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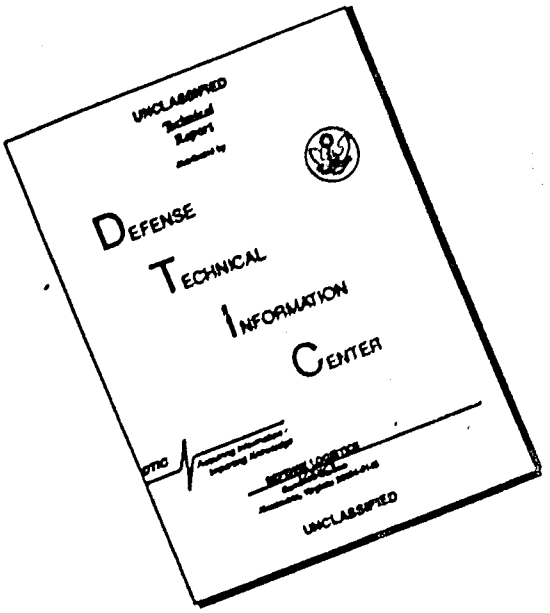

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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO
AGAM-P (M) (8 Nov 67) FOR OT RD 670579 13 November 1967

SUBJECT: Operational Reports--Lessons Learned, Headquarters, 46th Engineer Battalion (Construction), Period Ending 31 July 1967

TO: SEE DISTRIBUTION

1. Subject report is forwarded for review and evaluation by USACDC in accordance with paragraph 6f, AR 1-19 and by USCONARC in accordance with paragraph 6c and d, AR 1-19. Evaluations and corrective actions should be reported to ACSFOR OT 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

1 Incl
as

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3

DEPARTMENT OF THE ARMY
HEADQUARTERS, 46TH ENGINEER BATTALION (CONSTRUCTION)
APO 96491

EGBB-CO 14 August 1967

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 31 July 1967

THRU: Commanding Officer, 159th Engineer Group (Const), APO 96491
Commanding Officer, US Army Engineer Command Vietnam (Prov)
ATTN: AVCC-P&O, APO 96491
Commanding General, United States Army, Vietnam, ATTN: AVGC-DH, APO 96307
Commander in Chief, United States Army, Pacific, ATTN: GPOP-OT, APO 96588

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

Section 1, Significant Organization or Unit Activities

1. Command: LTC William V. McGuinness, Jr, commanded the battalion during the entire reporting period.

2. Personnel, Administration, Morale and Discipline:

a. The 46th EBC was reorganized under TO&E 5-116E, 5-117E, 5-118E effective 12 June 1967, as directed by GO 107, HQ United States Army, Pacific. On 20 May 1967 the 536th Engineer Detachment (Port Construction) was relieved from attachment to the 46th EBC.

b. Other units under operational control of the 46th EBC during this period were:

(1) 617th Panel Bridge Company - modifying the Tan Thuan (Fishmarket) Bridge in Saigon.

(2) Elements of the 643d Pipeline Construction Company working on the Saigon pipeline and tank project.

c. Vietnamese continue to be employed in a variety of occupations -- laborers, carpenters, masons, electricians, etc. The total number of Vietnamese employed was approximately 700.

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d. Personnel strength: The battalion was authorized 10% overstrength under the Delta series TO&E. Under the Echo series TO&E, effective on 12 June 1967, the battalion is not authorized a 10% overstrength. The battalion's current 11% overstrength will be lowered to the authorized level by normal attrition.

e. Morale and Welfare: Morale continues high even though the battalion operations continue on a seven day week, two shift day during the rainy season. All of the EM in the battalion are now living in tropical wooden buildings and improved shower-laterine complexes are being constructed by each company. A new EM-NCO club is under construction and upon completion will release the buildings currently occupied by the NCO and EM club for PX expansion, a battalion day room, and a battalion chapel. A roof has been added to the outdoor theater.

3. Intelligence and Counterintelligence: The battalion continues to disseminate intelligence information via a weekly briefing by the battalion intelligence NCO to all company and staff representatives. The briefing digests all intelligence summaries for the week pertinent to our areas of operation.

4. Plans, Operations and Training:

a. During this period projects in the Vung Tau area were turned over to the 34th Engineer Group. All attachments were relieved and D Co moved to Long Binh. The entire battalion became located at the same installation for the first time since its arrival in country. Preparation of the D Company area was done in advance where possible. The other companies constructed billets and motor pool facilities so that D Company could assume project responsibility with a minimum of delay.

b. Headquarters Company. The company continued to produce potable water for consumption by the battalion and neighboring units. Erdlators at the battalion water point processed 2,309,475 gallons of potable water during the reporting period.

c. Company A. The equipment support and maintenance mission was changed somewhat during the period due to the switch from TO&E 117D to TO&E 117E. The most significant change is in the Field Maintenance Platoon where the Ordnance Direct Support Section was deleted and a Field Maintenance Section was added. In actuality the phase out from Ordnance Direct Support will occur gradually. Attrition by rotation and retraining of ordnance mechanics will accomplish the change, over several months time. A USARV team spent a week in the company reviewing and updating the PLL and ASL. This team did an outstanding job and helped train the repair parts personnel. The Equipment Platoon has helped support the battalion's horizontal construction effort with dozers and dump trucks. One piece of equipment that has been in heavy use is the earth auger.

Soils exploration, utility pole installation, and bunker construction has kept it in almost constant use. The rock crusher was deadlined for about a month during this period for bearings for the secondary shaft. The bearings were ordered on a Red Ball Express requisition and arrived in twenty-five days. The 34E concrete paver produced 6,815 cubic yards of concrete during the period at a static batch plant site. The paver was in Bear Cat for part of the period supporting a Group project and is now in Phu Loi in support of the 79th Group. Two new Littleford asphalt distributors were received during the period. Quantity of asphaltics used were: 80,350 gallons of peneprime, 22,400 gallons of RS-1, 4,000 gallons of MC-2, 12,800 gallons of RC-3, and 8,000 gallons of soil binder.

d. Company B.

(1) During the last quarter, B Company completed the largest and most significant project in the Long Binh area; the Long Binh Ammunition Supply Depot. In addition to the 225 ammo storage pads completed previously, they have now finished the 30 protective earth berms around 30 of the pads and the clearing both inside and outside the ASP. The clearing outside the ASP consisted of a 300 meter band completely around the outside of the fence with the first 100 meters being completely stripped bare of all growth and left with a graded finish. This was accomplished using Rome Plows, bullblades and a 500 foot anchor chain.

(2) The extension of the Honai Storage facility has progressed to the point of being 82% complete. Priority I, II, and III are complete as of this date, with work nearing completion on the last priority, priority IV. A new surfacing material, UCAR 131, was applied to two pads in priority III by the 92d Engineer Battalion. It is a clear plastic type sealer used on roads and pads for protection from moisture damage. Results are now being checked at the yard with occupation of the storage pads by the 506th Field Depot. Approximately 75,000 square yards are now available for use in the extension area.

(3) The 199th Light Infantry Brigade Cantonment area is close to completion at the present time. The original scope of work of 30 pads, 30 two story prefabbed troop billets and two messhalls had been accomplished. All that remains now is the construction of 10 more of an additional 15 pads plus the perimeter road. An added item was the construction of two complete headquarters buildings by this unit in the cantonment area. The first building, a Brigade Headquarters, features 40 foot free span wooden trusses and sliding glass windows. The second building was a Battalion Headquarters, which is a 20 by 100 foot building with glass windows. The interior of both buildings were completely paneled with masonite

(4) The B Company carpenter shop has used another 970,000 board feet of lumber in the manufacturing of messhalls, two story troop

billets, latrines, showers and various other structures. At the present time the carpenter shop is preparing to move to a new location behind the battalion area. The new location will provide much greater storage area for both materials and completed buildings as well as better security for the entire shop.

e. Company C.

(1) At the beginning of this period Company C was building two General Officer quarters in the IIFFV area, a PDO Yard with temporary facilities, a 126,000 gallon water fill point in IIFFV, and a 5000 man cantonment area.. One of the General Officers quarters is 30 x 40 feet, the other is 20 x 30 feet. Both are two bedroom quarters with air conditioning, brick exterior, electric kitchens and interior wall paneling. The PDO facility included approximately 75 acres of clearing, three miles of roads, and a half acre of hardstand. Work was continued on these projects during the month of May.

(2) During the later part of the month a project came down to Company C to replace five culverts in the Long Binh Headquarters area. This project was completed in about one week. Two 48" and three 36" culverts were installed. In the early part of June we were given four more projects; another GOQ, a trailer park for eight General Officer's trailers, to include water supply, waterborne sewerage and power, a 21,000 gallon water fill stand for the 199th Light Infantry Brigade and a MER project for two light helicopter companies. The MER project includes roads, drained and shaped billet areas, showers, latrines, motor pool, maintenance area, and a 500-man mess hall. At the end of the period directives came down for other facilities necessary for two assault helicopter Companies and a Direct Support Maintenance Company. These facilities include three hangars totaling 63,550 square feet, 24,000 sq ft of covered storage, 60 helicopter landing pads, 1,000 bbl POL storage, ammunition bunkers, operations buildings, tech supply buildings, 10,000 sq yds of hardstands, and a helicopter staging area. This project called IIFFV Heliport will continue until the spring of 1968.

(3) During the second week of June the trailer court project was expanded to include spaces for ten more trailers. In the third week of June the initial requirement for the trailer courts were completed. The last week in June the first two GOQ's were completed. The first week in July the trailer court project was expanded to include spaces for 26 more trailers. The following week the 5000 man cantonment area was turned over to Delta Company. The third week in July the trailer courts were completed as was the PDO Yard. The last week of July the trailer court project was re-opened and a requirement for four trailer spaces added.

(4) At the end of this reporting period Company C is working on the MER project, and is completing the water fill stand for the 199th Light Infantry Brigade, the fourth trailer court and the fourth General Officers Quarters.

7.

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14 August 1967

f. Company D.

(1) During this period D Company moved from Vung Tau to Long Binh. The move was accomplished primarily by ship. Motor march was scheduled originally but due to the lack of security and damage to bridges along Route 15 at that time a ship movement was necessary. The move started on 3 June 1967 and terminated on 24 June 1967. It was spread out over a long period of time for two main reasons. First, the port could not give notice of availability of ships more than a few hours in advance. Secondly, a phase out of projects at Vung Tau and phase in of those at Long Binh was possible this way. Equipment and personnel were ready to go on short notice but continued to be usefully employed. When they arrived at Long Binh they supported current projects and improved their area. By the time the company was completely moved they were completely operational and had their own projects assigned.

(2) When D Company left Vung Tau the surcharge test for Highway 15 causeways was complete, the Vung Tau Ammunitions Storage Depot was 50% complete, the Communications Center was partially complete, the 500-man mess hall was completed, the hardstand for electrical equipment at the port was completed, the 100,000 barrel POL facility was complete except for minor portions for which parts were not available, and 320,000 sq ft of M8A1 matting was placed on the open storage area. The two largest rock quarries in Vietnam were turned over to the 34th Group as was the barge loading facility which enabled us to ship rock to the Mekong Delta.

(3) Since arriving at Long Binh, D Company has constructed latrines and showers for USARV; is working on the Long Binh ASP renovation and the Bakery Annex; has completed a 40' x 100' Processing Building at the 90th Replacement Battalion; is working on a bus parking area, and a USARV storage pad; and has begun electrical wiring renovation of the Engineer cantonment in preparation for commercial power.

g. Other: In early May the 617th Engineer Company (FB) was attached to the 46th Engineer Battalion for the purpose of replacing an existing one-way, TS reinforced 120 foot long Bailey Bridge, which spanned a weakened bascule section of the Tan Thuan (Fishmarket) Bridge, with a two-way DS-DD 70 foot Baily Bridge. The one-way Baily Bridge had been causing a bottleneck on the heavily traveled route between Saigon and Na Bha and had attracted attention at the ambassadorial level. Because of the need for this route to be opened to as much traffic as possible, the new bridge was constructed during the early morning hours on five successive days. The after action report of this operation is included as inclosure 2 to this report.

5. Logistics: During the past quarter the S4 section has issued an average of 490,000 bf of lumber and 11,000 bags of cement per month. Electrical supplies were a critical shortage but are starting to come into country. The Battalion is presently short three water distributors and two 3-wheel 10-ton rollers which are needed for horizontal construction. The

battalion is currently at 96% fill of TO&E authorization for construction equipment and general purpose vehicles.

6. Force Development: The organic work of the battalion is currently being augmented by approximately 700 permanent hire Vietnamese. This labor force is used on most battalion projects. The use of Vietnamese on such semi-and non-skilled work as carpenter shop, sandbag shop, cement-sand-laterite block shop, culvert placement, headwall construction and concrete work, frees Engineer troop labor for more critical positions such as heavy equipment operator. An example of the usefulness of the Vietnamese labor is the manner in which this battalion has been able to produce bunkers, culverts and sandbags for the security of MACV Headquarters with extremely short notice and without drawing troop labor from other critical projects. The production per Vietnamese is less than that using troop labor, but because of the difference in pay the overall cost is much less using Vietnamese.

7. Command Management: The battalion management is manifested through frequent project inspections, on-site coordination, and liaison with higher headquarters. A project schedule is maintained showing predicted project requirements for three months and indicating past project experience. The schedule is discussed with 159th Engineer Group on a weekly basis. Daily battalion operations meetings have proven to be very useful as a tool for project coordination and as a forum for discussing technical problems that are encountered during construction.

8. Civic Affairs: The Battalion maintains an active interest in civic action projects. The battalion medics make trips to the village of Xuan Tra when a doctor is available. The following items were donated by members of the battalion to adjacent orphanages, convents and villages: 600 bars of soap, 75 pounds of clothing, 200 pounds of assorted food, scrap lumber and 8,500 $VN for the orphanage operations. Three village gates and one water pump were repaired by members of the battalion.

Section 2, Part 1 - Observations (Lessons Learned)

1. Personnel - None

2. Operations

a. Item: Material Substitutes for Peneprime.

Discussion: Because of the pressing need for dust suppressors on Battalion projects and the frequent shortage of peneprime, various types of asphalt products have been tested as possible substitute material. One such product that was tested by A Co is RS-1. Physically, RS-1 is an emulsion that is dark brown in color and has a low flash point; it is used mainly as a tack coat in double surface treatment preparations.

Observations: For our test cases we used three highly compacted laterite storage pads; the RS-1 was shot at an application rate of .5

gal per sq yd and at a temperature of 125°F. During the spraying operation we encountered considerable problems with gumming in the asphalt distributor spray bar and pump assembly. To correct this problem, the distributor crews were forced to clean the sprayer bar nozzles and flush the asphalt pump repeatedly with diesel fuel. Other than this there were no application problems; coverage was 100% effective and no blotting was encountered. Our field tests soon showed that RS-1 has very poor curing characteristics. The emulsion was allowed to set for five days, during which very little curing occured. Further examination of the pads revealed that no penetration had taken place. This may have been related to the poor curing characteristics of RS-1. To correct this situation we were forced to spread sand on the RS-1 at a rate of 1 cu yd of sand per 300 sq yds of surface area. Later the pads were rolled with a steel wheeled roller to ensure proper bonding between the sand and the RS-1. The resulting surface had good wearing characteristics and was considered excellent. RS-1 is more difficult to apply and cure than peneprime but when blotted with sand produces a better surface.

b. Item: Truck Dump 5 Ton M51A2 and Truck Tractor 5 Ton M52A2

Discussion: It has been our experience that one of the major causes for down time on these two trucks is that the rivets connecting cross members to the main frame and the rivets connecting the spring hangers to the main frame keep coming loose.

Observation: These deficiencies can not be corrected at 1st or 2nd echelon levels but must be processed thru 3rd echelon or direct support causing a great loss of man hours as well as down time for the vehicle.

c. Item: Clearing Capability of the Small Rome Disc Plow

Discussion: Tests were conducted outside the perimeter of IIFFV to determine the capability of the small Rome disc plow harrow for clearing of grassy and lightly vegetated jungle areas. The scope of the tests included the determination of the point at which clearing with a dozer mounted Rome plow clearing blade would be more economical.

Observation: The harrow was found to be extremely effective in grassy areas and in areas covered with low brush three to four feet in height. Absolute clearing capability was found to be in the range of one acre per hour in these areas.. The finished area was clear of brush and free of the windrowed stock piles characteristic of clearing with the Rome plow blade. The maximum clearing capability of the small Rome disc harrow is in brush about ten feet in height. Even in these areas, clearing with the Rome plow blade would have been much faster although the cleared area would not have been as clean of brush and debris. The disc harrow is extremely difficult to pull through swampy and wet areas and it is totally ineffective in clearing or cutting bamboo. The Rome disc harrow is recommended for use in grassy and low shrub areas and in very light jungle areas where a smooth and clean finished area is required. The Rome plow equipped

dozer is recommended for all areas having brush greater than ten feet in height.

d. Item: Large Rome Disc Plow

Discussion: Company C was assigned the task of testing the effectiveness of the large Rome disc plow in clearing operations under varying conditions. The results were accumulated from use in clearing operations at the PDO facility and the NEK project.

Observation: In heavy thick brush approximately ten to twelve feet high, the D7E tractor with plow attached cleared the test run after three passes. It was necessary to lower the dozer blade approximately twelve inches above the ground level to push the brush over. The plow, set with maximum angle on the disc, had a tendency to ride up over the brush and collect the debris in front of the disc causing tremendous strain on the tractor. After three passes over an area containing three to four inch diameter trees as described above adequate cutting action was obtained but the clearing rate per hour is severely decreased to approximately ¼ acre per hour. It is considered that under these conditions the Rome plow blade would be much more effective. In moderately thick brush approximately six to seven feet high the test area was approximately 15 acres which was cleared at the rate of one acre per hour. The results obtained were satisfactory, however the area was not completly free of vegetation. There was only one pass made over the entire area and a few widely dispersed clumps of brush were left standing as the result of not making a sufficient overlap of passes. This problem can easily be solved as the familiarity of the operators with the characteristics of the Rome disc plow increase. The advantageous points of using this Rome disc plow for clearing operations is that there are no piles of spoil left to be disposed of and erosion control is much better, in that hillsides are not susceptible to sheet drainage as would be obtained if the earth was scraped clean with a bulldozer. The noted disadvantages are that when working in thick material the plow has a tendency to ride up over the material and therefore not providing good cutting action. This problem can be solved simply by adding ballast to the plow frame. It is believed that an estimated 2 to 2½ tons would solve this problem but would add to the problem of overheating. At the time of testing a single D7E tractor was used to tow the plow. It quickly overheated the tractor and made operation in any speed other than low range impossible. This plow taxed the tractor to the upper limits of its draw bar pull. It is recommended that in large clearing areas where the Rome disc plow is to be used that two D7E tractors be hitched in tandem, however this will necessitate two highly coordinated operators who can anticipate each others actions. It seems that a hydraulically equipped D8H would be the ideal tractor to tow the large home disc plow, however this combination has not been tested for its efficiency.

e. Item: Test of Republic Steel Matting for Revetments

Discussion: Tests were conducted to evaluate the effectiveness of Republic Steel Matting for use around troop billets. Two sheets of matting were erected using a space of 12 inches, 18 inches and 24 inches. The space between the matting was filled with sand for the test. After the revetments were constructed various weapons were fired at them. The weapons included M-14, M-16, 50 cal. machine gun, 81mm mortar, 4.2" mortar and M-79 grenade launcher.

Observation: The fifty caliber machine gun penetrated a one foot thickness at 100 meters but failed to penetrate the 18 inch model. The M-14 and M-16 did not penetrate a one foot model at 50 meters. All the mortar rounds were detonated at ranges as close as one meter but none of them penetrated a one foot model. It is recommended that the Republic Steel Matting may be used for revetments with 18 inches of sand used as a filler. This has two benefits. With an experienced crew it is found to be quicker than sandbags, and it is more sightly and longer lasting than sandbags.

f. Item: Rolling Screed

Discussion: Company C, 46th EBC has recently been experimenting with a rolling screed designed by CPT Miller L. Love, Jr. Company Commander. The screed is designed to replace the wooden screed formerly used The main problems with the wooden screed were the sag which developed in the middle of the screed after a few uses and the slowness of the screeding process. The sag necessitated rebuilding the screed after four or five uses.

Observations: The design of the screed is basically a four inch pipe with roller bearings in the ends supporting two welded pipe handles. The original design had the bearings in the caps which screwed to the end of the pipe. Although this arrangement allowed the screed to be extended easily and quickly for wide slabs, it was found that the cap caused the screed to ride up and not finish the pad flush with the previously one poured i.e. the second half of a 40' x 150' pad. The present design incorporates the bearings in the ends of the pipe instead of in a removable cap. The rolling screed has proven quite successful providing a rapid level screeding operation.

g. Item: Loading Barges with Rock

Discussion: The following requirements must be met when loading rock on 35-70 ton barges. Freeboard of at least 2½ feet at the bow and two feet at the stern must be maintained. No more than a 2° list can be tolerated. Hatches must be inspected for watertightness frequently as the civilian barges in service in Vietnam are old.

Observation: On the barges loaded it was found that the minimum freeboard limited the amount of rock before the rated tonnage was reached. A moveable conveyor and chute are necessary to distribute the rock evenly so listing would not be too great.

h. Item: M8A1 Matting

Discussion: Many problems were encountered in the covering of a large pad with M8A1 matting. The most prominent and difficult to solve was the proper locking of the matting.

Observation: It was found that after laying a few rows, gaps began to develop between the locking studs and the slots into which they fit. This gap became progressively larger as more rows were laid. It eventually reached the point where it was impossible to slide the matting into locking position. The problem encountered was narrowed down to three specific causes.

(1) Not taking adequate care in locking joints tightly.

(2) Using M8A1 matting that was produced by three different manufacturers. Each type proved to have different dimensions on its studs and slots.

(3) Not keeping a constant spacing between adjacent sections when overlapping. To allow the job to be done better and more efficiently, Conduct close supervision when joints are locked together. Segregate matting according to manufacturer and use only similar brands in continuous sections, and maintain a constant space of 1¼" between adjacent sections on the overlap.

3. Training and Organization: None

4. Intelligence: None.

5. Logistics: None

Section 2, Part II, Recommendations

1. Personnel: None

2. Operations: None

3. Training and Organization:

a. The TO&E 116E should be modified to provide two light vehicle drivers who are also radio operators for the S3/S2 Section. The section is authorized three jeeps, two of which have FM radios, and two 3/4 T trucks. Two clerks, two rodman, two construction draftsman, and the terrain analist are assigned the additional duty by TO&E, as light truck drivers. However, the

clerks must stay in the S-3 and S-2 sections respectively because of the workload. The rodmen drive the 3/4's for the surveyors, and the draftsmen are employed on a full time basis, drafting. The terrain analyst can be used as a driver, but he is an E-6 and should be more gainfully employed. There is no one in the section trained to maintain or operate the radios and there are no drivers actually available to drive for the S-3, Civil Engineer, and Pipeline Engineer.

b. The Echo series TO&E, to which we converted this quarter, introduces trends which are opposite to the operations experience developed by this Battalion. We recommended that the experiences of Engineer Construction Battalions in Vietnam be surveyed and, if comments are similar to ours, adjustments made along the following lines:

(1) Increase horizontal capability, even at the expence of reduced vertical capability. The Echo series is a move in the opposite direction. The limiting factor in almost all our work has been the horizontal effort required. Even under the Delta series it was necessary to convert carpenters and plumbers to equipment operators, to sustain a full two-shift equipment capability. We were always able to make up for the loss of vertical effort through the use of native labor or, in a few cases, by postponing slightly the non-critical upgrading of cantonments. The Echo series complicates the problem by decreasing essential horizontal personnel and increasing the number of vertical personnel.

(2) Improve organic maintenance capability. An Engineer Construction Battalion easily represents a sufficiently large concentration of both ordnance and engineer equipment to warrant an organic 3rd echelon maintenance capability.

(a) The Echo TO&E keeps nearly the same number of ordnance mechanics, but it badly maldistributes them. We receive an unneeded increase in 2nd echelon capability and lose all of our much-needed 3rd echelon authority.

(b) We retain our 3rd echelon Engineer authority but lose 40 percent of our Engineer mechanics.

4. Intelligence: None

5. Logistics: The following recommendations are repeated for emphasis since they vitally affect the capabilities of this organization to efficiently perform its assigned mission.

a. Fork lifts should be procured and issued to the S-4 to enable large quantities of construction materials and supplies to be handled thereby relieving the 20 ton cranes for construction use. Fork lifts would be adequate for much of the work required in handling supplies by hand and with the use of a 20 ton crane, as is now the practice.

b. That FM radios be procured for the construction companies. Comparisons with units having FM radios have shown that when AM radios presently used will not function, the FM net had clear reception. As a security measure and to increase control and efficiency, the FM radio sets would be indispensable. They are on the Echo series TO&E.

W.V. McGUINNESS, JR
LTC CE
Commanding

2 Incl
1. Organization Chart
2. After Action Report-Fishmarket Bridge

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EGB-3 (14 Aug 67)
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 31 July 1967

DA, HQ, 159th Engineer Group (Const), APO 96491 22 August 1967

THRU: Commanding General, 20th Engineer Brigade, APO 96491

TO: Commanding General, United States Army Engineer Command Vietnam (Prov), ATTN: AVCC-P&O, APO 96491
Assistant Chief of Staff for Force Development, Department of the Army (ACSFOR-DA), Washington, D.C. 20310

1. The subject report, submitted by the 46th Engineer Battalion (Const) has been reviewed by this headquarters and is considered comprehensive and of value for documentation and review of the reporting units activities and experiences.

2. This headquarters concurs with the submitted report, with the following comments:

a. Section 1, paragraph 6: The Carpentry Prefabrication Shop of the 46th Engineer Battalion, which is manned by 1 NCO, ? EM, and over 130 Vietnamese is considered a model of an efficient and well organized operation.

b. Section 2, paragraph 2, ITEM: Material Substitutes for Peneprime. RS-1, with its slow curing period and added requirement for a sand layer, is not considered to be a satisfactory substitute for a dust control product such as peneprime due to the time and effort required to provide a treated surface.

c. After Action Report, Fishmarket Bridge: This report is considered an excellent account of the planning and execution of this unusual and critical bridge mission.

FOR THE COMMANDER:

JOHN L. PEEL
1LT, CE
Asst Adjutant

Copy furnished:
CO, 46th Engr Bn

DA, Headquarters, 20th Engineer Brigade, APO 96491, 1 September 1967

TO: Commanding General, USAECV(P), ATTN: AVCC-P&O, APO 96491

1. The subject report, submitted by the 46th Engineer Battalion, 159th Engineer Group, has been reviewed by this headquarters, and is considered comprehensive and of value for documentation and review of the reporting units activities and experiences.

2. This headquarters concurs with the submitted report, with the following comments:

Reference section 2, part 1, paragraph 2h: Deficiencies have been observed when M8A1 matting of different manufacturers has been assembled. Currently a field investigation of these facilities is underway.

FOR THE COMMANDER:

CECIL D. CLARK
Major, CE
Adjutant

Info Copy:
CO, 159th
Engr Gp

HEADQUARTERS, UNITED STATES ARMY ENGINEER COMMAND
VIETNAM (PROV), APO 96491 28 SEP 1967

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

This headquarters concurs with the 46th Engineer Battalion ORLL report and previous indorsements as written, subject to the following comments:

1. Reference Section 1, paragraph 5, page 5: Concur. Electrical supplies are becoming more readily available and should not be a critical problem in the future. The 46th Engineer Battalion has been issued one 3-wheel, 10-ton roller since their report. Water distributors and compaction equipment are arriving in-country in limited quantities, as they become available from USAMEC.

2. Reference Section 2, Part I, paragraph 2d, page 8: Concur. The requirement for a tractor larger than the D7E for land clearing purposes is being reviewed by this headquarters.

3. Reference Section 2, Part II, paragraph 3, page 10: Unit TOEs and MTOEs are presently under study at this headquarters. Units that have discrepancies should resubmit MTOEs through channels to be reviewed by the DA ACSFOR team in late November. Submission should be expedited and coordination with like units should be made to standardize MTOEs.

4. Reference Section 2, Part II, paragraph 5a, page 11: Concur. An emergency MTOE has been submitted to USARPAC requesting authorization for rough terrain, 10,000 lb, fork lifts. Authorization is for two per construction battalion and one per combat battalion. As these assets become available, 1st Logistical Command will issue the fork lifts to units of the Engineer Command on sixty day temporary loan pending approval of the emergency MTOE.

5. Reference Section 2, Part II, paragraph 5b, page 12: Concur. Engineer construction units are low on the priority list for receipt of FM radios.

FOR THE COMMANDER:

PAUL A. LOOP
Colonel, CE
Chief of Staff

SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 31 July 1967

Copies furnished:
CG, 8th US Army, ATTN: Engr
CG, 20th Engr Bde
CO, 159th Engr Gp
CO, 46th Engr Bn

SUBJECT: Operational Report-Lessons Learned for the Period Ending 31 July 1967 (RCS CSFOR-65) (U)

HEADQUARTERS, UNITED STATES ARMY VIETNAM, APO San Francisco 96375 : 7 [illegible]67

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

1. This headquarters has reviewed the Operational Report-Lessons Learned for the period ending 31 July 1967 from Headquarters, 46th Engineer Battalion (Construction) (CWWA) as indorsed.

2. Concur with report as indorsed. Report is considered adequate.

FOR THE COMMANDER:

[signature]
[illegible] SCHULTS
Major, AGC
Asst Adjutant General

2 Incl
nc

GPOP-DI(14 Aug 67) 5th Ind
SUBJECT: Operational Report for the Quarterly Period Ending 31 July 1967 from HQ, 46th Engr Bn (Const) (UIC: WCWWAA) (RCS CSFOR-65)

HQ, US ARMY, PACIFIC, APO San Francisco 96558 27 OCT 1967

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

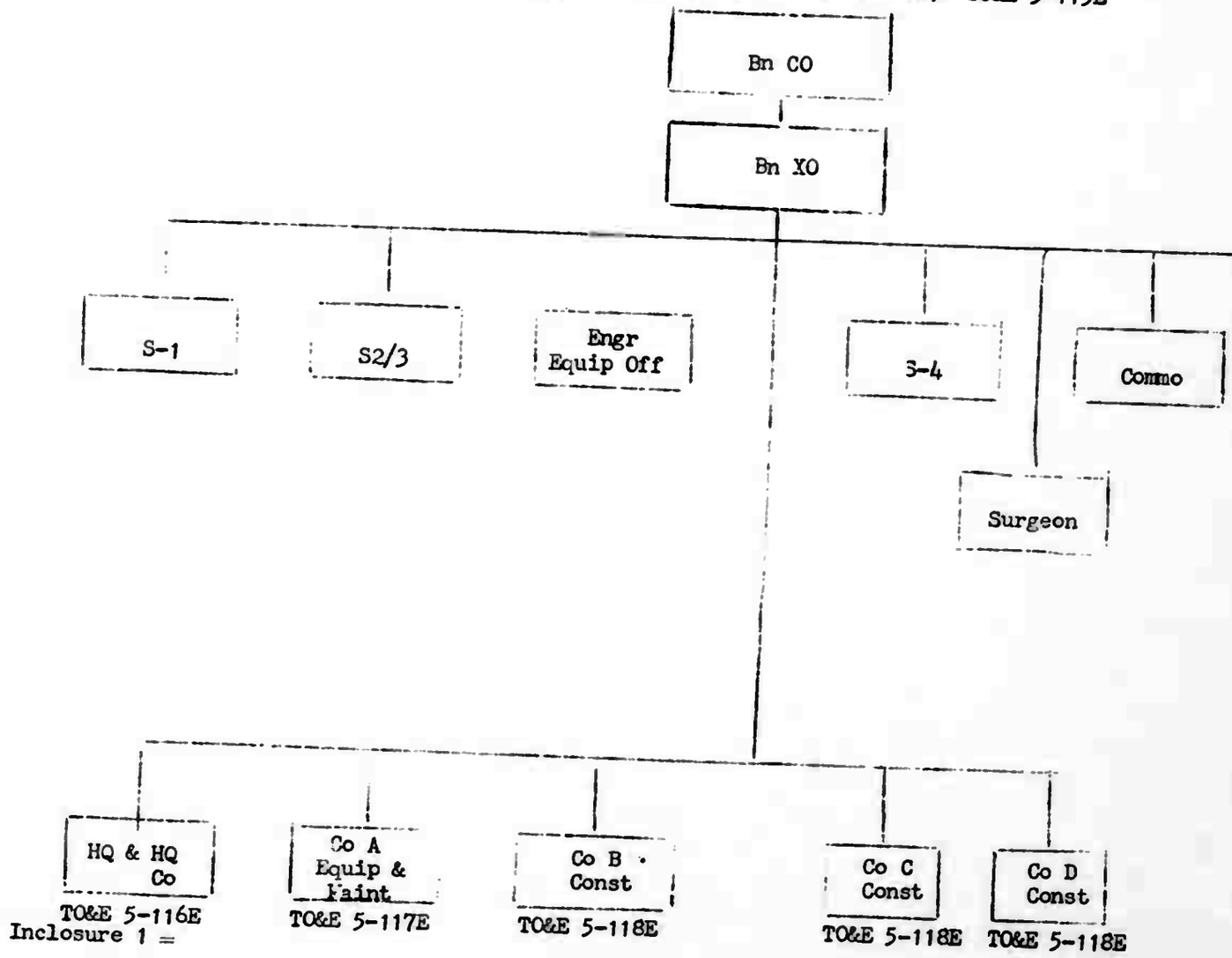
This headquarters has evaluated subject report and forwarding indorsements and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:

T. F. OSBOURN
AJ, AGC
Asst AG

2 Incl
nc

46th Engineer Battalion (Construction) TO&E 5-115E



Inclosure 1 =

APO 96491

EGBB-3 1 June 1967

SUBJECT: After Action Report

TO: Commanding Officer
159th Engineer Group(Const)
ATTN: EGB-3
APO 96491

1. Name of Operation: Fishmarket Bridge

2. Dates of Operation: 6 - 11 May 1967

3. Location: XS 884891

4. Command Headquarters: 159th Engr Gp(Const)

5. Task Organization:

a. Organic Units: 46th Engr Bn(Const)

b. Attachments: 617th Engr Co (PB)

c. Detachments: None

d. Supporting Forces: None

6. Intelligence: Rumors were circulated that the bridge would be blown up during construction. The Viet Cong announced this on the radio. Armed bridge boats of the 41st Port Construction Company patrolled the river throughout the operation.

7. Mission: To replace an existing one way, TS reinforced, 120 foot long Bailey Bridge with a two way, DS-DD 70 foot long Bailey Bridge. Work was accomplished so that one way Class 35 traffic could use the bridge between 0630 and 2330 hours daily. Closure of the bridge at 2200 hours for the first night's operations was an exception to this criterion.

Incl 2

EGBB-3 1 June 1967
SUBJECT: After Action Report

8. Background: The Fishmarket (Tan Thuan) Bridge is one of the major bridges in Saigon. It serves the heavy commericial traffic generated by the busy port of Saigon and the port of Nha Be, which is the principal POL terminal for South Vietnam[1]. In December 1966 a damaged bascule section had been spanned by a Bailey Bridge. Because of obstructions at each end the Bailey had to be single-lane causing great congestion and lines of traffic several miles long on each approach. The military, economic and political pressure created by this bottleneck had reached such proportions by May 1967 that both Premier Ky and U.S. Ambassador Bunker had strong personal interest in relieving the situation as soon as possible.

9. Concept of Operations: Upon receipt of notification of the mission, detailed planning was done to insure accomplishment within the specified time limitations. The most critical factor was insuring our ability to open the bridge to Class 35 traffic at 0630 hours each morning. The increments of work and the detailed steps within each increment were planned in concept. The 617th Panel Bridge Company then rehearsed this concept in their bridge yard. They built a bridge similar to the existing one and proceeded to convert it to the new bridge under the same restrictive conditions that would be encountered on the actual site. With the knowledge gained from the rehearsal final plans were made and presented to Major General R.R. Ploger, Commanding General, USAECV (P) at a decision briefing on 29 April 1967. Inclosure 1, Plan For Improving Fishmarket Bridge, is the plan that was presented. Safety was stressed throughout rehearsals and actual construction. Working at night with heavy structural members considerably increased the possibility of a serious accident. An ambulance and medical corpsman supplied by the 46th Engineer Battalion Medical Aid Station was on site during all operations. No injury was reported for the entire operation. Inclosure 2, Fishmarket Bridge Safety Factors, outlines some of the significant safety points. Coordination was effected with the G-3 Advisor to the Capital Military District for traffic control and security. The Fourth Police District provided traffic control policemen and U.S. Military Police Security Patrols were assigned.

[1]Daily traffic upon completion of the improvement was 18,000 vehicles per day 55% of which were trucks. For comparison the average daily traffic volume corresponding to the practical capacity of a four-lane urban expressway in the United States with 20% commercial traffic is 31,000 (Highway Engineering by Ritter-Paquette).

Incl 2

25

EGBB-3 1 June 1967
SUBJECT: After Action Report

10. Execution: The work went according to plan until the third night when a change in design for the ramp on the Saigon end of the bridge became necessary because of new information submitted by the civilian consulting engineer. The design change eliminated the standard forty foot Bailey Bridge Ramp and substituted a forty foot span supported at two points. The design was initiated on site that night so that procurement of the necessary materials might start the next morning. This major change caused a delay in the completion time of only 11½ hours. Inclosure 3, Situation Reports 1 thru 7, dated 050001 May 67 to 121800 May 67, show the progress of the work throughout the operation. After completion of the mission the 46th Engr Bn, which has a continuing responsibility for maintenance of the bridge, returned and improved the transition from the roadway to the ramp on the Saigon end. This change enables vehicles to enter the ramp more easily and improves traction on the uphill side. Inclosures 4 through 11 are drawings of the original and new bridges.

Inclosure 4 - Profile of Tan Thuan(Fishmarket)Bridge
Inclosure 5 - Detail of Bascule
Inclosure 6 - Original 120' Bailey Bridge on Tan Thuan Bridge
Inclosure 7 - New 70' two way Bailey on Tan Thuan Bridge
Inclosure 8 - How load is transferred from new Bailey Bridge to piers
Inclosure 9 - Plan of new Bailey Bridge
Inclosure 10 - End Section of new Bailey Bridge
Inclosure 11 - Section of Ramp on Saigon Side

11. Results:

a. Enemy Personnel Losses: None

b. Friendly Personnel Losses: None

c. Enemy Equipment Captured: None

d. Friendly Equipment Losses: None

e. Enemy Structures Destroyed; Tunnels Destroyed; Acres cleared; etc: None

f. Significant Engineer Accomplishments: One way, TS reinforced Bailey Bridge, 120 feet long in an extremely restricted location was converted to a two way, DS-DD Bailey Bridge, 70 feet long.

12. Administration and Logistics: Designs were based upon the locally available materials. The best solution utilizing what was on hand was selected.

Incl 2

EGBB-3 1 June 1967
SUBJECT: After Action Report

13. Special Equipment and Techniques: No special equipment was used. The technique of laterally moving a one way Bailey Bridge by rolling it on inverted rocking rollers worked quite successfully. For a detailed technical account of the analysis of the existing bridge and the methods of overcoming this defect, see this battalion's Technical Report - Tan Thuan Bridge, 1 June 1967 (Incl 12)

14. Commander's Analysis and Lessons Learned : The two principal lessons learned were the importance of responsiveness and detailed planning.

a. Responsiveness: Thirty hours after the Battalion received the warning order, the bridge had been visited, the basic concept had been set and the bridge company had begun rehearsals to perfect execution. Four days later while rehearsals were still underway the decision briefing was given and final agreement obtained to request the Vietnamese to close the bridge during specified night-time hours. Every morning throughout the five day construction period the bridge was opened to the heavy dawn traffic despite a major change in design, and the inevitable unforseen contingencies. Special crews worked through the night at the Long Binh support base reacting to radio requests from the bridge site to fabricate and transport key materials. The responsiveness and flexibility of an Engineer Unit charged with both design and construction far exceeds the best of contract engineer resources. Five days after the project was completed the architect-engineer submitted his analysis of what should be done.

b. Detailed Planning: An operation of this type, bearing the personal interests of Premier Ky and U.S. Ambassador Bunker, can be accomplished only if the most deliberate type of prior planning and rehearsal(time permitting) is accomplished. The political sensitivity of failing to have one of the major bridges in Saigon open for the heavy morning traffic meant that each step had to be planned in advance to the minutest detail. The point of no return for each night's work had to be identified so that a decision could be made when that point was reached to continue working or to restore the bridge to the starting configuration for that night. Arrival on site had to be coordinated so that as soon as the bridge was closed to traffic work could began without delay. Materials, equipment, and personnel were positioned for the most efficient execution. A backup crane was positioned nearby as a hedge against equipment failure. These preliminary actions were deemed absolutely necessary and provided the constructing unit with a small time safety factor. The results of the operation have borne out the validity of this approach.

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EGBB-3
SUBJECT: After Action Report

1 June 1967

15. Recommendations: None

FOR THE COMMANDER:

12 Incl
as

KEITH V. PORTER
CPT, CE
Adjutant

29

PLAN FOR IMPROVING FISHMARKET BRIDGE

INITIAL PREPARATION

A. GET PLANS APPROVED
   OBTAIN AND ASSEMBLE MATERIAL
C. REHEARSE
D. OBTAIN CLEARANCE FROM VIETNAMESE AND ARRANGE FOR VIETNAMESE GUARD FOR NIGHTS D-2 TO CONCLUSION
E. RELOCATE WIRES (BY OTHERS)
F. SET UP LIGHTS
G. PLACE BOTH ABUTMENT BASES AND WELD
H. STOCKPILE ALL REMAINING MATERIALS AT SITE WITH GUARD (CLOSURE FOR 2 HOURS ON NIGHT D-2)

1ST NIGHT (2200-0630)

A. REMOVE RIGHT UPPER STORY AND OUTSIDE PANEL ON LEFT UPPER STORY
B. REMOVE BOTH RAMPS
C. JACK AND CRIB. PLACE ROLLERS
D. REMOVE TWO FAR-END BAYS
E. ROLL BRIDGE 5 FT TOWARDS NEAR SHORE
F. PLACE ABUTMENT BEAM AND BASE PLATE ON FAR SHORE
G JACK DOWN ONTO FAR SHORE BASE PLATE
H. REPOSITION NEAR SHORE CRIBBING AND BASE PLATE
I. JACK DOWN ONTO NEAR SHORE BASE PLATE
J. REPLACE BOTH LENGTHENED REMPS
K. FINISH WELDING FAR SHORE ABUTMENT BEAM BAILEY SPAN NOW USEABLE CLASS 50 TS 100 FT LONG

2ND NIGHT (2230-0630)

A. REMOVE BOTH RAMPS
B. JACK AND CRIB BRIDGE
C. REMOVE THREE END BAYS ON NEAR SHORE
D. PLACE END ABUTMENT BEAM ON NEAR SHORE
E. JACK DOWN ONTO BASE PLATES
F. REPLACE BOTH RAMPS
G. REMOVE REMAINING EXCESS PANELS
H. CONSTRUCT WALKWAY ON RIGHT SIDE
I. FINISH WELDING NEAR SHORE ABUTMENT BEAM BAILEY SPAN NOW USEABLE CLASS 60 DS 70 FT LONG

INCL 1 to Incl 2

3RD NIGHT (2330-0630)

A. REMOVE BOTH RAMPS
B. JACK AND CRIB BOTH ENDS
C. PLACE ROLLERS SIDEWAYS ON BOTH ABUTMENT BEAMS
D. JACK DOWN BRIDGE ONTO ROLLERS
E. CUT AWAY THE EXISTING RIGHT HANDRAIL
F. ROLL BRIDGE TO RIGHT TO FINAL POSITION
G. REPOSITION BASE PLATES IN FINAL POSITION
H. JACK DOWN BRIDGE ONTO BASE PLATES
I. EMPLACE MODIFIED RAMPS BAILEY SPAN NOW USEABLE CLASS 60 DS 70 FT LONG

4TH NIGHT (2330-0630)

A. COMPLETE CONSTRUCTION OF 2ND BRIDGE
B. REMOVE EXISTING HANDRAIL AND START CONSTRUCTION OF LEFT WALKWAY BAILEY SPAN NOW TWO WAY CLASS 60 DS-DD 70 FT LONG

5TH NIGHT (2330-0630)

A. COMPLETE BRIDGE TO INCLUDE LEFT WALKWAY WELDING BASE PLATE AND PLACING BRIDGE CLASSIFICATION SIGNS IN VIETNAMESE AND ENGLISH BAILEY SPAN NOW TWO WAY CLASS 60 DS-DD 70 FT LONG

31

PRIMARYNT BRIDGE SAFETY FACTORS

1. All persons working over the water (over existing sidewalks or farther out) will wear a life vest.

2. All persons working over the water after the guardrail has been removed will have a safety line attached to his person.

3. Materials moved by crane will have tagline attached.

4. The ends of the abutment beams will have welded stops to keep the bridge from rolling of the beams.

5. When the bridge is on rollers positioned to move it laterally, a crane will be used as an additional safety line to keep the bridge from rolling too far.

6. Restricted width signs will be posted when the modified ramps are emplaced.

7. Bridge endposts will be marked with bold stripes when final position is attained. Energy absorbers will be emplaced in front of endposts.

8. Two ways bridge classification signs will be posted when second lane is opened.

9. LT Tucker and SFC Sztroin are appointed safety officer and NCO respectively.

Incl 2 to Incl 2

33

CORRECTED COPY

EGBE-3
SUBJECT: Situation Report (U)

Hq, 46th Engr Bn (Const)
Long Binh, Vietnam
8 May 1967

Situation Report No. 1

Period Covered: 050001 May 67 - 052400 May 67

Reference:

1. OPERATION FISH MARKET BRIDGE, 46th Engineer Battalion (Const).

2. Initiated 050001 May 1967.

3. 617th Engineer Company (FB).

4. Long Binh, Vietnam.

5. Delivered following material to bridge site:
   a. 6 14" 40' long I beams.
   b. 8 6" 14' long I beams.
   c. 1000' wear tread.
   d. 6 transoms.
   e. 7 sheets steel plates.

6. None.

7. None.

8. None.

9. 1%.

10. None.

McGUINNESS
LTC

OFFICAL

KOWEL
S-3

Incl 3 to Incl 2

34

EXCB-3
SUBJECT: Situation Report (J)

Hq, 46th Engr Bn (Const)
Long Binh, Vietnam
7 May 1967

Situation Report No. 2

Period Covered: 061200 May 67 - 071200 May 67

Reference:

1. OPERATION FISHMARKET BRIDGE, 46th Engineer Battalion (Const).

2. Second story removed, bridge lightened and shortened by 20' one abutment completed. Bridge moved 5' and put on new abutment. Bridge is now 100' long 1 lane class 35 capacity.

9. 20%.

McGuinness
LTC

OFFICIAL

KCVEL
S-3

Incl 3 to Incl 2

2

35

EGEB-3
SUBJECT: Situation Report (U)

Hq, 46th Engr Bn (Const)
Long Binh, Vietnam
8 May 1967

Situation Report No. 3

Period Covered: 071200 May 67 - 081200 May 67

Reference:

1. OPERATION FISH MARKET BRIDGE, 46th Engineer Battalion (Const)

5. Shorten bridge to 70', completed second abutment, removed excess panels and constructed one walkway. Added 10' on near shore ramp class 35, 1 lane.

9. 40%.

McGUINNESS
LTC

OFFICAL

KOVEL
S-3

3

Incl 3 to Incl 2

3 C

EGBB-3
SUBJECT: Situation Report (U)

Hq, 46th Engr Bn (Const)
Long Binh, Vietnam
9 May 1967

Situation Report No. 4

Period Covered: C81200 May 67 - 091200 May 67

Reference:

1. OPERATION FISH MARKET BRIDGE - 46th Engr Bn (Const).

5. Removed both ramps;moved bridge sideways to final position and placed modified ramps on each side. Completed panels and ten transoms on the second lane of the bridge. Present classification of the bridge--CL 35 one lane.

9. 65%.

McGUINNESS
LTC

OFFICIAL

KOVEL
S-3

Incl 3 to Incl 2 +

37

EGDD-S
SUBJECT: Situation Report (U)

Hq, 46th Engr Bn (Const)
Long Binh, Vietnam
10 May 1967

Situation Report No, 5

Period Covered: 091200 May 67 -- 101200 May 67

Reference:

1. OPERATION FISH MARKET BRIDGE, 46th Engineer Battalion (Const).

5. Completed construction of 2nd bridge less ramps and removed existing handrail completed construction of left walkway. Bridge is now class 35 one lane.

9. 85%

McGUINNESS
LTC

OFFICIAL

KOTEL
S-3

Incl 3 to Incl 2 5

38

EGFB-3
SUBJECT: Situation Report (U)

Hq, 46th Engr Bn (Const)
Long Binh, Vietnam
19 May 1967

Situation Report No. 6

Period Covered: 101200 May 67 - 111200 May 67

Reference:

1. OPERATION FISH MARKET BRIDGE, 46th Engineer Battalion (Const).

5. Far shore ramp completed and working on near shore ramp. Put 8 I beams in place and right ramp completed. Bridge is now class 35 one lane.

9. 93%.

McGUINNESS
LTC

OFFICAL

KOVEL
S-3

Incl 3 to Incl 2

39

EGHB-3
SUBJECT: Situation Report (U)

Hq, 46th Engr Bn (Const)
Long Binh, Vietnam
19 May 1967

Situation Report No. 7

Period Covered: 111200 May 67 - 121800 May 67

Reference:

1. OPERATIONS FISH MARKET BRIDGE, 46th Engineer Battalion (Const)

2. Terminated 121800 May 67.

5. Near shore ramp completed, bridge is now class 35 two lane traffic.

6. 100%.

McGUINNESS
LTC

OFFICIAL

KOVEL
S-3

Incl 3 to Incl 2 7

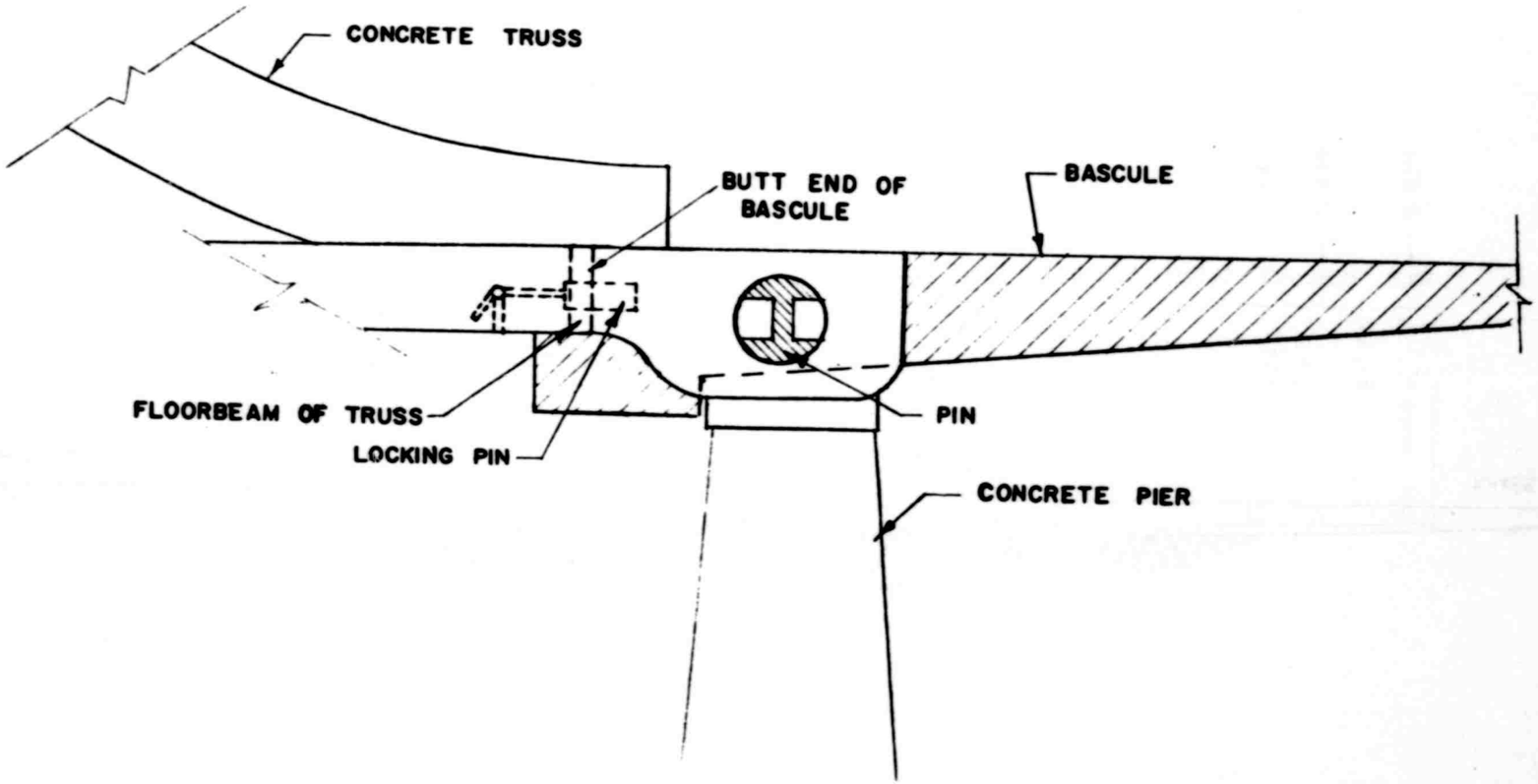
41

Incl 4 to Incl 2

TAN THUAN BRIDGE

SCALE: 1" = 100'

INCL. 4



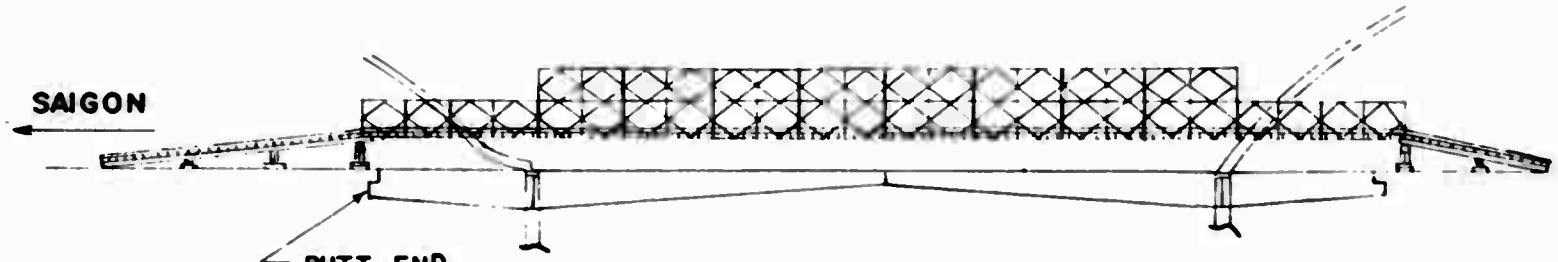
BASCULE
NOT TO SCALE

INCL. 5

Incl 5 to Incl 12

24

43



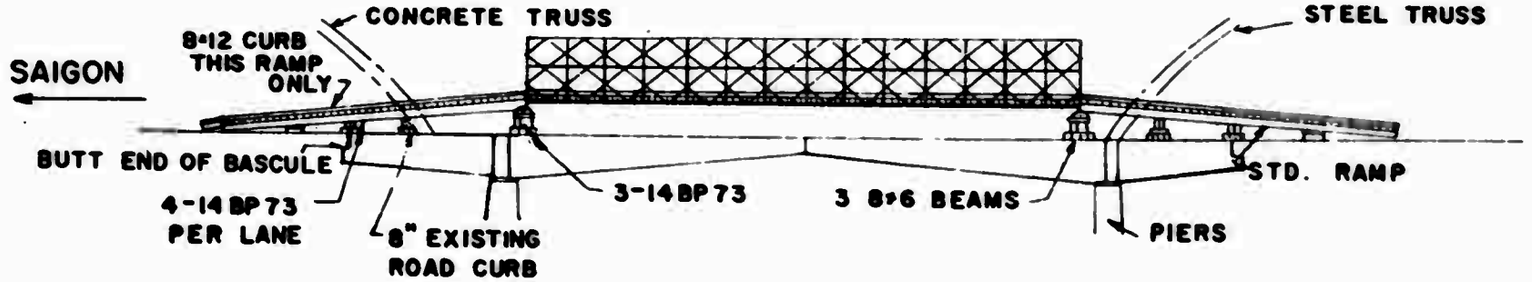
OLD BAILEY BRIDGE

ELEVATION

SCALE: 1" = 20'

INCL.6

Incl 6 to Iwel 2



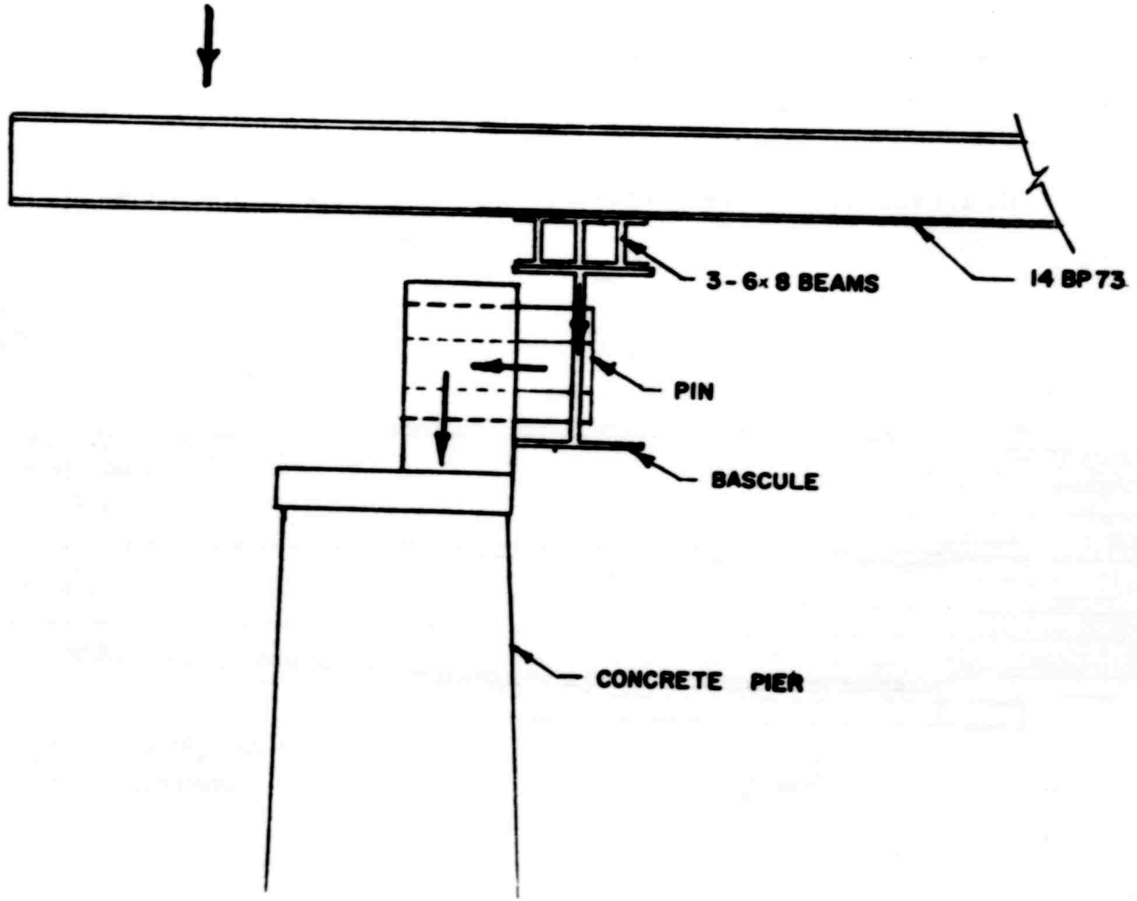
NEW BAILEY BRIDGE

ELEVATION

SCALE: 1" = 20"

INCL. 7

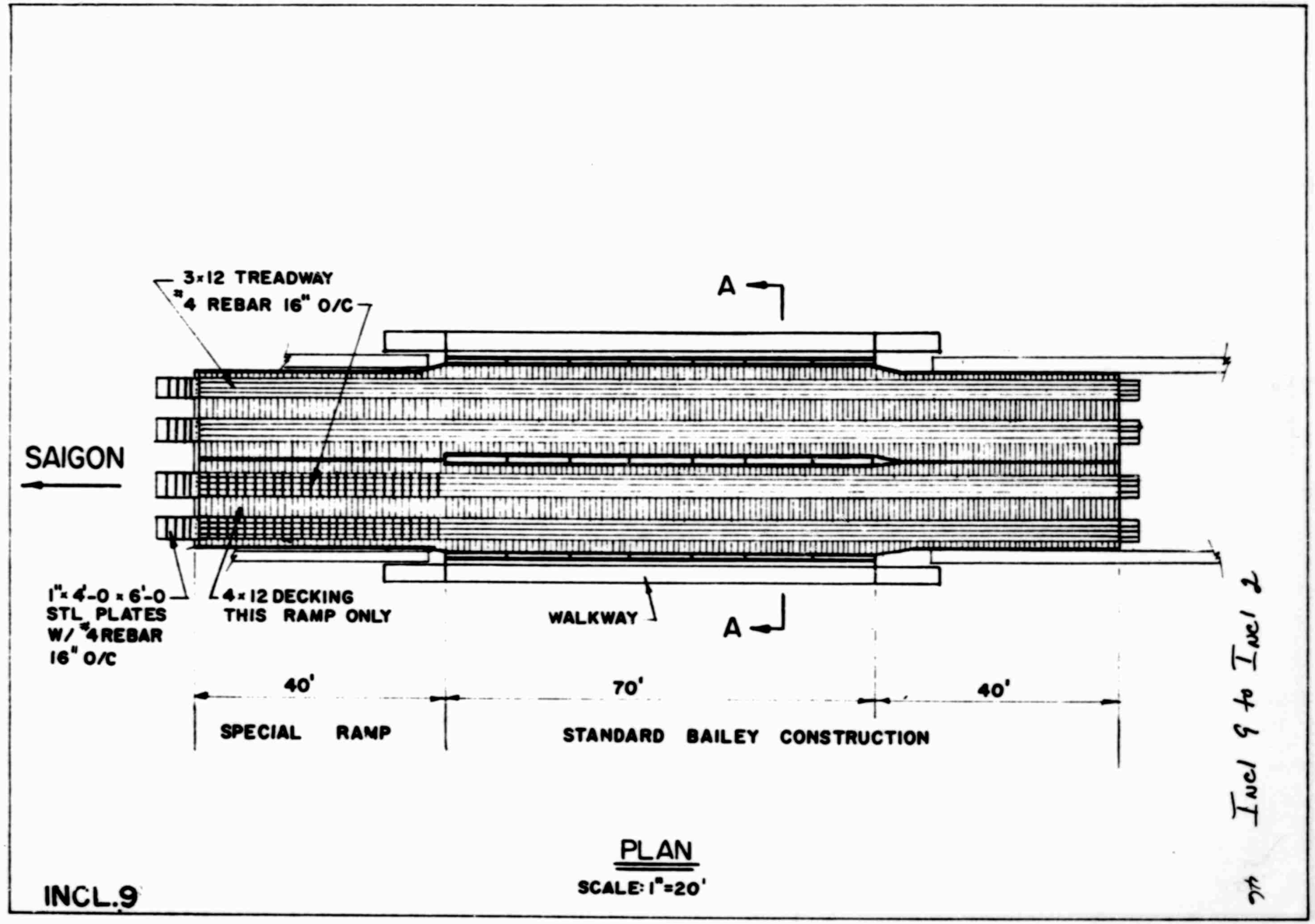
Incl 7 to Incl 2

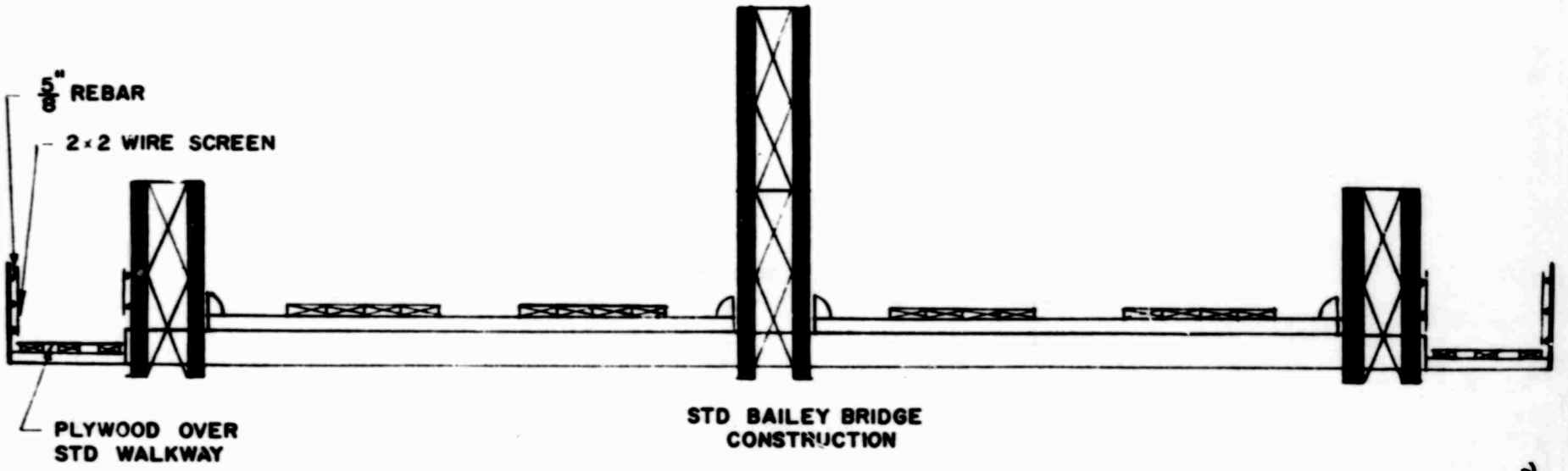


LOAD DISTRIBUTION
NOT TO SCALE

INCL. 8

Incl 1 to Incl 2


3×12 TREADWAY
#4 REBAR 16" O/C
A
SAIGON
1"×4'-0×6'-0 STL PLATES W/ #4 REBAR 16" O/C
4×12 DECKING THIS RAMP ONLY
WALKWAY
A
40'
70'
40'
SPECIAL RAMP
STANDARD BAILEY CONSTRUCTION
PLAN
SCALE: 1"=20'
INCL.9
Incl 9 to Incl 2



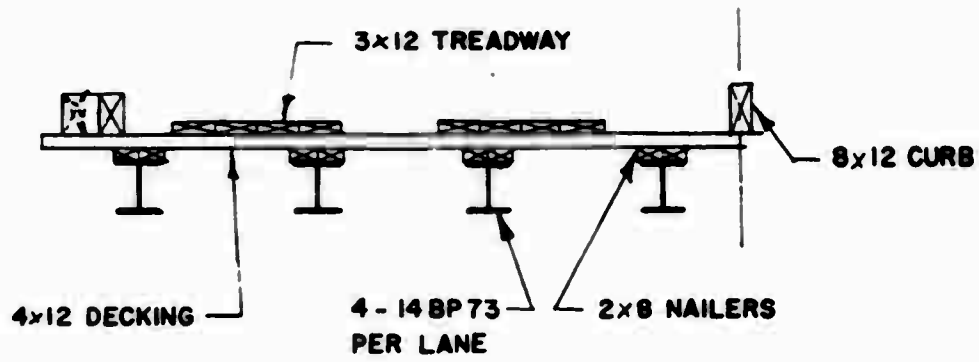
SECTION A-A

SCALE: 1/4" = 1'-0"

INCL. 10

Incl 10 to Incl 2

84



SECTION (ONE LANE SHOWN)
OF SPECIAL RAMP

SCALE: $\frac{1}{4}$" = 1'-0"

INCL. 11

Incl 11 to Incl 2