



*Aerial view of the Pentagon from May 2001. In the foreground, Wedge 1 (between the white lines) encompasses approximately 1,000,000 square feet of building space in the area serviced by Corridors 3 and 4. All of the 5,000 employees who worked in the wedge had been relocated to leased office space or elsewhere in the Pentagon so that renovation could begin. Demolition and abatement activities have been completed and most of the interior space has been completed, including all new utilities, new elevators and escalators, and entirely new office space featuring modern systems furniture and temperature controls. In February 2001, personnel began moving back into renovated areas in the wedge.*



## **The PENTAGON RENOVATION PROGRAM**

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

### **THE NEED**

The Pentagon, designated a National Historic Landmark in 1992, has never undergone a major renovation, and after more than 57 years, renovation is essential in order to meet current health, fire and life safety codes and provide reliable electrical, air conditioning and ventilating services. Absent a major renovation, the building infrastructure will become increasingly unreliable and soon unable to effectively support the headquarters and nerve center of the national military establishment. Major building systems have deteriorated to such an extent that repairs are no longer effective and entire systems need replacement. The presence of asbestos in the ceiling plaster, ventilating ducts, pipes and floor coverings is a hazard that makes repairs or alterations extremely disruptive and expensive.

From 1982 through 1990, the Department of Defense discussed with the General Services Administration (then owner of the building) renovation of the Pentagon and, in the mid 1980's, GSA supported the concept of transferring the building to the DoD.



*The Pentagon was constructed in just 16 months, from September 1941 to January 1943, as 15,000 workers labored in three shifts around the clock due to the pressures of wartime. The structure is almost entirely reinforced concrete as steel was preserved for the war effort. The Pentagon has never undergone a major renovation and after 58 years, all its building systems are beyond repair and need complete replacement. Hazardous materials are also prevalent throughout the 29-acre structure and it is minimally accessible for persons with disabilities.*

## THE TRANSFER

Based on consultation within the Administration and with Congressional Committees, legislation was prepared to transfer the Pentagon from the Administrator of General Services to the Secretary of Defense so that the renovation of the Pentagon could be undertaken.

The Defense Authorization Act of FY 1991 transferred control of the Pentagon Reservation from the Administrator of General Services to the Secretary of Defense. Under the same Act, Congress established the Pentagon Reservation Maintenance Revolving Fund for the expressed intent of renovating the Pentagon. This Act allows the Secretary of Defense to establish rent

rates for the tenants to support the renovation.

## THE PROGRAM

In 1990, a Concept Plan for the Pentagon Renovation was approved based on renovating the building in five 1,000,000-gross-square-foot "wedges" with renovation of the basement as a separate endeavor. The plan

envisioned the complete removal of all support systems (mechanical, electrical, plumbing) down to the base structure and then construction of all new systems. This full-scale removal is dictated by the wide-spread presence of asbestos throughout the building. Removal of plumbing systems is based on the high probability of catastrophic failure.



*The River Terrace under construction in 1942. Rather than backfilling the entire site, two levels were created below ground to keep the project on schedule.*



*The River Terrace as it appeared in April 1999. Declared a historical landmark in 1992, the Pentagon has had few changes to its exterior facades.*

The Renovation Program provides all new mechanical, electrical and plumbing systems, sprinkler systems, vertical transportation, cable management systems, improvements in fire and life safety systems, and flexible ceiling, lighting and partition systems. The Renovation will also provide accessibility throughout for persons with disabilities. It will preserve historic elements, upgrade food service facilities, construct operation centers, install modern telecommunications support features, comply with energy conservation and environmental requirements, reorganize materials



*45,000 cubic yards of material was excavated in the Pentagon's basement to allow for construction of a new lower slab, which cleared the way for an entirely new mezzanine level.*

handling and provide safety improvements in vehicular and pedestrian traffic.

The renovation concept for the Pentagon includes, as a first phase, a new Heating and Refrigeration Plant, which has been constructed. In conjunction with construction of the H&RP, a Center Courtyard Utilities Tunnel was constructed. The tunnel houses piping and conduit which will distribute building utilities provided by the new plant.

The second phase of the Program is the renovation of the Basement and Mezzanine which started in September 1994.



*The Pentagon's new Heating & Refrigeration Plant provides steam and chilled water to the Pentagon and Navy Annex (8,000,000 sq. ft. of space) and can operate on fuel oil or natural gas.*

## STATUS

On December 26, 1996, Deputy Secretary John White directed that the renovation of Wedge 1 begin in January 1998, and that the wedge be vacated by December 1997.

On January 15, 1997, as required by Congress, the Pentagon's Director for Administration and Management certified that the design, construction and installation of (building) equipment would not exceed \$1,118,000,000. In 1999, that amount was augmented to \$1,220,000,000 to accommodate new security initiatives.

Wedge 1 will be completed and fully occupied in October 2001. The overall renovation is expected to be completed in 2014.

The third through seventh phases of the program are the five wedges of the building from the first floor to the fifth floor.

These areas have been determined to be the optimum divisions



*The Pentagon Renovation Team works with the DoD disability manager to address issues of concern for persons with disabilities.*

for renovation while continuing operations. In order to vacate each wedge prior to renovation, tenants will be moved either to nearby leased office space or to space identified within the Pentagon.



*1,200 employees have moved to newly renovated space in the basement and mezzanine.*

*A ribbon-cutting ceremony in the Air Force Council Room with the Pentagon Renovation Program Manager and the Air Force Chief of Staff.*

## Wedge 1

Right: On March 8, 2001, David Cooke (left), Pentagon Director of Administration and Management, and Lee Evey, Pentagon Renovation Program Manager, cut a ribbon to mark the opening of Wedge 1 to Pentagon personnel.



Above: In February 1998, Pentagon senior officials participated in a "Wall-Bashing" ceremony to mark the beginning of demolition inside Wedge 1.



Floor slabs were removed in this area of Wedge 1 revealing all of its five floors and clearing the way for a new escalator bank (inset) that improves vertical mobility. Renovation also includes installation of 40 new passenger elevators throughout the Pentagon.



More than 5,000 personnel were relocated from Wedge 1 to swing space in leased office buildings or elsewhere in the Pentagon.



The wedge is gutted down to its bare bones requiring the removal of 100 million pounds of debris and 27 million pounds of asbestos contaminated material.



New insulation and windows improve the Pentagon's thermal envelope and increase energy efficiency.



New systems furniture features "spinewall" technology that allows all electrical and communication lines to run within the furniture itself. This enhances the flexibility of the office space and facilitates rapid reconfiguration.



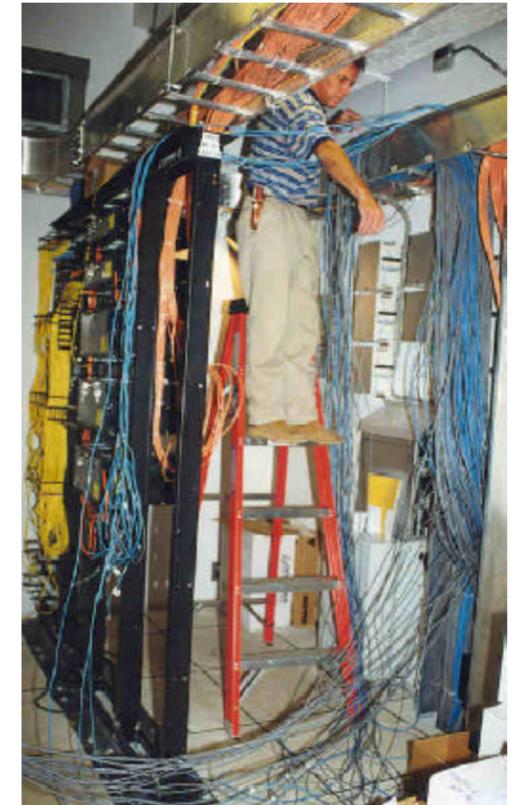
## A Modern Health Facility

Above: The reception area to the Pentagon's new TRICARE clinic.

At right is a new training room for clinic personnel.

The 50,000-square-foot medical facility consolidates the Army, Navy, Air Force and Civilian clinics in the Pentagon. The state-of-the-art clinic features tele-medicine and computer connectivity with physicians throughout the U.S. Radiology features filmless technology. X-rays are digital providing physicians nearly instant feedback. In all, 21 areas of medicine including optometry, trauma care, physical therapy, podiatry, dermatology, cardiology, immunology, pharmacy and others are provided in the clinic. A new dental clinic includes 30 chairs, compared to the 12 that previously existed in the Pentagon.

Right: A new exam room.



Above: 75,000 miles of old wiring will be replaced with new lines and modern fiber optics, which eventually will carry voice, data and video across one line.



Above: Information Management & Telecommunications personnel inspect design drawings detailing locations of new communication lines below raised flooring.



Left: Pentagon personnel in the new Network Systems Management Center test equipment in the facility, which monitors and provides maintenance for the Pentagon's vast array of computer systems.

## 21st Century Telecommunications

The Pentagon is receiving a complete overhaul to its telecommunications system including the installation of fiber optics and the consolidation of computer server rooms and telephone switches.

A room inside the Pentagon's new Network Systems Management Center. Among several services, the facility helps to ensure the security of the Pentagon's 25,000 computers and hundreds of local area networks.

