

504.4 5.410.2 Commissioning. For new ~~Group A, B or E office, retail and institutional buildings greater than two stories in height and buildings 10,000 50,000~~ square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the ~~owner's~~ project requirements. Commissioning shall be performed in accordance with this section ~~by personnel trained and certified in commissioning by a nationally recognized organization.~~ Commissioning requirements shall include ~~as a minimum:~~

1. ~~Owner's~~ Project Requirements.
2. Basis of Design.
3. Commissioning measures shown in the construction documents.
4. Commissioning Plan.
5. Functional Performance Testing.
6. Post Construction Documentation ~~& Training.~~
7. Commissioning Report.

All building systems and components covered by Title 24, Part 6, as well as process equipment and controls, and renewable energy systems shall be included in the scope of the Commissioning Requirements.

504.4.1 5.410.2.1 Owner's Project Requirements (OPR). The expectations and requirements of the building shall be documented before the design phase of the project begins. ~~At a minimum, T~~ this documentation shall include the following:

1. Environmental and Sustainability Goals.
2. Energy Efficiency Goals.
3. Indoor Environmental Quality Requirements.
4. Equipment and Systems Expectations.
5. Building Occupant and O&M Personnel Expectations.

504.4.2 5.410.2.2 Basis of Design (BOD). A written explanation of how the design of the building systems meets the ~~Owner's~~ Project Requirements shall be completed at the design phase of the building project, ~~and updated as necessary during the design and construction phases. At a minimum, t~~ 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 System.
4. Renewable Energy Systems.
5. Landscape Irrigation Systems.
6. Water Reuse Systems.

504.4.3 5.410.2.3 Commissioning plan. ~~Prior to permit issuance a~~ A commissioning plan shall be completed to document the approach ~~to 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 at a minimum:~~

1. General Project Information.
2. Commissioning Goals.
3. Systems to be commissioned. Plans to test systems and components shall include ~~at a minimum:~~ a. A detailed explanation of the original design intent.
b. Equipment and systems to be tested, including the extent of tests, a. Functions to be tested.
- d. Conditions under which the test shall be performed, a. Measurable criteria for acceptable performance. 4. Commissioning Team Information.
5. Commissioning Process Activities, Schedules & Responsibilities - plans for the completion of Commissioning Requirements listed in A5.410.4.4 through A5.410.4.6 shall be included.

504.4.4 5.410.2.4 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 approved plans and specifications. 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.

504.4.5 5.410.2.5 Post construction documentation and training. A Systems Manual ~~and Systems Operations Training are~~ is required.

504.4.5.1 5.410.2.5.1 Systems manual. Documentation 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. At a minimum, t~~ The Systems Manual shall include the following:

1. Site Information, including facility description, history ~~and current requirements.~~
2. Site Contact Information.

3. Basic Operations & Maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log
4. Major Systems.
5. Site Equipment Inventory and Maintenance Notes.
6. A copy of all special inspection verifications required by the enforcing agency or this code.
7. ~~Other Resources & Documentation.~~

~~504.4.5.2~~ **5.410.2.5.2 Systems operations training.** ~~The training of the appropriate maintenance staff for each equipment type and/or system shall include, as a minimum, the following:~~

4. ~~System/Equipment overview (what it is, what it does and what other systems and/or equipment it interfaces with).~~
 2. ~~Review of the information in the Systems Manual.~~
 3. ~~Review of the record drawings on the system/equipment.~~
- This section could be moved to the voluntary chapter.

~~504.4.6~~ **5.410.2.6 Commissioning report.** ~~A complete report of commissioning process activities undertaken through the design, construction and post-construction phases of the building project shall be completed and provided to the owner or representative.~~

5.410.3 Testing, adjusting and balancing. Testing, adjusting and balancing of systems shall be required ~~for buildings less than 10,000 square feet.~~

5.410.3.2 Systems. Develop a written plan of procedures for testing, adjusting and balancing systems. Systems to be included for testing, adjusting and balancing shall include at a minimum, as applicable to the project:

1. HVAC systems and controls
2. Indoor and outdoor lighting and controls
3. Water heating systems
4. Renewable energy systems
5. Landscape Irrigation Systems
6. Water Reuse Systems.

5.410.3.3 Procedures. Perform testing, adjusting and balancing procedures in accordance with industry best practices and applicable ~~national~~ standards on each system.

5.410.3.3.1 HVAC balancing. Before a new space-conditioning system serving a building or space is operated for normal use, balance the system ~~should be balanced~~ in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards (2003); the National Environmental Balancing Bureau Procedural Standards (1983); ~~or~~ Associated Air Balance Council National Standards (1989) or as approved by the building official. (Provide standards and date in the standards chapter)

5.410.3.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.3.5 Operation and maintenance manual. Provide the building owner or representative a with detailed operating and maintenance instructions and copies of warranties/guaranties for each system prior to final inspection.

5.410.3.5.1 Special inspections and reports . Include a copy of all ~~special~~ inspection verifications required by the enforcing agency ~~or this code.~~

Notation:

Authority - Health and Safety Code Sections 18930.5, 18934.5 and 18938 (b).

Reference - Health and Safety Code, Division 13, Part 2.5, commencing with Section 18901.