

BEYOND SMART CITIES

LEARN.BEYONDSMARTCITIES.IN

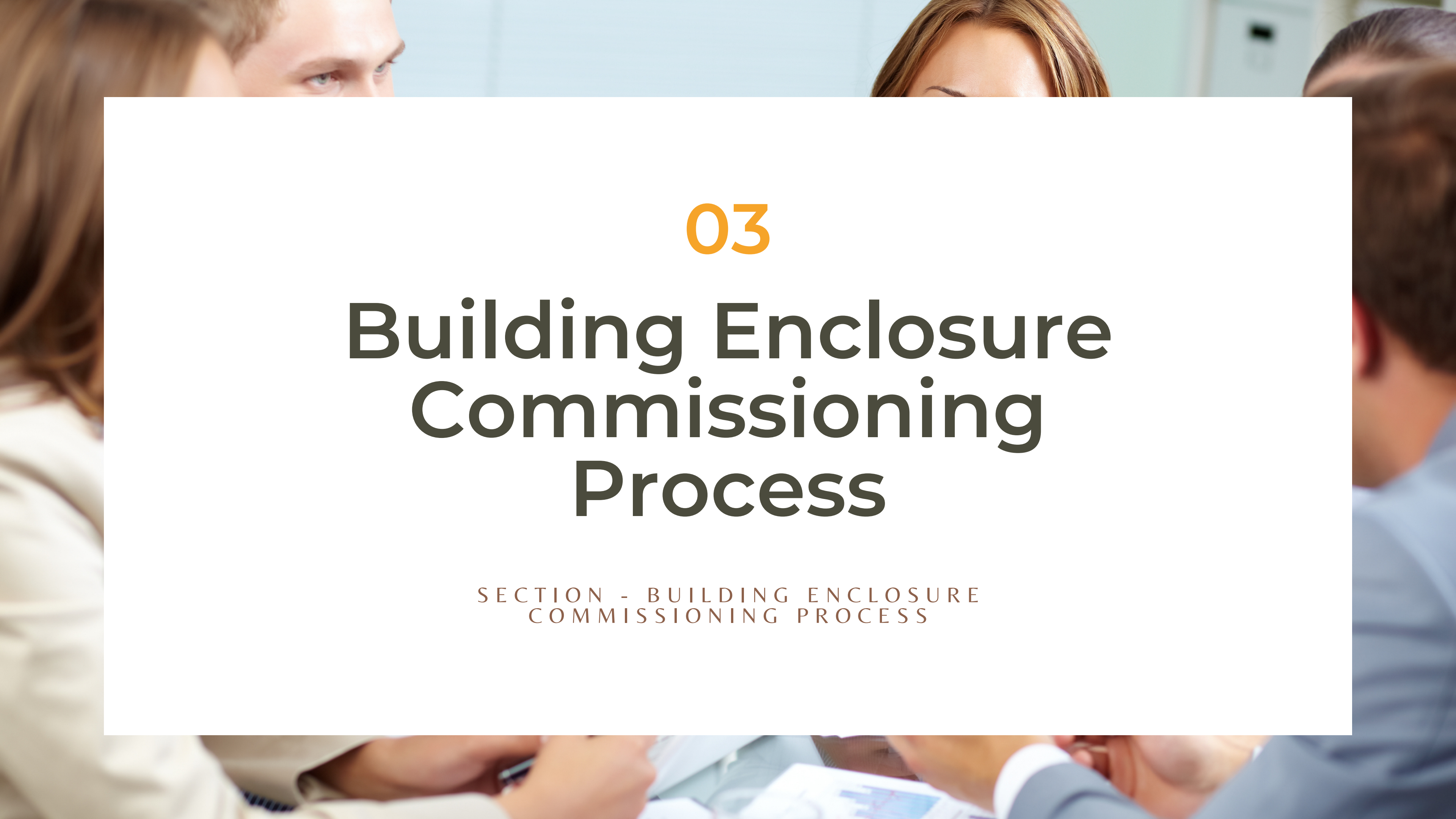


WELCOME TO BUILDING ENCLOSURE COMMISSIONING

ONLINE TRAINING

KRISHNAJI PAWAR - CEO & FOUNDER



A blurred background image showing several people in a meeting or collaborative work environment. The focus is on the text overlay in the center.

03

Building Enclosure Commissioning Process

SECTION - BUILDING ENCLOSURE
COMMISSIONING PROCESS

Building Enclosure Commissioning Process



03

WHAT YOU WILL LEARN

- Building Envelope Commissioning Defined
- Building Enclosure Commissioning Process
- How does the commissioning of the building envelope take place?

[LEARN.BEYONDSMARTCITIES.IN](https://learn.beyondsmartcities.in)





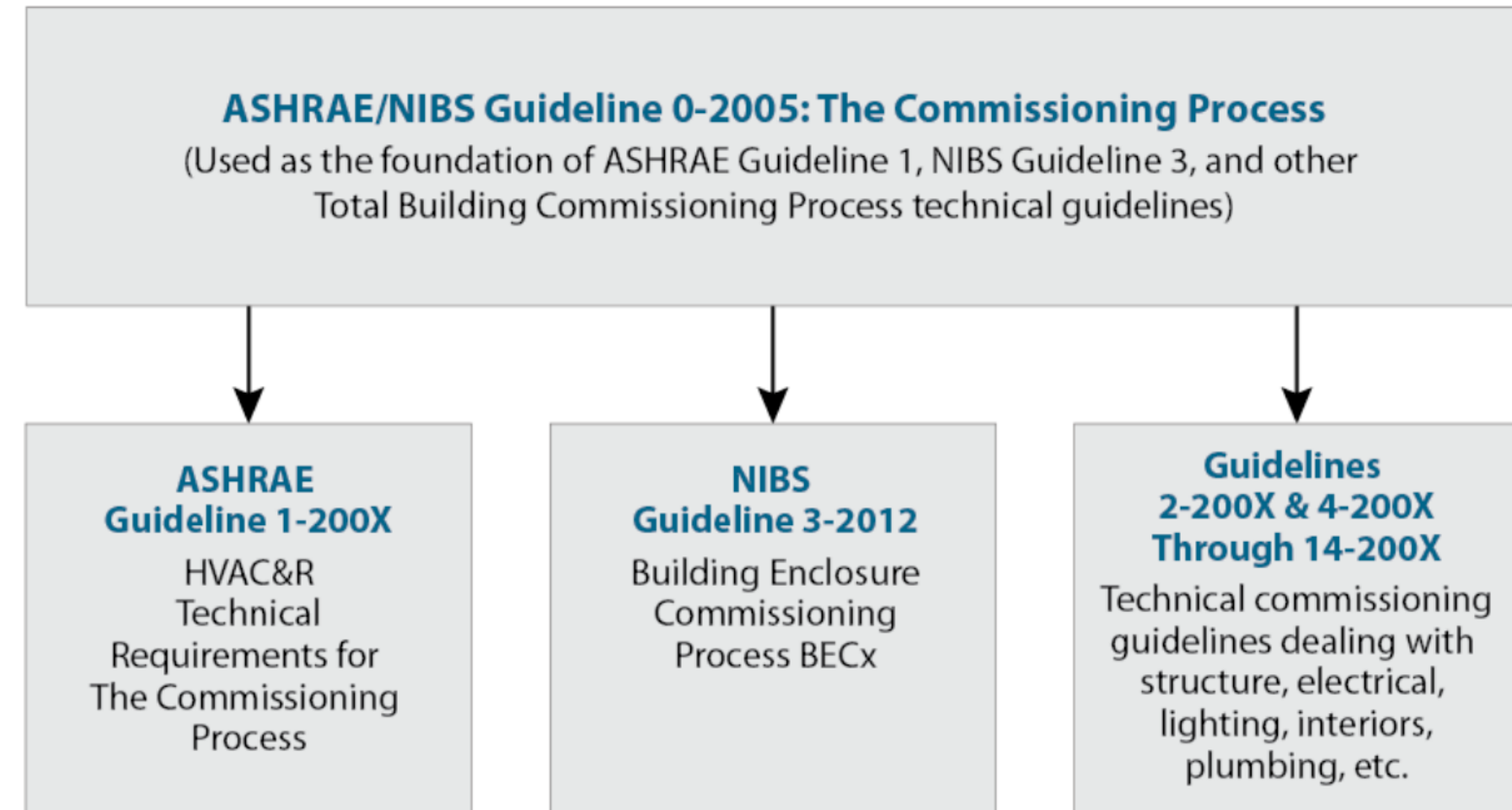
Building Envelope Commissioning Defined

Current guidelines and documentation for commissioning include ASHRAE guideline 0-2005, which defines the commissioning process for both ASHRAE technical volumes for HVAC&R and NIBS guidelines for roofing, lighting, fire life safety, interiors, envelopes and plumbing. This course focuses on ASHRAE guideline 0-2005 and NIBS guideline 3-2012, Exterior Enclosure technical requirements.

Per ASHRAE and NIBS, the building commissioning process is:

- A quality-oriented way of achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets owner-defined objectives, from concept to operations and maintenance.
- A system by which owners, architectural programmers, designers, contractors, and operations and maintenance personnel are fully accountable for the quality of their work.

NIBS defines Exterior Enclosure as “the exterior enclosure of a building includes all systems separating the interior environment from the exterior, including exterior walls, fenestration, and roofing and roof openings, below grade perimeter walls and the slab-on-grade or crawlspace.”



LEARN.BEYONDSMARTCITIES.IN

THE BASIC ABBREVIATED BUILDING ENVELOPE COMMISSIONING PROCESS FOLLOWS THESE STEPS:



- The basic abbreviated building envelope commissioning process follows these steps:
- Initiate conceptual pre-design consulting with the team.
- Prepare an Owner's Project Requirements (OPR) document.
- Prepare a Basis of Design (BOD) report.
- Conduct design peer review at determined design stages.
- Supervise mock-up construction and testing, carrying forward any lessons learned.
- Devise performance testing standards.
- Provide construction-phase commissioning, including inspection and testing.
- Develop a commissioning report.

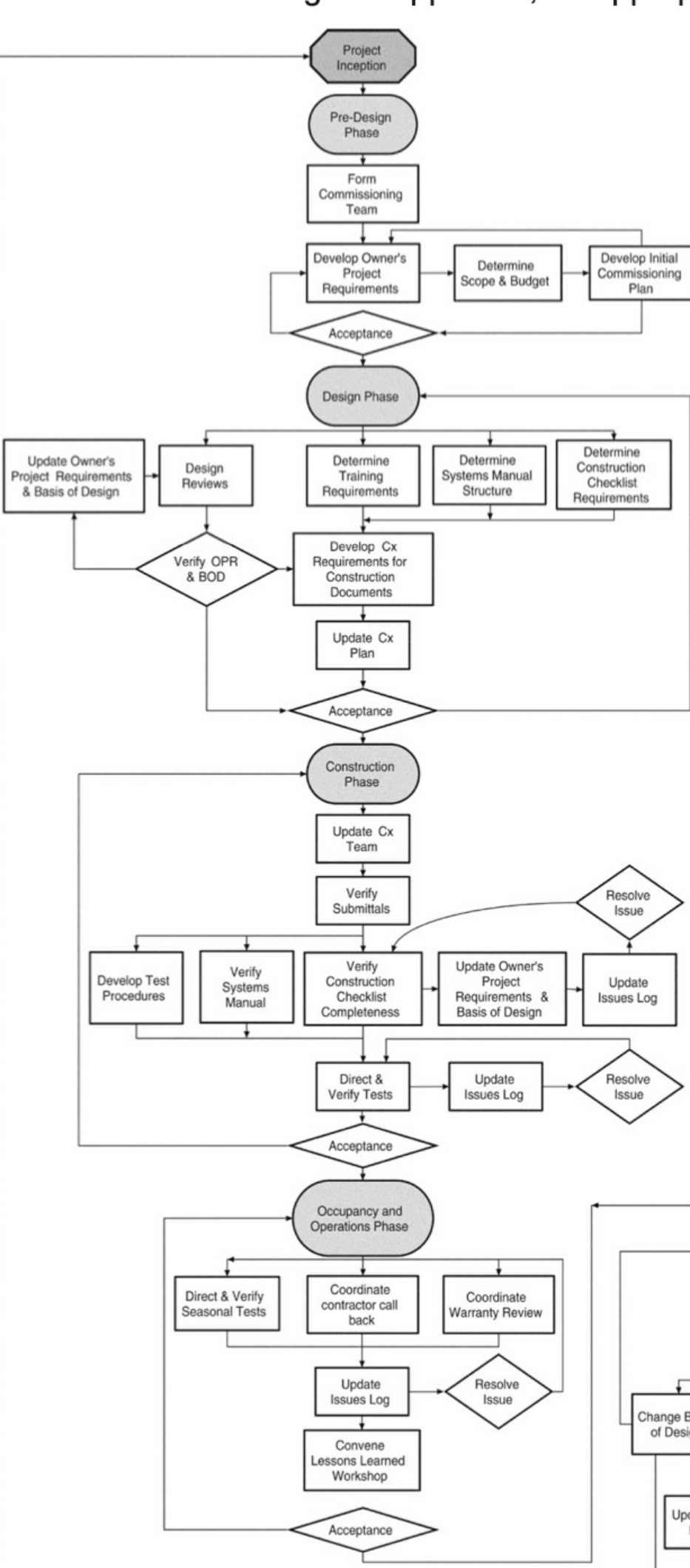
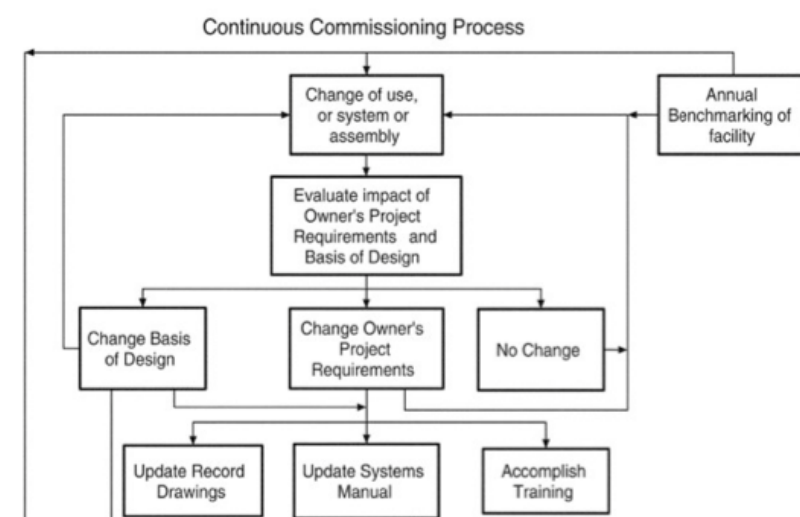


A. Develop a building envelope scope of work

- The first step in the commissioning process is to figure out how big the process will be and how much it will cost.
- The process of commissioning the building envelope can include a wide range of services with a wide range of costs.
- If the owner or owner's representative doesn't provide a scope of work, the building envelope commissioning agent must ask many comprehensive questions to understand the owner's demands and concerns.
- The commissioning agent might ask the owner how maintenance and running costs will affect ROI, capitalization rates for resale, and system upgrade payback periods. When creating the commissioning scope, the owner's project goals must be understood.
- Commissioning should be budgeted. Commissioning usually saves money by reducing change orders, improving building performance, and reducing system failure. The commissioning process (Figure 1) must be established with all project stakeholders at the start.

LEARN.BEYONDSMARTCITIES.IN





The following sections provide details of the building envelope commissioning process:

- A. Develop a building envelope scope of work**
- B. Pre-Design Phase**
- C. Design Phase**
- D. Construction Phase**

B. Pre-Design Phase

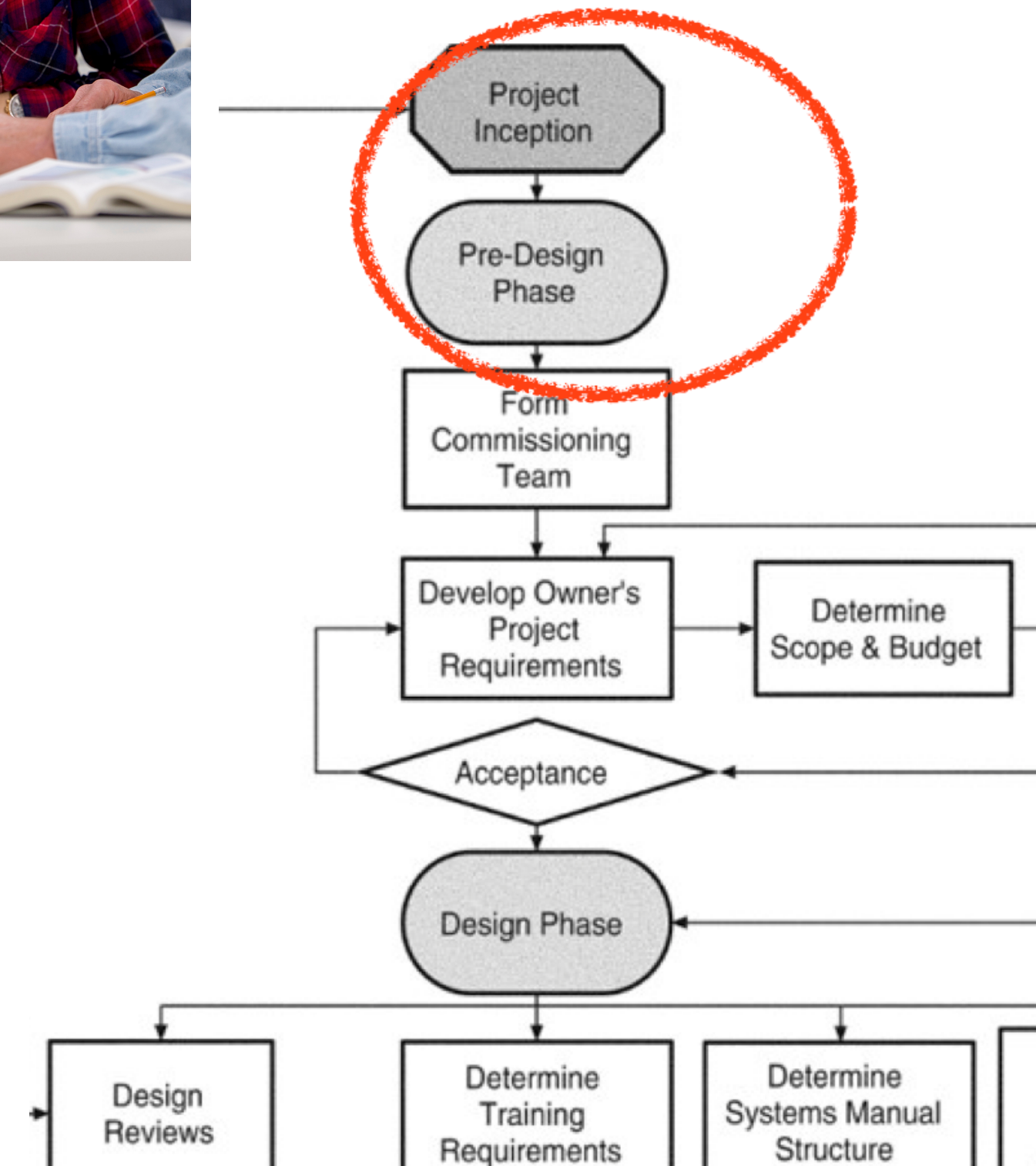
During the Pre-Design Phase, the Commissioning Plan is developed to address the OPR. The Commissioning Plan identifies processes and procedures and includes a schedule of commissioning activities, team member responsibilities, documentation requirements, communication and reporting protocols, and evaluation procedures. The Commissioning Plan is a “living document” that is continually updated during the life of a project. During the Pre-Design Phase, the Commissioning Plan focuses on defining the scope of the Commissioning Process for the Design Phase.

- The following pre-design commissioning objectives must be met for any project:
- Ascertain the owner’s financial and building performance goals.
- Propose Building Enclosure Systems and Assemblies that match their intended use.
- Determine if the Building Enclosure meets the climate conditions.
- Review if the Building Enclosure meets the heating and cooling needs and the
- Owner’s life cycle expectations.
- Confirm that the selected systems meet owner’s budget requirements.

LEARN.BEYONDSMARTCITIES.IN



BEYOND
SMART CITIES



C. Design Phase

The Design Phase also includes:

- Revise the Commissioning Plan with Construction, Occupancy, and Operations processes.
- Design and develop Construction Document Commissioning Procedures, including quality-assurance and quality-control procedures. Commissioning includes paperwork, training, testing, and installation of systems and assemblies.
- Develop pre-installation, installation, and equipment/assembly verification checklists. These checklists verify that the equipment and materials specified and submitted are delivered to the site and have been inspected before installation. The checklist's installation component confirms system installation and testing.
- Develop a Systems Manual to manage systems and assemblies. The Systems Manual should also document system and assembly upgrades and changes during construction, occupancy, and operation. Construction Documents should specify contractor Systems Manual contributions.

LEARN.BEYONDSMARTCITIES.IN



BEYOND
SMART CITIES



D. Construction Phase

The Building Envelope Commissioning Agent confirms that OPR-compliant systems and assemblies have been installed, inspected, tested, and put into service during construction. Construction Phase Commissioning Services analyse submittals, shop drawings, mockups, and sample construction to ensure materials fulfil project specifications and test performance.

- The Building Envelope Commissioning Agent will review field mock-ups for general and particular interface conditions during construction to ensure they match design intent and OPR system performance.
- The Building Envelope Commissioning Agent witnesses design-phase system testing. The Agent visits critical sites periodically and records observations. The Commissioning Agent tracks open issues from observations in an open issues log.

LEARN.BEYONDSMARTCITIES.IN



How Does Building Envelope Commissioning Work?

- The building envelope commissioning programme is calibrated to the OPR and focuses on improving the envelope rather than meeting code minimums. The building envelope commissioning provider analyses architectural elements, vapour and air barrier definitions, cladding, and weather barriers during the design review. They also examine chemical compatibility, envelope membrane compatibility, and adhesive compatibility.
- The building envelope commissioning provider visits the site regularly to evaluate methods and procedures, including construction sequencing and installation, and creates inspection reports. They also ensure construction matches design. The building envelope commissioning supplier should visit a 200,000-SF complex school 10 times.
- Building envelope commissioning, like HVAC commissioning, establishes rules and verifies the contractor's testing. The contractor should test the air barrier as part of the specifications. . The building envelope commissioning provider would specify that an AAMA-accredited testing organisation do window testing and field check it. Hiring a qualified testing organisation may increase testing expenses, but it saves a battle later if the testing fails. Sealant pull tests, window assembly, roof integrity, and waterproofing are other tests. Project complexity and risk/success considerations should determine testing.
- Building envelope commissioning ends after construction. The post-occupancy examination checks window and door seals and envelope and cladding maintenance documents in the O&M manual.

LEARN.BEYONDSMARTCITIES.IN



THANK YOU

LEARN.BEYONDSMARTCITIES.IN