No. 12

THE REPUBLIC OF ECUADOR

CRM

Centro de Rehabilitación de Manabí

WATER TRANSBASIN PROJECT FOR CHONE-PORTOVIEJO RIVER BASINS

CRM - OECF

INTERNATIONAL TENDERING No. ____

FOR

CONSTRUCTION OF CIVIL WORKS

PACKAGE 2

TRANSPEDANA-POZA HONDA TRANSBASIN

AND

POZA HONDA-VINCHE GRANDE TRANSBASIN

INVITATION TO PRE-QUALIFICATION

OF

CONSTRUCTING FIRMS

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MARCH 1995

THE REPUBLIC OF ECUADOR

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Centro de Rehabilitación de Manabi

WATER TRANSBASIN PROJECT FOR CHONE - PORTOVIEJO RIVER BASINS

CRM - OECF

INTERNATIONAL TENDERING No. ____

FOR

CONSTRUCTION OF CIVIL WORKS

PACKAGE 2

LA ESPERANZA ~ POZA HONDA TRANSBASIN
AND
POZA HONDA ~ MANCHA GRANDE TRANSBASIN

INVITATION TO PRE - QUALIFICATION

OF

CONSTRUCTING FIRMS

MARCH 1995

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INVITATION TO PRE-QUALIFICATION OF CONSTRUCTING FIRMS

CRM
Centro de Rehabilitacion de Manabí

WATER TRANSBASIN PROJECT
FOR
CHONE-PORTOVIEJO RIVER BASINS

CRM - OECF

INTERNATIONAL TENDERING No._____
FOR
CONSTRUCTION OF CIVIL WORKS

PACKAGE 2

LA ESPERANZA~POZA HONDA TRANSBASIN
AND
POZA HONDA~MANCHA GRANDE TRANSBASIN

In accordance with what was settled by the Contracting Committee of the Centro de Rehabilitación de Manabí (CRM) in a session celebrated on _____, 199__, the Firms, or Association of all countries, are invited to participate with the Pre-Qualification, previous to the Tendering that will be executed with resources from a loan granted by the OVERSEAS ECONOMIC COOPERATION FUND OF JAPAN (OECF), for the Construction of the Civil Works, Package 2: La Esperanza~Poza Honda Transbasin and Poza Honda~Mancha Grande Transbasin of the Water Transbasin Project for Chone-Portoviejo River Basins.

1. WORK TO BE TENDERED

The work to be tendered consists of the construction of the civil works for the La Esperanza~Poza Honda Transbasin and Poza Honda~Mancha Grande Transbasin; including the Severino pumping station, penstock, head tank, substation and open channel with siphons, crossing structures and inspection road; La Esperanza~Poza Honda diversion tunnel with inlet, outlet and work adits; Poza Honda~Mancha Grande diversion tunnel with inlet structure, outlet and work adit; access roads; and Daule-Peripa 138 kV switchgear yard. The summary of the main works to be constructed is as follows:

(1) La Esperanza~Poza Honda Transbasin

(a) Severino Pumping Station

- La Esperanza reservoir :

	F.W.L.	:	EL. 69.0 m
	H.W.L.	:	EL. 66.0 m
	L.W.L.	:	EL. 37.0 m
•	Weighted overage water level	:	EL. 58.5 m
•	Minimum operation water level	:	EL. 47.0 m
•	Sill elevation of intake	:	EL. 42.0 m
•	Elevation of pump center	:	EL. 46.0 m
•	Actual head	:	
	Maximum	:	67.3 m
	Minimum	:	48.3 m
•	Installed capacity	:	16.0 m^3/sec (3.2 m^3/sec x 5 units)
•	Number of units	:	5 units on duty and 1 unit for stand-by
•	Type of pumps (to be installed by the other contractor)	:	Vertical shaft, single suction volute type
•	Type of motors be installed by the other contractor)	:	Vertical shaft, three phases, wound-rotor (to induction type
•	Substructure of pump house	:	29.0 m W x 67.5 m L x 30.1 m H
•	Superstructure of pump house	:	22.5 m W x 65.0 m L x 13. 5 m H

(b) Severino Penstock

•	Type	:	Above ground type, steel pipe
•	Number of lanes	:	2 nos.
•	Length	:	
	No. 1 pipeline	:	173 m
	No. 2 pipeline	:	170 m
•	Inside diameter	:	2,000 mm

(c) Severino Head Tank

•	Type	:	Overflow weir type
•	Dimension	:	56.7 m L x 19.2 m W
•	Crest elevation of weir	:	EL. 113.3 m
•	Maximum water level	:	EL. 114.0 m

(d) Severino Open Channel

•	Type	:	Trapezoidal shape, concrete lining with bottom width of 1.6 m and side slope of 1:1.2
•	Maximum discharge	:	16.0 m^3/sec
•	Length including siphons	:	6.4 km
•	Bottom slope	:	1 : 3,000

•	No. 1 siphon	:	72 m L x 8.7 m in max. head
•	No. 2 siphon	:	233 m L x 36.6 m in max. head
•	No. 3 siphon	:	326 m L x 47.6 m in max. head
•	No. 4 siphon	:	76 m L x 5.5 m in max. head
•	No. 5 siphon	:	174 m L x 17.5 m in max. head
•	Inspection road	:	3.0 m wide and about 7.5 km long
•	Caña-Dulce inlet culvert	:	
•	Type	:	Non-gated concrete structure
•	Length	:	78 m
•	Bottom elevation	:	EL. 107.4 m

(e) La Esperanza~Poza Honda Diversion Tunnel

•	Type	:	Standard horseshoe section, open free flow
•	Flow capacity	:	16.0 m^3/sec
•	Inside diameter	:	3.5 m
•	Length	:	11.4 km
•	Slope of tunnel	:	1 : 1,500
•	Invert level	:	
	Inlet	:	EL. 107.3 m
	Outlet	:	EL. 99.7 m
•	Los Cuyuyes outlet	:	
	Type	:	Trapezoidal shape, concrete lining with bottom width of 3.5 m and side slope of 1 : 0.5

(f) La Seca Work Adit : Semi-circular and rectangular section, 4.0 m wide x 4.0 m high, 519 m long, schotcrete lining

(g) Los Cuyuyes Work Adit : Semi-circular and rectangular section, 4.0 m wide x 4.0 m high, 130 m long, schotcrete lining

(h) Severino Substation

•	Space	:	
	138 kV switchgear yard	:	1,800 m^2 (30 m x 60 m)
	Main transformer yard	:	720 m^2 (16 m x 45 m)
•	Main transformers (to be installed by the other contractor)	:	Three phases, oil immersed, forced-air-cooled/self-cooled, outdoor use type

(i) **Transmission Line (to be constructed by the other contractor)**

• Length	:	32.6 km from Daule-Peripa power station to Severino substation
• Circuit	:	Single circuit
• Voltage	:	138 kV

(j) **Daule-Peripa 138 kV Switchgear Yard**

• Space	:	11,635 m^2 (121.2 m x 96 m)

(k) **Severino Access Road** : Permanent road to be constructed newly, 6.0 m wide and about 9.3 km long

(l) **Caña Dulce Inlet Access Road** : Temporary road to be constructed newly, 4.0 m wide and about 2.7 km long

(2) **Poza Honda~Mancha Grande Transbasin**

(a) **Poza Honda Inlet**

• Poza Honda reservoir		
F.W.L.	:	EL. 110.3 m
H.W.L.	:	EL. 106.5 m
L.W.L.	:	EL. 88.3 m
• Sill elevation of intake	:	EL. 91.4 m
• Diversion water level	:	
L. W.L.	:	EL. 94.0 m (Q = 4 m^3/sec)
Lowest	:	EL. 91.4 m (Q = 0 m^3/sec)
• Valve chamber	:	
Type	:	Vertical shaft, oval shape, reinforced concrete structure
Dimension	:	20.0 m L x 16.0 m W x 22.45 m H
Roof level	:	EL. 112.5 m
Steel pipes (to be installed by the other contractor)	:	2 lanes of 900 mm dia., with cone sleeve valves

(b) **Poza Honda~Mancha Grande Diversion Tunnel**

• Type	:	Standard horseshoe section, open free flow
• Flow capacity	:	4 m^3/sec
• Inside diameter	:	2.5 m
• Length	:	4.1 km
• Slope of tunnel	:	1 : 3,900

•	Invert level	:	
	Inlet	:	EL. 90.0 m
	Outlet	:	EL. 89.0 m
•	Mancha Grande outlet	:	
	Type	:	Trapezoidal open channel, concrete lining with bottom width of 2.5 m and side slope of 1:0.5
	Length	:	200 m
(c)	**Poza Honda Work Adit**	:	Semi-circular and rectangular section, 4.0 m wide x 4.0 m high, 168 m long, schotcrete lining
(d)	**Los Cuyuyes Access Road**	:	Permanent road to be constructed newly, 6.0 m wide and about 14.7 km long
(e)	**La Seca Access Road**	:	Temporary road to be constructed newly, 4.0 m wide and about 3.8 km long
(f)	**Poza Honda Inlet Access Road**	:	Permanent road to be constructed newly, 6.0 m wide and about 0.7 km long

2. CONSTRUCTION PERIOD

The estimated period for the total execution of the work is 54 calendar months, counting from the day of commencement order.

CRM has foreseen the probable date for Tender Call in the month of_____, 199__.

3. FINANCING

The work will be financed by means of the Loan No._____ of the Overseas Economic Cooperation Fund of Japan (OECF).

4. REQUIRED INFORMATION

The Applicants must submit:

A. Presentation and Commitment Letter (Form No. 1)

B. General Data of the Firms (Form No.2)

C. Documents that would accredit the Legal Constitution of the Firms or Association

and the Nomination of their Legal Representative

D. Experience and Capabilities in the Execution of Similar Works (Forms Nos. 3, 3A, 3B and 4), attaching Certificate about the Execution Fulfillment issued by the Clients

E. Personal Data and Experience of the Directive and Technical Personnel of the Applicant that would be assigned to the Project (Forms Nos. 5, 5A, 5B, 5C and 5D), attaching Curriculum Vitae and Commitment Letter (Forms Nos. 5E and 5F)

F. List and Characteristics of the Construction Equipment available for the Work (Forms Nos. 6 and 6A)

G. List of Occasional Sub-contractors (Form No. 7) and General Data of Them (Form No. 7A)

H. Affiliation Certificate issued by the Construction Chamber, or the Chamber of Commerce or Another Similar Entity of the Country that the Applicant comes from

I. Certificate of No Pending Debts to the Ecuadorian Institute of Social Security (IESS)

J. Certificate from the Comptroller's Office on the Fulfillment of the Contracts

K. Certificate from the Company's Superintendence

L. Certificate from the Ministry of Finances about the Amount caused by Concept of the Income Tax for the Year 1995

M. Solvency Certificate issued by National or Foreign Banks backed-up by Banks domiciled in Ecuador

N. Financial Statements for the Years 1993, 1994 and 1995, duly audited (Forms Nos. 8 and 8A)

O. Name of the Bank or Company that will issue the Bond on the Execution of the Contract (Form No. 9)

P. Total Sales in the Last Ten (10) Years (Form No. 10)

Q. List of the Stockholder's Structure (Form No. 11)

R. Declarations and/or Demonstrations

S. Additional Illustrative Information that the Tenderer considers Useful

5. GETTING THE PRE-QUALIFICATION DOCUMENTS

The Pre-Qualification Documents can be obtained in the Secretary's Office of the Contracting Committee of the Centro de Rehabilitación de Manabí (CRM), 18 de Octubre y Sucre, Portoviejo, from 09:00 hr. to 15:30 hr. during working days, previous the non-reimbursable payment of S/. 1,000,000 in cash or by means of a certified check payable to the order of CRM. Payment will also serve as registration to participate in the Pre-Qualification.

6. INFORMATION TO BE SUBMITTED

The interested parties must submit the Pre-Qualification application, with the forms containing the required information and other requested documents, to the Secretary's Office of the Contracting Committee in the address aforementioned, until 15:00 hr. of the _____ day of _____ 199__, written in Spanish language in a sealed envelope, with the respective safeguards to avoid knowing its content before its official opening and that will have on the outside part of it the name of the Applicant and the following:

CENTRO DE REHABILITACION DE MANABI (CRM)

WATER TRANSBASIN PROJECT
FOR
CHONE-PORTOVIEJO RIVER BASINS

PACKAGE 2

LA ESPERANZA~POZA HONDA TRANSBASIN
AND
POZA HONDA~MANCHA GRANDE TRANSBASIN

INTERNATIONAL TENDERING No. _____

PRE-QUALIFICATION DOCUMENTS

The documents sent by mail, telex or fax, will not be accepted.

7. SELECTION OF FIRMS

CRM reserves the right to:

Not pre-qualify the Applicants that, in CRM's judgement, did not fulfill satisfactorily the requirements requested in the Pre-Qualification Documents.

To declare the convoked Pre-Qualification withdrawn, in case that the Applicants did not fulfill the requirements to be pre-qualified, or for reason of non-responsiveness to the interests of CRM.

Select the Firms, according to their capabilities, to execute the whole Works.

8. TENDERING REGIME

The Tendering No._____ is subject to the Public Contracting Law and by the Loan Agreement _____ celebrated between the Governments of Ecuador and Japan.

Portoviejo

PRESIDENT
CONTRACTING COMMITTEE
CRM

REPUBLIC OF ECUADOR

C R M

Centro de Rehabilitación de Manabí

WATER TRANSBASIN PROJECT FOR CHONE-PORTOVIEJO RIVER BASINS

CRM-OECF

INTERNATIONAL TENDERING No._____

FOR

CONSTRUCTION OF CIVIL WORKS

PACKAGE 2

LA ESPERANZA~POZA HONDA TRANSBASIN
AND
POZA HONDA~MANCHA GRANDE TRANSBASIN

(PART I)

PRE-QUALIFICATION BASES

MARCH 1995

1. GENERAL CONDITIONS

1.1 Introduction

The pre-qualification of the Applicants to the Construction of Civil Works, Package 2: La Esperanza~Poza Honda Transbasin and Poza Honda~Mancha Grande Transbasin of the Water Transbasin Project for Chone-Portoviejo River Basins, will be carried out based on the Applicant's proposals, which will be founded on the documents issued by the Centro de Rehabilitación de Manabí (CRM).

1.2 Definitions

Wherever the following terms in this document are used, their intention and meaning will be interpreted in the following manner:

Association: Association is one form of legal association, established among more than one campany (or firm), for a particular business. The nationalities of such companies may or not be the same.

OECF: Overseas Economic Cooperation Fund of Japan.

CRM: Manabí Rehabilitation Center.

Works: Construction of civil works, Package 2: La Esperanza~Poza Honda Transbasin and Poza Honda~Mancha Grande Transbasin of the Project.

Participants: Firms and Associations, from all countries in the Loan Agreement signed between the Governments of Ecuador and Japan, that intervene in the Tendering presenting the requested documents in these bases.

Submittal of Tender: The second phase of the Tendering procedure in which the Pre-Qualified Applicants only can submit their offers, for which they will be notified by writing. In that opportunity, the Tender Documents for the execution of the Works will be handed in.

Tenderers: The Applicants qualified to participate in the Second Phase of the Tendering procedure, this is to say, the presentation of the Tenders.

1.3 Notice for the Pre-Qualification

The notice for the Pre-Qualification will be done by CRM.

1.4 Applicants

Firms and Associations from all countries that submit the required documentation, and that

fulfill the requirements established in the Pre-Qualification Bases can participate with the Tendering procedure. Such Firms and Associations, must be duly registered in those countries, and furthermore, controlled by people of those nationalities.

1.5 Calendar

The Tendering procedure comprises two stages, i.e.;

(1) Pre-Qualification of Firms

(2) Submittal of the Tender from the Qualified Firms

Concerning Item (1) above, the scheduled dates for the submittal of the Pre-Qualification Documents are as follows;

(a) _____, 1996: Commencement day when those who are interested can purchase the Pre-Qualification Documents.

(b) _____, 1996: Due date for those interested to request clarifications from CRM.

(c) _____, 1996: Due date for CRM to issue addendum to the Pre-Qualification Documents.

(d) _____, 1996: Closing date for the reception of the Pre-Qualification Documents.

The Applicant(s) may be required to provided clarifications or additional data upon CRM's request, for effects of the pre-qualifications. In spite of the provisions contained in this document, CRM reserves the right to make any change in the calendar herewith captioned.

1.6 Obligations

Prior to the Pre-Qualification Documents presentation, the Applicants, on their own will, must request from the fiscal authorities of Ecuador, the information of all the regulations dealing with Foreign Company, National Firm or Association, that the contractor must be obliged to; and, must be knowledgeable of all the regulations as to exemptions of such obligations for the contractor and his expatriate personnel, for the execution of projects financed by international loans; and as to the legal procedure to be followed.

Unless the fiscal authorities of Ecuador exempts, the contractor and his personnel must pay all the duties and taxes that may rise from the Contract. The contractor shall bear the costs and expenses derived from the partial lack of the knowledge above mentioned, in the case the Contract is awarded.

1.7 Pre-Qualification Objective

The Applicants specialized in the field of construction of civil works for the diversion tunnels, pumping station, substations, penstock, head tank, open channel including siphons, inlet structure and access roads, shall show that they have the technical capabilities and enough economical bases to satisfy the conditions and/or requirements stipulated in this document, so that they can participate in the Tendering No._____, Package 2: La Esperanza~Poza Honda Transbasin and Poza Honda~Mancha Grande Transbasin; open to only those who are pre-qualified by CRM's Contracting Committee.

1.8 Domiciliation of Foreign Applicants and Associations (Legal Address)

The legal address in Ecuador is necessary in order to sign the Contract. Therefore, the Foreign Applicant to whom the Contract has been granted, inclusive a Firm or Association being formed, must settle his domicile, prior to the Contract signing, for which he will have to fulfill all the laws, regulations, orders and decrees of which the Government of Ecuador have dictated for that effect. In this context, it is strongly recommended to the qualified Applicants that may have not done this yet, to consider the necessary time for this transaction; since after the evaluation of the Tenders, it is of CRM intends to proceed to the contracting without any delay.

In the event that the Association is proposed for the Pre-Qualification, its conditions shall not change till withdrawal of the Tender. Any change will be ground for rejection of the Tender.

The legal address must meet with the one originally proposed in the Pre-Qualification, without any modification.

1.9 Prohibition of Double Participation

Any Applicant can participate only once in the Pre-Qualification, be it individually or as a member of an Association. The Applicant who intends to doubly apply as a member of an Association in addition to his own application, will not be judged as the pertinent applicant.

2. DESCRIPTION OF THE PROJECT

2.1 Brief Description and Location

The Daule-Peripa dam is located on the Daule river at about 15 km upstream of Pichincha. Main functions of this dam are flood control, domestic and irrigation water supply and hydroelectric power generation. The La Esperanza dam is now under construction and is scheduled to be completed in 1996, and its main functions are flood control of the Carrizal river, domestic and irrigation water supply in the Chone river basin. The Poza Honda dam, which was constructed in 1971, is located on the upper reach of the Portoviejo river at bout 22 km upstream of Santa Ana town, and about 30 km east of Portoviejo city. It is capable

to secure a quantity of 107 x 10^6 m^3/year for domestic and irrigation water supply systems.

Portoviejo is the capital city of the Manabí Province, which is one of the provinces in the Costa region facing to the Pacific Ocean.

The Project, for which the Firms are being pre-qualified, is located in the following three areas;

(1) La Esperanza~Poza Honda Transbasin

This is located between the La Esperanza reservoir to be impounded in 1996 and the existing Poza Honda reservoir.

(2) Poza Honda~Mancha Grande Transbasin

This is located between the existing Poza Honda reservoir and the proposed Mancha Grande outlet which is situated on the Mancha Grande river at about 26 km upstream from Río Chico, and about 28 km east of Portoviejo.

(3) Daule-Peripa 138 kV Switchgear Yard

This switchgear yard is located in the proposed outdoor switchyard of the Daule-Peripa power station, but not yet completed, which is planned to be constructed at about 78 km east of Portoviejo.

There is an international sea port in Manta, and two domestic airports in Portoviejo and Manta. Roads are divided into two categories, i.e. trunk roads (73 % is asphalt-paved) and secondary roads (only 2 % is asphalt-paved).

The locations of the Project is indicated in Fig. 1 attached herewith.

On account of good trunk road network, the area is completely accessible by paved roads, throughout the year. However, in the Project area, accessibility during the rainy season is not good, because of poor drainage, steep gradient, unpaved and narrow roads which are connected with the secondary roads running around the Project area.

The existing Pichincha road is asphalt paved and good traffic condition from Portoviejo to Piedra Azul. From Piedra Azul to the Severino pumping station, there is no existing road. Therefore, the permanent access road has to be constructed newly through Bijagual. Total length is about 9.3 km. The road will connect to the Severino inspection road near Bijagual. On the other hand, a temporary access road is required from Bijagual to the Caña Dulce inlet with its total length of 2.7 km.

From Portoviejo to the existing Poza Honda dam, there is the existing road. However, from the said dam to the proposed Los Cuyuyes outlet, there is no existing road.

Therefore, the permanent access road is required to be constructed newly. Total length of this road is about 14.7 km. Another permanent access road, about 0.7 km long, is also required newly branching off from the Los Cuyuyes access road to the Poza Honda inlet. For the La Seca work adit, a temporary access road, about 3.8 km long, is required newly branching off from the Los Cuyuyes access road at La Mercedes No. 1 village.

2.2 The Contracted Works

The Works consist of the construction of civil works for Package 2: La Esperanza~Poza Honda Transbasin and Poza Honda~Mancha Grande Transbasin including pumping station, penstock, head tank, open channel, diversion tunnel, inlet structure, access roads and substations, and they will be divided into following seventeen work items:

Work Item	Description
1	General Items
2	Severino Pumping Station
3	Severino Penstock
4	Severino Head Tank
5	Severino Substation
6	Severino Open Channel
7	La Esperanza~Poza Honda Diversion Tunnel
8	Poza Honda~Mancha Grande Diversion Tunnel
9	La Seca Work Adit
10	Los Cuyuyes Work Adit
11	Poza Honda Work Adit
12	Severino Access Road
13	Caña Dulce Inlet Access Road
14	La Seca Access Road
15	Los Cuyuyes Access Road
16	Poza Honda Inlet Access Road
17	Daule-Peripa 138 kV Switchgear Yard

(1) General Items

General Items are composed of various works, mainly related to preparatory works common to other work items. Major components will be:

- Construction, operation, maintenance of the Contractor's offices, stores, workshops, motor pools and repair shops, staff quarters and labor camps, Contractor's laboratory including provision of necessary equipment and testing equipment;

- Installation, operation, maintenance of the water supply system, electricity supply systems, telephone systems, first aid facilities including provision of ambulance car(s), etc., which are necessary for the Contractor's operation;

- Construction, operation and maintenance of temporary access roads to the various working areas, including temporary supports to strengthen the existing roads, waterways, bridges and piers, etc.;

- Construction and maintenance of laboratory for the Supervision including testing equipment and survey equipment;

- Construction and maintenance of main and branch offices for CRM and the Supervision including furnitures and office equipment;

- Construction and maintenance of main camp and housing for CRM and the Supervision including accommodations, water and electric supply, and communication system;

- Supply, maintenance and services for vehicles for CRM and the Supervision;

- Exploratory boring and excavation of test pits; and

- Monument and memorial.

(2) Severino Pumping Station

La Esperanza dam is at present under construction and will be completed in 1996. The Severino pumping station will be constructed after completion of the said dam and impounding of the reservoir. However, it may be possible that the reservoir water level will be drawn down to a certain low level for construction of the pumping station.

The general features of this pumping station are as follows;

(a) Water Level of La Esperanza Reservoir

F.W.L.	:	EL. 69.0 m
H.W.L.	:	EL. 66.0 m
L.W.L.	:	EL. 37.0 m

(b) Pumping Station

Weighted average water level	:	EL. 58.5 m
Minimum operation water level	:	EL. 47.0 m
Elevation of pump center	:	EL. 46.0 m
Sill elevation of intake	:	EL. 42.0 m
Pumps (to be installed by the other contractor)	:	
Type	:	Vertical shaft, single suction and volute type
Installed capacity	:	16 m^3/sec, 3.2 m^3/sec each

Number of unit	:	6 units including 1 unit for stand-by
Max. actual head	:	67.3 m
Min. actual head	:	48.3 m
Design actual head	:	55.5 m
Electric motors (to be installed by the other contractor)	:	
Type	:	Vertical shaft, 3 phases and wound-rotor induction type
Output	:	2,400 kW, 4.16 kV and 60 Hz
Dimension of substructure	:	29.0 m W x 67.5 m L x 30.1 m H
Dimension of superstructure	:	22.5 m W x 65.0 m L x 13.5 m H

(3) Severino Penstock (hydro-mechanical works are installed by the other contractor)

This penstock is provided for connecting the pumping station and the head tank and the major features are as follows;

Type	:	Open air structure, steel pipelines
Inside diameter	:	2,000 mm
Number of lanes	:	2
Length of pipelines	:	
No. 1 pipeline	:	173 m
No. 2 pipeline	:	170 m

(4) Severino Head Tank

This head tank is provided between the penstock and the open channel and the major features are as follows;

Type	:	Concrete overflow weir type
Dimension	:	19.2 m W x 56.7 m L
Crest elevation of weir	:	EL. 113.3 m
Maximum water level	:	EL. 114.0 m

(5) Severino Substation (electrical works are installed by the other contractor)

This substation is provided for receiving the electric power from the Daule-Peripa power station, which is not constructed yet, and the major features are as follows;

Type	:	Outdoor type
Space of yards	:	
For 138 kV switchgear	:	1,800 m2 (30 m x 60 m)
For main transformer	:	720 m2 (16 m x 45 m)
Main transformer	:	10 MVA x 2 units

(6) Severino Open Channel

This open channel is provided for connecting the Severino head tank and the Caña Dulce inlet and the major features are as follows;

(a) Open Channel

Type	:	Trapezoidal shape, concrete lining
Maximum discharge	:	16.0 m^3/sec
Length including siphons	:	6.4 km
Bottom width	:	1.6 m
Side slope	:	1 : 1.2
Height	:	
Type A	:	3.0 m
Type B	:	2.8 m
Channel slope	:	1 : 3,000
Water level at beginning point	:	EL. 113.3 m

(b) Siphons

Type	:	Reinforced concrete structure
Flow capacity	:	16.0 m^3/sec
Dimension	:	
No. 1 siphon	:	72 m long and 8.7 m in max. head
No. 2 siphon	:	233 m long and 36.6 m in max. head
No. 3 siphon	:	326 m long and 47.6 m in max. head
No. 4 siphon	:	76 m long and 5.5 m in max. head
No. 5 siphon	:	174 m long and 17.5 m in max. head

(c) Inspection Road

Total length	:	About 7.5 km
Width of road	:	3.0 m

(7) La Esperanza~Poza Honda Diversion Tunnel

This diversion tunnel is provided for connecting the Caña Dulce inlet and Los Cuyuyes outlet, which is located in the existing Poza Honda reservoir, and the major features are as follows;

(a) Caña Dulce Inlet

Type	:	Reinforced concrete culvert
Sill elevation of inlet	:	EL. 107.4 m
Length of culvert	:	78 m

(b) Diversion Tunnel

Type	:	Standard horseshoe section, concrete lining
Diameter	:	3.5 m
Length	:	11.4 km
Flow capacity	:	Open free flow, 16.0 m^3/sec
Slope	:	1 : 1,500
Invert level	:	
Inlet	:	EL. 107.3 m
Outlet	:	EL. 99.7 m

(c) Los Cuyuyes Outlet

Type	:	Trapezoidal section, concrete facing
Invert Level	:	EL. 99.7 m

(8) Poza Honda~Mancha Grande Diversion Tunnel

The Poza Honda inlet consists of an entrance structure (7.5 m long), an inlet tunnel (26.5 m long) and a valve chamber. The valve chamber of oval shape vertical shaft, 16.0 m wide x 20.0 m long x 22.5 m high, is located at about 47 m from the inlet portal. Two steel pipes, each 900 mm in diameter, are installed by the other contractor in the inlet tunnel which connects between the inlet portal and the valve chamber to lead water into the diversion tunnel.

In the latter part of the dry season from September to November, the Poza Honda reservoir water level can be drawn down to EL. 92.0 m, securing water supply to the existing Guarumo treatment plant and river maintenance flow utilizing the remaining effective reservoir capacity below EL. 92.0 m of 10 million cubic meters for about 5 months. Therefore, it is suggested to keep the reservoir water level lower than EL. 92 m for at least 3 months for construction of the inlet structures.

The diversion tunnel, flow capacity of 4 m^3/sec, will be constructed with inside diameter of 2.5 m and total length of 4.1 km, between the existing Poza Honda reservoir and the Mancha Grande outlet. The tunnel is designed by a standard horseshoe section with open free flow.

The major features of this diversion tunnel are as follows;

(a) Poza Honda Inlet

Water level of Poza Honda reservoir	:	
F.W.L.	:	EL. 110.3 m
H.W.L.	:	EL. 106.5 m

L.W.L.	:	EL. 88.3 m
Sill elevation of inlet	:	EL. 91.4 m
Diversion water level	:	
L.W.L.	:	EL. 94.0 m (Q = 4 m^3/sec)
Lowest	:	EL. 91.4 m (Q = 0 m^3/sec)

(b) Valve Chamber (hydro-mechanical works are installed by the other contractor)

Type	:	Oval shape vertical shaft, reinforced concrete structure
Roof elevation	:	EL. 112.5 m
Dimension	:	16.0 m W x 20.0 m L x 22.5 m H
Steel pipes	:	2 lanes of 900 mm in dia.
Discharge control valve	:	2 sets of cone sleeve valve, 900 mm in dia.

(c) Diversion Tunnel

Type	:	Standard horseshoe section, concrete lining
Diameter	:	2.5 m
Length	:	4.1 km
Flow capacity	:	Open free flow, 4.0 m^3/sec
Slope	:	1 : 3,900
Invert level	:	
Inlet	:	EL. 90.1 m
Outlet	:	EL. 89.0 m

(d) Mancha Grande Outlet

Type	:	Trapezoidal section, concrete facing
Invert level	:	EL. 89.0 m
Length of outlet channel	:	200 m

(9) La Seca Work Adit

This work adit is provided at the point about 4 km upstream from the outlet and the major features are as follows;

Type	:	Semi-circular and rectangular section, shotcrete lining
Size	:	4.0 m W x 4.0 m H
Length	:	519 m
Slope	:	1 : 4

(10) Los Cuyuyes Work Adit

This work adit is provided at the outlet site and the major features are as follows;

Type	:	Semi-circular and rectangular section, shotcrete lining
Size	:	4.0 m W x 4.0 m H
Length	:	130 m
Slope	:	1 : 4

(11) Poza Honda Work Adit

This work adit is provided at the inlet site and the major features are as follows;

Type	:	Semi-circular and rectangular section, shotcrete lining
Size	:	4.0 m W x 4.0 m H
Length	:	168 m
Slope	:	1 : 4

(12) Severino Access Road (Permanent)

This access road has a function of connecting the existing Pichincha road at Piedra Azul and the Severino pumping station through Bijagual village. The road has to be constructed newly and will connect to the Severino inspection road and the Caña Dulce inlet access road at Bijagual. The major features of the access road are as follows;

Width	:	6.0 m
Length	:	About 9.3 km

(13) Caña Dulce Inlet Access Road (Temporary)

This access road will be constructed newly branching off from the Severino access road at Bijagual and connecting to the Caña Dulce inlet. The major features of the access road are as follows;

Width	:	4.0 m
Length	:	About 2.7 km

(14) La Seca Access Road (Temporary)

This access road will be constructed newly branching off from the Los Cuyuyes access road at La Mercedes No. 1 village and connecting to the La Seca work adit. The major features of the access road as follows;

Width	:	4.0 m
Length	:	About 3.8 km

(15) Los Cuyuyes Access Road (Permanent)

This access road has a function of connecting the existing road at the Poza Honda dam and the Los Cuyuyes outlet passing through near the Poza Honda inlet. The road has to be constructed newly and the major features are as follows;

Width	:	6.0 m
Length	:	About 14.7 km

(16) Poza Honda Inlet Access Road (Permanent)

This access road will be constructed newly branching off from the Los Cuyuyes access road and connecting to the Poza Honda inlet. The major features of the access road are as follows;

Width	:	6.0 m
Length	:	About 0.7 km

(17) Daule-Peripa 138 kV Switchgear Yard (electrical works are installed by the other contractor)

This switchgear yard is located in the outdoor switchyard of the Daule-Peripa power station which is not constructed yet. The major features are as follows;

Type	:	Outdoor type
Space of yard	:	11,635 m^2 (121.2 m x 96 m)

Outlines of the respective structures are shown on the Drawings attached herewith, Figure 8 through Figure 20.

2.3 General Site Conditions

Ecuador is located on the west coast of South America, between 1° 30' north latitude and 5° 05' south latitude and between 81° and 75° 10' west longitude. The Project site is located in the central part of Manabí Province, one of the provinces in the Costa region facing to the Pacific Ocean.

The daily rainfall data are available from the Dos Bocas, Chone, Portoviejo, Rocafuerte, Calceta, Chamotete, Santa Ana and Boyaca precipitation stations of which the locations are shown in Fig. 2 attached herewith. The monthly rainfall records at these stations are shown in Tables 1 to 8.

The mean meteorological characteristics at Portoviejo are illustrated in Fig. 3. From this Figure, the climate is sub-tropical with a mean temperature of 25°C and a monthly variation of ± 2°C. The major precipitation period is from December to May, in which 90 % of the annual rainfall occurs. The mean relative humidity is 77 %.

On the other hand, the isohyetal map in the Manabí Province is shown in Fig. 4.

The results of flood studies at the respective damsites are summarized below:

Return Period (Years)	Peack Flood Discharge (m3/sec)	
	La Esperanza Dam	Poza Honda Dam
5	775	286
10	1,350	497
25	1,650	608
50	1,950	718
100	2,120	781
500	2,675	986

Besides, the reservoir water levels in the Poza Honda dam from 1979 to 1993 are shown in Fig. 5.

Geological basement of the Costa region is Piñón formation, Cretaceous in geological age and basalt in rock type. This layer outcrops at Picoaza town in the western vicinity of Portoviejo. Major geological layers related to the Project is Borbon, Onzole and Tosagua formations in Tertiary.

The Borbon formation consisting of sandstone and mudstone is distributed around the Daule-Peripa dam. The Onzole formation is profoundly related to the construction works of the Project, extending over almost all the Project area.

The diversion tunnels of this Project are planned to be laid at levels between EL. 60 m and EL. 110 m. In these levels, the tunnels will pass in the horizontal beds of the Onzole formation composed of conglomerates, sandstones and mudstones which are poorly to moderately cemented.

The compressive strength of intact rocks ranges from 40 to 50 kgf/cm^2; the deformation modulus is from 7,000 to 10,000 kgf/cm^2; the cohesion is from 3 to 5 kgf/cm^2; and the internal angle of friction is 40°.

Tunnelling by using a cutting machine, such as a road header, instead of blasting, will be suitable for those soft, compact and massive bedrocks. Some of the bedrocks show tendencies of slaking and swelling, probably due to clay minerals of the montmorillonite group contained.

The prospective sources of sand and gravel materials for concrete aggregate are shown in Fig. 6 and Fig. 7. Crushed sand is produced in Picoazá and Cantera Basaltica Picoazá, using rod mill with a capacity of 30 ton/hr. It is basalt sand.

In the Picoazá area, there are four aggregate quarries operated by three firms. The rock is all basalt. The production capacity is more than 150 ton/hr.

Therefore, it is considered sufficient to supply the concrete aggregate from these quarry sites for the Project.

Salient features of the La Esperanza and Poza Honda Projects are as shown below;

Description	La Esperanza Project	Poza Honda Project
Catchment area	445 km^2	175 km^2
Annual mean rainfall	1,520 mm	1,300 mm
Annual mean inflow	376 x 10^6 m^3	95 x 10^6 m^3
Probable max. flood	3,040 m^3/sec	1,120 m^3/sec
Gross storage capacity	455 x 10^6 m^3	98 x 10^6 m^3
Effective storage	391 x 10^6 m^3	75 x 10^6 m^3
Flood water level	EL. 67.7 m	EL. 110.3 m
Normal high water level	EL. 66.0 m	EL. 106.5 m
Low water level	EL. 37.0 m	EL. 88.3 m
Reservoir surface area	22.7 km^2	4.9 km^2
Main dam		
Type	Zoned earthfill earthfill with asphalt facing	Homogeneous
Height	57 m	40 m
Crest elevation	EL. 69.0 m	EL. 112.3 m
Crest length	696 m	531 m
Dam volume	3.7 x 10^6 m^3	0.6 x 10^6 m^3
Spillway		
Type	Gated overflow-weir overflow weir	Non- gated
Design discharge	900 m^3/sec	875 m^3/sec
Outlet capacity	140~153 m^3/sec	30 m^3/sec

2.4 Work Financing

The Works will be financed by means of the Loan No._____ of the Overseas Economic Cooperation Fund of Japan (OECF).

2.5 Execution Term of the Works

The estimated term for the work execution is 54 calendar months, counted from the date of Commencement Order of Works.

2.6 Tendering Regime

The Tendering No._____ is public, under the Pre-Qualification system for construction firms and is subject to the actual Public Contracting Law of Ecuador.

The Pre-Qualification will be done by CRM through the Contracting Committee.

Based on the submitted documents by the Applicants, the Contracting Committee will pre-qualify the Firms or Associations, who will be asked to submit the respective offers.

3. INSTRUCTIONS TO THE PARTICIPANTS

3.1 Submittal of Documents

For the Pre-Qualification, the Applicants must submit the documents containing all the information required in this text according to the following instructions:

(1) All the Forms must be filled out completely in Spanish language.

(2) The original documents written in the language other than Spanish, must be accompanied with their respective translations in Spanish and duly legalized.

(3) Document photocopied will not be accepted, unless they are legally certified.

(4) All the pages of the Pre-Qualification Documents, including the annexes and the references, must be numbered progressively and signed by the Legal Representative of the Applicant.

(5) The Pre-Qualification Documents must be binded so as not to lose the pages.

(6) The Pre-Qualification Documents can be accompanied by the illustrative documents which are considered to be useful or to be better to attach for giving wider references.

(7) The documentation must be submitted in a close envelope with the Forms and their annexes duly filled in, one original and four copies.

(8) The Documents of an Applicant that do not include all Forms or that do not contain all the requested documents for the Pre-Qualification, will be rejected.

The Documents must be submitted in direct handing over only, by an authorized representative of the Applicant, therefore, the Documents submitted by mail, telex, fax, or in open envelopes will not be accepted.

The envelopes that contain the required documents and information must be submitted sealed with the appropriate manner to avoid knowing its content before the official opening of the envelopes and they will have outside the envelope the name of the Applicant and the following:

CENTRO DE REHABILITACION DE MANABI (CRM)

WATER TRANSBASIN PROJECT
FOR
CHONE-PORTOVIEJO RIVER BASINS

PACKAGE 2

LA ESPERANZA~POZA HONDA TRANSBASIN
AND
POZA HONDA~MANCHA GRANDE TRANSBASIN

INTERNATIONAL TENDERING No._____

PRE-QUALIFICATION DOCUMENTS

All the required documents in this Pre-Qualification Document must be submitted in the Secretary's Office of the Contracting Committee of the Centro de Rehabilitación de Manabí (CRM), 18 de Octubre y Sucre, Portoviejo, __th floor, office No._____ until 15:00 hr. of_____ 1996 according to the established date in the Convoking.

CRM will not receive and consequently will not be liable for the documents that are not submitted within the hour and due date as indicated in this Document, and any change to the documents after the submittal shall not be allowed in this Pre-Qualification.

3.2 Acceptation

The presentation of the requested documents implys being subject, on the Applicants part, to all and each of the regulations of this Document, without need for just clarification.

3.3 Consulting and Clarifications regarding the Pre-Qualification Documents

The consulting and clarifications regarding the Pre-Qualification Documents will be submitted to CRM by writing and they will only be received in the stipulated dates in Clause 1.5, and will be absolved and given to all the other Applicants for their knowledge, at least 10 days before the date for the documents submittal.

The clarifications and/or modifications that given by CRM in writing only can be effect.

3.4 Clarifying Information

CRM reserves the right to request the documents and information for clarification that may deemed to be necessary during the Pre-Qualification process. Such clarifications will be requested to the Applicants by means of an official communication and the information attained will form a part of the Pre-Qualification Documents.

The Clarifying documents and information requested eventually by CRM can not contradict in any manner the requirements or documents duly submitted.

The Applicants authorizes CRM to carry out investigations to verify the truthfulness of the declarations and submitted documents.

3.5 Receiving of Documents and Opening of Envelopes

The sealed envelope that contains the Pre-Qualification Documents will be received by the Secretary of the Contracting Committee until the hour and day established in the Convoking.

The opening of these envelopes will be done by the Contracting Committee in a session convoked by CRM for that effect, which must be held in the set day and hour and to which the authorized representative of the Applicants can attend.

3.6 Evaluation of Documents and Pre-Qualification Procedure

The Contracting Committee will assign the analysis of the submitted documents to the Technical Commission that will be established for such effect, which will have to present the corresponding reports with the proper recommendations.

The Contracting Committee, prior to the envelopes opening session, will approve the instructive criteria for the Pre-Qualification of the Firms, setting the methodology that the Commission must consider in order to evaluate the information, taking into account the following factors:

- Legal Aspects
- Financial Economic Capability of the Applicant

- Experience in the construction of similar works, including the amount of the actual contracts

- Experience and availability of directive and technical staff that the Firm will have for the execution of the Contract

- Available equipment of the Firms

3.7 Notification to the Applicants

The decision made by the Contracting Committee once agreed with the OECF, will be notified to all the Applicants in writing in the domicile indicated by them, within three days of the approval of the Act of the Committee.

3.8 Safekeeping and Confidentiality of the Documents

CRM will keep in their archives all the submitted documentation by the Applicants and it will not be returned, even in the case when the Applicants are not pre-qualified.

All documents and information submitted by the Applicants will be of strict confidential use.

3.9 CRM's Right to the Pre-Qualification

CRM reserves the right to:

(1) Not pre-qualify the Applicants that, to CRM's judgement, do not fulfill satisfactorily with the requirements requested in the Pre-Qualification Documents.

(2) To declare the convoked Pre-Qualification canceled in the event that the Applicants that have submitted the documents, during the course of the set period, do not fulfill the conditions to be pre-qualified, or for in such manner to agree with the national interest of the institution or the Country.

4. REQUIREMENTS AND NECESSARY DOCUMENTS FOR PRE-QUALIFICATION

4.1 Requirements

The Applicants must fulfill all the requirements in case the application is done in an Association form, not only the proposed association but also the each member of it must satisfy the following, event if the Association is not legally established:

(1) Photocopy of the last income tax filing done by each Applicant or each member firm of the Association must be submitted with a certificate stating no debts to the Ecuadorian State for income tax with-held.

It is also fundamental that the Applicant fulfill with the following:

(In the event that the participation is done in the Association, be it the proposed entity or at least one member firm of it, must fulfill with the following, even if the Association has not been legally established yet).

(2) That the Applicant or at least one of member firm of the Association, has conducted activities as a general contractor for more than ten (10) years.

(3) That the Applicant or at least one of member firm of the Association, must have enough administrative organization, staff member and technical personnel, business facilities, financial capability and installations to carry out his business.

(4) That the Applicant or at least one of member firm of the Association, had executed, in the last ten (10) years, preferably as the prime contractor, the following:

(a) Not less than one (1) Work of similar technical characteristics to this Tender, for an amount not less than US$ 65 millions or the equivalent.

(b) To have undertaken Works corresponding to the most important items of the Tendering (See Form No. 3A), for an amount not less than US$ 70 millions or the equivalent.

(c) To have undertaken general Civil Engineering Work, for an amount not less than US$ 75 millions or the equivalent.

4.2 Documents

A. Presentation and Commitment Letter by filling in the Form No. 1, signed by the Legal Representative, who will have to sign each one of its pages

B. General Data of the Firms by filling in the Form No. 2

C. Documents that would accredit the Legal Constitution of the Firm or Association and the Nomination of their Representative

The Applicant must submit a certified copy of the constitution deed, statutes and its reforms, where it indicates at least: name, type of organization, date and place of the constitution, domicile, object and capital, indicating if it is filial or subsidiary of some other firm or company. If the Firms is foreign company, this document must have the certification from a competent authority of the home country of the Firm, duly authentified by the Ecuadorian Consul nearest to the Applicant's domicile. The signature of the Consul must be authentified in the Ecuadorian Chancellery.
In the case of an Association already established or in the process of being established (constituted), this one and each Firm that integrate it must submit the documents requested in this Clause.

If the Association is about to be constituted, it must submit additionally, the corresponding draft minutes of the association agreement, jointly with a commitment letter and the acceptation of each Firm that will form the Association. In the draft minutes of the association agreement must establish the participation percentage of each one of the member within the Association.

The Applicant must have at least 10 years of legal existence, in the case of a juridical person. In the case of an Association, each Firm that integrate it, must demonstrate legal existence.

The Applicant must submit a certified copy corresponding to the appointment of the Legal Representative.

In the case of an Association, this one must assign a sole legal representative, by means of a power of attorney granted individually or jointly by the Legal Representatives of the Firms that integrate Association, in which it will indicated the name of the assigned person and the object of the representation. In each integrating Firms of the Association it will attach the document that accredits the corresponding legal representative.

The Ecuadorian Applicant must submit the nomination or power of attorney of his representative duly inscribed in the Mercantile Registry.

The documents issued in foreign countries that contain the nomination or assignment of the Legal Representative or sole legal representative of a Firm or Association, respectively, must count with the authentifications of the Ecuadorian Consul nearest to the domicile of the Applicant and the Chancellery of Ecuador.

D. Experience and Capability in the Execution of Similar Works

The Applicant must demonstrate to have enough capacity and experience to carry out the works object to this Tender, by means of references and technical certificates issued by the Employer of Works that the Applicant may have executed.

The Applicant must demonstrate to have executed in the last ten (10) years, at least, one work of similar technical characteristic to this object.

In the same manner, the Applicant will indicate the civil works of other type that has carried out in such period.

Additionally, the Applicant must fill in the Forms Nos. 3, 3A and 3B over the experience of the Applicant, and the Form No. 4 over all the projects that the Applicant has executed up to now.

In the case that the applicant is an Association, the information must be given by each member Firm.

E. Personal Data and Experiences of the Directive and Technical Personnel of the Applicant that would be assigned to the Project

The Applicant must demonstrate that he has the experienced technical personnel and indicate it in the Forms Nos. 5, 5A, 5B, 5C and 5D.

Personal data and experience of the executive of the Firm.

Personal data and experience of the technicians who works on a full time basis.

Personal data and experience of the technicians who works occasionally.

List of the personnel who would provide the services in the main office of the Applicant, and list of the personnel that would work on the Works site.

The curriculum vitae of each one will be attached, and the letter of commitment of the personnel that would be assigned to the Project. (Forms Nos. 5E and 5F).

F. List and Characteristics of the Construction Equipment available for the Work

The Applicant must submit the list and characteristics of the construction equipment available for the construction of the Work. In case that the equipment necessary for the job is not the property of the Applicant, he will indicate in the Form, what factory, person or organization it will be purchased or rented from, indicating the place where it usually is located.

The Applicant must fill in the Forms Nos. 6 and 6A.

G. List of Occasional Sub-contractors

The Applicant must indicate if he thinks in sublet a part of the Work in this Tendering and, if so, he will provide the list of the occasional sub- contractors with the type of the job to be sublet. This information must be indicated in the Forms Nos. 7 and 7A attached.

H. Affiliation Certificate issued by the Construction Chamber, or the Chamber of Commerce or Another Similar Entity of the Country that the Applicants comes from the certificate issued in a foreign country must be authentified by the Consul of Ecuador nearest to the residence of the Applicant and the same from the Ministry of Foreign Relations.

I. Certificate of No Pending Debts to the Ecuadorian Institute of Social Security (IESS) for the foreign applicant without a domicile in Ecuador, this certificate is not necessary

J. Certificate from the Comptroller's Office on the Fulfillment of the Contracts with the Ecuadorian State, or, Certificate of no having celebrated Contracts with the State

K. Certificate from the Company's Superintendence that would accredit that the Applicant is legally operating in the country and the Applicant has fulfilled all the obligations established by the Companies Law, or, Certificate stating that the Applicant is not operating in Ecuador

L. Certificate from the Ministry of Finances about the Amount caused by Concept of the Income Tax for the Year 1995, in case that the Applicant has carried out activities in Ecuador

M. Solvency Certificate issued by National of Foreign Banks backed-up by Banks domiciled in Ecuador

Each Firm must submit bank references that would accredit his economic solvency. If the certificate is issued by a foreign bank, the foreign bank must be backed up by a Bank domiciled in Ecuador.

N. Financial Statements for the Years 1993, 1994 and 1995, duly audited

Each Firm must attach the financial statement and the profit and loss statement corresponding to the years of 1993, 1994 and 1995 certified by an Independent Auditor or by an equivalent authority of the country that the Applicant comes from.

In the financial statement or annexes of the same, the applicant must clearly state, the accounts and values that represent the current assets as well as the current liabilities. (Forms Nos.8 and 8A).

O. Name of the Bank or Company that will issue the Bond on the Execution of the Contract

The Applicant must indicate the name of the bank, financial company or insurance company that will issue the bond on the fulfillment of the Contract (Form No. 9).

P. Total Sales in the Last Ten (10) Years (Form No. 10)

The record on which the number of contracts are indicated which were done by the Applicant in the last ten (10) financial years.

In the event that an Association, all and each of the parent Firms will fill the form; in the case of an Association already constituted, each member will do it.

Q. List of the Stockholder's Structure (Form No. 11)

The Applicant will provide detailed information of the shareholding structure of the Firm. If it is an Association, all and each of the parent Firms will fill in the Form; in the case of an Association, each member will fill it.

R. Declarations and/or Demonstrations

The national Firm as an individual Applicant or as part of an Association, whose capital is composed of foreign capital also, within the percentage allowed by Law, must demonstrate.

To declare that the Applicant that proposes to constitute the Association, do not form part of other Association being constituted or already constituted which will participate in this Pre-Qualification, and that the Applicants does not doubly apply for.

The Applicant must indicate if he has or has had court actions or if has resorted to arbitration that keeps relation with the work of the Firm, giving an explanation about the type of it and presenting copies of the sentence, in the case if any.

The Applicant must indicate if he has had contracts that have been canceled (called off) unexpectedly. In case the answer is affirmative, the Applicants must submit the corresponding explanation; and in the event that there is a sentence, a copy of such sentence also.

In the case of an Association already constituted, or in the process of being constituted, all and each of the member Firms of it must declare and/or demonstrate the Item R, and submit the certificates of the Items H, I, J, K, L and M.

LIST OF TABLES

Tabla .1 Monthly Rainfall at Dos Bocas Station

(Unidad : mm)

AÑO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	455.1	213.3	460.8	278.6	5.8	8.7	8.3	7.9	4.7	3.1	0.4	6.8	1,453.5
1965	194.2	266.3	564.2	312.8	328.9	30.3	6.7	2.3	0.5	0.0	0.0	137.8	1,844.0
1966	581.7	279.1	278.3	153.5	141.0	22.2	33.0	0.2	54.3	0.5	2.6	71.9	1,618.3
1967	753.7	458.4	186.6	51.8	103.3	0.5	0.0	0.2	3.0	6.7	0.9	22.3	1,587.4
1968	196.2	592.0	95.5	120.8	37.0	0.0	0.1	0.0	90.2	0.7	0.1	4.0	1,136.6
1969	239.1	122.3	470.8	183.7	345.4	33.9	0.5	5.7	0.0	13.2	43.0	12.3	1,469.9
1970	208.0	157.8	219.0	320.0	257.9	17.6	48.3	0.9	0.1	1.3	0.7	83.1	1,314.7
1971	159.9	331.9	604.1	73.1	22.8	13.5	3.0	1.4	41.7	1.5	1.5	45.5	1,299.9
1972	159.1	479.1	458.2	200.2	102.5	366.1	142.6	57.0	0.0	0.0	0.0	175.2	2,140.0
1973	541.7	80.5	449.3	218.9	252.9	47.2	4.6	5.6	0.0	1.7	0.0	47.3	1,649.7
1974	67.7	309.3	162.4	85.2	52.1	10.1	0.0	0.0	12.5	11.2	17.2	100.3	828.0
1975	443.6	630.0	436.6	120.1	29.0	2.4	12.8	2.7	32.5	47.4	3.0	143.0	1,903.1
1976	718.3	230.5	282.0	182.1	114.8	15.9	0.0	3.8	5.3	0.4	0.0	43.0	1,596.1
1977	405.0	370.0	501.0	88.0	38.5	0.0	0.0	1.6	19.1	7.4	0.0	48.5	1,479.1
1978	224.0	263.0	334.5	104.5	195.0	0.0	0.0	0.0	9.1	0.0	0.0	14.3	1,144.4
1979	325.8	209.9	169.4	219.9	199.9	30.5	10.0	0.0	9.7	4.0	0.0	1.8	1,180.9
1980	171.1	280.8	201.3	297.7	36.9	0.0	0.0	0.0	0.0	0.3	0.0	84.5	1,072.6
1981	135.6	533.8	288.4	270.5	0.0	0.0	43.0	0.0	0.0	5.0	5.0	88.9	1,370.2
1982	136.4	219.0	202.8	160.3	33.5	21.5	11.0	0.0	12.0	197.8	326.1	454.3	1,774.7
1983	493.7	381.6	659.1	477.5	375.2	294.5	421.2	227.4	161.7	13.4	10.2	87.5	3,603.0
1984	22.4	566.7	378.5	308.8	65.9	4.0	3.0	0.0	7.5	0.0	0.0	107.5	1,464.3
1985	127.1	214.6	291.9	176.9	12.4	23.8	0.0	0.0	0.0	0.0	0.0	155.2	1,001.9
1986	426.9	215.1	192.0	348.6	0.0	0.0	0.0	0.0	0.0	70.5	0.0	67.4	1,320.5
1987	341.3	727.8	555.8	497.9	203.4	0.0	0.0	50.4	0.0	0.0	0.0	79.4	2,456.0
1988	299.9	574.4	101.0	206.8	227.2	30.8	24.1	0.0	0.0	24.0	22.4	65.6	1,576.2
1989	542.8	423.3	144.9	365.5	35.2	30.4	0.0	0.0	23.0	10.6	0.0	72.0	1,647.7
1990	112.8	205.0	144.6	106.5	0.0	0.0	0.0	0.0	0.5	11.6	0.1	29.9	611.0
1991	204.0	316.0	335.9	152.8	43.4	77.7	1.4	5.9	0.2	1.5	0.0	59.0	1,197.8
1992	145.0	190.6	420.1	335.5	100.1	30.2	0.0	5.0	7.0	1.5	0.0	59.0	1,294.0
MAX	753.7	727.8	659.1	497.9	375.2	366.1	421.2	227.4	161.7	197.8	326.1	454.3	3,603.0
MEDIA	304.6	339.4	330.7	221.3	115.9	38.3	26.7	13.0	17.1	15.0	14.9	81.6	1,518.5
MIN	22.4	80.5	95.5	51.8	0	0	0	0	0	0	0	1.8	611

Tabla .2 Monthly Rainfall at Chone Station

(Unidad : mm)

YEAR	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	215.8	148.3	359.0	372.9	4.7	15.7	10.3	5.2	9.7	6.3	6.8	5.8	1,160.5
1965	123.2	160.6	346.1	339.6	101.3	75.0	59.5	26.3	7.1	23.4	10.2	37.0	1,309.3
1966	312.5	373.0	288.2	113.2	67.4	36.7	8.2	27.8	39.1	30.2	10.8	34.7	1,341.8
1967	408.1	411.5	87.6	50.1	54.3	8.5	9.9	3.9	39.0	3.8	0.0	6.4	1,083.1
1968	114.8	117.8	109.2	94.5	15.2	21.0	4.0	0.0	4.7	11.5	0.7	5.1	498.5
1969	142.0	59.2	251.4	169.5	115.6	145.8	80.0	3.0	2.4	1.4	21.9	12.6	1,004.8
1970	158.2	107.6	244.2	357.9	85.4	36.8	14.1	10.2	6.0	18.2	28.1	28.1	1,094.8
1971	71.6	238.0	629.0	60.2	18.2	18.0	0.0	4.1	14.3	26.2	2.0	24.3	1,105.9
1972	42.7	342.7	285.5	127.8	54.4	321.4	63.5	110.4	0.4	11.2	5.9	204.0	1,569.9
1973	290.5	115.0	352.7	194.6	148.9	26.6	32.9	7.1	18.0	7.2	4.1	33.7	1,231.3
1974	82.3	481.2	44.9	193.1	26.9	26.4	2.2	0.5	11.7	4.3	12.9	86.7	973.1
1975	410.8	424.5	516.5	221.6	7.9	55.6	20.0	5.7	8.0	11.2	4.7	75.2	1,761.7
1976	450.7	307.8	327.1	260.1	156.5	218.0	12.8	2.0	9.1	1.8	2.0	67.0	1,814.9
1977	407.4	486.9	354.6	145.1	0.0	23.3	0.0	2.8	13.5	6.3	0.2	33.8	1,473.9
1978	228.1	285.5	228.2	62.7	79.5	8.6	7.0	4.7	1.1	28.8	0.0	12.6	946.8
1979	169.2	247.9	123.6	85.4	22.0	68.5	0.0	0.9	15.0	4.4	1.0	0.9	738.8
1980	169.8	243.8	342.8	210.9	75.1	13.0	0.0	2.0	0.4	7.8	2.9	31.2	1,099.7
1981	162.9	291.2	229.8	229.8	1.4	5.8	15.6	6.3	10.8	4.6	1.1	25.0	984.3
1982	155.5	83.0	150.1	85.9	54.4	14.2	3.0	0.0	8.2	240.9	215.8	391.3	1,402.3
1983	548.7	593.0	541.5	284.1	681.6	395.3	310.1	133.8	114.5	9.2	8.5	62.8	3,683.1
1984	15.7	377.0	428.8	239.7	20.8	31.2	5.0	2.5	9.1	6.8	2.2	141.6	1,280.4
1985	124.4	234.1	153.1	108.0	38.4	9.0	6.3	7.1	4.4	3.0	3.6	92.6	784.0
1986	388.6	117.4	201.2	270.2	21.6	2.3	2.4	7.4	19.0	31.1	5.3	92.8	1,159.3
1987	216.3	652.6	380.0	504.1	124.1	2.2	14.4	68.3	14.3	9.7	6.6	58.7	2,051.3
1988	189.9	270.6	50.0	123.4	76.5	27.1	10.2	14.3	8.5	6.0	7.6	21.9	806.0
1989	319.9	434.3	145.1	244.7	60.2	31.0	7.7	4.1	11.5	22.1	0.9	29.3	1,310.8
1990	130.4	178.1	207.2	232.4	7.8	11.8	2.5	0.1	0.4	3.4	1.0	24.3	799.4
1991	103.8	253.3	127.4	69.6	13.1	15.2	3.5	5.0	0.3	0.6	12.5	32.9	637.2
1992	210.4	180.1	253.0	278.7	175.8	13.1	17.2	2.6	3.8	3.5	0.4	14.9	1,153.5
MAX	548.7	652.6	629.0	504.1	681.6	395.3	310.1	133.8	114.5	240.9	215.8	391.3	3,683.1
MEDIA	219.5	283.3	267.5	197.6	79.6	57.8	24.9	16.1	13.9	18.8	13.1	58.2	1,250.4
MIN	15.7	59.2	44.9	50.1	0.0	2.2	0.0	0.0	0.3	0.6	0.0	0.9	498.5

Tabla .3 Monthly Rainfall at Portoviejo Station

(Unidad : mm)

YEAR	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	59.7	46.8	205.0	69.1	5.1	8.3	0.0	0.5	0.0	4.4	0.6	0.9	400.4
1965	29.2	53.3	136.0	67.2	46.8	47.6	15.3	2.7	0.2	0.4	2.2	3.2	404.1
1966	78.0	94.2	112.5	68.0	18.9	7.0	3.1	8.3	8.2	1.7	1.8	10.5	412.2
1967	184.9	164.9	28.2	6.4	11.6	0.3	2.8	0.0	1.0	0.1	0.0	1.0	401.2
1968	56.9	66.0	21.9	34.0	0.5	1.7	0.0	1.0	0.9	0.0	1.0	2.1	186.0
1969	146.6	17.4	97.6	79.0	83.2	50.4	17.0	0.2	0.1	0.3	4.1	7.2	503.1
1970	46.2	52.5	118.8	84.5	65.5	3.1	0.3	0.2	2.0	0.1	1.3	7.9	382.4
1971	30.8	133.1	219.5	8.1	0.0	6.6	0.1	0.1	3.3	1.3	2.8	1.3	407.0
1972	75.8	199.6	245.7	81.1	2.7	84.1	20.5	6.3	3.6	1.6	0.7	18.3	740.0
1973	183.1	177.1	55.1	68.8	29.7	4.6	1.8	1.8	2.9	0.0	0.8	4.1	529.8
1974	24.1	114.7	54.6	50.1	13.3	5.4	0.6	0.1	1.8	4.4	5.8	24.2	299.1
1975	213.9	247.5	166.2	63.0	3.2	3.8	0.4	0.6	14.7	19.2	0.7	24.6	757.8
1976	202.4	121.2	124.5	65.8	44.9	19.2	7.6	0.0	2.9	0.2	2.0	8.8	599.5
1977	36.2	126.2	143.7	107.9	0.0	6.0	0.0	0.1	8.9	0.3	0.0	15.5	444.8
1978	52.8	73.6	58.8	122.2	11.5	0.0	4.4	0.0	0.4	0.0	0.0	1.1	324.8
1979	37.9	145.2	20.5	20.9	9.9	4.0	1.0	1.0	1.1	0.0	0.0	0.0	241.5
1980	39.1	33.1	90.7	54.4	12.8	2.2	0.0	0.0	0.1	0.3	0.9	0.4	234.0
1981	50.2	95.7	41.0	18.4	0.0	0.0	0.0	0.2	0.6	2.3	0.2	8.4	217.0
1982	20.0	7.3	28.9	6.5	9.7	2.6	0.0	0.0	1.1	35.2	98.3	116.7	326.3
1983	264.3	125.0	205.0	254.7	271.5	338.9	231.6	23.4	46.8	1.7	0.7	25.6	1,789.2
1984	1.7	202.4	116.5	31.6	29.5	2.9	0.6	0.0	0.0	0.1	8.5	120.1	513.9
1985	40.3	78.0	95.9	35.1	42.6	1.6	0.0	0.0	0.0	0.3	0.0	17.1	310.9
1986	283.9	44.2	75.7	80.0	3.7	0.0	0.7	0.0	0.0	3.5	0.0	3.8	495.5
1987	70.6	333.3	138.3	95.7	23.3	0.0	0.8	16.5	1.5	0.1	2.4	2.8	685.3
1988	51.1	96.1	30.0	66.5	23.8	0.0	0.8	0.2	12.2	0.0	1.3	6.8	288.8
1989	245.4	162.0	189.1	60.5	1.4	1.3	0.1	0.0	6.1	0.9	0.0	0.0	666.8
1990	32.2	76.3	59.3	38.8	0.9	1.7	0.0	0.0	0.0	0.0	0.1	8.8	218.1
1991	57.4	96.1	28.4	34.1	17.0	0.1	0.0	0.2	1.9	0.0	3.2	18.8	257.2
1992	107.1	139.1	295.0	235.7	145.8	9.4	0.5	0.0	0.0	0.0	0.0	8.8	941.4
MAX	283.9	333.3	295.0	254.7	271.5	338.9	231.6	23.4	46.8	35.2	98.3	120.1	1,789.2
MEDIA	93.9	114.5	110.4	69.2	32.0	21.1	10.7	2.2	4.2	2.7	4.8	16.2	482.0
MIN	1.7	7.3	20.5	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	186.0

Tabla .4 Monthly Rainfall at Rocafuerte Station(Inamhi)

(Unidad : mm)

YEAR	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	33.6	55.0	191.9	66.4	5.6	0.0	1.1	0.0	0.0	0.0	0.0	0.0	353.6
1965	12.4	54.4	131.1	81.0	29.5	36.6	2.4	2.0	1.0	3.6	0.0	1.9	355.9
1966	104.8	122.5	79.2	31.3	19.7	1.4	0.0	0.0	5.8	0.0	1.2	0.6	366.5
1967	80.6	184.3	81.7	22.0	12.3	0.0	2.8	0.0	3.2	0.0	0.0	0.5	387.4
1968	66.1	79.2	9.5	4.2	0.0	1.6	4.0	0.0	2.3	0.0	0.0	42.7	209.6
1969	110.5	14.5	96.1	22.7	27.1	9.4	0.0	0.0	0.0	0.0	1.8	3.4	285.5
1970	72.2	32.9	35.0	81.9	86.4	2.3	1.2	0.0	0.2	0.0	1.2	3.6	316.9
1971	24.9	81.7	230.0	11.6	0.0	6.2	0.0	0.4	0.8	0.2	0.0	1.2	357.0
1972	22.4	157.3	169.8	110.9	4.3	70.6	0.9	3.2	0.0	0.0	0.0	20.5	559.9
1973	149.3	115.0	55.4	39.7	19.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	380.0
1974	25.2	84.9	78.7	32.9	9.7	4.7	0.0	0.0	2.0	0.0	0.0	30.0	268.1
1975	182.3	261.1	133.1	48.4	4.5	7.5	0.5	1.5	4.0	9.0	1.5	5.6	659.0
1976	176.7	201.4	176.3	82.0	33.1	11.6	0.0	0.0	10.6	0.0	0.0	12.5	704.2
1977	94.7	111.7	183.4	80.5	0.5	9.2	0.0	0.0	4.0	0.0	0.0	0.0	484.0
1978	46.9	94.0	59.9	2.3	2.2	0.0	0.5	0.0	2.5	0.0	0.0	0.0	208.3
1979	50.1	129.6	23.2	11.5	4.9	0.6	0.0	0.0	8.1	0.2	0.0	0.0	228.2
1980	41.2	83.9	62.7	42.6	13.0	2.8	0.0	0.0	0.0	0.2	8.2	0.3	254.9
1981	64.2	147.5	31.2	12.5	0.0	0.0	0.0	0.0	0.0	1.5	0.6	2.5	260.0
1982	26.2	4.0	15.9	9.7	7.8	6.2	0.8	0.0	0.7	27.2	49.5	60.8	208.8
1983	273.0	185.2	170.1	188.9	337.4	196.9	235.0	13.7	52.8	1.1	1.9	33.0	1,689.0
1984	0.0	303.1	131.3	12.6	8.2	5.6	0.0	0.2	0.0	0.0	3.1	143.6	607.7
1985	42.8	62.2	10.6	10.4	63.7	0.3	0.0	1.0	0.0	0.0	0.0	17.3	208.3
1986	180.0	5.3	17.9	94.5	1.7	0.0	0.0	0.0	0.0	3.9	0.0	0.0	303.3
1987	0.0	257.0	122.7	49.9	38.6	0.0	1.0	9.4	0.0	0.0	3.0	8.2	489.8
1988	32.8	60.3	38.1	31.9	24.6	0.0	0.0	0.0	1.2	0.0	0.0	3.5	192.4
1989	119.9	228.3	126.0	31.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	506.3
1990	10.2	76.3	20.6	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	138.2
1991	45.4	46.4	31.0	30.5	5.4	0.0	0.0	0.0	0.0	0.0	2.2	6.4	167.3
1992	70.9	130.9	284.2	212.2	89.8	0.0	0.0	0.0	0.0	0.0	0.0	1.0	789.0
MAX	273.0	303.1	284.2	212.2	337.4	196.9	235.0	13.7	52.8	27.2	49.5	143.6	1,689.0
MEDIA	74.5	116.2	96.4	50.7	29.3	12.9	8.6	1.1	3.4	1.6	2.6	14.4	411.7
MIN	0.0	4.0	9.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	138.2

Tabla ..5 Monthly Rainfall Calceta Station

(Unidad : mm)

YEAR	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	114.4	213.7	392.4	267.7	5.9	9.7	5.4	9.1	0.7	4.0	4.9	10.4	1,038.3
1965	134.8	111.8	469.8	234.3	78.2	54.6	56.1	1.3	6.9	31.7	5.1	27.1	1,211.7
1966	239.5	257.3	216.5	110.9	71.0	29.3	5.4	20.5	8.8	16.2	3.3	15.8	994.5
1967	393.9	267.7	78.9	38.9	18.2	5.0	7.4	0.7	46.4	0.0	0.0	1.7	858.8
1968	67.6	88.0	54.1	128.2	12.9	9.0	1.7	1.4	24.6	6.4	0.0	3.4	397.3
1969	198.3	32.6	211.4	175.4	114.7	96.2	12.2	0.6	0.0	0.4	8.3	14.8	864.9
1970	138.5	130.3	175.8	399.8	55.9	46.9	7.1	0.7	3.1	4.2	6.5	13.1	981.9
1971	81.4	246.6	554.8	58.7	10.4	13.6	1.2	0.6	6.8	14.3	6.1	12.5	1,007.0
1972	113.8	259.4	193.8	174.0	40.3	208.6	26.6	51.6	4.7	7.1	14.7	84.0	1,178.6
1973	252.3	217.6	180.2	98.1	128.0	23.0	24.1	3.5	8.5	2.5	1.6	7.4	946.8
1974	67.4	328.3	119.8	94.5	16.0	13.0	3.1	0.0	8.7	0.5	66.9	84.3	802.5
1975	398.3	397.2	479.1	206.2	11.4	9.9	8.0	1.8	2.2	16.6	2.9	102.6	1,636.2
1976	138.8	214.8	556.7	198.9	106.2	116.8	57.4	10.6	8.1	1.4	0.0	26.3	1,436.0
1977	310.9	267.5	257.1	140.3	0.5	18.1	1.5	0.0	14.4	2.1	0.0	24.7	1,037.1
1978	209.5	280.5	178.0	18.9	79.4	0.0	9.9	0.0	10.0	1.3	0.0	1.7	789.2
1979	127.1	216.9	118.2	80.2	59.0	10.0	0.0	0.0	1.4	3.3	0.0	0.0	616.1
1980	75.5	192.9	291.3	189.0	46.5	4.5	0.0	0.0	0.0	0.0	0.0	62.3	862.0
1981	65.4	278.5	263.0	191.7	0.0	3.2	9.7	0.5	3.7	1.2	2.4	6.5	825.8
1982	60.8	143.7	118.0	186.7	16.5	5.8	7.3	0.0	26.3	76.8	127.7	230.7	1,000.3
1983	497.6	365.0	270.9	331.7	357.7	336.6	485.5	85.2	118.2	0.0	7.3	79.4	2,935.1
1984	3.6	304.9	354.4	59.7	4.9	11.6	0.0	2.5	5.5	3.9	3.6	150.6	905.2
1985	132.9	176.6	120.8	122.3	24.0	7.1	5.5	0.0	0.0	0.0	0.0	71.0	660.2
1986	173.5 *	256.9 *	270.4 *	162.3 *	60.8 *	53.0 *	40.6 *	10.1 *	14.6 *	9.0 *	14.6 *	60.8 *	1,126.6
1987	237.1 *	351.1 *	369.6 *	221.8 *	83.2 *	72.4 *	55.4 *	13.9 *	20.0 *	12.3 *	20.0 *	83.2 *	1,540.0
1988	123.2 *	182.4 *	192.0 *	115.2 *	43.2 *	37.6 *	28.8 *	7.2 *	10.4 *	6.4 *	10.4 *	43.2 *	800.0
1989	200.2 *	296.4 *	312.0 *	187.2 *	70.2 *	61.1 *	46.8 *	11.7 *	16.9 *	10.4 *	16.9 *	70.2 *	1,300.0
1990	84.7 *	125.4 *	132.0 *	79.2 *	29.7 *	25.8 *	19.8 *	4.9 *	7.2 *	4.4 *	7.2 *	29.7 *	550.0
1991	92.4	136.8	144.0	86.4	32.4	28.2	21.6	5.4	7.8	4.8	7.8	32.4	600.0
1992	154.0	228.0	240.0	144.0	54.0	47.0	36.0	9.0	13.0	8.0	13.0	54.0	1,000.0
MAX	497.6	397.2	556.7	399.8	357.7	336.6	485.5	85.2	118.2	76.8	127.7	230.7	2,935.1
MEDIA	168.5	226.5	252.2	155.2	56.2	46.8	33.9	8.7	13.8	8.6	12.1	48.4	1,031.1
MIN	3.6	32.6	54.1	18.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	397.3

* Valores Estimados Mensuales

Tabla .6 Monthly Rainfall at Chamotete-Jesús Maria Station

(Unidad : mm)

YEAR	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	120.1 *	89.2 *	383.7 *	226.3 *	0.0 *	4.5 *	0.4 *	5.9 *	0.0 *	0.0 *	1.3 *	0.0 *	831.4
1965	111.7 *	147.6 *	488.4 *	216.7 *	267.0 *	22.1 *	0.0 *	2.0 *	0.0 *	0.0 *	1.0 *	97.0 *	1,353.5
1966	569.8 *	161.7 *	199.0 *	96.8 *	110.2 *	15.5 *	18.9 *	0.5 *	57.4 *	0.0 *	2.3 *	38.6 *	1,270.7
1967	773.1 *	359.4 *	106.2 *	15.0 *	78.7 *	0.0 *	0.0 *	0.5 *	0.0 *	0.4 *	1.5 *	0.0 *	1,334.8
1968	114.1 *	506.7 *	14.0 *	62.9 *	23.4 *	0.0 *	0.0 *	0.0 *	105.6 *	0.0 *	1.2 *	0.0 *	827.9
1969	164.8 *	50.0 *	393.9 *	128.0 *	280.8 *	25.0 *	0.0 *	4.4 *	0.0 *	6.2 *	20.1 *	0.0 *	1,073.2
1970	148.0	139.9	252.1	324.7	87.2	84.3	5.5	0.0	1.2	2.4	6.5	18.7	1,070.5
1971	96.6	243.0	518.2	72.6	6.7	39.3	4.0	0.7	3.6	6.2	6.7	13.9	1,011.5
1972	99.4	192.3	424.4	130.5	115.8	283.1	18.6	44.6	59.8	8.8	29.0	166.8	1,573.1
1973	401.3	339.9	415.3	166.2	179.2	46.0	10.3	4.6	10.7	2.2	0.9	29.8	1,606.4
1974	40.7	419.8	112.7	72.6	6.7	38.5	1.1	0.0	7.3	3.0	9.6	57.2	769.2
1975	519.6	455.7	355.7	191.1	34.1	34.0	9.2	2.4	5.6	31.6	3.1	45.7	1,687.8
1976	529.7	375.3	411.0	324.4	194.2	124.5	32.8	5.3	3.7	0.0	1.4	45.4	2,047.7
1977	278.0	318.4	343.7	180.0	11.7	16.4	0.0	0.6	5.6	2.2	0.0	60.7	1,217.3
1978	177.4	232.6	203.1	79.8	80.7	3.0	0.4	0.0	0.4	0.3	0.0	4.8	782.5
1979	124.7	192.4	189.8	109.6	38.9	27.6	7.1	0.0	3.6	4.4	10.7	10.7	719.5
1980	65.4	131.2	247.5	305.3	112.4	4.6	0.0	1.6	0.0	0.0	6.6	4.6	879.2
1981	100.0	430.6	139.1	195.8	103.9	2.2	9.7	1.6	1.0	0.0	0.0	23.8	1,007.7
1982	128.5	88.3	159.8	39.5	42.9	3.4	27.7	0.0	12.0	186.9	179.4	456.4	1,324.8
1983	413.7	421.0	427.3	527.4	353.7	238.8	381.5	187.4	241.7	1.1	3.8	24.3	3,221.7
1984	235.2	594.6	461.7	75.9	14.0	3.4	1.3	1.6	18.0	0.0	0.0	81.6	1,487.3
1985	97.3	182.3	265.1	239.2	57.0	56.2	1.4	0.4	1.3	0.4	0.0	65.7	966.3
1986	602.9	119.3	73.9	200.3	16.3	5.9	13.0	0.7	0.9	20.9	1.4	29.2	1,084.7
1987	276.0	584.9	262.3	461.8	155.5	5.6	8.0	53.0	4.3	9.0	13.7	49.8	1,883.9
1988	152.8	368.0	94.7	287.8	114.9	5.5	5.5	4.4	10.3	0.0	23.1	40.7	1,107.7
1989	702.4	396.3	264.0	253.7	30.7	13.7	3.8	0.9	32.3	12.5	0.6	25.4	1,736.3
1990	87.4	99.1	254.9	241.9	2.1	0.0	5.2	0.0	0.2	0.2	0.0	58.1	749.1
1991	166.0	171.9	339.0	102.2	83.5	38.3	0.0	2.8	1.1	0.0	17.5	27.8	950.1
1992	453.3	378.4	656.8	424.2	413.0	78.0	3.3	1.8	0.6	1.0	0.4	34.7	2,445.5
MAX	773.1	594.6	656.8	527.4	413.0	283.1	381.5	187.4	241.7	186.9	179.4	456.4	3,221.7
MEDIA	267.2	282.4	291.6	198.4	104.0	42.0	19.6	11.3	20.3	10.3	11.8	52.1	1,311.1
MIN	40.7	50.0	14.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	719.5

* Valores Corregidos Mediante la Curva de Doble Masa

Tabla .7 Monthly Rainfall at Santa Ana Station

(Unidad : mm)

YEAR	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	110.8	43.4	319.0	226.5	6.0	10.7	3.7	0.0	0.0	0.0	0.0	4.6	724.7
1965	39.3	89.0	376.0	147.0	73.4	61.0	32.6	0.0	21.6	2.8	0.0	7.6	850.3
1966	185.4	146.4	141.0	40.9	2.8	7.6	0.0	2.8	15.2	1.8	10.8	3.8	558.5
1967	329.2	319.4	111.2	24.4	23.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	807.8
1968	96.2	75.8	31.8	32.4	0.0	0.0	0.0	0.0	7.4	0.0	0.7	5.9	250.2
1969	121.8	69.5	168.5	272.0	200.9	74.3	20.5	2.9	1.7	0.8	68.5	32.4	1,033.8
1970	102.4	114.0	152.8	222.3	93.2	19.8	6.3	0.6	1.5	0.4	1.1	5.5	719.9
1971	80.2	199.0	349.1	35.5	3.0	34.0	0.0	0.3	10.9	3.2	10.5	14.6	740.3
1972	119.9	208.5	219.3	97.9	37.1	211.3	63.5	31.9	0.6	8.2	3.1	53.8	1,055.1
1973	175.9	166.3	260.3	197.0	107.8	92.9	3.6	0.0	5.1	0.0	0.0	13.6	1,022.5
1974	27.4	191.9	112.2	65.7	28.0	22.8	0.0	0.0	0.0	3.4	0.0	52.8	504.2
1975	319.0	330.6	332.4	164.4	5.6	40.6	5.6	0.0	20.6	1.3	6.5	39.9	1,266.5
1976	320.1	304.2	210.6	162.9	72.5	170.6	36.0	10.1	1.8	0.0	0.0	74.0	1,362.8
1977	120.3	213.0	227.6	104.0	16.0	66.8	0.0	0.0	54.0	0.0	0.0	33.5	835.2
1978	132.8	137.0	198.1	28.7	81.5	51.9	13.0	2.9	8.3	1.3	6.5	21.2	683.2
1979	68.6	164.7	101.4	112.8	52.0	18.3	0.0	0.0	0.0	0.0	0.0	0.0	517.8
1980	91.4	63.8	140.4	121.8	121.7	2.8	0.0	0.0	0.0	0.0	9.0	1.7	552.6
1981	45.0	198.3	236.2	140.1	6.7	0.0	4.8	0.0	0.0	0.0	0.0	2.9	634.0
1982	56.7	26.0	80.9	43.2	55.1	0.0	1.5	0.0	4.3	67.6	83.8	257.7	676.8
1983	387.9	320.2	342.5	280.1	463.5	243.5	222.2	78.8	84.4	0.0	0.0	28.0	2,451.1
1984	11.4	222.1	292.1	43.5	8.3	12.3	0.0	0.0	0.0	0.0	0.0	136.6	726.3
1985	90.5 *	122.3 *	154.0 *	110.2 *	27.2 *	19.8 *	0.0 *	4.8 *	3.2 *	0.0 *	4.6 *	59.3 *	595.9
1986	319.7 *	117.2 *	154.1 *	128.9 *	52.2 *	3.5 *	3.0 *	0.0 *	3.4 *	9.4 *	0.0 *	0.8 *	792.2
1987	235.9 *	235.0 *	191.9 *	208.7 *	150.4 *	3.1 *	0.0 *	88.8 *	10.8 *	0.0 *	0.0 *	17.2 *	1,141.8
1988	143.7 *	199.6 *	146.6 *	143.7 *	85.8 *	6.3 *	0.0 *	0.6 *	7.4 *	0.0 *	18.7 *	39.0 *	791.4
1989	154.1 *	220.1 *	251.5 *	138.3 *	87.0 *	73.4 *	26.2 *	9.4 *	13.6 *	10.5 *	8.4 *	55.6 *	1,048.1
1990	58.3 *	83.3 *	95.1 *	52.3 *	32.9 *	27.8 *	9.9 *	3.6 *	5.2 *	3.9 *	3.2 *	21.0 *	396.5
1991	60.3	86.2	98.5	54.2	34.1	28.7	10.3	3.7	5.3	4.1	3.3	21.7	410.4
1992	161.7	131.0	264.0	145.2	91.3	77.0	27.5	9.9	14.3	11.0	8.8	58.3	1,000.0
MAX	387.9	330.6	376.0	280.1	463.5	243.5	222.2	88.8	84.4	67.6	83.8	257.7	2,451.1
MEDIA	143.6	165.4	198.6	122.2	69.6	47.6	16.9	8.7	10.4	4.5	8.5	36.7	832.8
MIN	11.4	26.0	31.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	250.2

*Valores Estimados mensuales

Tabla .8 Monthly Rainfall at BoyacáStation

(Unidad : mm)

YEAR	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	ANUAL
1964	152.2 *	185.4 *	193.7 *	124.0 *	65.1 *	51.0 *	36.0 *	22.7 *	2.6 *	8.5	8.0	0.8 *	850.0
1965	112.6	143.6	255.7	215.6	72.0	41.4	12.7	13.6	15.6	15.6	23.3	11.1	932.8
1966	160.1	166.4	274.2	92.9	49.0	18.8	12.6	22.6	10.3	23.0	4.9	18.7	853.5
1967	219.4	283.3	43.9	41.5	101.3	9.2	9.9	5.0	11.5	5.0	0.0	3.3	733.3
1968	114.1	290.2	78.7	101.2	4.0	31.2	0.7	4.6	4.2	5.3	0.0	4.7	638.9
1969	67.2	37.3	222.1	135.2	90.8	49.4	19.7	3.8	2.3	1.5	17.3	13.7	660.3
1970	158.1	80.6	194.2	353.6	71.2	13.8	12.5	4.7	16.9	16.5	10.4	15.1	947.6
1971	53.4	218.5	280.8	24.3	5.8	46.0	8.8	5.7	9.2	25.7	0.0	12.0	690.2
1972	61.3	224.7	217.5	120.8	23.9	172.3	28.4	14.5	25.5	6.6	6.2	71.4	973.1
1973	259.8	177.9	192.6	127.8	106.0	16.9	19.7	12.2	10.8	11.2	3.1	6.1	944.1
1974	99.0	281.4	77.6	95.3	23.1	8.9	7.8	2.3	10.4	6.9	5.0	46.4	664.1
1975	376.6	412.8	346.8	121.4	8.2	9.9	25.0	7.0	4.5	3.2	6.4	27.4	1,349.2
1976	316.4	129.1	135.3	127.3	89.1	44.3	9.0	8.6	6.4	0.0	5.0	21.4	891.9
1977	191.2	267.0	214.6	122.6	2.3	122.2	28.4	9.7	32.9	46.6	0.3	11.1	1,048.9
1978	196.5	171.9	121.0	28.5	13.7	1.1	8.9	4.1	23.4	41.7	7.5	32.6	650.9
1979	106.0	261.8	64.9	53.7	9.9	25.3	1.3	10.2	19.1	8.2	1.5	35.0	596.9
1980	62.8	160.8	214.7	64.3	69.8	9.1	1.9	5.6	0.6	5.3	9.7	11.0	615.6
1981	150.7	191.7	190.9	120.3	0.2	2.5	18.2	23.8	75.3	5.2	4.6	32.6	816.0
1982	90.1	41.6	203.0	60.8	25.8	11.3	1.9	0.0	4.4	71.1	132.2	106.2	748.4
1983	244.6	208.2	425.4	391.1	441.3	162.0	246.2	73.6	86.0	12.1	18.1	26.8	2,335.4
1984	147.9	282.7	191.4	118.3	56.6	41.8	26.1	12.2	21.7	17.4	13.9	40.0	970.0
1985	168.6	208.2	218.1	134.9	64.4	47.6	29.7	13.9	24.8	19.8	15.9	45.6	991.5
1986	65.8	81.3	85.2	52.6	25.2	18.6	11.6	5.4	9.7	7.8	6.2	17.8	387.2
1987	248.4	306.8	321.4	198.7	94.9	70.1	43.8	20.5	36.5	29.2	23.4	67.2	1,460.9
1988	124.8	154.2	161.6	99.9	47.7	35.2	22.0	10.3	18.4	14.7	11.8	33.8	734.4
1989	120.4	148.7	155.8	96.3	46.0	34.0	21.2	9.9	17.7	14.2	11.3	32.6	708.1
1990	103.9	128.3	134.4	83.1	39.7	29.3	18.3	8.5	15.3	12.2	9.8	28.1	610.9
1991	109.2	134.9	141.4	87.4	41.8	30.8	19.3	9.0	16.1	12.9	10.3	29.6	642.7
1992	170.0	210.0	220.0	136.0	65.0	48.0	30.0	14.0	25.0	20.0	16.0	46.0	1,000.0
MAX	376.6	412.8	425.4	391.1	441.3	172.3	246.2	73.6	86.0	71.1	132.2	106.2	2,335.4
MEDIA	153.5	192.7	192.3	121.7	60.5	41.4	25.2	12.3	19.2	16.1	13.2	29.2	877.5
MIN	53.4	37.3	43.9	24.3	0.2	1.1	0.7	0.0	0.6	0.0	0.0	0.8	387.2

* Valores Corregidos Mediante la Curva de Doble Masa

Table 1 Maximum and Minimum elevation and volumes during Poza Honda Honda reservoir operation, 1979-1993 (*)

Year	Maximum Elevation (m)	Volume (MCM)	Minimum Elevation (m)	Volume (MCM)
1979	104.57	86.50	93.12	29.00
1980	103.05	78.38	92.97	28.42
1981	107.24	101.32	93.76	32.04
1982	102.85	77.36	95.23	44.15
1983	107.24	101.32	101.78	71.90
1984	107.23	101.27	101.94	72.70
1985	106.82	99.10	96.95	47.75
1986	107.26	101.43	96.95	47.75
1987	107.28	101.54	96.51	45.55
1988	107.12	100.60	96.65	46.25
1989	107.12	100.60	96.38	44.90
1990	105.69	92.55	95.21	39.05
1991	106.87	99.35	94.76	36.80
1992	107.15	100.83	96.00	43.00
1993	107.12	100.66	98.13	53.65

(*) The values from which table was made were gotten from CRM - Poza Honda Operation Department.