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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/I/AID/78
AID LOAN 497-U-044

MONTHLY PROGRESS

REPORT NO. 42
MARCH 1982

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



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SECTION I

GENERAL

I-A NARRATIVE SUMMARY

As mentioned in the previous report, two of the remaining public latrines were agreed to be restored by the Phase III contractor due to a larger one being eliminated by D.P.U. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] (see Appendix VI).

Final operations are under way by the two distribution main construction contractors. One railroad crossing remains to be done and the Railway Enterprise is presently installing reinforcement track to do that. Minor tests remain in Kelurahan Gilingan, Jebres, Tipes and Serengan and some stream crossings are not yet completed.

Tender Documents for Phase III have been forwarded by the Consultant to the Project and a prebid conference is planned for 06 April 1982. Part of the piping included in Phase III has been installed by the Surakarta Water Enterprise and approval has been obtained by the Project to install casings under the Sugar Enterprise's narrow gauge railroad in three places for Phase III. The Phase I contractor will do the work in early April so it will not delay the start of sugarcane harvest on 01 May 1982. Cipta Karya has awarded Ø 250 PVC pipe and fittings for Ph. III.

Notice to proceed was issued by the Director General Cipta Karya on 26 March 1982 for the procurement of water well pumping equipment and accessories. The Consultant has issued the Purchase Orders and has prepared a draft of an amendment to the Contract in order for Cipta Karya to obtain the necessary Import tax and custom duty exemption for all imported commodities to be purchased and shipped from the United States of America for this Project.

Some of the O & M equipment has been received and final plans are underway to modify the existing facilities for same. The leak survey has continued and additional personnel have been trained in the use and care of required equipment used during the survey. The Surakarta Water Enterprise has provided the O & M Specialist necessary papers which are countersigned by the Mayor of Surakarta identifying him as the instructor for the leak detection and training program.

I-B PROBLEMS AND PROPOSED SOLUTIONS

With the final determination of required pipe and fittings to complete Phase III of the distribution piping, it has been found that additional material will be required. In order to not use funds provided by the Project intended for installation labor, the Consultant has proposed that the PVC pipe and fittings be supplied by the original supplier and he be issued a change order for same as soon as possible.

SECTION II
ADMINISTRATION

II-A SUBMISSIONS/APPROVALS.

Consultant's Invoice No. 42 for February 1982 U.S. Dollar reimbursable expenses was submitted to Cipta Karya on 04 March 1982 and was approved by Cipta Karya on 08 March 1982.

Consultant's Rupiah Invoice No.27 for February 1982 submitted to Cipta Karya on 12 March 1982 was approved on the same date.

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 March 1982 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

Indonesian Professional and Technical :

- Mohammad 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
- Abdul Rasyid, Inspector
arrived 11 June 1981
- Susena, Draftsman
arrived 20 October 1980

Administrative :

- Dradjat Atmardjo, Office Manager
arrived 02 October 1978

- Haryani Pudyastuti, Secretary
hired 17 November 1980

- Rubiyo, Clerk
hired 01 November 1978

- Pamudji Rahardjo, Driver
hired 02 October 1978

- Sutrisno, Driver
hired 02 April 1979

- Puranto, Driver
hired 17 October 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 Contract certified complete 06/07/81	668,712.83	100	- o -
III-A-1-4 Clow Corporation Casting, Auto Air Vents & Valves. Contract certified complete 15/05/81	125,912.00	100	- o -
III-A-1-5 Ford Meter Box Company Brass Valves Parts & Acces- sories. Contract certified complete 12/02/81	390,775.15	100	- o -
	<hr/>	<hr/>	<hr/>
Sub Total III-A-1 :	3,784,373.58	100	- o -

III-A-2 Special Equipment Procurement/Consultant Contract

III-A-2-1	Western International Leak Detectors & Pipe Locators Complete	2,496.14	100	- o -
III-A-2-2	Kennedy/MacLane Distribution Network Valves Complete	58,546.40	100	- o -
III-A-2-3	Laboratory Equipment-Variou Sources - Complete	11,303.54	100	- o -
III-A-2-4	Publication & Reference Data Various Sources - Complete	1,465.85	100	- o -
III-A-2-5	Repair Parts For Clow Various Sources - Complete	228.51	100	- o -
III-A-2-6	O & M Facility Outfitting Various Sources - Partial	83,901.30	6	78,869.92
III-A-2-7	Well Water Pumping Equipment Various Sources	156,439.66	-0-	156,439.66
	Sub Total III-A-2 :	<u>314,381.40</u>	<u>25.15</u>	<u>235,309.58</u>
	Total US \$	<u>4,098,754.98</u>	<u>94.259</u>	<u>235,309.66</u>

III-B CONSTRUCTION SUPERVISION

The Phase I contractor has completed the installation of new piping across the Kali Anyar which was his last stream crossing. He is presently making repairs to asphalt road surfaces where he crossed with his work. A letter of acceptance from the Railway Enterprise has been received for the one crossing made by the Phase I crew. He lacks two small tests to complete all work

in Kelurahan Gilingan and Jebres. This contractor will install three ϕ 450 steel pipe casings under the Sugar Enterprise narrow gauge railroad before harvest begins. This will keep Phase III from being delayed in Kelurahan Sumber and Karangasem. Phase I is now at 86.2 % complete.

The Phase II contractor still has several stream crossings to complete and some tests to perform in Kelurahan Tipes, Serengan and Panularan. The ϕ 200 pipeline has been installed under the Main Line of the rail road north of the intersection with Line "Q". Connection to Line "Q" is pending location and raising existing valve boxes so water can be turned off in that area. Approximately half of the new ϕ 200 pipeline has been tested and the balance will be completed in April. The Railway Enterprise personnel are installing reinforcement track along Jl. Gilingan to prepare for installation of the casing under the five tracks there for the new ϕ 150 PVC. Phase II is now at 80.5 % complete.

The Surakarta Water Enterprise has installed approximately 432 LM of ϕ 200 and 282 LM of ϕ 100 and ϕ 75 mm PVC pipe in Kelurahan Jajar. The larger two sizes are in the Phase III scope of work and will be reimbursed to the Surakarta Water Enterprise by that contractor.

Tender Documents are complete for Phase III distribution main construction and invitation to bid is being issued by the Project. A prebid conference is scheduled for 06 April 1982 so that work will begin very shortly on that part of the Project. Total completion status of the entire distribution pipe installation is 71.1 %.

Bids were received for Phase IV of the public latrine restoration program. All were rejected due to errors and omissions. Readvertisement was made and retender-

ed bids were received on 30 March 1982. The Consultant evaluation (see Appendix VI) was made and forwarded to the Project with a recommendation that an award be made to the lowest responsive bidder, subject to the approval of U.S.A.I.D. who has indicated a willingness to increase the "DBA" so that all forty one of the public latrines may be upgraded.

The entire bath house/public latrine construction work is considered to be slightly over 50 percent at this time. The bath houses overall are considered to be 70.9% while the public latrines are considered to be 14.8% completed. Completion status of the individual contract Phases is as follows :

<u>PHASE</u>	<u>ITEM</u>	<u>% PER ITEM</u>	<u>% TOTAL CONTRACT</u>
I	BH 3-4	83.6	18.929
I	BH 3-6	98.4	30.526
I	BH 3-8	61.0	15.497
I	14 Public Latrines	15.3	3.188
	TOTAL PHASE I		68.140
II	BH 3-1	78.2	15.225
II	BH 3-3	83.4	14.173
II	BH 3-5	36.9	6.584
II	BH 3-7	83.8	14.738
II	15 Public Latrines	42.8	12.030
	TOTAL PHASE II		62.750
III	BH 3-2	65.0	11.034
III	BH 3-9	62.0	9.543
III	BH 8-10	56.5	8.802
III	32 Public Latrines	20.1	10.454
	TOTAL PHASE III		39.833

Fill is being moved from along Jl. Kol. Sutarto where the replacement ϕ 450 mm piping was installed to the site of bath house 3-5.

III-C GROUNDWATER EXPLORATION AND WELL DEVELOPMENT PROGRAM

Completed.

III-D MANAGEMENT ASSISTANCE PROGRAM

Completed.

III-E O & M TRAINING AND ASSISTANCE PROGRAM

The leak survey is continuing with O-J-T being conducted with the required equipment to newly assigned personnel of the Surakarta Water Enterprise. New equipment bought at the request of the Project was received in March and some of their personnel were also trained in the use of it as follows :

<u>NAME</u>	<u>ORGANIZATION</u>
Budiyono	PAB I Surakarta
Masykur	PAB I Surakarta
Surat Hadisantosa	Wonogiri Water Enterprise
Suyadi	Boyolali Water Enterprise
Saidi	Surakarta Water Enterprise
Sudarjo	Surakarta Water Enterprise
Suharno	Surakarta Water Enterprise
Paiman	Surakarta Water Enterprise

The Surakarta Water Enterprise is presently having electrical power and lights installed in the Kartasura and Jebres reservoirs. The radio equipment will be reassigned from the temporary use by the Project and Consultant and with transformers will be useable

at the reservoirs when it is necessary to go to 24 hour operation at same. Reimbursement has been made by U.S.A.I.D. for the radio purchase.

The shop air compressor has been received at the location for the new O & M machine shop. Final plans are ready for the construction contractor to begin installation of shelves, storage bins, work tables, equipment foundations and grease pit at the new facilities.

The Surakarta Water Enterprise has hired a contractor to install part of the ϕ 200 mm PVC pipeline up Jl. Jajar from the ϕ 600 mm transmission main north for some 432 meters. At that location, they have run a ϕ 75 mm line east approximately 270 meters from which new service connections will be made. The old blowoff line at the Jebres reservoir has been reconnected to the replacement ϕ 450 mm transmission main but disconnected from the blowoff pit and rerouted to the existing ϕ 60 mm distribution main paralleling Jl. Kol. Sutarto on the south side. They have also connected a ϕ 150 PVC line where a tee was provided for them by the Phase I contractor and extended it to reconnect the ϕ 60 distribution main on the west end and reconnect the ϕ 150 mm supply line to the Tirtomoyo swimming pool (see Appendix V).

The Surakarta Water Enterprise completed the repairs in and around the Jebres reservoir. A hand sump pump was installed in the pipe gallery to keep room dry. An old float type level gauge was found inside the east chamber when cleaning and repairing operations were underway. The Consultant made recommendations for making it operable and it has since been in use to provide levels on the upper part of the scale which were previously unknown due to the low height of the ceiling in the pipe gallery.

III-F METER REPAIR TRAINING PROGRAM

Completed.

III-G NEW WATER DISTRIBUTION NETWORK DESIGN

Completed.

III-H CONFERENCES

02 March 1982 : Coordination meeting with the two distribution main contractors wherein the contractors were advised to concentrate on completion of the network within the amount of time allotted. The Phase I contractor was instructed to correct size of casing under the railroad in Jebres to ϕ 450 mm.

Site visitation and tour by representatives of U.S.A.I.D. who saw first hand damage at Pusur River in Cokrotulung. They were informed by the caretaker of bath house No. 3-6 that there were 150 - 200 people using the facility each morning and 75 - 100 in the evening hours.

03 March 1982 : Coordination meeting with the three contractors involved with bath houses and public latrines wherein it was agreed the Phase II contractor would haul excess fill from along Jl. Kol. Sutarto left by the distribution main contractor to bath house No. 3-5 in order to raise floor elevation a minimum of 80 cm. Savings of shorter runs for water service realized when No. 3-1 and 3-5 were relocated will be used to pay for it. The Phase III contractor agreed to rehabilitate PL. Nos. V-Ee-4 and IV-Di-3 in lieu of No. IV-Dg-2 which was torn down by DPU.

09 March 1982 : Coordination meeting with the two distribution main contractors wherein the claim for additional work by the Phase II contractor was turned down because he was using wrong data for calculating the span. The Phase I contractor was advised he could make final connection to ϕ 500 mm transmission main when the replacement ϕ 450 mm transmission main is placed into service.

10 March 1982 : Meeting at the offices of the Merapi Flood Control Project with the Project Manager, Ir. Darmadi and Messrs Rahardjo, Amin and Bambang of DSE, CJWSP Project Manager, the Head of PAB-I, Messrs Djaelani and Hari of SWE and the Consultant wherein help from the Merapi project was requested to repair damage to the SWE facilities at Cokrotulung along the Pusur River. Immediate help was offered involving supply of basket wire and sand bags. Long term help will depend upon allocation of funds from Jakarta. Meeting was followed with a site inspection of the damage and discussion of proposed plans to correct the problem.

13 March 1982 : Meeting in the office of the Bengawan Solo Project with representatives of SWE, PAB-I and the Consultant wherein request was made to utilize earth moving equipment of Bina Marga to work the Pusur River at Cokrotulung. It was said the earliest that equipment would be available would be July, or more likely August of 1982 because of need for it at the Wonogiri Dam.

16 March 1982 : Prebid meeting for Phase IV of the Public Latrine Restoration Program. The three invited contractors were each the second

lowest on the previous Tenders for Phases I, II and III. Copy of the minutes will become part of the Contract Documents.

23 March 1982 : Meeting in the office of the Head of Logistics DSE in Jakarta with U.S.A.I.D. wherein final review of the proposed Amendment No. 3 to the Consultant's Contract was done and an agreement reached on the text.

24 March 1982 : Coordination meeting with the three contractors involved with the bath houses and public latrines wherein it was learned that a neighbour to bath house No. 3-1 has complained the septic tank encroches on his property 40 cm. Original survey was made with the Chief of the Kampong Nusukan so contractor was advised to coordinate with those parties to resolve problem. The Phase III contractor was warned by the Project to increase his effort or face a fine being levied against him.

26 March 1982 : Retender prebid meeting for the Phase IV Public Latrine Restoration Program. All Contractors were instructed to separate the costs where two prices are required on Items "E", "J" and "M". They were also advised of a revised quantity of sewer piping and instructed to pull out the cost for the project sign and services cost of meeting refreshments, etc. to show that total separate.

31 March 1982 : Coordination meeting with the three contractors involved with the bath houses and public latrines wherein the contractors were instructed to call SWE to set water meters wherever they are ready as soon as possible. The Project received word from the Head of DPU that DPU would instruct the Kelurahan Chief to apply

to PLN for electrical service at each respective bath house.

III-J ACTIVITIES PLANNED FOR NEXT MONTH

Continue with all construction effort and prepare to start new contractor on Phase IV of the public latrine restoration. Hold prebid meeting for Tender of Phase III distribution main construction. Followup on procurement effort on off-shore purchases. Hold Final inspections when requested by the contractors. Continue with the leak survey and O-J-T with O & M tools and equipment. Supervise modifications to be made in the O & M facilities in preparation of receipt of the machine shop and automotive shop tools and equipment.

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

CONTRACT NUMBER GI/WS-S/AID/78 AID LGAN 497-U-044	MAN - MONTHS				
	FOR MARCH 1982	CUMULATIVE THROUGH MARCH 1982	TOTAL IN CONTRACT SCHEDULE	% OF TOTAL USED PER SCHEDULE	BALANCE
EXPATRIATES					
PROCUREMENT ENG. CHIEF ENGINEER	1.28 0	10.47 26.2	14.5 30	72.2 87.3	4.03 3.8
CONSTRUCTION SPECIALIST LIAISON OFFICER	1 0.16	30.1 5.15	36 7.5	83.6 68.6	5.9 2.35
PRINCIPAL	0	0.17	2	8.5	1.83
HYDROGEOLOGIST DRILLING SPECIALIST	0 0	8.1 10.5	12 12	67.5 87.5	3.9 1.5
O B M SPECIALIST METER SPECIALIST	1 0	37.4 8	41.5 8	90.1 100	4.1 0
MANAGEMENT SPECIALIST SPECIALIST	0 0	20.2 0	21 3	96.1 0	0.8 3
DESIGN SPECIALIST	0	12	12	100	0
EXPATRIATE TOTAL	3.44	168.29	199.5	84.3	31.21

INDONESIAN PROFESSIONAL & TECHNICAL					
COUNTERPART CHIEF ENG.	0	28.6	33	86	4.4
CONSTRUCTION SUPERVISOR	1	20.5	36	56.9	15.5
HYDROGEOLOGIST	0	20.7	26	79.6	5.3
MATERIALS COORDINATOR	1	42	48	87.5	6
INSPECTORS	3	125	146	85.6	21
DRAFTSMAN	1	53	66	80.3	13
ACCOUNTANT	0	34	32	106.2	(2)
TECHNICAL TRANSLATOR	0	17.8	18	98.8	0.2
DESIGN ENGINEER	0	6	8	75	2
SPEC. / COST ESTIMATOR	0	4.6	3	153.3	(1.6)
SR. SURVEYOR / PLOTTER	0	5.4	5	108	(0.4)
SURVEYOR	0	5	5	100	0
INSTRUMENTMAN	0	6.3	5	126	(1.3)
INDON. PROF. & TECH.	6.0	368.9	431	85.6	62.1
INDONESIAN ADMINISTRATIVE					
OFFICE MANAGER	1	42	48	87.5	6
SECRETARY (Bilingual)	1	40.6	54	75.1	13.4
TYPIST	0	27.2	51	53.3	23.8
CLEKKS	1	103.6	88	117.7	(15.6)
DRIVERS	3	165.3	223	74.1	57.7
LABORERS	1	169.2	258	65.5	88.8
ROOMEN / CHAINMEN	0	13.8	10	138	(3.8)
ADMINISTRATIVE TOTAL	7.0	561.7	732	76.7	170.3

SURAKA
REPORT OF
BURNS & McDONNELL

CONTRACT NO 01/WS-S/AID/78 SIGNED 26 OCT. 1978 START 1 JAN. 1978 END 30 SEP. 1982	COSTS FOR	CUMULATIVE COSTS THROUGH	
	MARCH 1982	AMOUNT	% OF TOTAL BUDGET ESTIMATE
REIMBURSABLE EXPENDITURES			
Salaries and Related Costs	20,794.26	1,029,623.18	90.9
Transportation	-	73,631.72	88.3
Equipment	-	12,455.36	77.8
Miscellaneous	-	63,563.48	109.4
Contingencies	-	53,543.45	84.6
TOTAL DOLLARS	20,794.26	1,232,817.19	91.1
			INDO
Salaries	3,461,000	180,412,384	80.6
Transportation	977,850	73,239,453	87.2
Housing	-	64,000,000	101.6
Vehicle Costs	597,500	51,087,472	95.1
Equipment Costs	-	24,610,860	101.4
Miscellaneous	452,095	84,317,575	91.8
Contingencies	-	33,144,580	99.7
TOTAL RUFIAH	5,488,445	510,812,324	89.0

RTA WATER PROJECT
 ENGINEERING COSTS
 TRANS-ASIA ENGINEERING ASSOC.

AL E	CUMULATIVE PAYMENTS THROUGH			TOTAL BUDGET
	AMOUNT RECEIVED IN MARCH 1982	TOTAL AMOUNT RECEIVED THROUGH MARCH 1982	% OF TOTAL BUDGET ESTIMATE	ESTIMATE FOR CONTRACT
S DOLLARS				
	13,595.66	1,008,828.92	89.1	1,132,179
	-	73,631.72	88.3	83,343
	-	12,455.36	77.8	16,000
	-	63,563.48	109.4	58,063
	-	53,543.45	84.6	63,271
	13,595.66	1,198,427.27	88.5	1,352,856
INDONESIAN RUPIAH				
	-	163,329,217	72.9	223,759,250
	-	68,331,483	81.4	83,952,600
	-	64,000,000	101.6	62,975,000
	-	48,029,472	89.4	53,675,000
	-	24,610,860	101.4	24,253,000
	-	82,362,140	89.7	91,810,000
	-	33,144,580	99.7	33,236,460
	-	483,807,752	84.3	573,661,310

AMENDMENT NO. 1

AMENDMENT NO. 2

1980												1981												1982											
JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP									

AMENDMENT NO. 1

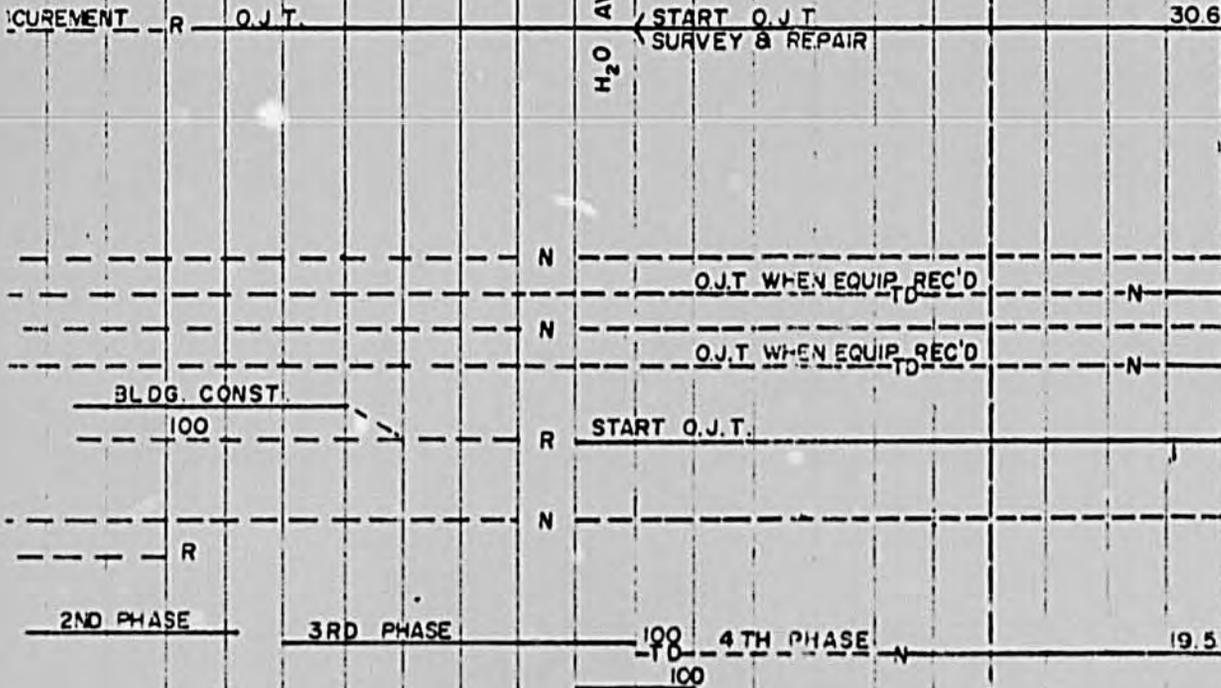
AMENDMENT NO. 2

80

1981

1982

UL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP

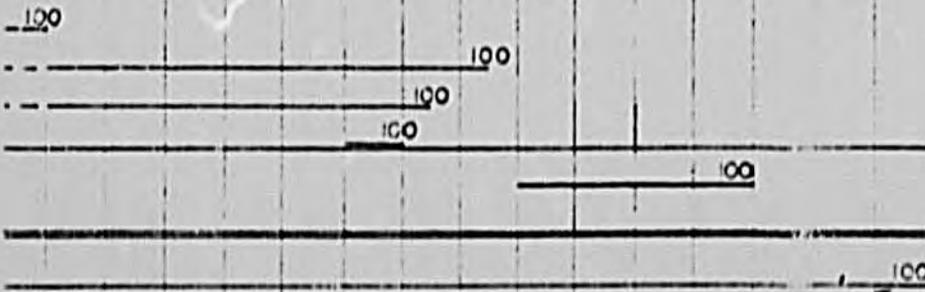


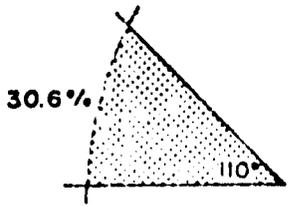
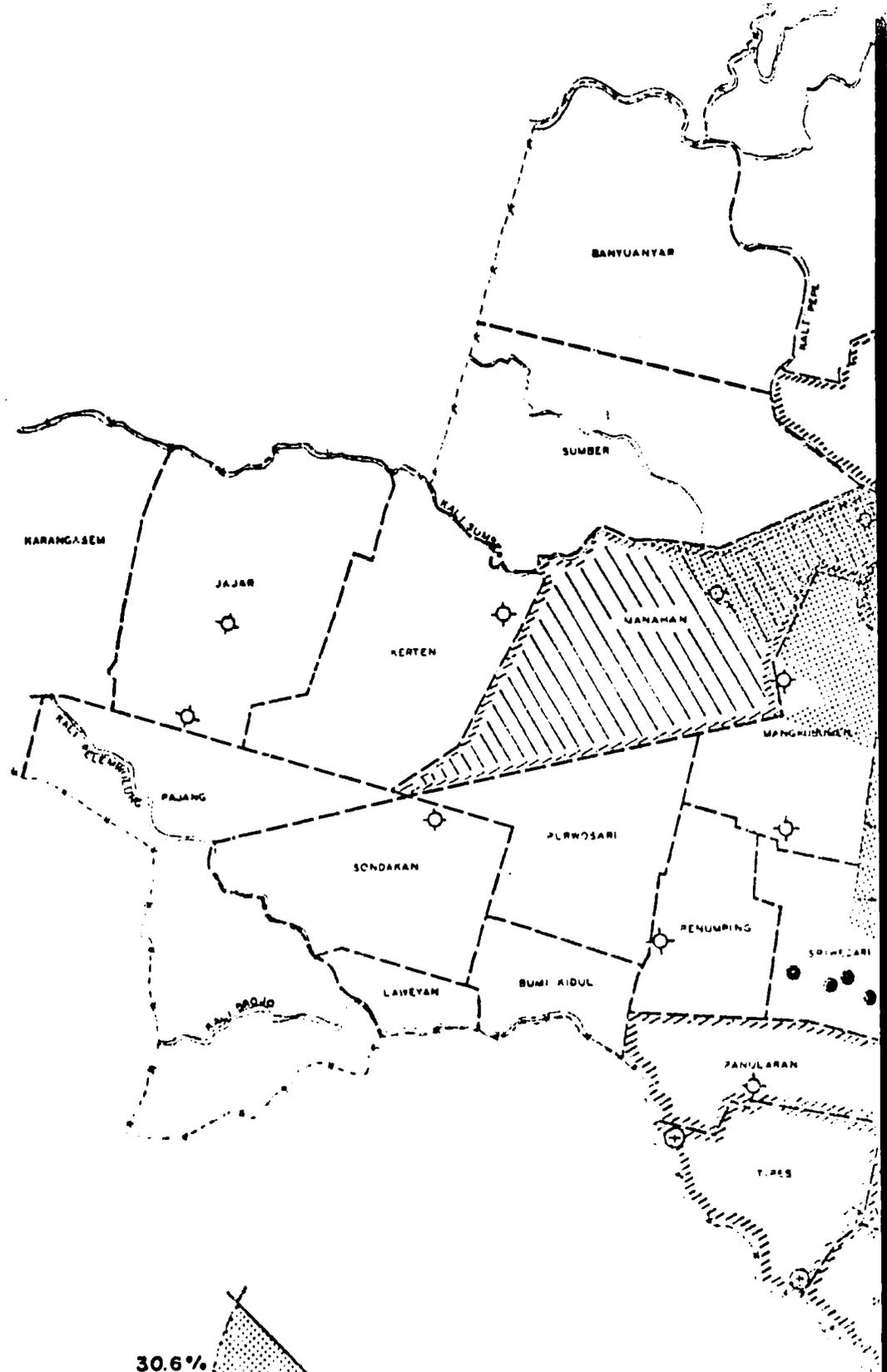
82

END OF CONTRACT

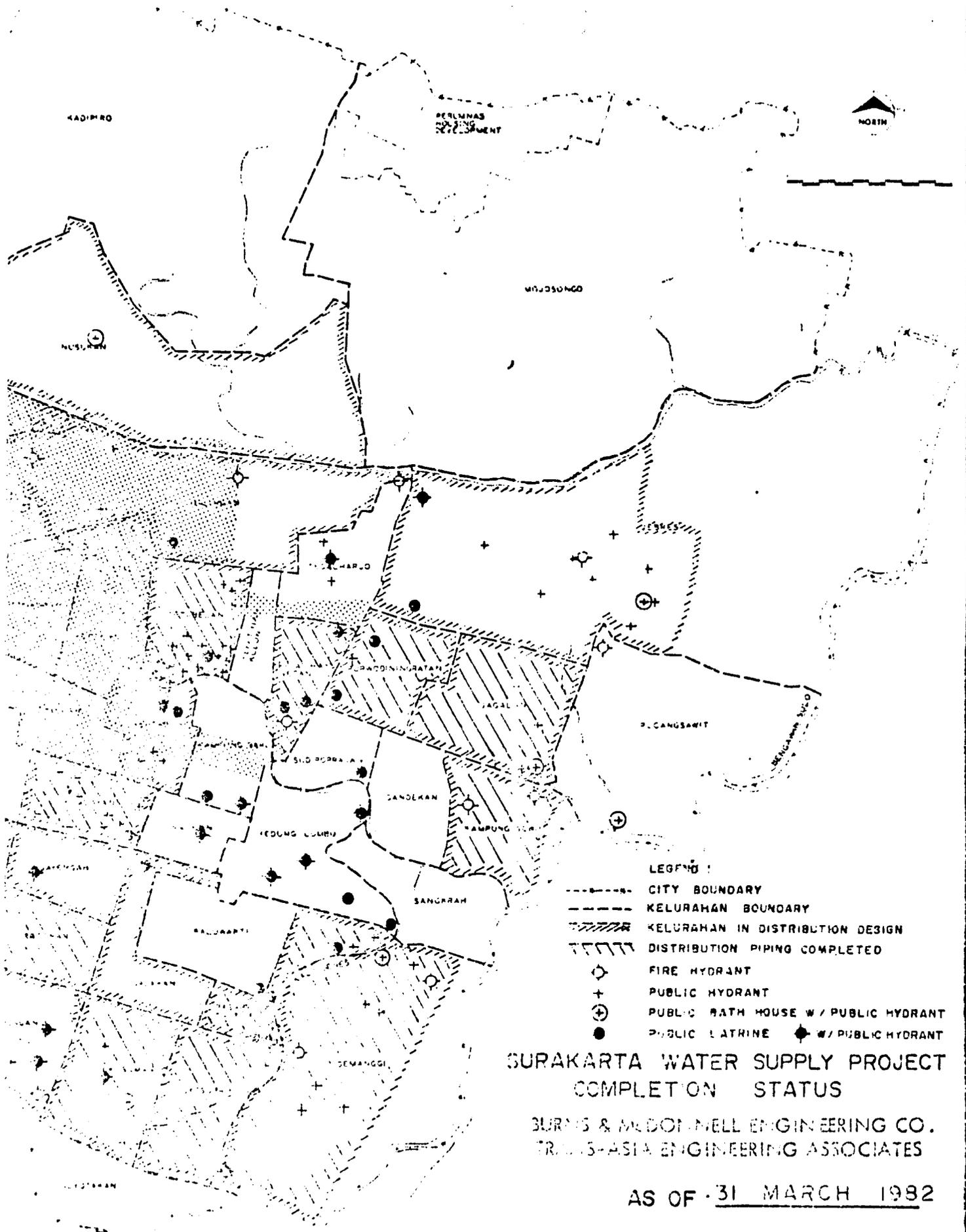
LEGEND

- A : SUBMITTAL DATA APPROVAL
- C : COMPLETE / CERTIFIED
- N : NOTICE TO PROCEED
- P : PORT ARRIVAL
- Q : QUOTATION REVISED
- R : RECEIVED AT JOBSITE
- S : SHIPPED (3' NO SHIPMENT SAME SOURCE
- FI : FINAL INSPECTION
- TD : TENDER DOCUMENTS
- 0 - 100 : PERCENTAGE CONSIDERED COMPLETE
- (EST.) : ESTIMATED
- T : TERMINATED
- Co : CHANGE ORDER





LEAK SURVEY COMPLETION
(SHADED AREA)



KADIPIRO

PERUMNAS
DEVELOPMENT



MJOSONGO

MUSI

HARJO

PAWONINIRATAN

AGAL

P. CANGSAWIT

SELIGAMA SUDO

SIDHOBRAJA

SANDEAKAN

PAMPUNG

TEGUNG LUMIH

SANGRAHA

BALUBARTI

DEMANGGI

LEGEND :

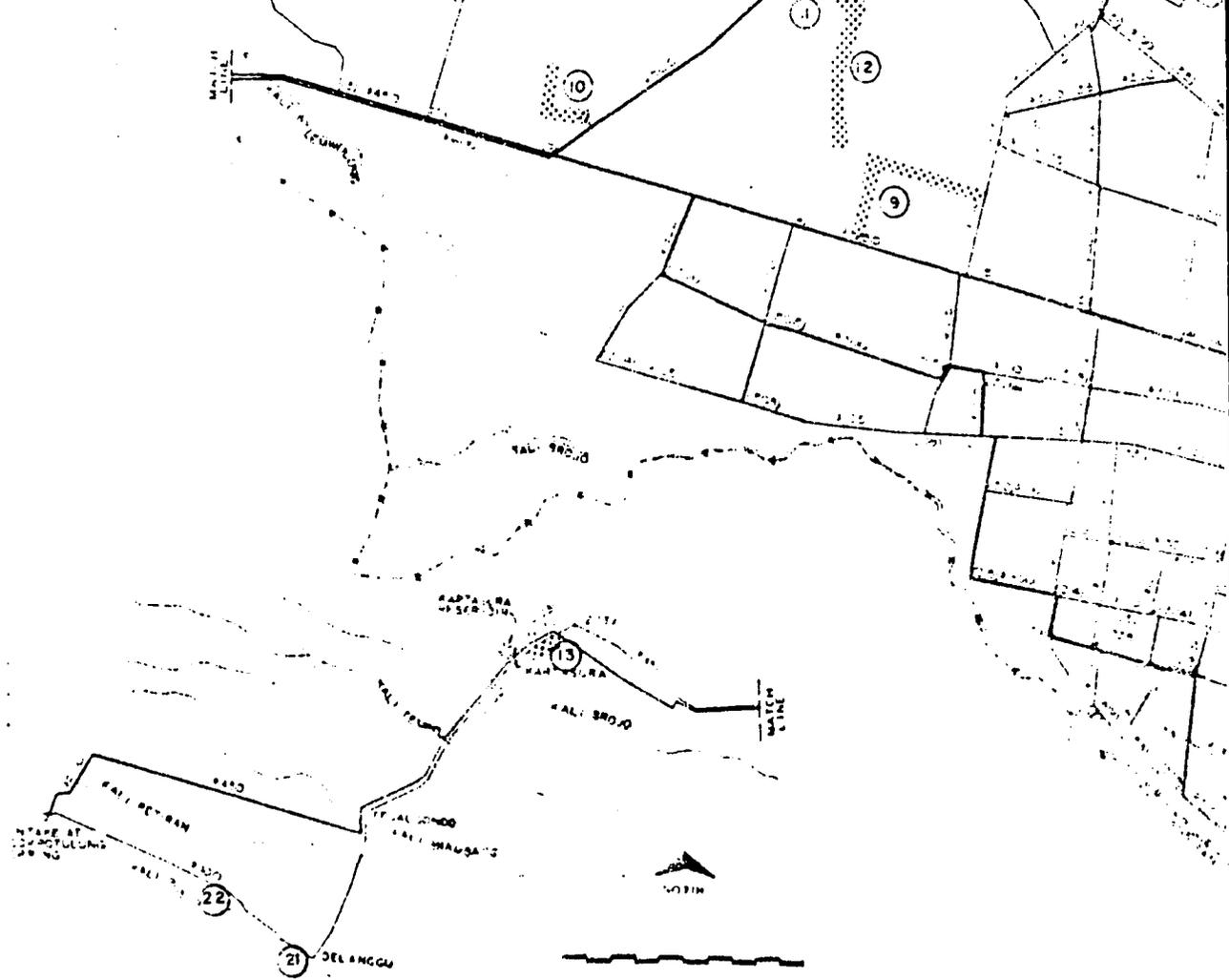
- CITY BOUNDARY
- - - - - KELURAHAN BOUNDARY
- ////// KELURAHAN IN DISTRIBUTION DESIGN
- ||||| DISTRIBUTION PIPING COMPLETED
- ⊕ FIRE HYDRANT
- + PUBLIC HYDRANT
- ⊕ PUBLIC BATH HOUSE W / PUBLIC HYDRANT
- PUBLIC LATRINE ● W / PUBLIC HYDRANT

**SURAKARTA WATER SUPPLY PROJECT
COMPLETION STATUS**

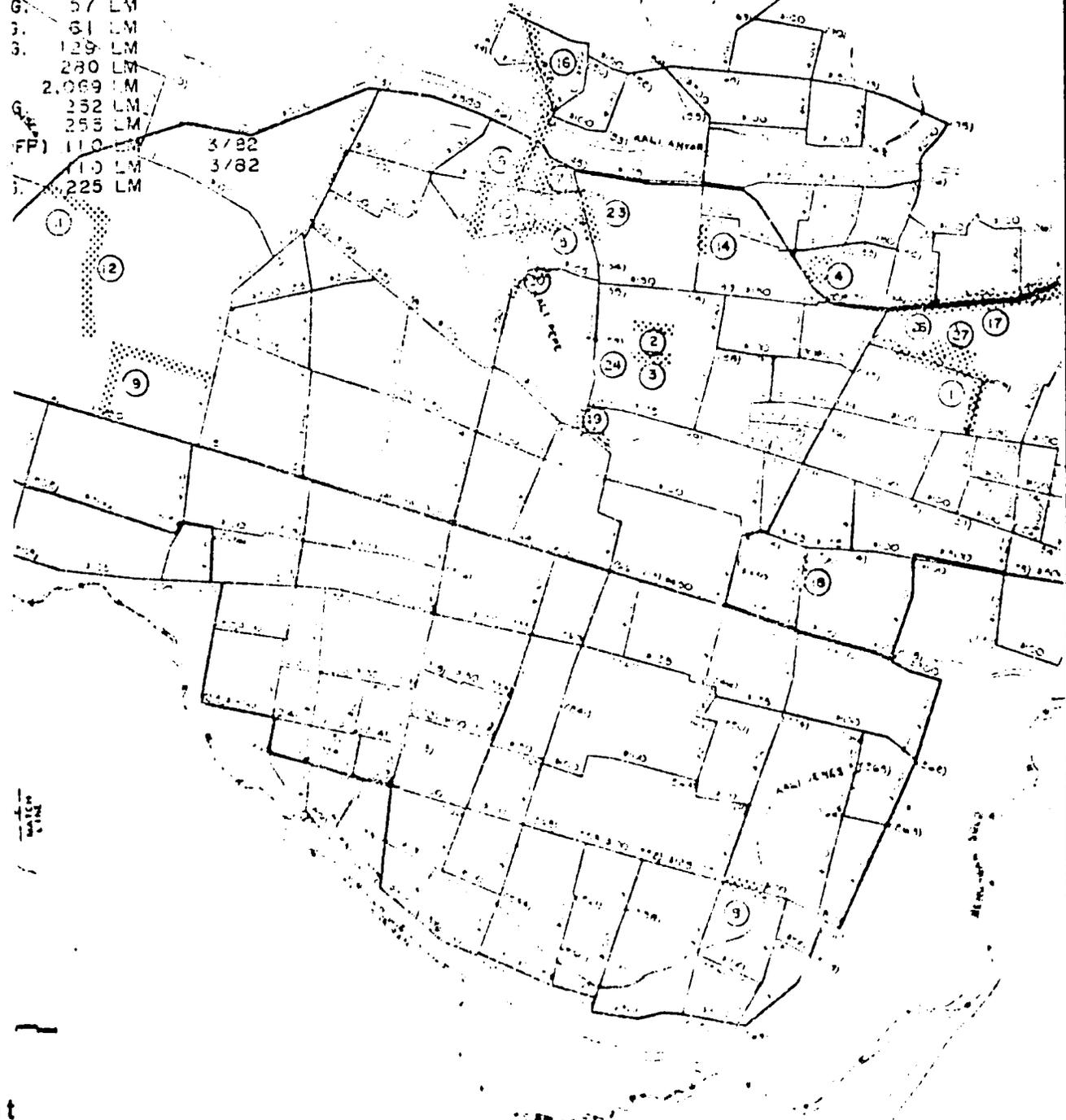
BURNS & MCDONNELL ENGINEERING CO.
TRANS-ASIA ENGINEERING ASSOCIATES

AS OF 31 MARCH 1982

#	PH	LOC.	SIZE	LENGTH ±	DATE
1	II	JL. LEDOKSARI	Ø 30 (OLD 80)	675 LM	7/80
2	II	JL. BAWEAN (KARIMUNJAWA)	Ø 30 (OLD 80)	165 LM	6/80
3	II	JL. ENGGANO	Ø 30 (OLD 80)	140 LM	6/80
4	II	JL. TEGALHARDJO	Ø 30 (OLD 30) - NOT CONN.	253 LM	9/80
5	II	JL. CINDEREJO RT III	Ø 100 (OLD 30)	400 LM	9/80
6	II	JL. NUSUKAN	Ø 150 (OLD 125) - NOT CONN.	150 LM	9/80
7	II	KP. GILINGAN	Ø 30 (REPL. HOUSE SERV.)	150 LM	9/80
8	II	JL. BATURONO	Ø 30 (OLD 100)	250 LM	8/80
9	II	JL. MAWAR	Ø 30 (REPL. HOUSE SERV.)	795 LM	10/80
10	II	JL. KENCUR	Ø 30 (REPL. HOUSE SERV.)	500 LM	10/80
11	II	JL. PEMUDA SELATAN	Ø 100 (OLD 80 + LINE K.)	400 LM	8/80
12	II	JL. KERINCI	Ø 30 (OLD 30)	600 LM	8/80
13	III	SOLO - YOGYA HIGHWAY	Ø 450 (OLD 400)	400 LM	3/81
14	III	JL. NGEMPLAK BRIDGE	Ø 150 (OLD 150)	30 LM	7/81
15	IV	JL. CINDEREJO RT. I	Ø 100 (OLD 30)	243 LM	1/82
16	IV	JL. NUSUKAN (COMPLETION)	Ø 150 (OLD 125)	679 LM	3/82
17	IV	JL. KOL SUTARTO	Ø 450 (OLD 430)	970 LM	2/82
18	IV	JL. LOJI WETAN	Ø 150 (OLD 125) IN PROG.	57 LM	
19	IV	JL. PASAR LEGI	Ø 100 (OLD 30) IN PROG.	61 LM	
20	IV	JL. BALAPAN GAJAH MADA	Ø 150 (OLD 100) IN PROG.	129 LM	
21	IV	DELANGGU	Ø 400 (OLD 400)	280 LM	
22	IV	DELANGGU - TULUNG ROAD	Ø 400 (OLD 400)	2,069 LM	
23	IV	JL. GILINGAN	Ø 150 (OLD 125) IN PROG.	252 LM	
24	IV	JL. JOYOBOYO TO JL. PASARLEGI	Ø 75 (OLD 80)	255 LM	
25	IV	JEBRES RESERVOIR	Ø 75 (OLD 20) BLOW OFF	110 LM	3/82
26	IV	JL. KOL SUTARTO	Ø 150 (OLD 150)	110 LM	3/82
27	IV	JL. NGENINGAN	Ø 75 (OLD 80) IN PROG.	225 LM	



LENGTH ±	DATE
675 LM	7/80
165 LM	6/80
140 LM	6/80
NN. 253 LM	9/80
400 LM	8/80
NN 150 LM	9/80
1) 150 LM	9/80
250 LM	8/80
1) 795 LM	10/80
1) 500 LM	10/80
1) 400 LM	8/80
600 LM	8/80
400 LM	3/81
30 LM	7/81
243 LM	1/82
679 LM	3/82
970 LM	2/82
G. 57 LM	
3. 61 LM	
3. 129 LM	
280 LM	
2,069 LM	
G. 252 LM	
255 LM	
FF) 110 LM	3/82
110 LM	3/82
225 LM	



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