11

SUPPORTING THE COMBAT FORCES

During the 1970s the Federal Republic of Germany made increasingly significant military contributions to the North Atlantic Treaty Organization (NATO). This allowed U.S. military planners to reassess the strategic positioning of U.S. troops in West Germany and to conclude that they could redeploy combat elements to improve the Western alliance's defenses. As the plans for redeployment developed, new weapons systems came into production, making sophisticated technologies available. Both of these trends created new work for the Army engineers. Redeployment led to construction of a new garrison in northern Germany, and new weapons systems stimulated construction of new support facilities. These developments significantly increased the workload of the Europe Division in the late 1970s and throughout the 1980s.

Redeploying U.S. Forces

The Reforger exercises (REturn of FORces to GERmany) began in the late 1960s to deflect political pressures and reduce the number of American soldiers in Europe. Balance-of-payment problems, exacerbated by overseas spending to sustain the Vietnam War, intensified political demands to reduce troop levels and shift the burden of mutual defense to European nations, especially Germany. In response, the West German government accepted minor withdrawals of U.S. troops in the late 1960s, increased its financial contribution by accepting a series of agreements to offset U.S. costs, and initiated the Modernization of United States Facilities (MOUSF) program.[1]

As American military strategists faced the 1970s, they undertook a reexamination of the geographic position of U.S. forces, realizing that troop deployment had more to do with history than with current strategic needs. U.S. troops remained concentrated in southern Germany, the area assigned in 1945 as the U.S. zone of occupation. By the 1970s West

German military forces could assist in an effective defense of that region. Moreover, if an attack came, Soviet and Warsaw Pact forces might just as readily strike at the north German plain as at positions in the south. In the north, British forces had been reduced out of economic necessity, and they and the Belgian forces responsible for defending the region were thinly stretched. The open northern terrain invited a rapidly moving mechanized attack that might overrun Western Europe before U.S. and other NATO forces had time to deploy.

The new line of strategic thinking contended that the United States could enhance its contribution to NATO and simultaneously reinforce the credibility of its commitment to defend against a Soviet attack by stationing troops where a potential attack was most attractive.[2] The strategic plan that grew out of this reconsideration led to two major events. First, it prompted the redeployment to Germany of elements of two divisions stationed in the United States under the dual-basing plan. Second, it brought about the construction of a new garrison in the northern German community of Garlstedt to accommodate one of the redeployed units.

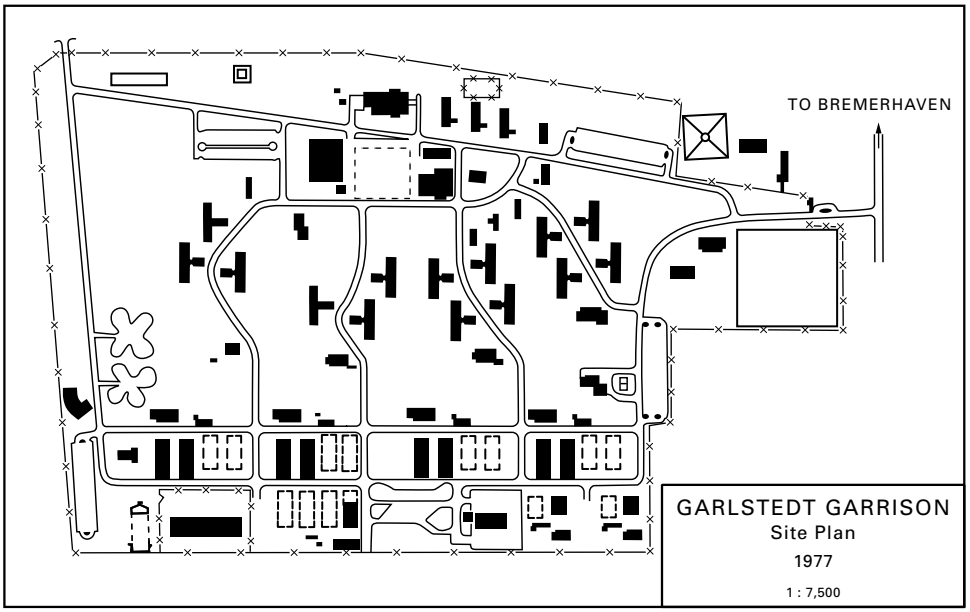
Garrison in Garlstedt

Planning to reposition Army combat forces in northern Germany began during the "tooth-to-tail" debate in the early 1970s. Secretary of Defense James Schlesinger decided to redeploy combat brigades from the United States to Germany beginning in fiscal year 1975. The Army assigned one brigade of the 2d Armored Division to Germany in 1975 (Brigade 75) and one brigade of the 4th Infantry Division (Mechanized) in 1976 (Brigade 76). In March 1975, Brigade 75 deployed to temporary positions in the major training areas controlled by the United States Army, Europe (USAREUR)—Grafenwöhr, Hohenfels, and Wildflecken—all in the area over which NATO's Central Army Group exercised responsibility. Brigade 76 moved into Wiesbaden Air Base, which was also in the Central Army Group's area.[3]

Between 1974 and 1976, and paralleling the repositioning of the brigades, the United States engaged in multilateral discussions with the West Germans, the British, and the Belgians that led to the decision to construct a new garrison. The location chosen, near Garlstedt, thirty miles south of Bremerhaven in the area defended by NATO's Northern Army Group, would become the permanent home for Brigade 75 from the 2d Armored Division. (*Figure 5*) It would include a brigade headquarters and headquarters company as well as a support battalion that would be permanently reassigned from the United States to West Germany. The plan called for several other units to be deployed on a temporary basis and rotated every 179 days with replacement units from the United States. Ultimately, the plan for units on temporary assignment was dropped, and all elements of the brigade took permanent station in Garlstedt.[4]

The project had high political visibility and endorsement. President Gerald Ford and West German Chancellor Helmut Schmidt signed a

Figure 5: Site Plan of the Garrison in Garlstedt, 1977



cost-sharing agreement in mid-July 1976 for the construction of the new facilities in Garlstedt. The Federal Republic agreed to pay Deutschmark (DM) 171.2 million (about $68 million at the prevailing exchange rate) for the construction of permanent facilities such as troop billets; dining halls; officers' quarters; and facilities for supply, maintenance, administration, and utilities. This represented about half the anticipated costs of the complex. The United States agreed to pay the costs for facilities that the German Army would not normally construct for its soldiers, who were stationed close to home where community facilities existed. Amenities such as an open mess hall; a chapel; and athletic, recreational, and community service facilities received the label "U.S. peculiar" and were financed with appropriated funds. In addition, USAREUR programmed 1,027 units of housing for the families of U.S. soldiers, to be funded by the United States and built by German civilian contractors under a build-to-lease arrangement.[5]

During the negotiations for the Garlstedt garrison, the Europe Division (EUD) provided technical assistance to USAREUR concerning the planning. In October 1975 EUD arranged meetings with the *Oberfinanzdirektion* (State Financial Office) of Hanover to discuss plans for housing U.S. troops temporarily in renovated structures. Late that month EUD received $4.3 million in construction authorization from the secretary of defense's contingency funds to begin design on facilities for Brigade 75.[6]

Priorities kept changing. In April 1976, when USAREUR and the West German military decided to put Brigade 75 into the area permanently

rather than temporarily, the master plan that EUD developed had to be modified. Revisions included eliminating several maintenance complexes but adding a club for noncommissioned officers, an elementary school, and a high school.[7] At the end of April 1976, the West German ministries in Bonn sent a letter to the *Land* (state) government of Niedersachsen (Lower Saxony), where the construction would take place, requesting approval to solicit bids for the project.[8]

From the start, planners were conscious of the importance of public relations to the success of their project. Although the Garlstedt area had long been a military range and training site, the German population prized the heath around it for recreation and open-air activities. U.S. troops had never been present in the area, and the West German government expected resistance to the new military installation. Officials therefore chose to reveal the plans for the garrison by degrees to give the local population time to adjust. The concern was justified. By spring 1976 German opponents of the planned garrison had gathered 40,000 signatures on a protest petition, and in May a human chain containing 75,000 to 100,000 protesters formed around the proposed construction site.[9]

Plans went forward. On 23 September 1976, the *Oberfinanzdirektion* of Hanover opened the first bids on construction contracts for the troop facilities in Garlstedt. A month later the state legislature in Lower Saxony formally approved the stationing of a U.S. brigade in the region, the last formal endorsement that the project needed. Sensitive to the opposition that the project had generated, the legislature directed the state government to ensure that "the legitimate rights of the population of the country are safeguarded to the greatest extent possible." As a spokesman for the government put it, the stationing depended upon "safeguarding the environment and ensuring the continued utilization by the people of adjacent recreational areas."[10]

Mindful of public concern regarding the environmental impact of the construction, the contractors erected special fences, ten feet high, to protect two well-known prehistoric graves located near the new installation. They also spent more than DM 4 million ($1.6 million at the prevailing exchange rate) to restore open areas to more general use by removing undetonated ammunition, some of which dated back to World War I. The removal, begun in August 1976, eventually covered areas adjacent to the installation at an estimated cost of an additional DM 16 million ($6.35 million). Workers removed more than thirty tons of dud ammunition from the sands of the surrounding heath.[11]

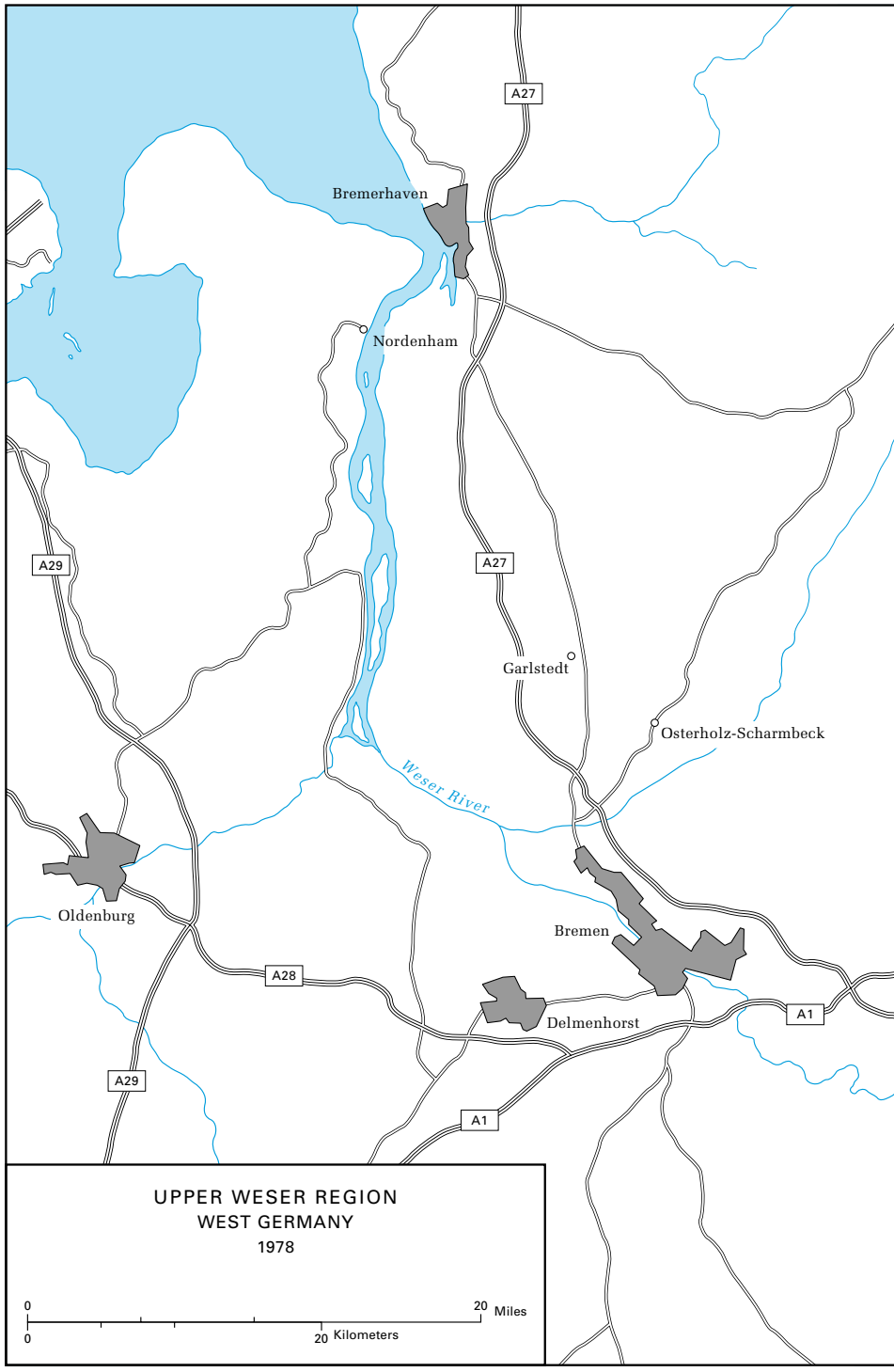
Both design and construction were handled by indirect contracting. Local officials approved the first construction contracts for the project in late January 1977, and workmen began preparing the site in Garlstedt in February. In April construction actually began on the largest single project, fourteen enlisted men's barracks and three dining facilities for 2,800 soldiers. On 5 May 1977, West German Minister of Defense Georg Leber hosted U.S. Secretary of the Army Clifford L. Alexander in a formal cornerstone-laying ceremony at the construction site.[12]

Family Housing in Osterholz-Scharmbeck, Germany

In July 1977 the *Oberfinanzdirektion* of Hanover announced that Osterholz-Scharmbeck, a town of 2,400 just a few miles east of the Garlstedt installation, would become the site for the 1,027 build-to-lease housing units and one of the schools for U.S. dependents. As anticipated, some elements of the community protested the concentration of so many Americans in such a small town. To address local concerns, community relations groups from both the American and the German sides met together. To gather information about living near large concentrations of U.S. troops, representatives from Osterholz-Scharmbeck traveled to other communities in Germany where U.S. troops were permanently stationed and to Washington, D.C., and Fort Hood, Texas, the home of the 2d Armored Division.[13]

These early contacts fostered good relations, and in early November 1977 the Sports Club of Osterholz-Scharmbeck hosted a group of brigade officers and their wives at the traditional club ball. As a sign of honor and acceptance of the new residents of the community, the club flew the American flag outside the hall where the ball was held. The wife of Osterholz-Scharmbeck's city manager organized "Operation New Neighbor" and used computers to match German and American families based on common interests. Many of the local families "adopted" incoming families and entertained them. Nearly every new family that expressed an interest in having a local sponsor received one. English lessons became popular with the townspeople.[14]

On 5 December 1977, officials laid the cornerstone for the housing units in Osterholz-Scharmbeck. (*See Map 28*.) The new accommodations


A27
Bremerhaven
Nordenham
A29
A27
Garlstedt
Osterholz-Scharmbeck
Weser River
Oldenburg
Bremen
A28
Delmenhorst
A1
A29
A1
UPPER WESER REGION
WEST GERMANY
1978
0
20 Miles
0
20 Kilometers

Map 28

(589 apartments, 425 row houses, 12 duplexes, and 1 single-family house) were interspersed among existing housing at six locations in the community. To avoid creating an American "ghetto," the planners selected designs similar to the German houses in each neighborhood.[15]

To limit the impact of the U.S. military presence on the community of Osterholz-Scharmbeck, USAREUR planned a minimum level of support for the new living area. Troops and families could use the shopping facilities in nearby Bremerhaven, including a post exchange and a commissary. The build-to-lease program in Osterholz-Scharmbeck included a multiuse building containing an Army Community Service office, child care and dependent youth activity centers, a commissary annex, an Army and Air Force Exchange Service (AAFES) pickup point, a *Stars and Stripes* bookstore, and limited facilities for the sale of beverages and merchandise. The complex also had four outdoor multipurpose recreational courts (for basketball and tennis) and a fifty-car parking lot adjacent to the community center.[16]

At the Garlstedt installation, the soldiers and their families could find a bowling alley, a chapel, a theater, a barber and beauty shop, and a bank. Garlstedt also had its own recreation center and indoor and outdoor athletic facilities. All these facilities, which USAREUR approved for construction in December 1977, were built with U.S. funds as enhancements to the quality of life for U.S. service personnel.[17]

By August 1978 EUD's Northern Area Office, working through a resident office in Garlstedt, had supervised the completion of $26 million of construction, including the fourteen barracks buildings. Despite delays occasioned by an unusually wet summer, the prefinal inspection of the first barracks building occurred on 5 July 1978. Communications facilities for telephone and television advanced as planned, and in September a microwave link between Garlstedt and Bremerhaven was fully operational. That same month the Armed Forces Network Television began transmitting its programs to the area. Telephone circuits connecting the caserne with Fort Hood, Texas, became available after the advance elements of Brigade 75 took up residence.[18]

The decrease in the value of the dollar from DM 2.56 to DM 1.85 between 1976 and 1978 created financial problems for the construction in Garlstedt. To cover the shortfall at the end of the 1978 fiscal year, USAREUR had to apply about $5.5 million from funds earmarked for base operations directly to the U.S.-funded part of the construction. With funding secure, the brigade headquarters and headquarters company and the 498th Support Battalion began moving into their new permanent facilities in Garlstedt. The first units of the 2d Armored Division, about 200 people, moved into the installation in September 1978. The first dependent family moved into one of the newly constructed housing units on 16 October. The following day, German Defense Minister Hans Apel and Secretary of Defense Harold Brown participated in a formal ceremony transferring the facility to the United States.[19]

The mayor of Osterholz-Scharmbeck personally greeted the first American family with traditional German gifts: a loaf of brown bread,

a filled shaker of salt, and a new one-pfennig piece for good luck. By the end of 1978 a total of 282 family housing units were occupied and 410 more were ready for occupants. Interim support facilities opened in Garlstedt, and AAFES, Europe, opened a snack bar in a truck. The community center that eventually housed these and other activities opened in 1979.[20]

Because of construction delays, special arrangements had to be made to have schools for the American children by the opening of the academic year in the autumn of 1978. A leasing arrangement with a local German school provided eleven rooms in Osterholz-Scharmbeck for grade school classes during the autumn term; high school students had to travel to the Department of Defense dependent school in Bremerhaven for the first semester. On 1 January 1979, an elementary and high school complex of six buildings officially opened in Osterholz-Scharmbeck.[21]

American medical facilities were expanded to accommodate the growing community. Construction of a clinic at Garlstedt Caserne fell behind and opened only in March 1979. In the early 1980s the military hospital in Bremerhaven increased its staff, and its capacity rose from twenty-five to seventy-five beds.[22]

Several unique characteristics distinguish the Garlstedt project, making it difficult to use as a model for any other undertaking. From the outset it had the entire weight of the West German political and military establishments behind it. Few projects commanded the level of attention evident in the very fact that the U.S. president and the West German chancellor signed the agreement authorizing the project in July 1976. Funding came directly from the Federal Republic, a factor that gave the project two advantages in the early phases. First, German-funded elements were easier and faster to initiate, execute, monitor, and release to the American users than dollar-funded projects. Second, the American statutory, regulatory, administrative, and technical legal requirements that often delayed dollar-funded work did not apply where Deutschmarks were used.

The project also benefited because most buildings in Garlstedt used existing, off-the-shelf designs, a one-time advantage that facilitated early start of construction. From the beginning the *Oberfinanzdirektion* of Hanover had sufficient personnel to handle the volume of work that Garlstedt entailed. USAREUR's middle- and top-level management devoted time and talent to the project, underscoring the importance and urgency of the endeavor in the minds of the German authorities. EUD also gave top priority to the project, assigning its most experienced and qualified German engineers and its most proficient German-speaking American employees to the work. All the construction took place in a relatively limited geographic area and consisted of repetitive structures. The combination of these factors certainly contributed to the Garlstedt project's success.[23]

By February 1979 the coordination between EUD, USAREUR, German government agencies, and civilian contractors had produced facilities for 4,000 troops of the 2d Armored Division, Forward. Establishing the new

home for the brigade took less than two years from the start of construction, though not all the support facilities were complete. In October 1978 the installation had been formally dedicated as General Lucius D. Clay Caserne in memory of the former commander in chief of U.S. forces in occupied Germany and Berlin. General Clay's efforts on behalf of the Germans, especially during the Berlin Airlift of 1948–1949, made him revered in Germany; naming the caserne after Clay paid fitting tribute to the cooperation between German and American authorities in the creation of Garlstedt.[24]

Forward Stationing in Vilseck

The repositioning of American combat units to northern Germany was one manifestation of new strategic thinking that developed in the 1970s. An extension of that thinking, forward stationing, became evident in the 1980s. The concept was simple: Move U.S. troops out of areas west of the Rhine to positions close to the border with East Germany and Czechoslovakia, points at which the Soviets might launch a preemptive ground attack. Although formulated in the mid-1970s, the strategy of forward stationing gained allied and West German approval only in the early 1980s.[25]

The new strategy and repositioning of troops meant increased construction to support the consolidation of armored and infantry units around Vilseck and Hohenfels, northeast and southeast of Nuremberg, respectively. Design began in the early 1980s on operational and support facilities. When the chief of construction, John Blake, first visited Vilseck in 1981, he saw "Sleepy Hollow," a quiet, rural community with little activity. All that changed with the beginning of construction in 1985, starting with two buildings for battalion headquarters.

In 1987, as a part of USAREUR's Total Force Modernization program, the first elements of a planned five battalions of VII Corps (2 armored, 1 mechanized, 1 field artillery, and 1 forward support) began to move into Vilseck. One of the innovative construction techniques applied during the work in Vilseck involved a school begun in March 1987 and completed in August of 1988. The building contained about forty classrooms, but according to Walt Bogdanow, chief of EUD's Vilseck project office, they were "not at all your standard square classrooms." The building "looks like a ship's screw" and used cast-in-place concrete, a technology that Bogdanow described as "very time-consuming" but one that allowed construction of an unusual design. The school also had masonry work exposed on exterior and interior walls.[26]

By 1989 EUD had completed or had plans for sixty projects related to Vilseck with a construction value exceeding $300 million. In the Vilseck project office an on-site force of eleven engineers and technicians supervised 30 projects, including 6 headquarters buildings; 7 maintenance facilities; 8 barracks buildings; chapel; fire station; police station; 5 recreational facilities; and 882 factory-built housing units, of which 225 were

In 1987 U.S. military personnel moved into newly constructed facilities in Vilseck, Germany, northeast of Nuremberg.

already occupied. Projections called for an increase in the size of the Vilseck military community from 3,000 to more than 10,000 people by 1992.[27]

All this activity in Vilseck took place in an area of about two square miles, making the coordination of contractors and work crews a major concern. The Vilseck military community, which had to continue in operation throughout the construction, had to be included in the coordination effort. Because there was essentially only one way into and out of the post, the construction turned people's lives upsidedown.[28]

One of the most difficult and disruptive aspects of the construction was the installation of district heating, a system that had not been a part of the original design. The introduction of this heating system rather than coal-fired boilers involved changing all the specifications. Vilseck's director of engineering and housing started supervising the district heat system, but EUD took it over midway through the work. The district heat lines were two feet wide and ran in all directions from the boundary of the post to a main heat substation. Excavations for them cut across nearly every road on the complex.[29]

With its potential for disruption of daily living, construction in Vilseck could have been a public relations disaster, but it was not. According to the area engineer in the Nuremberg Area Office, Lt. Col. Grosvenor W. "Bud" Fish, Jr., much of the credit for making the Vilseck project work smoothly belonged to Capt. Kent Henson, the project office's liaison officer to the military community.[30]

Henson met daily with Vilseck community officials to keep them apprised of the status of construction. He participated in weekly community staff meetings and a monthly meeting with the community commander; Blake frequently traveled from Frankfurt to participate in the monthly meeting. Henson also attended meetings with each of the housing communities on the post to give the soldiers and their families the latest information about road closures or utilities disruptions. Henson's efforts notably improved EUD relations with the military community.

Problems arose in coordinating the construction with the surrounding German community. As Bogdanow noted, "The forest belongs to the German government even though it is on a U.S. post. We just basically rent the land.… They've got rights to say what happens to their trees, what happens to their soil." The Germans also exercised the right to say what happened to their birds. When shore swallows—birds on the German endangered species list—were found nesting in one of the open storage areas, construction stopped until the fledglings had left the nest. The stoppage delayed the project and the contractor became eligible for payments to cover his costs.[31]

As the tempo of construction increased through 1989 and into 1990, Blake observed that Vilseck had changed from Sleepy Hollow to "probably the biggest concentration of work that we've had since I've been in Europe.… We have overhauled every square inch of Vilseck." One of the Vilseck project officers, Doug Sommer, marveled, "Vilseck has gotten one new of about everything that you can think of."[32]

Supporting New Weapons Systems

Late in the 1970s the Army began to introduce a series of major new weapons systems that required enhanced facilities—the AH–64 Apache attack helicopter, the Black Hawk troop transport helicopter, the Abrams M1 tank, the Bradley armored personnel carrier, and the Patriot air defense missile. Nearly simultaneously, planning also began for the Air Force's Ground Launched Cruise Missile (GLCM) and the Army's Pershing II missile. The EUD commander, Brig. Gen. George Kenyon "Ken" Withers, Jr., knew that one of the division's main tasks early in the 1980s would be "to prepare the training ranges, the barracks for the soldiers who would man those systems, and any other facilities necessary to accommodate [the weapons'] introduction into Europe."[33] Withers had no doubt that this is what the chief of engineers, Lt. Gen. Joseph K. Bratton, wanted. He drew his conclusion from an offhand comment that Bratton had made during a visit to EUD in March 1981: "Ken, the CINC USAREUR [commander in chief, USAREUR] mentioned to me that he didn't want the Corps of Engineers responsible for the delay in fielding any major weapons system in Europe."[34]

In fiscal year 1980 USAREUR received $1.7 million from Congress to provide realistic practice firing ranges in Grafenwöhr and Wildflecken to train crews manning the Abrams tank and the Bradley armored personnel

Apache Attack Helicopters in a Maintenance Hangar in Crailsheim, Germany

carrier. EUD acted as the construction agent; Louis Berger International designed the new ranges; and the 18th Engineer Brigade provided troop labor for construction.

Upgrading the Ranges

EUD planned to procure materials for construction at the Grafenwöhr range in April 1981, with completion of design programmed for the following autumn. USAREUR scheduled the 18th Engineer Brigade, under command of Col. James W. van Loben Sels (who became EUD commander in 1984), to begin construction in April 1982. Aside from the valuable training for engineer troops that the project offered, the 18th received the assignment because EUD could not find at a reasonable price a private contractor willing to work on the range given the danger of unexploded ordnance.[35]

Working in the Grafenwöhr live-fire range necessitated removing the unexploded ammunition that had accumulated. Continuous use of the range during the renovations prompted Louis Berger International to limit its soil investigation to topographical studies from the air. Ground verification could only be done on Sundays, when the range was not in use. Once on site, the 18th Engineer Brigade found shortcomings in the design

based on its own analysis of the soil. Much of the area occupied by the Grafenwöhr range was a peat bog with a high water table. The engineer brigade's inspection showed that the ground, a mixture of peat and sand, flexed considerably under weight. Any rupture of the peat layer caused the sand to liquefy and the ground to sink. The brigade requested design modifications and recommended a geotextile fabric, generally called a filter fabric, which would allow water to pass through yet contain and stabilize the sand. The designers incorporated the filter fabric, allowing much of the bog to be reclaimed and used for roads, target areas, defilade firing positions, and parking.[36]

In September 1981 other changes in design for the range arrived, adding roads at two ranges, changing the elevations of target pits, and modifying the orientation and location of buildings. These changes had not been adequately coordinated with the German forest service, which disapproved many of the relocations when construction began. The 18th Engineer Brigade received the changes so late that delays in construction were inevitable.[37]

The procurement of materials and equipment ran particularly smoothly in Grafenwöhr because, starting early in the planning process, the 18th Engineer Brigade and EUD cooperated to develop effective procedures for tracking procurement of materials. As they identified problems, they moved quickly to avoid possible bottlenecks. They also prevailed upon the deputy commander in chief of USAREUR to keep the U.S. Army Contracting Agency, Europe, working overtime to maintain the procurement schedule. Despite the quantity of materials involved, worth about $17 million, procurement always kept pace with construction, and the appropriate supplies remained available at each stage of the work.[38]

Between 1 April and 30 November 1982, the 18th Engineer Brigade placed seventeen moving target systems totaling more than 14,500 feet across six ranges. It created 549 concrete target pits that held electrically operated targets depicting vehicles and personnel that popped up automatically. The brigade also lay over thirty miles of gravel roads for use by tanks practicing firing and for maintenance of the targets themselves. Wherever tanks turned on the roads, the engineers installed concrete pads to limit damage. The brigade furnished the Grafenwöhr range with 7 buildings for billeting troops, 4 dining facilities, and 5 target maintenance buildings with running water and latrines. These facilities reduced the time that soldiers spent commuting to the range and made maximum use of their training time. Five range control towers and one observation tower helped soldiers monitor range activity. Five parking areas, each providing 8,900 square feet of concrete surface, accommodated the tracked vehicles, and nine gravel parking areas took care of wheeled vehicles. The engineers installed 13,000 feet of fencing, 1,600 feet of concrete roads, and more than 200 culverts for drainage.

Grafenwöhr was the largest troop construction project ever attempted in peacetime. At its peak the project employed over 4,000 soldiers in seven reinforced engineer battalions.[39] Private contractors handled work too

Pop-up targets were a part of the modernization of the Grafenwöhr training range during the 1980s.

technically sophisticated for the troops, and EUD project staff coordinated the construction to minimize the time that the range would have to be closed.[40] The contractors built water wells, programmable control units to regulate the targets, self-propelled trolleys for carrying targets at speeds from ten to twenty-five miles an hour, and electrical transformer stations. They also made the automated targets sensitive to the thermal-imaging night sights that the combat vehicles used. The targets popped up according to a command and control system that could be programmed for a variety of situations.[41] The moving targets provided more realistic gunnery training than in the past. Stationary firing positions and roads for firing while moving provided training for both defensive and offensive situations. Combat commanders reported that their range training efficiency improved by 50 percent during the first year of exercises on the upgraded range.[42]

EUD made adjustments for 1983 based on the experience gained during the first year. A single supplier was chosen for the targetry and computer-based control units, reducing costs and eliminating problems of installing differing systems. By 1985 Grafenwöhr had become the most modern firing range for tanks and the largest training area in Europe. In addition to improving the range, the redesign aimed to conserve energy wherever possible and to reduce noise levels.[43]

In 1987 EUD initiated work on a prototype for a test firing range that would use space efficiently and employ a new material. Standard rifle

ranges in the United States, where space was plentiful, were built thirty yards wide. In a test conducted between 17 November and 10 December 1987, EUD set up the prototype of the new range with four firing lanes, each 5.5 yards wide. The prototype used shock-attenuating concrete to cover the target banks instead of the customary wooden covers. This substance consists of an aerated concrete mixed with small steel fibers, developed for use in facilities designed to train for military operations in urban terrain. It offered four advantages over wood. First, it limited ricochets, a critical factor with ranges set so close together. Second, it withstood the repeated impact of ammunition much better than wood. Third, it was easier to replace than shattered wooden panels. Fourth, it absorbed more sound. These tests prepared the way for contracts in 1988 and 1989 to build eleven new rifle ranges at a cost of $30 million.[44]

The Army invested large sums of money during the 1980s in a second firing area, Wildflecken, northeast of Frankfurt and directly north of Würzburg. The local populace's objections to the noise level at the firing ranges held up work in Wildflecken for years, but in early 1989 EUD began work, combining troop construction—battalions of the 18th Engineer Brigade—with contract construction for the more sophisticated work.

The work in Wildflecken—to provide training areas for Bradley personnel carriers and Abrams tanks—included 7 moving targets, 73 stationary vehicle targets, and 136 personnel targets, plus defilade firing positions and the associated roads and turning pads. With the approval of the West German government, tree cutting for the project began in March 1989. By April EUD engineers had discovered serious design flaws: All five of the new Bradley battle positions and three of the defilade positions left the vehicle without a clear line of sight to the moving targets. The design had to be changed. By the end of the 1989 fiscal year, the project was only 20 percent completed.[45]

USAREUR needed to continue development of Grafenwöhr and Wildflecken because so many of its forces were stationed in urban areas and had no training space. As German cities expanded, they enveloped installations that had once been in the countryside. Because Grafenwöhr remained one of the few relatively open areas, more rifle firing ranges were concentrated there, in addition to the tank ranges. EUD continued to oversee work related to Grafenwöhr to the end of the decade, and similar work in Wildflecken extended into the 1990s.[46]

Combat Maneuver Training Center in Hohenfels

The Army was well aware that not all future combat would take place from tanks and armored personnel carriers; much of it was likely to occur in urban settings. To provide the troops in Europe with training to prepare them for street-to-street fighting, USAREUR developed the combat maneuver training center in Hohenfels, a small town situated at the southern apex of a triangle formed with Nuremberg and Grafenwöhr as the western and

Training at the MOUT village in Hohenfels, Germany, prepared troops for urban combat.

northern apexes, respectively. USAREUR hoped to offer through the training center force-on-force training under conditions closely resembling those at the National Training Center in Fort Irwin, California. The center in Fort Irwin had 640,000 acres, allowing it to put about thirty-six battalions a year through training. The training terrain in Hohenfels extended over only 40,000 acres, 6 percent the size of Fort Irwin, but the program for Hohenfels called for training fifty-two battalions a year.[47]

To overcome the lack of space in Europe, USAREUR decided to concentrate sophisticated facilities for training combat maneuvers in Hohenfels, just as it had concentrated facilities in Grafenwöhr and Wildflecken for training the gunners and crews in armored vehicles. Hohenfels became a complex that provided realistic, stressful training at the level of the battalion task force. It combined an "opposition force" permanently stationed at the facility with the use of the multiple integrated laser engagement system and the integration of combat support and combat service support. The opposition force's familiarity with the terrain and the exercises could make the training forces "pay" for any mistakes that they made during the exercises. Each commander received a detailed, computerized assessment of how soldiers performed at any given point in a mock battle. The assessment, which included tapes of the radio traffic during the battle, could be reviewed in detail to improve future performance.[48]

As a key element in the training in Hohenfels, USAREUR projected the creation of a mock village called the MOUT (military operations in

urban terrain) site. The village, constructed in 1989, resembled a typical German town, complete with a church, a cemetery, a city hall, a barn, and even buildings in rubble as if they had been bombed. The design called for hideaways, corners, and creep-through sewers to allow soldiers to infiltrate from one area of the town to another. The architecture and the landscaping of the mock city won it an honorable mention in the chief of engineers' Design and Environment Awards Program for 1989. The buildings were also attractive enough from the outside that the local media described them as ready to occupy. Nuremberg's area engineer, Colonel Fish, under whose office the project was executed, claimed that "all the local mayors offered to trade their buildings" for those in the MOUT village. They were only shells, however, designed to present the training soldier with situations that might arise in urban combat.[49]

In addition to the MOUT village, construction in Hohenfels included a storage and maintenance warehouse, also completed in 1989, that featured 24 covered loading docks, 32 concrete vehicle parking areas, and more than 1,400 square yards of storage space. From this facility the vehicles and personnel from incoming units were to be outfitted with the equipment that allowed laser tracking of their movements during exercises. The operations center for the range housed DM 18 million ($11.14 million) worth of high-tech equipment in a DM 5 million ($3.09 million) building. Completed during the summer of 1990, it controlled the field exercises over the entire range. Using the sensor equipment carried by the troops and vehicles, the operations center could monitor and record all movements and provide a record of the training. USAREUR anticipated another 75 percent growth in the program in Hohenfels during the early 1990s.[50]

Modernizing Operational Facilities

The training facilities necessary to develop proficiency in the new weaponry had to be supplemented by new and improved operational facilities that directly supported the deployment and day-to-day activity of combat and combat support units. Such operational facilities involved surfaced parking areas, airfields and associated buildings, ammunition and equipment storage areas, specialized troop housing such as that needed for rotating border duty, and operations control buildings.[51]

The poor quality of such facilities, in which the service personnel worked every day, and the inadequacy of maintenance facilities throughout Europe had contributed to the deterioration of equipment during the 1970s. Even simple maintenance could not be performed in the mud; as a result, soldiers deferred routine maintenance until problems became serious and costly to correct. A survey conducted in 1976 of 1,800 maintenance facilities in USAREUR indicated that 98 percent were substandard because they lacked space, running water, heat, toilets, and lift capacity. Many of them also failed to meet Army safety standards.[52]

Since the late 1970s, EUD had been involved in efforts under a program called Pre-positioned Organizational Materiel Configured to Unit

Sets (POMCUS) to provide enhanced maintenance facilities. During the 1980s USAREUR undertook to assure adequate maintenance facilities for its new and complex modern equipment. The Facilities Modernization Program formed one part of this effort. USAREUR initiated it in the late 1970s for the rehabilitation, modernization, and alteration of substandard maintenance facilities. Under this program, Military Construction, Army (MCA), funds could be used for any and all maintenance and repair work, not just for work that involved new construction, as had been the case with earlier programs. In other words, MCA money could be applied to reduce the backlog of maintenance and repair, normally funded only by money for Operations and Maintenance, Army (OMA). In addition, the program permitted facilities to be completely replaced when estimates suggested that to be more economical than rehabilitation. Money from the Facilities Modernization Program could also be used to satisfy safety, environmental, or energy conservation requirements.[53]

Even this special program was not enough to counterbalance all the years of neglect. During his first two years as commander in chief of USAREUR, General Frederick J. Kroesen became convinced that more had to be done to fund operational facilities. On 1 April 1981, Kroesen sent a report to the Senate Armed Services Committee titled "Living and Working Conditions in United States Army, Europe." The booklet, prepared by USAREUR's Office of the Deputy Chief of Staff, Engineer, detailed the deplorable conditions of the facilities in which U.S. troops lived and worked. General Kroesen underscored his concern and frustration in a cover letter to a member of that committee, Senator Gordon J. Humphrey:

> Senator Humphrey, I thank you for your interest, but I want you to know also that many of us in Europe remember any number of reports of this nature which have been submitted in the past years. I was personally responsible for one which was prepared five years ago. Each of those past reports was either staffed to death, filed for future reference, or ignored when budget formulation time arrived. We cannot afford to have that happen many more times or we will have no facilities left for sustaining the Army.[54]

The report had the intended effect, and Congress began to make money more available. The work undertaken under the Facilities Modernization Program continued, but additional programs now supplemented it. During the 1980s Kroesen's contention that proper facilities played a vital role in making both troops and modern equipment effective won increasing support among the leadership of the U.S. defense establishment.[55]

The new support generated by Kroesen's appeal to the Senate made possible the expansion of building programs, such as five new maintenance shops at Smith Barracks in Baumholder. The facilities provided over 9,500 square yards of space; drive-through capability for machinery;

Army engineers also constructed washracks for tanks, trucks, and other vehicles.

overhead cranes; carbon monoxide exhaust systems; and systems for heating and ventilation, compressed air, lighting, and power. The construction included access roads; paved parking areas; and an extension of the distribution lines of the existing heating, electrical power, and sewer and water systems. The design incorporated drainage and oil separators so that rain water running off the vehicle parking areas could be processed to safeguard the quality of the local ground water.[56] New construction included tank washracks that used high-pressure water nozzles to blast mud and grime off tank treads and undercarriages, high-pressure wash facilities for helicopters, and hot-point fuel spots that allowed helicopters to refuel without shutting off their engines.[57]

These modern facilities presented varying degrees of engineering challenge. Pouring acres of concrete holds little fascination, although its impact on troop morale was potentially high. Designing and constructing wash facilities that incorporated the pumps and pressurized water sprays to clean a tank or helicopter presented a greater challenge. Still, the greatest challenge frequently lay in making the facility truly usable. Richard Birner, a German engineer employed by EUD in the Nuremberg Area Office, explained the challenge: "[The average soldier] doesn't know anything about watts and volts and amperes … [or] the strength of concrete. He knows how to push a button. But there [the challenge] starts already, because [one] soldier pushes the button with his foot and the other operates it the right way."[58] Designers had to ensure that the facility would operate even if misused, and designs were modified as the equipment

changed. In April 1982 EUD had to adjust its designs for washracks to accommodate the new Abrams tank and allow for more effective cleaning under the skirt. General Withers instructed his design staff also to incorporate suggestions from the commander of the 3d Armored Division, whose men were using the equipment.[59]

Overcoming the long-standing neglect took more than a few programs and a few years. In 1984, although a third of the U.S. Army was stationed in Europe, only 40 percent of the combat battalions maintained their vehicles in motor pools "with adequate hardstands; the rest were in the mud." The vice chief of staff of the Army proposed using troop labor to speed construction to change that condition. USAREUR quickly formed a "hardstand attack group" and gave it the mission of "getting the troops in Europe out of the mud." By late 1987 USAREUR had eighty-one projects in the hardstand-building program, construction valued at $147 million.[60]

In an effort to stretch the construction dollar and as a part of its mission to use new construction technologies, EUD experimented with roller-compacted concrete pavement as a new method of providing hardstands. The method, though new to Europe, had been used in Canada for about a decade and in the United States since the early 1980s. The name derives from the technique. Over a prepared surface a machine resembling the equipment used to lay asphalt dispenses under pressure a relatively dry, coarse concrete mix. Vibrators and rollers then pass over the concrete to compact it in place. Because the resulting surface is not as smooth as traditional methods yield, it cannot be used for highways or airfield runways, but is perfectly adapted to hardstands. In its use, speed was not only a virtue but also a necessity. The integrity of the concrete was compromised when the time between the preparation of the mixture and its application exceeded an hour. The process also promised cost savings up to 30 percent, attributable in part to the limited manual labor needed.[61]

In July 1986 engineers from the Europe Division and the Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi, supervised the pouring of a 2,400-square-yard test section of roller-compacted concrete in Kitzingen, West Germany, as part of a 19,000-square-yard hardstand. Because this was a relatively new process, it was not recognized by German construction regulations; and the West German government would not allow it to be incorporated into the standard bidding process when EUD let contracts. For months after the experiment in Kitzingen, EUD's staff worked with contacts in the German government ministries to devise procedures that would establish criteria to allow routine use of roller-compacted concrete in contracts for U.S. military construction in the Federal Republic. Initially, they could win no better an arrangement than to permit this process as a change order or as an alternate bid on a contract. Bureaucratic resistance to the new method slowed its application to construction projects. By 1989, however, EUD negotiators had gained new guidelines and the use of this method began to increase. The combined total of roller-compacted concrete used from fiscal year 1986 to 1988 amounted to over 58,500 square yards. In the first ten months

Roller-compacted concrete was used to construct hardstands in Kitzingen, Germany, in 1986 and 1987.

of fiscal year 1989, EUD awarded contracts totaling 340,000 square yards. All these contracts were awarded under the alternate bid procedure.[62]

In all, between 1981 and 1987 USAREUR spent approximately $766 million from its military construction budget and its operation and maintenance budget to improve the Army's maintenance facilities.

Patriot Missile Program

Like the Abrams tank and the Bradley armored personnel carrier, the Patriot missile represented a new level of technology with several advantages over its predecessors. The Patriot system offered medium- to high-altitude air defense using mobile ballistic missiles that could operate in all weather conditions. It required fewer pieces of equipment to operate than the systems it supplanted and therefore demanded less logistical support. It also required fewer people. The Nike Hercules had more than 1,000 soldiers in its basic firing unit, and the improved Hawk had 878 soldiers; whereas the Patriot battery was operated by 765 persons, although the number might vary depending on the number of firing positions at any given site. Being a missile with a conventional warhead, the Patriot also demanded fewer security and safety measures.[63]

Planning for the installation of the Patriot began in the late 1970s. By 1981 EUD and its NATO counterparts had initiated design and developed a schedule that called for construction to begin in 1984. General

Withers closely supervised the Patriot schedule because of the admonition from General Bratton not to let the Corps be the cause of any delays. Construction began in Giessen, north of Frankfurt, then in Hanau to the east, and later in Ansbach to the southeast. The program reached a milestone on 7 April 1982, when the first bids were opened for Patriot facilities; the first construction package was awarded at the end of May. Dexheim, Kaiserslautern, Giebelstadt, Illesheim, and Bitburg all eventually had Patriot batteries installed.

Design for the support facilities—the launching area, the administrative area, and the control area—in Giessen, Dexheim, and Kaiserslautern went to the architect-engineer firm of Georgi Reitzel. A former USACAG employee in the 1950s, Reitzel became a private contractor and won contracts on Nike and Hawk installations during the 1960s and 1970s. Louis Berger International, another company that worked on Nike and Hawk facilities, designed Patriot installations in Hanau and Babenhausen, a missile storage area in Münster-Dieburg, and administration and support facilities in Grossauheim.[64]

NATO and the United States conjunctively funded all the Patriot facilities. That is, NATO paid for the elements it deemed essential for war: the readiness and operations buildings; the systems maintenance building; the generator buildings with converters; paving, earthwork for the protective berms, and electrical systems for the control, radar, and launcher; the central missile storage area; and the facility for the direct support unit. NATO also paid for about 86 percent of the costs of a maintenance shop at each site and about two-thirds of the costs of the battery administration and battalion headquarters buildings. The United States funded the barracks and dining facilities for the enlisted soldiers manning the system, the remaining costs for the maintenance shop and the battery administration buildings, the nuclear-biological-chemical decontamination cell, storage for the basic load of ammunition, and defensive fighting positions.[65]

Unlike the older Hawk installations, which had very rudimentary facilities, the Patriot installations were built as fully functioning, almost independent posts. Each new Patriot facility had a small shop where soldiers could buy items for their immediate needs and living quarters that provided far more comfort than the open-bay barracks with cots at the Hawk sites. The facilities consisted of an engagement control station, a battery control group, emergency power equipment, radar equipment, and unmanned launchers. Each Patriot missile was mounted on a sixteen-wheeled articulated transport vehicle called a Hummtee (HEMTT, or heavy expanded mobility tactical truck), in which power passed to every wheel, making the transporter effective in almost any terrain. At the initial readiness point on the site, the missiles and transporters were positioned behind dense earthen berms with reinforced concrete walls. In the missile's raised and ready firing position, only a lightning rod rose higher than the missile itself.[66]

The Patriot installations required multiple contracts for design. For instance, EUD issued eighty contracts to architect-engineer firms for the

Patriot missile facilities, like this one in Hanau, were eventually located throughout Germany.

Patriot facility at the Bitburg Air Base. Design began in 1985, and the contractor broke ground for the construction in 1987. EUD turned over the facilities on 5 July 1989.[67] That same summer EUD turned over several other Patriot installations in Kaiserslautern. By the end of the decade, EUD had provided facilities for seven Patriot air defense artillery battalions and one brigade headquarters at a cost of $230 million, of which NATO paid about $130 million (56.5 percent) and the United States paid the rest.[68]

The introduction of other new weapons systems provoked animated protests in Germany, but installing the Patriot air defense system caused hardly a ripple within the local population.[69] The radar systems that governed each battery overlapped to provide a missile-defense umbrella for much of the West German territory. Although the American planners intended that the Patriot missile system replace the older Hawk air defense system, not enough Patriots had been installed by 1990 to blanket West Germany entirely; so NATO decided to upgrade and renovate selected Hawk emplacements as well. EUD continued to work on Hawk sites into the 1990s in close coordination with USAREUR and NATO.[70]

Cruise and Pershing Missiles

In contrast to the Patriot air defense system, the introduction into Europe of a new generation of intermediate range, surface-to-surface mis-

siles during the 1980s attracted widespread public attention and vocal protest. Two systems caused a dramatic uproar: the Air Force's Ground Launched Cruise Missile (GLCM) and the Army's Pershing II, a second generation of the Pershing missile stationed in the Federal Republic of Germany since about 1969. Unlike the Patriot, both the GLCM and the Pershing II were designed to carry nuclear warheads. The Pershing II was an improved version of an earlier ballistic missile, whereas the Cruise represented quite a different technology. The Cruise missile was a small, relatively inexpensive, self-guided, pilotless, miniature aircraft that could be programmed to fly low, underneath Soviet radar coverage, to a predetermined target. The GLCM, like the Pershing II and Patriot missiles, was a mobile system with two basic elements, a control module and a transporter-launcher.[71]

The pressure to station GLCMs and Pershing IIs in Europe came not from the U.S. government but from the member states of the Atlantic alliance acting through NATO. During the second half of the 1970s, the Soviet Union had modernized its arsenal with a powerful land-based surface-to-surface nuclear missile—the new Soviet SS–20, which had a 3,000-mile range and multiple warheads that could be independently targeted. It was also mobile and therefore more difficult to locate and destroy than earlier systems. From its new forward positions in Eastern Europe, the missile could reach targets in West Germany in twenty minutes. NATO allies, particularly the West Germans, became uneasy about possible Soviet tactical nuclear superiority over the United States in Central Europe.

To counter the Soviet threat, the NATO Council voted on 12 December 1979 to deploy several hundred Pershing II and Cruise missiles in Britain, Italy, Belgium, the Netherlands, and West Germany. If the Soviet Union failed to agree to an accord eliminating its SS–20 threat to Europe, the American missiles would be put into place beginning late in 1983.[72]

The Europe Division began preparing for the deployment of these intermediate range nuclear weapons in three of the five countries into which the weapons were to be introduced—Belgium, West Germany, and the Netherlands. On 27 July 1982, the division signed a technical agreement for the construction of the first GLCM installation. At an estimated cost of $50.2 million, NATO and the United States conjunctively funded the GLCM installation. EUD funded all support facilities (about seventy individual projects) and operational facilities, particularly those that NATO did not fund, such as fire protection, safety, and welfare facilities.[73]

The GLCM program lagged in fiscal year 1983 because of congressional delays in approving the design program for permanent facilities. The Air Force had made contractual commitments on the basis of the original schedule, and it asked EUD to help meet them. The deputy division engineer, Col. Donald E. Hazen, and the Northern Area Office engineer, Lt. Col. Kenneth W. Kvam, suggested that the division establish a program management office to concentrate exclusively on the GLCM projects. Kvam, in whose area much of the GLCM work would be constructed, would head the office. The division engineer, Brig. Gen. Scott B.

Smith, accepted the idea, even though it meant taking the unconventional step of dividing the Northern Area Office into two elements. Kvam would oversee the GLCM work and report to Smith through Hazen; Kvam's civilian deputy, Charles Schneider, would manage all other work and report to the chief of the Construction Division.[74]

Hazen and Kvam began to organize the new GLCM office in October 1983. Smith announced that "LTC Kvam is now a senior member of the EUD Staff. He is no longer speaking through Construction as the Northern Area Officer. He is now the Creek [code word for GLCM] Project Officer. Give him your full support."[75] During November and December Kvam selected people from headquarters and from the area offices to fill positions in the program management office and in resident offices at the GLCM sites. In February 1984 General Smith reported to the chief of engineers, General Bratton, that the "program management concept will successfully deliver a quality project to one of our most important customers, the Air Force." He added that the project "enhances NATO preparedness and has the potential to strengthen USACE's [U.S. Army Corps of Engineers] relationships with the Air Force."[76]

By the summer of 1984 the GLCM office established a "cradle-to-grave" tracking system that followed projects through design and construction on a monthly basis, analogous to what Brig. Gen. Norman G. Delbridge, Jr., commander of the Europe Division in the mid-1970s, had hoped to promote with his "big board." Each month the staff saw whether they were ahead, keeping pace, or falling behind the schedule established by the Air Force for completion of facilities. After the end of June 1984, project managers had 5 percent of the program completed or in construction, 55 percent in design, and 40 percent awaiting initiation of design.[77]

The GLCM projects continued to have both high public visibility and geopolitical sensitivity, factors that made keeping them on schedule of paramount importance. In fiscal year 1984 EUD performed 23 percent ($795 million) of its design workload and 6 percent (about $22 million) of its construction placement for the Air Force. The volume of work increased as the GLCM project progressed.[78]

Work began first in Belgium, then in West Germany, and finally in the Netherlands, all between 1983 and 1986. In 1983 engineers from the Europe Division began traveling to Belgium to work with local officials on the first GLCM site. Early in 1984 the division opened a resident office in Florennes, and in June the Belgian government formally signed the authorization for construction of the GLCM site in Florennes adjacent to a Belgian Air Force base. Starting with a staff of three, the Florennes Resident Office expanded over the next two years to thirteen people—nine engineers, two translators, a secretary, and a procurement clerk.[79]

The Florennes Resident Office first built prefabricated temporary living quarters, administrative offices, a dining hall, and shopping facilities for Air Force personnel. In July 1985 a security fence went up around the permanent GLCM site, and in August the first of the permanent construction began. In January 1987 EUD turned over to the 485th Tactical Missile

Wing the first permanent building completed at the site, the recreation center. Its opening provided the 1,000 personnel of the wing, already on site in the temporary living quarters, with a snack bar, a library, a weight room, a basketball court, and racquetball courts. By the end of 1987 the resident office had completed about thirty facilities, including dormitories, the electrical distribution system, and other facilities directly related to the missile's mission. EUD expected to award contracts for a commissary, a post exchange, a bank, a medical facility, and 600 off-base housing units with a child care center and school. Diplomatic discussions between the United States and the Soviet Union made the future of the Cruise missiles uncertain, prompting EUD to delay these awards.[80]

In the same period the GLCM work in Germany at Hahn Air Base lagged, and it became clear that the Air Force's 38th Tactical Missile Wing would not have the necessary facilities on schedule. To avoid disrupting the mission of the missile wing, resident engineer Rod Markuten secured permission to renovate an old aircraft hangar for the new GLCM system. Markuten had to work with a hastily prepared design, but the temporary construction began in March 1985 and was completed by September, allowing the missile wing to meet its mission deadline. In the spring of 1986 the Society of American Military Engineers gave Markuten the 1985 Tudor award, its highest prize, for his work at Hahn Air Base.[81]

When GLCM work in West Germany continued to encounter delays, EUD persuaded the government of the Federal Republic to let the division issue contracts directly. With the special attention given to these GLCM projects, the division overcame the delays, kept the program on track, and continued to meet the Air Force's deadlines. As the end of the 1986 fiscal year approached, EUD's 1987 design program for GLCM was about 90 percent complete. The work in Belgium neared completion; the work in the Netherlands was just beginning and programmed to last until 1991.[82] (*Map 29*)

The Air Force chose to furnish the GLCMs from the start with adequate service and maintenance areas and with newly constructed or renovated barracks, all designed specifically for the support of the weapons and the people who operated them. The units assigned to GLCM installations had family housing, schools, commissaries, and similar amenities explicitly conceived and programmed by the Air Force. By contrast, for the initial deployment of the Pershing II missile—which fulfilled a comparable military mission, had the same lethal characteristics, and enjoyed (or suffered from) the same political sensitivity—the Army made very few special preparations. The missiles, which had mobile launchers very similar to the GLCM, were simply deployed with existing military units. There was, as General Smith recalled, "a dramatic difference between the security support and permanence of the one compared to the other."[83]

The first battery of nine Pershing II missiles had been flown into West Germany and stationed in Mutlangen on 23 November 1983, just twenty-four hours after the West German Parliament had approved deployment. In the next year a total of fifty-four missiles arrived in the country, most

U.S. ARMY ENGINEER DIVISION, EUROPE
NETHERLANDS
1986
Northern Area Office Headquarters
Netherlands Resident Office and
U.S. Air Force Ground Launched Cruise Missile Site
Pre-positioned Organizational
Materiel Storage (POMSS) Site
Long Range Security Program (LRSP) Site
U.S. Air Force Base
0
50
100 Miles
0
50
100 Kilometers
Ter Apel
Steenwijk
Coevorden
Harde
Almelo
AMSTERDAM
The Hague
Soesterberg Project Office
W E S T
G E R M A N Y
Volkel
Gilze-Rijen
Woensdrecht
Rhine R
Düsseldorf
B E L G I U M
BRUSSELS
Brunssum
Hoensbroek
Meuse R
Liège

Map 29

GLCM sites in Western Europe, such as Florennes, Belgium, included support and operational facilities.

stationed in southern Germany. To achieve the rapid deployment scheduled by NATO in response to the threat of the Soviet SS–20 missiles that were already in place in Eastern Europe, the Army introduced the Pershing II without extensive new design and with no construction of support facilities. EUD had very little involvement with their initial deployment, but the division's commitment of effort jumped dramatically after an accident in 1985. Three U.S. soldiers died and sixteen others were injured on 11 January in a fire involving one of the Pershing II rocket propulsion units. The weapon, stationed in Heilbronn, north of Stuttgart on the Neckar River, had not been armed with its nuclear warhead, but the fire was still the most serious incident associated with the ballistic missiles.[84]

Investigators from the Office of the Secretary of the Army concluded that the Army's own inadequate maintenance and support facilities had contributed to the accident. In what General Smith characterized as "a blinding flash of the obvious," the Army sought to redress the situation by upgrading the support facilities for the Pershing II. Lt. Col. Lloyd Colio, area engineer in Stuttgart, the region in which most of the work for the Pershing IIs took place, remembered that "within weeks money just came pouring in." For months thereafter EUD worked to design and construct shelters to protect and cover the missiles and the troops who maintained them.[85]

In December 1987 President Ronald Reagan and Premier Mikhail Gorbachev signed the Intermediate Nuclear Force Treaty. Both powers

agreed to eliminate all ground-launched missiles with ranges between 300 and 3,500 miles—the Cruise and Pershing II missiles and the Soviet SS–20 missiles. The mutual removal of the weapons realized the goal behind the original NATO decision to deploy the missiles. In mid-April 1991 USAREUR removed the last Pershing II launcher from Europe; five weeks later commanders inactivated the 56th Field Artillery Command, which had operated the Pershing missiles in West Germany. Like many at EUD, John Blake felt proud that the division's execution of the GLCM program for the Air Force and the upgrade of the Pershing II for the Army "convinced the Russians that they had better not try" a military confrontation in Europe.[86]

While the Army focused attention on new weapons systems and on upgrading operational and support facilities to improve morale and performance by the troops, it began to address the facilities in which the soldiers and their families lived. Just as the Europe Division became heavily involved in building to improve quality in operational and support facilities during the 1980s, it also extended its efforts to the facilities that supported everyday life for American military personnel and their dependents. Construction for quality of life became a major enterprise for the division in the 1980s and constitutes another important facet in the history of the Army engineers in Europe.