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AGO, d/a ltr, 29 Apr 1980

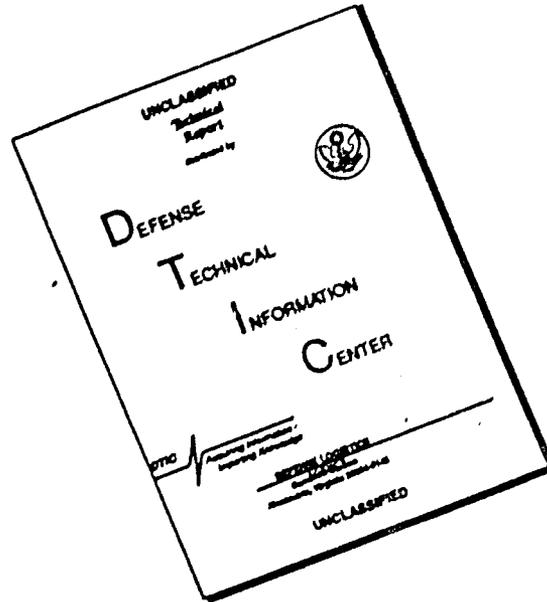
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IN REPLY REFER TO

AGAM-P (M) (2 Aug 68) FOR OT RD 682199 15 August 1968

SUBJECT: Operational Report - Lessons Learned, Headquarters, 87th Engineer Battalion, Period Ending 30 April 1968 (U)

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

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, 87TH ENGINEER BATTALION (CONSTRUCTION)  
APO 96312

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Period Ending 30 April 1968, RCS CSFOR-65(RL)

THRU: Commanding Officer  
35th Engineer Group (Construction)  
APO 96238

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

Commanding General  
United States Army, Vietnam  
ATTN: AVHGC(DST)  
APO 96307

Commander in Chief  
United States Army, Pacific  
ATTN: GPOF-DT  
APO 96588

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

## SECTION 1, Operations: Significant Activities.

1. Command: LTC Charles J. Fiala was in command of the battalion during the report period.
2. Personnel, Administration, Morale, Discipline:
  - a. The total authorized enlisted strength of the battalion and its

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attached units is 1,308. As of 30 April the assigned strength was 1,136 for an 87% fill. Replacements are not matching losses and with a rotational hump forthcoming in the period May-August there will be a decrease in effectiveness unless the number of replacements is increased. Of the total authorized officer strength of 49 there are 41 assigned as of 30 April. Anticipated losses in next 90 days are 10 officers. There are no known gains at present.

b. Critical MOS Shortages:

<u>Title</u>	<u>MOS</u>	<u>Auth</u>	<u>Asg</u>	<u>Short</u>
Machinist	44E20	7	4	3
Structures Spec	51C30	14	7	7
Const Foreman (E6)	51H40	23	9	14
Electrician	52F20	41	12	29
Const Mach Op	62E30	21	6	15
Powderman	62G30	8	1	7
Hvy Veh Dvr	64B20	96	57	38
Divers Apprentice	00B10	3	0	3
Quarryman	62G30	37	31	6

c. There have been no serious disciplinary problems in the command. An increase in the number of Class II offenses was expected as the overall strength increased with the attachment of two separate companies and two platoons.

d. Morale and attendance at religious activities remained high during the period. The observation in this unit's previous ORLL concerning the increase in morale of units stationed off the Cam Ranh Peninsula remains valid.

3. Intelligence and Counterintelligence: As a result of the expansion of this Battalion's AOR and the TET offensive, many incidents of enemy activity were encountered. The majority of these were mortar and small arms harassment fire upon Cam Ly Airfield, Dalat. A vigorous program for reporting, recording and disseminating intelligence information was activated. Additional sources of intelligence for Dalat, Phan Rang and Phan Thiet were obtained in order to develop an overall intelligence picture for the Battalion's AOR. In the CRB area, 4 to 5 reconnaissance patrols per month continue to be dispatched by this Headquarters throughout selected zones of the peninsula as designated by Sub-Area Command. These patrols operate in the more remote areas of the peninsula in order to detect possible enemy activity and/or signs of infiltration.

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4. Plans, Operations and Training:

a. The battalion performed construction operations for a total of 82 days during the period and conducted training for 7 days.

b. During this quarter the battalion's capabilities were increased with the addition of three (3) companies and two (2) platoons. On 19 February 1968, Company D, 27th Engineer Battalion (Cbt) was placed under the operational control of the battalion. At the same time a platoon of the 572nd Engineer Company (LE) was attached and further attached to Company B, stationed in Phan Rang. This platoon returned to its parent unit in April 1968. Company D, 27th Engineer Battalion (Cbt) is located in Phan Thiet providing Engineer support for 3/506th Infantry, 101st Airborne Brigade, during Operation McClain. On 15 March 1968, the 497th Engineer Company (PC) and the 610th Engineer Company (CS) were attached to the battalion. A platoon of the 643rd Engineer Company (PL)(CS) had been attached to the 497th and so remained when the company was attached to the battalion. Both of these latter two companies have their headquarters in Cam Ranh although elements are sent away from the Peninsula on a mission basis.

c. With the relocation of 35th Engineer Group (Construction) in March 1968, and the change in various areas of responsibility the battalion's AOR was increased to cover an area of approximately 6,500 square miles. Active projects were in Cam Ranh, Ba Ngoi to Phan Rang, Dalat, Lang Bian Mountain, Phan Thiet and Gia Nghia.

d. The following major projects were under construction during the period:

(1) Operational Support-Operation McClain: Company D, 27th Engineer Battalion (Cbt), from its base camp in Phan Thiet, provided engineer support to 3/506th Infantry in the general area bounded by Phan Rang-Phan Thiet-Bao Loc-Duc Trong. Included in this area are the airfields at Bao Loc and Phan Thiet plus portions of highways QL-1, QL-11, QL-20 and QL-21A. The company provided engineer support by conducting hasty and deliberate reconnaissance of all primary LOC's. In addition, numerous destroyed bridges were bypassed and/or repaired with culvert and heavy timbers. Minesweeping and clearing operations were conducted which resulted in the detection and destruction or removal of 3 mines. Roads were cleared of 92 timber, earth, and roadblocks and 151 cuts were backfilled. Six (6) damaged and/or destroyed structures were rebuilt for the 3/506th and other support units. 1,150 meters of berms, 2,000 meters of security fences, mines and trip flares were installed on the perimeter of LZ Betty. 26 aircraft revetments to include 4 with 23' x 54' M8A1 holipads were constructed and work is continuing on six (6) additional revetments. The company provided water support to 3/506th and other support units by producing 413,549 gallons of potable during this period.

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(2) 200,000 BBL Air Force Tank Farm: Construction of the first of four welded steel tanks commenced on 8 March 1968. To date Tank #1 is complete except for the swing line, tank drain, and 15% of the welding. On Tank #2, the base plate and three of the four rings have been constructed. Two and one-half miles of 3 each 12" coupled POL lines have been laid from the Marine Terminal facility Tank Farm #3 (See item 3). This is a joint Army/Air Force project and the 555 Civil Engineer Squad (Red Horse) has performed a portion of the earthwork to include the preparation of the crushed rock tank pads. At present all materials necessary to complete the tanks are not on hand. However, they are reported to be enroute from CONUS. To date 13,872 man-hours have been expended on this project.

(3) 200,000 BBL Tank Farm and Marine Terminal Facility: On 18 February 1968, work was completed on the four Army 50,000 BBL welded steel POL tanks in Tank Farm #3. The tanks have since been tested by filling them with sea water with some minor leaks detected and repaired. A total of 20,150 pounds of welding rod was used in constructing this facility. The berms were reshaped and the road network on top of the berms was completed; 1,000 cubic yards of 2"(-) rock and 2,500 cubic yards of crusher tailings were used for this phase of construction. Remaining work includes the erection of a 20' x 48' quonset building and stabilizing the berms with peneprimo. The 7,000 BPH centrifugal pump, "Tiny Tim", arrived at CRB in March and was manifolded into the three 12-inch pipelines that connect the T-5 Jetty and the tank farm, a distance of 4.5 miles. A temporary mooring system consisting of four riser type buoys has been installed allowing T-5 tankers to moor to the jetty. Permanent dolphins are being designed and are programmed for future construction. In addition, 60% of a 4-mile, 6-inch pipe line between the T-5 jetty and the US Naval Facilities, Market Time; a 3,000 BBL tank for black oil; and a 500 BBL tank providing fuel supply for "Tiny Tim" have been constructed this period.

(4) Dalat Airfield: During this reporting period the 4,700' x 60' airfield started last period was completed. Construction accomplished this period included 30,000 cubic yards of soil moved during cut and fill operations. The sub-base was compacted to a CBR of 28 after which 7,456 cubic yards of 3"(-) base course was placed and compacted to a CBR of 80. The DBST required 1,346 cubic yards of 3/4"(-) and 3/8"(-) rock and 35,000 gallons of asphalt. Construction during this period was hampered on several occasions by heavy enemy activity in the Dalat area during the TLT offensive. Subsequent to that period there have been numerous harassing incidents of mortar fire and small arms fire. For security reasons the troops living on the airfield moved into bunkers during the last month of this quarter. Work was further hampered by the onset of the annual monsoon. The runway and related facilities were approximately 98% completed at the end of this period with an expenditure of 24,560 man-hours and 9,100 equipment-hours.

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(5) Quarry Operations, Dalat: The Quarry Platoon of the 610th Engineer Company (CS) was attached to Company C for the purpose of supporting the airfield construction. The platoon developed and operated the quarry achieving the following production during the period:

Blast Rock.....	17,950 cu. yds.
3"(-).....	12,673 cu. yds.
3/4"(-).....	3,200 cu. yds.
3/8"(-).....	451 cu. yds.
Fines.....	3,200 cu. yds.

This material was used in the construction of the Cam Ly Airfield, the access road for Lang Bian Mountain, concrete aggregate for the Vietnamese Military Academy and miscellaneous other commitments. Finishing this task the last week in April the platoon, less drilling personnel transferred to the Ba Ngoi Quarry, has returned to Cam Ranh to prepare its equipment for use in the Ba Ngoi Quarry when the battalion assumes full responsibility for its operation in May 1968.

(6) Lang Bian Mountain Access Road: Late in February, improvement of the final mile of the four (4) mile access road to the Signal Site on top of Lang Bian Mountain was begun. The existing road, with an average grade of 7%, was realigned with the movement of 4,600 cubic yards of earth. To provide drainage structures the constructing platoon used 460 feet of 36", 325 feet of 48" and 160 feet of 24" Corrugated Metal Pipe (CMP) complete with sandbag headwalls. Some 4,200 linear feet of the road was stabilized by the use of cement which was mixed into the soil using a disc harrow mounted on a 3/4 ton truck (see Section 2, para. 2.2). To date this has consumed some 3,800 bags of cement. Base course work is presently in progress with 2,000 cubic yards of 3"(-) rock in place, hauled from the Dalat Quarry by Army trucks and a civilian contractor.

(7) Quarry Operations, Cam Ranh Bay: During the reporting period numerous failures of components of the 225 TPH crushing and screening plant reduced the rock production of this unit. Engines on three (3) of the four (4) components as well as four (4) electric conveyor motors had to be replaced due to adverse effects of heat and dust. To reduce reoccurrences of these breakdowns, all electric motors have been painted with reflective aluminum paint and all engines are washed daily. Non-availability of track drills and a shortage of repair parts reduced drilling capabilities by 50%. Some shaped charges and composition C-4 were used to supplement normal drilling and blasting. This produced a large amount of blast rock but required secondary drilling and blasting of the oversize rocks. The size and amount of crushed rock produced during this reporting period are as follows:

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Blast Rock	11,700 cu. yds.
3"(-)	16,500 cu. yds.
2"(-)	5,200 cu. yds.
3/4"(-)	6,400 cu. yds.
Fines	5,100 cu. yds.
Decomposed Granite	2,200 cu. yds.

(8) Ammunition Area "C", Cam Ranh Bay: Phase II of this project was completed with the exception of minor deficiencies. Notable progress during the period included the movement of 255,270 cubic yards of sand, placing of four storage pads made with M8A1 steel matting and the construction of 6,205 feet of two-lane sand cement road. A total of 2,300 tons of asphalt were used to surface 9,275 linear feet of the 24 foot wide roadway. Total man-hours and equipment-hours expended were 25,520 and 21,000 respectively.

(9) QL-1 Up-Grading: On 1 February 1968, one company of the Battalion began the upgrading of QL-1 from Ba Ngoi to the Kien Kien River (BP 977174 - BN 893948). To date 176,400 cubic yards of fill material have been hauled, compacted and shaped to a rough subgrade from the Kien Kien north five (5) KM. In addition one (1) KM of roadway was raised and widened to MACV standards from BP 949141 to BP 957161 with 26,000 cubic yards of select fill. 1,663,000 gallons of water have been used for road fill compaction and dust control. Nineteen (19) drainage structures have been placed and backfilled using 1,372 LF of CMP. Thus far, 52,900 man-hours and 34,400 equipment-hours have been expended for construction. In addition, 7,200 man-hours were required for work site security. The 203rd ARVN Engineer Battalion (CBT) completed four of the six class 35/50 bridges started last quarter. The remaining two bridges are scheduled for completion in May.

(10) Pontoon Pier Extension: Three Ammi pontoons were installed at Market Time naval facility at Cam Ranh Bay to serve as extensions to two floating piers already in service. The pontoons were secured by driving four 18" circular steel pile through casings built into the barge and by chain connectors on the ends of the barges. This project is complete and the piers are in use.

(11) Repair of Bolted Steel Tank: Elements of the 3rd Platoon, 643rd Engineer Company (PL)(CS) disassembled, cleaned and reassembled a 10,000 barrel bolted steel POL tank in Tank Farm #2, CRB. The task consumed 7,200 man-hours and is complete.

(12) Dracone Mooring System: The 497th Engineer Company (PC) constructed a mooring system for a "Dunlop" Dracone in the harbor at Phan Thiet. The Dracone is a floating rubber bladder capable of holding 90,000 gallons of fuel. It can be towed by a vessel into shallow water ports. The anchorage system consisted of 12 timber piles, an 8,300 pound anchor block with three (3) 1,500 pound anchors, and a buoy.

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(13) My Ca Bridge Checkpoint: A military police check point and associated security facilities were constructed for the recently finished permanent bridge connecting the mainland with the Cam Ranh Peninsula. The scope of work included 680 square feet of wood floor for five (5) tant frames, two each 15-aisle covered check points, four (4) guard huts, ten (10) bunkers, two (2) latrines (burn-out type), 15,600 feet of triple concertina barbed wire and 4,000 square feet of single surface treatment roads. In addition, catwalks were constructed on the six bridge piers for the anti-swimmer guards. In the future a barrier against swimmers will be constructed around each pier pending the approval of the design.

(14) Scout Dog Kennels: Construction was completed on the 120 unit Scout Dog Kennels. Work done during the period included two (2) each 27' x 30' kennels (10 units each), one (1) each 30' x 65' hospital, one (1) each 250 barrel elevated water tank and 1,430 linear feet of chain link security fence. 540 cubic yards of crusher tailings were placed and compacted on the access road and parking lot. This kennel complex is in full operation and is presently providing training, housing and hospital facilities for sentry dogs from throughout the II Corps Tactical Zone.

(15) Asphalt Plant, Cam Ranh Bay: The 610th Engineer Company (CS) continues to operate its TOE asphalt plant with the responsibility of supplying hot mix asphalt for the Cam Ranh-Dong Ba Thin area. The unit's major project is the paving of highway QL-1 north from Dong Ba Thin. A total of 8,135 tons of asphalt were placed to surface 34,030 linear feet of road during this period. In addition, the unit placed 2,300 tons of asphalt over 18,550 linear feet of road in Ammunition Area "C". Various other minor projects consumed 2,200 tons for a total production of 12,635 tons of asphalt.

(16) LST Ramp Complex: The 420 foot sheet pile bulkhead and the back filling for this project were started and completed this quarter. 14,260 cubic yards of select fill and 3,440 cubic yards of red sand were required to fill and stabilize the surface behind the bulkhead. The exposed side slopes were rip-raped with 300 cubic yards of blast rock. A 12 pile steel mooring dolphin with concrete cap was completed and work has been initiated on both of the inclined ramps. Two 12 pile timber dolphins were installed for use with spring lines from the vessels moored on the ramps.

5. Logistics: The problems of supplying the various companies of the battalion were intensified during the period. This was particularly true in the case of Company C at Dalat and Company D, 27th Engineer Battalion (Cbt), at Phan Thiet. The latter unit's problems were the lesser of the two inasmuch as its mission of operational support insured a higher priority for materials shipment. For the unit at Dalat the problems were of the same or increased difficulty as noted in this unit's previous ORLL. The Class I forward supply point envisioned by the 1st Logistical units never materialized. The procedures reported in Section II, Part 1, para. 5.b., page 14, of the ORLL for

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the period ending 31 January 1968, continued to be used with varying degrees of success. Transportation of construction materials and repair parts was also difficult. On several occasions the battalion was forced to mount a special convoy solely for the purpose of delivering needed materials, thus consuming valuable engineer assets on a transportation mission. With the anticipated return of most of Company C to Cam Ranh in the next month this problem will be somewhat alleviated for the battalion

6. Force Development: None

7. Command Management: None

8. Inspector General: None

9. Information: The Battalion Public Information Office submitted a total of 18 feature stories, 253 hometown news releases and 20 photographs of construction projects and other newsworthy items.

10. Civic Affairs:

a. The most significant work accomplished during this reporting period was the assistance provided to the Vietnamese during and after the TET offensive throughout the Battalion's area of operation. In Phan Thiet, 22,500 square meters of native housing (destroyed by enemy action) was cleared by the removal of 700 cubic yards of rubble. Potable water was provided to the city and a dozer worked at the sanitary fill in order to minimize the spread of disease. In Dalat, dozers cleared and removed 2,500 cubic yards of debris. Assistance was provided for the disposal of unexploded 60 mm and 80 mm mortars, misfired rockets and unexploded grenades, 500 lb. bombs and 750 lb. bombs. 500 lbs. of food consisting of meat, milk, fruit, and vegetables were donated to refugees from Ban Me Thout seeking help through the My Ca Monastery. A total of 4,880 bags of partially hydrated cement was distributed to MACV advisory and other military units throughout the Battalion AOR for the rebuilding of schools, churches and other public facilities.

b. The 497th Company (PC), attached to the 87th, constructed a vitally needed fishing pier for the people of the island of Binh Ba. The pier is 220 feet long and has a 50 foot T-head.

c. An access road 1 KM long was constructed from the village of Ap Ka Rem (near Phan Rang) to QL-1. This village was previously isolated during the monsoon season. 2,200 cubic meters of fill were used in elevating the existing road and providing a wearing surface for local traffic.

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d. Panels and trusses were prefabricated and provided for a 40' x 60' school house being constructed for Vietnamese Navy dependants at CRB. The battalion also furnished 20 cubic yards of ready mix concrete for the school foundation.

e. In Dalat, a demolition team assisted the Minister of Public Works for two days in clearing large boulders from the road leading from Dalat to Cam Ly Airfield.

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

1. Personnel:

a. Replacements with medical profiles and/or deferred surgery.

(1) OBSERVATION. Some incoming personnel are arriving with medical profiles limiting their duty performance. In two (2) cases individuals had a well documented history of long term problems requiring surgery that, although scheduled in the United States, was cancelled when the individual was alerted for Vietnam. Upon arrival the rigorous schedule in country aggravated their problem requiring evacuation for surgery. One of these was an Engineer Equipment Repair Technician, Warrant Officer, MOS 621A, a serious loss to the unit.

(2) EVALUATION. Although construction engineer units are classed as support units their missions in Vietnam are very similar to the combat engineer units. The long working hours and arduous labor performed precludes anything but top physical condition. Medical profiles that limit a soldier's performance or deferred surgery conditions are almost always aggravated by the activities in which the unit is engaged. Consequently, the man either performs below an acceptable standard or becomes a loss.

(3) RECOMMENDATION. Efforts should be made to preclude the assignment of individuals having medical profiles or long term medical problems to TOE units. Corrective surgery should be performed in other theaters prior to assignment to Vietnam. This should also include any necessary recovery periods.

✓ b. Education level of officers assigned to the construction battalion.

(1) OBSERVATION. Of the 41 officers assigned to the battalion and its attached units, 26 have college degrees and of these 17 have engineering degrees.

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(2) EVALUATION. An assignment in Vietnam is a training vehicle for the Engineer Officer who is branch qualified. When a unit such as this one is assigned construction missions of varying complexities, the unit's performance is in direct relation with the knowledge of its leaders, particularly at the company and platoon level. While it is realized that the supply of college trained engineer officers is limited, their use in administrative functions or in other than engineer units is not in keeping with good personnel management. This is especially true of those officers with bachelor and masters degrees in the field of engineering.

(3) RECOMMENDATION. Incoming engineer officers should be screened at USARV level and those possessing engineering degrees should be assigned to positions that effectively utilize their technical knowledge.

### 2. Operations:

#### a. Specialized equipment required for soil-cement stabilization.

(1) OBSERVATION. A requirement existed for a means of mixing cement into the soil on Lang Bien Mountain access road which was too narrow to accommodate the disc harrow used by the Land Clearing Teams.

(2) EVALUATION. (see Figure 1) A 1000 pound disc harrow with 18-inch discs was determined to be the most practical size for the job. Since no farm tractor with a 3 point hitch was available, a 3/4 ton truck, 4 x 4, was modified to pull the harrow. An assembly consisting of a base plate for the truck bed with attached rear A-frame, an A-frame for the front of the truck, and a pulling yoke were installed. The swivel point for mounting the pulling yoke and a jeep spring are also attached to the base plate. The front A-frame is constructed of 2 1/2" pipe and is fastened to the pins of the lifting shackles on the front bumper. The other side of the frame is welded to a 4" channel, bolted under the truck frame just below the door hinges. A side opening shackle with pulley is used for the cable. A rear A-frame is welded to the 4 corners of the base plate with additional bracing. The jeep spring was positioned under the plate when the harrow is lowered so that it rides level and penetrates the soil about 4 inches. The front winch cable of the truck is utilized to connect through the pulleys to lift the harrow when turning or just moving from place to place.

(3) RECOMMENDATION. None

#### b. Installing corrugated metal roofing on a 100' x 200' Butler Building.

(1) OBSERVATION. Due to the unavailability of a crane to place roof panels for a Butler prefabricated metal building, an expedient method was required.

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(2) EVALUATION. It was found that a pulley system could be employed to lift the tin from the inside of the building. Two pulley's were attached to the purlins with a chain and bolt about 20' apart. (These pulley's were placed close to the rafters to prevent buckling of the purlin member). A rope was passed through the pulley and formed into a sling around the wooden shipping box used as a pallet for the tin. The free end of the rope was then tied to a 5 ton truck. By backing the truck the pallet of tin was lifted to the required installation height. By this method installation time for roofing was reduced approximately 30%.

(3) RECOMMENDATION. Training in the use of common rigging techniques is recommended to preclude total reliance on mechanical equipment.

c. Extending the usable life of sockets in the construction of prefab buildings.

(1) OBSERVATION. The primary fasteners used for Butler and Pasco prefabricated buildings are hexagon head metal screws. It was noticed that an excessive number of sockets were being used in installing those fasteners.

(2) EVALUATION. It was determined that a portion of the depth of the socket never came in contact with the screws due to the configuration of the screw. Thus, only a part of the socket lands were rendered unusable. By grinding down the end of the socket by approximately 3/8" the life of the socket was increased by 100%.

(3) RECOMMENDATION. None

d. Use of the 20 Ton Rough Terrain Crane in Port Construction Operations.

(1) OBSERVATION. Cranes used in the various aspects of port construction are generally employed from positions on floating barges. The cranes are used in pile driving operations and in the transfer of heavy materials from barges to shore and vice versa.

(2) EVALUATION. Tests conducted using the 20 Ton Rough Terrain Crane to support port construction resulted in the rejection of this type crane. The basic problem is one of stability. This crane has a higher center of gravity than truck mounts or crawler cranes. Furthermore, the outriggers are fixed in their relation to the body of the crane, i.e., they will not extend out from the carriage to provide lateral stability. Consequently, they can not be used on floating barges as their inherent instability coupled with the natural movement of the barge results in an unsafe condition.

(3) RECOMMENDATION. Based on the above investigation it is recommended that the Port Construction TOE (5-129E) be amended to limit the type of crane authorized for the unit to other than the Rough Terrain model.

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e. Reduced life expectancy of cargo hose on submarine pipelines.

(1) OBSERVATION. Numerous repairs to cargo hoses ("sea hose") have been necessary in all off-loading facilities within this unit's AOR in the past several months.

(2) EVALUATION. An investigation of the problem reveals that increased supervision of loading-offloading operations is required to reduce the failures of these lines. Improper handling which allows loops to form in the line or which allows lines to become crossed is the primary contributing factor to the damage. At Vung Ro Bay an expedient method for reducing the damage due to tensile overstress was tried and has proven to effective so far. The method uses 3/4" wire rope in lengths shorter than the sections of cargo hose thereby transmitting the tensile stresses along the wire rope rather than through the hose. (See figure 2 for details)

(3) RECOMMENDATION. Personnel who operate the system must be trained in the correct techniques for loading-offloading to reduce unnecessary repairs. It should be noted that it requires a diving barge and skilled submarine divers to make the necessary repairs.

f. Need for angledozers in construction companies.

(1) OBSERVATION. There is a requirement for angledozers for opening borrow areas on hillsides, rough earthwork on LOC upgrading and for working side-hill cuts. The angledozer blade is no longer in the Army inventory for the D7E tractor.

(2) EVALUATION. To solve this problem this unit obtained a salvage Rome Plow blade and converted it in to an angledozer. This was accomplished by removing the "stinger" and cutting edge of the Rome Plow. D7E cutting edges were then welded to the plow with approximately six (6) inches of cutting edge extending below the plow blade. Center cutting edges from a 290M Scraper were then bolted to the D7E cutting edges using the 290M cutting edge bolts (the bolt holes of the two types of cutting edges are in alignment). The pitch of the finished blade can then be manually adjusted to obtain optimum results. Production with this blade was three times that obtainable with a bull blade.

(3) RECOMMENDATION. Angledozer blades should be included in the construction company's inventory. It is recommended that each company have two such blades in addition to the present number of bulldozer blades. This was not included on the MTOE submitted in late 1967.

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EGACBB-CO

30 April 1968

SUBJECT: Operational Report of 87th Engineer Battalion (Construction) for  
Period Ending 30 April 1968, RCS CSFOR-65(RL)

g. Locally manufactured center column plates for 50,000 bbl. tanks.

(1) OBSERVATION. In the construction of 50,000 bbl. welded steel POL tanks it was found that the conical shaped center column plate was missing.

(2) EVALUATION. It was found that the conical pitch of the roof could be duplicated by welding a circular piece of  $\frac{1}{2}$ " steel plate, 15" in diameter, on top of a  $\frac{3}{4}$ " steel plate, 30" in diameter, concentrically.

(3) RECOMMENDATION. None

3. Training. None

4. Intellogince. None

5. Logistics. None

6. Organization. None

7. Maintenance.

a. Disposition of Army nonstandard equipment destroyed in combat.

(1) OBSERVATION. Two (2) Euclid Dump Trucks, 20 Ton, Model 99FD, were heavily damaged by B40 rocket fire on 11 January 1968, in the Dalat Quarry. Technical inspections were performed on 12 January and damage was determined to be combat loss. Personnel from the DSU inspected the trucks on 20 January and classified them as economically repairable. A period of inactivity ensued pending a determination as to whether the trucks were repairable or not. Finally, on 2 April this unit was informed through engineer channels that the trucks were repairable and the battalion should requisition the necessary parts. Red Ball requisitions for approximately 320 repair parts were submitted on 15 April. It is anticipated that these trucks will not be repaired due to a lack of parts for several more months.

(2) EVALUATION. The Army supply system for repair parts is not responsive for nonstandard items of equipment. Furthermore, firm guidelines apparently have not been established to provide timely disposition instructions for this type of non-TOE equipment. As a result, valuable time in the form of equipment-hours has been and will be lost.

(3) RECOMMENDATION. Specific guidance should be established for the various items of equipment that are nonstandard to insure that expeditious action may be taken to repair or turn-in damaged items.

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Period Ending 30 April 1968, RCS CSFOR-65(R1)

b. Overheating of the striker bar on the Chicago Pneumatic Track Drill.

(1) OBSERVATION. The striker bar on the Chicago Pneumatic Track Drill was overheating and causing breakage of strikers and collars.

(2) EVALUATION. It was determined that the #30 weight oil used to lubricate the drilling head was too heavy. A switch to #10 weight oil has proven to eliminate this problem satisfactorily.

(3) RECOMMENDATION. The use of a lighter weight oil for the drilling head of the Chicago Pneumatic Track Drill is recommended.

*Charles J. Fiala*

CHARLES J. FIALA  
LTC CE  
Commanding

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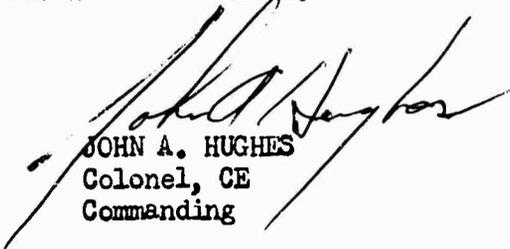
EGA-3(30 April 1968) 1st Ind Maj Pierce/fgg/2003  
SUBJECT: Operational Report - Lessons Learned (ICS-CSFOR-65)(R-1) for  
Quarterly Period ending 30 April 1968.

DA, Headquarters, 35th Engineer Group (Const), APO 96238, 21 May 1968

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

1. The Operational Report - Lessons Learned submitted by the 87th Engineer Battalion (Const) has been reviewed by this headquarters and is considered an excellent summary of the Battalion's operations during the reporting period ending 30 April 1968.

2. The remarks of the Battalion Commander are concurred in with the following comment reference Section 2, Part 1, Item b. Assignment of officers to positions which will provide maximum utilization of skills and provide optimum opportunity for career development is the responsibility of all level of command, Department of Army to line company. Requirements for professionally qualified Corps of Engineer Officers in other than TOE Engineer Units is recognized; however, in view of shortages, utilization of CE Officer in Branch Immaterial (BI) positions should be minimized.

  
JOHN A. HUGHES  
Colonel, CE  
Commanding

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11 JUN 1968

AVBC-C (30 Apr 68) 2nd Ind

SUBJECT: Operational Report of the 87th Engineer Battalion (Construction)  
for the Period Ending 30 April 1968, RCS CSFOR-65 (R1)

DA, Headquarters, 18th Engineer Brigade, APO 96377

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

1. This headquarters has reviewed the Operational Report - Lessons Learned for the 87th Engineer Battalion (Const) for the quarterly period ending 30 April 1968. The report is considered to be an excellent account of the Battalion's activities for the reporting period.

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

a. Reference Section 2, paragraph 2d. The rough terrain crane is the replacement for the truck mounted crane, neither of which were intended to be operated from a barge. Three crawler mounted cranes were placed in the port construction companies TOE for that purpose. This capability was further modified by MTOE action which eliminates 1--10 Ton crawler crane and adds 3--40 Ton crawler cranes. Wheel mounted cranes are essential to provide a highly mobile lifting, loading, and pile driving capability. While it is recognized that the now obsolete truck mounted crane is perhaps more stable than a rough terrain crane when barge mounted, it is felt that the added flexibility of having a crane successfully operate in two environments is offset by the increased maintenance problems caused by obsolete equipment.

b. Reference Section 2, paragraph 2f. The addition of angle dozers to a construction company will be considered during future MTOE actions.

FOR THE COMMANDER:



DOUGLAS K. BLUE  
Colonel, CE  
Deputy Commander

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AVHGC-DST (30 Apr 68) 3d Ind CPT Arnold/dls/LBN 4485  
SUBJECT: Operational Report of 87th Engineer Battalion (Construction) for  
Period Ending 30 April 1968, RCS CSFOR-65(R1)

HEADQUARTERS, US ARMY VIETNAM, APO San Francisco 96375 25 JUN 1968

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

1. This headquarters has reviewed the Operational Report - Lessons Learned for the quarterly period ending 30 April 1968 from Headquarters, 87th Engineer Battalion (Construction).

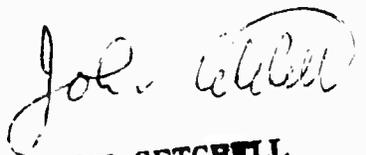
2. Comments follow:

a. Reference item concerning replacements with medical profiles and/or deferred surgery, page 9, paragraph 1a: Nonconcur. The case referred to was reexamined and the officer was assigned to the unit by DA. A physical profile is not a bar to assignment. If, however, personnel arrive overseas with a profile of such a nature that medical regulations prohibit assignment to that particular area, action should be taken to notify DA of the malassignment.

b. Reference item concerning educational level of officers assigned to the construction battalion, page 9, paragraph 1b; and 1st Indorsement, paragraph 2: Concur. Major subordinate commands have the responsibility to equitably distribute their personnel resources. Any diversion of incoming personnel resources by this headquarters is accomplished only to meet priority operational requirements.

c. Reference item concerning disposition of Army nonstandard equipment destroyed in combat, page 13, paragraph 7a: Nonconcur. 1st Log Cmd Regulation 700-40 contains explicit instructions concerning requisitioning of nonstandard items. Turn in procedures for nonstandard items are the same as indicated in Section IV AR 735-35 for standard items.

FOR THE COMMANDER:

  
**JOHN V. GETCHELL**  
Captain, AGC  
Assistant Adjutant General

Cy furn:  
HQ 87th Engr Bn (Const)  
HQ 18th Engr Bde

GPOP-DT (30 Apr 68) 4th Ind

SUBJECT: Operational Report of HQ, 87th Engr Bn (Const) for Period  
Ending 30 April 1968, RCS CSFOR-65 (R1)

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HQ, US Army, Pacific, APO San Francisco 96558 16 JUL 1968

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

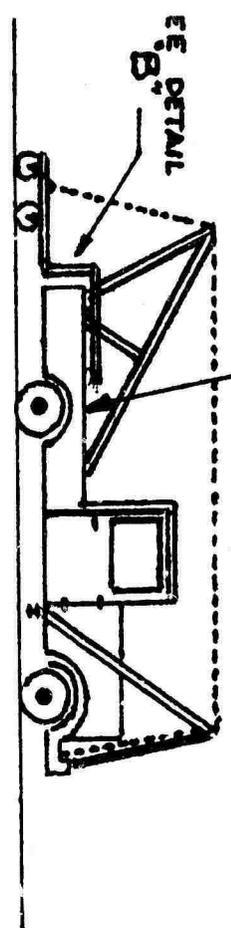
This headquarters has evaluated subject report and forwarding indorse-  
ments and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:



K. F. OSBOURN  
MAJ. AGC  
Asst AG

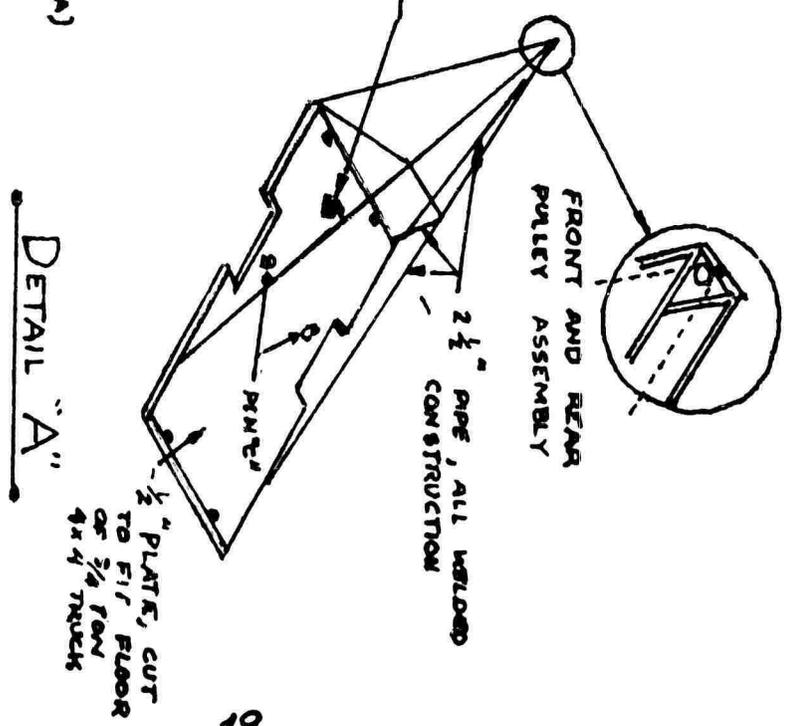
SEE DETAIL "A"



EE  
B  
DETAIL

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JEEP COIL SPRING



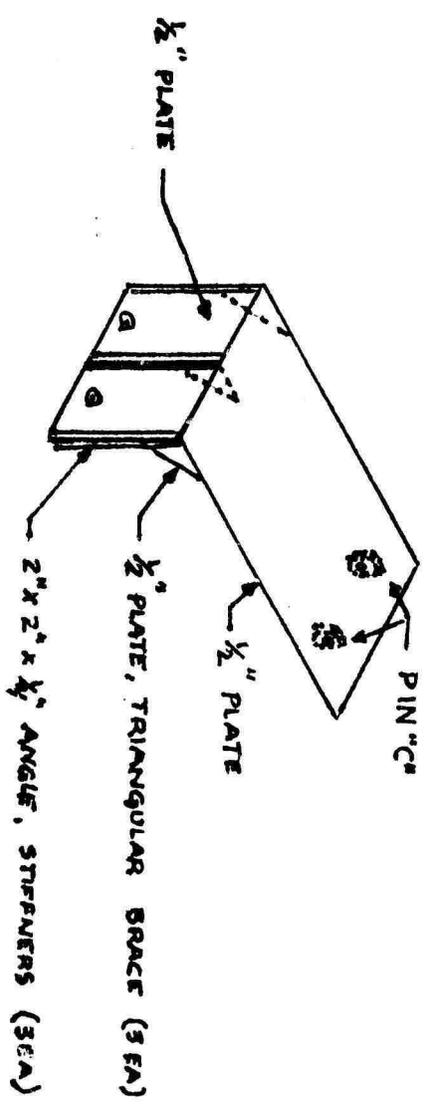
FRONT AND REAR  
PULLEY ASSEMBLY

2 1/2" PIPE, ALL WELDED  
CONSTRUCTION

19

DETAIL "A"

1/2" PLATE, CUT  
TO 5 1/2" FLUOR  
OF 3/4 TON  
4x4 TRUCK



PIN "C"

1/2" PLATE

1/2" PLATE, TRIANGULAR BRACE (3EA)

2" x 2" x 1/4" ANGLE, STRIPPERS (3EA)

PULLING YOKE DETAIL "B"

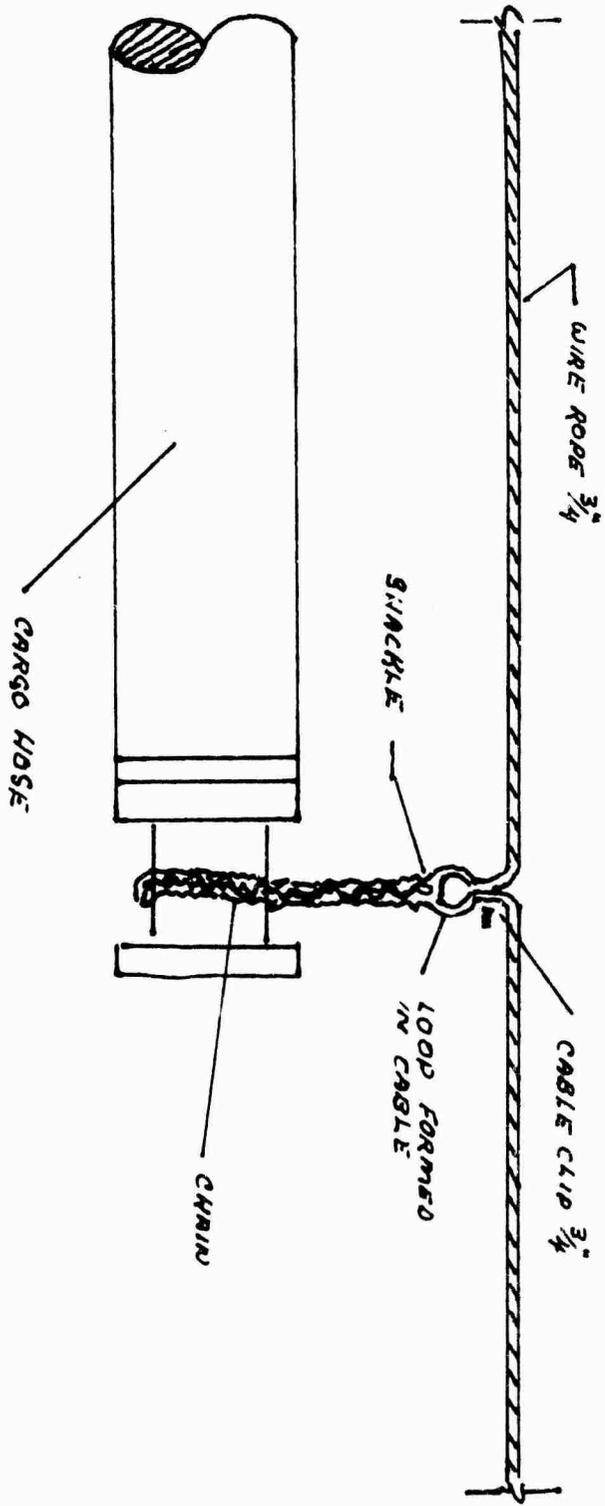
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FIGURE 1A

INCL 1

FF

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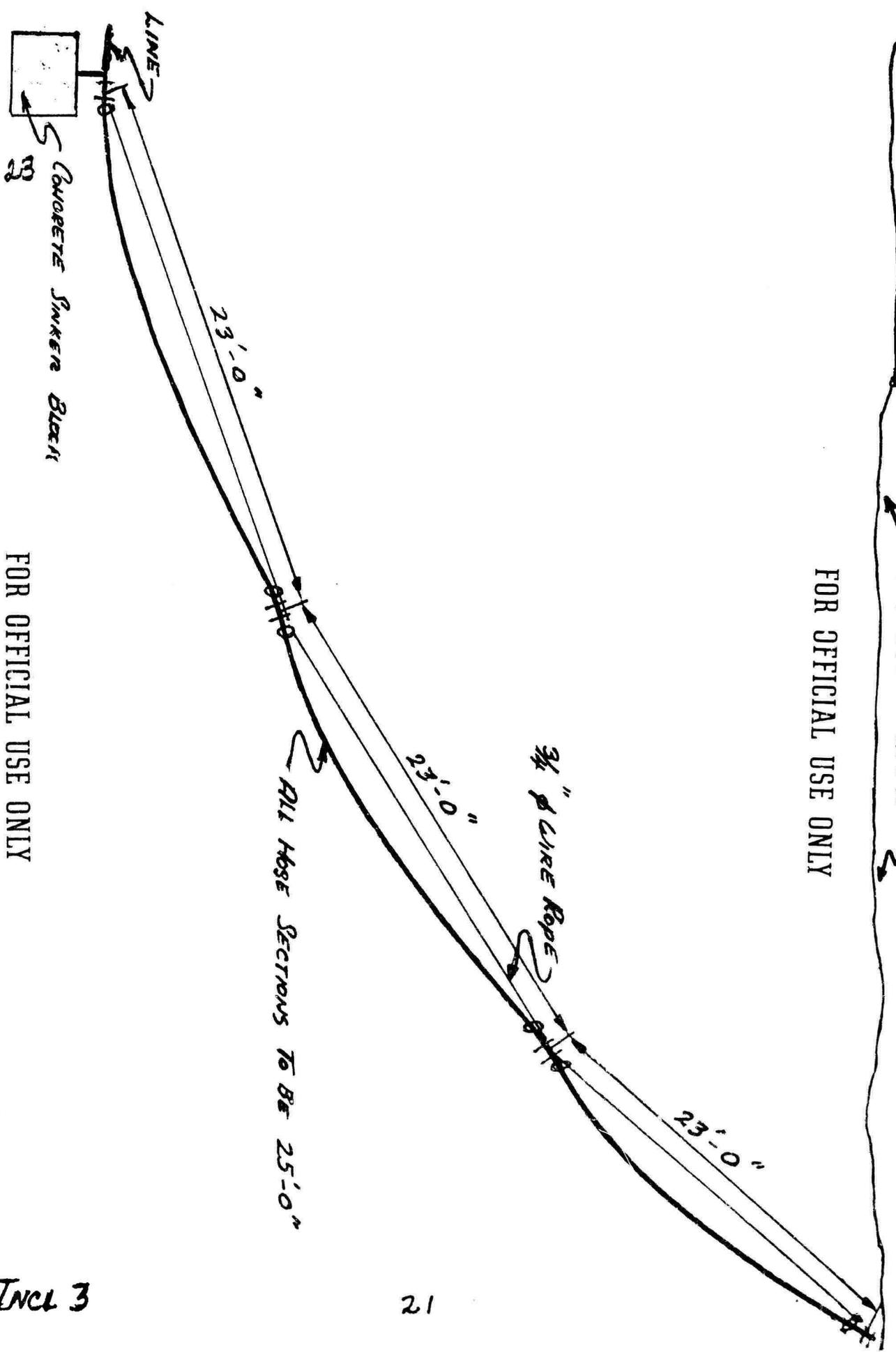
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FIGURE 2A

INCL 2

WATER LEVEL

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Figure 2B

Incl 3

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Operational Report - Lessons Learned, Headquarters, 87th Engineer Battalion (Const)		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates)		
Experiences of unit engaged in counterinsurgency operations, 1 Feb - 30 Apr 1968		
5. AUTHOR(S) (First name, middle initial, last name)		
CO, 87th Engineer Battalion		
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The following items are recommended for inclusion in the Lessons Learned Index:

ITEM 1

\* SUBJECT TITLE \_\_\_\_\_

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ITEM 2

SUBJECT TITLE \_\_\_\_\_

FOR OT RD # \_\_\_\_\_

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ITEM 4

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ITEM 5

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\*\*\*Page # : That page on which the item of interest is located.