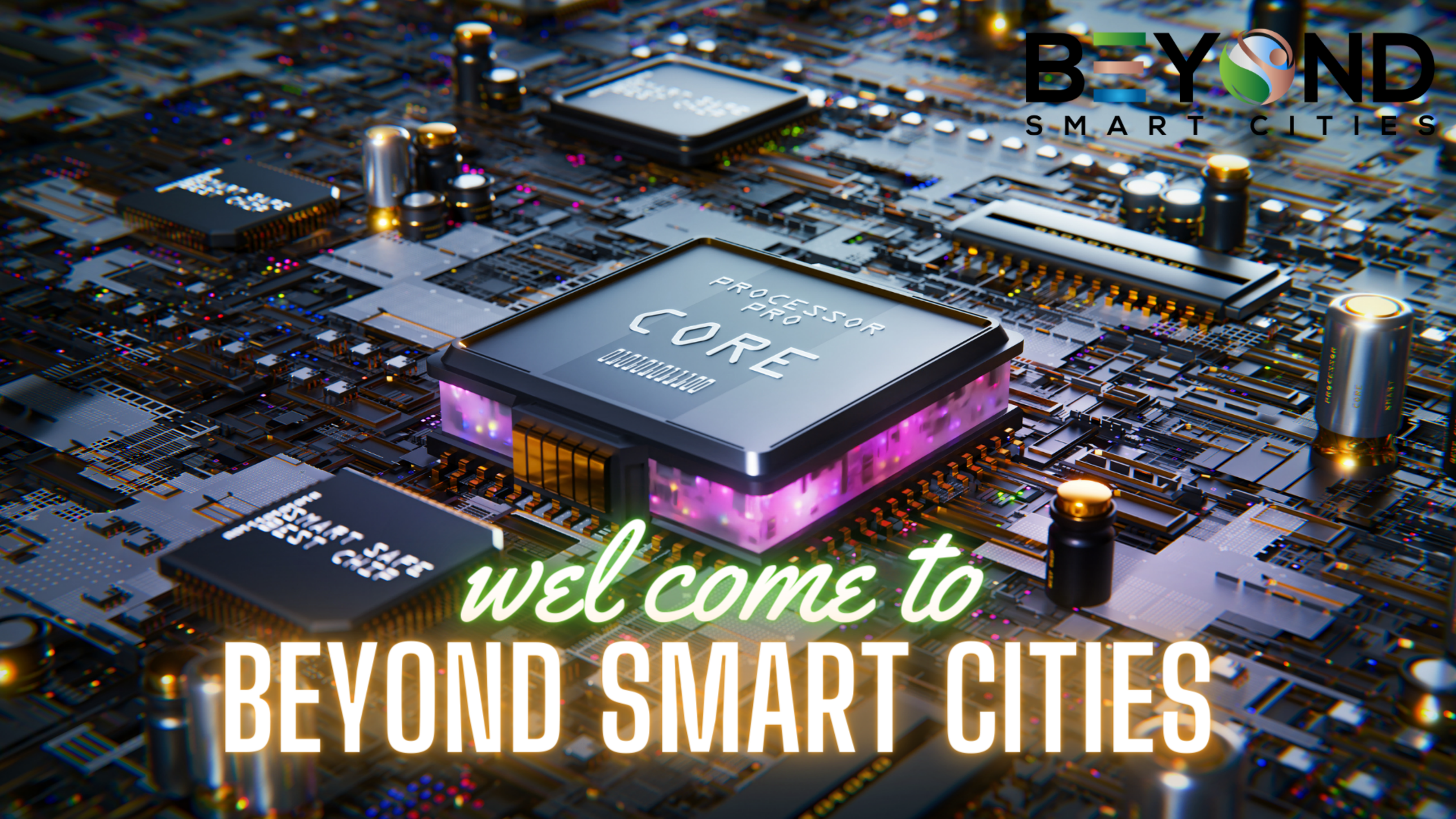

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DESIGN-PHASE COMMISSIONING PROCESS
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MODULE 08

CxA Specifications

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DESIGN-PHASE COMMISSIONING PROCESS OVERVIEW

Commissioning providers (CxPs) must write and submit the commissioning specification to the owner and design team during design. The CxP specifies contractors, subcontractors, suppliers, and testing agencies' commissioning roles in the Commissioning Specification. Before signing GC, PM, or GMP agreements, construction contract documents include the commissioning specification.

Learning Objectives

- Introduction & Overview
- Specificationions
- Sections
- Commissioning Specifications
- Section 00800: Supplemental Conditions
- Section 01810 : Commissioning
- Section 01815 : Commissioning HVAC Systems
- Section 01815.9: Commissioning TAB

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INTRODUCTION

- Commissioning providers (CxPs) must write and submit the commissioning specification to the owner and design team during design.
- The CxP specifies contractors, subcontractors, suppliers, and testing agencies' commissioning roles in the Commissioning Specification.
- Before signing GC, PM, or GMP agreements, construction contract documents include the commissioning specification.
- The CxP may create and use a standard commissioning specification template that is updated for each project based on the commissioning services and building systems.
- The CxP verifies that construction team members' building systems commissioning roles are in the contract.
- The commissioning specification may not specify training program requirements.
- Besides a template, the CxP uses the project manual to write the commissioning specification.
- The CxP should scour the project manual for building systems commissioning project specifications to include in the commissioning specification.



COMMISSIONING SPECIFICATIONS



- The specifications can make or break a project based on what they say and how well they say it.
- It takes both art and science to come up with good specifications.
- Not All firms are good at coming up with quality standards.
- And when it comes to specs for commissioning, many, if not most, designProfessionals don't know nearly enough about what makes a good commissioning specification.
- Also, the commissioning industry hasn't grown up enough for the experts in the specification The writing business has come up with standards for commissioning.
- So, most of the time, a design professional is breaking new ground with each new commission-specification.
- A skilled commissioning authority has another big chance to have a big impact on the success of the commissioning program by making sure that the important parts of the commissioning specifications have been covered.
- The The next few paragraphs can only summarize requirements; they can't guarantee that design professionals who read them will immediately start making commissioning specifications for the content and quality needed to get the job done.

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SPECIFICATION SECTIONS

- When discussing commissioning issues, the dynamic operating system and building owners' and operators' maintenance issues come first.
- As commissioning is now seen as a process for ensuring all of a facility's systems—both dynamic and passive—perform to the owner's project requirements, it's important to recognize all construction elements that may need to be tested and proven.
- A leader in specification preparation, the Construction Specifications Institute (CSI) has worked with design professionals and construction contractors to develop standard specifications and other resources to improve work quality in both industries.
- Appendix 4 is an excerpt of standard CSI specification divisions and sections that may result in equipment, systems, and installations that need commissioning to meet the owner's project requirements.
- Besides the listing in Appendix 4, many Division 1 sections require special attention in commissioning specifications.
- The project specification writer can use Sections 01811–01819 as desired.





SPECIFICATION SECTIONS +



- Before discussing several commissioning sections, it is important to note that there is no consensus on where to place commissioning requirements in project specifications.
- A division or section specification location should contain all commissioning requirements.
- The main reason for grouping all commission requirements in one division (Division 1, Sections 01810-01819) is that the prime contractor must clearly take responsibility for all commissioning work to successfully fulfill all construction contract commissioning requirements with minimal argument and conflict.
- While the prime contractor, subcontractors, and equipment suppliers share the responsibility of commissioning tests and corrections, it cannot be easily delegated to subordinate parties due to the nature of the work.

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SPECIFICATION SECTIONS +



- Seeing and documenting all commissioning program requirements in one place from a construction perspective is another compelling reason.
- This arrangement helps everyone see all requirements and create bid proposals.
- Otherwise, a Collating and aggregating the many commissioning requirements from the technical specifications will take a lot of work, but it can be done.
- A testing contractor is the prime contractor's designee for developing, coordinating, and implementing commissioning program requirements on large projects to facilitate their participation.

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COMMISSIONING SPECIFICATIONS+

- Division 1: General Requirements

Section 00800: Supplementary Conditions
Section 01770: Closeout Procedures
Section 01780: Closeout Submittals
Section 01810: Commissioning
Section 01811: Commissioning: Foundation, Structure, and ExteriorClosure and Roof Systems
Section 01812: Commissioning: Interior Systems
Section 01813: Commissioning: Conveying Systems
Section 01814: Commissioning: Plumbing and Piping Systems
Section 01815: Commissioning: HVAC Systems
Section 01816: Commissioning: Electrical Systems
Section 01817: Commissioning: Communications and SignalsSystems
Section 01818: Commissioning: Special Equipment Systems
Section 01819: Commissioning: Intersystem FunctionalPerformance

- Division XX: (Any Division for Which Commissioning IsSpecified)

Section XX995: Commissioning: (Any Division's) Requirements

- Division 15: Mechanical

Section 15995: Commissioning: Mechanical Requirements

- Division 16: Electrical

Section 16995: Commissioning: Electrical Requirements





SECTION 00800 : SUPPLEMENTAL CONDITIONS



- Supplemental Conditions is a section in the specification that makes it easy for the design professional to make changes to the General Conditions of the contract, which, in the case of standardized documents like AI Document A201, General Conditions of the Contract for Construction, or the general conditions of state and federal agencies, are standardized, preprinted documents that do not allow for direct changes in Sections within the Supplemental Conditions of the contract.
- Supplemental Conditions is a section in the specification that makes it easy for the design professional to make changes to the General Conditions

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SECTION 01810 : COMMISSIONING

- The requirements for commissioning are outlined in Section 01810 .
- Section 01810 defines the commissioning procedure and the commissioning responsibilities of the contractor.
- The qualifications, responsibilities, and authority of the testing contractor are outlined in Section 01810.
- It is recommended that a principal of the general contractor be required to write a letter to the testing contractor outlining the testing contractor's responsibilities and authority on the project, with copies to all prime, subcontractor, and vendor participants in the commissioning program.
- This will ensure that the testing contractor is not prevented from performing the specified commissioning work when it conflicts with the construction schedule.
- The specifications spell out the level of detail required for the presentation of commissioning tasks in the schedule.
- In order to finalize the test procedures, the operations and maintenance (O&M) manual materials, including installation and startup requirements, must be available.





SECTION 01810 : COMMISSIONING +



- The requirements for the contractor to perform and document successful execution of commissioning tests and to demonstrate a sample of the tests to the CxA or other designated witnesses of the owner are specified in Section 01810.
- The contractor must conduct the tests in accordance with the agreed-upon written procedures and using calibrated, approved equipment.
- Because commissioning is a relatively new process for the majority of projects and because most contractors have little or no experience with commissioning documents, Part 4, Examples, of Section 01810 provides examples of typical documents the contractor will be working with.
- Therefore, Appendix 4–6 includes the following examples: Air Handling Unit (AHU)-Supply Air Control Commissioning Test Specification; Commissioning Test Procedure: AHU-1-Supply Air Control Commissioning Test Data Form: AHU-1-Mixed Air Control Control Interface Diagrams 1 and 2 and Commissioning Deficiency Report Form.
- The unit must keep records of all commissioning activities to be submitted upon completion of the commissioning work.
- Before the Certificate of Functional Completion can be issued, all documentation pertaining to the commissioning process must be submitted.

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SECTION 01815 : COMMISSIONING : HVAC SYSTEMS

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- The section 01815 of the specifications is an example of a technicalcommissioning requirements section.
- Section 01815 specifies technical requirements for commissioning HVAC systems, but does not restate the general requirements for commissioning defined in Section 01810.Section 01815 specifies the instruments that the contractor must use to conduct the tests outlined in the section.
- The majority of Section 01815 is devoted to specifications for individualcommissioning tests, which are separated into several categories.
- Similarly, flushing and cleaning of mechanical systems is now included in the commissioning specification.
- Verification of the testing, adjusting, and balancing work is now a function of commissioning.
- It is essential, when specifying commissioning tests, to provide bidders with sufficient information to enable them to submit fair and competitive bids.
- That is a significant burden for the individual.preparing the requirements.





SECTION 01815 : COMMISSIONING: HVAC SYSTEMS +



- When the four items listed below are specified for each test, bidders have sufficient information to estimate the cost of the work.
- This section describes the conditions under which the equipment or system will be evaluated.
- Acceptable results should be expressed in terms that are consistent with the performance specifications of the tested equipment or system.
- In addition to the allowable error rate for the subject of the test, allowances should be made for errors in test instrumentation.
- If test demonstrations are to be required for less than one hundred percent of the equipment or systems to which the test applies, acceptance and rejection criteria for the sample must be specified.

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SECTION 01815.9 : COMMISSIONING: TESTING, ADJUSTING, AND BALANCING



- This Section outlines the requirements for testing, adjusting, and balancing (TAB) of University systems, controls, and equipment.
- Heating, ventilation, and air conditioning (HVAC), supply and exhaust air systems, hot water heating, chilled water systems, cooling towers, and condensate systems are among these systems.
- The engineer/contractor or Commissioning Authority is responsible for applying the principles of this section to ensure that the project achieves a level of quality and consistency in the design, operation, and construction of its facilities.
- A quality specification must be included for the testing, adjusting, and balancing work in order to demand and achieve quality outcomes.

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