



MINISTRY OF PUBLIC WORKS AND ELECTRIC POWER
DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
DIRECTORATE OF IRRIGATION
AND PROS'IDA

JRAGUNG DAM

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

MONTHLY PROGRESS REPORT

No. 14

APRIL 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
Jl. Pattimura 20/7
Kebayoran Baru
Jakarta Selatan*

May 20, 1978

*Attention: In. Oesman Djojoadinoto
Director Irrigation.*

*Our file: 1196/MR/14
191/78*

*Subject : Monthly Progress
Report No. 14.*

Dear Sir:

We submit herewith fifteen (15) copies of the Monthly Progress Report No. 14 for the month of April, 1978. The report is prepared in pursuance of Section 10.15 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.

*cc. U.S. AID Jakarta
(Attention: Mr. P. Thorn)
with eight (8) copies of
the report.
ECI Denver (SD 161)
Project Manager
Jratunseluna Basin Project
General Manager PROSIDA
Ten (10) copies.
ECI Semarang.*

*Very truly yours,
Engineering Consultants, Inc.*

*Saeed A. Rana
Saeed A. Rana
Resident Manager.*

SAR/ m.

JRAGUNG DAM PROJECT

MONTHLY
PROGRESS REPORT
NO. 14

PERIOD
APRIL 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

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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, Republic of Indonesia, 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.

During the month under report, the design stage investigations for the dam and structures foundations progressed satisfactorily and are expected to be completed on schedule. Borrow area investigations in the field for embankment materials are essentially completed and for other materials are continuing. At the damsite, based on the geological, foundations and material investigations, layout for the main dam has been determined and further design of the section is in progress.

The events which took place, the actions which were initiated or completed and other points pertinent to the Project design are described in the following.

1. A meeting to explain the Project design concepts and the progress achieved to that date was held at Semarang on April 7. It was attended by authorities of the DGWRD from Jakarta, including the General Manager of PROSIDA, Project Officer of U.S. AID, the Project Manager and staff of the Jratunseluna Basin Project and all the expatriate staff of the Consultant. Each member of the Consultant team explained the particular job he has accomplished or was working on and how he planned to complete the final design. A copy of ECI Memo dated

April 12, 1978 containing summary of discussions held in the meeting is appended to this section of the progress report.

2. The survey and mapping field work required at the right abutment of the final alignment of the dam has been completed. It is now being plotted in the office. The remaining part of the miscellaneous surveys and other secondary mapping work are progressing on schedule. These are comprised mainly of the mapping at the Tuntang Diversion and in the borrow areas.

3. The geological investigation work has essentially been completed, except for some of the area where trenching is needed. The assignment of the Consultant's geologist terminated with effect from April 30. However, final review of geology and report writing have to be done by the Consultant's Chief Engineering Geologist during the next couple of months. At that time, the staff geologist will return to Jragung for a period of about two weeks to help finalize the investigation program. Before the arrival of the Chief Geologist, the remaining part of the trenching work should be completed so that all field data is available.

The drilling work is continuing at the dam foundations and in the borrow areas under the supervision of the Dam Design Engineer. All this work is expected to be completed by the end of June 1978.

A detailed description of progress in the geological exploration work is given in Section IV-A and for damsite drilling in Section IV-B of the Report.

4. It was stated in the last quarterly report that for the finalized alignment of the main dam, it had become necessary to re-locate the dive along tunnel and add a cut and cover section in part of the length of the conduit. The design of the River Diversion Works submitted earlier has accordingly

been revised and the revisions are being incorporated in the design drawings. The changed Volume II "Drawings" of the Contract Documents for the River Diversion Works will be submitted in the first week of June.

The construction drawings for the relocated access roads and the bridge have already been submitted to the Ministry and U.S. AID. The Consultant requests that these documents and those of the River Diversion Works be reviewed at an early date so that formal contract documents can be printed and submitted for issuance on schedule.

The proposed layout of the Base Camp (previously called Government Camp) has since been submitted by the Consultant. The review by the Consultant of the design of buildings prepared by the Proyek engineers has already been completed and a report sent to the Proyek. Both this part of the design and part of the new Access Road have to be finalized by the Proyek engineers. It should be noted that the preliminary contract actions have already been initiated and the contract documents must be drafted, reviewed and printed by the middle of July. The design, drafting and the printing work should, therefore, be expedited.

The final scheme of structure for the Spillway has been decided. According to this, at the new location stated in the previous progress report, there will be a one stage structure, rather than the two stage investigated earlier, originating from a bath tub crest and ending in a stilling basin close to the river channel. The concrete chute will be continuous between the inlet and the stilling basin and will have varying invert slopes to conform to the existing topography with minimum amount of excavation.

Plans and design layout of the Scheme described above have already been sent to the DPMA hydraulic laboratory at Bandung where the model testing is being conducted.

The design of the Irrigation and Power Tunnel and the Power House Civil Works have been completed at the specification level. These are being drafted and will be issued within the next two months. Work on the preparation of construction drawings will commence soon afterwards. It is hoped that local counterpart help will be available for the preparation of detailed construction drawings.

The design of the mechanical and electrical installations is currently in progress.

With the finalization of the location of the main dam axis, the major design activity remains concentrated on determining the required section of the dam which will be completed by the middle of September.

Work on the preliminary design of the Tuntang Diversion is currently in progress. The final alignment of the tunnel and the location of the diversion and outlet works have already been decided.

Detailed reports on progress achieved in the design of various components of the Project are given in Sections IV-B and IV-C of the Report.

5. Further investigation to determine the availability of sand and aggregate has been made and some additional sources at Muntilan, Kalasan, Weleri and Pandjangan are currently being examined. Investigations to determine the quantities and characteristics of rock in the form of boulders found in different borrow areas are continuing.

6. The special sediment measurement program which was initiated by Dr. Stevens, the Consultant's River Regime Specialist in October 1977 has gone through the first year of rainy season. Appraisal of data and study of sediment transport at the damsite have been started. A report on the results obtained will be submitted in due course of time. Related

to the same subject of erosion in the watershed and sedimentation in the reservoir, the Consultant through its Watershed Management Specialist, Dr. H. Fletcher has started study of the existing management practices in the Jragung Watershed. Based on this study, recommendations will be made to adopt measures by which excessive erosion of steep hill slopes of the watershed could be reduced.

7. The preparation of technical specifications and the contract documents is proceeding on schedule. The current activity is centered on the preparation of technical specifications for the Base Camp.

The BOQ rates for different items of the Project are currently being evaluated. These will be used in preparing the Engineer's estimate.

A detailed report on this activity is given in Section IV-D.

8. Two of the Consultant's principal design engineers, namely, Mr. Glenn Trowbridge and Mr. J. Hoge are working on TDY assignments at Semarang to complete the design of the Spillway and the Tuntang Diversion. It may be noted that these two assignments have been made in place of a Resident Design Engineer. The scheduled period of eighteen (18) months for that position is being used partly for the above said two TDY assignments and partly for the design of Civil Works of the Power House at Denver. It will also be used for any future TDY assignment required to complete the design work.

9. The fourth installment of Rupiah payment of Rp. 12,000,000.- is now due and the Consultant requests the payment of that. As of the end of April, the reimbursable Rupiah expenditure amounted to Rp. 19,934,854.- This does not include an amount of Rp. 1,065,000.- advanced to the Proyek for the shipment of soil samples to U.S.A. and other Project related works.

The reimbursable Dollar expenditure up to the end of March 1978, amounted to \$ 694.717.69.

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

To : Files
From : Saeed A. Rana

April 12, 1978

Our file : 1196/G/9
156/78

Subject : ECI-Proyek Meeting
No. 14

The fourteenth monthly ECI-Proyek meeting was held on April 7, 1978 in the Jratunseluna office committee room. The attendance was the following.

Saeed A. Rana	ECI	Ir. Martopo	Proyek
Carlos A. Borinelli		Ir. Bambang Soedjono	
Robert McLaughlin		and Counterparts	
Jeffery Frey			
James E. Pyne		Ir. Soewasono	PROSIDA
Glenn Trowbridge		Ir. David Suleiman	
G.J. Hoge			
Michael A. Stevens		Mr. Paul Thorn	U.S. AID
H.C. Fletcher			

A brief summary of discussions held, comments made and the decisions arrived at is given in the following.

1. The final alignments of the dam embankment and structures were presented. The axis of the main dam embankment has been moved upstream, in front of the narrow part of the ridges, so that an impervious blanket is formed over the faulted abutment ridges.

2. The river diversion tunnel alignment has been shifted downstream, toward the center of the dam embankment. Previously, the tunnel was aligned beyond the limits of the dam embankment, cutting through the right abutment ridge upstream of a major fault. The new dam alignment would have placed the diversion tunnel well within the limits of the dam embankment and required a substantial increase in the length. The final alignment of the diversion tunnel, as presented in the meeting, reduces the length to a 260-meter cut and cover conduit section and a 168-meter tunnel section.

The realignment of the dam embankment and diversion tunnel is based on the findings of the Consultant's review team visit in February. The review team, comprised of Messrs. Kuehl, Burke, Strauss and Hillis, made further site reconnaissance, studied the aerial photographs and reviewed the latest geological information in making their recommendations. The Consultant feels that the changes will minimize structural problems and also result in economical designs.

3. Three alternatives are being considered in the final design of the spillway. Each is a two-stage scheme designed to handle the probable maximum flood of 1,350 cubic meters per second. Alternative 1 has a curved alignment with straight upper crest. Alternatives 2 and 3 follow the same straight alignment; Alternative 2 has a straight upper crest while Alternative 3 utilizes a double side channel, or bath-tub type crest. The lower crest and chute are the same for the three alternatives. The present cost analysis favors Alternatives 2 and 3 slightly but the results of the model studies being performed in Bandung are required before a final selection can be made. Minor dikes to Elevation 130 meters on both sides of the upper spillway crest are required in every case.

4. An alternate power house and power and irrigation tunnel alignment has been considered but proved to have no advantage over the original alignment. Therefore, the power house and power and irrigation tunnel alignment remain essentially unchanged.

5. An explanation was given as to why the river diversion tunnel and the power and irrigation tunnel cannot be combined into one. The reasons given were :

(1) The power and irrigation tunnel must be designed as a pressure tunnel. To construct the required four-meter diameter diversion tunnel for pressure flow conditions would be too costly.

(2) There is no suitable site for the power house anywhere in the area of the diversion tunnel outlet.

(3) The foundation conditions in the area of the diversion tunnel inlet are unsuitable to support the power and irrigation intake structure.

(4) An additional five meters of head is gained by placing the power and irrigation tunnel through the left abutment; the river is very steep in the vicinity of the damsite. There is no suitable diversion site through the left abutment.

6. The total length of boreholes drilled thus far for the foundation investigation is 3,668 meters. A drilling program has been established which requires an additional 450 meters of drilling in 12 borings. The program will continue through June.

7. Exploration of the Penawangan Borrow Pit is continuing. It is now estimated that the area can yield up to 10 million cubic meters of embankment material including substantial quantities of riprap. The Penawangan area is only 4 kilometers upstream from the damsite. Previously, it was expected that all of the embankment material needs would come from Borrow Area VII, 7.5 kilometers from the damsite.

8. The question of permeability of the foundation and the anticipated requirements of the grouting program was raised. The permeability of the foundation is estimated to be 10^{-4} to 10^{-6} centimeters per second, but this depends largely on local conditions. The six months of grouting work to be done on the river diversion works should be very revealing and will help to define the grouting needs for the dam construction. The Consultant will provide detailed recommendations for the grouting program in the final design report.

9. Final designs, specifications and construction drawings for the access roads and bridge are now complete. The final designs and specifications for the Government camp are underway and scheduled to be completed by the middle of May.

10. The sedimentation sampling program has continued uninterrupted since November, 1977. Dr. M.A. Stevens, ECI's River Regime Specialist, is presently at work in the Semarang office compiling and analyzing the results of the 1977-78 wet season sampling program. His final report will be submitted before the middle of May.

11. Dr. H.C. Fletcher is also working in the Semarang office at this time. Dr. Fletcher, ECI's Watershed Management Specialist, outlined a multi-faceted program to be implemented by existing government agencies. The program emphasizes making effective use of the present organization and will include recommendation on technical steps to be taken for progressive land and water conservation in the Jragung watershed. If implemented, this program will reduce excessive erosion in the watershed and will help in reducing sediment inflow into the Jragung reservoir.

Saeed A. Rana

cc. ECI Denver (SD 112)
Project Manager Jratunseluna
Jragung Project Engineer
U.S. AID Jakarta
Attention : Mr. Paul Thorn
PROSIDA
ECI Staff

Saeed A. Rana
Resident Manager.

SAR/ m.

SECTION II
PERSONNEL

A. EXPATRIATE

1. At Semarang on March 31, 1978

Saeed A. Rana	Resident Manager
Carlos Borinelli	Materials and Dam Engineer
Robert McLaughlin	Structural Engineer
James E. Pyne	Resident Geologist
Jeffery P. Frey	Specification Engineer
Glenn Trowbridge	Principal Design Engineer
James Hoge	Principal Design Engineer
Dr. H. Fletcher	Watershed Management Specialist
Dr. M.A. Stevens	River Regime and Sediment Specialist

2. Arrived in Semarang during April, 1978

None

3. Departed from Semarang during April, 1978

James E. Pyne	Resident Geologist
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4. At Semarang on April 30, 1978

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

Dr. H. Fletcher
Dr. M.A. Stevens

Watershed Management Specialist
River Regime and Sediment Specialist

B. COUNTERPART

1. Assigned Full Time as of March 31, 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 Aht (Assistant Counterpart)
Buang Soekardjono (Assistant Counterpart)
Ir. Muhammad Ali
Ir. Tri Hardono (Assistant Counterpart)
Ir. Yusuf Gayo
Djasriyah Aht.
Ir. Diah Kusumawati
Harris BMF
Ir. Bambang Sujono

2. Assigned Full Time During April, 1978

None

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 April, 1978

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

<u>Plate</u>	<u>Date</u>	<u>Event</u>	<u>Participation</u>	<u>Organization</u>
April 7, 1978	Semarang	Consultant-DGWRD Meeting Explained Project Designs and progress.	Ir. Soewasono Ir. David Suleiman Ir. Martopo Ir. Bambang Counterparts Mr. Paul Thorn Resident Staff	PROSIDA Jratunseluna Proyek U.S. AID ECI
April 13, 1978	Tuntang	Visit to Jelok and Timo Power Plants	Rana Ir. Hartopo Djasriansyah	ECI PLN
April 15-16, 1978	Geboong	Administrative and Account Matters	Rana Rogers	ECI
April 19, 1978	Semarang	Meeting with PLN for determining operating procedures Tuntang power plants	Rana Gayo Engineers of Operation Section Semarang	ECI Jratunseluna Proyek PLN
April 24, 1978	Semarang	Discussion Project Matters	Rana Ir. Bambang Drs. Toto Sugianto	ECI Jratunseluna Proyek
April 27, 1978	Semarang	Discussion Ministry Personnel Training Program	Rana Ir. Bambang	ECI Jratunseluna Proyek

In addition to the above reported events, regular field visits were made by the Consultants' resident and TDY staff to the damsite and Project area.

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. Geology

A project meeting was held on April 7 where the semi final geologic maps were presented and the complex site geologic conditions discussed, particularly with regard to their effect on proposed engineering structures. In order to avoid time consuming and costly construction problems related to the presence of faulting, fracturing, shearing, and their indirect influence on permeability and slope stability, it was pointed out that the dam axis was being adjusted and revised alignments of the diversion and power tunnels were being studied. Also, a slight adjustment in the spillway arrangement was being considered.

Diversion Tunnel

A suggested revised alignment for the diversion tunnel was received from L.aver, Colorado early this month. A portion of the alignment was investigated by excavating and logging 5 new test pits. Detailed measurements of fracturing, shearing, and bedding were taken. Also, samples were retained for laboratory testing. In connection with the new tunnel alignment, some clean out work was completed in Trench No. 6. A geologic cross section accompanying geologic map for the revised tunnel location were transmitted to Denver on April 15.

Power and Irrigation Tunnel

A suggested revised alignment for the power and irrigation tunnel was also received from Denver this month. Some preliminary field work has been completed that indicates the alignment to be favorable, particularly with regard to construction in the tunnel outlet and power house area. It is anticipated that more detailed field work and drilling will be initiated during May and completed in June by the Chief Engineering Geologist.

Tuntang Diversion Tunnel

On April 19, a field trip was conducted with Mr. Hoge, ECI Design Engineer, for the purpose of inspecting the tunnel intake area. The foundation conditions that would be encountered in and across the Tuntang River were discussed. The presence of fracturing, shear zones, and probable faulting in the tunnel portal area were also pointed out. The optimum tunnel alignment has been selected by the design engineer and is presently being staked by the surveyors. Geologic investigations along the Tuntang side of the ridge are essentially complete; however, trenching and geologic mapping is needed on the Jragung side of the ridge.

Drilling

A third drill rig arrived at the site on April 17 and began drilling on April 24. Since the last monthly report period, the following borings have begun drilling or have been completed.

Boring No.	Drilling		Location	Depth
	Begin	End		
EC-36D	27-3-78	9-4-78	River Valley U/S of Dam Axis	30.52 m
EC-37D	1-4-78	13-4-78	River Valley U/S of Dam Axis	40.00 m
EC-39D	18-4-78	(drilling)	U/S Right Abutment	(40 m)
EC-40D	18-4-78	23-4-78	U/S Right Abutment	40.00 m
EC-41D	24-4-78	(drilling)	D/S Left Abutment	(30 m)
EC-38D	27-4-78	(drilling)	U/S Right Abutment	(40 m)

Trenching

Planned new trench excavation and clean out of existing trenches has fallen behind schedule.

Some trench work remains to be completed in the left abutment, along the Tuntang tunnel alignment, and in the relocated right abutment area. Most of the remaining trenching is located in areas of difficult terrain where two bulldozers should work together in the interest of safety and efficiency. It is strongly recommended that the bulldozer at the borrow area be repaired and moved back to the damsite as soon as possible. All the trenching work has been explained to the counterpart and must be completed before the arrival of Chief Engineering Geologist in May.

The ECI project geologist is scheduled to depart for the Karangsembung Project in Gombong at the end of April. With the Project's approval, he will return to Semarang for 2 weeks in May/June to assist Mr. Strauss, ECI Engineering Geologist from Denver, who will be supervising the remaining geology work.

B. Dam Design

Geotechnical Damsite Embankment Foundation Subsurface Exploration

Five more 45 degree angle borings have been drilled this month under the proposed embankment to determine the foundation conditions. The cores of five of the 45 degree angle borings drilled on the upstream embankment foundation area were inspected and relogged by the Dam Design Engineer.

Boring hole location EC-42D was selected in the downstream embankment foundation area. This boring is being drilled at the present. It consists of a 45 degree angle hole. The depth of this boring will be 50 meters measured along the 45 degree angle.

An additional vertical boring is being drilled on the right abutment with water pressure tests being performed.

According to the information obtained so far, the following materials were encountered in the foundation:

- a) closely jointed claystone moderately weathered to fresh,
- b) crushed material (Fault Gouge Material), low to highly plastic,
- c) highly fractured claystone,
- d) sandstone in some areas.

Additional borings could be required upstream and may be also at the downstream.

Samples were selected from the different materials encountered in the borings drilled lately. Some of the materials are being tested in the Proyek laboratory, where basic testing can be performed. Additional testing including unconfined compression, swelling-shrinkage, direct shear, etc., will be performed in other laboratories.

Embankment and Foundation Material Shearing Strength Testing

The second shipment to U.S.A. including embankment and foundation materials was picked up from the Proyek laboratory during the first part of April. All the samples were processed, basic testing performed, and ready to be sent overseas at the end of March.

Embankment and Foundation Materials Shearing Strength Testing Program

The testing program for the second shipment of materials, including testing instructions, was prepared and sent to Denver office.

Borrow Area Drilling Subsurface Exploration Program

Four borings have been drilled up to the present in Borrow Area VII by the Proyek rig. A total of 89 lineal meters were drilled.

A rig will be taken to Penawangan Borrow Area during the early part of May. This rig is owned by the damsite drilling contractor.

Dam Design

The latest layout of the dam was received from Denver Office. The layout was drafted on 1 : 2000 scale, embankment cross sections, and volume determinations were made.

Left Abutment Dike Design

The left abutment dikes, including blanketing of the approach channel area were designed for one of the spillway alternatives.

C. Structural Design

Structural Design program during period of this report is herein described in the following paragraphs.

The base camp community layout configuration submitted by Denver office has been reviewed by this office and comments on same were sent to Denver. At this same time a detailed quantities list and unit cost schedule is being developed and should be ready by the end of the next period. Comments on the plans for the various structures considered for use in the camp area have been given to project designers.

Within the period under consideration work on the spillway alternatives has been directed towards Alternative II only. (Alternative II was described along with the other two in the last quarterly report, March 1978). This is the most favored alternative by this office and therefore these design calculations are well underway. Model testing has been initiated but is not yet far enough advanced for any results.

The diversion tunnel design for the cut and cover section has been completed in Denver. The work on the tunnel portion, adapting the present set of plans to the new set of conditions, is being done at Semarang. This work should be completed during the early part of next month.

Work on the power house civil works continues in Denver with the ECI and project staffs working together. The drawings are expected to arrive at Semarang early next month.

Preliminary work on the Tuntang Diversion Works is well underway and various alternatives have been considered besides the feasibility design. The most favored design at this point in time, differs from the feasibility

report in two ways; first, the sandstone outcrop originally chosen for use as a location for the diversion weir is not suitable and therefore the weir location has been moved approximately fifty meters upstream; secondly the entrance to the tunnel is not from the sidewall of the overflow channel, but is on out and away from the side channel, situated in such a way that construction operations can occur on both the tunnel and channel-weir works simultaneously. Additional survey work has been ordered for the area in order to obtain more river cross sections and site access data. This survey work should be completed soon in the next month. With this more detailed design work can begin. The preliminary designs should be nearing completion by the middle of the next month.

D. Specifications

During the period under report, the specifications work has concentrated on the preparation of technical specifications for the Base Camp. The design of the buildings and related structures for the Base Camp is under the direction of the Project. The designs are in accordance with the current building practices in Indonesia. The technical specifications are referenced to Indonesian standard specifications for materials and workmanship and supplemented with United States construction industry standards.

The Project staff is also responsible for providing the designs and drawings for the remaining portion of the Main Access Road, approximately 16 kilometers. Our proposed bidding schedule calls for issuance of bid documents for the Access Roads and Base Camp Contract on September 1, 1978. It is imperative, therefore, that the designs for the Access Roads and Base Camp be completed as soon as possible. In order to insure that sufficient time is available for review of the designs by the various agencies involved, it is urged that the designs, complete with bid document drawings and a final Bill of Quantities be completed by June 15, 1978.

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:

<u>Name of Report</u>	<u>Date due</u>	<u>Status</u>	<u>Date Submitted</u>
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
9. Contract Documents River Diversion Works		Draft	February 23, 1978
10. Technical Specifications and Drawings Access Roads and Bridge		Draft	March 13, 1978

SECTION VI
PROBLEM AREAS

At this point in time, the only problem is to get the required trenching work done at the damsite, so that the final review and completion of the Geology work scheduled to be done during the period starting from the later part of May till the end of June could be accomplished. Due to mechanical problems with the bulldozers, this work could not be completed earlier.

There is no problem in any other area.

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 December 1977. The expenditure to that date as well as the budget amounts are shown in Annexure IV included in the report.

Rupiah Accounts

Up to the end of the month under report, a total amount of Rp. 19,934,854.- was spent. This represents 28.1 percent of the total Rupiah reimbursable costs provided in the Contract. The corresponding percentage of the contract elapsed is 56.2.

The summary of the Rupiah budget and costs is given in Annexure No. V.

Annexure I

JRAGUNG DAM PROJECT

Engineering Consultants, Inc.

Monthly Progress Report No. 14

Period: Ending April, 1978

Assignment of Resident and TDY Staff

<u>NAME</u>	<u>NATIONALITY</u>	<u>JOB TITLE</u>	<u>PROJECT ASSIGNMENT</u>		<u>MANMONTHS IN INDONESIA</u>	
			<u>ARRIVAL</u>	<u>DEPARTURE</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>
1. Saeed A. Rana	Permanent Resident U.S.A.	Resident Manager	March 16, 1977		24	13.5
2. James Rollins	U.S.A.	Geologist	March 16, 1977	June 30, 1977	3.5	3.5
3. Robert McLaughlin	U.S.A.	Structural Design Engineer	April 5, 1977		23	12.9
4. Carlos Borinelli	Permanent Resident U.S.A.	Materials Dam Engineer	June 4, 1977		18	10.9
5. James E. Pyne	U.S.A.	Resident Geologist	September 1, 1977		6	8.0
6. Jeffery P. Frey	U.S.A.	Specifications Engineer	December 18, 1978		12	4.45
7. Glen Trowbridge	U.S.A.	Design Engineer	February 7, 1978		18	2.75
8. Cecil M. Langford	U.S.A.	Project Director	August 6, 1977 January 23, 1978	August 12, 1977 January 31, 1978	1.5	0.52
9. M.K. Kuehl	U.S.A.	Chief Engineer	June 27, 1977 February 4, 1978	July 2, 1977 February 12, 1978	1.5	0.50

JRAGUNG DAM PROJECT

Engineering Consultants, Inc.

Monthly Progress Report No. 14

Period: Ending April, 1978

Assignment of Resident and TDY Staff

NAME	NATIONALITY	JOB TITLE	PROJECT ASSIGNMENT		MANMONTHS IN INDONESIA	
			ARRIVAL	DEPARTURE	SCHEDULED	ACTUAL
10. Paul Otter	U.S.A.	Project Engineer	March 16, 1977 March 1, 1978	March 18, 1977 March 4, 1978	1.5	0.23
11. Peter Strauss	U.S.A.	Chief Geologist	March 16, 1977 June 13, 1977 February 4, 1978	March 18, 1977 July 1, 1977 February 7, 1978	4	0.93
12. William Wenger	U.S.A.	Electrical Engineer	March 16, 1977	March 21 1977		0.50
13. Ralph Goodrich	U.S.A.	Electrical Engineer	January 20, 1978	February 15, 1978	4	0.90
14. M.A. Stevens	Canada	River Regime Sedi- ment Specialist	March 20, 1977 October 21, 1977 March 27, 1978	March 23, 1977 December 15, 1977	3	3.00
15. W. Stevens	U.S.A.	Surveyor	April 4, 1977 August 1, 1977	May 31, 1977 January 15, 1978	7.5	7.25

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Monthly Progress Report No. 14

Period: Ending April, 1978

Assignment of Resident and TDY Staff

<u>NAME</u>	<u>NATIONALITY</u>	<u>JOB TITLE</u>	<u>PROJECT ASSIGNMENT</u>		<u>MANMONTHS IN INDONESIA</u>	
			<u>ARRIVAL</u>	<u>DEPARTURE</u>	<u>SCHEDULED</u>	<u>ACTUAL</u>
16. E.B. Bartel	U.S.A.	Design Engineer	November 12, 1977	December 20, 1977		1.30
17. S.F. Hillis	Canada	Chief Materials	June 26, 1977	July 18, 1977	3	1.15
27			February 2, 1978	February 12, 1978		
18. Robert Campbell	U.S.A.	Assistant Chief	November 7, 1977 November 28, 1977	November 10, 1977 December 12, 1977		0.63
19. John Ismert	U.S.A.	Chief Mechanical Engineer	January 27, 1978	February 12, 1978	4	0.77
20. Dr. W. Burke	U.S.A.	Geologist Consultant	February 4, 1978	February 12, 1978		0.30
21. James Hoge	U.S.A.	Design Engineer	March 23, 1978			1.30
22. Dr. H. Fletcher	U.S.A.	Watershed Management	March 31, 1978		3	1.00

JRAGUNG DAM PROJECT

Engineering Consultants, Inc.

Monthly Progress Report No. 14
Period: Ending April, 1978Assignment of Counterparts and Technical Personnel

<u>NAME</u>	<u>EXPERTISE</u>	<u>WORK ASSIGNMENT</u>	<u>PROJECT ASSIGNMENT DATES</u>		<u>MAN MONTHS WORKED</u>
			<u>STARTING</u>	<u>ENDING</u>	
<u>Counterparts</u>					
1. Ir. Martopo	1. Project Management 2. Project Planning	November 1, 1975	March 16, 1977		13.5
2. Ir. Bambang Soedjono	1. Project Management 2. Project Planning	November 1, 1975	March 16, 1977		13.5
3. Maryono Bony M.E.	1. Project Planning 2. Dam Design Engineer	November 1, 1975	March 16, 1977		13.5
4. Ir. Wisnu Suharto	Hydraulic Structures	November 1, 1975	March 16, 1977		13.5
5. Ir. Soedaryanto Hs.	Geologist	January 1, 1977	March 16, 1977		13.5
6. Drs. Redjiono	Hydrologist	January 1, 1977	March 16, 1977		13.5
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		13.5
9. Ir. Muhammad Ali	1. Dam Design Engineer 2. Soil Mechanics, Material	January 1, 1976	March 16, 1977		13.5

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Monthly Progress Report No. 14

Period: Ending April, 1978

Assignment of Counterparts and Technical Personnel

<u>NAME</u>	<u>EXPERTISE</u>	<u>WORK ASSIGNMENT</u>	<u>PROJECT ASSIGNMENT DATES</u>		<u>MAN MONTHS WORKED</u>
			<u>STARTING</u>	<u>ENDING</u>	
10. I. Soedjono BEE	Electrical Engineer	March 16, 1977	March 16, 1977		13.5
11. Djasriansyah Aht	Electrical Engineer	March 16, 1977	March 16, 1977		13.5
12. Ir. Hartopo	Hydro Power Engineer	March 16, 1977	March 16, 1977		13.5
13. Harris BME	Mechanical Engineer	March 16, 1977	March 16, 1977		13.5
14. Ir. Supriyo	Specification Engineer	September 16, 1977	September 16, 1977		7.5
<u>Assistant Counterpart</u>					
1. Triyono BE	Geologist	June 1, 1976	March 16, 1977		13.5
2. Sutardjo BE	Geologist	December 1, 1976	March 16, 1977		13.5
3. Bambang Gunadi B.Sc	Hydrologist	January 1, 1976	March 16, 1977	November 1, 1977	7.5

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Monthly Progress Report No. 14

Period: Ending April, 1978

Assignment of Counterparts and Technical Personnel

<u>NAME</u>	<u>EXPERTISE</u>	<u>WORK ASSIGNMENT</u>	<u>PROJECT ASSIGNMENT DATES</u>		<u>MAN MONTHS WORKED</u>
			<u>STARTING</u>	<u>ENDING</u>	
4. Ir. Tri Hardono	Dam Design Engineer	March 16, 1977	March 16, 1977		13.5
5. Ir. Rustiyanti	Hydraulics Structures	January 1, 1976	March 16, 1977		13.5
6. Buang Sukardjono	Hydrologist	January 1, 1977	March 16, 1977		13.5
7. Edy Arifin Aht	Civil Structures	April 1, 1976	March 16, 1977		13.5
8. Ir. Diah Kusumawati	Hydro Power Engineer	December 1, 1976	February 15, 1978		2.5
<u>Draftsmen</u>					
1. Mukiyat	Draftsman	March 1, 1976	March 16, 1977		13.5
2. S.V. Barleyanto	Draftsman	November 1, 1975	March 16, 1977		13.5
3. Bambang Prayitno	Draftsman	February 1, 1976	March 16, 1977		13.5
4. Aris Mudjianto	Draftsman	December 16, 1977	December 16, 1977		13.5

Annexure III

Engineering Consultants, Inc.

JRAGUNG DAM PROJECT

Monthly Progress Report No. 14

Period: Ending April, 1978

Direct-hire Indonesian Personnel

<u>NAME</u>	<u>POSITION</u>	<u>PERIOD OF SERVICE</u>		<u>MAN/WOMAN MONTHS</u>	
		<u>DATE STARTED</u>	<u>DATE ENDED</u>	<u>PROVIDED</u>	<u>SPENT</u>
1. Mrs. Tan Ik Goen	Interpreter/Translator I	March 16, 1977		24	13.5
2. Miss Dra. Djca Sioe Lan	Interpreter/Translator II	May 16, 1977		24	11.5
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			12.0
5. Mrs. Sri Moenasih Soetikno	Clerk/Typist	March 16, 1977	July 31, 1977	24	4.5
	Secretary	August 1, 1977		19.5	9.0
6. Miss Sri Anon	Clerk/Typist	March 16, 1977		24	13.5
7. Mr. Suhandi	Messenger	March 16, 1977		24	13.5

Annexure IV

JRAGUNG LAM PROJECT

Monthly Progress Report No. 14

Period: Ending March, 1978

Summary of U.S. Dollar Expenditures

<u>COST ITEMS</u>	<u>AMOUNT AVAILABLE</u> US \$	<u>EXPENDITURE</u>			<u>PERCENTAGE</u>	
		<u>PRIOR</u>	<u>DURING PERIOD</u> <u>REPORTED</u>	<u>UP TO DATE</u>	<u>EXPENDITURE</u>	<u>TIME</u> <u>ELAPSED</u>
1. Resident Staff Base Salaries	181,360.00	79,769.46	9,084.52	88,853.98	48.99	52.0
2. Overseas Differential	53,890.00	19,910.70	2,271.13	22,181.83	41.16	
3. Overhead Resident Staff (75% base salaries)	136,020.00	59,935.49	6,813.39	66,748.88	49.07	
4. TDY & Denver Staff Salaries	206,700.00	118,582.11	26,240.91	144,823.02	70.06	
5. Overhead TDY & Denver (95% base salaries)	196,365.00	112,652.97	24,928.86	137,581.83	70.06	
6. Fixed Fee	138,000.00	63,250.-	5,750.-	69,000.-	50.00	
7. Travel and Per Diem	73,120.00	32,557.16	3,493.27	36,050.43	49.30	
8. Transportation (Relocation)	12,000.00	11,150.-	-	11,150.-	92.91	
9. Other Direct Costs & Miscellaneous Expenses	53,800.00	27,198.53	2,869.12	30,067.65	55.88	

Annexure IV
Continued

JRAGUNG DAM PROJECT

Monthly Progress Report No. 14
Period: Ending March, 1978

<u>COST ITEMS</u>	<u>AMOUNT AVAILABLE</u> US \$	<u>EXPENDITURE</u>			<u>PERCENTAGE</u>	
		<u>PRIOR</u>	<u>DURING PERIOD</u> <u>REPORTED</u>	<u>UP TO DATE</u>	<u>EXPENDITURE</u>	<u>TIME</u> <u>ELAPSED</u>
10. Ministry Personnel	60,000.00	6,091.22	3,769.90	9,861.12	16.43	
11. Special Purchases	190,000.00	51,361.16	27,037.79	78,398.95	41.26	
12. Contingencies	70,000.00	-	-	-		
Total Dollar Costs	1,371,255.00	582,458.80	112,258.89	694,717.69	50.6	52.0

JRAGUNG DAM PROJECT

Monthly Progress Report No. 14

Period: Ending April, 1978

Summary of Spish Expenses

<u>COST ITEMS</u>	<u>BUDGET ALLOCATION</u> (Rp.)	<u>EXPENDITURE</u>			<u>PERCENTAGE</u>	
		<u>PRIOK</u>	<u>PERIOD REPORTED</u>	<u>TO DATE</u>	<u>EXPENDITURE</u>	<u>TIME ELAPSED</u>
I. <u>PER DIEM</u>						
Jakarta	3,300,000.-	1,452,250	90,750	1,543,000	46.75	56.2
Barabang & Semarang	18,000,000.-	2,890,000	740,000	3,630,000	20.16	
Other	1,800,000.-	591,650	15,000	606,650	33.70	
Family	230,000.-	80,000	-	80,000	34.78	
Sub Total	23,330,000.-	5,013,900	845,750	5,859,650	25.11	
II. <u>OTHER DIRECT COSTS</u>						
Cable & Telephone	2,000,000.-	743,119	79,920	823,099	41.15	
Postage	2,000,000.-	306,425	35,410	341,835	17.09	
Reproduction & Printing	15,000,000.-	2,975,968	695,598	3,671,566	24.47	
In Country Transportation	2,000,000.-	1,297,451	67,600	1,365,051	68.25	
Supplies & Materials	6,000,000.-	877,885	72,765	950,650	15.84	
Miscellaneous	7,000,000.-	1,476,739	145,124	1,621,863	23.16	
Sub Total	34,000,000.-	7,677,587	1,096,477	8,774,064	25.80	

JRAGUNG DAM PROJECT

Monthly Progress Report No. 14

Period: Ending April, 1978

Summary of Rupiah Expenses

<u>COST ITEMS</u>	<u>BUDGET ALLOCATION</u> (Rp.)	<u>EXPENDITURE</u>			<u>PERCENTAGE</u>	
		<u>PRIOR</u>	<u>PERIOD REPORTED</u>	<u>TO DATE</u>	<u>EXPENDITURE</u>	<u>TIME ELAPSED</u>
<u>III. ADMINISTRATIVE PERSONNEL</u>						
Secretaries	3,610,500.-	1,571,941	141,500	1,713,441	47.45	
Interpreters	6,017,500.-	2,077,782	175,950	2,253,732	37.45	
Clerks/Typists	2,402,000.-	1,111,751	68,526	1,180,277	49.13	
Messenger	373,500.-	128,600	25,090	153,690	41.14	
Severance Pay	1,037,500.-	-	-	-		
Sub Total	13,446,000.-	4,890,074	411,066	5,301,140	39.42	
Grand Total	70,776,000.-	17,581,561	2,353,293	19,934,854	28.1	56.2

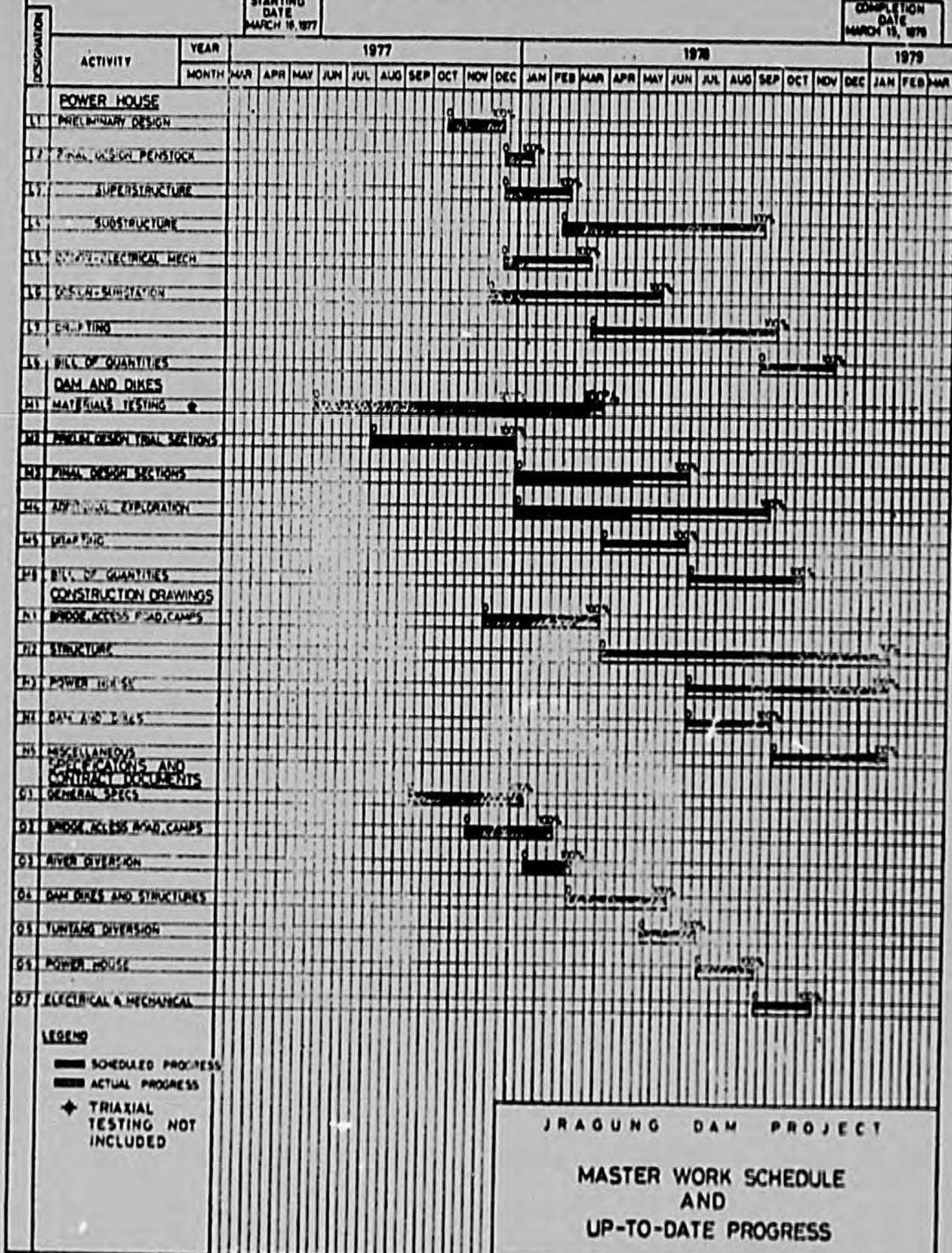
SUMMARY OF REIMBURSEMENT

Rupiah Payments Received by Consultant from Ministry up to the end of Report Period	= 31,685,381.-
Rupiah Expenditure by Consultant Approved for Reimbursement	= <u>19,934,854.-</u>
Balance	= 11,750,527.-
Advance to Proyek	= <u>1,065,000.-</u>
Balance	10,685,527.-

JRAGUNG DAM PROJECT PROGRESS REPORT

STARTING DATE
MARCH 15, 1977

COMPLETION DATE
MARCH 15, 1979



LEGEND
 ■ SCHEDULED PROCESS
 ■ ACTUAL PROCESS
 ◆ TRIAXIAL TESTING NOT INCLUDED

JRAGUNG DAM PROJECT
 MASTER WORK SCHEDULE
 AND
 UP-TO-DATE PROGRESS

