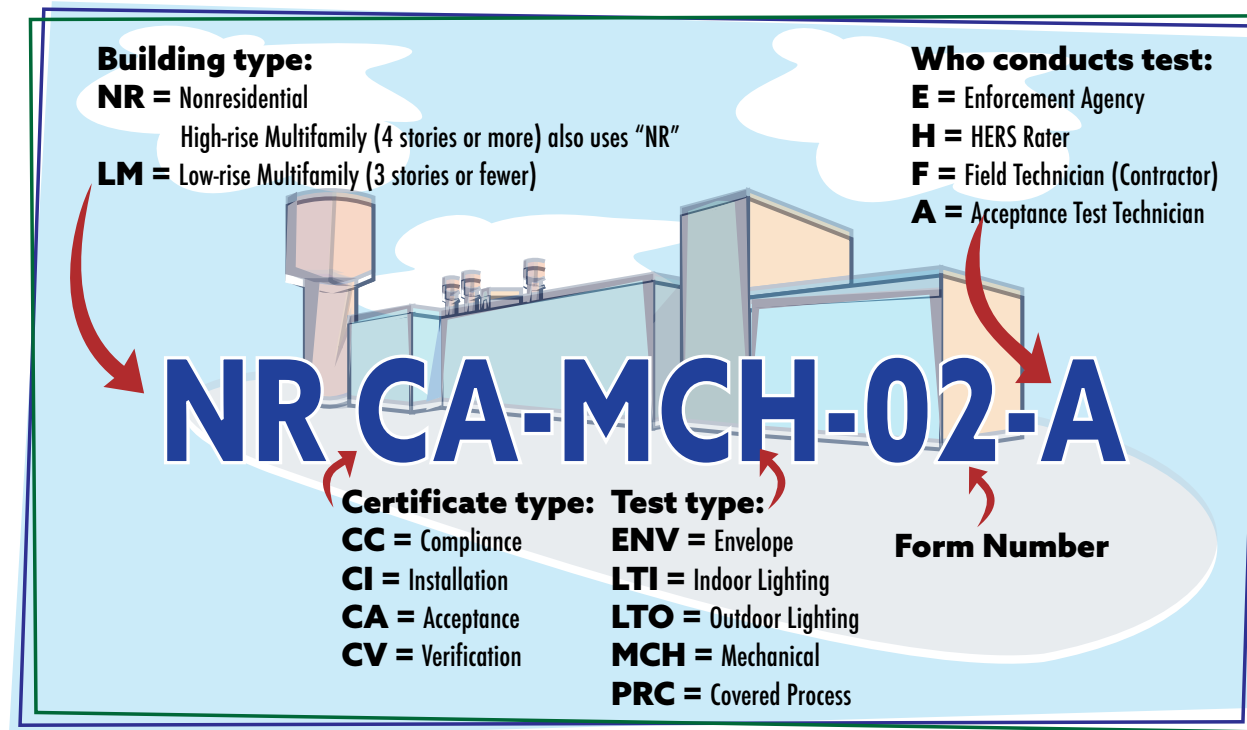


Energy Code Compliance Forms

Virtual Compliance Assistant

Use the Virtual Compliance Assistant (VCA) at www.energycodeace.com/content/project-tool to complete certificates of compliance and installation:

- ✦ NRCC-MCH-E: Certificate of Compliance needed for permit approval
- ✦ NRCI-MCH-E: Certificate of Installation needed for final walk-through



Compliance Forms				
Building Type	Certificates of Compliance	Certificates of Installation	Certificates of Verification	Certificates of Acceptance
Nonresidential	NRCC	NRCI	NRCV	NRCA
Hotels and Motels	NRCC	NRCI	NRCV	NRCA
Multifamily Buildings with ≥ 4 Habitable Stories	NRCC	NRCI	NRCV	NRCA
Multifamily Buildings with ≤ 3 Habitable Stories	LMCC	LMCI	LMCV	NRCA

Table 2. Compliance Forms Required by Building Type



Acceptance Tests

Depending upon the scope of a small commercial HVAC project, the Energy Code may require acceptance testing. Each acceptance test must be performed by a Certified Mechanical Acceptance Test Technician (CMATT) who is trained and certified by an Acceptance Test Technician Certification Provider Program (ATTCP). CMATTs must show that they have a minimum of three years of experience working in the area of testing that they will perform.



Mandatory Requirement

Acceptance Tests: Packaged Units — Single-zone, Constant Air Volume and Split Systems						
When Required: → Project Scope: ↓ Change this and nothing else	FORMS					
	NRCA-MCH-02-A	NRCA-MCH-03-A	NRCA-MCH-04-A NRCV-MCH-04-H	NRCA-MCH-05-A	NRCA-MCH-06-A	NRCA-MCH-11-A
	Ventilation Systems: Adequate OSA: When HVAC provides ventilation	Constant-volume, Single-zone Unitary AC and Heat Pump: Proper system temperature scheduling and controls for DX units	Air Distribution Systems: ^(A) Duct leakage rate	Air Economizer Controls: Proper operation of economizer controls	Demand Control Ventilation: Proper operation of DCV controls	Demand Shed Controls: Demand response ^(B)
Whole Package Unit	YES	YES	YES	YES ^(C)	YES ^(D)	YES
Entire Split System	YES	YES	YES	YES ^(C)	YES ^(D)	YES
New or Replacement Ducts and Whole Package Unit or Split System	YES	YES	YES	YES ^(C)	YES ^(D)	YES
Air Handler, or Cooling or Heating Coil, or Outdoor Condensing Unit	No	YES	YES	No	No	YES
Ductwork	No	No	YES	No	No	No
For Nonresidential HVAC systems, a change in blower motor, compressor or condenser coil is considered a Repair and does not trigger the Energy Code. However, Repairs must not increase the pre-existing energy consumption of the repaired component system or equipment.						
AC = air conditioning; DCV = demand control ventilation; DX = direct expansion; HVAC = heating, ventilation and air conditioning; OSA = outside air.						

Table 3 Footnotes

- ^(A) Duct sealing and testing requirements apply if a system is constant air volume (CAV) single-zone and serves < 5,000 ft² of conditioned floor area and > 25% of the duct surface is in unconditioned space. When new or completely replaced duct systems and ventilation systems do not serve a constant air volume (CAV) system < 5,000 ft² and have > 25% of ducts outside conditioned space, they must instead be sealed and then tested in accordance with the *California Mechanical Code* §603.9.
- ^(B) The acceptance test requirement only applies if the unit has direct digital controls (DDC) controls.
- ^(C) If the system has a factory-installed economizer that is certified operational by the manufacturer to the California Energy Commission's economizer quality control requirements, the in-field functional tests do not have to be conducted. Regardless of whether the economizer is field- or factory-installed, complete the construction inspection, including the compliance with high temperature lockout temperature setpoints.
- ^(D) If system is single zone with any controls or multi-zone with direct digital controls (DDC), has an airside economizer, and serves a high-density space (≥ 25 people per 1,000 ft²), the acceptance test requirements apply. If replacing a packaged system that provided ventilation with any system that does not, mechanical ventilation must be provided to the space(s).

Table 3. Acceptance Tests: Packaged Units — Single-zone, Constant Air Volume and Split Systems



For More Information

CALIFORNIA ENERGY COMMISSION

www.energy.ca.gov

Learn more about the California Energy Commission (CEC) and its programs on its website.

2022 Building Energy Efficiency Standards

bit.ly/CEC2022Standards

Explore the main CEC web portal for the 2022 Energy Code, including information, documents and historical information.

2022 Building Energy Efficiency Standards Summary

bit.ly/CEC2022Summary

View or download this visual summary of the Energy Code's purpose, current changes and impact.

2022 Reference Appendices

bit.ly/ECA-2022-reference-appendices

View the Joint, Residential and Nonresidential Appendices here

Energy Code Hotline

Call: 1-800-772-3300 (Free)

Email: Title24@energy.ca.gov

Acceptance Test Technician Certification Provider (AT-TCP) Program Frequently Asked Questions

bit.ly/ATTCP-Program-FAQ

Consult these FAQs for indepth information on the ATTCP Program.



www.energycodeace.com

Stop by this online "one-stop-shop" for no-cost tools, training and resources designed to help you comply with California's Title 24, Part 6 and Title 20.



Tools

www.energycodeace.com/tools

Explore this suite of interactive tools to understand the compliance process, required forms, installation techniques and energy efficiency regulations in California.

Reference Ace

www.energycodeace.com/content/reference-ace-2022-tool

Navigate the Title 24, Part 6 Energy Code using an index, keyword search and hyperlinked text.

Q&Ace

www.energycodeace.com/QAndAce

Search our online knowledge base or submit your question to Energy Code Ace experts.

Virtual Compliance Assistant

www.energycodeace.com/content/project-tool

Use this tool to complete forms and verify compliance for nonresidential, hotel, motel, high-rise multifamily and low-rise multifamily projects.



Training

www.energycodeace.com/training

On-demand, live in-person and online training alternatives are tailored to a variety of industry professionals and address key measures.

Of Special Interest:

♦ 2022 Title 24, Part 6 Essentials – Nonresidential Standards: What's New

bit.ly/ECA-training-2022-nonres-whats-new

♦ 2022 Title 24, Part 6 Essentials — Nonresidential Standards for Small Commercial HVAC Contractors

bit.ly/ECA-training-2022-nr-small-comm-hvac



Resources

www.energycodeace.com/resources

Downloadable materials provide practical and concise guidance on how and when to comply with California's building and appliance energy efficiency standards.

Of Special Interest:

Fact Sheets

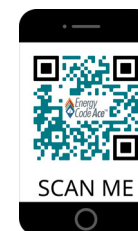
♦ Nonresidential Buildings: What's Changed in 2022

♦ Nonresidential and Multifamily Buildings Acceptance Testing



Check EnergyCodeAce.com for our latest 2022 tools, training and resources!

Create an account on the Energy Code Ace site and select an industry role for your profile in order to receive messages about all our offerings!



This program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison Company (SCE) under the auspices of the California Public Utilities Commission.
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What Is Included in this Fact Sheet?

The 2022 California Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) includes requirements for building components and systems to have acceptance testing. In a few cases, testing and verification can optionally be provided by a Home Energy Rating System (HERS) Rater. This fact sheet describes the testing and verification roles, process, methods and compliance forms for multifamily buildings and for hotels, motels and nonresidential buildings.

What Is Acceptance Testing?

Acceptance testing includes targeted inspections and functional performance tests that are conducted to ensure that the systems and equipment are installed and operating as designed and in compliance with the Energy Code. When triggered by a project, acceptance testing is a Mandatory requirement.

Acceptance testing does not take the place of test and balance procedures (TAB), and it does not replace commissioning. Acceptance testing is a part of the full commissioning process as shown in the Table 1 comparison.

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How Does Commissioning Differ from Acceptance Testing?		
	Commissioning	Acceptance Testing
Scope	The whole building throughout the entire design and construction process	Specific systems and equipment after installation
Purpose	A systematic quality assurance process to help ensure that systems are designed and operating: <ul style="list-style-type: none"> ✦ To meet the owner's goals ✦ In compliance with the Energy Code 	Targeted inspections and functional performance tests to help ensure that equipment is operating: <ul style="list-style-type: none"> ✦ As designed ✦ In compliance with the Energy Code
Applicable Projects	Applies to nonresidential New Construction: <ul style="list-style-type: none"> ✦ Full commissioning: buildings with $\geq 10,000$ ft² conditioned space ✦ Only the design review phase of commissioning: buildings with $< 10,000$ ft² conditioned space Does not apply to: <ul style="list-style-type: none"> ✦ Healthcare facilities ✦ Additions to existing buildings ✦ Alterations of existing buildings ✦ Multifamily, hotel or motel occupancies 	Applies to specific envelope, lighting and mechanical systems that are: <ul style="list-style-type: none"> ✦ New ✦ Replacement ✦ Altered
When Performed	Throughout design and construction	During construction after installation
Required Tasks	Activities and documentation at all stages of design and construction, including acceptance testing during construction	Inspections, functional tests, and documentation in accordance with acceptance testing procedures
More Information	See Tables 2 and 3 below ECA Nonresidential Commissioning Fact Sheet: bit.ly/ECA-building-fact-sheets CEC 2022 Nonresidential and Multifamily Compliance Manual: bit.ly/nonresidential-multifamily-compliance-manual <ul style="list-style-type: none"> ✦ Chapter 11.2: [Multifamily Building] Compliance and Enforcement ✦ Chapter 13: Building Commissioning Guide ✦ Chapter 14: [Nonresidential Building] Acceptance Test Requirements 	

Table 1. How Does Commissioning Differ from Acceptance Testing?

What Forms Are Required?

For each acceptance test, the Energy Code specifies specific forms to be completed for different tests and building types. Table 2 details which type of compliance form is required for each acceptance test. Figure 1 explains the naming conventions for each of these types of forms.

Compliance Forms				
Building Type	Certificates of Compliance	Certificates of Installation	Certificates of Verification	Certificates of Acceptance
Nonresidential	NRCC	NRCI	NRCV	NRCA
Hotels and Motels	NRCC	NRCI	NRCV	NRCA
Multifamily Buildings with ≥ 4 Habitable Stories	NRCC	NRCI	NRCV	NRCA
Multifamily Buildings with ≤ 3 Habitable Stories	LMCC	LMCI	LMCV	NRCA

Table 2. Compliance Forms Required by Building Type

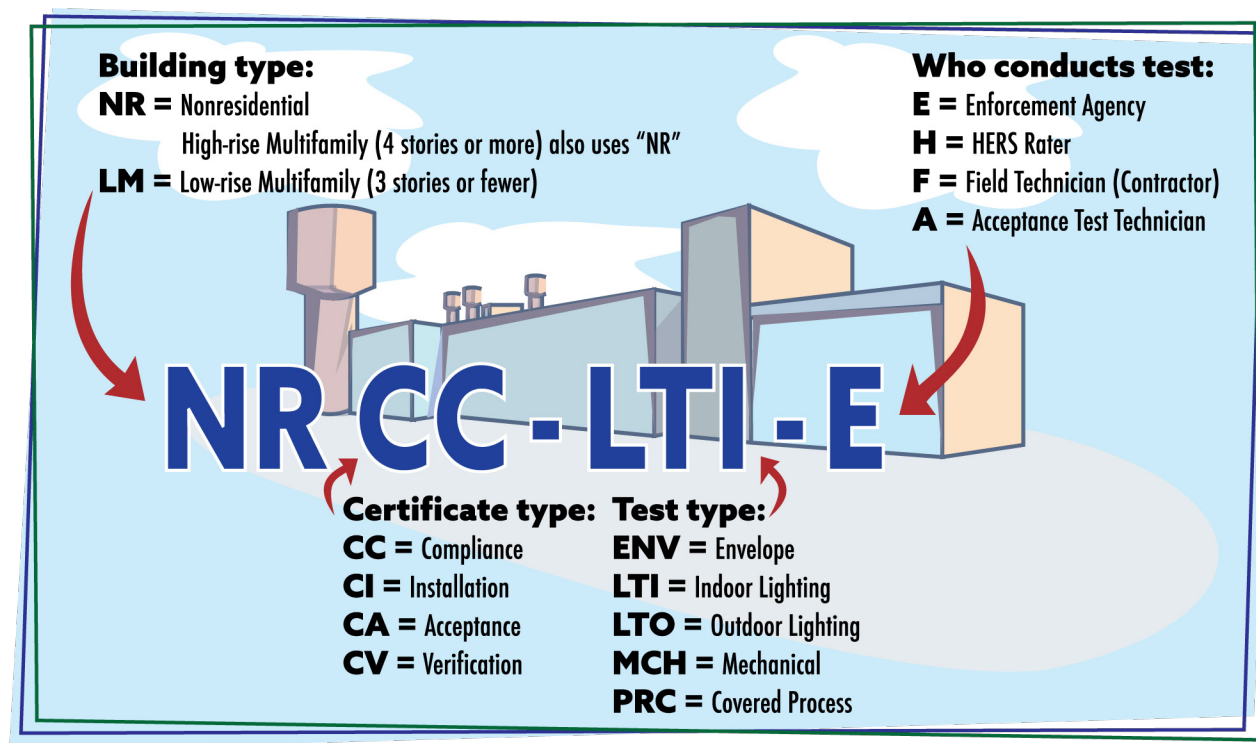


Figure 1. Nonresidential and Low-rise Multifamily Compliance Forms Naming Conventions



Who Conducts the Tests?

For each acceptance test, the Energy Code specifies who is allowed to conduct the test: a certified acceptance testing technician (ATT), a Home Energy Rating System (HERS) Rater or a field technician. Table 3 compares these three types of acceptance testers. Table 4 details which type of tester is allowed to conduct each acceptance test.

How Do Acceptance Testers Compare?			
	Acceptance Test Technician (ATT)	Home Energy Rating System (HERS) Rater	Field Technician
Project Team or Third Party Status	The ATT sometimes is a member of the project team such as: <ul style="list-style-type: none"> ✦ Installing technician ✦ Other technician ✦ Commissioning agent The ATT may also be hired from outside of the project team.	The HERS Rater is hired from outside of the project team to provide third-party verification.	The field technician is a member of the project team such as: <ul style="list-style-type: none"> ✦ Installing technician ✦ Other technician The field technician may also be hired from outside of the project team.
Qualifications	Two types of ATTs are trained and certified by an Acceptance Test Technician Certification Provider Program (ATTCP): <ul style="list-style-type: none"> ✦ Certified Lighting ATT (CLATT) ✦ Certified Mechanical ATT (CMATT) ATTs must show that they have a minimum of 3 years of experience working in the area of testing that they will perform.	HERS Raters are trained and certified by HERS Providers.	A field technician requires: <ul style="list-style-type: none"> ✦ Proven field service experience ✦ Ability to test and repair equipment to the satisfaction of the enforcement agency A field technician does not require: <ul style="list-style-type: none"> ✦ ATTCP or HERS Provider Certification ✦ Contractor's, architect's or engineer's license
Systems Tested	ATTs are required to perform acceptance testing in nonresidential buildings and multifamily building common use areas for: <ul style="list-style-type: none"> ✦ Lighting controls ✦ Mechanical systems 	HERS Raters may perform acceptance testing for some mechanical systems including: <ul style="list-style-type: none"> ✦ Duct leakage in nonresidential buildings ✦ Dwelling unit airflow and envelope leakage in multifamily buildings 	Field technicians may perform nonresidential acceptance testing for: <ul style="list-style-type: none"> ✦ Envelope features ✦ Covered process systems
Special Coordination	When a CLATT or CMATT is required to perform acceptance testing: <ul style="list-style-type: none"> ✦ Certified ATTs may be found on ATTCP websites. ✦ The ATT should be selected early in the project to facilitate coordination. 	When a HERS Rater will perform acceptance testing: <ul style="list-style-type: none"> ✦ For multifamily buildings with three or fewer habitable stories, compliance forms must be registered with a HERS Provider. All other building types are required to have applicable Certificate of Verification forms registered. ✦ The HERS Rater must be hired early in the project, especially for a multifamily building project. 	When a field technician will perform acceptance testing, the field technician who will perform the acceptance test is generally selected or identified as the installation is nearing completion.
Responsibilities	The ATT is responsible for: <ul style="list-style-type: none"> ✦ Performing the acceptance test ✦ Documenting the test on the NRCA form and signing the form ✦ Submitting the form to the ATTCP ✦ Providing the NRCA form to the building owner and onsite for inspection 	The HERS Rater is responsible for: <ul style="list-style-type: none"> ✦ Performing the acceptance test ✦ Documenting the test on the NRCV or LMCV form and signing the form ✦ Submitting the form to the HERS Provider ✦ Providing the NRCV or LMCV form to the building owner and onsite for inspection 	The field technician is responsible for: <ul style="list-style-type: none"> ✦ Performing the acceptance test ✦ Documenting the test on the NRCA form and signing the form ✦ Providing the NRCA form to the building owner and onsite for inspection
More Information	CEC 2022 Nonresidential and Multifamily Compliance Manual, Chapter 14.1.2: Acceptance Test Requirements Roles and Responsibilities: bit.ly/nonresidential-multifamily-compliance-manual CEC Acceptance Test Technician Certification Provider Program Frequently Asked Questions web page: bit.ly/ATTCP-Program-FAQ CEC Home Energy Rating System Providers web page: bit.ly/CEC-HERS-Providers		

Table 3. How Do Acceptance Testers Compare?



What Is the Process?

Acceptance Testing

When the Certificates of Compliance (NRCC or LMCC) are completed by using the Virtual Compliance Assistant (VCA) Tool, the VCA Tool and author identify which acceptance tests are required. Compliance software is another means to produce the NRCC or LMCC and auto populates the required acceptance testing. Paper forms provided by the CEC can also be used, but there is no guidance or autopopulation supported when using them.

Acceptance testing follows testing protocol established by the Energy Code. Acceptance testing seeks to confirm that the building's systems that require acceptance testing are installed and functioning as indicated by the plans, including the approved Certificate of Compliance (NRCC or LMCC) and the filed Certificate of Installation (NRCI or LMCI).

1. Complete Installation

Before acceptance testing can be conducted on a building feature, the feature must be installed and operational. The installing technician should confirm that the installation is complete.

2. Inspect Construction

The purpose of the construction inspection is to ensure that the feature is present and capable of complying with the acceptance test requirements for the functional test. The construction inspection is performed following the procedures specified for the feature in the Nonresidential Reference Appendices. The construction inspection generally includes checking records including the NRCI or LMCI, provided by the installing contractor, and then conducting a visual inspection to ensure that the installation is congruent with the records.

3. Conduct Functional Testing

The functional testing is conducted as specified in the Nonresidential Reference Appendices and documented on the applicable compliance form. Functional testing involves manipulating controls and taking measurements. These tests are pass/fail. A failed test requires adjustments to the installation until the test passes.

4. Complete the Certificate of Acceptance Form

After the feature passes the acceptance test requirements, the person who performed the acceptance test completes and signs the Certificate of Acceptance (NRCA) form. A responsible person for the project must also sign the form to ensure that the performance of the scope of work specified by the Certificate of Acceptance and the test results provided are complete. The completed NRCA form is provided to the building owner and made available on site for the inspection by the authority having jurisdiction (AHJ). When applicable, the NRCA form also is submitted to an Acceptance Test Technician Certification Provider (ATTCP).

HERS Verification

Some acceptance tests may be conducted by a Home Energy Rating System (HERS) Rater. A HERS Rater is specially trained and certified to perform field verification and diagnostic testing.

Typically, HERS Raters are hired to verify that residential installations comply with the Energy Code. However, as new Energy Code requirements mandated duct testing in some small commercial new or altered ductwork, it seemed practical to allow HERS Raters to use their certified expertise and instrumentation to provide the duct leakage testing for nonresidential projects.

For a multifamily building with three or fewer habitable stories, the project and all associated compliance forms, including the LMCV form, need to be registered with a HERS Provider. For a project on a nonresidential building or a multifamily building with four or more habitable stories, only the NRCV needs to be registered. Check the CEC website for approved HERS Providers at bit.ly/CEC-HERS-Providers.

For New Construction and Additions, the building owner or the general contractor typically hires the HERS Raters. For HVAC Alterations, HERS Raters are typically hired by the installing contractor. HERS Raters cannot be employees of the builder or contractor whose work they are verifying; cannot have a financial interest in the builder's or contractor's business and cannot advocate or recommend the use of any product or service that they are verifying.

Typically, HERS Raters should be engaged at the beginning of a project so that they can coordinate on when they need to perform inspections and testing and to allow the HERS Rater access to the registered compliance documentation associated with the project.

The HERS Rater performs on-site inspections and diagnostic tests, to ensure proper installation as specified in the Nonresidential Reference Appendices.

After the inspection and testing is done, the HERS Rater completes and signs the Certificate of Verification (NRCV or LMCV) form and registers it with the HERS Provider. The completed NRCV or LMCV form is provided to the building owner and made available on site for the inspection by the authority having jurisdiction (AHJ).



What Are the Required Tests?

Each acceptance test must be performed using methods specified in the Nonresidential Reference Appendix NA7 and have a particular form or forms completed to document that the component or equipment passes the test. Some tests may be performed by field technicians or HERS Raters. Other tests require specific Certified Lighting Acceptance Test Technician (CLATT) or Certified Mechanical Acceptance Test Technician (CMATT) qualifications for the person conducting the test. See Table 4 for a list of the required acceptance tests by building feature and for the methods, forms and tester qualifications required for each test.

Nonresidential and Multifamily Buildings: Required Acceptance Tests by Building Feature				
Acceptance Tests <i>To be performed after system is installed but before final permit</i>	Title 24, Part 6 Section	Nonresidential Appendices Test Method	Required Compliance Forms	Who Can Perform the Test
ENVELOPE				
Fenestration Window Films Dynamic Glazing	§10-111 §110.6	NA6.1 NA7.4.1 NA7.4.2 NA7.4.3	NRCA-ENV-02-F	Field Technician
Power Adjustment Factors (PAFs) Applied to the Lighting System ✦ Clerestories ✦ Interior or Exterior Horizontal Slats ✦ Interior or Exterior Light Shelves	§140.3(d) §170.2(e)	NA7.4.4 NA7.4.5 NA7.4.6	NRCA-ENV-03-F	Field Technician
LIGHTING CONTROLS				
Lighting Alterations <i>For information on required acceptance tests and forms, see §141.0(b)2l.</i>				
All Lighting Controls Newly Installed Lighting Control Systems ✦ Occupancy Sensors ✦ Shut-off Controls ✦ Automatic Time Switch Controls	§110.9(b) §130.4(a) §130.1(c) §160.5(b)4C	NA7.6.2 NA7.7	NRCA-LTI-02-A	Certified Lighting Acceptance Test Technician (CLATT)
Automatic Daylighting Controls	§110.9(b) §130.4(a) §130.1(d) §160.5(b)4D	NA7.6.1 NA7.7.5.1	NRCA-LTI-03-A	CLATT
Demand Responsive Controls	§110.12 §130.4(a) §170.2(e)2Bxi	NA7.6.3 NA7.6.5	NRCA-LTI-04-A	CLATT
Energy Management Control System (EMCS)	§130.0(e)	NA7.7.2	NRCA-MCH-18-A	CLATT
Institutional Tuning	§130.4(a) §140.6(a)2J §170.2(e)2Bxi	NA7.6.4	NRCA-LTI-05-A	CLATT
Interlocked Lighting Systems	§140.6(a)1 §170.2(e)2A	NA7.7.4	NRCA-LTI-E (Installation Form)	CLATT
Lighting Controls Installed to Earn a Power Adjustment Factor (PAF) <i>(Lighting Controls continued on next page)</i>	§140.6(a)2 §170.2(e)2B	NA7.7.5	NRCA-LTI-03-A NRCA-LTI-04-A NRCA-LTI-05-A	CLATT



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Nonresidential and Multifamily Buildings: Required Acceptance Tests by Building Feature				
Acceptance Tests <i>To be performed after system is installed but before final permit</i>	Title 24, Part 6 Section	Nonresidential Appendices Test Method	Required Compliance Forms	Who Can Perform the Test
LIGHTING CONTROLS (continued)				
Lighting for a Videoconferencing Studio	§140.6(c)2Gvii	NA7.7.6	NRCI-LTI-E (Installation Form)	CLATT
Outdoor Lighting Controls ✦ Motion Sensor ✦ Photocontrol ✦ Automatic Scheduling Control	§110.9(b) §130.4(a) §130.2(c) §160.5(c)2	NA7.8	NRCA-LTO-02-A	CLATT
MECHANICAL SYSTEMS				
Simple HVAC Replacements with No Duct Alterations <i>For information on required acceptance tests and forms, see §141.0(b)</i>	§141.0(b) §141.0(b)2C-E	NA7.5	NRCA-MCH-02-A NRCA-MCH-03-A NRCA-MCH-05-A NRCA-MCH-12-A	Certified Mechanical Acceptance Test Technician (CMATT)
Outdoor Air Ventilation	§120.5(a)1 §160.3(d)1A	NA7.5.1	NRCA-MCH-02-A	CMATT
Constant Volume, Single Zone AC and Heat Pump Controls	§120.5(a)2 §160.3(d)1B	NA7.5	NRCA-MCH-03-A	CMATT
New or Altered Duct Systems Acceptance testing is required for single zone units serving < 5,000 ft ² of floor area where > 25% of duct surface area is in an unconditioned space. Duct System Alterations For information on required acceptance tests and forms, see §141.0(b)2D . New duct systems that are not subject to testing under §120.4(g)1 must instead meet the duct leakage testing requirements of California Mechanical Code §603.9.	§120.4(g) §120.5(a)3 §160.3(d)1C	NA1.9 NA2 NA7.5.3	NRCA-MCH-04-A NRCV-MCH-04-H LMCV-MCH-20	HERS Rater or CMATT
Air Economizer Controls	§120.5(a)4 §140.4(e) §160.3(d)1D	NA7.5.4	NRCA-MCH-05-A	CMATT
Demand Control Ventilation Systems	§120.1(d)4 §120.5(a)5 §160.3(d)1E	NA7.5.5	NRCA-MCH-06-A	CMATT
Supply Fan Variable Flow Controls	§120.5(a)6 §140.4(c) §160.3(d)1F	NA7.5.6	NRCA-MCH-07-A	CMATT
Valve Leakage Test	§120.5(a)8 §140.4(k)2 §140.4(k)3 §160.3(d)1H	NA7.5.7	NRCA-MCH-08-A	CMATT
Supply Water Temperature Reset Controls <i>(Mechanical Systems continued on next page)</i>	§120.5(a)9 §140.4(k)4 §160.3(d)1I	NA7.5.8	NRCA-MCH-09-A	CMATT

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Nonresidential and Multifamily Buildings: Required Acceptance Tests by Building Feature				
Acceptance Tests <i>To be performed after system is installed but before final permit</i>	Title 24, Part 6 Section	Nonresidential Appendices Test Method	Required Compliance Forms	Who Can Perform the Test
MECHANICAL SYSTEMS (continued)				
Hydronic System Variable Flow Acceptance	§120.5(a)7 §140.4(k)6 §160.3(d)1G	NA7.5.9	NRCA-MCH-10-A	CMATT
Automatic Demand Shed Controls	§110.12(b) §120.5(a)10 §160.3(d)1J	NA7.5.10	NRCA-MCH-11-A	CMATT
Fault Detection and Diagnostics (FDD) for Packaged Direct Expansion (Dx) Units	§120.2(i) §120.5(a)11 §160.3(d)1K	NA7.5.11	NRCA-MCH-12-A	CMATT
Automatic FDD for Air Handling Units (AHUs) and Zone Terminal Units	§120.2(i) §120.5(a)12 §160.3(d)1L	NA7.5.12	NRCA-MCH-13-A	CMATT
Distributed Energy Storage DX Air Conditioning Systems	§120.5(a)13 §160.3(d)1M	NA7.5.13	NRCA-MCH-14-A	CMATT
Thermal Energy Storage Systems	§120.5(a)14 §160.3(d)1N	NA7.5.14	NRCA-MCH-15-A	CMATT
Supply Air Temperature Reset Controls	§120.5(a)15 §140.4(f) §160.3(d)1O	NA7.5.15	NRCA-MCH-16-A	CMATT
Water-cooled Chillers Served by Cooling Towers with Condenser Water Reset Controls	§120.5(a)16 §160.3(d)1P	NA7.5.16	NRCA-MCH-17-A	CMATT
Energy Management Control System	§110.12 §120.5(a)17 §160.3(d)1Q		NRCA-MCH-18-A	CMATT
Occupant Sensing Zone Controls	§120.2(e)3 §120.5(a)18 §160.3(d)1R	NA7.5.17	NRCA-MCH-19-A	CMATT
Central Ventilation System	§160.2(b)2C §160.2(c)	NA2.2 NA7.18	NRCA-MCH-20a-H LMCV-MCH-27-H	HERS Rater or CMATT
Kitchen Range Exhaust	§160.2(b)2Avi §160.2(b)2Bii	NA2.2.4.1.3 NA2.2.4.1.4 NA7.18	NRCA-MCH-20b-H LMCV-MCH-32-H	HERS Rater or CMATT
Indoor Air Quality Ventilation	§160.2(b)2Aivb §160.2(b)2Av	NA2.2.4.1	NRCA-MCH-20c-H NRCV-MCH-27b LMCV-MCH-27b	HERS Rater or CMATT
Dwelling Ventilation <i>(Mechanical Systems continued on next page)</i>	§160.2(b)2Biii §170.2(c)3	NA2.2.4.1.5 NA7.18	NRCA-MCH-20d-H NRCV-MCH-27b LMCV-MCH-27b	HERS Rater or CMATT

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Nonresidential and Multifamily Buildings: Required Acceptance Tests by Building Feature				
Acceptance Tests <i>To be performed after system is installed but before final permit</i>	Title 24, Part 6 Section	Nonresidential Appendices Test Method	Required Compliance Forms	Who Can Perform the Test
MECHANICAL SYSTEMS (continued)				
Envelope Leakage Multifamily ≥ 4 Habitable Stories	§120.1 §120.4	NA2.3 NA7.18	NRCA-MCH-21-A NRCV-MCH-24a-H NRCV-MCH-24b-H LMCV-MCH-24a-H LMCV-MCH-24b-H	HERS Rater or CMATT
New Ventilation Duct Leakage Multifamily ≥ 4 Habitable Stories	§160.2(b)2Av	NA7.5 NA7.18.3 NA7.18.4	NRCA-MCH-22-A	CMATT
Energy Recovery Ventilation (ERV) or Heat Recovery Ventilation (HRV)	§160.2(b)2Av §170.2(c)3B	NA7.5.4.2 NA7.18.4.1 NA7.18.4.2	NRCA-MCH-23-A	CMATT
COVERED PROCESSES				
Compress Air Systems	§120.6(e)	NA7.13	NRCA-PRC-01-F	Field Technician
Commercial Kitchen Exhaust	§140.9(b)	NA7.11	NRCA-PRC-02-F	Field Technician
Enclosed Parking Garages	§120.6(c)	NA7.12	NRCA-PRC-03-F	Field Technician
Refrigerated Warehouses	§120.6(a) §120.6(a)2 §120.6(a)3 §120.6(a)4 §120.6(a)5 §120.6(a)7 §120.6(a)8	NA7.10.1 NA7.10.2 NA7.10.3.1 NA7.10.3.2 NA7.10.3.3 NA7.10.4 NA7.20	NRCA-PRC-04-F NRCA-PRC-05-F NRCA-PRC-06-F NRCA-PRC-07-F NRCA-PRC-08-F NRCA-PRC-16-F NRCA-PRC-17-F	Field Technician
Elevators (Lighting and Ventilation Controls)	§120.6(f)5 §160.7(a)	NA7.14	NRCA-PRC-12-F	Field Technician
Escalators and Moving Walkways (Speed Controls)	§120.6(g)2	NA7.15	NRCA-PRC-13-F	Field Technician
Laboratory Exhaust Ventilation Systems	§140.9(c)	NA7.16	NRCA-PRC-14-F	Field Technician
Fume Hood Automatic Sash Closure	§140.9(c)4	NA7.17	NRCA-PRC-15-F	Field Technician
Central Steam Trap Fault Detection and Diagnostics Monitoring	§120.6(i)	NA7.19	Not Available*	Field Technician
* Use an NRCI form to document that the steam trap installation is compliant in accordance with Nonresidential Reference Appendix NA7.19 acceptance testing procedures.				

Table 4. Nonresidential and Multifamily Buildings Required Acceptance Tests by Building Feature



For More Information

CALIFORNIA ENERGY COMMISSION

www.energy.ca.gov

Learn more about the California Energy Commission (CEC) and its programs on its website.

2022 Building Energy Efficiency Standards

bit.ly/CEC2022Standards

Explore the main CEC web portal for the 2022 Energy Code, including information, documents and historical information.

2022 Building Energy Efficiency Standards Summary

bit.ly/CEC2022Summary

View or download this visual summary of the Energy Code's purpose, current changes and impact.

2022 Nonresidential and Multifamily Compliance Manual, Chapters 11.2, 13, 14

bit.ly/nonresidential-multifamily-compliance-manual

Read the Compliance Manual for more indepth information on the Energy Code.

Energy Code Hotline

Call: 1-800-772-3300 (Free)

Email: Title24@energy.ca.gov

Online Resource Center

bit.ly/CEC-ORC

Use these online resources developed for building and enforcement communities to learn more about the Energy Code.

Acceptance Test Technician Certification Provider (ATTCP) Program Frequently Asked Questions

bit.ly/ATTCP-Program-FAQ

Consult these FAQs for indepth information on the ATTCP Program.

Home Energy Rating System (HERS) Providers

bit.ly/CEC-HERS-Providers

Start here to find a HERS Provider and HERS Raters.



www.energycodeace.com

Stop by this online "one-stop-shop" for no-cost tools, training and resources designed to help you comply with California's Title 24, Part 6 and Title 20.



Tools

www.energycodeace.com/tools

Explore this suite of interactive tools to understand the compliance process, required forms, installation techniques and energy efficiency regulations in California.

Reference Ace

www.energycodeace.com/content/tools-ace/

Navigate the Title 24, Part 6 Energy Code using an index, keyword search and hyperlinked text.

Q&Ace

www.energycodeace.com/QAndAce

Search our online knowledge base or submit your question to Energy Code Ace experts.



Training

www.energycodeace.com/training

On-demand, live in-person and online training alternatives are tailored to a variety of industry professionals and address key measures.



Resources

www.energycodeace.com/resources

Downloadable materials provide practical and concise guidance on how and when to comply with California's building and appliance energy efficiency standards.

Of Special Interest:

Fact Sheets

- ◇ Multifamily Buildings: What's Changed in 2022
- ◇ Nonresidential Buildings: What's Changed in 2022
- ◇ Nonresidential Commissioning Fact Sheet



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