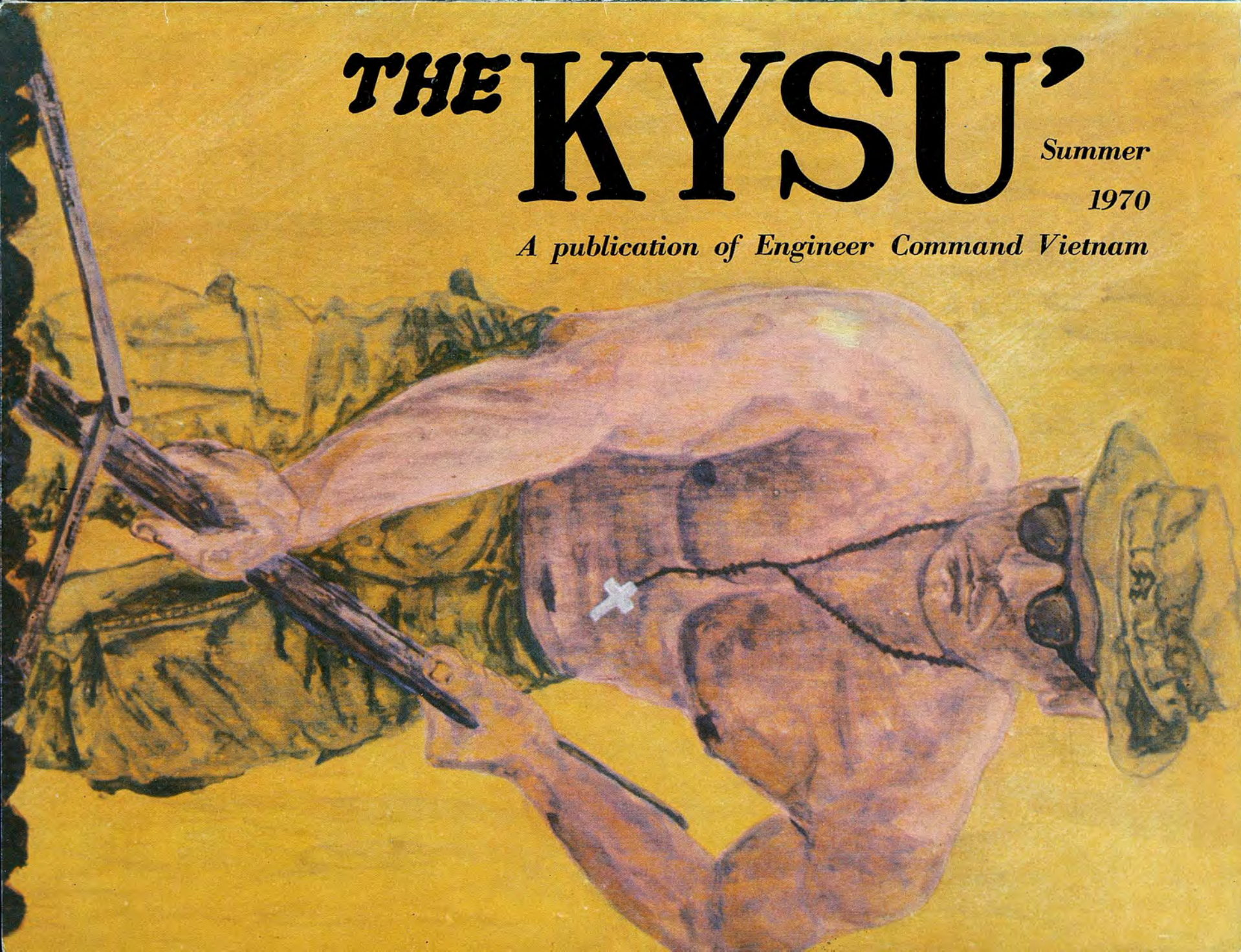
THE KYSU'

Summer 1970

A publication of Engineer Command Vietnam



Baccheschi

In Memoriam

On May 12, 1970 our commanding general lost his life when the helicopter in which he was riding received hostile fire and crashed. Nine others died in the crash, including Colonel Carroll E. Adams, Lieutenant Colonel Fred V. Cole, Captain William D. Booth, Captain Raymond R. Dulak, and First Lieutenant Kenneth F. Rodgers. Also killed were Chief Warrant Officer Glenn A. Adams, Command Sergeant Major Griffith A. Jones, Specialist Five Steven R. Renner and Specialist Four James H. Rawson.

General Dillard believed very strongly that the engineers were accomplishing positive objectives in support of U.S. and allied troops in the Republic of Vietnam as well as aiding the economy and government of the Vietnamese people.

The general also realized that he might be called upon to lay down his life for these objectives. Shortly before his death, Gen. Dillard asked the engineers in times of crisis to "call upon a reserve strength—the Engineer character—to insure that our comrades who started our work for us will be able to say when we're finished, 'Well Done'." Let us now call upon that reserve strength.

THE KYSU'

A Quarterly Publication Of
Engineer Command Vietnam
VOL. 2 NO. 2

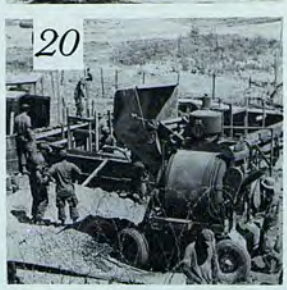
The summer issue of KYSU' magazine carries a dual theme of Vietnamization and pacification. The engineers in Vietnam realize the significance of these projects and they are coordinating their efforts to meet the demand.

Specialist Four Willis Meeuwsen gives his account of the construction of a bridge near Tam Quan village (page 6). Specialist Five Neil Gaston has reported on the final phase of the "Vietnamization of Land Clearing" (page 12). A divining rod in hand, Specialist Four Paul Cole visits the engineers who search for the "Waters of Pacification" (page 17). In preparation for the complete Vietnamization of the war, the engineers are building compounds for the MACV Advisor Teams. First Lieutenant Daniel Campbell records the progress that has been made (page 20).

These type of projects are designed to strengthen South Vietnam and contribute to a more unified nation. The story of Engineer Command Vietnam is the story of the men who are accomplishing these tasks.

SP4 Curtis A. Nelson, Jr.
EDITOR

ON THE COVER: The winner of the KYSU' cover contest was Specialist Four Sullivan Tonti, an engineer draftsman with the 20th Engineer Brigade at Bien Hoa. Tonti's depiction of an engineer using an asphalt screeder was selected by the late Major General John A.B. Dillard.



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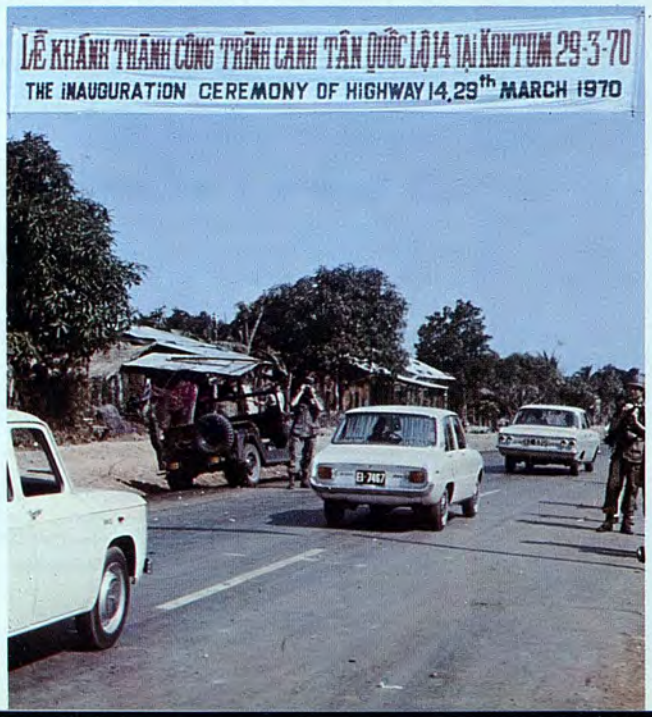
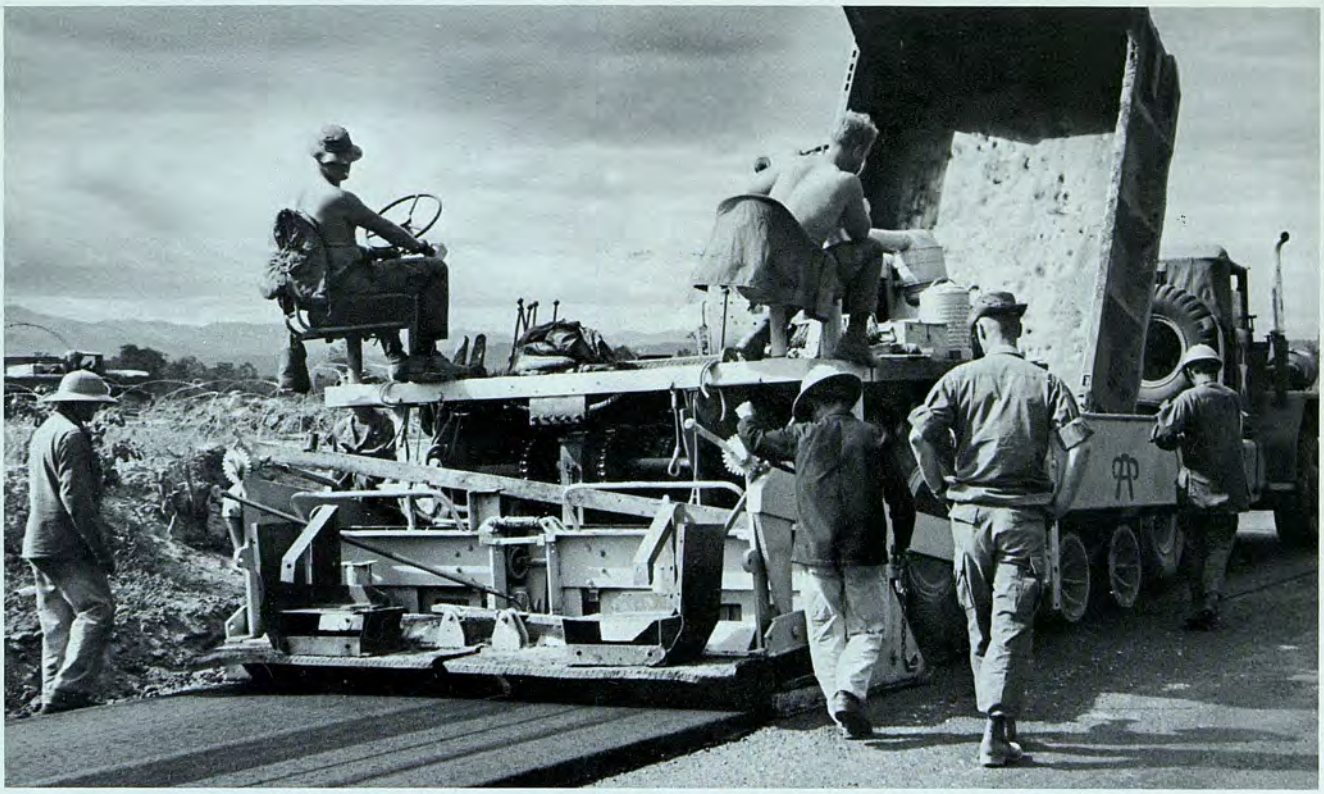
A Road Through The Highlands



Fredrick



Fredrick

An asphalt platoon paves an initial 12 foot wide lane north to Dak To.

By Specialist Five Paul Fredrick

Specialist Four Richard A. Long

There's a sinister chain of mountains called the Annamite Cordilleran that creeps out of Cambodia through the center of the Republic of Vietnam. This offshoot of the Himalayas forms the backbone of Vietnam and is referred to as the Central Highlands.

It is a strange, forbidding region consisting of highland jungle, mountain valleys, dense fogs, cold damp mornings and scorching afternoons. It is the homeland of a mysterious nomadic people called Montagnards, and for years it has been a lush natural sanctuary for the Viet Cong.

Through the middle of the Central Highlands a road winds its way from Quang Nam Province, through Dak To and Pleiku, and south towards the Mekong Delta. It is the major supply route in South Vietnam running north and south, paralleling the Laotian and Cambodian borders. This road, National Highway QL-14, has long been recognized as a strategic link in military operations as well as civilian pacification.

In January 1954, Colonel Barrou, French commander of a mobile group, was camped in the Central Highlands. He was deeply concerned with the losses the French were suffering. In his journal the Colonel wrote: "The very means of support and coordination which make for the strength of my mobile group also create some enormous obligations in a mountainous area where roads are rare and of poor quality." Colonel Barrou's statement was directed specifically at National Highway QL-14. Six months later, on July 17, Colonel Barrou's Mobile Group was destroyed on National Highway QL-14 at the Chu Dreh Pass between Pleiku and Ban Me Thout.

Within the last few months, a large portion of National Highway QL-14 has become the object of an ambitious road construction project being carried out by two units of the 18th Engineer Brigade's 937th Engineer Group (Cbt). The 20th Engineer Battalion (Cbt) and the 815th Engineer Battalion (Const) have undertaken and successfully completed the task of turning the one-lane, pot hole-filled road into a 20-foot wide, double-lane highway.

A pre-construction season introduction of special, high production, commercial road building equipment (called MCA-LOC equipment) consisting of huge dump trucks, rock crushers and paving machines, tremendously increased the construction power of both battalions in their difficult task of turning the 69-mile segment of Route 14 into a thoroughfare. The 815th was handed the job of working on Route 14-North from Kontum to Dak To, while the 20th Battalion was responsible for 14-South from Dragon Mountain, near Pleiku, south to the intersection of Route 7B.

During the first week of October 1969, the rainy monsoon skies were gradually clearing after five con-

secutive months of drenching the Central Highlands. Enemy activities in the area were noticeably less. His traditional hiding places had been leveled and crushed by engineer land clearing units and, with the 3rd ARVN Armored Cavalry Division providing the necessary security, it was time for work on the QL-14 project to move into high gear.

When National Highway QL-14 was originally constructed, the French used a technique similar to those which were used by the Romans. The U.S. Army engineers' methods are different. Instead of placing smaller rocks on top of larger ones by hand, the engineers use material of the same size as the French, but mix the rock and asphalt, with the accent on mechanization.

During the four-step road building process, from surveying to paving, nearly 2,000 soldiers of the 20th and 815th Battalions took part in the project. Surveyors, truck drivers, road grader and dozer operators, wheel tractor drivers and men from nearly every type of engineer specialty were a part of the mammoth undertaking.

Not only were Americans working but Vietnamese also played vital roles. As a part of the Vietnamization program, many ARVN soldiers assisted in the Route 14 project. On the 14-North phase of construction, 22 soldiers, and dump trucks from the 20th ARVN Engineer Group hauled rock from Webb Quarry to the Pleiku Asphalt Plant.

A couple of innovations, put into operation by the 815th Battalion, proved successful and expedited completion of their segment of the project. The asphalt convoy made three trips daily, from the asphalt plant in Pleiku to the work site and back. With some clever planning, return trips saw the trucks loaded with sand and mineral fines from Kontum. These materials were used by the asphalt plant to produce more hot mix. The truck drivers involved called this operation "The Great Circle Route". Many times as they pulled into the Pleiku plant, a carton of C-Rations and cold sodas constituted a quick lunch, while their

Fredrick

After the cold mix asphalt is dumped, spreading and compacting are the two remaining steps.

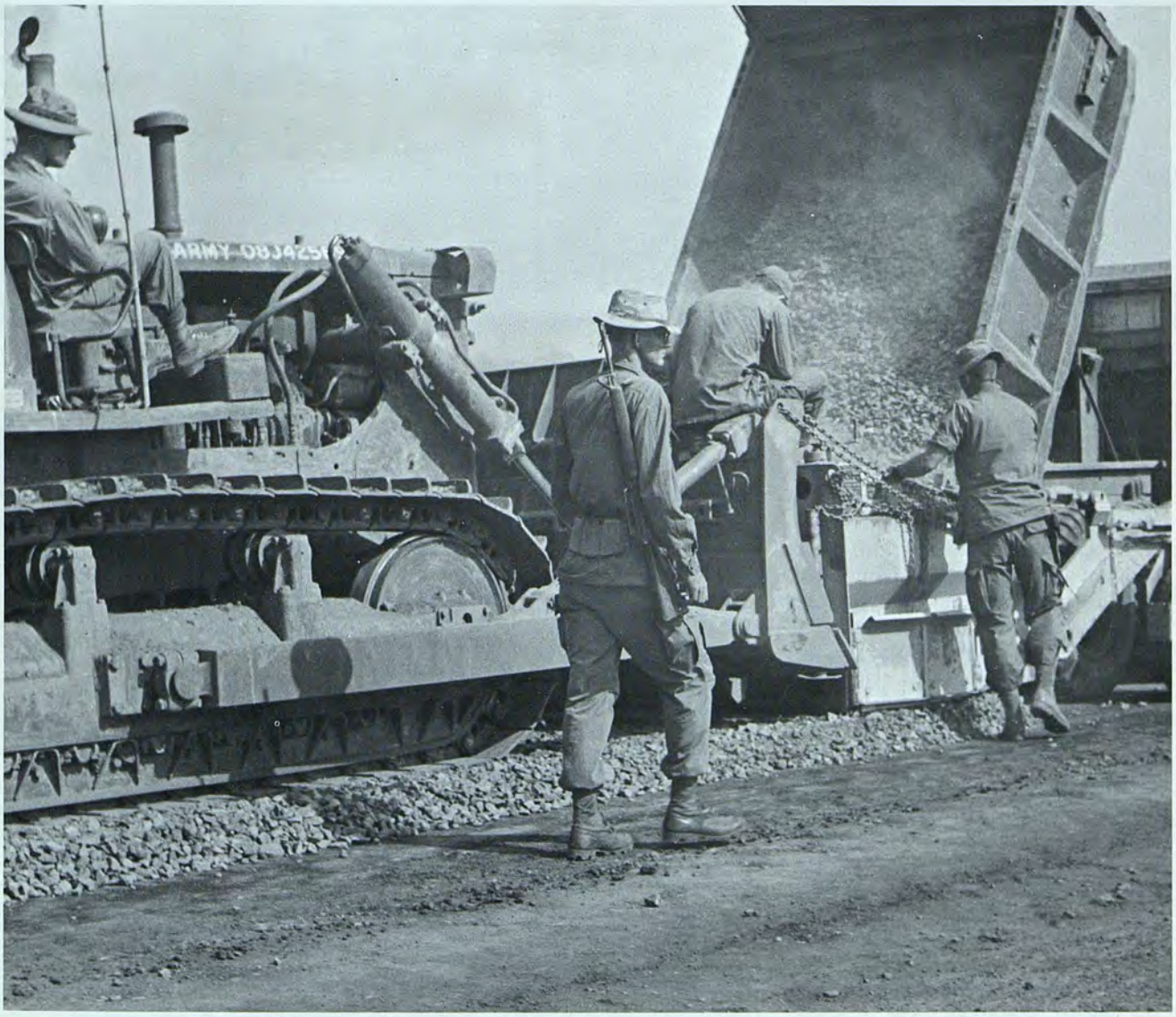
trucks were being loaded for another trip.

In order to keep the trucks rolling, in spite of long hours and many miles, a maintenance inspection station was set up at the asphalt plant in Pleiku. As the trucks arrived for another load, they were routed over the grease rack. A team of mechanics swiftly checked the trucks, performing necessary greasing and lubrication, and promptly released them. The operation resembled an Indianapolis "Pit Stop."

On at least one occasion, the enemy was successful in slowing down the battalion's progress, but only for a short time. The Viet Cong planted charges to blow Bridge 29 on 14-North. Before they could get the job done, the ARVN defenders drove the attackers away. One charge blew a 60-foot stringer out of the north lane of the bridge, making only one-way traffic possible for three days. On the fourth day a new beam was in place and the bridge was again open for two-way traffic.

The goals of this project were two-fold. While offering the Vietnamese an obvious military asset, the improvement of this vital roadway aids in furthering the political and economic integration of Vietnam. Now as Vietnamese vehicles travel National Highway QL-14 with their loads of rice, bananas and timber, the probability of economic expansion is apparent.

The road "that couldn't be built" is now finished and much of the credit for this success must indeed go to the determined engineer-soldier. They experienced the threat of enemy attacks, the dust of crusher operations, the heat of asphalt plants, the endless hours spent on countless convoys and the mental and physical frustration of seeing a piece of equipment break down. These men accomplished the "impossible."

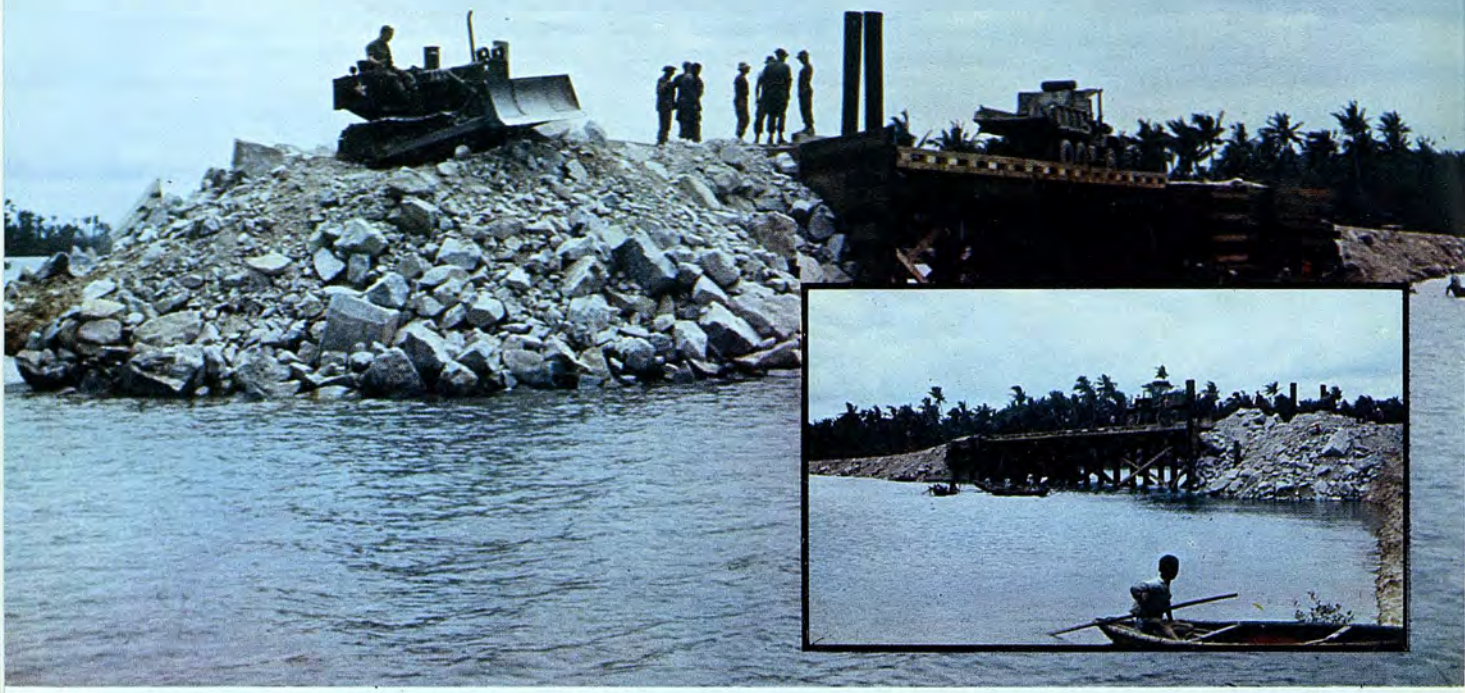


Pike

The men of D company employ a Jersey Spreader as a security guard keeps watch.

Bridge For The People

By Specialist Four Willis Meeuwsen



Meeuwsen

The U.S. Army Corps of Engineers in the Republic of Vietnam have come to realize that it takes more than superior fire power to discourage the enemy and to enable the people of Vietnam to stand up and freely express themselves as a nation. With this fact in mind, the 18th Engineer Brigade has been placing renewed emphasis on pacification during 1970.

The pacification projects are unique and fruitful as was evidenced by the recent completion of the Tam Quan Bridge and causeway in Northern II Corps. In addition to the military importance of the bridge, the work done by the second platoon of Bravo Company, 39th Engineer Battalion (Cbt) will provide a firm economic base for the citizens of Tam Quan village. The bridge and causeway stretch nearly 800 feet from an off-shore island to the mainland. The completion of the bridge will provide the island fishermen with a more rapid link to the mainland markets and will enable them to make quick sale of their daily catch.

"We had one hell of a time, but we finally made it", said First Lieutenant John Erdman, Westwood, N.J., when asked about the construction project his platoon had been working on since early January. Only two of the squad leaders and the platoon sergeant were experienced in building timber bridges. A new dimension was added to the project since all the construction was being done over water. The bonus of the project was that the men realized that they would have the satisfaction of working on a project from start to finish.

According to Specialist Four Richard Del Gaudio, Hartford, Conn., "Before we moved down there, they told us we'd be working on an island paradise—ideal conditions, beautiful setting and plenty of beach." And that is what they found—a quiet village on the mainland separated from an off-shore island by a tidal river. Fishing boats sailed in and out; small children played under coconut and banana trees. The men wanted to live right there, but they had to settle for nearby LZ North English and commute.

"It took about 600 loads of blast rock to complete the first section of the causeway", stated Platoon Sergeant William McGuire, Denver, Colo. Five-ton dump trucks came down from the 39th Battalion's Alpha and Delta companies located in Chu Lai to help with the construction. Each day's early morning hours were spent mine-sweeping the quarry area four miles north of old LZ Highboy and on the 1-1/2 mile road from QL-1 through the village to the job site.

"We found eleven mines altogether", said 1Lt Erdman. "Nine using the detectors and two the hard way." One mine was pointed out by a little child one morning as they were

sweeping through the village. "It had probably been there a couple days; we were really lucky on that one", 1Lt Erdman said.

While the first section of causeway was being completed, a call to the 137th Engineer Company for a crane, "Rosemary's Baby", to drive the bridge piling brought Specialist Four James Bradford, Sharples, W.VA., to the scene. Battalion surveyor, Specialist Four Ronald Rauch, Clarksdale, Miss., was on the job to insure that the bridge remained in line. "This proved to be quite a hassle, considering the rocky bottom conditions the piling had to be driven through," related Rauch.

As the 137th finished the sixth 20-foot span and far shore headwall, the platoon became anxious to get the remaining causeway finished and head back to LZ Dottie, the com-

Meeuwsen

"Rosemary's Baby" was called in to drive the piles (above) and to support the sky platform (left).

The skytroopers of the 173rd Airborne Brigade set up a camp nearby for security (left). Daily mine sweeps were conducted for further protection

pany's base camp. "We figured that we'd be back home within a week, but did we get a surprise," exclaimed Specialist Four Bruce Williams, Magnolia, N.J.

During the minesweep the next morning, the men sensed that something was wrong. No mines were found along the route—a variation of the normal routine. As the sweep team rounded the last curve, they discovered that indeed something was wrong—their bridge was in flames.

By the time the engineers reached it, the bridge was too far gone to be saved. Lieutenant Erdman questioned the villagers through an interpreter and learned that after a brief firefight with the Popular Force night security, the Viet Cong had set fire to the abutment and substructure of several bents. The fire spread quickly upward along the freshly creosoted piles to the superstructure.

By noon all the spans had dropped into the water. A feeling of real disappointment swept through the platoon. After six weeks of diligent and exhausting work, there was suddenly nothing to show for their efforts.

Colonel William R. Wray, commanding officer of the 45th Engineer Group, and Lieutenant Colonel Hugh G. Robinson, commanding officer of the 39th Battalion, flew to the jobsite that afternoon. After viewing the extent of the damage, Col. Wray suggested the bridge be rebuilt according to a timber trestle design, using the unburned portions of the piles for support.

That evening pencil sketches were made and discussed and by morning the idea had taken shape. Brigadier General John W. Morris, commander of the 18th Engineer Brigade, sent a message emphasizing the importance of the project. This was the shot in the arm the platoon needed to restore their morale. "Everyone was down in the dumps", said 1Lt Erdman, "but it didn't take much push after it was decided what had to be done."

The men responded by working late hours and occasionally at night. "We had to work at night to cut off the burned piles, because only then was the tide low enough", said SP4 Del Gaudio. After cutting off the piles, a 10×12 inch cap was bolted and scabbed onto them. This provided the substructure for the uniquely designed timber trestle bridge. "We may have cut down on the bridge classification, but not enough to amount to anything", added PSG McGuire.

"Skysoldiers" from the 173rd Airborne Brigade set up a guard position on the hill overlooking the bridge. Their standing order was, "If the bridge burns again, you'd better be standing on it." Additional Popular Force security also came to guard the bridge at night.

Expediting the project considerably, the engineers developed a way to pre-fabricate the 20-foot bents at LZ North English and haul them to the bridge site. By using the sawed off piles and pre-fabricated bents, the platoon was able to rebuild the bridge in only 22 days. The 511th Panel Bridge Company sent 13 dump trucks and a platoon of men to help build the second section of causeway. Four days later, the entire project was completed without further incident.

Since the morning of the bridge burning, the Tam Quan area has come under an intensive pacification campaign. PSYOP teams have dropped thousands of leaflets, explaining why the engineers built and persisted in rebuilding the bridge and how the people can benefit by it. There has been a definite awakening in the local populace, as if they finally realize what pacification and self-help are all about. This time the bridge will stand. The people themselves will see to it.

U.S. Army photo

It Takes A Cautious Paw

By Major John F. Corby

The enemy's abundant and indiscriminate use of mines and booby traps is one of the most serious and frustrating problems faced by Allied Forces in the Republic of Vietnam and continues to pose a formidable threat to both men and machinery.

Considerable effort has been expended both in-country and in the research and development community in the Continental United States (CONUS) to improve our ability to counter the enemy's mining tactics. Much progress has been made, and further efforts are underway.

One very promising innovation is the mine detecting dog. The canine family's keen senses of sight, sound and smell have long been recognized. Dogs are not new to warfare and have been used in Vietnam for several years as scouts, trackers and sentries. Only recently, however, has consideration been given to utilizing dogs in purely mine detecting roles.

The Army Concept Team in Vietnam (ACTIV) in 1969 conducted a formal evaluation of a specially formed canine corps unit, the 60th Infantry Platoon (Scout Dog, Mine, Tunnel). For evaluation purposes, the 60th Infantry Platoon was assigned iniatially to the 25th Infantry Division and subsequently to the Americal Division, thus affording two widely divergent environments for the dogs to work and train in. The evaluation proved conclusively that mine detecting dogs can perform effectively in Vietnam.

The dogs and handlers are trained in either Okinawa or CONUS. Upon arrival in Vietnam a refresher training period is essential in order to allow time for the dogs to become accustomed to the heat and humidity of the country, to instill confidence and to develop effective teamwork between dog and handler. This training is conducted under the direction of the United States Army Vietnam (USARV) Dog Training Detachment located at Bien Hoa Army Base.

The mission of the detachment is primarily one of training and retraining. It also serves as a replacement center for the dogs and dog handlers newly assigned to Vietnam. Handlers are assigned TDY at the detachment, being teamed with a dog prior to

Baccheschi

moving on to a permanent assignment with a field unit. Upon DEROS of a handler, his dog is returned to the detachment to be retrained with a replacement handler.

The dogs are trained to detect all US, CHICOM, Russian, VC and NVA explosives and homemade devices employed by the enemy in Vietnam, as well as, trip wires of all types. His ability to find ordnance and other explosive artifacts is a function primarily of his superior sense of smell. If a mine was recently emplaced, human scent left behind by the person or persons laying the mine may be sufficient to allow detection. More commonly, however, it is the odor emitted by the explosive itself which alerts the dog.

Most trip wires are discovered by sight with the dog combining his keen vision with the advantage of the proximity of his eye to the ground. Failing to see a wire, a dog is dexterous enough to instantly stop when his leg makes contact with a wire; most wires require an appreciable tug before activating a firing device. A third possible method of trip wire detection is by hearing the sound emitted when a breeze causes vibration. The dogs ability to detect wires in this manner, however, has never been proven.

The mine detector dog is trained for use on roads, trails, and in open terrain. In all areas of operation the dog handler must be on point. The patrol is deployed so as not to distract the dog, being positioned with regard to wind direction and terrain. Upon discovery of a mine or booby trap, the dog will "alert" by sitting within two feet of the device. At this point the dog team has finished its mission. Neutralization of the device is not the responsibility of the dog handler. This is done by another member of the search party.

If the dog finds a device it is important that he be rewarded immediately. Food is the primary reward, although praise and affection are equally effective. In the event of a false alert, the dog is neither scolded or rewarded. The effectiveness of this simple incentive system is wholly dependent on the rapport between dog and handler. The dogs are not foolproof; occasionally they miss something. Thus it is important that normal tactical measures not be relaxed. The dogs are a supplement to the search party, not a substitute.

Many successful finds by these dogs over the past several months have confirmed that their unique detection capabilities have increased the confidence which commanders place in them resulting in ever increasing use and demand for more dogs.

The mine detection dog, though no panacea to thwart the enemy's use of mines and booby traps, is an invaluable addition to allied countermine tactics.

If the dog finds a device it is important that he be rewarded immediately. (opposite page).

U. S. Army photo

Vietnamization of Land Clearing
—The Final Phase

By Specialist Five Neil Gaston

Browning

The dusty 10-ton trucks, low bed trailers laden with modified D7E dozers moved in a tired caravan over the steaming asphalt. The faces in the cabs, grimed with the red stain of laterite, evidenced the weariness each man felt. As the convoy moved past, there appeared to be nothing unusual about it, nothing out of the ordinary to distinguish it from the hundreds which roll daily through the Republic of Vietnam.

If one looked beyond the weariness and the dust, however, a difference could be discerned. The drivers were not all GIs. Neither were they all ARVN soldiers. The convoy was driven by both. The diamond shaped patch of the 20th Engineer Brigade alternated with the shield of the 30th ARVN Engineer Group. This convoy was the end product of a month long training program involving U.S. Army and Vietnamese personnel.

In December, 1969 the 62nd Engineer Battalion of the 20th Engineer Brigade began training ARVN engineers from the 30th Engineer Group located in the Third Corps Tactical Zone. These trainees were selected to be trained in the operation of D7E dozers which had been modified with special reinforcements for land clearing. The program would involve all facets of the land clearing activities and would result in the creation of a new company, the 318th ARVN Engineer Company (Land Clearing). The unit would be the first Vietnamese land clearing company.

For the trainees the program began on December 15, 1969. With a short retreat ceremony the 318th was welcomed into the 62nd Engineer Bat-

talion. For two weeks the trainees received instruction from the personnel of the battalion's Alpha Company motor pool. They got their first close-up view of the behemoth Rome plow and began to familiarize themselves with its care and maintenance.

Seldom have students learned in a more dangerous or demanding classroom. The program was on-the-job training with the Americans acting as instructors on a one-to-one ratio. The trainees sat in a special "buddy seat" constructed inside the cab of the Rome plows. With temperatures nearing the 100 degree mark outside, the enclosed area of the cab sometimes reached temperatures of 130 degrees and above. From this special vantage point the trainees began to understand the intricacies of land clearing.

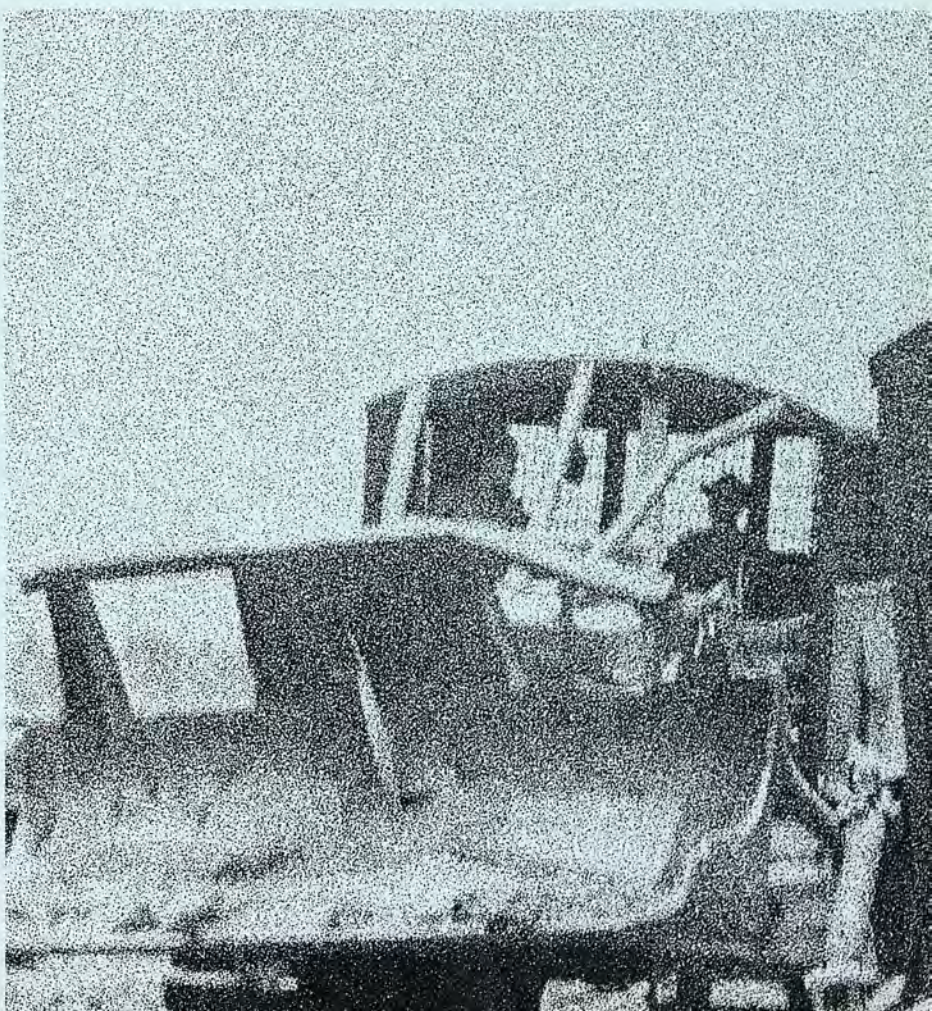
They performed daily operational maintenance with the Americans. Early morning light and gathering dusk found pairs of ARVNs and GIs huddled over the plows' motors checking water and oil and securing connections. They began to learn the awesome power of the plows, which crushed and flattened the green wall of jungle, leaving shattered stumps and mangled vegetation in their wake.

While the trainees watched and learned they were observed by their instructors. The instructors decided when the trainees were ready to solo. Some were ready within a week. Others took longer. Specialist Five William J. Polson, an operator with nearly a year of experience, spoke about his experience as an instructor. Wiping the dust from his deeply tanned face, he said, "The guy I worked with was an all right guy. The only trouble was that he wanted to do it all when he wasn't quite ready. I had a heck of a time convincing him to go slow."

The presence of Vietnamese on the operation was a new experience for the men of the 501st. Prior to the mission some men felt apprehension about working with them. "It was pretty hectic at first around here," said Specialist Four Thomas S. Grogan as he surveyed the night defensive position carved from the surrounding double canopy. "Everyone wondered what it would be like when we got hit. Out here you've got to know that you can trust the guy next to you. Your life may depend on it. Those ARVN dudes are something else. They were really cool about the whole thing."

As operational support was being learned, a second cycle of plow operators began training with the 984th land clearing company. They followed the pattern set by the 501st: orientation, maintenance standown and training in the field. When they moved to the field a class began training with the 60th Land Clearing Company. Fifteen days later they followed the 984th to the field.

With the entire 62nd Engineer Battalion involved, all of the facets of land clearing operations were being

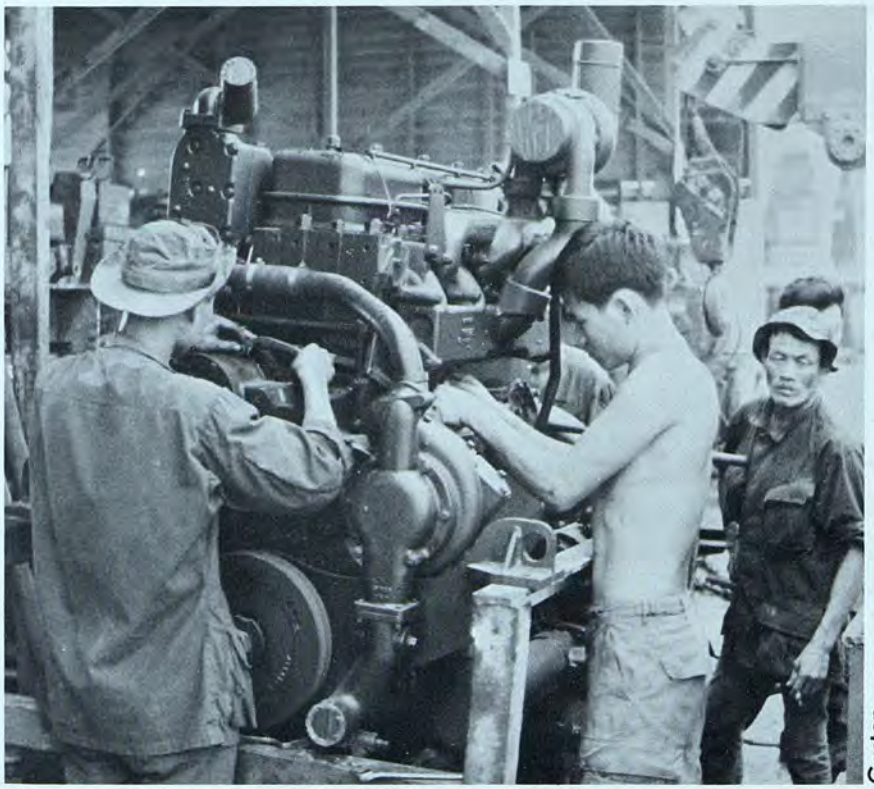


Having recently completed his intensive training this ARVN engineer takes the controls of his Rome plow.

Browning

This Armored Vehicle Launched Bridge (AVLB) has a 40 ton capacity and can be positioned in 15 minutes. Here it is used to enable Rome plows to cross a ravine on the way to the cut.

Browning



Gaston

Maintenance and care of equipment were an integral part of the training program

taught. Captain Richard A. Burlingame, the 62nd's officer in charge of the training program commented on the thoroughness of the training. "Land clearing is an extremely complex business," he said. "We want to prepare this company to take over all of the aspects of the job."

By the middle of March there were almost 60 trained plow operators, and the training of support personnel was in high gear. The 501st was deactivated in early April. Ten of the company's Rome plows were then transferred to the 30th ARVN Engineer Group.

Composed of operators trained by the 501st, 984th, and 60th Land-Clearing Companies, a new joint ARVN-U.S. company was formed. The support elements of the company continued to be Americans assisted by ARVN trainees.

The provisional company necessitated by the deactivation of the 501st and the fact that the 318th would not be activated until July became a curious hybrid with two languages, two company commanders, two first sergeants, and two cultures. In the jungle east of Tay Ninh it all came together as the ARVN showed their stuff. This was their first chance to demonstrate on their own what they had learned. The former trainees took to the opportunity with great vigor.

The lead plows on the cut were manned by ARVNs with the American operators following behind. Should the enemy attack it is the lead plow and the lead platoon which are most exposed and will incur the brunt of the assault. As the 318th's company commander guided the cut from the low flying OH-58 it was apparent that the program was a success. Said one American operator, "I just didn't think it was going to work. In the first few weeks of the program the ARVN trainees didn't impress me at all. Now I think I see what the problem was. While we were explaining, they wanted to be doing. Now that it's their baby, they really want to produce."

ARVN successes during this transitional period laid the next to last stone in the building of an all-Vietnamese land clearing program. The convoy of dusty trucks and lowboys which brought the provisional company back to Long Binh signaled the end of U.S. direct supervision of the company. The advisors from the old 501st will be reassigned to other land clearing companies in the battalion.

The provisional company received the remainder of equipment needed from the 20th Engineer Brigade, USAECV (P), and the 62nd Engineer Battalion.

On May 25, 1970 the first all-ARVN land clearing operation began. With the exception of less than a handful of American advisors, the new company will be on its own. Supplies were drawn through American channels but were used as the ARVN company commander decided. For this first operation the 318th functioned as a subordinate unit of the 62nd Engineer Battalion.

For Captain Nguyen Van Tich, the 318th company commander, this program has been an opportunity to utilize the training he received at the U.S. Army Engineer School at Fort Belvoir, Virginia. When asked if he envisioned problems for the first operation he replied, "My men are ready. I think that we should be able to match the American engineer's performance, at least on this first operation."

The 318th ARVN land clearing company was formally activated on July 1, 1970. Gradually the planning of the clearing operations and the decisions as to where those operations will take place will be shifted to Vietnamese hands. In line with this expected assumption of responsibility, the 62nd Engineer Battalion has begun training two new ARVN land clearing companies. In late February the 218th land clearing company, which will operate in II Corps Tactical Zone, began training and in March the 118th from I Corps Tactical Zone began training. It is expected that the experiences gained from the work with the 318th will prove invaluable in the preparation of the two companies.

The Waters of Pacification

By Specialist Four Paul R. Cole

In the past, water and the water source were strategic questions. Armies planned their movements with as much consideration to water as to munitions. Battles were fought to capture or deny capture of this precious commodity. In the Republic of Vietnam, the US Army is acutely aware of the importance of water to its mission, further, the Army is well aware that water plays a vital role in the stability of Vietnam.

The soldier requires water to survive. It is used for drinking, for washing and for cooking. It is vital that there be a water source wherever units are located. This water source must be potable. Additionally, it must be secure and independent. In brief, the unit should not have to worry about where their water is coming from and whether or not it is safe to use. The same considerations apply to the people of Vietnam.

In terms of a small investment of manpower paying off in great dividends, US Army engineers are providing water through the use of specialized four or five-man well-drilling teams. Working with either percussion or rotary well-drilling rigs, these teams are normally capable of drilling a well that will provide

Cole

Cole

a pure water supply anywhere from one to three days, depending on soil conditions and depth. With either type rig it is complicated work.

All well-drilling involves sinking a shaft a certain depth to reach water. After it has been determined that the water source found is sufficient to provide the required amount, the final steps of equipping the well with a filtering and pumping system complete the task.

One example of such work is the job that the 18th Brigade's 23rd Well-Drilling Detachment did for the Hospital of the Catholic Mission near Kontum.

For ten years the hospital provided treatment to Vietnamese and Montagnard citizens of Kontum and refugees from outlying areas. During the 1968 Communist Offensives, it was one of the points over-run by the North Vietnamese Army. Since that time, Dr. Pat Smith and her staff have been required to use a former Montagnard school for girls as a temporary facility.

In the eleven years since she volunteered to leave her practice in the coal mining region of eastern Kentucky for a two-year assignment with the Catholic Mission, Dr. Smith has

Browning

Dr. Pat Smith and the hospital for which the engineers of the 23rd Well-Drilling Detachment provided the much needed water.

Cole

experienced most of what life has to offer a doctor and hospital administrator in a sub-tropical war zone. Malaria, tuberculosis and even plague are constant reminders of the vulnerability of a community without medical facilities or the services of a doctor. Dr. Smith is anxious to provide that service despite the handicaps imposed by war and the unavailability of supplies and equipment. With the re-establishment of military security in the area, civilian workers returned to the original, larger hospital and began to rehabilitate it. Hammers, nails, and paint brushes served the project up to a point, but before the staff and patients could move back, someone had to solve the problem of a critical water shortage.

"Besides the usual trouble we have finding medical supplies," said Dr. Smith, "getting decent drinking and bathing water is one of our major problems. A good well at the hospital will make all the difference in the world. It will keep the people from getting diseases on top of the ones they already have."

The men of the 23rd Well Drilling Detachment offered to help out. Specialist Five Richard Nemic of Chicago, whose crew included Specialist Four Major Caulder of Marion, South Carolina; Specialist Four Hollis Seals of Chattanooga, Tennessee; and Specialist Four Louis Duval from Morgan City, Louisiana, moved their percussion well-drilling rig out to the reclaimed hospital and started probing for water last February.

Percussion well-driliing is cumbersome work. Crews have to wrestle with outsized wrenches and chains in tightening or breaking down equipment connections. The mechanical arm of the drilling rig jerks up and drops the 28 foot long, four inch cylinder of steel that makes up the bit, into the shaft. Twenty-foot sections of steel pipe casing are driven into the shaft to keep its walls from collapsing as the well progresses. These casings are threaded at each end for screw type, water tight connections. The drilling continues in this manner; driving the bit deeper into the ground and adding succeeding sections of casing, until the water source has been reached.

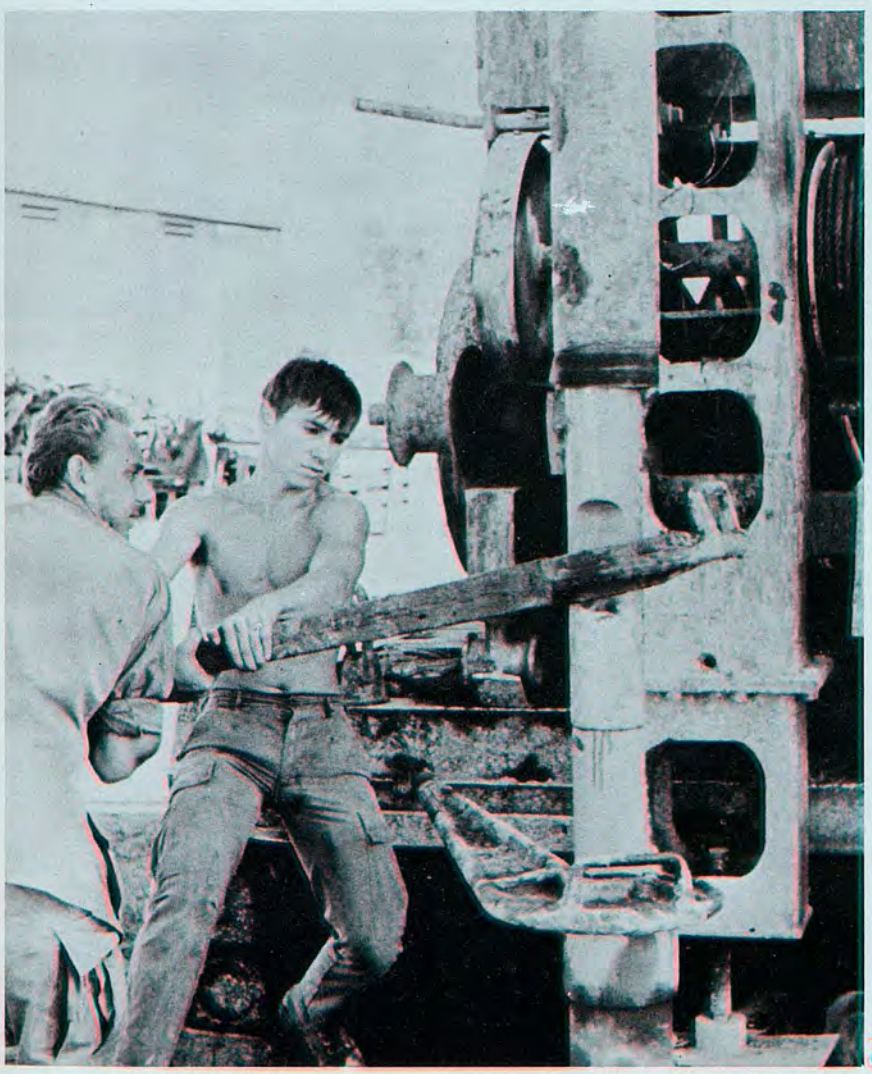
At a depth of 175 feet, SP4 Nemic

and his crew 'hit' a water source that was worth developing. After adding the necessary pumping and filtering equipment, one of the struggling hospital's many problems had been solved. Dr. Smith, staff and patients moved into their remodeled quarters soon after the well was completed.

More ambitious projects of water-resource exploitation are being prepared with the introduction of the rotary drill to the Army's well-drilling detachments' equipment. The rotary drill is a more effective, sophisticated and expensive piece of equipment than percussion models. Instead of a hole being pounded into the ground, a spinning drill bit cuts a hole into the ground in two-thirds of the time required by the percussion set up. The relative speed of the newer rigs makes manifold well systems feasible. This arrangement spreads a series of holes at various depths across a promising water field. Water tables which might not be fully covered by a single well can be reached by several such quickly sunk shafts joined at the surface in a common tap. A well made in this manner is not vulnerable to the failure of any one shaft and can provide a reliable and constant water supply.

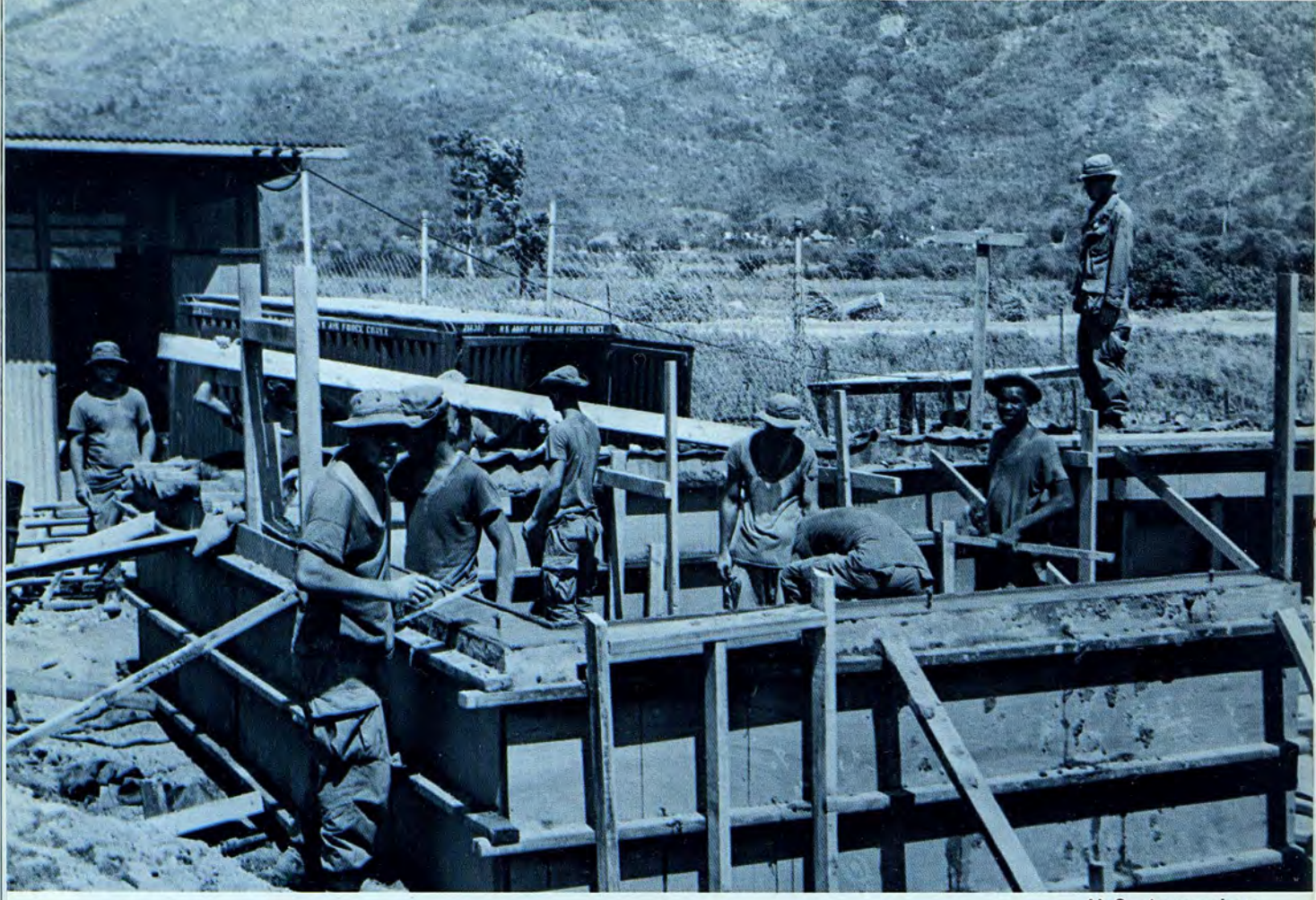
At a site at Cam Ranh Bay, the 23rd Detachment, together with the three other well-drilling teams of the 18th Brigade, is training on the new equipment. This will mean that more work of the type done at the hospital in Kontum can be accomplished throughout the I and II Corps Tactical Zones by the men of the 18th Brigade.

Standing inside fire support bases or along side bunkers, these well-drilling rigs represent an answer to the soldier's need. Located behind schools and hospitals, they represent an expanding effort on the part of the US Army Engineers to aid in the stability of Vietnam.



Cole

The drill tool extension is lowered through the casing (below) and is then attached to the drill stem (left).



U. S. Army photo

Builders For The Advisors

By First Lieutenant Daniel L. Campbell

Long after most of us have returned to our homes and families back in the United States, there will remain in the Republic of Vietnam a small group of professional military men whose main objective will be to advise and train the South Vietnamese to wage their own war against oppression. These are the MACV Advisors.

As Vietnamization progresses, the role of these advisors grows exceedingly more important and the engineers are presently playing a very significant part in providing the best possible living and working conditions for these men.

The increase in engineer involvement with the MACV Advisor Program began in January of 1968. At that time studies made by MACV showed that the MACV Advisor effort was not receiving adequate construction support for existing teams, nor for new teams which were being formed as the Vietnamization program moved forward.

The results of these studies gave birth to the "MACV Advisor Site Upgrade Program." This program is designed to make every advisor site in the country from the DMZ to the Delta an independent community. An independent community denotes that each site will have its own water supply, power supply, storage facilities, mess halls, housing, latrines, maintenance shops, security fortifications, as well as community facilities such as recreational clubs.

When the program is finished there will be a total of 213 advisor sites which will have been renovated. At present, 87 of these sites are finished, and 82 more are under construction. The rest have projected starting dates sometime in the near future.

To accomplish all the construction necessary to provide the required number of sites the MACV Upgrade Program has been divided into three major zones of responsibility. First are sites which are to be constructed by engineer troops; second are sites

which are to be constructed by a contractor; and third, sites to be constructed by a joint troop-contractor effort.

Engineer troops are responsible for 102 of the sites and have additional joint responsibility with the contractor for 78 more. From these totals one can see the majority of the construction done of the MACV Upgrade Program is the responsibility of the engineers.

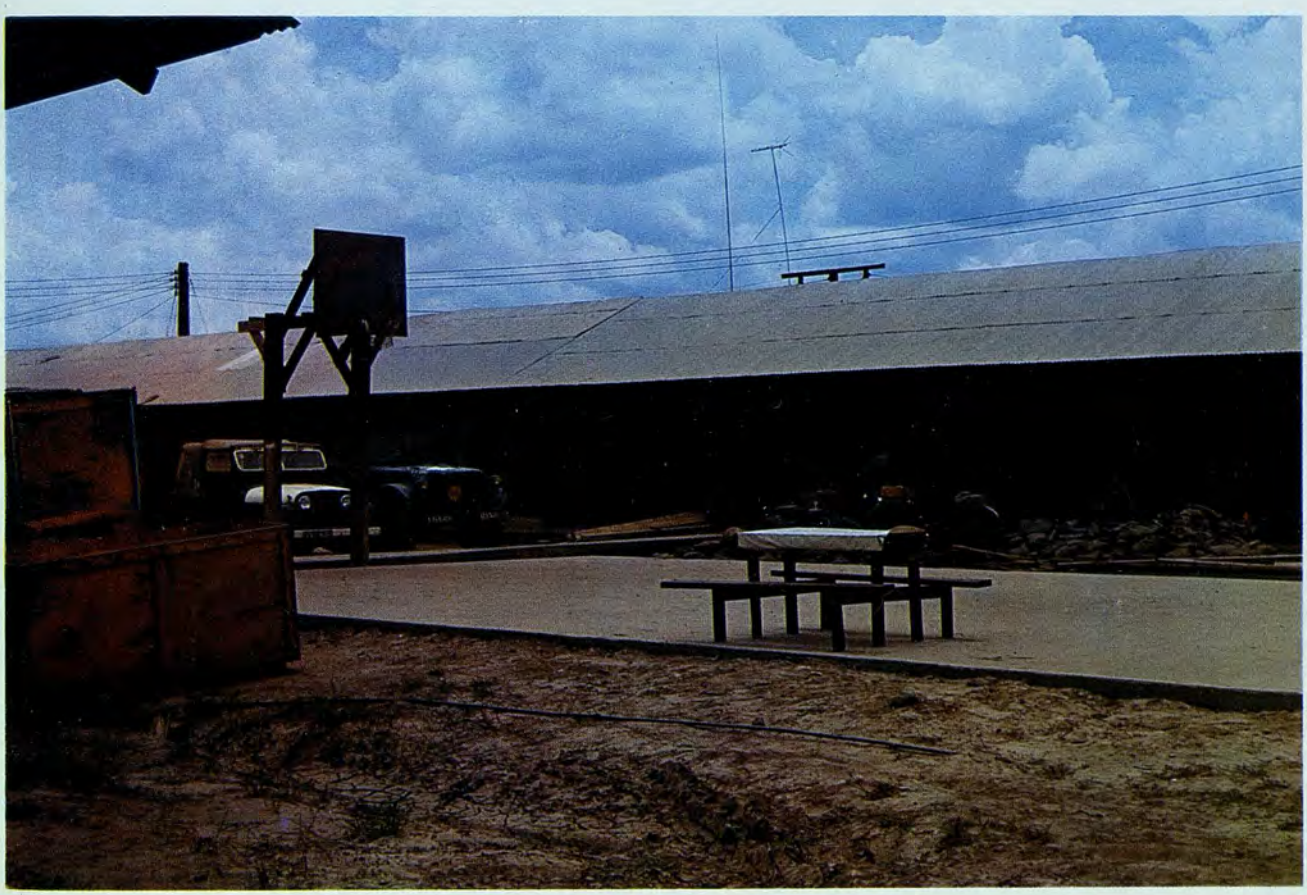
Perhaps the best way to get a clear understanding of the MACV Upgrade Program and some of the difficulties that the engineers have overcome in accomplishing their mission, is to look at just one individual project and follow its history from start to finish.

Late in 1968 MACV requested that an entire compound for a newly established advisory team be built in Kien Tuong Province at Moc Hoa, located in the north central section of the Mekong Delta along the Song Vam River. Since the team strength was to be 40 officers, 60 enlisted men and 40 vehicles, providing the necessary facilities was to be no small matter.

In March 1969, the 93rd Engineer Battalion of the 20th Engineer Brigade arrived at the proposed site. Immediately they were faced with the problem of not having a solid foundation upon which to build the compound. This area, like most of the Delta, was almost all water. It was decided to bring in five feet of fill to make a suitable foundation for construction.

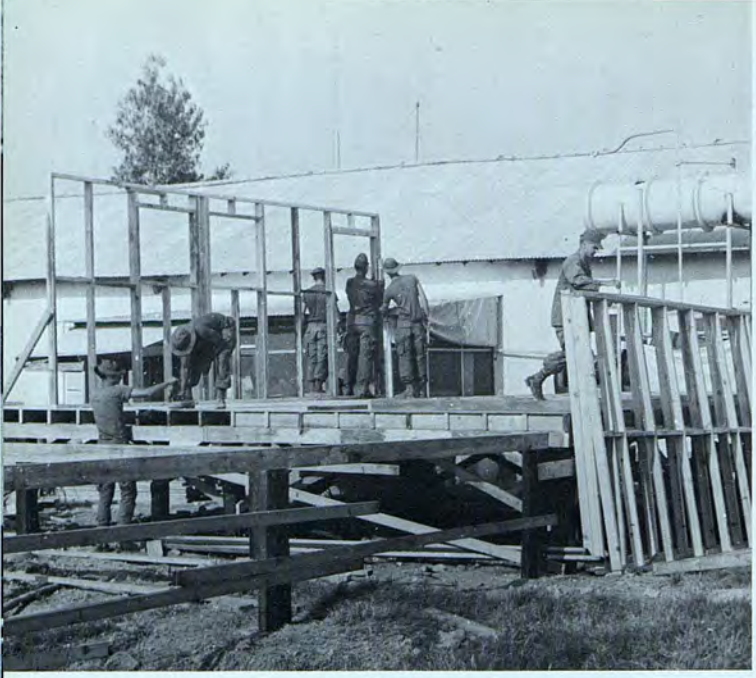
Before the foundation was considered ready for vertical construction, over 6,000 cubic yards of fill had to be brought to the site by barge. Barges had to be used because what few access roads did exist were not capable of handling the number of loaded trucks that would be required to bring in such large quantities of fill. Also, additional fill was needed to construct a defensive berm, for this area of the Delta was not secure from enemy activity.

The vertical construction for Moc Hoa compound was to consist of living quarters, mess halls, community and recreational facilities totalling approximately 12,000 square feet, but after construction had already begun, the scope of the work was increased to approximately 30,-



Browning

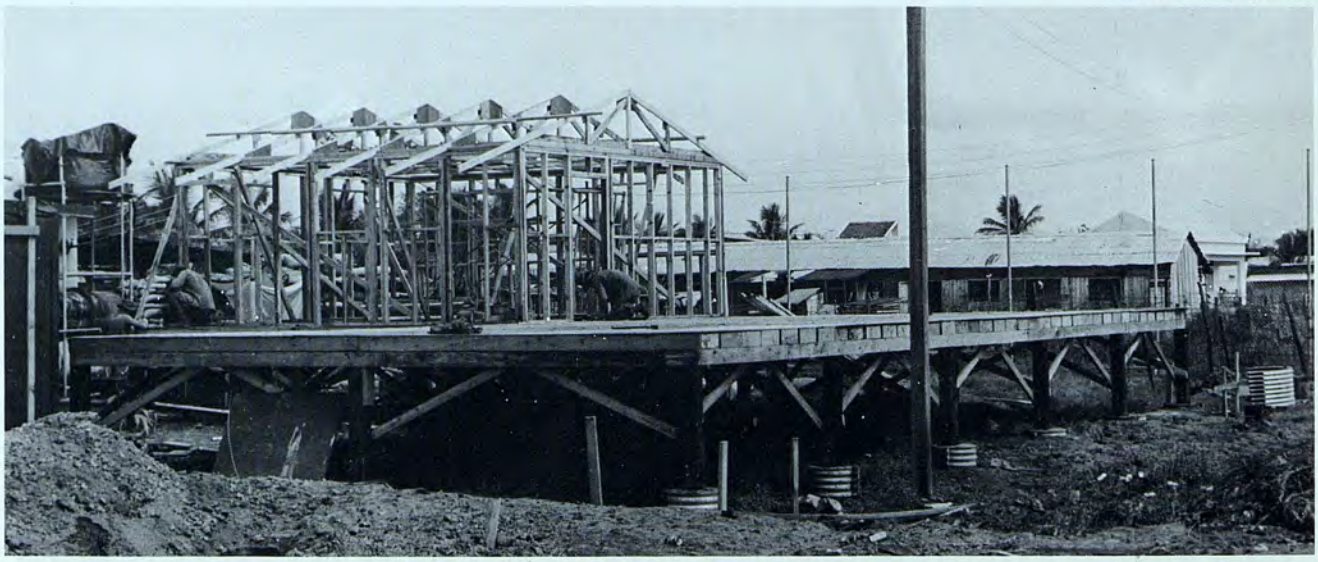
The engineers were flexible enough to build what is today one of the finest MACV compounds in Vietnam.



U. S. Army photo

Engineers are working to upgrade MACV facilities. Here they are erecting wall panels (left) and placing deck (below).

U. S. Army photo



000 square feet. This increase was due to additional needs such as more storage space, a larger communication and administration building and increased living space for men.

These changes in the scope, while necessary to make the compound a more functional facility, presented certain difficulties for the engineers. Not only did design plans have to be changed, but the materials needed to accomplish the work had to be re-evaluated as well as the construction effort having to be redirected.

The engineers were flexible enough to absorb the additional scope and were able to maintain a timely construction schedule to build what is today one of the finest MACV advisor compounds in the country.

The water requirement at Moc Hoa had been established as 12,000 gallons per day. To meet this requested output, the engineers installed the necessary pumps and pipeline to bring water from the Van Co Tay River to the compound where they had already constructed two storage tanks, one for treated water and one for raw water. The matter of treating the raw water was taken care of by using an erdlater.

Once the independent water supply was constructed at Moc Hoa, the last significant hurdle in providing a complete independent community had been cleared. In March of this year, the site was completed.

Moc Hoa is just one example of how the engineer troops have been able to create a completely self-sufficient compound in a remote and sparsely inhabited area. Throughout Vietnam, in such places as Song Be, Go Dau Ha, and Ban Me Thuot, the engineers have been and are continuing to be the primary "Builders for the Advisors".

Miller

Keeping The Channels Open

By First Lieutenant Edward M. Miller

An Army engineer gazes over the swamp which must be made ready to provide a home for the 35th Engineer Battalion by fall.

The new site, located near Chau Duc, can't hold the weight of a man without his sinking into mud over his knees. As he surveys the mucky expanse, he realizes almost 850,000 cubic yards of fill will be needed to provide a firm foundation for the new camp.

Where is the large volume of fill to be found, and how can it be put into place most effectively? The answer—dredge from the floor of the adjacent rice paddies. Removal of the surface layer of muck will expose a stable sand which will be used for fill. This simple but tedious project is necessary if the swampy land in the Republic of Vietnam is to be transformed into valuable real estate.

This is an example of the type of dredging operations that are underway in Vietnam. Most of these are undertaken by Raymond, Morrison, Knudson, Brown, Root and Jones (RMK-BRJ) under contract with the U.S. Navy Officer-in-Charge-of-Construction (OICC).

There are three types of dredges operated in the Republic of Vietnam: pipeline, hopper, and sidecaster. All of them employ a cutter head, suction technique, and yet they use different methods of disposing the muck or spoil.

The pipeline technique is used in all land fill projects and may be used in maintenance dredging. The spoil can be pumped distances up to several miles with large pipeline dredges. Hopper and sidecasting dredges are used in maintenance dredging operations of rivers, ports and harbors. The objective of this operation is to deepen the waterways being dredged. The dredged material is considered disposable. In hopper dredge operations the spoil is deposited in the hold of the ship. When full the ship moves out to deep water, the hoppers are opened and the material is released. Sidecaster dredges are generally used on rivers. As the name implies, the material is cast overboard

Miller

A sidecaster dredge works to clear the muck out of the channel bottom.

through a long pipe.

The pipeline type is the most common dredge. RMK operates six of them in Vietnam. Equipment used in pipeline operations generally includes the dredge, a derrick, fuel and pipe barges, a welding barge, one or more tugs to tend the dredge and a surveying craft.

Many types of cutter heads exist to facilitate removal of material ranging from soft silt to coral and rock.

The cutter is connected by a shaft to a cutter motor which rotates it. Power applied by the motor can be as high as 3,000 horsepower. The blades agitate soft or loose material or cut hard material so that it can be picked up by suction.

In the Republic of Vietnam a special problem exists because of the extensive amount of explosive ordnance left in the rivers over the years. Dredges have reported picking up as many as 40 pieces of explosive ordnance in one day. The items include many VC and old French-type mines but most are predominately US types. Dredged ordnance has been the cause of at least two dredges sinking during the past year. Precautions include use of screen filters and the welding of steel rods between the blades of the cutter head.

The main pump is generally located forward in the hull with its center near the loaded line. Most pumps are powered by diesel engines although the larger class dredges are often powered by steam turbines. As much as 10,000 horsepower is applied to the pumps on large dredges. Small dredges can be powered with as little as 300 horsepower. The speed of the pump is relatively slow—about 800 to 900 revolutions per minute on small dredges and as slow as 300 revolutions per minute on large dredges.

A pipe extends from the pump housing over the stern where it is connected to the floating line by a swivel joint. The floating line is made up of pipe sections from 30 to 50 feet long which are supported by one or two pontoons. These are connected either by flanges, ball joints, or rubber sleeves. The floating line is usually laid out in a wide arc from the dredge to the shore so that the dredge may advance without frequent stops to add additional pontoon and pipe sections. The shore line consists of shorter and lighter pipe sections. Pipeline dredges are referred to by the diameter of their discharge line. The dredge New Jersey, the longest presently in use in Vietnam, is a 30-inch dredge.

It was noted that land fill projects, as described in conjunction with the pipeline dredge, were not the only type of dredge projects. In fact, fill and stockpile projects constitute only about 40% of the USARV dredging

Miller

The dredge "Depsea" at moor in the Newport harbor near Saigon (above). A pipeline dredge, the "Hong Ha", clears a channel at Long Xuyen (below).

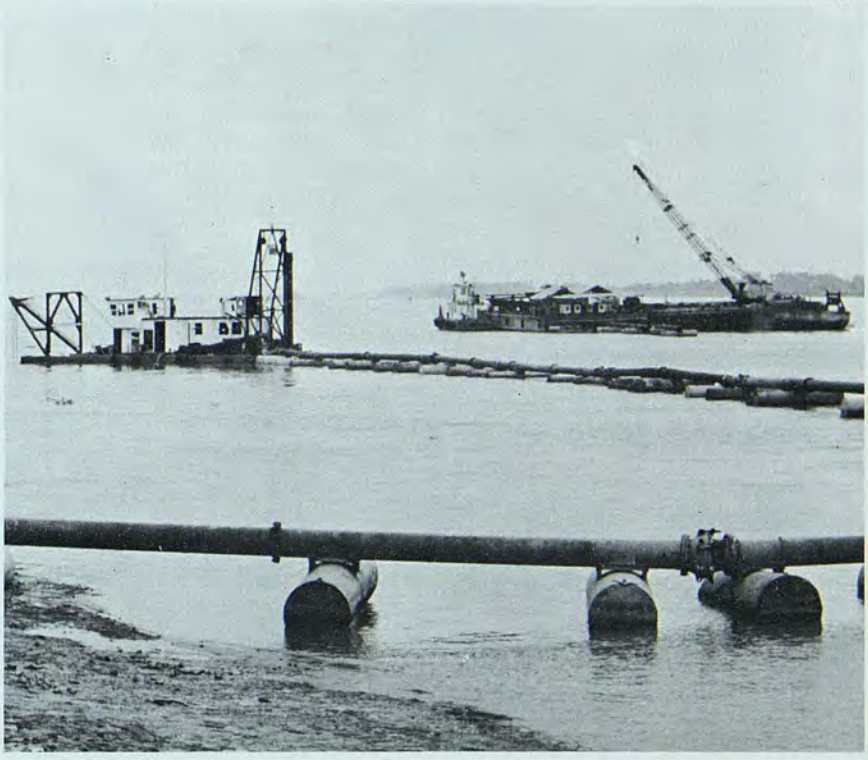
program. Water in Vietnam, particularly in the Delta, is extremely mucky and has a high silt content. Silt is an extremely fine material carried in the water and deposited on the channel bottom. In some areas this is at a rate as high as two or three feet per year, depending on flow action. To bring in vessels of the required draft this silt must be removed. That is the purpose of maintenance dredging. In Vietnam maintenance dredging operations are conducted regularly at Cua Viet, Tan My, the Perfume River, Da Nang, Chu Lai, Qui Nhon, Cam Ranh Bay, Saigon-Newport, Dong Tam and, as needed, at Vang Ro Bay, Vung Tau, Nha Trang, Phan Rang and Phan Thiet. To keep these waterways open will require the removal of over 8,000,000 cubic yards of silt in fiscal year '71. At times, as with the upcoming Qui Nhon maintenance dredging, the spoil is suitable for fill material and can be deposited for construction use. At Qui Nhon a Landing Surface Transport (LST) ramp will be constructed with the spoil material.

Prior to beginning a dredging operation a survey must be made to determine the depth of the water, how much material must be removed, and the composition of the material. The test used to answer these unknowns is the hydrographic survey, a chart of the channel bottom.

The Officer-In-Charge of Construction and USARV deploy several teams of men who continually survey Vietnam ports and waterways gathering hydrographic data which is sent back for compilation and analysis. In addition to hydrographic teams, soil exploration teams take soil borings along the channel to determine the content of the channel bottom. Often good fill is found under a layer of more than a foot of muck. In such cases it is necessary to first dredge off this overburden.

Working a dredge may not be as glamorous as running a gunboat down a river, but without the dredge that gunboat may not have a river to run down. Without the dredge, infantrymen would be living in rice paddies and engineers might be housed on the paddy next door.

Miller



Engineer Groundpounders

By Specialist Five Paul Grieco

Grieco

When the job is road construction through the Republic of Vietnam countryside, the elements or equipment breakdown are not always the most serious obstacles. Without a strong security force to protect the road builders the enemy could destroy equipment, impede progress and most important, take lives. For these reasons the engineer must be prepared to defend himself and if necessary, purposely seek out and destroy the enemy on his own terms. This is what was required of the 19th Engineer Battalion, 35th Engineer Group in many of their recent construction operations.

Transformation from engineer to infantryman occurred during the construction of QL-1 from Bong Son to Duc Pho. Many sections of the road were saturated with Viet Cong who continually harassed the engineers. These daily encounters with the enemy, including ambushes and mines, hampered the battalion's progress. To neutralize these attacks the 19th initiated mine sweeps and recon patrols on a regular basis and added two amored vehicles to their contingent.

The need for further security required that two companies, Charlie and Delta, be reorganized. Their mission would be to provide the necessary fire support for the crews working on the roads. Before this plan could be implemented, however, the men had to receive more training in various infantry skills. The techniques taught included patrolling, ambush, and care and use

Grieco

Two men of the 19th keep alert for Charlie (left). Artist Dennis Baccheschi presents his conception of a mine sweep

of weapons.

Soon after the training was completed it was put to the practical test. The men of Alpha Company took part in operations with the 3rd Brigade, 1st Infantry Division and also provided security between LZ Lowboy and LZ Charlie Brown. Company A recon patrols went out as far as one kilometer from the connecting artery between the two LZ's, QL-1.

A minimum of 70 men per day were involved in the search and clear missions being carried on by Delta Company. Support demolition missions with the 3rd of the 1st Infantry were also conducted and resulted in 138 enemy bunkers and tunnels being destroyed.

Teamwork was not just a slogan used by these engineers, it was a conditioned reaction. The men responded quickly and effectively against all enemy activity and despite the heavy contact, the morale was high. As a result of their prowess under combat conditions the men of the 19th became known as the "Fightingest Engineer Battalion in Vietnam."

When their job was done on QL-1, the men of the 19th moved to Camp Smith near Bao Loc. Their construction responsibility there was to upgrade fifty miles of National Highway QL-20. The area at Camp Smith had been vacated when the Idaho National Guard's 116th Engineer Battalion went home. In this new area the 19th continued to conduct their own mine sweeps and recon patrols. Previous experiences with the enemy on QL-1 were valuable for them on the new project because they still had to deal with roadblocks, booby traps, ambushes and sniper fire.

On one such occasion Captain Robert W. Lane Jr., commanding officer of Alpha Company, was with a convoy of three vehicles on QL-20 just south of Bao Loc. As the men rounded a bend in the road on Blao Pass they were confronted with a roadblock. When they stopped they were pinned down by a hail of small arms fire. A reaction force was deployed from Bravo Company to blow the roadblock and to allow the convoy to continue to Battalion Headquarters.

The knowledge gained by the engineers in combat skills while they worked on QL-1 played an important part in the success of the QL-20 project. "QL-1 was the real test of combat" said Lieutenant Colonel Wilson P. Andrews, executive officer, 18th Engineer Brigade, and former company commander of the 19th. "Because of the experience the men gained on QL-1 they were able to respond more effectively on the QL-20 project."

The engineers of the 19th Engineer Battalion have proven themselves capable soldiers in a combat situation. This has enabled them to continue their progress on construction projects despite enemy resistance. They have learned to adapt to any situation. The 19th was able to reorganize itself into an effective combat unit while at the same time carrying on its prescribed mission. These are the things that make a combat engineer unit.

Grieco

Engineers from the 19th begin their search for VC booby traps.

WHAT DID YOU DO IN THE WAR, DADDY?

By Specialist Five Richard D. Holtz

If you are an engineer in the Republic of Vietnam you could reply:

I helped to:
Complete roads in Vietnam under the 1969 Lines of Communication Program equivalent to a 2-lane highway from Chicago to Philadelphia.

Clear over 250,000 acres of Vietnamese land of primary growth in 1969, or an area larger than New York City. Much of the cleared land is now being used for farming where once there was only jungle.

Crush enough rock for use in military projects in Vietnam during 1969 to fill a stack of CONEX containers reaching 380 miles into the sky—through the first three layers of the earth's atmosphere and 80 miles into the last one.

Utilize enough peneprime in 1969 to fill a line of 5,000 gallon tankers over 38 miles long and enough asphalt to fill an additonal 35 miles of tankers, as well as a quantity of cement enough to add 104 miles of 5-ton dump trucks to the convoy.

Produce enough crushed rock each week to fill a line of 5-ton dump trucks 78 miles long. Asphaltic concrete produced in the same period would account for an additional 14 miles of trucks.

Expend some 72 million man hours on projects in 1969. To equal this, a 144-man company would have to work 24 hours a day for 57 years.