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|  | **CxMM1-A** | | | |
|  | **Commissioning Mandatory Measures (Section 120.8)** | | | |
| **Contact Information** | | **Site Address** | |
| **Features/Measures; Heating, Ventilation, Air Conditioning Systems, Indoor Lighting Systems, Water Heating Systems, Covered Processes** |  | | **Enforcing Agency** |
|  | | | | |
| **Code Section** | **CEC Commissioning forms**  **required at plan check submittal** | **Submitted by**  **Foot Note #1** | **Compliance**  **Method**  **Foot Note #2** | **Date & notes** |
| **BEES 10-103(a)** | **NRCC-CXR-01-E Design Review Kickoff**  This form is used to document that the requirement to hold a design *review* kickoff meeting between the owner, design engineer and design reviewer has been met. The intent of the kickoff meeting is to discuss the project scope, design, project schedule, and the design reviewer's involvement using schematic design documents, the Owner's Project Requirements and the Basis of Design. The kickoff meeting should be held during the schematic design phase. The design reviewer will deliver the appropriate Certificates of Compliance-  Cx Construction |  |  |  |
| **BEES 10-103(a)** | **NRCC-CXR-02-E**  Construction Document Certificate of Compliance is the design review checklist that must be completed by all projects, regardless if the HVAC system type is complex or simple. The purpose of the form is to document that applicable code elements are included and are well-documented in the construction documents. Not all code elements are included in the checklists. Rather, the forms focus on items known to be more frequently overlooked or to contain insufficient detail. No second review of issues raised is required by the design reviewer |  |  |  |
| **BEES**  **10-103(a)** | **NRCC-CXR-03-E** or the Construction Document- Simple HVAC Systems Certificate of Compliance is the design review checklist that must be completed by all projects that have HVAC systems that are NOT defined as Complex, per Section 100.1. |  |  |  |
| **BEES**  **10-103(a)** | **NRCC-CXR-04-E** or the Construction Document- Complex Mechanical Systems Certificate of Compliance is the construction documents design review checklist that must be completed by all projects that *have* HVAC systems defined as Complex, per Section 100.1. |  |  |  |
| **BEES**  **10-103(a)** | **NRCC-CXR-05-E Cx Design Review Signature Page**  This form documents that the required construction documents design review has been completed for the project |  |  |  |
| **CxMM-1** | | | | |
| **GRN-20** | **Commissioning Documents** |  | | |
| **Section 120.8(b). Owner's or Owner representative's Project Requirements (OPR).**  The energy-related expectations and requirements of the building shall be documented before the design phase of the project begins. This documentation shall include the following:  1. Energy efficiency goals;  2. Ventilation requirements;  3. Project program, including facility functions and hours of operation, and need for after  and need for after hour’s operation  4. Equipment and systems expectations. |  |  |  |
| **GRN-21** | **Section 120.8(c). Basis of Design (BOD).** A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project, and updated as necessary during the design and construction phases. The Basis of Design document shall *cover* the following systems:  1. Heating, ventilation, air conditioning (HVAC) systems and controls  2. Indoor lighting system and controls  3. Water heating systems and controls  **4.** Covered processes |  |  |  |
| **Completed CEC For NRCC-CXR-02**  Com | **Section 120.8(d). Design phase design review.**  **1. Design Reviewer Requirements.** For buildings less than 10,000 square feet, design phase design review may be completed by the design engineer. Buildings between 10,000 and 50,000 square feet require completion of the Design Review Checklist by either an engineer in-house  To the design firm but not associated with the building project, or a third party design engineer. For buildings larger than 50,000 square feet or for buildings with complex mechanical systems, an independent review of these documents by a third party design engineer is required.  **2. Design Review.** 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 how the design reviewer will coordinate with the project team. The building owner or owner's representative shall include the Design Review Checklist compliance form in the Certificate of Compliance documentation (see Section 10-103).  **3. Construction Documents Design Review:** The construction documents design review compliance forms list the items that shall be checked by the design reviewer during the construction document review. The completed forms shall be returned to the owner and design team for review and sign-off. The building owner or owner's representative shall include the construction documents design review compliance forms in the Certificate of Compliance Documentation (see Section 10-103) |  |  |  |
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| **GRN-22** | **Section 120.8/e). Commissioning measures shown in the construction documents.** Include commissioning measures or requirements in the construction documents (plans and specifications). Commissioning measures or requirements should be clear, detailed and complete to clarify the commissioning process. These requirements should include the list of systems and assemblies commissioned, testing scope, roles and responsibilities of contractors, requirements for meetings, management of issues, the commissioning schedule, operations and maintenance manual development and training, and checklist and test form development, execution and documentation. Include, for information only, roles of non-contractor parties. |  |  |  |
| **GRN- 23** | **Section 120.8(f). Commissioning plan.** Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned and shall be started during the design phase of the building project. The Commissioning Plan shall include the following:  1. General project information  2. Commissioning goals  3. Systems to be commissioned.  4. Plans to test systems and components, which shall include:  a. An explanation of the original design intent  b. Equipment and systems to be tested, including the extent of tests c. Functions to be tested  d. Conditions under which the test shall be performed e. Measureable criteria for acceptable performance  f. Commissioning team information including roles  g. Commissioning process activities, schedules and responsibilities. Plans for the  completion of commissioning requirements listed in Sections 120.8(g) through  120.8(i) shall be included. |  |  |  |
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| **GRN-24** | **Section 120.8(g). Functional performance testing.** Functional performance tests shall demonstrate the correct installation and operation of each component, system, and system-to­ system interface in accordance with the acceptance test requirements. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made. |  |  |  |
| **GRN-25** | **Section 120.8(h) 1. Systems manual**. Documentaf1on of the operational aspects of the building shall be completed within the Systems Manual and delivered to the building owner or representative and facilities operator. The Systems Manual shall include the following:  1. Site information, including facility description, history and current requirements.  2. Site contact information  3. Instructions for basic operations & maintenance, including general site operating  procedures, basic troubleshooting, recommended maintenance requirements, and a site events log  4. Description of major systems  5. Site equipment inventory and maintenance notes  6. A copy of all special inspection verifications required by the enforcing agency or the  Standards |  |  |  |
| **GRN-25** | **Section 120.8(h) 2. Systems operations training.** Appropriate maintenance staff for each equipment type or system shall be documented in the commissioning report. Training materials shall include the following:  1. System and equipment overview (i.e. what is the equipment, what is its function, and with what other systems or equipment does it interface)  2. Review and demonstration of operation, servicing, and preventive maintenance  3. Review of the information in the Systems Manual  4. Review of the record drawings on the systems and equipment |  |  |  |
| **GRN-26** | **Section 120.8(i). Commissioning report.** A complete report of commissioning process activities undertaken through the design, construction and reporting recommendations for post­ construction phases of the building project shall be completed and provided to the owner or representative. |  |  |  |