

Owners Project Requirements & Basis of Design

The purpose of the OPR is to provide a clear and concise document of the Owner's goals, expectations and requirements for the building. It provides the design team with the information to develop the Basis of Design (BOD) during schematic design, serving as a road map for the development of the design and construction documents. Additionally, OPR and BOD provide the owner and commissioning agent with tangible benchmarks to measure success, quality and confirm that the building and systems constructed align with the Owner's expectations and requirements.

A concise OPR must be developed by the design team and owner during the project programming phase, or by the midpoint of schematic design, for projects without a programming phase. For projects with a programming phase, the OPR is required to be complete and included in the project program. For projects without a programming phase the, the OPR is required to be complete and included in the schematic design review set.

As the project develops, it is expected that many of the elements of the OPR and BOD will evolve. Once the initial OPR and BOD are developed by the design team and the Commissioning Agent (CxA) has been integrated into the project, it is to be reviewed by the CxA at the SD, DD and CD submittal. Changes to the OPR and BOD, from one design phase to the next, must be documented by the design team.

Additionally, the OPR and BOD should serve as a foundation for the projects systems manuals delivered to the Owner as part of the "as-built" documents.

The following sections must be included in the OPR.

- Project information
 - Project name
 - Project site address
 - Building typology
 - Utility bill/account information
 - Rate schedule
 - Meter number (if known)
 - Project team contact information (emails, addresses, phone numbers) per programming and design phase teams
 - Owner Information
 - DFCM Project Manager
 - DFCM Energy Program Director
 - Agency Project Manager
 - Agency Energy Manager
 - Facility Operator - if this is unknown, identify who in the agency will represent the interests of the person(s) who will operate and maintain

the building, through the design and construction period. Identify the date in which the Facility Operator will be known.

- Architect
 - Principle In Charge
 - Project Architect
- Mechanical Engineer
- Electrical Engineer
- Cost Estimator
- Kitchen Designer
- Lighting Engineer
- Civil Engineer
- Landscape Architect
- Other project consultants
- General Contractor
 - Project Executive
 - Project Manager
 - Superintendent
 - Project Engineer
 - Cost Estimator
- Project background
 - General building information including but not limited to the following
 - Square footage
 - Number of floors
 - Construction Costs (soft and hard)
 - Location
 - Design schedule
 - Construction schedule
 - Project delivery method
 - Estimated occupancy
 - Code occupancy schedules
 - Abatement (if necessary)
 - General project background
 - Brief summary of the project
 - Intended use
 - Occupancy
 - Construction type
 - Other
 - Mission
 - Objectives
 - Possible needs for flexibility and expansion
- Code & standards

- Building codes
- DFCM standards
- Agency standards
- Other
- Building performance
 - See Section 5.0 – High Performance Building Standard, for applicable requirements
 - Context sensitive design
 - Site design
 - Open space
 - Landscape
 - Storm Water
 - Heat Island Reduction
 - Light Pollution
 - Energy performance
 - Performance requirement
 - New Construction vs Major Remodel
 - Energy Model vs Qualitative Energy Engineering
 - Design Build Competitions
 - Life Cycle Cost
 - Identify anticipated energy costs for all sources to project
 - Life cycle expectations
 - General building
 - Building envelop systems
 - HVAC systems
 - Electrical systems
 - Plumbing systems
 - Warranty expectations
 - Equipment performance
 - Controls strategies
 - Economizers
 - Premium efficiency motors
 - Transportation management
 - Parking requirements
 - Alternative parking requirements
 - Alternative transportation provisions
 - Water Efficiency
 - EPA Water Sense Requirement
 - Materials and Resources
 - Recycling
 - Sourcing
 - Indoor environmental quality

- Air quality measures
 - Views
 - Identify areas in the space program to have visual access to the outdoors.
 - Daylighting
 - Outside air
 - Ventilation
 - Lighting levels
 - Occupancy sensor for lighting and thermal controls
 - Filtration
 - Building flush
 - VOCs
- Education and Outreach Program
- Building envelope
 - See Section 5.13 – Envelope Commissioning
 - Internal, external and thermal loads in conjunction with mechanical and electrical criteria
 - Façade
 - Fenestration
 - Assemblies
 - Roof
 - Subgrade
 - Warranty expectations
- Incentives and Rebates
 - Identify rate schedules
 - Identify utility providers
 - Identify anticipated energy costs for all sources
 - Include final incentive documentation in final OPR and O&M manuals
- Spaces program
 - Occupancy schedules
 - Daily on a weekly and monthly basis per space program
 - Consider weekend uses and summer uses for educational projects
 - After hours schedules
 - Cleaning schedules
 - Set points
- Architectural criteria
 - Identify unique design features that may impact building performance
 - Atriums
 - Smoke Evacuation expectations
 - VFD's for supply and exhaust fans
 - Code requirements for controls, testing and detection

- Clerestory
 - Mixed occupancies
 - Interior garages
 - Kitchens
 - Tunnels
 - Bridges
 - Future expansions
- Electrical & Lighting criteria - per space program
 - Per space program
 - Light power density (LPD)
 - Foot-candle levels
 - Controls
 - Remote BMS access needs, notifications and clearances
 - Occupant controls
 - Controls interface requirements
 - Lighting strategies
 - Task
 - Ambient
 - Emergency
 - Daylighting & outdoor views
 - Special requirements
 - Exterior requirements
 - Emergency requirements
 - UPS
 - Distribution
 - Metering
 - Equipment types
 - Power quality control
 - Peak demand control
 - Redundancy requirements
 - Warranty expectations
 - Identify internal, external and thermal loads
- Mechanical criteria - per space program
 - Design conditions for summer and winter including tolerances
 - Acoustical isolation criteria
 - Pressurization
 - Ventilation
 - Humidity
 - Passive strategies
 - Zoning
 - Controls
 - Remote BMS access needs, notifications and clearances

- Occupant controls
- User interface requirements
- Metering
- Analytics
- Equipment types
- Refrigeration needs
- Domestic hot water
- Peak demand control
- Redundancy requirements
- Warranty expectations
- Identify internal, external and thermal loads
- BAS/BMS requirements
 - Accessibility
 - Type
 - Integration
 - Metering, see Section 5.10 - Metering
 - Points, see Section 5.11 – Data Points
- Security requirements
- Audio Visual requirements
- Integration into existing campus infrastructure systems
 - Consult campus hydraulic flow analysis
 - Consider capacity
 - Diversity
 - Identify possible campus infrastructure implications
 - Electrical distribution systems
 - Building heating and cooling distribution systems
 - Interface with existing BMS and controls systems
 - Add meters when possible to existing systems to further energy management efforts on older systems
 - Identify existing campus systems performance levels
 - Provide existing energy performance data
 - Metering levels of existing systems related to the project
 - Clarify billing arrangements of building tenants
 - Identify opportunities for renewables or site based resources
 - Solar
 - Wind
 - Ground source
 - Water wells
 - Other
- Greenhouse Gas Emissions performance implications

- If applicable or requested by the owner identify GHG reporting requirements and tracking metrics.
 - Carbon dioxide – CO₂
 - Methane – CH₄
 - Nitrous Oxide – N₂O
 - Track throughout the design process
 - Identify direct emissions contributors
 - Identify indirect emissions contributors
- Renewable systems
 - LCC considerations
 - Offsite generation considerations
 - Onsite generation considerations
 - Alternative and additional financing mechanisms
 - Power Purchase Agreement
 - Donor funds
 - Student fees
 - Agency funding
 - Grants and incentives
 - Renewable Energy Certificates
- LEED Requirements
- Acoustical criteria
 - Per space program
 - Internal considerations
 - External considerations
- General systems to be commissioned. With the Facilities Operator identify which systems and which equipment is to be commissioned as well as the commission scope
 - See Section 5.12 – Commissioning
 - See Section 5.13 – Building Envelop Commissioning
 - HVAC
 - Electrical
 - Controls
 - Lighting Controls
 - Life Safety
 - Security
 - Plumbing
 - Elevator
 - Equipment
 - Telecom
 - Remote BMS access needs and clearances
- Post-occupancy and warranty
 - 5 Month Walk Through Meeting

- Onsite meeting five to six months after Substantial Completion to review performance and quality of the facility with the following in attendance (minimum)
 - Facility Operators
 - Agency Energy Manager or DFCM Energy Program Director
 - Commissioning Agent
 - Mechanical Engineer
 - General Contractor
 - Mechanical Subcontractor
 - Architect
 - User Representative
 - 10 Month Walk Through Meeting
 - Onsite meeting 10 months after Substantial Completion to review warranty, performance and quality issues with the following in attendance (minimum)
 - Facility Operators
 - Agency Energy Manager or DFCM Energy Program Director
 - Commissioning Agent
 - Mechanical Engineer
 - General Contractor
 - Mechanical Subcontractor
 - Architect
- Operations and maintenance
 - Benchmarking requirements per ENERGY STAR Portfolio Manager
 - Requirements and expectations by Facility Operators
 - Training
 - HVAC systems
 - BMS & Controls
 - Electrical systems
 - Lighting systems
 - Security systems
 - Identify who is to be trained
 - Number of training sessions
 - Follow up training sessions
 - Other as deemed necessary by Facility Operators and Owner
 - Systems Manuals
 - As-Builts
 - Single line schematics
 - Controls As-Built
 - Drawings
 - Sequences
 - Set points

- Recalibration schedule
 - OPR
 - BOD
 - Commissioning functional test reports
 - Must be organized, electronic and searchable
 - Other as deemed necessary by Facility Operators and Owner
- Preventative maintenance program expectations
 - Recommended re-commissioning schedule
 - Attic Stock expectations
- Education and Outreach Program, see Section 5.9 – Education and Outreach Program
- Building occupant expectations
 - Additional areas beyond areas previously discussed in the OPR
- Possible behavioral implications of HPBS goals and strategies
 - Occupants role in energy efficiency and sustainability
 - Facilities operators role in energy efficiency and sustainability
- Budget considerations
 - Balance efficiency, quality, budget, comfort and maintenance
- Specific building typology requirements must be developed during programming in conjunction with the design team, Authority Having Jurisdiction, specialized design consultants, building occupants, and commissioning agent
 - Labs
 - Vivarium
 - Courthouses
 - Acute care hospitals
 - BioSafety Level (1,2,3) type facilities
 - Prisons and Jails
 - Libraries
 - Museums
 - Data Centers
 - Others as necessary

5.0 Appendices

- A. Data Points List – Section 5.11
- B. Energy Modeling Spreadsheet – Section 5.5
- C. Life Cycle Cost Worksheet – Section 5.5
- D. HPBS Sustainability Worksheet – Section 5.6, 5.7, 5.8, 5.
- E. HPBS Workshop Suggested Agenda – Section 5.1
- F. OPR Required Sections – Section 5.15
- G. Envelope Commissioning Matrix – Section 5.13
- H. Incentives and Rebates Process Guidelines – Section 5.14
- I. Incentives and Rebates Responsibility Matrix – Section 5.14