

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK
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PR-1519-A
14 October 1986
Original: Spanish

H A I T I

PORT-AU-PRINCE STORM DRAINAGE PROJECT

SECOND STAGE

(HA-0057)

PROJECT REPORT

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Table of Contents

	<u>Page</u>
I. INTRODUCTION	1
A. Background	1
B. The application, its priority, and missions	1
II. FRAME OF REFERENCE	3
A. The sanitation sector in the country	3
B. Metropolitan Port-au-Prince	7
C. Design and sizing of the Port-au-Prince Storm Drainage Project	15
III. EVALUATION OF THE FIRST STAGE OF THE PORT-AU-PRINCE STORM DRAINAGE PROJECT	17
A. General	17
B. Description of the project	17
C. Advancement of the project	19
D. Execution of the project	21
E. Fulfillment of contractual obligations	22
F. Technical cooperation ATN/SF-1685-HA	28
G. Technical cooperation ATC/SF-1686-HA	29
IV. THE PROJECT	30
A. Purposes of the project	30
B. Description of the project	30
C. Area of influence of the project	34
D. Costs of the proposed project	35
E. Project financing plan	39
V. THE BORROWER AND EXECUTING UNIT	40
A. Introduction	40
B. Institutional analysis	40
C. Financial administration	44
D. Analysis of past projects	47

	<u>Page</u>
VI. EXECUTION OF THE PROJECT	51
A. Introduction	51
B. Status of designs and initiation of works	51
C. Technology of the project	52
D. Ecological and environmental aspects	53
E. Status of land acquisition	54
F. Plan of execution	55
G. Acquisition of goods and services	55
H. Calendar of investments and use of resources	58
I. Supervision by executing agency	58
J. Advance of funds	58
K. Operation and maintenance of the present and future drainage system	59
L. Ex post evaluation	60
M. Inspection and supervision by the Bank	61
VII. JUSTIFICATION OF THE PROJECT	62
A. Technical feasibility	62
B. Institutional feasibility	63
C. Financial feasibility	63
D. Socioeconomic feasibility	67

ANNEXES

- Anexo 1 Situación y Perspectivas Económicas de Haití.
- Anexo 2 Costos Subproyecto A.
- Anexo 3 Costos Subproyecto B.
- Anexo 4 Costos Subproyecto C..
- Anexo 5 Costo de las Expropiaciones.
- Anexo 6 Costos: Supervisión y Administración
- Anexo 7 Organigrama: MTPTC.
- Anexo 8 Organigrama: Dirección de Obras Públicas.
- Anexo 9 Organigrama: Unidad Ejecutora.
- Anexo 10 Presupuesto de Operación y Mantenimiento, y
Organigrama del SEEU.
- Anexo 11 Asesor Internacional - Area Ingeniería:
Especificaciones de Trabajo.
Asesor Internacional - Operación y Mantenimiento:
Especificaciones de Trabajo.
- Anexo 12 Asesor Local - Control Gerencial y Sistemas:
Especificaciones de Trabajo.
Asesor Local - Finanzas: Especificaciones de
Trabajo.
- Anexo 13 Parámetros de Diseño y otras Características
de las Obras.
- Anexo 14 PPEP y Cronograma de Actividades.
- Anexo 15 Reglamento de Licitaciones (BID)
- Anexo 16 Procedimiento de Selección y Contratación
de Consultores.
- Anexo 17 Indicadores Socioeconómicos
- Anexo 18 Estimación de Beneficios Unitarios
- Anexo 19 Matriz de Conversión de Categorías de Costos
de Inversión a Uso de Insumos.

ABREVIATURAS Y ACRONISMOS

APN	Autoridad Portuaria Nacional
AEP	Aprovisamiento de Agua Potable
AEPA	Aprovisionamiento de Agua Potable y Saneamiento
CAF	Centro de Apoyo a las Formaciones para del Desarrollo Rural
CAMEP	Central Autónoma Metropolitana de Agua Potable
CARE	Cooperative for American Relief Everywhere
CEE	Comunidad Económica Europea
CONADE	Consejo Nacional del Agua
CONADEPA	Comité Nacional de Acción para el Decenio Internacional del Agua
DARNDR	Departamento de Agricultura, de los Recursos Naturales y del Desarrollo Rural
DRENAJE I	Primera Etapa del Programa BID de Drenaje
DRENAJE II	Segunda Etapa del Programa BID de Drenaje. Programa Actualmente en Estudio.
DIEPA	Decenio Internacional del Agua Potable y del Saneamiento
DSPP	Departamento de Salud Pública y Población
DTP	Departamento de Trabajos Públicos
FAC	Fondos de Ayuda y Cooperación (Francia)
EH	Electricité de Haïti
FED	Fondos Europeos de Desarrollo
EPPLS	Empresa Pública de Vivienda Social
FEM	Fondo Especial de Mantenimiento para el Sistema de Drenaje
FENU	Fondo de Equipamiento de las Naciones Unidas
GKW	Gesellschaft fur Klaronlagen und Wasserversorguag (Firma consultora alemana)
KFW	Banco Aleman de Reconstrucción y de Desarrollo
lps	litros por segundo
O&M	Operación y Mantenimiento
OMS	Organización Mundial de la Salud
ONG	Organismo no Gubernamental
OPEP	Organización de Países Exportadores de Petróleo
OPS	Organización Panamericana de la Salud
PNUD	Programa de las Naciones Unidas para el Desarrollo
POCHEP	Poste Commuataire d'Hygiene et d'Eau Potable
RFA	República Federal de Alemania
SEEU	Servicio de Mantenimiento de Infraestructura Urbana
SMCRS	Servicio Metropolitano de Colección de Residuos Sólidos
SG	Canalización Saint George
SNEP	Servicio Nacional de l'Eau Potable
SNEM	Servicio Nacional de Enfermedades Mayores
TPTC	Ministerio de Trabajos Públicos, Transportes y Comunicaciones
TELECO	Telecomunicaciones de Haïti
UNICEF	Organización de las Naciones UNidas para el Apoyo a la Niñez
UE	Unidad Ejecutora

MEDIDAS

mm	=	milímetros	=	0.04 pulgadas
cm	=	centímetros	=	0.39 pulgadas
m	=	metro	=	3.28 pies
Km	=	Kilómetro	=	0.62 millas
Km2	=	Kilómetro cuadrado	=	0.39 millas cuadradas = 100 hectáreas
l	=	litro	=	0.26 US galones
m3	=	metro cúbico	=	264 US galones = 35.3 pies cúbicos
m3/s	=	metro cúbico x segundo	=	22.82 MGD (millones US galones por día)
m3/s	=	metro cúbico x segundo	=	1000 litros x segundo = 86.400 m3/día = 31.54 Mm3/año
Kg	=	Kilogramo	=	2.2 libras (lb)
Ton	=	1000 Kg	=	2.200 libras (lb)
l/s/ha	=	litro por segundo por hectárea	=	39.2 gals por minuto por acre

TASA DE CAMBIO

Tasa de cambio (desde 1919)	=	5 Gourdes (G) por 1 US\$
<u>Año Fiscal de Gobierno:</u>	=	1 octubre - 30 septiembre
<u>Ciclo de Planificación:</u>	=	5 años
<u>Presente Plan Quinquenal:</u>	=	1982-1986

I. INTRODUCTION

A. Background

- 1.01 In the topography in the metropolitan area of the city of Port-au-Prince, rainwater flows by gravity starting from the top of the hill of Morne l'Hôpital, down the natural gulleys, and at the bottom passes through 12 settling tanks and then on down to the natural water courses, and is ultimately carried out into Port-au-Prince bay by open and closed culverts. Floods are constant during the rainy season (April-May and September-October), and as the season advances they become increasingly severe as the soil becomes saturated and carrying capacity of the storm-sewer system decreases. Water and mud flow through the streets and finally become stagnant. The associated health problems, aggravated by the presence of liquid and solid wastes in the storm drainage system, create many foci of infection in different parts of the city.
- 1.02 Despite the severity of the situation, which requires ongoing assistance, the state of the storm sewer system in metropolitan Port-au-Prince has visibly improved. Drainage into the bay in front of the capital, erosion control and the cleanliness of the city present an encouraging prospect thanks to the execution and nearing completion of the first stage of the Storm Drainage Project, to whose financing the Bank is participating with loan 564/SF-HA.

B. The application, its priority, and missions

- 1.03 On 23 June 1983 the Secretary for Planning presented an application for financing for the second stage of the Port-au-Prince Storm Drainage project.
- 1.04 During the Bank's programming mission in October 1985, the Government of Haiti stated that it gave highest priority to execution of the proposed project. This priority was ratified by the government on 4 April 1986 and during the visit of the Minister of Finance to Washington in June 1986.
- 1.05 The IDB's strategy for the Sanitation Sector establishes that the Bank's actions should be directed at, among other activities, the execution of a second drainage stage in Port-au-Prince. In consequence, the present project (second stage) has been included in the Bank's tentative program for 1985-1987 as a possible loan for 1986.
- 1.06 In several visits made to the country, the Bank has closely followed the progress of preparation of the technical, institutional-financial and socioeconomic documentation for the project. In addition, these missions have verified the state of execution of the first stage (564/SF-HA) in order to determine the timeliness of processing the successor operation in light of the state of fulfillment of the various contractual obligations of the project in execution.

- 1.07 During the period from 16 to 27 June 1986, an analysis mission was in the country and reviewed the available information on the drainage systems and other components of the second stage of the project.
- 1.08 The second stage of the project would consist chiefly of the physical execution of culvert systems and works to protect the hill of Morne l'Hôpital. The total cost of the project is estimated at the equivalent of US\$57,550,000, of which the Bank would contribute the equivalent of US\$51,800,000 (US\$51,550,000 in foreign exchange and US\$250,000 in local currency, both amounts from the FSO).

II. FRAME OF REFERENCE

A. The sanitation sector in the country 1/

1. Situation in the sector

- 2.01 The storm sewer subsector is confined to Port-au-Prince: no works of any significance in this subsector have been carried out in any other city in the country. Despite the severity of the situation, which requires ongoing assistance, the state of storm drainage in metropolitan Port-au-Prince has improved with the execution and nearing completion of the first stage of the Storm Drainage Project, to the financing of which the Bank has contributed with loan 564/SF-HA.
- 2.02 No city in the country (including Port-au-Prince) has ever yet enjoyed the benefits of sanitary sewerage. It is estimated that about 20% of the population in the capital have sanitary fixtures operating with running water, with human waste disposal in blind drains, and that less than 1% have complete installations for disposal in septic tanks. The remaining 79% must rely on a variety of facilities such as privies, concealed spaces, certain culverts and ravines, and bags or sacks for removal with garbage. Of all the houses in marginal neighborhoods, not more than 27% have latrines, and of these, two thirds are inoperative. In the rainy season some low-lying neighborhoods of the city are still exposed to dramatic situations.
- 2.03 In Haiti the supply of drinking water is still an important social problem, for it is available to only 16% of the total population (6% of the rural and 31% of the urban population). This gives rise to very severe health problems, particularly among the undernourished infant population, and contributes to the occurrence of such diseases as diarrhea, which accounts for 75% of the deaths of infants under one year and for 50% of those between 1 and 4 years of age. As will be noted further on, the Bank has participated in projects to mitigate the lack of water supplies in the capital (1965-1980) and is currently financing similar projects elsewhere in the country.

2. Purposes and policies in the sector

- 2.04 The purposes and goals of national policy in the sewerage subsector are directed at i) the establishment of sanitary sewerage systems in the capital and provincial cities and at the installation of sewage treatment and recycling stations; ii) continuing the execution of sanitation works in Port-au-Prince; iii) as activities connected with sanitary and storm sewerage, directing and controlling the urbanization process; iv) controlling erosion and reforesting the watersheds

1/ See Annex 1 for the Country's Economic Situation and Outlook.

of Port-au-Prince and other cities, particularly Cap-Haitien, and v) laying the foundations for a proper land-use policy and compiling a national cadastre.

- 2.05 With financing under the Bank's technical cooperation (ATN/SF-1025-HA), in 1972 the consulting firm of Engineering Science, Inc., drew up a Master Plan for storm and sanitary sewerage in Port-au-Prince. The plan recommended construction of the storm drainage system in two phases and of the sanitary sewer system in three. Although the studies acknowledge the high priority of both systems, they recommend execution of the storm drainage works first because the sanitation system adopted in Port-au-Prince is technically acceptable, the latrine system is not polluting the city's aquifers, the sector's institutional capacity is very limited, there are no studies of sanitary sewerage, funds to finance a local contribution are lacking (because of the other operations to be executed), and serious operating and maintenance problems persist stemming from a deficient rate structure. Between 1980 and 1982 this Master Plan was revised by the French firm of SCET International; it broke up the stages for the storm drainage works into five, which became the basis for the three stages hitherto envisaged in the Port-au-Prince storm drainage project. In coordination with the IDB, UNICEF, the World Health Organization and the Federal Republic of Germany, the country is developing a number of programs, to be referred to further on, which, apart from the Bank's project for radically solving the storm drainage problem in Port-au-Prince, are designed to alleviate the critical state of the sanitation subsector by building latrines in some cities. The country has made relatively greater gains in the drinking water subsector.

3. Institutional structure of the sector

- 2.06 Principal institutions in the sewerage sector. The Organic Law of the Ministry of Public Works, Transport and Communications (MTPTC), published in the Official Gazette of 20 October 1983, establishes in the Public Works Directorate at the units of Urban Planning, Urban Engineering and Maintenance of Urban Infrastructures, which, among other functions, deal with urban drainage works. Municipal governments are also concerned with the sanitation aspects of the cities.
- 2.07 Principal institutions in the drinking water subsector. As a response to the priorities of the International Drinking Water Supply and Sanitation Decade 1981-1990 (IDWSSD), a National Action Committee (CONADEPA) was constituted in December 1980. This Committee has proposed the creation of a National Water Council (CONAE), which is pending approval. The agency responsible in this area in Port-au-Prince is the Port-au-Prince Potable Water Authority (CAMEP), established in May 1964. The National Potable Water Service (SNEP), established in August 1977 and attached to the MTPTC, is concerned with all drinking water supply services in the country outside the capital. POCHEP (Community Health and Rural Water Supply Posts), an

agency of the Ministry of Public Health and Population (MSPP), was established in 1979 to execute IDB-financed projects for rural water supplies in communities of 200 to 3,000 inhabitants. The Water Resources Bureau, established in December 1980, manages water resources in the Ministry of Agriculture, Natural Resources and Rural Development (MARNDR). The NGOs, or nongovernmental organizations, most of them members of the Haitian Association of Voluntary Agencies (HAVA), carry out small-scale drinking water projects in the countryside.

4. Activities of the Bank and other agencies in the financing of the sector

a) Activities of the Bank in the sector

2.08 In the sewerage subsector the Bank is participating in the financing of the Port-au-Prince Storm Drainage Project (first stage) with loan 564/SF-HA. 1/ In the drinking water supply subsector the Bank has participated with loan operations in both metropolitan Port-au-Prince and the countryside. The Port-au-Prince Potable Water Authority was assigned the execution of the following three loans: 39/SF-HA in 1964, 261/SF-HA in 1970, and 261(A)/SF-HA in 1975, which made possible the construction of reservoirs, wells and pumping systems, and the replacement of distribution lines in very sizable sectors of the capital. Under loan 39/SF-HA CAMEP satisfactorily carried out the first stage of improvement of the metropolitan area aqueduct. Document PR-999-A of 27 November 1979 contains references to the execution and results of these loans. In April 1980 the Bank and the Republic of Haiti signed the contract for loan 609/SF-HA (POCHEP I) to finance the construction of 70 conduit systems to bring drinking water supplies to rural communities. Document PR-1469-A (the project report on POCHep II) reviews the execution of this first stage of the program. On 3 December 1985 the Bank's Board of Executive Directors approved loan 784/SF-HA (POCHEP II) for the partial financing of the second stage of the program, consisting in another 70 conduit systems to carry rural drinking water. The loan contract was signed on 27 June 1986.

b) Operations of other agencies in the sanitation sector

2.09 The World Bank provided US\$300,000 to finance the preparation of feasibility studies for a Water Supply Master Plan for Port-au-Prince. The studies were done by a French firm with the collaboration of the Pan American Health Organization. It is estimated that the first phase of the project in the investment stage could require about US\$30 million, for execution between 1988 and 1992.

1/ An evaluation of this loan is presented in the next chapter.

- 2.10 USAID. 1/ Studies begun in 1983 are in progress for 40 rural water supply systems in Grand Anse and the Southwest. The cost of the envisaged investments is US\$8 million, of which the AID would donate US\$6 million, and the Government of Haiti and the communities concerned would put up US\$2 million. USAID is also sponsoring a program for the construction and rehabilitation of rural drinking water supply systems built mainly by the Cooperative for American Relief Everywhere (CARE) chiefly in the south of the country; the water systems use gravitational technology, hand-operated pumps, and solar energy. Their advancement is estimated at 15% on 30 June 1986.
- 2.11 UNICEF. 2/ This agency is carrying out a project for the construction and rehabilitation of the Northwest project, which will install a drinking water supply system that will serve 34,000 people in 17 settlements. The cost of the investment is reportedly US\$1,578,000. Also envisaged is the execution of a program of 400 wells operated by hand pumps in six lowland areas; the financing has not yet been determined, but is expected to be in the form of a grant. In addition, UNICEF, in conjunction with the World Health Organization, is providing about US\$200,000 to finance a private project for the construction of latrines in some neighborhoods of Port-au-Prince.
- 2.12 KFW. 3/ A drinking water supply project for 10 provincial towns financed jointly with the World Bank and costing US\$8 million was recently completed. A project is currently under study for the following 8 additional towns: Duvalierville, Arcahaie, Petite Riviere de la'Artibonite, Dessalines, l'Estere, Desdunes, Passerine and Villa-Bonheur. Possible extensions are also envisaged to water systems in the towns of Saint Marc, Gonaives, Cap-Haitien, Port-de-Paix, Miragoane, Aquiu and Cayes. These projects would be financed in their entirety by a KFW loan at a cost of US\$952,000.
- 2.13 Also worth mentioning is the German assistance being provided to sanitation works in marginal neighborhood of Cap-Haitien and Gonaives, and by UNICEF to latrine construction in the capital and marginal neighborhoods such as Saint Martin. The Federal Republic of Germany (FRG) through its Office of Technical Cooperation has in preparation, with the participation of PAHO/WHO, a rural sanitation program that would cost US\$2.1 million. There is also a master plan for the rehabilitation of marginal neighborhoods in northwestern Port-au-Prince drawn up by the EPPLS (Public Enterprise for the Promotion of Low-Cost Housing) with KFW financing (July 1982).

1/ United States Agency for International Development.

2/ United Nations Children's Fund.

3/ Kreditanstalt für Wiederaufbau, of the Federal Republic of Germany.

- 2.14 The Government of Haiti has established preliminary contacts with the Federal Republic of Germany (FRG) with a view to participation in financing for the following purposes: i) drinking water supplies for Cabaret and Arcahaie by individual pump-driven installations at a cost estimated at US\$541,000; ii) a gravity-operated drinking water supply system for Petit Rivière de l'Artibonite at a cost of US\$650,000, and iii) drinking water supplies for the localities of Dessalines and Passe-Riene de Artibonite, the amounts of the financing for which have not yet been determined. The SNEP will serve as executing agency in all three cases.
- 2.15 The UNDP has begun preliminary talks with the Government of Haiti for the execution of a project for construction, operation and maintenance of the drinking water supply system in the northwestern sector of Port-au-Prince (the districts of Cité Soleil, Linthau, Boston, Brooklyn, Belekou, Jean Claude and Drouillard). The total cost and term for execution of the projects have not been established; CAMEP 1/ and EPPLS 2/ would serve as executing agencies.

c) Reforestation projects in Haiti

- 2.16 USAID is financing forestry projects through such agencies as Cooperative for American Relief Everywhere (CARE), CARITAS, Operation Double Harvest and other private and semiprivate organizations. These projects are financed with funds donated by USAID to those three agencies and funds provided from private sources in industrialized countries through the other agencies. CARE, CARITAS and Operation Double Harvest do the work of i) setting up and operating nurseries, ii) distributing plants, and iii) forestry extension. Plants are distributed free of charge to beneficiaries, who set them out with the agency's technical assistance. This arrangement has a long tradition in the Haitian agricultural sector, and is applied by the 80 or so international private and semiprivate agencies that have provided financial assistance for low-income groups. In addition to the reforestation program of USAID and international private and semiprivate agencies previously mentioned, assistance for forestry development is being offered by the IBRD, CTDA, The Netherlands and Switzerland.

B. Metropolitan Port-au-Prince

1. The urban setting

- 2.17 From the standpoint of its urban configuration, the city may be considered as consisting of the following districts: 3/

-
- 1/ The Port-au-Prince Potable Water Authority.
2/ The Public Enterprise for the Promotion of Low-Cost Housing.
3/ See map of the city on the next page.

HAITI

OBJET DE DRAINAGE DES EAUX PLUVIALES DE PORT-AU-PRINCE RESEAU PRIMAIRE DE DRAINAGE EXISTANT

LEGENDE

- Limites de zones
- Limites de bassins
- Zones inondables
- Réseau hydrographique
- Canal ou dalot
- Degraveur

SAINT MARTIN	PL	RUE PAUL VI	RA	RIVIERA
BREA	JJ	RUE JOSEPH JANVIER	PN	POINTE LAMENTIN
MARTELLY	RF	RIVIERE FROIDE	PT	POINTE THOR
LECLERC	WB	WANEY BIJOU	DL	DOMAINE IDEAL
MARCHAND	DI	DIQUINI	DS	DELMAS
RUE DES FRONTS PORTS	BN	BIZOTON	EH	ELECTRICITE d'HAITI
SAINT JOSEPH	AD	ASSAD	PI	PARC INDUSTRIEL
BOULEVARD DE LA SALINE	MC	MONT CARMEL	PO	PAPACITO
BOIS DE CHENE	SI	SIMBIE	SY	SOREY
RUE PAVEE	FA	FONTAMARA	SG	SAINT GEORGE
	DD	DURAND		

BAIE DE PORT-AU-PRINCE

ZONE NORD

Port-Au-Prince

ZONE CARREFOUR

ZONE CENTRALE

Morne L'Hopital

1 2
Echelle en km's

- (i) The Northern District, which includes the lands subject to flooding in Cité Soleil, the industrial grounds toward the airport and the recent extensions of Delmas;
 - (ii) The Central district, which includes the center of the city and its extensions toward Petionville, and
 - (iii) The Carrefour district, which embraces the southwestern end of the city.
- 2.18 Port-au-Prince is the country's most important urban center and the principal center of industrial and commercial activity (80% and 60%, respectively, of the national totals). Its present population--about 724,000 inhabitants (1982)--is 11 times greater than that of Cap-Haitien, the second-largest city. While the population of Haiti as a whole has grown an average of 1.7% (1970-84), the rate in the metropolitan area has been somewhat higher--about 3.7%. This urbanization process began in the 1950s and, though other urban centers have also grown, Port-au-Prince is still the most powerful lure for those who leave the countryside.
- 2.19 Crowding is very great in the quarters housing the great majority of the residents in the metropolitan area. The per capita area for the lowest-income group (about two-thirds of the metropolitan population) averages a mere 2m².
- 2.20 In regard to the aforementioned housing problem, apart from a few studies done under the United Nations Development Program (UNDP), the Program for Rehabilitation of the Saint Martin quarter and the Urban Sector Survey done by the World Bank in 1978, there is no coherent plan for urban development on the requisite scale.
- 2.21 During the analysis mission for the present operation the Minister of TPTC said that he would shortly be applying to the Bank for technical cooperation in drawing up the Master Urban Development Plan for Port-au-Prince.

2. Rainfall and runoff

a) Rainfall

- 2.22 Rainfall averages about 1,360 mm a year in the center of the city; it varies appreciably with the elevation, from 1,000 mm a year at the edge of the Cul-de-Sac plain to 2,000 mm a year on the overshadowing heights of Kenscoff. The rainy season runs from March to November with two periods of exceptionally heavy rainfall in April-May and September/October.
- 2.23 Rains are of two types: i) tropical rainstorms of brief duration and high intensity, of which there are about 42 significant episodes per year, and which give rise to violent runoff, and ii) cyclonic rains

that are very infrequent--less than one significant event a year--of long duration: continuing more or less without interruption for 24 to 72 hours, and giving rise to no flash flooding as the tropical storms do, but capable of causing severe inundations in the absence of drainage networks.

- 2.24 The cumulative duration of periods of intense accumulation of rain-water is very brief. It might also be noted that intensities vary very widely over the project area.

b) Runoff

- 2.25 The volumes of runoff depend on two main factors: i) the use being made of the land, and ii) the general slope of the watershed. The recent evolution of land use in Port-au-Prince has been influenced by two phenomena: i) the deforestation of Morne l'Hôpital, pronounced since the turn of the century, which has increased the volume of runoff over the denuded soils, and ii) the ongoing urbanization of the city, which increases the built-up and paved areas and reduces water retention by soils and vegetation.

- 2.26 The rapid buildup of runoff in the city is accelerated by the steep slopes of the natural terrain. In other words, all conditions are present for any given episode of rainfall to give rise to a particularly brief and violent discharge of runoff in the urban area. In 1990 the project area will be almost completely urbanized except for 2,000 very steep hectares of Morne l'Hôpital, which must be kept free of small urban development.

c) Sediment transport

- 2.27 Increased deforestation of Morne l'Hôpital has had two consequences: i) a reduction of foliage, which absorbs part of the energy of rainstorms, and of tree roots, which help fix the soil on the steep slopes of Morne l'Hôpital, which in turn has favored sheet erosion on the Morne, and ii) an increase of runoff and reduction of time rainwater concentration, which in turn has favored rapid erosion along ravines as the velocity of water flow has increased. ^{1/} The result is that the increasing volumes of sediment that reach the urban area of the drainage accumulate and give rise to flooding and sizable buildups of gravel and sediment in the streets of Port-au-Prince.
- 2.28 The volume of sediment transported may be estimated at about 160,000 m³/year, of the following composition: i) about 30,000 m³ of silt and fine sand, and ii) about 130,000 m³ of intermediate sand, gravel and entrained rocks.

^{1/} The concentration time is the interval between the time when rain falls at a given spot and the time when the resultant runoff rises to a given height downstream. This time is affected by characteristics of the watershed.

d) Flooding and unsanitary conditions

- 2.29 On the slopes of the Morne the runoff concentrates in the very steep and deep ravines. In Port-au-Prince two types of floods may be distinguished: i) floods in the high and intermediate elevations of the city, and ii) sheet floods in its low-lying areas. The former occurs generally because the natural flow channels of the ravines are too narrow to hold the water and also because urban structures are emplaced nearby and in the streambeds themselves. The violence of the torrent undermines slopes, placing the adjacent homes in acute jeopardy. In areas where the initial hydrographic network is indistinct or nonexistent and in the absence of an adequate drainage system, the torrent, finding no outlet, cuts through roads and streets, which are generally not paved and are rapidly eroded into ravines.
- 2.30 Sheet flooding is caused by changes of gradient in low-lying areas, which cause torrents to spread out, deposit their sediment and clog natural and man-made outlets.
- 2.31 In consequence of this flooding, the population is at high risk of contracting diseases because the water entrains sediments and solid wastes, and causes the overflowing of latrines and blind drains.

3. Status of basic public services

- 2.32 Port-au-Prince is particularly undersupplied with urban infrastructures. The Government of Haiti is now making a special effort to develop the sanitary infrastructure and has decided to give absolute priority to continuation of the storm drainage project described herein. The paragraphs that follow present a brief analysis of the basic public services of metropolitan Port-au-Prince. The existing installations and services chiefly serve the affluent populations. Except for very few services provided by health facilities and certain charitable organizations, the more deprived class is left to depend on traditional medicines, the results of which, though not insignificant, fall short of requirements.

Water supplies

- 2.33 The Port-au-Prince water supply system is beset by serious qualitative and quantitative shortcomings:
- (i) Generally speaking, the raw water undergoes no sterilization or chemical treatment;
 - (ii) The water resources are insufficient and, in the absence of any storage facilities, their supply is intermittent;

- (iii) The piping system is becoming rapidly clogged, is not leak-proof, and is alternately full and empty; the result is major leaks when the system is under pressure and more or less general pollution when the pressure is negative, and
- (iv) House connections are proliferating chaotically; there is no metering, which results in ongoing waste, chiefly owing to the almost uniform absence of float valves on private tanks and systems.

2.34 About 70% of the population has no access to the drinking water network and is supplied from public fountains with an average of 14 meters/inhab/day. According to a study of 1980, about 36 public fountains yielded 18 liters per day to about 55,000 persons.

Solid waste collection

2.35 About 186,000 tons of solid waste was generated in urban Port-au-Prince in 1980; in 1986 this figure is expected to rise to 265,000 tons for the entire metropolitan area, which includes Petionville, Delmas, Carrefour and Croix de Bossalles.

The composition of this solid waste is as follows:

(i)	Household waste	75%
(ii)	Market waste	15%
(iii)	Industrial waste	7%
(iv)	Other waste (hotels, public institutions, etc.)	<u>3%</u>
	Total	100%

Sanitary sewerage

2.36 There is no public sanitary sewer system in Port-au-Prince. It has been estimated that, in 1980:

- (i) Between 75% and 80% of the population used dry-pit latrines, or privies, for the elimination of fecal matter;
- (ii) Between 20% and 25% of the population had sanitary devices that operated with running water and deposited the waste in on-site cesspools; and
- (iii) Less than 1% of the population was provided with complete individual installations for the removal of sewage into septic tanks and by infiltration into the soil.

2.37 The observed sanitary problems arise in the following cases:

- Generally speaking, there are not enough cesspools, and many of them are clogged, which results in ongoing spillages of sewage, which then flows along gutters and ditches into the drainage network.
- In rainy seasons, latrines that are not regularly maintained overflow, and effluents spread out over the ground and are more or less collected into the drainage network.
- In low-lying areas, where the water table is near the ground surface, the absorption capacity of wells is insufficient and latrines overflow when it rains. The effluents spill out over the ground and, since there is no effective drainage system, polluted waters puddle in the proximity of dwellings.

2.38 During the studies done by a consulting firm for the Master Plan in 1972 it was recommended that two separate systems be provided, one for sewage and the other for storm water. Given the small magnitude of the city's drinking water supply, the urgency of or need for a sanitary sewer system would depend on the water supply's being increased; meanwhile, the individual disposal facilities in use at present can be relatively effective and inexpensive provided they are properly maintained. In addition, the Master Plan made a technical and economic study of alternatives and gave priority to storm sewerage.

Storm sewerage

- 2.39 Because of the topography in the metropolitan area, storm water runs off by gravity, the large volumes flowing from the high point of Morne l'Hôpital through natural stream beds, at the foot of which, where the gradients of the Morne become gentler, they are channeled into 17 existing settling tanks, from which they continue on down along stream beds and are ultimately discharged through open and closed culverts into Port-au-Prince Bay.
- 2.40 Construction of the system was begun about 60 years ago. Many of the pipes, conduits and channels were laid down around 1910, and the settling tanks were built in 1920. On the occasion of the world's fair in Port-au-Prince in 1949, part of the bay was filled in and the storm sewer system extended through the new landfill. This last section of the sewer system has virtually no gradient whatever, which enormously hinders the final discharge of storm water into the Bay. The present system, including the first stage of the project co-financed by the Bank, comprises about 57 km of sewer with about 1,000 catch basins and 5 open culverts.
- 2.41 The existing sewer system is severely clogged, and its capacity is estimated to be reduced 50% in the low-lying parts of the metropolitan area and 40% elsewhere in that area. The result is severe flooding problems in heavy downpours and severe problems afterwards when the hydraulic capacity is reduced yet further.

4. The erosion problem

- 2.42 As a result of a succession of human actions over many years during the settlement of Haiti, the hill known as Morne l'Hôpital has been suffering increasing erosion. The nature of land use over the last 20-30 years has had disastrous consequences for the metropolitan area, particularly through the entrainment of sediment and detritus (garbage) generated by or present in the path of storm water runoff.
- 2.43 Although no systematic studies have been made to measure the impact of erosion and sediment transport into the valley in which the capital city lies, some experts have estimated that:
- (i) To obtain fuel for the lime kilns, an average of 375 ha per year has been deforested, that is, about one fourth of the area of Morne l'Hôpital; and
 - (ii) despite the legal restriction subsequently imposed making the area a "reserve," it is estimated that crops are grown even now on about 200 ha on the hill slopes.
- 2.44 The Port-au-Prince basin, a calcarious formation, has an area of about 2,500 ha. Its slopes are steep and there are several subbasins, some of them with gradients of more than 40%. The soils are at present severely eroded, have lost their original characteristics and are by now extremely thin, without any organic cover and with reduced biological activity. Except in some areas that are not yet very heavily used and where the soil may be a meter or more deep, the soil is generally not more than 15 to 20 cm deep, and on gradients of more than 30% a depth of only two to seven cm is common.
- 2.45 The consequences of the eroded state of the ground on Morne l'Hôpital are as follows:
- (i) it is estimated that the annual loss of agricultural soil on Morne l'Hôpital could amount to 50,000 to 175,000 MT of sediment, which is carried down into the valley of Port-au-Prince; on denuded soil with gradients of 30% the loss can amount to some 2,800 MT per ha. Plant cover could reduce the loss to a mere 1% of that figure;
 - (ii) in these conditions, one single torrential rainstorm can cause a loss of as much as 300 MT/ha, or the removal of 3 to 5 cm of surface soil, which has taken thousands of years to form; and
 - (iii) an appreciable reduction of water absorption capacity owing to the velocity of the torrents results in a reduction of the ground water reserves that feed the sources on which Port-au-Prince relies for its potable water supply, and the degrading of these sources is impairing the microclimate of the metropolitan area.

- 2.46 Flooding is constant during the rainy season (May-June and September-October), but as the season advances this flooding becomes increasingly severe as the absorption capacity of the soil and the carrying capacity of the storm sewer system decrease. In some low-lying parts of the city (25% of the drainage system) the storm sewer system simply ceases to function. Water and mud flow through the streets and finally become stagnant. The resultant health problems, aggravated by the presence of solid and liquid waste in the storm sewer system, give rise to foci of infection in different parts of the city.
- 2.47 With execution of the first stage of the Sewerage Project partly financed by the Bank, major advances have been made toward erosion control by both the trees planted (400,000) and the retaining walls built. In its second stage, the project proposes to continue rehabilitating the existing storm sewer system by expanding its capacity and continuing the erosion control process. The construction and improvement of an appropriate primary drainage system would have the following benefits for the community: i) reduced loss of life and property from floods, ii) reduced expenditures for street maintenance, iii) reduced health expenditures, iv) improvement of traffic, and v) an increase in the value of urban lands subject to flooding. In consequence, high priority is attached to the extension and strengthening of the primary drainage network.

C. Design and Sizing of the Port-au-Prince Storm Drainage Project

- 2.48 The continual flooding of Port-au-Prince is caused by a precipitation regime that generates 1,000 to 1,300 mm of rainfall a year in the low-lying parts of the city (Centreville and Damiens). Recorded monthly fluctuations range between an average low of 45-50 mm in January and February and an average high of 200 mm in May. For purposes of economic analysis it is worthwhile to stress two additional points: i) according to the records of the Damiens station, the stated precipitation is concentrated in some 105 days of rain a year, with precipitation above 5 mm/24 hours on 42 of those days. It is at this level that rainfall becomes significant for analytical purposes as the threshold intensity at which surface water begins to run off, and ii) data on rainfall intensities and durations also establish that these rains tend to be of relatively short duration (less than 30 min.) and of great intensity (55% of the total rainfall is recorded in precipitations of 16 or more mm/hour). All this adds up to conditions highly unfavorable to the existing drainage system, which is incapable of carrying off large volumes in a short time. Thus, the floods that occur in some parts of the city remain standing for several days, and even where conditions are most favorable (Centreville) the water level may take one or two hours to drop.
- 2.49 Because of these problems, in 1980 a Master Plan was established which identified and gave priority to 36 channelling subprojects to meet the needs of the population down to 1990. In the first phase of the storm drainage project four of these subprojects were built:

Bois-de-Chene, Croix-de-Bossales (including Front-Forts, Saint Joseph and La Saline), St. Martin and Martelly-Marchand. These subprojects are all in central Port-au-Prince. The present loan application covers subprojects selected from among 15 that have highest priority under the aforementioned Master Plan. 1/

- 2.50 To determine the priority of the subprojects, the Master Plan established a quantitative index based on four criteria: i) investment cost per inhabitant served (in 1990); ii) the "sensitivity" of the district served, based on an ordinal scale that takes account of erosion, flooding, health and traffic problems; iii) and "urgency" index measured by the expected rate of population growth; and iv) a "coherence" index based on the location (upstream or downstream) of the culvert section, the level at which the project receives the runoff of the entire basin and whether an interceptor is required. These criteria are in general correlation with the net benefits expected of the project, although they obviously do not constitute a very appropriate measure of socioeconomic benefit. This is why the final selection of subprojects was based on the criteria of internal rate of return (IRR) and net present value (MPV), as shown in Chapter VII of this report.

1/ The terminology used in the rest of this report differs somewhat from that of the Master Plan, which accounts for the lack of agreement between the number of subprojects and those presented in the table of costs and the socioeconomic evaluation.

III. EVALUATION OF THE FIRST STAGE OF THE PORT-AU-PRINCE
STORM DRAINAGE PROJECT
(Loan 564/SF-HA, ATN/SF-1865-HA and ATC/SF-1686-HA)

A. General

- 3.01 On 7 December 1978 the Board of Executive Directors of the Bank approved a loan in the equivalent of US\$34,830,000 to participate in the financing of the first stage of the Port-au-Prince Storm Drainage Project. The OPEC Fund is also contributing to the financing of the project with loan 117P/OP-HA in the equivalent of US\$4 million. The counterpart contribution, in the equivalent of US\$9,646,000, has been partly financed with external resources as follows: US\$3,500,000 from loan 43/VF-HA and US\$1,800,000 of OPEC loan 17, leaving a local counterpart contribution of US\$4,346,000. The total cost of the project comes to the equivalent of US\$48,476,000. The loan contract was signed by the IDB and the National Bank of the Republic of Haiti on 22 February 1979, and has been in effect since 23 April 1979.
- 3.02 In conjunction with the loan, the Bank granted two technical cooperations: ATN/SF-1685-HA in the equivalent of US\$265,000, and ATC/SF-1686 for US\$170,000. The first operation, the beneficiaries of which are the Project Executing Unit and the Metropolitan Solid Waste Collection Service (SMCRS), was for the institutional strengthening of those two agencies. The second, made on a contingent recovery basis, was for the benefit of the MTPTC and was used to make the engineering studies for the drainage system of the second stage.
- 3.03 The project was conceived as a whole, and aims at a rational harmonization between the investment needs in a specific area and the requirements of man and nature for distortion-free development. The project is being executed with a view to erosion control in the Morne l'Hôpital area, the establishment of an efficient program for the collection and disposal of solid wastes, the cleaning, repair and the rectification of the Port-au-Prince storm drainage system, and execution of new works to expand that system.

B. Description of the project

- 3.04 To accomplish these purposes, the project was divided into four subprojects as follows:

- Subproject A: Erosion control in the Morne l'Hôpital area

This subproject consists of two categories of work: civil engineering projects, comprising the construction of 60,000 m³ of retaining walls along the upper elevation of Morne l'Hôpital, 20,000 m³ of retaining walls with wire mesh protection on the lower slopes of Morne l'Hôpital, 24 new settling tanks of 500 m³

each, and the stabilization of about 28 km of city streets and drainage works along the Rue Panaméricaine and the Rue Sanatorium-Bautilliers; and agronomic engineering works consisting of soil conservation and erosion control, for which 1,200 m of contour terraces were built around the grade curves on Morne l'Hôpital, and the growing and planting of about 400,000 trees on selected tracts on this hill.

- Subproject B: Collection and disposal of solid wastes

This subproject consists in the implementation of an appropriate, efficient program for the collection and disposal of solid wastes in metropolitan Port-au-Prince, involving the following activities: acquisition of the equipment needed for the efficient collection and disposal of solid waste. Construction of feeder roads, the paving of the grounds of the markets and of the places where the public trash receptacles will be placed. Preparation of the area land on which the waste will be permanently deposited, and the construction and organization of the equipment maintenance shop.

- Subproject C: Cleaning, repair and rectification of the existing storm sewer system

The cleaning and removal of about 35,000 m³ of sediment from the sewers, culverts and settling tanks. Repair of about 11,000 m of sewers, culverts and tanks. Rectification of critical sections in about 2,840 m of open culverts, 2,060 m of closed culverts, and 2,900 m of pipe. Dredging of about 110,000 m³ of silt and garbage at the outlets of the open and closed culverts in Port-au-Prince Bay.

- Subproject D: New works to expand the present storm sewer system

This subproject involves the expansion of open and closed culverts ranging in section from 3.0 m x 1.5 m to 6.0 m x 2.0 m over a total length of 7,560 m. A Special Fund has been set up in the Central Bank specifically for maintenance of the storm drainage system.

3.05 The status of disbursements for the project were as follows on August 31, 1986.

(thousands of US\$ or equivalent)

	<u>Original cost</u>	<u>Disbursed</u>	<u>Pending disbursement</u>	<u>Present cost</u>
564/SF-HA	34,830	32,987	1,843	34,830
117/OP-HA	4,000	3,938	62	4,000
Local contribution	<u>6,980</u>	<u>8,448</u>	<u>1,125</u>	<u>9,573</u>
Totals	45,810 =====	45,373 =====	3,030 =====	48,403 =====

- 3.06 The original cost of the project has increased by US\$2,666,000, which is being financed through the national counterpart contribution. Part of this increase was generated in the stage precedent to execution of the project, when some of the designs had to be revised and adjusted, which resulted in an increase in the volume of certain works and, in consequence, an increase in the general cost of the project. The longer period of execution has also increased the cost by 5.8% altogether. As a contribution to covering this cost overrun of the project, the Bank is considering the granting of a financing in the equivalent of US\$1.5 million under a possible loan from the Program for Support to Projects in Progress.

C. Advancement of the project

- 3.07 On 30 June 1986 the weighted physical advancement of the project was about 97%. Its execution began about twelve months behind schedule chiefly owing to the need to revise plans and designs and to delays in organizing the Executing Unit. Subsequent delays in the bidding process for procurement of the waste collection equipment and for the dredging of the bay, the slow pace of the dredging, and impediments generated by delays in expropriations, and delays in the restoration of services, caused by execution of the works, prolonged the execution time even more. The complexity of the project made it necessary for the Bank to allow a term of five years for its execution. Despite this provision, for the reasons stated the deadline for the last disbursement was extended three times for a total of 36 months and is now 23 April 1987. The state of advancement of each individual subproject in June 1986 is as follows:

- Subproject A. This component of the project is finished. In consequence of the redesigning of some structures, the executing agency decided to reduce the number of settling tanks from 24 to 7 which, although considerably fewer than the original number, does not affect the purposes accomplished by this subproject. For the same purposes, a total of 36,000 m³ of the envisaged 80,000 m³ of retaining walls have been built on the upper and lower slopes of Morne l'Hôpital, which accomplishes the established purpose of checking erosion on the hillside. Also, owing to the high cost of stabilizing 28 km of urban streets,

streets, instead 11 km have been paved with concrete blocks. The second phase of the project, covered in the present document, would include the paving of 22 km of streets, which would include most of the streets not stabilized in this first stage of the project. All the envisaged 400,000 trees have been planted, chiefly on the 1,050 m of terraces that have been cut into the hillside.

- Subproject B. This component of the project, financed jointly with the OPEC Fund, for procurement of the equipment needed for the collection of solid wastes, is 95% advanced and will be finished in April 1987 with completion of the construction and outfitting of the new administrative building (a work additional to what had been envisaged), a garage and a washing station for the operation and maintenance of that equipment. Procurement of the waste collection equipment (37 units), waste disposal equipment (3 units), and vehicles for control and supervision by the SMCRS (14 units) has been completed. The sanitary landfill installations at Trutier have been constructed. The initial phase (August 1986) of solid waste collection is in operation and is removing about 40% of the refuse generated in metropolitan Port-au-Prince, along with the sanitary landfill where the refuse is permanently deposited.

- Subproject C. This subproject is about 97% advanced. Cleaning and removal of sediment has been completed for 5,300 m³ of the envisaged 35,000 m³ of sediment. Owing to the review of the designs and the change in the ranking by priority of the subproject's components, combined with the limited resources available, repairs to the open and closed culverts originally intended were not carried out. In consequence, whereas the original target was the dredging of 110,000 m³ of sediment and refuse at the discharge outlets of the open and closed culverts into the bay, 543,000 m³ have been dredged instead, and 150,000 m³ remain to be removed to meet the present needs of the subproject, estimated at 700,000 m³. Despite the considerably higher volume of dredging accomplished, this work has met with difficulties. As a result of the events of early 1986 in the country, the firm of Haïti Construction, to which the works had been entrusted, was not allowed to continue and resume the works, for which reason they have remained at a standstill for the last eight months. In these circumstances, and in order to surmount this obstacle to the project as quickly as possible, the MTPTC has completed its negotiations with the Dominican firm of COCIMAR to complete the works remaining to be done. This enterprise submitted the second-best tender in the bidding operation in which the award went to Haïti Construction, and the contract should be signed, following the Bank's approval, in October 1986.

- Subproject D. This subproject has been completed. The laying down of culverts in Saint Martin, Martelly-Marchand, Croix des Bossales, Boulevard de la Saline (an additional work), Bois de Chene and in part, Rue Pavée-Paul VI, with a total length of 20.30 km, compared with the envisaged total of 15.25 km, has been completed. The works still to be carried out for the culverts of Rue Pavée-Paul VI are part of the second stage of the project.

D. Execution of the project

- 3.08 As previously noted, execution of the project began fairly late essentially owing to revision of the designs for the works and to difficulties in organizing the Executing Unit. In consequence, the increase in the volume of works resulting from the new designs, the extension of the execution period, and unit cost and escalation estimates lower than those actually encountered, have naturally resulted in an increase of the general cost of the project. The process of expropriating lands and structures for the laying down of culverts has been slow owing to the failure to provide local counterpart funding in good time.
- 3.09 Reports. The borrower was generally behindhand in presenting its progress reports in the format required by the Bank. Financial statements certified by independent auditors were generally presented within the contractually prescribed terms, but these financial statements and their certification are not used as management tools, but are rather regarded as instruments of control valid only to meet the requirements of loan contracts. In addition to the presentation of the project's financial statements, loan 564/SF-HA requires the presentation of financial statements for the Special Fund for Maintenance of the Drainage System and for the Metropolitan Solid Waste Collection Service (SMCRS), which now functions in the office of the Mayor of Port-au-Prince. The Bank exempted the SMCRS from having to present financial statements for fiscal 1983 and 1984, and is considering a similar exemption for fiscal 1985 owing to the meagerness of the information left by the previous regime. The borrower/executing agency has little capability to prepare properly the reports needed for the ex post evaluation of the project. This subject is considered further on in this chapter and a revised methodology is proposed for the presentation of these reports.
- 3.10 The executing agency's supervision has been fairly satisfactory in all matters relating to the preparation and conduct of the bidding operations for works, awards, and supervision of construction work

and related labor-intensive works on force account. This experience indicates that, unless proper justification can be shown for the execution of works on force account, in the next stage of the project this arrangement should be used only for the paving of streets with blocks and for erosion control, the erection of dry walls, reforestation, terracing, etc.

- 3.11 The coordination of the participating agencies was not as effective as expected in the execution of this highly complex project. The project very rightly provided financing for five co-managers in the fields of administration, engineering, waste collection and disposal, finance, and operation and maintenance of the sewer system for the Executing Unit. It is considered that these co-managers, having performed their functions satisfactorily, contributed largely to mitigate the shortcomings in coordination of the agencies involved directly and indirectly in execution of the project.
- 3.12 Conclusion. Although some parts of this project remain to be executed, it has had a highly visible impact on the appearance of Port-au-Prince, and the experience of its execution has been essential in enabling the executing agency and the Bank to design a less complex second stage with an improved structure. While some components of the project could not be completed in that first stage, it is also true that its purposes were largely accomplished by making adjustments in those components that in most cases resulted in a net total increase in the works, the financing of which devolved upon the local counterpart contribution. The outcome of the arrangement provided for execution of the project was that the Executing Unit, with the collaboration of international experts, was endowed with the capability to supervise the subsequent stages of this project.
- 3.13 Today, this first stage is virtually completed, with all systems constructed in operation. The second stage is simpler, and the executing unit is functioning satisfactorily and is strengthened with such operational components as those for the cleaning of culverts, the financing for which is proposed herein; as will be seen in the chapters hereafter, this second stage will enable the process of cleaning up Port-au-Prince, which began with the assistance of IDB loan 564/SF-HA, to continue until a stable situation is achieved. The problems encountered in establishing the Executing Unit on schedule, properly complying with the requirements on procurement established by OPEC and the initial ineffectiveness of coordination with the other participating agencies have been taken into account in drawing up the scheme for execution in the second phase, and the necessary steps have been taken to avoid their repetition.

E. Fulfillment of contractual obligations

- 3.14 The status of fulfillment of the substantive clauses of the contract for loan 564/SF-HA is as follows:

1. Rates for the collection of solid wastes (Resolution, Clause 8(d))

- 3.15 This clause requires that rates for the service of solid waste collection shall produce, on completion of the works of Subproject B, at least enough income to cover all the costs of operating the system, including those for administration, operation, maintenance and depreciation. This subproject is scheduled for completion in the first quarter of 1987. It was provided that the rates for refuse collection would be collected through the rate collection system of the Electric Power Company of Haiti under an agreement signed between that company and the Metropolitan Solid Waste Collection Service (SMCRS) on 20 October 1982. On 31 August 1984, as a result of its negotiations with the World Bank for a loan of US\$26 million for the first energy program, the country rescinded that agreement without previously consulting the IDB because the IBRD considered that it was inappropriate to include this charge in the electric rate bill. In order to arrive at an alternative financing formula, that operation included US\$500,000 in technical cooperation for the Port-au-Prince Urban Community (CUPAP), in which it was proposed that studies be made for improving the administration of that agency and finding ways to finance the solid waste collection system.
- 3.16 Since the purpose of the IBRD financing is the execution of an electric power program, the technical cooperation has not received the attention needed to get it started. Moreover, it has been said that the purpose of this US\$500,000 should be revised so that it may be used by the electric power company. It is therefore considered advisable that the Bank consider granting a technical cooperation for the specific purpose of reviewing the mechanisms by which the SMCRS could be adequately funded and whether it is actually at all feasible to charge rates for the service. In advance of the preparations for this technical cooperation, the Bank is arranging a short-term mission to define the context of that cooperation and the terms of reference needed for its execution.
- 3.17 In the absence of the results of the technical cooperation and until its recommendations are satisfactorily implemented, it will not be possible to fulfill this contractual clause within the current deadline, and it is therefore proposed separately and under the analysis made for the possible financing from the Program in Support of Projects in Execution (HA-0077) that this deadline be extended until the 1991 fiscal year. In addition, it is recommended within this operation that the borrower obligate itself to attain the annual targets for the collection of proportions of the total solid wastes generated in Port-au-Prince, beginning with the 40% expected to be collected in the 1986 and 1987 fiscal years. These targets would be 50% in the 1988 fiscal year, 60% in 1989, and an expected maximum of 70% starting in 1990. 1/

1/ See Recommendations.

2. Clause on legal possession. (Recommendations, clause 1(ii))

- 3.18 This clause stipulates that, prior to the invitation to bid for each work or group of works, or prior to commencement of the works when no bidding is required, the borrower must present to the Bank through the MTPTC, in the case of works, evidence of legal possession of the lands and rights-of-way require for execution of the respective works, and related documents. The analysis of Subproject A "Erosion Control on Morne l'Hôpital" envisaged the expropriation (legal possession) of about 1,535 ha, and the relocation of several families. The expropriation process was launched with publication in the Moniteur of a Presidential Decree of 17 November 1978 condemning the Morne l'Hôpital area (about 2,000 has) and the establishment of a Special Indemnification Committee to examine the legal status of the properties with a view to the expropriation procedure. However, owing to difficulties encountered in identifying and measuring the properties to be expropriated (there is no cadastre of the area) and to the cost involved, the Government of Haïti asked the Bank for, and the latter granted, authorization to begin the work without the need of legal possession of the lands, and the government undertook that about 2,000 has would be expropriated and their proprietors compensated before the activities of the project were completed. Considering that (1) Subproject A - Erosion Control on Morne l'Hôpital - has been finished and its primary purpose accomplished, which is that of controlling erosion through the execution of engineering and agronomic works and the planting of 400,000 trees in selected areas; (2) the planting of trees and related activities (terracing) are not regarded as works requiring the presentation of evidence of legal possession of the grounds, and (3) the engineering works were executed only on the ravines in the hillside that are on government-owned lands, which guarantees access for their maintenance and operation, 1/ it may be concluded that the obligation in question has been properly fulfilled. The results obtained in this subproject justified the approach taken and, therefore, it is not necessary to require for the second stage, covered by the present Project Report, legal possession of the lands before the tree-planting work can begin (see Chapter VI).

3. Special Fund for Operation and Maintenance of the Storm Drainage System (Recommendations 8 (i) and (ii))

- 3.19 The obligation stipulates that the borrower shall demonstrate, within 42 months from the effective date of the loan contract, that it has established a Special Fund for the stated purposes and shall present a financing plan providing for its establishment additional contributions in the equivalent of US\$350,000 a year for 10 years as from the date of the last disbursement from the loan. The Fund began to

1/ There is legislation that makes the ravines and the land 15 m to either side of them public property.

function in September 1984 and the government has contributed the equivalent of some US\$375,000 to it in the 1984 and 1985 fiscal years. On 7 January 1985 the MTPTC presented the plan for financing this Fund, which was approved by the Bank. However, the amount originally stipulated by the Bank is insufficient to carry out the maintenance, and this document proposes that the Bank collaborate with the country in attaining the requisite level during the first two years of execution of the second stage, after which the country would undertake to finance it with the new estimated amounts (US\$973,000 a year) (see paragraph 6.26).

- 3.20 The following table presents the cost of maintaining the Port-au-Prince drainage system and its financing for the period from 1984 to 1986 according to the record of the SEEU and the financial statements of the Program 564/SF-HA.

(in thousands of US\$ or equivalent)

	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>Total 1984 to 1986</u>	
				<u>\$</u>	<u>%</u>
<u>Current expenditures</u>					
With IDB funds-Proj.I	22.8	65.8	32.5	121.1	4.4
With government funds	<u>671.8</u>	<u>865.7</u>	<u>840.5</u>	<u>2,378.0</u>	<u>86.5</u>
Total current expenditures	694.6	931.5	873.0	2,499.1	90.9
<u>Capital expenditures</u>					
With IDB funds-Proj.I	-	<u>96.9</u>	<u>152.7</u>	<u>249.6</u>	<u>9.1</u>
Total expenditures	<u>694.6</u>	<u>1,028.4</u>	<u>1,025.7</u>	<u>2,748.7</u>	<u>100.0</u>
	=====	=====	=====	=====	=====

- 3.21 During the period considered expenditures totalled US\$2.7 million, 91% of which went for current and 9% for capital expenditures. The government contributed 87% of the financing and the Bank 13%. The Bank's financing covered 5% of the current expenditures, those for payment of the international expert and the purchase of tools, and all the equipment purchased during the period, which came to US\$249,600.
- 3.22 The resources from the government increased from US\$671,800 in 1984 to US\$840,500 in 1986, and were provided from the following sources:

(US\$ thousands or equivalent)

	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>Total 1984 to 1986</u>	
				<u>\$</u>	<u>%</u>
From the SEEU's operating budget	619.1	541.3	708.9	1,869.3	78.6
From the Development Budget, Contributions to the Special Maintenance Fund	<u>52.7</u>	<u>324.4</u>	<u>131.6</u>	<u>508.7</u>	<u>21.4</u>
Total	<u>671.8</u>	<u>865.7</u>	<u>840.5</u>	<u>2,378.0</u>	<u>100.0</u>
	=====	=====	=====	=====	=====

- 3.23 From its operational budget, the government allocated annual amounts ranging between US\$541,000 and US\$709,000 for maintenance. The foregoing table also shows that, in real terms, the government provided US\$400,000 of the Special Maintenance Fund plus resources in the amount of US\$108,000 that could be considered to be part of the annual US\$350,000 in contributions required pursuant to the contract, beginning on the date of the last disbursement of loan 564/SF-HA.

4. Ex post evaluation of the Project

- 3.24 The borrower has not succeeded in developing a capability to produce the information needed as a basis for the ex post evaluation of the project and consequently, as a result of an exhaustive review of the situation done during the course of the analysis mission for this second stage of the project, the new operation proposed herein would include resources from the prospective loan from the Bank to finance this work. ^{1/} As well, the Bank could, if necessary, bolster these efforts with a short-term mission.
- 3.25 Recommendation 4 in document PR-905-2 of 10 January 1979, in relation to Clause 6.07 of the contract for loan 564/SF-HA, stipulates the following obligation:

"(a) Within twelve (12) months after the effective date of the contract, the MTPTC must present to the Bank:

- (i) The baseline data in accordance with the categories stated in paragraph 4.107 of the Project Report, and
- (ii) A description of the system for the collection and processing of the data to be used for the annual comparisons with the baseline data for purposes of evaluating the results accomplished by execution of the project.

^{1/} See the Terms of Reference for International Advisors in Annex 11.

- (a) As from the effective date of the contract and every year up to five (5) years after the date of the last disbursement from the loan, the MTPTC must present to the Bank an annual comparison of the data referred to in (a)(i), above.
 - (c) At the end of the fifth year following the date of the last disbursement from the loan, the MTPTC must present to the Bank an ex post evaluation report containing the results of the project."
- 3.26 The borrower has not fulfilled its obligation of presenting to the Bank the table of comparative data for the years 1984 and 1985. Regarding 1983, although fulfillment of this clause was approved, it was put on record in the comments on this fulfillment that there were important deficiencies in the technical and economic information. Owing to the irrelevance and staleness of that report, and in view of the persistence of the basic problems associated with the capability to compile and analyze the information requested, it has become necessary to change the requirement to bring it more into line with the executing unit's capabilities. The second stage of the project provides funds from the loan resources to finance advisory services to the MTPTC in preparing the ex post evaluation of the project, and establishes obligations that are more within the borrower's capabilities as complemented by those advisory services.
- 3.27 To be consistent with this recommendation for the second stage, it is proposed that the present Recommendation 4 of loan 564/SF-HA be amended to read as follows: 1/
- "4. Within six months following the data of the last disbursement, the borrower shall present an ex post evaluation report covering the following points:
- (i) an analysis of the degree of adherence to the established execution timetables, including the causes of any delays, cost overruns, etc., which have affected the duration and costs of the works.
 - (ii) an analysis of the technical and economic aspects of the works, including recommendations for their improvement. Specifically, the analysis will cover matters relating to design parameters, the sizing of the works, intensive use of labor, modalities of execution on contract compared with execution on force account and any other arrangement that may emerge as relevant in this connection.

1/ See Appendix IV of the Loan Proposal.

- (iii) An analysis of the technical, administrative and financial aspects of the maintenance of the works, including recommendations for surmounting problems encountered. Specifically, an examination will be made of the degree to which the system functions properly or improperly and of the resources required and budgeted for the purpose.

The foregoing points will be considered in relation to each component of the project, as follows: erosion control; solid waste collection and disposal; cleaning, repair and rectification of the present system; and new works to expand the storm drainage system. In all cases the analysis must present appropriate figures and evidence in support of its conclusions. Moreover, the recommendations will stress operational aspects so that they may be immediately implemented."

F. Technical cooperation ATN/SF-1685-HA

- 3.28 On 7 December 1978 the Board of Executive Directors approved, in parallel with loan 564/SF-HA, a nonreimbursable technical cooperation to the MTPTC in the equivalent of US\$265,000. The agreement was signed on 22 February 1979. The cost of the operation came to the equivalent of US\$300,000, which included a local contribution of US\$35,000.
- 3.29 The purpose of the operation was to participate in the financing of the costs to be incurred in the execution of the technical cooperation program that consisted in (a) establishing the administrative and financial procedures in the Executing Unit for the Port-au-Prince drainage project (564/SF-HA), and (b) establishing the organization and the administrative, financial and operating procedures in the SMCRS, which has charged of the collection of solid waste in the city.
- 3.30 On 7 June 1979 the MTPTC hired the firm of Lavalin International Inc., of Canada, to do the work for the institutional strengthening of the Executing Unit. Later, in November of the same year, the firm Scet-International/Beture, of France, was hired to support the solid waste collection operation. The two firms began work at the end of 1979 and in early 1980, respectively.
- 3.31 In regard to the first part, relating to administrative and financial advisory services to the Executing Unit, in June 1980 Lavalin International Inc. presented its final report, in which it discussed the matters dealt with extensively. Later it carried out four supervisory visits until September 1983. In general, these inspections indicated that the project's accounts were satisfactory. The work of the consultants may be rated as beneficial even though the Executing Unit still suffers from internal control failings and the cost accounting system has not been installed as envisaged. For the second stage, it is expected that these shortcomings can be resolved

with the measures described in Chapter V, below. Regarding the other part, the operation and maintenance of the SMCRS, the consulting firm of Scet International/Beture presented its final report on February 1982. Its work may be regarded as highly beneficial inasmuch as the waste collection service was established in March 1981 and is in operation today.

G. Technical cooperation ATC/SF-1686-HA

- 3.32 On 7 December 1978 the Board of Executive Directors approved, in conjunction with loan 564/SF-HA, technical cooperation in the equivalent of US\$170,000 to the MTPTC on a contingent-recovery basis; the agreement for this operation was signed on 22 February 1979. The cost of the operation came to the equivalent of US\$190,000, which included a local contribution of US\$20,000.
- 3.33 The purpose of the operation was to participate in the financing of the expenses to be incurred in the execution of a technical cooperation program that consisted in the performance of the engineering studies for the drainage system in the areas of Cité Simone (Saint George) and environs, in the northern part of the city, and in Carrefour, west of the Papacito ravine, so that the beneficiary could at last present a request for financing to an international agency (the loan application considered herein).
- 3.34 For the execution of this technical cooperation, on 1 October 1979 the MTPTC signed a contract with the firm Scet-International/Beture of France, which performed its tasks satisfactorily and presented a final report in the second half of 1981. In spite of this, subsequent analyses brought out a difference of interpretation with the consultant of the terms of reference on the details of the construction designs. Since the completion of this technical assistance was essential to a possible second stage of the drainage project, an extension was therefore granted to the deadline for the last disbursement until 23 October 1984. On expiration of the deadline for the last disbursement, there remained a balance of US\$26,294 of the technical cooperation granted by the Bank; the disbursed amount of US\$143,706 is shown in the table of costs for the second stage of the project as an integral part of the possible IDB loan. It is currently estimated that the MTPTC can complete the missing designs (for the areas of Diquini y Brea-Sorey-Leclerc) by the end of the second half of 1986, and the consulting firm (Scet-International/Beture) has undertaken to review those plans, make the necessary adjustments, and recommend their execution to the MTPTC.

IV. THE PROJECT

A. Purposes of the project

4.01 The aim of this second stage of the project is to reduce erosion in the Morne l'Hôpital area; to clean, repair and preserve the Port-au-Prince storm drainage system, and to execute the new works for its expansion. The principal objectives of the project would be as follows:

- (i) the environmental improvement of metropolitan Port-au-Prince;
- (ii) a substantial reduction of flooding, to the benefit of about 400,000 inhabitants, with a consequent reduction of risks to life and property, in addition to a reduction of public health hazards;
- (iii) expansion, rectification and improvement of the present storm drainage system, and
- (iv) a reduction of erosion on the northern slope of Morne l'Hôpital.

B. Description of the project

4.02 The project consists chiefly in the construction of works to expand the existing drainage system, erosion control on Morne l'Hôpital, and activities in connection with operation and maintenance, as described in detail in what follows.

1. Subproject A: Erosion control on Morne l'Hôpital (US\$4,050,000)^{1/}

4.03 This subproject comprises the following works:

- (i) the planting of about 200,000 trees to reforest selected areas on Morne l'Hôpital (see map elsewhere in this chapter);
- (ii) the construction of about 12,000 m³ of stone retention walls with wire mesh protection in the lower reaches of eight ravines;
- (iii) the construction of five settling tanks in five ravines in the environs of urban Port-au-Prince, and

^{1/} For further details on the components and costs of the subproject, see Annex 2.

- (iv) the stabilization and paving of about 14 km of streets five to eight meters wide, most of them at the foot of Morne l'Hôpital.

2. Subproject B: New works to expand the existing storm drainage system (US\$24,900,000) ^{1/}

4.04 This subproject consists in the construction and installation of:

- (i) seven culverts (primary network) to carry out storm waters (see map on next page);
- (ii) the dredging of about 600,000 m³ at six discharge outlets into the bay; and
- (iii) about 7.3 km of secondary sewers in pipes of diameters ranging between 1.20 and 0.60 m in Carrefour, which includes the paving of 8 km of street with plain concrete blocks.

4.05 The culverts would be laid down in the following quarters: (i) Saint George and Electricité d' Haïti, to the north, (ii) Rue Pavée-Paul VI, Brea-Sorey-Leclerc and Papacito in the central part, and (iii) Waney-Bijou-Rivière Froide and Diquini in the Carrefour section to the southwest. The works for these more or less seven culverts would consist in about 3.8 km of closed culverts of reinforced concrete poured onsite (dalots), 6.6 km of trapezoidal culverts in stone masonry, 310 m of rectangular culvert of reinforced concrete, 615 m of reinforced concrete pipes 2 m in diameter and 1,240 m of reinforced concrete pipes in diameters between 1.50 and 0.60 m. The Carrefour secondary network comprises 7.3 km of reinforced concrete pipe in diameters of 1.20 to 0.60 m, and the paving of 8.3 km of streets.

4.06 The primary networks are sized for the year 2000 as the horizon year and for a 10-year frequency rainfall. The secondary networks are designed for a rainfall intensity of annual frequency. The drainage network is designed with a view to rainstorms of brief duration, and the following data have been obtained: (i) at the annual frequency, the highest intensity in 15 minutes is 325 l/sec/ha (liters per second per hectare) and in 30 minutes 220 l/sec/ha; at a 10-year frequency, the maximum intensity in 15 minutes is 480 l/sec/ha and in 30 minutes 300 l/sec/ha. ^{2/}

4.07 In its design of the primary network of the Port-au-Prince drainage system, the consulting firm used parameters based on the future development of the city's sewer system. During the analysis mission

^{1/} For more details on the components and costs of this subproject, see Annex 3.

^{2/} See Annex 13 for more detailed design parameters and the rated discharge volumes for the different culverts of the primary network.

OBJET DE DRAINAGE DES EAUX PLUVIALES DE PORT-AU-PRINCE

LEGENDE

- Limites de zones du p
 Zone à équiper de res
 en 2ème tranche
 en 3ème à 5ème tran
 Ouvre primaire exist
 en 1ère tranche
 en 2ème tranche
 Ouvre primaire à re
 en 1ère tranche
 en 2ème tranche
 en 3ème à 5ème tran
 Degraveur isolé 2ème
 Degraveur
 Point de calcul

[illegible]

the Haitian authorities expressed interest in presenting shortly to the Bank a request for technical cooperation in drawing up the Master Plan for the urban development of Port-au-Prince, which would provide better guidance for the growth of the urban area and its connection to improvements in the city's infrastructure. Execution of the project is expected to prevent any overflow, in the event of long and heavy rainfall, that could affect sanitary installations.

- 4.08 In order to lay down the seven aforementioned culverts, the Government of Haiti, acting through the MPTC, would have to compensate and/or expropriate about 585 families living along the culverts; the great majority of these lands are government-owned and the people living on them are squatters without any right of occupancy. During the first stage, executed between 1980 and 1985, similar operations were carried out, and no major obstacles arose to impede the laying down of the five culverts.

3. Subproject C: Maintenance

- 4.09 As mentioned in Chapter III, it had been provided that the maintenance of the works executed in the first stage of the project was to be financed from a Special Maintenance Fund, which was to be fed with the equivalent of US\$350,000 a year as from the last disbursement of the loan. The Fund was established, but the prescribed amount has been insufficient to carry out the maintenance, and this document proposes collaborating with the country in financing the maintenance activities so that the requisite level of maintenance will be attained. The Bank's contribution would be made for the first two years of execution of the second stage, and thereafter the country would undertake to finance the new amounts, which are estimated at US\$973,000 a year. Accordingly, execution of the project would be accompanied by activities essential to its operation, directed at cleaning and maintaining the drainage system, which includes the dredging of culvert outlets into the bay. This work includes the general cleaning of the old drainage system built before 1979 and the culverts laid down in the first stage of the project (special maintenance), and maintenance, during execution of the second stage of the project, of the facilities built (routine maintenance). The work would be done by the Urban Infrastructure Maintenance Service (SEEU). Based on studies and estimates of the quantities of works to be executed, it is expected that the cost items for the cleaning of the installations of the old system and those deriving from the works built in the first stage (loan 564/SF-HA) are (i) the cleaning of submerged pipes; (ii) the replacement of 5 km of pipes of too small diameter; (iii) rectifications of manholes and curb catchbasins, and the placement of manhole covers; (iv) dredging of 266,000 m³ at 14 outlets; (v) acquisition of maintenance equipment; and (vi) improvements to installations of the SEEU (See Annex 4).

4. Hiring of consultants

- 4.10 During execution of the first stage of the project, the Executing Unit enjoyed the collaboration of three experts (co-managers) in the areas of engineering, administration and finance, who provided adequate support and advisory services for execution of the project within a reasonable time. It is considered necessary to continue this support for execution of the second stage, to which end the proceeds of the possible loans would include funds to cover the cost of hiring two advisers of international standing in the areas of engineering and of operation and maintenance (for the equivalent of US\$720,000), and two Haitian advisers in areas of financial administration (for the equivalent of US\$240,000).

C. Area of influence of the project

- 4.11 The main purposes of the project are directly associated with the prevention of flooding at different points in the city. On the basis of the identification of these flood-prone areas, an area of influence has been traced for each culvert based on such factors as the hydrographic basin, topography, degree of urbanization and characteristics of the existing drainage facilities.
- 4.12 Northern district. In this district, the St. George and Electricité d'Haiti culverts would be laid down to improve the drainage situation in an area of about 220 ha confined by those culverts north and south, National Highway 1 to the east, and the seashore to the west. In addition, the St. George culvert extends to the east, crosses an area of industrial parks and terminates shortly after crossing the road that links Port-au-Prince and the International Airport. The area involved is all below 2 m above sea level, and the slope is so slight that the entire area is subject to extensive and lingering floods.
- 4.13 Centreville district. In this area culverts would be built or rehabilitated in the streets Miracles, Pavée (including an extension in Rue Lamarre), Paul VI and Champ de Mars, these works being limited to the east by the Ave. Guilloux or Rue Lamarre and to the west by the outlet into the sea. This area is part of the civic and commercial center of Port-au-Prince and is traversed by major arteries such as Blvd. Truman and Blvd. J. J. Dessalines, and as such is an urban area already consolidated with adequate street paving.
- 4.14 South-Central district. The purpose of the proposed works in this area is to place culverts in the principal ravines that cross it, as follows: Brea, Sorey, Leclerc and Papacito. Together with the proposal for Centreville, these culverts virtually complete the coverage of the drainage service in the low-lying central part of Port-au-Prince.

- 4.15 Carrefour district. In this part of the city the project proposes construction of the Diquini, Waney-Bijou and Rivière Froide culverts. Unlike the other cases, part of the secondary drainage network would also be built here, particularly on the higher ground of Carrefour. The Diquini culvert would run along the ravine of the same name, and its upper reach traverses a segment of the high ground of Carrefour. Meanwhile, the Waney-Bijou and Rivière Froide culverts lie directly on the J. J. Dessalines road, which links Port-au-Prince with the southwestern region of the country. These culverts would serve rather to intercept the water flowing down from the upper reaches of the area. The area in the immediate vicinity of these culverts is heavily subject to floods, which interrupt the heavy traffic carried by that arterial road.
- 4.16 Morne l'Hôpital district. Morne l'Hôpital lies within the perimeter of metropolitan Port-au-Prince. More than 80% of the surface of the hill is of rural-forest characteristics. While the deforestation of Morne l'Hôpital has not reached critical proportions, it has contributed to accelerate the volume of runoff over the denuded soils. On the hillside the project proposes the planting of trees, rectification of ravines, construction of settling tanks and paving of streets, all works directed at reducing the transport of solid matter into the lower part of the city.

D. Costs of the proposed project

- 4.17 The total cost of the second stage of the project calculated at June 1986 prices, is estimated at the equivalent of US\$57.5 million. Of this amount it is proposed that the Bank finance up to the equivalent of US\$51.8 million. Of the difference in the equivalent of US\$5.5 million, US\$3.1 million would be provided from the recoveries deposited in the Bank of the Republic (the Central Bank) deriving from the USAID PL-480 Program, and US\$2.7 million from the Haitian national budget. The following table presents the estimated total cost of the project broken down by investment category and source of financing.

(US\$ thousands or equivalent)

	IDB Loan		IDB Subtotal	Local Contribution	Total	%
	For. Exch.	Loc. Cur.				
Cat. 1 <u>Engineering and Administration</u>	<u>4,170</u>	<u>240</u>	<u>4,410</u>	<u>1,690</u>	<u>6,100</u>	<u>10.6</u>
1.1 Studies	144	a/ -	144	-	144	
1.2 Supervision and Administration	3,306	-	3,306	1,690	4,996	
1.3 Advisory Services	720	240	960		960	
Cat. 2 <u>Direct Costs</u>	<u>28,950</u>	<u>-</u>	<u>28,950</u>	<u>-</u>	<u>28,950</u>	<u>50.4</u>
A. <u>Erosion Control</u>	<u>4,050</u>	<u>-</u>	<u>4,050</u>	<u>-</u>	<u>4,050</u>	<u>7.0</u>
2.1 Tree-planting	400	-	400	-	400	
2.2 Ravine rectification	800	-	800	-	800	
2.3 Street paving	2,450	-	2,450	-	2,450	
2.4 Sediment settling tanks	400	-	400	-	400	
B. <u>Culverts</u>	<u>24,900</u>	<u>-</u>	<u>24,900</u>	<u>-</u>	<u>24,900</u>	<u>43.4</u>
2.5 Electricité d'Haïti	480	-	480	-	480	
2.6 St. George	7,440	-	7,440	-	7,440	
2.7 Pavee-Paul VI	2,950	-	2,950	-	2,950	
2.8 Brea, Sorey, Leclerc	950	-	950	-	950	
2.9 Waney-Bijou-Rivière Froide	4,385	-	4,385	-	4,385	
2.10 Diquini	1,150	-	1,150	-	1,150	
2.11 Papacito	1,500	-	1,500	-	1,500	
2.12 Discharge outlets (dredging)	3,975	-	3,975	-	3,975	
2.13 Carrefour Secondary Network	2,070	-	2,070	-	2,070	
Cat. 3 <u>Concurrent Costs</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>2,240</u>	<u>2,240</u>	<u>3.9</u>
3.1 Expropriations and Indemnifications	-	-	-	2,240	2,240	
Cat. 4 <u>Maintenance Costs</u>	<u>5,050</u>	<u>-</u>	<u>5,050</u>	<u>-</u>	<u>5,050</u>	<u>8.8</u>
4.1 Special	4,150	-	3,900	-	4,150	
4.2 Routine	900	-	900	-	900	
Cat. 5 <u>Unallocated Expenditures</u>	<u>11,755</u>	<u>-</u>	<u>11,755</u>	<u>1,510</u>	<u>13,265</u>	<u>23.1</u>
5.1 Contingencies	3,447	-	3,447	730	4,177	
5.2 Escalation	8,308	-	8,308	780	9,088	
Cat. 6 <u>Finance Charges</u>	<u>1,625</u>	<u>10</u>	<u>1,635</u>	<u>310</u>	<u>1,945</u>	<u>3.2</u>
6.1 Interest	1,110	7	1,117	-	1,117	
6.2 Credit Fee	-	-	-	310	310	
6.3 Insp. and Sup.	515	3	518	-	518	
TOTALS	<u>51,550</u>	<u>250</u>	<u>51,800</u>	<u>5,750</u>	<u>57,550</u>	<u>100.0</u>
Percentage (%)	89.6	0.4	90.0	10.0	100.0	

a/ Corresponds to the US\$143,706 used under ATC/SF-1686-HA.

1. Engineering and administration (US\$6,100,000)

- 4.18 The cost for Engineering and Administration has been calculated on the basis of the salaries and benefits to be paid to the present and additional personnel of the executing unit, which would have a maximum of 133 staff members during the five years of execution of the project. This item includes the cost of two international advisers in the areas of engineering and of operation and maintenance, and of two Haitian advisers for areas of financial administration. Allowance is also made for the US\$143,706 used under ATC/SF-1686-HA to prepare the designs and documentation for this second stage, which would thus be reimbursed to the Bank.
- 4.19 This item, which accounts for 10.6% of the estimated total cost of the project, includes the costs for engineering, supervision and administration. These figures are deemed reasonable, and they break down into the following subcategories: 1/
- (i) Studies. Reimbursement of US\$143,706 spent under ATC/SF-1686-HA.
 - (ii) Supervision and Administration. US\$4,996,000 to cover the fees and social benefits of the technical personnel, supervisors and administrative and accounting personnel, and the cost of procurement of 24 vehicles for supervision of the works, the cost of fuels, lubricants and maintenance of the vehicles, rental of the premises of the Executing Unit, acquisition of five typewriters and computer equipment (plus staff training in its use), and printing and information processing equipment.
 - (iii) Two advisers of international standing. US\$720,000 to cover the cost of hiring two professionals in engineering and maintenance who would advise the executing unit during the five years of execution of the project.
 - (iv) Two Haitian advisers. The equivalent of US\$240,000 would be provided for payment of the fees of two professionals in the area of finance, who would advise in execution of the project for five years.

2. Direct construction costs (US\$28,950,000)

- 4.20 The direct construction costs (50.4% of the project cost) were determined on the basis of the current budgets as of June 1986, five of the project's seven culverts, the cost of the Carrefour secondary network and the five sediment settling tanks. For the remaining components, such as the tree-planting, paving of streets with plain

1/ See Annex 6 for further details.

concrete blocks, stone walls with gabions, the Diquini and Papacito culverts, and dredging at the discharge outlets into the bay, current unit costs of June 1986 were used. The works envisaged in this second stage are identical in type to those built in the first stage between 1980 and 1985. 1/

3. Concurrent costs (US\$2,240,000)

- 4.21 This category, which accounts for 3.9% of the estimated total cost of the project, covers the expenditures for indemnification and/or expropriation of about 585 families living along the natural ravines, the great majority of whose lands are government-owned but were occupied without legal title. The estimated value of these properties is based on real prices paid during the first stage from 1981 to 1984. 2/

4. Maintenance costs (US\$5,050,000)

- 4.22 This category accounts for 8.8% of the estimated total cost of the project and comprises the general cleaning of the old drainage system (special maintenance) laid down before 1979, and the cleaning of the works built in the first stage. The total cost of these items comes to the equivalent of US\$4,150,000. The figure for this category is completed by the cost of maintaining the works of the second stage (routine maintenance) as they are finished up to the deadline for complete execution of the project, and calculated at the equivalent of US\$900,000 over the three-year period (1989-1991). 3/

5. Unallocated expenses (US\$13,265,000)

- 4.23 Since the MTPTC has designs ready for bidding purposes for more than 80% of the works envisaged in the second stage, it has been deemed sufficient to use 10% for contingencies both for category 2 (Direct Costs) and for categories 1, 3 and 4. The amount for this purpose comes to US\$4,177,000. Price escalation during the five years of execution of the project have been calculated in light of the Bank's applicable provisions, the provenance of the goods to be possibly imported, and the possible proportion of currencies to be requested in the disbursements; the amount for escalation comes to US\$9,088,000.

1/ See Annexes 2 and 3.
2/ See Annex 5.
3/ See Annex 4.

6. Finance charges (US\$1,945,000)

- 4.24 Based on a possible IDB loan of US\$51,800,000 in foreign exchange from the resources in the Fund for Special Operations (FSO), this category, which comes to 3.2% of the total project cost, comprises the interest on the loan in foreign exchange (FSO) that will accrue during the execution period and the amounts of the credit fee and for inspection and supervision of the project.

E. Project financing plan

1. IDB resources

- 4.25 The foreign exchange amount of US\$51.8 million was determined in keeping with the current policy laid down in Document AB-1109 for the sector of Urban Development and Social Infrastructure of a Group D country, that is, by taking up to 90% to the total cost of the project, including the nonrecurrent incremental costs for specialized personnel. The operation includes a portion of the loan in the equivalent of US\$250,000, in gourdes.

- 4.26 The possible IDB loans in foreign exchange and gourdes would be made on the following terms and conditions:

- | | |
|------------------------------------|--|
| (a) Source of funds: | Funds for Special Operations (FSO) |
| (b) Disbursement period: | 5 years |
| (c) Period of amortization: | 40 years |
| (d) Interest: | 1% p.a. during the grace period, and
2% p.a. during the amortization period |
| (e) Credit Fee: | 1% of the undisbursed balance of the
loan |
| (f) Inspection and
supervision: | 1% of the amount of the loan |
| (g) Grace period: | 10 years |

2. Resources of the local counterpart contribution

- 4.27 The local contribution to this second stage of the project is estimated at the equivalent of US\$5,750,000 (10% of the total cost), and would be made by the Government of the Republic of Haiti in the form of annual budgetary appropriations and from recoveries under USAID PL-480 Program up to the equivalent of US\$3.1 million in accordance with the investment requirements for execution of the project.

V. THE BORROWER AND EXECUTING UNIT

A. Introduction

- 5.01 The borrower would be the Republic of Haiti, and execution of the project, including the technical cooperation, would be entrusted to the Ministry of Public Works, Transport and Communications (MTPTC) through the Executing Unit - a subdivision of the Public Works Directorate - which has had charge of execution of the first stage partially financed with loan 564/SF-HA. 1/

B. Institutional analysis

1. Legal status, functions and organizational structure of the executing agency

- 5.02 The MTPTC is a public agency governed by its own Organic Law of 18 October 1983. The functions of this government agency are to provide for the study, planning, execution, maintenance and evaluation of the physical infrastructure relating to urban and rural facilities, roads, ports and airports, telecommunication systems and drinking water supply systems, and to establish regulations for urban development and technical construction standards. The highest officer in the MTPTC is its Minister of State, who is assisted by a Secretary of State and an Advisory Council. 1/
- 5.03 The executive functions of the MTPTC are vested in the General Director, who directs, analyzes, coordinates and supervises all the Ministry's technical and administrative activities. The General Director is assisted by three supporting offices: a Secretariat, a Financial Control Unit and a Unit of the Coordinator of Technical Units. The General Director delegates the executive function to four central units and five regional units.
- 5.04 The four central units are three operational directorates (Public Works, Transportation and Communications), and an administration directorate.
- 5.05 Each regional directorate is organized on the same lines as the General Directorate of the Ministry, that is, under each regional director there is substructure consisting of three operational units: Public Works, Transportation, and Communications, and an Administrative Unit. The Organic Law also prescribes the establishment in each regional directorate of support units similar to those functioning under the General Director.

1/ See the MTPTC's organizational chart in Annex 7.

5.06 The Public Works Directorate (DTP) is in charge of the study, planning, supervision and maintenance of urban and rural civil works such as bridges, parks, buildings and public monuments, and sanitation systems, with special regard to drainage works. It comprises four advisory bureaus and the following services: 1/

- Urban Engineering, which performs construction functions and has two executing units: one for the IDB Drainage Project and another for the IBRD Program for Construction of the Croix de Bossales Market.
- Planning, which is responsible for the formulation of strategies, studies and plans in the Directorate's area of work.
- Maintenance (Urban Infrastructure Maintenance Service - SEEU), responsible for the functioning of the physical works, including those built and to be built with resources from IDB loans.

5.07 The functional separation of the technical operations of the SEEU is considered satisfactory.

5.08 DTP Staff. In June 1986 the DTP had the following staff:

	<u>Office of Director</u>	<u>Urban Engineering</u>	<u>Planning</u>	<u>Mainte- nance</u>	<u>Total</u>	
					<u>No.</u>	<u>%</u>
Professionals	6	30	30	4	70	11
Technicians	-	24	-	10	34	5
Accountants and Assts.	8	7	1	2	18	3
Administrative	11	9	4	22	46	7
Laborers and Others	16	47	3	423	489	74
	<u>41</u>	<u>117</u>	<u>38</u>	<u>461</u>	<u>657</u>	<u>100</u>
	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>

5.09 The above personnel include the staff of the Executing Unit of Drainage Project I, which had the following 71 employees: 15 professionals, 16 technicians, 3 accountants, 4 administrative employees, and 33 laborers and others. It is important to note that about 30 persons are assigned to the studies for the second stage of the project. Except for changes in the number of personnel in the IDB and IBRD project executing units, the DTP's personnel strength has not changed substantially in the last two years.

1/ See organizational chart of the DTP in Annex 8.

2. Executing unit (Sewerage Project)

- 5.10 The Executing Unit was organized by means of technical assistance ATN/SF-1685-HA for the purpose of developing the first stage of the project. During the execution of that stage that unit enjoyed the collaboration of three experts (co-managers) in the areas of engineering, administration and finance. The unit had weaknesses in the financial area, including the processing, control and information systems, which will be discussed in the context of the financial organization of the MTPTC.
- 5.11 The unit would be headed by a civil engineer answerable to the Director for Public Works, and would consist of the following sections: 1/
- (i) Studies, which engages in activities directed at the project here considered and a possible third stage (24 persons);
 - (ii) Administration, in charge of bidding operations and purchases, and of personnel control and administration (27 persons);
 - (iii) Finance, responsible for the control and processing of and information on activities in this area (7 persons); and
 - (iv) Works Supervision, which supervises works carried out on contract and on force account (20 persons).
- 5.12 The unit would have a maximum of 133 employees. Personnel additional to the 71 persons now on the staff would be taken on as the progress of the project required.
- 5.13 It is considered that, with the above organization and personnel, complemented by the recommendations presented further on in the analysis of the MTPTC's financial administration, the executing unit will have the administrative and financial capacity needed to execute the project.

3. The Urban Infrastructure Maintenance Service (SEEU)

- 5.14 The unit in charge of maintenance of the Port-au-Prince storm drainage system is the Urban Infrastructure Maintenance Service (SEEU), which replaced the Urban Engineering Service pursuant to a law of 18 July 1978. Like the executing unit of the Sewerage Project, the SEEU is attached to the Public Works Directorate (DTP), and consists of three divisions with the following personnel: 2/

1/ See the executing unit's organizational chart in Annex 9.

2/ See Annex 10 for the SEEU's organizational chart.

- (i) Operations, with 388 people;
- (ii) Administration, with 59, and
- (iii) Technical, with 10 staff members.

5.15 In the Operations Division, the Operating Section (225 people) and the Rectification Section (38 persons) are engaged exclusively in maintaining the storm sewer system of Port-au-Prince. The SEEU engages chiefly in the following activities: (i) Maintenance of the Port-au-Prince drainage system; (ii) street works and asphaltting in Port-au-Prince inland cities; and (iii) maintenance of the streets in all the cities of the country.

5.16 Most of the storm drainage system was built between 1910 and 1920. On the occasion of a world's fair in 1949, part of the bay was filled in and the storm sewers were extended through that fill. This last part of the sewer system has virtually no gradient whatever, which makes it enormously difficult for storm water to be discharged into the bay. The present system is complemented by the culverts laid down in the first stage of the project between 1980 and 1985. Also part of the system are the many ravines in the side of Morne l'Hôpital, which in their natural state transport storm water, with entrained sediment, into Port-au-Prince Bay.

5.17 The SEEU's Operating Section, with its present staff, equipment and implements, cleans the following volumes of sediment:

- (i) removal of 12,600 m3 of sediment from the 17 settling tanks;
- (ii) removal of 16,200 m3 of sediment from culverts; and
- (iii) extraction of 1,400 m3 of sediment from pipes; this work is done by the Operating Section with a staff of 225 plus 148 temporary personnel, who are hired during the five months of the rainy season.

5.18 The Rectification Section, with 38 persons, normally carries out the following activities every year:

- (i) construction of 35 manholes and repair of another 180;
- (ii) manufacture and installation of 500 concrete and 80 metal manhole covers;
- (iii) construction of 700 m of gutters;
- (iv) construction and installation of 110 m of concrete pipes; and
- (v) placement of 875 m3 of gabions.

C. Financial administration

1. Financial administration of the MTPTC

- 5.19 The expenditures of the Haitian government are regulated by two budgets. The functional budget carried by the Ministry of Economic Affairs and Finance (MEF), and a development budget carried by the Ministry of Planning (MP). ^{1/} The former is divided among the ministries and, although the total amounts of the different ministries can be determined, it is not possible to determine the amounts pertaining to specific agencies within the ministries. The development budget is divided among the sectors, which in most cases include activities that pertain to different ministries.
- 5.20 The foregoing duality is transmitted with additional complications to the MTPTC, which has a multiplicity of inadequately coordinated accounting offices responsible for carrying accounts on funds in accordance with the budgetary nature of the expenditure and the funding source. In addition, failures of coordination result in unclear definitions of responsibilities, and there are cases in which one office does not carry the accounts of expenditures because it believes that they are the responsibility of some other office.
- 5.21 Although the MTPTC maintains the Central Accounting Service under the Administration Directorate for the purpose of providing accounting information on the Ministry's overall expenditures, this Service actually carries the accounts for only part of the remunerations financed under the Government's functional budget. To obtain overall figures, the MTPTC has recourse to information from the MEF and the MP, which, for the previously stated reasons, satisfies its needs only in part.
- 5.22 During the World Bank's review of public expenditures in the country, areas were identified in which the government must take measures for improvement, including those indicated in this section, which would eventually become part of a structural adjustment program now under consideration by that financing agency.
- 5.23 The weaknesses of the MTPTC's financial administration are shared by all the country's ministries. Sorting out the situation would require the preparation of a plan of action for the medium term, which might possibly require the participation of several international agencies. The measures proposed in the following paragraphs to place the Executing Unit in sound condition are inspired by a strategy of modest scope, but with the realistic goal of endowing the projects with a satisfactory financial administration.

^{1/} On 8 August 1986 the responsibilities of the Ministry of Planning were transferred to the Commisariat National à l'Administration et à la Fonction Publique, an agency of the National Council of Government.

2. Financial administration of the DTP and the executing unit

- 5.24 The DTP has a financial unit functioning under the Director and with the following four accounting offices: (i) IDB Drainage Project; (ii) IBRD Croix de Bossales Project; (iii) Urban Planning; and (iv) Maintenance Service.
- 5.25 The DTP's Financial Unit, the Project's Accounting Office, the SEEU's Accounting Office and the MTPTC's Central Accounting Service all have a hand in processing the accounts of the IDB project. The routine accounting operations in the executing unit are those of initiating the payment process and keeping the accounts for capital expenditures made with proceeds of the loan. The other operations - preparation of payrolls, accounts of expenditures with local resources, control of budgetary items, etc. - are spread among the other offices previously mentioned and, again, without proper coordination. The result of this division of work is delay in the presentation of reimbursements to the IDB, accounts that are made current only by dint of extraordinary efforts to present financial statements to the Bank, and the lack of an accounting system capable of providing timely information on the progress of the project.
- 5.26 More importantly, under the aforementioned division of work there is no office specifically responsible for applying the rules of internal control and sound financial administration to the project. Although technical cooperation ATN/SF-1685-HA laid the foundations for a decentralization of financial activities under the project, and the latter was provided with an international expert (a financial co-manager) (see paragraph 3.29), the system was not implemented, chiefly for the following reasons:
- A lack of interest at the higher level in the Directorate in implementing the system;
 - the placement of the expert at a level at which he had insufficient authority, and with technical abilities not consistent with his responsibilities; and
 - the strong influence on the personnel in general of the financial arrangements, that is, their organization on the basis of two separate budgets.
- 5.27 The DTP's financial system can be divided into two areas: financial administration of projects and fiscal accounting. For the previously stated reasons, it is felt that what should be done at this time is to strengthen the executing unit's accounting system, rationalize activities in the two aforementioned areas, and improve the coordination and communication systems. The paragraphs that follow propose the changes considered necessary, to this end.

- 5.28 The financial administration of the project, including its accounts, would be centralized in the executing unit. Meanwhile, the DTP's financial unit would be essentially responsible for the fiscal classification of expenditures, which would provide for the transfer of accounting personnel from this unit to the executing unit's office of financial administration. It is accordingly recommended that, as a condition precedent to the first disbursement from the possible loan by the Bank, evidence be presented for the transfer of at least three accountants to the executing unit. 1/
- 5.29 For account of the requested loan, two financial experts of Haitian nationality would be hired for the duration of execution of the project, and be directly answerable to the Director of the DTP. One of the experts would be designated by the Director to organize the centralization of the Project's financial administration, and then administer it. The accounting and financial organization to be developed would follow the guidelines laid down in technical cooperation ATN/SF-1685-HA. Meanwhile, the second expert, whose field would be management control and systems, would advise in the area of ongoing control and review of systems, and perform functions similar to internal auditing in addition to those of the organization of systems and methods. This adviser must also leave an established basis for the development of internal auditing within the MPTC. The hiring of Haitian nationals for this work from the proceeds of the possible loan (in local currency) would be in line with the government's campaign to recruit Haitian professionals from abroad with a view to their possible repatriation. Suitable candidates will have to meet the requirements stipulated in the terms of reference, which include a mastery of the Creole language. 2/
- 5.30 In relation to the foregoing paragraph, it is recommended that the hiring of the financial experts be a condition precedent to the first disbursement from the possible loan. 3/ The condition is also recommended that the Executing Unit's financial system be centralized and implemented within a period of 18 months following the effective date of the contract. 4/
- 5.31 To facilitate the coordination and communication process, the DTP has provided for the establishment of a Coordination Committee headed by the Director of the DTP and having as its members the service chiefs and aforementioned consultants.

1/ See Proposed Resolution.
2/ See terms of reference for the advisers in Annex 12.
3/ See Proposed Resolution.
4/ See Recommendations.

3. Internal auditing

- 5.32 While the MTPTC's Organic Law assigns to the Financial Control Unit, under the General Director, functions of internal auditing, as also financial analysis functions, this Unit actually does no internal auditing, of which it has no knowledge, and it is believed that there is little possibility of its acquiring this knowledge in the medium term without suitable assistance.
- 5.33 In consequence of the foregoing, and as has been indicated, the consultant in management control and systems would perform for the project, as part of his functions, activities similar to internal auditing and, in addition, would establish a foundation for the development of this area at the level of the Ministry.

4. External auditing

- 5.34 The MTPTC is subject to external auditing by the High Court of Accounts. Much of the work of this Court, however, is confined to the review of payment documents.
- 5.35 The financial statements of the project (first phase) partly financed by loan 564/SF-HA are certified by a firm of public accountants acceptable to the Bank. It is recommended that this arrangement be continued for the operation here considered during the period of its execution. 1/

D. Analysis of past projects 2/

1. Comparison of expenditures of the DTP, MTPTC and central government

- 5.36 The resources available to the MTPTC for paying its current and capital expenditures derive from budgetary appropriations of the government.
- 5.37 Two clarifications are required in connection with the tables that follow: (i) owing to the budgetary duality previously referred to and to the Ministry's reorganization in 1984, it has not been possible to determine the amount of the DTP's current expenditures; and (ii) the capital expenditures for the MTPTC and DTP have been obtained by identifying each of their projects, which was made necessary by the fact that, in the information of the Ministry of Planning, these expenditures are classed by sectors and not by ministries. The following tables present the budgetary amounts spent in the indicated Haitian business years, which end on 30 September:

1/ See Recommendations.

2/ All amounts in this subchapter are expressed in US\$ of June 1986. The exchange rate used is US\$1.00 = 5.00 gourde.

(US\$ thousands or equivalent)

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u> ^{1/}
<u>Central Government</u>				
Current Expenditures	237,500	263,858	274,091	239,200
Capital Expenditures	<u>132,899</u>	<u>151,255</u>	<u>127,604</u>	<u>147,200</u>
<u>Total</u>	<u>370,399</u>	<u>415,113</u>	<u>401,695</u>	<u>386,400</u>
<u>MTPTC</u>				
Current Expenditures	7,924	16,096	14,993	15,456
Capital Expenditures	<u>35,068</u>	<u>30,932</u>	<u>25,961</u>	<u>31,788</u>
<u>Total</u>	<u>42,992</u>	<u>47,028</u>	<u>40,954</u>	<u>47,244</u>
<u>DTP</u>				
Current Expenditures	*	*	*	5,522
Capital Expenditures	<u>11,109</u>	<u>10,207</u>	<u>7,496</u>	<u>2,272</u>
<u>Total</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>7,794</u>

* No data obtained.

Percentages

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>
<u>MTPTC/Central Govt.</u>				
Current Expenditures	3.3	6.1	5.5	6.5
Capital Expenditures	26.4	20.5	20.3	21.6
Total Expenditures	11.6	11.3	10.2	12.2
<u>DTP/MTPTC</u>				
Current Expenditures	-	-	-	35.7
Capital Expenditures	31.7	33.0	28.9	7.1
Total Expenditures	-	-	-	16.5

^{1/} In the column for 1986, the amounts of the central government, the MTPTC and the current expenditures of the DTP reflect the budget. The figure for the DTP's capital expenditures is an estimate.

- 5.38 In 1983 the MTPTC's current expenditures amounted to 3.3% of the government's, and then increased to and held at 5.5% to 6.5%. The increase that began in 1984 coincides with the Ministry's reorganization. The ratio of the MTPTC's capital expenditures to those of the government held constant in the range of 21% to 22% from 1984 to 1986, after having stood at 26% in 1983. The later percentage reflects the level of investment in that year of Storm Drainage Project I and investments in transportation projects.
- 5.39 Moreover, it is seen from the DTP/MTPTC ratios that the DTP's capital expenditures came to about one third those of the Ministry during the first three years, but then fell to a mere 7.1% in 1986.

2. Capital expenditures of the DTP and their financing

- 5.40 The following table summarizes the DTP's capital expenditures:

(US\$ thousands or equivalent)						
	1983	1984	1985	(estimated) 1986	Total 1983-1986	
					\$	%
IDB Drainage Project	11,031.9	10,106.1	7,034.6	1,807.6	29,980.2	96.4
Other Projects	<u>77.5</u>	<u>100.7</u>	<u>461.8</u>	<u>464.5</u>	<u>1,104.5</u>	<u>3.6</u>
Total	<u>11,109.4</u>	<u>10,206.8</u>	<u>7,496.4</u>	<u>2,272.1</u>	<u>31,084.7</u>	<u>100.0</u>

- 5.41 The investments in the Drainage Project, First Stage, partly financed by the Bank, accounted for almost all the MTPTC's capital expenditures. The ratio of budget to expenditures varied between 63% and 86% for the IDB project, but for Other Projects was low, ranging between 1% and 7%. The reason for this low level of implementation was both the existing weakness in the planning and development of budgets and the interruption of the Croix des Bossales markets project, in the Other Projects category. This project, whose execution was interrupted because of the probability of a reorientation, had been slated for partial financing by the IBRD. It is not known at present whether this project is likely to be continued.
- 5.42 The financing of the expenditures indicated in the preceding paragraph breaks down as follows:

(US\$ thousands or equivalent)

	1983	1984	1985	Estimated 1986	Total	
					\$	%
IDB Loans	8,684.4	8,652.8	5,786.1	1,607.6	24,730.9	79.6
Loans other agencies	-	28.3	153.5	100.2	282.0	0.9
Total external resources	8,684.4	8,681.1	5,939.6	1,707.8	25,012.9	80.5
Government resources	2,425.0	1,525.7	1,556.8	564.3	6,071.8	19.5
Total Financing	11,109.4	10,206.8	7,496.4	2,271.2	31,084.7	100.0

- 5.43 During the period considered, the DTP's capital expenditures were financed on average 20% with government resources and 80% with external resources, almost all of them from the IDB. The annual financing of the government declined from US\$2.4 million in 1983 to an estimated US\$564,300 in 1986, reflecting the level of investments in the first stage of the project.

VI. EXECUTION OF THE PROJECT

A. Introduction

- 6.01 The second stage of the Port-au-Prince Storm Drainage Project would be carried out by the Executing Unit set up within the MTPTC, which in its execution of the first stage (loan 564/SF-HA) has already acquired technical and administrative experience in the construction of works such as those proposed in this new operation.

B. Status of designs and initiation of works

- 6.02 Based on the studies done by the French firm of SCET in the framework of technical cooperation ATC/SF-1686-HA, the MTPTC is in possession of the designs for execution of the second stage of the project, which are advanced to the following extent:

	<u>% Advancement on 30 June/86</u>	<u>Time required for completion (months)</u>
2.1 Rectification of ravines	0	4
2.2 Street paving	20	5
2.3 Sediment settling tanks	100	-
2.4 Electricité d'Haïti culvert	100	-
2.5 Saint George culvert	100	-
2.6 Pavée-Paul VI culvert	100	-
2.7 Brea, Sorey, Leclerc culvert	90	2
2.8 Waney-Bijou culvert	90	2
2.9 Diquini culvert	50	4
2.10 Papacito culvert	50	5
2.11 Discharge outlets (dredging)	100	-
2.12 Carrefour Secondary Network	<u>100</u>	-
Weighted Advancement (%)	82	

- 6.03 The advancement in preparation of the designs is considered adequate and permits a reasonable estimation of the total cost of the project. 1/ Using resources from the Fund for Local Contributions established by the IDB, the MTPTC's Executing Unit has scheduled completion of the designs in a five-month period running from July to November 1986. To ensure that the envisaged works program is executed within the five-year disbursement period proposed herein,

1/ See Design Parameters in Annex 13.

and considering that every culvert is justified independently of the others in the others in the project, it is recommended that the possible loan contract include an obligation on the part of the borrower to initiate the physical works for all the culverts within 36 months after the effective date of the possible loan contract. This term, comfortable in view of the state of preparation of the designs, is considered reasonable from the standpoint of the execution timetable, within the institutional capacity of the Executing Unit, and consistent with the annual availability of local counterpart funds. 1/

C. Technology of the project

- 6.04 The execution of the project would be characterized by the application of appropriate technologies, with the intensive use of labor in tasks in which it is considered appropriate. It is expected that this arrangement could generate an average of about 1,200 jobs a year. This generation of urban employment would accomplish the purpose of providing a degree of relief to the alarming levels of poverty prevailing in the metropolitan area.
- 6.05 The technology used in designing the various components of the project is appropriate for Haiti. The subprogram for erosion control on the slopes of Morne l'Hôpital calls for the construction of stone walls with gabions in the ravines, reinforced concrete settling tanks to keep sediment out of the culverts, storm drain pipes and the paving of steep streets with plain concrete blocks. Except for the steel mesh for the gabions and the equipment to transport the materials, the materials would be local and the works would embody a high content of unskilled labor.
- 6.06 The technology that the contracting firms selected would use to lay down the culverts would require construction equipment appropriate for completion of the works within the envisaged terms, including earth-moving equipment, compressors, pumps, compacting equipment, vehicles, concrete mixers, etc. For the dredging work, a marine dredge with all fittings and necessary ancillary equipment would be used to dredge up to 860,000 m³ over a period of about four years. Almost all the materials required for the project would be of local provenance, such as cement, sand, stone, gravel, pipes, steel, wood, etc. The imports would be the additional equipment to be acquired by the contracting firms that would execute the works, the vehicles needed by the Executing Unit to direct and supervise the works, and the equipment needed by the MTPTC's Urban Infrastructure Maintenance Service (SEEU) to maintain the storm drainage system. The fuels and lubricants, and the replacement parts needed for the different equipment to be used during execution of the project, would be of foreign provenance.

1/ See Proposed Resolution.

- 6.07 To summarize, the project is designed to make the most of local materials and both skilled and unskilled local labor, together with the equipment needed for its completion within the established term. Its execution would be very similar to that of the first stage, from 1980 to 1985, which is considered adequate for Haiti.

D. Ecological and environmental aspects

- 6.08 Throughout the duration of the project, about 200,000 trees would be planted on the northern slope of Morne l'Hôpital, stone walls with gabions would be built in selected ravines together with sediment settling tanks, and streets would be paved. Execution of Subproject A is thus expected to reduce erosion, the transport of sediment into the drainage system, and the formation of puddles (stagnant water) in many streets that are inhabited by about 1,000 families, which would benefit directly from a more healthful environment that would present fewer health hazards.
- 6.09 The planting of trees on Morne l'Hôpital would be done on public and the private-owned land as was done in the first stage, in which 400,000 trees were planted. Following is a summary account of the legal status of Morne l'Hôpital:
- (a) The law of 8 May 1936 decreed that the Polisence and Cerisier basins, in which the hill of Morne l'Hôpital is located, were "reserved areas", and declared this area and the work of reforesting it in the public interest.
 - (b) On 27 August 1963 a law was enacted declaring "in the public interest" the work done and to be done in the future for the restoration of Morne l'Hôpital, and stipulating that, as from the date of promulgation of that law and until the issuance of a presidential decree delimiting a certain area of Morne l'Hôpital and declaring it to be "Government Property," any disposition of land in the area decreed to be a "protected area" on Morne l'Hôpital without a previous expert appraisal would be considered prejudicial to the rights and interests of the sellers. The Law itself established that any disposition of land effected during the aforementioned period without such prior expert appraisal would be declared null and void.
 - (c) Another law of 27 August 1963 made the hydrographic basin of Morne l'Hôpital a "Protected Area," and forbade (i) the keeping of unconfined cattle, goats, pigs and sheep, (ii) the cutting of wood and kindling and the extraction of sand, rock and stone for construction purposes, and (iii) the growing of such crops as corn, cassava and potatoes. Article 4 of this law establishes monetary fines and prison terms for violators of any of these prohibitions.
 - (d) On 18 November 1978 the President issued a decree declaring 2,000 ha of Morne l'Hôpital land a public-interest reserve.

- 6.10 Since it is impossible to prevent campesinos from cutting some trees as firewood or to make charcoal for their subsistence, it would be recommended that the Government of Haiti undertake to present to the Bank, as a prior condition to the first disbursement, a plan of action to complement Subproject A. This plan of action would have to include the measures to be taken to regulate soil use on Morne l'Hôpital, limit the development of quarries so as to keep them to no more than three, and reduce, and if possible eliminate, the growing of crops that foster erosion, with the consequent damage done to the storm drainage system by the solid matter washed down into the system and the increase maintenance costs thereby created. So that the implementation of these measures can be monitored, a report on the work done in this connection will have to be submitted to the Bank in the first three months of each fiscal year beginning in 1988. 1/
- 6.11 The works called for in Subproject B would prevent torrential rains from producing floods consisting of long-standing sheets of water mixed with the solid wastes that otherwise would be flushed out of the many latrines in the flat areas of Port-au-Prince. Although the project here considered is only the second of five stages envisaged in the Master Plan drawn up in 1980-82, its impact would appreciably improve the city's environment, particularly in the areas of high population density such as Cité Soleil, Linthau, Brooklyn, Boston, Wharf, Belekou and Drouillard between the culverts of Saint George and Electricité d'Haïti north of the city. Similar environmental improvements would result in the vicinity of Brea, Sorey, Leclerc and Papacito culverts in the central district and the adjacent areas of Diquini and the Waney-Bijou-Rivière Froide culvert in the Carrefour district.

E. Status of land acquisition

- 6.12 The works for the erosion control subproject will be executed on public land; the stone walls with gabions, the sediment settling tanks and the urban streets to be paved at the foot of Morne l'Hôpital are all on public land. The tree planting will be done as required on the tracts involved in accordance with need regardless of whether they are publicly or privately owned. On the basis of the experience in the first stage of this project, no impediment is expected to the accomplishment of these works.
- 6.13 The lands on which the culverts of the primary network are to be laid must be available before the bidding operations for this work can begin. This would affect about 585 families at a cost in indemnification, in the cases of those occupying public lands, or in expropriation, estimated at the equivalent of US\$2,240,000. 2/ It is noted

1/ See the Proposed Resolution, the Recommendations, and Appendix III of the Loan Proposal.

2/ See Annex 5 for further details on the cost of the expropriations.

that the country has a law of 18 September 1979, on Expropriation in the Public Interest which allows the government to take possession of lands once they are declared to be of public interest and following payment of an indemnification to be fixed by a special commission. The culvert that would require the largest number of new land properties is the one that would pass through Cité Soleil. In this quarter people have built without authorization on public lands, and there would not be expropriation but indemnification for improvements made on those lands.

F. Plan of execution

- 6.14 According to the Preliminary Plan for Execution of the Project (PPEP), ^{1/} the project would be executed in a period of five years running from the effective date of the possible loan contract; this term is considered adequate in view of the advanced state of the designs, the experience of the Executing Unit in the MTPTC, and the timely availability of the resources for its financing.
- 6.15 The activities that have initially entered the critical path for execution of the project relate to the signing of the possible loan contract and to fulfillment of the conditions precedent to its eligibility for disbursement, which affects the date on which the works and disbursements begin. The term for completion of these activities would be 48 weeks from the date of approval of the possible loan by the Bank, which is considered adequate in light of the experience acquired in the execution of the first stage.
- 6.16 Other critical activities are the bidding for the works of the Papacito culvert; the third bidding operation for urban streets and the dredging of the discharge outlets, which would be completed at the end of 1991. It is estimated that the bidding operations would require a period of 26 weeks, which is considered reasonable and in line with the Bank's requirements.

G. Acquisition of goods and services

1. Procurement and contracting procedures

- 6.17 In the acquisition of equipment, materials and other goods for the project and in contracting for works financed totally or in part with proceeds of the possible IDB loan, the system of international public bids would be used in all cases in which the value of those acquisitions and contracts exceeded the equivalent of US\$200,000. This procedure is substantially similar to the one agreed upon with

^{1/} See Annex 14 for the Preliminary Plan of Execution and the Timetable of Activities.

the Government of Haiti for other operations. 1/ In the selection and hiring of consulting services to be financed entirely or in part with foreign currency resources of the loan, the procedures established in the loan contract must be followed, in the understanding that the borrower may not impose conditions that prevent or restrict the participation of consultants of member countries of the Bank. 2/

- 6.18 During the execution of the first stage of the Port-au-Prince storm drainage system, the MTPTC executed works on force account to a value in the equivalent of only US\$4.8 million even though it was contractually authorized to execute under that arrangement works for up to US\$11 million if it could justify them to the Bank. The MTPTC was able to show that fewer stone walls with gabions and settling tanks could be built and less paving of streets with blocks done than had been originally estimated; it had the last three settling tanks built by private contractors. During this second stage, the only work to be done on force account would be the planting of 200,000 trees on the north slope of Morne l'Hôpital at a cost in the equivalent of US\$400,000, owing to the special features of this work. 3/

2. Plan of bidding operations for the acquisition of goods

- 6.19 For the acquisition of goods and equipment required for the execution of the project, the MTPTC has scheduled not more than two international bidding operations involving a value of about US\$1,230,000, not counting contingencies and price escalation. Following is a list of the bidding operations to be carried out during the first year and the estimated value of each:

	Quantity Units	Year 1 Semester		Year 2 Semester		Total (US\$1,000)
		<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	
1. Transportation vehicles	24	360	-	-	-	360
2. Equipment for maintenance of the Port-au-Prince storm drainage system (includes trucks, loaders, excavators, a compressor, pumps, light trucks and miscellaneous)	<u>20</u>	-	<u>870</u>	-	-	<u>870</u>
Total	44	360	870	-	-	1,230
	==	===	===	===	===	=====

1/ See Annex 15.

2/ See Annex 16.

3/ See Proposed Resolution.

3. Plan of bidding operations for works contracts

- 6.20 For execution of the civil works under the erosion control subprogram and for the various culverts called for in the project, it is proposed to conduct ten international bidding operations involving a total value of about US\$30,015,000, not accounting contingencies and price escalation. Following is the timetable for these bidding operations, which shows their values in thousands of U.S. dollars, and the opening and closing dates for submission of bids and for the commencement and completion of the corresponding works:

<u>Bidding Operation No.</u>	<u>Works</u>	<u>Total Cost (thousands of US\$)</u>	<u>Opening dates for bids</u>	<u>Closing dates for bids</u>	<u>Commence- ment of works</u>	<u>Comple- tion of works</u>
01/87	Stone Walls Gabions	800	02/87	05/87	07/87	02/90
02/87	Settling Tanks	400	08/87	11/87	01/88	12/89
03/87	Paving urban streets (4 km)	700	02/87	05/87	07/87	06/89
04/87	Culverts SG and EH	7,920	05/87	08/87	10/87	04/90
05/87	Culverts Pavée and Paul VI	2,950	04/87	07/87	10/87	03/90
06/87	Dredging 860,000 m ³	5,440 ^{1/}	05/87	08/87	11/87	12/91
01/88	Culverts Waney-Bijou	4,385	01/88	04/88	07/88	06/90
02/88	Culverts Brea-Sorey-Leclerc, Diquini and Papacito, and Carrefour Secondary Network	5,670	10/88	01/89	03/89	02/92
03/88	Paving 5 km urban streets	875	03/88	05/88	07/88	06/90
01/89	Paving 5 km urban streets	875	04/89	07/89	10/89	12/91
		<u>30,015</u>				
		<u>-1,465</u>				
		<u>28,550</u>				

- 6.21 Haiti has few contractors qualified to carry out works of the type called for and, therefore, it is thought that contracting firms of some member countries would participate in the bidding for the major culvert works and the dredging at the discharge outlets in Port-au-Prince bay, as they did in the first stage. In the bidding for such works as the settlement tanks, stone walls with gabions on the ravines of Morne l'Hôpital and the paving of streets with plain concrete blocks, although the operations were international, it is very probable that the contracts will go to local firms owing to the lack of complexity of these works and their heavy use of local labor and materials. No problem is anticipated in the provision of the local goods to be supplied by the different contractors.

^{1/} Includes US\$1,465,000 for the dredging of 266,000 m³ at 14 discharge outlets under subcategory 4.1, Special Maintenance, in the table of costs.

H. Calendar of investments and use of resources

- 6.22 The proceeds of the possible IDB loan, the possible grant of the European Community, and the local counterpart contribution of the Haitian government would be disbursed over a 5-year period, commencing to run on the effective date of the loan contract. According to the PPEP, the calendar of investments under the project would be as summarized in the following table:

(US\$ thousands or equivalent)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Total</u>	<u>%</u>
IDB FSO loans	7,930	14,750	13,770	8,950	6,400	51,800	90.0
USAID contribution	750	1,000	1,000	300	-	3,050	4.9
Government of Haiti	360	570	460	640	670	2,700	9.6
	<u>9,040</u>	<u>16,320</u>	<u>15,230</u>	<u>9,890</u>	<u>7,070</u>	<u>57,550</u>	<u>100.0</u>
Percentages	(15.7)	(28.4)	(26.4)	(17.2)	(12.3)	(100.0)	

I. Supervision by executing agency

- 6.23 The MTPTC's supervision and administration of the project would be carried out, as in the first stage, by the Executing Unit, which is attached to the Public Works Directorate. Now that the first stage, partly financed by loan 564/SF-HA, is 97% advanced in its physical aspects, the Executing Unit has 30 persons employed almost exclusively in completing the designs for the works that would be built in this possible operation.
- 6.24 As noted in several places, the Executing Unit would be advised, as in the first stage, by experts of international standing (identified as co-managers in the first stage) in the area of engineering and by one in the operation and maintenance of storm drainage systems. In addition, as already noted in the preceding chapter, the project would also enjoy the services of two experts in financial administration. ^{1/}

J. Advance of funds

- 6.25 To provide the borrower with the funds needed to finance the various activities that would be carried out with resources of the Bank, it is recommended that authorization be given to set up an advance of funds from the possible loan for up to 10% of its amount. This would make available funds to cover on schedule the various obligations that would be incurred in executing the project.

^{1/} The terms of reference for these experts are presented in Annexes 11 and 12.

K. Operation and maintenance of the present and future drainage system

6.26 The general cleaning of the storm drainage system and its restoration to satisfactory condition would be accomplished with resources from the financing during the first two years of execution of the project. On the completion of these activities, the MPTC would have to assign to the SEEU sufficient funds to maintain the system in proper condition. Estimates based on experience and projections indicate that the following annual amounts would be required to cover the operation and maintenance of the storm drainage system starting in the third year of execution of the project: the equivalent of US\$973,000 a year from 1988-89 to 1990-91, and US\$1,750,000 a year starting in the fifth year (1991-92). These figures include the US\$350,000 contribution to the Special Maintenance Fund established by loan 564/SF-HA and whatever the ministry would be able to spend on the maintenance and operation of the system. The chief components of the maintenance costs would be: 1/

- (i) US\$543,400 for dredging;
- (ii) US\$405,000 for wages and salaries;
- (iii) US\$257,355 for fuels and lubricants;
- (iv) US\$120,000 for rectification materials; and
- (v) US\$180,000 for equipment maintenance.

6.27 For the sake of satisfactory operation and maintenance of the Port-au-Prince storm drainage systems, it is recommended that the possible loan contract include a clause obligating the borrower (i) to have the works executed under the contract administered, operated and maintained in keeping with generally accepted technical standards, and (ii) to present to the Bank during the 13 years following completion of the cleaning work and within the first quarter of each calendar year, an annual plan for the maintenance of the Port-au-Prince storm drainage system and a detailed report on the maintenance carried out in the preceding year and on the degree of operating efficiency, and also on the state of repair of the system at the end of that preceding year. In addition, to ensure the availability of sufficient funds to cover the costs of operating and maintaining the city's entire sewer system, it is recommended that the foregoing obligation be complemented with another requiring the borrower to provide to the SEEU the amounts indicated in the preceding paragraph for a period of 13 years following completion of the works stipulated in "Subproject C: Maintenance" (investment subcategory 4.1) estimated for 1988. 2/

1/ See detailed projections of maintenance costs in Annex 10.
2/ See Recommendations.

- 6.28 As an important part of the maintenance of the system, which must reduce the accumulation of refuse in the ravines and culverts of the storm drainage system, solid waste collection must function efficiently. Special attention must therefore be given to implementation by the prospective borrower of measures to ensure that the timetable for the utilization of financial resources is adhered to and that the efficiency targets for the collection of garbage recommended in this document (see paragraph 3.17) are met.

L. Ex post evaluation

- 6.29 To establish the extent to which the project's socioeconomic purposes have been accomplished and to make the most of the experience acquired in the execution of future stages of expansion of the system, the borrower must present, within 12 months following the last disbursement, an ex post evaluation report covering at least the following points: 1/

- (i) An analysis of the extent to which the established execution timetables have been fulfilled, including the causes of delays, cost overruns, etc., if any, that have affected the duration and cost of the works. Recommendations in this regard would be presented for application in future stages.
- (ii) An analysis of the technical and economic aspects of the works, including recommendations for their improvement. Specifically, the analysis would cover matters relating to design parameters, the sizing of the works, intensive use of labor, arrangements for execution on contract compared with force account, and any other matter that may be found relevant in this connection.
- (iii) An analysis of the technical, administrative and financial aspects of the maintenance of the works, including recommendations for the solution of problems detected. Specifically, the analysis would evaluate the extent to which the system functions well or badly, and the funds required and budgeted for maintenance.
- (iv) A cost/benefit analysis based on ex post data obtained in a socioeconomic survey taken of a statistically representative sample of beneficiaries on completion of the works. To this end, 0.5% of the housing units would be selected at random in each area of influence (at least 20 interviews would be held in each such area). The methodology and the basic data for the calculations of these economic costs and benefits would be those presented in the related project report. The ex post analysis would include information on the degree of beneficiary satisfaction, and the socioeconomic characteristics of those beneficiaries, particularly their family income.

1/ See Recommendations and Appendix III of the Loan Proposal.

Items (i) to (iii), above, would be applied to each component of the project, but item (iv) only to the culvert component. In all cases the conclusions of the analysis must be supported by the related figures and evidence. Also, the recommendations will emphasize operational aspects so that they can be applied immediately.

- 6.30 The borrower has little capability to produce the material of the ex post analysis of the project, and the Bank's possible loan provides funds to finance the activities involved in that work. In addition, if necessary, the Bank could provide timely reinforcement for the work by sending out a short-duration mission. 1/

M. Inspection and supervision by the Bank

- 6.31 The Bank will supervise the execution of the project through its field office in the Republic of Haiti.

1/ See the Terms of Reference for the international advisers in Annex 11.

VII. JUSTIFICATION OF THE PROJECT

A. Technical feasibility

- 7.01 The studies, designs, plans and specifications for more than 80% of the components of the project, and particularly the 7 main culverts, have been prepared by an engineering firm of established international standing, on the basis of generally accepted design parameters and principles of sanitary engineering. The technical solution found for each culvert is considered appropriate. The decision to pave the steeply sloped streets with plain concrete blocks is also appropriate.
- 7.02 No difficulties are anticipated in the supply of materials or labor. The execution timetable is realistic, having taken account of the characteristics of the work and scheduled the acquisition of the principal goods and construction of works. In keeping with the experience acquired in the preceding stage of the project, the Executing Unit would carry out the planting of trees on Morne l'Hôpital on force account at a cost amounting to little more than 1% of the direct costs.
- 7.03 The project's budget has been calculated not only in light of domestic prices, but also by making comparisons with international indexes. The escalation of construction has been analyzed and calculated in accordance with the Bank's instructions in the matter. To summarize, all the technical aspects have been carefully evaluated, and it has been concluded that the operation is technically justified. Moreover, the Executing Unit would be reinforced in the engineering area and employ a maximum of 133 staff members, of which about 35 would be professionals. In consequence, it is considered that the Executing Unit would have the technical capacity to supervise the execution of the works.
- 7.04 The results of execution of the project would be reflected in an improved standard of living of the low-income population residing in quarters with population densities in excess of 800 inhabitants per hectare and situated at less than 5 meters above sea level, and would thereby contribute to the preservation of the human capital and to the integration and development of the marginal districts of the Port-au-Prince area.
- 7.05 The reforestation component in this second phase of the Storm Drainage Project, although modest compared with the other activities, would reduce the transport of solid matter into the city's sewer system, and thus reduce the need for costly routine maintenance of that system. In the first stage the planting of trees on Morne

l'Hôpital was completed without difficulty, and it is expected that, with the experience acquired by the Executing Unit in the organization and supervision of this work, the case will be the same in the second stage.

B. Institutional feasibility

- 7.06 The purpose of the envisaged reinforcement of the DTP is to improve the areas in which weakness could affect negatively the development of the project here considered. With this reinforcement and the experience it has already acquired in the first stage of the program, it is expected that the Executing Unit would be adequately prepared to execute the project and to handle its accounting and financial administration.

C. Financial feasibility

1. Feasibility of the local counterpart contribution

- 7.07 The funds necessary to cover the local contribution to the project would be provided through appropriations on the government's development budget to a total amount of US\$2.7 million and local-currency contributions of AID totaling US\$3.1 million in funds recovered under PL-480. In addition to the local contribution to the Bank's projects, the only other appropriations under that budget for the DTP anticipated during the projected period are: i) an annual contribution in the equivalent of US\$350,000 to the Special Maintenance Fund required under contract 564/SF-HA; ii) appropriations in the equivalent of US\$500,000 for the asphaltting and rebuilding of urban streets; and iii) a small counterpart contribution (US\$87,000) for the construction of a market at Cap-Haitien partly financed by the Government of France.
- 7.08 The following projections show the expenditures for the above-cited projects and their financing.

PUBLIC WORKS DIRECTORATE
Projections of Capital Expenditures and their Financing
In US\$ thousands ^{1/}
For Years Ending 30 September

	Estimate 1986	1987	1988	1989	1990	1991	Total 1987-91
<u>Expenditures</u>							
IDB project under study		9,040	16,320	15,230	9,890	7,070	57,550
Stage I Drainage Project	1,808	2,507					2,507
Other projects	465	1,018	1,397	1,063	850	850	5,178
Total expenditures	2,273	12,565	17,717	16,293	10,740	7,920	65,235
<u>FINANCING</u>							
IDB loan for proj. under study		7,930	14,750	13,770	8,950	6,400	51,800
IDB loans, Drainage I	1,608	2,377					2,377
Subtotal IDB	1,608	10,307	14,750	13,770	8,950	6,400	54,177
AID contr. to proj. under study		750	1,000	1,000	300		3,050
Other financial agencies	100		400	200			600
Total external resources	1,708	11,057	16,150	14,970	9,250	6,400	57,827
Resources Govt. of Haiti	565	1,508	1,567	1,323	1,490	1,520	7,408
TOTAL FINANCING	2,273	12,565	17,717	16,293	10,740	7,920	65,235

^{1/} In constant dollars of June 1986, except for the IDB project under study, which includes price escalation.

- 7.09 The projections indicate that during the period considered the DTP's investments, would consist mostly in the projects partially financed by the Bank, which represent 92% of the DTP's total capital expenditures during the period, a level that attests to the importance of those projects if the DTP is to continue in operation.
- 7.10 The projections also show that the government should assign every year to the DTP amounts ranging between US\$1.3 million and US\$1.6 million. In comparison, the annual appropriations from 1983 to 1985 range between US\$1.5 million and US\$2.4 million. The reason for the reduction of the appropriation to US\$564,000, in 1986 was that many of the works of the first stage of the drainage project came to a standstill owing, among other things, to the recent political events.
- 7.11 It can be inferred from the foregoing comparison that, except for 1986, a year made unique by the events that have occurred in it--the annual national budget appropriations projected as needed are in line with past annual government contributions to the DTP.

2. Feasibility of the local funding for maintenance

- 7.12 The local resources for maintenance of the Drainage System would come, as in the past, from the SEEU's functional budget for Maintenance and from the Special Maintenance Fund (FEM). The purpose of the following table is to determine whether, based on the financing for SEEU operations provided under Sewerage Projects I and II and in view of the annual contributions of US\$350,000 to the Special Maintenance Fund, as required under contract 564/SF-HA, enough resources would be available to cover the maintenance operations during the period of execution of the project if the SEEU's budget remains at past levels.

PUBLIC WORKS DIRECTORATE
Projection of Income, Expenditures and Balance in the
Special Fund for Maintenance of the Drainage System
In thousands of US\$ of June 1986
For years ending 30 September

	<u>Estimated</u> <u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>
Init. bal. Spec. Fund	-	-	378,4	517,1	728,3	438,5
<u>INCOME</u>						
Govt. of Haiti						
SEEU funct. budget	708.9	623.0	623.0	623.0	623.0	623.0
Contr. to Spec. Fund	131.6	470.0	471.3	350.0	350.0	350.0
Total Govt of Haiti	840,5	1,093.0	1,094.3	973.0	973.0	973.0
IDB Drnge. proj. I and II	185.2	550.0	435.0	735.0	300.0	300.0
TOTAL INCOME	1,025.7	1,643.0	1,907.7	2,225.1	2,001.3	1,711.5
<u>EXPENDITURES 1/</u>	<u>1,025.7</u>	<u>1,264.6</u>	<u>1,390.6</u>	<u>1,496.8</u>	<u>1,562.8</u>	<u>1,750.0</u>
Final bal. Spec. Fund	-	378.4	517.1	728.3	438.5	-38.5

7.13 In this table the annual budgetary appropriations are projected at the average level of the last three years. The annual contributions to the FEM in 1987 and 1988 include, in addition to the required US\$350,000, the recovery of the balance due of the first installment (US\$241.3 thousand recovered in two years). Regarding the financing of the project here considered, the table contains only the resources for activities properly identifiable with the SEEU's normal operations, to wit, the purchase of equipment and cleaning of culverts and settling tanks. These funds amount to US\$1.8 million of the total of US\$5.1 million for maintenance under the proposed project. The above table shows that, with resources that the government is already committed to contribute for maintenance on the budget for the SEEU--assumed to be similar to the historical level and therefore feasible--plus the contributions to the FEM, there would be during the period of execution enough resources to cover the operational costs of maintenance. This is made possible by the Bank's financial support through Drainage Programs I and II, which permit the formation of reserves in the FEM during the first three years for use in the last two. Although the FEM ends with a negative balance of US\$38.5 thousand, no problems are envisaged in covering this amount.

1/ See Annex 10.

- 7.14 Finally, in addition to the maintenance costs, the DTP has other current expenditures--mostly remunerations--in its other sections. These other expenditures are estimated at about US\$400,000 a year for 1986 and for the years of the execution period considered. Given the nature of these expenditures, it is expected that they can be covered in the future. It may be stressed that, from 1992 on, the year following completion of the project, the government would have to increase its functional budget for the SEEU from US\$623,000 to US\$1,400,000 a year which, added to the annual contribution of US\$350,000 to FEM, would cover the estimated maintenance costs from 1992 on. It is recommended that the government be required to make the necessary contribution to cover that maintenance. 1/
- 7.15 In view of all the foregoing, it is considered that the proposed project is also feasible from the financial standpoint.

D. Socioeconomic feasibility

1. Introduction

- 7.16 The main purpose of the proposed project is to significantly reduce the flooding that occurs in several parts of Port-au-Prince because of the periods of prolonged rainfall in the region. Accordingly, the economic analysis methodology employed here seeks to quantify the principal benefits by establishing the damage to the population from this flooding: i) damage to homes and to personal effects in them owing to the makeshift nature of the housing in extensive areas of the city; ii) hours of work lost of people living in flooded areas; iii) losses associated with the traffic congestion caused in the city's chief arterial thoroughfares; and iv) in some cases, savings in the cost of maintaining and cleaning the present culvert systems. These benefits are itemized further on as part of an analysis of the project's economic cost.
- 7.17 There are obviously other costs and benefits associated with the rehabilitation and extension of the drainage network which, being in small amounts or difficult to specify, have not been quantified; these include: i) costs to the population associated with nuisances and losses during construction of the works. An important instance of this is the Waney-Bijou and Rivière Froide culverts, which are squarely on the Dessalines thoroughfare in Carrefour. This street currently carries a traffic averaging 1,200 vehicles/hour on only two lanes. Construction of the work would significantly increase the congestion on this thoroughfare; ii) an additional consequence of the flooding is the formation of puddles, which are foci of infection in that they permit the proliferation of mosquitoes that carry malaria and other diseases. They are also sources of other water-borne

1/ See Recommendations.

diseases (diarrhea, etc.) and contribute to the generation of disagreeable odors. Although, generally speaking, these circumstances derive directly from the absence of a proper sanitary sewer system, it is considered that the project would contribute to improvement of the environment and the health of the population; 1/ iii) the St. George and Electricité d'Haïti culverts in particular are expected to clear for construction purposes lands that are today almost permanently submerged. Much of this land is presently owned by the National Port Authority, and is reserved for a future duty-free zone project. The indefiniteness of this project and of future urbanization projects in the Brooklyn, Boston and Wharf quarters, has prevented a reasonable assessment of this benefit; iv) although in part duplicated by the aforementioned benefits, the value of the properties in the vicinity of the culverts and associated pavings in consequence of the project is expected to rise, as a general reflection of the high value that these families assign to the reduction of flooding. The scarcity of data on the value of properties and leases in relation to different features of the housing unit and its location prevent a formal analysis of this element, which is therefore not included; and v) one last element of some importance is the prevention of interference with street trade, the open-air markets and pedestrian traffic. Owing to the significance of the informal sector in Port-au-Prince, this element is not without significance. Unfortunately, data on these activities are nonexistent.

- 7.18 In addition to the foregoing, it must be mentioned that the project includes resources for improving the operating conditions of the existing system. In particular, the tree plantings on Morne l'Hôpital, ravine-rectification works, construction of sediment settling tanks, paving of roads and general cleaning are expected to contribute to a reduction of the costs of maintaining the system in consequence of the expected reduction in the volumes of sediment transported by rainwater into the network. The impossibility of accurately measuring the probable impact of the first stage of the erosion control works and of anticipating the quantitative effect of the proposals in this stage have made it impossible to perform a cost-benefit analysis of this component. 2/ It is not amiss to mention further that these works contribute to a general improvement of the environment by preserving and extending an area of greenery in the vicinity of an important urban center and to increase the value of the properties adjacent to the roads to be paved.

1/ See Chapter II, Frame of reference, for information.

2/ It is estimated that, as a direct consequence of erosion on Morne l'Hôpital and adjacent ravines, some 160,000 m³/year were carried off by the existing system in 1980, which was the direct cause of the drop in that system's efficiency. For budgetary purposes, however, it is now considered necessary to remove some 25,000 m³/year of sediment at a direct cost of approximately US\$360,000.

- 7.19 A general note of caution may be sounded here concerning the accuracy of the calculations of socioeconomic return and distributional impact that follow: the quality of the figures reported by the Government of Haiti is fairly poor; this is reflected in both the obtaining of contradictory data from different sources, in the need to use somewhat stale information, and in the emphasis on studies done by international consulting firms and agencies. ^{1/} In this particular case, preference has been given to the data of an ad-hoc survey done to establish the levels of damage to families in the submerged quarters. Accordingly, the results presented must be viewed with more than usual caution.
- 7.20 To assess both the costs and the benefits of the project in economic terms, the corresponding market prices have been adjusted to their "frontier" equivalents by discounting taxes, tariffs and other transfers. The following table gives the conversion factors used:

	<u>Factor</u>
Local materials and equipment	0.95
Imported materials and equipment	1.00
Skilled labor	0.95
Unskilled labor	0.44
Lands	0.95

- 7.21 These factors were established as follows: i) on the basis of statistics on foreign trade and tariff revenue for the period 1980-1984, a standard conversion factor of 0.95 was computed for direct application to local materials and equipment, lands (or indemnifications), and skilled labor; ^{2/} ii) the goods and equipment directly imported for execution and maintenance of the project works are duty-free, and the conversion factor is therefore 1.0; and iii) the opportunity cost of unskilled labor was taken as the equivalent of a 7-gourde work day actually paid which, based on the budgeted minimum wage of 15 gourdes/day and adjusted to frontier prices (0.95) yields the coefficient shown of 0.44.

2. Analysis of benefits and costs

a) Area of influence of the project

- 7.22 The principal benefits of the project are directly associated with the avoidance of flooding in different parts of the city. It is therefore to identify these flood-prone areas that an area of

^{1/} In fact, the results reported are based on the report of a consultant hired under the WHO-PAHO/IDB Agreement in May-June 1985.

^{2/} For lack of better information, the standard conversion factor is made equivalent to the conversion factor for consumption.

influence has been defined for each culvert taking account of such factors as the hydrographic basin, topography, degree of urbanization, and characteristics of the existing drainage. 1/ The table on the next page gives the estimated numbers of housing units in each area of influence; as can be seen, they total little more than 80,000 in 1986. Additional details on each case are presented in what follows:

1/ The analysis is based on maps of Port-au-Prince drawn to a scale of 1:5,000 together with information on watersheds, flood-prone areas and population density data available in the study for the Master Plan prepared by SCET International in 1980.

Summary of Benefits
(US\$ thousands)

	Housing units	Growth rate	<u>Damage to Dwellings</u>		<u>Damage to Effects</u>		<u>Recovery Lost Days</u>		<u>Traffic Congestion</u>		
			Unit	Present	Unit	Present	Unit	Present	Unit	Cost	Value
<u>Total</u>	<u>1986</u>	<u>%</u>	<u>(US\$/yr)</u>	<u>Value</u>	<u>(US\$/yr)</u>	<u>Value</u>	<u>(US\$/yr)</u>	<u>Value</u>	<u>Vehicles</u>	<u>Cost</u>	<u>Value</u>
<u>Culvert</u>											
<u>Northern district</u>											
St. George	21261	1.7	73.7	8446	24.1	2771	8.3	947	-	-	-
Electricité d'Haïti	10607	1.7	34.3	1964	31.9	1825	12.7	728	-	-	-
<u>Central District</u>											
Pavée-Paul VI	10590	1.85	35.2	2041	13.1	757	2.2	126	3700	12.3	248
Brea	1593	3.7	88.7	936	58.0	612	5.5	58	-	-	-
Sorey	1460	3.7	88.7	858	58.0	561	5.5	53	-	-	-
Leclerc	1449	3.7	88.7	851	58.0	557	5.5	53	-	-	-
Papacito	3006	3.7	51.0	1015	72.3	1437	5.5	108	-	-	-
<u>Southern District (Carrefour)</u>											
Diquini	3408	3.7	112.3	2535	66.1	1492	2.2	51	-	-	-
Waney Bijou/Rivière F.	27184	2.9	46.4	7685	21.7	3590	2.1	350	-	-	-
<u>TOTAL/AVERAGE</u>	<u>80558</u>	<u>2.4</u>	<u>55.9</u>	<u>26331</u>	<u>28.3</u>	<u>13602</u>	<u>5.5</u>	<u>2474</u>	<u>-</u>	<u>-</u>	<u>248</u>

- 7.23 Northern District: The St. George and Electricité d'Haïti culverts are to be laid down in this district. The main reason for the priority of these works is the fact that in 1986 about 125,000 persons reside in a usable area of 85 has, for a density of about 1,500 persons/ha. 1/ This extremely high density reflects the abject poverty of the families in the sector as measured by any socioeconomic indicator whatever. 2/ Moreover, this is an area of accelerated population growth owing to immigration from rural areas, opportunities for employment in the neighboring industrial parks, and the efforts at urbanization and population relocation made by the Government of Haiti together with international agencies and other governments, the World Bank and Federal Republic of Germany, among others.
- 7.24 The growth rate shown in the foregoing table--1.7% between 1986 and 2006--conservatively assumes a saturation level of 176,000 persons (an inhabited area of 220 ha with a density of 800 inhab./ha) to be achieved in 1993 at the present 5% growth rate. For purposes of the analysis, the area of influence of each culvert has been isolated on the basis of the topography (the water parting), and it has been established that the quarters north of the avenue linking National Road 1 to the coast (Blvd. Cité Soleil), that is, Cité Soleil, Linthau I and Linthau II, and also half of the Boston quarter, will be directly drained by the St. George culvert. The rest of the Boston quarter and all of Brooklyn will be within the area of influence of the Electricité d'Haïti culvert. The preceding table gives the respective figures.
- 7.25 Centreville District: In this district, works are to be executed for the construction and rehabilitation of culverts in the streets Rue de Miracles, Pavée (including an extension in Rue Lamarre), Paul VI and Champ de Mars. The proposed works partly complement those executed in the first stage of the project, with, for example, the culvert on Pavée street continuing downstream a culvert that is part of the Bois-de-Chêne system. It is also important to note that the main purpose of the project is to rehabilitate and complement an old drainage system that today is only partly operative. The area in which the problems associated with rain would be avoided totals 54 has, determined chiefly by their immediate proximity to the streets in which the works will be executed, owing to the fact that the district is so heavily urbanized that waters accumulate along the streets, to the detriment essentially of the properties along them. Thus, with an average density (in 1976) of 800 inhab./ha and an

1/ Exclusive of the Wharf quarter, this district was estimated in 1980 to be inhabited by some 93,300 persons (FCH International, "Etude d'Améliorations Physiques des Cités Simone, Jean-Claude, Linthau, Brooklyn, Boston et Wharf," 1981). To update this figure to 1986, the growth rate has been assumed to be 5%, higher than the 3.7% for Port-au-Prince as a whole.

2/ See Annex 17.

assumed growth of 1.85% a year (equivalent to half of Port-au-Prince as a whole), gives slightly over 10,000 housing units affected by the project, as indicated in the foregoing table. Also because of this high density and the high degree of consolidation of the area, a relatively low growth rate is used in the projections.

7.26 South-Central District: The purpose of the works proposed in this district is to channel the principal ravines that traverse the area: Brea, Sorey, Leclerc and Papacito. The entire hydrographic area to be covered comes to 285 ha, with a density estimated at 260 inhab./ha in 1976. For purposes of the following calculations, however, the areas of influence are considered to be only those in the vicinity of the ravines, which total almost 99 ha, less than 35% of the total area. The main reason for this is the topography, which makes for relatively deep ravines and steep slopes in the adjacent lands, which makes for significantly high volumes of water runoff and severe erosion of the adjacent lands. It should be further noted that the road that links Port-au-Prince with the Carrefour quarter and the southeastern region of the country crosses these ravines at their lower ends. With an average traffic of about 1,200 vehicles an hour, this street becomes heavily congested when water spills out over the main intersections and brings traffic to a stop. In view of the low population density, the growth rate for purposes of the projections for the period 1986-2006 has been assumed at 3.7%, the same as the rate recorded during the intercensus period (1971-1982) for Port-au-Prince as a whole.

7.27 Carrefour District: In this district the project calls for the construction of the Diquini, Waney-Bijou and Rivière Froide culverts. Unlike the other cases, this also includes the construction of part of the secondary drainage network, particularly in the upper reaches of Carrefour. The Waney-Bijou and Rivière Froide culverts actually serve to intercept the waters flowing down from the upper reaches of the district. The land immediately adjacent to these culverts is subject to severe flooding, which brings to a stop the heavy traffic that moves along the aforementioned arterial thoroughfare. The secondary network to be built would serve an area of influence of 214 ha, which in 1986 has 27,000 housing units, for a density of 620 inhab./ha. Weighing a low growth in high-density quarters (Rivière Froide) with a similar growth for the city as a whole, yields for the rest of the city a rate of 2.9%, which has been used to project the benefits of the project.

b) Benefits from reduction of damage

7.28 The main damage caused by flooding to the population of Port-au-Prince is the destruction of or damage to homes and personal effects. The low quality of the housing units, the lack of street infrastructures in some sectors and the topography conspire to inflict major property damage in extensive areas of the city. The

basic purpose of the proposed project is to put an end to this flooding, which will benefit the families by sparing them the expense of repairing and replacing their goods.

- 7.29 To quantify the damage done by flooding, a socioeconomic survey has been conducted among 325 families that would benefit from the proposed works. Following is a summary of the salient findings of the survey, which are consistent with the foregoing table. 1/
- 7.30 The damage to housing has been established at an economic cost of US\$56 per family per year. Considering that there are about 42 significant rainfalls a year, this represents an expenditure of US\$1.3 per rainfall per family. Although this figure is apparently slight in absolute terms, it must be remembered that the income level in Haiti is exceedingly low. This cost amounts to almost half of a minimum daily wage, which means that the annual family expenditure comes to the equivalent of the pay for 19 days of work.
- 7.31 An additional average of 50% has been computed for damage to personal effects as reported by the families interviewed. Combining this with the data of the preceding paragraph, it is found that the project would avert damage valued at US\$84.2/family/year under both headings.
- 7.32 It is clear that there is some correlation between the levels of damage and the socioeconomic characteristics of the population. Thus, the highest levels of damage combine with the indicators of most abject poverty in the areas adjacent to the St. George, Diquini and Waney-Bijou culverts. The opposite is the case in the Centreville district where, as already noted, the housing and street infrastructures are better.
- 7.33 The foregoing table also shows the present value of these benefits based on the following considerations: (i) according to the program's general investment timetable, the benefits received are 100% starting in the sixth year of the analysis (1992), 73% in the fifth year, and 41% in the fourth year; (ii) the discount rate is 12% and the analytical horizon is 20 years; and (iii) the growth of the benefits equals the expected growth of the population, that is, the unit benefits per housing unit would hold constant in real terms.
- 7.34 Based on the stated assumptions, the benefits under this head of property damage would total US\$39.9 million, which comes to an average equivalent to almost US\$500 per housing unit considered in 1986. In regard to each culvert and, obviously, on the basis of the total number of housing units affected and of the level of the unit benefits, the highest level of avoided damage is about US\$11.2 million each for the Waney-Bijou and St. George culverts. At the other extreme are the Brea, Sorey and Leclerc works with benefits under this heading on the order of US\$1.4 million each.

1/ See Annex 18.

(c) Benefits from recovery of days of work

- 7.35 In addition to the property damage caused by floods, the populations residing in flooded areas are frequently prevented from carrying on their normal occupational, educational, recreational and other activities. This naturally imposes an additional cost (on the families and the country as a whole) that would be avoided by building the culverts.
- 7.36 The methodology followed in this case considers only the value of the work days lost by the population and ignores, as difficult to quantify, the cost associated with the days on which schools are closed, homemakers are prevented from doing their work, and the family is barred from possible recreational activity.
- 7.37 On the basis of the aforementioned socioeconomic survey, it has been determined on the basis of the answers given by the people interviewed that every year each family loses slightly over four days of work because of flooding. 1/ This figure is tantamount to inability to work one of every 10 days of significant rainfall and is associated directly with the need of the affected family to repair or replace the damage done and to the traffic congestion that is caused in extensive areas of the city. 2/ The number of days lost is significantly higher in the northern district where, owing to the topography, the floods tend to last longer, and are fewer in sectors like Centreville where water runs off more rapidly and the places of work are nearer.
- 7.38 The monetary value of the man/hours recovered as a result of the project is computed on the basis of the social opportunity cost of unskilled labor, which is equivalent to one day wage of US\$1.30. This has been used to obtain, as shown in the foregoing table, annual benefits averaging US\$5.50 per family, which vary between US\$2 in Carrefour and US\$13 in some parts of the northern district.
- 7.39 Using the previously stated assumptions for the analytical horizon, discount rate and timetable of benefits yields a benefit under this heading of about US\$2.5 million for the project as a whole. The aforementioned table also shows the results obtained for each culvert considered.

1/ See Annex 18.

2/ When it is considered that the cost of repairing this damage includes charges for the use of unskilled labor, which must be provided by members of the family for the most part, it is seen that the quantification of this benefit in lost workdays involves an undetermined degree of duplication. No data are available with which to eliminate this possible duplication, which, however, is not considered important owing to the relatively low level of these benefits as a proportion of the total.

(d) Benefits from less traffic congestion

- 7.40 All the culverts under the project directly affect traffic on the most important arterial thoroughfare in the city of Port-au-Prince, which is Blvd. Jean-Jacques Dessalines. This street connects to the north with National Road 1 (in the vicinity of the Electricité d'Haiti plant) and links the capital with the country's principal cities: St. Marc, Gonaïves (and Cap-Haitien), Mirebalais, etc. To the southwest, this thoroughfare continues to the town of Les Cayes, capital of the Sud Department. This arterial thoroughfare carries a sizeable freight and passenger traffic into and out of Port-au-Prince. Moreover, within Port-au-Prince it is the main artery linking the civic and commercial center of the city and the low-lying quarters (both to the north and to the south). Indeed, it is virtually the only link with the populous Carrefour district.
- 7.41 For purposes of the present analysis, benefits from reduced congestion have been quantified only for the central sector of the city (Centreville), chiefly on the basis of available traffic counts and the relative importance of this element for determining the need to build the Pavée-Paul VI culvert system. ^{1/} The principal assumptions, hypotheses and results of this exercise are presented in what follows, and it is apposite to reiterate the warning about the uncertainty of the available basic data.
- 7.42 The area of influence of the Pavée-Paul VI culverts is determined directly by the streets and avenues under which they are to be laid: Rue des Miracles, Rue Pavée, Rue Paul VI and Rue Champ de Mars, all running from east to west. The area of influence also includes the sections within this area of the main north-south streets: J.-J. Dessalines, Rue Magasin de L'Etat, Rue de Quai, and Blvd. H. Truman. This area corresponds to the lower reaches of the culverts to be laid down and in part implies completion of the works constructed upstream in the first stage.
- 7.43 For this sector an average traffic of 3,700 vehicles/hour has been estimated on the basis of the following data: (i) traffic counts on Blvd. Jean-Jacques Dessalines and at the intersections in the stated area of influence, dating to December 1978-January 1979; (ii) these counts, conducted between the hours of 6 a.m. and 7 p.m., have been adjusted to an hourly average for a 24-hour period using a factor of 2/3 to reflect lower traffic during the night; and (iii) this traffic figure has been updated to 1986 with an average of the results of two hypothesis, the first assuming zero growth of the traffic in the area

^{1/} As already noted, all the proposed culverts affect this street and, therefore, the quantified benefits underestimate the total benefits in all cases except Centreville. This calculation could also be important in justifying Waney-Bijou and Rivière Froide, although it must be considered that an alternative link between Port-au-Prince and Carrefour is under study.

inasmuch as congestion was already high in 1978/1979 and a count during the analysis mission showed no significantly higher figures for hourly traffic; and the second assuming that total traffic continues to grow as a function of the total population and of an elasticity of trips/person assumed to be 0.5. The result of the foregoing is a rate of 8.5% for the period 1979/80 and 1986.

- 7.44 The principal effect of floods on traffic is congestion, which reduces the speed of vehicles moving in the area. This lower speed implies (i) an increase in vehicle operating costs and (ii) an increase in the time that persons take to enter, traverse and leave the flooded area. In a first calculation it was established that the increase in vehicle operating costs is minute owing to the relatively short distances and the already slow speed of traffic; therefore, in what follows only the saving of time for the persons driving in the area is estimated.
- 7.45 The time saving per vehicle has been estimated at about five minutes for each significant rainfall assuming 1/ (i) a mean duration of congestion of one hour per significant rainfall; (ii) an average trip distance of 0.51 km to traverse the area (in either a north-south or east-west direction); and (iii) mean speeds of 5 km/hr during floods and 20 km/hr in normal weather.
- 7.46 The economic value of an hour of time per vehicle has been estimated at US\$3.50 based on the facts that (i) 45% of the vehicles in the area of influence are small buses carrying five passengers, of whom 50% are travelling in connection with their work. This work is assumed to be unskilled manual labor and valued at its opportunity cost (US\$3x0.44); and (ii) the remaining vehicles are automobiles carrying an average of 1.5 passengers, of which 1.0 is travelling in connection with his or her work and is assigned a minimum income of US\$1,000/month needed to own the vehicle. This income is regarded as that of skilled labor and is converted at frontier prices by a standard factor of 0.95. It must be noted that the proposed calculation disregards the value of the time of students, homemakers and other economically inactive persons who also benefit from the reduced congestion. 2/

1/ The data that follow are assumptions based on information provided by individuals familiar with the situation in the sector, and some parameters obtained from other cities in Latin America.

2/ It is possible that part of the time saved under this heading has already been counted for the inhabitants of Centreville, under the heading of benefits for recovery of days lost. However, since Centreville is an important civic and commercial center, it is assumed that the proportion of trips from origins and to destinations within the same district is minute relative to the total of trips into and out of that sector.

- 7.47 Assuming the occurrence of an average of 42 episodes of significant rainfall per year yields benefits of US\$12 per vehicle/year. Further considering a traffic growth rate of half the growth rate of the population in the past yields benefits in present value at 12% of US\$0.25, as brought out in the preceding table.

(e) Economic costs of investments

- 7.48 The table that follows breaks down the investment costs of the project for each culvert and under the main input categories. 1/ These costs include (i) the value of the culvert works and associated structures (as detailed in Chapter III); (ii) the cost of the works for the dredging of each culvert; 2/ (iii) for the Waney Bijou/Rivière Froide system the investment cost includes the associated secondary network; (iv) in the appropriate cases the cost of street paving directly associated with the reduction of erosion and of sedimentation in each culvert is added; (v) the costs of expropriations and indemnifications connected with each work are also included; (vi) the general engineering and administration costs have been prorated to the sum of the foregoing costs and constitute a surcharge of 19.6%; and (vii) to the total of the foregoing is added a 10% charge for physical contingencies. Unlike the table of the general costs of the project, this table, following the usual methodology, excludes charges for price escalation and finance charges.

1/ The matrix used to convert each category of costs to economic inputs is presented in Annex 19. For the economic calculation, additional information on the use of imported inputs was available.

2/ These costs come to US\$683,000 and affect 3.9 km in the sectors of Brea, Carrefour, Leclerc and Papacito.

Investment Costs

By Input Categories

(US\$000, average 1986)

Culvert	Labor		Materials and Equipment	Taxes	Financial Total	Economic Total	P
	Unskilled	Skilled					
<u>Northern District</u>							
St. George	821.6	4,599.5	7,797.5	195.0	13,413.6	12,303.7	9
Electricité d'Haïti	76.6	515.3	1,419.6	27.1	2,038.7	1,888.6	1
<u>Central District</u>							
Pavée-Paul VI	245.8	1,385.4	2,406.9	59.3	4,097.4	3,760.4	2
Brea	85.3	491.2	1,123.0	24.2	1,723.7	1,586.9	1
Sorey	19.1	108.1	189.4	4.6	321.3	294.9	
Leclerc	52.1	263.5	472.5	12.0	800.1	730.7	
Papacito	164.3	900.0	1,723.8	41.0	2,829.1	2,595.3	1
<u>Southern District</u>							
Diquini	118.4	683.3	1,289.0	30.2	2,120.9	1,949.8	1
Wainey-Bijou/Rivière Froide	586.3	3,206.7	5,325.0	135.9	9,253.9	8,477.1	6
TOTAL	2,169.5	12,153.0	21,746.7	529.3	36,598.7	33,587.4	24
Percentage	5.9	33.2	59.4	1.4	100.0	91.8	

- 7.49 The total cost of the subproject for the culverts totals US\$36.6 million, of which about 62% is for the St. George and Waney-Bijou/Rivière Froide culverts. This is obviously a direct consequence of the magnitude of the works to be executed, both in their extent and in the volumes of design discharge flows. Based on the total number of housing units in the area of influence of the works, it is found that the investment cost per family would be US\$454. This indicator of cost-efficiency varies significantly, however, between a low of US\$192 per housing unit for the culvert of Electricité d'Haïti to US\$1,082 for the Brea culvert.
- 7.50 The last columns in the table give, respectively, the investment costs valued at frontier prices and their present value in 1986 discounted at 12% based on the program's general investment timetable. 1/ The adjustment of financial to economic prices amounts to a discount of 8.2%, reflecting chiefly internal transfers associated with the collection of rates, the value-added tax and distortions on the labor market. The present value of the total cost of the program is US\$24.7 million in economic terms.
- 7.51 It must be taken into account that the stated values largely represent the final solution for a process of cost minimization owing to the taking into account, for designing purposes, of such elements as (i) maximum utilization of the existing works (particularly in the Centreville area); (ii) preferential use of local materials; (iii) intensive use of labor (this item exceeds 39% of the total cost of the project); and (iv) in the specific case of the Papacito and Diquini ravines, preference to containment, rectification and reinforcement works over culvert works without appreciable affecting the expected benefits. Despite the lack of formal studies of alternatives, it is clear that from the reports reviewed and from discussions with the MTPTC that this element weighed considerably in several aspects of the designs. 2/

(f) Economic costs of maintenance

- 7.52 The following table presents the maintenance costs associated with the construction of each culvert. It must be noted that these costs are incremental, reflecting the expected difference between the case with the project and the case without it. Data provided by the MTPTC's Maintenance Service indicate that US\$46,600 is spent yearly

1/ The percentages of the resources used between 1987 and 1991 are, respectively 15%, 29%, 29%, 17% and 10%.

2/ The single notable exception is the selection of a precipitation recurring every 10 years as the basis for sizing the primary drainage network. This value was selected on the basis of experience in other countries and takes account of the uncertainty of future urban development, takes 1990 as its horizon year, and allows a substantial safety margin. A shorter recurrence period (for example 5 years) might have been more advisable.

to clean out the sediment that builds up in the existing natural ravines with every rainfall, and this budget also includes the cost of cleaning the streets in the vicinity of the flooded areas. With the project the total budget rises to US\$356,500, essentially owing to the need for periodic dredging of the discharge outlets of the culverts. 1/ In the exceptional case of Pavée-Paul VI this incremental cost is negative because there is no additional dredging to be done, this work having already been done in the first phase of the storm drainage project.

- 7.53 The annual incremental costs come to US\$317,000 at financial prices and US\$272,000 at economic prices, and include items for dredging, cleaning of culverts and streets (net of the case without the project), the cleaning of settling tanks where appropriate, an annual cost for maintenance of the paved streets subject to flooding, and a charge for general and administrative expenses. 2/ An analysis of unit costs has also yielded information on economic inputs as presented in the table that follows. Note here the high proportion of imported inputs in culvert maintenance chiefly owing to the significant proportion of the dredging costs and to the use of fuels and special equipment.
- 7.54 Based on the timetable for completion of the works, and assuming a 20-year horizon and a 12% discount rate, the present value of these maintenance costs has been calculated as shown in the last column in the table. These costs total US\$1.2 million for an average of 5% of the respective investment costs.

1/ Subsequent to the completion of this report, the MTPTC revised this figure upward by 12%. The calculations that follow have not been revised owing to the slight effect of this element on the profitability of the project. For an updated detailed presentation of the total costs for maintenance of the system, see Annex 10.

2/ This annual cost has been assumed at 1% of the paving cost.

Investment Costs

By Input Categories

(US\$000, average 1986)

Culvert	Labor		Materials and Equipment	Taxes	Financial Total	Economic Total	Present Value
	Unskilled	Skilled					
<u>Northern District</u>							
St. George	821.6	4,599.5	7,797.5	195.0	13,413.6	12,303.7	9,059.6
Electricité d'Haïti	76.6	515.3	1,419.6	27.1	2,038.7	1,888.6	1,390.9
<u>Central District</u>							
Pavée-Paul VI	245.8	1,385.4	2,406.9	59.3	4,097.4	3,760.4	2,768.5
Bréa	85.3	491.2	1,123.0	24.2	1,723.7	1,586.9	1,168.5
Sorey	19.1	108.1	189.4	4.6	321.3	294.9	217.2
Leclerc	52.1	263.5	472.5	12.0	800.1	730.7	538.2
Papacito	164.3	900.0	1,723.8	41.0	2,829.1	2,595.3	1,910.7
<u>Southern District</u>							
Diquini	118.4	683.3	1,289.0	30.2	2,120.9	1,949.8	1,435.8
Waney-Bijou/Rivière Froide	586.3	3,206.7	5,325.0	135.9	9,253.9	8,477.1	6,241.7
TOTAL	2,169.5	12,153.0	21,746.7	529.3	36,598.7	33,587.4	24,731.1
Percentage	5.9	33.2	59.4	1.4	100.0	91.8	67.6

(g) Summary of results

- 7.55 The principal results of the cost/benefit analysis are presented in the table that follows, which establishes that all the accepted projects have a positive net present value discounted at 12%, the best results being given by the culverts that would be laid down in the northern district (St. George and Electricité d'Haïti) and in the southwest (Diquini and Waney-Bijou/Rivière Froide). For the project as a whole, the net benefit obtained is US\$17 million. In line with the foregoing, in all cases the internal rate of return is over 12%, ranging between 14% and 16% for four culverts and exceeding 20% in all the others. The benefit/cost indicator (over 1.0 in all cases) also reflects the merit of the projects considered and gives an idea of the safety margin embodied in the results. Thus, on the average the project's economic benefits exceed its economic costs by 64%, and by less than this average in only four projects whose coefficients range between 1.15 and 1.31.

Annual Maintenance Costs

By Input Categories 1/

(US\$ thousand, average for 1986)

Culvert	Labor		Materials and Equipment	Taxes	Financial Total	Economic Total	Present Value
	Unskilled	Skilled					
<u>Northern District</u>							
St. George	28.3	23.0	139.9	8.6	200.5	172.1	781.2
Electricité d'Haïti	3.9	3.2	19.2	1.2	27.5	23.6	107.1
<u>Central District</u>							
Pavée-Paul VI	-0.6	-0.5	-3.1	-0.2	-4.5	-3.9	-17.7
Brea	2.6	2.2	12.9	0.8	18.6	15.9	72.2
Sorey	0.7	0.6	3.4	0.2	4.9	4.2	19.1
Leclerc	1.5	1.2	7.4	0.5	10.6	9.1	41.3
Papacito	1.3	1.1	6.5	0.4	9.4	8.1	36.8
<u>Southern District</u>							
Diquini	3.9	3.3	19.6	1.2	28.0	24.0	108.9
Waney-Bijou/Rivière Froide	3.1	2.6	15.2	0.9	21.8	18.7	84.9
TOTAL	44.7	37.4	221.0	13.6	316.8	271.8	1,233.8
Percentage	14.1	11.8	69.8	4.3	100.0	85.8	-

1/ Refers to incremental maintenance costs.

Basis: Analysis of unit costs of principal categories of expenditure.

- 7.56 A better idea of the possible margins for error in the decision to accept or reject a subproject is given by the results of the sensitivity analysis presented in the foregoing table. It is established, in general, that most of the projects exceed the minimum IRR in the presence of significant changes independent of the principal parameters. 1/ Even in the case of the culverts of relatively lowest return the IRR does not fall below 10% in the presence of unfavorable changes in the assumptions used.
- 7.57 The analysis also considered the timeliness of the projects by calculating the net present value (NPV) resulting from postponing the investment program for one year. The results for the base case are shown in the last column of the table, which shows a net reduction in the return of US\$1.9 million for the project as a whole. This reduction of the NPV is also found for each culvert considered, which warrants the conclusion that the best course is to execute the project as scheduled.
- 7.58 It is concluded from the foregoing observations that, from the economic standpoint, each culvert is profitable, reliable and timely.

3. Analysis of the distributional impact

- 7.59 This section presents a quantification of the changes in economic flows to be produced by the direct effects of the project for three economic agents: private low-income groups, other private groups and the public sector. Following the established methodology, the impact on private groups deriving from net changes in public sector income is disregarded.
- 7.60 The low-income threshold agreed upon between Haiti and the Bank for purposes of this analysis was, in February 1986, G/2892 per capita per year. However, the absence of recent statistics on income distribution makes it impossible to use this threshold figure rigorously to distribute the project's expected benefits. It was only on the basis of partial information gathered on the ground and indirect indicators such as characteristics of housing units and health indexes that the results were obtained that are presented in what follows.
- 7.61 It is considered that the benefits deriving from the reduction of damage to dwellings and effects are received directly by those affected by flooding. Based on the available indicators for the Cité Soleil area, it is estimated that 100% of the inhabitants of the northern district are low-income earners. 2/ This percentage has

1/ An analysis was also made of the sensitivity of the results in the presence of increases in the annual maintenance costs and assuming elimination of the benefits associated with work days lost. These are not shown in the summary table owing to the slight effect on the results obtained.

2/ See Annex 17.

also been applied to the other areas of the project owing to the general similarity of the socioeconomic conditions, particularly the housing, to those of Cité Soleil. The only exception to this is the area of influence of the Pavée and Paul VI culverts in Centreville, to which no low-income beneficiaries have been assigned because it is predominantly a civic and commercial center whose residents are in markedly more comfortable circumstances. Thus, the weighted effect is 93% for low-income earners, which yields a total of US\$45 million (in present value discounted at 12%). ^{1/} It should further be noted that the public sector receives a negative income because lower requirements for materials, equipment, etc, imply lower revenues from the taxes on such goods.

- 7.62 In the case of benefits from the recovery of lost work days, in line with the value placed on those benefits, they have been assigned in their entirety to the private low-income sectors. The savings of time from reduced traffic congestion have been distributed on the basis of the proportion of affected cars and buses, employment rates and the differential incomes of the users of these vehicles. Assuming that 100% of the users of buses, and none of the users of cars, are in the low-income sector yields a weighted coefficient of 5% for this group.
- 7.63 The differential of wages to unskilled labor implicit in the calculation of shadow prices is regarded as a transfer to the private low-income sector through investment and maintenance expenditures. This transfer comes to 53.3% of the wages budget for unskilled labor. ^{2/} On the basis of the proportions of resources in this category, the resulting transfer to low-income groups is US\$1.2 million.
- 7.64 The foregoing data are summarized in the following table, which shows that the private sector would receive income in the equivalent of US\$52.5 million, of which 93% would go to the low-income sector. The results for the public sector would be a net outflow of about US\$35.8 million.

^{1/} This percentage may significantly overestimate the low-income beneficiaries in the sense that the savings in prevented damage will probably be transferred to the owners of the dwellings in the form of higher rents and property values. Assuming that 100% of the owners of rented dwellings (40% of all the dwellings in Cité Soleil) are not low-income earners, a weighted coefficient of 56% would be obtained for the low-income sector. Although speculative, this figure conveys an idea of the lower limit of the project's distributional impact.

^{2/} The minimum wage is 15 Gds/day and the opportunity wage 7 Gds/day, hence $(15-7)/15 = 0.533$, the percentage given in the text.

Summary of the Distributional Impact

Category	Low Income	Other Private	Total Private	Public Sector	Economic Total
<u>Benefits</u>					
-Reduction of damage	45,113	3,396	48,509	-8,576	39,933
-Recovery days lost	2,474	-	2,474	-	2,474
-Less congestion	12	236	248	-	248
Subtotal	47,599	3,632	51,231	-8,576	42,655
<u>Costs</u>					
-Investment	1,156	-	1,156	-25,887	-24,731
-Maintenance	93	-	93	-1,327	-1,234
Subtotal	1,249	-	1,249	-27,214	-25,965
TOTAL	48,848	3,632	52,480	-35,790	16,690

Coefficient of distributional impact = $48848/52480 = 93\%$.

H A I T I

PROYECTO DE ALCANTARILLADO PLUVIAL DE
PUERTO PRINCIPE - SEGUNDA ETAPA
(HA-0057)

ANEXOS

H A I T I

Marco de Referencia

A. Situación económica reciente

- 1.01 No obstante un crecimiento moderado en los últimos dos años, el producto real de la economía haitiana no recuperó los niveles alcanzados al principio de la década. Entre 1980 y 1985, el producto interno bruto (PIB) real por habitante se redujo en casi un 10 por ciento. El período se caracterizó por una inestabilidad de la inversión, una reducción en los niveles ya críticos del consumo por habitante y un deterioro en la infraestructura, tanto económica como social, y en los servicios. Las exportaciones de bienes sólo en el año 1985 lograron superar en un 3 por ciento el valor alcanzado en 1980; la entrada de capitales no pudo compensar el saldo negativo de la cuenta corriente de la balanza de pagos y el sector externo incurrió en pérdidas de divisas en todos esos años. Aunque recién en 1985 se observó un claro mejoramiento del desequilibrio fiscal, desde mediados de 1984 el país no pudo continuar girando los recursos provenientes del acuerdo con el Fondo Monetario Internacional por falta de cumplimiento de las metas. Frente al problema de la desocupación y de los deprimidos salarios reales, el país enfrentó en los últimos años disturbios sociales que culminaron con el cambio de Gobierno a comienzos de 1986.
- 1.02 Durante 1985, el crecimiento de la economía se estimó en sólo 1,7 por ciento, originado en parte, por el débil comportamiento de la demanda interna. La agricultura, debido a los mejores resultados alcanzados durante el primer semestre, mantuvo, aunque a un ritmo menor que el año anterior, una tendencia ligeramente hacia el alza, principalmente en sus rubros alimenticios y en algunas de sus exportaciones. Al mismo tiempo, las construcciones residenciales, facilitadas por la mayor disponibilidad de crédito para las mismas, lograron obtener un mejor ritmo de actividad, observándose paralelamente una expansión de la producción de cemento que contrasta con el comportamiento deprimido de años anteriores. En este sector de la construcción, la acción oficial no tuvo un impacto dinámico, dado que sus inversiones continuaron debilitadas con el corte de los últimos años en los gastos públicos de capital. La industria, por su parte, mostró nuevamente bajas en diversos rubros vinculados con el consumo interno, en tanto que el subsector de exportaciones en general continuó mostrando dinamismo, el que deriva de la mayor demanda proveniente de los Estados Unidos. Cabe señalar que en la distribución del crédito por actividad se observó una significativa expansión de los orientados a las construcciones y servicios financieros en detrimento principalmente del sector industrial.
- 1.03 En el sector externo siguieron observándose los signos del desequilibrio. No obstante haber mejorado el nivel de las exportaciones agrícolas menores, del cacao, de las industriales y de

casi haberse contenido las importaciones, el país siguió experimentando un fuerte déficit comercial. En la producción y exportación de café se observaron caídas de volumen y valor no obstante la mejora de precios. También bajaron las exportaciones de azúcar y sisal, dada la reducción de la cuota de importaciones de Estados Unidos y la competencia de productos sintéticos, respectivamente. Además, se observó una gradual reducción de los ingresos por turismo así como aumento de los egresos lo que puede estar vinculado, entre otros factores, con la apreciación de la moneda en términos reales efectivos. Todo ello, junto a la menor entrada de capitales, particularmente oficial, derivó nuevamente en una situación de pérdidas de reservas con efectos en algún atraso de pagos externos.

- 1.04 La reducción del déficit del Gobierno Central en 1985 se logró tanto por la vía de una menor expansión del gasto corriente y la reducción de los de capital, como por la vía del crecimiento de la recaudación tributaria en virtud de medidas tomadas oportunamente. Esta disminución del déficit contribuyó a una menor presión sobre el crédito interno y a una baja en la tasa de crecimiento de la oferta monetaria. La inflación aumentó sólo ligeramente después del incremento decretado en los precios de los combustibles y otros bienes esenciales, particularmente el carbón que es de uso generalizado. A eso contribuyó el menor nivel de precios de los productos agrícolas durante la primera parte del año.

B. Políticas económicas

- 2.01 Desde el comienzo de la década de los ochenta, la política monetaria y crediticia se reorientó hacia el uso del crédito interno para poder financiar el elevado déficit fiscal, con lo que se redujo la disponibilidad de crédito privado. Ello se debió a la expansión del gasto que ya se venía observando y a la caída del ingreso corriente en 1981. También se procedió a aumentar la tasa de interés y el encaje legal de los depósitos. Al mismo tiempo, se fueron tomando medidas dirigidas a racionalizar el manejo del sistema fiscal y del presupuesto.
- 2.02 Las políticas en 1985 fueron orientadas a restablecer el acuerdo Stand-by con el FMI que había quedado suspendido desde abril del año anterior, buscando reducir las presiones del déficit a través de los ingresos. Ello se hizo mediante el aumento de diversos tipos de impuestos en octubre de 1984 y marzo de 1985, la ampliación del impuesto a las ventas del 7 al 10 por ciento y otras medidas similares adoptadas hacia el fin del año con efectos para el período fiscal que va desde octubre 1985 a septiembre 1986. Entre otros esfuerzos, pueden señalarse como aspectos importantes de organización, la centralización por primera vez de todos los rubros de ingresos del fisco, la comprensión en el presupuesto 1985/86 del sector público como un todo, y la sujeción de las empresas estatales al impuesto a los beneficios industriales y comerciales. Los instrumentos del sector monetario como requerimientos de encaje y tasas de interés no mostraron variación durante 1985.

C. El sector público

- 3.01 Dentro del sector público, el Gobierno General participa con alrededor del 60 por ciento del total --tanto de los ingresos como de los gastos corrientes-- y con el 80 por ciento de los gastos de capital. Lo restante corresponde a las empresas públicas, las que, en su conjunto, transfieren parte de sus ahorros al Gobierno General. Este último tuvo ahorros negativos en todo el período 1981-85 debido a la reducida base tributaria y al aumento del gasto que se dio desde antes de iniciarse este período. Aunque el déficit público global se redujo en 1982 luego tendió a empeorar hasta 1984. La necesidad de mejorar dicho déficit motivó un fuerte corte de la inversión pública en 1985.
- 3.02 Frente a tales dificultades y después de cumplir adecuadamente con un primer acuerdo (1982-83) con el FMI, el país no pudo satisfacer las metas estipuladas sobre el nivel del déficit fiscal y el aumento del financiamiento interno a través de préstamos del Banco Central de un segundo convenio para el lapso 1983-85. Desde abril de 1984 este último quedó en suspenso en espera de un mejoramiento, lo que tampoco pudo lograrse. Más aún, en 1985 el país entró en un atraso de pagos, incluyendo al FMI.
- 3.03 Como consecuencia de los problemas fiscales, las previsiones para los dos primeros años del Plan de Desarrollo 1982-86 no pudieron cumplirse. Debido a ello, el país revisó sus planes y elaboró una nueva estrategia 1984-86 en la que estableció un nivel de inversiones inferior en un 30 por ciento. No obstante esta reducción, hasta 1984 el plan se cumplió en un 70 por ciento con respecto a lo revisado y en casi un 60 por ciento con relación al plan original. El 1985 la inversión volvió a reducirse. Comparado con las inversiones del quinquenio 1977-81, la participación de la energía, la industria y el desarrollo urbano del presente período aumentó en detrimento de la agricultura, el transporte, la educación y la salud que permaneció sin cambios. Los sectores afectados, al mismo tiempo, son los que se financian casi masivamente a través de la ayuda externa.
- 3.04 Entre 1981 y 1985, el sector público como un todo logró reducir su déficit fiscal de 13 hasta un 6,4 por ciento del PIB. Sin embargo, ello se logró principalmente a través de la baja de los gastos de capital, que actuaron como el factor de ajuste ante la dificultad de reducir los gastos corrientes. En efecto, los gastos públicos de inversión llegaron a representar el 7,6 por ciento del PIB en 1985 con relación al 12,1 por ciento en 1981 y como proporción del gasto total se redujeron de 42 a 29 por ciento. Además, estos gastos que a veces incluyen gastos corrientes, registran continuas oscilaciones. Dentro de los gastos públicos de inversión, los más importantes son los que se financian parcialmente con recursos concesionales y representan alrededor del 80 por ciento del total incluyendo a las empresas públicas. Luego se tienen las inversiones financiadas por el Tesoro, de por sí bajas (18 por ciento del total), las que recién en 1985 recuperaron niveles anteriores.

Gastos de Capital - Sector Público Global
(En millones de Gourdes)

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
<u>Ahorro Público</u>	-69	66	86	48	119
<u>Gasto de Capital</u>	<u>883</u>	<u>748</u>	<u>848</u>	<u>977</u>	<u>762</u>
Tesoro	135	144	95	96	127
Parcial con Recursos Concesionales					
Gobierno General	380	510	481	515	484
Empresas Públicas	144	102	225	255	187
Otros	224	-8	47	111	-36
<u>Déficit Sector Público</u>	<u>952</u>	<u>682</u>	<u>762</u>	<u>929</u>	<u>643</u>
<u>Fuentes de Financiamiento</u>	<u>952</u>	<u>682</u>	<u>762</u>	<u>929</u>	<u>643</u>
Donaciones	236	285	280	310	263
Préstamos Concesionales	217	195	329	310	265
Desembolsos	230	212	351	328	298
Amortizaciones	13	17	22	18	33
Préstamos Comerciales					
Externos	252	-40	56	-8	-79
Préstamos Internos	247	242	97	317	194

- 3.05 La asistencia externa bilateral y multilateral significa un importante flujo de divisas. Estos ingresos son inestables, han disminuido y podrían bajar más aún si no se mejora la capacidad financiera interna para poder obtener mayores fondos externos. El monto neto de los préstamos concesionarios viene reduciéndose debido tanto a las mayores amortizaciones anuales, pero más por los menores desembolsos de los últimos años, lo que implica la demora en la ejecución de los proyectos. En el caso del BID el monto de los desembolsos se redujo en los últimos tres años y quedó sin ejecutar un 35 por ciento en promedio de lo programado para cada año entre 1982 y 1985. En el programa USAID/Haití también se redujeron los desembolsos y quedó sin ejecución un 22 por ciento promedio de lo previsto entre 1982 y 1984. Entre los problemas que tiene el país para dinamizar el uso de los recursos concesionarios, se tiene, además de los vinculados con factores técnico-institucionales, la débil capacidad de contrapartida. En esta última influye la dificultad de disminuir los gastos corrientes, la deficiente asignación de los mismos, a lo que se agrega el impacto de los conflictos sociales últimos. También inciden las limitaciones existentes para aumentar el endeudamiento interno en razón del desequilibrio financiero del Gobierno, y para incrementar los préstamos comerciales externos dada la baja calificación que tiene el país ante estas fuentes de financiamiento.

D. Perspectivas

- 4.01 Dado el bajo nivel de infraestructura económica y social que tiene el país, es claro que sus necesidades inmediatas, sin tomar en cuenta las necesidades correspondientes al aparato técnico-institucional, es el de mantener el nivel de inversiones (tanto públicas como privadas), o aún el de expandirlas. Los conflictos político-sociales que se dieron desde comienzos del año fiscal junto a los daños físicos ocurridos fueron en detrimento de la economía, por lo que se estima alguna reducción de la producción con relación a los niveles de 1985. A su vez, el Gobierno realiza esfuerzos de políticas y de organización como medio de dinamizar la economía y evitar un clima recesivo más prolongado que el inmediato. Tales conflictos tuvieron que ver, además de los factores políticos, con el detrimento de los niveles de vida de la población en general, en un ambiente en el que la capacidad de absorción de trabajo es muy limitada.
- 4.02 Por lo anterior, con el objeto de aliviar las dificultades sociales que el país venía confrontando, el Gobierno había procedido a decretar la reducción de precios de ciertos artículos esenciales de consumo en enero de 1986, algunos de los cuales fueron otra vez reducidos por el nuevo Gobierno. Este último procedió también a eliminar ciertos impuestos a las remuneraciones en general como medio de aumentar la capacidad de compra de la población, a tiempo que se otorgaron aumentos salariales en diversas ramas de la administración pública. Por otra parte, el Ministerio de Finanzas estudia los medios de continuar en el futuro próximo con un nuevo programa de reforma del sistema impositivo.
- 4.03 Aunque el fuerte aumento del precio del café contribuye a compensar parte de las pérdidas que tuvo la recaudación impositiva con motivo de los conflictos sociales ocurridos en 1986, el Gobierno procura controlar el nivel del déficit público a través del control de sus gastos operativos. La disponibilidad de divisas es otra dificultad que enfrenta el país, no obstante el efecto favorable de los precios del café.
- 4.04 Un flujo regular de divisas es urgente, tanto para sustentar un nivel mínimo de consumo, como para mantener un nivel de inversiones adecuadas para frenar el deterioro de la planta física actual. Consecuentemente, el aporte externo de recursos rápidamente desembolsables es vital para dinamizar los programas nacionales en actividades prioritarias, como incentivo tanto para la inversión privada como para liberar los fondos locales para programas que se financian internamente. Paralelo a las acciones que contemplan los diversos organismos internacionales, hacia fines de agosto de 1986 una misión conjunta Fondo Monetario Internacional-Banco Mundial visitó Haití con el objeto de iniciar conversaciones sobre la viabilidad de un posible programa de acción con el país.

DRAINAGE DES EAUX PLUVIALES DE PORT-AU-PRINCE (Suite)

2^e PHASE DES TRAVAUX

EAU SECONDAIRE

12

Revêtement et Drainage à Carrefour

2

ervation sol et eaux	Mise en pleine terre de 200,000 arbustes	
tion de 5 dégraveurs isolés	Turgeon, Bois Patate, Maltèque, Bourgoy, St. Gérard	
agement de ravines	Environ 12,000 m ³ de mur en gabion sur différentes ravines	
es Urbaines	Revêtement de 14 Km de voies urbaines	2

Corrección y/o estabilización de quebradas

<u>Número</u>	<u>Nombre de Quebrada</u>	<u>Número aproximado de muros de piedra con gabiones</u>	<u>Volumen (m3)</u>	<u>Costo Total (US\$1.000)</u>
1	Turgeonau	18	740	49,3
2	Au Chat	35	1.435	95,7
3	Bois Patate	9	370	24,7
4	Marchand	33	1.350	90,0
5	Martelly	32	1.310	87,3
6	Debussy	6	265	17,7
7	Mont Joli	13	530	35,3
8	Bois de Chene	40	6.000	400,0
	Totales	186	12.000	800,0

PROYECTO DE DRENAJE PLUVIAL DE PUERTO PRINCIPE
2a. ETAPA (HA-0057)

CANALIZACION	SUBLOTE	CONDUCTO	DRAGADO	CANAL TRAPEZOIDAL		ENROCAMIENTO	DESARENADOR	CANAL RECTANGULAR	TUBERIA	TUBER
		COLADO		EN MAMPOSTERIA	Y CAIDAS EN			HORMIGON	HORMIGON	
		EN SITIO	(m3)	(m)	(m3)	(m3)		HORMIGON ARMADO	Ø2 (m1)	Ø0.60 a
		(m)						(m)		
Lote No. 1										
St-Georges	1.1		404.397		4.688					
	1.2	25		1.260						
	1.3			1.250						
	1.4	44		713		800				
	1.5	55		840				10		
Lote No. 2	2.1		51.218		1.239					
Electricité d'Haiti	2.2	38		522				172		
Lote No. 3	3.2	320		103						
	3.3	263								
Rue Pavée-Paulo VI	3.4	1040						39		749
Lote No. 4										
BREA-SOREY-LECLERC	4.1		64.364		2.424					
	4.2	210								
	4.3	496		298		2 x 200				114
Lote No. 5	5.1		9.540		1.049					
PAPACITO	5.2	13		216				67		
	5.3	13		337						
Lote No. 6	6.1		35.686		722					
DIQUINI	6.2	28		555		576				
Lote No. 7										
Waney - Bijoux - RF	7.1		30.000		1.000					
(WB-RF)	7.2	208		481				23	616	380
	7.3	1.048								
	7.4									
TOTALES		3.801	595.208	6.575	11.122m3	1.776m3		311m	616	1243m

DRAGADO DE LAS DESEMBOCADURAS DE PUERTO PRINCIPE

2a. ETAPA DE LOS TRABAJOS

(HA-0057)

(COSTOS EN US\$ DOLARES)

LOCALIDAD	CANALIZACIONES	LOTE NO.	EXPROPIACION	DRAGADO	OBRAS	TOTAL
Puerto	St. George	1	334.800	2.425.000	7.436.000	10.195.800
	Electricité d'Haïti	2	686.600	383.000	480.000	1.549.600
Central	Rue Pavée - Paulo VI	3	170.000	-	2.949.000	3.119.000
	Brea - Sorey - Leclerc	4	444.600	510.400	952.000	1.907.000
	Papacito	5	300.000	150.000	1.500.000	1.950.000
ARREFOUR	Waney - Bijoux/Rivière Froide	6	100.000	249.500	4.386.000	4.735.500
	Diquini	7	204.000	257.100	1.150.000	1.611.100
TOTALES			2.240.000	3.975.000	18.853.000	25.068.000

Red Secundaria en Carrefour

<u>Calles</u>	<u>Longitud</u> (m)	<u>Costo en (US\$1.000)</u>
Cayemite	818	263
Waney 89	444	105
Beliof	319	54
Mahotiere 75	225	67
Charpentier	958	242
Waney 93	1.074	296
Waney 91	378	101
Veronique	125	18
Thor 73	178	51
Mahotiere 85	750	160
Mahotiere 77	305	68
Mahotiere 83	259	48
Thor 67	452	108
Franccis Duvalier	347	98
Waney 87	985	244
Mahotiere 81	194	56
DesDunes	560	93
Total	8.281 =====	US\$2.072 =====

PROYECTO DE DRENAJE PLUVIAL DE PUERTO PRINCIPE 2a. ETAPA
(HA-0057)
DRAGADO DE LAS DESEMBOCADURAS A LA BAHIA

<u>Lote No</u>	<u>Canalizaciones</u>	<u>Volumen</u> <u>Dragado (m3)</u>	(US\$ 1.000)		
			<u>Costo</u> <u>Dragado</u>	<u>Costo</u> <u>Enrocamiento</u>	<u>Costo</u> <u>Total</u>
1	Saint-George	404.400	2.224	201	2.425
2	Electricite de HAITI	51.200	282	101	383
3	Pavee-Paulo VI	-	-	-	-
4	Brea-Sorey-Leclerc	64.400	354	156	510
5	PAPACITO	9.500	52	98	150
6	WANEY BIJOU-				
	RIVIERE FROIDE	30.000	165	85	250
7	DIQUINI	35.700	196	61	257
		595.200	3.273	702	3.975

Costos Limpieza y Rehabilitación General del Sistema de
Drenaje de Puerto Príncipe (P.A.P) HAITI

		<u>Valores en US\$</u>	
		<u>Sistema Drenaje P.A.P.</u>	
		<u>Sistema Antiguo y Obras 1a. Etapa</u>	<u>Obras de 2a. Etapa</u>
1.	Limpieza manual de las tuberías sumergidas en el área entre la Avenida J.J. Desalines, Paralela a la Costa y 5a. Avenida Bolosse y Rue Saint Joseph, perpendiculares al litoral.		
	8360 m3 x US\$30/m3 =	250.000	-
2.	Reemplazo de tuberías de pequeño diámetro (ø 18" y ø 24")		
	5000 metros x US\$240 =	1.200.000	-
3.	Rectificaciones diversas	150.000	-
4.	Limpieza de canales, tanques de retención de sedimentos y desembocaduras correspondientes a la 2a. Etapa (HA-0057)		900.000
5.	Desembocaduras, 1a. Etapa		
	266000m3 x US\$5.50	<u>1.463.000</u>	-
6.	Adquisición equipo para mantenimiento	870.000	-
7.	Mejoras a las instalaciones del SEEU	<u>217.000</u>	-
	Total Costo de Mantenimiento	4.150.000	900.000
		=====	=====
		US\$5.050.000	
		=====	

Proyecto de Drenaje Pluvial Puerto Príncipe 2a. Etapa (HA-0057).
Limpieza inicial, reemplazo de tuberías pequeñas,
rectificaciones diversas, limpieza canales y desgravadores, dragado,
desembocaduras antiguas y de la etapa, adquisición de equipo
mantenimiento y mejoras instalaciones SEEU.

1. Limpieza de las tuberías sumergidas

<u>Sección</u>	<u>Longitud</u> (m)	<u>Area</u> (m2)	<u>Volumen de Sedimentos</u> (50% de la sección) (m3)
30" día	1.800	0.50	450
36" día	3.100	0.65	1.008
1 m x 1 m	1.200	1.00	600
1,5 m x 2,0 m	1.400	3.00	2.100
2,0 m x 3,0 m	1.400	6.00	4.200
			<u>8.358</u>

Costo de limpieza inicial = 8.358 m3 x \$30.00 = \$250.740.00

2. Reemplazo de tuberías de cemento de ø18" y 24" por tuberías
ø 30" y 36":

<u>Localización</u>	<u>Longitud en metros</u>
Route des dalles	1.100
Rue Mgr. Guilloux	500
Rue Lamarre	200
Rue Tiremasse	500
Rue Sans Fil	500
Ruelle Titus-Rue Makandal	400
Route Canape Vert	500
Boulevard J.J. Dessalines	1.200
Avenue Francois Duvalier	400
Total	<u>5.000</u>

Costo 5.000 x US\$240.00 = US\$1.200.000

		(Unidades)	US\$ Costo Unitario	US\$ Costo Total
3.	<u>Diversas Rectificaciones</u>	<u>Cantidad</u>		
	i) Reconstrucción de pozos de registro	50	350	17.500
	ii) Rectificación de pozos de registro	285	100	28.500
	iii) Tapaderas en hormigón	280	50	14.000
	iv) Rejas metálicas	280	150	42.000
	v) Colocación tuberías ø 36" y ø 30"	200 m	240	48.000
	Total			150.000

4. Limpieza de canales, tanques de retención de sedimentos de las obras de la 2a. etapa que se terminen durante el 3o., 4o. y 5o. año de ejecución del Proyecto.

<u>Canalización</u>	<u>Período de Mantenimiento (Años)</u>	<u>Costo Anual (US\$1.000)</u>	<u>Costo Total (US\$1.000)</u>
Saint George	2,25	205	461
Electricite de Haiti	2,25	31	70
DELMAS	1,25	100	125
PAVEE-Paulo VI (abajo)	3,25	2	6
PAVEE-Paulo VI (arriba)	2,25	2	5
PINTADE	3,25	20	65
Joseph Janvier	3,25	7	23
Rue 4	2,25	5	11
PAPACITO	0,60	12	7
Brea-Sorey-Leclerc	1,25	53	66
DIQUINI	0,60	30	18
WANEY-BIJOU-RIVIERE FROIDE	2,00	25	50
Red Secundaria Carrefour	0,75	5	4
			911

5. Gastos, limpieza general, sistema drenaje de Puerto Príncipe
(incluye canalizaciones antiguas y las construídas en la 1a. Etapa)
(Considerados categoría 4a., Gastos Mantenimiento Cuadro de Costos)

<u>No.</u>	<u>Canalizaciones</u>	<u>Dragado</u> (m3)	<u>Dragado</u> (1.000 US\$)
1	Saint Martin y Delmas	100.000	550,0
2	Martelly - Marchand	25.000	137,5
3	Croix de Bossales	5.000	27,5
4	Bois de Chene	75.000	412,5
5	Paul VI	4.000	22,0
6	Joseph Janvier	5.000	27,5
7	CHARERON	8.000	44,0
8	FRONT FORTS	5.000	27,5
9	De la Poste	6.000	33,0
10	Des MIRACLES	5.000	27,5
11	CHAMP DE MARS	7.000	38,5
12	Saint HONORE	11.000	60,5
13	PAVEE	5.000	27,5
14	5a. AVENUE BOLOSSEE	5.000	27,5
	TOTALES	266.000	1.463,0

6. Equipo requerido para el mantenimiento del Drenaje de Puerto Príncipe

<u>Tipo de Equipo</u>	<u>Cantidad</u>	<u>Costo</u> <u>Unitario</u> (US\$1000)	<u>Costo</u> <u>Total</u> (US\$1000)
Jeep	2	12	24
Pick-up (doble cabina)	2	12	24
Pick-up (camioneta)	5	10	50
Cargador sobre ruedas (1,2m3)	2	70	140
Excavadora clamshell/retro	2	150	300
Camiones de Volteo	7	40	280
Compresor	1	15	15
Malacate-vibrador	1	6	6
Bombas portátiles diesel	6	4	24
Equipos Diversos	-	-	7
Total			870

7. Mejoras Instalaciones

Servicio de Entretien de los Equipamientos Urbanos (SEEU)

	<u>Area</u>	<u>Costo</u>	<u>Costo</u>
	<u>(m2)</u>	<u>Unitario</u>	<u>Total</u>
		<u>(US\$)</u>	<u>(US\$)</u>
1. Ampliación espacio de oficina	125	460	57.500
2. Ampliación almacén	150	440	66.000
3. Mejora del local, oficina y almacén, baños, equipos aire acondicionado, máquinas de escribir, teléfonos, etc.	-	-	65.000
4. Compra equipo de oficina	-	-	28.500
Total			217.000
			=====

ANEXOS

PROYECTO DE DRENAJE PLUVIAL PUERTO PRINCIPE (2a. ETAPA)
COSTO DE LAS EXPROPIACIONES

<u>Lote No.</u>	<u>Canalizaciones</u>	<u>Costo de Indemnización o expropiación (US\$ dólares)</u>	<u>Domicilio y/o Familia No.</u>	<u>Area (m2)</u>
Lote 1	Saint George (SG)	334.800	127	8.511
Lote 2	Electricite de Haití (EH)	686.600	279	5.042
Lote 3	Rue Pavée-Paulo VI (PE-PL)	170.000	2	-
Lote 4	Brea-Sorey-Leclerc (BA-SY-LC)	444.830	80	5.146
Lote 5	Papacito (PO)	300.000	45	2.112
Lote 6	Diquini (DI)	205.000	47	3.177
Lote 7	Waney-Bijou Riviere Froide (WB-RF)	100.000	5	1.000
	Total	2.241.230	585	24.988

Sub-Categoría 1.2 Supervisión y Administración

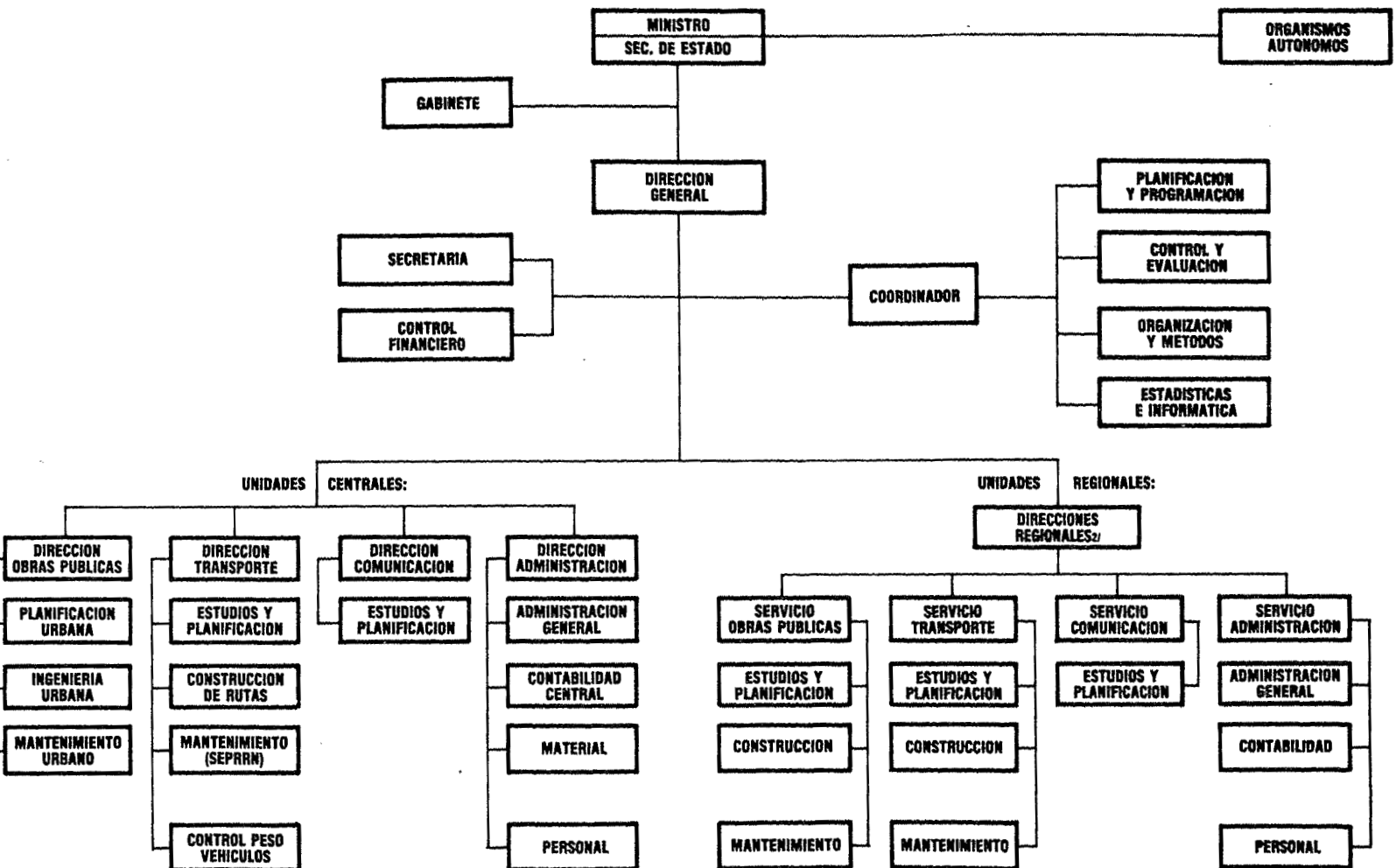
A. Personal Unidad Ejecutora (UE)

<u>Especialidades o Cargos</u>	<u>US\$ mes</u> <u>Honorarios y/o</u> <u>Salarios</u>	<u>Período</u> <u>(meses)</u>	<u>(Miles)</u> <u>US\$ Costo</u> <u>Total</u>
1 Gerente de Proyecto	1.800	60	108,0
1 Gerente Adjunto	1.400	60	84,0
2 Asesores Internacionales (Co-gerentes)	6.000	60	720,0
2 Ingenieros Senior	1.100	60	132,0
20 Ingenieros Senior	800	60	960,0
6 Ingenieros Junior	550	60	198,0
8 Topógrafos	470	60	225,6
24 Cadeneros 1/	250	60	360,0
6 Dibujantes	400	60	144,0
1 Administrador	1.000	60	60,0
1 Asesor en Control Gerencial y Sistemas	2.000	60	120,0
1 Consultor en Finanzas	2.000	60	120,0
5 Contadores	600	60	180,0
8 Administrativos	400	60	192,0
9 Secretarías 1/	450	60	243,0
11 Inspectores	300	60	198,0
14 Choferes 1/	250	60	210,0
1 Archivador 1/	400	60	24,0
5 Ordenanza 1/	150	60	45,0
3 Guardianes 1/	125	60	22,5
4 Personal de Aseo 1/	100	60	24,0
133			4.370,1

1/ Financiado con la contrapartida local.

B. <u>Gasto de Vehículos</u>	<u>Precio Unitario</u>	<u>Costo Total</u>
	(US\$ 1.000)	(US\$ 1.000)
Compra de 24 vehículos	15	360
Mantenimiento de vehículos	0,19/mes	270
Combustibles y lubricantes	0,33/mes	480
		<u>1.110</u>
C. <u>Gastos de Oficina</u>		
Alquiler local UE	2,0	120
Gastos de impresión	2,0	120
Suministros de oficina	1,0	60
Compra 5 máquinas de escribir	2,0	10
Compra equipo de computación		20
Compra equipo de topografía		30
Servicios públicos	1,0	60
Misceláneos		<u>56</u>
		476
Total Subcategoría 1.2 Supervisión y Administración	5.956,0	
Total Subcategoría 1.1 Estudios	<u>144,0</u>	
Total Categoría 1. Ingeniería y Administración	6.100,0	

REPUBLICA DE HAITI
DEPARTAMENTO MINISTERIAL DE OBRAS PUBLICAS, TRANSPORTE Y COMUNICACIONES (TPTC₁/)
ORGANIGRAMA DE ACUERDO AL DECRETO DEL 18 DE OCTUBRE DE 1983

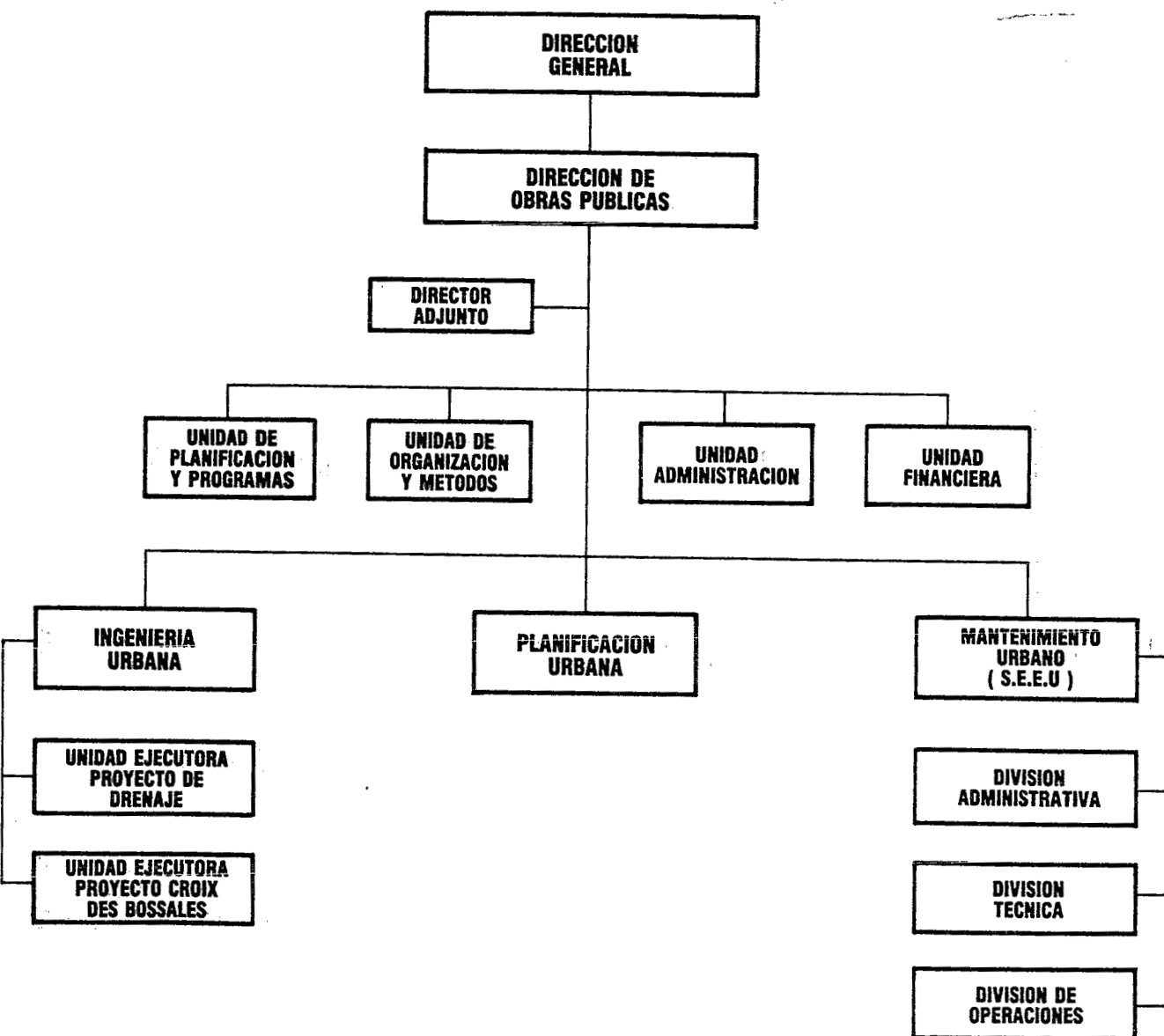


Notas:
 1. TPTC Son las siglas del nombre en francés del departamento a saber, "Travaux Publics, Transports et Communications".
 2. Las Direcciones Regionales son las siguientes:

- I Region del Norte: Cap Haitien
- II Region Transversal: Gonaives (Artibonite Central y Provincias de Nordeste)
- III Region del Oeste y del Sureste: Port au Prince
- IV Region del Sur y el Suroeste: Cayes
- V Area Metropolitana de Port au Prince: Port au Prince

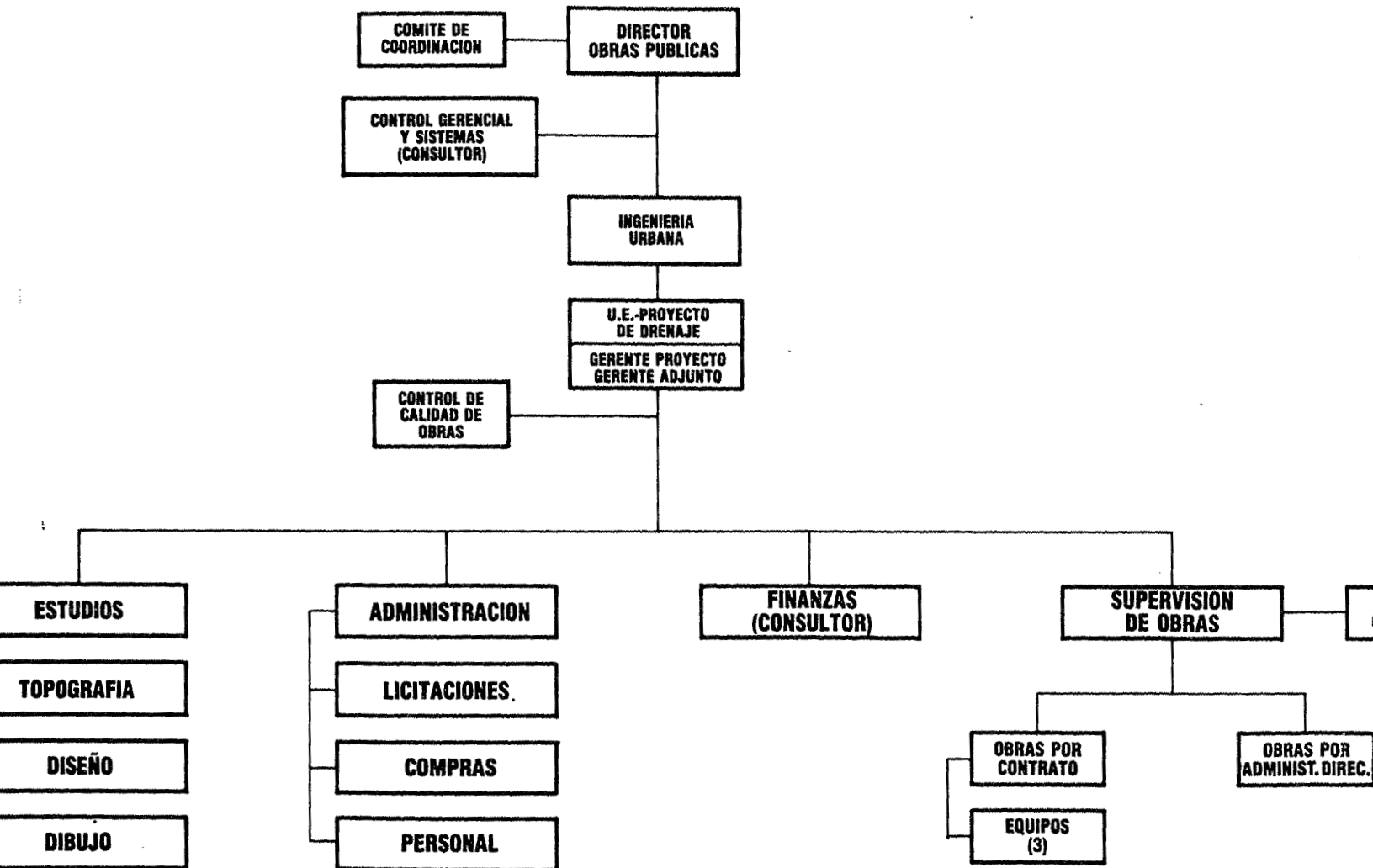
FUENTE: T P T C
 JUNIO 1988

REPUBLICA DE HAITI
T P T C
ORGANIGRAMA DE LA DIRECCION DE OBRAS PUBLICAS



FUENTE: T P T C
JUNIO 1986

REPUBLICA DE HAITI
T P T C
ORGANIGRAMA DE LA UNIDAD EJECUTORA
PROYECTO DRENAJE, II ETAPA



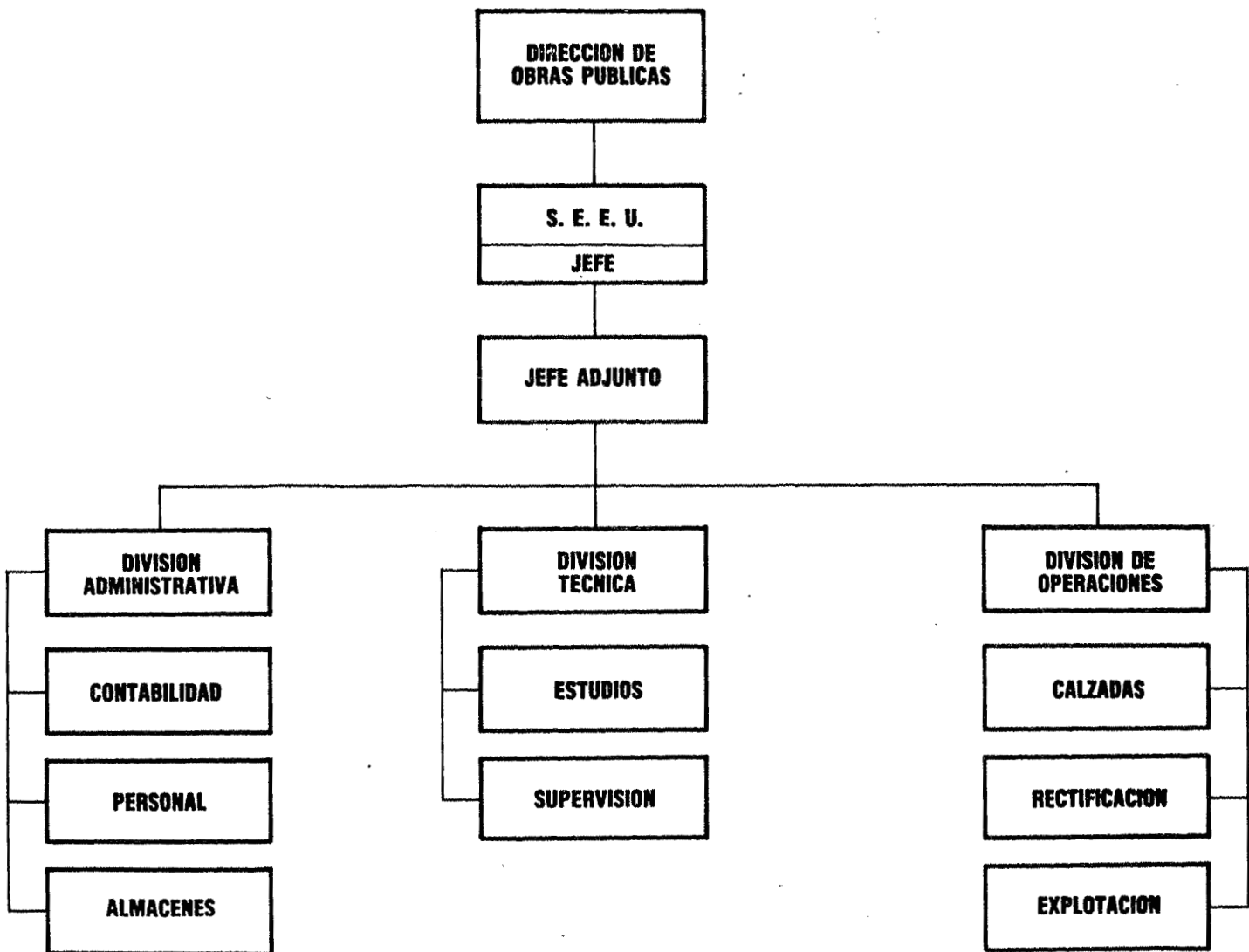
DRENAJE PLUVIAL PUERTO PRINCIPE 2a. ETAPA
(HA-0057)
PRESUPUESTO ANUAL DE OPERACION Y MANTENIMIENTO
(a largo plazo a partir de 1991 en US\$)

1.	Salarios	US\$ 405.000
2.	Piezas y lubricantes	60.000
3.	Combustible	257.355
4.	Depreciación del equipo	120.000
5.	Materiales de rectificación	120.000
6.	Contrato de dragado de las desembocaduras	543.400
7.	Limpieza de los dregraveurs	57.630
8.	Gastos Generales	186.615
	Total	1.750.000

PROYECCION DE LAS NECESIDADES DE MANTENIMIENTO DEL SISTEMA DE
DRENAJE EN PUERTO PRINCIPE, HAITI
(En miles de US\$ dólares)

Costos de Funcionamiento	1984/1985	1985/1986	1986/1987	1987/1988	1988/1989	1989/1990	1990/1991
<u>Proyecto 564/SF-HA</u>							
Salarios	169,8	168,0	167,0	170,6	174,0	148,0	148,0
Mantenimientos	6,6	2,2	4,5	4,0	4,0	1,2	1,2
Equipo, Mantenimiento y Operación	35,2	45,2	51,2	59,2	93,0	111,0	111,0
Gerente	79,6	79,6	29,8	-	-	-	-
Materiales y Contratos	49,4	54,0	63,0	69,0	70,6	285,2	297,2
Total Proyecto 564/SF-HA	<u>339,6</u>	<u>348,0</u>	<u>312,8</u>	<u>300,4</u>	<u>339,2</u>	<u>545,4</u>	<u>557,4</u>
<u>Resto del Sistema de Drenaje</u>							
Salarios	396,2	397,8	389,8	398,0	406,2	296,0	296,0
Mantenimientos	15,6	5,4	4,2	3,4	3,4	2,6	2,6
Equipo, Mantenimiento y Operación	52,8	61,8	76,8	88,8	139,6	95,2	95,2
Materiales y Contratos	58,2	60,0	81,0	85,0	93,4	96,0	138,4
Total Resto del Sistema Drenaje	<u>522,8</u>	<u>525,0</u>	<u>551,8</u>	<u>575,2</u>	<u>642,6</u>	<u>489,8</u>	<u>532,2</u>
<u>Etapas Drenaje II (HA-0057)</u>							
Salarios	-	-	-	-	-	148,0	148,0
Mantenimientos	-	-	-	-	-	1,2	1,2
Equipo, Mantenimiento y Operación	-	-	-	-	-	111,0	111,0
Gerente	-	-	-	80,0	80,0	80,0	-
Materiales y Contratos	-	-	-	-	-	72,4	285,2
Total Etapa Drenaje II	<u>-</u>	<u>-</u>	<u>-</u>	<u>80,0</u>	<u>80,0</u>	<u>412,6</u>	<u>545,4</u>
Total Costos Funcionamiento	<u>862,4</u>	<u>873,0</u>	<u>864,6</u>	<u>955,6</u>	<u>1061,8</u>	<u>1.447,8</u>	<u>1.635,0</u>
<u>Costos de Inversión</u>							
<u>Proyecto 564/SF-HA</u>	95,0	152,8	400,0	-	-	-	-
Equipo	-	-	-	-	-	-	-
Resto Sistema de Drenaje	-	-	-	-	-	115,0	115,0
Equipo	-	-	-	-	-	-	-
Etapas Drenaje II (HA-0057)	-	-	-	435,0	435,0	-	-
Total Costos de Inversión	<u>95,0</u>	<u>152,8</u>	<u>400,0</u>	<u>435,0</u>	<u>435,0</u>	<u>115,0</u>	<u>115,0</u>
Total Gastos de Mantenimiento	<u>957,4</u>	<u>1.025,8</u>	<u>1.264,6</u>	<u>1.390,6</u>	<u>1.496,8</u>	<u>1.562,8</u>	<u>1.750,0</u>

T. P. T. C.
DIRECCION DE OBRAS PUBLICAS
ORGANIGRAMA DEL SERVICIO DE MANTENIMIENTO
DE LA INFRAESTRUCTURA URBANA (SEEU)



FUENTE: TPTC
JUNIO 1986

Area Internacional - Area Ingeniería

Especificaciones de Trabajo

1. Título del cargo: Asesor Internacional
2. Supervisor Inmediato: Director Unidad Ejecutora del Proyecto
3. Objetivo básico del puesto: Asistir al Director de la Unidad Ejecutora en la conducción de las tareas de ingeniería relacionadas con la ejecución del proyecto.

4. Detalle de las funciones normales:

En el cumplimiento de sus funciones es responsable por:

- 4.1 evaluar los diseños y planos de construcción de los diferentes elementos del proyecto, considerando la mayor utilización de materiales locales (especialmente piedra) así como el uso intensivo de mano de obra;
- 4.2 elaborar los pliegos y bases de licitación para los bienes que requiera el proyecto así como los diferentes contratos de obra. Recomendar al Director de la Unidad Ejecutora las ofertas más convenientes y ventajosas de conformidad al Reglamento de Adquisiciones aprobado por el Banco y el TPTC, y que figura como Anexo al contrato de préstamo;
- 4.3 actualizar el cronograma de ejecución de obras correspondientes a los dos subproyectos;
- 4.4 controlar la calidad de los bienes a ser utilizados así como de las obras, tanto por administración directa como por contrato;
- 4.5 resolver sobre cualquier consulta técnica, tanto de diseño como de ejecución de obras que le presente el Director de la Unidad Ejecutora;
- 4.6 determinar la cantidad y características del equipo de transporte y de construcción a ser requerido para la ejecución por administración directa del subproyecto de Control de Erosión y para la supervisión del subproyecto de Canalizaciones;
- 4.7 en colaboración con el asesor en el área de administración financiera, determinar los costos unitarios de las obras que serán reconocidos para fines de desembolso y su actualización oportuna;
- 4.8 con el asesor en administración, llevar un estricto control sobre el número y oportunidad de las licitaciones tanto de bienes, como de ejecución de obras;

5. Presentación del informes

- 5.1 Preparar informes trimestrales que reflejen con precisión y detalle al avance físico y financiero del proyecto así como las acciones que el MTPTC y el Banco deberían tomar para procurar desarrollar el proyecto dentro del plazo establecido de 5 años.

6. Conocimiento y experiencia

- 6.1 Título universitario en Ingeniería Sanitaria y/o Civil.
- 6.2 Experiencia mínima de 8 años como director y/o supervisor de obras de alcantarillado, estructuras de estabilización y revestimiento de calles similares a los del proyecto.
- 6.3 Dominio hablado y escrito del idioma francés.

7. Transferencia de tecnología

- 7.1 Formar un grupo de homólogos, designado entre el personal del MTPTC, que lo asista en sus tareas y que continuará, de ser el caso, con el seguimiento de la aplicación de las funciones una vez que el Asesor Internacional haya finalizado su gestión. El Asesor Internacional tratará de perfeccionar al máximo posible su correspondiente homólogo.
- 7.2 Realizar cursos cortos, conferencias y/o seminarios con la frecuencia necesaria y acordada con el Jefe de la Unidad Ejecutora para que el personal haitiano que trabaja en ella pueda adquirir los conocimientos y experiencias del asesor en su área de actividad.

8. Evaluación Ex-Post

- 8.1 Asistir al MTPTC en la preparación de la evaluación ex-post.

9. Duración de los servicios

- 9.1 El plazo de ejecución del proyecto estimado en 5 años, a partir de 1987.

Asesor Internacional - Operación y Mantenimiento del Alcantarillado Pluvial

Especificaciones de Trabajo

1. Título del cargo: Asesor Internacional
2. Supervisor inmediato: Director del Servicio de Mantenimiento de la Infraestructura Urbana (SEEU)
3. Objetivo básico del puesto: Asistir al Director de SEEU en la organización y puesta en marcha del programa de operación y mantenimiento del alcantarillado pluvial de Port au Prince y, dirección y supervisión de su ejecución.

4. Detalle de las funciones normales:

En el cumplimiento de sus funciones es responsable de:

(a) etapa de organización

- 4.01 la creación y organización dentro de la Dirección del SEEU una División de Operación y Mantenimiento del Alcantarillado Pluvial de Port au Prince, estableciendo una definición de funciones y responsabilidades para alcanzar una operación y mantenimiento eficiente del sistema;
- 4.02 la determinación de personal mínimo necesario y sus calificaciones para alcanzar una operación y mantenimiento eficiente del sistema;
- 4.03 la reglamentación de la utilización del Fondo Especial de Operación y Mantenimiento; y
- 4.04 diseño del plan de mantenimiento preventivo y correctivo del alcantarillado pluvial incluyendo los tanques de retención de sedimentos, estructuras de estabilización, conductos, canales, obras complementarias y dragado de la habia a la salidad de los canales.

(b) etapa de operación

- 4.05 la elaboración del plan de mantenimiento anual incluyendo la determinación de los fondos necesarios;
- 4.06 la ejecución del plan de mantenimiento;
- 4.07 registro de los costos anuales de mantenimiento, desglosados para las distintas actividades: (i) desgravadores; (ii) tuberías y conductos enterrados; (iv) dragado; (v) aborización; (vi) muros de piedra y (vi) calles urbanas;

4.08 la continuación de la reparación y rectificación del sistema existente; y

4.09 la evaluación anual del estado de mantenimiento del alcantarillado pluvial.

5. Conocimientos y experiencia

5.01 Título universitario en Ingeniería Sanitaria y/o Civil.

5.02 Experiencia mínima de 8 años como director o Jefe de Unidad responsable de las actividades de operación y/o mantenimiento de sistemas de alcantarillado.

5.03 Dominio hablado y escrito del idioma francés.

6. Transferencia de tecnología

6.1 Formar un grupo de homólogos designado entre el personal del SEEU, que lo asista en sus tareas y que continuará, cuando sea el caso, con el seguimiento de la aplicación de las funciones una vez que el Asesor Internacional haya finalizado su gestión. El Asesor Internacional tratará de perfeccionar al máximo posible su correspondiente homólogo.

6.2 Realizar cursos cortos, conferencias y/o seminarios con la frecuencia necesaria (no inferior a 2 por año) y acordada con el Director del SEEU para que el personal haitiano profesional, técnico y capataces o contramaestros que trabajan en el SEEU puedan adquirir los conocimientos y experiencia del asesor en su correspondiente área de actuación.

7. Evualación Ex-Post

7.1 Asistir al MTPTC en la preparación de la evaluación ex-post.

8. Duración de los servicios

8.1 Un período de 5 años, igual al estimado para ejecución de la segunda etapa del Proyecto de Alcantarillado Pluvial de Puerto Príncipe.

Ministerio de Obras Públicas, Transportes y Comunicaciones
Dirección de Obras Públicas
Proyecto de Alcantarillado Pluvial, Segunda Etapa
Términos de Referencia para la Contratación de un Consultor
Asesor en Control Gerencial y Sistemas

1. Título del Cargo: Consultor Asesor en Control Gerencial y Sistemas.
2. Supervisor Inmediato: Director de la Dirección de Obras Públicas (DTP).
3. Período de Contratación: Durante el período de ejecución del Proyecto estimado en 5 años.
4. Responsabilidades y Atribuciones del Puesto: el consultor será responsable en general por la continúa investigación y evaluación de los sistemas de controles operacionales y financieros de la DTP y del desarrollo de sistemas y procedimientos necesarios para asegurar el eficiente trabajo de la misma. En adición, el consultor colaborará con la Unidad de Control Financiero de la Dirección Central del MPTC en el desarrollo de las bases para la implantación de un sistema de Auditoría Interna al nivel del Ministerio. En este contexto, el consultor prestará especial atención a las actividades indicadas a continuación, sin que esto signifique la exclusión de otras actividades necesarias en su área de responsabilidad.
 - 4.1 Basado en los objetivos de la DTP y sus programas y actividades claves, el consultor determinará inicialmente las políticas y procedimientos necesarios para asegurar un control efectivo sobre las operaciones de la Dirección, dando énfasis al mejoramiento de canales de comunicación y coordinación de actividades, así como al establecimiento de informes periódicos al Director en concordancia con sus necesidades gerenciales. En relación a este punto, el consultor tomará la iniciativa y el liderazgo en la implantación de sistemas administrativos de control de áreas tales como: licitaciones, compras, contratos, personal, supervisión de obras.
 - 4.2 Asesorará al Director en las regulaciones y procedimientos de trabajo del Comité de Coordinación.
 - 4.3 En colaboración con el Consultor Financiero, racionalizará y organizará por separado las actividades contables del Proyecto BID bajo la Unidad Ejecutora del mismo y las actividades contables fiscales bajo la Unidad Financiera de la DTP, tomando especial atención al traspaso de información necesaria entre estos dos sistemas.
 - 4.4 En relación al Proyecto BID realizará las siguientes pruebas sustantivas con la periodicidad que se requiera y recomendará los ajustes y mejoras necesarios:
 - (a) funcionamiento efectivo de los controles contables (protección de activos del Proyecto, registro oportuno y correcto de

transacciones financieras, preparación correcta y oportuna de estados financieros e informes);

- (b) control del número de personal de acuerdo a los límites y categorías establecidos de común acuerdo entre el Banco y la DTP, y preparación de nóminas y pago de salarios;
- (c) preparación oportuna y correcta de las licitaciones, contratos y compras;
- (d) utilización de los recursos financieros del Proyecto, incluyendo aquellos en la cuenta de anticipo de fondos, de acuerdo a las autorizaciones contractuales;
- (e) preparación oportuna y correcta de los pedidos de desembolsos al BID y de fondos de contrapartida;
- (f) logro de metas operacionales y razones para las variantes entre metas y actividades realmente realizadas; y
- (g) control de inventarios de materiales, incluyendo la toma de inventarios físicos y su comparación con el valor expresado en los registros contables.

4.5 Brindará entrenamiento en el área de su competencia al personal miembro de la Unidad de Organizaciones y Métodos de la DTP.

4.6 En relación a su colaboración con la Unidad de Control Financiero de la Dirección General del MTPTC el consultor realizará, por lo menos, las siguientes actividades:

- (a) dictar seminarios de corta duración sobre los objetivos y funciones de auditoría interna, en sus aspectos operacionales y financieros, organización de la función de auditoría interna y, proceso en el desarrollo de programas de auditoría financiera y operacional;
- (b) colaborar en la identificación de áreas claves en la labor del MTPTC y en la preparación de programas de auditoría para estas áreas; y
- (c) colaborar en la determinación de los requerimientos físicos y de personal para la organización de la función de auditoría interna al nivel del MTPTC.

5. Lugar de Trabajo

- (a) El consultor desarrollará sus labores en Puerto Príncipe en las oficinas de la DPT, la cual proporcionará al consultor las facilidades de oficina, secretaría y transporte que se requiera.
- (b) Previa la iniciación de sus labores, el consultor tendrá una orientación inicial de dos días en la Sede del Banco.

6. Informes y Documentación

- (a) Dentro de seis meses de iniciada sus labores, y luego anualmente, el consultor presentará al Director un programa de trabajo debidamente razonado. Estos programas, junto con los comentarios del Director, deberán ser sometidos al Banco.
- (b) El desarrollo de sistemas deberá ser debidamente documentado mediante procedimientos y manuales escritos.

7. Requisitos Profesionales

- (a) Título universitario con énfasis en contabilidad. Diez años de experiencia preferiblemente en el sector de la construcción y en áreas de auditoría interna, y desarrollo de sistemas administrativos y contables. Se considerarán candidatos que hayan adquirido parte de esta experiencia en firmas de contadores públicos independientes. Cuatro años de esta experiencia podrá ser sustituida por un título equivalente a la Maestría en Administración de Empresas. Conocimiento en el uso de computadoras personales. Facilidad para presentar en forma clara y concisa recomendaciones. Probada habilidad para implantar sistemas.
- (b) El candidato deberá ser preferiblemente de nacionalidad haitiana y tener un buen dominio del creole.

Ministerio de Obras Públicas, Transportes y Comunicaciones
Dirección de Obras Públicas
Proyecto de Alcantarillado Pluvial, Segunda Etapa
Términos de Referencia para la Contratación de un Consultor en Finanzas

1. Título del Cargo: Consultor. Jefe Subdivisión Financiera. Programa de Alcantarillado Pluvial.
2. Supervisor Inmediato: Director de la Dirección de Obras Públicas con asignación permanente a la Subdivisión Financiera del Proyecto.
3. Período de Contratación: Durante el período de ejecución del Proyecto estimado en 5 años.
4. Responsabilidades del Puesto. En general, el Consultor será responsable por la implantación, coordinación, control y administración del sistema financiero del Proyecto. En este contexto el Consultor prestará especial atención a las actividades listadas a continuación, sin que esto signifique la exclusión de otras actividades necesarias en su área de responsabilidad.
 - 4.1 Con base al sistema contable desarrollado por la firma Lavalin (Asistencia Técnica ATN/SF-1685-HA), y de su propia evaluación de procedimientos, controles internos contables e información requerida, centralizará la función financiera del Proyecto BID bajo la Unidad Ejecutora y desarrollará un sistema que brinde información oportuna y confiable sobre la contabilidad general y los costos del Proyecto.
 - 4.2 Evaluará y controlará permanentemente el funcionamiento de controles internos contables del Proyecto, incluyendo aquellos necesarios bajo acuerdos previos con el Banco, tales como límite en el número de personal, cargos financieros autorizados al Proyecto, uso de la cuenta anticipo de fondos.
 - 4.3 Se asegurará del cumplimiento de cláusulas contractuales financieras con el Banco y de la presentación correcta y oportuna de informes y de pedidos de desembolso al mismo.
 - 4.4 Desarrollará informes financieros periódicos sobre la ejecución del Proyecto para los diferentes niveles de decisión y con la información necesaria a cada nivel.
 - 4.5 Colaborará con el Asesor en Control Gerencial y Sistemas en el desarrollo un sistema contable para el SEEU que permita obtener la información requerida por el Banco.
 - 4.6 Colaborará con el antedicho asesor en la racionalización y organización por separado de las actividades contables del Proyecto BID y de las actividades contables fiscales, así como del traspaso de información entre estos sistemas.

- 4.7 Evaluará el proceso de pago con el objeto de agilizarlo sin perder los beneficios de principios de control interno en esta área.
- 4.8 Tomará la iniciativa y liderazgo para agilizar las contribuciones de contrapartida del Proyecto y el pago oportuno de salarios.
- 4.9 Brindará entrenamiento en el área de su competencia al personal contable de la Unidad Ejecutora.
- 4.10 Preparará los estados financieros anuales del Proyecto.

5. Lugar de Trabajo

- (a) El consultor desarrollará sus labores en Puerto Príncipe en las oficinas de la Unidad Ejecutora. La DTP proporcionará al consultor las facilidades de oficina, secretaría y transporte que se requiera.
- (b) Previa la iniciación de sus labores, el consultor tendrá una orientación inicial de dos días en la Sede del Banco.

6. Informes

A los seis meses de iniciada sus labores, el consultor presentará un informe al Director de la DTP sobre el estado de la centralización de las actividades contables del Proyecto. Este informe con los cometnarios del Director será sometido al Banco.

7. Requisitos Profesionales

- (a) Título universitario con énfasis en Contabilidad. Diez años de experiencia, por lo menos, cuatro de los cuales hayan sido a un nivel supervisor en el área de la construcción. Probada experiencia en la implantación de sistemas contables y de control interno. Experiencia en el uso de computadoras P.C.
- (b) El candidato deberá ser preferiblemente de nacionalidad haitiana y tener un buen dominio del creole.

Parámetros de Diseño y otras Características

A. Horizonte de Dimensionamiento

Las redes primarias son dimensionadas para el año 2.000 y calculadas para las lluvias de frecuencia decenal. Para apreciar la validez de los criterios seleccionados se consideraron 3 factores que los influncian: i) incertidumbre sobre la urbanización futura: nos parece poco probable que el crecimiento urbano permanezca al nivel de las perspectivas actuales y un crecimiento mayor sería más realista; se expone entonces al riesgo de subdimensionar las obras; ii) perspectivas de disposición de las cuencas drenantes: las cuencas drenantes incluidas en las zonas del proyecto deberán, en todas las hipótesis, ser urbanizadas en su casi totalidad al año 2.000; después de dicho año, la escorrentía no debería acrecentarse más que ligeramente por densificación de la vivienda; y, iii) influencia de los trabajos de lucha contra la erosión sobre el Morne L'Hopital: se ha considerado que los resultados a corto plazo de estos trabajos habrán de conferir a las zonas que presentan una sensibilidad particular a la erosión características comparables a las otras zonas del Morne; a más largo plazo, es decir después de 1990, cuando los árboles habrán alcanzando un enraizamiento y desarrollo de las hojas suficiente, el caudal de recogimiento tenderá a disminuir, compensando el incremento de escorrentía en la zona urbana.

En otros términos, el efecto acumulado de estos 3 factores conduce a estimar que la red dimensionada para el año 2.000 deberá poder asegurar el mismo nivel de servicio a más largo plazo.

B. Frecuencia de Dimensionamiento.

La frecuencia que ha sido propuesta para el dimensionamiento de la red primaria es decenal y para la red secundaria la anual. El colector primario se dimensionó para tiempos de concentración variando de 15 a 30 minutos y la red secundaria con tiempos de concentración de 5 a 10 minutos. Resultando en 480 l/ha/seg para la red primaria y en 325 l/ha/seg para la red secundaria.

C. Criterios de Servicio

- i) En las áreas no urbanizadas situadas aguas arriba de las zonas urbanizadas, las quebradas se conservan en su estado actual.
- ii) En las áreas urbanizadas una red primaria será sistemáticamente considerada siempre que la superficie

urbanizada de la cuenca drenante captada por dicha red sobrepase 25 hectáreas (has).

- iii) En las áreas urbanizadas, una red secundaria será prevista bajo las condiciones siguientes:
 - a) superficie urbanizada de la cuenca captada por dicha red no menor a 5 has.
 - b) densidad mínima de vivienda en año 2.000 de 800 habitantes/ha.
 - c) sensibilidad particular del barrio considerado, sea a las inundaciones, sea a la erosión.
- iv) en las áreas no urbanizadas situadas aguas abajo, ninguna red, excepto los colectores de tránsito, será prevista.
- v) no será considerada red terciaria dentro del marco del proyecto.

D. Parámetro de Diseño Propiamente Dichos

La cantidad de agua lluvias se calculó por el método racional, utilizando la fórmula:

$Q = C \times I \times A$ en la cual

Q = Cantidad de aguas lluvias en litros por segundo

C = Coeficiente de afluencia

I = Intensidad de precipitación en litros/hectáreas por segundo.

A = Area tributaria en hectáreas

Para los cálculos hidráulicos se utilizó la fórmula de Manning con los siguientes coeficientes de rugosidad:

Tubos de hormigón:	0,015
Canales de concreto:	0,016
Canales de mampostería:	0,025
Canales en tierra, con hierba:	0,050

Velocidades Máximas y Mínimas:

Velocidad máxima en tubería de hormigón:	5,0 m/s
Velocidad máxima en canales de mampostería:	5,0 m/s
Velocidad máxima en canal de hormigón:	6,0 m/s
Velocidad máxima en canal de tierra:	0,8 m/s
Velocidad mínima en tuberías de hormigón:	0,8 m/s
Velocidad mínima en canales de mampostería:	0,8 m/s
Velocidad mínima en canales de hormigón:	0,6 m/s
Velocidad mínima en canales de tierra:	0,3 m/s

Pendientes Máximas y Mínimas

Las pendientes máximas serán las correspondientes a velocidades máximas.

Las pendientes mínimas serán las correspondientes a velocidades mínimas.

Díámetro Mínimo: ϕ 0,60 m

Profundidad Mínima: 1,20 m sobre la clave del tubo.

Los desgravadores (tanques de retención de sedimentos)

Los desgravadores se construirán lo más cerca posible del límite no edificado en función de la posibilidad de acceso. Ellos son dimensionados de manera a interceptar el volumen de transporte de sólidos de frecuencia "3 veces por año", Se ha podido determinar que en promedio anual se podrá extraer alrededor de diez veces el volumen de los desgravadores durante una estación de lluvia, lo que supone que cada desgravador supuesto lleno será enteramente vaciado en los 10 días siguientes.

Las Obras Típicas

La red de drenaje comprende las obras siguientes:

- i) colectores constituidos de canales donde una franja de terrenos o derecho de vía suficiente es disponible y por conductos enterrados en el centro de la ciudad;
- ii) puentes para las transversales de las calles para los canales;
- iii) disipadores de energía; y,
- iv) desgravadores.

Los materiales serán producidos localmente:

- la piedra calcárea compacta para la mampostería.
- el cemento y el hierro para el hormigón armado.

Para los colectores se han considerado diez secciones típicas (ver figuras 14 y 15). La comparación económica de estas obras ha permitido seleccionar:

- 1) Para los canales:

La sección típica No. 1: canal rectangular en mampostería cuando el derecho de vía es reducido.

La sección típica No. 4: canal trapezoidal en mampostería cuando la franja de terreno disponible es suficiente.

La sección típica No. 9: canal dragado de los desembocaduras.

- 2) Para los conductos colados en sitio y los puentes (box-culverts):

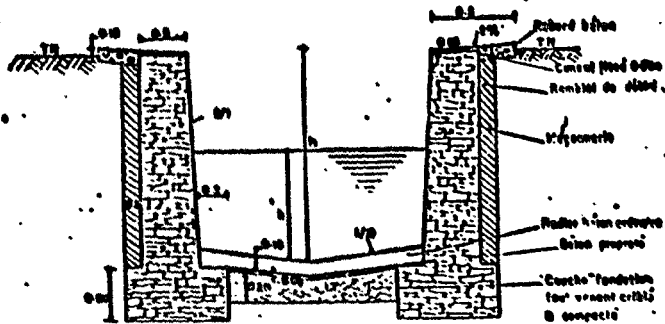
La Sección típica No. 6: conducto rectangular simple para gastos o caudales inferiores a 20m³/s.

La sección típica No. 7: conducto rectangular múltiple para caudales superiores a 20m³/s.

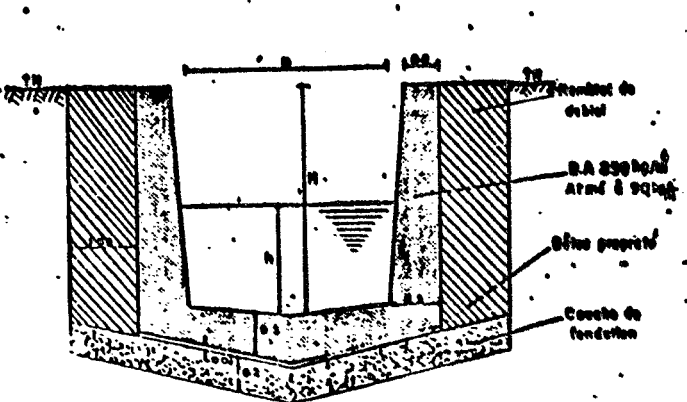
- 3) Para redes secundarias: conductos circulares de hormigón armado (sección típica No. 10) o, en las zonas bajas, los canales trapezoidales (sección típica No. 4).

FIG. 14 SECTIONS-TYPE DE COLLECTIONNEURS

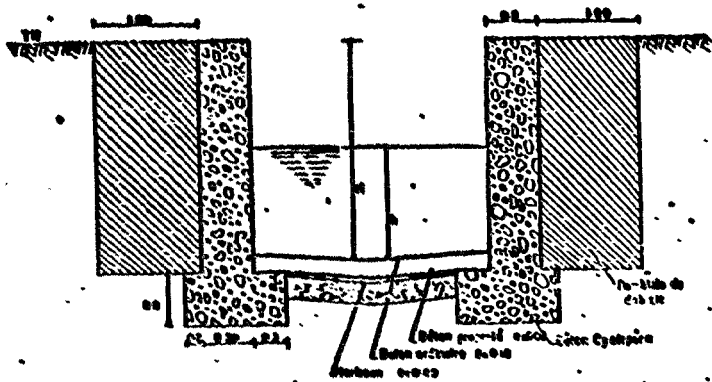
SECTION TYPE (1) CANAL RECTANGULAIRE EN MAÇONNERIE



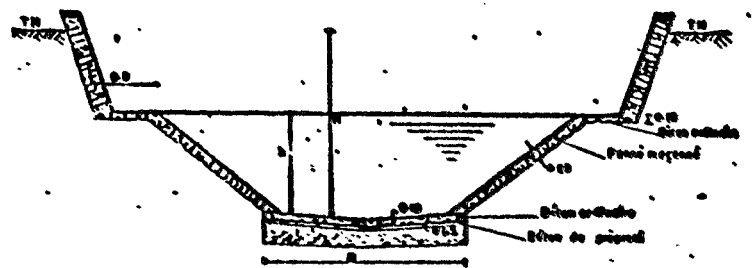
SECTION TYPE (2) CANAL RECTANGULAIRE EN BÉTON ARMÉ



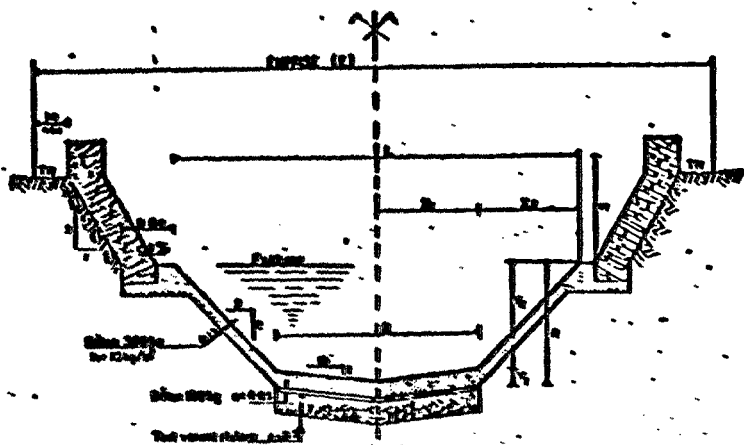
SECTION TYPE (3) CANAL RECTANGULAIRE EN BÉTON CYCLOPÉE



SECTION TYPE (4) CANAL TRAPÉZOÏDAL PIERRE MACHUR



SECTION TYPE (5) CANAL TRAPÉZOÏDAL EN BÉTON DÉFORMÉ



SECTION TYPE (6) CANAL RECTANGULAIRE ARMÉ

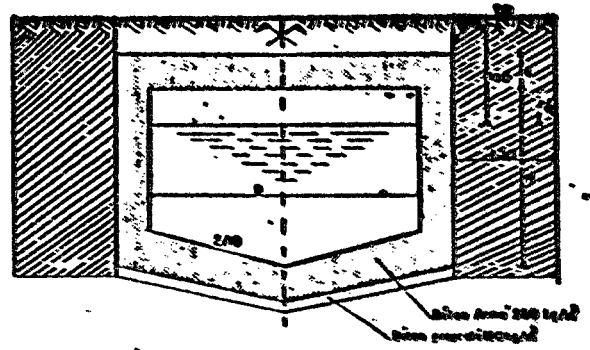
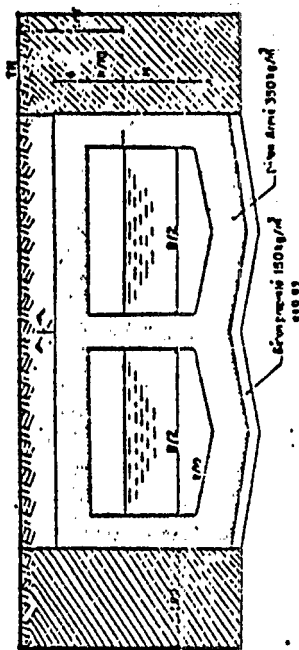
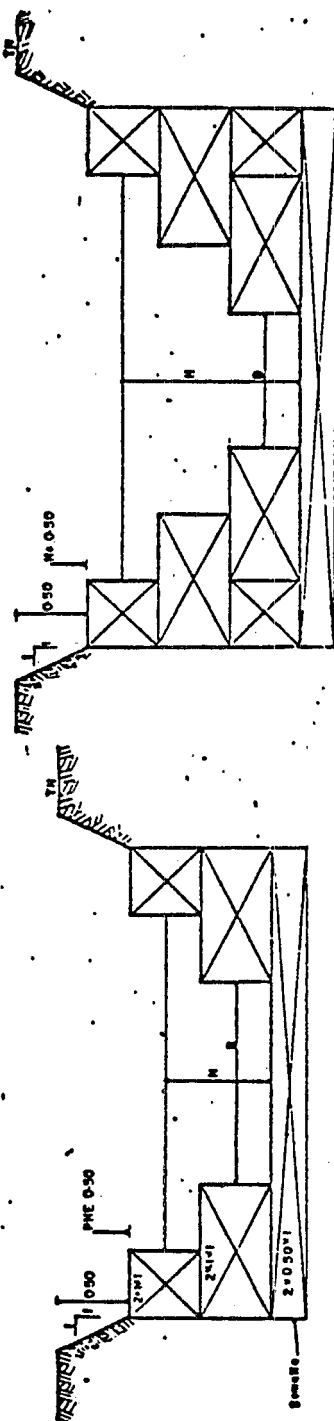


FIG. 15 SECTIONS-TYPE DE COLLECTEURS (SOUTIER)
SECTION TYPE 9 PROF. RECTANGULAIRE, BASSIN



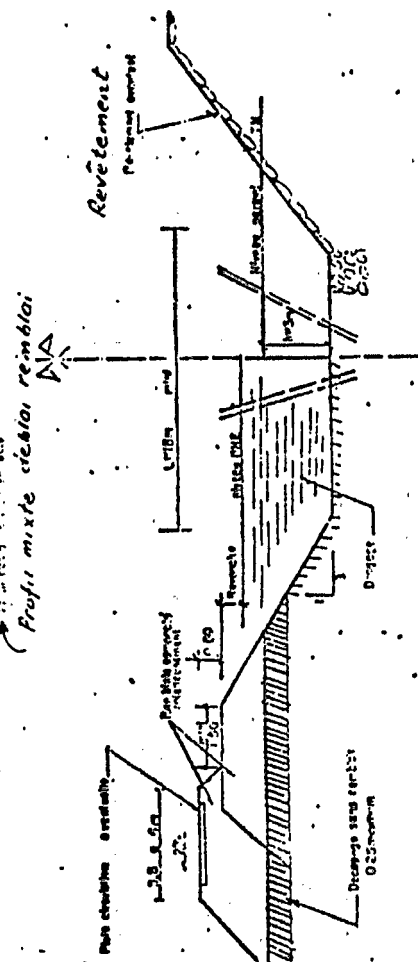
SECTION TYPE 9 REVÊTEMENT EN GARDON (15 cm x 23)

SECTION TYPE 10 REVÊTEMENT EN GARDON INCLINÉ



SECTION TYPE 9 PROF. MIXTE DÉCLIVITÉ REMBLAI

PROF. MIXTE DÉCLIVITÉ REMBLAI



SECTION TYPE 10 BUSES CIRCULAIRES (Pour Mémoire)

SISTEMA SEGUIMIENTO PROYECTOS PMS+

CALENDARIO DE ACTIVIDADES

RED DEL PROYECTO N°1 (HA-0057)ALCANT. PLUVIAL PDF-AJ-PRINCE

INICIO PROYECTO 30 SET 86 FECHA ACTUA: 31 SET 86
TERM. PROYECTO 27 ABR 92 PROX. ACTUALIZ. 27 JUL 87

CALENDARIO DE ACTIVIDADES POR ACTIVIDAD

PDF COD. DE ORGANIZACION

RANGO MINIMO 30 SET 86 FECHA PROG. 13 JUN 87
RANGO MAXIMO 27 ABR 92 SEC. PROGRESO ()
FAS. 1

COD. DE ACTIVIDAD	DESCRIPCION DE ACTIVIDAD	DUR.	%	INICIO	INICIO	DEMOGRA	TERM.	TERM.	DEMOGRA
		REMAN	CUM	TEMP.	TARDIO	MAX	TEMP.	TARDIO	DIFER. CAL.
1000	APROBAR PRESTAMO DIRECTORIO BID	0.	0	30SET86	30SET86	NADA	30SET86	30SET86	NADA 7199
1010	NEGOCIAR Y SUSCRIBIR CONTRATO PRESTAMO	124.0	0	30SET86	30SET86	NADA	31ENE87	31ENE87	NADA 71 01
1020	RATIFICAR CONTRATO PRESTAMO	60.0	0	1FEB87	1FEB87	NADA	1ABR87	1ABR87	NADA 71 01
1111	PREFABR INFORME JURIDICO	30.0	0	2ABR87	2JUL87	91.	1MAY87	21JUL87	NADA 71 03
1112	OBTEENR APROBACION DEL BID INFORME JURID	30.0	0	2MAY87	1AGOS7	91.	31MAY87	30AGO87	25. 71 03
1120	DESIGNAR PERSONEROS LEGALES	90.0	0	2ABR87	2JUN87	61.	30JUN87	30AGO87	NADA 71 03
1210	M.E-R.F.:ADQUIRIR SERVIDUMBRES DERECHOS	180.0	0	2ABR87	10SET87	161.	28SET87	7MAR88	52. 71 03
1211	S.GEORGE:ADQUIRIR SERVIDUMBRES DERECHOS	60.0	0	2ABR87	6JUL87	95.	31MAY87	32ET87	22. 71 03
1212	E.D MITI:ADQUIRIR SERVIDUMBRES DEFECHOS	365.0	0	2ABR87	8JUL87	253.	31MAR88	6JUL88	157. 71 03
1213	R.POVEE-P.VI:ADQ. SERVIDUMBRES Y DERECHO	60.0	0	2ABR87	2JUL87	91.	31MAY87	30AGO87	22. 71 03
1315	PAPACITO:ADQUIRIR SERVIDUMBRES Y DERECHO	730.0	0	2ABR87	27FEB88	331.	31MAR89	25FEB90	251. 71 03
1316	B.SGREY/LECL:ADQUIRIR SERVIDUM.DERECHOS	345.0	0	2ABR87	6ENE88	279.	31MAR88	4ENE89	222. 71 03
1317	DIQUINI:ADQUIRIR SERVIDUMBRES Y DERECHOS	180.0	0	2ABR87	6NOV88	594.	28SET87	4MAY89	541. 71 03
1318	CARREFOUR:ADQUIRIR SERVIDUMBRES DERECHOS	180.0	0	2ABR87	5MAY88	399.	28SET87	31DCT88	341. 71 03
1500	ELEGIBILIDAD DEL PRESTAMO	0.	0	30JUN87	30AGO87	61.	30JUN87	30AGO87	NADA 7199
1700	VIGENCIA DEL CONTRATO	0.	0	1ABR87	1ABR87	NADA	1ABR87	1ABR87	NADA 7199
2001	TRAMITAR Y RECIBIR PRIMER DESEMBOLSO	0.	0	30JUN87	30AGO87	61.	30JUN87	30AGO87	NADA 7199
2010	DEMOSTRAR DISPON. APORTE LOCALES ANO 1	90.0	0	2ABR87	2JUN87	61.	30JUN87	30AGO87	NADA 71 03
2021	CONTRATAR FIRMA AUDITORES EXTERNOS	30.0	0	2ABR87	2JUN87	61.	1MAY87	1JUL87	NADA 71 03
2022	APROBAR BID CONTRATO FIRMA AUDITORES	60.0	0	2MAY87	2JUL87	61.	30JUN87	30AGO87	NADA 71 03
2051	PRESENTAR PLAN DE CUENTAS	60.0	0	2ABR87	2JUN87	61.	31MAY87	31JUL87	NADA 71 03
2032	AFROBAR PLAN DE CUENTAS	30.0	0	1JUN87	1AGOS7	61.	30JUN87	30AGO87	NADA 71 03
2999	TRAMITAR Y RECIBIR ULTIMO DESEMBOLSO	90.0	0	29ENE92	29ENE92	NADA	27ABR92	27ABR92	NADA 71 03
3011	PREPARAR PRESENTAR PEP INICIAL	60.0	0	2ABR87	2JUN87	61.	31MAY87	31JUL87	NADA 71 03
3112	APROBAR BID PEP INICIAL	30.0	0	1JUN87	1AGOS7	61.	30JUN87	30AGO87	NADA 71 03
3190	RECIBIR OBRAS Y LIQUIDAR CONTRATOS	62.0	0	26FEB92	26FEB92	NADA	27ABR92	27ABR92	NADA 71 03
3830	FIN DEL PROYECTO	0.	0	27ABR92	27ABR92	NADA	27ABR92	27ABR92	NADA 7199
4000	D.ISOLES:PREPARAR DOCUMENTACION	30.0	0	5JUL87	31AGO87	57.	3AGOS7	29SET87	NADA 71 03
4010	D.ISOLES:APROBAR BID DOCUMENTACION	30.0	0	4AGOS7	30SET87	57.	2SET87	29OCT87	NADA 71 03
4020	D.ISOLES:INVITAR RECIBIR OFERTAS	60.0	0	3SET87	30OCT87	57.	1NOV87	28DIC87	NADA 71 03
4030	D.ISOLES:ANALIZAR ADJUDICAR	30.0	0	2NOV87	29DIC87	57.	1DIC87	27ENE88	NADA 71 03
4040	D.ISOLES:SUSCRIBIR LEGALIZAR CONTRATO	30.0	0	2DIC87	28ENE88	57.	31DIC87	26FEB88	NADA 71 03
4060	D.ISOLES:EJECUTAR OBRA	730.0	0	1ENE88	27FEB88	57.	30DIC87	25FEB90	56. 71 03
4100	M.B-R.F.:PREPARAR DOCUMENTACION	30.0	0	3NOV87	8ENE88	66.	2DIC87	6FEB88	NADA 71 03
4110	M.B-R.F.:APROBAR BID DOCUMENTACION	30.0	0	3DIC87	7FEB88	66.	1ENE88	7MAR88	NADA 71 03
4120	M.B-R.F.:INVITAR RECIBIR OFERTAS	60.0	0	2ENE88	8MAR88	66.	1MAR88	6MAY88	NADA 71 03

UNIDAD DE TIEMPO DEL INFORME = DIAS

() REALIZADA HOLGURA () REALIZADA HOLGURA
TOTAL TOTAL DIFER.

SISTEMA SEGUIMIENTO PROYECTOS PMS+

CALENDARIO DE ACTIVIDADES

RÉD DEL PROYECTO HATY (HA-0057)ALCANT.PLUVIAL PORT-AU-PRINCE

INICIO PROYECTO 30 SET 86 FECHA ACTUA: 30 SET 86
TERM. PROYECTO 27 ABR 92 PROX. ACTUALIZ. 30 JUN 87

CALENDARIO DE ACTIVIDADES POR ACTIVIDAD

PCR COD. DE ORGANIZACION

RANGO MINIMO 30 SET 86 FECHA PROC. 12 JUN 86
RANGO MAXIMO 27 ABR 92 SEC. PROCESO 0
PAG. 2

CDI. DE ACTIVIDAD	DESCRIPCION DE ACTIVIDAD	DUR. REMAN	% CUM	INICIO TEMP.	INICIO TARDIO	DEMORA MAX	TERM. TEMP.	TERM. TARDIO	DEMORA DISPON.	CAL
4130	M.B-R.F.:ANALIZAR ADJUDICAR	30.0	0	2MAR83	7MAY88	66.	31MAR88	5JUN88	NADA	71 00
4140	M.B-R.F.:SUSCRIBIR LEGALIZAR CONTRATO	30.0	0	1ABR88	6JUN88	66.	30ABR88	5JUL88	NADA	71 00
4150	M.B-R.F.:EJECUTAR OBRA	730.0	0	1MAY88	6JUL88	66.	30ABR90	5JUL90	65.	71 00
4200	S.GEORGE:PREPARAR DOCUMENTACION	30.0	0	4MAY87	6JUL87	63.	2JUN87	4ABR87	NADA	71 00
4210	S.GEORGE:APROBAR BID DOCUMENTACION	30.0	0	3JUN87	5ABR87	63.	2JUL87	3SET87	NADA	71 00
4220	S.GEORGE:INVITAR RECIBIR OFERTAS	60.0	0	3JUL87	4SET87	63.	31ABR87	2NOV87	NADA	71 00
4230	S.GEORGE:ANALIZAR ADJUDICAR	30.0	0	1SET87	3NOV87	63.	30SET87	2DIC87	NADA	71 00
4240	S.GEORGE:SUSCRIBIR LEGALIZAR CONTRATO	30.0	0	1OCT87	3DIC87	63.	30OCT87	1ENE88	NADA	71 00
4250	S.GEORGE:EJECUTAR OBRA	910.0	0	31OCT87	8ENE88	69.	27ABR90	5JUL90	68.	71 00
4270	S.GEORGE:EJECUTAR ELECTRICITE D HAITI	456.0	0	5OCT88	7DIC88	63.	3ENE90	7MAR90	62.	71 00
4300	RUE RAVEE-P.VI:PREPARAR DOCUMENTACION	30.0	0	4MAY87	2JUL87	59.	2JUN87	31JUL87	NADA	71 00
4310	RUE RAVEE-P.VI:APROBAR BID DOCUMENTACION	30.0	0	3JUN87	1ABR87	59.	2JUL87	30ABR87	NADA	71 00
4320	RUE RAVEE-P.VI:INVITAR RECIBIR OFERTAS	60.0	0	3JUL87	31ABR87	59.	31ABR87	29OCT87	NADA	71 00
4330	RUE RAVEE-P.VI:ANALIZAR ADJUDICAR	30.0	0	1SET87	30OCT87	59.	30SET87	28NOV87	NADA	71 00
4340	RUE RAVEE-P.VI:SUSCRIBIR LEGAL.CONTRATO	30.0	0	1OCT87	29NOV87	59.	30OCT87	28DIC87	NADA	71 00
4360	RUE RAVEE-P.VI:EJECUTAR OBRA	540.0	0	31OCT87	29DIC87	59.	22ABR89	20JUN89	53.	71 00
4370	RUE RAVEE-P.VI:EJECUTAR PE-PL (AMONT)	547.0	0	30OCT88	5ABR89	157.	29ABR90	3OCT90	156.	71 00
4400	PAPACITO:PREPARAR DOCUMENTACION	30.0	0	28DIC89	28DIC89	NADA	26ENE90	26ENE90	NADA	71 00
4410	PAPACITO:APROBAR BID DOCUMENTACION	30.0	0	27ENE90	27ENE90	NADA	25FEB90	25FEB90	NADA	71 00
4420	PAPACITO:INVITAR RECIBIR OFERTAS	60.0	0	26FEB90	26FEB90	NADA	26ABR90	26ABR90	NADA	71 00
4430	PAPACITO:ANALIZAR ADJUDICAR	30.0	0	27ABR90	27ABR90	NADA	26MAY90	26MAY90	NADA	71 00
4440	PAPACITO:SUSCRIBIR LEGALIZAR CONTRATO	30.0	0	27MAY90	27MAY90	NADA	25JUN90	25JUN90	NADA	71 00
4460	PAPACITO:EJECUTAR OBRA	610.0	0	26JUN90	26JUN90	NADA	25FEB92	25FEB92	NADA	71 00
4500	B.SOREY-LECL:PREPARAR DOCUMENTACION	30.0	0	23SET88	6NOV88	44.	22OCT88	5DIC88	NADA	71 00
4510	B.SOREY-LECL:APROBAR BID DOCUMENTACION	30.0	0	23OCT88	6DIC88	44.	21NOV88	4ENE89	NADA	71 00
4520	B.SOREY-LECL:INVITAR RECIBIR OFERTAS	60.0	0	22NOV88	5ENE89	44.	20ENE89	5MAR89	NADA	71 00
4530	B.SOREY-LECL:ANALIZAR ADJUDICAR	30.0	0	21ENE89	6MAR89	44.	19FEB89	4ABR89	NADA	71 00
4540	B.SOREY-LECL:SUSCRIBIR LEGAL.CONTRATO	30.0	0	20FEB89	5ABR89	44.	21MAR89	4MAY89	NADA	71 00
4560	B.SOREY-LECL:EJECUTAR OBRA	540.0	0	22MAR89	12MAY89	51.	12SET90	2NOV90	50.	71 00
4570	B.SOREY-LECL:EJECUTAR OBRA DIQUINI	547.0	0	22MAR89	5MAY89	44.	19SET90	2NOV90	43.	71 00
4700	CARREFOUR:PREPARAR DOCUMENTACION	30.0	0	5JUL88	2SET88	59.	3ABR88	1OCT88	NADA	71 00
4710	CARREFOUR:APROBAR BID DOCUMENTACION	30.0	0	4ABR88	2OCT88	59.	2SET88	31OCT88	NADA	71 00
4720	CARREFOUR:INVITAR RECIBIR OFERTAS	60.0	0	3SET88	1NOV88	59.	1NOV88	30DIC88	NADA	71 00
4730	CARREFOUR:ANALIZAR ADJUDICAR	30.0	0	2NOV88	31DIC88	59.	1DIC88	29ENE89	NADA	71 00
4740	CARREFOUR:SUSCRIBIR LEGALIZAR CONTRATO	30.0	0	2DIC88	30ENE89	59.	31DIC88	28FEB89	NADA	71 00
4760	CARREFOUR:EJECUTAR OBRA	1092.0	0	1ENE89	1MAR89	59.	28DIC91	25FEB92	58.	71 00
UNIDAD DE TIEMPO DEL INFORME = DIAS										
				() REALIZADA	HOLGURA	() REALIZADA	HOLGURA			
				TOTAL			DISPON.			

SISTEMA SEGUIMIENTO PROYECTOS PMS*

CALENDARIO DE ACTIVIDADES

RED DEL PROYECTO HATY (HA-0057)ALCANT.FLUVIAL PORT-AU-PRINCE

INICIO PROYECTO 30 SET 86 FECHA ACTUA: 30 SET 86
TERM. PROYECTO 27 ABR 92 PROX. ACTUALIZ. 30 JUN 92

CALENDARIO DE ACTIVIDADES POR ACTIVIDAD

FOR. COD. DE ORGANIZACION

RANGO MINIMO 30 SET 86 FECHA PROC. 12 JUN 92
RANGO MAXIMO 27 ABR 92 SEC. PROCESO 0
PAG. 3

COD. DE ACTIVIDAD	DESCRIPCION DE ACTIVIDAD	DUR. REMAN	% CUM	INICIO TEMP.	INICIO TARDIO	DEMANDA MAX	TERM. TEMP.	TERM. TARDIO	DEMANDA DISPON.	CAL.
4810	DESEMBOCADURA:PREPARAR DOCUMENTACION	30.0	0	4ABR87	12JUN87	69.	3MAY87	11JUL87	NADA	71.00
4810	DESEMBOCADURA:APROBAR BID DOCUMENTACION	30.0	0	4MAY87	12JUL87	69.	2JUN87	10AGO87	NADA	71.00
4820	DESEMBOCADURA:INVITAR RECIBIR OFERTAS	60.0	0	3JUN87	11AGO87	69.	1AGO87	9OCT87	NADA	71.00
4830	DESEMBOCADURA:ANALIZAR ADJUDICAR	30.0	0	2AGO87	10OCT87	69.	31AGO87	8NOV87	NADA	71.00
4840	DESEMBOCADURA:SUSCRIBIR LEGAL.CONTRATO	30.0	0	1SET87	9NOV87	69.	30SET87	8DIC87	NADA	71.00
4840	DESEMBOCADURA:EJECUTAR OBRA	1540.0	0	1OCT87	9DIC87	69.	18DIC91	25FEB92	69.	71.00
5060	PLANTACION:REFORSTAR 200 MIL UNIDADES	1239.0	0	1JUL87	1SET87	62.	20NOV90	21ENE91	61.	71.00
5110	CORRECTION QUEBRADAS	940.0	0	1JUL87	31AGO87	61.	25ENE90	27MAR90	60.	71.00
5200	RUTAS URBANAS 1:PREPARAR DOCUMENTOS	30.0	0	1FEB87	3ABR87	61.	2MAR87	2MAY87	NADA	71.00
5210	RUTAS URBANAS 1:APROBAR BID DOCUMENTOS	30.0	0	3MAY87	3MAY87	61.	1ABR87	1JUN87	NADA	71.00
5220	RUTAS URBANAS 1:INVITAR RECIBIR OFERTAS	30.0	0	2ABR87	2JUN87	61.	1MAY87	1JUL87	NADA	71.00
5230	RUTAS URBANAS 1:ANALIZAR ADJUDICAR	30.0	0	2MAY87	2JUL87	61.	31MAY87	31JUL87	NADA	71.00
5240	RUTAS URBANAS 1:SUSCRIBIR LEGAL.CONTRATO	30.0	0	1JUN87	1AGO87	61.	30JUN87	30AGO87	NADA	71.00
5250	RUTAS URBANAS 1:EJECUTAR 4 KLMS.	730.0	0	1JUL87	31AGO87	61.	29JUN89	29AGO89	60.	71.00
5300	RUTAS URBANAS 2:PREPARAR DOCUMENTOS	30.0	0	23SET88	23NOV88	61.	22OCT88	22DIC88	NADA	71.00
5310	RUTAS URBANAS 2:APROBAR BID DOCUMENTOS	30.0	0	23OCT88	23DIC88	61.	21NOV88	21ENE89	NADA	71.00
5320	RUTAS URBANAS 2:INVITAR RECIBIR OFERTAS	30.0	0	22NOV88	22ENE89	61.	21DIC88	20FEB89	NADA	71.00
5330	RUTAS URBANAS 2:ANALIZAR ADJUDICAR	30.0	0	22DIC88	21FEB89	61.	20ENE89	22MAR89	NADA	71.00
5340	RUTAS URBANAS 2:SUSCRIBIR LEGAL.CONTRATO	30.0	0	21ENE89	23MAR89	61.	19FEB89	21ABR89	NADA	71.00
5360	RUTAS URBANAS 2:EJECUTAR 4 KLMS.	730.0	0	20FEB89	22ABR89	61.	19FEB91	21ABR91	60.	71.00
5400	RUTAS URBANAS 3:PREPARAR DOCUMENTOS	30.0	0	29SET89	29SET89	NADA	28OCT89	28OCT89	NADA	71.00
5410	RUTAS URBANAS 3:APROBAR BID DOCUMENTOS	30.0	0	29OCT89	29OCT89	NADA	27NOV89	27NOV89	NADA	71.00
5420	RUTAS URBANAS 3:INVITAR RECIBIR OFERTAS	30.0	0	28NOV89	28NOV89	NADA	27DIC89	27DIC89	NADA	71.00
5430	RUTAS URBANAS 3:ANALIZAR ADJUDICAR	30.0	0	28DIC89	28DIC89	NADA	26ENE90	26ENE90	NADA	71.00
5440	RUTAS URBANAS 3:SUSCRIBIR LEGAL.CONTRATO	30.0	0	27ENE90	27ENE90	NADA	25FEB90	25FEB90	NADA	71.00
5460	RUTAS URBANAS 3:EJECUTAR 4 KLMS.	730.0	0	26FEB90	26FEB90	NADA	25FEB92	25FEB92	NADA	71.00
9999	TERMINO DE LAS OBRAS	0.	0	25FEB92	25FEB92	NADA	25FEB92	25FEB92	NADA	71.00

UNIDAD DE TIEMPO DEL INFORME = DIAS

() REALIZADA HOLGURA () REALIZADA
TOTAL DISPON.

FIN DEL INFORME

DURACION DEL PROYECTO = 2037.0 DIAS

NOMEN- ECHEDULE HATY (HA-0057)ALCANT.PLUVIAL FORT-AU-PRINCE

PROJ BASE DATE 30 SEP 86 DATA DATE 30 SEP 86
PROJ COMP DATE 27 APR 92 PROP DATA DATE 30 JUN 87

MILESTONE REPORT BY EARLY START

MILESTONE REPORTING LEVEL 0

LOWR SPAN DATE 30 SEP 86 RUN DATE 12 JUN 86
UPPR SPAN DATE 27 APR 92 RUN SEC 0

PAGE 1

LEVEL	MILESTONE DESCRIPTIONS	WORK ITEM CODE	EARLY DATE	LATE DATE	SCHED. DATE	TYPE	TOT FLT	PCS.
0	APRECIAR FRESTAND DIRECTORIO BIL	1000	30 SEP 86	30 SEP 86			NONE	FINISH
0	NEGOCIAR SUSCRIBIR CONTRATO FRESTAND	1010	31 JAN 87	31 JAN 87			NONE	FINISH
0	AGENCIA DEL CONTRATO	1700	1 APR 87	1 APR 87			NONE	FINISH
0	CONVOCATORIA RUTAS URBANAS LICIT.1	5220	2 APR 87	2 JUN 87			61.	START
0	ADJUDICAR RUTAS URBANAS LICIT.1	5230	31 MAY 87	31 JUL 87			61.	FINISH
0	ADJUDICAR RUTAS URBANAS LICIT.1	5240	30 JUN 87	30 AUG 87			61.	FINISH
0	CONVOCATORIA DESEMBOCADURA	4820	3 JUN 87	11 AUG 87			69.	START
0	ELEGIBILIDAD DEL PRESTAND	1530	30 JUN 87	30 AUG 87			61.	FINISH
0	TRANSMITAR RECIBIR PRIMER DESEMBOLO	2001	30 JUN 87	30 AUG 87			61.	FINISH
0	INICIAR OBRAS PLANTACION	5060	1 JUL 87	1 SEP 87			62.	START
0	CONCLUIR OBRAS PLANTACION	5060	20 NOV 90	21 JAN 91			62.	FINISH
0	INICIAR OBRAS CORRECTION DES RAVINES	5160	1 JUL 87	31 AUG 87			61.	START
0	CONCLUIR OBRAS CORRECTION DES RAVINES	5160	25 JAN 90	27 MAR 93			61.	FINISH
0	INICIAR OBRAS ROUTES URBAINES	5260	1 JUL 87	31 AUG 87			61.	START
0	CONVOCATORIA SAINT GEORGE	4220	3 JUL 87	4 SEP 87			63.	START
0	CONVOCATORIA RUE POVEE-PAULO VI	4320	3 JUL 87	31 AUG 87			59.	START
0	ADJUDICAR DESEMBOCADURA	4830	31 AUG 87	8 NOV 87			62.	FINISH
0	ADJUDICAR SAINT GEORGE	4220	30 SEP 87	2 DEC 87			63.	FINISH
0	ADJUDICAR RUE POVEE-PAULO VI	4330	30 SEP 87	28 NOV 87			59.	FINISH
0	CONVOCATORIA DESEMBOCADURA	4840	30 SEP 87	8 DEC 87			65.	FINISH
0	CONVOCATORIA DESEMBOCADURA ISOLEE	4020	3 SEP 87	30 OCT 87			57.	START
0	CONVOCATORIA SAINT GEORGE	4240	30 OCT 87	1 JAN 89			62.	FINISH
0	CONVOCATORIA RUE POVEE-PAULO VI	4340	30 OCT 87	28 DEC 87			59.	FINISH
0	INICIAR OBRAS DESEMBOCADURA	4860	1 OCT 87	9 DEC 87			69.	START
0	CONCLUIR OBRAS DESEMBOCADURA	4860	18 DEC 91	25 FEB 92			65.	FINISH
0	INICIAR OBRAS SAINT GEORGE	4260	31 OCT 87	8 JAN 88			62.	START
0	CONCLUIR OBRAS SAINT GEORGE	4260	27 APR 90	5 JUL 90			65.	FINISH
0	INICIAR OBRAS RUE POVEE-PAULO VI	4360	31 OCT 87	29 DEC 87			59.	START
0	CONCLUIR OBRAS RUE POVEE-PAULO VI	4360	22 APR 89	20 JUN 89			59.	FINISH
0	ADJUDICAR DESEMBOCADURA ISOLEE	4030	1 DEC 87	27 JAN 88			57.	FINISH
0	CONVOCATORIA DESEMBOCADURA ISOLEE	4040	31 DEC 87	26 FEB 88			57.	FINISH
0	INICIAR OBRAS DESEMBOCADURA ISOLEE	4060	1 JAN 88	27 FEB 88			57.	START
0	CONCLUIR OBRAS DESEMBOCADURA ISOLEE	4060	30 DEC 89	25 FEB 90			57.	FINISH
0	CONVOCATORIA WANEE-BIJOU R.FROIDE	4120	2 JAN 88	8 MAR 88			66.	START
0	ADJUDICAR WANEE-BIJOU R.FROIDE	4130	31 MAR 88	5 JUN 88			66.	FINISH
0	CONVOCATORIA WANEE-BIJOU R.FROIDE	4140	30 APR 88	5 JUL 88			66.	FINISH
0	INICIAR OBRAS WANEE-BIJOU R.FROIDE	4160	1 MAY 88	4 JUL 88			66.	START
0	CONCLUIR OBRAS WANEE-BIJOU R.FROIDE	4160	30 APR 90	5 JUL 90			66.	FINISH
0	CONVOCATORIA CARREFOUR	4720	3 SEP 88	1 NOV 88			55.	START
0	ADJUDICAR CARREFOUR	4730	1 DEC 88	29 JAN 89			59.	FINISH
0	CONVOCATORIA BREA.SOREY-LECLERE	4520	22 NOV 88	5 JAN 89			44.	START
0	CONVOCATORIA RUTAS URBANAS LICIT.2	5320	22 NOV 88	22 JAN 89			61.	START
0	CONVOCATORIA CARREFOUR	4740	31 DEC 88	28 FEB 89			59.	FINISH
0	ADJUDICAR RUTAS URBANAS LICIT.2	5330	20 JAN 89	22 MAR 89			61.	FINISH
0	INICIAR OBRAS CARREFOUR	4760	1 JAN 89	1 MAR 89			55.	START
0	CONCLUIR OBRAS CARREFOUR	4760	28 DEC 91	25 FEB 92			59.	FINISH
0	ADJUDICAR BREA.SOREY-LECLERE	4530	19 FEB 89	4 APR 89			44.	FINISH
0	ADJUDICAR RUTAS URBANAS LICIT.2	5340	19 FEB 89	21 APR 89			61.	FINISH
0	CONVOCATORIA BREA.SOREY-LECLERE	4540	21 MAR 89	4 MAY 89			44.	FINISH
0	INICIAR OBRAS BREA.SOREY-LECLERE	4560	22 MAR 89	12 MAY 89			51.	START
0	CONCLUIR OBRAS BREA.SOREY-LECLERE	4560	12 SEP 90	2 NOV 90			51.	FINISH
0	CONVOCATORIA RUTAS URBANAS LICIT.3	5420	28 NOV 89	28 NOV 89			NONE	START
0	ADJUDICAR RUTAS URBANAS LICIT.3	5430	26 JAN 90	26 JAN 90			NONE	FINISH
0	ADJUDICAR RUTAS URBANAS LICIT.3	5440	25 FEB 90	25 FEB 90			NONE	FINISH
0	CONVOCATORIA PAPACITO	4420	26 FEB 90	26 FEB 90			NONE	START
0	CONCLUIR OBRAS ROUTES URBAINES	5460	25 FEB 92	25 FEB 92			NONE	FINISH
0	ADJUDICAR PAPACITO	4430	26 MAY 90	26 MAY 90			NONE	FINISH
0	CONVOCATORIA PAPACITO	4440	25 JUN 90	25 JUN 90			NONE	FINISH
0	INICIAR OBRAS PAPACITO	4460	26 JUN 90	26 JUN 90			NONE	START
0	CONCLUIR OBRAS PAPACITO	4460	25 FEB 92	25 FEB 92			NONE	FINISH
0	TRANSMITAR RECIBIR ULTIMO DESEMBOLO	2999	27 APR 92	27 APR 92			NONE	FINISH
0	TERMINO DE LAS OBRAS	9999	25 FEB 92	25 FEB 92			NONE	FINISH

TIME UNITS THIS REPORT ARE DAYS

() MEANS ACTUAL DATE

PROJECT BASE DATE 30 SEP 86

PROJECT DURATION 2036 DAYS

PROJECT COMPLETION 27 APR 92

END OF REPORT

DRENAJE PLUVIAL DE PUERTO PRINCIPE (2a. ETAPA)

CRONOGRAMA DE ACTIVIDADES

DURACION DEL PROYECTO: 60 MESES

AÑOS	1986	1987	1988	1989	1990	1991
MESES	EFMAMUJASOND	EFMAMUJASOND	EFMAMUJASOND	EFMAMUJASOND	EFMAMUJASOND	EFMAMUJASOND
<u>ACTIVIDADES</u>						
1. <u>Ingeniería y Administración</u>						
2.1 <u>Lucha contra la Erosión</u>						
Plantación						
Corrección de Quebradas						
Desgravadores						
Calles Urbanas						
2.2 <u>Canalizaciones</u>						
1. Saint George (SG)						
2. Electricite de Haití (EH)						
3. Pavee-Paulo VI (PE-PL (AVAL)						
4. Pavee-Paulo VI (PE-PL (AMONT)						
5. Brea-Sorey-LECLERC						
6. Papacito (PO)						
7. Diquini (DI)						
8. Waney Bijou-Rivière Froide (WB-BF)						
9. Red Secundaria CARREFOUR						
10. Desembocaduras (DRAGADO)						

WPC/HA0057

ANNEXE C

PROCEDURES D'ACHATS DE BIENS ET DE SERVICES

I. DISPOSITIONS GENERALES

- 1.01 Ce Règlement établit les conditions et procédures qui seront appliquées dans les appels d'offres et l'adjudications des contrats pour l'achat des biens pour l'Organisme exécutant responsable.
- 1.02 Toute souscription de contrat pour l'achat de matériaux et/ou équipement avec les ressources de ce prêt, sera réalisé seulement à travers une adjudication publique si la valeur de l'offre excède l'équivalent de E.U.\$200.000. Quand il s'agit d'utiliser les ressources en devises du prêt, l'adjudication devra prendre un caractère international et permettre la participation de fournisseurs de tous les pays membres de la Banque. Quand il s'agit d'employer les fonds de contrepartie et/ou les monnaies locales du prêt l'adjudication peut être limitée au marché local.

II. PREQUALIFICATION

- 2.01 Pour l'utilisation du système de préqualification des firmes qui sera appliqué pour les contrats de construction à être financés avec les ressources du Prêt /SF-RA il sera publié un avis de préqualification qui permettra la participation des entreprises de tous les pays membres de la Banque Interaméricaine de Développement (BID) et dont les bases seront préalablement approuvées par la BID.
- 2.02 L'avis devra être publié au moins trois fois dans deux des journaux de plus fort tirage de la ville de Port-au-Prince et deux journaux internationaux dont le "Development Forum". Un tel avis, avec une circulaire appropriée sera simultanément adressé aux ambassades ou consulats des pays membres de la BID accrédités auprès du Gouvernement haïtien.
- 2.03 Les bases de préqualification devront comprendre, entre autres, les informations suivantes:
- (a) Description générale du projet dont il s'agit, le lieu de réalisation et les caractéristiques principales.
 - (b) Dates approximatives pour le lancement des appels d'offres, pour l'ouverture des soumissions, pour le démarrage des travaux qui font l'objet de l'adjudication et pour l'achèvement de sa construction ou la mise à disposition des biens, le cas échéant.
 - (c) Le fait que le Projet est partiellement financé par la Banque, et que l'éligibilité en fonction de la nationalité des soumissionnaires

- 2 -

éventuels ainsi que de l'origine des biens et services sera déterminée en vertu des règles applicables à l'utilisation des sommes provenant du prêt de la BID.

- (d) Les autres conditions que devront satisfaire les intéressés afin de qualifier et d'être postérieurement invités à participer à l'appel d'offres.
- (e) Le lieu, l'heure et la date où les formulaires de préqualification pourront être recueillis.
- (f) Le délai, avec indication de la date, l'heure et le lieu où les formulaires de préqualification et les documents devront être présentés.
- (g) Le bureau ou l'endroit où les entreprises pourront retirer les formulaires de préqualification approuvés par la BID et le Ministère des Travaux Publics, des Transports et Communications (MTPTC) ainsi que le jour et l'heure limites pour que les entreprises ou fournisseurs intéressés puissent obtenir lesdits formulaires.

2.04 Les formulaires de préqualification devront solliciter entre autres les informations suivantes:

- (a) Antécédents légaux sur la classe de société ainsi que les status et autres documents relatifs à sa constitution; une indication si l'entreprise est une filiale ou société affiliée d'une autre institution; en cas de consortia, le nom de chacun des membres avec copie des status ou de l'instrument qui a servi de base pour l'établissement du consortium. Chaque membre du consortium devra remplir séparément le questionnaire respectif. Les consortia qui comprennent un ou plus d'un membre qui ne sont pas éligibles en raison de nationalité, ne seront pas qualifiés comme éligibles.

La détermination de la nationalité d'une entreprise éligible se fera d'après les critères suivants:

- (i) elle est constituée sinon organisée dans un pays membre de la BID;
- (ii) son principal établissement est domicilié dans un pays membre de la BID;
- (iii) (1) plus de 50% de son capital appartiennent à une ou des entreprises dont le siège se trouve dans un ou des pays membres (entreprises également qualifiées sous le rapport de la nationalité) et/ou à des ressortissants ou des résidents bona fide desdits pays membres; et (2) elle est partie intégrante de l'économie du pays membre où elle a son domicile;
- (iv) il n'existe aucune disposition en vertu de laquelle une part substantielle des bénéfices nets ou autres profits corporels

- 3 -

reviendrait ou serait versée à des non-ressortissants ou à des non-résidents de pays membres; et

- (v) au minimum 80% des effectifs remplissant un service au titre du marché dans le pays où des travaux doivent être exécutés, qu'ils soient employés directement par l'entrepreneur ou par un soustraitant, seront des ressortissants d'un pays membres de la BID. Aux effets de ce calcul, on ne comptera pas les citoyens ni les résidents permanents du pays sur le territoire duquel les travaux sont entrepris.

Les entreprises devront fournir une liste de leurs principaux actionnaires en indiquant leur nom et leur domicile enregistré ainsi qu'une déclaration du secrétaire de la société anonyme certifiant qu'il ne possède aucune information selon laquelle le propriétaire de la société n'est pas l'actionnaire qui figure dans les registres et que le domicile officiel n'est pas différent du domicile légal de cet actionnaire.

Les critères ci-dessus s'appliquent à chacun des membres d'une association en participation ou consortium (effort conjugué de deux ou plusieurs entreprises) et à toute entreprise soustraitante proposée à la réalisation d'une partie des travaux.

- (b) Antécédents techniques et financiers de l'entreprise ou de la société.
- (c) Expérience dans la matière qui fait l'objet de l'appel d'offres.
- (d) Conduite dans l'accomplissement des contrats antérieurement réalisés en Haïti ou dans les autres pays membres de la BID.
- (e) Preuve que l'entreprise dispose du personnel et de l'équipement suffisants pour réaliser d'une manière satisfaisante le contrat et indication de l'endroit où se trouve ledit équipement.
- (f) Situation financière certifiée qui devra comprendre au minimum un état des pertes et profits pour les dernières années, un bilan, des références bancaires.
- (g) Evidence de sa capacité pour obtenir des cautions.
- (h) Les autres documents que l'intéressé devra joindre au formulaire de préqualification.

2.05 Les entreprises intéressées à participer à la préqualification devront présenter leur demande d'inscription dans un délai de trente (3) jours à partir de la date de la dernière publication de l'avis, en suivant les procédures de préqualification établies et qui leur auront été remises à cet effet.

2.06 Les antécédents présentés par les entreprises seront étudiés par un Comité ad hoc établi par le MIPTC, lequel désignera les firmes

- 4 -

sélectionnées. La liste des firmes sélectionnées et le antécédents présentés par les entreprises seront remis à la BID afin d'obtenir de celle-ci une déclaration d'approbation ou de non-objection.

2.07 L'avis d'appel d'offres doit inclure les renseignements nécessaires qui permettent aux entreprises dont le nom figure sur le Registre de Préqualification ou aux soumissionnaires éventuels lorsqu'une préqualification n'est pas nécessaire, d'obtenir les documents nécessaires de soumission, comprenant au moins:

- (a) L'endroit où peut obtenir les documents de soumission.
- (b) Le prix de ces documents.
- (c) Le délai final pur soumettre les propositions.
- (d) Un résumé des spécifications qui comprend l'ampleur et le type de travail proposé.
- (e) Une brève description de l'équipement ou du matériel à acheter.
- (f) Une déclaration selon laquelle l'éligibilité concernant l'origine des biens et des services doit être établie selon les règles fixées par la BID pour ce type de financement.
- (g) Une déclaration selon laquelle l'éligibilité concernant l'origine des biens et des service doit être établie selon le règles fixées par la BID pour ce type de financement.

Lorsque la BID a décidé avec l'emprunteur de ne pas utiliser la préqualification pour embaucher l'entrepreneur, la procédure d'appel d'offres sera régie par les dispositions applicables à l'achat de biens.

2.08 Les soumissions, l'ouverture et l'étude des plies et l'adjudication de contrats seront régis par les dispositions des Sections III 1, 3, 4, 5, 6, 7, 8 et 9, de cette Procédure.

III. ADJUDICATION PUBLIQUE

3.01 Le cahier des charges et conditions spécifiques de chaque appel d'offres devra être préalablement soumis à l'approbation de la BID.

Dans le cahier des charges et conditions spécifiques devront figurer les dispositions relatives à l'emploi des fonds stipulées dans la Clause des Conditions Spéciales du Contrat de Prêt. De plus, il y sera établi le délai pour l'ouverture des offres et pour la signature des contrats ainsi que le montant et la forme de garantie (espèces, valeurs publiques facilement convertibles ou garantie bancaire) que les soumissionnaires offriront à l'organisme exécutant pour le maintien des offres.

Les conditions spécifiques de chaque appel d'offres devront exiger des soumissionnaires, en outre, une justification détaillée de l'utilisation

- 5 -

du matériel et/ou équipements déplaçant la main d'oeuvre, afin d'assurer une production intensive de celle-ci.

Dans le cahier des charges et conditions, on fixera le montant de la garantie que l'adjudicataire devra présenter pour appuyer l'exécution du contrat et la façon dont on disposera de cette garantie en cas de non exécution. La garantie sera constituée par des dépôts en espèces ou des valeurs publiques facilement convertibles ou garantie bancaire. Aucune offre ne sera prise en considération si elle n'est accompagnée de la garantie requise.

En aucun cas le montant de la garantie ne sera inférieur à dix pour cent (10%) de la valeur totale du contrat. A l'occasion de tout contrat d'exécution d'ouvrages, cette garantie sera augmentée des retenues qui seront appliquées sur les paiements partiels à faire à l'entrepreneur jusqu'à ce que la garantie atteigne un pourcentage acceptable.

Aucune offre modifiant ou s'écartant des bases et conditions d'appel d'offres ne sera pris en considération même si les modifications sont avantageuses.

3.02 Un délai d'au moins trente (30) jours devra être observé entre la date de la publication de l'appel d'offres et celle de la présentation des offres par les entreprises ou fournisseurs, quand la valeur des achats de biens ou de services sera inférieure à cinq cent mille dollars de Etats-Unis d'Amérique (US\$500.000) ou leur équivalent en toute autre monnaie et de 45 jours pour toute valeur excédant cinq cent mille dollars des Etats-Unis d'Amérique (US\$500.000) ou leur équivalent. Les avis d'appel d'offres dont les textes devront être préalablement soumis à l'approbation de la BID devront préciser au moins ce qui suit:

- (a) L'objet de l'adjudication et l'origine des fonds devant servir à son financement.
- (b) Une indication que le contrat sera partiellement financé avec les ressources du prêt de la BID et que l'adjudication du contrat sera sujet aux conditions d'éligibilité de la BID et conforme aux règles qui son établies dans cette procédure.
- (c) Le jour, lieu et heure où les intéressés pourront se renseigner sur les conditions générales de l'adjudication et où ils pourront recevoir avec ces conditions tous les documents relatifs y compris, selon le cas, les spécifications, cahiers des charges et conditions et plans.
- (d) L'Autorité ou Comité qui devra recevoir les offres, les examiner et faire son choix. Au moins un représentant du MSPP devra figurer parmi les membres de ce Comité.
- (e) Le jour, lieu et heure d'ouverture des offres en présence des participants (ou de leur représentant) qui se seront présentés.

- 6 -

La publication de l'avis devra se faire au moins dans deux (2) des journaux de plus fort tirage de la ville de Port-au-Prince et dans deux journaux internationaux dont le "Development Forum" avec un intervalle d'au moins trois (3) jours entre chaque publication. Un tel avis, avec une circulaire appropriée sera simultanément adressé aux ambassades ou consulats des pays membres de la BID accrédités auprès du Gouvernement haïtien. Dans cette circulaire figureront les mêmes informations contenues dans l'avis.

3.03 No pourront participer à un appel d'offres:

- (a) Ceux qui son frappés d'une interdiction légale ou judiciaire;
- (b) Ceux qui n'ont pas 'été préalablement sélectionnés lorsqu'il s'agit de l'exécution des travaux;
- (c) Les débiteurs du-MTPTC ou du Fisc, contre qui des réclamations sont produites ou une contrainte a été décernée;
- (d) Toute personne qui aura failli dans l'accomplissement d'un engagement quelcon que envers le Gouvernement haïtien ou toute branche de l'Administration Publique; et
- (e) Tout service public ou toute branche de l'Administration Publique ou tout organisme autonome de l'Etat et ceux qui occupent une position de direction dans un tel service ou organisme autonome.

3.04 Les offres un fois ouvertes, les propositions de prix seront notamment inscrites dans un procès verbal qui pourra être signé également par tous les soumissionnaires présents.

3.05 Dans l'analyse des offres pour l'achat de machinerie, équipement et matériel d'origine locale, on pourra ajouter une marge de préférence de quinze pour cent (15%) ou le droit douanier, en donnant la préférence à celle qui sera la moins onéreuse, au prix CAF des offres étrangères indiquées en l'équivalent de la gourde, conformément aux règles suivantes:

- (a) Le prix proposé ou offert pour des articles d'origine locale sera le prix de remise de ces articles sur les lieux du projet, une fois déduits (i) les droits d'importation payés sur les matières premières principales ou composantes manufacturées et (ii) les impôts locaux sur les ventes, à la consommation et à la valeur ajoutée, incorporés au coût de l'article ou des articles offerts. Le soumissionnaire fournira la preuve écrite des montants à déduire conformément aux points (i) et (ii) précédents.
- (b) Le prix proposé ou offert pour des articles d'origine étrangère sera le prix CAF (exception faite des droits d'importation consulaires et portuaires) auquel on ajoutera les dépenses de manipulation dans le port et le transport local du port ou de la frontière sur les lieux du projet.

- 7 -

- (c) Un bien sera considéré d'origine locale, quand le coût des matériaux, de la main d'oeuvre et des services locaux employés à sa fabrication, ne représentera pas moins de 40% de son coût total.
- (d) La conversion des monnaies pour établir des comparaisons entre le prix, se fera à partir du taux de change établi par la BID dans le Contrat de Prêt. quand en appliquant les règles précédentes, il arrive que la machinerie ou l'équipement de fabrication locale est plus adéquate que celle de fabrication étrangère, on pourra employer pour son achat, les devises qui font partie du prêt et qui sont destinées au financement des importations directes, conformément au Contrat de Prêt.

- 3.06 Le MTPTC enverra à la BID, en deux copies au moins, les tableaux comparatifs des offres ainsi que les rapports qui auront été dressés pour l'analyse et l'appréciation des résultats de l'adjudication. L'organisme devra aussi faire parvenir à la BID, le budget officiel confectionné par les ingénieurs. Dans un délai raisonnable, la BID se prononcera par écrit sur cette documentation et sur le choix fait par l'organisme responsable.
- 3.07 L'adjudication favorisera, le cas échéant, l'offre ou la combinaison d'offres, la plus avantageuse économiquement, qui sera généralement celle avec le prix le plus bas, compte tenu de la qualité, de l'efficacité, du délai et d'autres facteurs pertinents.
- 3.08 Le modèle du contrat d'achat qui sera laissé aux fournisseurs devra comprendre des clauses relatives à l'origine des matériaux ou articles qui seront utilisés dans la construction des ouvrages, ne devra pas être différente de celle stipulée dans la Clause 6.01 des Conditions Spéciales du contrat de Prêt.
- 3.09 Préalablement à la souscription d'un contrat d'achat, la BID sera mise en mesure, par l'organisme responsable de se prononcer sur les conditions du contrat, de produire toutes les observations qu'elle jugera utiles, de solliciter tous les éclaircissements nécessaires et de proposer tous les redressements et modifications dont il sera tenu compte.

WPC/HA0044
HA-0022

SELECTION ET EMBAUCHE DES CONSULTANTS

Dans la sélection et l'embauche des Consultants on appliquera les normes suivantes:

I. DEFINITIONS

- 1.01 Par experts à titre personnel on entend les professionnels ou techniciens spécialisés dans une science, un art ou une discipline.
- 1.02 Par société de consultants on entend une association légalement constituée qui se compose essentiellement d'un personnel professionnel pour fournir des services de consultation, des conseils techniques, des opinions d'experts et des services professionnels d'autre genre.
- 1.03 Aux fins de la présente Annexe, les organisations sans but lucratif comme les universités, les fondations, les organismes autonomes ou semi-autonomes et les organisations internationales qui offrent des services de consultation (institutions spécialisées) seront considérés comme des sociétés de consultants.

II. CONFLITS D'INTEREST

- 2.01 La Contribution ne pourra pas être utilisée pour embaucher un expert à titre personnel qui:
 - (a) est membre du personnel permanent ou temporaire d'un organisme gouvernemental haïtien;
 - (b) est ou, après le sixième mois précédant la demande de financement, a été un membre du personnel permanent ou temporaire du bénéficiaire du financement ou de la coopération technique de la Banque, ou en tant que membre de ce personnel, a participé personnellement au projet ou programme financé par la Banque.
- 2.02 Les sociétés de consultants pleinement qualifiées qui sont affiliées ou ressortissantes à une entreprise de construction, à un fournisseur de matériel ou à une société de portefeuille ne seront normalement agréées que si elles s'engagent par écrit à limiter leur rôle à la prestation de services consultatifs professionnels et si, dans le contrat signé, elles prennent l'engagement, pour elles et leurs associés, de ne participer ni aux travaux du projet ni à la fourniture de matériel ou d'équipement ni à aucune autre opération d'ordre financier le concernant.

III. ELEGIBILITE ET CRITERES DE NATIONALITE

- 3.01 L'organisme exécutant ne pourra pas établir dans l'application des procédures décrites dans la présente Annexe des dispositions ou conditions qui restreignent ou empêchent la participation de Consultants originaires de pays membres de la Banque.
- 3.02 Conformément aux dispositions de l'Accord concernant l'utilisation de la Contribution, la nationalité d'un expert sera établie sur la base de son passeport ou de tout autre document d'identité officiel. Toutefois, la Banque pourra faire des exceptions à cette règle lorsque l'expert qui ne remplit pas les conditions requises pour des raisons de nationalité: (i) a son domicile dans un pays admissible, répond aux conditions juridiques nécessaires pour pouvoir y travailler (en dehors du statut de fonctionnaire international) et a déclaré qu'il n'a pas l'intention de rentrer dans un avenir immédiat dans son pays d'origine; ou (ii) a fixé son domicile permanent dans un pays admissible et y a résidé pendant une durée minimale de 5 ans.
- 3.03 pour déterminer la nationalité d'une société de consultants, les critères ci-après seront pris en considération:
- (a) le pays où la société est dûment constituée ou légalement organisée;
 - (b) le pays où la société a le siège de ses affaires;
 - (c) la nationalité des sociétés, la citoyenneté ou la résidence bona fide des individus détenant la propriété à plus de cinquante pour cent (50%) de la société avec droit de participation aux bénéfices, conformément au certificat accordé par un fonctionnaire dûment autorisé de ladite société;
 - (d) l'existence d'arrangements en vertu desquels une grande partie des bénéfices ou autres avantages tangibles de la société est destinée à des sociétés ou des personnes d'une nationalité donnée; et
 - (e) la détermination par la Banque que la société fait partie intégrante de l'économie d'un pays comme en atteste la résidence bona fide dans le pays d'une grande partie du personnel exécutif, technique et professionnel de la société, et que la société compte dans le pays sur le matériel et l'équipement d'exploitation ou d'autres éléments nécessaires pour mener à bien les travaux à réaliser sous contrat.
- 3.04 Les critères de nationalité fixés para la Banque seront également applicables aux sociétés qui ayant été proposées pour exécuter une partie des travaux requis, en association conjointe ou dans le cadre d'un sous-contrat passé avec une société de consultants compétente qui remplit elle même les critères de nationalité.

IV. QUALIFICATIONS PROFESSIONNELLES

- 4.01 L'analyse des qualifications professionnelles d'une société de consultants considérée pour un projet donné portera sur: l'expérience de la société et de ses dirigeants dans la prestation de services de consultation sur des projets d'une dimension, d'une complexité et d'une spécialisation technique comparables à la tâche; l'expérience acquise dans la région et à l'étranger; la connaissance de la langue du territoire; la capacité financière; la charge de travail actuelle; la capacité d'organiser une équipe assez nombreuse pour réaliser les travaux dans les délais impartis; la réputation sur le plan éthique et professionnelle; et l'absence absolue de conflit d'intérêts.

V. PROCEDURE DE SELECTION ET D'EMBAUCHE

A. SELECTION ET EMBAUCHE DES EXPERTS

- 5.01 Dans la sélection et l'embauche des experts à titre personnel:

- (a) Avant de procéder à la sélection de l'expert, le MEN devra soumettre à l'approbation de la Banque ce qui suit:
 - (i) la procédure de sélection;
 - (ii) les termes de référence (spécifications) et le calendrier des services à fournir;
 - (iii) le nom des experts provisoirement sélectionnés en indiquant dans le détail leur nationalité et domicile, leurs antécédents, leur expérience professionnelle et leur connaissance des langues;
 - (iv) le formulaire du contrat qui sera utilisé pour embaucher l'expert.
- (b) Une fois que l'organisme exécutant et la Banque ont donné leur approbation, l'organisme exécutant devra embaucher l'expert. Le contrat qui sera passé avec l'expert devra être conforme au modèle de contrat qu'ont arrêté la Banque et l'organisme exécutant. Une copie authentique du texte signé du contrat sera envoyée promptement à la Banque.

B. SELECTION ET EMBAUCHE DE SOCIETES DE CONSULTANTS

- 5.02 Dans la sélection et l'embauche d'une société de consultants:

- (a) Avant de procéder à la sélection de la société de consultants, l'organisme exécutant devra soumettre à l'approbation de la Banque ce qui suit:

- (i) la procédure qui sera utilisée dans la sélection et l'embauche de la société. La sélection et l'embauche devront être annoncées dans la presse nationale et, si la complexité et le degré de spécialisation de l'assistance consultative demandée le justifie, dans des revues étrangères spécialisées. De plus, la Banque devra être informée de ces annonces et elle devra en recevoir des coupures indiquant la date et le nom de la revue dans laquelle elles ont paru;
 - (ii) les termes de référence (spécifications) décrivant les travaux qu'exécutera la société de consultants ainsi qu'une estimation de leur coût;
 - (iii) une liste d'au moins trois sociétés et de six au plus auxquelles on envisage d'envoyer une convocation.
- (b) Dès que la Banque aura approuvé les critères susmentionnés, toutes les sociétés de consultants approuvées devront être invitées à présenter des propositions conformément aux procédures et termes de référence approuvés.
- (c) Les invitations à soumettre des propositions doivent établir l'emploi selon le cas d'une des modalités suivantes:
- (i) Dans le premier cas, seule sera incluse la proposition technique sans cotation de prix. Le MEN examinera les propositions reçues et les classera dans l'ordre de mérite. Si la complexité du cas l'exige, il pourra recourir, à ses propres frais, à un groupe de consultants pour qu'il examine les propositions et donne son avis technique et spécialisé sur le classement effectué.
- Une fois établi le classement des sociétés de consultants, la société classée au premier rang sera invitée à négocier un contrat. Pendant les négociations, on examinera les détails des termes de référence pour s'assurer d'un accord complet et mutuel avec la société, les conditions contractuelles et juridiques de l'accord, et on élaborera le détail des coûts. Au cas où il s'avère impossible d'arriver à un accord avec cette société sur les termes du contrat, on l'avisera par écrit que sa proposition a été rejetée et on entreprendra des négociations avec la société classée au deuxième rang et ainsi de suite jusqu'à ce qu'un accord satisfaisant soit conclu.
- (ii) Dans le second cas, deux enveloppes scellées devront être présentées, l'une contenant la proposition technique sans indication de coût et l'autre le coût des services.

L'organisme exécutant examinera les propositions techniques et en établira l'ordre de mérite. Les négociations contractuelles

commenceront avec la société qui offre la proposition technique la meilleure. La seconde enveloppe présentée par cette société sera ouverte en présence d'un ou de plusieurs représentants de ladite société et elle sera utilisée dans les négociations contractuelles. Toutes les secondes enveloppes présentées par les autres sociétés demeureront scellées, et, si un accord est conclu avec la société classée au premier rang, elles seront renvoyées aux sociétés intéressées. Par contre, si un accord n'est pas conclu avec cette société sur les termes du contrat, on l'avisera par écrit de cet état de chose et on entreprendra des négociations avec la société classée au deuxième rang et ainsi de suite jusqu'à ce qu'un accord satisfaisant soit conclu. L'incapacité d'arriver à un accord sur le détail des coûts ou la rémunération des services, ou le fait que l'organisme exécutant estime que ces coûts ou cette rémunération ne conviennent pas ou sont excessifs, sera cause suffisante pour annoncer le rejet de la proposition et pour entreprendre des négociations avec la société classée au rang suivant. Lorsque la proposition d'une société a été rejetée, on ne l'invitera plus à négocier ce contrat.

- (d) Le texte du projet de contrat négocié avec la société de consultants devra être soumis par l'organisme exécutant à l'approbation de la Banque avant que le contrat ne soit signé et que les travaux ne commencent. Une copie authentique du texte signé devra être envoyée promptement à la Banque.

5.03 Nonobstant la procédure établie aux paragraphes 5.01 et 5.02 ci-dessus, et à la demande du l'organisme exécutant, la Banque pourra participer à la sélection des Consultants ainsi qu'à l'élaboration de leurs contrats. Il est cependant entendu que la négociation finale des contrats et leurs signature, dans des termes et conditions acceptables par la Banque, relèveront exclusivement du l'organisme exécutant et que la Banque n'assumera aucune responsabilité à cet égard.

VI. MONNAIES DE PAIEMENT

6.01 Dans les contrats passés entre l'organisme exécutant et les Consultants, il faudra préciser les monnaies dans lesquelles se feront les paiements respectifs, conformément aux normes suivantes:

(a) Palements aux experts à titre personnel:

- (i) Si l'expert est domicilié dans le pays où il fournira ses services, sa rémunération sera payée exclusivement dans la monnaie de ce pays.
- (ii) Si l'expert n'est pas domicilié dans le pays où il fournira ses services et si la durée de son contrat est de moins de quatre mois, sa rémunération sera payée en dollars des Etats-Unis d'Amérique ou en d'autres monnaies convertibles que font partie du Fonds des opérations spéciales de la Banque.

- (iii) Si l'expert n'est pas domicilié dans le pays où il prêtera ses services et si la durée de son contrat est de quatre mois ou plus, sa rémunération sera payée de la manière suivante: (1) 30% dans la monnaie de ce pays; et (2) 70% en dollars des Etats-Unis d'Amérique ou dans d'autres monnaies convertibles qui font partie du Fonds des opérations spéciales de la Banque.
- (iv) Les indemnités de séjour seront dans chaque cas payées dans la monnaie du pays où l'expert les reçoit.
- (v) Les dispositions de l'Accord concernant les taux de change seront appliquées.

(b) Paie ment aux sociétés de consultants:

- (i) Si la société de consultants est domiciliée dans le pays où elle doit fournir ses services, sa rémunération sera payée exclusivement dans la monnaie de ce pays, à l'exception des dépenses en devises au titre des voyages ou indemnités de séjour à l'étranger, lesquelles seront remboursées en dollars des Etats-Unis d'Amérique ou en leur équivalent dans d'autres monnaies qui font partie du Fonds des opérations spéciales de la Banque, sauf celle du pays où seront fournis les services.
- (ii) Si la société de consultants n'est pas domiciliée dans le pays où elle doit fournir ses services, le pourcentage le plus élevé possible de sa rémunération lui sera versée dans la monnaie de ce pays et le reste en dollars ou leur équivalent dans d'autres monnaies qui font partie du Fonds des opérations spéciales de la Banque, étant entendu que la somme correspondant aux indemnités de séjour devra être payée dans la monnaie du pays ou des pays dans lesquels seront déboursées les indemnités. Si le pourcentage à payer dans la monnaie du pays où seront fournis les services est inférieur à trente pour cent (30%) du total de la rémunération de la société de consultants, une justification complète et détaillée sera soumise à la Banque pour examen et commentaires, en même temps que le projet de contrat correspondant.
- (iii) Lorsqu'il s'agit d'un consortium composé de sociétés domiciliées dans le pays où seront fournis les services et de sociétés non domiciliées dans celui-ci, la partie de la rémunération correspondant à chacun des membres du consortium sera versée conformément aux règles décrites dans les paragraphes (i) et (ii) ci-dessus.
- (vi) Les dispositions de l'Accord concernant les taux de change seront appliquées.

VII. RECOMMANDATIONS

- 7.01 Il est entendu que les opinions et recommandations des Consultants n'engagent ni l'organisme exécutant ni la Banque, lesquels se réservent le droit de formuler les commentaires ou les réserves qu'ils estiment nécessaires.

VIII. PORTEE DE L'ENGAGEMENT DE LA BANQUE

- 8.01 Il reste convenu que la Banque n'assume pas l'engagement de financer tout ou partie d'un programme ou projet qui, directement ou indirectement, pourrait découler des services fournis par les Consultants ou des recommandations faite par eux.

IX. CONDITIONS SPECIALES

- 9.01 Dans les contrats que passe l'organisme exécutant avec les Consultants il sera stipulé que:
- (a) les Consultants devront travailler en étroite collaboration avec le personnel professionnel local qui, conformément aux dispositions de l'Accord, ait affecté ou embauché pour participer à la réalisation du Programme afin de permettre au personnel d'acquérir à la fin des travaux des compétences techniques et opérationnelles;
 - (b) le dernier paiement prévu par le contrat sera subordonné à l'acceptation par l'organisme exécutant et la Banque du rapport final. Il sera égal à 10% au moins du montant total de la somme convenue dans le contrat pour le paiement des honoraires.

Indicadores Socioeconómicos Seleccionados
Zona Nor-oeste de Puerto Príncipe

Población (1980): 99,900
Viviendas (1980): 23,780
Personas/vivienda: 4,2

Viviendas según
número de habitaciones (%): - 1 habitación: 76%
- 2 habitaciones: 20%

Tipo de vivienda según estado (%):	Condición		Total
	Bien	Mal	
Madera	8,4	23,1	31,5
Bloques de cemento	35,6	6,8	42,4
Tugurio ("tandis")	-	26,1	26,1
	44,0	56,0	100,0

PEA según actividad (%)=	Obrero:	22,5
	Vendedor:	28,6
	Jornalero/Artesano:	17,5
	Desempleado:	16,8
	Otro	14,6
		100,0

Ingresos semanales por familia (US\$, 1981):	menos que 5:	33,5
	5-12:	22,9
	12-25:	19,7
	25 y más:	6,8
		100,0

Razón de insatisfacción del barrio (%):	Inundaciones:	45%
	Malos olores:	26%
	Mosquitos:	22%
	Otro:	7%

Fuente: FCH International: "Etude d'améliorations physiques des cites Simone, Jean-Claude, Linthau, Brooklyn, Boston et Wharf", 1981. Basado en encuesta a 1000 familias estadísticamente representativas de la zona.

Estimación de Beneficios Unitarios

1. Para efectos de estimar los perjuicios que se evitarían con el proyecto, se levantó una encuesta socioeconómica, durante mayo de 1985, destinada a recoger de los propios afectados los datos básicos correspondientes. Este anexo resume los principales procedimientos y resultados.
2. Habiéndose identificado las principales áreas afectadas por inundaciones se entrevistaron unas 325 familias estadísticamente representativas de la población del lugar. El cuadro adjunto señala los tamaños muestrales por barrios así como las fracciones de muestreo según datos de población actualizados.
3. Se utilizó para la entrevista un cuestionario sencillo de 10 preguntas destinadas a investigar la seriedad del problema de inundaciones para la familia, los costos que ellas le significaban y algún dato de fuerza de trabajo. Los principales resultados se indican en el cuadro adjunto el cual resume los promedios muestrales así como los errores estandar de estas estimaciones. Según estos últimos en todos los casos los errores muestrales de las variables de interés están dentro de los rangos de aceptación normales. Sólo en los barrios de Centreville y Papacito las varianzas observadas sugerirían que los tamaños de muestra son algo reducidos. No se debe sobreestimar, sin embargo, el grado de precisión obtenido de la encuesta. La utilización de un cuestionario muy simplificado, por restricciones de tiempo para encuestar y procesar los datos, falta de recursos humanos adecuados para la tarea y, la naturaleza de las cuestiones planteadas, dan lugar a la posibilidad de errores no muestrales significativos, incluso sesgos, en las estimaciones presentadas. No se dispone desafortunadamente de fuentes de estimación alternativas para estos propósitos.

Resultados Seleccionados de Encuesta Socioeconómica.

	<u>Zona Norte</u>		<u>Zona Centro</u>			<u>Zona Carrefour</u>		
	<u>Electricite</u>							
	<u>Cite Soleil</u>	<u>d' Haiti</u>	<u>Centreville</u>	<u>Brea</u>	<u>Papacito</u>	<u>Diquini</u>	<u>Carrefour</u>	<u>Total 5/</u>
año								
muestra 1/:	117	11	39	21	17	24	88	317
coefficiente de variación (%) 2/	0,55	0,10	0,37	0,47	0,57	0,70	0,32	0,39
ingresos a tiendas (S/año)								
promedio	425,1	198,2	203,1	511,9	294,1	648,1	535,1	438,6
s.e. 3/	67,4	77,8	94,9	108,7	131,7	163,2	91,1	40,5
C.V. 4/	15,9	39,2	46,7	21,2	44,8	25,2	17,0	9,2
ingresos a talleres (S/año)								
promedio	132,9	175,5	71,8	318,9	397,1	363,6	238,2	201,0
s.e.	13,8	22,6	31,6	119,4	181,8	109,4	26,9	18,1
C.V.	10,4	12,9	44,0	37,4	45,8	30,1	11,3	9,0
horas de trabajo recibidos								
promedio	6,3	9,6	1,6	4,2	4,1	1,7	3,2	4,4
s.e.	0,9	0,6	0,8	0,6	1,7	0,4	0,5	0,5
C.V.	14,6	6,1	51,2	14,2	40,4	25,5	16,5	12,2

Questionarios válidos

Universo muestral según Cuadro 6.1 en texto.

Error estándar del promedio

Coefficiente de variación = s.e./promedio (%)

Los datos se refieren a un total de 325 encuestas que incluyen adicionalmente el sector de Delmas.

4. Los resultados indican que, en promedio 1/ a la fecha de la encuesta, las familias gastaban unos US\$87 al año con el objeto de reparar los daños ocasionados a las viviendas. Este alto valor 2/ refleja en buena parte la precariedad de las condiciones de las viviendas en grandes sectores de Puerto Príncipe, así como también la intensidad del régimen de lluvias. Nótese que en promedio ello significa un gasto de unos US\$2 por lluvia, es decir, casi un jornal mínimo. Debe destacarse también que en los sectores de ingresos relativamente menores, Cité Soleil y Carrefour 3/ estos costos son significativamente mayores que en áreas de mayor calidad de vivienda (Centreville) y que por lo tanto están mejor protegidas del impacto de las lluvias.
5. Unos US\$40 al año adicionales se gastan en reponer los bienes y enseres damnificados por inundaciones. Mayor significancia alcanza este valor en la zona Sur-Oeste de la ciudad donde las condiciones topográficas y precariedad de las viviendas inciden en mucho mayores pérdidas por este concepto.
6. En términos de tiempo de trabajo perdidos la encuesta reporta, en promedio por familia, unos 4,4 días al año, es decir, prácticamente en uno de cada diez días de lluvia los miembros del hogar se ven imposibilitados de asistir a sus puestos de trabajo. Este indicador es bastante más alto en los barrios de la zona norte donde las inundaciones tienden a ser más duraderas por las características de pendiente del área. Para efectos del análisis estos días perdidos se han valorado al

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- 1/ Los promedios que se indican en este y los siguientes párrafos incluyen las personas que declararon no soportar pérdidas por concepto de inundaciones.
- 2/ Equivale a un 12% del salario mínimo anualizado (US\$3/día) y se ubica entre 1-2 veces el valor de un arriendo mensual.
- 3/ Se exceptúa aquí el caso de los barrios vecinos a Electricité d'Haití que inexplicablemente registran bajos niveles de daños por este concepto.

costo de oportunidad de la mano de obra no calificada, equivalente a US\$1,32/día 1/

7. Los cálculos finales reportados en el cuadro 6.1 del texto principal incluyen los siguientes ajustes adicionales: (i) los datos han sido reajustados en 7% para reflejar valores de 1986 y se han convertido a dólares estadounidenses en la tasa oficial de GDS5/US\$; (ii) los ahorros por daños han sido convertidos a precios económicos con los factores de conversión citados en el texto y las siguientes ponderaciones:

<u>Item</u>	<u>Daños a Viviendas</u>	<u>Daños a Enseres</u>
Mano de obra no calificada	30	20
Mano de obra calificada	10	10
Materiales nacionales	30	60
Materiales importados	30	10
Factor de conversión promedio	.81	.85

(iii) En caso de Carrefour/River Froide se tomó la mitad de los valores entregados por la encuesta para reflejar aproximadamente el conjunto de la población servida por la red secundaria. La encuesta sólo se centró en las áreas de mayores inundaciones vecinas a los canales por construirse, ya que sólo con posterioridad a su levantamiento se amplió el proyecto para incluir dicha red secundaria. Hay que destacar que en la situación actual esta área de influencia "ampliada" contiene principalmente calles sin pavimentar, en condiciones de topografía de alta pendiente, que favorecen la generación de altos perjuicios a la población.

1/ Salario mínimo día = US\$3 x coeficiente conversión mano de obra no calificada = 0.44.

Matriz de Conversión de Categorías de
Costos de Inversión a Uso de Insumos.
(Porcentajes)

<u>Insumos</u>	<u>Canalización</u>	<u>3/ Expropiación</u>	<u>Revestimiento de Calles</u>	<u>Ingeniería Administ.</u>	<u>Imprevistos</u>
Mano de obra					
-no calificada	.076	0	0.118	0	0.059
-calificada <u>1/</u>	.289	0	0.270	0.673	0.332
Materiales y equipos					
- nacionales	.365	1	0.472	0.062	0.361
- importados	.266	0	0.132	0.196	0.234
Impuestos <u>2/</u>	.004	0	0.008	0.069	0.014
TOTAL	1.000	1.000	1.000	1.000	1.000

1/ Incluye utilidades y parte de los gastos generales de los contratistas.

2/ Se refiere al impuesto al valor agregado (tax sur le chiffre d'affairs)
aplicado especialmente al acero, cemento y combustibles.

3/ Incluye obras de dragado.

Bases: Análisis de costos unitarios de las principales ítems de gasto.