

BUILDING THE PENTAGON IN ARLINGTON

By

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Whenever you travel throughout the United States, and even overseas, and you mention you live in Arlington, Virginia, there is usually a glimmer of recognition. "Oh, yes," comes the reply, "where the cemetery is." But Arlington has another, less well known landmark - - the Pentagon. With 6.5 million square feet of floor space and 17.5 miles of corridors, the Pentagon was when it was completed in 1943 and remains today the world's largest office building¹ and an architectural wonder.

With the outbreak of war in Europe in 1939, the United States began a rapid expansion of its Army and Navy and this growth was soon reflected in the Service headquarters in Washington. By the summer of 1941, the War Department numbered over 24,000 military and civilian employees housed in seventeen buildings scattered throughout the city. The Public Works Administration planned to erect temporary buildings to ease the office shortage. Brigadier General Brehon H. Somervell, USA, Chief of the Construction Division, Office of the Quartermaster General², had a better idea. He wanted to build one building for all the War Department employees.

On Thursday, 71 July 1941, General Somervell called George E. Bergstrom, a California architect and former president of the American Institute of Architects and now a civilian with Somervell's Construction Division, and Lt. Col. Hugh J. Casey, USA, an engineer also with the Division, to his office. By the following Monday morning, the General wanted a plan for an office building to house 40,000 persons and contain all the War Department activities. He wanted a modern four-story building on the site of the old Hoover Airport in Arlington County, across the Potomac from Washington. But, upon inspection, it was discovered that the airport site was in the river flood plain, and General Somervell changed the location to the north and west to the former agricultural experimental station, Arlington Farms, near the entrance to Arlington Cemetery. This sixty-seven acre tract, once part of the Arlington estate, now belonged to the War Department.³

Bergstrom and Casey rose to the task and General Somervell had his plan on Monday morning. The General lost no time in pursuing the project and, the next day, 22 July 1941, presented the plan to a subcommittee of the House of Representatives. Since the site was bounded by five roads, the building would have five sides. It would be of reinforced concrete rather than having a steel framework, in order to save steel for the defense effort. It would have three stories and contain a gross area of 5.1 million square feet with four million square feet available for office space. The plan included parking areas, approach roads, and landscaping. General Somervell estimated the cost of the project at \$35 million. He justified the project on the need for increased efficiency. With all the Department's activities collected under one roof, employees would no longer have to use part of their time traveling around the city to consult with other employees. Further, the new build-

ing would save \$3 million annually in rent.⁴

Initial action by the Congress was rapid. The House Appropriations Committee and Public Buildings and Grounds Committee gave immediate consent. The proposal was introduced to the full House on 24 July and there questions began to rise. Congressman Merlin Hull of Wisconsin challenged the size and cost of the project, and consideration was postponed.⁵

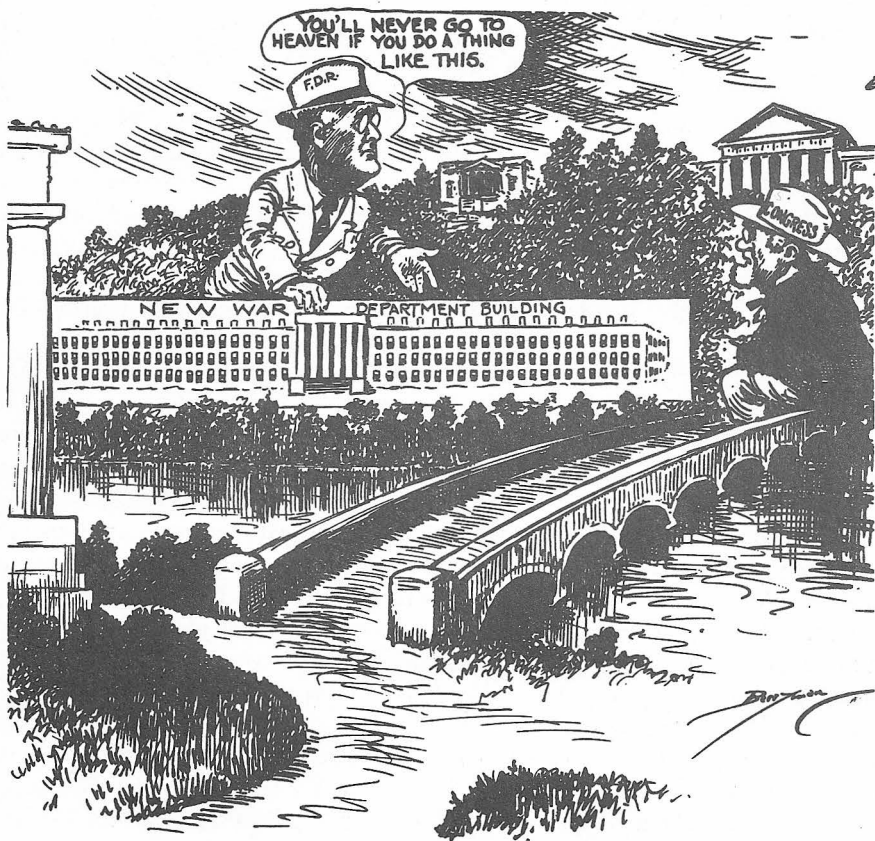
Others began to question the proposed War Department building as well. In an editorial on 25 July, the *Washington Evening Star* called the proposal "a staggering project." The *Star* pointed out that the building's 40,000 employees would be only about 15,000 less than the entire population of Arlington County. Moreover, the *Star* continued, "a building of such colossal size" would be beyond the capacity of the already strained water, sewer, and other utility services of Arlington.⁶ In a similar vein, Arlington County Manager Frank C. Hanrahan said that the County would have to seek additional Federal funds for the extension of necessary public services. "It's enough to make one dizzy," Hanrahan exclaimed.⁷

The House resumed debate on the matter on 28 July. Considerable discussion ensued over the size, cost, and impact of the project, but the House approved the measure that same afternoon and sent it to the Senate.⁸

Opposition to the new War Department building was growing. The Chairman of the Washington Fine Arts Commission told a Senate committee that, while the Commission did not want to interfere with the defense effort, it felt strongly that erection of such a structure in the proposed location would be "a great mistake." The area, the Commission felt, should remain open, either as a park or as an addition to the Arlington Cemetery. The Chairman of the National Capital Park and Planning Commission, Frederic A. Delano, President Roosevelt's uncle, also expressed concern that the project would cause permanent injury to "the dignity and character" of the area encompassing the Lincoln Memorial, the Arlington Memorial Bridge, and the Arlington National Cemetery. Mr. Delano also speculated about traffic and transportation problems for the proposed location across the river from the city. The National Association of Building Owners and the D. C. Chapter of the American Institute of Architects joined the opposition.⁹

Mr. Delano appealed to his nephew, and the President wrote to the Senate Committee. He supported the provision of additional space for the War Department and did not object to use of the Arlington Farms site. President Roosevelt did, however, favor a smaller building to accommodate only 20,000 employees to reduce the possible traffic and transportation problems. At the same time, he left open the possibility of future expansion if the situation warranted it.¹⁰

The Senate committee considered the issue at some length on 8 August. Various alternative locations were reviewed. Most were in Washington, but one was in Virginia. Located three-quarters of a mile southeast of Arlington Farms and near the Hoover Airport, this alternative also belonged to the War Department and was designated for a Quartermaster depot. Selection of this site would remove aesthetic objections though not transportation and traffic ones. But in his testimony, General Somervell remained adamant for his original proposal at Arlington Farms. Mr. Freeland Chew, Chairman of the Arlington County Board, also appeared before the committee. He pointed out that the War Department had never consult-



Editorial cartoon appearing the the *Washington Evening Star*, 20 August 1941.

ed the County government on construction of the building, but he expressed complete support for "anything that the (U.S.) Government wishes to do in this regard." When asked which of the two sites in Arlington he favored, Mr. Chew was somewhat reluctant to choose. Finally, he concluded that "the site the War Department picked out (at Arlington Farms) would be far more preferable." In the end, the committee endorsed the Arlington Farms site, and the Senate gave its approval on 14 August.¹¹

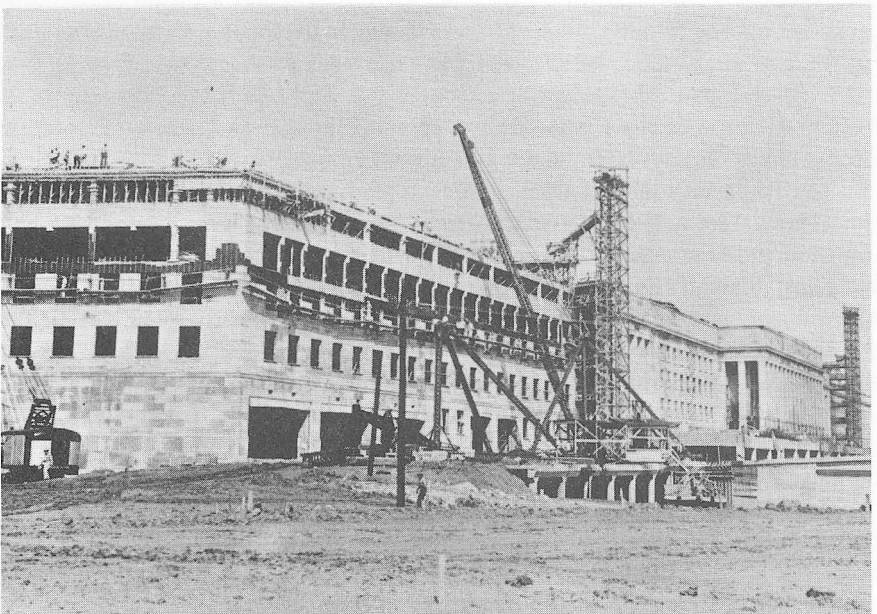
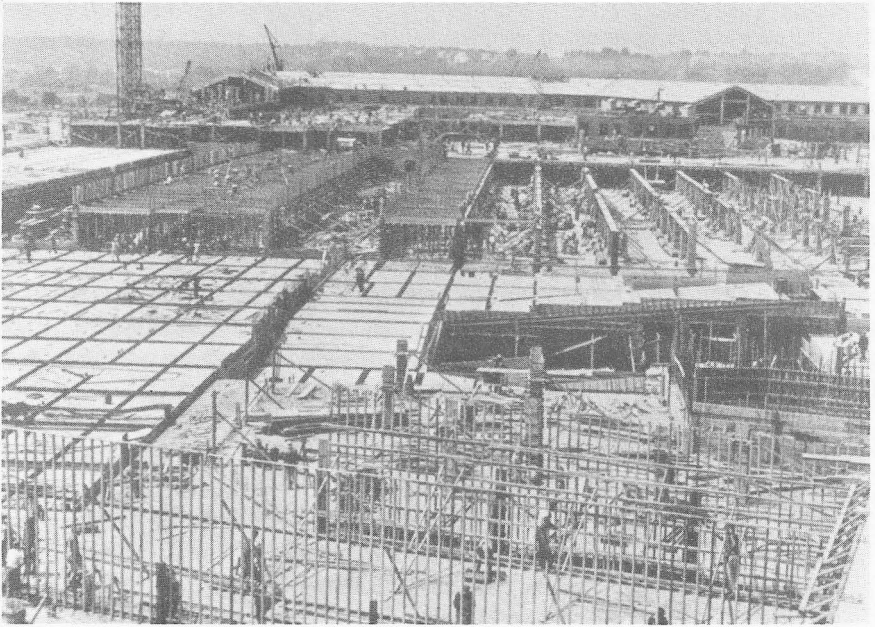
Still, the location of the new War Department building was not resolved. For, on 19 August, President Roosevelt indicated that he was inclined not to accept the decision to place the new structure in Virginia where it might mar the beauty of Arlington Cemetery, the Tomb of the Unknown Soldier, and the "Lee House." He explained that, as Assistant Secretary of the Navy in 1917, he had convinced President Wilson to construct temporary buildings in Potomac Park (the Munitions and Main Navy Buildings) which were still there spoiling the beauty of Constitution Avenue.¹²

On 25 August, the President signed the appropriations bill that contained the provision for the controversial War Department building, but reserved the right to select a different location for the building. At a press conference the following day, he announced that the structure would be located at the Quartermaster depot site and that it should be about half as large as originally planned.¹³

General Somervell now proceeded with the building at the new location though he largely ignored the President's provision for a reduction in size. Despite the change in location, the five-sided plan was retained. George Bergstrom, assisted by Architect David J. Witmer of Los Angeles, completed final plans. The building, overlooking the Boundary Channel, would consist of five concentric pentagons, separated by light wells, and connected by ten radiating spoke-like corridors, two on each side. It would have five stories. In all, the building would occupy thirty-four acres including a five-acre center court. On 10 October, when construction had been underway for a month, Somervell presented the final plans to President Roosevelt. Confronted with an accomplished fact, the President gave his approval with one reservation - - no marble would be used.¹⁴

Construction now proceeded at full speed. Lt. Col. Clarence Renshaw was the officer in charge; John McShain, Inc., Doyle & Russell, and Wise Contracting Co. Inc. were the contractors. Three shifts worked around the clock and, by early December 1941, 4,000 men were at work on the building. Some 41,492 concrete piles anchored the foundation. A lagoon, created by enlarging the Boundary Channel, allowed barges to deliver sand and gravel, dredged from the Potomac, directly to the construction site. Concrete reinforced with steel was used for the framework. The outer walls were faced with limestone while beveled wooden forms gave the inner concrete walls a wood texture. By January 1942, the pentagon shape was clearly visible and one side was ready by 29 April when the first occupants moved into the building.

The basic shell and roof were finished within one year, and the entire "Pentagon," as it was now called, was complete by 15 January 1943, just sixteen months after construction began. Some 435,000 cubic yards of concrete were consumed by the project, but wartime conditions forced other changes. Concrete ramps were sub-



The Pentagon under construction

stituted for passenger elevators. Drainage pipes were concrete; ducts were asbestos fiber; interior doors were wood. Bronze doors, copper ornament, and metal toilet partitions were all eliminated. These modifications, however, did nothing to reduce the costs, and the final figure of \$83 million far exceeded General Somervell's original estimate. Costs in terms of injuries were high as well - a total of forty including one fatality.

If the building was not particularly handsome, it was functional and convenient. It had a shopping concourse with stores and shops, six cafeterias, and underground roadways that brought buses and taxis directly into the building. The 320 acres round about were landscaped with trees and shrubs and included an esplanade and terraces leading down to the lagoon, parking for 7,000 automobiles, thirty miles of approach roads and cloverleaves, and twenty-one overpasses and bridges. The building also had its own sewage treatment plant.

Residents of Washington had watched the construction of the Pentagon with wonderment and amusement, and the project was the butt of endless jokes and funny stories. Completion of the building in January 1943 set off a spate of articles in the current news magazines. All concentrated on the size of the building. "Colossal," "stupendous," and "vast" were the typical adjectives used in the descriptions. Singled out for comment were such things as the building's requirement for 300 telephone operators, 700 janitors, and 1,900 toilets. *Newsweek* speculated that "rats which psychologists have tormented in mazes for years must be chattering and squeaking with glee over the frustrations of human beings lost in a new \$70,000,000 man-made maze - the world's largest office building in Arlington, Va. . . ." *Reader's Digest* reported that an anonymous wit had sent out a memo requiring all personnel moving into the building to provide themselves with a sleeping bag, clothing for one week, food and water, three extra pairs of shoes, a compass, a scout knife, a pistol, and roller skates or a scooter. . . . And *Life* related the story of the Western Union messenger who got lost in the Pentagon and, when the company located him three days later, he was a lieutenant colonel.¹⁵

The Pentagon's limited access approach roads with over- and underpasses and cloverleaves were new for the Washington area. They, too, were greeted with both suspicion and amusement. There were frequent tales of drivers becoming so hopelessly lost that MPs in jeeps had to rescue them.¹⁶ The author's father, a young Army major, moved into the building when it opened in early 1943. On his first morning, he took a bus from downtown Washington. The driver soon became entangled in the approaches and, finally, when still a half-mile from the Pentagon, pulled the bus over to the side of the road. Pointing to the building, he told his passengers: "There it is, but I can't get any closer, You'll have to walk the rest of the way."¹⁷

Even the architectural journals were taken with the size of the building, commenting on its "labyrinthine" corridors, its "curious" design, and the "difficulties" of access. *Architectural Forum* said "the ineffective light courts and unattractive central court" should have been eliminated in favor of "a scheme consistent with the real potentialities of artificial light and ventilation." A service core at the center, this criticism continued, "could have contained a bus terminal, cafeterias, etc., which is where proper planning would have put them in the first place."

Missing from the press coverage, both popular and professional, was any recognition of the building's architectural innovation, its functional design, or its efficiency and convenience for the large number of persons working there.¹⁸

Over the years, the Pentagon was evolved in reponse to changing needs. In the automobile-dominated society of the late 1940s and 1950s, the parking lots were enlarged to accommodate 10,000 cars. A heliport was added during the 1960s. Then, in the 1970s, the Metro was built past the Pentagon with a station opening directly into the building. Most recently, in December 1983, the bus and taxi lanes under the Pentagon were closed to preclude the possibility of terrorist bombings.¹⁹

Other physical changes have occurred in the building as well. Portions of light courts have been closed to provide additional office space. When the Pentagon opened in January 1943, most of the building was large, open bays. Gradually however, these were divided into separate offices and have now been built and rebuilt many times. Technological advances have brought the installation of vast communications facilities and complex command centers.

Yet, despite the changes, the Pentagon has aged well. Even though the heating and air-conditioning systems are showing the strains of forty-one years, the building still functions well. Unlike the tall high rise office buildings, such as the World Trade Center in New York, where there are constant problems of congestion and delays for elevators during peak periods, access into and within the Pentagon is easy. Movement within the building presents no problems and it is possible to walk between farthest points in not more than six minutes. The architects and engineer officers who planned the Pentagon in just a few days did a remarkable job. They produced a design that was both innovative and prescient. For the Pentagon remains today an efficient and convenient working space for its current 26,000 occupants.

FOOTNOTES

¹ The New York World Trade Center, completed in 1973, contains 9.5 million square feet, but it is a complex of several buildings, including the twin towers that dominate Manhattan skyline.

² On 16 December 1941, the Construction Division was transferred from the Office of the Quartermaster General to the Office of the Chief of Army Engineers in order to consolidate all Army construction under one office.

³ Lenore Fine and Jesse A. Remington, *U.S. Army in World War II, The Technical Services, The Corps of Engineers: Construction in the United States*. Washington, 1972, p. 415, 431.

⁴ House Subcmte of the Cmte on Appropriations, 77th Cong, 1st sess, Hrgs, *First Supplemental Nat'l Defense Appropriation Bill for 1942*, p 500-513. H. Rpt, 77th Cong, 1st sess, *First Supplemental Nat'l Defense Appropriation Bill for 1942*, 24 Jul 41, p. 12-14.

⁵ 87 *Cong. Record*, 6303, 6322-6324.

⁶ *Wash. Evening Star*, 25 Jul 41, A8.

⁷ *Wash. Post*, 26 Jul 41, 11.

⁸ 87 *Cong. Record*, 6363-6375.

⁹ S. Subcmte of the Cmte on Appropriations, 77th Cong, 1st sess, Hrgs on H.R. 5412, *First Supplemental Nat'l Defense Appropriation Bill for 1942*, p. 136-167.

¹⁰ Ltr, Pres. Roosevelt to Chm, Subcmte on Deficiencies, Cmte on Appropriations, US Senate, 1 Aug 41, printed in *ibid.*, p. 182-183.

¹¹ *Ibid.* p. 184-202, 232-236. 87 *Cong. Record*, 7145.

¹² *Wash. Evening Star*, 20 Aug 41, A1.

¹³ *NY Times*, 26 Aug 41, 8; 27 Aug 41, 5.

¹⁴ All information on construction of the Pentagon is from Fine and Remington, *The Corps of Engineers: Construction in the United States*, p. 437-439; Pentagon Tour Office Pamphlet, "The Pentagon," undated; Descriptive Panels in the Pentagon Tour Office; and "Planning the World's Largest Building," *Engineering News-Record*, 22 Oct 42, p. 569-575.

¹⁵ *Time*, 22 Feb 43, p. 60-61. *Newsweek*, 15 Feb 43, p. 64. *Life*, 21 Dec 42, p. 83-84; 24 May 43, 11-13. *Readers' Digest*, Jan 43, p. 112.

¹⁶ *Life*, 24 May 43, p. 12.

¹⁷ Recollections of BGen Willard Webb as told to Willard J. Webb.

¹⁸ *Architectural Record*, Jan 43, p. 63-70. *Architectural Forum*, Jan 43, p. 37-42.

¹⁹ Information on physical changes in the Pentagon is from: Pentagon Tour Office Pamphlet, "The Pentagon," undated; Ken Ringle, "Five Sided Home of Megathink Blithely Ignores 40th Birthday," *Wash. Post*, 15 Jan 83, Bl. Wash. Hqs Services, Bldg Circular, "Closing of Pentagon Bus Tunnels," 14 Dec 83; and the author's recollections from 24 years of employment in the Pentagon.