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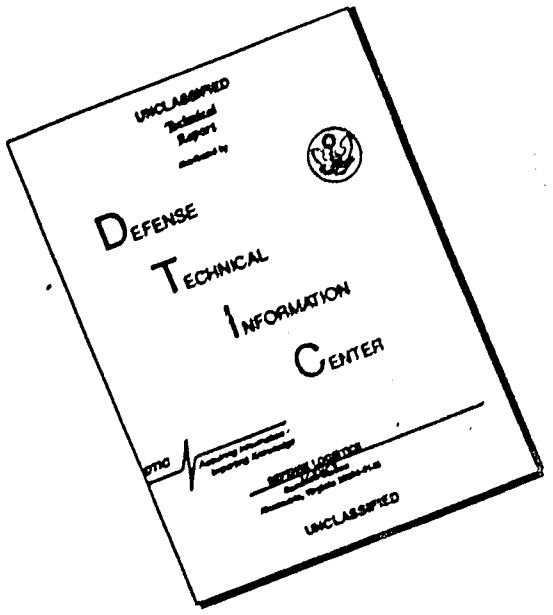

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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO
AGDA (M) (1 Oct 69) FOR OT UT 693070 3 October 1969

SUBJECT: Operational Report - Lessons Learned, Headquarters, 20th Engineer Battalion, Period Ending 31 July 1969

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DEPARTMENT OF THE ARMY
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APO SAN FRANCISCO 96318

EGCB-OP 31 July 1969

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

Commanding Officer
937th Engineer Group (Combat)
APO 96318

Commanding General
18th Engineer Brigade
APO 96377

Commanding General
US Army Vietnam
ATTN: AVHGC (DST)
APO 96375

Commander in Chief
US Army Pacific
ATTN: GPOT-DT
APO 96558

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

Section I: Operations: Significant Activities

1. At the beginning of the report period the Battalion Headquarters, Headquarters Company, Company B, Company C (-), and Company D (-), and 1st Platoon, 584th Engineer Company (LE) were located at Engineer Hill (AR 795525). Company A (-) and the 584th Engineer Company (LE) were situated at the Wooly Bully II Quarry (AR 765815) south of Kontum. The 538th Engineer Company (LC) and 2nd Platoon, D Company were sited along QL-14S between Ban Me Thuot and Duc Lap. The 614th Engineer Detachment (PL) was located at the 4th Division Base Camp, Camp Enari (AR 801339). C Company had its 2nd Platoon at Blackhawk Firebase (AR 032528) and its 3rd Platoon at Camp Radcliffe, An Khe, (BR 476445) along with the 2nd Platoon, 584th Engineer Company (LE). The 3rd Platoon D Company was located in Kontum City (ZA 196902).

4. Company A (-), located at Wooly Bully II, was engaged in construction of chain link standoffs for the Asphalt Plant and upgrade of the C Btry, 6/14th Arty,

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EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

firebase at Mary Lou. 1st Platoon was located at Ben Het upgrading the B Btry, 6/14th Arty firebase.

B. Company B, located at Engineer Hill, was mainly engaged in the sophisticated construction of two concrete abutment, steel stringer bridges, #14-22.1 (ZA 197687) and #19-37 (ZA 099299). Other missions included the operation of the battalion prefab yard, construction of the 704th Maint Bn 40' X 100' warehouse, and LOC Maintenance of QL-19W.

C. Company C (-), headquartered at Engineer Hill, had mission responsibilities for the minesweep of QL-14 between Pleiku and Kontum, prefab of aircraft revetments for several users, and the placement of concrete wash aprons at Camp Enari. The company's 2nd Platoon had an operational support mission with the 2/1 Cav located at Blackhawk, while the 3rd Platoon at Camp Radcliffe, An Khe, was upgrading the An Khe Tank Farm, rebuilding ASP berm at Camp Radcliffe, and repairing the An Khe Airfield. The 2nd Platoon, 584th Engineer Company (LE) was attached to C Co for earthwork in An Khe as was a land clearing platoon of the 687th Engr Co (LC), operating in support of the ROK Army east of An Khe.

D. Company D (-), also headquartered at Engineer Hill, had its 1st Platoon engaged in the construction of the 20th Engineer Battalion TOC. The 2nd Platoon was in support of the 538th Engineer Company (LC) for demolition and road maintenance missions along QL-14S south of Duc Lap.

E. The 584th Engineer Company (Light Equipment) (-), located at Wooly Bully II south of Kontum, was engaged in operating a crusher and quarry complex. 1st Platoon was attached to the Headquarters Company for subgrade improvement on QL-14N in front of the 815th Engr Bn paving train. 2nd Platoon was attached to C Company at An Khe for earth work on the An Khe ASP berms.

F. The 538th Engineer Company (LC) was engaged in a land clearing mission along QL-14S between Ban Me Thuot and Duc Lap.

G. The 614th Engineer Detachment (PL) and Generator Installation Detachment were located at Camp Enari involved in the upgrade of interior wiring for the entire basecamp.

2. On 1 May, the 20th Engineer Battalion continued minesweep missions on QL-14N covering a total of 800 miles during this quarter. 29 mines were found of the following types: 7 box, 1 plastic, 8 metal, 2 AP, and 11 other. Minesweep responsibilities have been assigned to several units. From 1 May to 25 May, C Company performed the minesweep on QL-14N from ZA 232536 to ZA 218598. B Company assumed this mission on 25 May and performed it until 22 June when D Company took control of this important mission. A Company assumed responsibility for the minesweep north of Kontum on QL-14N from ZA 230906 to ZA 185992 from the 299th Engr Bn on 15 May. All sweeps are performed with armor security as well as organic personnel performing off-road flank security duties. This method of operation has proved very effective in detecting

Inclosure 1.

command detonating wires ahead of the sweeping body as well as detecting enemy ambushes before the sweeping element comes within the ambush zone of fire. Such an ambush was thwarted by A Company on 23 June.

3. On 1 May, B Company poured 50 cubic yards of concrete at Bridge #19-37. This single pour lasted twenty hours with the entire company to include supply clerks and cooks participating in this pour. The concrete work by B Company continued on this bridge and Bridge #14-22.1 through 24 May; the total poured was 230 cubic yards of reinforced concrete.

4. On 2 May the 1st platoon of C Company departed Engineer Hill to join 3rd platoon in construction of U-21 aircraft revetments which had a directed completion date of 21 May. With this mission and the several more assigned to C Company in An Khe, the company headquarters relocated to Camp Radcliffe on 5 May. On 4 May the 2nd platoon at Blackhawk firebase joined the company at An Khe.

5. On 4 May A Company was tasked to clear a company firebase for the 2/8th Inf (Mech) in the vicinity of ZA 212730. Two dozers were dispatched and clearing operations completed on 6 May.

6. On 10 May the 1st Platoon of D Company completed the 20th Engineer Battalion TOC. Begun on 31 March, the 20' X 40' structure was completed utilizing 3700 manhours. With consideration to seasonal weather, the TOC was built above ground with a four foot thickness of earth placed around the entire structure and held in place by a nine foot high retaining wall.

7. On 12 May, 2nd Platoon, C Company, completed an observation tower atop Artillery Hill for the 52nd Artillery Group.

8. On 13 May, 3rd Platoon, D Company, departed for Cheo Reo to place four large concrete patches on the Cheo Reo Airfield at touchdown and turning points. Problems with the penetration macadam made concrete patches necessary.

9. On 14 May A Company's 2nd Platoon completed the chain link standoff around the Asphalt Plant at Wooly Bully II. The standoff was installed in two sections; an inner and outer fence. The outer fence surrounded the entire asphalt complex while the inner fence protected the 40 foot superstructure. An RPG/mortar attack on 21 May proved the standoff's effectiveness in that the barrier detonated all rockets striking the fence without damage to the asphalt plant. Standoffs proved equally effective on the A Company perimeter in Kontum where three B-40 rounds struck and destroyed the standoff without damage to the bunker or the personnel manning the bunker.

10. On 14 May A Company assumed responsibility for the sand pit operations at Kontum. The 815th Engr Bn Asphalt Plant in Pleiku was the biggest user. During the quarter 16, 020 cubic yards were loaded.

Inclosure

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

11. On 15 May A Company relocated from Wooly Bully II into Kontum City where they assumed a sector of the city defense perimeter. Because of the poor security afforded by the A Company sector, an upgrade of the perimeter was initiated to include land clearing 150 meters beyond the wire, replacement of all the concertina, installation of fougasse, and construction of new perimeter bunkers. The relocation of A Company was carried out in order for A Company to better assume the operational support missions in Kontum Province upon the departure of the 299th Engineer Battalion.

12. On 15 May C Company was tasked to fill a crater at BR 302455 on QL-19E in order for convoy traffic to pass. Similar missions on 17 and 23 May and 6 June for C Company give evidence to the quick reaction LOC maintenance role which the 20th Engineer Battalion has been assigned. Immediate reaction to enemy interdiction on Primary Supply Routes enabled necessary supplies to reach units of the Central Highlands in the 20th Engineer Battalion TAOR greatly enhancing mission accomplishment.

13. On 15 May D Company assumed the self-help mission of constructing the 45th General Support Group TOC at Camp Schmidt. This type self-help project is common for SEA-Hut construction and security facilities. Other projects of this nature were nine each 50-man mortar bunkers and SEA-Huts for the 4th Infantry Division. Technical advice, site preparation, and materials are the requirements upon engineers, however the technical advice is often inflated to include equipment and additional personnel in order to maintain momentum on these projects.

14. On 19 May C Company completed the U-21 aircraft revetments at Camp Radcliffe. The scope of this project included 610 linear feet of 12 foot high revetments and the placement of 50,000 square feet of M8A1 matting. Begun on 2 May with a directed completion date of 21 May, this project was completed by C Company ahead of schedule.

15. On 20 May C Company completed the repair of the lateral taxiway at the An Khe Airfield. This repair was made necessary by the failure of the subgrade under the M8A1 matting caused by repeated turning of C130 and C123 aircraft. The repair of this section of the entire airfield upgrade project included subgrade repair and placement of 105,000 square feet of M8A1 matting.

16. On 22 May A Company began repair of the isolated Dak Seang Airfield (YB 895406) north of Dak To. This project necessitated the airlift of 130 barrels of RC-800, an asphalt kettle, and a squad of engineers. The entire airfield was sanded, shot with RC-800 in two coats and sanded once again; the project was completed on schedule on 30 June.

17. On 24 May the 538th Land Clearing Company completed their land clearing mission on QL-14S between Ban Me Thuot and Duc Lap. The terrain in this area was rugged to slightly level and densely covered with trees of varying diameters. Rains during the last 10 days caused the cutting rate to be cut in half. However, this was the only inclement weather encountered and did not effect the planned completion date of the operation. The road project itself was completed

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

17 May with a total of 4020 acres cleared using the organic dozers, 38,073 lbs explosive, and 7350 feet of bangalore torpedo. Demolition work was performed by 2 squads of 2nd Platoon D Company. Buddy dozing was the primary method of clearing in this area because of the number and size of the trees to be pushed into windrows. Felled trees and brush were pushed into gullies and ravines where possible but in most areas the debris was pushed into windrows 100 meters apart. Once the road was cleared, traffic increased considerably and enemy activity decreased. Security was provided by elements of the 23rd ARVN Infantry Division out of Ban Me Thuot. The use of infantry, armor, and artillery security forces combined with a hasty but professional road camp perimeter afforded adequate protection for the land clearing operations. Enemy activity was light as only two contacts were made on separate occasions in the pass at ZU 074893 involving an ARVN outpost and unknown size enemy forces. With the completion of road clearing on 17 May, Civil Affairs projects were carried out over the next seven days. These projects included the clearing of a secondary road from QL-14 to a Special Forces camp outside Duc Lap, the clearing and grading of a schoolhouse site in Duc Lap, and the clearing of the side of an old volcano 2 miles south of Duc Lap. Upon completion of this work the 538th Land Clearing Company departed for Pleiku for a 15 day maintenance stand-down prior to beginning land clearing operations along LTL-6B south of Qui Nhon.

18. On 26 May, D Company completed concrete wash aprons for units of the 4th Infantry Division at Camp Enari.

19. On 27 May the 3rd Platoon of the 687th Land Clearing Company completed its clearing operations for the ROK Army east of An Khe on QL-19E. With the completion of this operation, the platoon was detached from C Company and reverted to control of the 687th Land Clearing Company in Qui Nhon.

20. On 29 May D Company completed the MACV "Get Well" project in Kontum.

21. On 28 May the 1st Platoon of A Company relocated to Kontum and the 2nd Platoon assumed the construction mission at Ben Het. The scope of work involved ammunition storage bunkers, gun pads, and berms, and construction of necessary fair weather roads. During the 54 day seige of the tri-border firebase, A Company continued with its Engineer effort in keeping with the best traditions of combat engineering. Unfortunately, the effort was slowed by the enemy action which halted movement of construction materials, prevented equipment operation, and slowed manual construction.

22. On 31 May twelve sorties of C-130's landed at Cheo Reo Airfield and caused massive failure in the penetration macadam runway surface. The scope of the current repair, which was near completion, was increased to include excavation of failed areas, upgrade of subgrade, and application of a 4" cold mix asphalt surface. On 31 July this new scope was 87% complete.

23. On 8 June the 1st Platoon of D Company began work on upgrading the 52nd Artillery Group Airfield (ZA 225534) which included scarifying, shaping, and resealing the airfield using RC-800.

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

24. On 10 June one TOE Platoon from D Company and B Company were relocated to Dak To to relieve two platoons of A and D Company, 299th Engineer Battalion, which relocated to Engineer Hill. For ten days the two platoons from the 20th Engineer Battalion were assigned numerous missions to include bunker construction, minesweep security, and upgrade of the 299th Engineer Battalion TOC. Under sporadic enemy fire, two casualties were incurred during this exchange of platoons.

25. On 14 June the 538th Land Clearing Company began convoy movement to RC #1 on LTL-6B (BR 892124) to begin clearing operations along this route. The scope of work was similar to the work on QL-14S with clearing required 150 meters deep on each side of the road for 56 kilometers. The security was supplied by a company of the 10th ROK (Tiger) Division which proved to be very effective. Liaison was very good as can be seen by the on site coordination with the ROK Army engineers to install two washed out culverts along the route. Maintenance was supported by the 5th Maintainance Battalion in Phu Tai and an administrative 20th Battalion forward with B Company, 299th Engineer Battalion.

26. On 18 June the 2nd Platoon of C Company completed the An Khe ASP Berms and on 19 June the chain link standoffs for two 10,000 barrels and five 3,000 barrel tanks.

27. On 21 June, the 2nd platoon 584th Engineer Company (LE) completed construction of an earth berm at a proposed POL Tank location. This tank was built to a height of 15 feet with a 15 foot level surface on the top of the berm. At the same time the 3rd and Support Platoons operated the Wooly Bully II quarry and crushers south of Kontum. During this period 5,850 cubic yards of 3/4" (-) rock, 2,904 cubic yards base course, and 6,620 cubic yards of fines were produced. This rock was used primarily by the 102nd Engineer Company (CS), which operates the asphalt plant on the same compound. Paving operations on QL-14N were curtailed on or about 1 July 1969 with the advent of the monsoon season. The 584th Engineer Company (LE) continued to crush rock in preparation for the construction season commencing in late September.

28. On 21 June the 1st Platoon D Company began construction of a water tower at FOB II south of Kontum for the Special Forces/CIDG. The tower was to support 3,000 gallons of water and was completed on 19 July with delays in pouring concrete footers due to monsoon weather.

29. On 23 June LTC Morris Gardner assumed command of the 20th Engineer Battalion.

30. On 23 June 3rd Platoon D Company assumed the mission of relocating generator POL storage tanks at the 8th PSYOPS Battalion Radio Station west of Pleiku. Three tanks were moved 50 feet to afford accessibility to the generators. This project was completed on 17 July.

31. On 4 July C Company received the mission to assemble and bury five miles of pipeline west from An Khe. 26,000 feet of coupled tubing in twenty foot lengths were hauled from Qui Nhon, and five entrenchers and an MCA Gradall were obtained

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

from 18th Brigade assets. C Company instituted a twenty-four hour operation with a two platoon effort, one platoon assembling and burying and one platoon erecting suspension traverses over two bridges on QL-19E. A USARV directed completion date of 25 July made this a high priority project and as such, all other An Khe projects were halted to make the entire company available for this project. Good coordination with the Qui Nhon Support Command, Quartermaster using units, and the 937th Engineer Group greatly expedited problem areas such as obtaining pipe testing equipment, maintaining entrenching machines, and receiving pipe from Qui Nhon in a timely manner. Utilizing every member of the unit under good management, C Company completed the project on schedule.

32. On 7 July B Company completed Bridge 14 22.1. This AC foot single span steel stringer bridge was a challenging project for this combat engineer company and was constructed with fine professional engineer competence. On 26 July Bridge 19-37 was completed in a similar manner. As a 60 foot single span, five 36 WF 230 stringers were installed and a timber deck laid. Both projects exhibited an outstanding company effort and were in keeping with the high standards of the 20th Engineer Battalion.

33. On 15 July A Company, augmented with two dozers, initiated land clearing operations in northern Pleiku Province around four Montagnard villages. A two hundred meter clearing around the villages opened the area for farming as well as providing fields of fire to the Regional Forces/Popular Forces tasked with village security.

34. On 15 July A Company also began work on the FOB II Helipad (ZA 232860) for CH-34 helicopters. The scope of this project was to repair and surface a 30' X 200' area. At the end of the report period, the project was 70% complete.

35. On 26 July C Company relocated to Engineer Hill from An Khe as A and D Companies of the 299th Engineer Battalion arrived at An Khe from Dak To and assumed all missions previously assigned to C Company.

36. On 28 July 2nd Platoon B Company relocated to Wooly Bully II to support construction of cantonment facilities in preparation for A Company's move to Wooly Bully II on 28 July. SEA-Hut construction proceeded as scheduled, allowing A Company a smooth transition to their new compound.

37. On 31 July the 20th Engineer Battalion redistributed LOC Maintenance responsibilities. A Company was assigned maintenance responsibilities north of Kontum on QL-14, D Co on QL-14 between Pleiku and Kontum, B Company west from Camp Enari on QL-19W, and C Company east from Pleiku to Mang Yang Pass on QL-19E. During the quarter LOC Maintenance was performed by all units in keeping with fair weather requirements; however, with the arrival of the monsoon season the requirements changed and increased commitments became necessary. Priorities were given to maintenance of potholes, maintenance of shoulders, standing water in ditches, and clearing of ditches in that order.

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

38. On 31 July the units of this battalion were performing their missions at the following locations:

A. Battalion Headquarters and Headquarters Company were located at Engineer Hill.

B. Company A (-) was located at Wooly Bully II engaged in the following projects:

1. Minesweep of QL-14N from ZA 230906 to ZA 185992 by the 3rd platoon.

2. Maintenance QL-14N north of Kontum by 1st Platoon.

3. Operation of the Kontum Sandpit by 3rd platoon.

4. Upgrading the FOB II CH-34 helipad by 3rd platoon. 70% Complete

5. Land clearing in vicinity Plei Op in Pleiku Province. 50% Complete

6. Construction of A Company cantonment facilities at Wooly Bully II by 1st Platoon. 80% Complete.

7. Upgrade of Ben Het Firebase by 2nd Platoon. 85% Complete

C. Company B (-) was located at Engineer Hill engaged in the following projects:

1. Construction of cantonment facilities at Wooly Bully II by 2nd Platoon. 80% Complete

2. Construction of guard tower at the Pleiku Tank Farm. 15% Complete

3. Maintenance of QL-19W by 1st Platoon.

4. Operation of Battalion Pre-fab yard.

5. Construction of 10,000 - barrel POL Tank by 2nd Platoon.

D. Company C (-) was located at Engineer Hill engaged in the following projects:

1. Maintenance of QL-19E by 1st Platoon

2. Upgrade POL Point access road at Camp Holloway by 3rd platoon.

3. Installation of the battalion soil stabilization plant by 2nd Platoon.

E. Company D (-) was located at Engineer Hill engaged in the following projects:

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

1. Upgrade of 8th PSYOPS Battalion Radio Bunker (Yellowbird) by 3rd Platoon.

2. Maintenance of QL-14N by 1st Platoon.

3. Minesweep of QL-14N from ZA 232536 to ZA 218598 by 1st Platoon.

4. Upgrade of Cheo Reo Airfield by 2nd Platoon. 87% Complete

5. Construction of 45th General Support Group TOC by 1st Platoon. 90% Complete

F. The 584th Engineer Company (LE) was engaged in the following projects:

1. Upgrade of Wooly Bully Compound by 1st and 2nd Platoons.

2. Operation of the crusher quarry by the 3rd and Support Platoons.

G. The 538th Engineer Company (LC) was 97% complete on their land clearing mission on LTL-6B and was preparing for a 15 day maintenance stand-down in Qui Nhon prior to operations in the vicinity of An Khe.

H. The 614th Engineer Detachment (PL) was engaged in the upgrade of the Engineer Hill power distribution.

39. Inclosure # 1 is an organizational chart of the Battalion at the close of report period.

40. During the report period the Battalion was engaged in 88 battalion days of operation and 3 battalion days of training.

41. Personnel

A. During this report period, the battalion was operating at approximately 90% strength. Losses and gains were about equal during May but in June the losses outnumbered the gains and on 30 June the battalion was at 83.3% strength. July brought increased replacements and by 31 July the battalion was at 94% strength. Projected NCO and officer losses early in the next quarter indicate a critical need for their replacements.

B. A full time Reenlistment NCO was added which was shown effective by six reenlistments in July.

C. Religious services were held each week for all personnel. Coordination with other Chaplains was necessary for units in outlying areas although the Battalion Chaplain made periodic visits to all battalion units to include the 538th Land Clearing Company south of Qui Nhon, 2nd Platoon D Company in Cheo Reo and 2nd Platoon A Company at Ben Het.

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period 1 May 1969 thru 31 July 1969

D. During this period personnel of the 20th Engineer Battalion received 7 Purple Hearts, 28 Army Commendation Medals for Meritorious Service, 2 Army Commendation Medals with "V" Device, 26 Bronze Stars for Meritorious Service or Acheivement, 2 Bronze Stars with "V" Device, and 1 Air Medal.

42. Intelligence and Civil Affairs

A. During this period, the 20th Engineer Battalion (Combat) S-2 Section continued to maintain contact with the various intelligence collecting agencies in the Battalion TAOR to include the 937th Engineer Group, 4th Infantry Division, 5th Special Forces Group, and II Corps Advisory Group. Virtually all intelligence is received from Intelligence Summaries although Spot Reports from battalion units continued to supply up-to-date intelligence data within the 20th Engineer Battalion AO.

B. Reconnaissance activities during this period were performed on all primary routes in the Battalion AO. The advent of the monsoon season made increased road recons necessary because of the adverse effect of the weather on road conditions. Copies of these recons were made available to all battalion elements with LOC Maintenance missions.

C. Base camp defenses received increased emphasis during this period with a complete upgrade of the Kontum perimeter by A Company. The Engineer Hill perimeter was continuously upgraded and plans made for a major perimeter revision to include relocation of bunkers and towers.

D. Civic Action: In addition to the massive civil action work done by the 538th Land Clearing Company at Duc Lap after completing the road clearing on QL-14S, the Civic Action Team accompanied the Battalion Surgeon on numerous trips to Plei Rong Dup. (AR 830538). At this location they began to upgrade the village perimeter by installing a cattle fence with the full support of the village. Civilian clothes sent from Civic Action Team parents in the United States were also distributed in this Montagnard village.

43. Logistics:

A. Resupply of units in forward areas was accomplished without serious difficulty with the exception of Ben Het. During the intensive enemy action at that location only small amounts of construction materials were delivered which delayed construction. Resupply of the 538th Land Clearing Company was accomplished by excellent coordination with forward support elements in Ban Me Thuot and Qui Nhon.

B. Supplies and Equipment:

1. During this quarter the Battalion received several pieces of much needed equipment. All units were brought up to TOE strength in 5-Ton dump trucks and front loaders which greatly aided the battalion engineer effort.

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly Period 1 May 1969 thru 31 July 1969

2. Shortages of plywood, 1X lumber, and corrugated sheet metal continued to delay completion of certain construction projects.

3. Battalion water points were operating in Ban Me Thuot, Kontum, Qui Nhon, and Dak To. 780,000 gallons of potable water were produced; however, the shortage of 65 GPM pumps and pump repair parts hampered continuous operations.

44. Communications

A. The Battalion continued to communicate with every battalion element in the AO. In addition, with the relocation of the 538th Land Clearing Company to the Qui Nhon area, a battalion relay station was established atop Vung Chau Mountain near Qui Nhon, enabling constant communications with that land clearing operation.

B. The Communications Section moved into its new commo center on 10 May. The new center afforded separate radio and switchboard areas and a more secure CRYPTO area.

C. Teletype and single side band AM radio facilities were also incorporated into the battalion communications system during this period.

45. MCA - LOC Equipment

A. The 20th Engineer Battalion received several pieces of this equipment as part of the planned major upgrade of Lines of Communication (LOC) in the Republic of Vietnam. Nearly all of the equipment was assigned to the 584th Engineer Company (LE). The two most valuable items of equipment were the D-9 dozer and the six cubic yard capacity bucket loader both of which were utilized in crusher and quarry operations. The Littlefield asphalt distributor was utilized in the preparation of the subgrade of QL-14N ahead of the paving operations of the 35th Engineer Battalion. Plans were made to install a Soils Stabilization Plant on Engineer Hill early in the next Quarter under the operational control of C Company.

B. Initial problem areas involving maintenance and licensing of operators were quickly overcome through coordination with the Dynaelectron contractors and the 937th Engineer Group Maintenance Section.

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

Section II: Commander's Observations, Evaluation, and Recommendations:

1. ITEM: Placement of large "I" beams in bridge construction.

OBSERVATION: Placing a large "I" beam such as a 36WF230 across a gap presents a problem when the weight and angle exceed the capacity of a 20-ton R/T crane.

EVALUATION: Undue delays would be incurred if the project waited for additional lifting capability.

RECOMMENDATION: A D7E and VTR/M88 aided the crane. The D7E winch cable was attached to one end of the "I" beam and the VTR/M88 cable to the other end. The beam was pulled across the gap until the crane could lift one end and lower it into place.

2. ITEM: Concrete bucket.

OBSERVATION: Large concrete pours of fifty yards or more utilizing the 16S concrete mixer necessitates the use of a crane and concrete bucket.

EVALUATION: It was found that the time required to place concrete could be cut in half using a concrete bucket rather than chutes and a wheelbarrow. However, concrete buckets are in short supply necessitating concrete work to be scheduled in coordination with the availability of a concrete bucket. Fabrication of a concrete bucket out of sheet steel was rejected as being impractical.

RECOMMENDATION: It was discovered that a 3/4 yard clam shell, without any modification, makes an excellent concrete bucket.

3. ITEM: Underground Placement of Gate Valves.

OBSERVATION: A housing was necessary for access to gate valves on a POL pipeline burial project west of An Khe.

EVALUATION: 36" culvert was suggested but the difficulty in welding a cover hinge to the galvanized culvert made another solution desireable. Empty 55 gallon drums proved to be a good solution. The hinge was easier to weld, the empty drums available, and the cost much less than the cost of culvert.

RECOMMENDATION: 55 gallon drums make acceptable housings for buried gate valves.

4. ITEM: Lacing wire rope through chain link standoffs.

OBSERVATION: Lacing joints in chain link fence necessitates cumbersome scaffolds or towers making this operation very slow.

EGCB-OP 31 July 1969
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

EVALUATION: Another solution was tried using two individuals equipped with pole climbers and safety straps.

RECOMMENDATION: This method proved to be much quicker and also saved the additional cost of scaffold construction. Personnel using pole climbers should be given specific safety instructions.

5. ITEM: Irregular length coupled tubing.

OBSERVATION: To speed operation during a pipeline burial project, pipe was assembled from two locations and inevitably where the two sections met the pipe needed to join them was of irregular length.

EVALUATION: Because the pipe was of a coupled nature, simply cutting the pipe to the right length was unacceptable. However, with a center section of the pipe removed and the two grooved ends joined, a pipe of the proper length was produced.

RECOMMENDATION: Using coupled pipe, with the requirement for grooved ends, a pipe of any irregular length can be fabricated by the removal of a center section of pipe and welding of the two outside sections.

6. ITEM: Culvert booby traps.

OBSERVATION: Road reconnaissance includes checking of culverts. Culverts in isolated sections of road are checked for booby traps as a normal procedure. However, recons of culverts which have on site security are often performed with less attention to booby traps.

EVALUATION: One near incident revealed that secured culverts are often booby trapped by the security elements as an additional measure to thwart road interdiction.

RECOMMENDATION: Extreme caution should be used when checking all culverts regardless of the security on site.

7. ITEM: Waterproofing

OBSERVATION: The use of T-17 membrane has proved to be an effective waterproofing cover for underground structures. However these structures are normally built with flat roofs which hinder drainage. Water tends to pool on top of the structure and eventually penetrates seams and joints.

EVALUATION: Drainage can be improved if the roofs are given a pitch when constructed. Another method to improve drainage on underground structures is to shape sandbags or earth fill on top of the flat structure prior to laying the waterproof T-17 cover.

RECOMMENDATION: T-17 membrane should not be applied to a flat surface.

31 July 1969

EGCB-OP
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

8. ITEM: Bunker Flooring

OBSERVATION: Earth floors in bunkers have proved undesirable in light of rat control and bunker cleanliness.

EVALUATION: Effort was not available to place concrete or wood floors. Over a month period, asphalt left over after patching operations of QL-14N was placed to make floors in three bunkers.

RECOMMENDATION: As floors are desirable in perimeter bunkers, excess asphalt for this purpose provides a good floor and a good use for otherwise wasted asphalt.

MORRIS L. GASTLER
LTC, CE
Commanding

1 Incl
1-Organizational Chart

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EGC-CO(31 July 69) 1st Ind
SUBJECT: Operational Report on Lessons Learned for the Period 1 May 1969 thru 31 July 1969.

DA, HEADQUARTERS, 937TH ENGINEER GROUP (COMBAT) APO 96318, 23 August 1969.

TO: Commanding General, 18th Engineer Brigade, ATTN: AVCB-CB APO 96377.

1. The subject report, submitted by the 20th Engineer Battalion (Combat), has been reviewed and is considered a well compiled report of organization activities.

2. I concur with the observation and recommendations of the Battalion Commander.

W.G. KRATZ
COLONEL, CE
Commanding

AVBC-CG (31 Jul 69) 2nd Ind
SUBJECT: Operational Report of the 20th Engineer Battalion (Combat) for the Period Ending 31 July 1969, RCS CSFOR-65 (R1)

DA, HEADQUARTERS, 18TH ENGINEER BRIGADE, APO 96377 1 SEP 1969

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

1. This headquarters has reviewed the Operational Report - Lessons Learned for the 20th Engineer Battalion (Combat), as indorsed by the 937th Engineer Group (Combat). The report is considered to be an excellent account of the Battalion's activities during 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 I, paragraph 41A. Overall personnel shortages are recognized as problem areas by this headquarters and USARV. This headquarters is in daily contact with the replacement battalions and USARV. Updated requirements, to include casualty losses and medevacs, are now being incorporated in these requirements. These procedures were recently discussed with a representative from USARV G-1, Personnel Management. Our personnel posture should improve considerably in the immediate future, if our requisitions are honored. USARV was also advised that notification of cancellations of lower grade EM fills would be of assistance in up-dating our requisitions. Currently, this information is being provided for senior grade personnel.

b. Reference: Section II, paragraph 7. The Engineering and Plans Section of this headquarters will revise the living-fighting bunker design to include a pitched roof. Laying the waterproofing material with a minimum 12" overlap, together with a pitched roof, should remedy problems of roof leakage. M-17 membrane should not be used for waterproofing due to its high cost.

J. W. MORRIS
BG, USA
Commanding

CF:
1 - CO, 937th Engr Gp
1 - CO, 20th Engr Bn

AVHGC-DST (31 July 1969) 3d Ind
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), of Quarterly Period 1 May 1969 thru 31 July 1969

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

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 1969 from Headquarters, 20th Engineer Battalion (Combat) and concurs with the report as indorsed.

FOR THE COMMANDER:

B. A. GOODWIN
CPT, AGC
Assistant Adjutant General

Cy furn:
20th Engr Bn
18th Engr Bde

GPOP-DT (31 Jul 69) 4th Ind
SUBJECT: Operational Report of HQ, 20th Engineer Battalion (Combat) for Period Ending 31 July 1969, RCS CSFOR-65 (R1)

HQ, US Army, Pacific, APO San Francisco 96558 18 SEP 69

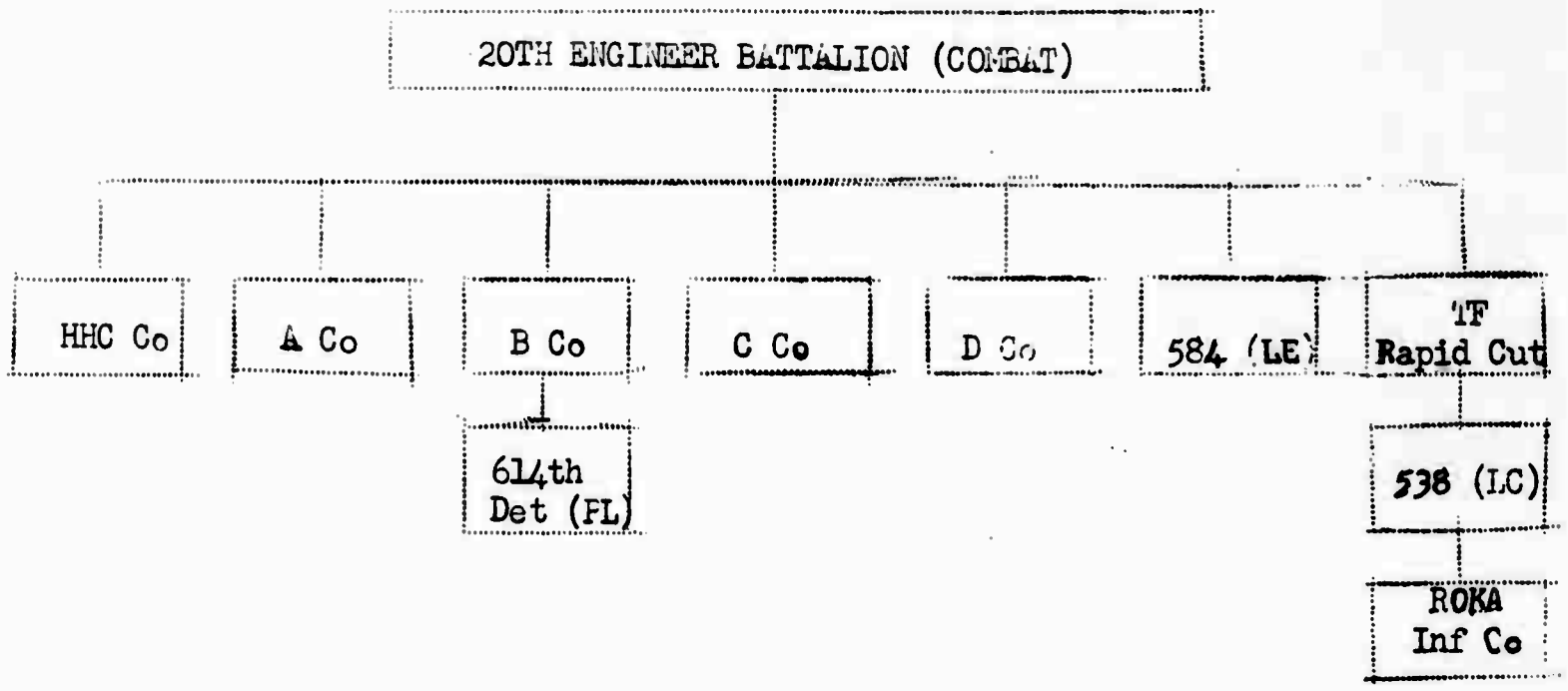
TO: Assistant Chief of Staff for Force Development, Department of the Army, Washington, D. C. 20310

This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:

C. L. SHORTT
CPT, AGC
Asst AG

ORGANIZATIONAL CHART 20TH ENGINEER BATTALION (COMBAT)



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

CO, 20th Engineer Battalion

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