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

IN REPLY REFER TO

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AGDA (M) (23 Dec 70) FOR OT UT 703126 29 December 1970

SUBJECT: Operational Report - Lessons Learned, Headquarters, 79th Engineer Group, Period Ending 31 July 1970

SEE DISTRIBUTION

1. Subject report is forwarded for review and evaluation in accordance with paragraph 4b, AR 525-15. Information of actions initiated as a result of subject report should be forwarded to ACSFOR OT UT 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, 79TH ENGINEER GROUP
APO 96491

EGE-CO 15 August 1970

SUBJECT: Operational Report of 79th Engineer Group (Construction)
For Period Ending 30 July 1970

THRU: Commanding General
20th Engineer Brigade
ATTN: AVBI-OS
APO 96491

Commanding General
United States Army Engineer Command, Vietnam (P)
ATTN: AVCC-MO
APO 96491

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

Commanding General
United States Army, Pacific
ATTN: GBOP-OT
APO 96588

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

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FOR OT UT
703126
Inclosure

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EGE-CO
SUBJECT: Operational Report of 79th Engineer Group (Construction) for Period Ending 30 July 1970

Section I, Significant Organization Activities

A. Headquarters and Headquarters Company, 79th Engineer Group

1. General:

a. The 79th Engineer Group (Construction) command post remained at the Plantation Compound, Long Binh, RVN, throughout the reporting period.

b. Enemy-initiated activity throughout the Group Area of Operations remained relatively light throughout most of the period. The primary reason for this was the combined operations into Cambodia during the period. The enemy generally remained dispersed and conducted only indirect fire attacks with the exception of the areas adjacent to and in Cambodia. During the closing period of the Cambodian Campaign and immediately thereafter the enemy made heavy attacks against isolated elements of the command. During the period, the Group suffered 215 casualties (12 KIA, 203 WIA) of which 139 (7 KIA, 132 WIA) occurred during the Cambodian Campaign.

2. Command and Control:

a. The 79th Engineer Group continued to be commanded by COL Ernest J. Denz. During the period three of the Group's battalions received new commanders. On 11 July 1970 LTC Richard H. Gray assumed command of the 31st Engineer Battalion (C)(A) from LTC Gwynn A. Teague. On 5 July 1970 LTC Robert P. Monfore assumed command of the 62nd Engineer Battalion (LC)(P) from LTC Paul C. Driscoll. On 14 May 1970 LTC Nelson P. Conover assumed command of the 588th Engineer Battalion (C)(A) from LTC Thomas A. Stumm. Other personnel changes in the Group Headquarters Staff included MAJ Edward R. Janues who assumed duties as the Executive Officer. MAJ William E. Moeller replaced MAJ John H. Vickers as S-3 Officer. CPT Richard B. Kepner replaced MAJ Hugh P. Stevenson as S-4 Officer.

3. Personnel, Administration, Morale and Discipline:

a. Personnel: During the reporting period there were no significant personnel activities. Some strength shortages in MOS 94B40 (Mess Steward) continue to exist without immediate sign of relief. The Cambodian operations caused no significant personnel problems. Continued emphasis placed on proper personnel management allowed the 79th Engineer Group operations to remain at its usual high level of performance.

b. Morale: Morale was maintained at a high level throughout the command, as evidenced by the continued high rate of promotions and excellent Espirit de Corps. The Group had 331 extensions and 53 reenlistments during the period. The high level of morale was particularly significant in the successful completion of all assigned operations during the Cambodian

Campaign despite unusual hardships and extremely long working hours.

c. Awards: A total of 1094 decorations were awarded during the period. These included 2 Silver Stars, 40 Bronze Stars with "V", 7 Army Commendation Medals with "V", 188 Bronze Star Medals, 3 Legion of Merits, 686 Army Commendation Medals, 13 Air Medals and 155 Purple Hearts.

d. Disciplinary punishment remained essentially the same with a moderate increase of Article 15's for minor offenses and no change in the number of Court-Martials. Marijuana cases continue to be at a lower level than previous quarters.

e. There were 24 Congressional Inquiries during the period. The inquiries received during the period covered a wide spectrum from people seeking support from a service member, EM accusing the Army of violating his rights as guaranteed under the "Bill of Rights", to various requests for special consideration for Compassionate Discharge or Reassignment. The majority of the requests were in the area of Compassionate Discharge and Reassignment. Nine of the inquiries received were initiated by individuals other than the individual involved. None of the inquiries received during the period carried racial overtones. The continued command emphasis placed on the reduction of congressionals through frequent education and information classes delineating the available sources of assistance contributed considerably to the twenty-nine percent reduction of inquiries during the period.

4. Intelligence and Counterintelligence:

a. The 79th Engineer Group Headquarters continues to receive and distribute intelligence documents and information from 20th Engineer Brigade, II Field Force, Vietnam, and other higher headquarters. Spot reports on enemy activity are required of all units within the command. These are promptly forwarded to 20th Engineer Brigade Headquarters.

b. Initial security briefings for all newly arrived personnel who are assigned to HHC, 79th Engineer Group, 66th Engineer Company (TOPO), 104th Engineer Company (DT), and 79th Engineer Company (Bridge)(Provisional) were continued by this headquarters. The daily intelligence briefing continued to give the Group Staff a current picture of the military and operational highlights throughout III Corps Tactical Zone.

c. The Group continues to handle security actions for personnel assigned to HHC, 79th Engr Gp, 66th TOPO, 104th and 79th Companies. This includes validation of clearances up to and including TOP SECRET. Personnel security actions for the Group's battalions and their attached companies are administered by the Battalion S-2's.

5. Plans, Operations and Training:

a. General: The 79th Engineer Group's Quality Control and Construction Management Programs continued to receive command emphasis. This, together with assistance and guidance in design and planning from the Group Staff, has resulted in the maintenance of both quality and quantity of construction by all of our battalions. Continued emphasis was placed on assistance visits to all elements of the command.

b. Operations: During the months of May and June the largest portion of the Group's available resources were utilized in support of the Cambodian Campaign. The Group supplied assistance to all elements of the task force in the Fishhook area of Cambodia. Attached as an inclosure to this report is the After Action Report for the Cambodian Campaign. As a result of the increased emphasis on support of this operation, other operational missions and projects were deemphasized. The LOC Program continued to receive emphasis during the period and suffered no significant setback as a result of the Cambodian Campaign. During the month of July, construction on varied combat and operational support missions continued as the Group maintained its high standards of support to the 25th Infantry Division, the 1st Air Cavalry Division, and other US and ARVN units in the III CTZ.

c. Land Clearing:

(1) The 62nd Engineer Battalion supported the 25th Infantry Division, the 1st Air Cavalry Division, the 18th ARVN Division and II Field Force, Vietnam with land clearing operations during this period. At the present time, the 118th Land Clearing Company (ARVN) is undergoing an OJT training program conducted by the 62nd Engineer Battalion. The 318th Land Clearing Company (ARVN) successfully completed the training program during the period, and is currently conducting its own land clearing operation.

(2) The 60th Land Clearing Company (US), 984th Land Clearing Company (US), and the 318th Land Clearing Company (ARVN) continued to eliminate the enemy's cover and concealment as they cleared a total of 27,688 acres during the reporting period. Operations were conducted throughout the III Corps Tactical Zone. Clearing operations were held in the vicinity of Nhon Trach, Minh Thanh, the Renegade Woods, the Dog's Head Area, and Bear Cat. During the Cambodian Campaign, operations were conducted in the vicinity of Thien Ngon, Bu Dop, and the Fishhook region of Cambodia.

(3) During the period, 62nd Engineer Battalion received four D9G Caterpiller Tractors with Rome Plow Kits for testing and evaluation. The D96's proved to be well adapted for land clearing. They consistantly cut three to four times as much jungle as the same number of D7E's. The most significant problem encountered was difficulty in transporting the D9G's. The 60 ton lowbed proved to be the only suitable means of carrying the D9G8s. These trailers are scarce in this command.

d. Airmobile Equipment: The 31st Engineer Battalion continues to provide airmobile equipment support throughout III Corps Tactical Zone. Equipment support missions during the period continued to be mainly limited to the provision of dozer and backhoe support to isolated fire support bases and CIDG operational camps.

e. Training: The 79th Engineer Group continued its weekly training in Army and USARV mandatory subjects, as well as weekly officer classes. The training has been expanded to include intensive training in physical security as a result of the reduction in available security forces from outside agencies. All newly arrived replacements are now receiving initial in-country orientation training at divisional tactical training centers.

6. Logistics:

a. Supply:

(1) During the reporting period work was continued on transfer of the necessary equipment to the 318th Land Clearing Company (ARVN) in order to properly equip the unit.

(2) Major items of equipment were received at an accelerated rate to fill requirements for the Cambodian Operation. Due to the urgency of the requirements for additional items of equipment not readily available, temporary loan actions were necessary in many instances. As a result of these transactions, certain items of equipment in excess of TOE Authorization, but required for current operations were obtained for retention on a temporary basis (i.e., 2 ea M48A1E tanks w/mine rollers, 2 ea commercial fork lifts, minesweep jeeps, etc.).

(3) During the Cambodian Operation prestockage of construction materials at forward locations was developed to relieve the pressure on transportation requirements from US Army Depot, Long Binh to job sites. Extensive use of Saigon Support Command Transportation units assets enabled organic transportation assets to remain in forward areas for movement of materials and equipment to the various work sites. Intensive management of construction materials at Group level by expediting releases from depot, monitoring on hand items at forward locations and arranging for transportation contributed a great deal to the success of the Group during the operation.

b. Reports of Survey: The value of reports of survey processed during the reporting period increased considerably from the previous reporting period to a value of $185,500.00. The primary cause of the large increase in the dollar value of surveys was the failure of the individual units of this command to perform the necessary administrative actions for Combat Losses in the required time period. The tactical situation, and in some cases communication problem, were of such a nature that the owning organizations were not aware of the final determination of combat loss before

the administrative period had elapsed. In other than Combat Losses, the contributing factor continued to be reports of survey for vehicle accidents. Stringent controls continued to be applied to this area, and security of government property continues to receive command emphasis.

c. Food Services:

(1) The first two months of the reporting period (1 May-30 June) were devoted in their entirety to Cambodian Operations. Of the four battalions assigned to the Group, three - the 31st, 62nd, and 588th Engineer Battalions were extensively engaged in all phases of Engineer Activities in the Cambodian Campaign. Class I support for these battalions during May and June were provided by the Quan Loi, Cu Chi, Tay Ninh, and Katum ration breakdowns, with Quan Loi and Tay Ninh (1st Air Cavalry Division and 25th Infantry Division) bearing the brunt of the support requirements. Due to the constant shifting of locations of the companies and detached platoons, direct provisioning of many of our units by supporting elements was no feasible. Although both of the supported divisions subsisted primarily on "C" rations during this period, our engineer companies, where possible, elected to have their mess sections accompany them in forward areas and use organic transportation for resupply. Without exception, at least two hot meals were available daily, along with the luxury of ice.

(2) July was a month of transition as all units returned from the Cambodian operations and relocated themselves. New mess accounts were opened, excesses disposed of, shortages requisitioned and equipment cleaned.

d. Maintenance: Average Dead-Line statistics for the three month period are as follows:

Category	Percent
Critical (Selected Engineer Ordinance Equipment)	16.3
MCA/LOC Equipment	13.3

The division of deadline between items requiring organizational and direct support maintenance at the end of the reporting period was 46.7% of deadlined equipment in organizational maintenance and 53.3% in direct support maintenance. The increased deadline rate during the quarter was a direct result of the Cambodian Operation. During the reporting period all Battalion Maintenance Officers were changed. These changes, combined with a large number of unit moves (some companies moving five times) and unit fractionalizing, contributed substantially to the disruption of the normal maintenance routine.

e. LOC Program: No new items of LOC equipment were received during the period. The Group's density was reduced to 57 items on hand during the period as the result of transferring one transit-mixer to another organization.

Increased deadline of equipment during the period was primarily caused by increased haul distances and working periods for the 12 cubic yard dump trucks. Problems in the repair of this equipment continue. However, close supervision, extensive follow-up, and a controlled maintenance program for the MCA/LOC equipment continues to pay dividends. The additional maintenance work on the 12 cubic yard dump trucks continue to create some problems with the reduction of the number of Dyna-Electron Corporation personnel available to perform maintenance.

B. 66th Engineer Company (Topographic)

1. General: The 66th Engineer Company remained located at the Plantation Compound, Long Binh, RVN.

2. Command: No significant command changes took placed during the reporting period. The company remained attached to the 79th Engineer Group and under operational control of the M&I Division, USARV Engineer Section.

3. Personnel, Morale, Administration, and Discipline:

a. Personnel: Although the unit is presently over its authorized strength, a shortage of certain type of personnel continues to exist. The Cartographic and Reproduction Platoons continue to be short key NCO personnel. A large turnover of personnel will occur in the month of August with a subsequent reduction in strength.

b. Morale: The morale of the unit continues to be high. A significant factor has been the various letters of appreciation received commending the unit for its outstanding support of the Cambodian Operations.

c. Discipline: The unit had a total of 13 Article 15's and no court martials during the period. This is a reduction of 38% over the last period, and is a direct result of continued command emphasis on assistance and counseling by all personnel in the Chain of Command.

4. Intelligence and Counterintelligence: The unit continues to provide support in this field through printing and distribution of mapping intelligence and survey data.

5. Operations:

a. This reporting period saw a large increase in activity throughout the unit as a direct result of the Cambodian Campaign. During May and June the unit was called upon to supply all the necessary maps for ground operations in Cambodia. The 547th Map Depot Detachment worked around the clock issuing in excess of one million maps to combat units.

b. During the period when depot stocks were in danger of depletion, the Reproduction Platoon produced over 50,000 base maps during one two week period in May as well as printing mosiacs and tactical data overlays.

c. In addition to the unit's support of the Cambodian Operation other major projects undertaken included base planning mosaics. During this period Saigon, Cu Chi, Phan Rang and Tuy Hoa photomaps were printed. Other projects included the revision of II and III Military Regions Roads and Airfields Charts.

d. The Survey Platoon continued its major effort in support of engineer construction activities. A survey of eight additional airfields from Quan Tri in the north to Vinh Long in the Delta was undertaken to provide information to be used in planning extensions or modifications of existing runways. In support of the LOC Program a complete survey was performed at 35 possible bridge sites throughout the Delta.

e. The unit continued direct support of USAF Task Force Alpha units located in Thailand. This support consists of printing and overprinting selected topographic maps in support of their missions.

C. 79th Engineer Company (Bridge)(Provisional)

1. General: The unit remained stationed at the Long Binh Post in Camp Frenzell Jones, RVN.

2. Command: The unit remained under the command of CPT Torbjorn Gmmundsen during the reporting period.

3. Personnel Administration, Morale and Discipline: During the reporting period, the 79th Engineer Company continued to maintain high individual morale with few disciplinary problems. There were no Court-Martials and 11 punishments under Article 15, Uniform Code of Military Justice for the period.

4. Intelligence and Counterintelligence: The 79th Engineer Company (BP) receives continuous distribution of intelligence documents from the 79th Engineer Group Headquarters and higher echelons. Requests for granting, validating and upgrading of security clearances are submitted to the 79th Engineer Group as required.

5. Plans, Operations, and Training:

a. During the reporting period the 79th Engineer Company (B[illegible] in both its primary mission of providing panel and float bridge supp[illegible]nd technical assistance, and in its secondary mission of providing dump truck support to the 79th Engineer Group and other units in III Military Region.

b. The company completed 19 separate bridge support missions during the period.

c. Total haul for the period was 6,810 tons of rock, 3,205 tons of asphaltic concrete, 8 pallets of cement, 1500 drums of peneprime, 24 bridge truck loads of lumber, 210 tons of sand and 9 rolls of concertina fence. For the quarter, a total of 542,607 miles were traveled. While the haul tonnage was reduced, the number of miles driven was approximately doubled due to the extended support rendered during the Cambodian Campaign.

d. Training: Weekly refresher training in military skills was continued with attendance mandatory for all personnel. Required replacement and orientation training was accomplished for all replacement personnel.

6. Logistics: At the present time, the 79th Engineer Company (BP) consists of two panel bridge platoons, two float bridge platoons, one reinforced maintenance platoon, and one headquarters platoon. The company is continuing its support missions with panel bridge, footbridge, light tactical raft, dry span bridge and material transporatation. There are currently available thirty five-ton dumps and thirty-six five-ton bridge trucks in the unit.

D. 104th Engineer Company (Dump Truck):

1. General: The 104th Engineer Company remained stationed at Long Binh Post in Camp Frenzell Jones, RVN.

2. Command: CPT Bruce E. Brockway remained in command during the reporting period.

3. Personnel, Administration, Morale, and Discipline: During the period there were three Special Court-Martials and 31 men received punishment under Article 15, UCMJ.

4. Intelligence and Counterintelligence: The 104th Engineer Company (DT) receives continuous distribution of intelligence documents from the 79th Engineer Group Headquarters. Requests for granting, validating and upgrading security clearances are submitted as required.

5. Plans, Operations, and Training:

a. Operations:

(1) During the reporting period the unit continued to fulfill its primary mission of operating dump trucks for the movement of bulk materials in support of the 79th Engineer Group (Construction).

(2) During the period, dump trucks of the 104th Engineer Company (DT) amassed 775,873 miles driven hauling 50,141 CY of rock, 4,943 CY of sand-laterite and 29,937 tons of asphaltic concrete.

(3) The two tactical five ton dump truck platoons were heavily committed during the months of May and June in support of the Cambodian Operation.

b. Training: Required replacement training is given to all incoming personnel at the 199th Light Infantry Brigade Training Center. The vehicle operators retraining was continued in order to insure all safety and maintenance requirements were being met. These classes are part of a continuing program established by the unit Maintenance Officer.

6. Logistics: There are no serious equipment or material shortages within the unit. At the end of the reporting period there were forty-eight five-ton dumps and 28 LOC dump trucks on hand.

7. Civic Action: During the month of June seventy-five cubic yards of fill material were supplied to the Bien Hoa Mental Hospital to facilitate construction of a fill area for a new classroom.

Section II, Lessons Learned, Commander's Observation, Evaluation, and Recommendations

A. Personnel: None.

B. Intelligence: None.

C. Operations: None.

D. Organization: None.

E. Training: None.

F. Logistics:

Critical Shortage of Map Shipping Boxes:

a. Observation: Map shipping boxes are a critically short item. A check of ICCV revealed that there are no map shipping boxes in Vietnam.

b. Evaluation: Map shipping boxes are a low demand item in Vietnam. Presently, as a stop-gap measure, map boxes received from TTMICP Hawaii are being re-used for in-country shipments. Requisitions were submitted to CONUS requesting that boxes be shipped directly to the map depot.

c. Recommendations: Requisitions will be submitted on a monthly basis to establish demand. Sufficient stocks of boxes will be maintained to meet any eventuality in the future.

EGE-CO
SUBJECT: Operational Report of 79th Engineer Group (Construction) For Period Ending 30 July 1970

G. Communication: None.

H. Material: None.

I. Other: None

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ERNEST J. DENZ
Colonel, CE
Commanding

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AVBI-OS (15 Aug 70) 1st Ind
SUBJECT: Operational Report of the 79th Engineer Group (Construction) For Period Ending 30 July 1970.

DA, HEADQUARTERS, 20TH ENGINEER BRIGADE, APO 96491

TO: Commanding General, United States Army Engineer Command Vietnam (Provisional), ATTN: AVCC-ND, APO 96491

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

1. Submitted in accordance with letter, AVCC-HC, USAECV(P), dated 15 July 1970, subject: Operational Reports - Lessons Learned (ORLL's) and USARV Regulation 525-15, dated 13 April 1968.

2. This headquarters concurs with the submitted report.

FOR THE COMMANDER:

D. L. MC BRIDE
1LT, CE
Assistant Adjutant

Copy furnished:
CO, 79th Engr Gp

AVCC-HO (15 Aug 70) 2nd Ind
SUBJECT: Operational Report - Lessons Learned for 79th Engr Gp 1 - SEP 1970

DA, HQ, US Army Engineer Command Vietnam (Prov), APO 96491

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

Subject report is under review in this Headquarters. Comments for inclusion in the Headquarters, USAF indorsement to CINCUSARPAC will be forwarded to your Headquarters by separate cover.

FOR THE COMMANDER:

ROBERT E. SHEA
CPT, AGC
Assistant Adjutant

16 OCT 1970

AVHDO-DO (15 Aug 70) 3d Ind
SUBJECT: Operational Report of 79th Engineer Group (Construction) For Period Ending 30 July 1970

Headquarters, United States 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 1970 from Headquarters, 79th Engineer Group (Construction)and comments of indorsing headquarters.

FOR THE COMMANDER:

R. E. THOMPSON
CPT, AGC
Assistant Adjutant General

Cy furn:
USAECV(P)
79th Engr Gp

GPOP-DT (15 Aug 70) 4th Ind
SUBJECT: Operational Report-Lessons Learned, HQ 79th Engineer Group (Construction), for Period Ending 30 July 1970, RCS CSFOR-65 (R2)

HQ, US Army, Pacific, APO San Francisco 96558 27 OCT 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:

L.M. OZAKI
CPT, AGC
Asst AG

DEPARTMENT OF THE ARMY
HEADQUARTERS, 79TH ENGINEER GROUP
APO San Francisco 96491

FOE-3 15 August 1970

SUBJECT: After Action Report for Operation Toan Thang 43, 190-5569-0-20 in which this unit participated during the period 1 May 1970 through 30 June 1970.

Commanding General
20th Engineer Brigade
ATTN: AVLI-OS.
APO 96490

The following is the After Action Report for Operation Toan Thang 43, 190-5569-0-20 in which this unit participated during the period 1 May 1970 through 30 June 1970.

1. NAME OF OPERATION: Operation Toan Thang 43

2. DATES OF OPERATION: 29 April 1970 through 30 June 1970.

3. LOCATION:

a. Route TL-4 South XT2678 to TL-4 (XT2154)

b. Katum Airfield (XT330905)

c. Snuol, Cambodia (XU498399)

d. Thien Ngon Airfield (XT083825)

e. Route QL-22 (XT1950) to QL-22 (XT0881)

f. QL-22 (XT0881) to Route 78 (Cambodia) (XT0789)

g. Route 78 (Cambodia) XT0789 to Krek (Cambodia) XU0101.

h. TL-4 North (Cambodia) XU3006 to TL-4 XT3389

i. TL-4 South (XT3389) to FSB Carolyn (XT2678)

j. Prek Klok (XT268878)

k. Bu Dop (XU975292)

l. FSB Blaster (XT045895)

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m. FSB West I (XU342943)

n. FSB West IX (XT344932)

o. FSB Carolyn (XT277788)

p. FSB X-Ray (SU359009)

q. Nui Ba Den Quarry

r. FSB Buell (XT222564)

s. FSB Sabre (XU5734)

t. FSB Jerri (XU960221)

u. FSB Sisson (XU656285)

v. FSB Brown (YU071374)

w. FSB Myron (YJ069436)

x. FSB Colorado (XU424120)

y. FSB N. Dakota (XU489033)

z. Doomsday I (XT7781)

aa. Doomsday II (XU7218)

ab. Area 12 Kilometers north of Bu Dop on Highway 14, in the vicinity of FSB Brown and FSB Myron. (Srok O Rang Cambodia)

ac. FSB North I

ad. FSB North II

ae. Minh Thanh-- Route LTL-13 from Chon Thanh (West) to Minh Thanh (East and Road intersecting QL-13 at XT766720 running southeast to XT658664).

af. Fishhook area within the boundaries XU450000 and XU550000, XU450100 and XU550100.

ag. Northwest corner of the SPK Rubber Plantation near Snoul, Cambodia (XU500397) west and north to the Prek Chhlong River, vicinity XU402413.

ah. Cambodia, area from XU461010 to XU490019

ai. Cambodia, area from XU490015 to XT480990.

4. COMMAND HEADQUARTERS: II Field Forces Vietnam

5. TASK ORGANIZATION:

a. Organic Units:

(1) HHC, 79th Engr Gp (Const)

(2) HHC, 588th Engineer Battalion (Combat)(Army)

(3) A Co, 588th Engineer Battalion (Combat)(Army)

(4) B Co, 588th Engineer Battalion (Combat)(Army)

(5) C Co, 588th Engineer Battalion (Combat)(Army)

(6) D Co, 588th Engineer Battalion (Combat)(Army)

(7) HHC, 31st Engineer Battalion (Combat)(Army)

(8) A Co, 31st Engineer Battalion (Combat)(Army)

(9) B Co, 31st Engineer Battalion (Combat)(Army)

(10) C Co, 31st Engineer Battalion (Combat)(Army)

(11) D Co, 31st Engineer Battalion (Combat)(Army)

(12) HHC, 62nd Engineer Battalion (LC)

(13) A Co, 62nd Engineer Battalion (LC)

(14) 984th Engineer Company (LC)

(15) 60th Engineer Company (LC)

(16) 595th Engineer Company (LE)

(17) 362nd Engineer Company (LE)

(18) A Co, 554th Engineer Battalion (Const)

(19) 79th Engineer Company (B)(P)

(20) 104th Engineer Company (DT)

(21) 557th Engineer Company (LE)

(22) Task Force Parker (2nd platoon, 60th Engr Co)

(23) Task Force Wright (1st platoon, 60th Engr Co)

b. Attachments:

(1) Equipment unit with operators attached from 34th Engineer Group: 6 trucks, tractors, 10 ton w/25 ton trailers.

(2) Equipment with operators attached from 1f'th Engineer Brigade: 15 Trucks, tractors, 10 ton w/25 ton trailers.

(3) HHC, 92nd Engr Bn (-)

(4) B Company, 92nd Engineer Battalion (+)

(5) D Company, 92nd Engineer Battalion (-)

(6) One platoon, 510th Maintenance Company (Engr).(DS)

(7) One platoon, 118th Engineer Company, ARVN (LC)

(8) One platoon, 67th Engr Co (DT)

(9) Equipment with operators attached from 159th Engineer Group:

(a) 50 trucks, tractor, 10 ton w/25 ton trailers

(b) Tractor, full tracked, D7E- 2 each

(c) Roller, sheepsfoot - 2 each

(d) 1 truck, tractor, 10 ton w/60 ton trailer

c. Supporting Forces:

(1) A Troop, 1st Squadron, 11th Armored Cavalry Regiment.

(2) B Troop, 3rd Squadron, 11th Armored Cavalry Regiment.

(3) L Troop, 3rd Squadron, 11th Armored Cavalry Regiment.

(4) J Troop, 3rd Squadron, 11th Armored Cavalry Regiment.

(5) C Troop, 1st Squadron, 11th Armored Cavalry Regiment.

(6) G Troop, 3rd Squadron, 11th Armored Cavalry Regiment.

(7) 4th Battalion, 23rd Infantry Brigade, 25th Infantry Division.

(8) 1st Brigade, 1st Cavalry Division (AM)

(9) 23rd Artillery Group

(10) 8th Engr Bn (C) (AM)

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d. Detachments: None

6. INTELLIGENCE:

a. Terrain, Vegetation, Soil: The terrain in Tay Ninh, Binh Long, and Phuoc Long provinces of the Republic of Vietnam and operational areas of Cambodia is gently sloping from north to south with only two major high points, Nui Ba Den mountain and Nui Ba Ra mountain. Streams were low at the start of the operation but started rising with the onset of the rainy season. The area is generally agricultural. Dense triple canopy jungle containing broad leaved trees 80 to 120 feet high predominate the non-agricultural areas. Some areas have been cleared with Rome Plows and defoliation agents. Soils are moderately stable supporting military traffic when dry but deteriorating rapidly when wet. In several areas as the rain increased soil instability created severe problems.

b. Enemy Forces:

(1) Enemy forces at the inception of the operation were known to have the capability to launch large scale direct and indirect fire attacks and ambushes, and to extensively place mines and booby traps. The sanctuary areas to be invaded were vital to enemy operations and it was assumed they would be defended at all costs.

(2) Due to the rapidly changing situation the specific enemy units were not readily identified. Positive contact was made with elements of following units:

(a) 174th NVA Infantry Regiment

(b) 27th Reconnaissance Battalion

(c) Military Region 10 Headquarters

(d) 275 VC Infantry Regiment

(e) 7th Sapper Battalion

(f) 101st NVA Infantry Regiment

c. Engineer Elements:

(1) Significant amounts of laterite were used from the following borrow areas. These borrow pits could prove to be valuable assets to any future engineer operating in these areas:

(a) XT3597

(b) XT3390

(c) XT3289

(d) XT2560

(e) XT1358

(f) XT1171

(g) XT0689

(h) XT2861

(i) XT0975

(2) The following items of engineer type equipment were observed by the 31st Engineer Battalion in the Snuol area of Cambodia at the indicated co-ordinates. All items appeared to belong to the Cambodian Government, unless otherwise indicated. No recovery or extraction operations were undertaken.

(a)	Water distributor, 2,000 gal	XU552343
(b)	Truck pickup, 3/4 ton	XU580451
(c)	Body,Truck, 1½ ton	XU580451
(d)	Truck, dump, 10 wheel	XU580451
(e)	Tractor TD 25B with blade	XU584456
(f)	Crane, truck mounted, 8 ton	XU584456
(g)	Tractor TD 25 without blade	XU584456
(h)	Truck, Skoda, 2½-5 ton (D/L)	XU584456
(i)	Distributor, asphalt, 1,000 gal	XU584456
(j)	Saw, band, diesel operated	XU584456
(k)	Generator, 10 KW	XU584456
(l)	Generator, 100 KW	XU596457
(m)	Mixer, concrete, elect, approx 16S	XU596457
(n)	Theodalite	XU580451
(o)	Tractor, D-4, w/dozer (Property of plantation)	XU580451

8. CONCEPT OF OPERATIONS: Prior to the Cambodian Campaign, the 79th Engineer Group (Const) was involved in improving the lines of communication, providing combat support and operational support for US

tactical units in the III Military Region. Initial thrust into Cambodia was made by Task Force Shoemaker, 1st Cavalry Division (AM) on May 1 1970. At this time the requirement for massive Engineer support was realized and the 79th Engineer Group was called upon to provide combat support to this operation.

Forward airfields and supply points and main supply routes were to be developed and improved as required. As the operation progressed and the axis of advance was determined, the required support was also increased.

Bridging materials were stockpiled at predetermined locations and relocated as the axis of advance changed to insure that all requirements for avenues of approach and evacuation could be met in an adequate and timely manner. Available support was furnished for evacuation and/or destruction of captured enemy materials and base camp areas. Enemy areas of sanctuary, routes of approach and ambush sites were denied through the use of jungle clearing techniques. Various other types of combat support were provided as dictated by the tactical situation.

Once the Cambodian operation was in full swing, the majority of the Group's assets were committed to the support of the operation.

9. EXECUTION:

a. Pre-operational Planning: Due to the extremely short notification time, the pre-operation planning was very limited and in many cases non-existant. The flexibility of working forces engaged in Operational support missions enabled them to quickly deploy and provide the needed combat support. Upon receipt of instructions from 20th Engineer Brigade on 29 April, bridge stockpile were initiated. Planning continued as additional requirements were received.

b. D Company, 588th Engineer Battalion (D/588) and the 362nd Engineer Company (LE) were already committed to construction at Thien Ngon airfield when the Cambodian operation commenced. Working in this area since 16 April 1970, the engineers accelerated the rate of construction at the request the 25th Infantry Division. By 8 May 1970 a 991 ft. runway was opened for essential resupply traffic. Elements of the 92nd Engineer Battalion arrived at Thien Ngon on 11 May 1970. They immediately began work on the logistics facility which was to be able to support a brigade logistics base. Work on this project moved quickly and the majority of the facility was completed on 16 May 1970.

Continued maintenance was performed by D/588th until 5 July when they displaced to Cu Chi. During that period 2800 square feet of runway surface was patched using 104 cubic yards of asphaltic cold mix. The extensive number of aircraft sorties at Thien Ngon caused failures to the matted surfaces. Extensive welding of joints was required to keep the runway in usable condition. Utilizing equipment support from HHC/588th and the 362nd Engr Co (LE), D Company was able to complete the interior road network in the logistical base and the bypass by 20 June 1970.

c. Route TL-4 Tay Ninh to Memut, Cambodia (Map 1): The largest portion of the road effort expended by the 588th Engineer Battalion was the extension of TL-4 north from Katum to Memut, Cambodia. The 1st Cavalry Division (AM) initially alerted elements of the group on 1 May 1970 to the requirement for upgrade and maintenance of TL-4 from Tay Ninh to the Cambodian Border.

TL-4 through Katum to Memut , Cambodia was the initial penetration route used by the 1st Cavalry Division (AM) and became the MSR for resupply in the Katum, Memut, FSB Colorado area. This portion of TL-4 was to be developed in three phases: Phase #1- open a road from Katum to FSB X-Ray, Cambodia, passable to truck vehicles by 8 May 1970; Phase # 2 - the road from Katum to Route 7 would be made passable for tracked and wheeled vehicles by 15 May 1970; Phase #3 - The TL-4 Extension would be upgraded to an all weather road.

On 5 May 1970 A Company, 588th Engineer Battalion (A/588) moved from Cu Chi to Katum to begin construction on Route TL-4. On 6 May 1970, with supporting elements from C Company, 588th Engineer Battalion, 595th Engineer Company (LE) and five Rome Plows from the 984th Engineer Company, 62nd Engineer Battalion (LC), A/588th began construction of the road through heavy jungle. The tactical road was opened for track vehicles to FSB X-Ray, completing phase #1, one platoon of A/588th remained at FSB X-Ray. On 9 May 1970, a borrow pit was opened just north of the Cambodian border (XT3597) and remained in use until 29 June 1970.

At the same time work was progressing north of Katum, one and one half platoons of B Company, 588th Engineer Battalion relocated from Katum to FSB Carolyn (XT277788) on 4 May 1970 to begin restoration of the road between Prek Klok and Katum.

On 10 May 1970, A/588th was augmented by five 290M scrapers and a 35 ton compactor from the 595th Engr Co (LE). Between 6 May and 16 May 1970, 22,000 cubic yards of clay topping materials was placed, compacted and shaped into a usable road surface. On 16 May 1970 the 17.9 kilometer road from Katum to the road junction with Route 7 (XU305065) in Cambodia was ready for convoy traffic.

Two bridges were required on the extension of TL-4 into Cambodia. On 14 May 1970, an existing bridge in the Memut Rubber Plantation was reinforced to Class 50 with M4T6 trestle. On 18 May 1970, a 38' 4" fixed dry span was placed on the Memut bypass (XU306057), completing phase II and III.

On the northern leg of TL-4 from Prek Klok to Katum two additional bridges were placed. In May 1970 A/588th installed a 90 foot triple-single Bailey Bridge just south of Katum (XT306856). To avoid closing the MSR to Katum, all work on this bridge was performed at night. On 19 May 1970, A/588th also placed a timber deck on the 40 foot span adjacent to the Katum water point.

On 18 May 1970, C/588th moved from Katum to FSB Buell and assumed responsibility

for maintenance of the southern leg of TL-4 from Prek Klok to FSB Buell. Mine sweep and clearing responsibilities from FSB Buell to FSB St Barbara and the operational control of the quarry site at the base of Nui Ba Den mountain was also assigned to C/588th. Working in conjunction with the 595th Engr Co (LE) at FSB Barbara, C/588th performed continuous maintenance of TL-4 from XT215530 to XT306850. A continuous task force evolved with elements operating out of Tay Ninh Base Camp, FSB Buell, FSB St Barbara, FSB Carolyn, Katum and FSB X-Ray.

Between 19 May and 1 July 1970, 40,000 cubic yards of laterite were placed and 315 linear feet of culvert installed on TL-4. All lateritic materials utilized were obtained from borrow pits located at XT2560, XT3289 and XT3596.

By the termination of the operation the entire 64.5 kilometers of TL-4 from Tay Ninh to Memut, Cambodia was all weather tactical road. During the entire operation TL-4 was one of the primary routes of supply and evacuation in the Memut-Fishhook area.

Enemy action in this area was primarily limited to mining incidents with very few direct and indirect fire attacks. A brief list of the enemy initiated incidents are as follows.

5 May 1970 -- NDP at Prek Klok received an indirect fire attack. Three 82Mm mortars landed in the NDP resulting in 1 WIA and no damage to equipment.

d. Route QL-13 An Loc North to Snoul, Cambodia:

On 7 May 1970 Company C, 31st Engineer Battalion (C) (A), (C/31st) was alerted to open Route QL-13 north from An Loc to Snoul. This operation was necessary to assist the passage of armor units that had been sweeping through the fishhook area up to Highway 7 at Snoul and were now attempting to proceed southeast along QL-13 to return to Vietnam. C/31st, located at Doomsday, was the only unit in a position to rapidly respond to this requirement. C/31st moved northward to establish a new night defensive position (NDP) at XU7217 within two hours after initial notification. The mission entailed clearing the road of brush, repairing bomb craters and installing a 38'4" M4T6 dry span bridge. This bridge was preassembled at Quan Loi and flown to the bridge site in two sorties by flying cranes. C/31st finished the road repair by the following afternoon and the elements crossed the border moving south to Vietnam. The visual reconnaissance performed by the S-3 Section, 31st Engineer Battalion was one of the primary reasons for the timely completion of this mission.

e. Snuol, Cambodia Area Operations and the Snuol Bypass: (Map 3)
On 14 May 1970, C/31st moved from Camp Doomsday with 3/11th Armored Cavalry Regiment and opened FSB Sabre. Initial work consisted of the construction of bypasses around the town of Snuol which had been devestated during previous heavy fighting. The first bypass opened was on the east side of Snuol linking highway 7 and QL-13. These roads were required to permit lateral and axial movement of armor columns without the necessity of

reentering the town of Snuol which had been declared off limits to US troops. The upgrade consisted primarily of placing a laterite cap on existing light traffic roads through the rubber plantation around the city. C/31st also rendered general combat support to all three squadrons of the 11th Armored Cavalry Regiment with missions being received directly from the tactical commander. This work included the construction of FSB Sisson. On 27 May 1970 C/31st moved to XU4939 on the northern corner of the Snuol Plantation and constructed a defensive perimeter and prepared a road in the existing Rome Plow cut running to the Chhlong River, west of their defense positions. Culvert preassembled by D/31st in Song Be was airlifted to the job site and installed for hasty stream and gully crossings. The culvert proved to be aerodynamically unstable and only 50% of it arrived at the construction site. The bypass road proved highly effective in supporting both tactical and logistical operations and prevented congestion in the city of Snuol.

f. Katum Airfield and Logistical Complex (Map 1):

To properly align the existing priorities, repair of the airfield was executed as a two phase operation. The first phase was the repair of the runway surface and the laying of the matting. The second phase was the continued maintenance of runways, parking aprons and adjacent drainage structures.

On 2 May 1970, C/588th moved to Katum to begin construction. The next day, supported by elements of the 362nd Engineer Company (LE), C/588th began soil cement stabilization of the runway and parking apron. By the morning of 5 May 1970, nearly 500 bags of cement and 3300 gallons of MC-70 asphalt had been consumed and the runway was ready for matting.

The airfield could not be closed during daylight hours due to the urgency of the aerial resupply at Katum. As a consequence all construction on the runway had to be performed at night.

To direct the work in the Katum area, headquarters 588th Engineer Battalion established a forward command post at Katum on 8 May 1970. The forward CP remained here until 21 May 1970 at which time it was relocated at Tay Ninh, where it remained until the operation terminated.

On the night of 8 May 1970 the airfield was attacked by indirect fire resulting in the death of a forklift operator, the wounding of 8 engineer soldiers and the destruction of a forklift.

On 11 May 1970, D/588th moved to Katum from Cu Chi to assist in laying matting on the runway. A total of 8000 square yards of matting was placed on the 1200 ft runway.

A/588th maintained the airfield until the termination of the operations in Cambodia. The majority of the maintenance effort consisted of patching potholes, leveling aircraft off-loading areas, improving airfield drainage, securing matting and painting the M8A1 matting with non-skid paint.

A/588th assumed the construction responsibility of the Forward Logistics Complex at Katum. This facility was used to support two (2) US Army

Brigades and one ARVN Airborne Brigade. The construction included a logistics area (Class I, II, III, IV, V), an airfield bypass road, a staging area, a road to the class V storage area, a berm for aircraft protection, vehicle refueling areas, staging /parking area for tractor trailers, and an aerial resupply hookout pad.

A/588th remained at Katum after US Forces returned from Cambodia to support US elements still in the border area and to construct fire support bases.

On 2 July 1970 an unknown size enemy force attacked Katum airfield. The enemy penetrated the wire and caused considerable damage with satchel charges and grenades. Two (2) engineers were killed and 16 wounded. Except for one PRC 25 radio, all communications equipment was destroyed as well as damage to a 1/4 ton vehicle, a 3/4 ton vehicle and electrical generator. Six enemy were killed and three captured. Several blood trails leading to Cambodia were also found.

g. Route QL-22 and Cambidian Route 78 (Map 2):

D Co 92nd Engineer Battalion (Const) was assigned initial responsibility for maintenance of QL-22 shortly after their attachment to the 79th Engineer Group on 6 May 1970. D/92nd was joined by D/588th at Thien Ngon on 21 May 1970 for a combined effort on the project. D/92nd was responsible for that portion of the road from XT162553 to XT115710 while D/588th worked from XT115710 to the Cambodian border. The combined effort of these two companies on 46.3 kilometers of QL-22 consumed 18,250 cubic yards of laterite fill and capping material. D/92nd returned to Operational Control of its parent unit on 15 June 1970.

Two major bridges were built on Route QL-22 south of Thien Ngon. At XT097763, D/588th was faced with the problem of spanning a 165 foot gap. After reconnaissance and evaluation of both the site and available material, a 140 foot triple-double Bailey Bridge with 40 foot double-single bailey supported by an intermediate pier was erected. Construction was initiated on the morning of 22 May 1970 and by the morning of 27 May was open to continuous traffic. B/588th furnished construction crews to augment the widely dispersed elements of D/588th.

On 30 May 1970, D/92nd initiated construction of a 30 foot steel stringer bridge at XT115708. It was opened to continuous traffic by 4 June 1970.

In Cambodia, Route 78, the extension of QL-22 from the border (XT075879) to its junction with Route 7 (XT015011) at Krek required considerable repair and upgrading. On May 1970 two platoons of B/588th relocated from FSB Carolyn to FSB Blaster (XT045895). A borrow pit was developed at XT072895 with 6,700 cubic yards of fill material being extracted by the completion of the upgrade.

h. 11th Armored Cavalry Regiment (11ACR) Support in the Fishhook:

After the Cambodian operation was launched, elements of the 11th ACR swept north from FSB North I and North II and reached Highway 7 east of

Menut. In order to insure their continued momentum north to NVA store points at Snuol, it became evident that a river crossing would be necessary at XU5023. Reconnaissance by members of the 1st Air Cavalry Division (AM) (1st ACD) led to a plan to airlift bridge material to the site and to execute a rapid river crossing operation.

Prestocked M4T6 bridging materials at Quan Loi were preassembled into two 30 foot ramp sections and one 15 foot center trestle section. On 3 May a platoon from C/31st was inserted at the bridge site by a CH-47 helicopter. Airmobile dozer support for the preparation of abutments was provided by the 8th Engineer Battalion, 1st ACD. The center trestle and ramp sections subsequently flown to the site and placed into their final configuration by CH-54 cranes. The bridge was completed eight hours after the first engineer troops arrived at the site and remained in use throughout the campaign.

On 5 June 1970 C/58th moved from XU496399 to establish a new defensive position with the 11th ACR at XU4106. The purpose of this move was to provide engineer support to upgrade existing trails to improvide the mobility of the 11th ACR units as they extended their search for enemy personnel and cache sites to the southeast. Progress was slowed considerably by the onset of the rainy season and the subsequent poor traficability of the soils. Despite these handicaps, significant improvement was made in the area. The momentum of the 11th ACR's thrust was not hampered.

On 14 June 1970, C/31st moved to FSB Colorado on Highway 7 in anticipation of bridge construction at two Armored Vehicle Launched Bridge (AVLB) sites, XU5019 and XU5020. The steady deterioration of the AVBL crossing, brought about by heavy traffic and continued rain precipitated the need for immediate repair, initiated on 15 June 1970. Although heavy rains slowed progress at the start, the most significant obstacle was a sudden increase of enemy activity in this area.

On 16 June 1970, 23 trucks from the 104th Engineer Co (DT) and 7 dump trucks from 79th Engr Co (BP) arrived at FSB Colorado with rock for the bridge sites. Due to the crowded conditions within the FSB it was necessary to park vehicles in partially exposed positions. During the night heavy rains developed and at approximately 0330 hours the FSB was attacked with RPG and small arms fire. 13 Engineer personnel were wounded and a large number of vehicles received minor shrapnel damage. One truck, 1/4 ton, one 3/4 ton and one bridge truck received considerable damage.

The bridge, a 110 foot triple-single Bailey was completed on 16 June 1970. On the morning of 17 June elements traveling to the bridge sites were taken under fire and forced to remain within the fire support base for the remainder of the day. It was at this time that operational trends were reversed and retrograde movements were initiated by US Forces.

On 19 June 1970 work was initiated on the disassembly of the 110 foot triple-single bridge and the 75 foot dry span. Work schedules and security requirements were initially predicated on the premise, that the enemy still

retained sufficient capability to disrupt the operation. This was further substantiated by the ambush of working parties on their way to the bridge site on 16 June in which 8 individuals were wounded.

Inspite of these problems, two seperate sections of 75 foot dry span were extracted by air and the 110' triple-single Bailey was dismantled and evacuated with the exception of its launching nose. The remainder of the dry span was mired in the mud, preventing extraction in the available time limits. As a result, the dry span remaining was blown in place and the launching nose was destroyed by US Air Force fighter-bombers. On 26 June all elements working in the area including 62nd Engr Bn and 11th ACR units returned to South Vietnam through Katum.

i. "Cache City Road" (Map 3):

On May 1970 immediately after the opening of QL-13 to Cambodia, C/31st received the mission to construct a road to "The City" - a cache site which was to become the most infamous cache site of the war. Aerial reconnaissance revealed an unused trail which led from C/31st camp at XU722178 to the city at XU656215. Using a combination of minesweepers, bulldozers and graders. The route was opened in two days. This route was to become very essential for the extraction of enemy materials and supplies. Both organic engineer equipment and vehicles of local transportation units were used in the extraction of the discovered materials. Since rainfall had not yet become a factor in the operation and the dry weather permitted the utilization of hasty fords without the requirement to install culverts and large amount of fill. At the completion of this mission C/31st returned to Doomsday.

j. QL-14A North of Bu Dop (Map 4):

On 11 May, one platoon of B/31st, one team of Rome Plows from the 62nd Engineer Battalion and one Panel Bridge Platoon from the 79th Engineer Company departed Quan Loi for Bu Dop to open Route QL-14A. Widespread mining presented a severe problem to the work force due on this section of QL-14A. Twenty-five enemy installed mines were discovered on the first day and one five ton dump truck was destroyed when it detonated a mine on the side of the road. As a direct result of these incidents, the units exercised extreme caution and performed thorough minesweeps as they advanced. Forward progress was slow and the first night was spent in FSB Jerri, about five miles south of Bu Dop. On 12 May 1970, the task force, with security provided by I/11th ACR, advanced to a NDP about 300 meters south of the Cambodian border. Reconnaissance and analysis of the 50 foot gap at the border was made on 12 May 1970 and a decision was made to push out causeways from each bank and to span the gap with a 38'4" M4T6 dry span. On 13 May the preassembled dry span was airlifted from Quan Loi and implaced. The convoy, spear headed by Rome Plows, crossed the gap and opened the road to FSB Brown YU0637. This road operation was a vivid illustration of the advances through thick jungle growth. Without the Rome Plows this road would have taken 6 additional days to complete. Operating first from FSB Brown and then FSB Myron the task force installed two additional Bailey bridges, one 38'4" dry span and several culverts along QL-14 north to YU0054S.

With the onset of the rainy season and the subsequent increase in stream flow, the original expedient crossing utilizing the M4T6 dry support span became untenable. It was replaced with an 80' double-single Bailey Bridge.

k. Upgrading of QL-14A (Map 4):

During the period of 26 May to 1 June one of the most successful MSR operations in the eastern portion of the Area of Operations (AO) was performed by the 31st Engineer Battalion. QL-14A was upgraded to withstand the heavy loads necessary to resupply the forward tactical elements with ammunition and rations, and the rapid evacuation of captured materials and supplies.

Two companies, A/31st and D/31st were reinforced with equipment from the 557th Engr Co (LE) and the 554th Engr Bn (Const) with two troops of the 11th ACR furnishing security. To facilitate operations and avoid dead time for travel, two NDP's were established at XU8617 (NDP #1) and XU9622. Task forces worked along the road in both directions improving drainage, filling potholes, correcting alignment and installing culverts. One bridge at XU9421 was replaced by preassembled multi-plate pipe arch culvert (MPPA).

This proved to be a very effective technique and continued use of MPPA on other missions decreased road opening times considerably. Enemy activity during this phase of the operation was negligible, but mining incidents occured periodically. D/31st maintained this route until mid June to insure a suitable retrograde route for B/31st.

l. Rock Island Road: (Map #4):

One of B/ 31st's missions north of Bu Dop was to construct a tactical road to Rock Island East, a large cache site located at YU0344. Initial reconnaissance and evaluation of the area indicated that the most expeditious approach would be to move North along QL-14 to Sh See Preah, (YU0447) and then southwest along an existing trail. Further reconnaissance however revealed a more suitable route leading west from QL-14 in the vicinity of YU0644. When engineer troops moved into the area and started construction, this area was found to be a main enemy supply route. This area contained several classrooms, messhalls, and meter pools. Some Flows were utilized to widen the road to furnish a route for engineer units and transportation units to evacuate several hundred tons of captured supplies and materials. Full exploitation of the existing trail in this area assisted in the rapid completion of this phase of the operation.

m. Ap Loc Thanh Booby Trap Village (XU7414) (Map 3):

The large number of Cambodian refugees flowing down Route QL-13 in vicinity of Snuol in early June created a serious tactical problem. They were without shelter and were susceptible to accidental injury or attack by friendly forces. The 1st ACD decided that a refugee village

should be built to protect the refugees and to avoid local repercussions if they penetrated too deeply into RVN.

The site chosen was Ap Loc Thanh Village which had been previously booby trapped by friendly forces. Between 11 and 14 June 1970 elements of A/31st used bangalore torpedoes to clear the booby trapped village. This also served as a test area for using a D-7 dozer with protective cage to clear antipersonnel mines and booby traps. The techniques utilized in launching bangalore torpedoes is discussed at length in paragraph of this report.

n. Task Force Wright (Tactical Land Clearing in Snuol and Prek Chulong Rivers Area of Cambodia: Map 3 :

In the middle of May it became evident that if the 11th ACR was to maintain its momentum and initiative in the Snuol Cambodia area. Assistance in opening routes of travel through the jungle was required. A task force from the 60th Engineer Company (LC) consisting of 28 men and nine Rome Plows joined elements of the 11th ACR convoy at Chon Thanh on 26 May. The convoy moved north on 27 May to the SPK Rubber Plantation surrounding Snuol, Cambodia. The first NDP, FSB Hammerstone was built at XU5093. Clearing was initiated on 28 May 1970 and continued through 3 June 1970 with moves to New NDP's on 30 May 1970 (FSB Henry XU4639), on 3 June 1970 (NDP #3, XU4140). On 4 June the task force returned to FSB Hammerstone, loaded all equipment and proceeded south into the I/11th ACR's area of operations. They offloaded at FSB Colorado, rejoining the balance of the 60th Engr Co (LC). A total of 7 days cutting resulted in clearing 155 acres.

An enemy force of unknown strength was operating in the cut area throughout the operation, with significant contacts being made each day. These contacts included ambushes, boobytraps, RPG's and AK-47 fire. Following is a list of the daily contacts:

28 May 1970- Ambushed several times in the cut by RPG's and AK-47 fire. One Rome Plow sustained slight damage and the operator received minor wounds. One NVA was killed by mechanical ambush west of the NDP at 1830.

29 May 1970- One light observation helicopter was shot down west of the cut. One NVA killed in mechanical ambush.

30 May 1970- Advance security elements were taken under fire by an unknown enemy force using RPG's, small arms and grenades. One member of the security element was wounded. Two NVA were killed by air strikes and artillery. A six ton rice cache discovered.

31 May 1970- Two NVA killed by mechanical ambushes in the evening.

1 June 1970- Five NVA (including one officer) killed by mechanical ambushes in evening.

2 June 1970- Advance security again taken under fire by an unknown size

enemy force using RPG's and AK-47's. No damage or casualties.

3 June 1970- Ground attack outside the NDP at 2100 hours. Negative results.

o. Task Force Parker (Operations in Support of 11th ACR Cache Opening and Tactical Probes): (Map 4)

During the period 10 May, through 5 June 1970 the 2nd platoon, 60th Engineer Company (LC) supported the 31st Engineer Battalion and 3/11th ACR by developing roads to cache sites and reconnaissance by clearing missions.

Initiate work progressed from intersection of Route 307 and QL-14A, north of Bu Dop. Both sides were cleared for approximately 25 meters, to the entrance of a trail at YU052467.

The trail located at YU052467 was the entrance to the Rock Island East Cache and was opened to YU010435. In many instances the plows were responsible for actually uncovering the cache sites. A total of approximately 40 enemy huts, 100 bunkers and 100 fighting positions were destroyed during the operation.

The operation was initiated with 6 Rome Plows and one bull blade. Contary to the normal procedure in jungle clearing it was found that 3 Rome Plows and one bull blade were the best combination to use in this area. The normal measurement of jungle clearing is in number of acres cleared, but for this type operation the statistics do not give a clear picture of the actual work accomplished. There were 19 clearing days during which 750 acres were cleared for an average of 39.5 acres per day.

In the course of this operation a total of six by-passes and three culverts were placed by the elements of the 60th Engr Co (LC).

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p. Rome Plow Operations in the Minh Thanh - Fishhook Area:

On 15 May 1970 the 60th Engr Co (LC)(-) moved from Long Binh to a NDP #1 at XT7500706. On 16 May 1970 they cut along both sides of Highway LTL-13 from Chon Thanh (West) to Minh Thanh (East) and along both sides of the road intersecting QL-13 at XT766720 running southwest to XT658664. Additonal NDP's were established on 21 May 1970 (XT658664) at NDP #2 and on 29 May 1970 (XT684637) at NDP #3.

Both indirect fire and mining incidents took place on each day in the Minh Thanh area. A detailed list of the incidents follows:

16 May 1970 - Lead plow in cut detonated a 40 lb mine resulting in two US Engineer personnel wounded and one plow moderately damaged. Security forces accompanying the cutting element found the body of a previously killed NVA officer, with documents and medicine on his person.

18 May 1970 - One RPG round was fired at a M-548 resulting in no damage or casualties.

19 May 1970 - The light observation helicopter flying for the cutting force received small arms fire while flying a trace route. There was moderate damage to the helicopter, but no casualties. A security APC received small arms fire from an unknown size enemy force in the cut. This action resulted in minor damage to the APC and no casualties.

20 May 1970 - One RPG round was fired at a Rome Plow resulting in one wounded US Engineer and heavy damage to the plow.

22 May 1970 - One Rome Plow detonated an 80 lb mine resulting in one WIA and heavy damage to the plow.

24 May 1970 - The LOH received small arms fire resulting in no casualties or damage. One security APC detonated a 40 lb mine resulting in no casualties, but heavy damage to the APC.

26 May 1970 - One RPG round was fired at security forces APC with negative results.

27 May 1970 - One Rome Plow sustained a hit from a RPG round resulting in one WIA with no damage to the plow. A 2½ ton truck utilized by the security element detonated a 40 lb mine resulting in 4 WIA and heavy damage to the vehicle.

28 May 1970 - An element of the security force received small arms fire in their NDP with negative results.

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29 May 1970 - Elements of the security force discovered an 80 lb mine in the road and were able to detonate it in-place.

30 May 1970 - Elements of the security force discovered an 80 lb mine in the road and were able to detonate it in-place.

As a result of the intensive effort expended by the enemy forces, cutting techniques were varied extensively to avoid the establishment of a specific cutting pattern.

On 2 June 1970 the unit started its journey to the Fishhook area; they stayed in Quan Loi that night. Enroute to Quan Loi two vehicles detonated mines, resulting in 2 WIA and heavy damage to the vehicle.

On 3 June 1970 the unit left Quan Loi and set up a temporary NDP at XU 6624 Departing the temporary NDP on 4 May 1970, they traveled directly to XU451080 and established an NDP in the Fishhook area. Additional moves were made 3 June 1970 (NDP #5 - XU477071), 20 June 1970 (NDP #4 - XU451080), 21 June 1970 (NDP #6 - XU464048), and 22 June 1970 (NDP #7 - XU416076).

The purpose of the mission in the Fishhook area was to locate and to destroy enemy fortifications, places of refuge, supplies, and equipment. The results of this operation were as follows:

4 June 1970 - Security elements found 50 bunkers with overhead cover, 24 lbs of C-4 explosives, 1 bandolier of M-16 ammunition and 1 rucksack of medicine. Several enemy dead were located as well as 20 tons of rice.

6 June 1970 - Security elements located a bunker complex, approximately 1 square kilometer in area, bunkers, and 10 to 20 enemy personnel (NVA) were seen running through the complex, but no actual contact was made. The security elements searched approximately 20 bunkers finding warm rice bowls and wet laundry still hanging on the clothes lines.

7 June 1970 - The LOH operating in conjunction with the cutting force was fired upon with small arms 4 times during the day with no casualties. During the last incident the LOH received moderate damage. The security elements continued the search of the bunker complex, locating 75 bunkers with two feet of overhead cover and 50 huts. During the search security elements killed one NVA and captured his weapon. The following enemy material was captured during the search: 400 - 82mm mortar rounds, 100 Chicom grenades, 2 crew served weapons, 3 AK-47 rifles, 1 M-16 rifle, 1 Chicom machine gun, 2 tons of rice, 1 X-ray machine, 1 AM/FM radio, 3 clips of M-16 ammunition, several packs containing medical supplies and documents, 50 - 2½ gallon containers of medicine and medical instruments. and 6 - 50 lbs sacks of medical journals.

9 June 1970 - During the day the Rome Plows were taken under fire on 3 different occassions. One plow was hit by a B-40 rocket with 2 WIA and moderate damage. In the other two occassions, RPG rounds and small arms fire were encountered resulting in no damage or casualties. During the day the security force, was continually harassed by enemy elements. One APC from A/1/11 ACR was heavily damaged by an RPG resulting in one KIA. B/1/11 ACR received both direct and indirect fire during the day. The initial attack on B/1/11 ACR occurred in their NDP and resulting in no casualties or damage. Later that day, B/1/11 ACR received 3 mortar rounds and 2 RPG rounds resulting in 3 WIA and heavy damage to a Sheridan tank. The security APC's in the cut area were fired on with 2 RPG's but no damage or casualties were sustained. Mining incidents continued to be a problem throughout the day with one plow and two security Sheridans detonating 40 lb mines. The two Sheridan incidents resulted in two WIA and only moderate damage to the Sheridans. The Rome Plow was not affected by the mine. The security force located and destroyed 150 bunkers and huts.

10 June 1970 - During the search of a bunker complex the security force was ambushed resulting in 2 WIA and no damage to equipment. During this bunker search the following enemy material was captured: 2 X-ray machines, 1 generator, 1 Honda engine, 1 typewriter, 1 claymore mine, 2 rifle grenades, 300-400 lbs of medical supplies and instruments, 10 bicycles, a small quantity of ammunition, numerous cooking and eating utensils and several pounds of documents.

12 June 1970 - Fifty bunkers with 2 feet of overhead cover were discovered and destroyed. Enroute to the NDP at the end of the day's cut, the work force received mortar and small arms fire but no damage or casualties were sustained. A/1/11 ACR and B/1/11 ACR had contact with the enemy in the same general area which resulted in 1 KIA and 18 WIA.

13 June 1970 - Located and destroyed 150 bunkers, 30 huts, 8 bicycles, and several eating utensils.

15 June 1970 - During the day security elements located and destroyed 50 bunkers and captured the following enemy material: 1 printing press, 1 typewriter, 15 lbs of medical supplies, 40 lbs of medical textbooks, 1 - 9mm machine gun with 3 clips of ammunition, several hundred feet of hose and several articles of clothing. The security unit's LOH was fired on, but sustained no damage or casualties. The enemy again attempted to disrupt the cut with RPG and small arms fire resulting in no casualties and moderate damage to one Rome Plow. Security elements swept the contact area and located 6 enemy dead (NVA).

16 June 1970 - The enemy intensified his attacks on the entire cutting force with a total of 70 individual attacks on Rome Plows with RPG's and small arms fire resulting in 3 operators being wounded and 2 plows being lightly damaged. The LOH used to locate the cut trace,

received small arms fire during the day without sustaining casualties or damage. One Rome Plow detonated a small mine resulting in one WIA and moderate damage to the plow. During the contact the security killed 1 NVA soldier and captured 1 RPG-7 launcher and round. During the day 150 bunkers with overhead cover and 50 huts (still under construction) were located.

17 June 1970 - During the day the security elements located and destroyed 75 bunkers and captured the following enemy materials: 1400 lbs of rice; 1 printing press; 1 SKS rifle, 1 AK-47 rifle, 1 - 22 caliber US rifle, 8 bicycles, numerous medical supplies, 100 lbs of documents, maps of Tan Son Nhut Airbase and Tay Ninh City, plans and rosters, pictures of NVA officers and leaders, pictures of anti-war demonstrations in the US and numerous other propaganda material. During the return march to the NDP the column was taken under fire by an unknown size enemy force. The lead Rome Plow received 100 AK-47 hits and 1 RTG resulting in 1 KIA, 1 WIA, and moderate damage to the plow.

18 June 1970 - Two Rome Plows received hits from RPG's resulting in 3 WIA with one plow lightly damaged and one moderately damaged.

20 June 1970 - The convoy of advance elements returning to home station detonated a mine resulting in 3 WIA and 1 plow moderately damaged.

21 June 1970 - Personnel taking vehicles to home station stopped at FSB Colorado which was attacked by mortar, rocket, RTG's, and a ground probe. Two members of the unit were wounded.

On 24 June the elements of this unit departed Cambodia via Katum and were one of the last forces to cross the border.

EGE-3
SUBJECT: After Action Report, 190-5569-0-20, Operation Toan Thang

q. Tactical Land Clearing Cut in Cambodia, XU461010 to XU490019, XU490015 to XT480990:

On 13 June the 984th Engineer Company (LC) moved from FSB Tanee to Katum prior to entering Cambodia. On 14 June the 984th Engineer Company departed Katum for Cambodia. Due to poor soil trafficability the unit was not able to close on their NDP at XU423053 until 2020 hours. One empty low-boy in the convoy hit a mine at XU3701 resulting in no casualties and moderate damage to the trailer. On 15 June the unit closed its first operational NDP (XU464010) without incident.

On 16 June the NDP received two RPG rounds which resulted in five WIA. The tactical cut was initiated and resultedin the capture of approximately 3000 lbs of rice, medical supplies and clothing.

Clearing operations continued on 17 June with enemy pressure on the cutting crews increasing in tempo. During the day 4 separate enemy small arms fire and RPG attacks took place. These attacks resulted in 1 ARVN security personnel wounded, 1 ARVN Engineer wounded, 2 security personnel wounded and 1 NVA killed. During the day's operations 10,000 lbs of medical supplies and 800 lbs of rice were captured while 1200 lbs of rice and 18 bicycles were destroyed due to lack of extraction capability.

During this cut the hardest blow dealt to any element of this command occurred. On the night of 19 July 1970, at approximately 1700, two NVA soldiers fired at plows on their way to the NDP. An unknown size enemy force attacked the NDP four times during the night, finally breaking contact at 2300 hours. During the attack six 122mm rockets, twenty 82mm mortar rounds, and an unknown number of RPG rounds impacted inside the NDP. As a result of the attack the 984th had 3 personnel killed and 18 wounded. Casualties inflicted on the security force were 5 wounded.

On 21 June 1970 the 984th Engineer Company continued its cutting operation. At approximtely 1145 the unit uncovered a cache and bunker complex at XU494001. Approximtely one hour later contact was made with the enemy and one Rome Plow was struck by an RPG damaging the cab and wounding the operator. Enemy contact continued in such force that the unit was pulled out of the cut and air strikes and artillery were called in on the area.

On 22 June 1970 the enemy's harassing attacks continued resulting in 3 WIA's. The 984th was again pulled out of the cut and air strikes and artillery called in.

On 23 June the unit located and captured 1 machine gun, 3 B-40 rockets, 20 RPG rounds, eight 60mm rounds, 300 lbs of medical supplies, and

2000 rounds of small arms ammunition. That evening the NDP received a ground attack again by an unknown size enemy force supported by RPG and small arms fire. The attack resulted in 8 engineers WIA and 1 security WIA. The 984th concluded its land clearing operation in this area on 23 June 1970.

On 24 June 1970 the 984th started its march from Cambodia. Enroute the column was ambushed by an unknown size force using RPG's and small arms. This attack resulted in 1 engineer WIA, 1 security WIA and damage to a 10 ton tractor.

On 25 June the 984th Engr Co (LC) traveled to Katum to await outload of equipment. No contact with the enemy was made on this final day.

r. Tactical and Security Cut, Vicinity of Thien Ngon (Task Force Young): (Map 2)

On 18 May 1970 a task force consisting of 7 Rome Plows from the 984th Engr Co (LC) joined the 588th Engineer Battalion in Thien Ngon to assist in clearing possible ambush areas and in securing Route QL-22 from interdiction by the enemy.

On 22 May 1970 an additonal six Rome Plows departed Long Binh to join the task force bringing its available work force to 13 Rome Plows.

The initial mission was to clear the area adjacent to both sides of QL-22 to prevent ambushes and to clear fields of fire in the Thien Ngon area. During the period 18 May - 25 May 1970 cutting was accomplished along both sides of QL-22 without incident. The first plows entered Cambodia on 26 May 1970. One plow detonated a 40 lb mine resulting in no casualties and moderate damage to the Rome Plow. By 27 May 1970 a 100 meter strip had been cleared on each side of QL-22 from XT082818 north to XT061909. On 27 May portions of the task force cleared field of fire on the western side of Thien Ngon.

Operations along QL-22 south of Thien Ngon were initiated on 28 May 1970 with a 30 meter swath cut on each side from Thien Ngon to the stream located at XT098763. On 29 May 1970, previously cut area was extended to a width of 80 meters.

During the period of 30 May through 3 June 1970 the unit continued cutting south on QL-22 without incident. On 3 June 1970 a falling tree detonated a mine without any effect on the cutting force.

On 4 June 1970 the unit initiated a cut along Route LTL-20 from Thien Ngon west to XT970751. This task was completed on 6 June 1970.

On 6 June 1970 two plows were utilized to cut an area around the laterite pit at XT1170. All elements of the original Task Force Young departed Thien Ngon on 8 June 1970. During this operation 763 acres were cleared.

s. Direct and General Bridge Support Furnished by the 79th Engr Co (BP):

The 79th Engr Co (BP) (79BP) furnished direct and general support to all elements of the 79th Group during the operation.

On the 27 April 1970 the 79th Engr Co (BP) was alerted to combat load one 80' DS Bailey Bridge and one (1) set of M4T6 float bridge and be prepared to move NLT 0700 on 28 April, with an additonal set of M4T6 to be loaded and ready for movement NLT 1200 hrs 28 April.

When this mission was received, there was no M4T6 available in the bridge park. As a result, the bridge was picked up from depot, assembled and combat loaded.

The first platoon was assigned the mission with the 80' DS Bailey Bridge. After it was delivered to Quan Loi the first platoon returned to the bridge park and loaded and additional 80' DS Bailey for delivery to Quan Loi.

The second platoon was assigned responsibility for the M4T6 whith they moved to Quan Loi where they remained to support the 31st Engineer Battalion. During the initial portion of the campaign the second platoon remained in Quan Loi where they preassembled M4T6 dry spans for airlift.

The third platoon received the mission for loading the set of M4T6 for 1200 28 April deadline, to stand by to deliver it to Cu Chi.

The fourth platoon was assigned the mission of preparing another 80' DS Bailey Bridge for Quan Loi.

Throughout the operation the 79th Engr Co (BP) was further tasked to remove 6 Armored Vehicle Launched Bridges (AVLB) from depot, assemble them and prepare them for use in the 588th Engr Bn and 65th Engr Bns AO.

The unit also ordered two (2) sets of M4T6 float bridge for the 65th Engr Bn and coordinated pickup.

The 79th Engr Co (BP) was supported by other units of the 20th Engineer Brigade including elements of the 159th Engineer Group, 34th Engineer Group and 79th Engineer Group. These units furnished transportation for bridging materials to allow certain portions of the 79th Engineer Company's assets to remain combat loaded for rapid response to requirements. The 588th and 554th Engineer Battalion furnished assistance

to assemble bay loads of Bailey and M4T6 bridging in the bridge park.

The first and fourth platoons moved into Cambodia at FSB Brown with the 31st Engineer Bn and operated from that location. They supported the 1st Cavalry Division (AM) with trucks for retrograding rice and materials located in the various cache sites within Cambodia.

The second platoon loaded a 140' TS Bailey Bridge and one (1) 90' DS Bailey for a mission on Route 7A in Cambodia. The bridges were transported, installed, and removed by the 79th Engr Co (BP) and elements of the 31st Engr Bn.

The third platoon supported the 65th Engr Bn and the 588th Engr Bn with a number of Bailey Bridges in their ACR. These included several Bailey Bridges and four 45' dry spans with trestles.

Upon conclusion of the operation the 79th Engr Co (BP) returned all bridging materials to the Long Binh area with the exception of two sets of Bailey Bridge which are in emergency stock at Cu Chi and Phuoc Vinh.

t. Emergency Repair, Tonle Chan Airfield:

Tonle Chan Airfield developed several soft spots due to the increase in rain. On 19 June, one platoon from the 557th Engr Co (LE) relocated to that area and completed repairs by 28 June 1970.

u. Loc Ninh Airfield Parking Ramp: (Map 4)

Early May 70, D/31 (-) moved to Loc Ninh to undertake one of the larger airfield projects of the campaign. To provide better off loading facilities, it was necessary to construct a 500' x 210' parking ramp. Auxilary facilities to be constructed included a perimeter road, ammunition berms, a sling out pad for resupply operations, helicopter refuel facilities, repair of an old parking ramp and maintenance of the airfield itself.

The airfield parking ramp was constructed of a soil cement base course covered with M8A1 matting.

v. Maintenance at QL-13, An Loc to Loc Ninh:

During the capaign, elements of B/31, C/31, and D/31 and the 557th Engr Co (LE) performed recurring maintenance on this important MSR. This road was the main route in the eastern portion of the AO.

w. Fire Support Base Preparation:

Throughout the campaign, continual equipment support was given to several FSB's. Providing this support was often extremely difficult

because of the rapid displacement of artillery elements.

In the western portion of the Area of Operations, the 588th Engineer Bn furnished dozers and operators which remained with the artillery units. Approximately 40 fire support bases were constructed or improved.

x. Upgrade of Route LTL-1A:

D/31 spent approximately 10 days upgrading the northern leg of LTL-1A between QL-14 and the Song Be River.

10. RESULTS:

a. Enemy Personnel Losses: Unknown.

b. Friendly Personnel Losses: 7 KIA, 132 WIA

Mortar and rocket attacks and land mines caused the majority of casualities. The majority of the casualties occurred during the period of 16 through 19 June in the Fishhook area of Cambodia. On 16 June an attack on FSB Colorado resulted in 13 Engineer personnel being wounded. On 18 June a work party enroute from FSB Colorado to a bridge work site was ambushed, resulting in 8 WIA. The hardest single blow dealt to any element occurred on the night of 19 July 1970 when the 984th Engr Co (LC) was attacked in their NDP and had 3 personnel killed and 18 wounded. The remaining casualties were suffered in sporadic enemy actions or mine detonation incidents throughout the campaign period.

c. Enemy Equipment and Material Captured:

(1)	Rifle, AK-47	15 each
(2)	Round, RPG	26 each
(3)	Round, Mortar, 60MM	18 each
(4)	Machine Gun, Chicom	3 each
(5)	Spare Barrel, Chicom Machine Gun	1 each
(6)	Hand Grenades, Chicom	106 each
(7)	Rifle, SKS	21 each
(8)	Rifle, .22 Cal (US Made)	1 each
(9)	Launcher, RPG	1 each
(10)	Round, Mortar, 82MM	440 each

(11)	Mine, Claymore (US Made)	11 each
(12)	Explosive, C-4 (US Made)	25 pounds
(13)	Ammunition, 7.62MM	31 clips
(14)	Mines, 80 lb	2 each
(15)	Rifle Grenades	4 each
(16)	Launcher, Grenade, M-79	1 each
(17)	Pistol, Chicom, K-54	1 each
(18)	Medical Supplies	15,422 lbs
(19)	Rice	707,000 lbs
(20)	X-Ray Machines	3 each
(21)	Printing Press	2 each
(22)	Typewriters	2 each
(23)	Radio, AM/FM	1 each
(24)	Packs of Medical Supplies	21 each
(25)	2½ Gallon Containers of Medicine and Medical Supplies	50 each
(26)	Gasoline, 5 Gallon Cans	15 each
(27)	Generator	1 each
(28)	Engine, Honda	1 each
(29)	Journals, Medical	300 pounds
(30)	Bicycles	26 each
(31)	Rubber Hose	100 ft
(32)	Propaganda Materials, Documents and Maps	150 pounds
(33)	Truck, 2½ Ton	6 each
(34)	Truck, ¼ Ton	3 each

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(35)	Differential for 3/4 Ton Truck	15 each
(36)	Axle, for 2½ Ton Truck	50 each

d. Friendly Equipment Losses:

(1)	Truck, 5 Ton Dump	6
(2)	Tractor, D7 w/Dozer	5
(3)	Tractor, D7 w/Rome Plow Kit	5
(4)	Galvanometer, Blasting	1
(5)	Demolition Equipment Set, Blasting	1
(6)	Rifle, 5.56MM, M-16	6
(7)	Pistol, Caliber .45	1
(8)	Launcher, Grenade M-79	5
(9)	Machine Gun, 7.62MM, M-60	3
(10)	Mask, Individual Protective	2
(11)	Detector Set, Mine, Portable	1
(12)	Bayonet-Knife, Rifle, 7.62MM	1
(13)	Antenna Radio	1
(14)	Truck, 2½ Ton Cargo	1
(15)	Trailer, 25 Ton, Lowbed	2
(16)	Radio Set PRC-25	2
(17)	Radio Set GRC-125	2
(18)	Crane, Rough Terrain	1
(19)	Radio Set PRR-9.	1
(20)	Radio Set PRC-4	1
(21)	Truck, Tractor, 10 Ton	1

(22) Boat Reconnaissance 1

(23) Ditching Machine 1

e. Enemy Structures Destroyed:

Approximately 815 bunkers, 130 huts and innumerable 2-man fighting positions were destroyed during the operation. Numerous mines and booby traps were also located and destroyed.

f. Significant Engineer Accomplishments:

(1) New Roads Opened:

Cache Road off of QL-13	18 KM
Rt 246 Tonle Chan to Katum	38 KM
Cache Roads off of Rt 14	12 KM
Cache Road NW of Snuol	20 KM
Rt 7 Krek to Snuol	75 KM
TOTAL	163 KM

(2) Road Maintenance and Upgrading:

QL-13 An Loc - Snuol	60 KM
Rt 14, QL-13 to Ph Sre Preah	57 KM
Rt 246 Tonle Chan to An Loc	28 KM
TL-4 Tay Ninh to Memut	60 KM
QL-22 & Rt 78 Tay Ninh to Krek	60 KM
TOTAL	265 KM

(3) Constructed Katum Logistical Complex, capable of supporting two (2) US Army Brigades and one (1) ARVN Airborne Brigade.

(4) Constructed Thien Ngon Logistical Complex capable of supporting one (1) US Army Brigade and numerous ARVN units.

(5) Established and operated a rock quarry and crusher site producing 12,311 tons of various size rock.

(6) Performed necessary earthwork to include berms and firing pads for 36 fire support bases.

(7) Retrograded over 3 tons of captured enemy supplies.

(8) 103,784 CY of laterite was extracted, transported and placed on road surfaces and logistical areas.

(9) Culverts:	2008 LF Placed
Corrugated Metal Pipe 18"	376 LF
Corrugated Metal Pipe 12"	42 LF
Corrugated Metal Pipe 24"	365 LF
Corrugated Metal Pipe 36"	467 LF
Corrugated Metal Pipe 48"	498 LF
Corrugated Metal Pipe 72"	102 LF
Wooden Box Culvert 12"	86 LF
Multi-Plate Pipe Arch 5'8"	72 LF

(10) 1,800,000 gallons of water were produced by 9 water points.

(11) 3706 acres of jungle were cleared for fields of fire, opening of cache roads and denial of sanctuary areas to the enemy.

(12) Placed one 38'4" M4T6 dry span at YU022345 on Route QL-14.

(13) Placed one 170' DS Bailey Bridge w/Bailey Pier at XT097763 on Route QL-22.

(14) Placed one 100' DS Bailey Bridge at YU052473 on Route QL-14.

(15) Placed one 110' TS Bailey Bridge at XU496180 on Route 7.

(16) Placed one 110' TS Bailey Bridge at XU501193 on Route 7.

(17) Placed one 110' DS Bailey Bridge at YU051474 on Route QL-14.

(18) Constructed one 36' steel stringer bridge at XT1269 on Route QL-22.

(19) Assembled, transpoted and retrograded the following amounts of bridge materials:

Bailey Bridge:

7 ea 80' DS with 62 extra panels
4 ea complete sets

M4T6 Dry Span:

6 ea 45' Dry Spans w/Trestles
4 ea 48'4" Dry Spans w/Trestles
1 ea 75' Dry Span w/Trestle

M4T6 Float Bridge:

3 Complete Sets

(20) Maintained and upgraded 118,668 SY of airfield surface.

(21) Layed 11,778 SY of M8A1 matting on airfield surfaces.

(22) 12,132 CY of rock were hauled and placed on LOC's.

(23) 298 tons of asphaltic-cold-mix were hauled and placed as emergency patching on airfield and road surfaces.

11. ADMINISTRATION AND LOGISTICS:

a. Administration:

(1) Courier: The battalions established regular courier service from the field locations to the forward CP.

(a) 588th Engineer Battalion: Due to the nature of the area covered, the 588th Engineer Battalion was able to maintain road courier services for each location. Each individual company provided a 2½ ton truck daily to keep their unit supplied with supplies, mail, and all other necessities that were not regulary available in the field.

(b) 31st Engineer Battalion: The operational area in which 31st operated was of such nature that road contact was not possible between all elements of the battalion. Maximum utilization of aircraft was made.

(c) 62nd Engineer Battalion: All contact with elements of the 62nd Engineer Battalion was by air only.

(d) Daily aircraft was furnished from the resources of the 20th Engineer Brigade to all elements of the command for control, resupply and reconnaissance.

(2) Casualty Reporting: All casualties were reported directly to the S-1, 79th Engineer Group by the most expeditious means. They were received rapidly and with generally little or no difficulty.

(3) Chaplain: Chaplain services were generally good throughout the operation. The 588th Engineer Battalion did no have an assigned chaplain during the operation. This obstacle was overcome through cooperation between chaplains of the 20th Engineer Brigade, 79th Engineer Group, the 92nd Engineer Battalion and the 65th Engineer Battalion. With the help of these chaplains, the men in the operational area were able to attend services or speak with a chaplain several times a month.

(4) Promotion and Awards: No significant changes were made during the operation to existing procedures. Recommendations were relayed to the appropriate promotional authority. Promotion boards were held in the field to insure all eligible personnel would have equal opportunities for promotion.

(5) Pay: Class A agents payed all elements in the field. Money order and soldier's deposit facilities were available to all personnel in the field.

(6) Communication: Both land lines and radio communications were used throughout the operation. The 588th Engineer Battalion established a net control station at Katum. The net control station for 31st Engineer Battalion was located at Quan Loi. The 588th Engineer Battalion established a relay on Nui Ba Den Mountain which was utilized for direct voice communications by all elements in the western portion of the Area of Operations.

(7) MEDCAPS: The Battalion Surgeon of the 588th Engineer Battalion performed numerous MEDCAPS while in the Katum and Thien Ngon areas. On several occassions when the need for assistance became readily apparent the surgeon crossed over the border into Cambodia to assist the local poplace. A total of 720 indigeneous persons were treated at various times during the operation.

b. Rations:

(1) 588th Engineer Battalion: Resupply of rations generally posed no significant problems because of the proximity of the Tay Ninh Base Camp. Messing facilities were established at Katum Airfield and Thien Ngon Airfield and adequate facilities at other locations. While C-rations were extensively used, most individuals received one hot meal per day.

(2) 31st Engineer Battalion: No significant resupply problems occurred in the 31st Engineer Battalion's Area. The wider dispersion of elements of the 31st Engineer Battalion required more extensive use

of C-rations.

(3) Task Force Parker: For the first 8 days of field operations C-rations were used exclusively. During the period 18 May to 4 June 1970 the 512th Infantry Battalion furnished hot meals from their mess facilities. During operational missions outside the FSB, I/11 ACR furnished all rations.

(4) 60th Engineer Company (LC) (Minh Thanh - Fishhook Area): "A" rations for breakfast and supper and C-rations for the noon meal were furnished by the 25th Infantry Division during the Minh Thanh Cut and by the 11th Armored Cavalry Regiment in the Fishhook Cut.

(5) Task Froce Wright (60th Land Clearing Company): "A" rations for breakfast and supper and "C" rations for dinner were provdied by the 11th Armored Cavalry Regiment.

(6) 984th Engineer Company (LC): Rations were supplied by the security unit. Hot "A" rations were served for breakfast and evening meals each day. "C" rations were issued for the dinner meal.

c. Ammunition:

Ammunition resupply created no significant problems. Class V supply points were sufficiently close in most instances with the supported unit furnishing resupply in all other cases.

d. Uniforms and Equipment:

(1) Uniforms: No special items of uniform were issued other than that normally carried by troops in the field.

(2) Equipment: No significant shortages of equipment developed during the operation. Items of equipment not readily available from organic resources were supplied by other 20th Engineer Brigade units in a timely manner.

e. Construction Materials:

No significant shortages occurred during the operations. Rapid planning and adequate stock piling at forward areas significantly reduced reaction time. When necessary, aerial resupply was furnished by United States Air Force elements, organic aircraft of supported units and 20th Engineer Brigade aircraft.

f. Real Property Facilities:

No construction or work was performed which required real property accountability.

12. SPECIAL EQUIPMENT AND TECHNIQUES:

a. Multiple Plate Pipe Arch:

Multiplate pipe arch shelters consisting of corrugated steel sections bolted together, were used as expedient protective shelters. During the Cambodian operation extensive use was made of MPPA for expedient culvert requirements. Prefabbing and stockpiles located in the immediate tactical operation zone, permitted rapid deployment by air. The MPPA proved more effective than normal preassembled culvert for airlift due to its rigidity and weight.

b. Mine Clearing:

During the operation two M-48 tanks with front rollers were utilized for minesweep operations. These were utilizied strictly for minesweep operations with the only active armament being the M-60 and .50 caliber machine guns. The tanks were used for both road and area minesweeping. This technique proved highly successful in rapid road clearing for convoy travel and reduced the required time by approximately 50%. A single disadvantage with this technique is the possibility of driver-error. All vehicles must follow the exact trace made by the mine clearing tank.

c. Forward Stockpile Points:

Extensive use of stockpiling bridge sets/components, M8A1 matting, bridge timbers, peneprime and culvert was made. These stockpile points contributed to the success of the mission by reducing the required reaction time by 60 to 70 percent. The only problem encountered was the necessity for erecting 2, 3, or 4 bridges in the same general time frame. This was partially alleviated by airlifting required items from one site to another.

d. Preassembled Culvert:

Culvert was preassembled in 12 and 15 foot lengths at several locations within the AOR for rapid emplacement where required. This technique proved highly successful when the preassembled culvert was transported by vehicle. To date, elements of this command have not been able to overcome the aerodynamic instability of the culvert. Several sorties of culvert were lost in the jungle when lift pilots became concerned over the oscillating loads and ejected them.

e. Preassembled Bridges:

Use of M4T6 bridge supplied by air insured rapid opening of roads and minimum delays to the advancing troops. A 38'4" dry span can be lifted to a bridge site in two sorties. Assembly time for the 38'4" dry span

after arrival on site is about 45 minutes. A 75' dry span with trestle was air lifted in three CH-54 sorties.

13. COMMANDER'S ANALYSIS AND LESSONS LEARNED:

a. Rome Plow Operations:

(1) Task Force Wright (Snuol Plantation Area):

(a) Due to the small number of plows available for clearing (usually 6 or 7) and the extremely dense bamboo undergrowth encountered in this area, a varied method of cutting was used. It was quickly determined that the standard echelon-formation was not feasible. A single plow could not push over a bamboo thicket resulting in a trace too narrow and cluttered for security elements. An effective alternative was developed by sending the lead plow approximately 50-100 meters into the jungle on a desired azimuth with the remaining plows splitting up and simultaneously pushing to the left and right. Once the direction of the cut was determined, the lead plow rejoined the pack. When the point of deepest penetration was reached, then the entire process was repeated. This method allowed the plows to double and triple up for removing the bamboo, and left a 30-40 meter wide corridor completely free of downed trees and debris. While this slowed the cutting and reduced the number of acres of production per day, it had the advantage of giving the security a much wider route and faster reaction time.

(b) Deeper penetration of enemy sanctuaries, the cutting formation and increased enemy contact, made it necessary to reevaluate and change the cutting methods.

After initial enemy contact, it was evident that the security's reaction time was excessive. The plows were required to clear the cut before the track vehicles could move forward to engage the enemy.

The security elements divided its forces and sent elements into the jungle 50-100 meters ahead of and on both flanks of the plows. They also kept another element to the rear of the plows. This method proved highly effective as potential ambushes were broken up and the plows were given maximum protection. This method also proved to be extremely slow as the security vehicles encountered considerable diffulty in traveling through the jungle.

(c) A third method was developed and followed for the duration of the Snuol area cut. Here, the security would recon by fire at random intervals of 5 to 45 minutes apart. Also, on the way to the cut area in the morning, and on the return march at night, the plows would cut small chunks of jungle, and the security vehicles would move to the front, middle and rear with the plows moving to the center at random intervals.

At this time the security would recon by fire to the front and flanks. This method combined with the chunk style of cutting proved to be the most effective as no contact was made with enemy forces.

(2) "Automatic Ambushes": Automatic ambushes proved to be a very effective means of protecting cutting elements, both in the working cut and in the NDP. The attached security units would set out "automatic ambushes" (trip wire across trail connected to a battery and a bank of five or six claymores) at the completion of the day's cutting. While this proved extremely effective in reducing enemy activity in the area, it also involved the loss of time in the next cutting day as those which had not been activited during the night would have to be cleared from the area. This proved to be a delicate and time consuming task requiring approximately 2½ to 3 hours per day. However, the results in terms of security and reduction of casualties far outweighed the loss of cut acreage.

(3) Small Size Task Forces: During this operation small size Rome Plow Task Forces were used for the first time since the inception of the Land Clearing Battalion. The use of Rome Plows in platoon size, or smaller elements is an effective tool for probing areas and providing tactical avenues for armored units trying to reach a key position in heavy jungle. In addition the capability to build pioneer roads suitable for heavy trucks was proven during the operation. The use of small size units of Rome Plows must be balanced very carefully against the objective to insure that unnecessary splintering of operational forces does not occur. The land clearing company as a whole performs more effectively and usefully than the sum of the attached units. Problems develop in the area of maintenance, repair parts resupply, and total acreage cut. Land clearing companies should never be split into smaller elements unless it is a very clear tactical necessity to accomplish the assigned mission.

b. <u>FSB Planning</u>:

While it is realized that the location of fire support bases for heavy artillery units is predicated on the tactical unit, it is felt that they should be more closely coordinated with the local engineer commander on the ground. This will insure the selection of suitable ground areas and allow sufficient time to construct an operational fire base prior to the unit moving to the site. This is particularly important during the rainy season where the difference in location of as little as 400 or 500 yards can delay a project for a considerable period due to soil instability. The local engineer commander on the ground should also be consulted as early as possible before a contemplated move is begun. Engineer efficiency is reduced by over 50% if roads and gun pads are constructed after the artillery is in place.

c. Use of Cold Mix Asphalt for Repairs:

The use of cold mix asphaltic concrete proved to be a very effective means of rapid repair for potholes in airfield surfaces. Cold mix asphalt prepared by the 159th Engineer Group was used in several locations. A great deal of caution must be used in mixing and handling cold mix asphalt during the rainy season. All aggregate utilized must be throughly dried prior to production of the cold mix and covered while being transported.

d. Depot Pack Bridging:

The 79th Engineer Company (BP) drew all bridging from stockpiles and prepared it for forward movement. In most cases this entailed removing from depot pack, preparing combat loads and moving it to the final stockpile location. When it was not possible to remove it from depot pack, it was shipped intact. A review of this practice shows that it is highly undesirable (i.e., Components are often missing from the packages). It is recommended that in future operations of this nature, all bridging be unpacked and combat loaded.

e. Repair Parts:

During the operation, repair parts for some items of equipment were critical at various times. However, they posed no hazard to the operation as the supporting and organic maintenance personnel exerted every effort to locate and obtain parts.

14. CONCLUSIONS:

a. Although initial information concerning the operation was rather sketchy, the engineer elements reacted rapidly. The initial warning order for the operation (Inclosure 1) did not furnish the nature of the operation or the materials required.

As the situation developed, rapid stockpiling of bridge supplies and materials were undertaken. Transporation became a critical problem because of the large amount of materials requiring movement, and the continuous relocation of units and their elements. Considerable assistance was furnished by the 20th Engineer Brigade for additional transportation requirements.

b. Security provided by the 11th Armored Cavalry Regiment for most of our land clearing elements was outstanding.

c. Elements of the 92nd Engineer Battalion and the 67th Engineer Company (DT) provided outstanding assistance in the completion of the mission. They reacted rapidly to all situations and gave unstintingly of their time and effort.

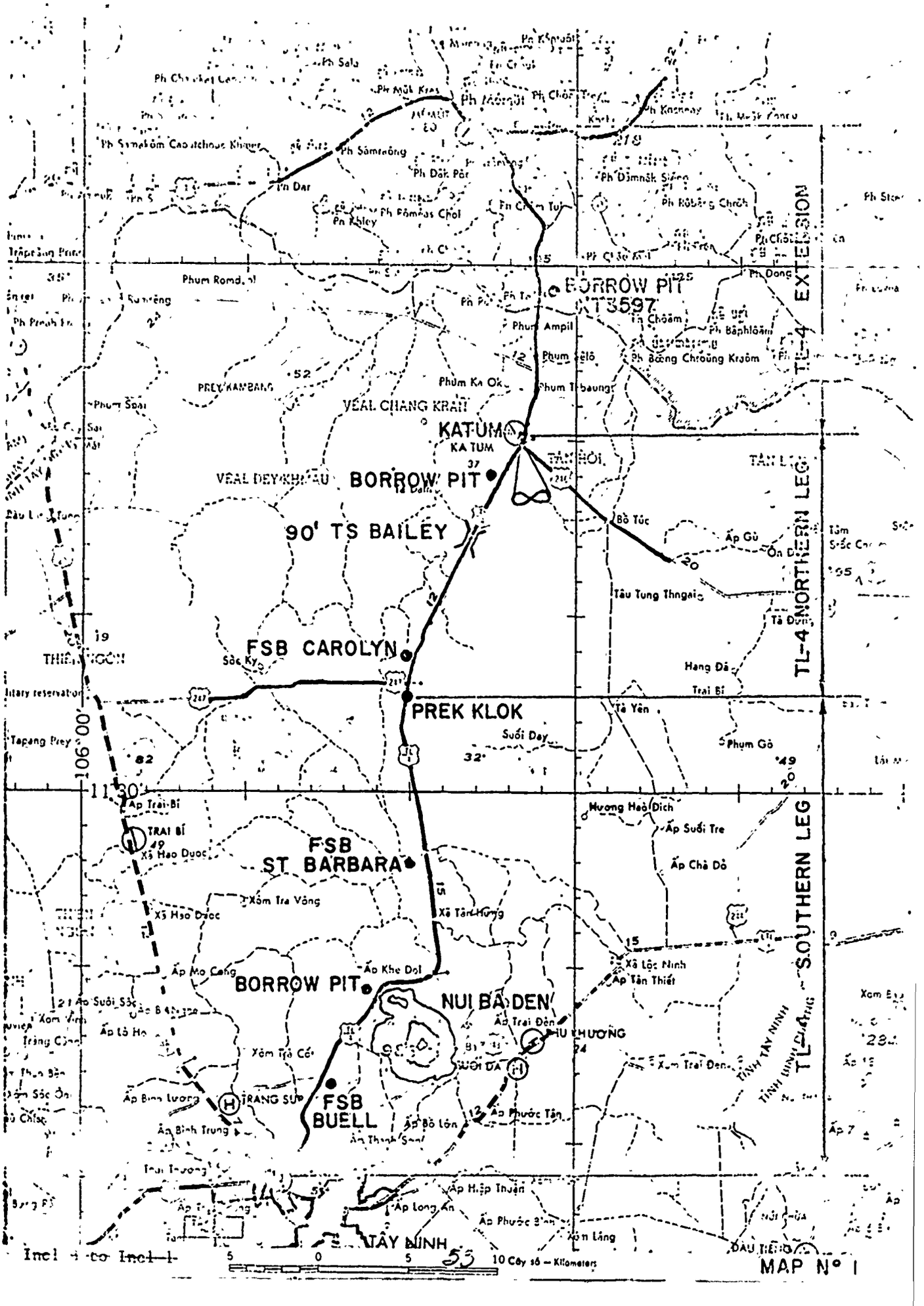
d. Communications equipment, systems and coordination require some improvement. In many cases land lines were of little or no use in direct communication. However, in most cases voice and teletype radio communication were established without delay. The 588th Engineer Battalion operated a relay point on Nui Ba Den Mountain which assisted in communications in the western half of the Area of Operations.

e. In all future operations of this nature the Group Commander of the Engineer Unit providing the support should be read into the overall plan as early as possible in order to insure that his resources can be adequately distributed and utilized.

f. All elements of this command exerted the maximum available effort in making this operation successful and once again proved the versatility and flexibility of the engineer troop units in tactical operations.

ERNEST J. DENZ
Colonel, CE
Commanding

8 Incl
as
Incl 1 & 2 wd HQ DA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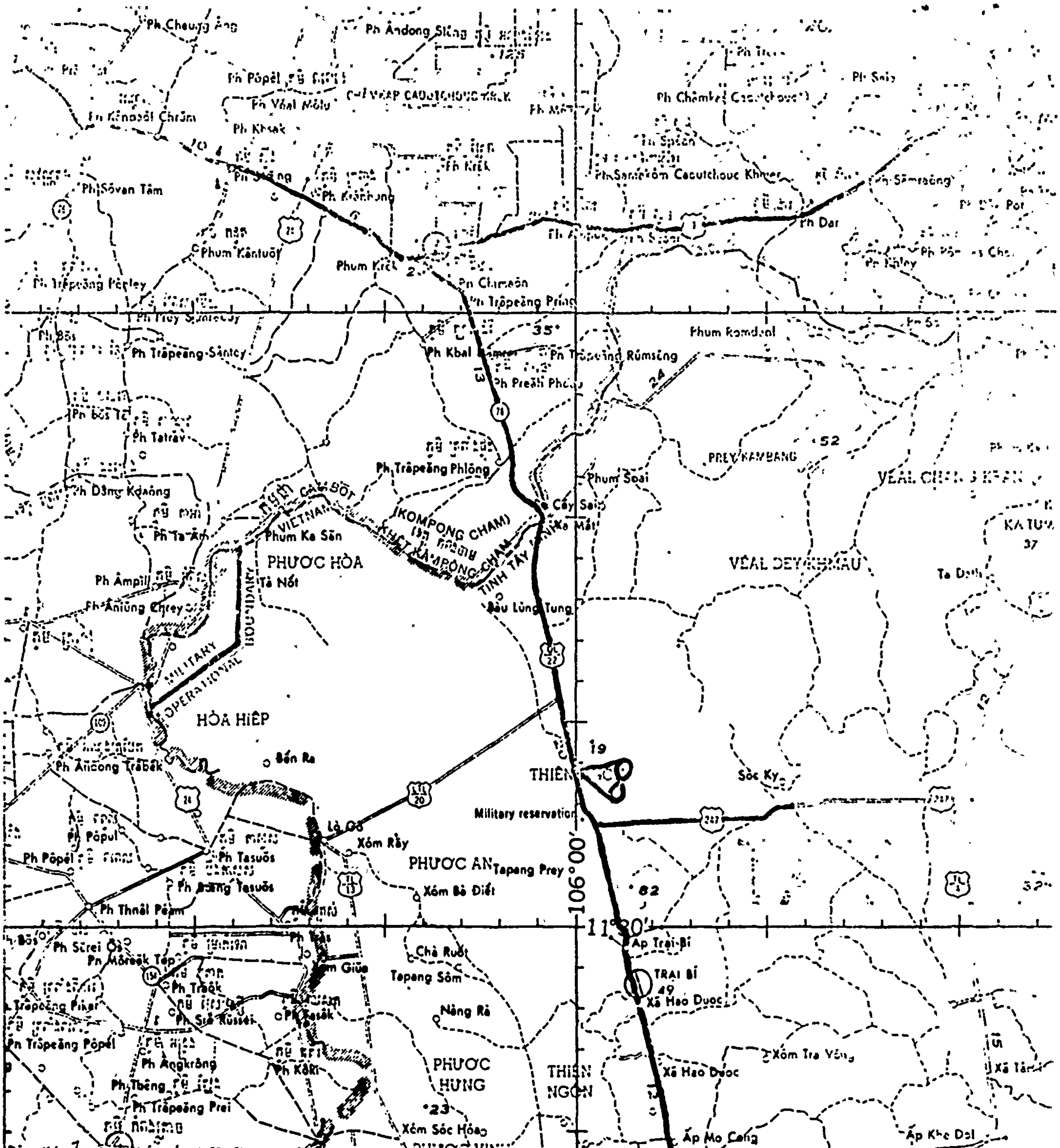

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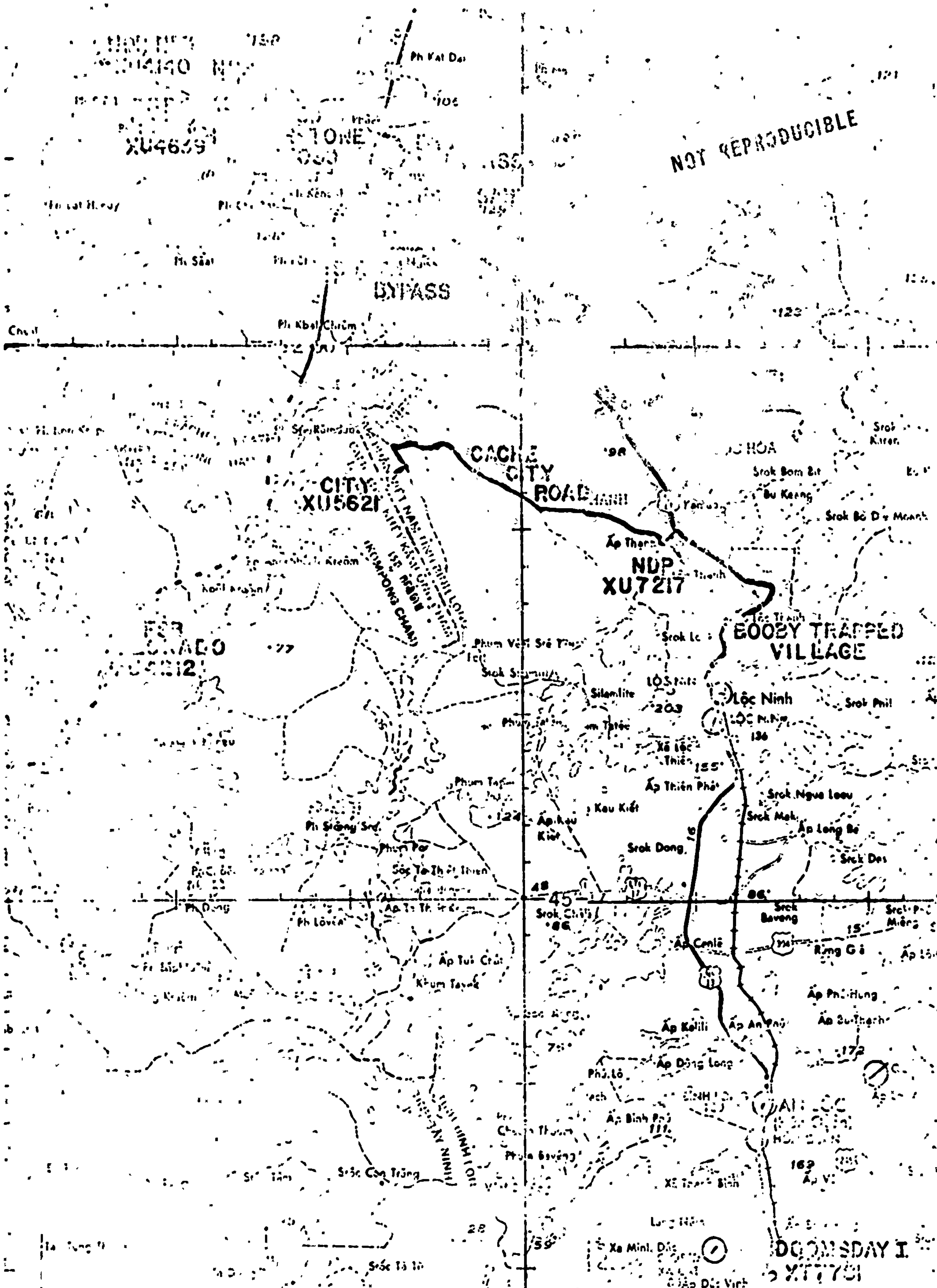
MAP Nº 2



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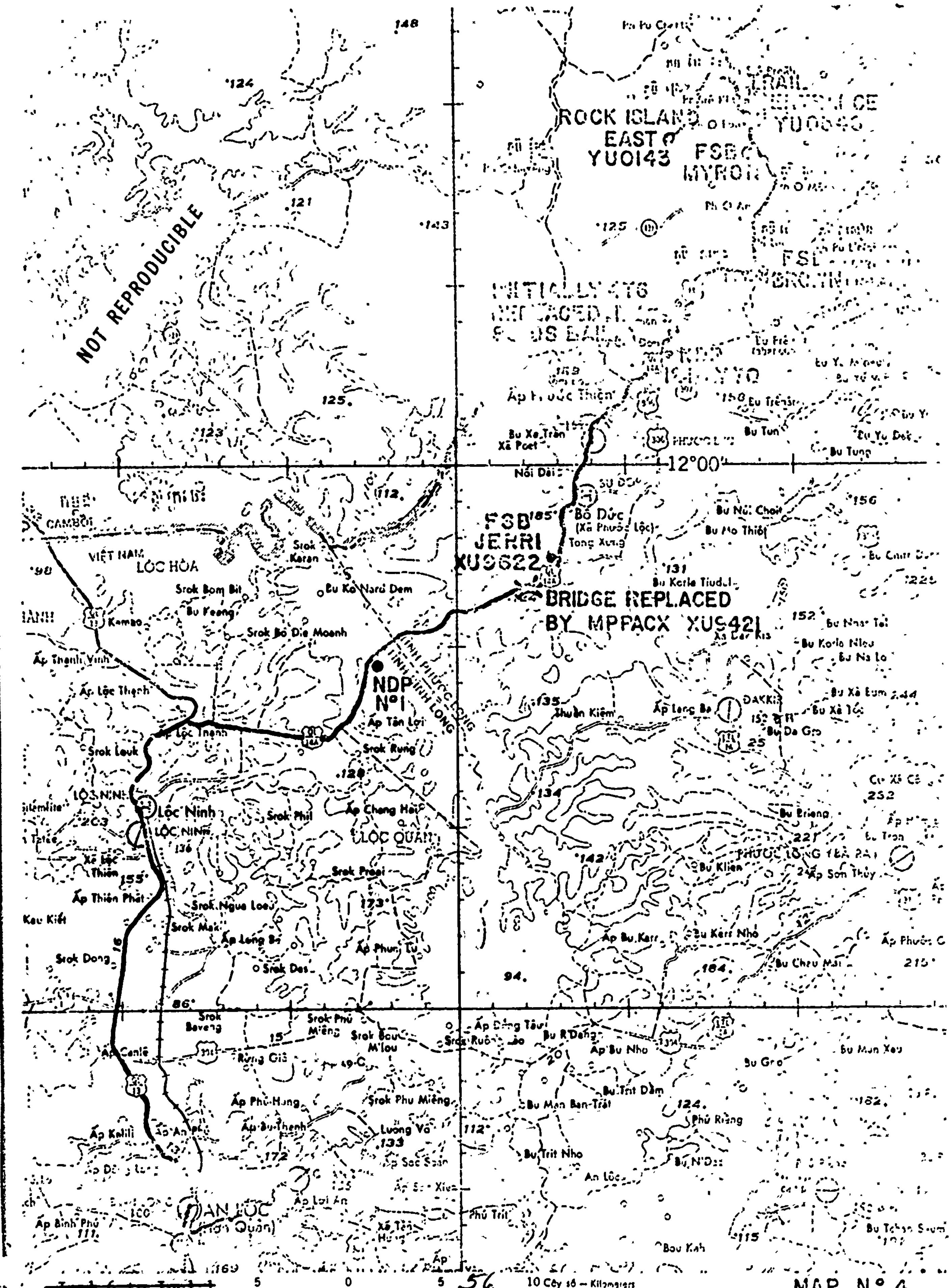
MAP N° 3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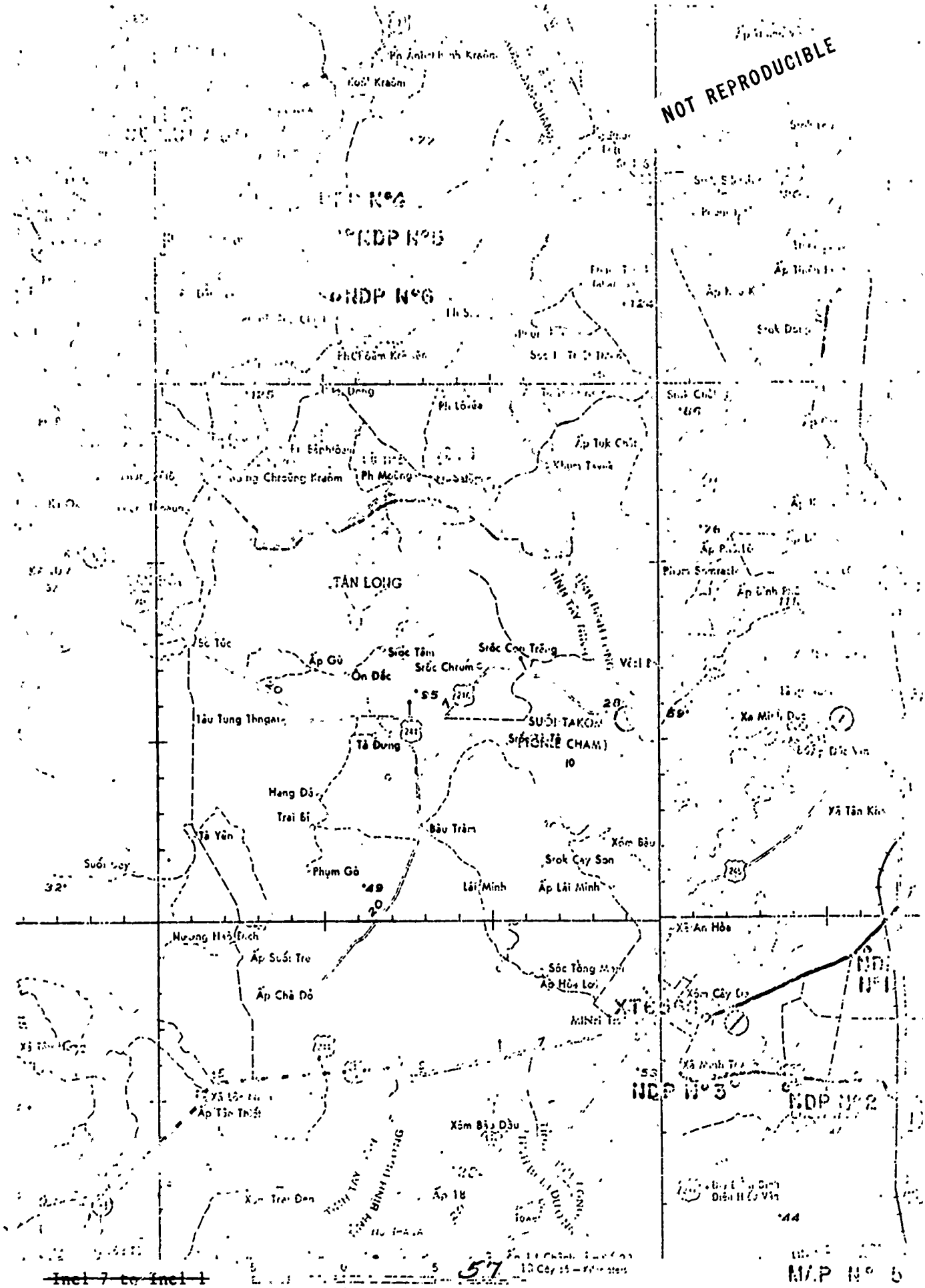
MAP N° 4



DEPARTMENT OF THE ARMY
HEADQUARTERS 62D ENGINEER BATTALION
APO San Francisco 96491

EGEB-3 16 July 1970

SUBJECT: Lessons Learned in Preventing Casualties as a Result of the Cambodian Operation.

THRU: Commanding Officer
79th Engineer Group
ATTN: EGE-3
APO SF 96491

TO: Commanding Officer
20th Engineer Brigade
ATTN: AVBI-3

1. Reference: Unclassified Message 13034 EGE-3, 7 July 70, Subject: Losses To Land Clearing Company of 20th Engr Bde.

2. Operations of the 60th and 984th Land Clearing Com anies in Cambodia emphasized the tactical aspect of Rome Plow operations. In addition, the independent operation of platoons illustrated the value of small land clearing teams in the probing of suspected bunker or cache areas, and the preparation of pioneer roads for armor and trucks to evacuate captured enemy supplies. The purpose of this study is to explain what procedures were adopted to offset the intense enemy resistance and resulting casualties and what lessons were learned from the mission requirements of the Cambodian Operation.

a. Nature of enemy resistance: Intelligence reports indicated that the 165th and 209th NVA Regiments were operating in the region of the Fish Hook cut by the 60th and 984th. Furthermore these regiments were the strongest and best equipped units the NVA had in the area. Most of their efforts were delaying tactics to prevent access to their major cache areas, performed with team size ambush elements. The enemy never engaged in a sustained contact with the elements in the cut. The RPG was the most damaging weapon employed by the NVA in these contacts. Although the contact was broken almost as soon as security returned fire the enemy did not hesitate to position himself close to the armor column and make several (a maximum seven) contacts, in one day. The NVA operating in this area were the most adept utilizers of the RPG the 60th and 984th have received to date. In many cases the RPG was placed precisely in the cab of a plow. The enemy was also capable of damaging indirect and direct fire

~~Incl 8 to Incl 1~~ 58

attacks on the NDP. Although the 60th LCC was never hit in the NDP, the 984th suffered the majority of its casualties (3 KIA and WIA in one attack) while in the NDP.

b. Nature of the mission: The 4 elements of the 62nd Engineer Battalion that operated in Cambodia(Task Force Wright, Task Force Parker, 60th LCC and the 984th LCC) were essentially in the common mission of providing an avenue into suspected enemy supply areas, that could be traversed by armor and easily observed from the air. The very nature of the mission cutting into the heart of NVA bunker and cache complexes, provides some answer to the questioning of increased casualties, taken by the units.

c. Techniques employed to secure the cutting operation:

(1) Platoon size operation: The task force leaders of the 60th operations and their respective security Troop Commanders of the 11 ACR employed techniques that proved successful in preventing serious casualties while in the cut.

(a) The fire and cut method: In addition to reconnadsance by fire to and from cutting area, it was found that cutting for a random (15 to 45 min) period followed by a saturation by fire of the area being cut, and immediate resumption of cutting was effective in preventing the enemy from setting up ahead of the plows. The drawback to this method is the time required to halt the cut and have the security move into position for firing and then regrouping again for the cut. Ten minutes per cutting hour was lost in this method, however, the time lost proved worth the security gained.

(b) Use of armored vehicles as point vehicles: In light jungle, or when a trail was being followed, armored vehicles were placed ahead of the lead plow to locate trouble spots and trip suspected ambushes. Furthermore, in some instances armored vehicles were placed well to both flanks of the plows in the cut. Again, the major consideration is the type of jungle.

(c) The "Wedge": The platoon size operations (Task Force Parker & Wright) found it useful in some instances to avoid the standard echelon formation used in normal land clearing. The wedge was found to be an ideal formation when a small width cut was desired and only 4 to 5 plows were employed. The echelon is suitable for securing one flank and cutting a trace, however, in operations where a small avenue is needed to reach enemy strong holds, the echelon is not a secure formation. The lows in the lead do not receive adequate protection if hit since only one security vehicle is able to react. In addition, the security vehicles cannot easily manevuer over fallen trees to reach the exposed flank of the echelon formation, since security vehicles travel a path provided by

a bull bleade. By placing plows in the wedge formation, more fire power concentration is available to each plow and the distance to the extreme flanks is greatly reduced. The wedge is not as efficient in clearing jungle as the echelon, but when operating with 4 to 5 plows on a probing manevuer it is decidely more secure.

(2) Company size operations:

(a) The system used in performing the cuts was the construction of a series of rays extending from the NDP. In cutting into cache areas it was found that 10 plows were capable of providing a sufficiently cleared path, while being a suitable number of vehicles to secure. Two Cav Troops could have easily been supported, and significantly increased the production of cache finds and land clearing had more security been available.

(b) It was found that leaving a probe cut unfinished, that is not reaching the objective in one day, nearly always resulted in enemy contact the following day as the cut was resumed where the previous day's had ended. To preclude this problem the plows by passed all large trees and cut as quickly as possible. This enabled the element to complete the mission within 7 - 9 hours.

(c) In platoon and company size Rome Plow operations reconnaisance by fire proved to be a main enemy deterrent. This cannot be done while in the cut, however, in moving to and from the cutting area, which proved to be the most vulnerable time, reconnaisance by fire was employed with much success.

* The requirement of flak jacket and steel pot has not been mentioned in the tactical discussion, however, it should be noted that all operators wore flak jackets and steel pots in the Cambodian operation. This SOP saved severe casualties and lives in several instances.

d. The Night Defensive Position:

(1) The 9E4th received the greater number of casualties of the two Rome Plow companies operating in Cambodia. Most of these casualties were a result of indirect fire on the NDP. On the night of which 3 men were killed and 18 were wounded, the first few incoming rounds took the greatest toll. The NDP, the 9E4th moved into on the day of the heavy indirect fire had been prepared the day before for use by another Cav Troop. The security moved to this NDP because intelligence reports indicated that their present NDP was to be hit by a concentrated enemy effort and the Cav Troop who was going to use it had a change of plans. The move may have prevented losses in one area, however, moving into a position completed a day prior to use could have provided the NVA time to coordinate

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SUBJECT: Lessons Learned in Preventing Casualties as a result of the Cambodian Operation

the indirect fire which resulted in the most casualties of any day in C Cambodia by this unit. The 984th had no alternative to moving into previously prepared NDP since the security directed the operation, however, in the future it is recommended that if a move is required it should be to an area where a new NDP must be established rather than an area where work was done previously to prepare a defensive position.

(2) As soon as a new NDP is established the construction of overhead cover must begin. If it is dark before "digging in" can be initiated and tactical requirements are such that noise and light discipline must be enforced personnel should be told to sleep under dozers or heavy equipment. The 60th LCC followed this procedure where digging in was not possible because of the time factor. Although not as comfortable as a bunker, the dozer provides adequate protection to personnel sleeping under it.

3. The employment of mechanical or "automatic" ambushes was successful in preventing ground probes to the NDP. Troop Commanders differ on methods of using these devices, however, each method provided an efficient deterrent to enemy ground forces attempting to approach the NDP.

FOR THE COMMANDER:

s/Richard O. Miller
t/RICHARD O. MILLER
1LT, CE
Adjutant

A TRUE COPY

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Cpt, CE
Asst S-3
79th Engr Gp

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