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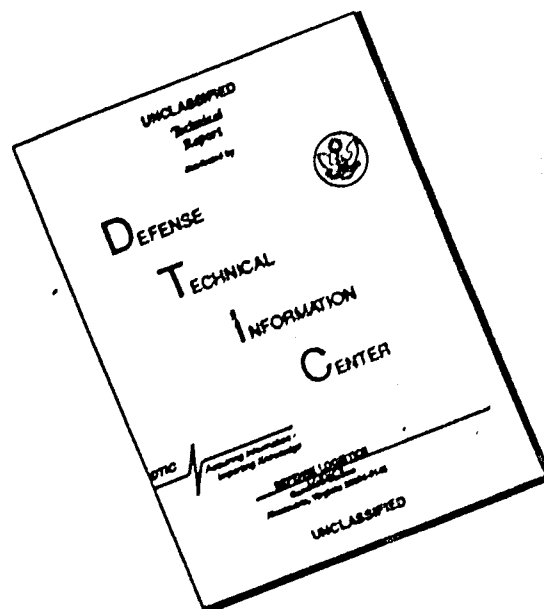
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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO

AGAM-P (M) (6 May 68)

FOR OT RD 681186

6 May 1968

AD832369

SUBJECT: Operational Report - Lessons Learned, Headquarters, 20th
Engineer Battalion (Cbt), Period Ending 31 January 1968 (U)

STATEMENT #2 UNCLASSIFIED

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1. Subject report is forwarded for review and evaluation in accordance with paragraph 5b, AR 525-15. Evaluations and corrective actions should be reported to ACSFOR OT RD, Operational Reports Branch, within 90 days of receipt of covering letter.

2. Information contained in this report is provided to insure 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, 20TH ENGINEER BATTALION (CBT)
APO 96318

EGCA-OP 31 January 1968
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 January 1968

THRU: Commanding Officer
937th Engineer Group (Cbt)
APO 96318

Commanding General
18th Engineer Brigade
APO 96377

Commanding General
United States Army, Vietnam
ATTN: AVC-DH
APO 96375

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

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

Section I, Significant Organization or Unit Activities:

1. General:

a. At the beginning of the report period, the Battalion Headquarters, Headquarters Company, Company B, Company C (-), 584th Engineer Company (LE)(-), and one platoon of Company D were located in the 4th Infantry Division's Camp Enari Base Camp. Company B was involved in the construction of a 177' x 192' pre-engineered, steel aircraft maintenance hangar and a 80' x 150' woodframe Special Service Club. Company C was actively engaged in the construction of four elevated concrete reefer pads for the 4th Infantry Division's 4th Supply and Transport Battalion, 88 helicopter revetments for the 7/17 Cavalry Squadron, two unit maintenance buildings for the 1st Brigade, 4th Division, and the Camp

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Enari Armed Forces Radio Television (AFRT) station. One platoon of Company C was located at Bam Blech, BQ003547, in general support of the 2nd Brigade, 4th Infantry Division's Operation MacArthur. The primary mission was to insure continued serviceability of the airfield and to provide engineer support to the 2nd Brigade's Fire Support Base (FSB), this entailed the construction of command bunkers, helicopter revetments, upgrading of approximately five miles of access road from National Highway QL-14 to the FSB and maintenance of QL-14 within the area of operations. The 584th Engineer Company's (LE) CP was located at Camp Enari. The Light Equipment Company was midway in the preparation of 400,000 square yards of base course preparation for programmed flexible pavement in Camp Enari. The Quarry Support Platoon of the 584th continued quarry operations at the Woolly Bully Quarry, ZA057315. Company D had one platoon located in Camp Enari. This platoon operated the Battalion Prefab Yard and Battalion Batch Plant in direct support of the Base Camp Construction Program. The CP's of both Company A and Company D were located at Woolly Bully Quarry. Company A was engaged in LOC upgrading of Route QL-14B and continued facility expansion at the Woolly Bully Quarry bivouac. Company D was committed to LOC upgrading of Route QL-19W from Dragon Mountain, AR780369, to Duc Co, YA840240. The scope of the work on QL-19W involved a widening of the existing route, massive laterite soil recapping, and surfacing of the roadway with penetration macadam pavement. The 35th Engineer Platoon (LC) had one land clearing section committed to agricultural land development at the Edap Enang Resettlement Village, ZA031311, and one section clearing a 100 meter strip on either side of Route QL-14B. This land clearing was concurrent with Company A's LOC upgrading mission on 14B.

b. On 2 November, the first platoon of Company C was relieved of its responsibility for Base Camp Construction and was convoyed to Phu Non Airfield, AQ871993, to perform hasty repairs on the 3,140 foot T-17 rubber membrane strip. The scope of the work involved the removal of approximately 1/3 of the membrane on the strip, filling, regrading, recompacting the subgrade, and resealing the membrane. The repair was completed and first platoon returned to Base Camp to resume responsibility for Base Camp projects on 7 November 1967.

c. Land Clearing and upgrading on QL-14B was completed on 4 November 1967. At this time, the second platoon of Company A and its attached Land Clearing Section were committed in general support of the 6/14th Artillery and the Special Forces Detachment at Polei Djereng, YA8645. Work at this location involved clearing and leveling the perimeter, digging of ammo bunkers, sumps, sanitary fill pits, and leveling of abandoned positions. The Polei Djereng project was completed on 10 November 1967, 2/A/20 and the Land Clearing Section returned to Woolly Bully Quarry. Company A was assigned the mission of LOC upgrading of QL-19W from Woolly Bully Quarry, ZA057315, west to the intersection of QL-19W and QL-14B, YA904270; Company D retained responsibility of QL-19W from the Quarry east to Dragon Mountain. When Company A began work on QL-19, Company D began paving a 600 meter test section of penetration macadam on QL-19W. Experience gained on

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the 600 meter test section made it apparent that the organic compaction equipment of the 20th Engineer Battalion was inadequate for this type of surfacing. For this reason, it was decided to change from penetration macadam paving to a double-bitumen-surface treatment (DBST). 20th Engineer Battalion DBST designs required a base course of mixed laterite soil and 4" (-) crushed rock; the base course was to be constructed 15 centimeters deep. Once the base course was suitably compacted, it was treated with 0.2 to 0.5 gallons of penprime per square yard as a prime coat. After the prime coat cured, paving followed with 0.3 gallons of RC-3 per square yard, immediately followed with 55 lbs per square yard application of 3/4" (-). The first surface treatment was allowed to set for 24 hours. 0.2 gallons of RC-3 per square yard was then shot on the surface, and a layer of 1/4" (-) and quarry fines at 20 lbs per square yard constituted the second surface treatment. Following the application of the fines, the surface was drag broomed, rolled, and swept. Approximately 14 kilometers of roadway have been surfaced during the report period utilizing this DBST design.

d. On 11 November 1967, the 35th Engineer Platoon (LC) was committed in general support of the Battle of Dak To. The mission of the detached platoon was to conduct land clearing operations along the 4th Division's Pleiku to Dak to MSR. When the Battle of Dak To terminated on 31 December 1967 with total US victory, two sections of the platoon were returned to 20th Engineer Battalion operational control and were recommitted to agricultural clearing at Edap Enang. On 3 January, one section was conveyed to Qui Non where they outloaded on LST's and were transported to Phan Rang. The remaining squad continued its missions at Edap Enang; clearing was completed on 27 January 1968 after the clearing of 1,480 acres. At the end of the report period, this section was engaged in clearing high speed armored vehicle reaction trail from ZL205217 on Route TL-6C to Oasis Fire Base, ZAL16277, and the third section was completing clearing on QL-14W with the 299th Engineer Battalion (Cbt). During the report period 2,565 acres were cleared within the battalion's area of operations.

e. The 7/17th Cavalry Squadron helicopter revetment project was completed on 10 November 1967. The actual construction of the revetments (88 each) was completed in the previous report period, however, the construction of the revetments had removed a great deal of the natural vegetation of the area resulting in an extreme dust problem. Since an immediate solution was necessary, it was decided to penprime the entire 55 acre area. To accomplish this, the soil was scarified with disc harrows, moistened with water distributors, and recompact to optimum density before being penprimed. A more complete discussion of the method of operations is presented in Section II, Lessons Learned. Equipment from the 584th Engineer Company and 35th Engineer Platoon (LC) was attached to Company C to accomplish the project.

f. On 10 November, the battalion received the mission to upgrade Ban Blech Airfield to MACV Class II, C-130 criteria; a survey team was dispatched to

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obtain data on the center line profile and conduct a topographic survey of the existing facility. On 22 November 1967, the surveys were completed and preliminary planning and work estimates began. Due to the fact that the airstrip was situated in a cut across the tip of a hill with extensive filling at one end, it would be necessary to do massive cut and fill operations to satisfy MACV specifications of line of sight and lateral clearance criteria. For this reason waivers of line of sight, lateral clearance, and overruns were submitted to 937th Engineer Group. A waiver was approved for runway length, but all others were refused. Preliminary work estimates indicated that the cut and fill operation would require the moving of approximately one-half million cubic yards of earth to have the strip conform with unwaivered criteria. When these figures, and accompanying equipment requests were submitted to 937th Engineer Group, a conference was arranged with IFFV Theater Army Logistic Officer (TALO). As a result of this preconstruction conference, the existing airfield was accepted with modified lateral clearance and line of sight criteria.

g. In late November, enemy activity with the battalion's area of operations increased. On 24 November a minesweep team from 3/A/20 was ambushed by an estimated NVA Company north of Jackson Hole, YA897307. Prompt reaction by 3/A/20 and the attached security force caused the enemy to be driven off and minimized friendly casualties. Results were: 2 US KIA (security), 4 US WIA (3/A/20), 6 NVA KIA. On the following day two mines were found on QL-19W and a 2 1/2-ton cargo truck from the 584th Engineer Company (LE) was ambushed near Tanh Binh Village, ZA080311. The ambush resulted in 1 US KIA, 1 US WIA, 2 Local Nationals KIA, and 3 Local Nationals WIA.

h. On 7 December, the 584th Engineer Company (LE) began a project to pave QL-19W through Tanh Anh Village, Z 127290. It was decided to accelerate the paving effort in this area because of the extreme dust problem caused by US traffic. The roadway was surfaced with DBST as discussed above. On 6 December 1967, the project was completed and the road was officially opened with a ceremony attended by LTC Phillips, CO, 20th Engineer Battalion, MG Peers, CO, 4th Infantry Division, COL Marshall, CO, 937th Engineer Group, the Pleiku Province Chief, and several local Vietnamese Officials. The efforts of the Engineers were well received and the Commanding Officer of the 584th Engineer Company was presented a plaque as a token of the appreciation of the Tanh Anh Villagers.

i. In early December the battalion was given the mission of constructing forward air control (FAC) revetments at the Duc Co, Plei Mei, Oasis, Polei, Djereng, Cheo Reo and Camp Enari Airfields. A recon of Cheo Reo revealed that revetments already constructed at that location were sufficient and revetments for Cheo Reo was cancelled. On 16 December prefabrication of the revetments began in the battalion prefab yard. The revetments were constructed of a corrugated sheet metal crib which was filled with earth (see inclosure #1). Revetments were prefabricated in 8' x 10' panels with the ends and top pre-cut to the proper size. On 21 December the 2nd platoon, Company A moved to Duc Co, and initiated construct-

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ion of the two revetments required. The project was completed 24 December 1967. Filling of the revetments could not be accomplished due to a late dispute on their final location. 1/D/20 constructed and filled three revetments at Oasis from 21 December 1967 to 30 December 1967. 3/C/20 moved to Plei Djereng on 23 December 1967. The unit constructed and filled the two required revetments by 28 December 1967. 2/A/20 moved to Plei Mei on 27 December 1967 and completed erection of two revetments by 30 December 1967. The Plei Mei revetments were not filled at this time due to a critical shortage of bucket loaders. Erection of the 6 revetments for Camp Enari was undertaken by the 2nd platoon of Company D on 12 January 1968. Construction was delayed due to a dispute over revetment location. The location was finalized on 21 January 1968 and the revetments were completed by 30 January 1968. This type of revetment has proven to be superior to the prefabricated wooden revetments constructed in the past. Ease of erection, structural stability, and ease of prefabrication add to the credits of this design.

j. On 20 December 1967, Company B was committed in direct support of the Special Forces Group's, "Operation Florida". The mission: Construct a Civil Irregular Defense Group (CIDG) Camp and a C7-A capable airfield at Tieu Atar, ZV022062. Due to the fact that Tieu Atar is completely inaccessible by road, all equipment, personnel, and supplies were moved to the job site by CH-47 Chinook and CH-54 Sky Crane helicopter. An advance party consisting of a platoon minus was air lifted to the site on 20 December 1967. The remainder of the Company closed on 21 December 1967 utilizing 12 CH-47 helicopter sorties. A detailed analysis of the initial logistical support is covered in subsequent paragraphs. Airmobile engineer equipment necessary to accomplish the mission was obtained from the 8th Engineer Battalion, 1st Air Cavalry Division, the 937th Engineer Group, and the 5th United States Special Forces Group. Equipment sky craned to Tieu Atar included:

- (1) 2 each Airmobile Graders.
- (2) 2 each MRS-100 Tractor with Scrapers.
- (3) 5 each 2½ ton Dump Trucks.
- (4) 1 each D-5 Bulldozer.
- (5) 4 each D-6B Bulldozers.
- (6) 1 each 600 GPH Water Purification unit.

The equipment was flown to Ban Don Special Forces Camp (ZV0427) by C-130 aircraft and lifted 33 kilometers north to the work site by CH-54 Sky Crane.

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All construction materials were supplied by the 5th Special Forces Group and were air dropped into the work site by C-7A aircraft.

Initially all work effort was directed toward setting up a defensive perimeter and clearing fields of fire for the engineer work force and the security unit. Since the entire area of the camp and airfield was heavily forested with large hardwood trees, clearing was a major task. All possible work was done with the attached airmobile engineer equipment. A demolition squad followed approximately two days behind the equipment to remove large trees. Tree debris and stumps were dozed from the area and then burned. Native timber (teak) was extensively used in bunker construction. By 30 December 1967, preparation of the defensive perimeter was sufficiently advanced that work effort could be diverted to clearing of the airfield. A survey team had completed the center line profile and clearing began. Within two weeks the equipment clearing was completed on the airfield and equipment was re-diverted to enlarging fields of fire and additional clearing within the perimeter. At that time, the survey team made a complete topographic survey of the airfield/camp complex.

Soil samples taken from the airstrip center line indicated the need for a lateritic soil cap on the strip itself. As of the end of the report period; the airstrip proper, bivouac, and fields of fire were completely cleared; a laterite pit has been opened and earthwork is well in progress on the airfield; construction has begun on five of the permanent buildings in the CIDG Camp.

k. On 20 December 1967 arrangements were made for the 35th Engineer Group (Const) to use its organic tractor/trailer capability to have M8A1 matting and asphalt for the upgrading of Ban Blech Airfield. The haul was to be thru shipped from the Log Depot at Qui Nhon to Ban Blech. With the procurement and delivery of these items assured, Company C (-) moved by convoy from Camp Enari to Ban Blech, BQC 75595, on 21 December 1967 to undertake the project. The move into the bivouac site was accomplished quickly and work began immediately. Four supply convoys from the 35th Engineer Group delivered the necessary M8A1 and asphalt to Ban Blech on 22 and 28 December 1967, and 3 and 9 January 1968. The efficient delivery of these critical materials directly to the job site contributed greatly to the speed at which the project was undertaken. The scope of the work involved the construction of a 3,200 foot M8A1 runway with one 150' x 150' turnaround and a 750' x 160' parking apron served by two 170' taxiways. All surfaces to be covered with M8A1 matting were first treated with peneprime and RC-3. The treated surface was then covered with burlap and given a third coat of RC-3. Only minor earthwork was necessary to fill the 150' x 150' turnaround, reshaped the runway, recap & shape the taxiways and parking apron, and widen approximately 400 feet of the west end of the runway. Earthwork equipment was diverted on an "as available" basis to build up usable overruns since a rather steep drop of nearly 15 feet existed at each end of the runway.

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By 14 January approximately 2/3 of the runway was prepared for the matting and laying began from the center of the runway. Laying proceeded in two directions concurrently. Laying of the runway & turnaround proceeded without incident and both were completed on 23 January 1968. An average of in excess of 19,000 square feet of matting was laid per day with a maximum of 33,400 square feet laid on 19 January 1968. At the completion of the report period, both taxiways were completed, and work was proceeding on the parking apron.

1. On 22 January 1968, the 584th Engr Co (LE) completed the mission of placing 400,000 square yards of base course preparation, moved its equipment assets from Base Camp and began surfacing QL-19 from Dragon Mountain, AQ780369, west with DBST. The 584th Company (LE) was to pave west until they met Company D paving east from the Woolly Bully Quarry.

m. At the end of the report period Company A, Company D (-), and the 584th Engr Co (LE) were engaged in upgrading of QL-19 and quarry support operations; Company B continued support of 5th Special Forces Group at Tieu Ater, ZV022062; Company C was upgrading Ban Blech Airfield, BQ005595, and the first platoon of Company D remained at Camp Enari with responsibility for the Battalion Batch Plant & Prefab Yard. Headquarters and Headquarters Company remained in Camp Enari.

n. At the close of the report period, the battalion was actively engaged in the following missions:

- (1) Support for Operation MacArthur - 32-937/OS-67.
- (2) Maintenance of QL-19 - CD-98-200-15-T-MA-20.
- (3) Land Clearing - 31-937/OS-67.
- (4) Upgrading Ban Blech Airfield - 27-937/OS-67.
- (5) Support of Operation Florida - 38-937/OS-67.
- (6) Crusher and Quarry Operations - 85-937/V-67.
- (7) Operational Requirements - 50-937/V-67.
- (8) 11,492 Man Cantonment - CD 66-236DC-937.
- (9) Dragon Mountain Power Distribution - CD 63-236-01-T-75.
- (10) Mortar Bunkers, DMBC - 34-937/V-67.

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2. Personnel:

a. At the beginning of the report period, the assigned strength of the 20th Engineer Battalion including attachments of the 584th Engineer Company (LE), and the 35th Engineer Battalion's land clearing platoon was 40 officers, 3 warrant officers and 876 EM.

b. Personnel replacements were not quite adequate during the report period until the month of December when over 200 replacements were received.

c. At the close of the report period the battalion and attached units had an assigned strength of 42 officers, 4 warrant officers and 909 EM.

d. Personnel of the Battalion have been officially recognized by receipt of 11 Purple Hearts, 11 Army Commendation Medals for meritorious service, 16 Bronze Star Medals for meritorious service or achievement, and 1 Silver Star for valor. As of 31 January 1968 awards pending include, 5 Bronze Star Medals for meritorious service, 1 Purple Heart, and 3 Air Medals for meritorious service. During the report period the battalion suffered 2 KIA, and 10 WIA.

e. At present the battalion is employing 59 civilian carpenters and 62 O&MA permanent hire which includes 28 quarry workers. Additionally an average of 125 AIK daily hire workers are utilized by the battalion.

f. The Battalion Chaplain holds two Protestant Services on Sundays, one in the Battalion area and one at one of the forward line companies committed to operational support. To enhance the religious training within the Battalion, a film of a religious nature is shown on Sunday nights, and this is supplemented by the singing of hymns. Roman Catholic services are held each Thursday night, and Sunday morning in the Battalion Chapel. An average of 350 men per week participated in the Battalion's religious services during this report period.

3. Intelligence and Security:

a. During the reporting period the Battalion Intelligence Section continued to maintain contact with major intelligence collecting agencies in the Pleiku area to further the combat intelligence aspect of the operational support missions. The section is expanding its intelligence sources to the Brigade and Battalion size units of the 4th Infantry Division as a means of getting immediate intelligence reports.

b. The existing Camp Enari OPLAN for Perimeter Defense has given this Battalion the responsibility for perimeter defense of a designated sub-sector of the 4th Infantry Division's perimeter and to create an anti-infiltration line. The Battalion furnishes guards to 10 bunkers nightly and 2 guard towers on a 24 hour basis. This requirement is fulfilled by providing one officer or NCO

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(E7 or above), and 36 enlisted men daily. The Battalion will also be responsible for securing designated priority locations in the event of enemy attack or infiltration. They will be secured on order from the sector Commanding Officer, the Installation Coordination Center, or the Division Tactical Operations Center.

c. Continued emphasis was placed on engineer reconnaissance to develop knowledge and locations of construction materials and to provide early warning of critical areas of maintenance on the existing line of communications.

d. The Battalion Intelligence Section is continuing to provide a Civil Action Team to visit designated villages and to submit periodic progress reports to S-5, 1st Brigade, 4th Infantry Division. The mission of this program is three fold: (1) To win the hearts and minds of the people, (2) to improve their standard of living economically and medically, and (3) to collect information of intelligence value. The program has also shown a fourth and very valuable asset; soldiers participating in the program have learned much about the local people and their difficulties.

e. A "Buy Mine" program has been initiated during the latter part of this reporting period. Pamphlets and leaflets have been dropped in our area of operations. To date, it is too early to evaluate the response of local nationals to this program.

4. Operations:

a. Company A, Company D (-), the Quarry and Support Platoons of the 584th Engr Co (IE), and the 35th Engr Plt (LC) spent the entire report period in the field. Company B and Company C spent one-half of the period in Camp Enari and the remainder in the field. The first platoon of Company D, Headquarters, 584th Engr Co (IE), and the Battalion Headquarters, spent the entire period in Camp Enari.

b. In order to have the buildings constructed on Camp Enari accepted by the Post Engineer, the Battalion formed an R&U Carpenter Team and an R&U Electrical Team to correct deficiencies on these buildings. In addition, the Electrical Team is required to wire all buildings on Camp Enari as they are constructed. During the report period 67 buildings were made structurally acceptable and 39 buildings were completely wired. The Post Engineer accepted a total of 176 buildings during the report period. An average of 7 enlisted men and one NCO were utilized to accomplish this task.

c. During the report period, the 4th Infantry Division slowed its active self-help construction program in order to re-allocate the remaining authorized construction for Camp Enari. As of the end of the report period,

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the self-help program is again becoming very active. The Battalion Prefab Yard has produced 60 buildings (20' x 80') during the report period with 49 indigenous carpenters supervised by 5 EN. In addition, the Prefab Yard prefabricated 15 FAC Revetments and portions of an 80' x 150' Service Club. Total square footage of facilities provided the 4th Infantry Division and Supporting units during this period are:

- (1) 5,800 sq ft of Mess Halls.
- (2) 5,000 sq ft of Administrative Facilities.
- (3) 4,200 sq ft of Supply Facilities.
- (4) 101,480 sq ft of Billets.
- (5) 15,700 sq ft of Maintenance Facilities.
- (6) 34,000 sq ft of Aviation Support Facilities.

d. In addition to the Self-Help achievements of the 4th Infantry Division, units of the 20th Engineer Battalion have constructed:

- (1) 1 each 24' x 60' Chapel.
- (2) 2 each 26' x 65' Maintenance Buildings.
- (3) 4 each Concrete pads for 1,600 cu ft Reefers.
- (4) 1 each 177' x 192' Aircraft Maintenance Hangar.
- (5) 2 each 10' x 10' Tuning Sheds for the AFRT Station.
- (6) 88 each Revetments for UH1D and OH-6A helicopter.

e. Pads Poured:

- (1) 1 each 24' x 60'.
- (2) 2 each 26' x 65'.
- (3) 4 each 9' x 42' pads each with three 3' x 1.5' x 42' pedestals.
- (4) 1 each 177' x 192'.
- (5) 2 each 10' x 10'.

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- (6) 2 each 20' x 48'.
- (7) 1 each 24' x 36' (Tank Turning Pad)
- (8) 1 each 10' x 10' with 10' raised lip (penetrant loading facility).
- (9) 1 each 80' x 120'.

f. On 21 December 1967, the 815th Engineer Battalion (Const) assumed responsibility for all projects on Camp Enari to be constructed by engineer troops. Among these projects was a 75' x 202' Aircraft Hangar, a 80' x 150' Service Club, and 40 unit maintenance bays.

5. Operational Support Missions:

a. At the beginning of the report period Company A, Company D, and the first platoon of Company C were engaged in operational support missions as discussed in Section I.

b. 2 November: One squad from 1/C/20 moved by convoy from Ban Blech, BQ005595, to Phu Nhon to undertake repair of the Phu Nhon T-17 Airstrip. The membrane had become badly torn in several areas and the subgrade had failed in numerous spots. 1/A/20 relieved 2/A/20 of responsibility for maintenance of QL-14B and control of the land clearing operation.

c. 7 November: Repair of Phu Nhon Airstrip was completed and the squad from 1/C/20 returned to Ban Blech.

d. 8 November: 1/A/20 and Land Clearing Squad completed clearing and upgrading operations on QL-14B and began support of 6/14th Artillery and Special Forces at Polei Diereng, Y8645. Scope of the work involved clearing the firebase perimeter, leveling several berms within the firebase and outside the perimeter, and digging of several bunkers, sumps, and a sanitary fill pit. D/20 began a project at Oasis Airfield, Z4116277, which involved penetranting 40,000 square yards around the airfield and access road.

e. 10 November: 1/A/20 and Land Clearing Squad completed engineer support at Polei Diereng, Y8645, and returned to Woolly Bully Quarry, Z4057315. 1/A/20 assumed responsibility for maintenance and upgrading of QL-19 west of Woolly Bully Quarry and the Land Clearing Squad began a maintenance stand down.

f. 11 November: Two squads of the 35th Engr Plt (LC) departed for support of Dak To operations with the 297th Engr Bn.

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g. 22 November: Survey Team completed the centerline profile and topographic survey of Ban Blech Airfield and initial planning for the upgrading began.

h. 24 November: A Minesweep Team from 3/A/20 was ambushed on QL-14B near Jackson Hole, YA897307, and waged a successful battle with the NVA Company in ambush.

i. 25 November: A 2 1/2-ton truck from the 584th Engr Co (LE) on an administrative run was ambushed near bridge #37, QL-1W, ZA094299. C/20 (-) completed soil stabilization of 55 acres of the 7th Squadron 17th Cavalry Helicopter Pavements.

j. 3 December: During the previous report period, bridge #38, QL-19 (ZA077310) twice had hole punched in its concrete deck. For this reason, Company D, 2nd Engr Bn, was given the mission of placing a wooden surface on the concrete deck. The wearing surface was attached to the concrete deck by anchor bolts set into the concrete and grouted in place. In order to keep Route QL-19 open in the event of blown bridges, AVLB Bypasses were scheduled for all bridges along this Route. 3/A/20 began the construction of abutments for the bypass to Bridge #41, YA976291, on this date.

k. 7 December: The 3rd platoon of the 584th Engr Co departed Camp Enari for Woolly Bully Quarry to begin surfacing a 3.1 kilometer section of QL-19 through Thanh Anh Village, ZA127200.

l. 8 December: Company D completed the wearing surface on Bridge #38, QL-19.

m. 13 December: 3/A/20 completed the AVLB abutments for Bridge #41, QL-1W. One Bull Dozer and lowboy was attached to the 1st Bn 69th Armor to clear a firebase and a defense position and fields of fire around Bridge #6, QL-14B (10855839).

n. 15 December: Paving of QL-19 through Thanh Anh Village, ZA127200, was completed by 3/584/20 and the roadway was opened with a official ceremony. 2/D/20 began prefabricating of FAC Pavements for Camp Enari, A97835, Duc, YA840250, Oasis, ZA116277, Plei Noi, ZA163259, and Polot Djerang, YA8645.

o. 20 December: Company B advance party moved to Tieu Atar, ZV022062, from Camp Enari by Chinook to prepare for the arrival of the remainder of the Company. 2/A/20 moved by convoy from Woolly Bully Quarry, Z05735, to Duc, YA840250, to begin construction of two FAC pavements on the airfield. Dozer and lowboy from C/20 returned to Ban Blech from operations with 1/69th Armor.

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p. 21 December: Company B was airlifted to Tieu Ater, ZV022622, from Camp Enari in 12 CH-47 sorties and began preparation of a defensive position. Company C(-) moved by convoy from Camp Enari to Ban Blech, BQ005595, to begin upgrading of Ban Blech Airfield. 1/D/20 began construction of three FAC Revetments for Oasis Airfield, ZA116277. First 35th Engineer Group convoy, 80 vehicles, closed Camp Enari from Qui Nhon Depot.

q. 22 December: 35th Engineer Group convoy closed Ban Blech from Camp Enari, was unloaded, and two of three serials returned to Camp Enari.

r. 23 December: 3/C/20 moved by convoy from Camp Enari to Polei Djereng, YA8645, to begin construction of three FAC Revetments and engineer support of 6/14th Arty Bn at that location.

s. 24 December: 2/A/20 completed erection of revetments at Duc Co and returned by convoy to Woolly Bully Quarry. Revetments were left unfilled due to a dispute over their location.

t. 25 December: Merry Christmas!

u. 26 December: 2/A/20 moved by convoy from Woolly Bully Quarry to Camp Enari in preparation for a move to Plei Mei.

v. 27 December: 2/A/20 moved by convoy from Camp Enari to Plei Mei, ZA163259, to begin construction of two FAC Revetments at that location. Second 35th Group convoy closed Camp Enari from Qui Nhon Depot.

w. 28 December: 3/C/20 completed revetments at Polei Djereng and was diverted to engineer support of "Delta Force." Scope of the work involved the leveling of a 2 acre bivouac area, penpriming of a 15,000 square meter FASH area, the digging of five 8' x 20' x 100' storage bunkers and two personnel bunkers, and the filling of 50,000 sandbags for revetments and bunkers. Second 35th Group convoy closed Ban Blech from Camp Enari, unloaded, and returned to Camp Enari.

x. 29 December: 2/A/20 completed Plei Mei FAC Revetments.

y. 30 December: 1/D/20 completed construction of three FAC Revetments at Oasis Airfield, ZA116277.

z. 31 December: 2/A/20 returned from Plei Mei, ZA163259, to Woolly Bully Quarry by convoy. One squad of the 35th Engr Plt (LC) returned to Woolly Bully Quarry from the 299th Engr Bn.

aa. 1 January: 35th Engr Plt (LC) squad began clearing farm land at

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Edap Enang resettlement village, ZA031311. Third 35th Group convoy closed Camp Enari.

bb. 3 January: Third 35th Group convoy closed Ban Blech, unloaded, and returned to Camp Enari.

cc. 5 January: Company B completed clearing of required area (2,400' x 400') for Tieu Tan Airfield, ZV022062.

dd. 6 January: 3/C/20 completed support of Delta Force at Plei Djerang, YA8645, and returned to Camp Enari by convoy. Fourth 35th Group convoy closed Camp Enari from Qui Mon.

ee. 9 January: 3/C/20 convoyed from Camp Enari to join the remainder of Company C at Ban Blech. Fourth 35th Group convoy closed Ban Blech, unloaded, and returned to Camp Enari.

ff. 12 January: 2/D/20 began construction of six F C revetments for Hensel Army Airfield at Camp Enari. 1/A/20 moved to Hill 426, YA922269, for construction of abutments for Bridge #1, QL-14B, YA85305.

gg. 13 January: C/20 began laying of M8A1 matting of Ban Blech Airfield

hh. 16 January: 3/A/20 began construction of a concrete tank turning pad on QL-19W at Edap Enang, ZA031311. Approximately 12 of these turning pads are planned for QL-19W in conjunction with the surfacing operations. The pads are to be placed where the tank trails cross or join QL-19W. These pads will prevent damage to the road surface when tracked vehicles turn on the roadway. 2/A/20 closed Camp Enari from only Bully Quarry in preparation for road opening operations on Route TL-6C to Plei Mei, ZA163259. TL-6C had been ditched and mined by enemy forces.

ii. 17 January: 2/A/20 departed Camp Enari, 0600 hours to clear roadway to Plei Mei and fill F C Revetments. Scope of the mission included: Clearing two large punji stake fields (620' x 40' with 2 to 3 stakes per square foot), filling approximately twenty 1' to 2 foot dry-trenches dug across the roadway, conducting a minesweep the length of the roadway (25 kilometers), and filling of the F C revetments at Plei Mei, ZA163259. Platoon was furnished a bulldozer, bucket loader, and 20 5-ton dump trucks (loaded with fill) to accomplish their mission. Security consisted of one tank and four armored personnel carriers from the 1st Squadron, 17th Armored Cavalry. 2nd Platoon reached Plei Mei at 1840 after breaching all obstacles and discovering and destroying two mines. By working through the night, the F C Revetments at Plei Mei were filled.

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jj. 18 January: 2/A/20 completed FAC Revetments at Plei Mei and returned to Woolly Bully Quarry after sweeping themselves out. 1/A/20 completed abutments for AVLB Bypass of Bridge #1, QL-14B (YA895305).

kk. 19 January: Company C laid 33,000 square feet of M8A1 matting on Ban Bloch Airfield.

ll. 27 January: 35th Engr Plt (LC) squad completed clearing of Edap Snang farmland, ZA031311. Total project, begun in last report period, consists of 1,480 acres.

mm. 29 January: 35th Engr Plt (LC) squad moved by convoy to Z 205217 on Route TL-6C and began clearing 10 meter strips on either side of a maneuver road running west and north to Oasis Firebase, ZA116277.

nn. 31 January: D/20 repaired deck damage on Bridge #47, QL-17 (ZA057317).

6. Training:

a. The battalion's basic 2 hour per week training covered subjects required by higher headquarters and a weekly Command Information briefing. An ambitious on-the-job training program was followed to enable troops to become trained in positions where personnel shortages were critical.

b. Members of the battalion attended the 4th Infantry Division NCO Academy, 937th Engr Group Survey Course, an 18th Engineer Brigade Grader Course, and several other courses afforded by various higher headquarters.

7. Supply:

a. During this reporting period, the battalion decreased its Class IV Construction material requisitions by 60% as compared to the previous reporting period. This was largely due to the rapid completion of the base camp construction project 66-236DC-937. Corresponding construction material receipts and issues were also experienced during the same period. The following quantities of basic construction materials were placed on requisition in support of approved construction projects:

CEMENT: 8,104 Bags LUMBER: 662,897 BF NAILS: 13,127 LBS

b. New construction and maintenance of existing roads within the AO necessitated requisitioning large quantities of penoprime and RC-3 asphaltic materials. The following items were requisitioned, received and issued during this period for Ban Bloch Airfield, Route QL-19W, dust control of artillery and infantry fire bases, aircraft revetments and other operational support missions

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within the 4th Infantry Division Area of Operations:

ITEM	REQUISITIONED	RECEIVED	ISSUED
Peneprime	13,778 Drums*	4,756 Drums	9,694 Drums
RC-3	59,125 Drums*	4,417 Drums	2,243 Drums

*NOTE: 55 gallon drums

c. On 20 December 1967, Company B, 20th Engineer Battalion (Cbt) deployed to Tieu Atar, RVN, coordinates ZV022622, to construct a C7-A airstrip and to assist in the construction of an adjacent Special Forces Camp. Since there were no access roads into this location, the initial move and subsequent resupply have been accomplished by CH-47 Chinook helicopters. To date 43 sorties and 310,221 pounds of equipment and supplies have been airlifted to this location.

CLASS OF SUPPLY	POUNDS	TONS
Class I:	32,618	16.3
Class II & IV	16,436	8.2
Class III:		
Diesel	41,800 (5,500 gal)	20.9
Oil	11,942 (1,375 gal)	6.0
Class IV:		
Engineer Construction Materials	2,940	1.5
Class V:		
Ammunition	32,885	16.4
Explosives	57,845	28.9
Miscellaneous :		
Personnel	28,780	14.4
Mail	975	0.5
TOTAL	226,221	113.1

NOTE: Above figures do not include the initial move of 12 sorties weighing

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84,000 pounds. These sorties included selected organic equipment, 80 personnel, Class I basic load, Class V basic load and 2,000 gallons of diesel fuel.

d. On 23 December 1967, Company C, 20th Engineer Battalion (Cbt) deployed to Ban Bleh, BQ005595, to emplace M8A1 matting on the existing T-17 membrane airstrip. The initial move was made by convoy and subsequent resupply has been accomplished by CH-47 Chinook helicopter. To date 33 sorties and 222,737 pounds of equipment and supplies have been airlifted to this location.

<u>CLASS OF SUPPLY</u>	<u>POUNDS</u>	<u>TONS</u>
Class I	32,104	16.1
Class II & IV	7,515	3.8
Class III:		
Diesel	72,400 (9,500 gal)	36.2
Mogas	31,500 (4,500 gal)	15.8
Oil	8,638 (990 gal)	4.3
Class IV:		
Engineer Construction Materials	24,102	12.1
Class V:		
Ammunition	22,793	11.4
Miscellaneous:		
Personnel	22,730	11.4
Mail	955	0.5
TOTAL	222,737	111.6

e. The battalion water point teams continued their support of quarry operations and of Camp Enari, Base Camp of the 4th Infantry Division. During this reporting period the following quantities of potable water were produced.

<u>WATER POINT</u>	<u>TOTAL GAL PRODUCED</u>	<u>DAILY AVERAGE GAL PRODUCED</u>
Camp Enari	1,355,024	15,119
Quarry	485,889	5,341

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8. Medical:

a. During the quarter 2,243 outpatients and 43 quarters patients were treated in the Battalion Aid Station.

b. Periodic check of personnel's shot records are carried out both in the battalion base camp and in the field in order to maintain a suspense file on immunizations that are up to date and insure adequate and timely immunizations of all personnel.

c. A command letter was put out in August 1967 establishing a standard procedure for the calling Air Medical Evacuation. This establishes that the Battalion Surgeon is notified of the need for a Dust-off and this precludes the use of Dust-off in cases that do not warrant an immediate evacuation.

d. Through the activities of the CA teams of the Battalion in the nearby villages, the Battalion Surgeon has had the opportunity to observe that the villagers are now more receptive to the idea of leaving their villages and coming to the Aid Station for medical treatment when necessary.

9. Communications:

a. During this report period, the battalion went from a status of approximately 40% deployed to forward areas vs 90% at the close of the period. As a result, the amount of radio traffic more than doubled over a short period of time in mid-December.

b. To alleviate the resulting problem a completely new brevity codes were initiated to cover vehicles, repair parts, and construction materials. While this may have necessitated some additional time in writing messages, it paid dividends by reducing the time required to send messages and eliminated considerable confusion over the terminology used to describe repair parts and construction materials. Also, all members of the battalion who used the radio were counseled to shorten their messages as much as possible. Routine daily messages were scheduled to be sent during times of minimum radio traffic. By these methods, most of the problems of maintaining effective communications with as many as six forward units were eliminated.

10. Maintenance:

a. Undoubtedly, the most significant occurrence in the maintenance field during this report period was the lowering of an unacceptably high deadline rate. At the beginning of the report period the battalion had a critical item deadline rate of 35% and an overall deadline rate of 22%. At the end of the report period the critical item rate was down to 11% and the overall rate of 10%.

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b. This problem was not solved by a miracle. Increased command emphasis at the battalion level resulted in increased emphasis throughout the chain of command. The maintenance section improved the level of maintenance supervision and operator maintenance by the company motor pools by making unscheduled inspections of morning and evening motor stables. A driver/operator of the month program was initiated for every type of vehicle in the battalion. Each month a different type vehicle was inspected. Competition began on the company level and was run by the unit maintenance sections. The winning company vehicles were then entered into the battalion competition. The winner of the battalion competition is given a letter of commendation, \$25.00, and a three day in-country R&R. Competition was based on vehicle condition, log book, and driver knowledge. The benefits of this program were apparent in the noticeable spirit of competition between the drivers and between company motor pools in preparation for the competition. The sharp decrease in the deadline rate is attributed to all of the above points and not to any one in particular.

Section II Commander's Observations and Recommendations:

1. Personnel:

ITEM: Special Leave

DISCUSSION: Personnel who volunteer to extend their tour of duty in Vietnam for a period of six months are authorized a thirty day special leave. Many individuals departing this unit on special leave experienced difficulties in making the return trip to Vietnam. The special leave orders provided that personnel make arrangements at the Port of Embarkation; however, many personnel went from Vietnam to CONUS by-passing a point of embarkation. Some personnel were forced to pay their own fare across CONUS to Seattle or San Francisco and others went to the Red Cross who cut special orders for them, authorizing return travel. Many personnel lost days waiting at the port of embarkation for air space.

OBSERVATION: Orders for special leave should include port call for the return trip as well as sufficient authorization for trans-CONUS travel.

2. Operations:

a. ITEM: Healing of RC-3 Asphalt Cutback.

DISCUSSION: During an operation to apply a Double Bituminous Surface Treatment to a forward LOC, several tests were conducted to determine the optimum applicator temperature for the asphalt cutback in use on the project (RC-3). Various references on the subject were consulted and temperatures from 170°F to 240°F were recommended.

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OBSERVATION: During DBST surfacing operations on QL19W, field tests were conducted to ascertain the best application temperature of MC-3. The Asphalt Handbook indicated application temperatures of 200° to 240°. A great deal of difficulty was experienced when the Little-Ford trailer mounted distributor heated in this range. The asphalt had to be heated very slowly to prevent the cutback from boiling out of the reservoir. The increased heating time greatly slowed the overall operation. Best heating temperatures were found to be in the 190° to 195° temperature range; this range greatly reduced overall heating time and the cutback characteristics were not noticeably different from those encountered in the recommended 200° to 240° range.

b. ITEM: Asphalt Loading.

DISCUSSION: The loading of asphalt cutback has proved to be a bottle neck in paving operations. Loading the barrels directly into the distributor from 55 gallon drums has shown to take more time, man power, and equipment than was acceptable.

OBSERVATION: A sump was constructed at the top of a field expedient headwall to enable the barrels to be emptied into the sump and the distributor to be driven up to the headwall and loaded from the top. In one case a permanent concrete sump with a six-inch loading pipe and gate valve was constructed to increase asphalt output rates. This proved adequate for the less viscous asphalt cutback (up to MC-3) but was rather slow with the more viscous cutbacks. In a second case a field expedient sump and loading slot were cut with a dozer. The sump was lined with T-17 membrane and a woodframe trough also lined with T-17 membrane was used for loading. The trough was hinged where it joined the tank to allow the flow to be stopped at will. In both cases, a large area was graded adjacent to the sump for storage of the asphalt drums. This area should be sloped toward the sump to ease rolling of the drums into position. Both of the methods speeded the loading and eliminated the need for additional equipment.

c. ITEM: Reinforcement of frame on towed asphalt distributor.

DISCUSSION: During the report period, this unit received three "Little Ford," trailer mounted, 600 gallon asphalt distributors. It was found that the towing lunette would not marry with the tow pintle on military vehicles. In order to tow the distributor, it was necessary to replace the lunette and extensively reinforce the trailer frame. Once these modifications were accomplished, no further problems were encountered in towing the distributor. Attached diagrams show the reinforcing necessary on the frame.

d. ITEM: Loading Asphalt Distributor on the job site.

DISCUSSION: When placing a double bituminous surface treatment, the

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factor controlling production is generally the ability to apply asphalt to a prepared surface. Frequently the dedrumming point is quite a distance from the laydown point and much time is lost in charging the distributor.

OBSERVATION: A mobile dedrumming point was devised utilizing a standard S&P with a hinged loading platform that could be swung down from the side of the S&P to the top of the distributor. Drums of asphalt transported on the S&P were rolled onto the ramp and the distributor was charged "over the top". Attached diagram shows details of the "mobile dedrummer".

e. ITEM: Treating of large areas with peneprime.

OBSERVATION: During the report period, it was necessary to treat revetment areas approximately 55 acres in size, with peneprime. Since this requirement occurred during the dry season and dust was already an extreme problem in the area, extensive preparation of the area was necessary before the peneprime could be put down. To prepare the soil, a hydraulic disc harrow borrowed from the 35th Engineer Platoon (LC) scarified the soil to a depth of about 10 inches. Immediately behind the harrow, a grader, a water distributor, a sheepsfoot roller, a rubber tire roller, and 10-ton smooth-wheel roller followed in that order. Without this preparation, the peneprime would not properly penetrate or bind the soil. After the soil was prepared, a mixture of 85% peneprime and 15% diesel was applied in a single treatment of 0.40 gallon per square yard. This mixture was applied at a temperature of 160° to 170° and was the best mixture for ease of application, penetration, and end result. It must be noted that this method did not provide a final solution. The entire area was retreated on a regular basis to keep the dust down. This method, however, succeeded in getting the dust down to where regular applications could control it.

f. ITEM: Base Camp Security.

DISCUSSION: Security of remote Base Camps must be continually improved in order to remain effective. At the quarry site, 290M tractors were used to cut a "moat" approximately 20 feet deep adjacent to the outer band of perimeter wire.

OBSERVATION: This "moat" provides a barrier that is virtually impossible to breach without considerable forethought and planning on the part of the enemy.

g. ITEM: Rock Production.

DISCUSSION: Frequently the need for sized aggregates for paving or concrete may develop rapidly and although the quantity of rock on hand is sufficient, it must be processed through secondary crushers to be reduced to

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the proper size.

OBSERVATION: An efficient method of feeding secondary crushers was developed by constructing a sheet metal hopper near the base of a transfer conveyor. Material is then fed to the hopper by front loader by opening the jaws slightly permitting a controlled flow onto the conveyor. Additional support rollers were installed under the belt in the hopper to prevent excessive deflection of the belt at the loading point.

h. ITEM: Harassment and Interdiction Fires.

DISCUSSION: During the report period, four companies of the battalion were located in independent bivouac sites where they were required to provide their own security. To enhance the security of these positions, an H and I fire program was initiated with the units organic 81mm mortars, M-79 grenade launchers, and .50 cal machine guns.

OBSERVATION: In addition to enhancing the security, this program had the additional effects of training personnel in the firing of these weapons and giving the personnel on guard the feeling that they were actually doing something on guard rather than just attempting to stay awake. At least one secondary explosion has been reported as results of H and I firing on QL19W.

i. ITEM: Proper utilization of Land Clearing Team for maximum production.

DISCUSSION: The land clearing team was formed with the minimum of equipment and personnel to accomplish the mission, if employed as a unit. However, due to the large number of projects to be accomplished by the land clearing team during its tour in the Central Highlands, the tendency has been to have the three (3) sections function as separate units. This has brought about many problems which need not have evolved. Due to the large physical distances and the tactical situation, the support effected has often been inefficient and ineffective, causing an inordinate amount of down time and lost time. With two sections working together, it has shown that:

- (1) The state of maintenance rose significantly in very short time
- (2) The individual operators productivity rose significantly.
- (3) Resupply problems were greatly reduced.
- (4) The amount of security required for the two sections together was not as great as for two sections separated.

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OBSERVATION: Although there are a great number of projects to be accomplished, and the tendency is to separate the land clearing team into small sections, it must be realized that the projects will be completed quicker and more efficiently if the team is allowed to function as a whole..

j. ITEM: Bridge Security.

DISCUSSION: At the close of last quarter a strategic bridge on Route QL-19W was destroyed by enemy activity; the result was costly in materials, man power, and lost time. A breakdown in local security was given as the primary cause which allowed the bridge to become vulnerable. During this quarter no bridge incidents along Highway QL-19W have occurred, because of the installation of tactical wire around the critical structural bridge components by engineers and the frequent employment of armored ambushes at the bridge sites.

OBSERVATION: Sabotage of bridges can be significantly reduced by denying the enemy the ease of placing explosives by installation of tactical wire and non-patterned ambushes schedules.

k. ITEM: AVLB Bypass of Key Bridges.

DISCUSSION: Bridge repair and bridge damage from enemy action often impeded the flow of traffic to forward areas. At gaps where AVLB's can be used effectively, all weather bypasses and launching abutments are necessary to insure resupply without delay. The abutments provide a stabilized and firm launching site for the AVLB.

OBSERVATION: Where possible to be employed the AVLB launching abutments and bypass can greatly reduce the time that traffic is interrupted.

1. ITEM: Evaluation of Forklift for Battalion S-4.

DISCUSSION: Due to the large volume of materials being used and held in the Battalion S-4 Yard, a Rough Terrain Forklift was requisitioned and consequently released to the S-4. Since its arrival, the forklift has proven its worth. The lift and transport capability released critical equipment such as wreckers and cranes for field use. Effecting an overall savings in man and equipment hours, the forklift has become invaluable in S-4 Operations.

OBSERVATION: The Rough Terrain Forklift has proven to be of great value to a non-divisional Combat Engineer Battalion engaged in large volumes of material handling. It is suggested that a rough terrain forklift be included in the assets of the Combat Engineer Battalion or that provisions be made where by the conversion of bucket loader may be permitted.

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m. ITEM: Assignment of Mortars to Engineer Units.

DISCUSSION: This Battalion has had four 81mm mortars assigned to it for the past two years, and the results are very favorable. Overall defensive posture for isolated companies has greatly improved. Illumination and H&I rounds have served to reinforce these units to resist and deter attack. Crews have become proficient and reliable enough that Infantry units have requested from the engineers, night fire missions.

OBSERVATION: The 81mm mortar offers very good protection to Engineer Units. Its permanent assignment to Combat Engineer Battalions should be considered. Typical structure could be organized along the lines of an Infantry Weapons Platoon assigned to the Battalion Headquarters Company.

n. ITEM: Expedient Water Distributor.

DISCUSSION: At a remote airfield construction site the need arose for a water distributor. A 400 gallon water trailer was outfitted with a 10 foot, open trough slung beneath the drain valve in the rear. Holes were drilled in the bottom of the trough to allow water to pass.

OBSERVATION: A 400 gallon water trailer can readily be converted into an effective water distributor.

o. ITEM: Mess Hall Tables.

DISCUSSION: Units moving frequently under field conditions have a problem transporting tables used for personnel eating in the mess hall. A compact table was constructed by placing a piece of 1/2 inch plywood over the springs and frame of the standard metal bunk. By installing the bunk adapters to the legs of the bunks the table was raised to a comfortable height. Benches were constructed from materials which were available after arrival in the field, e.g. ammo boxes, logs, etc.

OBSERVATION: Six men can be seated at the table, readily fabricated from a standard bunk.

p. ITEM: Showers.

DISCUSSION: A single stall shower was constructed using ammo boxes, packing crates, a 55 gallon drum and a gasoline spout. The shower was further improved by fabricating an immersion heater out of a 155mm howitzer cannister, a #10 can with a small hole in the bottom to dispense fuel, and two 8 foot U shaped pickets wired together to form a smoke stack. A valve to control flow of water and a shower head complete the shower and are the only two parts which cannot be readily procured in the field.

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OBSERVATION: This expedient shower worked remarkably well and after the first one appeared in the company area, each squad built its own in a very short time. The comfort of having a hot shower immediately available to each man not only improved morale, but reduced personal hygiene problems as well.

q. ITEM: Footers for Steel Frame Buildings.

DISCUSSION: Concrete work for the 177' x 192' aircraft hangar was started in the middle of the monsoon season. Due to the weather situation it was recognized that rain and mud would seriously hamper all concrete work.

OBSERVATION:

(1) By placing just the footers, a cover could be made to protect the concrete when it was placed and allow the shell of the building to be erected. This afforded protection of the remaining subgrade and a more controllable environment for placing the floor slabs.

(2) It was noted that the footers needed to be redesigned to increase the surface area for the base of the columns. Two factors necessitated this, first the aggregate used in the concrete was some times dirty, thus weakening the concrete, second the bearing surface of the footers were considered inadequate for the existing subgrade. A design factor of 2 in all dimensions was used to give the necessary strength and preclude shear failure.

r. ITEM: Scaffolding.

DISCUSSION: While placing the corrugated metal siding on the hangar, a wooden scaffold was used initially. It was found that more time was spent in moving, erecting, and repairing the scaffold than was spent in affixing the siding. Also, the construction of a scaffold for the end walls would have entailed a wood scaffold 40' high by 100' long. This would have been not only costly in material and man hours but would have been an unsafe practice.

OBSERVATION: By constructing a 6' x 6' x 2' wood frame and suspending it by ropes to a crane, an efficient, inexpensive mobile scaffold was made which was safe and required approximately one third the work force previously required. Two men were able to function and place the siding where six men were needed before.

s. ITEM: Liaison Preparatory to Operations.

DISCUSSION: During the initial airlift of equipment to the

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Project Florida site, two problem areas were noted. The first was the lack of prescribed and consistent loading requirement for all aircraft of the same type. The aircraft commanders made an on-the-spot decision as to what would be loaded externally and internally. This caused some delays since some aircraft commanders did not want any explosives or ammunition carried internally and others didn't seem to care. The second problem dealt with the condition of equipment which was loaned to this unit from other units. The equipment, all light and airmobile is nonstandard to TOE 5-37E units and availability of repair parts is practically non-existent. Some pieces of this equipment, such as one D6B and one MRS-100 arrived on site in a deadline condition. No PLL (air filters, fuel and oil filters, spare hydraulic lines) came with the equipment and efforts to obtain them resulted in many days lost.

OBSERVATION: It is necessary for liaison between the using and lifting unit to work together so that question on loading policy can be resolved prior to the actual lift. Second, it would be better to have a representative from the using unit escort the equipment from start to destination and coordinate availability of PLL, spare parts and tools to service the equipment and to insure that the equipment arrives at the destination in operable condition.

t. ITEM: Red Ants.

DISCUSSION: Upon arrival at the work site and the beginning of operations with equipment, hundreds of large (1-6 foot high) ant hills were discovered. When these hills are broken open, literally millions of red ants were scattered on equipment and operators. These ants proved to be a great nuisance as they were almost impossible to brush off and their bites are painful for several days.

OBSERVATION: Reconnaissance of the area should include the factor of insect pests and adequate measures be taken to control or eradicate them. Use of water soluble DDT and/or a sprayer utilizing diesel fuel can be made. The diesel spray can be ignited to burn out the nests and provide a more pleasant working environment.

3. Maintenance:

a. ITEM: Swivel joint on Scoop Loader.

DISCUSSION: This unit has experienced difficulties with a swivel joint located on the bucket of its scoop loaders. Either the hydraulic line leading to the joint would crack, or the joint itself would leak. Efforts to weld the line, or repair the joint resulted in only limited success. It was decided to try to bypass the swivel joint completely. This was done by installing a high-pressure, hydraulic hose, with a double loop to prevent the hose from twisting when the bucket pivots. So far this has proven to be an

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effective field expedient repair.

OBSERVATION: An effective means of keeping a scoop loader operational while awaiting a replacement for a broken swivel joint, is to bypass the defective joint with a piece of hydraulic hose.

b. ITEM: Greasing underside of Rough Terrain Crane.

DISCUSSION: On the rough terrain crane there are three grease fittings which are extremely difficult and time consuming to get at. They are located on the underside of the crane between the belly pan and the chassis. In order to service these fittings, the belly pan must be removed, or if the mechanic is small enough, he can crawl into this area. The solution to this problem is a relatively simple one. We removed the fittings, and secured a length of copper tubing to the line. The tubing was then run to a convenient location near the outside of the frame, and the grease fittings replaced at the end. We are now able to service our rough terrain cranes much more quickly and effectively.

OBSERVATION: A length of copper tubing used, in effect, to relocate grease fittings to a position where they can be serviced easily, will result in a marked decrease in time and effort spent servicing rough terrain cranes.

c. ITEM: Repair Parts Supply for Units in the Field.

DISCUSSION: When units are operating in remote field locations the only means available for requisitioning parts is by radio. Much time has been wasted by completing and clarifying information necessary to fill requisitions. Trouble was reduced considerably by improving and enforcing an existing Battalion SOP.

OBSERVATION: Use of an exact and up to date SOP can save many man hours in filling parts requisitions.

4. Communications:

a. ITEM: Matching Unit Cable, CX 4722/VRC.

DISCUSSION: When there is a shortage of CX 4722/VRC cable, connect a known working cable from the receiver-transmitter to the antenna base and set the frequency desired on the receiver-transmitter. After the antenna is automatically matched to the operating frequency, the cable can be removed and used to preset another matching unit.

OBSERVATION: Matching units can be preset when there are short-

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ages of cable CX 4722/VRC by using a known working cable from another unit.

b. ITEM: Receiver-Transmitter, RT-524/VRC.

DISCUSSION: Due to the dusty conditions in areas of Vietnam, frequent cleaning of blower B6201 is required. Thru the use of an air compressor the dirt accumulated in the fan blades and ducts of the RT-524/VRC can easily be blown out. This eliminates deadlining the set for cleaning.

OBSERVATION: Much deadline time can be eliminated on the RT-524/VRC by blowing out accumulated dirt with the blower B6201.

c. ITEM: Emergency Waterproofing of all Handsets ie; H-138/PT, M-80/U and ect.

DISCUSSION: Seepage of water into the connector plug U-2229/U damages handsets. If waterproofing silicone compound is not available, GO-90 grease substance can be used in emergencies to waterproof the connector plug U-2229/U. CAUTION: Do not use the grease on push-to-talk switches.

OBSERVATION: Effective emergency waterproofing can be made with GO-90 grease.

FOR THE COMMANDER:

Richard M. Stazinski
RICHARD M. STAZINSKI

2LT, AGC
Adjutant

3 Incl

- 1-Aircraft Revetment
- 1-Expedient Off-Transport
Peneprime Unloader
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- 8-CG, 18th Engr Bde
- 5-CO, 937th Engr Grp (Ogt)
- 1-File
- 15-Reference

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EGC-CO (31 January 1968) 1st Ind
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 January 1968

DEPARTMENT OF THE ARMY, HEADQUARTERS, 937TH ENGINEER GROUP (COMBAT), APO
96318, 22 February 1968

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

1. The subject report, submitted by the 20th Engineer Battalion
(Combat), has been reviewed and is considered to be an accurate report of
organizational activities.

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



WILLIAM J. TALBOTT
Colonel, CE
Commanding

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AVBC-C (31 Jan 68) 2nd Ind CPT Ellegood/wd/DBT-163
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly
Period Ending 31 January 1968.

Headquarters, 18th Engineer Brigade, APO 96377 29 FEB 68

TO: Commanding General, U.S. Army Engineer Command, Vietnam (Prov)
ATTN: AVCC-P&O, APO 96491

1. This Headquarters has reviewed the Operational Report - Lessons Learned submitted by the 20th Engineer Battalion (Combat) for the reporting period ending 31 January 1968 and considers it to be an excellent and accurate account of the Battalion's activities.

2. This Headquarters concurs in the observations of the commander with the following comment added: Care must be taken to position all moats and similar barriers in such a position where they can be covered effectively by fire. It is entirely conceivable that if these moats are not protected by fire, they may provide a covered position for an attacking enemy force. (Ref Section II, para 2f)

Harold J. St. Clair
HAROLD J. ST CLAIR
Colonel, CE
Deputy Commander

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AVCC-P&O (31 Jan 68) 3rd Ind
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for Quarterly
Period Ending 31 Jan 68

HEADQUARTERS, UNITED STATES ARMY ENGINEER COMMAND
VIETNAM (PROV), APO 96491 15 MAR 1968

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

The attached ORLL, submitted by the 20th Engineer Battalion (Cbt), has been reviewed by this headquarters and is considered adequate except as follows:

Item concerning assignment of mortars, Section II, paragraph 2m, page 24. Adjustment and firing of mortars is not a normal mission of engineer units. However, as the situation dictates, weapons crews could be developed through the medium of proper training for HQ Company personnel to perform the function as an added duty.

FOR THE COMMANDER:

John Threlton 1LT, AGC
for RICHARD B. BIRD
Captain, AGC
Assistant Adjutant General

Protective Marking Cancelled
1 Jan 1970

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AVHGC-DST (31 Jan 68) 4th Ind (FOUO) CPT Arnold/ctw/LBN 4485
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65), for Quarterly
Period Ending 31 January 1968

HEADQUARTERS, US ARMY VIETNAM, APO San Francisco 96375 31 MAR 1968

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

1. This headquarters has received the Operational Report-Lessons Learned for the quarterly period ending 31 January 1968 from Headquarters, 20th Engineer Battalion (Combat).

2. Pertinent comments follow:

a. Reference item concerning special leave, page 19, paragraph 1. Procedures for obtaining transportation in connection with special leave are adequately covered in USARV Regulation 630-2. Return transportation instructions cannot be included in letter order prior to departure from Vietnam, since these arrangements can only be made at the appropriate Military Airlift Command facility upon arrival in CONUS.

b. Reference item concerning assignment of mortars to Engineer units, page 24, paragraph 2m; and 3d Indorsement. 81mm mortars were not included in standardized MTOE's submitted by the Engineer Command during February 1968. Authorization may be gained only through MTOE action. The 20th Engineer Battalion apparently has four 81mm mortars on hand without authorization. These mortars should be turned in since the items are in critically short supply, and current stocks are not adequate to fill TOE shortages and combat losses.

3. A copy of this indorsement will be furnished to the reporting unit through channels.

FOR THE COMMANDER:

John V. Atwell

Copies furnished:
HQ, USAECV (P)
HQ, 20th Engr Bn (Cbt)

This Protective Marking
is Cancelled 1 April 1969

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GPOP-DT (31 Jan 68) 5th Ind

SUBJECT: Operational Report of HQ, 20th Engr Bn (Cbt) for Period Ending
31 January 1968, RCS CSFOR-65 (R1)

HQ, US Army, Pacific, APO San Francisco 96558 23 APR 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:

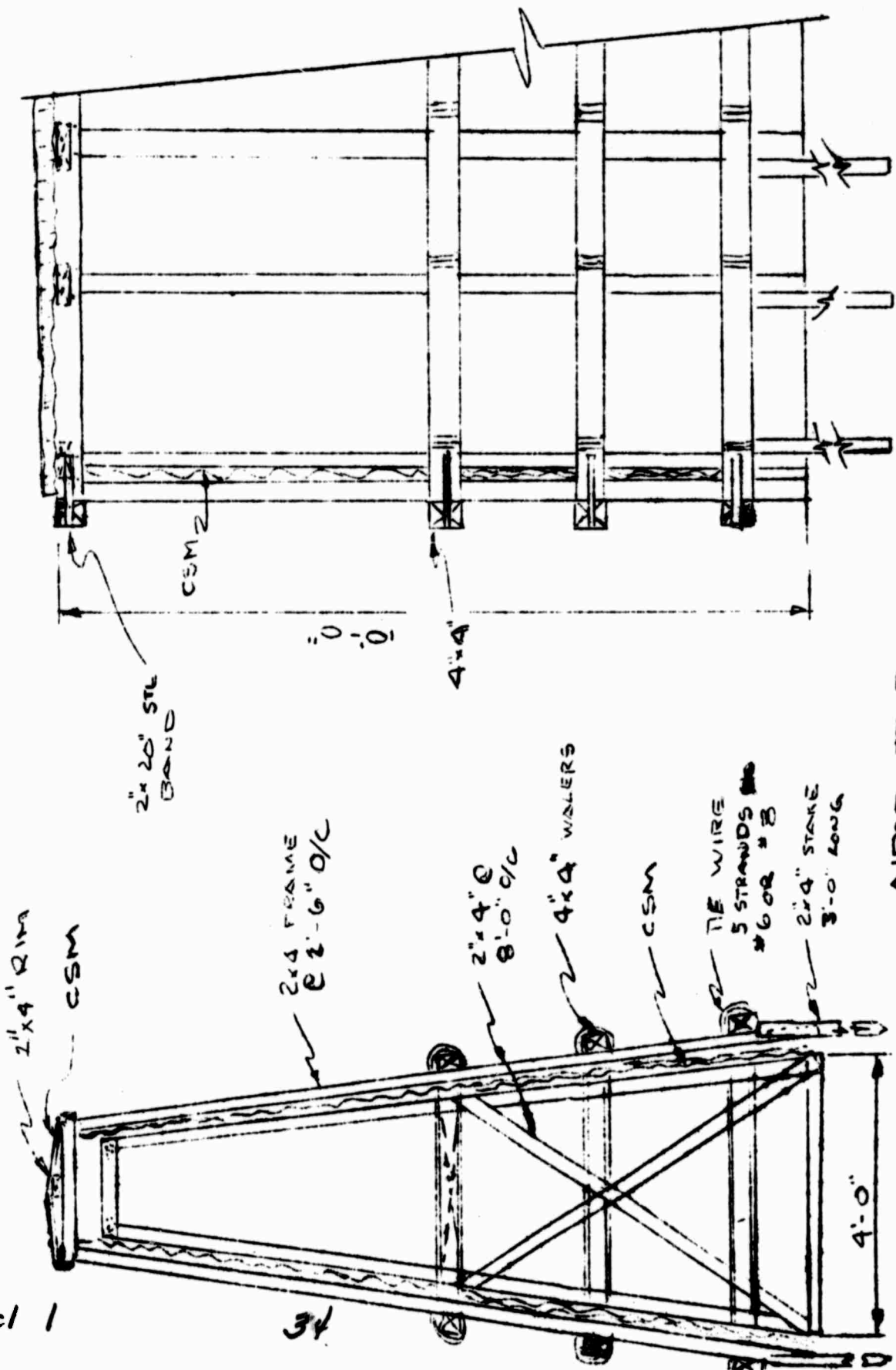


C.L. SHORTT
CPT, AGC
Asst AG

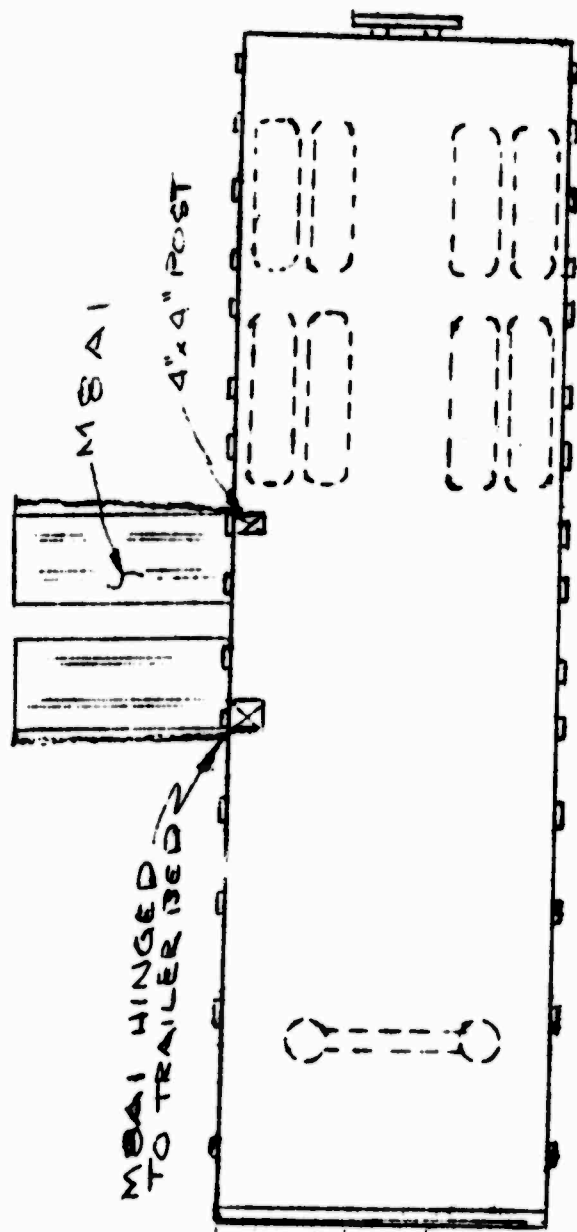
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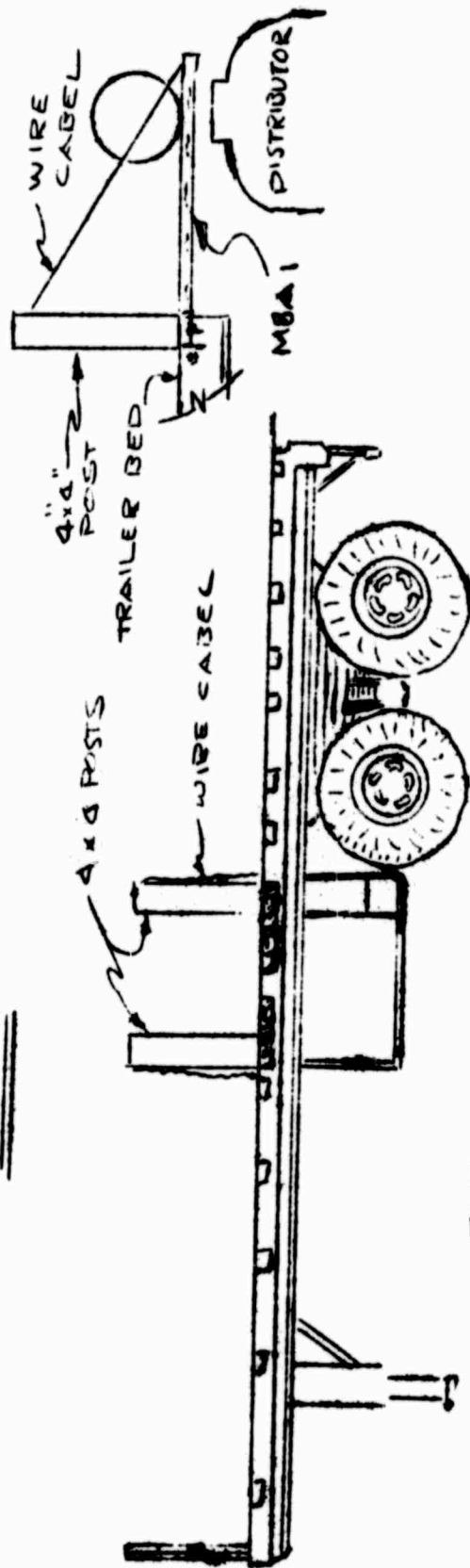
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AIRCRAFT REVETMENT



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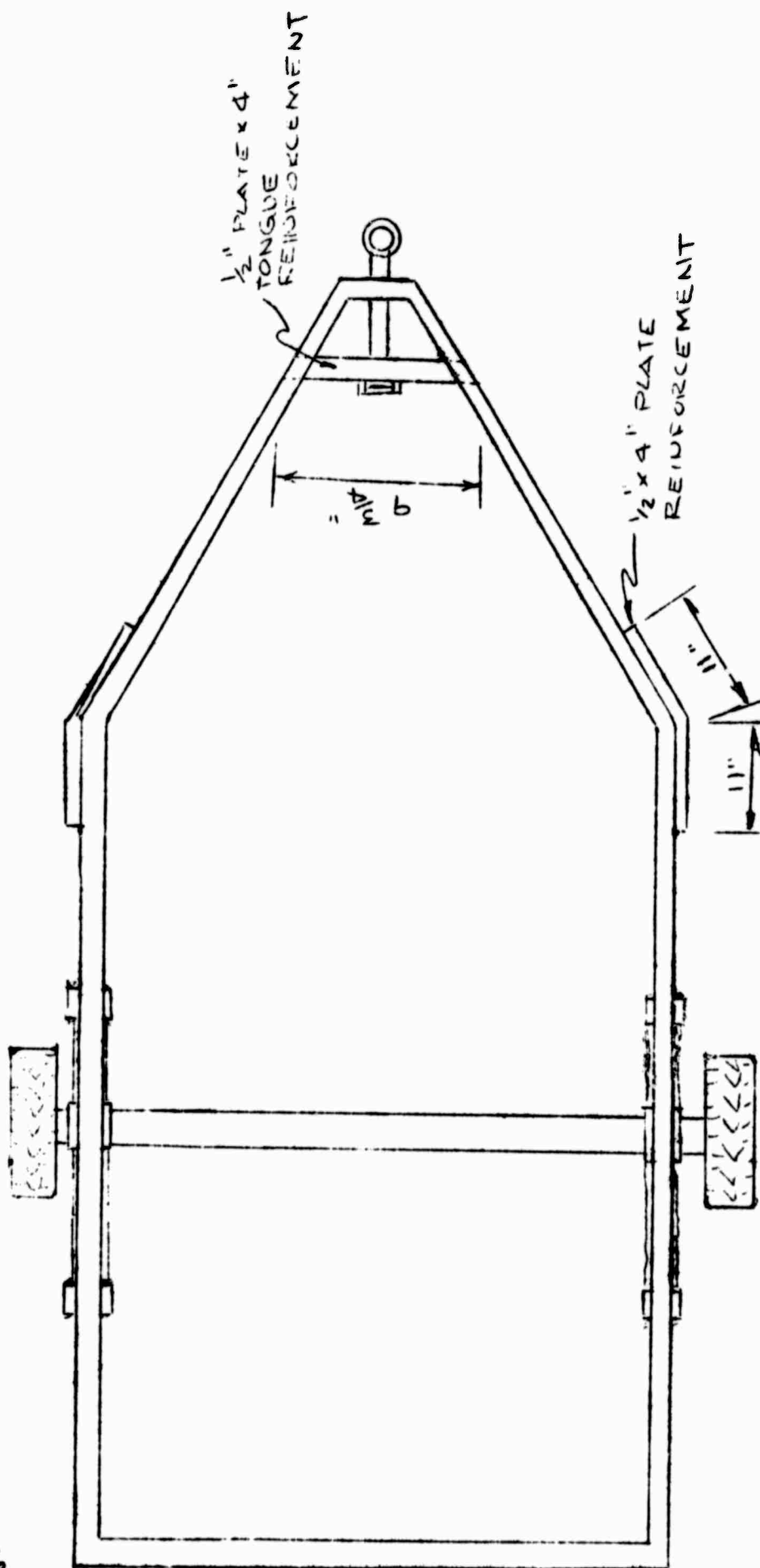


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