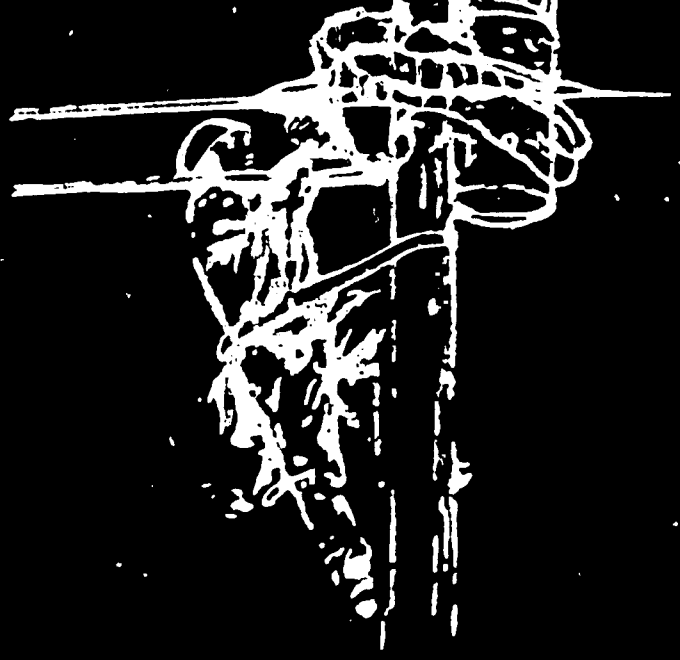


PERUSAHAAN

UMUM

LISTRIK

NEGARA

JAKARTA INDONESIA

MONTHLY REPORT

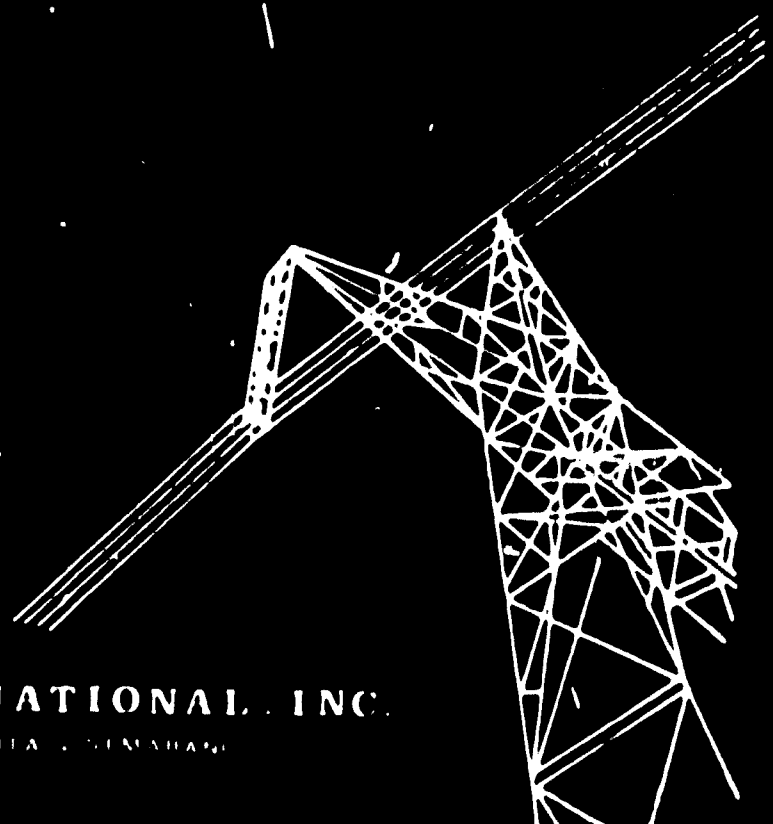
DECEMBER 1981

WEST JAVA I AND II PROJECTS

CONTRACTS

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

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



MAIN

Engineers

CHAS. T. MAIN INTERNATIONAL, INC.

BOSTON · BANDUNG · JAKARTA · SEMARANG

PERUSAHAAN UMUM LISTRIK NEGARA
JAKARTA, INDONESIA

WEST JAVA
ELECTRIC TRANSMISSION PROJECT

MONTHLY REPORT

DECEMBER 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

MAIN Engineers

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. 56069 JL. PROGO 32
JAKARTA P.O. BOX 100, KBT KEBAYORAN TIMUR. TEL. 776925 JL. WIJAYA 1/61
SEMARANG P.O. BOX 26, TEL. 31702 JL. SLAMET 1

11 January 1982
Letter No. B - 5356

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 December 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)

HOME OFFICE • SOUTHEAST TOWER PRUDENTIAL CENTER BOSTON MASSACHUSETTS 02199 U.S.A.

WEST JAVA I AND II PROJECTS

MONTHLY REPORT

DECEMBER 1981

A. PERSONNEL

1. Engineer

a. Mr. A. Tan, General Electric Field Engineer, departed Indonesia on 4 December. He will return to complete his work at Bandung Utara Substation as soon as the replacement parts for the 150 kV OCB's are received.

b. End of the month strength was as follows :

NAME	TITLE	ARRIVAL DATE
West Java I and II		
R.W. Malchow	Project Manager	24 Oct. 1978
C.J. Whitby	Manager of Administration	10 Sep. 1974
J.C. Harkey	Substation Eng./Constr. Mgr.	15 Oct. 1977
H. Gunawan	Administrative Assistant	13 Aug. 1979
T.L. Jones	Substation Engineer	3 Jul. 1981

2. PLN

a. End of the month strength was as follows :

JOB TITLE	NUMBER
Logistics Coordinator	1
Secretaries	2
Draftsmen	4
Accounting Clerks	1
Reproduction Personnel	2
Drivers	8

b. In addition to the above staff, approximately 40 PLN Counterpart and field personnel were assigned to the Projects as of 31 December.

B. ADMINISTRATIVE AND GENERAL

1. ADMINISTRATION

a. Terminal Dates

(1) TDDA - Terminal Date Disbursement Authorization - (Last day that USAID Loan Funds can be committed) - 30 June 1981.

Final Commitment of USAID Loan Funds :

	West Java I	West Java II
USAID Loan	$ 17,200,000.00	$ 19,700,000.00
Committed	$ 17,197,632.36	$ 19,699,990.40

(2) TDD - Terminal Disbursement Date - (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 $	3,824,009.00
			Rp.	555.096.119,-
	C.T. Main-Engineering Services			
(2)	No. Pj. 153/PST/77	5 Sep. '77	US $	2,902,946.03
	Irby Construction Company			
	Tower Steel, Insulators and Accessories			
(3)	No. Pj. 202/PST/77	28 Nov. '77	US $	294,739.06
	Copperweld Industries			
	Shieldwire			
(4)	No. Pj. 203/PST/77	28 Nov. '77	US $	1,991,843.83
	Southwire Company			
	Conductor			
(5)	No. Pj. 050/PST/78	10 Mar. '78	US $	400,636.37
	Tension Stringing Equipment Co.			
	Wire Stringing Equipment			
(6)	No. Pj. 051/PST/78	10 Mar. '78	US $	87,852.00
	Ohio Brass Company			
	Lightning Arresters			
(7)	No. Pj. 052/PST/78	11 Mar. '78	US $	4,547,414.46
	Irby Construction Company			
	Substation Equipment			
	Maintenance Tools and Equipment			

(8)	No. Pj. 053/PST/78 General Electric Company Substation Equipment	11 Mar. '78	US $	2,532,800.59
(9)	No. Pj. 087/PST/78 Motorola Radio Equipment	11 May '78	US $	395,819.20
(10)	No. Spj. 022/PLN/PI RING/77 P.T. Tikon Abadi Foundations - Section I	24 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 Tegal Substation Civil Work	21 Apr. '79	Rp.	50.278.000,-
(15)	No. Spj. 072/SPP/PI RING JATENG/78-79 P.T. Sigma Tirta Tegal Substation Structure Erection	17 Oct. '79	Rp.	25.966.000,-
(16)	No. Spj. 017/PLN/PI RING/78-79 P.T. Silkar National Conductor Stringing - Section I	22 Jan. '80	Rp.	127.790.850,-

(17) No. Spj. 019/PLN/PI RING/79-80 Rp. 164.364.000,-
P.T. Citac Ltd. 2 Feb. '80
Conductor Stringing - Section I

(18) No. Spj. 001/PLN/PI RING/80-81 Rp. 464.500.000,-
P.T. Erses 3 Apr. '80
Ujungberung Substation Civil Work

(19) No. Spj. 002/PLN/PI RING/80-81 Rp. 199.989.000,-
P.T. Erses 3 Apr. '80
Ujungberung Substation Control House

(20) No. Spj. 013/PLN/PI RING/80-81 Rp. 18.860.000,-
P.T. Dharma Niaga 6 Jul. '80
Ujungberung Substation Temporary 150 KV
Transmission Line By-Pass

(21) No. Spj. 007/PLN/PI RING/80-81 Rp. 32.234.000,-
P.T. Citacontrac 3 Jun. '80
Caisson for Tower No. 278

(22) No. Spk. 003/PLN/PI RING/81 Rp. 19.823.000,-
P.T. Citacontrac 26 Mar. '81
Relocate Towers 317 and 319

c. West Java II Contract Data

(1) No. Pj. 023/PST/75 25 Jan. '75 US $ 2,509,793.00
Rp. 718.743.035,-

C.T. Main-Engineering Services

(2) No. Pj. 152/PST/77 5 Sep. '77 US $ 8,199,107.37
Rp. 774.481.343,-

Irby Construction Company
Transmission Line Supply and Construction

(3)	No. Pj. 051/PST/78 Ohio Brass Company Lightning Arresters	10 Mar. '78	US $	87,852.00
(4)	No. Pj. 052/PST/78 Irby Construction Company Substation Equipment	11 Mar. '78	US $ Rp.	4,981,321.52 135.227.727,-
(5)	No. Pj. 053/PST/78 General Electric Company Substation Equipment	11 Mar. '78	US $	3,974,100.16
(6)	No. Spj. 001/PLN/PI RING/77-78 P.T. Citac Ltd. Foundations - Section II and III	5 Jun. '78	Rp.	329.553.000,-
(7)	No. Spj. 002/PLN/PI RING/78-79 P.T. Citac Ltd. Foundations - Ujungberung - Cigereleng	9 Aug. '78	Rp.	175.128.000,-
(8)	No. Spj. 022/PLN/PI RING/79-80 P.T. Sahabat Agung Cibinong - Gandul Stub Angles	4 Dec. '79	Rp.	10.618.000,-
(9)	No. Spj. 009/PLN/PI RING/79-80 P.T. Citac Ltd. Foundations - Section IV A	30 Nov. '79	Rp.	62.441.000,-
(10)	No. Spj. 010/PLN/PI RING/79-80 P.T. Citac Ltd. Foundations - Section IV C	30 Nov. '79	Rp.	36.029.000,-
(11)	No. Spj. 018/PLN/PI RING/79-80 P.T. Amarta Karya Foundations - Section IV B	24 Jan. '80	Rp.	64.630.000,-

(12) No. Spj. 008/PLN/PI RING/80-81 Rp. 334.619.000,-
P.T. Pembangunan Perumahan 5 Jun. '80
Bandung Utara Substation Civil Work

(13) No. Spj. 006/PLN/PI RING/80-81 Rp. 230.501.000,-
P.T. Perfect Circle 31 May '80
Bandung Utara Substation Control House

(14) No. Spj. 009/PLN/PI RING/80-81 Rp. 475.428.000,-
P.T. Perfect Circle 31 May '80
Bogor Substation Civil Work

(15) No. Spj. 007/PLN/PI RING/80-81 Rp. 212.915.000,-
P.T. Perfect Circle 31 May '80
Bogor Substation Control House

(16) No. Spj. 020/PLN/PI RING/79-80 Rp. 31.967.000,-
P.T. Hutama Karya 16 Feb. '80
Bandung Utara Substation Access Road

(17) No. Spj. 009B/PLN/PI RING/81-82 Rp. 64.700.000,-
P.T. Buana Power 29 May '81
Bogor Substation Access Road

(18) No. Spj. 013/PLN/PI RING/80-81 Rp. 10.608.000,-
P.T. Dharma Niaga 6 Jul. '80
Bogor Substation Temporary 150 KV
Transmission Line By-Pass

(19) No. Spj. 001j/PLN/PI RING/80-81 Rp. 89.843.000,-
P.T. Samapta Nusantara 6 May '81
Transportation of Power Transformers to Bogor

d. West Java I and II Contract Data

(1) No. Spj. 016/PLN/PI RING/77 Rp. 54.245.000,-
P.T. Sumber Jaya 4 Jul. '77
Grounding Material

(2) No. Spj. 017/PLN/PI RING/77 Rp. 40.100.000,-
P.T. Arcon 13 Aug. '77
Stub Angles

(3) No. Spj. 001j/OP LOG/79 Rp. 128.999.492,-
P.T. Keluarga Pradeni Veem 7 Feb. '79
Transportation of Power Transformers to Bandung.

2. GENERAL

a. Amendments to two (2) Letters of Commitment were received during the month. These Amendments extended the Expiration Dates.

b. Extension of the Expiration Date of one (1) Letter of Credit was requested.

c. Certificates of Performance to allow retainage payment on two (2) Contract invoices were processed during the month.

C. CONFERENCES AND EVENTS

1. Energization of Equipment

a. Bandung Utara Substation 150 KV bus
Energized 12 December 1981

b. Bandung Utara Substation 20 KV bus.
Energized 12 December 1981

D. PROBLEM AREAS AND TENTATIVE SOLUTIONS

1. The Ujungberung Switchyard Civil Works Construction is more than one year behind schedule. Responsibility for the Civil works construction has been taken away from P.T. Erses and the work will be completed by PLN.

   PLN is beginning to mobilize and the Civil Works Construction should be complete by the end of January. Delays in the remaining civil works will not delay complete energization of the substation.

2. The Bandung Utara Switchyard Contractor is several months behind schedule. However, no delay in the energization of the substation is expected, due to this aspect.

3. During erection of the electrical equipment, material shortages, defects and damages are continually discovered. Immediately upon discovery, replacement parts are ordered for air shipment. However, there is a possibility that some delays in equipment energization may occur.

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. Phase conductor and shieldwire have been installed.

f. Tower Movement. Towers No. 317 and 319 were monitored during the latter part of the month. No additional downhill movement was detected. Measurements will continue to be taken during the following months.

F. TRANSMISSION - WEST JAVA II

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. Phase conductor and shieldwire have been installed.

G. SUBSTATIONS

1. Construction

a. Tegal Substation

All work is completed and the addition has been energized.

b. Ujungberung Substation

(1) Switchyard Civil Work

The following work was completed during December :

Installation of 150/70 KV transformer oil containment pits.

Installation of chain link fence

Work continued on the grading and substation road. The work is over one year behind the original schedule. PLN has terminated the Contract and undertook to do the work. PLN has arranged for funds to complete the civil works construction. The remaining work should be completed by the end of January 1982.

(2) Control House

The Control House is complete. Final touch-up will be done after the electrical crews have completed their work.

(3) Erection, Wiring and Testing

The following work remains to be completed :

Installation, testing and energization of 60 MVA, 150 to 70 KV transformer. (The transformer has been placed on its pad and this work was started during the latter part of the month.)

Install wiring and high voltage connections to 150 to 70 KV transformer.

Energize Busses No. 2 and 2A (20KV).

This work is expected to be complete by the end of January.

c. Bandung Utara Substation

(1) Switchyard

The following work remains to be completed :

Installation of substation rock cover.

Final grading and clean-up of site.

The Contractor is over one year behind his original schedule. It is now estimated that the switchyard work will not be completed until the end of January.

(2) Control House

The Control House is complete.

The Contractor is now in the warranty period and will make repairs as required.

(3) Access Road

The road is complete.

(4) Erection, Wiring and Testing

The following work was completed during December :

Installation of above-ground grounding.

150 KV switch adjustment.

Installation of yard lighting.

Installation of 20 KV Switchgear.

Installation of Control Wiring.

Work continued on the following phases :

Testing of 20 KV switchgear.

Preliminary testing.

Final testing.

The 150 KV and 20 KV busses were energized during the month.

d. Bogor Substation

(1) Switchyard Civil Work

The Switchyard Civil Work is complete.

The Contractor is now in the warranty period and will make repairs as required.

(2) Control House

The Control House is complete.

The Contractor is now in the warranty period and will make repairs as required.

(3) Access Road

The road is complete.

(4) Erection, Wiring and Testing

The following work was completed during December :

Taping of 20 KV cable terminal studs.
(20 KV ties between switchgear lineups).

Varnishing of 20 KV cable terminal stud taping.

There are some wiring modifications to made to the bus differential protection and for the lockout of the line switch by the grounding switch. Secondly, transformer oil leaks have been detected and will be repaired.

The above mentioned work should be completed during January.

2. Material Supply

All material is presently in Indonesia except for replacement and spare parts. The need for replacement parts for the 150 KV OCB's and 20 KV Switchgear may delay completion of the Bandung Utara Substation.

H. MOBILE RADIO

1. Installation of the mobile radio system is complete and the system is operating.

I. SCHEDULES

1. Current Shipping Schedules

This schedule is on pages 16 and 17 . Based on the present supply Contracts only three (3) shipments are pending. As erection work continues and additional shortages are determined, the number of pending shipments can increase.

2. West Java I and II Projects Completion

The tables which are on pages 18 and 19 give the scheduled and actual completion of the various phases of the Projects. Engineering as well as physical completion are included in the percentage figures.

The page following is the Project Completion graph based on these tables and in addition shows the monthly scheduled percentage completion to the end of the Project. 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 pages following the Project Completion graph are Project schedules showing the relationship between the actual physical construction and Contractor or PLN scheduled progress. The Bandung Utara Substation Control House was completed in November and its schedule is not included.

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

Item	Shipping Date	ETA in PLN Warehouse	Comments
A. Contract Pj. 152/PST/77, Shipment Complete	Irby Construction Company. Transmission Line Materials - WJ II		
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		
G. Contract Pj. 053/PST/78, Shipment Complete	General Electric Company, Substation Equipment - WJ I & II		
H. Contract Pj. 087/PST/78, Shipment Complete	Motorola Company, Mobile Radio Equipment - WJ I		

Item	Shipping Date	ETA in PLN Warehouse	Comments
I. Contract Pj. 052/PST/78,	Irby Construction Company Substation Equipment and Maintenance Tools and Equipment - WJ I & II		
1. Fuses, Wire Terminals and Replacement Parts for Oil Filter Trailer	16 December 1981	16 Jan. 1982	Air Freight.
2. Spare Parts for Transformers and Switchyard.	15 December 1981	15 Feb. 1982	
3. Spare Parts for Transformers, Switchyard Controls and Relaying	15 January 1982	15 Mar. 1982	

West Java I Project

Project Completion

(Includes Engineering and Design)

as of 26 December 1981

Work Item	Weighted Percent of Project	Percent of Item Completed to Date Scheduled	Percent of Item Completed to Date Actual	Percent of Project Completed to Date Scheduled	Percent of Project Completed to Date Actual
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	100.0	11.7	11.7
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	100.0	93.9	15.2	14.3
Control House	11.5	100.0	100.0	11.5	11.5
Equipment Erection, Wiring and Testing	10.3	100.0	99.4	10.3	10.2
Radio System	5.7	100.0	100.0	5.7	5.7
Total	100.0			100.0	99.0

West Java II Project

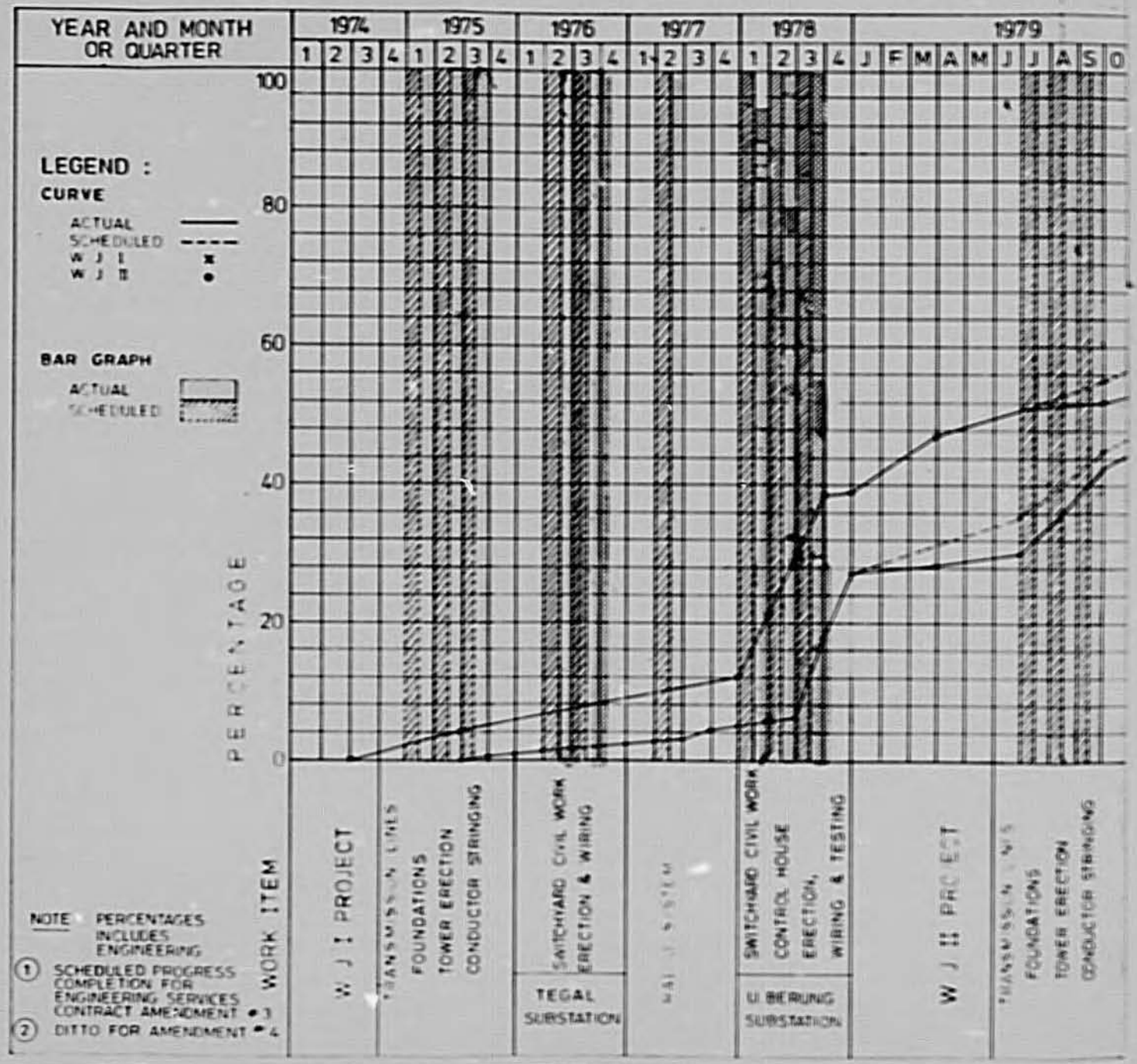
Project Completion

(Includes Engineering and Design)

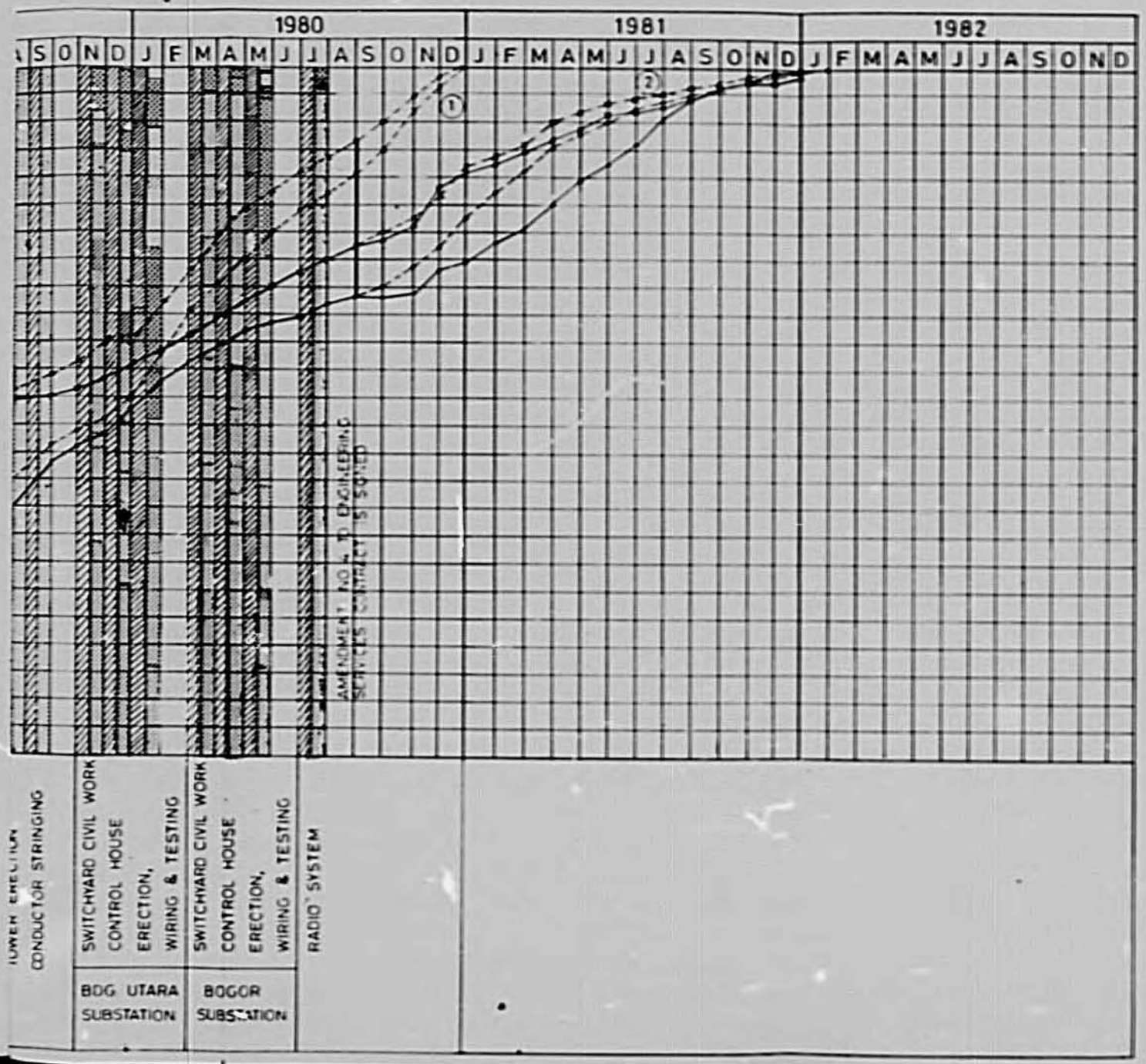
as of 26 December 1981

Work Item	Weighted Percent of Project	Percent of Item Completed to Date		Percent of Project Completed to Date	
		Scheduled	Actual	Scheduled	Actual
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	100.0	99.5	7.3	7.3
Control House	6.1	100.0	100.0	6.1	6.1
Equipment Erection, Wiring and Testing	4.9	100.0	98.0	4.9	4.8
Bogor Substation					
Switchyard Civil Work	10.6	100.0	100.0	10.6	10.6
Control House	5.8	100.0	100.0	5.8	5.8
Equipment Erection, Wiring and Testing	7.0	100.0	99.7	7.0	7.0
Radio System	6.0	100.0	100.0	6.0	6.0
Total	100.0			100.0	99.9

WEST JAVA I AND II PROJECTS
PROJECT COMPLETION AS OF DECEMBER. 26

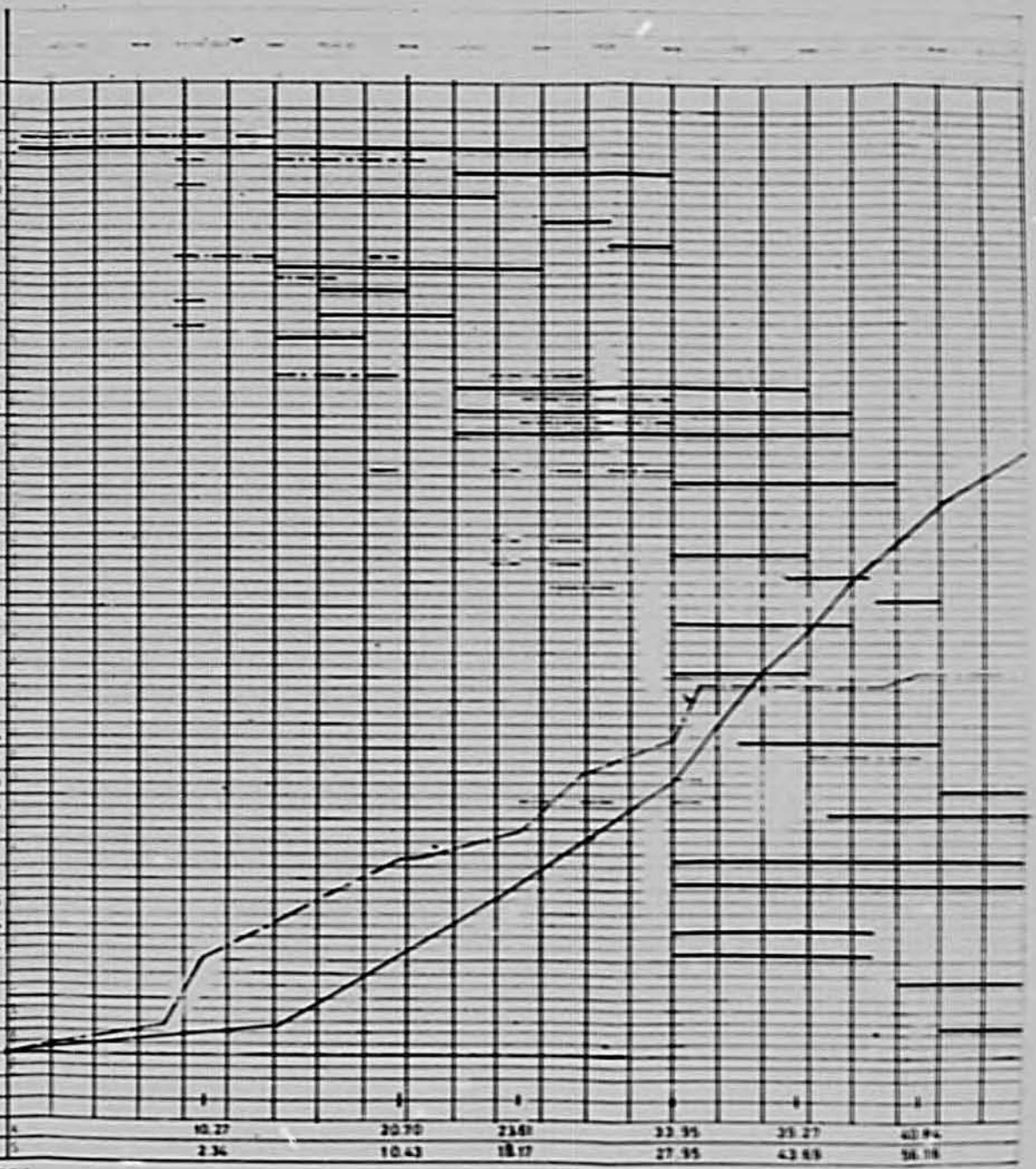


ER. 26 . 1981


1980
1981
1982
A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1
2
AMENDMENT NO. TO ENGINEERING SERVICES CONTRACT IS SIGNED
TOWER ERECTION
CONDUCTOR STRINGING
SWITCHYARD CIVIL WORK
CONTROL HOUSE
ERECTION,
WIRING & TESTING
BOG UTARA SUBSTATION
SWITCHYARD CIVIL WORK
CONTROL HOUSE
ERECTION,
WIRING & TESTING
BOGOR SUBSTATION
RADIO SYSTEM

TIME SCHEDULE
BANDUNG UTARA EREC

NO	WORK ITEM	UNIT	%
1	STRUCTURES		
1.1	150KV BUS SUPPORT STRUCTURES	130	6.78
1.2	150KV SWITCH SUPPORT STRUCTURES	24	2.60
1.3	150KV DEAD END TOWERS	4	2.60
1.4	20KV TERMINATOR STRUCTURE	2	0.78
1.5	66KV FUSE & TRANSF STRUCTURE	2	0.78
1.6	LIGHTING MAST STRUCTURE	14	3.13
1.7	CCVT & BUS SUPPORT STAND (BUS)	2	1.04
1.8	CCVT WAVE TRAPS & L.A STAND (LINE)	4	1.56
1.9	CCVT, L.A SUPPORT STRUCTURE	8	1.04
2	BUS		
2.1	INSULATORS	420	4.17
2.2	BUS PIPE & ACSR (AND DAMPER CABLE)	480	6.28
2.3	CONNECTORS	774	4.69
3	EQUIPMENT (SWITCH YARD)		
3.1	150KV SWITCHES (INSTALLATION)	18	2.08
3.2	150KV SWITCH ADJUSTMENT	18	4.17
3.3	66KV FUSE & SWITCHES	2	1.56
3.4	CCVTS	4	1.56
3.5	LIGHTNING ARRESTERS	12	1.04
3.6	WAVE TRAPS	4	0.78
3.7	OIL CIRCUIT BREAKERS	7	2.08
3.8	OIL CIRCUIT BREAKER SET UP	7	2.08
3.9	PRELIMINARY POWER TRASF SET UP	2	1.56
3.10	TRANSF INSTALLATION AND TESTING	2	1.04
3.11	STATION SERVICE TRANSFORMERS	6	1.56
4.0	GROUNDING MATERIAL	100	2.34
5.0	YARD LIGHTING	100	3.13
6.0	CONDUIT INSTALLATION	257	4.69
7.0	YARD PANEL INSTALLATION	13	2.86
8.0	CONTROL HOUSE		
8.1	RELAY AND CONTROL PANEL INST	9	4.17
8.2	20KV SWITCHGEAR INST.	24	6.51
8.3	FINAL 20KV SW GEAR TESTING	100	2.86
8.4	BATTERY CHARGER INSTALLATION	2	2.34
8.5	POWER PANEL INSTALLATION	4	2.34
9.0	CONTROL WIRING INSTALLATION	2328	5.99
10.0	TESTING		
10.1	PRELIMINARY TESTING	100	5.47
10.2	FINAL TESTING	100	1.56
11.0	ENERGIZING	100	0.78
	TOTAL		100



A = ACTUAL
S = SCHEDULE

ITEMS 100% COMPLETED (TYP)

NOTES:

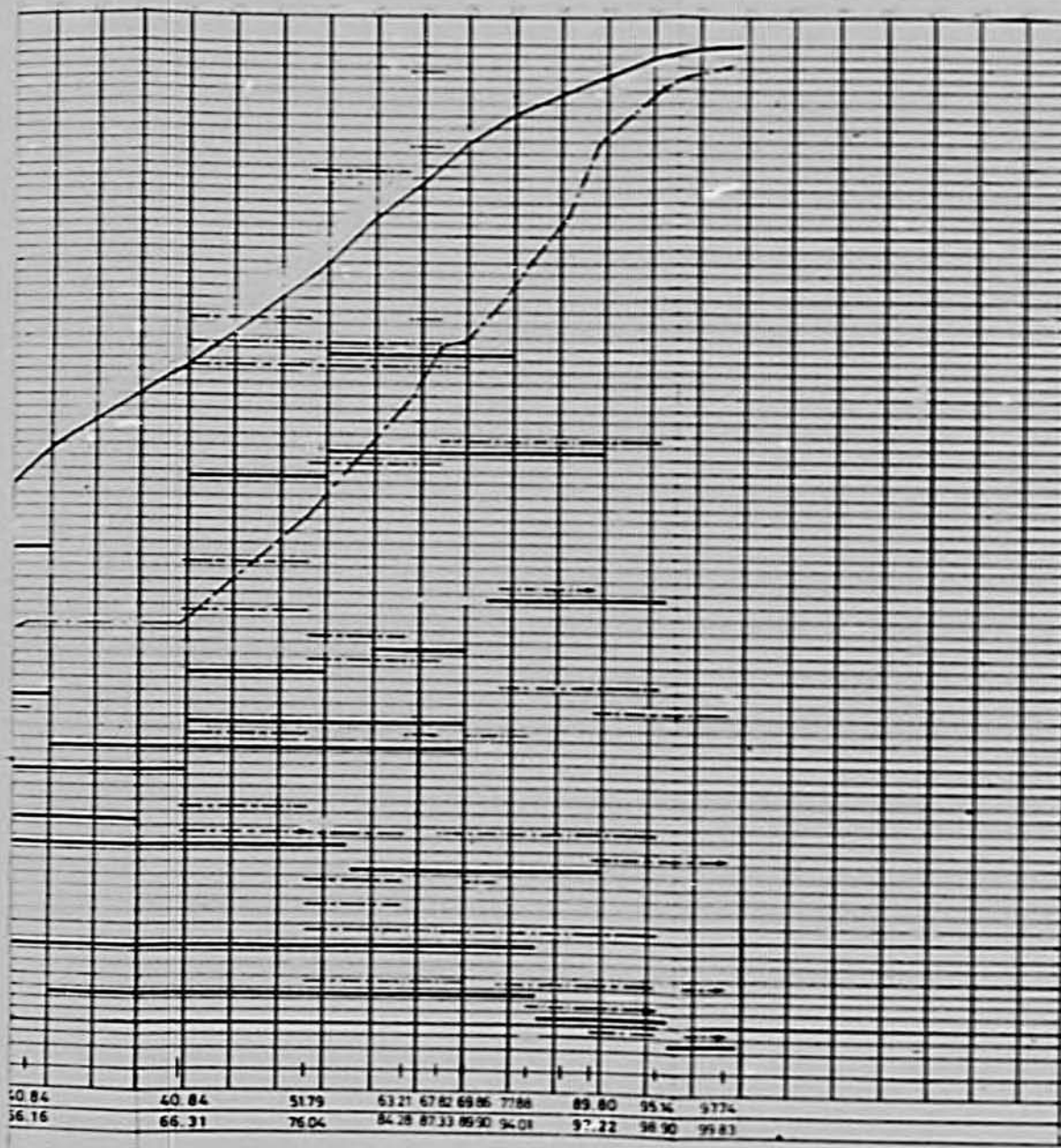
WORK NOT STARTED

WORK NOT COMPLETE AS OF DATE UNDER CONST. PROGRESS

1. WORK CAN NOT BE COMPLETED DUE TO MATERIAL PROBLEM

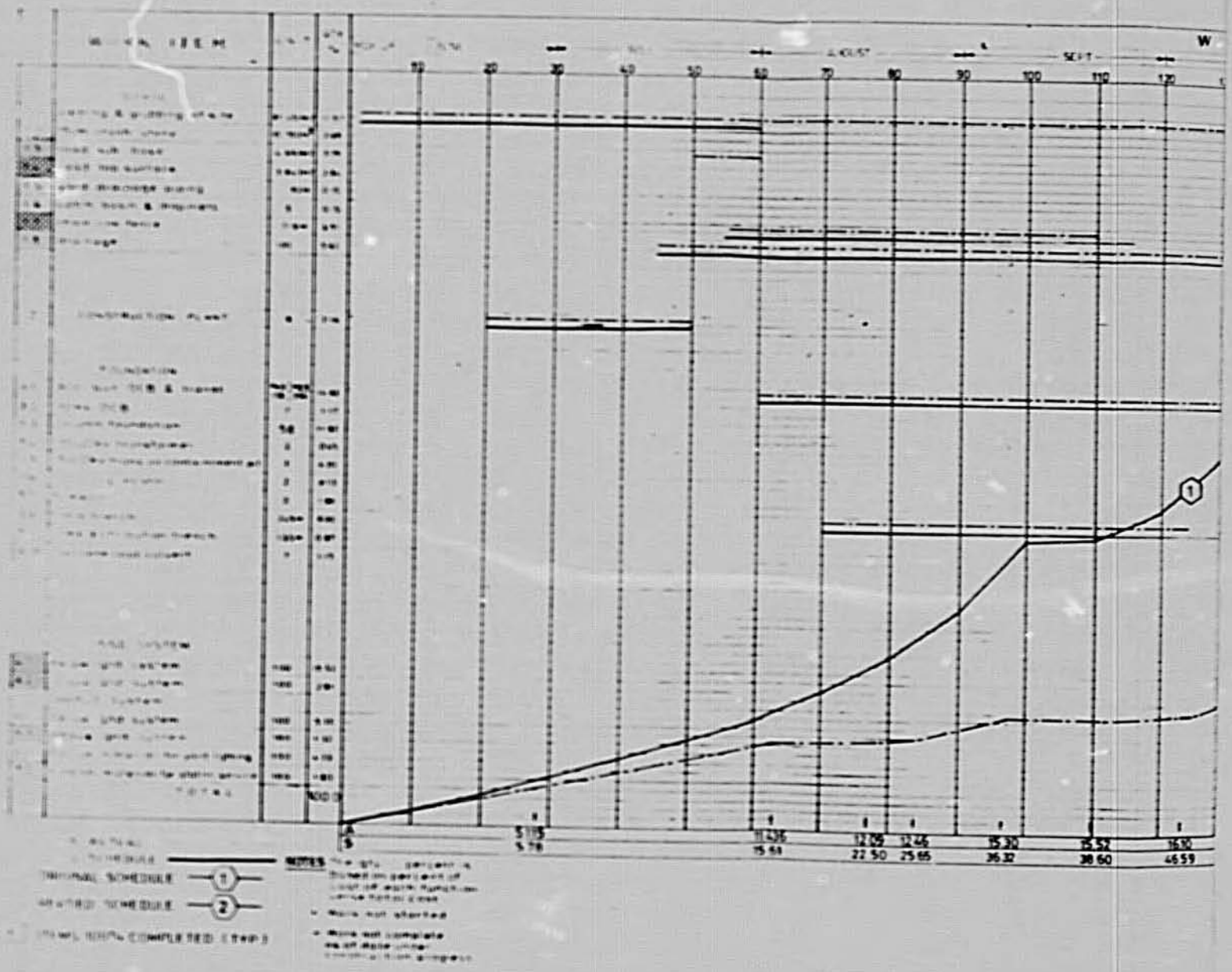
BEST AVAILABLE DOCUMENT

SCHEDULE
ARA ERECTION



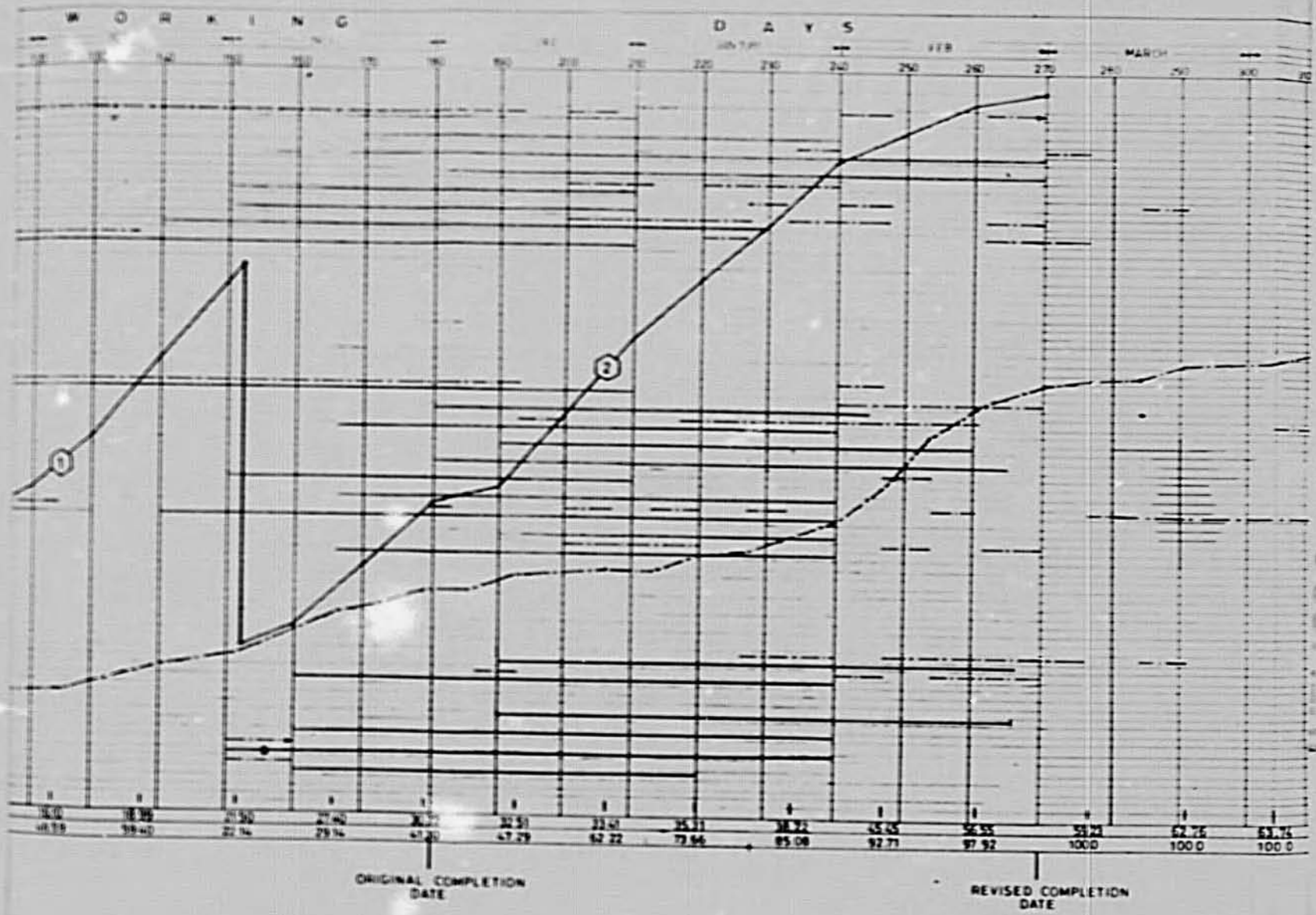
190	100	190	100	6.79	6.79		
24	100	24	100	2.60	2.60		
4	100	4	100	2.60	2.60		
2	100	2	100	0.79	0.79		
2	100	2	100	0.79	0.79		
14	100	14	100	3.13	3.13		
2	100	2	100	1.04	1.04		
4	100	4	100	1.56	1.56		
8	100	8	100	1.04	1.04		
406	100	406	100	4.17	4.17		
486	100	486	100	6.24	6.24		
774	100	774	100	4.69	4.69		
18	100	18	100	2.08	2.08		
18	100	18	100	4.17	4.17		
2	100	2	100	1.56	1.56		
14	100	14	100	1.56	1.56		
12	100	12	100	1.04	1.04		
4	100	4	100	0.79	0.79		
7	100	7	100	2.08	2.08		
3	42.86	7	100	0.89	2.08		SEE NOTE 1
2	100	2	100	1.56	1.56		
2	100	2	100	1.04	1.04		
6	100	6	100	1.56	1.56		
100	100	100	100	2.34	2.34		
100	100	100	100	3.13	3.13		
217	100	217	100	4.69	4.69		
13	100	13	100	2.86	2.86		
9	100	9	100	4.17	4.17		
24	100	24	100	6.51	6.51		
98	98	100	100	2.60	2.66		SEE NOTE 1
2	100	2	100	2.34	2.34		
4	100	4	100	2.34	2.34		
2328	100	2328	100	5.99	5.99		
95	95	100	100	5.20	5.47		SEE NOTE 1
60	60	100	100	0.94	1.56		
85	85	78	78	0.66	0.61		
				97.74	99.83		

BEST AVAILABLE DOCUMENT

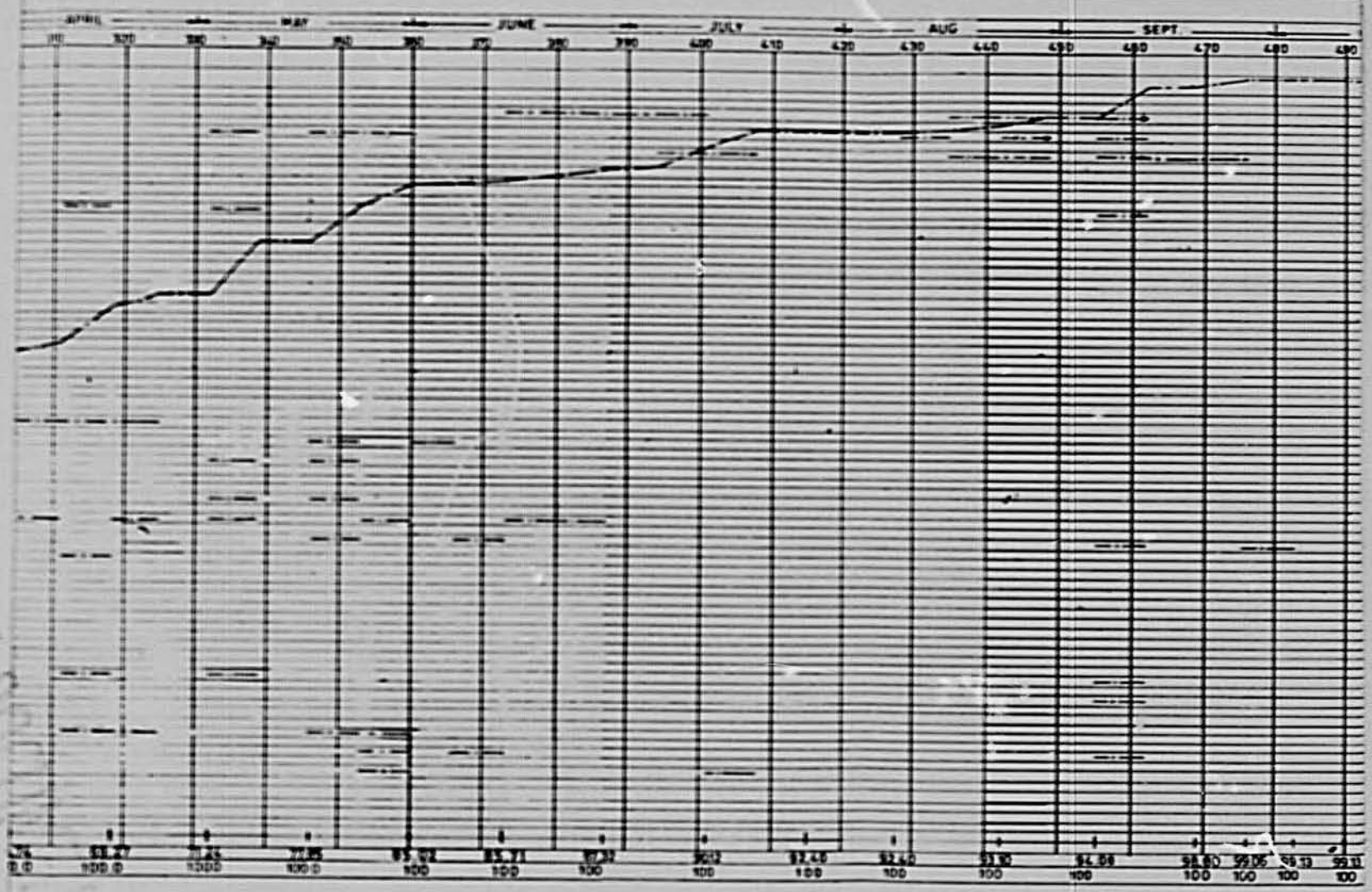


BEST AVAILABLE DOCUMENT

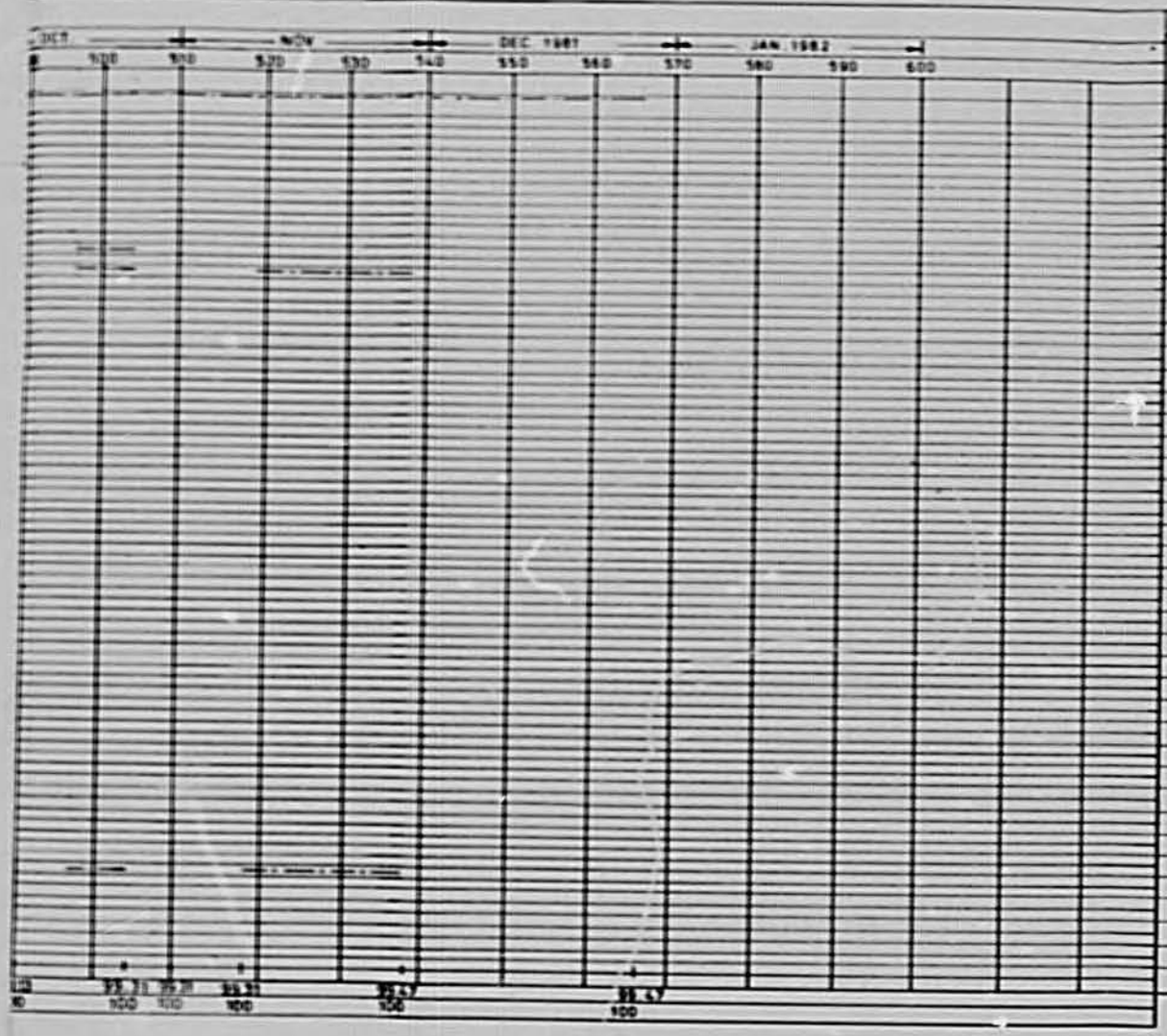
TIME SCHEDULE
BANDUNG UTARA SWITCH YARD



BEST AVAILABLE DOCUMENT



BEST AVAILABLE DOCUMENT



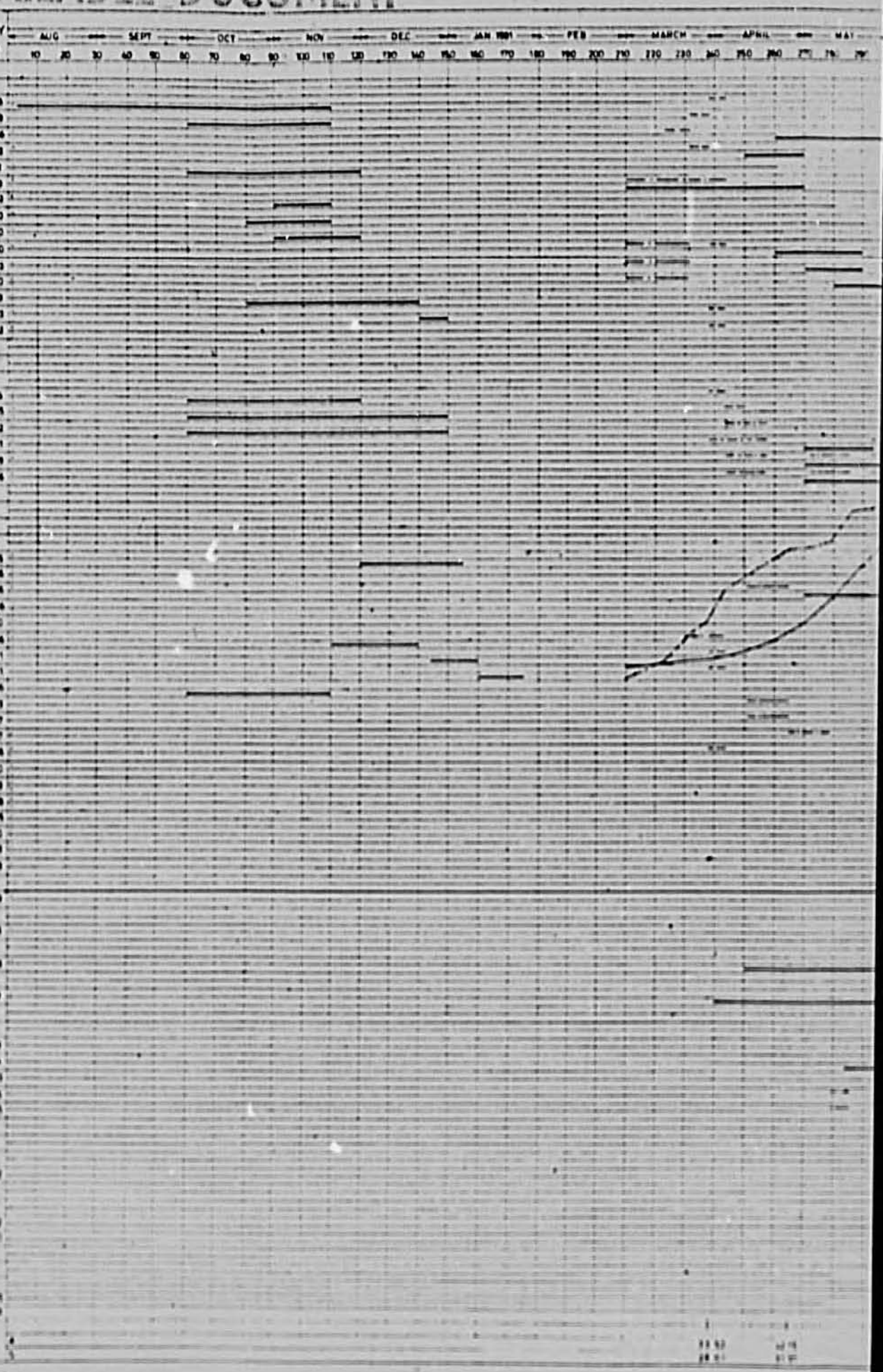
% OF COMPLETION	CONSTRUCTION PROGRESS TO DATE DEC 26, 1981 UNIT ACTUAL QTY.	ACTUAL %	SCHEDULED QTY.	SCHEDULED %	% OF CONTRACT ACTUAL %	% OF CONTRACT SCHED. %	NO
100							
97.5							1
95	79821 M²	98	81450 M²	100	11.34	11.57	1.1
92.5	10300 M²	96	10700 M²	100	2.59	2.69	1.2
90	4663 M²	100	4663 M²	100	3.09	3.09	1.3
87.5	3843 M²	100	3843 M²	100	2.84	2.84	1.4
85	82 M	100	82 M	100	0.15	0.15	1.5
82.5	5	100	5	100	0.15	0.15	1.6
80	719 M	100	719 M	100	3.51	3.51	1.7
77.5	100	100	100	100	0.61	0.61	1.8
75							
72.5							
70							
67.5	8	100	8	100	2.16	2.16	2
65							
62.5							
60	PAD / PIER	PAD / PIER	PAD / PIER				3
57.5	138 / 396	100 / 100	138 / 396	100	14.63	14.63	3.1
55	7	100	7	100	1.17	1.17	3.2
52.5	58	100	58	100	11.82	11.82	3.3
50	2	100	2	100	0.45	0.45	3.4
47.5	2	100	2	100	4.20	4.20	3.5
45	2	100	2	100	0.13	0.13	3.6
42.5	2	100	2	100	1.80	1.80	3.7
40	245 M	100	245 M	100	6.00	6.00	3.8
37.5	135 M	100	135 M	100	0.87	0.87	3.9
35	7	100	7	100	1.15	1.15	3.10
32.5							
30							
27.5							
25							
22.5							4
20	100	100	100	100	15.32	15.32	4.1
17.5	100	100	100	100	2.81	2.81	4.2
15							5
12.5	100	100	100	100	5.33	5.23	5.1
10	100	17.0	100	100	1.32	1.32	5.2
7.5	100	100	100	100	4.23	4.23	6
5	100	100	100	100	1.80	1.80	7
2.5							
0					99.47	100	

Bandung, October 1980

P.T. PEMBANGUNAN PERUMAHAN
WEST JAVA BRANCH

BEST AVAILABLE DOCUMENT

WORK ITEM	UNIT	QTY %
STRUCTURES		
[illegible]	277	4.38
[illegible]	28	2.19
[illegible]	24	1.46
[illegible]	4	0.73
[illegible]	12	2.19
[illegible]	130	2.19
[illegible]	3	0.73
[illegible]	8	1.10
[illegible]	12	1.10
[illegible]	12	1.10
[illegible]	3	0.73
[illegible]	12	1.10
[illegible]	16	2.19
[illegible]	2	0.73
[illegible]	2	0.73
BUS		
[illegible]	489	2.56
[illegible]	[illegible]	4.75
[illegible]	[illegible]	4.02
[illegible]	231	0.91
[illegible]	[illegible]	3.29
[illegible]	376	1.46
EQUIPMENT (SMITH MARK)		
[illegible]	26	1.65
[illegible]	26	2.56
[illegible]	16	1.46
[illegible]	16	2.56
[illegible]	1	1.10
[illegible]	20	1.46
[illegible]	18	0.91
[illegible]	6	0.91
[illegible]	10	2.56
[illegible]	17	0.73
[illegible]	12	0.37
[illegible]	3	0.37
[illegible]	6	1.46
[illegible]	16	4.20
[illegible]	1	0.73
[illegible]	2	1.28
[illegible]	1	0.55
[illegible]	4	1.10
[illegible]	4	0.73
[illegible]	3	0.73
[illegible]	[illegible]	2.19
[illegible]	100	2.19
[illegible]	445	3.29
[illegible]	29	2.19
[illegible]		
[illegible]	18	3.29
[illegible]	24	4.94
[illegible]	100	1.83
[illegible]	2	1.65
[illegible]	1	1.65
[illegible]	1366	4.38
[illegible]		
[illegible]	100	4.38
[illegible]	100	1.10
[illegible]	100	2.55
		100

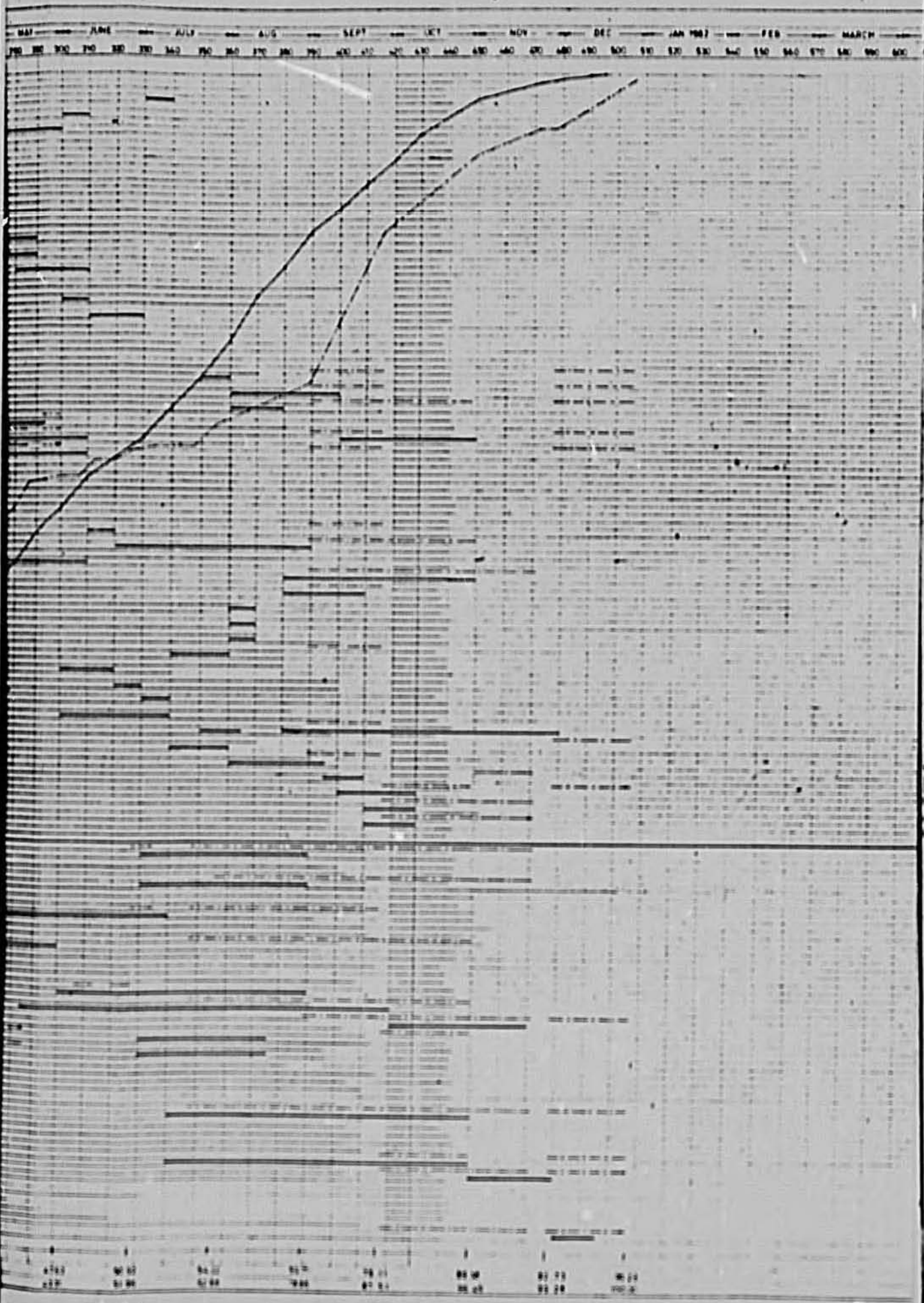


A = ACTUAL
S = SCHEDULE

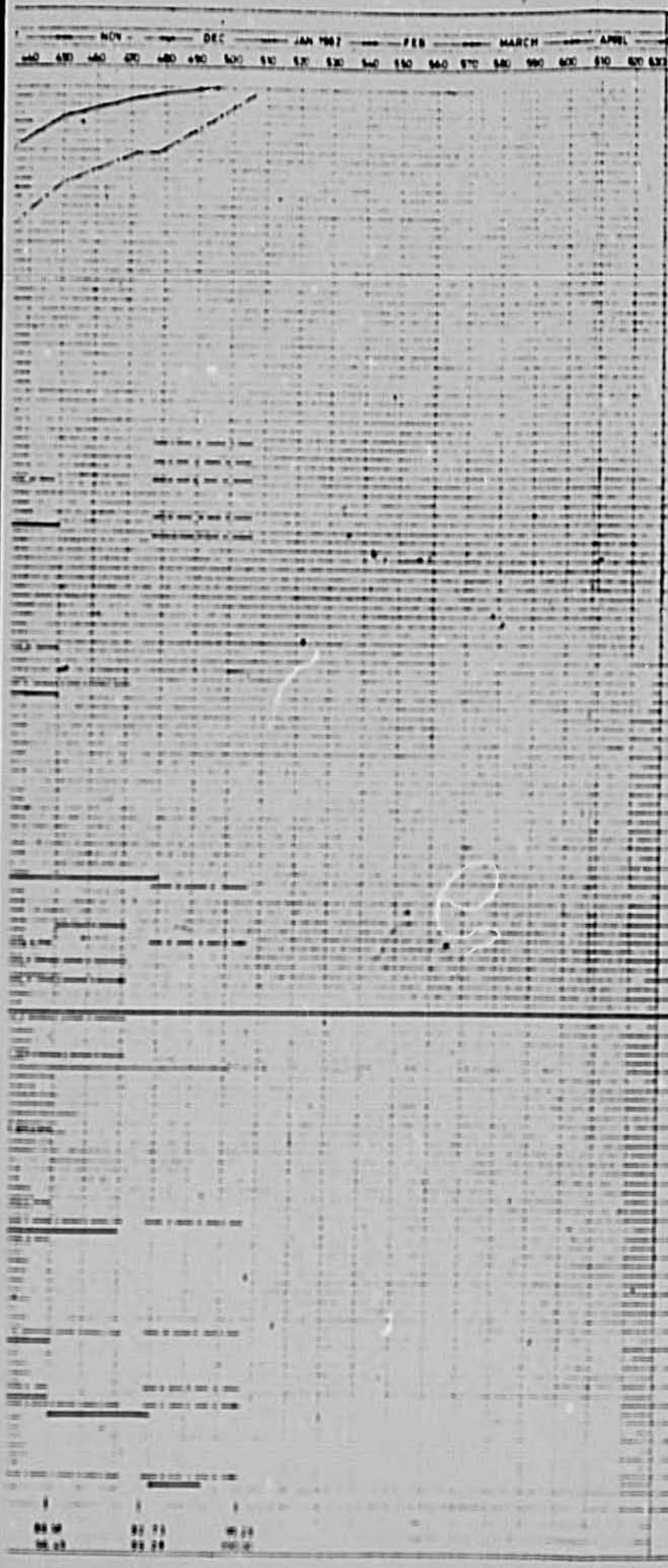
NOTES:
● WORK NOT STARTED
WORK NOT COMPLETE AS OF DATE
UNDER CONST PROGRESS

(ITEMS NOT ENUMERATED ITEM)

TIME SCHEDULE
UJUNG BERUNG ERECTION



BEST AVAILABLE DOCUMENT

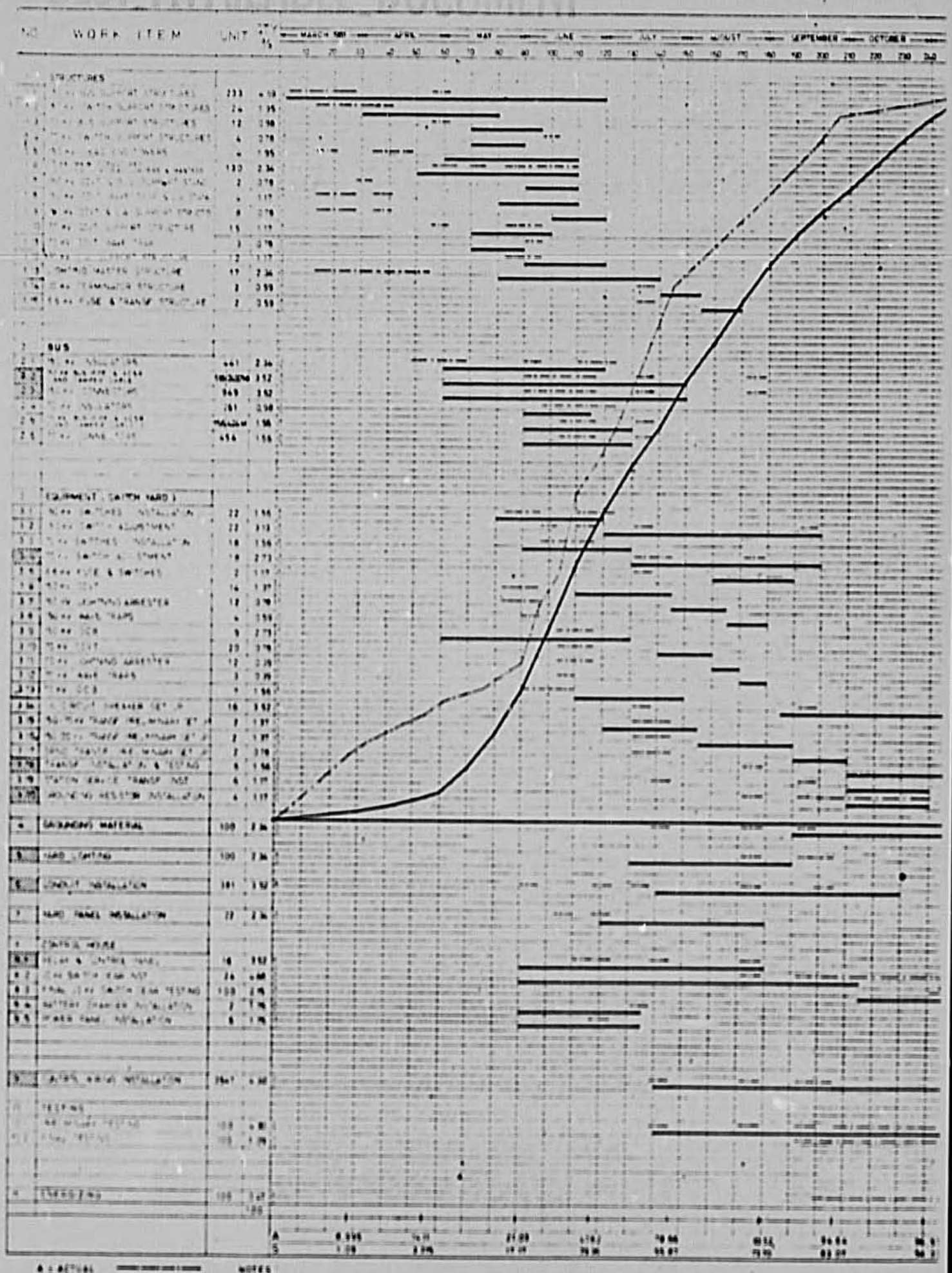


							NO
							1
94	277	100	277	100	4.38	4.38	1.1
	26	100	26	100	2.19	2.19	1.2
	24	100	24	100	1.46	1.46	1.3
	4	100	4	100	0.73	0.73	1.4
68	12	100	12	100	2.19	2.19	1.5
66	130	100	130	100	2.19	2.19	1.6
	2	100	2	100	0.73	0.73	1.7
	6	100	6	100	1.10	1.10	1.8
	12	100	12	100	1.10	1.10	1.9
75	12	100	12	100	1.10	1.10	1.10
76	3	100	3	100	0.73	0.73	1.11
	12	100	12	100	1.10	1.10	1.12
72	18	100	18	100	2.19	2.19	1.13
	2	100	2	100	0.73	0.73	1.14
68	2	100	2	100	0.73	0.73	1.15
							2
62	489	100	489	100	2.56	2.56	2.1
59	[illegible]	[illegible]	[illegible]	100	4.75	4.75	2.2
56	1060	100	1060	100	4.02	4.02	2.3
54	231	100	231	100	0.91	0.91	2.4
52	145	415 100	[illegible]	100	3.29	3.29	2.5
50	379	100	379	100	1.46	1.46	2.6
							3
	26	100	26	100	1.65	1.65	3.1
	26	100	26	100	2.56	2.56	3.2
	16	100	16	100	1.46	1.46	3.3
	16	100	16	100	2.56	2.56	3.4
37	2	100	2	100	1.10	1.10	3.5
	20	100	20	100	1.46	1.46	3.6
	18	100	18	100	0.91	0.91	3.7
	6	100	6	100	0.91	0.91	3.8
	10	100	10	100	2.56	2.56	3.9
27	17	100	17	100	0.73	0.73	3.10
27	17	100	17	100	0.37	0.37	3.11
	3	100	3	100	0.37	0.37	3.12
	6	100	6	100	1.46	1.46	3.13
	16	100	16	100	4.38	4.20	3.14
	1	100	1	100	0.73	0.73	3.15
	2	100	2	100	1.28	1.28	3.16
	1	100	1	100	0.55	0.55	3.17
	3	75	4	100	0.83	1.10	3.18
	4	100	4	100	0.73	0.73	3.19
	2	66	3	100	0.49	1.73	3.20
	100	100	100	100	2.19	2.19	4
	100	100	100	100	2.19	2.19	5
	445	100	445	100	3.29	3.29	6
	29	100	29	100	2.19	2.19	7
							8
	18	100	18	100	3.29	3.29	9
	24	100	24	100	4.94	4.94	10
	100	100	100	100	1.83	1.83	11
	2	100	2	100	1.65	1.65	12
	1	100	1	100	1.65	1.65	13
	3384	100	3384	100	4.22	4.22	
	85	100	100	100	4.22	4.22	
	87	87	100	100	1.99	1.99	
	87	87	100	100	1.99	1.99	

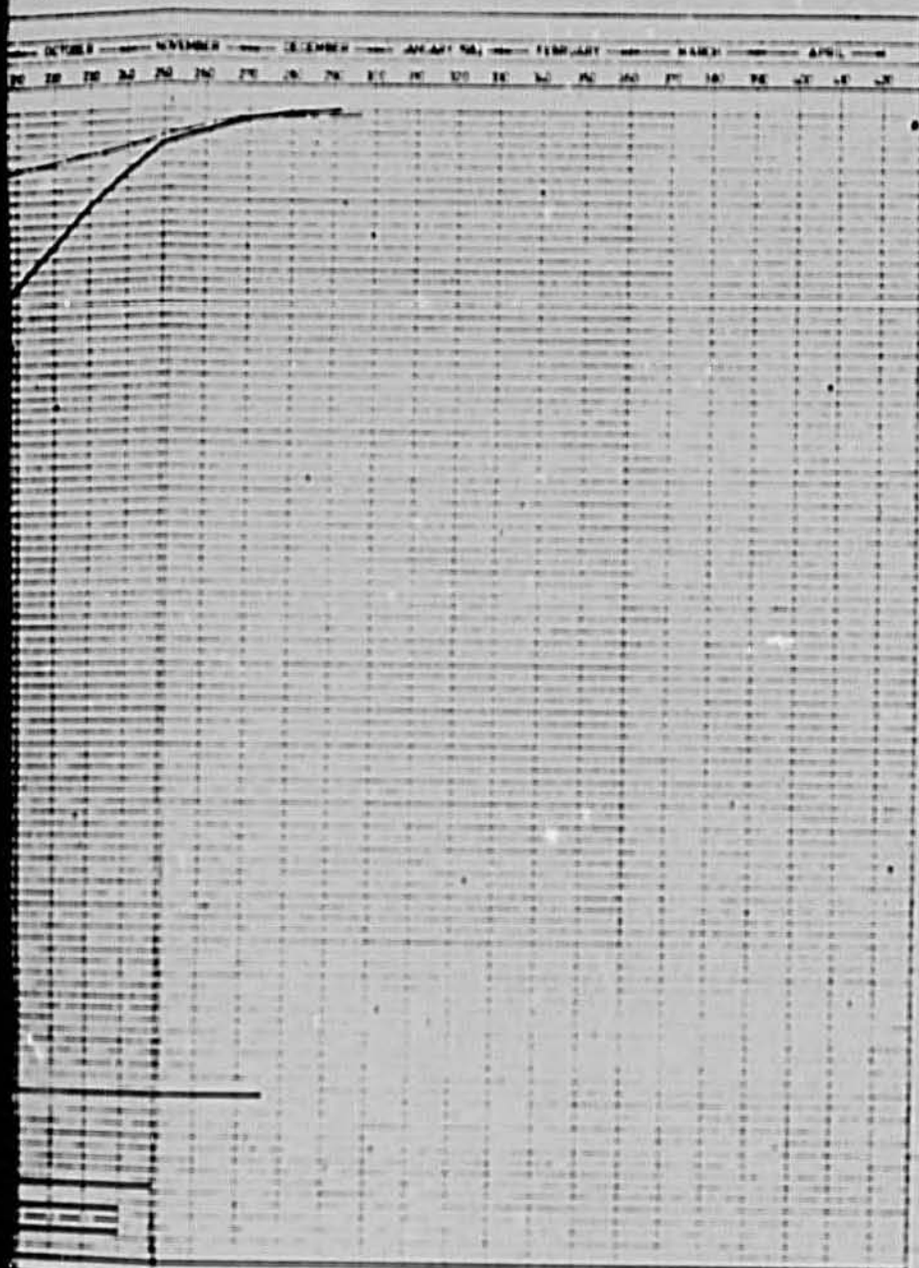
BEST AVAILABLE DOCUMENT

BEST AVAILABLE DOCUMENT

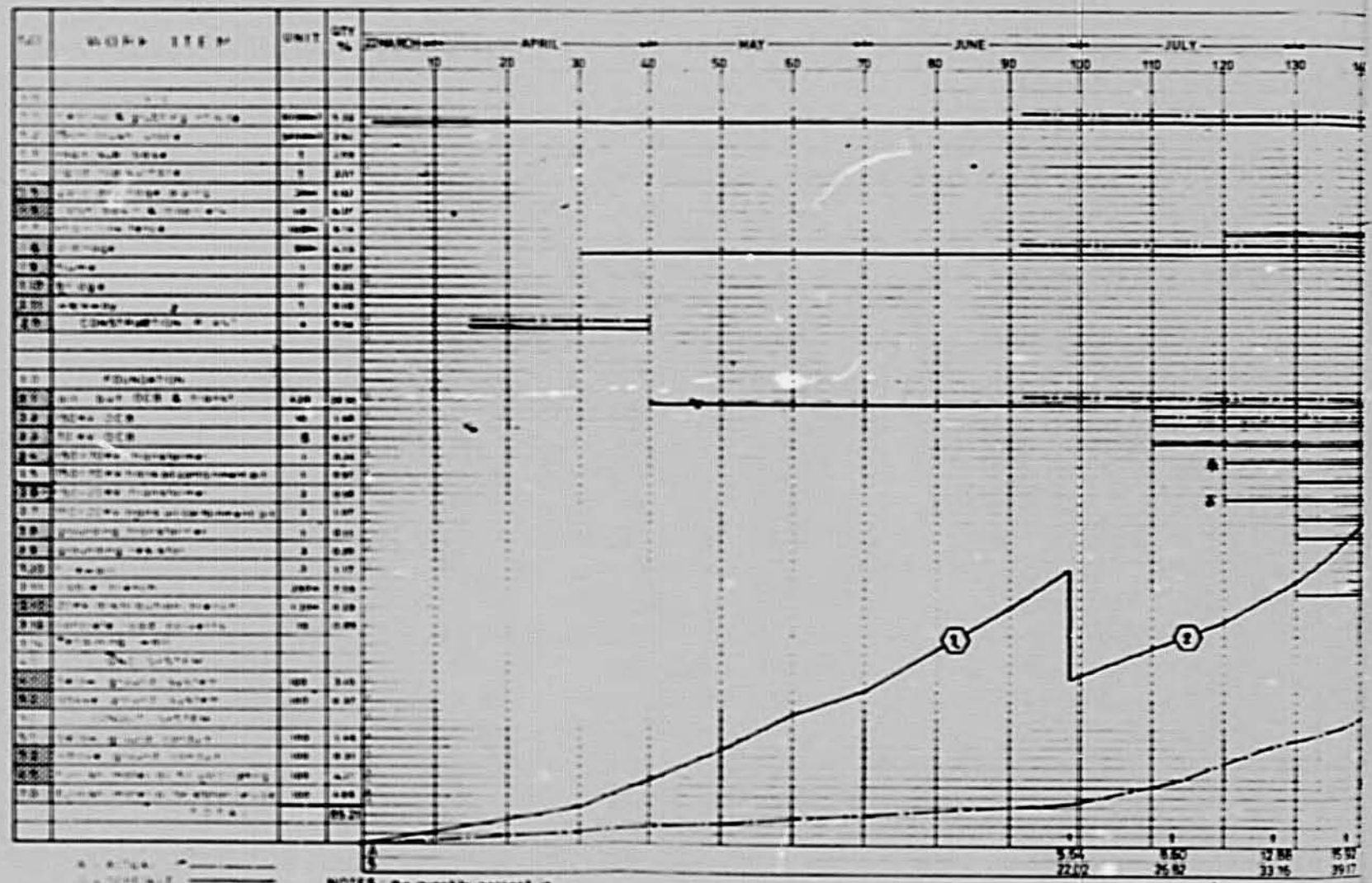
TIME SCHEDULE
BOGOR ERECTION



ULE
CTION

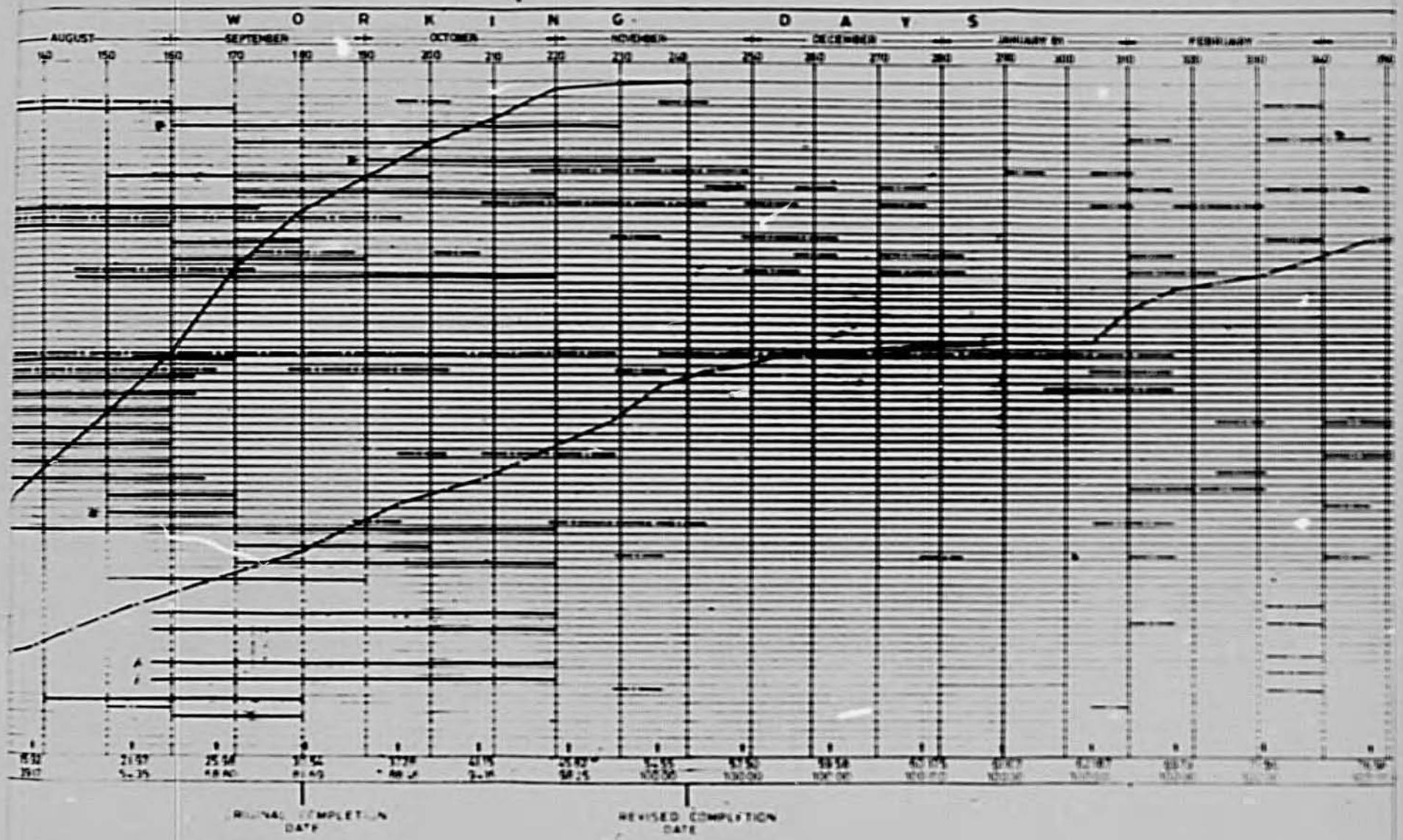


233	100	233	100	4.69	4.69		
24	100	24	100	1.95	1.95		
12	100	12	100	0.98	0.98		
4	100	4	100	0.78	0.78		
4	100	4	100	1.95	1.95		
130	100	130	100	2.34	2.34		
2	100	2	100	0.78	0.78		
4	100	4	100	1.17	1.17		
8	100	8	100	0.78	0.78		
15	100	15	100	1.17	1.17		
3	100	3	100	0.78	0.78		
12	100	12	100	1.17	1.17		
17	100	17	100	2.34	2.34		
2	100	2	100	0.59	0.59		
2	100	2	100	0.59	0.59		
441	100	441	100	2.34	2.34		
[illegible]	100	[illegible]	100	3.52	3.52		
949	100	949	100	3.52	3.52		
251	100	251	100	0.98	0.98		
[illegible]	100	[illegible]	100	1.56	1.56		
454	100	454	100	1.56	1.56		
22	100	22	100	1.56	1.56		
22	100	22	100	3.13	3.13		
18	100	18	100	1.56	1.56		
18	100	18	100	2.73	2.73		
2	100	2	100	1.17	1.17		
14	100	14	100	1.37	1.37		
12	100	12	100	0.78	0.78		
4	100	4	100	0.59	0.59		
9	100	9	100	2.73	2.73		
20	100	20	100	0.78	0.78		
12	100	12	100	0.39	0.39		
3	100	3	100	0.39	0.39		
7	100	7	100	1.56	1.56		
96	100	96	100	3.52	3.52		
2	100	2	100	1.37	1.37		
2	100	2	100	1.37	1.37		
2	100	2	100	0.78	0.78		
6	100	6	100	1.56	1.56		
6	100	6	100	1.17	1.17		
6	100	6	100	1.17	1.17		
100	100	100	100	2.34	2.34		
100	100	100	100	2.34	2.34		
381	100	381	100	3.52	3.52		
22	100	22	100	2.34	2.34		
16	100	16	100	3.52	3.52		
24	100	24	100	4.69	4.69		
100	100	100	100	2.15	2.15		
2	100	2	100	1.76	1.76		
6	100	6	100	1.76	1.76		
[illegible]	100	[illegible]	100	[illegible]	[illegible]		
94	94	100	100	[illegible]	[illegible]		
95	95	100	100	[illegible]	[illegible]		
94	94	100	100	[illegible]	[illegible]		



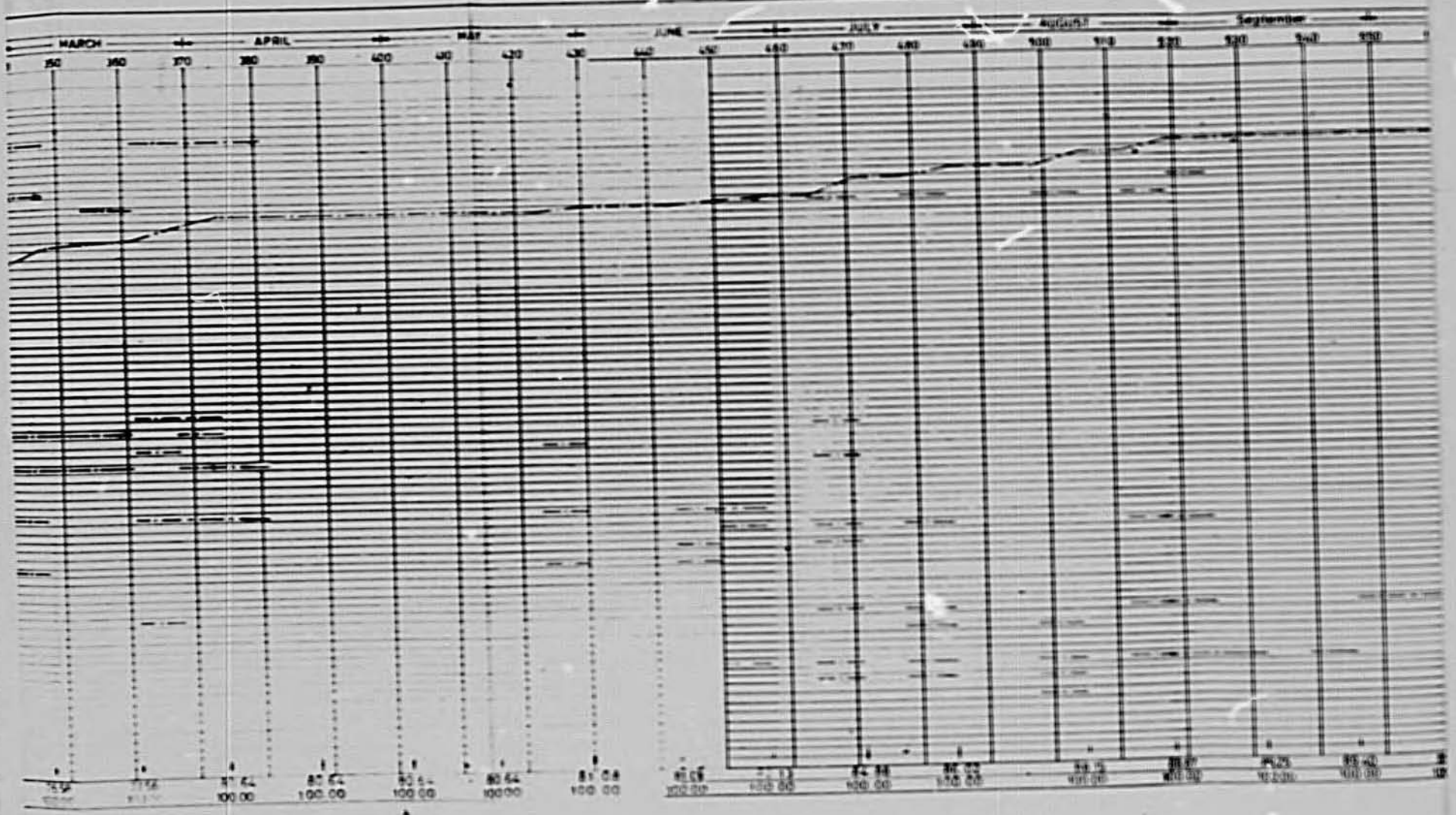
BEST AVAILABLE DOCUMENT

TIME SC
UJUNG BERUNG

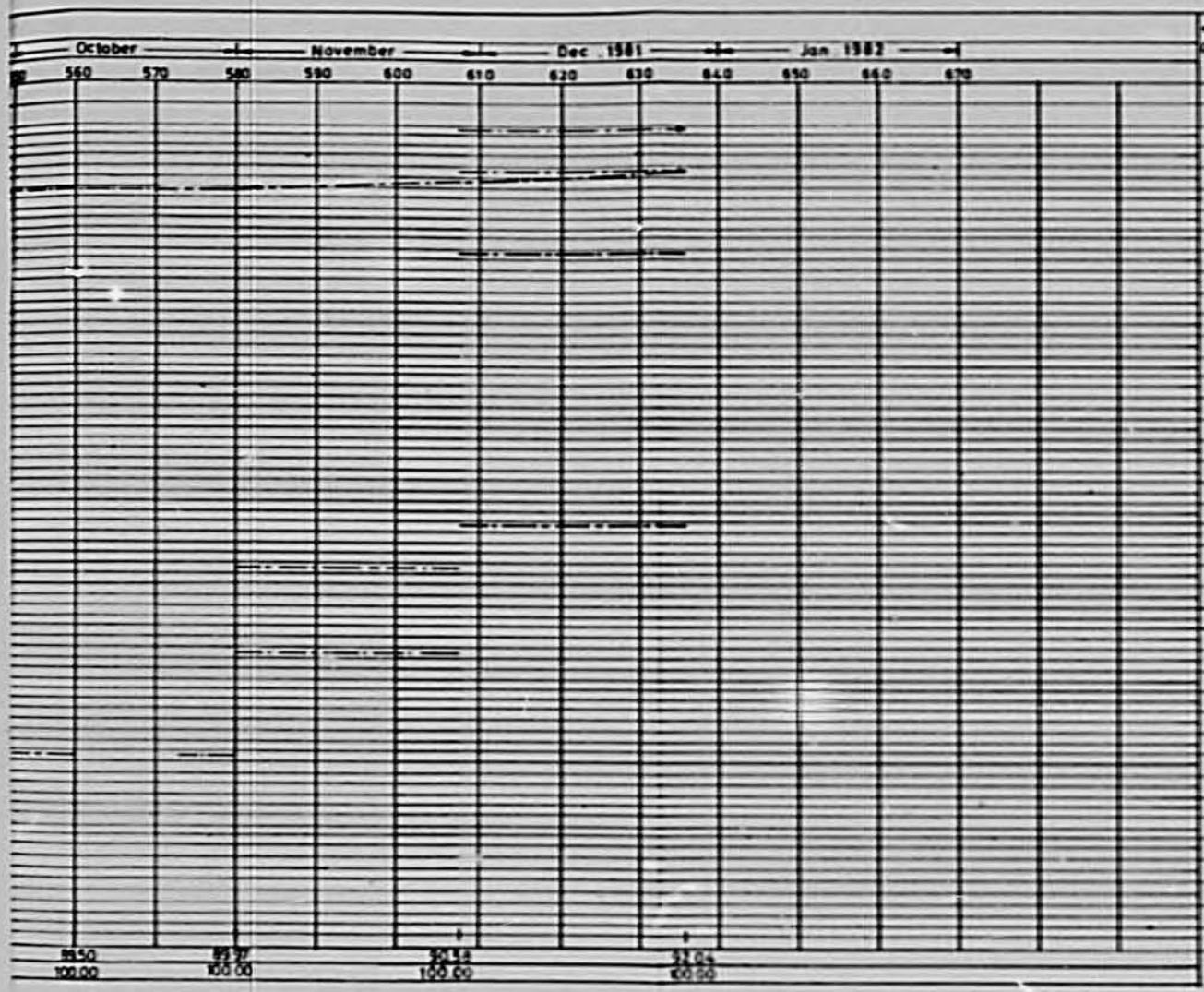


BEST AVAILABLE DOCUMENT

: SCHEDULE
RUNG SWITCH YARD



BEST AVAILABLE DOCUMENT



% OF COMPLETION	CONSTRUCTION PROGRESS				TO DATE : 12-26-1981		NO
	ACTUAL		SCHEDULED		% OF CONTRACT		
	QTY.	%	QTY.	%	ACTUAL	SCHED.	
100							
97.5							1.
95	[illegible]	99	[illegible]	100	5.18	5.23	1.1
92.5	0	0	[illegible]	100	0	2.92	1.2
90	0.80	80	1	100	2.15	2.66	1.3
87.5	0	0	1	100	0	3.27	1.4
85	106 m	100	106 m	100	0.82	0.82	1.5
82.5	10	100	10	100	0.27	0.27	1.6
80	1030 m	100	1030 m	100	6.18	6.18	1.7
77.5	500 m	100	500	100	4.13	4.13	1.8
75	1	100	1	100	0.37	0.37	1.9
72.5	1	100	1	100	0.22	0.22	1.10
70	1	100	1	100	0.10	0.10	1.11
67.5	0	100	0	100	0.50	0.50	2
65							
62.5							
60							3
57.5	420	100	420	100	20.50	20.50	3.1
55	10	100	10	100	1.60	1.60	3.2
52.5	6	100	6	100	0.47	0.47	3.3
50	1	100	1	100	0.34	0.34	3.4
47.5	1	100	1	100	0.67	0.67	3.5
45	2	100	2	100	0.50	0.50	3.6
42.5	2	100	2	100	1.07	1.07	3.7
40	1	100	1	100	0.11	0.11	3.8
37.5	3	100	3	100	0.20	0.20	3.9
35	3	100	3	100	1.17	1.17	3.10
32.5	360 m	100	360 m	100	7.55	7.55	3.11
30	120 m	100	120 m	100	0.29	0.29	3.12
27.5	10	100	10	100	0.05	0.05	3.13
25							3.14
22.5							4.
20	100	100	100	100	3.40	3.40	4.1
17.5	100	100	100	100	0.37	0.37	4.2
15							5.
12.5	100	100	100	100	1.48	1.48	5.1
10	100	100	100	100	0.21	0.21	5.2
7.5	100	100	100	100	4.21	4.21	6.
5	100	100	100	100	4.85	4.85	7
2.5							
0					78.43	85.21	
	USING 100 % AS BASE				92.04	100.00	

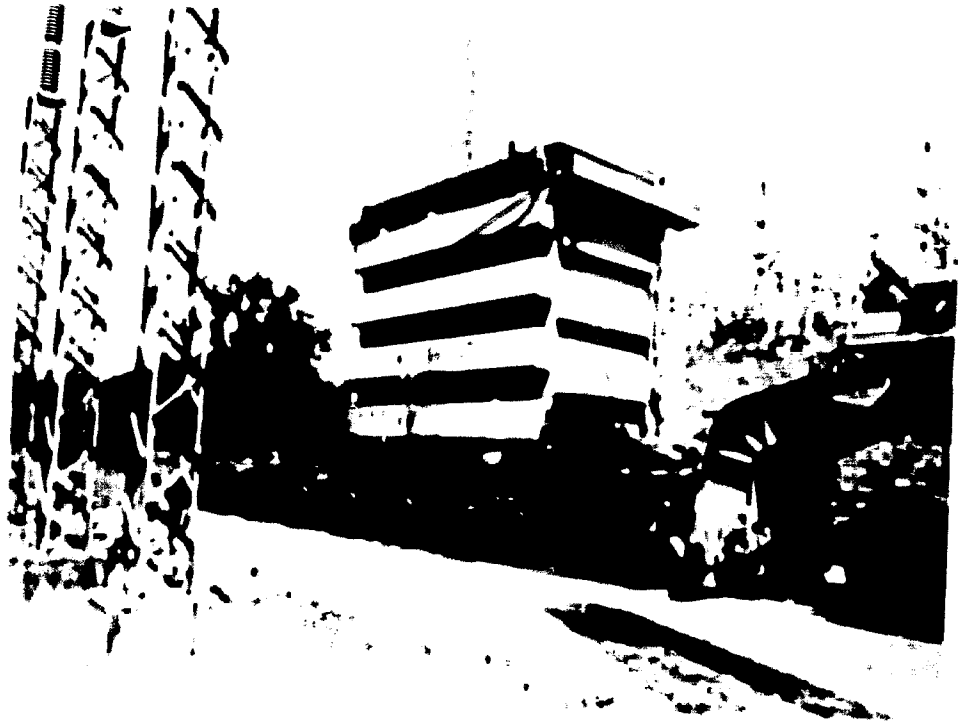
Jakarta April 1982

PT. [illegible]
Contractor

BEST AVAILABLE DOCUMENT

UJUNGBERUNG SUBSTATION

Connections to 20 kV
Cable, Grounding Resistor
and Station Service

Existing Battery in front
of Control Room

Entrance