Integrated Design and Active Ownership

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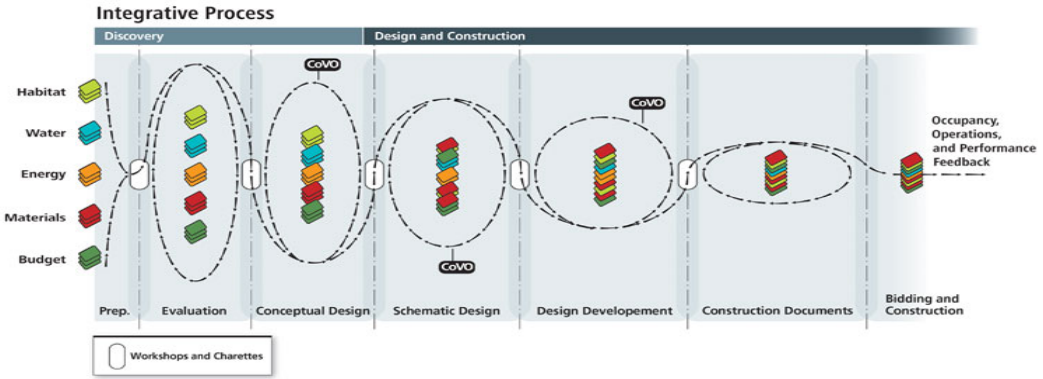
- Introduction
- Definitions, Terms, and Acronyms
- Integrated Design
- Active Ownership
- Metro Transit Police Facility – A Case Study
- Questions

Integrated Design

The intentional collaboration of design disciplines to develop a finished project that meets and/or exceeds stakeholder and end user expectations. Consistent communication to drive optimization between disciplines and stakeholders.



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Active Ownership

A process where project leadership facilitates meetings with stakeholders and design professionals to derive additional project requirements. Then based on input and estimated costs determine options for further discussion with stakeholders. Ultimately defining the project design, with considerable consideration to budget and total cost of ownership.

The Transit Police Facility - Getting Started

The design RFP, and the development of the Owner's Project Requirements.

- End User Driven Items
- Internal Stakeholder Items
- External Stakeholder Items
- Project Leadership Team Items

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Owner's Project Requirement Drivers

- Follow B3 Guidelines and Participate in EEDA Process
- Building Use and Occupancy
- Indoor Environmental Quality
- Construction Techniques
- System Controls
- Building System Lifespan Requirements
- Building Performance Criteria
- **Participation in EEDA Process**
- Sustainability
- Operation and Training

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Enhanced Energy Design Assistance Program

Collaborative approach with the owner, design team, and EEDA consultant to model the proposed facility as 2003 facility to establish a baseline which to measure required reduction.

Once baseline is established alternate energy reduction bundles are identified and analyzed for potential project inclusion. Owner participation at this point was integral to shaping the bundle configurations.

The Role of the Active Owner

- OPR Creator and Updater
- Co-Facilitator of End User Design Discussions and Needs Analysis
- Identifier of Major Systems for Bundles
- EEDA Reviewer for OPR Conformance
- Final Selector for Bundle Inclusion
- Construction Management and Opportunity Evaluator

The Metro Transit Police Facility

- Three Levels, 61,254 ft^2, Shares Common Wall with Existing Building
- Design Budget $2,200,000
- Estimated Cost to Construct $19,000,000
- Estimated Baseline Energy Cost $128,000
- Target EUI <30 $kBtu/ft^2$
- Construction Schedule 20 Months

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EEDA Bundle Descriptions

- **Baseline –** Central VAV air handlers (2), 120 ton air cooled chiller, condensing gas boilers, total heat recovery (70s/60l), R15.6walls , R-30 roof, triple pane glazing, building lighting 0.51W/ft^2
- **Bundle 1 –** Four pipe fan coil w/DOAS, 120 ton air cooled chiller, condensing gas boilers, total heat recovery DOAS(70s/60l), R15.6walls , R-30 roof, triple pane glazing, building lighting 0.51W/ft^2
- **Bundle 2 –** Four pipe fan coil w/Central VAV DOAS, ground coupled water to water heat pump, supplemental condensing gas boilers, total heat recovery DOAS (70s/60l), R15.6walls , R-30 roof, triple pane glazing, building lighting 0.51W/ft^2
- **Bundle 3 –** Four pipe fan coil w/DOAS w/ displacement, ground coupled water to water heat pump, supplemental condensing gas boilers, total heat recovery DOAS (70s/60l), R15.6walls , R-30 roof, triple pane glazing, building lighting 0.51W/ft^2

Selected Bundle Snapshot

- Mechanical – Ground Coupled Water to Water Heat Pumps
  - Originally Sized to Cooling Load, Pre-Bid Expanded to Cover Heating Load
  - 36 - 500’ Deep Wells
  - BAS w/ Sensors and Scheduling
- Lighting – High Efficiency LED – Dimming, Daylight, and Vacancy
- Glazing – Insulate Low-E w/ Thermally Broken Frames 50% Window to Wall Ratio
  Majority Double Pane, Some Triple Pane - Prevailing NW Wind
- Envelope – Walls R15.6 and Roof R30

The Final Project By the Numbers

- Bid Cost to Construct $ 17,000,000
- Estimated EUI 34.4 kBtu/ft2
- Selected Bundle Estimated Energy Cost $52,330
- Utility Rebate $95,837
- Simple Energy Only Payback - Approximately 7 years
- 30 Yr Lifecycle Cost for Selected Option over Baseline, $170k
- 30 Yr CO2 Emissions Reduction over Baseline 12,000 to 22,000 tons *

Questions?

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