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ago, d/a ltr, 29 apr 1980

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**DEPARTMENT OF THE ARMY  
OFFICE OF THE ADJUTANT GENERAL  
WASHINGTON, D.C. 20310**

IN REPLY REFER TO  
AGAM-P (M) (9 Feb 67) FOR OT

10 February 1967

**SUBJECT:** Operational Report - Lessons Learned, Headquarters, 20th Engineer Battalion (Combat)

**TO:** SEE DISTRIBUTION

1. Forwarded as inclosure is Operational Report - Lessons Learned, Headquarters, 20th Engineer Battalion (Combat) for quarterly period ending 31 October 1966. Information contained in this report should be reviewed and evaluated by CDC in accordance with paragraph 6f of AR 1-19 and by CONARC in accordance with paragraph 6c and d of AR 1-19. Evaluations and corrective actions should be reported to ACSFOR OT within 90 days of receipt of covering letter.

2. Information contained in this report is provided to the Commandants of the Service Schools to insure appropriate benefits in the future from lessons learned during current operations, and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

KENNETH G. WICKHAM  
Major General, USA  
The Adjutant General

1 Incl  
a/s

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HEADQUARTERS  
20TH ENGINEER BATTALION (COMBAT)  
APO San Francisco 96318

EGD-BB-CO

10 November 1966

SUBJECT: Operational Report on Lessons Learned for Quarterly  
Period Ending 31 October 1966 (RCS CSFOR-65)

THRU: Commanding Officer  
45th Engineer Group (Construction)  
APO San Francisco 96316

Commanding General  
18th Engineer Brigade  
APO San Francisco 96307

Commanding General  
United States Army, Vietnam  
ATTN: AVC-DH  
APO San Francisco 96307

Commander-in-Chief  
United States Army, Pacific  
ATTN: GPOP-MH  
APO San Francisco 96558

TO: Assistant Chief of Staff for Force Development  
Department of the Army (ACSFOR, DA)  
Washington, District of Columbia 20310

1. SIGNIFICANT ORGANIZATION OR UNIT ACTIVITIES:

a. General:

At the beginning of the reporting period the Battalion Headquarters, Headquarters Company, Company A and the 584th Engineer Company (Light Equipment) (minus) were located at Ninh Hoa, Republic of Vietnam, with the mission of constructing Standard 2 and selected Standard 4 facilities for the Republic of Korea Army 9th Infantry Division Headquarters and Regimental Cantonment complexes.

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Company (Light Equipment) (minus) were located at Ninh Hoa, Republic of Vietnam, with the mission of constructing Standard 2 and selected Standard 4 facilities for the Republic of Korea Army 9th Infantry Division Headquarters and Regimental Cantonment complexes. Company C (minus) was located at Nha Trang, RVN, to construct Standard 2 and selected Standard 4 facilities for the ROKA 100th Logistical Command and ROKA Hospital complexes. Company B, plus selected items of equipment, one platoon of Company C and the 513th Engineer Company (Dump Truck) (minus) were located at Dong Ba Thin with the mission of completing two bridges on Route QL-1 at that location and turning over construction projects initiated by the battalion to the 577th Engineer Battalion (Construction), newly arrived in RVN.

On 3 August 1966 the 513th Engineer Company (DT) (-) was relieved from attachment to the 20th Engineer Battalion (Combat) and was attached to the 577th Engineer Battalion at Dong Ba Thin. Company B and one platoon of Company C were placed under operational control of the 577th Engineer Battalion for completion of bridge construction.

Both bridges at Dong Ba Thin were completed on 8 August 1966. At this time the platoon of Company C moved to vicinity of Nha Trang to join its parent unit. Company B initiated preparation for movement to Ban Ma Thuot for the construction of a United States Army Brigade cantonment area at that location. The movement was made to Ban Me Thuot on 15 and 16 August 1966. In conjunction with road opening of Route QL-21 for the Company B movement, one platoon, Company A, was committed to combat support to emplace and remove an M4T6 bridge for a by-pass at BQ532132.

Concurrent with construction at the ROKA Divisional and Regimental Cantonments at Ninh Hoa, Company A installed an M4T6 bridge and approaches on Route QL-1 to by-pass bridge destroyed at BP990740 during the period 23 to 31 August 1966.

Concurrent with construction at the ROKA Logistical and Hospital Cantonments, Company C supported the Nha Trang Sub-Area Command with a concrete mixer for cantonment construction and ARVN forces with heavy construction equipment and technical assistance for road and bridge construction.

On 3 September 1966 one company of the 101st Airborne Division was deployed in the vicinity of Ninh Hoa for conducting search and destroy operations. On 4 and 5 September this company was reinforced by an additional infantry company and one battery (-) of artillery. This operation continued through 10 September. The 20th Engineer Battalion supported the infantry/artillery operations by providing demolition teams in support of offensive elements, security for bridge sites and command posts, and logistical support consisting of hot meals, water and ammunition resupply.

On 10 September 1966 the 502d Infantry was committed to the defense of the hamlet of Long Hoa (CQ182132). Concurrent with movement of that force to Long Hoa, Route QL-1 was opened from Ninh Hoa to Tuy Hoa. One platoon of Company A was placed in direct support of the 502d Infantry in defense of the hamlet. One squad plus of Company A provided mine and demolition reconnaissance

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for the convoy movement. Convoy control and command was assigned to the Commanding Officer, Company A. The route was opened from Ninh Hoa to Tuy Hoa on 14 September 1966. Defense of the hamlet terminated on 16 September with Company A elements returning to Ninh Hoa.

On 11 and 12 September 1966 the ROKA Logistical Cantonment project was turned over to the 577th Engineer Battalion and Company C joined the battalion at Ninh Hoa.

On 16 September one platoon of Company B was moved by air to Nhon Co to rehabilitate a C-130 airfield and clear areas for two infantry battalions and two airmobile companies. On 10 October this platoon was placed under the operational control of 45th Engineer Group and is still at that location.

On 22 September 1966 Company B (-) departed Ban Me Thuot for the mission of constructing a C-130 airfield and related facilities at Phu Tuc. The quarry and rock crusher personnel and selected equipment of the 584th Engineer Company remained at Ban Me Thuot to continue quarry operations. Company B (-) closed at Phu Tuc on 25 September. On 10 October 1966 Company B (-) was placed under operational control of 45th Engineer Group and is still working on the Phu Tuc airfield.

On 5 October 1966 45th Engineer Group assumed operational control of Company A. Company A was reorganized as infantry, attached to the 4th Infantry Division, and moved to the vicinity of Long Hoa (CQ182132) for defensive operations. During this attachment Company A conducted outpost, combat patrols and ambush site operations commensurate with its mission. On 13 October 1966 this operation was terminated with personnel elements of Company A rejoining The battalion at Pleiku on 15 October. A rear detachment of Company A moved to Ninh Hoa to coordinate air shipment of equipment and vehicles to Pleiku.

On 5 October 1966 the Battalion Headquarters, Headquarters Company, Company C and the 584th Engineer Company (LE)(-) moved from Ninh Hoa to Ban Me Thuot. These elements established a temporary camp awaiting security forces for the remainder of the trip to Pleiku. While at that location clearing operations and Standard 2 road construction of the Brigade cantonment were completed. On 10 October 1966 the last leg of the move was made to the 4th Infantry Division's Dragon Mountain Base Camp and the battalion was placed under the operational control of 937th Engineer Group (Combat). Present CP location is AR802337. Assigned missions and projects include:

1. Construction of a 10,200 foot, six inch diameter, pipeline with pumping facilities and a 1,000 barrel storage tank for the 4th Infantry Division base camp water supply.

2. Construction of a 1,000 foot forward liaison airfield for the 4th Infantry Division base camp.

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Hqs 20th Engr Bn (Cbt) Memo 415-3, dtd 20 Sep 66, Cont'd

(1) File folder(s), marked to show project number, title and location. Folders will be sequentially numbered for each project, where more than one folder is required to contain project files.

(2) Construction directives and changes thereto by date, with the earliest at the bottom.

(4) Construction plans, identified in paragraph 6. above.

(5) Design and construction progress reports.

(6) Project completion reports.

c. Construction and as-built drawings are considered to be a part of the project file but will normally be maintained in shelf or tube file for convenience.

d. Files will be held and disposed of in accordance with AR 345-215.

9. PROJECT SUPERVISION AND MANAGEMENT:

a. All commanders will insure that projects are competently managed. Such management implies the continuing and effective utilization of manpower, materials and equipment through thorough planning, task organization and site supervision. In this regard, constructing unit commanders will appoint for each assigned project a project officer and NCO. To the extent practicable, the existing chain of command and unit integrity will be preserved.

b. Project officers (and NCO's) are charged with the following specific responsibilities:

(1) Managing and supervising the project, consistent with the guidance of a. above, such that project plans, specifications and field changes are followed in prosecution of the work.

(2) Maintaining a current and accumulative account of man hours, equipment hours, materials and project statistics which will support the Design/Construction Progress Report. In computing man hours to be charged against a project the following categories will be used:

(a) Reportable personnel:

1. All personnel actually working on the job, either at the site or another area.

2. Tool room keepers.

3. Drivers who are supporting the job in any way.

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information came from this source. Information gathered was disseminated at daily staff meetings. In addition, a daily liaison was established with the Republic of Korea Army forces which were assigned the mission of securing the work sites and providing security for battalion work parties.

With the battalion isolated and responsible for its own physical security it was necessary to prepare a new physical security plan which complied with current requirements of higher headquarters. This plan was effectively used by all companies of the battalion whether they were located at the base camp or separated from the battalion at isolated locations.

With the relocation of the battalion (-) to the vicinity of Pleiku, it was integrated into the overall defense plan of the 4th Infantry Division Dragon Mountain Base Camp.

The battalion has contacted all major units in the Pleiku area for up to date combat and engineer intelligence information. Security of work parties and engineer reconnaissance patrols is being provided by the 4th Infantry Division.

Due to the critical shortage of rock and sand in the Pleiku area, extensive reconnaissance have been initiated to discover new sources of these materials. General reconnaissance are also being made in conjunction with newly assigned projects.

d. Operations and Training:

(1) Dong Ba Thin Military Complex:

Preparation for turnover of the Dong Ba Thin Military Complex to the 577th Engineer Battalion took place in the first part of the reporting period. Company B, one platoon of Company C and the 513th Engineer Company (DT) continued with the mission of constructing two bridges on Route QL-1 over interceptor drainage ditches and with fill operations. All other projects in the area were turned over to the 577th Engineer Battalion prior to the beginning of the period.

After all elements had cleared the Dong Ba Thin area the battalion found itself engaged in three separate projects at three locations. Headquarters Company, Company A and the 584th Engineer Company (LE) were located at Ninh Hoa for the purpose of constructing a Standard 2 cantonment for the 9th Infantry Division, ROKA. Also included in this project was supervision, technical assistance and equipment support to the ROKA troops while they accomplished Standard 4 construction. Company C was located at Nha Trang with the purpose of constructing the 100th Logistical Command, ROKA, Headquarters and Cantonment, including the complex facilities of a mobile army

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surgical hospital. Except for the hospital, which consisted largely of quonset construction, the requirements for this area closely paralleled those of the Ninh Hoa area. As stated earlier, Company B moved to the vicinity of Ban Me Thuot to construct a cantonment to Standard 2 requirements for a United States Army Brigade.

(2) ROKA Construction Projects:

Viet Cong mine warfare activity in the Ninh Hoa area accounted for damage to one civilian vehicle, one ROKA vehicle and two  $\frac{1}{2}$  ton trucks belonging to the battalion. All four occupants of one  $\frac{1}{2}$  ton were injured, the officer in charge to such an extent that he was evacuated to the United States. The second  $\frac{1}{2}$  ton incurred only minor damages to the vehicle and minor injuries to personnel. In order to prevent further injuries to unit personnel a system was devised by the 584th Engineer Company to sweep project area roads for pressure type mines using organic equipment. A conventional dozer was converted to a mine sweeper by the attachment of a mounting which permitted the attachment of a sheepsfoot roller to the front of the dozer blade. Two brackets were welded to the dozer blade to allow rapid attachment and detachment of the roller; these brackets did not affect the majority of the dozer's normal tasks. The tongue of the roller was left attached and was supported by a cable and turnbuckle system to the top of the dozer blade. The entire device could be lifted from the ground to allow steering in confined areas. While sweeping the dozer carried its blade in a float position and walked the sweeper over suspected areas.

Semi-skilled indigenous personnel were effectively utilized on the 9th Infantry Division, ROKA, Headquarters are for the construction of culverts, prefabricated structural sections and placing concrete. This provided an opportunity to free military labor for more necessary and complicated tasks and greatly expedited the general construction progress. Worthy of note is the fact that these skilled laborers were proficient at their professions, interested in the task at hand and loyal to the allied forces to such an extent that an absolute minimum of military supervisors were required.

After Company C closed into the Ninh Hoa project area upon being relieved from the 100th Logistical Command complex by Company D, 577th Engineer Battalion, each of the three companies assumed separate tasks in order to provide more construction effort on the ROKA 9th Division Headquarters. The major jobs were vertical, road and culvert construction. It was soon learned that there had to be a system of very close coordination between these construction forces - especially those working on roads and culverts. The culvert construction force had to, in all cases, precede the road force to insure that culverts were emplaced before road construction was begun in the area. This was especially true of construction over ravines, gullies and swales. It was also necessary to precede all road and culvert construction with a workable drainage plan for the entire area.

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The 100th Logistical Command complex at Nha Trang was an exercise in turnover of construction projects. To review, the project was originally assigned to Company B, 39th Engineer Battalion (Combat), and subsequently taken over by Company C of this unit. At the beginning of the reporting period Company C was in complete control of the project. After the third week of the reporting period Company D, 577th Engineer Battalion was assigned the task of vertical construction in the hospital area. Eventually, equipment of the 577th Engineer Battalion augmented that of Company C in horizontal work. The total construction of the hospital complex was then assigned to the 577th approximately one week later. On 11 September 1966 the entire Nha Trang project was assumed by the 577th Engineer Battalion. Although necessary for progressive construction efforts within the 45th Engineer Group, these constant alterations of responsibilities were somewhat disruptive to the battalion.

(3) United States Army Brigade Cantonment, Ban Me Thuot:

Company B experienced two distinct problems while engaged in the construction of the US Army Brigade cantonment in the vicinity of Ban Me Thuot. Because the terrain was level and the topsoil had a tendency to become very unstable under wet conditions it was decided to clear the variable underbrush causing a minimum disturbance to the topsoil. After unsatisfactory attempts at both forward and backblading it was found that heavy brush could be cleared by forward dozing with the blade in a float position and light brush could be effectively eliminated with a grader.

In attempting to locate a site for a rock crusher much difficulty was encountered finding a suitable bedrock source that would prove to be lasting. The prime reason for this is that the geologic report was 30 days late and verbal recommendations were misinterpreted. With the arrival of the written geologic report the recommended source was readily located and production began immediately.

(4) Reconnaissance Missions:

During the reporting period the battalion performed many reconnaissance missions. These missions included:

(a) Reconnaissance and engineer work estimate of the road from vicinity Plei Kly (AR867008) to vicinity of Plei Me (ZA165065) to the end of the reconnaissance at Ia Tae (river) vicinity ZA043038. The engineer work estimate was for upgrading the road to Class 31, two way/Class 50, one way, all-weather standards. This mission was performed in late August. A copy of the report is on file for future reference.

(b) In late September the mission of reconnoitering Route TL-7B from the vicinity of Cheo Reo (BQ2483) to Phu Tuc (BQ5059) was performed. A copy of this report is on file for future reference.

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(e) After arrival at Pleiku, Company C moved out in support of the 3d Brigade, 25th Infantry Division and the 4th Infantry Division on Operation PAUL REVERE IV. The mission involved the construction of bridges and by-passes along the main supply route and the installation of culverts and a bridge on an adjacent route in the area of operations. Tasks included the construction of a timber bridge, installation of two Armored Vehicle Launched Bridges (AVLB) and the erection of one M4T6 dry span bridge. The AVLB's and M4T6 components were furnished by the 4th Engineer Battalion. While on this operation one of Company C's dump trucks was damaged by an enemy mine resulting in minor injuries to three personnel. At the end of the reporting period Company C was still committed to this mission.

(f) During the third week of October, Company A provided one platoon for road maintenance of one of the 4th Infantry Divisions LOC's. The mission was to maintain the road passable for supply convoys.

(g) Near the end of the reporting period Company C furnished one squad to Phu Nhon to construct bunkers for Special Forces personnel. Company A constructed a parking area 180 feet by 450 feet for C-130 aircraft at Poley Djereng Airfield, improved the drainage system and constructed gun positions at that location. Company A also accomplished a deliberate reconnaissance and engineer work estimate of another airfield with a future project of bringing it to C-130 standards in mind.

(h) Upon arrival at Pleiku the 584th Engineer Company was assigned the tasks of building a forward liaison airfield at the Dragon Mountain Base Camp, initiating rock quarry and laterite pit operations, and bringing Route QL-19 up to Class 35, two way/Class 50, one way, all-weather standards. At the end of the reporting period the 584th was still actively engaged in these projects and progress was going well.

(6) Training:

Since a large percentage of replacements continued to arrive with non-engineer MOS, the OJT program continued to receive a great deal of command emphasis.

The training program has been directed toward the achievement of assigned and potential missions. To better delineate the requirements for this type of training, a new battalion memorandum was published during the quarter.

e. Logistics:

(1) Labor: As stated earlier, the battalion utilized indigenous Aid in Kind (AIK) personnel for much of the construction work on the 9th Infantry Division (ROKA) Headquarters with satisfactory results. For simple unskilled labor, Montagnard personnel have been utilized at Pleiku with outstanding results. While located at Ninh Hoa, the battalion laundry and barber shop were staffed by indigenous personnel. At Pleiku, two barbers have been employed to date.

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// (2) Maintenance:

Maintenance and repair parts support for the battalion remained a critical problem throughout the reporting period. The move to Pleiku caused a shift in support activities from Nha Trang to Pleiku. This caused a lag in the requisitioning and receipt of repair parts. To minimize problems the battalion sent personnel to Nha Trang to expedite the flow of repair parts to the new location.

The support activity in the Pleiku area was not geared to assume the additional work load of engineer equipment caused by the arrival of the battalion and the 584th Engineer Company. Plans are currently under way to increase the engineer support maintenance capabilities in the Pleiku area. This should alleviate the problem of maintenance support, but no relief is in sight for the repair parts problem.

(3) Supply:

Due to two major moves accomplished by the battalion, the maintenance of adequate lines of supply has become a major problem. From January to October this unit was located within traveling distance of its primary source of Class II and IV supplies - Cam Ranh Bay Depot. In October the battalion deployed to Pleiku and resupply from Cam Ranh Bay Depot was impractical. The Depot found itself unable to forward supplies with any guarantee of arrival at Pleiku. To insure the delivery of previously requisitioned items, the S-4 placed a rear detachment at Cam Ranh Bay to receive and forward supplies on available aircraft. Until supplies begin arriving from Qui Nhon, this unit will be dependent on materials requisitioned through Cam Ranh Bay Depot.

The move made by this battalion was accomplished utilizing TOE equipment. As a result many supplies and pieces of equipment not capable of traversing the routes of march were shipped from Nha Trang to Qui Nhon by LST and trucked to Pleiku. Approximately 76 Conex containers were shipped. Some loss was encountered due to pilferage, but the shipment through transportation channels was very successful. A party of guards was sent along to insure delivery of supplies and equipment.

As a result of operational missions assigned to subordinate units in isolated locations, it became necessary to resupply the units by air. Supplies were acquired from depot sources and stored in the battalion area. As aircraft became available supplies were flown to the units on a priority list established by the units. Approximately 39 tons of all classes of supply were flown into isolated areas during September and October.

f. Medical:

During the quarter 1,133 outpatients and 52 quarters patients were treated in the battalion aid station. Twenty-seven patients were hospitalized, two of whom were evacuated for more extensive treatment. Among all patients were 12 injuries and one death attributed to combat.

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The medical section has maintained its suspense file on immunization records to insure adequate and timely immunizations for all personnel.

The move to the Central Highlands of Vietnam has required the addition of Dapsone (DDS) tablets to the chemoprophylaxis regimen. A very practical solution to insure the daily dosage for each man has been roster distribution at squad and section level.

g. Communications:

The battalion was issued the new AN/VRC-12 series of radios at the beginning of the reporting period. The issue of these radios has greatly improved the FM communications capability of the battalion. Each company has one AN/VRC-47, four AN/VRC-46 and nine AN/PRC-25 radios.

During the period long distance communications became a problem with units located in remote areas. AM nets with units at distant locations were maintained but were not always reliable due to distance, weather and radio sets. Single Side Band relays through Special Forces and MACV channels were used to fill the gaps when necessary.

Considerable difficulty was experienced with VHF circuits. It was found that particular attention had to be given to the lines to the VHF vans and to the circuits themselves.

Maintenance of the new series radios was a real problem while the battalion was located at Ninh Hoa due to lack of field maintenance facilities in Nha Trang. At Pleiku, however, maintenance support is greatly improved with expeditious repair and return of radio sets to this unit. Maintenance became a critical problem with the AN/GRC-19 radios. At one time only two sets of five on hand were operational, leaving no back up for the two stations. After maintenance support was advised of this situation radios received immediate priority for repair.

h. Civic Action:

The battalion received a MEDCAP team number on 10 August, but unfortunately this approval was only for the Ba Ngoi Sub-Sector area, the location of the battalion's civic action programs while located at Dong Ba Thin, and could not be transferred to Ninh Hoa. A request for a new MEDCAP team number and account number has been submitted.

During the period the battalion was located at Ninh Hoa the Battalion Medical Section assisted the Ninh Hoa MACV Medical Advisor in a MEDCAP program for the people of Ninh Hoa. In all, 487 patients were examined and treated on six different occasions. The Medical Section also made a one-time visit to a Montagnard village in the Duc My area to instruct the inhabitants on proper, elementary medical care.

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Other civic action projects in the Ninh Hoa area consisted of: constructing a wooden gate at the entrance to the District health facility; recovering a disabled Vietnamese vehicle which had been accidentally driven off a bridge into a river; assisting in the installation of a generator into the Ninh Hoa electrical power system and instructing local personnel in the proper maintenance and operation of the generator; and the construction of a series of earth dams with wooden flood gates to control the flow of water.

Upon arrival in the Pleiku area, the Battalion Civic Action Officer coordinated with the G-5 of the 4th Infantry Division on possible areas where the battalion can perform civic action.

2. COMMANDER'S OBSERVATIONS AND RECOMMENDATIONS:

Part I, Observations:

a. Personnel: None

b. Operations:

(1) Item: Control of construction missions by a combat engineer battalion.

Discussion: As this unit received more and more construction missions it was evident that a means of implementing, managing efficiently, controlling and reporting all phases of troop construction was necessary.

Observation: Battalion Memorandum 415-3 (Inclosure 1 of this report), "Construction SOP", was published this quarter to better define standard policies and procedures while the battalion is engaged in construction missions.

(2) Item: Forming concrete pads.

Discussion: To insure that all pads are square, form diagonals must be measured before pouring concrete. If this is not done, there is a good chance that the pad will not be square and both time and materials will be wasted on reconstruction.

Observation: Diagonals must be checked on all forms before pouring concrete.

(3) Item: Uniform.

Discussion: It was found that one canteen is not sufficient to sustain an individual on a combat support mission in the climate of Vietnam. Halizone and salt tablets are a must for this type of operation. It was also discovered that protective vests are too hot to be worn on foot movements and their use may result in heat casualties. Suspenders must be worn to take the load off the hips and allow for more freedom of movement.

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Observation: The following uniform should be considered standard for one day combat support with variations to fit the situation:

Pistol belt with suspenders  
Two magazine pouches  
First aid pouch with packet  
Two canteens  
Bayonet  
Combat pack with poncho, halizone and salt tablets, clean socks and mosquito repellent.

(4) Item: Demolition.

Discussion: Demolition teams operating with the infantry soon discovered that 20 pounds of explosives was about the maximum amount an individual could carry and still maintain the pace. In addition, most bunkers and fortified houses destroyed were entirely demolished with two or three pounds of explosive. Since most of these structures were of mud and log construction, TNT proved most effective. Speed can be achieved by carrying prepackaged two or three pound charges with one or two five pound charges per team.

Observation: Each man designated to carry demolitions should be outfitted with 20 pounds of TNT pre-packaged into two and five pound charges.

(5) Item: Demolition accessories.

Discussion: If all accessories for a demolition mission are carried by one person in one bag, the effectiveness of that team can be totally voided if that bag is lost.

Observation: An extra box of blasting caps, 10 to 15 feet of time fuze, one set of crimpers and ten fuze lighters should be carried by an individual other than the one carrying the accessory bag. This would give the team a ten charge capability if the accessory bag were lost or destroyed.

(6) Item: Sandbagging vehicles and locking seats down.

Discussion: It has been observed that sandbags are an effective means of protection against shrapnel and blast effect due to land mines and quite often can mean the difference between life and death. Also, the seats of  $\frac{1}{2}$ -ton vehicles should be securely fastened.

Observation: All troop carrying vehicles and the beds of heavy trucks utilized as troop carriers should be well sandbagged.

(7) Item: Installation of culverts.

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Discussion: During this quarter it was necessary to install culverts in areas that did not present a suitable foundation, such as swift stream beds. In these cases foundations had to be fabricated which would distribute weight placed on the culverts sufficiently so that they did not sink or become misaligned. Also, after the culverts were installed under these conditions they had to be braced to avoid damage during back filling operations.

Observation: All available and necessary local materials (rocks, logs, etc) must be used to construct a timber frame for culverts being installed in soft, unstable areas to insure proper foundation and bracing.

(8) Item: Ambush reaction.

Discussion: During an ambush of a platoon by a force of approximately ten Viet Cong, the immediate reaction of those being fired upon accounted for three of the enemy being killed with only three minor injuries in the platoon. By this reaction the surprise and initiative of the enemy were taken away and they broke contact. However, if more weapons were used effectively even more of the enemy force would have been destroyed.

Observation: It is basic to be ever ready in the event of an ambush, but in such instances personnel must be able to use all of their weapons effectively and quickly.

(9) Item: Combat support operations.

Discussion: This unit has had the opportunity to provide combat support for divisional units and many lessons were learned in regard to movement, security, communications, resupply and coordinating with supported units.

Observation: Unit resupply must be timely so as to never delay operations. Unit requirements must be made known as soon as the need for them is realized. Communications must be maintained at all times to continuously gain as much information about the current situation and future missions as possible. Definite and accurate coordination with supported units and security is essential, for any misunderstanding could lead to catastrophe. The unit should be prepared to assume a new mission on minimum notice.

(10) Item: Bridging and fording.

Discussion: During recent combat support operations it was learned that all factors must be considered to determine whether a river crossing site is suitable for a ford or bridge. Bank and stream bottom conditions must be tested, the availability of local materials has to be considered, and the availability of tactical bridging must be known. In several cases it was not possible to by-pass or ford rivers because of unsatisfactory water depth and velocity and poor site conditions.

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Observation: In tactical operations it is as important to save time as well as equipment. It is necessary to promptly select a course of action that will cost the least amount of time, energy and materials in order to allow traffic to pass critical point on a timely basis.

c. Training and Organization:

(1) Item: Organization for demolition teams.

Discussion: After two demolition missions were completed it was found that five men make an efficient team. This allows each team to carry enough explosives to accomplish its mission, yet it doesn't become unwieldy.

Observation: The following demolition team will meet most requirements and can give complete support to a platoon of infantry:

Team leader equipped with accessory bag  
Radio-telephone operator equipped with AN/PRC-25  
Three demolition men equipped with 20 pounds of explosives each, prepackaged into two and five pound charges.

(2) Item: Command of troops in vehicles.

Discussion: It has been observed that during tactical vehicular movements the vehicle commander, specifically squad leaders, usually ride in the cab of the vehicle. If the vehicle is ambushed during such a movement the troops in the bed of the truck are disorganized and may panic due to lack of leadership.

Observation: Vehicle commanders should ride in the beds of vehicles with their troops during tactical vehicle movements.

(3) Item: TO&E items.

Discussion: When an engineer company is reorganized as infantry most engineer TO&E items of equipment are left behind. This usually includes all trailers. The fact that reorganization to infantry has been accomplished is not the critical factor but, rather, whether or not the trucks accompany the unit. The addition of the remainder of the TO&E, including trailers, will not increase the problems of an engineer company fighting as infantry. Guards have to be left on the trucks whether trailers are present or not. All other items can be transported either on the trucks or trailers.

Observation: When an engineer company moves with its trucks and there is a possibility that the battalion base camp may also move, all TO&E items of equipment should be moved with the company.

(4) Item: Extended convoys.

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Discussion: In a move of almost 200 miles, problems were encountered which would not be experienced in short distance moves. Particular problems were communications over long distances, refuelling, inadequate security throughout the convoy, and the overextension of maintenance capabilities as well as a lack of sufficient towing devices in the unit. Operational checks need to be emphasized.

Observation: Special precautions must be taken to insure that all vehicles in an extended convoy reach their destination. This can be accomplished by organizing a rear element with as much recovery capability as possible.

d. Logistics:

(1) Item: Refrigeration equipment.

Discussion: Refrigeration equipment currently authorized TO&E units is inadequate to store perishable foods and cold beverages in the climate of Vietnam.

Observation: Each company size unit should be authorized one 600 cubic foot, walk-in refrigerator for storage of perishable food.

(2) Item: Ice-making machine.

Discussion: Due to the high temperatures in RVN, the need for ice to cool beverages is critical. The supply of ice to this unit has been inadequate since the unit arrived in country.

Observation: The supply of ice could be provided if each company size unit were issued a 400 pound ice making machine. This issue would apply only to those areas where an adequate ice supply is not available.

(3) Item: Use of PLL items.

Discussion: Organizational use of PLL parts for ranges, immersion heaters and weapons exceeds that calculated in formulating the PLL. Resupply rate for these PLL items is approximately six months.

Observation: Establishment of demands for PLL items immediately upon usage is imperative to maintain proper stocks.

(4) Item: Mortar ammunition.

Discussion: It was found that old HE ammunition, due to deterioration, is very inaccurate and unsafe to fire over troops.

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Observation: Old ammunition should be withdrawn and replaced with fresh stock.

(5) Item: Demolition firing systems.

Discussion: One combat support mission required the use of time fuze which was unavailable in the companies. This necessitated using electric firing systems which slowed the teams down to such an extent that they were unable to keep up with the infantry in several cases.

Observation: All companies and the battalion S-4 should keep time fuze on hand. Non-electric firing systems should be used on combat support missions. Time fuze can be pre-cut and fuze lighters attached. Safety precludes the attachment of blasting caps.

(6) Item: Class IV yard operations.

Discussion: During a recent construction project a Class IV yard of MCA materials was maintained by the constructing unit for its own use as well as that of another unit. Accounting for materials and their issue for each project was critical and construction progress was dependent upon the effective requisitioning and handling of these materials.

Observation: It is ideal for a constructing unit to have such control over required materials; however, it requires that unit personnel also forecast requirements for all projects and issue materials so that projects continually progress. An up-to-date inventory is necessary.

(7) Item: Requisitioning.

Discussion: When the main body of the battalion is located a great distance from its subordinate units and the supply source the effectiveness of the supply system is limited by the ability to submit timely requisitions for repair parts, replace major items, and provide necessary follow-up action.

Observation: It is necessary to have a unit representative stay at or near the supply activity and make frequent trips between the supply activity and the unit location to provide necessary coordination.

(8) Item: Supply procedures.

Discussion: Units required to move frequently from one logistic area to another lose valuable requisition time by having to resubmit requisitions after the move. Through frequent moves this unit has had several accounts at several activities: Cam Ranh Bay, Class II and IV; Nha Trang, Class II and IV; Pleiku Sub-Area Command, Class II and IV. The problem is more critical in repair parts where a great number of requisitions are submitted. This has required the unit to send personnel to the previous

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19 supporting activities on frequent occasions to close out supply accounts and to pick up items of issue. In a number of cases requisitions and issues were lost to the unit and no record can be obtained.

Observation: Units required to make frequent moves should requisition directly from depots. This would provide a larger area of supply support for the unit to move and still requisition to the same depot.

e. Other:

(1) Item: Forward suspension system, 20-ton crane shovel.

Discussion: The forward suspension system (leaf springs and shock absorbers) of the crane shovel, truck mounted, 20-ton, M202 (Quick Way model) failed when cranes were utilized to position Conex containers in the rough terrain of the battalion cantonment at Ninh Hoa.

Observation: Though not built for use in rough terrain, the 20-ton crane shovel organic to this battalion must sometimes be utilized as such. When the cranes are utilized on rough terrain, failures develop. It is suggested that cranes organic to combat engineer battalions be of a type suited for rough terrain work.

(2) Item: Communication equipment.

Discussion: It was found that when an engineer company reorganized as infantry there was a serious lack of portable radios. Each squad has one AN/PRC-25 but the company commander and platoon leaders have only vehicle mounted radios. When the company was on foot and the operation or terrain precluded the use of vehicles the entire command structure was without communications. The only recourse was to take radios from the squads to fill the void, but this in turn created a problem which was equally serious.

Observation: In addition to the vehicle mounted radios, each platoon leader should be authorized on AN/PRC-25 and the company commander two AN/PRC-25's (for two net operations, i.e. company and battalion).

(3) Item: Coordination of location by radio.

Discussion: It was found that by assigning certain portions of the map code names as reference points, the location of elements of this unit could be pinpointed with a minimum of confusion.

Observation: A point designator map reference system is a quick and handy method of transmitting locations.

Part II, Recommendations: NONE

2 Incl

1. Construction SOP
2. Statistical Summary of Major Engineer Effort

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/s/ Robert L. Gilmore  
ROBERT L. GILMORE  
LTC, CE  
Commanding

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HEADQUARTERS  
20TH ENGINEER BATTALION (CBT)  
APO US Forces 96240

\*MEMORANDUM  
NUMBER 415-3

20 September 1966

CONSTRUCTION SOP

1. PURPOSE: The purpose of this Memorandum is to establish standard policies and procedures for the implementation, efficient management, control and reporting of troop construction within this organization.

2. APPLICABILITY: The policies and procedures outlined herein will apply to all construction projects and constructing units, regardless of scope of source.

3. GENERAL: The primary TOE mission of this battalion is "to increase combat effectiveness of corps and army by means of engineer combat support and general engineer work". The provisions set forth in this memorandum relate to general engineer work assigned as directed construction projects. Combat support missions, when directed, will be the subject of separate operation orders.

4. CONCEPT:

a. The force structure of this organization for the accomplishment of construction missions is the 20th Engineer Battalion (Cbt) and its attached units.

b. Missions will be routinely assigned to one of the three line companies (Company A, B or C), 20th Engineer Battalion (Cbt), the constructing unit. These companies will be responsible for the accomplishment of the missions. Other organizational assets provided constructing units will, when allocated, unless specifically directed, be in direct support of the constructing unit.

c. Organizational construction equipment assets will be centrally controlled by this headquarters, and allocated for operations in keeping with project priorities and requirements.

5. CONSTRUCTION EFFORT:

a. Priorities of directed construction effort will be in accord with reference 15.u. and Annex A.

\*This Memorandum supersedes 20th Engr Bn (Cbt) Memo 415-2, dtd 5 Mar 66 with Change 3, dtd 22 Aug 66 and Memo 415-3, dtd 22 Mar 66 and rescinds DF, EGDEB-3, subject: Visitor Briefing Folders, dtd 1 Sep 66 and DF, EGDEB-3, subject: Construction Management, dtd 30 Aug 66.

b. Each project assigned to a constructing unit by this headquarters will have two priority designators, one assigned by higher headquarters which is consistent with a. above, and a battalion designated priority which indicates the priority of effort to be given the project in relation to others assigned that unit. These priorities will be included in the project directive to the constructing unit.

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6. PROJECT PLANNING, ESTIMATES AND SCHEDULES:

a. Project directives will normally be formally issued by this headquarters to subordinate units in the format shown in Annex B, r as an indorsement to a project directive from higher headquarters.

b. On receipt of the directive the constructing unit will:

(1) Assign a project officer and NCO (OIC and NCOIC) for the project.

(2) Insure that the following is completed in keeping with the priority of the project:

(a) A thorough project reconnaissance of the construction site/area.

(b) Based on results of the reconnaissance and construction considerations, i.e. weather, time, local resources, equipment availability and construction methods, complete the construction plan.

(3) Submit the construction plan to S-3, this headquarters, in two copies. This plan will consist of the following:

(a) Narrative description of work, the elements of work included within the overall task and site conditions or other factors then known which will adversely affect construction operations. (Relative priority of project can be a limiting factor.)

(b) Construction Schedule and Progress Chart (Annex C). The Construction Schedule/Progress Chart will identify, under construction phases, the major elements (subdivisions) of the task to be accomplished and visually portray how these elements are to be phased, assuming the ideal availability of men, equipment and materiel. This chart will be regarded as a worksheet, both in the constructing unit and this headquarters; it will be used for allocation of resources at organizational and unit level and should serve to fully identify, by work element, those limiting factors which preclude ideal accomplishment. While the bar representing actual progress will be updated daily or as progress is apparent, continuing revision of the bar reflecting scheduled work is not desired; change in the scope of work or design (which add or delete work elements) will prompt revision. The chart, by use of two bars for each work element, should reflect scheduled (ideal) and actual work accomplished and should be used to support project progress reported in Annex G.

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(c) The construction schedule will be supported by realistic work estimates, and documented on the Work Estimate Sheet, Annex D.

(d) A Materials Take Off List - Annex E - will be the basis for the tabulated Bill of Materials - Annex F.

7. DESIGN/CONSTRUCTION PROGRESS REPORTS:

a. Monthly report. This headquarters is required to consolidate and submit design/construction progress reports to higher headquarters on the 15th day of each month. Companies will submit a feeder report to S-3, this headquarters, NLT the 13th of each month for the period 1200 hours the 10th of the preceding month to 1200 hours the 10th of the month of the report. Format for the monthly report is included as Annex G.

b. Weekly report. A weekly construction progress report will be submitted to S-3, this headquarters, NLT 1200 hours each Tuesday for the period 1200 hours the previous Monday through 1200 hours Monday the week of the report. Format for the weekly report is the same as for the monthly report - Annex G.

c. The constructing unit will include as part of the reports all man and equipment hours expended on or in support of the project, to include those personnel and equipment items attached or in direct support. See paragraph 9.b.(2)(a) below.

d. Although not required for progress reports, equipment hours must be maintained by type for the project completion report.

e. Each unit, in addition to the above, will report total man hours devoted to physical security on projects and interior guard during the reporting period.

f. Weekly Rock Production Report. Units designated to have operational control of rock crushers will submit a weekly report to this headquarters NLT 1500 hours Monday covering production for the preceding week. Report format is at Annex J.

g. Daily Project Construction Status Report. A clear, concise statement of progress on each active project will be submitted to S-3, this headquarters, NLT 1500 hours daily by the constructing unit. Report will cover the period 1200 hours through 1200 hours.

h. Daily Strength Disposition Report. Unit commanders will provide S-3 a daily strength disposition report NLT 1800 hours daily. Format for the report is included as Annex I. Strength disposition will be projected for operations during the subsequent 24 hour period. S-3 will consolidate the report for the command.

i. Daily Equipment Status Report. Unit commanders will provide S-3 a daily equipment status report, NLT 1500 hours daily. Format for this report will be as prescribed by S-3. Equipment status will be that existing at the time of the report, to permit allocations to be made for the subsequent 24 hour period. S-3 will consolidate the report for the command.

j. Quarterly Operational Report on Lessons Learned (ORLL): Commanders will submit contributions to this headquarters for consolidation into the quarterly Report on Lessons Learned as outlined in AR 1-19 and USAFV Regulation 870-2. Contributions for each quarter ending in January, April, July and October will be submitted to S-3 NLT the 23d day of January, April, July and October. Significant activity occurring after the 23d but before the end of the month will be reported ASAP for incorporation into the battalion command report.

k. Project Completion Reports. Project completion reports will be submitted on each assigned project NLT three days following completion of the project and in the following format:

- (1) Total hours of troop labor expended on the project.
- (2) Total equipment hours, by item of equipment.
- (3) Exact quantities of materials used.
- (4) A brief summary of the scope of work.
- (5) The actual starting and completion dates.
- (6) Appropriate remarks of the unit commander regarding limiting factors and lessons learned.
- (7) As-built drawings of the completed project will be submitted. The as-built drawing will be the original construction drawing with field changes, etc, indicated in red to provide a working copy from which the final drawing can be developed.
- (8) Pictorial coverage, if applicable. (Photographic assistance will be provided by S-3, on request of the constructing unit.)

8. PROJECT FILES:

a. The office of record for project files is the S-3 Section, this headquarters. Working reference files will be maintained by the constructing unit throughout the period of construction (until a project completion report has been forwarded and approved).

b. The record project file will include:

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5 During this period this organization suffered 20 casualties: one man killed in action and 19 men wounded in action. At the close of the reporting period 16 Purple Hearts had been received by members of this command. Four recommendations for the Purple Heart are pending. In addition, 60 individuals have been recommended for awards for meritorious service and achievement. Five men have been awarded the Bronze Star Medal with "V" device for their actions in an encounter with the Viet Cong.

The battalion has an active command orientation program. A briefing of all newly arrived personnel is given by the Sergeant Major. These briefings include such topics as the United States mission and aims in Vietnam, the particular mission of this battalion, local customs and traditions, personal security, the chain of command and command relationships. The Battalion Chaplain covers moral and religious obligations of the individual and briefs personnel on the schedule of religious services within the 4th Infantry Division base camp.

Disciplinary problems within the command have been minimal, involving 15 courts-martial during the period, of which 12 were summary courts.

Local nationals were employed for the first time on a permanent hire basis. The results of using nationals to work on MCA projects proved to be very satisfactory. In all, three masons, two electricians, 20 carpenters and one interpreter were hired. The quality of their work was excellent and they were reliable. Their supervision required a minimum number of military personnel, therefore increasing the productivity of the battalion.

While the battalion was located at Ninh Hoa, continued improvements were made to the battalion chapel tent. On moving to Pleiku, however, the majority of chapel furniture was left behind due to lack of transportation. At the present, field expedient seating is being utilized. As materials become available new furniture will be constructed.

The Battalion Chaplain visited the companies when separated from the battalion on a once a week basis. During these visits worship services were conducted.

Roman Catholic coverage was provided by Roman Catholic chaplains from Nha Trang and Ban Me Thuot.

Jewish personnel were afforded the opportunity of attending High Holy Days services in Nha Trang. Otherwise, Jewish chaplain coverage has been inadequate due to the insufficient number of Jewish chaplains in Vietnam.

Intelligence:

During August and September with the movement of the battalion into an active area where it was entirely dependent upon its own resources for defense, the gathering of combat intelligence became of prime importance. Daily visits were made to the MACV Sub-Sector, Ninh Hoa, to keep abreast of the Viet Cong activity in the area. MEDEVAC, artillery support and most intelligence

4. Welders who are cutting or welding materials for the job.

5. Supervisors on the job site.

6. All personnel attached to or supporting the constructing unit who are working on the project, (e.g. equipment operators, surveyors, etc.)

7. Mobilization and demobilization time.

(b) Non-reportable personnel:

1. Administrative personnel (1st sergeants, clerks, etc).

2. Mess personnel.

3. Drivers and operators not supporting the project.

(3) Insuring that the construction policies and practices (paragraph 10.) and construction safety and police (paragraph 11.), as they relate and apply to their project, are observed.

(4) Orienting thoroughly all personnel employed on a project as to the nature and objective of the work, practices relating to job safety and security which will be observed as well as standards of work expected.

(5) Maintaining and identifying on the job site at all times a senior individual who is knowledgeable of the current operations, assets employed, the daily work plan, projected beneficial occupancy date (BOD) and the estimated date of completion (EDC).

(6) Insuring that the materials incorporated in the work are of good quality such that safety or good engineering practices are not violated.

(7) Reporting promptly to all visitors and/or inspectors to the project site and have in his possession for briefing such visitors the following data and notes:

(a) A blueprint or plan of the project. This plan should show by color code the particular building in an area being worked on or the amount of roads completed, that which is pioneered, etc.

(b) A construction schedule showing progress and total scope of work.

(c) A project briefing sheet as shown at Annex H.

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c. The foregoing responsibilities of project personnel are regarded in this command as extensions only of the unit commander's responsibility so as to permit effective direct project supervision. It is the policy of this headquarters to utilize the chain of command on project matters requiring direction or redirection. Only in instances involving personnel safety, abuse of equipment or material assets or apparent violations of project directives will on-the-spot corrections or modifications be made by members of the staff or command group.

d. Unit commanders will additionally be responsible for:

(1) The early and continuing identification of mission limiting factors which preclude the accomplishment of the scheduled work. Such limiting factors will be promptly reported to S-3.

(2) Prompt corrective or support actions, within their capabilities, to rectify unsafe conditions or malpractice, restore damaged work and forestall or eliminate project bottlenecks.

(3) Frequently inspecting the project sites for work assigned.

(4) The timely and accurate submission of reports.

(5) Providing organic equipment to projects in accordance with allocations by S-3.

e. The Battalion Commander, Executive Officer and personnel of the S-3 Section will frequently conduct inspections of the work at project sites. Inspectors or visitors from other headquarters may be expected. To the extent possible, the Battalion S-3 will advise unit commanders of visits or inspections by personnel outside this headquarters, and in all cases will arrange to accompany them or provide a knowledgeable escort officer. All such visits will be reported to the Command Group. Staff visitors or inspectors from Headquarters, 18th Engineer Brigade, Headquarters, USARV or Headquarters, USMACV will be encouraged to have an exit interview with the Battalion Command Group.

#### 10. CONSTRUCTION POLICIES AND PRACTICES:

a. General. Quality construction is considered essential and the normal standard for every project assigned this battalion. Quality control is a continuing effort to insure quality construction and involves training, planning, testing and inspection to insure that each phase or element of work results in high standards expected of the 20th Engineer Battalion and the Corps of Engineers. In a theater of operations, where critical material shortages or lack of an ideal piece of equipment may be expected, it is the responsibility of the entire command to utilize the materials and equipment available to their best advantage and demand first class workmanship.

b. Methods and Techniques. Department of the Army Field Manuals and Technical Manuals of the "5" series and supplementary Special Texts of the USAES, covering construction methods and techniques of virtually every type of field engineering requirement, are available in this headquarters. In particular, references 15.c. through s. relate to construction of foreseeable interest to this battalion and will be utilized as necessary for planning, field engineering and inspection. Questions relating to methods or techniques, which reasonable research does not answer, will be referred to S-3, this headquarters, at the earliest possible time.

c. Initiative and Expedient.

(1) Constructing units are encouraged to seek and exploit safe methods, which are consistent with good engineering practice, that will result in saving of time, material or manpower. Expedients, which yield quality construction and desired utility, may be used to avoid delays occasioned by shortages; expedients will be employed only upon approval of the Battalion S-3.

(2) Constructing units will continually estimate the situation and be prepared to execute alternate courses of action which will permit construction progress on each project, in the event circumstances beyond their control preclude construction according to previously prepared plans.

d. Quality Control Practices.

(1) Constructing units will manufacture test and quality control devices deemed appropriate for the projects assigned and utilize these, in addition to other devices available within the battalion, to assure quality work. Such devices include, but are not limited to, slump cones, assembly jigs for vertical construction, galvanometers, line pressure gauges, line levels, plumb bobs, batter boards, test beams and pumps.

(2) Requirements for survey support and soil tests should be requested of S-3, this headquarters, as much in advance of the time required as possible. In this regard in-place CBR tests are required for all projects specifying soil bearing capacities.

e. Drainage.

(1) Prior to any construction, an adequate drainage plan will be developed and checked to insure the least damage to construction ultimately, as well as during the progress of the work. S-3 will routinely provide lines and elevations as well as specify the type of drainage structures to be employed.

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(2) Provisions will be made during the course of construction to insure that should it rain, water will drain fully from the construction site.

f. Survey.

(1) Surveys will be made as necessary to provide information for design of new work, to check jobs received, to assist in layout of new construction and to check construction progress.

(2) Reference points will be marked with permanently installed or fixed objects (preferably concrete). Marking of reference points is the responsibility of S-3 and the direct responsibility of the Chief of Party.

(3) Limitations on survey personnel and equipment preclude the continuing presence of a survey capability on each project. Constructing units will properly schedule their requirements, plan for full utilization of survey capability when provided and fully exploit survey personnel in work which is over and above that which could be done with unskilled personnel.

g. Equipment Support.

(1) Construction equipment required will be allocated by S-3 to the various projects from the organic assets of all units in accordance with the priorities of the construction effort.

(2) Allocations are based on: 1) established construction priorities, 2) requests made of S-3 by the constructing units, and 3) operational limitations imposed by current deadline status.

(3) S-3 is responsible for allocating equipment and shifting equipment as necessary to best accomplish the mission. Such authority includes the responsibility for coordinating with the supporting and supported units. No re-disposition of equipment will be made without approval of S-3.

(4) Equipment deadlined during the course of work will be reported to S-3 using the fastest and most expedient means, by the constructing unit. Such reports will include the designation of equipment, parent unit, bumper number and apparent cause of deadline.

(5) The constructing unit maintains operational control of organic and supporting equipment at the project site. Equipment operators of supporting equipment will respond to operating directives of Project Officers and NCO's, excepting directives which would result in 1) a safety hazard, 2) equipment abuse, or 3) contravention of unit standing instructions. In any such exception the operator will inform the supervisor of the specific reason for excepting the directive.

(6) The supporting (parent) unit is responsible for all facets of equipment support and status reporting, except operational control, reporting on-the-job deadlines and project site security.

h. Training. Full utilization of personnel in their duty MOS is desired, however every opportunity should be taken to cross train members of the unit in other specialties during construction.

i. Field Changes.

(1) Deviations from plans and specifications required to meet field or site conditions, required because expedient or substitute materials are employed, and/or required by directed or approved redesign will not be undertaken by the constructing unit unless approved by the Battalion S-3.

(2) Field changes cannot alter the basic design or purpose for which the structure was intended, weaken the structural design or result in increased material requirements or construction effort.

(3) Constructing units are responsible for preparation of supplemental bills of materials associated with field changes. S-3 is responsible for coordinating field changes, including necessary approvals, with 45th Engineer Group (Const).

(4) All field changes will be fully identified on project as-built drawings.

j. Construction Materials.

(1) S-3 and S-4, this headquarters, are responsible for reviewing, editing and coordinating approval action on bills of materials and requisitions for Class IV supplies required to support assigned projects.

(2) S-4 maintains staff supervision of material transactions, pick-ups and returns from the Direct Support Supply Activity, US Army Depot, Cam Ranh Bay.

(3) S-4 will arrange for temporary storage of Class IV materials drawn for projects, which are not moved directly to the project site. The constructing unit is responsible for storage, police and security of Class IV materials when moved to the project site.

(4) Constructing units are responsible for providing loading and moving details, as well as for requesting and supervising transportation required to get materials from the Direct Support Supply Activity to the battalion and/or project storage site.

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k. Cantonment Construction. Construction of troop cantonments will not exceed the standards of construction specified in the construction directive. Standards of construction are defined in reference 15.u.

1. Photographs.

(1) Constructing units will request photography of construction projects prior to and at the conclusion of the project, as well as at selected times during the course of work which will permit identification of the various work phases. Sufficient views of the work should be taken to assure comprehension of the size and scope of the work being photographed, as well as special features or conditions.

(2) Requests for photography will be made to the Battalion S-3. Units will assist the photographer as necessary to insure adequate coverage of the work.

(3) Selected photographs should be selected to pictorialize any information release prepared in conjunction with project work.

(4) Battalion S-3 will, in addition to construction photography forwarded with Bi-weekly Photographic Reports, maintain a command project photo album of selected photographs.

m. As-Built Drawings.

(1) As-built drawings will be required for every major project (Brigade or Group directed project) assigned a constructing unit.

(2) Constructing units are responsible for the assembling of data and material necessary for the preparation of as-built drawings. They are additionally responsible for review and validation of the completed drawings. S-3 will provide technical assistance and drafting necessary to accomplish the as-built drawings.

(3) As-built drawings will include all or a portion of the following, dependent on the nature of the construction project:

(a) Site plan.

(b) Grading and drainage plan (profile and cross section)

(c) General facility layout.

(d) Utility layouts:

1. Water distribution.

2. Sanitary system.
3. Electrical distribution.

(e) Structural drawings:

1. Siting and architectural.
2. Foundation plans.
3. Floor plans.
4. Elevation and plan detail views.
5. Utility layouts.

(f) Paved areas.

(4) As-built drawings will be:

- (a) Submitted by the constructing unit project officer.
- (b) Checked by the constructing unit commander.
- (c) Approved by the Battalion S-3.

n. Project Site Security. Project security requirements vary greatly with the location and must be provided commensurate with the situation. Each project will be reviewed by the constructing unit with the Battalion S-2 and S-3 as to the extent and nature of security to be provided. No project will be initiated outside a secure area without an approved security plan. Battalion S-3 will arrange for special security requirements or support for motor marches, unit displacements, or isolated projects, wherein other US Forces, ARVN or Free World Forces are to be employed.

o. Communications.

(1) FM radio communications will be established routinely by the constructing unit between project site and the company Net Control Station. Nets will be active during all periods of activity at the project site, except where permission is granted by the Net Control Station to withdraw from the net. Company NCS will periodically check AM communications with the Battalion NCS to insure that nets are operational.

(2) When distance or environment precludes radio communications with this headquarters, aggressive efforts will be made to immediately establish communications to the nearest telephone terminal point

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Hqs 20th Engr Bn (Cbt) Memo 415-3, dtd 20 Sep 66, Cont'd

and thence by land lines and/or radio-telephone to this headquarters from the project site.

11. CONSTRUCTION SAFETY AND POLICE.

a. Standards and safety practices pertinent to construction are detailed in the Corps of Engineers Safety Manual, reference 15.t. This manual is available in Headquarters, 20th Engineer Battalion and will be reviewed by all project officers. The provisions of this document are to be considered a part of this SOP, when appropriate to any construction undertaken by the battalion.

b. The following precautionary requirements are emphasized:

(1) Existing utilities, overhead, surface or underground, will be identified, marked and/or physically secured by guards or guides during construction operations.

(2) Construction roads will be maintained in such condition as to permit planned construction traffic flow and hazard free operations.

(3) On-site construction materials will be carefully organized and stockpiled to preclude storage hazards, material damage or poor police.

(4) Vehicles and equipment will be precluded from movement in or parking on finished horizontal construction at grade, except where such construction is provided for overland traffic.

(5) Driver/operator safety precautions set forth in this battalion's Maintenance SOP will be observed.

c. The following standards of police will be observed:

(1) During construction:

(a) Police at project site will conform to the safety requirements established in a. above.

(b) Project sites will be policed daily of all waste material, empty containers and other items to insure that site presents an orderly appearance.

(c) Precautions will be taken to insure that the movement of equipment through or adjacent to the site is controlled in order to minimize the requirements for police and repair.

(2) End of construction:

Hqs 20th Engr Bn (Cbt) Memo 415-3, dtd 20 Sep 66, Cont'd

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(a) The project site will be policed of all rubbish, spoil, trash and excess construction materials.

(b) The project site will be graded and dressed, and all large stones or organic debris removed.

12. EMERGENCY SUPPORT: See reference 15.w.

13. SELF HELP: Self help improvement of unit cantonments is encouraged, subject only to the limitations of reference 15.u.

14. CIVIC ACTION: See Military Civic Action Plan Number 1, Headquarters, 20th Engineer Battalion (Cbt), dated 21 February 1966.

15. REFERENCES:

- a. AR 1-19
- b. FM 5-6
- c. FM 5-34
- d. FM 5-35
- e. FM 5-162
- f. TM 5-226
- g. TM 5-232
- h. TM 5-250
- i. TM 5-251
- j. TM 5-252
- k. TM 5-302
- l. TM 5-331
- m. TM 5-336
- n. TM 5-337
- o. TM 5-461
- p. TM 5-541
- q. TM 5-624

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Hqs 20th Engr Bn (Cbt) Memo 415-3, dtd 20 Sep 66, Cont'd

r. TM 5-742

s. ST 5-188, Structures and Utilities, Theater of Operations  
Construction (Volumes A and B), USAES, January 1965

t. Corps of Engineers Safety Manual

u. USARV Regulation 405-2

v. USARV Regulation 405-4

w. 18th Engineer Brigade Regulation 415-1

x. 18th Engineer Brigade Regulation 415-2

y. 18th Engineer Brigade Regulation 415-3

z. 45th Engineer Group Regulation 415-2

aa. 45th Engineer Group Regulation 415-3

FOR THE COMMANDER:

*Michael I. Brown*

MICHAEL I. BROWN  
2LT, CE  
Adjutant

ANNEXES:

- A - Priorities for Allocation
- B - Project Directive
- C - Schedule/Progress Chart
- D - Work Estimate Sheet
- E - Materials Take Off List
- F - Bill of Materials
- G - Design/Construction Progress Report
- H - Project Briefing Sheet
- I - Daily Strength Disposition
- J - Weekly Rock Production Report

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Annex A (Priorities for Allocation of Engineer Troop Effort and Construction Materials) to 20th Engr Bn (Cbt) Memo 415-3, 20 Sep 66

PRIORITIES FOR ALLOCATION

OF ENGINEER TROOP EFFORT AND CONSTRUCTION MATERIALS

1. Clearing and grubbing troop areas - equipment effort.
2. Field fortifications. (Materials for use by using unit.)
3. Clearing fields of fire.
4. Water supply points (beyond capability of tactical elements.)
5. LST ramps and bollards.
6. Latrines (pit with half 55 gallon drums - materials only - self help item.)
7. Flight strips - with access roads.
8. Ports - roads and hardstands.
9. Hospitals.
- 9a. Sentry dog kennels.
10. Ammunition storage areas and access roads.
11. Communications facilities.
12. POL storage facilities (tank farms).
13. Flight strips - ramps and parking areas.
- 13a. Covered storage - Class I.
14. Post exchange storage facilities (one per base area with latrine.)
15. Ports - jetties.
16. Dispensaries - tactical units (at least one per base area.)
17. Security lighting - wire and floodlights.
18. Internal axial roads.
19. POL distribution systems - (depot).
20. Flight strips - maintenance buildings.
21. Administration buildings. (Work on not more than one in any area, sub-area or camp at one time with priority to major operational headquarters.)
22. Kitchen pads.
23. Mess halls (no plumbing.)
24. Dispensaries - other than tactical troops, one per base or sub-base.
25. Warehousing space and open storage area depots.
26. Maintenance facilities - weapons.
27. Maintenance facilities - communications equipment.
28. LOC - road improvement.
29. POL off loading and feeder pipelines.
30. Ports - piers.
31. LOC - bridge strengthening.
32. Maintenance facilities - vehicles, field.
33. Fire protection sumps.
34. Warehousing space, covered storage.
35. Internal tributary roads.
36. Maintenance facilities - vehicles, shop.
37. Shower points.

Annex A (Priorities for Allocation of Engineer Troop Effort and  
Construction Materials) to 20th Engr Bn (Cbt) Memo 415-3, 20 Sep 66

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38. Warehousing space (reefer storage.)
39. Post offices and exchange sales stores.
40. Bakeries.
41. Laundries.
42. Service clubs.
43. Ports - wharves.
44. EM billets - combat elements capable only of intermittent self help because of engagement with the enemy.
45. Maintenance facilities - vehicles, unit.
46. EM billets - other combat elements.
47. EM billets - combat support units.
48. Access roads - stabilized.
49. E. billets, general support units (including engineers of the 18th Engineer Brigade.)
50. LOC - road surface treatment through villages.
51. LOC - bridge replacement.
52. Vehicle parking areas - stabilized.
53. Ammo storage areas - bermed - with stabilized pads.
54. Billets - officers - combat units.
55. Billets - officers - combat support units.
56. Billets - officers - general support units.
57. Security lighting - generator sheds.
58. Chapels.
59. Ammo storage areas (covered storage.)

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Annex B (Project Directive Format) to 20th Engr Bn (Cbt) Memo 415-3,  
20 Sep 66

HEADQUARTERS  
20TH ENGINEER BATTALION (CBT)  
APO US Forces \_\_\_\_\_

File Symbol

Date \_\_\_\_\_

SUBJECT: Project Directive, (Number)

TO:

1. The following project is assigned to your command for construction:
  - a. Title:
  - b. Location:
  - c. Priority:
    - (1) Group:
    - (2) Your:
  - d. Facility Number:
  - e. Starting Date:
  - f. Basic Occupancy Date (BOD):
  - g. Estimated Date of Completion (EDC):
  - h. Funding:
2. Real Estate:
3. Materials:
4. Scope of Work:
5. Supporting Data:
6. Miscellaneous:

(Signature Block)







Annex E (Materials Take Off List) to 20th Engr Bn (Cbt) Memo 415-3  
20 Sep 66

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### INSTRUCTIONS

1. Form to be used on all lumber requests and will include materials involved in construction.
2. Form will be based on plan or sketch which will be attached.
3. Heading - self explanatory.
4. Column 1 - ITEM - numbered 1, 2, 3, 4 etc for identification purposes.
5. Column 2 - NAME OR USE OF PIECE - i.e. lumber, vertical framing, nails, finishing, bolts, stove, etc.
6. Column 3 - QUANTITY - Number of pieces of item.
7. Column 4 - U/M - Unit of Measure - example Pc, Ea, Gal, BF, etc.
8. Column 5 - LENGTH IN PLACE - actual dimensions in feet and inches.
9. Column 6 - SIZE - lumber dimensions, 2 x 4, 4 x 6, etc. Items should be arranged with the largest sizes first and like sizes kept together.
10. Column 7 - STD LGTH - Standard Length - always an even foot, i.e. 10, 12, 14 etc. Lengths should be kept as uniform as possible for each size. Common lengths in this area are 12, 14, 16, 18 and over 20 feet.
11. Column 8 - PCS/LGTH - Pieces per Length - divide column 7 by column 5.
12. Column 9 - LGTHS REQ'D - Lengths Required - divide column 3 by column 8.



INSTRUCTIONS

1. Form will be used for all requests for material to be issued for a project or detail.
2. Forms will be based on a Materials Take Off List for lumber requests.
3. Heading - self explanatory.
4. Column 1 - ITEM - numbered 1, 2, 3, 4 etc for identifying purposes.
5. Column 2 - QUANTITY - total number of pieces, bags, cubic yards, etc of particular material requested.
6. Column 3 - U/M - Unit of Measure - Pc, Bag, Lbs, CY, etc.
7. Column 4 - SIZE AND LENGTH - for all lumber will be written as 2 x 4 - 10', or 1 x 4 - 12'. For other materials will adequately describe item, such as nails, 6d, bolts,  $\frac{1}{4}$ " x 4", plywood, 3/8" - 4' x 8', etc.
8. Column 5 - BFM - Board Foot Measure - i.e. 1" x 12" - 1' = 1 BF. All lumber items will have this column filled in. Other items will not use this column.
9. Column 6 - DESCRIPTION OR WHERE USED - When form is used in conjunction with the Materials Take Off List the description of the item will be included and, in addition, the item numbers being consolidated will be referenced. This will allow cross referencing of all materials between the two forms. When this form is used alone, the description of the item will be included, i.e. lumber, nails, bolts, plywood, cement, corrugated metal pipe, insulators, etc.

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Annex G (Design/Construction Progress Report) to 20th Engr Bn (Cbt)  
Memo 415-3, 20 Sep 66

TO: S-3, 20th Engr Bn (Cbt) FROM:

SUBJECT: Design/Construction Progress Report for the Period  
\_\_\_\_\_ to \_\_\_\_\_

1. Project Number: Priority:
2. Title:
3. Design: 

<u>Date Dir Rec'd</u>	<u>Asg To</u>	<u>SD</u>	<u>EDC</u>	<u>% Comp</u>
-----------------------	---------------	-----------	------------	---------------
4. Construction:
5. Total man hours worked:
  - a. US Troops:
  - b. Indigenous:
6. Total equipment hours worked:
7. Total tons of fill hauled:
8. Total cubic yards of concrete placed:
9. Total acres cleared:
10. Total miles of road completed:
  - a. Sub-base:
  - b. Base:
  - c. Surface:
11. Total lineal feet of runway completed:
12. Total storage completed:
  - a. Open storage (sq ft):
  - b. Covered storage (sq ft):
  - c. Refrigerated storage (sq ft):
13. Total square footage of troop billets completed:
  - a. Standard 3:
  - b. Standard 4:
  - c. Standard 5:
14. Total square footage of vertical construction completed:
  - a. Hospital wards:
  - b. Other:
15. Other (specify): a. Total tons of laterite placed:
16. Remarks:

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Annex H (Project Briefing Sheet) to 20th Engr Bn (Cbt) Memo 415-3,  
20 Sep 66

PROJECT BRIEFING SHEET

PROJECT NUMBER:

TITLE:

SCOPE OF WORK:

UNIT ASSIGNED PROJECT:

ASSIGNED STRENGTH:

PRESENT FOR DUTY STRENGTH:

BOD:

EDC:

EQUIPMENT ASSIGNED PROJECT:

D/L

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

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Annex I (Daily Personnel Strength Disposition Format) to 20th Engr Bn (Cbt)  
 Memo 415-3, 20 Sep 66

DAILY STRENGTH DISPOSITION

Date \_\_\_\_\_

20TH ENGINEER BATTALION (CBT)	A		B		C		H/H		584		TOTAL	
	O	WO	O	WO	O	WO	O	WO	O	WO	O	WO
1. Authorized Strength												
2. Assigned Strength												
3. Augmentation												
4. Duty Losses:												
a. TDY												
b. Leave												
c. AWOL/Conf												
d. Hospital												
e. Intransit In												
f. Intransit Out												
5. Present for Duty												
6. Company Administration												
7. Company Maintenance												
8. Battalion Headquarters												
9. Battalion Maintenance												
10. Details:												
a. Group												
b. Battalion												
c. Company												
d. Guard Duty												
11. Off Duty/Stock Call												
12. Projects:												
a. Project												
b. Project												
c. Project												
d. Project												
e. Project												
f. Project												
g. Project												
h. Project												
i. Project												
j. Project												
k. Project												
13. Committed Strength												

Explain paragraphs 6 and 10 on the reverse side of this form.

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Annex J (Rock Production Report) to 20th Engr Bn (Cbt) Memo 415-3,  
20 Sep 66

ROCK PRODUCTION FORMAT

Time Period: 1800 \_\_\_\_\_ to 1800 \_\_\_\_\_ Date: \_\_\_\_\_

1. Amount of rock produced (cubic yards) by size:
2. Number of hours crusher operated.
  - a. Primary:
  - b. Secondary:
3. Amount of rock issued by size and to whom:
4. Amount currently stockpiled by size:  
(Note: If more than one stockpile, use sub-entries and indicate location of stockpiles.)
5. Location of rock crusher:

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## STATISTICAL SUMMARY OF MAJOR ENGINEER EFFORT

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1. Work on Republic of Korea Army projects by the battalion consisted of clearing and grubbing 316 acres of land; loading, hauling and placing 104,737 tons of fill and lateritic soil; placing 828 cubic yards of concrete; constructing 9.2 miles of roads with drainage structures; and completing 78,136 square feet of vertical construction. 181,177 US Troop and 136,100 indigenous man hours were expended on ROKA projects.

2. The United States Army Brigade Cantonment area, Ban Mo Thuot, consisted of clearing and grubbing 69 acres and constructing five miles of roads with drainage structures. Concurrently, quarry operations produced 873 cubic yards of three inch minus aggregate. 55,800 US Troop and 1,280 indigenous man hours and 14,274 equipment hours were expended.

3. Combat support operations conducted by the battalion, excluding those elements under operational control of other units, expended 106,503 man and 11,168 equipment hours. Significant activities of combat support elements were constructing MAT6 by-passes and approaches and emplacing bridges as follows:

- a. One on Route QL-1 for semi-permanent by-pass.
- b. Two on Route QL-21 for route openings.
- c. One on Route 509 for Operation PAUL REVERE IV.

Other significant combat support activities included: constructing abutments and approaches for and installing Armored Vehicle Launched Bridges (AVLB) at two locations in support of Operation PAUL REVERE IV; constructing expedient earth filled log crib bridge and numerous culverts and fords; destroying 67 enemy bunkers, tunnels and structures; and rehabilitating the airfield at Poley Djereng.

*Incl 2*

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EGD-3 (15 Nov 66) 1st Ind  
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly  
Period Ending 31 October 1966

HEADQUARTERS, 45th Engineer Group (Const), APO 96238, 17 November 1966

THRU: Commanding General, 18th Engineer Brigade, APO 96307  
Commanding General, United States Army, Vietnam, ATTN: AVC-DH, APO 96307  
Commander in Chief, United States Army, Pacific, ATTN: GROF-MH, APO 96558

TO: Assistant Chief of Staff for Force Development, Department of the Army,  
(ACSFOR DA), Washington, D.C. 20310

1. Concur with observations of Commanding Officer, 20th Engineer Battalion  
(C) except:

a. 2c(3). When reorganized as Infantry, Engineer units must strip to the minimum essential equipment. Normally, in a light Infantry role, most vehicles would be left behind; however under the circumstances, when it might be necessary to take heavier supply vehicles, trailers should be left behind. The maneuverability of trucks pulling trailers on the narrow roads of Vietnam is extremely limited and when committed as Infantry, the area of operations can be normally expected to be of limited trafficability. In any event, all heavy engineer equipment must be temporarily stored during commitment as Infantry.

b. 2d(1). Units are presently authorized one 65 cubic foot refrigerator and one 12 cubic foot freezer. This is sufficient cold storage for one day supply of perishables. Units habitually operating in areas where supply must be effected by airlift or "road runner" method, should be authorized an additional 600 to 800 cubic foot cold storage capacity dependent upon frequency of re-supply capability. Units have obtained additional cold storage with justification and submission of USARV Form 47R.

c. 2d(5). Time fuze is considered as part of demolition and prescribes specific storage conditions usually found only at Class V supply points. The need for time fuze should be predicted by a unit prior to commitment and can be drawn in sufficient quantity from Class V supply point just prior to operation.

d. 2d(8). Condition as cited is present logistics policy in Vietnam. This headquarters recommends having support activity continue to honor departed units requisitions and tranship fills up to ninety days after departure. Unit responsibility would entail necessary coordination and forwarding address prior to departure. This would allow sufficient reaction time on requisitions placed with support activity.

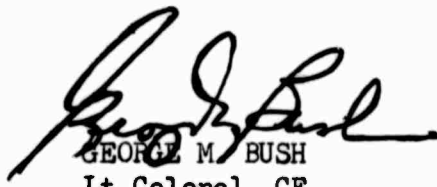
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EGD-3

17 November 1966

SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65), for Quarterly  
Period Ending 31 October 1966

2. The 20th Engineer Battalion (C) engaged in a wide variety of activities from construction of cantonments thru combat support of tactical units to reorganization as Infantry. This diverse activity can be classified as typical for Engineer units in this theater and future doctrine concerning use of Combat Engineers must take into account the wide variety of missions assigned and accomplished by this type of unit.



GEORGE M. BUSH  
Lt Colonel, CE  
Commanding

cc/20th Engr Bn (C)

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AVBC-C (10 Nov 66) 2d Ind  
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for Quarterly  
Period Ending 31 October 1966

Headquarters, 18th Engineer Brigade, APO 96307 5 DEC 1966

TO: Commanding General, United States Army, Vietnam, ATTN: AVC-DH  
APO 96307

1. The subject report, submitted by the 20th Engineer Battalion (Cbt), has been reviewed and is considered an excellent report of unit activities.
2. This headquarters concurs with the observations and recommendations of the submitting and indorsing commanders, subject to the following comments:
  - a. Section 1, para b, page 5, Officer shortage. This headquarters assigns officers, to the groups, against requirements across-the-board. A shortage of company grade officers does exist through out this brigade.
  - b. Section 2, Part I, para 6(9) Combat Support Operations. When facilities and transportation resources permit, the battalion S4s stock a usage factor mission or basic load. This enables units to make a more rapid response to mission demands and eliminates the reaction delay of a higher headquarters or depot from requisition to delivery time.
  - c. Section 2, Part I, para e(1), 20 Ton Crane Shovel: Non-Concur. Occasional requirements to use a 20 ton crane shovel in rough terrain, do not justify rough terrain type cranes. Proper towing of crane to work site and proper positioning of jacks should preclude suspension failures.
  - d. Section 2, Part I, para e(2), Communication Equipment: Concur. This is a sound idea and unit should submit USARV Form 47R for this equipment, in excess of authorized allowances. This has been brought to the group S4's attention.

FOR THE COMMANDER:

*Wayne J. Reynolds*  
WAYNE J. REYNOLDS  
Major, CE  
Adjutant

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AVHGC-DH (10 Nov 66) 3d Ind  
SUBJECT: Operational Report-Lessons Learned for the Period Ending  
31 October 1966 (RCS CSFOR-65)

HEADQUARTERS, UNITED STATES ARMY VIETNAM, APO San Francisco 96307 1 JAN '67

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-OT  
APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the period ending 31 October 1966 from Headquarters, 20th Engineer Battalion (Combat) as indorsed.

2. Pertinent comments are as follows:

a. Reference Paragraph d(1), Part I, Section 2, Page 19: Nonconcur. The 600 cubic foot refrigerator is considered excessive for use by a company size unit in most cases. The 70 cubic foot refrigerator is a walk in type box designed for field use and is presently being received in-country. Based on the gross space planning factor of .1, this 70 cubic foot reefer provides refrigerated storage for one day for 700 troops.

b. Reference Paragraph d(2), Part I, Section 2, Pages 19 and 20: Concur. Company size units are presently authorized one 200 pound ice making machine as a part of the cantonment mess project. These machines are being issued as quickly as they are made available from CONUS.

c. Reference Paragraph d(5), Part I, Section 2, Page 20 as pertains to demolition firing systems: Nonconcur. Time fuse is never precut and exposed to the elements. Paragraph 71a of FM 2-25 clearly states the procedures to be used when using time fuse.

d. Reference Paragraph d(6), Part I, Section 2, Pages 20 and 21 as pertains to Class IV yard operations: Concur. Operation of a class IV yard by a unit is one means of insuring that accurate material cost on projects are developed. MCA Material Requirements Letters and/or Bills of Materials are compiled for each project. These documents provide an accurate basis for maintaining stock records.

e. Reference Paragraph d(8), Part I, Section 2, Page 21 as pertains to supply procedures: Nonconcur. Although this unit cites an unspecified number of frequent moves from one Logistics Support

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P 11AM '67

AVHGC-DH (10 Nov 66)  
SUBJECT: Operational Report-Lessons Learned for the Period Ending  
31 October 1966 (RCS CSFOR-65)

Area to another, this is not justification for requisitioning direct to depot nor is resubmitting requisitions for items already on requisition a proper supply procedure. Coordination with supporting DSU/GSU as to unit pickup or follow on delivery can eliminate the problems mentioned.

f. Reference Paragraph e(1), Part I, Section 2, Pages 21 and 22 as pertains to cranes: Concur. TOE 5-35E authorizes an Engineer Combat Battalion, 7 each, 20 ton rough terrain cranes and 14 each 20 ton truck mounted cranes. Action to convert the Engineer Combat Battalion in Vietnam to the Echo series TOE was discussed at DA during the period 26 November to 2 December 1966. Favorable consideration is expected on requested MTOE's. Rough terrain cranes are expected in Vietnam in quantity by June 1967.

FOR THE COMMANDER:

*W. R. Autrey, Cpt*  
W. R. AUTREY  
Cpt, AGC  
Asst Adjutant General

2 Incls

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GPOP-OT (10 Nov 66) 4th Ind  
SUBJECT: Operational Report-Lessons Learned for the Period Ending  
31 October 1966 (RCS CSFOR-65)

HQ, US ARMY, PACIFIC, APO San Francisco 96558 9 JAN 1967

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D. C. 20310

This headquarters concurs in the basic report as indorsed.

FOR THE COMMANDER IN CHIEF:

*g.l. McMullin*

G. L. McMULLIN  
CPT, AGC  
Asst AG

1 Incl  
nc

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