

# *AIA Vision 2009: Building Commissioning*

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## **OPR, BOD, Systems Manual; Cost Effective Project Tools**

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# **OPR, BOD, Systems Manual**

Expensive, Useless Encumbrances

Or Valuable, Cost Effective Tools

**It's Up to You**

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# OPR, BOD & Systems Manual

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- Owner's Project Requirements (OPR)
- Basis of Design (BOD)
- Systems Manual (SM)



# OPR, BOD & Systems Manual

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## In a Nutshell (ASHRAE & USGBC):

- Owner's Project Requirements (OPR) – documents:
  - Owner's functional requirements
  - Associated success criteria
- Basis of Design (BOD) – documents:
  - Concepts on which systems are based
  - Rational & methodology
  - How the design satisfies the OPR
- Systems Manual – documents:
  - Information to help understand and operate systems
  - Goes beyond equipment O & M
  - Consolidated and Comprehensive



# OPR, BOD & Systems Manual

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**Received differently by  
different project teams  
depending on past  
experience**



# OPR, BOD & Systems Manual

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## Typical 1<sup>st</sup> time reactions:

- More work - who's going to do it?
- Added cost - how do we pay for it?
- Takes time - how will we fit it into the project schedule?

# OPR, BOD & Systems Manual

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**Typical 1<sup>st</sup> time reactions:**



# OPR, BOD & Systems Manual

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**Teams experienced with proper  
use :**





# OPR, BOD & Systems Manual

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## **Teams experienced with proper use view them as:**

- Tools for successful project design, construction & Cx
- Cost effective and improve efficiency
- Valuable records for the life of the building



# OPR, BOD, SM What they have in common

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## **All consist of work provided already**

- Don't require a substantial increase in fees or schedule
- Done at the right time they are easy and beneficial practices that reduce costs by filling several needs at once



# OPR, BOD, SM What they have in common

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## **The documents give rise to and build on one another**

- Programming leads to OPR
- OPR leads to BOD leads to Sequences
- Systems manual includes the OPR & BOD



# OPR – cost effective use

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## **Begin the OPR early**

- Develop the OPR at programming phase
- Base the project on the OPR – don't develop it after the project's been designed



# OPR – cost effective use

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## **Importance ≠ length and complexity**

- Be concise
- Don't be strictly bound to following a sample document
  - If it's important put it in
  - If you don't know what to say, consider leaving it out



## **BOD – cost effective use**

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### **Begin the BOD early**

- Achieve Owner's approval on concepts before designing specifics



## BOD – cost effective use

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### **Use the BOD as a tool, not just a record**

- Develop it as the project evolves –
- Outline the direction to be taken as a common understanding for the entire team
- Obtain Owner's approval before investing development time
- Base the design & CDs on the BOD – don't develop it after the project's been designed



## **BOD – cost effective use**

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**Pictures can be worth many words – where possible:**

- Use system 1-line diagrams
- Present data in tables



# BOD – cost effective use

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## Leverage BOD efforts

- Use system 1-line diagrams that will also be useful on the design drawings & CDs
- Describe the basics in the OPR, followed by general BOD sequences of operation (developed as the design evolves)
- Reuse the sequences on the design drawings & CDs to provide the contractor with control programming goals and requirements



# Systems Manual – cost effective use

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## **Develop the document as the project evolves**

- Most of the contents provide value to the project before the manual is compiled.
- Start with a binder and dividers. When the project is done, the Manual is done.

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Thanks for Attending!

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