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PERUSAHAAN UMUM LISTRIK NEGARA
JAKARTA , INDONESIA

WEST JAVA
ELECTRIC TRANSMISSION PROJECT

MONTHLY REPORT

FEBRUARY 1981

WEST JAVA I AND II PROJECTS
CONTRACTS

Pj. 013/PST/74 and Pj. 023/PST/75

USAID LOANS 497-H-028 & 497-W-032



CHAS. T. MAIN INTERNATIONAL, INC.

BOSTON MASSACHUSETTS U.S.A.
BANDUNG , INDONESIA

MAIN
Engineers

PERUSAHAAN UMUM LISTRIK NEGARA CONSULTANT
CHAS. T. MAIN INTERNATIONAL, INC.

BANDUNG - TROMOLPOS 69. TEL. 56869 JL. PROGO 32
JAKARTA - P.O. BOX 100. KBT KEBAYORAN TIMUR. TEL. 776925 JL. WIJAYA 1/61
SEMARANG - P.O. BOX 26. TEL. 311702 JL. SLAMET 1

17 March 1981

Letter No. B - 4172

Ir. R. Semiawan

Perusahaan Umum Listrik Negara

Proyek Induk Jaringan Jawa Barat & Jakarta Raya

Jl. Cililitan Besar 1

Jakarta.

Subject : West Java I and II Projects
Monthly Report

Dear Ir. Semiawan :

In accordance with Article 7.2 of the West Java I Contract No. Pj.013/PST/74 and Appendix V of the West Java II Contract No. Pj.023/PST/75, enclosed are six (6) copies of our Report for the month of February 1981.

Very truly yours,

CHAS. T. MAIN INTERNATIONAL INC.

R.W. Malchow

R.W. Malchow

Project Manager

RWM/ns.-

cc. : DIRBANG - PLN Pusat (Encl.1)
USAID - JKT (Encl.4) ✓
MAIN - BSN (Encl.1)
MAIN - CHA (Encl.1)

WEST JAVA I AND II PROJECTS

MONTHLY REPORT

FEBRUARY 1981

A. PERSONNEL

1. ENGINEER

a. Mr. P.V. Wilson, Stores Specialist, West Java I & II, completed his assignment and left the Projects on 28 February.

b. End of the month strength was as follows:

<u>NAME</u>	<u>TITLE</u>	<u>ARRIVAL DATE</u>
<u>West Java I and II</u>		
R.W. Malchow	Project Manager	24 Oct. 1978
C.J. Whitby	Manager of Administration	10 Sep. 1974
J.C. Harkey	Substation Engineer	15 Oct. 1977
C.L. Crume	Substation Constr. Eng.	3 Jun. 1979
H. Gunawan	Administrative Assistant	13 Aug. 1979
Zainal Saur	Surveyor	16 Mar. 1978

West Java II

D.L. Hawks	Substation Inspector	29 Feb. 1980
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2. PLN

a. End of the month strength was as follows:

<u>JOB TITLE</u>	<u>NUMBER</u>
Logistics Coordinator	1
Secretaries	3
Draftsmen	6
Accounting Clerks	2
Reproduction Personnel	2
Drivers	14

b. In addition to the above Staff, approximately 100 PLN Counterpart and field personnel were assigned to the Projects as of 28 February.

3. ADMINISTRATION AND GENERAL

1. ADMINISTRATION

a. Terminal Dates

- (1) TDDA (Last day that USAID Loan Funds can be committed) - 30 June 1981.
- (2) TDD (Last day that payments can be made from USAID Loan Funds) - 31 March 1982.
- (3) Scheduled Final Substation Energization - 31 December 1981.
- (4) Scheduled Completion of Engineering Services - 30 June 1982.

b. West Java I Contract Data

(1) No. Pj. 013/PST/74	16 Feb. '74	US \$	1,366,452.00
		Rp.	81.308.525,-
Amendment No. 1	2 Sep. '75	US \$	
		Rp.	14.575.975,-
Amendment No. 2	12 Mar. '77	US \$	1,589,996.00
		Rp.	49.916.408,-
Amendment No. 3	10 Jan. '79	US \$	867,561.00
		Rp.	92.358.466,-
Amendment No. 4	29 Aug. '80	US \$	-
		Rp.	316.936.745,-

C.T. Main-Engineering Services

(2) No. Pj. 153/PST/77	5 Sep. '77	US \$	2,531,335.58
Amendment No. 1	10 Jul. '78		
Amendment No. 2	17 Sep. '79	US \$	202,682.67
Amendment No. 3	8 Oct. '80	US \$	168,927.78

Irby Construction Company

Tower Steel, Insulators and Accessories

(3) No. Pj. 202/PST/77	28 Nov. '77	US \$	284,289.50
Amendment No. 1	30 Nov. '78	US \$	10,449.56

Copperweld Industries

Shieldwire

(4) No. Pj. 203/PST/77	28 Nov. '77	US \$	1,906,391.70
Amendment No. 1	10 Jul. '78	US \$	54,615.55
Amendment No. 2	30 Mar. '79	US \$	30,914.45

Southwire Company

Conductor

(5) No. Pj. 050/PST/78	10 Mar. '78	US \$	369,473.98
Amendment No. 1	13 Dec. '78	US \$	33,446.88

Tension Stringing Equipment Co.

Wire Stringing Equipment

(6)	No. Pj. 051/PST/78 Ohio Brass Company Lightning Arresters	10 Mar. '78	US \$	87,852.00
(7)	No. Pj. 052/PST/78 Amendment No. 1 Irby Construction Company. Substation Equipment Maintenance Tools and Equipment	11 Mar. '78 17 Sep. '79	US \$	4,499,800.74 47,613.72
(8)	No. Pj. 053/PST/78 Amendment No. 1 General Electric Company Substation Equipment	11 Mar. '78 7 Jan. '80	US \$	2,452,391.40 80,409.19
(9)	No. Pj. 087/PST/78 Amendment No. 1 Amendment No. 2 Motorola Radio Equipment	11 May '78 22 Dec. '79 21 Nov. '80	US \$	395,819.20
(10)	No. Spj.022/PLN/PI RING/77 P.T. Tikon Abadi Foundations - Section I	27 Oct. '77	Rp.	199.278.000,-
(11)	No. Spj.023/PLN/PI RING/77 P.T. Gunung Kencana Foundations - Section IIA	27 Oct. '77	Rp.	153.445.000,-
(12)	No. Spj.024/PLN/PI RING/77 P.T. Dharma Niaga Foundations - Section IIB	27 Oct. '77	Rp.	164.789.000,-
(13)	No. Spj.010/PLN/PI RING/78-79 P.T. Perfect Circle Tower Erection	8 Dec. '78	Rp.	132.894.300,-

(14)	No. Spj.065A/SPP/PI RING JATENG/78-79 P.T. Santraco Raya 21 Apr. '79 Tegal Substation Civil Work	Rp. 50.278.000,-
(15)	No. Spj.072/SPP/PI RING JATENG/78-79 P.T. Sigma Tirta 17 Oct. '79 Tegal Substation Structure Erection	Rp. 25.966.000,-
(16)	No. Spj.017/PLN/PI RING/79-80 P.T. Silkar National 22 Jan. '80 Conductor Stringing - Section I	Rp. 127.790.850,-
(17)	No. Spj.019/PLN/PI RING/79-80 P.T. Citac Ltd. 2 Feb. '80 Conductor Stringing - Section III	Rp. 164.364.000,-
(18)	No. Spj.001/PLN/PI RING/80-81 P.T. Erses 3 Apr. '80 Ujungberung Substation Civil Work	Rp. 464.500.000,-
(19)	No. Spj.002/PLN/PI RING/80-81 P.T. Erses 3 Apr. '80 Ujungberung Substation Control House	Rp. 199.989.000,-
(20)	No. Spj.013/PLN/PI RING/80-81 P.T. Dharma Niaga 6 Jul. '80 Ujungberung Substation Temporary 150 KV Transmission Line By-Pass	Rp. 18.860.000,-

c. West Java II Contract Data

(1)	No. Pj. 023/PST/75 25 Jan. '75	US \$ 1,541,729.00
	Amendment No. 1 12 May '75	Rp. 90.589.149,-
	Amendment No. 2 12 Mar. '77	US \$ 856,064.00
		Rp. 15.239.504,-

Amendment No. 3	10 Jan. '79	US \$ 112,000.00
		Rp. 97.708.072
Amendment No. 4	29 Aug. '80	US \$
		Rp. 515.307.310,-
C.T. Main Engineering Services		
(2) No. Pj. 152/PST/77	5 Sep. '77	Rp. 452.526.908,-
		US \$ 7,744,165.78
Amendments No. 1 & 2	10 Jul. '78	Rp. 13.137.605,-
		US \$ 311,400.72
Amendment No. 3	17 Sep. '79	Rp. 3.560.229,-
		US \$ 140,881.33
Amendment No. 4	23 Oct. '80	Rp. 176.242.175,-
		US \$ 2,659.54
Irby Construction Company		
Transmission Line Supply and Construction		
(3) No. Pj. 051/PST/78	10 Mar. '78	US \$ 87,852.00
Ohio Brass Company		
Lightning Arresters		
(4) No. Pj. 052/PST/78	11 Mar. '78	US \$ 4,981,321.52
Amendment No. 1	17 Sep. '79	Funded under Loan
		497-H-028 West Java I
Irby Construction Company		
Substation Equipment		
(5) No. Pj. 053/PST/78	11 Mar. '78	US \$ 3,974,100.16
Amendment No. 1	7 Jan. '80	Funded under Loan
		497-H-028 West Java I
General Electric Company		
Substation Equipment		

- | | | |
|------|--|-------------------|
| (6) | No. Spj. 001/PLN/PI RING/77-78
P.T. Citac Ltd. 5 Jun. '78
Foundations - Sections II and III | Rp. 329.553.000,- |
| (7) | No. Spj. 002/PLN/PI RING/78-79
P.T. Citac Ltd. 9 Aug. '79
Foundations - Ujungberung - Cigereleang | Rp. 175.128.000,- |
| (8) | No. Spj. 022/PLN/PI RING/79-80
P.T. Sahabat Agung 4 Dec. '79
Cibinong - Gandul Stub Angles | Rp. 10.618.000,- |
| (9) | No. Spj. 009/PLN/PI RING/79-80
P.T. Citac Ltd. 30 Nov. '79
Foundations - Section IV A | Rp. 62.441.000,- |
| (10) | No. Spj. 010/PLN/PI RING/79-80
P.T. Citac Ltd. 30 Nov. '79
Foundations - Section IV C | Rp. 36.029.000,- |
| (11) | No. Spj. 018/PLN/PI RING/79-80
P.T. Amarta Karya 24 Jan. '80
Foundations - Section IV B | Rp. 64.630.000,- |
| (12) | No. Spj. 008/PLN/PI RING/80-81
P.T. Pembangunan Perumahan 5 Jun. '80
Bandung Utara Substation Civil Work | Rp. 334.619.000,- |
| (13) | No. Spj. 006/PLN/PI RING/80-81
P.T. Perfect Circle 31 May '80
Bandung Utara Substation Control House | Rp. 230.501.000,- |
| (14) | No. Spj. 009/PLN/PI RING/80-81
P.T. Perfect Circle 31 May '80
Bogor Substation Civil Work | Rp. 475.428.000,- |

- | | | |
|------|---|-------------------|
| (15) | No. Spj. 007/PLN/PI RING/80-81
P.T. Perfect Circle 31 May '80
Bogor Substation Control House | Rp. 212.915.000,- |
| (16) | No. Spj. 020/PLN/PI RING/79-80
P.T. Hutama Karya 16 Feb. '80
Bandung Utara Substation Access Road | Rp. 31.967.000,- |
| (17) | No. Spj. /PLN/PI RING/
Contract not yet signed
Bogor Substation Access Road | Rp. 64.700.000,- |
| (18) | No. Spj. 013/PLN/PI RING/80-81
P.T. Dharma Niaga 6 Jul. '80
Bogor Substation Temporary 150 KV
Transmission Line By-Pass | Rp. 10.608.000,- |

d. West Java I and II Contract Data

- | | | |
|-----|---|------------------|
| (1) | No. Spj. 016/PLN/PI RING/77
P.T. Sumber Jaya 4 Jul. '77
Grounding Material | Rp. 54.245.000,- |
| (2) | No. Spj. 017/PLN/PI RING/77
P.T. Arcon 13 Aug. '77
Stub Angles | Rp. 40.100.000,- |

2. GENERAL

- a. A third draft of Amendment Number 2 to the PLN/Irby Substation Equipment Contract was prepared and submitted to PLN/Pusat. This Amendment provides for the purchase of additional control cable, watt-hour meters, tools and spare parts.

- b. Certificates of Performance to permit payment of retainage money to Irby Construction Company are in process by PLN/Projects.
- c. Where appropriate, retainage funds are being held to ensure full Contract completion by the suppliers.
- d. PLN and Tension Stringing Equipment, Inc. have agreed on certain changes, additions and deletions to the schedule of tools and equipment to be furnished under Contract Number Pj. 050/PST/78. The result of these changes is a decrease in the Contract amount of US \$ 2,284.49. A reduction in the associated Letter of Commitment and Letter of Credit is in process.
- e. PLN and Southwire Company have agreed that Contract Pj. 203/PST/77 should be reduced by US \$ 77.87 to reflect the actual CIF cost of Conductor supplied under the Contract. A reduction in the associated Letter of Commitment and Letter of Credit is in process.
- f. An expiration date extension for Letter of Commitment Number 497-H02809 for Motorola is in process.

C. CONFERENCES AND EVENTS

1. Construction Meetings

- a. Ujungberung Substation Civil Work and Control House.
Contractor - P.T. Erses
9 February 1981
23 February 1981 (Civil Work only)
- b. Ujungberung Substation Control House.
Contractor - P.T. Citac Ltd.
9 February 1981
23 February 1981

c. Bandung Utara Substation Civil Work.

Contractor - P.T. Pembangunan Perumahan

10 February 1981.

24 February 1981

d. Bandung Utara Substation Control House.

Contractor - P.T. Perfect Circle

10 February 1981.

24 February 1981

e. Bogor Substation Civil Work and Control House.

Contractor - P.T. Perfect Circle

11 February 1981

25 February 1981

2. The Project Evaluation Summary meeting for the West Java Projects was held on 25 February.

D. PROBLEMS AREAS AND TENTATIVE SOLUTIONS

1. The Ujungberung Switchyard and Control House Construction remains several months behind the original schedule. Control House Construction has been turned over to a subcontractor, thereby permitting P.T. Erses to concentrate fully on completion of the Switchyard Civil Works. With this new arrangement, the Switchyard and Control House critical items should be completed in sufficient time so the substation can be energized by the end of the year.
2. The Bogor Substation Switchyard and Control House Construction is approximately one and half (1½) months and one (1) month behind schedule, respectively. The contractor will increase personnel to catch up on the Control House. The scheduled completion date for the Switchyard was February 28. Contractor delays should not delay scheduled completion of the Project past 31 December 1981.

3. The Bandung Utara Switchyard Contractor is approximately four (4) months behind his original schedule. None of the items of the Switchyard Construction is presently critical but rate of construction must be increased in order not to delay scheduled completion of the Project past 31 December 1981.
4. The Bandung Utara Control House Contractor is approximately two and half (2½) months behind schedule but intends to add personnel to increase the rate of construction. Contractor delays should not delay scheduled completion of the Project past 31 December 1981.
5. PLN has come to agreement with all landowners of the permanent access road to Bandung Utara Substation. PLN will request road contractor to employ additional crews.
6. The land for the permanent access road to Bogor Substation has been purchased and PLN is making the required drawings for the Construction to be let for bids. Temporary heavy duty Access Road will be constructed to permit transport of Transformers and other heavy equipment. The scheduled completion of the Project should not be affected.

E. TRANSMISSION - WEST JAVA I

1. Construction

- a. Tower - Site Procurement. All tower sites have been procured.
- b. Foundations. All foundations have been installed.
- c. Tower Erection. All towers are erected and accepted.
- d. ROW Procurement and Clearing. All ROW Procurement and Clearing, are completed.

- e. Conductor and Shieldwire. Stringing between Towers No. 38 and 42 on the Ujungberung - Bandung Utara Line Section began during the month. This work should be completed during the month of March. During the month new towers and gantries were installed allowing the 70 KV lines at Ujungberung to be lowered and the conductor installed between Towers No. 1 and No. 2 of the Ujungberung - Bandung Utara Transmission Line.

The slack spans between Tower No. 51 of the Ujungberung - Bandung Utara Line and the Substation Terminal structures were installed during February.

New tower locations to replace Towers No. 317 and No. 319 on the Cirebon - Ujungberung Line Section were staked during the month.

F. TRANSMISSION - WEST JAVA II

1. Construction

- a. Tower - Site Procurement. All tower sites have been procured.
- b. Foundation. All foundations have been installed.
- c. Tower Erection. All towers have been installed and accepted.
- d. ROW Procurement and Clearing. All ROW procurement and clearing are completed.
- e. Conductor and Shieldwire. Phase conductor and shieldwire have been installed.
- f. By-Pass. The By-Pass Tower at Bogor Substation has been erected and the Gandul - Cigereleng 150 KV Transmission Line energized.

2. Material Supply

- a. A few items of line hardware to be used as spares are in transit.

G. SUBSTATIONS

1. Construction

a. Tegal Substation

All work is completed and the station has been energized.

b. Ujungberung Substation

(1) Switchyard Civil Work

The Contractor completed the grounding resistor, grounding transformers and the 70 KV foundations, the 70 and 150 KV OCB foundations and the bridge and walk way during the month. The Contractor continued work on the transformer foundations, fence, road culverts, cable trench, catch basins, road and grading. Work started on the station ground mat and flume gate. The Contractor is over six (6) months behind his original schedule.

(2) Control House

The Contractor completed pouring the roof during February. Work continued on the site fill, soil compacting and brickwork. Work began on rough plastering and preparations for pouring the ground floor slab and the cable trench. Work on the ground floor slab was delayed due to incorrect spacing between 20 KV Switchgear columns shown on the drawings. The Contractor is over six (6) months behind his original schedule.

(3) Erection

Erection work in the 70 KV Switchyard structures began during February.

c. Bandung Utara Substation

(1) Switchyard

The Switchyard foundations, except for the Transformer Foundations, are complete.

Work was also completed on the yard drainage piping. The Contractor is continuing work on the transformer column foundations, cable trench, fence, yard drainage, road culverts and ground mat. The Contractor has not fallen any further behind schedule, but does not have sufficient personnel to make up lost time. The Contractor did not complete the required work by the guarantee date of 28 February 1981.

(2) Control House

The Contractor completed pouring the ground floor roof during February. The Contractor is continuing to fall further behind schedule and is approximately two and half (2½) months behind schedule.

(3) Access Road

The Contractor continues to work on the Access Road. It is expected that a second crew will begin work from the Substation end during March. Agreement has been reached with all landowners.

(4) Erection

PLN crews started erection of switchyard structures in February.

d. Bogor Substation

(1) Switchyard Civil Work

All foundations except for the 20 KV & 6.6 KV structures and the Transformers are complete. Except for the part between the road and the Control House, the cable trench is complete. Work continued on the drainage system, cable trench, yard grading and transformer foundations.

Work began on the substation road, road culverts and ground. An area was prepared for the ground assembly of substation structures.

The Contractor is approximately six (6) weeks behind schedule.

(2) Control House

The Contractor completed pouring the ground floor roof and roof beams and began work on the septic tank. The Contractor is approximately four (4) weeks behind schedule.

(3) Access Road

Payment to property owners for the permanent access road has been made. PLN is now negotiating with low bidder for previous access road route. A heavy duty temporary access road will be built from the Toll Road to the Substation. This will permit transport of the transformers and the other heavy pieces of equipment.

(4) Erection

Delivery of substation steel to substation has started.
PLN started ground assembly and erection of 150 KV structures.

2. Material Supply

Most material is presently in Indonesia with remaining control boards and control cable in transit. There should be no delays due to material shortage.

H. MOBILE RADIO

1. The duplexer at the Puncak Repeater Station needs tuning. The local Motorola agent has still not made adjustments.
2. The fixed station at Bandung Utara will be installed when electric power is installed.

I. SCHEDULE

1. Current Shipping Schedule

This schedule is on pages 18 and 19. Based on the present supply contracts only six shipments are pending. All material should be received well before the end of 1981.

2. West I and II Projects Completion

The tables which are on pages 20 and 21 give the scheduled and actual completions of the various phases of the Projects. Engineering as well as physical completion are included in the percentage figures.

Another page following is a graph based on these tables and in addition shows the monthly scheduled percentage completion to the end of the Projects. The scheduled completion is based on the estimated schedule at the time Amendment No. 4 of the Engineering Services Contract was signed and does not necessarily reflect the Schedule provided by the various Construction Contractors.

3. Construction Progress

The next page following is a graph showing the relationship between the actual physical construction and Contractor or PLN scheduled progress.

In this month's chart, schedules have been changed for the following phases:

a. Ujungberung Substation, Building Construction

Construction responsibility has been turned over to a new contractor and a new construction schedule has been provided.

b. Bandung Utara Substation, Electro/Mechanical Construction

PLN erection forces were not able to start work previously.

c. Bogor Substation, Electro/Mechanical Construction

PLN erection forces were not able to start work previously.

WEST JAVA I AND II
 TRANSMISSION AND SUBSTATION PROJECTS
CURRENT SHIPPING SCHEDULE

<u>Item</u>	<u>Shipping Date</u>	<u>ETA in PLN Warehouse</u>	<u>Comments</u>
A. Contract Pj.152/PST/77, Socket Clevis	Irby Construction Company, Transmission Line Materials - WJ II 23 December 1980	5 March 1981	
B. Contract Pj.153/PST/77, Shipment complete	Irby Construction Company, Transmission Line Materials - WJ I		
C. Contract Pj.203/PST/77, Shipment complete	Southwire Company, Conductor - WJ I		
D. Contract Pj.202/PST/77, Shipment complete	Copperweld Industries, Alumoweld Shieldwire - WJ I		
E. Contract Pj.050/PST/78, Shipment complete	Tension Stringing Equipment, Inc. Wire Stringing Equipment - WJ I		
F. Contract Pj.051/PST/78, Shipment complete	Ohio Brass Company, Surge Arresters, WJ I & II		

<u>Item</u>	<u>Shipping Date</u>	<u>ETA in PLN Warehouse</u>	<u>Comments</u>
G. Contract Pj.052/PST/78,	Irby Construction Company,		
	Substation Equipment and Maintenance		
	Tools and Equipment - WJ I & WJ II		
1. Panels for Bandung Utara (3), and Bogor (1), Batteries, Test Equipment, Control Cables, and Miscellaneous items.	23 December 1980	5 March 1981	In Indonesia
2. Panels for Bogor (2), Bandung Utara (2) & Bandung Selatan (1), and miscellaneous items.	4 April 1981	4 June 1981	
H. Contract Pj.053/PST/78,	General Electric Company,		
	Substation Equipment - WJ I & WJ II		
1. Spare Parts	22 August 1980	22 March 1981	
2. Replacement Parts	26 December 1980	26 March 1981	
I. Contract Pj.087/PST/78,	Motorola Company,		
	Mobile Radio Equipment - WJ I.		
Communication System Analyzer, Channel Elements & Base Station Module Servicing Adaptor.	30 April 1981		

West Java I Project
 Project Completion
 (Includes Engineering and Design)
 as of 28 February 1981

<u>Work Item</u>	<u>Weighted Percent of Project</u>	<u>Percent of Item Completed to Date</u>		<u>Percent of Project Complete to Date</u>	
		<u>Scheduled</u>	<u>Actual</u>	<u>Scheduled</u>	<u>Actual</u>
Transmission Line					
Foundations	28.9	100.0	100.0	28.9	28.9
Tower Erection	13.5	100.0	100.0	13.5	13.5
Conductor Stringing	11.7	100.0	99.2	11.7	11.6
Tegal Substation					
Switchyard	2.0	100.0	100.0	2.0	2.0
Erection and Wiring	1.2	100.0	100.0	1.2	1.2
Ujungberung Substation					
Switchyard Civil Work	15.2	89.5	84.4	13.6	12.8
Control House	11.5	72.2	59.8	8.3	6.9
Equipment Erection	8.2	47.6	56.1	3.9	4.6
Wiring and Testing	2.1	23.0	23.0	0.5	0.5
Radio System	5.7	100.0	100.0	5.7	5.7
Total	100.0			89.3	87.7
	=====			=====	=====

West Java II Project
 Project Completion
 (Includes Engineering and Design)
 as of 28 February 1981

<u>Work Item</u>	<u>Weighted Percent of Project</u>	<u>Percent of Item Completed to Date</u>		<u>Percent of Project Completed to Date</u>	
		<u>Scheduled</u>	<u>Actual</u>	<u>Scheduled</u>	<u>Actual</u>
Transmission Line					
Foundations	28.1	100.0	100.0	28.1	28.1
Tower Erection	13.1	100.0	100.0	13.1	13.1
Conductor Stringing	11.1	100.0	100.0	11.1	11.1
Bandung Utara Substation					
Switchyard Civil Work	7.3	89.0	64.4	6.5	4.7
Control House	6.1	65.6	49.3	4.0	3.0
Equipment Erection	3.9	28.2	30.0	1.1	1.2
Wiring and Testing	1.0	12.8	12.8	0.1	0.1
Bogor Substation					
Switchyard Civil Work	10.6	87.8	67.9	9.3	7.2
Control House	5.8	65.5	42.8	3.8	2.5
Equipment Erection	5.6	26.8	12.8	1.5	0.7
Wiring and Testing	1.4	12.8	12.8	0.2	0.2
Radio System	6.0	100.0	99.9	6.0	6.0
Total	100.0			84.8	77.9
	=====			====	====

WEST JAVA I & II
CONSTRUCTION PROGRESS
AS OF 28 FEBRUARY 1981

MICROFILMED FROM BEST AVAILABLE COPY

NO.	WORK ITEM	ACTUAL COMPLETED TO DATE %	ACTUAL COMPLETED THIS MONTH %	SCHEDULED COMPLETION TO DATE %	Progress Scale				
					10%	20%	30%	40%	50%
WEST JAVA I									
1	TOWER ERECTION UJ.BERUNG - BANDUNG UTARA	100	0	100	[Progress bar: 100% complete]				
1A	TOWER ACCEPTANCE UJ.BERUNG - BANDUNG UTARA	100	0	100	[Progress bar: 100% complete]				
2	CONDUCTOR STRINGING UJ.BERUNG - BANDUNG UTARA	99.5	0.5	100	[Progress bar: 99.5% complete]				
3	UJ.BERUNG SUBSTATION CIVIL CONSTRUCTION	79.7	13.9	100	[Progress bar: 79.7% complete]				
4	UJ.BERUNG SUBSTATION BUILDING CONSTRUCTION	47.8	5.8	68*	[Progress bar: 47.8% complete]				
5	UJ.BERUNG SUBSTATION ELECTRO / MECHANICAL CONSTRUCTION	43.0	1.0	26	[Progress bar: 43.0% complete]				
WEST JAVA II									
1	BOGOR SUBSTATION BUILDING CONSTRUCTION	34.4	5.4	47	[Progress bar: 34.4% complete]				
2	BOGOR SUBSTATION CIVIL CONSTRUCTION	63.2	8.6	100	[Progress bar: 63.2% complete]				
3	BOGOR SUBSTATION ELECTRO / MECHANICAL CONSTRUCTION	-	-	0**	[Progress bar: 0% complete]				
4	BANDUNG UTARA SUBSTATION BUILDING CONSTRUCTION	41.8	8.8	85	[Progress bar: 41.8% complete]				
5	BANDUNG UTARA SUBSTATION CIVIL CONSTRUCTION	59.2	15.9	100	[Progress bar: 59.2% complete]				
6	BANDUNG UTARA SUBSTATION ELECTRO / MECHANICAL CONSTRUCTION	13.0	13.0	3**	[Progress bar: 13.0% complete]				

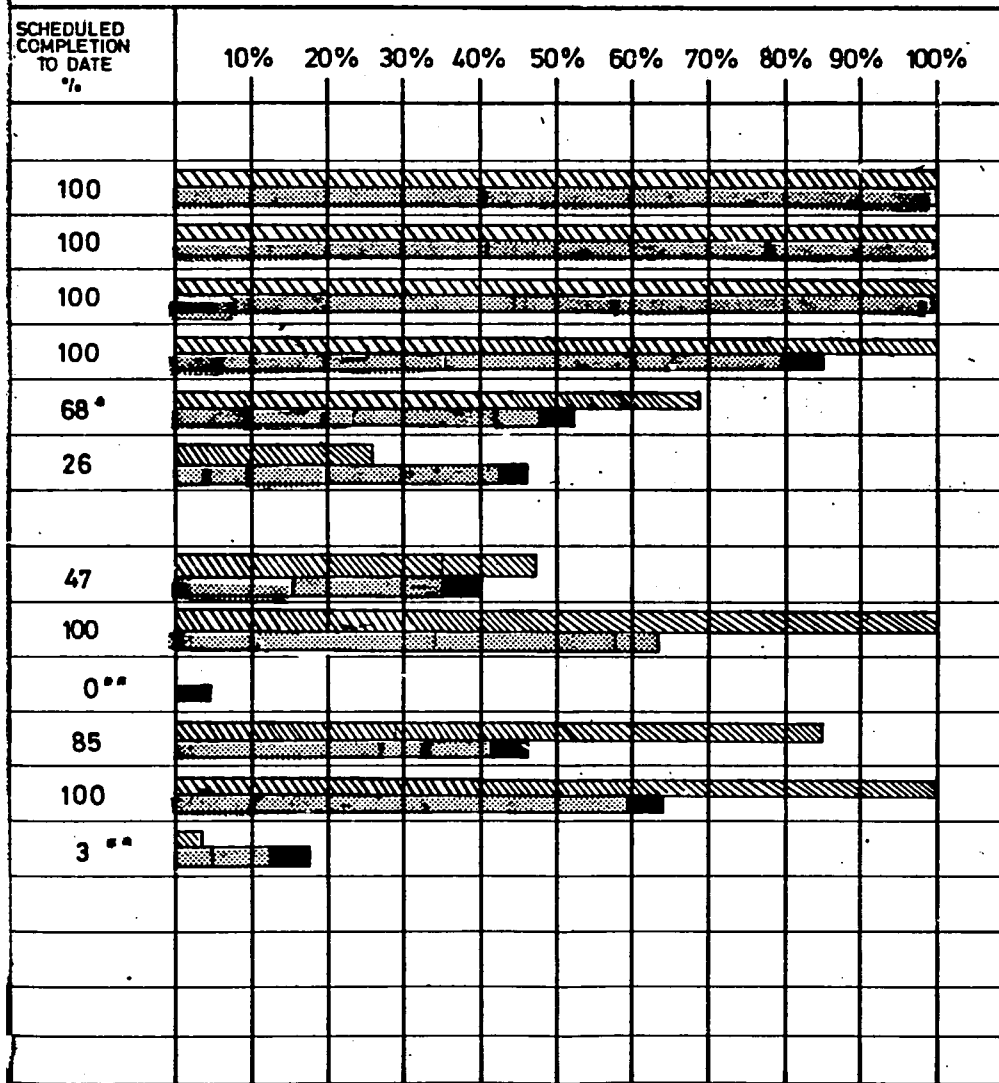
NOTE: PERCENTAGES DO NOT INCLUDE ENGINEERING AND DESIGN.
SCHEDULED COMPLETION IS BASED UPON CONTRACTOR'S APPROVED SCHEDULES.

* BASED ON NEW SCHEDULE PROVIDED BY SUB CONTRACTOR.
** REVISED SCHEDULE BASED ON CONSTRUCTION PROGRESS

WORK IN PROGRESS [diagonal lines] SCHEDULED [dotted pattern] ACTUAL [solid black]

C.T.MAIN INTL. INC.

JAVA I & II
SECTION - PROGRESS
FEBRUARY 1981



WORK IN PROGRESS SCHEDULED COMPLETION TO DATE

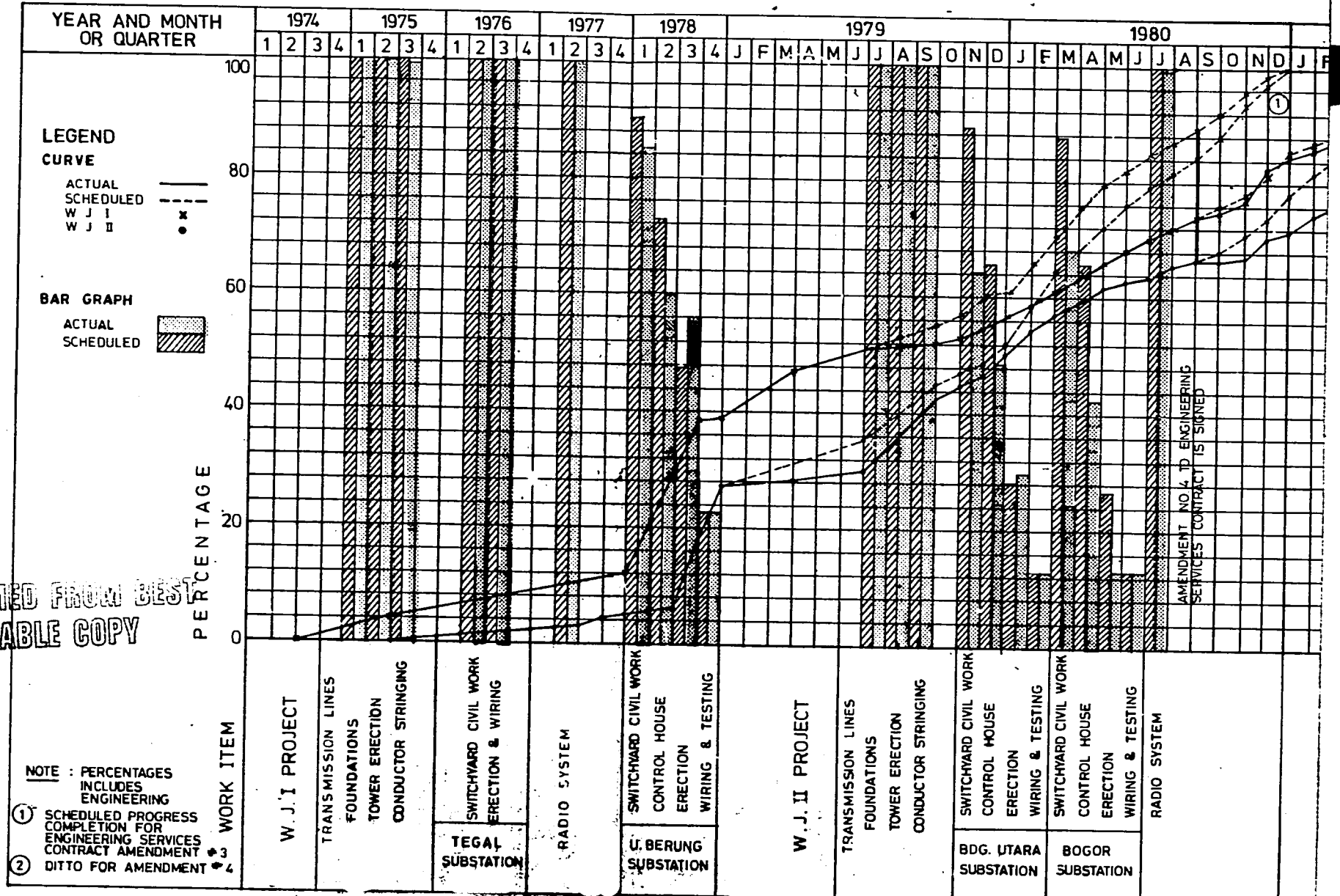
ACTUAL COMPLETION TO DATE

NTL . INC.

MICROFILMED FROM BEST
 AVAILABLE COPY

WEST JAVA I AND II PROJECTS

PROJECT COMPLETION AS OF FEBRUARY 28, 1981

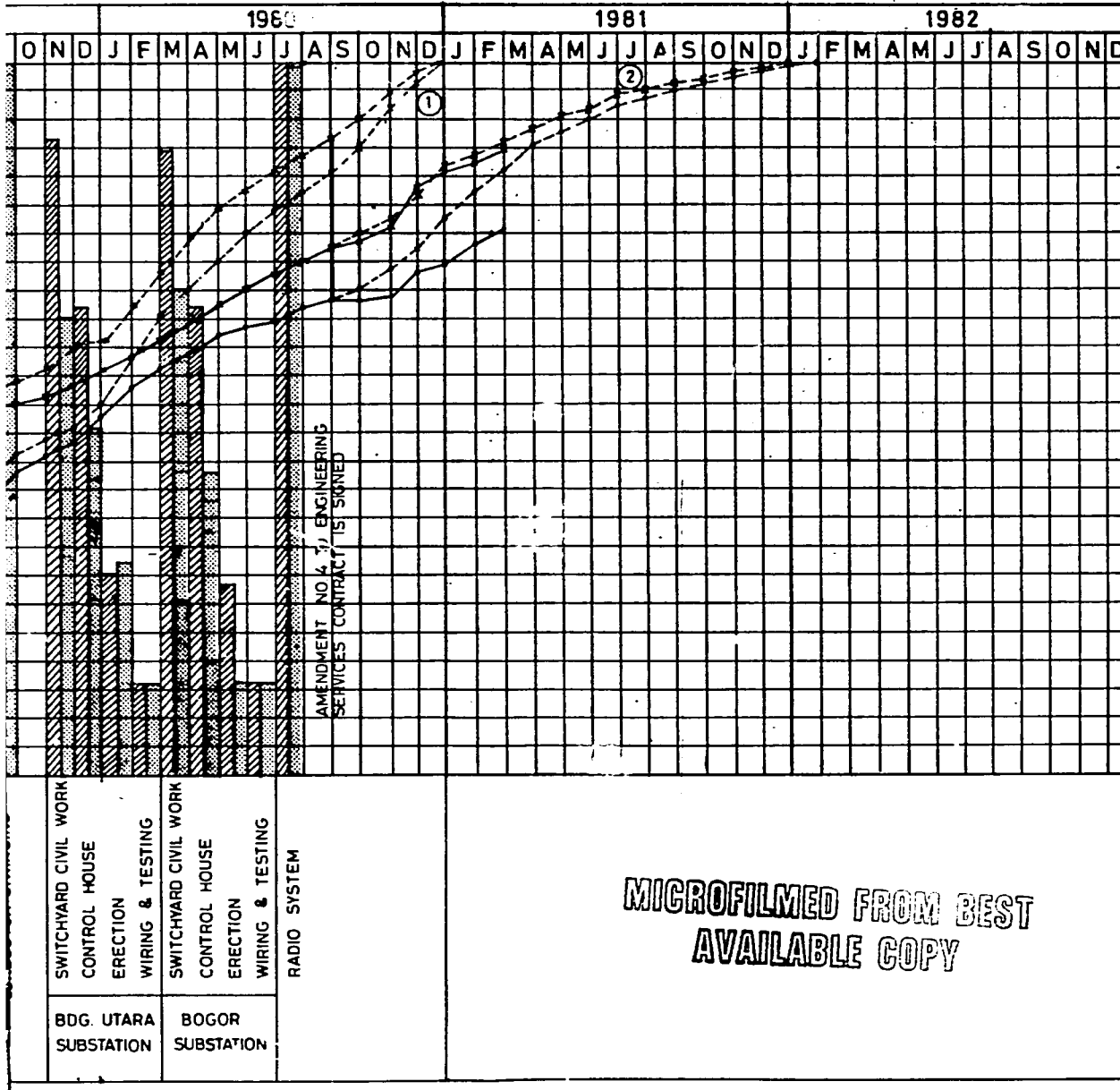


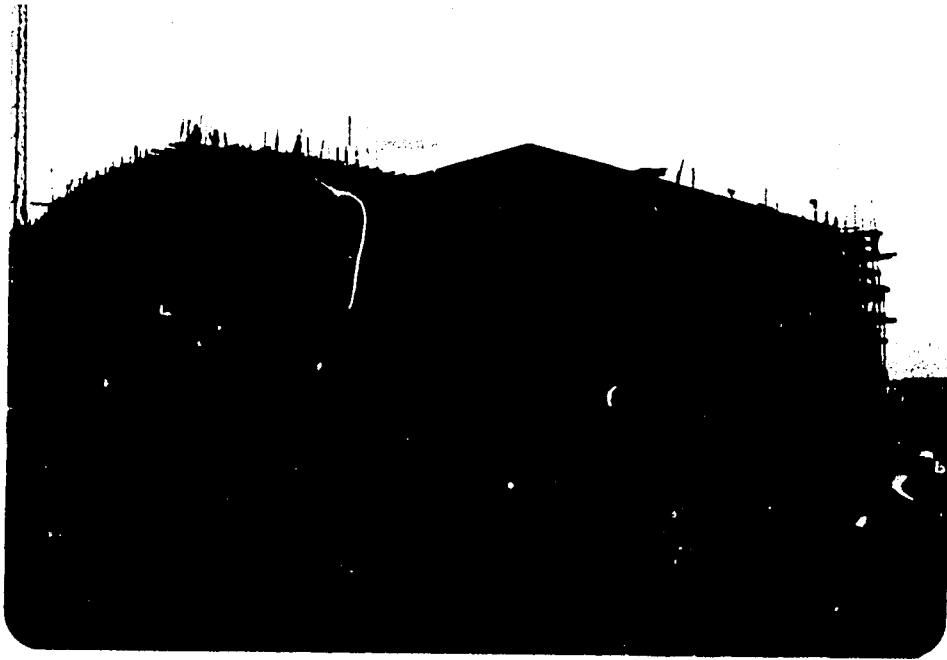
MICROFILMED FROM BEST AVAILABLE COPY

NOTE : PERCENTAGES INCLUDES ENGINEERING
 ① SCHEDULED PROGRESS COMPLETION FOR ENGINEERING SERVICES CONTRACT AMENDMENT
 ② DITTO FOR AMENDMENT

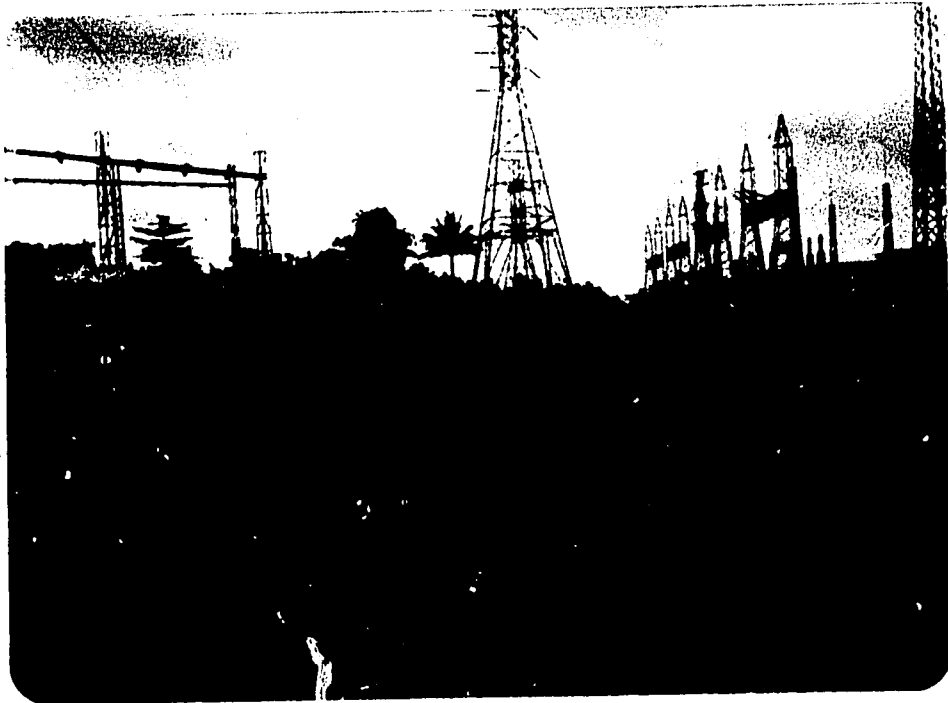
AMENDMENT NO. 4 TO ENGINEERING SERVICES CONTRACT IS SIGNED

8. 1981





**Ujungberung Substation
Control House**



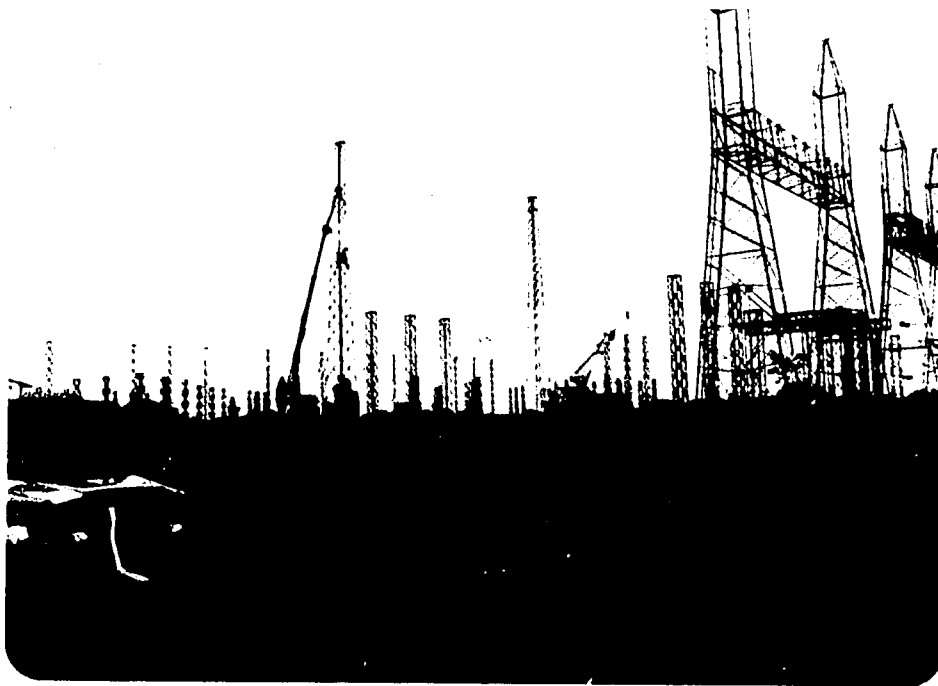
**Ujungberung Substation
70 KV Switchyard Foundations**



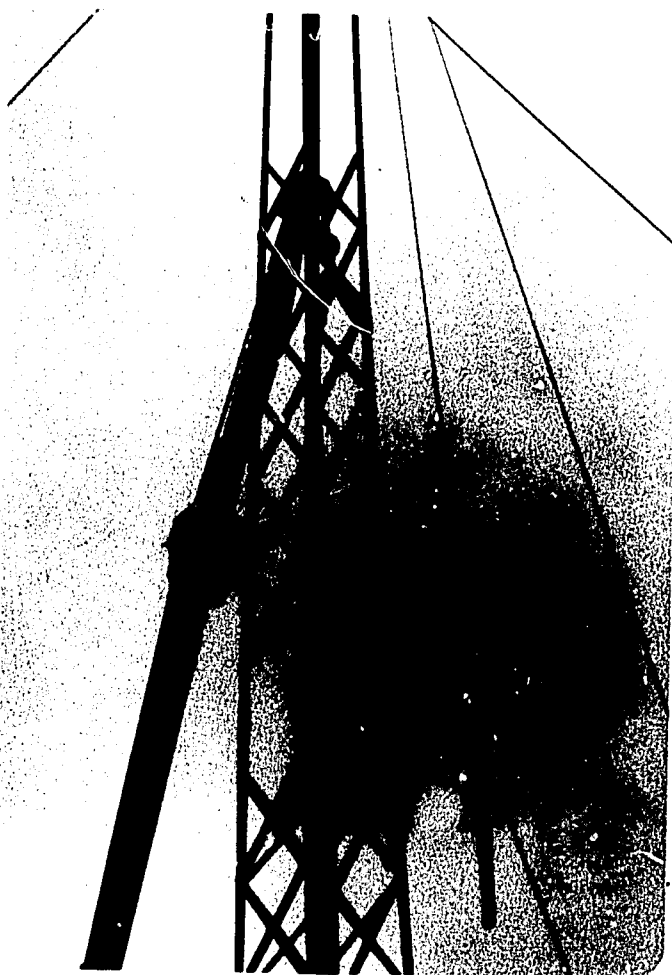
Bandung Utara Substation
Preparing Ground Mat
Connection



Bogor Substation
Area Prepared for Steel Structure Asembling



**Bandung Utara Substation
Installing 150 KV Structures**



**Bandung Utara Substation
Installing 150 KV Lightning Mast**