A Status Report to Congress on

The Renovation of the Pentagon

Prepared by
The Office of the Secretary of Defense

March 1, 2001

Annual Status Report to Congress
March 1, 2001

11th Edition

This report is provided to the Congress in compliance with Title 10 United States Code, Section 2674. This requires the Secretary of Defense to submit an annual report on the status of the renovation of the Pentagon Reservation, and a plan for the renovation work to be conducted in the fiscal year beginning in the year in which the report is transmitted.

This is the eleventh annual report submitted in compliance with 10 USC 2674. The report covers accomplishments to date and actions proposed for FY 2001. In addition, information is included on several related projects which support the overall objectives of operations and maintenance of the Pentagon Reservation.

ADDENDUM

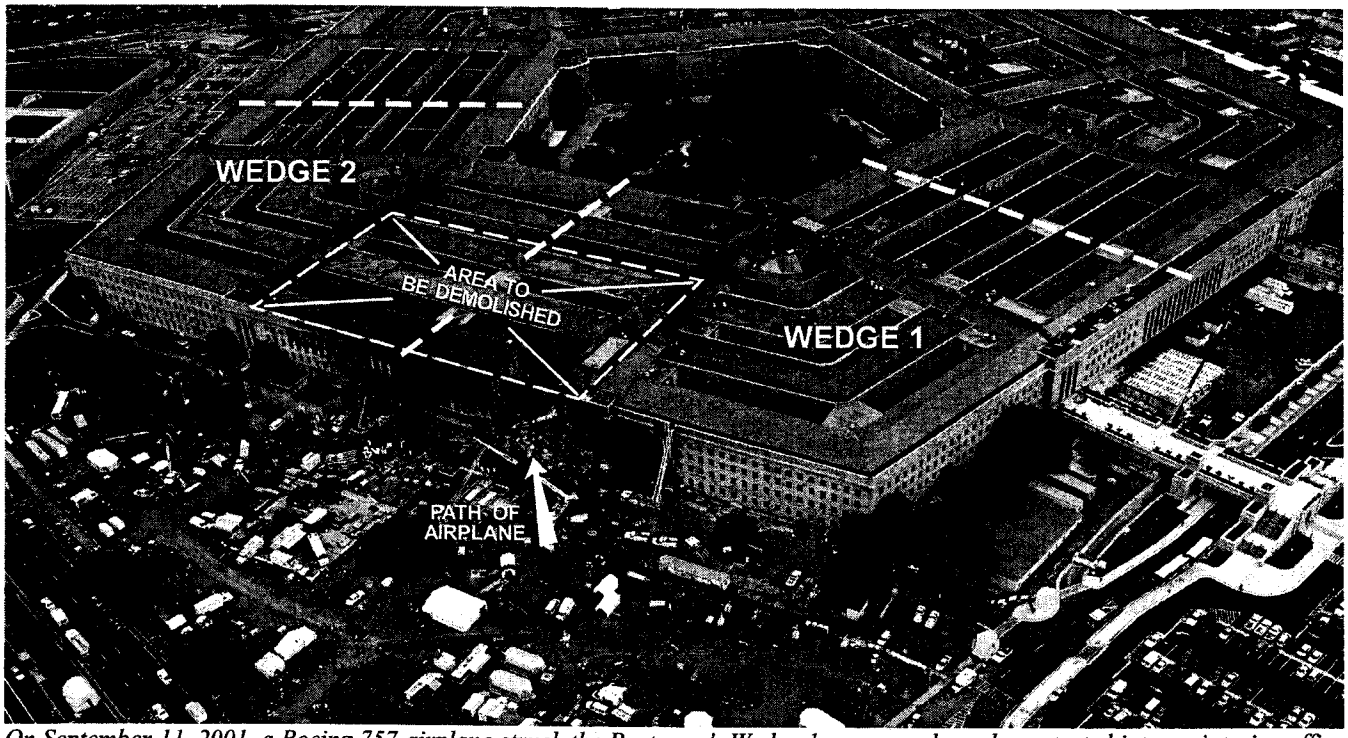
This Annual Report to Congress reflects Pentagon Renovation Program activities accomplished in Fiscal Year 2000. It does not include response activities following the September 11, 2001, terrorist attack on the Pentagon. Those activities will be addressed fully in the Fiscal Year 2001 submission of this document, which will be released in March 2002.

However, in light of the significant and immediate impacts of the attack on the Renovation Program, it is appropriate to provide in this report a brief description of these impacts and the actions taken to both reconstruct the damaged areas of the Pentagon and to move forward with the overall renovation of the building.

Area of Impact: Wedge 1, which spans the southern half of the Pentagon's Heliport side and the western half of the South Terrace, was the first one-fifth of aboveground space to be renovated and is discussed in greater detail in the "Projects in Progress" portion of this report. The 1,000,000-square-foot wedge was five days away from completion when it was struck by hijacked American Airlines Flight 77.

The Boeing 757 struck Wedge 1 on the Heliport side of the Pentagon very low to the ground and entered Wedge 1 just to the north of Corridor 4 on the first and second floors. The plane traveled through the Pentagon at a roughly 45-degree angle to the face of the building. It went through Wedge 1 and into the un-renovated Wedge 2 before exiting the C-ring, the third ring of offices, and into a roadway (A/E Drive) that circles the perimeter of the Pentagon between the B and C-rings (see photo below).

Security Enhancements: According to federal investigators, the fully fueled plane was traveling at 350 mph when it struck the Pentagon. Several concrete support columns on the first floor were completely sheared away as the plane penetrated the E-ring. Three measures taken



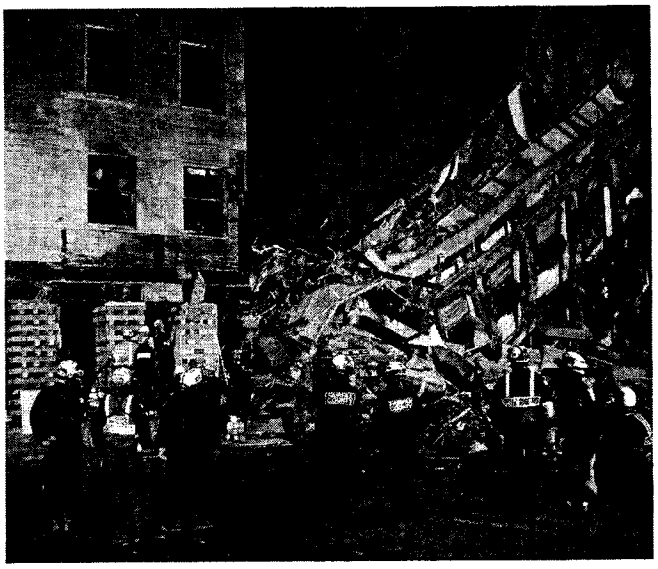
On September 11, 2001, a Boeing 757 airplane struck the Pentagon's Wedge 1 on an angle and penetrated into an interior office ring in Wedge 2. Wedge 1 was just five days from completion, but the plane impacted areas that were only partially occupied.

during the renovation of Wedge 1 to reinforce the inner and outer walls served to dramatically slow the plane as it entered the building, reduce the extent to which it penetrated the rings, and prevent the immediate collapse of the structure directly above the area of impact.

1. Blast-resistant windows were installed along the E-ring and were composed of solid steel frames and extra thick and specially treated glass panes. Each window unit weighs approximately one ton.
2. Structural steel beams strengthened the walls both vertically and horizontally through all five floors. The steel beams were bolted through the floors and ceilings to form a web-like configuration.
3. The interior of the outer walls were lined with a geotechnical material that was stretched between the steel beams to prevent bricks and mortar from becoming shrapnel in the event of an external explosion.

Despite the tremendous impact of the plane and the fire that was fed by the plane's fuel, the "web" created by the blast-resistant windows, steel columns, and geo-technical mesh, held the building together for 35 minutes, giving many Pentagon employees, some located directly above the area of impact, time to escape. The Pentagon Renovation Program received numerous accounts from personnel located in renovated areas directly above or adjacent to the area of penetration. Many of these personnel were standing directly in front of or close to the new blast-resistant windows. Most of the new units remained intact and prevented severe injuries and possible loss of life. However, old window units in Wedge 2, up to 200 feet away, blew out during the initial impact and explosion of jet fuel.

Damage assessments: The fire that burned for nearly three days after the impact left extensive damage on the Wedge 2 side of the building. However, new sprinklers in Wedge 1 extinguished the fire quickly where it was not directly fed by jet fuel and minimized the spread of fire throughout the wedge. In addition to fire and smoke damage, water damage and mold caused by the thousands of gallons of water that flooded the building have caused health concerns. Air monitoring results have been analyzed on a daily basis for mold, asbestos, lead and silicate. Once the site was turned over from the FBI to the



On the first night following the terrorist attack on the Pentagon, fire and rescue squads from Fairfax, Arlington and Montgomery Counties observe a crew working to support portions of the building where columns were sheared away by the airplane.

Pentagon Renovation, hazardous conditions were quickly brought under control and acceptable air quality levels were achieved.

Demolition and Debris Removal: The collapsed area of the building was removed to safely continue the recovery effort. In all, approximately 10,000 tons of debris were removed from the site. As this document was prepared for printing, the extent of the known structural damage will require the full demolition of the C, D, and E-rings between Corridors 4 and 5, an area encompassing nearly 400,000 square feet. The demolition of this area began on October 18, 2001, starting with the disassembly of outer limestone cladding on the exterior of the building.

Immediate Response: Within minutes following the attack, the Pentagon Renovation Program took action to provide personnel, equipment and materials for the rescue and recovery effort. Contractors from other renovation projects around the Pentagon were mobilized within minutes of the attack. Architects, engineers and construction personnel with extensive knowledge of the Pentagon proved to be a valuable resource to the efforts of the rescue teams. According to FBI officials, the crime scene investigation of the magnitude of the attack on the Penta

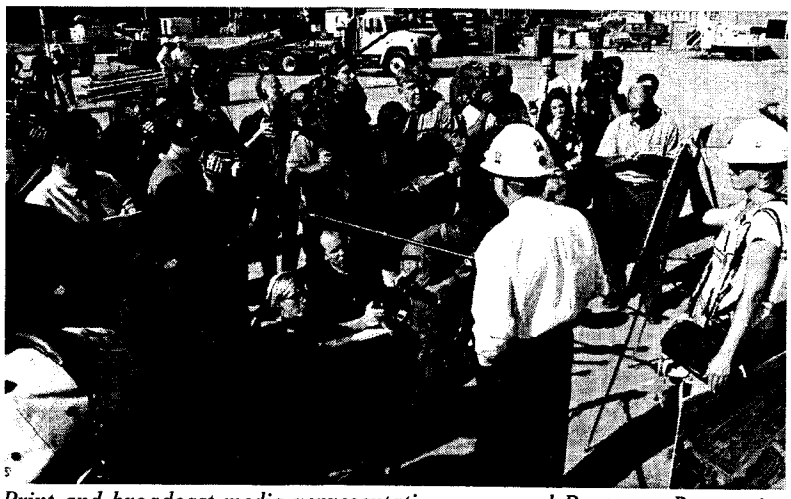
gon normally would require a minimum of six weeks to complete. However, the prompt support of the Renovation Program, the Pentagon Building Management Office and the private sector reduced the period of investigation to two weeks.

Contracting Actions: By September 15th, just three days after the attack, the Pentagon Renovation Office had awarded contracts amounting to $1.3 billion dollars to begin the reconstruction of the damaged areas and move forward with the Renovation Program. A not-to-exceed (NTE) $520-million letter contract was awarded to AMEC, the original Wedge 1 contractor, for the rebuilding and restoration efforts in Wedge 1. A base $758-million contract for the renovation of Wedges 2 through 5 was awarded to Hensel Phelps Construction, the culmination of a year-long competition. Several letter contracts were written to initiate immediate specialized recovery activities, including historic restoration of the damaged façade. In addition, the Government Services Administration and the Pentagon's Real Estate and Facilities Division worked together to lease over 800,000 square feet of nearby office space to relocate the 4,600 Pentagon tenants displaced by the attack.

Other Support: While the Pentagon Renovaton Program has received significant notoriety because of its actions during the recovery period, it should be noted that many building organizations played extremely significant roles in

Armies of workers have removed thousands of ton of debris from areas of the Pentagon damaged by smoke, fire and water.

the response and recovery efforts. Washington Headquarters Services (WHS) offices were in the forefront of these activities; specifically, the Real Estate and Facilities Office which accomplished immediate lease and move activities, the WHS Contracting Office which provided contracting support for efforts by WHS organizations, the Federal Facilities Division which provided heroic services from the newly constructed Wedge 1 Building Operations Control Center while the building was on fire. The Federal Facilities Division -subsequently assisted in numerous recovery activities and contributed directly and significantly to bringing damaged utility systems back on line. In addition, the WHS- Defense Protective Service (DPS) provided the first response to the disaster scene, taking quick action which saved lives and helped ensure that injuries were treated quickly and effectively while securing the crash site. DPS subsequently provided security services over many days under the most difficult of circumstances, which allowed recovery activities to be accomplished in an efficient and effective manner. Last but not least, the WHS General Counsel's Office provided timely and prudent advice which helped greatly in the decision making process and contributed greatly to speed with which response could be provided.



Print and broadcast media representatives surround Pentagon Renovation Program Manager Lee Evey as he describes plans to reconstruct the Pentagon.

Recovery and Re-occupancy: In areas of Wedge 1 with less extensive damage, the cleanup of water, smoke and mold progresses

rapidly. Crews have worked around the clock to replace drywall, restore electrical power and communications capabilities, install new carpeting and replace furniture. Vanguard personnel from the Office of the Secretary of Defense were relocated back into Wedge 1 on October 2, 2001, just 22 days after the attack. It is anticipated that significant amounts of recovered areas in Wedge 1 will be turned over for occupancy from November 2001 through January 1, 2002.

Schedule: In addition to the rebuilding efforts, the Renovation Program is continuing with its original scope of work. At the time of the attack, all renovation work was scheduled to be completed in December 2012. The Renovation Program intends to make up lost time and meet the original schedule. The Army Corps of Engineers expects to dedicate a memorial at the crash site on September 11, 2002, the one-year anniversary of the attack. The Pentagon Renovation Program has taken as a personal challenge to relocate personnel back into the E-ring adjacent to the crash site allowing them to watch the dedication ceremony from their offices.

New Security Initiatives: Due to the increasing threats of terrorism, the need for security improvements has become more urgent. Even preceding the events of 11 September, to meet potential threats, the Renovation Program had been tasked with projects outside of its original scope of work, such as the Remote Delivery Facility, the Metro Entrance Facility, and other security related enhancements incorporated within renovation activities. These ancillary projects are funded outside of the Renovation Program's $1.22 billion cost cap and are discussed in detail in this Report. As demonstrated on September 11, 2001, some building security enhancements paid for themselves in the blink of an eye by saving lives and preventing countless injuries. In coordination with the Defense Protective Service, the Pentagon Renovation Program is continuing to evaluate other potential security enhancements at the Pentagon.

Lessons Learned: The Renovation Program also has initiated an effort to gather information about the building's performance immediately following the attack. Personnel near the area of impact have been asked to provide their observations, especially during their attempts to evacuate areas ravaged with explosion, fire, and smoke. These and other valuable insights will be compiled and translated into a "lessons learned" document, provided to both the Wedge 1 and Wedges 2-5 contractors, and used to further improve building structures. To the greatest extent possible, these lessons learned will be incorporated into new designs to improve building operations, and in particular, fire and life safety systems.

Dressed in Tyvek suits and wearing respirators, workers remove drywall that had been damaged when millions of gallons of water, from sprinkler heads and fire hoses, pooled in offices and corridors throughout Wedge 1 prompting the widespread growth of mold on walls and carpeting.

In summary, the Pentagon Renovation Program initiated immediate actions to support the rescue and recovery efforts following the attack. In addition, the Program promptly awarded several contracts to begin the immediate reconstruction, recovery and re-occupancy of damaged areas, and to move ahead with renovation activities. These activities, along with the myriad projects discussed in this Report, both completed and ongoing, demonstrate the Pentagon Renovation Program's dedication to renovating the Pentagon *"On Cost, On Schedule, and Built for the Next 50 Years."*

MESSAGE FROM THE PROGRAM MANAGER

The past year has been one of great change for the Pentagon Renovation Program; it has been marked by a transition away from traditional construction practices moving toward new and improved methods of construction acquisition. The year has also seen transition to modified program goals, crafted in accordance with our "Back to Basics" approach, in order to ensure that we are planning, designing, and building a renovated Pentagon fully responsive to our customer's mission requirements at modest cost.

Over the past year, the Pentagon Renovation Program has continued to add to its accomplishments at an ever-accelerating rate. We have completed much of Wedge 1 and have begun moving tenants into newly renovated space. Thus, before the end of this year we will have delivered over 1.5 million square feet of renovated space and fully reoccupied the first of the five wedges of the Renovated Pentagon! We have completed the Remote Delivery Facility to the point of full operation, although final landscaping and some other close-out activities remain underway. In less than 18 months, this security facility adjoining the Pentagon was designed, constructed and delivered in record fashion, on time and significantly within budgetary estimates. The size and complexity of these accomplishments can only truly be appreciated by seeing them first hand! I heartily welcome congressional visitation and tours of the renovated Wedge 1 and the new Remote Delivery Facility.

In addition this year, we have largely completed the demolition and remediation of Basement Segments 2 and 3 which provide additional options for within-the-building swing space to support renovation activities. We have also completed construction of the South Terrace Pedestrian Bridges. We have completed all exterior Information Management and Telecommunications work, which for the first time will provide for redundant telecommunications capabilities and enable access to commercial communications lines and allow for future competitive acquisition of communication access services. We completed the construction of the new Heliport Control Tower and Fire Station. We accomplished many external utilities projects of various types. These accomplishments have resulted in our program receiving favorable notice and awards from the construction industry.

Our most significant undertaking, from the perspective of the future of the program, has been the release of the solicitation for construction of Wedges 2 through 5. This marks the conclusion of two years of preparatory effort to first identify new and improved ways of doing business and to then devise ways to achieve those goals. For example, we identified the use of performance specifications as a means of improving even further the gains we had achieved through the use of such procedures as design-build construction. Unfortunately, our efforts to identify experts in the use of performance specifications in construction met with limited success. We discovered that to move to the use of a pure performance specification would take us much farther than is the norm in the construction industry and that we would have to make that journey pretty much on our own; we would have to devise the solutions ourselves. We accepted the challenge and endeavored to develop new ways of capturing our requirements and expressing them in pure performance terms. The result is a solicitation, which we believe, breaks new ground for the acquisition of construction and establishes us as a construction industry leader. In fact, the tremendous competition between three highly qualified, design and construction contractor teams for the Wedges 2 through 5 renovation contract and the selection of the most highly qualified offeror gives us enormous confidence and pride that the Pentagon Renovation program is becoming an international model of best practices for cost effective renovation and construction work.

Message from the Program Manager

As I indicated in my annual message last year, the primary risk now facing successful completion of the renovation is completing the austere program for Wedges 2 through 5 over the next 12-14 years without adjustments for normal inflation, as mandated in the Congressional Cap. The current Congressional Cap, established for the design, construction, and installation of equipment for renovation of the Pentagon, is based upon an early program estimate accomplished in 1994. That estimate was subsequently reduced $100 million by Congress, in 1997, as a "management challenge." The 1994 estimate upon which the Congressional Cap was based contained no provision for inflation. That means the existing Congressional Cap will require the Program to operate across its entire 20-year life without any accommodation for inflation costs. Based on the program's successful implementation of many innovative acquisition approaches, demonstrated success of project completion on cost and on schedule and as outlined in the Department's certification letter this year, we request that the Congress act this year to remove the cap to allow the renovation program to be managed consistent with standard military construction procedures including adjustments for inflation and contingencies.

Within the Pentagon Renovation Program we have worked diligently to accomplish our program within the challenging un-inflated cap. The acquisition approaches we have undertaken have placed our program at the forefront of acquisition reform and have enabled us to reduce the size of our Government workforce while maximizing innovation by our construction contractors. We have devised every possible technique to keep costs down and at the same time accomplish needed renovation improvements. We have complied with the clear intent of Congress that our renovation be utilitarian in approach and a wise expenditure of taxpayer monies. Similarly, we have worked hard to ensure our decisions, where possible, considered life cycle costs and did not unnecessarily trade off short term economy at the cost of long term expenditure or high operating costs. The result has been program economies which we believe, absent inflation, would offer the program a reasonable chance of accomplishing its work within the Congressional Cap. However, inflation has been operating on the program since 1994 and will continue to operate until its completion. Our current estimates project that, with a modest projected rate of inflation, when added to the erosive effects of inflation already absorbed by the program, we will not be able to achieve sufficient economies to overcome the burden of inflation across the total 20-year life of the Pentagon Renovation Program.

The response of the Pentagon Renovation Program workforce to the many challenges addressed over the past year has been heartening. It has been both a privilege and an honor to be associated with such remarkable individuals and to have the opportunity to serve as their leader. I look forward to our continued association over the coming year as we award the contract for Wedges 2 through 5 and begin the renovation of Wedge 2.

Sincerely,

Walker Lee Evey

EXECUTIVE SUMMARY

As required by Section 2674 of Title 10, United States Code, the attached status report to Congress on the renovation of the Pentagon is presented annually. This is the eleventh report. This report is a synopsis of the Pentagon Renovation Program, the work that has been completed during the past fiscal year and the work that is anticipated to be completed during the next fiscal year. In addition, this report reviews the design and construction costs-to-date within the framework of the overall certified summary. The following four sections are covered in detail.

I. PROGRAM OVERVIEW

Since its completion in 1943, the Pentagon has been the headquarters for the U.S. Department of Defense (then known as the War Department), including the Army, Navy, and Air Force, all under a single roof.

Over the course of the past 58 years, with the rapid advance of technology and military science, these organizations have undergone vast changes. The Pentagon itself has not. Since 1943, the building has never undergone a major renovation and, as a result, it is unable to meet the daily demands placed on it by its current tenants. All of the Pentagon's major utility systems need to be replaced, a process which is complicated by the presence of asbestos and other hazardous materials, and the need to work around fully occupied space; 20,000 people who cannot afford interruption in their daily operations.

In addition to renovation activities, an impetus has been placed on the need for security improvements as a direct result of the ever-growing threat of terrorism. To meet this potential threat, the Renovation Program has been tasked with projects outside of its original scope of work, such as the Remote Delivery Facility, the Metro Entrance Facility, and other security related enhancements incorporated within renovation work activities.

The Program distinguishes between renovation projects that fall within the $1.222 billion budget limitation set by Congress and "non-Renovation," or ancillary, projects which fall outside the defined scope of the Congressional cost cap.

As the Renovation Program evolves, so does its schedule. Changes to the schedule are necessary as each work effort brings new challenges and the Program invents new ways to overcome them.

Recent changes to the budget and schedule have led the Program to adopt a Back-to-Basics approach that will allow us to complete renovation activities in a timely and cost-effective manner.

All of the projects undertaken by the Renovation Program follow a similar renovation sequence:

- Tenants are moved out of their offices in the Pentagon and into temporary swing space while the area they previously occupied is renovated. The reoccupation of Wedge 1 began in February 2001.
- Temporary mechanical, electrical, plumbing, and communications are installed to keep the remaining Pentagon tenants operational. Barrier walls are constructed between the building tenants and the area under construction.
- The area undergoing renovation is demolished, brought down to just the concrete slabs and columns that support the building. The area is also abated of all hazardous materials. This task is accomplished with extreme caution to keep the building tenants from being exposed to any potentially dangerous substances such as asbestos, lead, Polychlorinated Biphenyls (PCBs), or mercury.
- Construction begins with the core and shell build-out. This includes the construction of the infrastructure and common elements such as hallways and utilities.
- Construction continues with the tenant fit-out phase. This involves building the space configured to meet

the intended tenants' requirements.

- Information management and telecommunications is an extensive effort to bring the Pentagon the most dependable data technology and communications systems available.

- The installation of modern and flexible furniture, fixtures, and equipment will make the Pentagon a more "worker friendly" environment and allow for increased future flexibility.

- The security of the Pentagon is a top priority of the Renovation Program. Security checks and upgrades are implemented throughout construction and security accreditation is essential to the acceptance of the completed space.

- The commissioning process helps to define tenant requirements and ensure that the renovated space can be operated and maintained efficiently after turnover.

- The culmination of every renovation effort is the move-in of tenants to the renovated space.

Beginning in FY 2000, commissioning and acquisition and installation of post renovation furniture was programmed and budgeted as a non-renovation expense, within the Facilities Operations Program as reflected in the Congressional Budget Justification package.

Excavation near Wedge 1 clears a trench for new telecommunication conduits.

II. WORK IN PROGRESS

All of the work accomplished in 2000 is broken down into the renovation sequence described in the Program Overview section. Significant progress has been made in Phases 2 and 3, the basement, and Wedge 1, of the Renovation Program's 7-phase plan. The Basement Segment 1 areas, including the DiLorenzo TRICARE Clinic were completed in 2000. Segments 2 and 3 of the basement and mezzanine areas will not be renovated past demolition and abatement under the Back-to-Basics approach. Wedge 1 is nearing completion. A phased re-occupation of the wedge is currently underway. Both South Terrace bridges and the South Terrace loading dock are now complete. Wedges 2 through 5 are in the source selection phase. The Remote Delivery Facility and the Metro Entrance Facility are projects implemented to increase security. The Remote Delivery Facility Phase 1 is now operational with construction expected to reach completion (Phase 2) in Summer 2001. The contract for the Metro Entrance Facility was awarded in September 2000. A phased construction plan is currently being implemented to minimize disruption to transit users. Other ancillary projects to the Renovation Program are the Heliport Fire Station and Control Tower, the Physical Fitness and Readiness Facility, Chilled Water Line Feeders and the Condenser Intake Outfall Line for the Heating and Refrigeration Plant. The Heliport Fire Station and Control Tower is now complete and fully operational while the Physical Fitness and Readiness Facility is in the early stages of planning. The Chilled Water Line Feeders and Condenser Intake Outfall Line are ancillary to the Renovation Program but tie into the operation of the Heating and Refrigeration Plant. These are classified as Power/Site projects and are managed by the Power/Site Integrated Product Team.

On August 31, 2000, Lee Evey, Pentagon Renovation Program Manager (right) and David "Doc" Cooke, Pentagon Director, Administration and Management, cut the ribbon to mark the Phase 1 completion of the Pentagon's Remote Delivery Facility.

III. PROCESS IMPROVEMENTS

The Renovation Program is constantly evolving, developing new and better ways of doing business. This section highlights the Program's efforts in the areas of security, acquisition, commissioning, the tenant move process and the implementation of flexible systems furniture, and program management. Security improvements include the installation of blast-resistant windows in Wedge 1 and the construction of the Remote Delivery Facility and the Metro Entrance Facility. The Renovation Program's acquisition process continues to be at the forefront of acquisition reform and is improving the reputation of government contracting practices. This is complemented by the structure of Integrated Product Teams, which reach across every aspect of the renovation.

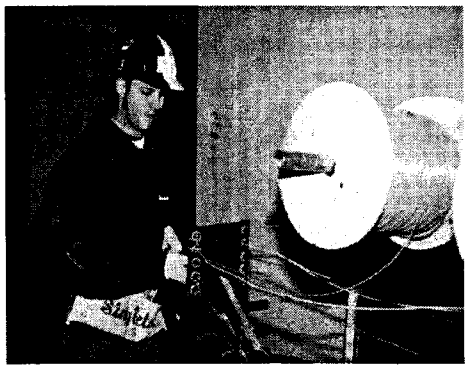
IV. APPENDICES

The appendices include a glossary of terms used throughout this report for easy reference and additional background information about the history of the Pentagon Renovation Program and the need for renovation. A timeline of projects completed prior to the scope of this report is also included. As required by the Fiscal Year 2000 Authorization Bill, Section 2881, a description of the use of the Navy

Annex property is included as well.

The Renovation Program has been repeatedly recognized in the past year for the importance of its work and innovative practices. The appendices include a sample of the media recognition the program has received, including articles in *USA Today* and *Engineering News Record*. Finally, important contact information is provided for those interested in learning more about the Pentagon Renovation Program and information on how to obtain a tour of renovation activities.

During construction, Wedge 1 is populated by a daily average of 450 workers.



PENTAGON
RENOVATION
PROGRAM

ON COST, ON SCHEDULE, BUILT FOR THE NEXT 50 YEARS

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I. Program Overview

An aerial view of the Pentagon, March, 2000.

I. PROGRAM OVERVIEW

Program Background

Program Challenges

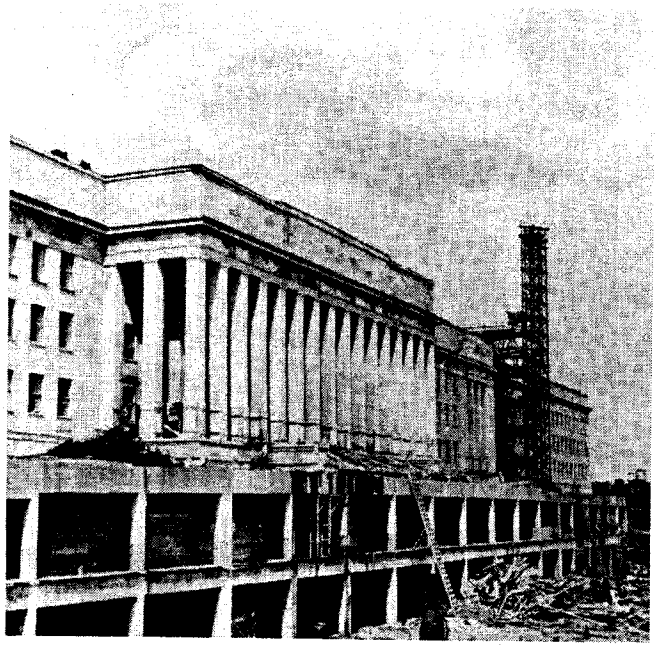
Program Schedule

Program Budget

Renovation Sequence

The Pentagon Heliport (left), Wedge 1 (center), and the South Terrace bridges (right) are in view in this aerial photo taken in January, 2001.

PROGRAM BACKGROUND



The original construction of the Pentagon took only 16 months to complete. The 29-acre structure is supported by 41,492 concrete columns.

THE NEED

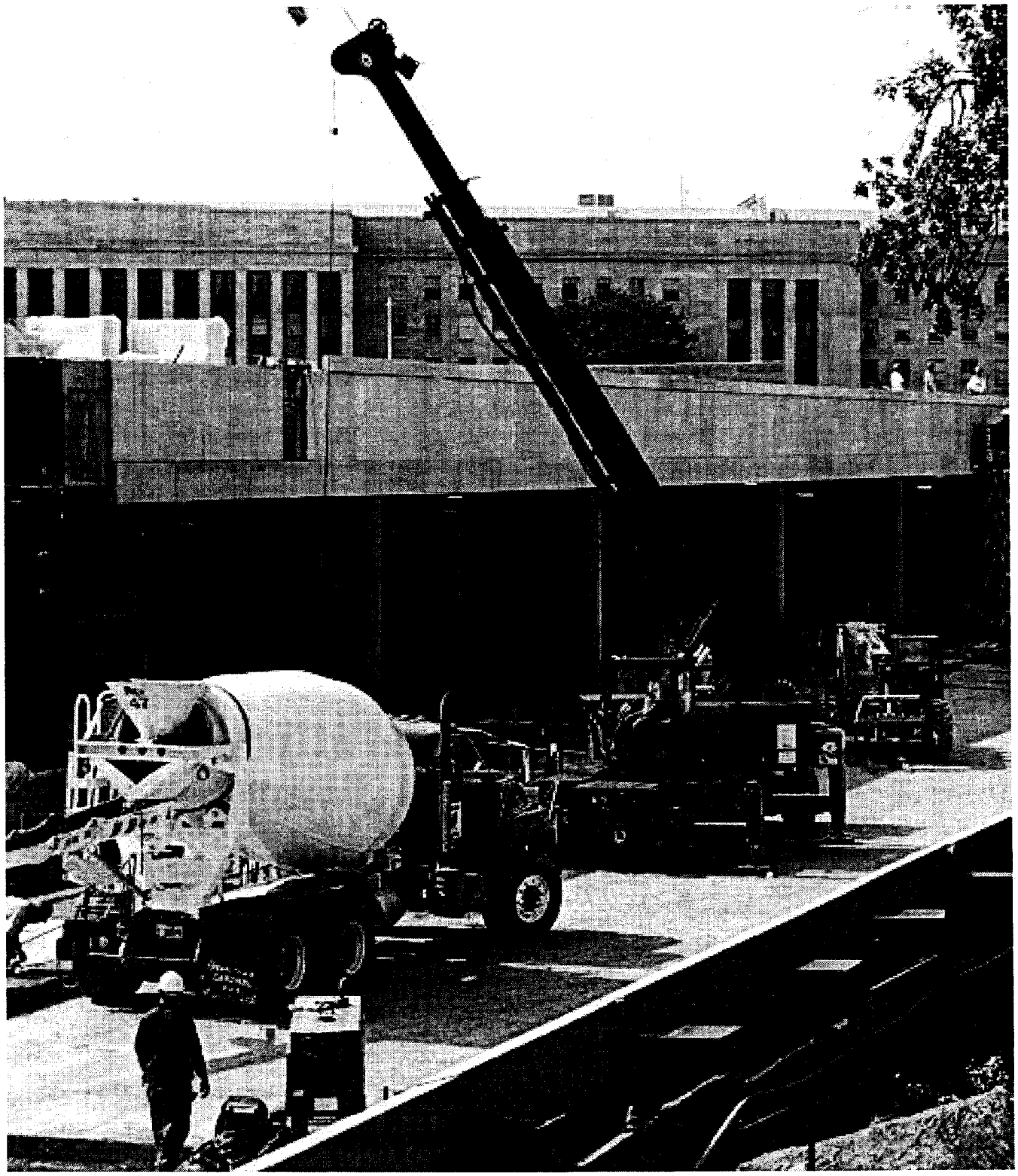
The Pentagon, designated a National Historic Landmark in 1992, has never undergone a major renovation, and after more than 58 years, renovation is essential in order to meet current health, fire and life safety codes, and provide reliable electrical, air conditioning and ventilating services. Absent a major renovation, the building infrastructure has become increasingly unreliable and unable to fully support the headquarters and nerve center of the national military establishment. Major building engineering 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, heating and 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 ownership of the building to the Department of Defense in order to proceed with the much needed renovation.

THE TRANSFER

Based on consultation within the Administration and with Congressional committees, legislation was prepared to transfer ownership of 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 which support the renovation.



Construction vehicles line the west side of the Pentagon's new Remote Delivery Facility in June 2000. On August 31, 2000, just two months later, the first delivery vehicles entered the facility.

I. Program Overview

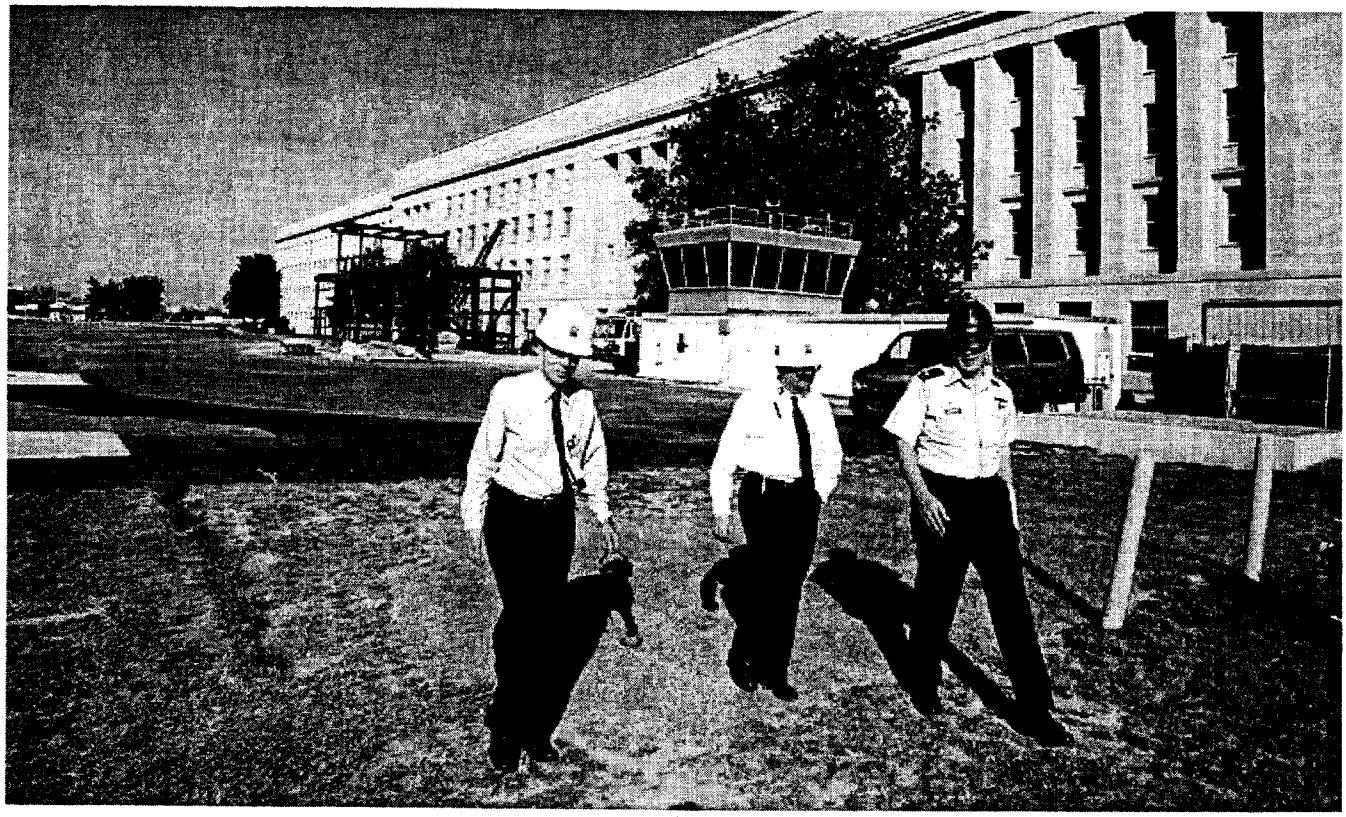
THE PROGRAM

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 engineering systems (mechanical, electrical, plumbing) down to the base structure and construction of all new systems. This full-scale removal is dictated by the widespread presence of asbestos throughout the building. Replacement of the electrical, mechanical, and plumbing systems is based on the high probability of catastrophic failure.

The Renovation Program is providing all new engineering systems, sprinkler systems, vertical transportation, cable management systems, lighting, and improvements in fire and life safety systems.

The Renovation will also provide accessibility for persons with disabilities. It will preserve historic elements, upgrade food service facilities, construct strategically located operation centers, install modern telecommunications support features, comply with energy conservation and environmental requirements, reorganize materials handling, and provide safety improvements in vehicular and pedestrian traffic.

The renovation concept for the Pentagon included, as a first phase, a new Heating and Refrigeration Plant, which has been completed and is operational. In conjunction with the construction of the Heating and Refrigeration Plant, a Center Courtyard Utilities Tunnel was constructed. The tunnel houses various utility lines which will distribute building utilities provided by the new plant.



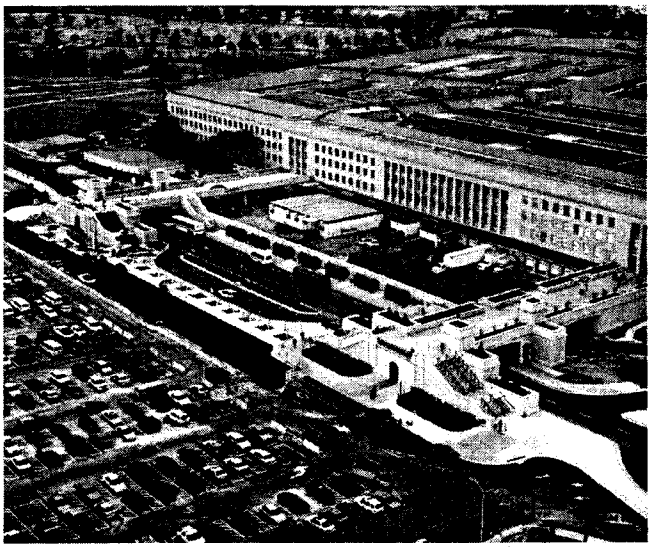
The Pentagon Renovation Program Manager (center), the Deputy Program Manager (left), and the Program Manager for telecommunications (right) leave the site of the Pentagon's Heliport Fire Station and Control Tower after a progress inspection..

The second phase of the Program is the renovation of Segment 1 of the Basement and Mezzanine, which started in September 1994. 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 for renovation while continuing the operation of major utility systems. In order to vacate Wedge 1 prior to renovation, tenants were moved either to nearby leased office space, to swing space identified within the Pentagon, or into a previously renovated building area. In most cases, tenants in Wedges 2-5 will be moved into the newly renovated areas of the Pentagon while tenants in swing space remain in their current location for the duration of renovation activities.

In addition to the seven project phases, the Program is working on several ancillary projects, such as the Remote Delivery Facility, the Metro Entrance Facility, the Heliport Fire Station and Control Tower, and the Physical Fitness and Readiness Center. The Renovation Program's organizational team structure, its in-house expertise and its ability to employ innovative procurement practices, allow it to take on related projects on the Reservation when appropriate. In many instances, accomplishing ancillary projects in coordination with renovation activities reduces overall costs by coordinating work efforts.

STATUS

This past reporting year was exciting for the Pentagon Renovation Program. The Pentagon tenants are experiencing the results of the Renovation effort and are pleased with the improvements to the quality of working conditions in the building. A major milestone for the Renovation Program was the reoccupation of Wedge 1, which began in early 2001 with the majority of the tenants moving from Wedge 2. The Remote Delivery Facility opened in August 2000 and is operational, receiving and screening over 230 trucks and other delivery vehicles per day. A design-build construction contract for the Metro Entrance Facility was awarded in September 2000 and a phased construction plan is now being implemented to minimize disruption to 17,000 mass transit riders who use this facility every day. The construction of the Heliport Fire Station and Control Tower is complete, combining the two outdated and inadequate buildings into a single, modern structure.



View of the Pentagon's new South Terrace Pedestrian Bridges.

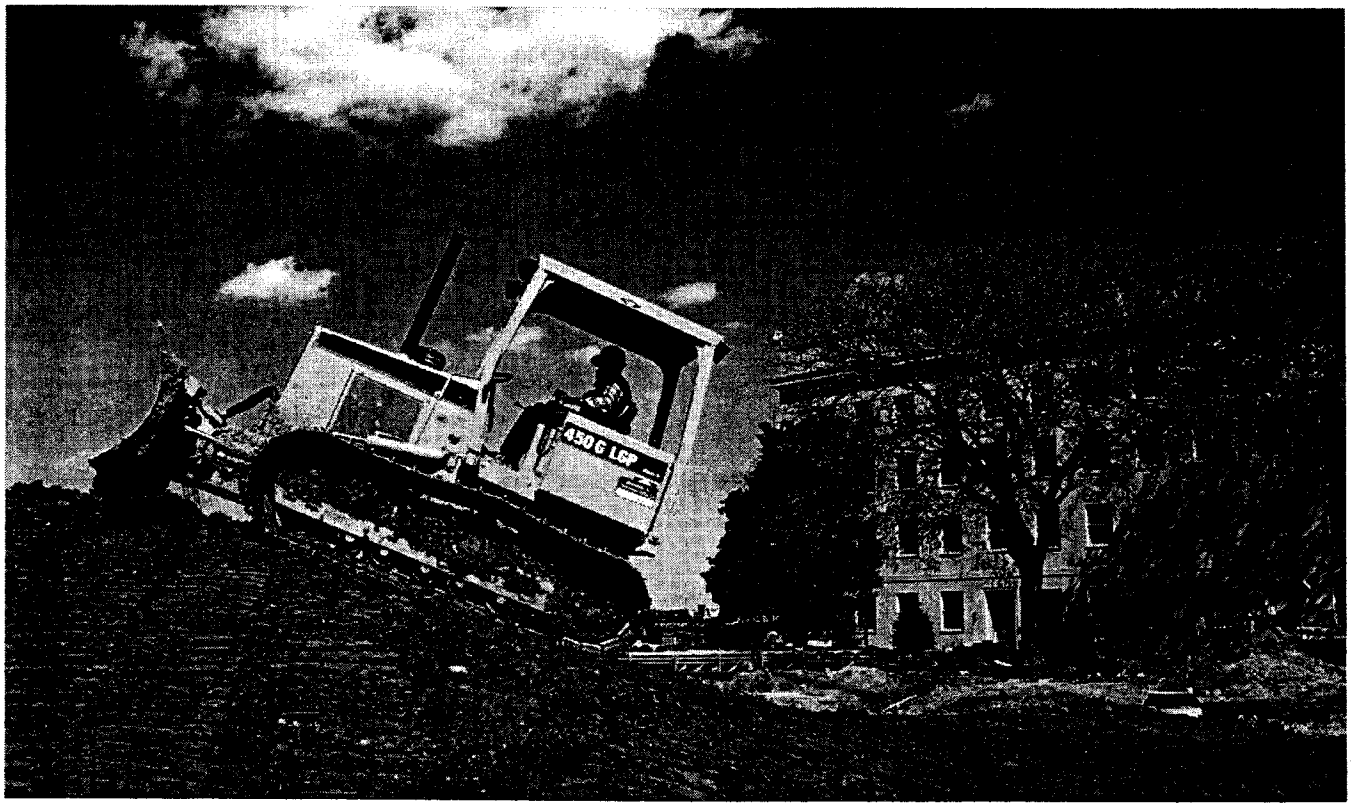
PROGRAM CHALLENGES

A complete renovation of the Pentagon is necessary to provide a modern, flexible, and efficient work environment that will endure well into the 21st century. Without a major renovation, the building will continue to deteriorate, ultimately rendering it unable to serve its mission.

A brief summary of some of the specific challenges facing the renovation team is presented below.

To better understand the challenges the renovation team faces, it is important to understand the unique features of the Pentagon itself. Unlike most large office buildings, the Pentagon is the command and control center for our nation's military establishment and headquarters to the senior leadership, including the Secretary of Defense, the Chairman of the Joint Chiefs of Staff and the heads of each of the armed services. It is from within the Pentagon walls that the Department of Defense monitors and deploys forces around the world. Yet, it is within these same walls that renovation activities, often involving heavy construction, must take place.

In terms of size, the Pentagon looks and operates much like a small city: it has its own heating and refrigeration plant, water and sewage facilities, police force, fire station, heliport, child care center, cafeterias, mini-mall, Metro station, and medical clinic. The building itself covers 34 acres and, overall, the Pentagon Reservation includes parking for 10,000 vehicles. In terms of population, the Pentagon's 25,000 employees make it larger than nine out of ten towns in the U.S. The large number of Pentagon personnel, the complexity and the critical nature of their missions, and the sheer magnitude of the building combine to create challenges that can be found in no other renovation project in the world.



Excavation along the Pentagon's Heliport side clears the way for new chilled water lines.

CHALLENGE: RELOCATE 25,000 PEOPLE DURING THE COURSE OF RENOVATION

It was determined early in the planning process that the most efficient way to renovate the Pentagon was to vacate one fifth of the building (one wedge) at a time and then move ahead with demolition, abatement, core and shell construction, and tenant fit-out. Pentagon personnel would then be moved from the adjacent wedge into the renovated wedge, clearing the way for the renovation of the next wedge.

Relocating 5,000 employees from Wedge 1 posed significant challenges to the renovation team. To accomplish the task, three office buildings were leased within a three-mile radius of the Pentagon. Over a three-year period, 45 floors of leased building space totalling 910,000 square feet were renovated to accommodate the mission-specific needs and security requirements of Pentagon personnel. In addition, new telecommunication capabilities were established to ensure employees in swing space maintain full and secured connectivity with the Pentagon.

Where possible, additional swing space was created in and around the Pentagon to minimize costs associated with leasing external office space. In all, swing space encompasses nearly one million square feet, the equivalent of the space in Wedge 1.

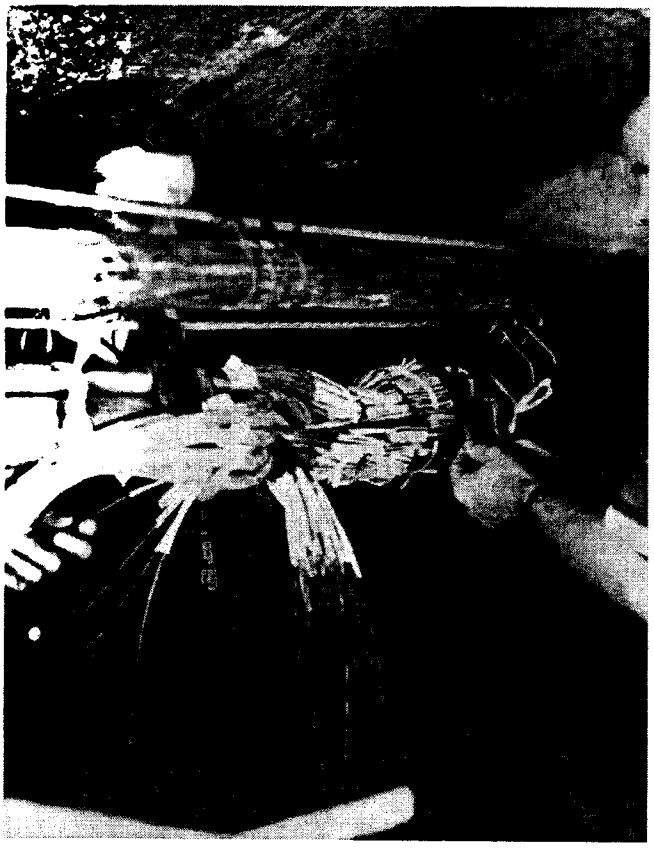
During the course of renovation, all 25,000 employees in the Pentagon, including the Secretary of Defense, will be relocated into new office space in the building.

25,000 military and civilian employees and close to 5,000 visitors enter the Pentagon's doors each day. All personnel will be relocated to renovated space at some time during the renovation program.

CHALLENGE: KEEP THE PENTAGON OPERATIONAL AT ALL TIMES

By far, the most difficult challenge for the renovation team is to work around the nearly 20,000 Pentagon employees remaining in the building who must continue to execute critical Department of Defense missions uninterrupted.

However, the existing building utility systems are already unreliable. Before the renovation program began, none of the original major building systems had ever been replaced, nor have any been significantly upgraded. Records and documentation are incomplete at best, and changes made during the last 58 years are seldom reflected on current building plans. Further, with the advent of computers and modern technology, the changing office environment has outstripped the capacity of deteriorated building systems. Electrical, plumbing, and heating, ventilation, and air conditioning systems need to be replaced and modernized to accommodate added loads to be more efficient and flexible. The information systems that were installed in the Pentagon are plagued with abandoned cabling and an unverifiable communications backbone for the building.



Technicians install original telephone wiring in the Pentagon. Much of it still exists as new systems were laid on top of old. During the Pentagon's 58-year history, building drawings were seldom updated when new communication systems were installed.

To meet the challenge of maintaining operations during the wedge-by-wedge renovation process, the renovation team first identifies every utility and communication line that needs to be rerouted around the wedge being renovated. This painstaking process is critical to ensure that no utility pathway or communication line is severed while it is still active. Over 16,000 miles of old telecommunications wiring currently exists within the Pentagon, so the process is a severe challenge. Without exception, new temporary or permanent utility and information systems are installed before old systems are removed. This requires that new pathways be established, which, in turn, requires the abatement of asbestos and other hazardous materials along the new pathways.

Keeping the Pentagon operational at all times also means minimizing disruption to personnel. This is particularly challenging because much of the renovation requires demolition and heavy construction activities that generate a significant amount of noise. Whenever and wherever possible, the renovation team works with senior officials and the tenants adjacent to construction activities to determine the most appropriate schedule for noise-generating activities. Notices are disseminated to provide tenants the schedule of upcoming activities and, in many cases, work is scheduled at night or on weekends when fewer personnel are in the Pentagon.

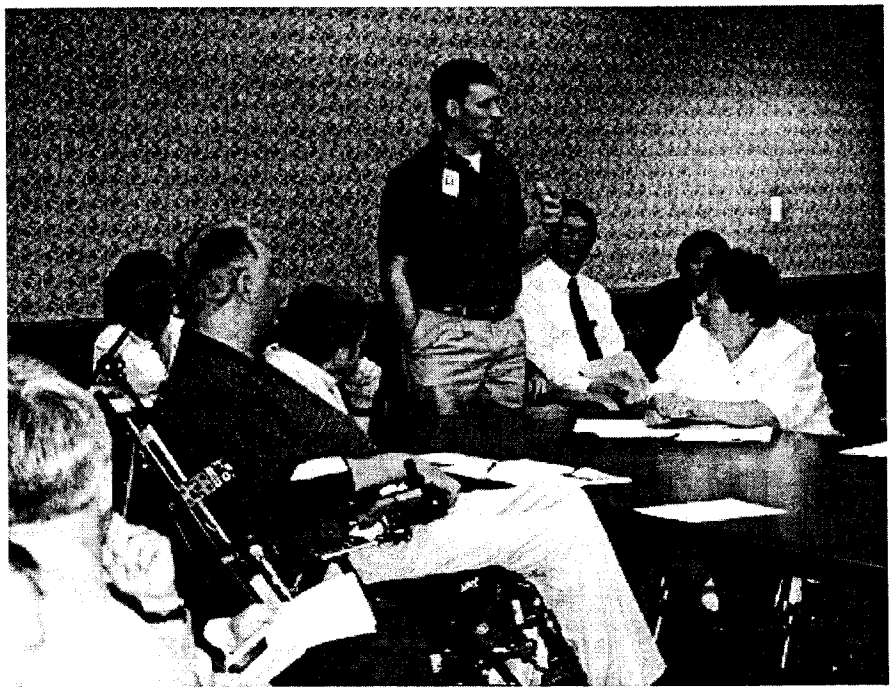
CHALLENGE: COORDINATE WITH ALL STAKEHOLDERS

Renovation activities impact a variety of offices and agencies, both inside and outside the Pentagon. Partnering with all the stakeholders is critical to the success of the program in terms of meeting budget and schedule requirements and, most importantly, the needs of the Pentagon tenants. To ensure that all key parties are involved in the renovation process, from early planning through construction, an Integrated Product Team (IPT) structure has been established.

The goal of an Integrated Product Team is to bring together, at the earliest stage of the renovation process, representatives from all the offices or agencies that will be involved in a specific project. In addition to employees from the Renovation Program and contractors, an Integrated Product Team includes representatives from the Pentagon Building Management Office (responsible for operation and maintenance), the Defense Protective Service (responsible for physical security), and the tenant groups impacted by the specific renovation activity. Depending on the project, a team may also include members of local, state and county governments, area historical planning boards and commissions, and departments of public works and transportation.

Obtaining input from all stakeholders ensures that requirements and issues of concern are addressed early in the planning and design phases, where changes cost far less than during construction. Minimizing changes during construction is critical to keeping a project on budget and on schedule.

Through regularly scheduled Integrated Product Team meetings, all parties are kept informed of project progress, potential risks, and issues and changes, which effectively ensures customer satisfaction when a facility is turned over to the tenant.



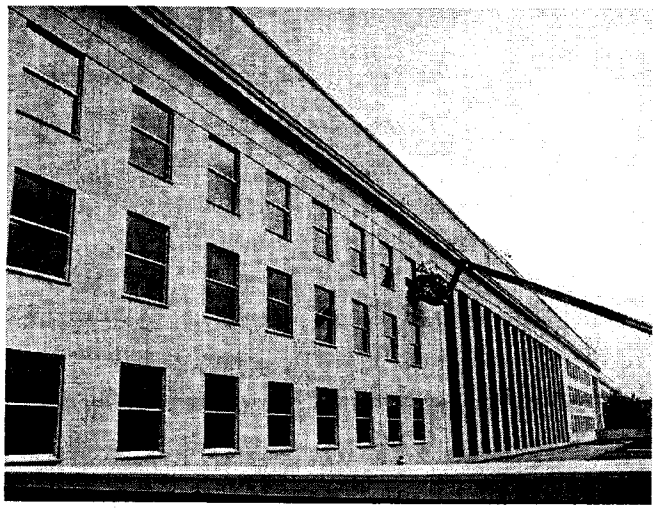
Coordination meetings with all the stakeholders are critical to ensuring satisfied customers when a project is complete.

CHALLENGE: IMPROVE THE ENERGY EFFICIENCY OF THE BUILDING

The Pentagon was the first of 500,000 Department of Defense facilities to be designated as an "Energy-Efficient/Environmentally Sensitive Department of Defense Showcase Facility" - an initiative to improve both the energy efficiency and environmental performance of the Pentagon Reservation.

This initiative is particularly challenging in light of the Pentagon's National Historic Landmark status, which places certain restrictions on the extent of modifications that can be made to the building. Despite this, the Pentagon Renovation team has identified opportunities to increase energy efficiency and reduce waste during the renovation. Selected recommendations made during the Energy Efficient, Environmentally Sensitive Department of Defense Showcase Facility Session held in the first quarter of FY 1995 are being implemented. The renovation of the Pentagon includes improving energy efficiency through:

- Double-pane windows
- Economizer cycles for heating, ventilating and air conditioning equipment
- Energy efficient mechanical and electrical equipment
- Reduced overall lighting load and increased use of task lighting
- Automated energy management system
- Increased use of thermal insulation
- More efficient Heating & Refrigeration Plant



All of the Pentagon's 7,748 windows will be replaced with new energy efficient units.

In addition, the Pentagon Reservation will continue to comply with environmental regulations by testing soils and ground water for contamination, and by using appropriate soil erosion and sediment control. The Pentagon is now in compliance with the Clean Air Act after reducing emissions from the Heating and Refrigeration Plant and the Classified Waste Incinerator Plant. Both projects were completed during earlier phases of the renovation.

Significant improvements to the working environment include replacement and upgrade of mechanical, electrical, plumbing, and all building support systems to modern standards. Interior spaces are being reconfigured to include vertical transportation systems. New space will be added, both through the conversion of ramp and corridor space to office and support space, and through the expansion of the Mezzanine areas.

In summary, the renovated Pentagon will benefit from improved indoor air quality, the new, highly efficient Heating and Refrigeration Plant, automated energy systems management, energy-efficient lighting, and an improved thermal building envelope. The renovation also will facilitate the reconfiguration of space to provide modern and flexible office space, readily adaptable to accommodate future organizational changes as well as technological advances in office equipment and work-space environments.

CHALLENGE: MAINTAIN AND IMPROVE ACCESSIBILITY FOR PEDESTRIANS AND PERSONS WITH DISABILITIES

Presently, the Pentagon fails to meet codes established by the Americans with Disabilities Act. Several initiatives within the renovation program will greatly improve accessibility and vertical mobility in and around the Pentagon for all personnel.

Along the South Terrace, pedestrians and persons with disabilities no longer need to cross three lanes of traffic to enter the Pentagon from South Parking. Two bridges divert pedestrians over traffic, thereby improving safety and decreasing traffic congestion during the morning and evening rush hours. Two elevators in each bridge provide access for persons with disabilities. The bridges are now complete. The first bridge provides access to the Corridor 2 lobby and the second bridge will provide access to the Corridor 3 lobby upon completion of Wedge 1.

At the River Terrace, ramps were added providing wheelchair access to the River Terrace Parade Field from the upper River Terrace parking area. The new ramps marked the first time in 55 years that limestone was added to the Pentagon. To accommodate access to the River Terrace Entrance, a fully concealed handicap access lift was installed, which, at the turn of a key, raises a wheelchair-bound person to the entrance level from the lower parking level. Historical interest groups maintained that a ramp alongside the River Terrace façade would have altered the historical features of the façade. All improvements were made in accordance with historical review agencies and were met with approval by the Pentagon's disability management office.

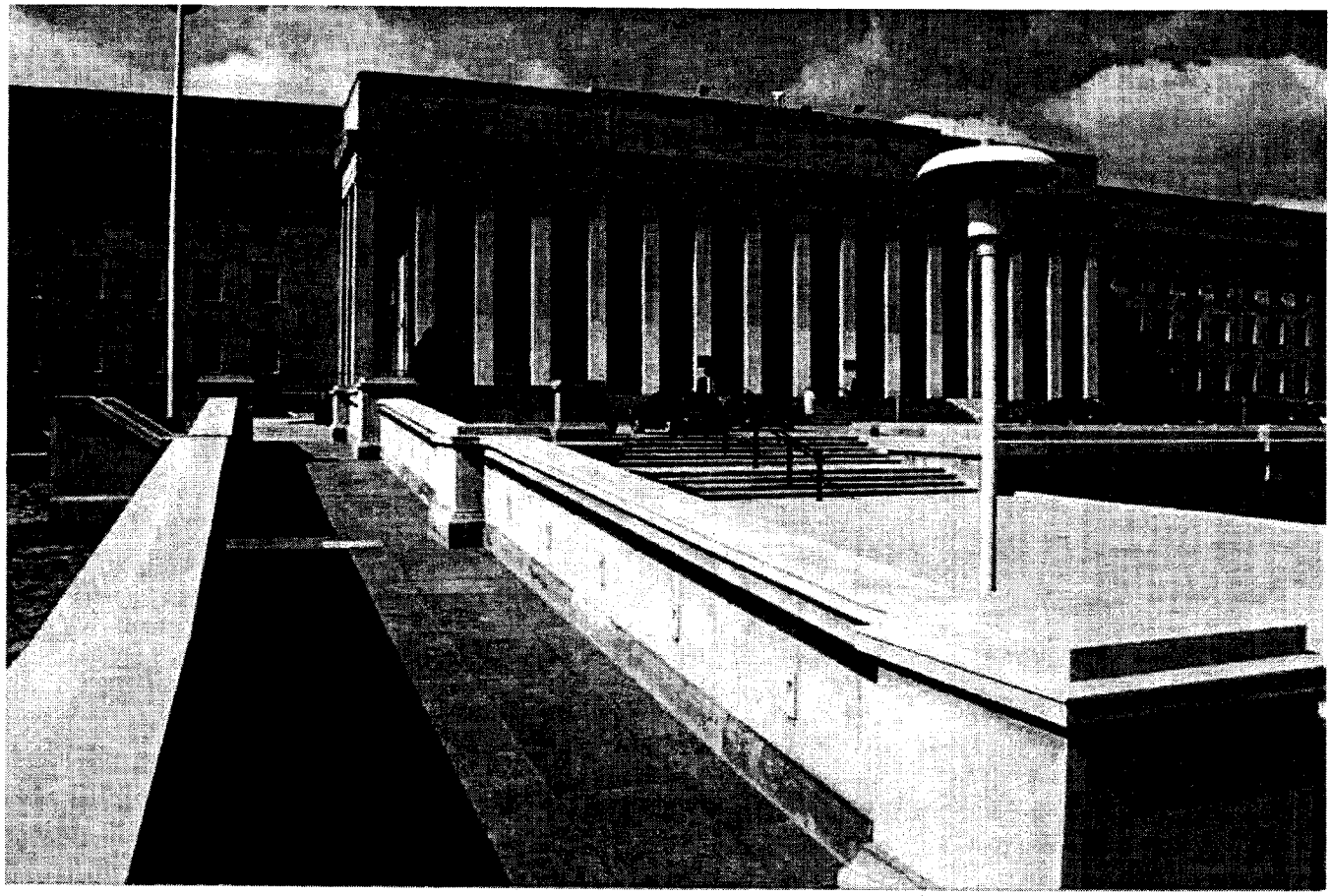
Internal circulation will be enhanced by the installation of escalators and 40 personnel elevators. Today, persons with disabilities must use the 12 original freight elevators, whose doors close vertically from the floor and ceiling. More than 40 head injuries have been reported during the last three years by building occcupants attempting to use the elevators. Because they must use freight elevators, persons with disabilities often ride alongside garbage dumpsters and electric freight vehicles, resulting in collisions with motorized carts. New freight-only elevators will minimize vehicle/pedestrian conflicts.

As each wedge is renovated, new restrooms will meet current requirements to comply with the Americans with Disabilities Act, eliminating the need for persons with disabilities to travel long distances to access an accessible restroom. Internal work-space areas will also be more accessible as space is converted to an "open bay" environment with fewer ceiling to floor partitions and improved access to individual office stations.

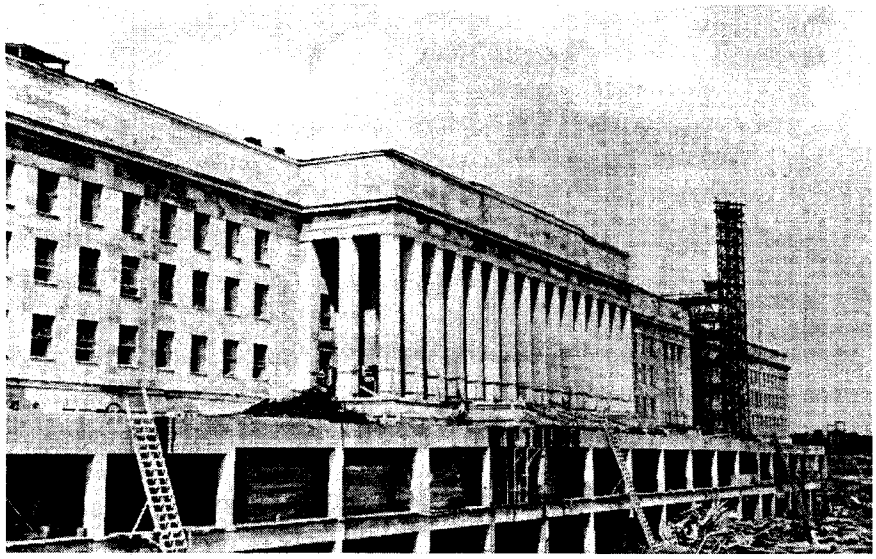
Engineers and designers from the Pentagon Renovation Program tour renovation sites with Pentagon disability representatives to ensure accessibility codes are met.

CHALLENGE: PRESERVE HISTORICAL FEATURES

The Pentagon was declared a National Historic Landmark in 1992. This status places significant restrictions on external renovation activities and presents several challenges to the renovation team. The renovation team regularly coordinates and obtains approval from a variety of planning and historical review agencies, including the National Capital Planning Commission, the Fine Arts Commission, the Virginia Department of Historic Resources and the Advisory Council on Historic Preservation.



A new wheelchair ramp for persons with disabilities marked the first time in 55 years that limestone had been added to the Pentagon. The new stone was obtained from the Indiana quarry where the original limestone was cut for the Pentagon to match the color and texture of the River Terrace facade. Another ramp lies on the opposite side of the parade field.



Pentagon construction in 1942. As evidenced by the photo on the opposite page, the outer facades have changed little since the structure was completed in 1943. The Pentagon was declared a National Historic Landmark in 1992.

There are five historic elements of the Pentagon that are cited for special attention:

1. The five outer facades of the Pentagon.
2. The Center Courtyard and surrounding facades.
3. The terrace fronting the Mall Entrance.
4. The terrace fronting the River Entrance.
5. The Pentagon's distinctive five-sided shape.

Within budget constraints, renovations to or along the outer facades of the Pentagon must replicate existing conditions. Where allowances are made for changes, such as the two wheelchair access ramps on the River Terrace or pedestrian access bridges along the South Terrace, project teams paid special attention to architectural details so that all new additions match the style, color and ornamentation of existing Pentagon features. For example, to ensure a close color match with new limestone used on both the access ramps and new bridges, the renovation team purchased the needed limestone from the Indiana quarry where the original limestone was obtained for the Pentagon in 1942.

In Wedge 1, every window along the inner façade (A Ring) and outer façade (E Ring) will be replaced with new blast-resistant units, which match the historical details of the existing windows, including the location of the handles, even though the new units will be secured in a closed position to optimize the new heating, ventilation, and air conditioning system and to aid the improved safety system.

Throughout the program, the renovation team will continue to preserve and maintain the historical integrity of the original Pentagon design while ensuring that the "new" Pentagon will endure well into the 21st century.

PROGRAM SCHEDULE

Since last year's report, the completion date of the Pentagon Renovation Program has been moved to FY 2014, reflecting a time growth of about three years. This expected time increase is based on the experience with the Wedge 1 analyses of the most cost-effective rate for renovation activities and estimates of similar impacts on the remaining wedges. However the Renovation Program has developed plans and processes that will mitigate some of the time growth experienced in Wedge 1 with the renovation of Wedges 2 through 5.

The five major contributors to the time growth in the completion of Wedge 1 were:

- The actual time required to relocate tenants and remove the surplus materials prior to the start of demolition and abatement work.
- The difficulties in removing the massive amounts of asbestos and construction debris from the wedge.
- The amount of time required to install temporary utilities, necessary to keep the rest of the building operational, and the two barrier walls that protect the remaining building tenants from construction activities.
- The exposure of hidden conditions behind walls and above ceilings.

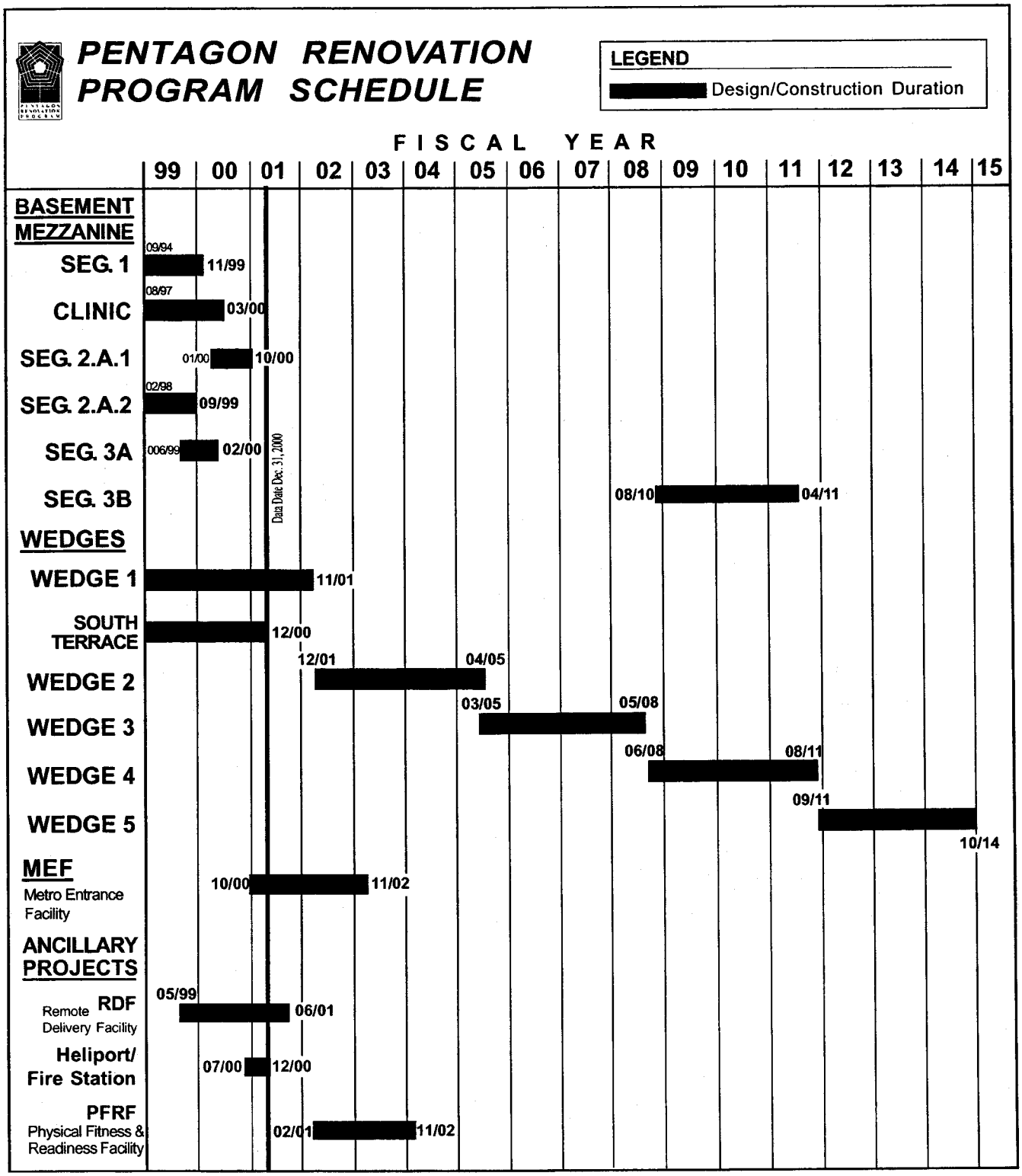
We plan to mitigate these factors by moving the tenants in a more contiguous manner, providing the construction contractor with an entire wedge at one time for demolition and abatement, eliminating the installation of more temporary utilities and communications systems than necessary. Since the barrier wall between Wedge 1 and Wedge 2 already exists, it will only be necessary to construct one additional barrier wall per wedge. The Renovation Program has learned that unforseen sight conditions and undocumented building features are a matter of fact. This has been taken into consideration when planning for construction in future wedges. Process changes in furniture and telecommunications work will be incorporated into future efforts.

More than 100 million pounds of debris have already been removed from the Pentagon during renovation of the basement and Wedge 1. Close to 70 percent of all debris is recycled.

Other factors implemented to mitigate the impact on the Program schedule include the extensive use of award fees to motivate contractor partnering, the use of incentive fees to improve schedule and cost, the evaluation of contractor proposed master schedules as a selection factor, and the nearly exclusive use of design-build contracts. The use of performance specifications in the design-build contracts will allow the contractor to maximize innovations to reduce the schedule and budget.

The estimated completion date of FY 2014 includes the full scope of renovation activities including tenant move-out, demolition and abatement, core and shell construction, tenant fit-out construction, telecommunications backbone installation, installation of systems furniture and furnishings, security systems installation, migration of command center systems, and tenant move-in from external swing space. It is anticipated that with the learning curve to be experienced in Wedges 2 through 5, we may be able to re-capture this three-year schedule growth. Until time-saving measures are achieved however, Wedge 1 serves as our time model.

Overlap on the schedule from Wedge 2 to Wedge 3 is due to the migration of the National Military Command Center from Wedge 3 into Wedge 2. Construction in Segment 3B was postponed to a later date, allowing the tenants in that area to be relocated to their final office space.

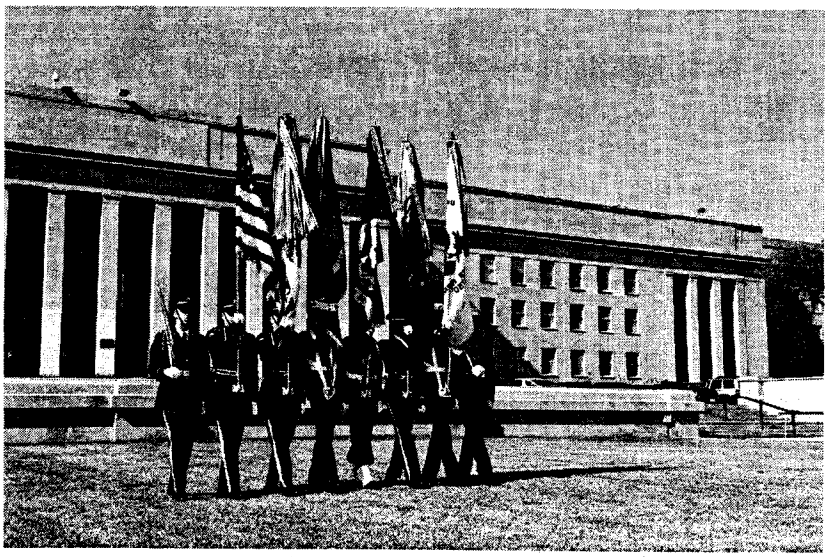


PROGRAM BUDGET

SOURCE OF FUNDS

Section 2804 of the Department of Defense Authorization Act, 1991 (Public Law 101-510, see Appendix), established the Pentagon Reservation Maintenance Revolving Fund. The Act transferred responsibility for the operation, maintenance, protection, repair, and renovation of the Pentagon Reservation from the General Services Administration to the Secretary of Defense. The revolving fund is the funding source for the Pentagon Renovation Project. In addition, it finances a full range of building services for Department of Defense components, including the military departments, and other activities housed within the Pentagon Reservation.

The renovation was designed to be budget-neutral to the Department of Defense in that the Department could operate, maintain, protect, and renovate the Pentagon for the rent the Department would have paid to the General Services Administration over a 12 to 14 year period.



The River Terrace Parade Field is home to numerous ceremonies throughout the year. Much of the site underwent renovation, including extensive waterproofing measures, to accommodate new facilities below ground.

Accordingly, the Pentagon Reservation Maintenance Revolving Fund has been designed to operate on a break-even basis over the long term. Revenue for the revolving fund may be generated from various sources; however, the fund depends primarily upon monies collected from a user charge for space and building services. These charges are paid by the Department of Defense components and other tenants using Pentagon Reservation facilities or land, with rates corresponding to six categories of space: office, storage, special, joint use, commercial support, and outside parking. The rates are established to recover the cost of day-to-day operations, maintenance, protection of the Reservation, and essential capital improvements, including all costs associated with the Pentagon Renovation Program.

CERTIFICATION OF COST

Based on early estimates of the costs to be incurred, which did not include any provision for inflation over the life of the Program, the Defense Appropriations Acts for FY 1995 and FY 1996 required that the Secretary of Defense certify that the total cost for the planning, design, construction and installation of equipment for the renovation of the Pentagon Renovation shall not exceed $1,218,000,000.

Subsequently, the Department of Defense Appropriations Act for FY 1997 reduced the cost certification for the renovation to $1,118,000, 000. This certification requirement was $100,000,000 less than the certification ceiling initially supported by the Department and the Congress. The Department of Defense Appropriations Act for FY 2000 increased the certification ceiling amount to $1,222,000,000 for specific security improvements.

TOTAL ANNUAL PROGRAM FOR DESIGN & CONSTRUCTION *

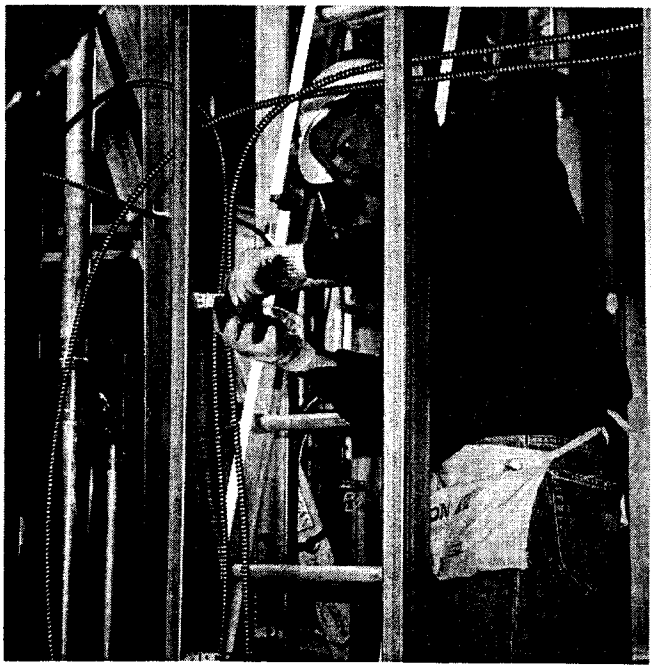
Fiscal Year	Design & Construction	Cumulative Totals	Items
1994	77,900,000	77,900,000	Obligations
1995	50,200,000	128,100,000	Obligations
1996	64,500,000	192,600,000	Obligations
1997	59,000,000	251,600,000	Obligations
1998	97,100,000	348,700,000	Obligations
1999	131,000,000	479,700,000	Obligations
2000	86,800,000	566,500,000	Obligations
2001	190,100,000	756,600,000	Budgeted
2002	45,000,000	801,600,000	Budgeted
2003-2014	420,400,000	420,400,000	Program
Total	1,222,000,000	1,222,000,000	

* *Uninflated*

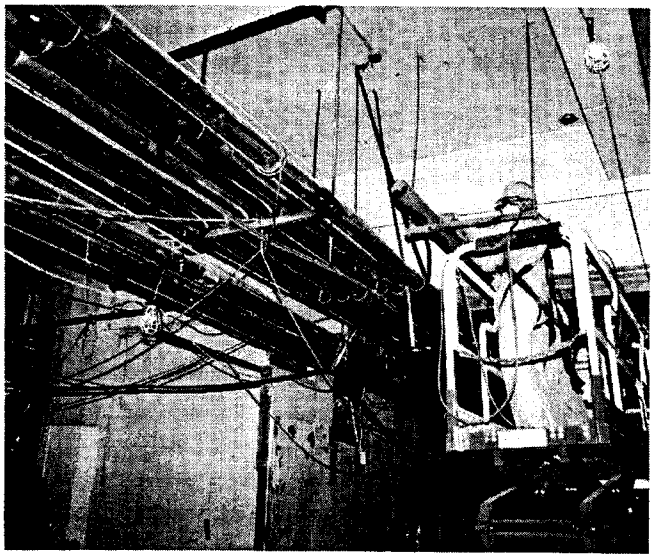
The total program cost will depend heavily on inflation of construction costs over the next 12 to 14 years and the effectiveness of management and contracting initiatives undertaken by the Program. However, inflation has been impacting the Program since 1994 and will continue to do so until its completion.

Internal management controls are in place to insure accurate tracking and monitoring of costs associated with the certification ceiling and to segregate costs of ancillary projects.

Consistent with cost estimates for projects in a military construction program, this estimate does not include the cost of: 1) design and construction of the Heating and Refrigeration Plant, the Classified Waste Incinerator, the Remote Delivery Facility, the Heliport Fire Station and Control Tower, and the Physical Fitness and Readiness Center; 2) purchase and installation of Information Management and Telecommunications (IM&T) equipment; 3) rental and operation of leased swing space; 4) purchase and installation of furniture; 5) some recently required security enhancements and 6) costs prior to FY 1994. The Department of Defense Appropriations Act for FY 2001 and the required certification are included in the Appendix.



Worker installs electrical conduits inside the new Heliport Fire Station and Control Tower. The facility was completed in January, 2001.



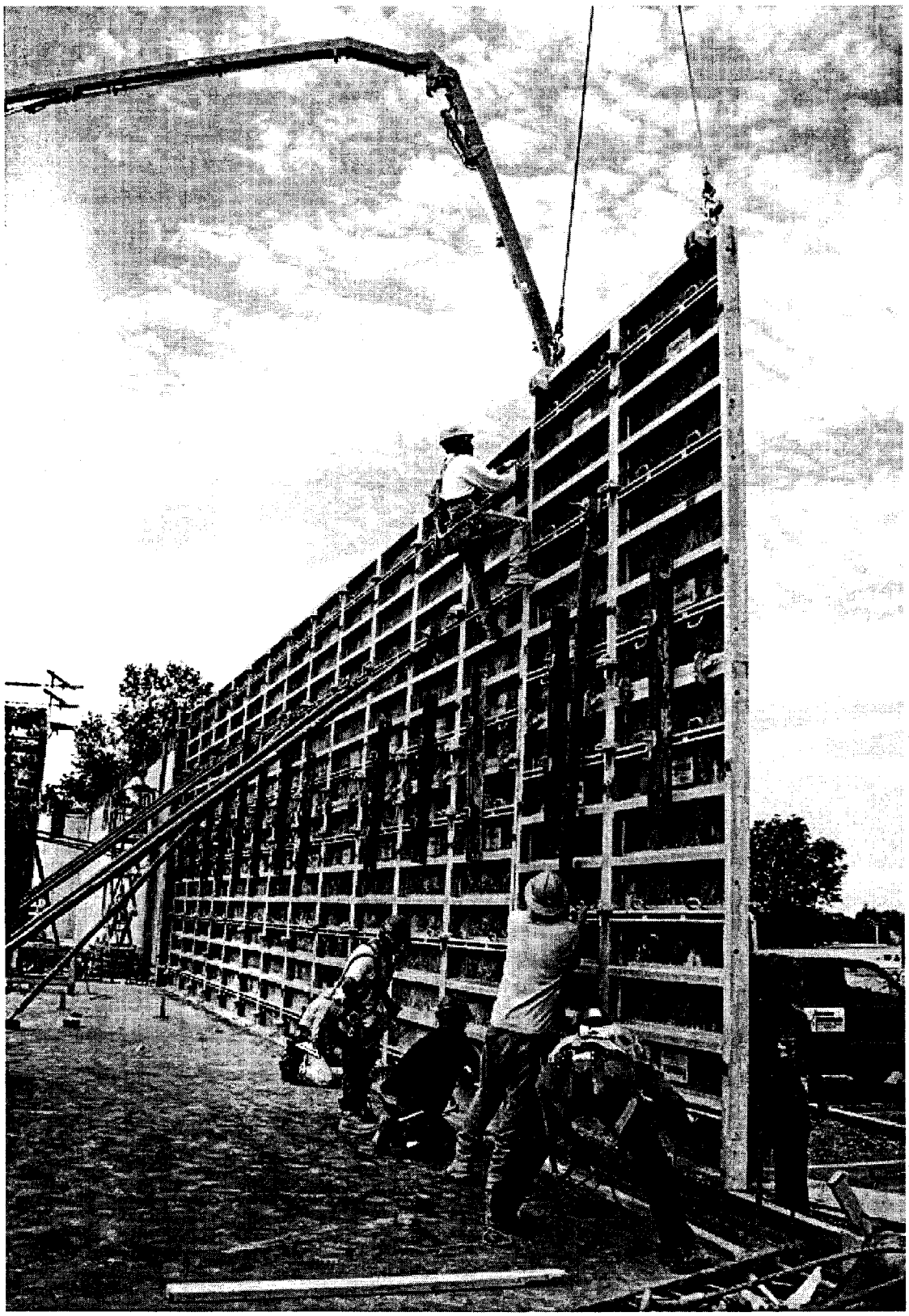
The Program's schedule has shifted, due, in part, to thousands of miles of undocumented wires, cables and conduits.

In order to continue critical projects, the Program will constrain the cost of design and construction.

Fundamental changes have been made to meet this challenge. These have included restructuring the three organizations responsible for supporting the Renovation Program into geographic and functional Integrated Product Teams. Each geographic project within the program has a Geographic Integrated Product Team responsible for the entire renovation activity within that geographic area. Coupled with these internal management changes are procurement changes which have streamlined and improved the acquisition process. Construction awards, previously based on firm fixed-price low bids, resulted in continuous conflicts between the general contractor and the Renovation Program. These conflicts included multiple claims, contract changes, increased costs, and delays.

Contract awards, negotiated between the government and the contractor, are now based on best value to the taxpayer and the government, not necessarily the lowest proposed cost. Best-value determination is based on an analysis of factors including past performance, management approach, technical approach, probable cost, and small and disadvantaged business support. Oral proposals and page limits on proposals reduce time and help gain additional insight into contractor capabilities.

Active partnering is being used with general contractor offerors in multi-phase source selections. Sophisticated contracting vehicles are being used to reinforce team partnering. Savings incentives reward efficient contract performance. Award fees are used to reward creativity and efficiency on the part of contractors. The intention is to secure superlative contract performance at reasonable cost by fundamentally changing the relationship between the government and the contractor. The Program is working hard to form partnerships with industry which will improve contractor performance, reduce cost, and meet schedule parameters.

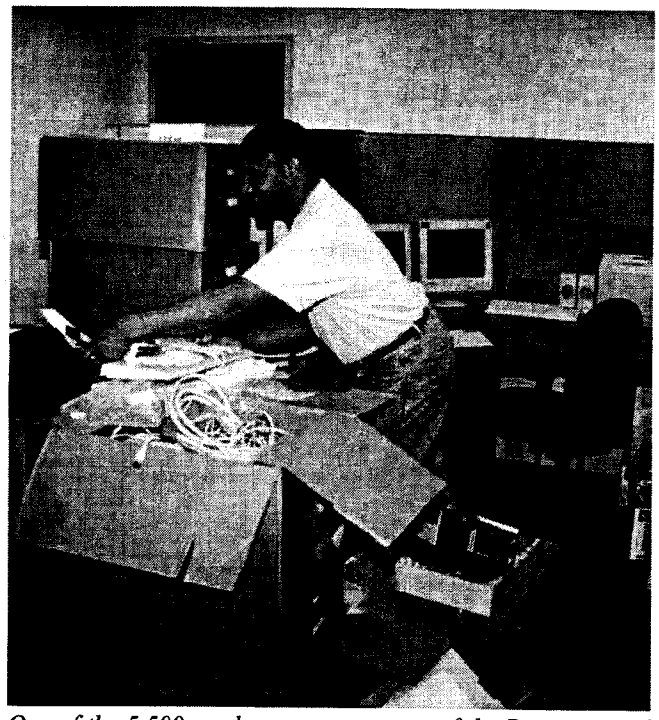


Construction of a blast wall at the Remote Delivery Facility.

The delivery facility is an ancillary project to the Renovation Program and is not accounted for in the $1.22 billion Congressional budget cap.

RENOVATION SEQUENCE

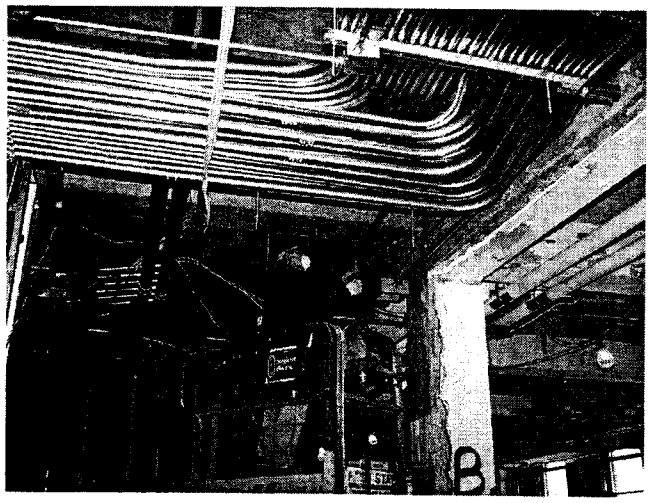
The Pentagon Renovation consists of several individual efforts of work that all follow a similar sequence towards completion. In the following section, this sequence will be identified with icons to outline the progress of each project.



One of the 5,500 employees to move out of the Pentagon and into swing space as of February, 2001.

MOVE-OUT

One of the major challenges faced by the Renovation Program on a daily basis is the necessity of working around 20,000 people. Before renovation of an occupied area can begin, the people in that space must be moved to leased office space, temporary space built out within the Pentagon, or new permanent space after the completion of Wedge 1. This move includes all of the tenants' personal belongings, computer equipment and telephones. A major factor in the move-out process is the fact that Pentagon employees cannot afford any downtime in their daily activities. Therefore, the swing space must be renovated and operational to meet the needs of the displaced Pentagon tenants before the move-out process can occur. After the move, tenants are typically up and running at full speed within a 24-hour period.



Before demolition in Wedge 1 could begin, temporary utilities and communication lines had to be installed.

TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING AND COMMUNICATIONS

Temporary utilities, and communications are necessary to keep the Pentagon tenants surrounding the area under construction operational with minimal disruption. Temporary barrier walls, constructed to ensure the safety and security of the tenants, prevent noise, dust, and hazardous work conditions from being a distraction.

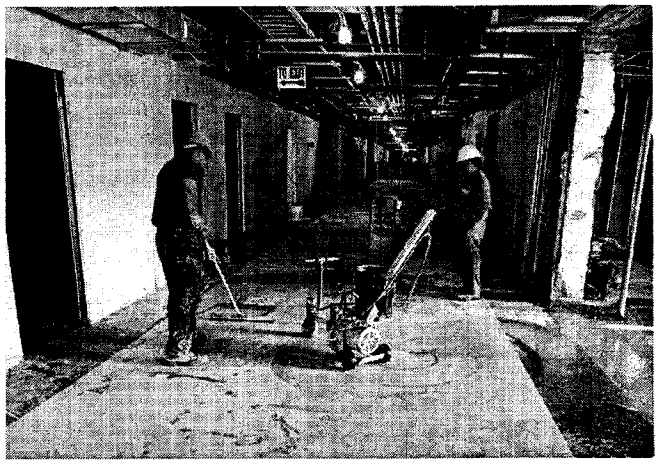
DEMOLITION AND ABATEMENT

Before construction can begin, the area must undergo the demolition of all existing utilities and the abatement of hazardous materials including asbestos, lead-based paint, and PCBs. This is a very expensive and time consuming effort but absolutely essential in order to assure the health and safety of Pentagon tenants.

Demolition work in Basement Segment 3A.

CORE AND SHELL

Core and shell construction includes the build-out of common elements in an area, including walls and public corridors, and the rebuilding of main utility systems.



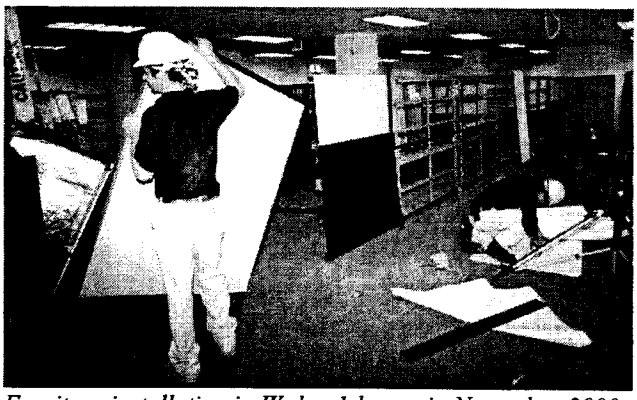
The terrazzo floor installation in Wedge 1 is part of core and shell construction. Terrazzo was selected as a floor covering in high traffic areas because of its superior life-cycle cost.

TENANT FIT-OUT

Tenant fit-out is the building of interior office space based on the requirements of the intended tenants.

Tenant space is defined based on organizational requirements.

A worker installs new telecommunication lines.



Furniture installation in Wedge 1 began in November 2000.

The Corridor 8 entrance was one of the first above-ground spaces in the Pentagon to be renovated in order to provide secure entrance to the Pentagon and the new DiLorenzo TRICARE Clinic.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

Information management and telecommunications is an extensive effort to meet the requirements of the existing tenants while ensuring that the technological needs of future tenants can be met without another major renovation. Modern telecommunications and information management sources are provided throughout the Pentagon with access to global networks. Backbone communications are renovated to support voice, data, video, and other user requirements such as local area networks.

FURNITURE, FIXTURES AND EQUIPMENT

After the interior office space has been fitted-out and the information technology equipment installed, flexible systems furniture is installed to facilitate the operation of a modern office environment. The systems furniture includes a spine-wall work station configuration, providing easily accessible pathways for electrical power and for telecommunications. This allows much greater flexibility in both the initial furniture layout and future reconfigurations.

SECURITY

The security of the Pentagon is a top priority to the Renovation Program. Security checks and upgrades are implemented throughout construction and security accreditation is essential to the acceptance of the completed space.

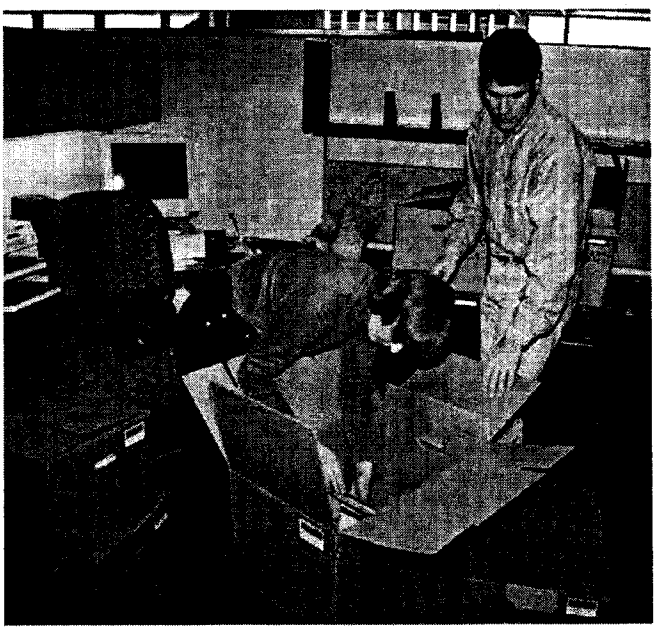
COMMISSIONING

Commissioning is the process of verifying and documenting the performance of building systems in accordance with the design and the owner's functional and operational needs. Commissioning starts in the design phase and extends through the construction process and warranty period.

Pentagon Renovation team members inspect potential systems furniture with Pentagon tenants prior to installation.

MOVE-IN

The culmination of every renovation effort is the move-in of tenants to the renovated space. As with the move-out, the Renovation Program strives to minimize any downtime the tenants may experience in their daily operations. Tenants are typically back to full operation within 24 hours of vacating their office for their newly renovated space in the Pentagon. This includes the relocation of all personal items and the reattachment of computers and telephones to the IM&T infrastructure.



The Renovation Program's Relocation Team strives to have Pentagon tenants completely operational in their new office in the next business day following a move.

PHASE NOT STARTED or NOT APPLICABLE

If the phase of the project being discussed has not yet been started, than "Not Started" will appear with the icon. If the phase does not apply to the project being discussed than "Not Applicable" will appear with the icon.

Light well repair work in progress between the C and D-Rings in Wedge 1.

II. WORK IN PROGRESS

SWING SPACE

BASEMENT/MEZZANINE

Basement/Mezzanine Segment 1
- DiLorenzo TRICARE Health Clinic

Basement/Mezzanine Segment 2-3

WEDGES

Wedge 1
- Floors 1-5
- South Terrace

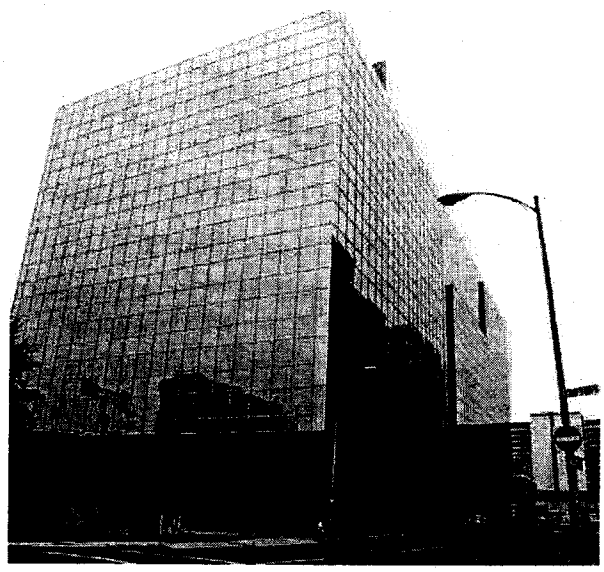
Wedges 2-5
- Floors 1-5

METRO ENTRANCE FACILITY

ANCILLARY PROJECTS

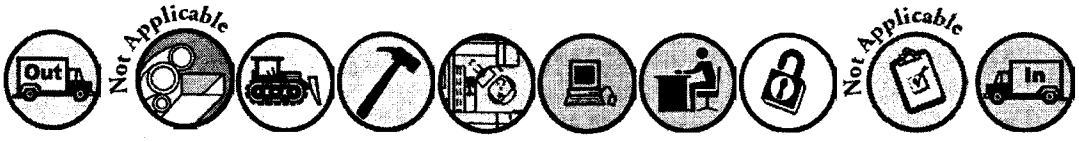
Remote Delivery Facility
Heliport Firestation and Control Tower
Physical Fitness and Readiness Facility
Power/Site
- Chilled Water Line Feeders
- Condenser Intake Outfall Line for the Heating and Refrigeration Plant

Three office buildings in nearby Rosslyn and Crystal City were leased and then renovated for use as swing space.



Swing space tenants were relocated to Rosslyn, which can be seen in the distance at the top of the photo, and Crystal City.

SWING SPACE



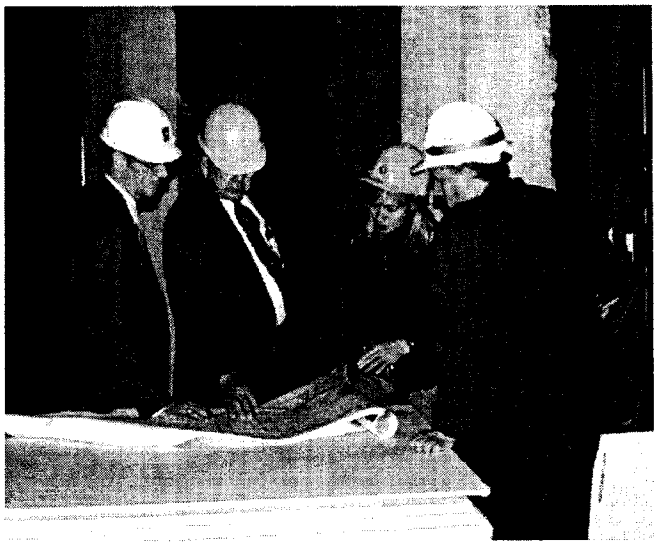
Early in the planning process, it was determined that the most efficient way to renovate the Pentagon while keeping the building operational for its 25,000 tenants was to relocate one fifth of the building's personnel from their current location in the Pentagon into temporary offices, or swing space, in and around the building. The vacated "wedge" is then demolished and abated of all hazardous materials before being built-out to meet the needs of the tenants in the adjacent wedge, who will move-in upon completion of the space.

Because full connectivity from external swing space to the Pentagon is so critical, three main external swing space buildings have been built-out with classified and unclassified telecommunications backbones, local area networks, telephone lines, and electronic mail. These three buildings feature modern office space with new systems furniture, state-of-the-art voice and data communications systems, and sophisticated security systems. It will be necessary for these swing space buildings to remain occupied by displaced Pentagon employees throughout the entire renovation, however, smaller leased spaces will be vacated and those leases terminated at the completion of Wedge 3. During calendar year 2000, swing space leases and lease delegation authority were transferred from the US Army Corps of Engineers to the Office of the Secretary of Defense, Washington Headquarter Service - Space Policy and Acquisition Division, which now supports the Renovation Program with these activities.

In addition to the previously built-out external swing space, the Renovation Program anticipates a growing and continuing need for internal swing space due to the profile of upcoming tenants affected by future wedge construction. As renovation work progresses around the building, the list of essential personnel who must remain inside the Pentagon during renovation is increasing and will peak with Wedges 3 and 5.

During this past year, approximately 120,000 square feet of swing space was identified within the Pentagon and assigned to Wedge 2 tenants not slated to move into Wedge 1. Such areas include:

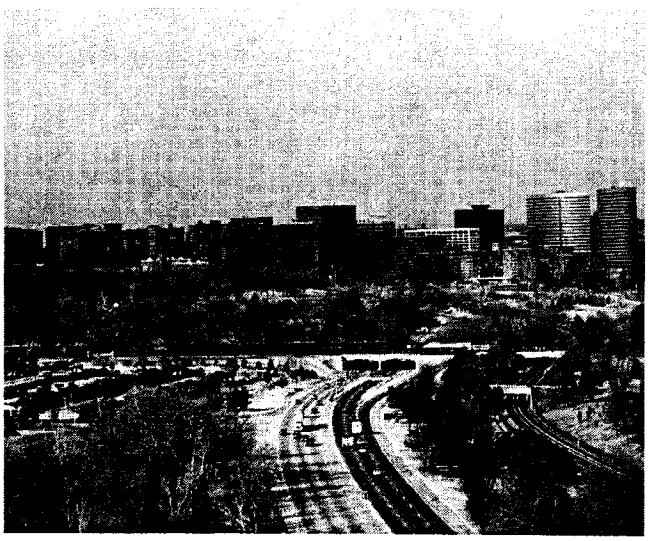
- The former DiLorenzo Clinic (approximately 30,000 square feet)
- A large portion of space to be vacated as a result of a planned move to Federal Office Building #2 by the Ballistic Missile Defense Organization (approximately 65,000 square feet)
- The former Defense Post Office (approximately 12,500 square feet)
- A portion of the public cafeteria located near Corridors 1 and 2 on the Second Floor (approximately 11,000 square feet).



A Pentagon Renovation Program Tenant Service Representative inspects swing space plans with Office of the Secretary of Defense personnel in the former DiLorenzo Clinic. Tenants from Wedge 2 who are not slated to move into the newly renovated Wedge 1, will occupy this space.

SWING SPACE HIGHLIGHTS

- 910,000 square feet renovated
- 45 floors of building space
- More than 7,000 moves accomplished
- Full connectivity with Pentagon maintained
- Modern telecommunications installed



Tenants from Wedge 1 were moved to external swing space in leased office buildings in nearby Rosslyn and Crystal City.

MOVE-OUT

The first swing space move-outs into newly renovated areas of the Pentagon began in early 2001 with a move into the new Remote Delivery Facility, followed by the re-occupancy of Wedge 1, which will be completed in the winter of 2001.

The original relocation plan envisioned Pentagon tenants rotating out of the wedge being prepared for renovation and into external swing space, with the swing space occupants moving into the newly completed wedge. The Program's Back-to-Basics concept has attempted to reduce the amount of move activity by requesting tenants currently out of the building to remain outside of the Pentagon until the completion of Wedge 5. Therefore, the re-population of Wedge 1 will largely be accomplished by tenants from Wedge 2.

TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING, AND COMMUNICATIONS

The construction of temporary mechanical, electrical, plumbing and communication systems is not necessary for swing space buildings.

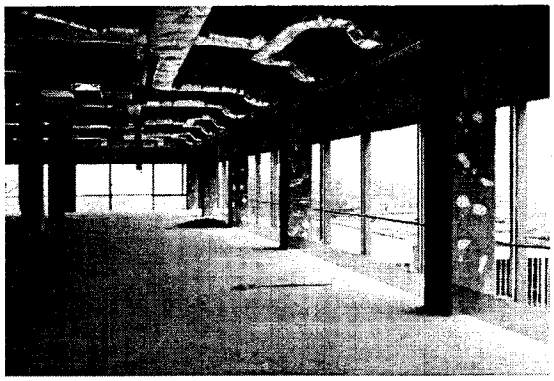
DEMOLITION AND ABATEMENT

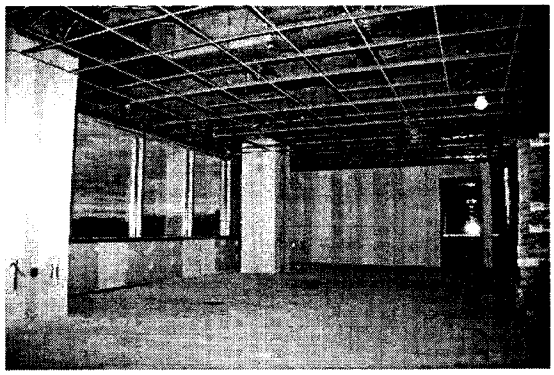
Because 30,000 square feet of assigned Swing space was formerly the Pentagon's DiLorenzo Clinic, an unusually extensive amount of demolition and abatement work has been required this past year to not only remove asbestos and asbestos-lined ductwork, but also to remediate hazardous chemicals inherent to certain Clinic activities. Contaminates such as mercury, silver, lead, barium, cobalt, and cyanide were discovered, removed, and properly disposed of as hazardous waste.

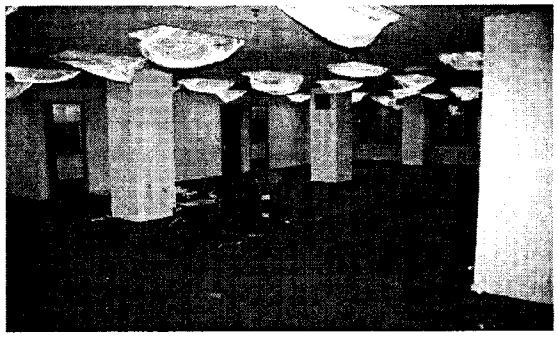
The Clinic is a unique situation regarding hazardous chemical remediation. Other swing space build-outs should require minimal asbestos abatement. However, as portions of the building are vacated and reassigned to the Renovation Program for swing space, these areas often require extensive asbestos abatement once the Program attempts to remove existing partition walls.

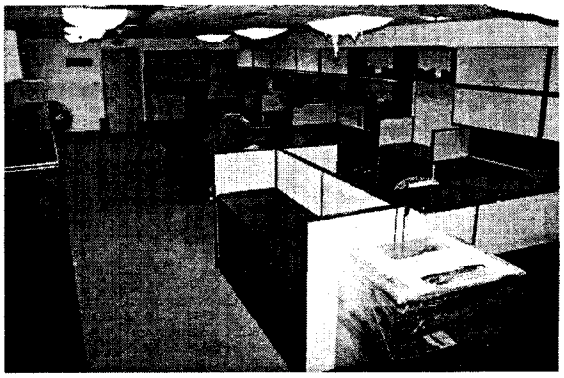
CORE AND SHELL

Core and shell construction does not apply to internal, isolated swing space build-outs.

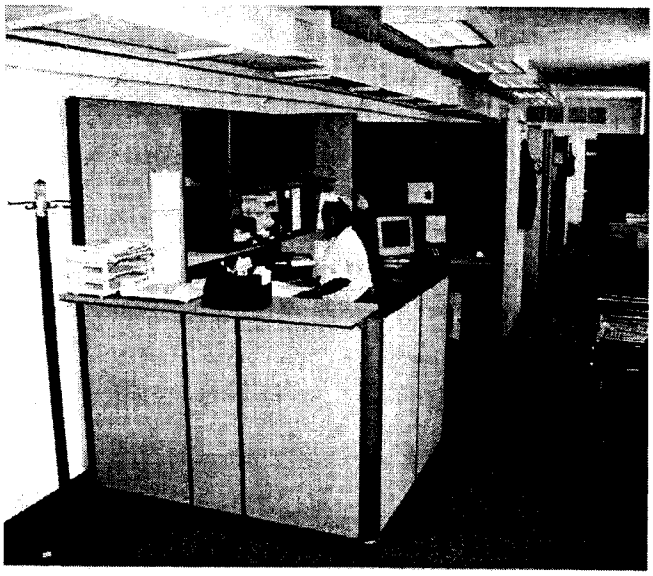








Leased office buildings were renovated to accommodate the unique connectivity and security requirements of Pentagon tenants. Existing space was gutted (top), then rebuilt, including new telecommunications systems and new systems furniture. In all, 910,000 square feet of swing space was renovated outside the Pentagon.



Additional swing space was built in the Pentagon's A-ring.

TENANT FIT-OUT

Much of the swing space team's activity this past year was preparatory work for Wedge 2 move-outs. To meet the Wedge 2 tenants' requirements, slightly over 120,000 square feet of internal swing space has been designed and the construction documents describing the work to be done have been completed. Once vacated, these Pentagon spaces are turned over to the Renovation Program to begin the renovation process. During calendar year 2000, the Renovation Program assumed possession of the former DiLorenzo Clinic and the public Cafeteria at Corridors 1 and 2 in addition to several small office areas.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

Over the past year, IM&T provided telecommunications support to the swing space effort during the design and construction document phase as well as on-site supervision during the construction and telecommunication equipment installation phase.

The Pentagon Renovation Program incurs an on-going cost at all swing space locations to maintain and continually upgrade the IM&T infrastructure. After the initial installation, the maintenance and monitoring service is provided to the Pentagon Renovation Program by the Network Infrastructure Services Agency-Pentagon, formerly known as Single Agency Manager.

FURNITURE, FIXTURES AND EQUIPMENT

Prior to FY 1999, the Pentagon Renovation Program had contracted with a furniture manufacturer to furnish and install systems furniture in the three major swing space buildings which are now fully furnished and occupied. Reconfigurations, when necessary, of the systems furniture already provided in external swing space are coordinated and funded by individual tenant agencies as part of on going facility management.

The configuration of a typical swing space workstation has been modified to replicate that of the workstation standard designed for the permanently renovated wedge, since the standardized design has proven to save time and money, especially during IM&T installation. Furthermore, the Pentagon Renovation Program has negotiated a tiered-discount structure with each systems furniture manufacturer participating in the Renovation Program, with swing space purchases counting toward the deeper discounts.

SECURITY

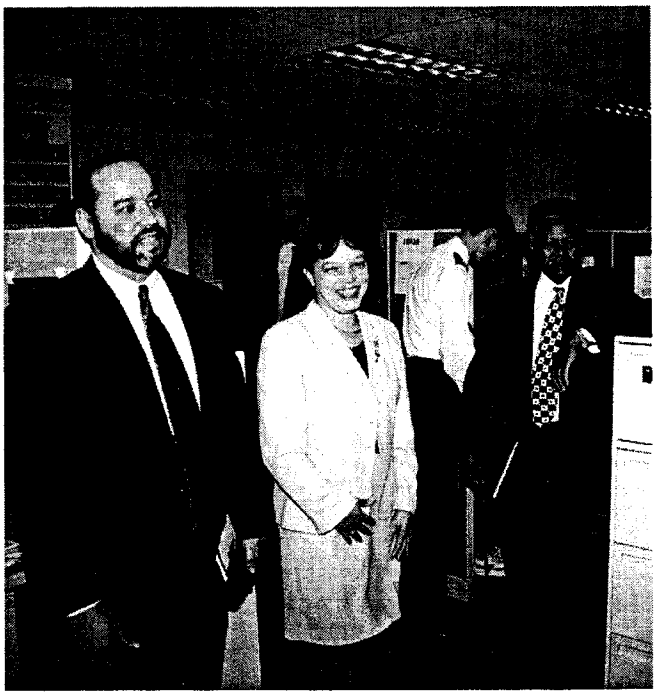
Similar to the Renovation Program's responsibility to continually maintain and upgrade the IM&T infrastructure at swing space locations, the Pentagon Renovation Program also funds the cost of on-going maintenance and monitoring of the security alarm systems as well as periodic upgrades to the security equipment to ensure the same high level of security as required in the permanent tenant offices. Each swing space location is also supported by the Pentagon's Defense Protective Service to provide full-time security guards and Defense Protective Service police officers as needed. The Renovation Program provides funds for this service.

COMMISSIONING

While a commissioning process does not apply to external swing space, internal swing space is subject to a pre-occupancy survey to assure baseline health and safety issues are addressed.

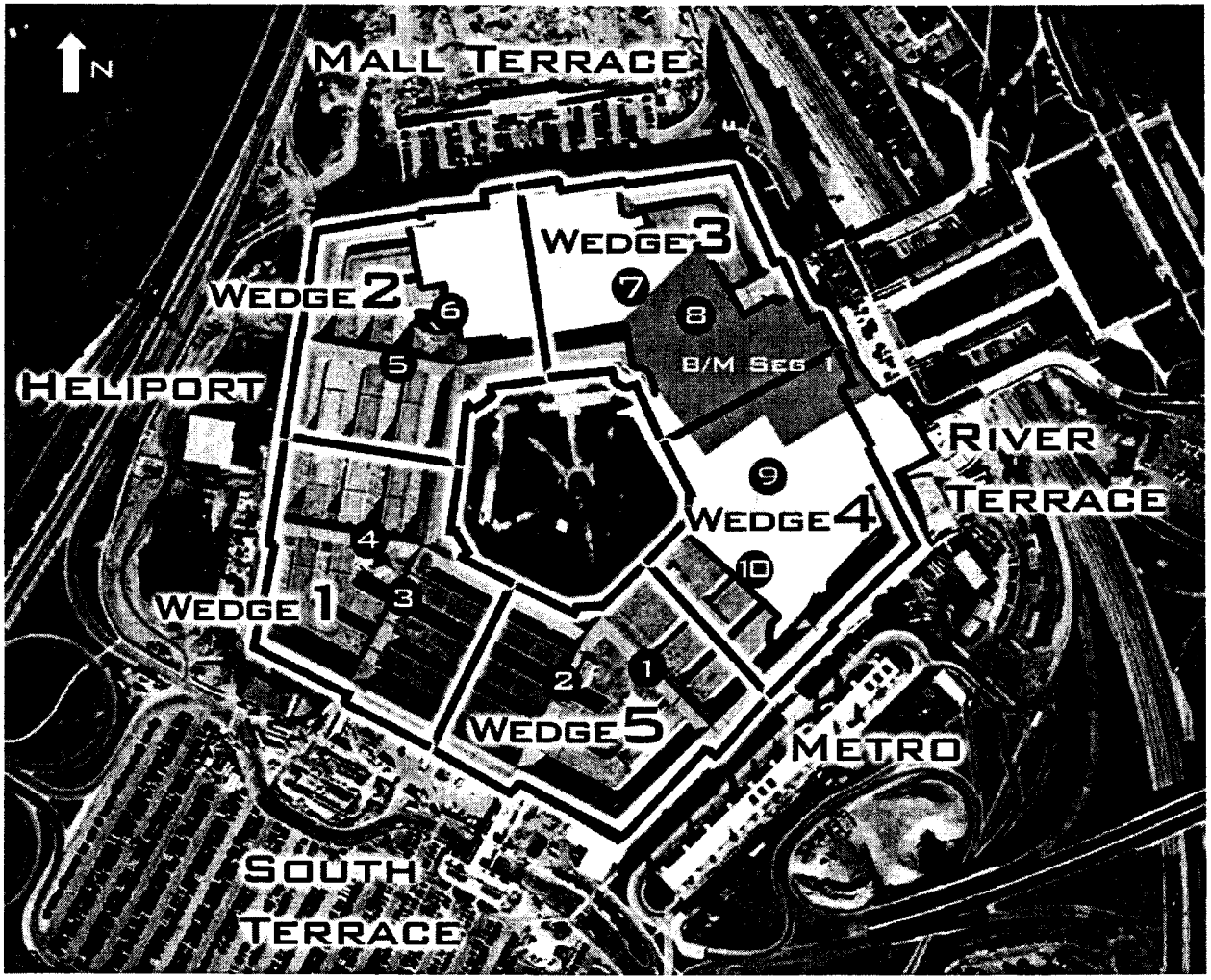
MOVE-IN

Occupancy of the renovated (former) DiLorenzo Clinic, the (former) Ballistic Missile Defense Organization, the (former) Defense Post Office, and the (former) cafeteria at Corridors 1 and 2 will account for the majority of the 600 to 700 swing space move-ins anticipated between May and October of calendar year 2001.



Swing space tenants admire their new home. In most cases, swing space tenants were moved out of the Pentagon on a Friday and were operational in their new office by Monday morning.

The opening of the new DiLorenzo TRICARE Clinic occurred in February 2000.



Basement/Mezzanine Segment 1 Locator

BASEMENT/MEZZANINE SEGMENT 1

THE DILORENZO TRICARE HEALTH CLINIC

The DiLorenzo TRICARE Health Clinic was constructed as part of the Segment 1 Mezzanine and is now complete. The space formerly housed a motor pool and has been transformed into a state-of-the-art health care facility. This consolidated facility will eliminate redundancy of services, including pharmacies, radiology suites, file centers, and other ancillary support functions while saving valuable personnel time. The construction contract for the clinic was awarded on August 21, 1997. A ribbon cutting ceremony was held in February 2000 to officially recognize the opening of the DiLorenzo TRICARE Health Clinic.

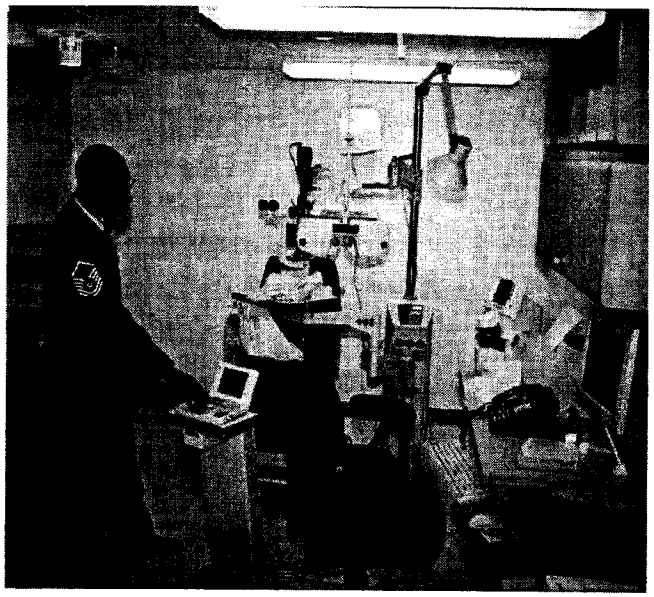
SEGMENT 1 HIGHLIGHTS

- 440,000 square feet renovated
- 1,200 personnel moved into renovated space
- 1,800 piles driven to support new slab
- 45,000 cubic yards of soil removed
- Basement slab lowered
- New Mezzanine level created an additional 240,000 square feet of space

MOVE-OUT

The occupants of the former DiLorenzo Clinic moved directly to the new DiLorenzo TRICARE Clinic. The vacated space was abated of hazardous materials and is being renovated for use as swing space.

The clinic features a state-of-the-art pharmacy with automatic dispensing features.



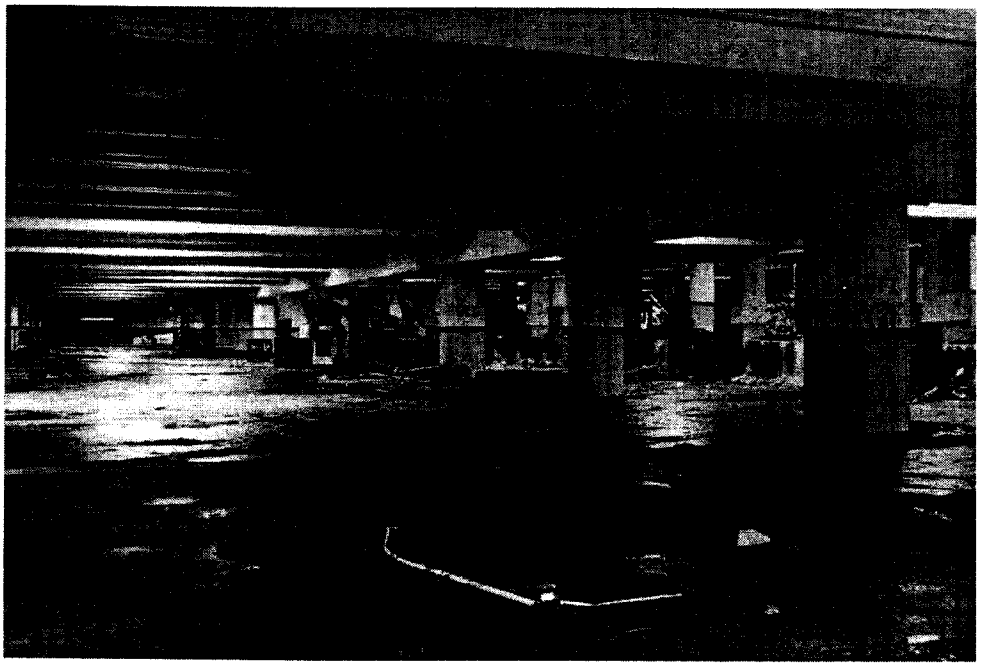
The new clinic features 30 dental suites compared to only 12 that existed previously in the Pentagon.

TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING, AND COMMUNICATIONS

For the DiLorenzo TRICARE Clinic, the temporary mechanical, electrical and plumbing work was accomplished by a combination of the demolition and abatement contractor and the prime clinic construction contractor. The demolition and abatement contractor rerouted or removed the majority of the old motorpool electrical services and provided the barrier walls to the adjacent occupied areas of the Pentagon. The prime clinic construction contractor provided the mechanical demolition and relocation as part of the main construction contract. Since the area was previously a motorpool, there was no communications infrastructure to be demolished and relocated. As part of the move-out of the existing drivers' lounge, the Renovation Program's IM&T team coordinated the relocation of the drivers' phone lines to the temporary drivers' lounge.

DEMOLITION AND ABATEMENT

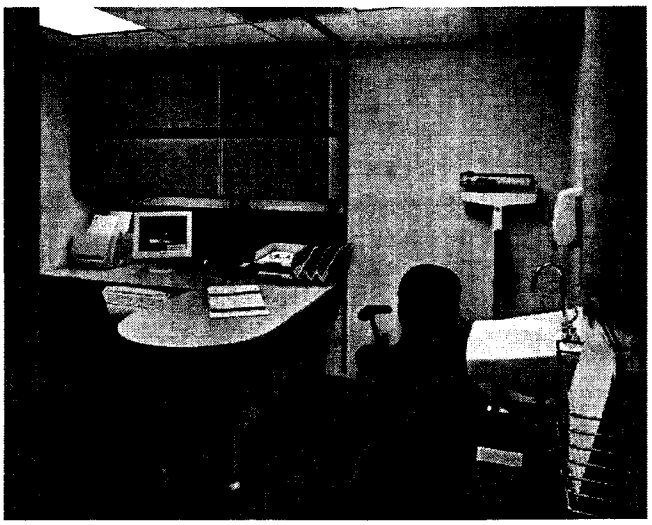
The site for the DiLorenzo TRICARE Health Clinic was formerly the Pentagon motorpool and was rife with lead-based paints, petroleum-soaked concrete, mercury and PCB contaminated light ballasts, and asbestos pipe insulation and plasters. A local abatement firm performed the abatement of the clinic during FY 1997-98. All areas were fully abated leaving a clean site for the construction to follow.



The Pentagon motor pool below the River Terrace as it appeared in 1997 before its transformation into a state-of-the-art health facility began.

CORE AND SHELL

Core and shell construction for the DiLorenzo TRICARE Clinic was accomplished by a combination of the Basement Segment 1 construction contract and as part of the main clinic construction contract. The Basement Segment 1 contractor provided the floor slab and penetrations for mechanical and electrical systems. The prime clinic contractor completed the mechanical systems within the new clinic space, including the construction of clinic mechanical rooms located in the 2A2 area of the Pentagon basement. Other core and shell items such as hallways, electrical and telecommunication closets, and restroom facilities were completed concurrently with the tenant fit-out portion of the construction contract.

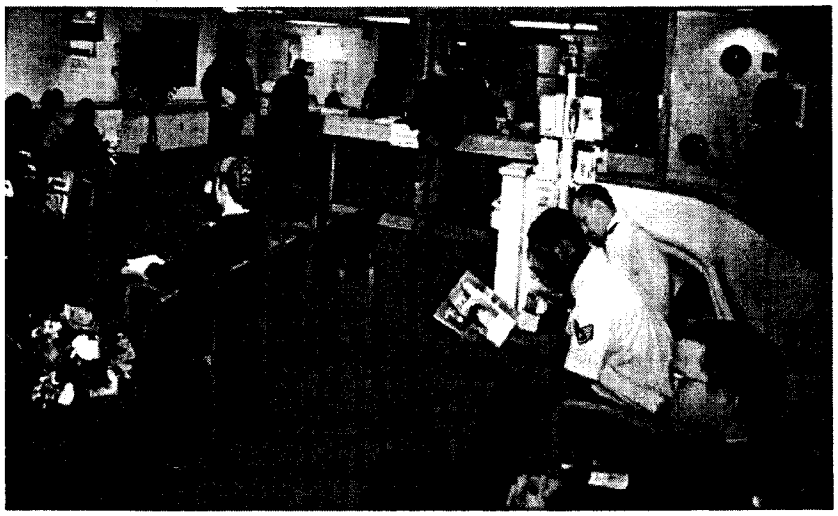


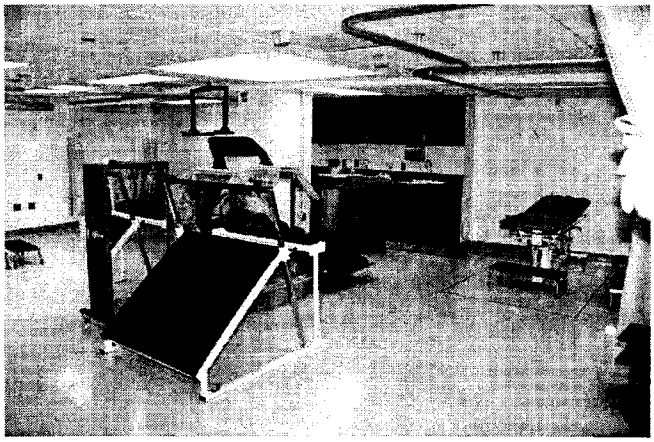
The installation of sinks (right) and other features allows this office in the new TRICARE Clinic to be easily converted to an exam room should it be required.

TENANT FIT-OUT

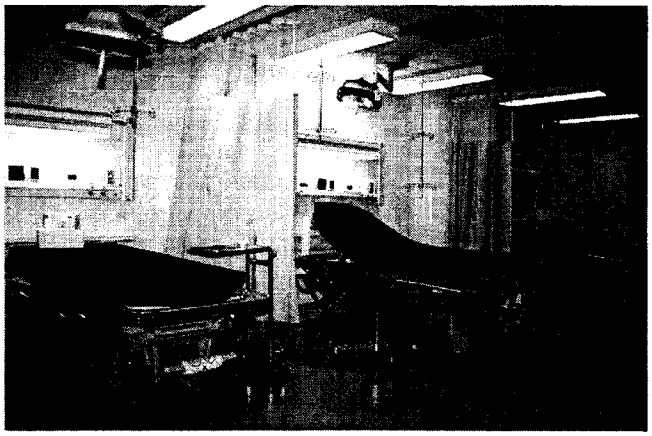
The tenant fit-out phase was accomplished as a combination of the prime clinic construction contract, an independent carpet contract and coordinated Health Affairs contracts. The clinic construction contractor completed the general infrastructure construction. A flooring contractor provided carpeting, installed the furniture and much of the actual medical equipment. The work required close coordination between all parties to ensure a successful project. The program schedule did not allow the luxury of each contractor completing his efforts in ideal sequence. Despite complicated planning and multiple contractors sharing a space, the project was brought to successful completion. The completed clinic consists of specialized areas such as pharmacy, radiology, optometry, audiology, physical therapy, minor surgery, trauma center, dental, podiatry, and others. A common theme throughout the clinic is the ability to make full use of tele-medicine. The clinic's state-of-the-art communication system allows both internal communications as well as worldwide connectivity.

The main reception area of the new DiLorenzo TRICARE Health Clinic near the Corridor 8 entrance. The clinic was turned over to the Pentagon medical community in February 2000.





Modern physical therapy facilities in the new clinic.



For the first time, Pentagon medical personnel can perform emergency care in the new clinic's trauma care rooms.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

The IM&T effort has been completed. The required facilities were incorporated in both design and construction.

FURNITURE, FIXTURES, AND EQUIPMENT

Furniture installation was completed in February 2000.

SECURITY

Security was incorporated during both design and construction. The majority of the work relates to access control of the facility and prescription drugs.

COMMISSIONING

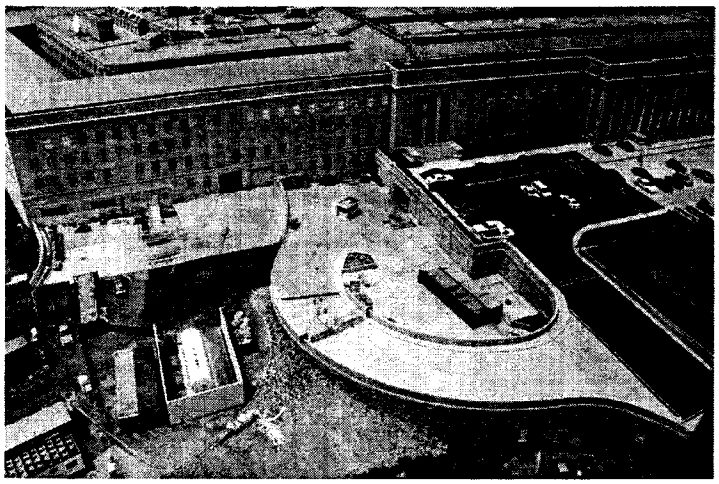
The commissioning occurred concurrently with the design and construction of the clinic and carried into the warranty period. Because the area is highly specialized, commissioning included medical gas, medical vacuum specialized exhaust, miscellaneous medical systems and extensive electrical/mechanical/ plumbing requirements. Successful commissioning of the clinic was achieved through extensive integrated cooperation with general contractors, specialized contractors, medical personnel, and Pentagon Renovation team members.

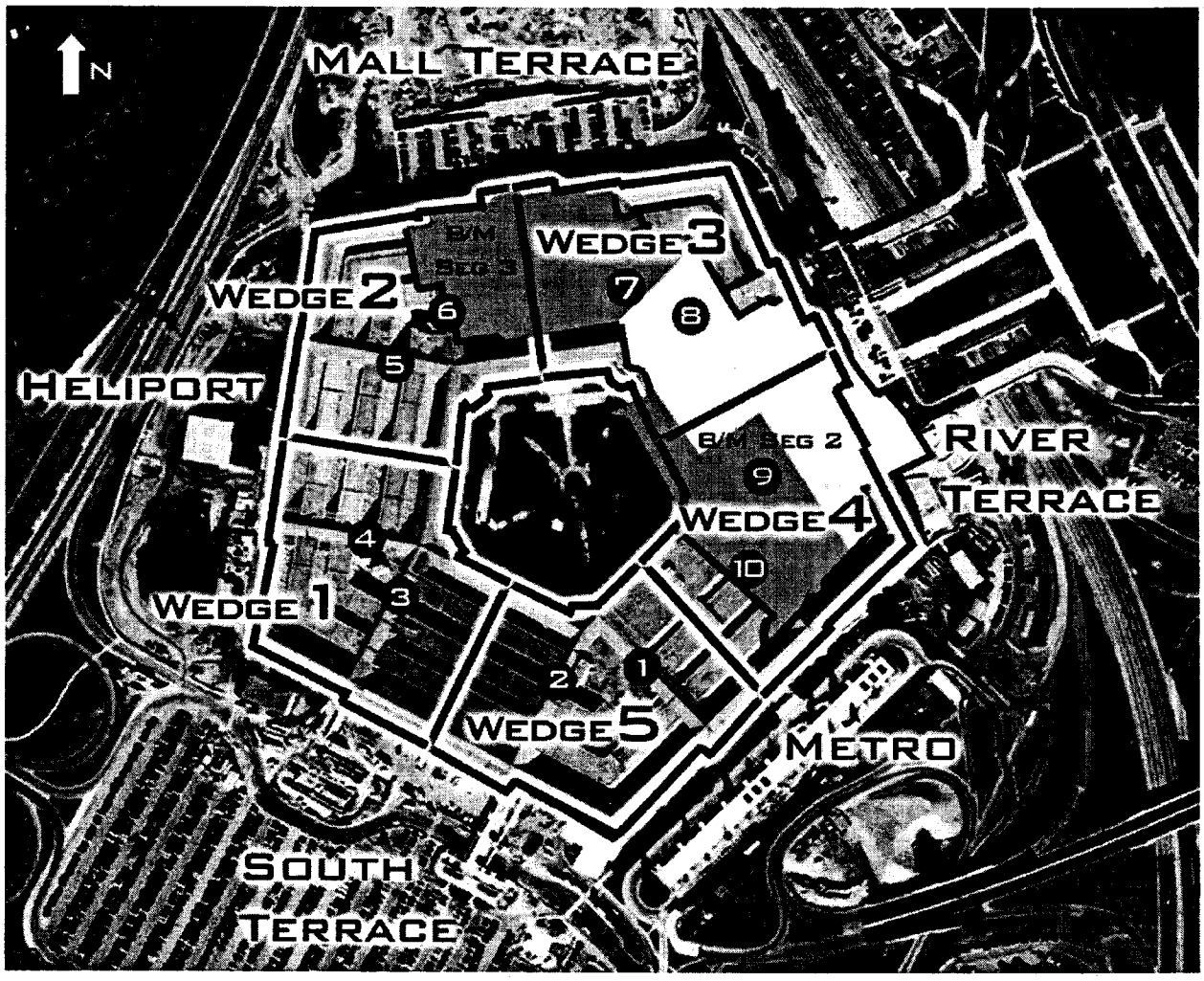
MOVE-IN

The move-in of 120 people was accomplished from March 2 to March 11, 2000. This was a direct transfer from the old clinic and did not require the use of swing space.

State-of-the-art exam rooms feature digital radiology. No longer do physicians have to wait for x-rays to be developed. The filmless technology eliminates the discharge of mercury and silver contaminants associated with the X-ray process. Instead, digital images appear on computer monitors instantaneously and can be e-mailed should the expertise of another physician outside the facility be required.

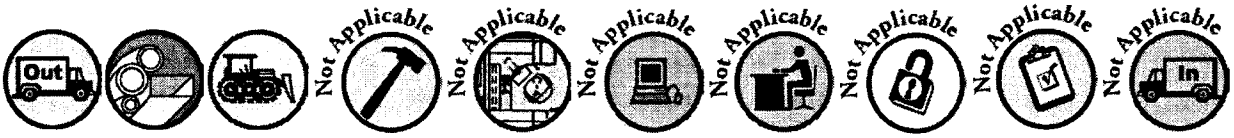
Aerial view of the semi-circular roadway adjacent to the River Terrace, which serves as the roof over a portion of renovated space in the Pentagon's basement.





Basement/Mezzanine Segment 2-3 Locator

BASEMENT/MEZZANINE SEGMENT 2-3



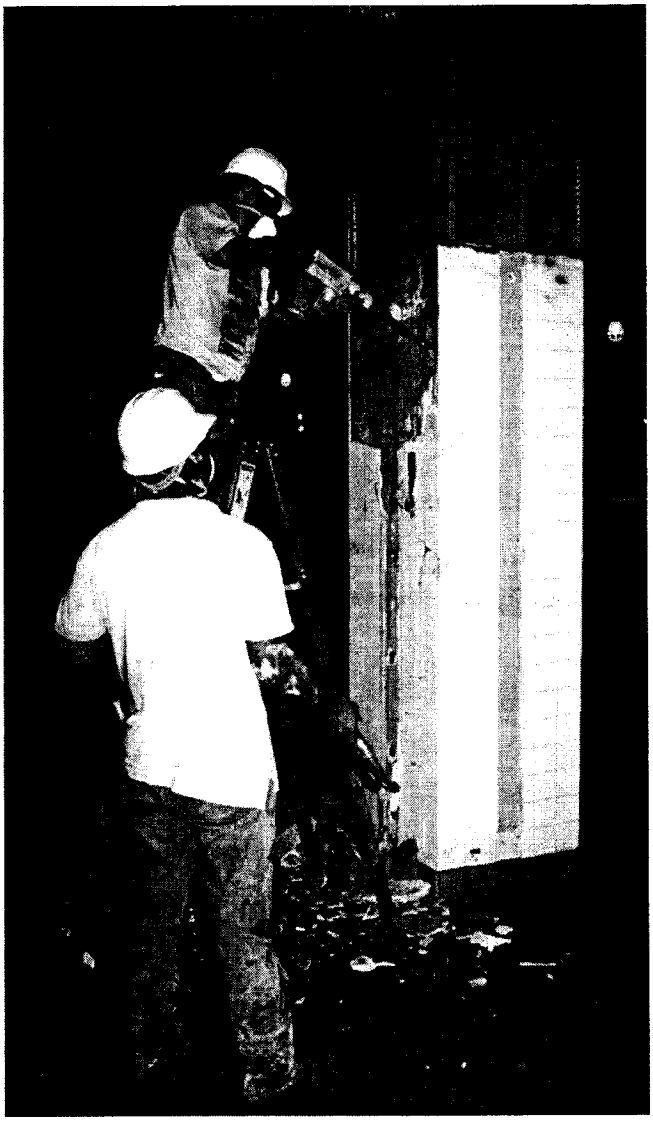
Segment 2A1 and Segment 3 of the Pentagon's Basement and Mezzanine levels comprise approximately 500,000 square feet of below ground space. As of December 2000, the plan is to complete the demolition and abatement of these areas and to improve life safety elements. Other than some portions of Segment 3A, which will be used for the new Physical Fitness and Readiness Facility, the Renovation Program is not planning to continue work in the basement after the completion of the demolition and abatement process due to budget restrictions and the difficulty involved with working in areas above occupied spaces when renovation activity begins in Wedges 2, 3 and 4.

MOVE-OUT

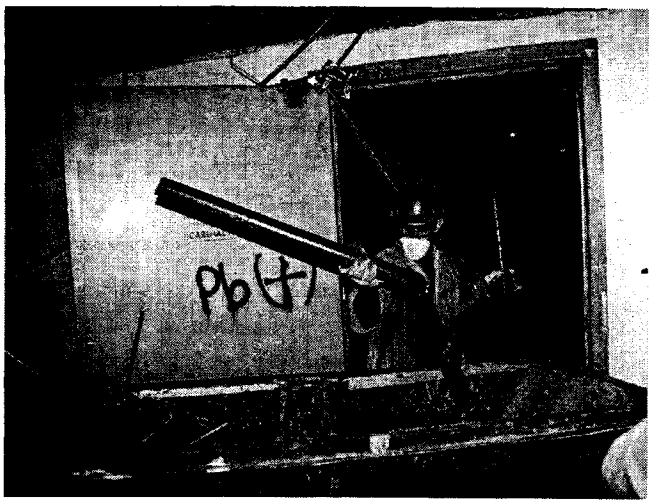
Segment 3 is divided into two areas, 3A and 3B. Move-out of 3A, previously occupied by 411 tenants, was completed in the spring of 1999. Segment 3B will not be vacated until 2010. Segment 2A1 was originally occupied by 924 tenants. The final tenants were moved from the area in January 2000.

TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING, AND COMMUNICATIONS

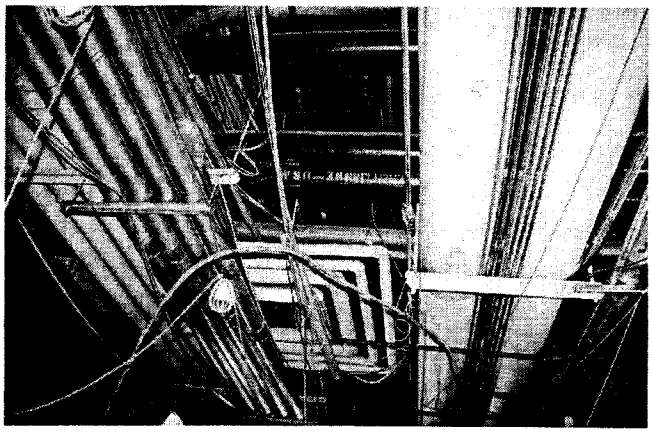
The installation of temporary mechanical, electrical, plumbing and communications was completed in Segment 3A in the summer of 1999. In Segment 2A1 this process began on January 15, 2000, and is nearly complete.



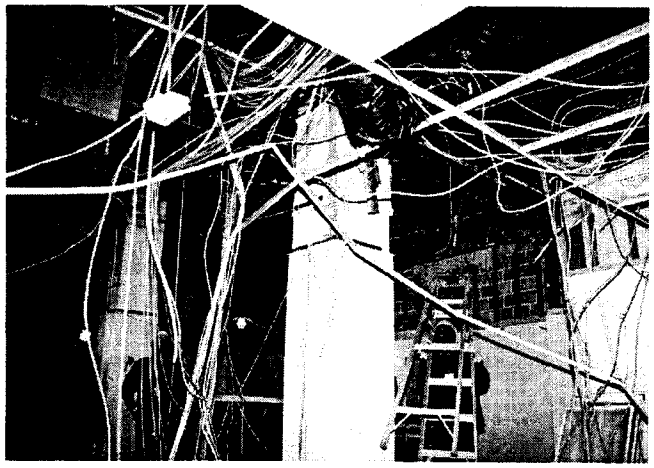
Demolition work continued in basement areas below the Mall and River Terraces. Demolition and abatement activities were substantially complete in January 2001.



Debris removal in the Pentagon's basement.



Undocumented pipes and conduits lined the ceilings in the Pentagon's basement and mezzanine.



Thousands of miles of cables and wires were removed during the demolition process.

DEMOLITION AND ABATEMENT

Segment 3A demolition and abatement began in May 1999 and was completed in January 2000. Segment 2A1 demolition and abatement began in January 2000 and will be completed in January 2002.

CORE AND SHELL

As previously stated, construction work in the basement and mezzanine will not continue past the demolition and abatement phase due to budget restrictions.

TENANT FIT-OUT

As of December 2000, there are no plans to build-out the remaining basement and mezzanine areas.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

In coordination with the Pentagon Renovation Program office, IM&T will continue to operate within the Renovation Program's Back-to-Basics efforts. The primary IM&T challenge in FY 2001 will be the development of final designs resulting from the decision to relocate remaining Command Centers to above ground locations. The new locations are considered preferable for security and other considerations.

FURNITURE, FIXTURES, AND EQUIPMENT

This is not applicable as Segments 2 and 3 will not be built-out.

COMMISSIONING

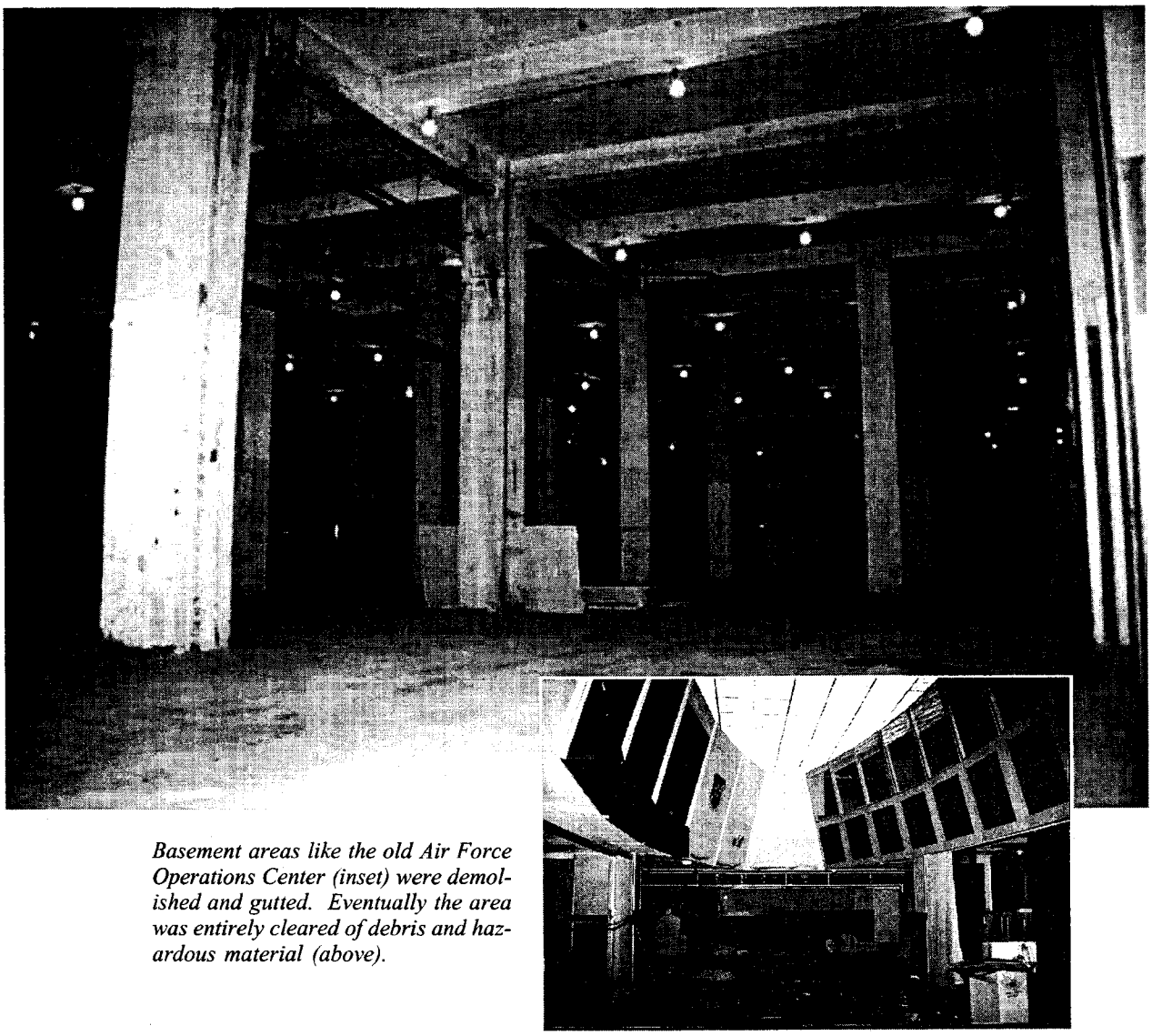
Commissioning will not become an issue until a decision is made to build out Segments 2 and 3.

SECURITY

The security of Segments 2 and 3 primarily involves issues pertaining to access control.

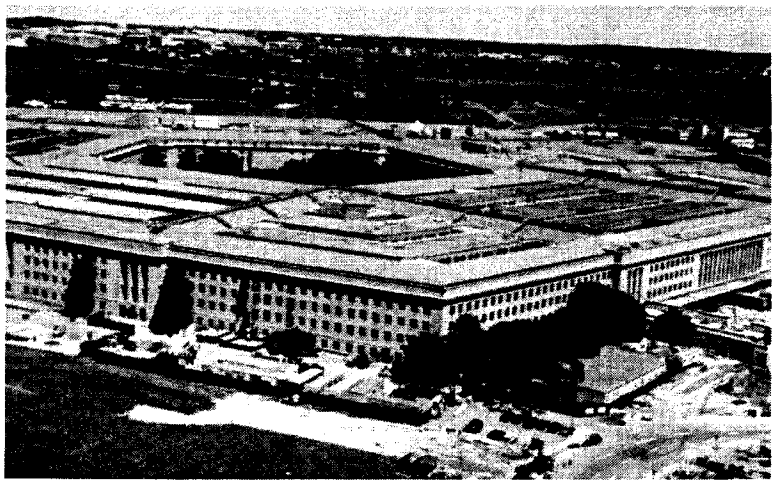
MOVE-IN

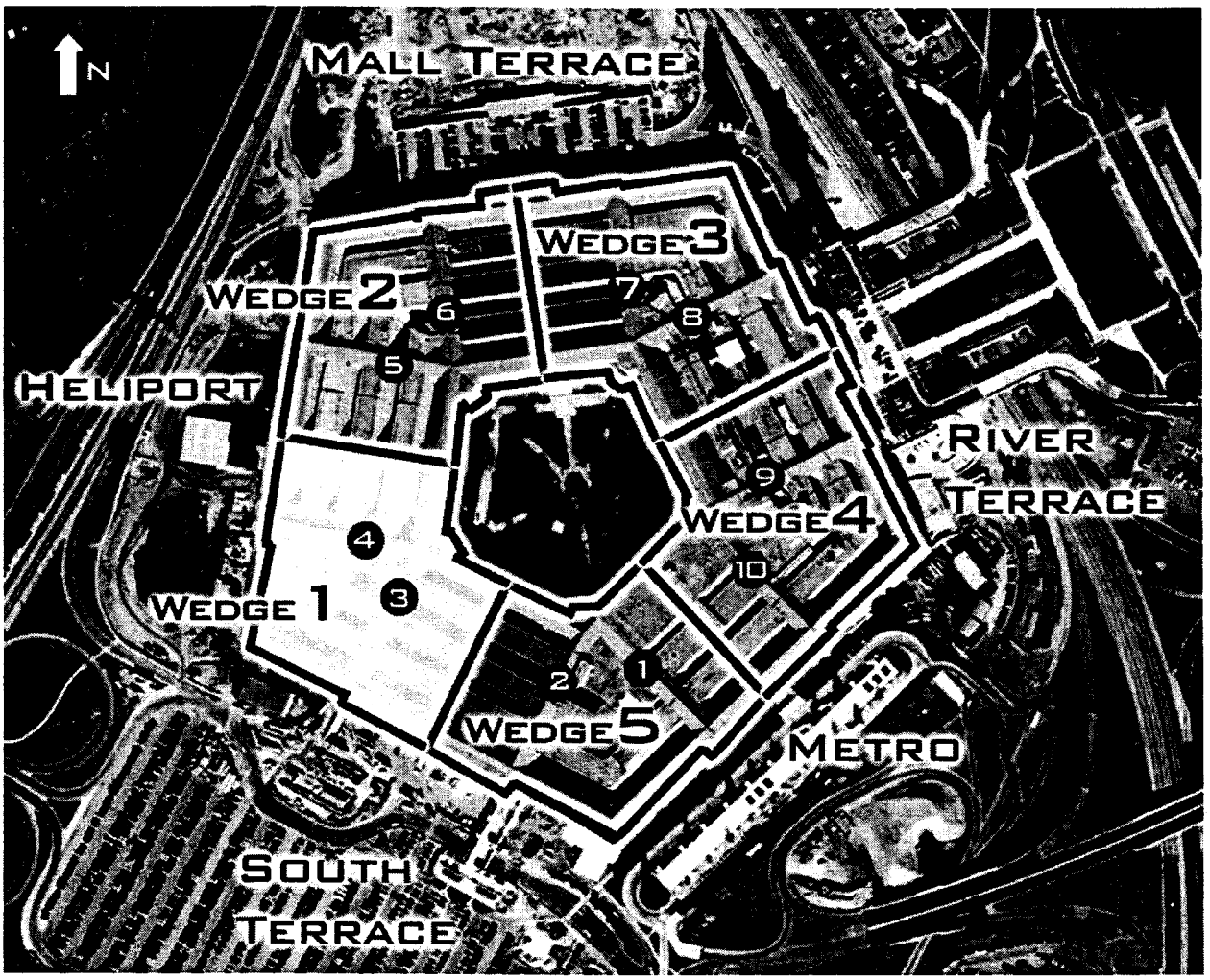
As of December 2000, there is no tenant move-in scheduled to occur.



Basement areas like the old Air Force Operations Center (inset) were demolished and gutted. Eventually the area was entirely cleared of debris and hazardous material (above).

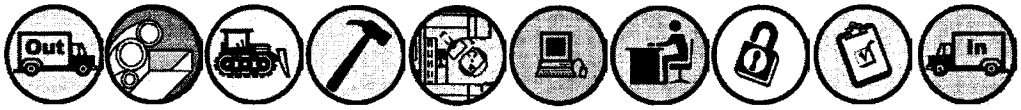
Aerial view of Wedge 1. The wedge encompasses 1,000,000 square feet of building space. Demolition and abatement of hazardous materials are complete. In January 2001, tenant fit-out was substantially complete and furniture installation had begun.





Wedge 1 Locator

WEDGE 1

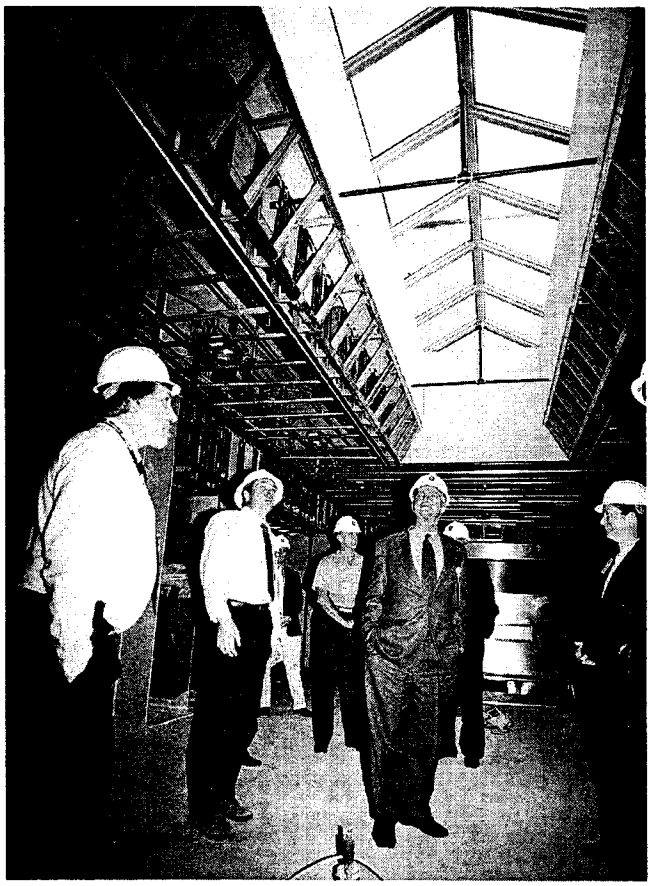


FLOORS 1-5

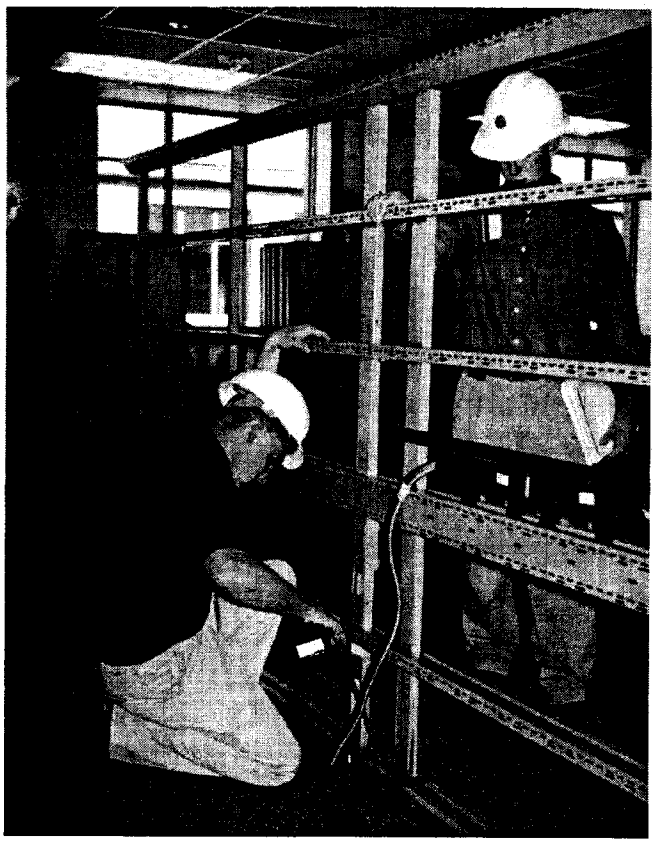
The renovation of the five floors in Wedge 1, approximately 1 million square feet of space, began in 1998. The project included major structural demolition, installation of new utilities, and the build-out of tenant areas. A phased move-in of tenants began in February 2001. Wedge 1 is accessed by Corridors 3 and 4.

WEDGE 1 HIGHLIGHTS

- 1,000,000 square feet of building space
- 1,282 new energy efficient windows
- 386 historic blast resistant windows installed
- 5,000 personnel relocated to swing space
- 83 million pounds of debris removed
- 28 million pounds of asbestos contaminated material removed
- 70 percent of removed materials recycled
- A new bank of escalators traversing all five floors
- 8 new elevators to increase vertical mobility
- New energy management control system
- New heating and cooling system
- New telecommunications infrastructure



During a tour of Wedge 1, senior Pentagon personnel catch a glimpse of skylights in the new cafeteria that was built between the B and C-rings.



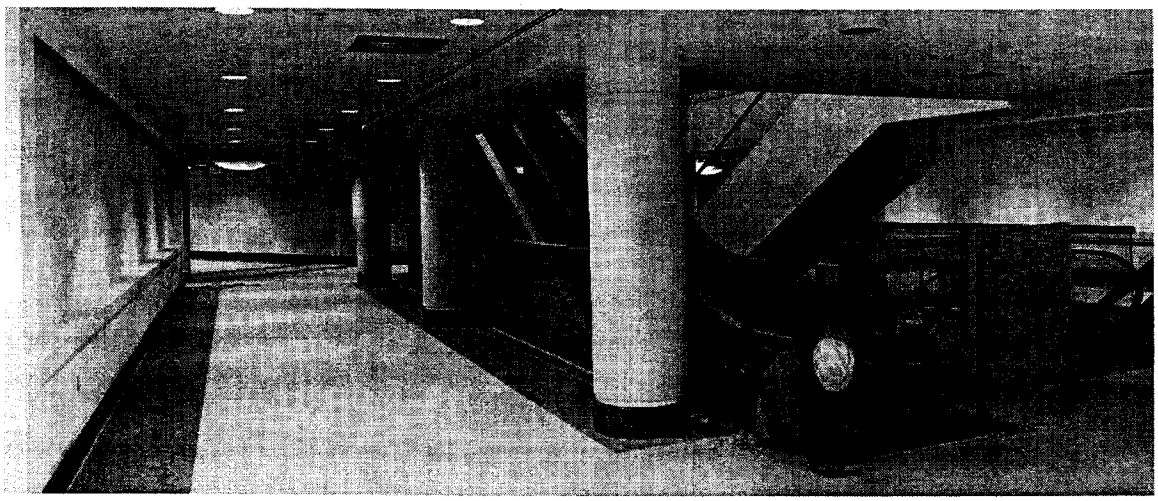
New spinewall furniture is installed in Wedge 1.

MOVE-OUT

The 5,000 occupants of Wedge 1 moved out of the wedge between January 1, 1998, and December 31, 1998 into various swing space locations. Some moved to other areas of the Pentagon, but most were relocated to temporarily leased office space. Part of the relocation process involved the design and modification of these leased spaces to maintain the tenants' connectivity with the Pentagon. In most circumstance the personnel moved into swing space from Wedge 1 will remain in the leased office space until Wedge 5 is completed in 2014.

TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING, AND COMMUNICATIONS

In order to begin demolition and abatement work, it was necessary to isolate Wedge 1 from the rest of the building. To accomplish this task, mechanical, electrical, plumbing and communications systems had to be disconnected in Wedge 1 while ensuring that the rest of the building remained operational. Two sound attenuating barrier walls were constructed to separate Wedge 1 from the two adjacent wedges (2 & 5). The barrier walls were mostly built in occupied spaces at night. The work was completed by the end of 1998.



Worker completes electrical connections for a new escalator bank in Wedge 1.

DEMOLITION AND ABATEMENT

Demolition and abatement of asbestos and lead was a massive project in itself. Work began as soon as the various tenants vacated Wedge 1. Once the areas were cleared of non-toxic rubbish, they were enclosed to prevent the escape of asbestos fibers and abatement was carried out under strict safety precautions. In all, 636 dumpsters of debris, 685 tractor-trailer loads of asbestos waste and 17 truckloads of lead waste were removed from the wedge. Items with salvage value were sold, with the proceeds reducing contract costs. Approximately 70 percent of the items demolished were recycled. Abatement was completed in September of 1999.

CORE AND SHELL

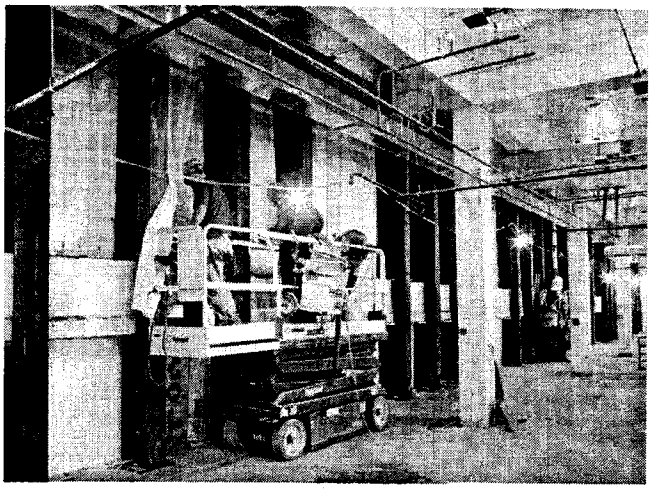
The majority of the core and shell construction in Wedge 1 is complete. The A and B-Rings of the wedge are built-out, with work remaining in the C, D, and E-Rings. All windows are in place and all underground utilities are completed.

TENANT FIT-OUT

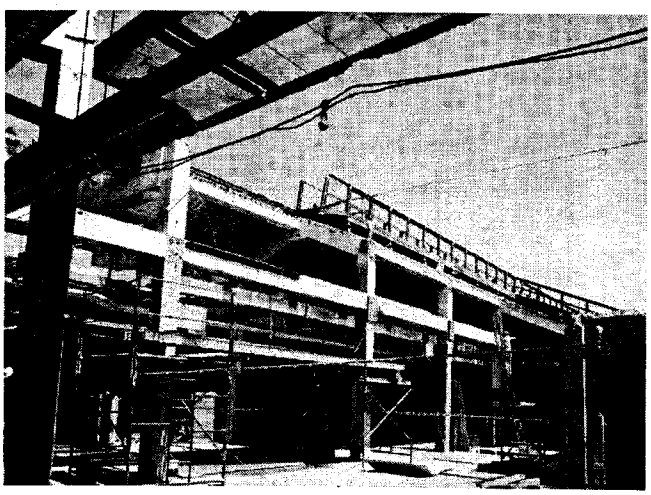
Tenant fit-out work will be done in phases. The A and B-Rings were completed, with carpet, ceiling tile and painting in January 2001. Tenant fit-out work has started in the other areas with the last area expected to be completed by May 2001. Tenant fit-out is followed by furniture installation, communication hook up and move-in.

Engineers with the Joint Staff inspect design features in Wedge 1.

Wedge 1 construction between the B and C-rings.



The walls of the 5th floor E-ring are reinforced with steel to improve their blast resistance capability.



Some areas of the roof above Wedge 1 were exposed to clear the way for new elevator shafts.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

Most of the communication pathways are completed and ready for the installation of communication cable. The telecommunication closets on the A and B-Rings are completed and have the majority of the communication equipment installed.

FURNITURE, FIXTURES, AND EQUIPMENT

Furniture delivery and installation started on November 1, 2000 in the A and B-Rings.

SECURITY

Security installation began in the spring of 2000 and will continue in conjunction with the tenant fit-out construction.

COMMISSIONING

The Commissioning process is continuing throughout construction and is essential to having the space ready for move-in. Commissioning for the A and B-Rings is continuing and scheduled for the earliest possible completion.

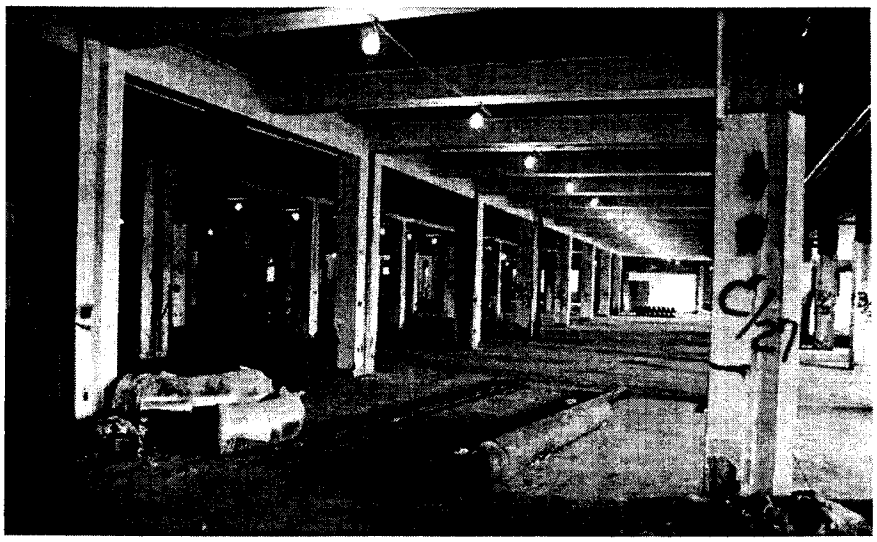
MOVE-IN

The culmination of the renovation of Wedge 1 is moving the new occupants into the renovated office space. The majority of the new occupants will come from Wedge 2. Approximately 5,000 people will be moved into Wedge 1 in phases, starting February 2001 and ending in the late fall of 2001.

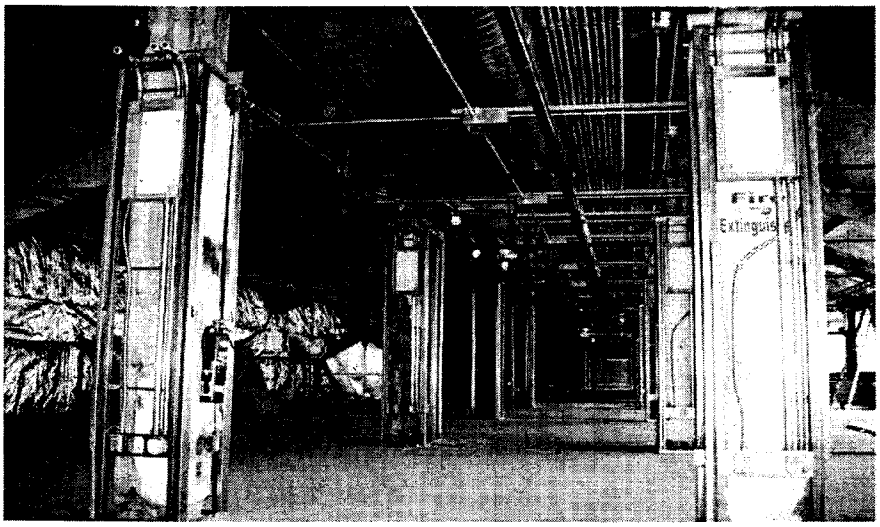
Navy tenants will be among the first to move to renovated space in Wedge 1. Frequent tours with tenants during the construction process helps the renovation team to identify and resolve design issues well before tenants move into renovated space.

Carpet installaters apply adhesive for new carpet tiles in a C-ring office bay in Wedge 1.

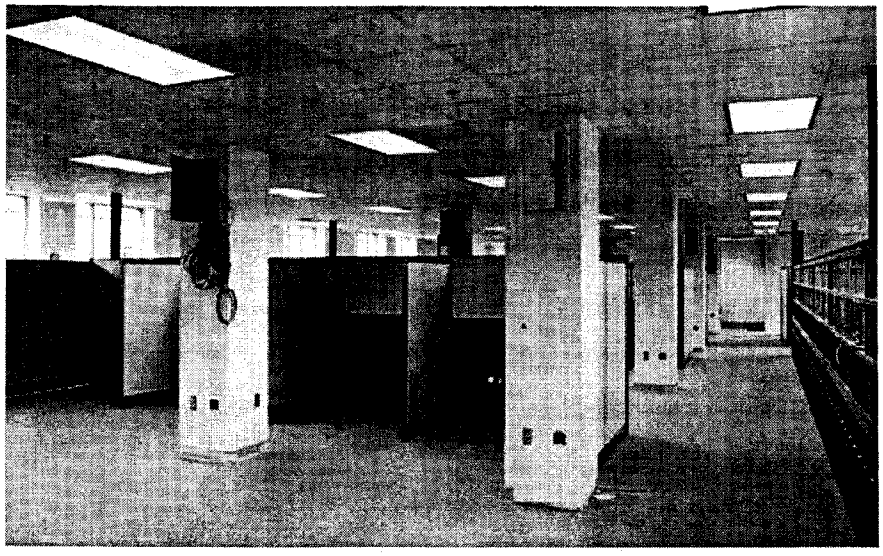
II. Work in Progress



Wedge 1 as it appeared after demoltion and abatement. The entire 1,000,000 square-foot wedge was brought down to its bare structure.



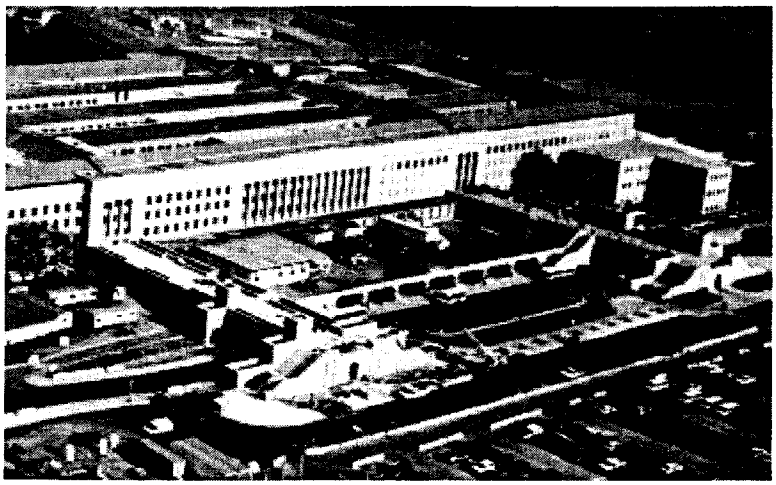
New insulation, tenant fit-out and telecommunication lines are installed as tenant space is defined by new studwalls.

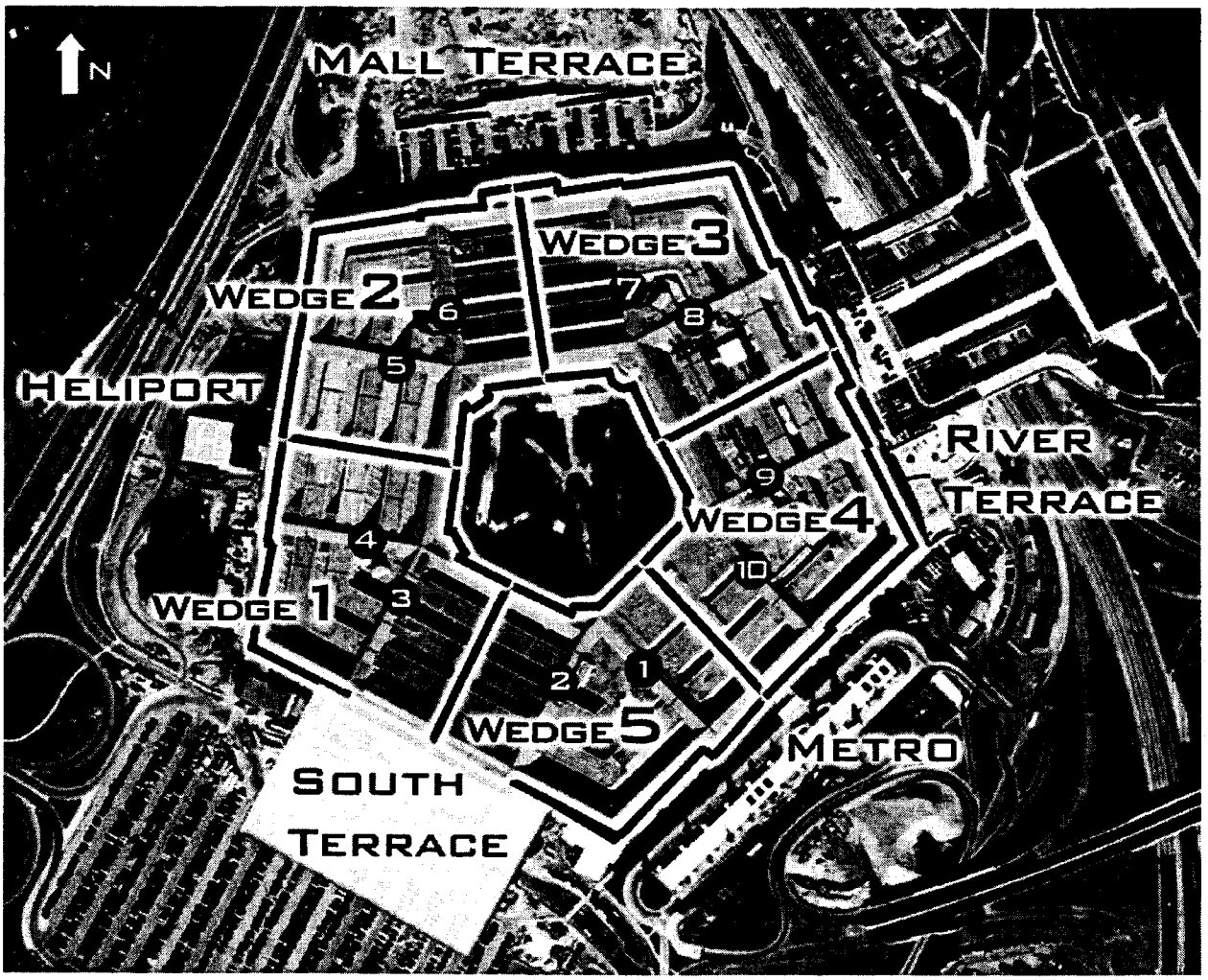


Areas are carpeted and the "spinewalls" and office partitions are then installed.

The 5th floor A-ring apex in Wedge 1 offers a view of the new escalator bank.

The South Terrace Pedestrian Bridges in January 2001.

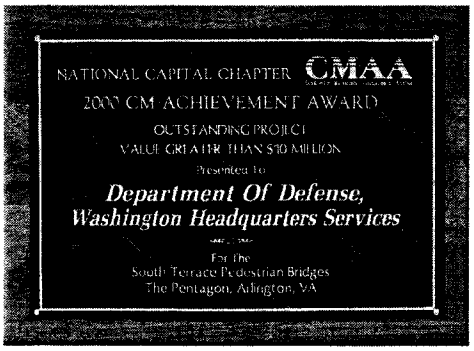




South Terrace Locator

SOUTH TERRACE

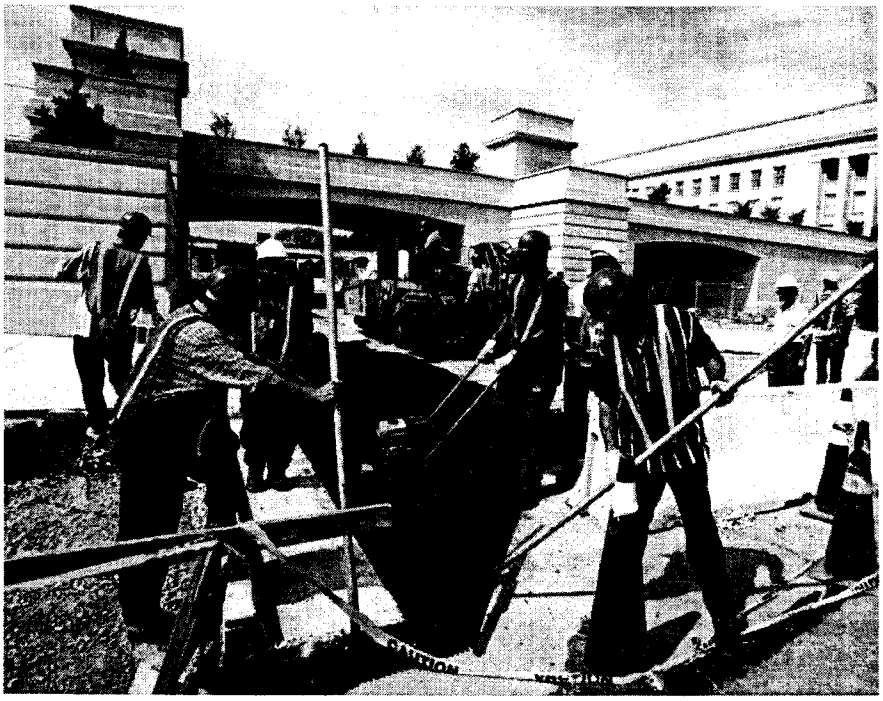
The South Terrace Pedestrian Bridges Project includes two pedestrian bridges over Rotary Drive, renovation of the loading dock, and connection to the 2nd Floor of the Pentagon at Corridors 2 and 3. The main purpose of the project is to provide separation of vehicular and pedestrian access while easing traffic congestion along Rotary Drive. The bridges also serve to bring all pedestrians into and out of the Pentagon on the second floor, which will be the standard for all Pentagon entrances whenever possible. The first of two bridges was completed in December 1999. The second bridge, and connecting bus stop wall, was substantially completed in December 2000.



The South Terrace Pedestrian Bridges Project was selected by the National Capital Chapter of the Construction Management Association of America as a Project of the Year Award Winner for 2000.

A five-phased construction plan was conceived for the South Terrace. Phases 1-3 included the Corridor 2 bridge and lobby entrance, new dockmaster offices, and the renovation of the eastern half of the existing South Terrace loading dock. Phases 4 and 5 include the bridge at the Corridor 3 building entrance and the bus stop wall connecting the two bridges, which also provides a visual and security barrier to the loading dock operation.

Due to the construction of the new Remote Delivery Facility, only the eastern half of the existing South Loading Dock was renovated. The western half was converted into occupiable tenant space.



Workers pave the roadway that runs under the new South Terrace Pedestrian Bridges.

Concrete is placed and finished along a new "kiss-and-drop" area near the South Terrace Pedestrian Bridge at Corridor 2.

MOVE-OUT

The dockmaster moved from the Corridor 2 side of the loading dock in late October 1998, and operated at the Corridor 3 side during renovation of the Corridor 2 side. The dockmaster then moved back to the Corridor 2 side when it was completed in December 1999. Approximately 20 administrative and 50-80 dock personnel were involved in the relocation.

TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING, COMMUNICATIONS

Temporary utilities were provided to the Wedge 1 dock operation while the Corridor 2 side of the dock was being renovated. Permanent utilities have been installed and are in operation on the Corridor 2 side, while all existing utilities at the loading dock near Corridor 3 have been cut. New permanent utilities should be completed at the Corridor 3 side of the dock by July 2001.

South Terrace project engineers inspect construction activity along the new bus stops between the Corridor 2 and 3 bridges.

DEMOLITION AND ABATEMENT

Demolition and abatement work was completed at the Corridor 2 side of the dock in March 1999 and at the Corridor 3 side in December 1999.

CORE AND SHELL

The Corridor 2 side of the loading dock core and shell construction was completed in September 1999. The Corridor 3 work has been deleted from the South Terrace contract.

TENANT FIT-OUT

Tenant fit-out in the Corridor 2 side of the loading dock office areas was substantially completed during November 1999.

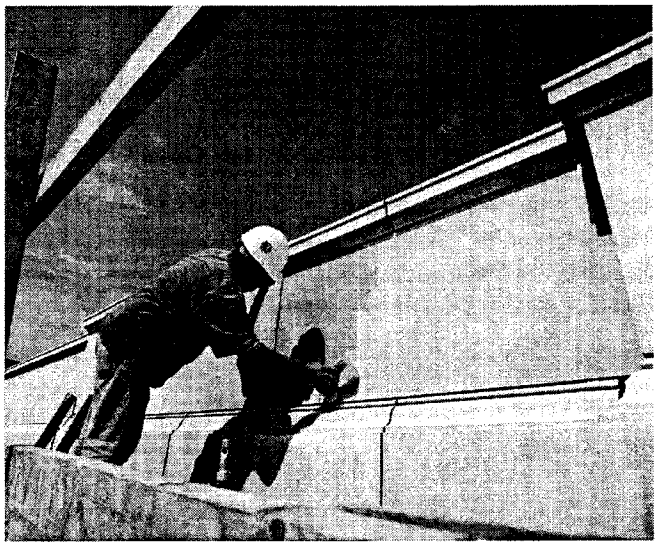
INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

IM&T work in the Corridor 2 side of the loading dock office areas was substantially completed during November 1999. The IM&T work for the Corridor 3 side of the loading dock office areas was deleted from the South Terrace contract and added to the Wedge 1 contract.

FURNITURE, FIXTURES, AND EQUIPMENT

This phase of renovation does not apply to the South Terrace project.

Workers align a new bus stop canopy along the South Terrace.



A worker washes new limestone on the South Terrace Pedestrian Bridge at Corridor 3. Limestone for the bridge project was obtained from the same Indiana quarry that provided the Pentagon its limestone in 1942 to ensure a close match of texture and color with the existing facade.

Concrete is "sculpted" on the outer face of the South Terrace Pestrian Bridge at Corridor 3 to match the architectural molding of the Pentagon.

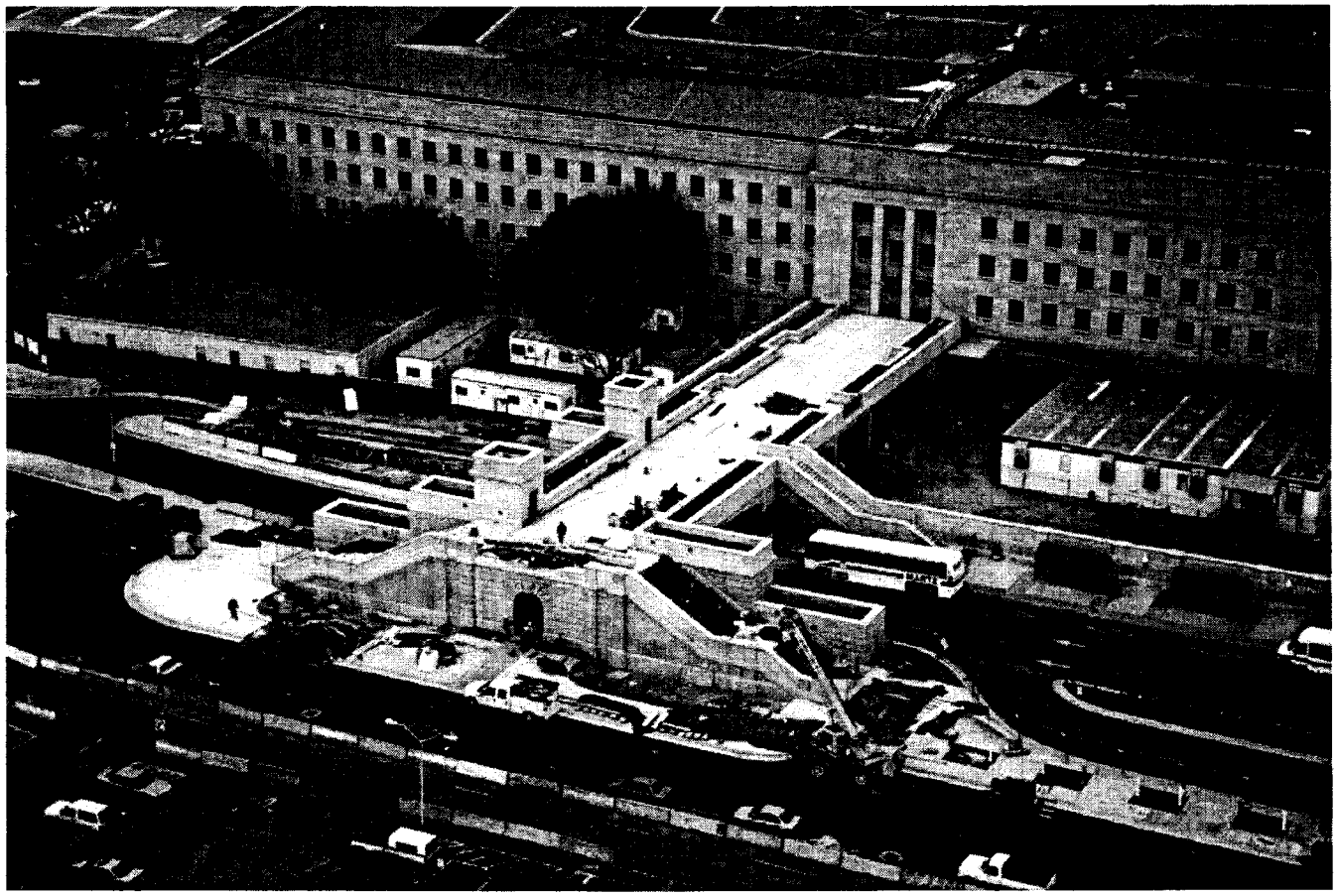
SECURITY

Pedestrian safety and building security were the main reasons for the construction of the pedestrian bridges. Security in the Corridor 2 perimeter areas was substantially completed during December 1999. The Corridor 3 scope of work was deleted from the South Terrace contract and added to the Wedge 1 contract.

COMMISSIONING

Commissioning of the Corridor 2 office areas was substantially completed during December 1999. Commissioning of Phases 4 and 5 was completed in January 2001.

The South Terrace Pedestrian Bridges provide safe access to and from the Pentagon for the 7,000 personnel that use the South Parking Lot each day. The bridges minimize pedestrian and vehicular conflicts and greatly improve traffic flow during rush hours.



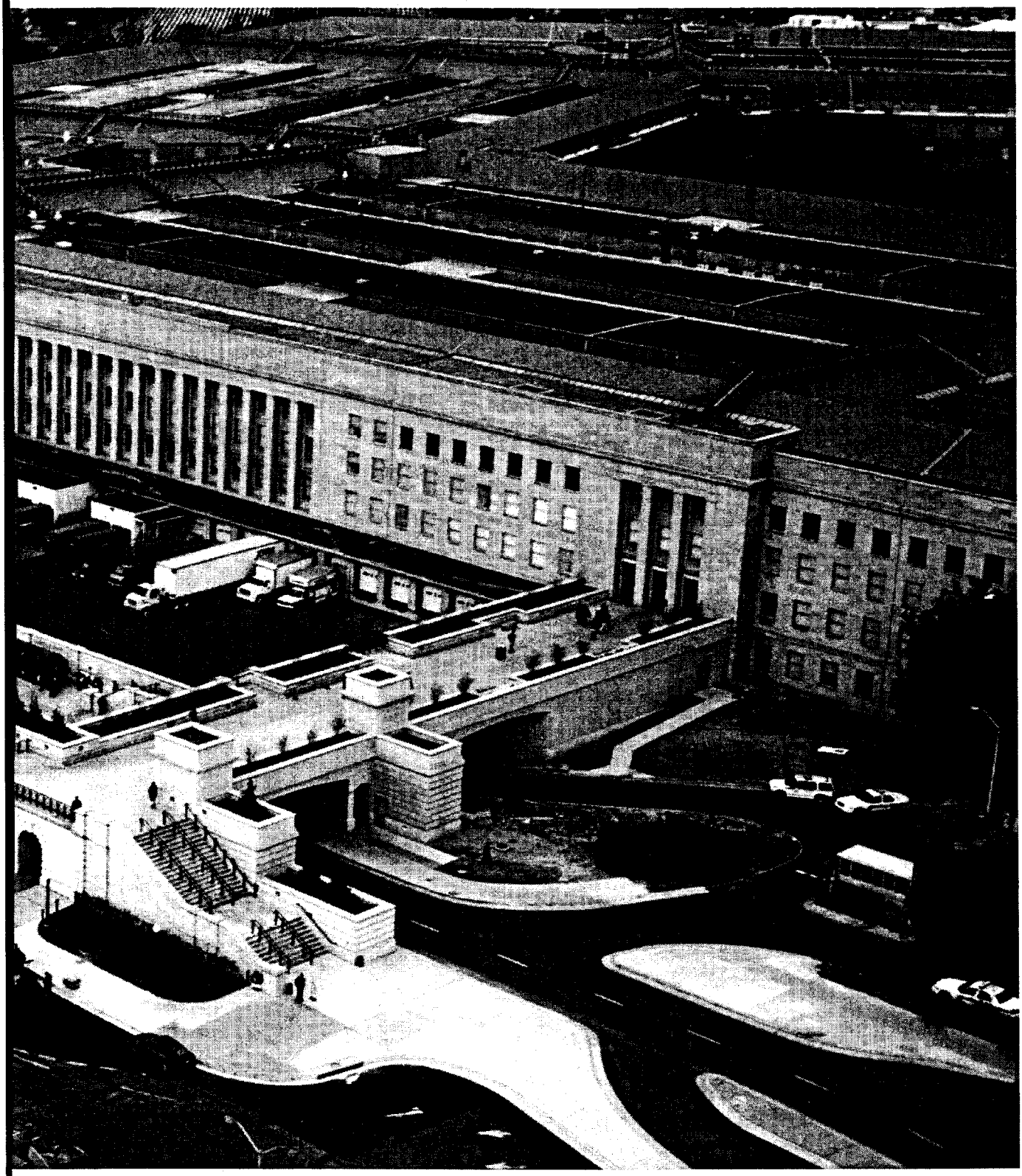
The South Terrace Pedestrian Bridge at Corridor 3 was nearing completion in January 2001. Wedge 1 tenants can use the bridge for safe and convenient access to South Parking when the wedge is completed in the Fall of 2001.

MOVE-IN

The Dockmaster moved into the newly completed loading dock area between Corridors 2 and 3 in January 2000. Rotary Road bus pick-up and drop-off lanes were completed in September 2000. The Corridor 3 pedestrian bridge was completed in December 2000 and will open upon completion of Wedge 1.

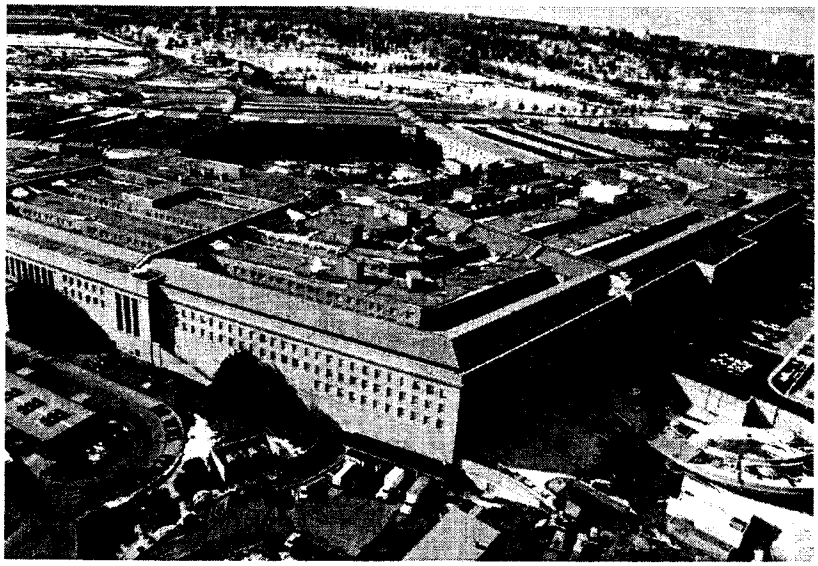
The South Terrace Pedestrian Bridge at Corridor 2 brings people into the Pentagon on the second floor, the main floor for circulation around around the building.

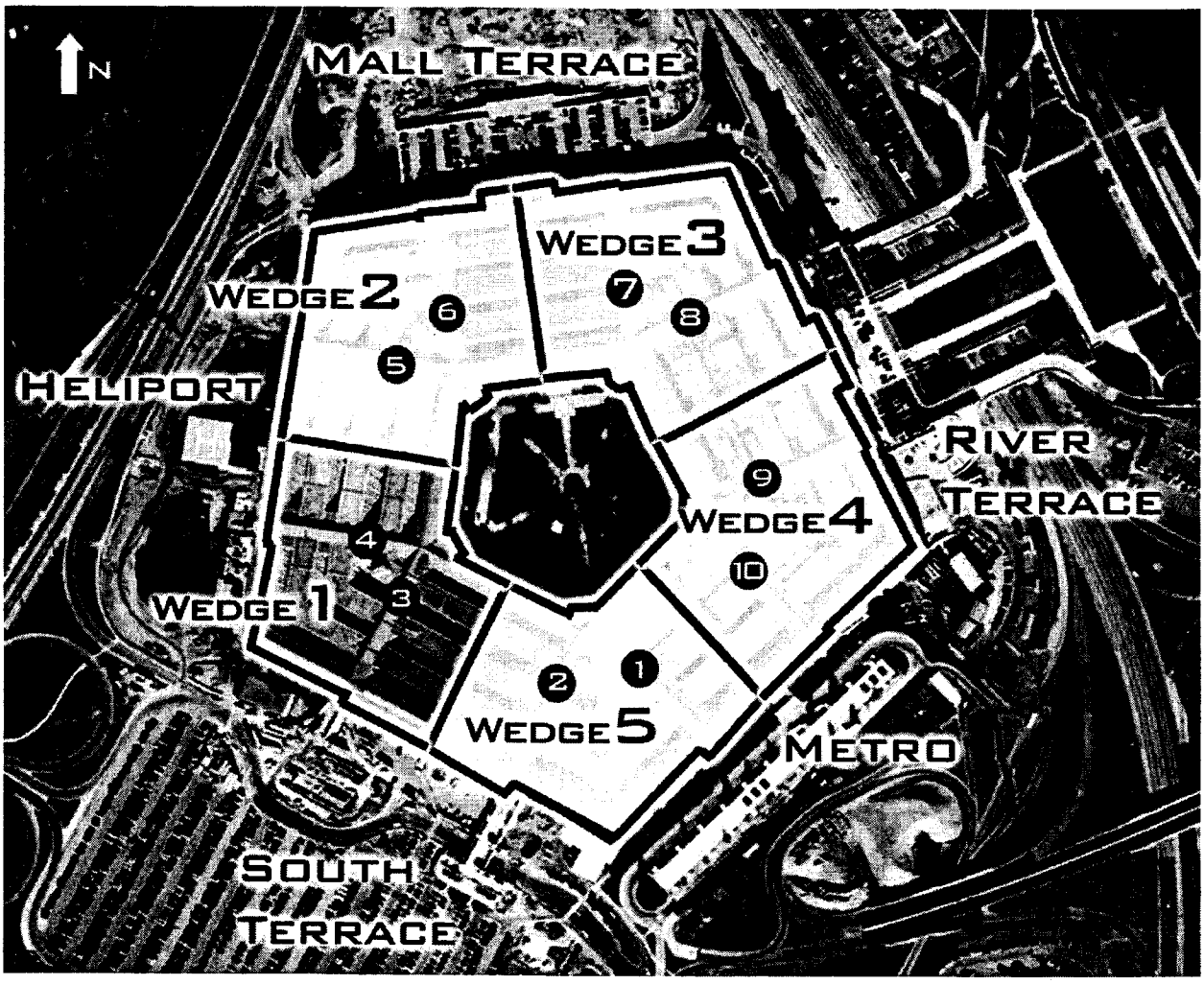
Aerial from January 2001 of the entire South Terrace Pedestrian Bridge Project. Two pedestrian bridges, bus canopies and a new



kiss-and-drop lane mark the key features of the project. Two elevators in each bridge provide access for persons with disabilities.

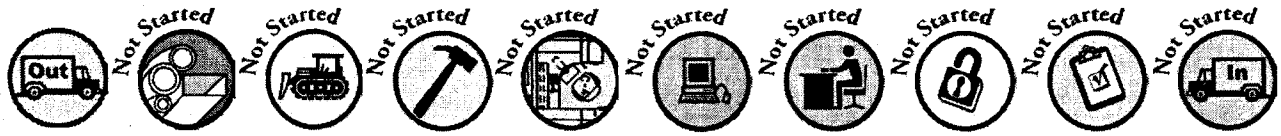
Aerial view of the Pentagon at the corner of the Metro (left) and River Terrace (right) facades. The point marks the center of Wedge 4.





Wedges 2-5 Locator

WEDGES 2-5



FLOORS 1-5

Wedges 2 through 5 (all five floors) are currently being planned as a single acquisition, with phased construction. The approved acquisition strategy will utilize a design-build project delivery method with performance based criteria. The objective is to realize cost savings with one prime design-build team through the benefits of a true partnering environment by minimizing the learning curve on each wedge. The Pentagon Renovation's primary schedule risks are working around and moving tenants to accomplish construction. The design-build team's input during design will be instrumental in providing a truly constructable and coordinated solution. The project also includes providing utilities for future occupation of the Pentagon's basement and mezzanine which will be sequenced with the work in the wedges above.

Construction will be phased, with completion scheduled one wedge at a time. Phasing includes:

- Moving tenants from Wedge 2 into Wedge 1, Wedge 3 into Wedge 2, etc.
- Installing temporary utilities needed to keep the other wedges and basement operational
- Demolition and abatement
- Core and shell construction
- Tenant fit-out construction
- Move in.

The use of one design-build team will help to identify and plan work in portions of other wedges and the basement and mezzanine. Potentially, this will result in schedule and budget improvements.

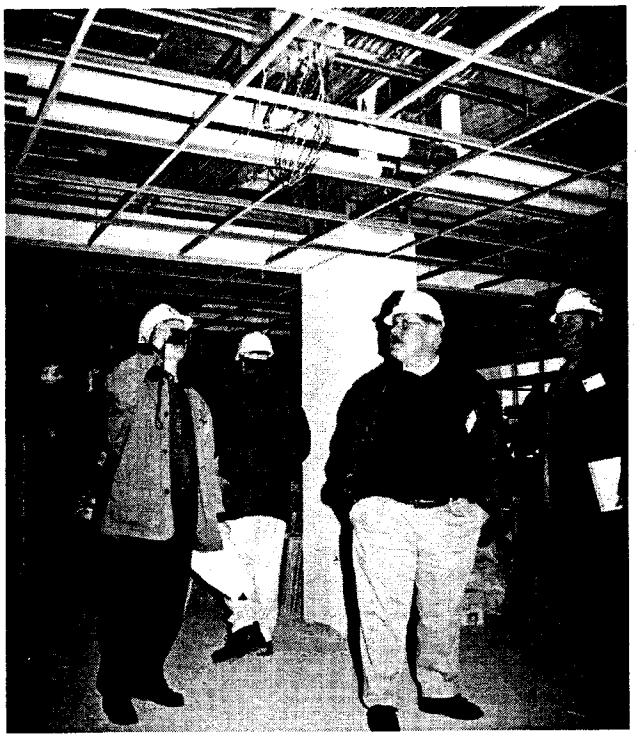
Wedge 2-5 Highlights

- 4,500,000 gross square feet of building space
- 20,000 people occupy Wedges 2-5, requiring 20,000+ moves
- 5,000 tenants to be coordinated/relocated during each phase
- Communication connectivity required for relocated tenants
- Design-build project delivery method planned
- Temporary utilities required for each phase to maintain existing building services
- Providing utilities for future occupiable use of Basement/Mezzanine
- Demolition/abatement removal estimates:
  -332 million pounds of debris
  -115 million pounds of hazardous material
  -Goal of 70% material to be recycled
- New building elements:
  - energy saving building elements/materials
  - elevators/escalators
  - automated building control systems
  - thermal insulated and blast resistant windows
  - security upgrades
  - Building code and ADA compliance
- Relocation and build-out of Defense Secretaries/Operation centers
- Relocation and planning for food service and retail building functions

The Wedge 2-5 team has developed the project's performance criteria to reflect the Program's Back-to-Basics goals. The use of performance criteria enable the Program to capture requirements without dictating the solution, thus allowing the successful offeror freedom to meet those requirements as efficiently as possible. As a comparison, the Wedge 1 designs, drawings, and specifications totalled over 3,500 pages, while the technical performance criteria for Wedges 2 through 5 total only 16 pages. As an example, instead of requiring that a bathroom be constructed using ceramic tile, and then providing extensive specifications and drawings to depict and control the design and construction, performance criteria describe the characteristics we seek. For bathroom construction, the finish material chosen should be durable, sanitary, easy to maintain, and cost-effective over the life cycle of the facility. Choice of materials and their design is left up to the contractor, but must meet our performance criteria. This effort became part of the project's "criteria package" which will be used to obtain design-build team proposals. One of the challenges the team faces is to reduce first costs (construction cost) to meet the Renovation's congressionally mandated budget, or "cap cost", while attempting to minimize the life-cycle cost of operating the Pentagon in future years. Reducing first costs may not always provide an efficient and cost-effective solution for reducing future building operational expenses, which in the end, could increase the taxpayer's burden by increased energy or maintenance expenses. However, in our efforts to meet the Pentagon Renovation's cap cost, the first cost reduction approach is a controlling criteria, used in conjunction with other Program requirements.

Aerial view of the Mall Terrace, which lies at the midpoint between Wedges 2 and 3.

The Wedge 2-5 acquisition approach is using two-phased design-build procurement procedures in accordance with Federal Acquisition Regulation 36.3. Phase I is the Request for Qualifications leading to the establishment of a pool of contractors to compete in Phase II. This was completed in July 2000 with the selection of three design-build teams. Phase II is the Request for Proposals leading to contract award, currently planned for the summer of FY 2001. The start of actual construction for the first portion of the next renovation phase (Wedge 2) is directly tied to the completion of Wedge 1.



Members from one of the three design-build teams competing for the Wedges 2 through 5 contract inspect construction progress in Wedge 1.

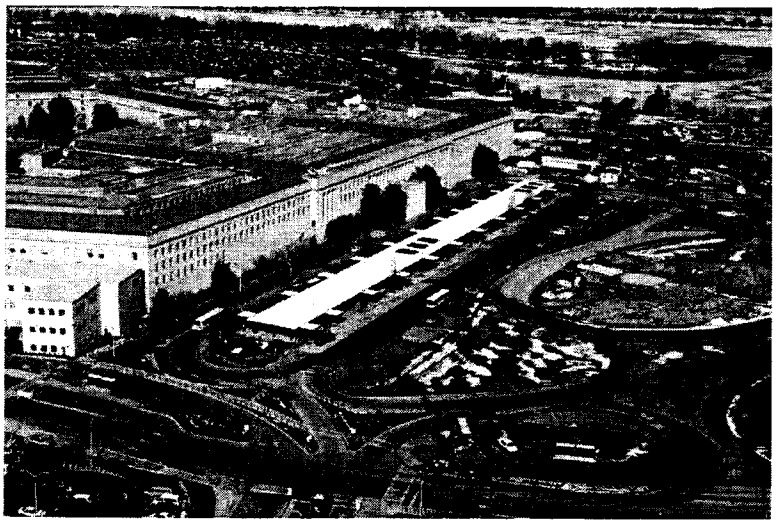
MOVE-OUT

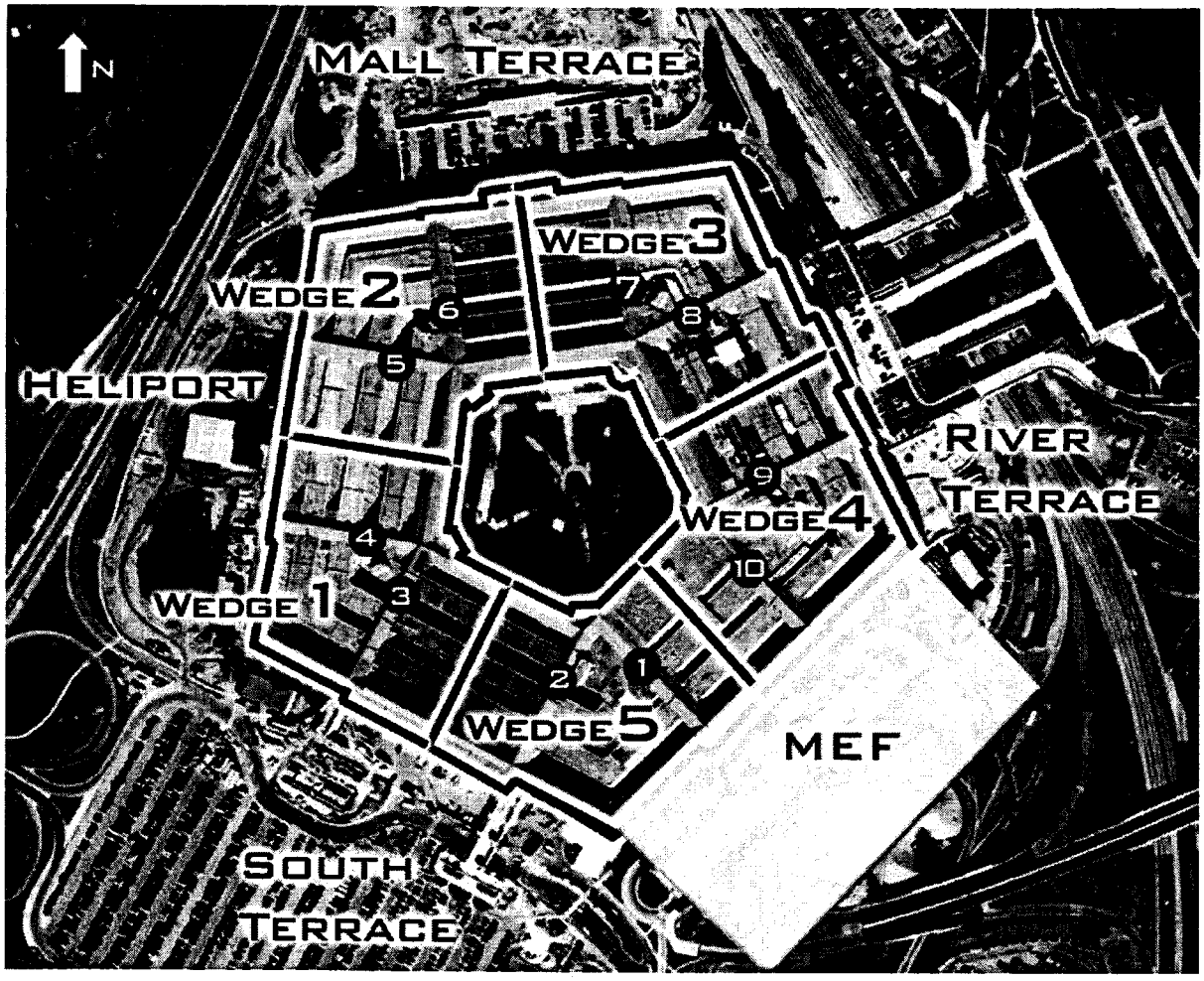
Tenants began to vacate Wedge 2 and relocate into the renovated Wedge 1 offices in February 2000. Temporary utilities and demolition and abatement will start immediately after the wedge is vacated and a design-build team has been selected.

Like all areas in the Pentagon, due the presence of asbestos and other hazardous materials, even the well-appointed Bradley Corridor along the E-ring near Corridor 8 will have to be demolished during the course of renovation.

Replication of the Pentagon's Hall of Heroes and other ceremonial display areas will present challenges for the Renovation Program.

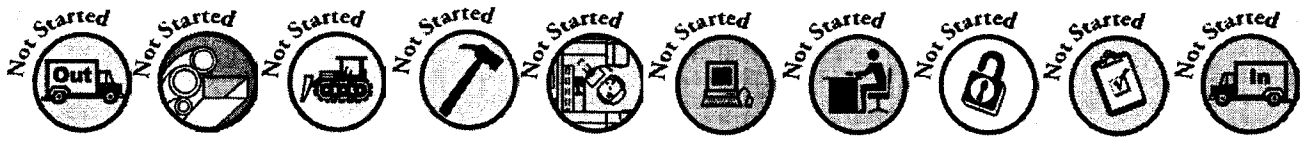
Aerial view of the Pentagon Metro Entrance shows the confusing road patterns that often result in pedestrian and vehicular conflicts.



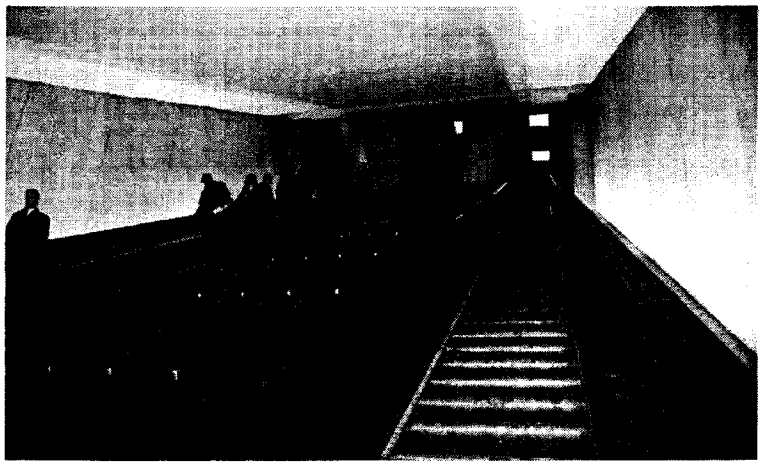


Metro Entrance Facility Locator

METRO ENTRANCE FACILITY



The Metro Entrance Facility project was directed by Congress in the FY2000 Department of Defense Appropriations Act in response to recent threat assessments that identified the need to improve the physical security of the Pentagon. These initiatives involve relocating the current bus station away from the face of the Pentagon and removing the existing direct entry into the building from the Metrorail station. Under the revised site configuration, all persons entering the Pentagon will be screened in a building addition that will serve as a public access control area. This addition will also house the Pentagon Tour Office and Badging Office.



View of the escalators leading from the Metro station and into the Pentagon. The top of the escalators are within the building perimeter.

The Metro Entrance Facility is of significant interest to the surrounding communities as 34,000 persons transit through the facility each day. Working closely with the Washington Metropolitan Area Transit Authority, members of Congress and their staffs, and the public, the Pentagon Renovation Program was able to address the concerns of the various interested parties and incorporate their needs into the design, while still meeting the Department of Defense security requirements. It is important to note that mass transit operations and access into the Pentagon will be maintained during all phases of the project.

The existing Metro bus loop allows vehicles to be within close proximity to the Pentagon and occupied office space. Current security initiatives require the loop to be relocated farther away from the building.

Although the Metro Entrance Facility is a new security related construction project not within the original scope of the Renovation Program, Congress has directed that the Metro Entrance Facility costs be tracked within the Renovation Program's Congressional cap.

The Metro Entrance Facility project manager uses a model to explain features of the new canopy design for the bus loop.

Due to the phasing of construction, necessary to keep the current facility operational and the Pentagon accessible, the renovation sequence for the Metro Entrance Facility project will be done slightly out of order. For example, the temporary mechanical, electrical, plumbing and communications lines will need to be in place for bus facility to remain operational long before any of the tenants need to move out of their offices in the Pentagon, which will not be affected until construction begins on the building addition.

Not Started

MOVE-OUT

Once the new bus loop is completed in November 2001, all bus operations will be transferred overnight to the new bus station to minimize disruption. This transfer will involve redirecting the 34,000 daily passengers to the new bus station. Move-out for Pentagon building occupants will involve approximately 25 personnel and will occur once the new building addition is completed in early FY 2003.

Not Started

TEMPORARY MECHANICAL, ELECTRICL, PLUMBING, AND COMMUNICATIONS

Temporary utilities for the Metro Entrance Facility project will be used to support the multiple phases of construction required to maintain mass transit operations and access into the Pentagon throughout construction. Additionally, given the nature of the construction and the high volume of traffic flowing through the facility each day, temporary barricades and walkways will be used extensively to protect facility users from the hazards associated with construction.

Members of the Metro Entrance Facility project team clarify the dimensions of project features at a recent coordination meeting with disability representatives in December 2000.

Not Started

DEMOLITION AND ABATEMENT

During FY 2001, demolition will be focused on site work associated with the construction of the new bus station. This work includes clearing the site, mass excavation, and decommissioning utilities. No abatement work is anticipated for this project.

Not Started

CORE AND SHELL

Construction of the new bus station will include the following features: two bus platforms and realigned roadways, a Metro sales office, and support spaces. Additionally, the Pentagon Renovation Program will provide the infrastructure to support future technologies.

Not Started

TENANT FIT-OUT

Tenant fit-out is not applicable to the new bus station but will occur during the construction of the building addition in FY 2002.

Not Started

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

IM&T work is not necessary for the bus ramps but the design-build contractor will provide infrastructure to support WMATA's telephone and data requirements. IM&T will be included in the new building addition in FY 2002.

METRO ENTRANCE FACILITY PHASING PLAN

The Metro Entrance Facility is the second project within the Pentagon Renovation Program to use a design-build project delivery system, where one single entity is responsible for the design and construction of the project.

Phase One

The entire facility design and construction of a taxi staging area, was awarded in September 2000.

Phase Two

The construction of the bus ramps and the building addition, was awarded in January 2001. During FY 2001, the Metro Entrance Facility design will be completed and the bus station will be constructed. Shortly after the end of FY 2001, all bus operations will be transferred to the bus ramps.

Phase Three

Following this transition, the Pentagon building addition and the interface zone between the Pentagon, Metrorail station exits, and the bus ramps will be constructed. Project completion is scheduled for early FY 2003.

Not Started

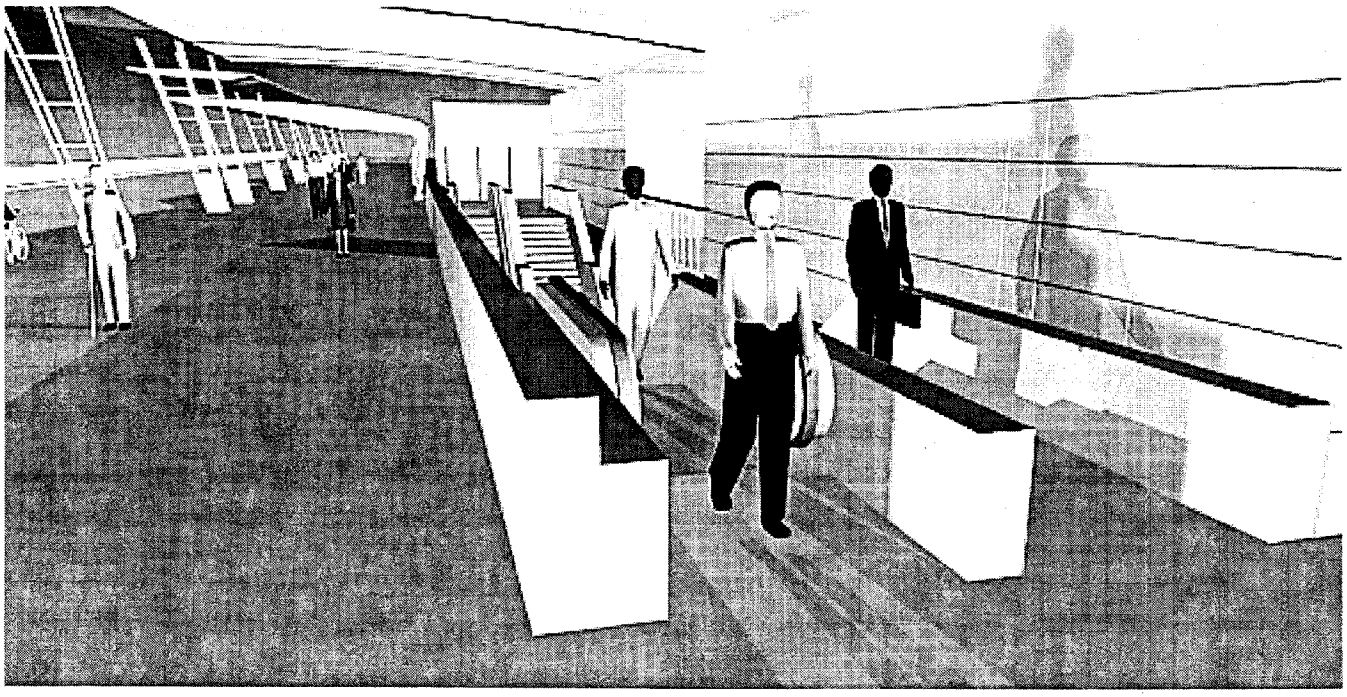
FURNITURE, FIXTURES, AND EQUIPMENT

Furniture, fixtures and equipment efforts are not applicable for the bus station but will be incorporated in the new building addition in FY 2002.

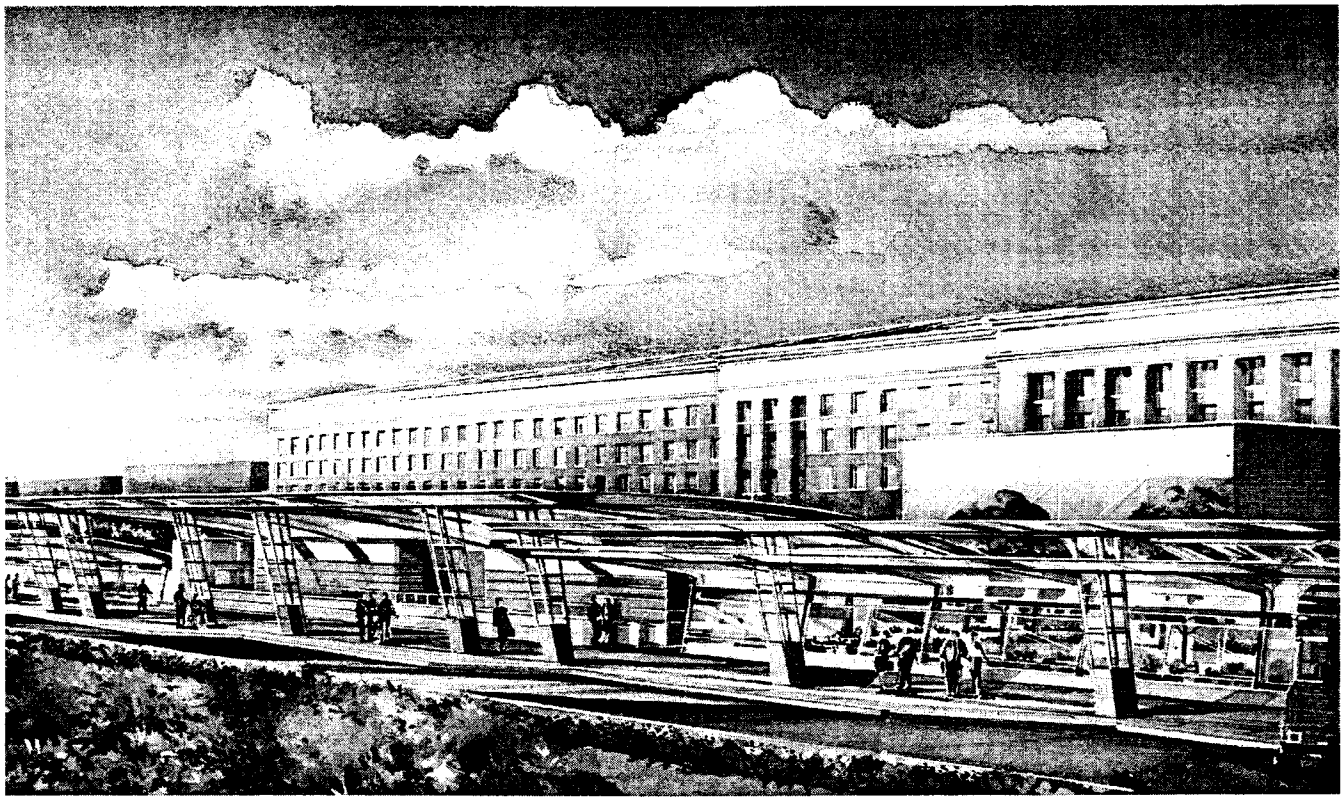
Not Started

SECURITY

Security is the driving factor behind the Metro Entrance Facility project. In addition to moving vehichular traffic away from the Pentagon and eliminating direct access to the building, the bus ramps will include security features such as increased lighting, closed circuit television monitoring, and emergency call stanchions.



A conceptual rendering of the escalators from the lower bus platfrom to the upper bus platform.at the new Metro Entrance Facility. The vertical transfer to the upper bus platform will be accomplished via two elevators, two escalators, or two stairwells.



A conceptual rendering of the completed Metro Entrance Facility.

Not Started

COMMISSIONING

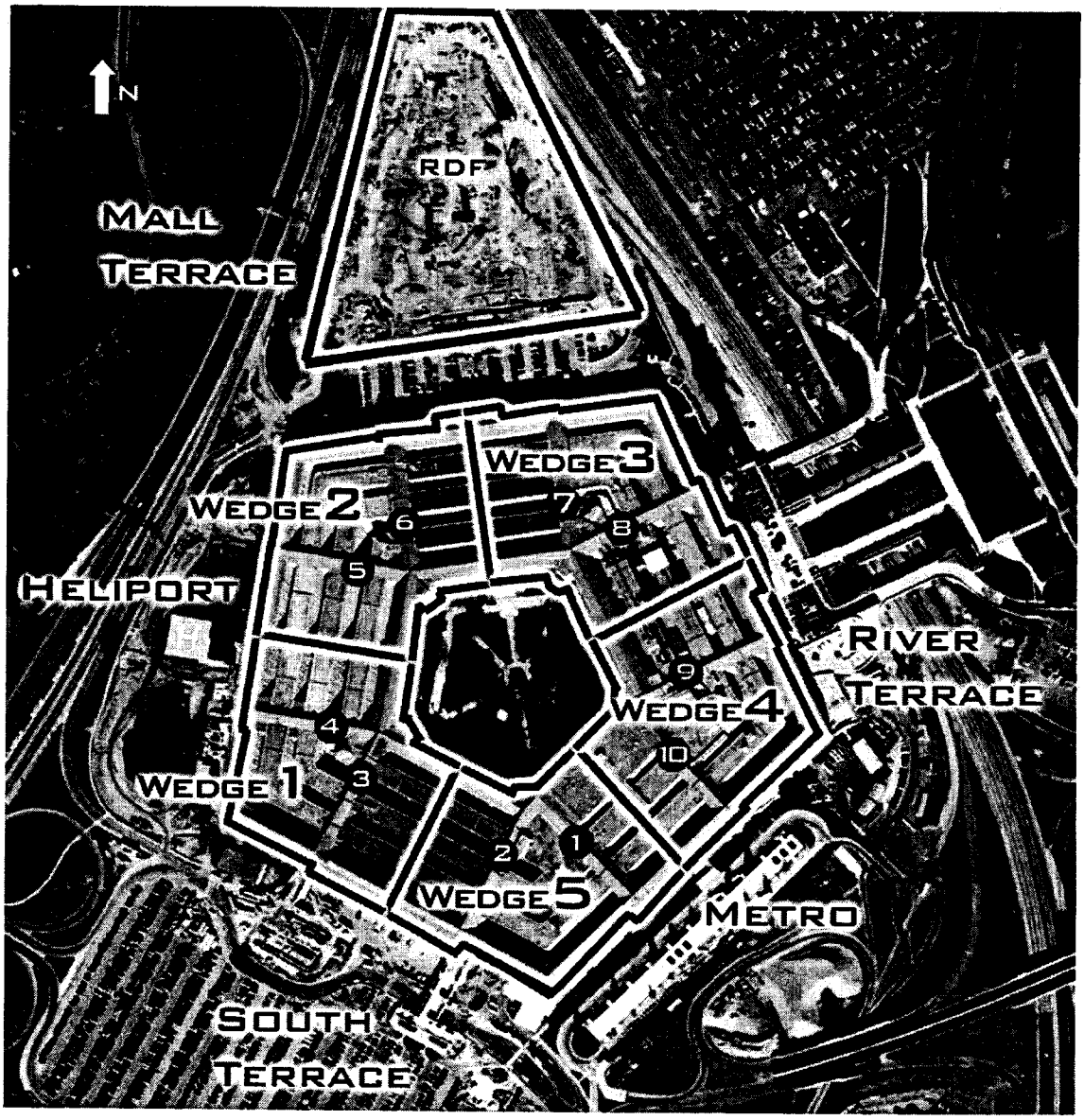
The commissioning of the Metro Entrance Facility will be accomplished through extensive multi-contractor coordination. The Pentagon's commissioning process will be used to facilitate turnover of the new bus station to Washington Metropolitan Area Transit Authority.

Not Started

MOVE-IN

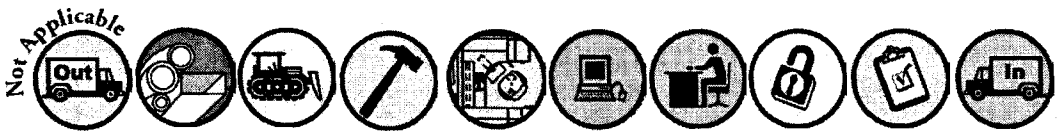
Once the new bus facility is completed in November 2001, all bus operations will be transferred overnight to the new bus station to minimize disruption. After the building addition is completed in early FY 2003, the Defense Protective Service security screening personnel, the Badging Office and the Tour Office will move in.

View looking east of the Pentagon's new Remote Delivery Facility.



Remote Delivery Facility Locator

ANCILLARY PROJECTS



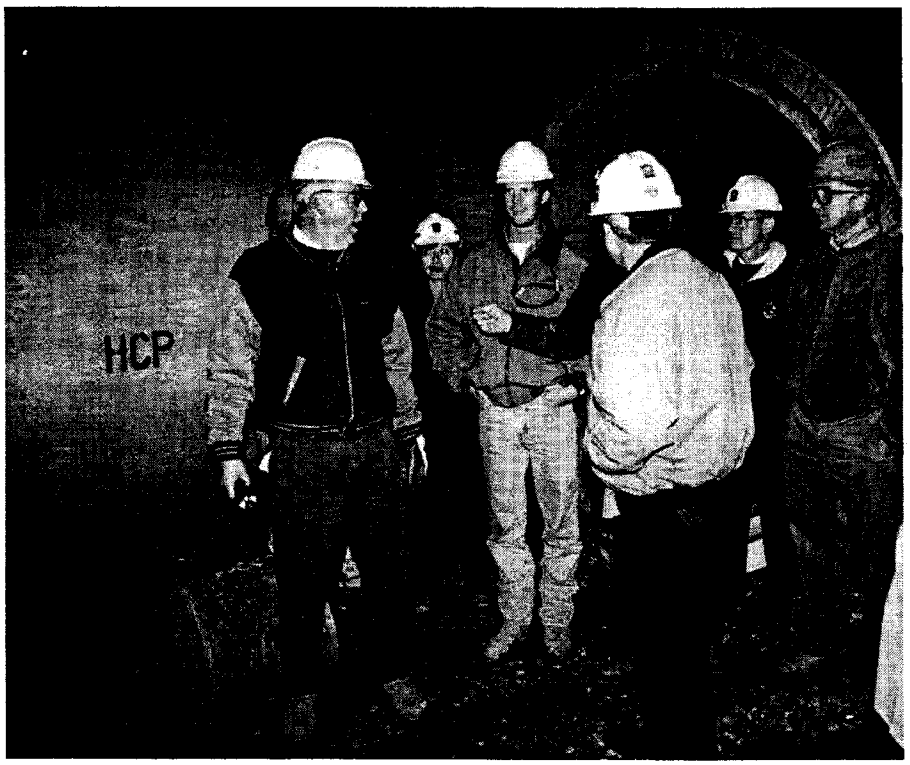
REMOTE DELIVERY FACILITY

The Remote Delivery Facility (RDF) is a new 250,000-square foot shipping and receiving facility adjoining the Pentagon. The RDF significantly improves the physical security of the Pentagon by providing a secure consolidated location for receiving and screening thousands of items shipped to the building each day. The new low profile facility, which connects to the Pentagon's Mall Terrace, includes thirty-eight loading docks, a material screening area, and associated material handling and security functions. Additionally, the facility will house the Pentagon's maintenance shops and other light industrial operations as well as a physical plant.

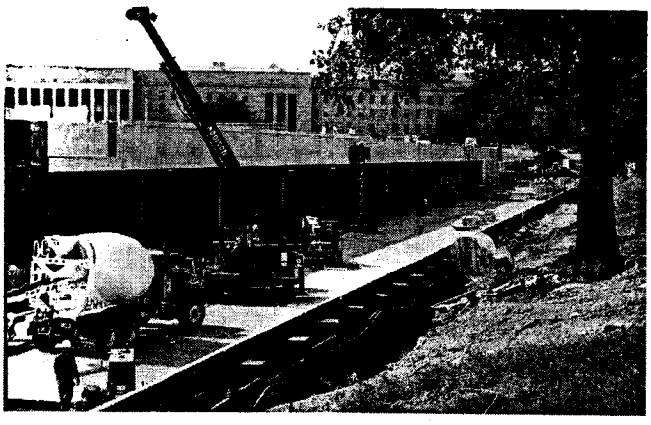
The RDF is the first major project to be accomplished at the Pentagon utilizing a design-build project delivery system. Following a highly competitive two-phase, best-value source selection, contract award was made in April 1999. The winning design exceeds established performance criteria and successfully integrates the building into the site through extensive use of berms and landscaping. The contract is structured such that the design-build team earns profit based only on its ability to earn award fee by exceeding pre-established performance standards and incentive fee by performing work efficiently.

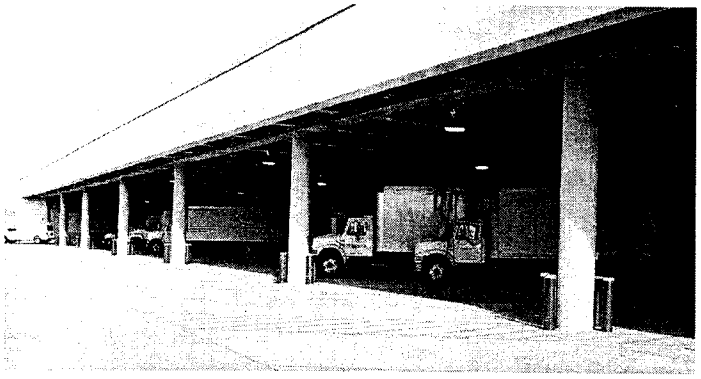
Design of the RDF was completed in December 1999 and construction is nearing completion. Phase 1, which includes the loading dock and screening operations area, was completed on schedule and opened for business on August 31, 2000. Phase 2 was completed on December 31, 2000. The project is on schedule and within budget. The last phase, the mission critical chilled water and power plant, will be completed in Summer 2001.

Note: Ancillary project costs are not reflected in capped cost tracking.



Members of the RDF team inspect work related to the connector tunnel adjoining the Remote Delivery Facility to the Pentagon's Mall Terrace.





MOVE-OUT

A tenant move-out was not necessary for this project.

TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING, AND COMMUNICATIONS

Foundation work and installation of major underground utilities began in August 1999 and was completed in June 2000.

DEMOLITION AND ABATEMENT

Before construction of the RDF could begin, the Mall Extension parking lot was demolished. By storing the excavated soil at sites around the Pentagon Reservation for later use instead of disposing of it off site, the Program saved over $1 million. Demolition was completed in June 1999.

From top to bottom, the photo sequence at left shows progress of the Remote Delivery Facility loading dock area during 2000. The design-build project opened precisely as scheduled on August 31, 2000.

CORE AND SHELL

Placement of structural floor slabs, columns, walls, and roof slabs was completed in July 2000.

TENANT FIT-OUT

The first phase was completed in August 2000 and the second phase was completed in December 2000.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

The first phase was completed in August 2000 and the second phase was completed in December 2000.

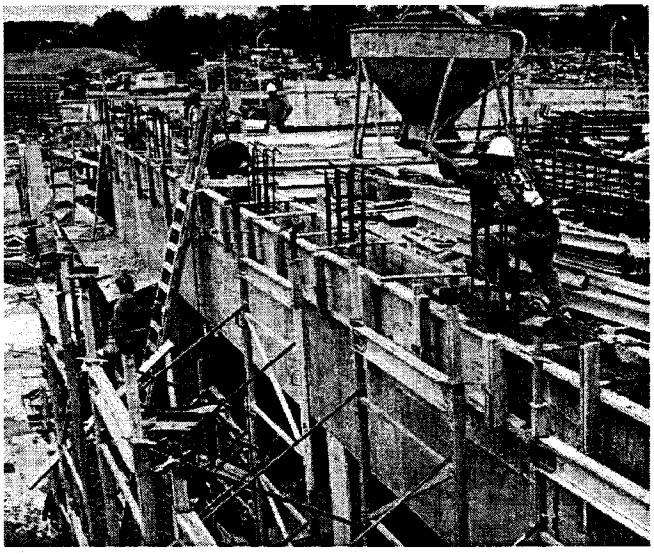
FURNITURE, FIXTURES, & EQUIPMENT

The first phase was completed in August 2000 and the second phase was completed in December 2000. Furniture requirements were minimal (116 workstations), however a large amount of security and maintenance shop equipment was installed in the new facility.

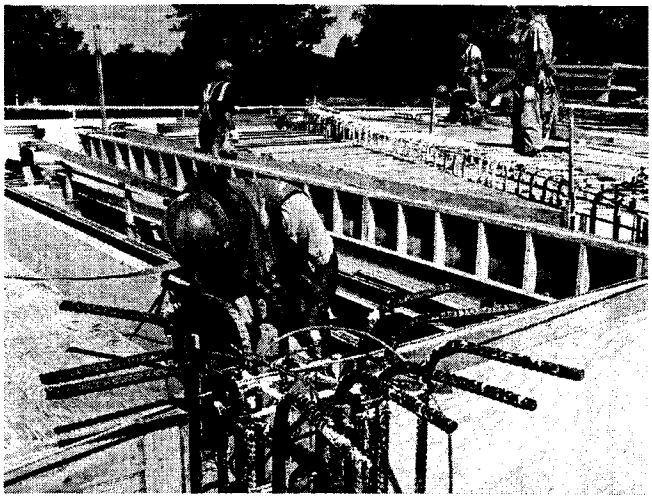
SECURITY

Security is the reason for the existence of the RDF. Careful attention has been paid to security needs and requirements throughout design and construction.

Workers secure a reinforced wall of the Remote Delivery Facility.



Workers place concrete on the roof of the Remote Delivery Facility.



Worker ties rebar for a structural column of the Remote Delivery Facility.

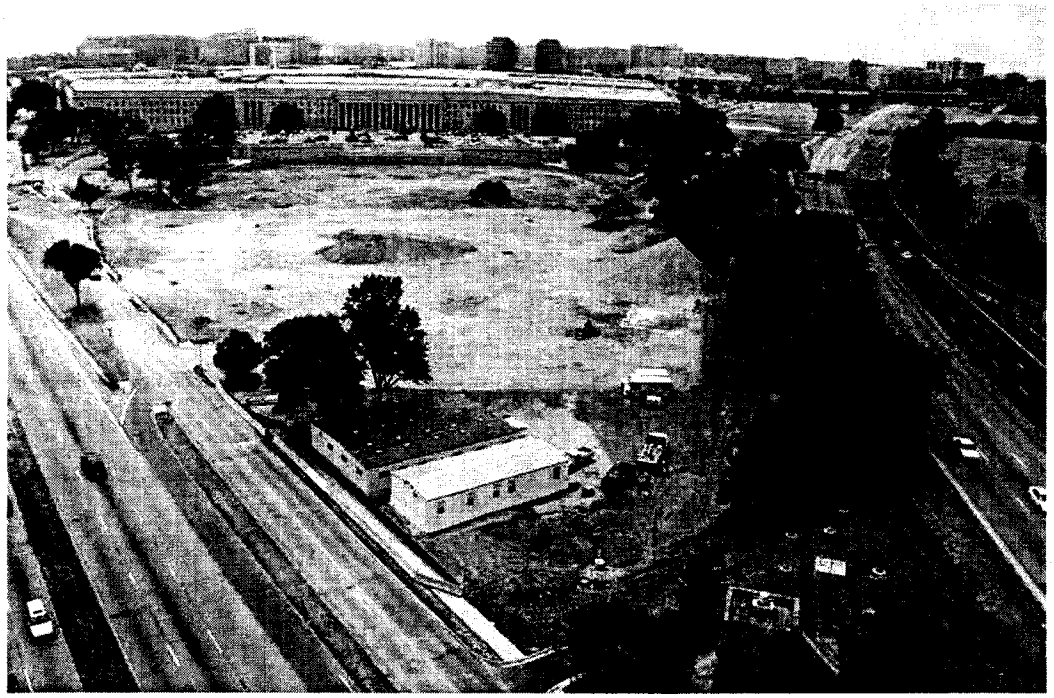
COMMISSIONING

The Remote Delivery Facility is the first project to completely integrate the commissioning process from the start of planning and design. Commissioning is currently in progress and will be completed by Summer 2001 with the completion of Phase 3.

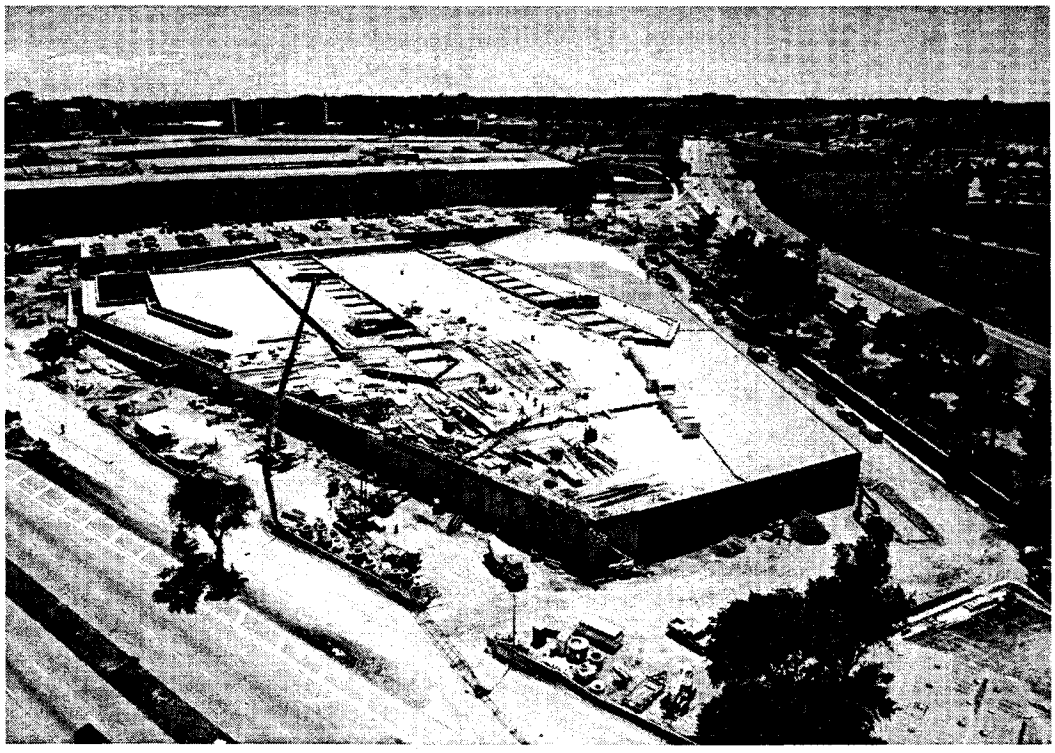
MOVE-IN

Move-ins occurred on schedule immediately following Phase 1 and Phase 2 completion. Defense Protective Service and Dockmaster personnel moved in and began material receiving and screening operations in August 2000. In January 2001, the remainder of the building with the exception of the physical plant was occupied by the Defense Post Office, Central U.S. Registry, Defense Courier Service, Diplomatic Courier, U.S. Post Service, Concessions Committee, and Federal Facilities personnel.

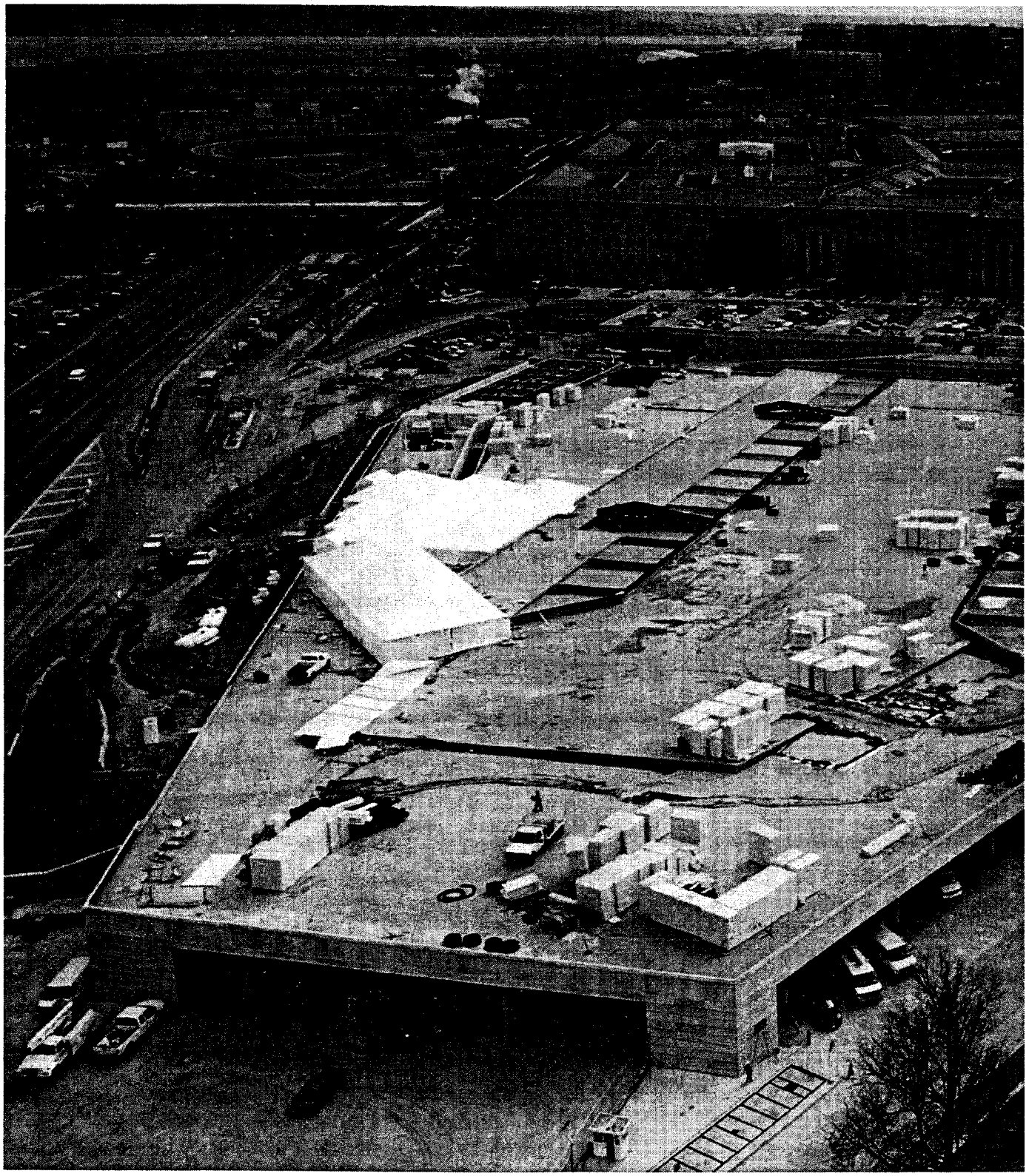
Worker finishes concrete slab on the roof of the Remote Delivery Facility.



Excavation for the Remote Delivery Facility began on May 17, 1999.

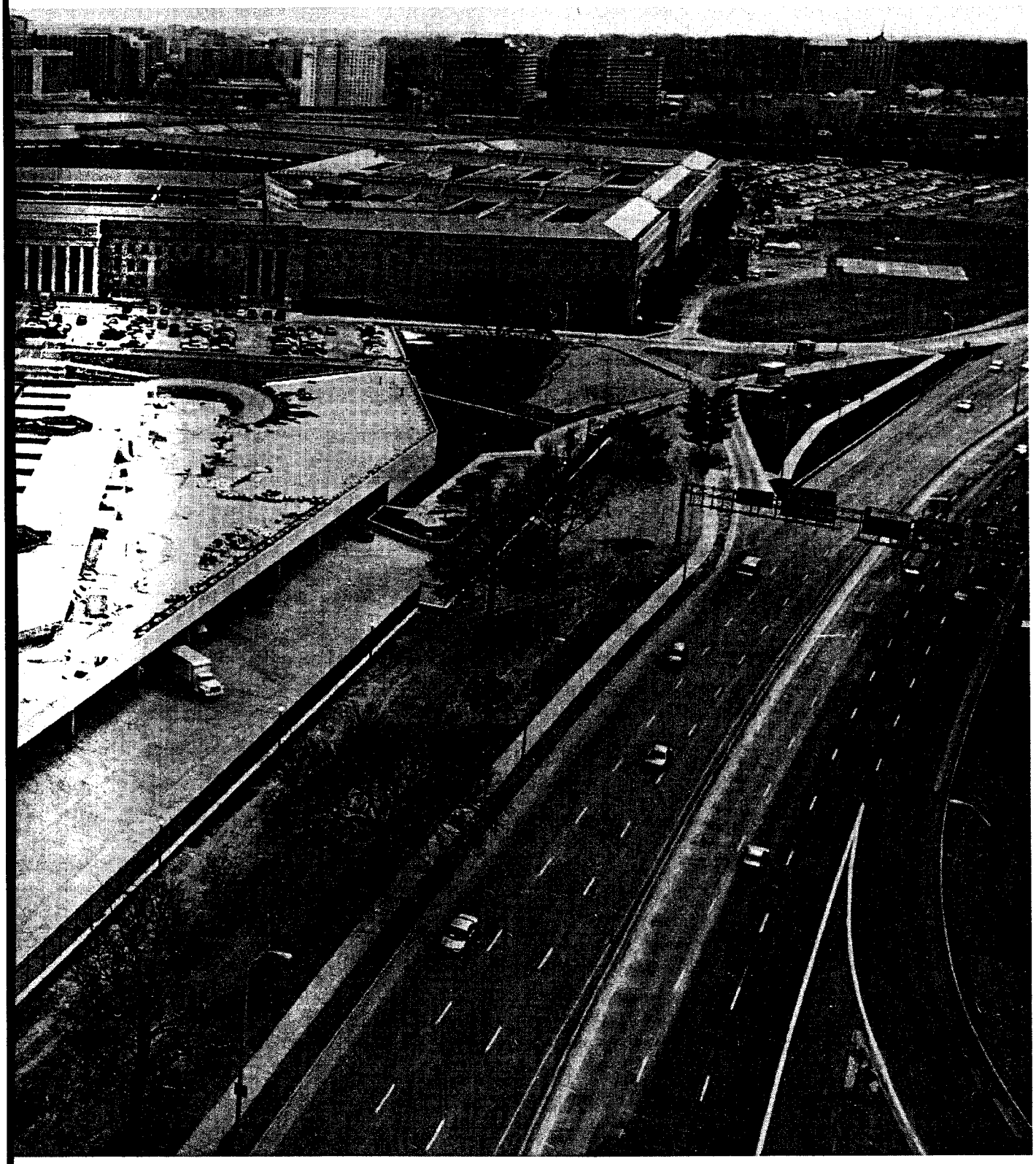


One year later, much of the exterior construction was completed.

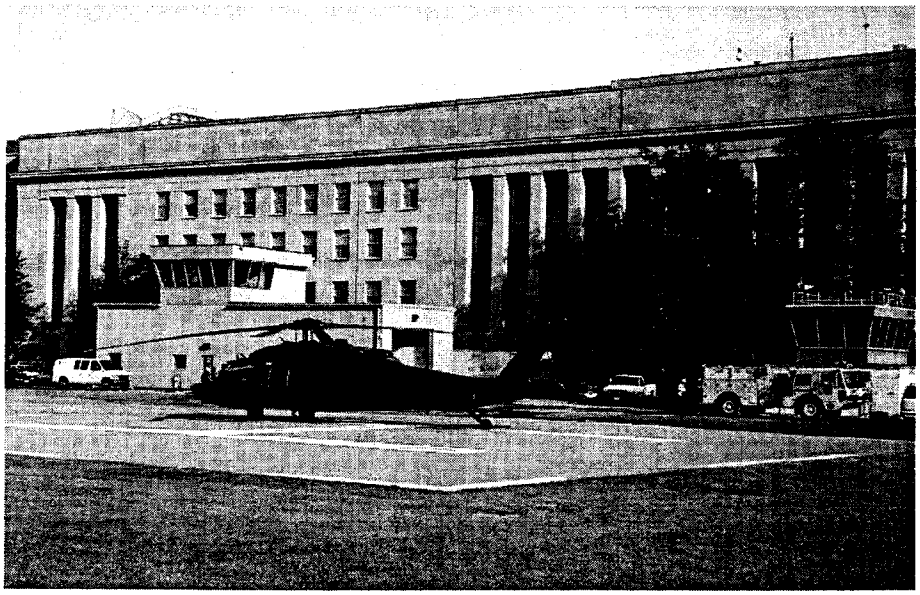


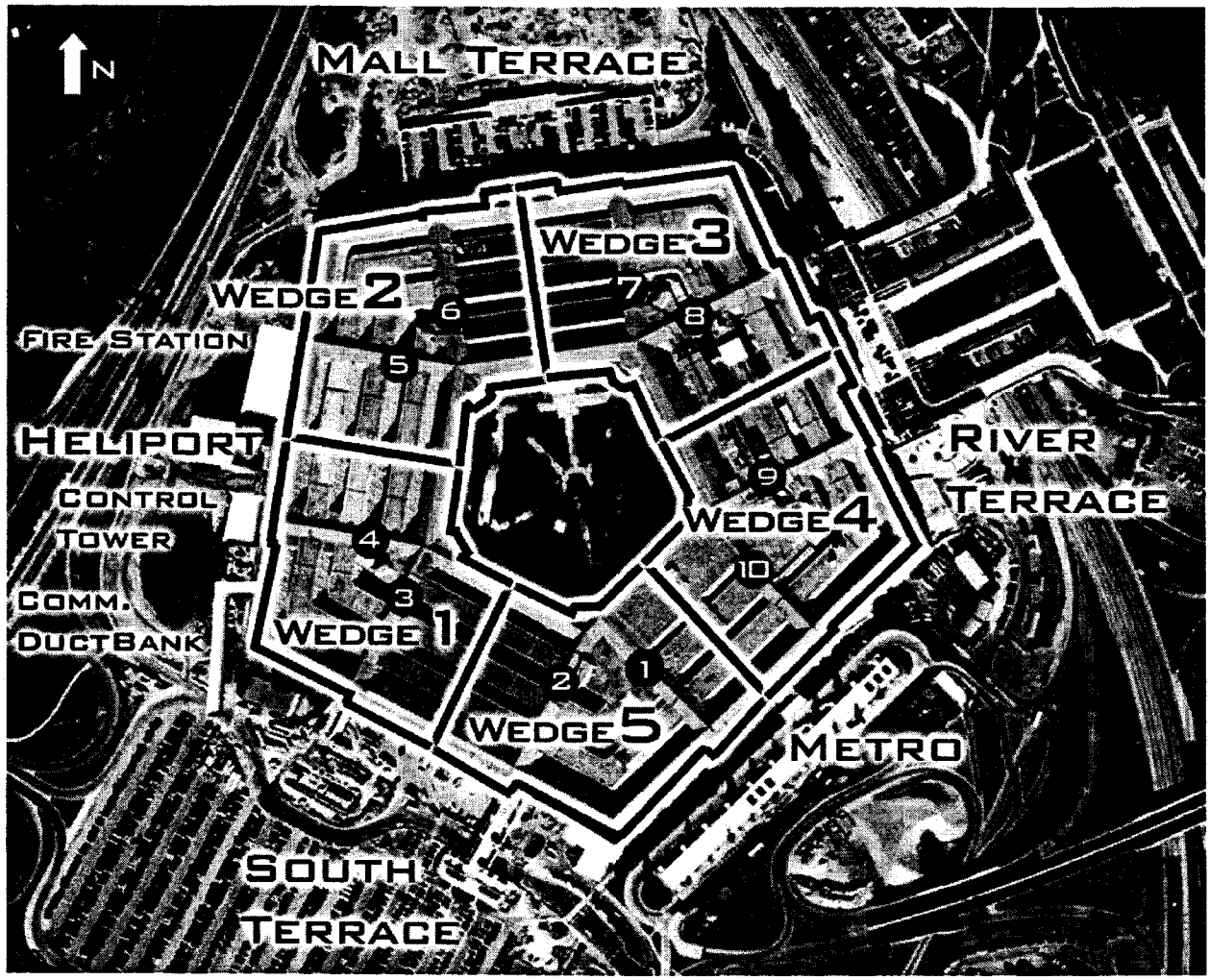
Aerial view of the Remote Delivery Facility taken in January 2001.

II. Work in Progress Ancillary Projects - Remote Delivery Facility



A helicopter sits in front of the Pentagon's new Heliport and Fire Station. To the right is the old Heliport which was demolished in January 2001.





Heliport Fire Station and Control Tower Locator

HELIPORT FIRE STATION AND CONTROL TOWER

On June 27, 2000 a design-build contract was awarded to a small and disadvantaged business, in the amount of $664,465. The contractor replaced the existing fire station and control tower with a single upgraded facility. The new building has expanded communications capabilities, an enlarged apparatus bay for the fire truck, and a day room for the fire fighters. New bathrooms, compliant with the Americans with Disabilities Act, and an enlarged control tower were also part of the upgrade. The building was completed on December 15, 2000 in order for the control tower operations to move in over the holiday shutdown.

Note: Ancillary project costs are not reflected in capped cost tracking.

HELIPORT HIGHLIGHTS:

- Design-build contract
- Small Disadvantaged Business contractor
- Communications upgrades
- New code compliant building replaced two outdated facilities
- Life-safety improvements

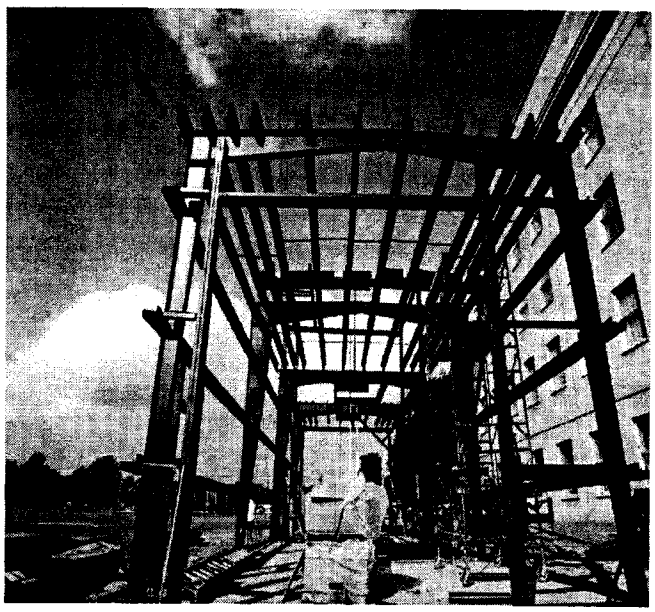
MOVE-OUT

Three firefighters moved from the old fire station on September 13, 2000.

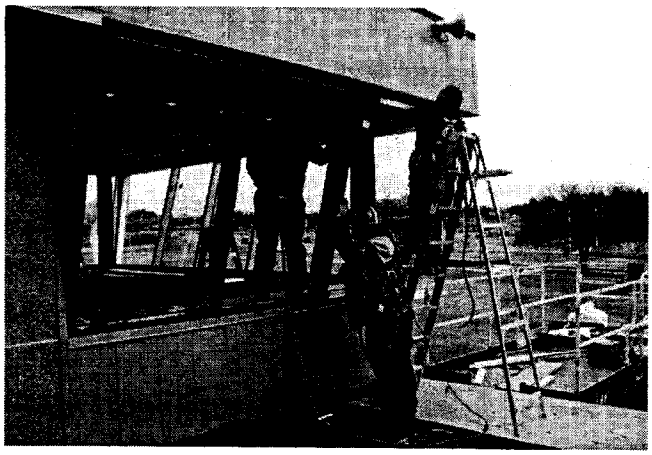
TEMPORARY MECHANICAL, ELECTRICAL, PLUMBING, AND COMMUNICATIONS

Temporary power was provided for the aircraft warning lights. No other temporary utilities were necessary.

Constructed in just five months, the Pentagon's new Heliport/ Fire Station and Control Tower (at right) became fully operational in January 2001.



Steel framework goes up for the new Heliport /Fire Station and Control Tower.



Window installation at the Heliport Traffic Control Tower.

DEMOLITION AND ABATEMENT

The old fire station building was demolished in September. It took 10 days and included a small amount of asbestos removal. The control tower was demolished in January and also took 10 days with some asbestos removal.

CORE AND SHELL

The building was designed and constructed for a specific tenant with a pre-defined mission. There was almost no division between the core and shell phase and the tenant fit-out phase.

TENANT FIT-OUT

The tenant fit-out phase required moving some existing furnishings.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)

The expansive IM&T effort was completed on December 22, 2000. It included the installation of new phone lines, and special crash circuits. New data hook-ups and cable television were installed. Radios were relocated to the new Consolidated Radio Room in Wedge 1. New antennas were placed on the Pentagon roof and voice-recording devices and wind sensors had to be relocated.

FURNITURE, FIXTURES, AND EQUIPMENT

Some desks and chairs were provided for the new control tower. Most of the existing furniture was moved into the new facility from the old control tower. This was all completed on December 19, 2000.

SECURITY

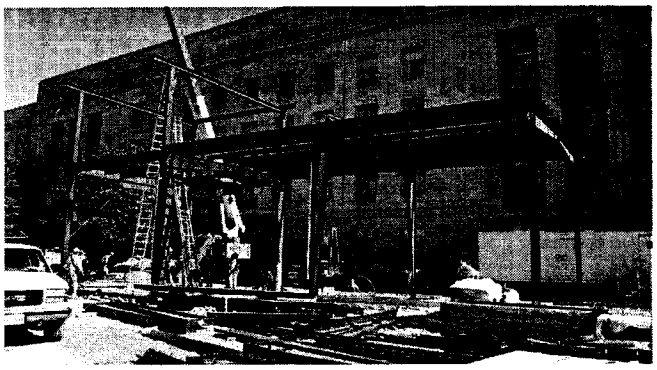
New cameras, monitors, card swipes, motion detectors, alarm systems and intercom systems were installed. The security phase was completed on December 20, 2000.

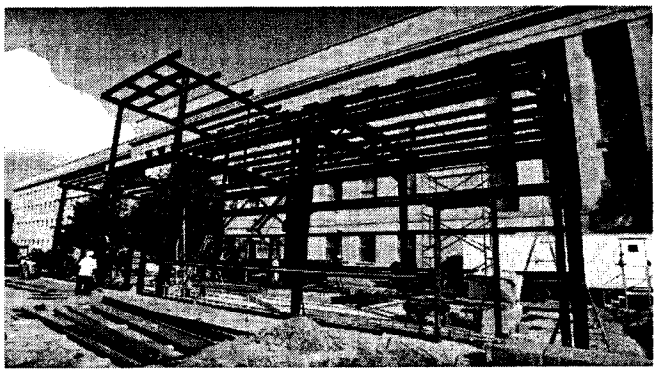
COMMISSIONING

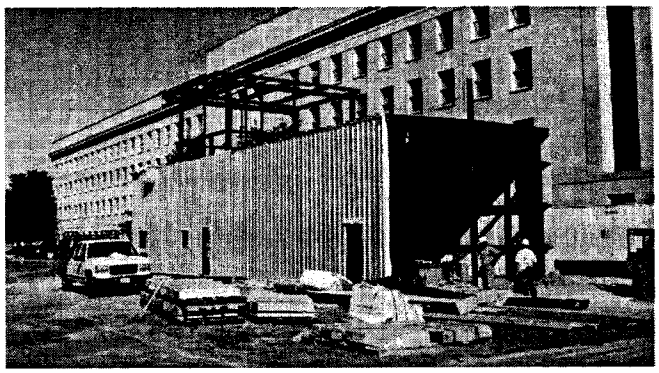
The commissioning of the new fire station and control tower took place December 15, 2000 and the radio commissioning took place on December 22, 2000. The personnel who now occupy this building were heavily involved in the commissioning process.

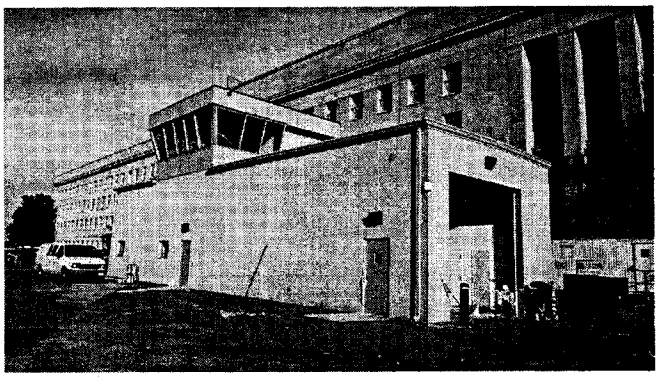
MOVE-IN

Three firefighters and three Air Traffic Controllers have moved into the new building.



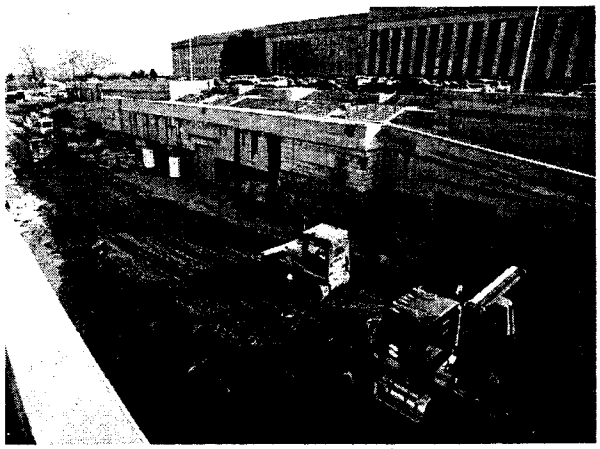


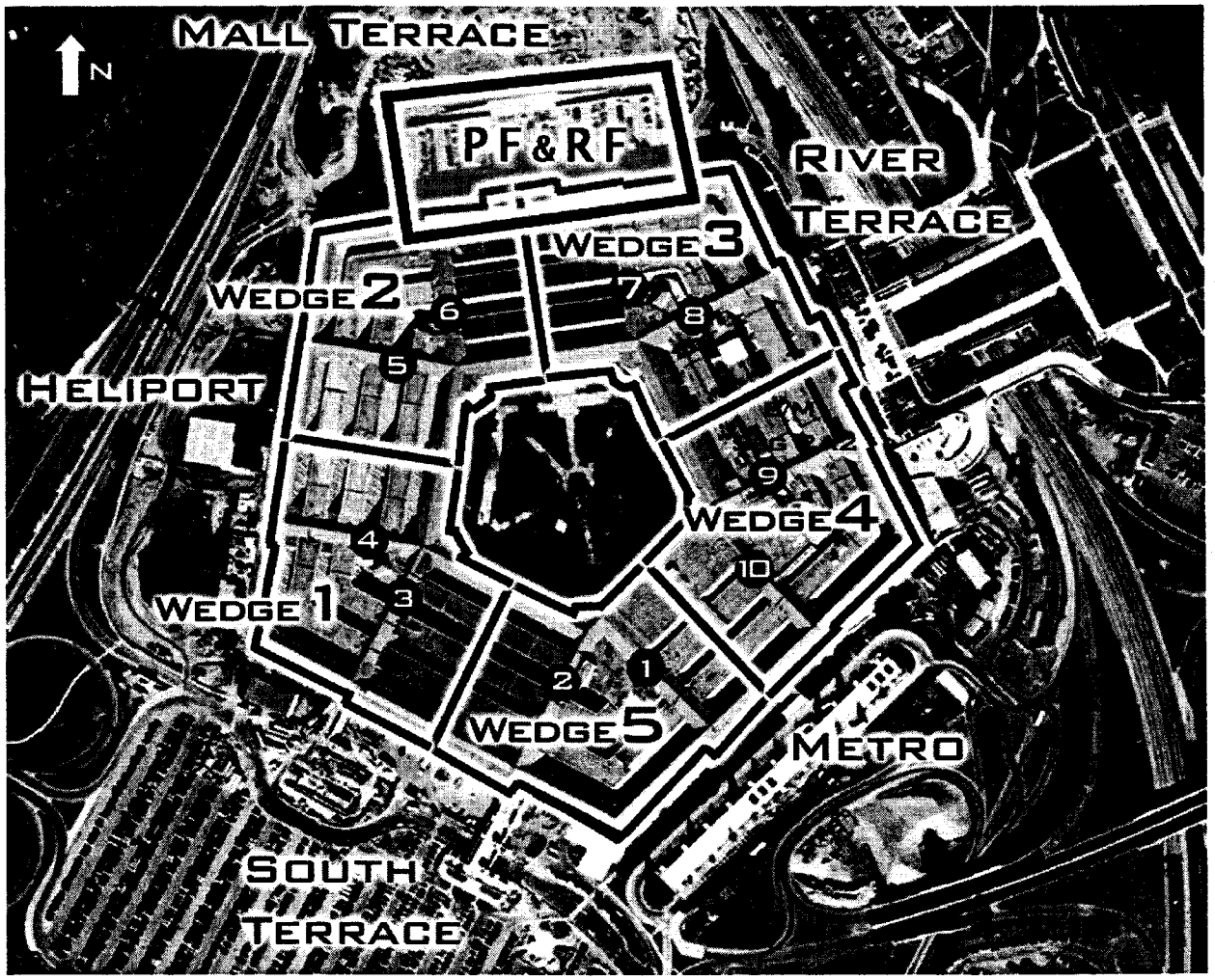




From top to bottom, the photo sequence at right shows construction progress of the Pentagon's new Heliport/Fire Station and Control Tower.

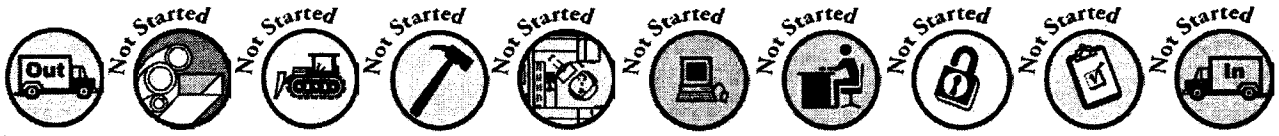
The Physical Fitness and Readiness Facility will have a new home below Mall Terrace parking and the 100-foot zone between the terrace and the Remote Delivery Facility. The stairs along either side of the Mall Terrace will be removed during construction.





Physical Fitness and Readiness Facility Locator

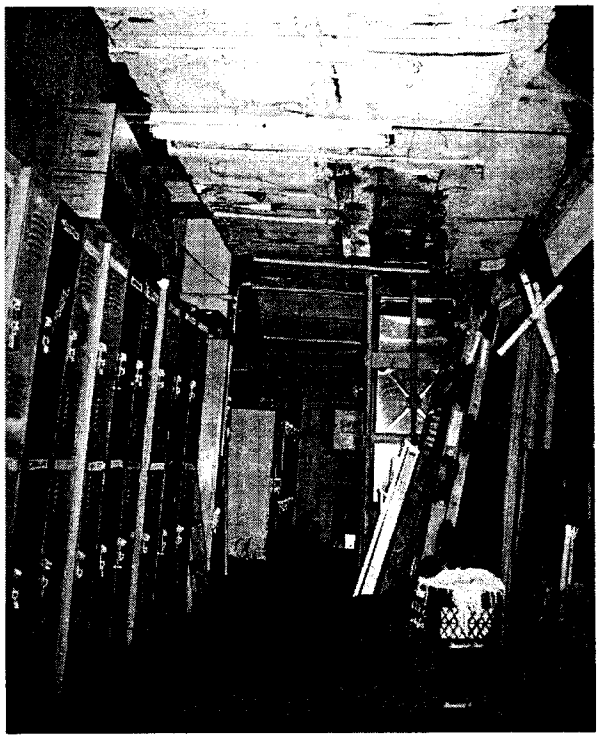
PHYSICAL FITNESS AND READINESS FACILITY



The Pentagon Physical Fitness and Readiness Facility will replace the existing 55 year old Pentagon Athletic Facility with a larger, modern facility that meets membership fitness and readiness needs based on current usage patterns and anticipated incremental growth. The 130,000-square-foot facility will be located at basement level underneath and adjacent to the Pentagon's Mall Terrace.

The Physical Fitness and Readiness Facility will be accomplished using a design-build project delivery system. The structure of the contract will allow the design-build team to earn a profit only on its ability to earn award fees by exceeding pre-established performance standards and incentive fees by performing work efficiently. Contract award is targeted for Fall 2001, with construction scheduled to begin in early 2002.

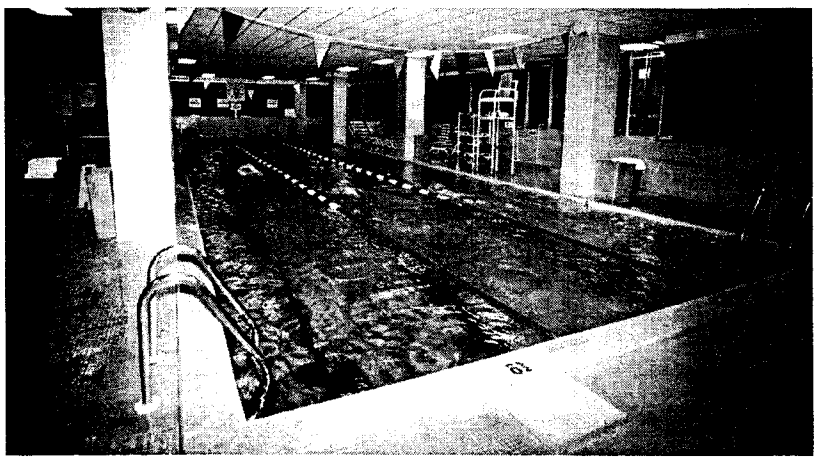
Note: Ancillary project costs are not reflected in capped cost tracking.



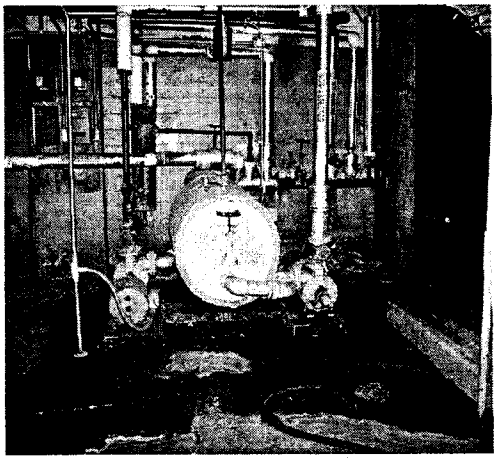
On a wavy floor slab in the existing Pentagon Athletic Facility, employees' lockers lie below corroded ductwork and share space with maintenance equipment.

MOVE-OUT

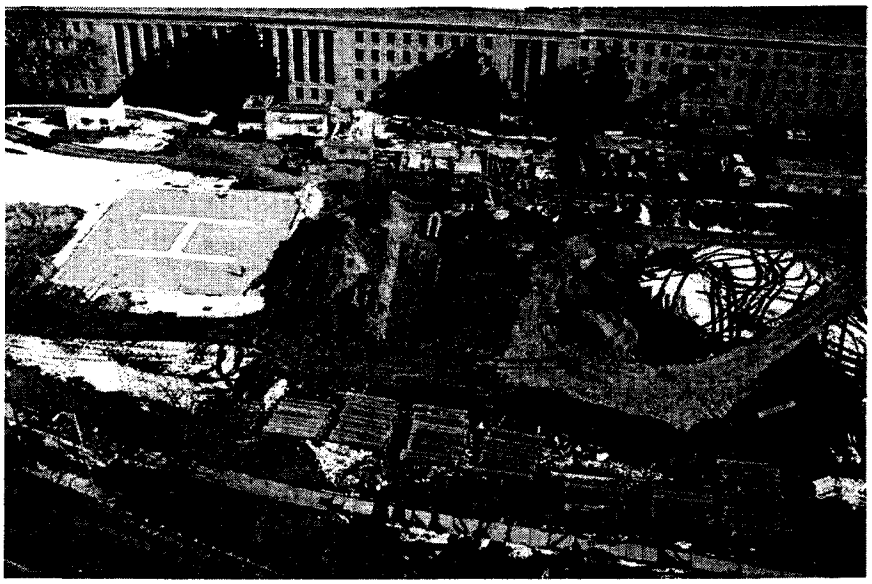
Tenants previously occupying the basement areas that will be used for the Fitness Facility were moved out before the basement was demolished along with Segment 3A.



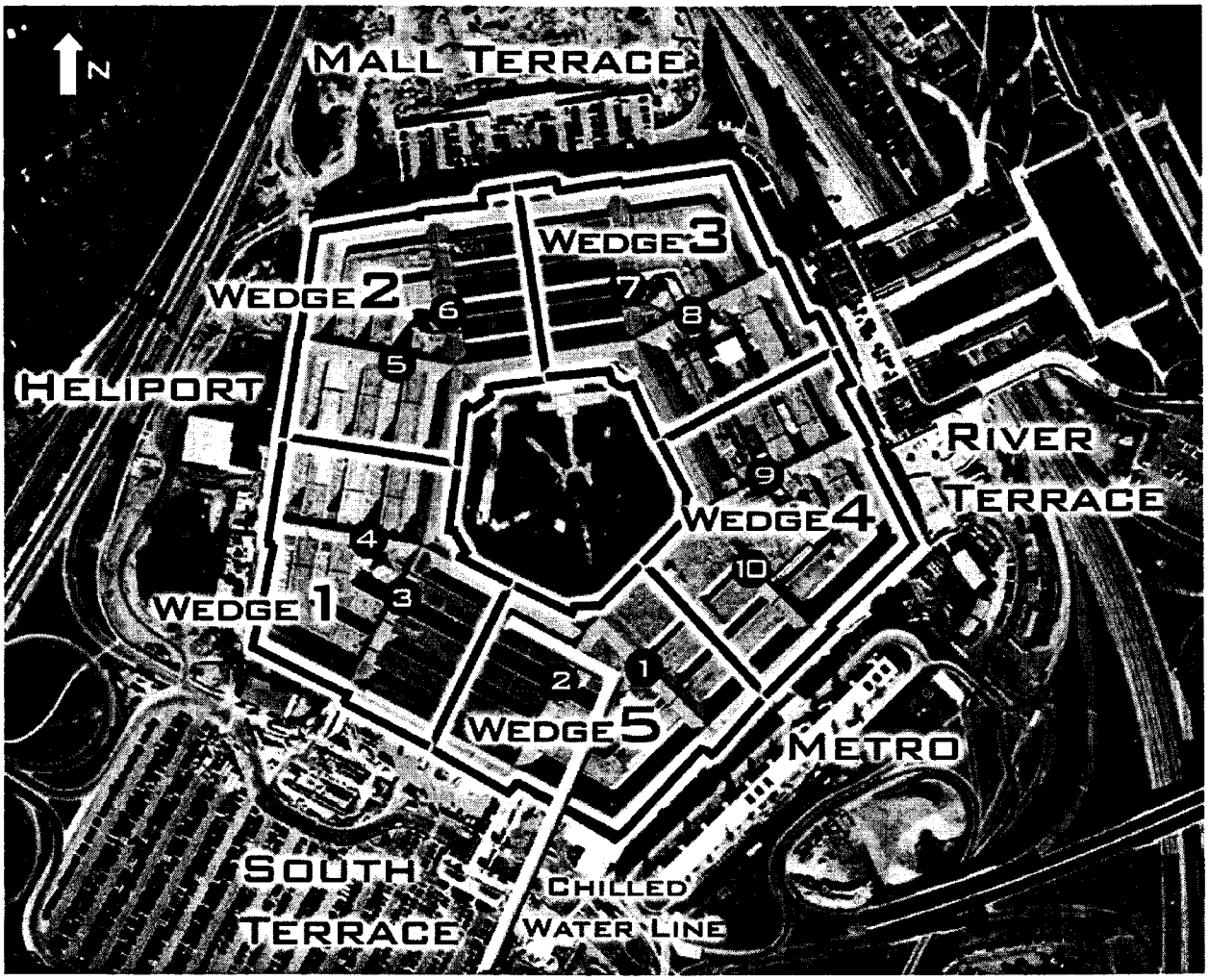
The relatively small size of the existing pool in the Pentagon Athletic Facility can accommodate only a handful of swimmers at one time.



Mechanical equipment in the Pentagon Athletic Facility suffers from age and disrepair.



Excavation for new chilled water lines near the Pentagon Heliport.



Chilled Water Line Feeders Locator

POWER/SITE

CHILLED WATER LINE FEEDERS

The installation of new chilled water line feeders into the building is complete. This project connects the chilled water lines of the Heating and Refrigeration Plant from their termination point in South Parking to the new chilled water loop installed in the Center Courtyard. The two new 36-inch lines complete the chilled water main piping for the building's air-conditioning system.

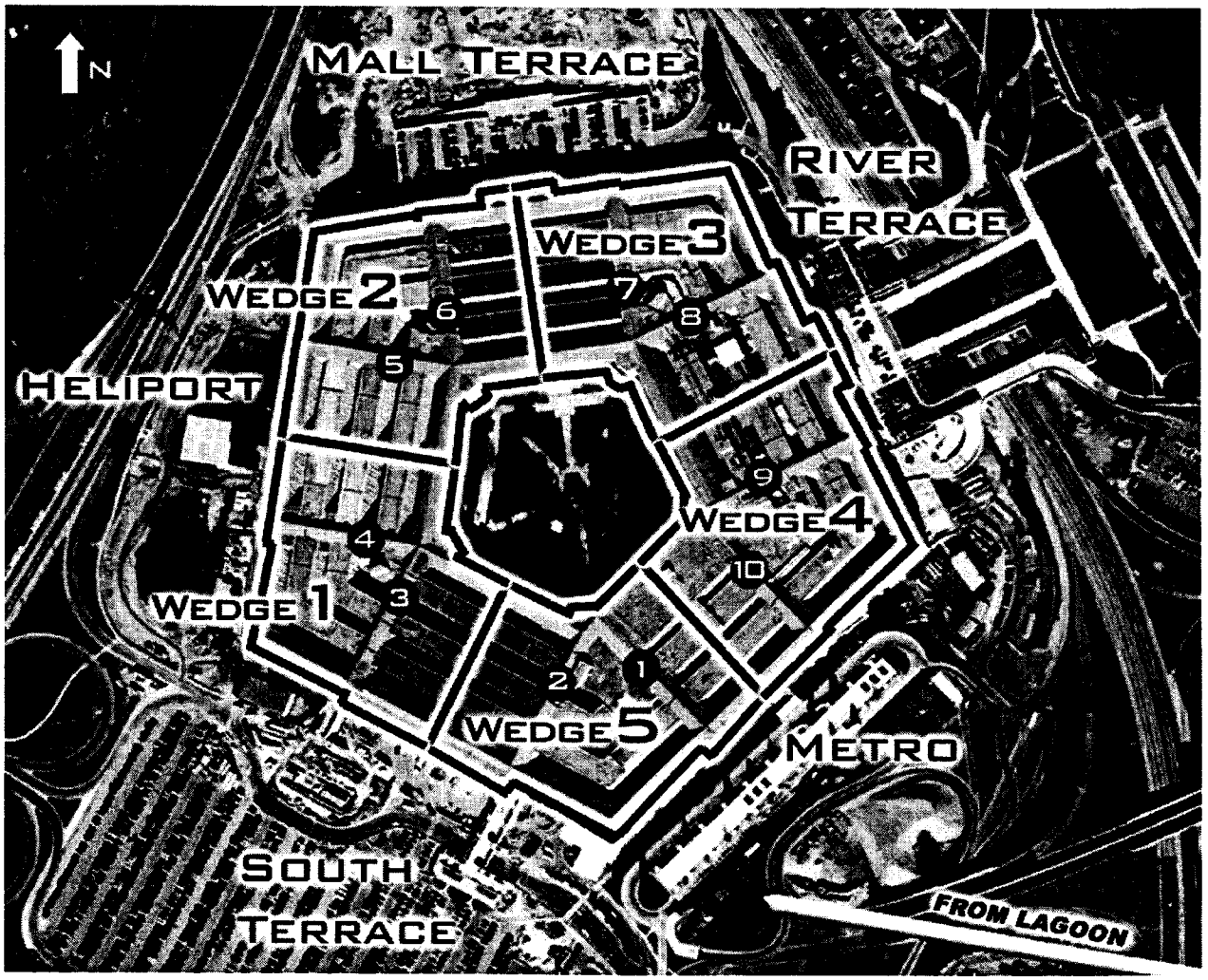
Note: Ancillary project costs are not reflected in capped cost tracking.

CHILLED WATER LINE FEEDER HIGHLIGHTS:

- 900 feet of new 36-inch pipe
- Half of the line is below ground
- Half of the line is installed in existing utility tunnel
- Small and disadvantaged business contract

New chilled water lines will improve the reliability of the Pentagon's cooling systems.

Worker welds joint of a new utility line.



Condenser Intake Outfall Line for the Heating and Refrigeration Plant Project Locator

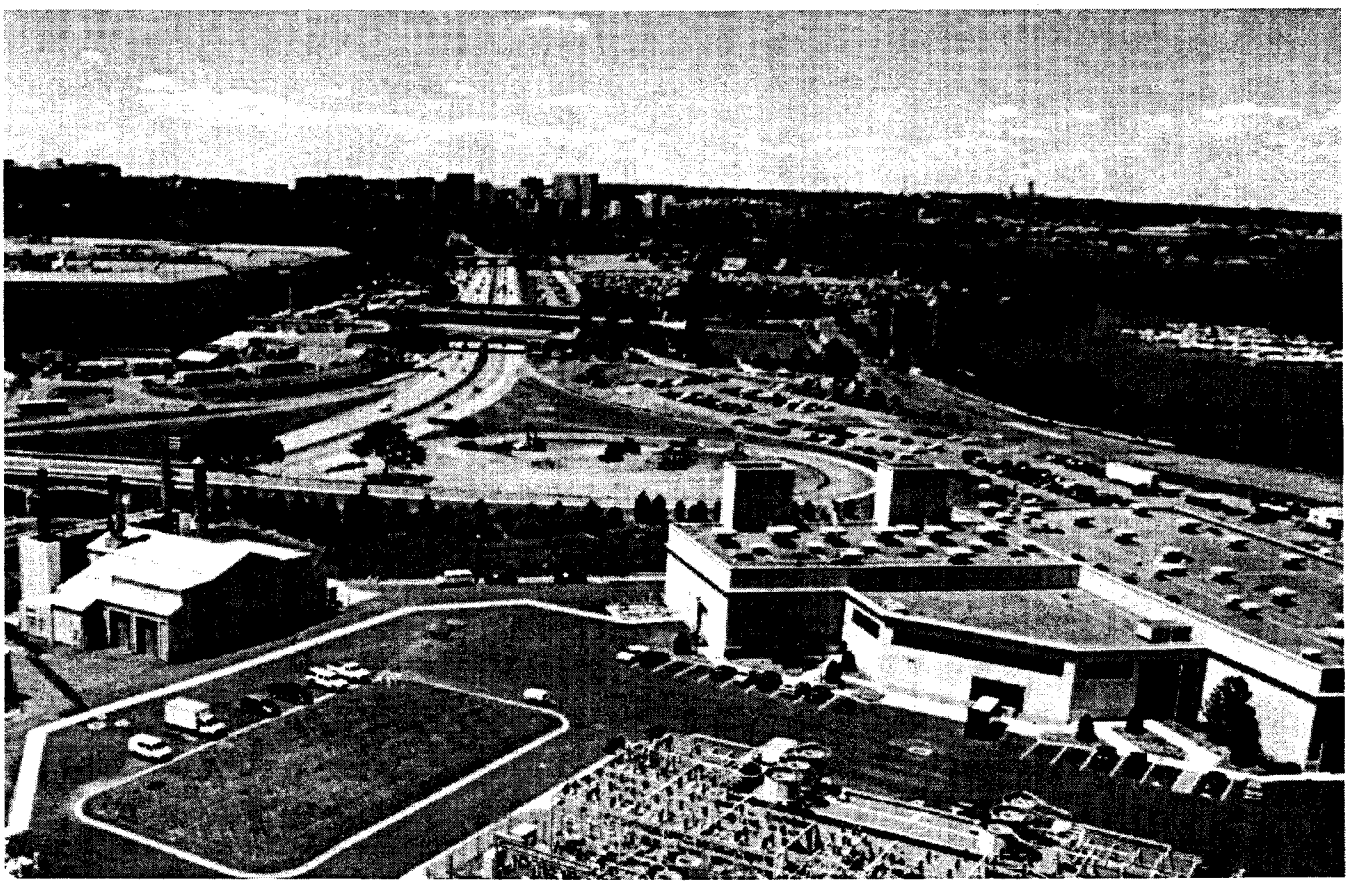
CONDENSER INTAKE OUTFALL LINE FOR THE HEATING AND REFRIGERATION PLANT

The new condenser intake outfall line replaces the 58-year old, deteriorated, underground pipe that supplies cooling water from Boundary Channel Lagoon to the Heating and Refrigeration Plant. The discharge pipe, running from the plant through Arlington County to Roaches Run Lagoon, is also being replaced. The total project is valued at $15 million and is scheduled for award in August 2001.

Note: Ancillary project costs are not reflected in capped cost tracking.

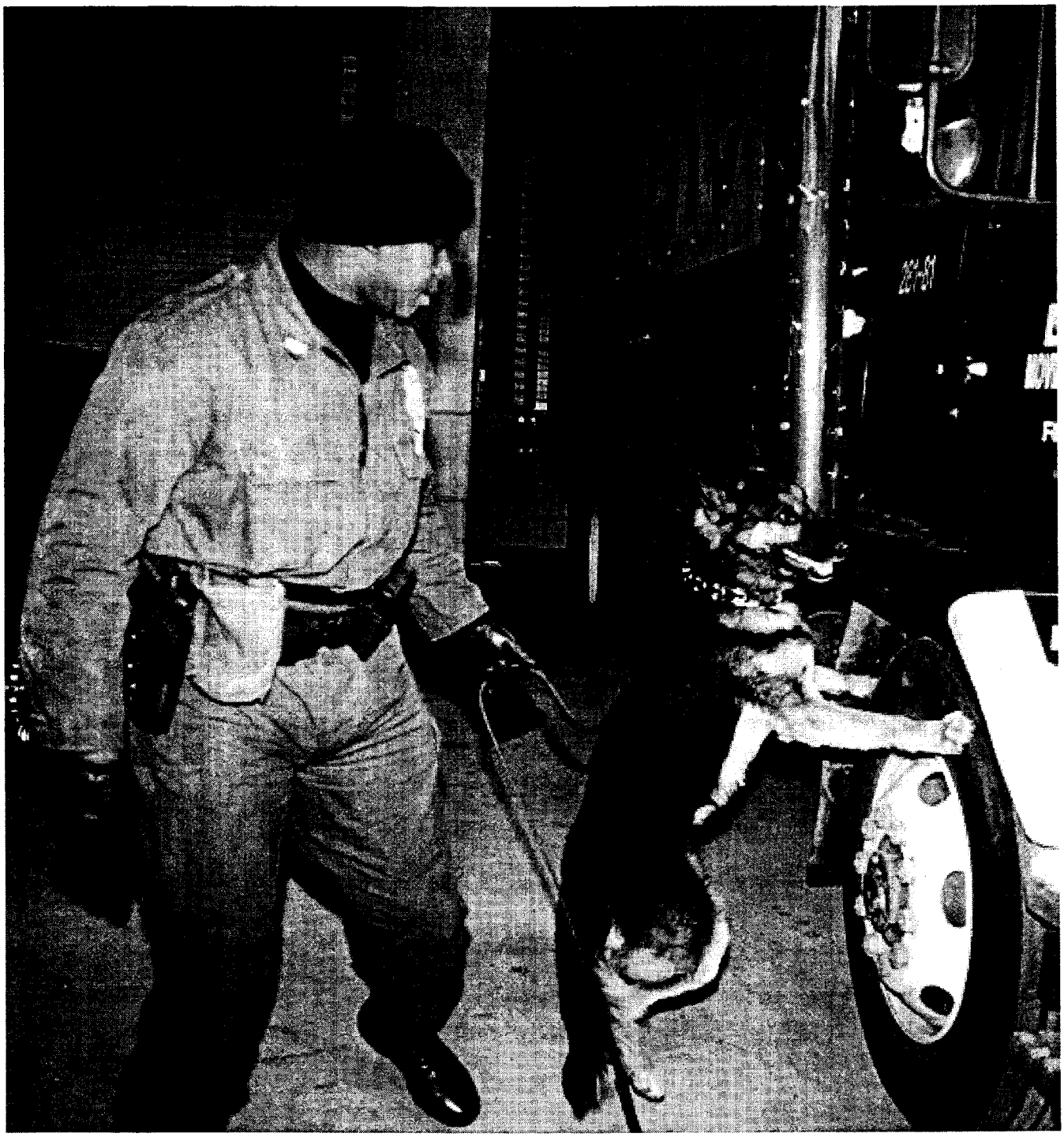
CONDENSER INTAKE OUTFALL LINE HIGHLIGHTS:

- 600 feet of 8-inch diameter tunnel for the intake line
- 1700 feet of 6-inch diameter buried pipe for the outfall line through Arlington County
- New intake structure
- New screen house



Ten chillers in the Pentagon's Heating and Refrigeration Plant (right) use water from the Potomac.

Aerial view of the Pentagon's River Terrace with National Airport and the Heating and Refrigeration Plant in the background.



The Renovation Program works closely with Defense Protective Service to improve the security of the Pentagon. The increased level of security, afforded by the construction of the Remote Delivery Facility, is enhanced by the K-9 Unit that inspects each delivery vehicle.

III. PROCESS IMPROVEMENTS

Security

Acquisition

Information Management and Telecommunications (IM&T)

Commissioning

Tenant Moves

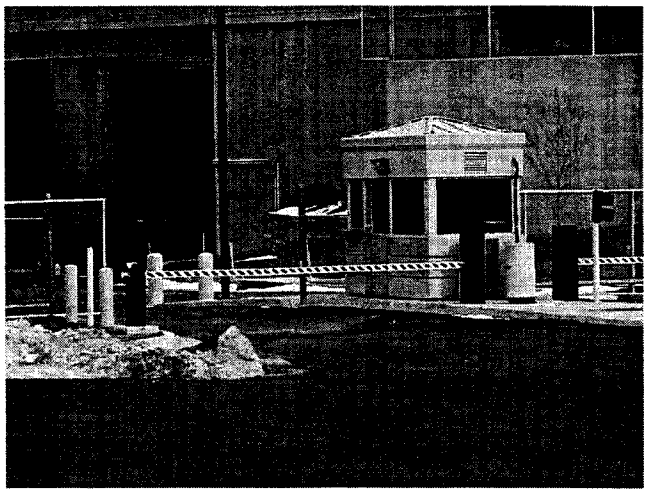
Systems Furniture Implementation

Program Management

Defense Protective Services Chief describes the security procedures in place at the Remote Delivery Facility.

SECURITY

Crash-rated pop-up barriers protect the Mall Terrace.



Perimeter access is controlled at the Heating and Refrigeration Plant with crash-rated barrier protection.

The Pentagon Renovation Program security upgrades include maintaining the existing security afforded to the entire building, while upgrading perimeter access control, building access control, and expanding the closed circuit television system to include areas under construction. The security upgrade measures are based on an overall master security program upgrade process. This process is enhanced by additional projects mitigated by protection requirements based on terrorist threats and force protection issues.

PERIMETER ACCESS CONTROL

A system of crash gates and bollards were upgraded in 1999 to control vehicle access to Pentagon entrances. The vehicle access control is now activated by using the building pass, which is issued to approved personnel. Further crash gate operational and technical improvements are scheduled to begin in FY2001 and will continue through FY 2002.

Note: The perimeter access control system was constructed under a contract issued by the Defense Protective Services and not the Pentagon Renovation Program. However, renovation activities are designed, where appropriate, to work in concert with security initiatives.

BUILDING ACCESS CONTROL

The Defense Protective Service has upgraded all personnel entrances to a turnstile access control system that utilizes the building pass (badge) of individuals. This provides the Pentagon Defense Protective Service with the capability of positive access control and visitor control. Reports can be generated to reflect the user population at any given time.

The Pentagon Renovation Program worked in conjunction with the system installation, typically providing information management and telecommunications support activities.

CLOSED CIRCUIT TELEVISION SYSTEM

The Pentagon's closed circuit television security systems were substantially improved during 1999. A major emphasis was placed on improving the lighting and camera coverage of the parking lots. Additionally, motion-activated closed circuit television cameras were placed to monitor the traffic on Highway110. This activity was also completed under a Defense Protective Service contract. All renovation efforts will work in concert with ongoing non-renovation security initiatives.

WEDGES 1-5

Wedge 1 and Wedges 2-5 are receiving the majority of the Pentagon's security upgrade attention. The first, core and shell security, deals primarily with the building's standard security requirements, i.e., closed circuit television in corridors, securing the electrical and mechanical rooms, and the building perimeter doors (entrances and emergency exits). All the output from the devices performing these security functions are sent to the Defense Protective Service Records Control Center where these devices are monitored 24 hours a day.

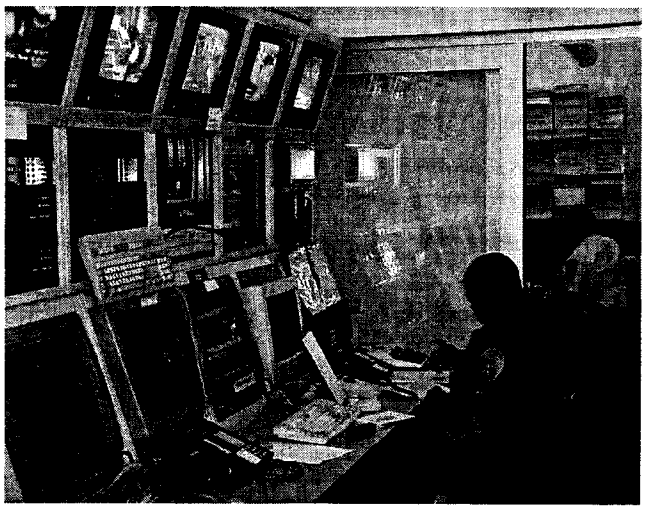
WINDOWS

There are 7,748 windows in the Pentagon. They consist of steel casements largely embedded in the perimeter walls of the concentric inner courts, and steel double-hung units in the outermost perimeter and in the Center Courtyard walls. The double-hung units in the central pavilions of the Mall and River Entrances are steel. The casements are rusted and corroded at the joints, racked out of shape, and cannot be properly closed.

The new windows on the A and E-Rings will be blast-resistant and permanently closed and fixed. This will not only increase the energy efficiency of the building, but will also serve to protect the tenants against an external attack.

The Defense Protective Service will have blast protective film installed on all E-ring windows in Wedges 2 through 5 during the first and second quarter of FY 2001, as a temporary safety measure until the windows are replaced with the new blast resistant units during the course of renovation.

All of the Pentagon's 7,748 windows will be replaced in conjunction with the wedge-by-wedge renovation of the Pentgon. The blast-resistant windows on the E-Ring in Wedge 1 are pictured above.



State-of-the-art security stations with closed circuit television are part of the security upgrades being made to the Pentagon.

TENANT SECURITY

Tenant security requirements are determined by tenant needs and must meet National Security Policy. The requirements can range from a lock on a facility entrance door to an area that requires combination door locks, a secure area access control system, and an Intrusion Detection System. The tenant has the option of monitoring these systems or having the monitoring done by the Defense Protective Service.

FY 1999 ushered in additional Pentagon security requirements based on experience gained as a result of international and domestic terrorist attacks. Two major projects were started as counter-terrorism measures to enhance the security of the Pentagon. These are the Remote Delivery Facility and the Metro Entrance Facility.

At the Remote Delivery Facility, each vehicle is carefully inspected with mirrors and specially trained dogs.

REMOTE DELIVERY FACILITY

The Remote Delivery Facility adjoins the Pentagon's Mall Terrace. The function of the Delivery Facility is to screen all material being delivered to the Pentagon. This will involve the use of large x-ray units, explosive material detection equipment (including specially trained dogs), under-vehicle closed circuit television systems, and incoming material physical inspections performed by highly trained Defense Protective Service personnel. The magnitude of this effort can be expressed in the number of deliveries, which peaked during the delivery of Wedge 1 systems furniture at 450 trucks per day. During a normal work day, the facility will screen over 230 trucks containing thousands of packages. The material screening capability was activated in the Remote Delivery Facility in August 2000, and the final construction will be completed in the third quarter of FY 2001.

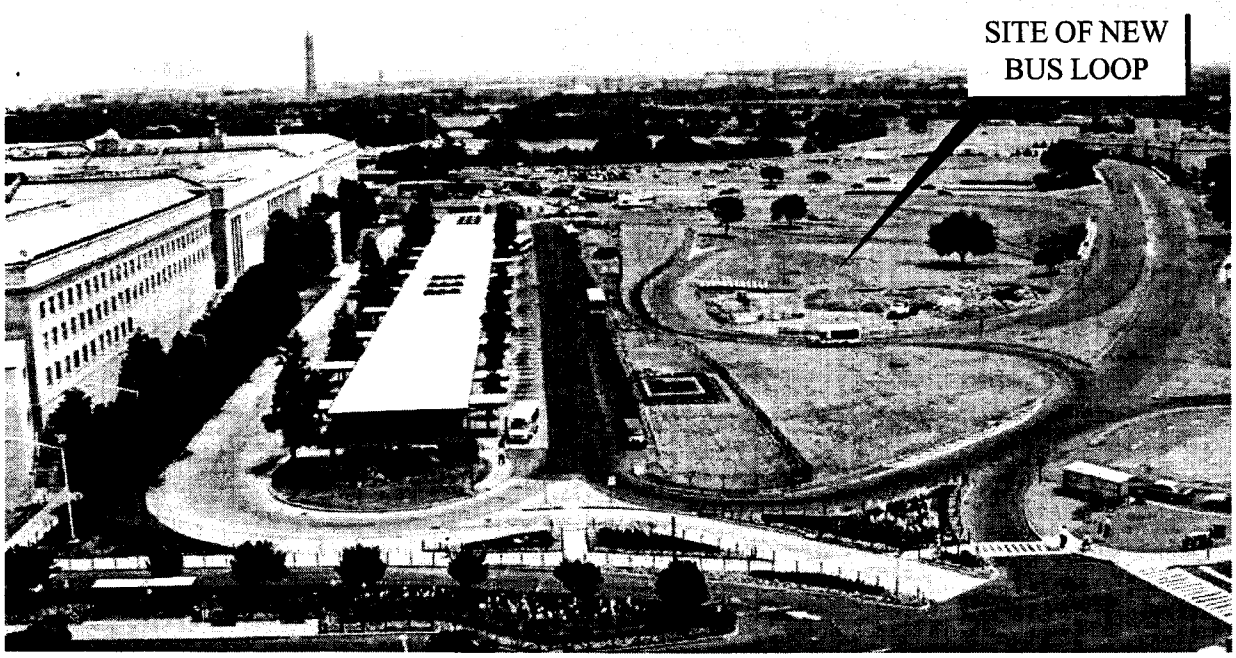
METRO ENTRANCE FACILITY

A Pentagon security assessment recommended a separate visitor and receiving center for the people entering the building. The Metro Entrance Facility will allow for a more secure processing of visitors into the Pentagon. The concept is to isolate potentially dangerous people from gaining access into the building. The primary objective of the Metro Entrance Facility is to improve the level of safety and security of the Pentagon building, while continuing to provide convenient access to the Metro and the various means of above ground transportation along the southeast side of the building. The Metro Entrance Facility project includes:

- The relocation of the existing bus facility away from the Pentagon building.
- The construction of a new secured Pentagon building entrance structure, which would include the tour office and badging office.
- An alternative means of access to the existing Pentagon Metro Station.
- Improved facilities for private vehicle and taxi service.

The contract for the Metro Entrance Facility project was awarded in September 2000 and currently in the design review process.

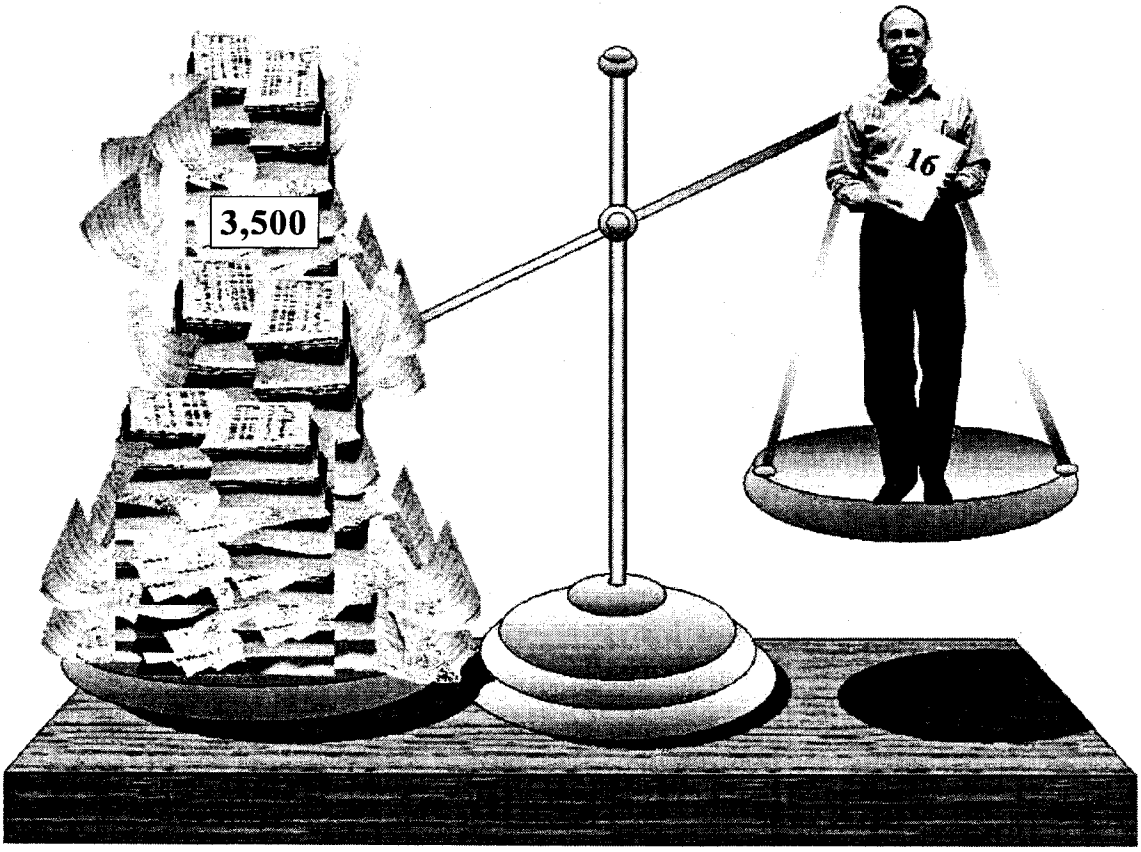
The relocation of the bus facility will improve the perimeter security of the building and meet the Defense Protective Service mandate to keep all vehicular traffic a prudent distance from the Pentagon.



ACQUISITION

In 1997, the technical requirements for the construction of Wedge 1, acquired under the design-bid-build method and representing only 25% of the square footage of the Pentagon, were over 3,500 pages of the solicitation. For Wedges 2-5, the largest single acquisition the Renovation Program will undertake, all of the technical requirements for the performance of all architectural and building systems are included in just 16 pages in the solicitation.

In FY2000 the Renovation Program continued the development and institutionalization of revolutionary construction business practices that are performance-based and results-oriented. Building on the successful practices first utilized in the acquisition of the Pentagon Remote Delivery Facility, in 2000 the contract for the design and construction of the Metro Entrance Facility was awarded and the competition for the eventual award of Wedges 2 through 5 (all the remaining above-ground renovation in the Pentagon) got underway. Both of these major projects utilize state of the art acquisition reform techniques and incentive structures to maximize limited budgets and promote performance and behaviors necessary to make the projects successful in their challenging environment.



Traditional specifications vs. performance specifications.

Design-Bid-Build = Conflicting Goals

In the traditional design-bid-build delivery method, the Government pays for the development of a design by one party, accepts the design, and then contracts for the construction of the design with another party. The Government is essentially placed in the middle in the event of discrepancies between the design and the constructability of it, and the focus of the contract becomes *how* to construct the design. This produces an environment of cross-purposes and conflicting goals, and often results in claims and litigation.

Design-Build

Under design-build arrangements, the Government contracts with one entity for the design and construction; one contractor becomes responsible for ensuring the Government's requirements are satisfied.

The Remote Delivery Facility was in and of itself a groundbreaking acquisition in the public construction sector. It used the design-build delivery method, which is still relatively new in federal contracting.

Best Value

As has been the practice within the Renovation Program for some time, the acquisition of the Remote Delivery Facility was based on the "best value" technique. That is, the contractor was not selected based on the lowest bid. Rather, quality, past performance, and technical and management approaches, were the most important factors in determining which firm received the contract.

Incentives/Award Fees

The resulting contract included a sophisticated incentive arrangement that emphasized customer satisfaction and quality of performance and would penalize contractor behavior that seeks to maximize profit at the expense of performance. These incentives place the entire contract reward structure in the hands of the Renovation Program. The contractor can only realize profits if the government determines it has earned them.

PERFORMANCE-BASED REQUIREMENTS

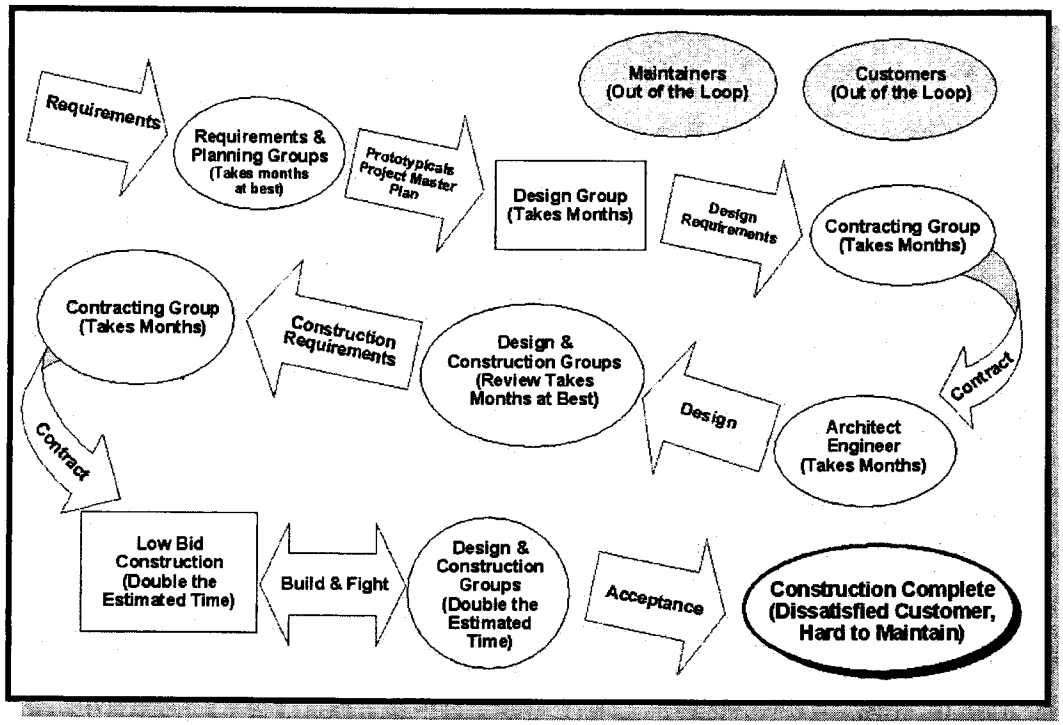
"The contract focus is on what needs to be done, and the contractor, using the innovative forces at play in the market, determines how to do it."

The results of these acquisition techniques have been impressive. The facility was constructed on cost and on schedule, despite significant increases in project scope. Just as importantly, the customers who received the completed facility are delighted with the product and the contractor's responsiveness to their needs. Finally, because the contractor performed at or above our expectations, it earned incentives on the project through the contract incentive and award fee provisions. This acquisition approach truly produces a "win-win" situation.

Performance-Based Requirements

This year the Renovation Program used a refined version of essentially the same approach in awarding the contract for the Metro Entrance Facility. Like the Remote Delivery Facility, this project was acquired using the design-build delivery methods. In addition, the Metro Entrance Facility built on the initial attempts in the Remote Delivery Facility acquisition to use performance-based requirements. This type of requirements statement is especially well-suited to the design-build delivery method. The contract focus is on *what* needs to be done, and the contractor, using the innovative forces at play in the market, determines how to do it. The incentive structure in the contract ensures that these solutions will be derived with customer satisfaction in mind.

The traditional way of doing business in government construction projects often produces conflicting interests.



Single Acquisition for Wedges 2 Through 5

Both the Remote Delivery Facility and Metro Entrance Facility acquisitions, while successful in their own right, serve as testbeds for the largest single acquisition the Program will undertake. The renovation of Wedges 2 through 5 will be delivered through the design-build technique.

Using procedures specifically prescribed in federal regulations for this delivery method, the Renovation Program initiated a two-phased competition in May 2000 that is expected to result in a contract award in the summer of 2001. In phase one, all interested firms were invited to submit a qualifications proposal centered heavily around recent, relevant past performance. Seven teams from around the country, including some that do not typically submit proposals for federal work, chose to participate in phase one, representing some of the best of the construction and architectural/engineering industries. In August 2000, three of these seven offerors were selected by the Renovation Program Manager to continue into phase two of the competition. The Program chose to devote 60 days to in-depth discussions with the three teams on every aspect of the final request for proposals while it was still in draft. In fact, the offerors help the government write the *request for proposals* to ensure the solicitation was complete, comprehensive, and written flexibly such that each offeror could propose the most innovative solutions. The resulting request for proposals was issued in January, 2001, and proposals are due in March 2001.

16-Page Performance Requirements

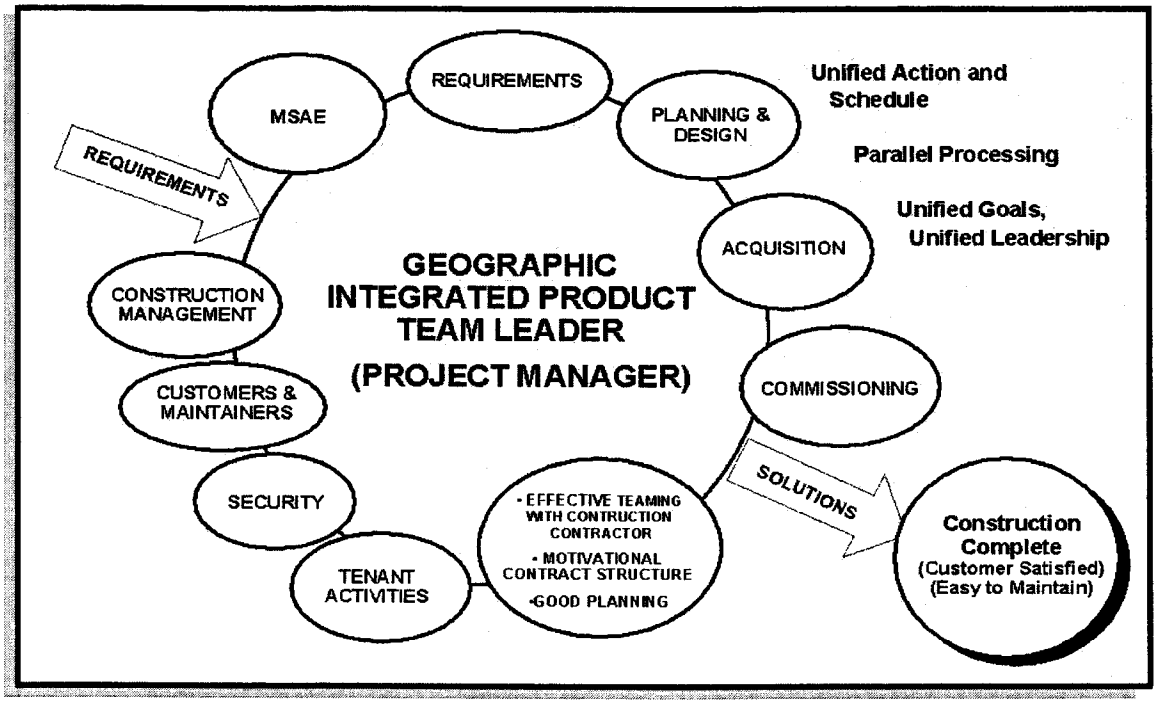
The acquisition achieves the final step in the evolution toward true performance-based requirements. In Wedges 2-5 all of the technical requirements for the performance of all architectural and building systems are included in just 16 pages in the solicitation. These 16 pages represent the results we expect from the renovated space. What's been cut out is the how-to instructions that limit the contractor's creativity and innovation in achieving those results. To fully gauge how significant a step this is, one need only consider that in 1997 the technical requirements for the construction of Wedge 1, acquired under the design-bid-build method and representing only 25% of the square footage of this acquisition, were over 3,500 pages of the solicitation.

Given the budget constraints inherent in the Wedge 2-5 project, the challenges of working in a renovated building, and the changes that are almost certain over the 12 to 14 year period of performance, this acquisition approach is our best guarantee of a successful endeavor. The entire approach centers on selecting the right contractor with which we will partner, solve problems, manage the budget, maximize capability, and share in risks and rewards. The incentive structure reinforces the essential win-win nature of the relationship we must forge with this contractor. Unlike the traditional business approach in construction, we cannot afford to enter into an adversarial relationship that feeds on conflicting motivations and wastes resources. Although our approach places the reward structure in the Government's hands, our expectations and the *potential* profit are clearly defined in advance. The Wedge 2-5 contractor will be rewarded, if it greatly satisfies the customer by producing a high quality product on time and within budget.

In summary, the Renovation Program has fully embraced the design-build delivery method and competition for the balance of the renovation work is well underway. The heart of our acquisition strategy for success is relying on three interdependent phases:

- Conduct an open competition and select a contractor based on the best value to the Government as defined by past performance, quality of performance issues, and cost.
- Include performance based requirements in the contract to reap the benefits of the most creative, innovative thinking in the industry.
- Include effective incentives to keep the contractor focused on customer satisfaction and performance and make the arrangement a win-win for both parties.

An indication of how revolutionary this approach is within the industry is the media exposure and the number and diversity of other public entities expressing interest in understanding and employing these techniques.



The new way of doing business in the Pentagon Renovation Program promotes cooperation between the contractors and the client.

WEDGES 2-5 ACQUISITION PROCEDURE	APPROXIMATE DATES OF COMPLETION	
ACQUISITION STRATEGY APPROVED	DEC 1999	
PHASE I SOLICITATION ISSUED	APR 2000	*30 day minimum required by FAR*
PHASE I SELECTIONS MADE	AUG 2000	
DRAFT RFP REVIEW WITH OFFERORS	SEP - DEC 2000	*Voluntary process, unique to Pentagon Renovation*
PHASE II RFP ISSUED	JAN 2001	*30 day minimum required by FAR*
PHASE II PROPOSALS RECEIVED	MAR 2001	
SOURCE SELECTION CONTRACT AWARD	JUN/JUL 2001	

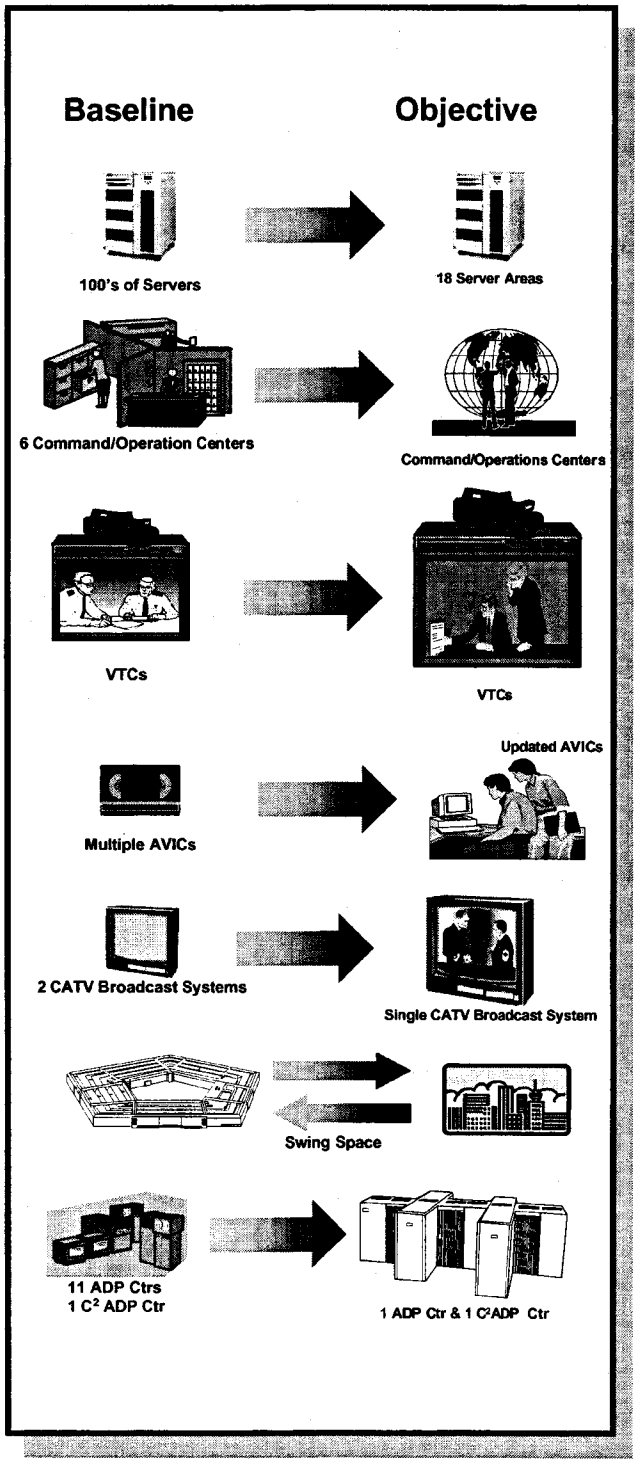
EXAMPLE PERFORMANCE SPECIFICATION CRITERIA FOR WEDGES 2-5

CRITERIA	
TYPE 1	Equipment selection can be any combination of centralized or de-centralized system as long as the equipment/systems meets the mechanical space criteria. Heat Pump systems are not acceptable and roof mounted equipment will require special approval do to the historic status of the facility. Design the HVAC system to provide thermal zones of control. Provide terminal equipment for each zone. Terminal equipment may be variable-air-volume boxes, fan-coil units, or similar devices that are capable of controlling the temperature in their respective zone. Separate perimeter exposure from internal zones. A perimeter zone shall not exceed 55.74 Sq. M, which includes a maximum of 6.1 meters of exterior wall. An interior zone shall not exceed 167.22 Sq. M.. Provide separate zone based on the mechanical criteria spreadsheet.
TYPE 2	Equipment selection shall be based on the specific areas needs. This system will be utilized in the "Special Spaces", primarily operating 24 hours a day capable of meeting specific space requirements as defined on the "Performance Criteria-Mechanical" special space and command areas.
ACCESSIBILITY	Pertains to the ability to locate and perform service on all valving and HVAC equipment/systems that will need attention after installation for operation, maintenance, or emergency needs.
ACOUSTICS	Pertains to the HVAC equipment having an acceptable noise limit based on the space criteria matrix "*Noise Criteria*" performance levels for the individual spaces defined.
DURABILITY	Pertains to the abil life expectancy as and/or as stated i
ENERGY EFFICIENT	All installed HVAC *Standard 90.1-199*
FLEXIBILITY	Pertains to the ability of the installed HVAC systems to accommodate for future expansion (i.e. increases in capacity, additional zone control needs, pertinent isolation valves, and tenant fit-out

All installed HVAC equipment/systems shall meet the requirements of Section 6 "ASHRAE/IESNA Standard 90.1-1999"

Wedges 2-5 performance criteria were clearly defined and collected in just 16-pages.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS (IM&T)



Separate but related to the Pentagon Renovation Program is a necessary modernization of the building's information management and telecommunications infrastructure and systems. The basic information system infrastructure in the Pentagon was installed long before the advent of personal computers, facsimile machines, video teleconferencing, and digital telephone service, and has evolved without a design plan. In 1943, when the Pentagon was built, there was one telephone for every three employees. Over the last 57 years, new information technology capabilities have emerged and the new systems have been laid on top of the old. Over time, this merging of technology has become unmanageable and not easily upgraded. As requirements emerged, facilities and systems were added with little or no regard to existing capabilities or long term requirements. The individual military departments and agencies engineered and installed equipment and cables to meet their immediate specific needs.

The objective of the IM&T effort is to provide cost-effective services and capabilities that will best serve the needs of the Pentagon tenants and Department of Defense senior leadership by leveraging technology advancements and designing and developing integrated systems. The Project Manager for IM&T derives acquisition authority from the Deputy for Systems Acquisition, Communications and Electronics Command and operates under a Project Manager Charter issued by the Army Material Command and authorized by the Army Acquisition Executive. The information technology modernization is being accomplished in conjunction with the building's wedge by wedge renovation.

IM&T is simultaneously simplifying and upgrading the Pentagon's data and communications systems.

Today, the 20,000 workers in the Pentagon and the 5,000 workers in swing space are largely 'Information Age' workers with at least one telephone and desktop computer system per person. They require state of the art systems and netronics that will provide immediate access to local as well as world-wide networks and the tools to rapidly collect data, analyze it, and present it to decision makers in a timely manner. This requirement defines the objectives of the IM&T Project:

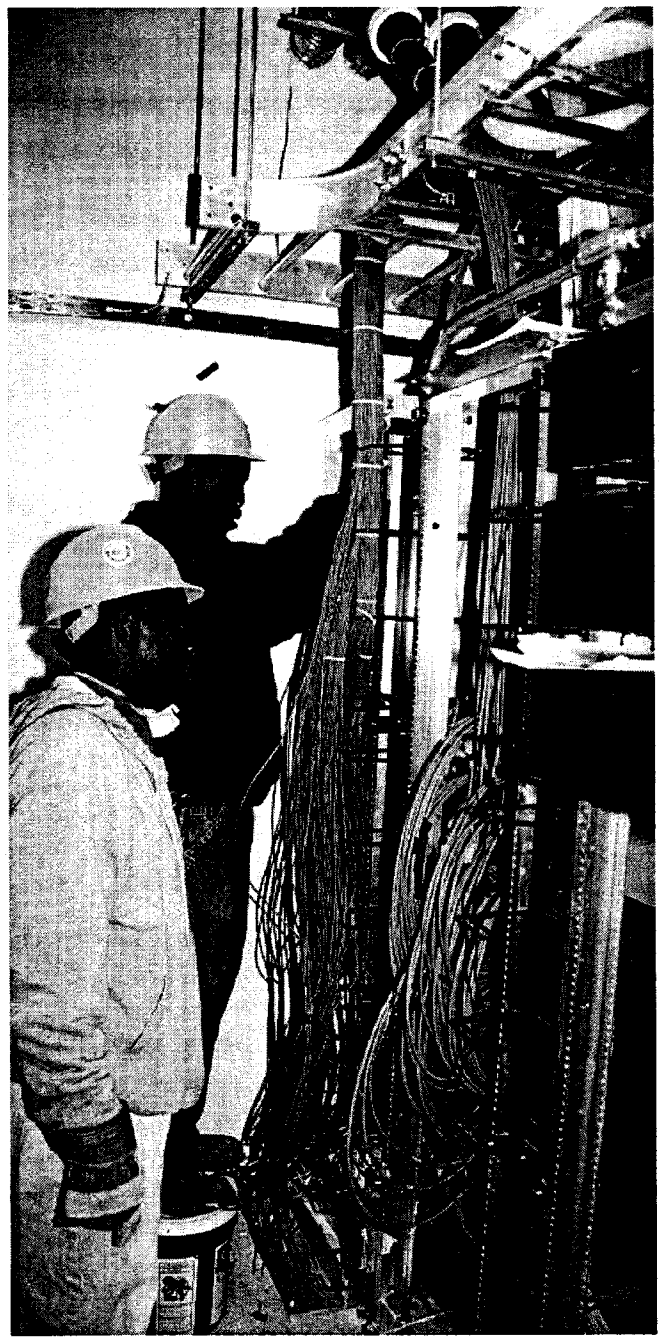
- Provide modern telecommunications and information management services throughout the Pentagon with access to global networks. The communications network will support voice, data, and video at varying security levels.

- Define, procure, integrate, and test hardware and software items necessary to meet functional requirements for a consolidated Network Systems Management Center.

- Relocate all command and operations centers to renovated facilities. These include the Air Force Operations Group, Navy Command Center, Marine Corps Command Center, National Military Command Center, and the Army Operations Center.

- Modernize and consolidate the functions and responsibilities of the seven technical control facilities in a single Pentagon Consolidated Technical Control Facility.

- Relocate the Defense Information Systems Agency, Joint Staff Support Center, Command and Control Automated Data Processing Centers from existing facilities into one new facility located in renovated space.



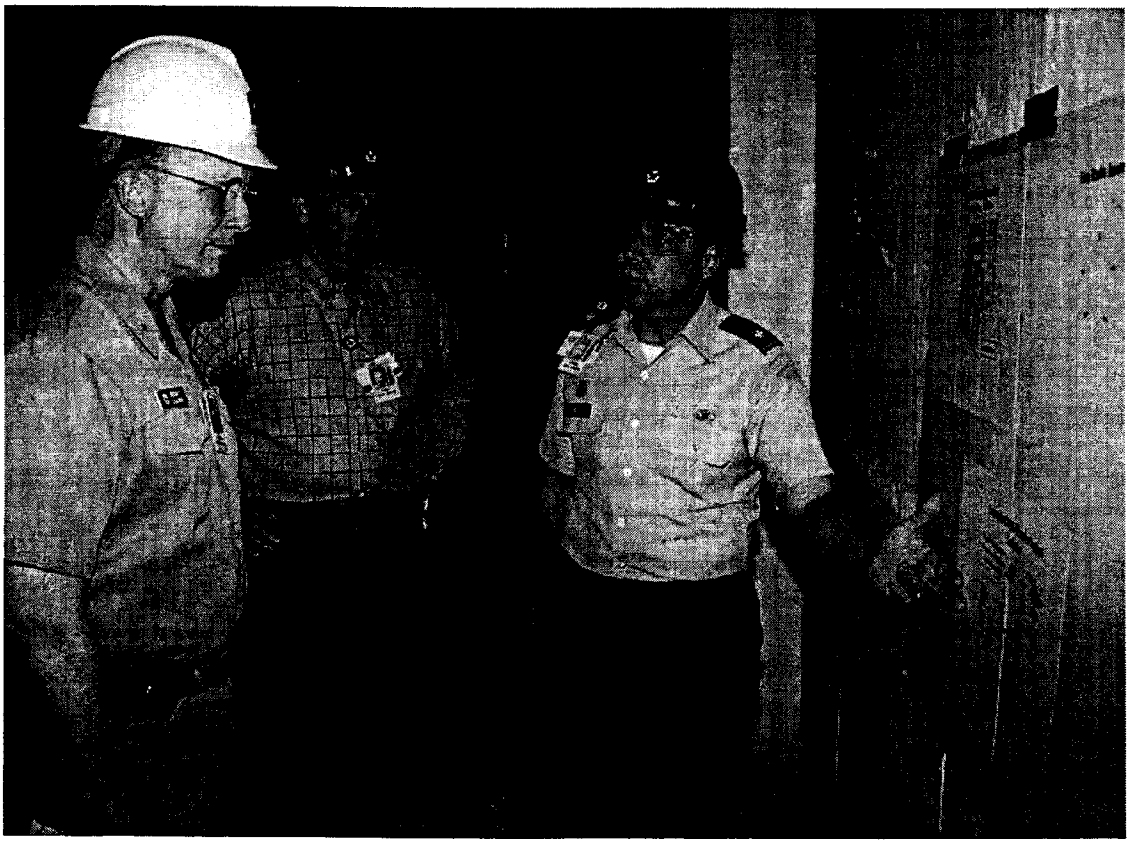
Telecommunications technicians install new telephone lines in Wedge 1.

- Paralleling the Command and Control Automated Data Processing efforts, develop a consolidated, shared Business Automated Data Processing Center which will provide a modernized data processing facility for Army and Air Force systems. The Business Automated Data Processing Center will house mainframe processors, large servers, and their peripheral equipment, including storage devices and network processors.

- Three to four consolidated server facilities will be built in each wedge. These server facilities will allow the many server requirements of all services and agencies to be consolidated into these 18 common facilities without the need to build hundreds of special purpose facilities throughout the building.

- Provide the renovated Pentagon with improved voice communications currently provided by 22 Command and Control, Tactical, and Administrative telephone switches located in 12 different facilities. Refurbish, upgrade and install the primary and secondary classified and unclassified Command and Control telephone switches. Install the Main telephone patch panel in the General Purpose Switch Room and reduce the number of telephone switches in the Pentagon from 22 to eight.

- Replace the 130 radio systems distributed throughout the building with one Consolidated Radio Room in each wedge.



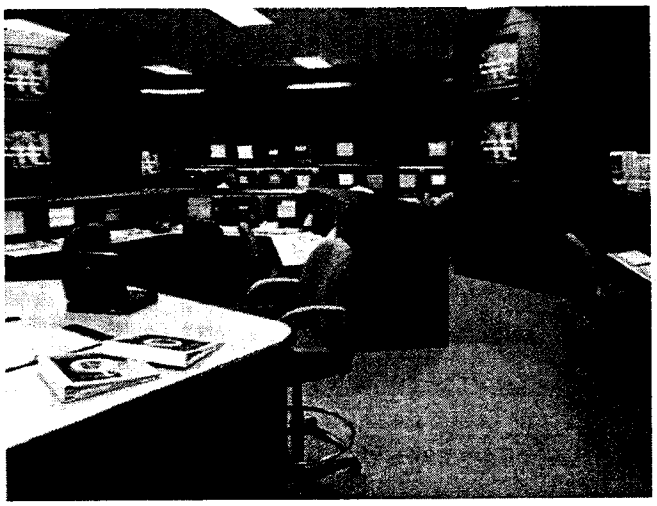
The relocation of the Navy Operations Center to Wedge 1requires a great deal of coordination between Renovation Personnel and the eventual owners of the facility.

The renovated Pentagon will include a 30,000-line administrative telephone switch providing voice services through optical fiber-based distributed telephony; common user systems such as e-mail and messaging; co-located automatic data-processing facilities; an information infrastructure of fiber optic and copper cable; a common user data, voice, video backbone (four levels of classification); and a single Network Systems Management Center. The backbone provides interoperability between existing and renovated commercial networks; is secure, scaleable, upgradeable, and flexible; in no way degrades current user network capabilities; and is standards-based.

IM&T Statistics:

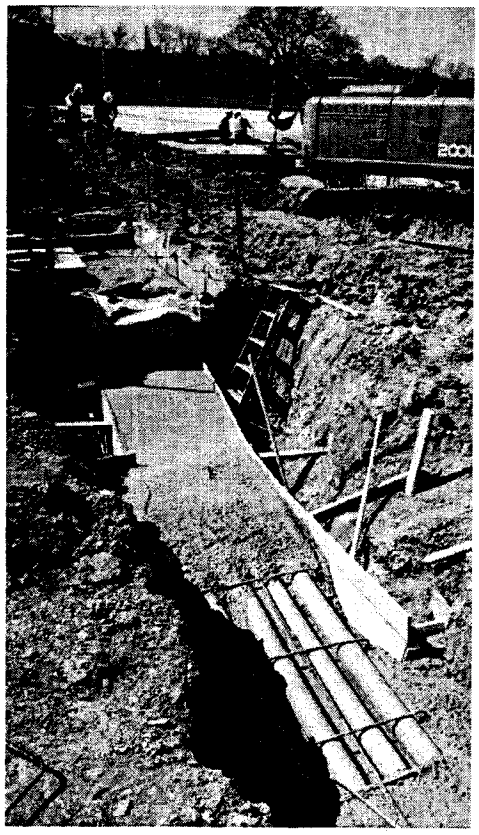
- 1,700+ Miles of Cabling
- 100,000+ Voice, Data, and Video Drops
- 50,000 Data Faceplates
- 30,000 Tenants and Their IT Assets

This past year has been fast-paced and much has been accomplished. In 2000, the Renovation Program's IM&T team completed the Outside Plant Infrastructure, which for the first time in 50 years provides the Pentagon with assured continuity of operations for its telephone and data cables and the services they carry in the case of a catastrophic event. The year included the Y2K rollover date (December 31, 1999-January 1, 2000), which transpired without any disruptions of service or negative impacts. Also this year, in an effort to maintain currency with evolving technologies, a higher bandwith network technology (Gigabit) insertion within the data communications network of the renovated Pentagon was implemented, thereby providing for increased data bandwidth availability for information technology services. Additionally, the Renovation Program's IM&T team continues implementation of the distributed telephone switching architecture, which employs fiber optic cabling to facilitate redundancy and survivability of voice services while eliminating massive pathway and copper cabling requirements in the building.

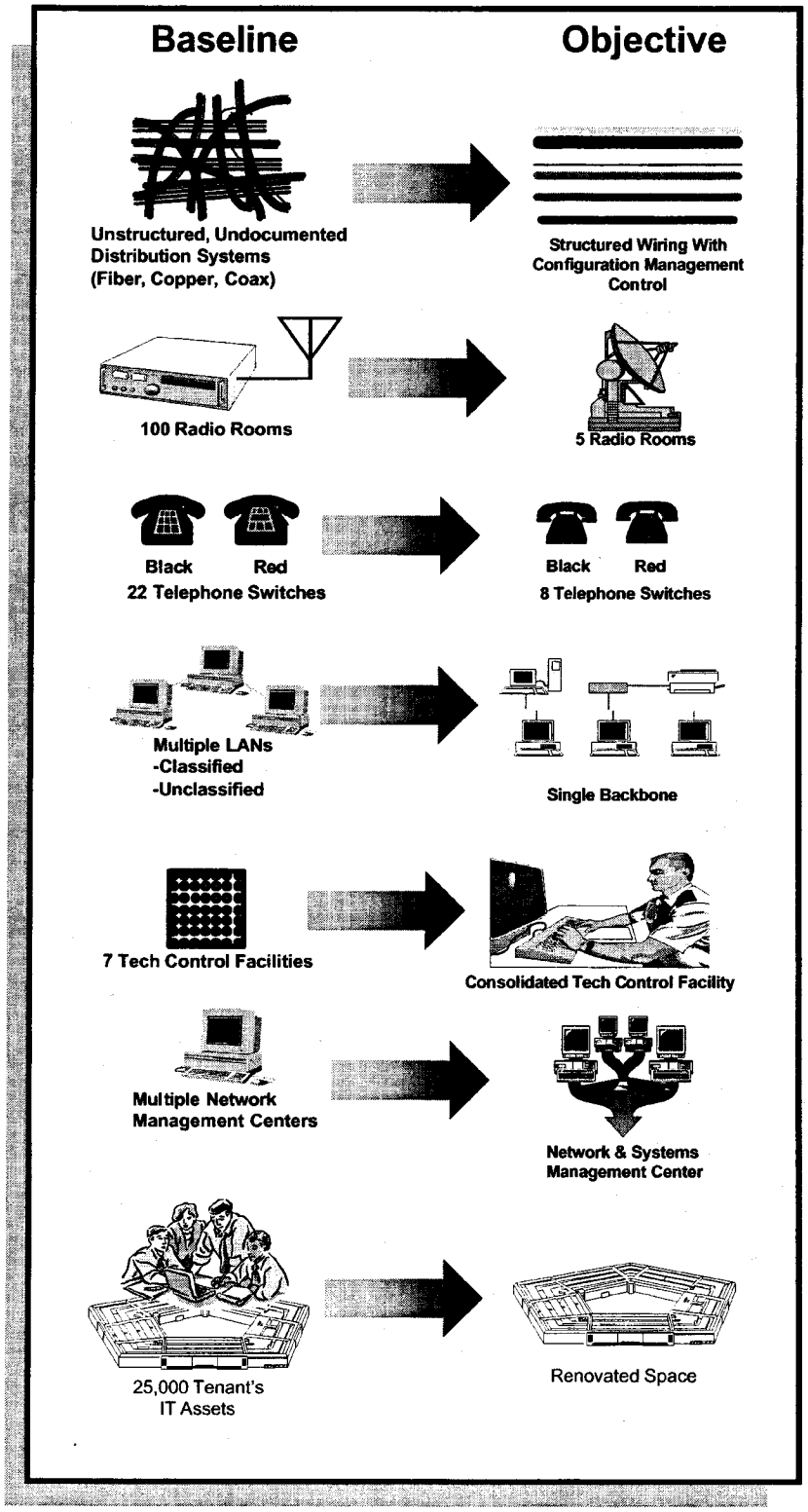


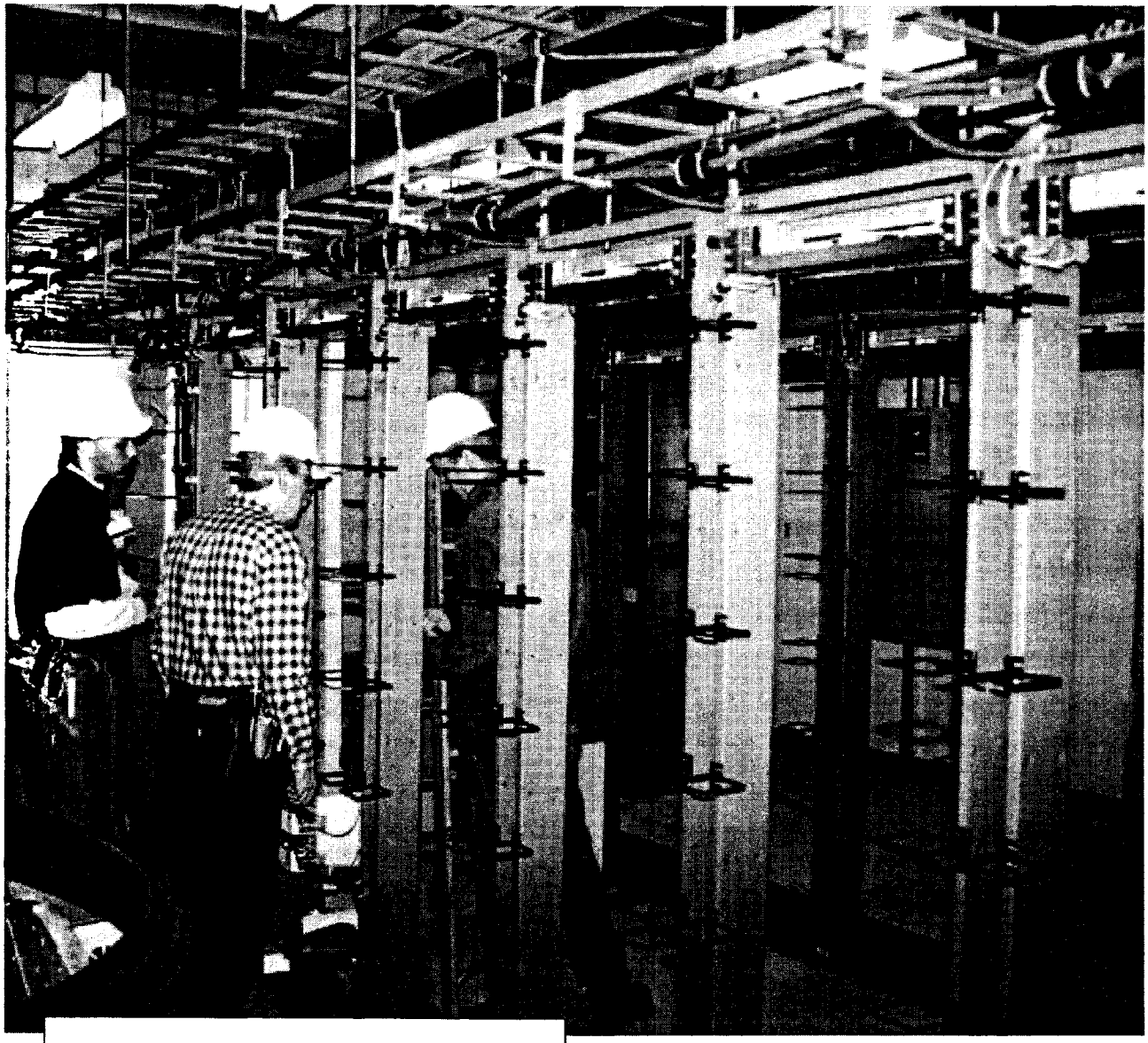
The renovated Network Systems Management Center monitors and supports all of the computer activity in the Pentagon.

The IM&T capabilities of the renovated Pentagon will be more flexible and reliable to meet the growing information technology demands being placed on the current systems by the building tenants.



New information and telecommunications trench being completed on the Heliport side of the Pentagon.





Technicians install new fiber optics in a Wedge 1 telecommunications closet.

Major Milestones/Schedule:

- **Wedge 1 Backbone Operational 15 Feb 2001**
- **Wedge 1 Distributed Voice 15 Feb 2001**
- **Wedge 2 Award FY 2001**
- **Navy Ops Center Operational 1 Aug 2001**

COMMISSIONING

Commissioning of the Heliport Fire Station and Control Tower electrical system.

Commissioning is the process of achieving, verifying and documenting the performance of building systems in accordance with the design intent and the owner's functional and operational needs. Commissioning starts in the design phase and extends through the construction process and into the warranty period. In brief, the commissioning process entails developing clear and complete design and operational intent documentation, verifying and documenting proper equipment and system performance, ensuring that appropriate operations and maintenance documentation is left with the building operating staff and ensuring that the building operators are sufficiently trained. Building commissioning is a team effort and requires cooperation by all parties to succeed.

Commissioning goes beyond testing, adjusting, and balancing and traditional inspection services. Commissioning involves functional performance testing to determine how well building systems, such as fire safety, mechanical and electrical systems, work together. Commissioning seeks to determine whether equipment meets a facility's operational goals or whether it needs to be adjusted to improve efficiency and overall performance.

These activities are not, as many owners and managers believe, part of the typical design and construction process or part of standard operations and maintenance procedures.

COMMISSIONING BENEFITS

The benefits most often cited for conducting commissioning are:

- Improved system performance
- Improved operation and maintenance
- Improved indoor air quality
- Improved energy efficiency

REQUIREMENT

Executive Order 12902, March 8, 1994, Energy Efficiency and Water Conservation at Federal Facilities, Section 306, requires that a facility commissioning program be established for all new or renovated buildings, but refers specifically to ensuring that performance standards, as set forth in 10 CFR 435, are met.

IMPLEMENTATION

The integration of the Commissioning process into Pentagon Renovation Projects was accomplished in phases. Five major projects underway or in planning are: the Tricare Clinic, Wedge One, the Remote Delivery Facility, the Metro Entrance Facility, and Wedges 2-5.

The TRICARE Clinic project was completed in February 2000. Commissioning was incorporated near the end of core and shell construction. Commissioning activities consisted of reviews of required submittals including operations and maintenance manuals, training plans, equipment startup checklists, functional performance tests, and 'as built' drawings. In many cases, commissioning included writing test procedures where there was no requirement for these under the pre-existing construction contract.

THE GOAL OF COMMISSIONING:

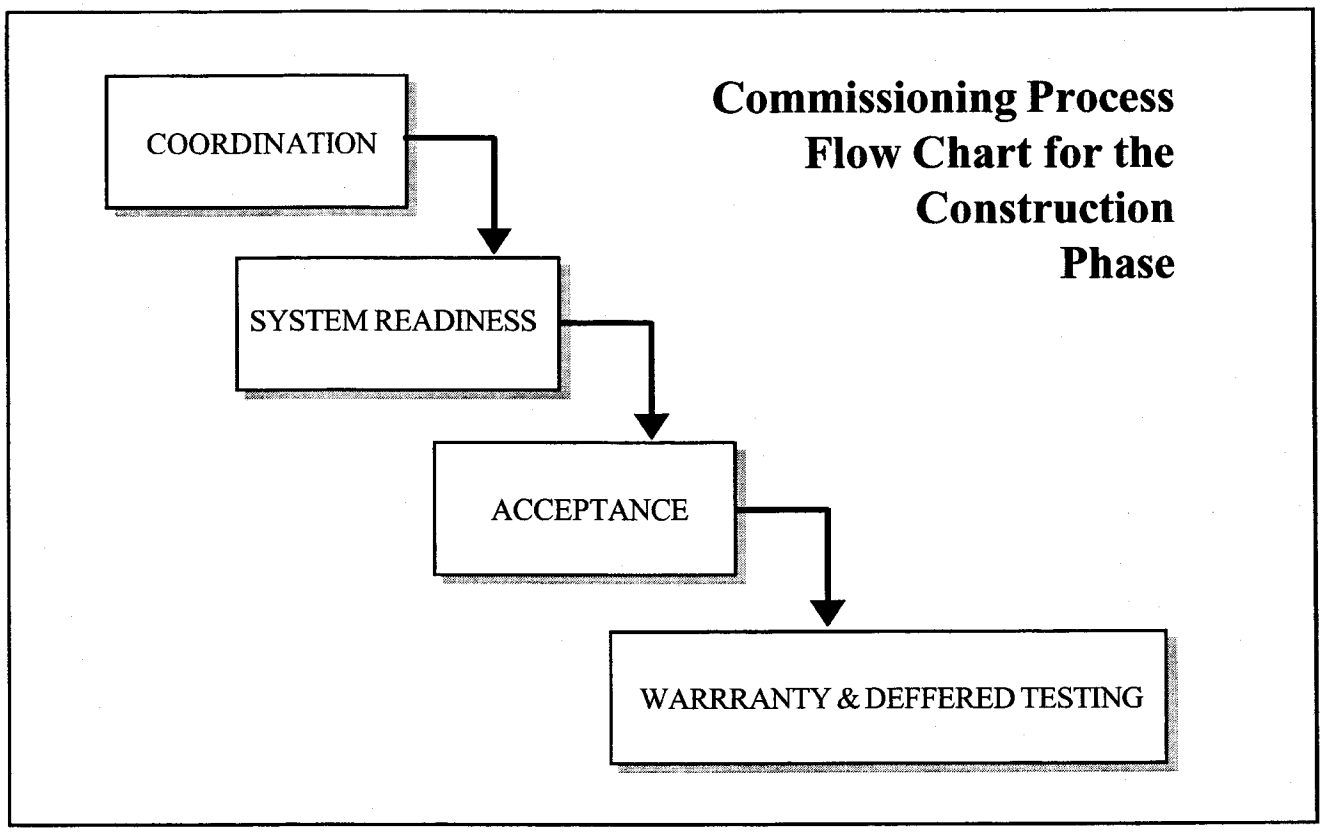
"Commissioning seeks to determine whether equipment meets a facility's operational goals or whether it needs to be adjusted to improve efficiency and overall performance."

ELEMENTS OF COMMISSIONING

1. Identifying and documenting the Owner's needs and the requirements of the facility;
2. Verifying that the designed systems are commensurate with and meet the Owner's needs;
3. Verifying that the systems installed are operable and maintainable;
4. Testing of the systems to verify that they are interacting and performing optimally;
5. Verifying that the design intent, the installations, and the Operations and Maintenance requirements are clearly and thoroughly documented; and
6. Training of the operators and the facility staff to help them operate and maintain the facility per the design intent.

The Wedge 1 project had completed the design phase and was just beginning the core and shell construction phase when commissioning activities commenced. Commissioning here included building system design reviews, and equipment and product data submittal reviews. As with the TRICARE Clinic project, commissioning activities included reviews of operations and maintenance manuals, training plans, equipment startup checklists, functional performance tests, and "as-built" drawings. The project also included execution of equipment startup checklists and functional performance tests, primarily of electrical systems.

The Remote Delivery Facility project is the first project for which the commissioning process was fully integrated from the start. Commissioning activities here began with technical reviews of the Conceptual Design, Basis of Design, and the Design Intent documents, and continued throughout all design phases and into the construction phase. Commissioning activities included reviews of operations and maintenance manuals, training plans, equipment startup checklists, functional performance tests, and 'as built' drawings. The project also included execution of equipment startup checklists and functional performance tests of electrical and mechanical systems.



The Metro Entrance Facility and Wedges 2-5 projects commissioning process was also fully integrated from the start. Commissioning activities here began with technical reviews of the Conceptual Design and RFP design criteria. After award of each project, commissioning will follow the same path laid out by the Remote Delivery Facility, incorporating lessons learned from the TRICARE Clinic, Wedge One, and the Remote Delivery Facility.

Scope of Commissioning Services

1. Normal Power Supply System
2. Emergency Power Supply System
3. Standby Power Supply System
4. Life Safety Lighting Systems
5. Fuel Oil Leak Detection System
6. Waterproofing System
7. Heating, Ventilation, and Air Conditioning Systems
8. Direct Digital Controls Systems (Emergency Management and Controls Systems)
9. Fire Protection and Suppression Systems
10. Electrical Distribution System
11. Building Envelope (including energy efficiency)
12. Potable Water System (including cross connection control/backflow prevention)

Note: Information Management and Technology (IM&T) systems are of primary importance in the design and construction of the Pentagon Renovation. The highly specialized nature of these systems requires that specialists internal to the Pentagon be tasked with the technical requirements and Commissioning of these systems.

TENANT MOVES

Due to the logistical constraints presented by the Pentagon building, its security requirements, and the necessity to minimize downtime and disruption to employees' daily activities, the Renovation Program implemented a unique and innovative process to relocate tenants within the Pentagon in order to meet the renovation schedule. This approach removes much of the guesswork associated with relocating and turning over space and, by coordinating with the tenant, minimizes disruption to tenant operations. To accomplish these tasks the Program established a Relocation Planning Team. The primary responsibility of the Relocation Planning Team is to prepare the tenants for the move. This includes:

- Providing agency-specific relocation checklists, which give the tenants an "itemized" list of tasks to be accomplished prior to, and after, the move;
  - Relocation Handbooks, which instruct the tenant on packing and labeling procedures, move timeframes, etc.;
  - "Move Packets", which have pre-printed labels and check-out sheets;
  - Post move questionnaires, which give the tenants an opportunity to provide the Program feedback on the relocation process, new space, furniture, systems, etc. These documents and forms have been made accessible to all Pentagon employees electronically, thus saving the government printing costs.
- Coordinating the logistical and security requirements between the movers and the affected agencies, such as the Defense Protective Service, Information Management and Telecommunications, the Dockmaster, and the Pentagon Building Management Office.

The Relocation Planning Team has saved the Government money on moves, approximately 25-percent, when compared to industry standards through up-front planning with the tenant, its understanding of the customers' needs, their working environment and the dynamics of the Pentagon building.

The decision to procure moving services through a multiple award contract has allowed flexibility in move assignments and removed constraints on resources. Some notable accomplishments are:

- Negotiating the cost for each move activity and overseeing the move activity to ensure adherence to the Government's instructions.
- Tracking, coordinating and overseeing the delivery and installation of furniture, furnishings, and equipment for tenants being relocated to renovated space as well as coordinating and overseeing the removal of surplus items.
- Coordinating the cleaning of the new space immediately after the move and prior to occupancy, as well as the removal of trash at the old space once the move has been completed.
- The relocation of almost 8,000 personnel from various wedges to external swing space locations, as well as to internal Pentagon locations.

The process developed by the Relocation Planning Team has resulted in saving the government money by establishing moving service contracts that allow the Program to handle activities that may not usually fall under a mover's purview. For example, the movers can provide cleaning services, subcontracting services for specialty equipment with warranties that require a certain vendor to perform the services, personal computer de-certification and re-certification services, etc. This flexibility allows the Program to handle a variety of tenant requirements.

Navy tenants enter Wedge 1 for the first time for a pre-move-in inspection.

Understanding the difficulty in adhering to schedules of the magnitude the Pentagon renovation requires, the Program procured a 60,000-square-foot warehouse to temporarily store new construction materials, furniture, furnishings, and information technology equipment in support of the renovation.

- Currently, warehousing the blast proof windows for the renovated Pentagon.

- Beginning a recycling program for cardboard trash at the warehouse. To date, the Renovation Program has recycled over 30,000 lbs. of cardboard.

To many, the successful relocation of the tenant to temporary or permanent space represents the end of the process. For the Program, however, the activities following the relocation are critical to the overall success of the renovation. The space vacancy and turnover process has been a significant factor for the renovation schedule. The coordination between the Renovation Program and all stakeholders to de-certify a space for demolition has been honed into a finely tuned process. The Program is responsible for removing the surplus furniture, furnishings, and equipment from vacated tenant space. To do this, the Program must inventory, identify surplus, and present to potential customers any furniture, furnishings, and equipment not being relocated to renovated space. Based on the condition of the surplus items, the Renovation Program has to determine if the items will be presented for re-use within the government, donated to charitable organizations or deemed excess property and officially disposed of. The Renovation Program must then coordinate with the various other partners in order to allow the disconnection of utilities, removal of secure lines, telephone lines and equipment, etc. The Program then coordinates a trash removal activity with its cleaning contractor in order to officially turn over a space to the demolition and abatement contractor to begin renovation. These myriad coordination activities have been reduced to a one-month duration after tenant move-out.

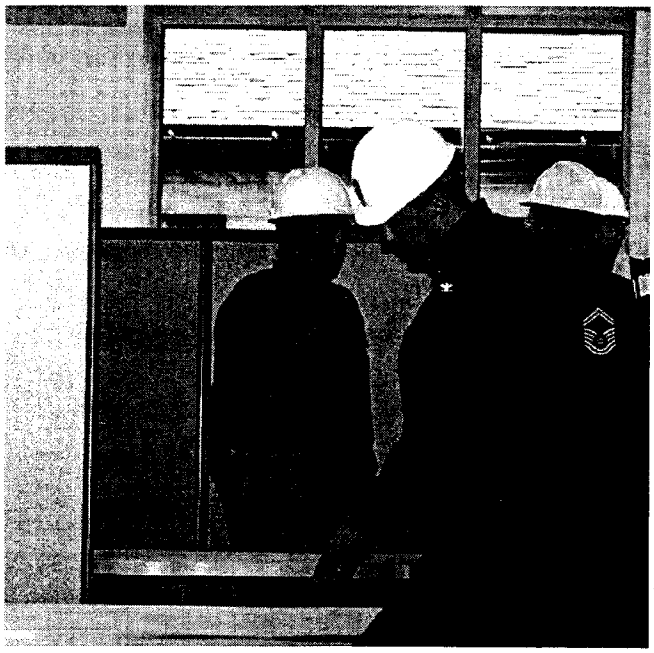
ACTIVITY STATUS - PROJECTS IN DESIGN

The Renovation Program has a Back-to-Basics approach to upcoming activities. Based on the lessons learned from the Wedge 1 move-outs and subsequent moves into swing space and new permanent space, the Program will perform the following activities by simplifying our move process, and begin to work closely with the design-build contractor in support of the following activities:

- **FY 2001** – The Renovation Program will handle the furniture tracking, delivery, and installation oversight, as well as the relocation planning, moves, and surplus removal services as it relates to the occupancy of Wedge1 and swing spaces. The Renovation will also procure the services of a cleaning contractor to provide pre-move cleaning and minor repair services for renovated Pentagon space. In addition, the Renovation Program will continue to use its three moving services contractors in support of the moves.

- **Outyears** – Artwork and artifiact removal and storage has been turned over to the Office of the Secretary of Defense.

SYSTEMS FURNITURE IMPLEMENTATION



Pentagon personnel inspect systems furniture in Wedge 1 during a pre-move-in inspection. The flexibility of the new furniture enhances the ability of organizations to change office configurations as mission requirements dictate.

WORKSTATIONS

In partnership with General Services Administration, a systems workstation schedule contract was awarded in January 1999 to five workstation manufacturers.

QUANTITY DISCOUNTS

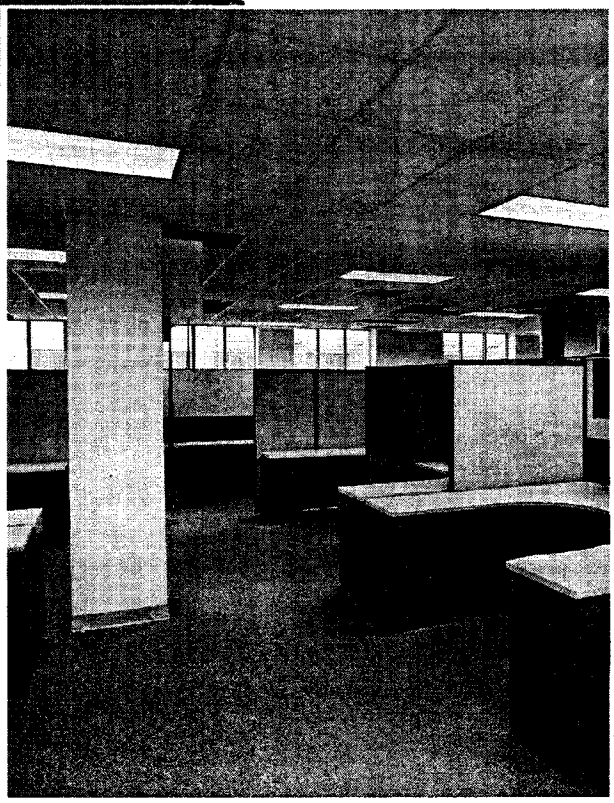
Because of the large number of workstations to be procured during the renovation, discounts were negotiated with each of the five furniture manufacturers to obtain cumulative quantity discount thresholds exceeding the maximum discount available from the General Services Administration schedule.

Installation of the spine-wall furniture in Wedge 1.

AWARD FEE PROVISION

An award fee provision was included to help ensure that furniture design and installation services are given the emphasis required to successfully integrate the furniture installation schedule into the construction schedule.

One spine-wall can provide data and communications lines for up to 12 work stations.



SPINE-WALL TECHNOLOGY

The advantages of using a spine-wall workstation configuration are:

(1) Telecommunications are run within the furniture in easily accessible raceways;

(2) Power and telecommunications are accessed at a "beltline" level rather than at the floor, making desk connections much quicker and simpler; and

(3) "Wing" wall panels connect anywhere along the length of the spine wall, not only at the panel intersections as in older style system furniture. This allows much greater flexibility in both initial furniture layout and future reconfigurations.

To ensure the government receives the best value, the Renovation Program...

(1) worked with the research and development components of the furniture manufacturers to develop extraordinarily capable furniture designs,

(2) will keep contractors in constant competition,

(3) will use award fees to ensure contractor profits are based on performance, and

(4) will re-use pre-existing free-standing furniture (file cabinets, tables, executive and conference room furniture).

These measures have reduced by $10 million the cost estimated to furnish each Wedge for a potential total savings of up to $40 million for Wedges 2 through 5.

PROGRAM MANAGEMENT

Like any major project, the Pentagon Renovation involves multiple, often competing interests. The project has a variety of organizations each with an important stake in the outcome of the renovation. Beyond the traditional owner-contractor interests, the project owner, Department of Defense, is itself a huge amalgam of organizational components and interests. The oversight of the entire Legislative and Executive Branches of Government is constant as cost and defense interests are continually re-balanced. In addition, there are regional energy, transportation, historical, and planning groups and their considerations that must be incorporated into the renovation process.

A major challenge for the Pentagon Renovation Program is the coordination of all of the projects and processes

Renovation Program Manager Lee Evey (left) describes renovation activites to Congressman James Moran.

described in this report, each with its own vitally important issues, in an on-going construction environment. The success of the Renovation Program requires an innovative management approach to accommodate the many interrelated and simultaneous construction efforts.

The use of Integrated Product Teams to manage manufacturing, research, and major systems acquisition programs has had a significant history, but such teams had not been adopted previously in the renovation for a complex construction project. The Integrated Product Teams bring together representatives from all the parties with significant interests in a particular activity.

It is often important to enlist construction contractors, or others traditionally considered adversarial to the traditional owner, as members of an Integrated Product Team. Team members are encouraged to share information with the group. They are all assumed to share the same goal of providing the best value and best quality product available. Innovative contracting incentives, such as the award fee process and under-run cost sharing, ensure that contractors also have an important interest in finding the most effective solution to problems.

There are several management teams on the Renovation Program. Representatives of the basic Government team including Washington Headquarters Services, the U. S. Army Communication-Electronic Command, and specialized Government and contractor employees form the core of most Integrated Product Teams. The teams are managed by Group Leaders who report to the Deputy Program Manager and Program Manager of the Pentagon Renovation Program. The Program Manager reports directly to the Deputy Secretary of Defense on all matters relating to the Program.

Team members most often are part of both functional and geographic Integrated Product Teams. The functional teams provide process management and planning expertise to the geographic teams. They are responsible for developing improved processes and providing people to the geographic IPTs fully trained in those processes, which include planning, design and contracting, among many others.

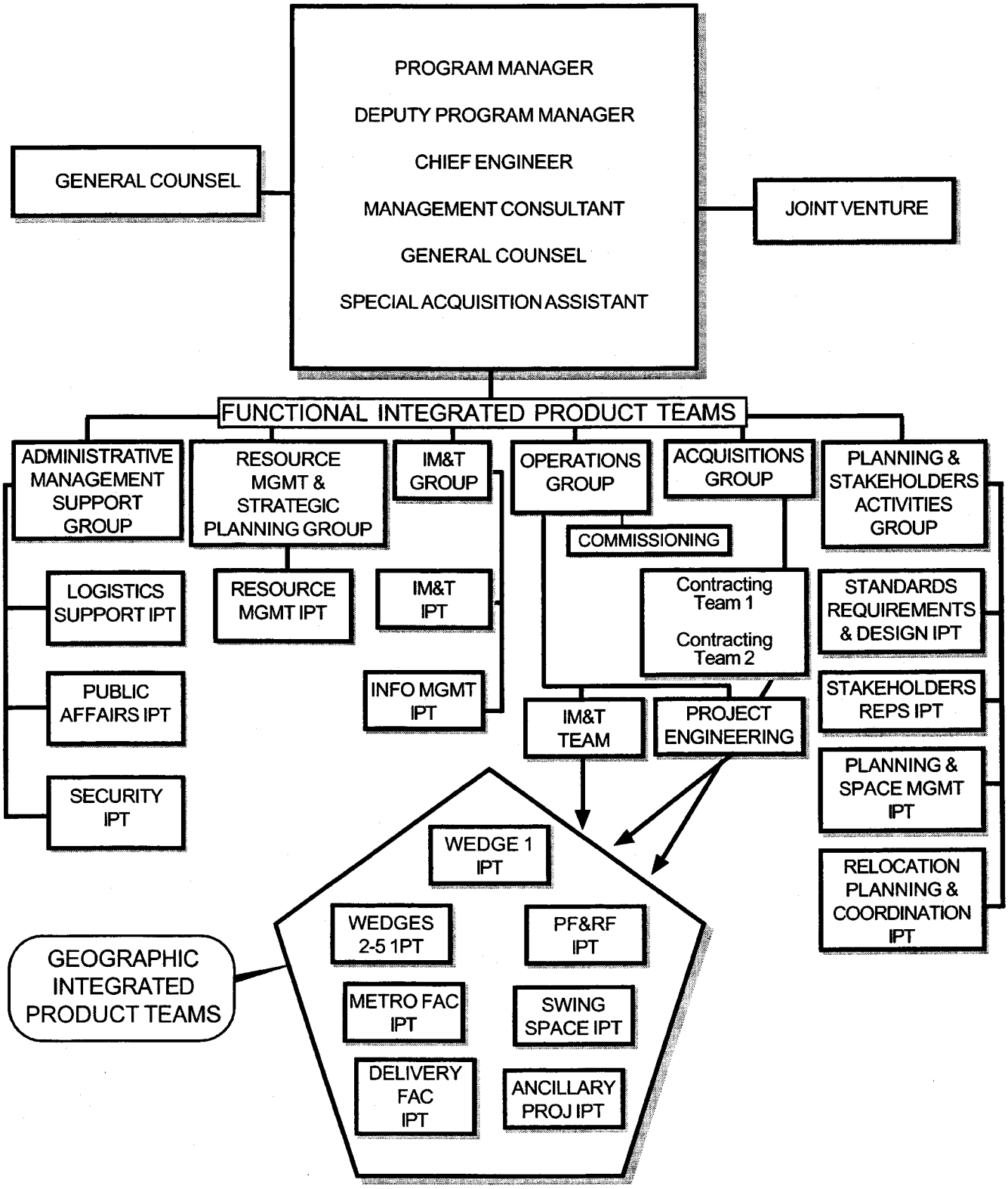
The role of a Geographic Team Leader is similar to that of the traditional "project manager" in terms of overseeing a project from its inception through to completion. The geographic teams "own" their schedule and budget, which means that they are responsible for the day-to-day execution of project activities, ensuring that all costs and schedules are maintained.

The Integrated Product Team meeting is a critical component in the Renovation Program's business plan. In stark contrast to the traditional construction contract progress meeting, Integrated Product Team meetings promote vigorous interaction and the best ideas normally gain a consensus, regardless of the proponent's sponsor.

Representatives from other user organizations, private contractors, or other entities are often added to particular teams to reflect important interests in a specific project activity. Legal, engineering, telecommunications, tenant activities, contracting, and other key interests must be integrated. One of the goals of the Integrated Product Team approach is to keep everyone informed while also obtaining the benefit of their ideas at the earliest possible point. Changes are agreed upon, implemented, and adhered to more easily when all interested parties have meaningful input throughout the process from start to finish.

In addition to the teams discussed above, special short-term teams, called project or Process Action Teams, are formed to deal with temporary issues or problems. As always, the early involvement of various interest groups provides the best opportunity to reach a mutually acceptable solution or to define the full range of issues.

PENTAGON RENOVATION PROGRAM TEAM STRUCTURE



IV. APPENDIX

Glossary of Terms

Program History - The Need for Renovation

Work Completed Timeline

Public Affairs

FY 2000 - National Defense Authorization Act (Federal Building 2)

FY 1991 - Legislative Authorization

FY 2000 - Department of Defense Appropriations Act

FY 2001 - Department of Defense Appropriations Act with Certification

Contact Information

GLOSSARY OF TERMS

As-builts
A graphic representaton that shows the actual site conditions as oppossed the intended architectural plan. The as-built drawings are turned over to the property owner as part of the commissioning process.

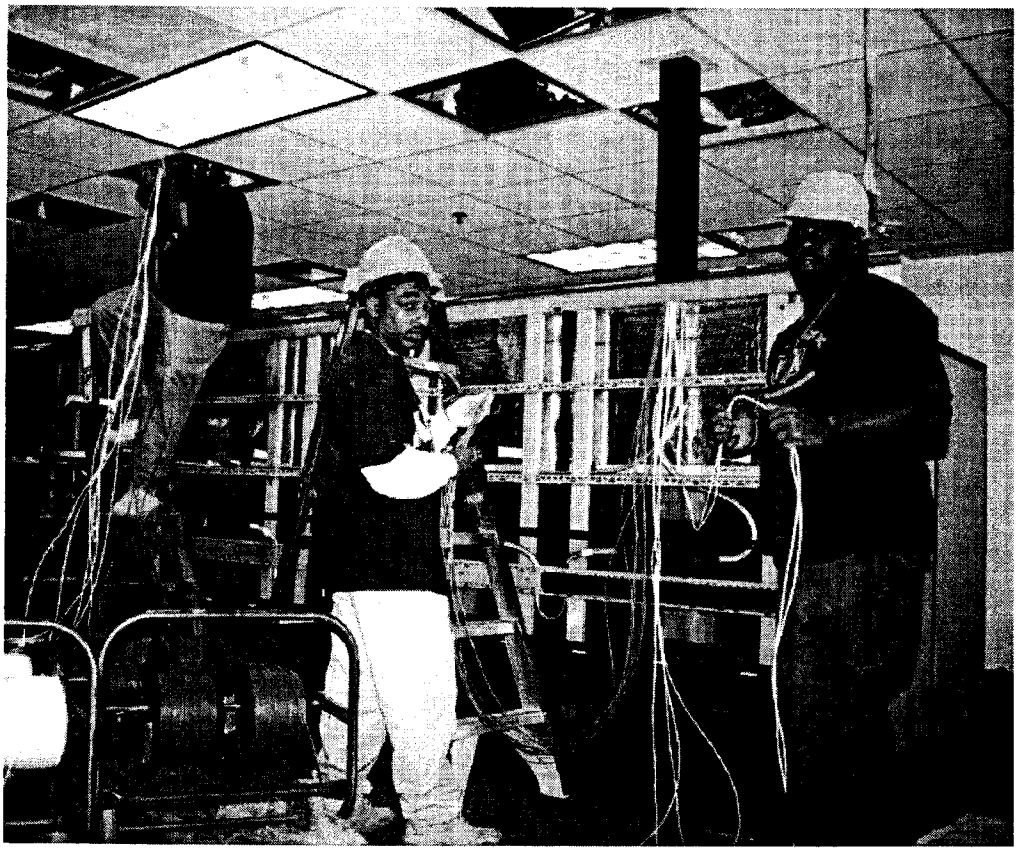
Ancillary Projects
Projects that fall outside of the Renovation Program's identified scope of work and do not fall under the Congressional budget restriction of $1.22 billion.

Backbone
The primary infrastructure for the transmission of data including major telecommunications components.

Back-to-Basics
Cost reduction initiatives implemented after unforeseen conditions inside the Pentagon lead to a growth in both schedule and cost threatening to bring the Renovation Program over the Congressional-spending cap.

Best value
Best value determination is typically based on an analysis of factors including past performance, management approach, technical approach, probable cost, and small and disadvantaged business support.

Core and Shell
Building common elements in an area, including walls and public corridors and rebuilding the main utility systems.



The addition of a drop-ceiling in Wedge 1, allows all of the cables, telecommunications conduits and utilities to be brought into an office from overhead.

Design-bid-build
The standard procedure for construction contracts.

Design-build
The Renovation Program's approach to construction contracts that allows the design and construction to operate simultaneously to best meet the requirements of the intended tenant.

External swing space
Temporary office space outside of the Pentagon in nearby office buildings.

Fiscal Year (FY)
The days falling between October 1 through September 31; used rather than Calendar Year for budget purposes.

Fit-out
Building interior office space for the intended tenant.

Internal swing space
Temporary office space built-out inside the Pentagon.

Lessons learned
A list of the unforseen problems the Renovation Program was faced with once demolition and abatement began, particularly in Wedge 1, and how they were resolved.

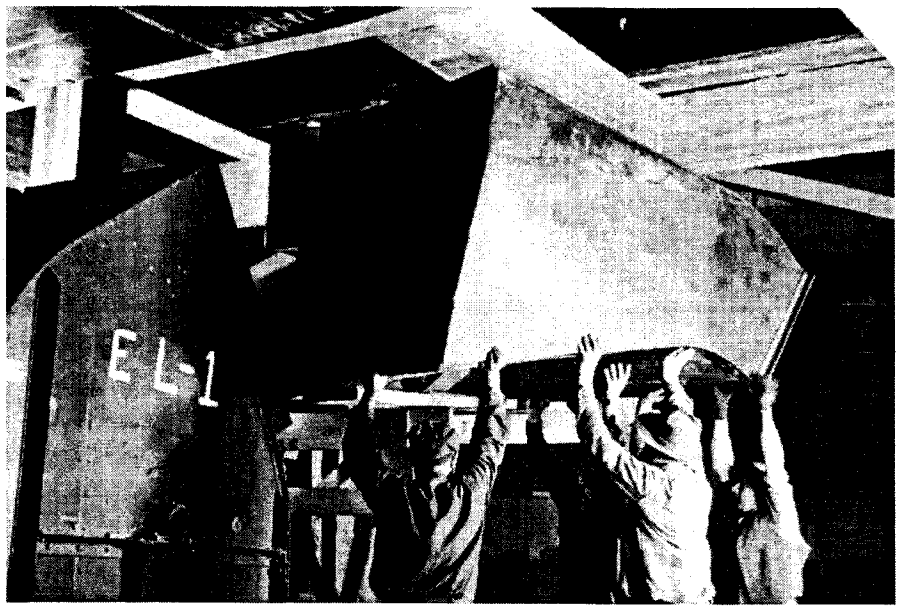
Power/Site
Ancillary projects to the Pentagon Renovation Program that relate to the operation of the Heating and Refrigeration Plant.

Punch list
A list of outstanding construction items.

Spine-Wall
The demountable wall found in systems furniture that carries electrical and telecommunications wiring.

Swing space
Temporary tenant space built-out in areas in and around the Pentagon. Occupied while the existing space is being renovated.

Systems Furniture
Demountable partitioned office furniture that provides greater flexibility than standard office furniture.



During original construction all of the heating, ventilation, and air conditioning was housed in the Pentagon's Fifth Floor and brought into an office bay through the weather master window units.

PROGRAM HISTORY – THE NEED FOR RENOVATION

The Pentagon is one of the most recognizable buildings in the world. It has been inseparably linked with the United States Military since its construction during World War II.

During the first half of 1941 the War Department found it increasingly difficult to provide space for the headquarters staff of an expanding army. In May, the Public Buildings Administration proposed erecting temporary structures for various agencies on the outskirts of the city. In July 1941, 24,000 personnel were scattered among 17 buildings in Washington, D.C., with others in Fort Myer and Alexandria, Virginia. By the beginning of 1942, the number of personnel was expected to reach 30,000. The President, therefore, asked Congress for authority to construct additional buildings within or near the District of Columbia. The War Department's Chief of Construction, Brigadier General Brehon B. Somervell, had a better idea, a scheme to house the entire War Department under one roof. He talked to General Moore, Deputy Chief of Staff, and to U.S. Representative Woodrum (D-Virginia) about his idea.

The Pentagon under construction in 1942. The 29-acre structure was completed in just 16 months. The building has never undergone a major renovation and today, after 58 years, all its building systems need complete replacement.

At a Thursday, July 17, 1941, hearing on construction projects before the House Subcommittee on Appropriations, the Chairman, Mr. Woodrum of Virginia, suggested to Brigadier General Eugene Reybold and Brigadier General Somervell that the War Department find an overall solution to its space problem rather than the partial solution proposed by the Public Buildings Administration. Somervell directed Architect G. Edwin Bergstrom to place on his desk, by 9 o'clock Monday morning, basic plans and architectural perspectives for an office building to house 40,000 people. Five days later, on Tuesday, July 22, 1941, Reybold and Somervell presented the plan to the Subcommittee. The plan was approved by the House on July 28, 1941, and by the Senate on August 14, 1941.

On August 25, 1941, President Roosevelt signed the bill appropriating funds for construction. However, because of considerable controversy over the proposed location at the foot of Arlington National Cemetery, he reserved the right to pick the site. The following day, the President directed that the construction site be moved south to the Pentagon's present location.

The Pentagon's unusual five-sided configuration was dictated by the site originally proposed (adjacent to Memorial Drive, about three-fourths of a mile north of where the building was actually constructed). An early plan called for a square structure with one corner cut off to accommodate an existing road. This resulted in a skewed Pentagon shape. Serious objections were raised to locating the building on open land directly between Arlington Cemetery and Washington's Monumental Core, and discussions ensued regarding selection of a building site resulting in less visual and physical impact from the project.

During the debate on the site, the project's chief architects, George Edwin Bergstrom and David J. Witmer, continued to refine the design. The final design retained the five sides, in the form of a true pentagon, which gave rise to the building's name. That shape resulted in the most efficient use of available space. The concept of using several concentric rings to contain the space evolved during further refinement of design. Preliminary design and drafting took just 34 days. A project of this magnitude and urgency demanded the rapid assembly of an unprecedented design and production effort.

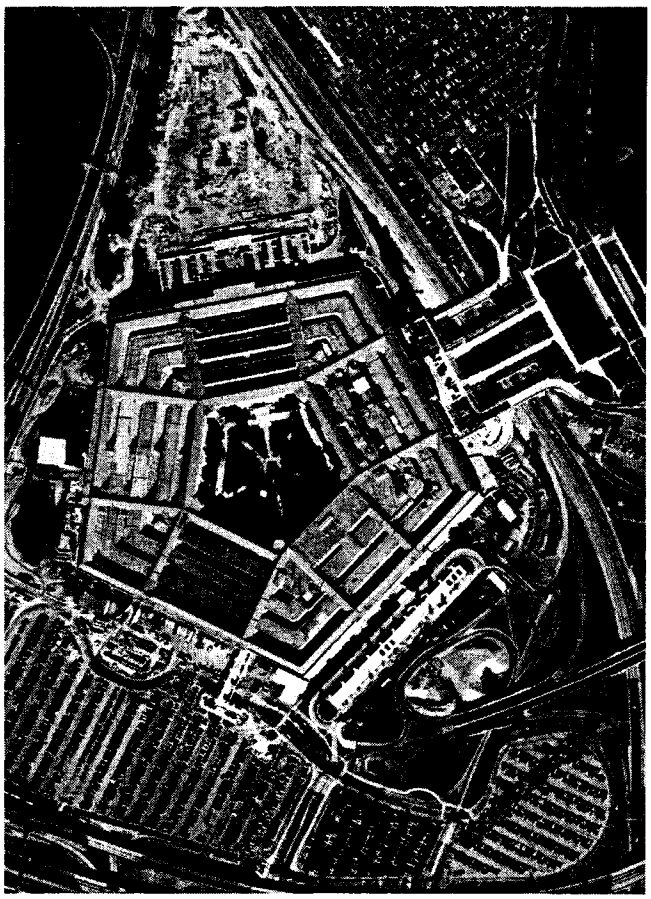
The office of the chief architect rapidly grew to 327 architects and engineers who were supported by 117 field inspectors. The weekly output of prints ranged from 12,000 to 30,000 with reproduction machines running on a 24-hour basis. For periods of time, new drawings were issued nightly. The reproduction effort consumed 15,000 yards of print paper per week.

Construction began on September 11, 1941, and was completed on January 15, 1943. At one stage of construction, 15,000 people were employed on the job working three shifts, 24 hours a day. At night, they worked under floodlights. Construction took just 16 months, a remarkable feat of engineering and management.

THE PENTAGON BUILDING

The Pentagon is the Headquarters of the Department of Defense and the national defense establishment. It houses the Offices of the Secretary of Defense, the Joint Chiefs of Staff, and the Secretaries of the three Military Departments. The Pentagon building, at 6,500,000 square feet, provides approximately 3,800,000 square feet of occupiable space. At the peak of World War II, 33,000 people were provided working space in the building.

Aerial view of the Pentagon in November 1999. The Pentagon building covers 29 acres and has three times the office space of the Empire State Building.



SIZE

The Pentagon building is composed of five concentric pentagonal rings connected by ten radial corridors. Each of its outer walls is 921.6 feet long. The building covers 29 acres, the largest ground area of any office building in the world. A five-acre pentagonal courtyard is located in the building's center. The building and its central courtyard cover 34 acres. There are 17.5 miles of corridors in the building. The structure is three times the size of the Empire State Building and 50 percent larger than Chicago's Merchandise Mart. The building rests on 41,492 concrete piles, the combined length of which would stretch 200 miles. The five concentric pentagonal rings are separated by interior courts which serve as light wells. This design feature increases the number of windows allowing natural light. Each ring has five stories. The Mall and River sides of the building have a Basement area which includes a partial Mezzanine. The innermost and outermost rings have sloping slate roofs, while the other three rings have flat, built-up roofs. The rings are connected at each floor level by a series of ten radial corridors extending from the "A" ring (innermost) to the "E" ring (outermost).

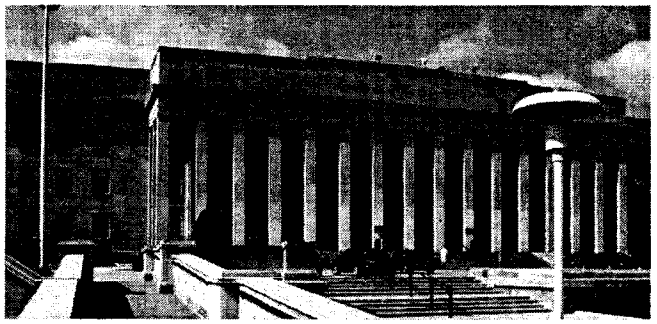
EXTERIOR

The exterior walls of the concentric rings and the interior courtyard are exposed concrete. They appear to have a wood-grain texture because they were poured into wooden forms made of 8-inch boards. A gap was left between boards enabling concrete to ooze and form a slight ridge. From a distance this gives an appearance of limestone.

Clockwise from its northern point, the Pentagon's five facades are the Mall Terrace Entrance facade, the River Terrace Entrance facade, the Concourse Entrance (or Metro Station) facade, the South Parking Entrance facade, and the Heliport facade. The outer facades of the Pentagon are simple, with a minimum of ornamental embellishment. Although the ornamentation style is classical in origin, it has been greatly simplified. The outer walls are limestone, as a direct result of a restriction by President Roosevelt that there be no marble in the building.

MATERIAL SHORTAGES

The shortages of materials required for war production raised many design and construction problems. The use of reinforced concrete in lieu of formed steel for the building made possible a saving of 43,000 tons of steel, more than enough to build a battleship. The use of concrete ramps rather than elevators further reduced steel requirements. Drainage pipes were concrete; ducts were fiber, interior doors were wood. An unusual wall design - concrete spandrells carried to window sill level - eliminated many miles of through-wall copper flashing. When Somervell was asked to make still more drastic reductions, he agreed to "striptease" the entire structure. Bronze doors, copper ornamentation, and metal partitions in rest rooms were among the first to go. The stripping process continued throughout construction.



The Pentagon's River Terrace as it appeared in April 2000.

THE SITE

The Pentagon Reservation is located in southeastern Arlington County, Virginia, and is situated between a large man-made lagoon (the Pentagon Lagoon, formed during construction) and the southeastern corner of Arlington National Cemetery. The northeastern and eastern facades have unobstructed vistas of the Monumental Core of the Nation's Capital across the Potomac River. The Pentagon's relatively low profile also permits clear vistas of Washington from the highlands of Arlington National Cemetery.

TERRACES

There are large ceremonial terraces in front of the Pentagon's Mall and River Entrances. The River Entrance terrace extends 900 feet to the Pentagon Lagoon bounded by a ceremonial landing dock and two monumental stairways. The maximum width of the River Terrace is 450 feet. The terrace in front of the Mall Entrance is smaller, measuring 600 feet by 125 feet.

For many, the network of roads around the Pentagon is often as confusing as the maze of rings and corridors inside the building.

ACCESS

The Pentagon site originally contained three cloverleaf interchanges that were among the earliest such structures constructed in the United States. These freeway-scale interchanges were necessary to handle traffic associated with the large number of people working in the building.

LAGOON

The Pentagon Lagoon was created during construction of the building as a result of dredging sand and gravel for concrete, and to obtain fill for landscaping. The lagoon is also the location of the water intake for the Pentagon's Heating & Refrigeration Plant. The Roaches Run Waterfowl Sanctuary lagoon, created during construction of the George Washington Parkway in the early 1930's, is used for the Heating & Refrigeration Plant's water discharge outfall.

The Pentagon Reservation has been altered over the years. A heliport was added; Shirley Highway (now I-395), a limited access Interstate Highway and interchange, infringed on the Pentagon site on the south side; a major Metro station and transfer point was added, and underbuilding bus and taxi tunnels were converted to offices.

BUILDING CONDITION

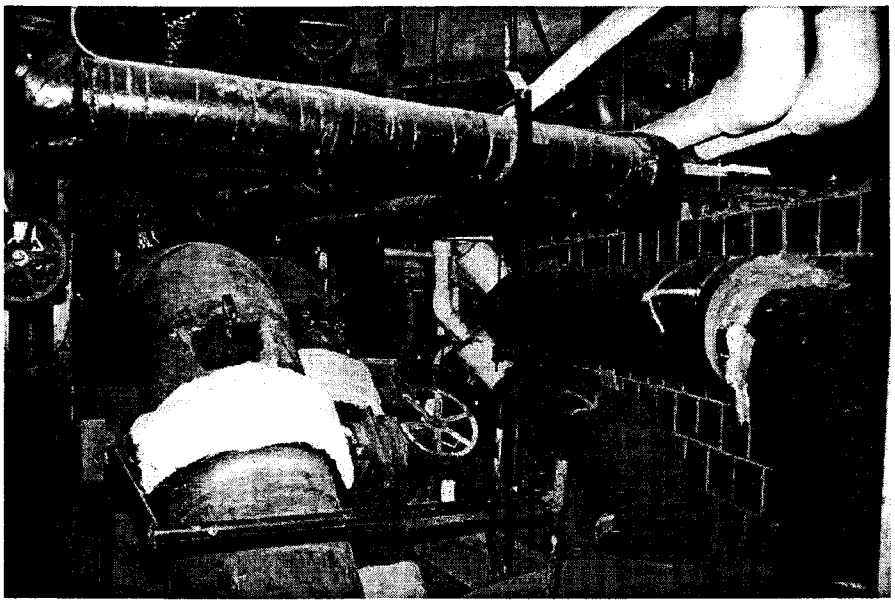
The Pentagon has suffered from decades of neglect and under-funded maintenance and repair programs. Many of the building systems have deteriorated beyond economical repair and require complete replacement. Building code violations and unsafe conditions have been brought about by the Pentagon's non-compliance with the fire protection and life safety standards established over the last 50-plus years. Structural deficiencies also need to be corrected. Some areas of the Basement have settled as much as 12 inches due to the poor load bearing capacity of the soil under the floor slab.

INTERIOR SPACE LAYOUT

The Pentagon's original interior space layout has been modified over the years. Walkways and service corridors have been closed and converted to office and storage space. Original office areas that were large open spaces have been chopped up and enclosed with full height partitions that make the building functionally inefficient. This adversely affects heating, ventilating, and air conditioning system controls and distribution.

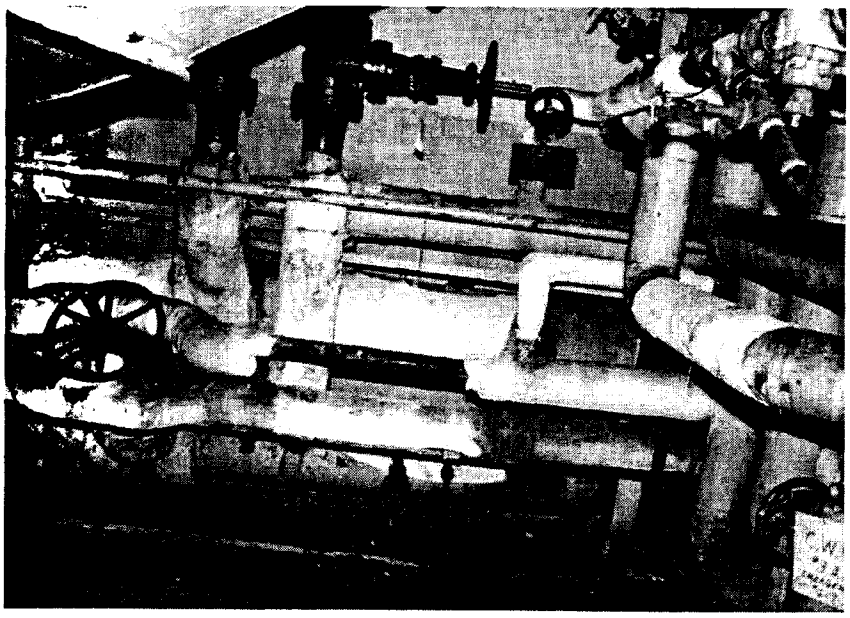
BUILDING SYSTEMS

Before the Renovation Program began, none of the original major building systems had ever been replaced nor had they been significantly upgraded. The widespread use of computers and modern technology has overwhelmed the capacity of deteriorated building systems. Electrical, plumbing, heating, ventilation, and air conditioning (HVAC) systems need to be replaced and modernized to accommodate added loads and to provide efficiency and flexiblity. The building has individual packaged air conditioning units providing cooling for special use areas in addition to the chilled water provided by the Pentagon Heating & Refrigeration Plant. The overloaded secondary electrical circuits result in as many as 20 localized power outages every day, which increases to between 30-40 a day in the winter when people bring unauthorized space heaters into the building to compensate for the deteriorated HVAC system. Regular plumbing failures occur as a result of the deteriorating piping systems, which are 58 years old. Of the 691 drinking fountains in the Pentagon, approximately 30 are out of service on a daily basis.



The Pentagon's existing utility distribution system is in "a potential state of catastrophic failure" according to an independent consultant. In addition to their antiquated condition, most pipes are insulated with asbestos.

During Desert Shield/Desert Storm, a fire broke out in the Joint Chiefs of Staff area of the Pentagon. Arlington County, which provides fire protection to the Pentagon, pressurized a standpipe and, consequently, blew out a four foot section of ten inch pipe. Water flooded approximately 350,000 square feet of the Pentagon basement, nearly causing the Army and Air Force Operations Centers to shut down. The water flowed through a steam tunnel to the Heating & Refrigeration Plant basement, where the water reached a height of seven feet.



Old corroded pipes result in frequent leaks throughout the Pentagon.

Frequent leaks, breaks in pipes, and clogged pipes not only escalate operation and maintenance costs, but also create potential health hazards.

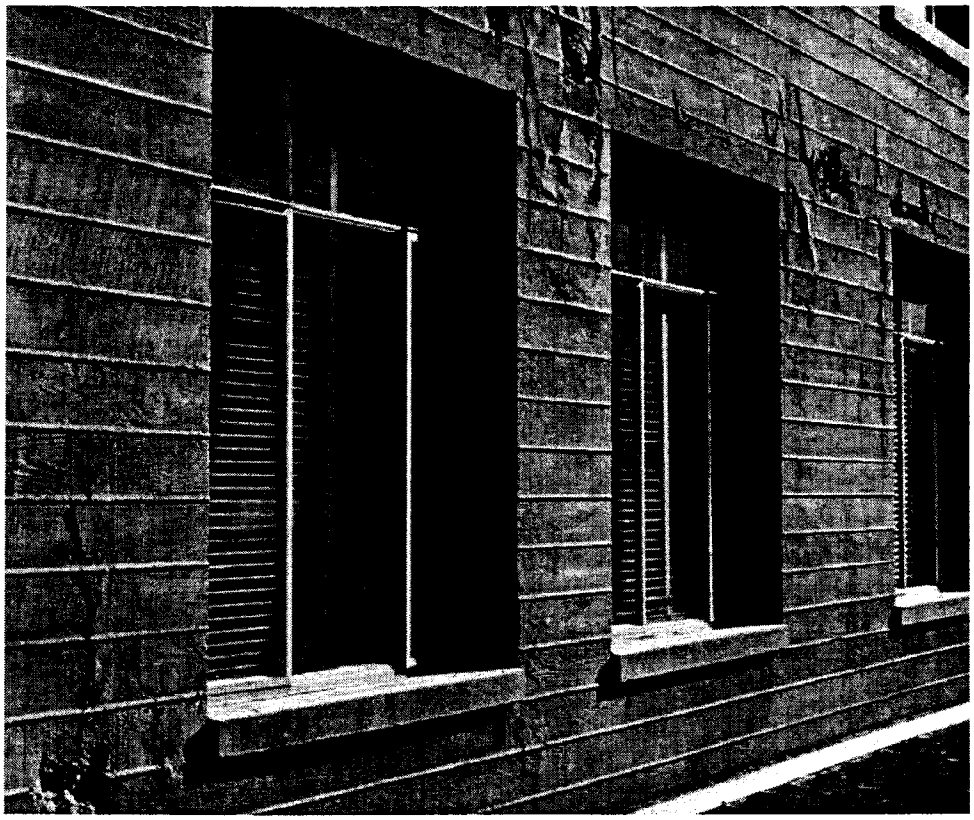
The basement has been flooded as the result of condensate leakage, inoperable sump pumps that were unable to accommodate rising ground water, and rusted and corroded valves. Only valves that have been replaced are operable.

The HVAC systems are original and in need of replacement. Of the Pentagon's 150 miles of ductwork, approximately 17.5 miles of it is made from asbestos, typical of the time when the Pentagon was built.

The electrical system was designed for a manual office and does not support the demands of today's high-tech office environment. Obsolete components make maintenance and repair difficult. Panel boards are loaded beyond maximum capacity and do not meet code, thereby creating a fire and safety hazard. The information systems that were installed in the Pentagon are plagued with abandoned cabling and an unverifiable backbone for the building. Consequently, there are numerous local area networks that are operated independently of one another, which causes problems.

EXTERIOR WALLS

Architectural and structural elements of exterior walls have shifted and settled. Moisture is penetrating cracks, causing damage to the concrete and reinforcement. Cracking and evidence of movement is apparent on all perimeter walls. The exterior walls are not thermally efficient. The limestone facade is in need of cleaning and repair to insure its weather tightness.



Much of the Pentagon's exterior concrete is in disrepair.

There are two types of courtyards at the Pentagon: (1) interior courts (light wells) between concentric rings of the building and, (2) the Center Courtyard.

All courtyard walls are of concrete with fair to failing surface conditions. Concrete is spalling, particularly where rusting reinforcing bars are exposed. Patch material is failing; cracks, efflorescence, and water stains are evident everywhere. In addition to problems cited in the courtyard walls, cornices are disintegrating, especially between Corridors 7 and 10. There are also problems due to use of non-conforming materials and poor construction.

Access bridges span several interior courts at the approximate mid-point of the court length. Originally, these bridges were open, crossing the court at each floor level. A number of the bridges have been enclosed and incorporated into secondary corridor systems while others open directly from individual offices. All of these bridges are in poor condition. Attempts made to control leaks at the interior spaces have been unsuccessful. At a minimum, replacement of the roof/bridge drainage system will be required at each bridge. Concrete surfaces and waterproofing will have to be repaired and interior surfaces restored.

BASEMENT FLOOR

The Basement floor of the Pentagon was constructed as a slab on grade, designed to carry a light storage load. A 1983 report on the stabilization of the depressed floors states that the basement floor slab was placed directly on the underlying soil fill, which consists of surface fill materials overlying compressible organic soil. The subsidence has been gradual over the years and was aggravated by voids under the slab, leaking utility lines, and at times by the dewatering during the construction of Metrorail. These subsurface conditions, along with the assignment (and reassignment) of special purpose activities and the storage of heavy loads of material and equipment, have caused the basement slab to settle up to 12 inches in some areas, causing severe damage to critical communication centers. Repairs were made to correct the distressed areas by pumping concrete under the floor, or by adding leveling slabs, but these repairs were unsuccessful. The only recourse is to remove entirely some 300,000 to 500,000 square feet of slab and reframe the floor as an independent floor slab bearing on new and existing pile foundations. A large portion of this deficient slab has been replaced during the renovation of Basement Segement 1. Lowering the Basement slab in some areas will allow maximum expansion of the Mezzanine space.

Garbage containers and buckets catch water leaking from pipes overhead in the Pentagon's basement. In addition to a sinking floor slab, water-stained ceiling tiles and dark corridors are commonplace in the lower levels of the building.

RIVER AND MALL TERRACE

The River and Mall terraces extend beyond the exterior perimeter of the building and the occupied areas beneath have experienced considerable damage from water intrusion. Extensive reworking of major building expansion joints, deteriorated waterproofing and concrete elements is required to make these areas watertight. The River Terrace waterproofing has been completed as part of the basement renovation activities.

The entire River Terrace parking lot and a portion of the parade field were excavated to clear the way for waterproofing and repair to the area.

NORTH PARKING PEDESTRIAN RAMP

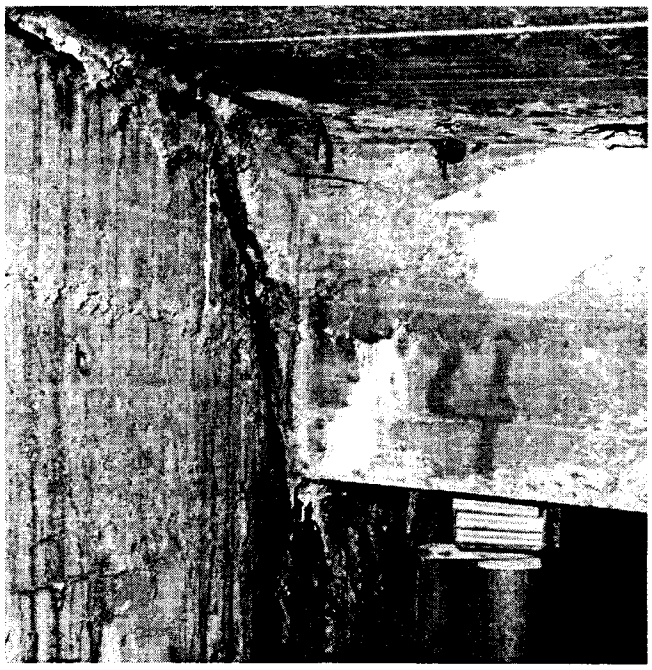
The pedestrian ramp, leading into the Corridor 8 Entrance from the North Parking lot has undergone serious deterioration as a result of failure of one of the abutments.

HEATING AND REFRIGERATION PLANT

The original Heating & Refrigeration Plant (now fully demolished) that was built in 1943 provided utility services (heating steam and chilled water) to the Pentagon as well as to other parts of the Pentagon Reservation. The plant became obsolete and was no longer efficient and serviceable. Temporary chillers and boilers were being rented to support the needs of the Pentagon, Federal Building #2 (Navy Annex), and Henderson Hall (Marine base). Three rental boilers and six rental chillers were used from 1989 to 1996 for a cost of over $2,000,000 per year. This antiquated plant was replaced in 1998 with the new Heating and Refrigeration Plant.

INFORMATION MANAGEMENT AND TELECOMMUNICATIONS

The current Pentagon information and telecommunications infrastructure is an accumulation of systems and networks, which have been installed, in a piecemeal fashion, since 1943. There are multiple deficiencies specific to the information management and telecommunications posture of the Pentagon. These include outdated and overworked communications systems, an enormous number of single user-oriented and user-unique data systems, inadequate wiring systems, obsolete and congested wire closets, risers, cable pathways, and protected distributed systems, poor quality grounding systems, and limited wiring system access due to asbestos hazards. As information management requirements and technology changed throughout the years, new telecommunications systems were added in an ad hoc manner, often over existing wiring. This has produced a collection of independent and largely non-interoperable systems and networks, many of which are poorly documented.



Before renovation, a person's entire hand and arm could fit through this crack in a concrete beam below the North Parking pedestrian ramp. The bridge has now been completely repaired.

SITEWORK

Traffic conditions, especially in the South Parking areas, are very hazardous. Reconfiguration of roadways, bus, and truck access areas and parking is necessary to provide safety for pedestrians. Parking lots are in poor condition with minimal landscaping. Wide spread failure of pavement base and sub-base is evident. Roads, walks, fences, bridges, and other structures and elements exhibit significant deterioration. Bridge concrete and stonework is crushed and spalled. Exterior steps and terraces are spalled, joints are open, and the occupied areas below these elements have experienced water leakage on a continual basis.

SUMMARY

Generally, the Pentagon's problems requiring a full scale renovation can be grouped into seven categories:

1. Changing requirements for fire and life safety.
2. Miscellaneous systems failure.
3. Engineering systems failure.
4. Changing technology with an increased demand for services.
5. Security.
6. Compliance withe environmental standards.
7. Compliance with the Americans with Disabilities Act.

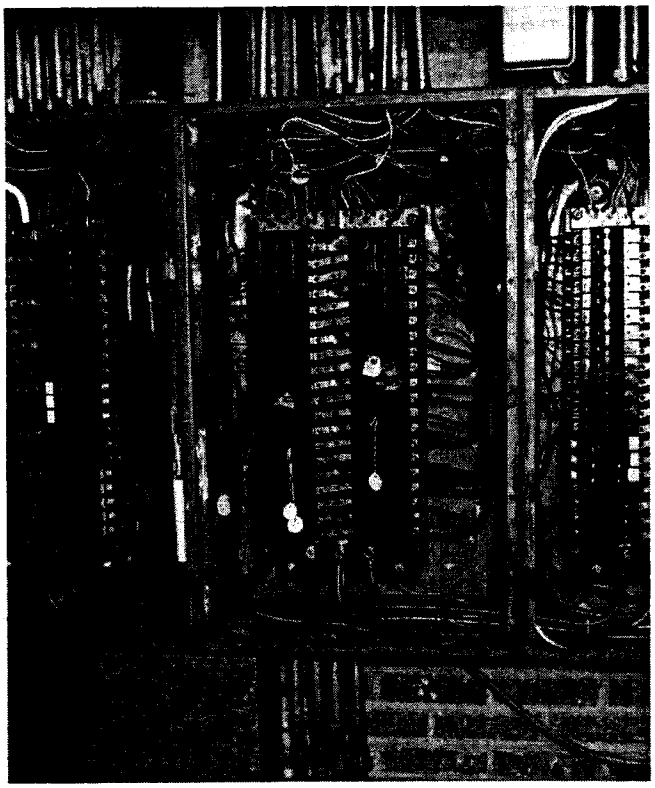
The Pentagon's old Heating and Refrigeration Plant was demolished when the new facility became operational. The original plant was coal-fired until the mid-1980s and each of its boilers and chillers were mechanically unreliable and of insufficient capacity.

FAILURE TO KEEP PACE WITH CHANGING STANDARDS FOR HEALTH, FIRE, AND LIFE SAFETY

Pervasive asbestos and lead contamination of interior surfaces and pipe insulation requires the use of asbestos and lead abatement for even minor repairs to avoid possible health risks to building occupants when these materials are disturbed. This is a significant time and cost restraint to the maintenance and repair program.

The Pentagon's antiquated building systems pose present many potential hazards, including:

- Inadequate sprinkler systems to protect the entire building.
- Numerous emergency diesel generators are currently located inside the Pentagon presenting a potential fire and carbon monoxide gas hazard.
- Excessively long fire egress routes in the building.
- Vehicle/pedestrian conflicts exist throughout the reservation.



Old electrical circuits can not accommodate the energy demands of today's modern technology. An average of 30 localized outages are experienced each day in the Pentagon.

The deterioration of the Pentagon structure and its support systems is marked by the characteristics listed below and on the opposite page.

MISCELLANEOUS SYSTEMS

- Rusted and corroded casement window frames in most of the 7,748 windows.
- Shifting and cracking of architectural and structural elements deteriorated expansion joints, cracking of building elements, and water penetration.
- Spalling of concrete, rusting reinforcement bars in the concrete, and deteriorating cornices.
- Deterioration of beam/girder connections.
- Failure of the basement floor due to lack of stable ground support.
- Intrusion of water through deteriorated expansion joints and deteriorated surface waterproofing.
- Deterioration of roadway bridges and their drainage systems.

ENGINEERING SYSTEMS FAILURE

- Severely undersized, inflexible and unreliable, heating, ventilation, and air conditioning (HVAC) systems.
- Unreliability of current building HVAC systems has resulted in independent air conditioning (A/C) units having been installed in certain areas.
- Deteriorated and overloaded secondary electrical circuits result in daily failures of electrical systems.
- Deteriorated and undersized electrical closets prohibit proper wiring and management of electrical systems.
- Deteriorated undersized plumbing, hot water, domestic water and other mechanical systems.

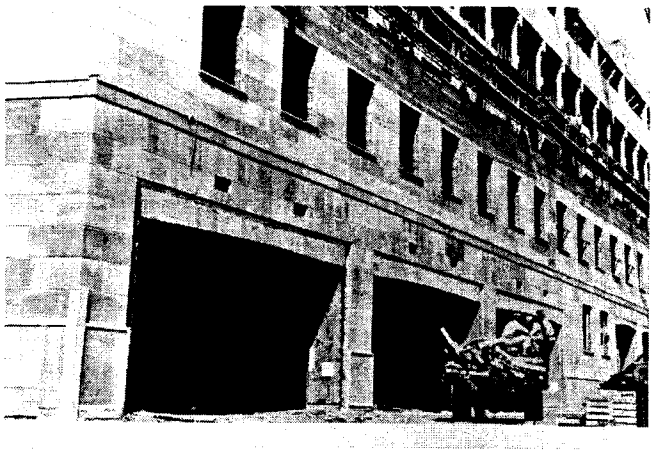
CHANGING TECHNOLOGY REQUIREMENTS

- Increased electrical and HVAC loads due to office equipment such as computers and copy machines, and special equipment such as video and graphics production equipment.
- Current wire chases cannot accommodate cabling systems for telephones, computer networks, and audio/video information systems.
- Inflexible and inefficient space arrangements limit the continued utility of the Pentagon office and support space.

SECURITY

- Metro escalators penetrate into the building envelope forcing the security perimeter inward.
- The dispersed loading docks are difficult to secure. Numerous delivery vehicles penetrate the building security perimeter daily.
- Limited approachways hinder security control at loading docks and delivery entrances (distance from non-control to control areas is so short that guards have no response time before vehicle has reached the guard position).

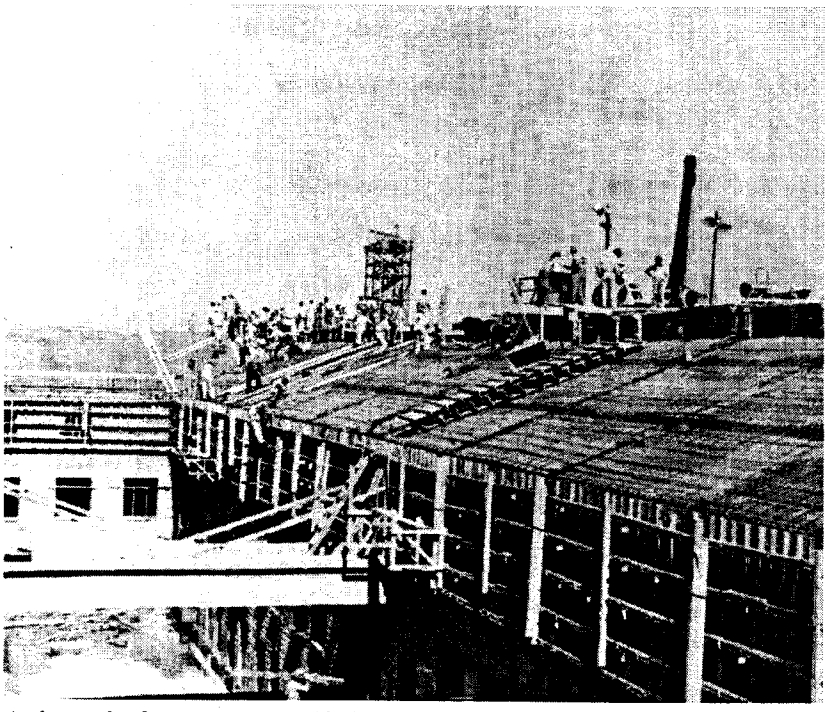
A typical office in the Pentagon as it appeared in the 1970s. Makeshift conditions continue to plague the building as improvements to building systems have failed to keep pace with technological advances.



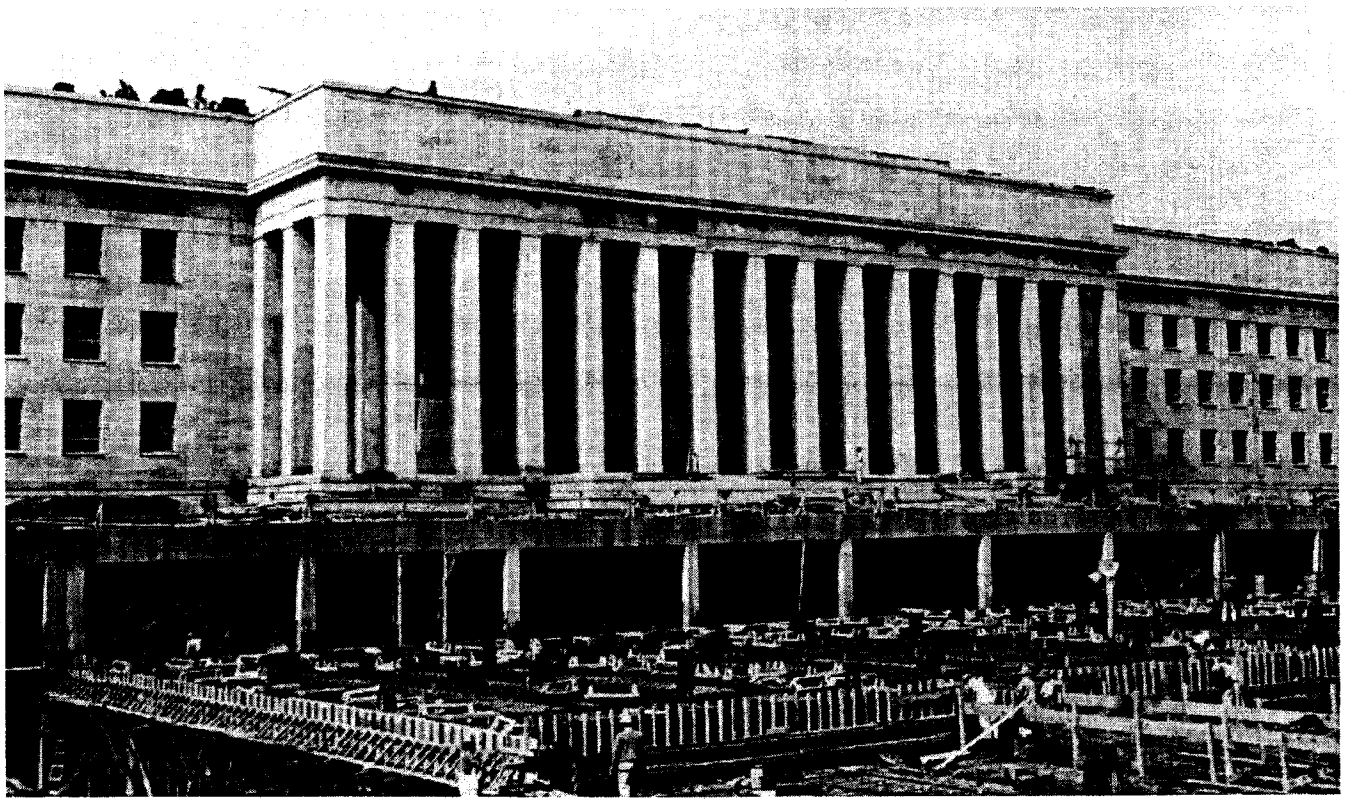
The Pentagon's original bus terminal was located within the building's perimeter. Security requirements and air quality concerns forced its closure and relocation to the outside. New security initiatives will push the existing bus loop even farther away from its present location.

The Pentagon is a building of interest to local, state, federal, and architectural historians for the following reasons:

- It is associated with events that have made a significant contribution to the geo-political role of the United States as a superpower during the period from World War II to the present.
- It is associated with the lives of persons who are significant in American history from the time of construction in 1941 to the present day.
- It embodies the distinctive characteristics of the "stripped classical" variant of architectural classicism. This stylistic mode flourished during the second quarter of the 20th century, and was a major theme in federal architecture.
- It is currently classified as the largest low-rise office building in the world.
- It was constructed during an important historical period.
- It was built in 16 months, requiring a monumental effort in design and construction.
- It is located adjacent to Arlington National Cemetery.
- It is in proximity to the Nation's Monumental Core.
- It is situated along a major gateway to the Nation's Capital.



At the peak of construction in 1942, 15,000 workers labored around the clock to construct the Pentagon in just 16 months from September 1941 to January 1943.



Work on the Pentagon's River Terrace progresses in 1942. Rather than backfill the entire site, engineers extended columns down to the existing grade. This resulted in a basement area below two fifths of the Pentagon.

The Secretary of Defense, the Honorable Richard Cheney, was notified by the Secretary of the Interior, the Honorable Bruce Babbit, that the Pentagon had been designated as a National Historical Landmark on October 5, 1992. This designation also automatically placed the Pentagon in the National Register of Historic Places.

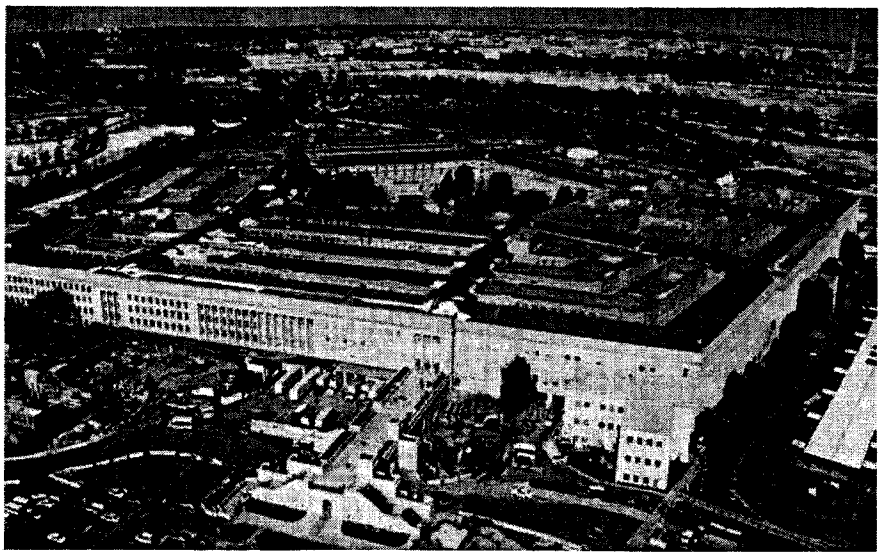
There are five historic elements of the Pentagon that are cited for special attention:

- The five outer facades of the Pentagon.
- The Center Courtyard and surrounding facades.
- The terrace fronting the Mall Entrance.
- The terrace fronting the River Entrance.
- The Pentagon's distinctive five-sided shape.

A ceremony celebrating the 50th Anniversary of the Pentagon in May 1993 included presentation of a bronze plaque stating "THIS PROPERTY POSSESSES NATIONAL SIGNIFICANCE IN COMMEMORATING THE HISTORY OF THE UNITED STATES OF AMERICA." This ceremony was hosted by Les Aspin, the Secretary of Defense, and General Colin Powell, Chairman of the Joint Chiefs of Staff.

PROGRAM DEVELOPMENT

At the start of the Renovation Program, control of the design process over the life of the project required the development of design guidelines and criteria. This control was necessary because of the size and duration of the project, the multi-acquisition approach, and design activities occurring throughout the project as each increment was renovated. As discussed in the Acquisition section, in the Process Improvements chapter of this report, the Renovation Program has moved to a design-build acquisition approach and the renovation of Wedges 2 through 5 is currently undergoing the source selection process as a single contract.



Aerial view of the Pentagon's South Terrace in February 2000. Renovation activities are visible in or around all five sides of the building.

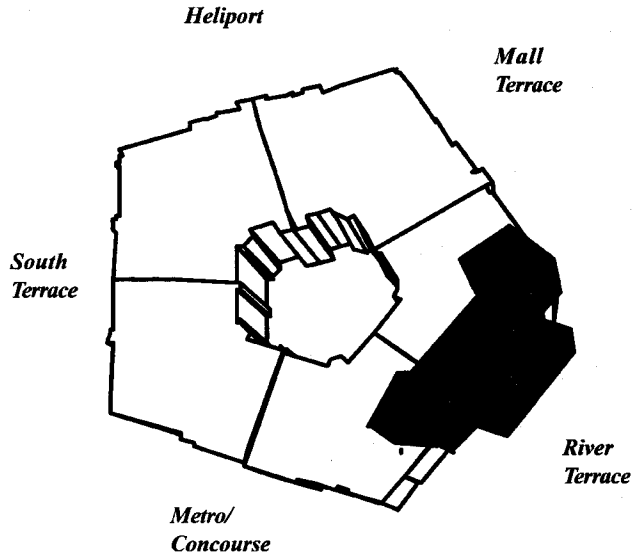
Early in the Program's history, a Management Support Architect-Engineer, prepared design guidelines and criteria; prepared the Reservation Master Plan, which addresses environmental issues; prepared the Pentagon Building Master Plan; developed prototypical designs for architectural standards, heating, ventilating and air conditioning systems, plumbing systems, fire protective systems, electrical systems, and security systems; and continues to develop programming and swing space requirements, schedules and cost estimates, and is providing technical and management support and Computer-Aided Design Documents for record drawings, shop drawings, and shop drawing reviews. Broad-scale design criteria, which are equivalent to a concept stage, will ensure that each individual increment will be compatible with the rest of the work. The goal is to achieve a completed project that has uniform and compatible materials and systems that are economic to maintain.

In the mid-1990's the importance of information management and telecommunications (IM&T) within the Pentagon was recognized and the United States Army was tasked with establishing a project office for Information Management and Telecommunications, renovation related tasks. The Pentagon IM&T project office was established in 1991.

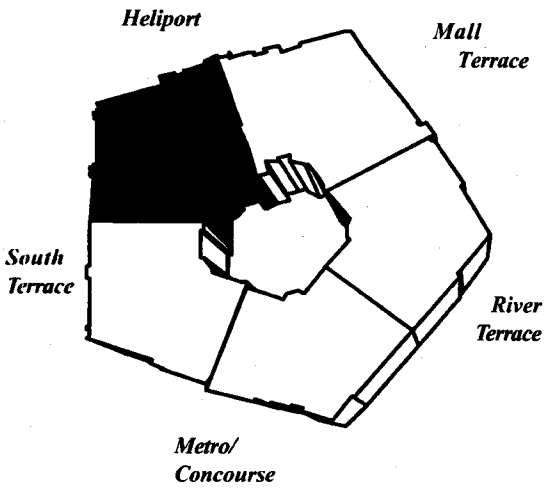
The IM&T objective is to provide cost-effective IM&T services/capabilities that will best serve the needs of the Pentagon tenants and DoD Senior Leadership by leveraging technology advancements and designing/developing integrated systems, well into the 21st Century.

BASEMENT RENOVATION

The design of the Segment 1 renovation of the Basement was completed in mid-FY 1994 with the construction beginning October 1994. The construction of Segment 1 of the Basement, preceded by the temporary re-routing of utilities, was completed in FY 1999. The design of the remaining segments began in FY 1997.



The Basement and Mezzanine levels lie under the Pentagon's Mall and River Terraces.



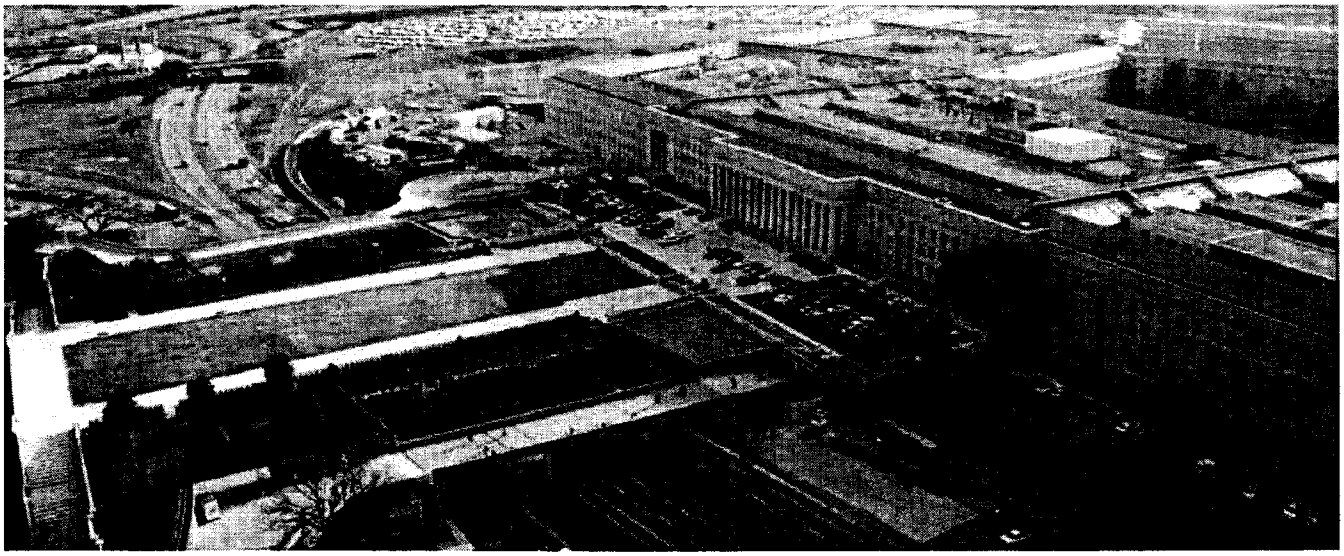
Wedge 1 is accessed by Corridors 3 and 4.

WEDGE 1

In December 1996, the Deputy Secretary of Defense directed that Wedge 1 be vacated by December 1997, and the construction of Wedge 1 to start by FY 1998. Renovation of above-ground areas of the Pentagon began with Wedge 1. Work is centered around Corridors 3 and 4.

The renovation work involves the demolition and removal of all partitions, ceilings, floor finishes, mechanical, electrical, plumbing, fire protection, and communications systems. The basic structural system, as well as the stairwells and their enclosing walls, will remain. All electrical, mechanical, and plumbing systems will be replaced and a modernized telecommunication back-bone infrastructure will be installed. Utility connections will be made through the new Center Courtyard Utilities Tunnel without affecting the rest of the building. Wedge 1 will have a new food service facility, new vertical transportation service, and enhanced foyers. Much of the renovated space will be configured as "open office" space consistent with the Concept Plan. The improvements include the new South Terrace Pedestrian Bridges, which will connect South Parking to Corridors 2 and 3. The South Terrace structure consists of two bridges accommodating pedestrian traffic entering the Pentagon at the second floor at Corridors 2 and 3. This work incorporates some of the security improvements by re-routing public access to the second floor and improves safety by separating pedestrians from the vehicular traffic on the very busy Rotary Road in South Parking.

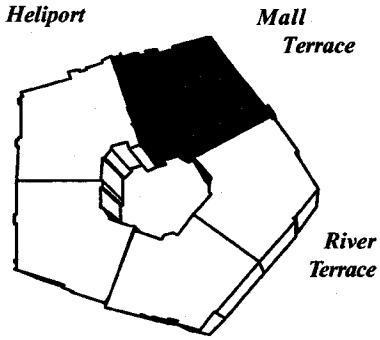
The design of Wedge 1 began in January 1994, and the last revisions were completed in FY 1999. Construction activity began in January 1998, with a "wall bashing" ceremony in February 1998, to symbolically signify the start of the above-ground work activity. Construction is scheduled for completion in FY 2001.



The River Terrace entrance marks the midpoint between Wedges 3 and 4.

WEDGE 2

Wedge 2 is also a complete slab-to-slab reconstruction of the space. Replacement of all electrical, mechanical, and plumbing systems will occur in accordance with the new design and a modernized telecommunication backbone infrastructure will be installed.

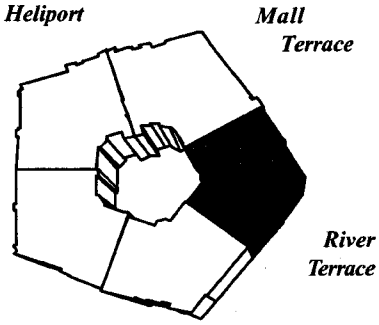


Wedge 2 is accessed by Corridors 5 and 6.

WEDGE 3

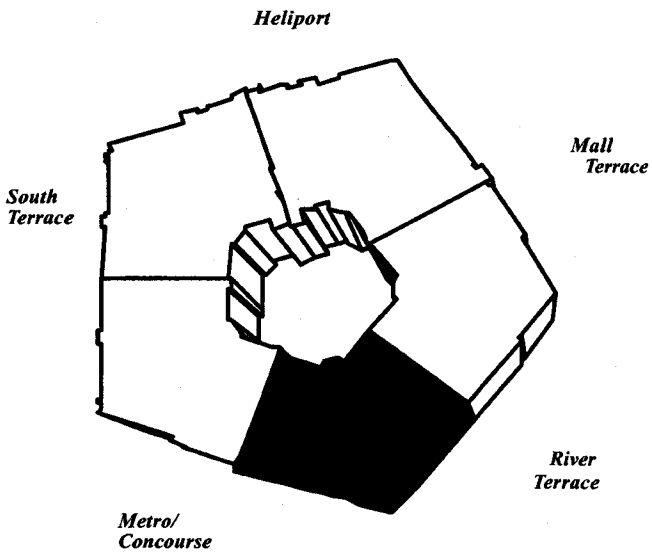
Wedge 3 includes a complete slab-to-slab reconstruction of the space. All electrical, mechanical, and plumbing services will be replaced in accordance with the new design and a modernized telecommunication infrastructure will be installed. The removal of non-masonry partitions will open the space to an "open office" concept. The work will be centered around Corridors 7 and 8.

This work also incorporates some of the security improvements by re-orienting public access to the 2nd floor.



Wedge 3 is accessed by Corridors 7 and 8.

WEDGE 4



Wedge 4 is accessed by Corridors 9 and 10.

A slab-to-slab reconstruction of the space in Wedge 4 is programmed. All electrical, mechanical, and plumbing services will be replaced and a modernized telecommunication infrastructure will be installed. The removal of non-masonry partitions will open the space to an "open office" concept. The work will be centered around Corridors 9 and 10.

This incremental area houses portions of the cafeteria facilities, the Concourse, and the Metro entrance.

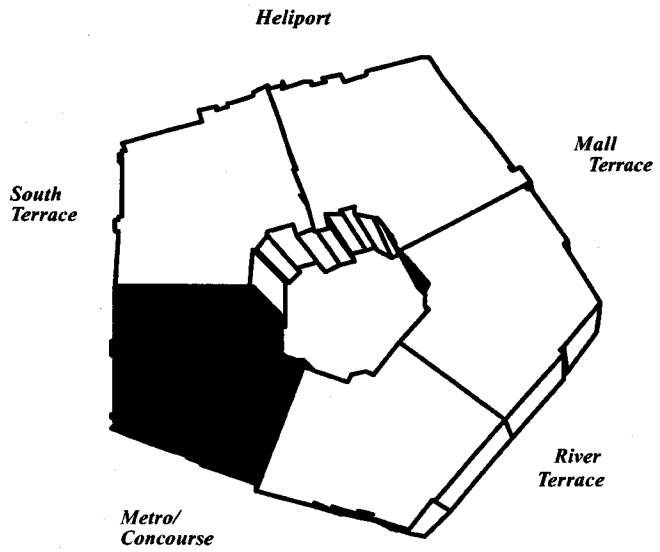
This area also incorporates some of the security improvements by re-orienting public access to the 2nd floor. Existing ramp space to upper floors will be redistributed to incorporate expanded multi-purpose facilities as well as additional office space.

The Metro/Concourse entrance marks the dividing line between Wedge 4 and Wedge 5.

WEDGE 5

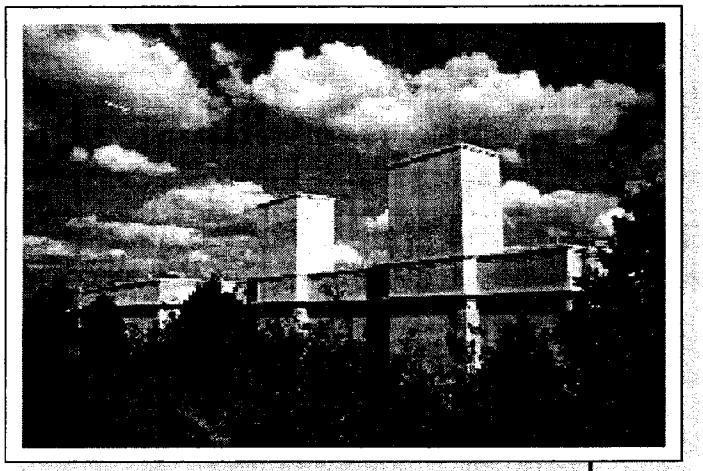
This last area will also undergo a slab-to-slab reconstruction. All electrical, mechanical, and plumbing services will be replaced and a modernized telecommunication infrastructure will be installed. The removal of non-masonry partitions will open the space to an "open office" concept. This last incremental area is centered around Corridors 1 and 2.

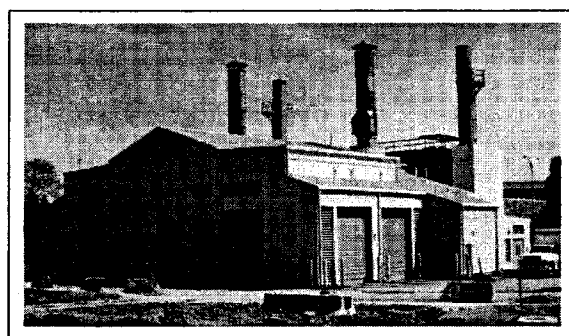
The area houses the remaining portions of the cafeteria facilities and the Concourse. Existing ramp space to upper floors will be redistributed to incorporate auditorium facilities.



Wedge 5 is accessed by Corridors 1 and 2.

WORK COMPLETED TIMELINE





1996 — November 1996

North Parking Pedestrian Ramp

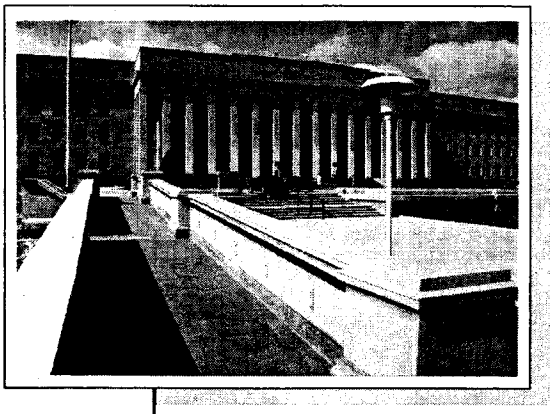
1997 — February 1997

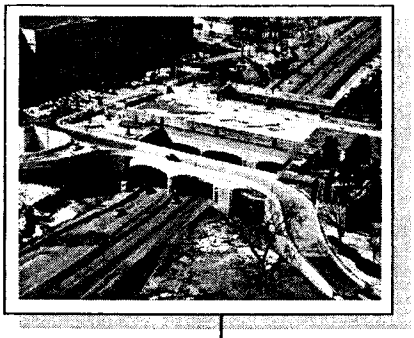
Sewage Lift Station

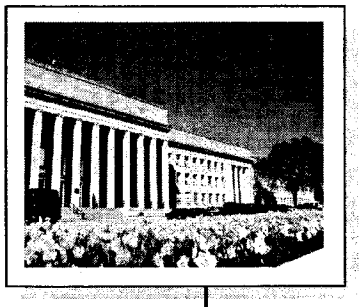
Classified Waste Incinerator — August 1997

Heating & Refrigeration Plant — September 1997

Work Completed Timeline

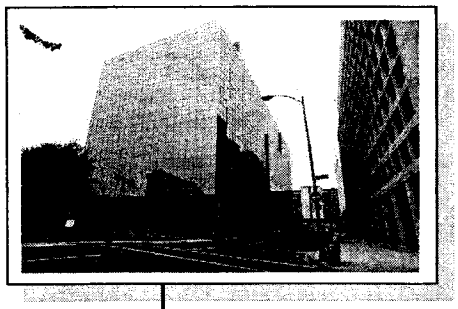


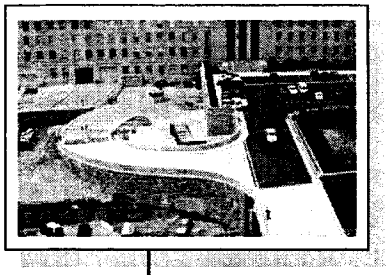


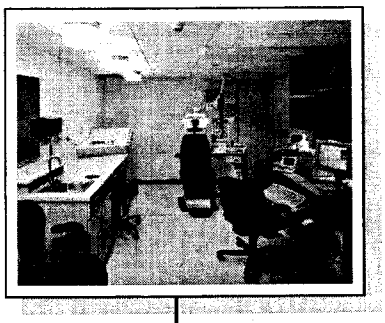


- *January 1997* — River Terrace Handicapped Access
- *June 1997* — Center Courtyard Utilities Tunnel
- *October 1997* — River Terrace Vehicle Bridge
- *1998*
- *May 1998* — Corridor 8 Entrance Renovation
- *August 1998* — River Terrace Renovation

WORK COMPLETED TIMELINE







1999

Renovation and Furnishing of Swing Space Facilities — *June 1999*

Mug Handle Infill — *September 1999*

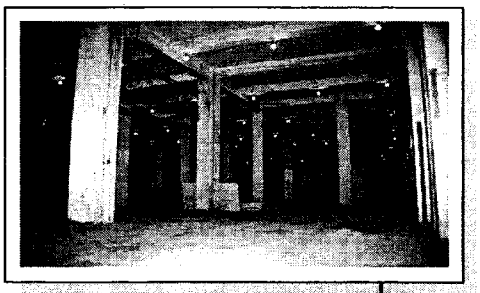
Basement Segment 2A2 — *October 1999*

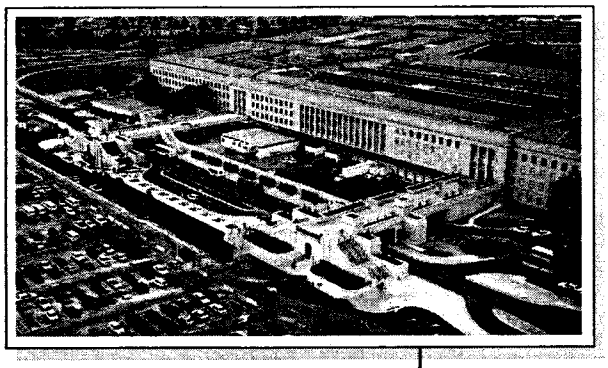
2000

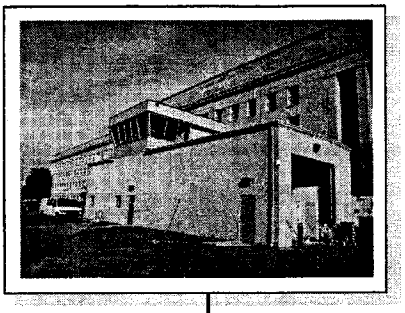
Basement/Mezzanine Segement 1 — *March 2000*

DiLorenzo TRICARE Health Clinic — *March 2000*

Work Completed Timeline







Remote Deliviery Facility Phase 1 Completion

Replacement of Underground Water Lines

Basement 3A Demolition and Abatement

Remote Delivery Facility Phase 2

2001

Heliport/Fire Station

South Terrace Pedestrian Bridges

August 2000

September 2000

October 2000

December 2000

January 2001

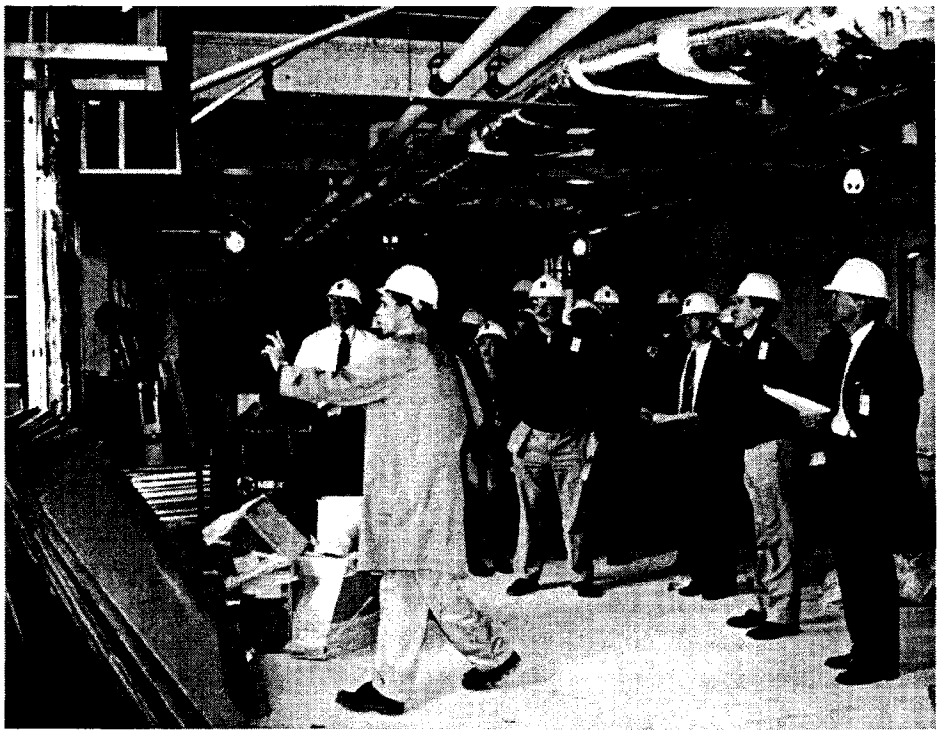
February 2001

PUBLIC AFFAIRS

The Public Affairs Integrated Product Team is responsible for communicating information related to Pentagon renovation activities to the 25,000 employees of the Pentagon, the general public, military personnel, local government officials, the media and groups affected by the project.

Toward this end, the public affairs team disseminates information through a dedicated web site, http://renovation.pentagon.mil, informational brochures and notices, presentations, open forums, displays, and signs. In 2000, public affairs staff also conducted close to 200 tours of renovation sites for Pentagon personnel, senior military leadership, political officials, and the media. Renovation e-mail and telephone "helplines" also serve to maintain open lines of communication.

Tours of renovation activities help to keep Pentagon tenants informed about the project status.



The increased visibility of Pentagon renovation activities both inside and around the Pentagon resulted in significant and overwhelmingly positive media attention in 2000. While most of that attention focused on the magnitude and complexity of the renovation itself, several trade publications were particularly interested in the innovative procurement practices being employed by the program acquisition team. Following are some of the key highlights of the Pentagon Renovation public affairs program in 2000.

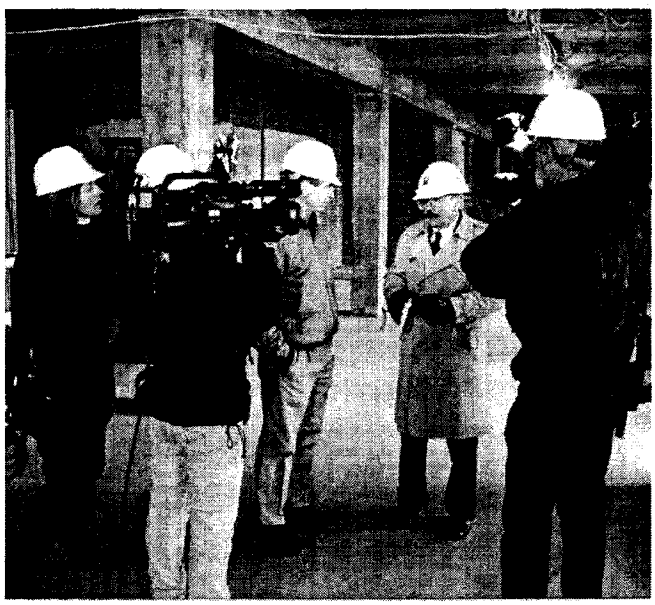
- January 2000 – *USA Today* runs an article and full-page graphic on the Renovation Program.

- January 2000 – Lee Evey, Pentagon Renovation Program Manager is named one of *Engineering News Record's* top 25 newsmakers of 1999 because of his implementation of "innovative procurement practices." The Program's move to a "pure performance specification" approach is also cited in the award justification. Engineering News Record is the premiere publication in the design and construction industry.

- February 2000 – A one-hour program about the Pentagon and the Renovation Program airs on the Discovery Channel and continues to air throughout the year.

- March 2000 – The Renovation Program is featured on *60 Minutes II* on CBS. The segment highlights the antiquated conditions inside the Pentagon, the ı for renovation and associated challenges. Lee E Pentagon Renovation Program Manager is feat prominently in the segment.

- May 2000 – The Pentagon is included in an h long special on *The Learning Channel*, a nati cable station, titled "The Ultimate 10" featuring ments on the world's 10 largest structures. The gram included a six-minute segment on the Pent and included renovation activities. The program tinues to air about once each month.



The Renovation Program was featured on various news programs and in print media in the year 2000.

- June 2000 – The Renovation Program's plan to construct a new Metro Entrance Facility receives attention in the *Washington Post* and local county newspapers. Concern over accessibility is the primary focus of the articles. By year's end, the Renovation Program's Metro team develops a strong working relationship with key disability representatives. Project coordination efforts and design changes win praise and overwhelming support from disability representatives.

- July 2000 – An "Accessibility Forum" was held in the Pentagon to update Pentagon personnel on all renovation activities, answer questions, and address any issues of concern to personnel.

- July 2000 - *Metropolis* magazine, a modern architecture and design publication, prints a comprehensive article on the Renovation Program.

- August 2000 – *Government Executive* magazine prints a comprehensive article on the Renovation Program.

- September 2000 – The Renovation Program is the cover story in *Engineering News Record*. A comprehensive article covers all aspects of the Renovation Program and highlights the Program's innovative procurement approach.

- October 2000 – An article about the Pentagon Renovation appears in *Details* magazine.

- October/November 2000 – The Renovation Program is the cover story on back-to-back issues of *Engineered Systems*, a monthly magazine that focuses on design and engineering issues.

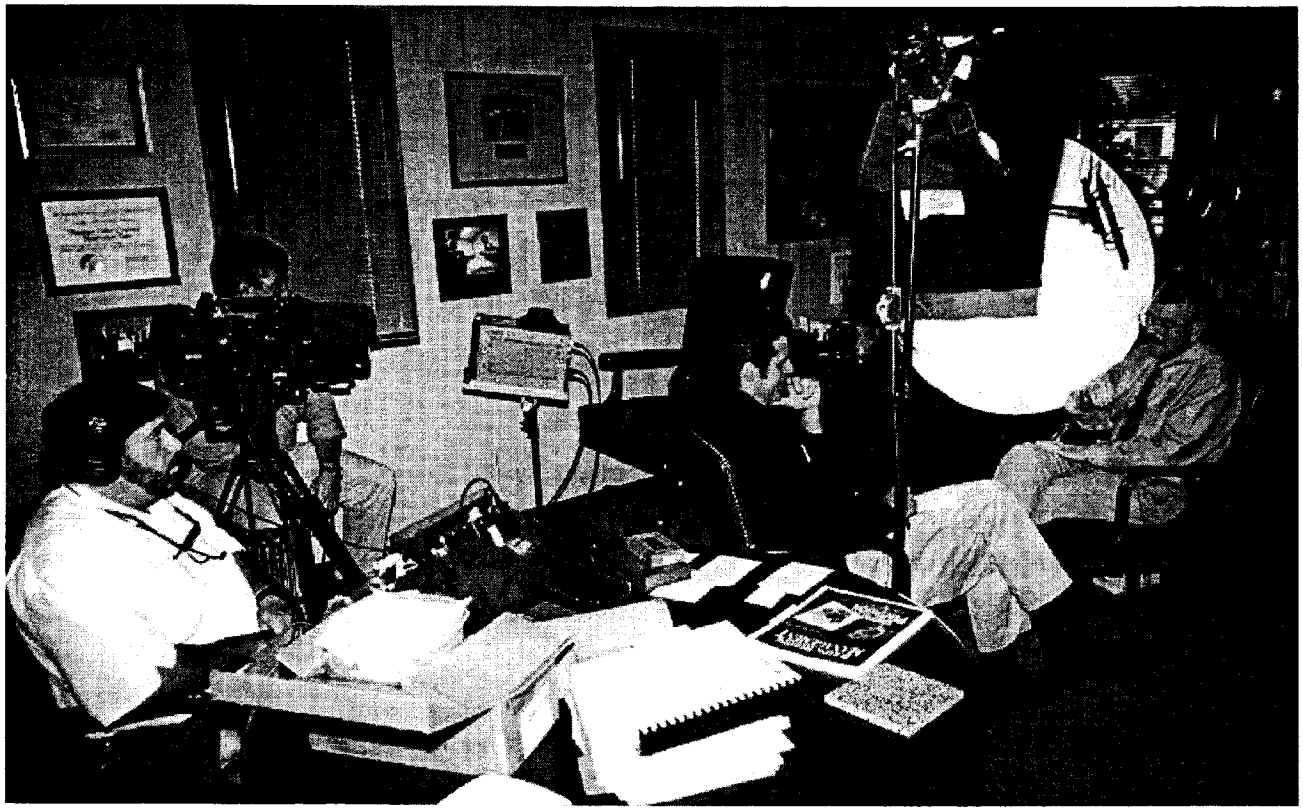
- September/October/November 2000 – The Renovation Program works closely with a production crew from The History Channel over a three-month period to accommodate several video shoot requests, tours, interviews and graphic support. A one-hour program about the Pentagon and the renovation efforts is expected to air in February 2001.

- December 2000 – The Renovation Program creates a Metro Entrance Facility Project web site. The site will provide information to the 34,000 daily users of the Pentagon Metro bus and rail station.

Among the key public affairs initiatives for 2001 will be the distribution of the Pentagon Renovation newsletter, *The Renovator*, which will be made available at distribution points throughout the Pentagon. A redesigned web site will improve access to information and the availability of images depicting renovation activities. These efforts will most directly keep the 25,000 employees in the Pentagon and external swing space informed of significant activities and their associated impacts.

In February 2001, the airing of the History Channel's one-hour program will likely prompt additional interest in the Pentagon Renovation Program from other regional and national news outlets. The public affairs team stands ready to provide the media information, images, tours and interviews to enhance the image of the Pentagon Renovation Program as one that is responsive, open, and accessible.

Program Manager, Lee Evey, is interviewed for a segment on the Pentagon that will air on the History Channel.



FY 2000 - NATIONAL DEFENSE AUTHORIZATION ACT (FEDERAL BUILDING 2)

Subtitle F—Expansion of Arlington National Cemetery

SEC. 2881. TRANSFER FROM NAVY ANNEX, ARLINGTON, VIRGINIA.

(a) LAND TRANSFER REQUIRED- The Secretary of Defense shall provide for the transfer to the Secretary of the Army of administrative jurisdiction over three parcels of real property consisting of approximately 36 acres and known as the Navy Annex (in this section referred to as the 'Navy Annex property').

(b) USE OF LAND- (1) Subject to paragraph (2), the Secretary of the Army shall incorporate the Navy Annex property transferred under subsection (a) into Arlington National Cemetery.

(2) The Secretary of Defense may reserve not to exceed 10 acres of the Navy Annex property (of which not more than six acres may be north of the existing Columbia Pike) as a site for—

(A) a National Military Museum, if such site is recommended for such purpose by the Commission on the National Military Museum established under section 2901; and

(B) such other memorials that the Secretary of Defense considers compatible with Arlington National Cemetery.

(c) REDEMPTION OF LAND FOR CEMETERY USE- Immediately after the transfer of administrative jurisdiction over the Navy Annex property, the Secretary of Defense shall provide for the removal of any improvements on that property and shall prepare the property for use as a part of Arlington National Cemetery.

(d) ESTABLISHMENT OF MASTER PLAN- (1) The Secretary of Defense shall establish a master plan for the use of the Navy Annex property transferred under subsection (a).

(2) The master plan shall take into account (A) the report submitted by the Secretary of the Army on the expansion of Arlington National Cemetery required at page 787 of the Joint Explanatory Statement of the Committee of Conference to accompany the bill H.R. 3616 of the One Hundred Fifth Congress (House Report 105-436 of the 105th Congress), and (B) the recommendation (if any) of the Commission on the National Military Museum to use a portion of the Navy Annex property as the site for the National Military Museum.

(3) The master plan shall be established in consultation with the National Capital Planning Commission and only after coordination with appropriate officials of the Commonwealth of Virginia and of the County of Arlington, Virginia, with respect to matters pertaining to real property under the jurisdiction of those officials located in or adjacent to the Navy Annex property, including assessments of the effects on transportation, infrastructure, and utilities in that county by reason of the proposed uses of the Navy Annex property under subsection (b).

(4) Not later than 180 days after the date on which the Commission on the National Military Museum submits to Congress its report under section 2903, the Secretary of Defense shall submit to Congress the master plan established under this subsection.

(e) IMPLEMENTATION OF MASTER PLAN- The Secretary of Defense may implement the provisions of the master plan at any time after the Secretary submits the master plan to Congress.

(f) LEGAL DESCRIPTION- In conjunction with the development of the master plan required by subsection (d), the Secretary of Defense shall determine the exact acreage and legal description of the portion of the Navy Annex property reserved under subsection (b)(2) and of the portion transferred under subsection (a) for incorporation into Arlington National Cemetery.

(g) REPORTS- (1) Not later than 90 days after the date of the enactment of this Act, the Secretary of the Army shall submit to the Secretary of Defense a copy of the report to Congress on the expansion of Arlington National Cemetery required at page 787 of the Joint Explanatory Statement of the Committee of Conference to accompany the bill H.R. 3616 of the One Hundred Fifth Congress (House Report 105-736 of the 105th Congress).

(2) The Secretary of Defense shall include a description of the use of the Navy Annex property transferred under subsection (a) in the annual report to Congress under section 2674(a)(2) of title 10, United States Code, on the state of the renovation of the Pentagon Reservation.

(h) DEADLINE- The Secretary of Defense shall complete the transfer of administrative jurisdiction required by subsection (a) not later than the earlier of—

(1) January 1, 2010; or

(2) the date when the Navy Annex property is no longer required (as determined by the Secretary) for use as temporary office space due to the renovation of the Pentagon.

Under the current schedule for the renovation of the Pentagon, it is anticipated the Navy Annex property and facility will be used as temporary and permanent office space until the conclusion of the renovation program. After that time, all the facility occupants will be relocated to either the Pentagon and/or other government controlled space.

(2) The Secretary of Defense shall include a description of the use of the Navy Annex property transferred under subsection (a) in the annual report to Congress under section 2674(a)(2) of title 10, United States Code, on the state of the renovation of the Pentagon Reservation.

Washington Headquarters Service (WHS), Real Estate & Facilities Division (RE&FD) Response to Section 2881

It is currently planned that, in accordance with Section 2881 of the FY 2000 Defense Appropriations Act, the Secretary of Defense will assign administrative jurisdiction of the Navy Annex property to the Secretary of the Army by January 1, 2010.

Further, in accordance with Section 2881 of the FY 2000 Defense Appropriations Act, by September 2001, the Secretary of Defense will establish a master plan for the use of the Navy Annex property that will take into account (A) the report submitted by the Secretary of the Army on the expansion of Arlington National Cemetery required at page 787 of the Joint Explanatory Statement of the Committee of Conference to accompany the bill H.R. 3616 of the One Hundred Fifth Congress, and (B) the recommendation of the Commission on the National Military Museum to use a portion of the Navy Annex property as a site for the National Military Museum.

FY 1991 - LEGISLATIVE AUTHORIZATION

SEC 2804. OPERATION AND CONTROL OF THE PENTAGON RESERVATION

(a) IN GENERAL - (1) Chapter 159 of title 10, United States Code, is amended by inserting after section 2673 the following new section:

"§2674. Operation and control of the Pentagon Reservation

"(a)(1) Jurisdiction, custody, and control over, and responsibility for, the operation, maintenance, and management of the Pentagon Reservation is transferred to the Secretary of Defense.

"(2) Before March 1 of each year, the Secretary of Defense shall transmit to the Committees on Armed Services of the Senate and the House of Representatives, the Committee on Environment and Public Works of the Senate and the Committee on Public Works and Transportation of the House of Representatives a report on the state of the renovation of the Pentagon Reservation and a plan for the renovation work to be conducted in the fiscal year beginning in the year in which the report is transmitted.

"(b) The Secretary may appoint military or civilian personnel or contract personnel to perform law enforcement and security functions for property occupied by, or under the jurisdiction, custody,

Nov. 5 DEFENSE AUTHORIZATION ACT P.L. 101-510

Sec. 2804 and control of the Department of Defense, and located at the Pentagon Reservation. Such individuals—

"(1) may be armed with appropriate firearms required for

personal safety and for the proper execution of their duties,

whether on Department of Defense property or in travel status; and

"(2) shall have the same powers as sheriffs and constables to

enforce the laws, rules, or regulations enacted for the protection of persons and property.

"(c)(1) The Secretary may prescribe such rules and regulations as the Secretary considers appropriate to ensure the safe, efficient, and secure operation of the Pentagon Reservation, including rules and regulations necessary to govern the operation and parking of motor vehicles on the Pentagon Reservation.

"(2) Any person who violates a rule or regulation prescribed under this subsection is liable to the United States for a civil penalty of not more than $1000.

"(3) Any person who willfully violates any rule or regulation prescribed pursuant to this subsection commits as Class B misdemeanor.

"(d) The Secretary of Defense may establish rates and collect charges for space, services, protection, maintenance, construction, repairs, alterations, or facilities provided at the Pentagon Reservation-

"(e)(1) There is established in the Treasury of the United States a revolving fund tobe known as the Pentagon Reservation Maintenance Revolving Fund (hereafter in this section referred to as the'Fund'). There shall be deposited into the Fund funds collected by the Secretary of space and services and other items provided an organization or entity using any facility or land on the Pentagon Reservation pursuant to subsection (d).

"(2) Monies deposited into the Fund shall be available, without fiscal year limitation, for expenditure for real property management, operation, protection, construction, repair, alteration, and related activities for the Pentagon Reservation.

"(f) In this section:

"(1) The term 'Pentagon Reservation' means that area of land (consisting of approximately 280 acres) and improvements thereon, located in Arlington, Virginia, on which the Pentagon Office Building, Federal Building Number 2, the Pentagon heating and sewage treatment plants, and other related facilities are located, including various areas designated for the parking of vehicles.

"(2) The term 'National Capital Region' means the geographic area located within the boundaries of (A) District of Columbia, (B) Montgomery and Prince Georges Counties in the State of Maryland, (C) Arlington, Fairfax, Loudoun, and Prince William Counties and the City of Alexandria in the Commonwealth of Virginia, and (D) all cities and other units of government within the geographic areas of such District, Counties, and City."

(2) The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2673 the following new item:

"2674. Operation and control of the Pentagon Reservation."

P.L. 101-510 LAWS OF 101st CONG.—2nd SESS. Nov. 5 Sec. 2804

(b) TRANSFER OF FUNDS FOR FISCAL YEAR, 1991.—For fiscal year 1991, the Secretary of Defense may transfer into the Pentagon Reservation Maintenance Revolving Fund (established by section 2674(e) of title 10, United States Code), from funds appropriated to the military departments and the Defense Agencies, amounts equal to the amounts that would otherwise be paid by the military departments and the Defense Agencies to the General Services Administration for the use of the Pentagon Reservation.

FY 2000 - DEPARTMENT OF DEFENSE APPROPRIATIONS ACT

The Department of Defense Appropriations Act, 2000, Public Law 106-79, Section 8064 (Oct. 25, 1999)

SEC. 8064. (a) None of the funds appropriated in this Act may be transferred to or obligated from the Pentagon Reservation Maintenance Revolving Fund, unless the Secretary of Defense certifies that the total cost for the planning, design, construction and installation of equipment for the renovation of the Pentagon Reservation will not exceed $1,222,000,000.

(b) The Secretary shall, in conjunction with the Pentagon Renovation, design and construct secure secretarial offices and support facilities and security-related changes to the subway entrance at the Pentagon Reservation.

FY 2001- DEPARTMENT OF DEFENSE APPROPRIATIONS ACT

The Department of Defense Appropriations Act, FY 2001, Public Law 106-259, Section 8061 (Aug. 9, 2001)

SEC. 8061. None of the funds appropriated in this Act may be transferred to or obligated from the Pentagon Reservation Maintenance Revolving Fund, unless the Secretary of Defense certifies that the total cost for the planning, design, construction and installation of equipment for the renovation of the Pentagon Reservation will not exceed $1,222,000,000.

COST CERTIFICATION LETTERS SENT TO:

United States Senate

Honorable Richard B. Cheney, President of the Senate
Honorable John C. Warner, Chairman , Committee on Armed Services
Honorable Carl Levin, Ranking Minority Member, Committee on Armed Services
Honorable Bob Smith, Chairman, Committee on Environment and Public Works
Honorable Max Baucus, Ranking Minority Member, Committee on Environment and Public Works
Honorable Ted Stevens, Chairman, Committee on Appropriations
Honorable Robert C. Bryd, Ranking Minority Member, Committee on Appropriations

United States House of Representatives

Honorable J. Dennis Hastert, Speaker
Honorable Floyd Spence, Chairman, Committee on Armed Services
Honorable Ike Skelton, Ranking Minority Member, Committee on Armed Services
Honorable Bud Shuster, Chairman, Committee on Transportation and Infrastructure
Honorable James L. Oberstar, Ranking Minority Member, Committee on Transportation and Infrastructure
Honorable C.W. Bill Young, Chairman, Committee on Appropriations
Honorable, David R. Obey, Ranking Minority Member, Committee on Appropriations

THE DEPUTY SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

SEP 19 2001

Honorable Richard B. Cheney
President of the Senate
Washington, DC 20515

Dear Mr. President:

The Department of Defense Appropriations Act, Fiscal Year 2001, Public Law 106-259, §§8061 (August 9, 2000) requires the Secretary of Defense to certify that the total cost for the planning, design, construction and installation of equipment for the renovation of the Pentagon will not exceed $1,222,000,000. In order to continue with this critical program, I certify that the Department will constrain the specified expenditures on the renovation to $1,222,000,000. However, continued adherence to this cost ceiling will not permit the Department to complete this renovation in a cost-effective manner that will properly rehabilitate and restore this historic building to normal commercial standards. Additionally, this certification does not include the cost associated with the recovery or restoration of the Pentagon resulting from the attack on September 11, 2001.

In each annual certification letter to Congress since 1997, the Department has committed to review the actual cost experiences in the first of the five wedges of the Pentagon, as well as the impacts of both the $100-million reduction in the program ceiling and the long-term effects of inflation on the total program. Now, at this stage in the construction process, we have actual experience from our first "wedge" of construction and competitive pricing for Wedges 2-5 to use as a baseline from which to estimate total costs for the remaining four wedges.

The cost ceiling was established for the design, construction, and installation of equipment for renovation of the Pentagon based upon a program estimate accomplished in 1994 for a renovation with an estimated performance period of 10 years. That ceiling was subsequently reduced by $100 million by Congress in 1996 and then increased by $104 million in 1999 to accommodate additional security measures. The 1994 estimate contained no provision for inflation. That means the existing ceiling requires the Program to operate across its entire 20-year life without any accommodation for normal inflation costs.

Within the Pentagon Renovation Program, we have worked diligently to accomplish our program within this challenging ceiling. The acquisition approaches we have undertaken have placed our program at the forefront of acquisition reform and have enabled us to reduce the size of our Government workforce while maximizing opportunity to utilize industry innovation. We have devised every possible technique to keep costs down and at the same time accomplish needed renovation improvements. We have complied with the clear intent of Congress that our renovation be utilitarian in approach and a wise expenditure of taxpayer monies. Similarly, we continue to work hard to ensure our decisions consider life cycle costs and do not unnecessarily trade off short term economy at the cost of long term expenditure or high operating costs. The result has been program economies which we believe, absent inflation, would have permitted us to complete this project within the Congressional ceiling. However, inflation has

been operating on the program since 1994 and will continue to operate until its completion. Our current competitive prices project that we will not be able to achieve sufficient economies to overcome the burden of inflation across the total 20-year life of the Pentagon Renovation Program.

As a result, we request that the statutory ceiling be removed to allow the program to be managed consistent with effective construction practices and to accommodate necessary adjustments for inflation and contingencies. We believe that this change will allow the Department to complete the badly needed renovation of this mammoth and historic building to normal commercial standards and to do so in the most cost effective manner possible. This action by Congress will not require additional funds in fiscal year 2002.

Consistent with cost estimates for projects in the Military Construction Program, this certified amount does not include the cost of: 1) purchase and installation of information management and telecommunications equipment, 2) rental and operation of leased swing space, and 3) purchase and installation of furniture for the renovated Pentagon. The certification also does not cover ancillary projects including the design and construction of the Heating and Refrigeration Plant, the Classified Waste Incinerator, the Remote Delivery Facility, the Physical Fitness and Readiness Facility, other recently required security enhancements, and costs prior to Fiscal Year 1994.

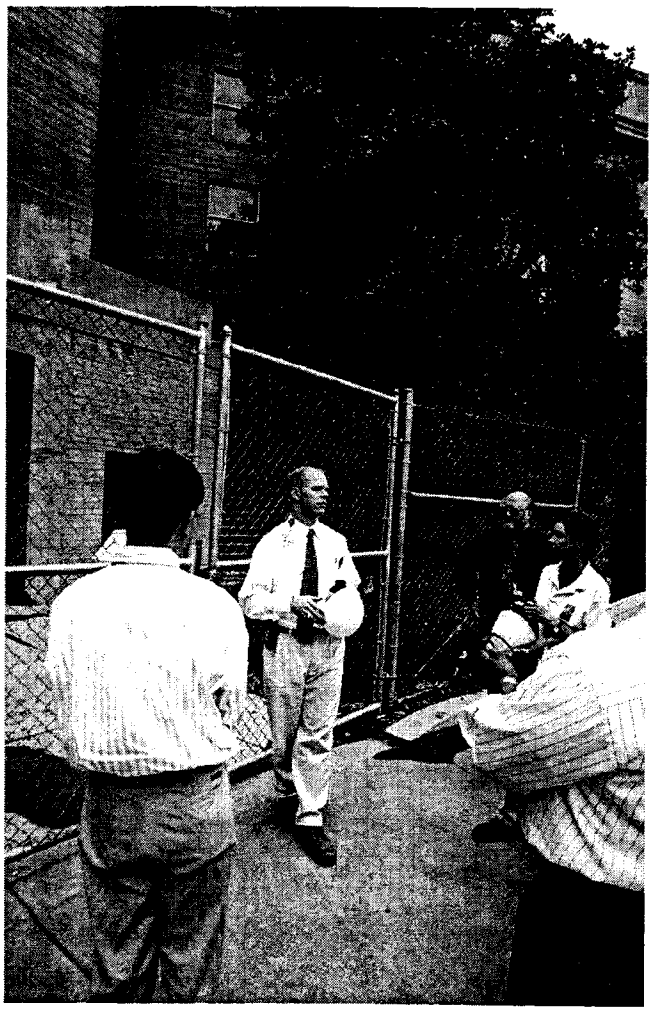
If you have any questions about the Pentagon Renovation Program, please have your staff contact Mr. Lee Evey, Program Manager for the renovation, at (703) 693-8954.

Sincerely,

Paul Wolfowitz

ON COST, ON SCHEDULE, BUILT FOR THE NEXT FIFTY YEARS

CONTACT INFORMATION



The Pentagon Renovation Program frequently provides tours through renovation activities for Pentagon personnel.

If you would like more information about the Pentagon Renovation Program, or if you would like to set up a tour of renovation activities, please call the Public Affairs Office at (703) 693-8935 or (703) 693-8933 during business hours, or call our helpline at (703) 693-4357 (HELP). To e-mail us or read more about the renovation program, visit our website at http://renovation.pentagon.mil.