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

55p.

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

MONTHLY PROGRESS

**REPORT NO. 4  
JANUARY 1979**

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

MONTHLY PROGRESS  
REPORT NO. 4

SURAKARTA WATER SYSTEM  
CONSULTING ENGINEERING SERVICES

# BEST AVAILABLE DOCUMENT

FOR THE MONTH OF JANUARY

1979

SUBMITTED BY :

  
DONALD DEWART  
Chief Engineer



PREPARED BY:

BURNS & MCDONNELL ENGINEERING CO., INC  
TRANS-ASIA ENGINEERING ASSOCIATES, INC  
A Joint Venture  
KOTAK POS 105  
SURAKARTA, INDONESIA

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# BEST AVAILABLE DOCUMENT

## SECTION I

### NARRATIVE SUMMARY

#### IA GENERAL

In late December, irrevocable letters of credit were sent to U.S. banks, to confirm off-shore purchase of pipe, fittings, appurtenances, and equipment for Surakarta Water System. The U.S. manufacturers have started production of the off-shore purchased materials.

Data taking continued on the groundwater exploration program.

The management specialist continued to advise the Surakarta Water Enterprise on revisions of management procedures.

The O & M Specialist became involved in existing O & M procedures at the Surakarta Water Enterprise.

Preparation continued for letting the contracts for the transportation of the materials purchased off-shore from ship at Semarang port to storage in Surakarta, for transmission pipeline construction, and for well drilling.

A communications bottleneck has been eliminated by the arrival of two new electric Olivetti typewriters and a Sharpfax reproduction machine during the latter part of the month, in the Surakarta office.

#### IB MAJOR PROBLEMS

The rapid rate of inflation of costs of all "hard goods" has become a major problem since mid-December.

All attempts to buy the two additional allocated Toyota jeeps have been frustrated. A rental car is being used as a substitute for one of them. One motorcycle has been purchased, now awaiting registration.

A shortage of large electric household appliances is developing in Surakarta and Semarang retail shops.

SECTION 2  
ADMINISTRATION

2A SUBMISSIONS/APPROVALS

Consultant's rupiah invoice No. 2 for reimbursible expenses during the two months period of November and December 1978 was submitted to Cipta Karya in Semarang on 8 January 1979. This is in accordance with the contract, Appendix II, page 11-15.

Consultant's dollar invoice No. 3 for December reimbursible expenses was submitted to Cipta Karya in Jakarta on 5 January 1979.

The second rupiah payment to the Consultant, in accordance with the schedule in the Contract (page 11 - 15) was approved by Cipta Karya in late January.

2B CONFERENCES

2B1 Monthly Project Conference on 9 January at Surakarta.

The project monthly conference was held at the office of The Central Java Potable Water Project in Surakarta on 9 January, attended by :

Mr. Suwandi Sanudi,	Directorate of Sanitary Engineering
Mr. Harsono,	Directorate of Sanitary Engineering
Mr. Soedarto,	Surakarta Water Enterprise
Mr. Sularno,	Surakarta Water Enterprise
Mr. Abraham Grayson,	USAID
Mr. Paul Thorn,	USAID
Mr. Fred Midgett,	BM/TAE
Mr. Donald Dewart,	BM/TAE
Mr. A.F. Dengah,	BM/TAE

The conference opened at 9.30 am.

Consultant reported that the project office is fully staffed. The Toyota dealers have been refusing to accept an order for two land cruiser models until a few days ago. A rental car is being used until delivery is assured.

Consultant distributed draft copies of the project monthly progress report for December. USAID requested that the report should include a comparison between elapsed time and amount of work accomplished.

Consultant distributed sketches showing recommended pipe storage area at Manahan Athletic Field in Solo. A gravel drive through the center would be required for heavy trucks and equipment for unloading and reloading piping materials. USAID asked whether funds for this are included in the budget.

Consultant reported continuation of analysis of transmission pipeline construction operation and study of installation details, to forestall possible delays during construction. This work will be completed in February.

USAID reported that irrevocable letters of credit were issued for the off-shore purchase contracts on 30 December.

Consultant reported one month slippage on investigation of prospective on-shore pipe transportation contractors. The work will be completed in early February.

Consultant agreed that transportation contract should be awarded one month before arrival of off-shore purchased material at Semarang Port, to allow the contractor enough time to organize the 35 heavy trucks required.

Mr. Dengah reported his interviews of prospective transportation contractors at Semarang Port.

Written requests for permission to lay the transmission pipeline within their jurisdiction will be sent to each Regency that the pipeline route will traverse

USAID asked that Cipta Karya Directorate of Public Works be requested to furnish a guarantee that other underground utilities will not be located within the 5 meter wide easement for the transmission pipeline. Mr Suwandi agreed to obtain the guarantees.

It was noted that there will be a meeting shortly with Central Java Public Works to discuss details of the location of the pipeline route within the highway right-of-way.

USAID noted the need for constructing secondary and tertiary distribution pipelines in the most densely populated sections of Surakarta to ensure that the water allocated from the proposed transmission pipeline to the people who need it most will be delivered in adequate quantity to them,-- as stated in the original concept of the project upon which the USAID assistance decision was based. 35 km. of 100 mm. tertiary distribution pipe was included, to accomplish the purpose.

The consultant confirmed that adequate maps of the existing tertiary distribution piping are not available for use in planning construction of the additional tertiary piping.

A meeting will be held in Jakarta on 13 January to discuss this situation with the Directorate of Sanitary Engineering.

The conference ended at 12:15 p.m.

#### 2B2 Memorandum of Meeting

A meeting was held at Cipta Karya, Jalan Pattimura office in Jakarta on 13 January, 1971, at 09:00 hrs. with the following present:

<u>Name</u>	<u>Organization</u>
Ir. Azis	DTP
Mr. Soeratmo	DTP
Ir. Darmawan	DTP
Ir. Rahardjo	DTP
Ir. Soewandi	DTP
A. Grayson	USAID
P. Thorn	USAID
F. Midgett	BM/TAE

Subject of the meeting was the Surakarta water distribution system.

Mr. Azis welcomed all present and briefly discussed the past and present budgets for the subject project. He asked for comments from A.I.D.

Mr. Grayson reviewed the background and planning for the project and discussed particularly the background on A.I.D.'s decision to assist in the development of the Surakarta Water System with emphasis on the distribution system.

It was explained that A.I.D.'s intent, as set forth in the program documents, was to bring water to the poorer section of the city. One provision for this was the inclusion for an estimated 35 km. of 100 mm. pipe for secondary distribution. A.I.D.'s objective was to provide emergency construction for the poorer class south of the river. He expressed A.I.D.'s concern that lines were being laid and planned for sections north of the river and that there was no evidence of adequate plans for expanding the distribution system in the area that was originally intended to benefit most from the expansion.

He expressed A.I.D.'s reluctance to continue support for the project unless ways could be found to follow their original intent.

Mr. Rahardjo discussed further the background of the design and planning that went into the distribution system drawings as submitted by the consultant to Cipta Karya. He explained that the exact scope of work (including the 35 km. of 100 mm. pipe) was not clearly delineated on the drawings.

Mr. Thorn explained that the available time in the consultant's contract did not permit a detailed design of the secondary and tertiary lines of the whole distribution system. Also, no details on service locations and connections were shown. He reiterated that the intent of the project was to provide water to poorer, more crowded areas (i.e. south of the river) and it was intended that the exact location for the secondary lines would be decided at the time of installation.

Mr. Darmawan agreed that the secondary pipes can normally be located and planned in the field and that it appears there is still time and money remaining to accomplish the design and construction necessary to meet A.I.D.'s requirements and still be within the project time frame.

When asked the magnitude of the design effort required, Mr. Midgett replied it could range between 10 and 36 expatriate man months depending upon the scope of the work required.

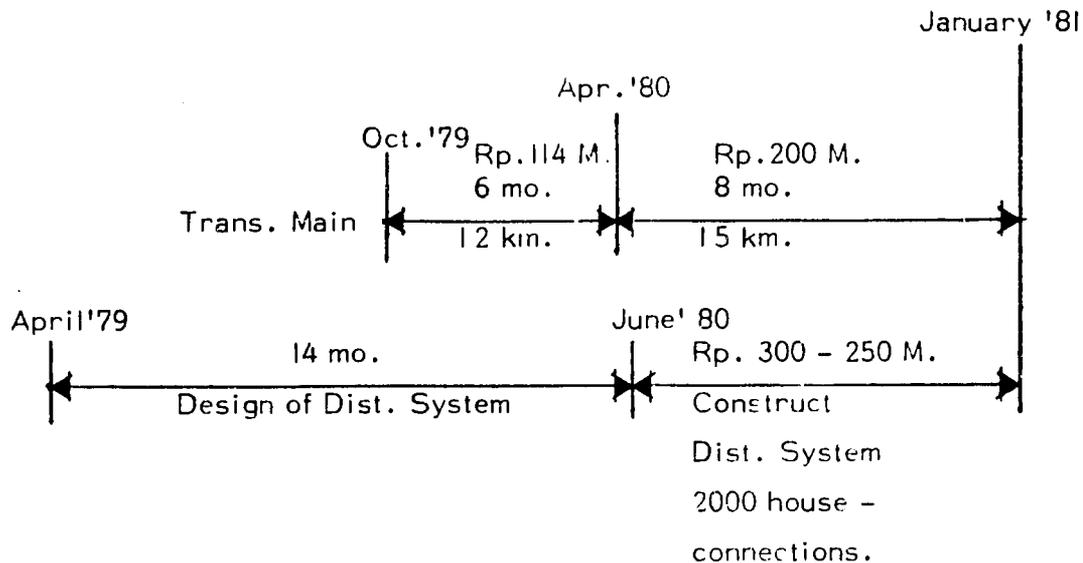
Mr. Soeratmo stated that it would be very difficult for their present staff to accomplish this design work with the present heavy workload.

After some discussion between DTP and A.I.D. it was decided to request BM/TAE to submit a proposal for designing the secondary and tertiary system.

A discussion on the details of the required scope of work resulted in the decision that the DTP (Mr. Rahardjo) would have an outline of a TOR ready to discuss with the consultant by 17 January, 1979. It was understood that the entire distribution system would be designed and planned, with the area south of the river being constructed in the first phase. Also the designs would include locations and designs for bathhouses, public hydrants and latrines (if required).

It was planned that the design period would be approximately 14 months beginning about April, 1979.

The sketch shown below was put on the blackboard as a target time frame.



Mr. Grayson complimented Cipta Karya on their budget planning and inquired as to the available budget for 1979/1980 fiscal year.

Mr. Soewandi replied that there was Rp. 114 Million for construction of 12 km. of the transmission main in 1979/1980 fiscal year and estimated between Rp. 250 and 300 Million for 1980/1981 fiscal year of which approximately Rp. 200 Million was for the remaining 15 km. of the transmission line. The difference was for the distribution system and approx. 2000 service connections.

A discussion of Rate Structures and the survey of potential customers was held with several ideas put forth concerning the best methods to get an accurate evaluation of the number of customers and how they could pay for service. Some suggestions were :

- a) Advertise through poster campaigns and radio spot announcements.

- b) Assign local leaders to make a survey of those wishing service connections instead of having personnel from CK, the Consultant or Mayor's Office.

No definite decision was reached on the exact method of the survey.

The meeting was adjourned at 11:00 hrs.

2B3 Meeting with Central Java Department of Public Works in Surakarta on 26 January.

A meeting was held at the office of the Department of Public Works, Central Java, in Surakarta, attended by :

Mr. Supangat	-- Dept. of Public Works (DPU) Surakarta.
Mr. Suyitno	-- Dept. of Public Works (DPU) Surakarta.
Mr. Harsono BE	-- Dir. Gen. Cipta Karya - Directorate Sanitary Engineering.
Mr. Widodo	-- Directorate General Cipta Karya - Directorate Sanitary Engineering.
Mr. Sudarto	-- Surakarta Water Enterprise
Mr. Sularno	-- Surakarta Water Enterprise
Mr. Donald Dewart	-- Burns & McDonnell/Trans-Asia
Mr. Thomas Fodor	-- Burns & McDonnell/Trans-Asia
Ir. A.F. Dengah	-- Burns & McDonnell/Trans-Asia

An introduction was delivered by Mr. Harsono, explaining that the meeting will be focused on the work of installation of transmission pipes from Cokrotulung to Surakarta.

The principle subject was the installation of the section of the proposed supply pipeline to be located within the right-of-way of highways that are under the jurisdiction of the Department of Public Works. This includes the section between pipeline station 73 + 50 at Wonosobo River bridge and Station 196 + 00 at the western boundary of the City of Surakarta.

Engineer Supangat said that the Department of P.W. will be guided by the letter of 30 December 1978 from their Semarang office ( see APPENDIX ).

A survey crew from D.P.W. will start on 1 February to set stake markers for the proposed pipeline route along the east side of the Yogyakarta - Kartasura highway, and along the south side of the Kartasura - Surakarta road, with the understanding that BM/TAE will observe this work carefully and advise on the feasibility of this location. The right-of-way is 22 meters wide. The staked route would generally be 6.5 meters from the centerline of the Yogyakarta highway, and from the centerline of the bicycle path along the south side of the Kartasura - Surakarta highway.

Pavement replacement work will be included in the transmission pipeline construction contract.

Maps of the staked out pipeline route and Bina Marga specifications for replacing the asphalt pavement will be ready on 1 March to enable the Consultant to revise the pipeline contract plans and specifications where necessary.

Brambang River crossing (pipeline Station 77 + 25). Plans show proposed pipeline suspended (beside the existing pipeline) or the existing highway gridge.

Bina Marga plans to make the bridge wider. Probably the existing bridge will be replaced by an entirely new structure. The Consultant was requested to reconsider a pipeline crossing under the river bed to avoid the problems of maintaining a pipeline crossing above the river during bridge reconstruction.

Central Government planning envisages ultimately a 30 meter wide right-of-way for highways.

SECTION 3  
SCHEDULES

3A PROGRESS

3A1 Procurement of Off-Shore Material.

Production of pipe, fittings, appurtenances, and equipment has been started by factories in the U.S.A. Coordination work is 99% complete.

3A2 On-shore Transportation of Off-shore Purchased Material.

Investigation of facilities and capacities of prospective transportation contractors is nearly complete. Advisory work is 40% complete and is on schedule.

3A3 Construction of Transmission Pipeline.

Investigation of prospective construction contractors is under way and will be completed during February. Advisory work is 10% complete. Pipeline construction is scheduled to start on 1 June.

3A4 Groundwater Investigation and Development.

Hydrogeological data taking and analysis is on schedule and is 50% complete.

Prequalifying, tendering, and awarding drilling contract. Advisory work is 10% complete and is 2 weeks behind schedule.

Prequalifying of prospective drilling contractors is nearly complete. Drilling contract is being drafted.

3A5 Management Assistance to Surakarta Water Enterprise.

Work is on schedule and is 19% complete.

3A6 Operation and Maintenance Technical Assistance to Surakarta Water Enterprise.

Visual examination of existing system is nearly complete and is on schedule. Advisory work is on schedule and is 8% complete.

3A7 Water Meter Maintenance Assistance. Work scheduled to start 1 June 1979.

### 3B WORK SCHEDULED FOR NEXT MONTH

Continue coordination of procurement of off-shore purchased material.

Complete investigation of prospective contractors for on-shore transportation contract. Prepare report and recommendations and assist Cipta Karya in issuing bid invitations.

Continue investigation of prospective contractors for construction of transmission pipeline.

Continue groundwater data taking. Start writing report. Complete investigation of prospective well drilling contractors. Complete preparation of drilling contract.

Revise engineering contract between BM/TAE and Cipta Karya to include well drilling contract responsibility.

Issue invitations to bid on drilling contract.

Continue management advisory services to the Water Enterprise.

Continue assistance and supervision on the general accounting work.

Assist in the preparation of January 1979 reports.

Prepare detailed procedures to implement the recommendations on billing and collection.

Continue O & M assistance to the Water Enterprise.

Continue preparing O and M Manual.

Prepare a program of O & M training.

## SECTION 4

### ENGINEERING AND MANAGEMENT

#### 4A CONSTRUCTION OF TRANSMISSION PIPELINE

Land easements for Right-of-Way.

Sketches showing recommended easement areas were presented to Cipta Karya Directorate of Sanitary Engineering.

The sketches incorporate revisions as requested.

Off-shore Purchase of Pipeline materials.

Production of materials purchased in the U.S.A. has been started.

Earliest factory shipping date (according to the Purchase Agreements) is 45 days from 1 January, or 15 February. Assuming no delay in loading on ship at U.S. port, and 40 days ocean transit, the earliest possible arrival time at Semarang Port is 20 March.

On-shore Transportation of Materials Purchased off-shore.

Inspection of the facilities of eligible transportation contractors has been completed. Analysis and recommendations are being prepared.

Pipeline Location.

Bina Marga highway planning requires 6.5 meters minimum distance from centerline of pavement to pipeline. A field survey is being organized by Bina Marga to check out the section of pipeline route under their jurisdiction, as noted in SECTION 2.

#### 4B GROUNDWATER INVESTIGATION AND DEVELOPMENT

Began detailed exploration to locate the geological formations.

Tentatively defined four possible locations for test borings in Area 1 ( NE of Surakarta ).

Began reconnaissance of possible groundwater recharge areas.

Developed form for use in recording bore hole data during test drilling.

Started format (or general outline) forthcoming report on results of groundwater exploration.

Continued preparing maps.

#### 4C MANAGEMENT ASSISTANCE TO SURAKARTA WATER ENTERPRISE

##### 4C1 Work Done.

###### A. General Accounting.

Assistance and supervision in the proper use of the various books of accounts prescribed in the Guidebook, Performance of Administration Water Enterprise. The accounting staff were taught simplified and efficient procedures in recording transactions from the source documents to summary books and subsidiary records. One of the areas whereby bookkeeping procedures were simplified concerns recording of issuances of materials and supplies. At the present time the practices on recording issuances are as follows :

1. Materials and supplies issued from the warehouse are evidenced by Materials Issue Slip and Materials Request Form.
2. Details of issuances as shown in the Material Issue Slip and Materials Request Form are recorded in the Stock Card maintained by the Accounting Clerk for each item of materials and supplies.
3. The same details posted to the Stock Cards are then again posted to Material Issue Summary.

Since the details being recorded in the Material Issue Summary

are not used for any purpose, it was recommended that only cost of materials issued should be posted in the Summary.

#### B. Chart of Accounts.

Assistance in the correct interpretation of the new chart of Accounts recommended in the Guidebook. Until December 31, 1978 the Water Enterprise used the old chart of Accounts. Work on this consisted of helping the Accounting Staff match the old Chart of Accounts with the new Chart of Accounts. The Balance Sheet and Profit and Loss statement for the year ending December 31, 1978 were prepared based on the new Chart of Accounts. All transactions beginning January 1979 were already recorded in the books based on the new Chart of Accounts.

#### C. Financial and Operating Reports.

Assistance and supervision in the preparation of the 1978 financial and operating reports. Assistance included discussion on the correct treatment of transaction for accounting purposes, the correct procedures in preparing necessary schedules, and the proper presentation of the financial and operating reports. The following reports for the year 1978 were prepared in January 1979 :

- Financial and Operating Highlights
- Balance sheet
- Profit and Loss Statement
- Cash Flow Statement
- Fixed Assets Schedule
- Summary of Materials and Supplies Inventory
- Billing Summary by Types of Customer
- Collection Efficiency Report
- Customers Report by District

- Water Production and Distribution Report
- Personnel Report

As of January 31, 1979 some of these reports are still in the process of reproduction. Distribution of these reports to various recipients shall be done in February 1979.

Presented below are some comments on the report prepared for the year 1978.

1. Balance Sheet and Profit and Loss Statement.

The Balance Sheet and the Profit and Loss Statement for the year 1978 were prepared based on the recorded transactions in 1978, and from Balance Sheet and Profit and Loss Statements dated April 1, 1976, March 31, 1977 and December 31, 1977. Reclassification of the Old Chart of Accounts was made to conform with the new Chart of Accounts.

2. Accounts Receivable.

Included among the assets turned over by the City Government to the Water Enterprise on April 1, 1976 were Accounts Receivable from customers amounting to Rp. 58,057,175. Although all uncollected bills as of April 1, 1976 were also turned over to the Water Enterprise there is no detail available per customer. As of December 31, 1978 the balance of the Accounts Receivable pertaining to billings in 1976 and previous years amounted to Rp. 38,269,972.

In 1978 Water Enterprise received instructions from the Board of Supervisors to write off Accounts Receivable amounting to Rp. 12,940,000. However, adjustment of this account is deferred until 1979 because the detail per customer of the amount to be written off is not yet available. As of this date the preparation of

the list per customer pertaining to 1976 and previous Accounts Receivable is in progress.

### 3. Fixed Assets.

Including in the Balance Sheet as of December 31, 1978 are fixed assets with total amount of Rp. 859,324,513 (Rp. 767,893,492 after provision for depreciation).

This amount consists of assets recorded in the books as of April 1, 1976 the date the Water Enterprise become autonomous, and recorded acquisitions since then. On various dates starting in 1974 and until 1978 the Central Java Water Project did some rehabilitation of existing transmission lines and construction of additional distribution lines totalling more than 17,000 meters. The cost of these assets is not included in the December 31, 1978 Balance Sheet because the Water Enterprise has not yet received from the Central Java Project the total amount chargeable to these projects.

### D. Billing and Collection.

Started the review of the present procedures on billing and collection. The findings and recommendations on this area of operation are included in the APPENDIX, Summary of Findings and Recommendations.

A more detailed study of the present operations namely meter reading, billing, collection, connection and disconnection, and other aspects about customer services is already underway.

### 4C2 Findings and Recommendations.

A summary of findings and recommendations on various areas of operations is included in the APPENDIX.

The findings and recommendations contained therein were discussed with the Director, the Chief finance and Administration Division and other personnel concerned. Detailed procedures on how to implement said recommendation shall be worked out in coordination with personnel concerned.

4C3 Problem Encountered.

More time than necessary was spent in preparing schedules needed to complete the financial reports because of some deficiencies in record keeping.

As mentioned in the findings and recommendations in APPENDIX VI of the December monthly report not all of the accounts in 1978 were recorded in the General Ledger. Records of some of the transactions were kept in various booklets. Likewise, some adjustments were effected directly on the General Ledger without first preparing Journal Vouchers, thus some accounts affected by such adjustments were not adjusted.

This is compounded by the fact that in 1978 the Water Enterprise did not prepare monthly financial statements or monthly Trial Balances to at least verify the correctness of the recorded transactions. As a consequence, at the end of 1978 the total Debit recorded did not tally with the total Credit. Considerable amount of time was spent in locating errors.

4D OPERATION AND MAINTENANCE ASSISTANCE TO SURAKARTA WATER ENTERPRISE

4D1 Housing for new Equipment.

Assisted in planning a new building for storing and operating the new maintenance and repair equipment included in the off-shore purchase contracts.

4D2 Inventory of Existing Facilities and Equipment.

A material and equipment inventory has been made at the Water Enterprise

central facility, to review and study the present capability for operation and maintenance of the existing transmission and distribution system ( see APPENDIX)

#### 4D3 Inspection of Existing Distribution System.

The existing distribution system includes 130 km. of pipe 60 mm. to 300 mm in size. ( see APPENDIX )

Examination of pieces of pipe that have been removed from service indicated both internal corrosion and external leaching of ferrous material from the pipe wall, leaving mostly the graphite portion of the original cast-iron pipe.

It is difficult to establish which section of pipeline requires replacement due to the lack of leakage detectors (Enterprise owned detector is broken) and due to the lack of manpower and equipment for exposing the inoperative buried lines.

The majority of the service lines leading to the consumer properties are broken or in poor condition because of corrosion or poor joints. It is probable that some of the pipes have been damaged because they were laid with inadequate cover (approximately 20 cm below surface or exposed) . The service connections to the mains are also in poor condition.

#### 4D4 Existing O & M Personnel.

It is noted that there are no engineers employed in O & M and none of the labor force appear to have any formal training for operating and maintaining the existing system. Consequently maintenance is on a low level of activity, due to lack of funds and equipment and to the lack of qualified personnel.

4D5 Recommendation.

It is recommended that the enterprise should hire at least 1 engineer with 1 or 2 years of experience on municipal projects to organize a training course on operation and maintenance of pipelines and distribution systems for their personnel.

4D6 Operation and Maintenance Manual.

Initiated preparation of an O & M Manual.

SECTION 5  
PERSONNEL

The Drilling Specialist, Mr. Joe Palka is tentatively scheduled to arrive in Surakarta on 15 March.

The Surakarta office personnel at the end of January were as follows :

- Donald Dewart, Chief Engineer  
arrived 29 September 1978
  
- Bernado B. Bayongan , Management Specialist  
arrived 5 November 1978
  
- James T. Beirn, Hydrogeologist  
arrived 5 November 1978
  
- Thomas G. Fodor, Acting O & M Specialist  
arrived 25 December 1978 with spouse
  
- A.F. Dengah, Counterpart Chief Engineer  
arrived 8 November 1978
  
- Suyatno Yuwono , Counterpart Hydrogeologist  
arrived 5 January 1979
  
- Dradjat Atmardjo, Office Manager  
arrived 2 October 1978
  
- Mohammad Khalil, Materials Coordinator  
arrived 2 October 1978

- Danardio, Draftman  
arrived 22 January 1979
- Ambar Istiningsih, Secretary  
hired 1 January 1979
- Yonathan Djowi, Accountant  
hired 2 December 1978
- Aryani Karnasih, Administrative Clerk  
hired 8 January 1979
- Wahyudhi, Translator  
hired 18 January 1979 – left 31 January 1979
- Rubiyo, Clerk  
hired 1 November 1978
- Pamudji Rahardjo, driver  
hired 2 October 1978
- Mulyatmono, Watchman/Labour  
hired 9 October 1978
- Soewarno, Office Boy  
hired 1 November 1978
- Budi Dwi Putranto, driver  
hired 4 January 1979

SECTION 6  
APPENDIX

## LETTERS SENT DURING JANUARY 1979

NUMBER & DATE	TO	FROM	SUBJECT
1/BM/TAE/SKA/79 9 January 1979	Cipta Karya Surakarta	BM/TAE Surakarta	Request for copy of off-shore material purchase contracts
2/BM/TAE/SKA/79 10 January 1979	Burns & McDonnell Kansas City, Mo. (copy to BM/ TAE Jakarta)	BM/TAE Surakarta	Request for information about transmission pipeline equipment
3/BM/TAE/SKA/79 10 January 1979	Bison Instruments Minneapolis, USA (copy to BM/TAE Jakarta)	BM/TAE Surakarta	Request for brochures of water well drilling equipment
4/BM/TAE/SKA/79 10 January 1979	First Indra Corporation Ltd. Jakarta (copy to BM/TAE Jakarta)	BM/TAE Surakarta	Request for Brochures on water well drilling equipment
5/BM/TAE/SKA/79 10 January 1979	Sewater Engineering Co, (PTE) Ltd. Jakarta (copy to BM/TAE Jakarta)	BM/TAE Surakarta	Request for brochures on water well drilling equipment
6/BM/TAE/SKA/79 10 January 1979	Borneo oil Tool Co., Ltd. Singapore 10	BM/TAE Surakarta	Request for brochures on water well drilling equipment

Cont'd....

LETTERS SENT DURING JANUARY 1979  
(cont.d)

NUMBER & DATE	TO	FROM	SUBJECT
15/BM/TAE/SKA/79 23 January 1979	USAID Jakarta	BM/TAE Surakarta	Sending copy of letters No. Pro SI/62/1/79 and A.7/2/23/79
16/BM/TAE/SKA/79 23 January 1979	P. T. Varuna Tirta Prakarsa Semarang	BM/TAE Surakarta	Transmitting inquiry form for prospective bidder on transportation contract
17/BM/TAE/SKA/79 23 January 1979	PT. Intra Veem Semarang	BM/TAE Surakarta	do.
18/BM/TAE/SKA/79 23 January 1979	PT. Mpu Tantular Lloyd Semarang	BM/TAE Surakarta	do.
19/BM/TAE/SKA/79 23 January 1979	PT. Semarang Veem Semarang	BM/TAE Surakarta	do.
20/BM/TAE/SKA/79 23 January 1979	PT. Meja Laut Semarang	BM/TAE Surakarta	do.
21/BM/TAE/SKA/79 23 January 1979	PT. Marabunta Semarang	BM/TAE Surakarta	do.
22/BM/TAE/SKA/79 23 January 1979	Surakarta Water Enterprise	BM/TAE Surakarta	Initial findings and recommendations
23/BM/TAE/SKA/79 4 January 1979	Cipta Karya Semarang	BM/TAE Surakarta	Transmitting data on groundwater in upper Solo Basin and well drilling methods

Cont'd....

LETTERS SENT DURING JANUARY 1979

(cont.d)

NUMBER & DATE	TO	FROM	SUBJECT
7/BM/TAE/SKA/79 11 January 1979	To whom it may concern	BM/TAE Surakarta	Certification for Mr. A.F. Dengah to execute evaluation of the qualification of companies
8/BM/TAE/SKA/79 12 January 1979	Cipta karya Surakarta	BM/TAE Surakarta	Surakarta Water Transmission pipeline
9/BM/TAE/SKA/79 23 January 1979	Directorate General of Taxes Semarang	BM/TAE Surakarta	Request to be excused from taxes
10/BM/TAE/SKA/79 23 January 1979	PT. Waskita Karya Unit Drilling Surabaya	BM/TAE Surakarta	Sending of inquiry forms
11/BM/TAE/SKA/79 23 January 1979	Ellison Instrument Division Colorado, USA.	BM/TAE Surakarta	Request for Catalogues & technical information on equipment for Sura- karta Water Project
12/BM/TAE/SKA/79 23 January 1979	American Cost Iron Pipe Co. Alabama, USA	BM/TAE Surakarta	Request for Catalogues & technical information on equipment for Sura- karta
13/BM/TAE/SKA/79 23 January 1979	Clow Corporation	BM/TAE Surakarta	Request for catalogues, technical information on equipments for Sura- karta Water Project
14/BM/TAE/SKA/79 23 January 1979	The Rohan Company Oklahoma USA.	BM/TAE Surakarta	do.

Cont'd....

LETTERS SENT DURING JANUARY 1979  
(cont.d)

NUMBER & DATE	TO	FROM	SUBJECT
24/BM/TAE/SKA/79 5 January 1979	Cipta Karya Semarang	BM/TAE Surakarta	Minutes of the meeting 12 December 1978
25/BM/TAE/SKA/79 5 January 1979	Directorate General of Housing Building , Planning and Urban Development Jakarta	BM/TAE Surakarta	Submitting US dollar Invoice # 3 for engineering services
26/BM/TAE/SKA/79 31 January 1979	BM/TAE Jakarta	BM/TAE Surakarta	Monthly Rupiah Account Report for the month of January 1979

## LETTERS RECEIVED DURING JANUARY 1979

NUMBER & DATE	TO	FROM	SUBJECT
1249/BM/TAE/78 27 December 1978	Archicons Engineers, P.T. (copy to BM/TAE Surakarta)	BM/TAE Jakarta	Confirmation assignment of Hydrogeologist Counterpart to Solo Office
9834/III 21 December 1978	Cipta Karya Surakarta (copy to BM/TAE Surakarta)	Directorate General Telecommuni- cation Surakarta	Position of ground cable
606/PAM/JT/XII/78 30 December 1978	Directorate General Immigration, Semarang (copy to BM/TAE Surakarta)	Cipta Karya Semarang	Request for Mr. Thomas G. Fodor's stay permit
HL/01/02/II 22 December 1978	BM/TAE Jakarta (copy to BM/TAE Surakarta)	Cipta Karya Jakarta	Surakarta Water Supply Project approval of Personnel
1258/BM/TAE/79 3 January 1979	PT. Archicons, Engineers, Jakarta. (copy to BM/TAE Surakarta)	BM/TAE Jakarta	Surakarta Water Supply Project approval of Personnel
5 January 1979	BM/TAE Jakarta. (copy to BM/TAE Surakarta)	Cipta Karya Jakarta	Visit to Cipta Karya by Mr. B. Bayongan
619/PAM/JT/I/79 6 January 1979	PT. Intra VEEM PT. U.T.P. PT. Mpu Tantular Lloyd (copy to BM/TAE Surakarta)	Cipta Karya Semarang	Introducing Ir. A.F. Dengah to Contractors
618/PAM/JT/I/79 6 January 1979	Harbour Officer, Semarang (copy to BM/TAE Surakarta)	Cipta Karya Semarang	Introducing Ir A.F. Dengah to Contractors

Cont'd....

LETTERS RECEIVED DURING JANUARY 1979 (CONT.)

NUMBER & DATE	TO	FROM	SUBJECT
BBG/L/004/1/79 10 January 1979.	BM/TAE Surakarta.	P.D. Bah Bolon Trading Co., Bandung.	Equipment for measuring water flow.
15 January 1979	BM/TAE Surakarta	BM/TAE Jakarta	Meeting on 13 January 1979 at Cipta Karya office in Jakarta, concerning Surakarta Water Distribution System
638/PAM/JT/1/79 13 January 1979	BM/TAE Surakarta	Cipta Karya Semarang	Approval to rent a car
Ku.04.02 21 September 1978	USAID/ Indonesia Jakarta	Cipta Karya Jakarta	USAID Loan 497-U-004; Request for letter of commitment for Surakarta Water Supply Project (Rohan Co.)
645/PAM/JT/1/79 20 January 1979	Cipta Karya Jakarta (copy to BM/TAE Surakarta)	Cipta Karya Semarang	List of pipeline construction and well drilling contractors
KU.04.02 21 September 78	USAID/ Indonesia Jakarta (copy to BM/TAE Surakarta)	Cipta Karya Jakarta	USAID Loan 497-U-044; Request for letter of Commitment for Surakarta Water Supply Project (American Cost iron Pipe Co.)
KU.04.01 11 October 1978	USAID/ Indonesia (copy to BM/TAE Surakarta)	Cipta Karya Jakarta	USAID Loan 497-U-044 Request for Letter of Commitment for Surakarta Water Supply Project (Ellison Instrument Division)
A.7/2/23 30 December 78	Department Public Works Semarang (copy to BM/TAE Surakarta)	Bina Marga Semarang	Installation of proposed transmission Pipeline

Cont'd....

LETTERS RECEIVED DURING JANUARY 1979 (CONT.)

NUMBER & DATE	TO	FROM	SUBJECT
Pro.SI/62/1/79 11 January 1979	Cipta Karya Semarang	National Urban Development Corporation Jakarta	Application for Water Supply Connection to PERUMNAS- Phase II Project Solo
154/PAM 1/1/79 13 January 1979	BM/TAE Surakarta.  Surakarta Water Enterprise.	Cipta Karya Surakarta	Data on the installation of transmission pipes
SES. 7246/612 17 January 79	BM/TAE Surakarta	Sewater Engineering Co, Singapore 15	Johnson-keck Instruments for well measuring
157/PAM/1/IX/79 23 January 79	BM/TAE Surakarta. Surakarta Water Enterprise.	Cipta Karya Surakarta	Invitation to meeting on 26 January 1979
646/PAM/JT/1/79 20 January 79	Directorate General Immigration Semarang (copy to BM/TAE Surakarta)	Cipta Karya Semarang	Request for Mr. D.Dewart's Residence Permit
668/PAM/JT/1/79 25 January 1979	Cipta Karya Jakarta, Central Java Water Project. Surakarta Water Enterprise. BM/TAE Surakarta.	Cipta Karya Semarang	Invitation to meeting on 13 February 1979
158/PAM 1/1/79 24 January 1979	Master Plan of Surakarta Department (copy to BM/TAE Surakarta	Cipta Karya Surakarta	Data on Surakarta Master Plan

Cont'd....

## LETTERS RECEIVED DURING JANUARY 1979 (CONT.)

NUMBER & DATE	TO	FROM	SUBJECT
161/PAM 1/1/79 27 January 1979	Regent of Klaten Regency. Regent of Sukoharjo Regency. Chief of Wonosari District. Chief of Kartasura District. Chief of Tegal Gondo village . Chief of Pucangan village . Chief of Pabelan . (copy to BM/TAE Surakarta)	Cipta Karya Surakarta	Request permission to stake out transmission pipeline

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

CONTRACT NO 01/WS-S/AID/78	M A N - M O N T H S			
	PERSONNEL	FOR JANUARY 1979	CUMULATIVE THROUGH 31 JANUARY	% OF TOTAL SCHEDULE
E X P A T R I A T E S				
Principal Liaison Engineer	0	0.3	15%	2
Procurement Engineer	0.03	0.39	13	3
Chief Engineer	0	6.5	100	6.5
Pipeline Engineer	1	4.0	20	20
Hydrogeologist	0	0	0	16
Drilling Specialist	1	2.6	21.6	12
Management Specialist	0	0	0	12
O & M Specialist	1	2.6	16.2	16
Meter Specialist	1	1.4	6.6	21
EXPATRIATE TOTAL	0	0	0	8
	4.03	17.79	15.3%	116.5
I N D O N E S I A N - P R O F E S S I O N A L				
Counterpart Chief Engineer	1	2.6	13%	20
Construction Supervisor	0	0	0	14
Hydrogeologist	0.8	0.8	5.3	15
Material Coordinator	1	4	28.6	14
Inspectors	0	0	0	48
Draftsman	0.2	0.2	1.2	16
Translator	0.4	0.4	3.3	12
Accountant	1	2	9.0	22
INDON. PROF. & TECH.	4.4	10.0	6.2%	161
I N D O N E S I A N - A D M I N I S T R A T I V E				
Office Manager	1	4	20%	20
Secretary	1	4	20	20
Typist	0	0	0	22
Clerks	1.7	3.7	8.4	44
Drivers	1.8	4.8	6	30
Laborers	3	8.6	5.4	160
ADMINISTRATIVE TOTAL	8.5	25.1	7.3%	346

APPENDIX III

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 REIMBURSIBLE EXPENDITURES	COSTS FOR JANUARY 1979	CUMULATIVE COSTS THROUGH 31 JANUARY 1979		TOTAL BUDGET ESTIMATE FOR CONTRACT
		AMOUNT	% OF TOTAL BUDGET ESTIMATE	
US DOLLAR COSTS				
Salaries and Related Costs	\$21,837.06	\$115,269.47	18.8%	\$612,922
Transportation	0	9,787.54	16.1%	60,638
Equipment	8,045.05	8,045.05	22.3%	36,000
Miscellaneous	0	25,481.00	76.8	33,181
Training	0	0		14,544
Contingencies	0	0		75,729
<b>TOTAL DOLLARS</b>	<b>\$29,936.11</b>	<b>\$158,583.06</b>	<b>19.0%</b>	<b>\$833,014</b>
INDONESIAN RUPIAH COSTS				
Salaries	2,096,666	5,044,999	7.0%	71,150,000
Transportation	990,123	6,609,251	23.4	28,196,600
Housing	0	23,200,000	72.6	31,950,000
Vehicle Costs	687,500	11,269,477	44.9	25,050,000
Equipment Costs	2,369,800	4,743,110	36.0	13,153,000
Miscellaneous	492,640	6,485,430	26.3	24,670,000
Contingencies	449,800	449,800	0.2	19,416,960
<b>TOTAL RUPIAH</b>	<b>7,086,529</b>	<b>57,802,067</b>	<b>27.0%</b>	<b>213,586,560</b>

MANAGEMENT ASSISTANCE REPORT  
SURAKARTA WATER ENTERPRISE  
SUMMARY OF FINDINGS AND RECOMMENDATIONS  
January 1-31, 1979

1. PREPARATION AND CHECKING OF WATER BILLS

FINDINGS

The Billing Section prepares bills using billing machine that simultaneously produces Billing Summary. Before the bills and the Billing Summary are distributed to various recipients namely Collection, Cashiering, and Bookkeeping Sections, these are being checked first by Bill Examiner as to their accuracy in terms of rate, water usage, fixed charges, additional charges and total billings.

COMMENT

The review procedure currently being done is adequate.

2. CONTROL OF DAILY OFFICE COLLECTION

FINDINGS

- a. The Collection Section records the total number and amount of bills to be paid by customers before these are forwarded to the Collectors for collection. Thus, the total collection from water bills during the day can be checked from this record.
- b. A Daily Collection Report is being prepared for all collections during the day. Total Collections are then deposited intact in the bank on the same day.

COMMENT

The internal control over office collections currently being done is adequate.

3. IMPOSITION AND COLLECTION OF PENALTY CHARGES

FINDINGS

Penalty charge of 10% total billing is being imposed and collected on all

overdue accounts.

The present policy on the deadline for payment of accounts without penalty charges is on the 25th day of the following month after billing. The present practice, however, is that customers are given a grace period of one month to settle their account without penalty charges. According to the Chief, Finance and Administration Division the reason for giving such a grace period is to allow for possible delay in bills preparation. It was noted, however, that the Billing Section is already up-to-date in the preparation of bills.

#### RECOMMENDATION

The present policy on imposition and collection of penalty charges on late payment of bills should be implemented. The Chief of the Finance and Administrative Division has agreed to implement the policy as soon as possible.

#### 4. ASSIGNMENT OF METER READERS

##### FINDINGS

At present there are ten Meter Readers each of whom is permanently assigned to a particular area. No rotation of assignment of Meter Readers is being done.

##### RECOMMENDATION

To avoid any possible collusion between the Meter Reader and the Customer, the Meter Readers should be rotated in their assignments.

This will also serve as automatic check determining the efficiency performance of the Meter Readers.

#### 5. METER READING AND COMPUTATION OF WATER CONSUMPTION

##### FINDINGS

The present procedures in meter reading and determining customer water consumption are as follows :

- a. The Meter Reader indicates in a Meter Reading sheet the current meter reading and date of reading.

- b. A copy of Meter Reading Sheet is forwarded to a clerk in the Billing Section who transfers the current meter reading to a "Water Consumption Card" maintained for each customer.
- c. Current Water consumption is then computed and indicated in the Water Consumption Card by subtracting previous meter reading from the current meter reading.
- d. Bills are prepared based on the Water Consumption Card.

#### RECOMMENDATION

To simplify procedures, save on time utilization, and prevent possible errors in transferring data from the Meter Reading Sheet to the Water Consumption Card the following procedures are recommended :

- a. The Meter Reader indicates meter reading directly to the Water Consumption Card.
- b. The Meter Reader immediately computes current water consumption by subtracting the previous meter reading from the current meter reading.
- c. The Water Consumption Card is then forwarded to the Billing Section as basis for preparing bill.

#### 6. PREPARATION OF CUSTOMERS NOTICE OF BILL

##### FINDINGS

Once a month the Collection Section prepares a Notice of Bill for each customer. The Notice of Bill contains the customer's bill for the month and unpaid bills of the previous month. The procedures are as follows :

- a. The Collection Section prepares a Customer Register, showing Customer Name, connection number, and monthly billings based on the Billing Summary received from the Billing Section.
- b. A notice of Bill is then prepared for each customer by copying from the Customer Register the Billing for the particular month.

The above procedures illustrate duplication of work, since the Notice of Bill

can be prepared directly from the Billing Summary.

#### RECOMMENDATION

To facilitate preparation of Notice of Bills, it is recommended that these be prepared directly from the Billing Summary instead of preparing a Customer Register and transferring the same data to the Notice of Bill.

### 7. FILING OF UNPAID CUSTOMER BILLS

#### FINDINGS

Customer bills received from the Billing Section are grouped by the Collection Section according to the page number of the Billing Summary.

A group may consist of about 27 bills belonging to the same district. Each group is bundled, secured by a rubber band and then placed in a box. A box may contain up to 15 bundles of bills.

When a customer comes to the office to settle his account, considerable amount of time is spent in retrieving the bill since the following procedures are to be done: A clerk locates in the box the bundle containing the bill to be paid, removes the rubber band securing the bundle, and looks for the bill. After finding the bill he secures the bundle again with the rubber band and returns the box. These operations may be done repeatedly on a bundle of bills since more than one customer whose unpaid bills are contained in the same bundle may settle an account during the day.

#### RECOMMENDATION

To facilitate retrieval of bills it is recommended that a more efficient filing system be adopted. One system that can be adopted is by constructing a special kind of shelf whereby unpaid bills can be filed numerically by district without having them bundled. A receivable Envelope may be maintained for each customer to keep his unpaid bills. The shelf should be locked at the end of each day to avoid tampering or losing the bills.

8. DUE DATE FOR SETTLEMENT OF WATER BILLS

FINDINGS

The due date for settlement of monthly water bills is on the 25th day of the following month. Collection pattern shows that majority of customers pay within a week before and including the due date. All are made at the water office.

RECOMMENDATION

To evenly distribute the work load of the Collection Section and allow more convenience to the customers by reducing waiting time it is recommended that customers be divided into groups and be assigned various due dates. For example Districts 1,2,3,4,5 & 6 may have due dates on the 5th, 10th, 15th, 20th,25th, and 30th of the month. Accordingly, due dates set for meter reading, billing preparation and distribution of notice of bills should take into consideration the due dates for collection of bills.

9. CUSTOMERS DEPOSIT

FINDINGS

Customers are required to make deposit before service is extended to them, as a guarantee in case of non-payment of water bill. As of December 31, 1978 the recorded customer deposit amounted to Rp. 14,629,195. However, the Water Enterprise does not maintain a separate record of each customer's deposit. Data on customer deposits are mixed with other records which make it difficult to determine the amount to be credited to unpaid water bills in case of disconnection of service.

RECOMMENDATION

A separate Deposit Ledger Card should be maintained for each customer to facilitate retrieval of information. The Ledger Card should be used only for transactions in connection with customer deposits.

10. FIXED ASSTS

FINDINGS

On various dates from 1974 to 1978 the Central Java Water Project turned over to the Water Enterprise completed projects consisting of about 17 km.

of rehabilitated transmission piping and additional distribution pipelines. To date, however, the Central Java Potable Water Project has not yet furnished the Water Enterprise the exact cost of these projects. The Balance Sheet as of December 31, 1978, therefore, does not include the cost of these assets.

RECOMMENDATION

To show the real worth of the Enterprise, the cost of the above projects should be recorded in the books. The Director of the Water Enterprise should formally request the cost of the assets from the Central Java Potable Water Project.

SURAKARTA WATER ENTERPRISE  
EXISTING TRANSMISSION AND DISTRIBUTION MAIN PIPING

PIPE CLASSIFICATION	INSIDE DIAMETER MM.	TOTAL LENGTH METERS
<u>TRANSMISSION MAIN LINE</u>		
New Pipe	450	108
Old Pipe	450	14,431
Old Pipe	400	13,680
New Pipe (Rehabilitated)	450	200
New Pipe (Rehabilitated)	400	1,000
TOTAL LENGTH OF TRANSMISSION		29,419
<u>DISTRIBUTION SYSTEM</u>		
New Pipe Steel	150	8,450
New Pipe Steel	125	14,175
New Pipe Steel	100	19,850
New Pipe Steel	80	56,550
New Pipe Steel	60	11,275
SUBTOTAL		110,300
<u>DISTRIBUTION SYSTEM PVC.</u>		
New Pipe , Polyvinylchloride	200	1,650
New Pipe , Polyvinylchloride	150	1,157
New Pipe , Polyvinylchloride	100	4,693
New Pipe Steel	150	24
New Pipe Steel	100	14
SUBTOTAL		7,538

Cont'd ....

SURAKARTA WATER ENTERPRISE  
 EXISTING TRANSMISSION AND DISTRIBUTION MAIN PIPING  
 (CONTINUED)

PIPE CLASSIFICATION	INSIDE DIAMETER MM.	TOTAL LENGTH METERS
<u>DISTRIBUTION SYSTEM</u>		
New Pipe Cement - Asbestos	300	10,610.50
New Pipe ( P.V.C.)	200	458
New Pipe ( P.V.C.)	150	270
New Pipe ( P.V.C.)	100	250
New Pipe Steel	300	32
SUBTOTAL		11,620.50
TOTAL LENGTH OF TRANSMISSION LINE		29,419
TOTAL LENGTH OF DISTRIBUTION MAINS		129,458
TOTAL LENGTH OF MAIN PIPING		158,877

SURAKARTA WATER ENTERPRISE  
EQUIPMENT AND MATERIALS INVENTORY

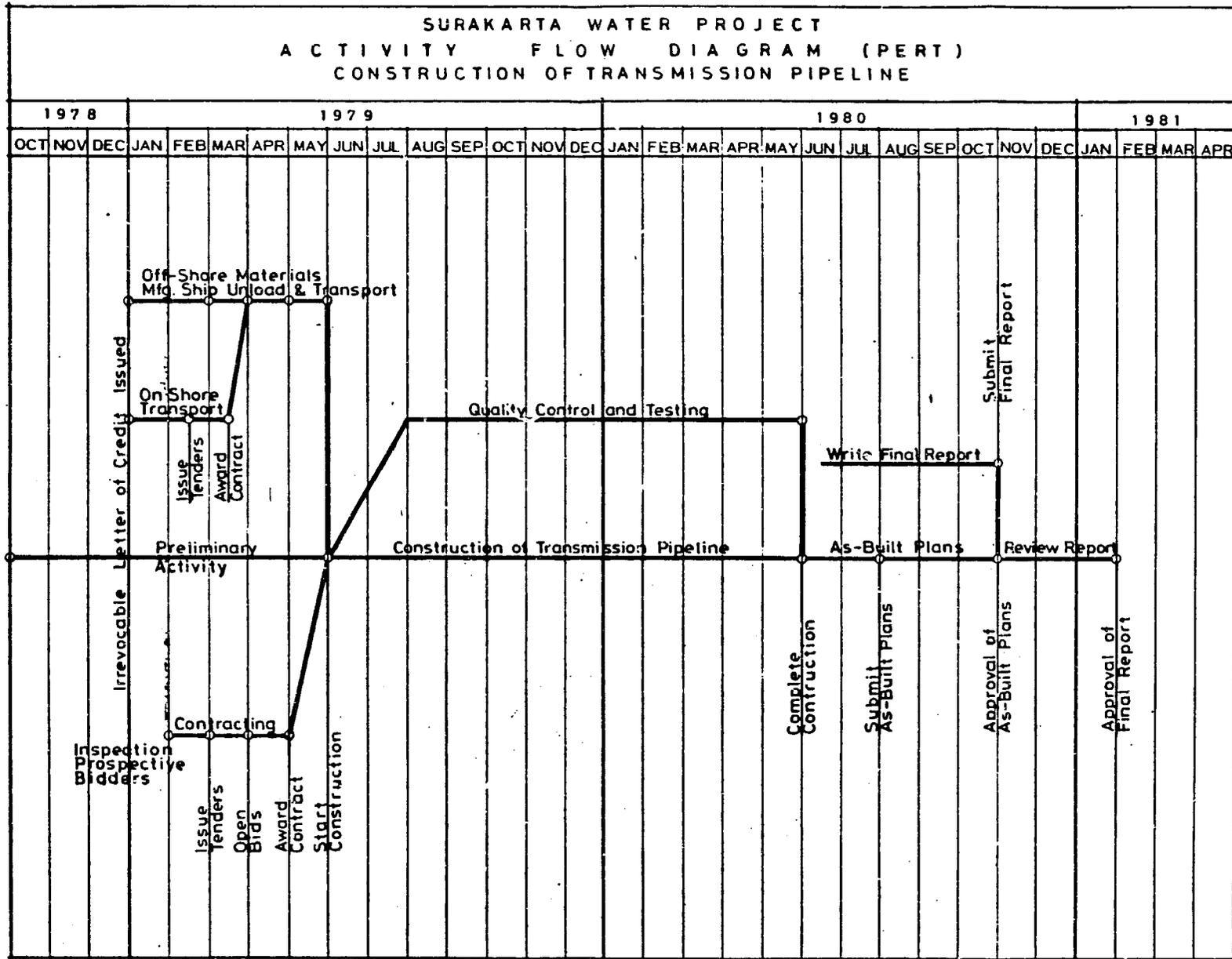
NAME OF EQUIPMENT OR TOOLS	QUANTITY	CONDITION
Meter Testing Equipment	1	Fair
1 M <sup>3</sup> Water Tank w/pump	1	"
Hand Driven Drilling mach.	1	Poor
Hand Driven Bit Sharpener	1	"
Copper Bucket	14	Broken
Metal Bucket	2	"
Screwdriver	2	Good
Handsaw	2	"
Small Hammer 250 gr.	1	"
Hammer 500 gr.	3	"
Adjustable Wrench	2	Poor
Misc. Size Wrenches	24	"
Measuring Tape 3 mt.	3	Good
Measuring Tape 5 mt.	1	"
Hand Pliers	2	Poor
Chisel Small	2	"
Chisel Larger	2	"
Tapping Machine	1	"
Misc. Tapping Tools	1 set	"
Hoe	3	"
Hand Shovel	5	Good
Misc. Bolts and Nuts	10	"
Black Smith Owen	1	poor
Galvanized st. Pipe 1/2"	154 m	Good
Galvanized st. Pipe 3/4"	42 m	"
P.V.C. Pipe 1/2" and 3/4"	86 m	"
Misc. Size Fittings	126	"
Pipe Rack	1	Rusty

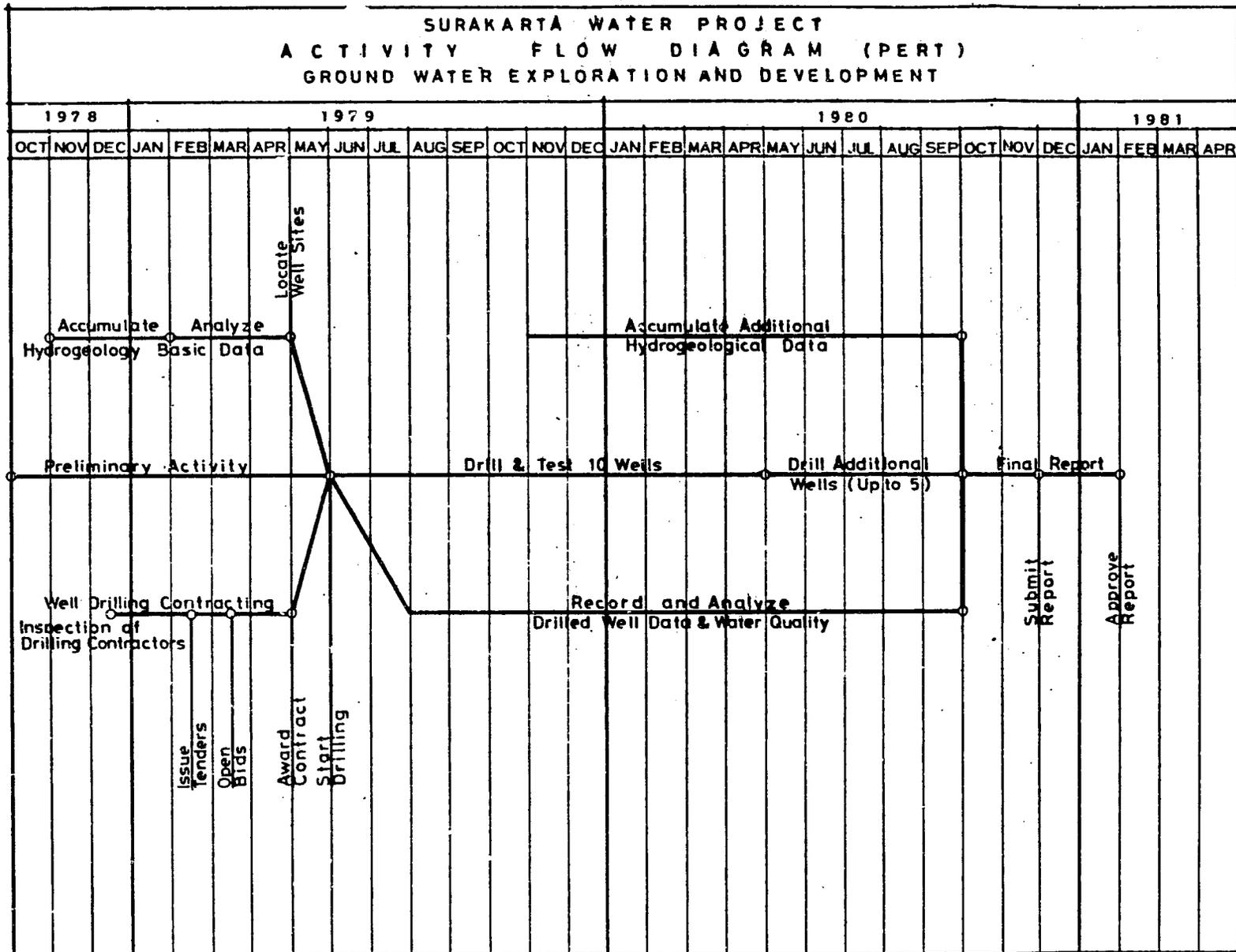
SURAKARTA WATER ENTERPRISE  
WATER METERS IN WAREHOUSE

WATER METERS T.M.	SIZE INCHES	QUANTITY	CONDITION
Allison	1/2	1	poor
B.R. - 106	1/2	25	"
B.R. - 36	1/2	1	"
Bosco	1/2	3	"
Bosco	3/4	12	"
Bosco	3	1	"
Bosco	5	2	"
P.B. - 30	1/2	1	"
S.H. - 412	1/2	5	"
S.H. - 403	1/2	5	"
S.H. - 430	1/2	1	"
S.H. - 20	1/2	1	"
B.R. - 75	1/2	3	"
Aquameter	1/2	1	"
Asahi	1/2	75	"
Asahi	3/4	90	"
Asahi	5	2	good
Bosco	2	1	"
Century	1/2	60	"
Century	6	1	"
Century	1	2	"
Kimon	1/2	370	Poor / good
Kmon	1/2	19	"
Zachi	1/2	100	"
TOTAL METERS		782	

SURAKARTA WATER ENTERPRISE  
PERSONNEL OF THE TECHNICAL DIVISION

CLASSIFICATION	NUMBER	LOCATION
Director	1	Enterprise Office
Production Section	8	Reservoir & Spring
Maintenance	7	Distribution
Laboratory Technician	2	Water Quality
Transmission / Distribution	21	Laborers
Meter Section	5	Repair & Testing
Technical Planning	2	Distribution & Transm.
Supervisors	2	Distribution & Transm.
TOTAL PERSONNEL	48	

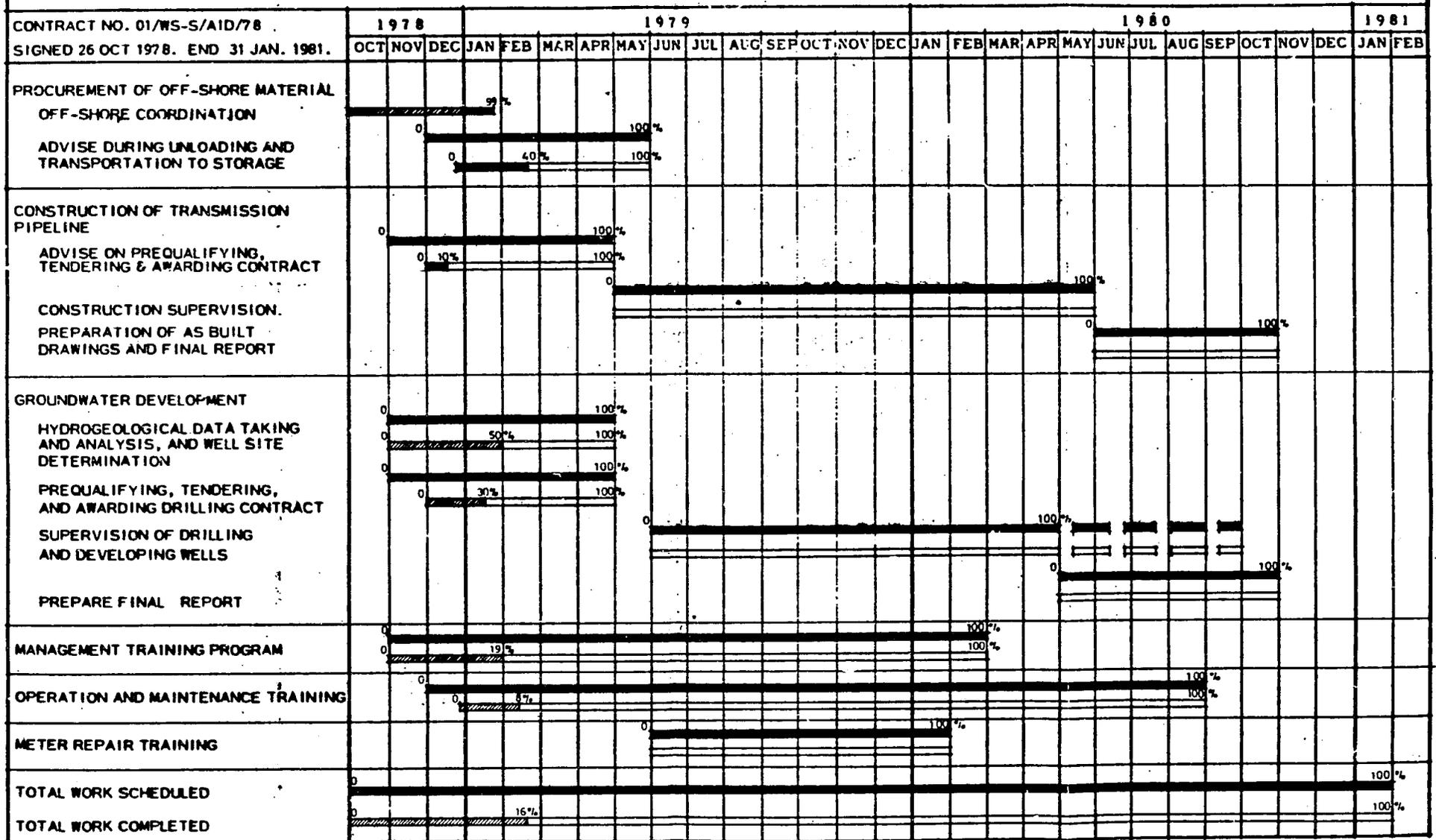




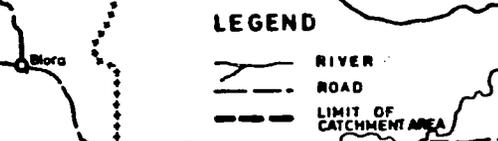
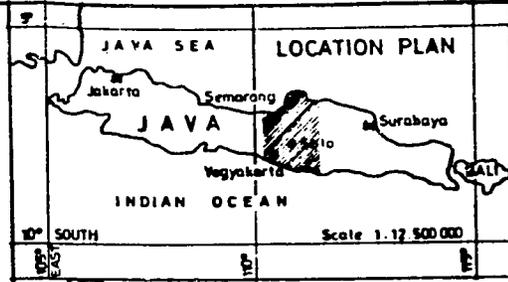
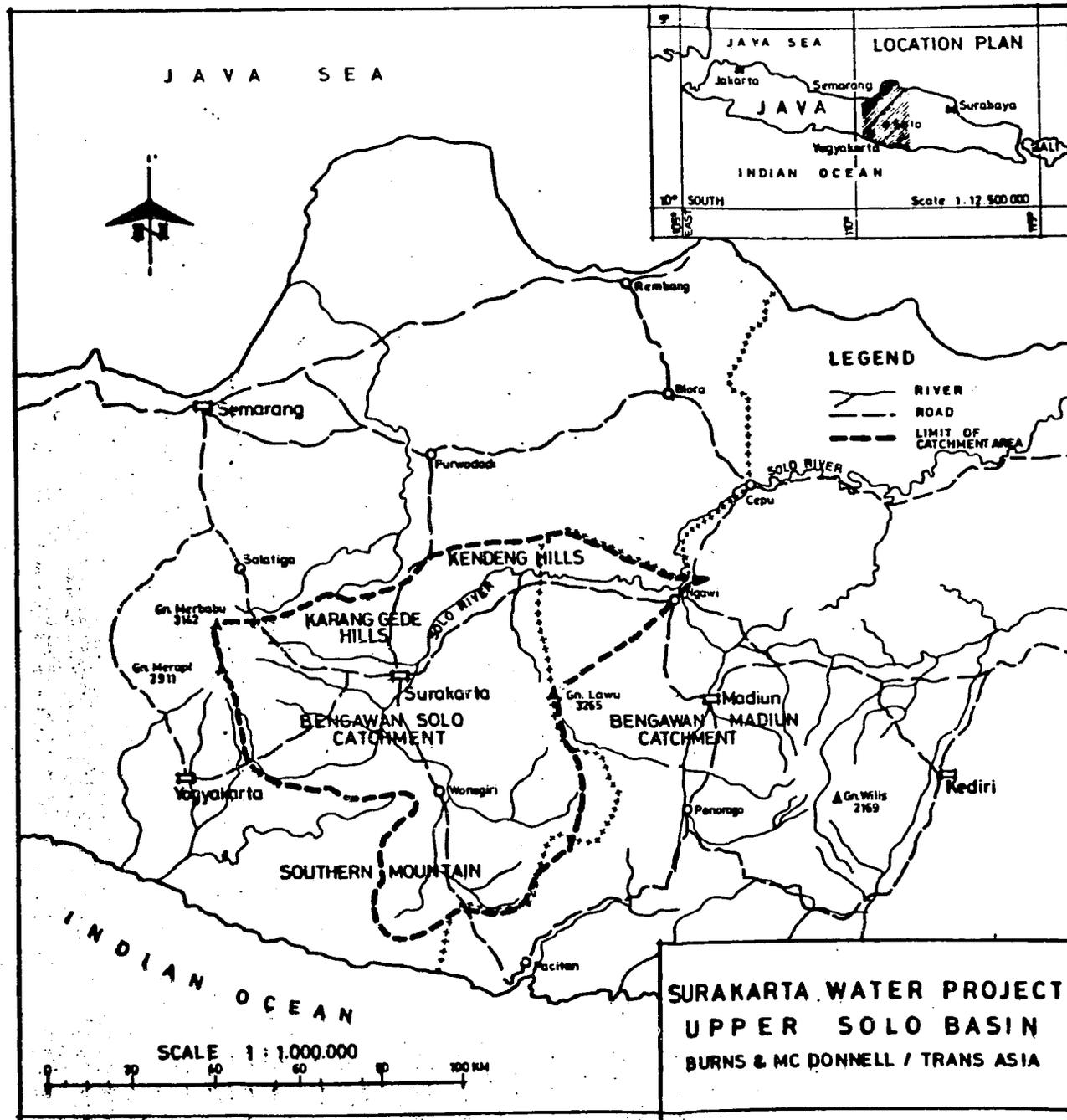




**SURAKARTA WATER PROJECT  
SCHEDULE OF ENGINEERING ACTIVITIES  
PERCENT COMPLETED AT END OF JANUARY 1979**



BURNS & MCDONNELL ENGINEERING CO.  
TRANS ASIA ENGINEERING ASSOCIATES INC.



**SURAKARTA WATER PROJECT  
UPPER SOLO BASIN  
BURNS & MC DONNELL / TRANS ASIA**



**KEY**

- IMPOUNDING RESERVOIR 
  - RAILWAYS 
  - MAIN ROADS 
  - MINOR ROADS 
  - RIVERS 
  - TOWNS 
  - AREAS SERVED BY EXISTING DISTRIBUTION SYSTEM 
  - PROPOSED SUPPLY PIPELINE 
- LEVELS ARE GIVEN IN METERS ABOVE SEA LEVEL



TO SEMARANG

BANYUDONO

KARTOJURD SERVICE RESERVOIRS T.W.L. 150.7

K. BRAMBANG

PROPOSED TRANSMISSION MAIN

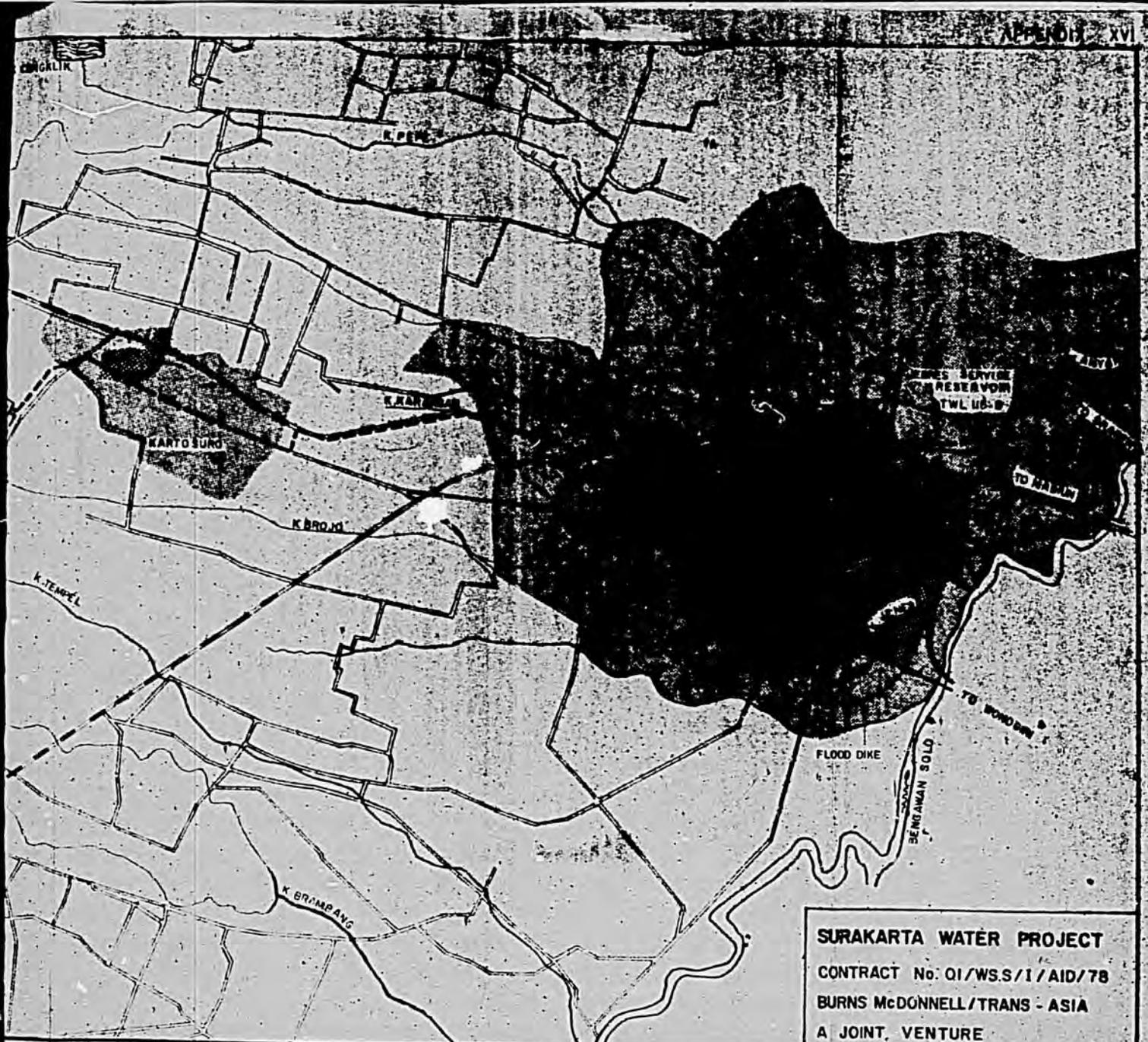
TEGAL-GONDIO

K. PETIRAN (JEBOL)

K. PULUH

DELANGGU





**SURAKARTA WATER PROJECT**  
 CONTRACT No: 01/WS.S/1/AID/78  
 BURNS McDONNELL/TRANS - ASIA  
 A JOINT VENTURE

No. : A.7/2/23

Semarang, Dec. 30'78

Central-Java Provincial Public Works  
Semarang area  
Semarang.

Subject : Permission for piping construction .

We have received a copy of letter from the Central Java Water Project No. 562/PAM/JT/XII/78 dated 9 - 12 - 1978 regarding the captioned subject and addressed to your favour .

Herewith, we would inform you the following explanation on this subject :

1. Pipes-installation along side a road (govt/provincial road) should be laid-off minimum 10 (ten) meters from the axis of existing road pavement. In case of technical problems the pipes could be installed 6.5 m from the axis.
2. If the pipes obliged to be installed across the road, so the installation should be minimum 2 meters of depth under the road surface. In case of technical problems the pipes could be installed minimum 0,80 meter of depth under the road surface with sufficient protection. The execution of work should not affect traffic disturbances and the condition of which should be reconstructed to the former condition.
3. In case the pipelines should cross a river, an installation should be horizontally laid-off minimum 1 (one) meter under the deepest river-base with 10 (ten) meters distance from the axis of the bridge.
4. Construction of under river-base pipelines should begin minimum of 10 (ten) meters from the most outside bridge-walls pole.

Please be guided as necessary.

Head of Central Java Provincial  
Public Works - for Directorate  
Bina Marga

(Ir. Hartono)

cc : -- Project Manager of  
Central Java Water-supplies  
- file