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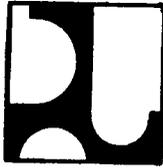
**REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL CIPTA KARYA
DIRECTORATE OF SANITARY ENGINEERING**

**CONTRACT FOR CONSULTANT SERVICES
FOR
SURAKARTA WATER SYSTEM
NO. 01/WS-S/1/AID/78**

MONTHLY PROGRESS

**REPORT NO. 28
JANUARY 1981**

**BURNS & McDONNELL ENGINEERING COMPANY.
AND
TRANS-ASIA ENGINEERING ASSOCIATES, INC.
A JOINT VENTURE**



**REPUBLIC OF INDONESIA
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A JOINT VENTURE**

BURNS & McDONNELL Engineering Co.

Architect - Engineers

A JOINT VENTURE

Consultants - Planners

TRANS-ASIA Engineering Associates, Inc.

Kotak Pos 105

Please Reply to. Surakarta, Indonesia.

063/BM/TAE/SKA/81
05 February 1981

Mr. Soesanto Mertodiningrat, Director,
Directorate of Sanitary Engineering,
Directorate General Cipta Karya
Jl. Pattimura 20
Jakarta Selatan.

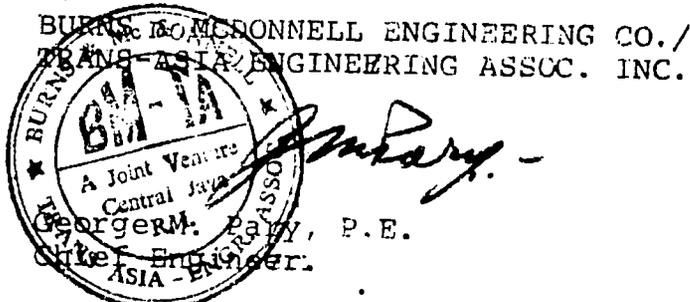
Subject: Contract for the Consultant Services for
Surakarta Water System No. 01/WS-S/I/AID/78
dated 28 October 1978.

Dear Sir:

In accordance with Section 4.12 and Appendix 1 of the
subject Contract, we are pleased to submit fifteen
copies of the Monthly Report No. 28 for the month of
January 1981.

We hope, that this report will meet with your approval.

Very truly yours,



cc: CJWSP	Semarang	(10 copies)
USAID	Jakarta	(8 ")
BM/TAE	Jakarta	(2 ")
Burns & McDonnell	Kansas City	(1 copy)
CJWSP-I	Surakarta	(1 ")
SWE	Surakarta	(1 ")
Mayor of Surakarta	Surakarta	(1 ")
File.		

Encl.
GMP/rd

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TABLE I
GENERAL

I-A NARRATIVE SUMMARY.

The transmission pipeline has undergone final testing and flushing during January 1981 and on the 27th the line was put into service. Some finishing work is still being performed, but this is expected to be completed in February. The completion of the transmission line is considered to be 96.6%.

The drilling and yield testing of wells TW-1 and TW-2 was completed and samples of water were sent to the University of Yogyakarta for chemical testing. The wells will be capped to await pumps and motor-generator.

O&M Specialist is continuing balancing of the supply to the city through valve manipulation. The proper balancing is difficult due to the poor condition of some of the old valves and many leaks throughout the city. Rehabilitation of the existing system has become imperative. The previous problems still have not be remedied. The full list of items needing immediate action is enclosed in O&M Specialist's Report in Appendix VII of this report.

The design of the secondary and tertiary has been completed. Some negligible adjustments may have to be done after computer balancing of the whole (old and new) system.

Site plans for public latrines have been completed, however no progress was made on public bathhouses.

Pre-bid meeting on the supply of PVC pipe for the new system was held on 7 January and bid opening on 24 January 1981. The bidding documents are now being evaluated by the Consultant. Valves for the system were ordered in January from the United States and should arrive on the site in April 1981.

The part of distribution system fully paid by Cipta Karya (12 km pipe, 1,100 house connections) is proceeding, however problems are developing with the house services contractor. These problems are fully described in Construction Specialist's Report, in Appendix IX of this Report.

I-B PROBLEMS AND PROPOSED SOLUTIONS.

The interpreter position at SWE still vacant and the Consultant must use part time the Material Coordinator as interpreter in order to achieve progress in O&M department.

The problem which has now developed is the poor condition of the looping distribution main built two years ago. Considerable repairs and insertion of fittings are required, before the pipe can be put in service. CJWSP has promised to commence the repairs on priority basis, however to date no work has been started.

SECTION II
ADMINISTRATION

II-A SUBMISSIONS/APPROVALS

Consultant's Invoice No. 27 December 1980 U.S. Dollar reimbursible expenses was submitted to Cipta Karya on 20 January 1981 and was approved by CK on 24 January 1981 Consultant's Rupiah Invoice No. 12 submitted to Cipta Karya on 22 December 1980 was approved on 24 December 1980 and was paid on 30 December 1980. These submittals are in accordance with the Contract Appendix II, page II-15.

II-B CONTRACT STATUS

Appendix I shows the continuation of Consultant's effort in man-months from the beginning of the Contract.

Appendix II shows the billings of approved expenditures to date.

II-C PERSONNEL.

The Surakarta Office personnel in January were as follows :

Expatriates

- George M. Pary, P.E., Chief Engineer
arrived 17 August 1979
- James F. Baucom, Pipeline Engineer
arrived 26 September 1979
- Albert G. Ringler, O&M Specialist
arrived 9 May 1980
- Jerry E. Bragdon, Water Distribution Engineer
arrived 8 June 1980
- William L. Lee, Well Drilling Specialist
arrived 8 June 1980
- Emmett F. Lowry, Management Specialist
arrived 27 January 1981

Indonesian Professional and Technical :

- A.F. Dengah, Counterpart Chief Engineer
arrived 8 November 1978
- Sutjipto, Hydrogeologist Counterpart
arrived 1 October 1980
- Mohamad Khalil, Materials Coordinator
arrived 9 October 1978
- Mohamad Syarif Lembah, Chief Inspector
arrived 1 May 1979
- Gatot Bramono, Inspector
arrived 19 November 1979
- Soewanto, Inspector
arrived 11 March 1980

- Slamet Riyanto, Inspector
transferred to Design - 19 November 1980
arrived 7 July 1980
- Suyono, Inspector
arrived 17 November 1980
- Susena, Draftsman
arrived 20 October 1980
- Sumardi, Translator
hired 24 November 1980
- Jonathan Jowie, Accountant
laid-off 31 January 1981

Administrative:

- Dradjat Atmardjo, Office Manager
arrived 2 October 1978
- Haryani Pudiastuti, Secretary
hired 17 November 1980
- Endang Tri Siwi, Typist
hired, 1 December 1980
- Rubyo, Clerk
hired 1 November 1979
- Chaiz Hidayati, Administrative Clerk
hired 8 October 1979
- Pramudji Rahardjo, Driver
hired 2 October 1978

- Soedarno, Driver
hired 1 December 1979
- Sutrisno, Driver
hired 2 April 1979
- Heru Soewarto, Driver
laid-off 31 January 1981
- Suharman, Driver
hired 8 September 1980
- Puranto, Driver
hired 17 October 1980
- Djumhan Hardi, Expeditor/Labor
laid-off 31 January 1981
- Endang Tri Siwi, D.M., Receptionist/Labor
promoted to Typist position
- Suwarno Hadi, Office Boy / Labor
laid-off 31 January 1981
- Mulyatmono, Watchman/Labor
hired 9 October 1978
- E.M. Suprpto, Field Assistance/Labor
laid-off 31 January 1981
- Memed Barmawi, Copy Machine Operator/Labor
hired 23 June 1980
- Tukino, Office Boy/Labor
hired 10 November 1980

SURVEY AND DESIGN. (all personnel terminated as of
31 January 1981).

Professional and Technical:

- Abdul Kadir, Design Engineer
arrived 1 August 1980
- Budiman Sinaga, Sr., Surveyor
hired 2 August 1980
- Slamet Riyanto, Cost Estimator
hired 2 August 1980
- Harry Triyanto, Surveyor
hired 1 August 1980
- Hadi Harsanto, Instrumentman
hired 1 August 1980
- Wardoyo, Draftsman
hired 1 August 1980
- Marry Suyatno, Draftsman
hired 1 August 1980
- Bb. Eddy Harsono, Draftsman
hired 1 December 1980

Local Support:

- Hermani Guntur, Secretary
hired 1 August 1980
- Tiny S. Kartono, Typist
hired 4 December 1980

- Sundaru Nindyatmoko, Driver
hired 1 November 1980

- Suhadi, Driver
hired 1 November 1980

- Soehar, Driver
hired 1 November 1980

- Darwin Sudibyoy, Rodman/Chainman
hired 2 August 1980
promoted to Draftsman, as of 1 Dec. 1980

- Sutedjo, Rodman/Chainman
hired 4 November 1980

- Ciepta S., Clerk
hired 6 August 1980

- Suharman, Office Boy
hired 1 August 1980

- Nanang Sukaryuki, Labor
hired 6 November 1980

SECTION III
ENGINEERING AND MANAGEMENT

III-A OFF-SHORE PURCHASED MATERIALS.

III-A-1 American Cast Iron Pipe Company.

The Consultant certified fulfillment of the contract on 1 February 1980.

III-A-2 Colcorindo Raya.

The Consultant certified fulfillment of the contract on 7 April 1980.

III-A-3 Rohan Company.

Missing and damaged materials from previous shipments have been shipped from Rohan on 8 August 1980. They arrived in Semarang. The formal documents have been processed by the importer and sent to Cipta Karya. The Consultant has requested Cipta Karya to expedite formalities.

III-A-4 Clow Corporation.

The package with missing and damaged materials has been shipped on the 20th of June. This shipment arrived in Semarang on 1 September. Formal documents have been processed by the importer and sent to Cipta Karya. The Consultant has requested Cipta Karya to expedite formalities.

III-A-5 Ford Meter Box Company.

All ordered equipment has arrived on the jobsite. The Consultant has certified the

the fulfillment of the Contract by letter to Cipta Karya dated 14 January 1981.

III-B CONSTRUCTION OF TRANSMISSION PIPELINE.

The contractors have basically completed the transmission pipeline and it has been put in service on 27 January 1981. The remaining work, mostly clean-up and surface reconstruction work continue, as well as painting the pipe gallery in the Kartasura reservoir.

The total completion of the project is considered to be 97%. Full report of the Construction Specialist will be found in Appendix V of this report.

III-C GROUNDWATER EXPLORATION AND WELL DEVELOPMENT PROGRAM.

Well drilling, developing and testing for yield has been completed. The wells have been capped in expectation of pumps and motor-generators.

The yield, on a continuous pumping basis has been calculated to be 65 liters per second, each well. Full report of the Drilling Specialist will be found in Appendix VI of this report.

III-D MANAGEMENT ASSISTANCE PROGRAM.

No action this month.

III-E O & M ASSISTANCE PROGRAM.

The main work of the O&M Specialist at the present time is to balance the now ample supply of water to the city, so that as large as possible number of customers may be served. However, the problem of unchecked leaks continues, compounded by the unreliability of the old valves, and incomplete condition of the mains built in 1978 and 1979. Full report of the O&M Specialist will be found in Appendix VII of this report.

III-F METER REPAIR TRAINING PROGRAM.

No action this month.

III-G NEW WATER DISTRIBUTION NET DESIGN.

Construction drawings for the three phases of secondary and tertiary distribution system have been completed. Cipta Karya approval is expected soon.

Survey and construction plans for Public Hydrants, Yard Hydrants and Water Services have been completed.

Procurement of materials has considerably forged ahead. On 24 January bids were opened for the supply of pipe and fittings. These bids are now being evaluated by the Consultant. In addition, the Consultant will inspect physical facilities of bidders, to check their ability to provide both, quality and quantity as specified.

Valves for the secondary and tertiary distribution system have been ordered from the United States. Delivery is expected early in April 1981.

Full report of the Design Specialist will be found in Appendix VIII of this report.

III-H DISTRIBUTION SYSTEM CONSTRUCTION.

Neither of the contractors has completed their work as per contract (28 January 1981) however CJWSP decided to give the contractors any extension they require.

The distribution piping contract is 98.7% completed, however house connections and hydrant contract is only 10.5% completed.

Some of the work was done contrary to the Specifications, however the CJWSP has decided to accept this work, provided, that in the future the contractor follows the specifications.

Full report of the Construction Specialist will be found in Appendix IX of this report.

III-J HYDROGEOLOGY REPORT.

No report this month, due to the fact, that the Consultant is awaiting well tests to be performed by the drilling contractor, before the report can be finalized.

III-K CONFERENCES.

A progress conference was held on 21 January 1981. Full report will be found in Appendix X of this report.

III-L ACTIVITIES PLANNED FOR NEXT MONTH.

Complete the transmission pipeline remaining details.
Continue the O&M program and start actual repairs.
Continue finalizing new bath house design.
Complete research on hydrogeology of the area and prepare recommendations on the exploitation of the new wells.

SURAKARTA WATER PROJECT
REPORT OF MAN-MONTHS EXPENDED BY CONSULTANT
BURNS & McDONNELL/TRANS-ASIA ENGINEERING ASSOCIATES

CONTRACT NUMBER OI/WS-S/AID/78 AID LOAN 497-U-044	MAN - MONTHS			
	FOR January 1981	CUMULATIVE THROUGH January 1981	% OF TOTAL SCHEDULE	TOTAL IN CONTRACT SCHEDULE
EXPATRIATES				
PROCUREMENT ENG.	0	6.5	44.8	14.5
CHIEF ENGINEER	1	24.5	81.6	30
PIPELINE ENG. (TRANS)	1	16.1	73.2	22
LIAISON OFFICER	0.09	3.33	60.5	5.5
PRINCIPAL	0.26	0.71	35.8	2
HYDROGEOLOGIST	1	9.1	75.8	12
DRILLING SPECIALIST	1	10.5	87.5	12
O & M SPECIALIST	1	24.4	89.1	27.5
METER SPECIALIST	0	8	100	8
MANAGEMENT SPECIALIST	0.3	19.2	91.4	21
SPECIALIST	0	0	0	3
PIPELINE ENG. (DIST.)	1	7.7	64.1	12
EXPATRIATE TOTAL	6.65	129.35	76.3	169.5
INDONESIAN PROFESSIONAL & TECHNICAL				
COUNTERPART CHIEF ENGINEER	1	26.6	80.6	33
CONSTRUCTION SUPERVISOR	1	6.9	49.2	14
HYDROGEOLOGIST	0.9	18.7	71.9	26
MATERIALS COORDINATOR	1	28	82.3	34
INSPECTORS	4	82.4	114.4	72
DRAFTSMAN	1	23.6	69.4	34
ACCOUNTANT	1	27	84.3	32
TECHNICAL TRANSLATOR	1	14	77.7	18
INDON PROF. & TECH.	10.9	226.2	86.0	263

I-A

INDONESIAN ADMINISTRATIVE

OFFICE MANAGER	1	28	82.3	34
SECRETARY	1	26.6	78.2	34
TYPIST	1	17.3	44.3	39
CLERKS	3	85.4	115.4	74
DRIVER	6	103.3	64.5	160
LABORERS	8	145.2	59.5	244
ADMINISTRATIVE TOTAL	20.0	405.8	69.3	585

INDONESIAN STAFF FOR DISTR. SYSTEM DESIGN AND SUPERVISION

INDONESIAN PROFESSIONAL & TECHNICAL

DESIGN ENGINEER	1	6	75	8
SPEC./COST ESTIMATOR	1	2.5	83.3	3
CONSTRUCTION SUPV.	0	0	0	8
SR. SURVEYOR/PLOTTER	1	5.4	108	5
SURVEYOR	0	5	100	5
INSTRUMENTMAN	1	6.3	126	5
INSPECTORS	0	0	0	32
DRAFTSMEN	3	15.4	85.5	18
INDON. PROF. & TECH.	7.0	40.6	48.3	84

INDONESIAN ADMINISTRATIVE

SECRETARY (BI-LINGUAL)	1	6	100	6
TYPIST	1	5.9	49.1	12
DRIVER	2	11.8	45.3	26
RODMEN/CHAINMEN	1	13.8	138	10
ADMINISTRATIVE TOTAL	5.0	37.5	69.4	54

I-8

II - A

SUPPLEMENTARY
REPORT OF LI
BURNS & McDONNELL/TRA

CONTRACT NO. OI/WS-S/AID/78 SIGNED 26 OCT. 1976 START 1 JAN. 1978 END 31 JAN. 1981 REIMBURSABLE EXPENDITURES	COSTS FOR	CUMULATIVE COSTS THROUGH	
	January - 1981	AMOUNT	% OF TOTAL BUDGET ESTIMATE
USD			
Salaries and Related Costs	34,708.72	766,382.75	81.7
Transportation	4,062.50	52,148.49	48.2
Equipment	-	2,496.14	0.4
Miscellaneous	-	48,407.17	83.2
Training	-	-	-
Contingencies	-	5,569.10	3.1
TOTAL DOLLARS	38,148.49	874,380.92	45.1
INDONESIAN			
Salaries	9,717,333	119,338,632	68.5
Transportation	3,211,900	51,719,232	73.6
Housing	-	50,025,000	102.1
Vehicle Costs	875,000	34,526,472	80.0
Equipment Costs	-	23,110,860	95.2
Miscellaneous	310,345	63,969,030	89.2
Contingencies	-	19,416,960	44.9
TOTAL RUPIAH	14,114,578	362,106,186	76.1

II-B

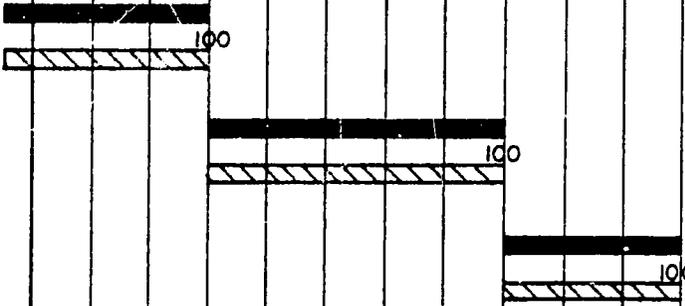
WATER PROJECT
 EXPERIMENTAL COSTS
 S-ASIA ENGINEERING ASSOCI.

CUMULATIVE PAYMENTS THROUGH			TOTAL BUDGET ESTIMATE FOR CONTRACT
AMOUNT RECEIVED IN January - 1981	TOTAL AMOUNT RECEIVED THROUGH January - 1981	% OF TOTAL BUDGET ESTIMATE	
DOLLARS			
42,699.67	731,674.03	78.0	937,533
1,572.78	48,085.99	44.4	108,108
936.54	2,496.14	0.4	641,500
-	48,407.17	83.2	58,131
-	-	-	14,544
-	5,569.10	3.1	175,982
45,237.84	836,232.43	43.2	1,935,798
INDONESIAN RUPIAH			
4,470,999	73,614,965	42.3	174,029,000
-	30,338,826	43.2	70,257,600
6,150,000	50,025,000	102.1	48,975,000
605,000	30,166,472	69.9	43,140,000
-	19,733,935	81.3	24,253,000
14,765	28,765,970	40.1	71,710,000
-	19,416,960	44.9	43,236,460
11,240,764	252,062,128	53.0	475,601,060

III - 1

**SURAKARTA
SCHEDULE
PERCENT COMPLETED**

	ORIGINAL CONTRACT													
	1978			1979										
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
CHIEF ENGINEER														
GENERAL COORDINATION AND ENGINEERING & MANAGEMENT ASSISTANCE														
O & M SPECIALIST														
REVIEW EXIST. O & M STANDARDS & CONDITION OF DISTRIB. SYSTEM														
PREPARE O&M MANUAL & PLAN FOR REHAB. OF EXIST. SYSTEM														
PREPARE O&M TRAINING MANUAL														
FORMAL CLASSROOM TRAINING														
END PHASE I. PREPARE REPORT														
CONDUCT LEAKAGE DETECTION AND DEVELOP REHABILITATION PLAN														
SET UP WAREHOUSING & RECOMMEND ADDITIONAL O&M EQUIPMENT														
OFFSHORE EQUIPMENT PROCUREMENT														
SET UP O&M SHOP														
SUPERVISE REHAB. OF EXIST. DISTR. SYSTEM														
WRITE FINAL REPORT AND CERTIFICATION														
* POSITION ELIMINATED BY INSTRUCTION OF USAID														



IV-1

SURAKARTA
EXPATRIATE ST

ORIGINAL CONTRACT

	1978			1979											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	
LIAISON OFFICER *	[Hatched bar]														
PRINCIPAL *	[Hatched bar]														
OFF-SHORE PROCUREMENT ENGR. *	[Hatched bar]														
CHIEF ENGINEER	[Hatched bar]														
PIPELINE CONSTR. SPECIALIST															[Hatched bar]
O & M SPECIALIST				[Hatched bar]											
DISTRIBUTION DESIGN ENGR.															
HYDROGEOLOGIST		[Hatched bar]													
WELL DRILLING SPECIALIST								[Hatched bar]							
METER SPECIALIST														[Hatched bar]	
MANAGEMENT SPECIALIST		[Hatched bar]													
SPECIALIST															
* NOT A FULL-TIME ENGAGEMENT-AVAILABILITY AS REQUIRED															

PHASE I

SURAKARTA WATER PROJECT
TRANSMISSION MAIN
MONTHLY PROGRESS REPORT NO.16
02 FEBRUARY 1981

During the month of January 1981 the pipeline was tested, cleaned and flushed from the crosstie at Station 191+ 50 through to the crosstie at Station 271+ 40. On 27 January 1981 the new transmission main was put into service. The Section D contractor continues making corrections to his work on the crosstie immediately in front of the Jebres Reservoir. It will be sometime in February before those corrections are completed and all other connections to the distribution system can be checked out for permanent use.

All permanent air vent assemblies were installed throughout the system and placed into operation. The Section D contractor's personnel was using the air vent at Station 254+ 85 to obtain testing water for the last section. In the process of doing that, they literally destroyed one of the new globe shut off valves under one of the air vents. As there are no replacements for such valves that dual unit was reduced to a single air vent.

The Section C contractor has painted the interior and exterior walls of the Kartasura reservoir pipe gallery less windowframes, doors and trim. He has not followed the approved specifications contained in the Consultant's letter dated 02 July 1980 therefore the piping within the pipe gallery has not been painted. Correction of backfill and other deficiencies within Sections A and C are continuing by the same contractor. He has installed the retaining wall at the Wonosobo River and started installing the ϕ 450 mm replacement piping north of the Kartasura reservoir parallel to the old main adjacent to the military complex.

With consideration of completion of all items of work, the total percent complete as of this report is projected to be 96,87 %.

WELL DRILLING
FINAL REPORT

- A. INTRODUCTION
- B. HISTORY OF DRILLING ACTIVITIES
 - A. DRILLING SPECIALIST
 - B. PRE - CONSTRUCTION
 - C. CONSTRUCTION OF WELL TW - 1
 - C.1. Drilling
 - C.2. Placement of Casing and Screen
 - C.3. Gravel Packing and Development
 - D. CONSTRUCTION OF WELL TW - 2
 - D.1. Drilling
 - D.2. Placement of Casing and Screen
 - D.3. Gravel Packing and Development
 - E. WELL TESTING
 - E.1. Well Testing TW - 1
 - E.2. Well Testing TW - 2
- C. CONCLUSIONS
- D. RECOMMENDATIONS
- E. APPENDIX
 - 5.1.1 Diagram ; Well Construction ; TW - 1
 - 5.1.2 Diagram ; Well Construction ; TW - 2
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 - 5.1.4 Diagram ; Lithological Log ; TW - 2
 - 5.1.5 Plot of Drawdown Test Data ; TW - 1
 - 5.1.6 Plot of Drawdown Test Data ; TW - 2
 - 5.1.7 Graph of Relation of drawdown to Yield ; TW - 1
 - 5.1.8 Graph of Relation of drawdown to Yield ; TW - 2
 - 5.1.9 Graph of Contractors Construction Progress for:
TW - 1 and TW - 2
 - 5.1.10 Area Map of TW - 1 Location
 - 5.1.11 Area Map of TW - 2 Location
 - 5.1.12 Chemical Analysis of Water : TW - 1
 - 5.1.13 Chemical Analysis of Water : TW - 2

A

INTRODUCTION

The purpose of this report is to present the history of activities which occurred during the construction and testing of two Test - Production wells (TW-1 and TW-2), in the immediate vicinity of the city of Surakarta, Central Java.

The two wells are primarily a test program to verify previous studies on ground water availability for the area concerned but will be utilized as production wells to provide additional required water to Surakarta and environs.

This report will cover the scope of Drilling, Logging Samples, E - Logging, Gravel Packing, Development, and Pump Testing of wells TW-1 and TW-2.

The conclusions and recommendations made are the result of careful observation of the construction and testing as performed by the contractor.

|

B

HISTORY OF ACTIVITIES

A. DRILLING SPECIALIST :

A Drilling Specialist was provided by the Consultant, Burns & McDonnell/Trans-Asia Engineers, to monitor the construction and testing of wells TW-1 and TW-2, and to advise the project and contractor of correct procedures.

B. PRE - CONSTRUCTION :

A briefing was given by Mr. Krisno, Project Manager, CJWSP, in Semarang on June 10, 1980 concerning the drilling project and Mr. Krisno gave a tentative date of June 29, 1980 as the start-up date. There was a delay however and the formal start-up date was indefinite. The Pre-Construction meeting was held in Surakarta at the Consultant's office on July 7, 1980 and the contractor, P.T. City Cipta indicated that the equipment would be on sites TW-1 and TW-2 no later than July 28, 1980. The pre-construction meeting was productive in that several minor technical errors in the specifications were corrected and agreed upon. However, it was apparent at the meeting that the capability of the contractor's staff and crew and his equipment was doubtful. During the period between July 7, 1980 and July 30, 1980 there were several meetings between the Drilling Specialist and contractor's technical assistant. These meetings were utilized to advise the contractor on the use of drilling mud, sample taking and use of drill logs and other reports. The contractor presented a schedule of construction to the consultant giving 5 October 1980 as the completion date for both, TW-1 and TW-2. On July 30, 1980

drilling equipment was being brought onto both sites TW-1 and TW-2. Problems began immediately. The equipment to be used to drill well TW-1 was inspected and found to be incapable of doing the job as specified due to limitations of weight handling capacity. The consultant immediately advised the contractor, the Project and Cipta Karya. The next problem at TW-1 was the arrival of tools and materials. These arrived at various times over a period of 48 days before enough tools and material were on site to begin drilling.

The same basic problems were encountered at the site of TW-2. Delivery of tools and materials and equipment set-up required 25 days. Inspection of the equipment at TW-2 found the equipment in very poor mechanical condition and tooled wrong to drill the formations expected. The contractor's representative was advised of the problems he would encounter unless he used the proper tools. The contractor chose however to proceed with his own methods.

C. CONSTRUCTION OF WELL TW-1 :

C.1. DRILLING

The drilling of well TW-1 began on 18 September 1980. The contractor requested permission to first drill on 8 inch pilot hole stating that the machine could not drill an 18 inch hole in one pass. Permission to drill the pilot hole was granted and drilling commenced.

Well TW-1 was drilled by the rotary method using Bentonite clay as a drilling fluid. Experiencing many inefficient wells in the past years, Cipta Karya expressed strongly their desire for proper control of the drilling fluid. The Consultant purchased a drilling fluid balance and viscosity

kit and after instruction by the Drilling Specialist the kit was loaned to the drilling crew to use as instructed. Constant monitoring by the Drilling Specialist kept the drilling fluid within acceptable limits during the drilling process. Lacking experience using bentonite, the drilling crew had a tendency to use heavy, thick mud and constant advice had to be given to thin down the fluid.

The 8 inch pilot hole was drilled to 170 - meter depth on September 24, 1980. On 27 September, 1980 the engineer from the contractor arrived and ran the E - log on the well. The E - log was plotted and presented to the Consultant for study. Reaming of the 8 inch pilot hole to 12 inches started on 27 September 1980 and was completed on 30 September 1980. The contractor did not have an 18 inch reaming bit so the Drilling Specialist presented him with a drawing and advice on how to build one. The contractor altered the design and delivered the reamer to the site of TW-1 on 9 October 1980. The contractor was advised by the Drilling Specialist that the reamer was not satisfactory since it was poorly constructed and made from soft iron. The contractor instructed the crew to proceed with reaming using this tool and on 10 October 1980 reaming to 18 inches began. On 14 October 1980 the reamer reached 169 meters depth and was removed from the hole. The reaming bit had lost 5 inches of its diameter which caused a tapered, undersized borehole. A new reaming bit was built as advised by the Drilling Specialist and reaming again was started on 16 October 1980 and was completed on 18 October 1980 to a full 18 inches diameter and 169 - meter depth.

C.2. SETTING CASING AND SCREEN (TW-1)

Upon completion of drilling and reaming of the

borehole the contractor was again advised to secure the services of a crane to be used to set the casing as he had agreed to do at previous progress meetings. The capability of the drilling machine was not sufficient for the weights to be hoisted. The contractor chose to try and set the casing and screens using the drilling machine. The consultant presented the contractor with drawings of the design for placement of screens and casing as was determined from the E - Log and well samples. (See Appendix 5.1.1)

20 October 1980 the crew was prepared and started setting casing and screen. At 03:30 a.m. on 21 October 1980 the hoist tower of the drill machine collapsed, as predicted by the Consultant, under a load of 8200 kg. The Project and the contractor were advised to immediately hire a crane and continue to set the casing and screen or remove the casing and screen already installed before caving of the borehole would cause sands and clays to "lock" the casing in the hole. The contractor was advised that removal of the casing and screen was preferable at this time.

The contractor chose to repair the tower and then attempt to pull the casing. The tower was disassembled on 21 October 1980 and repairs were not complete until 24 October 1980. The tower was erected and the attempt made to pull the casing. The Drilling Specialist investigated and found that the borehole had caved and advised that the borehole be "backwashed" to flush out the sand lock and that a crane be used to lift the casing. On 30 October 1980 the contractor attempted to use jacks to pull the casing but did not flush the sand out of the borehole. When this attempt failed the contractor left the area and did not return until 6 November 1980. This time the contractor flushed the borehole and by washing and jacking managed to remove 18 meters of casing from the well. At this time the machine was capable of hoisting the remaining casing and screens from the well. Removal of the

casing and screens was completed on 21 November 1980. The contractor asked permission from the Project to enlarge the borehole to 20 inches to insure that the casing would go down. The Project granted permission and the contractor commenced reaming to 20 inches on 23 November, 1980 and completed reaming on 29 November 1980.

The well (TW-1) set open from 29 November 1980 until 13 December 1980. During this period the contractor after much urging and advice, hired a crane to set the casing and screens in TW-1. The crane was on site on 12 December 1980 and commenced setting casing on 13 December 1980. Setting was completed on 14 December 1980.

C.3. GRAVEL PACKING AND DEVELOPMENT (TW-1)

Immediately upon completion of the casing and screening of the well the crew started gravel packing. This was done in a satisfactory manner and completed in one day.

The development of well TW-1 was delayed due to late arrival of the air compressor. Drawings were made and presented to the contractor and drilling foreman along with advice on the correct method of developing a gravel packed well with air. When the compressor arrived the well was capped with 54 meters of air line placed in the casing and the casing was pressurized with air. The drill crew and the project was immediately advised that this was extremely harmful to the gravel pack and the aquifer but the practice continued for several hours. No attempt was actually made to properly develop this well by the contractor. Prior to the pump test the drill crew attempted to clean the well of sand by installing an air lift system to 150 meters.

D. CONSTRUCTION OF WELL TW-2 :

D.1. DRILLING :

The drilling of well TW-2 began on 24 August 1980 using the cable tool method. The drill machine was in extremely poor mechanical condition and not properly rigged or tooled to drill the specified borehole properly. The contractor was advised to correct the mechanical discrepancies and to provide the proper bit design to drill the expected formations. Nothing was done to correct these deficiencies and drilling proceeded. A drilling rate of 3.5 meters per day was maintained until 6 September 1980. During this first 14 day period the Drilling Specialist was advising the contractor to maintain the machine in a level position so as to prevent the hole from enlarging and possibly going crooked. The crew however would continue drilling without leveling the machine and at 27 meters the hole developed a bend. The contractor leveled the machine and tried to continue drilling but the cable and tools dragging on the side of the borehole started the walls to cave in and drilling was stopped. The Drilling Specialist advised that bentonite be used to help seal and hold the walls from caving while an attempt was made to straighten the borehole. The contractor purchased the bentonite and started the process of straightening the hole. This method worked satisfactorily and drilling resumed on 8 September 1980. The contractor was advised continue to add bentonite occasionally to prevent further caving but the advice was rejected as too expensive. Drilling continued until 14 September 1980 and at this time the drilling cable broke and 6 days delay was experienced waiting for new cable to arrive from Bandung. Drilling resumed on 20 September 1980. The driller reported the borehole caving at

71 meters on 22 September 1980 and he stopped work to wait for instructions from the contractor. On 27 September 1980 drilling resumed using bentonite to control caving. The hole had however caved back to 51 meters and had to be cleaned to 71 meters. Drilling continued until 14 October 1980 but repeated caving of borehole was a big problem since the advice of the Drilling Specialist to set temporary casing was rejected.

On 14 October 1980 a depth of 107 meters was reached and it was estimated by the Drilling Specialist that approximately 42 m^3 of material had been removed from the borehole and caving continued. The drill crew started to use bentonite again and try to clean the hole, but no progress was made. The Consultant's hydrogeologist discovered on 19 October that there was a very good possibility of encountering a salt water formation at the site of TW-2 at the depth of 100 to 120 meters. The Consultant immediately informed the Project and drilling was stopped. On 20 October 1980 the Drilling Specialist was successful in persuading the contractor to change the bit design and to use additional bentonite in an attempt to clean caved material from the well. The cleaning proceeded without any major problems until a depth of 107 meters was again reached on 25 October 1980. An E - Log was done immediately and occasionally bailing was carried out over the next 11 days while awaiting delivery of screen and casing. On 5 November 1980 casing and screen were delivered but the hole had caved back to 83 meters. The work of cleaning the well did not start until 13 November 1980 and was completed on 18 November 1980. The Consultant presented to the contractor at this time with drawings of the design for placement of screen in TW-2 as determined from the E - Log and well samples. (See Appendix 5.1.2)

D.2. SETTING CASING AND SCREEN (TW-2)

The placement of casing and screen in well TW-2 started on 18 November 1980. The contractor had set 50 meters of casing and screen before it was discovered that he had mis-interpreted the instructions for the proper placement of the screens. The 50 meters were pulled and the screens were re-positioned in the correct location and again placed in the well. All casing and screen was in the well in position on 20 November 1980 and gravel packing was started.

D.3. GRAVEL PACKING AND DEVELOPMENT (TW-2)

Gravel packing of well TW-2 was done by pouring the gravel into the top of the well bore since tools and equipment were not available for the proper placement of gravel. No swabbing was done during the placement of gravel although the contractor was advised to do so. Because of caving, large caverns were formed in two of the strata and 19 m³ of 5 mm gravel was used to pack from 106 meters up to 50 meters. The contractor was given permission to use 5 mm to 15 mm gravel to continue the gravel pack but used 25 - 100 mm gravel in the amount of 8 m³ to gravel pack from 50 mm up to the 30 meters level. The contractor was at this time advised to proceed with developing of the well and then to clean the well prior to installing the test pump. The well set with no development or cleaning from 20 November 1980 until the test pump arrived and was installed on 13 December 1980.

E. WELL TESTING :

E.1. WELL TESTING : TW-1

The testing of well TW-1 was delayed until the com-

pletion of testing TW-2 due to the lack of sufficient pump column and shaft required for well TW-1. The static water level in well TW-2 is 25.5 meters and required a deeper pump setting to obtain sufficient drawdown to evaluate the well and aquifer. The pumping equipment was moved from TW-2 to TW-1 site on 19 January and the available column was installed in the well to a depth of 36 meters. While awaiting the delivery of the promised additional column and shaft the Drilling Specialist utilized the pump to try and do some development work on the well. Repeated drawdown to 36 meters and surging with the pump for sixteen hours resulted in some development. The well during the first 8 hours of pump developing pumped mostly drilling mud drawn from the aquifer and a large amount of sand. In the second 8 hours the well started to clean-up pumping only some sand immediately after a surge and less drilling mud. Pumped at a sustained rate of 32 liters per second the well cleaned rapidly and pumped clean, sand free water for two hours. Because the well was not developed during and after the gravel packing it is expected that the well may occasionally pump some sand in very small amounts for a period of 1-2 minutes at the start up of the pump.

On 22 January a test was made on well TW-1 to determine pumping rates for the final well testing after the installation of additional pump column. Hand dug wells within a radius of \pm 750 meters were measured to determine the effect, if any, caused by the pumping of well TW-1. The test was conducted for a period of 8.5 hours and no effect was registered on the hand dug wells. On 25 January 1981 an additional 15 meters of pump column was delivered by the contractor and installation of additional column was started on 26 January 1981. The final testing of well TW-1 began on 26 January 1981 and

completed on 27 January 1981. The aquifer exhibits excellent potential with a Specific Capacity of 5.76 l/s/m.

The well is calculated to be 53 % efficient. This is primarily contributable to lack of development. The rate of production increased and the rate of drawdown decreased as the well was being pumped. This is due to the continued development caused by drawing water through the aquifer and opening the water courses within the formation.

Based on data collected during the testing procedure it has been recommended that a pump of 63 l/s be placed in this well with a setting at 100 meters. The radius of influence of drawdown is estimated a 1 km and the drilling of additional wells in this general area should be spaced a minimum of 1 km apart to prevent undue interference in the drawdown of the wells.

E.2. WELL TESTING TW - 2

The test pump for TW-2 arrived on site on 8 December 1980. The pump was a line shaft pump with right angle drive, powered by a diesel engine. This size was 8 inch with 2 stages and was set at a depth of 27 meters. The pump was suitable for conducting the aquifer evaluation test. A deeper setting (to 90 meters) would have been preferable for conducting the well capacity test for pump selection determination but adequate information was obtained to enable the consultant to specify a pump of suitable capacity. The first well test was started on 15 December 1980. A step drawdown test of 8 hours was conducted using pumping rates of 25 l/s, 40 l/s, 50 l/s and 73 l/s. At the end of the 8 hours step drawdown test a recovery test was performed, lasting 12 hours. On 16 December 1980 a long term drawdown test was started

with a pumping rate of 73 l/s. After four hours of pumping the well started to develop and the pumping of sand began. The pumping was continued for eight more hours and during this period the well continued to pump sand in unacceptable amounts and occasional period of cloudy water. It was decided to stop the test at this point and check depth of the gravel pack. The gravel pack had dropped 2 m. Gravel was added to the gravel pack and a gravel fill tube was installed. The annulus from 30 meters to ground surface was grouted with cement. On 25 December 1980 a second series of tests were started. The well pumped considerable amount of sand for two hours and the water was very turbid. It was observed that the production of the well had greatly diminished and after 8 hours the test was stopped again. A recovery test was performed for 16 hours. The Drilling Specialist requested that the well depth be measured to determine if the inside of the casing had partially filled with sand due to the developing caused by pumping the well. The contractor was unable to obtain a measuring device until 27 December 1980 and at this time it was found that there was 7 meters of material in the bottom of the well. This amount of material blocked off 60% of the bottom well screen. Since the water bearing strata at 95 meters to 103 meters is considered as the best production strata in the well it was evident that the production of the well was greatly reduced due to the 7 meters of debris blocking the entrance of water. The Consultant considered the first tests invalid and notified the Project, recommending that the well be cleaned of the 7 meters of debris and that a new series of test be conducted. The Project accepted the recommendation and cleaning of the well began on 30 December 1980. The cleaning was performed using a

bailer made at the job site. The design of the bailer was poor and resulted in extremely slow progress. During the bailing sea shells were removed with the debris confirming that the contractor did not clean the well prior to installing the test pump. These shells and fossils were found at the 97 meters to 102 meters level. The cleaning of the well was completed on 9 January 1981 and the re-testing of the well began on 13 January 1981. The re-testing was conducted as a continuous 48-hours drawdown test. The test was completed on 15 January 1981 and was followed by a 24 hours recovery test. The results were satisfactory for providing aquifer evaluation and pump selection.

The data obtained from the test were evaluated and it was determined that the well has a specific yield of 2.2 l/s. The efficiency of the well is indicated at 67 %.

Based on the data obtained from the test it has been recommended that a pump of 65 l/s capacity be installed in well TW-2. A pump of larger capacity would cause interference with any well drilled up to 7 kms distance from TW-2. All existing known factors were considered ; i.e., well interference, estimated aquifer storage and recharge, need for the water and operational economics. Further considerations will have to be undertaken when the well field is completed such as the possibility of alternate wells being pumped from each well. The spacing of wells that are pumped simultaneously should be at least 2 kms apart as the drawdown influence of a well in the area of TW-2 is expected to be of a radius of at least 1 km from the pumped well. A further and more precise study of this phenomenon has been presented in the Consultant's Hydrogeologist's report on this area.

During the 48 hours pump test it was discovered that excessive drawdown occurred in 4 wells in the village of Kemloko. These wells are approximately 750 meters north of TW-2. The village is located on top of an outcropping that is approximately 20 meters higher than well TW-2.

The wells in this area are 12 - 18 meters in depth. (See Appendix 5.1.11 for location). Some negligible drawdown (16 - 62 cm) occurred in wells adjacent to TW-2 but unlike the wells in Kemloko did not prove to be a problem. Because of the effect on the wells in Kemloko a letter was submitted to the project advising that a study be made concerning the provision of water to the village of Kemloko. Two recommendations were suggested ; (1) that water be provided from the main transmission line which passes the village ; or (2) that a deep well of 30 - 40 meters be drilled and resealed. Some means of providing the village with water will be necessary if more wells are to be drilled in the area.

Considering the poor workmanship in the construction of well TW-2 the efficiency factor of 67 % is quite good and as expertise in the drilling companies develop, more efficient wells will be drilled.

The chemical analysis of the water from TW-2 is presented in appendix 5.1.13. The water will only need basic chlorination of 1 to 2 ppm. as treatment to precipitate the manganese and provide adequate protection. Analysis should be conducted at least once a month and a well evaluation conducted periodically so that recommendations can be made if the well performance changes.

C

C O N C L U S I O N S

The following conclusions were drawn after carefully observing the construction of wells TW-1 and TW-2 for the Surakarta Water Enterprise. The contract, awarded by the Central Java Water Supply Project was for two deep wells with an expected production rate of approximately 30 l/s each. The wells were to be drilled as TEST/PRODUCTION wells so as to provide sufficient information about the aquifer and their potential in order that an evaluation could be made as to the feasibility of a supporting and supplementary water source to the present system in service for the City of Surakarta, Central Java.

The wells were drilled by two different methods ; TW-1 was drilled with a rotary drill machine using Bentonite clays as a drilling fluid. TW-2 was drilled by a cable tool machine. Neither machine was capable of constructing the wells as specified due to limitation of weight handling capacities. Neither machine was properly tooled to drill the wells in specified manner. To construct an efficient well, certain tools are essential in both methods of drilling.

The prime contractor, P.T. City Cipta, exhibited very little knowledge of the proper drilling methods required. The supervisory personnel and crew of City Cipta lacked the knowledge necessary to combat day to day mishaps. Due to this lack of knowledge many delays resulted. The extremely poor mechanical condition of the cable tool drill machine also resulted in almost daily breakdowns lasting from one hour up to six days.

The Sub-Contractor ; (CV.ITA) who drilled well TW-1 with the mud rotary machine was much better organized. The crew had been

trained but lacked experience. The crew responded well to advice and was eager to learn new things and over-all performed well. There were however long delays resulting from lack of proper tools. Most of the delays were due to the prime contractor failing to provide materials on time or to provide instructions. The lack of knowledge concerning gravel packing and development of wells was exhibited both, the rotary drill crew and the cable tool drill crew. The supervisor had no knowledge of the correct methods and refused all advice offered. This resulted in poorly gravel packed wells and no development.

The test pump was provided by CV. ITA with a pumping crew. Testing of TW-2 was done first. The test was performed by the Consultant's Drilling Specialist and Hydrogeologist. During the testing the crew of CV.ITA was instructed on test procedure and methods and were very receptive and expressed their desire to learn the proper procedures. The pumping equipment was in excellent condition and the crew very knowledgeable about it's operation.

The testing of well TW-1 was started with an aquifer evaluation step drawdown test for a period of 8 hours. During this test development of the well continued throughout the test. As with well TW-2, well TW-1 was not developed. The lack of knowledge of development work is a serious matter throughout the drilling industry in Indonesia and until the correct methods of development are learned and practiced wells will continue to be inefficient and costly to operate.

In summary it can be concluded that the performance of the prime contractor was unsatisfactory. More efficient wells could have been constructed utilizing a more experienced and better equipped contractor.

D

RECOMMENDATIONS

Throughout the period of construction and testing of wells TW-1 and TW-2 on this project it was very evident that the entire range of drilling and testing procedures were inadequate to meet the standards of the specifications in the contract and adjustments had to be made. It is therefore recommended that a more in-depth study be made before allowing a contractor to bid a job requiring such specifications as this contract stipulated. It is further recommended that strict supervision and inspection be maintained by an experienced specialist to insure that proper construction and particularly the development is obtained.

The selected areas near Surakarta for the projected well fields as recommended by the consultant have proved to be highly productive. It is however recommended, that the spacing of the wells be increased to a minimum of 1 km. The data obtained from the test evaluation indicate a greater influence of drawdown than was previously assumed.

It is recommended that any future wells drilled have a minimum borehole of 480 mm. It is further recommended that a pilot hole drilled first ; then an E - log run, to be utilized in design of the screen and casing size and the size of gravel pack which will be required.

The final recommendation is that the construction of the well be performed in the shortest possible time. This assures a more efficient well, less costly to operate and maintain. Until such time as the expertise of the contractors has been proved it would be beneficial to engage a consultant in the role of inspector/supervisor to insure that the investment of the Government money in the program is protected.

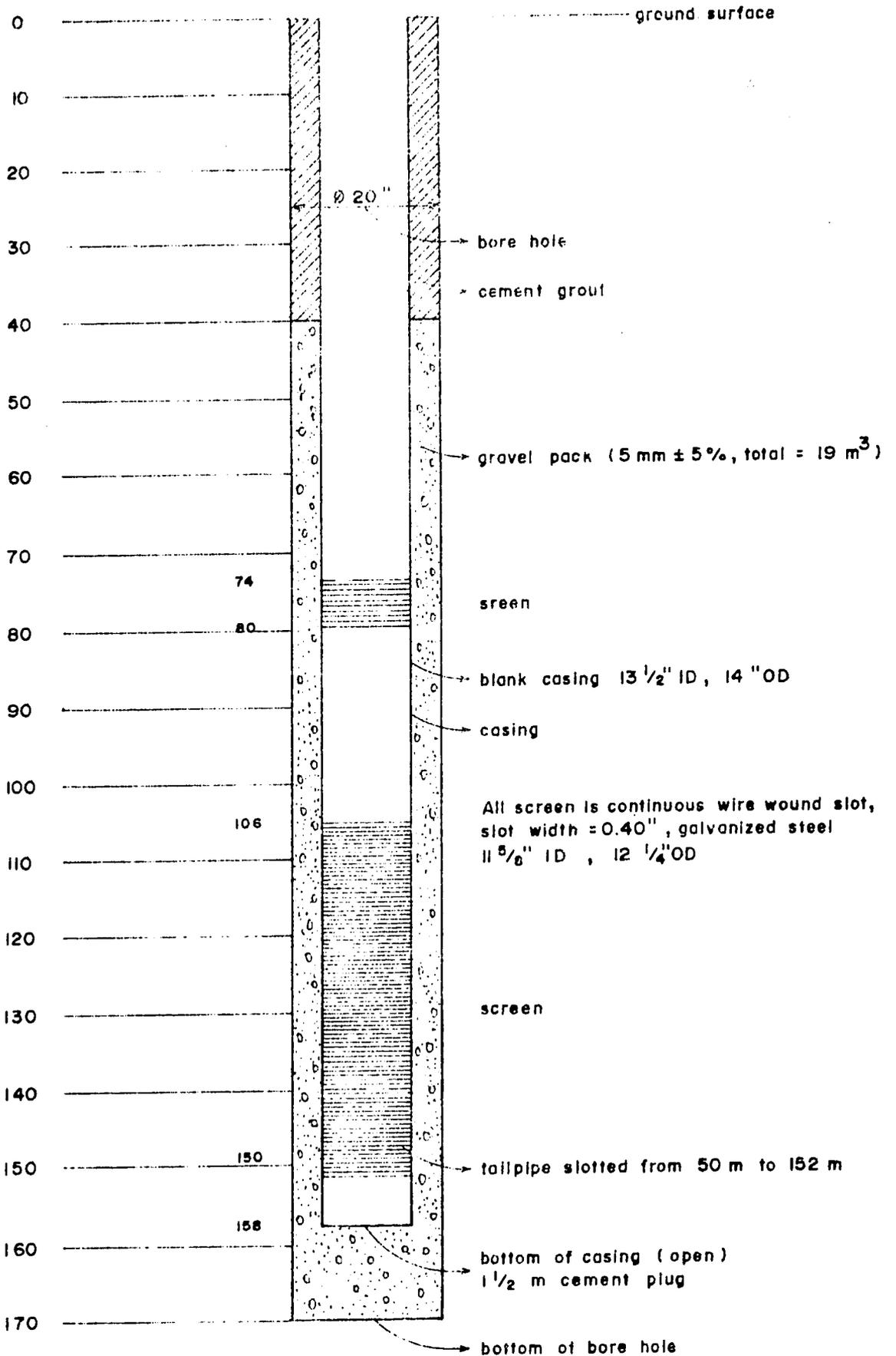
Test Production Well TW-1

Elevation ± 125 m

Vil. Busukan

Dist. Mojosongo

Well Construction



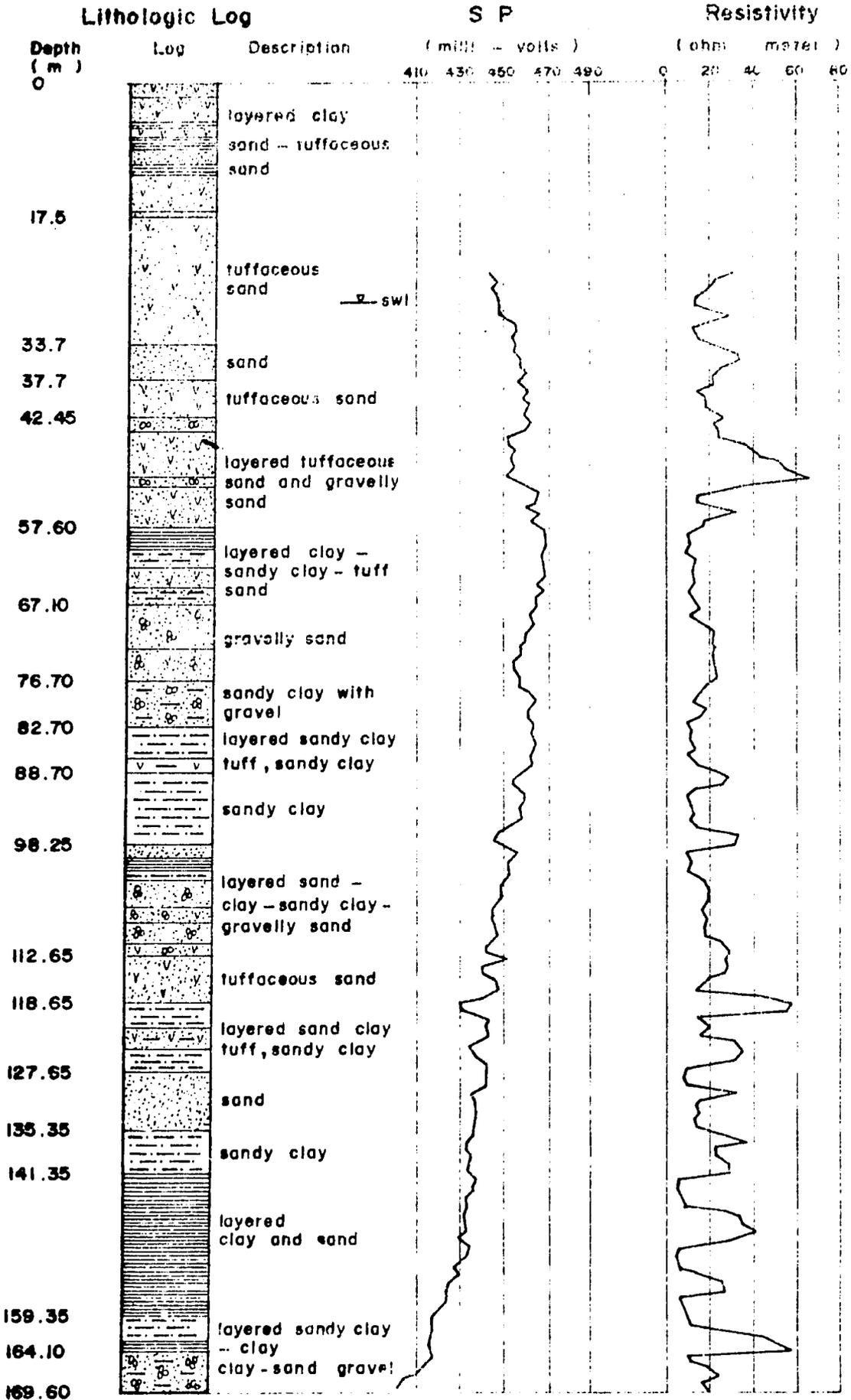
4

Test Production Well TW-1

Elevation : ± 125 m

Vil. Busukon

Dist. Mojosongo



Minutes

2

3

4

5

6

7

8

9

10

2

3

4

5

6

7

8

9

10

2

3

4

5

6

7

8

9

10

STEP DRAWDOWN TEST TW-1

Meters

0

10

20

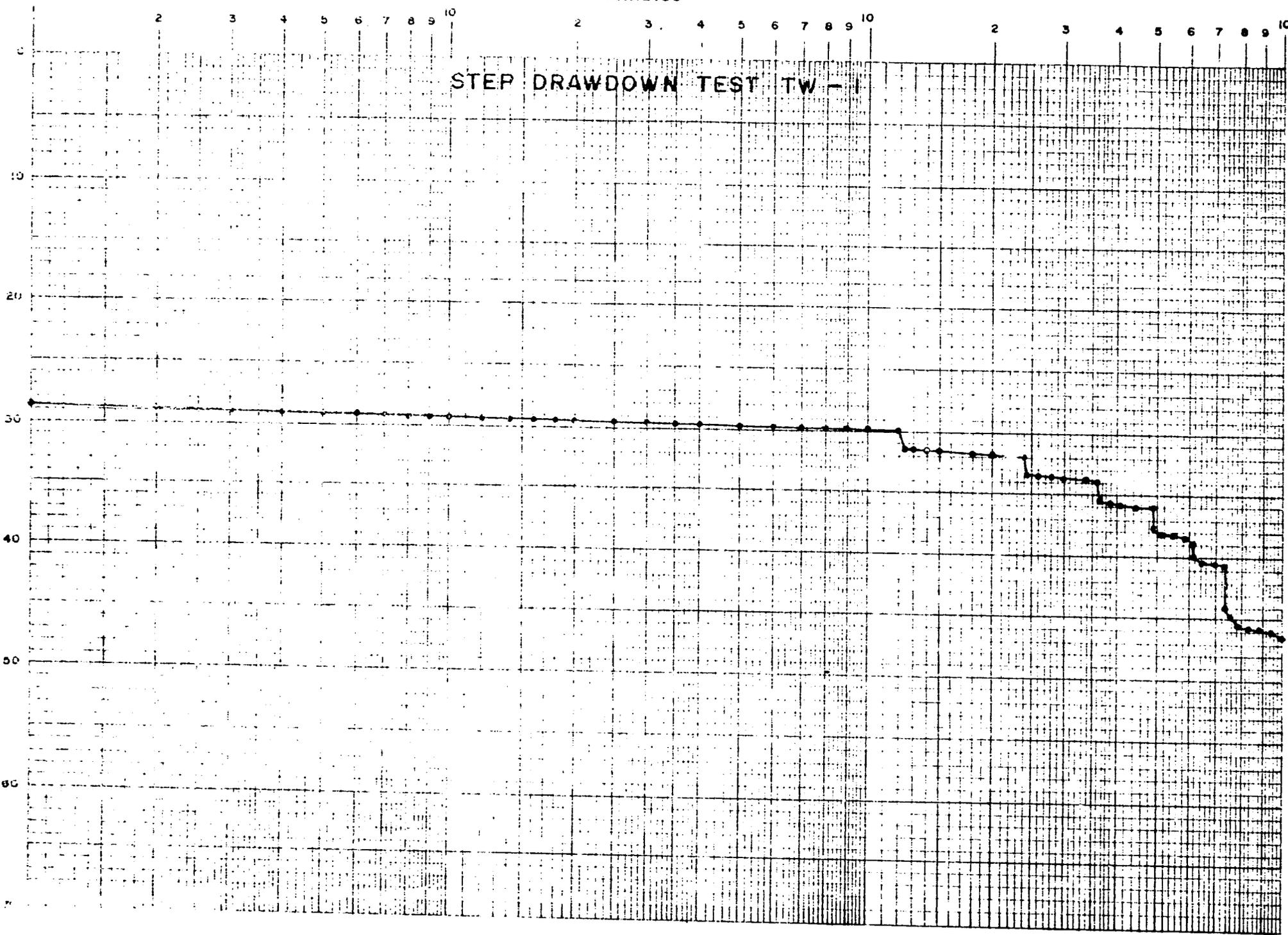
30

40

50

60

07

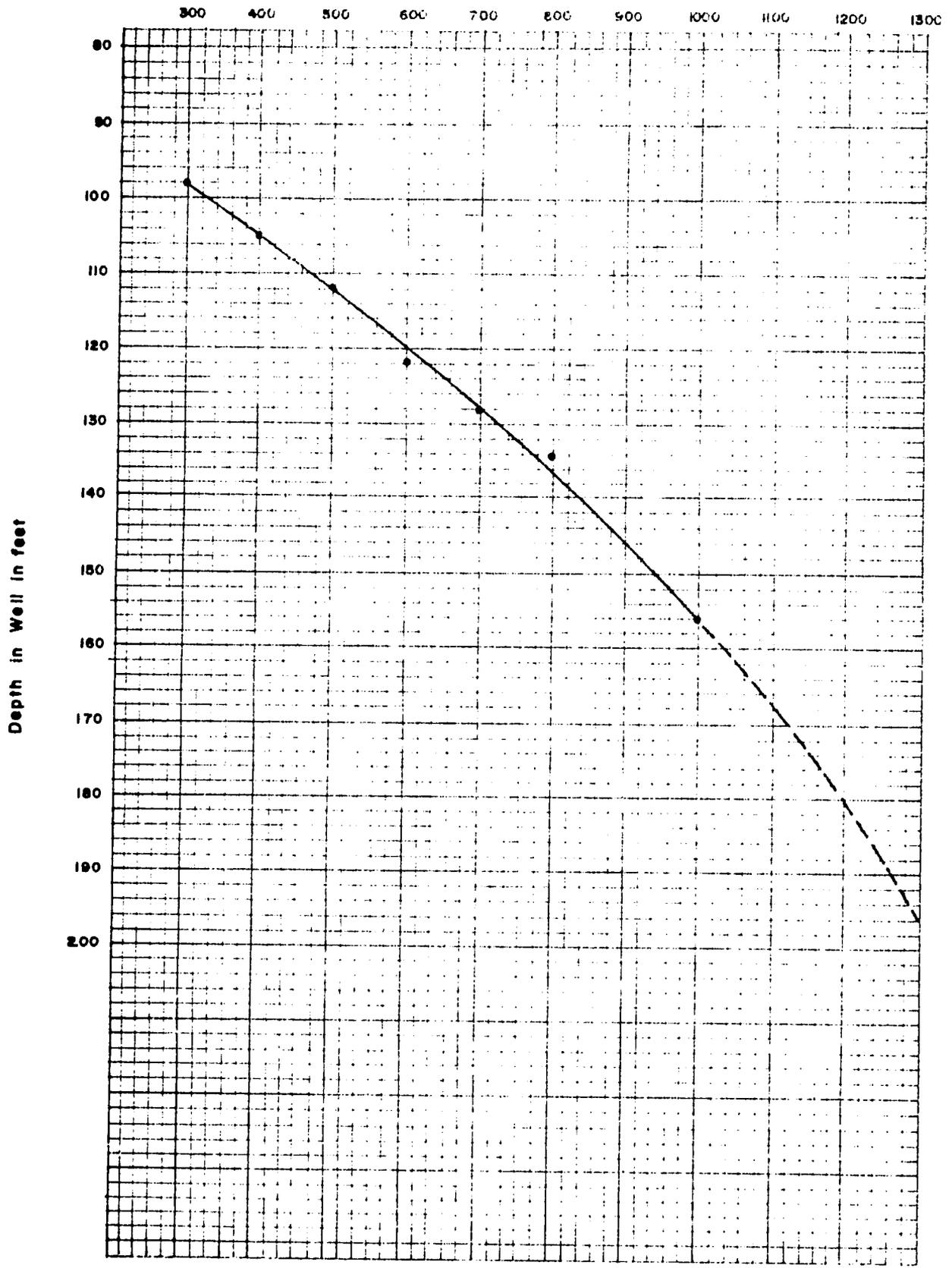


6

WELL TW-1

GRAPH OF WELL TEST

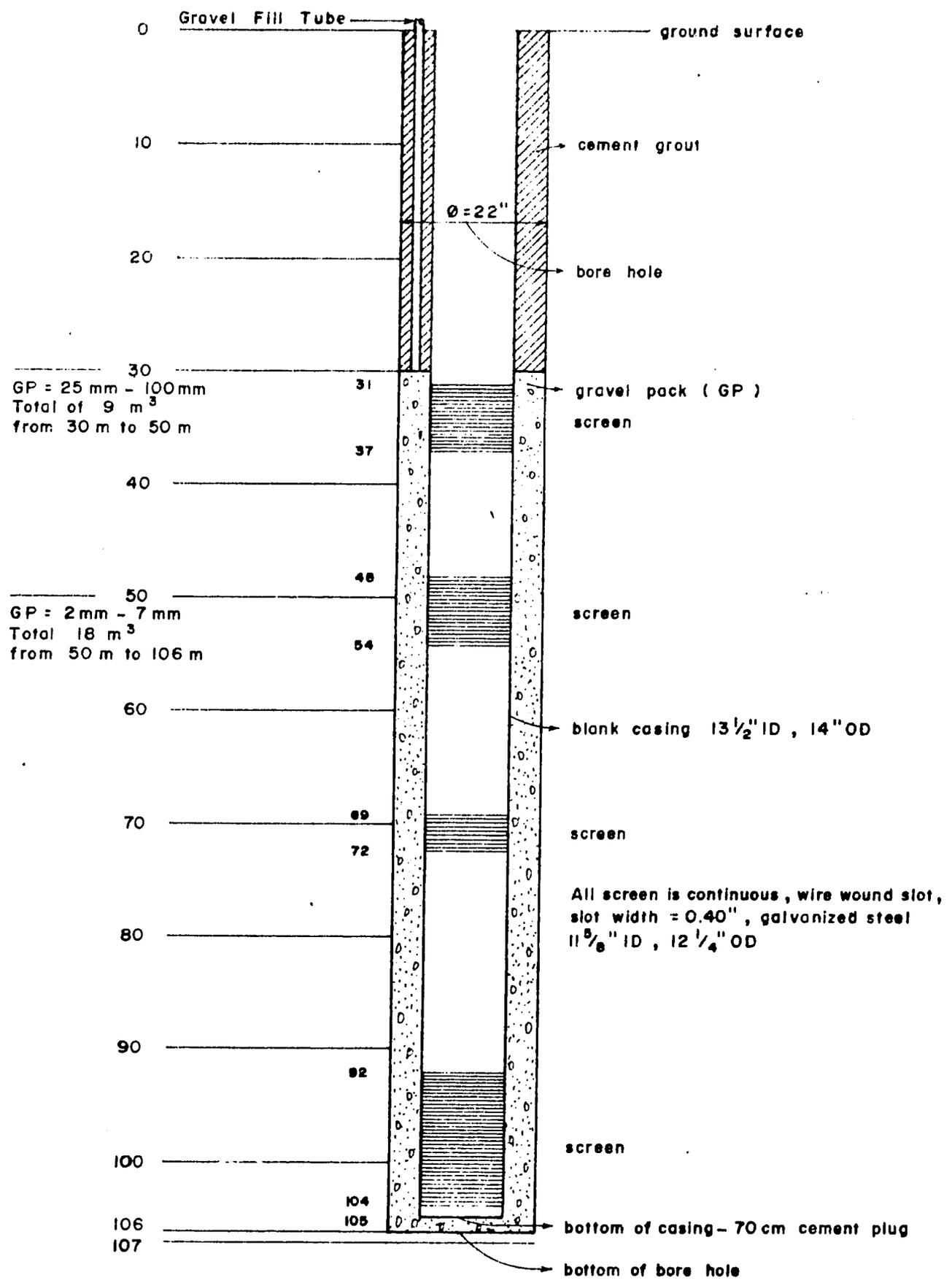
Yield in Gallons Per Minutes



Test Production Well TW - 2

Elevation ± 135 m
Vil. Jabung
Dist. Kartasura

Well Construction



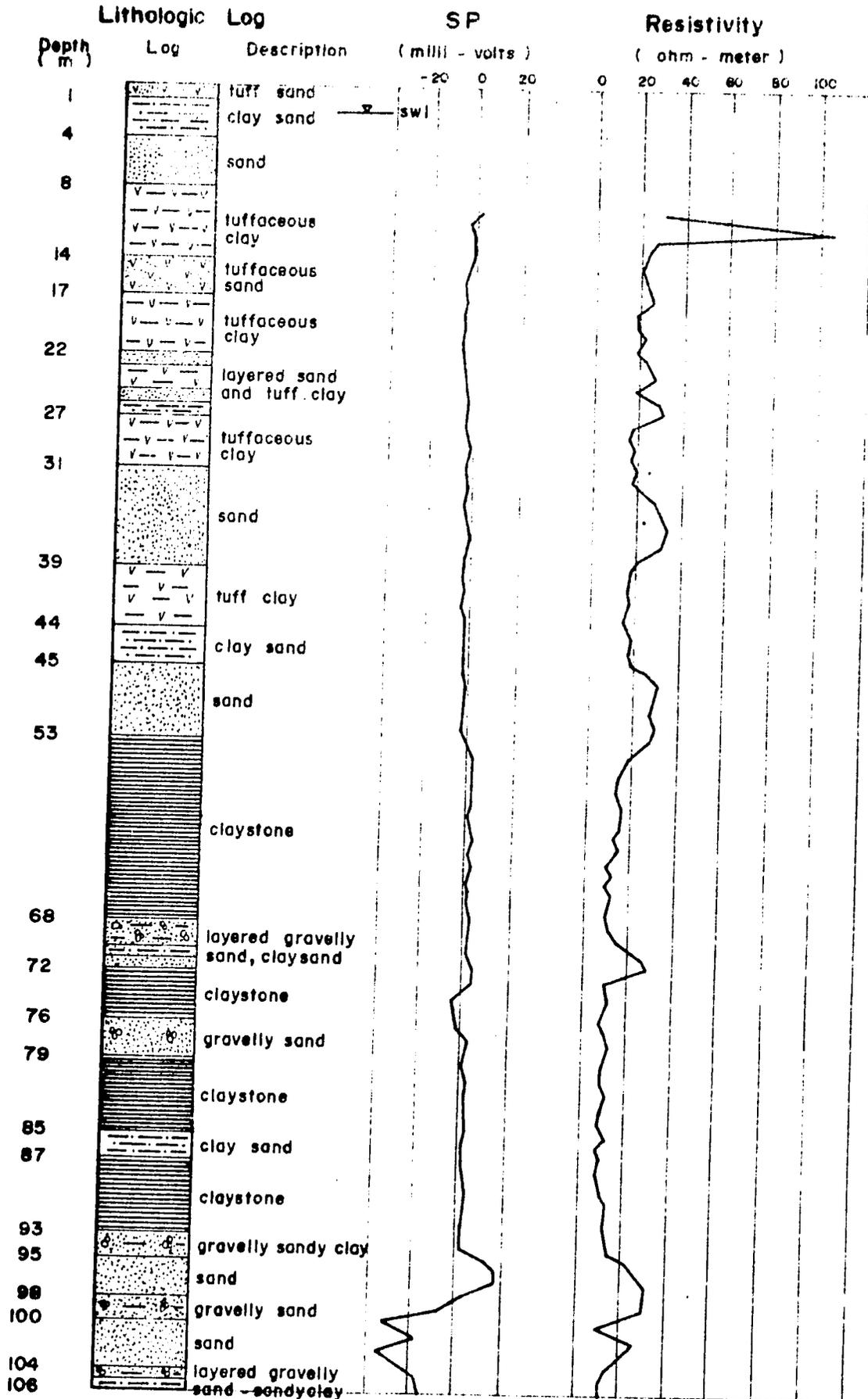
9

Test Production Well TW-2

Elevation ± 135 m

Vil. Jabung

Dist. Kartasura

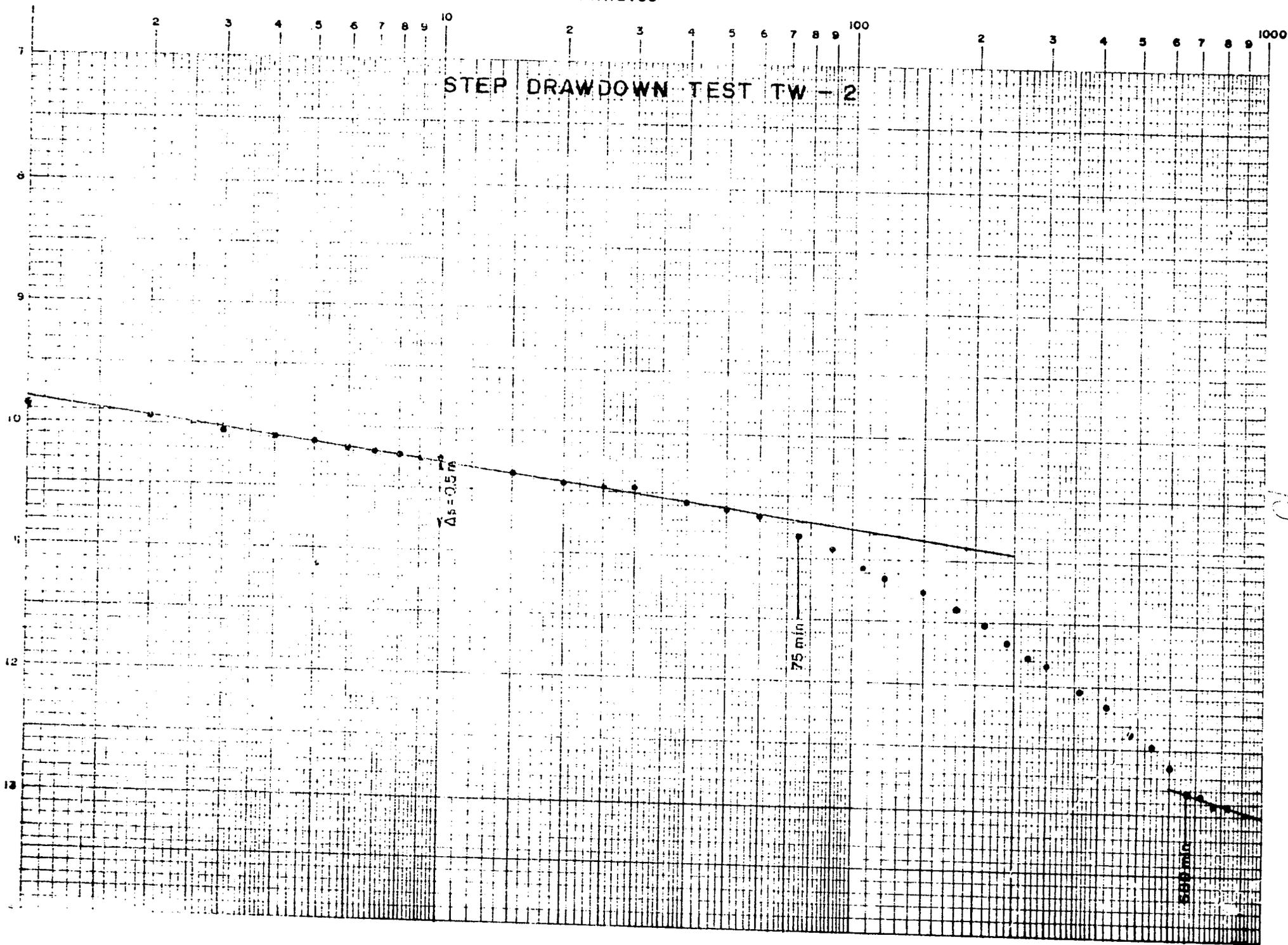


Note : below 50m lithology change maybe 1 - 2 m lower than shown on log

time in minutes

STEP DRAWDOWN TEST TW - 2

DTW in meters below measuring point



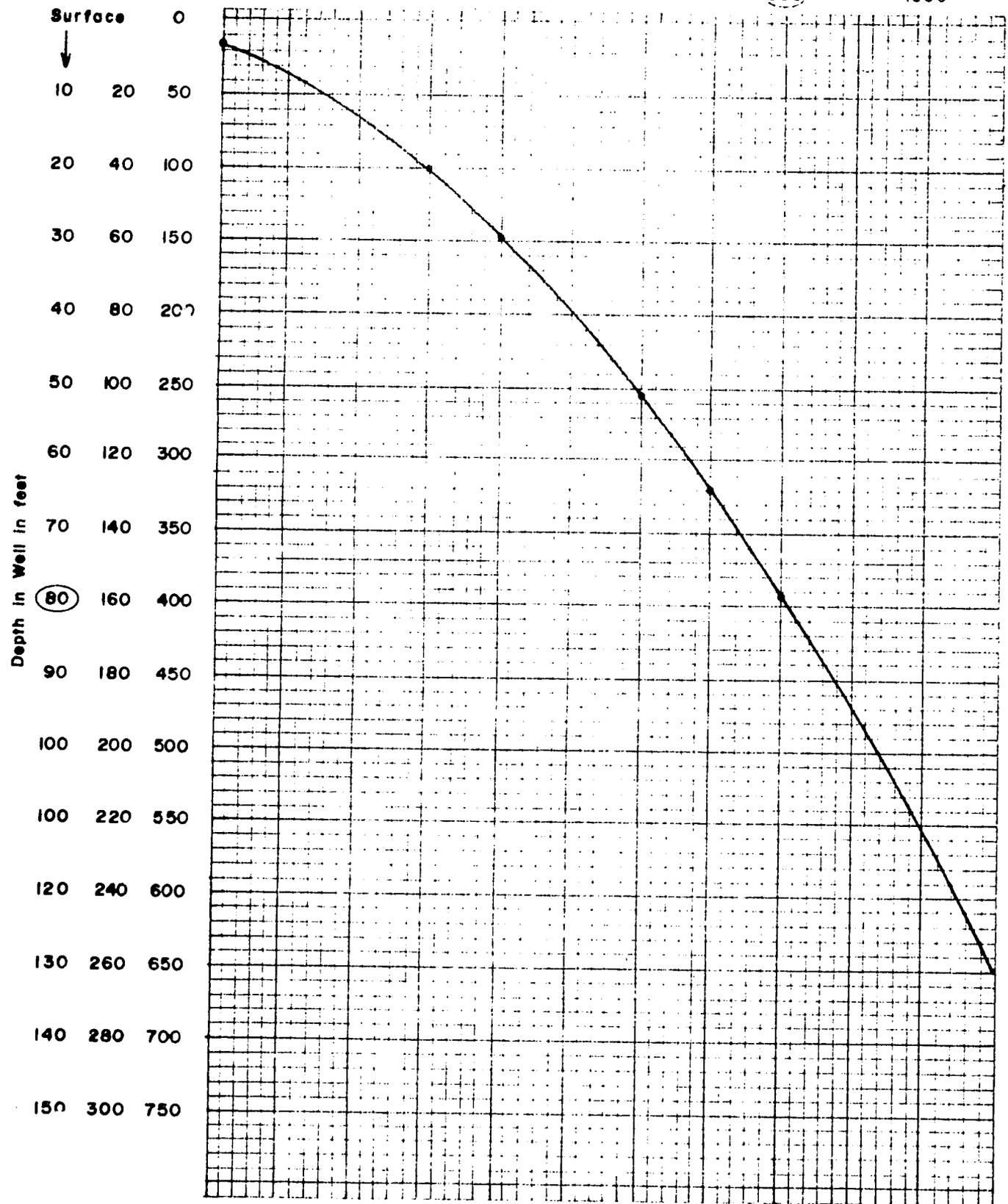
CF

WELL TW - 2

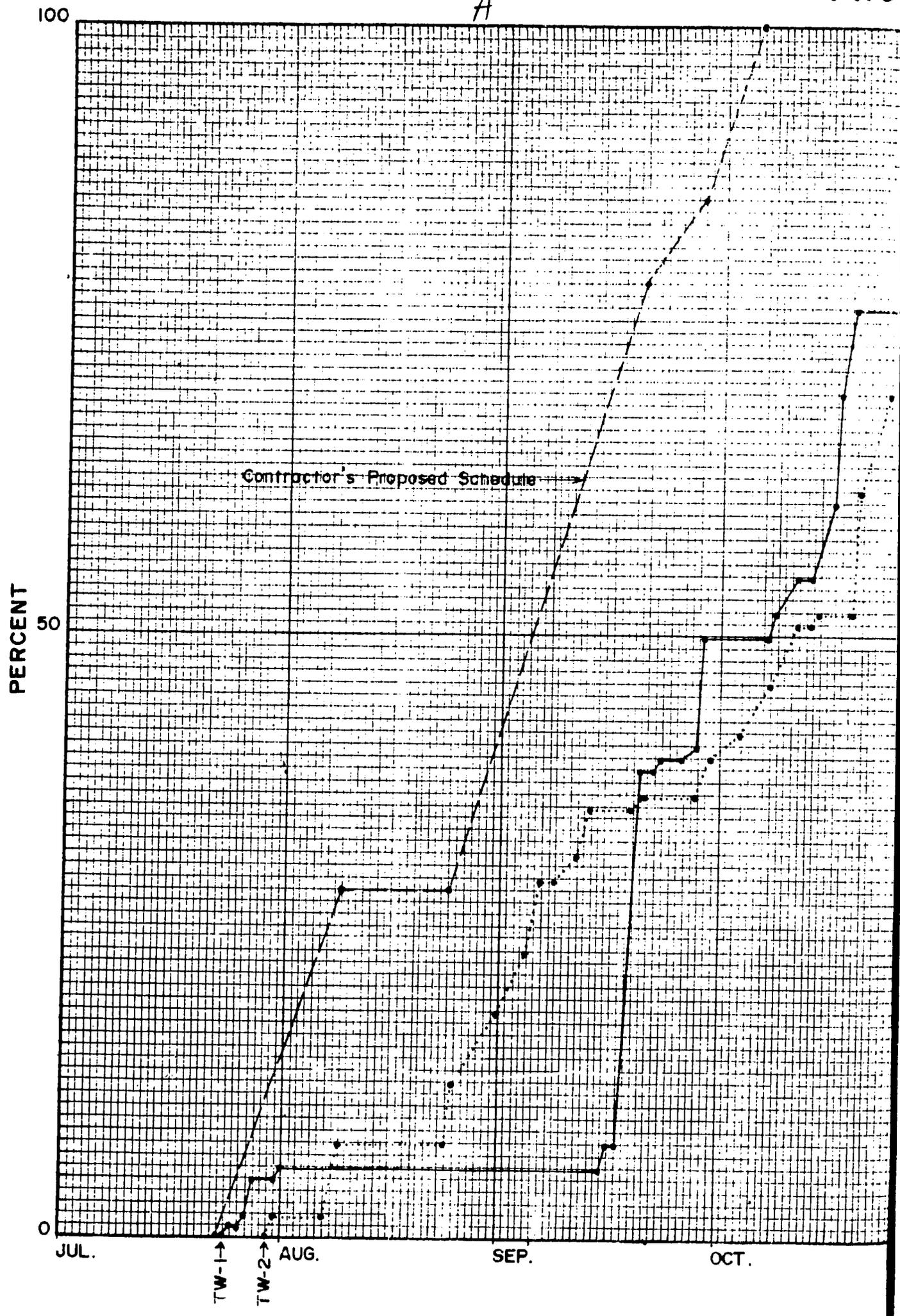
GRAPH OF WELL TEST

Yield In Gallons Per Minute

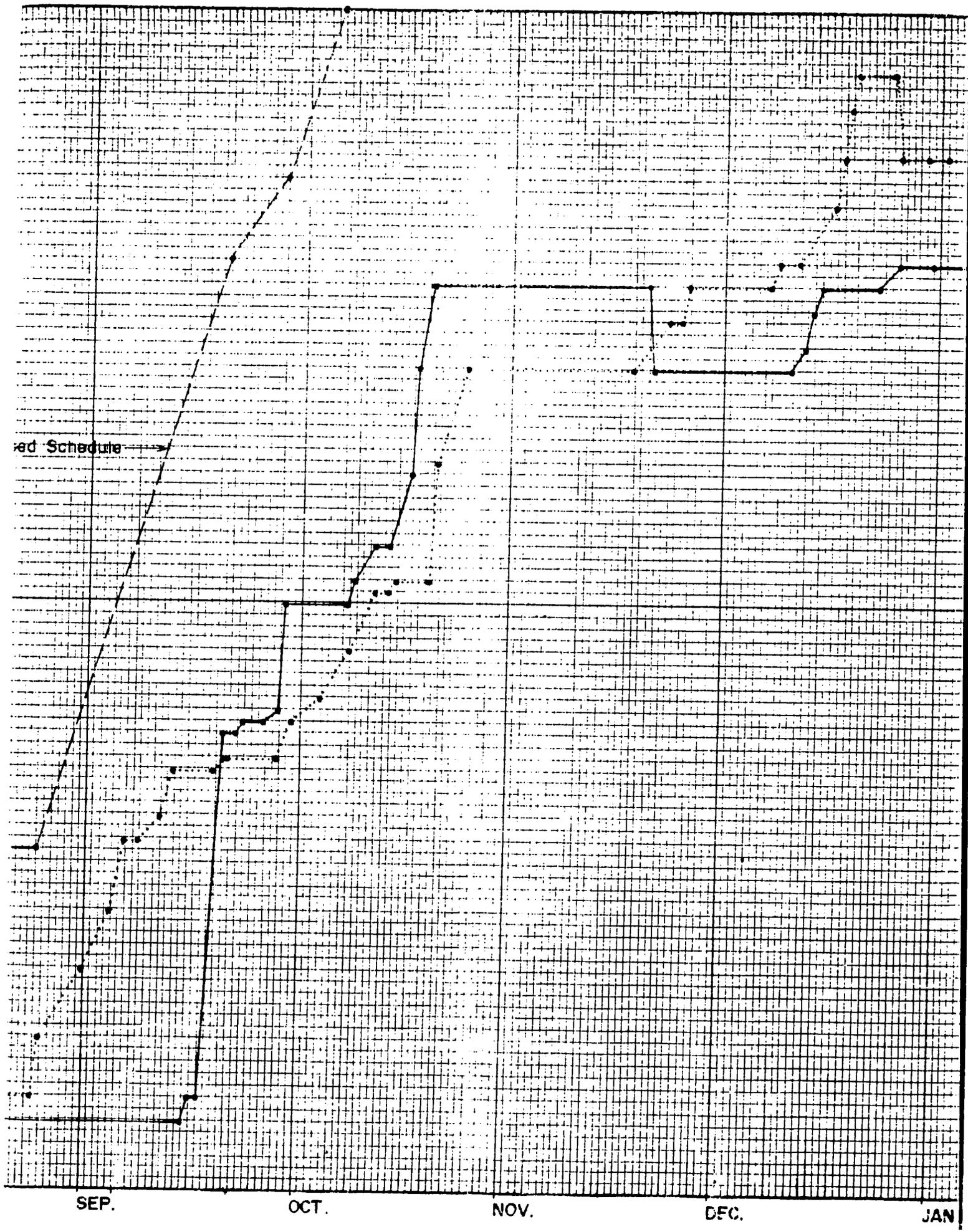
0	20	40	60	80	100
0	100	200	300	400	500
0	200	400	600	800	1000



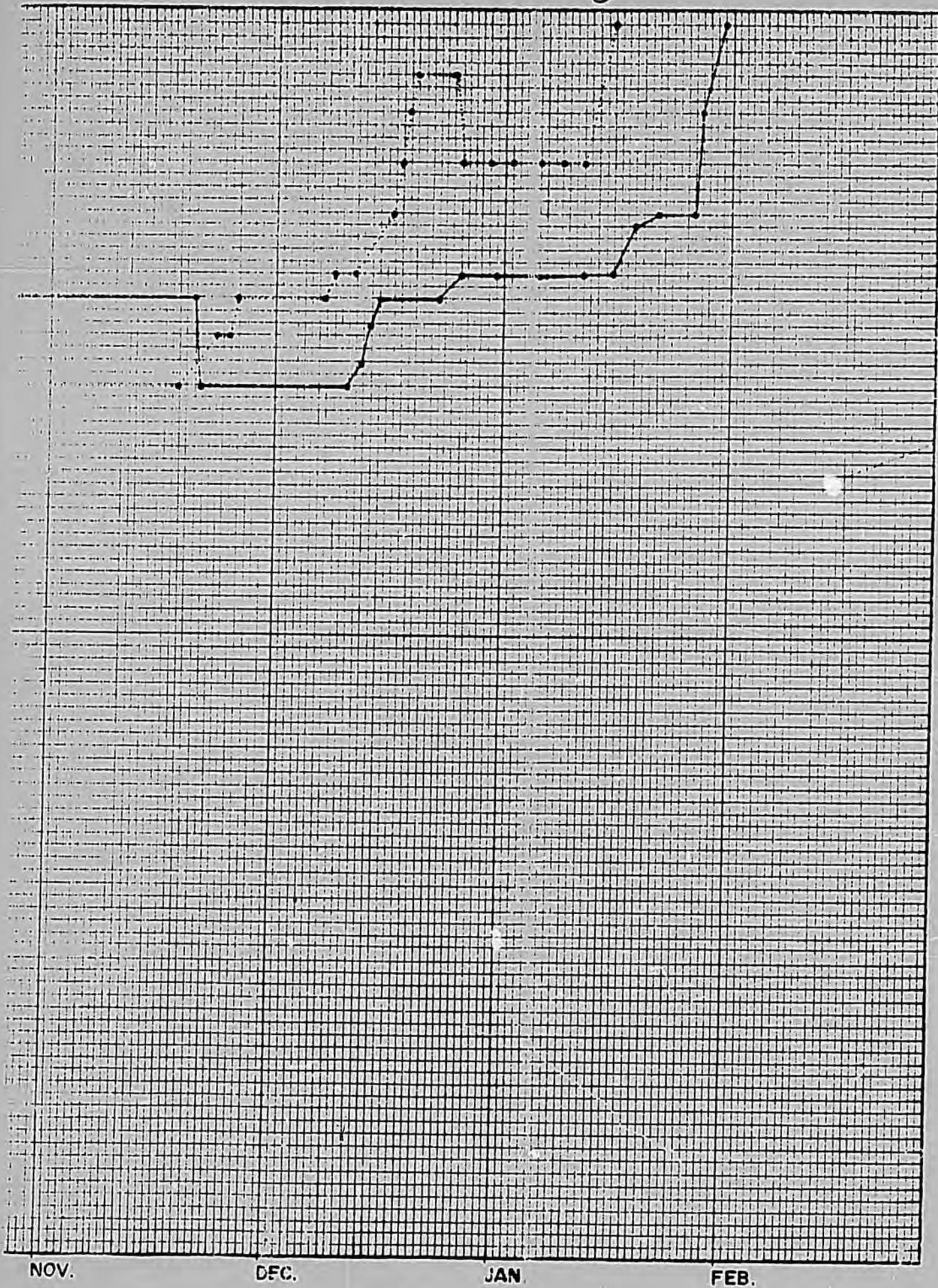
A



B
WELL DRILLING
PROGRESS



C



O & M SPECIALIST
MONTHLY REPORT
JANUARY 1981

The city of Solo presently receiving water at a rate of ± 383 l/s through the old and new transmission lines. There are still many valves not open, resulting in areas of the city having very little or no water. We are trying to control the water by using only the main distribution line valves and the tertiary line valves in the full open position. As of this report the system is not yet balanced.

With the transmission line in service to Station No. 263 + 39, we opened the Cross tie BV # 48 and supply the North-east part of the city with water from the new transmission line. We opened the valve at Station No. 216 + 28 supplying water to line K and also the new fire hydrant at this location. The connection to the distribution lines at Stations No. 242 + 45, 244 + 87 and 251 + 71 cannot be put into service because of the many leaks we found when we opened these valves. The lines involved are lines M & L which were installed under the supervision of CJWSP I in the years of 1978 and 1979. From all indications these lines have never had water in them, and had never been pressure tested in any way. The air valve boxes are too small, and the valves cannot be operated because of their rusty and corroded condition.

The connection from Station No. 244 + 87 going South cannot be put into service because the 150 mm line is not connected at the railroad track ; this also applies to the line going South from Station No. 251 + 71. These connections should be made by S.W.E. as soon as possible.

With the numerous leaks and general condition of the existing distribution system, I suggest that S.W.E. start working their personnel longer hours to get the present leaks under control, before we start a more intensive leak survey.

CJWSP I has let the contract to contractor Tukadmas for the rehabilitation of the existing transmission line in front of the army complex north of Kartasura reservoir. Excavation started on the twentieth of the month and they started laying the pipe on the twenty third. They will replace \pm 400 meters of this line.

Existing problems remain the same.

1. S.W.E. has no fittings to complete lines previously installed and no pipe for new rehabilitation work.
2. S.W.E. has not submitted to the Consultant work schedules for new construction, rehabilitation or connections being made.
3. There has been no progress on O & M facilities.
4. No transfer of materials presently retained by the Consultant.
5. The project has not started the connection between the 450 mm existing transmission line and the 300 mm line A at the intersection of Jl. Slamet Riyadi and Jl. Sidomulyo.
6. The 300 mm line A at station No. 32 + 85 has not been repaired by contractor Tukad Mas.
7. Water Enterprise has not disposed of their scrap pipe and valves, to facilitate the storing of new material that will arrive soon.

WATER DISTRIBUTION NETWORK
MONTHLY PROGRESS REPORT No. 8
JANUARY 1981

I. GENERAL :

On January 5, 1981, the Consultant met with Mr. Rahardjo, Section head of the Design Office for Cipta Karya. The discussion concerned various styles of bath houses to be considered for use in Surakarta.

On January 7, 1981 a Pre-Bid Meeting for the Pipe & Fittings order was held in the CJWSP office in Surakarta. Nine contractors and suppliers were represented. The date designated to receive bids was changed to January 24, 1981, one week later than originally proposed.

The Monthly Progress Meeting was held in Surakarta on January 21, 1981.

Construction drawings for Phase I, II & III were essentially completed. Minor revisions remain to be made in all three phases.

The field survey was completed for the public latrines. The actual number still in existence was determined to be 110.

At the request of USAID, preliminary estimates were prepared for each of the 3 construction phases for distribution pipe, the latrines and bath houses.

II. TOPOGRAPHICAL SURVEY & PREPARATION OF PLANS

A. Tertiary Distribution System

Field survey was completed in December for all of

the 22 Kelurahan. Plan sheets were completed in January for all three phases. Minor revisions will be necessary after design and checking are completed.

B. Public Hydrants, Yard Hydrants & Water Services
The topographical survey and preparation of plans have been completed.

C. Rehabilitation of 147 Public Latrines
The field survey was completed in January. From the original 147 public latrines proposed, it was determined that no records could be found for 18 public latrines. At 19 locations it was determined the public latrines have been removed and the property was being utilized for other purposes.

Site plans for the 110 public latrines were completed in January. Minor revisions will be made after the design is completed.

D. Design of 10 Public Bath Houses
No progress was made this month on the survey and preparation of plans.

E. Design For Well Distribution Piping
The survey and plan sheets were completed in December for the TW-2 well southwest of Kartasura.

No information has been received regarding the Perumnas Housing Development in north central Surakarta. No survey of plans has been prepared because it is not known how the TW-1 well will be utilized.

III. DESIGN OF DISTRIBUTION NETWORK

A. Tertiary Distribution System
Design of all three phases of water mains proposed

in the 22 Kelurahan has been completed. Some detail work remains for the proposed fire hydrant installations and comparisons with the material order.

- B. Public Hydrants, Yard Hydrants and Water Services
This project has been completed.
- C. Rehabilitation of 147 Public latrines
Design is expected to be in progress next month now that the field survey is completed.
- D. Design of 10 Public Bath Houses
After discussion with Cipta Karya, it has been determined that CJWSP has no standard bath house design. Design of the bath houses will be determined on an individual basis depending on conditions at the various locations being proposed.
- E. Design for Well Distribution Piping
The well drilling contractor finished the test for TW-2. The design for discharge pipe from the well to the new transmission main is completed.

IV. PROCUREMENT OF MATERIALS

- A. Tertiary Distribution System
On December 22, 1980 Cipta Karya invited bids for the pipe and fittings required for Phase I, II & III and for rehabilitation of portions of the transmission main. A Pre - Bid meeting was held in Surakarta on January 7, 1981. The meeting was attended by six contractors and four manufacturers.
The bids were opened on January 24, 1981 in Jakarta. and are currently being evaluated by the Consultant. The valves to be purchased via Off - Shore procurement were ordered in January and are expected to be delivered in March.

B. Public Hydrants, Yard Hydrants and Water Services
All materials have been acquired.

C. Rehabilitaiton of 147 Public Latrines
Materials required for this project are proposed to be furnished by the Contractor rehabilitating the public latrines.

D. Design of 10 Public Bath Houses
Materials required for this project are proposed to be furnished by the contractor constructing the public bath houses.

E. Design of Well Distribution Piping
Pipe, valves and fittings required in the pump house at TW-2 are proposed to be furnished by the contractor constructing the pump house. The discharge piping from the pump house to the existing system is being procured in the tender for the distribution pipe and fittings prepared for the 22 Ke-lurahans.

V. CONSTRUCTION SPECIFICATIONS

A. Teriary Distribution System
With the exception of the drawings, construction specifications have been completed for Phase I. Revisions remain to be done for Phase II and III.

B. Public Hydrants, Yard Hydrants and Water Services
All specifications have been completed.

C. Rehabilitation of 147 Public Latrines
Preparation of specifications are in progress.

D. Design of 10 Public Bath Houses
No progress has been made this month.

E. Design of Well Distribution Piping

No progress has been made this month.

Preparation of specifications will depend on whether the piping is included in the contract to construct the pump house at TW-2 or included in one of the three construction phases of the tertiary distribution network.

VI. ACTIVITIES PLANNED FOR NEXT MONTH

A. Tertiary Distribution System

Construction drawings and specifications for Phase I should be submitted to CJWSP for approval.

The evaluation of the bids received for pipe and fittings should be completed.

B. Public Hydrants, Yard Hydrants and Water Services

No activity planned next month.

C. Rehabilitation of 147 Public Latrines.

Design and specifications should be in progress.

D. Design of 10 Public Bath Houses

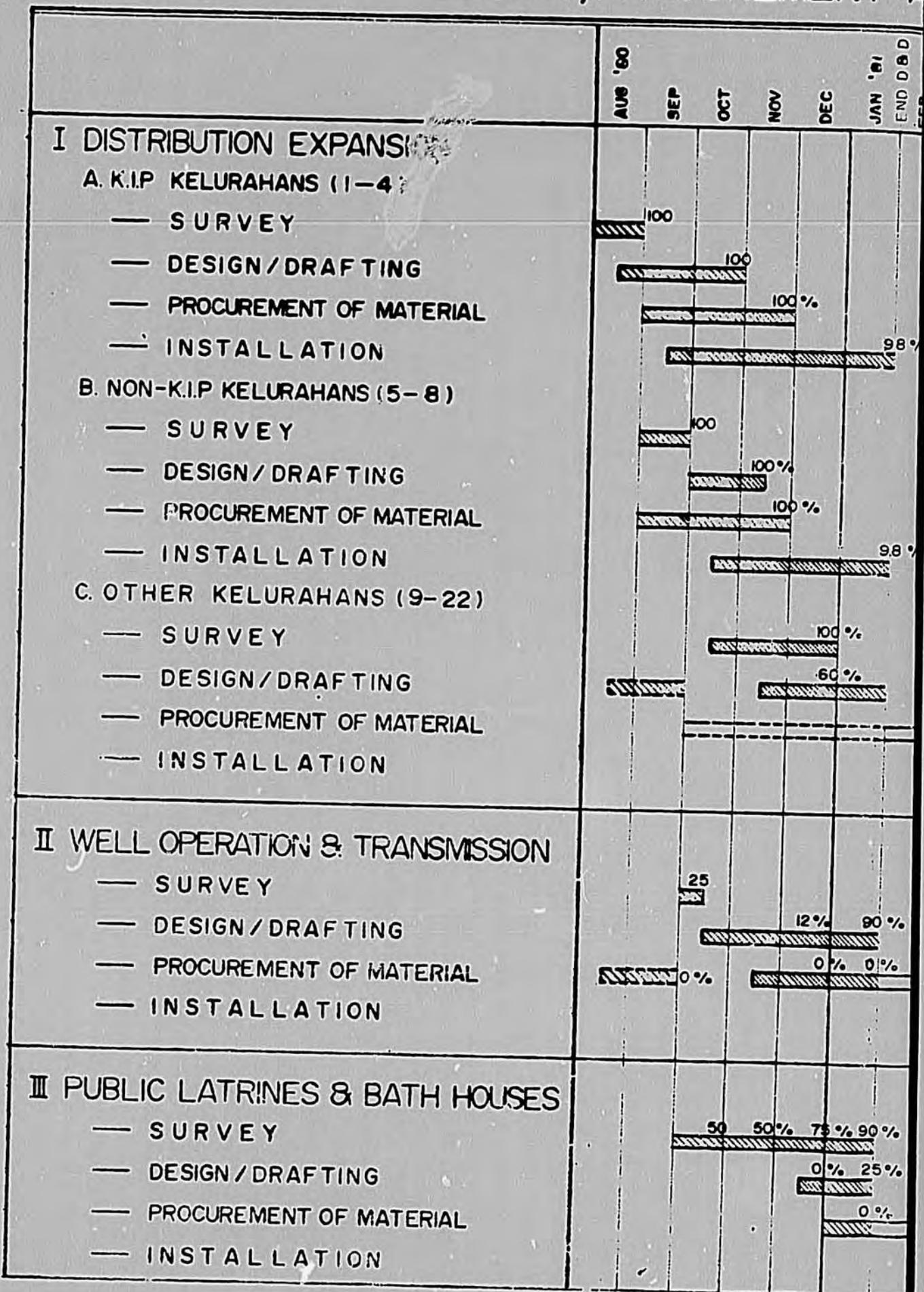
Design and specifications should be in progress.

E. Design of Well Distribution Piping

No activity planned this month.

VII. COMMENTS OF THE WATER DISTRIBUTION SPECIALIST

Apparently there are some budget proposals that could significantly affect the project. It is hoped that construction of the improvements for the Surakarta Water Project will not be delayed.



DISTRIBUTION SYSTEM AND CONSTRUCTION SCHEDULE

VIII B-2

APPENDIX VE.E

AS OF JANUARY 1981

													REMARKS	
FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN '82	FEB	MAR	
														BY CONTRACTOR FY 1980-1981 BUDGET
														BY CONTRACTOR FY 1980-1981 BUDGET
														FY 1981-1982 BUDGET
														EXCLUDING PERUMNAS FY 1981-1982 BUDGET
														FY 1981-1982 BUDGET

SURAKARTA WATER ENTERPRISE
DISTRIBUTION SYSTEM
CONSTRUCTION PROGRESS REPORT NO. 5
02 FEBRUARY 1981

I. GENERAL :

Present construction contracts had terminal dates of 28 January 1981, however, neither contractor is completed with his work. It is assumed CJWSP will grant an extension of time to each based upon their individual requirements.

II. WORK IN PROGRESS :

A. P.T. Sarana Alam completed testing the major portions of his work. CJWSP has decided to waive any subsequent tests on these systems regardless of work done since the partial tests were accepted by the Consultant. The understanding CJWSP will make with the contractor will be to extend his responsibility for such untested work for a period of six (6) months beyond his normal two (2) months maintenance period. The Contractor installed galvanized piping with welded black steel flanges at two bridge locations. The Consultant brought this to the attention of CJWSP, who has decided to accept the piping as installed but requires the contractor to follow specifications in future. It has been determined to be necessary to increase line sizes in certain locations. It was arranged with the contractor to provide such increased line sizes and offset the costs by reducing the total length of pipe to be installed. The following portrays the contractor's activities as of this reporting period.

<u>Kelurahan</u>	<u>LM Inst.</u>	<u>LM Tested</u>	<u>last test Date</u>	<u>Tie-in Tie-in</u>	<u>Tie-in Done</u>	<u>Bov Bov</u>	<u>Bov Done</u>	<u>Other</u>
1. Setabelan	1,155	1,149	8/1/81	13	4	5	-0-	-0-
2. Joyosuran	4,200	4,102	27/12/80	11	4	2	-0-	-0-
3. Kemlayan	886	886	25/12/80	4	2	3	-0-	-0-

4. Jebres	1,755	1,735	6/1/81	6	-0-	3	-0-	-0-
5. Pasar Kliwon	1,030	1,018	13/1/81	8	-0-	2	-0-	streaming
6. Semanggi	647	641	14/1/81	5	-0-	-0-	N/A	streaming
7. Purwodiningratan	657	657	23/12/80	8	1	1	1	-0-
8. Keprabon	120	120	8/1/81	3	-0-	-0-	N/A	-0-

Total percent complete is considered to be 98.74.

- B. P.T. Palagan continues to install work without consideration of testing it. Also, regarding the house services, very few meter boxes have been set in place because of the lack of metal tops. The contractor was to have received the fabricated metal tops the last week of this reporting period but none have subsequently been installed to date. As of the end of this reporting period the contractor has made 93 house connections which are 50 % complete and another 92 considered to be 75 % finished which combined is 10.5 % of the total house connections to be made. Regarding the installation of public hydrants, the following is a resume of completion status as at C.O.B. 31 January,

<u>KELURAHAN</u>	<u>PH STARTED</u>	<u>PH COMPLETED</u>	<u>PERCENT DONE</u>
1. Setabelan	19	-0-	56.25
2. Kemlayan	*11	-0-	72.73
3. Pasar Kliwon	3	-0-	18.75
4. Semanggi	3	-0-	18.75
5. Jebres	5	-0-	25.00
6. Keprabon	* 2	-0-	16.66
Total	43	-0-	48.05

* One (1) PH was deleted from Kelurahan Kemlayan and, in turn, added to Kelurahan Keprabon thus figures and percentages reflect this change.

III. PROBLEMS :

Same as previous report except Ford Meter Box Co. meter stops have been received for installation and the shop drawings for all stream crossings have been received and acted upon.

IV. PLANNED :

- A. Continue to make connections to existing mains and install valves and valve boxes for flush.
- B. Continue with all contractual obligations.

V. CONSTRUCTION SPECIALIST'S COMMENTS :

There seems to be some differences of opinion between the various organizations that result in activities being undertaken with a lack of coordination even though weekly meetings are held for such purposes. During the life of the present construction contracts the Consultant has been requested to provide only the construction drawings, act as the approving agency for the contractors' submittals of data and/or materials and supervise the construction.

All other Contract Documents were published and issued by CJWSP and/or their affiliated organization. Decisions made and agreed to by parties who are contractually bound one to another, in effect, become changes to such Contracts. The Consultant will continue to do that which is required to see that the finished work complies with the intent of all Contract Documents.

It is incumbent upon the Administrator to keep the personnel of the Consultant apprised of any and all changes which could affect the technical aspects of the work.

MINUTES OF PROJECT PROGRESS MEETING.

Place : EM/TAE Office Surakarta
 Date : January 21, 1981
 Time : 10.00 am - 13.30 pm.

ATTANDED BY :

1. Ir. Azis S.	DSE
2. Ir. Rachmat Rani	DSE
3. Ir. Rahardjo	DSE
4. Ir. Krisno Darusman	CJWSP
5. Ir. Hari Wahyuadi	CJWSP
6. Mr. Grayson	USAID
7. Mr. Paul Thorn	USAID
8. Mr. Sularno	SWE Surakarta
9. Mr. Moch. Ichsan	SWE Surakarta
10. Mr. George M. Pary	BMTAE
11. Mr. Jerry Bragdon	BMTAE
12. Mr. William Lee	BMTAE
13. Mr. J.F. Baucom	BMTAE
14. Mr. Al. Ringler	BMTAE
15. Ir. A.F. Dengah	BMTAE
16. Ir. Abdul Kadir	BMTAE
17. Mr. Sunaryoko BE	BMTAE

I. The meeting was opened by Ir. Azis S. who proposed the following program :

1. Project progress
2. Finance and planning
3. Training for SWE personnel

II. REPORTS :

1. Mr. Pary reported :

- Financial conditions can be adjusted, to a smaller level of effort but extended in time.
- Purchase of pumps and accessories will be proposed as soon as the results of well testing are on hand

and specifications for pumps and motor-generators can be written.

- On January 24, 1981 bid opening will be held in Cipta Karya offices in Jakarta, for the supply of pipe for secondary and tertiary water distribution.
- Laboratory apparatus on order.
- SWE personnel have difficulties working with system under pressure. It is suggested, that the O & M Specialist provide special training on this subject.

2. Mr. Thorn considers the following priorities :

- To restore the old distribution system
- To install the tertiary and secondary distribution by stages.
- To build 10 Public bathhouses.
- To restore + 140 public latrines.
- To install two pumps and two motor-generator sets on the already drilled wells.

The Consultant was given one week to estimate the cost of material and labor for the above priorities and submit them to USAID, DSE and CJWSP.

3. Mr. Ringler reported :

- 300 mm loop south of the city was not completed, the connection to the old transmission line have not been done because the repairs were not carried out.
- SWE is not ready with the material storage space. The Consultant held material will be used by SWE for repairs.

Ir. Azis stated that Indonesian has worked out priorities and targets on the installation of pipe.

Pipe repair will proceed as planned and the data for further repairs will be obtained from the Consultant as required.

Mr. Thorn stated, that he did not receive actual figures on the cost of repairs. (These figures were included in the April 1979 monthly report, however now, due to inflation the figures will be higher, Cons.)

Mr. Ringler stated, that most of the leaks appear on the service lines. The remainder is divided between tertiary distribution and the old transmission main.

The report by Mr. Fodor, the previous O & M Specialist, listed leaks which could be detected at the time, with little or no pressure in the pipe. The present situation, with higher pressure presents new problems, which could not be discovered in spring of 1979.

III. Finance and Planning execution :

1. Ir. Krisno Darusman presented the following budget for 1981/82 :

a. Installing 20 km pipe with small diameter	Rp. 89,900,000
b. Building two pumps houses and installing the two pumps and motor-generators	Rp. 30,000,000
c. Cost of Handling (including Rp 25 million in Addendum II)	Rp. 40,000,000
d. Consultant expenses	Rp. 130,000,000
	<hr/>
Total	Rp. 289,900,000

2. Mr. Bragdon described the location of Kelurahan in Phase I which will be executed for 1981 - 1982.

On 1 st of April the materials are expected to be ready so that the installation might be started.

Ir. Rahardjo recommends to the Consultant, the planning of Public Bathhouses should contain several different approaches.

3. As for as testing distribution piping is concerned, it was decided, that all new construction will be tested

as per specifications, however the connections between the old and the new system will be work-tested, that is under the normal working pressure.

IV. Training Program :

1. Ir. Azis discussed the plan of Sub Directorate of Training on the three months Training Program for :

- I. Chief of SWE and Chiefs of Departments.
- II. Chiefs of Sections.

The number of trainees to be about 10 persons.

Training Location at : Malang, Banyuwangi and Denpasar. SWE was requested to send the list of trainees and pay the cost to DSE Jakarta so that the schedule can be arranged.