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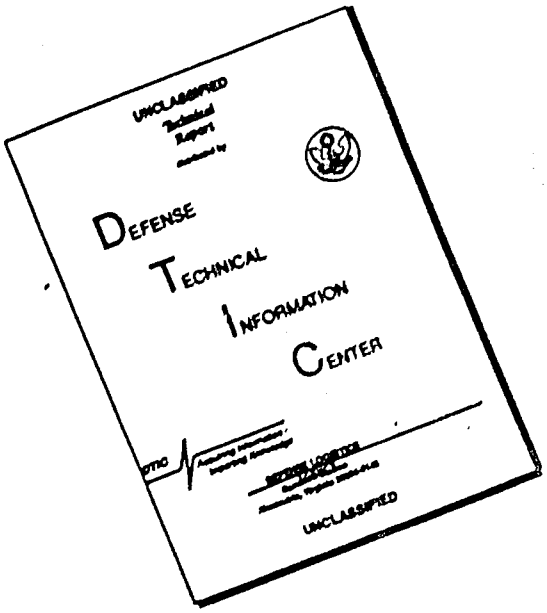

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OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO

AGAM-P (M) (13 Feb 69) FOR OT UT 684138 25 February 1969

SUBJECT: Operational Report - Lessons Learned, Headquarters, 19th Engineer Battalion (Combat)(Army), Period Ending 31 October 1968

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1. Subject report is forwarded for review and evaluation in accordance with paragraph 5b, AR 525-15. Evaluations and corrective actions should be reported to ACSFOR OT UT, Operational Reports Branch, within 90 days of receipt of covering letter.

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

BY ORDER OF THE SECRETARY OF THE ARMY:

Kenneth G. Wickham

KENNETH G. WICKHAM
Major General, USA
The Adjutant General

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DEPARTMENT OF THE ARMY
HEADQUARTERS 19TH ENGINEER BATTALION (COMBAT)(ARMY)
APO SAN FRANCISCO 96492

EGCA-CO 31 October 1968

SUBJECT: Operational Report Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1968

THRU: Commanding Officer, 35th Engineer Group (Const), APO 96377

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

Commanding General, USARV, ATTN: AVHGC-DST, APO 96375

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

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

SECTION I. OPERATIONS: SIGNIFICANT ACTIVITIES

a. Battalion Narrative.

During this reporting period (August 1968 through October 1968), the 19th Engineer Battalion (Combat)(Army) has continued its primary mission of upgrading QL-1 to MACV standards from Bong Son to Mo Duc; and its operational support mission of road maintenance on QL-1 from Phu Cat to Bong Son. The battalion continued its non-divisional engineer support within its AOR to the AMERICAL Division and to the 173rd Airborne Brigade. Also provided was operational support to the 8/64th Artillery Battalion, the U.S. Navy detachment at Sa Huynh and other units in its AOR. The battalion also assumed the high priority mission of upgrading LZ English Airfield to an asphaltic concrete surface capable of handling C-130 Aircraft.

The 19th Engineer Battalion (Combat)(Army), organized under TOE 5-35E, consists of HHC and four (4) line companies. Attached are the 137th Engineer Company (LE), the 73rd Engineer Company (CS), and the 70th Engineer Company (DT). The 35th Engineer Battalion (Combat) Land Clearing Team was attached until 9 October 1968 for operational control. Attached as Inclosure 1 is a list reflecting the organizational structure of the battalion.

The Battalion Headquarters, A Company, and the 137th Engineer Company (LE) are operating from LZ North English (BS 883056); C Company, the 73rd Engineer Company (CS), and the 70th Engineer Company (DT) are operating from LZ Lowboy (BS 913147);

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D Company is operating from LZ Thunder (BS 060318); and B Company is operating from LZ Max (BS 763472). The 35th Engineer Battalion (Combat) Land Clearing Team operated from LZ Uplift (BR 923750).

Changes in the command and staff elements of the 19th Engineer Battalion (Combat)(Army) during this reporting period included the Battalion Commander, Battalion Executive Officer, Battalion Adjutant, Battalion S-3, Assistant S-3, Battalion S-2, Battalion Surgeon, Company Commander of Headquarters Company, Commanding Officer of B Company, Battalion Maintenance Officer, and Battalion Sergeant Major. LTC Donald A. Wisdom received command of the battalion from LTC James L. Sutton on 3 September 1968. MAJ Don E. Meeker arrived in the unit on 9 August 1968 and assumed the duties of the Executive Officer. 1LT Sanford Greenfarb arrived in the unit on 25 September 1968 and replaced 1LT William C. Lolley as Adjutant. When 1LT James H. Schaeffer departed on 9 September 1968, 1LT Randy D. Davis vacated his position as Heavy Equipment Platoon Leader and assumed the duties of the S-2 Officer. MAJ Fred L. Farnsworth arrived in country on 31 July 1968 and became Battalion S-3 Officer on 2 August 1968 upon MAJ Joseph Bogden's departure. CPT Leonard Good took command of Headquarters and Headquarters Company on 6 August 1968 from 1LT Edward L. Nagel. On 21 August 1968 CPT Karl S. Snyder arrived at the unit and was assigned as Assistant S-3. The position of Battalion Maintenance Officer was filled on 25 September 1968 by CPT George M. Whitfield. On 20 August 1968, CPT William E. Swan became Battalion Surgeon, a position which had been vacant since the departure of CPT Edward J. Zobian on 18 August 1968. CPT Daniel H. Hornbarger was assigned as B Company Commander upon his transfer from the 864th Engineer Battalion (Const) on 17 August 1968. He replaced CPT Robert G. Tames who departed for CONUS on 18 August 1968. Sergeant Major Richard T. Frisby rotated on 20 August 1968. The position of the Battalion Sergeant Major was vacant until the arrival of Sergeant Major David C. Lay on 29 September 1968.

As in the last reporting period the battalion continues to experience shortages of assigned personnel. As of the end of the reporting period total assigned strength was 1128 of 1256 authorized. During the reporting period 174 new personnel were assigned to the battalion and 173 rotated, leaving shortages relatively constant throughout the period. There were 53 extensions from personnel within the battalion during this reporting period. Morale continues to be high in the battalion as indicated by the high extension rate, the attitude, appearance, and accomplishments of the men assigned to the 19th Engineer Battalion (Combat) (Army).

In carrying out its mission the 19th Engineer Battalion has received many construction type projects not normally given to a combat engineer battalion. The combat engineer battalion is organized to accomplish combat type engineer missions. The battalion is not sufficiently staffed for the planning and control of construction missions.

Other pertinent personnel actions occuring within this reporting period are seven (7) reenlistments recorded by the battalion, 15 Special Courts Martial

conducted, and 38 Field Grade Article 15's administered.

During this reporting period, the reconnaissance section of the S-2 completed a bridge and culvert reclassification between Phu Cat Airbase (BR 890470) and Bong Son (BR 872958). This included completion of DA Form 1249-R (Bridge Recon Report) on 63 bridges and culverts and three (3) pictures of each bridge/culvert depicting the substructure, the superstructure and the bypass. Serious flooding and subsequent damage of a major portion of QL-1 elicited a special recon of QL-1 in the Battalion AOR by the S-2. The road was reconned, with damaged and flooded areas being noted, and a comprehensive overlay was compiled for the S-3 for use in planning construction operations to repair the damage. An airfield reconnaissance was performed at LZ Pony (BR 789833) to determine requirements for rehabilitation of an airfield capable of landing CV-7A's. Total mileage of reconnaissance for this period was 141.6 miles.

The intelligence collection and dissemination efforts of the S-2 Section were augmented by receipt of daily intelligence summaries from the 173rd Airborne Brigade and from the 11th Light Infantry Brigade. Intelligence agent reports which might affect elements of the battalion were gathered from MACV Advisors in Mo Duc, Duc Pho, and Hoai Nhon along with agent reports from elements of the 172nd and 52nd Military Intelligence Detachments and the 40th ARVN Regiment. This gave the battalion a comprehensive study of enemy activity throughout its area of operations.

There were a total of 355 enemy incidents recorded during this reporting period. Elements of the battalion were fired on by the enemy with small arms, automatic weapons, grenades, and M-79's in 117 of these incidents. Equipment, vehicles, and personnel detonated a total of 35 mines and booby traps ranging from grenades to mines with an approximate charge of 35 pounds. The company mine sweep teams detected 61 mines and booby traps along with several detonating devices on QL-1 within the battalion AOR. The enemy destroyed 18 culverts by placing explosives inside or directly above the culverts. Casualties resulting to the battalion from these incidents were 6 US KIA and 69 US WIA. The enemy removed 70 pieces of 4"x6" decking and 5 6"x16" stringers from one bridge construction site (BS 771461) and they constructed 71 obstacles on QL-1 for the purpose of harassment. These obstacles consisted of hand dug trenches and barricades of bamboo, wire, pieces of metal and earth.

The Battalion's VIP program continued throughout the period with increasing success. Funds were obtained from the 52nd Military Intelligence Detachment at LZ Bronco and the 18th Engineer Brigade. The following items were turned in by the local Vietnamese:

60mm Mortar rounds (duds)	7 each	M-79 40mm rounds	9 each
105mm Artillery rounds (duds)	2 each	M-72 LAW	1 each
155mm Artillery rounds (duds)	3 each	M-18A1 Claymore mine	1 each
M-60 rounds	100 each	Home-made grenades	2 each
20# Satchel charge	1 each		

Total expenditures for the above mentioned items was 4600 $VN.

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Propaganda was found by the battalion including effigies of soldiers with knives in them and written instructions to Vietnamese civilians not to give information to Americans or they would be killed. In a number of instances the 19th Engineer Battalion was specifically mentioned.

Fifty-seven suspicious VN Nationals were apprehended and turned over to local infantry units for interogation. The battalion recorded seven (7) enemy killed in action and one (1) enemy wounded.

During the reporting period, elements of the battalion spent 81 days on LCC upgrading, operational support, and construction projects. Eleven days were spent on training and maintenance standdown.

The battalion has continued its upgrading of QL-1 to MACV roadway standards by the completion of a 300' timber pile bridge, two 60' timber pile bridges, a 102' steel stringer bridge (50% completed) and 25 culverts (these either replaced destroyed bridges or existing bridges), and widening of the existing roadway. 8826 cubic yards ofsand were hauled to widen and stabilize the right of way for the road. 61,313 cubic yards of laterite were hauled for subgrade fill. 4971 cubic yards of blast rock were utilized for stabilization and repair of flood damage. 16,641 cubic yards of 2 1/2" (-) rock was utilized as base course material covering 8678 linear yards. Thirty-eight masonry and concrete headwalls were constructed for existing and newly constructed culverts, 941 feet of 60" culvert, 92 feet of 36" culvert, 55 feet of 30" culvert, and 100 feet of 18" culvert were installed for drainage. Normal maintenance effort along QL-1 involved repairing existing bridging and drainage, re-cutting ditches, cleaning out culverts, and filling pot holes. Eighteen culverts have been replaced as the result of enemy action.

In October, a typhoon passed close to the coast of Vietnam causing severe rainstorms for over a week. In one seven day period over thirty inches of rain fell on the battalion AOR. At the beginning of this period, effort was directed toward saving all bypasses and the Bong Son causeway. These were soon indunated and effort was directed toward keeping QL-1 open along its entire length. This included the installation of one 70' bailey bridge, preparing one ford and constructing one 65' timber pile bridge (immediately destroyed by the enemy). At the height of the flood, water was between three and four feet deep over portions of the road surface. Several culverts washed out as well as some sections of the road. The fill behind bridge abutments and under pavement washed out in some locations. All effort was expended for a week in repair of this damage. Repair has continued until the end of the reporting period without all damage being repaired. It is estimated that with current available resources and project priorities, it will take until 1 December 1968 to repair most of this damage. Complete repair may not be effected for months as hidden damage to bridge substructures may not have been found.

LZ English Airfield was assigned to this battalion early in this reporting period and has assumed first priority among current projects. Currently the southern half of the airfield is being upgraded to an asphaltic concrete surface.

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The northern half is scheduled to be upgraded upon completion of the southern half. To date 2480 cubic yards of earth have been excavated from the runway, 9850 cubic yards of laterite fill has been hauled for the subbase, and 16,121 cubic yards of 2 1/2" (-) rock have been placed. All M8A1 matting has been removed from the southern half of the runway, the taxiway, and the parking apron. Eight-hundred feet of runway 60 feet wide has been paved with a 1 1/2" lift of asphalt.

Major operational support was provided on the following projects:

The 19th Engineer Battalion continued to operate two water points at LZ English until 28 August 1968. At this time they were removed to the Bong Son River while a well and a water tower were being constructed. Upon completion of the well the water points were returned to LZ English. One water point is also operated at QL1-399 in support of units in that sector of the battalion AOR. An average of 38,000 gallons of potable water is dispensed per day.

Daily repair of the airfield runway and aprons at LZ English was performed by welding the M8A1 matting.

Artillery pads were constructed at LZ Pony (BR 798833) and LZ Uplift (BR 92375[illegible]

Maintenance of the causeway at Bong Son River was conducted to keep the causeway open to traffic until it was flooded and washed out in October. Repair will not be attempted until after the monsoon season is over.

Drainage at LZ Tom (BS 900090) was improved by shaping the area and cutting drainage ditches. The accomplishment of this mission included breaching a mine field.

Three culverts were emplaced on Highway 506 to enable 1/67th Armor to conduct combat operations in the area.

A helipad is being reworked for 173rd Airborne Brigade Aviation units at LZ English. There were over 322,500 cubic yards of cut and fill and the surface was graded and compacted. Penoprime was applied over 70,915 square yards of surface. The project is presently 90% complete with final leveling and shooting of approximately 40% of the area yet to be completed.

Direct support was provided to units within the battalion's AOR in the form of equipment, such as D7E dozers, 16S concrete mixers, and 20-Ton rough terrain cranes. The Land Clearing Team worked east of LZ English, in the vicinity of LZ Uplift and in 506 Valley between LZ Uplift and LZ Pony clearing an estimated 6,335 acres.

In addition to the above, this battalion has expended 560,000 BF of lumber, 9,000 bags of cement and 19,550 pounds of spikes and nails in support of LOC

upgrading and operational support missions this quarter.

During this report period, 31 pieces of major equipment have been received. One of the most important is a new 225TPH rock crusher being received by the 73rd Engineer Company (CS) just as the reporting period closed. The battalion has also been hampered somewhat in its operations by shortages of construction equipment with 5-Ton dump trucks being the most critical.

Another major problem area is the long haul distance from the source of supply. Materials are drawn in Qui Nhon, moved seventy miles to the Battalion's S-4 Yard, and finally transported to the various jobsites.

b. Headquarters and Headquarters Company Narrative.

During the reporting period Headquarters and Headquarters Company continues to support the battalion in all areas. Operations continued to function smoothly even with a large turn-over of key personnel.

Four major events had effect upon the staff and other sections during this period. The first of those was the change of command from LTC Sutton to LTC Wisdom on 3 September 1968. All operations continued smoothly during this time. The next major occurence was the flooding caused by rains from 11 October 1968 to 22 October 1968. During this period all efforts were directed toward maintaining LOC contact with supply and other support elements for units in this area. Throughout this reporting period, the Headquarters, and all other elements of the command were preparing for their Annual General Inspection. The inspection will be held 4 November to 8 November. The last major event of this reporting period is the impending change of the 19th Engineer Battalion from the 35th Engineer Group (Const) to the 937th Engineer Group (Combat) on 1 November 1968. All preparations have been proceeding smoothly in this direction and all is in readiness for the anticipated change.

The communications section worked daily against enemy and natural forces to maintain communications with higher elements. The land line to LZ English required repair almost daily. Problems increased tenfold during the flooding in October, but communications were rapidly restored even before the flood waters subsided. In October, work was started to establish reliable communications with the 937th Engineer Group.

The battalion medical section continued its excellent support throughout the reporting period. Personnel were seen with ailments ranging from common colds and cuts to those with malaria, infectious hepatitis, and combat injuries. All were efficiently cared for. In addition, immunizations were kept up to date for battalion personnel and frequent health inspections were made of living, eating, and working areas.

The battalion heavy equipment section was committed throughout the AOR on all projects. Support was given units of the 173rd Airborne Brigade, the U.S. Navy

detachment at Sa Huynh, and other units in the area. Equipment was committed to companies working on the LOC, on LZ English Airfield, and in maintenance and rehabilitation of battalion areas.

The battalion maintenance section has continued to keep all possible equipment operational. This has entailed sending teams to remote project locations for on the spot repairs, helping companies in their shops when needed, and working late hours to repair critical pieces of equipment. Equipment damaged in enemy contact is quickly evaluated and repaired if feasible. An additional preventative maintenance burden was placed on the section when daily checks of all submerged parts for proper lubrication or presence of water in lubrication reservoirs had to be made during the October flood.

c. A Company Narrative.

A Company has been primarily engaged in operational support and LOC maintenance during this report period. Four artillery pads were constructed at LZ Pony and four at LZ Uplift during the month of August. The LZ Pony Airstrip was also rehabilitated during this period. A water point, including water tower, was constructed at LZ English. Culverts were installed at three locations along Highway 506 in support of combat operations of the 1/69th Armor. The mission capability of the 8/64th Artillery, at LZ Tom, was seriously impaired due to the October flood. A Company reconstructed their drainage system as soon as the area was dry enough to be worked. This entailed breaching an existing minefield.

Construction of a 60' timber pile bridge was completed during this period. The Bong Son causeway and the approaches to the Bong Son River Bridges required constant maintenance. When the causeway washed out in October, a 70' double-single bailey bridge was recovered before it could be washed into the river. Constant maintenance was required on QL-1 to counter the effects of the heavy traffic on the unpaved portions of this major LOC.

Minesweep operations required at least two platoon hours daily with increased harassment from the enemy being noted in late August.

d. B Company Narrative.

B Company was engaged mainly in road upgrading, drainage construction and minesweep operations during this reporting period. B Company has been engaged in widening and raising QL-1 throughout its AOR. This task was made more difficult in the month of September when equipment was committed to the airstrip at LZ English.

The construction and repair of culverts and bridges continued, with progress being made despite a high level of enemy activity in the area. Fifteen of the eighteen culverts destroyed in the battalion AOR were in the B Company AOR.

Minesweep was a major activity for this company throughout the reporting period. Mines were discovered and destroyed almost daily. Twenty men were

wounded and two killed in the B Company AOR during this period. Most of these casualties occurred on minesweep operations.

The flood in October halted B Company's operations almost completely for several days; with vehicular movement to supply points and the Battalion Headquarters cut off, helicopters had to be used to transport food and potable water. The end of the reporting period found B Company in the midst of repairing the extensive damage caused by the flood waters.

e. C Company Narrative.

C Company's resources were concentrated at LZ English during this reporting period. Overall responsibility for upgrading of LZ English Airfield was assigned to this company. Work began early in August to remove the M8A1 matting from the southern half of the runway and to excavate the fill from the old runway. By the end of the reporting period all matting was removed from the southern half of the runway, the parking apron, and the southern taxiway. These areas were excavated and leveled. Eight-hundred feet of the runway was paved with the first lift and base course is being placed and compacted on the remainder of the southern half. A soils analysis lab was built to aid in quality control on the project. The drainage system for the airfield is presently being worked on.

Other projects completed by C Company include a bunker for the water point north of LZ Lowboy and the casting of curbstones to be used in Duc Pho. Almost completed is a helipad at LZ English. Construction also began on a pad for the 73rd Engineer Company (CS) 225TPH rock crusher.

Mine sweep normally required 3 platoon hours daily. Harrassment by the enemy occurred often. At the end of August, activity increased to a point where up to seven platoon hours were used daily. Obstacles and debris thrown on the road were the most frequent incidents encountered. Booby traps and mines were scattered along the whole road forcing the mine sweep team to proceed at a slow pace.

f. D Company Narrative.

D Company divided its time this reporting period between LOC upgrading, drainage improvement, and mine sweep operations. QL-1 was maintained in the southern part of D Company's AOR and road widening and upgrading were performed in the northern part. Curbstones, precast by C Company, were installed in Duc Pho to aid drainage. Three bailey bridges were removed from the AOR during this report period. A 70' double-single bailey was installed to keep the LOC open when a bypass washed out during the flood in October. A ten tube culvert with each tube being 60" in diameter was also completed during this time.

Construction of the only steel stringer bridge in the battalion AOR was 50% complete at the end of the reporting period. Further construction was awaiting shipment of stringers from Qui Nhon. Other bridge and culvert repair and construc-

tion was accomplished as needed. At the end of the reporting period major repairs were being performed on sections of the road and drainage structures where they were damaged by flood waters.

Mine sweep operations in this AOR consumed between six and twelve platoon hours daily. Enemy activity was especially severe during the last part of August and the beginning of September.

g. 70th Engineer Company (DT) Narrative.

The 70th Engineer Company (DT) supported other battalion units with their haul capability during this reporting period. Through most of the period, one section was committed to B Company, one section to D Company, and one platoon to LZ English Airfield and to asphalt operations. Total haul for LZ English and QL-1 consisted of 18,196 cubic yards of laterite, 7,235 cubic yards of blast rock, and 24,405 cubic yards of base course. In addition, 4,850 cubic yards of asphalt were hauled for use on QL-1 and 3,375 cubic yards for LZ English Airfield.

h. 73rd Engineer Company (CS) Narrative.

The 73rd Engineer Company (CS) continued its operation of the heavy construction support facility consisting of two 75TPH primary and three 75TPH secondary rock crushers. Production during the reporting period yielded 24,678 cubic yards of 2 1/2" (-) rock, 2,010 cubic yards of 3/4" rock, and 7,108 cubic yards of 1/2" (-) rock. 60,000 pounds of explosives were used in the quarry operations. The asphalt plant produced 5,038 tons of asphalt. 1.1 miles of QL-1 were paved with a 2 1/2" lift and a 24' wide roadway. Also, an 800' section of LZ English Airfield, 60' wide, was paved with a 1 1/2" lift.

i. 137th Engineer Company (LE) Narrative.

The 137th Engineer Company (LE) provided equipment support for road, bridge, and airfield construction during this reporting period. Equipment support was also given to elements of the 173rd Airborne Brigade and other units in the area. Other operational support requirements were also supported by this unit.

This unit supervised the laying of base course on QL-1 and LZ English Airfield, compacted it, and prepared the surfaces for paving.

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SECTION II, LESSONS LEARNED: COMMANDER'S OBSERVATION, EVALUATION, AND RECOMMENDATIONS:

a. PERSONNEL: None

b. OPERATIONS:

(1) Tool breakage while cutting asphalt.

(a) OBSERVATION: Each paving day a clean straight edge must be cut at the end of the previously laid asphalt in order to provide a good bond and starting edge. At times air compressors are not available and hand tools must be used to do the work. Because of the hardness of the material being cut, the ax handles and sledge hammer handles break easily. Time and money were both lost in the periodic replacement of these handles.

(b) EVALUATION: By making handles out of stronger material, time and money can be saved. Also additional safety will be gained as the heads are quite dangerous when handles break and the heads fly off.

(c) RECOMMENDATION: When wooden ax handles break, they are replaced with heavy sheet steel handles. The edges of these handles are ground smooth and the handle welded to the head. In the same manner, heavy piping is welded to sledge hammer heads. This eliminates broken handles.

(2) French masonry type culverts.

(a) OBSERVATION: French masonry type culverts are usually not long enough for road widening or tend to collapse at the ends under the weight of heavy equipment.

(b) EVALUATION: Personnel of this unit do not have the knowledge or experience to rebuild or extend masonry culvert using the original design and materials. Since most of the culvert will bear the weight of traffic, it would be a waste to remove the entire surface to emplace a new culvert if the existing sections can be utilized.

(c) RECOMMENDATION: If the existing culvert is of the type that has a flat bottom, vertical sides and an arch top, and if the top is caved in, it may be repaired by replacing the top. The bottom and sides of the culvert will remain untouched, thereby offering no obstruction to the flow of water. One half of a standard galvanized culvert placed over the damaged section will complete the repair. All places where the galvanized culvert joins with other material should be sealed with grout or mortar to prevent shifting and leakage of water.
In the event that the design of the culvert is other than that above or the culvert needs to be extended, a length of galvanized culvert may be used. Care ...

should be used in the joining of the two types of culvert because a leak would tend to undermine the road and an uneven joint would cause sand and dirt to build up in the culvert. Grout or mortar mix may be placed in the culverts to bring about a gradual change of shape and enhance smooth flow. The down-stream section can be larger to insure smooth water flow through the culvert.

(3) Classification signs.

(a) OBSERVATION: Wooden and metal bridge classification signs do not have adequate longevity in Vietnam due to the repeated wetting of wood signs and rust of metal signs even though painted.

(b) EVALUATION: Material other than wood or metal should be used for bridge classification signs.

(c) RECOMMENDATION: Classification signs can be easily precast of reinforced concrete to standard dimensions. These concrete signs are not affected by weathering as are wooden and metal signs.

(4) Antenna cables.

(a) OBSERVATION: Radio frequency cables have a tendency to pull loose from the connector at the top of the 292 antenna.

(b) EVALUATION: To save time and effort the cable should be secured to prevent its being pulled loose.

(c) RECOMMENDATION: Run the radio frequency cable directly down the antenna. Fasten it to the mast section of the antenna with electrical tape to eliminate the possibility of force being applied to the connector.

(5) Deep water ground guides.

(a) OBSERVATION: During heavy monsoon rains, roads in some locations are under water. This makes it impossible to see the limits of the road when driving.

(b) EVALUATION: A means must be readily available to drivers to enable them to drive safely along inundated roads.

(c) RECOMMENDATION: All vehicles driving where this condition may be encountered should carry long sticks. The assistant driver can walk the vehicle along the road using the stick to feel for the edge of the road and sudden drop-offs.

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(6) Removal of M8A1 matting.

(a) OBSERVATION: M8A1 matting which has been in place for any length of time usually is difficult to remove because of the corrosion of the locking pins and subsequent difficulty with retracting those pins.

(b) EVALUATION: Fabrication of a device to help remove the locking pins will simplify the task of removing M8A1 matting.

(c) RECOMMENDATION: A slide can be made to fit the slot in M8A1 matting by welding two (2) of the locking pins together to provide a raised surface.

[redacted]

By using a sledge hammer or air hammer in conjunction with the slide, the pins can be driven out.

(7) Increased efficiency from the bin feed unit on the 150 TPH asphalt plant.

(a) OBSERVATION: Under normal operations aggregate is fed to the dryer in an asphalt plant by a bucket elevator and two bin feeders, which in turn is fed by a 20-ton RT crane operating from stockpiles. In most locations the stockpiles must be formed by trucking aggregate from the crusher site, where it is loaded by bucket loader to the asphalt plant. This usually involves the following equipment:

1 bucket loader at crusher site

2 five ton dumps to haul aggregate

1 bucket loader or dozer to work stockpiles

1 20-ton RT crane to load bins

(b) EVALUATION: By engineering a bin feed unit which could be fed directly from 5-ton dump trucks, the following critical equipment could be freed for work at other locations; one bucket loader or dozer to work the stockpiles at the asphalt plant and one 20-ton RT crane to load the bins. The aggregate could be loaded at the crusher site, hauled to the plant, and dumped directly into the bin feed unit.

(c) RECOMMENDATION: To create this more efficient operation the following changes were made. First, a headwall was built and backfilled to provide a ramp for the trucks. Next the bin feed unit was installed in front

of the headwall. Now because of the size of the loading ramp and distance required for the slope to run off, the bin unit must be located farther away from the plant than the bucket elevator will reach. Therefore a belt conveyor must be modified to do the job. The conveyor on the bin feed unit turns at 15 RPM, therefore the feed conveyor must operate at the same speed. To accomplish this a 26 tooth gear was engineered and manufactured in this unit's maintenance shop. Replacing the normal conveyor drive gear with this 26 tooth gear reduced the speed to 15 RPM. Now 5-ton dumps can back to the headwall and dump directly into the bin unit, which feeds into the dryer by use of a belt conveyor (see diagram on page 19). This frees a 20-ton RT crane and a loader or dozer to work elsewhere.

(8) Inadequacy of culverts on QL-1.

(a) OBSERVATION: During the upgrading of QL-1, planning of drainage was based on the average rainfall received during any one period during the monsoon season. During a recent rain, made more severe by a nearby typhoon, all planning factors were exceeded causing serious problems along QL-1.

(b) EVALUATION: Present estimates for planning must be revised upward with subsequent redesign and construction of major highways in threatened areas.

(c) RECOMMENDATION: Conduct studies to evaluate maximum flooding possibilities along major roads. Then, allowing margin for error, redesign and reconstruct all critical areas of major highways to insure their continued use during all weather conditions.

(9) Cracking of asphalt coat on wooden bridges.

(a) OBSERVATION: Asphalt placed on wooden bridges cracks and breaks loose on many occasions.

(b) EVALUATION: Vibration of the wooden bridge appears to be the major cause in the deterioration of the asphalt surface.

(c) RECOMMENDATION: Install only a normal wood wearing surface on the bridge. This surface can be maintained or replaced in less time than required for an asphalt surface.

(10) Mobile flood lights.

(a) OBSERVATION: When night work is to be performed at a job site, much time must be taken in preparation of flood-lights for illumination.

(b) EVALUATION: A portable system of flood-lights is needed that can be

moved out of the way for daytime operations and rapidly set up where needed as darkness approaches.

(c) RECOMMENDATION: Mount the necessary number of flood-lights in ¼ ton trailers. These trailers can quickly be driven into place when needed, cables stored in the trailers, removed and connected with ajoining lights, and the whole circuit connected to a generator.

c. TRAINING: Requirement for engineer troops to be trained in infantry skills.

(1) OBSERVATION: Troops of this unit perform mine sweep operations along QL-1 daily. Many times infantry tactics must be used to counteract ambushes encountered during this daily task. Occasionally engineer units are called on to perform sweeps through villages or other areas as part of clearing operations.

(2) EVALUATION: To effectively conduct infantry type operations, engineer troops need refresher training in this subject. Current techniques should be taught for greatest effect of this training.

(3) RECOMMENDATION: Engineer units can be attached to infantry units for training purposes. Either squad or platoon integrity should be maintained. This training can take the form of classroom training followed by participation in actual operations with the unit conducting the training. The engineer soldier will return to his unit with a new understanding of infantry tactics and with confidence in the knowledge that he can perform his job with a greater degree of skill and safety

d. INTELLIGENCE:

(1) Securing of claymore mines.

(a) OBSERVATION: Claymore mines casually emplaced will be removed or reversed in place by the Viet Cong.

(b) EVALUATION: An effective way must be found to secure claymore mines against tampering. In addition, they should be emplaced behind a wire entanglement and visually checked daily for added safety.

(c) RECOMMENDATION: A method used by this unit to secure claymore mines is as follows: 55 gallon drums are filled ½ to 3/4 full of compacted sand. Holes are punched in the container about 5" from the top. Then the container is filled with concrete. The legs of the claymore are spread apart, bent at a 90° angle 1" from the ends and set into the concrete. The barrel is then set in a hole in the ground and earth tamped in place around it.

(2) Removal of mines over culverts.

(a) OBSERVATION: On several occasions, anti-vehicular mines have been located near or over culverts so that the blowing in place procedure would cause damage to the drainage structure. Extraction by the grappling hook has become difficult since the VC have been placing larger charges deeper in the ground.

(b) EVALUATION: If a decision is made to save the drainage structure, the pressure firing device should be removed by the grappling method. A portion of the explosive can then be uncovered by careful probing and digging. Cut a piece of C4 explosive approximately 1" wide for the full length of the standard 2½ pound block. Place the strip vertically in the bore with the bottom portion resting on the exposed charge. Igniting the top of the C4 strip will provide a time delay plus a means of igniting and burning the exposed charge in the ground. In most instances the charges have not exploded and have left only a small cavity near the culvert that can easily be filled.

(c) RECOMMENDATION: That the above method of burning mines be employed whenever damage to the drainage structure is probable and extraction by hand or grappling hook is hazardous.

(3) Mines set in potholes.

(a) OBSERVATION: Viet Cong emplace mines in potholes along the old French highway where it has not yet been upgraded. Mines and firing devices emplaced in potholes are hard to detect visually because the potholes are filled with water or gravel which makes camouflage easy. The types of mines used by the Viet Cong in this area often cannot be detected by mine detectors and potholes are too numerous to probe each individually.

(b) EVALUATION: Since the mines emplaced in this section cannot be detected easily because of road conditions, a solution is to eliminate the potholes in the road.

(c) RECOMMENDATION: Rip up potholed sections of the road. Mix laterite with the resulting rock and spread this to form a smooth homogeneous surface. Covering this with penetrime will produce a temporary surface on which visual detection of tampering will be simplified.

c. LOGISTICS: Field expedient name tapes.

(1) OBSERVATION: Name tapes for uniforms are often times difficult to obtain through supply channels.

(2) EVALUATION: Stenciling names directly to the shirt is unsatisfactory since the shirt cannot be reissued to another person in this condition. A substitute for name tape material is required.

(3) RECOMMENDATION: The straps on small arms ammunition bandoleers can be used with ½" stencils to make adequate name tapes.

f. ORGANIZATION: None

g. MAINTENANCE:

(1) Checking of brake shoes.

(a) OBSERVATION: The prescribed method to check brake shoes on the ¼-ton truck is to remove 5 lugnuts, remove the tire, remove the axle flange cap, and finally remove the cotter key and locking nut to expose the brake shoes.

(b) EVALUATION: This process is tedious and time consuming. An alternate method is available which achieves the same result on the ¼-ton truck with less time and effort. First remove the axle flange cap and wheel bearing locking nut, then grasp the wheel and remove wheel, brake drum and spindle all at once.

(c) RECOMMENDATION: Use the above procedure when checking and changing brake shoes as it saves time while achieving the same results.

(2) Loose bolts on D-7E dozer.

(a) OBSERVATION: The first three (3) bolts holding the rock guard come loose during normal operation even after being checked and tightened during operator maintenance.

(b) EVALUATION: Normal operator maintenance will not insure that these bolts stay tight during operation so they should be affixed semi-permanently.

(c) RECOMMENDATION: These bolts can be secured sufficiently by tack welding them to the rock guard.

(3) Air cleaner assembly and filter.

(a) OBSERVATION: In the operation of Cat 12 graders, some down time has been experienced due to the unavailability of the air cleaner assembly and filter elements thru normal supply channels.

(b) EVALUATION: This down time, although minor, is a continuous problem. The air cleaner assembly and filter elements after continuous service to the elements must be replaced periodically.

(c) RECOMMENDATION: These assemblies and elements can be completely replaced with a complete air filter assembly from a 5-ton truck, M52A2, in 1½ hours. This procedure will prevent excessive down time.

(4) Failure of left fender on M51A2 5-ton dump truck.

(a) OBSERVATION: The left front fender of the M51A2 5-ton dump truck often fails while driving on the rough roads of Vietnam, causing the truck to be deadlined.

(b) EVALUATION: This occurs primarily because of the weight of the air cleaner assembly which is mounted on this fender.

(c) RECOMMENDATION: Fabricate a brace from 2" angle iron. This brace is bolted to the frame and the fender directly below the air cleaner assembly. This will help alleviate the problem of excess weight on the fender.

(5) Failure of radiator on M51A2 5-ton dump truck.

(a) OBSERVATION: Frequent failure of the radiators on truck, dump, 5-ton, 6x6, M51A2, has resulted in excessive down time for repairs. These radiators are difficult items to obtain through normal supply sources. Therefore, repairs must be attempted within organic maintenance facilities which is time consuming at best.

(b) EVALUATION: Most failures are due to separation of water tubes from the lower water tank. In addition there is not enough protection of the water tubes so any flying objects (stones, etc) will penetrate the tubes. On most radiators the tubes are protected by the air fins, which is not the case on this type radiator.

(c) RECOMMENDATION: In recent cases, due to nonavailability of multi-fuel radiators, 5-ton gasoline radiators have been modified for use on the multi-fuel trucks by removing the shroud from the multi-fuel radiator and soldering it onto the gasoline radiator.

(6) Vapor lock in bituminous paving machine.

(a) OBSERVATION: During paving operations in the hot sun the Barber Greene Model SA 35 paving machine develops a vapor lock on or about 1400 hours

FGCA-CO 31 October 1968
SUBJECT: Operational Report Lessons Learned (RCS CSFOR-65), for Quarterly Report Ending 31 October 1968.

every afternoon. This causes a severe slow down in paving operations and a loss of valuable production time.

(b) EVALUATION: The vapor lock can be temporarily cured by placing cold towels or ice over the fuel pump. However this is only a temporary cure and within a short time the vapor lock occurs again. However, an auxilary fuel pump will solve the problem.

(c) RECOMMENDATION: Install an electric fuel pump between the tank and normal fuel pump. This fuel pump can be activated by means of a toggle switch. Whenever vapor lock occurs activate the auxilary fuel pump and continue paving without interruption.

h. OTHER: Expedient flare.

(1) OBSERVATION: Heavy use of flares can cause a situation in which an expedient is needed.

(2) EVALUATION: An expedient type flare should be improvised for emergency use.

(3) RECOMMENDATION: Use a 55 gallon barrel and two (2) 105 or 155 shell casings to prepare the flare in the following manner:

(a) Cut the barrel down to 1/3 size and insure it has no leaks in it.

(b) Place one (1) shell casing upright in the 55 gallon barrel and secure firmly in place. Then slightly reim the opening in the shell and fill it with gasoline.

(c) Take the second casing, drill a ¼" hole in the bottom and place it atop the first shell (open end to open end). Tape both shells together to secure.

(d) Fill the 55 gallon barrel used with a mixture of oil and gasoline.

(e) When the mixture of gasoline and oil is ignited, the gasoline in the shell casings heats up, vaporizes, and comes out the quarter inch hole. Burning this gives a satisfactory light source.

1 Incl
as

DONALD A. WISDOM
LTC, CE
Commanding

EGA-3 (31 Oct 68) 1st Ind
SUBJECT: Operational Report Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1968

DA, Headquarters, 35th Engineer Group (Const), APO 96312, 24 November 1968

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

1. This headquarters has reviewed the Operational Report - Lessons Learned for the 19th Engineer Battalion (Cbt) for the quarterly period ending 31 October 1968. The report is considered an excellent summary of the battalion's activities for the reporting period.

2. This headquarters concurs with the remarks of the Battalion Commander with the following comments added: Reference Section II, paragraph b.(8). When designing a drainage structure, the effort and materials required to construct the facility must be weighed against the effort required to repair the structure should it be damaged by a storm greater than used in the design. Consideration might be given to increasing the present 5 year design storm established by the 18th Engineer Brigade Highway Design Criteria; however, a 50 year design storm is felt unjustified.

GILBERT N. FOWLER
Colonel, CE
Commanding

AVBC-CS (31 Oct 68) 2nd Ind
SUBJECT: Operational Report of the 19th Engineer Battalion (Combat) for the Period Ending 31 October 1968, RCS CSFOR - 65 (R1)

DA, Headquarters, 18th Engineer Brigade, APO 96377 8 DEC 1968

TO: Commanding General, U.S. Army Vietnam, ATTN: AVHGC-DST, APO 96375

1. This headquarters has reviewed the Operational Report - Lessons Learned for the 19th Engineer Battalion (Combat) as indorsed by the 35th Engineer Group. The report is considered to be an excellent account of the Battalion's activities for the reporting period.

2. This headquarters concurs with the observations and recommendations of the Battalion and Group Commander with the following comments added:

a. Reference: Section II, paragraph b.(8). This problem will be resolved by the new MACV Directive Number 415-6, Restoration, Maintenance and Repair of Roads and Bridges; which calls for increasing the design storm to a maximum of 20 years.

b. Reference: Section II, paragraph g.(1). Removal of the spindle exposes wheel bearings making the introduction of dirt and other foreign matter a distinct possibility. The perfect alignment of the spindle during removal and installation is necessary to preclude the possibility of damage to seals. The added weight involved in removing the wheel, drum and spindle as a unit makes alignment more difficult and increased seal failures can be anticipated. Recommend that the unit use prescribed method to check brake shoes on ¼ ton trucks.

c. Reference: Section II, paragraph g.(2). Concur as a field fix only if the cause of the failure is determined to be worn threads in the truck frame. The failure of the rock guard attaching bolts to remain tight during operation could also be caused by bent rock guards which should be straightened or replaced, or worn bolts which should be replaced.

JOHN H. ELDER, JR
Colonel, CE
Commanding

CF:
CO, 35th Gp
CO, 19th Bn

AVHGC-DST (31 Oct 68) 3d Ind
SUBJECT: Operational Report Lessons Learned (RCS CSFOR-65), for Quarterly Period Ending 31 October 1968

HEADQUARTERS, UNITED STATES ARMY, VIETNAM, APO San Francisco 96375 13 DEC 1968

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

This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 October 1968 from Headquarters, 19th Engineer Battalion (Combat)(Army) and concurs with the report as modified by the preceding indorsements.

FOR THE COMMANDER:

A.R. GUENTHER
CPT. AGC
ASST. ADJUTANT GENERAL

Cy furn:
HQ 19th Engr Bn (C)(A)
HQ 18th Engr Bde

GPOP-DT (31 Oct 68) 4th Ind
SUBJECT: Operational Report of HQ, 19th Engr Bn (Cbt)(Army) for Period Ending 31 October 1968, RCS CSFOR-65 (R1)

HQ, US Army, Pacific, APO San Francisco 96558 6 JAN 1969

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

This headquarters has evaluated subject report and forwarding indorsements and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:

C L SHORTT
CPT, ACC
Asst AG

ORGANIC UNITS

Headquarters and Headquarters Company, 19th Engr Bn (C)(A)

Company A, 19th Engr Bn (C)(A)

Company B, 19th Engr Bn (C)(A)

Company C, 19th Engr Bn (C)(A)

Company D, 19th Engr Bn (C)(A)

ATTACHED UNITS

70th Engineer Company (DT), Administrative and Operational Control.

73rd Engineer Company (CS), Administrative and Operational Control.

137th Engineer Company (LE), Administrative and Operational Control.

35th Engr Bn (Cbt), Land Clearing Platoon, Operational Control (until 9 Oct 68).

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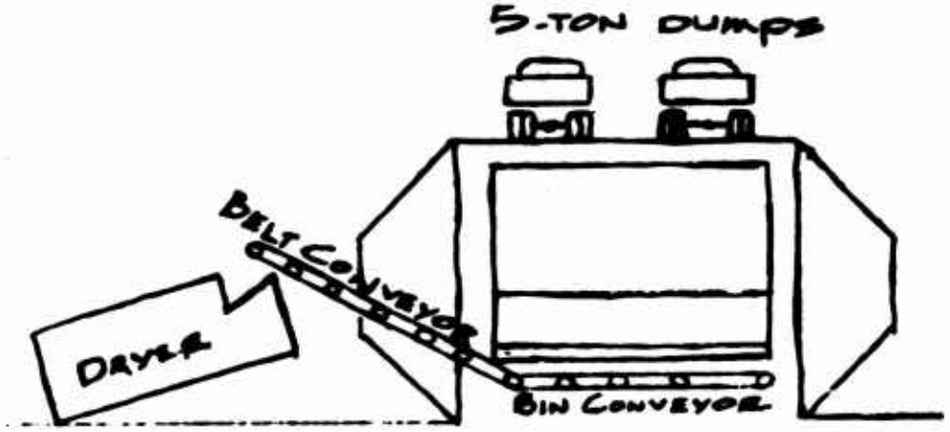

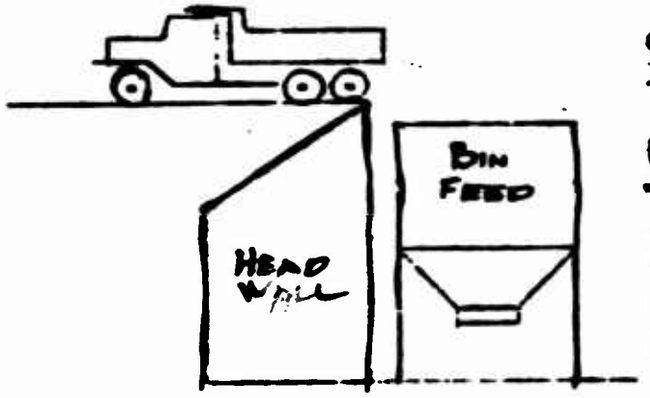

SIDE VIEW OF BIN FEED UNIT

DRAWN NOT TO SCALE

Bin Feed Unit On 150 TPH Asphalt Plant

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CO, 19th Engineer Battalion (Combat)(Army)

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