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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. 31
APRIL 1981**

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



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BURNS & McDONNELL Engineering Co.

Architect - Engineers

A JOINT VENTURE

Consultants - Planners

TRANS-ASIA Engineering Associates, Inc.

Please Reply to: Kotak Pos 105
Surakarta

108/BM/TAE/SKA/81
05 May 1981

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

Subject : Contract for the Consultant Services for
Surakarta Water System No. 01/WS-S/I/AID/78
dated 28 October 1978 as Amended 08 November 1980

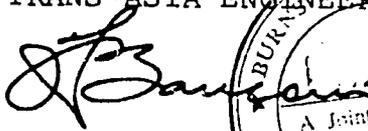
Dear Sir :

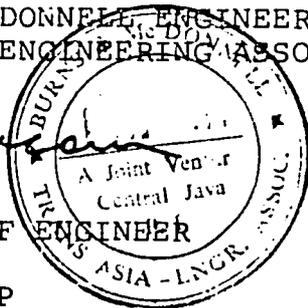
In accordance with Section 4.12 and Appendix 1 of the
subject Contract, we are pleased to submit fifteen
copies of the Monthly Report No. 31 for the month of
April 1981.

We trust that this report will meet with your approval.

Very truly yours,

BURNS & MC DONNELL ENGINEERING CO.
TRANS-ASIA ENGINEERING ASSOC., INC.


J.F. BAUCUM
ACTING CHIEF ENGINEER



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

Encl.

JFB/yp.

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SECTION I

G E N E R A L

I-A NARRATIVE SUMMARY

The major portion of the Consultant's effort has been concentrated on two fronts; (i) finalization of design drawings for the expansion of the Surakarta water distribution network, public latrines and public bathing facilities and; (ii) making water availability greater by charging secondary loop piping installed by CJWSP during the period 1977 through 1979 plus tertiary main piping installed during the same period and also 1976.

A final inspection was also conducted during the month of April on Section D of the Transmission Main. All of the original design drawings for the transmission main were transmitted back to the Project Manager, CJWSP-Semarang in an "as-built" condition according to Appendix No. I of the Consultant Contract, Paragraphs 2.03 a and 2.03 p.

The Surakarta Water Enterprise laboratory implements were partially received and the Consultant was advised the valve order was shipped early February and in the port of Singapore. The valves are expected to arrive at the port of Semarang on or about 10 May 1981. Pipe and fitting orders from local sources are in procurement committee. The Consultant has completed a final review of the required quantities and has forwarded it to Cipta Karya for them to incorporate same into their purchase agreement with the suppliers.

It was agreed during the monthly progress meeting, see Appendix V, that the Project could and would transfer the off-shore procured tools, equipment and materials

destined for the Surakarta Water Enterprise to them as soon as possible after all that will be required for the new distribution design installation is identified. The Consultant anticipates the transfers to be made by the middle of May 1981. It was also stated during said meeting that the Project having nearly satisfied their priority for installation of piping could now proceed to modify the structures at Jl. Brig. Jen. Sudiarto 534 for the Surakarta Water Enterprise O & M facilities. It was said the funds necessary to make the modifications were presently at the disposal of the Enterprise.

The Surakarta Water Enterprise has provided records of the cubic meters of water billed each month beginning with the month of November 1980 and carried through to the month of April (Appendix VI). What the data really reflects is an apparent 67% loss in billable units (M^3). As was reported in the December 1980 Progress Report, on 08 December, the transmission main was routed into and out of the Kartasura reservoir delivering a maximum of 292 l/s to Surakarta. That equates to $756,864 M^3$ in a thirty (30) day period. During the next two months various quantities of water was used to test, clean and flush the new transmission main between the Kartasura and Jebres reservoirs. However, in March 1981 almost no water was used in construction so that all water was delivered for consumption by the customers in Surakarta. For the entire month of March 1981, the new flow meters at the Kartasura reservoir averaged a reading of 1.39 which would be 386+ l/s, or over a thirty (30) day period would be over one million cubic meters of water going to Surakarta. The Water Enterprise billed during the month of March 1981 a total of $327,059 M^3$ which is about one-third of the total available. As a result of this revelation the Director of the Surakarta Water Enterprise will establish an investigative task force to search out and identify unmetered customers and losses. It is understood that Cipta Karya considers 20% loss as being ideal.

I-B PROBLEMS AND PROPOSED SOLUTIONS

A concerted effort by all parties is being made to get the replacement shipments out of the port of Semarang. Both The Rohan Company and The Clow Corporation have had the final ten percent (10%) of their Contracts held pending certification of completeness of the order. It had been anticipated the goods could be obtained by the transportation contractor the latter part of April. Some additional information was requested at the last of April by the customs people so that delivery will not be made until the month of May 1981. The requested additional information was submitted by the Consultant to Cipta Karya on 30 April 1981.

The continuing delay in procurement of the PVC and AC pipe and accessories is impacting the proposed staggered construction activities due to the end time constraint of the end of the fiscal year 1981/1982 on 31 March 1982. It is now probable that the materials will not be on site until sometime in August 1981 which will leave only a short time for construction. The Consultant would make a recommendation that Tenders for construction be processed immediately with Notice-To-Proceed coordinated to be when materials are delivered, regardless of date.

Completion of corrective work on the ϕ 300 mm secondary loop is mandatory in order to be able to supply Surakarta with water in all parts of the City for the intensive leak survey to begin. The original installation contractors have been contracted to make repairs by the Project but, to date, only token effort has been provided. As a result, the Surakarta Water Enterprise has been making the repairs with their own funds and personnel at the expense of doing the work in other areas. The Project should insist that the construction contractors do more of the work of repairing their own defaults, which have laid dormant and unnoticed for lack of water since the installation was made from 1976 through 1979.

SECTION II
ADMINISTRATION

II-A SUBMISSIONS/APPROVALS.

Consultant's Special Invoice No. 30 and Invoice No. 31 for March 1981 U.S. Dollar reimbursible expenses was submitted to Cipta Karya on 08 April 1981 and Special Invoice No. 30 was approved by Cipta Karya during April 1981.

Consultant's Rupiah Invoice No. 15 and 16 submitted to Cipta Karya on 15 April 1981 was approved on 18 April 1981 and payment is in process.

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 April were as follows :

E x p a t r i a t e s

- James F. Baucom, Acting Chief Engineer
arrived 26 September 1979
- Albert G. Ringler, O & M Specialist
arrived 09 May 1980
- Jerry E. Bragdon, Water Distribution Engineer
arrived 08 June 1980

Indonesian Professional and Technical :

- Mohamad Khalil, Materials Coordinator
arrived 09 October 1978
- Mohamad Syarif Lembah, Construction Supervisor
arrived 01 May 1979
- Gatot Bramono, Inspector
arrived 19 November 1979
- Soewanto, Inspector
arrived 11 March 1980
- Budiman Sinaga, SR., Cost Estimator
hired 01 February 1981, Completed Assignment
04 April 1981
- Suyono, Inspector
arrived 17 November 1980

- Susena, Draftsman
arrived 20 October 1980
- Sumardi, Translator
hired 24 November 1980
- Sri Sukanti, Accountant
hired 03 January 1981

Administrative :

- Dradjat Atmardjo, Office Manager
arrived 02 October 1978
- Haryani Pudyastuti, Secretary
hired 17 November 1980
- Endang Tri Siwi, Reassigned to the Position of
Receptionist to take effect 31 May 1981
hired 01 October 1979
- Rubiyo, Clerk
hired 01 November 1979
- Chaiz Hidayati, Administrative Clerk
hired 08 October 1979
- Pamudji Rahardjo, Driver
hired 02 October 1978
- Soedarno, Driver
hired 02 October 1979
- Sutrisno, Driver
hired 02 April 1979

- Puranto, Driver
hired 17 October 1980

- Kentut Aryanto, Driver
hired 07 January 1981

- Mulyatmono, Watchman/Labor
hired 09 October 1978

- Memed Barmawi, Copy Machine Operator/Labor
hired 23 June 1980

- Tukino, Office Boy/Labor
hired 10 November 1980

SECTION III
ENGINEERING AND MANAGEMENT

III-A OFF-SHORE PURCHASED MATERIALS	US.\$ COMMITTED	% PAID (ASSUMED)	US. \$ BAL. DUE
III-A-1 Direct Cipta Karya Procurement Contract			
III-A-1-1 American Cast Iron Pipe Co. Ductile Iron Pipe & Fittings Contract certified complete 01/02/80	2,595,511.60	100	- o -
III-A-1-2 Colcorindo Raya Flow Metering Equipment Contract certified complete 07/04/80	3,462.00	100	- o -
III-A-1-3 Rohan Corporation Water Meters, Repairs Parts- Tools & Equipment Replacement Parts Awaiting Port Clearance since 23/10/80	669,438.43	90	± 66,943.84
III-A-1-4 Clow Corporation Castings, Autho Air Vents & Valves. Replacement Parts Awaiting Port Clearance since 01/09/80	125,912.00	90	± 12,591.20
III-A-1-5 Ford Meter Box Company Brass Valves Parts & Acces- sories. Contract certified complete 12/02/81	390,775.15	100	- o -
	-----	-----	-----
Sub Total	3,785,099.18	97.9	75,535.04

III-A-2 Special Equipment Procurement/Consultant Contract

III-A-2-1 Western International Leak Detectors & Pipe Locators	2,496.14	100	- o -
III-A-2-2 Kennedy/MacLane Distribution Network Valves In Transit	53,224.00	90	5,322.40
III-A-2-3 Laboratory Equipment-Variou Sources Partial Received Balance In Transit	10,775.00	- o -	10,775.00
III-A-2-4 Publication & Reference Data Various Sources In Transit	1,460.50	- o -	1,460.50
	Total US \$ 3,853,054.82	97.6	93,092.94

III-B CONSTRUCTION SUPERVISION

Contractor P.T. Lepen Kencan has submitted the two copies of project photographs and his "as-built" drawings as required by his Contract on Section D of the transmission main. On 07 April 1981 a final inspection of his work was conducted (Appendix VII). That contractor is presently correcting the deficiencies noted during the inspection.

Contractor P.T. Tukadmas has done very little during the month of April. In fact, most, if not all of his field personnel were located outside of the Surakarta Water Project for the major portion of the month.

Contractor P.T. Sarana Alam has provided the fittings to the Surakarta Water Enterprise for them to make the final tie-in to the existing distribution network in Kelurahan Setabelan. As of the date of this writing, that connection remains uncompleted. The contractor began excavating the last of April to make the tie-in of the ϕ 300 mm Line "A" to the old ϕ 450 mm transmission main under Jl. Slamet Riyadi. This has been the subject of much discussion in the past and will permit the new and old combined network to balance throughout the southern and eastern sectors of the City.

Contractor P.T. Palagan was given a revised target of 330 house services to install plus completion of the 47 public hydrants. The contractor continues to work on the public hydrant completion. It was noted during the meeting 20 April that the contractor could consider rehabilitation of old services as part of the total of 1,100 he has been obligated to install.

III-C GROUNDWATER EXPLORATION AND WELL DEVELOPMENT PROGRAM

A final draft of this operational area is presently being prepared for publication.

III-D MANAGEMENT ASSISTANCE PROGRAM

Completed.

III-E O & M TRAINING AND ASSISTANCE PROGRAM

Early in the month of April, the O & M Specialist worked with crews of the Surakarta Water Enterprise giving them training in the procedures for cleaning and flush-

ing new and/or rehabilitated pipelines. The starting point for this activity was just east of the Jebres reservoir where the new transmission main is connected to the ϕ 300 mm secondary loop piping. After the Section D contractor had completed repairs to the work he had installed in FY 1978/1979 on Line "A", the Water Enterprise reinstalled the section removed for the contractor's flushing operations of the new transmission main. They then removed a similar section on the south side of the City and flushed 10.55 kilometers of the secondary loop from Jebres. It was noted there were more than ten (10) leaks on the ϕ 300 mm pipeline route. The O & M Specialist directed the SWE crews in investigative excavations at the various locations. The piping was found to be installed without any concrete thrust blocks and many of the flange joints were short the required number of bolts and/or incorrectly tightened all of which caused leaks. Poor workmanship was also noted on much of the PVC pipe that was installed from 1976 to 1979. The balance of the month was mostly consumed in the O & M Specialist working with repair crews and instructing them in the use of the new tools, trucks and materials provided as a part of this Project. A request was made by the Consultant for the Project to get cooperation from the construction contractors who originally did the work to make the necessary repairs which the Project did do. Very little actual help has been provided by the contractors as of this writing, however. The importance of making the ϕ 300 mm secondary loop operational is paramount. Until it is, the intensive leak survey cannot proceed (Appendix VIII). There is a sufficient amount of water being transmitted to Surakarta so that the swimming pool can now be filled overnight while the reservoir at Jebres is being filled. Not having the loop system in operation is creating a balancing problem that precludes all sections of the City being supplied with water as intended. The O & M Spe-

cialist, in working with the SWE crews has also discovered locations where concrete plugs had been inserted into the distribution pipes effectively shutting off any circulatory operation of the network in those areas. Other activities of the O & M Specialist has involved setting up the water laboratory at SWE with the equipment now arriving so that water samples can be made "in-house". The Consultant has transmitted copies of the transmission main "as-built" drawings and details for house services and public hydrants to the Surakarta Water Enterprise for their use and standards.

III-F METER REPAIR TRAINING PROGRAM

Completed.

III-G NEW WATER DISTRIBUTION NETWORK DESIGN

Design drawings for Phase I and II have been provided to the Design Section of DSE for review and comments. Copies have also been forwarded via the Project to the various utility enterprises and the City Public Works. The Consultant is awaiting return of the drawings or comments to be made by the recipients within a reasonable time then will make any changes required before securing approval signatures from DSE. In response to an inquiry from the Project, the Chief of Kecamatan Serengan has transmitted a list of six (6) possible sites for bath houses with maps. The Consultant will check the sites with the Project to determine which can be utilized. Other locations will be searched to complete the required quantity of ten. Construction drawings for the public latrine rehabilitation program are nearing completion. Shop drawings of the supplier for cast fittings were reviewed and approved by the Design Engineer. The balance of submittals will be

reviewed as received as a condition precedent to the supply of the materials for all phases of the piping to be installed.

III-H CONFERENCES.

The monthly progress meeting was held in Surakarta on 20 April 1981 (Appendix V) followed by a meeting in the office of the Mayor of Surakarta. A copy of the Minutes from the latter has graciously been provided by the Director of SWE and is included herein as Appendix IX.

III-J ACTIVITIES PLANNED FOR NEXT MONTH

Assist as requested in the preparation for the Dedication Ceremonies presently scheduled for 02 June with plans for a combined ribbon cutting to inaugurate both the Surakarta Water Project and the K.I.P. activities which have been coordinated throughout. Pursue final inspections on all construction for completion. Continue with OJT for SWE personnel by assisting on repairs to secondary and tertiary distribution mains then flush and charge same for operational use. Assist in tendering new construction contractors as requested. Pursue all offshore procurement through arrivals and implementations.

App. I-A

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 APRIL - 1981	CUMULATIVE THROUGH APRIL - 1981	TOTAL IN CONTRACT SCHEDULE	% OF TOTAL USED PER SCHEDULE	BALANCE
EXPATRIATES					
PROCUREMENT ENG. CHIEF ENGINEER	0	6.5	14.5	44.8	8
CONSTRUCTION SPECIALIST LIAISON OFFICER	1 0.09	19.1 3.6	22 5.5	86.8 65.4	2.9 1.9
PRINCIPAL	0	0.71	2	35.8	1.29
HYDROGEOLOGIST DRILLING SPECIALIST	0 0	8.1 10.5	12 12	67.5 87.5	3.9 1.5
O & M SPECIALIST METER SPECIALIST	1 0	26.4 8	27.5 8	96 100	1.1 0
MANAGEMENT SPECIALIST SPECIALIST	0 0	20.2 0	21 3	96.1 0	0.8 3
DESIGN SPECIALIST	1	9.7	12	80.8	2.3
EXPATRIATE TOTAL	3.09	140.92	169.5	83.1	28.58

EXPATRIATE TOTAL	3.09	140.92	169.5	83.1	28.58
INDONESIAN PROFESSIONAL & TECHNICAL					
COUNTERPART CHIEF ENG.	0	28.6	33	86.6	3.4
CONSTRUCTION SUPERVISOR	1	9.9	22	45	12.1
HYDROGEOLOGIST	0	20.7	26	79.6	5.3
MATERIALS COORDINATOR	1	31	34	91.1	3
INSPECTORS	3	92.4	104	88.8	11.6
DRAFTSMAN	1	42	52	80.7	10
ACCOUNTANT	1	30	32	93.7	2
TECHICAL TRANSLATOR	1	17	18	94.4	2
DESIGN ENGINEER	0	6	8	75	2
SPEC. / COST ESTIMATOR	0.1	4.6	3	153.3	(1.6)
SR. SURVEYOR / PLOTTER	0	5.4	5	108	(1.4)
SURVEYOR	0	5	5	100	0
INSTRUMENTMAN	0	6.3	5	126	(1.3)
INDON. PROF. & TECH.	8.1	298.9	347	86.1	48.1
INDONESIAN ADMINISTRATIVE					
OFFICE MANAGER	1	31	34	91.1	3
SECRETARY	1	29.6	34	87	4.4
TYPIST	1	26.2	51	51.3	24.9
CLERKS	2	91.4	74	123.5	(17.4)
DRIVER	5	130.1	186	69.9	55.9
LABORERS	3	154.2	244	63.1	89.8
SECRETARY (BI - LINGUAL)	0	6	6	100	0
RODMEN / CHAINMEN	0	13.8	10	138	(3.8)
ADMINISTRATIVE TOTAL	13	482.3	639	75.4	156.7

APP. I - 8

App. II-A

SURAKARTA
 REPORT OF EXPENDITURES
 BURNS & McDONNELL/TRA

CONTRACT NO. OI/WS-S/AID/78 SIGNED 26 OCT. 1978 START 1 JAN. 1978 END 30 NOV 1981 REIMBURSABLE EXPENDITURES	COSTS FOR	CUMULATIVE COSTS THROUGH	
	April 1981	AMOUNT	% OF TOTAL BUDGET ESTIMATE
USD			
Salaries and Related Costs	19,896.25	846,677.01	94.8
Transportation	-	56,002.49	51.8
Equipment	169.05	2,666.19	7.4
Miscellaneous	20.00	48,427.17	83.3
Training	-	-	-
Contingencies	-	53,470.70	57.2
TOTAL DOLLARS	20,085.30	1,007,242.56	83.7
INDONESIAN			
Salaries	6,050,000	140,555,465	75.3
Transportation	2,220,925	62,034,417	81.5
Housing	-	50,025,000	102.1
Vehicle Costs	875,000	37,151,472	84.1
Equipment Costs	-	23,110,860	95.2
Miscellaneous	284,470	65,211,685	89.8
Contingencies	-	19,416,960	44.9
TOTAL RUPIAH	9,390,395	397,505,859	80.2

II-8

JAKARTA WATER PROJECT
 REPORT OF ENGINEERING COSTS
 ANNELL/TRANS-ASIA ENGINEERING ASSOC.

THROUGH	CUMULATIVE PAYMENTS THROUGH	
PERCENTAGE OF TOTAL BUDGET ESTIMATE	AMOUNT RECEIVED IN April 1981	TOTAL AMOUNT RECEIVED THROUGH April 1981
US DOLLARS		
94.8	29,002.28	826,780.76
51.8	2,724.00	56,002.49
7.4	-	2,496.14
83.3	-	48,407.17
-	-	-
57.2	47,901.60	53,470.70
83.7	79,627.88	987,157.26
INDONESIAN RUPIAH		
75.3	-	73,614,965
81.5	2,113,768	32,477,594
02,1	-	50,775,000
84.1	-	30,166,472
95.2	400,000	20,134,475
89.8	21,710,820	50,476,790
44.9	-	19,416,960
80.2	24,224,588	276,286,716

Peasant and Bu
 From the collection of Dr. and

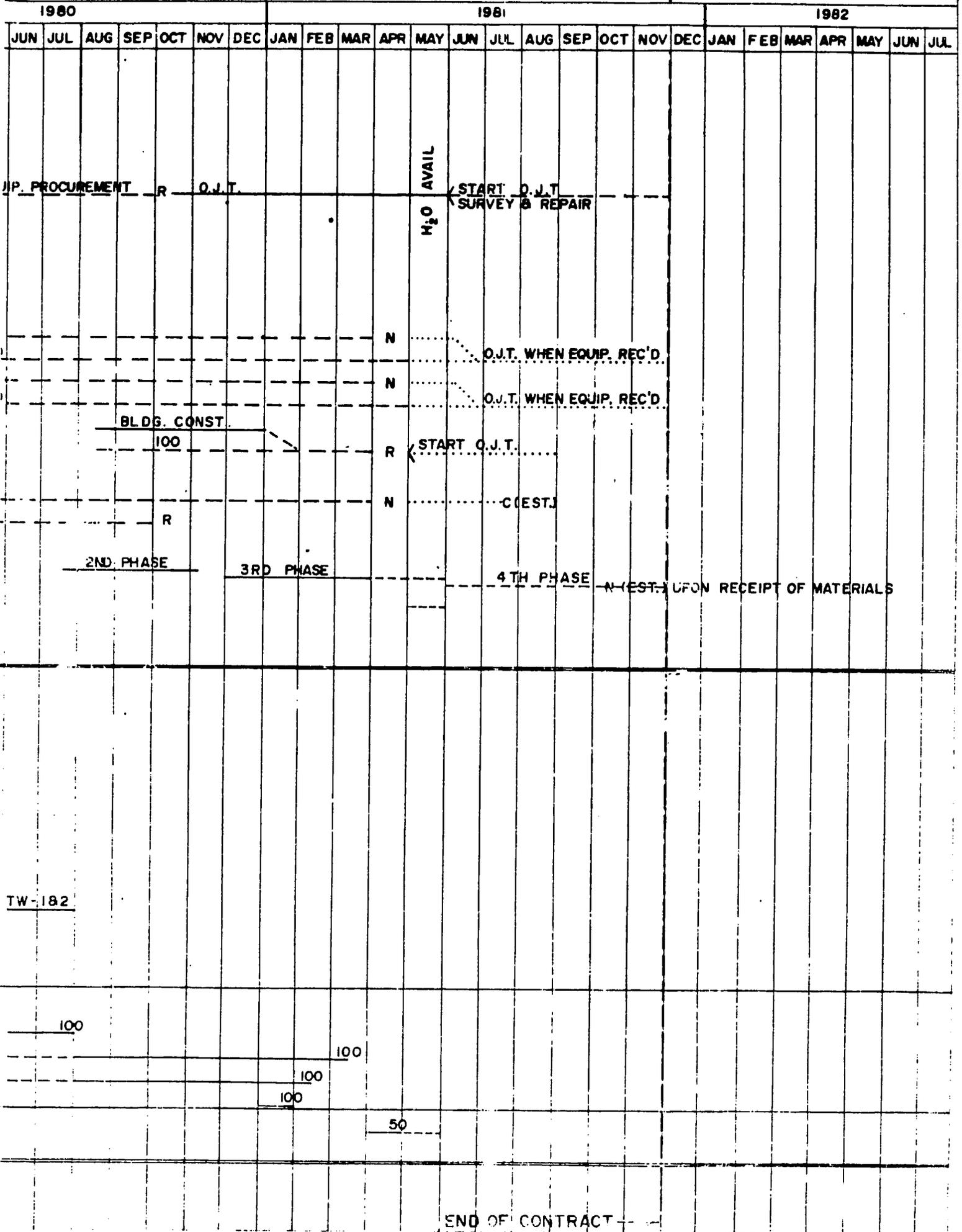
WATER PROJECT
ENGINEERING COSTS
ASIA ENGINEERING ASSOC.

CUMULATIVE PAYMENTS THROUGH			TOTAL BUDGET ESTIMATE FOR CONTRACT
AMOUNT RECEIVED IN April 1981	TOTAL AMOUNT RECEIVED THROUGH April 1981	% OF TOTAL BUDGET ESTIMATE	
DOLLARS			
29,002.28	826,780.76	92.6	892,733
2,724.00	56,002.49	51.8	108,108
-	2,496.14	6.9	36,000
-	48,407.17	83.2	58,131
-	-	-	14,544
47,901.60	53,470.70	57.2	93,340
79,627.88	987,157.26	82.0	1,202,856
SIAM RUPIAH			
-	73,614,965	53.3	174,029,000
2,113,768	32,477,594	58.1	70,257,600
-	50,775,000	102.1	48,975,000
-	30,166,472	74.1	43,140,000
400,000	20,134,475	98.8	24,253,000
21,710,820	50,476,790	43.8	71,710,000
-	19,416,960	44.9	43,236,450
24,224,588	276,286,716	61.0	475,501,060

ORIGINAL CONTRACT

OPERATIONAL AREAS	1978			1979																
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
	<p>3 O & M SPLST (CONT'D)</p> <p>(c) ADVISE on SWE O & M STAFF 100</p> <p>(d) CONDUCT FORMAL CLASS ROOM TRAINING 100</p> <p>(e) CONDUCT LEAKAGE TEST OJT to SWE STAFF EQU</p> <p>(f) RECOMMEND O & M EQUIP. & FACILITIES - SUP. CONST.</p> <p>(1) MACHINE SHOP BLDG. CONST TD</p> <p>(2) O & M EQUIP. 100</p> <p>(3) AUTOMOTIVE SHOP BLDG. CONST TD</p> <p>(4) AUTOMOTIVE EQUIP. 100</p> <p>(5) WATER TESTING LAB.</p> <p>(6) LABORATORY EQUIP.</p> <p>(7) METER SHOP BLDG. CONST. 100</p> <p>(8) PARTS WARE HOUSE BLDG. CONST. TD</p> <p>(9) LEAK & PIPE LOC. EQUIP.</p> <p>(g) PLAN TEST, REHAB & PREV. MAINT. PROG.</p> <p>(h) PROVIDE MAINT. MANUAL FOR EXPANDED SYSTEM</p> <hr/> <p>d GROUND WATER INVESTIGATION and DEVELOPMENT</p> <p>1 HYDROGEOLOGIST</p> <p>(a) Obtain & Review Data Of Existing Conditions 100</p> <p>(b) Conduct Surface Investigation Geology, Water Levels and Chemical Analysis 100</p> <p>(c) Field Survey & Stake Loc. 100</p> <p>(d) Report of Pre-drilling Findings & Recommendations 100</p> <hr/> <p>2 DRILLER</p> <p>(a) Preliminary Investigations 80</p> <p>(b) TEST WELL TW - 1</p> <p>(c) TEST WELL TW - 2</p> <p>(d) Post Drilling Report</p> <hr/> <p>3 GROUND WATER SURVEY COMPLETION REPORT</p>																			

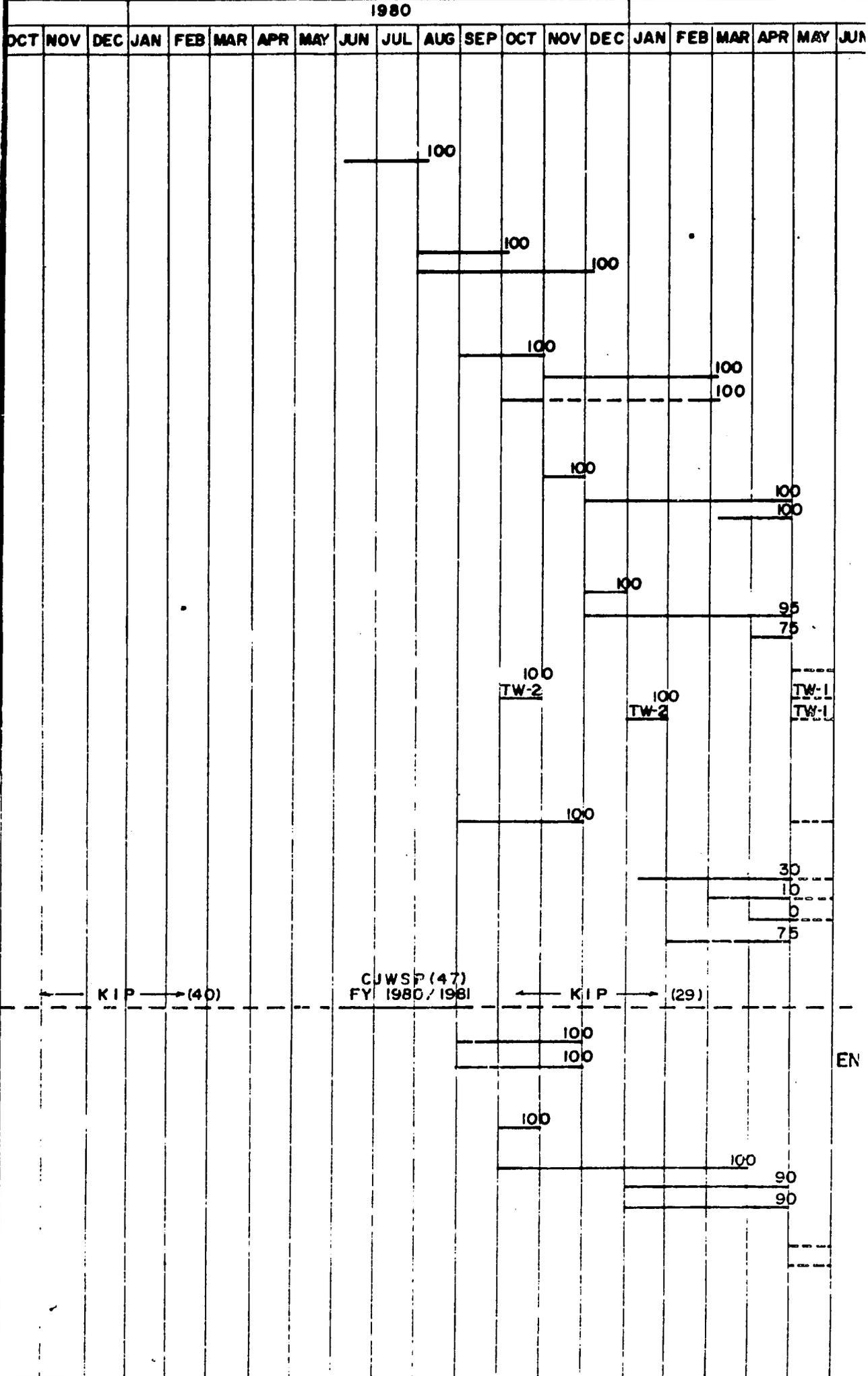
AMENDMENT NO. 1



TECHNICAL WORK APPROACH

17 III-C

CT AMENDMENT NO. 1



From

WATER DISTRIBUTION NETWORK
MONTHLY PROGRESS REPORT NO. 11
APRIL 1981

I. GENERAL.

Construction drawings for Phase I and Phase II - Water Distribution Mains were submitted to the Chief of Design for Cipta Karya for approval. Drawings were also submitted to the Department of Public Works, the Telephone and Electric Departments in Surakarta. The Consultant is waiting for comments from these offices.

Shop drawings for the material Order of Pipe and Fittings were received by the Consultant this month. The drawings have been received and final revisions are being made. Some drawings have not yet been submitted.

Final adjustments were made to the Material Order quantities to match installation requirements and have been submitted to Cipta Karya.

The search continued for suitable bath house sites. Four sites have been selected to date.

II. TOPOGRAPHICAL SURVEY & PREPARATION OF PLANS.

Two (2) sites for the Public Bath Houses were surveyed this month. A total of three (3) have been surveyed to date and site plans have been drawn of the ten (10) required.

Six (6) sites have been proposed and are currently being evaluated.

III. DESIGN OF DISTRIBUTION NETWORK.

The design of the public bath houses remains to be completed. This work will be completed when the surveys have been completed.

Design of Phase I and Phase II water distribution is completed and some minor revisions remain for Phase III.

Design for the public latrines is completed.

IV. PROCUREMENT OF MATERIALS.

The material contractors were requested to submit shop drawings for approval in preparation of the contract award. Some of the drawings were submitted to the Consultant. Of these some have been approved and some have been returned for revisions. Some drawings required have not yet been submitted.

The award of the contract has not yet been made.

V. CONSTRUCTION SPECIFICATIONS.

Construction specifications are completed in Phase I and II - Water Distribution Mains. Drawings for these Phases were submitted to the Chief of Design for Cipta Karya for review and the Consultant is waiting for comments.

Phase III - Water Distribution Mains Specifications are complete except for some drawing corrections and preparation of a material quantities list.

Public Latrine construction drawings are 90 % complete. The Consultant received AID requirements for the Public

Latrine and Bath House specifications which are being incorporated into the specifications.

Detailed specifications and material quantities lists remain to be completed for both Public Latrines and Bath Houses.

VI. ACTIVITIES PLANNED FOR NEXT MONTH.

Since May is the last month for the Water Distribution Specialist at the Surakarta Water Project the following items remaining should be as nearly complete as possible.

1. Make final revisions of construction drawings, if any, as required by the Chief of Design for Cipta Karya for Phase I & II Water Distribution Mains.
2. Make final drawing revisions and material quantities list and submit specifications to Chief of Design for approval.
3. Complete site selection and survey seven (7) bath house sites.
4. Complete drawings and specifications for Public Latrines and Bath Houses.
5. Collect data required to prepare hydraulic reanalysis of the Surakarta Water distribution system.

MINUTES OF PROJECT PROGRESS MEETING

Place : BM/TAE Office Surakarta
 Date : 20 April 1981
 Time : 0945 - 1330

Attended by :	Mr. Aziz	DSE
	Mr. Sorta	DSE (first portion of meeting)
	Mr. P. Thorn	USAID
	Mr. Krisno Darusman	CJWSP
	Mr. Hari Wahyuadi	PAB - I
	Mr. Soedarto	PDAM (last portion of meeting)
	Mr. Soelarno	PDAM
	Mr. A.F. Dengah	DC
	Mr. F. Midgett	BM/TAE
	Mr. J.F. Baucom	BM/TAE
	Mr. A.G. Ringler	BM/TAE
	Mr. J.E. Bragdon	BM/TAE
	Mr. Syarif L.	BM/TAE
	Mr. M. Khalil	BM/TAE

Results :

Mr. Aziz opened the meeting with the suggested topics being a report on construction activities, O & M progress, tender activities, Consultant Contract Amendment No. 2 and Training Program. The Consultant requested to add to the agenda discussion to clarify O & M facilities, equipment and materials.

Mr. Baucom provided handouts to representatives of DSE and USAID of the revised charts to be included in the March Progress Report. He then provided an overview of the progress of the Project up to the date of this meeting. Regarding the transmission main, it was reported that the Section D contractor had requested and had received a final inspection on his work. It was pointed out that the same contractor has turned in his "as-built" drawings and project photographs but until he completes the deficiencies noted during the inspection, the Con-

sultant cannot certify him as being 100 % complete. The activities on the distribution system construction were reported to be nearing a state of completion. The contractor is making some repairs to the valves installed in Kelurahan Joyosuran and is bringing the materials in to make the connection of the ϕ 300 mm line to the ϕ 450 mm transmission main on Jl. Slamet Riyadi. Until that is completed, the contractor will be unable to request a final inspection. A tour of the public hydrant construction was conducted first to determine a suitable location that could be used for an opening ceremony as requested by USAID, but, during the tour it was noted up to fourteen locations did not have water meters set. The contractor involved also has considerable work to do before being completed. A list of the deficiencies noted has been provided to the contractor. Mr. Baucom then advised work had been completed on the replacement transmission main piping north of the Kartasura reservoir. Also, the Surakarta Water Enterprise has been providing the labor and material to repair leaks on the ϕ 300 mm distribution main on the east side of Surakarta. It was reported that the line was flushed for a while until up to ten leaks were noted. At that time the O & M Specialist stopped the flushing operation and requested both the Project and the Surakarta Water Enterprise to assist in getting the repairs made. It was noted that neither transmission main contractor has had men working the last two or three weeks. Those two are the same that did the work installing Line "A" as well as Lines "L" and "M" which need some repairs to be made.

Mr. Sorta was then given the floor to discuss materials and equipment procurement. He requested clarification from the Consultant regarding the letter transmitting recommendations for procurement of the O & M machine shop equipment. The reply was that on the air compressor and grinding/sanding equipment, the lowest bidders did not provide 220 V, 50 Hz motors. They were, therefore, considered nonresponsive and the next lowest bidder(s) that did comply with the Specified

electrical characteristics were selected. Mr. Sorta requested the Consultant to provide a letter so stating those reasons and was advised such a letter would be written immediately. Another item which needed clarification was the alternate suggested by the Consultant on the welding equipment. After explanation was completed Mr. Sorta advised he was satisfied and no letter on that subject would be required. Mr. Sorta then provided copies of letters and submittal data to and from the prospective suppliers for the pipe and fittings tender. He requested the Design Engineer to review it during the meeting and provide him with a set and comments to take back to Jakarta with him. This was done. Mr. Sorta advised it may be necessary for Mr. Bragdon to come to Jakarta if more verifications are required to assure the intended suppliers can meet the Specifications. The Consultant advised there was no problem for Mr. Bragdon to make such a trip provided it did not conflict with a planned meeting with Ir. Rahardjo during the week of 27 April 1981. Mr. Sorta advised the pipe was no real problem in that delivery can be made in a short time. The fittings being manufactured in Central Java could be a problem, however, if it is found the foundry is a member of an association which has recently received a large order from Cipta Karya for the same type of product. It may be necessary to consider having a lower their supplier approved in the event it becomes necessary to obtain outside assistance in making delivery on time. The DSE representatives suggested proceeding with the administrative parts of the local purchases and while that is in process, handle the shop drawing approvals. Doing so they said would speed up the entire process. The Consultant and USAID agreed. It was as a result of a question from Mr. Thorn that he was advised, in the case of James H. Hardy, they must sell their product through an agent unless it is an international tender due to their ownership. Messrs Aziz and Sorta said the Consultant should have access to the plants of the suppliers and be able to deal directly with them to resolve problems regarding shop drawings, Specifications or delivery. They advised a clause that would empower the Consultant with that authority would be inserted into the supply contract(s). Mr. Sorta advised

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the activity regarding valve order being in Amendment No. 1a was just about finished and that Amendment No. 2 would include the generator sets and pumps for the two wells and all of the O & M tools and equipment. The Consultant inquired about obtaining the Clow and Rohan shipments from the Port of Semarang. Mr. Krisno advised everything is in order and those two shipments should be turned over to the transportation contractor within the next few days. It was not known where the valve shipment was presently so no attempt will be made to hold up the transportation of the Clow and Rohan shipments just to be able to combine the shipments from Semarang to Surakarta.

Mr. Thorn advised their survey team would again be in Surakarta and would be taking up to 400 water samples about 25 May '81. He said they would like to be able to use the laboratory at the Surakarta Water Enterprise. The Consultant advised the order for the sample bottles was not scheduled to ship until 21 May and an update would be requested from the supplier.

Mr. Ringler then reported on the O & M activities centering around the repairs being made to the pipelines installed from 1976 to 1979. He said that at the present rate of repairs, the lines could not be used for up to two months. More problems may become known after the lines have pressure put to them. The Consultant advised there had been a complete lack of activity on the O & M facilities constructed for the machine shop, automotive shop and parts warehouse since it was stated several progress meetings back that the facilities would remain under the ownership of Cipta Karya. Mr. Aziz advised that there was no problem in the Surakarta Water Enterprise using the facilities as approved previously and that the Project had merely placed a higher priority on installation of transmission and distribution piping. The Surakarta Water Enterprise has the funds necessary to make the required modifications and would proceed with that work according to Mr. Aziz. Mr. Aziz also stated it was normal practice for Cipta Karya to only make transfers to the local water enterprises upon completion of the project. However, he said in the case of this project,

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they would make partial transfers to Surakarta Water Enterprise so that the on-the-job training can proceed in the operations and maintenance of the system. Also, as construction is completed, the Surakarta Water Enterprise would incorporate the new work into their network on an operational basis. An inquiry was made regarding the scattered activity on the 1,100 house services. The Consultant reviewed activities up to the early part of December '80 when the Project decided to take full charge of obtaining new customers and personally collecting the deposit/connection fees. The Consultant also restated the consensus that all house connections should be done solely by the Surakarta Water Enterprise. Only in that way can the work be controlled, recorded for billing and assure standards of construction are met. The Consultant advised that neither their inspectors nor those of the Project combined had been able to watch all of the Contractor's work because of a lack of daily planning on the part of the contractor and quantity of crews working in various parts of town all at the same time. Mr. Aziz said some of the 1,100 total could be done as rehabilitation of existing services that need to be replaced. He said it seems the Water Enterprise is reluctant to set meters if there is no water - afraid the meters may be stolen. Another excuse given by the Water Enterprise related to a lack of manpower. It is hoped a meeting with the Mayor of Surakarta can be set up later today to discuss this problem, Mr. Aziz said. Mr. Soelarno indicated the balance of water meters could be set within a week from now.

In addition to the 62.02 km of PVC pipe included in the present design for Phases I, II and III, it was pointed out that there is over 70 km of PVC pipe in the procurement package presently being concluded. The difference being that required for rehabilitation of the existing network and installation of some of the loop piping indicated on the 1975 design drawings but never completed. Cipta Karya will review the budget so that the quantity of materials purchased will be very close to the

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total to be installed including the \pm 9.5 km of PVC and 4.8 km of asbestos cement pipe in phase IV. Mr. Aziz verified with Mr. Thorn that USAID would pay costs for public latrines and bath houses. Mr. Thorn said yes.

Mr. Aziz verified with Mr. Soedarto the possibilities of inaugurating this project even though the construction is not complete.' No problem, according to Mr. Soedarto. When asked, Mr. Soedarto advised the current issue of TEMPO magazine had misquoted him during an interview held recently. Mr. Aziz stated he had personally written a refutation to the reporter and requested his comments be published in the next issue of TEMPO.

The Surakarta Water Enterprise cannot afford to send any of their people away for training either out of country or in country, it was indicated. Mr. Thorn said if they determined they did not want to spend the money in the loan for training, it could either be deleted in Amendment No. 2 or reallocated for something else. The Consultant stated the funds could be put to good use for the purchase of the radio equipment once approved but stopped because of the increase in price after the 60 day firm quote time elapsed. Mr. Soedarto verified it would seem more advantageous to him to be able to complete the O & M equipment as soon as possible so that the OJT could be done. Mr. Soedarto also advised they planned to take twelve day laborers and make permanent employees of them.

After the meeting adjourned, a field trip was planned to look at the possible sites for an inauguration ceremony. The Mayor was to be contacted also to see if it would be possible for Messrs Aziz, Krisno, Hari and Thorn to meet with him and Messrs Soedarto and Soelomo.

DATA PEMAKAIAN AIR MINUM KODYA SURAKARTA

No.	WILAYAH	BULAN PEMAKAIAN						KETERANGAN
		Nopember	Desember	Januari	Februari	Maret	April	
1.	Bagian I	31.161	29.061	32.283	35.225	32.199	Jumlah lang- ganan sampai dengan bulan Maret 1981 : 7.595.	
2.	Bagian I A	46.151	44.097	51.046	52.692	47.667		
3.	Bagian II	22.955	22.588	29.217	29.501	28.705		
4.	Bagian II A	19.878	19.893	26.610	25.145	23.897		
5.	Bagian III	10.607	10.371	13.633	13.482	12.683		
6.	Bagian III A	22.269	21.722	28.826	29.437	27.995		
7.	Bagian IV	11.668	11.222	13.273	14.647	16.309		
8.	Bagian IV A	17.416	16.817	22.287	22.997	22.192		
9.	Bagian V . .	18.632	17.546	22.433	21.641	22.570		
10.	Bagian V A	17.914	16.581	22.179	20.410	20.243		
11.	Istimewa	53.723	62.835	68.681	70.887	72.599		
T o t a l		272.374	272.733	330.568	336.064	327.059		

FINAL INSPECTION - PUNCH LIST.

SECTION: D CONTRACTOR: P.T. LEPEN KENCANA UTAMA DATE: 07 APRIL 1981

1. TRANSMISSION MAIN (SEE ADDITIONAL DISCREPANCIES)
2. AIR VALVE VAULT NO. 14 REPLACE 1" GLOBE VALVE & PVC RISER PIPE
3. AIR VALVE VAULT NO. 15 OK
4. BV-41 LOWER VALVE BOX FLUSH WITH GRADE
5. BV-42 VALVE BOX TOP MISSING - MUST BE CLEANED BEFORE CHECKING
6. BV-43 VALVE BOX TOP MISSING - ADD BACKFILL
7. BV-44 MOVE VALVE BOX OVER OPERATING NUT - ADD BACKFILL 1M COVER
8. BV-45 OK
9. BV-46 ADD BACKFILL TO TOP OF VALVE BOX
10. BV-47 OK
11. BV-48 OK
12. BV-49 OK
13. BV-50 ADD BACKFILL
14. BV-51 ADD BACKFILL
15. BV-52 OK
16. CROSS-TIE NO. 4 $\phi 100\text{mm}$ VALVE BOX TOP MISSING AT FIRE HYDRANT
17. CROSS-TIE NO. 5 $\phi 200\text{mm}$ RAISE VALVE BOX OR LOWER GRADE
18. CROSS-TIE NO. 6 $\phi 150\text{mm}$ RAISE VALVE BOX 3CM
19. CROSS-TIE NO. 7 $\phi 150\text{mm}$ OK
20. CROSS-TIE NO. 8 $\phi 200\text{mm}$ OK
21. CROSS-TIE NO. 9 $\phi 150\text{mm}$ NO CONCRETE BASE UNDER VALVE BOX - MUST BE PRESENT
22. CROSS-TIE NO. 10 $\phi 250\text{mm}$ ADD ASPHALT AROUND VALVE BOX
23. CROSS-TIE NO. 11 $\phi 450\text{mm}$ OK
24. CROSS-TIE NO. 12 $\phi 450\text{mm}$ OK
25. CROSS-TIE NO. 13 $\phi 300\text{mm}$ OK
26. RAILROAD CROSSING NO. 4 OK
27. OUTLET TEE STA. 208+44 $\phi 100\text{mm}$ RAISE VALVE BOX 0.6M & CLEAN RISER PIPE
28. OUTLET TEE STA. 211+27 $\phi 100\text{mm}$ ADD FILL TO TOP OF VALVE BOX
29. OUTLET TEE STA. 216+43 $\phi 250\text{mm}$ OK
30. OUTLET TEE STA. 222+13 $\phi 150\text{mm}$ STRAIGHTEN VALVE BOX
31. OUTLET TEE STA. 226+92 $\phi 100\text{mm}$ VALVE BOX TOP MISSING - NOT CONSTRUCTED
32. TEMPORARY FIELD OFFICE OK CORRECT - MUST BE CLEANED OUT - BACKFILL
33. JERRES RESERVOIR GALLERY PIPING & ACCESSORIES PAINT BOLTS, NUTS AND AIR VENT.

[Signature]

[Signature]

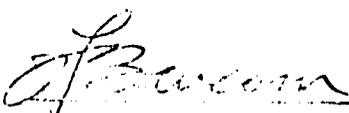
NOT PRESENT

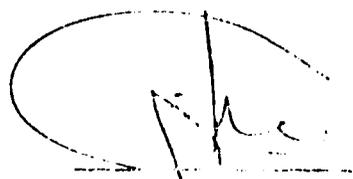
FINAL INSPECTION - PUNCH LIST

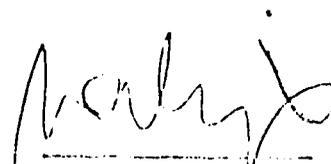
SECTION: D CONTRACTOR: P.T. LEPEN KENCANA UTAMA DATE: 07 APRIL 1981

34. ADDITIONAL DISCREPANCIES:

- ① STA. 215+60± REPAIR ASPHALT DRIVEWAY TO PERTAMINA.
- ② STA. 220+00± ADD FILL FOR 1M COVER
- ③ STA. 264+00± REPAIR ASPHALT DRIVEWAY TO PERTAMINA.
- ④ STA. 271+40± ADD FILL WHERE REQUIRED BY USING EXCESS MATERIAL BETWEEN AIR VALVE VAULT NO. 15 & BV-SD,


FOR CONSULTANT
J.F. BAUCAN


FOR CONTRACTOR
Gunadi


FOR OWNER
(K. 1000 1000 1000)

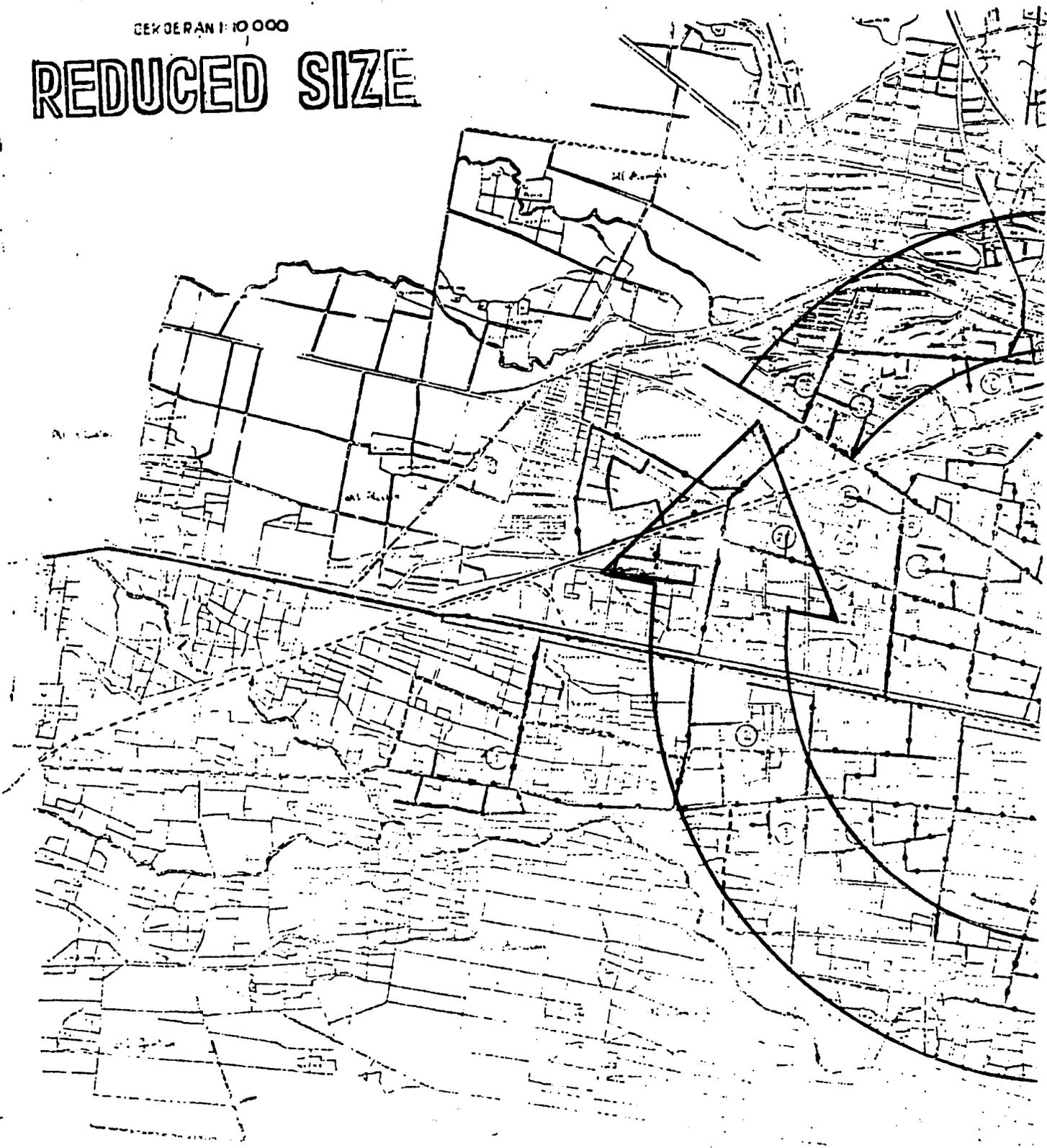
NOT PRESENT
FOR PDAM

KOTA
SOERABAYA

CEKDERAN 1:10 000

REDUCED SIZE

App. VIII (A)

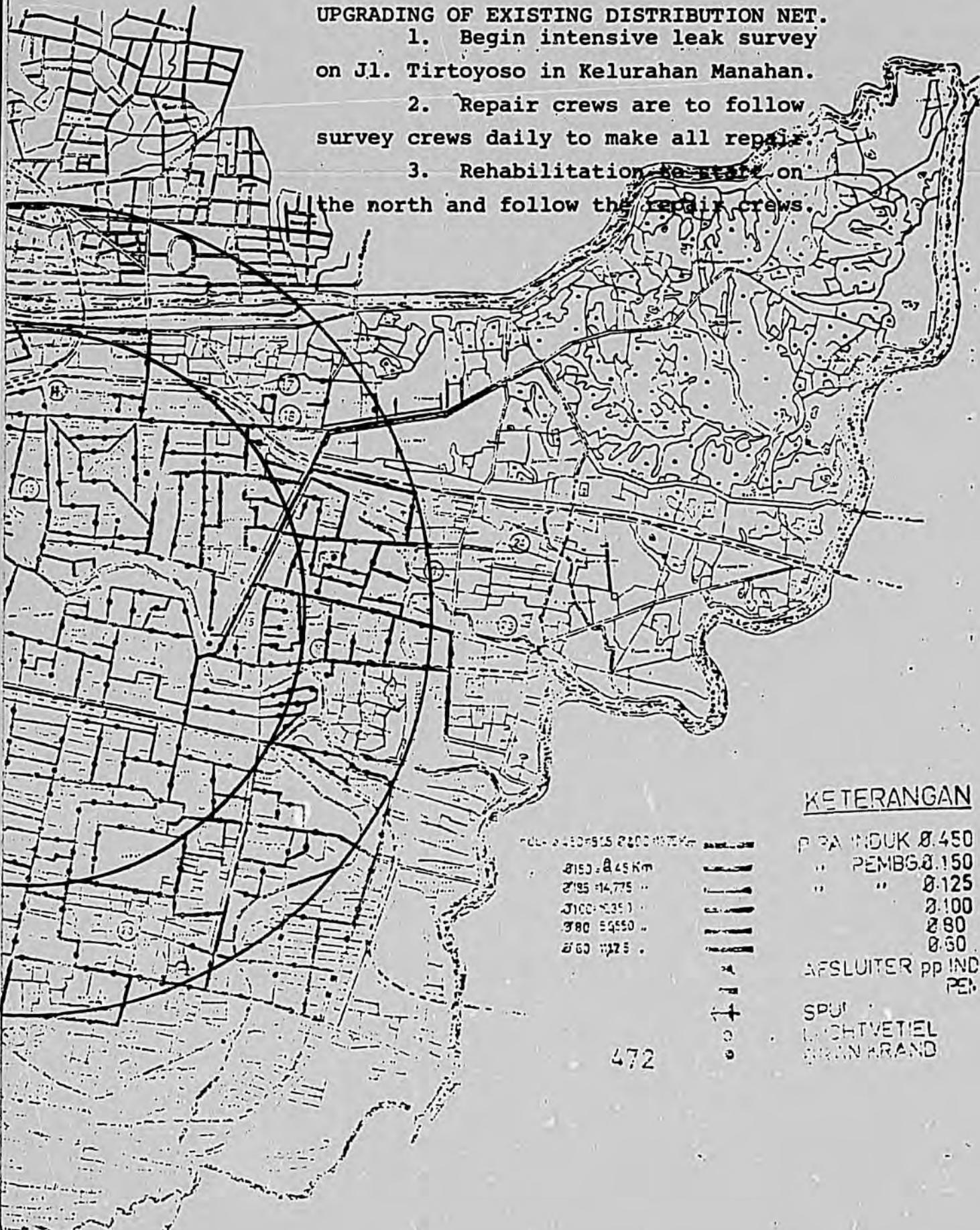


App. VIII
(B)

P L A N O F I M P L E M E N T A T I O N

UPGRADING OF EXISTING DISTRIBUTION NET.

1. Begin intensive leak survey on Jl. Tirtoyoso in Kelurahan Manahan.
2. Repair crews are to follow survey crews daily to make all repair.
3. Rehabilitation ~~to start~~ on the north and follow the repair crews.



Ø 150 - 0.45 Km	=====
Ø 125 - 0.150	=====
Ø 100 - 0.125	=====
Ø 80 - 0.100	=====
Ø 60 - 0.080	=====
Ø 45 - 0.060	=====
	+
	o
	o

KETERANGAN

- Pipa induk Ø.450
- " PEMB. Ø.150
- " " Ø.125
- " " Ø.100
- " " Ø.80
- " " Ø.60
- Afsluiter pp IND
- PEH
- SPUI
- LIJCHTVETIEL
- BRANBRAND

Notulen Rapat tgl....April 1981

Tempat : Balai kota Surakarta.
 Dihadiri : Bp alikotamadya Surakarta.
 Bp Ir. Azis dari DTP.
 Mr Paul Thorn (USAID)
 Bp Soedarto PDAM Surakarta
 Bp Soelarno PDAM Surakarta.

Jalannya pembicaraan :

1. Ir Azis : Untuk target pemasangan baru sejumlah 1.100 ini beliau ingin mengetahui berapa jumlah peminat/pendaftar calon langganan dahulu dan kemudian baru akan dicukupi pipa distribusinya.
2. PDAM : Menginginkan adanya pemasangan pipa distribusi lebih dahulu baru kemudian calon langganan pasti banyak yang mendaftar.
3. Ir Azis : Apakah dapat menambah sarjana teknik untuk keperluan PDAM ?
4. Bp Walikota & PDAM : Prinsipnya setuju tetapi karena hal tersebut adalah kebutuhan daerah maka kaderisasi akan dilakukan oleh daerah sendiri. Hal ini juga disebabkan karena sistim penggajian di PDAM Surakarta belum seperti sistim penggajian perusahaan melainkan masih mengikuti sistim penggajian pegawai negeri sipil daerah.
5. PDAM : PDAM sedang mempelajari sistim penggajian yang berlaku pada perusahaan2 lain sebagai bahan perbaikan penggajian.
6. Ir Azis : Tentang pembayaran bagi pemasang air baru yang besarnya Rp 50.000,- serta mengangsur yang dimasukkan income PDAM dulu tapi supaya dapat diperuntukkan untuk membantu proyek PAB.
7. Bp Walikotamadya : Bagaimana PDAM ? Hingga sekarang penicilan uang di maksud masuk dalam perputaran Kas.
8. PDAM : Apa sebab busi jalur2-nya dulu yang terpasang tapi penerimaan calon langganan yang dulu.
9. Ir Azis : Biaya/DIP yang diperuntukkan bagi pemasangan jalur dipergunakan untuk menunjang program KIP yaitu pemasangan public hydrant 47 buah dengan alasan agar dapat menjangkau masyarakat yang berpenghasilan rendah.
10. Ir Azis : Menurut laporan LORRY diperlukan banyak penggantian pipa distribusi dan konsumen, dimohon agar PEMDA tidak banyak membebani PDAM sebab kalau pada dewasa ini tidak diutamakan mengganti pipa2 yang tua maka kebocoran akan parah.
11. Bp Walikota : Dapat menerima apa yang diusulkan dan anggaran yang sebagian akan diperuntukkan bagi kepentingan air minum demi perkembangan.
12. Paul Thorn : Ada tiga usulan :
 1. Di bagian teknik keliratan ada kekurangan tenaga, perlu dibenahi. PDAM mulai Januari 1981 sudah membenahi menambah kekurangan tenaga yang diperlukan dengan mengingat kemampuan anggaran yang tersedia. (jawab PDAM)
 2. Mohon pada Pak Ali agar PDAM jangan dibebani kewajiban yang memberatkan.
 3. Apakah kerangka teknis tidak memadai?

PDAM : Penjelasan dari PDAM mengenai berkurangnya kemungkinan ada tetapi tidak besar pengaruhnya. Sebab bagi langganan yang menjadi soal adalah mancurnya air bila membuka kran, a begitu buka kran air mancur saja jelas langganan tidak begi memasalahkan tarip.

P.Azis : Pembaca meter belum menaati kewajiban yang sebenarnya.

PDAM : PDAM telah membuat tem :
1. penertipan,
2. inventerisasi, dan
3. klasifikasi langganan.

Mengetahui
Direktur PDAM Surakarta

PERUSAHAAN AIR MINUM
SUR KARTA
Notulis

(SOEDARTO)

(sudiharjo)

T R A N S L A T I O N

MEETING MEMORANDUM APRIL 20, 1981

Place : City Hall, Surakarta

Attended by : Mayor of Surakarta

Mr. Aziz, DSE

Mr. Paul Thorn, USAID

Mr. Soedarto, SWE

Mr. Soelarno, SWE

Conversation as follows :

1. Mr. Aziz : He wants to know how many would be customers have applied for new connections. Based on the number of applicants then the planning of the distribution pipes can be drawn up. This is in accordance with the plan to install 1.100 new water connections.
2. SWE : SWE wishes that the distribution pipes be laid up first. After completion of the distribution lines many new customers will be applying for water connections.
3. Mr. Aziz : Could SWE add a personnel of full degree engineer of its present force ?
4. Mayor & SWE : Principally the Mayor and SWE agreed to this matter but because the necessity for this engineer personnel is the privilege of the city, the city will choose its own cadre. This also reflects the remuneration system in SWE which has no remuneration system as an Enterprise should but follows the civil servant remuneration system.

5. SWE : SWE is making studies on other Enterprise's remuneration system to improve SWE's system.
6. Mr. Aziz : It is suggested that costs to install new connection whis is Rp. 50,000 with install-ments not to be categorized as SWE income but to be collected to support CJWSP project.
7. Mayor : What is the opinion of SWE ? Up until now the money has been put as SWE's Income.
8. SWE : Are not the distribution lines to be install-
ed first, but why listing new customers as
the first ?
9. Mr. Aziz : The budget to install the distribution lines
is used to support KIP that is the installa-
tion of 47 public hydrant upon the reason
that these hydrants could serviced the low
income people.
10. Mr. Aziz : Based on Mr. Lowry's Report, there are many
of distribution lines and service connections
yet to be replaced, it is requested that the
city doesnt't overburden SWE (as income sour-
ces) because if at the present no action put
into replacing those old pipes, the leaks may
be getting worse and worse.
11. Mayor : Suggestion and request granted and next FY
budget, portion of the budget will be for the
development of potable water.
12. Mr. Thorn : There are three suggestions :
1. In the Technical Division, there is lack
of personnel, must be filled up.
SWE : starting January 1981 filling up the

personnel has been made in accordance with the SWE funding ability.

2. Suggested to the Mayor that SWE must not be overburden as an income source.
3. Is increase on water tariffs may result in decreased number of the customers ?

Mayor : Because of increasing exploitation costs and increased budget the Mayor has issued a decree of new increased tariffs. (SK Walikota).

SWE : SWE explains that decreasing number on customers is a probability and may happen but the influenced is not serious. Because what the customers want is that water pours out in opening the faucet. If this happens, water rates doesn't matter much on the customers.

Mr. Aziz: Meter man hasn't fulfilled their original tasks yet, as per work instructions.

SWE : SWE has organized teams to cope with :

1. discipline
2. inventory, and
3. customers classification.

Seen and approved :

SWE Prepared by :

Soedarto

Sudiharjo