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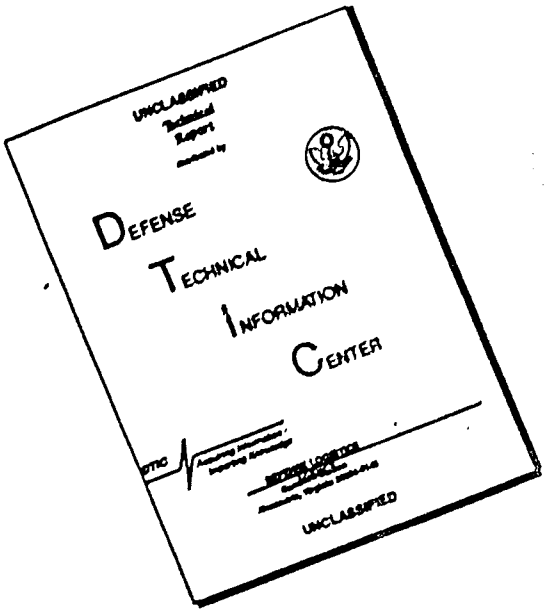

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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO

AGAM-P (M) (14 Oct 68) FOR OT RD 683181 16 October 1968

SUBJECT: Operational Report - Lessons Learned, Headquarters, 35th Engineer Battalion (Combat), Period Ending 31 July 1968

SEE DISTRIBUTION

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 RD, Operational Reports Branch, within 90 days of receipt of covering letter.

2. Information contained in this report is provided to insure that the Army realizes current benefits from lessons learned during recent operations.

3. To insure that the information provided through the Lessons Learned Program is readily available on a continuous basis, a cumulative Lessons Learned Index containing alphabetical listings of items appearing in the reports is compiled and distributed periodically. Recipients of the attached report are encouraged to recommend items from it for inclusion in the Index by completing and returning the self-addressed form provided at the end of this report.

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C. A. STANFIEL
Colonel, AGC
Acting The Adjutant General

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3

DEPARTMENT OF THE ARMY
HEADQUARTERS 35TH ENGINEER BATTALION (COMBAT)
APO San Francisco 96337

WGD-BD-3 10 August 1968

SUBJECT: Operational Report - Lessons Learned, Headquarters, 35th Engineer Battalion (Combat), for the Quarter Ending 31 July 1968, RCS CSFOR-65 (R1)

THRU: Commanding Officer
45th Engineer Group (Const)
APO San Francisco 96337

Commanding General
18th Engineer Brigade
APO San Francisco 96337

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

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

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

Section 1: Operations Significant Activities

During the reporting period, the 35th Engineer Battalion (C) had the primary mission of upgrading Highway QL-1 from Nam O Beach (15 km north of Da Nang) north through the Hai Van Pass to Phu Loc; a total of 50.7 km. The Battalion Headquarters and Headquarters Company, two Combat Engineer Companies (-), an attached Light Equipment Company (-), and a Panel Bridge Company (-) are currently located at Camp Nam O, approximately 15 km north of Da Nang on the bank of the Cu De River and the South China Sea. One Combat Engineer Platoon (Company D) was located in an ARVN compound south of the Hai Van Pass summit and recently returned to Camp Nam O. One Combat Engineer Platoon (Company C)

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is located adjacent to a Marine compound at the summit of the Hai Van Pass. One Combat Engineer Platoon (Company A) and the Quarry Section of the Light Equipment Company are located at Lang Co (22.7 km north of Nam O). Companies A and B, augmented with one section of the Panel Bridge Company and one platoon (-) of the Light Equipment Company, are located on Hill 24 on the Lang Co Peninsula (25 km north of Nam O).

The strength of the battalion and the attached units is considerably below authorized. The overall strength dropped from 95.6% to 86.9% with 125 replacement gains as opposed to 235 rotational losses. The lack of experienced leaders is reflected in the 83.3% strength of officer assignments and 61.3% of NCO assignments. However, due to the challenging assignments and visible accomplishments, the esprit and morale of the troops has continued at a high level; and even increased. This is evidenced by the 56 men who extended their tours in Vietnam. During the quarter, 90 awards and decorations were issued in the battalion, again displaying the characteristic esprit and determination of the men throughout the project.

The basic mission of upgrading QL-1 was increased to include construction of a two lane, surfaced, all weather road. A total of 21.7 km from White Bridge (Nam O) to Lang Co is being paved with asphaltic concrete, while the remaining 27.3 km from Lang Co to Phu Loc will be surfaced with a double treatment of rapid curing asphalt.

The concept of operation for the mission was to break down the battalion AO (Area of Operations) into company size AO's. With detailed plans provided by the S3 section, the companies would accomplish the upgrading process. During May, the major task was blasting a roadway out of the mountain so that engineer heavy equipment could be utilized effectively. This widening process continued until 20 May. On 20 May, surfacing with a 5 inch layer of base course rock began. During the month of May, a total of 12,961 vehicles, military convoys and civilian, traveled the partially opened road. Base course and drainage construction continued throughout May and into June. On 24 June the first application of 2 inch asphaltic concrete was placed. During this month, the volume of traffic continued with the passage of 12,610 vehicles. By July, the total length, 50.7 km, had been widened to two lanes. July brought the first real rainstorm of the season and erosion. The latter part of July was therefore spent in increased erosion control and continued asphalt laydown. During July, as a result of the completed two lanes; 15,675 vehicles used the road. The sum of the battalion and attached units' effort in upgrading QL-1 during the reporting period is as follows:

a. Cut and moved 182,469 cubic yards of earth
b. Blasted and moved 131,152 cubic yards of rock
c. Hauled and placed 70,673 cubic yards of fill
d. Placed 4,022 linear feet of culvert (all sizes)

e. Constructed 177 headwalls (retaining walls)

f. Constructed 80 linear feet of Class II bridge

g. Constructed 8 concrete abutments for wide flange beam bridges ranging in height from 14-21 feet

h. Placed 4[illegible],152 cubic yards of 2½ minus base course rock

i. Placed 11,810 tons of asphaltic concrete over 10.7 km of road

During the reporting period, 71 days were devoted to operations. Of the remaining 13 days, one half day, each Sunday, was devoted to training.

The major problems encountered during the reporting period are as follows:

a. Maintenance: The climatic and soil conditions - hot and dusty - increased maintenance problems. The slow process of obtaining repair parts increased downtime. To emphasize the need for good maintenance, several programs were initiated. Classes for officers and supervisors were presented. Command emphasis and [illegible] aggressive supervision during the motor stables were established. One platoon from the 156th Heavy Equipment Maintenance Company was moved and co-located with battalion headquarters to provide direct support maintenance. This reduced downtime of equipment by shortening transportation time to higher echelon repair facilities. Redball requisitions helped alleviate downtime due to repair parts requirements.

b. Erosion Control: This problem erupted after the first major rainstorm of the year and is currently being corrected. Erosion resulted not because of inadequate drainage planning, but by techniques employed in construction of these facilities. The computations relating to drainage facilities were accurate. However, due to a lack of time, tests were not made of the material used for fill or materials used in the construction of the head wall systems. The corrective measures being taken are as follows:

(1) Channelling of water into desired flow areas by construction of impermeable ditches or berms.

(2) Spillways are extended far enough away from the road to prevent undermining of the base course.

(3) Headwall and retaining wall systems are improved to prevent washouts.

(4) Terracing was accomplished where necessary.

(5) Grass seed will be planted to stabalize slopes as required.

During the reporting period, the battalion was engaged in the following secondary missions:

a. Operational Support: The battalion was responsible for the construction of the barriers for the Civilian War Casualty Hospital in Da Nang East. This involved construction of approximately 600 meters of triple standard concertina with a split apron fence and 900 meters of four strand fence with a triple standard concertina barrier.

b. Civic Action: An active civil affairs program including projects involving construction of school facilities, repair of

floors and roofs in churches and temples, acquisition of clothing for children and complete relocation of a refugee village. These actions, along with continued hiring of AIK's (Assistance In Kind), has established a desirable rapport with the native population and has resulted in improvement of Operation Induce.

c. Minor Tasks: All companies upgraded their defenses to include rebuilding of gates, additional bunkers, and wire entanglements. The erection of a covered maintenance shop at Nam O Beach assisted the maintenance program.

During the reporting period, the battalion incurred 3 KIA, 48 WIA and 23 damaged pieces of equipment. The apex of enemy activity occurred during the period of 4-11 May and involved 46 incidents, resulting in 2 KIA, 41 WIA and 8 damaged pieces of equipment. Enemy activity since this time has been sporadic in nature. During this period, there were two types of security employed in defense of the road. One involved a mobile defense which consisted of the security force moving to higher ground and dividing into 3-5 man patrols and patrolling the area around the road. The second type was a static defense involving positions along the road similar in nature to a perimeter except linear. It has been observed that with the mobile defense, fewer incidents occurred.

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

a. Personnel.

(1) AIK Laborers

(a) OBSERVATION: AIK workers are a good source of cheap labor; however, they tend to work at a very slow rate, thus decreasing their usefullness.

(b) EVALUATION: It has been observed that AIK's possess a competitive spirit when working next to a soldier.

(c) RECOMMENDATION: AIK and soldier labor on a job site be intermixed and the supervisor direct his efforts towards instilling a feeling of competition between parties.

b. Operations.

(1) Loss of Base Course Rock

(a) OBSERVATION: Traffic on new base course material tends to push it to the side of the road. If on a steep hill, the material is sometimes forced over the side, resulting in complete loss of rock.

(b) EVALUATION: If a small 6 inch cut were made with a grader on either side of the surface way, it would act as a retaining ditch for the loose base course rock.

(c) RECOMMENDATION: A 6 inch cut be made prior to laying base course material to act as a retaining ditch for the material.

(2) Protecting Outrigger Ram on Rough Terrain Crane

(a) OBSERVATION: When using a wrecking ball on a rough terrain crane to reduce secondary blasting at a quarry, it was observed that rock fragments were hitting the outrigger ram causing them to become scored.

(b) EVALUATION: A small piece of corrugated metal culvert pipe placed in front of the outrigger ram absorbed the rock impact, thus reducing scoring of the ram.

(c) RECOMMENDATION: To protect the outrigger ram, this method of using culvert pipr protection be employed.

(3) Radio Hand Sets Being Exposed to Prolonged Rainfall

(a) OBSERVATION: When radio hand sets are exposed to prolonged rainfall, an increased amount of static is noticeable.

(b) EVALUATION: If plastic bags are put over the hand sets, it protects them from the rain and does not hamper transmissions.

(c) RECOMMENDATION: Plastic protective bags be put over all radio hand sets as a field expedient measure to protect them from rainfall.

(4) Expedient Methods for aligning pile bents in timber trestle bridge construction

(a) OBSERVATION: Where piles had to be aligned and no materials existed besides materials for the bridge itself, an expedient was necessary to hold the piles in line as they were capped. The materials for the aligning frame had to be constructed of bridge materials, yet the materials had to be completely reusable on the bridge or a succeeding bridge.

(b) EVALUATION: The items used for the aligning frame of the pile bent consisted of two timber walers (6" x 10" x 20'), deadmen turnbuckles, and 20-inch bolts used to secure the curbs. The timber walers were placed parallel to and one on each side of a pile bent. The walers were drawn together by a double turnbuckle system described in illustration 1. One turnbuckle set was placed between each two piles, a 20-inch bolt was used to turn the turnbuckles. After the piles were brought into alignment and capped, the materials were free to be used for their originally intended purpose.

(c) RECOMMENDATION: This method be considered if an expedient means of aligning piles is needed. (Illustration 1 and 2)

(5) Roadside control on side-hill cut road

(a) OBSERVATION: Superelevated curves which drain across the road down-hill caused significant erosion on the downhill side of the road due solely to road runoff.

(b) EVALUATION: A masonry curb was constructed on the downhill side of the road parallel to the road centerline to a point lower in elevation where the superelevation reverses and carries the runoff to the inside ditch. The water can also be directed to a spillway

constructed on the downhill side of the road. The shoulder between the road and the masonry curbs should be sealed. In this case, 3-inch minus rock was placed, compacted and sprayed with asphalt. This provided a drainage structure resistant to erosion.

(c) RECOMMENDATION: If erosion is a major problem, this method be used. (Illustration 3)

(6) Culvert Spillways

(a) OBSERVATION: In mountain passes, erosion at the downstream end of culverts presented a problem in spite of placement of rock at the culvert exit. The water would erode the side of the hill under the culvert headwall at such a rate that failure of the headwall might result.

(b) EVALUATION: Construction of half culvert spillways carried the water as far down the hill as necessary to drain on a more gentle slope, rocks or dense vegetation. Eight-foot U-shaped pickets were driven six feet along the length of the culvert. The pickets were fixed to the culvert flange by welding or by heavy gague wire. The picket-culvert complex was the supported by placing a masonry base underneath the culvert to surround and tie in with all the pickets. This provided a relatively stable drainage structure.

(c) RECOMMENDATION: Construction of expedient spillways using half sectionf of corrugated metal culvert pipe and steel U-shaped pickets will significantly reduce erosion. (Illustration 4)

(7) Vibration of Concrete

(a) OBSERVATION: During the reporting period, the battalion constructed eight concrete abutments ranging from 200 to 250 cubic yard of concrete per abutment. Numerous manhours were expended while placing the conrete, trying to properly distribute the concrete throughout the forms. Also, the quality of the end product was substandard because of honeycombing caused by improper vibration.

(b) EVALUATION: If a conrete vibrator attachment to the air compressor was available to engineer units, numerous manhours could be saved. The quality of finished concrete would also increase.

(c) RECOMMENDATION: A concrete vibrator attachment to the air compressor or another suitable replacement be made TOE to all engineer battalions.

c. Training.

(1) Replacement Training

(a) OBSERVATION: The replacements sent to this unit had very little knowledge concerning the operations of the battalion.

(b) EVALUATION: A seven-hour block of instruction (See program outline) by battalion staff sections aimed toward orientation of battalion replacements helped in developing a sense of responsibility and esprit. This orientation produced a well-informed replacement and enabled him to begin work immediately upon assignment to the companies.

(c) RECOMMENDATION: Orientation of all replacements be conducted at battalion level, and respective staff officers present applicable material. (See Annex 1)

d. Intelligence.

(1) Multiple Mines

(a) OBSERVATION: Enemy mines are usually placed in pairs from 15-100 meters apart.

(b) EVALUATION: When minesweep operations detect one mine, a deliberate sweep of an area should be made to uncover the second mine.

(c) RECOMMENDATION: A deliberate search be accomplished of the area 100 meters surrounding the point of discovery of an enemy mine.

(2) Booby Traps of Enemy Obstacles

(a) OBSERVATION: When the enemy has created an obstacle, example, a blown culvert, he usually places mines on the shoulders of the road where investigating vehicles are likely to stop. Also, the blown culvert is likely to be booby-trapped.

(b) EVALUATION: Extreme care must be exercised during investigation of enemy obstacles. Deliberate searches and minesweeps of the area must be accomplished. Sentry dogs have proven to be extremely valuable in detecting enemy presence and devices.

(c) RECOMMENDATION: When an enemy obstacle has been located, a deliberate search and minesweep of the area, both above and below, should be completed before vehicles are allowed to proceed on the road, and extreme care should be exercised in removal of the obstacle.

(3) Enemy Utilization of Plastic Bags

(a) OBSERVATION: Enemy mines have been found wrapped in the plastic bags that had been previously used for protection of cement pallets. These bags protect the mines from inclement weather conditions.

(b) EVALUATION: These bags are obtained from waste dumps and US Forces who dispose of them along the roadside after use.

(c) RECOMMENDATION: Plastic bags and any other water-proof material which can be utilized by the enemy for protection of their mines should be policed and destroyed.

e. Logistics. None

f. Organization

(1) Testing Facilities in Engineer Units

(a) OBSERVATION: The lack of even a basic soils testing capability has been a detriment to this unit. Soils laboratores and test equipment authorized at higher headquarters, i.e., engineer group (Construction), are unable to accomplish all testing required at battalion levels.

(b) EVALUATION: If a basic soils lab was issued to each battalion, on a mission essential basis, it would enable the battalion to accomplish all soils sampling and testing expeditiously.

(c) RECOMMENDATION: Soils testing equipment be authorized for augmentation on a mission essential requirement to engineer battalions involved in horizontal or vertical construction where soils testing is necessary.

JOSEPH A. YORK
MAJ, CE
Commanding

Annex-1-
Incl-1-- Withdrawn, HQ, DA

EGD-3 (20 August 1968) 1st Ind
SUBJECT: Operational Report - Lessons Learned, Headquarters, 35th Engineer Battalion (Combat) for Period Ending 31 July 1968, RCS CSFOR-65 (RI)

DA, Headquarters 45th Engineer Group (Construction), APO 96337

TO: Commanding General, 18th Engineer Brigade, APO 96377

1. This Headquarters has reviewed the Operational Report - Lessons Learned for the 35th Engineer Battalion and considers it an accurate description of activities and accomplishments during the reporting period ending 31 July 1968.

2. Concur with the Battalion Commander's observations and recommendations.

JOHN G. WAGGENER
COL CE
Commanding

AVBC-C (31 Jul 68) 2nd Ind
SUBJECT: Operational Report of the 35th Engineer Battalion (Combat) for Period Ending 31 July 1968, RCS CSFOR - 65 (R1)

DA, Headquarters, 18th Engineer Brigade, APO 96377

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

1. This headquarters has reviewed the Operational Report - Lessons Learned for the 35th Engineer Battalion (Combat) as indorsed by the 45th Engineer Group (Construction). 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 Commanders with the following comments added:

a. Reference Section 2 Paragraph c(1). Replacement training at battalion level is considered an excellent means of implementing 18th Engineer Brigade Regulation 350-1. The level at which this training is conducted is not specified in the regulation to permit maximum flexibility to group and battalion commanders. It should be noted that weapons familiarization and the gas chamber exercise are conducted at company level.

b. Reference: Section 2 paragraph f(1) Temporary authorization for soil testing apparatus can be obtained by processing a request for 180 day loan. Additionally, soil test sets will be considered for addition to the Combat Battalions during the next MTOE action.

Douglas K. Blue
DOUGLAS K. BLUE
Colonel, CE
Deputy Commander

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AVHGC-DST (10 Aug 68) 3d Ind MAJ Klingman/ds/IDN 4433
SUBJECT: Operational Report - Lessons Learned, Headquarters, 35th Engineer Battalion (Combat), for the quarter Ending 31 July 1968, RCS CSFOR-65 (R1)

HEADQUARTERS, US ARMY VIETNAM, APO San Francisco 96375

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 July 1968 from Headquarters, 35th Engineer Battalion (Combat), 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 18th Engr Bde
HQ 35th Engr Bn

TEXT NOT REPRODUCIBLE

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GPOP-DT (10 Aug 68) 4th Ind
SUBJECT: Operational Report of HQ, 35th Engr Bn (Cbt) for Period Ending 31 July 1968, RCS CSFOR-65 (R1)

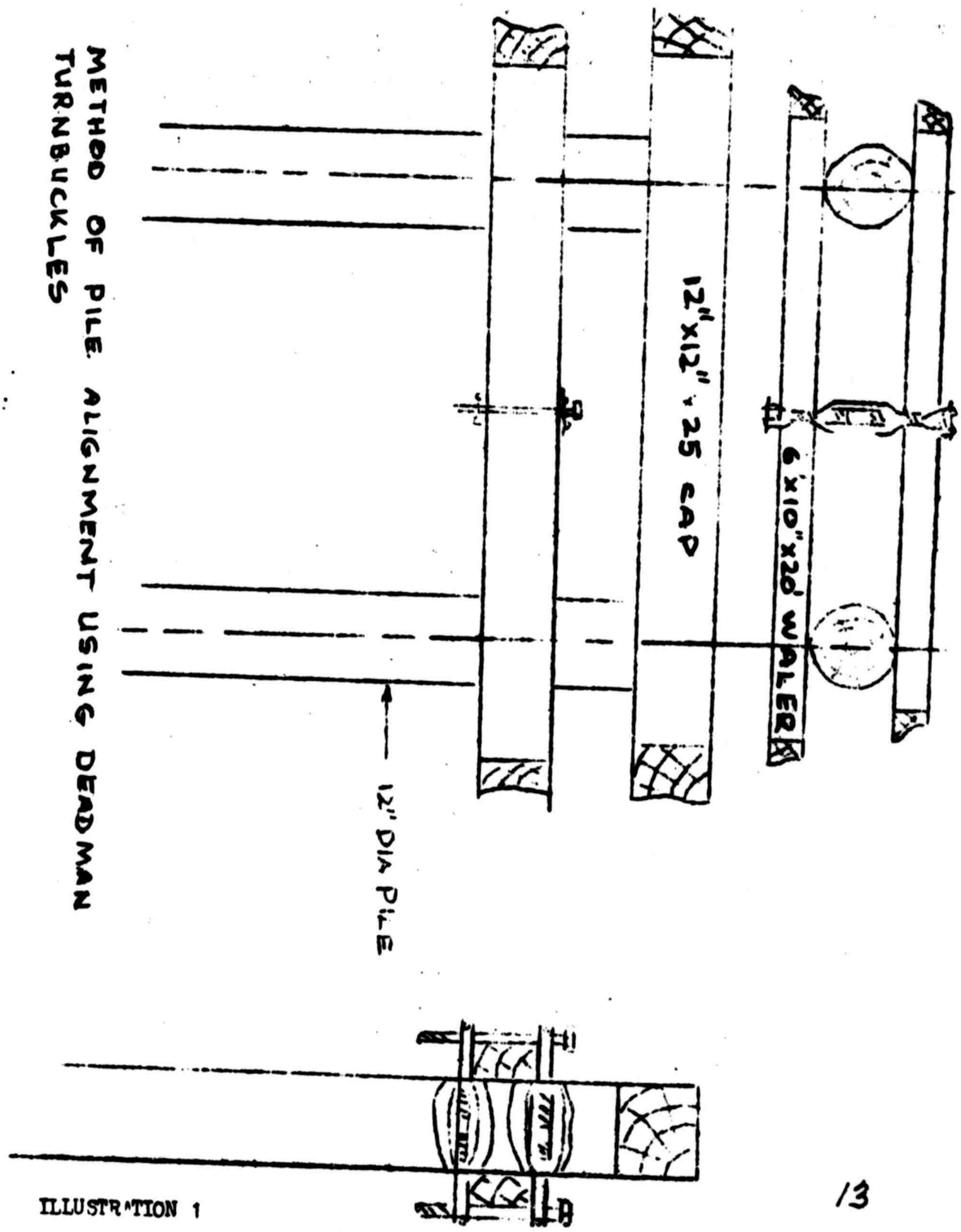
HQ, US Army, Pacific, APO San Francisco 96558 3 OCT 1968

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.

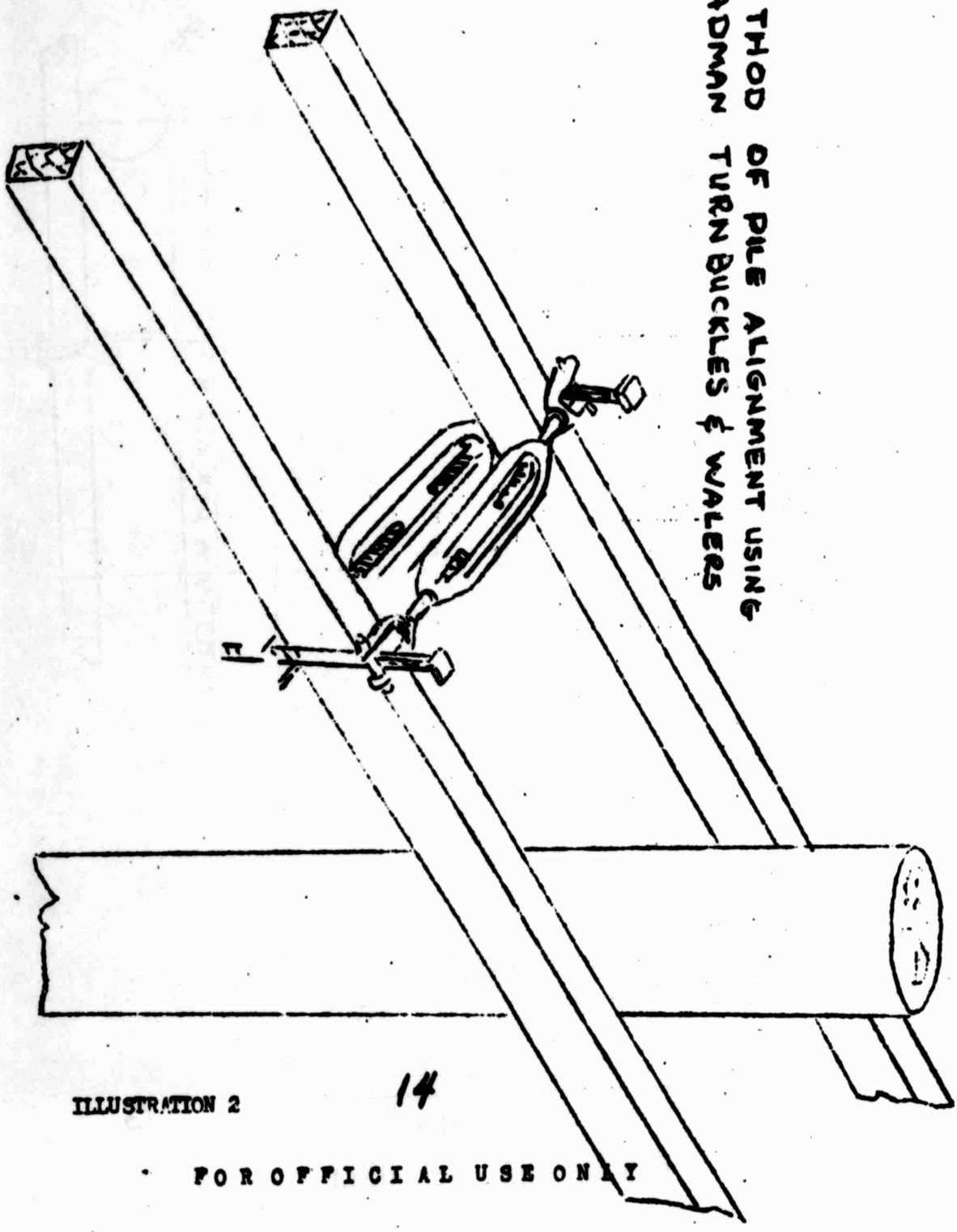
FOR THE COMMANDER IN CHIEF:

C. L. SHORTT
CPT, AGC
Asst AG



METHOD OF PILE ALIGNMENT USING DEADMAN TURNBUCKLES

ILLUSTRATION 1



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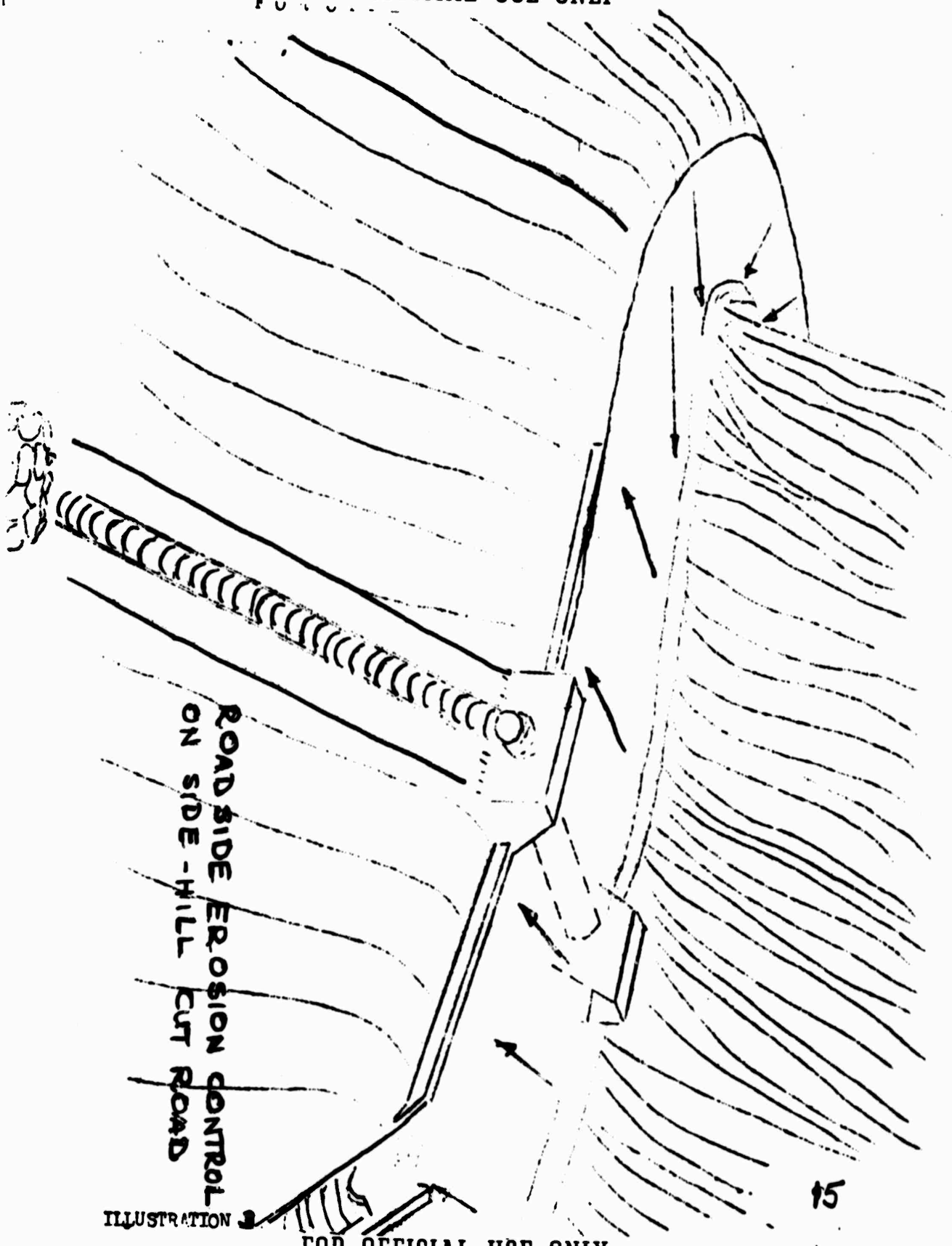
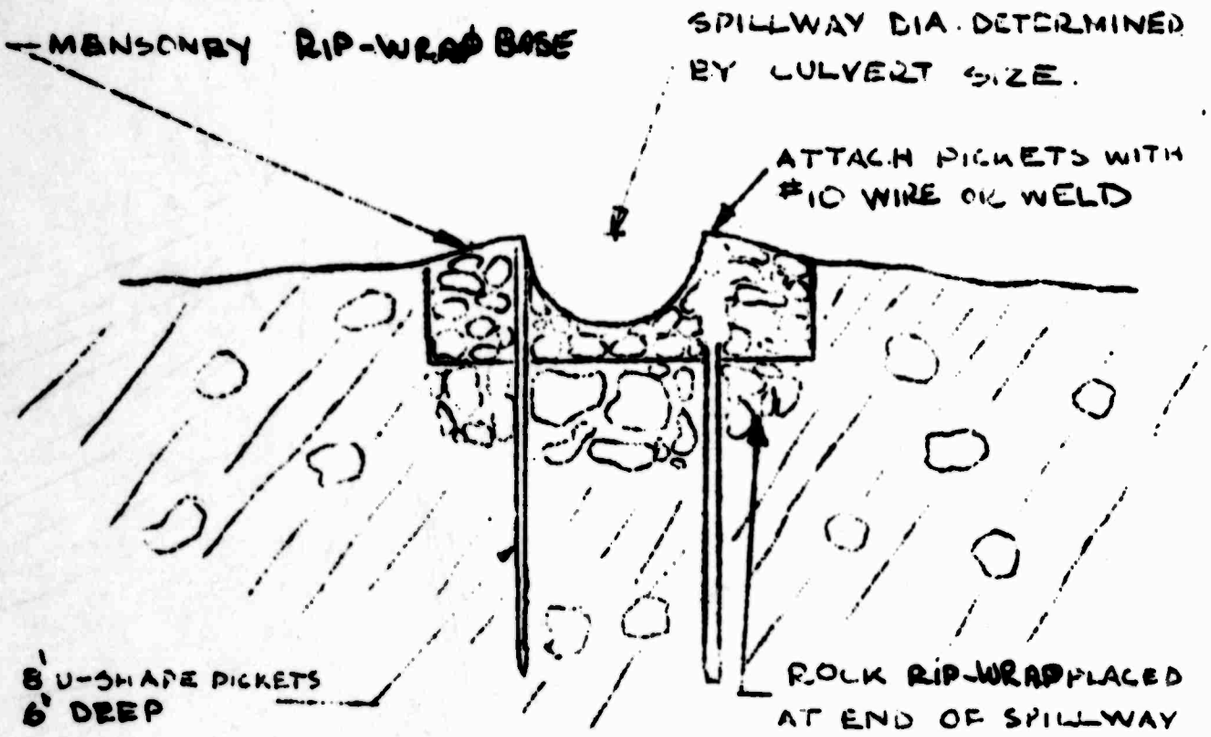
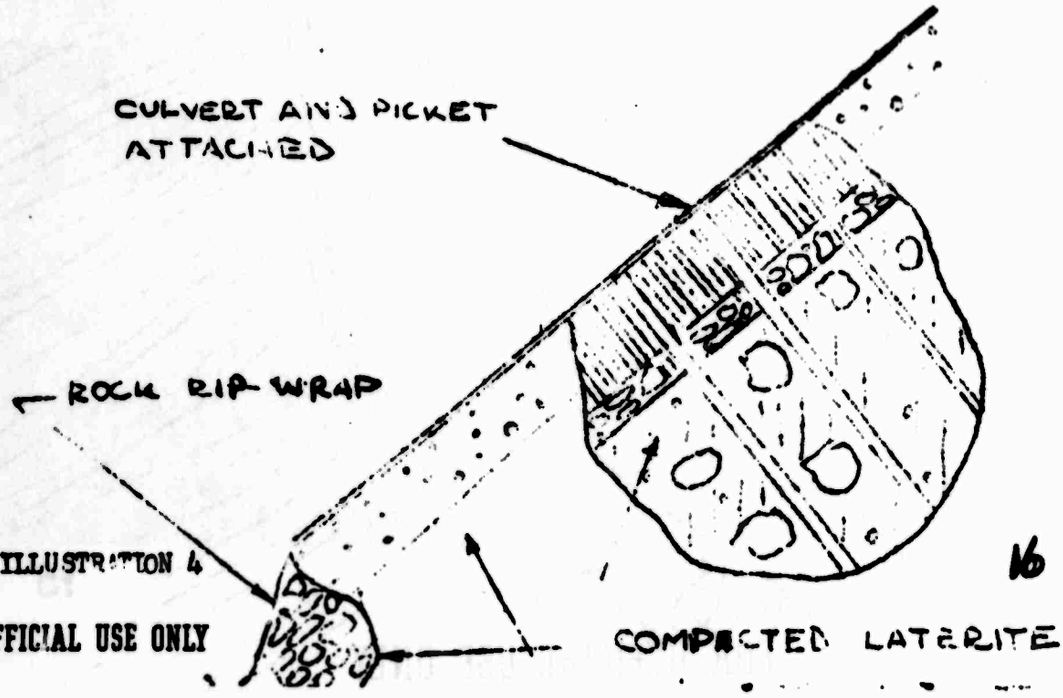


ROADSIDE EROSION CONTROL
ON SIDE-HILL CUT ROAD

ILLUSTRATION 3

CULVERT SPILLWAY CONSTRUCTED ON STEEP SLOPES





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4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

Experiences of unit engaged in counterinsurgency operations, 1 May - 31 Jul 68

5. AUTHOR(S) *(First name, middle initial, last name)*

CO, 35th Engineer Battalion (Combat)

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13. ABSTRACT

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