MINISTRY OF PUBLIC WORKS AND ELECTRIC POWER
DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
DIRECTORATE OF IRRIGATION
AND PROSIDA

JRAGUNG DAM

MULTI-PURPOSE IRRIGATION FLOOD CONTROL HYDROELECTRIC AND MUNICIPAL AND INDUSTRIAL WATER SUPPLY PROJECT

QUARTERLY PROGRESS REPORT
No. 6

INCLUDES MONTHLY PROGRESS
REPORT No. 19

SEPTEMBER 1978

SUBMITTED BY :

ENGINEERING CONSULTANTS, INC.
Denver, Co., USA — Semarang, Indonesia

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JRAGUNG DAM PROJECT
P.O. BOX 220
SEMARANG
CENTRAL JAVA
INDONESIA

Director General of
Water Resources Development
Ministry of Public Works
Jalan Pattimura 20/7
Kebayoran Baru
Jakarta Selatan

October 13, 1978

Our file: 1196/MR/19
376/78

Attention: Ir. Oesman Djojoadinoto
Director Irrigation

Subject : Quarterly Progress Report No. 6.

Dear Sir:

We submit herewith fifteen (15) copies of the Quarterly Progress Report No. 6 for the period July 1 to September 30, 1978. It may be noted that separate monthly report for the month of September 1978 has not been prepared; the same is included in this Progress Report.

The report is prepared in pursuance of Section 10.15 B of Contract No. KAB. 9/3/12 between the Directorate General of Water Resources Development and the Engineering Consultants, Inc. for providing engineering services for the design of Jragung Dam Project. The draft of the report was shown to the Jragung Dam Project Management at Semarang before its printing.

Your comments, if any, on the contents of the report are respectfully requested.

Very truly yours,
Engineering Consultants, Inc.

Saeed A. Rana

Saeed A. Rana
Resident Manager

cc. U.S. AID Jakarta
(Attn: Mr. P. Thorn)
with eight (8) copies
of the report.

General Manager PROSIDA

Project Manager
Jratunseluna Basin Project

ECI Denver (SD 289)

ECI Semarang

SAR/ m.

JRAGUNG DAM PROJECT

QUARTERLY PROGRESS REPORT

NO. 6

INCLUDES MONTHLY PROGRESS REPORT

FOR SEPTEMBER 1978

PERIOD

JULY 1, 1978 - SEPTEMBER 30, 1978

CONTRACT NO. KAB. 9/3/12

U.S. AID LOAN NO. 497 - T - 040

ENGINEERING CONSULTANTS, INC.

DENVER, COLORADO — SEMARANG

U.S.A. — INDONESIA

TABLE OF CONTENTS

		Page No.
SECTION I	GENERAL	1
SECTION II	PERSONNEL	17
	A. EXPATRIATE	17
	B. COUNTERPART	18
	C. TECHNICAL	18
	D. ADMINISTRATIVE	19
SECTION III	MEETINGS CONFERENCES AND MAJOR EVENTS	20
SECTION IV	PROGRESS REPORT BY ACTIVITIES	23
	A. Structural Design	23
	B. Dam Design	25
	C. Specifications	27
SECTION V	PREPARATION OF REPORTS	29
SECTION VI	PROBLEM AREAS	31
SECTION VII	FINANCIAL	32
ANNEXURES		
I	Assignment of Resident and TDY Staff	33
II	Assignment of Counterparts and Technical Personnel	37
III	Direct-hire Indonesian Personnel	40
IV	Summary of U.S. Dollar Expenditures	41
V	Summary of Rupiah Expenses	43
VI	Master Work Schedule and Up-To-Date Progress	45

SECTION I

GENERAL

This report has been prepared in pursuance of Section 10.15 of the Contract No. KAB. 9/3/12 dated March 15, 1977 between the Directorate General of Water Resources Development of the Ministry of Public Works and the Engineering Consultants, Inc. for consulting services for the Jragung Dam Project. The design job is being financed by the United States of America acting through the Agency for International Development for which a loan No. 497-T-040 dated July 28, 1976 has been obtained by the Government of Indonesia.

The report covers the period July 1978 through September 1978. The monthly progress report for the month of September 1978 is also included in this report.

During the period under report, the appraisal of the reservoir sedimentation was completed and updating of the Project hydrology was done. The project designs were reviewed by the Consultant's team of specialists and incorporation of review comments in the final designs was initiated. As recommended by the Consultant, to counteract the effect of anticipated sedimentation in the reservoir on the storage capacity, the Ministry agreed in principle to raise the normal maximum reservoir at Jragung from elevation 125.00 per feasibility report to about elevation 130.00. Reservoir operation studies are currently in progress on the Consultant's computer at Denver. On the basis of the studies done so far, it appears that the normal maximum water elevation of 131.00 will be optimum. However, studies are continuing to determine whether building the reservoir to this elevation will be technically feasible. The technical feasibility of keeping normal maximum water elevation at 130.00 has already been established. The final crest elevation of the dam will either be 135.00 or 135.50 depending upon which of the above two elevations are finally accepted for the crest of the Spillway. Design of the dam is progressing accordingly.

The effects on the economics of the Project of raising the dam and adjusting the appurtenant structures correspondingly are presently being studied.

The events which took place, the actions that were initiated or completed and the points pertinent to the Project design including those mentioned above are described in the following.

1. A meeting, presided by Ir. Oesman Djojoadinoto, Director of Irrigation was held at Jakarta on August 24, 1978 and was attended by Ir. Soewasono General Manager PROSIDA, Mr. Paul Thorn Project Officer U.S. AID, representatives of PLN, DPMA, Bina Program, Jratunseluna Project and the resident staff of ECI, the Project Consultant. The purpose of the meeting was to discuss the status of the final design of the Jragung Dam Project and also to discuss the Consultant's latest report on the reservoir sedimentation and its effects on the useful life of the Project. Relevant extracts from that report were given in the July monthly progress report. A Design Status Report dated July 1978 was prepared by the Consultant, copies of which were distributed to all the concerned agencies. This report contained explanation and recommendations by the Consultant of all the aspects of the Project design including the reservoir sedimentation problem. A summary of the discussions which took place during the meeting is recorded in a note prepared by the Consultant and submitted to the Directorate of Irrigation with letter 1196/G/33 - 308/78 dated August 26, 1978, copy of which is appended to this section of the Report.

2. The mapping of the damsite and of all the appurtenant structures as originally contemplated has since been completed. However, need had arisen to map an additional area at the right abutment of the main dam for accomodating the raised section of the dam embankment. This work has been completed by the Proyek surveyors. Also, the secondary mapping work and other miscellaneous surveys progressed on schedule.

3. The geological field investigation work is complete. A final review

of the geological investigation and the data collected was made by the Consultant's Chief Engineering Geologist, Mr. P. Strauss and by Dr. H.W. Burke. They are satisfied that the picture of the Project geology is clear and all information needed by the designers and the construction engineers is available. Documentation of all the geological data and the borehole logs is presently being done by the Materials and Dam Design Engineer. Some of the laboratory test results related to the foundation materials are needed to complete the final report on geology. No problems or delays are expected in this regard.

4. A slight change in the alignment of the River Diversion Works, as stated in the preceding monthly report, was made to locate the conduit beneath the dam section on the revised alignment. The revisions to the drawings, thus necessitated, have been made. The final design and specification drawings have been issued by the Consultant and submitted to the Proyek.

The construction drawings of the River Diversion Works have been prepared and are presently being drafted. This part of the work will be completed by the end of November.

The design of the Tuntang Diversion Works done by Mr. Hoge at Semarang has been reviewed by Mr. Kuehl, Chief Engineer ECI. The implementation of the changes and revisions proposed by Mr. Kuehl is presently being done. This work is expected to be completed by the end of October.

The model testing in the DPMA laboratories at Bandung of the Spillway stilling basin continued during the period under report. The model was visited by Mr. Kuehl and many test runs were made in his presence. He was satisfied with the overall scheme of the structure, its intake, the flume and the general layout of the flipbucket. Certain changes to the flip and improvement of the outlet conditions of the model were recommended by him to increase the efficiency of the flip under low flow conditions and to get

a more realistic picture of the downstream scour pattern. Interim reports have been prepared by the DPMA hydraulic engineers, containing results of all testing done so far and have been discussed with the Consultant. The point presently being studied in detail is to devise measures by which turbulance observed during the transitionary operation of the stilling basin between the hydraulic jump type and the ski jump type could be minimized.

In consequence of the proposed raising of the normal reservoir level, the crest of the Spillway will have to be raised accordingly. The design and specification drawings for this structure are being worked on and will be finalized after all model test results have become available. It is expected that the entire design of the Spillway will be completed by the end of October.

The basic concept of the design of the Spillway remains the same as was explained in detail in the previous quarter's progress report. It ensures the safety of the dam under all conditions of floods including the PMP flood and economizes on the cost of structure by designing the stilling basin not for extreme conditions but for normal operating condition. Under the extreme conditions of flood the flow will sweep through the stilling basin which will then act as a flip bucket and will perform as such for the entire range of the higher discharges.

The design of the main dam has now entered the final stage after review of the data and field condition has mostly been completed. The basic design criteria for the dam follow.

When design stage investigations were started, many geological complexities and structural weaknesses were detected in the ridges. The presence of many faults and shear zones and the existence of weaker claystone interbeds within the strong claystone and the sandstone precluded the possibility of abutting the dam at the locations proposed in the feasibility report.

For the geological conditions, it was considered that the ridges were too narrow at these locations. Therefore, it was believed necessary that the ridges should not be exposed directly to water from the reservoir where they were narrow and the resulting seepage could lead to sliding failures.

The final design of the dam takes due cognizance of the above mentioned conditions. The axis of the dam has been located upstream of the original location so that the embankment guards the entry of water from the reservoir into the ridges and abuts the ridges at locations where they have substantial width and are thus structurally stable. The impervious core and filter and drainage zones of the embankment have been designed in such a manner that seepage from the reservoir is collected and drained out before it can enter the ridges. In addition, drainage galleries at appropriate elevations have been provided within the ridges to collect any water which seeps under the dam and thus bypasses the filter and drainage zones and infiltration from the surface.

The weakness of the dam foundation area requires weight berms at the toes of the embankment slopes. The strength of the foundation material is being determined by laboratory tests and stability analyses are being performed in order to arrive at the most economical yet safe section for the dam. The work presently being done at Semarang on the dam design relates primarily to aligning the dam for the raised crest elevation based on the stated design criteria.

It has been suggested by our Dam Design Specialist that efforts should be made to exploit the Penawangan Borrow Area located about 5 kilometers in the north-western direction from the damsite. The soils in the prospective borrow area are volcanic in origin and are classified as Agglomerate. In situ, these are consolidated and held together by cohesion and interstitial fine materials. To exploit the borrow area, it is felt that it will be necessary to rip the material before its excavation and haulage to the dam.

The local representative of Caterpillar was approached to conduct seismic refraction tests and determine the extent of ripping and the type of equipment needed. The field work by Caterpillar technicians was completed during September and a detailed report from them is expected within the first part of the month of October. However, the preliminary results show that the material can be ripped by D-8 machines. For the D-7 machine it will be a marginal case. If exploitation of Penawangan area proves economically feasible, it can provide excellent material for the outer shells of the dam.

The final shipment of the foundation materials was sent to laboratories in North America for testing during the later part of the month of August. All the test results are expected to be available for the finalization of the dam section by the end of October. The slope stability analyses are being performed on the ECI computer at Denver where all the results of material testing are being collected.

The construction drawings of the River Diversion Works have been completed by the Design Engineer. These are presently being drafted. Work has been initiated on the preparation of construction drawings for the Tuntang Diversion Works. The preparation of construction drawings for the various structures will continue through the remaining period of the current design stage contract.

Detailed reports of progress achieved in the design of various components of the Project are given in Section IV-A and IV-B of this report.

5. The appraisal of data and study of sediment transport in the Jragung River at the damsite was completed by Dr. M.A. Stevens, the Consultant's River Regime Specialist. This study was of vital importance to estimate the future rate of sedimentation in the reservoir and to decide the dam crest elevation so that the necessary storage at the dam is available. In fact, based on the results of the study now known, it has become

necessary to raise the normal maximum reservoir level from elevation 125.00 as per feasibility report to about elevation 130.00. This has been necessitated to counter the effect of higher rates of sedimentation on the future capacity of the reservoir.

The reports of Dr. Stevens relating to the sedimentation studies and updating of the Project hydrology were appended to the monthly progress reports No. 17 and 18 for the months of July and August 1978, respectively. However, for ready reference, summaries of those reports are given in the following.

Sediment Yield

The suspended sediment loads measured on a continuous basis during the 1977-78 wet season in the Jragung River at the Borangan Bridge showed that the average long term wet season (November through April) suspended sediment transport would be of the order of 1,800,000 tons. The bed load transport calculated by using 5 different bed load formulas was in the range of 50,000 to 300,000 tons per year. An average value of 200,000 tons per year was used for estimating the total yield.

The total yield of sediment from the Jragung watershed upstream from the Borangan Bridge is the sum of the suspended and the bed loads and is estimated to be 2,000,000 tons per year. The corresponding yield at the damsite would be approximately 1,800,000 tons per year. This load represents an average sediment concentration of 15,000 milligrams per liter.

Reservoir Sedimentation

Assuming a trap efficiency at the reservoir of 96 percent and an average consolidated dry unit weight of 1.1 tons per cubic material for the deposited sediment, the total volume of sediment deposited in the reservoir would be 1,640,000 cubic meters per year.

The above estimate does not take into account the flows diverted from the Tuntang River. Since only wet season flows have to be diverted to the Jragung Reservoir, the volume of sediment coming from the Tuntang River would be approximately 300,000 tons per year.

Water Yield

Since the time when the feasibility studies were completed, additional data for three years became available. The analysis of the hydrologic data indicated that the previous estimate of water yield from the Jragung watershed should be revised. The results are given below:

Mean Annual Rainfall at the Jragung Watershed above the damsite	=	2,647 millimeters
Average Effective Rainfall	=	1,364 millimeters
Average Annual Runoff	=	121 x 10^6 cubic meters

6. The original draft of the contract documents for the River Diversion Works was submitted by the Consultant to all the concerned agencies in February 1978. As directed by PROSIDA the contract documents including the Bidding Form and the Conditions of Contract should be similar to those already approved by them for the New Rentang Barrage and the Appurtenant Works Contract. The revised draft of the contract has accordingly been prepared and an advance copy of that was submitted to the Proyek in September.

The work on preparation of the technical specifications for the Base Camp continued. A detailed report on the activity of the preparation of contract documents is given in Section IV-C.

7. All the participants of Part II of the Ministry Personnel Training Program returned to Indonesia after completing their respective training schedules. The Ministry Personnel Training Program has now been completed in its entirely in accordance with the provisions of the current design

stage contract.

8. During the period under report, the Project was visited by Mr. M.K. Kuehl, Chief Engineer and Vice President, Mr. S.F. Hillis Chief Engineer Materials and Dam Design, Mr. Peter Strauss Chief Engineering Geologist and Dr. H.W. Burke Geology Consultant. Their visits were meant primarily to carry out review of field investigation data and the design work completed thus far. Their presence on the Project has been extremely beneficial in providing guidance to the resident design engineers for completing the remaining part of the design work.

9. During the month of September, Mrs. Moenasih Sutikno resigned from her job as Office Secretary with ECI. At her departure, Miss Murtianingsih was appointed as Office Secretary.

10. With the need now established to raise the normal maximum reservoir level and the crest of the dam to elevations higher than those which were given in the feasibility report and according to which the dam and the appurtenant structures have already been designed, it is obvious that additional effort is being made to carry out the related changes and revisions to those designs. Furthermore, additional reservoir operation studies are being done by the Consultant to determine the revised allocation of reservoir capacities and their usages for various purposes. Detailed economic analyses are also being performed for evaluating the Project economics. All these jobs are consuming considerably more manpower than was originally provided in the Contract. Although the Consultant has been making every effort to finish the entire job within the manpower and the time schedule given in the Contract, yet it appears that the total estimated contract dollar costs might be exceeded and extension of contract period might become necessary. This subject has been taken up separately with the Ministry and U.S. AID.

The schedules of the expatriate personnel of the Consultant are given in Section II of the Report.

11. The reimbursable Dollar expenditure up to the end of August amounted to $1,123,094.24. As of the end of September, the reimbursable Rupiah expenditure amounted to Rp. 31,445,733.-.

A detailed description of Rupiah and Dollar expenditures is given in Section VII of this Report.

August 24, 1978

Subject: Discussion of Final Design - Jragung Dam Project

A meeting, presided by Ir. Oesman Djojoadinoto Director Irrigation, was held at Jakarta on August 24, 1978 in the meeting room of the Directorate of Irrigation. It was attended by Ir. Soewasono General Manager PROSIDA, Mr. Paul Thorn Project Officer U.S. AID and his assistant, representatives of PLN, DPMA, DGWRD and the resident staff of ECI, the Project Consultant. The attendance sheet is attached hereto.

The purpose of the meeting was to discuss the status of the final design of the Jragung Dam Project which is now in the concluding stage and also to discuss the Consultant's latest report on the reservoir sedimentation and its effects on the useful life of the Project.

The points which were discussed and the decisions arrived at are described in the following.

1. The design of the dam and the final schemes of the appurtenant structures were explained by the Consultant. It was stated that due to difficult geological conditions at the damsite and at the locations of all the appurtenant structures, more effort had to be put by the Consultant and the Project authorities in the design of the project, and the related field investigations than would normally be needed. The Consultant was confident that even under those conditions the final design of the Project works would be completed on schedule. The preparation of detailed construction drawings for the structures might be delayed but if more counterpart help was available, that job could also be completed on schedule. However, the final design drawings, the contract documents and other related reports would be completed by March 15, 1979, the date on which the current design stage Contract is scheduled to terminate.

2. The latest report on the reservoir sedimentation prepared by Dr. M.A.

Stevens, ECI's River Regime and Sediment Specialist, was presented. It was stated that based on actual sediment measurements carried out at the damsite by the Proyek and the Consultant during the rainy season of 1977-78, it was now estimated that the annual sediment yield at the Jragung damsite would be about 1,800,000 tons. The estimate made by ECI in the Upgraded Feasibility Report for the Project was 1,500,000 tons per year. Inasmuch as there was no data available at that time to substantiate such high sediment yield, it was not used in the reservoir operation studies. The availability of storage capacities of the reservoir for the multiple usages was, therefore, determined by assuming a lower value of the sediment yield.

3. The allocation of total storage capacity, in MCM, at Jragung made in the feasibility studies was the following.

	Initial	After 50 years	Intermediate Operation
Sediment + Dead Storage	8	27	13
Irrigation	97	97	97
Municipal	36	17	31
Sub Total (Below Spillway Crest Elevation)	141	141	141
Flood Storage	25	25	25
Total	166	166	166

Based on the rates of sedimentation in the reservoir estimated by Dr. Stevens, the available storage capacities after periods of 25 years and 50 years would be 102 MCM and 64 MCM, respectively. The available capacity of the reservoir even after 25 years of operation will not be sufficient to provide storage necessary for the irrigation and municipal and industrial requirements.

For irrigation alone, a storage capacity in the reservoir of 97 MCM is needed which according to the latest estimates of reservoir

sedimentation will not be available beyond 28 years of reservoir operation. The allocation of reservoir capacities which was made during the feasibility studies will, therefore, not apply under the conditions of the estimated reservoir sedimentation rates. Revised allocation will have to be decided based on new reservoir operation studies which are currently being made by taking into consideration the reductions in storage capacity caused by sedimentation.

4. The case of Cacaban dam, also in Central Java near Tegal, where the storage capacity of the reservoir has drastically been reduced due to sedimentation was quoted and comparison was made of the conditions observed at that dam and those anticipated in the future operation of the Jragung Dam. The following table showing the said comparison and the conditions observed at two other dams in Indonesia was presented.

Dam	Year storage commenced	D.A. km^2	Surface km^2	Capacity Initial MCM	Capacity 1972 MCM	Erosion Rate mm/yr
Penjalin	1933	28	1.25	9.5	8	1
Malahayu	1937	63	9.25	60	40	13
Cacaban	1958	59	9.83	90	60	36
JRAGUNG	1983	94	5.88	141	102*	18.6

* After 25 years of operation.

5. It was stated that the report on the Jragung watershed management prepared by ECI's Specialist has already been submitted to the Proyek for their initial review. This report contains description of the existing land management and farming practices in the watershed and gives a general recommendation for making improvement in those practices in an effort to reduce erosion in the watershed and sediment yield at Jragung. A summary of that report will be sent to DGWRD for consideration.

6. It was stated that the water yield of the Jragung watershed at the damsite has also been reviewed by the Consultant after incorporating

the hydrological data collected during the period 1975-1978. The mean annual water yield is now less than that was used in the feasibility studies. The previous estimate of water yield was based on only two years of the available runoff record.

7. It was stated that the Consultant was carrying out reservoir operation studies to review the available storage capacity of the reservoir and fix capacity allocations for various usages by taking into consideration the increased sediment yield and reduced water yield which have now been estimated.

8. The Consultant recommended that the crest of the Jragung Dam should be raised by 5.0 meters from elevation 130 to elevation 135 and that of the Spillway should be raised from elevation 125 to elevation 130. The increase in the storage capacity of the reservoir thus achieved would nearly offset the reduction in storage caused by sedimentation. Such a raising of the dam was technically feasible and could either be done in two stages or be accomplished in one stage construction. In the former case if only provision was made now for future raising, and the dam was not actually raised the estimated increase in cost would be about U.S. $ 1.25 million. In the latter case, the increase in cost for the dam to be built initially to elevation 135.0 would be known in due course of time after necessary revisions to design for that condition had been carried out.

9. The required raising of the saddle dike to the recommended elevation was explained and it was stated that the remaining part of the reservoir rim would also be checked to ensure that there were no low spots or saddles which would be overtopped if the dam was raised as proposed.

10. On a suggestion from the DPMA, it was stated that the design of the intake tower for the irrigation and power tunnel would be revised to take into consideration the effect of sedimentation. The latest sedimentation report will also be sent to DPMA for their information

of the mathematical model of the geometry of the reservoir during the course of sedimentation presented in that report.

11. The matter concerning the review of the Project designs, specifications contract documents and other reports by the concerned agencies was discussed. The Consultant requested that the review of the reports, drawings and the documents should be done as soon as possible after the drafts were submitted by them. The Consultant will provide necessary design calculations and the design notes for the design work already completed.

12. The following decisions were made.

    a. The height of the dam and the crest of the Spillway should be raised above those of the feasibility report to provide additional storage at the Jragung Dam. However, the exact height and the final elevations to which the raising should be done would be determined after the results of the ongoing studies being done by the Consultant were known. The revisions to designs necessary for raising the dam should be started.

    b. The Jratunseluna Proyek authorities at Semarang will be responsible for coordinating and carrying out the review of design drawings, specifications, reports and other documents submitted by the Consultant. They will get help from PROSIDA, Irrigation Directorate and other concerned agencies including U.S. AID to accomplish this task.

    c. The effect of raising the Jragung Dam on the Tuntang Diversion weir should be studied by the Consultant.

    d. The hydropower potential of the Jragung Dam for the proposed raising of the reservoir water surface should be examined. Also, the cost component for hydropower facilities of the Project should be evaluated separately.

DEPARTMENT OF PUBLIC WORKS

Directorate General Water Resources Development

DIRECTORATE OF IRRIGATION

Jl. Pattimura 20, Kebayoran Baru, Jakarta

ATTENDANCE SHEET

Meeting Invitation : Jragung Dam (Final Design)

Day and Date : Thursday, August 24, 1978

Time : 10.00 AM

Chairman : Ir. Oesman Djojoadinoto

No.	Name	Occupation	Office
1	Ir. Oesman Djojoadinoto	Director Irrigation	Directorate Irrigation
2	Ir. Soewasono	General Manager	PROSIDA
3	Ir. Gatot Soenarjo	Assistant Director	Directorate Irrigation
4	Ir. Bambang Soedjono	Project Manager	Jratunseluna Project
5	Much. Jiddin	DJH	PLN
6	Koesaeni	DDG	PLN
7	Ir. Moch. Memed	Chief of Hydraulic Section	DPMA
8	Drs. Erman Mawardi	Technic Staff	DPMA
9	Ir. E.A. Wahab M.Sc	Engineer	Direktorat Bina Program Pengairan - P3SA
10	Ir. Ruchyat	Engineer	Direktorat Bina Program Pengairan - P3SA
11	Ir. David Sulaiman	Technical Assistant	PROSIDA
12	Bambang Sigit	Second Section	Directorate Irrigation
13	Prawito Said	Perintal Staff	DGWRD
14	Carlos A. Borinelli	Dam Designer	ECI
15	Jeffery Frey	Specification Engineer	ECI
16	Robert McLaughlin	Structures	ECI
17	Maryono Bony M.E.	Jragung Proyek Engineer	Jratunseluna
18	Eddi S.K.	Civil Engineer	U.S. AID
19	Paul Thorn	Project Officer	U.S. AID
20	Saeed A. Rana	Resident Manager	ECI

SECTION II

PERSONNEL

A. EXPATRIATE

1. At Semarang on June 30, 1978

Saeed A. Rana	Resident Manager
Carlos A. Borinelli	Materials and Dam Engineer
Robert G. McLaughlin	Structural Engineer
Jeffery P. Frey	Specification Engineer
Glen Trowbridge	Principal Design Engineer

2. Arrived in Semarang during July 1 - September 30, 1978

M.K. Kuehl	Chief Engineer and Vice President
S.F. Hillis	Materials and Dam Design Engineer
Mr. P. Strauss	Chief Engineering Geologist
Dr. H.W. Burke	Consultant Geologist

3. Departed from Semarang during July 1 - September 30, 1978

M.K. Kuehl	Chief Engineer and Vice President
S.F. Hillis	Materials and Dam Design Engineer
Mr. P. Strauss	Chief Engineering Geologist
Dr. H.W. Burke	Consultant Geologist
Glenn Trowbridge	Principal Design Engineer

4. At Semarang on October 1, 1978

Saeed A. Rana	Resident Manager
Carlos A. Borinelli	Materials and Dam Engineer
Robert G. McLaughlin	Structural Engineer
Jeffery P. Frey	Specification Engineer

B. COUNTERPART

1. Assigned Full Time as of September 30, 1978

Mr. Maryono Bony M.E.	
Ir. Wisnu Suharto	
Ir. Sudaryanto HS	
Drs. Redjiono	
Triyono B.E.	(Assistant Counterpart)
Sutardjo B.E.	(Assistant Counterpart)
Ir. Haryono Wardi	
Ir. Sudarno	
Ir. Supriyo	
Ir. Rustiyanti	(Assistant Counterpart)
Eddy Arifin	(Assistant Counterpart)
Buang Sukardjono	(assistant Counterpart)
Ir. Muhammad Ali	
Ir. Tri Hardono	
Djasriansyah Aht	
Harris BME	
Ir. Bambang Sujono	
Nursalim B.Sc	

C. TECHNICAL

During the period under report, the following technical personnel provided by the Proyek worked with the Consultant:

Mr. Mukiyat	Draftsman
Mr. Barleyanto	Draftsman
Mr. Bambang Prayitno	Draftsman
Mr. Aris Mudjianto	Draftsman
Mr. Baryono	Geology Field Supervision

D. ADMINISTRATIVE

On-Hand as of September, 1978

Mrs. Tan Ik Goen	Interpreter I
Miss Dra. Djoa Sioe Lan	Interpreter II
Miss Dra. L. Murtianingsih	Secretary
Miss Sri Anon	Clerk/Typist
Mr. Suhandi	Messenger

Dates of arrival and departure of the Consultant's resident staff, TDY Staff, the ministry personnel and the direct hire administrative personnel are given in Annexures I, II and III, respectively.

SECTION III

MEETINGS CONFERENCES AND MAJOR EVENTS

Date	Place	Event	Participation	Organization
July 4-5, 1978	Bandung	Spillway Model Test Runs and Discussion	Ir. Memed	DPMA
			Ir. Bambang, Mr. Bony Ir. Wisnu	Jratunseluna
			Rana Trowbridge	ECI
July 11, 1978	Jakarta	Discussion Project Matters	Mr. Nur	DGWRD
			Rana	ECI
July 25-26, 1978	Semarang	Dam Design Review Meetings	M.K. Kuehl S.F. Hillis S.A. Rana C.A. Borinelli	ECI
July 27-28, 1978	Damsite	Field Inspections	M.K. Kuehl S.F. Hillis S.A. Rana C.A. Borinelli J.E. Pyne	ECI
July 29-31, 1978	Semarang	Dam Design Review Meetings	M.K. Kuehl S.F. Hillis S.A. Rana C.A. Borinelli J.E. Pyne	ECI
August 5, 1978	Semarang	Dam Design Meeting	Ir. Bambang, Mr. Bony Mr. Takrim and staff	Jratunseluna Project
			Messrs. Rana, Kuehl, Borinelli and Frey	ECI
August 8, 1978	Jakarta	Discussions Project Matters	Drs. M. Nur	DGWRD
			Rana	ECI
August 14-15, 1978	Bandung	Discussions Spillway Model Testing	Staff	DPMA
			Kuehl, Rana	ECI

Date	Place	Event	Participation	Organization
August 16, 1978	Jakarta	Discussions Project Designs and Related Matters	Ir. Oesman Djojoadinoto	DGWRD
			Ir. Bambang	Jratunseluna Project
			Messrs. Grayson Thorn	U.S. AID
			Messrs. Kuehl, Rana	ECI
August 24, 1978	Jakarta	Meeting Project Designs and Reservoir Sedimentation Problem	Ir. Oesman Djojoadinoto	DGWRD
			Ir. Soewasono	PROSIDA
			Ir. Bambang Mr. Bony	Jratunseluna Project
			Ir. Moh. Memed	DPMA
			Messrs. Moh. Jiddin and Koesaeni	PLN
			Staff	DGWRD
			All Staff	ECI
August 29, 1978	Semarang	Discussion Project Matters	Messrs. Thorn and Eddy	U.S. AID
			Rana	ECI
August 30, 1978	Semarang	Discussion Project Matters	Ir. Bambang	Jratunseluna Project
			Rana	ECI
September 11-15, 1978	Semarang/ Damsite	Seismic Refraction Testing Penawangan Borrow Area	Mr. Bunbun Djajanggadiredja and Party	Caterpillar
			Mr. C.A. Borinelli	ECI
September 13, 1978	Semarang	Discussion Irrigation Service Areas Jratunseluna	Mr. Takrim Mr. Maryono	Jratunseluna Project
			Rana	ECI

Date	Place	Event	Participation	Organization
September 14, 1978	Semarang	Discussion Spillway Model Testing	Ir. Memed	DPMA
			Rana	ECI
September 16, 1978	Semarang	Discussion Jratunseluna Basin Development Project and Water Resources Development	Ir. Martopo, Ir. Bambang Ir. Gayo	Jratunseluna
			Dr. M. Albertson	CSU Fort Collins
			Rana	ECI
September 27, 1978	Semarang	Discussion Project Designs	Dr. H.W. Burke, Mr. P. Strauss	Geologist Consultant ECI
			Rana Borinelli	ECI

In addition to the above mentioned events, regular field trips were made to the Project area and the damsite by the Consultant's resident and TDY staff at Semarang.

SECTION IV

PROGRESS REPORT BY ACTIVITIES

A brief description of work being done in the major fields of activity on the Project was given in Section I. A detailed description of the work involved and the progress achieved during the period under report are given in the following.

A. Structural Design

Structural Design Work continues to progress despite some problem causing revisions. All of the appurtenant structures have been designed and are now in various drawing stages of either a contract document or a construction drawing.

Spillway

The model testing of the DPMA laboratories in Bandung continues at the time to accomodate certain changes as follows; the Chief Engineer from ECI Denver visited the model and suggested alterations to the flip and outlet conditions in order to make the flow at lower conditions more efficient and to investigate downstream scour conditions; also, the raising of the reservoir rim requires raising of the crest elevation and this too will be investigated for its effects on the model. The revised schedule for the entire spillway design completion is now the first part of November.

Diversion Tunnel

One other small change in the alignment of this structure was made during this past quarter; the large curvature of the alignment under the main portion of the dam was straightened at the suggestion of the dam design expert who visited the job in August. Although there were no major changes

due to this modification, much time was involved making the revisions that were necessary, both to the specification drawings and the construction drawings. The major portions of the structure have been layed out in construction drawing form and made ready for drafting. Any changes required resulting from the final dam section in this area can easily be incorporated in the layouts. There is a total of fifteen drawings required for these construction drawings; these comprise excavation drawings, concrete outline drawings and steel reinforcement drawings. Therefore, as of the quarter under report for this structure, the specification drawings have been completed, and the construction drawing layouts are complete but have got to be drafted. This drafting work should be completed during the next quarter.

Tuntang Diversion

The final design work was completed on these works and it has been reviewed by the Chief Engineer from ECI Denver; his comments and changes have not as yet been incorporated due to the fact that more time was required for revision work on the Diversion Tunnel structure. However, at this time the scheduled date for completion of the Tuntang Diversion Specification Drawings, including the comments and changes from revieus, is the end of October, after this work will begin on construction drawings. It has been estimated that approximately seventeen drawings will be required to complete the Tuntang Diversion structures, plus mechanical drawings. These of course will include excavation, concrete outline, and reinforcement drawings for the weir retaining walls, the inlet and sluiceway structures, the gate structure, the cut and cover sections and the portals and outlet structures. This work would not include revisions due to any changes resulting from studies of the effects of the raising of the reservoir water level elevation on the Tuntang Diversion Works.

Power and Irrigation

Although the specification drawings are complete for the power tunnel structures and powerhouse, construction drawings have not as yet begun because of work on other structures where revisions were required. Construction drawing work on this structure will be divided into two phases; the first will comprise the morning-glory type intake structure, the tunnel, and the outlet portal and channel area, and the second will comprise the powerhouse itself. However, this work will not commence until after that work on the Tuntang Diversion Works and the Spillway has been completed.

B. Dam Design

Geotechnical Damsite Subsurface Exploration Program

The subsurface exploration program has been completed. A total of 49 deep borings were performed. The total depth drilled is 1,554.12 meters.

Embankment Borrow Areas Drilling Subsurface Exploration Program

This program also has been completed. Five large borrow pits were investigated. A total of 44 deep borings were performed. The total depth drilled is 847.16 meters.

Foundation Materials Testing

The damsite local foundation material testing has been completed. Some overseas testing is still underway. Additional twenty one foundation undisturbed Pitcher samples were sent overseas for special Soil Mechanics testing.

Borrow Areas Materials Testing

All the local testing has been completed. Some special Soil Mechanics testing is still underway overseas.

Concrete Materials Testing

All the testing is being done in DPMJ Construction Laboratory in Bandung according to a testing program prepared by the Consultant.

Design

Design has been performed concerning the main dam, the dike, reservoir rim low area and drainage gallery.

Review of Design

The design has been reviewed by Mr. Max K. Kuehl, ECI Vice President and Chief Engineer and Mr. Sidney Hillis. The reviewer of the design brought with them to Indonesia the first reports of Overseas Soil Testing performed by Thurber Laboratory Ltd. and Soil Consultants, Inc. Laboratory.

According to the foundation testing performed so far by Thurber Laboratory, the residual shear strength of the foundation claystone is very low. For this condition the coefficient of internal friction is only 8 degrees, considerable lower than expected. This will require higher and longer upstream berms than originally assumed.

Besides, the embankment material testing showed that the strength of the core material is somewhat lower than expected. This will need to have a little flatter slopes in the embankment.

In addition, it was decided because of other consideration to raise the height of the dam from Elevation +130 to Elevation +135.

At this final stage, because of all the above given considerations, the layout of the dam is undergoing some slight modifications.

Final Report

The preparation of the final report is underway.

C. Specifications

During the third quarter of 1978, the major concern of the specification work continued to be preparation of contract documents for the River Diversion Works Contract. Revisions of the contract document drawings necessitated by a change in alignment decided upon in August were carried out during August and September. The revised set of drawings will be submitted for final approval and the signatures of the Proyek authorities during the first week of October. Following approval the originals will be reproduced for publication by photographic reduction and copying by offset printing.

An advance draft copy of the Bidding Form and Conditions of Contract for the River Diversion Works contract documents was submitted to the Proyek on September 22, 1978. This latest draft of Conditions replaces that previously submitted to all the concerned agencies in February 1978. As directed by PROSIDA, the form which the Conditions now take follows the contract documents approved for the New Rentang Barrage and Appurtenant Works Contract. Additional copies of the final draft of Bidding Form and Conditions of Contract are being prepared and will be submitted for review and approval to PROSIDA and U.S. AID by mid-October.

Technical Specifications sections for the main civil work contract, "Jragung Dam and Power Plant", and the electrical and mechanical supply and install contracts for the Power plant, switchyard and 20 kV distribution line are being compiled in the Semarang office with assistance from the Denver office. A draft of the technical specification sections for the contract, "Furnish, Deliver and Install Power Plant Electrical Equipment" along with the electrical design criteria was submitted to the Proyek, PROSIDA, Director Irrigation and U.S.AID on July 10, 1978

During the month of July, an initial Engineer's Estimate was prepared for the Jragung Dam Project. The estimate includes all features of the dam, power plant, spillway, diversion works, Tuntang River Diversion facilities, access roads and base camp. A summary of the initial Engineer's Estimate was presented in the July Monthly Progress Report.

SECTION V

PREPARATION OF REPORTS

The schedule of submittals and the current status of all the reports required to be prepared by the Consultant is stated in the following:

Name of Report	Date due	Status	Date Submitted
1. Inception Report (draft)	May 15, 1977	Completed	May 12, 1977
2. Final Design Report (draft)	November 15, 1978		
3. Final Completion and Engineering Report on Construction Contracts	March 15, 1979		
4. Monthly Progress Reports	10th Day of the following month	Schedule being met	
5. Quarterly Progress Reports	20th Day of the following month	Schedule being met	
6. General Design Criteria Civil Works			July 8, 1977
7. Appendix I to (6) Dam and Dikes Design Criteria			August 1, 1977
8. Advance Notice of Intent to Invite Bids and Pre-qualification Instructions		Draft	January 25, 1978
Submitted Revised Draft			March 15, 1978
Submitted 130 copies		Final	June 1, 1978
9. Contract Documents River Diversion Works		Draft	February 23, 1978
Revised Bill of Quantities and Drawings			June 8, 1978
Revised Contract Documents as per PROSIDA - Advance Draft Copy			September 22, 1978

Name of Report	Date due	Status	Date Submitted
10. Technical Specifications and Drawings Access Roads and Bridge		Draft	March 13, 1978
11. Drawings Irrigation and Power Tunnel and Powerhouse			June 14, 1978
12. Electrical Design Criteria and Specifications of Electrical Equipment		Draft	July 10, 1978
13. Jragung Dam Project - Design Status Report			August 9, 1978
14. Jragung Dam Project - Upper Watershed Management Report		Draft	August 7, 1978

SECTION VI

PROBLEM AREAS

None.

SECTION VII

FINANCIAL

Dollar Accounts

Due to the reasons explained in monthly progress report No. 2, the Dollar accounts are being reported for the period up to the end of the month of August, 1978. The expenditure to that date as well as the budget amounts are shown in Annecure IV included in the report.

Rupiah Accounts

Up to the end of the month under report, a total amount of Rp. 31,445,733.- was expended. This represents 44.43 percent of the total Rupiah reimbursable costs provided in the Contract. The corresponding percentage of the contract elapsed is 77.08.

The summary of the Rupiah budget and costs is given in Annexure V.

Annexure I

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978

Assignment of Resident and TDY Staff

NAME	NATIONALITY	JOB TITLE	PROJECT ASSIGNMENT		MANMONTHS IN INDONESIA	
			ARRIVAL	DEPARTURE	SCHEDULED	ACTUAL
1. Saeed A. Rana	Permanent Resident U.S.A.	Resident Manager	March 16, 1977		24	18.5
2. James E. Rollins	U.S.A.	Geologist	March 16, 1977	June 30, 1977	3.5	3.5
3. Robert McLaughlin	U.S.A.	Structural Design	April 5, 1977		23	17.9
4. Carlos Borinelli	Permanent Resident U.S.A.	Materials and Dam Design Engineer	June 4, 1977		18	15.9
5. James E. Pyne	U.S.A.	Resident Geologist	September 1, 1977	May 1, 1978	8.5	
			May 21, 1978	June 4, 1978		8.5
6. Jeffery P. Frey	U.S.A.	Specifications Engineer	December 18, 1978		12	9.45
7. Glenn Trowbridge	U.S.A.	Design Engineer	February 7, 1978	July 20, 1978	18	5.40
8. James Hoge	U.S.A.	Design Engineer	March 23, 1978	June 20, 1978		3.00

Annexure I
(Continued)

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978

Assignment of Resident and TDY Staff

NAME	NATIONALITY	JOB TITLE	PROJECT ASSIGNMENT		MANMONTHS IN INDONESIA	
			ARRIVAL	DEPARTURE	SCHEDULED	ACTUAL
9. E.B. Bartel	U.S.A.	Design Engineer	November 12, 1977	December 20, 1977		
			May 4, 1978	May 13, 1978		
			July 8, 1978	July 14, 1978		1.83
10. Cecil M. Langford	U.S.A.	Project Sponsor	August 6, 1977	August 12, 1977	1.5	
			January 23, 1978	January 31, 1978		0.52
11. M.K. Kuehl	U.S.A.	Chief Engineer	June 27, 1977	July 2, 1977	1.5	
			February 4, 1978	February 12, 1978		
			July 25, 1978	August 16, 1978		1.25
12. Paul Otter	U.S.A.	Project Engineer	March 16, 1977	March 18, 1977	1.5	
			March 1, 1978	March 4, 1978		0.23

Annexure I
(Continued)

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978

Assignment of Resident and TDY Staff

NAME	NATIONALITY	JOB TITLE	PROJECT ASSIGNMENT		MANMONTHS IN INDONESIA	
			ARRIVAL	DEPARTURE	SCHEDULED	ACTUAL
13. Peter Strauss	U.S.A.	Chief Geologist	March 16, 1977	March 18, 1977	4	
			June 13, 1977	July 1, 1977		
			February 4, 1978	Februray 7, 1978		
			May 21, 1978	June 4, 1978		
			September 25, 1978	September 28, 1978		1.63
14. William Wenger	U.S.A.	Electrical Engineer	March 16, 1977	March 21, 1977	4	0.50
15. Ralph Goodrich	U.S.A.	Electrical Engineer	January 20, 1978	February 15, 1978		0.90
16. Lawrence Boval	U.S.A.	Electrical Engineer	June 15, 1978	June 25, 1978		0.37
17. M.A. Stevens	Canada	River Regime Sediment Specialist	March 20, 1977	March 23, 1977	3	
			October 21, 1977	December 15, 1977		
			March 20, 1978	May 20, 1978		3.30

Annexure I
(Continued)

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Assignment of Resident and TDY Staff

NAME	NATIONALITY	JOB TITLE	PROJECT ASSIGNMENT ARRIVAL	PROJECT ASSIGNMENT DEPARTURE	MANMONTHS IN INDONESIA SCHEDULED	MANMONTHS IN INDONESIA ACTUAL
18. W. Stevens	U.S.A.	Surveyor	April 4, 1977	May 31, 1977	7.5	
			August 1, 1977	January 15, 1978		7.25
19. S.F. Hillis	Canada	Chief Materials	June 26, 1977	July 18, 1977	3	
			February 2, 1978	February 12, 1978		
			July 23, 1978	August 3, 1978		1.55
20. Robert Campbell	U.S.A.	Assistant Chief Engineer	November 7, 1977	November 10, 1977		
			November 28, 1977	December 12, 1977		0.63
21. John Ismert	U.S.A.	Chief Mechanical	January 27, 1978	February 12, 1978	4	0.77
22. Dr. H.W. Burke	U.S.A.	Geologist Consultant	February 4, 1978	February 12, 1978		
			September 25, 1978	September 28, 1978		0.43
23. Mr. H.C. Fletcher	U.S.A.	Watershed Management	March 31, 1978	June 1, 1978	3	2.1

Annexure II

JRAGUNG DAM PROJECT

Engineering Consultants, Inc.

Quarterly Progress Report No. 6
Period: Ending September 1978

Assignment of Counterparts and Technical Personnel

NAME	EXPERTISE	WORK ASSIGNMENT	PROJECT ASSIGNMENT DATES STARTING	PROJECT ASSIGNMENT DATES ENDING	MAN MONTHS WORKED
Counterparts					
1. Ir. Martopo	1. Project Management 2. Project Planning	November 1, 1975	March 16, 1977		18.5
2. Ir. Bambang Soedjono	1. Project Management 2. Project Planning	November 1, 1975	March 16, 1977		18.5
3. Maryono Bony M.E.	1. Project Planning 2. Dam Design Engineer	November 1, 1975	March 16, 1977		18.5
4. Ir. Wisnu Suharto	Hydraulic Structures	November 1, 1975	March 16, 1977		18.5
5. Ir. Soedaryanto Hs.	Geologist	January 1, 1977	March 16, 1977		18.5
6. Drs. Redjiono	Hydrologist	January 1, 1977	March 16, 1977		18.5
7. Susanto B.Sc	Geologist	November 1, 1975	March 16, 1977	March 31, 1977	0.5
8. Ir. Sudarno	Civil Structures Engineer	March 16, 1977	March 16, 1977		18.5
9. Ir. Muhammad Ali	1. Dam Design Engineer 2. Soil Mechanics/Material	January 1, 1976	March 16, 1977		18.5

Annexure II
(Continued)

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978

Assignment of Counterparts and Technical Personnel

NAME	EXPERTISE	WORK ASSIGNMENT	PROJECT ASSIGNMENT DATES STARTING	ENDING	MAN MONTHS WORKED
10. I. Soedjono BEE	Electrical Engineer	March 16, 1977	March 16, 1977		18.5
11. Djasriansyah Aht	Electrical Engineer	March 16, 1977	March 16, 1977		18.5
12. Ir. Hartopo	Hydro Power Engineer	March 16, 1977	March 16, 1977		18.5
13. Harris BME	Mechanical Engineer	March 16, 1977	March 16, 1977		18.5
14. Ir. Supriyo	Specification Engineer	September 16, 1977	September 16, 1977		12.5
Assistant Counterpart					
1. Triyono BE	Geologist	June 1, 1976	March 16, 1977		18.5
2. Sutardjo BE	Geologist	December 1, 1976	March 16, 1977		18.5
3. Bambang Gunadi B.Sc	Hydrologist	January 1, 1976	March 16, 1977	November 1, 1977	7.5

Annexure II
(Continued)

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978

Assignment of Counterparts and Technical Personnel

NAME	EXPERTISE	WORK ASSIGNMENT	PROJECT ASSIGNMENT DATES STARTING	ENDING	MAN MONTHS WORKED
4. Ir. Tri Hardono	Dam Design Engineer	March 16, 1977	March 16, 1977		18.5
5. Ir. Rustiyanti	Hydraulics Structures	March 16, 1977	March 16, 1977		18.5
6. Buang Sukardjono	Hydrologist	January 1, 1977	March 16, 1977		18.5
7. Edy Arifin Aht	Civil Structures	April 1, 1976	March 16, 1977		18.5
8. Ir. Diah Kusumawati	Hydro Power Engineer	December 1, 1976	June 30, 1978		4.5
Draftsmen					
1. Mukiyat	Draftsman	March 1, 1976	March 16, 1977		18.5
2. S.V. Barleyanto	Draftsman	November 1, 1975	March 16, 1977		18.5
3. Bambang Prayitno	Draftsman	February 1, 1976	March 16, 1977		18.5
4. Aris Mudjiamto	Draftsman	December 16, 1977	December 16, 1977		18.5

Annexure III

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978

Direct-hire Indonesian Personnel

NAME	POSITION	PERIOD OF SERVICE		MAN/WOMAN MONTHS	
		DATE STARTED	DATE ENDED	PROVIDED	SPENT
1. Mrs. Tan Ik Goen	Interpreter/Translator I	March 16, 1977		24	18.5
2. Miss Dra. Djoa Sioe Lan	Interpreter/Translator II	May 16, 1977		24	16.5
3. Mrs. Ariati Haryono	Secretary I	March 16, 1977	July 31, 1977	24	4.5
4. Miss Dra. L. Murtianingsih	Clerk/Typist	March 16, 1977	April 30, 1977	24	1.5
	Secretary	May 1, 1977			17.0
5. Mrs. Sri Moenasih Soetikno	Clerk/Typist	March 16, 1977	July 31, 1977	24	4.5
	Secretary	August 1, 1977	September 20, 1978	19.5	14.0
6. Miss Sri Anon	Clerk/Typist	March 16, 1977		24	18.5
7. Mr. Suhandi	Messenger	March 16, 1977		24	18.5

Annexure IV

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending August 1978

Summary of U.S. Dollar Expenditures

COST ITEMS	AMOUNT AVAILABLE US $	EXPENDITURE PRIOR	EXPENDITURE DURING PERIOD	EXPENDITURE UP TO DATE	PERCENTAGE EXPENDITURE	PERCENTAGE TIME ELAPSED
1. Resident Staff Base Salaries	181,360.00	105,804.38)				
2. Overseas Differential	45,340.00	26,419.43)				
3. Overhead Resident Staff (75% base salaries)	136,020.00	79,461.68)				
4. TDY & Denver Staff Salaries Including Overseas Differential	215,250.00	193,574.34)				
5. Overhead TDY & Denver (95% base salaries)	196,365.00	183,895.59)	103,888.72	693,044.14	89.50	72.92
6. Fixed Fee	138,000.00	80,500.00	15,525.00	96,025.00	69.58	
7. Travel and Per Diem	73,120.00	39,711.87)				
8. Transportation (Relocation)	12,000.00	11,150.00)				
9. Other Direct Costs & Miscellaneous Expenses	53,800.00	41,156.84)				

Annexure IV

Continued

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending August 1978

COST ITEMS	AMOUNT AVAILABLE US $	EXPENDITURE PRIOR	EXPENDITURE DURING PERIOD REPORTED	EXPENDITURE UP TO DATE	PERCENTAGE EXPENDITURE	PERCENTAGE TIME ELAPSED
10. Ministry Personnel	60,000.00	30,514.62)				
11. Special Purchases	190,000.00	140,530.89)	48,028.56	311,092.78	79.99	72.92
12. Contingencies	70,000.00	-	22,932.32	22,932.32	32.76	
Total Dollar Costs	1,371,255.00	932,719.64	190,374.60	1,123,094.24	81.90	72.92

Annexure V

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978
Summary of Rupiah Expenses

COST ITEMS	BUDGET ALLOCATION (Rp.)	EXPENDITURE PRIOR	EXPENDITURE PERIOD REPORTED	EXPENDITURE TO DATE	PERCENTAGE EXPENDITURE	PERCENTAGE TIME ELAPSED
I. PER DIEM						
Jakarta	3,300,000.-	1,774,000	288,750	2,062.750	62.51	77.08
Bandung & Semarang	18,000,000.-	5,210,000	465,000	5,675,000	31.53	
Other	1,800,000.-	615,650	15,000	630,650	35.04	
Family	230,000.-	80,000	-	80,000	34.78	
Sub Total	23,330,000.-	7,679,650	768,750	8,448,400	36.21	
II. OTHER DIRECT COSTS						
Cable & Telephone	2,000,000.-	978,889	197,994	1,176,883	58.84	
Postage	1,500,000.-	395,120	81,410	476,530	31.77	
Reproduction & Printing	15,000,000.-	4,168,640	951,652	5,120,292	34.14	
In Country Transportation	2,700,000.-	1,639,751	353,275	1,993,026	73.82	
Supplies & Materials	6,000,000.-	1,173,605	265,400	1,439,005	23.98	
Miscellaneous	6,800,000.-	2,080,567	3,143,883	5,224,450	76.83	
Sub Total	34,000,000.-	10,436,572	4,993,614	15,430,186	45.38	77.08

Annexure V

Continued

JRAGUNG DAM PROJECT

Quarterly Progress Report No. 6
Period: Ending September 1978

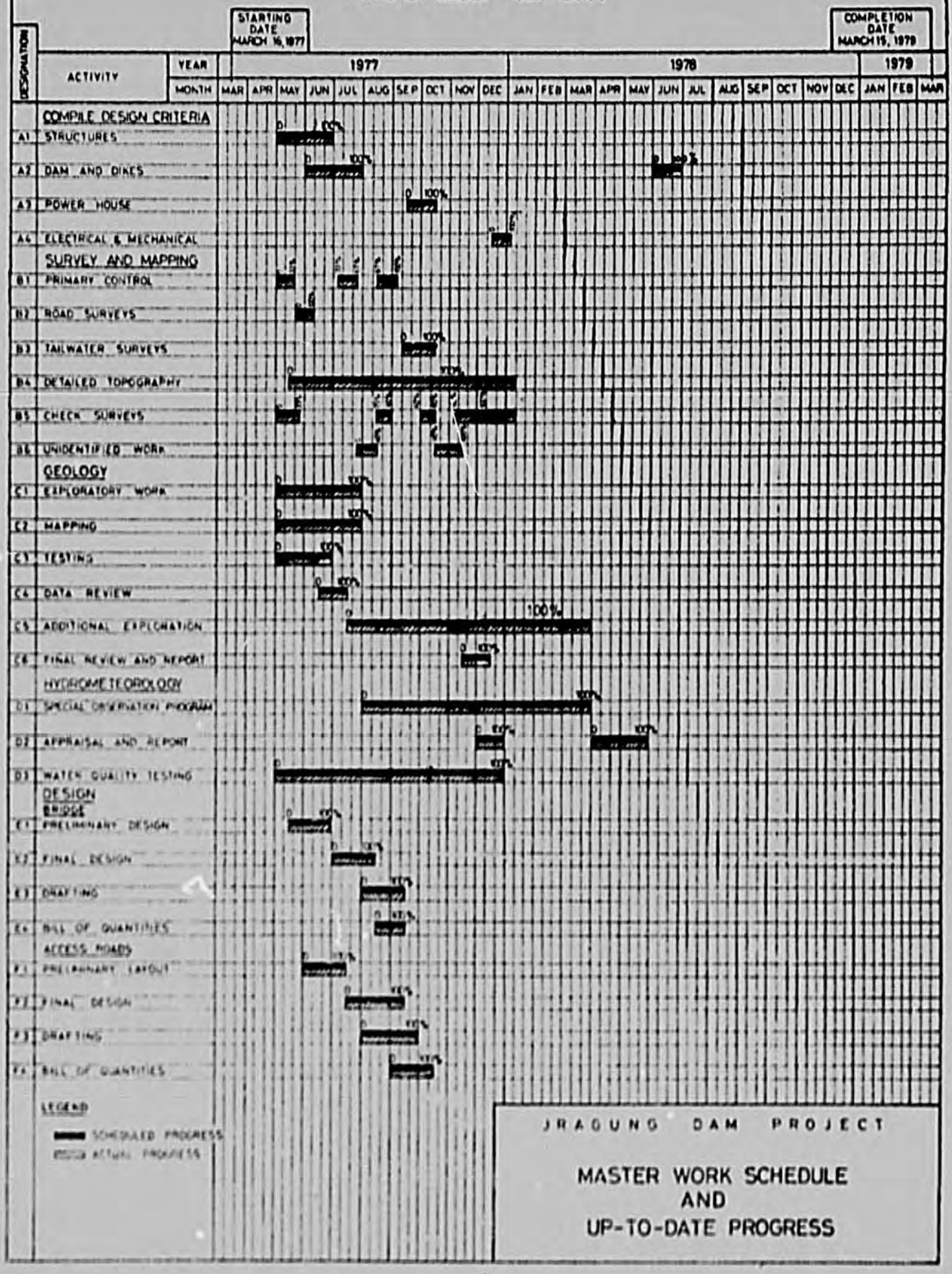
Summary of Rupiah Expenses

COST ITEMS	BUDGET ALLOCATION (Rp.)	EXPENDITURE PRIOR	EXPENDITURE PERIOD REPORTED	EXPENDITURE TO DATE	PERCENTAGE EXPENDITURE	PERCENTAGE TIME ELAPSED
III. ADMINISTRATIVE PERSONNEL						
Secretaries	3,610,500.-	2,024,996	454,168	2,479,164	68.67	
Interpreters	6,017,500.-	2,660,936	610,776	3,271,712	54.37	
Clerks/Typists	2,402,000.-	1,330,092	221,427	1,551,519	64.59	
Messenger	373,500.-	172,962	41,790	214,752	57.50	
Severance Pay	1,037,500.-	-	50,000	50,000	4.82	
Sub Total	13,446,000.-	6,188,986	1,378,161	7,567,147	56.28	
Grand Total	70,776,000.-	24,305,208	7,140,525	31,445,733	44.43	77.08

SUMMARY OF REIMBURSEMENT

Rupiah Payments Received by Consultant from Ministry up to the end of Report Period	=	35,685,381
Rupiah Expenditure by Consultant Approved for Reimbursement	=	31,445,733
Balance	=	4,239,648

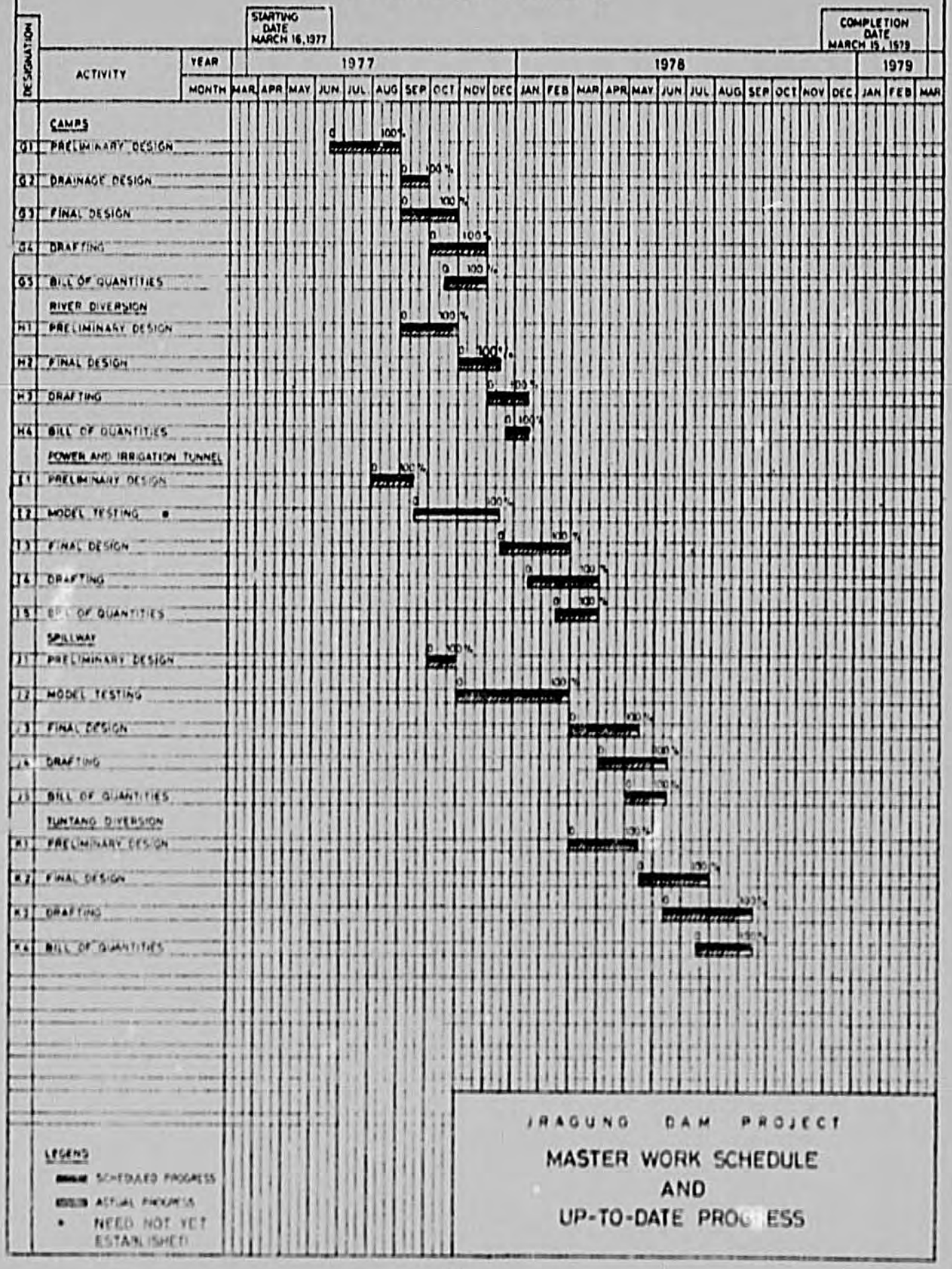
JRAGUNG DAM PROJECT
PROGRESS REPORT



JRAGUNG DAM PROJECT

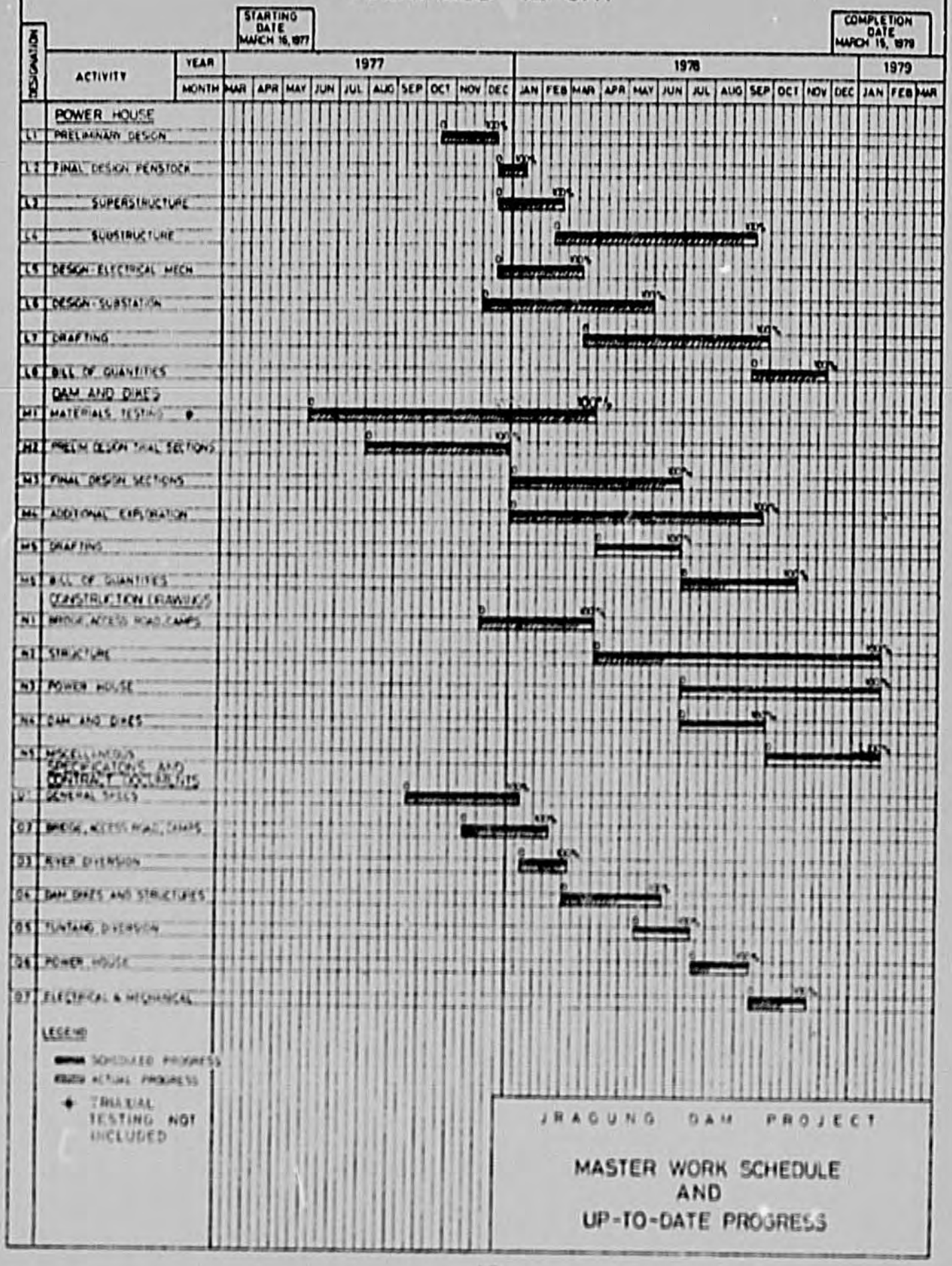
MASTER WORK SCHEDULE
AND
UP-TO-DATE PROGRESS

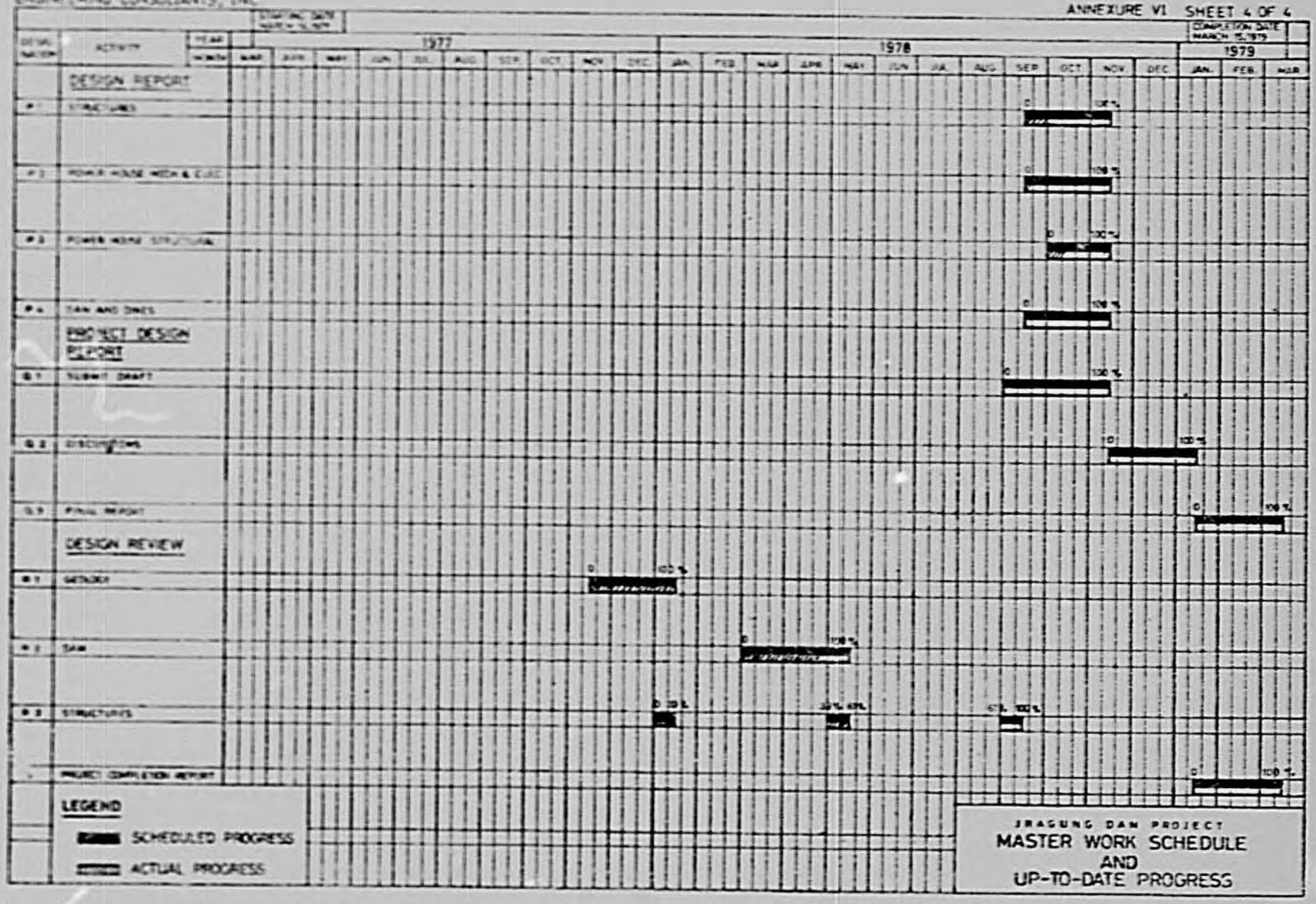
JRAGUNG DAM PROJECT
PROGRESS REPORT



ANNEXURE VI

JRAGUNG DAM PROJECT
PROGRESS REPORT



ENGINEERING CONSULTANTS, INC.

ANNEXURE VI SHEET 4 OF 4