



*2005 Tri-Service Infrastructure Conference  
August 2-5, 2005*

# ***REBUILDING AND RENOVATING THE PENTAGON***



**PENTAGON  
RENOVATION &  
CONSTRUCTION**

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Renovation Program Manager*

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

*<http://renovation.pentagon.mil>*



# ORIGINAL CONSTRUCTION

*September 11, 1941 to January 15, 1943*

Completed in 16 months by working three 5,000-man shifts around the clock.





# THE EARLY YEARS

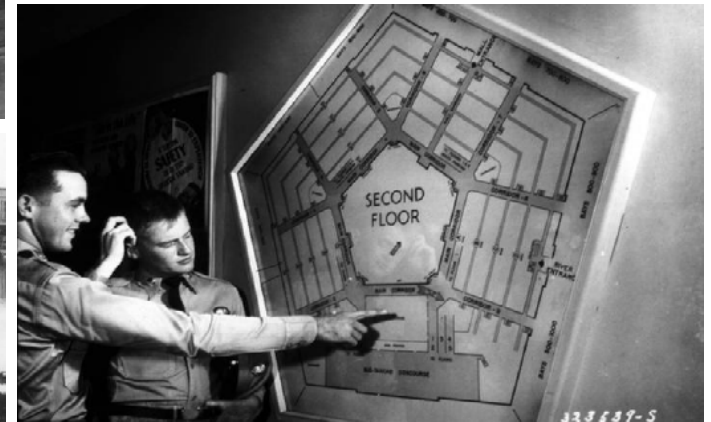


1943

1950s

1960s...

Minimal electrical, communications and HVAC requirements/capacity; Open-bay office environment; Flooding conditions.





# A SMALL CITY

1965

1970

1975



The Pentagon has never undergone a major renovation.



**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 per day**

**Police force**

**Metro station**

**Fire Station**

**Health Facilities**

**Post Office**

**Mini-mall**

**Heliport**



# HAZARDOUS WORKING CONDITIONS



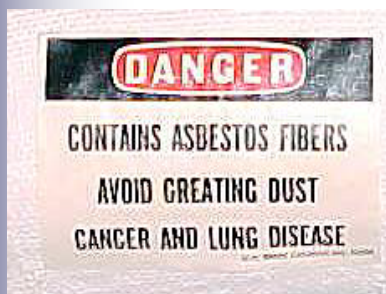
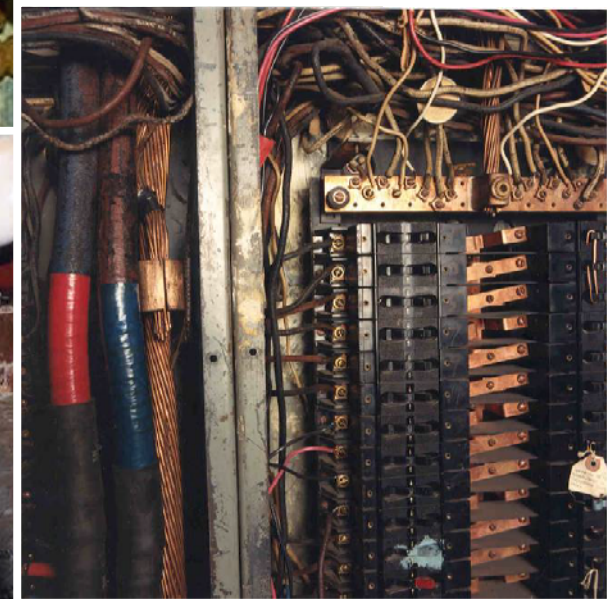
Major building systems beyond repair, hazardous materials (PCBs, Asbestos, Mercury, Lead) throughout, poor energy efficiency.

*“The Pentagon is a classic example of “disinvestment” in federal buildings. For at least 10 years, needed major repairs and alterations to the Pentagon have been deferred. DoD officials, beginning in 1985, sought operational control of the building.”*

GAO Report to the Chairman, Subcommittee on Public Buildings and Grounds, Committee on Public Works and Transportation, House of Representatives

May 1991

GAO/GGD-91-57





# WORKING CONDITIONS



Inefficient office space, non-code compliant...





# PENREN HISTORY



Core Function = Renovation

Traditional contracting strategies led to cost overruns, schedule delays and potential cancellation.



Heating & Refrigeration Plant  
(design & construction 1992-1997 )



Basement/Mezzanine Segment 1  
(design & construction 1993-2000)

**LOW BID  
DESIGN-  
BID-  
BUILD**

**Drives away  
best  
performers**

- 1997 - New Program Manager Assigned – his assessment of the program:

*“Costs soared as schedules stretched, then stretched again.”*

*“Consistently failed to meet commitments made to customers.”*

*“Basic work gone wrong.”*

***“It is essential that PENREN improve its performance fast.”***



# GOAL



Implement Approach that Rewards Behavior We Like!







# CHANGES

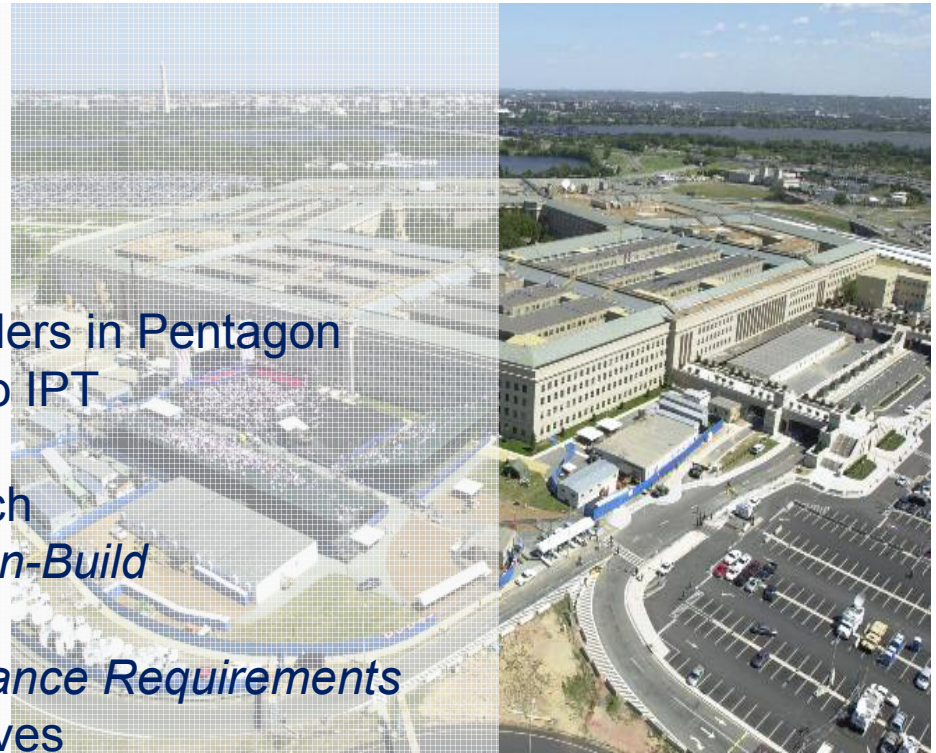


## Restructuring of Program Responsibility

- In Function
- In Reporting

## Across the Program

- More Communication w/Senior Leaders in Pentagon
- Reorganization - From “stovepipe” to IPT
- Reinvention Laboratory
- Restructuring of Acquisition Approach
  - *From Design-Bid-Build to Design-Build*
  - *From Low Bid to Best Value*
  - *From Project Specs to Performance Requirements*
- Set and Measure Goals and Objectives



## Results:

- Projects On or Under Budget
- Ahead of Schedule



# Incentives to motivate behavior



## Contract 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



## Contractor and the government split any savings

- Savings splits range from 50/50 to 70/30 percent government/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

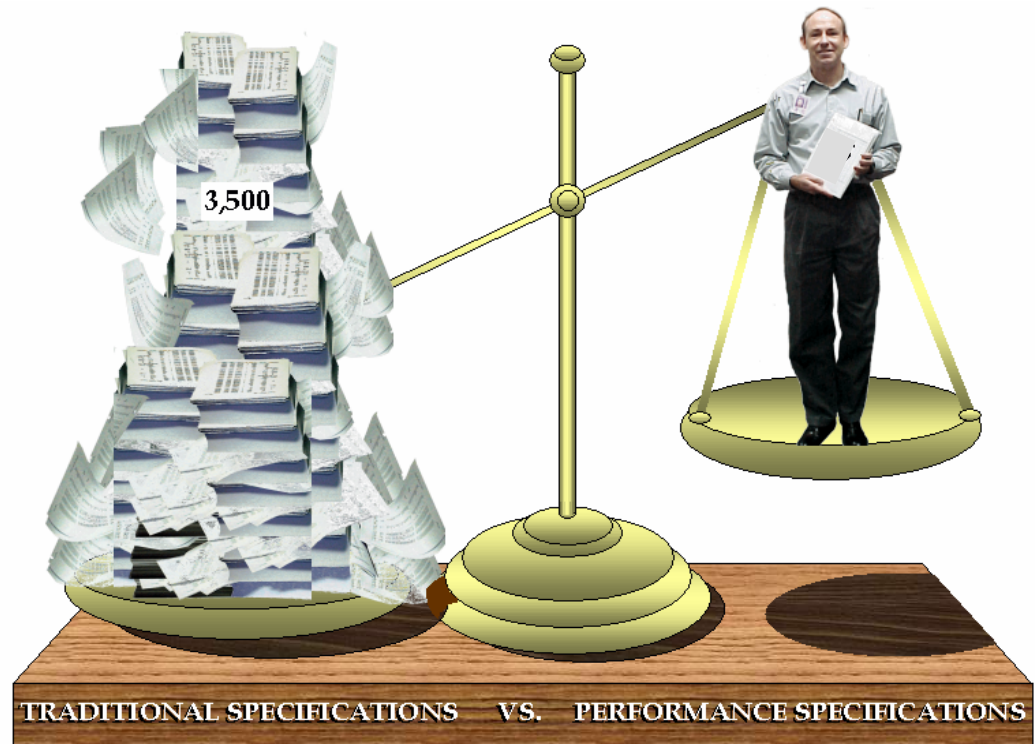


# KEY TO SUCCESS



## Set Clear Goals

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





# KEY TO SUCCESS



## Restructure Acquisition Approach

### Matrix Performance Specifications for W2-5

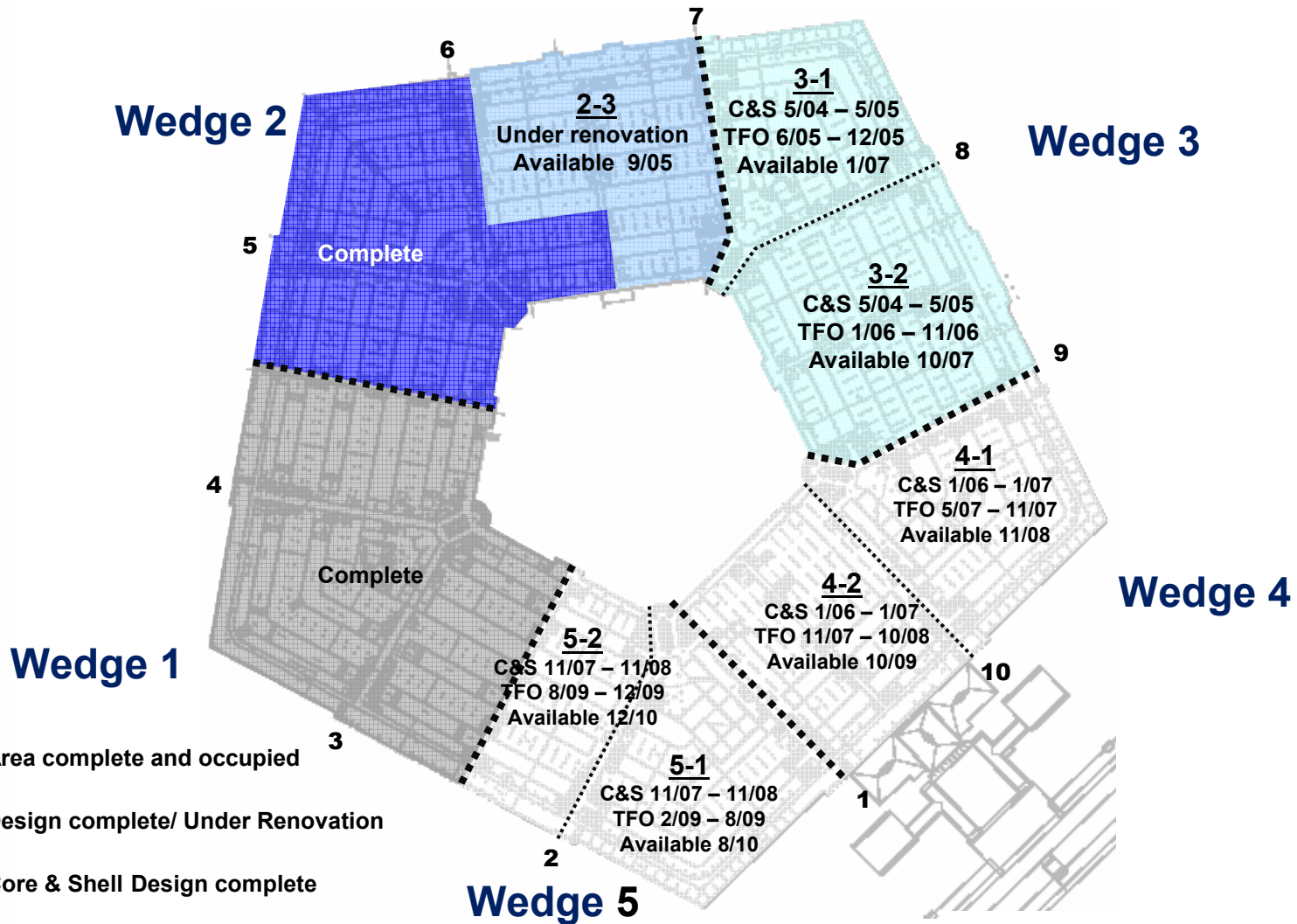
CRITERIA		OFFICES SUITES			SPECIAL SPACES		
		0-1 Senior Executive Office Suites	0-2 Executive Offices	0-3 General Office Area	SP-1 Laboratory	SP-2 Food Service	SP-4 Automatic Processing (ADP)
		TYPE	1	1	1	1	1&2
<b>MECHANICAL</b>							
Occupancy Schedule	Monday-Friday	0600-1800	0600-1800	0600-1800	0600-1800	0600-2000	24
	Saturday	Closed	Closed	Closed	Closed	Closed	24
	Sunday	Closed	Closed	Closed	Closed	Closed	24
	Holidays	Closed	Closed	Closed	Closed	Closed	24
Temp. (°C) (Occupied)	Cooling Summer	24 (+-2)	24 (+-2)	24 (+-2)	24 (+-2)	25 (+-2)	21 (+-2)
	Heating Winter	21 (+-2)	21 (+-2)	21 (+-2)	21 (+-2)	21 (+-2)	21 (+-2)
Humidity (%RH)	Summer	50%	50%	50%	50%	50%	50%
	Winter	-	-	-	-	-	30%
O.A. Ventilation Rate		20 CFM/Person	20 CFM/Person	20 CFM/Person	20 CFM/Person	15 CFM/Person	20 CFM/Pe
Space Pressure		Positive	Positive	Positive	Negative	Negative	Positiv
Total Air Flow (ACH-Minimum) During Occupancy		6	6	6	12	12	6
Redundancy		no	no	no	no	no	yes
Filtration (% Efficient Pre-Filter / After Filter)		30/80	30/80	30/80	30/80	30/80	30/80
Noise Criteria (NC)		25	25	45	25-40	25	45



# Wedge 2-5 Renovation



## Where We Are Today



Note: Future dates are projections only and subject to modification due to unforeseen scheduling and/ or funding issues.



# KEY TO SUCCESS



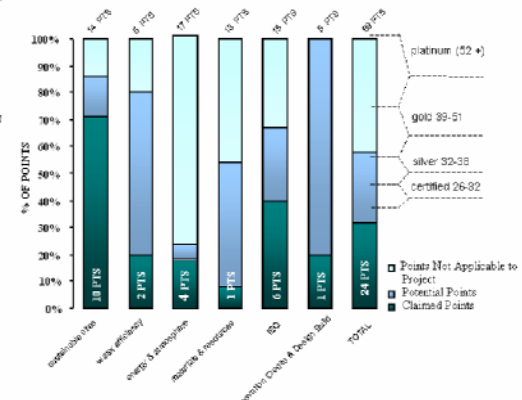
## Set Clear Goals – Monitor Progress Monthly Metrics

- Useful for identifying trends and developing rules-of-thumb
- Award fee contracts produce many criteria to judge and reward contractor
- Criteria naturally lend themselves to metrics
- Provides confidence intermediate goals are being met

Generic Project LEED Evaluation Chart

**Action Items**

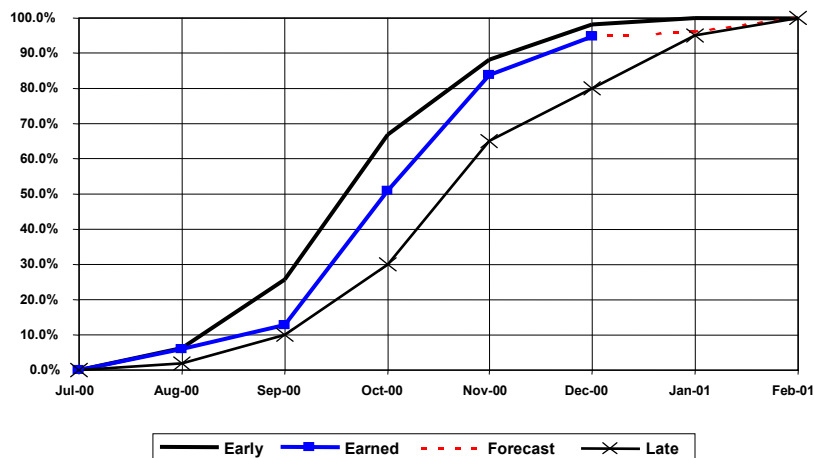
- Sustainable Site**
  - Urban Redevelopment
  - Stormwater Management
- Water Efficiency**
  - Water Efficient Landscaping
- Energy & Atmosphere**
  - Commissioning Input from Team
- Materials & Resources**
  - Local and Regional Materials
  - Recycled Content Materials
- Indoor Environment Quality**
  - Confirmation of Low Emitting Materials
  - Construction IAQ Plan
- Innovation Credits**
  - Signage



- Shows positive trends and identifies problems
- Contractor participates in development of the metric

Generic Project Total Progress

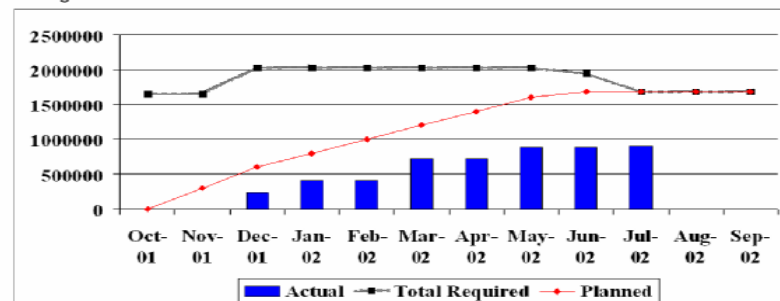
(Based on Weighted Units)



Resource Management Generic Project

Total Required: \$1.7M  
Planned Obs: \$1.7M  
Actual Obs: \$ .9M

Obligations: 45%





# SSE IMPLEMENTATION

## Four Projects registered with USGBC for LEED Certification

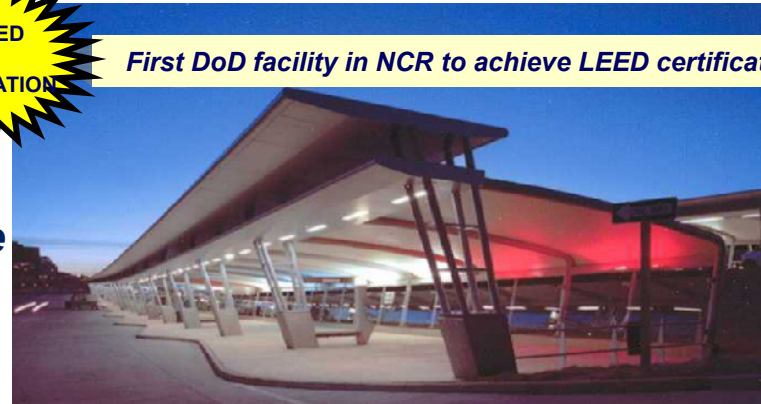


**Wedges 2-5**



*First DoD facility in NCR to achieve LEED certification*

**Metro Entrance Facility**



*Second DoD facility in NCR to achieve LEED certification*

**Pentagon Athletic Center**



**Remote Delivery Facility**



# PENTAGON ATTACKED

*September 11, 2001 9:37 a.m.*

- 184 lives lost
- 110 people severely injured
- 2 million square feet of space damaged







# THE CHALLENGE

September 14, 2001



WEDGE 2

WEDGE 1



- Recover, Stabilize, Analyze, Demolish, Rebuild, Renovate
- Awarded \$1.5 billion worth of contracts by 9/15/2001
- A promise made



# RECOVERY & STABILIZATION

*September 14, 2001*



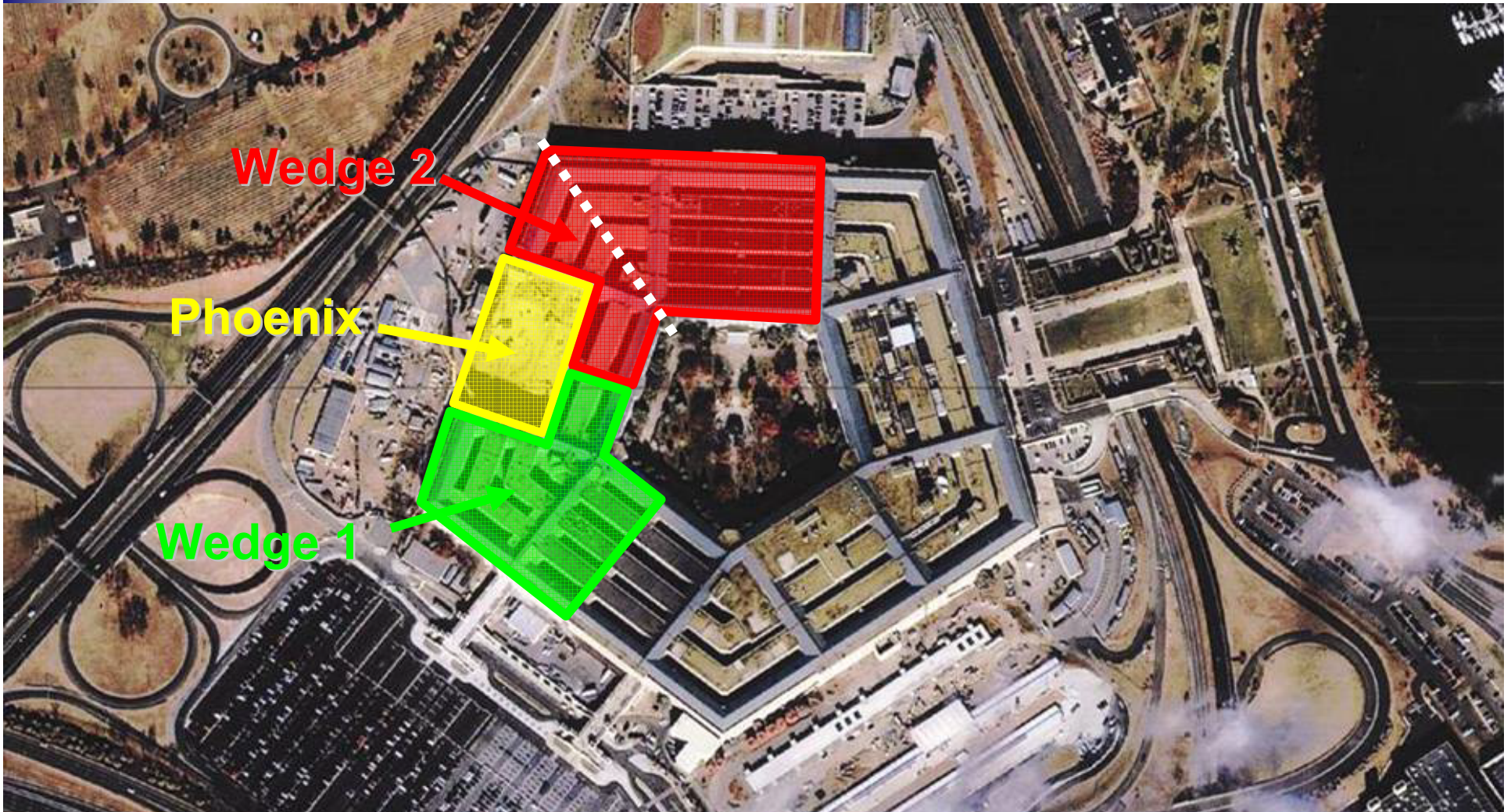


# ANALYSIS

*September 2001*

- 1.6 million sq. ft. of fire, water, smoke, mold damage
- 400,000 sq. ft of severe structural damage

*October 2001*





# BEFORE & AFTER

September 11, 2001

September 11, 2002





# BEFORE & AFTER

September 11, 2001

September 11, 2002



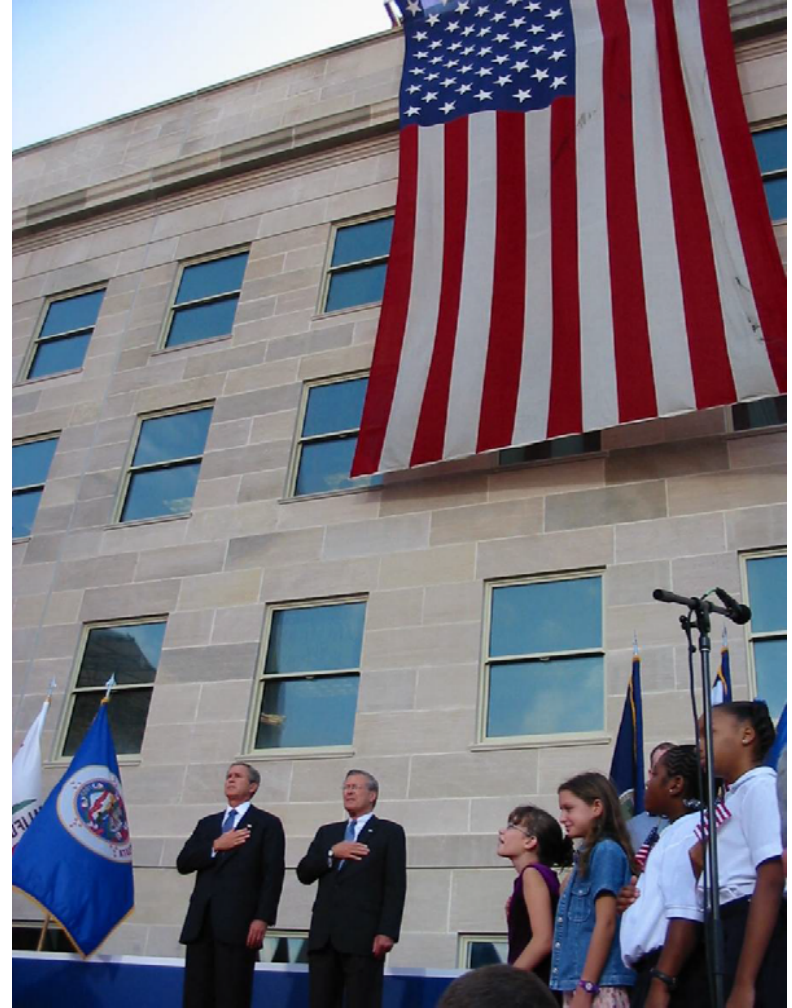


# BEFORE & AFTER

September 11, 2001



September 11, 2002





# PENTAGON MEMORIAL



- Commemorates the 184 lives lost at the Pentagon on 9/11/2001
- Concept design selected from more than 1,100 entries in a world-wide competition
- Funded by private donations
- Web site for Pentagon Memorial Fund [www.pentagonmemorial.net](http://www.pentagonmemorial.net)

## Milestones:

- Design select 3/2003
- Design-build contract awarded 8/2003
- Construction start and completion based on funding





# PENREN PROJECTS

ALT SITES



CCSP



Heliport



Wedge 2-5



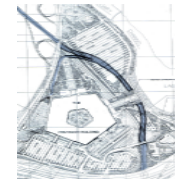
PAC



Conference & Logistics Center



Pentagon Secure Bypass



Intake/Outfall



Ancillary Projects

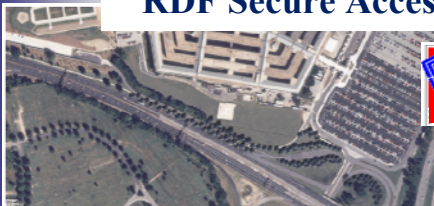


MEF



**MEF** Arriving in Style.  
Pentagon Metro Entrance Facility <http://metro.pentagon.mil>

RDF  
RDF Secure Access Lane



Phoenix Project



Memorial Project



Wedge 1 Renovation







# PENTAGON TODAY



November 2001

TODAY





# PENTAGON RENOVATION & CONSTRUCTION PROGRAM OFFICE



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

<http://renovation.pentagon.mil>