



What Is Included in this Fact Sheet?

The 2022 California Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) specifies design review and Commissioning requirements for nonresidential buildings.

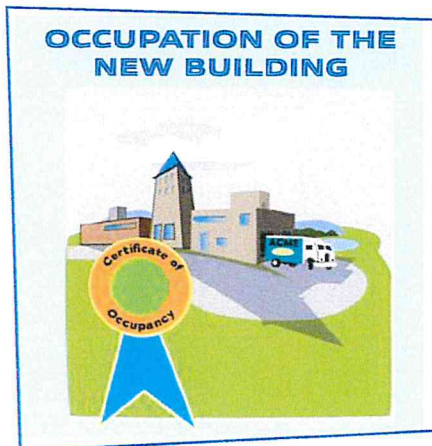
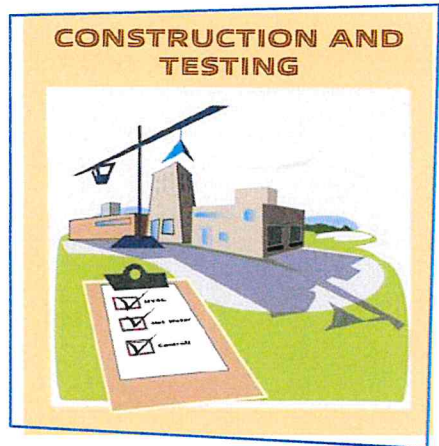
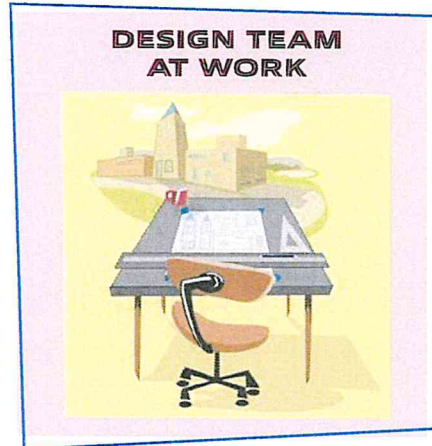
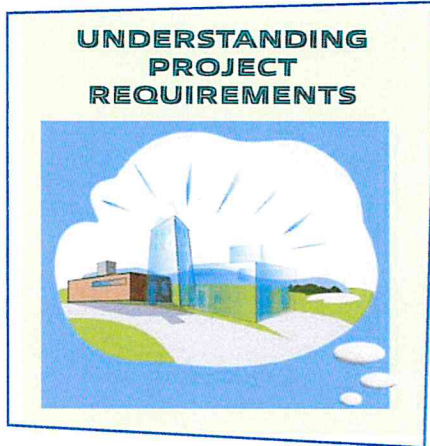


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What Is Design Review and Commissioning and the Importance of Compliance?

Commissioning (Cx) is a quality assurance process to verify that a building and its systems are planned, designed, installed, operated and maintained as the owner intended and that the building staff are prepared to operate and maintain the building’s systems and equipment. Design review is a secondary review of the construction documents (drawings and specifications) that seeks to improve compliance with existing Title 24, Part 6, regulations, encourage adoption of best practices in design, and encourage designs that are constructable and maintainable.

Full Commissioning, which includes all Commissioning tasks, design review and documentation, is required for newly constructed nonresidential buildings that have ≥ 10,000 ft² of conditioned space. For buildings with < 10,000 ft² of conditioned space, only design review and acceptance and verification testing requirements are required. See [Table 1](#) and [Table 2](#) for a list of nonresidential building and occupancy types that have Commissioning requirements in the 2022 Energy Code. See [Table 3](#) for an overview of the Commissioning process.

If the newly constructed building is a mixed-use building with any “R” occupancies (hotel, motel and multifamily), only the conditioned nonresidential occupancies of the mixed-use building are required to meet the design review and Commissioning requirements. In an “R” occupancy, all areas of the building, including common use areas, are not subject to these requirements.

Commissioning is not required for the following:

- ✦ Additions to existing buildings
- ✦ Alterations of existing buildings
- ✦ Multifamily, hotel or motel buildings (Occupancy R)
- ✦ Licensed healthcare facilities (Occupancy I)

Figure 1. Commissioning Requirements For Nonresidential Buildings

Commissioning Requirements

Commissioning requirements are included in [§120.8](#) of the Energy Code and apply to newly constructed nonresidential buildings except healthcare facilities. Healthcare facilities must instead comply with the applicable requirements of Chapter 7 of the

California Administrative Code (Title 24, Part 1). Mixed use, such as hotel/motel and high-rise residential projects that have nonresidential occupancies, trigger Commissioning requirements. These requirements apply to systems serving the nonresidential occupancies of the building. Areas that are intended for use by

residents of the dwelling units (i.e. lobby, gym, laundry room and other common areas within the "R" occupancy) are not subject to meeting the Commissioning requirements. See Table 1 below for examples of building types subject to Commissioning and [Table 2](#) for building types that are not.

Occupancies and Buildings Covered in this Fact Sheet

Building Type	Code	Occupancy Group and Building Type California Building Code §§303-309, 311-312	Examples of Building Types Subject to Commissioning
Nonresidential Buildings	A	Assembly: Buildings or spaces where groups of people gather for civic, social or religious functions, recreation, food or drink consumption, entertainment, awaiting transportation, or television and movie production, among other uses	Occupancy Group A: Assembly Examples: Auditoriums, convention centers (assembly buildings), libraries, tenant lease spaces*, theaters
	B	Business: Buildings or spaces for office, professional or service-type transactions, including storage of records and accounts	Occupancy Group B: Business Examples: Financial institutions, offices, restaurants, tenant lease spaces* <i>Healthcare facilities are exempt.</i>
	E	Education: Buildings or spaces used for more than 6 persons at any one time for educational purposes through the 12th grade	Occupancy Group E: Education Examples: Schools for any number of students at any grade level
	F	Factory: Buildings or spaces used for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy	Occupancy Group F: Factory Examples: Warehouses, tenant lease spaces*
	H	High Hazard: Buildings or spaces that involve the manufacturing, processing, generation or storage of materials that constitute a substantial physical or health hazard	Occupancy Group H: High hazard Examples: Factories or storage facilities for hazardous materials
	I-2	Institutional: Hospitals and 24-hour medical care facilities	Occupancy Group I-2: Institutional <i>Healthcare facilities are exempt from Energy Code Commissioning but must meet the Commissioning requirements of the California Department of Health Care Access and Information (HCAI).</i>
	M	Mercantile: Buildings or spaces used to display and sell merchandise to the public, plus supporting areas for stocks of goods, wares or merchandise	Occupancy Group M: Mercantile Examples: Grocery stores, retail stores, tenant lease spaces*
	S	Storage: Buildings or spaces used to store materials that are not classified as hazardous	Occupancy Group S: Storage Examples: Self storage facilities
	U	Miscellaneous: Accessory buildings and structures and miscellaneous structures not classified in any specific occupancy	Occupancy Group U: Miscellaneous Examples: Nonresidential accessory buildings

* Tenant lease space is a room or area in a building intended for lease for which a specific tenant is not identified at the time of building permit application

Table 1. Occupancies and Buildings Covered in this Fact Sheet - Examples of Building Types Subject to Commissioning



Building Types NOT Subject to Commissioning

Table 2 below lists types of residential buildings that are NOT subject to Commissioning requirements.

Occupancies and Buildings NOT Covered in this Fact Sheet			
Building Type	Code	Occupancy Group and Building Type California Building Code §310	Examples of Building Types <i>NOT</i> Subject to Commissioning
Single-family Buildings	R-3	Residential Group R-3: Buildings with 2 or fewer dwelling units for permanent residents	Single-family: Occupancy Group R-3 buildings with 2 or fewer dwelling units Single-family buildings are exempt.
Multifamily Buildings	R-2	Residential Group R-2: Buildings with 3 or more dwelling units for permanent residents	Multifamily: A building, other than hotel or motel, of Occupancy Group R-2, R-3 or R-4 Multifamily buildings are exempt. This includes common use spaces intended for use by the residents of the dwelling units, such as lobby, gym, laundry room and other common areas within the R occupancy. Nonresidential occupancies in mixed-use buildings are required to meet Commissioning requirements when applicable.
	R-3	Residential Group R-3: Some multifamily congregate residences with primarily permanent residents	
	R-4	Residential Group R-4: Supervised residential environments for more than 6 ambulatory clients and up to 16 total residents, excluding staff	
Hotel and Motel Buildings	R-1	Residential Group R-1: Buildings with sleeping units for primarily transient occupants	Residential Group R-1: Hotel and motel Hotel and motel buildings are exempt. This includes common use spaces intended for use by the occupants of the guest rooms, such as lobby, gym, laundry room and other common areas within the R occupancy. Nonresidential occupancies in mixed-use buildings are required to meet Commissioning requirements when applicable.

Table 2. Occupancies and Buildings NOT Covered in this Fact Sheet - Examples of Building Types NOT Subject to Commissioning



Start Early!



If your project requires Commissioning or design review, it is important to start the Commissioning process promptly to meet the 2022 Energy Code requirements. These include holding a design review kickoff meeting, and preparing the owner's project requirements (OPR) and basis of design (BOD) to complete the Commissioning design review. See [Table 3](#) for a list of requirements.

Energy Code Ace™ has developed the Virtual Compliance Assistant (VCA) to support you in understanding, completing and documenting the Commissioning process, as well as to help you in completing some of the required forms and verifying compliance. The VCA facilitates use of the Certificates of Compliance required for Commissioning and design review (NRCC-CXR-E used for Nonresidential and High-rise Multifamily buildings and LMCC-CXR-E used for Low-rise Multifamily buildings) as a design tool supporting the many layers associated with Commissioning and design review.

The VCA is available at no cost in the Energy Code Ace website at [Virtual Compliance Assistant](#).

Key Terms

Basis of Design (BOD): A written explanation of how the design of the building systems meets the OPR that must be completed at the design phase of the building project and updated as necessary during the design and construction phases and must cover the following systems and components:

- ✦ HVAC systems and controls
- ✦ Indoor lighting system and controls
- ✦ Water-heating systems and controls
- ✦ Any building envelope component considered in the OPR
- ✦ Other: Any other building equipment or systems listed in the OPR such as photovoltaics (PV) and battery storage

Commissioning Agent: Either a third-party Commissioning provider or an experienced member of the design team or owner's staff who plans, schedules and coordinates the Commissioning team to implement the Commissioning process

Commissioning Plan: Prior to permit issuance, a Commissioning plan must be completed to document how the project will be commissioned during construction. It must include Commissioning goals, systems to be commissioned, and the plans to test those systems and components, including any required acceptance testing or HERS verification required by the Energy Code.

Design Reviewer: The person who reviews the design documents to ensure the design will likely meet the OPR and Energy Code requirements

Functional Performance Test (FPT): Test to ensure that all components, equipment, systems and system-to-system interfaces were installed as specified, and operate according to the OPR, BOD, and plans and specifications

Operations and Maintenance (O&M) Manuals: Documents that provide information necessary for operating and maintaining installed equipment and systems

Owner's Project Requirements (OPR): A document that establishes the owner's goals, requirements and expectations for everything related to energy consumption and operation and that documents the energy-related expectations and requirements of the building before the design phase of the project, including:

- ✦ Energy efficiency goals
- ✦ Ventilation requirements
- ✦ Project program, including facility functions and hours of operation and need for after-hours operation
- ✦ Equipment and systems expectations
- ✦ Building envelope performance expectations

VIRTUAL COMPLIANCE ASSISTANT WELCOME SCREEN

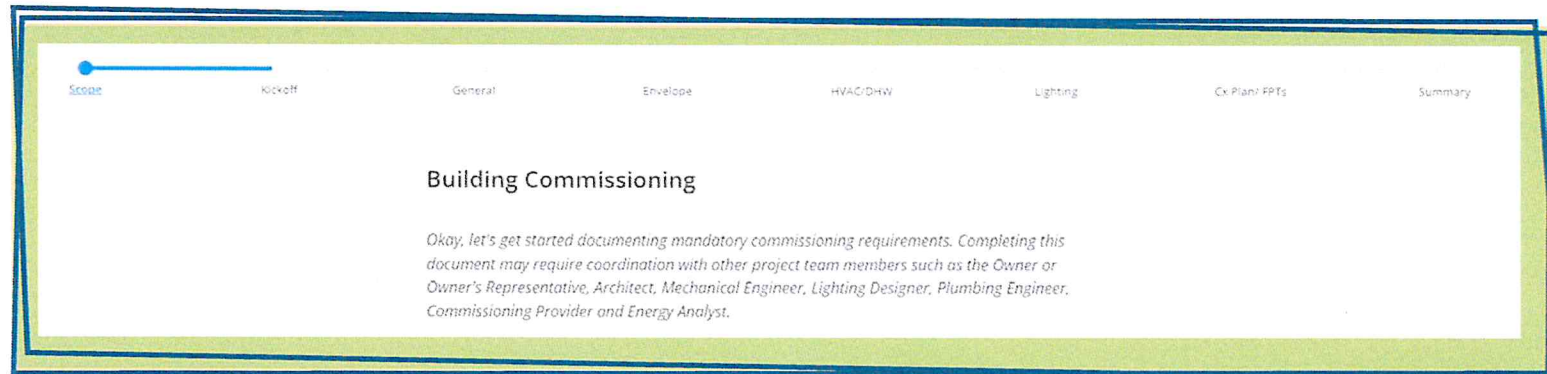


Figure 2. Virtual Compliance Assistant Welcome Screen



THE COMMISSIONING PROCESS

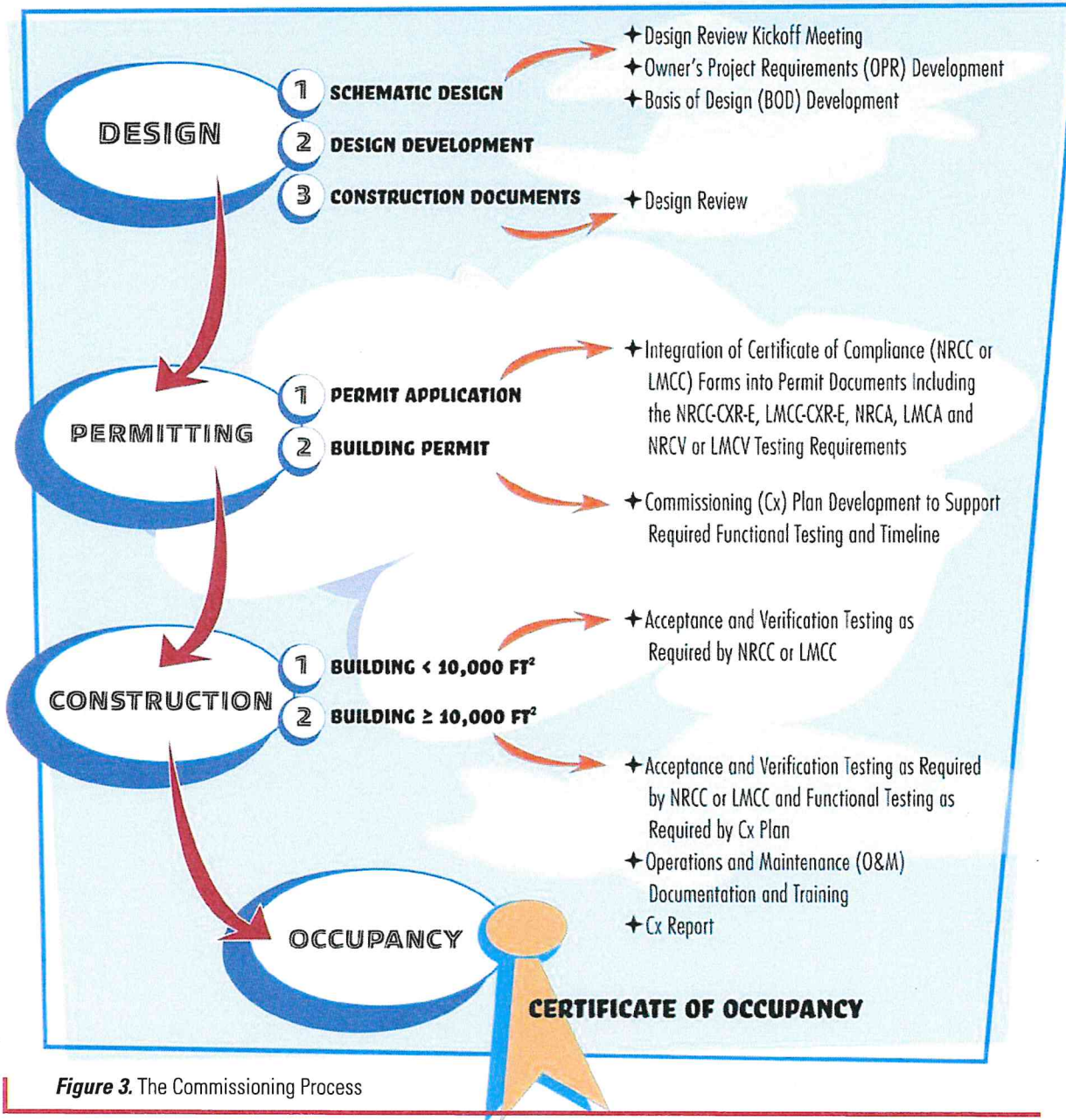


Figure 3. The Commissioning Process

Commissioning Process

The most appropriate person to fill each of the roles in [Table 4](#) depends on the experience and expertise of the project team. The Energy Code does not specify who must function as the commissioning agent. However, there are restrictions in [§120.8\(d\)1](#) on who may act as the design reviewer. See the Commissioning Design Review section and [Table 5](#) for more information.

Title 24, Part 11 (CALGreen)

Title 24, Part 11 (CALGreen) also includes requirements for Commissioning in *Chapter 5 - Nonresidential Mandatory Measures*. These requirements are complementary to the Energy Code requirements, but be sure to read through them as additional systems such as renewable energy, landscape irrigation and water reuse systems are covered here.



Commissioning Process Overview

Table 3 below supports the various tasks required for either Design Review or Commissioning. The table lists requirements based on project conditioned floor area, and it shows how the Virtual

Compliance Assistant can support the process. Table 3 also explains which team members are responsible for each task and when the task should be accomplished in the project timeline.

Commissioning Process Overview						
Phase	Tasks and Documents	When Required by Energy Code: Conditioned Space		What the Virtual Compliance Assistant (VCA) Provides	Roles and Responsibilities	When
		< 10,000 ft ²	≥ 10,000 ft ²			
Design	Design Review Kickoff Meeting §120.8(d)1 Compliance Manual Commissioning Guide Ch. 13.4.2A	Required	Required	Documentation of the meeting date and participants via the NRCC-CXR-E or LMCC-CXR-E Certificate of Compliance form, reminders can be utilized to support design and construction schedule.	Roles include building owner, design team, engineers and energy analysts who participate in the design review kickoff meeting in which they: Discuss the project scope, schedule and how the design reviewer will coordinate with the project team. Discuss who the design reviewer will be as specified by the Energy Code.	Hold meeting when project team is selected.
	Owner's Project Requirements (OPR) §120.8(b) Compliance Manual Commissioning Guide Ch. 13.2	Not Required	Required	Includes template, if desired, for OPR.	Roles include building owner or owner's representative who develops the OPR.	Develop in the pre-design phase.
	Basis of Design (BOD) §120.8(c) Compliance Manual Commissioning Guide Ch. 13.3	Not Required	Required	Includes template, if desired, for BOD.	Roles to develop the BOD include: Mechanical Designer/Engineer: HVAC systems and controls and water heating systems and controls. Electrical Designer/Engineer: Indoor lighting system and controls Designer/Architect: Any building envelope component that should be considered Other: Any other building equipment or systems listed in the OPR such as photovoltaics (PV) and battery storage.	Draft during schematic design and update as necessary.
	Design Review §120.8(d) Compliance Manual Commissioning Guide Ch. 13.4	Required	Required	Includes template, if desired, for design review.	Roles include the design reviewer who meets the minimum requirements based on project size and the mechanical equipment type. The completed and signed NRCC-CXR-E Certificate of Compliance indicates that the construction documents design review has been completed.	Complete and include form in the construction documents for the plan check.
✓ Milestone: Design Completed						

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Commissioning Process Overview						
Phase	Tasks and Documents	When Required by Energy Code: Conditioned Space		What the Virtual Compliance Assistant (VCA) Provides	Roles and Responsibilities	When
		< 10,000 ft ²	≥ 10,000 ft ²			
Permitting	Commissioning Measures in Construction Documents §120.8(e) Compliance Manual Commissioning Guide Ch. 13.5	Required	Required	All applicable NRCC or LMCC indicates what testing is required during construction (e.g., envelope, lighting and Performance reports).	The design team member identified as responsible during the design review kickoff meeting (such as the energy consultant or applicable design professional) provides these measures.	Include in the construction documents submitted for plan check.
	Commissioning Plan §120.8(f) Compliance Manual Commissioning Guide Ch. 13.6	Not Required	Required	Includes template, if desired, for the Commissioning plan.	Commissioning agent completes and distributes the Commissioning plan, which includes an overall plan for testing systems and components supporting: <ul style="list-style-type: none"> ✦ An explanation of the original design intent ✦ Equipment and systems to be tested, including the extent of tests ✦ Functions to be tested ✦ Conditions under which the test must be performed ✦ Measurable criteria for acceptable performance ✦ Commissioning team information ✦ Commissioning process activities, schedules and responsibilities 	Produce before construction begins and share with construction team. Include a draft of the Commissioning plan in construction documents submitted for plan check.
✓ Milestone: Permit Application Submitted; Permit Issued						

(Continued)



(Continued)

Commissioning Process Overview						
Phase	Tasks and Documents	When Required by Energy Code: Conditioned Space		What the Virtual Compliance Assistant (VCA) Provides	Roles and Responsibilities	When
		< 10,000 ft ²	≥ 10,000 ft ²			
Construction	Functional Performance Testing and Documentation §120.8(g) Compliance Manual Commissioning Guide Ch. 13.7	Not Required	Required	Includes template, if desired, for functional testing.	The contractor (or responsible party) coordinates testing with the Commissioning agent who is overseeing and documenting testing results.	Perform testing throughout construction.
	Operations and Maintenance (O&M) Systems Manual §120.8(h)1 Compliance Manual Commissioning Guide Ch. 13.8	Not Required	Required	Records that documentation has been provided.	The operation of the building and its systems must be included in the systems manual, and the manual must be delivered to the building owner or representative and facilities operator.	Develop manual before occupancy.
	Systems Operation Training §120.8(h)2 Compliance Manual Commissioning Guide Ch. 13.9	Not Required	Required	Records that training has been provided.	The training of the maintenance staff for each equipment type or system must be documented in the Commissioning report.	Conduct training before occupancy.
	Commissioning Report §120.8(i) Compliance Manual Commissioning Guide Ch. 13.10	Not Required	Required	Records that documentation has been provided.	The Commissioning agent completes and provides the report to the building owner or representative. The report confirms that commissioned systems meet the conditions of the OPR, BOD and contracts. It documents Commissioning Process activities undertaken through the design and construction phases of the project and may include recommendations for post-construction phases of the building project.	Provide report before occupancy permit is granted.
✓ Milestone: Certificate of Occupancy Issued						
<i>BOD = Basis of Design; HVAC = Heating, Ventilation and Air Conditioning; O&M = Operations and Maintenance; OPR = Owner's Project Requirements; VCA = Virtual Compliance Assistant.</i>						

Table 3. Commissioning Process Overview



Commissioning Design Reviewer Qualifications

The Energy Code in [§120.8\(d\)](#) specifies the qualifications required for the Commissioning design reviewer by building size and system complexity. See Table 4. (For a list of the required commissioning forms for nonresidential, mixed-use and low-rise multifamily buildings, see Table 5.)

Functional Performance Testing vs. Acceptance Testing

Per [§120.8\(g\)](#), functional testing performed to satisfy Commissioning requirements in nonresidential buildings (other than healthcare facilities) must be performed in accordance with acceptance testing procedures outlined in other sections of the Energy Code to demonstrate the correct installation and operation of each component, system and system-to-system interface.

Note that functional performance tests needed for Commissioning are based on the systems documented in the Owner's Project Requirements (OPR) and Basis of Design (BOD) documents as supported in the Commissioning plan and may be more comprehensive than the project's required acceptance tests. Not being included in the OPR or BOD does not exempt a system from acceptance test requirements outlined in other sections of the Energy Code.

For more information on acceptance test requirements, see the [Nonresidential and Multifamily Buildings Acceptance Testing Fact Sheet](#).

Commissioning Forms

For a list of the required Commissioning forms for nonresidential, mixed-use low-rise multifamily buildings, see Table 5.

Commissioning Design Reviewer Qualifications			
Commission (Cx) and Design Review §120.8 (NRCC-CXR-E) / HC: Use OSHPD Cx Requirements			
Building Size	< 10,000 ft ²	10,000 - 50,000 ft ²	> 50,000 ft ² or ≥ 10,000 ft ² and Complex Systems*
System	<ul style="list-style-type: none"> ✦ Complex System(s) serving < 10,000 ft² ✦ Simple System(s) serving ≤ 50,000 ft² 		<ul style="list-style-type: none"> ✦ Complex System(s) serving ≥ 10,000 ft² ✦ Simple System(s) serving > 50,000 ft²
Allowed Design Reviewer	A licensed professional engineer, architect or contractor, including the engineer or architect of record	A qualified engineer or architect in-house to the design firm but not associated with the project, a third-party engineer, architect or contractor	An independent review by a third-party engineer, architect or contractor
<p>*Complex and Simple Systems:</p> <p><i>Complex mechanical systems include any of the following:</i></p> <ul style="list-style-type: none"> ✦ Fan systems serving multiple thermostatically controlled zones ✦ Built-up air handler systems (non-unitary or non-packaged HVAC equipment) ✦ Hydronic or steam heating systems ✦ Hydronic cooling systems <p><i>Simple mechanical systems have any of the following:</i></p> <ul style="list-style-type: none"> ✦ Unitary or packaged equipment listed in Tables 110.2-A, 110.2-B, 110.2-C and or 110.2-E that each serves one zone <p><i>Two-pipe, heating-only systems that serve one or more zones</i></p>			

Table 4. Commissioning Design Reviewer Qualifications

Commissioning Forms Required by Building Type				
Building Type	Certificates of Compliance	Certificates of Acceptance	Certificates of Verification	Cx Specific when ≥ 10,000 ft ² CFA of NR Occupancy
Nonresidential and High-rise Multifamily Buildings	NRCC-CXR-E	NRCA-###-##-A or F	NRCV-MCH-##-H	OPR, BOD, Cx Plan, O&M Manual, Cx Report
Mixed-use Low-rise Multifamily Buildings	LMCC-CXR-E	NRCA-###-##-A or F	LMCV-MCH-##-H	OPR, BOD, Cx Plan, O&M Manual, Cx Report
<p>BOD = Basis of Design; CFA = Conditioned Floor Area; Cx = Commissioning; O&M = Operations and Maintenance; OPR = Owner's Project Requirements.</p>				

Table 5. Commissioning Forms Required by Building Type



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](#)

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

[2022 Building Energy Efficiency Standards Summary](#)

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

Energy Code Hotline

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

Email: Title24@energy.ca.gov

[Online Resource Center](#)

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

[Nonresidential & Multifamily Compliance Manual
Chapter 13 - Commissioning Guide](#)



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

[Energy Code Ace Tools](#)

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

[Reference Ace](#)

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

[Q&Ace](#)

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

[Virtual Compliance Assistant](#)

Get interactive help to fill in NRCC or LMCC Forms.



Training

[Energy Code Ace 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](#)
- ◇ [2022 Title 24, Part 6 Essentials - Nonresidential Standards: What Is Acceptance Testing?](#)



Resources

[Energy Code Ace 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 and Multifamily Buildings Acceptance Testing Fact Sheet](#)

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