

The following notice applies to any unclassified (including originally classified and now declassified) technical reports released to "qualified U.S. contractors" under the provisions of DoD Directive 5230.25, Withholding of Unclassified Technical Data From Public Disclosure.

NOTICE TO ACCOMPANY THE DISSEMINATION OF EXPORT-CONTROLLED TECHNICAL DATA

1. Export of information contained herein, which includes, in some circumstances, release to foreign nationals within the United States, without first obtaining approval or license from the Department of State for items controlled by the International Traffic in Arms Regulations (ITAR), or the Department of Commerce for items controlled by the Export Administration Regulations (EAR), may constitute a violation of law.
2. Under 22 U.S.C. 2778 the penalty for unlawful export of items or information controlled under the ITAR is up to ten years imprisonment, or a fine of \$1,000,000, or both. Under 50 U.S.C., Appendix 2410, the penalty for unlawful export of items or information controlled under the EAR is a fine of up to \$1,000,000, or five times the value of the exports, whichever is greater; or for an individual, imprisonment of up to 10 years, or a fine of up to \$250,000, or both.
3. In accordance with your certification that establishes you as a "qualified U.S. Contractor", unauthorized dissemination of this information is prohibited and may result in disqualification as a qualified U.S. contractor, and may be considered in determining your eligibility for future contracts with the Department of Defense.
4. The U.S. Government assumes no liability for direct patent infringement, or contributory patent infringement or misuse of technical data.
5. The U.S. Government does not warrant the adequacy, accuracy, currency, or completeness of the technical data.
6. The U.S. Government assumes no liability for loss, damage, or injury resulting from manufacture or use for any purpose of any product, article, system, or material involving reliance upon any or all technical data furnished in response to the request for technical data.
7. If the technical data furnished by the Government will be used for commercial manufacturing or other profit potential, a license for such use may be necessary. Any payments made in support of the request for data do not include or involve any license rights.
8. A copy of this notice shall be provided with any partial or complete reproduction of these data that are provided to qualified U.S. contractors.

DESTRUCTION NOTICE

For classified documents, follow the procedure in DoD 5220.22-M, National Industrial Security Program, Operating Manual, Chapter 5, Section 7, or DoD 5200.1-R, Information Security Program Regulation, Chapter 6, Section 7. For unclassified, limited documents, destroy by any method that will prevent disclosure of contents or reconstruction of the document.

UNCLASSIFIED

AD NUMBER

AD824497

LIMITATION CHANGES

TO:

Approved for public release; distribution is unlimited.

FROM:

Distribution authorized to U.S. Gov't. agencies and their contractors; Critical Technology; 10 MAY 1967. Other requests shall be referred to Office of Assistant of Staff Force Force Development, Attn: FOR-OT-RD, Washington, DC 20310. This document contains export-controlled technical data.

AUTHORITY

AGO D/A ltr, 29 Apr 1980

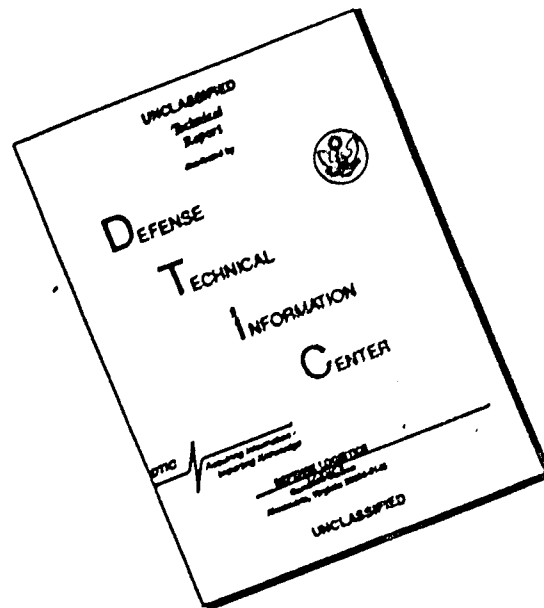
THIS PAGE IS UNCLASSIFIED

THIS REPORT HAS BEEN DELIMITED
AND CLEARED FOR PUBLIC RELEASE
UNDER DOD DIRECTIVE 5200.20 AND
NO RESTRICTIONS ARE IMPOSED UPON
ITS USE AND DISCLOSURE.

DISTRIBUTION STATEMENT A

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

DEPARTMENT OF THE ARMY
HEADQUARTERS, 70TH ENGINEER BATTALION (COMBAT)(ARMY)
APO 96294

①

AD 824497

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967.

THRU: Commanding Officer
937th Engineer Group (Cbt)
APO 96318

Commanding General
18th Engineer Brigade
ATTN: AVBC-C
APO 96377

Commanding General
United States Army Engineer Command, Vietnam
ATTN: AVCC-PO
APO 96491

Commanding General
United States Army Vietnam
ATTN: AVGC-DH
APO 96307

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

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

AD D C
R
JAN 2 1968

63

STATEMENT OF U.S. GOVERNMENT

This document is subject to special export controls and each transmittal to foreign government officials may be made only with prior approval of the Department of the Army.

FOR OT RD File

And 36 670294

DEPT OF ARMY
OFFICE OF ASST CHIEF OF
STAFF FOR FORCE DEVELOPMENT
ATTN: "FOR-OT-RY"
WASH. DC 20310

3

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967.

SECTION I. SIGNIFICANT UNIT ACTIVITIES

1. COMMAND.

a. MISSION:

- (1) To command assigned and attached units.
- (2) To plan and coordinate operations of units assigned or attached to the battalion.
- (3) To provide all non-divisional engineer support required for tactical operations in the battalion area of responsibility.
- (4) To serve as the construction agency for all army troop labor construction projects within the battalion area of responsibility.
- (5) To act as point of contact for, and to maintain liaison with the Director of Construction, Qui Nhon, Regional Officer in Charge of Construction in An Khe and to provide a contracting officer's representative on army contracts as assigned by higher headquarters.
- (6) To act as a counterattack force to restore the integrity of the Camp Radcliff barrier in the event the barrier is penetrated by an enemy force.

b. ORGANIZATION:

(1) To accomplish the mission, the following units were assigned or attached to the battalion during the reporting period:

| <u>UNIT</u> | <u>TOE</u> |
|----------------------------|------------|
| Co B/84th Engr Bn (Const) | 5-118D |
| 511th Engr Co (PB) | 5-77E |
| One Plt 585th Engr Co (DT) | 5-124D |
| One Plt 630th Engr Co (LE) | 5-54D |
| 444 Engr Det (HO) | 5-500C |

(2) A chart showing the battalion organizational structure is attached as Incl 1.

[Handwritten Signature]

| | |
|-------------------------------------|--------------------------------|
| SEARCHED | INDEXED |
| SERIALIZED | FILED |
| MAY 1967 | |
| FBI - QUANG BINH | |
| <input type="checkbox"/> TRANSLATED | <input type="checkbox"/> FILED |
| <input type="checkbox"/> INDEXED | <input type="checkbox"/> FILED |
| <input type="checkbox"/> SERIALIZED | <input type="checkbox"/> FILED |
| <input type="checkbox"/> SEARCHED | <input type="checkbox"/> FILED |

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967.

c. **COMMAND RELATIONSHIPS:** The 70th Engineer Battalion (Cbt)(A) is attached to the 937th Engineer Group (Cbt) and has a conventional relationship with its parent unit with the exception that the battalion responds to the operational emergency support requirements of the 1st Air Cavalry Division. An example is the battalion's local security mission.

2. PERSONNEL, ADMINISTRATION, MORALE AND DISCIPLINE,

a. **PERSONNEL:** The average present for duty strength of the battalion remained within the range of 85% to 117%, with an average of approximately 98% during the reporting period. The operational strength of the battalion was increased during this reporting period by the attachment of 45 personnel of the 585th Engineer Company (Dump Truck).

b. **MORALE AND DISCIPLINE:**

(1) Morale increased sharply during this reporting period and is running high at present. The increase and present high state of morale can be attributed to: the increase in productive activity after a frustrating monsoon season hindered the construction effort; participation of this unit in two operational support missions during the reporting period; and competent leadership at all levels of command. As a result of the high morale of this unit, disciplinary problems have been minimal with only one special and one summary court martial during this period.

(2) Movies are conducted on an average of 5 nights weekly in three locations within the battalion, offering a wide variety of entertainment. Officer, NCO, and EM Clubs also provide nightly relaxation areas for unit personnel. Television from Qui Nhon is now being received in An Khe.

(3) There have been a total of 69 religious services provided with a total attendance in excess of 2000 for both Protestant and Catholic faiths. Jewish personnel and those of other religious sects have been provided information and the privilege of attending their own services when such services are available. Character guidance classes are conducted on a regular basis, and during the reporting period seven religious films were shown for the men on Sunday evenings.

3. INTELLIGENCE AND COUNTERINTELLIGENCE:

a. **PHYSICAL SECURITY:** This unit continues to stress safeguarding of defense information and assures through training that all members of the command are aware of the proper procedures for handling classified material.

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 30 April 1967

b. RECONNAISSANCE: Deliberate route reconnaissance of national highway 19 within the battalion area of responsibility was performed in February and a deliberate recon of Highway 508 for approximately 12 miles north of route 19 was performed on 30 April 1967. During the reporting period, weekly and biweekly spot checks were made of route 19 within our sector. Prior to operation MARAUDER, a search and clear operation conducted out to 4000 meters from the Camp Radcliff Barrier, extensive reconnaissance was made of six company sectors of responsibility for selection of assembly areas and combat movement azimuths.

c. INTELLIGENCE: Continued coordination was made with intelligence gathering agencies operating within the battalion area of responsibility. Daily contact is made with 1st Air Cavalry Division G2 section for current local intelligence data.

4. PLANS, OPERATIONS AND TRAINING

a. GENERAL:

(1) During the reporting period this unit engaged in extensive construction projects normally associated with construction battalions. The requirements of the command and the relative lack of major tactical activity in the immediate area have contributed to this situation. The size of this unit and its heavy augmentation of engineer equipment has made it possible to make a great deal of progress since the last monsoon season.

(2) During the reporting period this unit accomplished two operational support missions. Both called for reorganization as infantry and although the missions were short in duration, they allowed the unit to test its ability to accomplish its secondary mission.

(3) The shortage of major items of engineer equipment has limited the units horizontal construction capability. The shortage of equipment availability is due principally to a shortage of repair parts for both organizational and support maintenance. Lower priority projects in particular suffered and in some cases required adjustments of EDC. Graders, bucket loaders and compaction equipment were the most critical items of engineer equipment. This problem now seems to be decreasing and some relief for these lower priority jobs is anticipated in the near future.

(4) Much progress was seen in the self help standard 4 cantonment development at Camp Radcliff. This battalion is responsible for ~~prefabbing the~~ wood frame structures for the program along with providing the general engineer supervision and inspection. During the reporting period some 273 20' x 80' equivalent buildings were issued, bringing the total issued since the program began on 20 October 1966 to 517.

(5) This unit had 82.5 days of operations and 6.5 days of training.

10 May 1967

1
5
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 30 April 1967

b. OPERATIONAL SUPPORT: This unit had two operational support missions during the reporting period, and began a third on the final day of the reporting period.

(1) Operation ESSAYONS:

(a) Operation ESSAYONS was a 72-hour mission during which this unit reorganized as infantry, became OPCON to the 3rd Brigade, 1st Air Cavalry Division, and provided tactical route security of National Route 19 within the Division TAOR from BR 560457 to BR 250484. During this 72-hour period the infantry unit which the battalion replaced air-assaulted into another portion of the TAOR to perform a search and clear operation.

(b) The mission was conducted with 3 companies of 3 platoons each with command and control provided by battalion headquarters. The battalion was responsible for securing ten key bridges on national route 19, occupying numerous observation posts during daylight hours and one isolated post on a 24-hour basis, conducting 4 patrols daily in pre-designated areas, establishing listening posts and ambush points during the hours of darkness in pre-designated sectors, assuring the smooth flow of traffic (725 vehicles in 72 hours) throughout the division TAOR, maintaining liaison with boundary units. In addition, the battalion provided security for an artillery battery position, provided a motorized patrol for continuous reconnaissance of the entire section of road, secured the signal relay site on Nui Nhon mountain, and provided a two-company ready reaction force for defense of the Division base camp. The mission provided this unit an opportunity to reorganize as infantry and perform in its secondary mission in direct support of the 1st Air Cavalry Division.

(2) Operation MARAUDER.

(a) This was a one-day search and clear mission performed from the Camp Radcliff barrier out to a distance of 4000 meters. This headquarters was again command and control for 6 companies of 3 platoons each. Two of these companies were organic engineer line companies and the remaining four were attached to the 70th from other tenant units on post.

(b) The mission was conducted in two phases. During phase I, the units moved in a line of skirmishers to a line 2000 meters from the Camp Radcliff barrier. Phase II consisted of a search out to 4000 meters conducted in company combat formations. The 4000 meter line was searched and the return to the barrier was made in combat formation along a pre-designated azimuth. The mission was accomplished without casualty or mishap between 0800 hours and 1900 hours 10 March 1967.

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

c. CONSTRUCTION:

(1) During the reporting period the following projects were completed:

(a) In the An Khe Logistical Complex much progress was made in the vertical development with the completion of one 70' x 140' prefabricated steel maintenance building, a 40' x 200' steel technical supply building, a 20' x 90' administrative building, two 48' x 96' warehouses with 15' vertical clearance, and 5 concrete ammunition storage pads.

(b) In the 1st Air Cavalry Division Supply Complex, a miniature log depot, the following projects were completed: a 40' x 125' open storage shed, two 20' x 100' open storage sheds, a 20' x 50' administrative building and a 30' x 200' ration breakdown warehouse.

(c) A rectangular arrangement of standard 20' x 100' billets provides quarters 60' x 100' enclosing a 20' x 60' open space to house the females of Camp Radcliff. The building consists of twenty rooms, a day room, and a shower-latrine septic system.

(d) A 30' x 80' wood frame Automatic Data Processing Center was constructed to house the equipment that will computerize the records keeping and administration of the Division.

(e) A 70' x 140' wood frame administration facility to serve the Division G2-G3 section was completed.

(f) A mortar attack on Camp Radcliff on 9 April 1967, necessitated the replacement of 16 panels on the AM-2 Airstrip that were damaged by 82 mm rounds.

(g) A 45' two lane class 35 timber trestle bridge was completed as the first in a series of drainage improvements within the cantonment area.

(h) At the STRATCOM IWCS facility the site preparation was completed, as were footings, foundations, slabs, bonding and grounding for the warehouse, the electronic equipment building, the power equipment building, and the 30' antenna base.

(i) During early February the concrete batch plant operated by the 444th Engr Det (HO) was erected, calibrated and put into operation. This plant is presently producing concrete for the remaining 22 ammo storage pads in the log depot and will support the paving operation of the new An Khe airfield.

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

(2) Projects being worked on at the end of this reporting period:

(a) Log Depot - A 40' x 200' open storage shed under construction will complete the vertical work with the depot. Ammo pad construction continues along with internal roads and hardstands.

(b) Division Supply - Currently under construction are a 30' x 75' vented warehouse, a 40' x 100' map storage warehouse, and site preparation for storage areas in the Class II, IV, & V Yards.

(c) A BOQ similar to the completed female quarters, less the latrine-shower septic system, is being constructed for the field grade staff officers of the 1st Air Cavalry Division.

(d) An APO complex consisting of a 20' x 100' and 30' x 100' wood frame buildings with connecting ramps is under construction.

(e) The 4000' DBST at An Khe airfield is presently undergoing repair. Soft spots are being excavated and replaced with 3"(-) rock and new DBST. Only 2000' of the airfield is closed at any one time to permit continued light aircraft operations.

(f) A 175' x 190' prefabricated aircraft maintenance hangar is being constructed for the 1st Air Cavalry Division.

(g) The construction of helipads on the Golf Course, although slowed, is still progressing. Two hundred and thirty five (235) are completed out of 432 required.

(h) A 200' x 500' ramp extension with taxiways is being constructed at the Golf Course AM-2 Strip. The extension will be constructed with MSAI and will serve as a parking and maintenance area for the Division's ASTA platoon.

(i) Survey was initiated and site preparation has begun for the construction of a Communications Center for the Division.

(j) February saw the beginning of the erection of the first tank of the An Khe 65 MBEL Tank Farm. The farm consists of 5 each 10 MBEL and 5 each 3 MBEL tanks, with a manifold system and administrative complex. As of 30 April 1967, 9 tanks were constructed with 7 complete and the manifold system 80% complete. This tank farm is expected to be completed by 15 June 1967 and at present is capable of accepting 3 products from the Qui Nhon - An Khe pipeline.

(k) The earthwork on a 4,060' concrete runway at An Khe is progressing well in spite of a persistent shortage of grading and compacting equipment. During the reporting period five very large soft spots were removed from the subgrade and select fill was recompacted in these areas.

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

The largest of these soft spots contained 27,000 cu yds which had to be replaced. The runway was to final grade, up to station 1800 by 30 April 1967, and ready to accept the base course. By borrowing parts from an identical paver at Cam Ranh, the 444th's slip-form paver has all the components required for operation. The concrete batch plant supporting the paver is fully operational. Sand is being hauled and stockpiled at the batch plant. Seventy thousand (70,000) sacks of cement have been stockpiled for the runway concrete at the batch plant.

(L) Quarry and rock crushing operations at An Khe have seen a great deal of development and improvement during the reporting period.

1. At An Khe Quarry, D7E tractors were used to improve haul roads, establish benches, and strip overburden. Drilling was accomplished by track drills. A 4' x 4' drilling pattern proved to give poor breakage when charged with military dynamite and stemmed with 2' - 3' of clay. This pattern was reduced to 3' x 3' and breakage improved. One and one tenth pounds of military dynamite per cubic yard of rock to be moved was the blasting formula. Replacement parts supply has been found to be very poor on both American and Japanese made track drills. Two 40 ton shovels have been operating at An Khe Quarry to load blast rock and open pit fill. At the Hon Cong Quarry, a 40 ton crawler has been providing fill and rock for the one 75 TPH Eagle primary crusher now at that location. Maintenance on the 3 - 40 ton shovels has to be continuous to maintain operations.

2. At the main crusher site, which will support the batch plant with aggregate for the concrete runway, much progress has been made to make this facility an efficient operation for 3 primary and 4 secondary 75 TPH Eagle units. (Thus far, only 3 primary and 2 secondary units are operational at this site.) Headwalls, crusher pads, a generator pad and building, site drainage, and site lighting have been completed. Two complete units are now operating 16 hours per day with 8 hours scheduled maintenance daily. Repair parts supply is generally poor.

(m) Maintenance of 31 miles of National Route 19 along with maintenance of LOC's within the battalion sector of responsibility is continuous.

(n) The An Khe dial central is complete except for tile. Forty (40) gallons of tile mastic are required. Tiling will take approximately one week after receipt of the tile mastic.

(o) Nine tee-shaped Armco revetments are being installed to protect the flying cranes assigned to the 1st Air Cavalry Division.

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

d. **CONTRACT LIAISON AND INSTALLATION MASTER PLANNING:** This headquarters maintains liaison in the following RMK-BMJ contracts:

(1) An Khe Primary Power Distribution System.

(2) An Khe Airfield Lighting System.

(3) Well Drilling by Roscoe-Moss Inc.

5. **LOGISTICS:**

a. During the reporting period, the battalion S-4 section continued to handle large quantities of construction materials. One of the larger tasks was the receipt and storage of 138,000 bags of cement.

b. The battalion continued to supply potable water for tenant units on Camp Radcliff, but is phasing out of the operation as the An Khe Sub-Area Command is putting additional water purification units into operation and will completely relieve the battalion by the end of May.

c. The over-all material handling capacity of the battalion was increased as a result of the acquisition of a hydraulic crane from RMK-BMJ at Pleiku. It is only 40% as efficient as a fork lift, but has significantly reduced the wait time for transportation vehicles.

d. **Maintenance.** The battalion's maintenance capability has improved markedly by completion of one battalion maintenance shelter and five company maintenance shelters. In addition, the maintenance areas have been stabilized with 3" (-) rock. The large quantity of equipment excess to TOE, principally that equipment involved in quarrying and rock crushing, continues to place a very heavy load on the battalion maintenance capability and upon the DSU capability. The high priority accorded these operations consistently requires that maintenance and repair of TOE equipment be deferred and job-site availability of TOE equipment suffers. The DSU, the 178th Maintenance Company, has done an excellent job of 3rd echelon maintenance of rock crushers, 40-ton shovels, and dump trucks. A lack of repair parts and the low number of competent engineer mechanics in the DSU has caused an excessive delay in repair of graders, bucket loaders, 20-ton truck-mounted shovels and generators.

6. **FORCE DEVELOPMENT:** None.

7. **COMMAND MANAGEMENT:** None.

8. **INSPECTOR GENERAL:** None.

9. **INFORMATION:** None.

10. **CIVIC AFFAIRS:** None.

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

SECTION II. PART I, OBSERVATIONS (LESSONS LEARNED)

1. OPERATIONS:

ITEM: Application of peneprime to dry, dusty roads.

DISCUSSION: Due to the dry, dusty roads and the impossibility of closing the roads to traffic, a method had to be devised to apply peneprime with minimum pickup by vehicle wheels and maximum palliative effect. Several mixtures and methods were tried to include wetting the road surface just prior to applying peneprime.

OBSERVATION: A mixture of one barrel diesel fuel and five barrels of peneprime was found to give best penetration and minimize wheel pickup by traffic.

ITEM: Laying deadman cables.

DISCUSSION: In placing deadmen in rocky soil or soil which contains many roots when no entrenching machine is available, it was found that drilling holes through the soil saved many manhours in excavation. The holes were drilled with an air compressor hand drill using eight foot steels and star-point bits. Two holes were drilled side by side, resulting in tunnels large and clean enough to pass the cable through without obstruction, facilitating control.

OBSERVATION: At least 1000 manhours were saved by using the drill to replace excavation in deadman cable placing.

ITEM: Placing steel water tanks on towers.

DISCUSSION: When placing the floor panels of a steel tank on the tower platform it is not advisable to set the panels directly on the stringers. A BASE CONSISTING OF $\frac{1}{2}$ " x $\frac{3}{4}$ " plywood or equivalent material should be placed under the panels to allow enough space for door flanges on the side panel to rest on the stringers. Failure to do so results in the tank being canted on the side because the door flanges project lower than the floor panels. The ultimate result is tremendous stress applied to the bolts in the immediate area of the door flange. Placing a plywood base under the tank allows the entire tank to rest flat upon the platform.

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

OBSERVATION: With the flange on the door of steel tanks extending below the floor level, it is necessary to place a base of plywood or equivalent under the floor to compensate for this flange extension.

ITEM: Using the new T type polyethelyne sandbags for culvert headwalls.

DISCUSSION: The new T type polyethelyne sandbags have a tendency to slide off one another due to the slick texture of the bag. The problem is greatest when backfill is used around the sandbags, as in culvert headwalls.

OBSERVATION: Great care must be taken to properly stack the sandbags or use a good anchorage system of pickets or stakes of some type.

ITEM: End damage to AM-2 panels.

DISCUSSION: A temporary anchorage system of steel pickets driven into the ground on the outside edge of the AM-2 Airstrip temporarily stopped the panels from sliding. The steel pickets caused some damage to the panels due to rubbing and hitting the panels when the planes land on the strip with great force.

OBSERVATION: Replace the steel pickets with 4" x 4" or 2" x 4" wooden pickets. The larger wooden pickets will supply the same holding power without damaging the ends of the AM-2 panels.

ITEM: Concrete pouring and temperature cracking.

DISCUSSION: Just as important as keeping freshly poured concrete covered and moist is the saturation of the base area to be poured. Dry fill as a base draws moisture from the concrete and adds to the possibility of surface cracking and improperly cured concrete.

OBSERVATION: In addition to surfacing curing after pouring operations, the pad base should be wet prior to pouring.

ECC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 30 April 1967

ITEM: Billet rifle racks.

DISCUSSION: Space limitations due to the floor space occupied by rifle racks and the accumulation of dust on rifles in the racks are problems encountered when storing individual weapons in 20' x 80' wood tropical billets.

OBSERVATION: Rifle racks should be built at each end of the billets adjacent to the doors using the studs and girts as supports. Wall rifle racks raise the weapons from the floor and reduce dust accumulation on them. These weapons can be locked in the racks with one lock and one piece of rebar.

ITEM: Expedient footer forms.

DISCUSSION: During the monsoon season, dry, compactable earth fill was not available for the construction of a building with an elevated loading ramp. Eighteen inch CMP was utilized as an expedient forming material for construction of a large number of three foot footers to support a one foot cap. The 115 footers were poured in four stages, allowing repeated use of the CMP. The CMP was greased and bolted with ridges opposed to allow a level cap surface. The amount of concrete escaping through CMP "valleys" was insignificant and was easily removed with a hammer. Leveling of the expedient footers was tedious and should only be considered when fill is either not available or is unsuitable.

OBSERVATION: When fill material is unsuitable or unavailable, CMP may be used as expedient forming material. Greasing the CMP permits reuse for additional forming and eventual use as culvert material.

ITEM: Filtering river water.

DISCUSSION: To construct a filter device to fit over the end of a six inch intake pipe, a fifty-five gallon drum was drilled with holes more than equal in total area to the area of the six inch pipe. One large hole was placed in one end of the drum, and the pipe was inserted six inches and welded into place. A double layer of wire mesh was placed around the drum to filter out any foreign matter drawn near the drum.

OBSERVATION: A fabricated filter was installed to allow free travel of water through a pumping system while denying access to any foreign matter into the system.

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

ITEM: Leveling 10 MBEL or 3 MBEL tank pads.

DISCUSSION: It is very important that 3 MBEL or 10 MBEL tanks be erected on a level foundation. The tank is erected on a pad constructed of 3 inch minus compacted base material. After compaction the pads normally have several low areas. These areas present a problem in leveling the pad with a uniform layer of sand.

OBSERVATION: The irregularities in the pad can be eliminated by choking the 3 inch minus rock with a hand raked layer of 3/4 inch minus rock followed by a layer of sand.

ITEM: Wedge gasket splitting on bolted steel tank.

DISCUSSION: This unit has had problems with splitting wedge gaskets used to seal joints of bolted steel tanks. Even with minimum tightening, the gasket spreads excessively and breaks at the thick end. This condition was reduced by splitting the thin web molding on the thick side of the gasket.

OBSERVATION: This reduced the horizontal force applied to the gasket which resulted in fewer broken gaskets and a better seal.

ITEM: Final testing for leaks in POL storage tanks.

DISCUSSION: When testing steel bolted tanks for leaks, several ideas were combined to shorten the time involved. First and foremost, it is always easier to tighten a wall bolt and washer than it is to remove it. The rubber washer beneath the bolt must not be flattened against the face of the tank but should be fitted just snugly against the face to allow for expansion. Secondly, the door of a bolted tank should not be put on until the sealing compound along the inside joints has dried. After this, the door should be bolted but not sealed as it must be removed to drain the test water from the bottom of the tank. Only after the tank has been entirely tested should this door be sealed.

OBSERVATION: When wall bolts were left intentionally loose to be tightened as a tank was being tested and when the door was not sealed until testing was completed, time and effort were saved. (This procedure does not apply to floor bolts.)

ECC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 30 April 1967

14

ITEM: Tank farm manifold construction.

DISCUSSION: In constructing a manifold, blocks were set beneath the pipes to insure that should a repair have to be made, the entire manifold would not have to be lifted to remove one clamp or a section of pipe. The blocks are also high enough to permit a repair overcoupling to be placed around any leaking clamp without manipulating the manifold pipe in any way.

OBSERVATION: A quick and efficient means to provide for pipe repairs or replacement was insured by placing blocks beneath the bottom pipes in the manifold.

ITEM: Placing roof panels on bolted-steel, POL storage tanks.

DISCUSSION: In the construction of 3 MBL and 10 MBL storage tanks, a tendency developed after the third ring of staves, (side panels), had been placed, for the staves to converge and bend forming an ellipse which replaced the original circular form. This new form prohibited the joints on the roof panels from meeting those on the center-pole ring and staves when the normal, counterclockwise direction of placing roof panels was attempted.

OBSERVATION: By placing four roof panels into position at ninety degree angles from one another, the sides and center-pole ring were held rigidly in place. The elliptical effect was removed and normal construction procedure was again resumed; the four original panels were loosened and lifted into permanent position as the construction crew reached the location of these panels.

ITEM: Concrete testing.

DISCUSSION: Specifications for the concrete for An Khe airfield require a concrete with a flexural (beam) strength of 600 psi at 28 days. Normally this would not be difficult to obtain consistently. In an attempt to design an acceptable concrete mix to meet these specifications, a number of trial mixes were made and test beams broken at 7 and 28 days. Generalized results are as follows:

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 30 April 1967

| Mix No. | Water/Cement Ratio | Slump | Flexural Strength (PSI) | |
|---------|--------------------|--------|-------------------------|---------|
| | | | 7 days | 28 days |
| 1 | 5.5/1 | 2 3/4" | 357 | 435 |
| 2 | 5.0/1 | 1" | 378 | 605 |
| 3 | 4.75/1 | 2 3/4" | 462 | 582 |
| 4 | 4.5/1 | 1 3/4" | 518 | 537 |

The 7 day strengths appeared to be acceptable as they fell within the curves in the PCA concrete manual. However, with one exception - Mix No. 2 -, all failed to meet expected 28 day strengths. The exception was so marginal, it was also rejected. The cement used was "Universal" cement, manufactured in Taiwan. 80,000 bags were on hand. Additional tests were made with bags selected at random from the stack. These tests confirmed the first tests. Another oddity noted during the preparation of the test beams was a tendency for some of the concrete to take a flash set within 10 minutes of mixing. This cement has been rejected for all high quality projects and is used exclusively in billet pads and ammunition pads. A chemical analysis of this and two additional brands of cement on hand is being made by PA&E (R&U Contractor) utilizing GVN laboratory facilities in Saigon. Subsequent test of a fresher batch of cement from a different manufacturer has produced beams with 7 day strengths consistently over 500 psi and some over 600 psi. 28 day strengths in excess of 700 psi are expected.

- OBSERVATION:
- It can never be assumed that foreign-manufactured cement will meet PCA specifications and it should not be used where high strength is required unless it is thoroughly tested.
 - The ability to test concrete beams and cylinders is not organic to engineer combat and construction battalions. Each engineer group should have a complete soils and concrete testing capability.

EGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 30 April 1967

16

2. LOGISTICS:

ITEM: Movement of large quantities of cement.

DISCUSSION: This battalion received a large quantity of cement in a short period of time for airfield and other construction projects. The desirability of taking as much cement as possible off a given ship to minimize quality variation poses a significant transportation problem, considering the off-loading capability of the ships and the round trip haul distance (approximately 120 miles). Transportation S & P's are not available in sufficient numbers to solve the problem.

OBSERVATION: Five-ton bridge trucks are being used to augment the S & P's. Experience shows that although an S & P carries an average of two or three pallets more than a bridge truck, the bridge trucks are at least as effective as S & P's. This is due to the point-to-point haul of the bridge trucks as opposed to S & P's which are frequently delayed in Trailer Transfer Points. Also, bridge trucks attached from another unit are much easier to control and the cargo loss due to theft is largely eliminated.

BGC-70E-CO

10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 30 April 1967

SECTION II, PART II, RECOMMENDATIONS.

1. PERSONNEL: None.

2. OPERATIONS: None.

3. TRAINING AND ORGANIZATION: This battalion is still organized under the Delta series TOE, probably one of three such engineer battalions remaining in the active army. The advantages of the Echo TOE as compared to the Delta TOE are principally in the addition of a line company, additional equipment (sorely needed), more modern and adequate unit radio communications and an increased maintenance capability. An MTOE converting this unit to Echo TOE and augmenting it with the combat construction section in the augmentation section of the Echo TOE was provided to Department of the Army in December 1966. It is recommended that action be taken to approve and implement the MTOE.

4. INTELLIGENCE: None.

5. LOGISTICS:

a. This unit is engaged primarily in the construction of base camp and log support facilities. Very large quantities of building materials are handled daily and except for 20-ton truck mounted cranes and 5-ton wreckers, there is little or no MHE available to this unit from TOE resources. One hydraulic crane ("Cherry-picker") has been furnished from RMK assets acquired in Pleiku and it has proven to be a lifesaver. The An Khe Sub-Area Command has made available a fork lift for fulltime use. These two items can handle the load, if used 24 hours daily, as they are, and if they stay operational, which they do not. A rough terrain fork lift should be TOE to all engineer combat and construction battalions. This requirement is not considered unique to Vietnam.

b. Red Ball requisitions submitted by this unit are collected by our DSU and a consolidated Red Ball requisition for the An Khe Sub-Area Command is prepared. Our unit identification code is omitted from the AKSAC Red Ball requisition and their UIC substituted. It is suspected that this consolidation of Red Ball requisitions also occurs at the Qui Nhon Support Command. This practice tends to defeat the purpose of the Red Ball system in that parts, once received by whatever higher echelon submits the Red Ball to CONUS, must be crosschecked against registers to determine what subarea command requested them and this procedure repeated at every level until it arrives at the original requesting unit. All of this could be eliminated if the original requisition were sent to Okinawa or CONUS and the parts shipped to and marked for the requesting unit. Recommend that the practice of consolidating Red Ball requisitions be discontinued.

EGC-70E-CO

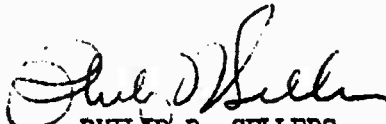
10 May 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 30 April 1967

c. The 1st Air Cavalry Division controls the priorities of base development at Camp Radcliff. Unit maintenance facilities carry priority 11 of 21, and come after messhalls, latrine/showers, billets, dayrooms, aid stations, headquarters buildings, operations buildings, commo facilities, storage and warehouse facilities. Some relief is available in that once a battalion reaches 65% of its authorized billets, the commander may request a change in priorities. This unit was able to obtain an exception to this policy and has erected unit maintenance facilities. The quality of maintenance performed has improved markedly. The importance of building maintenance facilities early in any base development program cannot be overemphasized. These facilities should rank just behind mess and latrine/shower facilities and this should be USARV policy.

6. OTHER: None.

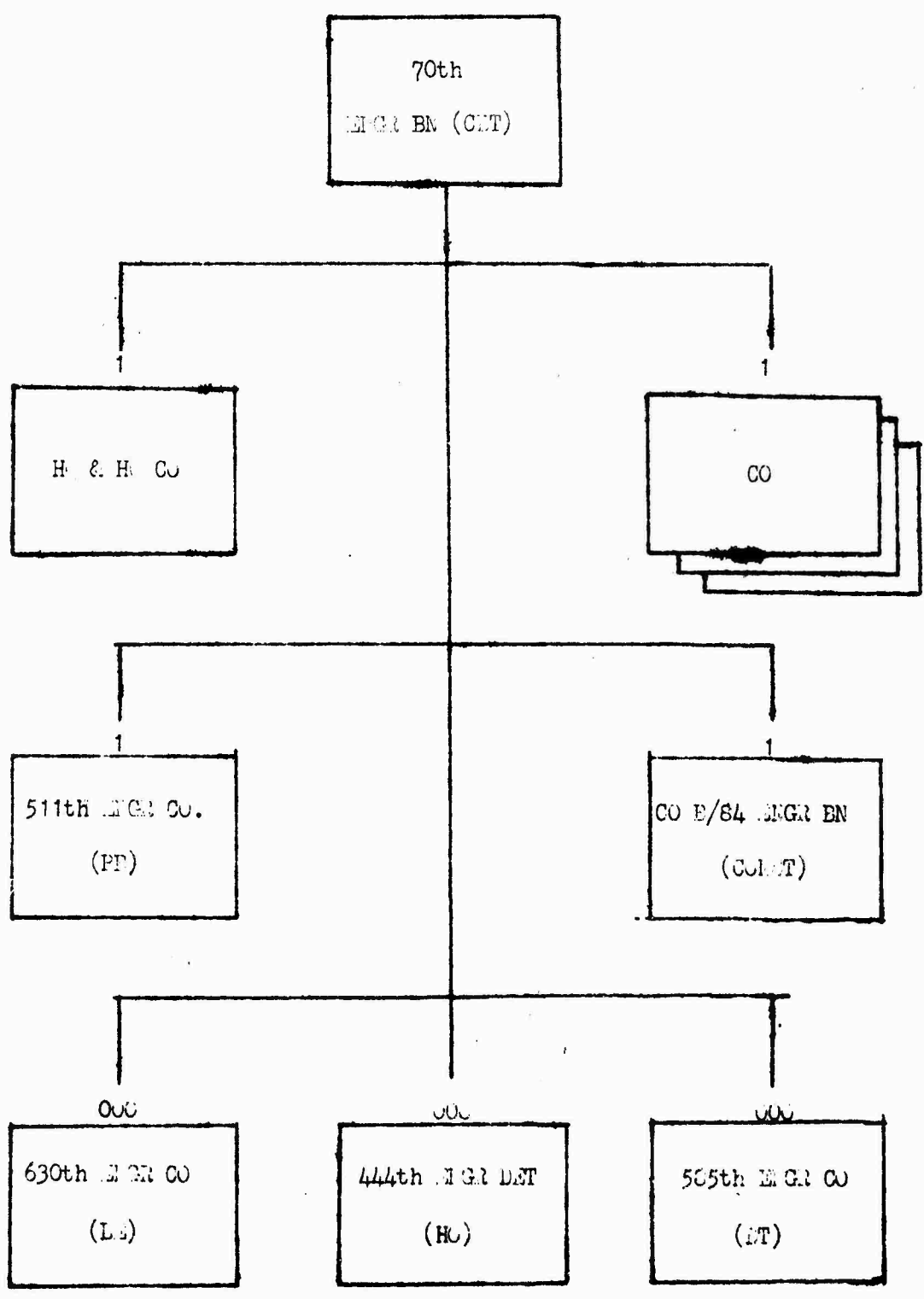
2 Incl
as


PHILIP D. SELLERS
LTC, CE
Commanding

DISTRIBUTION:

- 3 - CO, 937th Engineer Group (Cbt), ATTN: EGC-3, APO 96318
- 3 - CG, 18th Engineer Brigade, ATTN: AVBC-C, APO 96377
- 3 - CG, US Army Engineer Command (Prov), Vietnam, ATTN: AVCC-BC,
APO 96491
- 3 - CG, USARV, ATTN: AVC-DH, APO 96307
- 2 - CINCUSARPAC, ATTN: GPOP-MH, APO 96558 (Air Mail)
- 2 - CINCUSARPAC, ATTN: GPOP-OT, APO 96558 (Air Mail)
- 1 - Copy File
- 10 - Extra

19



28 MAY 1967

3

EGC-CO (10 May 67) 1st Ind
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 30 April 1967.

DEPARTMENT OF THE ARMY, HEADQUARTERS, 937TH ENGINEER GROUP (COMBAT), APO
96318, 27 May 1967

TO: Commanding General, 18th Engineer Brigade, ATTN: AVBC-C, APO 96377

1. The subject report, submitted by the 70th Engineer Battalion (Combat), has been reviewed and is considered a well compiled report of organizational activities.

2. I concur in the observations and recommendations of the Battalion Commander, with the following exception: Reference Section II, Part II, para 5.b: The recommended change in the Red Ball requisitioning system was in effect prior to January 1967. A lack of intermediate controls caused many delays in receiving incoming parts and in January 1967 the present system of consolidating Red Ball requisitions was initiated to eliminate delays while still maintaining adequate controls. I consider the current system of consolidating requests an improvement over the old system, and do not concur in the recommendation to discontinue the practice of consolidating Red Ball requisitions.

3. The following comments are added:

a. Reference Section II, Part II, para 5a:

The 70th Engr Bn (C) has recently received a 15-ton-capacity fork lift. The fork lift is now being utilized to support construction operations at various locations in the An Khe area (Primarily the An Khe Airfield), rather than to support logistical operations. However, the fork lift is available in the unit and can be utilized for materials handling as required.

b. Reference Section II, Part II, para 5c:

I share the views expressed concerning the relative priority for the construction of maintenance facilities for engineer units but do not consider myself able to recommend that a high priority be assigned to the construction of maintenance facilities for all units. The effectiveness of some units may not be so dependent upon the operability of heavy vehicles and mechanical equipment as is the case with engineer units.



E. P. BRAUCHER
Colonel, CE
Commanding

19

FOR OFFICIAL USE ONLY

3

AVBC-C (10 May 67) 2nd Ind Cpt Mills/rzg/DBT-163
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for the
Quarterly Period Ending 30 April 1967

22

Headquarters, 18th Engineer Brigade, APO US Forces 96377 1 4 JUN 1967

TO: Commanding General, US Army Engineer Command, Vietnam (Prov),
ATTN: AVCC-P&O, APO US Forces 96491

1. This headquarters has reviewed the Operational Report - Lessons Learned for the 70th Engineer Battalion (Combat) for the period ending 30 April 1967.

2. Concur with the observations and recommendations of the Battalion Commander, as modified by Commanding Officer, 937th Engineer Group (Combat), with the following additional comments.

a. Page 7, paragraph (2) (k) - The total length of the An Khe concrete runway, with over-runs, is 4,365 feet.

b. Page 8, paragraph (2) (n) - An Khe Dial Central - Tile mastic has been delivered to allow completion of the last portion of the project.

c. Page 10, paragraph 1, Item: Penepriime - best results are obtained when road surfaces are sprayed with water prior to the application of asphaltic materials. The use of cut back asphalt is recommended for traffic bearing surfaces due to its better binding and wearing qualities. Penepriime should be used primarily for non-trafficked areas where immediate use is contemplated, such as helipads and landing areas.

d. Page 11, Item: End damage to AM-2 panels - when wood pickets are used for anchorage of AM-2 panels, the anchorage system should be checked daily to determine if any replacements are necessary.

e. Page 11, Item: Concrete placement - surfaces against which concrete is to be placed, and with which it is designed to bond should be moist and clean. However, the subgrade should not be made soft by excessive moisture.

f. Page 13, Item: Leveling of LOMBEL or MMBL tank pads - In lieu of 3/4 inch minus rock, the compacted base material can be shot with asphaltic material and choked with sand.



C.M. DUKE
Brigadier General, USA
Commanding

20

FOR OFFICIAL USE ONLY

23

AVCC-P&O (10 May 67) 3d Ind CPT Hubbard/ccb/BH 404
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for Quarterly
Period Ending 30 April 1967

HEADQUARTERS, UNITED STATES ARMY ENGINEER COMMAND
VIETNAM (PROV), APO 96491 21 JUN 1967

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

1. The subject report, submitted by the 70th Engineer Battalion (Cbt),
has been reviewed by this headquarters and is considered adequate.

2. The recommendations and comments made by the submitting and Indorsing
commanders have been reviewed and this headquarters concurs, subject to the
following added comments:

a. Section 2, Part II, paragraph 3, page 17. This action is presently
pending at DA.

b. Section 2, Part II, paragraph 5b, page 17. A letter has been
sent to 1st Logistical Command requesting clarification of this procedure.


c. Section 2, Part II, paragraph 5c, page 18, and paragraph 3b, 1st
Indorsement.

(1) Priorities for allocation of Engineer Troop Effort and Con-
struction Materials, USARV Reg 405-2, is currently under revision and assigns
higher priority to construction of unit maintenance facilities.

(2) It is also noted that the existing priority list established
by USARV Reg 405-2 assigns unit maintenance facilities of an Engineer Battalion
higher priority than EM billets and rooms.

(3) This headquarters will insure that the approved USARV priority
list is brought to the attention of all subordinate units.

FOR THE COMMANDER:


RICHARD J. DUCOTE
Colonel, OE
Chief of Staff

21

USARV, ATTN: AVHGC-DH

24

AVHGC-DST (10 May 67) 4th Ind
SUBJECT: Operational Report-Lessons Learned for the Period Ending 30 April
1967 (RCS CSFOR-65)

HEADQUARTERS, UNITED STATES ARMY VIETNAM, APO San Francisco 96307 16 JUL 1967

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 30 April 1967 from Headquarters, 70th Engineer Battalion (COMBAT) (ARMY).

2. Pertinent comments follow:

a. Reference item concerning shortage of items of engineer equipment, paragraph 4a (3), page 4: Concur. Continued efforts by higher headquarters must be made to improve the asset position of engineer equipment.

b. Reference item concerning rough terrain fork lifts, paragraph 5a, page 17, and paragraph 3a, 1st Indorsement: Non-Concur. The use of a rough terrain fork lift would not necessarily be applicable to all engineer battalions as recommended. Recommend unit initiate MTOE action for this item. Action in 1st Indorsement is considered adequate as an immediate solution.


c. Reference item concerning action to be taken to approve and implement the MTOE, paragraph 3, page 17: MTOE has since been approved and implemented by PAC GO 107, 5 Jun 67.

d. Reference item concerning Red Ball requisitions, paragraph 5a, page 17 and paragraph 2, 1st Indorsement: Concur in 1st Indorsement comments. For units without activity address codes (AAC) dues-out at the DSU level must be established. DSU AAC is recorded on the requisition in order that the repair parts can be delivered direct to the appropriate DSU. Requisitions are not consolidated above DSU level. Requisitions must not by-pass DSU and RVN depot systems or demand data will be lost.

e. Reference item concerning base camp development, paragraph 5c, page 18; paragraph 3b, 1st Indorsement and paragraph 2c (1), 3d Indorsement: Concur. As noted in 3d Indorsement, action is being taken to revise construction priorities and a much higher priority will be assigned to unit maintenance facilities.

FOR THE COMMANDER:

2 Incl
nc


E. L. KENNEDY
CPT, ACC
Asst Adjutant General