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ago, d/a ltr, 29 apr 1980

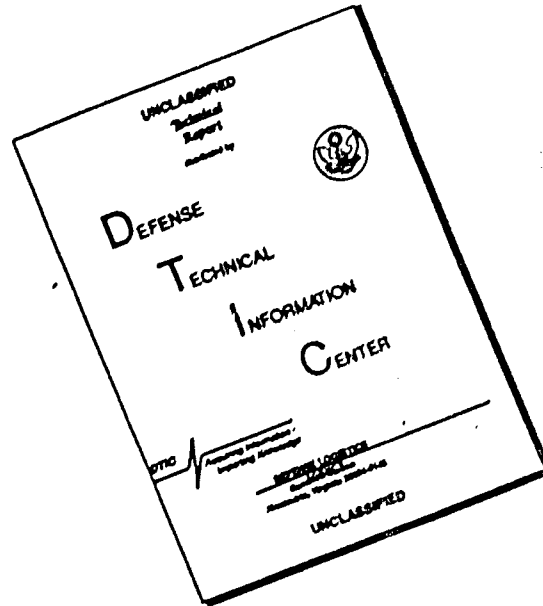
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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO

AGDA (M) (18 Feb 70) FOR OT UT 694310

26 February 1970

SUBJECT. Operational Report - Lessons Learned, Headquarters, 35th Engineer Battalion, Period Ending 31 October 1969

AD 866374

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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
Major General, USA
The Adjutant General

1 Incl
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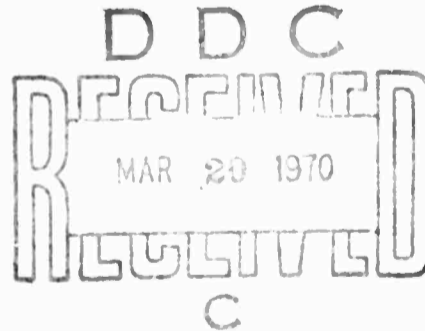
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14

DEPARTMENT OF THE ARMY
HEADQUARTERS, 35TH ENGINEER BATTALION (COMBAT)
APO San Francisco 96320

EGFF-OP

10 November 1969

SUBJECT: Operational Report - Lessons Learned 35th Engineer Battalion
(Combat) for Period Ending 31 October 1969, RCS CSFOR - 65 (R2)

THRU: Commanding Officer
34th Engineer Group (Const)
APO 96320

Commanding General
20th Engineer Brigade
APO San Francisco 96491

Commanding General
USA Engineer Command Vietnam (Prov)
ATTN: AVCC-P&O
APO 96491

Commanding General
United States Army, Vietnam
ATTN: AVHGC-DST
APO 96375

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

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

1. Section 1. Operations: Significant Activities

During the period 1 August 1969 to 31 October 1969, the 35th Engineer Battalion (Combat) completed its primary mission in the Mekong Delta, the major/minor repair of Highway QL-4 from Can Tho to Soc Trang which was initiated on 1 February 1969.

The project directives CD 98-233-LC-034 (Can Tho to Thanh Hoa, 13.5 km) and CD 98-234-LC-034 (Thanh Hoa to Soc Trang, 46.6 km) required that the road be restored to its original capability to sustain the volume and weight classes of traffic for which it was originally designed and then be surfaced with a Double Bituminous Surface Treatment (DEST). Original design criteria was an all weather, 5 meter (16 feet) wide, Class 20 light traffic road. Upon the completion of the the project on 7 September 1969, the following work had been accomplished:

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1. Patched 11.5 km of existing pavement with 8.5 km north of Soc Trang being maintained by the Ministry of Public Works and required no effort for repair.

2. Scarified, added 3"(-) base course, shaped, and compacted 40 km of base course to a CBR of 100 and then applied a Double Bituminous Surface Treatment.

3. Installed 18 culverts and constructed 20 headwalls.

The following materials were expended on the project:

1. 3"(-) rock - 37,500 cu yds
2. 3/4" rock - 16,250 cu yds
3. 3/8" rock - 1,900 cu yds
4. Asphalt - 191,700 gallons
5. Concrete - 114 cu yds
6. Corrugated Metal Pipe - 765 linear feet
7. Asphaltic Concrete - 1,052 tons (pothole patching)

The project completion was delayed approximately 99 days due to several reasons. First and most serious was the lack of certain pieces of equipment such as rollers and asphalt distributors which were necessary to complete the mission. During the latter months of the project the battalion was plagued by deadlined equipment and monsoon rains. After 1 June, rain showers and a rising water table had a marked effect on the progress of the mission. A small amount of effort was lost due to enemy activity and at times during the progress of construction the non-availability of rock of a satisfactory quality hampered efficient construction.

In conjunction with the original directive requiring restoration of Highway QL-4, the battalion was assigned during the quarter the construction of 7 - 2 lane, steel stringer, concrete abutment bridges and 2 multitube corrugated metal pipe culverts with headwalls. Bridges were to be constructed according to AASHO-HS-20. During the quarter the battalion worked on the construction of bypasses for Bridge 14 (WR803985), Bridge 8 (WR943793), and culvert 11A (WR843924). The following work was accomplished at each location:

<u>Location</u>	<u>SD</u>	<u>EDC</u>	<u>Total Fill for Bypass</u>	<u>% Total Project</u>
Bridge 8	13 Sep 69	31 Jan 70	1107 cu m sand 94 cu m 3"(-) rock	7%
Bridge 14	16 Sep 69	31 Jan 70	3315 cu m sand	15%
Culvert 11A	11 Sep 69	30 Nov 69	422 cu m sand 499.5 cu m 3"(-) rock	20%

During the quarter the battalion had the following secondary missions:

1. B company completed the last of the "Delta Stagefield" projects at Bac Lieu (OS 210-5466-1-21) on 22 August 1969. The purpose of the project was to provide ammunition and fuel storage facilities for aircraft supporting tactical operations in the Delta. The scope of work included the hauling of 14,331 cu yds of fill for berms, stabilization of 10,000 square feet of ammo pads, and the installation of over 4,000 square feet of M&A matting.

2. On 1 September 1969, D company 3rd platoon moved to Pa Xoai near the

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Cambodian border to begin construction of a K-wall (sheet steel) revetment with sandbagged roof to serve as a protective bunker for sophisticated communications equipment (OS 210-5869-0-20). The project included the construction of 161 feet of 13.3 foot high K-wall, a heavily reinforced timber roof, and the hauling of 430 cubic yards of fill. The project was completed on 14 October 1969, approximately one week behind schedule. The delay was caused by the failure of an existing masonry retaining wall which had been incorporated into the bunker design. A cribbed timber wall was designed to replace the wall and was constructed to serve as part of the bunker.

3. On 17 October 1969 C company, 1st platoon, moved to Tinh Bien, also located near the Cambodian border to construct a barrel revetment with sandbagged roof to house sophisticated communications equipment (OS 290-5977-0-20). The project was completed on 21 October 1969 and the scope of work included the placing and filling of 154-55 gallon drums and the construction of a heavily reinforced timber roof covered with sandbags.

4. B company initiated the improvement of the MACV Advisory Facility at Ke Sach on 22 September 1969 and the project was completed on 26 September 1969, (CD 10-292-10-034). Work included the pouring of a 16' x 16' concrete slab and the construction of a wood frame POQ with corrugated metal roof. Improvements still remain for the Long Phu facilities and are scheduled for the next quarter.

At the close of the quarter several important missions were still under construction:

1. C company, 3rd platoon, was attached to the 94th Engineer Detachment (Quarry) at Vung Tau 31 August 1969 to repair 5 miles of haul road to include restoration of proper drainage and replacing base course and DEST as required to bring about a safe and efficient operating level capable of supporting all weather heavy haul equipment traffic (CD 491-5302-1-21). In addition to the haul road repair, the area for the new crusher site will be filled with sand, brought to grade, and stabilized. At the end of the quarter 16 headwalls and 9 culverts had been completed and the subbase was completed and ready for DEST.

2. On 28 August 1969 two platoons from A company and one from D company initiated the construction of a 200 man Screening and Detention Facility at Soc Trang, (CD 510-9314-1-21). The project included 3 guard towers, 7 support buildings, 4 prisoner barracks, sewage facilities, and an electrical distribution system. Project was 29% complete at the end of the quarter.

3. On 15 October 1969 B company, 1st platoon, moved to Ha Tien South to repair and upgrade the existing airfield facility (OS 291-5903-0-20). The project included the soil-cement stabilization of certain failures in the runway and the cleaning of drainage ditches. The project was 20% complete at the end of the quarter.

4. On 27 October 1969 C company, 1st platoon, moved to Thuong Thoi on the Cambodian border to begin construction of a Protective Bunker for communication facilities, (OS 290-5978-0-20). No significant progress had been made at the close of the quarter.

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5. On 8 October 1969 B company, 3rd platoon, was assigned the mission of constructing 6000 linear feet of a double apron, triple concertina, chain link fence. To date the project has used 221 rolls of concertina, 28 rolls of barbed wire, and 697 8' and 4' pickets. At the end of the quarter, the project was 10% complete.

The battalion continued unloading operations at the Soc Trang and Phung Hiep Barge Sites. During the reporting period 18,570 tons of rock were unloaded at Phung Hiep and 21,425 tons of rock were unloaded at Soc Trang.

The rock offloading site at An Thanh was turned over to the 4th ARVN Ranger Group on 13 September 1969. The site had been initiated by the battalion on 29 April 1969 and had averaged offloading 3100 tons of rock per month. The site was invaluable during the major/minor repair of QL-4.

Near the close of the quarter a new mission was assigned to the battalion which will be initiated during the next quarter and be continued throughout the 1970 construction season. The scope of work consists of widening of QL-4 to meet "Class F" standards from Thanh Hoa to Soc Trang. The design and planning for the project was in progress at the end of the quarter.

During the reporting period, the battalion suffered 2 WIA's in connection with operations on the QL-4 major/minor repair and the bunker construction at Ba Xoai which were the result of sniper fire and mortars.

Rain showers occurred intermittently throughout the reporting period with rain and wet working conditions having a marked effect on all projects.

The battalion strength decreased from the preceding quarter to 93% in October. The 517th Engineer Company (LE) increased in strength from the preceding quarter to 91% of authorized personnel.

Critical MOS shortages in the battalion included:

05E20 - short 7
51N40 - short 6
62F30 - short 10
63A10 - short 9
62E20 - short 7

The battalion had 120 extensions during the quarter and 161 awards and decorations were awarded to personnel of the battalion including 35 bronze stars and 1 purple heart.

During the reporting period the battalion spent 79 days on projects and 13 days in training.

2. Section 2. Lessons Learned; Commander's Observations; Evaluations and Recommendations

- a. Personnel: None
- b. Intelligence: None
- c. Operations:

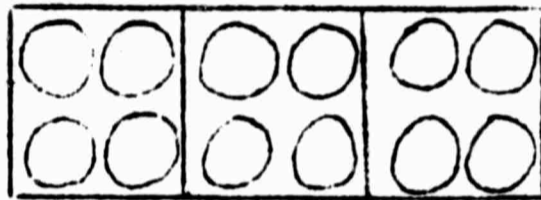
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(1) Prevention of Failure in K-wall Revetment

(a) OBSERVATION: When constructing a K-wall in 3 tiers failure has often been observed in the bottom tier.

(b) EVALUATION: The excessive pressure caused by the sand fill in the K-wall had a tendency to shear the locking pins on the bottom tier of the revetment.

(c) RECOMMENDATION: Before filling the K-wall, place four 55 gallon drums (with tops removed) in each of the bottom cubes to relieve pressure from the K-wall. (See Drawing). Then fill each tier as it is constructed Placing each tier inside of the preceding producing a telescopic effort.

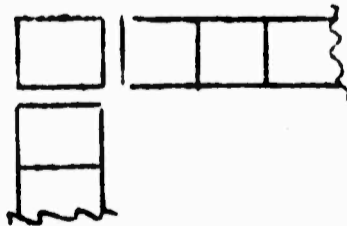


(2) Construction of Corners using K-wall

(a) OBSERVATION: During recent construction of a three tier K-wall revetment, problems were encountered when constructing corners for the revetment.

(b) EVALUATION: Because of the necessity of filling K-wall one row at a time, the assembly of each higher row becomes extremely difficult at corners due to the bulge of the K-wall. The difficulty was experienced on the inside of a corner. On 14 of the pins, 4 sheets of K-wall had to be lined up and on the 2 pins connecting each row with the row above, 8 sheets of the K-wall are required to be lined up for one pin.

(c) RECOMMENDATION: To save manhours and to facilitate easy repair in case of a foundation failure or any other panel failure to include enemy destruction it is suggested that the corner be made into an independent cube with 2 additional sheets and the two walls are not connected to the corner tier. The walls, if placed close to each other, will bulge when filled with soil to form a tight seal. In case of a failure at a corner there will be no torn sheets and will facilitate repair. NOTE: If it is required that the two walls be connected, this battalion recommends that the panels be drilled and bolted together instead of using the standard connecting pins.



(3) Soil Stabilization in the Mekong Delta

(a) OBSERVATION: It has been difficult to obtain a suitable soil bearing surface on several projects undertaken in the Delta.

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(b) EVALUATION: It was determined from past experiences that soil stabilization followed by an application of a sealant provided a suitable surface.

(c) RECOMMENDATION: It has been found that stabilizing the top 18" of soil with a 5% lime, 10% cement mixture produces a suitable bearing surface which will serve to eliminate a great number of the failures which are caused during the monsoon season. A coating of soil binder on the clay surface of runways, ammo pads, etc. followed by a coating of MC70 will produce a more water proof surface than the MC70 alone.

d. Organization: None

e. Training: None

f. Logistics: None

g. Communications: None

h. Materials: None

i. Other:

(1) Expedient Wash Point for Vehicles

(a) OBSERVATION: In tactical areas water for washing vehicles and equipment is scarce.

(b) EVALUATION: In tactical as well as non-tactical areas clean vehicles and equipment is an important part of preventive maintenance.

(c) RECOMMENDATION: A simple high pressure wash point can be constructed near a stream with the following materials:

- (1) Air Compressor - TOE to all Combat Engr Units
- (2) 1 each board - 2" x 8" x 22'
- (3) 1 each sump pump and hose
- (4) 2 each 1" diameter pipe 2' long
- (5) 1 each 10' rope
- (6) Water Supply and hose

Tie the sump pump onto the 2" x 8" board and lower the pump into the canal. To make the high pressure hose, make a "Y" shaped connection with 2 lengths of pipe. One part of the "Y" is attached to the hose of the sump pump and one part is attached to the airline of compressor while the stem of the "Y" serves as the high pressure line when connected to a hose.

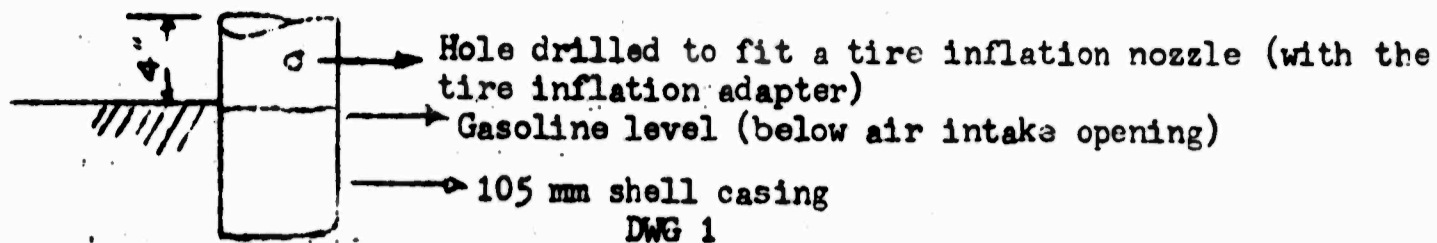
(2) Expedient Burner

(a) OBSERVATION: Isolated units often do not have standard equipment for preparing food.

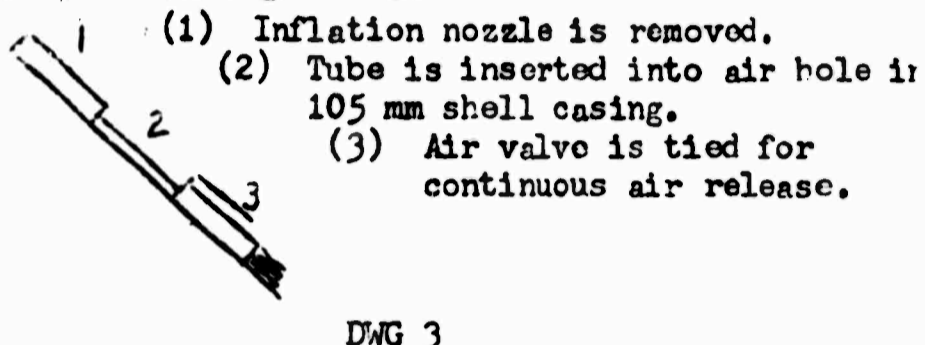
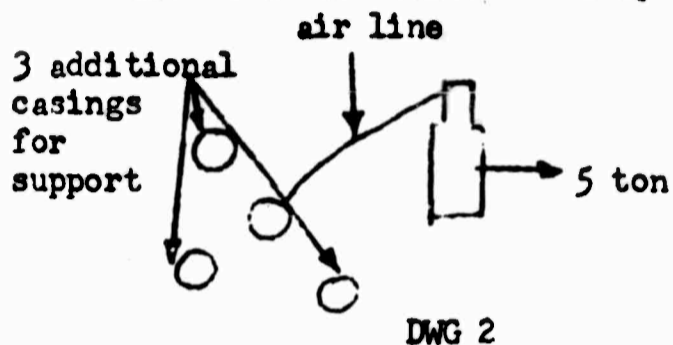
(b) EVALUATION: Units working in isolated areas for short periods of time often have to improvise to find ways to prepare hot food.

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(c) RECOMMENDATION: One expedient burner can be made using a 105mm shell casing with gasoline as the source of fuel. (See Drawing.1)



Other shell casings can be used as a support for whatever is sitting over the burner and a 5 ton dump truck can be used as a source of air with the aid of a tire inflation adapter. (See Drawings 2 & 3)



- (1) Inflation nozzle is removed.
- (2) Tube is inserted into air hole in 105 mm shell casing.
- (3) Air valve is tied for continuous air release.

To operate the burner, place the air nozzle into the air intake hole making sure that the air is turned off. Ignite the gasoline fumes by holding a flame near the top of the shell casing and due to a lack of oxygen, the gasoline will burn slowly at first increasing as more oxygen is added. Next, turn on the air which is regulated by a valve in the 5 ton truck and the increased oxygen supply gives the casing the appearance of a Bunsen burner. Certain safety steps must be followed:

- 1) DO NOT IGNITE THE GASOLINE WHILE AIR IS COMING THROUGH THE AIR NOZZLE.
- 2) DO NOT INSERT THE AIR NOZZLE INTO THE AIR INTAKE HOLE WHILE THERE IS A FLAME IN THE BURNER.
- 3) TO TURN THE BURNER OFF, SHUT OFF THE AIR AND THE FLAME WILL EXTINGUISH ITSELF DUE TO LACK OF OXYGEN.

(3) Prevention of Wear on Hydraulic Ram Seals

(a) OBSERVATION: Seals have a tendency to wear prematurely under extensive use in the Delta.

(b) EVALUATION: It was discovered that sand and dust particles entering around the hydraulic ram caused a severe maintenance problem.

(c) RECOMMENDATION: It has been found that a dust cover made of flexible rubber can be placed around the hydraulic ram and will prevent the entry of dust and sand.

(4) Expedient Tin Snips

(a) OBSERVATION: Tin snips for cutting galvanized steel are often unavailable.

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(b) EVALUATION: When tin snips are unavailable an expedient is often required in a short time.

(c) RECOMMENDATION: One expedient would be to use worn grader cutting edges bolted together to form scissors which can be made sharp by filing. The scissors can be made stable by welding braces on the blade; and handles can be welded at the end of the top blade for cutting leverage.

3. Section 3. Headquarters Department of the Army, Survey Information.
None

1 Incl
as

James W Ray
JAMES W. RAY
LTC, CE
Commanding

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EGF-OP (31 Oct 69) 1st Ind

SUBJECT: Operational Report of 35th Engineer Battalion (CBT) for Period
Ending 31 October 1969, RCS CSFOR-65(R2)

DA, HEADQUARTERS 34TH ENGINEER GROUP (CONST), APO 96320 1 9 10 116.

TO: Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D. C., 20310
Commanding Officer, 20th Engineer Brigade, ATTN: AVBI-OS, APO 96491.

The subject report submitted by the 35th Engineer Battalion (CBT) has been reviewed by this headquarters and is considered comprehensive and of value for documentation and review of the reporting unit's activities and experiences.

FOR THE COMMANDER:


IVYL L. MYERS
CPT, CE
Adjutant

Copy Furnished:
CO, 35th Engr Bn (CBT)

AVBI-OS (10 Nov 69) 2nd Ind
SUBJECT: Operational Report of 35th Engineer Battalion (CBT) for
Period Ending 31 October 1969, RCS CSFOR-65 (R2)

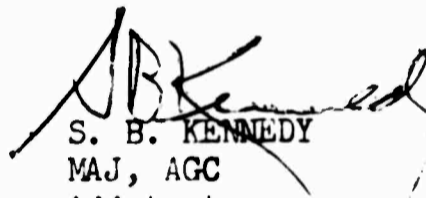
DA, HEADQUARTERS, 20TH ENGINEER BRIGADE, APO 96491 **07 DEC 1969**

TO: Commanding General, United States Army Vietnam, ATTN: AVHGC-
DST, APO 96375

1. Submitted in accordance with USARV Regulation 525-15, dated
13 April 1968.
2. This headquarters concurs with the submitted report with the
following comment:

Section II, paragraph i(2), page 6: The expedient burner will
provide heat for cooking and could be used in an emergency. It is
not recommended for use when Stove, Gasoline, One Burner, 5500 BTU,
FSN 7310-263-8736 is available for 1 to 15 men. Also, Field
Cooking Outfit, Small Detachment, FSN 7360-271-1661, may be used
for 15 to 40 men. Other expedient burners and stoves approved for
use are listed in TM 10-405 with instructions on how to build them.

FOR THE COMMANDER:


S. B. KENNEDY
MAJ, AGC
Adjutant

CF:
CO, 34th Engr Gp
CO, 35th Engr Bn

AVHGC-DST (10 Nov 69) 3d Ind
SUBJECT: Operational Report-Lessons Learned 35th Engineer Battalion
(Combat) for Period Ending 31 October 1969, RCS CSFOR-65 (R2)

HEADQUARTERS, UNITED STATES ARMY, VIETNAM, APO San Francisco 96375 81 DE 69

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

1. This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 October 1969 from Headquarters, 35th Engineer Battalion (Combat).

2. Reference item concerning "Expedient Burner", page 6, paragraph 21(2) and 2d Indorsement, paragraph 2; nonconcur. As pointed out in the 2d Indorsement, standard cooking units are available to fill the need stated. The suggested expedient involves a fire in a too-large quantity of gasoline and the gasoline is in an extremely unstable container. Other field expedients, such as a 1-gallon can filled with gasoline-soaked dirt, provide excellent heat with a much lower probability of catastrophe.

FOR THE COMMANDER:


B. A. GOODWIN
MAJ, AGC
Assistant Adjutant General

Cy furn:
35th Engr Bn
20th Engr Bde

GPOP-DT (10 Nov 69) 4th Ind
SUBJECT: Operational Report of HQ, 35th Engineer Battalion (Combat)
for Period Ending 31 October 1969, RCS CSFOR-65 (R2)

HQ, US Army, Pacific, APO San Francisco 96558 27 JAN 70

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

This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:



C. L. SHORTT
CPT, AGC
Asst AG

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Organization of 35th Engineer Battalion (Combat)

1. Assigned:
 - a. Headquarters and Headquarters Company (Minus Land Clearing Platoon)
 - b. Four Engineer Companies (A, B, C, D)
2. Attached: 517th Engineer Company (Light Equipment)

Inclosure 1

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CO, 35th Engineer Battalion		
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