



An Energy-Efficiency Workshop and Exposition



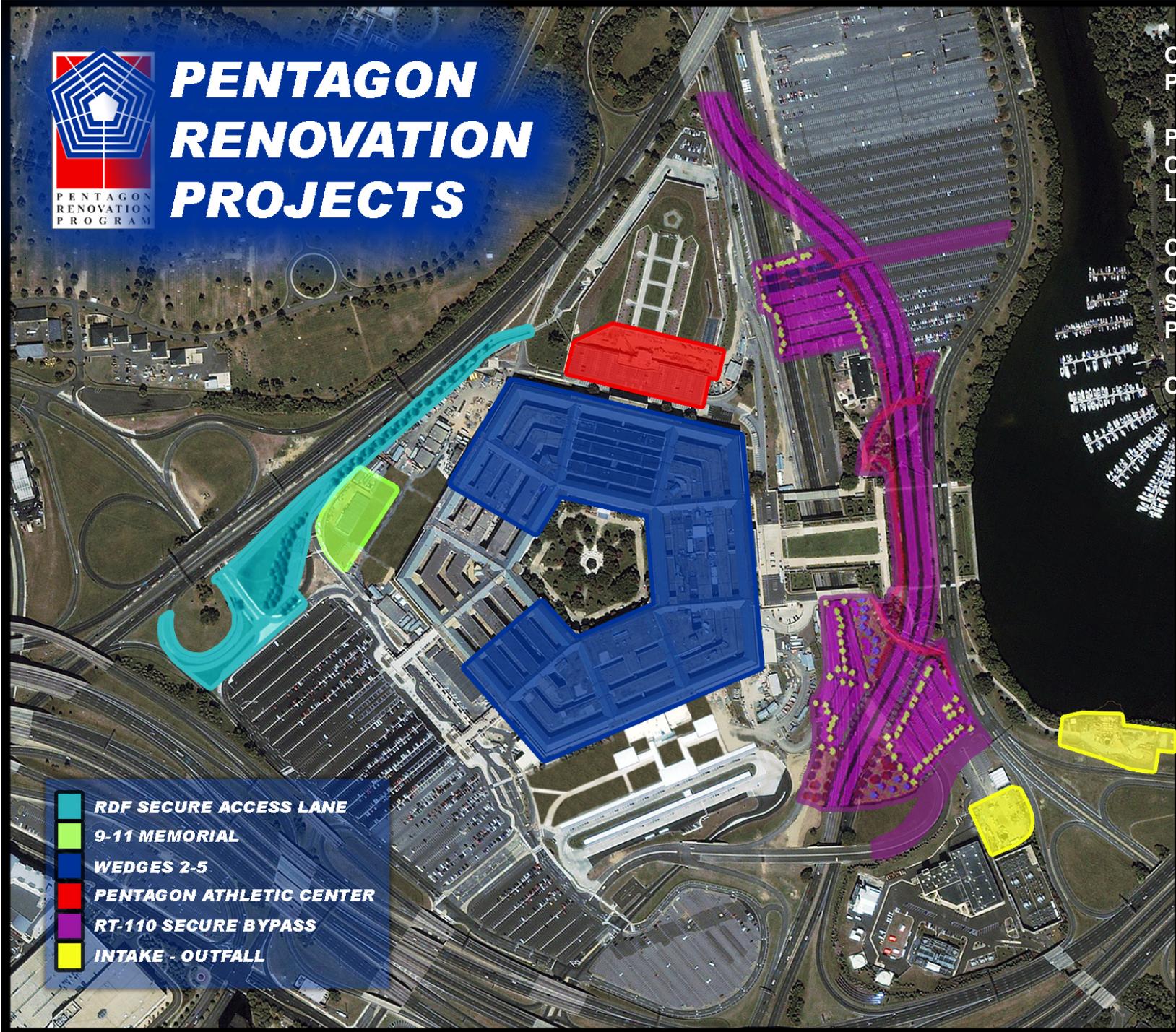
Pentagon Renovation Program

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PENTAGON RENOVATION PROJECTS



-  RDF SECURE ACCESS LANE
-  9-11 MEMORIAL
-  WEDGES 2-5
-  PENTAGON ATHLETIC CENTER
-  RT-110 SECURE BYPASS
-  INTAKE - OUTFALL

- Other PENREN
Projects:**
- Pentagon
Conference &
Logistics Center
 - Command
Communications
Survivability
Program
 - COOP – Alt Sites



The Pentagon - A Small City



Has never undergone a major renovation in its 60-year history.

- 34 acres
- 6.5 million sq. ft.
- 3 Empire State Bldgs.
- 7,748 windows
- 17.5 miles of corridors
- 25,000 personnel
- 1,000,000 calls each day
- Police force
- Metro station
- Fire Station
- Health Facilities
- Post Office
- Mini-mall
- Heliport

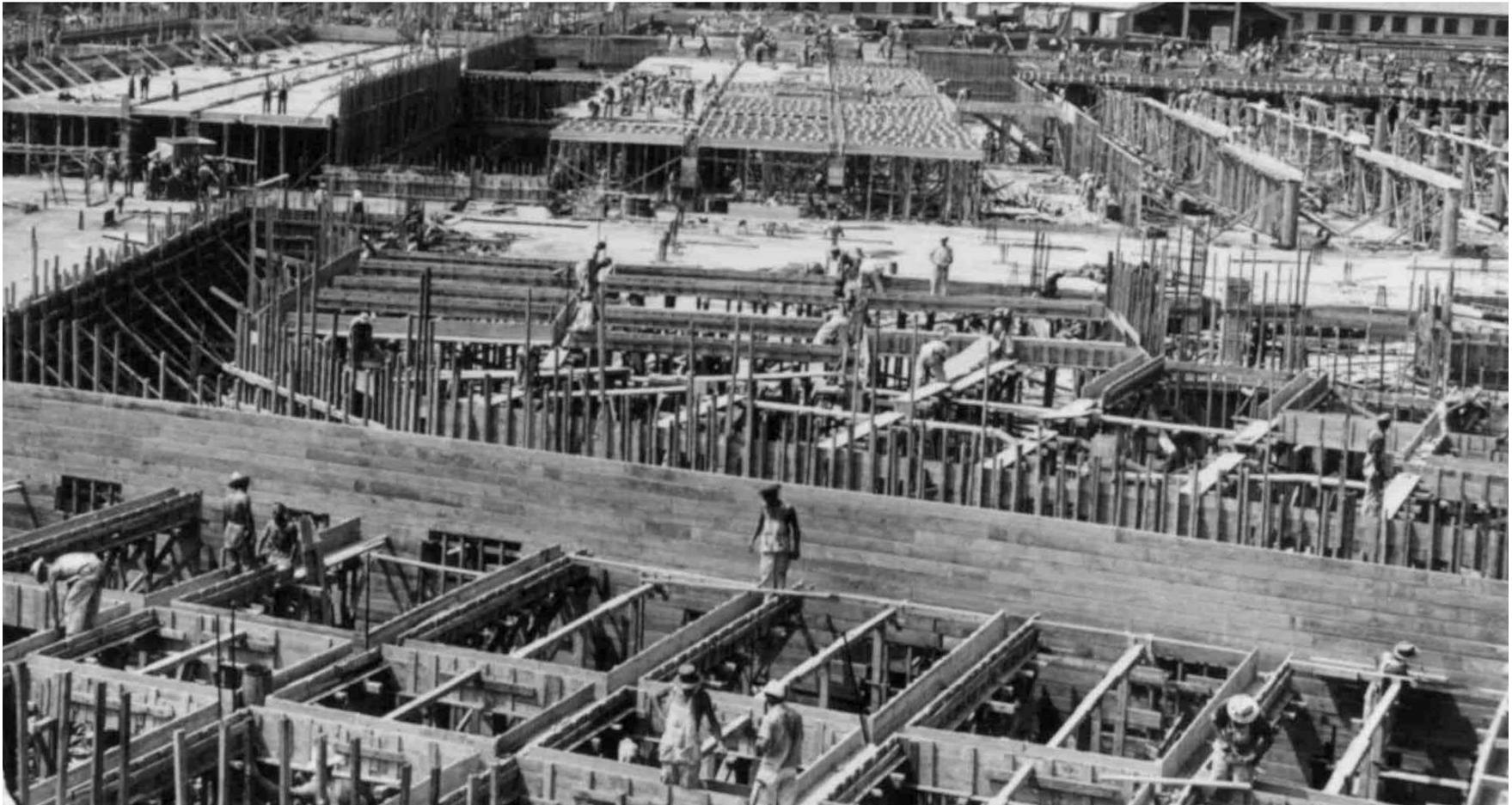


The Pentagon: Original Construction

- 400 architects and engineers

- 15,000 workers

- Original cost: \$83 million



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*Pentagon Early Years:
"Open Bay" Office Environment*



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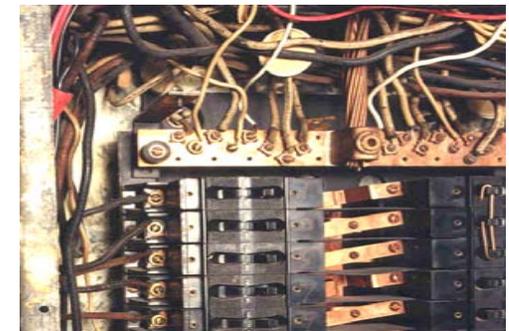
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The Need for Renovation

Major building systems beyond repair, non-compliant with modern building codes and ADA, hazardous materials present throughout, poor energy efficiency.





•Replacement of Exterior High Pressure Water Lines



•Monitoring & Control Systems
•Building Operations Command Center



•Fire Sprinklers
•Automatic Fire Doors
•Fire/Life Safety Codes
•ADA Compliance



•Blast Resistant Windows
•Steel Reinforcement
•Kevlar Mesh



What's Wrong with Construction Today?

Contracts reward inappropriate behavior

- *Low bid awards drive away top performers*
- *Bidding process drives bids below reasonable cost*
- *Contractors enter process as enemies*



- *Driven to find problems to make profit*
- *Turmoil, confusion, problems and time delays increase profit*
- *Contractors play the game according to our rules*



Improve Energy Performance With Improved Contracting Methods



- Hire better contractors
- Give them incentives to achieve your goals
- Set clear goals
- Operate as a team
- Measure progress against goals
- Reward Achievement



Hire Better Contractors

Improve Acquisition Strategy

Traditional Strategy

- Low bid
 - Drives away top performers
 - Bids below reasonable cost
 - Liar's contest
- Design-Bid-Build
- Government caught between designer and constructor



PenRen Strategy

- Best-value
- Design-Build
- Multi-phase source selection
- Stipends for design
- Most probable cost
- Performance specifications





Hire Better Contractors

Improve Acquisition Strategy

- **Phased source selection:**
 - **Phase 1 (Initial down-select)**
 - Typically 2-3 teams selected
 - Selection primarily based on past performance
 - Fast decision, minimum cost to offerors
 - **Phase 2 (Final Selection)**
 - Competition between teams from Phase 1
 - Results in conceptual design
 - Best value...cost, design, team, IMP/IMS
 - “Build to budget”
 - Stipend to offerors





Give them Incentives to Achieve Your Goals

Contracting Structure

- Fixed-price Incentive (Firm target) with an award fee
- Zero Target Profit
- Award fee up to 10% of contract price - Based on performance
- Contractor and the government split any savings
 - Savings splits have ranged from 50/50 to 70 percent to the government and 30 percent to the contractor
- Also split overruns 50/50 up to 120% of the contract price
- Gate between award fee and potential underrun earnings
 - Contractor must achieve at least 85% (average) on all award fee determinations to collect their share of any underrun
 - Keeps contractor focused on award fee (performance, customer satisfaction); prevents cutting corners and sacrificing quality

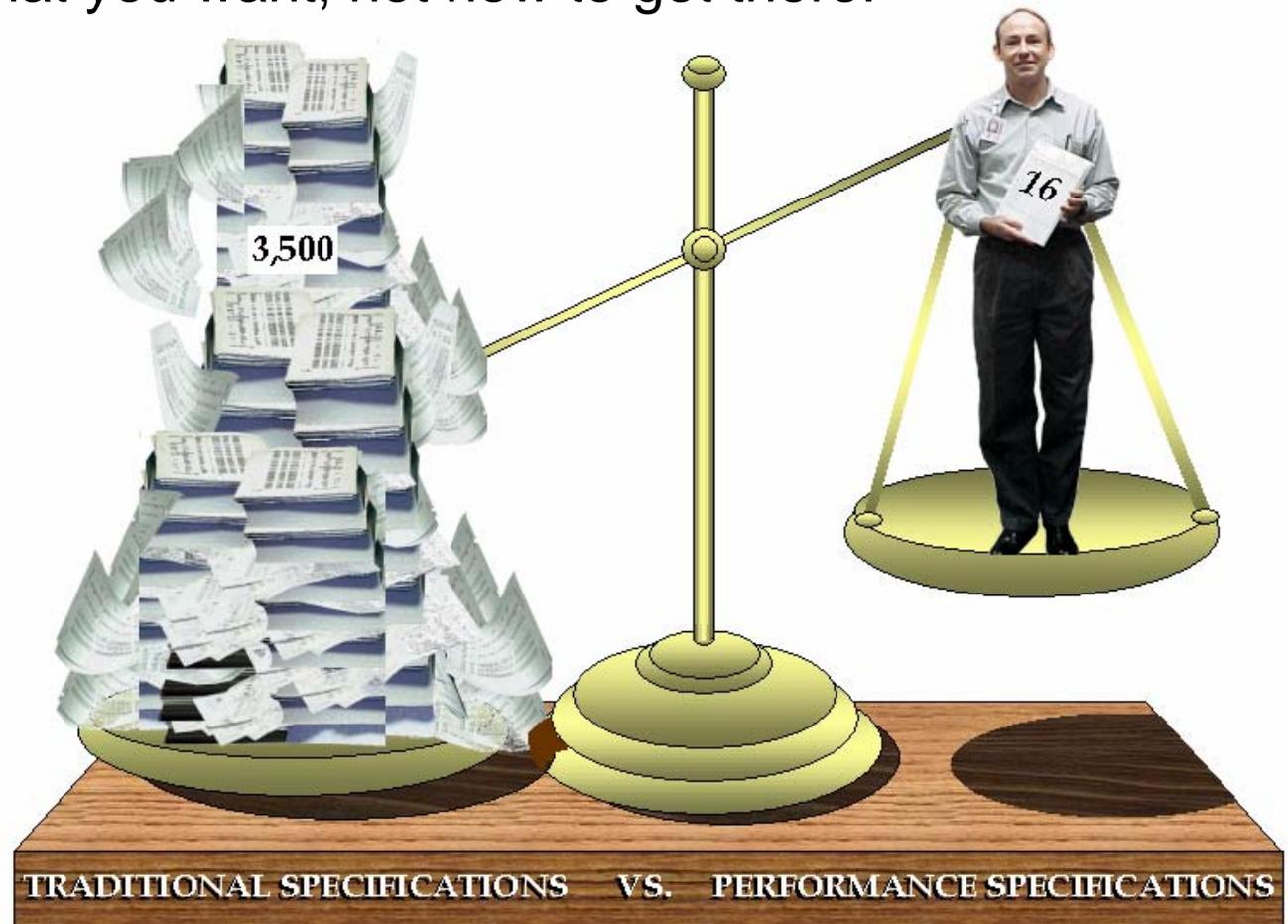




Set Clear Goals

Performance Requirements

- Tell contractor what you want, not how to get there!
- Cost
- Performance
- Schedule





Set Clear Goals

Integrated Sustainable Design

- Goals
 - Energy efficient improvements
 - Enhanced indoor environmental quality (IEQ)
 - Greenhouse gas reduction
 - Water supply
 - Waste prevention
 - Maintainable
 - Environmentally preferred products (EPP)
 - Waste management



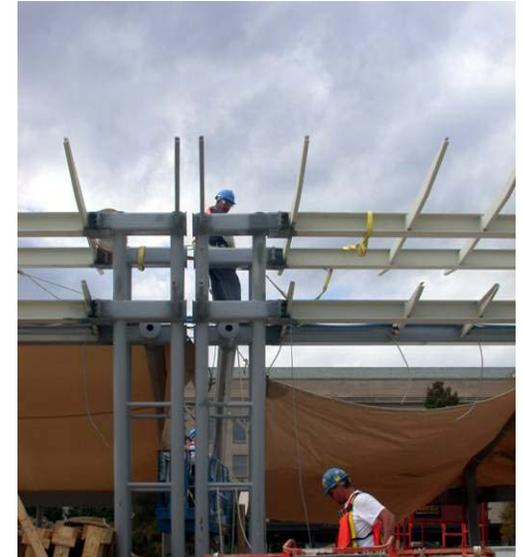
“A building that is not maintainable is not sustainable.”



Set Clear Goals

Integrated Sustainable Design Goals

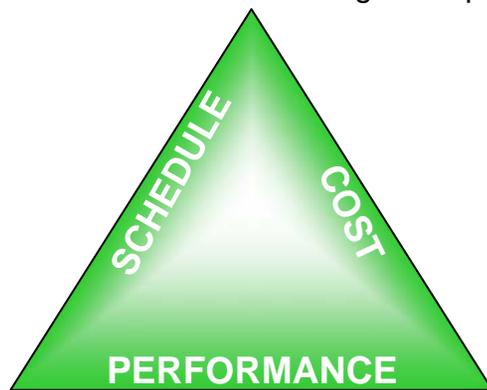
- Waste prevention/management
 - Contractor required to submit a construction and demolition recycling program that diverts 50% of all recyclable waste from landfill or incineration
- Maintainable
 - Commissioning assures maintainability- must balance sustainable, “green” design with operability and maintainability
 - Involves cost, durability and performance specifications; trade offs of products and systems
- Environmentally preferred products (EPP)
 - Use EPP as defined by EPA in the Comprehensive Procurement Guidelines (CPG)
 - Examples of percentages specified in CPG include- percent flyash in concrete, percent post-consumer waste recycled, percent post industrial waste recycled





Sustainable Construction Goals

- New Heating & Refrigeration Plant and utility distribution system
- State-of-the-art climate control system, tighter thermal building envelope
- Open bay environment improves energy efficiency: air flow, lighting
- Use of environmentally safe materials
- Improvements to pedestrian/vehicular traffic flow
- Greater flexibility for future changes
- Investments in new technology and alternative sources of energy
- Achieve LEED rating on all projects



Conventional Method



Sustainable Method





Operate as a Team

Integrated Product Teams (IPTs)

- Integration of contractor personnel onto teams
 - Contractors working with us to write the RFP
- Design Teaming
- Integration of customers/maintainers onto teams
- Opens lines of communication





Operate as a Team

Integrated Product Teams (IPTs)



G E O G R A P H I C I P T S

	WEDGE 1	WEDGE 2	WEDGE 3	BASEMENT 1	BASEMENT 2	BASEMENT 3	ETC.
REQUIREMENTS							
PLANNING & DESIGN							
ACQUISITION							
COMMISSIONING							
CONSTRUCTION							
SECURITY							
TENANT ACTIVITIES							
ETC.							

Each person belongs to at least two teams



Measure Progress Against Goals

- Periodic Award Fee Determination
- Monthly feedback provided to contractor
- Award fee determined and paid on quarterly basis
- Contractor has input in determination process
- Milestones
- Energy Measurement
- Earned Value



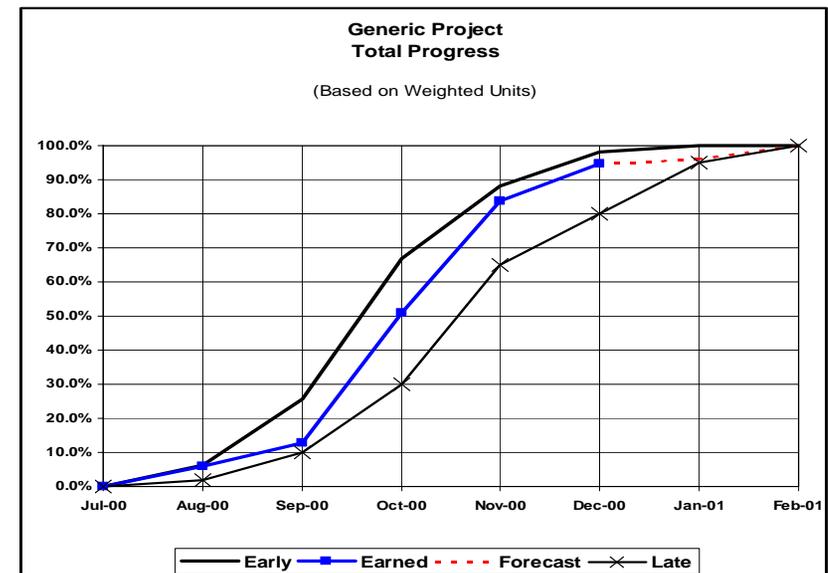
2003 Measure Progress Against Goals



Earned Value Analysis

Analysis of cost and schedule data, used in a trend, for assessing current, and predicting future, schedule and cost status.

- Budgeted Cost for Work Scheduled/Budget Cost for Work Performed
- Provides early warning of problems in cost and schedule
- Provides valuable insight to financial health of project for contractor













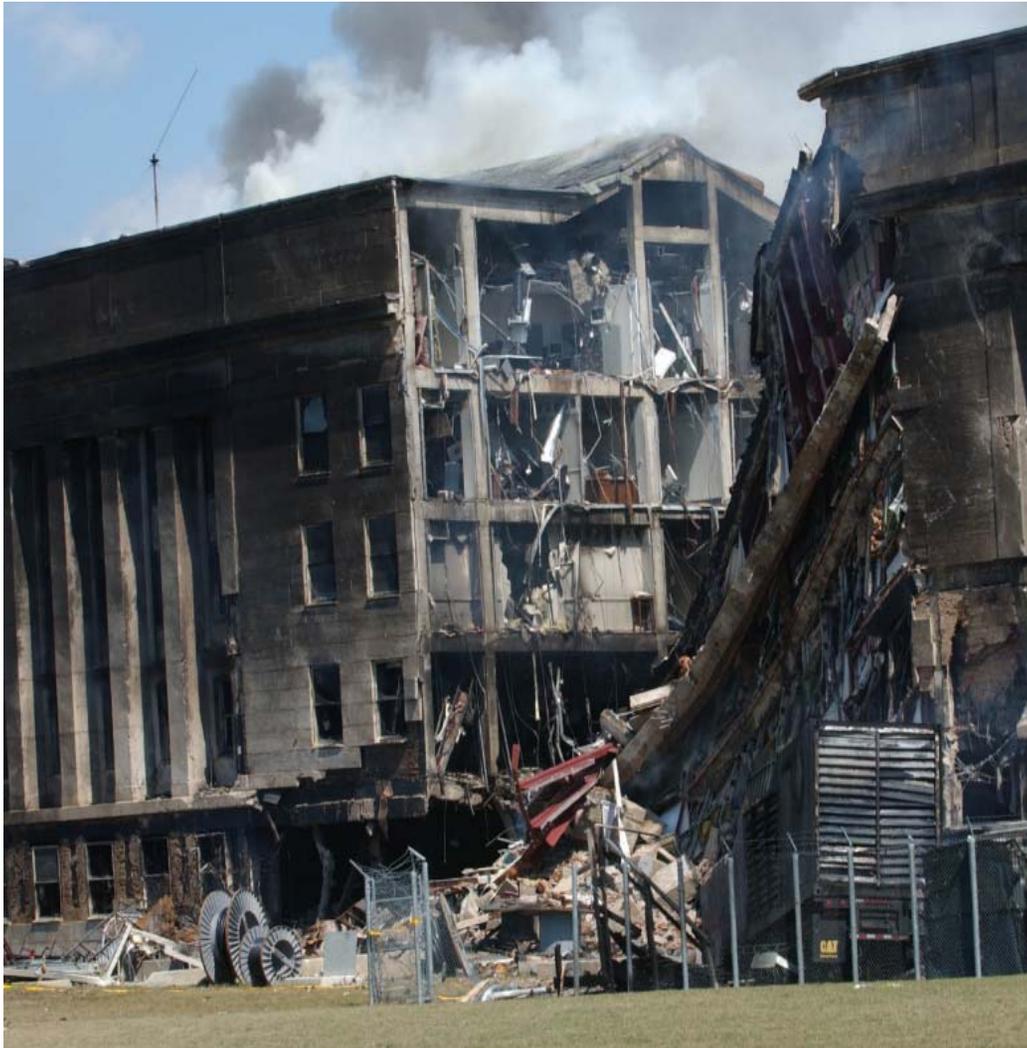
Pentagon Renovation Emergency Response



- **Verbal direction to contractors**
 - Structural engineering Support
 - Shoring material
 - Heavy equipment
 - Specialty personnel
- **Extensive use of the Gov't credit card to support all agencies and organizations**
- **Awarded \$570M in emergency and recovery effort contracts within 4 days**
 - Recovery of Wedge 1
 - Specialized engineering
 - Other Support contractors



9/11/01 – 9/11/02





Pentagon Renovation Program Initiatives

- **The US Green Building Council (USGBC) LEED 2.0 system (LEED for New Buildings) is organized according to environmental areas of concentration. It is a rating system that consists of four levels, with points being given for meeting requirements within each of the five areas of concentration**
 - **A total of 69 points are available, with point breakdown as follows:**
 - **LEED certification - basic - 26-32 points**
 - **Silver certification - 33-38 points**
 - **Gold certification - 39-51 points**
 - **Platinum certification - 52 + points**

2003 “Greening” of the Pentagon Summary of Initiatives



- *New Heating & Refrigeration Plant and utility distribution system*
- *State-of-the-art climate control system, tighter thermal building envelope*
- *Open bay environment improves energy efficiency: air flow, lighting*
- *Use of environmentally safe materials*
- *Improvements to pedestrian/vehicular traffic flow*
- *Greater flexibility for future changes*
- *Investments in new technology and alternative sources of energy*

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Pentagon Renovation Program

On Cost, On Schedule, Built for the Next 50 Years



<http://renovation.pentagon.mil>