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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
AID LOAN 497-U-044

MONTHLY PROGRESS

REPORT NO. 13
OCTOBER 1979

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

BURNS & McDONNELL Engineering Co.

Architect - Engineers

A JOINT VENTURE

Consultants - Planners

TRANS-ASIA Engineering Associates, Inc.

Please Reply to: Surakarta Water Project
Kotak Pos 105
Surakarta

No. 232/BM/TAE/SKA/79
5 November 1979

Mr. Soesanto Mertodiningrat
Director of Directorate of Sanitary Engineering
Directorate General Cipta Karya
Jl. Pattimura no: 20
Jakarta Selatan

Subject : Contract for Consultant Services for
Surakarta Water System, No. 01/WS-S/I/AID/78
dated 26 October 1978.

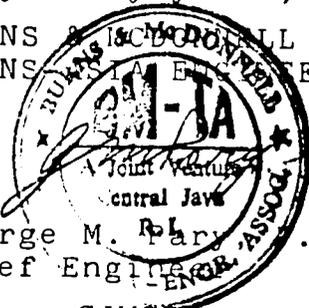
Dear Sir,

In accordance with Section 4.12 and Appendix I of the subject Contract, we are pleased to submit fifteen copies of Monthly Report No. 13 for the month of October 1979.

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

Very truly yours,

BURNS & McDONNELL ENGINEERING CO.
TRANS-ASIA ENGINEERING ASSOC, INC.



George M. Perry, P.E.
Chief Engineer

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

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MONTHLY PROGRESS REPORT

SECTION 1
NARRATIVE SUMMARY

1A GENERAL

TRANSPORTING OFF SHORE PURCHASED MATERIALS

The Ministry has awarded the contract for transporting the third and last shipment of pipes and fittings on October 6, 1979.

CONSTRUCTION OF THE TRANSMISSION PIPELINE

Central Java Water Supply Project has awarded the contract for constructing the transmission pipeline sections A & B. Field work has started on October 15, 1979 and the work for both sections is continuing.

GROUNDWATER EXPLORATION AND WELL DEVELOPMENT PROGRAM

Final Report has been sent to the Ministry and USAID approval. Specifications and Drawings for tendering are nearing completion.

MANAGEMENT ASSISTANCE PROGRAM

Advisory work is continuing.

O & M ASSISTANCE PROGRAM

Preparatory work for the Classroom Training Program is continuing. Technical illustrations are 60% complete.

METER REPAIR PROGRAM

Meter repair specialist has submitted sketches for the meter shop layout and equipment to the Director of Surakarta Water Enterprise.

1B MAJOR PROBLEMS

The equipment and materials for construction are still awaiting transportation from Semarang to Surakarta. The Consultant again requested Cipta Karya to expedite the award of contracts. Unless these materials and equipment are received very soon, the construction of the pipeline may have to stop and the meter shop training of SWE personnel will be further delayed.

The Ministry is also requested to expedite the acquisition of rights of way from Bina Marga. None have been received to date.

SECTION 2
ADMINISTRATION

2A SUBMISSION/APPROVALS

Consultant's Invoice No. 12 for September, 1979 U.S. Dollar reimbursible expenses was submitted to Cipta Karya on October 6, 1979 and was approved by CK on October 16, 1979. This is in accordance with the Contract, Appendix. II, page 11 - 15.

2B CONFERENCES AND REPORTS

2B1 Memorandum of Monthly Conference
Appendix. VIII

Memorandum of Conference on Management and
Development of the Surakarta Water Enterprise
Appendix. IX

Memorandum of Conference for
Groundwater Investigation and
Well Drilling Program
Appendix. X

Transmission Pipeline Installation
Project Coordination Conference
Appendix. XI

2B2 Report on Management Assistance Program
Appendix. XIII

Report on the Transmission Pipeline
Construction
Appendix. XIV

Groundwater Exploration and Development Report
Appendix. XV

SECTION 3
SCHEDULES

3A PROGRESS

3A1 TRANSPORTING OFF-SHORE PURCHASED MATERIALS
AMERICAN CAST IRON PIPE COMPANY :

Contract for transporting the third and last shipment of 2107 MT of pipes and fittings from Semarang Harbor to Surakarta Storage Area have been awarded to P.T. EMKL INTRAVEEM of Semarang on October 6, 1979. Actual transportation work is expected to start first week of November 1979.

THE ROHAN COMPANY :

The following shipment has arrived from the U.S. to port of Semarang on August 7, 1979

Flush Model Hydrants

Self Closing "

Ford Meter Box Test Bench

Misc. tools and portable pump equipment

The Consultant is awaiting the Ministry's decision for selecting transportation contractor.

CLOW CORPORATION :

47.141 MT of misc. size valves have arrived to port of Semarang on August 6, 1979.

The Consultant is awaiting the Ministry's decision for selecting transportation contractor.

COLCORINDO RAYA :

36.32 kg of materials consisting of 4 annubar and flow meter were arrived to port of Semarang on June 20, 1979. The Consultant is awaiting the Ministry's decision for selecting transportation contractor.

3A2 CONSTRUCTION OF THE TRANSMISSION PIPELINE
SECTION A & B

Central Java Water Supply Project of Semarang has awarded the contracts on October 8, 1979 to P.T. Tukad Mas for Section "A" and to P.T. Lepen Kencana for Section "B". Actual field work has began on October 15, 1979 on Section "A" and on October 23, 1979 on Section "B".

3A3 GROUNDWATER EXPLORATION PROGRAM

Hydrogeological data taking and resistivity survey work is 100% complete. The Consultant has submitted the final Groundwater and Well Development Report on October 29, 1979 for the Ministry and USAID approval.

3A4 WELL DRILLING PROGRAM

The Consultant has received the Ministry and USAID decision concerning local v.s. International Tendering. The Consultant is to prepare Pre-Qualification and Tender Documents which are to be submitted to the Ministry and USAID for their review and approval. The Consultant is proceeding with all necessary revisions and the work is 80% complete.

3A5 MANAGEMENT ASSISTANCE PROGRAM

Work is on schedule and is 75% complete.

3A6 O & M ASSISTANCE PROGRAM

Preparatory work for Classroom Training Program is continuing, and is on schedule. Due to the construction delay the remainder of Program is one month behind schedule. Estimated starting date will be on December 3, 1979.

3A7 METER REPAIR PROGRAM

Advisory work is on schedule and is 12% complete. Requirements for additional shop equipment to be acquired locally, have been submitted to SWE.

3B WORK SCHEDULED FOR NEXT MONTH

Continue coordination of loading, transporting and unloading the off-shore purchased materials.

Continue to supervise the Transmission Pipeline Construction Sections A & B.

Continue working on the drilling program and all related documentation.

Continue Management Advisory services to the Surakarta Water Enterprise, supervise General Accounting and assist implementing the Organization Manual.

Preco-ordinate the Classroom and On-site Training Program. Assist and supervise the 2nd phase O & M building construction.

Continue Meter Repair Advisory services to Surakarta Water Enterprise.

SECTION 4

ENGINEERING & MANAGEMENT

4A TRANSPORTING OFF-SHORE PURCHASED MATERIALS

The Consultant reporting several months of slippage for transporting of the balance of the Off-Shore Purchased Materials. It is imperative that all materials be transported from Semarang port to Surakarta Storage area to avoid potential delay claim from the pipeline contractors.

4B CONSTRUCTION OF THE TRANSMISSION PIPELINE

Work done during the month of October, see Appendix. XIV

4C GROUNDWATER EXPLORATION AND WELL DEVELOPMENT PROGRAM

See Appendix. XV

4D MANAGEMENT ASSISTANCE PROGRAM

The Management Specialist is continuing to advise the Surakarta Water Enterprise on management and administrative procedures. For work which has been performed during the month of October see Appendix. XIII

4E O & M ASSISTANCE PROGRAM

The Consultant has submitted the schedule of the O & M On-Site, Classroom and Overseas Training Program on September 20, 1979 for the Ministry's and USAID's comment. As of this date no official comment has been received. The Consultant reporting one month slippage in the program due to the construction delay for completing the O & M building.

4F METER REPAIR PROGRAM

The Meter Repair Specialist has submitted layouts and equipment drawings to the Surakarta Water Enterprise for setting-up the Meter Testing and Meter Repair Shops.

SECTION 5
P E R S O N N E L

The Surakarta office personnel in October were as follows :

E x p a t r i a t e s

- George M. Pary, P.E. Chief Engineer
arrived 17 August 1979
- Thomas G. Fodor, O & M Specialist
arrived 25 December 1978, with spouse
- James F. Baucom, Pipeline Engineer
arrived 26 September 1979
- Bernardo B. Bayongan, Management Specialist
arrived 5 November 1978
- George R. Pike, Meter Specialist
arrived 26 September 1979

I n d o n e s i a n

Professional and Technical :

- A.F. Dengah, Counterpart Chief Engineer
arrived 8 November 1978
- Djoko Imbarno, Construction Supervisor
arrived 3 September 1979
- Suyatno Yuwono, Counterpart Hydrogeologist
arrived 5 January 1979

- Mohamad Khalil, Material Coordinator
arrived 2 October 1978
- Abdul Kadir, Senior Inspector
arrived 9 October 1979
- Bambang Agus Salam, Inspector
arrived 1 May 1979
- Mohamad Syarief Lembah, Inspector
arrived 1 May 1979
- Akhmad Aries, Draftsman
arrived 13 April 1979
- Hendradi, Translator
arrived 3 September 1979
- Yonathan Jowie, Accountant
arrived 2 December 1978

Administrative :

- Dradjat Atmardjo, Office Manager
arrived 2 October 1978
- Sri Hartati, Secretary
hired 1 June 1979
- Dewi Yuliati, Typist
hired 7 February 1979
- Rubiyo, Clerk
hired 1 November 1978
- Chaiz Hidayati, Administrative Clerk
hired 8 October 1979

- Pamudji Rahardjo, Driver
hired 2 October 1978
- Budi Dwi Putranto, Driver
hired 4 January 1979
- Djoni Santoso, Driver
hired 1 May 1979
- Sutrisno, Driver
hired 2 April 1979
- Ermita Taher, Supply Clerk/Labor
hired 19 March 1979
- Arum Munawar, Copy Machine Operator/Labor
hired 8 March 1979
- Djumhan Hardi, Expeditor/Labor
hired 2 January 1979
- Endang Tri Siwi D.M., Receptionist/Labor
hired 1 October 1979
- Suwarno Hadi, Office Boy/Labor
hired 1 November 1978
- Mulyatmono, Watchman/Labor
hired 9 October 1978

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

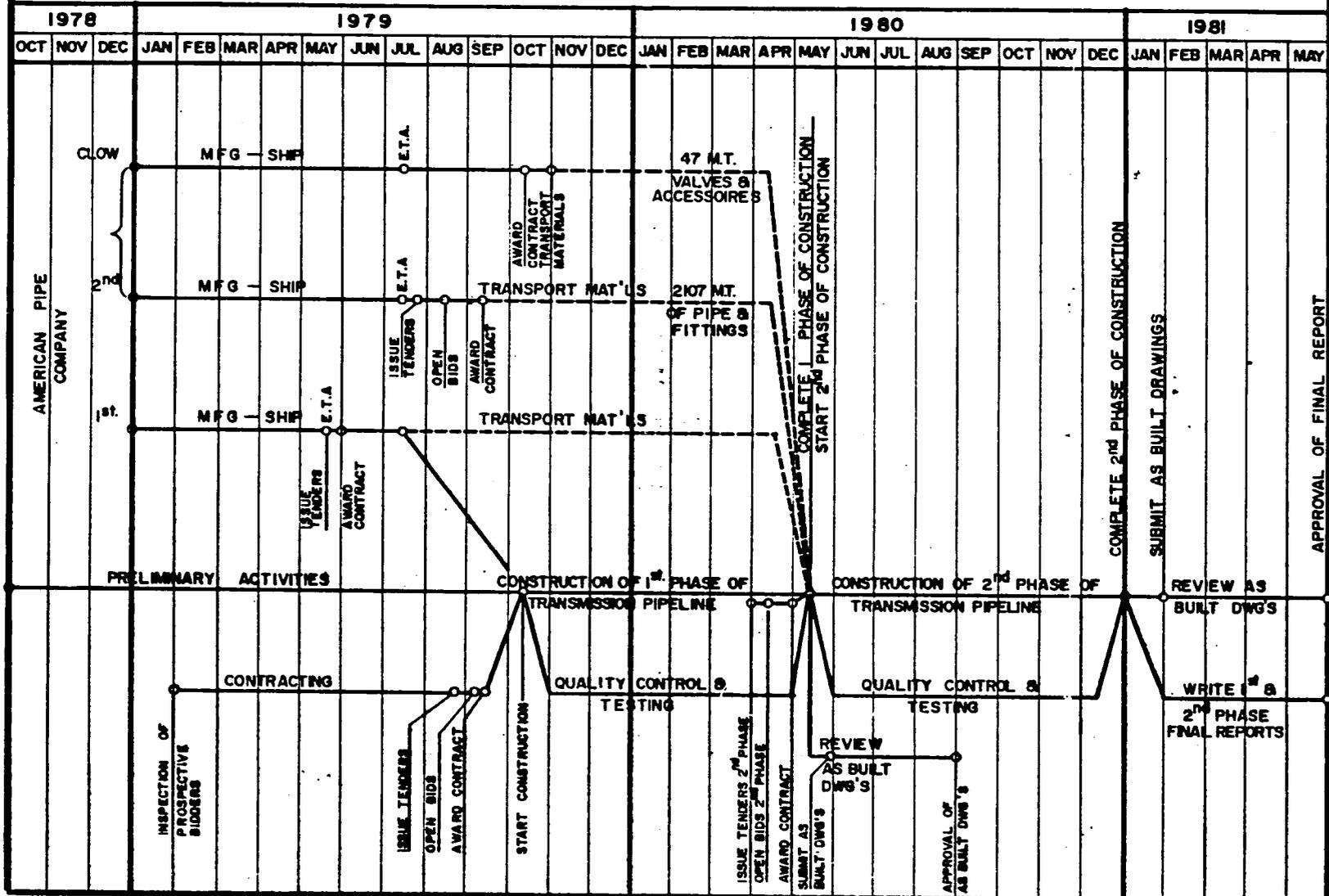
CONTRACT NUMBER 01/WS-S/AID/78 AID LOAN 497-U-044	MAN - MONTHS			
	FOR OCTOBER 1979	CUMULATIVE THROUGH 31 October	% OF TOTAL SCHEDULE	TOTAL IN CONTRACT SCHEDULE
EXPATRIATES				
Principal Liaison Engineer	0	0.3	15	2
Procurement Engineer	0.09	1.98	66	3
Chief Engineer	0	6.5	100	6.5
Pipeline Engineer	1	9.5	47.5	20
Hydrogeologist	1	1.1	6.8	16
Drilling Specialist	0	5.7	47.5	12
Management Specialist	1	2.8	23.3	12
O & M Specialist	1	11.6	72.5	16
Meter Specialist	1	10.4	49.5	21
EXPATRIATE TOTAL	1	1.1	13.7	8
	5.09	50.9	43.7	116.5
INDONESIAN PROFESSIONAL & TECHNICAL				
Counterpart Chief Engineer	1	11.6	58	20
Construction Supervisor	1	1.9	13.5	14
Hydrogeologist	1	9.8	65.3	15
Materials Coordinator	1	13	92.8	14
Inspectors	2.6	12.6	26.2	48
Draftsman	1	8	50	16
Translator	1	8.7	72.5	12
Accountant	1	11	50	22
INDON. PROF. & TECH.	9.6	76.6	47.5	161
INDONESIAN ADMINISTRATIVE				
Office Manager	1	13	65	20
Secretary	1	12	60	20
Typist	1	8.6	39	22
Clerks	4	34.5	78.4	44
Drivers	4	38	47.5	80
Laborers	5	45.3	28.3	160
ADMINISTRATIVE TOTAL	16	151.4	32.1	346

APPENDIX I

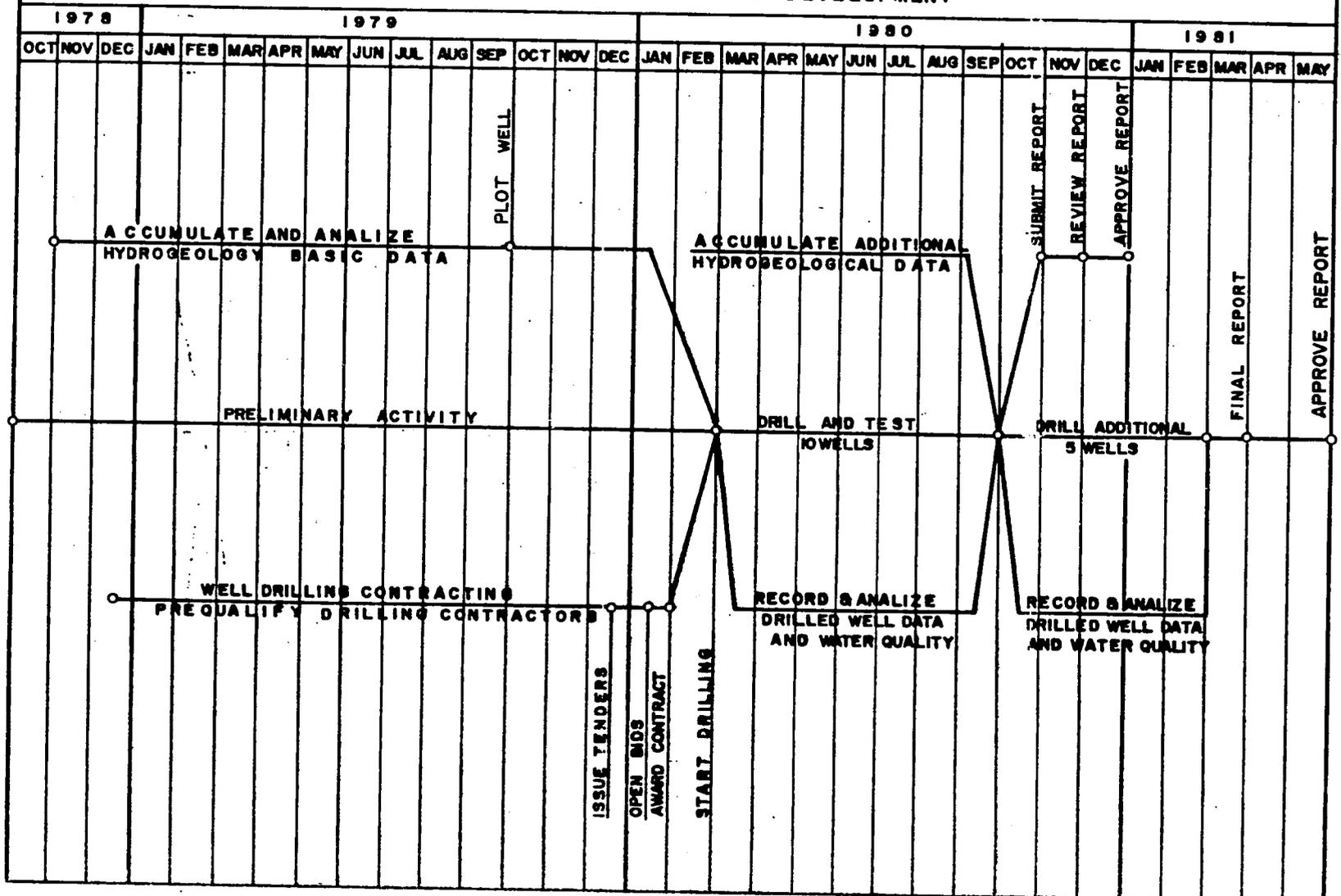
SURAKARTA WATER PROJECT
REPORT OF ENGINEERING COSTS
BURNS & MCDONNELL/TRANS-ASIA ENGINEERING ASSOC.

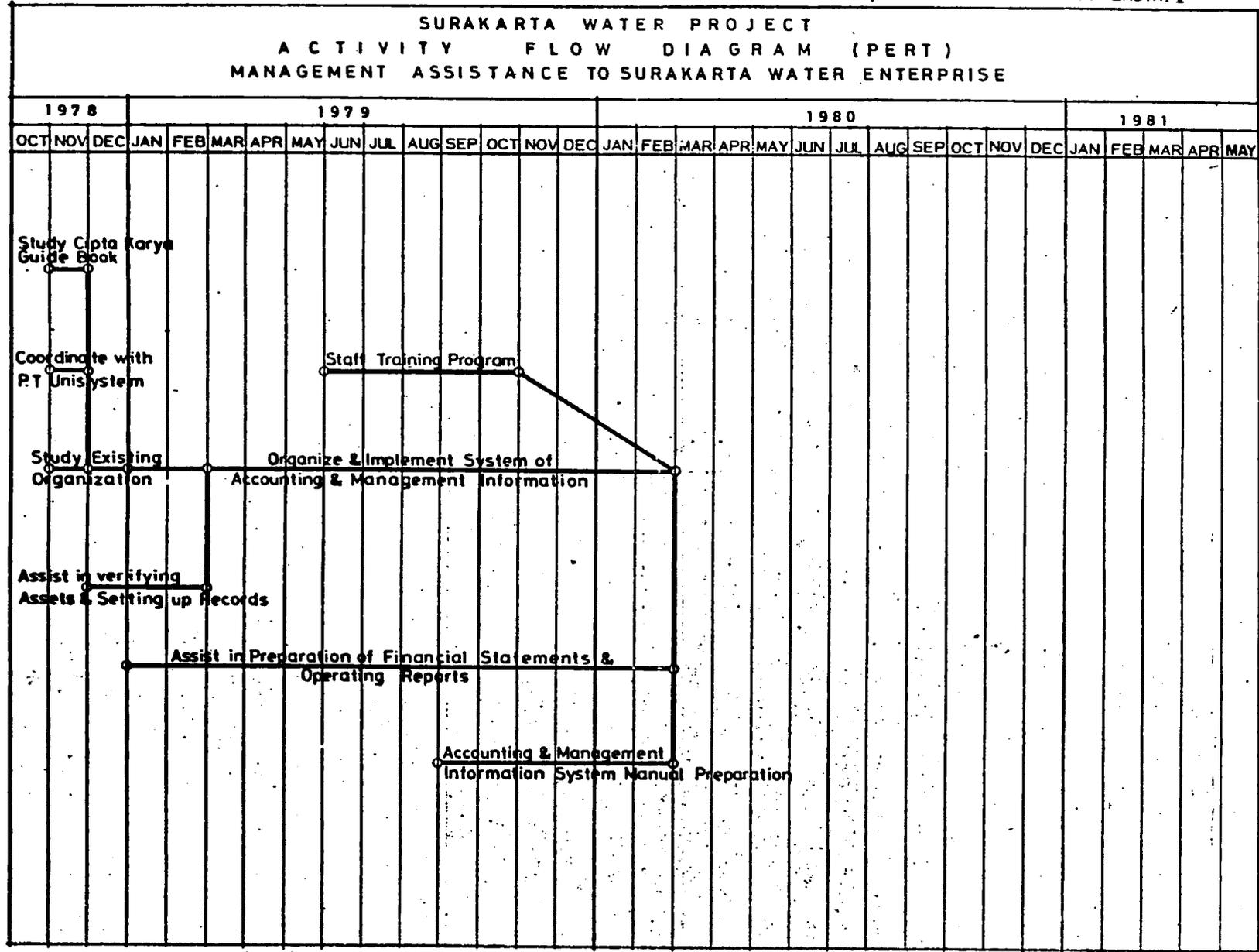
CONTRACT NO. 01/WS-S/AID/78 SIGNED 26 OCT. 1978 START 1 JAN. 1978 END 31 JAN. 1981 REIMBURSABLE EXPENDITURES	COSTS FOR	CUMULATIVE COSTS THROUGH OCTOBER 1979		CUMULATIVE PAYMENTS THROUGH OCTOBER 1979			TOTAL BUDGET ESTIMATE FOR CONTRACT
	OCTOBER 1979	AMOUNT	% OF TOTAL BUDGET ESTIMATE	AMOUNT RECEIVED IN OCTOBER	TOTAL AMOUNT RECEIVED THROUGH OCTOBER	% OF TOTAL BUDGET ESTIMATE	
US DOLLARS							
Salaries and Related Costs	28,592.84	289,217.30	47.1	18,920.02	260,380.58	42.5	\$ 612,922
Transportation	-	16,010.45	26.4	4,284.10	32,020.90	52.8	60,638
Equipment	-	-	-	-	-	-	36,000
Miscellaneous	-	30,678.32	92.4	3,697.32	34,375.64	103.6	33,181
Training	-	-	-	-	-	-	14,544
Contingencies	-	-	-	-	-	-	75,729
TOTAL DOLLARS	28,592.84	335,906.07	40.3	26,901.44	326,777.12	39.2	\$ 833,014
INDONESIAN RUPIAH							
Salaries	7,230,000	28,551,666	40.1	12,896,667	21,321,666	29.9	71,150,000
Transportation	1,591,914	13,912,033	49.3	4,488,786	12,320,119	43.6	28,195,000
Housing	-	23,200,000	72.6	-	23,200,000	72.6	31,950,000
Vehicle Costs	670,000	25,827,494	103.1	8,324,674	25,157,494	200.4	25,050,000
Equipment Costs	59,900	5,808,210	44.1	1,001,700	5,748,310	43.7	13,153,000
Miscellaneous	1,819,725	12,257,130	49.6	3,014,100	10,437,405	42.3	24,670,000
Contingencies	-	6,639,075	34.1	853,275	6,639,075	34.1	19,416,960
TOTAL RUPIAH	11,371,539	116,195,608	54.4	30,669,202	104,824,069	49.0	213,586,560

**SURAKARTA WATER PROJECT
ACTIVITY FLOW DIAGRAM (PERT)
CONSTRUCTION OF TRANSMISSION PIPELINE**

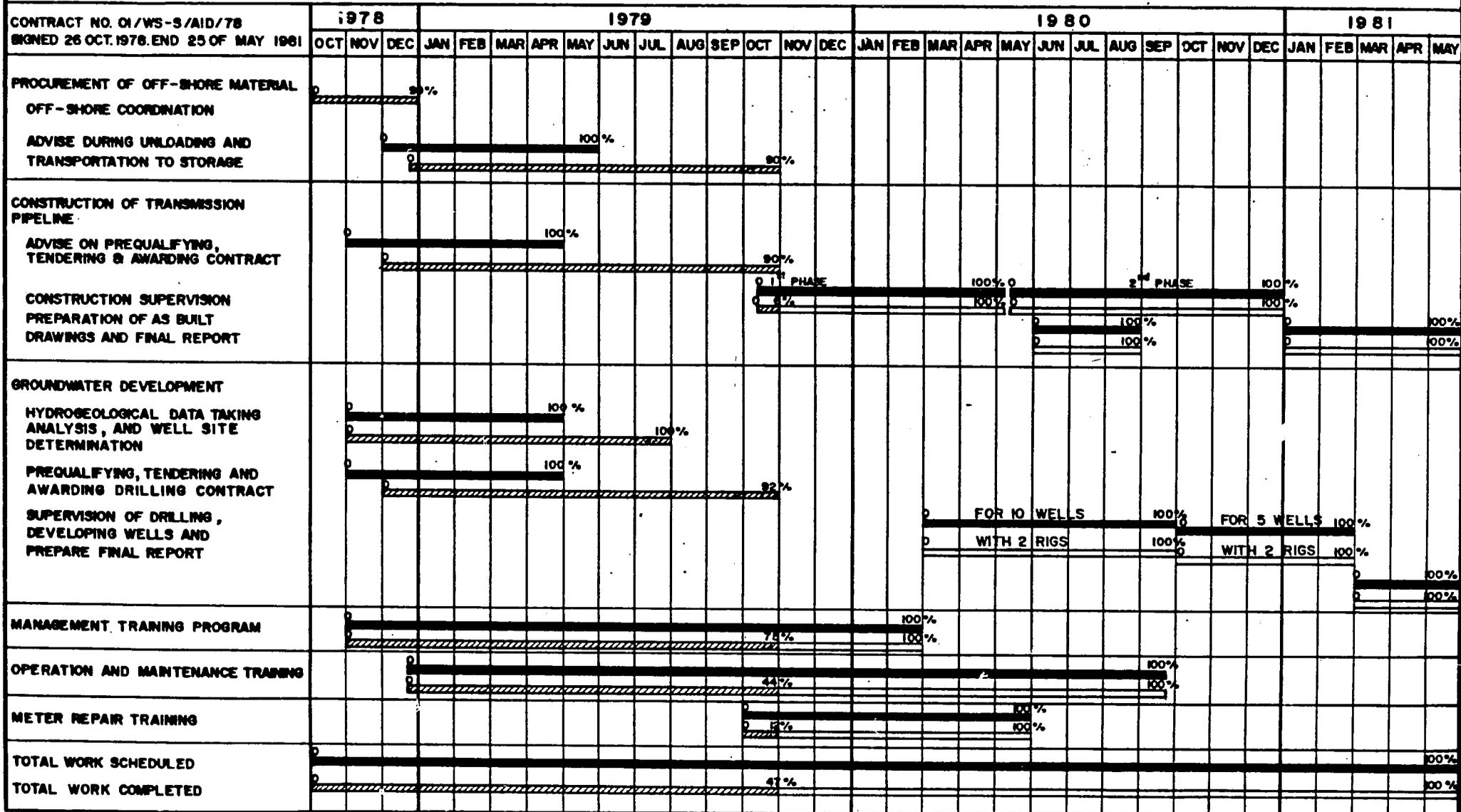


**SURAKARTA WATER PROJECT
ACTIVITY FLOW DIAGRAM (PERT)
GROUND WATER EXPLORATION AND DEVELOPMENT**





**SURAKARTA WATER PROJECT
SCHEDULE OF ENGINEERING ACTIVITIES
PERCENT COMPLETED AT END OF OCTOBER 1979**



MEMORANDUM OF MONTHLY PROGRESS MEETING

Meeting held at : Cipta Karya, Jakarta
 on : Thursday, October 11, 1979
 1.00 p.m - 3.15 p.m.

Attended by :

1. Mr. Susanto Mertodiningrat; Dir. of San. Eng. Jakarta
2. Mr. Aziz ; - " -
3. Mr. Rachmat Rani ; - " -
4. Mr. Sihono ; - " -
5. Mr. Subandrio ; - " -
6. Mr. Robinson ; Cipta Karya, Jakarta
7. Mr. Grayson ; USAID, Jakarta
8. Mr. Thorn ; USAID, Jakarta
9. Mr. Iing ; CJWSP, Semarang
10. Mr. Harsono ; CJWSP, Surakarta
11. Mr. Sudarto ; SWE
12. Mr. Hariyanto ; SWE
13. Mr. Midgett ; BM/TAE, Jakarta
14. Mr. Pary ; BM/TAE, Surakarta
15. Mr. Bayongan ; BM/TAE, Surakarta
16. Mr. Dengah ; BM/TAE, Surakarta

Meeting opened by Mr. Susanto at 1.00 p.m.

Results :

1. General :
 - USAID is concerned about progress of Project and proposes to improve communications and coordination between all concerned parties.
 - Consultant to submit to CK for approval a new revised schedule for time extension on the Contract.
 - Consultant to add an amendment to Design Tertiary Distribution System and transmission of additional water from the wells.

- Consultant submitted to CK the first copy of part of the amendment and will complete it soonest and discuss it.
- It will be possible to transform test well into production well. USAID loan is sufficiently flexible to permit acquisition of necessary equipment.

2. Groundwater Investigation Program :

- To be thoroughly discussed in a separate meeting after USAID Hydrogeologist returns from USA.

3. Well Drilling Program :

- USAID agrees to tender it among local contractors
- Prequalification of local contractors should be in accordance with USAID regulations.
- US Dollar payment to the contractors will be issued through CK using Direct Reimbursement Authorization payment method.

4. O & M Training Program :

- Expenses to finish and furnish the building will have to come from the municipality and Project.
- Additional training equipment as requested by the Consultant in April 1979, can be purchased through USAID in small packages.
- Consultant to forward explanation of the 43% reported accomplishment of the work.
- Off-shore training program to be submitted to USAID for approval at least two months prior to scheduled departure, containing :
 - a. Program
 - b. List of participants
 - c. Brief resume of each participant.

Participants to be tested in English language proficiency, or otherwise an interpreter must accompany the group.

5. Meter Repair Program :

- Consultant to submit soonest the estimated budget to furnish the meter repair shop.

6. Management Training Program :

- Consultant to revise statement in 1976 BM/TAE Study Report (page 54) stating that the 55% contribution of the SWE to the Surakarta Municipality as mentioned in the Surakarta Mayor's Decree is against the Indonesian Government Policy.
- Financial projections on SWE, submitted by the Consultant, to be discussed at a separate meeting on October 12, 1979.

7. Transportation of Material :

- Directorate of Sanitary Engineering has decided to award the contract of the third shipment to PT. Intraveem and will issue the Notice to Proceed soonest to enable to transport the needed appurtenances for installation of the transmission main.
- Directorate of Sanitary Engineering to complete the final acceptance of the 1st and 2nd shipments of American Cast Iron Pipe Company's pipes and fittings.

8. Installation of Transmission Main :

- Consultant reported that contracts have been awarded and contractors will start next October 13, 1979 with a ceremony at the springs.

Meeting adjourned at 3.20 p.m.

MEMORANDUM OF CONFERENCE
ON MANAGEMENT AND DEVELOPMENT
OF THE SURAKARTA WATER ENTERPRISE

Meeting held on : Friday, October 12, 1979
09.00 a.m. - 11.00 a.m.
at : Cipta Karya Conference Room

Participants :

1. Mr. Susanto ; Directorate of Sanitary Eng.
2. Mr. Oemarsiddik ; Directorate of Sanitary Eng.
3. Mr. Panjaitan ; Ministry of Home Affairs
4. Mr. Sumari ; Mayor of Surakarta
5. Mr. Moedjono ; Surakarta Municipality
6. Mr. Soedarto ; Surakarta Water Enterprise
7. Mr. Harriyanto ; Surakarta Water Enterprise
8. Mr. Thorn ; USAID
9. Mr. Thivierge ; USAID
10. Mr. Iing ; C.J.W.S.P
11. Mr. Robinson ; Cipta Karya
12. Mr. Sihono ; Directorate of Sanitary Eng.
13. Mr. Midgett ; BM/TA
14. Mr. Pary ; BM/TA
15. Mr. Bayongan ; BM/TA
16. Mr. Dengah ; BM/TA

Meeting opened by Mr. Susanto at 9.00 a.m.

Results :

- USAID loan agreement with the GOI contains several conditions, which have not yet been fulfilled by the GOI.

- SWE should be financially viable, have control of its money, in order to cover all expenses, operation and maintenance and pay back loan.
- Independence of the SWE from the municipality is in a Transition Period, but beginning January 1980 the SWE will become totally independent.
- 55% of the SWE net profit (after depreciations): contribution to the Surakarta Municipality is in accordance to the Government Law.
- Agreement between GOI and the SWE about paying back USAID loan will be settled soon.

Meeting adjourned at 10.55.

Small meeting held after it between :

DSE, Ministry of Home Affairs, Mayor of Surakarta,
USAID and SWE.

MEMORANDUM OF CONFERENCE
FOR GROUNDWATER INVESTIGATION
AND WELL DRILLING PROGRAM

- I. Held at : Directorate of Sanitary Engineering
Directorate General of Cipta Karya
Jl. Pattimura 20 Jakarta
- II. Date : October 16, 1979; 11.00 a.m. - 4.00 p.m.
October 17, 1979; 1.00 p.m. - 4.30 p.m.
- III. Attended by : 1. Mr. Azis AS. Cipta Karya Jakarta
2. Mr. Djoko Rismiarto Cipta Karya Jakarta
3. Mr. Achmad Rani Cipta Karya Jakarta
4. Mr. Paul Thorn USAID Jakarta
5. Mr. Robert E. Davis USAID Jakarta
6. Dr. William M. Turner USAID Jakarta
7. Mr. Eddy Kristiawan USAID Jakarta
8. Mr. F. Midgett BM/TAE Jakarta
9. Mr. George M. Pary BM/TAE Surakarta
10. Mr. Y. Suyatno Y. BM/TAE Surakarta

IV. Result of the Discussion

A special meeting was held at the Cipta Karya office in Jakarta, in order to discuss the results of groundwater investigations and the proposed well drilling program. The meeting was attended by the Cipta Karya, USAID and BM/TAE representatives. Dr. William M. Turner, consulting Hydrogeologist to USAID was the primary speaker.

The Groundwater Investigation and Well Development Report by BM/TAE

and USAID's review of the hydrogeology and program recommendations were discussed in detail. The following are the results of the discussion, agreed upon by all the participants.

1. Groundwater can be expected from the entire investigated area, but the pumped water yield will differ in quantity, estimated yield of each well ranging from 10 l/s up to more than 50 l/s, 30 l/s being considered as average. If the well is of high efficiency type, more than 30 l/s can be obtained. The yield prediction was based upon the hydraulic analysis of the existing wells by Dr. W.M. Turner.
2. Aquifers were expected from the Notopuro and Kabuh Formations, and might also occur in Pucangan Formation and young volcanic succession.
3. Aquifer transmissivity was calculated by analysis of the pumping test and drawdown data from the existing wells, and arrived at the average value of $225 \text{ m}^2/\text{day}$, that is about 18,000 g.p.d./ft. From that value of transmissivity and 1×10^{-4} storage coefficient, each well can produce 40 l/s permissible pumped water for 40 years without obtaining recharge, and the allowable drawdown will be taken as one third of the available saturated thickness of aquifers or say 30 m. It should be noted however, that the well must be in high efficiency condition.
4. USAID proposed that water should be taken from Kabuh and Pucangan Formations in storage condition but the Consultant proposed to take also the water from young volcanic succession and Notopuro Formation, expecting the additional water can be obtained from recharge. The Consultant recommendations are based on the planned use of the Kartosuro reservoir, west of the city, therefore shorter transmission lines will be required.
5. Providing the higher efficiency of the well as stated at item 3 above, Cable Tool drilling rig should be employed for drilling performance, however rotary drilling rig will be taken as secondary recommendation for drilling program if high quality bentonite is used as drilling mud. Using natural clay will not be permitted. By using bentonite mud in the drilling performance, a Mud Engineer must be assigned.

6. Approved borehole diameter is 16" from top to bottom of total depth, well casing diameter must be 12" and stainless steel wire wound screen must be installed also in 12" size. Average length of the screen is assumed to be about 40 m.
Surface or conductor casing will be required at 10 to 15 m. depth from ground surface, cement seal must be installed at 10 to 15 m. depth from ground surface before drilling, in order to prevent the effect of artesian condition of the well in the top soil or vice versa, while drilling is in progress.
7. Drilling observation well was disapproved.
8. Ten test wells have been approved to be drilled, instead of 15 Test Wells and 2 Observation wells originally proposed by the Consultant. Drilling pilot hole in 6" diameter at each test well was disapproved. Drilling must be done one step to the 16" diameter of final borehole. Average depth of the test well was approved at about 125 m. Casing centralizer can be used as required.
9. Pumping test :
 - Step drawdown pumping test in 8 hours must be performed.
 - 24 hours continuous pumping test at maximum rate must be performed after completing the step drawdown pumping test.
 - For recovery test, at least residual drawdown must be detected 48 hours after pumping has been stopped or twice the duration time of pumping test itself, or in some cases until water level reaches the original static water level.
10. Since the aquifers spread out beneath the entire investigated area, well drilling site can be located anywhere at the distance of 15 Km. around Surakarta City. USAID recommended north-east of Surakarta about 3 Km. east of Bengawan Solo, while the Consultant recommended south-west of Surakarta between Kartosuro and Delanggu Town. Final decision for locating well drilling sites should be taken by Cipta Karya rather than the Consultant or USAID, because of the consideration to be taken should be based upon social, economic and political aspects or transmission and distribution water design aspects rather than hydrogeological aspects alone.

11. Well spacing is recommended to be about 500 – 600 m.
12. The following figure is the typical well design approved by the conference. (Fig. 19)
13. The well should be equipped with submersible pumps operated by electric motor. Pumps should be set near the bottom of the wells.
14. The Consultant should assign Expatriate Hydrogeologist who is familiar with the method of well hydraulic analysis introduced by Dr. W. M. Turner.

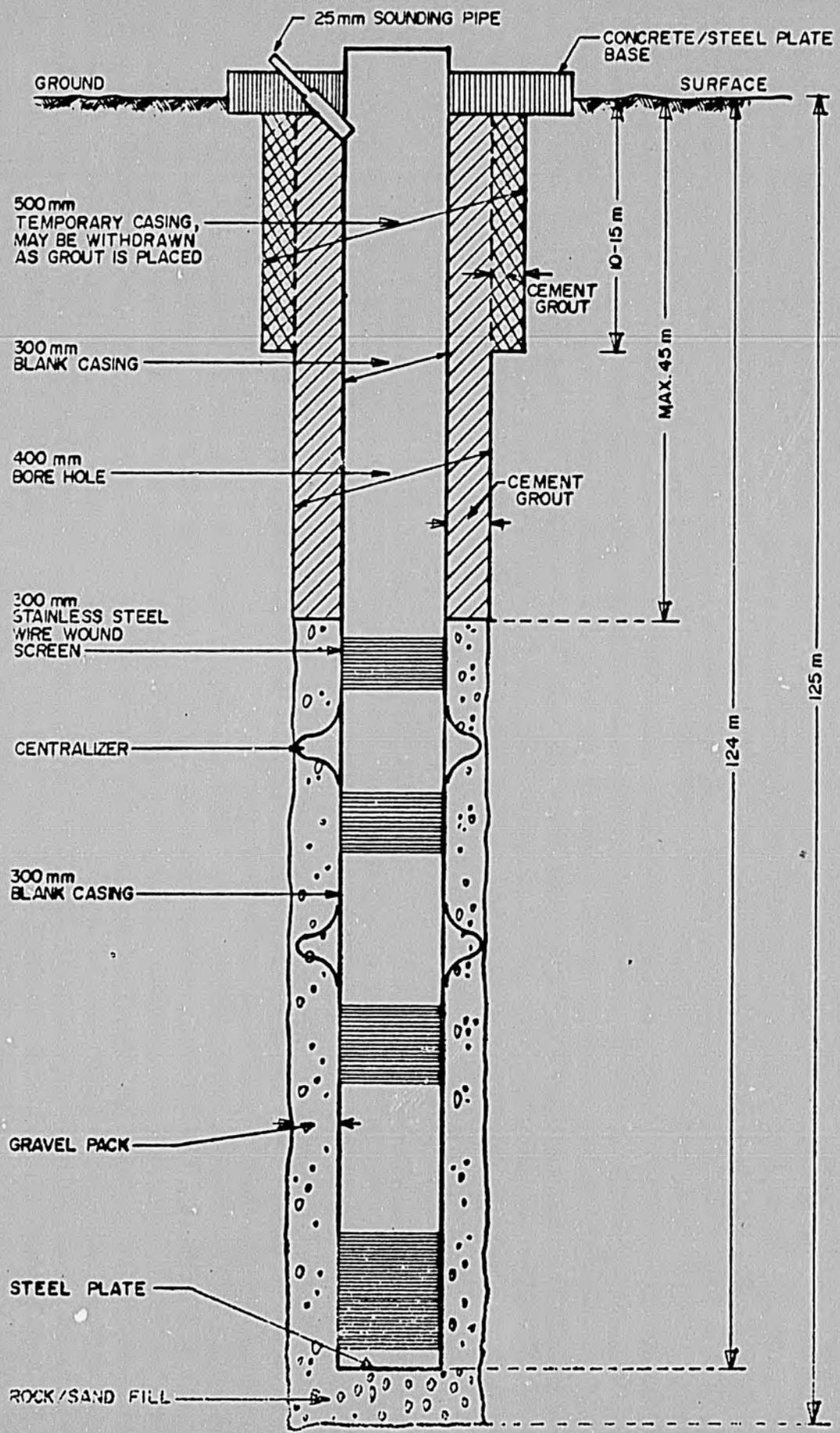


Fig. 18

TYPICAL TEST-PRODUCTION WELL DESIGN

NOTE: NO SCALE

TRANSMISSION MAIN PIPELINE INSTALLATION
PROJECT COORDINATION CONFERENCE

Meeting : 1st
Date : October 22, 1979
Day : 15th/210

Place : Consultant Office
Time : 09:10 - 11: 00 local time

Attended by:

1. Mr. A.F. Dengah - BM/TAE (Consultant)
2. Mr. Djoko Imbarno - BM/TAE
3. Mr. Abdul Kadir - BM/TAE
4. Mr. Bambang A.S. - BM/TAE
5. Mr. Syarief Lembah - BM/TAE
6. Mr. Moh. Khalil - BM/TAE
7. Mr. Waluyo Sejati - Water Supply Project
8. Mr. Sukandji - T.M. (Tukad Mas)
9. Mr. Kaswan M. - T.M.
10. Mr. A. Dawam - L.K.U. (Lepen Kencana)
11. Mr. A. Sulaeman - L.K.U.

Conclusions :

- 1.01.01 The Project Coordination Meeting will be held on every Monday starting at 09:00 a.m. Representatives of both contractors will attend the meeting. Main subjects to be discussed : administrative and technical problems. All decisions taken in Coordination Meetings will be binding for all parties concerned.

- 1.02.01 Tukad Mas's Field Personnel list has been received, the list of Lepen Kencana's Field Personnel will be submitted to the Consultant not later than October 27, 1979, including the Contractor's contract address in Surakarta.
- 1.03.01 Proposed time schedule bar charts have not yet been received by the Consultant. They will be submitted to the Consultant not later than October 27, 1979, after being discussed with the Construction Supervisor and/or Pipeline Engineer.
- 1.04.01 Contractor to provide on the job site :
1. Daily Performance Record Book
 2. Daily Supervisory Record Book
 3. Visitors Book
- 1.05.01 Contractors have not yet received Daily Report Forms.
- 1.06.01. Daily and Weekly Report Forms should be completely filled as soon as possible starting from October 8, 1979.
- 1.07.01 As-built drawings should be immediately made after the installation of the pipe.
- 1.08.01 Transit and level should be on job site every day.
- 1.09.01 Contractor has to make the total material schedule required for entire work according to the Contract. The schedule should be completed with the material installation schedule according to the types of material and its location. The request for materials should be in accordance with the schedules.

- 1.10.01 Contractor will submit the sequence of work plan in accordance with the time schedule.
- 1.11.01 Contractors are always expected to maintain a good relationship with the community and the local village officials.
- 1.12.01 Consultant to issue the drawings of change orders at some stations not later than October 27, 1979. Contractors are expected to submit the cost of it (increase/decrease) not later than November 1, 1979.
- 1.13.01 Contractors should add man-power as soon as possible, but not later than October 24, 1979.
- 1.14.01 Obtaining materials from the storage area shall be subject to the prior approval by the Material Coordinator. If there is no personnel in charge in the field, the Consultant Office should be contacted.
- 1.15.01 Handling of pipes should be done carefully to avoid bumping against each other. Pipes out of storage must be in good condition and ready for installation (Pipe cutting to the required size to be done at the storage area). Any damage to the pipe arriving at the job site is the Contractor's responsibility.
- 1.16.01 In order to maintain the laborer's health, the Contractor should provide drinking water at job sites.
- 1.17.01 If overtime work is planned, a prior report to the Consultant should be made, at least one day in advance.

1.18.01 Section A Contractor should place suitable signs at night along the road where the pipe is being laid.

1.19.01 The next Weekly Coordination Meeting will be held by Tukad Mas and the place for the meeting should be decided not later than October 27, 1979.

TRANSMISSION MAIN PIPELINE INSTALLATION
PROJECT COORDINATION CONFERENCE # 2

D a t e : October 29, 1979
T i m e : 09:05 - 10:30 a.m. local time
P l a c e : Kandang Menjangan

Attended by :

1. Mr. George M. Pary	: BM/TAE
2. Mr. J.F. Baucom	: BM/TAE
3. Mr. A.F. Dengah	: BM/TAE
4. Mr. Djoko Imbarno	: BM/TAE
5. Mr. Abdul Kadir	: BM/TAE
6. Mr. Moh. Khalil	: BM/TAE
7. Mr. Syarif Lembah	: BM/TAE
8. Mr. Bambang A.S.	: BM/TAE
9. Mr. Waluyo Sejati	: P.A.B. I
10. Mr. Trijaya	: P.A.B. I
11. Mr. I Made Kari	: T.M.
12. Mr. Karun M.	: T.M.
13. Mr. A. Dawam	: L.K.U.
14. Mr. Tony K.	: L.K.U.
15. Mr. Marjoso	: I.T.B.
16. Mr. M. Naufel	: I.T.B.
17. Miss Laksmi Cahyaniwati	: I.T.B.
18. Mr. Hafil W.	: I.T.B.

Conclusions :

1.01.02 The Project Coordination Meeting to start at
09:00 a.m. Suggested to be present before
09:00 a.m. in order not to waste time.

- 1.02.02 Lepen Kencana Field Personnel list received on October 29, 1979.
- 1.03.02 Time schedule/Bar Charts :
Tukad Mas to adjust the job description with the Bid Proposal without altering the costs.
Lepen Kencana Utama to submit Bar Chart at the Consultant office not later than October 30, 1979
- 1.07.02 As-built drawings :
Contractors to build permanent bench marks as recommended by the Consultant and show them on as built drawings.
- 1.08.02 Transit is not yet available at Section A.
Level and Transit are not yet available at Section B.
- 1.09.02 Schedule of Material Requirement :
To be submitted not later than November 5, 1979
- 1.10.02 Sequence of Work :
To be submitted not later than November 5, 1979
- 1.12.02 The drawings for clarification and information (from BM/TAE) will be issued after the meeting with the parties concerned.
- 1.15.02 The handling of pipes must be done carefully.
Tukad Mas not to drop pipes anymore.
Lepen Kencana Utama will use trucks without side-fences to transport the pipes.

- 1.16.02 Drinking water for laborers is not yet available at the job site. Contractors to provide some as soon as possible.
- 1.18.02 Section A to use petroleum lamps covered by red material for traffic safety at night.
- 2.01.01 The equipment and materials needed for river crossings to be prepared first before starting the syphon work.
- 2.02.01 The syphon work should be immediately performed because no time extension can be approved due to the weather condition. The delay of work will be the Contractors responsibility.
- 2.03.01 Hydrostatic Pressure Test :
- Can be performed by the contractors by using their own equipment.
 - Chlorine to be added to disinfect the pipe.
- 2.04.01 K 225 Concrete : prepare test cylinder
- No laboratory test is needed for syphon concrete work, but slump-test to be performed.
 - A laboratory test should be done for structural concrete
- 2.05.01 The first Aid Kit must be and always available in each job site.
- 2.06.01 BM/TAE will determine the definite elevation points at Section B.

- 2.07.01 Backfilling must be in accordance with the Specifications and tamping hammer (pneumatic hammer) should be set at the job site.
- 2.08.01 Valves will be needed immediately by Contractors.
- 2.09.01 Contractors to send a letter to the village head with the carbon copy to the Project before starting any work at concerned villages.
- 2.10.01 The next meeting will be arranged by Lepen Ken-cana Utama.

SURAKARTA WATER ENTERPRISE
MANAGEMENT ASSISTANCE PROGRAM
PROGRESS REPORT NO. 13

I. PERIOD COVERED

This report covers the period from October 1 to 31, 1979.

II. WORK DONE

A. General Accounting and Management Information System

Continued supervision and giving advice to the accounting staff about the proper recording in the books of accounts of the daily transactions of the Water Enterprise.

Also continued the monitoring and giving advice in the preparation of the monthly financial and other operating reports. The financial and other operating reports for the month of September 1979 were distributed to the various recipients on October 17, 1979.

B. Accounting System and Management Information System Manual

Finished the preparation of the Accounting System and Management Information System Manual. The Manual consists of the systems and procedures adopted by the Surakarta Water Enterprise and serves as a guide and reference by the officials and staff of the Water Enterprise along the following phases of the operations :

- 1) general accounting,
- 2) management reports,
- 3) budget preparation,
- 4) meter reading, billing and collection
- 5) disbursements,
- 6) purchasing and inventory,
- 7) payroll,
- 8) work order and construction accounting, and
- 9) fixed assets accounting.

As applicable, the systems and procedures in these phases of operations are already being implemented.

Copies of the Manual will be distributed in November 1979 to the officials and staff concerned of the Surakarta Water Enterprise and other recipients. The Manual was prepared based on the general guidelines on the operations of a water enterprise issued by the Directorate of Sanitary Engineering, Directorate General Cipta Karya taking into consideration the existing conditions in the Surakarta Water Enterprise.

C. Financial Viability of the Water Enterprise

Prepared an eight year financial projections of the Surakarta Water Enterprise to determine the financial viability of the project for the improvement of the transmission and distribution system of the Water Enterprise which is being financed jointly by the USAID and the Government of Indonesia. It is prepared to determine the capability of the Water Enterprise to generate enough revenue to repay the loan used to finance the project.

Based on the first draft of the projection the Water Enterprise can generate enough revenue to pay the operating expenditures including depreciation and loan repayments. This can be attained through increased water production available for sale and by gradually increasing the water rate throughout the projection period starting in 1980. The increased water rate, however, is still within the financial capability of the poorer people of Surakarta, who will pay no more than Rp 300 per family per month until 1985.

The first draft of the projection was discussed on October 12, 1979 in a meeting in the office of Cipta Karya in Jakarta which was attended by the representatives from the USAID, representatives from Cipta Karya, a representative from the Ministry of Home Affairs, the Mayor of Surakarta, the Director of the Surakarta Water Enterprise and the Consultants. During that meeting some revisions were made in the assumptions used in the projection including among others the following : remittance to the Municipality of Surakarta an amount equivalent to 55% of the net profit of the Water Enterprise based on the decree creating the Surakarta Water Enterprise. This remittance should be made only after the end of each year when the result of the operations of the Surakarta Water Enterprise has been audited by the State Accountants.

Other revisions in the assumptions used in the financial projection shall be made in the light of the latest development in the project. A revised financial projection will be prepared in November 1979.

D. Analysis of the Accounts Receivable

Prepared an analysis of the accounts receivable of the Water Enterprise as of September 30, 1979. Based on our analysis Rp 34,286,805 or 41% of the total receivable as of that date pertains to billings in 1976 and prior years and are already doubtful of collection. On May 31, 1978 the Supervisory Board approved to write-off Rp 12,940,686 out of the receivables. We proposed to the Director of the Surakarta Water Enterprise to recommend to the Supervisory Board the writing-off of the remaining balance of these receivables, that is Rp 21,346,119 (Rp 34,286,805 less Rp 12,940,686 already approved to be written-off).

The findings and recommendations in the analysis of accounts receivable is shown in Exhibit 1. This was sent to the Director of the Water Enterprise on October 20, 1979 and discussed with the officials concerned on October 27, 1979.

E. Personnel Requirements of the Water Enterprise

Prepared a schedule of personnel requirement of the Surakarta Water Enterprise for the next five years starting 1980 based on the revised organization structure. The personnel requirements of the Water Enterprise for the next five years will be as follows :

<u>Year</u>	<u>Number of Personnel Required</u>	<u>Additional Requirements (1)</u>
1980	142	10
1981	144	2
1982	152	8
1983	164	12
1984	174	10

(1) Note : Additional requirements means the difference between the number of personnel required in a particular year and the number of personnel during the previous year.

The details of the personnel requirements and an implementation plan to adopt the revised organization structure is shown in Exhibit 2. A copy of this report was sent to the Director of the Water Enterprise on October 30, 1979.

III. PROGRAM FOR NEXT MONTH

- A. Continue assistance in the preparation of the monthly financial and other operating reports.
- B. Prepare revised financial projection of the Water Enterprise.
- C. Compile operating policies and procedures of the Water Enterprise for guide and reference of the officials and staff.

SURAKARTA WATER ENTERPRISE
ANALYSIS OF ACCOUNTS RECEIVABLE

A. Findings

1. As of September 30 ,1979 the total accounts receivable amounted to Rp 84,191,236, of which 99% constitute receivable from water bills. The remaining one percent represents receivable from miscellaneous services rendered to customers like repairs of customers' connection. The breakdown of the receivables as of September 30, 1979 is shown below :

	<u>Amount</u>	<u>%</u>
Water Bills		
1979 Current	Rp 9,997,206	11.87%
One month old	3,714,935	4.41
Two months and older	12,679,107	15.06
1978 Accounts	16,017,261	19.02
1977 Accounts	6,504,521	7.72
1976 and prior years	<u>34,286,805</u>	<u>40.72</u>
Subtotal	<u>Rp 83,199,835</u>	<u>98.82</u>
Other receivables		
1979	Rp 629,130	0.75
1978	<u>362,271</u>	<u>0.43</u>
Total Receivable	<u><u>Rp 84,191,236</u></u>	<u>100.00%</u>

As can be seen in the above analysis, the balance of receivables corresponding to billings in 1976 and prior years constitute 41% of the total receivables. The balance of the 1976 and prior years bills as of January 1, 1979 was Rp 38,269,972.

Out of this only Rp 3,983,167 or 10.4% has been collected from January 1 to September 30, 1979.

On May 31, 1978 the Supervisory Board of the Surakarta Water Enterprise approved to write-off Rp 12,940,686 pertaining to the balance of accounts receivable billed in 1976 and prior years. This amount has not yet been recorded in the books of accounts of the Water Enterprise as of October 20, 1979.

2. An Accounts Receivable Ledger Card (ARLC) is being maintained for each customer. An ARLC is a subsidiary record where the monthly billings of and collection from a customer is being recorded. This is a control record to determine at any one time the balance due from each customer. At the end of each month the balance of each ARLC are being added and the total is being compared against the balance of the accounts receivable as recorded in the General Ledger. As of August 31, 1979 there is a minor difference of Rp 21,230 between the total of the balance of the ARLC and the balance in the General Ledger computed as follows :

Total per ARLC, representing transactions	
from January 1977 to August 1979	Rp 46,974,110
Balance per General Ledger, representing	
transactions from January 1977 to	
August 1979	<u>46,952,880</u>
Difference : Balance per ARLC is bigger	Rp 21,230 =====

Note : The Water Enterprise started maintaining the ARLC only in 1977, thus, only transactions starting January 1977 were recorded in the ARLC. The unpaid bills corresponding to 1976 and prior years are grouped accordingly by year and the total is recorded in the General Ledger.

3. The policy of the Water Enterprise on late payments are as follows :
 - a. Any customer who pays after the due date, which is one month after billing is being assessed and required to pay a penalty charge equivalent to 10% of the bills to be paid.
 - b. The service connection of any customer shall be cut if he does not pay his bills within two months after billing.

The policy on imposing penalty charge on late payment is being implemented by the Water Enterprise. The policy on disconnection however, is being enforced only to customers residing in areas where there is a continuous flow of water.

B. Comments and Recommendations

1. The amount of Rp 12,940,686 pertaining to 1976 and prior years bills which was already approved by the Supervisory Board to be written off should be recorded in the books of accounts of the Water Enterprise.
Note : This was recorded in the books of accounts on October 29, 1979.
2. Recommend to the Supervisory Board to write off the remaining amount of receivables corresponding to unpaid bills in 1976 and prior years, which are already doubtful of collection that is Rp 21,346,119 (Rp 34,286,805 less Rp 12,940,686) as of September 30, 1979.

The Water Enterprise should concentrate its effort in collecting unpaid accounts starting from 1977 billings which are more likely to be collected since they are properly supported by individual Accounts Receivable Ledger Card. The Water Enterprise should devise and implement a plan to collect these arrearages. To make it easier for the customer, an installment plan of collecting these arrearages can be adopted.

Each customer should be required to sign a promissory note binding him to pay the arrearages in so much number of equal installments, but not to exceed 12 installments. This should be paid together with the current monthly billings.

3. An actual count of the unpaid bills pertaining to 1976 and prior years should be conducted to determine the correctness of the balance as recorded in the General Ledger. This should be done in November 1979 setting October 31, as the cut-off date.
4. Enforce strictly the disconnection policy in connection with non-payment of bills as soon as there is sufficient water flowing to the system. As it is now, majority of customers with arrearages reside in the area where there is a minimal flow of water.

SURAKARTA WATER ENTERPRISE
PERSONNEL REQUIREMENTS
1980 - 1984

Based on the revised organization structure as shown in Exhibit 3, the Surakarta Water Enterprise will require a total of 142 employees in 1980 an increase of ten employees over the present work force (as of October 15, 1979). The details of the personnel requirements of the Water Enterprise for the next five years starting in 1980 is shown in Exhibit 4.

We suggest that the revised organization structure be implemented immediately by taking the following steps :

1. Change the official designation of the Chief Transmission and Distribution Department to Chief Operations and Maintenance Department.
2. Change the official designation of the Chief Technical Planning Department to Chief Project Engineering, Design and Construction Department.
3. Designate Chief or acting Chief in the various sections where such position is not yet existing.
4. Fill up the additional personnel requirements in 1980 as follows :
 - a. Chief, Plant, Shop and Building Department
 - b. One staff in the Purchasing Section
 - c. One staff in the Warehousing Section
 - d. Chief and staff in the Leak Survey Section

- e. Two staff in the Meter Shop Section
- f. One staff in the Project Inspection Section. He may temporarily handle the job in the Contracts and Specifications Section.

The above requirements should be filled up not later than January 1, 1980.

- 5. Maintain the present structure and manpower in the Finance and Administration Division except the additional requirements mentioned in items 4b and 4c above.
- 6. Effect the changes in the Technical Division as follows :

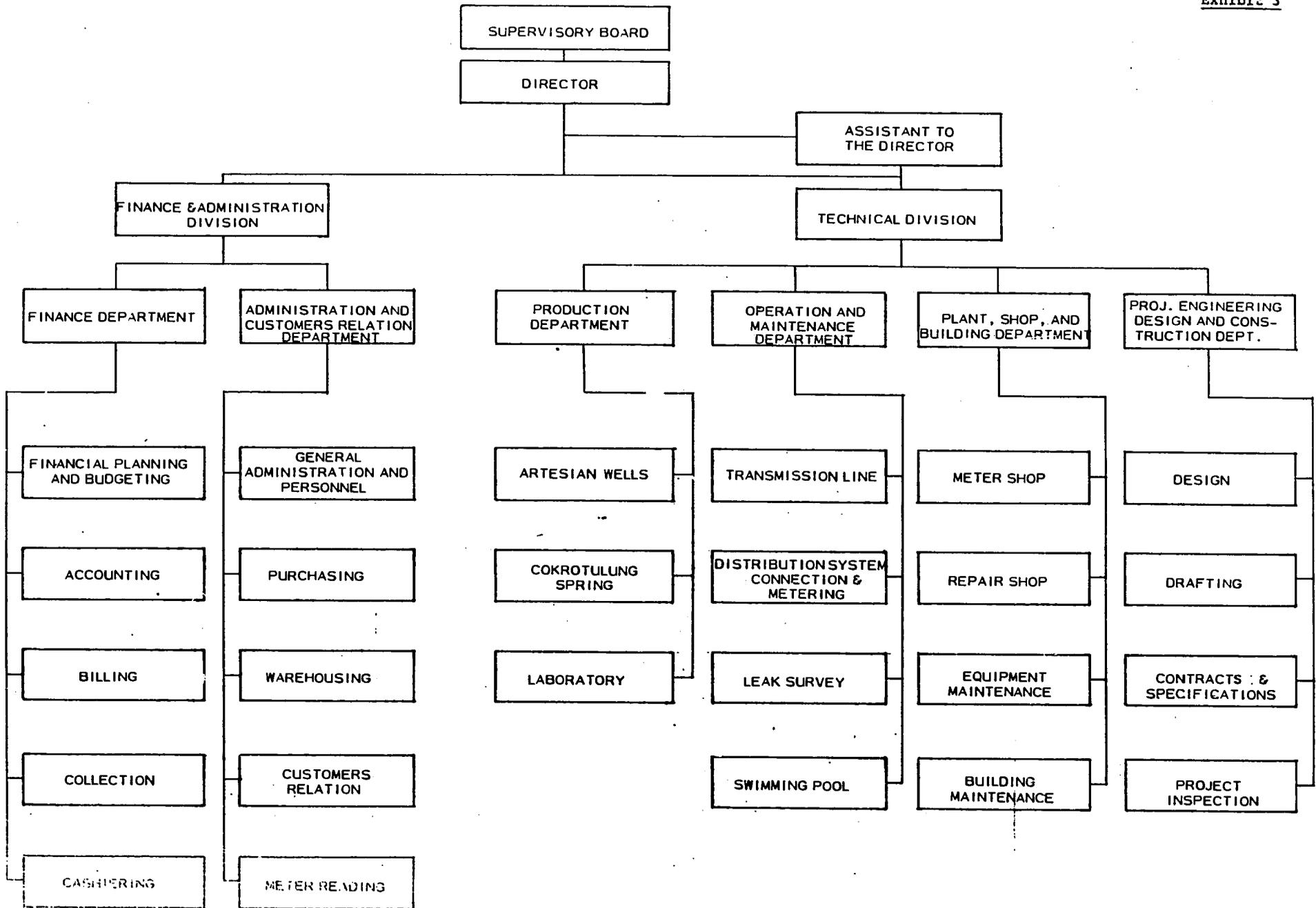
<u>Old Organization Structure</u>		<u>Revised Organization Structure</u>	
<u>Section</u>	<u>No. of Existing Personnel</u>	<u>Section</u>	<u>No. of Personnel as Distributed</u>
Operation and Water Treatment	12	Artesian Wells	1
Laboratory	2	Cokrotulung Spring	10
Distribution & Connection	19	Laboratory	1
Meter & Sealing	6	Transmission Line	10
Ground, Building & Equipment Maintenance	10	Distribution System, Connection and Metering	15
Design	2	Meter Shop	1
Technical Adm.	1	Repair Shop	5
		Equipment Maintenance	4
		Building Maintenance	2
		Design	2
		Drafting	1
Total	52	Total	52
	==		==

(1) Note : The additional two staff needed in the Meter Shop Section should be hired accordingly as specified in item 4e above.

In hiring officials to head the various divisions, Departments, or sections or in filling up such positions, the management should consider the qualification guidelines as detailed in the Organization Manual. In this connection we also recommend that the Water Enterprise choose promising employees from among its present work force to be trained as future officials of the Enterprise. They can be sent to various seminars or they can be sent to universities at the expense of the Enterprise to pursue higher education along the line of responsibilities they are to assume in the future.

SURAKARTA WATER ENTERPRISE
ORGANIZATION STRUCTURE

Exhibit 3



SURAKARTA WATER ENTERPRISE
PERSONNEL REQUIREMENTS
1980 - 1984

	(A) No. of Personnel Required (B) Additional Requirements									
	1980		1981		1982		1983		1984	
	A	B	A	B	A	B	A	B	A	B
Director	1		1		1		1		1	
Assistant to the Director	2		2		2		2		2	
Chief Finance and Administration Division	1		1		1		1		1	
Chief Finance Department	1		1		1		1		1	
Financial Planning and Budgeting Section	2		2		2		2		2	
Accounting Section	9		11	2	13	2	17	4	21	4
Billing Section	12		12		12		14	2	16	2
Collection Section	12		12		12		12		12	
Cashiering Section	6		6		6		6		6	
Chief Administration and Customer Relations Dept.	1		1		1		1		1	
Administration and Personnel Section	6		6		6		6		6	
Customers Relation Section	2		2		3	1	3		3	
Purchasing Section	2	1	2		2		2		2	
Warehousing Section	3	1	3		3		3		3	
Meter Reading Section	12		12		12		16	4	20	4
Chief Technical Division	1		1		1		1		1	
Chief Production Department	1		1		1		1		1	
Artesian Wells	1		1		1		3	2	3	
Cokrotulung Spring	10		10		10		10		10	
Laboratory	1		1		1		1		1	
Chief Operation and Maintenance Department	1		1		1		1		1	
Transmission Line	10		10		10		10		10	
Distribution System, Connection and Metering	15		15		20	5	20		20	
Leak Survey Section	3	3	3		3		3		3	
Swimming Pool	6		6		6		6		6	
Chief, Plant shop and Building Department	1	1	1		1		1		1	
Meter Shop Section	3	2	3		3		3		3	
Repair Shop Section	5		5		5		5		5	

	<u>A</u>	<u>B</u>	<u>A</u>	<u>B</u>	<u>A</u>	<u>B</u>	<u>A</u>	<u>R</u>	<u>A</u>	<u>B</u>
Equipment Maintenance Section	4		4		4		4		4	
Building Maintenance Section	2		2		2		2		2	
Chief Project Engineering, Design and Construction Department	1		1		1		1		1	
Design Section	2		2		2		2		2	
Drafting Section	1		1		1		1		1	
Contracts and Specifications Section	1	1	1		1		1		1	
Project Inspections Section	<u>1</u>	<u>1</u>	<u>1</u>	<u> </u>						
T o t a l	<u>142</u>	<u>10</u>	<u>144</u>	<u>2</u>	<u>152</u>	<u>8</u>	<u>164</u>	<u>12</u>	<u>174</u>	<u>10</u>

SURAKARTA WATER PROJECT
TRANSMISSION MAIN
PROGRESS REPORT NO. 1
30 OCTOBER 1979

I. GENERAL :

The Pipeline Construction Specialist, an employee of Burns & McDonnell, arrived in country 28 September 1979 and was in temporary residence at Surakarta on 01 October 1979. After review of Tender Documents, personnel and previous progress on procurement tenders the first week of October, a meeting was held in the office of the Central Java Water Supply Project, Semarang on 08 October 1979.

The purpose of the meeting was to officially notify two contractors, namely Lepen Kencana and Tukad Mas, that they were the successful bidders for the proposed construction of the transmission main from Cokrotulung Springs, Sta. 0 + 00 to Sta. 50 + 00 (Section B) and from Sta. 50 + 00 to Sta. 103 + 90 plus modifications at the existing Kartosura Reservoir (Section A) respectively.

II. WORK IN PROGRESS :

- A. The Contractor for Section A arrived on site 15 October 1979 and began work at Sta. 73 + 15 progressing southwestward toward Sta. 50 + 00. Instruction was given to the contractor personnel and all inspection personnel of the Consultant by the Pipeline Construction Specialist regarding proper procedures for handling and installation of ductile iron pipe.

The first jointing was done in such a manner that all could witness the procedure and understand the method. The need for good excavation, proper back-fill and safety was also emphasized. During the remainder of the month of October the contractor on Section A has progressed to approximately station 71 + 00, started other crews working at Sta. 59 + 00 and staked river crossings to start excavation for same this date. Distribution of pipe has exceeded 700 meters.

- B. The Contractor for Section B began delivery of pipe and fittings to Cokrotulung Springs 23 October 1979 and started excavating adjacent to the first tunnel. Size and quantity of rocks in excavation requires close supervision to assure having a proper bed for piping. Excavating work is being carried on from Sta. 0 + 00 to approximately Sta. 2 + 40 plus preparation for making crossing at Pusur River.

III. P R O B L E M S :

- A. Late procurement of brass goods will delay completion of transmission main regarding installation of corporation stops at drain tapplings etc. in Kartosura Reservoir.
- B. Late award of transportation contracts to move all pipe, valves, fittings and specials from the port of Semarang to Surakarta will delay installation of same into the transmission main per the planned construction. This could force unnecessary use of additional sleeve couplings to do so later at great cost in material.

IV. FUTURE PLANNING :

All preliminary work should be completed within the balance of 1979 in order to place the remainder of the transmission main construction out for tender during the first quarter of 1980. Award and notice to proceed should be timed to be made at the very beginning of the new Indonesian fiscal year for budget and payment.

V. PIPELINE CONSTRUCTION SPECIALIST COMMENTS :

During this first month of construction effort, it is the opinion of the Pipeline Construction Specialist that progress has been satisfactory considering mobilization, hiring of manpower and attendant learning curve experienced by the contractors as they determine personnel ability and become familiar with job site conditions. There is no doubt the project could be accomplished at greater speed utilizing mechanical excavators, material handling equipment and other special equipment. To maintain a labor intensive effort will require the work to be spread over a larger area geographically. In turn, the Consultant supervision and inspection will be spread seriously thin. It may prove necessary to increase the inspection staff to properly protect the interest of the client.

GROUNDWATER EXPLORATION AND DEVELOPMENT

MONTHLY PROGRESS REPORT

This report covers the period from October 1, 1979 up to October 31, 1979.

I. TASK ACCOMPLISHED :A. TRIPS :

1. Made a field trip throughout project area with Dr. W.M. Turner, USAID Consulting Hydrogeologist.
2. Made a trip to Sragen with Dr. W.M. Turner, in order to observe on the spot well drilling performance conducted by P.T. Biraz using a rotary drilling rig.
3. Made a trip to Jakarta with Dr. W.M. Turner on October 4, 1979, came back on October 6, 1979. The intention was to look for additional hydrogeological data concerning the project area at P2AT office. Also visited P.T. City Cipta, which is operating cable tool type drilling rig.
4. Made a trip with the Chief Engineer to Jakarta on October 15, 1979 and came back on October 18, 1979, in order to attend a special meeting on the geohydrological conditions and prospects within the project area. The Consultant's Final Draft Report on Groundwater Investigation and Well Drilling Program, together with Review of the Hydrogeology of the Surakarta area prepared by USAID's Hydrogeologist have been discussed in detail.

The detailed report on the conference is shown in the attached Memorandum of the Conference.

B. OFFICE :

1. Revising and completing the Final Report on Ground-water Investigation and Well Drilling Development in accordance with the Conference recommendations.
2. Revising and completing Well Drilling Specification in accordance with the Conference recommendations.
3. Preparing Monthly Report.

III. PROGRAM FOR NEXT MONTH :

1. Continuing preparations for the drilling tender.
2. Locating drilling sites together with Cipta Karya's representatives.
3. Preparing drilling and logging forms etc.