



# COMMISSIONING REQUIREMENTS NEW YORK CITY COMMERCIAL CODE For New Construction and Substantial Renovation

## OVERVIEW

New York State has established significant energy goals in its Reforming the Energy Vision strategy. In October 2016, the state's and New York City's commercial construction code was updated to align with international standards for energy efficiency and building performance. This document briefly summarizes new commissioning requirements according to

- Section C408 of the 2016 NYC ECC

These commercial codes governing commercial energy efficiency and system commissioning now require a comprehensive commissioning process for projects involving a total mechanical capacity larger than

- > 480,000 BTU/hr COOLING, or
- > 600,000 BTU/hr HEATING & SERVICE HOT WATER

Rule of Thumb	Building Size
	<ul style="list-style-type: none"><li>• Larger than 20,000 SF – typically WILL require commissioning</li><li>• Smaller than 10,000 SF - typically will NOT require commissioning</li></ul>

## CODE SPECIFIES THAT:

- **Construction Documents:** Commissioning Requirements must be included by notes in the Construction Documents (references to the specifications allowed) Prior to DOB approval
- **Commissioning Plan** must meet certain requirements and be prepared by a registered design professional or approved agency<sup>1</sup>
- **Functional Testing** of equipment and controls must be performed and documented in a “Preliminary Commissioning Report” before final DOB inspection
- **Preliminary Commissioning Report** must be submitted prior to final inspection
- **Post-construction documents** include equipment manuals, submittals, as-built drawings must be provided within 90 days of Certificate of Occupancy or Letter of Completion
- **Final Commissioning Report** be completed within 18 to 30 months of Certificate of Occupancy<sup>2</sup>

<sup>1</sup> Approved Agency is not explicitly defined in the code (ongoing definition by DOB) but includes at a minimum the design professional on record, or an alternate registered engineer with 3+ years of relevant experience. Equivalent alternate qualifications are expected to be allowed similar to those for accepted for LL87 RCx inspections (CCP, EBCP).

<sup>2</sup> \*New non R-2 occupancies over 500,000 gross square feet: within 30 months of the C. of O. All other occupancies (including R-2): within 18 months of the C. of O.

## BUILDING SYSTEMS WHICH MUST BE COMMISSIONED:

### Mechanical Systems

- Mechanical Heating, Cooling, and Refrigeration Systems
- Air Handling and Distribution, Ventilation and Exhaust Systems, and Related Air Quality Monitoring Systems
- Air, Water, and Energy Recovery Systems
- Manual or automatic controls on all energy-using systems (local or remote temperature controls, setback sequences, and occupancy-based controls)
- "Other systems, equipment and components that are used for heating, cooling or ventilation and that affect energy use"

**Exception:** Certain packaged HVAC systems may be excluded from the required testing scope or allowed to go through a reduced testing sequence.

### Renewable Energy Systems

- Renewable Energy Systems
- Associated Energy Storage Systems

**Exception:** Renewable energy systems installed with generating capacity under 25 kW.

### Service Hot Water Heating Systems

- Plumbing, including (but not limited to):
- Domestic, mechanical service and process water systems,
  - Pumping and mixing systems,
  - All associated controls

### Electrical Power and Lighting Systems

- Occupancy and vacancy sensors
- Daylighting systems
- Bi-level lighting controls
- Timeclock lighting controls

**Note:** If following the ASHRAE 90.1 2013 compliance path the requirements revert to Ch. 9 of ASHRAE instead of the preceding Electrical section of the NYC ECC.

## DELIVERABLES AND SCHEDULE IMPACTS:

Documentation	Responsible Party	Phase
<p><b>Construction Documents</b> must list location and performance of each piece of equipment</p> <ul style="list-style-type: none"> <li>• Each supply-air outlet/zone terminal must be adjustable.</li> <li>• All hydronic systems need means to adjust &amp; measure flow — including individual heating/cooling coils.</li> <li>• Requirements include a document certifying that the installed lighting controls meet the documented performance criteria of the ECC be provided to the owner within 90 days</li> <li>• 90-day requirement for O&amp;M, and As-Built documents must be written into the Contract Documents</li> </ul>	Design Engineer	Construction Documents (prior to DOB approval)
<p><b>Commissioning Plan</b> must include:</p> <ul style="list-style-type: none"> <li>• Narrative of commissioning process, including activities/phases/personnel</li> <li>• List equipment to be tested and test descriptions</li> <li>• Include measurable performance criteria (pass/fail)</li> <li>• List functions to be tested, including controls</li> <li>• List necessary testing conditions (summer/winter/etc.)</li> </ul>	Commissioning Agent	Early Construction
<p><b>Testing, Adjusting and Balancing</b> Air and water side TAB required</p> <ul style="list-style-type: none"> <li>• Results must be within tolerances in product specifications</li> <li>• Balancing will first minimize throttling losses, then fan/ pump speed (or impeller size) adjusted to design conditions</li> </ul> <p>Exception: Fans under 1 HP and Pumps under 5HP Pumps where throttling results in &lt; 5% of nameplate horsepower more than if the impeller was trimmed.</p>	Testing and Balancing by TAB firm.  Engineers and Commissioning Agent review TAB report.	Construction

Documentation	Responsible Party	Phase
<p><b>Functional Testing – Mechanical, Renewables and Service Hot Water</b></p> <p>Tests based on design document requirements</p> <ul style="list-style-type: none"> <li>• Intended to confirm all design modes, sequence of operation, part/ full load testing &amp; maintenance serviceability</li> <li>• Include testing of emergency conditions</li> <li>• Includes controls tests/checklists that confirm calibration, sequences</li> </ul> <p>Exception: Testing of small unitary/package heat pumps &amp; AC units (listed in tables C403.2(1) through C403.2.3(3) NYC ECC) is not required assuming no air side economizers are involved.</p>	<p>Commissioning Agent</p> <p>Installing Contractors</p>	<p>Construction through Substantial Completion</p>
<p><b>Functional Testing - Lighting and Electrical</b></p> <p>Design professional certify that lighting controls tested and setup correctly <b>before</b> final inspection.</p> <p>Lighting Controls testing focuses on the following elements:</p> <p>Occupancy Controls – Sampling:</p> <ul style="list-style-type: none"> <li>• Sample 7 minimum and at least 10% (or 1) of each unique type/geometry.</li> <li>• If more than 30% fail all remaining units of that type must be tested</li> </ul> <p>Occupancy Controls – Testing Notes:</p> <ul style="list-style-type: none"> <li>• Confirm the sensors are installed as per manufacturers requirements</li> <li>• Must verify no nuisance triggers</li> </ul> <p>Time-switch –Testing must verify:</p> <ul style="list-style-type: none"> <li>• Correct time/date, schedule and battery backup</li> <li>• Overrides are no more than 2 hrs and override switches are located in the space they control</li> </ul> <p>Daylighting – Testing must confirm:</p> <ul style="list-style-type: none"> <li>• Proper setup and calibration</li> <li>• Controlled lights are correctly located</li> <li>• Recalibration restricted to authorized personnel only</li> </ul>	<p>Design Engineer</p> <p>Commissioning Agent</p> <p>Installing Contractors</p>	<p>Construction through Substantial Completion</p>

Documentation	Responsible Party	Phase
<p><b>Preliminary Commissioning Report</b>            A preliminary commissioning report must be completed and issues prior to the final DOB inspection.</p> <ul style="list-style-type: none"> <li>• Owner must send letter to the DOB certifying they have received their preliminary report</li> <li>• Mechanical, Renewables, DHW and electrical systems must be split into four sections (for independent review)</li> <li>• List of deficiencies not corrected at time of report, any deferred tests, and climate conditions needed to complete those tests must be included</li> <li>• Code official may require report for review</li> </ul>	<p>Commissioning Agent</p> <p>Installing contractors must resolve all major outstanding items for Preliminary Report to be issued.</p>	<p>Prior to final code inspection</p>
<p><b>Final Documentation</b></p> <ul style="list-style-type: none"> <li>• Submittals</li> <li>• Manufacturer Operations &amp; Maintenance manuals (mechanical, renewables, service hot water, and lighting)</li> <li>• Name/address of at least 1 service agency</li> <li>• HVAC &amp; service hot water controls maintenance/ calibration info (wiring diagrams, schematics, sequences, setpoints)</li> <li>• Light control inspection/recalibration schedule</li> <li>• Narrative of each system’s intended operation</li> <li>• Documented confirmation that lighting meets electrical performance criteria.</li> <li>• Construction drawings (as-builts) and TAB reports</li> </ul>	<p>Contractors</p> <p>Design Engineer</p> <p>TAB firm</p> <p>Commissioning Agent</p>	<p>Within 90 days of Certificate of Occupancy</p>
<p><b>Final Commissioning Report</b> including:</p> <ul style="list-style-type: none"> <li>• All test procedures &amp; results</li> <li>• Functional test acceptance criteria</li> <li>• Disposition of deficiencies found during testing, including corrective measures used/proposed</li> <li>• And the final documentation above</li> </ul>	<p>Commissioning Agent</p> <p>Installing contractors must resolve <u>all</u> outstanding items for Preliminary Report to be issued.</p>	<p>Within 18-30 months of Certificate of Occupancy  <small>(new non R-2 occupancies over 500,000 GSF are 30 months, all others 18)</small></p>

## CONCLUSION

New York City has substantially increased the depth and breadth of commissioning required to meet its commercial energy code requirements. By planning ahead and engaging a commissioning agent prior to issuing bid documents, the prudent building owner and project team will ensure that fulfilling these requirements is fully integrated with project development and completion. The Building Commissioning Association website at [www.bxca](http://www.bxca) offers many resources, including the [CCP Registry](#) of certified commissioning professionals. The long term benefits of commissioning as specified by NYS will be optimized building systems performance and reduced energy usage, beginning at occupancy and continuing throughout the life cycle of the building.

## ABOUT THE AUTHORS

Lou Vogel and Nate Goodell are both Certified Commissioning Professionals through the BCxA and Existing Building Commissioning Professionals through AEE. Together they have commissioned over 2 million square feet and worked on projects ranging from multi-million dollar school, hospital and public buildings, to small office buildings, theaters, industrial and commercial projects. They can be reached with questions at [lvogel@titem.com](mailto:lvogel@titem.com) and [ngoodell@titem.com](mailto:ngoodell@titem.com) or by phone at 315.600.8544.

## ABOUT TAITEM ENGINEERING

Taitem Engineering is a full-service consulting engineering firm at the forefront of innovative, sustainable design and building science. Founded in 1989 with a focus on energy efficiency and green building design, its team of design engineers, commissioning agents, energy analysts, and sustainability consultants works with clients to help create new high-performing buildings and improve the performance of existing buildings. Taitem also works with state and local agencies to ensure their energy programs deliver savings.

Taitem is a certified B-corporation, meeting rigorous standards of social and environmental performance, accountability, and transparency. "Taitem" stands for "technology as if the Earth mattered," reflecting the company's mission and values.