The Report

of Caldera Project

6th. Dec, 1979

Mission of the Government of Japan

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MINISTERIO DE OBRAS PUBLICAS Y TRANSPORTES
CENTRO DE INFORMACION Y DOCUMENTACION

1.- P R E S E N T A T I O N

We, the Mission of the Government of Japan, present our report herewith, concerning the matters of development of the Port of Caldera, to the Government of the Republic of Costa Rica and the Government of Japan.

Although our stay in Costa Rica was not enough period to find all facts and to confirm them, but we are able to believe that there will be continuous development of her economy in the future which - affects to port demands and vice-versa, the development of the port will contribute to the progress of Costa Rican economy.

So, we earnestly hope there should be more detailed survey on a plan for more development of the port.

We hope this brief report will advance our mutual undestanding and enhance close relation of both countries.

MISSION MEMBERS

AS CHIEF: S. Onogawa
Shigezumi Onogawa

AS COASTAL ENGINEER: H. Takeda
Hideaki Takeda

AS PLANNING ENGINEER: Sosuke Hitachi
Sosuke Hitachi

AS DESIGN ENGINEER: K. Nishijima
Kazuhiko ~~Nishi~~jima

AS COORDINATOR: Koji Morishita
Koji Morishita

2.- A C K N O W L E D G E M E N T

We have sincere appreciation to the Government of the Republic of Costa Rica, their officials and personnel concerned which gave us sufficient arrangements and cooperations, including supply of heavy equipments such as helicopter and boats.

Without enough and timely cooperation of the sort, we could not work so effectively in the short stay in this country.

We would like to show our gratitude, taking note of their names hereunder;

Ing. R. Méndez M.	The Minister, MOPT.
Ing. L. Venegas M.	Technical Assistant of the Minister, MOPT.
Ing. J. G. Chacón L.	Director of Port Works, MOPT.
Ing. E. Marín A.	Engineering staff of Caldera Project, MOPT.
Ing. R. Cruz V.	" "
Ing. A. Wesson A.	" "
Ing. C. Hidalgo B.	" "
Mr. J. F. Rojas Z.	" "
Mr. R. Sancho	" "
Ing. O. Elizondo M.	Director of Maritime Transport, MOPT.
Ing. A. Serrano E.	Staff of Maritime Transport, MOPT.
Ing. N. Morúa	Consulting Staff of Maritime Transport, MOPT.
Lic. M. Herrera F.	Director of Planning Division, MOPT.
Mr. R. J. Morris	Consulting Staff of Systan International, Inc.

Mr. P. G. M. Smith	Consulting Staff of Systan International, Inc.
Lic. Guillermo Pavez	Ministry of Economy, Commerce and Industry.
Ing. Yoram Levtov	" " "
Lic. C. Soto B.	Director, División de Inversiones, OFIPLAN.
Mr. A. J. Chen Lao	President, INCOP.
Mr. F. Soto S.	Director Portuario, INCOP
Arq. A. Castro A.	Coordinador, Plan Gran Puntarenas, INVU.
Ing. A. Leiva M.	Dpto. de Urbanismo, INVU.
Ing. J. M. Quirce L.	General Manager, Corporación Zona Franca de Exportación.

3.- SUBJECTS OF THE MISSION AND INTRODUCTION TO SURVEY RESULTS

The Mission was ordered from the Government of Japan to make clear a countermeasure for the sedimentation problem caused by littoral drift, as it does not affect badly the facility of the port of Caldera, and, as second subject, to confirm possibility on further expansion plan of the port.

For the subjects, general understanding and opinions of the mission are as follows. The details will be found in the following part 4 and 5.

1.- As to sand sedimentation:

Before departure of Tokyo, the mission had considered that new mouth opening at northern side of the present is unavoidable works, because if the mouth will be left at present location opened, continuous accumulation of the sedimented sand mass will be expected and finally will give bad effect to the new port facilities, although current channel on the sand mass may change its route, sometimes - west and sometimes south, according to thickness of the mass.

But, by observation of this visit, the mission found that the phenomena of sedimentation have almost stopped its enlargement, mainly by the reason of shutting the mouth with dyke. The action of the dyke weakened the current speed through the mouth.

Previous remarkable enlargement of the sand mass has happened with three actions, that are, wave action and tidal current which make coastal sand drift and move to south, wave sheltering effect by new breakwater which make the sand sedimentation promote at southward of the mouth where is in relatively calm, and relatively fast current

through mouth which accelerate velocity of tidal current southward.

Looking at the present condition, the mission once considered to leave all the condition as they are.

Nevertheless, having discussions, the mission has come to have its opinion that the new mouth opening is better tacties due to the following reasons:

That is, if we leave the mouth shut, there may be inundation into houses around the estuary by leveling up of water inside in rainy season, and mangrove or fishes will be affected badly with low exchange of water inside and outside, and moreover, even the mission said once that the enlargement of sand mass have stopped, the tendency which make coastal sand at Caldera Bay move to south will still remains due to wave action and tidal current, decreasing its extent remarkable compared with the condition of the mouth opened. And - setting new groin, which is better to set almost right angle to coast will cut sand supply from north to port side, and further, the setting will increase of sand thickness in north coast with reflecting action of waves by the groin.

The location of the groin which will be opened newly is recommendable to set at the narrowest part of sand bar extend from Mata de Limón, by topographical reason, and wave condition and expantion - scale of the port at 2nd stage, as the location will not become an obstacle in the coming expansion plan.

2.- As to possibility of 2nd expansion plan of the port:

We, the mission, consider that it is the best moment to give a feasibility study on second expansion plan of the Port of Caldera, and the study shall be done in early opportunity.

The way of our consideration is described in Part 5 of this report.

Anyway, the start of construction of the Port of Caldera, on its first stage, might be timely one, looking the damaged conditions of facilities of the Port of Puntarenas, and for enforced movement of its function to the Port of Caldera in earliest chance. And, moreover, it is our pleasure that the realization of new port seems to forward a stepping of industrialization in this country, even though its practical way may have some swings, but will go to a consolidated direction.

As all the quaywall of the Port of Caldera will be occupied almost with the cargoes enforced to shift from Puntarenas, the kinds of cargoes resulted by natural growth of Costa Rican Economy and new industrialization shall become to look for their handling spaces.

And further, the Port of Caldera shall be given an additional idea, such as roll on and roll off. Although the port already have facilities or space to handle containers, as to roll on and roll off system, we think it shall be a matter to be given another consideration.

This is just a reason that we considered the necessity of study on its second stage and to be connected a sending of next mission.

It is also our pleasure if the study will be done by Japanese mission which stepped into deeply on the first stage and the study will be forwarded same way as the first stage.

4.- S E D I M E N T A T I O N

It usually happens that the newly constructed structure of the port on the well-balanced sand beach, changes the coast line and makes another balanced sand beach.

In this case, generally speaking, drifting sand is deposited at up drift side of the structure, and at down drift side of the structure the beach is scoured due to trap of the drifting sand.

However, in the area behind the structure, the relatively calm area is created by sheltering effect of the structure, i.e. diffraction by - the breakwater, and because of the wave energy differences between shel tered and unsheltered areas, the longshore current tends to direct to sheltered area from unsheltered area.

In case of the Caldera Port, the longshore current directing to breakwater from the mouth of the estuary was created. It is observed that the coastal line around the port is almost well-balanced right now, but there will be some possibility that the mouth of the estuary will - direct to breakwater again after opening the new mouth, and so it is con cluded that the groin against drifting sand is necessary.

1.- The location of new mouth:

1) Design wave:

According to the wave observation data in 1978 and 1979, predominant significant wave period (T 1/3) was 14.0 sec., and predominant significant wave - height (H 1/3) was 0.5m to 1.0m.

No significant wave height that exceeds 2.0m was observed.

It is considered that waves in these years are relatively small from our experiences, and taking the design wave height for breakwater into consideration H 1/3 = 2.7m, T 1/3 = 14.0 sec at construction site is selected as the design wave for the groin.

2) Diffraction by the breakwater:

Fig.(1) shows diffraction effect of wave of 14.0 sec. period.

From Fig. (1), it is understood that the new mouth that MOPT had decided to open, locates on the inside limit of the diffraction zone.

It is preferable to construct a groin inside of the diffraction zone to prevent intense change of the coastline, and also from the topographical point of view, this point is ideal as mentioned above in Part 3.

2.- Cross section of the mouth:

1) From the relationship between tidal prism and the area of the cross-section, the area of 187 m2 is thought of sufficient, but to keep piers and revetment of the bridge from local scouring, larger area of the cross-section is advisable.

The cross-section of the mouth designed by MOPT has sufficient area and is well designed.

2) To excavate mouth, it is recommendable to use machines up to certain level and let tidal flush exca

vate below this level, but local scouring must be carefully checked.

3.- Direction of the groin:

1) The direction of the groin shall be parallel to the wave propagation and to avoid the long period waves reach from port side, the direction of the groin is decided to parallel to the propagation of short - period waves, say 8.0 sec.

2) By this direction, it is expected that the long period waves can be reflected to north and generate a local littoral drift from south to north direction.

4.- The length of the groin (Water Depth at end):

Taking account of the diffraction by the breakwater, refraction and shoaling, the depth of breaking is calculated to about-3.0m. so, it is recommendable to construct the groin until -3.0m water depth as first-step, and then the extention work of the groin until -5.0m depth will be done as second step only if the sedimentation is observed.

5.- Design of the groin:

Two types of the groins are designed as shown in Fig. 2 and Fig. 3.

The weight of stone is calculated by Hudson's formula.

The groin shown in Fig. 2 is more economical than one in Fig. 3, if small crane can be used.

The groin shown in Fig. 3 is designed to use the crane P&H/9125 that had been obtained by MOPT.

6.- Estimation of cost:

Very rough estimation is done using the data of Caldera Port construction as follows:

	Until - 3.0m		Until - 5.0m	
	Volume	Cost	Volume	Cost
TYPE A	35.000m3	₡3.500.000	60.000m3	₡6.000.000
TYPE B	40.000m3	₡4.000.000	70.000m3	₡7.000.000

Unit cost of rock, to obtain, deliver and mount it, is roughly estimated ₡100. from MOPT data.

7.- There will be some room for further study to decide the incident waves into the estuary through the mouth which will have wider channel than ever, even if the accumulation of the sand mass around the new mouth will be expected to - create and the mouth would decrease the wave energy passing through the new mouth.

It might be necessary to construct some revetments along the estuary at the other side of the mouth, to protect houses when large incident waves will be observed.

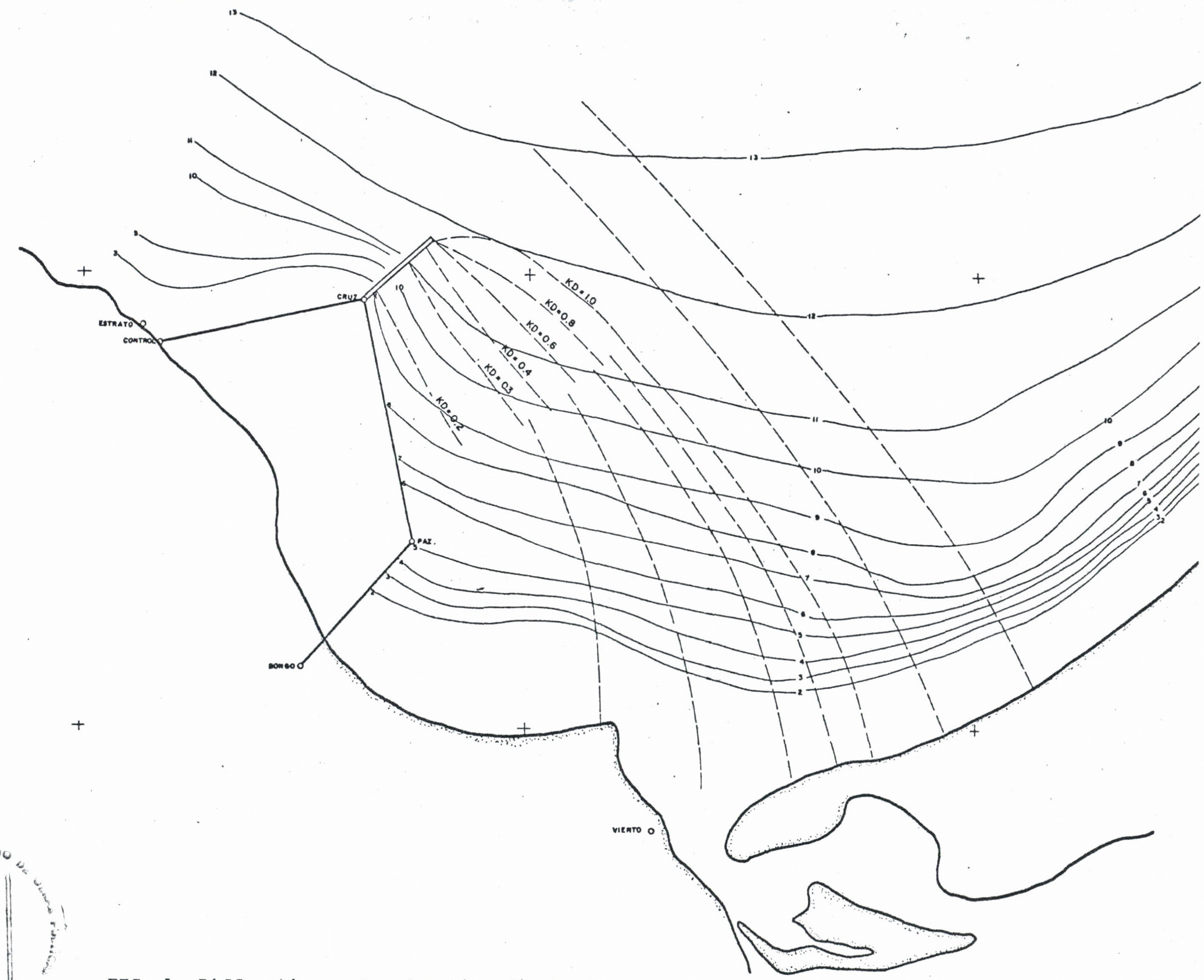
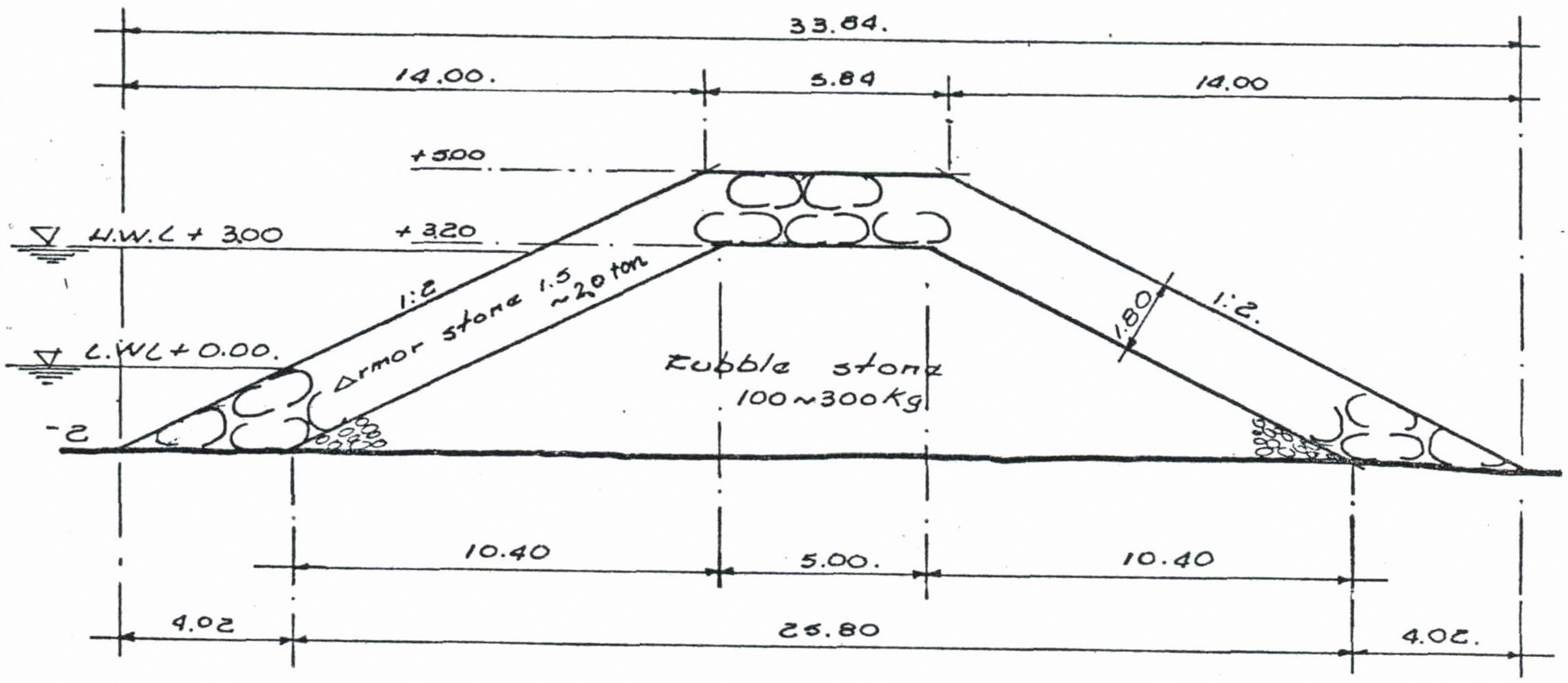


FIG. 1 Diffraction and refraction diagram*

* Contour lines are smoothed to draw the diagram.

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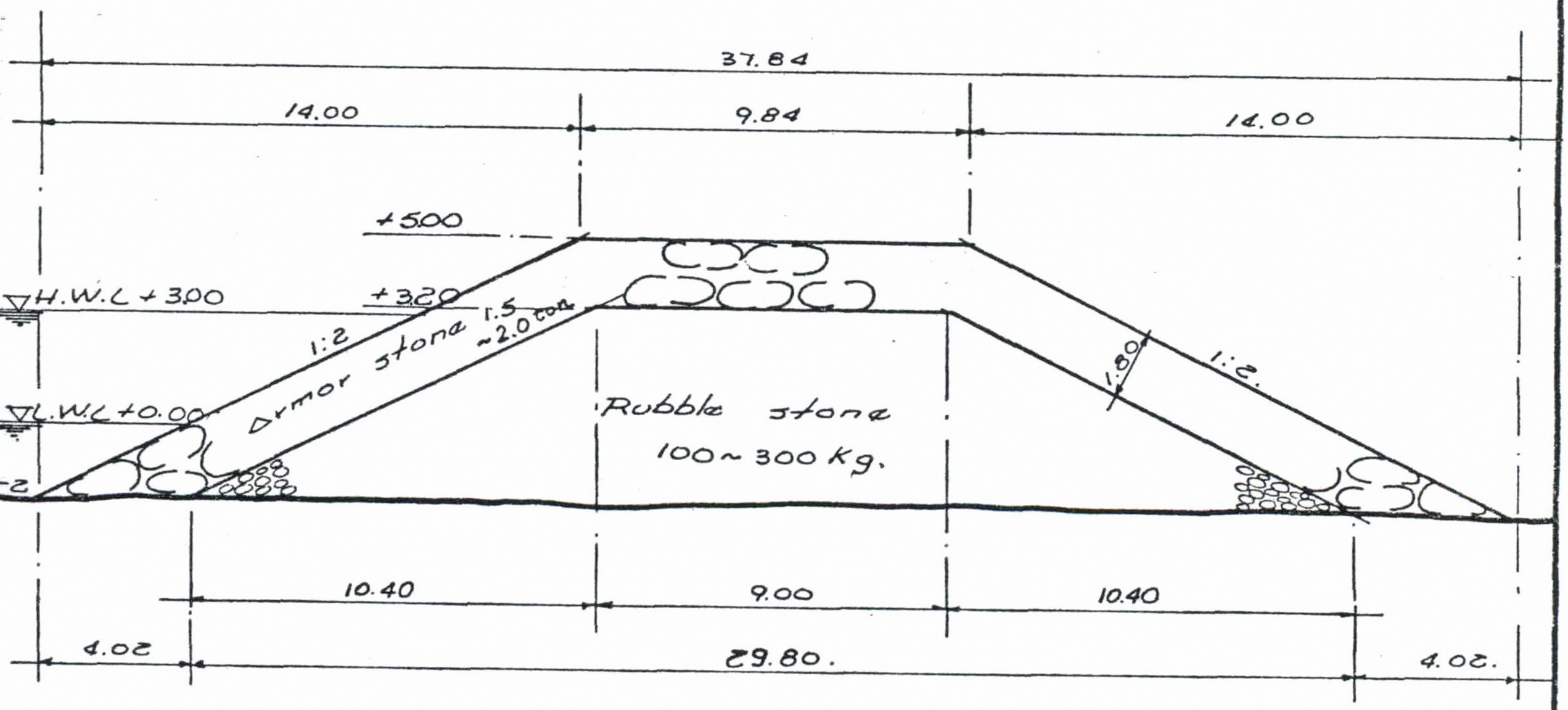
TYPICAL CROSS SECTION OF GROIN.

(-2.0m).

S : 1:200

U : m.

FIG : 2 Type A.



TYPICAL CROSS SECCTION OF GOIN.

(-2.0m).

FIG : 3 Type B.

S : 1:200

U : m.

5.- EXPANSION PLAN OF THE PORT OF CALDERA

As to the future of the Port of Caldera, we take the following considerations:

1.- Physical condition of facilities in Puntarenæs Port, that is, present condition of the pier, may better to be considered to come to the end of its life and can not be expected to be able to use for a long future.

2.- So, the cargoes which are handled at the port now shall be moved to the Port of Caldera, when Caldera opens its function.

The volumes of cargoes to be moved is almost same with the capacity of Port of Caldera, if we move general cargo and wheat to the Port of Caldera, they are about 400.000 - 450.000 tons for a few past years and the capæcity of Caldera may be maximum with 400.000 tons.

3.- As Costa Rica will have natural growth of her economy, and further, if the idea of development of industrialization come to fact, cargoes which is the result of above mentioned development, have to search their new space to be handled.

4.- An intentional realization of industrialization,no matter how they are the idea of industrial park or free industrial zone, depends on reality of furnished port with many facilities, or such infra-structure as a leading factor of Costa Rican economy and making up of unanimous national policy.

5.- Furhtermore, modernization of sea cargo flow, such as containerization or roll on and roll off system, requests much furnished port in Costa Rica too, the Port of Caldera is also demanded due consideration of the sort of facility, expecting a increasing of cargo flow in the route of west coast of North, Central and South America.

6.- As to a time to give a reconsideration of port function, including its expansion plan, this moment is the best, because the construction works of the Port of Caldera is almost completed on its front line works and is going to finish all the works until the end of next year. And, if needed, next mission can give minor amendment how to use the reclaimed land behind quaywall, in accordance with the ideas of second stage of the port or of land use around the estuary. The amendment of the plan in wide - sense, shall better be done as soon as possible.

7.- Following the above considerations, draft scope of works of feasibility survey on second stage of the Port of Caldera, shall be listed up, as attached list, due to its necessity. Their items of works listed shall be - shared by both Governments, according to our previous demarkation of the works which had applied to the first - stage.

D R A F T

SCOPE OF WORKS OF FEASIBILITY SURVEY

ON 2ND. STAGE OF THE PORT OF CALDERA

WORKS TO BE PROVIDED BY THE GOVERNMENT OF REPUBLIC OF - COSTA RICA:	WORKS TO BE PROVIDED BY THE FULL-SCALE MISSION OF THE - GOVERNMENT OF JAPAN:
1.- Determination of the objec tives of the Full-scale - mission. (It is recommendable to re quire the port expansion - plan and its feasibility - survey for the next 10 years and the master plan for next 20 years).	
2.- Establishment of compatible national economic plan and its prospective growth of Republic of Costa Rica. Population, Gross National Product and its detail into major sectors, development plan of industrialization, and inland transportation - plan.	
	3.- Forecast of cargo movement. Forecast shall be classified into major commodity groups for next 10 years, and as to total volume forecast shall be set at 2.000.

4.- Gathering of available data on the natural conditions - which are soil profile and mechanical property of the soil, wave data and sounding survey of concerned areas.	4.- Analysis of data given from Costa Rican side.
	5.- Drawing up to the plan of port facilities in detail at 1990, as master plan at 2.000.
6.- Gathering of unit cost investigation for construction work.	6.- Drawing up of preliminary design of quaywall and other - principal structure and estimation of construction cost and period.
	7.- Providing of cost-benefit analysis for recommended plan.
8.- Collection of information of vessels coming to Puntarenas port, as to cargo volumes in total and in detail, their - unit lot, congestion of vessels and port managemental - information such as port incomes and payments.	8.- Providing of financial analysis and recommendations for port management.

TABLE CARGO VOLUME THROUGH THE PORT OF PUNTARENAS

Unit; thousand tons

Year	Import				Export				Total	
	Wheat (1)	Raw material of fertilizer (2)	General cargo (3)	Sub total (4) =1+2+3	Sugar (5)*	Fertilizer (6)	General cargo (7)	Sub total (8) =5+6+7	Total (9) =4+8	Total of general cargo (10)=3+7
1974	65	102	291	458	69	45	76	190	648	367
1975	83	87	184	354	70	52	44	166	520	228
1976	70	126	164	360	69	92	40	201	561	204
1977	76	192	250	518	74	81	34	189	707	284
1978	62	115	359	536	70	59	38	167	703	397

Note: *----- Sugar was handled at the Port of Punta Morales.

Source: Made of the material No.8

6.- RECOMMENDATIONS TO THE GOVERNMENT OF REPUBLIC OF COSTA RICA

First of all, we, under the name of the mission dispatched by the Government of Japan, would like to present to your Government and concerned officials of the Caldera Project our respective and satisfactory minds to the beautiful advancement of construction - works which is in progress now at Caldera.

It is our pleasure that we could see an excellent fruit of our cooperation, and further, we have admiring minds to your intensive effort to have your country's economy growth.

As we described in previous parts of this report, we believe that a necessity come already to give due consideration on further expansion plan of the port of Caldera.

So, in order to make it fact, we would like to recommend you the following matters, including personal ~~experiencies~~ experiment met under the process of the cooperation:

1.- As to an target of your economic development, you had better set up your unanimous one of future population, GNP and productive incomes of main industries, or if you have some, you had better authorize them and make them wide spread into concerned organizations, as we met this time many understanding of them.

2.- As to systematic survey of natural conditions, you had better continue your effort periodically, For instance, sounding survey around the Port of Caldera, statiscal analysis of wave records, catching up of movement sedimenta-

tion, on littoral drift, record of earthquake, record of settlement of facilities built on coastal area and serial photo graphing of the site. This kind of works is not fit to a mission which will stay here in a short term.

3.- And as to another fundamental survey, such as soil boring and their test, as you have already their basic ~~experiencies~~ experiment, - you had better do them by your own hands, giving points of the boring on cross points of standardized lines.

To do this kind of works in early chances, it will make a setting up of expansion plan promote highly, as the works need a lot of times.

Because, it is suspected to appear much thicker layer of weak soil existence, at the location of second stage of construc tion works, specially for extension of breakwater.

We hope that the recommendations mentioned above will be performed before arriving of next mission and become a great help to them.

7.- RECOMMENDATIONS TO THE GOVERNMENT OF JAPAN

First of all, we, members of the mission, would like to report to the Government of Japan and their officials concerned to the cooperation of the Caldera Project that the cooperation works started since 1972 have been bearing fruit in an excellent way.

The cooperation might be a epoch making one more than our previous expectations. Along with the realization of new port, we have found a new factory under construction near the port, and everybody's mind in the side of Costa Rica is going to have a direction which is earnest intention of industrialization of the country.

As a matter of fact, the intention has just started and have not so many examples realized. But we are remembering the age of which we had National Income Doubling Plan, of course the scales of economies are comparatively small based on 2 million and bit more population of the Republic of Costa Rica, as the country seems to be an age of taking off her economy.

We, including personal sentiments who lived in the country under real cooperation at the site, can believe that this country would take steady steps to the future, supported by the society full of welfare and by Costa Rican Democracy.

As to Costa Rican Democracy, we would like to request further as to obtain your complete understanding of it. Owing to it, this country is promissed much more development in stable condition among Central America.

The Democracy is a particular one in the world, and relatively similar with it in Japan.

As it means mutual sympathy or consideration, bridging from high class to others, and vice-versa, on all over the people.

If the Government of Japan could continue further cooperation in the same way which was already preceding, it would be a leading example all over the Central America.

Finally summing up all informations described in this report, we would like to request to the Government of Japan as to give its highest consideration to send the mission of feasibility study on the second stage of Caldera Port Construction to this country in an early opportunity.

8.- APPENDIX

Talking Note No.1 - 10.

San José, November 22, 1979

MISSION NO. 1

TALKING NOTE WITH AMBASSADOR OF JAPAN AS TO DUTIES OF THE MISSION

1.- AS TO LITTORAL DRIFT:

This duty shall be considered to be charged as responsible one to the Mission,as it is purely engineering problem.

The final answer shall be established after giving field survey of this time upon Mr. Tokikawa's report, but we, members of - the mission, has not much worry about it, as the phenomena happens naturally when we give artificial structure upon naturally balanced sea coast.

So, as a conduct which shall be taken for the phenomena, we can consider a way which set a new lake mouth on northern site of the now where the outlet locates in a previous mechanism as to be in - natural balance, and a setting of stone dyke which lead and control current through the mouth will have effect, not to let the sedimentation spread to the site of the new port.

Due to the way mentioned, we can expect not to have more enlargement of sand sedimentation at the site of the new port, but, - on the other hand, we have to consider to move the existing sand accumulation, if it is amounted to the extent which actually affect badly the new port.

In the way of consideration of removal of accumulated sand,

if the sedimented mass can be realized to be used as a base of second stage of the port, such as a suitable location of land reclamation expected, we could realize a low cost planning of the project of second stage.

2.- AS TO A PLAN OF SECOND STAGE OF THE PORT:

We could have easy understanding as to enter the 2nd stage, as an intention of the Government of Costa Rica, because:

1) They have already experienced the port construction and have accumulated engineering knowledge.

2) Everybody could have expectation of much more economic development of Costa Rica among Central América, due to the - country's well balanced social welfare.

3) The facilities of Puntarenas port may come to an end of - their life, due to long term activity.

4) And, lasting cooperation of Japanese Government concerned - to the Caldera Project will be a typical and model case of the way of cooperation, which we had better continue it.

So, we, the Mission, would like to collect:

4a) Potential of the second spanding plan of Caldera Port.

4b) Extent or scope of the possibility for the project from the Government of Costa Rica.

To the notation mentioned above from Onogawa, the Ambassador showed his understanding as follows, indicating that he has same opinions and further;

5) This country is aiming to establish industrial activity through functions of the port of Caldera and Limón under duty free

scheme.

6) All public works is going to support the idea mentioned above, such as improvement of national highway, crossing the country from the Pacific to the Atlantic, improvement of railway and enlargemnt of electric power.

7) And agree that the type of the cooperation done on Caldera Project would be a type of to be continued.

MEMBERS ATTENDED: Mr. Hasegawa, 1st Secretary, Japan Embassy

Mr. Ayukawa, Staff, Japan Embassy

Mr. Yasutake, Resident Expert.

Mr. Tsutsumi, " "

San José, November 22, 1979

MISSION NO.2

TALKING NOTE WITH MINISTER OF MOPT

The following are the note communicated between Mr. Minister and Onogawa on the afternoon, of November 22nd.

1.- First, Onogawa showed his respect and satisfaction to the well progress of the Caldera construction works, and told itemized duties of the mission as following two paragraphs:

2.- AS TO LITTORAL DRIFT:

Onogawa considers that the phenomena is a natural one when someone gives artificial structure upon naturally balanced sea - coast, so we could obtain a satisfactory result when we lead the natural phenomena into newly well balanced condition and funda- mentally Onogawa does not worry about it so much. Mr. Tokikawa's study of phenomena, who had stayed here from the end of last year to the beginning of this year, gave us fine and detailed study, how to solve the problem. His answer was to have another river (or lake) mouth opened newly on the shore.

Onogawa said we fundamentally agree with Mr. Tokikawa's study but as we had one rainy season after his study, which might give - some affects on the phenomena indicated by him, so after we observe and check the effect of one rainy season, we wish to leave final - solution of the phenomena.

3.- AS TO FEASIBILITY SURVEY OF SECOND STAGE:

Onogawa showed his pleasure to be able to see good progress of the construction works undergoing now. And looking around the well controlled social circumstances of the country among Central América, he hopes and believes there will be much more progess of economic activities of the country.

So, as a general conception, Onogawa said we could get easy understanding about Government intention as to enter second stage, and as Governments of Costa Rica and Japan have had close relation or cooperation about Caldera Project, so we could say the Japanese Government has interest and concern to the second stage and sending a mission may have possibility of it.

So, in order to consolidate the next missioning and to furnish this report on the matter, Onogawa inquired Mr. Minister that you or your government's intention on what function shall be added - to Caldera Port or how they are realizing now to make the port a bigger one, and how to consider the future of Puntarenas Port.

To his notation and inquires, Mr. Minister answered as follows:

1.- First, Mr. Minister showed his thanks to the Government of Japan for the cooperation all over Caldera Project and specially for close cooperation of engineering field.

2.- And, Mr. Minister showed that he has also never considered that the phenomena of littoral drift was a troublesome one and agreed Onogawa's present intention as to leave final solution due to his way.

3.- As to expansion of the Port of Caldera into second stage, Mr. Minister showed his ideas as follows:

a) The function of the Port of Puntarenas shall be shifted into the Port of Caldera recently as its oldness.

b) Industrialization of the country shall be prometed due to social circumstances of the country among - Central America, and the intention will be supported and realized by enough supplemental plan of electric power and so on.

c) MOPT now has many heavy equipments for works, so Mr. Minister hopes to find effective plan of their use.

MEMBERS ATTENDED:

Ing. R. Méndez M.:	The Minister of MOPT
Ing. J. G. Chacón L.:	Director of Port Works, MOPT.
Ing. O. Elizondo M.:	Director of Maritime Transport MOPT.
Ing. R. Cruz V.:	Engineering Staff of Caldera Project - MOPT
Ing. C. Hidalgo B.:	Ditto.
Mr. N. Morúa C.:	Consulting Staff to Maritime Transport Dept., MOPT.
Mr. Hasegawa:	1st Secretary of Japan Embassy
Mr. Aikawa:	Staff of Japan Embassy
Mr. Yasutake:	JICA Expert
Mr. Tsutsumi:	Ditto.

San José, November 23, 1979

MISSION NO. 3

TALKING NOTE WITH MEMBERS OF MOPT

The following is the note communicated between MOPT's members and the Mission.

1.- AS TO ECONOMIC SURVEY:

Due to the Minister talk, the Mission considered that it is very important to collect all informations about industrialization or development plan of the Nation and around Puntarenas, so the Mission together with the Director of Ports Works, Mr. Chacón and others, choose the following wise men concerned to this field:

Representative of INCOP
" " " Maritime Transport
" " " I.N.V.U.
" " " OFIPLAN
" " " Ministry of Industrialization (and Commerce)
" " " SISTAN International

And also, to realize the past tendency of the economic field of the Nation, the Mission relied on the MOPT to give statistical data or documents studied at economic fields.

The list of documents given by the request are the following:

L I S T O F D O C U M E N T S

NO.	NAME OF MATERIAL	DATE OF ISSUE	AUTHOR, EDITOR OR PUBLISHER
1	Proyección de los Volúmenes de Importación y Exportación por los Puertos de Limón y Puntarenas 1978 - 1995	OCTUBRE 1978	Ministerio de Obras Públicas y Transportes, Direccion General de Planificación
2	Plan Nacional de Desarrollo 1979-1982 "Gregorio José Ramirez"	1979	Oficina de Planificación Nacional y Política Económica
3	Feasibility Studies for Second Stage of Caldera Project, Terms of Reference.		
4	Memorandum Técnico No.16, Review of Limón/Moín Port Development (English Draft).	16 Nov. 1978 Revisado 23 de Nov. de 1978.	Dir. Gen. de Planificación, Ministerio Obras Públicas y Transportes y Systan International, INC.
5	Anuario Estadístico de Costa Rica 1976.	1976	Dirección Gen. de Estadística y Censos, Ministerio de Economía, Industria y Comercio.
6	Cifras de Cuentas Nacionales de Costa Rica. Serie 1957-1977, Estimación 1978		Banco Central de Costa Rica
7	Situación Actual de las Empresas y Proyectos Propios y Ajenos.	Julio 31, 1979	Corporación Cost. de Desarrollo
8	Population, GDP, Cago Volume Handled in Ports.		
9	Memorandum Técnico No.17, Examen del Desarrollo del Complejo Portuario Caldera/Puntarenas.	Nov. 11, 1978 (Borrador en Inglés) Abril 16, 1979 (Traducido al Español).	Dirección General de Planificación, Ministerio Obras Públicas y Transportes y Systan International, INC.
10	Study of the Handling of Bulk Products in the Pacific Ports.		
11	Memorandum Técnico No. 16, Examen del Desarrollo del Complejo Portuario Limón/Moín	Borrador en Inglés Nov. 23 de 1978, Traducido Español Mayo 21 1979	Dirección Gen. de Planificación Ministerio Obras Públicas y Tranportes y Systan International, INC.
12	Informe de Trabajo No.12, Análisis de Alternativas de Transporte de Cementos del Pacífico, S.A.	Ago. 10, 1979	Dir. Gen. de Planif. Ministerio Obras Públicas y Transp. y Systa International, INC.

NO.	NAME OF MATERIAL	DATE OF ISSUE	AUTHOR, EDITOR OR PUBLISHER
13	Memorandum Técnico No. 22, Estudio Preliminar del Manejo de Productos a Granel en los Puertos del Pacífico.	Febrero 28 de 1979	Dirección General de Planificación, Ministerio de Obras Públicas y Transp. y Systan International, INC.
14	Informe Mensual, Proyecto Costanera Sur, Sección Tárcoles - Loma y Puente sobre el Río Tárcoles.	Setiembre de 1979	Ministerio de Obras Públicas y Transportes, División Obras Públicas, Dir. General de Estudios y Evaluación.
15	Estudio Regional de la Influencia de los Puertos de Caldera y Puntarenas, Resumen de Conclusiones y Recomendaciones.	Abril, 1977	Oficina de Planificación Nacional y Política Económica. (JICA)
16	Política Nacional de Recursos Marino.	1979	Presidencia de la República.
17	Estadística Económica de la Pesca y Caza Marítima.	Noviembre de 1978	Ministerio de Ganadería y Agricultura, Dir. Gen. de Recursos Pesqueros y Vida Silvestre.
18	Cuadros Estadísticos Sobre el Sector Transporte, 1975.	Octubre de 1976	Ministerio de Obras Públicas y Transp. Dir. Gen. de Planificación, Dpto. Estudios Económicos

2.- AS TO LITTORAL DRIFT:

In order to confine the fact happened after Mr. Tokikawa left here (Expert of Coastal Problems stayed here until Feb. 1979), the Mission asked and confirmed the periodical survey of sea bottom in wide region and depth survey around lake mouth, urgently done by need, are obtainable and usable.

And also, the Mission asked present progressing condition of new mouth cutting, and how the design of cross section of new mouth was decided and gained answers that, as to the former, the works just - started, and to the latter, the design of the old was adopted to the new

as it is, as all the materials already prepared are available.

And finally the mission request wave and tidal data at Caldera, which was given at satisfied accuracies.

MEMBERS ATTENDED:

Ing. J. G. Chacón L.:	Director of Port Works, MOPT
Lic. M. Herrera F.:	Director of Planning Division MOPT.
Ing. R. Cruz V.:	Engineering Staff of Port Division MOPT.
Ing. C. Hidalgo B.:	Ditto.
Mr. N. Morúa C.:	Consulting Staff to Maritime Transport Dept., MOPT.

Puntarenas, Noviember 25, 1979

MISSION NO.4

TALKING NOTE WITH MR. FULVIO SOTO SANABRIA
DIRECTOR PORTUARIO, INCOP

1.- The jetty of Puntarenas Port has its life for almost 60 years.

2.- Main piles of the jetty have had notable errosion, and many of them are cut at their top parts.

So, INCOP is doing remedial works, driving hexagon piles (dia. 40 cm) as to have increase of supporting power in general.

3.- Due to big swell of September and October this year, mooring vessel gave damages to the jetty by her collision. The damages - were destruction of west top end of the jetty, movement of self - standing fender piles to jetty side and cutting off a bit from - the pile fixed it.

4.- As a remedial work, INCOP is constructing new self standing fender near of the jetty, driving additional piles, and the same to fix the movedbit.

5.- As to port function, congestion has not come to so serious problem. Vessels wait usually 2 or 3 days of their mooring.

INCOP barges are helping to make the stay short.

Port cargos keep their volumes almost the same level for - these 2 or 3 years, and about 100 containers are received in a month.

There is no fact that the vessels which intend to call Puntarenas is calling Limón Port due to congestion or lack of attrac-

tiveness of Puntarenas Port.

MEMBER ATTEND:

Mr. F. Soto S. Director Portuario, INCOP.

San José, November 28, 1979

MISSION NO. 5

TALKING NOTE WITH MINISTERIO DE ECONOMIA, INDUSTRIA Y COMERCIO

The Japanese pre-study team for expansion of Caldera Project visited Ministerio de Economía Industria y Comercio on the 28th of November, 1979. Getting the mission's visiting purpose informed by Onogawa, the staffs of Ministerio de Economía Industria y Comercio explained the industrialization plan in this country as follows;

1.- MAIN SUBJECTS OF INDUSTRIALIZATIONS ARE AS FOLLOWS:

1.1.- Industrialization of agriculture.

1.2.- Introduction of metal and machinery industries.

1.3.- Introduction of industries of construction materials

1.4.- The idea of industrial free zone is being discussed as to locate in Limón and Caldera.

These ideas are based on as to increase labor market and to restrict capital population, and of course, to realize economic development nation wide.

2.- CHARACTERS OF THE INDUSTRIAL FREE ZONES:

2.1.- As to the industrial free zones, they are considered in limited areas near the ports.

2.2.- The markets of the products which will be manufactured in the industrial free zones, aimed to be transported and to be sold in North América, South América and Europian markets (the reason of excluding Central Amé-

rica from the markets is that there is a kind of rule which controls the trading flow in Central América).

3.- INDUSTRIALIZATION OF AGRICULTURE:

3.1.- Concentrated productions and manufacturings for export of tropical fruits, such as cashew nuts, papaya, pineapple, palmetto, gingerale and tomato, are considered.

3.2.- To raise the efficiencies of agricultural activities is considered by introducing population into local and also by their concentrated productions.

3.3.- Industrialization of fishery at Puntarenas will be an important subject in the future.

4.- METAL AND MACHINERY INDUSTRIES:

4.1.- ALUMINIUM:

In the first stage, construction of the factory near Caldera is being realized. That factory will process aluminium ingots which are imported from Jamaica through the - port of Limón into final forms.

In the second stage, bauxite which may be exploited at St. Isidoro ~~ro~~ is considered to be manufactured at the factory, supported by rich supply of electricity expected in the near future.

4.2.- Spareparts of cars, jet - airplane, etc.:

Factory for car knockdown and factory for productions of parts and repairs of cars or plane, are planned near San -

José.

Metal and machinery factories mentioned above are being arranged under investment by COOPESA and CODESA.

4.3.- Ship building factory may have possibility of its establishment.

5.- INDUSTRIALIZATION OF CONSTRUCTION MATERIALS:

5.1.- Industrialization of construction materials such as cement, etc. is being promoted.

The cement plant is constructed at Punta Piedra. At the same time, the railway for carrying cement is also under construction.

5.2.- The PVC factory is being planned to be arranged in the free zone of Caldera by INCOP. This factory is invested by the american company (33%), INCOP (33%) and public subscription (34%).

5.3.- Steel factory may have possibility of its establishment, even though its scale is not so large.

6.- OTHER INDUSTRY:

The oil refinery by RECOPE and the paper manufacture in Talamanca are being planned.

MEMBERS ATTENDED:

Mr. Guillermo Pavez: Minister of Economy, Commerce and Industry.

Mr. Yoran Levtov: Ditto.

San José, November 28, 1979

MISSION NO. 6

TALKING NOTE WITH OFICINA DE PLANIFICACION NACIONAL Y POLITICA ECONOMICA

The Japanese pre-study team for expansion of Caldera Port, visited Oficina de Planificación Nacional y Política Económica on 28th, November, 1979.

After expressing the purpose of visiting by Onogawa, the staff of Oficina de Planificación Nacional y Política Económica explained the development plans in this country as follows:

1.- Five local districts have each development plan and are going to arrange each infra-structure.

2.- In the development plan of Gran Puntarenas, a new port, new roads and a new airport (on the way from San José to Caldera) are being planned.

3.- In the development plan of Guanacaste, plans of irrigation, agriculture development, producing alcohol from sugar-cane are being considered.

4.- As for industrialization, the following two ideas are being considered, based on the purposes of dispersal of population and increase of labor market.

4.1.- INDUSTRIAL PARK:

In the industrial park, the commodities, which are consumed in Costa Rica and other Central América, are to be - manufactured.

In this industrial park, the following industries are being considered as to be arranged; agro-industry, paper manufactory, fishery - industry, timber processing, etc.

4.2.- INDUSTRIAL FREE ZONE:

The study of the industrial free zone in Moin and Caldera will start next year.

This study is financed by IDB and will be carried out by IDB, Costa Rica Government and consultant group.

In the industrial free zones, the commodities for - exportation to other countries (except Central America) will be manufactured.

As to light industries, such as metal machineries, electronics, toys and medicine, etc. are considered to be changeable to industrial park.

As to aluminium industries, the factory will process aluminium ingots by using rich electric power, which - will be produced by hydro-power station at Urca, and it will be established in Limón and also in Esparza.

(Esparza will be included in the industrial free zone, because Esparza is located in Gran Puntarenas.)

The reason why San José is not considered as industrial free zone, is that Metropolitan area has been - becoming a densely populated district and the increase of employment in Puntarenas has to be considered.

5.- A G R I C U L T U R E:

The agricultural products in Guanacaste are being considered to be led into agro-industry products.

6.- AS TO MACROSCOPIC INDEX TO ECONOMY:

The projected rate of population increase about 2% per year, is considered as a moderate figure.

The projected rate of GDP increase about 7% per year, is also considered as a moderare one.

The share or employed persons to total population, was 48% in 1976. This share will have possibility to raise it.

*ATTENDANT: MR. CLAUDIO SOTO BADILLA
Director, División de Inversiones, OFIPLAN.

San José, November 28, 1979

MISSION NO.7

TALKING NOTE WITH THE STAFF OF
PLANIFICACION, M.O.P.T.

1.- According to a study of consulting staff who is in charge of national transport plan, second stage of Caldera Port Construction Plan will be necessary. However, which type of cargo will be handled in Caldera is uncertain. Possibly, it may be - fertilizer, coal, etc.

GYPSUM: Estimated cargo handling amount will be 10.000-20.000 t/year.

CEMENT: The surplus of domestic consumption will be exported. It varies from year to year, in some year, export amount may be zero, at most 200.000 t/year. So the utilization of Caldera Port for the purpose of cement export, it is only temporary, or in uncertain condition.

ALUMINIUM: 10.000 t/year may be exported to Central America, however, whether Caldera Port will be used.

2.- Other staff of the Consulting Company studied production and consumption, by means of dividing all kind of products into 120 - items, and also dividing Costa Rica into 64 zones.

2.1.- The following are the estimation by his study:

Cement Factory:

Until second stage of Caldera Port Construction Plan is clarified, it is uncertain.

Dam:

In the south west part of the country, they may produce aluminium by using the domestic bauxite.

Coffee:

Judging from past achievement, it was too optimistic.

Fertilizer:

Whether they use Caldera Port or not is uncertain.

There is a possibility that the fertilizer plant in Pacific coast may be closed down and move to Atlantic coast, so it is uncertain.

Food Stuff Processing:

There is a big demand in the east coast of U.S.A.

For example, at present, most of the processed fish is exported from Limón port by roll on/ roll off system.

Compared with the Atlantic side of Costa Rica, the Pacific side is not so advantageous.

2.2.- AS TO IMPORT ITEM:

Iron Steel:

The possibility of establishing a steel mill in Costa Rica is scarce, so for the time being they will depend on imported inrom and steel.

Beans:

Its domestic production is insufficient for consumption.

Rice:

In some year they export rice, another year they import it. It is uncertain.

Wheat:

Import of wheat will increase along with population growth.

3.- Estimation of growth of all cargoes in the Pacific Coast of Costa Rica, from 1980 to 2000, will increase 50% in total. The followings are itemized examples:

General Cargo:

In 20 years, it will be double, from 300.000 t at present to 600.000 t.

Cement:

In 20 years it will be double, but uncertain.

Fertilizer:

In 20 years, 25 - 30% increase.

Liquid Products:

Negligible, but RECOPE may decide to import products from near Caldera.

4.- OTHER REMARKS:

4.1.- As a general idea, if the port facilities of Caldera is completed and would have been furnished more of their

functions, it will be another factor to increase cargo handling amount.

4.2.- To what extent Caldera Port will be used depends on - how Limón port functions are.

4.3.- The idea of "Industrial Free Zone": Judging from geographical location of Caldera, it is not so advantageous. It is too far from the market. Atlantic coast is much better for the location of "Industrial Free Zone".

4.4.- There may be a problem to obtain enough labour in Caldera, because residencial area is a bit far from Caldera.

5.- According to the staff of Planification, MOPT, the following items, have better possibility to develop in and around Caldera area:

..... Wood

..... Leather

..... Tropical Fruits (Coconuts, etc)

..... Fish (from Puntarenas to Caldera as a base)

..... Urea

..... Ammonia

..... Ship-building (in Caldera)

MEMBERS ATTENDED:

Mr. Mario Herrera Flores:	Planning Dept. Ministry of Public Works and Transport.
Mr. Richard J. Morris:	Coordinator, Consultant to Planning Dept. Ministry of Public Works and Transport from Systan International, Inc. Calif. U. S. A.
Mr. Peter G. M. Smith:	Economist Specialized in Transport
	ditto

San José, November 29, 1979

MISSION NO. 8

TALKING NOTE WITH MANAGEMENT
COMMITTEE OF CALDERA PORT

The japanese pre-study team for expansion of Caldera Port visited INCOP on November 29, 1979.

After expressing the purpose of visiting by Onogawa, the members of Management Committee of Caldera Port explained the important subjects concerned with the development of Caldera Port as follows:

1.- When the Port of Caldera begins its services, the functions of international trade in the Port of Puntarenas will be entirely passed into the Port of Caldera.

The facilities concerned with fishery will remain in Puntarenas.

When the functions of international trade in the Port of Puntarenas are passed into the Port of Caldera, the transit - sheds in the Port of Puntarenas will be passed into the hand of Municipality of Puntarenas. And INVU will study the utilization of those transit sheds. This matter has already decided by the law when the Japanese loan for Caldera Project was contracted.

The facilities of railway in the Port of Puntarenas will - be passed into the Municipality of Puntarenas.

2.- It is the future project that the depressed areas of the - northern side of Puntarenas island are reclaimed to make renewal the City of Puntarenas.

This project is considered to have the high possibility.

3.- The ferry boat system between Puntarenas and Playa de Naranjo will remain in Puntarenas, even after the commencement of port services of Caldera.

In the future the new ferry boat system, connecting Playa de Naranjo, Paquera, Caldera and Puntarenas, may be set up.

4.- As to bananas, coffee and rice, which are handled now mainly in the Port of Limón, will be transferred of its part to the Port of Caldera, when the port begins its services, to deliver them to the western part of U.S.A.

Accompanied with the commencement of port services of Caldera, the raw materials of fertilizers may have the possibility to be - imported at Caldera.

5.- When the Port of Caldera begins its services, the cargos from the industrial free zone, such as cement, processed wheat, etc. may be handled there.

And importing oil through the Port of Caldera is being considered by Shell Company.

As to the neighbor countries, some countries are planning to transport container cargos by land between Caldera and Limón.

6.- As to the development of coastal around the Port of Caldera, the arrangement of warehouse around Mata de Limón is being considered, and the members of the committee earnestly requested to us to be given Japanese advices to establish well considered plan of urbanization around the Port of Caldera, including the ideas of - stocking place and industrialization.

* ATTENDANTS:	Ing. Olman Elizondo M.	(MOPT)
	Ing. A. Serrano E.	(MOPT)
	Mr. A. J. Chen Lao	(INCOP)
	Mr. Ar. A. Castro A.	(INVU)
	Ing. A. Leiva M.	(INVU)

San José, November 29, 1979

MISSION NO.9

TALKING NOTE WITH THE EXPERT OF

MOIN INDUSTRIAL FREE ZONE

According to his idea, the industries which will locate in "Industrial Free Zone" are classified into two categories. One is light industries and another is heavy industries. The area of free zone in Moin is 70 to 100 ha. It is located inside the industrial park which area is as wide as 1.000 ha.

ITEMS OF LIGHT INDUSTRIES:

..... Electronics ex. T.V., Calculator, etc.

..... Metal Processing ex. Aluminium, Steel, Etc.

..... Wood Processing ex. Furniture

..... Garments

Raw materials for light industries will be carried by ship.

Final products of light industries will be exported to east side and west of U.S.A.

Some of such final products will be exported by air.

The estimated figure of cargo volume is not clear.

As for heavy industries, its type of cargo is unknown. The estimated figure of cargo volume is not clear.

In Costa Rica, due to the inflationary circumstances, the interest rate of bank loan on commercial base is 20 to 24%. And even the specially favored bank rate is 14 to 15%.

By comparison, the rate of International Development Bank is 12%

So, for the purpose of realizing the industrial facilities, he is looking for the generous financing agency which will give a loan at reason-

able interest rate.

MEMBERS ATTENDED:

Mr. José M. Quirce, Expert of Moin Industrial Free Zone, Director, Banco de Costa Rica.

San José, December 3, 1979

MISSION NO. 10

TALKING NOTE WITH ING. L. VENEGAS M.

The pre-study team of the expansion of Caldera Port visited Ing. L. Venegas M. on the 3rd of December, 1979. After expressing of the purpose of visit by Onogawa, Ing. Venegas explained the prospect of Caldera Project as follows:

1.- The full-scale Japanese study team of 2nd stage of Caldera Port will be welcome in early opportunity.

2.- In the expansion plan of Caldera Port, the facilities of roll on/roll off system may become necessary.

3.- In the 2nd stage construction, the caisson may be better for ~~breakwater of~~ wharf.

MEMBER ATTENDED: Ing. C. Hidalgo B.