APPENDIX

MINUTES OF MEETINGS

MINUTES OF MEETING FOR

EXPLANATION OF DRAFT PROGRESS REPORT I

(December 15, 1981)

Copies for:
NESDB, RID, PTT, IEAT, MWWA
Embassy of Japan, JICA, OECF

December 1981

Prepared by O. WAKAMOTO
Assistant Leader, Civil Works
Detailed Design Team

1. Place, Date and Participants

The meeting was held in the conference room of building of RID, on Dec. 15, 1981. It was commenced from 3:00 p.m. following a similar meeting about the Feasibility Study. The participants' list is attached herewith at the end.

2. Preparation for Meeting

The Detailed Design (hereafter called D.D.) team had prepared copies of the draft of Progress Report (hereafter called P.R.) 1 and hand-written memorandum which excerpted the important parts of P.R.1.
The copies of P.R.1 had been distributed to the participants one day before the meeting to help preparatory understanding.
The copies of memorandum was also distributed at the beginning of the meeting.

3. Minutes of Meeting

The meeting began after Dr. Savit's arrival and taking his seat at the table.
Mr. Boonthai of RID commented on some points of the recommendation made by the Feasibility Study team at the end of preceding meeting.
Dr. Savit took the meeting here and raised the question of temporary pumping station and after being explained by Mr. Wakamoto, D.D. team, about situation surrounding it, agreed to let it leave for later discussion. Mr. Wakamoto told the table about the two books.
The one covered, bound book of the draft and the other 5 pages' memorandum and suggested to proceed on explaining the memorandam instead of reading the draft page by page.
The procedure was agreed.
The following is the speeches of major participants as spoken in that order.

3.1 Thai Requests and Japanese Response

Mr. Wakamoto

At the previous meetings held on Nov. 25 at Japanese Embassy and on Dec. 2nd at NESDB.
Thai Government requested that the D.D. team had to consider earnestly about five issues. They were; Thai participation or local resources utilization as much as possible, shortening the construction period including supply by temporary pumping, decreasing cost, reliability of the system and the foreign-local ratio.

(1) Local supply. The steel pipes' quality is generally acceptable except the inside lining, however, the quantity appears rather too large to be supplied by single supplier and some means must be found. Other construction materials are satistactory also.
Foreign materials will be limited to the machinery like pumps, valves

and other appurtenances. Although we recommend that the prime contractor shall be foreign one with good reputation and experience, the most of sub-contracts will be practically done by local sub-contractors.

(2) Shortening the period. We recommend that the whole project shall be put on a single, package contract. It is one possible way of shortening, or making it completed within the scheduled period.

(3) Decreasing Cost. The Feasibility Study team had to do it at the stage, assuming the pipes were imported from overseas. The D.D. team has its own judgement about it regarding the Thai request. The local supply will be utilized as far as possible, thus decreasing the cost. Severe cutting, however, may cause the cost overrun and we have to find a compromise of saving the cost and avoiding the overrun.

(4) Reliability. A package contract will attract 1st class contractors. They only can make overall management, including the quality control and coordination of procument and construction. As was mentioned before reliable, mechanical goods must be imported.

(5) Foreign - Local ratio.
The cost estimate of the local portion, matters such as land, local labor, local materials, local contractors' overhead, is the first priority to be prepared for the domestic budget of the next fiscal year.

Findings and reasonings leading to the above discussion can be refered to 4.5.1. Findings, 4.2.2. Recommended Manners of contract etc. in the book of P.R.1. Information sources are pipe manufacturers, concrete and aggregate suppliers, civil works contractors for both technical and legal matters, machinery's rental agents and dealers. The names of local firms we looked into can be refered to 2.2.4 of the book. RID divisions concerned helped us in collecting information.

3.2 Issues to be confirmed and/or to be decided

3.2.1 Confirmation

Receiving Well, Receiving Reservoir, Filtration Plant

The D.D. team has to recommend on the size and the treatment method of filtration plant, according to the agreement with JICA. The necessity of Receiving Reservoir must be discussed, considering two kinds of usage, industrial and potable, and cases of termination of the supply for a long time due to unexpected happenings.
The receiving well, receiving reservoir and filtration plant are better be operated to-gether within a control system.

Branches, where and what size from Demand Forecast

The D.D. team likes to know where and what size branches must be prepared, both from the pipeline and from the receiving reservoir.

Whole treatment or partial treatment

The issue must be judged on consideration about concentration of man-power, chemicals used for treatment, energy consumption versus autonomy of the municipalities and identity of other parties concerned

3.2.2 Decision

Elevation of Receiving Well, How big land to be acquired

The elevation of receiving well is the most important factor, considering the conveyance capacity from Dok Krai to Mab Ta Pud and from Mab Ta Pud to Sattathip and also the residual pressure at the farther most points of the distribution system of Mab Ta Pud area. The choice of the lot comes also from what we think about the receiving well, receiving reservoir and filtration plant as discussed previously.

We are now surveying three possible lots within approximately 45 to 60 meter elevation range.
The extention to Sattathip will almost certainly need boosting by pump.

Location of Intake Tower

The Feasibility Report recommend a location 400 m upstream of the dam axis. The location seems to cause some incovenience to the existing conditions and another location, 1.0 to 1.5 km upstream of the dam axis, is now under study.
In case of the new location, the pipeline route can make a short cut to the head tank, though it needs solving about land problems. Before reaching a decision, a comparative study of the two alternatives will be carried out.

Borrowing land for execution

Besides acquisition of land by IEAT, borrowing land along the pipeline route will be neccessary to make construction easier.
It can be left to the contractors' option, a rough cost estimate being included in the Bill of Quantity or it can be included in the Tender documents with specific items. In case of the latter, we will have to specify about the construction method.
The method includes such things like handling the pipe by machinary from the side of road or from the opposite side.

3.2.3 Other issues to be confirmed and/or to be decided

Communication

When the pipeline is put into operation, three major points on the line should have means to communicate each other at any time of the day without interruption.
The points are the pump station, the head tank and the receiving well.
A telephone or wireless system must be set up before completion of the construction work.

Between PTT and D.D. team

The construction method of which a brief discussion was already made (in 3.2.2 Borrowing land for execution), must be discussed and decided.

Between IEAT & D.D. team

The D.D. team's survey is now underway.
The land for the head tank, receiving well, receiving reservoir, filtration plant will be decided with completion of the survey and the preliminary design of above mentioned structures.
On the pipeline route, where the water pipe runs parallel closely to the existing gas pipe, 5m width outside of ROW (Right of way) is going to be purchased, as we understand.
For the execution of construction work, some more width might be needed, not for permanent use but for construction stage. Preferably this extra part can be borrowed during a limited period.

Between Highway Dept. and D.D. team

It appears that between the local office and the central office of Highway Department, there is some division of authority.
What we have learnt is that the local can decide about the matters within 2m at the end of ROW.

We like to get the matters decided speedily when we determine the alignment of pipeline, being not much affected by the autorization problem. About the road crossing we will prepare materials for discussion.

Between Provincial Electricity Authority and D.D. team

Relocation of the poles of power supply might become neccessary at some places.
After deciding the pipeline alignment and finding such places we will inform immediately to PEA.

Mr. Wakamoto presented as above and asked Mr. Ohkubo to take over and give his speech on the matters about tender and contract.

3.3 Issues on Tender and Contract

Mr. Ohkubo

Our first consideration is in your benefit. Thais' priority are reliability, shortening the construction schedule, project cost, local resources.

The special features about the detailed design work is that within a very tight schedule we have to prepare for various kinds of works, in both technical matters and document matters of tender and contract. We must also point out that it is quite a large project with the current estimate cost of 1.5 billion bahts, the monthly average output of 85 million bahts when the figure is divided by 18 months' construction period.

The pipeline part makes about 30% of the total cost and it means a supply of big number of pipes shall be continuously done, well fitted to the construction schedule.

Taking consideration of other problems and the above features, we strongly suggest a package contract headed by a best class civil contractor as the prime contractor.

The pipe supplier shall be under the management of the prime, even though they are nominated.

The proposed temporary pumping facility will mean additional cost, 2 to 3 stages pumping, additional pipes. The cost will be over millions of bahts. It also causes problems in testing and taking over after completion of the system and switching from the temporary to the permanent system.

Mr. Ohkubo made his presentation about important matters.

4. Thai Sides' Comments

Dr. Savit thanked and congratulated the D.D. teams work, especially what they had done taking account of the discussion held at Japanese Embassy. He also thanked for the briefing for clearing explanation and coverage of the problems concerned.

Dr. Savit

In general we have no objection to the approach and the design. On the local supply, why the lining and coating of pipes are not satisfactory?

Mr. Wakamoto

With cement lining your quality is acceptable but as it cut the flow capacity by 5 to 7% when compared with expoxy lining, our choice is the latter. For epoxy lining sand blasting or shot blasting is indispensable for cleaning the steel surface of plate to have strong bondage between steel and expoxy. The blasting equipment does not cost much.

Dr. Savit

On shortening the construction period I have a good news. The gas separation plant will be completed in June instead of April. So the gap between it and the completion of pipeline is now 2 months. So considering the difficulties arising from technical and other sides, we better go for the permanent system.

Dr. Savit

On decreasing the cost. While full consideration on the local supply is taken in, the reliability is also important. I will admit that your effort is well done here.
On the foreign-local ratio. You submit the final documents to RID in August next year and when it is put on the tender, the local

portion must be well prepared. It must be included in the year's budget or be prepared as a special budget. For it, we like to request the Japanese team to send the information as soon as possible.
It will set up a target date and inform about it.

Dr. Savit

On the issue of the receiving well, receiving reservoir, filtration plant and on the issue of the whole treatment or partial treatment. As I now understand the scope of work agreed between JICA and the team, the receiving well and the receiving reservoir are in your responsibility and you work on the design. But the filtration plant needs only analysis and not designing. For possible filtration plant, prepare the size of land and the size of major structure.
On the issue of branching out. We will discuss among us about the demand, both industrial and urban, and inform you about it, taken either from the pipeline or from the reservoir.
On the land. It is importance but the required area does not amount very much and also some are in possesion of governmental agency.
On the intake tower. It is up to you and RID to decide about the two alternatives.
On the other issues. Communication, power supply, relocation of the electric poles, etc. shall be informed as soon as possible with possibly good details as many governmental agencies are not fast in processing these matters. The same things can be said about the road. Coordination with other agencies through RID or through RID and NESDB shall be done to promote the project.

Dr. Savit

Tendering of Contract. We have no problem if you feel that to ensure the reliability and the control of works you have to choose a big contractor with sub-contractors, and with designated sub-contractors if necessary. The responsibility is under one team.

Mr. Wakamoto

We will observe the basic principle of using local materials and local sub-contractors as much as possible.

LIST OF PARTICIPANTS, THAILAND

CIPO

DR. SAVIT	PHOTIVIHOK	
MR. MANAS	SANGUANDIKUL	
MR. KUMROPLUK	SURASWADI	

RID

MR. KATSUHIKO	KIMURA	Colombo Plan Expert, Project Planning Div.
MR. TAKASHI	MIYAZAKI	Colombo Plan Expert, Design Div.
MR. BOONTHAI	OTAGANONTA	Chief Engineer for Civil Engineering
MR. PHYOOL	CHANTASIRO	Director, Survey Div.
MR. PRASARN	LEELASORN	Director, Soik & Geo. Survey
MR. SUTHEP	TINGSABAHT	Director, Programme & Budget Div.
MR. CHAREUK	NONTHATHUM	Director, Region Office
MR. DAMRONG	JARASWATHANA	Director, Hydrology Div.
MR. SHOOMBHOL	CHAVEESUK	Director, Design Div.
MR. SUHA	THANOMSINGHA	Director, Region Office
MR. PRAKAI	SASTRAVAHA	Large Project Construction Div.
MR. KAMOL	CHITARKON	Large Project Construction Div.
MR. RUONGRIT	AMMAWAT	Chief Dam Design Branch
MR. JUMROEN	PANITYING	Medium Project Construction Div.
MR. CHALERMTHEP	RATANAPRAYOON	O & M Div.
MR. PAIROJ	NANONGKAI	Law & Land Div.
MR. SUPHON	CHIRAPUNTU	Chief, Soil Engineering Investigation Branch
MR. DHONGCHART	CHULLASUK	Economic Branch, Project & Planning Div.
MR. SUTHI	SONGVORAVIT	Chief, Policy Planning Branch, Planning Div.

MINUTES OF MEETING FOR EXPLANATION

OF DRAFT PROGRESS REPORT 1

(December 17, 1981)

Copies for:
NESDB, RID, PTT, IEAT, MWWA
Embassy of Japan, JICA, OECF

December 1981

Prepared by O. WAKAMOTO
Assistant Leader, Civil Works
Detailed Design Team

LIST OF PARTICIPANTS, JAPAN

Embassy of Japan

MR. HIDEKI KONDO

JICA Advisory Team

MR. KEISUKE HISATAKE

MR. TOSHIHIRO ENDO

MR. YUICHI MISHIMA

JICA Staff

MR. TAKASHI KANEKO

MR. KOICHI MIYOSHI

MR. TADASHI NITTA

JICA F/S Team

MR. YUICHI KATAYAMA

MR. YUMIO ISHII

MR. YOTAKA NAKAO

JICA D/D Team

MR. OSAMU WAKAMOTO

MR. MASAFUMI OHKUBO

MR. CHIKAICHI TAKAHASHI

MR. YOSHIYUKI TOMIOKA

MR. FUMIO ENOMOTO

MR. FUMIKI NAKAJIMA

1. Time, Place, Attendance

The meeting was held at 11:00 a.m. Dec. 17, 1981 in the conference room of RID building second floor.
The attendants' list is attached herewith.

2. Purpose

At the previous meeting held on Dec. 15, 1981, the draft of Progress Report 1 had been discussed. There the approach and the principle of design, after explanation by Japanese side and discussion between the two sides, had been accepted by Thai side.
The Detailed Design team wished the draft to be examined fully about the content, before it was pinted as complete one and submitted.

3. Minutes

As the meeting was carried out with the participants lively speeches and elaborate discussions, they are not quoted here in detail.
Only the major issues and conclusions are recorded here.

3.1 Shortening of Schedule

Although the starting up of gas separation plant is postponed until July,1984, it still is two months before the expected completion of the pipeline, that is, August 1984.
Thai side suggested that 16 months instead of 18 months might be designated in the tender document and Japanese side objected, reasoning about technical and procedural matters.
The argument was finalized by that the both parties would seek means to shorten the whole term before completion of the work, not only in the construction stage but also in the preceeding works.

3.2 Seismic Coefficient & Related Issues

The discussion started from the seismic coefficient K's validity and extended further into more details, theory, reasonings etc.
It was concluded that the design of intake tower, where the discussion had started from was important enough to be examined by the both parties, and at the stage of conceptual design a meeting was to be held.

3.3 Concrete Strength (refer to 3.2.2)

According to RID standards, the design compression strength is 210 kg/cm^2 and the allowable strength is 0.45 times of the said 210 kg/cm^2, namely 94.5 kg/cm^2.
The reinforcement bar of deformed shape uses 1,400 kg/cm^2 as allowable.
The draft was corrected as above.

3.4 Head Tank

The part of Feasibility Study Report concluding as Not Acceptable for R.C. tank (Table 4-8 Comparative Study of PC,RC, and Steel Head Tanks) is not agreed and must be deleted.
Ordinary reinforced concrete tank can be used and usage of earth dam basin shall be studied as an alternative.

As for the other parts of the draft, RID will give comments on Dec. 21 (Monday), 1981 and then the draft will go into printing for submission.

ANNEX 3 LIST OF PARTICIPANTS

Place : RID Conference Room

Date : Dec. 17, 1981

	NAME		POSITION
1.	MR. BOONTHAI	OTAGANONTA	Chief Engineer for Civil Engineering RID
2.	MR. PRAHAS	MASAMONDANA	Chief Design Section 6th, Design Div. RID
3.	MR. PRAKAI	SASTRAVAHA	Large Scale Construction Div. RID
4.	MR. SUWIT	THANOPANUWAT	Civil Engineer, Project Planning Div. RID
5.	MR. SIRIPONG	HUNGSPREUG	Civil Engineer, Design Div. RID
6.	MR. YUICHI	MISHIMA	Advisory Team, JICA
7.	MR. KOICHI	MIYAKE	Staff, JICA
8.	MR. YUICHI	KATAYAMA	Team Leader, D.D Team
9.	MR. OSAMU	WAKAMOTO	Assit. Leader, D.D. Team
10.	MR. YOSHIYUKI	TOMIOKA	Staff D.D. Team
11.	MR. FUMIO	ENOMOTO	-do-
12.	MR. FUMIKI	NAKAJIMA	-do-
13.	MR. MASAHIRO	ASADA	-do-

MEMORANDUM FOR MEETING
ATTACHED WITH MINUTES

January, 1982

Prepared by OSAMU WAKAMOTO
Co - Leader
Detailed Design Team, JICA

1. Reports

The following reports have been allocated to each member of the detailed design team, considering his role in the team.
The given titles are tentative, rather true to the content, and the readiness is classified into four, ready for typewritten and completed, almost ready for typewritten but not completed yet, prepared for draft in Japanese and expected for informations collected but unwritten.

List of Reports

No.	Title	Author, Role	Readiness
1.	Water Demand	WAKAMOTO, Co Leader	ready
2.	Facilities	"	"
3.	Filtration Plant	"	"
4.	Organization for Operation and Maintenance	"	"
5.	Water Supply	ASADA, Water Supply	prepared
6.	Limit of Low Water for Intake from Dok Krai	"	"
7.	Control of Pipeline System	TOMIOKA, Facilities	almost ready
8.	Head Tank	"	"
9.	Overall Comparative Study, Dok Krai - Mab Ta Pud-Sattahip	"	"
10.	Pumping System	ENOMOTO, Pumping	"
11.	Method of Pressure Reduction	NISHIDA, Pipeline	prepared
12.	Thickness of Pipe	"	"
13.	Receiving Well, Receiving Reservoir	MIYAKE, Facilities	almost ready

2. Review of Feasibility Study

The scope of work which was agreeded between JICA and the detailed design team included the demand and supply of water, the facilities and the filtration plant.
No. 1, 2, 3, 5 of the reports named before cover the scope and the detailed design team can go forth to design work.

3. In Relation with Progress Report 1st

The problems left undecided in Progress Report 1st are raised here again to be added with some explanation.

3.1. Intake Tower and Pumping Station

(1) Location (3.1.3.)

The alternative, 1.0 to 1.5 km upstream of the dam, was given up as it is apparently disadvantageous.

(2) Type (3.1.3.)

A type conceived in the Feasibility Study but discredited there is taken up again, with a new approach.
The new approach shall be done more from the marine - structural engineering than civil engineering and more use of steel than in the Feasibility Study. Needless to say, the type will have to use another type pump.
Of the type proposed in the Feasibility Study is explained in details by No. 10 report.

(3) Control of Pumps (3.1.2) (3.1.3)

The control of pumps is the control of flow of the pipeline system as a whole.
The detailed design team has decided almost every matters here, after considering the basic principles and design concepts.
It will be elaborated in No. 7, 4, 10 reports.

(4) Pump Head (3.2.1)

After No.6 report's completion, the lowest level to draw water in Dok Krai Reservoir must be decided. So far, it is 42.00.

(5) Bridge from Intake to shore (3.2.3)

The detailed design team is undertaking two alternatives and one more of worth studying is going to be worked in Japan.

3.2. Head Tank

The necessity of head tank is discussed in No.1, 10 reports. The design concepts and more details are in No.8 report. The location has been changed from the conceived one to the road side of Route 3191 with about 2 km saved length of pipe. The capacity needed for the pumps operation and the emergency is reasonably analysed. (No.8 report)

3.3. Receiving Well, Receiving Reservoir, Purification Plant

The purification plant, a subject in the scope of work, is discussed in No.3 report.
The receiving well and the receiving reservoir are discussed in principle and with design concepts in No.13 report.
the most possible location has been selected.

3.4. Dok Krai - Mab Ta Pud - Sattahip System

Even though the diameter of the pipeline between Dok Krai and Mab Ta Pud was decided from the demand and supply requirements in the Feasibility Study, comparative study has been made to see about the system from Dok Krai to Sattahip through Mab Ta Pud.
It found;

* 1.35 m diameter for the project was most reasonable.
* 0.8 m diameter pipeline to Sattahip is recommended.
* The receiving well's water level close to 60 m is desirable.

The above is elaborated in No. 9 report.

3.5. Pipeline and Pipe Material

(1) Pressure Reduction and Cavitation

In the earlier stage of operation when the flow is still small, a large part of the effective head between the head tank and the receiving well must be reduced by throttling at the receiving well.
Sudden reduction of pressure in water causes very fine bubbles occurance and the bubbles floating in very fast flow collide on and scour the surface of metal of pipe and valve. It is called cavitation.
The detailed design team has to solve it both technically and economically.
It is discussed in No. 11 in detail and has to be studied further.

(2) Pipe Wall Thickness.

It is 11.9 mm in the Feasibility Study.
The detailed design team is studying under what condition 10 mm thickness will become possible form every angle.
It will be reported in No. 12 report.

3.6. Organization for Operation and Maintenance

No.4 report.
It discuss about the system, number of personnel required for the operation and maintenance, reasoning from technical view and other consideration.
About the technical matters it is coordinated with No.7, 10.

4. Field Work

(1) Surveyor

Keeping contact with the surveyor, the detailed design team chose the most possible site for Receiving Well and Reservoir.
The head tank's alternative site at the roadside.
The total length of pipeline will become shorter than Feasibility Studys.

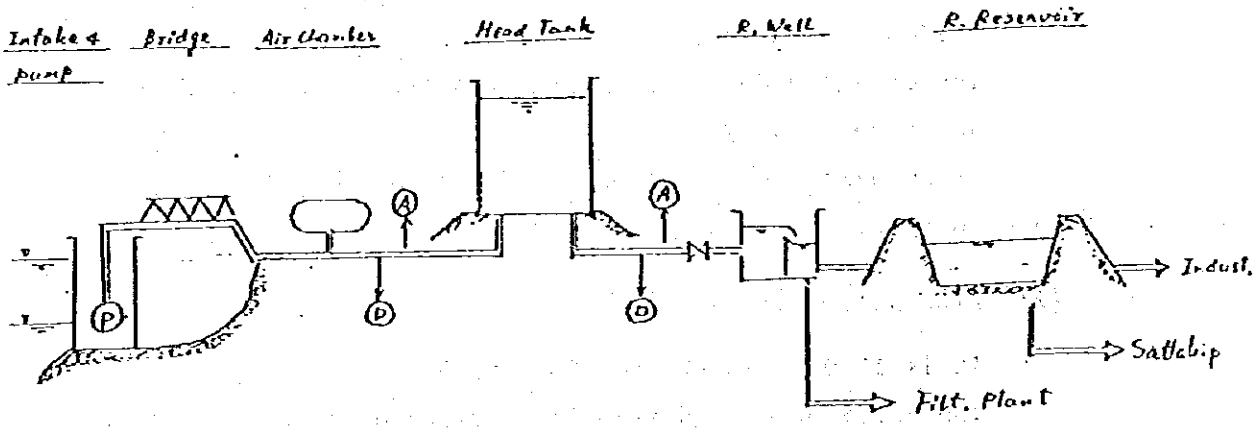
(2) Geologist

The new site of head tank is reported to have sufficient bearing strength for the tank.

Some more works will be needed before the investigation around intake tower site is completed.

5. Decided and Undecided Matters

We will see what are the matters decided and undecided.



5.1. Decided or Nearly decided

(1) Location & Elevation of Site

* Dok Krai Res.	HWL 54.10 LWL 42.00
* Intake Tower	Close to dam, same as before
* Head Tank	Roadside Route 3191 EL. 82.00
* R. Well	Roadside Route 3
* R. Reservoir	EL. 60.00 - 57.00
* Filt. Plant	

All above decided.

(2) Control of System

* Flow Control	On-off of pump
* Hydraulic Condition	R. Well's level between 60.00- 57.00 Head Tank's level " 105.00-102.00 Pump Head " 81.00- 78m including every loss
* Organization	

As the flow control system was decided, a proposal of the organization for operation and maintenance has been made and submitted. The range of water level and pump head is narrowed to 3m. The decision shall be made on the result of detailed survey of the Receiving Well - Receiving Reservoir-(Filtration Plant) site.

(3) Pipeline to Sattahip

* 0.80 m diameter is most recommendable.
* Pumping is necessary

(4) Supply to Industries in Mab Ta Pud

* The supply can be made with no pumping, by gravity.

(5) Head Tank

* The capacity, size and other details are decided.
* Prestressed Concrete is most possible.

(6) Receiving Well, Receiving Reservoir

* The capacity, size and other detailes are decided.
* The receiving well is made of rainforced concrete and the receiving reservoir is most possibly of earth dam type.

5.2. Undecided and Alternative

(1) Intake Tower and Pumping Station

* The original plan is now under way of detailed design stage.
* An alternative plan is going to be studied shortly.
* The two shall be compared at possibly earlier date.

(2) Bridge

* Besides the original,two more alternatives are conceived.
* The two are going to be studied shortly and the three, including the original shall be compared at possibly earlier date.

(3) Air Chamber

The air chamber shall be designed after comparing the two concepts of intake tower and pumping station.

(4) Pipeline

* The air valves and drain valves location will be decided before the end of January 1982.
* The thickness of pipe also before the end of January'82.
* The pressure reduction gadget will be decided later because of technical and economical reasons.
* The alignment of pipeline, without waiting the final survey drawing, shall be tentatively decided. Then meetings will be held with authorities concerned to discuss the details. The details are about river and road crossings, branches, construction methods about moving earth and pipe laying, relocation of electricity poles etc. In case these matters cannot be decided within the stay of pipeline engineer, they will be taken care by Co-Leader

6. Handing Over to Following Group, Technical

(1) Leaving Schedule

Water Facility Engineer and Structural Engineer of Water Facilities are leaving on 16th. January.
As their matters are already decided, they can go into the detailed design work in Japan.
Technical matters to be handed over to the coming group are mostly about the control of flow.
Pipeline Engineer is leaving at the end of January.
As mentioned before, his work must be assisted by Co-Leader both during and after his stay.
Technical matters to be handed over to the coming group are practically nil.
Pumping Engineer is scheduled to leave at the middle of February. Though his stay for another month is overlapped the coming Mechanical and Electrical Engineers by one month, a very good cooperation and hard work will be required because of importance of the intake and pump, and of many details involved.

(2) Coming Schedule

On 17th January two engineers, Mechanical and Electrical, are coming to stay and work for one month.

7. Handing Over to Following Group, Non-technical

On 18th , Specification Writer and Cost Estimator are coming with schedule of one month stay.

Co-Leader will discuss the matters with them on their arrival.

MINUTES OF MEETING

1. Date, Place, Attendant

Date ; Jan. 14, 1982 Place ; Conference room in RID

Attendant ;

MR. BOONTHAI	OTAGANONTA, RID
MR. SIRIPONG	HUNGSPREUG, RID
MR. WAKAMOTO	JICA
MR. TOMIOKA	JICA
MR. ASADA	JICA
MR. ENOMOTO	JICA
MR. MIYAKE	JICA

2. Mr. WAKAMOTO's Briefing

Mr. WAKAMOTO, having prepared Memorandum for Meeting, explained about it at the beginning and later some issues were raised to be discussed.

3. Dicided Issues

At the meeting following issues were decided;

* The bridge from the intake to the shore is going to be constructed with prestressed concrete beam which is available locally. The bridge will consist of a steel pipe bridge and a prestressed concrete road bridge, supported by a row of piers. The type is simple in structure and less costly in maintenance. Further study shall be made to find optimum span of the piers.

* The intake is to be located close to the dam, following the original plan of Feasibility Study.

* As for the filtration plant, the team has made a report which was specified by JICA. No further elaboration is needed and it will not be taken up any more.

4. Agreed Issues

* As for the intake tower - pump station, an alternative employing marine structure engineering and using more steel than concrete must be studied in haste.
  It shall be done before the end of February 1982 and then a comparison shall be made with the original and the alternative.
  The original plan shall proceed to the detailed design work while the alternative plan is studied.

* The pipe wall thichness is going to be examined to learn the possibility of making it thinner.

5. Next Meeting

The original plan of intake tower - pump station has problems to be solved. The next meeting possibly in early future must be held to see the progress of solving them.

MINUTES OF MEETING

PRESENTING DRAFT ENGINEERING REPORT

FEBRUARY 1982

Prepared by OSAMU WAKAMOTO
Assistant Leader
Detailed Design Team
JICA

1. Time, Place, Attendance

The meeting was held at 9:00 a.m. Feb. 26, 1982 in the conference room of RID building second floor, attended by the persons whose names and titles are shown on the attached list.

2. Purpose

According to the inception report, JICA team was to submit Engineering Report at the end of February 1982.
The team, with the arrival of an advisory member and a JICA staff, has prepared the report and presented it on the meeting, in the form of draft.

3. Content of Reports

The report consisted of five parts:

a) Water Demand and Supply
b) Meteorological and Hydrological Data
c) Report on Surveying with 30 drawings
d) Report of Geological Study and Geological Data
e) Compilation of Series of Technical Reports

These reports were presented and explained in the order.

4. Minutes of Meeting

After presentation of each part of the reports, questions and comments were given from RID, being followed by additional explanations from the team.
After the discussion, the part was received by RID.

4.1. Water Deamand and Supply

About the estimate of future demand different opinions were raised and discussions were followed. Eventually the Chief Engineers view that it would better be left to be seen in the future as no decisive forecast could be made was clonclusive about it.

Mr. Katayama opined that some figure might be modified as the feasibility study was being examined in Japan.

4.2. Meteorological and Hydrological Data

Raw data from several sources were edited and presented, for possible use of a part of the tender documents.
No discussion was followed.

4.3. Report on Surveying

The report was mostly to explain about the maps.
More informations will be put on the maps in order to be used for tender documents. Not much discussion was made about the survey.

4.4. Report of Geological Study and Geological Data

The study dealt with the soil geology concerning the earthwork, foundation and construction material and the groundwater concerning pipelaying and corrosion.
The report was accepted without much discussion.

4.5. Series of Report

Following matters were discussed and decided.

* The pipe bridge, instead of supporting itself, shall be put on the prestressed girder (or beam) so that the future maintenance will be ensured.
* The number of head tank is one.
* For the land of receiving reservoir, sufficiently wide land must be purchased at this stage.
* The wall thickness of pipe is a matter to be decided by the detailed design team with reasoning.
* Thai standards for office and personnel's living quarter shall be shown to the team.

5. Comments from Thai Side

Within about two weeks after the presentation,
Thai Side will give the comments of Draft Engineering Report to the team.
The team will then rivise, finilize and submit 30 copies as Engineering Report.

ATTENDANCE LIST

PIPELINE DETAILED DESIGN TEAM OF JICA

DATE : 26th FEB. 1982

PLACE : CONFERENCE ROOM OF RID

1.	BOONTHAI	OTAGANONTA	Chief Engineer for Civil Engineering, RID
2.	PRAHAS	MASAMONDANA	Engineer, Design Division
3.	SIRIPONG	HUNGSPREUG	Engineer, Design Division, RID
4.	KUMROPLUK	SURASWADI	CIPO, NESDB
5.	YUICHI	MISHIMA	JICA, Advisory Team
6.	YUICHI	KATAYAMA	JICA, Team Leader
7.	OSAMU	WAKAMOTO	JICA, Co-Leader
8.	FUMIKI	NAKAJIMA	JICA, Survey Team
9.	MASAHIRO	ASADA	JICA, Study Team
10.	KOICHI	MIYOSHI	JICA, Coordinator

Minutes of Meeting

on

July 8, 1982

prepared by JICA Detailed Design Team

1. Date, Place, Attendants

(1) Date

From 09.30 to 12.00 July 8, 1982

(2) Place

Conference room, RID

(3) Attendants

The lists are attached herewith

2. Aim of meeting

The leader of JICA Team stated that the aim of the meeting is to transmit the draft of the following documents to RID for checking:

- detailed design drawings
- design reports, main and supporting
- specifications, general and particular
- bill of quantities

The leader also explained that the actions to be followed before the end of August would be:

- RID sends JICA Team any comments on the above documents before August 10, 1982.

- Upon receiving the comments, JICA Team works on finalization of the documents until the end of August.

- JICA Team, upon finalizing the documents, submit them to JICA headquarter in Tokyo

- JICA headquarter will officially transmit the documents to the Thai Government.

Thus the meeting was to check the documents by the personnel concerned of RID and JICA.

3. Meetings to be held

Because of the limited time schedule and in order to promote efficiency, a proposal was presented and agreed upon:

. The participants are divided into two groups - design group and tender group.

- The groups will hold the meeting independently and separately to discuss the issues of importance for its own and conclude them.

- The two groups, at the same time, find the issues which are to be discussed in the general meeting where all personnel are present.

- The general meeting, besides the one on July 8 morning, will be held on July 14th, the day before JICA Team's departure on the 15th.

There and then, the findings and issues raised in the two group meetings are to be reported and discussed and finalized.

- The Chief Engineer ordered the formation of the two groups as shown in the attached list No. 2.

4. Issues at General Meeting on July 8th

The issues raised are:

(1) provision of office residence, transportation, and other services for consultants before the official award of contract.

(2) provisional take-over of the completed parts of the camps by the Employer for the ease of operation and maintenance staffs who participate at the stage of construction. Responsibility of the contractor on maintenance of the above after the provisional take-over.

(3) provision of the facilities and services like (1) for the staffs identified in (2).

(4) staff members to be assigned for overseas training. The expenses shall be covered by the Contractor for 15 persons of C-6 rank on the average and two months duration of training including per-diem.

Attached No. 1

ATTENDANT LIST

Name	Designation
RID:	
1. Boonthai Olaganonta	Chief Engineer for Civil Engineering
2. Chareuk Nonthathum	Director, Large Scale Const. Div.
3. Prahas Masamondhana	Chief, Design Section 6
4. Charoon Kamolratana	Chief, Design Section 10
5. Dibhyaraks Sukhum	Director, Foreign Financed Project
6. Thanee Kheosipalard	Architect
7. Pichai Phongnugul	Specification Officer
8. Thaweevong Thainseree	Legal Officer
9. Prakai Sastravaha	Construction Engineer, LSCD
10. Siripong Hungspreug	Design Engineer, Des. Sect. 6
JICA:	
1. Yuchi Katayama	D/D Team Leader
2. Shoichiro Higuch	D/D Team Manager
3. Osamu Wakamoto	D/D Team Co-Leader
4. Masafumi Okubo	D/D Specification Writer
5. Tomioka Yoshiyuki	D/D Design Engineer
6. Fumio Enomoto	D/D Design Engineer
7. Yoshikazu Nishida	D/D Design Engineer (Pipeline)

Attached No. 2

Organization of Groups of Discussion

General Meeting

Chairman: Boonthai

Design Group

RID:

Chairman:	Charoon
Representatives:	Prahas
	Thanee
Secretary:	Siripong
JICA:	Wakamoto
	Tomioka
	Enomoto
	Nishida

Tender Group

RID & CIPO:

Chareuk
Dibhyaraks
Chamnong
Somchit
Prakai
Manas

JICA: Higuchi
Okkubo

Minutes of Meeting of

Design Group

on

July 8, 1982

prepared by Design Group

JICA Detailed Design Team

1. Date, Place, Attendants

- from 13.30 to 16.30, July 8, 1982
- conference room, RID
- attendant list: Charoon, Thanee, Prahas, Siripong
  Wakamoto, Tomioka, Enomoto, Nishida

2. Issues

(1) Design Reports

Some parts of Design Reports were corrected on both sides' consent.

(2) RID signature on drawings

The original drawings need the signatures of RID during JICA team's stay until July 15, and some of them shall be corrected thereafter. The contradictions must be solved by the team's promise that:

- leaving the copies on which JICA Team shows the part and details of correction
- In Japan, JICA Team makes correction as mentioned above
- Corrected originals are transmitted toRID

(3) Intake Tower

RID requested the drawings concerning the additional reinforcing bars during various construction stages. The JICA Team agreed on sending them to RID.

(4) Temporary Bridge

JICA Team explained its method of using the temporary bridge in constructing the intake tower, adding that the method can be altered by the contractor. RID will have to study about the means of measurement for payment if other temporary works are to be employed.

(5) Head Tank

RID would like to have the material relating the design calculation. JICA Team will provide RID as a memorandum.

Minutes of Meeting of

Design Group

on

July 12, 1982

prepared by Design Group

JICA Detailed Design Team

1. Date, Place, Attendants

- from 13.30 to 16.00, July 12th, 1982
- conference room, RID
- Attendant list: Charoon, Prahas, Thanee, Siripong
  Mishima, Wakamoto, Tomioka, Enomofo, Nishida

2. Issues

The following drawings were examined with reference to some parts of the particular specification.

No. of drawing	Subject
2103, 2105	SGP (steel gas pipe) to be used wherever GP is used
2102	waterproof membrane - should use the one recommended by JICA
2201	soil type be classified
2205	dimension of weld is specified by the size of "throat" and will be mentioned in the drawing
2401	location of boring be footnoted "reference only"
4101	water level gauge to be relocated close to the ladder.
4101	metal insert for support of overflow pipe should be the type suggested by JICA D/D team (catalog is also given)
5105	all stairs must be reinforced and shown.
5201	stairway "No. 2" be filled
7106	all sections with cut-off bars must show the position of cut-off points
7107	SECTION B: B_4 instead of B_3 weld size must be shown M 15 means bolt size of 15 mm diameter
7107	temperature difference used in the design of the roof should be informed to RID "CB3" shall be filled "connection between column and slab at 4th floor" be filled. Also dotted line shall be drawn to show wall below.

No. of drawing	Subject
2101	Note 1 change from "care to" to "measuring from" Note 3 clear description be given
2201	no problem with cambering (M), (F) be explained
2204	no-shrinkage mortar to control displacement after adjustment
2204	"throat" weld size is to be footnoted
7106	U.N.O. ? must be explained and footnoted
7110	details of toilet shown on 7104 and 2106
7406	location of cesspool and sewer line from intake to cesspool be filled.

Other corrections to the drawings will be listed and left at RID as it is explained in the minutes of meeting of Design Group on July 8.

JAPAN INTERNATIONAL COOPERATION AGENCY
TECHNICAL COOPERATION FOR DETAILED DESIGN FOR THE PIPELINE SYSTEM IN THE EAST COAST

To: Mr. Boonthai Otagananta
Chief Engineer for Civil Engineering
Royal Irrigation Department

Ref. No.: P-28

Date: July 14, 1982

Re: Submission of Minutes of Meeting

Dear Sir,

I am pleased to submit the minutes of meeting which were held between July 8 and 14, 1982, attended by CIPO, RID and JICA Design Team. Those meetings were intended to exchange the views on the draft of Design Reports, General and Particular Specifications, Bill of Quantities and Design Drawings. I am grateful for your cooperation since the commencement of our works in November 1981 and happy about that our mission has almost been completed.

The issues raised during the meetings can be classified into two:

* Matters on which amendment and/or addition will be undertaken in Japan, upon the understanding and consent of RID.

* Matters on which Thai agencies will decide and later inform JICA team, in order to make amendment and/or addition for payment condition of Particular Specification.

Considering that JICA team has to submit all Documents in the end of August to JICA Head Office in Tokyo, your information on the aforementioned matters and written approval shall reach us before the end of July very desireably.

Again I thank you for your friendship and assistance endowed upon us at every stage of our works and I wish RID's successful accomplishment in the further implementation of Project.

accepted by

Very truly yours,

Y. Katayama
Leader
JICA Detailed Design Team

cc: JICA in Bangkok and Tokyo
Japanese Embassy in Bangkok
CIPO, NESDB

Y. Mishima
WITNESS: YUICHI MISHIMA
JICA ADVISER

MINUTES OF MEETING

ON JULY 14, 1982

Prepared by JICA Detailed Design Team

1. Date, Place, Attendants

09:30 - 14;00 , July 14, 1982
RID Conference Room
The list of attendants is attached herewith.

2. Explanation of Presented Papers

The followings were presented at the beginning of meeting:

Minutes of meeting on July 8	prepared by JICA Detailed Design Team
Minutes of meeting of Design Group on July 8 and 12	prepared by Design Group, JICA Detailed Design Team
Untitled proposal concerning documents	prepared by Document Group, JICA Detailed Design Team

3. Proceeding of Meeting

(1) Minutes of meeting on July 8
As the meeting had been attended by all personnel concerned, and the minutes included no issues needing serious consideration, it was accepted.

(2) Minutes of meeting of Design Group on July 8 and 12.
As the drawings were signed on July 13 and no significant matter was left unsolved, it was accepted.

(3) Untitled proposal concerning documents
The following issues were raised and decisions were made as shown on the attached sheets.

a) Final Reports
The style of cover is shown on the attached sheets.
The color of the reports and other documents shall be green, the color of RID.
The book shall contain the preface, letter of transmittal and written approval by RID, at the top.

b) Documents

The tender documents stated in the attached sheets shall have the covers of RID standard, having RID symbol at the top. However in the case, the consultants name at the bottom shall not be shown.

The drawings are to be titled "contract drawings"

c) No. of Documents to be presented

* Main reports 20 sets
* Supporting reports 10 sets
* Tender Documents 70 sets

d) Deadline of Comments and Instructions by RID

The deadline was set at the end of July, 1982.

e) Transmittal of Documents

JICA Tokyo is to mail them to the Embassy of Japan in Bangkok, to be transmitted lator to RID.

f) Take over

Different from other facilities, the take over of office and residential buildings is to be made 12 months after the contract signing.

g) Liquidation of damage

The practicability of transporting 12,000 cu.m/day water by truck shall be reconsidered.

h) Canteen facilities

To be reconsidered.

i) Measurement and Payment

* Temporary works clause needs rechecking and shall be modified.

j) Contingency

* Why OECF follows the fixed amount instead of percentage? See to it at OECF.

4. Attached Sheets

The attached sheets which had been prepared before the meeting in the form of draft was revised as attached herewith on the discussion and conclusion during it.

1. Tender Documents

(1) Final Tender Documents of the Project will consist of following separate documents and drawings.

a) Instructions to Tenderers
b) Conditions of Contract
c) Particular Specifications
d) General Specifications
e) Bill of Quantities
f) Contract Drawings

(2) Title of coverings of each document shall be as attached sheet.

(3) Number of each document to be submitted shall be as followings:

a) 70 sets of printed and booked documents and drawings (A-2 size)
b) One (1) complete set of reproducable documents
c) One (1) complete set of reproducable A-1 size drawings

(4) All comments and instructions on Draft Tender Documents will be made by RID up to 31st July 1982.
Comments and instructions shall be in written form.

(5) All the Documents shall be corrected in accordance with the comments and instructions of RID, and Final. Tender Documents will be prepared and booked up to 31st August 1982 or 3 weeks after receiving of comments by RID whichever later.

(6) All the Final Tender Documents shall be mailed by JICA to Embassy of Japan and be delivered to the Director General of RID.

2. Take-over of Works

(1) All office and Residential buildings shall be completed and be taken-over within 12 months from the date signing of contract.

(2) Therefore, the clause 44 of Special Stipulations of Contract shall be revised to as followings.

44. The take-over of works in present contract will be performed in two stages as below:

Stage One : All Office and Residential Buildings within 12 months from the date of signing of contract.

Stage Two : Other facilities of project within 18 months from the date of signing of contract. This period is including 2 months of Test Run Period.

(3) Revision mentioned above shall be also informed to Public Prosecution Department.

3. Blanks on Special Stipulations of Contract

(1) A blank remained in clause 46 of Special Stipulations of contract shall be instructed by RID.

(2) RID will inform to JICA the names of insurance companies as well as figures of percentage to be filled in the blanks of clause 31 and 51 of Special Stipulations of Contract.

4. Employer's Facilities

(1) Approximate 20 persons of RID will stay at site during construction period. They will not be accompanied by their families.

(2) Particular Specifications as well as Bill of Quantities shall be revised so as to satisfy the followings:

a) Employer's site office space for 20 persons in together and in addition with Engineer's site office is provided and maintained by the contractor during contract period.

b) Employer's site residences for 20 persons in together and in addition with Engineer's site office are provided and maintained by the contractor during contract period.

c) Canteen facilities (mess hall) shall be provided and meal shall be supplied by the contractor.

d) One saloon car of 2 liters, two microbus for ten persons and one pick-up of 1 ton are provided and maintained by the contractor for transportation of 20 persons of RID in addition to the transportations for the Engineer.

(3) Operation and Maintenance (O/M) people will start to stay at site from 13th month after the date of signing of contract.

(4) Particular Specifications as well as Bill of Quantities shall be revised so as to satisfy the followings:

a) Office and residential buildings shall be completed and taken-over to the Employer within 12 months after signing of contract.

b) The contractor shall start the training Programe.

c) Period of Oversea's training will be 30 man-months

d) New five pick-up (1 ton) and three moter-cycle (100 cc) shall be supplied by the contractor at 13th month after signing the contract.

5. Measurement and Payment

(1) All kind of temporary works shall be, as a general rule, paid by Lump Sum.

(2) Payment for major supplies such as pumping plant, electrical equipment, steel pipe, valve, coupling, EPT sheet, etc. shall be, as a general rule, as followings.

a) Payment for supply works shall be itemized separately to installation works.

b) 50% of total payment for supply items, which will be imported from foreign country, shall be made at the time of delivery of materials at site. Materials shall be insured under the name of the Contractor.

c) Remaining 50% of the payment for supply shall be made at the time of completion of installation works.

d) Payment for installation works shall be made at once at the time of completion of installation works.

e) 50% of total payment for supply items, which will be manufactured in Thailand (such as steel pipe), shall be made at the time of delivery of material at site and approved by the Engineer.

f) Remaining 50% of the payment shall be made at the time of completion of installation works.

(3) Payment for excavation, fill and backfill, rock excavation, riprap, etc. will be made in accordance with the quantities executed.

(4) Measurement for payment for earth works of pipeline will be the length in meter.

(5) Formworks and Reinforcing bar will be separately measured and paid from the reinforced concrete for usual structure.

(6) Payment for concrete works of caisson tower of which the requirement of formworks and Reinforcing bars will be differed depending upon the method of construction, shall cover all the concrete, formworks, reinforcing bar, etc.

(7) Payment for concrete works of P.C concrete of Head Tank will be made under calculation of Empty-cubic meter.

(8) Measurement for payment for building works will be the floor area in squar-meter or unit and the payment will be made after the completion of the building.

(9) Measurement for payment for steel pipe shall be the length in meter, not by ton.

6. Other Particulars

(1) Exploration Pit works shall be performed by the contractor, but shall not be paid.

(2) All miss-typing shall be checked carefully and corrected for the final document.

7. Final Cost Estimate

(1) Two sets of Final Cost Estimate shall be sent to the Director General of RID by sealed and registered mail at same time as of the mail of Final Tender Documents.

(2) Item of Provisional Sum for contingency of the Projected Works shall be provided in the Bill of Quantities.

TECHNICAL COOPERATION FOR DETAILED DESIGN
FOR THE PIPELINE SYSTEM FROM DOK KRAI TO MAB TA PUD IN THE EAST COAST

ATTENDANT LIST

Date:
Place:

	NAME		DESIGNATION
1.	BOONTHAI	OTAGANONTA	CHIEF ENG. FOR CIVIL ENGINEERING
2.	CHAREUK	NONTHATHUM	DIRECTOR, LARGE PROJECT CONST. DIV.
3.	CHAROON	KAMOLRATANA	CHIEF, DESIGN REGION 10 SECTION DESIGN DIV.
4.	THANEE	KHEOSIPALARD	ARCHITECT 6
5.	PRAHAS	MASAMONDANA	CHIEF, DESIGN SEC.6TH, DESIGN.DIV.
6.	SIRIPONG	HUNGSPREUG	ENGINEER, SEC.6TH, DESIGN DIV.
7.	OSAMU	WAKAMOTO	JICA
8.	KOICHI	MIYOSHI	JICA
9.	YUICHI	KATAYAMA	JICA D/D TEAM LEADER
10.	SHOICHIRO	HIGUCHI	JICA
11.	MASAFUMI	OKUBO	JICA
12.	YUICHI	MISHIMA	JICA
13.	YOSHIYUKI	TOMIOKA	JICA
14.	FUMIO	ENOMOTO	JICA
15.	YOSHIKAZU	NISHIDA	JICA
16.	PRAKAI	SASTRAVAHA	LARGE SCALE CONST. PROJECT
17.	SOMCHIT	PUNTOOMSUIT	LEGAL SECTION
18.	MANAS	SANGUANDIKUL	CIPO, NESDB
19.	CHAMNONG	HIRANPRADIT	CHIEF, SPECIFICATION DESIGN DIV.
20.	DIBHYARAKS	SUKHUM	LOAN FINANCED PROJECT CENTER

ROYAL IRRIGATION DEPARTMENT

MINISTRY OF AGRICULTURE AND COOPERATIVE

GOVERNMENT OF THE KINGDOM OF THAILAND

FINAL REPORT

FOR

DOK KRAI - MAB TA PUD WATER PIPELINE PROJECT

IN

THE EAST COAST AREA

(MAIN REPORT)

(SUPPORTING REPORT)

AUGUST 1982

JAPAN INTERNATIONAL COOPERATION AGENCY

ROYAL IRRIGATION DEPARTMENT
MINISTRY OF AGRICULTURE AND COOPERATIVE
GOVERNMENT OF THE KINGDOM OF THAILAND

DOK KRAI - MAB TA PUD WATER PIPELINE PROJECT IN THE EAST COAST AREA

A) INSTRUCTIONS TO TENDERERS
B) CONDITIONS OF CONTRACT
C) PARTICULAR SPECIFICATIONS
D) GENERAL SPECIFICATIONS
E) BILL OF QUANTITIES
F) ~~TENDER~~ CONTRACT DRAWINGS

AUGUST 1982

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

P.O.BOX 216 MITSUI BLDG
2-1, NISHI-SHINJUKU, SHINJUKU-KU TOKYO
160 JAPAN

Mr. Boonthai Otaganonta
Chief Engineer for Civil Engineering
Royal Irrigation Department
Samsen Road, Bangkok

Date : July 28, 1982
Ref. No.: P-29

Re: Minutes of Wrap-Up Meeting

Dear Sir:

We are pleased to submit herewith the minutes of wrap-up meetings held for a period covering from July 15 to July 28, 1982 as attended by representatives of RID and JICA Design Team. Said meetings were held with our intention to work out the RID's final comments on the Draft Reports and Draft Documents submitted by the JICA Team.

It is understood, with this concern, that the comments summarized in this minutes are of final, and the Final Design Reports and the Final Tender Documents shall be compiled after amendments have been made in accordance with the comments.

The Final Design Reports and the Final Tender Documents for Dok Krai - Mab Ta Pud Water Pipeline project is scheduled to be submitted to JICA Head Office in Tokyo by the end of August 1982.

Thanking you always for your kind consideration and usual cooperation extended to us throughout this term of detailed design for the project, with our hope to realize the successful implementation of the project at an early date.

Yours faithfully,

Masahiro Okabe
for. Yuichi Katayama
Team Leader
JICA Detailed Design Team

cc. : 1. JICA Head Office, Tokyo
2. JICA Bangkok Office

MINUTES OF WRAP UP MEETINGS

O N

JULY 15 - JULY 28, 1982

1. Date, Place, Attendants

(1) Date : From July 15 to July 28, 1982.

(2) Place : Head Office of RID.

(3) Attendants

* BOONTHAI OTAGANONTA	Chief Eng. for Civil Engineering
* CHAREUK NONTHATHUM	Director, Large Project Const. Div.
* CHAMNONG HIRANPRADIT	Chief, Specification Design Div.
* PRAHAS MASAMONDANA	Chief Design Sec. 6th
* DIBHYARAKS SUKHUM	Loan Financed Project Center
* SOMCHIT PUNTOOMSUIT	Legal Section
* MANAS SANGUANDIKUL	CIPO, NESDB
* PRAKAI SASTRAVAHA	Large Scale Const. Project
* SIRIPONG HUNGSPREUG	Design Sec. 6th
* THANEE KHEOSIPALARD	Architect 6
* MASAFUMI OKUBO	JICA Team

2. Aim of meetings

The meetings were held to work out the RID's final comments on Draft Report and Draft Documents submitted by the JICA Team.

3. Result of meetings

The result of meetings are summarized in attached sheets as "Comments on Draft Reports and Documents".

****

AMENDMENT

ON

DRAFT REPORTS & DOCUMENTS

****

I. DRAFT DESIGN REPORTS

Main Report & Supporting Report:-

(1) No more comment upon the Main Design Report other than those comments made during July 8 to July 14, 1982 and summerized in the Minutes of Meetings.

II. DRAFT CONTRACT DRAWINGS

(1) No more comment upon the Draft Contract Drawings other than those made during July 8 to July 14, 1982 and mark out on a draft contract drawings.

(2) Figures and words on the Drawings should be reviewed by the JICA Team in order to avoid discrepancy between the Drawings and the Specification and/or Bill of Quantities.

III. TENDER DOCUMENTS FOR CONSTRUCTION

(1) No more comment upon the Draft Documents.

(2) Tender documents for construction should be independently compiled and be entitled "Instructions to Tenderers".

IV. GENERAL CONDITIONS OF CONTRACT AND SPECIAL STIPULATIONS

(1) Final acceptance or comment by the Prosecution Office might be informed up to the middle of August 1982.

(2) Following amendments shall be made:-

a) GC clause 71 Settlement of Disputes

Instead of "final settlement under the Rules of Conciliation", following acts shall be made.

The notice of Contractor shall contain the name of the arbitrator he has appointed. The Employer then shall appoint an arbitrator within thirty (30) days from the date of receipt of such notice. Should the arbitrators fail within thirty (30) days after the appointment of the Employer's arbitrator to agree upon a decision of the dispute, or if no agreement is reached on the appointment of an umpire, they, or either of them, should the other refuse to act, shall apply within thirty (30) days to the proper Thai Court for the appointment of the umpire by the said Court, whose order shall be final in regard to the appointment applied for.

The arbitrators and umpire shall meet within thirty (30) days following the appointment of the umpire, and the dispute shall be finally settled. The decision shall be by the majority vote of the arbitrators and the umpire, and shall be final, conclusive and binding upon the parties there to. The arbitration proceedings shall be carried out in Thailand. Each party shall bear the cost of its own arbitrator. The proportion of which each party is to bear of the cost of the umpire, should one be appointed, shall be decided by the arbitrators, or, in case they disagree, by the umpire.

b) SS clause 31

No nomination by the Employer will be made for insurance companies.

c) SS Clause 44

Revised stipulations into two-stage take-over are agreed.

d) SS Clause 46

Amount of Liquidated Damage shall be as follows:-

- The Contractor shall deliver 12,000 cu.m/day of water to P.T.T. at 17th & 18th months during the period of test operation.

- In case the Contractor fail to deliver the water, the penalty shall be 360,000 ¥/day.
  (Max. 360,000 ¥/day x 60 days = 2,160,000 ¥).

- In case the Contractor fail to complete the offices and residences up to the date of 1st provisional take-over, the daily amount of penalty shall be 0.1% of total contracted prices of such building works.

- In case the Contractor fail to complete the whole works untill the date of 2nd provitional take-over, the daily amount of penalty shall be 0.1% of total contract amount.

- When the delay with respect to one or any of the date of provisional take-over exceeds one hundred and eighty (180) days, the Employer will be entitled to terminate the Contract for the Contractor's fault.

e) SS clause 51(2)

No percentage shall be indicated and the followings shall be written.

The Contractor declares himself fully acquainted with all that is related to the nature and location of the Project, the general and local conditions involved and all that may affect its execution, upkeep and cost, with particular reference to:-

a. Pertinent Laws, Rules and Regulations of the Kingdom of Thailand;

b. Geology at Site, and conditions of the terrain;

c. Communication and access facilities on the Site;

d. Meteorology and hydrology of the area;

e. Availability of labour;

f. Type of equipment and facilities required before and during construction;

g. Local availability of construction materials, equipment and tools;

h. Any other information that may in way affect the Project, its construction, operation, maintenance and cost.

Lack of knowledge of the above will not reduce the responsibility of the Contractor, or entitle him to receive extra compensation in addition to the Contract Price.

All the information on Local conditions given in the Contract Documents, and in documents issued by the Employer each time, are to be regarded as merly indicative, for the sake of information; responsibility for any conclusion drawn or decision made by the Contractor upon receipt of such information, shall rest entirely with the Contractor.

Improt Duties The Contractor shall pay all costs of procuring the necessary permits and licenses for importation of goods into the Kingdom of Thailand, and shall pay all duties and taxes of any nature imposes on imported goods by the Kingdom of Thailand on equipment, machinery, materials and supplies. Which are to be imported for use under this Contract.

All duties and taxes shall be included in the local currency portion of the Contract Prices.

Export Charges Any tariffs, duties, and other taxes or charges levied by the country of origin of the goods required for the performance of this Contract shall be paid by the Contractor.

Income Taxes The Contractor shall pay the cost of all immigration fees, income and other taxes assessed or collected by the Kingdom of Thailand or any political subdivision thereof or any municipality therein on his employees who are not nationals of the Kingdom of Thailand. Such fees and taxes shall be included in the Prices.

f) SS Clause 53

No escalation shall be applied to this contract and stipulations should be so amended.

g) SS Clause 5

Increase of the total Contract Amount for any reason shall be subject to the approval of the Employer.

h) Others

Any claim or appeal of the Contractor will be addressed to the Engineer within ten (10) days from the date the need has arisen, stating clearly and in detail the grounds for the claim or appeal itself.

V. GENERAL SPECIFICATIONS

(1) No particular comment upon the Draft General Specifications.

(2) A few mis-typing found should be corrected.

VI. PARTICULAR SPECIFICATIONS AND BILL OF QUANTITIES

(1) Clauses "Construction Materials", "plants and Materials of Supply" and "Sub Contractos" shall be added to Section 1000 "SUMMARY OF WORKS" of the Particular Specifications.

(2) Section 1300 "ENGINEER'S FACILITIES" of the particular Specifications shall be so revised as attached sheets.

(3) Bill of Quantities should be revised as attached sheet.

(4) Item numbers of the Bill of Quantities mentioned in the Clauses "Meadurement and Payment" should be strictly corresponded to the revised Bill of Quantities.

(5) A note "Numberings of clauses of the Particular Specifications are not corresponding to those of items of the Bill of Quantities" should be discribed in the Bill of Quantities.

(6) A few amendments and/or additions and/or eliminations verbally pointed out from time to time should be so revised.

(7) Mis-typings should be checked throughout the Specifications once again and be corrected by the Team in addition to those pointed out during the review of RID.

ROYAL IRRIGATION DEPARTMENT
MINISTRY OF AGRICULTURE AND COOPERATIVES
GOVERNMENT OF THE KINGDOM OF THAILAND

DOK KRAI - MAB TA PUD WATER PIPELINE PROJECT IN THE EAST COAST AREA

PARTICULAR SPECIFICATION

AUGUST 1982

1004 CONSTRUCTION MATERIALS

(1) Principal materials to be supplied for the works shall be subject to the Engineer's approval.
The Contractor shall submit samples of materials and list of it's supply sources and/or manufacturers to the Engineer for his approval within two months after signing of the contract. Principal materials being subject to the Engineer's approval include cement, aggregate and said, water for concrete mixing, materials of rip-rap reinforcing bar, steel, etc.

(2) All reinforcing bars for reinforced concrete shall be the deformed bars conformed to JIS G3112 or ASTM A615, except reinforcing bars for the concrete of building works which shall be the round bars.

(3) Cement shall be supplied from following listed manufactures or approved equal.

a. Jalaprathan Cement Co. Ltd.
b. Siam Cement Trading Co. Ltd.
c. Siam City Cement Co. Ltd.

1005 PLANTS & MATERIALS OF SUPPLY

(1) Manufacturers of principal plants and materials to be supplied for the works shall be nominated by the Contractor and accepted by the Employer at the time of Contract.

(2) Manufacturers of principal plants and materials to be supplied for the works shall include pumping plants, electrical plants and materials, steel pipes, valves and couplings, EPT rubber sheets, concrete P.C girders, etc.

1006 SUB CONTRACTORS

(1) When and in case the Contractor intends to employ sub-contractor(s) for the major part of civil works, such sub-contractor(s) shall be nominated by the Contractor and accepted by the Employer at the time of contract and/or shall be nominated by the Contractor after obtaining of the Engineer's approval within two months after the date of signing of contract.

(2) Construction works of Intake Tower, Intake Bridge, Head Tank, Receiving Reservoir and installation works of pipeline, etc. shall be deemed as the major part of civil works.

1007 WORK SCHEDULE

(1) The Contractor shall submit the Detailed Work Schedule in accordance with the Work Schedule attached to the Contract to the Engineer for his approval, within one month after the signing of Contract. The Detailed Work Schedule shall include detailed schedules of labours requirements, material supply, plants and equipments requirements, etc..

The critical path method shall be applied for the Detailed Work Schedule.

(2) The Contractor's construction planning network shall maintain or improve on the key dates listed below. Should the Contractor's activities be delayed to the point where the maintenance of key dates for the Works are jeopardized, the Contractor shall submit to the Engineer a detail report showing all corrective actions he proposes to adopt to retrieve the intended schedule status.

Completion of provisions of Engineer's Facilities	Within 13 months after signing of Contract
Completion of Supply of Electricity and water to Office & Residencial Buildings	12 months after signing of Contract
Completion of Intake Tower ready for installation of Pumps	13 months after signing of Contract
Delivery of water to the P.T.T. Gas Separation Plant	16 months after signing of Contract

1206 MEASUREMENT AND PAYMENT

(1) Payment for all kinds of common temporary works shall cover the supply, installation, operation, maintenance and removal of all kinds of common temporary facilities and temporary works except otherwise particularly itemized works in the Bill of Quantities.

(2) Payment for all kinds of common temporary works will be made in lump-sum under Item 1001 to 1009 inclusive of the Bill of Quantities. Thirty (30) percent of the lump-sum will become payable when the Engineer deems the common site preparation and the Contractor's

temporary facilities to be completed. The remaining seventy (70) percent of the lump-sum will be paid in equal monthly payments so that total sum shall be fully disbursed upon the Provisional Take-over of the Works.

SECTION 1300 EMPLOYER & ENGINEER'S FACILITIES

1301 EMPLOYER & ENGINEER'S OFFICE

(1) The Contractor shall provide and maintain the Employer & Engineer's Office throughout the Construction Period.

This item shall consist of construction and/or the rent, maintenance and cleaning of the Employer and Engineer's Office as well as the furnishing and maintenance of the office furnitures including the air-conditioners for the sole use of the Employer and the Engineer and their staffs together with the provision, installation, maintenance and services. The building, furnitures and equipments shall remain the property of the Contractor. The building shall be approved in advance by the Engineer.

The building and services shall be available within three (3) months working order after signing of the contract and shall continue to be so available during progress of the Works until the Certificate of the second Provisional Take-over of the Works has been issued.

The Contractor shall be responsible for the security of the building and its contents at all times and shall employ watchman for this purpose.

(2) Location of the Employer & Engineer's Office will be at Mab Ta Pud or in the vicinity of the Site which shall be proposed by the Contractor and approved by the Engineer.

The Building for the Employer and Engineer's office shall have following rooms and total area of this building shall not be less than 500 sq.m.

a) Site Manager's Room (Employer)
b) Site Engineer's Room for 6 persons (Employer)
c) Resident Engineer's Room (Engineer)
d) Supervisor's Room for 16 persons (Engineer)
e) Drafting Room
f) Administration Room
g) Conference Room for 20 persons
h) Conference Room for 8 persons
i) Storage
j) Kitchen
k) Toilet

(3) The building shall be furnished with new furnitures and equipments. The followings are lists of the minimum basic furnitures and equipments to be provided by the Contractor for the Employer and Engineer's Office.

a) Site Manager's Room

	Quantities
- Wooden Desk, 1.90 m x 0.90 m top, 6 side Drawers and 1 center drawer	1
- Revolving Executive Chair, on rollers, with armrests	1
- Streight Chair	2
- Bookcase, 0.30 m x 0.90 m x 0.80 m high, wood or metal	2
- Overstuffed Office Lounge Suite, Coffee Table, wooden, Formica top, 0.50 m x 1.20 m x 0.40 m high	1
- Wastebasket, large, solid sides, no wire	2
- Wall Board 250 cm x 150 cm	2
- 1 H.P. (12500 BTU) air conditioner	1

b) Site Engineer's Room

- Wooden Desk, 1.50 m x 0.75 m top, 6 side drawers and 1 center drawer	6
- Executive Chair with armrests	6
- Drafting Table	2

	Quantities
- Stool	2
- Bookcase, 0.30 m x 0.90 m x 0.80 m high, wood or metal	3
- Straight Chair	6
- Wastebasket, large, solid sides, no wire	6
- Wall Board, 250 cm x 150 cm	2
- Coffee table	1
- 1 H.P (12500 BTU) air conditioner	2

c) Resident Engineer's Room

- Same as those for Site Manager's Room

d) Supervisor's Room

	Quantities
- Wooden Desk, 1.70 m x 0.75 m top, 6 side drawers and 1 center drawer	6
- Executive Chair with armrests	6
- Wooden Desk, 1.5 m x 0.75 m top, 6 side drawers and 1 center drawer	10
- Executive Chair	10
- File Cabinet, four drawers, lock type, legal size with metal clip hanging files (30 per drawer)	8
- Drawing Cabinet, twelve drawers, lock type, 0.9 m x 1.3 m x 1.5 m high	2
- Drawing Hanger, 0.9 m x 1.2 m high	4
- Coffee Table	2
- Bookcase, 0.30 m x 0.80 m high, wood or metal	4
- Straight Chairs	8
- Wastebasket, large, metal, solid sides, no wire	16
- Wall Board 250 cm x 150 cm	4
- 1 H.P. (12500 BTU) air conditioner	4

e) Drafting Room

	Quantities
- Drafting Table.	2
- Complete Set of Drafting Machine	2
- Stool	2
- Wastebasket, large, metal solid sides, no wire	2
- Drawing instruments	2
- Drawing Cabinet, twelve drawers, lock type, 0.9 m x 1.3 m x 1.5 m high	2
- Drawing Hanger, 0.9 m x 1.2 m high	4
- Cupboard with shelves & locks	2
- Wall Board 250 cm x 150 cm	2
- Blue Printing Machine, Electric, to handle up to 90 cm x 120 cm paper, to be approved by the Engineer's Representative	1
- 1 H.P. (12500 BTU) air conditioner	1

f) Administration

- Wooden Desk, 1.50 m x 0.75 m top, 6 side drawers and 1 center drawer	2
- Executive Chair	2
- File Cabinet, four drawers, lock type, legal size with metal clip hanging files (30 per drawer)	2
- Coffee Table	1
- Bookcase, 0.30 m x 0.80 m high, wood or metal	1
- Wastebasket, large, metal, solid sides, no wire	2
- Cupboard with shelves and locks	1
- Wall Board 250 cm x 150 cm	1
- Typewriter Table, metal no rollers	2

	Quantities
- Electric typewriters, IBM, Dualectric, Thai & English or approved equal	2
- Dry Photo-Copier, Electric, XEROX Model "4800" or a-proved equal	1
- Wooden Desk 1.25 m x 0.75 m top, 3 side drawers and 1 center drawer	2
- Straight Chair	2
- 1 H.P. (12500 BTU) air conditioner	2
g) Conference Room for 20 persons	
- Table 250 cm x 125 cm	4
- Straight Chair	20
- Wall Board 250 cm x 150 cm	2
- Blackboard with eraser	2
- Wastebasket, large, solid sides, no wire	2
- 1 H.P (12500 BTU) air conditioner	4
h) Conference Room for 8 persons	
- Table 250 cm x 125 cm	1
- Straight Chair	8
- Wastebasket	1
- 1 H.P. (12500 BTU) air conditioner	1
i) Kitchen	
- Kitchen necessaries	1 set
- Tea and coffee sets	2 dozens
- Electric refrigerator (14 cu. feet)	1

(4) The Contractor shall be required to employ and be responsible for the welfare and housing of the following staff to be available during the hours agreed by the Engineer.

- Two cleaners
- Two office boys

(5) Following services shall be provided, installed and maintained in the Employer & Engineer's Office by the Contractor:

a) An adequate piped supply of clean, fresh water connected to the toilet and suitable sewage disposal facilities.

b) Potable water

c) Electricity supply, with sufficient and suitable light fittings and socket outlets.

d) Fire Extinguishings

e) Two outside telecommunication lines

f) Office supplies

(6) The Contractor shall provide fifty (50) sets of safty helmets, boots, raincoats in the Employer and Engineer's Office for use of the Employer and Engineer. Color of these shall be white or other color deffered from those of the Contractor, and the qualities of these shall be the subject to approval of the Engineer.

1302 EMPLOYER & ENGINEER'S RESIDENCE

(1) The Contractor shall provide and maintain the Employer and Engineer's Residence throughout the Contract Period.

This item shall consist of construction and/or the rent, maintenance and cleaning of the Employer and Engineer's Residences as well as the furnishing and maintenance of the furniture including the air-conditioners for the sole use of the Employer and the Engineer and their staff together with the provision, installation and maintenance of services. The buildings, furnitures and equipments shall remain the property of the Contractor. The buildings shall be approved in advance by the Engineer.

The buildings, furnitures, equipments and services shall be available in full working order within three (3) months after signing of the contract, and shall continue to be so available during progress of the Works until the commissioning works have been completed.

A few bedrooms and related facilities and services shall only be available during commissioning period after the date of Provisional Take-Over.

The Contractor shall be responsible for the security of the building and its contents at all times and shall employ watchmen for this purpose.

(2) Location of the Employer and Engineer's Residences will be at Mab Ta Pud or in the vicinity of the Site which shall be proposed by the Contractor and approved by the Engineer.

(3) The buildings for the Employer and Engineer Residence shall have at least following rooms and facilities and total area of the building(s) shall not be less than 900 sq.m.

a) Ten (10) single-bed Bedrooms with bath and toilet for the Employer use

b) Five (5) twin-bed Bedroom with bath and toilet for the Employer use

c) Fifteen (15) single bed Bedrooms with bath and toilet for the Engineer use

d) Five (5) twin bed Bedrooms with bath and toilet for the Engineer use

e) Sitting and Recreation Room(s)

f) Canteen Facilities

(4) Each building for the Employer and Engineer's Residences shall be furnished with new furnitures and equipments. The following furnitures and equipments shall be at least provided with each of the Residences by the Contractor as the minimum basic requirement.

Description	Quantities
Sitting Room	
- Wooden bookcase	1
- Wooden armchair	6
- Wooden teatable	1
- Curtain for window with insect net	
- 1 H.P. (12500 BTU) air conditioner	1
Recreation Room	
- Wooden dining tables for 4 persons	2
- Wooden chairs for above table	8
- Wooden cup-board	1
- Curtain for window with insect net	
- 1 H.P. (12500 BTU) air conditioner	1
Twin-bed Bedroom	
- Single bed with Dunloppillow mattress	2
- Wooden bed table	2
- Bed lamp	2
- Wooden table with chair	2
- Pillow with two pillow covers	2
- Sheet for single bed with mattress	4
- One person blanket	4
- Wardrobe	2
- Curtain for window with insect net	
Single-bed Bedroom	
- Single bed with Dunloppillow mattress	1
- Wooden bed table	1
- Bed lamp	1
- Wooden table with chair	1
- Pillow with two pillow covers	1
- Sheet for single bed with mattress	2

Description	Quantities
- Blanket	2
- Wardrobe	1
- Cabinet, lock type	1
- Curtain for window with insect net	

(5) More than one bathroom and toilet shall be provided for each of the Residences, and the bathroom and toilet shall be at least provided at the rate of four person to one.

(6) Canteen facilities shall have the capacity to provide mess for at least 40 persons of the Employer and the Engineer.

(7) The Contractor shall provide the sufficient number of personnels, such as cleaner, housemaid, boy, etc., for the welfare and maintenance of the Employer and Engineer's Residences.

(8) Following services shall be provided, installed and maintained in the Engineer's Residences by the Contractor:

a) Adequate piped supply of clean water connected to toilets and bathrooms in the Buildings and suitable sewage disposal facilities.

b) Potable water

c) Electric immersion water heaters in the bathrooms connected to the piped water supply.

d) Electric refrigerator (230 liters) for each of the Residences.

e) Electricity supply with sufficient and suitable light fittings and socket outlets.

f) Two internal telecommunication lines for each building

1303 EMPLOYER & ENGINEER'S TRANSPORTATION

(1) The Contractor shall provide and maintain until the end of the commissioning period vehicles for the Employer and Engineer

and staff for both on-site and off-site transport. The vehicles shall be for the exclusive use of the Employer and Engineer. The vehicles shall be new when provided. The property of vehicles shall remain to the Contractor during and after the contract period. Mailage of monthly off-site transport shall not be more than 5,000 km. (per

(2) The Contractor shall be required to provide:

a) Four (4) four-door saloon cars, air-conditioned, nominal engine capacity 2 litres, or similar.

- One car for the Employer use
- Three cars for the Engineer use

b) Four (4) micro buses, for not less than 10 persons seats, air-conditioned, nominal engine capacity 2 litres, or similar.

- Two micro bus for the Employer use
- Two micro bus for the Engineer use

c) Two (2) pick up of 1 ton, nominal engine capacity 1.6 liters, or approved equal.
Vehicles shall be right hand drive and shall be fitted with the following:.

1) Seat belts
2) Fire extinguishers
3) First aid kit

(3) Vehicles shall be regularly served and repairs shall be made as soon as required. Vehicles which have to be kept out of service due to extensive repairs or maintenance work shall be substituted by similar serviceable vehicles within 24 hours from the time the original vehicles become out of service.

Any vehicle which has become permanently defective, unreliable or otherwise unfit for its intended use shall be replaced with a

similar new vehicle within 60 days from the time the supply of such new vehicle has been ordered by the Engineer. Untill the new vehicle is available for use at Site, a temporary substitute, serviceable vehicle shall be provided.

Vehicle maintenance shall include, but not necessarily be limited to, all fuels, lubricants, tires and other supplies; all maintenance repairs; insurance; licenses and other operating requirements.

(4) The Contractor shall provide vehicles within following period and in accordance with a delivery schedule to be provided by the Engineer.

a) Four saloon car	:	within one month after signing of contract
b) Two pick up	:	within two months after signing of contract
c) Four Micro bus	:	within three months after signing of contract

Prior to ordering vehicles, the Contractor shall submit to the Engineer for approval detailed specifications, for each vehicle proposed.
A pertinent service handbook and related manuals shall be supplied with each vehicle.

(5) A licensed competent and experienced driver shall be provided on each vehicle.

1305 SUPPLY OF TRANSPORT

(1) The Contractor shall supply the following transports which will be uses of the operation and maintenance people of the Project.

a) Five (5) pick up

b) Three (3) moter cycle

(2) The pick up to be supplied shall be new and the specifications of the pick up are as followings:

a) Type : Pick up truck body. 4 x 2

b) Weight ratings : Gross vehicle weight not less than 1,950 kilograms. Payload approximately 1,000 kilograms.

c) Wheelbase : Minimum 2,400 mm.

d) Suspension : Springs and shock absorbers, front and rear.

e) Steering : Right hand drive

f) Engine : Make and model
Gasoline, water cooled, multicylinder engine. Piston displacement approximately 1,600 C.C. Minimum output 55 KW (75PS) at not more than 100 rps. (6,000 rpm)

g) Clutch : Manufacturer's standard

h) Transmission : Floor mounted shift lever, synchromesh gear type.

i) Brakes : 4-wheel hydraulic brake with vacuum booster. Hand parking brake shall be equipped.

j) Electrical Equipment : Manufacturer's standard

k) Gauges or warning lights : Direct reading or warning lights for fuel, lubricating oil pressure, temperature and battery charging indicator. Metric speedometer and recording odometer shall be equipped.

l) Accessories : Acessories and attachment furnished shall be the manufacturer's standard and shall include but not limited to dual electric windshield wipers, rear view mirrors, sun visors, insulated cab, safety glasses in cub, tools originally supplied in the manufacturer's tool kit.

m) Wheels and tires : Disc type wheel, tube type tires, manufacturer's standard tire size and ply rating. One spare wheel and tire.

n) Body : Steel-pick up type Dimensions consistent with manufacturer's standard model. Non-skid steel floor type and equipped with synthetic fabric top with rear side seats.

o) Paint finish : Omaha orange

(3) The motor cycle to be supplied shall be new and the specifications of the motor cycle are as followings

a) Suspension : Front and rear shock absorbers.

b) Engine : Approx. 100 C.C. piston displacement, gasoline, air cooled engine. Min. brake horsepower 9 HP or PS at approximately 7,500 revolutions perminute.

c) Electrical system : Kick starter type, front and rear turn signal lights, brake lights, speedometer light, head light, tail light and other necessary warning lights.

d) Clutch : Manufacturer's standard

e) Brakes : Front and rear wheels.

f) Transmission : Multiforward speeds. Gear shift by foot operation.

g) Tire : Tube type tire. Manufacturer's standard size and ply rating.

h) Accessories : Accessories and attachments furnished shall be the manufacturer's standard and shall include but not be limited to rear view mirrors, electric horn, speedometer, tool equipment orginally supplied in the manufacturer's standard tool kit. One copy of operator's Handbook.

i) Body : Rigid sturdy man riding type metal frame. Front and rear mudguards.

j) Paint : Dual seat - black.
Body - Manufacturer's standard paint.

(4) The Contractor shall supply the pick-up and motor cycles at 13th month after signing of the contract or in accordance with the instructions by the Engineer.

Prior to ordering vehicles and moter cycles, the Contractor shall submit to the Engineer for approval detailed specifications, for each vehicle proposed.

A pertinent service handbook and related manuals shall be supplied with the pick-up and motor cycle.

1306 MEASUREMENT AND PAYMENT

(1) Measurement for payment for the Employer and Engineer's Office shall cover the provision, maintenance and other requirements stated in the Specifications.

(2) Payment for the Employer and Engineer's Office will be made by lump sum under Item 1101 of the Bill of Quantities.

Thirty (30%) percent of the lump sum under Item 1101 will become payable when the Engineer deems the provision and furnishing of the Employer and Engineer Office to be substantially completed.

The remaining seventy (70%) percent of the lump sum will be paid in equal monthly payments so that the total sum shall be fully disbursed upon the Provisional Take-over of the Works.

(3) Measurement for payment for the Employer and Engineer's Residence shall cover the provision, maintenance and other requirements stated in the Specifications.

(4) Payment for the Employer and Engineer's Residences will be made by lump sum under Item 1102 of the Bill of Quantities.

Thirty (30%) percent of the lump sum under Item 1102 will become payable when the Engineer deems the provision and furnishing of the Employer and Engineer Residences to be substantially completed.

The remaining seventy (70%) percent of the lump sum will be paid in equal monthly payments so that the total sum shall be fully disbursed upon the Provisional Take-over of the Works.

(5) Measurement for payment for the Field Laboratory shall cover construction, furnishing, and maintenance of the laboratory and other requirements of the Specifications.

(6) Payment for the Field Laboratory will be made by lump sum under Item 1103 of the Bill of Quantities.

Thirty (30%) percent of the lump sum under Item 1103 will become payable when the laboratory is substantially completed and facilitied.

The remaining seventy (70%) percent of the lump sum will be paid in equal monthly payments so that the total sum shall be fully disbursed upon the Provisional Take-over of the Works.

(7) Measurement for payment for provision, operation and maintenance of vehicles shall cover the purchase, delivery of the vehicles to the site, provision of and operation by a licensed competent driver on a full time basis, depreciation, taxes, the cost of comprehensive insurance and licenses, petrol, oil and lubricants, repairs and replacement of parts and vehicles and all other costs and charges incurred in the running and upkeeping of the vehicles, and any other requirements stated in the Specifications.

(8) Payment for provision, operation and maintenance of vehicles will be made under Items 1104, 1105, 1106 and 1107 of the Bill of Quantities and shall be made on the vehicle-month basis as computed months from the date of delivery of each vehicle to be ready for operation to the date of return back of each vehicle to the Contractor.

(9) Payment for supply of pick up car will be made under Item 1108 of the Bill of Quantities. The payment will be made at the time of delivery of the pick-up and against the certificate of acceptance of the Engineer, and shall be cover the purchase and delivery to site of pick-up and any other requirements stated in the specifications.