

A HISTORY OF THE NAVY CIVIL ENGINEER CORPS, 1867 – 2007

Although civil engineers have worked with the Navy since the early 19th century, until 1867 they were all civilians. In 1827, William P. S. Sanger, a talented young engineer who would later become the first commissioned Civil Engineer Corps officer, was sent by a government contractor to supervise construction of a dry dock at the Norfolk Navy Yard. Nine years later the Board of Navy Commissioners hired Sanger as the Navy's first civil engineer on the civilian payroll. When the bureau system of administration replaced the Navy Commissioners in 1842, Sanger was appointed civil engineer for the Bureau of Navy Yards and Docks, the organization then charged with building and maintaining Navy yards and which has now evolved into the Naval Facilities Engineering Command.¹

In 1842, the naval shore establishment comprised only seven Navy yards and a few smaller stations scattered along the Eastern Seaboard from New Hampshire to Florida. The entire staff of the Bureau of Navy Yards and Docks consisted of its chief, Captain Lewis Warrington; the civil engineer; a chief clerk; two subordinate clerks; a draftsman; and a messenger.²

As the value of Sanger's work became clear, the commandants of various Navy yards hired other civil engineers to perform services at their activities under Sanger's direction. In 1850, these engineers officially became part of the Federal Government's "civil establishment" as civil servants appointed by the Secretary of the Navy, and in 1858, Sanger drew up formal regulations defining their duties

and responsibilities. Those regulations described duties that seem remarkably similar to the duties of a modern Navy public works officer.

The Early CEC

Since early in his tenure at the Bureau of Yards and Docks, Sanger had advocated the establishment of a staff corps of commissioned civil-engineer officers; but until after the Civil War, the civil engineers on the Navy's payroll all remained civilians. On 2 March 1867 – the day now celebrated as the birth date of the Civil Engineer Corps – Congress passed a bill providing that Navy civil engineers should be appointed by the President. It is not clear from the context if Congress intended to establish a new Navy staff corps: The language was too brief and vague, a mere 31 words on the subject tacked onto an appropriations bill. However, naval officers, unlike civil servants, received their commissions from the President, so the 1867 act made it at least possible for civil engineers to become commissioned officers.

Despite the ambiguity of Congress' intentions in 1867, over the next 14 years a new staff corps gradually evolved. In January 1869, civil engineers appeared for the first time in the Navy Register, a publication that listed all commissioned and warrant officers of the Navy. A July 1870 act that fixed the annual pay of naval officers included civil engineers in its provisions. Finally, in February 1881 the President conferred "relative rank" on Navy Civil Engineers; and later the same year CEC officers were authorized to wear a regulation Navy staff corps officer's uniform.³ At that point a new Navy staff corps clearly existed.⁴

Navy General Order 263 of February 1881 set the size of the CEC at 10 officers – one with the relative rank of captain, two with the relative rank of commander, three with the relative rank of lieutenant commander, and four lieutenants. For most of the next two decades, this small group of staff corps officers toiled in relative obscurity, performing public works functions at Navy yards and helping to administer the Bureau of Yards and Docks in Washington. Civil Engineer Corps officers quickly asserted themselves as the Navy's experts in the design, construction, and maintenance of shore facilities; and from the 1880's forward they essentially made all of the Bureau's technical decisions, although line officers continued to hold the position of Bureau Chief.

In the 1880's the Bureau embarked upon a Navy-yard modernization program to accommodate the new ironclad, steam-powered ships that were entering the Fleet. One of the major shore-establishment projects of the era was the construction of a new physical plant for the Philadelphia Navy Yard on League Island. The League Island yard was the first Navy yard specifically designed and constructed for modern iron ships. In 1888, the Bureau also submitted estimates for electric lights in the Navy yards at New York, Norfolk, and Mare Island, thus beginning an ambitious program of electrification.

Moreover, with the acquisition of Alaska in 1867 and the expansion of American shipping in the Pacific, the need for a Navy yard in the Pacific Northwest became evident. In 1891, the Bureau therefore began constructing a new yard at Puget Sound, Washington.

The war with Spain in 1898 marked the start of a new era for the Civil Engineer Corps. In that year Civil Engineer Mordecai Endicott became the first CEC officer to be appointed Chief of the Bureau of Yards and Docks; and in 1906 Congress passed a law mandating that all subsequent Chiefs of the Bureau should be appointed from the CEC. Endicott was also the first Civil Engineer Corps officer to hold the rank of rear admiral, the rank then conferred on the chiefs of Navy bureaus. In addition, after 1898 the Chief of the Bureau of Yards and Docks always served as the Chief of Civil Engineers, the principal spokesman within the Navy Department on CEC issues.

Because of wartime exigencies, the Civil Engineer Corps was expanded to 21 officers; and in 1903 the complement was increased again to 40 (28 civil engineers and 12 assistant civil engineers). An act of March 1899 abolished the curious custom of relative rank and finally conferred actual naval rank on CEC officers. The same act cautioned, however, that it should not be construed “as changing the titles of officers in the staff corps.” Members of the CEC continued to be addressed as “Civil Engineer” and “Assistant Civil Engineer” until a naval regulation of 1918 stipulated that every naval officer should be addressed by the title of his rank.

The treaty at the end of the Spanish-American War led to the establishment of overseas naval stations in Puerto Rico, Cuba, Guam, and the Philippines. The next decade also witnessed the expansion of several of the older Navy yards in the continental United States and the construction of another yard at Charleston, South Carolina. In addition, the Bureau of Yards and Docks

began a new program of dry dock construction and undertook the modernization of shops and waterfront facilities throughout the shore establishment. These endeavors kept the small Corps of Civil Engineers well occupied in the early years of the 20th century.

During this era Congress conferred important new responsibilities on the Bureau of Yards and Docks by consolidating all Navy public works under its cognizance. One result was increased authority and responsibility for the Civil Engineer Corps. First came the Naval Act of 27 April 1904, which provided that power at each Navy yard and station would be generated at a central plant and electrically distributed, with the entire system under the management of BuDocks. Previously, the various departments at Navy yards had operated their own power plants, a practice that was duplicative and uneconomical.

More important was a March 1911 law that for the first time placed the design and construction of all Navy public works under the Bureau of Yards and Docks. Before this law's passage, the bureau that operated each type of naval installation had performed its own design and construction – e.g., the Bureau of Ordnance built naval magazines, and the Bureau of Medicine and Surgery built naval hospitals. The House Naval Affairs Committee explained the rationale for the 1911 law thus:

In order to facilitate a better coordination of work in the matter of public works, the Committee has consolidated under this Bureau (Yards and Docks) all the public works of the entire Naval Establishment. This Bureau is controlled by the Corps of Civil Engineers . . . , which is a corps of officers especially trained in construction work at navy yards and stations.

Thus, the enormous growth of the shore establishment in subsequent decades was the work of the Civil Engineer Corps.

At the beginning of the 20th century, two distinguished CEC officers drew favorable attention to the Corps through their notable outside activities. Rear Admiral Harry H. Rousseau, Chief of the Bureau of Yards and Docks and Chief of Civil Engineers in 1907, later served on the Isthmian Canal Commission, which supervised the building of the Panama Canal. In this capacity he was responsible for the design and construction of both the Atlantic and Pacific terminals of the canal.⁵ Commander (later Rear Admiral) Robert E. Peary led numerous expeditions to the Arctic and in 1909 became the first man in recorded history to reach the North Pole. Peary was also a prominent early advocate of naval air power.

World War I

Just prior to American entry into World War I, Congress passed the Naval Act of August 1916, which led to some improvements in the status of CEC officers. First of all, the law created a permanent rank of rear admiral for the Civil Engineer Corps. Since Mordecai Endicott's tenure, the Chief of the Bureau of Yards and Docks had always been a rear admiral; but his rank was temporary, held only while he served as Chief. He then reverted to his previous rank.⁶ Congress had also conferred the permanent rank of rear admiral on Robert E. Peary and Harry H. Rousseau for their distinguished service to the nation, and in 1901 had advanced two 19th-century CEC officers to flag rank upon retirement for their meritorious service. Until 1916, however, there was no permanent rear

admiral's billet in the Civil Engineer Corps. From that date until the start of World War II, the CEC generally had two flag officers at a time on active duty – whoever was Chief of the Bureau and the individual who occupied the permanent flag billet. The latter admiral was generally chosen from the CEC captains on the basis of seniority.

The Naval Act of 1916 also increased the size of the Civil Engineer Corps by setting its strength at 2 percent of the size of the line. Within 2 years the number of active CEC officers had grown from 41 to more than 75.

Thirdly, the 1916 Naval Act established a Civil Engineer Corps Reserve Force. During 1917 and 1918, more than 100 Reserve CEC officers were recruited from civilian life. Without the services of these Reserve Force officers, the Bureau of Yards and Docks could not have accomplished the large construction program of World War I in a timely fashion.

Mobilizing the Navy for World War I required a rapid expansion of shore facilities. Between July 1916 and the armistice in November 1918, the Bureau of Yards and Docks expended \$347 million for public works. That was more money than the Navy had spent on shore facilities in the previous 116 years. The construction program included 35 naval training camps; submarine bases at New London, Connecticut, Pearl Harbor, Hawaii, and Coco Solo, Panama; and naval air stations at locations throughout the eastern United States and in England, Ireland, Italy, Tunisia, and France. Of course, the existing Navy yards, hospitals, magazines, and other shore stations were also expanded.⁷ This was a tremendous program for a small engineering corps. Government contractors

performed most of the actual construction, and Reserve CEC officers provided most of the onsite supervision.

Between the World Wars

The period between the two World Wars was generally a time of retrenchment and stagnation for Navy public works. The postwar problems confronting BuDocks and the CEC in 1919 and 1920 were those typical of demobilization – the salvage and disposal of surplus materials, the provision of berthing for decommissioned ships, and the closing of wartime naval bases. By 1921 more than 375 ships had been decommissioned and mothballed at Philadelphia and San Diego. Most of the naval air stations and training camps built during the war had also been closed.

During the decade prior to World War I, most CEC officers had served in public works departments at various naval bases, with at least four or five officers in addition to the Chief assigned to BuDocks Headquarters in Washington. In the 1920's CEC officers also acquired an important new role as district public works officers.

In 1903, the coastal areas of the United States had been divided into naval districts, primarily to provide local defense during times of war. Between 1915 and 1920 a series of developments, prompted mainly by World War I, changed naval districts into complex organizations with important administrative and logistical functions and large staffs. Geographically, the naval districts

spread inland, so that the entire country was brought into the system; and naval districts were also established in overseas areas with important U.S. naval bases.

By the 1920's a naval district's staff included a number of billets for commissioned officers with specialized expertise and functions. One of those officers was the district public works officer, usually a captain or commander in the Civil Engineer Corps. The district public works officer had general cognizance over all public works functions in his naval district and was the principal representative of the Bureau of Yards and Docks there, as well as the commandant's advisor on public works issues. He was directly responsible for most BuDocks construction in his district. Typically he also managed all transportation assets assigned to Navy yards and stations in his administrative area. He headed a sizeable department, often including more junior CEC officers and many civilian employees, principally engineers, draftsmen, construction inspectors, financial-management specialists, and clerical workers. In the interwar period, being named public works officer of a major naval district was often the capstone of a CEC officer's career.

Between the World Wars some CEC officers were assigned to detached duties with no direct connection to the Bureau of Yards and Docks. The most notable of those duties were related to the American occupation of Haiti and the Dominican Republic between 1915 and 1934. Because of political instability and financial disorder -- and the consequent threat of European intervention -- the United States imposed military occupations on these two small Caribbean countries in 1915-16. In the Dominican Republic Commander (later Rear

Admiral) Ralph Whitman and Commander (later Rear Admiral) Ralph Warfield successively supervised public works activities. In Haiti, Commander (later Captain) Ernest Gayler was appointed Engineer-in-Chief for the Haitian government in 1917. In this capacity he headed the Department of Public Works, which had responsibility for roads, bridges, harbors, public buildings, irrigation, sanitation, and communications. The Engineer-in-Chief directed the activities of a large staff of native personnel, in addition to at least four or five other CEC officers. Therefore, when the American military finally withdrew from Haiti in 1934, the Corps of Haitian Engineers was ready to continue the work begun by the CEC.

It now seems appropriate to discuss the personal and career characteristics of early Civil Engineer Corps officers: What kinds of people chose a career in the CEC? During the first 70 years of the Corps' history, what was a typical career in the CEC like?

First of all, as mentioned earlier, by modern standards the early Civil Engineer Corps was quite small. Until the Spanish–American War, naval regulations limited the Corps to 10 active officers at a time. Then the Corps was expanded to 21 officers and in 1903 to 40. By setting the size of the CEC at 2 percent of the size of the line, the Naval Act of 1916 permitted a substantial increase in the authorized strength of the CEC; but the number of billets actually filled was limited by congressional appropriations, which were not overly generous in the interwar period. Indeed, in the summer of 1939, as the Navy

began mobilizing for World War II, there were only 126 regular CEC officers on active duty, well below authorized strength.

The small size of the Corps had some advantages, since it enabled most officers to know each other personally; but it also had definite disadvantages. The main drawback was that the Corps was spread thin. As a result, during the interwar years small Navy and Marine Corps activities usually did not have a CEC officer assigned and had to manage their maintenance and minor repairs without the CEC's expert onsite advice.

A second important fact about the early Civil Engineer Corps was that its members were all white males; and most of them came from fairly affluent families of European ancestry. During the CEC's first 70 years, the only career officers who might be classed as minorities were two Cuban-Americans, Commander Anecito G. Menocal – who served from 1874 to 1898 – and his son, Commander Adolfo H. Menocal – who served from 1894 to 1921. However, the Menocals were from a lineage of privileged Cuban aristocrats of Spanish descent.⁸

A third important fact about early CEC officers is that they were extremely well-educated for the times in which they lived. In an era when the majority of Americans did not possess a high school diploma, almost all CEC officers were graduates of recognized technical colleges and universities.

Since Annapolis did not offer an engineering major in the 19th century, almost all CEC officers commissioned before 1906 came from civilian life.⁹ Aspiring junior officers had to pass a series of rigorous examinations before

qualifying for their commissions. Periodically until the late 1940's, a lengthy written examination was given to qualifying graduates of civilian engineering schools when the CEC needed new officers. In 1917, for example, over 1,000 young men applied to take an examination to fill vacancies in the CEC. Only 37 of them passed the preliminary and physical tests and were invited to Washington for five days of grueling examinations. Most of these well qualified engineers passed, and 25 received commissions in the CEC in June.¹⁰

In 1906, the Civil Engineer Corps began to select young Naval Academy graduates who showed an aptitude for engineering for post-graduate study at Rensselaer Polytechnic Institute and, upon successful completion of engineering degrees, commissioning in the CEC. Annapolis graduates were periodically chosen for this program until the start of World War II. Indeed, between 1925 and the mid-1930's, all new officers commissioned in the regular CEC were products of this program. As a result, by the late 1930's a significant percentage of career CEC officers were Annapolis graduates.

By modern standards, careers in the Civil Engineer Corps were long before World War II. After May 1908, naval officers were eligible to retire after 30 years of honorable service; but the majority of CEC officers chose to remain on duty until they reached the statutory retirement age, which was 62 before 1916 and 64 thereafter. In fact, more CEC officers retired on disability than retired voluntarily after 30 years; and a significant minority died of natural causes before they reached retirement.

Promotions were also slow. In the early years the number of officers at each rank was fixed, with most positions in the lower ranks. In 1916, for example, the CEC had two rear admirals, two captains, and two commanders. The 34 other officers on active duty were all in lower ranks.¹¹ In this situation a young officer usually could not hope for a promotion until someone in a higher rank retired or died. The Equalization Act of 1926 attempted to remedy the problem by assigning each staff corps officer a line officer as his “running mate” and making the staff corps officer eligible for promotion at the same time as his running mate. Unfortunately, budgetary constraints continued to limit promotional opportunities for CEC officers; and 50-year-old lieutenant commanders were not extraordinary. In fact, between 1930 and 1940, three career CEC officers retired for age as lieutenant commanders.¹²

A noteworthy development in the interwar period was the reestablishment of the CEC Reserve Force, which had been disbanded after World War I. In October 1925 the BuDocks internal newsletter, the *News Memorandum*, announced that the Navy Department had approved the appointment of 100 officers to a CEC Volunteer Reserve Force, and that preference would be given to the appointment of young engineers “who have proven themselves capable of taking complete charge of independent construction activities in the field.”¹³ By January 1928, 66 officers were enrolled in the CEC Reserve. By 1935 there were about 75 Reserve CEC officers; and the Bureau was endeavoring to increase the Reserve Force to 500, hoping to enroll graduate engineers under 35 years of age with several years of professional experience.

In the 1920's and 1930's the Navy's budget was generally too tight to provide much active-duty training to CEC Reserve officers. By the mid-1930's, however, BuDocks had designed a correspondence course for Reserve officers, which was mandatory for all officers commissioned after 1 October 1935. The course covered Navy regulations and BuDocks contracting procedures and construction and maintenance practices. Since all the officers in the CEC Reserve were professionally trained engineers, no instruction was offered in theoretical engineering; but the course did address the practical application of engineering principles to Navy public works.

In the late 1930's, as the Bureau of Yards and Docks began to ramp up the construction of bases for World War II, mobilized Reserve officers provided invaluable support to the small corps of career CEC officers. In January 1940 there were 56 Reserve officers on active duty to aid the 126 career CEC officers.¹⁴

The economic depression of the 1930's had important effects on the CEC's work. One of President Franklin D. Roosevelt's first initiatives to combat the Great Depression was the establishment of the Works Progress Administration (WPA), which sought to alleviate unemployment through a national program of public works. The Bureau of Yards and Docks administered WPA funds allotted to the Navy Department and used much of the money for projects to improve the shore establishment.

World War II

The first significant expansion of the Navy after World War I was authorized by the Vinson Law of May 1938, which called for a 20 percent increase in ships and an increase in aircraft strength to 3,000 planes. The law also directed the Secretary of the Navy to appoint a board to determine what additional shore facilities would be needed to support the enlarged Fleet.

In a report to Congress in December 1938, this board – known as the Hepburn Board – stated that the greatest need was for air bases. It recommended the establishment of new air stations and the expansion of existing air facilities to provide three major air bases on each coast, one in the Canal Zone, and one in Hawaii, with outlying operating bases in the West Indies, Alaska, and U.S. possessions in the Pacific. The Bureau of Yards and Docks responded by letting two huge construction contracts in 1939, one for bases in the Atlantic and one for bases in the Pacific. It also expedited the signing of contracts for new and enlarged naval bases within the continental United States. Nonetheless, when major conflict broke out in Europe in the spring of 1940, the shore establishment was woefully unprepared for a global war.

After the attack on Pearl Harbor in December 1941, the Navy's construction program for shore facilities developed exponentially. Moreover, the program soon grew to global proportions, expanding far beyond the United States and its prewar possessions to Europe, North Africa, Asia, and the Pacific.

During World War II the Bureau of Yards and Docks let nearly 7,500 construction and architectural-engineering contracts at a cost of over \$8 billion.¹⁵

About 75 percent of the funds were spent to procure new and enlarged bases within the United States, and resulted in a naval shore establishment about 14 times the size of the one that had existed in 1939. This huge construction program was made possible by the rapid recruitment of Reserve Civil Engineer Corps officers, who provided almost all the first-line supervision for construction contracts. Indeed, in August 1945 the CEC had only about 200 active career officers, including some retired officers who had been recalled to duty; but there were over 10,000 Reserve officers in uniform.¹⁶

Several remarkable engineering developments devised by the CEC played an important role in winning the war. One was the sectional floating dry dock, constructed of modules which could be transported separately to a remote location and then assembled, thus permitting the repair of large ships thousands of miles from the nearest permanent graving dock. During the last year of World War II, more than 7,000 ships were repaired in sectional dry docks located in combat zones. Many of those ships were too disabled to make the long journey back to a permanent dry dock and would have been lost without the CEC's invention.

Hardly less spectacular was the introduction of the Navy lighter pontoon, one of the most versatile tools of the war. Developed by the CEC's Captain John Laycock, this system of steel boxes tied together with angles and bolts could be assembled into dry docks, self-propelled barges, bridges, finger piers, and platforms for floating cranes. Most important was the ship-to-shore causeway,

which made possible amphibious landings over shallow beaches like those at Sicily and Normandy.

Wartime scarcity of important construction materials also led to some CEC design innovations. One of the most notable was a design for huge lighter-than-air hangars made entirely of wood, with no structural steel. These hangars were the largest timber structures ever built. The steel shortage also prompted the development of prestressed-concrete fuel storage tanks with plastic linings.

But the CEC's most important innovation of World War II was the establishment of the Naval Construction Battalions, the now-legendary Seabees. Planned by Rear Admiral Ben Moreell, Chief of Civil Engineers, and by other high-ranking CEC officers at the Bureau of Yards and Docks, the construction battalions were the first naval units in U.S. history specifically organized to perform construction overseas in combat areas. The founding of the Seabees also gave CEC officers their first opportunity to command troops, a prerogative jealously guarded by line officers in earlier times.¹⁷

At the beginning of the Pacific war, it became clear that the Navy could not rely on civilian workers for construction in combat zones. In the first place, under military law a civilian who tried to defend himself from enemies was classed as a guerilla and was liable to summary execution if captured. Furthermore, civilian construction workers generally lacked the training necessary to fight effectively. This reality was grimly demonstrated in the battles for Wake Island, Cavite, and Guam, where civilian workers were able to offer little resistance to the Japanese, and many were killed.

In January 1942 Rear Admiral Moreell received authority to recruit men for the first Naval Construction Battalions. The original Seabees were experienced construction workers with an average age of 37, who received brief naval training to adapt their skills to military pursuits and to learn the use of weapons for self-defense. Then they were quickly deployed overseas to begin constructing needed facilities.

Under the command of CEC officers, the approximately 325,000 Seabees performed remarkable feats of construction during World War II. They participated in every major invasion in both the Pacific and Atlantic Theaters of Operations. They were among the first troops to land at Sicily, Salerno, and Normandy; and they took part in almost every amphibious operation in the Pacific, often going ashore right after the Marines to begin building an airfield. At a cost of billions of dollars and numerous casualties, they constructed over 400 advanced bases in war zones to provide logistical support for troops at the front. Military historians generally agree that the Seabees played a significant role in the Allied victory, especially in the Pacific Theater, where 80 percent of the Naval Construction Force was concentrated.

This huge wartime program of advanced base construction was made possible by CEC Reserve officers, who provided almost all the leadership for Seabee units in the field. Although career CEC officers in Washington formulated policy for the Seabees, the officers assigned to operational Seabee units were overwhelmingly Reservists. In September 1944, for example, nearly

6,000 Reserve CEC officers were serving on Seabee duty, in contrast to only 72 career officers.

Because the majority of CEC officers on active duty during World War II were Reservists with no prior military experience, attention had to be devoted to their training. Although most Reserve officers were qualified engineers, few of them had much knowledge of the Navy or its organization, customs, and operations.

At the beginning of the war, the need for CEC officers was so urgent that new Reserve officers were shipped immediately to their posts with minimal indoctrination. They received their training, such as it was, through correspondence courses, which they completed in their spare time.

Admiral Moreell, however, was determined that the new Reserve CEC officers would get better preparation for their duties than he had received in 1917; and by July 1942 incoming Reserve officers were taking a 3-week indoctrination course at Camp Allen in Norfolk, Virginia. The emphasis was on naval customs and procedures and military leadership.

Early in 1943 the training program moved to Camp Peary, near Williamsburg, Virginia. There the indoctrination course was lengthened to 4 weeks for officers destined for Seabee duty and to 6 weeks for prospective public works officers. Special courses included such subjects as camouflage, soil mechanics, stevedoring, and chemical warfare. After completing the indoctrination courses, officers selected for Seabee duty received several weeks of training in the handling of enlisted men before they were detailed to battalions.

Officers assigned to public works duty were sent to Norfolk for a month of additional training.

In May 1944, the officers' training curriculum was reorganized and the school moved to Camp Endicott at Davisville, Rhode Island. Twelve months later the public works indoctrination course at Norfolk was transferred to Camp Endicott and merged with the Officer Training School to form the Civil Engineer Corps Officers School. The school offered indoctrination training for newly commissioned CEC officers, construction battalion officer training, stevedore battalion officer training, and various public works courses. In September 1946 the school moved to Port Hueneme, California.

The urgent need for qualified officers during World War II also led to the commissioning of the first female and black officers in the history of the Civil Engineer Corps. The first woman CEC officer was Kathleen F. Lux, who was commissioned an ensign in the CEC Reserve in March 1943. A sanitary engineer, she remained in the Reserves for some years after the war. One additional woman was commissioned in the CEC Reserve during World War II; thereafter there were no more female officers until the 1970's.

The first black CEC officer was Dr. Edward Swain Hope, who was commissioned a lieutenant in the CEC Reserve in April 1944. After his promotion to lieutenant commander early in 1946, he also became the highest ranking black naval officer of the World War II period. There was only one other black CEC officer of record during the war, however, in 1949 Wesley A. Brown, the first black person to graduate from Annapolis, was commissioned an ensign

in the Civil Engineer Corps and served honorably until his retirement in 1969. For the most part though, in the post-World War II era, minority faces remained uncommon in the CEC.

One last notable occurrence of the war years was a significant increase in the number of flag officers in the Civil Engineer Corps. Prior to World War II, the CEC generally had only two rear admirals at a time – one of whom held his rank temporarily while serving as Chief of the Bureau – and no flag officers of higher rank. The great expansion of the Bureau's activities during the war led to an increase in positions meriting flag rank and, thus, to more promotions of CEC officers to that level.

Early in the war the Bureau of Yards and Docks decentralized its operations by dividing the United States into seven areas, each overseen by a high-ranking CEC officer known as a "Superintending Civil Engineer" (SCE). There was also an SCE for overseas areas in the Atlantic and one for overseas areas in the Pacific. While the main duty of the SCE's was supervising naval construction in their respective geographical areas, they had extremely broad powers. An SCE was the direct representative of the Bureau in his area and had full authority to act on behalf of the Chief when he felt such action was required. Before the end of the war, the seven continental areas had been consolidated into four; and all six areas, including the two overseas, were headed by senior CEC officers holding the rank of rear admiral. The net result -- including other new positions meriting flag rank -- was that by March 1946 the CEC had 10 rear admirals.¹⁸

During World War II the Navy also revived as a temporary grade the one-star rank of commodore, a 19th-century designation that had been abolished in 1899. Eighteen CEC officers were promoted to commodore during the war, most while serving as officers in charge of Naval Construction Brigades. The CEC commodores who remained on active duty after the war had all reverted to captain by the end of 1947. However, 13 of the 18 officers who had held the rank of commodore were eventually promoted to rear admiral or vice admiral.¹⁹

Finally, Admiral Ben Moreell, Chief of the Bureau of Yards and Docks and Chief of Civil Engineers from 1937 to 1945, brought honor to the Corps by becoming the first CEC officer ever promoted above the rank of rear admiral. In February 1944, when he was Chief of the Bureau, he was advanced to vice admiral, the youngest naval officer ever promoted to that grade. In June 1946, while serving as Coal Mines Administrator in the Department of the Interior, he was promoted to four-star admiral. Ben Moreell was the first – and thus far the only – staff corps officer in the history of the Navy to attain four-star rank.

The Early Cold War Years

At the end of World War II, the Civil Engineer Corps' most immediate tasks were predictable: the inactivation of temporary shore facilities built for the war, the disposal of surplus war materials, and the construction of berthing facilities for decommissioned ships. The onset of the Cold War only a few years later, however, made it necessary to keep open – or quickly reopen – many wartime bases.

Since most Reserve CEC officers were released from active duty by the end of 1946, maintaining this much larger shore establishment presented a challenge. Moreover, in February 1946, the Secretary of the Navy for the first time gave the CEC responsibility for the maintenance and operation of public works and public utilities at all shore stations, regardless of which bureau had primary cognizance over a particular station. This assignment of new responsibilities led to creation of a billet for a CEC officer at nearly every shore activity, whereas prior to World War II only major naval stations had had public works officers.

The CEC also assumed long-term military responsibilities in the postwar era because the Seabees were made a permanent part of the Navy in 1947, although at a greatly reduced strength of less than 5,000 men. In the late 1940's most Seabees were assigned to small Construction Battalion Detachments (CBD) that maintained and operated overseas Navy bases. In addition, several World War II Naval Construction Battalions were kept in commission to provide maintenance services for major base complexes in Guam and Alaska; and the Atlantic and Pacific Fleets were each assigned a construction battalion specializing in amphibious warfare. Each of these Seabee units needed a complement of CEC officers to furnish its leadership.

Partly in response to this expansion of duties, Congress passed the Officer Personnel Act of May 1947, which – among other provisions – increased the authorized strength of the CEC from 2 to 3 percent of the total number of commissioned officers of the line. By July 1949 more than 800 CEC officers were

on active duty, including some Reservists. Most of the new career CEC officers had transferred from the Reserves after the war.

Many wartime Reserve officers who did not transfer to the regular CEC chose to join the Reserve Naval Construction Force (RNCF), which was authorized in December 1947. Recruiting for the Seabee Reserves excelled and the RNCF grew rapidly. By the end of 1949 the organized Seabee Reserves had 313 companies nationwide, comprising about 1,280 commissioned CEC officers and 6,700 enlisted men. The Reserve Seabee companies were organized geographically within each naval district, and their members received pay for weekly or monthly drills and 2 weeks of active-duty training per year.

A larger number of World War II officers joined the volunteer Seabee Reserves, where they filled unpaid positions. These officers were organized into drilling units that met for training seminars about 10 times a year. Among the topics studied were cold-weather engineering, new Seabee equipment, and radiological defense. By early in 1950 more than 3,000 Reserve CEC officers from World War II were participating in the Reserve Naval Construction Force.

During the Korean conflict many Reserve officers were recalled to active duty to help fight the war. In July 1950 fewer than 50 Reserve CEC officers were on active duty; by the end of 1952, more than 1,100 Reserve officers had been recalled. The Reserve officers supervised rehabilitation of closed World War II bases returning to active status and construction at active bases that were expanding to meet wartime needs. Some Reserve officers filled administrative positions at district public works offices and at BuDocks Headquarters. They

also provided much of the leadership for the 11 new Naval Mobile Construction Battalions established between 1949 and 1953.

When the Korean War broke out in June 1950, the CEC and the Seabees were ready to fight the enemy. The 104th Naval Construction Battalion – later redesignated Amphibious Construction 1 – participated in both the Inchon and Wonsan landings. At Inchon, despite the hazard of enormous tides, the Seabees positioned a pontoon causeway and dock to resupply the Army and Marines within hours of the initial assault. Other CEC officers and Seabee units built airfields and other advanced bases in Korea and support facilities for United Nations troops throughout the Pacific

Away from the battlefield, the onset of the Cold War required the Navy to increase its presence abroad in strategically important regions and the CEC was thus called upon to build large overseas base complexes. One of the first of these projects took place on the island of Guam, where the CEC and its civilian contractors built a mighty Pacific naval base after the war. The construction included communications facilities, a Marine Corps base, a large supply depot, a submarine base, ship repair facilities, and a naval ammunition depot. One of the most noteworthy projects involved improvements to Apra Harbor, comprising the construction of a 2-mile-long breakwater and the dredging of 30 million cubic yards of sand and coral from the harbor bottom.²⁰ In the end the CEC and its contractors had created a major outpost of American military power in the western Pacific, able to deter aggression and respond to emergencies in Asia.

Another huge construction effort took place in Spain, where the Bureau of Yards and Docks was designated the U.S. Government construction agent in 1953. Charged with building a complete base complex in a country where no U.S. bases had previously existed, the CEC and its contractors constructed four major Air Force bases; a naval air station; petroleum, oil, and lubricants (POL) facilities; and seven aircraft-control and weather sites.

During the 1950's the nuclear and missile age presented the CEC with new technical challenges. The Corps' design and research experts had to devise new plans for underground construction, protection of harbors, and dispersal of facilities at naval bases. Some examples of the sophisticated construction required were the Pacific Missile Range installations in California; the various facilities for the development, fabrication, and servicing of the Polaris Fleet Ballistic Missile System; and the nuclear power plant built at McMurdo Station, Antarctica, in 1962.

In the mid-1950's, as experienced Reserve CEC officers returned to inactive status, the Corps faced a new problem -- a significant decrease in the average rank of active-duty officers. Navywide personnel ceilings and congressional mandates limited officer accessions mainly to ensigns and lieutenants (jg.). As early as July 1953, about 45 percent of all active CEC officers were in those two lowest ranks. As a result, there was a serious imbalance between the experience level of CEC officers and the skills required to fill authorized billets. Indeed, except at the ensign and lieutenant (jg.) levels, the authorized positions for each rank exceeded the number of available officers.

The problem was most dire at the lieutenant commander level: There were only about 200 lieutenant commanders on active duty to fill 480 lieutenant commander billets. In consequence, virtually all CEC lieutenants were assigned to positions designated for lieutenant commanders; and all lieutenants (jg.) had “fleeted up” to positions designated for lieutenants.

This situation was exacerbated by retention difficulties. Because of the existence of a draft, the CEC rarely had much difficulty recruiting young engineers eager to obtain professional experience during their obligated military service; and the Corps was able to maintain its authorized strength of 1,500 to 1,700 officers.²¹ Few junior officers, unfortunately, desired to make the military their career; and about 80 percent served no more than 3 years on active duty.

By the early 1960's the retention problem had created a serious shortage of qualified officers at all ranks from lieutenant through commander. Therefore promotional opportunities were extremely good for career CEC officers: Ninety percent of lieutenants could reasonably anticipate being promoted to lieutenant commander, and 80 percent of lieutenant commanders could expect to be promoted to commander. Competition for promotion did not become stiff until the rank of captain. Due to the number of World War II accessions still on active duty, the CEC actually had a surplus of captains in the late 1950's. Some of these senior officers were “non-continued” (i.e., retired early) around 1960, and thereafter promotional opportunities to captain began to improve.

In the decade between the Korean and Vietnam Wars, advanced education and professional registration became important for career CEC officers.

Once junior officers chose to make the CEC their career, they had an excellent chance of being sent to graduate school to study for a master's degree at Navy expense. A 1956 BuDocks study on officer education revealed that about 50 percent of career CEC officers on active duty had at least two college degrees.²² The CEC's goal was to ensure that within 15 to 20 years, all career officers would have a master's degree by the time they were promoted to commander.

While professional registration was not mandatory, the Bureau strongly encouraged all career CEC officers to become registered professional engineers, participate in professional societies, and write technical papers for publication. According to a study conducted by the Association of Navy Civil Engineer Corps Officers, the number of licensed professional engineers on active duty was growing steadily during this decade: Whereas only 24 percent of the Association's active-duty members were licensed professional engineers in 1957, 35 percent were licensed by 1960.

From Vietnam Through the 1980's

In the spring of 1965, the United States sent combat troops into South Vietnam, commencing U.S. involvement in a "hot" war in Southeast Asia. From about 1,650 officers on active duty in the early 1960's, the Civil Engineer Corps grew to 2,200 officers by 1968. Many young engineering-college graduates, hoping to avoid the draft and serve their country in their chosen profession, sought commissions in the CEC; but there were still not enough officers to fill all the available billets, especially at the lieutenant and lieutenant commander grade

levels. In 1967, the CEC therefore announced a program for direct appointment of about 200 civilian engineers to middle-grade positions in the Corps.

Applicants had to be graduate engineers between the ages of 26 and 38 with 5 to 12 years of experience. This appointment program was the first time the CEC had attempted to obtain middle-grade officers directly from civilian life since World War II.

Although the Vietnam War was modest in size compared to World War II, it nonetheless generated demand for a large amount of military construction. In 1963, the Bureau of Yards and Docks was formally designated as the contract construction agent for Southeast Asia and thus became responsible for nearly all U.S. construction there, including facilities built for the Army, the Air Force, and other Federal agencies. In total, nearly \$1.8 billion worth of construction went into Vietnam under the Military Construction Program and the Civil Engineer Corps managed it.²³

The strategy in Vietnam was unique in the history of U.S. military involvements to that point in time. Because it was a civil war and the enemy was largely a guerilla movement, there was no front line. Therefore U.S. forces sought to establish enclaves throughout the country to support troop operations, and then to move out from those enclaves to pacify surrounding areas.

Unlike World War II, the situation allowed for a mix of civilian construction workers and military construction troops, with civilian contractors concentrating their efforts inside the enclaves. Construction troops, including the Seabees,

were primarily deployed outside the enclaves to build facilities in less secure areas prone to enemy attack.

More than 100 CEC officers at a time served on the staff of the Officer in Charge of Construction (OICC), Republic of Vietnam, which administered over \$1 billion of contracts with civilian companies at more than 40 sites throughout the country. In Thailand, through the OICC office in Bangkok, CEC officers administered another large construction program to build facilities for the Thai and U.S. military forces.

Other CEC officers provided leadership for the various Seabee units deployed to Vietnam to build and maintain military facilities in combat areas. These units included nine new Naval Mobile Construction Battalions, a Naval Construction Brigade, and two Naval Construction Regiments established to fight the war.²⁴ At the height of American involvement in Vietnam, nearly one-third of all active CEC officers were detailed to Seabee duty.

Seabee accomplishments in Vietnam were every bit as impressive as their exploits in earlier conflicts. Under the leadership of CEC officers, they constructed roads, bridges, airfields, troop camps, ammunition depots, hospitals, and other installations needed to support American combat forces. Sometimes they also had to fight to defend themselves and the facilities they were building. Four CEC officers and 81 enlisted Seabees were killed in action in Vietnam, and several hundred others received Purple Hearts and awards for valor. Seabee battalions were awarded numerous Navy Unit Commendations and Meritorious

Unit Commendations, and several battalions – or parts of battalions – won a Presidential Unit Citation for outstanding performance in combat.

The United States withdrew most of its military forces from Vietnam in 1973, and the end of American participation in the war brought the usual demobilization and funding cuts. Personnel levels were reduced, ships were decommissioned, and shore stations were closed.

Within the CEC community and the major command whose functions the CEC managed – now known as the Naval Facilities Engineering Command (NAVFAC) – emphasis was placed on improvements in personnel facilities to support the new all-volunteer Navy, environmental protection, and energy conservation in the postwar period.²⁵

In the 1970's the people of the United States became increasingly concerned about the environment, and Congress reacted by passing a number of environmental protection laws. The President then directed all Federal agencies to meet national environmental standards. The Navy responded by launching programs to prevent or control pollution and to clean up pollution it had previously caused. As manager of the Navy's programs for shore-based environmental protection, NAVFAC – and by extension the CEC – played an important role in this effort.

In 1973, the Organization of Petroleum-Exporting Countries (OPEC) imposed the first of several oil embargoes, leading to a shortage of petroleum-based products and higher fuel prices throughout the industrialized world. In response, the U.S. government took immediate steps to reduce energy use.

Within the Navy, NAVFAC and the CEC assumed leadership in devising energy conservation measures. Design standards and planning criteria for all types of naval construction were revised to increase energy efficiency, and the Naval Civil Engineering Laboratory initiated a major program to develop energy-saving strategies and alternative energy technologies.

Although the Civil Engineer Corps – like all Navy officer communities – experienced a reduction in size after the Vietnam War, because of the obvious relationship between civil engineering and energy and environmental issues the decline in the CEC’s complement was relatively modest, from about 2,200 officers on active duty in 1968 to about 1,400 officers 10 years later. Recruiting enough talented young engineers to keep the ranks filled, however, proved difficult. Congress had abolished the draft and in the wake of Vietnam, a military career was not an especially popular choice for young college graduates. Prior to the Vietnam War, the most important source of accessions for the CEC was Officer Candidate School (OCS), followed by Reserve Officer Training Corps (NROTC) programs and lateral transfers of officers with engineering majors from the line.²⁶ By the late 1970’s, however, the CEC was not able to fill its OCS accession quotas.

To provide alternative sources of young officers, two new CEC-officer accession programs were established. The first of these initiatives, the Direct Appointment Program, was inaugurated in fiscal year 1977. The Navy Recruiting Command identified qualified engineering-college graduates and offered them direct appointments as ensigns in the Naval Reserve. In lieu of reporting to OCS

for 19 weeks of training before commissioning, direct-appointment ensigns were sent to Officer Indoctrination School (OIS) for 6 weeks. Successful candidates were then commissioned at their local recruiting offices and were obligated for either 3 or 4 years of active duty, which began immediately.

In fiscal year 1980 the Secretary of the Navy approved the CEC Collegiate Program. Under this program the CEC could recruit engineering majors up to 12 months before graduation. Selected students would receive a monthly cash stipend while they finished their degrees and would be commissioned in the CEC following graduation and completion of OIS. They would then have a 4-year active duty obligation. The CEC Collegiate Program proved to be quite successful and remained in operation for many years.

By the mid-1980's, the recruiting woes of the previous decade had abated and in 1985 the Chief of Naval Personnel approved a request from the Chief of Civil Engineers that all CEC officer accessions from civilian universities be required to attend Officer Candidate School instead of the shorter Officer Indoctrination School course. The more rigorous OCS program would provide increased naval orientation and military training and would improve prospective CEC officers' understanding of the unrestricted line. The knowledge and training imparted at OCS were expected to enhance the ability of young CEC officers to perform their Fleet-support duties.

Following appointment to the Civil Engineer Corps, all new officers attended the basic CEC officers' qualification course at the Civil Engineer Corps Officers School (CECOS) in Port Hueneme, California. The purpose of this

course was to acquaint new officers with their role in the Navy and to prepare them for their first assignment in public works, contract administration, or construction battalion operations. In 1985, CECOS celebrated its 40th birthday and by that time the school was offering a variety of courses in addition to the basic CEC course. Those classes included a 2-week advanced CEC officers' course, two 6-week management courses for chief petty officers, and more than 20 specialty courses (e.g., public works management, shore-facilities planning, environmental protection). In 1984, CECOS trained over 3,000 students – including DOD civilians and some foreign military officers – in more than 30 courses.

In the post-Vietnam period the Civil Engineer Corps became a more diverse organization. Prior to that time, only two women had ever been commissioned in the CEC; and black, Asian, and other minority male officers were rare. In 1972, the Chief of Naval Operations, Admiral Elmo Zumwalt, Jr., issued a directive that opened service in the CEC to women. In February of the next year, Jerri Rigoulot, an architect with a degree from the University of Virginia, was commissioned an ensign in the CEC, thus becoming the first woman officer in the Corps since World War II. The number of women officers grew slowly but steadily thereafter, from 5 in 1975 to 18 in 1980 to 78 in 1984.²⁷ By 1988, there were nearly 100 women CEC officers, comprising 6 percent of the Corps.²⁸

Early women CEC officers felt that their advancement prospects were somewhat limited by their inability to serve in Naval Mobile Construction Battalions or operational regiments and brigades.²⁹ This barrier was removed in

1994, and in April of that year Lieutenant Michaela Bradley became the first woman officer to report to a Naval Mobile Construction Battalion. In 1999 Commander Katherine Gregory assumed command of NMCB-133, thus becoming the first woman officer to lead a Naval Mobile Construction Battalion. Half a decade later during Operation Iraqi Freedom, several female CEC captains commanded operational regiments in Iraq. Thus, 30 years after the Navy began to actively recruit women CEC officers, they had attained substantially equal opportunity to advance in their careers.

In the late 1960's and 1970's, in the wake of the civil rights movement, the CEC began to actively recruit members of minority groups. Whereas previously minority CEC officers had been few and far in between, by the 1970's many more minority engineers were joining the Corps. The increase can be tracked by examining the graduates of the basic CEC course at CECOS: In the early 1960's the fledgling officers were all male and almost all white. By September 1982, 13 percent of the most recent graduates (class no. 164) were minorities or women. By September 1986 (class no. 179), 24 percent of the graduates were minorities or women. By the early 21st century, it was not unusual for about one-third of the members of a CECOS basic class to be minorities or women.

Minority officers who made a career in the CEC also attained some important milestones in the 1980's and early 1990's. In 1985, Benjamin Montoya became the first Hispanic CEC officer to reach the rank of rear admiral. In addition, he served as Commander, Naval Facilities Engineering Command, and Chief of Civil Engineers from 1987 to 1989. In 1987, Commander Fred Warren

Dew became the first black CEC officer to lead a Naval Mobile Construction Battalion (NMCB-5). Four years later, Warren also became the first black CEC officer promoted to the rank of captain. Others subsequently followed in his steps. In 1991, Melvin H. Chiogioji was advanced to rear admiral, the first Asian-American to reach flag rank in the CEC. That same year he assumed command of the Reserve Naval Construction Force; and in 1992 he became Commander, 2nd Naval Construction Brigade. In this latter capacity he commanded all active-duty and Reserve NMCB's in the Atlantic Fleet. By the early 21st century, therefore, the CEC was a much more diverse organization than it had been before the Vietnam War with women and members of minority groups rising to positions of leadership.³⁰

The tight military budgets and force reductions of the 1970's did not last long, for in 1980 the United States began one of the largest peacetime military buildups in its history. For fiscal year 1981, the administration of President Jimmy Carter requested an increase in the DOD budget of more than 5 percent real growth. After Ronald Reagan took office the following January, the DOD budget grew even faster. Overall, it increased by 51 percent between fiscal year 1981 and fiscal year 1985.

In 1981, Secretary of the Navy John Lehman embarked upon a major program of shipbuilding to expand the Fleet from 540 to 600 ships by the middle of the decade. This expansion meant that the Navy needed more shore facilities to support the new ships, which in turn led to more construction work for the CEC.

Between fiscal year 1982 and fiscal year 1985, Congress appropriated more than \$5 billion for Navy military construction.

Partly because of the large military construction budgets, there was an increased emphasis on contracting skills for CEC officers in the 1980's. Moreover, in addition to the growth in traditional construction and architectural-engineering contracts, NAVFAC and the CEC were under pressure to contract out many types of naval-base services when it was economical to do so – alteration and repair, utilities operation, production of base master plans, and various types of base-operating support (BOS) services. The latter type of contracting was mandated by Office of Management and Budget Circular A-76, which stated that Federal Government agencies had to allow private businesses to compete to provide certain types of commercial services to the Government.³¹ Examples of such commercial activities are transportation, custodial services, grounds maintenance, pest control, and guard services. CA contracts were often hard to write because they were not designed to obtain a finished product but often were more of a statement of a required condition in which facilities or equipment had to be maintained. It was also difficult to arrive at definitions of adequate performance.

In the early 1980's NAVFAC conducted a study to investigate ways to improve the administration of contracts. The study concluded that NAVFAC contracting personnel, both civilians and CEC officers, required better acquisition training. One outcome was a new requirement that all career CEC officers become warranted contracting officers. Another was the establishment in 1985

of the Naval Facilities Contracts Training Center (NFCTC) in Port Hueneme. NFCTC provided specialized training in construction, design, and facility-support contracting administration to CEC officers and NAVFAC civilian procurement personnel. By fiscal year 1989 NFCTC offered 10 different acquisition courses and issued about 4,300 individual training-completion certificates. In addition, NFCTC maintained a procurement-training data base that verified the qualifications of contracting officers.

After the Cold War

At the end of the 1980's, the collapse of the Soviet Union brought an abrupt end to the Cold War; and the Navy no longer needed so many ships and planes or bases to support them. From the CEC's perspective, the most important result was the Base Realignment and Closure Program (BRAC). Between 1988 and 1995 Congress authorized four rounds of selections for base closures and numerous installations were identified as excess to military needs and slated for disestablishment.

NAVFAC and the CEC managed the BRAC Program for the Navy and Marine Corps. By the end of fiscal year 2002 they had helped the Navy dispose of 64 unneeded bases and had an inventory of 26 closed installations remaining to be excessed. Often the main impediment to civilian reuse of a former military base was environmental pollution. Since NAVFAC had for many years been the Navy's manager of shore-based environmental programs, the CEC had the expertise to identify the problems and select appropriate cleanup measures.

BRAC-related environmental problems, plus congressional mandates for higher environmental standards at active bases, meant that increasing numbers of CEC officers were assigned to environmental-management billets in the 1990's. As a result, graduate education for CEC officers in environmental fields expanded.

As the Fleet contracted in size, the Navy had less need for military construction and a greater demand for skilled facilities management. Through their public works programs, NAVFAC and the Civil Engineer Corps were uniquely positioned for this change in emphasis. In the 1990's the CEC therefore focused attention on improving public works management. Initiatives included expanding the number of public works centers to consolidate services, a small increase in management staffing of public works, and better use of contracting.

Between the late 1980's and the beginning of the 21st century, the Civil Engineer Corps experienced some reductions in authorized manpower, from about 1,600 officers in fiscal year 1987 to about 1,300 officers in fiscal year 2001. Compared to some other naval officer communities, however, the reductions in the CEC were modest because of the Corps' expertise in environmental restoration and compliance, its role in the BRAC Program, and its public works management skills. The worst problems occurred at the beginning of the period. When Congress began cutting the DOD budget in the late 1980's, the CEC had already executed promotion plans for captains and commanders on the basis of projected growth that halted quite abruptly. Suddenly the Corps had too many senior officers. At the same time, junior CEC officers were more career minded

than they had been 25 years earlier: Only about one-third of them were resigning from the Navy within 5 years of receiving their commissions.³²

To make room for junior officers to rise in the ranks, the CEC began to pressure captains and commanders to retire early. Thus, during the 1990's it became common for captains to retire after 26 years in the Navy rather than 30 and for passed-over commanders to retire after 21 or 22 years.

By the late 1990's the Civil Engineer Corps was again facing recruitment problems: Because of the booming economy and a nationwide shortage of engineers, competition for young engineering-college graduates was extremely stiff. The CEC responded with two new accession programs. The first was an expanded version of the CEC Collegiate Program. Now engineering students could enroll in the Collegiate Program at the beginning of their junior year, receive a monthly stipend until graduation, access all active-duty benefits while still in school, and obtain day-for-day credit toward promotions and retirement. This meant, essentially, that if an officer stayed in the CEC after the end of his obligated service, he would be eligible for the benefits of a 20-year military retirement after only 18 years of active duty.

The second accession initiative was the Bachelor Degree Completion Program, which offered engineering majors the same benefits starting in their sophomore year. Under this program a new CEC officer-recruit could earn nearly \$20,000 a year during their last 3 years of college and after graduation would have to serve on active duty only 17 years to reap the benefits of a

20-year military retirement. If a young officer commissioned under this program opted to stay in the CEC beyond the required 4 years of commissioned service, moreover, he or she was guaranteed a year in graduate school to study for a master's degree at Navy expense. Both programs proved popular and resulted in the recruitment of some talented young engineers.

For the Civil Engineer Corps, one of the most important developments of the early 21st century was a major reorganization and consolidation of NAVFAC's field activities that took place between 2004 and 2006. During this "transformation," as it was called, NAVFAC merged its engineering field divisions, engineering field activities, officer-in-charge-of-construction organizations, and public works centers into regional Facilities Engineering Commands (FEC's). Later Navy public works departments and regional engineering staffs were also integrated into the FEC's, and the commanding officers of the FEC's became double-hatted as regional engineers. As a result, 25 NAVFAC commands were consolidated into 16; and the Facilities Engineering Commands could provide the Marine Corps, regional Navy commanders, and other clients with a single touch point for all NAVFAC products and services. The transformation resulted in an organization that was more efficient, and it saved scarce dollars.

One result of the transformation was fewer billets for high-ranking CEC officers to fill. Therefore the authorized size of the CEC declined slightly over several fiscal years.

The principal author of NAVFAC's transformation was Rear Admiral Michael K. Loose, Commander, Naval Facilities Engineering Command, and

Chief of Civil Engineers from 2003 to 2006. In recognition of his outstanding management skills, Rear Admiral Loose was advanced to vice admiral in January 2007 and was assigned as Director, Material Readiness and Logistics, in the Office of the Chief of Naval Operations. He was the first active-duty CEC officer to attain the rank of vice admiral since Ben Moreell.³³

The deadly attacks on the Pentagon and the World Trade Center in New York on 11 September 2001 marked the start of the War on Terror, a conflict in which the Civil Engineer Corps did its part. During the invasion of Afghanistan in 2001 and the later invasion of Iraq, CEC officers provided the leadership for Seabee battalions that built facilities for American combat forces. Later in the war they also served as “individual augmentees” (IA’s) in Afghanistan, Iraq, and the Horn of Africa. As IA’s, CEC officers often performed as contract officers, helping to reconstruct infrastructure and build or repair schools, hospitals, and police stations. In Afghanistan IA’s also helped to train the Afghan army. More than 5 years after the war’s commencement, CEC officers also continued to lead Seabee units into Middle Eastern war zones to support American troops and build projects for local governments.

In March 2007 the Civil Engineer Corps celebrated its 140th birthday. It continues to administer the planning, design, construction, and maintenance of the naval shore establishment, now grown from the handful of Navy yards, ammunition magazines, hospitals, and recruiting stations that existed in 1867 to an enormous variety of facilities in nearly every part of the world. William P. S. Sanger would be amazed!

ENDNOTES

¹ An 1862 law removed the word “Navy” from the title. In the 20th century the Bureau’s name was abbreviated in Navy circles as “BuDocks.”

² Captain Warrington was, of course, a line officer, as was every subsequent Chief of the Bureau until 1898.

³ In the 19th-century Navy, military rank was a jealously guarded prerogative of line officers, who were loath to grant it to anyone who did not sail a ship. Therefore the Navy conferred something called “relative rank” on staff corps officers (e.g., civil engineer ranking with captain but not holding the actual rank of captain). Staff corps officers had professional titles (e.g., paymaster, chief surgeon, assistant civil engineer) and “ranked with” corresponding line-officer grades, but they did not possess actual military rank.

⁴ For a more detailed discussion of the establishment of the CEC, see Vincent A. Transano, “The Long Historical Struggle to Gain Professional Recognition,” *Navy Civil Engineer*, Summer 1981, pp. 3-6.

⁵ H. H. Rousseau was also probably the youngest rear admiral in the history of the Navy. When President Theodore Roosevelt tapped him to become Chief of BuDocks in 1907, he was a 36-year-old lieutenant. After his brief tenure as Chief, he reverted to his former rank and was subsequently promoted to commander. In 1915, in recognition of his distinguished service on the Canal Commission, Congress conferred the permanent rank of rear admiral on him.

⁶ Homer Stanford, for example, served as Chief of BuDocks from 1912 to 1916 and then reverted to his previous rank of lieutenant commander. He was subsequently promoted twice and had reached the rank of captain by the time he retired in 1929. Due to a 1938 naval personnel law, he was *finally* promoted to the permanent rank of rear admiral on the retired list 9 years after he retired.

⁷ For a detailed discussion of this construction program, see *Activities of the Bureau of Yards and Docks, World War, 1917-1918* (Washington, D.C.: Government Printing Office, 1921).

⁸ Aniceto Menocal had a particularly distinguished career in the CEC. He was most noted for his work to determine a canal route across Central America. After William P. S. Sanger retired in 1881, CDR Menocal replaced him as “engineering consultant,” the CEC officer posted to BuDocks Headquarters to advise the Chief – then a line officer – on technical engineering matters. He held that position for 9 years.

⁹ The only CEC officer who graduated from Annapolis in the 19th century was Commander Andrew Cunningham, who was commissioned an ensign of the line in 1879 and resigned from the Navy to enter engineering school a few years later. After nearly two decades as a civilian engineer, he rejoined the Navy during the Spanish–American War and was recruited for the CEC by Admiral Endicott. CDR Cunningham, who was a recognized authority on steel construction, served in the CEC with distinction until his death in 1917.

¹⁰ One of the highest scores was posted by a young engineer from Missouri named Ben Moreell, who later became one of the most outstanding officers in the history of the Civil Engineer Corps.

¹¹ U.S. Navy Seabee Museum, Seabee Archive, Record Group 6 Subject Files, "Rosters – CEC Officers."

¹² One of these officers, who spent 31 years in the Corps, evidently had a rather abrasive personality and damaged his promotional opportunities by angering the commandants of several bases where he served as public works officer. The other two officers did not receive their commissions until they were over 40 years of age and thus had less opportunity for promotion than the average CEC officer of their generation.

¹³ U.S. Navy Seabee Museum, Seabee Archive, Record Group 8 Publications and Special Collections, Bureau of Yards and Docks, *News Memorandum* (October 2, 1925), p. 5.

¹⁴ U.S. Navy Seabee Museum, Seabee Archive, Record Group 6 Subject Files, "Roster – CEC Officers."

¹⁵ Prior to World War II, almost all engineering and design work for naval shore facilities had been accomplished in-house by BuDocks civil servants and CEC officers; but the design needs of the war quickly outstripped the Bureau's resources and made procurement of plans by contract a practical necessity.

¹⁶ U.S. Navy Seabee Museum, Seabee Archive, Record Group 6 Subject Files, "CEC Statistics."

¹⁷ During World War II, however, CEC officers were not permitted to use the title "commanding officer." Instead, a CEC officer in command of a Seabee unit was called an "officer in charge." In 1949 the Secretary of the Navy finally issued a directive redesignating CEC officers in command as commanding officers.

¹⁸ U.S. Navy Seabee Museum, Seabee Archive, Record Group 6 Subject Files, "Rosters – CEC Officers."

¹⁹ Vincent A. Transano, "Commodore Grade Has Shaky History in CEC, Record Group 8 Publications and Special Collections, *Navy Civil Engineer*, Spring 1982, pp. 23-26.

²⁰ U.S. Navy Seabee Museum, Seabee Archive, Record Group 5 Geographical Files, "Guam – Apra Harbor."

²¹ During this period the strength of the regular CEC varied from a low of about 700 officers in 1955 to a high of about 1,075 in 1963. The remaining officers on active duty were Reservists, including most of the ensigns and lieutenants (jg.).

²² U.S. Navy Seabee Museum, Seabee Archive, Record Group 8 Publications and Special Collections, *Civil Engineer Corps Bulletin*, February 1957, pp. 26-27.

²³ For details on this program, see Richard Tregaskis, *Southeast Asia: Building the Bases* (Washington, D.C.: Government Printing Office, 1975).

²⁴ In 1965, there were 10 Naval Mobile Construction Battalions in commission. Because President Lyndon Johnson decided to make only limited use of Reserve units in Vietnam, the new Seabee battalions were established to fill the need for more naval construction troops.

²⁵ The name of the Bureau of Yards and Docks was changed to "Naval Facilities Engineering Command" effective 1 May 1966. The new name better reflected the diversity of the Command's responsibilities in the late 20th century.

²⁶ By the 1970's recent Naval Academy graduates could only be commissioned in the CEC if they were found not physically qualified for duty in the unrestricted line. As a result, in most years only about 5 percent of CEC accessions were Annapolis graduates.

²⁷ U.S. Navy Seabee Museum, Seabee Archive, Record Group 8 Publications and Special Collections, Navy *Civil Engineer*, Summer 1984, p. 25.

²⁸ Jim Hinze and LT Connie Madden, "More Women Join CEC Work Force," *Navy Civil Engineer*, Fall 1988, p. 12.

²⁹ Naval Mobile Construction Battalions and operational regiments and brigades were classed as combat units, and women were barred from service in combat units.

³⁰ More information can be found in U.S. Navy Seabee Museum, Seabee Archive, Record Group 3 Official Civil Engineer Corps Collection, Series IV Women and Series V Minorities.

³¹ The full name of this OMB circular was *Policies for Acquiring Commercial or Industrial Products Needed by the Government*.

³² Hinze and Madden, p. 15.

³³ Nine World War II-era CEC officers with distinguished records were promoted to vice admiral upon retirement, but they did not wear three stars while still on active duty. See Vincent Transano, "Commodore Grade Has Shaky History," pp. 24-25.