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

48p.

(11) 27 Apr 72

DAAG-PAP-A (M) (13 Apr 72) DAFD-OTT 27 April 1972

SUBJECT: Operational Reports - Lessons Learned, Headquarters, 39th Engineer Battalion, 20th Engineer Battalion, 45th Engineer Group, 36th Engineer Battalion. [redacted]

(6)

SEE DISTRIBUTION

(9) Operational rept. for period ending 31 Oct 71.

1. Section 2 of reports, subject as above, are forwarded for review and evaluation in accordance with para 4b, AR 525-15.

2. The information contained in these reports is provided to insure that lessons learned during current operations are used to the benefit of future operations and may be adapted for use in developing training material.

3. Information of actions initiated as a result of your evaluation should be forwarded to the Assistant Chief of Staff for Force Development, ATTN: DAFD-OTT, within 90 days of receipt of this letter.

4. As Section 1 of subject reports are not pertinent to the Lessons Learned program, they have been omitted.

BY ORDER OF THE SECRETARY OF THE ARMY:

VERNE L. BOWERS
Major General, USA
The Adjutant General

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Operational Report - Lessons Learned, 39th Engineer Battalion (Combat, Period Ending 31 October 1971, RCS CSFOR-65 (R3)

II. LESSONS LEARNED.

A. Personnel: None.

B. Intelligence: None

C. Operations:

1. Expedient Method of Applying Asphalt Cutback.

a. Observation: It was necessary to distribute asphalt cutback over a 200 meter section of road and no asphalt distributor was available.

b. Evaluation: In order to get this small amount of road covered it was necessary to improvise some expedient method of spreading asphalt.

c. Recommendation: The 55 gallon drums of asphalt cutback were loaded into the bucket of a front end loader. Holes were punched in the drums and the loader backed slowly along the road.

d. Command Action: None.

2. Raising Rebar Off the Ground:

a. Observation: In order that cement slabs containing rebar achieve maximum strength it is necessary that the rebar be completely embedded in the concrete. Commercial standoffs were not available.

b. Evaluation: A method must be found to keep the rebar off the ground allowing the concrete to get underneath the rebar.

c. Recommendation: In order to raise the rebar off the ground blocks made of sand and cement work very well. These blocks may be made of sand and cement work very well. These blocks may be made by using wooden forms of the desired dimensions and pouring the cement and sand mixture into the forms. While the cement is hardening two short wires should be placed in one end of the block. These are used to tie the rebar in place so it does not slip off the block.

d. Command Action: None.

3. Emergency Repair of Leaf Spring Mounting Bolts:

a. Observation: A leaf spring on an International Harvester asphalt distributor sheared its mounting bolts several miles from the company NDP.

b. Evaluation: A temporary repair was needed to allow the distributor to return to the company NDP.

c. Recommendation: Regular 8 inch culvert bolts from a nearby culvert project served to hold the leaf spring to the mount.

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d. Command Action: The driver was cautioned to drive very carefully and slowly while returning to the NDP. The culvert bolts do not have the required strength for a permanent repair, however, they did serve to move the vehicle back to a secure area where permanent repairs could be made.

4. Construction of Ford:

a. Observation: In the construction of a ford across a very hard and rocky stream bed, extreme difficulty was encountered in placing forms prior to placing concrete.

b. Evaluation: A more expedient method for forming the concrete pads in the ford was required.

c. Recommendations: Sandbags were used to form the concrete pads. The sandbags provided adequate support to hold the fresh concrete, effectively held back the stream flow, and were rapidly installed.

d. Command Action: None.

5. Concrete Batch Plant:

a. Observation: Concrete transit mixer trucks should be loaded with some type of hopper arrangement so that maximum utilization can be made of the trucks.

b. Evaluation: A way must be found to raise the hopper above the inlet to the transit mixer.

c. Recommendations: Two bays of double-triple bailey bridge were constructed. A platform was constructed on top and the hopper placed on that. The transit mixer truck is now easily filled by a clamshell.

d. Command Action: Special safety briefings have been given on procedures to be used while backing under the hopper; use of ground guides, moving slowly, and not starting to fill the hopper until the truck has stopped and the driver is out of the cab.

6. Handling AIK laborers:

a. Observation: The use of AIK laborers does not mean "more laborers, more work."

b. Evaluation: One NCO can properly supervise as many as ten AIK laborers, and more than ten will lead to confusion, accomplishing no constructive work.

c. Recommendation: AIK work parties should not number more than ten.

d. Command Action: None.

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7. Back Fill of Laterite Over Culverts:

a. Observation: When the minimum specified amount of fill (half the culvert diameter) has been placed over a culvert it has been found that the culvert often collapses under traffic.

b. Evaluation: When using laterite soils found in our area of operations more than one half the culvert diameter of fill must be provided.

c. Recommendation: For internally braced culverts place fill over the culvert equal to the culvert diameter; for non-braced culverts the depth of fill should be equal to one and one half the culvert diameter.

d. Command Action: This information has been passed on to all other companies in the battalion.

8. Portable Asphalt Loading Rack:

a. Observation: When applying asphalt cutback to a long road it is very time consuming to move the asphalt distributor back to base camp for reloading.

b. Evaluation: A means of loading the asphalt distributor near the work site had to be devised.

c. Recommendation: A portable asphalt loading ramp was constructed with timbers on the bed of a 5 ton dump truck. Placing asphalt barrel stock-piles along the road and loading the barrels onto the rack using a bucket loader greatly speeded the asphalting operation.

d. Command Action: None.

9. Lifting Hooks for Concrete Slab Revetments:

a. Observation: The bent steel rebar lifting hooks originally specified for the revetments were difficult to fabricate and often when lifting a slab,cracks would develop around the rebar hook.

b. Evaluation: A means had to be found to lift the revetments without cracking and that would not take as long to fabricate.

c. Recommendation: Chain was used for lifting hooks. The chain was placed over the rebar inside the concrete. This method was much faster than trying to make complex bends in half inch rebar, and also no cracks have developed when lifting revetments with chain lifting loops.

d. Command Action: None

10. Spreading Sand on Fresh Asphalt:

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a. Observation: When asphalt cutback is sprayed on a road it must be quickly covered with a layer of sand to protect it from being torn up by passing traffic. Spreading the sand with a dump truck is a slow process if a sand spreader is not available.

b. Evaluation: A quicker method had to be found to spread the sand.

c. Recommendation: Use a 290 scraper to spread the sand. It is quicker to load than using a bucket loader and dump truck and by opening the apron four inches and traveling at about 20 MPH a good coating of sand is laid down.

d. Command Action: Using this method requires an experienced operator. Also care must be used when driving on the fresh, very slippery asphalt.

D. Organization: None.

E. Training: None.

F. Logistics: None.

G. Communications:

1. Improvement of land line commo:

a. Observation: Running separate WD-1 telephone lines to each staff section and office results in a mass of wire, outages are frequent and difficult to find and repair.

b. Evaluation: To provide better commo a means had to be found to straighten out the telephone lines.

c. Recommendation: A considerable length of 25 and 100 pair multiple conductor cable was available. By replacing the numerous WD-1 wires with the large cables it eliminated a large mass of wires, cut down on outages by 90%, and made it easy to make any repairs that were necessary.

d. Command Action: None.

H. Material: None.

I. Other:

1. Vehicle Safety:

a. Observation: Local Vietnamese seem to run into the path of convoys with no warning.

b. Evaluation: Perhaps painting warnings on our larger vehicles would emphasize the safety hazards surrounding them.

c. Recommendations: Yellow and black stripes were painted on the bumpers of all vehicles over 3/4 ton. Warnings were also painted on the

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bodies of all large vehicles emphasizing the dangers of passing and following too closely.

d. Command Action: Special briefings were given to all vehicle drivers on the behavior of the Vietnamese and the importance of going slowly through villages.

HARRY G. RUNNAGEL
Major, CE
Commanding

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EDG-BA-2 (30 Nov 71) 1st Ind
SUBJECT; Operational Report - Lessons Learned, 39th Enginner Battalion (Cbt),

HEADQUARTERS, 45TH ENGINEER GROUP (CONSTRUCTION), APO 96317

THRU: Commanding General, USARPAC USCOMDV, ATTN: AVCC-MO, APO 96419

TO: Headquarters, Department of the Army (DAFD-ZA), Washington DC, 20301

1. The significant activities and lessons learned have been reviewed and are an adequate reflection of the units operations during this period.

2. Reference item concerning," Expedient methods of applying asphalt cutback," page 1., para 1. Concur. No action by USARPAC or DA recommended.

3. Reference item concerning," Raising Rebar off the ground", page 1 para 2. Concur. No action by USARPAC or DA recommended.

4. Reference item concerning," Emergency repair of laf spring mounting bolts," page 1, para 3. Concur. No action by USARPAC or DA recommended.

5. Reference item concerning," Construction of Ford," page 2, ,para 4. Concur. No action by USARPAC or DA recommended.

6. Reference item concerning, " Concrete Batch Plant," page 2,. para 12. Concur. No action by USARPAC or DA recommended.

7. Reference item concerning," Handling A In K labors," page 2,. para 6. Concur. No action by USARPAC or DA is recommended.

8. Reference item concerning," Back fill and laterite over culverts," page 3 para 7. Concur. No action by USARPAC or DA is recommended.

9. Reference item concerning," Portable asphalt Loading Racks," page 3 para 8. Concur. No action by USARPAC or DA is recommended.

10. Reference item concerning," Lifting hooks for concrete slabs revetments," page 3, para 9. Concur. No action by USARPAC or DA is recommended.

11. Reference item concerning," Spreading sand on fresh asphalt," page 3, para 10. Noncur with driving vehicle at 20 Mph on freshly treated surface. No action by USARPAC or DA is recommended.

12. Reference item concerning," Improvement of land line commo," page 4, para G. Concur. No action by USARPAC or DA is recommended.

13. Reference item concerning," Vehicle safety," page 4, para I. Concur. No action by USARPAC or DA is recommended.

FOR THE COMMANDER

Thomas N. Whitsett
THOMAS N. WHITSETT
CPT, CE
Assistant Adjutant

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AVCC-MO (10 Nov 71) 2nd Ind
SUBJECT: Operational Report - Lessons Learned, 39th Engineer Battalion (Combat), Period Ending 31 October 1971, RCS CSFOR-65 (R3)

HQ, U.S. Army Engineer Command Vietnam, APO San Francisco 96491

TO: Commanding General, U.S. Army Vietnam, ATTN: AVHDO-DO, APO San Francisco 96375

1. The significant activities and, lessons learned have been reviewed and are an adequate reflection of the units operation during this period.

2. Reference item concerning "Back Fill of Laterite Over Culverts", page 3, paragraph II-C-7. Nonconcur. The accepted rule of thumb stating culvert fill should be, as a minimum, one half culvert diameter is more fill than required through formulas given by culvert manufacturers. If the unit is experiencing culvert failure, close examination should be given to the compaction being achieved on the sides as well as on top of the culvert. Increased culvert cover may eliminate pipe failure but if proper compaction is not obtained, road failure may be expected over the culvert. No action by USARPAC or DA is recommended.

3. Reference item concerning "Lifting Hooks for Concrete Slab Revetments", page 3, paragraph II-C-9. Nonconcur. The cost and availability of chain is prohibitive when compared with the specified rebar. All cracking around lifting hooks can easily be eliminated through proper quality control and if necessary, by changing the angle at which the rebar lifting hooks enter the slab, i.e. the more perpendicular to the concrete, the less cracking. No action by USARPAC or DA is recommended.

4. Reference item concerning "Spreading Sand on Fresh Asphalt", page 3, paragraph II-C-10. Concur. This improvization should only be used when a spreader is not available, considering the extreme safety hazard of operating heavy equipment on crowned roadway with fresh cutback. No action by USARPAC or DA is recommended.

FOR THE COMMANDER

D.Y. FREED
CPT, AGC
Assistant Adjutant General

CF:
39th Engineer Battalion
45th Engineer Group

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AVHDO-DO (10 Nov 71) 3d Ind 17 FEB 1972
SUBJECT: Operational Report of 39th Engineer Battalion (Combat) for Period Ending 31 October 1971, RCS CSFOR-65 (R3)

Headquarters, United States Army Vietnam, APO San Francisco 96375

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

This headquarters has reviewed the Operational Report-Lessons Learned for the period ending 31 October 1971 from Headquarters, 39th Engineer Battalion and concurs with comments of indorsing headquarters.

FOR THE COMMANDER:

T. L. CHILDRESS
CPT AGC
ASSISTANT ADJUTANT GENERAL

Cy furn:
USARENGRCOMDV
39th Engr Bn

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GPOP-FD (10 Nov 71) 4th Ind
SUBJECT: Operational Report-Lessons Learned, HQ 39th Engineer Battalion (Cbt), Period Ending 31 October 1971, RCS CSFOR-65 (R3)

HQ, US Army, Pacific, APO San Francisco 96558 10 MAR 1972

TO: HQDA (DAFD-ZA) WASH DC 20310

This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:

M. L. Mah

M. L. MAH
1LT, AGC
Asst AG

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SUBJECT: Operational Report-Lessons Learned, 20th Engineer Battalion Combat, Period Ending 28 August 71, RCS CSFOR-65(R3)

2. Lessons Learned: Commander's Observations, Evaluations, and Recommendations.

a. Personnel

(1) Foreign Service Tour Curtailment

a. OBSERVATION: A draw down unit was not given curtailments of foreign service tours while inactivating units were.

b. EVALUATION: One company out of our eight was not allowed to curtail the foreign service tours of its members in conjunction with standdown while the other units were able to do so. This has caused a large drop in the morale of the unit which did not receive curtailments.

c. RECOMMENDATION: When the draw down unit is in the same battalion with inactivating units they should receive the same personnel curtailment instructions.

d. COMMAND ACTION: A message was sent to CO, 35th Engineer Group; CG Engineer Command; request that the company receive curtailments of foreign service tours. The request was denied by a message from CO, 35th Engineer Group.

(2) Foreign Service Tour Curtailment for Personnel on Extensions.

a. OBSERVATION: This unit was not allowed to curtail the foreign service tours of personnel who had previously extended their foreign service and had taken the 30 day special leave.

b. EVALUATION: This resulted in several personnel being reassigned to new units within Vietnam for periods of less than 30 days.

c. RECOMMENDATION: Criteria for curtailment of foreign tours should be standardized for all personnel in a standdown unit.

d. COMMAND ACTION: Request was made by phone to CO, 35th Engineer Group by CO, 20th Engineer Battalion for 30 days curtailments of foreign service tours of personnel on extensions. Request was denied by CO, 35th Engineer Group.

(3) Recurring Report.

a. OBSERVATION: No cut-off date for recurring reports was received.

b. EVALUATION: No guidance was provided as to the termination of routine recurring reports by higher headquarters. Consequently an administrative burden was placed on the unit personnel section to furnish reports and statistical data that in many instances was redundant or totally unnecessary due to the inactivation of the unit.

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c. RECOMMENDATION: That upon notification of standdown, cut-off dates for all recurring reports should be established with exception to those outlined in USARV Manual 600-1.

d. COMMAND ACTION: Request for a listing of cut-off for all recurring reports was made to XO, 35th Engineer Group by XO, 20th Engineer Battalion on 22 June 1971 at a conference on standdown activities at the 35th Engineer Group headquarters. No listing was ever received.

(4) DEROS Loss Report/Rosters.

a. OBSERVATION: Correct guidance as to proper procedures for preparation of DEROS loss report/rosters was not received.

b. EVALUATION: Initial DEROS loss rosters were submitted in accordance with USARV Manual 600-1 and instructions received from the standdown liaison officer from the 35th Engineer Group. The rosters were later determined to be unacceptable due to changes in the format. Rosters were resubmitted a total of three more times prior to acceptance as correct.

c. RECOMMENDATION: That USARV Manual 600-1 dated March 1971 be changed to reflect proper guidance and procedures in a detailed manner.

d. COMMAND ACTION: The above recommendation was presented to the USARV Assistance Team on 16 July 1971.

(5) Courts-Martial During Standdown

a. OBSERVATION: Timely distribution of Court-Martial orders were not made during standdown period.

b. EVALUATION: Copies of Court-Martial orders were not furnished on a timely basis for those personnel Court-Martialed prior to and during the standdown period which precluded administrative clearance, processing, reassignment and movement of personnel.

c. RECOMMENDATION: That personnel pending action under the provisions of AR 600-31 be immediately transferred to next higher headquarters for disposition as soon as thenotification of standdown is received.

d. COMMAND ACTION: Headquarters, 35th Engineer Group was continuously advised of the status by phone and by letter dated 15 July 1971 of all outstanding cases and the necessity of expediting them. A request was made to the 35th Engineer Group to transfer the personnel pending such actions to their headquarters on 8 August 1971. A message from 35th Engineer Group on 14 August 1971 instructed us to transfer the personnel as requested but not until 20 August 1971.

(6) Out-of-Country Reassignment Instructions.

a. OBSERVATION: Assignment instructions for out-of-country reassignments were not received in a timely basis.

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b. EVALUATION: Out-of-Country reassignment instructions for officers and career enlisted personnel (grades E-5 thru E-9) were not received in many instances prior to departure to afford personnel the opportunity to apply for concurrent travel of dependents, ship hold baggage/personal property, alert dependents of new assignment, etc.

c. RECOMMENDATIONS: Immediately after a unit is notified of standdown, personnel should be identified and priority be given in obtaining assignments for these personnel.

d. COMMAND ACTION: When the lack of assignment instructions became extremely critical the unit personnel officer was sent to the 35th Engineer Group, Engineer Command, and USARV to obtain them. This proved successful, however resulted in four days lost time for the Unit Personnel Officer during a very busy period for his section.

(7) Liaison and Assistance Visits

a. OBSERVATION: Liaison and assistance visits by higher headquarters were not adequate.

b. EVALUATION: Visits by liaison and assistance teams were too brief to render the required support necessary.

c. RECOMMENDATION: That specialists within the existing liaison or assistance teams be attached to standdown unit during complete standown phase.

d. COMMAND ACTION: Made the above recommendation to the liaison teams when they visited the battalion. USARV and Engineer Command teams each made a one day visit to the battalion.

b. Intelligence: None

c. Operations

(1) Use of Demolition on Reinforced Concrete

a. OBSERVATION: During the repair of bridge 19-33 on route QL-19 it became necessary to remove the damaged upper half of a reinforced concrete "T" shaped pier.

b. EVALUATION: Initially an "ear muff" charge was planned for use in destroying the damaged "T" section of the pier, however the charge proved to be ineffectual. To remove the "T" section it was necessary to breech the pier by using shaped charges to blast three holes through the concrete and then using tamped C-4 in the holes to complete the breech. The results were superior.

c. RECOMMENDATION: Since "ear muff" charges will not destroy reinforced concrete very easily it is recommended that the method described above be used.

d. COMMAND ACTION: None

(2) Providing Support Against the Recoil of Heavy Artillery Pieces.

a. OBSERVATION: When the spade of an 8" or 175mm self-propelled gun is dug in the berm of a gun pad the supporting earth often fails during periods of heavy rainfall.

b. EVALUATION: The recoil from a self-propelled gun causes the spade to exert a large amount of pressure on the berm of a gun pad and during periods of heavy rainfall the spade will often times be pushed through the berm and will eventually wear berm down.

c. RECOMMENDATION: Place 55 gallons drums filled with compacted earth around the inside edge of the berm to reinforce the berm. The barrels should be buried just inside the edge of the berm so that when they are backfilled, the inside of the berm retains its original shape. They should be buried half way below the gun pad level.

d. COMMAND ACTION: None

(3) Clearing Crushed Rock

a. OBSERVATION: Crushed rock which has a large amount of dirt and fines cannot be used as concrete aggregate and during the monsoon season cannot be used as base course very effectively.

b. EVALUATION: Rock that has a higher content of dirt and fines makes a poor quality concrete and when wet and being used as a base course, it cannot be compacted to provide a stable base on which to pave.

c. RECOMMENDATION: Crushed rock can be cleaned by running it through the asphalt plant which dries and screens out the fines and dirt.

d. COMMAND ACTION: None

(4) Pre-washing of Keystone Vehicles

a. OBSERVATION: While retrograding equipment it was noticed that the washing operations took an excessive amount of time and was a major bottleneck in the turn-in of equipment.

b. EVALUATION: Most of the problem was caused by layers of caked-on mud, which had been on the vehicle for sometime. It was discovered that pre-washing and cleaning before transporting to Cha Rang Valley eliminated this problem and greatly reduced the amount of time spent on the wash rack.

c. RECOMMENDATION: Pre-wash all vehicles before transporting to Keystone facilities.

d. COMMAND ACTION: None

d. Organization.

(1) Organization of Assets for Retrograde

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a. OBSERVATION: Much wasted effort and an inordinate amount of coordination was required to arrange haul assets organic to the unit for retrograde movement.

b. EVALUATION: The contributing factor to the wasted effort and increased coordination was determined to be improper organization of the haul assets and their chain of command.

c. RECOMMENDATION: That all haul assets of a Keystone unit to be placed under the control of the individual who could act as a liaison between S-3, S-4, and the battalion maintenance section in coordinating the assets and the loads to be hauled.

d. COMMAND ACTION: The above recommendation was initiated in this unit and resulted in a smooth operation and an extremely low deadline rate among the haul assets.

e. Training: None

f. Logistics:

(1) The shipment of Bailey Bridge and M4T6 Float Bridge by transportation Units.

a. OBSERVATION: When shipping Bailey Bridge and M4T6 bridge on transportation stake and platform trucks, problems were encountered in fastening the bridge securely enough to be hauled 200 kilometers to the turn-in point.

b. EVALUATION: The unique design of bridging causes banded loads to shift and fall while being transported. The use of cable is inefficient primarily for the same reason and is very time consuming.

c. RECOMMENDATION: That 5 ton cargo trucks be used to haul bridging material when it must be transported long distances. All that is necessary is to band the items prior to loading, place on the bed of the vehicle, and band or lash the loads straight down to the bed.

d. COMMAND ACTION: Arrangements were made with transportation to utilize 5 ton cargo trucks that haul ammunition from Qui Nhon to Pleiku and usually return empty to backhaul bridging on their return trips. This method proved to be many times more effective and much faster.

g. Communications: None

h. Material

(1) Shortage of 10 ton tractor and 25 ton trailers tires and tubes.

a. OBSERVATION: Critical shortages of 10 ton tractor and 25 ton trailer tires and tubes have existed throughout the II Corps area for approximately six months.

b. EVALUATION: Grader tires and tubes can be substituted for 10 ton tractor tires and 3/4 Ton truck tires and tubes are good substitutes for 25 ton trailers tires and tubes. Some problems in mounting the grader tires were experienced due to the size differences.

C. RECOMMENDATION: Tests should be made by Army Material testing agencies and the results made available Army-wide in publications such as the "PS magazine".

D. COMMAND ACTION: None

i. Other: None

JOHN S. LIESMAN
LTC, CE
Commanding

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AVEGA-C (28 August 1971) 1st Ind
SUBJECT: Operational Report - Lessons Learned Headquarters, 20th Engineer Battalion (Combat). Period Ending 28 August 1971, RCS CSFOR-65 (R3)

DA, Headquarters 35th Engineer Group (Const) APO 96312, 21 September 1971

TO: Commanding General, US Army Engineer Command Vietnam, ATTN: AVCC-MO APO 96491

1. The 20th Engineer Battalion (Combat) served with distinction in both combat support and construction missions. The quality and quantity of engineer work expended by this battalion met or exceeded the highest standards of engineer excellence.

2. This Headquarters has reviewed closely the Operational Report Lessons - Learned for the period ending 28 August 1971, submitted by the 20th Engineer Battalion (CBT) and concurs in general with the comments and observation of the commander. However, with reference to para 2 (1), we have found that it is impractical to use grader tires on 10 ton tractors except for expedient mission essential work. Such tires are not designed for highway use and the solution in itself results in a shortage of grader tires. Similar design problems occur with the 3/4 ton truck as well.

3. The battalion executed its standdown operation with precision, moving the resources of one battalion and two separate companies from Pleiku to Qui Nhon over a period of one month. Personnel reassignments went smoothly, with the exception of isolated cases. I feel strongly that when manning levels permit, personnel reassignment policy for draw down units should conform to that of a normal Keystone standdown.

JOHN S. ROBERT
COL, CE
Commanding

AVCC-MO (28 Aug 71) 2nd Ind
SUBJECT: Operational Report-Lessons Learned, 20th Engineer Battalion Combat, Period Ending 28 Aug 71, RCS CSFOR-65(R3)

HEADQUARTERS, UNITED STATES ARMY ENGINEER COMMAND, VIETNAM APO 96491 23 OCT 1971

TO: Commanding General, US Army Vietnam, ATTN: AVHDO-DO, APO 96375

1. The significant activities and lessons learned have been reviewed and are an adequate reflection of the units operation during this period.

2. Reference item concerning "Foreign Service Tour Curtailment", page 1, paragraph 2a(1). A drawdown unit is not eligible for Keystone Curtailments to Foreign Service Tour that are given to units deactivating and/or redeploying to CONUS. This office concurs that curtailments should be requested and granted if possible to drawdown units. This should be strongly emphasized when drawdown units are co-located with keystone redeploying and/or inactivating units.

3. Reference item concerning "Foreign Service Tour Curtailment for Personnel on Extension" page 1, paragraph 2a(2). Personnel on 6 months extension of foreign service tour who have taken 30 days special leave are governed by the provisions of Public Law 89-735 which prohibits curtailment for these individuals except for extreme hardship and then the special leave and travel may be converted to ordinary leave and the cost of transportation charged to the individual. No action by USARPAC or DA is recommended.

4. Reference item concerning "DEROS Loss Report/Roster", page 2 paragraph 2a(4) strongly concur. A sample format in the next revision to USARV Manual 600-1 seems appropriate.

5. Reference item concerning "Out-of Country Reassignment Instructions", page 2 paragraph 2a(6) strongly concur. Immediate identification of all personnel in need of out of country reassignments is necessary in order to preclude hardship of the individuals concerned. USARV should establish a separate team to handle Keystone related assignments and give these request priority.

6. Reference item concerning " Shipment of Bailey Bridge and M4T6 Float Bridge by Transportation Units", page 5, paragraph 2f(1). Efficient and practical means of loading and binding of bridge parts is described in TM 5-210, Chapter 6, Section III for the Bridge, Floating, Aluminum, Highway (M4T6). It is the policy of this headquarters that the standard loading and binding be adhered to as established in the appropriate references. However, it is also understood that the ideal situation is not always possible. When the prescribed trucks: Truck Cargo: 5 Ton 6x6

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AVCC-MO
SUBJECT: Operational Report-Lessons Learned, 20th Engineer Battalion Combat, Period Ending 30 Apr 71, RCS CSFOR-65(R3)

XLWB W/E (w/winch) for the M4T6 Bridge and Truck Dump: 5 Ton 6x6 W/E (w/winch) for the Bailey Bridge are not available for the transportation of the subject bridging, any safe and workable field expedient is acceptable. Special emphasis is placed on rigging and binding, and loading and balancing on available transportation. No action by USARPAC or DA is recommended.

7. Reference item concerning "Shortage of 10 Ton Tractor and 25 Ton Trailer Tires and Tubes", page 5, paragraph 2h(1). It is standard army policy that Class IX repair parts are utilized on end items in maintenance activity in accordance with specifications and identification found in the respective technical manuals and bulletins, and that PLL's are established and maintained to insure accomplishments of the unit's maintenance mission. In this consideration USARENGRCOMDV disapproves of the interchanging of repair parts except when other alternatives are not possible and the accomplishment of the unit's mission is impeded as witnessed with the 20th Engineer Battalion. Nonetheless, the 20th Engineer Battalion is commended for its field expedient solution on the problem of the acute shortage of 10 and 25 ton tractor trailer tires. This headquarters favorably considers this recommendation and lesson learned, and in turn recommends that thought be given to the standardization of grader and 10 ton truck tractor tires by the proper agencies.

FOR THE COMMANDER:

D. Y. FREED
CPT, AGC
Asst Adjutant General

AVHDO-DO (28 Aug 71) 3d Ind
SUBJECT: Operational Report - Lessons Learned Headquarters, 20th Engineer Battalion (Combat), Period Ending 28 August 1971, RCS CSFOR-65(R3)

Headquarters, United States Army Vietnam, APO San Francisco 96375 13 FEB 1972

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

1. This Headquarters has reviewed the Operational Report-Lessons Learned for the period ending 28 August 1971 from Headquarters, 20th Engineer Battalion and concurs except as indicated below:

a. Reference item concerning "FST Curtailment," paragraph 2a(1), page 1: Nonconcur. An identical tour for all personnel in RVN is desirable to insure equitability. Curtailments are permitted or required only when a unit no longer has a mission, or mandatory in-country strength objectives cannot be met without curtailment. At the present time curtailments are extended to drawdown units which undergo a reduction in spaces of 20 percent or more. This procedure should only be used when additional reduction in strength is required to meet DOD established ceilings.

b. Reference item concerning "Foreign Service Tour Curtailments for Personnel on Extensions," paragraph 2a(2), page 1: Nonconcur. Special Leave requires expenditure of appropriated funds and is used to encourage and reward personnel needed in RVN who volunteer to extend. To permit a soldier to use Special Leave and then complete only the normal tour would be mismanagement of appropriated funds.

2. Additional comments follow:

a. Reference item concerning "Recurring Reports," paragraph 2a(3), page 1: Concur. However, this is an action for USAENGRCOMDV. Appropriate instructions have been published by this headquarters.

b. Reference item concerning "DEROS Loss Report/Rosters," paragraph 2a(4), page 2: Concur. Action has been taken to publish changes based on experience gained in succeeding increments.

c. Reference item concerning "Courts-Martial During Standdown," paragraph 2a(5), page 2: Concur. However, this is an action for the USARENGRCOMDV. Appropriate instructions have been published by this headquarters.

d. Reference item concerning " Out-of-Country Reassignment Instructions," paragraph 2a(6), page 2: Concur. As noted in the report, USARENGRCOMDV and USARV assistance solved the problem, but with an undesirable time lag. DA should be informed that their assistance is required in this key area of redeployment.

FOR THE COMMANDER:

P. L. CHILDRESS
CPT AGC
ASSISTANT ADJUTANT GENERAL

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GPOP-FD (28 Aug 71) 4th Ind
SUBJECT: Operational Report-Lessons Learned, HQ 20th Engineer Battalion (Cbt), Period Ending 28 August 1971, RCS CSFOR-65 (R3)

HQ, US Army, Pacific, APO San Francisco 96558 10 MAR 197

TO: HQDA (DAFD-ZA) WASH DC 20310

This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:

M. L. Mah

M. L. MAH
1LT, ACC
Asst AG

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AVEGD-3 30 November 1971

SUBJECT: Operational Report - Lessons Learned, 45th Engineer Group (Construction), Period Ending 30 October 1971, RCS CSFOR-65 (R3)

2. LESSONS LEARNED:

a. Personnel:

(1) Transfer of personnel from inactivating/redeploying units.

(a) Observation: AS US Troop Strength declines in Vietnam, it is frequently the case that units are assigned personnel with fewer than 60 days retainability.

(b) Evaluation: The expense and effort required to process and transport personnel with less than two months time remaining in country is often not justified. In many cases, the newly assigned personnel are excess to the requirements of the unit and difficulty is experienced in providing the individual with suitable employment of his talents.

(c) Recommendation: The needs of the gaining unit should determine whether or not an individual as described above is to be given an additional curtailment of tour.

(d) Command Actions: None

(2) Morale:

(a) Observation: The presence of a hostile and aggressive enemy, unique climatic conditions and a never ending workload requires considerable emphasis to be placed on maintaining and improving the morale of engineer troops in Military Region 1.

(b) Evaluation: Morale within the command has remained high throughout the reporting period.

(c) Recommendation: Instituting programs such as organized athletics, junior enlisted council and mandatory three day maintenance standdown following the completion of major projects are methods of increasing morale. In addition, providing the combat engineer soldier with Sunday as a day free from work has a significant effect on morale and his increased productivity more than offsets the project time lost.

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An added device to increase morale is insuring that every soldier employed in the field enjoys at least one hot meal per day even if it required that the soldier in a cantonment area eat C-Rations for that particular meal. The institution of self service lines in messhalls and at field messes located on night defensive perimeters is appreciated by the young soldier and has the effect of improving morale. An extensive command information program is required for the soldier. It is important that he fully understands the significance of his efforts, that he is kept fully aware of the enemy situation and that he realizes that he is an integral part of his unit. In addition, the formation of human relations councils where commanders are in attendance and grievances and suggestions can be aired by members of minority groups and any individual desiring to attend will have the effect of relieving racial tensions, reducing congressional inquiries and lessen the work of the IG.

(d) Command Action: All techniques listed above have been implemented within 45th Engineer Group.

(3) Crimes of Violence and Larceny

(a) Observation: The excessive use of alcohol and abnormal use of drugs does produce crimes of violence and larceny.

(b) Evaluation: The availability of drugs has decreased substantially in the past few months, however, the devoted addict can and will obtain the drugs that he requires. Frequently, the drug user in order to support his habit, resorts to stealing negotiable items from other GI's such as cameras, radios, etc. There is a tendency by some individuals who over-indulge in the use of alcohol to become aggressive and beligerent. In both cases, a system to establish and maintain internal security is required.

(c) Recommendations: The use of roving patrols consisting of two or more easily identifiable individuals equipped with a radio and an adequate internal lighting system will reduce larcenies and discourage some crimes of violence. A system whereby weapons and explosives are maintained under command control at all times in rear areas is the minimum requirement to reduce crimes of violence. Of course, procedures must be developed that will allow the issue of weapons in the event that enemy activity is suspected.

(d) Command Action: All of the above recommendations have been instituted by 45th Engineer Group units.

b. Intelligence:

(1) Mine sweep procedures:

(a) Observation: Several esoteric methods were attempted to increase the detectability of mines along the tactical roads in Military Region 1.

(b) Evaluation: The classical method of mine sweeping with a hand held detector has been infinitely more successful along our tactical roads than any of the other methods employed. The use of dogs for detecting mines is best illustrated by the incident in Quang Tri province where the trained dog sat on an enemy planted mine with an inevitable result. The Firti System tank mounted, met with similar success as the dog program. Although none of the tanks detonated a mine they experienced negative success in locating mines.

(c) Recommendation: Mine sweeps should be conducted in the classic fashion with a hand held detector. Mine dogs should be retained due to their source of amusement to the troops and their positive effect on morale and tank mounted firti systems should be retained for their fire power.

(d) Command Action: All three systems were employed, the detector for security, the dogs for morale, and the Firti system for fire power.

(2) Shotgun Riders:

(a) Observation: A soldier individ[illegible] ing a piece of engineer equipment at a hostile work site requires [illegible]tion afforded by an armed guard whose sole function is security.

(b) Evaluation: An incident was experienced along HL-534 in Quang Nam province where a grader operator working less than 100 meters from a protected work site was the target of a hand grenade attack by a single guerrilla. The guerrilla would have either been discovered or intimidated by the guard. The operator described above lost his arm while throwing the grenade under his grader and drove the grader the 100 meters to the work site.

(c) Recommendation: Engineer Equipment and operators be protected on the work site by providing shotgun riders.

(d) Command Action: Adequate protection is provided all equipment operators on work sites and single pieces of equipment working in the immediate proximity of the site are provided security personnel.

c. Operations:

(1) Tactical road construction - Bituminous Surface treatments.

(a) Observation: Maintenance costs on tactical road networks could be substantially reduced by using a more well graded base course rock and by applying a single bituminous surface treatment.

(b) Evaluation: The tactical road network in Military Region 1 was not designed to be of LOC Specifications, however, the traffic the road systems support requires a considerable expenditure of engineer effort in maintenance. Experience has shown that most rock available in MR1 for base course material is of uniform gradation and 5" (-).

The technique used to produce the base course is to choke the 5" (-) with laterite and then roll the road, not for compactive effect, but to provide a smooth surface for the surface treatment. At this stage, an asphaltic surface of either RC 800 or MC 250 cut with diesel fuel is applied as a seal coat and a layer of sand is laid for a wearing surface. However, the laterite has the effect of allowing minimal penetration of the asphaltic surface and as a result the surface does not bind solidly.

(c) Recommendation: Techniques for providing a better gradation of rock for base course should be explored when constructing tactical road networks of long duration. In addition, the feasibility of applying a single bituminous surface treatment which would provide more rigidity and a better wearing surface should be investigated. It is believed that both of the above recommendations would greatly reduce maintenance costs of roads in areas subject to heavy vehicular traffic and monsoon rains and floods. It is to be noted that the inclusion of secondary units to 75 TPH rock crushers in future quarry sites would fulfill the requirement for base course rock and that ML-13C, which was bituminous surface suffered the least amount of damage from the floodwaters following Typhoon Hester.

(d) Command Action: None

(2) Submerged bridges:

(a) Observation: The floodwaters caused by monsoon rains and typhoons in Military Region 1 prevent the construction of routes which are passable at all times.

(b) Evaluation: The rains accompanying Typhoon Hester inundated portions of QL1 South of Da Nang with floodwaters which measure more than five feet above the road surface. It is to be noted in this particular area, that QL-1 is elevated approximately four feet above the level of the rice paddy.

(c) Recommendation: All road networks constructed in areas where flooding occurs periodically should be consistent in their design. It is both costly and laborious to install bridges at heights higher than two or three feet above road elevation and extremely wasteful if nearby portions of the roadway are impassable due to flood waters rendering the bridge useless. In addition, when the height of the bridge stringers is approximately the same as the flood water heights, the collection of debris is often the cause for the bridge to fail. The Pohl Bridge across the Perfume River is an example of washout due to debris being draped along the bridge stringers. It is recommended that bridges be designed consistent with road networks and bridge designs for areas subject to flooding, incorporate the design of causeways and spillways to permit floodwaters to pass over the structure with a minimum of debris build-up. Sufficient protection for abutment and piers would be an essential part for design of this bridge.

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(d) Command Action: A 480' spillway was constructed and found to substantiate the recommendations above.

(3) Tactical road networks - ditching and culverting:

(a) Observation: The most common cause of road failure, both tactical and LOC roads in Military Region 1, has been the washouts of culverts.

(b) Evaluation: The most common causes for culvert failure are improperly constructed headwalls and wingwalls and uncompacted backfilling over culverts.

(c) Recommendation: Command emphasis should be placed on the inspection of headwall and wing-wall construction. In addition, responsible personnel in the chain of command should be present during all backfilling operations to insure the required hand tamping of the fill is performed. AIK labor has proved to be invaluable in the tedious process of constructing headwalls, wing-walls and backfilling. To help reduce the volume of water passing through culverts, especially during the monsoon season, the construction of diversion ditches is essential. The use of diversion ditching in the mountainous portions of Thua Thien and Tuang Tri province left the roads virtually unscathed by the monsoon and typhoon floodwaters.

(d) Command Action: Emphasis is placed on inspecting all culverts and diversion and relef ditches are an integral part of the initial design on all road projects.

(4) Concrete Revetments (Portable)

(a) Observation: The construction of permanent revetments is costly, time consuming and frequently relocation of units in hostile areas require unnecessary expense in continually constructing revetments.

(b) Evaluation: Several designs have been proposed for the construction of portable revetments which allow reuse when bases and facilities are vacated by friendly forces. Revetments constructed of sand bags or M8A-1 matting are costly and time consuming to erect. The portable revetment which may be freely transported and reused again is worth the initial investment of construction.

(c) Recommendation: A standard military design be instituted for construction of revetments. The design should provide for the portability of the revetment, and maximize protection from small arms fire and shrapnel.

(d) Command Action: The 45th Engineer Group designed, constructed and tested relatively inexpensive concrete revetments. The basic design was a six inch thick slab of 5,000 psi concrete with a minimal amount of re-bar and wire mesh reinforcing steel. The re-bar and mesh were necessary to provide requisite tensile strength for handling by crane and to prevent shattering of the concrete caused by shrapnel and grenades.

Footers were also designed to be portable and the resulting design was able to withstand wind forces in excess of 100 miles per hour. It is to be noted that the revetments employed prior to Typhoon Hester were not blown over.

(5) Bunker design - 122 mm rockets

(a) Observation: The 122 mm rocket with a time delay fuze requires a non-standard bunker design.

(b) Evaluation: A 122mm rocket with a time delay will penetrate poorly designed bunkers and render the protection afforded by the bunker useless.

(c) Recommendation: Recommend that the ballistics and effects of 122 mm rockets be studied to develop easily constructed bunkers which would shield users against the effects of delay fuzes.

(d) Command Action: None

d. Organization:

(1) Inactivation of units

(a) Observation: The inactivation/redeployment of engineer units requires detailed contingency plans to meet suspense dates and to turn in equipment within the allotted time frame.

(b) Evaluation: The effort expended in formulating detailed plans for inactivating/redeploying units is more than compensated by the resulting smoothness of operation once retrograde begins. It is essential that the plan includes annexes on personnel, turn in of equipment, security and a master list of suspense dates to be set.

(c) Recommendation: It is recommended that upon notification of standdown, command emphasis be placed on developing detailed plans.

(d) Command Action: The recommendation above had been implemented by the 45th Engineer Group when it was announced that the 14th Engineer Battalion was redeploying.

e. Logistics

(1) Consolidation of haul assets, mine detectors and radios.

(a) Observation: In the preliminary planning phase of several projects, it was noted that additional assets in excess of the battalion's on-hand equipment, would be required to meet completion dates.

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(b) Evaluation: Haul capabilities were extremely limited during the peak of the construction season. With several tactical roads in progress and an MTOE shortage of dump trucks and ten ton tractors, maximum utilization of group's haul assets was essential to meet construction deadlines. A similar comment applies to mine detectors which were essential for not only the road construction program, but were required to fulfill other operational support missions. The mine detector shortage was due to high deadline rates caused by lack of parts in the direct support maintenance units. In addition, at one point during the construction season, six companies were between their commanders, convoys, base camp area and work sites. Again, it was the unavailability of repair parts at direct support facilities which produced shortages in radio assets.

(c) Recommendation: It is suggested that a change of MTOE be considered which would increase the haul capability of a combat engineer battalion and allow for the inability of direct support maintenance to completely fulfill its mission, or that maintenance floats be established in forward areas for critical items of engineer equipment.

(d) Command Action: The group assets were pooled and controlled by the operations officer and the group S-4 and laterally transferred from unit to unit to maximize utilization of the equipment.

(2) Material readiness expeditors

(a) Observation: The supply system in a tactical area of operation is often lethargic to the need for timely distribution of construction material.

(b) Evaluation: The large volume of supplies handled by depots, requires the requisitioning unit to provide assistance in locating specific items in depot stock to hasten their issue. Frequently, when specific requirements are placed on the depot the main delay in issue is locating the assets.

(c) Recommendation: The use of engineer trained personnel in depot stock yards and warehouses will speed up the location and issue of certain items of equipment, parts and construction material. These personnel referred to as material readiness expeditors when working closely with depot personnel will provide not only assistance to their parent unit but will increase the efficiency of depot operations. Recommend that an MTOE change be submitted to include additional officers in logistics sections of engineer battalions and groups to be employed as expeditors.

(d) Command Action: Material readiness expeditors although not MTOE authorized positions have been employed by 45th Engineer Group throughout the reporting period.

f. Maintenance

(1) Deadline rate:

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Mutual loaning of equipment, materials and sharing of ideas has produced an affable and profitable relationship.

(c) Recommendation: It is recommended that monthly conferences be held between US commanders and their allied counterparts with commanders in attendance. The goodwill and discussion of common areas of interest is beneficial to the allied effort.

(d) Command Action: Commander's conferences have been regularly scheduled between free world engineer units in Military Region 1.

FOR THE COMMANDER:

for Rindsey/Bufford, Capt, CE
THOMAS N. WHITSETT
CPT, CE
Assistant Adjutant

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AVCC-MO (30 Nov 71) 1st Ind
SUBJECT: Operational Report - Lessons Learned, 45th Engineer Group (Construction), Period Ending 31 October 1971, RCS CSFOR-65 (R3)

HQ, US Army Engineer Command, Vietnam, APO San Francisco 96491 21 DEC 1971

TO: Commanding General, US Army Vietnam, ATTN: AVHDO-DO, APO San Francisco 96375

1. The significant activities and lessons learned have been reviewed and are an adequate reflection of the unit's operation during this period.

2. Reference item concerning "Transfer of Personnel from Inactivating/ Redeploying Units", page 1, para 2a(1). Nonconcur. Personnel guidance published for Increment IX and X authorized keystone curtailments of up to 90 and 120 days respectively for enlisted personnel assigned to inactivating/ redeploying units. This eliminated the reassignment of personnel who had less time remaining on their FST than the established curtailment criteria. Exception of this policy were individuals whose DEROS had been frozen by extension of FST or who were specifically denied curtailments because of critical skills. The small number of personnel requiring reassignment because they were exceptions to the curtailment policy should have a negligible effect on the gaining unit. All individuals are reassigned based on MOS authorization and shortages. Overage of an MOS in a unit will be caused by a command-wide overage. No action by USARPAC or DA is recommended.

3. Reference item concerning "Mine Sweep Procedures", page 2, para 2b(1). Nonconcur. Mine dogs have proven to be very effective when they are kept in a high state of training. This requires daily training of the dogs under realistic conditions. When pets are made of the dogs, they lose their effectiveness. A trained mine dog represents a considerable investment and, unless it is to be properly utilized and maintained, should not be issued to a unit. The FIRTI is an expensive infrared system which has been found not very effective as a mine detector and, therefore, should not be issued to troop units for mine sweeps. If firepower is desired, tanks without the FIRTI system should be used. No action by USARPAC or DA is recommended.

4. Reference item concerning "Tactical Road Construction - Bituminous Surface Treatments", page 3, para 2c(1). Concur. Base course should be rolled to a high degree of compaction; 95% - 100% Modified AASHO, if the road is to last. A prime coat of MC-30 or MC-70 should be applied to the base, and cured, prior to placing the surface treatment. The light cutback will penetrate the laterite binder and provide a better bonding of the surface treatment. No action by USARPAC or DA is recommended.

5. Reference item concerning "Submerged Bridges", page 4, para 2e(2). Concur. The case cited, Pohl Bridge across the Perfume River, is not applicable because the logging operations upstream send down rafts of logs during floods. No action by USARPAC or DA is recommended.

6. Reference item concerning "Concrete Revetments (Portable)", page 5, para 2c(4). Concur. USAECV (P) TB 415-4, 1 Dec 70, contains information

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pertinent to the construction of a series of portable precast concrete revetments ranging in height from 4ft to 12ft. These revetments are desirable with respect to permanency, troop cost, repair effort and relocatability. USARENGRCOMDV is presently evaluating the desirability of using welded wire fabric in the revetments to further increase their worth in regard to cost, construction effort and flexibility of design. No action by USARPAC or DA is recommended.

7. Reference item concerning "Bunker Design - 122mm Rockets", page 6 para 2c(5). Concur. Action by USARPAC or DA is recommended to furnish additional information concerning subject missile.

8. Reference item concerning "Material Readiness Expeditors", page 7 para 2e(2). Concur. MRE's have been used by all units throughout the command in accordance with USARENGRCOMDV policy. No action by USARPAC or DA is recommended.

FOR THE COMMANDER:

Thomas E. Safley

THOMAS E. SAFLEY
1LT, ADA
Act Asst Adjutant General

CF:
45th Engr Gp

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AVHDO-DO (30 Nov 71) 2nd Ind 17 FEB 1972

SUBJECT: Operational Report - Lessons Learned, 45th Engineer Group (Construction), Period Ending 30 October 1971, RCS CSFOR-65 (R3)

Headquarters, United States Army Vietnam, APO San Francisco 96375

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

This headquarters has reviewed the Operational Report-Lessons Learned for the period ending 30 October 1971 from Headquarters, 45th Engineer Group and concurs with comments of indorsing headquarters.

FOR THE COMMANDER:

T. L. CHILDRESS
CPT AGC
ASSISTANT ADJUTANT GENERAL

Cy furn:
USARENGRCOMDV
45th Engr Gp

GPOP-FD (30 Nov 71) 3d Ind
SUBJECT: Operational Report-Lessons Learned, HQ 45th Engineer Group (Const), Period Ending 30 October 1971, RCS CSFOR-65 (R3)

HQ, US Army, Pacific, APO San Francisco 96558 10 MAR 1972

TO: HQDA (DAFD-ZA) WASH DC 20310

This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:

M. L. Mah

M. L. MAH
1LT, AGC
Asst AG

2. Lessons Learned: Commander's Observations, Evaluations and Recommendations

a. Personnel: None.

b. Intelligence: None.

c. Operations:

(1) Black Base:

(a) Observation: During this report the Battalion placed 20,000 tons of black base as a base course material. The black base was 2"(-) base course, mixed with AP-3 in an asphalt plant and laid with an asphalt paving machine. Laying procedures were identical to that of laying asphalt. The black base was laid in a 4" lift and compacted with a 10 ton steel wheel roller and a hyster self propelled rubber tired roller. Considerable experimentation was done with various black base placed as unadulterated base course material with a 3% to 4% asphalt content. The resulting mix when placed on the road was extremely open graded and very difficult to compact. Traffic subsequently kicked up large amounts of rock, leaving potholes in the black base. Rainfall easily penetrated the open gradation and quickly caused failures. Subsequent mixes were made, the best mix was a 2"(-) course with 20% sand added and a 5% to 6% AC content. The mix appeared to be excessively sandy yet it rolled out even and dense with no openings in the surface which would promote raveling or penetration by rain. Marshall stabilities of the mix were consistently in the 800 to 1000 range.

(b) Evaluation: The addition of sand or other fines to black base is necessary to insure a dense mix which will withstand traffic and weather until paved.

Exposure of open graded black base to traffic and weather will result in rapid failure.

(c) Recommendations: Recommend that up to 20% of sand be added to base course to insure a dense mix for black base.

Recommend that open graded sections of black base be either paved as soon as possible or that the black base be sealed with a single bituminous surface treatment if immediate paving is not possible.

(d) Command Action: All black base produced by this Battalion will have enough additional fines added and will have sufficient asphalt content to insure a dense stable mixture.

(2) Base Course Quality:

(a) Observation: The large size base course that this unit received (2"(-) with some 3" oversize) was extremely hard on the asphalt plant and paver. Numerous repairs to the dryer, elevators and bins on the other asphalt plant and on the augers and screeds on the paver were directly attributable to the large size rock in the black base.

(b) Evaluation: The larger size rock (over2") is extremely abrasive on the wearing parts of the paver and the asphalt plant tended to increase the amount of down time for minor repairs on augers, sheer pins, elevator buckets and screeds.

(c) Recommendation: That base course used for black base be no larger than 1½".

(d) Command Action: All base course requested and used by this Battalion will be 1½"(-) material.

(3) Partial Concrete Batching:

(a) Observation: In the pouring of the concrete abutments and piers on the bridges along 7A, due to the travel time from the batch plant to the job site, complete batching of the concrete transit trucks at the batch plant would result in over-mixing and premature setting of the mix. Batching of the rock, sand, and cement only would not work either as the moisture in the aggregate was enough to react with the cement and cause flash setting and balling in the truck.

Batching the trucks minus the cement and the water solved both problems. The addition of the cement was accomplished easily on site utilizing a fork lift to lift debaggers to the top of the transit truck. The addition of water was also easily accomplished by using the water tank installed on each transit truck.

(b) Evaluation: Complete batching of transit trucks for long hauls is inappropriate. Partial batching of just the aggregate with cement and water added at the job site solves the problems of over-mixing and insures optimum mix times and better quality control.

(c) Recommendation: That partial batching of concrete transit trucks be accomplished when travel time to job sites are longer than 30 minutes.

(e) Command Action: All concrete pours on those projects involving substantial travel time will be partially batched with cement and water being added on the site.

(4) The Use of Fixed Leads vs Swinging Leads:

(a) Observation: The use of fixed leads and catwalks in pile driving situations where the work site is tight or from barges or where the tide influence is great, is inefficient and prone to error because of the need for maneuver room for the crane and lack of flexibility with the crane.

The 36th Engineer Battalion experience is that especially for piers in the water, pile driving with a swinging lead and a well constructed template is by far the most efficient method to use.

(b) Evaluation: Use of a template and swinging leads when driving from a barge is really the only way to drive pile. Once a good template is set the driving of pile can be accomplished fairly easily in spite of tide fluctuations, current variations or small movements of the barge. The elimination of the catwalk also enables easier snaking of pile from shore when setting pile. The operation of setting pile is much more efficient because without the fixed leads several pile can be set for driving without moving the crane. When using swinging leads however primary quality control is accomplished by having constructed a sturdy accurate template. Failure of the template when using swinging leads is a guaranteed disaster.

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(c) Recommendation: That swinging leads be used to drive all pile driven from the water and on land where conditions dictate that a full template be used.

That template be thoroughly inspected for strength and accuracy before driving with swinging leads.

(d) Command Action: Swinging leads and precise sturdy templates will be used on all pile driving except where site conditions clearly indicate the desirability of fixed leads.

(5) Testing Existing Subbase:

(a) Observation: This unit has been instructed to rely on subbase density testing to determine when to place base course. Relying on subbase density tests alone resulted in many subbase failures after base course and pavement had been laid.

(b) Evaluation: Density testing of the existing subbase at 100 M or 200 M intervals is not sufficient testing to base a decision to lay base course or black base. The non-homogeneity of the subbase along LTL-7A was great enough that weak spots exist which will not be detected by density testing. To properly determine the condition of the existing subbase the density testing has to be supplemented with proof rolling with a 35 ton roller across the full width of the road to determine weak spots. Neither test by itself is sufficient for good quality control but proof rolling has a better chance of identifying deep subbase weaknesses than does the sand core density tests.

(c) Recommendation: That when base course or pavement is to be laid over existing subbase proof rolling be combined with density testing to accurately assess the condition of the subbase.

(d) Command Action: In testing existing subbase for stability proof rolling will be combined with density test results.

(6) Observation: Sand asphalt was used as the subbase for road construction on LTL-7A. On the section of road between XS 192165 and XS 200156 many road construction techniques were attempted. The original road was badly potholed. The old road was scarified and recompacted. Several lifts of clay - lime were then added to build up the roadway. The compaction equipment and later the traffic pumped water from below the roadway up into the new clay levers. Within a few days the road was almost impassible. The decision was made to try sand asphalt. Initially the sand asphalt was placed with a Jersey Spreader to a compacted depth of 18 to 20 inches. As the work progressed southeast, the depth was decreased to 8 to 10 inches compacted lift. Major potholes were excavated out and filled in with sand asphalt.

The areas where the major potholes were filled with sand asphalt and the depth was kept to at least 14 inches held up under both 20 ton Yellow Bird dump trucks and the Vietnamese traffic on the road. Where the depth of sand asphalt was below 13 inches and the potholes were not filled with sand asphalt the road failed and required potholing before the section could be paved.

This operation was the first work by the Battalion with sand asphalt. Since this time sand asphalt has been used as a sealing lift over very course black base and as a material to raise the road above the water of the rice paddies. As a sealing lift, the sand asphalt was spread over the black base with a grader in lifts of 4 inches. This sealing lift was also used to provide a crown on the road. For the repair of weak shoulders, sand asphalt was again used. The poor clay material on the shoulders was removed to a depth of 20 to 26 inches. Then the open trench was filled with sand asphalt. Lack of proper compaction required extensive potholing.

(b) Evaluation: The section of road between XS 192165 and XS 200156 has been turned into a workable section of road which can be paved with little fear of having to come back later to pothole. The area where sand asphalt was used as a sealing and leveling lift has proven successful. The shoulder widening and repair area would have been more successful if the sand asphalt had been compacted when it was placed with a vibratory roller.

Sand asphalt can be used as subbase material in wet areas for road construction if large quantities of sand and AP-3 are available. The placing of sand asphalt is a long and tedious job which requires the full time use of an asphalt plant or a modified soil stabilization plant. The operation must be watched closely so that the minimum depth is maintained.

One big advantage of sand asphalt is the ability to stockpile the material and use it at a later date. Sand asphalt is produced at about 300°F to 350°F and can be allowed to Cool to about 180° F before being used. Rock has been added at times to increase the stability of the sand asphalt. The addition of rock decreased the amount of time required to cool the sand asphalt after being placed on the road. Thus rolling is required sooner.

During the dry season the sun will heat the sand asphalt to the point where it will start to rot under vehicle traffic. Thus it requires a cover for protection.

(c) Recommendation: It is recommended that sand asphalt be considered an excellent solution for road construction in low lying areas as the Delta of Vietnam, where compacting existing material is difficult due to a high water table. When sand asphalt is used as subbase material it should be placed in one lift of at least 18 inches compacted. The sand asphalt should be placed with a Jersey Spreader and track compacted with a dozer. All wheel traffic should be kept off the sand asphalt until compacted with a vibratory roller while the sand asphalt is between 140°F and 160°F. Immediately following the rolling, the surface should be shaped with a grader and recompacted with the vibratory roller.

Shoulder repair areas should be cut wide enough to allow the vibratory roller to compact the sand asphalt. Also the shoulder repair areas should be benched into the existing roadway to prevent a shoulder shear failure.

When using sand asphalt for sealing and leveling, a small amount of rock should be added to speed up the cooling time and allow the compaction equipment on the section sooner. A grader can be used to spread this material.

All compaction should be completed while the sand asphalt is at a temperature between 160°F and 130°F with a vibratory roller. The AP-3 content should be between 5 to 7 percent and the density using our river dredged sand should be 108 lb/ft.

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(d) Command Action: A sand asphalt operation will be continued along LTL-7A for the repair of shoulders and extremely bad potholes. Some sand asphalt will be used for sealing if the black base is course. No plans exist at the present time for using extensive amounts of sand asphalt for building subbase along LTL-7A.

(7) Bridge Control and Surveying:

(a) Observation: The bridge control for all the bridges on LTL-7A was put in by the Battalion survey crew. The procedure was first to establish the new bridge center line off of the old road alignment and the old bridge. The centerline was marked at several points by using rebar pins and ram set nails. All center line points were tied to reference points; second, a minimum of one TBM was set off the bench mark shown on the plans, because the plan bench mark was usually on the old bridge which was to be removed. Third the tentative location of both abutments were marked and offset off the centerline. After the existing bridge was removed, the first pier was taped in from the abutment location. The nearest abutment and pier were then taped off the first pier. The farthest abutment or the next pier would be taped off the second pier. Thus each span is measured independently, and an error is not carried from one span to the next. All form work is checked for correct location and checked for elevation. Any errors were noted on the plans in red pencil and S-3 was informed.

One survey crew had been given the responsibility of the bridge surveys and this one crew works on the same bridges until they are completed.

(b) Evaluation: The use of this survey procedure has eliminated major bridge error from the 36th Engineer Battalion AOR. Minor errors had continued to occur, but this should be almost eliminated due to continuous checking of important control points.

One problem affecting the other Battalions was the use of both Group and Battalions survey parties on the same bridge. Each crew used its own control and ignored the others, the problem was mostly prevented on LTL-7A by the attempt to limit one survey party per bridge.

(c) Recommendations: It is recommended that similar procedure be used on all bridge construction projects. The use of one crew familiar with the bridge control point prevents excessive errors. Also the measuring of one span length independent of another removes the possibility of one error affecting two or more spans.

(d) Command Acton: The survey parties of the 36th Engineer Battalion will continue to use the above procedure for bridge layout so as to minimize the number of errors.

(8) Concrete vs Steel Pile:

(a) Observation: The 36th Engineer Battalion was driving 16" monotube pile, 18" monotube pile, HP 14X73 bearing pile, and 14"X14" prestressed concrete pile. All monotube pile has been started with a cone or pointed starter pile.

The concrete pile has been driven with a blunt end. All steel type pile required only a torch and welding machine. On the other hand, concrete pile required splice boxes, welding machine, and concrete or epoxy to patch spalled pile. The concrete pile weigh approximately twice what steel pile weigh. This increases the problem of handling and moving the concrete pile. Only half the number of concrete pile can be handled on a given trailer and only a 40 ft S and P can be used. Concrete pile crack if hauled on 25 ton trailers. At the present time, there are three types of concrete pile on hand, one type has no metal inserts and cannot be welded to another pile at either end. The second type of concrete pile has the metal insert at only one end and a welded connection can only be made at one end. The third and most preferable type has metal inserts at both ends. This type pile allows a welded connection at each end.

(b) Evaluation: An experienced pile driving crew can drive either concrete or steel pile with little problems. Many of the crews working on the bridges are continuously rotating and if no pile are driven for a couple months the experienced crew has DEROSed. It is easier for a new crew to learn how to drive steel pile than it is for them to learn to drive concrete pile. Due to our situation the movement of steel pile is simpler. More steel pile can be transported in a shorter time with less equipment. The concrete pile is less affected by the tide action of the Delta Area, and when finished leaves a better looking product.

(c) Recommendation: It is recommended that the use of steel pile be continued. The use of concrete pile should be minimized and the job of driving concrete pile be given to an experienced crew. The military equipment can more easily work with the steel pile.

(d) Command Action: The 36th Engineer Battalion will continue to use the most available pile. The Battalion would prefer the use of steel pile and will try to obtain as much steel pile as possible.

(7) Steel Stringers vs Chau Thoi Beam Bridges:

(a) Observation: The 36th Engineer Battalion started with the construction of steel stringer bridges with precast deck panels and has advanced to the construction of Chau Thoi prestress concrete beam bridge.

The steel stringer bridges required one 40 ton crane to set the wide flange beams. Usually two 40 ft trailers can carry all the stringers for a given span. The stringers can normally be placed in one day. The next and longest operation is the welding of diaphrams between the steel stringers. The welding operation usually last about a week per span, the last major task is the placing of the precast deck slabs with a 20 ton crane it takes about 1½ days to get the deck panels in place. At this point the bridge could be opened to traffic.

The Chau Thoi beams require two 40 ton cranes to off-load the barge and place the beam on the trailor. Only one beam can be hauled on a trailer at a time, because each beam weighs approximately 22 tons. If the haul is a short distance, 2 or 3 trips could be made a day, but as the distance increases the number of round trips the trailer can make decreases. One 40 ton crane can set the beam if the crane can walk midway between the abutment and pier. If not, a

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beam launcher is required, and a minimum of a 20 ton crane is needed. It would normally take one week to 10 days to set one span. After the span is in, the beams must be grouted together, post tensioned, and allowed to cure 28 days before traffic can be placed on the span. For a three-span bridge, the soonest traffic could pass over the bridge would be 3 months from the time the first beam was placed.

(b) Evaluation: The steel stringer bridge is more in the line of military construction due to the limitation of equipment. The military equipment was not planned to set 81 foot concrete beams which weigh 22 tons. The job can be completed but it requires pooling of manpower and equipment from several companies. Close supervision to include a Quinton Budlong advisor is required in setting Chau Thoi beams, the Army can construct more steel stringer bridges faster than concrete beam bridges.

(c) Recommendation: It is recommended that the military continue to construct steel stringer bridges instead of prestressed concrete beam bridges. If equipment could be changed to larger capacity cranes, the job would be simplified but an experienced crew is required for setting the beams.

(d) Command Action: Bridge will continue to be built as planned, either steel stringer or prestressed concrete beam.

(10) Elevation of LTL-Roads:

(a) Observation: Many of the existing roads in the Delta were constructed by placing rock over rice paddy clay. The existing roads are just above the water line and contain several failed sections. During the dry season, the paddy water drops the subbase can be reworked. The reworking normally consists of adding clay to stabilize the paddy clay, in many instances when the road compaction is completed the new road bed is not much more than 6 to 12 inches above the road. Then in the wet season the water comes up near the surface of the new road. Several failures have developed on low sections of road.

(b) Evaluation: As the water level comes up, more water is forced under the roadway and capillary action can bring the water close to the surface of the road. As the wheels of the vehicles pass over the road they start to deflect into the roadway. Each time the road deflects more water is pumped higher and closer to the road surface. Finally the surface fails and a large pothole is formed.

(c) Recommendation: It is recommended that the road be elevated a minimum of two feet above the high water level of the wet season. This will prevent large loads being placed on small saturated areas. The load can be more uniformly distributed over a larger area if the road is elevated.

(d) Command Action: Elevation of existing road beds will be closely checked against high water elevation to insure that new subgrades are at least 2 feet above high water.

d. Organization: None.

e. Training: None.

f. Logistics: None

g. Communications: None

h. Material: None

i. Maintenance:

(1) 5 Ton Dump Engines:

(a) Observation: The many engines being replaced, this was not due to lack of oil or water.

(b) Evaluation: Air cleaners and air cleaner hoses to the engine intake were unserviceable, allowing dust and dirt to enter the engine causing engine replacement.

(c) Recommendation: Operators should check air cleaners and hose everyday before operation, also explain to the operators the importance of the hoses and cleaner.

(d) Command Action: All maintenance personnel were informed to make rigid inspections of the trucks filters, follow up action was taken by Battalion maintenance personnel.

(2) Hoist Pump Seals on 5 Ton Dumps:

(a) Observation: Too many hoist pump seals are blowing out.

(b) Evaluation: The seals are blowing out because the trucks were being overloaded with 3 and sometimes 4 scoops of wet sand.

(c) Recommendation: Trucks should only be filled with two scoop loads of wet sand which is a sufficient load.

(d) Command Action: Operators and supervisory personnel are told to insure that only two scoop loads of sand are loaded.

(3) Shortage of Repair Parts:

(a) Observation: It was taking too long to get the repair parts for equipment.

(b) Evaluation: Parts were not being ordered the same day requests were submitted and in many cases PLL clerks were not qualified to eliminate these problems.

(c) Recommendation: All PLL clerks should be school trained and mechanics should know how to order from TM's.

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(d) Command Action: All PLL clerks were sent to school and mechanics were instructed on how to order from TM's.

(4) 25 Ton L/B Wheel Bearings:

(a) Observation: Too many wheel bearings were burning out.

(b) Evaluation: Dust covers were missing allowing dirt to enter the bearings.

(c) Recommendation: All 25 ton L/B's should be checked for dust covers on bearings.

(d) Command Action: All 25 ton L/B's were inspected for missing dust covers. Dust covers were ordered and the trailer was deadlined until dust covers were replaced. Also dust covers were fabricated for some trailers.

(5) Vehicle Maintenance:

(a) Observation: Improper maintenance being performed on vehicles.

(b) Evaluation: During Battalion roadside inspections it was found that a lot of the operators were not aware of the maintenance they were to perform.

(c) Recommandation: Closer supervision is needed on operator maintenance.

(d) Command Action: Company maintenance Sergeants were instructed to use closer supervision on operator maintenance.

(6) Batteries:

(a) Observation: Shortage of batteries for trucks.

(b) Evaluation: It was found that we had no way of telling whether a battery was good or bad.

(c) Recommendation: A battery inspection section should be set up.

(d) Command Action: 3rd shop set up a battery inspection and charging section and it was found that about 1 out of 4 batteries just needed cleaning and charging.

[illegible]

FOR GEORGE R. ROBERTSON
LTC, GS
Commanding

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AVEGB-OP (3 Dec 71) 1st Ind
SUBJECT: Operational Report-Lessons Learned, 36th Engineer Battalion (Const) Period Ending 31 Oct 71, RCS CSFOR-65 (R3)

HQ, 159th Engineer Battalion, APO 96491

THRU: Commanding General, USARENGRCOMDV, ATTN: AVCC-MO, APO 96491
Commanding General, USARV, ATTN: AVHD-DO, APO 96375
Commander-In-Chief, USARPAC, ATTN: GPOP-DT, APO 96588

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

1. The significant activities and lessons learned have been reviewed and are an adequate reflection of the unit's operations during the period. No action by USARPAC or DA is recommended.

FOR THE COMMANDER:

JOHN F. McBRIDE
CPT, CE
ASST Adjutant

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AVCC-MO (22 Nov 71) 2nd Ind
SUBJECT: Operational Report - Lessons Learned, 36th Engineer Battalion (Construction) Period Ending 31 October 1971, RCS CSFOR-65 (R3)

HQ, U.S. Army Engineer Command Vietnam, APO San Francisco 96491

TO: Commanding General, U.S. Army Vietnam, ATTN: AVHDO-DO, APO San Francisco 96375

1. The significant activities and lessons learned have been reviewed and are an adequate reflection of the unit's operation during this period.

2. Reference item concerning "Sand Asphalt", page 4, paragraph 2c(6). Concur. Two points in this paragraph should be considered separately. First the thickness of a sand asphalt lift placed over a Delta road which has failed under traffic should be greater than 14 inches. Second, potholes in the surface to be covered must be properly filled and compacted before placing the lift of sand asphalt over the entire width of the road. This insures uniform compactive effort over the entire width and prevents the potholes from recurring in the new surface. No action by USARPAC or DA is recommended.

3. Reference item concerning "Concrete vs Steel Pile", page 5, paragraph 2c(8). Concur. Important points in favor of the use of concrete pile are, first, the capability of manufacturing it in Vietnam and, second, its design life is 30 years while the design life of steel pile is 20 years. No action by USARPAC or DA is recommended.

4. Reference item concerning "Steel Stringers vs Chau Thoi Beam Bridges", page 6, paragraph 2c(9). Nonconcur. The largest wide flange steel girder available in Army Depots in RVN is the 36WF194. The typical design using this member to CENCOM standard classification has a span length of 40 feet or thereabout. The Chau Thoi beam bridge has a span of 81 feet. As an example a gap bridged with 3 Chau Thoi spans (with 2 piers between abutments) would require 6 36WF194 spans (with 5 piers). Construction time is thereby greatly increased. Furthermore structural steel is in critically short supply in RVN. Materials and equipment needed for manufacture of prestressed girders are more easily obtained and will continue to be so after the reduction of American logistical efforts. The construction of prestressed concrete bridges as opposed to steel girder-concrete deck bridges by the 30th Bn is a sound engineering decision and the training of Vietnamese military engineers in this capacity is vital to the Lines of Communication program. No action by USARPAC or DA is recommended.

5. Reference item concerning "5 Ton Dump Engines", page 8, paragraph 2i(1). Concur. Checking air cleaners and hoses is listed as a before and during operation check for vehicle operators in Table 1- Daily Preventive Maintenance Service, TM 9-2320-211-10, w/Ch5, dated 18 October 1966. No action by USARPAC or DA is recommended.

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AVCC-MO (22 Nov 71) 2nd Ind
SUBJECT: Operational Report - Lessons Learned, 36th Engineer Battalion (Construction) Period Ending 31 October 1971, RCS CSFOR-65 (R3)

6. Reference item concerning "Hoist Pump Seals on 5 Ton Dumps". Concur. Rule of thumb is: one cubic yard of material equals one ton. In the case of wet sand, the weight of the water must also be considered. Therefore two normal Scoop Loads (2 1/2 Cu yd bucket three-fourths full- approximately 2 cubic yards) of wet sand is approximately equal to 5 tons, the maximum haul weight of the truck. No action by USARPAC or DA is recommended.

7. Reference item concerning "Shortage of Repair Parts", page 8, paragraph 2i(3). Concur. The Engineer Command operates a 5 day course in PLL procedures for mechanics, clerks, and supervisors. The 34th Group was allocated four student spaces weekly. No action by USARPAC or DA is recommended.

8. Reference item concerning "Vehicle Maintenance", page 9., paragraph 2i(5). Nonconcur with command action. Company maintenance sergeants should not be used to supervise vehicle operator's maintenance. The tactical leaders (i.e. squad leaders, platoon leaders, commanders, etc.) should supervise operator's maintenance, particularly before operations checks (motor stables), per command policy. No action by USARPAC or DA is recommended.

FOR THE COMMANDER:

D. Y. FREED
CPT, AGC
Asst Adjutant General

cf:
36th Engr Bn
159th Engr Gp

19 FEB 1972

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AVHDO-DO (~~3 Dec~~ 22 Nov 71) 3rd Ind
SUBJECT: Operational Report - Lessons Learned, 36th Engineer Battalion (Const), Period Ending 30 October 1971, RCS CSFOR - 65 (R3)

Headquarters, United States Army Vietnam, APO San Francisco 96375

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

This headquarters has reviewed the Operational Report - Lessons Learned for the period ending 31 October 1971 from Headquarters, 36th Engineer Battalion (Construction) and concurs with comments of indorsing headquarters.

FOR THE COMMANDER:

I. L. CHILDRESS
CPT AGC
ASSISTANT ADJUTANT GENERAL

Cy furn:
USARENGRCOMD-V
36th Engr Bn

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GPOP-FD (22 Nov 71) 4th Ind
SUBJECT: Operational Report-Lessons Learned, HQ 36th Engineer Battalion (Const), Period Ending 30 October 1971, RCS CSFOR-65 (R3)

HQ, US Army, Pacific, APO San Francisco 96558 10 MAR 1972

TO: HQDA (DAFD-ZA) WASH DC 20310

This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:

M. L. Mah

M. L. MAH
1LT, AGC
Asst AG

UNCLASSIFIED
Security Classification

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