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Working with the Owner to Develop the OPR *and use it throughout the life of the building*

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Learning Objectives

1. Recognize the Owner's Project Requirements (OPR) real purpose, the design direction's importance, and how to make it a living document for projects.
2. Writing a OPR to make it relevant through the first year of building occupancy.
3. Assist Owners in identifying what is important to their project, setting performance goals, and establishing communication points for the project design team to meet those goals.
4. When is the OPR used in the commissioning Process.

What is the Owner's Project Requirements?

The Owner's Project Requirements (OPR) form the foundation for the design, construction, and occupancy and operation of the facility and is the basis for the Commissioning Process (Cx) Plan and schedule.

"A document that details the requirements of a project and the expectations of how it will be used and operated, including project goals, measurable performance criteria, cost considerations, bench-marks, success criteria, training requirements, documentation requirements, and supporting information."

ASHRAE Standard 202-2018

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Owner's Project Requirements (OPR)

- The OPR is first and possibly the most important document an Owner and CxP prepare together, to ensure the commissioning process meets the Owner's goals.
- The OPR defines the expectations, goals, benchmarks and success criteria for the project. The OPR must be developed by the Owner and the CxP should be tasked with assisting the Owner's team to develop this document. The CxP typically assists the Owner in identifying the facility's requirements regarding such issues as energy and water efficiency, indoor environmental quality, staff training, and operations and maintenance. An effective OPR incorporates input during the pre-design phase from the Owner, design team, operations and maintenance staff and end users of the building and is updated throughout the project.
- An OPR is developed in explanatory terms for an Owner/user audience. The OPR is updated throughout the project design, construction, and initial operation as necessary, and each revision should be accepted by the Owner or representative. Determining Project Performance Requirements details the items and information that are to be included in an OPR.

How does the OPR enhance the design and construction (and our efforts as CxP's)?

- The OPR is the opportunity for the Owner to set a quality assurance standard expectations for the project.
- The OPR will serve as the basis for evaluating whether the Design and Construction has been completed to the Owner's satisfaction.
- Simply it the rule book from the owner perspective…follow the rules, win the game

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Owner's Project Requirements (OPR) FAQs

- How is it developed?
- What's included?
- Small vs. large projects?
- What if its not in my scope?

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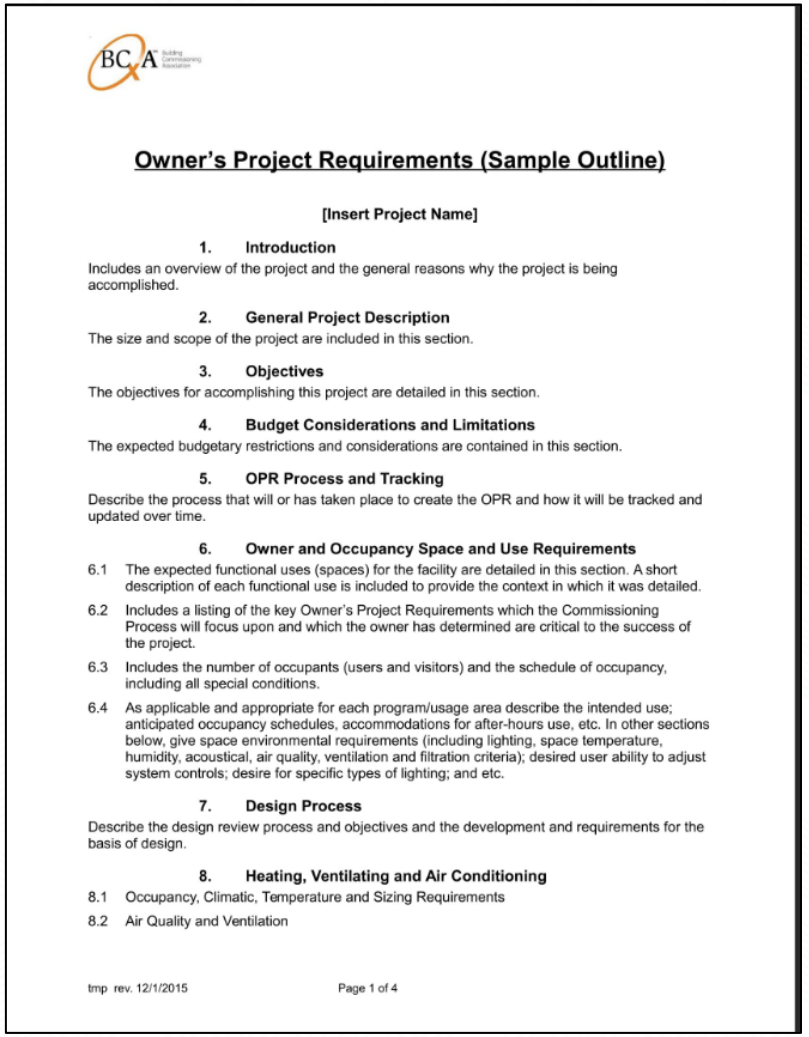
The OPR is a living document!

The OPR evolves with the design and requires input from…

- A&E
- Users
- Facilities Staff
- Maintenance Staff



Owner's Project Requirements (Sample Outline)

[Insert Project Name]

1. Introduction

Includes an overview of the project and the general reasons why the project is being accomplished.

2. General Project Description

The size and scope of the project are included in this section.

3. Objectives

The objectives for accomplishing this project are detailed in this section.

4. Budget Considerations and Limitations

The expected budgetary restrictions and considerations are contained in this section.

5. OPR Process and Tracking

Describe the process that will or has taken place to create the OPR and how it will be tracked and updated over time.

6. Owner and Occupancy Space and Use Requirements

6.1 The expected functional uses (spaces) for the facility are detailed in this section. A short description of each functional use is included to provide the context in which it was detailed.

6.2 Includes a listing of the key Owner's Project Requirements which the Commissioning Process will focus upon and which the owner has determined are critical to the success of the project.

6.3 Includes the number of occupants (users and visitors) and the schedule of occupancy, including all special conditions.

6.4 As applicable and appropriate for each program/usage area describe the intended use; anticipated occupancy schedules, accommodations for after-hours use, etc. In other sections below, give space environmental requirements (including lighting, space temperature, humidity, acoustical, air quality, ventilation and filtration criteria); desired user ability to adjust system controls; desire for specific types of lighting; and etc.

7. Design Process

Describe the design review process and objectives and the development and requirements for the basis of design.

8. Heating, Ventilating and Air Conditioning

8.1 Occupancy, Climatic, Temperature and Sizing Requirements

8.2 Air Quality and Ventilation

tmp rev. 12/1/2015 Page 1 of 4

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Occupancy Requirements

Owner Standards

Cost Considerations

Program Statement

Measurable Performance Criteria

Future Proofing

Building Use

Functional needs

Quality of Materials

CODES

Workshops

Interview

The “what not” to provide

IEQ

Training

Owner Participation

Project Goals

Survey

Workspace needs

OPR: what’s in the bag?

Life Safety

Project Intent / Design Intent

The WHO

Owner training

Success Criteria

Project Description

Sustainability

LEED

Benchmarks

Flexibility

Construction Considerations

Custodial

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OPR: Reasons to Develop:

- Convey owner's requirements to all involved in the project.
- Details the success criteria for the project.
- Provides O&M staff with system expectations and limitations.
- Best and most effective if this is the first document produced by the owner in identifying needs and requirements.

OPR: Who Develops? Who helps?

- The Owner creates the OPR, but……
- Requires buy in from owner team to develop properly.
- …generally, The Architect guides the process
- The Commissioning Provider can also guide the process if they are involved early enough
- Input from User Groups is used in creation of OPR
- OPR is a dynamic document, continually changing throughout the life of the project

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OPR: How is It Developed”

- Surveys
- User group meetings
- Interviews
- Workshops
- All of the above……

PROJECT REQUIREMENTS

PROJECT No:	MA-015-02	FULL PROJECT NAME:	Proje
DATE:		PROJECT MANAGER:	A Sm

REQUIREMENT LIST					
ID	REQUIREMENT DESCRIPTION	REQUESTED BY	CATEGORY	PRIORITY	ACCEPTANCE CRITERIA
Give each requirement a unique ID.	*The feature, function, condition or capability that is required from the project, product, service or result.*	*The stakeholder who requested the requirement.*	*The category or grouping of the requirement for example: functional, technical, operational, KPI (result metric), transitional.*	*The priority of the requirement for example: P1, P2, P3 or MoSCoW (Must have, should have, could have, won't have).*	*The criteria that the requirement must have for it to be accepted by the project stakeholders.*

REQUIREMENTS | DEFINITIONS | Useful resources

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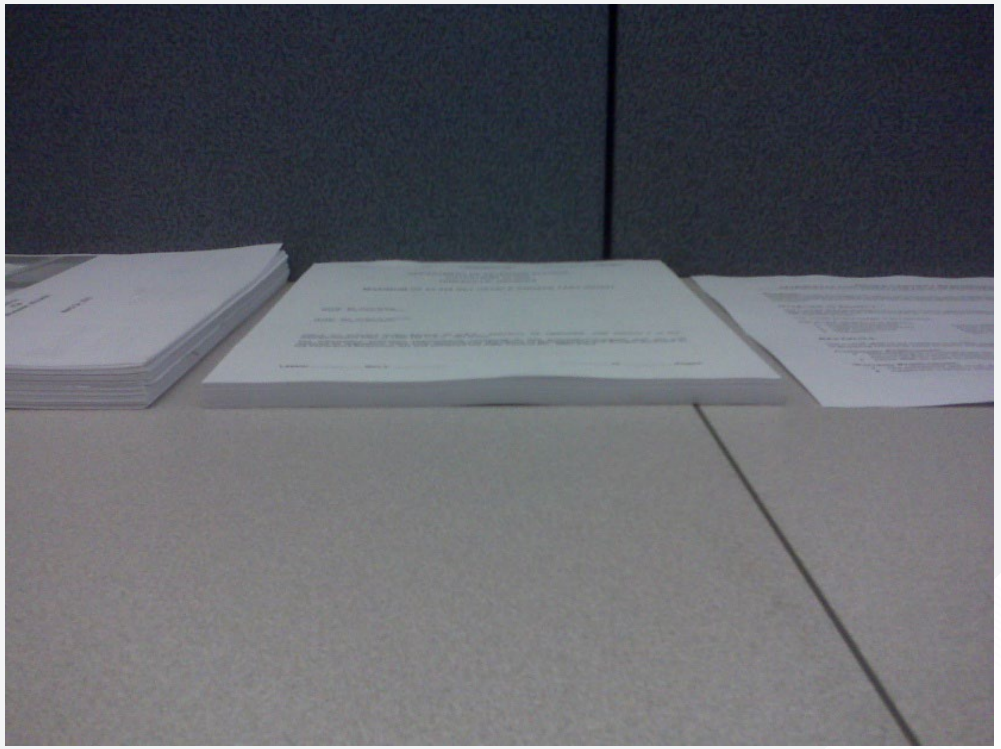
What tools are used to develop an OPR ?

- Survey
  - Too impersonal
  - May not elicit a range of thought
  - …it may be a good way to introduce the development of the OPR.
- Interview
  - Limited by the thoughts of only a few participants
  - …Again, it may be an opportunity to introduce some who are not otherwise normally involved to assist in the development of the OPR.
- Workshop
  - Offers a dynamic situation
  - Several participants can be assembled to address a wide range of considerations.
  - The interaction of diverse individuals can offer valuable ideas that would not otherwise surface.

OPR: Does Size Matter?

- OPR's can be short & sweet…meeting the general needs/requirements (LEED).
- OPR's can be long & poignant… indicating the needs of every space, acceptable and non-acceptable building products, etc.
- It's really about the quality.



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OPR: Long form vs. Short Form

- Long Form
  - Ideal for larger projects
  - Effective for “workshop” approach
  - Best for pre-design or earlier involvement
- Short Form
  - Better approach for smaller projects.
  - Good option when not engaged early.
  - Fits for interview and “interpretation” approaches.

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OPR: Long Format Example

- General project description
- Objectives
- Functional uses
- Quality of materials and construction
- Occupancy requirements
- IEQ requirements
- Performance criteria
- Budget considerations/limitations

OPR: Short Format Example

- Project Scope:
- Design Outcomes
- Performance Outcomes
- Key Milestones
- Constraints
- Goals

Who should attend the OPR workshop?

- Owner
- Key individuals that will occupy the building
- Architect/Engineer
- Physical plant & maintenance staff
- Commissioning Provider

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What should be included in the OPR?

- Project Description
- Objectives
- Functional Uses
- Quality of Materials
- Occupancy Requirements
- Indoor Environmental Quality Requirements
- Performance Criteria
- Construction Considerations
- Suitability Goals
- Budget Considerations and Limitations
- Code compliance (State, Local, National)

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Project Description

Provide a general description of the project.

Example…

" The project involves the renovation of an existing 65,000 gross square foot 2-story (including partial basement) office at 180 Technology Parkway, Peachtree Corners, Georgia. The building is currently un-occupied.

The facility will have administrative offices, publication development areas, reference library and document archive, website and IT support, computer server room, shipping and receiving, a staging area for ASHRAE off-site activities, meeting rooms, conference areas, and learning center. As such, the facility must facilitate functions that accommodate a multitude of operations which require pertinent spaces including a minimum number of individual private offices, open plan workspaces, and shared spaces consisting of reception, storage and copier areas, small meeting and break areas, larger meeting areas, staging areas for publications and preparation for ASHRAE functions off-site, wellness center, and a functional shipping and receiving area. The facility will be designed to provide office space initially for a current total of 125 occupants. Provisions shall also be made for the expansion to a total occupancy of 140 over the next 10 to 15 years, although funds have not been budgeted for this potential expansion. The design principle of long life, loose fit shall be top of mind in the planning of the facility."

Objectives of the OPR

There are several key objectives to be achieved....

- Code Compliance
- Appropriate Heating, cooling and ventilation expectations
- Water and Waste efficiency Goals
- Resiliency and Flexibility
- Energy efficiency and Sustainability Goals
- Listing of any Mission Critical Requirements and Highly Desirable Requirements.
  Examples:
  1) Exceed the requirements of ASHRAE Standard 189.1-2017
  2) A maximum energy consumption of building (excluding renewables)of 21.4 kBtu/SF/yr. Work with owner to limit maximum daytime plug load to 0.5 W/SF3)
  3) Director/Manager enclosed offices, maximize access to daylighting and view
  4) Design the project to achieve a Plug Load < 0.4 w/sf
  5) Design and construct the building to achieve a demand side EUI < 15 kBtu/SF/yr

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Functional Uses

Example of the functional uses:

- Conference Rooms
- Offices
- Storage
- Reception/waiting
- Employee areas
- Copier/equipment space
- Mechanical, custodial and electrical/communication space

General Quality of Materials and Construction

Materials should be selected based on…

- Longevity
- Sustainability
- Maintainability
- High quality and durability
- What not to provide (Based on experience)
- Warranties

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Occupancy Requirements

How is the building occupied…

- Schedule of occupancy (Ex.: Mon-Fri 6am-6pm)
- Occupancy by staff, by visitors, by support staff
- Special event occupancies
- After hours occupancies
- Future expansion or change in use

IEQ Requirements

Indoor Environmental Quality (IEQ) is important to the health, wellbeing and productivity of the building occupants.

- Temperature and humidity requirements
- Building Envelope
- Lighting – Natural and artificial
- Indoor air quality
- Noise level
- Air movement

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Performance Criteria

The performance for which the systems will be measured…

- Meeting professional and industry standards (ASHRAE 15, 55, 62, 90.1, Energy Star, LEED, local and state codes including the AHJ and Fire Department)
- Cost of operation: (Overall building heating, cooling and electrical operation)
- Life cycle cost (model building performance as a basis of choosing systems)
- Longevity (Major equipment life to be at least 30 years. Calibration of devices no less than 2-year intervals…)
- Temperature (Offices shall be maintained at 72°F plus or minus 4°F)
- Building Envelope (Blower door testing shall determine the building envelope performance)
- Air Distribution (Uniform air distribution with no noticeable drafts)
- Air quality measurements (IEQ testing may be performed to determine minimum VOC and CO2 levels prior to occupancy)
- Noise level (The background noise level shall be limited to 20 NC in offices, 30 NC in common areas)
- Punch Lists (The punch list shall be complete at substantial completion)
- Contractor callbacks (There shall be no contractor callbacks due to inadequate training, poor quality workmanship or uncomfortable conditions)

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Performance Criteria cont.

The performance for which the systems will be measured…

- Training (All training shall be video recorded and be adequately presented in order for staff members to train other staff)
- Commissioning Process (The Owner will be using the commissioning process to assure proper building operation, efficiency and staff training. A post evaluation of the facility operations will be conducted to assess the result.)
- Room Numbers (room numbers on the design documents shall match the actual building room numbering)
- Control System (Control systems shall function properly, room thermostats will be intuitive, and staff shall be able to operate the building efficiently.)
- The Engineer should review with the Owner on the type of system and what the Oner expect to be able to monitor and control. Too many systems end up being “more” than what the Owner really needs.

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Performance Criteria cont.

The performance for which the systems will be measured…

- Air handling units (All AHU's shall have factory recommended clearances maintained, anti-freeze coil protection and be located in spaces with adequate room for removal and replacement of major equipment.)
- Budget and schedule (The project shall be completed on time and on budget with no change orders unless directed by the Owner as a change order to the contract.)
- Maintenance (The systems shall be easily maintainable and have identifiable access to all components.)
- Project Record Drawings (Project record drawings shall constitute an accurate representation of the installed work.
- The Owner and CxP will periodically check to see that drawings are kept up to date during the construction.)
- Project Manuals (Provide in printed and electronic format)

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Construction Considerations

Describe conditions of working at the facility…

- Owner occupancy during construction
- Maintaining utilities and coordinating utility outages with the Owner and utility company
- Access to the site and parking for staff and construction personnel
- Protection of the construction site

Budget Considerations and Limitations

Budget constraints exist on all projects.

- Some areas to consider…
- How will energy improvements weigh against the overall cost?
- Will alternates be a way of dealing with budgets that may be tight?
- How will improvements or potential problems be brought to the attention of the owner during construction?
- Will the project be bid to General Contractors, or will Construction Management be considered?
- All changes before the project is “completed” should be priced by the on-board subcontractors – they know the systems and have the knowledge of the installation and what it will take to provide the modifications. You CAN run into warranty problems should you have the modifications performed by another subcontractor.

How does the CxP use the OPR in the commissioning process?

Pre-design Phase

- To assist the Owner in the development of the Owner's Project requirements
- Prepare a design phase Cx plan
- Assist in the development of the Basis of Design

Design Phase

- Review the Basis of Design to be in agreement with the OPR
- Review the Design documents during the design development stage and at the near complete stage.
- Prepare the Cx Specifications
- Develop a draft of the Construction Phase Commissioning Plan
- Define sampling strategies

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How does the CxP use the OPR in the commissioning process?

Construction Phase

- Update the Cx Plan
- Present the commissioning plan to the contractors
- Review submittals in parallel with the design team
- Develop pre-functional checklists for the systems to be commissioned
- Review the progress of the construction
- Develop functional tests
- Develop training agenda

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How does the CxP use the OPR in the commissioning process?

Acceptance Phase

- Accept the construction to be tested
- Perform and observe functional testing of the equipment
- Review of owners training requirements
- Develop the Systems Manual
- Review record documents for accuracy with the construction

Post-Acceptance Phase

- Interview the Owner and building occupants 10 month into the occupancy of the building to review operation
- Record any comments or concerns with the building use or operation
- Assist the Owner in reconciling any warranty items
- Complete any functional testing to meet seasonal conditions
- Update the systems manual

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Client Standards. . . Helpful

- A general ‘owner’s project requirement’ document.
- Built for experiences
- Likely required assistance in authoring from an architect or engineer
- Contains . . .

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Other Helpful Project Documents

- Architectural Program Statement
- Healthcare Example : FGI Functional Program
- SD Narrative

Deeper Perspective – A Round Table Q and A with the Central Chapter Board

- Stacy Carey
- Kenny Reed
- Scott Weaver
- Dave Guberud
- Alex Metschke
- Mike Amstadt
- Rick Dale
- David Cohen
- David Lewis

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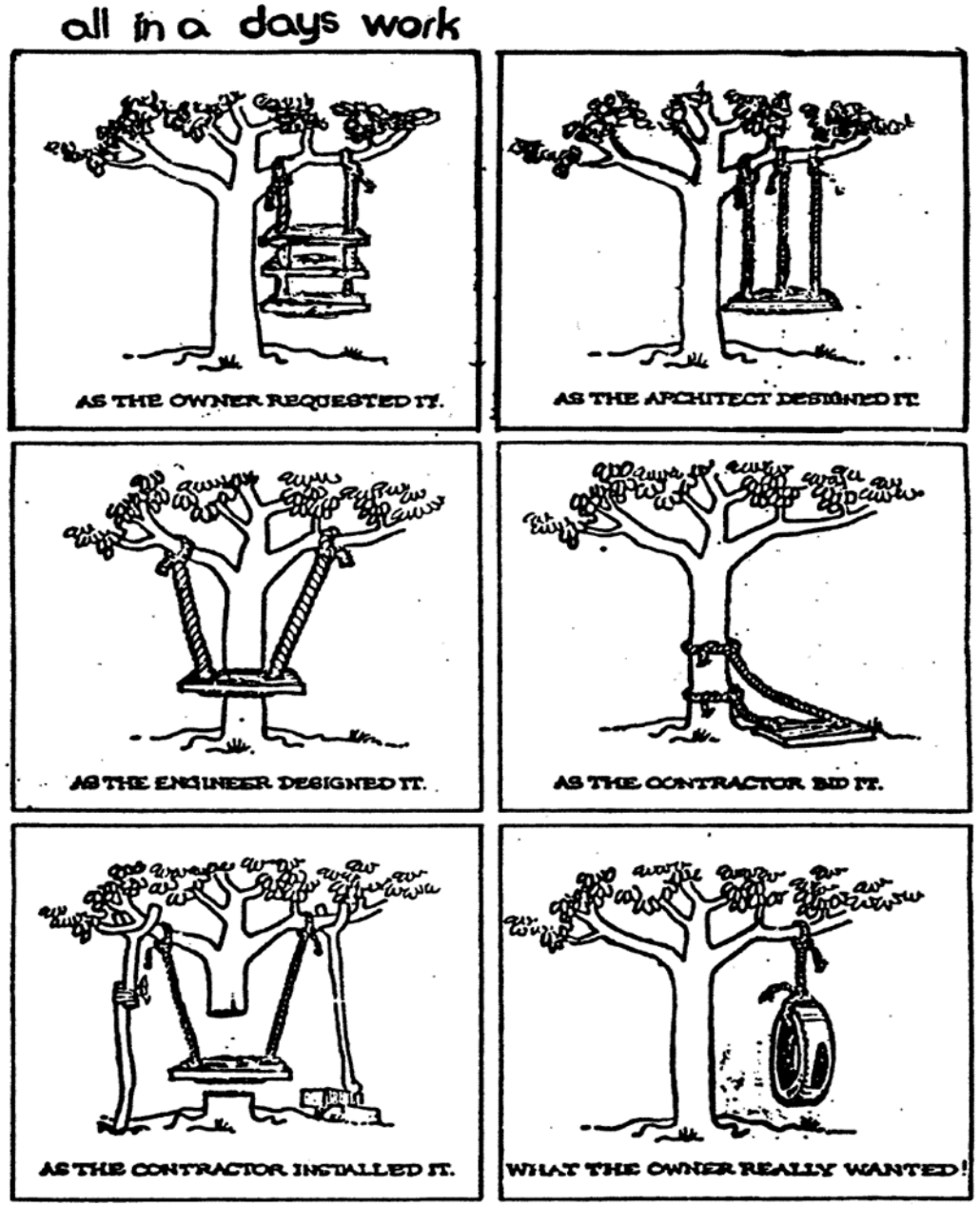
Questions to the Panel



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References:

- Commissioning - Building Commissioning Association (BCxA)
- OPR Template - Resources | BCxA Building Commissioning Association
- ASHRAE Standard 202-2018 Commissioning Process
- ASHRAE Guideline 0-2019 The Cx Process
- ASHRAE 90.1-2019
- Guideline 1.1-2007 HVAC&R Tech. Req. for the Cx Process
- WBDG - Whole Building Design Guide – Determining Project Performance Requirements

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