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PERUSAHAAN UMUM LISTRIK NEGARA
JAKARTA, INDONESIA

WEST JAVA
ELECTRIC TRANSMISSION PROJECT

MONTHLY REPORT

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

12 November 1981

Letter No. B - 5068

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 October 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

OCTOBER 1981

A. PERSONNEL

1. Engineer

a. Mr. J. Klessig, General Electric Field Engineer, departed Indonesia on 17 October. The work at Ujungberung and Bandung Utara Substation will be continued by Mr. A. Tan.

b. Mr. N. Hansen, Irby Construction Company (RTE/ASEA) Field Engineer, arrived in Indonesia on October 4 to test 150/20 KV, 30 MVA transformers at Bandung Utara and Ujungberung Substations. He left Indonesia on October 20 and will return after January 1, 1982 when the 150/70 KV, 60 MVA transformer is on its pad at Ujungberung Substation.

c. 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
A. Tan	General Electric Field Engineer	7 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	9

b. In addition to the above staff, approximately 50 PLN Counterpart and field personnel were assigned to the Projects as of 31 October.

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	$ 17,197,632.86	$ 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 C.T. Main-Engineering Services	16 Feb. '74	US $ Rp.	3,824,009.00 555.096.119,-
(2)	No. Pj. 153/PST/77 Irby Construction Company Tower Steel, Insulators and Accessories	5 Sep. '77	US $	2,902,946.03
(3)	No. Pj. 202/PST/77 Copperweld Industries Shieldwire	28 Nov. '77	US $	294,739.06
(4)	No. Pj. 203/PST/77 Southwire Company Conductor	28 Nov. '77	US $	1,991,843.83
(5)	No. Pj. 050/PST/78 Tension Stringing Equipment Co. Wire Stringing Equipment	10 Mar. '78	US $	400,636.37
(6)	No. Pj. 051/PST/78 Ohio Brass Company Lightning Arresters	10 Mar. '78	US $	87,852.00

(7)	No. Pj. 052/PST/78 Irby Construction Company Substation Equipment Maintenance Tools and Equipment	11 Mar. '78	US $	4,547,414.46
(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 Rp. 25.966.000,-
P.T. Sigma Tirta 17 Oct. '79
Tegal Substation Structure Erection

(16) No. Spj. 017/PLN/PI RING/78-79 Rp. 127.790.850,-
P.T. Silkar National 22 Jan. '80
Conductor Stringing - Section I

(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. 33.234.000,-
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 C.T. Main-Engineering Services	25 Jan. '75	US $ Rp.	2,509,793.00 718.743.035,-
(2)	No. Pj. 152/PST/77 Irby Construction Company Transmission Line Supply and Construction	5 Sep. '77	US $ Rp.	8,199,107.37 645.466.917,-
(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 $	4,981,321.52
(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 Rp. 62.441.000,-
P.T. Citac Ltd. 30 Nov. '79
Foundations - Section IV A

(10) No. Spj. 010/PLN/PI RING/79-80 Rp. 36.029.000,-
P.T. Citac Ltd. 30 Nov. '79
Foundations - Section IV C

(11) No. Spj. 018/PLN/PI RING/79-80 Rp. 64.630.000,-
P.T. Amarta Karya 24 Jan. '80
Foundations - Section IV B

(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

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

2. GENERAL

a. Amendment Number 2 to the PLN/Irby Substation Equipment Contract has been approved by PLN and AID. Formal processing is underway. The Amendment provides for the purchase of additional control cable, watthour meters, tools and spare parts.

b. Amendment Number 5 to PLN/Irby West Java II Transmission Line Contract has been approved by PLN and AID. Formal processing is underway. The Amendment provides for the purchase by PLN of materials presently in the Irby Construction Company Stores and for the transfer to PLN of equipment and vehicles imported duty-free by Irby under OR-23.

C. CONFERENCES AND EVENTS

1. Construction Meetings

a. Ujungberung Substation Civil Work
Contractor - PLN / P.T. Mitra Bangun Utama
13 October 1981

b. Ujungberung Substtaion Control House / Electrical Installation
Contractor - P.T. Citac Ltd.
13 October 1981

c. Bandung Utara Substation Civil Work
Contractor - P.T. Pembangunan Perumahan
14 October 1981
28 October 1981

d. Bandung Utara Substation Control House
Contractor - P.T. Perfect Circle
14 October 1981
28 October 1981

e. Bogor Substation Civil Work and Control House
Contractor - P.T. Perfect Circle
7 October 1981
22 October 1981

2. Energization of Equipment

a. Bogor Substation 20 KV bus.
Energized 15 October 1981 (Temporary).

b. Ujungberung Substation 150 KV bus
Energized 27 October 1981.

D. PROBLEM AREAS AND TENTATIVE SOLUTIONS

1. The Ujungberung Switchyard Civil Works Construction remains several months behind the original schedule. Responsibility for the civil works construction has been taken away from P.T. Erses and the work will be completed by PLN.

Due to monetary problems, PLN has not mobilized fully. A contractor has been retained to install the conduit, grounding and yard lighting. Another contractor has been retained for the electrical installation. PLN is presently arranging provisions for additional funds. Delays in the remaining civil works should not delay energization of the substation.

2. The Bandung Utara Switchyard Contractor is approximately eleven (11) months behind his original schedule. The Contractor must install some cable hangers and complete installation of the switchyard stone cover. No delay in the energization of the substation is expected.

3. Negotiations are continuing for the transport of the 60 MVA transformer. It appears that the 60 MVA transformer should be on site around December 20, 1981. The Ujungberung Substation should be completed by the end of January 1982.

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 first 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 October

Installation of underground grounding system.

Work continued on the chain link fence and cable trench. The work is over twelve (12) months behind the original schedule. PLN has terminated the Contract and undertook to do the work.

(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 was completed during October :

Adjustment of 150 KV switches
Installation of yard panels
Installation of 20 KV switchgear
Installation of battery chargers
Installation of station service transformers

Work continued on the following items :

Installation of 150 KV bus connections
Adjustment of 70 KV switches
Installation of above-ground grounding material
Installation of yard lighting
Testing of 20 KV switchgear
Installation of control wiring

Work began on the following items :

Installation and testing of transformers
Installation of grounding resistors
Preliminary testing
Final testing
Energization of equipment

During October, the Cigereleng and Sunyaragi 150 KV Line Terminals, the 150 KV Bus Tie OCB and one 30 MVA, 150 to 20 KV Transformer were put into service.

c. Bandung Utara Substation

(1) Switchyard

The following work remains to be completed :

Installation of substation rock cover
Installation of conduit to CCVT's
Installation of cable hangers

The Contractor is now approximately eleven (11) months behind his original schedule. It is now estimated that the Switchyard work will be completed by the end of November.

(2) Control House

The only work remaining is the installation of new door handles.

The Contractor is approximately seven (7) months behind the original schedule. It is estimated that the work will be completed by the middle of November.

(3) Access Road

The Road is complete.

(4) Erection, Wiring and Testing

The following work was completed during October :

Installation of 150 KV bus support structures
Installation of 20 KV terminal structures

Installation of 6.6 KV transformer structure
Installation of 150 KV bus insulators, bus pipe and connectors
Installation of 6.6. KV fuses and switches
Installation and testing of transformers
Installation of station service transformers
Installation of power panels

Work continued on the following phases :

Installation of conduits
Installation of 20 KV switchgear

Work began on the following phases :

Adjustment of 150 KV switches
Installation of battery charger
Installation of control wiring

A problem was discovered in the transformers automatic load tap changer operation which will be rectified upon return of the transformer field engineer.

d. Bogor Substation

(1) Switchyard Civil Work

The Switchyard Civil Work was completed during October.

The Contractor completed his work approximately eight (8) months behind schedule.

(2) Control House

The Control House was completed during October.

The Contractor completed his work approximately five (5) months behind schedule.

(3) Access Road

The kampung road between the substation entrance road and the main road is still undergoing improvement. This work is expected to be completed by the end of November.

(4) Erection, Wiring and Testing

During October PLN energized the remaining 150 to 70 KV and 150 to 20 KV transformers. The 20 KV bus was also energized temporarily.

Work was completed on the installation of the 20 KV switchgear and testing of the 20 KV Vacuum-Break switches. Work continued on the installation of the 20 KV Power Cable. 20 KV outgoing feeders have not yet been installed.

A problem with the control wiring has been discovered. This problem should be rectified during November and should not cause delay in energizing the outgoing feeders.

2. Material Supply

All material is presently in Indonesia except for replacement and spare parts. The 60 MVA power transformer is scheduled to be moved to Bandung during December.

H. MOBILE RADIO

1. The fixed station at Bandung Utara was installed during October. This completes installation of all fixed radio stations purchased for the Project.

I. SCHEDULES

1. Current Shipping Schedules

This schedule is on pages 17 and 18 . Based on the present supply Contracts only four (4) shipmenst 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 19 and 20 give the scheduled and actual completion of the various phases of the Projects. Engineering as well as physical completion are included in the percentages 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.

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. Battery Electrolyte	21 August 1981	21 Nov. 1981	Spare
2. Distance Relays (13) Watthour Meters (24), and Station Service Transformer (1)	27 August 1981	27 Nov. 1981	Spare Parts to be purchased under Amendment No. 2
3. Relay Panel Mounting Brackets and Hardware and Replacement Parts for Transformers.	20 October 1981	20 Dec. 1981	
4. Spare Parts for Transformers, switchyard and relaying	15 December 1981	15 Feb. 1982	Spare Parts to be purchased under Amendment No. 2

West Java I Project
Project Completion
(Includes Engineering and Design)
as of 31 October 1981

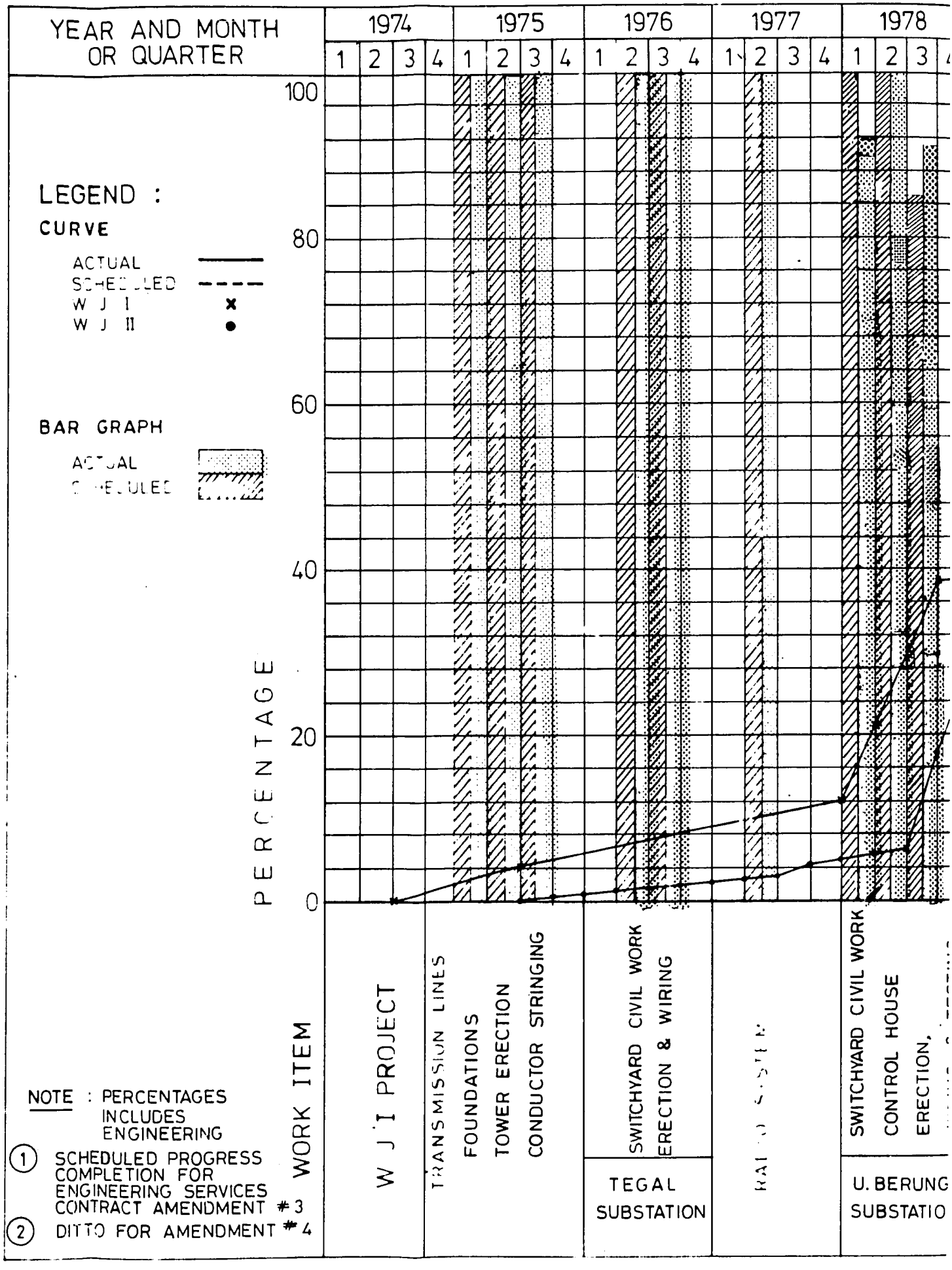
Work Item	Weighted Percent of Project	Percent of Item Completed to Date		Percent of Project Complete to Date	
		Scheduled	Actual	Scheduled	Actual
Transmission Line					
Foundations	28.9	100.0	100.0	28.9	28.9
Tower Erection	13.5	100.0	100.0	13.5	13.5
Conductor Stringing	11.7	100.0	100.0	11.7	11.7
Tegal 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	92.2	15.2	14.0
Control House	11.5	100.0	100.0	11.5	11.5
Equipment Erection, Wiring and Testing	10.3	84.5	91.5	8.7	9.4
Radio System	5.7	100.0	100.0	5.7	5.7
Total	100.0			98.4	97.9

West Java II Project
Project Completion
(Includes Engineering and Design)
as of 31 October 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	99.4	7.3	7.3
Control House	6.1	100.0	99.9	6.1	6.1
Equipment Erection, Wiring and Testing	4.9	81.6	73.7	4.0	3.6
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	84.3	96.7	5.9	6.8
Radio System	6.0	100.0	100.0	6.0	6.0
Total	100.0			98.0	98.5

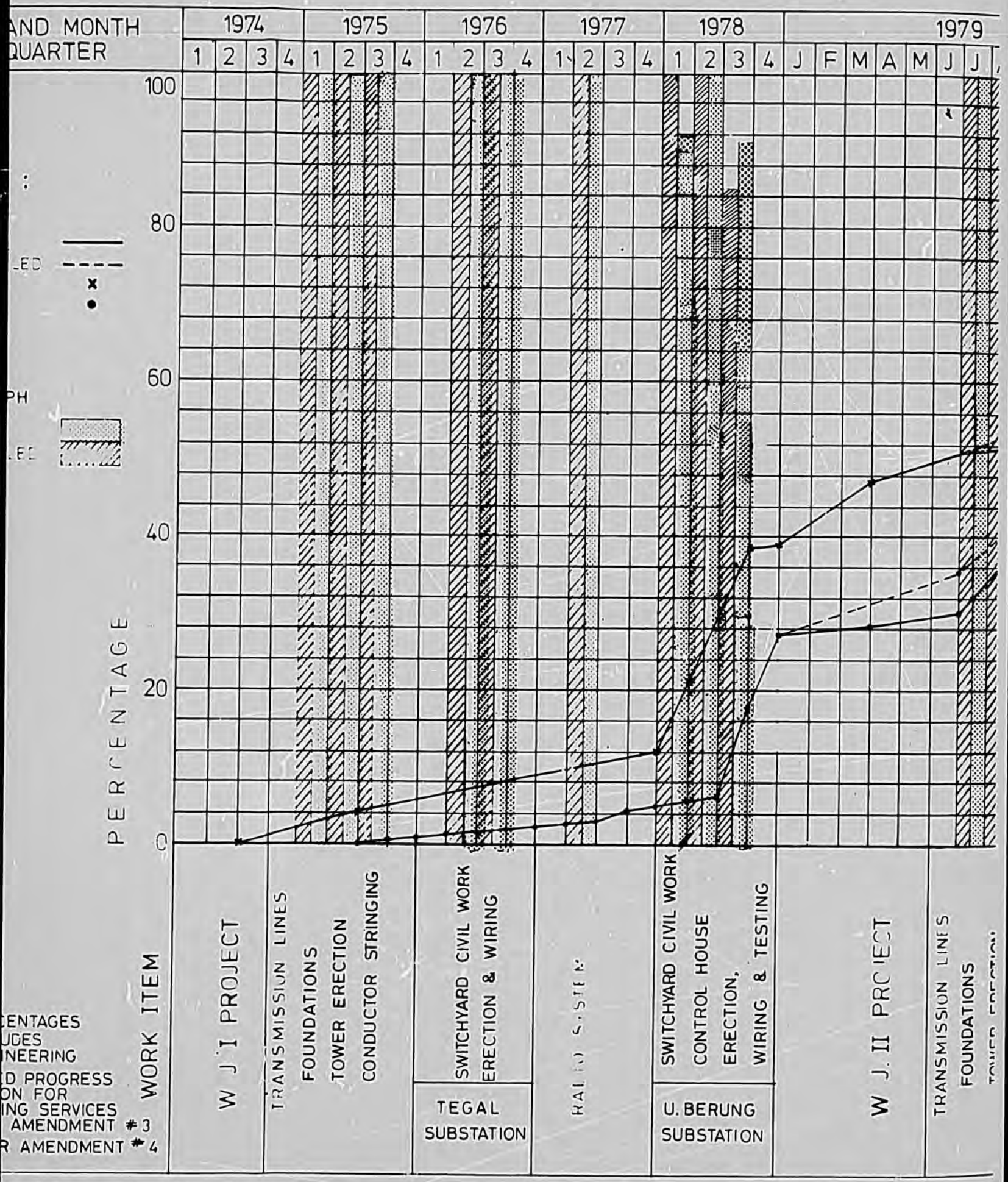
(1)

WEST JAVA I AND I
PROJECT COMPLETION



(2)

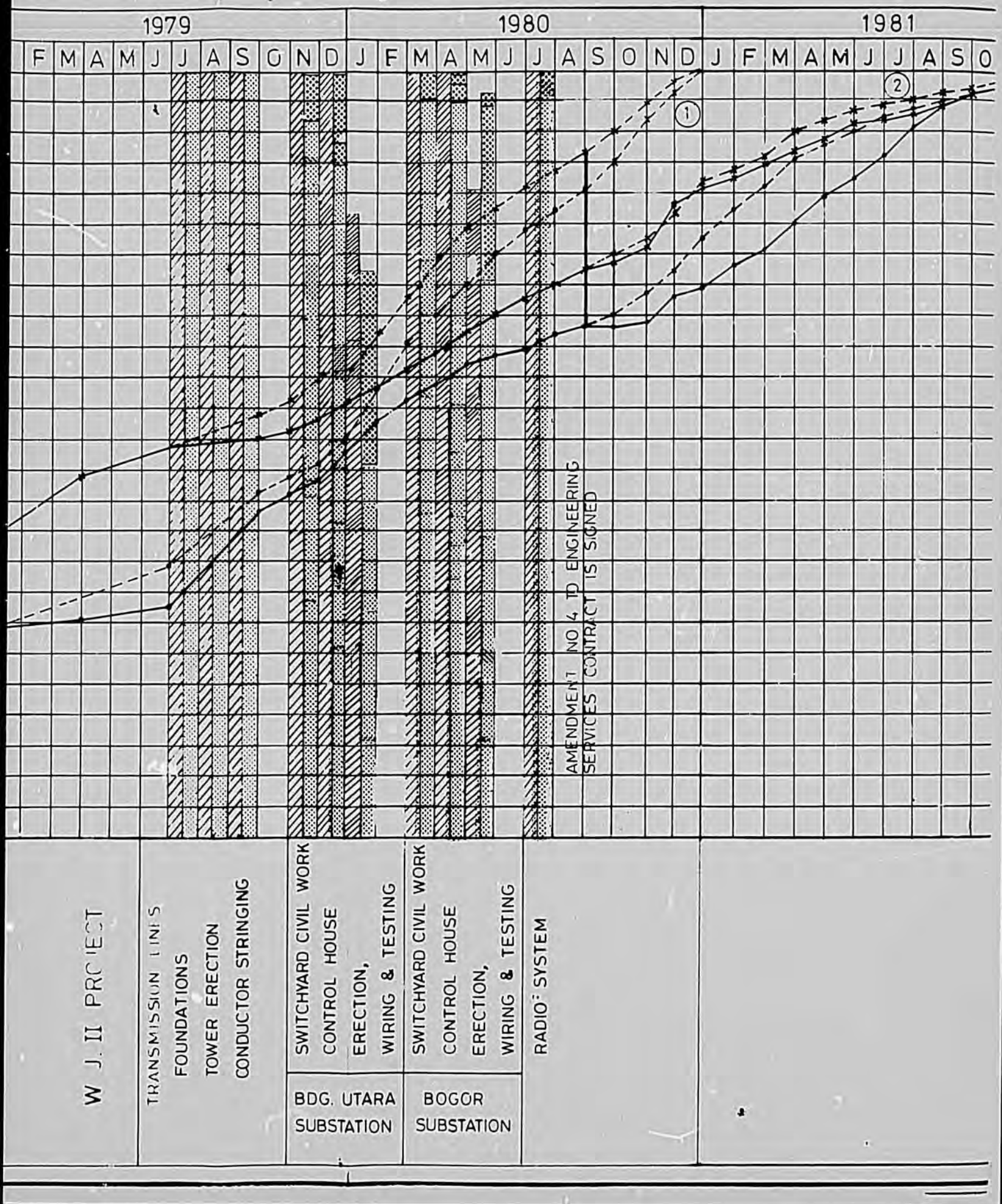
WEST JAVA I AND II PROJECTS
PROJECT COMPLETION AS OF OCTOB



PROJECTS

AS OF OCTOBER 31 .1981

(3)



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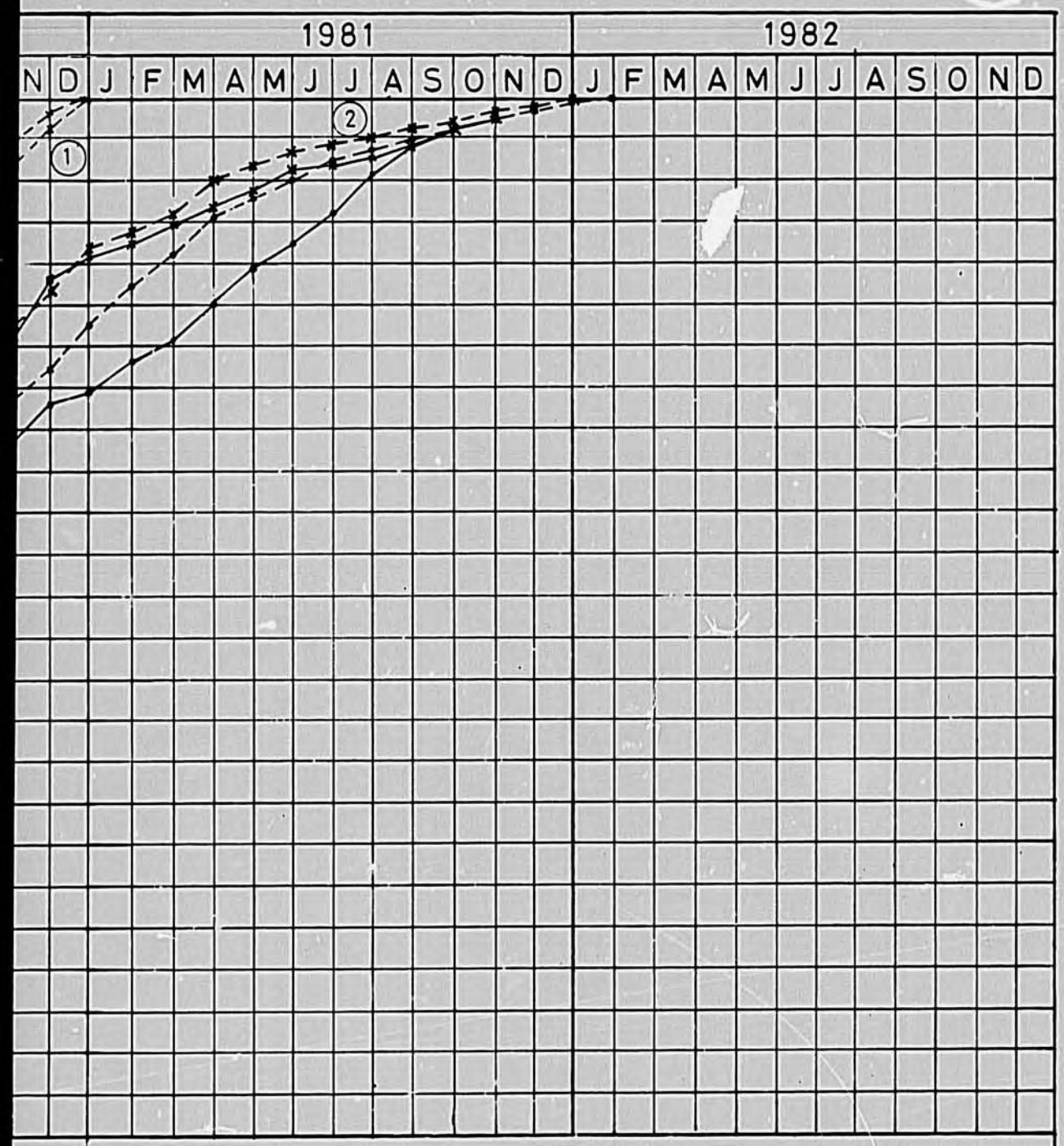
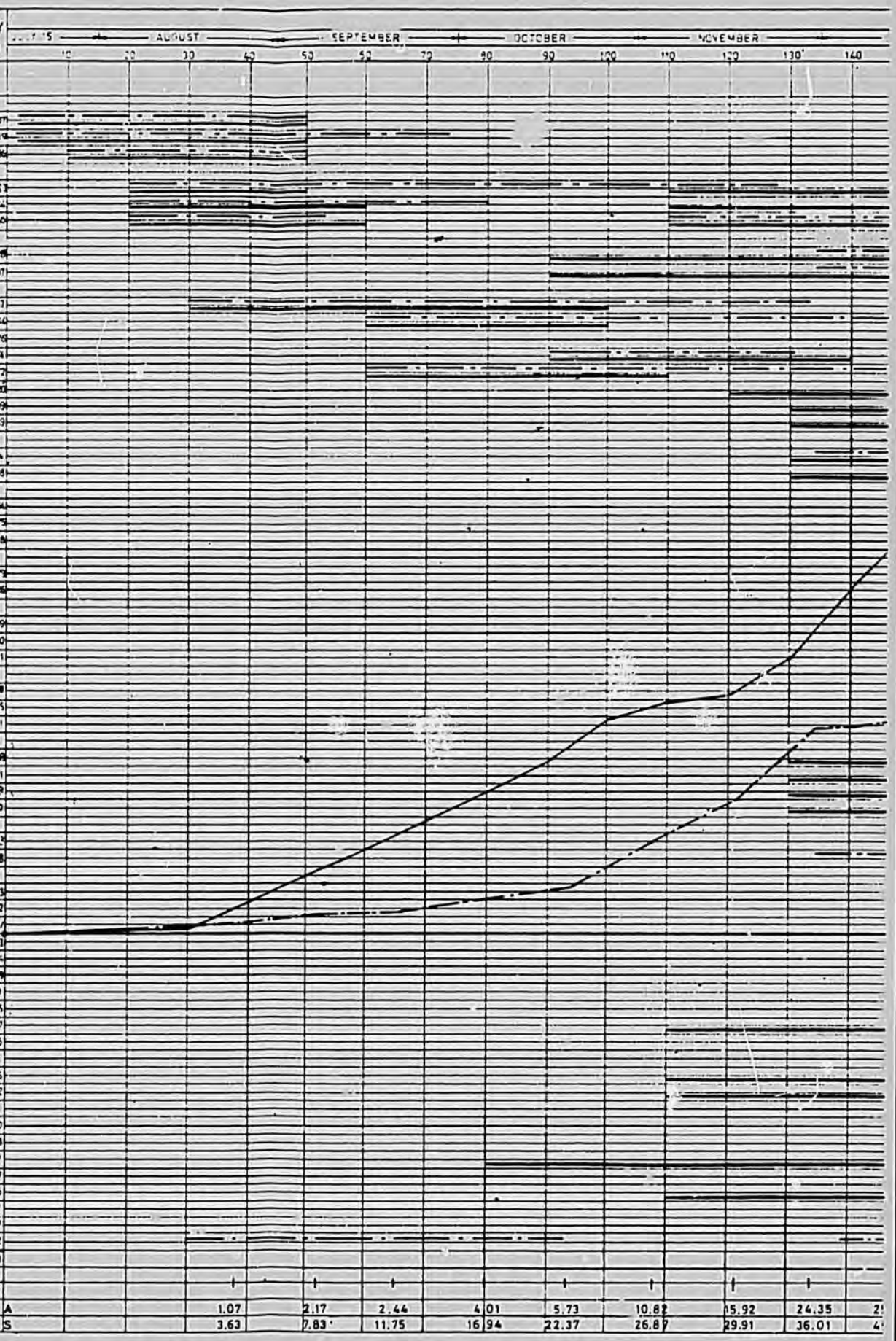


Control House (1)

NO	WORK ITEM	UNIT	QTY %
	PRELIMINARY WORK		
[illegible]	Clearing & grubbing of site	1525 M²	.07
[illegible]	Contractors office & fence	1	.19
[illegible]	Water supply and permits	1	.36
2	EARTH WORK		
[illegible]	Excavation	931 M³	.23
[illegible]	Site fill	537 M³	.04
[illegible]	Sand & soil compaction	293 M³	.36
3	MASONRY		
[illegible]	Stone	3775 M³	.28
[illegible]	Brick work	707 M³	1.87
4	CONCRETE WORK		
[illegible]	Square foundation	28	12.47
[illegible]	Foundation	4160 M³	1.40
[illegible]	Floor	1641 M³	7.16
[illegible]	Column	1067 M³	4.74
[illegible]	Tie beams	32.27 M³	1.72
[illegible]	Cable trench	232 M	3.30
[illegible]	Stairs	12.22 M	.69
[illegible]	Roof	3105 M	11.49
5	PLASTER WORK		
[illegible]	Rough	590 M²	.14
[illegible]	Final work	3380 M²	1.18
6	WOOD		
[illegible]	Kitchen cupboards	5 M²	.34
[illegible]	Ceiling hangers	305 M²	.75
[illegible]	Doors	34.64 M²	.18
7	DOOR WINDOWS		
[illegible]	Doors	23	1.29
[illegible]	Windows	37	5.26
8	CEILING WORK		
[illegible]	Gypsum ceiling	518 M²	.39
[illegible]	Acoustic ceiling	252 M²	.60
[illegible]	Asbestos cement	25 M²	.21
9	STEEL WORK		
[illegible]	Cable trench covers	144.08 M²	1.78
[illegible]	Switchgear channel support	148 M	.15
[illegible]	Cable rack / handrail	[illegible] M	1.11
10	FLOOR WORK		
[illegible]	Terrazzo tile	624 M²	1.08
[illegible]	Terrazzo plinth	219 M	.11
[illegible]	Jutecoin / ceramic tile	50 M	.18
[illegible]	Mozaik tile	18 M²	.10
	11		
[illegible]	PAINT	5722 M²	3.53
[illegible]	SANITARY	16	.38
13	ELECTRICAL	-	
13.1	Sockets	7	5.53
13.2	Fixtures	157	2.72
[illegible]	Outlets	72	.27
[illegible]	Switches	47	.03
[illegible]	Circuit (oc & ec room)	1	.44
[illegible]	Fans	9	.69
13.7	Transformer	1	.01
13.8	Lightning arrester	1	.55
[illegible]	Earthout	1	.27
[illegible]	Conductor	3	.75
14	FIRE PROTECTION		
[illegible]	CO2 cylinder	18	.46
[illegible]	Fire alarm system	40	2.72
15	DRAINAGE & WATER SYSTEM		
[illegible]	Rain water drainage	178.8 M	.20
[illegible]	Contact pipe	142.11	.38
[illegible]	Deep well	1	4.17
[illegible]	Pipe	39 M	.77
[illegible]	Pumps	3	3.65
[illegible]	Fire hose	1	.17
16	AIR CONDITION	24	1.57
[illegible]	OTHER WORK	3	.52
			100.0



A				1.07		2.17	2.44	4.01	5.73	10.82	15.92	24.35	2[illegible]
S				3.63		7.83	11.75	16.94	22.37	26.87	29.91	36.01	4[illegible]

A = ACTUAL
S = SCHEDULE

NOTES :

[illegible] PERCENTS BASED ON PERCENTAGE COST OF EACH ELEMENT VERSUS TOTAL COST

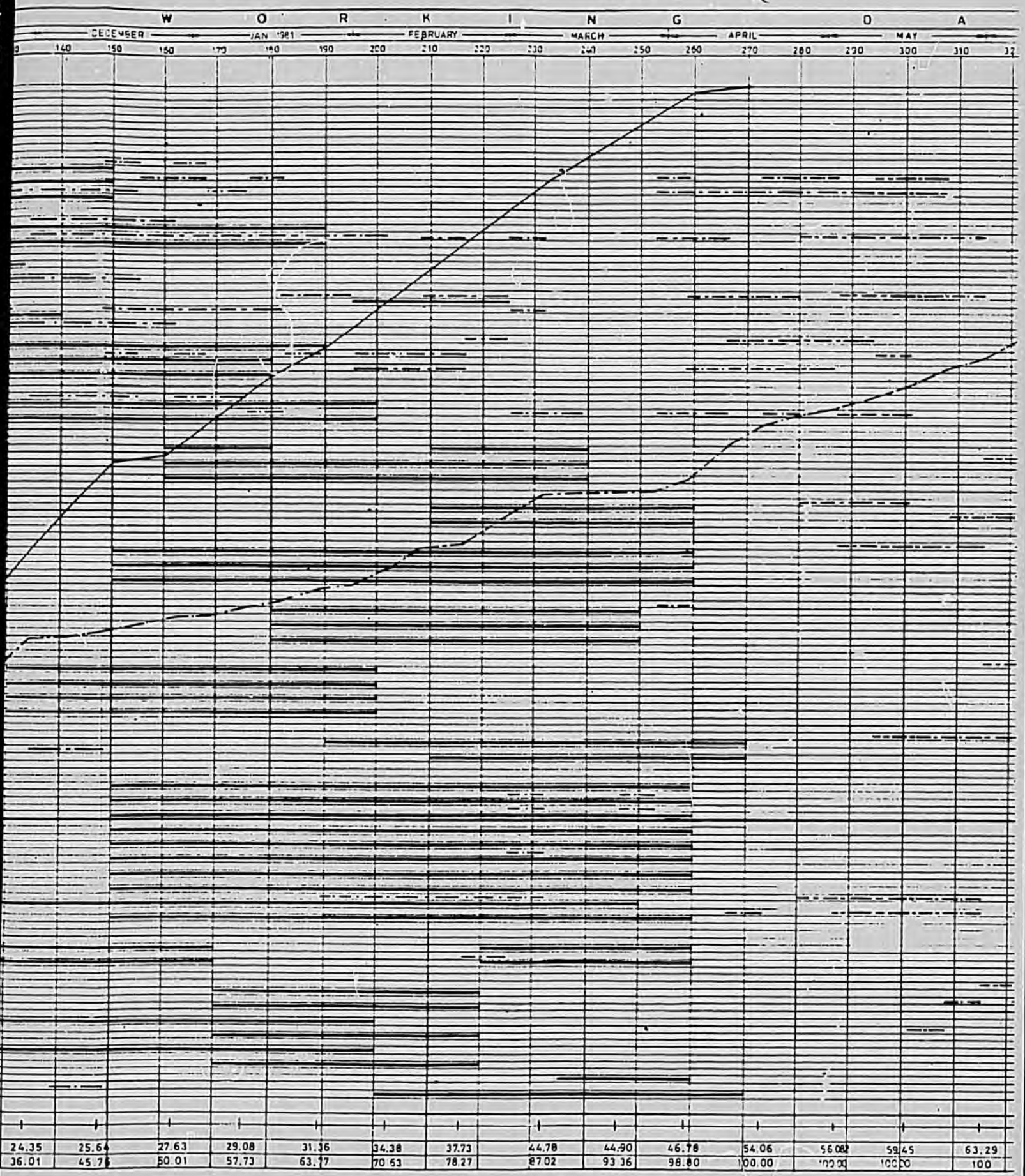
[illegible] WORK NOT STARTED

WORK NOT [illegible] AS OF DATE INDICATED

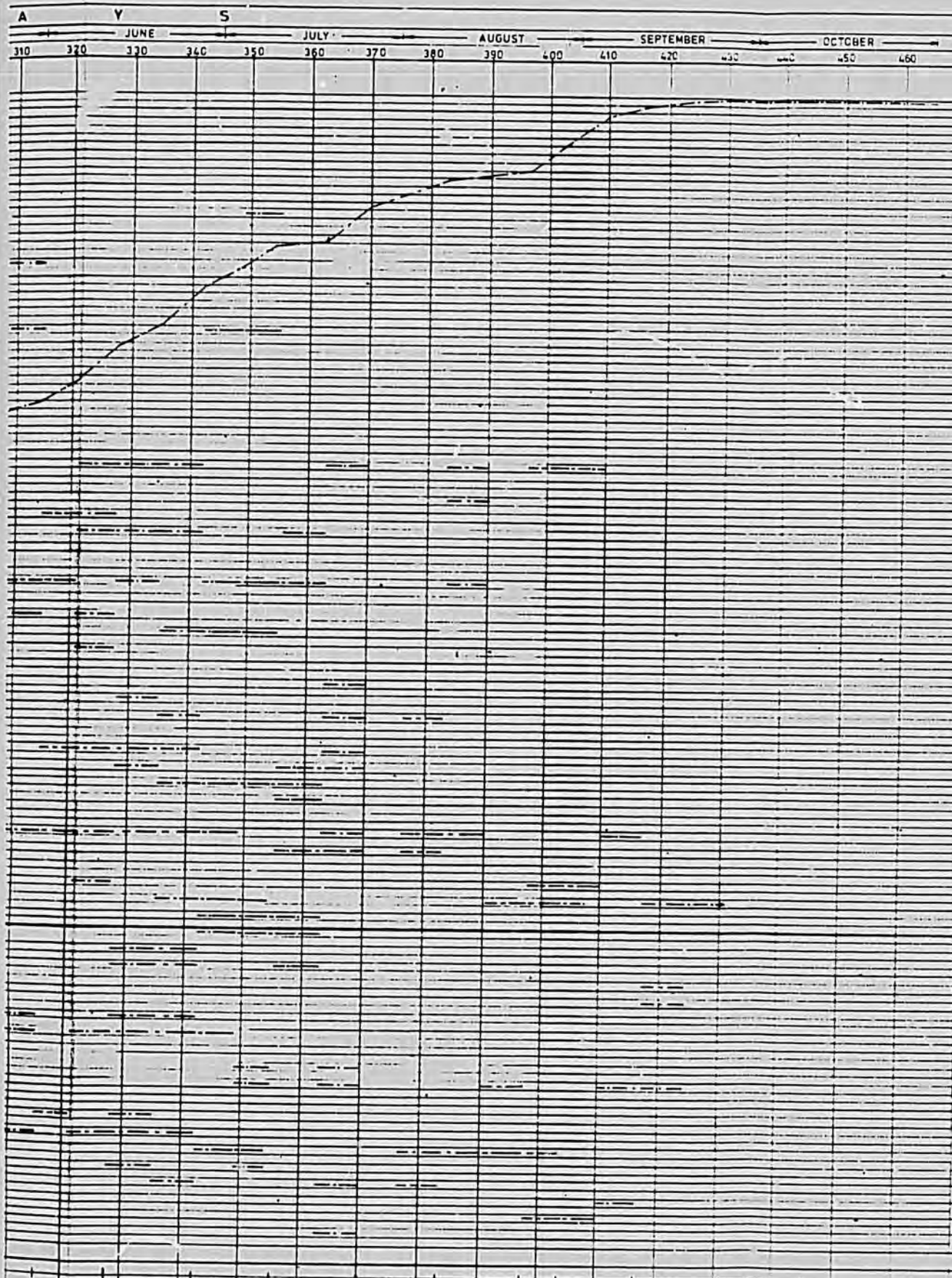
[illegible] PROGRESS

ITEMS 100% COMPLETED (TYP.)

TIME SCHEDULE
BANDUNG UTARA CONTROL HOUSE (2)



C. House (3)



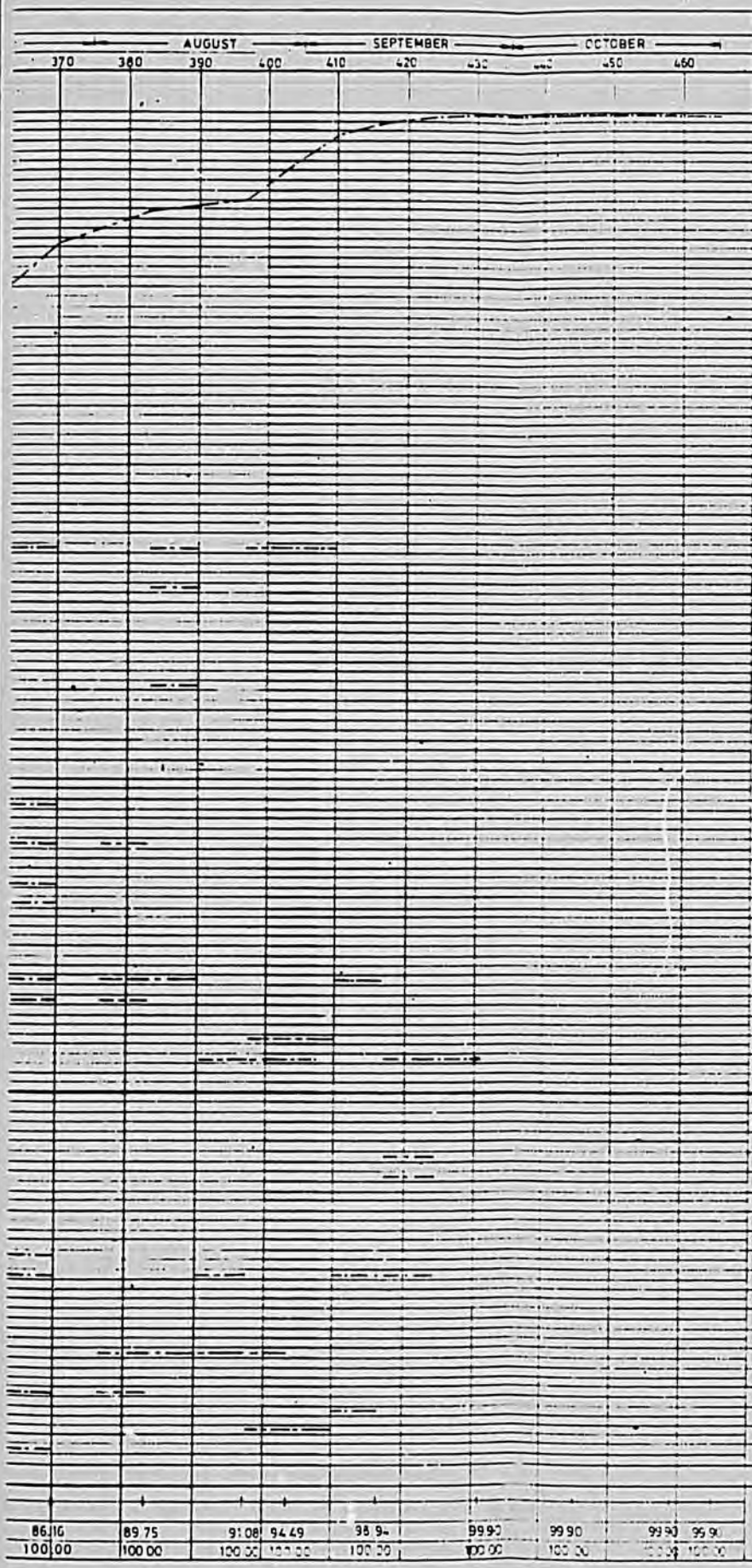
% OF COMPLETION	CONSTRUCTION PROGRESS UNIT ACTUAL QTY	%	SCHEDULE QTY	
100				
98				
96	1525 M2	100	1525 M2	
94	1	100	1	
92	1	100	1	
90				
88	931 M3	100	931 M3	
86	532 M3	100	532 M3	
84	293 M3	100	293 M3	
82				
80	37.75 M3	100	37.75 M3	
78	207 M3	100	207 M3	
76				
74	28	100	28	
72	43.60 M3	100	43.60 M3	
70	168.11 M3	100	168.11 M3	
68	70.63 M3	100	70.63 M3	
66	32.27 M3	100	32.27 M3	
64	232.8 M	100	232.8 M	
62	12.22 M	100	12.22 M	
60	310.51 M	100	310.51 M	
58				
56	590 M2	100	590 M2	
54	3380 M2	100	3380 M2	
52				
50	5 M2	100	5 M2	
48	905 M2	100	905 M2	
46	34.64 M2	100	34.64 M2	
44				
42	23	100	23	
40	37	100	37	
38				
36	618 M2	100	618 M2	
34	262 M2	100	262 M2	
32	25 M2	100	25 M2	
30				
28	144.08 M2	100	144.08 M2	
26	148 M	100	148 M	
24	352.25.75 M	100	352.25.75 M	
22				
20	524 M2	100	524 M2	
18	219 M	100	219 M	
16	50 M2	100	50 M2	
14	18 M2	100	18 M2	
12				
10	5722 M2	100	5722 M2	
8	16	100	16	
6				
4	7	100	7	
2	151	95	157	
0	72	100	72	
	47	100	47	
	1	100	1	
	9	100	9	
	1	100	1	
	1	100	1	
	1	100	1	
	3	100	3	
	18	100	18	
	40	100	40	
	136.8	100	136.8	
	142 M	100	142 M	
	1	100	1	
	39 M	100	39 M	
	3	100	3	
	1	100	1	
	24	100	24	
	3	100	3	

63.29	69.50	76.81	81.645	86.16	89.75	91.08	94.49	98.94	99.90	99.90	99.90 99.9
100	100	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00 100.00

Jakarta

P.T. PERFECT

C. House (4)



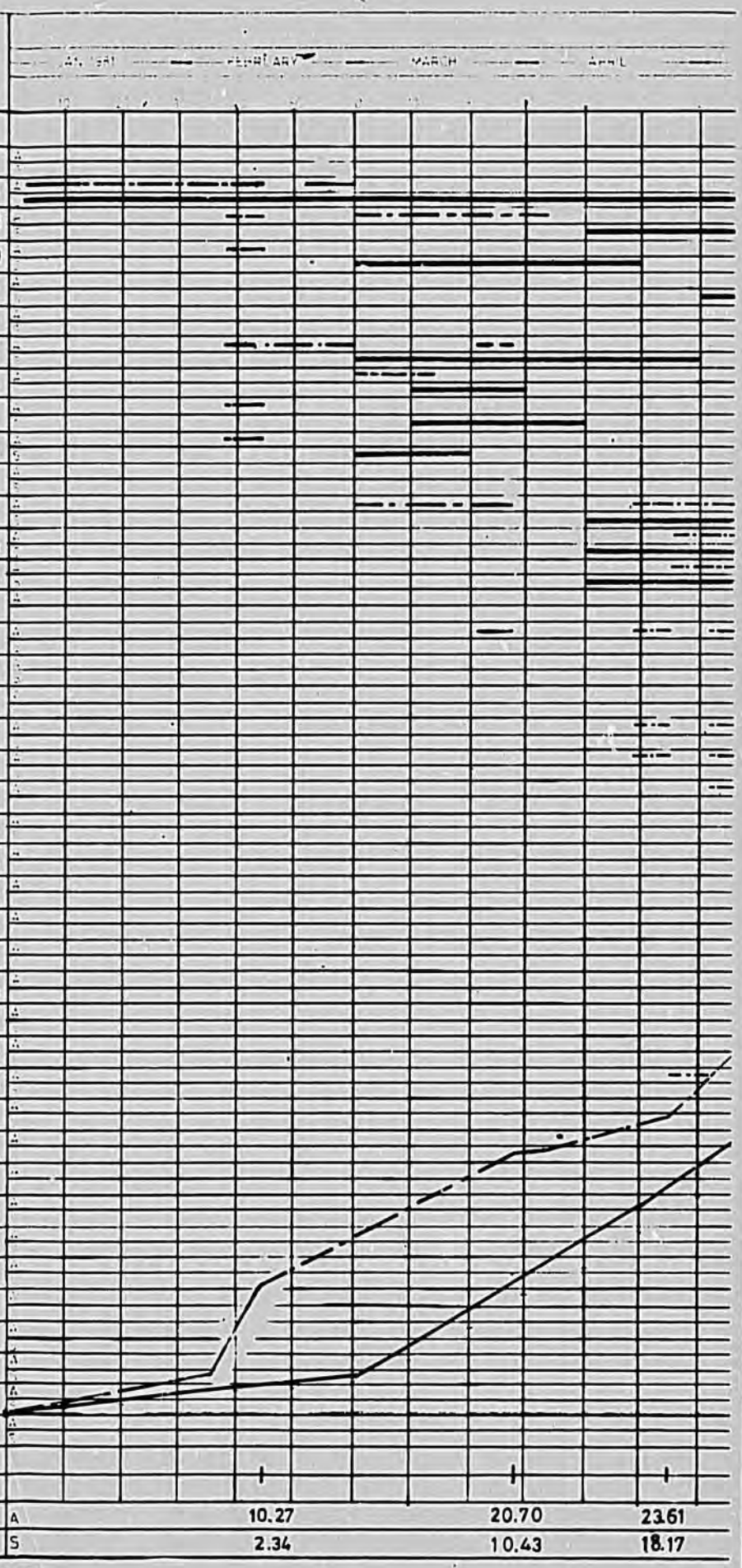
% OF COMPLETION	CONSTRUCTION PROGRESS TO DATE . 10-31-1981 UNIT ACTUAL QTY	ACTUAL %	SCHEDULED QTY	SCHEDULED %	% OF CONTRACT ACTUAL %	% OF CONTRACT SCHED %	NO
100							
98							1.
96	1525 M2	100	1525 M2	100	0.07	0.07	1.1
94	1	100	1	100	0.39	0.39	1.2
92	1	100	1	100	0.86	0.86	1.3
90							2.
88	931 M3	100	931 M3	100	0.23	0.23	2.1
86	532 M3	100	532 M3	100	0.04	0.04	2.2
84	293 M3	100	293 M3	100	0.36	0.36	2.3
82							3.
80	37.75 M3	100	37.75 M3	100	0.28	0.28	3.1
78	207 M3	100	207 M3	100	1.87	1.87	3.2
76							4
74	28	100	28	100	19.47	19.47	4.1
72	43.60 M3	100	43.60 M3	100	1.44	1.44	4.2
70	168.11 M3	100	168.11 M3	100	7.76	7.76	4.3
68	70.63 M3	100	70.63 M3	100	4.74	4.74	4.4
66	32.27 M3	100	32.27 M3	100	1.72	1.72	4.5
64	232.8 M	100	232.8 M	100	3.20	3.20	4.6
62	12.22 M	100	12.22 M	100	0.59	0.59	4.7
60	310.51 M	100	310.51 M	100	11.49	11.49	4.8
58							5.
56	590 M2	100	590 M2	100	0.14	0.14	5.1
54	3380 M2	100	3380 M2	100	1.18	1.18	5.2
52							6.
50	5 M2	100	5 M2	100	0.04	0.04	6.1
48	905 M2	100	905 M2	100	0.75	0.75	6.2
46	34.64 M2	100	34.64 M2	100	0.18	0.18	6.3
44							7.
42	23	100	23	100	1.29	1.29	7.1
40	37	100	37	100	5.26	5.26	7.2
38							8
36	618 M2	100	618 M2	100	0.39	0.39	8.1
34	262 M2	100	262 M2	100	0.60	0.60	8.2
32	25 M2	100	25 M2	100	0.01	0.01	8.3
30							9.
28	144.08 M2	100	144.08 M2	100	1.78	1.78	9.1
26	148 M	100	148 M	100	0.35	0.35	9.2
24	352 25.75 M	100	352 25.75 M	100	1.11	1.11	9.3
22							10
20	524 M2	100	524 M2	100	1.08	1.08	10.1
18	219 M	100	219 M	100	0.11	0.11	10.2
16	50 M2	100	50 M2	100	0.18	0.18	10.3
14	18 M2	100	18 M2	100	0.10	0.10	10.4
12							
10	5722 M2	100	5722 M2	100	3.53	3.53	11
8	16	100	16	100	0.38	0.38	12
6							13
4	7	100	7	100	5.63	5.63	13.1
2	151	95	157	100	2.62	2.72	13.2
0	72	100	72	100	0.27	0.27	13.3
	47	100	47	100	0.03	0.03	13.4
	1	100	1	100	0.44	0.44	13.5
	9	100	9	100	0.69	0.69	13.6
	1	100	1	100	0.01	0.01	13.7
	1	100	1	100	0.55	0.55	13.8
	1	100	1	100	0.27	0.27	13.9
	3	100	3	100	0.75	0.75	13.10
							14
	18	100	18	100	0.46	0.46	14.1
	40	100	40	100	2.72	2.72	14.2
							15
	136.8	100	136.8	100	0.20	0.20	15.1
	142 M	100	142 M	100	0.38	0.38	15.2
	1	100	1	100	4.17	4.14	15.3
	39 M	100	39 M	100	0.77	0.77	15.4
	3	100	3	100	3.66	3.66	15.5
	1	100	1	100	0.12	0.12	15.6
	24	100	24	100	1.57	1.57	16.
	3	100	3	100	1.52	1.52	17.
					99.90	100.00	

Jakarta , April 1980

P.T PERFECT CIRCLE ENGINEERING

(1)

NO	WORK ITEM	UNIT.	QTY %
1	STRUCTURES		
1.1	150 KV BUS SUPPORT STRUCTURES	130	6.78
1.2	150 KV SWITCH SUPPORT STRUCTURES	24	2.60
1.3	150 KV DEAD END TOWERS	4	2.60
1.4	20 KV TERMINATOR STRUCTURE	2	0.78
1.5	6.6 KV 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 TRAP & L.A STAND/LINE)	4	1.56
1.9	CCVT, L.A. SUPPORT STRUCTURE	8	1.04
2	BUS		
2.1	INSULATORS	405	4.17
2.2	BUS PIPE & ACSR. (AND DAMPER CABLE)	480 / 2486 M	6.28
2.3	CONNECTORS	774	4.69
3	EQUIPMENT (SWITCH YARD)		
3.1	150 KV SWITCHES (INSTALLATION)	18	2.08
3.2	150 KV SWITCH ADJUSTMENT	18	4.17
3.3	6.6 KV FUSE & SWITCHES	2	1.56
3.4	CCVTS	14	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	8	1.56
4.0	GROUNDING MATERIAL	100	2.34
5.0	YARD LIGHTING	100	3.13
6.0	CONDUIT INSTALLATION	217	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	20 KV SWITCHGEAR INST.	24	6.51
8.3	FINAL 20 KV 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 :

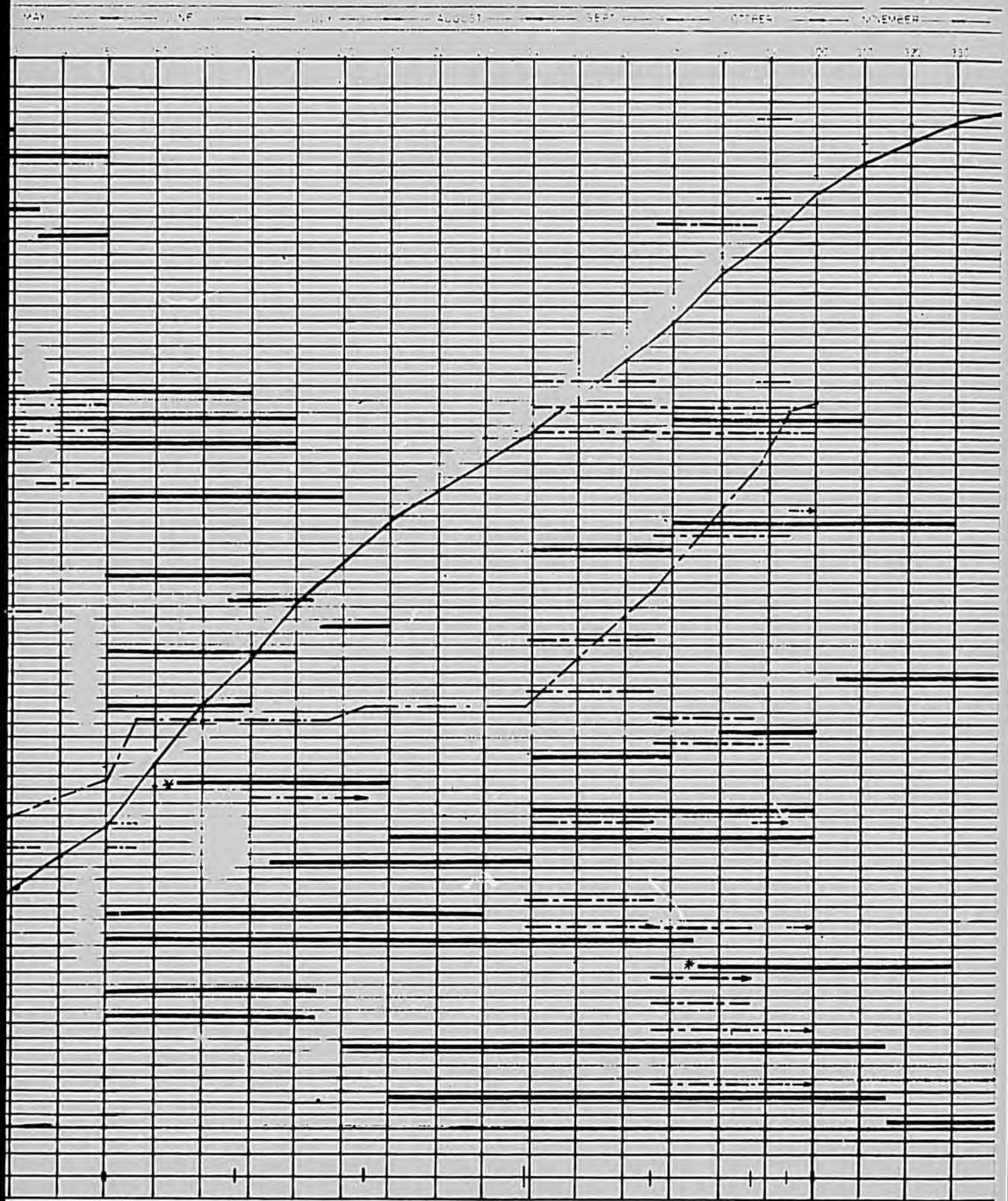
* WORK NOT STARTED .

WORK NOT COMPLETE AS OF DATE
UNDER CONST. PROGRESS .

BANDUNG UTARA ERECTION

(Work Item)

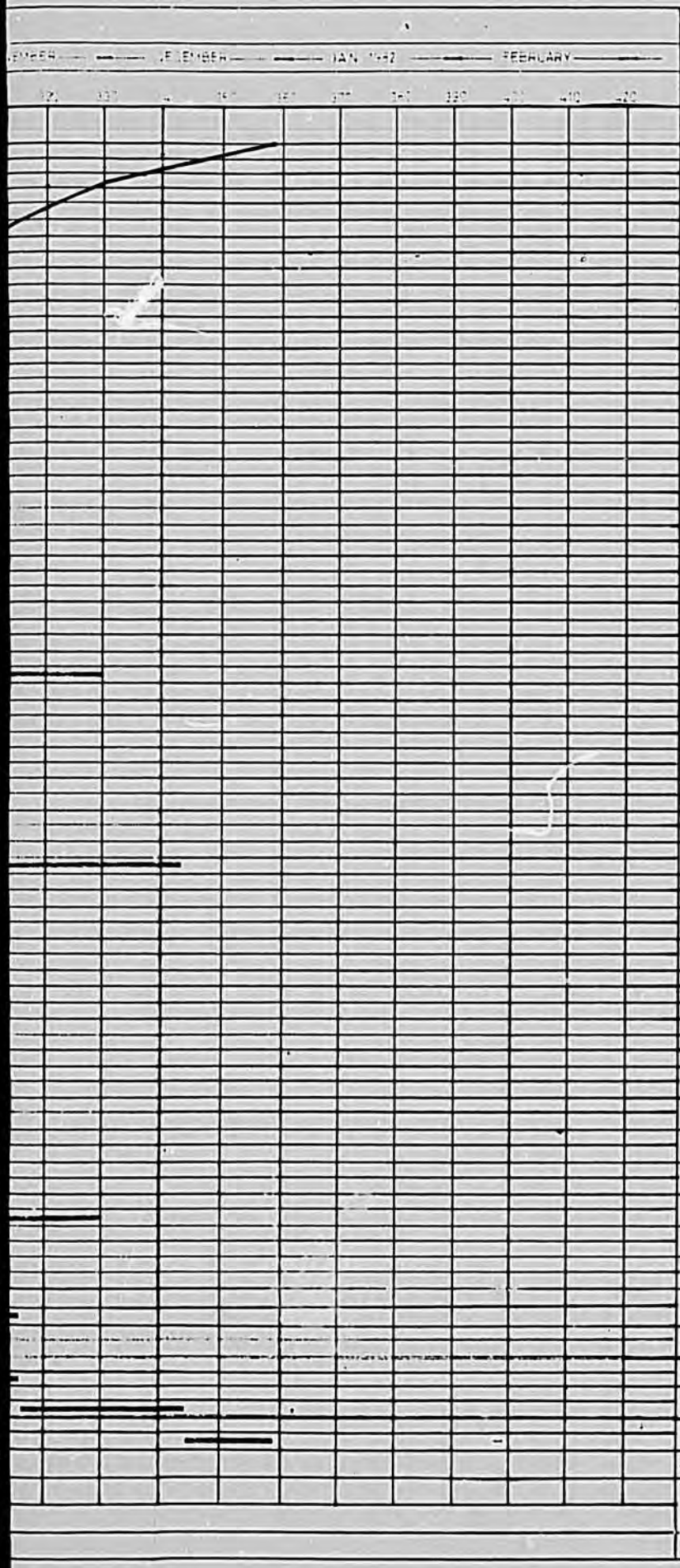
(2)



33.95	39.27	40.84	40.84	51.79	63.21	67.82	69.86
27.95	43.69	56.16	66.31	76.04	84.28	87.33	89.90

(Work Item)

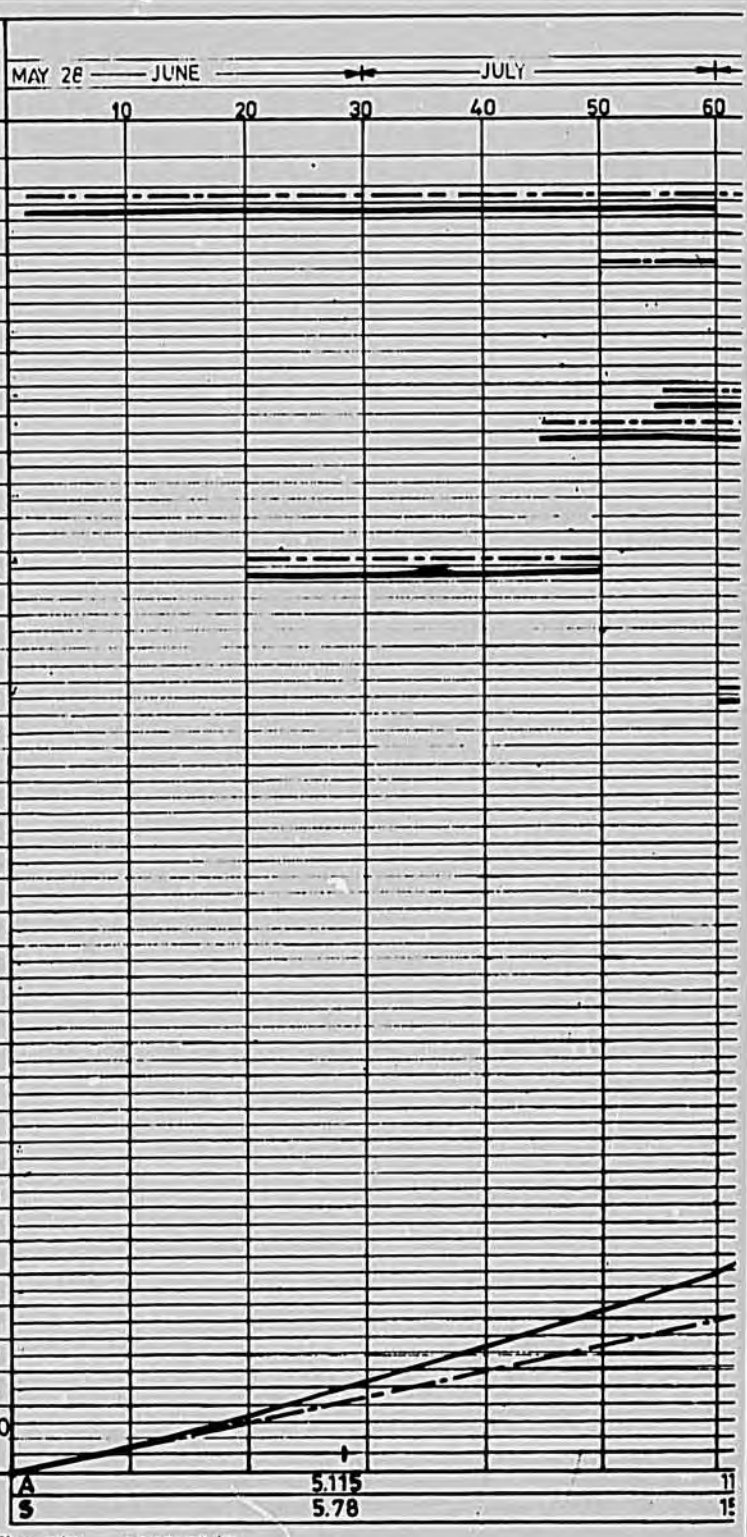
(3)



% OF COMPLETION	CONSTRUCTION PROGRESS TO DATE 10-31-81						NO.
	UNIT				% OF TOTAL		
	ACTUAL		SCHEDULED		ACTUAL	SCHEDULED	
	QTY	%	QTY	%	%	%	
100							
97.5							1
95	190	100	190	100	6.78	6.78	1.1
92.5	24	100	24	100	2.60	2.60	1.2
90	4	100	4	100	2.60	2.60	1.3
87.5	2	100	2	100	0.78	0.78	1.4
85	2	100	2	100	0.78	0.78	1.5
82.5	14	100	14	100	3.13	3.13	1.6
80	2	100	2	100	1.04	1.04	1.7
77.5	4	100	4	100	1.56	1.56	1.8
75	8	100	8	100	1.04	1.04	1.9
72.5							2
70	406	100	406	100	4.17	4.17	2.1
67.5	480/2486	100	443/2295	92.31	6.28	5.80	2.2
65	774	100	774	100	4.69	4.69	2.3
62.5							3
60	18	100	18	100	2.08	2.08	3.1
57.5	1.8	10	9	50	0.42	2.09	3.2
55	2	100	2	100	1.56	1.56	3.3
52.5	14	100	14	100	1.56	1.56	3.4
50	12	100	12	100	1.04	1.04	3.5
47.5	4	100	4	100	0.78	0.78	3.6
45	7	100	7	100	2.08	2.08	3.7
42.5							3.8
40	2	100	2	100	1.56	1.56	3.9
37.5	2	100	2	100	1.04	1.04	3.10
35	6	100	6	100	1.56	1.56	3.11
32.5	0	0	100	100	0	2.34	4.0
30	50	50	100	100	1.57	3.13	5.0
27.5	206	95	217	100	4.46	4.69	6.0
25	13	100	13	100	2.86	2.86	7.0
22.5							8.0
20	9	100	9	100	4.17	4.17	8.1
17.5	8.88	37	24	100	2.41	6.51	8.2
15	0	0	45.45	45.45	0	1.30	8.3
12.5	1	50	2	100	1.17	2.34	8.4
10	4	100	4	100	2.34	2.34	8.5
7.5	465	20	2024	86.95	1.20	5.21	9.0
5							10.0
2.5	10	10	85.71	85.71	0.55	4.69	10.1
0							10.2
							11.0
					69.86	89.90	

(1)

	WORK ITEM	UNIT	QTY %
1	CIVIL		
1.1	clearing & grubbing of site	81,450M2	11.57
1.2	15cm crush stone	10,700M2	2.69
1.3	road sub-base	4,663M2	3.09
1.4	road top surface	3,843M2	2.84
1.5	yard drainage piping	82M	0.15
1.6	catch basin & dropinlets	5	0.15
1.7	chain link fence	719M	2.51
1.8	drainage	100	0.61
2	CONSTRUCTION PLANT	8	2.16
3	FOUNDATION		
3.1	All but OCB & transf.	PAD 138 / PIER 396	14.63
3.2	150KV OCB	7	1.17
3.3	column foundation	58	11.82
3.4	150/20KV transformer	2	0.45
3.5	150/20KV trans oil containment pit	2	4.20
3.6	grounding resistor	2	0.13
3.7	firewall	2	1.00
3.8	cable trench	245M	6.00
3.9	20KV distribution trench	135M	0.87
3.10	concrete road colvert	7	1.15
4.0	GND SYSTEM		
4.1	below gnd. system	100	15.52
4.2	above gnd system	100	2.81
5.0	conduit system		
5.1	below gnd system	100	5.33
5.2	above gnd. system	100	1.32
6.0	furnish material for yard lighting	100	4.23
7.0	furnish material for station service	100	1.80
	TOTAL		100.0



A = ACTUAL

S = SCHEDULE

ORIGINAL SCHEDULE (1)

REVISED SCHEDULE (2)

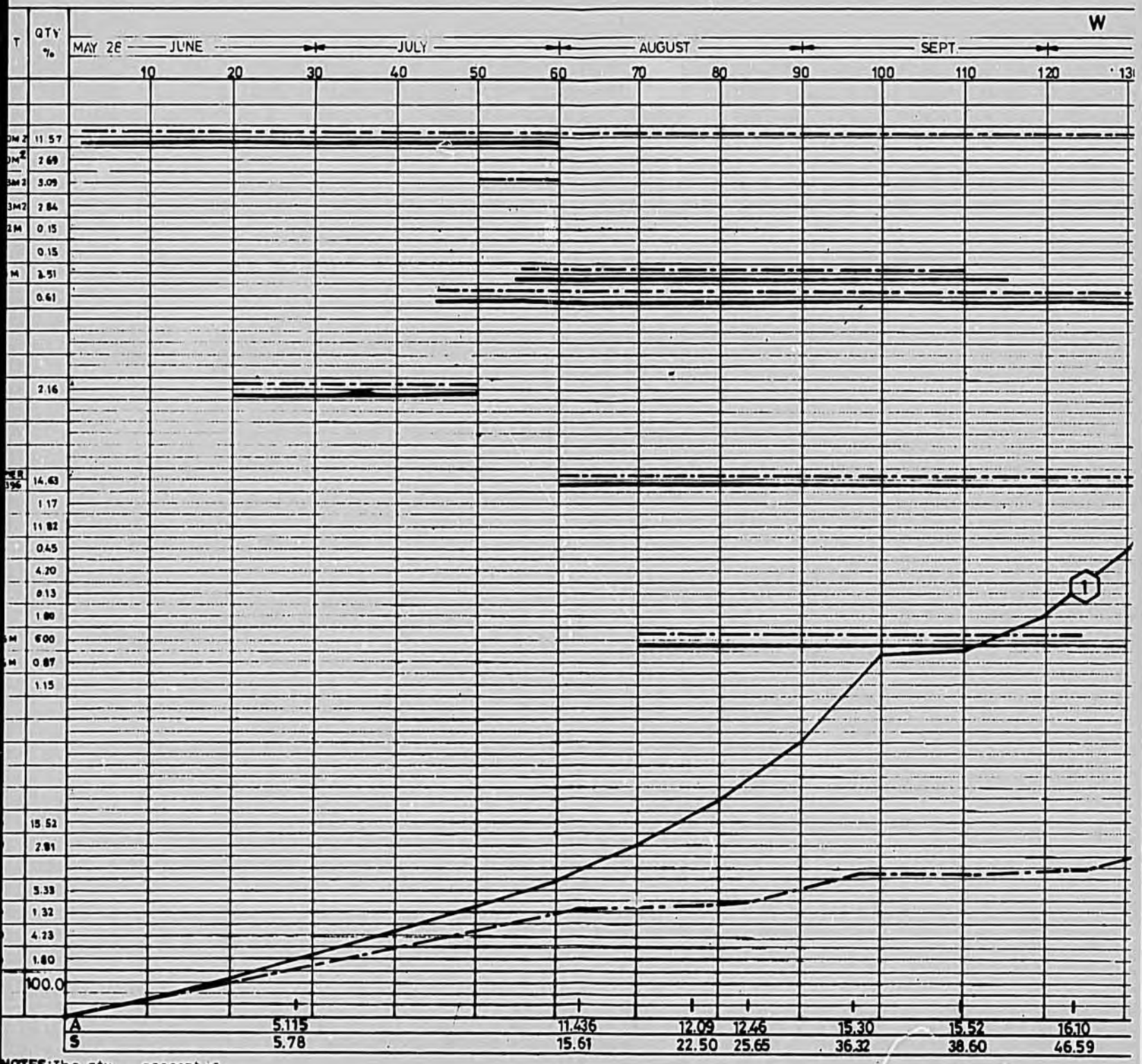
1.1 ITEMS 100% COMPLETED (TYP.)

NOTES: The qty. percent is based on percent of cost of each function verse total cost.

• Work not started.

→ Work not complete as of date under construction progress

(2)

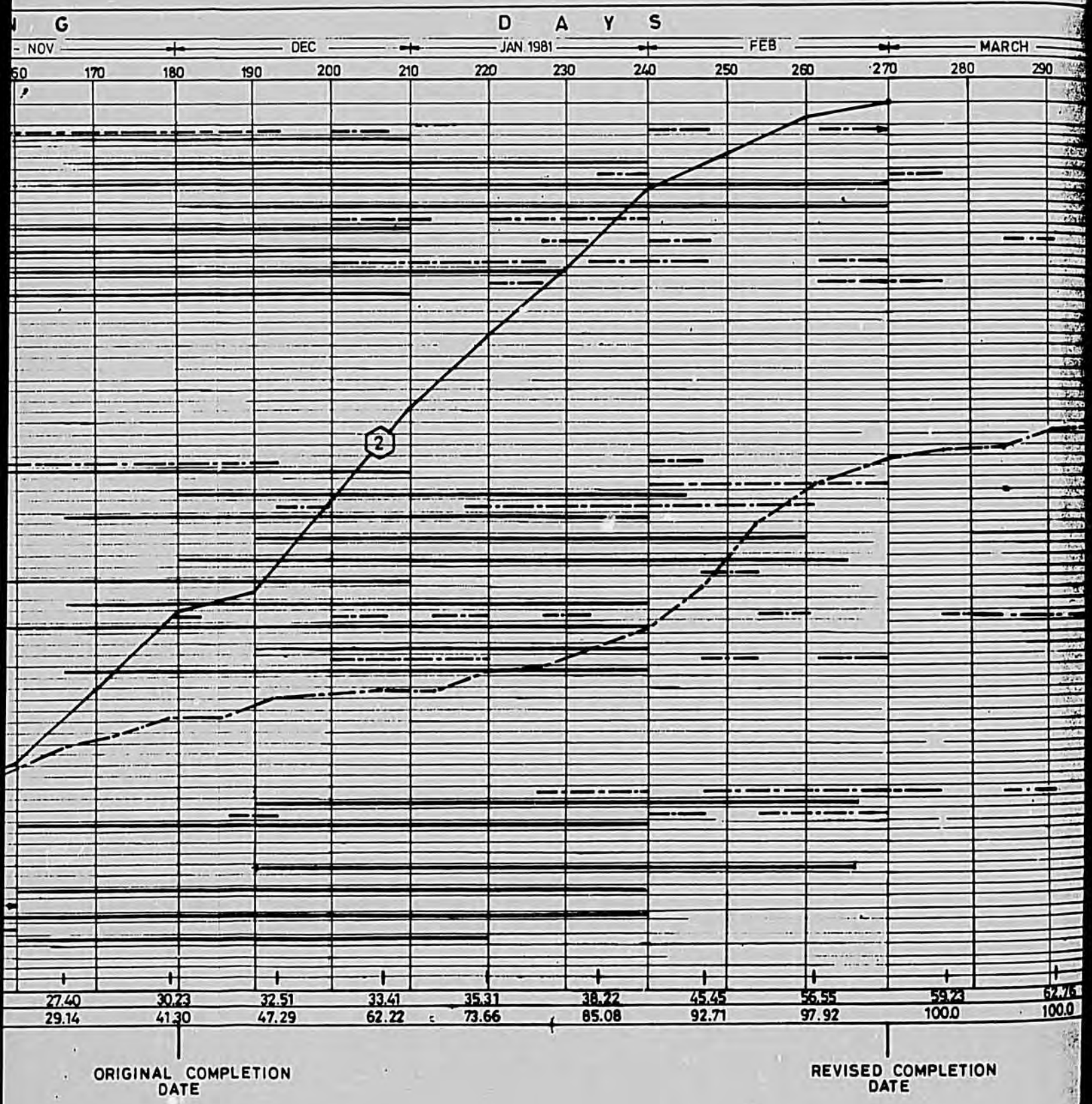


NOTES: The qty. percent is based on percent of cost of each function verse total cost.

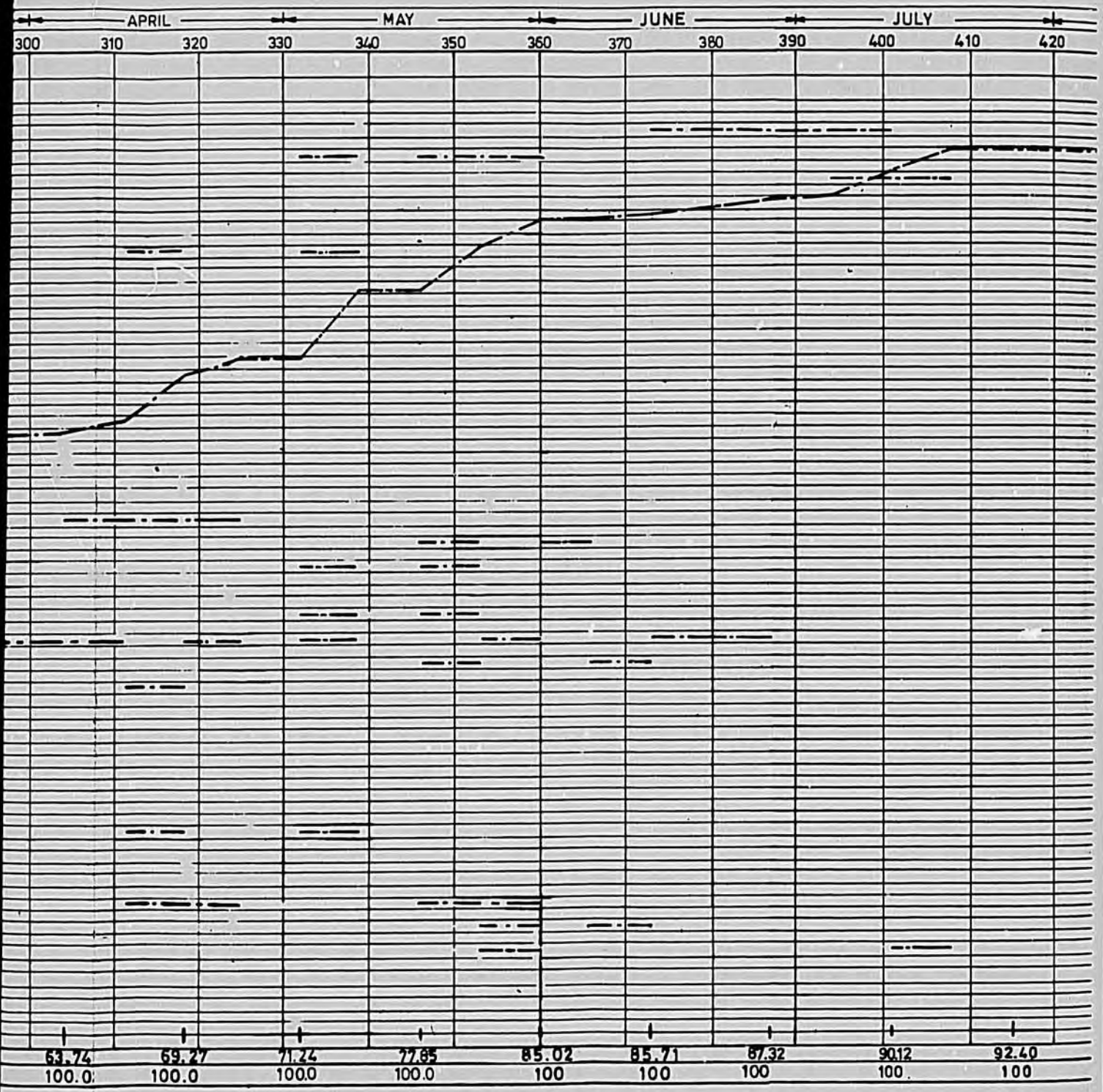
- Work not started.
- Work not complete as of date under construction progress

(3)

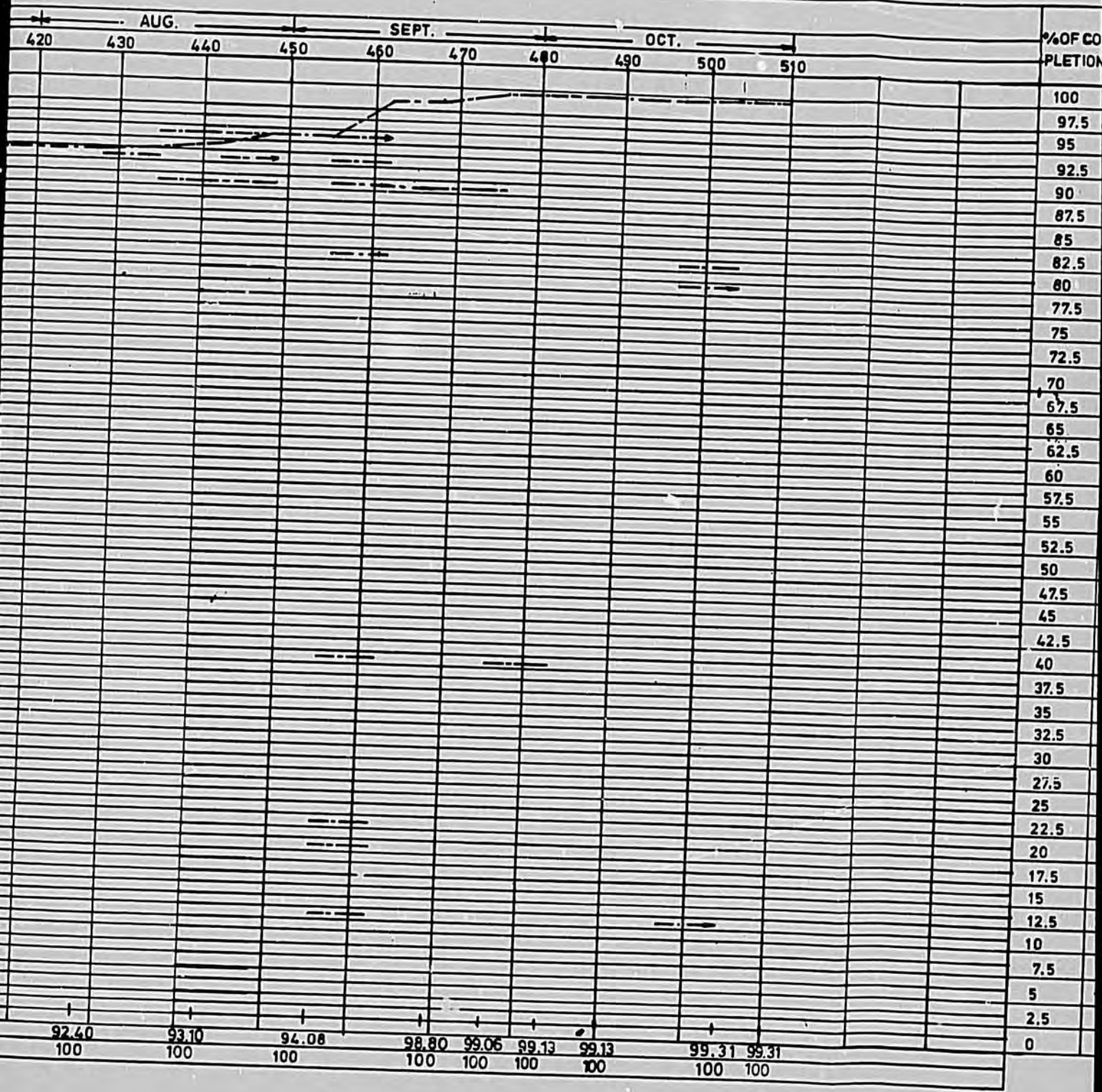
TIME SCHEDULE
BANDUNG UTARA SWITCH YARD



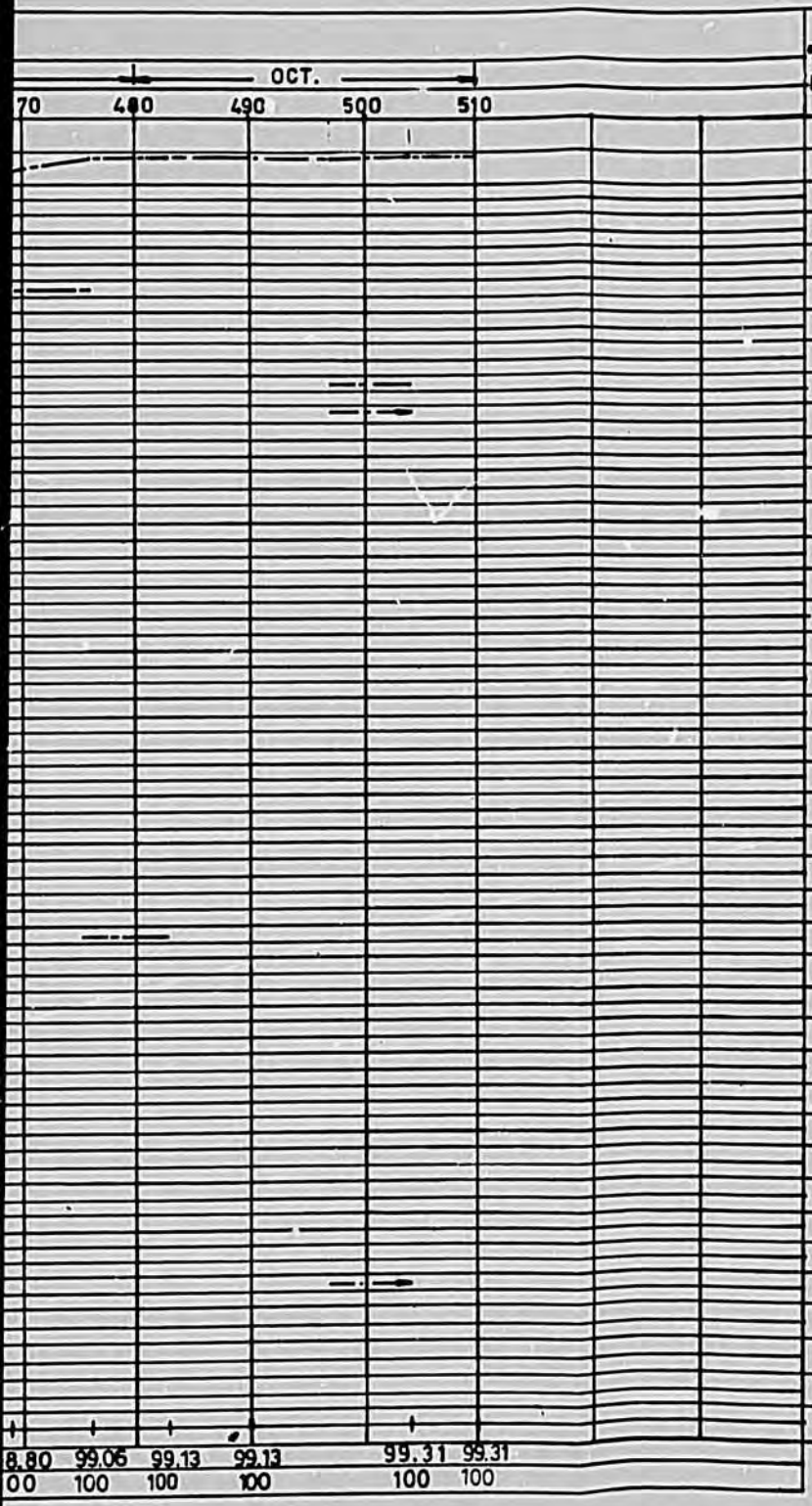
(4)


APRIL
MAY
JUNE
JULY
300
310
320
330
340
350
360
370
380
390
400
410
420
63.74
100.0
69.27
100.0
71.24
100.0
77.85
100.0
85.02
100
85.71
100
87.32
100
90.12
100
92.40
100

(5)


AUG.
SEPT.
OCT.
420
430
440
450
460
470
480
490
500
510
%OF CO
PLETION
100
97.5
95
92.5
90
87.5
85
82.5
80
77.5
75
72.5
70
67.5
65
62.5
60
57.5
55
52.5
50
47.5
45
42.5
40
37.5
35
32.5
30
27.5
25
22.5
20
17.5
15
12.5
10
7.5
5
2.5
0
92.40
100
93.10
100
94.08
100
98.80
100
99.06
100
99.13
100
99.13
100
99.31
100
99.31
100

(6)

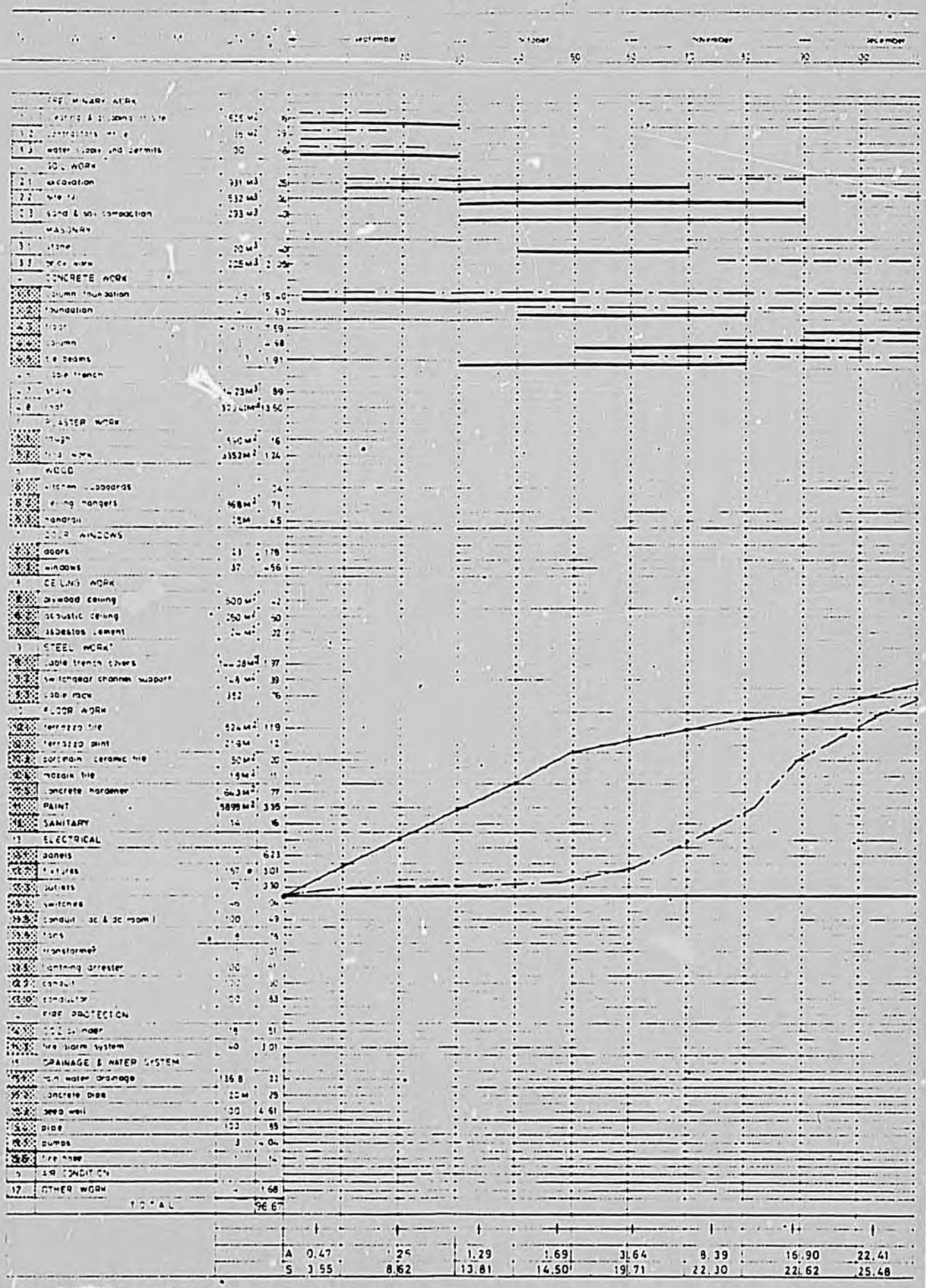


%OF COMPLETION	CONSTRUCTION PROGRESS TO DATE: OCT. 31. 1981							NO.
	UNIT				%OF CONTRACT			
	ACTUAL		SCHEDULED		ACTUAL	SCHED.		
	QTY.	%	QTY.	%	%	%		
100								
97.5								1
95	79821 M²	98	81450 M²	100	11.34	11.57		1.1
92.5	10300 M²	96	10700 M²	100	2.59	2.69		1.2
90	4663 M²	100	4663 M²	100	3.09	3.09		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	95	95	100	100	0.58	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	5.33		5.1
10	90	90	100	100	1.19	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					99.31	100		

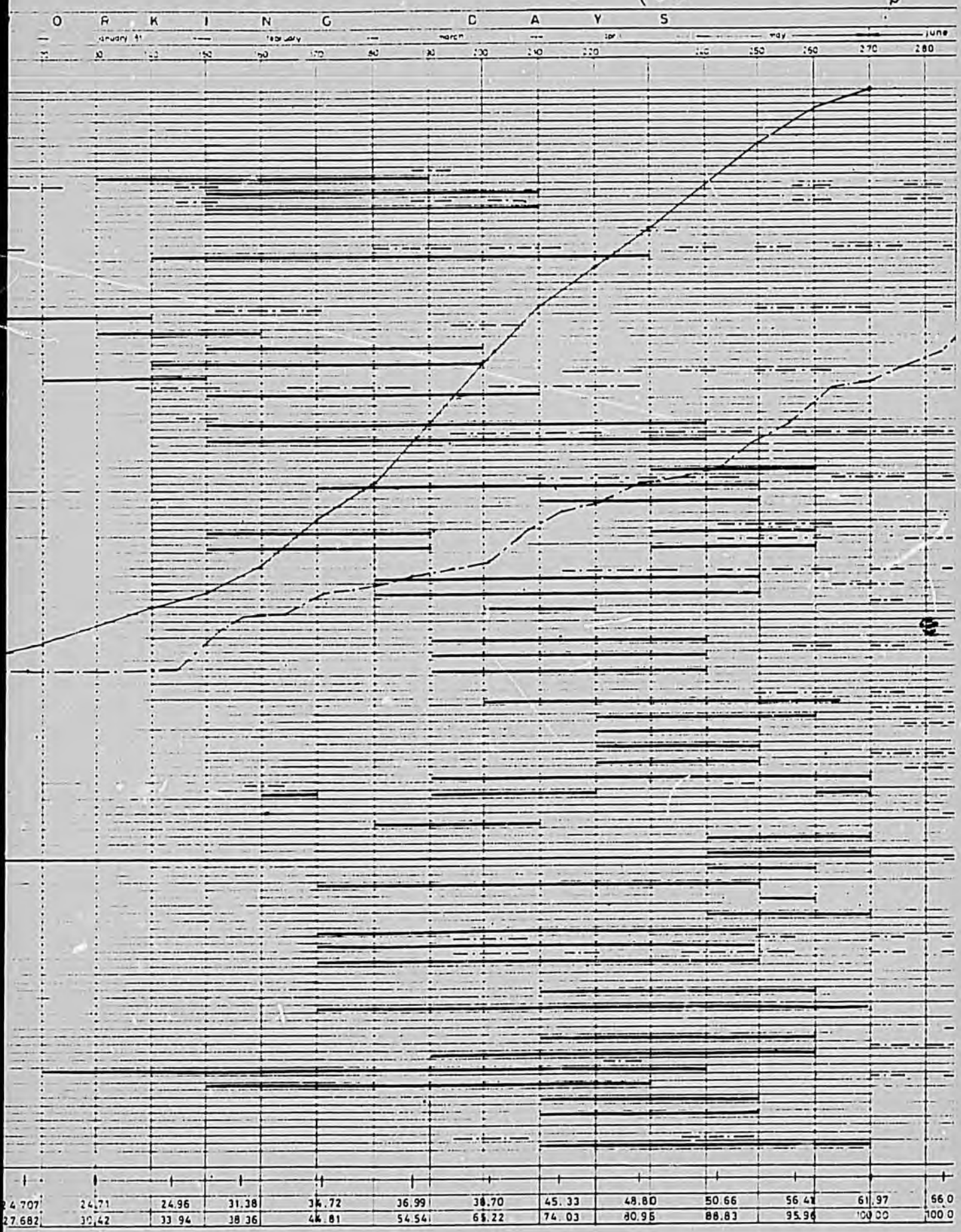
Bandung, October 1980

P.T. PEMBANGUNAN PERUMAHAN
WEST JAVA BRANCH

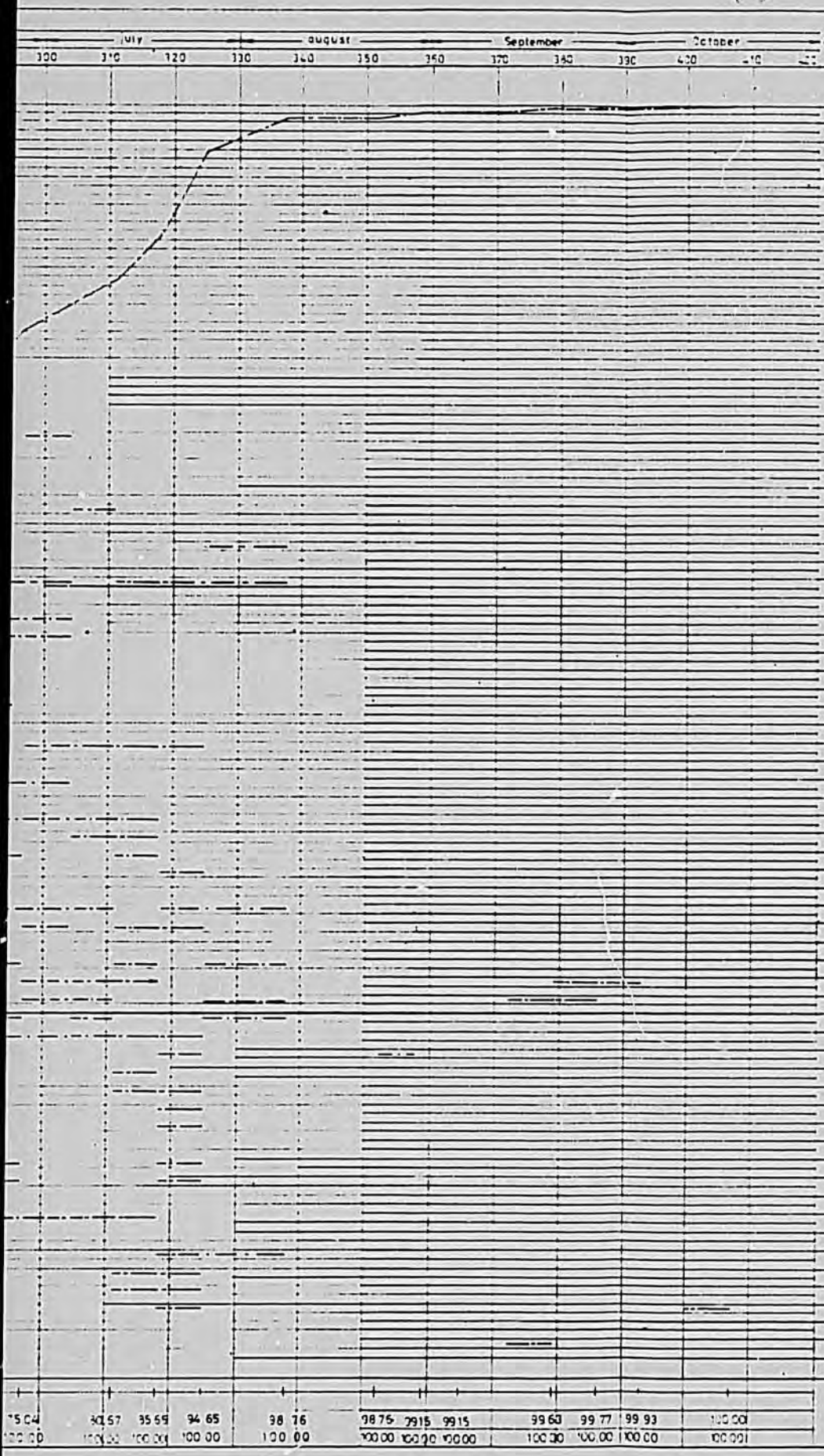
(1)


PRELIMINARY WORK
EARTH WORK
CONCRETE WORK
MASONRY
WOOD
PLASTER WORK
DOOR WINDOWS
CEILING WORK
STEEL WORK
FLOOR WORK
SANITARY
ELECTRICAL
FIRE PROTECTION
DRAINAGE & WATER SYSTEM
AIR CONDITION
OTHER WORK
TOTAL
A 0.47 1.25 1.29 1.69 3.64 8.39 16.90 22.41
S 3.55 8.62 13.81 14.50 19.71 22.30 22.62 25.48
A = ACTUAL
S = SCHEDULE
ITEMS 100% COMPLETED (TYP.)
NOTES
THE QTY PERCENT IS BASED ON PERCENT OF COST OF EACH FUNCTION VERSE TOTAL COST
WORK NOT STARTED
WORK NOT COMPLETE AS DATE UNDER CONSTRUCTION PROGRESS

TIME SCHEDULE
BOGOR CONTROL HOUSE (2)



(3)



% OF COMPLETION	CONSTRUCTION PROGRESS UNITS ACTUAL QTY	%	SCHEDULED QTY	%	% OF CONTRACT TIME TAKEN IN 31 ACTUAL %	SCHEDULE %	NO
100							
98							
96	1525M²	100	1525M²	100	0.06	0.06	1.1
94	35M²	100	35M²	100	0.29	0.29	1.2
92	100	100	100	100	0.58	0.68	1.3
90							2
88	931 M³	100	931 M³	100	0.25	0.25	2.1
86	532 M³	100	532 M³	100	0.04	0.04	2.2
84	293 M³	100	293 M³	100	0.40	0.40	2.3
82							3
80	20	100	20 M³	100	0.40	0.40	3.1
78	205M³	100	205 M³	100	2.05	2.05	3.2
76							4
74	29	100	29	100	15.4	15.4	4.1
72	42	100	42	100	1.6	1.5	4.2
70	158.11M³	100	158.11M³	100	7.59	7.59	4.3
68	30	100	30	100	4.68	4.68	4.4
66	13	100	13	100	1.91	1.91	4.5
64							4.6
62	14.23M³	100	14.23M³	100	0.59	0.89	4.7
60	329.41M³	100	329.41M³	100	13.50	13.50	4.8
58							5
56	590 M²	100	590M²	100	0.16	0.16	5.1
54	3352M²	100	3352M²	100	1.24	1.24	5.2
52							6
50	1	100	1	100	0.04	0.04	6.1
48	858 M²	100	858 M²	100	0.71	0.71	6.2
46	25	100	25	100	0.45	0.45	6.3
44							7
42	23	100	23	100	1.78	1.78	7.1
40	37	100	37	100	4.56	4.56	7.2
38							8
36	600M²	100	600M²	100	0.42	0.42	8.1
34	250	100	250M²	100	0.60	0.60	8.2
32	24	100	24 M²	100	0.02	0.02	8.3
30							9
28	1408M²	100	1408M²	100	1.97	1.97	9.1
26	148	100	148 M²	100	0.39	0.39	9.2
24	352	100	352	100	0.76	0.76	9.3
22							10
20	524 M²	100	524 M²	100	1.19	1.19	10.1
18	219 M	100	219 M	100	0.12	0.12	10.2
16	50 M²	100	50 M²	100	0.20	0.20	10.3
14	18 M²	100	18 M²	100	0.11	0.11	10.4
12	643	100	643M²	100	0.77	0.77	10.5
10	5893M²	100	5893M²	100	3.35	3.35	11
8	14	100	14	100	0.16	0.16	12
6							13
4	7	100	7	100	6.23	6.23	13.1
2	157	100	157	100	3.01	3.01	13.2
0	72	100	72	100	0.30	0.30	13.3
	46	100	46	100	0.04	0.04	13.4
	100	100	100	100	0.49	0.49	13.5
	8	100	8	100	0.75	0.75	13.6
	1	100	1	100	0.01	0.01	13.7
	100	100	100	100	0.51	0.51	13.8
	100	100	100	100	0.30	0.30	13.9
	100	100	100	100	0.83	0.83	13.10
							14
	18	100	18	100	0.51	0.51	14.1
	40	100	40	100	3.01	3.01	14.2
							15
	136.8	100	136.8	100	0.22	0.22	15.1
	120	100	120	100	0.29	0.29	15.2
	100	100	100	100	4.61	4.61	15.3
	100	100	100	100	0.85	0.85	15.4
	3	100	3	100	4.04	4.04	15.5
	1	100	1	100	0.14	0.14	15.6
							16
	4	100	4	100	1.68	1.68	17
					36.57	36.67	
			USING 100% AS BASE		100.00	100.00	

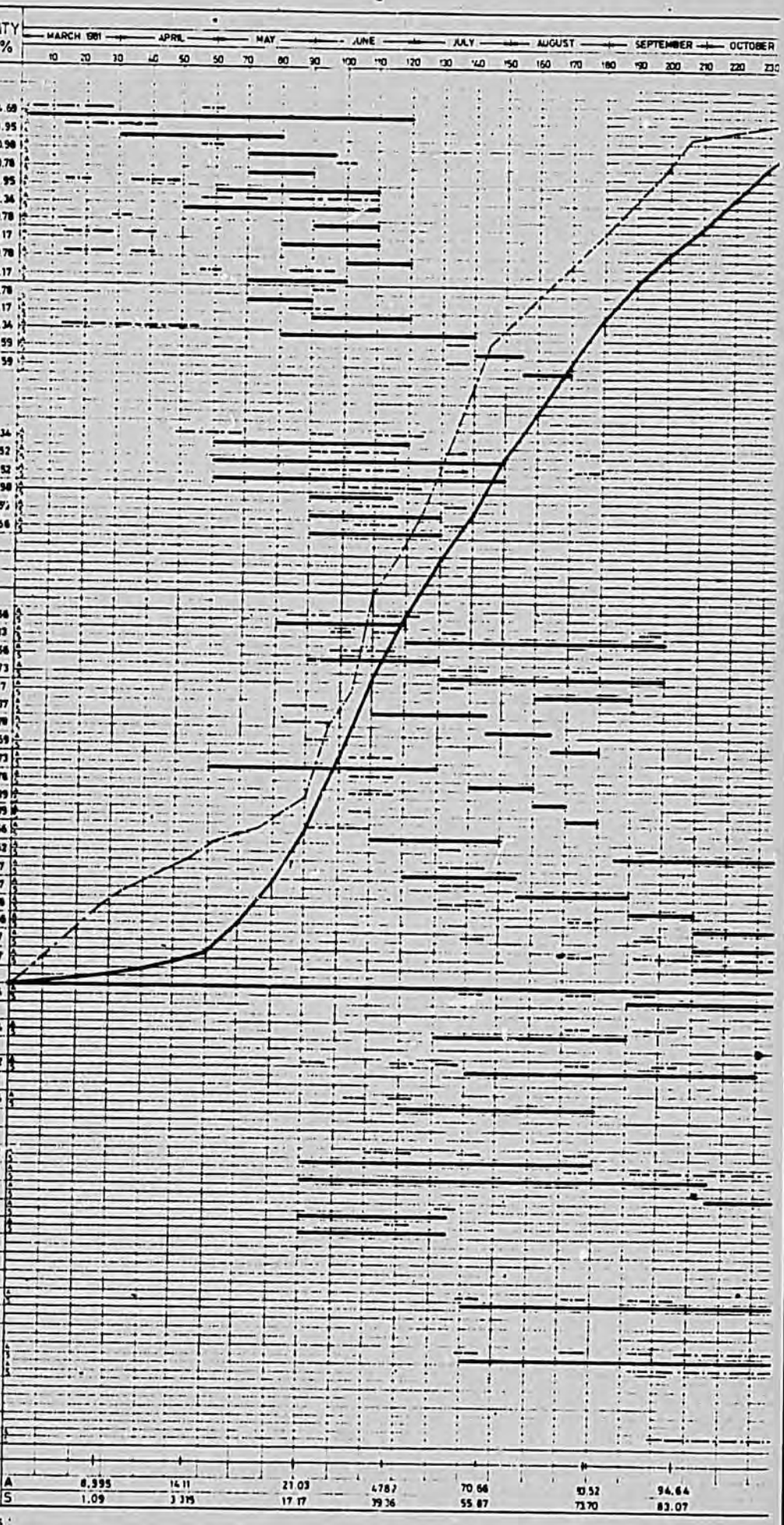
75.04	30.57	35.59	94.65	98.76	98.75	29.15	99.15	99.60	99.77	99.93	100.00
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

PT PERFECT CIRCLE

(1)

TIME SCHEDULE
BOGOR ERECTION

NO	WORK ITEM	UNIT	QTY	%
1	STRUCTURES			
1.1	150 KV BUS SUPPORT STRUCTURES	233		4.68
1.2	150 KV SWITCH SUPPORT STRUCTURES	24		1.95
1.3	70 KV BUS SUPPORT STRUCTURES	12		0.98
1.4	70 KV SWITCH SUPPORT STRUCTURES	4		0.78
1.5	150 KV DEAD END TOWERS	4		1.95
1.6	70 KV MAIN STRUCTURES (BUS, OVERHEAD GANTRY & MASTERS)	130		2.34
1.7	150 KV CCVT & BUS SUPPORT STAND	2		0.78
1.8	150 KV CCVT WAVE TRAP & L.A STAND	4		1.17
1.9	150 KV CCVT & L.A SUPPORT STRUCTS	8		0.78
1.10	70 KV CCVT SUPPORT STRUCTURE	15		1.17
1.11	70 KV CCVT WAVE TRAP	3		0.78
1.12	70 KV L.A SUPPORT STRUCTURE	12		1.17
1.13	LIGHTING MASTER STRUCTURE	17		2.34
1.14	20 KV TERMINATOR STRUCTURE	2		0.59
1.15	5.6 KV FUSE & TRANSF STRUCTURE	2		0.59
2	BUS			
2.1	150 KV INSULATORS	441		2.34
2.2	150 KV BUS PIPE & ACSR (AND DAMPER CABLE)	5812 METRE		3.52
2.3	150 KV CONNECTORS	949		3.52
2.4	70 KV INSULATORS	261		0.98
2.5	70 KV BUS PIPE & ACSR (AND DAMPER CABLE)	1584.26 M		1.95
2.6	70 KV CONNECTORS	454		1.56
3	EQUIPMENT (SWITCH YARD)			
3.1	150 KV SWITCHES (INSTALLATION)	22		1.56
3.2	150 KV SWITCH ADJUSTMENT	22		3.13
3.3	70 KV SWITCHES (INSTALLATION)	18		1.56
3.4	70 KV SWITCH ADJUSTMENT	18		2.73
3.5	5.6 KV FUSE & SWITCHES	2		1.17
3.6	150 KV CCVT	14		1.37
3.7	150 KV LIGHTNING ARRESTER	12		0.78
3.8	150 KV WAVE TRAPS	4		0.59
3.9	150 KV OCB	9		2.73
3.10	70 KV CCVT	20		0.78
3.11	70 KV LIGHTNING ARRESTER	12		0.39
3.12	70 KV WAVE TRAPS	3		0.39
3.13	70 KV OCB	7		1.56
3.14	OIL CIRCUIT BREAKER SET UP	16		3.52
3.15	150/70 KV TRANSF PRELIMINARY SET UP	2		1.37
3.16	150/20 KV TRANSF PRELIMINARY SET UP	2		1.37
3.17	GRND TRANSF PRELIMINARY SET UP	2		0.78
3.18	TRANSF INSTALLATION & TESTING	6		1.56
3.19	STATION SERVICE TRANSF INST.	6		1.17
3.20	GROUNDING RESISTOR INSTALLATION	4		1.17
4	GROUNDING MATERIAL	100		2.34
5	YARD LIGHTING	100		2.34
6	CONDUIT INSTALLATION	381		3.52
7	YARD PANEL INSTALLATION	22		2.34
8	CONTROL HOUSE.			
8.1	RELAY & CONTROL PANEL	16		3.95
8.2	20 KV SWITCH GEAR INST	24		4.88
8.3	FINAL 20 KV SWITCH GEAR TESTING	100		2.15
8.4	BATTERY CHARGER INSTALLATION	2		1.76
8.5	POWER PANEL INSTALLATION	6		1.76
9	CONTROL WIRING INSTALLATION	3547		4.30
10	TESTING			
10.1	PRELIMINARY TESTING	100		4.30
10.2	FINAL TESTING	100		1.09
11	ENERGIZING	100		0.47
				100



A = ACTUAL
S = SCHEDULE

1.1 ITEMS 100% COMPLETED (TYP)

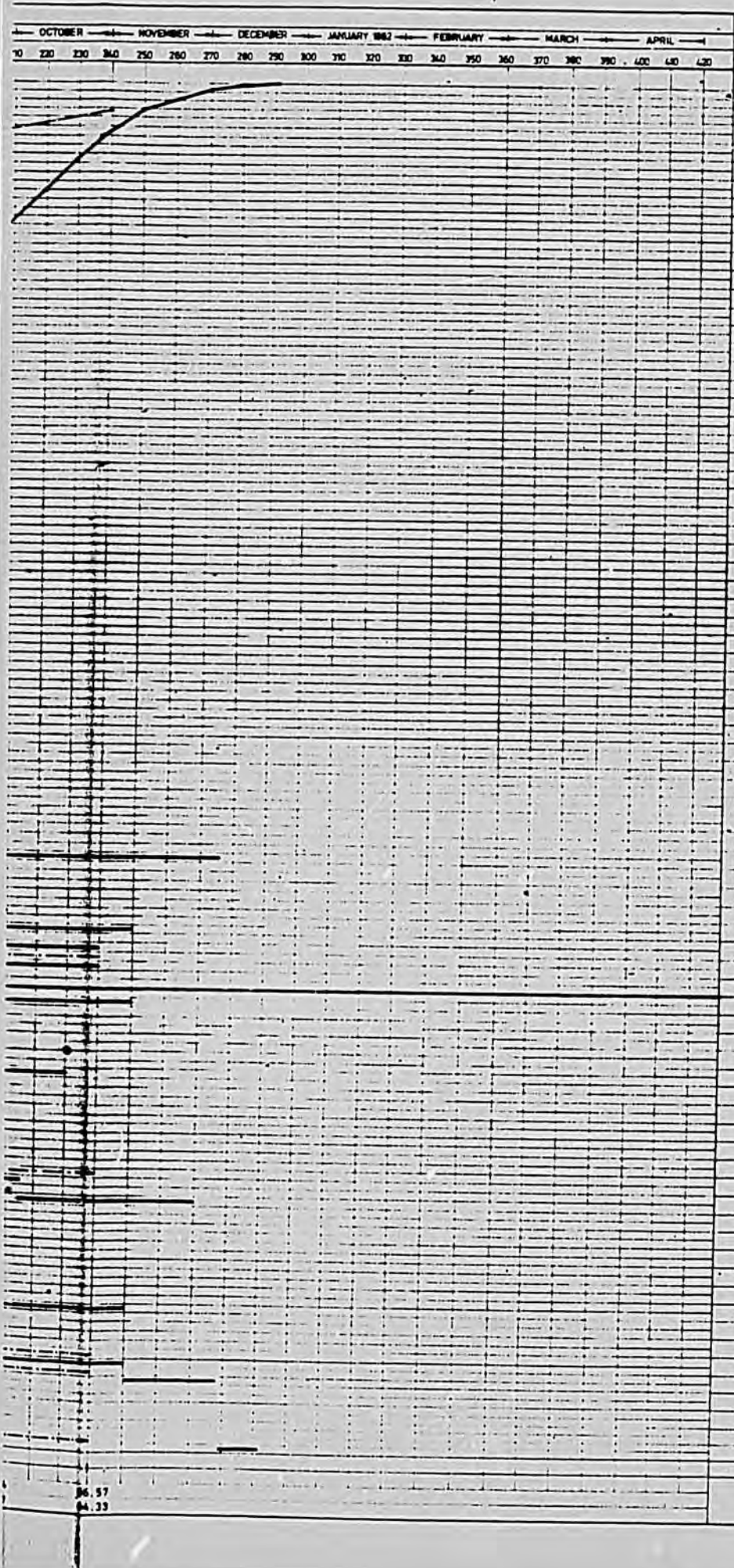
NOTES:

* WORK NOT STARTED

WORK NOT COMPLETE AS OF DATE
UNDER CONST. PROGRESS

ILE
:TION

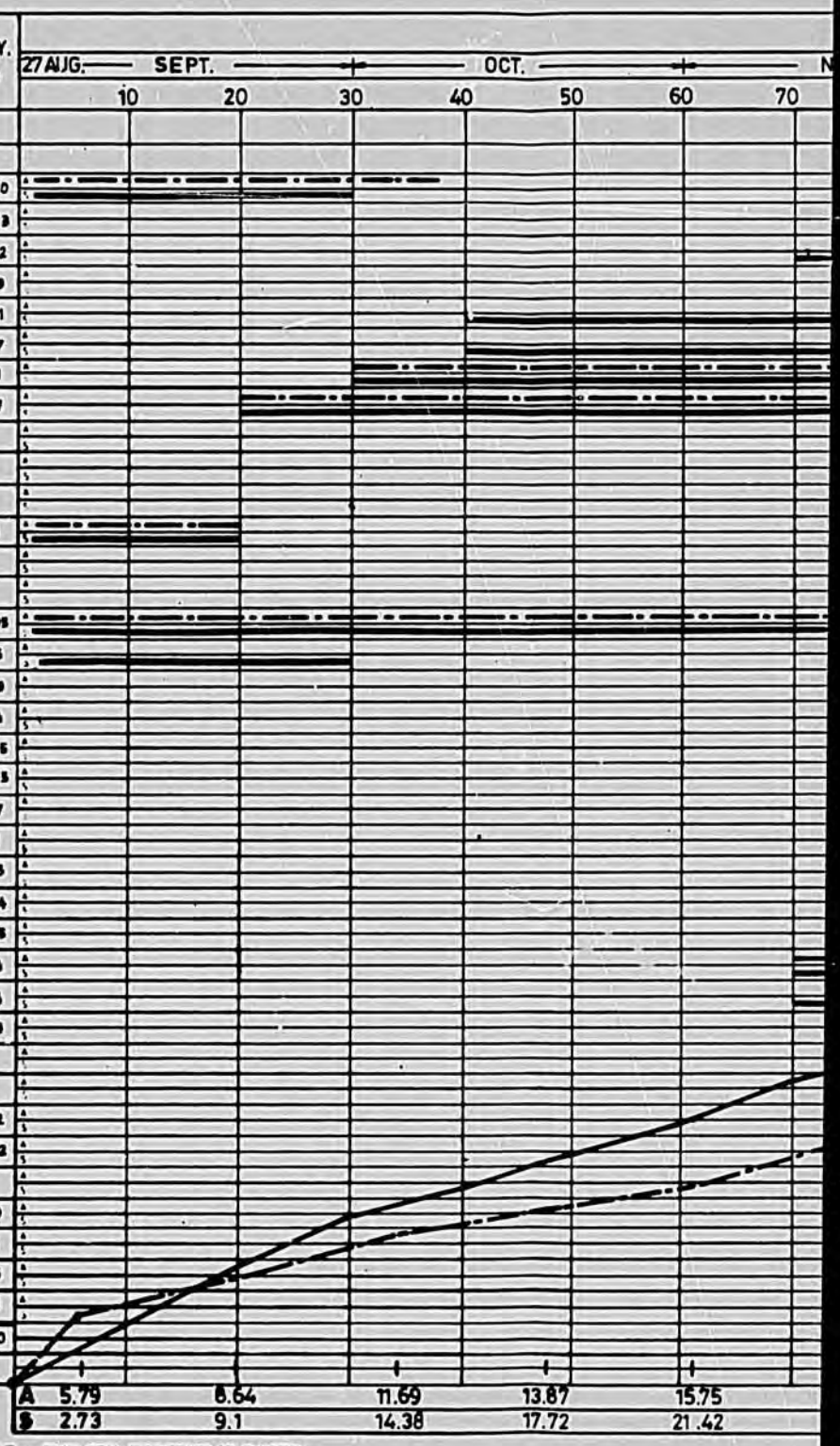
(2)



% OF COMPLETION	CONSTRUCTION PROGRESS TO DATE 10-31-81 UNITS ACTUAL		SCHEDULED		% OF ACTUAL		NO.
100							
98							
96	233	100	233	100	4.69	4.69	1 1
94	24	100	24	100	1.95	1.95	1 2
92	12	100	12	100	0.98	0.98	1 3
90	4	100	4	100	0.78	0.78	1 4
88	4	100	4	100	1.95	1.95	1 5
86	130	100	130	100	2.34	2.84	1 6
84	2	100	2	100	0.78	0.78	1 7
82	4	100	4	100	1.17	1.17	1 8
80	8	100	8	100	0.78	0.78	1 9
78	15	100	15	100	1.17	1.17	1 10
76	3	100	3	100	0.78	0.78	1 11
74	12	100	12	100	1.17	1.17	1 12
72	17	100	17	100	2.34	2.34	1 13
70	2	100	2	100	0.59	0.59	1 14
68	2	100	2	100	0.59	0.59	1.15
66							
64							
62							2
60	441	100	441	100	2.34	2.34	2 1
58	2499	100	100 488	2358	100	3.52	3.52	2 2
56	949	100	896	100	3.52	3.52	2 3
54	261	100	261	100	0.98	0.98	2 4
52	186 434	100	100 156	434	100	1.56	1.56	2 5
50	454	100	454	100	1.56	1.56	2 6
48							
46							
44							
42							3
40	22	100	22	100	1.56	1.56	3 1
38	22	100	22	100	3.13	3.13	3 2
36	18	100	18	100	1.56	1.56	3 3
34	18	100	18	100	2.73	2.73	3 4
32	2	100	2	100	1.17	1.17	3 5
30	14	100	14	100	1.37	1.37	3 5
28	12	100	12	100	0.78	0.78	3 7
26	4	100	4	100	0.59	0.59	3 8
24	9	100	9	100	2.73	2.73	3 9
22	20	100	20	100	0.78	0.78	3 10
20	12	100	12	100	0.39	0.39	3 11
18	3	100	3	100	0.39	0.39	3 12
16	7	100	7	100	1.56	1.56	3 13
14	16	100	10	61	3.52	2.15	3 14
12	2	100	2	100	1.37	1.37	3 15
10	2	100	2	100	1.37	1.37	3 16
8	2	100	2	100	0.78	0.78	3 17
6	6	100	4.50	75	1.56	1.17	3 18
4	6	100	6	100	1.17	1.17	3 19
2	4	100	4	100	1.17	1.17	3.20
0							
	100	100	83	83	2.34	1.95	4
	100	100	100	100	2.34	2.34	5
	381	100	381	100	3.52	3.52	6
	22	100	22	100	2.34	2.34	7
							8
	16	100	16	100	3.52	3.52	8
	21	90	24	100	4.39	4.88	9
	0	0	45.45	45.45	0	0.98	9
	2	100	2	100	1.76	1.76	10
	6	100	6	100	1.76	1.76	10
	3547	100	3224	90.91	4.30	3.91	11
							12
	90	90	90.91	90.91	3.87	3.91	12
	83	83	0	0	0.90	0	13
	67	67	0	0	0.31	0	
					96.57	94.33	

(1)

NO	WORK ITEM	UNIT	QTY. %
1	CIVIL		
[illegible]	clearing & grubbing of site	61.749 M³ 113.800 M²	7.20
[illegible]	15cm crush stone	19.800M²	3.53
[illegible]	road sub-base	5.400M	1.92
[illegible]	road top surface	818M	4.49
[illegible]	yard drainage piping	101M	0.31
[illegible]	catch basin & dropinlets	5	0.17
[illegible]	chain link fence	900M	3.41
[illegible]	drainage	875M	4.47
[illegible]	CONSTRUCTION PLANT	8	1.16
3	FOUNDATION		
[illegible]	all but OCB & transf	PAD PIER 190 521	21.95
[illegible]	piles	90	11.55
[illegible]	150KV. OCB	9	1.39
[illegible]	70 KV OCB	7	0.86
[illegible]	150/70KV transformer	2	0.55
[illegible]	150/70 KV trans oil containment pit	2	2.65
[illegible]	150/20 KV transformer	2	0.47
[illegible]	150/20 KV trans oil containment pit	2	1.41
[illegible]	grounding transformer	2	0.25
[illegible]	grounding resistor	4	0.24
[illegible]	firewall	4	2.15
[illegible]	cable trench	374M	6.66
[illegible]	20 KV distribution trench	32M	0.94
[illegible]	concrete road colverts	9	0.88
3.14	retaining wall		
40	GND SYSTEM		
[illegible]	below ground system	100	11.62
[illegible]	above ground system	100	2.32
50	conduit system		
[illegible]	below ground conduit	100	3.19
[illegible]	above ground conduit	100	1.91
[illegible]	furnish material for yard lighting	100	2.65
[illegible]	furnish material for station service	100	0.18
	TOTAL		100.00



A = ACTUAL
S = SCHEDULE

NOTES: THE QTY PERCENT IS BASED ON PERCENT OF COST OF EACH FUNCTION VERSE TOTAL COST

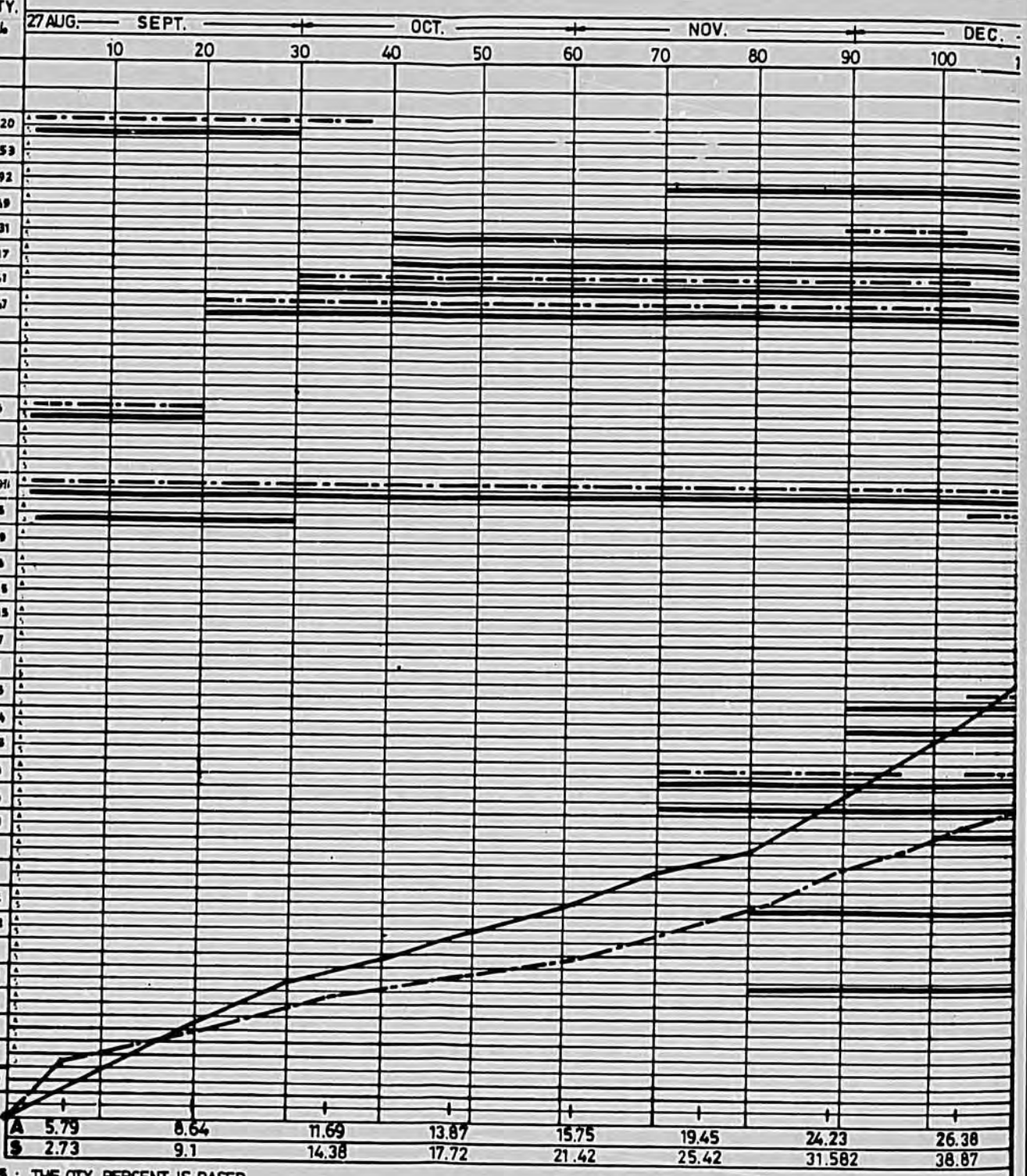
WORK NOT STARTED

WORK NOT COMPLETE AS DATE UNDER CONSTRUCTION PROGRESS

[illegible] ITEMS 100% COMPLETED (TYP.)

(2)

ITEM	UNIT	QTY. %
..ubing at site	61.749 M3 / 113.000 M3	7.20
..tone	19.800 M2	3.53
..se	5.400 M	1.92
..ace	818 M	4.49
..ge piping	101 M	0.31
& dropinlets	5	0.17
..ce	900 M	3.41
	875 M	4.47
..TION PLANT	8	1.16
..DATION		
& transf	PAD / PIER 190 / 321	21.9%
	90	11.55
	9	1.39
	7	0.56
..nsformer	2	0.56
..s oil containment pit	2	2.65
..nsformer	2	0.47
..s oil containment pit	2	1.41
..nsformer	2	0.25
..isjor	4	0.24
	4	2.15
..n	374 M	6.66
..tion trench	32 M	0.94
..d culverts	9	0.68
..all		
..SYSTEM		
..system	100	11.62
..system	100	2.32
..em		
..conduit	100	3.19
..conduit	100	1.91
..al for yard lighting	100	2.65
..al for station service	100	0.18
TOTAL		100.00



NOTES: THE QTY PERCENT IS BASED ON PERCENT OF COST OF EACH FUNCTION VERSE TOTAL COST

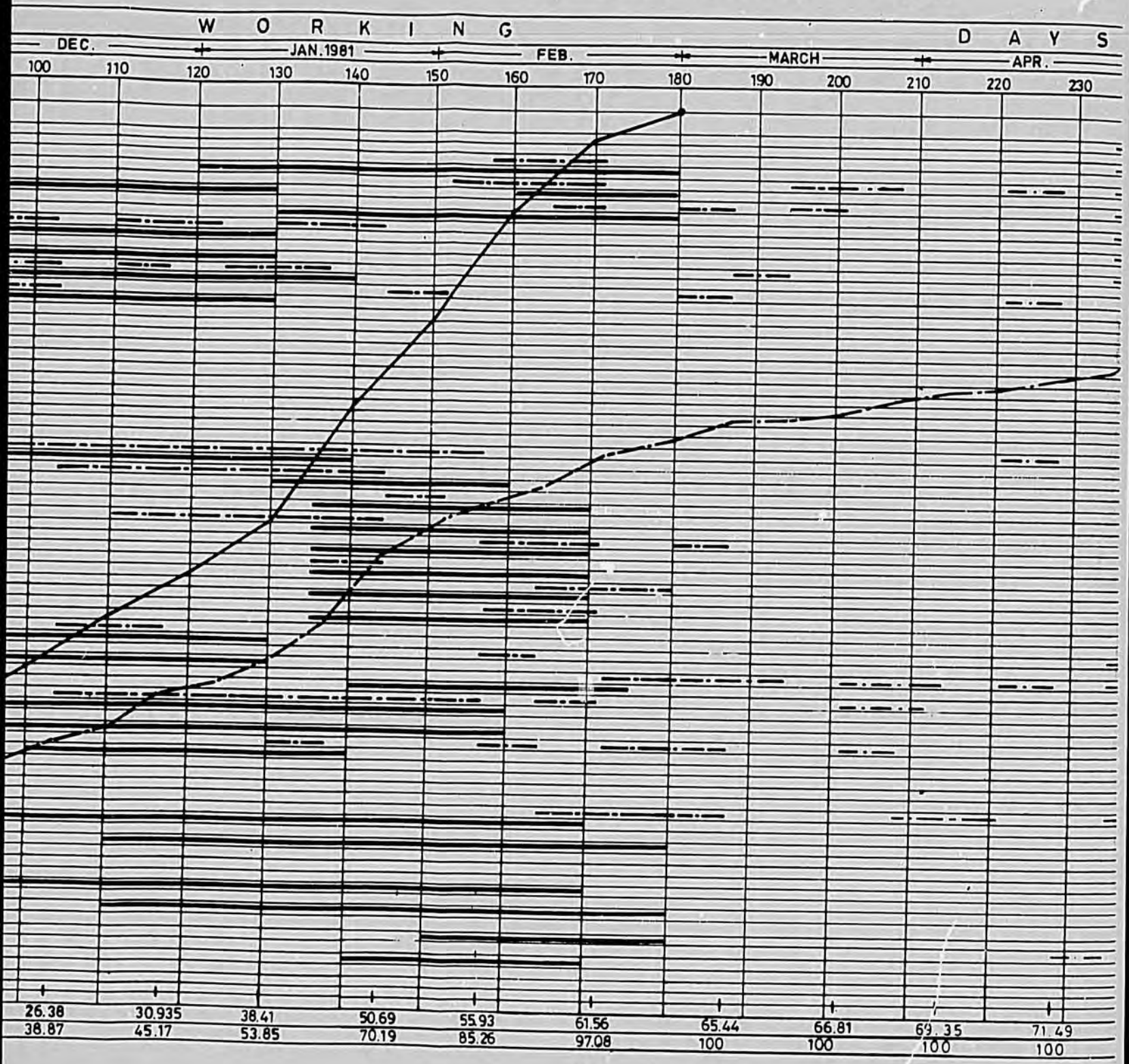
* WORK NOT STARTED

→ WORK NOT COMPLETE AS DATE UNDER CONSTRUCTION PROGRESS

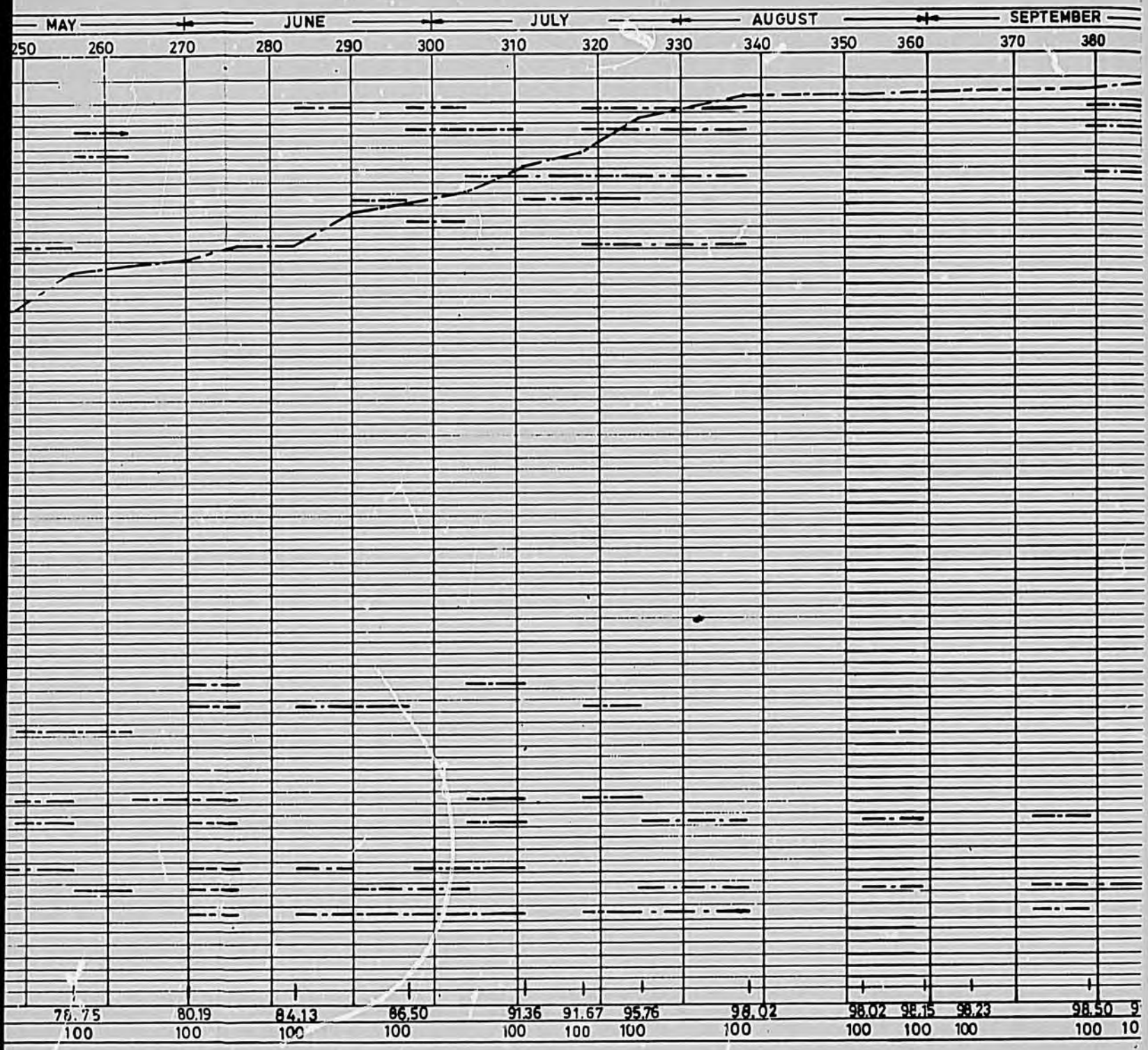
..% COMPLETED (TYP.)

(3)

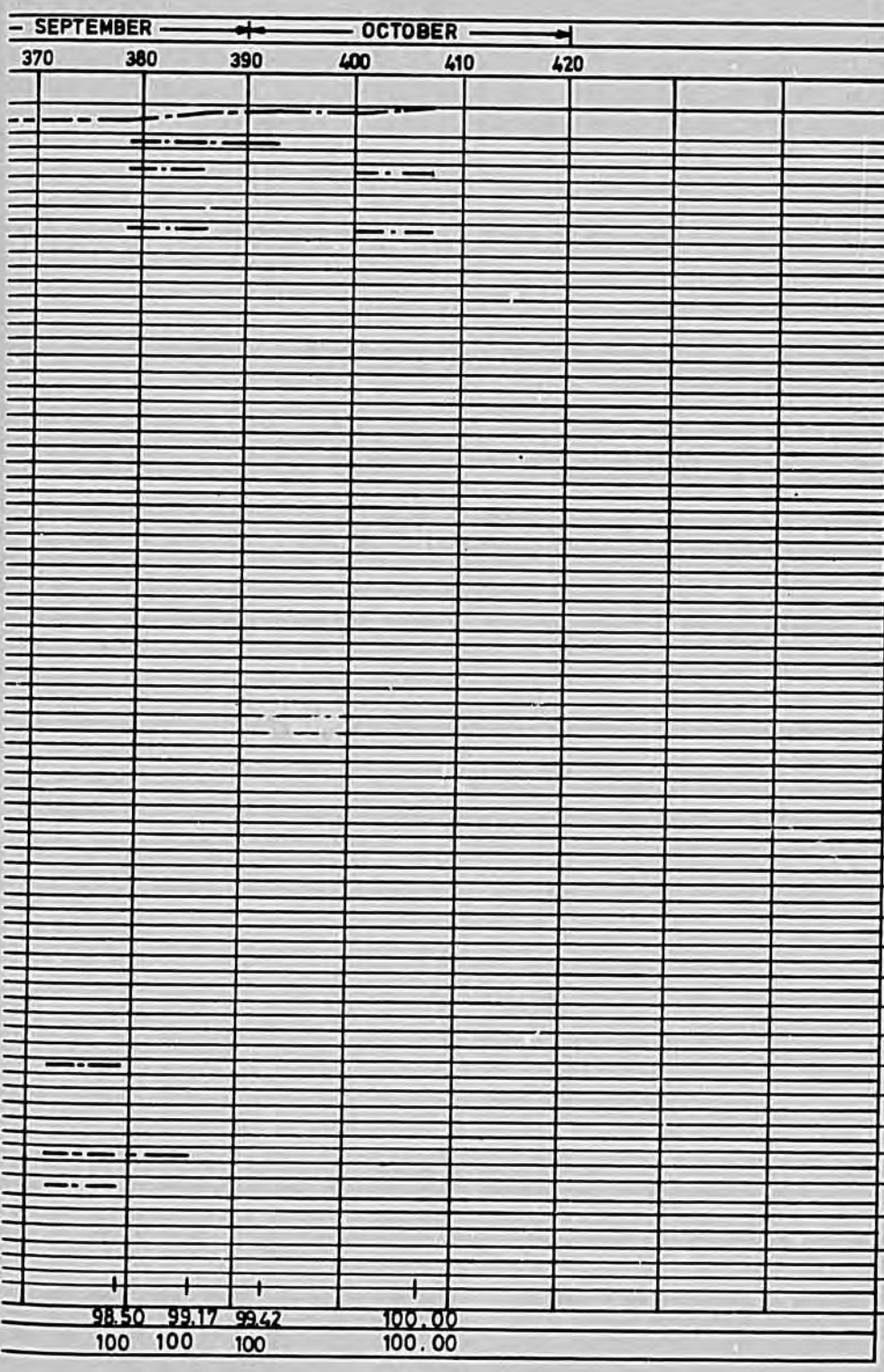
TIME SCHEDULE
BOGOR SWITCH YARD



(4)


MAY
JUNE
JULY
AUGUST
SEPTEMBER
250 260 270 280 290 300 310 320 330 340 350 360 370 380
76.75 80.19 84.13 86.50 91.36 91.67 95.76 98.02 98.02 98.15 98.23 98.50
100 100 100 100 100 100 100 100 100 100 100 100

(5)

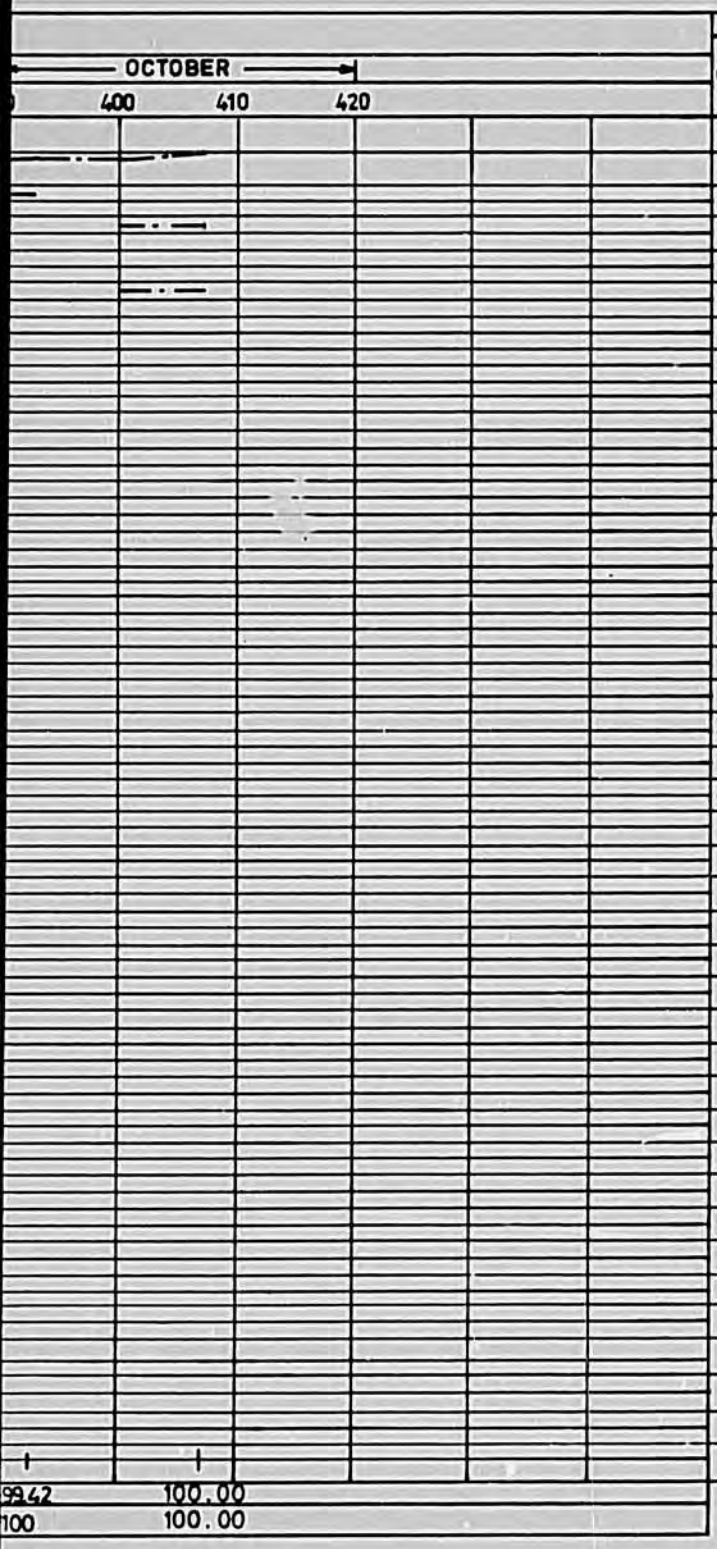


CONSTRUCTION PROGRESS TO DATE : OCT.-17-.

% OF COMPLE-TION	UNIT ACTUAL QTY.	UNIT ACTUAL %	UNIT SCHEDULE QTY.	UNIT SCHEDULE %	% OF CONTR ACTUAL %	% OF CONTR SCH %
100						
97.5						
95	113800M2	100	113800M2	100	7.2	7
92.5	19800M2	100	19800M2	100	3.53	3
90	5400M	100	5400M	100	1.92	1
87.5	818 M	100	818 M	100	4.49	4
85	101 M	100	101 M	100	0.31	0
82.5	5	100	5	100	0.17	0
80	900 M	100	900 M	100	3.41	3
77.5	875 M	100	875 M	100	4.47	4
75						
72.5						
70						
67.5	8	100	8	100	1.16	1.
65						
62.5						
60	190 521	100 100	190 521	100	21.95	21.
57.5	90	100	90	100	11.55	11.
55	9	100	9	100	1.39	1.
52.5	7	100	7	100	0.56	0
50	2	100	2	100	0.55	0
47.5	2	100	2	100	2.65	2
45	2	100	2	100	0.47	0
42.5	2	100	2	100	1.41	1.
40	2	100	2	100	0.25	0
37.5	4	100	4	100	0.24	0.
35	4	100	4	100	2.15	2.
32.5	374 M	100	374 M	100	6.66	6
30	132 M	100	132 M	100	0.94	0
27.5	9	100	9	100	0.69	0
25						
22.5						
20	100	100	100	100	11.62	11.
17.5	100	100	100	100	2.32	2
15						
12.5	100	100	100	100	3.19	3.
10	100	100	100	100	1.91	1.
7.5	100	100	100	100	2.65	2.
5	100	100	100	100	0.16	0.
2.5						
0					100.00	100

P.T. PERFECT C

(6)



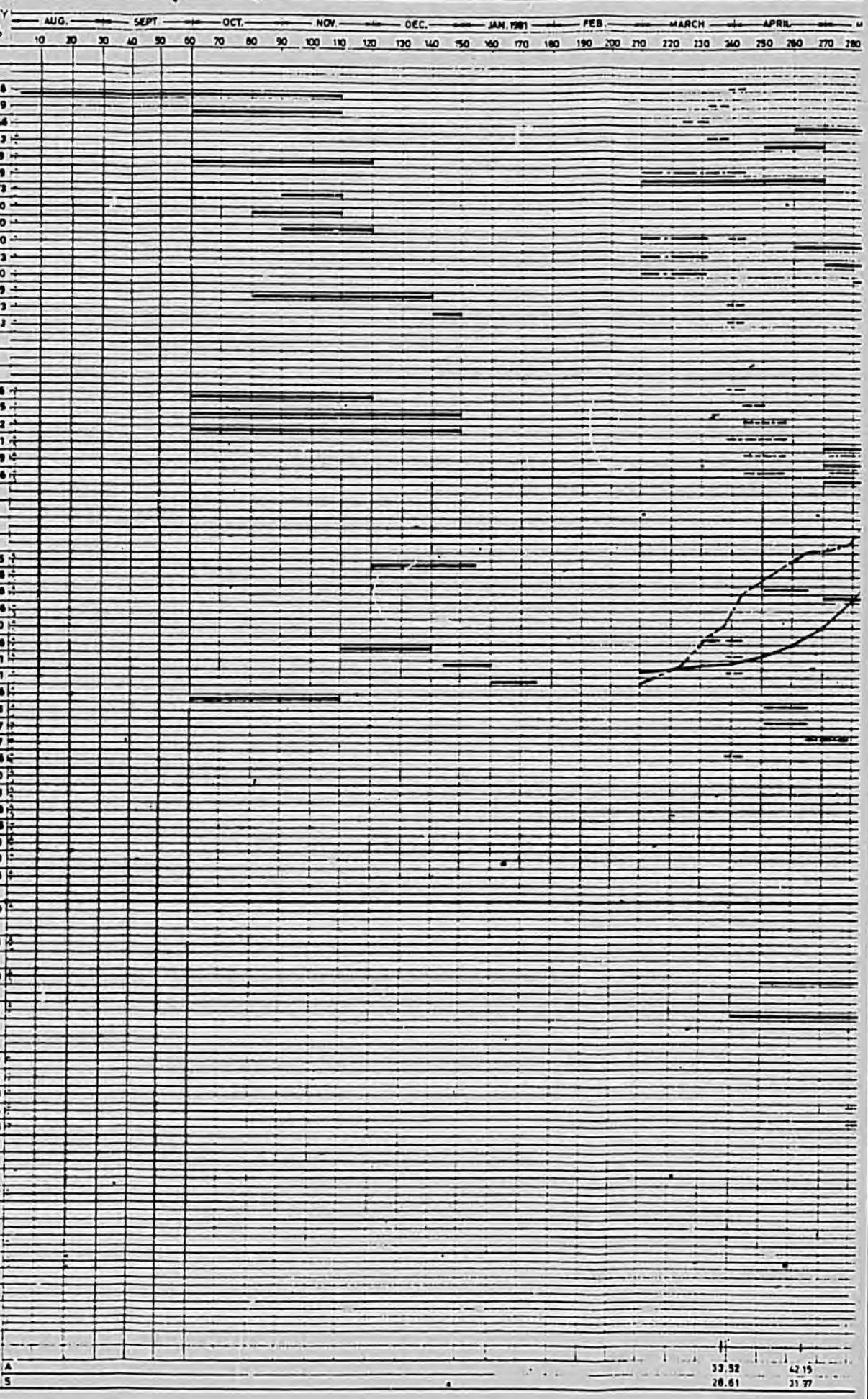
CONSTRUCTION PROGRESS TO DATE : OCT.-17-.1981

% OF COMPLETION	UNIT ACTUAL QTY.	UNIT ACTUAL %	UNIT SCHEDULE QTY.	UNIT SCHEDULE %	% OF CONTRACT ACTUAL %	% OF CONTRACT SCHED. %	NO.
100							
97.5							1.
95	113800M2	100	113800M2	100	7.2	7.2	1.1
92.5	19800M2	100	19800M2	100	3.53	3.53	1.2
90	5400 M	100	5400M	100	1.92	1.92	1.3
87.5	818 M	100	818 M	100	4.49	4.49	1.4
85	101 M	100	101 M	100	0.31	0.31	1.5
82.5	5	100	5	100	0.17	0.17	1.6
80	900 M	100	900 M	100	3.41	3.41	1.7
77.5	875 M	100	875 M	100	4.47	4.47	1.8
75							
72.5							
70							
67.5	8	100	8	100	1.16	1.16	2.
65							
62.5							3.
60	190 | 521	100 | 100	190 | 521	100	21.95	21.95	3.1
57.5	90	100	90	100	11.55	11.55	3.1A
55	9	100	9	100	1.39	1.39	3.2
52.5	7	100	7	100	0.56	0.56	3.3
50	2	100	2	100	0.55	0.55	3.4
47.5	2	100	2	100	2.65	2.65	3.5
45	2	100	2	100	0.47	0.47	3.6
42.5	2	100	2	100	1.41	1.41	3.7
40	2	100	2	100	0.25	0.25	3.8
37.5	4	100	4	100	0.24	0.24	3.9
35	4	100	4	100	2.15	2.15	3.10
32.5	374 M	100	374 M	100	6.66	6.66	3.11
30	132 M	100	132 M	100	0.94	0.94	3.12
27.5	9	100	9	100	0.69	0.69	3.13
25							3.14
22.5							4.
20	100	100	100	100	11.62	11.62	4.1
17.5	100	100	100	100	2.32	2.32	4.2
15							5.
12.5	100	100	100	100	3.19	3.19	5.1
10	100	100	100	100	1.91	1.91	5.2
7.5	100	100	100	100	2.65	2.65	6.
5	100	100	100	100	0.18	0.18	7.
2.5							
0					100.00	100.00	

P.T. PERFECT CIRCLE

(1)

No.	WORK ITEM	UNIT	QTY %
	STRUCTURES		
[illegible]	150 KV BUS [illegible]	277	4.38
	150 KV [illegible] STRUCTURES	26	2.19
[illegible]	[illegible] STRUCTURES	24	1.46
[illegible]	7[illegible] KV [illegible] STRUCTURES	4	0.73
5	150 KV [illegible] TOWERS	12	2.19
6	[illegible]	130	2.19
[illegible]	[illegible] TESTING	2	0.73
[illegible]	[illegible]	6	1.10
[illegible]	[illegible]	12	1.10
[illegible]	[illegible]	12	1.10
[illegible]	[illegible]	3	0.73
[illegible]	[illegible]	12	1.10
[illegible]	LIGHTING [illegible] STRUCTURE	16	2.19
[illegible]	[illegible] STRUCTURE	2	0.73
[illegible]	[illegible] FUSE & TRANSF STRUCTURE	2	0.73
2	BUS		
[illegible]	[illegible] INSULATORS	489	2.56
[illegible]	[illegible]	[illegible]	4.75
	[illegible]	1050	4.02
[illegible]	[illegible] INSULATORS	231	0.91
[illegible]	[illegible]	145 [illegible]	3.29
[illegible]	[illegible]	379	1.46
3	EQUIPMENT (SWITCH YARD)		
[illegible]	150 KV SWITCHES INSTALLATION	26	1.65
[illegible]	150 KV SWITCH ADJUSTMENT	26	2.56
[illegible]	[illegible] SWITCHES INSTALLATION	16	1.46
[illegible]	[illegible] SWITCH ADJUSTMENT	16	2.56
[illegible]	[illegible] FUSE & SWITCHES	2	1.10
[illegible]	[illegible]	20	1.46
3.7	[illegible] LIGHTNING ARRESTER	16	0.91
3.8	150 KV WAVE TRAPS	6	0.91
[illegible]	[illegible] CCB	10	2.56
3.10	[illegible]	17	0.73
3.11	[illegible] LIGHTNING ARRESTER	12	0.37
3.12	[illegible] WAVE TRAPS	3	0.37
3.13	[illegible] CCB	6	1.46
[illegible]	[illegible] CIRCUIT BREAKER SET UP	16	4.20
3.15	150 [illegible] TRANSF PRELIMINARY SET UP	1	0.73
[illegible]	150 [illegible] TRANSF PRELIMINARY SET UP	2	1.28
[illegible]	[illegible] TRANSF PRELIMINARY SET UP	1	0.58
[illegible]	TRANSF INSTALLATION & TESTING	4	1.10
3.19	STATION SERVICE TRANSF INST	4	0.73
[illegible]	GROUNDING RESISTOR INSTALLATION	3	0.73
[illegible]	GROUNDING MATERIAL	100	2.19
[illegible]	YARD LIGHTING	100	2.19
[illegible]	CONDUIT INSTALLATION	445	3.29
[illegible]	YARD PANEL INSTALLATION	29	2.19
[illegible]	CONTROL HOUSE		
[illegible]	[illegible] CONTROL PANEL	18	3.29
[illegible]	[illegible]	24	4.94
[illegible]	[illegible] TESTING	100	1.63
[illegible]	[illegible] INSTALLATION	2	1.65
[illegible]	[illegible] PANEL INSTALLATION	7	1.65
[illegible]	CONTROL WIRING INSTALLATION	3386	4.02
10	TESTING		
10.1	PRELIMINARY TESTING	100	4.02
10.2	FINAL TESTING	100	1.10
[illegible]	ENERGIZING	100	0.55
			100



A : ACTUAL
S : SCHEDULE

NOTES:

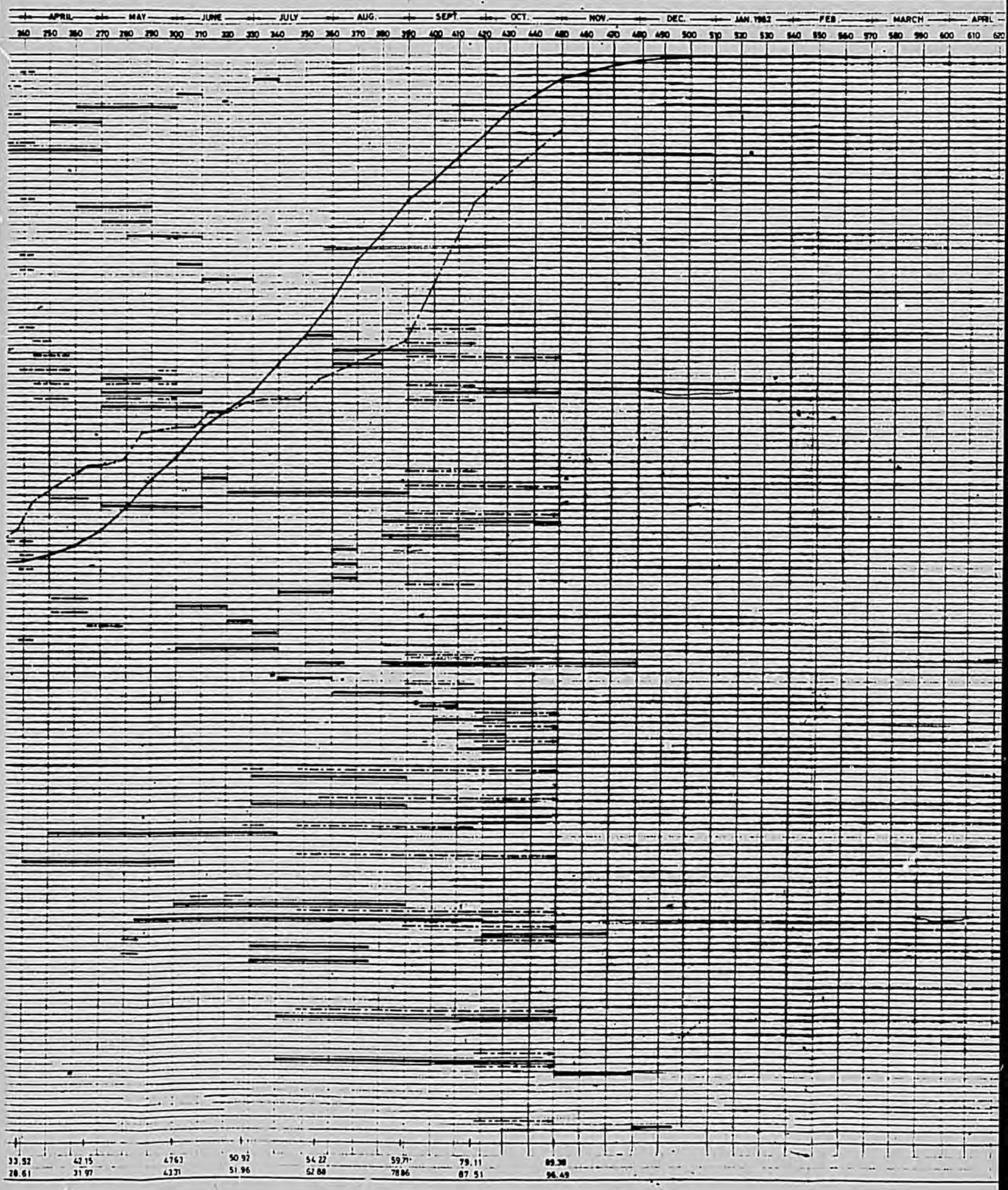
● WORK NOT STARTED.

→ WORK NOT COMPLETE AS OF DATE UNDER CONST. PROGRESS

[illegible] ITEMS 100% COMPLETED (TYP)

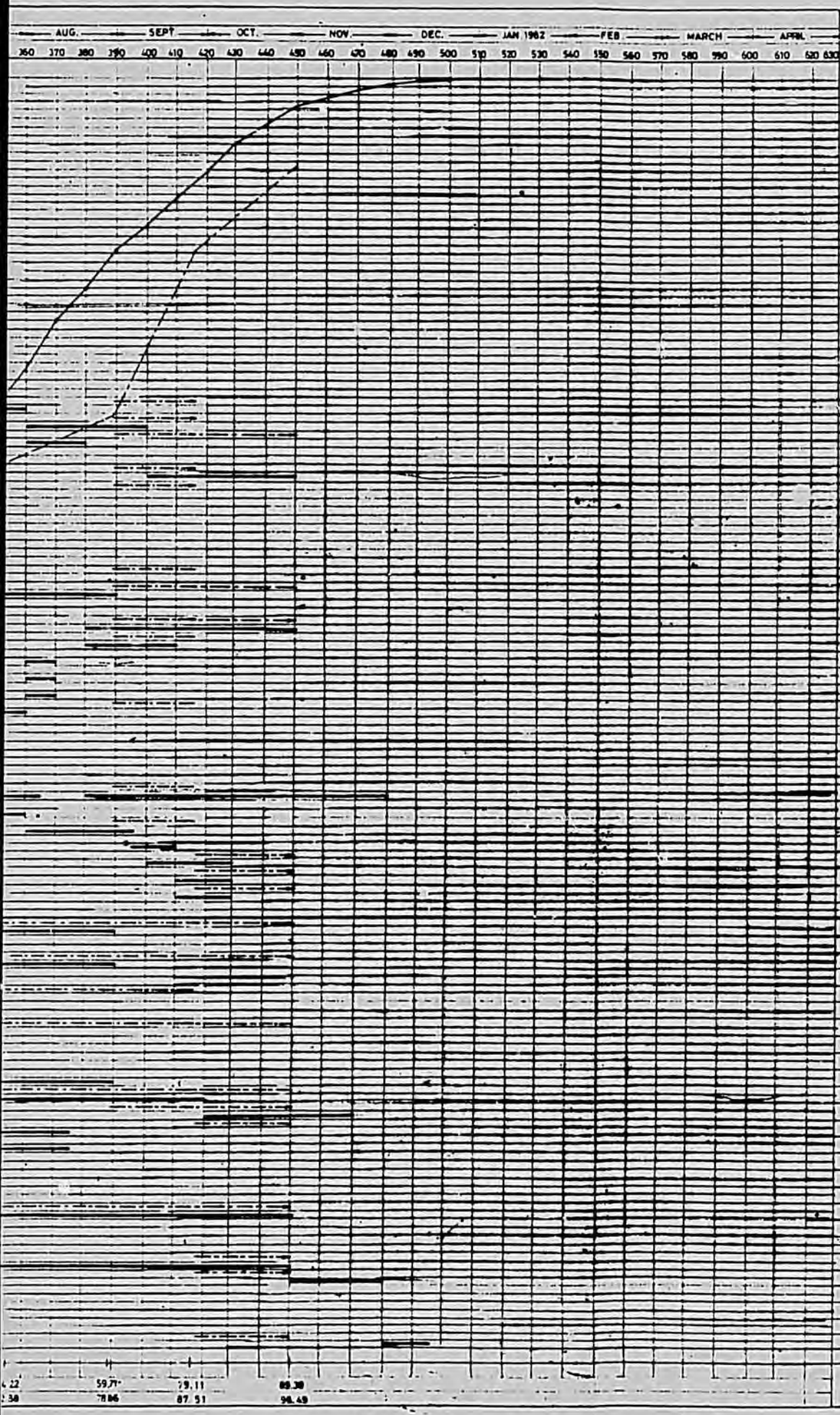
TIME SCHEDULE
UJUNG BERUNG ERECTION

(2)



CHEDULE
G ERECTION

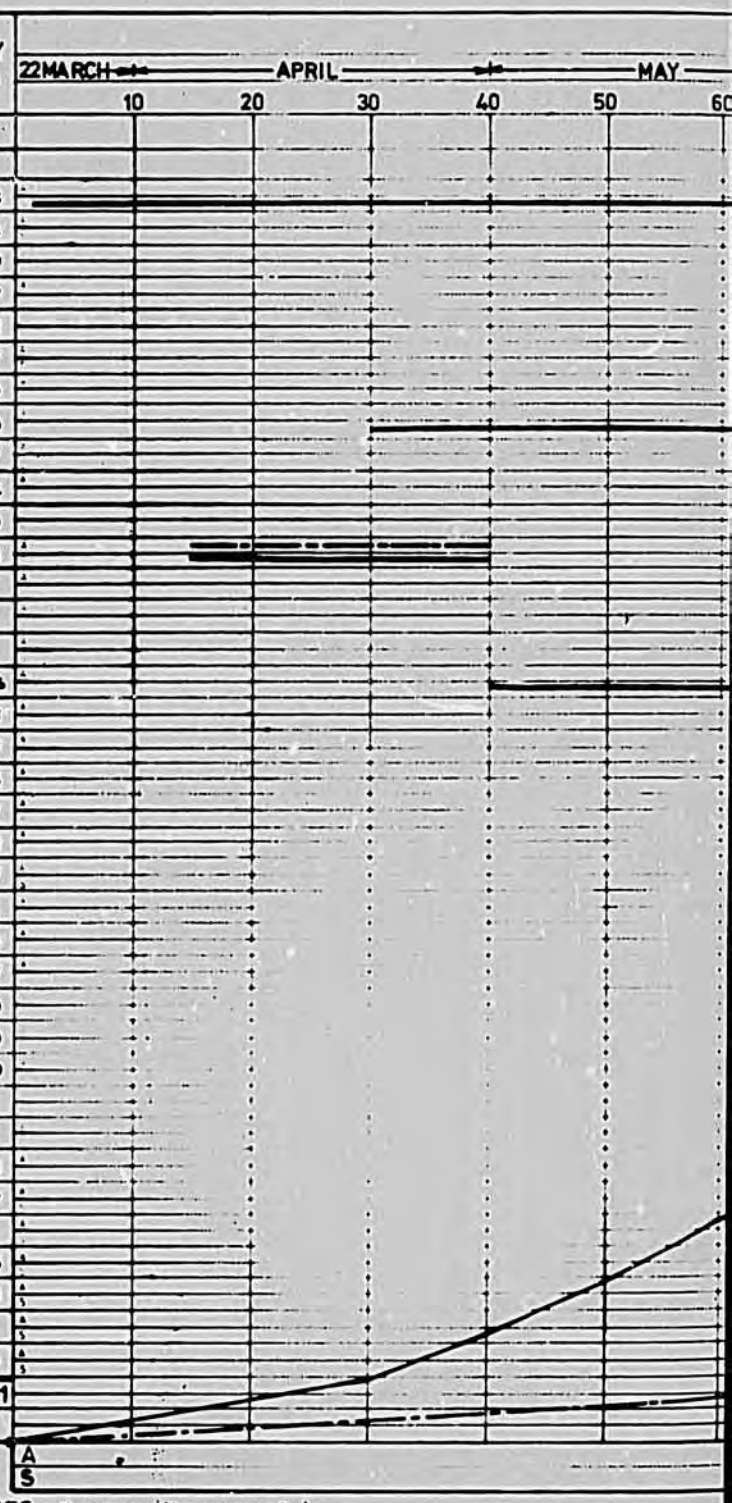
(3)



% OF COMPLETION	CONSTRUCTION PROGRESS TO DATE 10-31-61 UNIT ACTUAL QTY	%	SCHEDULED QTY	%	% OF TOTAL ACTUAL	SCHEDULED	NO.
100							
98							1
96	277	100	277	100	4.38	4.38	1.1
94	26	100	26	100	2.19	2.19	1.2
92	24	100	24	100	1.46	1.46	1.3
90	4	100	4	100	0.73	0.73	1.4
88	12	100	12	100	2.19	2.19	1.5
86	130	100	130	100	2.19	2.19	1.6
84	2	100	2	100	0.73	0.73	1.7
82	6	100	6	100	1.10	1.10	1.8
80	12	100	12	100	1.10	1.10	1.9
78	12	100	12	100	1.10	1.10	1.10
76	3	100	3	100	0.73	0.73	1.11
74	12	100	12	100	1.10	1.10	1.12
72	18	100	18	100	2.19	2.19	1.13
70	2	100	2	100	0.73	0.73	1.14
68	2	100	2	100	0.73	0.73	1.15
66							
64							
62							2.
60	483	98.77	489	100	2.53	2.55	2.1
58	554	25	[illegible]	100	2.73	4.79	2.2
56	1035	98.57	1050	100	3.96	4.02	2.3
54	231	100	231	100	0.91	0.91	2.4
52	138	250	[illegible]	100	2.72	3.29	2.5
50	361	95.25	379	100	1.35	1.46	2.6
48							
46							
44							
42							3.
40	26	100	26	100	1.68	1.68	3.1
38	26	100	26	100	2.56	2.56	3.2
36	16	100	16	100	1.46	1.46	3.3
34	12	75	16	100	1.92	2.56	3.4
32	2	100	2	100	1.10	1.10	3.5
30	20	100	20	100	1.46	1.46	3.6
28	18	100	18	100	0.91	0.91	3.7
26	6	100	6	100	0.91	0.91	3.8
24	10	100	10	100	2.56	2.56	3.9
22	17	100	17	100	0.77	0.77	3.10
20	12	100	12	100	0.37	0.37	3.11
18	3	100	3	100	0.37	0.37	3.12
16	6	100	6	100	1.46	1.46	3.13
14	18	100	12	73.91	4.20	3.10	3.14
12	0	0	1	100	0	0.73	3.15
10	2	100	2	100	1.28	1.28	3.16
8	0	0	1	100	0	0.55	3.17
6	2	50	4	100	0.55	1.10	3.18
4	2	50	4	100	0.37	0.73	3.19
2	1	33	3	100	0.24	0.73	3.20
0							
	96	96	100	100	2.19	2.19	4.
	83	83	100	100	1.82	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	8.1
	24	100	24	100	4.94	4.94	8.2
	74	74	60	60	1.35	1.10	8.3
	2	100	2	100	1.65	1.65	8.4
	7	100	7	100	1.65	1.65	8.5
	3188	94.15	3386	100	3.70	4.02	9
							10
	48	48	100	100	1.93	4.02	10.1
	24	24	0	0	0.26	0	10.2
	16	16	0	0	0.09	0	11
					89.38	96.49	

(1)

NO	WORK ITEM	UNIT	QTY %
1 0	CIVIL		
1 1	clearing & grubbing of site	5000M2	5.23
1 2	15cm crush stone	5000M2	2.92
1 3	road sub base	1	2.69
1 4	road top surface	1	3.27
[illegible]	yard drainage piping	300M	0.82
[illegible]	catch basin & dropinlets	10	0.27
1 7	chain link fence	1030M	6.16
[illegible]	drainage	900M	4.13
[illegible]	flume	1	0.37
[illegible]	bridge	1	0.22
[illegible]	walkway	1	0.10
[illegible]	CONSTRUCTION PLANT	6	0.58
3 0	FOUNDATION		
[illegible]	all but OCB & transf	428	28.36
[illegible]	150KV OCB	10	1.68
[illegible]	70 KV OCB	6	0.47
[illegible]	150 / 70KV transformer	1	0.34
3 5	150 / 70 KV trans oil containment pit	1	0.97
[illegible]	150 / 20 KV transformer	2	0.58
3 7	150 / 20 KV trans oil containment pit	2	1.07
[illegible]	grounding transformer	1	0.11
[illegible]	grounding resistor	3	0.20
[illegible]	firewall	3	1.17
3 11	cable trench	390M	7.59
[illegible]	20KV distribution trench	120M	0.29
[illegible]	concrete road colverts	10	0.89
3 14	retaining wall		
4 0	GND SYSTEM		
[illegible]	below ground system	100	3.40
[illegible]	above ground system	100	0.37
5 0	CONDUIT SYSTEM		
5 1	below ground conduit	100	1.46
[illegible]	above ground conduit	100	0.31
[illegible]	furnish material for yard lighting	100	4.21
[illegible]	furnish material for station service	100	4.86
	TOTAL		85.21



A : ACTUAL

S : SCHEDULE

ORIGINAL SCHEDULE (1)

REVISED SCHEDULE (2)

[illegible] ITEMS 100 % COMPLETED (TYP.)

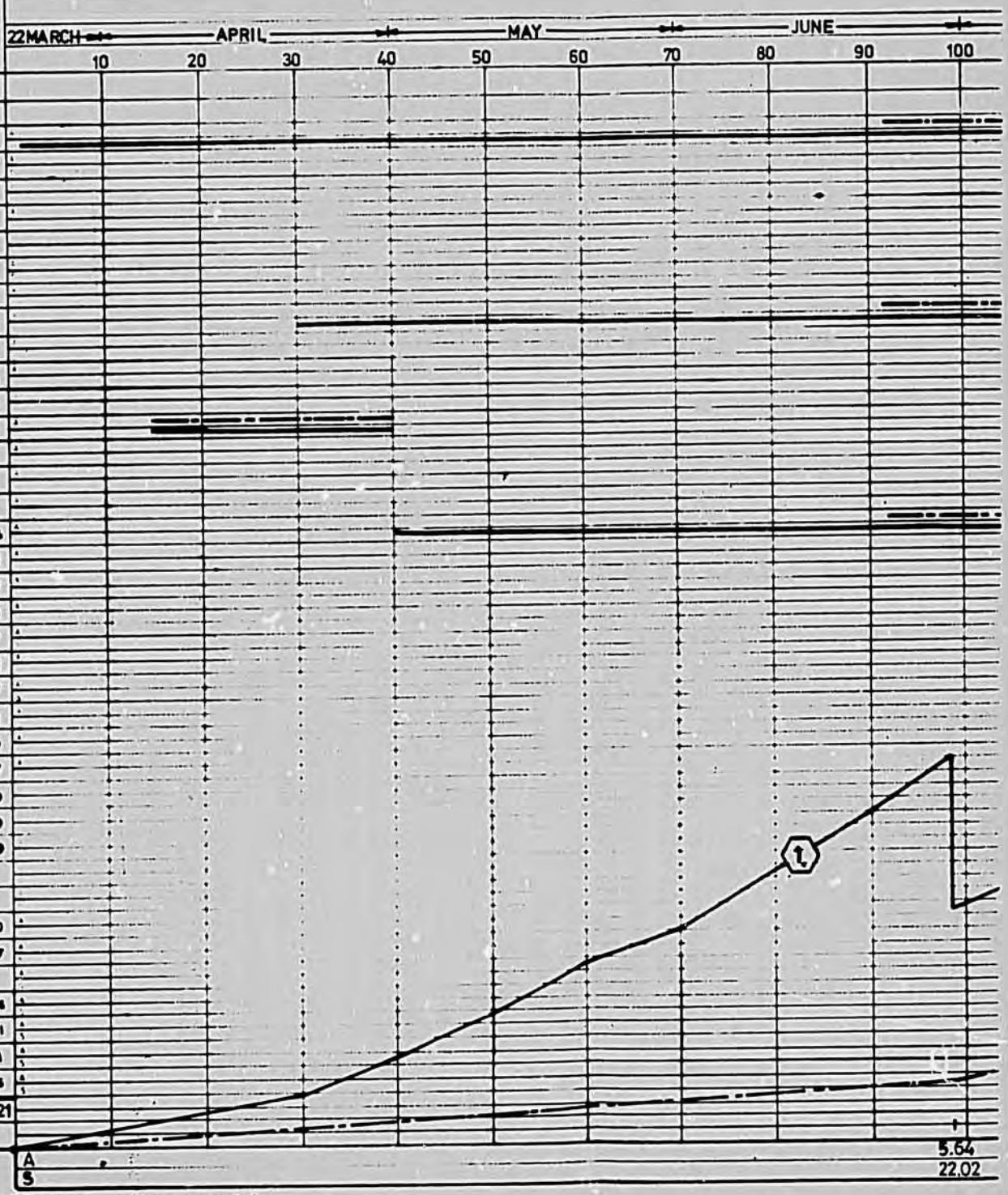
NOTES: the quantity percent is based on percent of cost of each function verse total cost

• work not started

— work not complete as of date under construction progress

(2)

RK ITEM	UNIT	QTY %
CIVIL		
& grubbing at site	5000M²	5.23
sh stone	5000M²	2.92
base	1	2.69
surface	1	3.27
inage piping	300M	0.82
sin & droplets	10	0.27
fence	1030M	6.16
	500M	4.13
	1	0.37
	1	0.22
	1	0.10
TRUCTION PLANT	8	0.58
OUNDATION		
t OCB & transf	428	28.96
CB	10	1.68
CB	6	0.47
V transformer	1	0.24
V trans oil containment pit	1	0.97
V transformer	2	0.58
V trans oil containment pit	2	1.07
g transformer	1	0.11
g resistor	3	0.20
	3	1.17
rench	390M	7.59
stribution trench	1.20M	0.29
road colverts	10	0.89
ng wall		
GND SYSTEM		
ground system	100	3.40
ground system	100	0.37
NDUIT SYSTEM		
ground conduit	100	1.46
ground conduit	100	0.31
material for yard lighting	100	4.21
material for station service	100	4.86
TOTAL		85.21



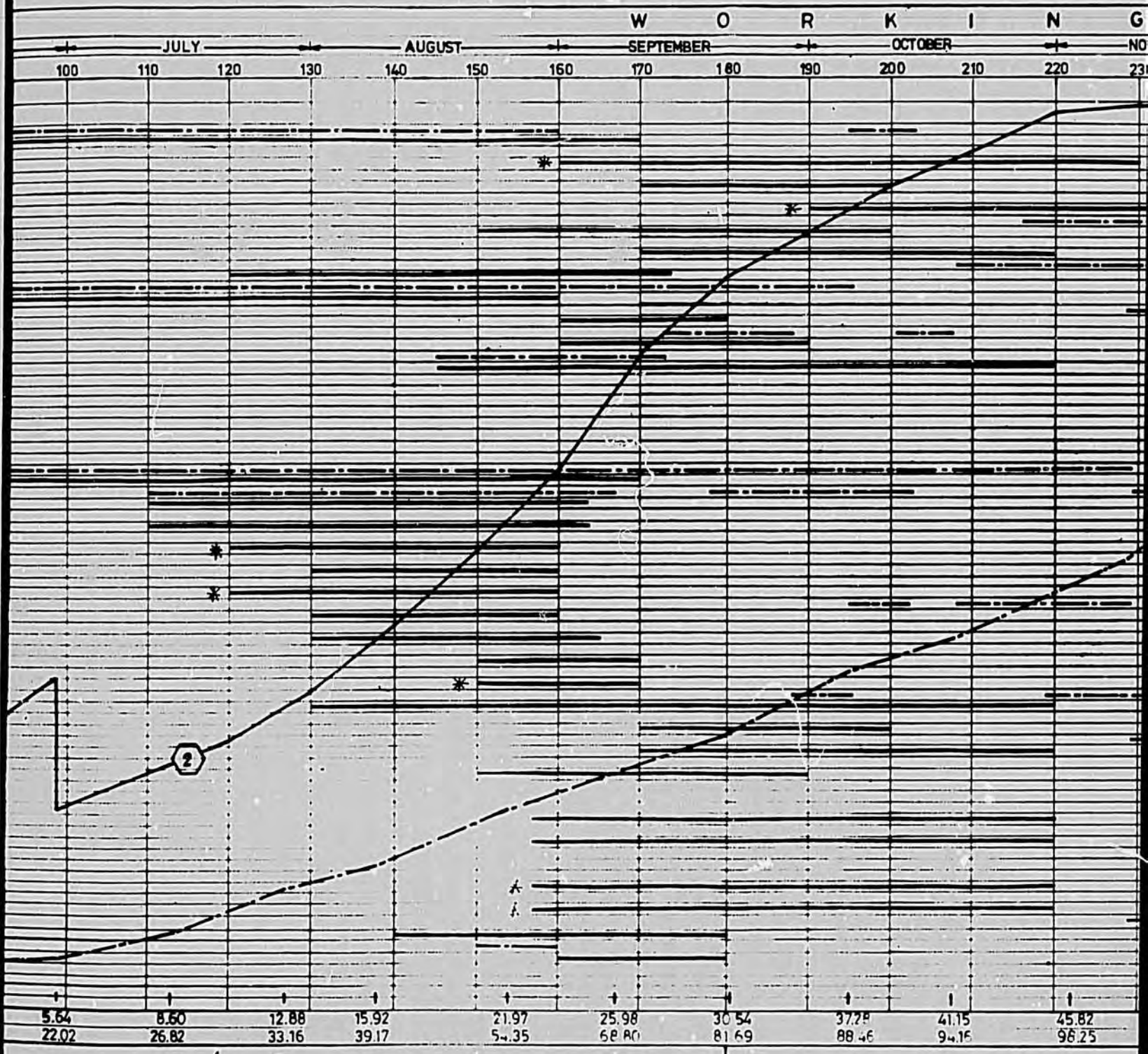
ACTUAL
SCHEDULE
SCHEDULE (1)
CHEDULE (2)
00 % COMPLETED (TYP.)

NOTES: the quantity percent is based on percent of cost of each function verse total cost

- work not started
- work not complete as of date under construction progress

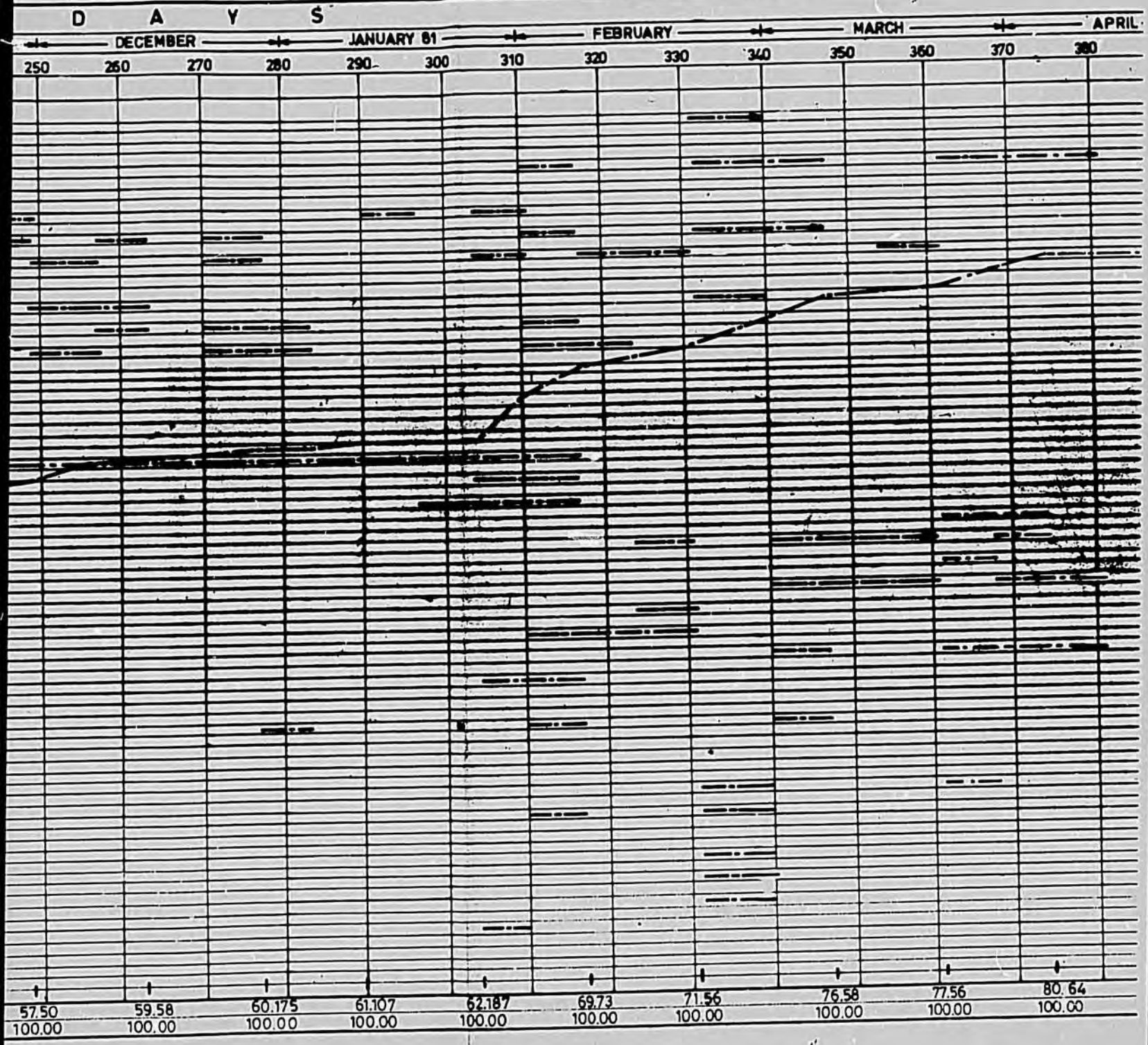
(3)

TIME SCHE
UJUNG · BERUNG S



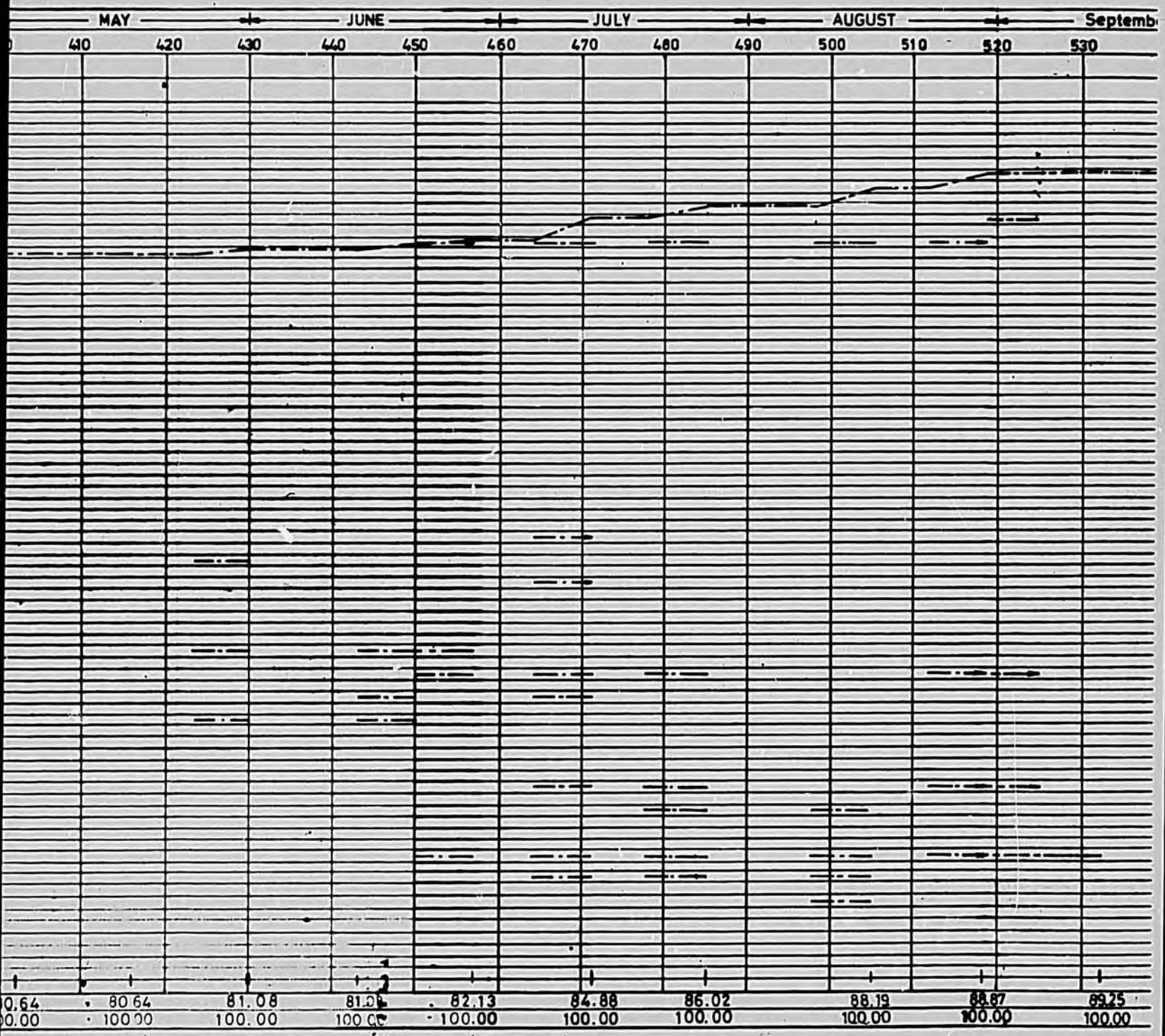
YARD

(4)

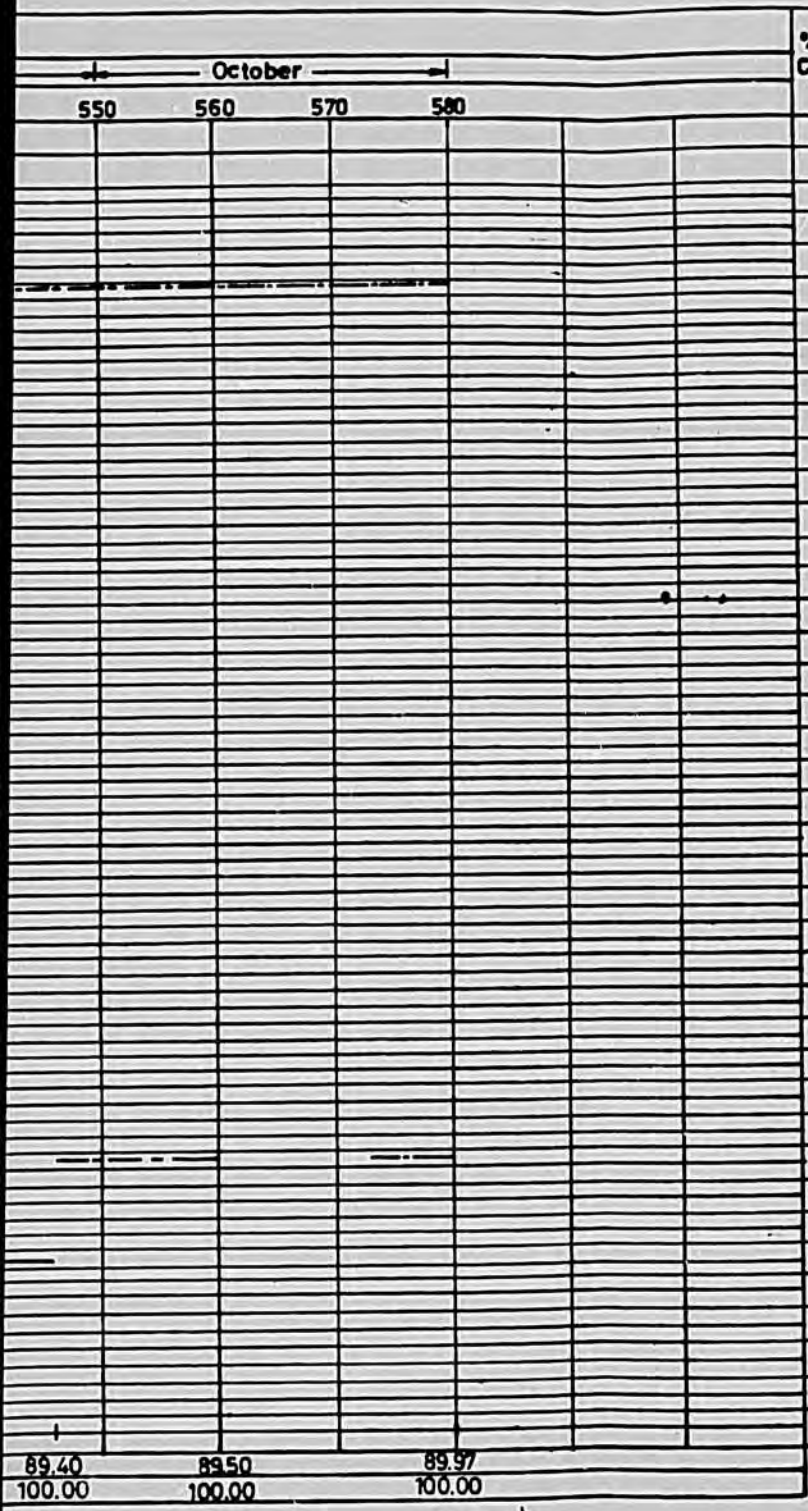


PLETION

(5)


MAY
JUNE
JULY
AUGUST
Septemb
410
420
430
440
450
460
470
480
490
500
510
520
530
0.64
80.64
81.08
82.13
84.88
86.02
88.19
88.87
89.25
0.00
100.00
100.00
100.00
100.00
100.00
100.00
100.00
100.00

(6)

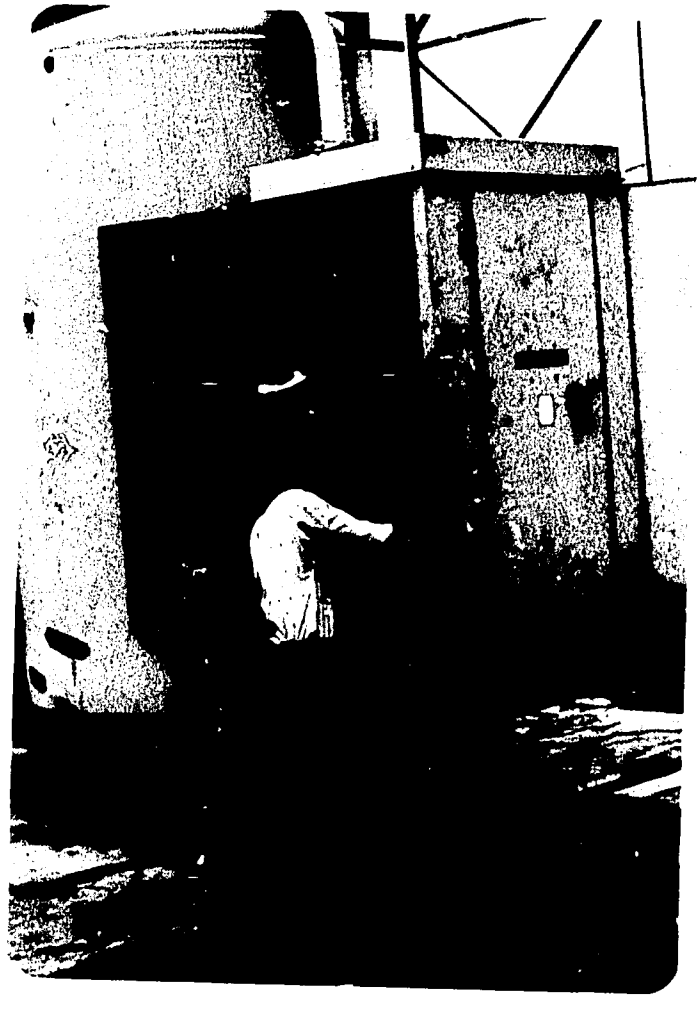


% OF COMPLETION	CONSTRUCTION PROGRESS TO DATE: 10-31-1981						NO.
	UNIT				% OF CONTRACT		
	ACTUAL		SCHEDULED		ACTUAL	SCHED.	
	QTY.	%	QTY.	%	%	%	
100							
97.5							1.
95	49000M²	98	50,000M²	100	5.13	5.23	1.1
92.5	0	0	50,000M²	100	0	2.92	1.2
90	0.40	40	1	100	1.8	2.69	1.3
87.5	0	0	1	100	0	3.27	1.4
85	306 M	100	306 M	100	0.82	0.82	1.5
82.5	10	100	10	100	0.27	0.27	1.6
80	990M	96	1030 M	100	5.94	6.18	1.7
77.5	500 M	100	500 M	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	8	100	8	100	0.58	0.58	2.
65							
62.5							
60							3.
57.5	428	100	428	100	28.56	28.56	3.1
55	10	100	10	100	1.68	1.68	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	0.98	98	1	100	0.95	0.97	3.5
45	2	100	2	100	0.58	0.58	3.6
42.5	1.98	99	2	100	1.06	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	370M	94.87	390 M	100	7.20	7.59	3.11
30	120 M	100	120 M	100	0.29	0.29	3.12
27.5	10	100	10	100	0.89	0.89	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	1.46	1.46	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	4.86	4.86	7.
2.5							
0					76.66	85.21	
			USING 100% AS BASE		89.97	100.00	

Jakarta , April 1980

P.T. ERSES
Contractor

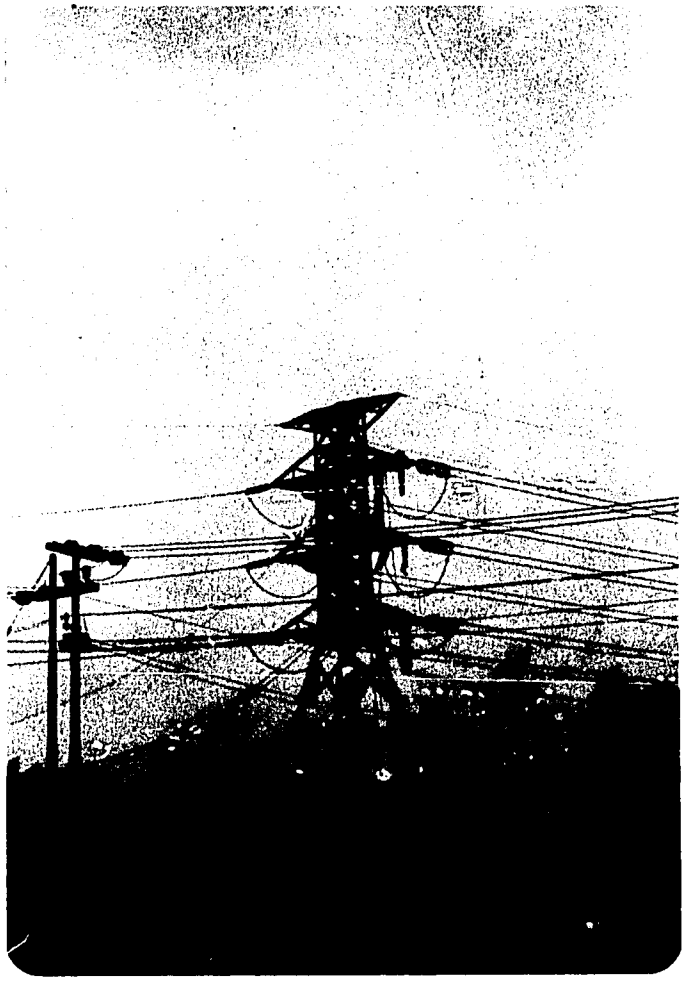
BANDUNG UTARA SUBSTATION



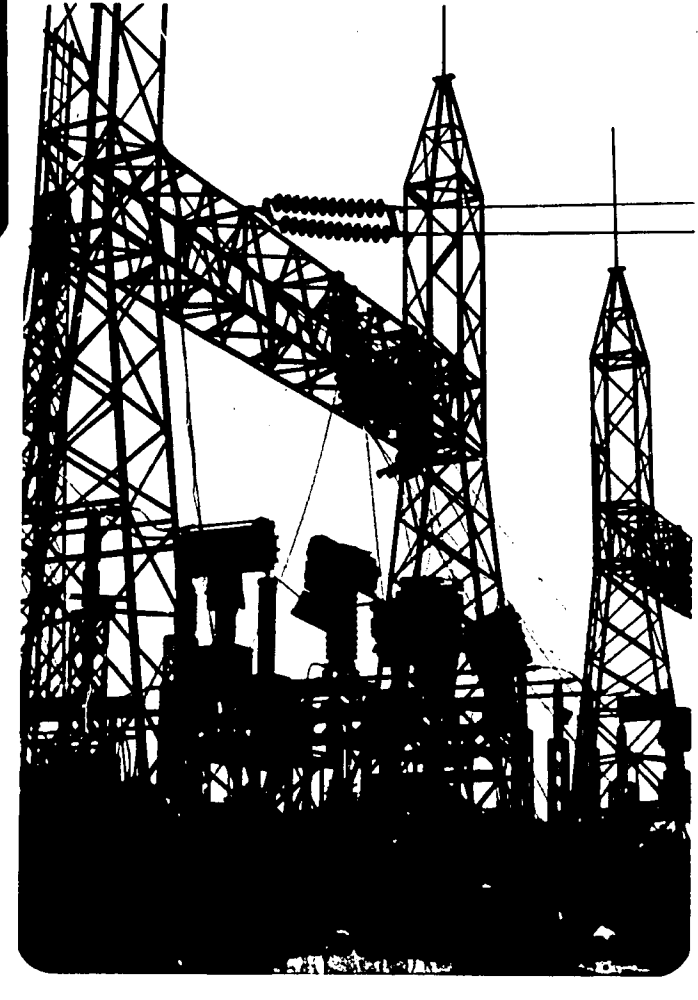
Connecting Control Cable to 150 KV OCB

Pulling Control Cable

UJUNGBERUNG SUBSTATION



Preparing to pull Slack Spans from Cigereleng Terminal Tower to Substation



Terminating Cigereleng Line

UJUNGBERUNG SUBSTATION

Installing Power Line Carrier
Communications Equipment

Testing Relays