

## **SUMMARY OF: COMMISSIONING AND FINAL INSPECTION REQUIREMENTS** **2012-IgCC**

**Commissioning IgCC** - Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1.

Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by DPS.

The approved agency shall be qualified and shall demonstrate Competence for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of DPS.

The approved agency shall provide written documentation to DPS demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**An approved Commissioning Agency shall:** Be objective, competent, and independent from the contractor responsible for the work being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

An approved agency shall have adequate equipment to perform the required commissioning. The equipment shall be periodically calibrated.

An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and commissioning.

1. Must be independent of the work of design and construction of this project (though may be an employee of the project design firm).
2. Must not be an employee of, or contracted through, a contractor or construction manager holding construction contracts of this project.
3. Must have prior experience commissioning a minimum of two (2) projects of similar scope.
4. May be an employee or consultant of the owner of this project meeting the above requirements.

### **AND**

**POSSESS AT LEAST ONE OF THE FOLLOWING CREDENTIALS:** Must be a Certified Commissioning Professional certified by at least one of the following commissioning provider certification agencies:

- Building Commissioning Association (BCA), Certified Commissioning Professional (CCP)
- Building Commissioning Certification Board (BCCB)- Certified Commissioning Professional -CCP
- ASHRAE, Commissioning Process Management Professional (CPMP)
- ASHRAE, Building Commissioning Professional Certification (BCxP)
- AABC Commissioning Group, ACG, Commissioning Authority (CxA)
- National Environmental Balancing Bureau (NEBB), Building Systems Commissioning (BSC)
- Association of Energy Engineers (AEE), Certified Building Commissioning Professional (CBCP)
- University of Wisconsin -Accredited Commissioning Process Manager (CxM)
- University of Wisconsin - Accredited Commissioning Process Authority Professional (CxAP or CAP)
- University of Wisconsin - Accredited Green Commissioning Process Provider (GCxP or GCP)

**550/081 – Final Inspection - Preoccupancy report requirement.** The approved commissioning agency shall keep records of the commissioning required by the IgCC. The approved agency shall furnish commissioning reports to the owner and the registered design professional in responsible charge and, upon request, to DPS. Reports shall indicate that work was or was not completed in conformance with *approved* construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. Where discrepancies are not corrected, they shall be brought to the attention of the owner, *DPS* and to the registered design professional in responsible charge prior to the completion of that phase of the work. **Prior to the issuance of a Certificate of Occupancy, a final commissioning report shall be submitted to and approved by DPS.**

**Post-occupancy report requirement.** Post-occupancy commissioning shall occur as specified in the applicable sections of this code. A post-occupancy commissioning report shall be provided to the owner within 30 months after the Certificate of Occupancy is issued for the project and shall be made available to DPS upon request.

**BUILDING OPERATIONS AND MAINTENANCE:** Building operations and maintenance documents in accordance with Section 904.3 shall be submitted to the owner prior to the issuance of the Certificate of Occupancy. Record documents shall be in accordance with Section 904.2.

The building owner shall file a letter with DPS certifying the receipt of record documents and building operations and maintenance documents.

At least one copy of these materials shall be in the possession of the owner and at least one additional copy shall remain with the building throughout the life of the structure.

**Record documents.** The cover sheet of the record documents for the project shall clearly indicate that at least one copy of the materials shall be in the possession of the owner. Record documents shall include all of the following:

1. Copies of the *approved* construction documents, including plans and specifications.
2. As-built plans and specifications indicating the actual locations of piping, ductwork, valves, controls, equipment, access panels, lighting and other similar components where they are concealed or are installed in locations other than those indicated on the *approved* construction documents.
3. For sites that have previously been a *brownfield*, or required environmental corrective action, remediation or restoration at the federal, state or local level, copies of engineering and institutional control information shall be provided.
4. A copy of the Certificate of Occupancy.

**Building operations and maintenance documents.** The building operations and maintenance documents shall consist of manufacturer's specifications and recommendations, programming procedures and data points, narratives, and other means of illustrating to the owner how the building, site and systems are intended to be maintained and operated.

The following information shall be included in the materials, as applicable to the specific project:

1. Directions to the owner or occupant on the manual cover sheet indicating that at least one copy of the materials shall be in the possession of the owner or occupant.
2. Operations and maintenance manuals for equipment, products and systems installed under or related to the provisions of Chapter 4 including, but not limited to, the following, as applicable:
  - 2.1. Vegetative shading, vegetative roofs and natural resource protections and setbacks.
  - 2.2. Water-conserving landscape and irrigation systems.
  - 2.3. Stormwater management systems.
  - 2.4. Permanent erosion control measures.
  - 2.5. Landscape or tree management plans.
3. Operations and maintenance documents for materials, products, assemblies and systems installed under or related to the provisions of this code for material resource conservation in accordance with Chapter 5 including, but not limited to, the following, as applicable:
  - 3.1. Care and maintenance instructions and recommended replacement schedule for flooring, including, but not limited to, carpeting, walk-off mats and tile.
  - 3.2. Care and maintenance instructions for natural materials including, but not limited to, wood, bio-based materials and stone.
  - 3.3. Available manufacturer's instructions on maintenance for:

- 3.3.1. Exterior wall finishes.
  - 3.3.2. Roof coverings.
  - 3.3.3. Exterior doors, windows and skylights.
  - 3.4. Information and recommended schedule for required routine maintenance measures, including, but not limited to, painting and refinishing.
4. Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for energy conservation in accordance with Chapter 6 including, but not limited to, the following:
- 4.1. Heating, ventilating and air-conditioning systems including:
    - 4.1.1. Recommended equipment maintenance schedule.
    - 4.1.2. Air filters and fluid filters, including recommended replacement schedule and materials.
    - 4.1.3. Time clocks, including settings determined during commissioning.
    - 4.1.4. Programmable controls and thermostats, including settings determined during commissioning.
  - 4.2. Domestic hot water systems including performance criteria and controls.
  - 4.3. *Building thermal envelope* systems including:
    - 4.3.1. Glazing systems inspection schedule.
    - 4.3.2. Performance criteria for replacements and repairs.
    - 4.3.3. Information and recommended schedule on required routine maintenance measures, including but not limited to, sealants, mortar joints and screens.
  - 4.4. Electrical and lighting systems including:
    - 4.4.1. Technical specifications and operating instructions for installed lighting equipment.
    - 4.4.2. Luminaire maintenance and cleaning plan.
    - 4.4.3. Lamp schedule, recommended relamping plan, and lamp disposal information.
    - 4.4.4. Programmable and automatic controls documentation, including settings determined during commissioning.
    - 4.4.5. Occupant sensor and daylight sensors documentation, including settings determined during commissioning.
  - 4.5. Automatic demand reduction systems.
5. Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for water conservation in accordance with Chapter 7, including, but not limited to the following:
- 5.1. Domestic fixtures.
  - 5.2. Water-regulating devices including faucets and valves.
  - 5.3. Irrigation and rainwater and gray water catchment.
6. Operations and maintenance documents for equipment products and systems under or related to the provisions of this code for indoor environmental quality in accordance with Chapter 8, including, but not limited to, the following:
- 6.1. Humidification/dehumidification.
  - 6.2. Green cleaning products, procedures and techniques.
  - 6.3. Recommended window cleaning schedule.
  - 6.4. Ventilation controls.
  - 6.5. Floor finishes.
  - 6.6. Fireplaces and combustion appliances.

✳ The following IgCC Commissioning Checklist shall accompany all IgCC plan submittals, complete as applicable.

**903.1  
COMMISSIONING PLAN**

Applies YES/NO	CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST- OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
					Preoccupancy	Post- occupancy	
<b>Chapter 4: Site Development and Land Use</b>							
	Natural resources and base line conditions of building site	X	None	Report	With permit submittal	None	401.2
	Landscape irrigation systems	X	None	Field inspection	Installation	None	404.1, 405.1.1
	Topsoil and vegetation protection measures; setbacks from protected areas	X	None	Field inspection and report	Installation of measures, prior to other site disturbance	None	405.1.1
	Imported soils	X	None	Field inspection and report	With permit submittal; after all-fill operations complete	None	405.1.3
	Soil restoration and reuse	X	None	Field inspection and report	Preparation and replacement of soils	None	405.1.4
	Stormwater management system operation	None	X	Field inspection	—	24 months	403.1
	Erosion and sediment control	X	X	Field inspection	During construction activities	Periodic for 24 months	405.1.1
	Hardscape and shading provided by structures and vegetation	X	X	Field inspection and report	During construction and installation	24 months	408.2
	Vegetative roofs	X	X	Field inspection and report	Installation of protective membranes, base materials, soils and vegetation	24 months	408.3.2
	Site lighting	X	None	Testing and report	Installation	None	409
<b>Chapter 5: Material Resource Conservation and Efficiency</b>							
Moisture control (Section 507.1)							
	1. Foundation sub-soil drainage system.	X	None	Field inspection and verification	Periodic inspection for entire sub-soil drainage system	None	507.1 and IBC Ch 18
	2. Foundation waterproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
	3. Foundation dampproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
	4. Under slab water vapor protection	X	None	Field inspection and verification	Periodic inspection for entire slab footprint	None	507.1, IBC Ch 19 and ASTM E 1643

	5. Flashing at: exterior windows, doors, skylights, wall flashing and drainage systems	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of all flashing locations.	None	507.1 and IBC Ch 14
	6. Exterior wall coverings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of exterior wall cladding systems.	None	507.1 and IBC Ch 14
	7. Roof coverings, roof drainage, and flashings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of roof covering, roof drainage and flashings.	None	507.1 and IBC Ch 15

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST- OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post- occupancy	

**Chapter 6: Energy**

Energy consumption, monitoring, targeting and reporting

	a. Monitoring system	X	None	Inspection and verification	During construction and prior to occupancy	None	603, 610.5
	b. Calibration	X	X	Testing and review and evaluation or test reports	During commissioning	Annually	603, 610.5

Mechanical systems completion – all buildings

	a. Air system balancing – provide the means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC
	b. Hydronic system balancing – provide means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC
	c. Mechanical system manuals – construction documents to require O&M manual	X	None	Verification of construction documents	Plan review	None	611.1.5.2

Mechanical systems – buildings over 5,000 square feet total building floor area

	a. Commissioning required and noted in plans and specifications	X	None	Verification of construction documents	Plan review	None	611.1
	b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning activities	None	611.1

	c.	Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning agent	Between plan review and commissioning initiation	None	611.1.1	
		d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer/contractor or commissioning agent	After installation HVAC systems prior to occupancy	of and	TBD	611.1.2
		e. Functional performance testing of HVAC equipment	X	X	HVAC system installer/contractor or commissioning agent	After installation HVAC systems prior to occupancy	of and	TBD	611.1.3
		f. Functional performance testing of HVAC controls and control systems	X	X	HVAC system installer/contractor or commissioning agent	After installation HVAC systems prior to occupancy	of and	TBD	611.1.3.2
	g.	Preparation of preliminary commissioning report	None	X	HVAC system installer/contractor or commissioning agent	None	Subsequent to commissioning	611.1.4	
		h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.1	
		i. Preparation and distribution of final HVAC system completion— Documentation that construction documents require drawings, manuals, balancing reports and commissioning report be provided to the owner and that they have been provided	None	X	RDP, contractor or commissioning authority	None	90 days after final certificate of occupancy	611.1.5	
<b>Chapter 6: Lighting</b>									
		Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4	
		Plug load controls	X	None	Functional testing	Final inspection	None	608.6	

Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11
b. Calibration	X	X	System installer, contractor or commissioning agent	Post-installation	18-24 months	611.3.3

**Chapter 7: Water Resource Conservation, Quality and Efficiency**

Appliances	X	None	—	—	—	702.6
Hot water distribution	X	None	—	—	—	702.8
Cooling tower performance	—	X	—	—	—	703.7.7
Metering	X	None	—	—	—	705.1.1
Rainwater system water quality	None	X	Field testing and verification	None	707.15.1	707.15.1
Gray water system water quality	None	X	Field testing and verification	None	708.13.8	708.13.8
Soil percolation test	X	None	Field inspection and report	Prior to installation of gray water irrigation system	None	708.14.2

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST- OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post- occupancy	

**Chapter 8: Indoor Environmental Quality and Comfort**

Building construction, features, operations and maintenance facilitation

Air-handling system access	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.2
Air-handling system filters	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.3
HVAC systems						
Temperature and humidity in occupied spaces	—	X	Field inspection and verification	—	18 - 24 months	803.2
Specific indoor air quality & pollutant control measures						

	Listing, installation and venting of fireplaces and combustion appliances	X	—	Field inspection and verification	During construction and prior to occupancy	—	804.1
Sound transmission							
	Mechanical and emergency generator equipment located outside buildings or located where exposed to exterior environment.	X	None	Field testing and verification	See Section 807.5.1	None	807.5.1
	HVAC background sound	X	None	Field testing and verification	See Section 807.5.2	None	807.5.2