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Winning Water Project Case Study
Washington D.C.

Case Study Overview

- Introduction
- Facility background
- Energy and Water Goals
- ESPC Water Savings Project
- Planning Phase
- Construction Phase
- Performance Phase
- Q&A

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Facility Background

- The Architect of the Capitol (AOC) is a Legislative Branch agency with 2600 employees
- We care for the Capitol Building, House and Senate Office Buildings, Library of Congress and Supreme Court
  - About 450 acres in Washington DC
  - 16.5 million square feet
  - Buildings range in age from late 1700's to 2008
  - Millions of annual visitors

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U.S. Capitol Complex Map

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House Office Buildings

- The House Office Buildings is a Division (Jurisdiction) within the AOC
  - Operate 4 large buildings housing 10,000 employees
  - Over 5 million square feet of space
  - Notable building tenants
    - Presidents Kennedy, Johnson, Nixon, Ford and Bush
    - Vice President Al Gore
    - Speaker Nancy Pelosi
- Millions of annual visitors

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Cannon Building

-First Congressional office building
-Opened in 1908
-826,000 square feet
-Rotunda used extensively for TV Interviews

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Rayburn Building

- Building opened in Feb. 1965
- 2.4 million square feet
- Congressional hearing rooms often featured on television

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Energy and Water Goals

- EISA 2007 contains specific AOC goals for energy conservation
  - Energy goals match Executive Branch
  - Water conservation goals not included in legislation for Legislative Branch
- Green the Capitol Initiative
  - Sponsored by Speaker Pelosi
  - Requires a 50% reduction in energy usage by 2017
  - Uses a FY06 baseline year
  - Applies to all House Office Buildings
- ESPC was identified as one of the key tools to help meet energy conservation goals

ESPC Water Overview

- Water conservation part of $34 million ESPC project
- Detailed Energy Survey conducted 2008
- Project awarded July 2009
- Water measure ECM about $4 million
- Annual savings of $400K
  - 32% reduction in water usage
  - 45 million gallons annual savings

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Specific Water Saving Measures

- Typical Water Items
  - Low flow fixtures
  - Kitchen fixture upgrades
  - Irrigation sewer deduct meters
- Exterior fountain controls
- Humidification systems on air handlers
- Non-typical items
  - Green Roof demonstration
  - Condensate make-up water for a fountain

Planning Phase

- Step 1: Establish Project Water Goals
  - Water saving measures were not the “cash cow” of our ESCP program
  - High quality fixtures
  - Solutions had to work in historic buildings with aging infrastructure
  - Include highly visible water conservation sustainability features

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Planning Phase

- Step 2: Building Population
  - Staff population easy, had to get creative to estimate visitor numbers
  - Used catering/cafeteria and visitor services data to quantify visitors
  - Studied using wireless phone signals

Planning Phase

- Step 3: Establishing Water Usage/Baseline
  - Consultant did audits and measurements to document fixture usage
  - Population numbers were used to develop in-building usage
  - Irrigation system usage was estimated using
    - Spot measurements
    - Survey of irrigation systems components and operating hours
    - Survey of grounds materials, soil types, etc.
  - Fountain make-up water
    - Overflow
    - Evaporation

Planning Phase

- Step 4: Defining Water and Sewer Rates
  - Water is supplied/managed by District of Columbia Water and Sewer Authority (DC WASA)
  - Rates
    - Water $3.93/kgal
    - Sewer $4.28/kgal
  - New Impervious surface charge in Washington, DC
    - FY10 rate $2.10/ERU (equivalent residential unit)
    - Project rate is $16.33/ERU by FY17
  - ESPC project used a 4% escalation rate

Planning Phase

- Step 5: Sustainability measures
  - Green Roof
  - Fountain water make-up cistern
  - Recycling of waste debris

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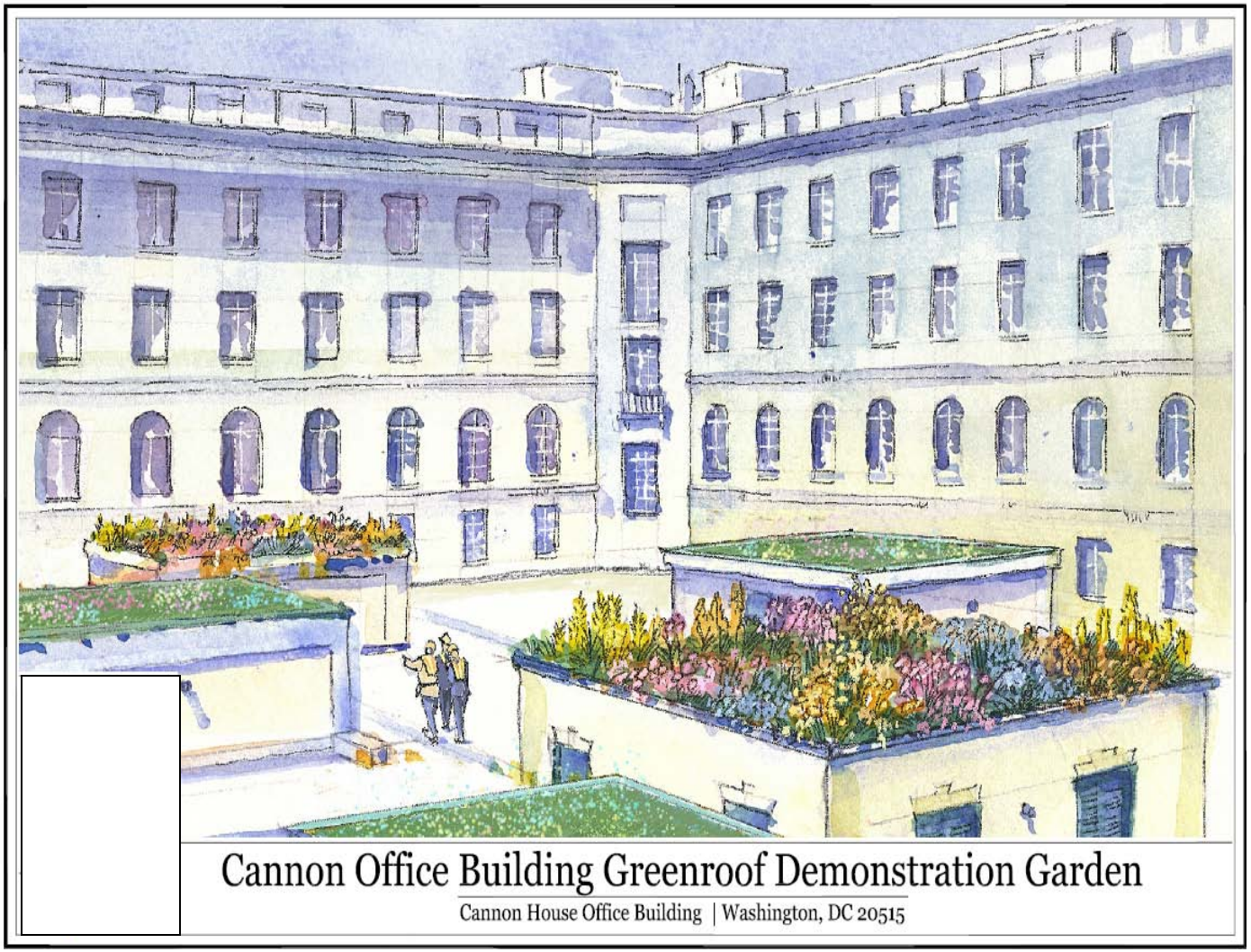

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Construction Phase

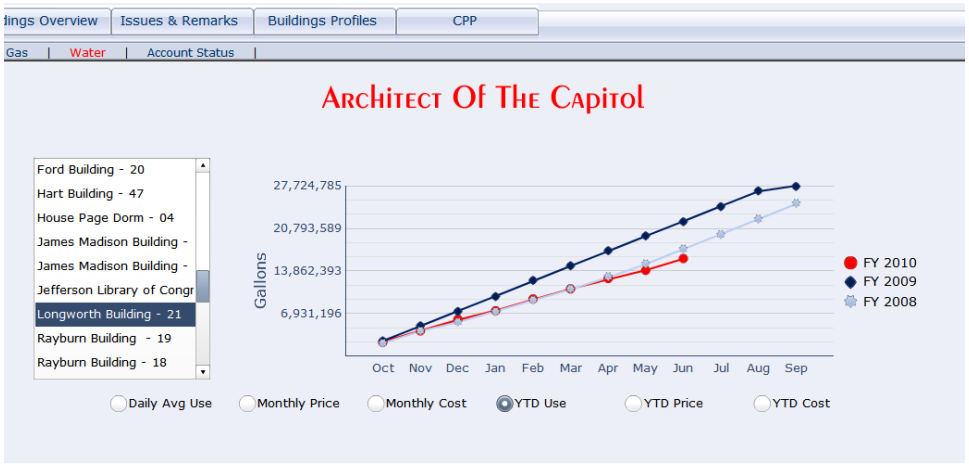
- We started slow during the December 2009 period
- Make sure to get contractors and in-house staff working together
  - Find your plumbers who have been there for 20 years and get them involved
- Completed humidification modifications quickly
  - 16 million gallons annual savings
  - Completed work over 3 weekends
- We worked with the ESCO to
  - Plan water work in conjunction with lighting work
  - Price in quality materials and necessary time
  - Supply in-house support to aid in water shutdowns

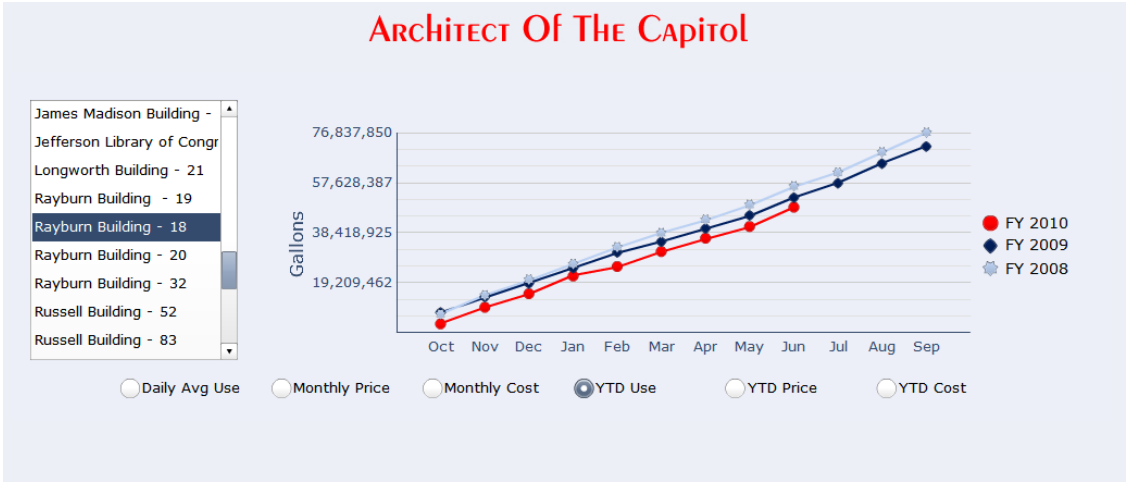
Construction Phase

- Unique Challenges
  - Valves that don't work
  - Evening/weekend working hours
  - Excess debris in water systems
- Novel solutions
  - Freezing supply lines
  - Specialty adaptors
  - Heavy duty mixing valves to handle debris in water lines

Performance Phase

- Completing M&V measurements as we complete buildings





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Performance Phase

- Leverage in-house/contractor team relationship to resolve warrantee issues
  - Include training components on new systems
  - Get spare materials on-hand
- Monitor for re-occurring maintenance issues

Questions/Discussion

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