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ONLINE TRAINING BY KRISHNAJI PAWAR
LEED AP(BD+C), GSAS CGP, GCP, ISO 14001
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MODULE

06 - B

Predesign Phase CXA Process

KRISHNAJI PAWAR - CEO & FOUNDER

LEED AP(BD+C),GSAS CGP,GCP,ISO 14001

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CERTIFIED COMMISSIONING MANAGER - CCM TRAINING OVERVIEW

This course has previously covered the benefits of commissioning for the owner, design professional, and contractor. It is more beneficial to involve the commissioning authority early in the predesign or design phases of a project than during construction.

Learning Objectives

- Introduction
- Benefits of Early CxA Participation
- Selecting the Commissioning Authority
- The Advertisement
- Owner's Project Requirements (OPR)
- Commissioning Plan
- Communications Plan
- Project Budget
- Commissioning Authority Agreement
- Selection of the Design Professional & Agreement
- Pre-Design Phase Overview
- Commissioning Meetings
- Which building systems are to be commissioned?

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INTRODUCTION

- Prior to this point, the predesign phase of a new building project is likely to have had the least formality, at least formality in the sense that it is an integral part of the larger quality assurance program.
- Typically, the predesign phase of a new construction project receives inadequate consideration.
- As soon as owners recognize the value of developing a comprehensive commissioning quality assurance program, they begin to comprehend the significance of developing a predesign procedure.
- Previous lectures in this course have addressed the benefits of commissioning for the primary process participants: the owner, design professional, and contractor.
- Involving the commissioning authority early in the predesign or design phases of the project, as opposed to only during the construction phase, has a greater value.

COMMISSIONING PLAN





- Now is the time for the owner to acknowledge the complexity of the commissioning process and formulate the basic commissioning plan accordingly.
- The commissioning authorities' services are a valuable addition to the commissioning plan's development.
- At this point in the project, the commissioning plan will serve as the framework for the final commissioning plan, which has yet to be completed.
- The objective of the commissioning plan is to identify the numerous sequential steps necessary for the quality assurance process to achieve the intended results.
- In addition, the plan specifies the commissioning responsibilities of each commissioning team member.

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COMMUNICATIONS PLAN

- The communications plan is a component of the commissioning plan.
- During the predecision phase, it is necessary to determine how to manage communications between all parties involved in the project.
- Thus, it is prudent for the owner to understand the benefits and risks of various communications and to develop a communications plan accordingly.
- As participants in the commissioning process come and go, the communications diagram must be updated to ensure the continuity of the communications program.
- As long as each participant is aware of and committed to the communications plan and diagram, miscommunications will occur less frequently.



PROJECT BUDGET

- Owners create project budgets as the final predesign task.
- However, a budget must be set to reflect the owner's funding needs and give design professionals a goal.
- The owner can learn a lot from the project budget, which includes the maximum allowable construction cost (MACC) for the facility and all associated project costs, such as design fees, environmental impact statement fees, soil and concrete testing permit fees, taxes, etc.,
- Owner will choose project construction type and quality simultaneously.
- The programmed building's MACC will be calculated using the per-square-foot construction figure.
- The project budget can be created with this number and the remaining line-item requirements.





COMMISSIONING AUTHORITY AGREEMENT



- The agreement contains provisions appropriate to the institutional environment of the public sector.
- The agreement section is a two-page document that can be modified to reflect the specifics of each project's contract.
- Attachment C, Scope of Services, is the final written proposal from the commissioning authority to the owner, detailing all services, projected hours, total labor costs, and anticipated reimbursable expenses.
- Prior to developing the final letter outlining the CxA's scope of services, the owner and CxA will have discussed in depth the required work and the letter's content.
- When included as an attachment to the agreement, there can be no doubt as to the services the CxA intends to provide and the costs associated with those services.
- Developing an agreement for the predesign and design phases may be necessary if the CxA is engaged during the predesign phase.

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SELECTION OF THE DESIGN PROFESSIONAL

- Before, during, or after completion of the predesign phase, different owners choose the design professional.
- Many owners have already established a procedure for selecting the DP.
- However, experience has shown that defining the DP's role in the context of the owner's project requirements results in better selections.
- The CxA can help formulate selection criteria that emphasize the DP's capacity to deliver a project that meets the owner's project specifications.





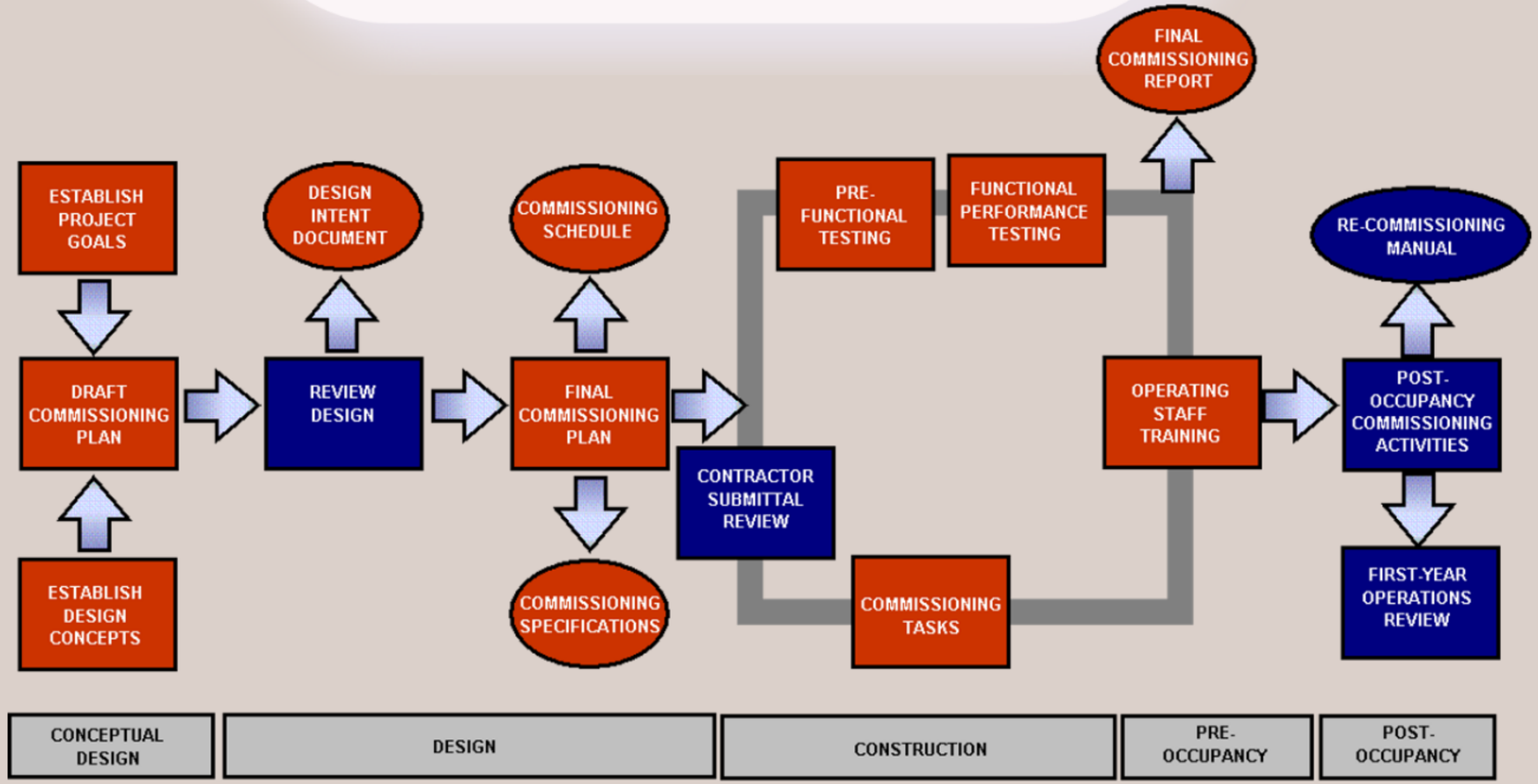
DESIGN PROFESSIONAL AGREEMENT



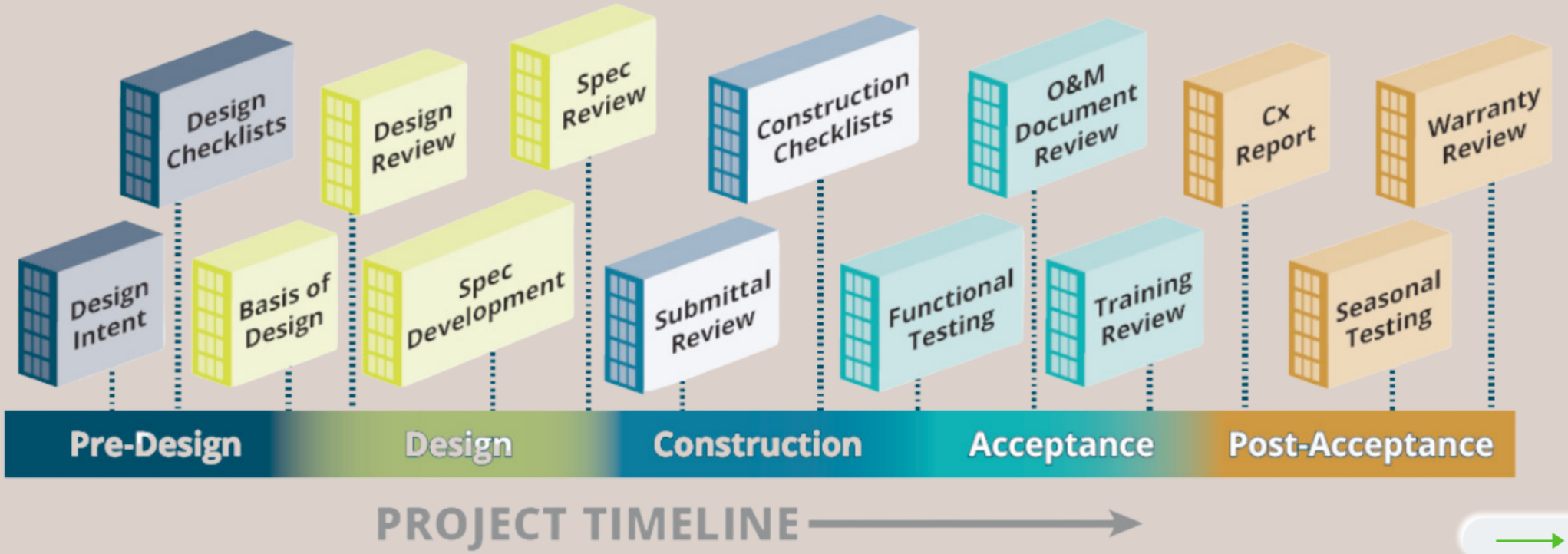
- The design professional's contract with the owner is recognized as a professional services agreement.
- Nevertheless, regardless of the format adopted, two modifications are essential to the success of the commissioning program.
- First, the agreement must clearly identify requirements for the design professional in developing the commissioning-related construction documents and in participating throughout the construction phase of the commissioning process.
- Either way, the design professional must be under contract for the services required to produce a quality set of commissioning documents that will be integrated into the construction documents.
- In addition, the DP's agreement must clarify the role of the CA in the commissioning process so the DP will understand the CxA relationship to their work on the project.
- The second modification is to include an attachment to the agreement that clearly identifies the owner's project requirements for design review submittals.

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Phases of Commissioning



Commissioning Activities



Pre-Design Phase Overview

- **Engage in project commissioning.**
- **Develop Cx scope**
- **A commissioning provider is hired.**
- **The CxA reviews or facilitates OPR.**
- **Set the pre-design Cx outline.**

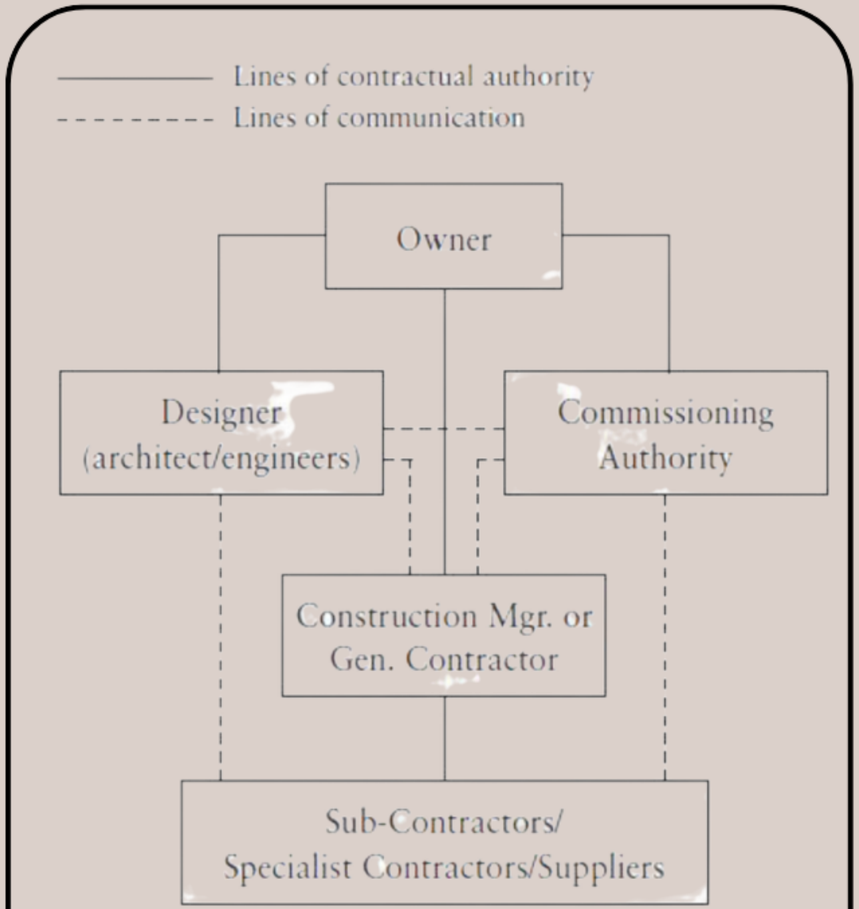
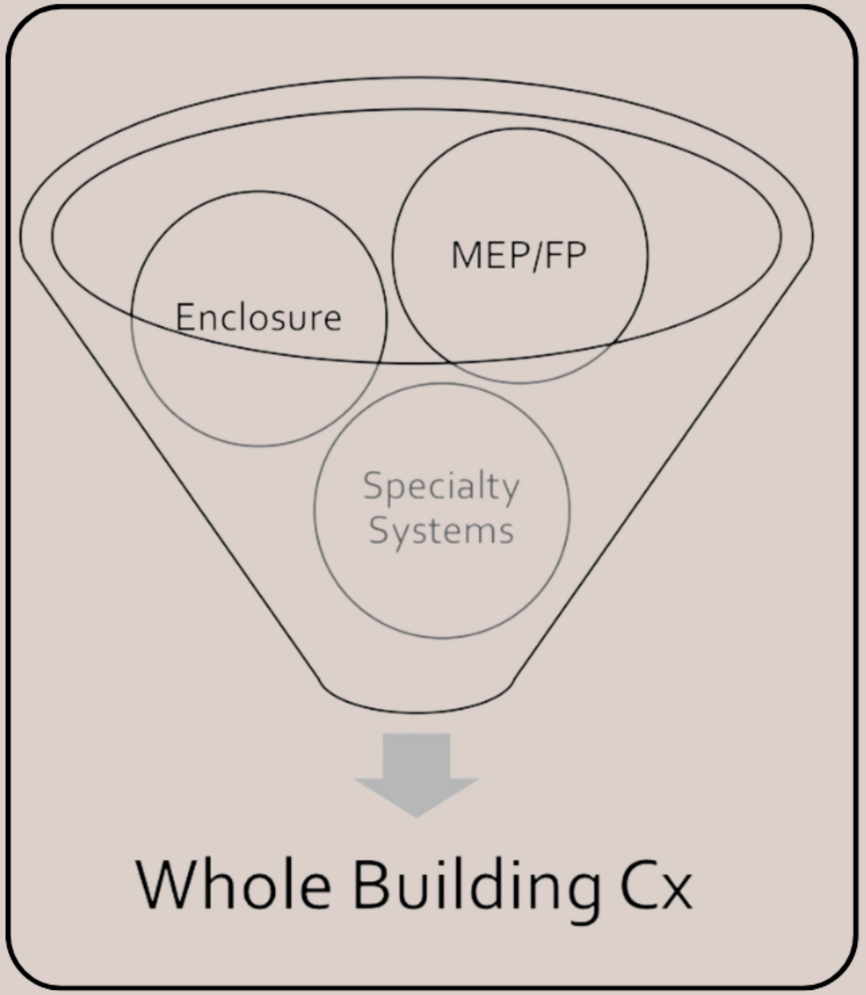


Figure 4.1 Organizational Structure for Comprehensive HVAC Commissioning—Plan and Spec

Establish commissioning:

- **Allocate budget funds.**
- **Decide: Third party or not?**
- **Systems:HVAC,Elec,etc.**



Develop scope:

- **Bring together scope and budget**
- **Based on requirements (past experience, end-user requirements, maintenance priorities)**
- **If the owner does not clearly define scope, ExperiencedCxA should.**

4.2.2 Commissioning Process Activities and Deliverables

	Activity	Deliverable
a.	Initiate Commissioning Process	Roles and Responsibilities
b.	Decide Project Requirements	Owner's Project Requirements
c.	Develop Commissioning Plan	Commissioning Process Plan
d.	Design Approach to Requirements	Basis of Design
e	Set Contractor Cx Requirements	Commissioning Specifications
f.	Review Design to Requirements	Design Review Report
g.	Review Submittals	Submittal Review Report
h.	Observe and Test	Construction Checklists & Reports
i	Resolve Issues	Issues and Resolution Log
j.	Assemble Systems Manual	Systems Manual
k.	Conduct Training	Training Plans and Records
l.	Post Occupancy Operation	End of Warranty Cx Report
m.	Assemble Commissioning Report	Commissioning Report

Reference: ASHRAE Standard 202



SELECT A COMMISSIONING PROVIDER (CXA):



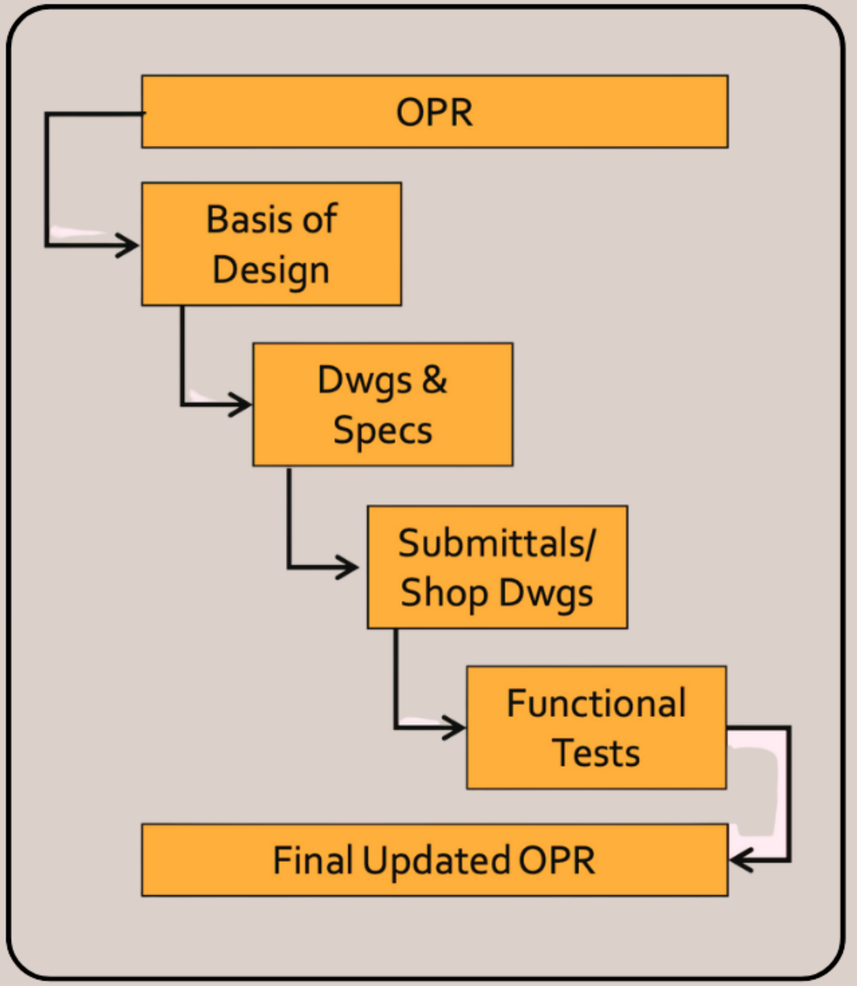
- Request for Qualifications
- Request forProposal
- Fixed cost through design phase, estimate for remaining phases

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CxA and the OPR:

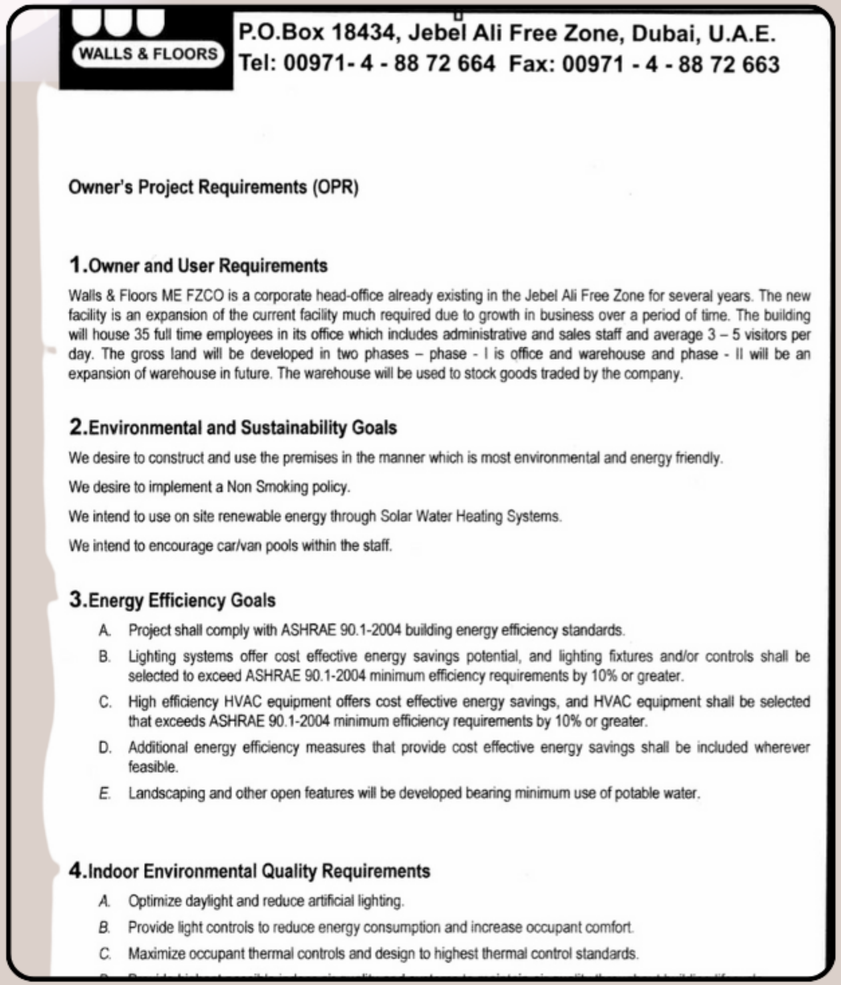
- **The OPR is a critical document.**
- **CxA facilitates OPR development through workshops.**
- **The OPR should be updated throughout the project.**

NOTE: OPR nomenclature replaces the former DID.



Owner’s Project Requirements

- **Program requirements**
- **Codes and regulations**
- **Site and climate**
- **Facility context and function • Performance criteria**
- **Sustainability goals**
- **Cost**
- **Schedule**
- **Client’s needs and capabilities**



WALLS & FLOORS

P.O.Box 18434, Jebel Ali Free Zone, Dubai, U.A.E.
Tel: 00971- 4 - 88 72 664 Fax: 00971 - 4 - 88 72 663

Owner's Project Requirements (OPR)

1.Owner and User Requirements

Walls & Floors ME FZCO is a corporate head-office already existing in the Jebel Ali Free Zone for several years. The new facility is an expansion of the current facility much required due to growth in business over a period of time. The building will house 35 full time employees in its office which includes administrative and sales staff and average 3 – 5 visitors per day. The gross land will be developed in two phases – phase - I is office and warehouse and phase - II will be an expansion of warehouse in future. The warehouse will be used to stock goods traded by the company.

2.Environmental and Sustainability Goals

We desire to construct and use the premises in the manner which is most environmental and energy friendly.

We desire to implement a Non Smoking policy.

We intend to use on site renewable energy through Solar Water Heating Systems.

We intend to encourage car/van pools within the staff.

3.Energy Efficiency Goals

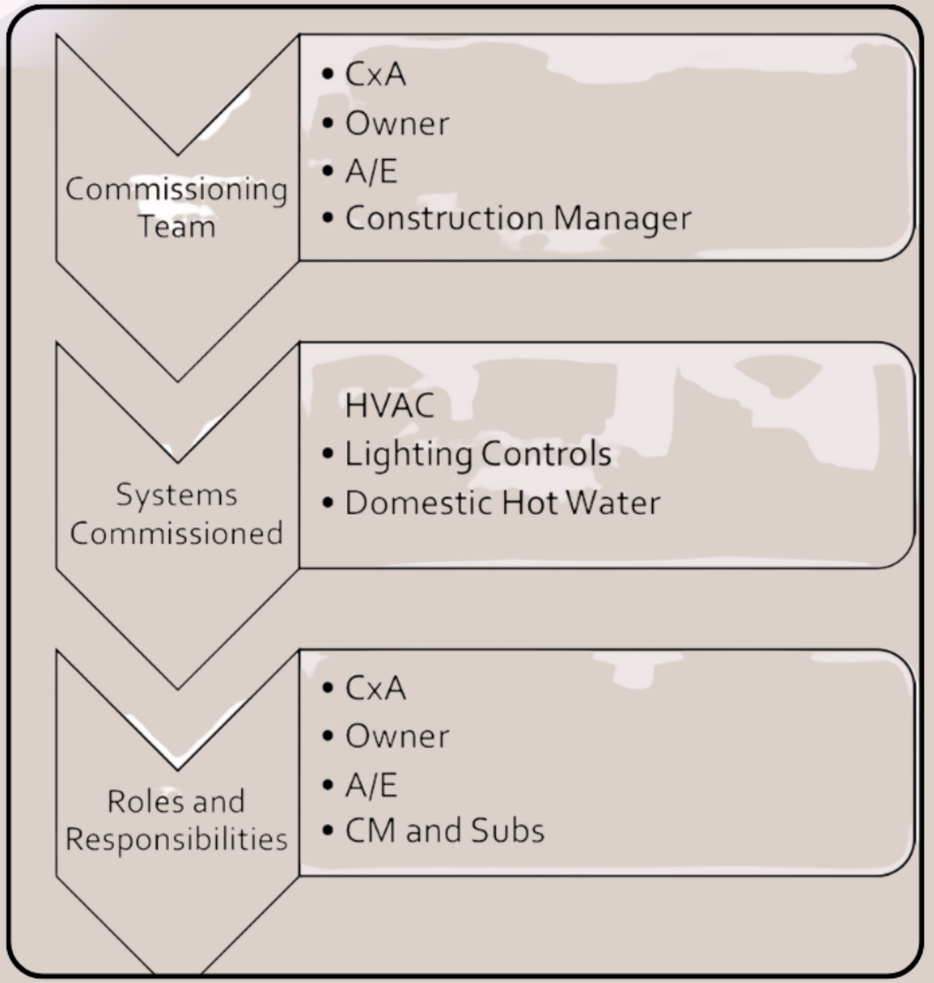
A. Project shall comply with ASHRAE 90.1-2004 building energy efficiency standards.
B. Lighting systems offer cost effective energy savings potential, and lighting fixtures and/or controls shall be selected to exceed ASHRAE 90.1-2004 minimum efficiency requirements by 10% or greater.
C. High efficiency HVAC equipment offers cost effective energy savings, and HVAC equipment shall be selected that exceeds ASHRAE 90.1-2004 minimum efficiency requirements by 10% or greater.
D. Additional energy efficiency measures that provide cost effective energy savings shall be included wherever feasible.
E. Landscaping and other open features will be developed bearing minimum use of potable water.

4.Indoor Environmental Quality Requirements

A. Optimize daylight and reduce artificial lighting.
B. Provide light controls to reduce energy consumption and increase occupant comfort.
C. Maximize occupant thermal controls and design to highest thermal control standards.

Pre-design commissioning outline:

- **Developed by the CxA**
- **Identify Cx budget and/or time requirements**
- **Cx team summary of roles**
- **Systems to be commissioned**
- **Outline evolves in to Commissioning Plan**



COMMISSIONING MEETINGS

The CxP must review with the owner or owner's representative the Owner's Project Requirements (OPR) or Current Facility Requirements (CFR), which may have been developed by the CxP, the owner, or the design team. In addition, the CxP should emphasize the significance of attendance and punctuality at all required Cx Team meetings throughout the duration of the project.

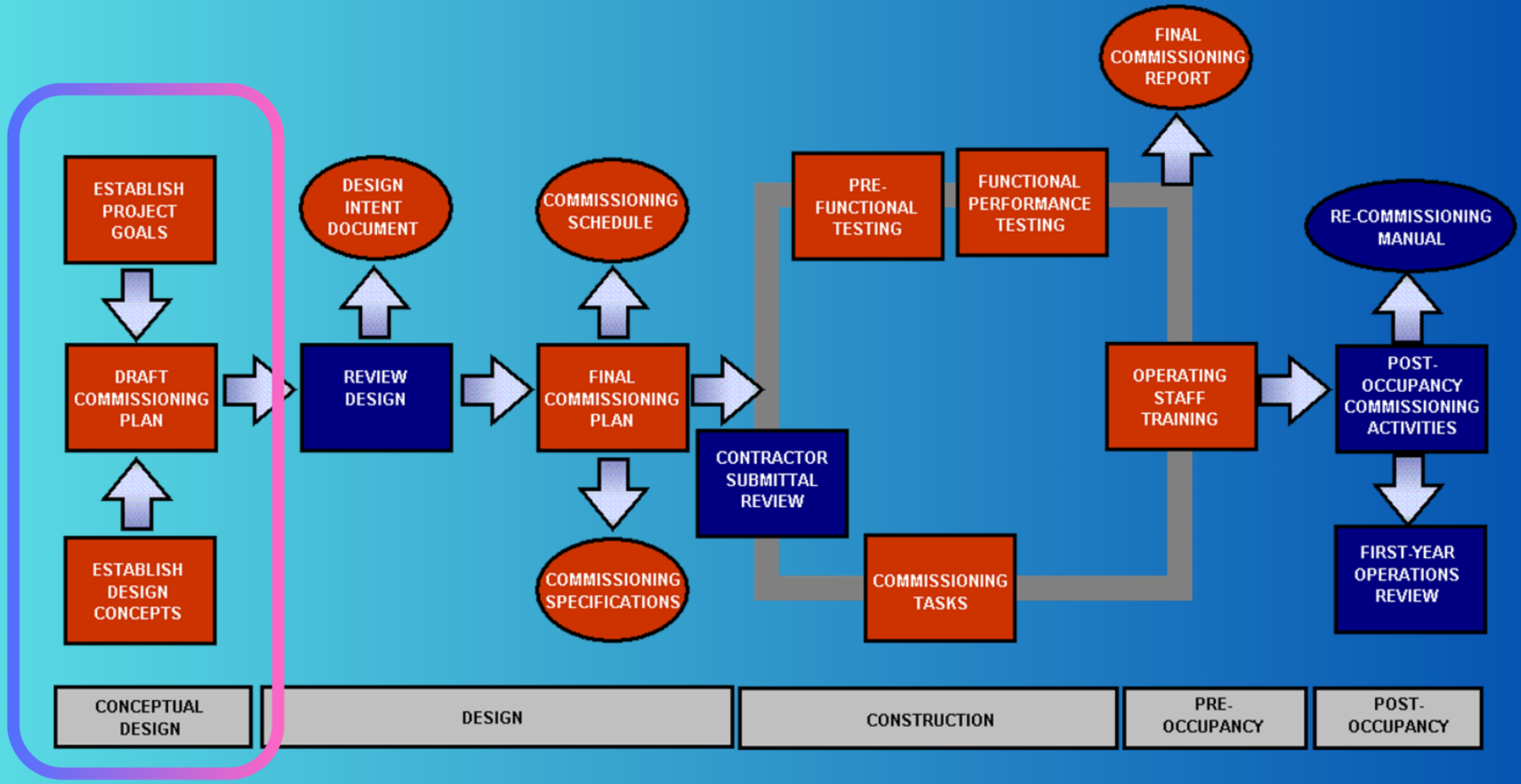
Cx Team meetings during the Project Initiation Phase may cover the following topics:

- Partnering with the owner or owner’s representative and the design team
- Project site walk-through.
- Owner’s Project Requirements (OPR) or Current Facility Requirements (CFR) workshop
- Design concept workshop.
- Commissioning scope of service identification.
- Organizational construction requirements.
- Jurisdictional codes and concerns



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COMMISSIONING AND THE BUILDING DEVELOPMENT PROCESS



WHICH BUILDING SYSTEMS ARE TO BE COMMISSIONED?

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The owner selects building systems based on the facility's purpose, sustainability goals, and jurisdictional codes. They specify these in the Request for Qualifications and Request for Proposal. Electrical systems include lighting controls, normal and emergency power systems, daylighting controls, distribution, renewable energy, UPS, lightning protection, and grounding and bonding.



- Heating, Ventilation, and Air-Conditioning (HVAC) Systems
- Exterior Enclosure Systems:
- Plumbing Systems
- Life Safety Systems
- Low-Voltage Systems
- Vertical Transportation Systems
- Miscellaneous Facility-Specific Systems



COMMISSIONING AS DEFINED HERE FOCUSES ON ACTIVE SYSTEMS THAT AFFECT SUSTAINABILITY



- “Active” system
  - –Any system that needs to change its operation in response to changing conditions in the building’s environment (indoor or outdoor) is an active system.
- “Affect Sustainability”:
  - –Degrades the expected environmental performance of the building, in terms of:
    - Energy
    - Water
    - Air
    - Visual / Thermal Comfort

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EXAMPLES OF ACTIVE SYSTEMS IN GREEN BUILDINGS:

- Lighting Controls
- Sun Controls / Shading
- Demand Controlled HVAC / Ventilation
- Ventilation Systems and Control
- Gray Water
- Storm Water Control
- Photovoltaics / Cogeneration / Fuel Cells
- Direct Digital Controls (DDC)
- Chiller and Boiler Plants



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CONTACT US

+91 6363032722

info@beyondsmartcities.in

learn.beyondsmartcities.in

#55,HMR Layout ,Bengaluru ,India



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THANK YOU

