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2. Compliance and Enforcement

2.1 Overview

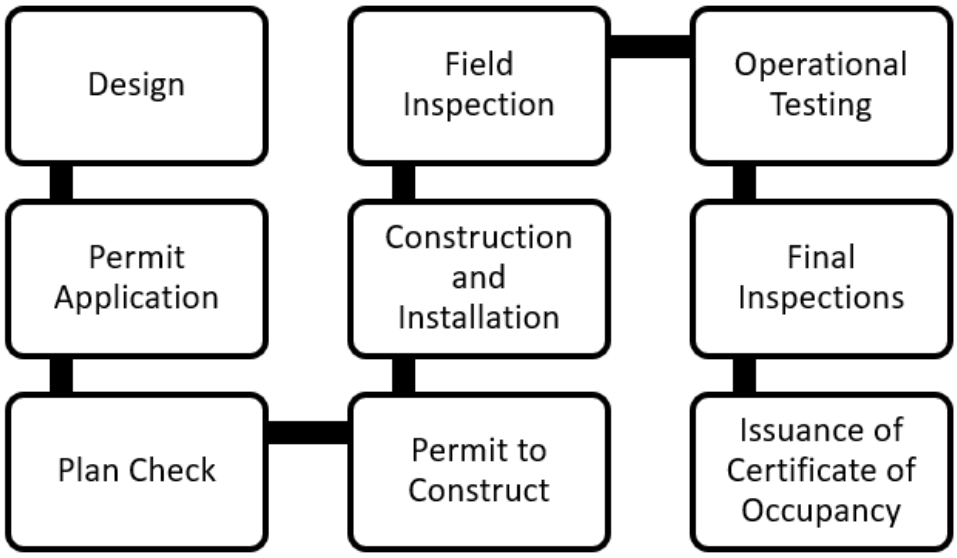
This chapter is organized as follows:

2.1 Overview
2.2 The Compliance and Enforcement Process
2.3 Final Inspection by the Enforcement Agency and Issuance of the Certificate of Occupancy
2.4 Compliance Documentation
2.5 Roles and Responsibilities

The California Building Standards Code is Title 24 of the California Code of Regulations and includes 12 parts covering all aspects of building construction regulations in California. The Building Energy Efficiency Standards (Energy Code) is Part 6 of Title 24. Primary responsibility for compliance with the Energy Code rests with the builder and building owner. The builder or building owner must demonstrate compliance with the Energy Code to an enforcement agency. The California Energy Commission (CEC) does not directly enforce the Energy Code. Enforcement agencies have the primary responsibility to issue a building permit for newly constructed buildings or additions and alterations to existing buildings and enforcement of all Parts of Title 24, including the Energy Code.

Most enforcement agencies are typically associated with a city or county government but can also include other agencies such as the California Division of the State Architect (for public schools). This chapter (Chapter 2) of the Nonresidential and Multifamily Compliance Manual is intended to show how compliance (by the builder) and enforcement (by the enforcement agency) of the Energy Code is achieved in the typical building project permitting process. Most enforcement agencies follow some version of the permitting process recommended by the International Code Council (ICC). Figure 2.1-1 shows an idealized version of the ICC permitting process.

Figure 2.1-1: Idealized International Code Council Permitting Process for Building Permit Applications



Source: California Energy Commission staff

To assist the builder, building owner, and enforcement agency, the CEC created four categories of compliance documents used to demonstrate compliance with the Energy Code for nonresidential construction projects and multifamily projects with four habitable stories or more:

- Certificates of compliance documents (NRCCs) are completed by the project proponent and submitted to the enforcement agency during the plan review phase.
- Certificates of installation (NRCI) are completed by the installing technician or contractor during construction and submitted to the enforcement agency during the project inspection phase.
- Certificates of acceptance (NRCA) are completed by the technician (may be in-house or third-party) who checks compliance of the installation with the Commission's acceptance testing requirements and submitted to the enforcement agency during the final inspection phase and prior to the enforcement agency issuing the certificate of occupancy. For lighting controls and mechanical system, the NRCA must be completed by a technician certified by a CEC-approved certification provider to perform the acceptance tests.
- Certificates of verification (NRCV, part of the CF3Rs) are required in some relatively rare instances. They are completed by an independent, third-party agent certified by a CEC-approved Home Energy Rating System (HERS) provider and submitted to the enforcement agency during the final inspection phase and prior to the enforcement agency issuing the certificate of

occupancy. Alternatively, the Certificate of verification can be waived if the related NRCA is completed by a certified Acceptance Testing Technician (ATT).

For residential construction projects, including multifamily projects with three habitable stories or less, the CEC created three categories of compliance documents for Energy Code compliance:

- Certificates of compliance (CF1R) are completed by the project proponent and submitted to the enforcement agency during the plan review phase.
- Certificates of installation (CF2R) are completed by the installing technician or contractor during construction and submitted to the enforcement agency during the project inspection phase.
- Certificates of verification (CF3R) are completed by an independent, third-party agent certified by a CEC-approved field verification and diagnostic testing provider and submitted to the enforcement agency during the final inspection phase and prior to the enforcement agency issuing the certificate of occupancy.

The independent, third-party agents responsible for completion of the certificates of verification are made available through the CEC's Home Energy Rating System (HERS) program. The HERS program consists of providers, approved by the CEC to train, certify, and oversee HERS Raters, who perform specific tests on energy efficiency features as required by the Energy Code. The related compliance process requires participation from the architect, building designer, engineers, energy consultants, contractors, the owner, HERS Raters, and others. In this compliance process, the HERS Raters are the agents that are independent and third-party from the builders, contractors and HERS Providers.

The certified technician responsible for the NRCAs are made available through the CEC's Acceptance Test Technician Certification Provider (ATTCP) program. Certified technicians are referred to as acceptance test technicians (ATTs) and are required to perform the NRCA acceptance tests for lighting controls and mechanical systems. Unlike HERS Raters, ATTs are not required to be independent, third-party agents from the builder. ATTs can (and often do) perform the installation work as well as acceptance testing of the lighting controls or mechanical systems.

This chapter describes the overall compliance and enforcement process and responsibilities throughout the permitting process. The scope of the Nonresidential and Multifamily Compliance Manual includes newly constructed buildings as well as addition and alterations to existing buildings. Building types covered in this manual include all of the following occupancy groups:

- Group A: Assembly, this occupancy is a used for gatherings such as civic, social, religious function, recreation, food/drink consumption, or waiting for transportation.

- Group B: Business, this occupancy is a used for functions such as an office or a professional or a service-type transaction.
- Group E: Educational, this occupancy is typically where six or more persons at any one time occupy a space for educational purposes through the twelfth grade.
- Group F: Factory and Industrial, this occupancy involves assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair, and processing operations that would not be otherwise classified as a Group H or Group S occupancy.
- Group H: High Hazard, this occupancy includes manufacturing, processing, generation, or storage of materials that can constitute a physical or health hazard. Group H occupancies are classified into five high-hazard areas that identify the type of hazard for each group.
- Group I: Institutional, where care or supervision is provided to people who are or are not capable of self-preservation without physical assistance or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted.
- Group M: Mercantile, involving the display and sale of merchandise, stocking of goods, and is accessible to the public.
- Group S: Storage, this occupancy involves a building that is used for storage purposes.
- Group U: Utility and Miscellaneous, this occupancy involves a building or structure that is used as an accessory or miscellaneous use not classified as any other specific occupancy.
- Hotel/Motels have six or more guest rooms or a lobby serving six or more guest rooms, where the guest rooms are intended or designed to be used, or which are used, rented, or hired out to be occupied, or which are occupied for sleeping purposes by guests, and all conditioned spaces within the same building envelope. Hotel/motel also includes all conditioned spaces that are (1) on the same property as the hotel/motel, (2) served by the same central heating, ventilation, and air-conditioning system as the hotel/motel, and (3) integrally related to the functioning of the hotel/motel as such, including, but not limited to, exhibition facilities, meeting and conference facilities, food service facilities, lobbies, and laundries. Hotel/motel also includes:
    - Group R-1, sleeping units in this occupancy group are primarily transient in nature including vacation timeshare properties. This occupancy group is most often associated with hotels and motels.
    - Group R-2, sleeping units or more than two dwelling units where the occupants are primarily permanent. For example: convents, dormitories, nontransient hotels, or vacation timeshare properties.
    - The following types of Group R-3:

- Congregate residences for transient use
- Boarding houses of more than six guests
- Alcohol or drug abuse recovery homes of more than six guests.

Additionally, the Nonresidential and Multifamily Compliance Manual includes a chapter regarding multifamily buildings (Chapter 11). Multifamily buildings are considered separate from nonresidential buildings. The Energy Code defines multifamily buildings as a building of occupancy group R-2 (other than a hotel/motel building or timeshare property), R-3 (that is a nontransient congregate residence, other than boarding houses of more than six guests and alcohol or drug abuse recovery homes of more than six guests), or R-4, more than 5 people but no more than 16, excluding staff, who reside on a 24-hour basis where the occupants are in a supervised residential environment and receive custodial care.

2.1.1 Manufacturer Certification for Equipment, Products, and Devices

During the permit application development phase, certain equipment, products, and devices must be selected for installation or use that are certified to be compliant with the Energy Code. These items are identified on the NRCC or the CF1Rs or both and are verified during inspection by the enforcement agency.

The equipment, products, and devices must be certified to the CEC by the manufacturer that it meets requirements under the Energy Code. The CEC makes no claim that the listed equipment, products, or devices meet the indicated requirements or, if tested, will confirm the indicated results. Inclusion on these lists confirms only that a manufacturer certification has been submitted to and accepted by the CEC. See the CEC's website for additional information about the required information for manufacturers to certify products and for lists of certified products:

http://www.energy.ca.gov/title24/equipment_cert/

In nonresidential buildings, the following are examples of products that must be certified by the manufacturer:

- Air economizers
- Airflow measurement apparatus — forced air systems
- Airflow measurement apparatus — ventilation systems
- Airflow measurement apparatus — whole house fan systems
- Air-to-water heat pump systems
- Economizer fault detection and diagnostics
- Intermittent mechanical ventilation systems
- Low-leakage air-handling unit
- Occupant-controlled smart thermostats
- Demand-responsive control systems

- Ducted variable capacity heat pump
- Fault indicator display
- Battery and energy storage systems

2.1.2 HERS Program Compliance Document Registration

§10-103
Reference Residential Appendix RA2
Reference Joint Appendix JA7
Reference Nonresidential Appendix NA1 and NA2

The HERS program was developed by the CEC to help ensure compliance with the Energy Code for residential projects that need to include a HERS Rater to perform required field verification and diagnostic tests (HERS Verification). For nonresidential projects, a HERS Rater may be required to perform a verification in two instances: duct leakage tests (for single zone HVAC systems with ducts primarily located outside of conditioned space) and compact plumbing designs.

Registration of residential compliance documentation (CF1Rs, CF2Rs, CF3Rs, and NRCVs) is required for any residential construction project for which a CF3R is required (not all residential construction projects require a CF3R). In this manual, the low-rise multifamily projects are the only residential projects that would be required to use the HERS program.

All residential compliance documents (CF1Rs, CF2Rs, and CF3Rs) submitted to the registry must be certified and signed by the applicable responsible person (§10-103) and the author of the document. The data registry will assign a unique registration number to each document when completed and certification (by an electronic signature) is provided by all signatories. The data registry will retain the unique registered documents, which are available via secure internet access to authorized users. This availability allows authorized users to make paper copies of the registered documents for purposes such as submitting to the enforcement agency, posting copies in the field for inspections, and providing copies to the building owner.

Authorized users of the registry include energy consultants, builders, building owners, construction contractors and installers, HERS Raters, enforcement agencies, and the CEC. Authorized users are granted access rights to the electronic data associated with the projects under their direct or shared control.

Registration requirements are described in this chapter and elsewhere in this manual. Also, Reference Joint Appendix JA7 provides detailed descriptions of document registration procedures and individual responsibilities for registration of CF1Rs, CF2Rs, and CF3Rs. More Details regarding registration requirements for NRCVs are found in Reference Nonresidential Appendix NA1 and NA2.

2.2 Compliance Phases

2.2.1 Design Phase

The design phase for newly constructed buildings is significant and can extend for more than a year in some cases. In fact, many projects fail during the design phase. This phase sets the stage for the construction project, anything from a newly constructed nonresidential or multifamily building to additions or alterations of an existing building. The design, plans, and compliance documentation are initially developed in the design phase. While nonresidential and multifamily projects typically rely heavily on design professionals (architect, engineers, contractors, etc.), it is ultimately the responsibility of the project owner(s) to ensure that the project complies with all applicable requirements of the California Building Code — including the Energy Code. Energy Code compliance is demonstrated by completing the required NRCCs for nonresidential, hotel/motel, and high-rise multifamily projects; NRCCs and CF1Rs for low-rise multifamily projects.

In addition to issues concerning zoning, lot orientation, property line easement, and infrastructure, design professionals are responsible for California Building Code compliance as well as local ordinances. The obligation to comply with building codes and ordinances is based on professional and contractor licensing laws, the contract to perform work on the project, and the standard of care for workmanship. The contractor can attempt to shift their obligations for code-compliant plans to the owner and the architect or engineer. However, the contractor should make it a practice to review the plans and specifications for code compliance prior to entering into a contract. If the contractor finds inaccuracies and errors in the plans and specifications that are code violations, they should immediately notify the owner, architect, or engineer. Project owners would be well advised to include a contractor review of the design plans and compliance documents prior to submitting them to a enforcement agency for a permit to construct.

2.2.2 Building Commissioning

§10-103(a); §120.8

Building commissioning is both a general industry term and a defined term (with associated regulations in §120.8) within the Energy Code. Originally, the term "commissioning" came from the ship building industry, with the intent of that commissioning transferring to the concept of building commissioning. When a building is commissioned, it is intended to undergo a quality assurance process that begins during design and continues through construction, occupancy, and operations. Commissioning is intended to ensure that the newly constructed buildings perform initially as intended and that building staff are prepared to operate and maintain the systems and equipment to continue that performance.

The Energy Code defines "building commissioning" as a systematic quality assurance process that spans the entire design and construction process, including verifying

and documenting that building systems and components are planned, designed, installed, tested, operated, and maintained to meet the owner's project requirements.

The CEC does not require certification to perform building commissioning for the Energy Code. Although a "commissioning agent" is not a defined term within the Energy Code, there are many professionals that are trained and certified by a variety of professional organizations to perform building commissioning. The CEC is aware of these certification programs but does not endorse them.

The Energy Code, Part 1, §10-103(a)1 does require that the person(s) reviewing and signing the commissioning compliance documents must be a licensed professional engineer or a licensed architect (as specified in the provisions of Division 3 of the Business and Professions Code). A licensed contractor that is representing services performed by or under the direct supervision of a licensed engineer or architect is also eligible to sign. The signatory is further restricted by §10-103(a)1 as follows:

- For buildings less than 10,000 square feet, this signatory may be the engineer or architect of record.
- For buildings greater than 10,000 square feet but less than 50,000 square feet, this signatory shall be a qualified in-house engineer or architect with no other project involvement or a third-party engineer, architect, or contractor.
- For buildings greater than 50,000 square feet and all buildings with complex mechanical systems (as defined by the Energy Code) serving more than 10,000 square feet, the signatory shall be a third-party engineer, architect, or contractor.

The square footage referenced in §10-103(a)1 refers to the total square footage of the project. This is an important distinction from the square footage used by the building commissioning triggers below.

Building commissioning (§120.8) applies to newly constructed nonresidential, hotel/motels, and high-rise multifamily buildings and is based on the square footage of the **nonresidential spaces** as opposed to the total square footage of these buildings. For example, the corridors, meeting rooms, lobbies, and other public spaces within a newly constructed hotel/motel or high-rise multifamily building count toward the nonresidential space, but the dwelling units themselves do not. Building commissioning does not apply to newly constructed low-rise multifamily buildings but is recommended as an industry best practice. Healthcare facilities are also not required to meet the Energy Code building commissioning requirements but must comply with Chapter 7 Safety Standards for Health Facilities of the California Administrative Code (Title 24, Part 1).

From §120.8, the explicit triggers for building commissioning are as follows:

- Newly constructed nonresidential buildings, including hotel/motels and high-rise residential buildings and excluding healthcare facilities, are required to comply with applicable requirements of §120.8.
- Such buildings with conditioned space of 10,000 square feet or more of nonresidential space are required to comply with the applicable requirements of §120.8(a) through §120.8(i).
- Such buildings with conditioned space of less than 10,000 square feet must comply with only §120.8(d) and §120.8(e).
- All building systems and components covered by Sections 110.0, 120.0, 130.0, and 140.0 are required to be included in the scope of the commissioning process, excluding those related solely to covered processes

CEC building commissioning requires the completion and documentation of the following items (§120.8[a] lists the coded sections within §120.8 that require compliance — §120.8[b] through §120.8[i]):

1. (§120.8[b]) Owner's or owner representative's project requirements (OPR)
    a. Required for projects with 10,000 square feet or more of conditioned nonresidential space
    b. OPR is the energy-related expectations and requirements of the building that are documented before the design phase of the project begins.
    c. Compliance documentation: 2022-NRCC-CXR-E, Table G.
2. (§120.8[c]) Basis of design (BOD)
    a. Required for projects with 10,000 square feet or more of conditioned nonresidential space
    b. BOD is a written explanation of how the design of the building systems and components meets the OPR and is completed at the design phase of the building project and updated as necessary during the design and construction phases. The BOD document at a minimum covers the following systems and components:
        i. Heating, ventilation, air conditioning (HVAC) systems and controls
        ii. Indoor lighting system and controls
        iii. Water heating systems and controls
        iv. Any other building equipment or system listed in the OPR
        v. Any building envelope component considered in the OPR
    c. Compliance documentation: 2022-NRCC-CXR-E, Table H
3. (§120.8[d]) Design Phase Design Review. The design reviewer is the signatory of the design review kickoff certificate(s) of compliance and construction document design review checklist certificate(s) of compliance.

a. Required for all projects with conditioned nonresidential space
b. Design review kickoff. During the schematic design phase of the building project, the owner or owner's representative, design team, and design reviewer must meet to discuss the project scope, schedule, and ways that the design reviewer will coordinate with the project team.
c. Compliance documentation: 2022-NRCC-CXR-E, Table F
d. Construction documents design review. The Construction Document Design Review Checklist Certificate of Compliance lists the items checked by the design reviewer during the construction document review.
e. Compliance documentation: 2022-NRCC-CXR-E, Table I

4. (§120.8[e]) Commissioning measures shown in the construction documents
   a. Required for all projects with conditioned nonresidential space
   b. These documents are complete descriptions of all measures or requirements necessary for commissioning included in the construction documents (plans and specifications).
   c. Compliance documentation: 2022-NRCC-CXR-E, Table I
5. (§120.8[f]) Commissioning plan
   a. Required for projects with 10,000 square feet or more of conditioned nonresidential space
   b. Prior to permit issuance, a commissioning plan is completed to document how the project will be commissioned and is started during the design phase of the building project.
   c. Compliance documentation: 2022-NRCC-CXR-E, Table-J
6. (§120.8[g]) Functional performance testing
   a. Required for projects with 10,000 square feet or more of conditioned nonresidential space
   b. Functional performance tests demonstrate the correct installation and operation of each component, system, and system-to-system interface in accordance with the acceptance test requirements in the Energy Code.
   c. Compliance documentation: 2022-NRCC-CXR-E, Table-K
7. (§120.8[h]) Documentation and training
   a. Required for projects with 10,000 square feet or more of conditioned nonresidential space
   b. This is a systems manual and systems operations training to be provided prior to the owner or owner's representative postconstruction.
   c. Compliance documentation: 2022-NRCC-CXR-E, Table-L

8. (§120.8[i]) Commissioning report
    a. Required for projects with 10,000 square feet or more of conditioned nonresidential space
    b. This is a complete report of commissioning process activities undertaken through the design, construction, and reporting recommendations for postconstruction phases of the building project and is provided to the owner or owner's representative.
    c. Compliance documentation: 2022-NRCC-CXR-E, Table-M

The compliance document NRCC-CXR-E is the bare minimum that the Energy Code requires. Certified commissioning agents will typically provide far more support and organization to a construction project as a matter of their certification training and industry best practices. The CEC encourages but does not require a building commissioning process and documentation beyond the minimum requirements of the Energy Code §120.8.

2.2.2.1 Integrated Design

Integrated design is not required by the Energy Code but is a recognized industry best practice related to building commissioning. "Integrated design" is the consideration that brings the design of all related building systems and components together. It brings together the multiple disciplines involved in designing a building or system and reviews the related recommendations as a whole. It recognizes that the recommendations for each discipline have an impact on other aspects of the building project. This approach allows for optimization of building performance and cost.

For example, often HVAC systems are designed without regard for lighting systems, or lighting systems are designed without consideration of daylighting opportunities.

The architect, mechanical engineer, electrical engineer, contractors, and other team members each have their scope of work and often pursue the work without adequate communication and interaction with other team members. This lack of communication can result in improper system sizing or systems that are optimized for nontypical conditions.

Even a small degree of integration provides some benefit, allowing professionals working in various disciplines to take advantage of design opportunities that are not apparent when they are working in isolation. This can also point out areas where trade-offs can be implemented to enhance energy efficiency. Design integration can avoid redundancy or conflicts with aspects of the building project planned by others. The earlier that integration is introduced in the design process, the greater the benefit that can be expected.

2.2.3 Permit Application

§10-103(a); §10-103(a)2

2.2.3.1 Certificates of Compliance

NRCCs (nonresidential certificates of compliance) are required for newly constructed buildings, as well as additions and alterations to existing buildings. The design team (architects, engineers, designers, or other specialty contractors) is responsible for ensuring that the building designs comply with the California Building Standards Code, including the Energy Code. Once the design team has settled on a code-compliant design, it is required (§10-103[a]) to document the compliance with the Energy Code by completing and signing the NRCCs. Table 2.2-1 lists all the possible NRCCs that the design team may need to use.

Table 2.2-1 Certificates of Compliance

Certificate of Compliance	Certificate Name
NRCC-CXR-E	Building Commissioning
NRCC-ELC-E	Electrical Power Distribution
NRCC-ENV-E	Building Envelope
NRCC-LTI-E	Indoor Lighting
NRCC-LTO-E	Outdoor Lighting
NRCC-LTS-E	Sign Lighting
NRCC-MCH-E	Mechanical Systems
NRCC-PLB-E	Water-Heating Systems
NRCC-PRC-E	Covered Process
NRCC-SRA-E	Solar-Ready Areas

Source: California Energy Commission staff

These NRCCs were available from the CEC (via Energy Code Ace) for 2019 Energy Code compliance and were designed to be dynamic forms that would expand, and contract as needed to describe the proposed project. The CEC adopted the Energy Code Ace Virtual Compliance Assistance (VCA) tool instead of the individual NRCCs for 2022 Energy Code compliance.

The VCA tool uses an interrogatory method to determine what NRCCs are necessary for a specific project, complete the necessary NRCCs based on the information entered, and make them ready for review and signature. The VCA can make recommendations only for projects that use the prescriptive path. (See Chapter 1 of the Nonresidential and Multi-Family Compliance Manual.) To complete the necessary NRCCs for projects using the performance path, the design team must use a CEC-approved compliance model. The CEC maintains a list of these approved compliance models on the 2022 Building Energy Efficiency Standards Approved Computer Compliance Programs website. The compliance model will create an NRCC-PRF-01 form with the necessary information for the design team to complete the required NRCCs.

Regardless of what compliance path or what compliance tool the design team uses, as the applicant applying for a permit to construct with an enforcement agency, the design team is solely responsible for completing the correct NRCCs and designing a code-compliant project. Once the design team has completed the required project

design details, NRCCs, and any other documentation required by the enforcement agency, it can begin the permit application phase by submitting a complete application for a permit to construct to the enforcement agency.

All applicable NRCCs must be signed by a document author and a responsible person. While there are no requirements for the document author, the responsible person must be eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on each NRCC (§10-103[a]). For example, a technician may complete the NRCC-MCH-E, but only the engineer of record (that was on the design team) can review and sign as the responsible person. The responsible person can also act as the document author. Once completed, reviewed by the responsible person, and signed, each NRCC must be included in the application for permit to construct to the enforcement agency.

2.2.3.2 Commissioning Design Review

For newly constructed buildings, the design review kickoff and construction document design review certificate of compliance (NRCC-CXR-E) must be signed by the approved design reviewer, as specified in §10-103(a)1 and submitted for approval by the enforcement agency with the permit application. This document is required for all newly constructed projects with conditioned nonresidential space regardless of the compliance method used (prescriptive or performance). To demonstrate compliance, all projects are required to complete the NRCC-CXR-E. The building owner, representative, design engineer and design reviewer must all sign and date the NRCC-CXR-E once the design review has been completed. Contractors accepting the responsibilities of the engineer under the provision of the Business and Profession Code may sign the documents in place of the design engineer. See Chapter 13 of for more details regarding building commissioning.

2.2.3.3 Preparation and Incorporation Onto the Plans

The length and complexity of the NRCCs may vary depending on the size and complexity of the building(s) or system(s) that are being permitted, regardless of which compliance method is used. The NRCCs are commonly prepared by an energy consultant or energy compliance professional (documentation author) although this is not a requirement of the Energy Code, just an industry practice. An energy consultant should be knowledgeable about the Energy Code and can benefit the design team by offering advice for the selection of the compliance method (prescriptive or performance), compliance tools (VCA or a compliance model or both), and the selection of the energy features used for compliance with the Energy Code. An energy consultant may also provide recommendations for the most cost-effective mix of building energy features for the design.

The Administrative Regulations, §10-103(a)2, require that the NRCCs and any applicable supporting documentation be submitted with the permit application and that the NRCCs be incorporated into the building plans. Many enforcement agencies require that all the energy compliance documents be incorporated electronically onto

the building plans. This incorporation enables the plans examiner to verify that the building or system design specifications shown on construction documentation are consistent with the energy features specified on the NRCCs. Samples of the CEC-approved documents are in Appendix A of this manual. A listing of certificate of compliance documents is available in Table 2.1-1.

2.2.3.4 HERS Data Registry — Compliance Document Registration

High-rise multifamily buildings, some nonresidential duct leakage testing, and plumbing designs are required to register compliance documents with the HERS data registry. The registration requires the builder or designer to become an authorized user of the HERS data registry and submit the required CF1Rs and an electronic signature to an approved HERS data registry to produce a completed, dated, and signed electronic CF1R that is retained by the HERS data registry.

Examples of authorized users of the HERS data registry may include energy consultants, builders, building owners, construction contractors and installers, enforcement agencies, the CEC, and other parties to the compliance and enforcement process that the documents are designed to support. Authorized users of the HERS data registry will be granted read/write access rights to only the electronic data that pertains to their project(s).

2.2.4 Plan Check

§10-103(d)1

2.2.4.1 Plans and Specifications

Enforcement agencies are required to check submitted building plans to determine compliance with the California Building Code, including the Energy Code. Vague, missing, or incorrect information on the NRCCs and CF1Rs may be identified by the plans examiner as requiring correction by the permit applicant. The permit applicant would then resubmit the revised building plans and specifications. When the permit applicant submits comprehensive, accurate, clearly defined building plans and specifications, the submission may help speed plan review. Because the enforcement agency bears responsibility for code enforcement, only it may pursue corrections to approved plans and compliance documents.

During plan review, the enforcement agency must verify that the building design details specified on the construction documents conform to the applicable energy code features information specified on the submitted NRCCs and CF1Rs. This conformance is necessary since materials purchasing personnel and building construction craftsmen in the field may rely solely on a copy of the building plans and specifications for direction in performing their responsibilities.

2.2.4.2 Energy Plan Review

The enforcement agency is responsible for verifying that all required NRCCs and CF1Rs have been submitted for plan review, are consistent with the submitted plans,

and do not contain errors. When the compliance documents are produced by a CEC-approved compliance software application, the VCA, or the HERS data registry, it is unlikely that there will be computational errors on the NRCCs or CF1Rs. Some examples of how the plans examiner will verify that the energy efficiency features detailed on the NRCCs are consistent with the building plans include:

1. Verifying the lighting fixtures and associated wattages, lighting controls, and so forth from NRCC-LTI-E are consistent with the electrical plans in a lighting schedule, lighting fixture legend for the floor plan, etc.
2. Verifying the window and skylight U-factor and SHGC values from NRCC-ENV-E are consistent with the structural/architecture plans in a window/skylight schedule, window/skylight legend for the floor plan, and so forth.
3. Verifying the wall, floor, and roof/ceiling insulation R-values from the NRCC-ENV-E are consistent with the structural/architecture plans in a framing plan, structural details, and so forth.
4. Verifying the HVAC equipment SEER, EER, AFUE, and other efficiency values from the NRCC-MCH-E are consistent with the mechanical plans in an equipment schedule.

Note: The enforcement agency should clearly articulate to the builder/designer the acceptable methods of specifying energy features on the building plans for approval.

2.2.5 Permit to Construct

§10-103(d)1

After the plans examiner has reviewed and approved the building plans, specifications, NRCCs, and CF1Rs for the project, the enforcement agency may issue a building permit at the builder's request. Issuance of the building permit is the first significant milestone in the compliance and enforcement process. The building permit is the green light for the contractor to begin work. In many cases, building permits are issued in phases. Sometimes, there is a permit for site work and grading that precedes the permit for actual construction. In large office, multifamily, or institutional buildings, the permit may be issued in phases, such as site preparation or structural steel.

2.2.6 Construction and Installation

§10-103(a)3

2.2.6.1 Certificates of Installation

As construction begins and progresses, the installing contractor, general contractor, specialty contractor, or other qualified person is required to complete the NRCIs (Nonresidential Certificates of Installation) relevant for each energy efficiency feature being installed. The NRCIs (or CF2Rs) document that the installing contractor is aware of the requirements of the NRCC (or CF1R) and the Energy Code and that the actual construction and installation meet these requirements.

NRCIs are required to be completed and submitted to document compliance of the installation of regulated energy efficiency features such as windows and skylights, water heater, plumbing, HVAC ducts and equipment, lighting fixtures and controls, and building envelope insulation. The licensed contractor responsible for the building construction or the installation of a regulated energy efficiency feature must ensure the work is done in accordance with the approved building plans, specifications, and NRCC (or CF1R) for the project. The installing contractor (and document author) must sign the NRCI.

The responsible persons must also sign the NRCI and are expected to verify that the installed features, materials, components, or manufactured devices for which they are responsible conform to the building plans, specifications, NRCC (or CF1R) approved by the enforcement agency for the project. A copy of the completed, signed, and dated NRCI must be posted at the building site for review by the enforcement agency before the final project inspection.

If construction of any regulated portion of the project will be impossible to inspect once subsequent construction is completed, the enforcement agency may require the NRCI to be posted upon completion of that feature/portion of the project and before completion of any subsequent construction.

A listing of NRCI documents is provided in Table 2.2-2. A copy of the NRCIs must be included with the documentation the builder provides to the building owner at occupancy as specified in §10-103(b). The NRCIs are available through the VCA tool, and the CF2R is available through a HERS data registry. Both the NRCI and CF2R are linked to the NRCCs and CF1Rs, respectively. The NRCI/CF2Rs identify each energy efficiency feature that the contractor must install and provides a check box (if that exact feature is installed). If the feature is changed out for another feature, the NRCI/CF2R provide data entry fields for the new feature and will automatically indicate if the change needs to be approved by the enforcement agency.

Table 2.2-2: Nonresidential Certificate of Installation Documents

Certificate of Installation	Description
NRCI-LTI-E	Indoor Lighting
NRCI-LTO-E	Outdoor Lighting
NRCI-LTS-E	Sign Lighting
NRCI-ENV-E	Envelope
NRCI-SRA-E	Solar-Ready
NRCI-ELC-E	Electrical
NRCI-PLB-E	Plumbing
NRCI-MCH-E	Mechanical
NRCI-PRC-E	Covered Processes

Source: California Energy Commission staff

2.2.6.2 Change Orders

A "change order" is an industry term for a formal amendment to a construction contract that changes the contractor's scope of work. Not all changes to a construction project result in a formal change order. In many instances, the project owner can change the scope of work without a formal agreement. Most change orders modify the work, materials, or time to complete the work. For there to be a valid change order, the owner and contractor must both agree on all terms. Change orders exist because construction plans, although very detailed, cannot possibly anticipate every nuance or issue that may arise on a construction project. Some change orders will affect the plans approved by the enforcement agency and will require a separate approval. For example, changing the finish on an interior wall is unlikely to affect the approved plans, but adding or removing a window will.

For the energy efficiency features recorded on the approved NRCCs and CF1Rs, generally any change that reduces the energy efficiency will require a new NRCC or CF1R to be completed, signed, submitted (to the enforcement agency), and approved. These actions may also result in a special inspection by the enforcement agency. For example, switching to more efficient lighting will not likely result in a change order that is required to be approved, but changing which lights are daylighting-controlled will.

To help track what change orders should result in an enforcement agency approval, the CEC requires that the installing contractor complete the NRCIs and CF2Rs (for low-rise multifamily) using the VCA tool or the HERS data registry. If the enforcement agency approval is required for the change order, the responsible person must update and resubmit the affected NRCC or CF1R or both to the enforcement agency.

However, the automatic evaluation from the VCA tool or the HERS data registry or both are advisory. It is still the responsibility of the builder and building owner to determine if a change order needs to be approved by the enforcement agency regardless of the VCA tool or HERS data registry. Additionally, many enforcement agencies have a stricter policy when it comes to change orders and want them all submitted for review and possible approval regardless of the scope of the change.

2.2.7 Operational Testing

§10-103(a)4; §10-103.1; §10-103.2

Operational testing is part of the competency of workmanship that any installing contractor will perform to verify that their own work is up to industry standards and complies with the project design and California Building Standards Code (including the Energy Code). Formal operational testing is typically referred to as *acceptance testing* or *acceptance criteria verification*. The Energy Code requires specific acceptance testing (performed by the installing contractor) for lighting controls, HVAC controls, air distribution ducts, envelope features, and special purpose equipment, referred to as *covered processes*. However, the Energy Code acceptance testing procedures do not alleviate the installing contractor from performing any manufacturer required startup and commissioning tests for the installed energy efficiency feature. Certified technicians who conduct acceptance testing for lighting and mechanical systems are required by to be trained and certified by a CEC-approved Acceptance Test Technician Certification Provider (ATTCP). These certified technicians are referred to as *acceptance test technicians* (ATTs) The CEC verifies that the ATTCP provides the required classrooms and hands-on training to perform the required acceptance tests and complete the required documentation (§10-103.1 or §10-103.2). Builders and installers will need to ensure that an ATT conducts the required acceptance testing and completes the required NRCAs (Nonresidential Certificates of Acceptance) for lighting controls and mechanical systems. For this purpose, the ATTCPs provide publicly available lists of ATTs certified by the ATTCP. Enforcement agency field inspectors can verify that the submitted NRCAs are signed by an ATT using the same public lists and by inspection of the NRCA itself. Each NRCA is watermarked by the ATTCP that certified the ATT for authentication. The NRCA itself can also be verified by the ATTCP as valid by contacting the ATTCP by phone to email. The CEC keeps a link to all ATTCP at its ATTCP-Website (https://www.energy.ca.gov/programs-and-topics/programs/acceptance-test-technician-certification-provider-program/acceptance). Table 2.2-3 lists the Energy Code required NRCAs and indicates which are to be completed by ATTs through the ATTCP program. For more information of the ATTCP program, see Chapter 14 of the Nonresidential and Multi-Family Compliance Manual.

Table 2.2-3: Nonresidential Certificate of Acceptance

Certificate of Acceptance	Description	ATTCP Required
NRCA-ENV-02-A	Envelope – Fenestration	No
NRCA-ENV-03-A	Envelope – Daylight PAFs	No
NRCA-LTI-02-A	Lighting Controls - Shutoff	Yes
NRCA-LTI-03-A	Lighting Controls – Daylighting	Yes
NRCA-LTI-04-A	Lighting Controls – Demand Response	Yes
NRCA-LTI-05-A	Lighting Controls – Institutional Tuning	Yes
NRCA-LTO-02-A	Lighting Controls – Outdoor	Yes
NRCA-MCH-02-A	Mechanical – Outdoor Air	Yes
NRCA-MCH-03-A	Mechanical – Constant Volume	Yes
NRCA-MCH-04-A	Mechanical – Duct Leakage (ATT)	Yes
NRCA-MCH-05-A	Mechanical – Economizer	Yes
NRCA-MCH-06-A	Mechanical – Demand Control	Yes
NRCA-MCH-07-A	Mechanical – Supply Control	Yes
NRCA-MCH-08-A	Mechanical -Valve Leakage	Yes
NRCA-MCH-09-A	Mechanical – Supply Water	Yes
NRCA-MCH-10-A	Mechanical – Hydronic System	Yes
NRCA-MCH-11-A	Mechanical – Demand Shed Control	Yes
NRCA-MCH-12-A	Mechanical – FDD Package Direct	Yes
NRCA-MCH-13-A	Mechanical – FDD AHU/ZTU	Yes
NRCA-MCH-14-A	Mechanical – Energy Storage	Yes
NRCA-MCH-15-A	Mechanical – Thermal Energy Storage	Yes
NRCA-MCH-16-A	Mechanical – Supply Air Temp.	Yes
NRCA-MCH-17-A	Mechanical – Condenser Water Temp.	Yes
NRCA-MCH-18-A	Mechanical — EMCS	Yes
NRCA-MCH-19-A	Mechanical – Occupancy Sensor	Yes
NRCA-MCH-20a-A	Mechanical – Multi-Family Dwelling Inspection	Yes
NRCA-MCH-20b-A	Mechanical – MF Kitchen Exhaust	Yes

Certificate of Acceptance	Description	ATTCP Required
NRCA-MCH-20c-A	Mechanical – MF IAQ System	Yes
NRCA-MCH-20d-A	Mechanical – MF Dwelling HRV/ERV System	Yes
NRCA-MCH-21-A	Mechanical – MF Dwelling Leakage	Yes
NRCA-MCH-22-A	Mechanical – MF Duct Leakage	Yes
NRCA-MCH-23-A	Mechanical – MF HRV/ERV Verification	Yes
NRCA-PRC-01-F	Covered Process – Compressed Air	No
NRCA-PRC-02-F	Covered Process – Kitchen Exhaust	No
NRCA-PRC-03-F	Covered Process – Garage Exhaust	No
NRCA-PRC-04-F	Covered Process – Refrigerated Warehouse Motor Controls	No
NRCA-PRC-05-F	Covered Process – RW Evaporator Controls	No
NRCA-PRC-06-F	Covered Process — RW Condenser Controls	No
NRCA-PRC-07-F	Covered Process — RW Compressor	No
NRCA-PRC-08-F	Covered Process - RW Underslab Hearing	No
NRCA-PRC-12-F	Covered Process – Elevator Lighting and Ventilation	No
NRCA-PRC-13-F	Covered Process – Escalator Speed Control	No
NRCA-PRC-14-F	Covered Process – Lab Exhaust	No
NRCA-PRC-15-F	Covered Process – Fume Hood	No
NRCA-PRC-16-F	Covered Process – Adiabatic Condenser	No

Source: California Energy Commission

2.2.8 HERS Verification — Certificate of Field Verification and Diagnostic Testing

When single-zone, constant-volume space-conditioning systems (1) serving less than 5,000 ft² of floor area and (2) having more than 25 percent of the system surface duct area are located in unconditioned space, duct sealing is prescriptively required by §140.4(l) for newly constructed buildings and §141.0(b)2C, D, and E for HVAC alterations. A HERS Verification of the duct system must be conducted by a certified

HERS Rater to verify that the air distribution duct leakage of the system is within specifications required by the Energy Code. The HERS Verification is performed on each duct system or on a sample (one in seven) of duct systems. For example, a series of buildings on a project site where the contractor is installing new HVAC systems (qualifying as indicated above) would require that the associated ducts be tested for leakage (limited to 15 percent of the system air volume). The installing contractor with an ATT certification can perform and document the duct leakage test (NRCA-MCH-04-A) and place seven of the completed NRCAs in a group. A HERS Rater then selects of the NRCAs in the group at random and performs the same acceptance test. The HERS Rater then records only the HERS Verification that they performed in the HERS data registry.

As an alternative for the contractor or builder (if approved by the enforcement agency), an ATT may perform and document the duct leakage test (NRCA-MCH-04-A) for each NRCA without a separate verification by a HERS Rater. The ATT must record the duct test in the ATTCP database tracking system. In either case, each duct system must be tested, either by the contractor or an ATT.

2.2.9 Final Inspection by the Enforcement Agency and Issuance of the Certificate of Occupancy

§10-103(d)2

Local enforcement agencies inspect all new buildings and systems to ensure conformance with applicable codes and standards. The inspector may require that corrective action be taken to bring the construction/installation into compliance. Thus, the total number of inspection visits and the timing of the inspections that may be required before passing the final inspection may depend on the size and complexity of the building or system.

Enforcement agencies withhold issuance of a final certificate of occupancy until all compliance documentation is submitted, certifying that the specified systems and equipment conform to the requirements of the approved design and Energy Code. All certificates of HERS verification must be registered copies from an approved HERS data registry.

2.2.10 Certificate of Occupancy

The final step in the permitting process is the certificate of occupancy is issued by the enforcement agency. This is the green light for the building to be occupied. Although a developer may lease space before the issuance of the certificate of occupancy, the tenant cannot physically occupy the space until the enforcement agency issues the certificate of occupancy.

2.2.11 Occupancy – Compliance, Operating, and Maintenance Information

§10-103(b)

At the occupancy phase, the general contractor or design team or both are required to provide the owner with copies of the energy compliance documents, including NRCCs, CF1Rs, NRCIs, CF2Rs, NRCAs, CF3Rs, and any HERS verifications. Documents for the construction/installation, operating, maintenance, ventilation information and instructions for operating and maintaining the features of the building efficiently are also included.

2.2.12 Compliance Documentation

Compliance documentation includes the documents, reports, and other information that are submitted to the enforcement agency with an application for a building permit. Compliance documentation also includes documentation completed by the installing contractor, engineer/architect of record, owner's agent, or certified technician to verify that certain systems and equipment have been correctly installed and commissioned. Compliance documentation will also include reports and test/inspection results by HERS Raters when duct sealing/leakage testing is required unless performed by an ATT.

Each portion of the applicable compliance documentation must be completed and/or submitted during:

1. The building permit phase (NRCCs, CF1Rs).
2. The construction phase (NRCIs, CF2Rs).
3. The acceptance testing and HERS verification phases (NRCAs, CF3Rs).
4. The final inspection phase (all compliance documents include building commissioning documents).

All submitted compliance documentation is required to be compiled by the builder or general contractor. A copy of the compliance documentation is required to be provided to the building owner so that the end user has information describing the energy features installed in the building.

2.3 HERS Providers

http://www.energy.ca.gov/HERS/

The CEC approves HERS Providers, subject to the CEC's HERS Regulations (Title 20, Chapter 4, Article 8, Sections 1670 through 1675). Approved HERS Providers are authorized to train and certify HERS Raters and are required to maintain quality control over HERS verifications. The CEC maintains a list of approved HERS Providers on the CEC-HERS Provider website (https://www.energy.ca.gov/programs-and-topics/programs/home-energy-rating-system-hers-program/home-energy-rating-system).

The HERS Provider must maintain a HERS data registry that incorporates an website-based user interface that has functionality to accommodate the needs of the authorized users of the data registry who must participate in administering HERS compliance, document registration, and Energy Code enforcement.

The HERS data registry must receive and record information to identify and track energy efficiency features that require HERS Verification in a specific building/system and must be capable of determining compliance based on the information from the results of testing or verification procedures input to the registry for the building/system. When the compliance requirements are met, the HERS data registry must make a unique registered certificate of field verification and diagnostic testing available to enforcement agencies, builders, building owners, HERS Raters, and other interested parties to show compliance with the document submittal requirements of §10-103. The HERS data registry must have the capability to facilitate electronic submittal of the registered CF3Rs of an CEC document repository for retention of the certificates for use in enforcing the regulations.

The HERS Provider must make available (via phone or internet communications) a way for building officials, builders, HERS Raters, and other authorized users of the HERS data registry to verify the information displayed on copies of the submitted certificate. Refer to Reference Nonresidential Appendix NA1 Residential Appendix RA1-4 and Reference Joint Appendix JA7 for additional information on the HERS Provider's role and responsibilities.

An approved HERS Provider is also to be approved as a registration provider and facilitate documentation registration for nonresidential buildings and projects.

2.3.1 HERS Raters

A CEC-approved HERS Provider certifies the HERS Rater to perform the field verification and diagnostic testing that may be required to demonstrate and document compliance with the Energy Code. HERS Raters receive training in diagnostic techniques and building science as part of the certification process administered by the HERS Provider.

If the documentation author who produced the CF1R documentation for the building is not an employee of the builder or subcontractor, the documentation author for the building may also perform the responsibilities of a HERS Rater, provided the documentation author has met the requirements and has been certified as a HERS Rater by an approved HERS Provider.

The HERS Rater is responsible for:

- Conducting the field verification and diagnostic testing of the air distribution ducts.
- Transmitting all required data describing the results to a HERS Provider data registry.
- Confirming that the air distribution ducts conform to the design detailed on the building plans and specifications and the mechanical certificate of compliance (NRCC-MCH-E) is approved by the enforcement agency for the building.
- Verifying that the information on the certificates of installation and certificates of acceptance are consistent with the certificates of compliance.

- Performing the Verification (CF3R) and registering the results with the HERS data registry.

The results from the HERS verification are registered to the HERS data registry, including failures. If the results indicate compliance, the HERS data registry will make available a registered copy of the CF3R. A copy must be posted at the building site for review by the enforcement agency, made available for all applicable inspections, and included with the documentation that the builder provides to the building owner at occupancy as specified in §10-103(b).

A listing of Certificate of Field Verification and Diagnostic Testing documents (NRCVs) is available in Table 2.3-1. The certificate of field verification and diagnostic testing documents submitted to the enforcement agency to demonstrate compliance shall conform to a format and informational order and content approved by the CEC. (See §10-103[a]1A.) Samples of the CEC-approved documents are in Appendix A.

Table 2.3-1: Certificate of Verification Documents

Documents Name	Energy Code Reference	Reference Nonresidential Appendix
NRCV-MCH-04-H Air Distribution System Leakage Diagnostic	§10-103(a)5; §140.4(l); §141.0(b)2C, D, and E	NA1; NA2
NRCV-PLB-21-H High-Rise Multifamily Central Hot Water System Distribution	§140.5; §150.1(c)8	RA3.6;RA4.4
NRCV-PLB-22-H High-Rise Single Dwelling Unit Hot Water System Distribution	§140.5; §150.1(c)8	RA3.6;RA4.4

Source: California Energy Commission staff

2.3.2 Verification, Testing, and Sampling

At the builder's option, HERS verification is completed either for each constant-volume, single-zone, space-conditioning unit in the building or for a sample from a designated group of units. HERS verification uses the diagnostic duct leakage from the fan pressurization of ducts procedure in Reference Nonresidential Appendix NA2. If the builder chooses the sampling option, the applicable procedures described in NA1.6.1, NA1.6.2, and NA1.6.3 are followed.

The builder or subcontractor will provide a copy of the NRCCs signed by the principal designer/owner and a copy of the NRCIs to the HERS Rater, as required in NA1.4. Before completing the HERS verification, the HERS Rater confirms that the NRCIs and NRCAs have been completed as required and show compliance consistent with the NRCCs.

If the HERS verification determines that the requirements for compliance are met, the HERS Rater transmits the test results to the HERS data registry, whereupon the HERS Provider makes a copy of the registered CF3R for the HERS Rater, the builder, the enforcement agency, and other authorized users of the data registry. Printed copies, electronic or scanned copies, and photocopies of the completed, signed, and registered certificate of field verification and diagnostic testing are allowed for document submittals, subject to verification that the information on the copy conforms to the registered document information on file in the provider data registry for the space-conditioning unit.

The HERS Rater provides copies of the HERS verification to the builder and posts a copy of the CF3R at the building site for review by the enforcement agency in conjunction with requests for inspection.

The HERS Provider makes available (via phone or internet communications) a way for enforcement agencies, builders, and HERS Raters to verify that the information displayed on copies of the CF3R conform to the registered document information on file in the HERS data registry.

2.3.3 Initial Model Field Verification and Diagnostic Testing

The HERS Rater can test the first constant, single-zone, space-conditioning unit of each building. This initial testing allows the builder to identify and correct any potential duct installation and sealing flaws or practices before other units are installed. If the HERS verification determines that the requirements for compliance are met, the HERS Rater transmits the test results to the HERS data registry.

2.3.4 Resampling, Full Testing, and Corrective Action

"Resampling" refers to the procedure that requires testing of additional units within a sample group when the selected sample unit within a group fails to comply with the HERS verification requirements. When a failure is encountered during sample testing, the failure shall be entered into the provider's data registry. Corrective action shall be taken, and the unit shall be retested to verify that corrective action was successful. Corrective action and retesting on the unit shall be repeated until the testing indicates compliance and the results have been entered into the HERS data registry.

In addition, the HERS Rater conducts resampling to assess whether the first failure in the group is unique or if the rest of the units in the group are likely to have similar failings. The HERS Rater randomly selects for resampling one of the remaining untested units in the group for testing of the feature that failed. If testing in the resample confirms that the requirements for compliance credit are met, then the unit with the failure shall not be considered an indication of failure in the other units in the group. The HERS Rater transmits the resample test results to the HERS data registry for each of the remaining units in the group, including the dwelling unit that was resampled.

If field verification and diagnostic testing in the resample result in a second failure, the HERS Rater must enter the second failure into the HERS data registry and report it to the builder and enforcement agency. Multifamily dwelling units in the group must thereafter be tested. The builder will take corrective action in all space-conditioning units in the group that have not been tested. In cases where corrective action would require destruction of building components, the builder may choose to reanalyze compliance and choose different features that will achieve compliance. In this case, a new CF1R is registered to the HERS data registry and a copy submitted to the enforcement agency and HERS Rater. The HERS Rater conducts HERS verification for each of these space-conditioning units to verify that problems have been corrected and the requirements for compliance have been met. Upon verification of compliance, the HERS Rater enters the test results into the HERS data registry, whereupon a copy of the CF3R for each unit in the group is made available to the HERS Rater, the builder, the enforcement agency, and other authorized users of the HERS data registry.

The HERS Provider files a report with the enforcement agency explaining all action taken (including field verification, diagnostic testing, and corrective action) to bring into compliance units for which full testing has been required. If corrective action requires work not specifically exempted by the California Mechanical Code or the California Building Code, the builder shall obtain a permit from the enforcement agency before commencing any of the work.

2.3.5 Third-Party Quality Control Program (TPQCP)

The CEC may approve Third-Party Quality Control Programs (TPQCP) that serve some of the functions of HERS Raters for field verification but do not have the authority to sign compliance documentation as a HERS Rater. Third-Party Quality Control Programs:

A. Provide training to installers, participating program installing contractors, installing technicians, and specialty TPQCP subcontractors regarding compliance requirements for features for which diagnostic testing and field verification are required.

B. Collect data from participating installers for each installation completed for compliance credit.

C. Perform data checking analysis of information from diagnostic testing performed on participating TPQCP contractor installation work to evaluate the validity and accuracy of the data and independently determine whether compliance has been achieved.

D. Provide direction to the installer to retest and correct problems when data checking determines that compliance has not been achieved.

E. Require resubmission of data when retesting and correction are directed.

F. Maintain a database of all data submitted by the participating TPQCP contractor in a format that is acceptable and made available to the CEC upon request.

The HERS Provider must arrange for the services of an independent HERS Rater to conduct field verification and diagnostic testing of the installation performed by the participating TPQCP contractor. If group sampling is used for HERS verification compliance for jobs completed by a participating TPQCP contractor, the sample from the group that is tested for compliance by the HERS Rater may be selected from a group composed of up to 30 units for which the TPQCP contractor has performed the installation. For alterations, the installation performed by TPQCP contractors may be approved at the enforcement agency's discretion, based upon a properly completed certificate of installation (NRCI-MCH-01) and certificate of acceptance (NRCA-MCH-04-A). If subsequent HERS compliance verification procedures determine that resampling, full testing, or corrective action is necessary for such conditionally approved dwellings in the group, the corrective work must be completed. If the Energy Code requires registration of the compliance documents, the certificates of installation and certificates of acceptance must be registered copies from a nonresidential data registry and a HERS provider data registry, respectively.

Refer to Reference Nonresidential Appendix NA1 for additional information about the Third Party Quality Control Program and for additional information about document registration.

2.3.6 For More Information

More details on field verification and diagnostic testing and the HERS Provider data registry are provided in the *2022 Reference Nonresidential Appendices* and *2022 Reference Joint Appendices*, as described below:

- Reference Nonresidential Appendix NA1 — Nonresidential HERS Verification, Testing, and Documentation Procedures
- Reference Nonresidential Appendix NA2 — Nonresidential Field Verification and Diagnostic Test Procedures
- Reference Joint Appendix JA7 — Data Registry Requirements

2.4 Roles and Responsibilities

Effective compliance and enforcement require coordination and communication among the architects, engineers, lighting and HVAC designers, permit applicant, contractors, plans examiner, and field inspector.[1] This manual recommends procedures to improve communication.

1 For small projects, an architect or engineer may not be involved, and the contractor may be the permit applicant.

The building design and construction industry, as well as enforcement agencies, are organized around these engineering disciplines:[2]

- The design of the electrical and lighting system of the building is typically the responsibility of the **lighting designer, electrical engineer, or electrical contractor**. This person is responsible for designing a system that meets the Energy Code, producing the building plans and specifications, and completing the compliance documents and worksheets.
- In larger enforcement agencies, an **electrical plans examiner** is responsible for reviewing the electrical plans, specifications, and compliance documents, and an **electrical field inspector** is responsible for verifying the correct installation of the systems in the field.
- The **mechanical plans examiner** is responsible for reviewing the mechanical plans, and a **mechanical field inspector** is responsible for verifying correct construction in the field.
- For the building envelope, the **architect** is typically responsible for designing the building and completing the documents.
- The **enforcement agency** is responsible for reviewing the design and documents, and the **enforcement agency field inspector** is responsible for verifying the construction in the field.

Unless the whole-building performance approach is used, the compliance and enforcement processes can be completed separately for each discipline. This enables each discipline to complete the work independently of others. For example, an applicant can use the prescriptive approach for the water heating and indoor lighting, then use the performance approach for all other building components. To simplify this process, compliance documents have been grouped by discipline.

2.4.1 Designer

5537 and 6737.1 of California Business and Professions Code

The designer is responsible for the overall building design. The designer is also responsible for specifying the building features that determine compliance with the Energy Code and other applicable building codes. Designers are required to provide a signature on the respective NRCCs to certify that the building has been designed to comply with the Energy Code.

The designer may be an architect, engineer, or other California-licensed professional and may personally prepare the NRCCs. This professional may delegate preparation of the energy analysis and certificate of compliance documents to an energy documentation author or energy consultant. If preparation of the building energy NRCC documentation is delegated, the designer must remain in charge of the

2 Small enforcement agencies may not have this type of specialization.

building design specifications, energy calculations, and all building feature information represented on the NRCC. The designer's signature on the NRCC affirms responsibility for the information submitted on the NRCC. When the designer is a licensed professional, the signature block on the NRCCs must include the designer's license number.

2.4.2 Documentation Author

§10-103(a)1

The person responsible for the design of the building may delegate the energy analysis and preparation of the NRCCs documentation to a building energy consultant or documentation author. Completed NRCCs documentation must be submitted to the enforcement agency during the building permit phase. The NRCCs demonstrate to the enforcement agency plans examiner that the building design complies with the Energy Code. Moreover, the building energy features information submitted on the NRCCs must be consistent with the building plans and specifications.

The documentation author is not subject to the same limitations and restrictions of the *Business and Professions Code* as the building designer because the documentation author is not responsible for specification of the building design features. The documentation author may provide the building designer with recommendations for building energy features that must be incorporated into the building design plans and specification documents submitted to the enforcement agency at plan check. The documentation author's signature on the NRCCs certifies that the documentation they have prepared is accurate and complete but does not indicate their responsibility for the specification of the features that define the building design. The documentation author provides completed NRCC documents to the building designer, who must sign the NRCCs prior to submittal of the NRCCs to the enforcement agency at plan check.

2.4.3 Builder or General Contractor

The term *builder* refers to the general contractor responsible for construction. During construction, the builder or general contractor usually hires specialty subcontractors to provide specific services, such as installing insulation and designing and installing HVAC systems. The builder or general contractor must ensure that the certificate(s) of installation is submitted to the enforcement agency by the person(s) responsible for construction/installation of regulated features, materials, components, or manufactured devices. The builder or general contractor may sign the NRCIs (as the responsible person) on behalf of the specialty subcontractors they hire, but generally, preparation and signature responsibility reside with the specialty subcontractor who provided the installation services. The NRCIs identify the installed features, materials, components, or manufactured devices detailed in the building plans and the NRCCs. A copy of each NRCI is

required to be posted at the building site for review by the enforcement agency in conjunction with requests for final inspection.

At final inspection, the builder or general contractor is required to leave all applicable completed and signed compliance documents for the building owner at occupancy in the building. Such information must, at a minimum, include information indicated on the following documents: NRCCs, NRCIs, NRCAs, and HERS verifications. These documents may be in paper or electronic format and must conform to the applicable requirements of §10-103(a).

2.4.4 Specialty Subcontractors

Specialty subcontractors provide the builder with services from specific building construction trades for installation of features such as wall and ceiling insulation, windows, HVAC systems or duct systems or both, water heating, and plumbing systems. These subcontractors may perform other trade-specific specialty services during building construction. The builder has ultimate responsibility for all aspects of building construction and has the authority to complete and sign/certify all sections of the required NRCIs documents. However, the licensed specialty subcontractor should be expected to complete and sign/certify all applicable NRCIs that document completion of the installation work they have performed for the builder. The subcontractor's responsibility for NRCI documentation includes providing a signed and registered copy of all applicable NRCIs to the builder and posting the documents at the building site for review by the enforcement agency.

2.4.5 Enforcement Agency

§10-103

The enforcement agency is the local agency with responsibility and authority to issue building permits and verify compliance with applicable codes and standards. The enforcement agency performs several key roles in the compliance and enforcement process.

A. Plan check: The enforcement agency performs the plan review of the NRCCs and the building plans and specifications. During plan review, the NRCCs are compared to the plans and specifications for the building design to confirm that the building is specified consistently in all the submitted documents. If the specifications for the building design features shown on the NRCCs do not conform to the specifications shown on the designer's submitted plans and specifications for the building, the submitted documents must be revised to make the design specification consistent in all documents. Thus, if the features on the NRCCs are consistent with the features given in the plans and specifications for the building design and indicates that the building complies, then the enforcement agency may issue a building permit.

B. Construction inspection: During building construction, the enforcement agency should make several visits to the construction site to verify that the

building is being constructed in accordance with the approved plans and specifications and energy compliance documentation. As part of this process, at each site visit, the enforcement agency should review any applicable NRCIs that have been posted or made available with the building permit(s). The enforcement agency should confirm that:

- The energy efficiency features installed in the building are consistent with the requirements given in the plans and specifications for the building approved during plan review.
- The installed features are described accurately on the NRCIs.
- All applicable sections of the NRCIs have been signed by the responsible licensed person(s).

The enforcement agency does not approve a building until it has received all applicable NRCIs.

C. Final approval: The enforcement agency may approve the building at the final inspection phase if the enforcement agency field inspector determines that:

- the building conforms to the requirements of the building plans and specifications,
- the NRCCs are approved by the enforcement agency at plan review,
- and the building meets the requirements of all other applicable codes and standards.

For buildings that have used an energy efficiency compliance feature that requires an NRCI, the enforcement agency shall not approve the building until it has received an NRCI that meets the requirements of §10-103(a) and has been completed and signed by the builder or subcontractor for each compliance feature. The builder must ultimately take responsibility to ensure that all required energy compliance documentation has been completed properly and posted at the job site or submitted to the enforcement agency in conjunction with any of the enforcement agency's required inspections. However, the enforcement agency, in accordance with §10-103(d), must examine all required copies of NRCIs, NRCAs, and HERS verification made available for the required inspections. It must confirm that these documents have been properly prepared and are consistent with the plans, specifications, and the NRCCs approved by the enforcement agency for the building at plan review.

D. Corroboration of information provided for the owner/occupant: At final inspection, the enforcement agency shall require the builder to leave energy compliance, operating, maintenance, and ventilation information documentation in the building (for the building owner at occupancy) as specified by §10-103(b).

Compliance documents for the building shall, at a minimum, include:

- NRCCs.

- NRCIs.
- NRCAs.
- HERS verification.

These documents are copies of the documentation submitted to or approved by the enforcement agency, and the copies must conform to the applicable requirements of §10-103(a).

Operating information includes instructions on how to operate or maintain the energy features, materials, components, and mechanical devices of the building correctly and efficiently. Such information shall be contained in a folder or manual that provides all information specified in §10-103(b). This operating information is in paper or electronic format. For dwelling units, buildings, or tenant spaces that are not individually owned and operated, or are centrally operated, this information is provided to the person(s) responsible for operating the feature, material, component, or mechanical device installed in the building.

Maintenance information is provided for all features, materials, components, and manufactured devices that require routine maintenance for efficient operation. Required routine maintenance actions are clearly stated and incorporated on a readily accessible label. The label may be limited to identifying, by title or publication number or both, the operation and maintenance manual for that particular model and type of feature, material, component, or manufactured device. For dwelling units, buildings, or tenant spaces that are not individually owned and operated, or are centrally operated, such information is provided to the person(s) responsible for maintaining the feature, material, component, or mechanical device installed in the building. This maintenance information shall be in paper or electronic format.

Ventilation information includes a description of the quantities of outdoor air that the ventilation system(s) are designed to provide to the conditioned space of the building, and instructions for proper operation and maintenance of the ventilation system. For buildings or tenant spaces that are not individually owned and operated, or are centrally operated, such information is provided to the person(s) responsible for operating and maintaining the feature, material, component, or mechanical ventilation device installed in the building. This information is in paper or electronic format.

2.4.6 Permit Applicant

The permit applicant is responsible for:

1. Providing information on the plans or specifications or both to enable the enforcement agency to verify that the building complies with the Energy Code. It is important to provide all necessary detailed information on the plans and specifications. The plans are the official record of the permit. The design professional is responsible for certifying that the plans and specifications are

consistent with the energy features listed on the NRCCs, and that the design complies with the standards.

2. Performing the necessary calculations to show that the building or system meets the Energy Code. These calculations may be documented on the drawing or on the worksheets provided in the manual and supported, when necessary, with data from national rating organizations or product or equipment manufacturers or both.
3. Completing the NRCC summary document. The NRCC is a listing of each of the major requirements of the Energy Code that applies to the project. The summary document includes information from the worksheets and references to the plans where the plans examiner can verify that the building or system meets the Energy Code.

2.4.7 Plans Examiner

The plans examiner is responsible for:

1. Reviewing the plans and supporting material to verify that they contain the necessary information for a plan review.
2. Checking the calculations and data contained on the worksheets.
3. Indicating by checking a box on the summary documents that the compliance documentation is acceptable.
4. Making notes for the field inspector about which items require special attention.

2.4.8 Field Inspector

The field inspector is responsible for:

1. Verifying that the building or system is constructed according to the plans.
2. Checking off appropriate items on the summary document at each relevant inspection.
3. Verifying that all the required compliance documentation (NRCIs, NRCAs, and HERS Verifications) is completed, dated, signed, and registered (when applicable).

The NRCCs may be used by the building permit applicant, the plans examiner, and the field inspector. This way, the permit application can call the plans examiner's attention to the relevant drawing sheets and other information, and the plans examiner can call the field inspector's attention to items that may require special attention in the field. The compliance documents and worksheets encourage communications and coordination within each discipline.