PD-AAS-884
ISN-43972

UNCLASSIFIED

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

GRENADA

PROJECT PAPER

INFRASTRUCTURE REVITALIZATION II

AID/LAC/P-271

Project Number:538-0129

UNCLASSIFIED

PDAAS-884
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AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: _____

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: GRENADA

3. PROJECT NUMBER: 538-0129

4. BUREAU/OFFICE: LATIN AMERICA/CARIBBEAN — 05

5. PROJECT TITLE (maximum 40 characters): INFRASTRUCTURE REVITALIZATION II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 12 DD 31 YY 87

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 86 B. Quarter 1 C. Final FY 86

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 86 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(5,000)	( )	(5,000)	(4,600)	(400)	(5,000)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country		300	300		300	300
Other Donor(s)						
TOTALS	5,000	300	5,300	4,600	700	5,300

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ESF	701	840				5,000		5,000	
(2)									
(3)									
(4)									
TOTALS						5,000		5,000	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 821 825

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
A. Code
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

The purpose of the project is to assist in improving Grenada's physical infrastructure to a level required to create immediate employment opportunities, encourage foreign exchange inflows and encourage a long-term flow of private sector investment.

14. SCHEDULED EVALUATIONS
Interim MM YY MM YY Final MM 09 YY 87

15. SOURCE/ORIGIN OF GOODS AND SERVICES
[X] 000 [ ] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)

17. APPROVED BY
Signature: James Holloway
Title: Director, RDO/C
Date Signed: MM 12 DD 13 YY 85

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM 1 DD 16 YY 86

AID 1330-4 (8-79)

PROJECT AUTHORIZATION

NAME OF COUNTRY: Grenada

NAME OF PROJECT: Infrastructure Revitalization II

NUMBER OF PROJECT: 538-0129

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Infrastructure Revitalization II Project for Grenada, involving planned obligations of not to exceed Five Million United States Dollars (US$5,000,000) in grant funds ("Grant") over a two (2) year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.

2. The project ("Project") will assist the Government of Grenada ("Grantee") in improving designated roads, upgrading the power generation capacity, development of an industrial park with sites and services, and upgrading the capacity to provide aggregate, asphalt and cement for public and private construction. The Project will furnish related services, where appropriate, for each element.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants, and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Grant shall have their source and origin in Grenada or in the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services financed under the Grant shall have Grenada or the United States as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Grant shall be financed only on flag vessels of the United States, except as A.I.D. may otherwise agree in writing.

James S. Holtaway
Director

December 13, 1985
Date

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INFRASTRUCTURE REVITALIZATION II
PROJECT PAPER

I. SUMMARY AND RECOMMENDATIONS

A. Recommendation

RDO/C Grenada recommends authorization of a grant of $5,000,000 to the Government of Grenada (GOG) to finance the Infrastucture Revitalization II Project (538-0129). This Project was originally conceived as an amendment to the Infrastructure Revitalization Project (543-0008) but, pursuant to guidance contained in State 353600, is being authorized as a separate project which draws upon the analysis in the Infrastructure Revitalization Project and builds upon the inputs of that Project. The Project Background and Rationale; Problem Description; AID Program Strategy; USAID Project Strategy; GOG Strategy; Other Donors; Project Goal and Purpose; and Social Soundness Analysis are unchanged from the original Project Paper for the Infrastructure Revitalization Project except where amplified to justify the Project Description for this Project.

B. Project Summary

The Infrastructure Revitalization Project, which was obligated in September, 1984, supports the productive sectors of agriculture, manufacturing and tourism by improving essential infrastructure. The project is consistent with the Country Development Strategy Statement (CDSS) and the FY86/87 Action Plan, which were approved in July, 1985, and which also identify infrastructure as a necessary prerequisite to increased private sector investment and employment generation. Although there have been visible improvements in the infrastructure base as a result of this project and the road building component of the Point Salines Airport Project (543-0006), it is clear that additional inputs are required to contribute to supporting foreign and indigenous private investment. The objectives of the Infrastructure Revitalization II Project are: (1)the purchase and installation of a portable asphalt plant to complement a new portable rock-crusher purchased separately; (2) the development of the Frequente Industrial Park; (3) the paving of approximately 18 miles of primary and secondary roads; (4) the procurement and installation of additional generating capacity at the Grenada Electricity Company (GRENLEC); and (5) the procurement of technical assistance and construction services for the operation of the asphalt/crusher plant and the construction of (2) and (3) above.

II. PROJECT BACKGROUND AND RATIONALE

A. Background and Problem Description

The situation decribed in the Economic Overview of the Infrastucture Revitalization Project remains essentially unchanged with Grenada's economy still dependent upon agriculture and tourism. Although there is a light manufacturing sector, it is very small and has not yet responded to efforts by the GOG and the donor community to promote its growth. Both agriculture and tourism have enjoyed modest growth in the past year but fundamental adjustments are required to encourage new investment and a faster growth rate in each of these productive sectors. The major constraining factor identified by the GOG and AID is the inadequacy of basic infrastructure; in particular, a primary and feeder road system, electric power and water. To these can be added the shortage of adequate factory space necessary to attract new manufacturing investments. Although the Infrastructure Revitalization Project (543-0008) addresses each of these areas, its impact is limited in scope, and major capital investments are required over the next few years to bring Grenada to a level comparable to other Eastern Caribbean states. There have been significant improvements in the infrastructure inventory in the past year, but much remains to be accomplished.

While it is difficult to find an area of Grenada where the infrastructure is not in poor condition, it is possible to identify geographic areas where immediate improvement is most likely to achieve immediate results in terms of investment promotion. It has become increasingly clear that major new investment is most likely to occur in the area between the Point Salines Airport and St. George's (the South-West Quadrant). This area offers manufacturing access to transportation facilities and labor. Most of the existing and planned hotel development is located in this area. Due to the road building activities under the Point Salines Airport Project, the road network in the South-West Quadrant has experienced significant improvement. The situation with regard to potable water has also been improved by the Infrastructure Revitalization Project with the completion of the 15,000 meter Mamma Cannes pipeline project which provides and additional 250,000 gallons per day of water to the St. George's area. New generators supplied by the UK have reduced the power shortage, but additional generating capability is needed to assure that peak load demand can be met and frequent load shedding can be eliminated. Some factory shell rehabilitation has already occured under the Infrastructure Revitalization Project, but Grenada still requires an inventory of factory space adequate for foreign investors. RDO/C believes that a major effort is required to complete infrastructure improvements in

the South-West Quadrant in order to provide a climate conducive to new investment in tourism and manufacturing. This effort requires the provision of additional generating capability for GRENLEC; the further development of the Frequente Industrial Park; and additional road rehabilitation.

Although new investments are most likely to occur in the South-West Quadrant, the rest of the island cannot be ignored in either political or economic terms. Grenada's economy remains based upon agriculture and the major agricultural areas are in the south-east and north-east portions of the island. Access between St. George's and the rest of the island is important in that it supports the link between farm and market and provides tourist access to scenic attractions located in other parts of Grenada. Access between St. George's and Grenville, Grenada's second largest city and only other port is necessary to allow Grenville to share in development. At present, the Infrastructure Revitalization Project and other donor-funded projects are contributing to the linkages discussed above by paving the Northern section of the Western Main Road, the North-Eastern Main Road and the South-Eastern Main road. The main road from St. George's to Grenville, which passes through the Grand Etang National Forest (a tourist attraction) and is the most direct link between the two cities, was to be partially paved under the Infrastructure Revitalization Project. However, the amount of paving is limited to only a small section of the road and does not address the problem of access between St. George's and Grenville. The paving of the St. George's/Grenville Road is recommended to complement the completion of major requirements in the South-West Quadrant; improve access to tourist attractions; link St. George's to the agricultural areas in the north-east; and create investment opportunities in Grenville. This road is particularly important since it demonstrates to the people living on the eastern side of the island that not all efforts to stimulate economic development are limited to the South-West Quadrant.

One of the major constraints to any development in Grenada is the absence of a reliable source of aggregate for construction. It must be stressed that the availability of aggregate is essential to all construction, including buildings, bridges and road paving. At present, all available aggregate for both public sector and private sector construction is being provided by the Mount Hartman Facility which is being operated by Morrison-Knudsen (MK) under the Point Salines Airport Project. Both the rock-crusher and asphalt plant at Mount Hartman are of East-Bloc manufacture and are rapidly succumbing to age and a lack of spare parts. Neither are expected to remain in operation beyond the demobilization, in December, 1985, of the MK technical personnel operating the quarry, crusher and asphalt plant. Once the Mount Hartman operation terminates, there will be no supply of crushed aggregate or asphalt on the island. This situation will bring

construction of all types to a standstill. RDO/C Grenada is procuring a portable rock crusher under the Point Salines Airport Project. However, technical assistance is required to place the new unit into operation and the provision of the rock crusher does not address the need for a new asphalt plant to replace the failing equipment presently providing asphalt for road paving.

III. PROJECT DESCRIPTION

A. Project Goal and Purpose

The project goal and purpose remain unchanged from the Infrastructure Revitalization Project. However, the latter stresses that the work to be carried out under that project is primarily aimed at satisfaction of immediate needs. While the interventions in this activity also address needs that are immediate, they will correct fundamental problems that must be solved to promote both immediate and long term economic growth.

B. Project Activities

The project will fund five infrastructure activities that directly affect the investment climate and the prospects for growth in the productive sectors of agriculture, tourism and manufacturing. Each of the activities have been identified by RDO/C Grenada and the GOG as priorities. The activities included in the following descriptions by no means represent all of the infrastructure needs of Grenada and additional complimentary infrastructure interventions will be required in the future. The proposed activities are supportive of completed and on-going activities in infrastructure, agriculture, fiscal reform and investment promotion. In each case, they solve an immediate constraint and should yield an immediate return in terms of economic growth.

1. Portable Asphalt Plant

When AID agreed to finance the completion of the Point Salines Airport Project, a decision was made to maximize the use of equipment owned by the GOG in order to speed mobilization of the construction contractor and reduce project costs. Among the equipment owned by the GOG were a rock-crusher and asphalt plant of East-Bloc manufacture that had been moved to Grenada from Angola where they had been in use for many years. This equipment proved to be in extremely poor condition and spare parts were in short supply. The U.S. contractor, Morrison-Knudsen (MK) has managed to maintain and operate the equipment only by extraordinary effort. The asphalt plant is the only one on the island and the rock crusher is the only one operating that is capable of producing large quantities of crushed aggregate. The rock-crusher is capable of producing only three hundred tons of aggregate per day, which barely

meets the requirements of MK for road paving and construction. Other donor-funded road paving projects have experienced delays because the output of aggregate is insufficient to supply their needs as well as those of MK. Private sector construction projects have been able to purchase small amounts of aggregate for concrete from private sources, but planned hotel construction estimates far exceed availability.

With the completion of the airport project in December, 1985, MK is scheduled to demobilize the personnel presently operating the rock-crusher, asphalt plant and quarry. These facilities are not expected to continue to operate for more than a few weeks given the extended age and condition of major pieces of equipment. Once they cease to operate, no asphalt, and only limited quantities of aggregate, will be available on the island. This will have serious implications for the activities being implemented under the Infrastructure Revitalization Project, the Mental Health Facility Project, donor-funded road paving projects, and all private and public sector construction projects.

RDO/C is financing the purchase of a new portable rock-crusher to replace the worn-out unit at the Mount Hartman Quarry. This project proposes to purchase a new portable asphalt plant to replace the existing unit at Mount Hartman and complement the new portable rock-crusher. These procurements will be supported by a technical assistance contract to install the new units and operate them for a period of one year while training Grenadian personnel to operate the units and the quarry.

2. Technical Assistance and Training

MK currently operates the quarry, rock-crusher and asphalt plant at Mount Hartman as part of the Airport Project. This effort has been oriented toward supplying aggregate and asphalt for MK's requirements. Although MK employs Grenadians at the quarry, its efforts have not been directed toward the training of Grenadians to take over the operation upon MK's departure. The critical situation with regard to continued operation of the facility has only recently become apparent. The GOG had planned to commence quarrying operations at Telescope point and The European Development Fund-funded Eastern Main Road project had financed a small rock-crusher for that site. Unfortunately, that rock-crusher has proven to be of a design unsuitable for the various grades of aggregate required and the GOG lacks equipment and expertise necessary to operate the quarry. Although the AID procurement of a portable rock-crusher and asphalt plant will provide the capability to supply the island's needs for aggregate and asphalt, the GOG still requires technical assistance to install and operate the

equipment and train personnel to assume responsibility for operation. This component will fund technical assistance for a period of one year to meet this requirement. The technical assistance contract will be combined with the contract for construction services discussed below in order to facilitate coordination with the project's construction components and reduce administrative costs. It is estimated that the technical assistance component will require the services of four long term expatriate staff. This team would be responsible for the installation of the equipment; the procurement of quarrying equipment and materials necessary for production; the operation of the quarries, rock-crusher and asphalt plant; the training of Grenadian personnel in all facets of operation; and the development of the operation as a profit-making entity. Both aggregate and asphalt would be sold to both the private sector and donor-financed projects, such as the Eastern Main Road Project and the IBRD farm roads project, at commercial rates. For its part, the GOG will be required to develop the operation as either a private company or an autonomous public sector company with a management contract. It is estimated that the objectives of the technical assistance contract will not be achieved in less than one year.

3. Frequente Industrial Park

New investment in Grenada is severely constrained by the shortage of available factory space for new investors. At present, there is no excess factory space on the island. The Infrastructure Revitalization Project contains a component to rehabilitate six structures in the Frequente area to be utilized as factory shells. However, the rehabilitated structures are only marginally suitable for manufacturing and have proven to be unattractive to foreign investors. Of the four factory shells rehabilitated to date, all have been assigned to local entrepreneurs. A study of available and potential factory space was recently conducted by Free Zone Authority which recommended the development of the Frequente site as an industrial park to be administered by the Grenada Industrial Development Corporation. RDO/C Grenada concurs with the recommendation.

Grenada finds itself at a comparative disadvantage with all of the other states in the Eastern Caribbean with which it competes for the attraction of foreign investment. The disadvantage arises from the absence of factory space; poor infrastructure, including roads and electricity; higher transportation costs; and a largely untrained labor force. Substantial improvements in infrastructure have been made in the past year and these will be augmented by this project. Training of labor is being provided by the OAS Non-Formal Skills Training Project and the AIFLD skills

training activity. Transportation costs will continue to be a problem but are not believed to be major when compared to other constraints. Conversations with numerous potential investors indicate that transportation concerns relate more to the low volumes of production associated with start-up and become of less concern as the volume of production increases. The major constraint to new investment at this time is the absence of factory space.

The Frequente site is located approximately one mile from the Point Salines International Airport and three miles from the St. George's Port. It is linked to both by newly surfaced roads completed under the Airport Project. The site, which is owned by the GOG, contains approximately 19 acres and, under the above mentioned Free Zone Authority report, can accommodate a total of 215,000 square feet of factory space. The report provides several alternative development plans that incorporate some of the existing buildings and provide for construction of roads, utilities, administration facilities and up to eleven new factory space structures. The proposed factory shells would utilize modular units that measure 100x30 feet and can be combined to create structures of any size. The recommended site plan that has been accepted by the Industrial Development Corporation and the GOG is depicted at Annex II, Exhibit C. This component proposes to develop the Frequente site as an industrial park to include roads, utilities, fencing, site preparation, and the construction of at least two complete factory shells totalling 20,000 square feet.

The development of Frequente must be approached as a phased program. This component will provide for the planned roads and site clearing, and some factory shells for Phase I of the industrial park. Utilities and additional factory shells to be constructed in future phases will be funded under other activities, by other donors, or through loans procured by the Industrial Development Corporation. The estimated cost of this component is $750,000 of which $500,000 will be provided by this project. The remaining requirement of $250,000 is already available for factory shells under the Infrastructure Revitalization Project.

Discussions have been held with the Industrial Development Corporation concerning the ownership and management of the industrial park. The Industrial Development Corporation has agreed that a condition precedent to disbursement shall be the agreement of the GOG to vest title to the Frequente site in the Industrial Development Corporation; to permit it to manage the facilities and receive revenues from leaseholds; and to charge user fees sufficient to provide an economic return. This is estimated to be 15% of the capital cost of the factory shell structures. It is unclear at this time whether the Industrial Development Corporation in its management plan will itself manage the facility or contract

with a management firm. Another aspect of management to be resolved is the issue of whether investors will be permited to purchase sites within the industrial park to facilitate financing of new factory shells. These issues will be resolved prior to disbursement in discussions concerning satisfaction of conditions precedent.

A final point of concern is the timing of the development of the industrial park. A Grenadian entrepreneur is presently negotiating with local banks to provide financing through the AID-funded IPIP Project for the construction of factory shells. The CDB is also planning to construct factory shells at a location adjacent to the Frequente site. Although the negotiations for these facilities have been protracted, the timing of the Frequente development must be considered to ensure that the development of these facilities is not affected adversely.

4. Roads

The road network in Grenada requires extensive rehabilitation and has the distinction of being in the poorest condition of any in the Eastern Caribbean. Substantial progress has been made under the Infrastructure Revitalization Project and the Airport Project in rehabilitating primary roads in the St. George's area. The overall situation in the South-West Quadrant has been dramatically improved in the past year. In addition to the AID-funded efforts, other donor-funded road paving projects include the EDF-funded Eastern Main Road and the CDB-funded Western Main Road. The former is making very slow progress and implementation of the latter has been delayed for six years. Substantial assistance is still required and funding for road paving leads the GOG's list of priorities.

Full rehabilitation of primary roads, as opposed to road patching, has proven to be one of the most visible and successful of RDO/C Grenada's undertakings. The successful upgrading of primary roads in the South-West Quadrant has impressed both Grenadians and foreign investors. It supports all of the productive sectors directly, but also has a positive impact on the level of confidence that Grenadians and foreign investors have in the economic and political viability of the country. This component proposes to complete the paving of major roads in the South-West Quadrant and to link St. George's and Grenville by paving the main road between the two. A discussion of each road segment follows:

Lance Aux Epines--This road, which is depicted on the map at Annex II, Exhibit F, supports the tourism industry by providing access to four hotels and one of the two marina facilities in Grenada. Access to the Mount Hartman Quarry is via the same

road. Repaving of the Lance Aux Epines road will link the above mentioned facilities to the newly resurfaced Airport, Woodlands and Grand Anse Roads. RDO/C Grenada supports this activity because it is necessary given the importance of tourism to Grenada. The road is approximately 2.5 miles in length and it is estimated that the cost of resurfacing will amount to $190,000.

Morne Rouge--This road, which is depicted on the map at Annex II, Exhibit F, is a logical extension of the resurfacing of the Grand Anse Loop which is being completed as a demonstration project under the Airport Project. The area it serves contains several hotels, a night club, potential hotel sites, and the beach area at Morne Rouge Bay. It is hoped that the completion of this road will encourage investment in that area. The road is .25 miles in length and the cost of resurfacing is $44,000.

St. George's Selected Road Segments--The resurfacing of the Careenage under the Airport Project has significantly improved the appearance of St. George's and its appeal as a tourist attraction. St. George's is an increasingly important stop for tour boats whose passengers have the potential to contribute significantly to the economy. In the first six months of 1985, there were 92 calls by tour ships to Grenada which brought 42,000 visitors. This is a substantial market for the retail establishments, restaurants and taxi operators located in the St. George's area. The condition of the streets in St. George's is generally poor and resurfacing is required to facilitate the movement of traffic and relieve congestion. The paving to be accomplished includes the linkage of the Careenage to the northern side of St. George's and points north and east; the paving of areas within the St. George's Port; and several short streets that provide access within the city. Total resurfacing consists of approximately 1.25 miles at an estimated cost of $144,000.

St. George's/Grenville Main Road--This road is one of the main arteries in Grenada and links Grenville to the port, airport and markets of St. George's. Grenville, with its smaller port and the now unutilized airport facilities at Pearl's is Grenada's second largest city and a potential area for tourism and manufacturing. The area to the north of Grenville is one of Grenada's major agricultural areas which require access to the deepwater port at St. George's. The St. George's/Grenville Main Road provides access to the interior of the island and passes through the Grand Etang National Forest which contains the Grand Etang Crater Lake. Both of these features are tourist attractions which are being developed by the GOG with donor assistance.

Although initial investment in the manufacturing and tourism sectors is most likely to occur in the South-West Quadrant, the importance of Grenville cannot be ignored in either economic or

political terms. Since the closure of the Pearl's Airport, Grenville has experienced a loss of revenue. RDO/C Grenada is about to fund a study of the Grenville/Pearl's area that will produce a conceptual master plan for the future development of the area in tourism, manufacturing and agribusiness. There is significant potential in the latter, given Grenville's proximity to the north-east agricultural area and its small port.

The St. George's/Grenville Road is in poor condition and requires resurfacing. Portions of the road were to be upgraded under the Infrastructure Revitalization Project, but it is now believed that the entire road needs to be resurfaced. The road is approximately 14 miles in length and the estimated cost of resurfacing is $1,200,000.

5. Generator

In September, 1985, the GOG approached RDO/C Grenada with a request to fund additional generating capacity for GRENLEC. RDO/C Grenada responded by funding a generating study which was completed in November, 1985 by EBASCO. EBASCO studied the generating facility at Queens Park which contains nine generators owned by GRENLEC and two leased units. The total site-rated capacity of the nine generators was found to be 9550kw to meet present peak load requirements of 5200kw. However, EBASCO found that generators 1,2,3 and 4 have reached or exceeded expected operating lifetime; are inefficient and costly to operate; are too often out of service; and cannot be depended upon to provide reliable service. EBASCO advised that these generators be taken out of operation, cannibalized and used only for emergency power requirements. The remaining generators (5,6,7, 8 and 9) were found to have a total site rated capacity of 7550kw. This figure was further reduced by EBASCO by discounting the two largest units (3640kw) for routine maintenance and equipment failure to a firm capacity of 3910kw. (The two leased units [1000kw] were not considered in determining firm capacity as they are not owned by GRENLEC and are very costly to lease and operate.) The difference between firm capacity and present peak load leaves a shortage of 1290kw. EBASCO, in its report, (see Annex II, Exhibit B), recommends the procurement of one to two generators with a total size range of 1800kw to 3000kw. It should be noted that the installation of the additional unit(s), while satisfying immediate requirements, allows for only modest growth in peak load demand. If hotel and manufacturing investment occurs as contemplated in the CDSS, GRENLEC will require additional generating capacity almost immediately. The installed cost of the unit(s) is estimated to be $1,250,000.

C. Cost Estimate and Financial Plan

The total estimated cost of the project is $5.3 million, of which $5.0 million will be borne by AID and $0.3 million by the GOG. The Summary Financial Plan below provides a breakdown of project costs by element. It should be noted that the GOG contribution for the road paving and Frequente components will consist of equipment which will be assigned to the US Contractor and the raw materials (aggregate and asphalt cement) utilized in construction of these elements. The GOG will be required to assign professional staff and laborers to the Mount Hartman and telescope quarries and to fund their salaries. The cost of these salaries will be offset by the income earned from the sale of aggregate and asphalt. Once the facilities are privatized, it is expected that the GOG will incur no recurrent costs for their operation. The level of funding provided by this project for TA to operate the quarry/rock-crusher/asphalt plant will permit approximately 12 months of assistance. It is believed that this level of assistance will be sufficient to place both the Mount Hartman and Telescope quarries into operation and train GOG personnel in their operation. RDO/C Grenada is concerned about increases in recurrent costs which constitute an added burden to the GOG which already has a significant gap between revenues and costs. The Frequente Industrial Park, the Mount Hartman/Telescope facilities and GRENLEC are all revenue earning entities that if properly managed will create no recurrent costs and should in fact, be a source of revenue to the GOG. (Although GRENLEC is not presently profitable, the replacement of aging equipment with the new generator, which has lower operating costs, will lower overall operating costs.) The roads component will resurface existing roads which, because of their deteriorated condition now require extensive maintenance. Although even the newly paved roads will require maintenance, the level of expenditure required to maintain them will actually be reduced for several years.

As discussed in the implementation and procurement plans, all construction and procurement elements are expected to be completed within one year of obligation, although the roads component may require some additional time to complete. Because of the short implementation period, no contingency or inflation allowance is included in the financial plan.

SUMMARY FINANCIAL PLAN

(Costs in US$000)

PROJECT COMPONENTS	AID	GOG	TOTAL
Asphalt Plant	500	-	500
Road Resurfacing	1,678	200	1,878
Technical Assistance/Materials	1,072	100	1,172
Frequente Development	500	-	500
Generator(s)	1,250	-	1,250
PROJECT TOTAL	5,000	300	5,300

IV. IMPLEMENTATION PLAN

The primary implementing agency for this project will be the Ministry of Communications and Public Works. The TA/construction services contractor will work directly with the Ministry under a host country contract to establish the facilities at Mount Hartman and Telescope Point; to develop Phase I of the Frequente site; and to resurface the roads described above. The construction of factory shells upon the developed site will be accomplished by host country contracting between the Industrial Development Corporation and either a local or regional contractor. The procurement and installation of the 1.8mw to 3.0mw diesel generator(s) for GRENLEC will be accomplished by GRENLEC under a host country contract with a US company.

The monitoring unit that is presently funded by the Infrastructure Revitalization Project which includes both AID-funded engineering expertise and Ministry of Communications and Public Works engineers seconded to the project, will be responsible for the supervision and monitoring of the various components of this project, with the exception of the generator component which will be supervised by GRENLEC with the assistance of the monitoring unit as required.

A. Project Components

Technical Assistance and Construction Services: The most critical element in this project is the procurement of the technical assistance for the operation of the facilities at Mount Hartman and Telescope quarries. As indicated above, the existing rock-crusher and asphalt plant are presently being operated by MK under the Airport Project. MK is planning to demobilize, on December 20, 1985, the personnel and laborers working under that project. The GOG will then assume responsibility for operations and, due to the condition of the equipment, it is unlikely that production of aggregate and asphalt will continue. It is therefore imperative that the technical assistance required to operate the the existing facility; install the new rock-crusher and the asphalt plant to be procured under this project; and put the new equipment into operation be contracted immediately. The project proposes to combine the technical assistance required for Mount Hartman and Telescope point with the construction services required for the Frequente site development and the road resurfacing. This arrangement has worked well on the Airport Project where MK has operated the quarry, rock-crusher and asphalt plant and provided

construction and engineering services. Also, the continuation of road paving activities and the development of Phase I at the Frequente site are deemed to be as urgent as the requirement for the technical assistance. Because of the limited amount of construction equipment available for this project it would be very costly and impracticable to try and divide the equipment between two separate contractors.

Portable Asphalt Plant: The procurement of the portable rock-crusher under the Airport Project is being accomplished under an AID direct contract. It is proposed that the asphalt plant be procured by using an AID/W centrally negotiated IQC with a qualified procurement services agent (PSA) to expedite the process and ensure installation at the earliest possible date.

Frequente Industrial Park: The Free Zone Authority report (Annex II, Exhibit C) establishes the need for the development of Phase I of the Frequente site to provide an inventory of factory space and ancillary facilities attractive to foreign investors. The report also discusses the planned construction of 40,000 square ft. by the CDB, with the first 16,000 suare feet to be completed by mid-1986, and the plans of a local entrepreneur to construct a private industrial park at Tempe, using funds obtained through the AID-funded IPIP project. Although there is no question that the facilities at Frequente will be required even if the CDB and private ventures are completed, there is some concern that the development of Frequente and construction of factory space on that site could adversely affect the timely completion and occupancy of those ventures. RDO/C Grenada plans to meet with representatives from the Free Zone Authority, the CDB and the private investor to coordinate a construction schedule for the Frequente Industrial Park that will not under-cut the other efforts. Initial conversations have indicated, however, that site development should proceed as soon as possible and that construction of factory shells on the site could be delayed for several months in order to allow the other ventures to be completed and, hopefully, occupied. This scenario would permit construction to begin at Frequente as soon as the contractor is mobilized.

Road Paving: The road paving component of this project will be implemented by the construction services contractor using equipment owned by the GOG and presently assigned to and under the control of MK under the AID financed Airport and Mental Health Projects. The contractor will first concentrate upon completion of the Frequente site development, as indicated above, and will then complete the indicated roads that are located in the South-West Quadrant. Once those elements are completed, the contractor will commence paving of the St. George's/Grenville road starting from St. George's. At the approximate half-way point, subject to the construction contractor's judgement, the quarrying operation, rock-crusher and asphalt plant would be moved to Telescope Point near Grenville.

Generator(s): The 1.8-3.0mw diesel generator(s) will be procured by GRENLEC using AID Handbook 11, Chapter 3 procurement procedures. The supplier will be responsible for delivery, installation (including foundation work), commissioning, and training of GRENLEC operators. GRENLEC will be responsible for support functions. This turn-key arrangement will eliminate gaps in responsibility and assure that the generator(s) is installed in the shortest possible time. Space for the unit(s) is available at the Queen's Park Power Station.

B. Procurement Plan

The following represents the expected timing and procedures to be followed for all required procurement actions :

(1) Technical Assistance and Construction Services:

January 2, 1986	-	Request for Expressions of Interest.
February 5, 1986	-	RFP for Cost-reimbursable fixed-fee contract prepared and mailed.
March 10, 1986	-	Closing date for proposals.
March 20, 1986	-	Evaluation completed.
March 31, 1986	-	Negotiation completed and award made.

The firms requested to bid on this RFP will be required to submit technical proposals and price proposals in separate envelopes at the same time. Once the evaluation of the technical proposals has been completed and the firms rank ordered, the priced proposals will be opened and negotiation with the top-ranked firm initiated. A criterion of evaluation will be the speed with which the bidder can mobilize.

(2) Asphalt Plant:
December 1--PIO/C issued to AID/W procurement service agent designated.
March 1--Asphalt plant delivered.

(3) Generator(s):
December 15--CDB notice and AID procurement information bulletin issued.
January 2-- RFQ issued.
February 20--Closing date.
March 15--Evaluation of quotations completed and rank ordered.
April 1--Contract award.
September 30--Generator(s) delivered and installation begun. (Note - this date assumes that no supplier can meet specifications with an off-the-shelf generator(s).)

The delivery time required for the generator(s) may be advanced if a proposer is able to meet requirements with a unit(s) already fabricated. For that reason, the RFP will permit a total size range of 1800kw to 3,000kw to be offered.

(4) Frequente Factory Shells:

January 1--RFP prepared for regional (538) procurement.
January 1--Expressions sought in regional newspapers.
January 1--RFP issued.
March 1--Closing date.
March 15--Evaluation completed and firms rank-ordered.
April 1--Contract Negotiated and award made.
April 15--Contractor mobilized.

This is the best-case scenario and mobilization may be delayed if discussions with the CDB and IPIP-funded local entrepreneur indicate that actual construction should be postponed.

V. SUMMARY OF ANALYSES

A. Technical Analysis

1. General Considerations

The project design of the Infrastructure Revitalization Project arose from the need to address priority concerns that would have an immediate impact; would provide employment during implementation; and would promote economic growth in tourism, agriculture and manufacturing. This project has the same goal and purpose but reflects a greater concern for the satisfaction of immediate needs that will yield long term economic benefits. The need for improvements in basic infrastrucure is enormous and includes inadequate water supply and distribution; inadequate sewerage and treatment; inadequate power transmission and distribution; inadequate roads; inadequate materials handling capability; inadequate factory space; inadequate telecommunications; and the need to rehabilitate and improve tourist attractions. The selection of the components in this project design is based upon the premise that investment in the productive sectors will occur first in the South-West Quadrant and that basic infrastructure must be upgraded in that area; that the availability of a reliable supply of aggregate for construction and asphalt for road paving is essential to any development; and that the primary road paving program must be continued to support all of the productive sectors.

One critical area that it not addressed by this project is the inadequacy of the water system in the South-West Quadrant and the island as a whole. The provision of adequate water is a major priority of the GOG and is essential to the quality of life and the attraction of investment in all sectors. RDO/C Grenada has discussed the problem with the Canadian Internatinal Development Agency (CIDA) which is planning to provide assistance in this area. CIDA has identified the need to conduct a study of requirements and develop a master plan for development. RDO/C Grenada agrees with CIDA's conclusions with the caveat that immediate improvements are required in the distribution system in the South-West Quadrant. RDO/C Grenada is hopeful that priority water requirements can be funded by a combination of CIDA resources and AID resources that will become available under the regional Infrastructure Expansion and Maintenance Systems Project now being designed. Rehabilitation of the telecommunications system will be accomplished by the GOG through a contract with Northern Telecom partially funded by CIDA. In selecting the interventions to be funded under this project, RDO/C Grenada and the GOG looked closely at the requirements in

infrastructure and selected interventions which were capable of timely completion and offered the maximum benefit in promoting growth in the productive sectors. The St.George's/Grenville road is the least critical component of the project, but is important in that it serves a large area of the country; is a political necessity in the short term; and an economic requirement in the long term.

2. Technical Feasibility

The activities proposed for funding under this project are technically feasible and in the case of the Mount Hartman Facility, Frequente development and road paving components are similar to the tasks that have been successfully performed under the Airport and Infrastructure Revitalization Projects. GRENLEC has recently received two new generators in the same size range that is proposed here and has proven that it can supervise installation, commission and operate the equipment.

B. Institutional Analysis

The institutional analysis of the Ministry of Communications and Public Works that was completed for the Infrastructure Revitalization Project is adequate for this project, given that the inputs are similar. It should be noted, however, that the monitoring unit with its close relationship to the Ministry and its staff of engineers has contributed to better efficiency in project implementation. The Ministry is still constrained by inadequate financial resources and trained staff, but with the help of the monitoring unit is capable of implementing this project.

GRENLEC has been the subject of at least three studies in the past five years, most recently by a US investor interested in the privatization of the utility. While GRENLEC is plagued by inadequate operating/maintenance resources, given the GOG's limited financial position which basically permits provision of funds only when the equipment breaks down, the technical staff are believed to be competent. The procurement of the generator proposed should pose no problem for GRENLEC. RDO/C Grenada's major concern is the need for GRENLEC to be privatized to promote better administrative management and to secure a source of capital for rehabilitation and expansion of the existing power grid. The issue of tariffs and collection needs to be attended to by the GOG to ensure that GRENLEC is placed on either a cash or utility basis return. All of these issues need to be addressed in the near future, but it should be noted that the proposed generator procurement only replaces obsolete equipment.

The Industrial Development Corporation is a new entity that only came into being this year. There is question whether it can contract for the construction of factory space and operate an industrial park. However, as pointed out in the Free Zone Authority Report, there is no other entity with more expertise and the need exists to make one organization responsible for the development and management of the industrial park. RDO/C Grenada will assist the Industrial Development Corporation in the development of Frequente and its management. The feasibility and efficacy of an estate management contract will also be explored and encouraged. The jury is still out on the capabilities of the Industrial Development Corporation, but the verdict will only be known if the Frequente site is developed.

C. Economic Analysis

The economic analyses carried out on the proposed segments of this infrastructure project amendment are not as complete in their quantification of results, primarily due to the short time available for preparation and the lack of adequate statistical data. However, even where adequate quantification is not possible, a qualitative discussion is included to indicate the potential effect that unquantified factors might have on the results of the analysis that was carried out. Inasmuch as such qualitative elements are usually positive, the relatively good internal rates of return presented in the following table are only likely to improve with further investigation:

Table ___. Results of Economic Analysis.

(internal rates of return in percent)

A.	Roads	
	1. St. George's-Grenville	14
	2. Morne Rouge	14
	3. Lance aux Epines	14
B.	Electric Power Generator	26
C.	Frequente Industrial Park	14
D.	Asphalt Plant	77

NOTES: For rates of return and their derivation, see Appendix _____.

In all cases, rates of return are high enough to recommend approval of the project components.

1. Roads

A.I.D.'s programs in Grenada over the past two years have contained a heavy infrastructure component, a significant portion of which has been road construction. A primary reason for the need to "revitalize" the road system was the severe inattention paid to maintenance activity by the People's Revolutionary Government. The deteriorated state of Grenada's road system has proved to be one of several elements of the environment that discourage potential investors and has raised costs of production, reducing Grenadian producers' competitiveness in domestic and external markets. The economic analysis carried out on the road subprojects proposed in this Project Amendment focus on the cost savings that will accrue to users of the revitalized roads. From society's standpoint, the improved roads will reduce costs, thereby permitting commercial users to become more competitive and permitting private users to spend income elements on increased purchases of domestic or foreign output. Both classes of users will benefit from the proposed road subprojects.

The following is a thumbnail sketch of the analysis. Basically, an internal rate of return is calculated for a discounted stream of net benefits ascribed to each road project. For each of the three roads, a financial analysis is followed by an economic analysis. To move from the former to the latter, two price adjustments are made: one reflects the opportunity cost of labor in Grenada and the other an estimate of the real EC$/US$ exchange rate. (All data are presented in US$.) Labor inputs to the project are deflated by 50 percent to arrive at an opportunity cost of labor that is half the nominal wage rate, a practice common in RDO/C project analyses. EC$-denominated costs (the original cost-saving calculations in the PP) are converted to US$ at the official exchange rate (EC$ 2.70 = US$ 1.00) in the financial analysis, but are converted at a different rate (EC$ 3.24 = US$ 1.00) in the economic analysis, to reflect the approximately 20-percent overvaluation of the EC$.

Project costs over a 15-year time period include initial road revitalization costs, annual maintenance costs, and resealing costs in year 10. Project benefits used in the calculation are the original PP's estimate of vehicle operating cost savings attributable to the project (a per vehicle per mile per day factor) multiplied by the miles of road, the number of vehicles, and 365 days. The cost figures are recent estimates; all other cost figures come from the 1984 PP, and are inflated by 5 percent to put them into 1985 prices.

It is important to note that neither all direct benefits nor any externalities have been included in the economic analysis. Data limitations preclude doing the latter. However, road improvements will almost certainly benefit all productive sectors, encouraging and facilitating further economic activity. An important element of this will be increased road usage, in excess of what has already been considered in the analysis. And this increased usage should encourage tourism and other service establishments. Although we cannot hazard a guess at the magnitude of the improvement, economic cost-benefit rates of return will clearly be higher than the figures derived using our methodology.

2. Electric Power Generator.

Grenada's power generation plant, completely thermal, has improved dramatically over the past two years since the late 1983 intervention. However, in spite of the addition of new generating power up until now, and in spite of the expected addition of facilities late in 1985, Grenlec appears to be unable to guarantee firm generating capacity during the two daily demand peaks. Potential investors view this situation as yet another element of the economy that argues against investment in Grenada.

An ideal economic analysis of the effects of adding generating capacity to the Grenlec system would examine the system as a whole, comparing costs and benefits without the additional capacity and with the new capacity. The economic analysis would flow from a financial analysis that made a similar comparison using actual prices of inputs (operating costs and amortization) and of outputs (power sale revenues) that Grenlec faces. The economic analysis would go beyond the financial analysis by (a) adjusting prices and (b) changing cost and benefit items. Prices would be adjusted to take account of economic prices because in many instances nominal prices will overstate or understate the opportunity cost of an item. (For example, legislated minimum wages usually overstate the opportunity cost of labor.) Cost and benefit elements would be added or deleted from the financial analysis to arrive at an economic analysis, because the economic analysis must consider effects on the economy as a whole. (For example, economic analysis would include economic benefits indirectly accruing to the project, even though these would not necessarily be of financial benefit to Grenlec.)

In the case of the economic analysis for this project, however, we have elected to first attempt a simpler (though theoretically less comprehensive) approach, in the interests of saving time. If this approach appears to justify the project on economic terms, we shall discuss how that justification might have been improved or made less acceptable if the ideal analysis had been carried out.

Rather than examining the entire Grenlec system, we have assessed the marginal rate of return to the additional generator. Costs included in the analysis are the capital costs of installing the generator, lubricating oil costs to run the generator, operating and maintenance costs, and transmission and distribution costs. No fuel costs are included in the cost side of the equation, because the fuel surcharge is not included on the benefit side. Benefits are measured as the revenue attributable to the new generator, given its contribution to total power generated per year in Grenada. The discounted stream of net benefits (benefits less costs) is used to calculate an internal rate of return on the project.

Both direct and indirect benefits can be attributed to the project, although the calculations include only direct ones. Indirect benefits are very important, but are difficult to quantify. First, the increased production activity permitted by the higher, more stable electrical generation capacity will stimulate further rounds of economic activity, particularly in the trade sector, the tourism sector, and other services that support sectors of production. Second, improved productive efficiency in the economy that arises from stability of power generation made possible by the new generator is not captured in the direct benefit calculation. Third, increased social cohesion that will result from the improved capability of Grenlec to deliver stable, increased power for social uses is also not reflected in the direct benefits. Studies of the relationship between direct and indirect benefits in other electrical projects suggest that indirect benefits are at least as great as direct benefits are, in general.

3. Industrial Site Development

A frequently heard complaint about Grenada is the shortage of industrial sites sufficiently developed to attract investors. Although some construction and refurbishing activity is underway, more is needed to meet demand. To tie in with existing and planned facilities in the True Blue/Frequente area, A.I.D. proposes constructing 20,000 square feet of additional factory shell space at Frequente, and providing some additional supportive infrastructure. The latter will also improve facilities in existing factory shells.

The economic analysis employs a methodology used by RDO/C in assessing the economic merits of the Infrastructure for Productive Investment project (IPIP) factory shell project. Inasmuch as the precise value of output of shell tenants is difficult to predict (given the range of possible types of productive facility), the methodology focuses on the benefits that

will stay in Grenada. The likelihood is strong that the shells will be used to process imported materials for export, probably using externally funded equipment and using foreign management. Thus, returns to Grenadian labor employed in occupied shells are an obvious measure of benefits of the project to the economy.

As RDO/C did in assessing the feasibility of the IPIP shells, the analysis converts the nominal wage to a "shadow price" to reflect the fact that the opportunity cost of this labor in the relatively underemployed Grenadian economy is less than the nominal wage rate. The difference between the opportunity cost and the actual wage paid may be considered a measure of the benefit to the economy of the project. It is the only element of the returns to production that is in excess of a cost of production and that remains in Grenada.

In addition to the relatively high rate of return to this infrastructure project based on direct benefits, there are benefit elements not included in the analysis that would further raise the viability of the project. First, a certain amount of the benefits ascribable to the non-shell portion of the costs will be the result of improved service to factory shells not included in this project. Second, a portion of the returns to other factors of production involved in the production of goods in the shell (such as foreign employees) would remain in Grenada and be reflected in the purchase of Grenadian goods such as housing and food. Neither of these benefits is included, primarily because quantification is very difficult.

4. Asphalt Plant

In order to continue with the necessary road construction (such as that set forth above) in Grenada, as well as to enable the Government of Grenada to maintain its road system properly over the coming years, the current asphalt-producing facilities must be replaced. The following analysis presents the costs and benefits associated with the purchase of new asphalt-producing facilities and derives an internal rate of return. The analysis is essentially a financial analysis, following which some allowance is made for the difference between financial and economic prices for inputs and outputs.

Costs include capital costs for the equipment to be installed as well as production costs over the life of the project. Production costs include non-labor operating costs (exclusive of rock and asphalt inputs) such as fuel and routine maintenance, labor costs, the cost of a foreign supervisor, and the costs of asphalt and crushed rock inputs.

The most readily measurable benefit is asphalt for road construction and maintenance. A.I.D. estimates firm production at 70,000 tons per year. The financial returns to the asphalt plant appear to be quite good. At the quoted price, the rate of return using a ten-year project life is 20 percent.

Abstracting from externalities for the moment, the financial analysis provides a basis for an economic analysis. First, two adjustments should be made to labor costs. Assuming that the EC$/US$ exchange rate is overvalued by 20 percent the $320 per day should be adjusted downward. In addition, the nominal wage exceeds the opportunity cost, and a second downward revision is made in the following table. Operating costs (primarily fuel) are already expressed in "border prices" and require no adjustment. Similarly, asphalt costs require no adjustment, because the product is procured abroad. On the cost side, finally, the cost of the crushed rock input must be adjusted downward to reflect the overvalued exchange rate. The result of these adjustments is to increase the rate of return above the rate of financial return. Given the positive financial returns, this increase only improves the viability of the project.

D. Environmental Analysis

The inputs of this project will result in the improvement or rehabilitation of existing infrastructure. In the case of Mount Hartman and Telescope quarries, these facilities are already operable and the proposed assistance will make them more efficient. The roads to be improved are already surfaced, though in poor condition. The St. George's/Grenville road will require some reshaping of the roadway and realignment as well as drainage; however, the impact of this construction will be minor. The generator to be supplied to GRENLEC replaces obsolete equipment and will be installed at the same site. The planned development of the Frequente Industrial Park will have minimal effect on the environment since it does not expand the size of the existing estate. Site development will cause temporary noise and dust pollution but these will be minor. The plan for development calls for the improvement of the storm drainage system within the Frequente site and this should have a beneficial effect on the environment by reducing erosion. New factory shells will require sewerage but the Free Zone Authority report indicates that this can be accomplished by septic tanks and soak-aways. In summary, analysis indicates that effects on the environment will be minimal.

E. Conditions, Covenants and Negotiating Status

The GOG and RDO/C Grenada have cooperated in the design of this project. The GOG is aware of the covenants and the conditions precedent and concurs in their inclusion. No delay is anticipated in negotiating a project agreement.

Conditions Precedent

Disbursement for Equipment for Power Generation Capacity

Prior to any disbursement, or to the issuance of any commitment documents under the Project Agreement for activities under the Power Generation Capacity component, the Grantee shall receive the prior written approval of A.I.D. to proceed with this component.

Disbursement for Construction of an Industrial Park

Prior to any disbursement, or to the issuance of any commitment documents under the Project Agreement for activities under the Construction of an Industrial Park component, the Grantee shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., evidence of:

(a) Grantee title to the land to be used in this component or evidence that the Grantee has initiated the necessary arrangements to secure unencumbered use of the land for the Project;

(b) A plan for the development, operation and management of the Frequente Industrial Park including a statement of the policy for setting rental rates sufficient to amortise the capital cost of construction and provide an economic return for the operation and maintenance of the facilities.

Disbursement for Each Major Item of Equipment to Upgrade the Capacity to Provide Aggregate, Asphalt and Cement for Public and Private Construction

Prior to any disbursement, or to the issuance of any commitment documents under the Project, for each major item of equipment to upgrade the capacity to provide aggregate, asphalt and cement for public and private construction, the Grantee shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D.:

(a) Specifications for the item of equipment;

(b) Evidence of availability of an acceptable site for the location of the item; and

(c) A preliminary training plan to operate the facility.

Disbursement for Technical Management Assistance

Prior to any disbursement or to the issuance of any commitment documents under the Project for technical management assistance, the Grantee shall, except as A.I.D. may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D., evidence that it will furnish the necessary assistance, support and facilities to install rock crushing and asphalt equipment at the Telescope Point Quarry.

Covenants

Privatization

(a) Except as A.I.D. may otherwise agree in writing, the Grantee covenants that, prior to expiration of the contract for technical services to operate the rock crushing and asphalt plants and in any event no later than one year after the date of signing of the Project Agreement, it shall have taken substantial steps to privatize the various operations of the Mount Hartman and Telescope Point Quarries, rock-crushing and asphalt plant facilities by means of a management contract or contracts, which contract(s) will include the requirement to put in place performance incentives and a plan to sell or lease the operation(s) to a private sector bidder under the most advantageous terms to the Government of Grenada.

(b) Except as A.I.D. may otherwise agree in writing, the Grantee covenants, to take within two years from the date of signing of the Project Agreement, the necessary steps to implement the privatization plan mentioned in 5. 2. (a) above.

ANNEX 1
EXHIBIT A

CERTIFICATION PURSUANT TO SECTION 611(e) OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, James S. Holtaway, as Director of the Regional Development Office/Caribbean of the United States Agency for International Development, having taken into account the maintenance and utilization of projects in Grenada and the Caribbean region previously financed or assisted by the United States, do hereby certify that in my judgement Grenada has both the financial capacity and human resources capability to effectively utilize and maintain goods and services procured under the proposed capital assistance grant project entitled Infrastructure Revitalization II. This judgement is based upon the implementation record of externally financed projects including AID-funded projects in Grenada, the commitments from the Government of Grenada, and the quality of the planning which has preceded this new project.

(Signed) James S. Holtaway
James S. Holtaway
Director, RDO/C

(Date) December 13, 1985

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1.	FAA Sec. 481; FY 1985 Continuing Resolution Sec.528. Has it been determined or certified to the Congress by the President that the government of the recipient country has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in Section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971) which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents, or from entering the United States unlawfully?	No
2.	FAA Sec. 620 (c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is denied or contested by such government?	No

3.	FAA Sec. 620(e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	No
4.	FAA Sec. 620(a), 620(f), 620(D); FY 1985 Continuing Resolution Sec. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Syria, Vietnam, Libya, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver?	No
5.	FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property?	No
6.	FAA Sec 620(l). Has the country failed to enter into agareement with OPIC?	No
7.	FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5.	
	(a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?	No

	(b) If so, has any deduction required by the Fishermen's Protective Act been made?	
8.	FAA Sec. 620(q); FY 1985 Continuing Resolution Sec. 518.	
	(a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country?	No
	(b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill (or continuing resolution) appropriates funds?	No
9.	FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual "Taking into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)	Yes

10.	FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?	No
11.	FAA Sec. 620(u). What is th payment status of the country's U.N. obligations? If the country is in arrears were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)	No
12.	FAA Sec. 620A; FY 1985 Continuing Resolution Sec. 521. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?	No
13.	FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA.	No

14.	FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)	No
15.	ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. of September 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)	No
16.	FY 1985 Continuing Resolution. If assistance is from the population functional account, does the country (or organization) include as part of its population planning programs involuntary abortion?	N/A

17. FY 1985 Continuing Resolution Sec. 530. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States?	No

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy?	No

2. Economic Support Fund Country Criteria

FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest?	N/A

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP-TO-DATE?
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1985 Continuing Resolution Sec. 525; FAA Sec. 634A; Sec. 653(b)653(b).	
(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project;	A Cogressional Notification has been forwarded.
(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that amount)?	Yes
2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	Yes
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	No further legislative action is required.

4.	FAA Sec. 611(b); FY 1985 Continuing Resolution Sec 501 If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973, or the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See AID Handbook 3 for new guidelines.)	N/A
5.	FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	Yes
6.	FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	No
7.	FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit	The project will improve the country's infrastructure to a level required to encourage investment in (a), (b), (d), and (e).

	unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	
8.	FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	U.S. goods and services will be used in the project and new U.S. private investment in Grenada will be promoted by the project.
9.	FAA Sec. 612(b), 636(h); FY 1985 Continuing Resolution Sec 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.	The host country is contributing staff, equipment, and materials and facilities to the project.
10.	FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?	No
11.	FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes

12.	FAA 1985 Continuing Resolution Sec. 522. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?	N/A
13.	FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16. Does the project or program taken into consideration the problem of the destruction of tropical forests?	Yes
14.	FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)?	N/A
15.	FY 1986 Continuing Resolution Sec. 536. Is disbursement of the assistance conditioned solely on the basis of the policies of any multilateral institution?	No

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status, (e) utilize and encourage regional cooperation by developing countries?	N/A

b.	FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?	N/A
c.	FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farm, small businesses, and small incomes of the poor)?	N/A
d.	FAA Sec. 110(a). Will the recipient country provide at last 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed country)?	N/A
e.	FAA Sec. 110(b). Will grant capital assistance be disbursed for project for more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined a capital project as "the construction, expansion,	N/A

	equipping or alteration of a physical facility or facilities financed by AID dollar assistance of not less than $100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character."	
f.	FAA Sec 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	N/A
g.	FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.	N/A

Development Assistance
Project Criteria (Loans Only)

a.	FAA Sec. 122(b). Information an conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.	N/A
b.	FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?	N/A

3. Economic Support Fund Project Criteria

a	FAA Sec. 531(a). Will this assistance promote economic and political stability? To the extent possible, does it reflect the policy directions of FAA Section 102?	Yes
b.	FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?	No
c.	FAA Sec. 534. Will ESF funds be used to finance the construction of, or the operation or	N

	maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?	
d.	FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?	N/A

5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the Agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1.	FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing commodities and services financed?	Yes
2.	FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?	Yes
3.	FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?	N/A
4.	FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)	N/A

5.	FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries which are direct aid recipients and which are otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one of these areas? Do these countries permit United States firms to compete for construction or engineering services financed from assistance programs of these countries?	No
6.	FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transportd on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates?	No
6.	FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly	Yes

suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?	N/A
International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available?	Yes
FY1985 Continuing Resolution Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?	Yes

B Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used?	Yes, where appropriate
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	Yes
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP)?	Yes

C. Other Restrictions

1.	FAA Sec. 122(b). If development loan, is intrest rate at least 2% per annum during grace period and at least 3% per annum thereafter?	N/A
2.	FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?	N/A
3.	FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries?	Yes
4.	Will arrangements preclude uses of financing:	
	a. FAA Sec. 104(f); FY 1985 Continuing Resolution Sec. 527. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to	Yes

	any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; (4) to lobby for abortion?	
b.	FAA Sec. 620(g). To compensate owners for expropriated nationalized property?	Yes
c.	FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons or other law enforcement forces, except for narcotics programs?	Yes
d.	FAA Sec. 662. For CIA activities?	Yes
e.	FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained?	Yes
f.	FY 1985 Continuing Resolution, Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel?	Yes

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g.	FY 1985 Continuing Resolution, Sec. 505. To pay U.N. assessments, arrearages or dues?	Yes
h.	FY 1985 Continuing Resolution, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?	Yes
i.	FY 1985 Continuing Resolution, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?	Yes
j.	FY 1985 Continuing Resolution, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?	No
k.	FY 1985 Continuing Resolution, Sec. 516. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?	No

DEC 3 1985

ANNEX I
EXHIBIT C

Ref. No. ..
In replying the above Number and date of this letter should be quoted.

MINISTRY OF WORKS, COMMUNICATIONS, PUBLIC UTILITIES, CIVIL AVIATION AND ENERGY.
ST. GEORGE'S,
GRENADA W.I.

2nd December, 1985

	Action	Info
	✓	
		✓

Mr. William B. Erdahl
AID Representative
RDO/C Grenada
The Carenage
ST. GEORGE'S

Dear Mr. Erdahl:

Over the past two years AID has provided valuable assistance to the Government of Grenada in helping to improve infrastructure throughout the country. The present AID financed Instrastructure Revitalization Project (543-0008), with the exception of the Gouyave to Sauteurs Road activity is almost complete. However, much more still needs to be done in the area of infrastructure rehabilitation if private sector investors are to invest in Grenada and if the agriculture and tourism sectors are to expand.

As you are aware current local revenue is insufficient to finance all of the activities necessary to finance all of the improvements necessary at this time. Therefore, on behalf of the Government, I request that for fiscal year 1986 AID finance a continuation of Infrastructure activities. Specifically assistance is required to upgrade roads linking St. George's to Grenville;to upgrade secondary roads leading into state owned farms which will soon be returned to local residents; to development of quarries of both Mt. Hartman and Telescope Point to supply crushed aggregate for both public and private sector development projects, to provide additional electrical power generation capacity and improve power distribution systems and; to increase the capacity of the Central Water Commission to provide residents with a reliable source of portable water.

The estimated cost of the above activities is approximately ten million dollars.

The staff of the Ministry of Works, Communications, Public Utilities, Civil Aviation and Energy look forward to working with AID on these activitits.

I look forward to an early initiation and completion of the above activities.

Yours faithfully,

Keith Mitchell

Dr. Keith Mitchell
Hon. Minister of Works, Communications, Public Utilities, Civil Aviation. and Energy.

ACTION TAKEN .....
BY .....DATE .....
FILED .....
9 NOV

SD

ANNEX I
EXHIBIT D

MISSION DIRECTOR'S GRAY AMENDMENT CERTIFICATION

"I, James S. Holtaway, as Director of the Regional Development Office/Caribbean, hereby certify that the procurement plan was developed with full consideration of maximally involving Gray Amendment organizations in the provision of required goods and services and that the project is ____ is not X appropriate for minority or Gray Amendment organization contracting."

James S. Holtaway
James S. Holtaway
Director

December 13, 1985
Date

ANNEX I
EXHIBIT E

ACTION AID-7 INFO AMB DCM P/E CHRON 10

VZCZCWN0134
RR RUEBWN
DE RUEHC #3600 3230038
ZNR UUUUU ZZH
R 190037Z NOV 85
FM SECSTATE WASHDC
TO RUEHWN/AMEMBASSY BRIDGETOWN 1880
INFO RUEHGR/AMEMBASSY GRENADA 7308
BT
UNCLAS STATE 353600

LOC: 001 165
19 NOV 85 0039
CN: 08567
CHRG: AID
DIST: AID

AIDAC

19 NOV 1985

E.O. 12356: N/A
TAGS: N/A
SUBJECT: GRENADA INFRASTRUCTURE REVITALIZATION PROJECT
II 538-0129

REF: (A) BRIDGETOWN 8969 (B) STATE 339996

1. THE SUBJECT PROPOSAL FOR DOLS 5 MILLION SUBMITTED TO AID/W PER REFTEL A WAS REVIEWED AND APPROVED. SINCE TE PROJECT IS A CONTINUATION OF ONGOING ACTIVITIES, REFTEL A WAS ACCEPTED AS A PID. THE FOLLOWING GUIDANCE IS PROVIDED FOR COMPLETING THE PP, WHICH WILL BE APPROVED BY RDO/C:

A. THE PROJECT DESIGN SHOULD INCLUDE THE ASSISTANCE NECESSARY TO ENSURE PROPER AND RELIABLE OPERATION OF TH ASPHALT PLANT, ROCK CRUSHER AND QUARRY OPERATION USED T CARRY OUT ROAD CONSTRUCTION ACTIVITIES. THE AID PROJECT SHOULD NOT BE INVOLVED IN THE SALE AND COLLECTION OR OTHER CONTROL OF PRODUCTS PRODUCED BY THE CRUSHING PLANT. THIS SHOULD BE A GOG RESPONSIBILITY;

B. THE MISSION AND THE GOG SHOULD AGREE ON A PLAN TO PRIVATIZE THE QUARRY OPERATION AND PRODUCTION OF AGGREGATE WITHIN TWO YEARS FROM THE DATE OF THE PROJECT

AGREEMENT;

C. THE ELECTRICAL POWER GENERATION CAPACITY TO BE PROVIDED GRENLEC SHOULD NOT EXCEED AN APPROXIMATE 1.8 MEGAWATTS, WHICH WILL BE SUPPLIED BY ONE ADDITIONAL GENERATOR; AND

D. THE ECONOMIC ANALYSIS SHOULD DEMONSTRATE THE ECONOMI FEASIBILITY OF THE ROADS SELECTED FOR RECONSTRUCTION, PARTICULARLY THE ST. GEORGES - GRENVILLE ROAD, AND DESCRIBE HOW THE RECURRENT COSTS OF THE FACTORY SHELLS WILL BE FINANCED.

2. MISSION REPRESENTATIVE AND LAC/DR AGREED THAT A SEPARATE PROJECT PAPER, PROJECT AUTHORIZATION AND PROAG WILL BE PREPARED FOR THE PROJECT. WHITEHEAD
BT

ACTION
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RLA
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EXO
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PROC
HRD
SAO
DATE TAKEN
SIGN

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ANNEX I
EXHIBIT F

(6) AID-2 INFO CHARGE DCM ECON CHRON

RAVZCZCGR0192
00 RUEHGR
DE RUEHWN #9522/01 3301601
ZNR UUUUU ZZH
O 2 1600Z NOV 85
FM AMEMBASSY BRIDGETOWN
TO RUEHC/SECSTATE WASHDC IMMEDIATE 7338
INFO RUEHGR/AMEMBASSY GRENADA 2922
BT
UNCLAS SECTION 01 OF 02 BRIDGETOWN 09522

LOC: 036 226
26 NOV 85 609
CN: 11216
CHRG: AID
DIST: AIDA

AIDAC

PLEASE PAS LAC/DR:JIM HESTER

E.O. 12356:N/A
TAGS: NONE
SUBJECT: INITIAL ENVIRONMENTAL EXAMINATION
FOR GRENADA INFRASTRUCTURE REVITALIZATION II
PROJECT NO. 538-0129

1. THIS IS AN ACTION MESSAGE.

2. THE FOLLOWING IS THE INITIAL ENVIRONMENTAL EXAMINATION FOR THE GRENADA INFRASTRUCTURE REVITALIZATION II (538-0129). RDO/C RECOMMENDS A NEGATIVE DETERMINATION FOR THE SUBJECT PROJECT. PLEASE CABLE YOUR RESPONSE TO THIS RECOMMENDATION AS SOON AS POSSIBLE SO THAT THE MISSION CAN PROCEED WITH PROJECT AUTHORIZATION.

PROJECT LOCATION: - GRENADA
PROJECT TITLE: - INFRASTRUCTURE REVITALIZATION II
FUNDING: - ESF, LOP DOLS5.0 MILLION
LIFE OF PROJECT: - TWO YEARS
IEE PREPARED BY: - JAMES STEPHENSON
PROJECT DEVELOPMENT OFFICER, RDO/C GRENADA
DATE: - NOVEMBER 21, 1985
ENVIRONMENTAL ACTION: - NEGATIVE DETERMINATION

A NEGATIVE DETERMINATION FOR THE INFRASTRUCTURE REVITALIZATION II PROJECT IS RECOMMENDED. THE PROJECT PROVIDES FOR THE FUNDING OF: (1) THE PURCHASE OF A PORTABLE ASPHALT PLANT; (2) THE PURCHASE OF A 1.8MW DIESEL GENERATOR FOR THE GRENADA ELECTRICITY COMPANY (GRENLEC); (3) THE PROVISION OF TECHNICAL ASSISTANCE TO OPERATE A QUARRYING/ROCK-CRUSHING/ASPHALT PRODUCTION FACILITY AT MOUNT HARTMAN AND TELESCOPE POINT; AND (4) CONSTRUCTION SERVICES TO DEVELOP THE FREQUENTE INDUSTRIAL PARK AND RESURFACE APPROXIMATELY 18 MILES OF EXISTING PRIMARY ROADS.

THE ASPHALT PLANT IS BEING PURCHASED IN CONJUNCTION WITH A ROCK-CRUSHER PROCURED UNDER ANOTHER PRO-

JECT IN ORDER TO REPLACE WORN-OUT EQUIPMENT AT THE MOUNT HARTMAN FACILITY. THE EQUIPMENT IS PORTABLE AND WILL BE MOVED FROM MOUNT HARTMAN TO TELESCOPE POINT QUARRY MID-WAY THROUGH THE PROJECT TO SUPPORT THE ROAD PAVING EFFORT. TECHNICAL ASSISTANCE IS BEING PROVIDED TO ENABLE THE GRENADIAN GOVERNMENT TO OPERATE THE FACILITIES EFFICIENTLY. BOTH QUARRIES ARE ALREADY IN OPERATION AND THE AID ASSISTANCE WILL NOT CONTRIBUTE TO ANY ADDITIONAL ADVERSE ENVIRONMENTAL IMPACT.

THE DIESEL GENERATOR BEING PROCURED UNDER THE PROJECT WILL REPLACE WORN-OUT EQUIPMENT AT GRENLEC'S QUEEN'S PARK POWER PLANT. THERE IS SUFFICIENT SPACE AT THE FACILITY TO ACCOMMODATE THE NEW UNIT. THE PROVISIONS OF THIS UNIT IS NOT FORESEEN TO HAVE ANY ENVIRONMENTAL IMPACT.

CONSTRUCTION SERVICES WILL BE UTILIZED TO DEVELOP THE FIRST PHASE OF THE FREQUENTE INDUSTRIAL [illegible] AND TO RESURFACE APPROXIMATELY 18 MILES [illegible] PRIMARY ROADS. THE FREQUENTE SITE CONSISTS OF 19.8 ACRES THAT IS PRESENTLY SITED WITH A NUMBER OF FACTORY SHELLS AND WAREHOUSES. AID HAS ALREADY FINANCED THE REHABILITATION OF FOUR FACTORY SHELLS ON THE SITE. THE WORK PLANNED WILL CONSIST OF SITE GRADING; THE PROVISION OF UTILITIES; ROAD CONSTRUCTION WITHIN THE SITE; AND THE CONSTRUCTION OF 20,000 SQUARE FEET OF FACTORY SPACE. ALTHOUGH THERE WILL BE SOME TEMPORARY ENVIRONMENTAL IMPACT CAUSED BY CONSTRUCTION, LONG TERM ADVERSE ENVIRONMENTAL IMPACT IS BELIEVED TO BE MINIMAL. THE ROAD RESURFACING INVOLVES ONLY EXISTING ROADS AND WHILE THERE WILL BE TEMPORARY ENVIRONMENTAL IMPACT CAUSED BY CONSTRUCTION, IT IS BELIEVED TO BE MINIMAL. IN THE CASE OF THE ROAD SEGMENT BETWEEN ST. GEORGE'S AND GRENVILLE, THERE MAY BE SOME MINOR REALIGNMENT AND DRAINAGE CONSTRUCTION; HOWEVER, THIS WORK WILL BE MINIMIZED AND, EVEN WHERE NECESSARY, SHOULD NOT HAVE ADVERSE ENVIRONMENTAL IMPACT OF ANY MAGNITUDE.

CONCURRENCE: TERRENCE BROW
ACTING DIRECTOR, REGIONAL DEVELOPMENT
OFFICE/CARIBBEAN
DATE:
CHIEF ENVIRONMENTAL OFFICER/LAC DECISION:

RECOMMENDATION APPROVED: DATE:
RECOMMENDATION DISAPPROVED: DATE:
ANDERSON
BT
#9522

NNNN

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UNCLASSIFIED

STATE 364731 ANNEX I EXHIBIT

(6) AID-2 INFO CHARGE DCM ECON CHRON

NOV 29 1985

318VZCZCGR0358
RR RUEHGR
DE RUEHC #4731 3321253
ZNR UUUUU ZZH
R 281254Z NOV 85
FM SECSTATE WASHDC
TO RUEHWN/AMEMBASSY BRIDGETOWN 1981
RUEHGR/AMEMBASSY GRENADA 7342
INFO RUESPR/AMEMBASSY PORT AU PRINCE 0391
BT
UNCLAS STATE 364731

LOC: 038 155
29 NOV 85 1253
CN: 11374
CHRG: AID
DIST: AIDA

CDO
RF
CHRON

AIDAC PORT AU PRINCE FOR JTALBOT

E.O. 12356: N/A
TAGS: N/A
SUBJECT: IEE GRENADA INFRASTRUCTURE (538-0129)

REF: (A) BRIDGETOWN 9508; (B) BRIDGTOWN 9522

1. INITIAL ENVIRONMENTAL EXAMINATION FOR GRENADA INFRASTRUCTURE REVITALIZATION II PROJECT (538-0129) APPROVED BY CHIEF ENVIRONMENTAL OFFICER ON NOVEMBER 27, 1985. IEE NUMBER IS LAC/DR-IEE-86-2. COPIES BEING POUCHED TO MISSION FOR INCLUSION IN PROJECT FILE.
WHITEHEAD
BT
#4731

NNNN

UNCLASSIFIED

STATE 364731

Office	Action	Info
DIR		
CONT		
CFO		
ECO	✓	
ENG		
CSO		

ACTION TAKEN NAM
BY JAS DATE 11/29
FILED 6 Dec

56

AID 1020-28 (1-72)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 86 to FY 88
Total U.S. Funding $5.0 million
Date Prepared: 11/27/85

Project Title & Number: Infrastructure Revitalization II (538-0129)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: Sustainable equitable economic growth based on free institutions and enterprise thereby increasing employment and raising incomes.	**Measures of Goal Achievement:** 3.9% annual growth in GDP 3% annual growth in employment 7% annual growth in exports	World Bank Country Reports IMF Economic Memorandum	**Assumptions for achieving goal targets:** Maintenance of open political and economic system continued economic growth in U.S. and other industrialized countries.
Project Purpose: To improve Grenada's physical infrastructure to a level required to create immediate employment opportunities, encourage foreign exchange inflows, and encourage a long-term flow of private sector investment.	**Conditions that will indicate purpose has been achieved: End of project status.** 1) 52,000 person days of employment over life of and directly attributable to the project. 2) End of load shedding. 3) Two additional light manufacturing plants in operation.	Ministry and parastatal corporate records, AID Reports GRENLEC Reports IMF Economic Memorandum AID Reports	**Assumptions for achieving purpose:** Absence of natural disasters and adverse weather. Load forecasts are reasonably accurate. Timely input of AID resources.
Outputs: 1) Increased supply of aggregate and asphalt for public and private sector construction. 2) Increased Grenadian capability in quarry operations. 3) Additional factory space. 4) Improved roads 5) Increased supply and reliability of electric power.	**Magnitude of Outputs:** 1) a. 480 tons of aggregate per day. b. 300 tons of asphalt per day. 2) 20 Grenadian personnel trained. 3) 2 factory shells totalling 20,000 square feet constructed. 4) 18 Miles of resurfaced roads.) 1 new 1800-2100 KW generator.	AID Reports and Records GRENLEC Reports MCW Reports IDC Reports	**Assumptions for achieving outputs:** Materials, equipment and labor available within time and cost limits. Cost of fuel to run generator remains stable.
Inputs:	**Implementation Target (Type and Quantity)**	USAID Disbursement Records GOG records	**Assumptions for providing inputs:** AID funds available. GOG provides adequate labor and financial support.

	AID	GOG	TOTAL
Asphalt Plant	500	-	500
Road Resurfacing	1,678	200	1,878
Technical Assistance/Materials	1,072	100	1,172
Industrial Park Development	500	-	500
Generator	1,250	-	1,250
	5,000	300	5,300

EXHIBIT A

GENERATION STUDY

For

GRENADA ELECTRIC COMPANY

EBASCO SERVICES INCORPORATED
NEW YORK
November 1985

GENERATION STUDY

For

GRENADA ELECTRIC COMPANT

Prepared by: Jurgen O C Kansog
Consulting Electrical Engineer

John E Kruck
Consulting Mechanical Engineer

Reviewed by: Cono A Petrizzo
Chief Corporate and Consulting
Electrical Engineer

EBASCO SERVICES INCORPORATED
NEW YORK
November 1985

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Section I - SUMMARY

1 PURPOSE
2 SCOPE
3 RESULTS
4 RECOMMENDAIONS

Section II - DISCUSSION

1.0 INTRODUCTION

2.0 DIESEL GENERATION

2.1 Number and Rating of Existing Diesel Generating Units
2.2 Operating History of Diesel Generating Units
2.3 Current Status of Diesel Generating Units

3.0 LOAD FORECAST

3.1 Introduction
3.2 Review of Existing Forecasts
3.3 Forecast Used for this Study

4.0 GENERATION REQUIREMENTS

4.1 Generation Requirements versus Demand
4.2 Selection of Additional Diesel Generation
4.3 Proposed Installation of New D/G Units

EXHIBITS

1 - Present Status of Diesel Generator Units
2 - Comparison of Actual and Forecast Peak Demands
3 - Actual and Forecast Peak Demand Used in Study
4 - Generation Capacity Margins Without Additions
5 - Generation Capacity Margins with 1.5 MW Additions
6 - Generation Capacity Margins with 1.8 MW Additions
7 - Generation Capacity Margins with 2.0 MW Additions
8 - Diesel Generator Cost Estimate
9 - Schematic Location of New D/G Unit
10 - MONTHLY PEAK LOAD
11 - KWH GENERATION & SALES

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SECTION I - SUMMARY

SECTION I - SUMMARY

1 - PURPOSE

This report presents the results of a study performed by Ebasco Corporation for Grenada Electric Company (Grenlec). The purpose of the study is to evaluate the current condition of Grenlec's diesel generation capability and to determine the actions required to ensure that future electric power demands are adequately met.

2 - SCOPE

The scope of the study is to perform a site inspection of Grenlec's diesel generation facilities to determine the present status of the various generating units, observe the rehabilitation effort now underway, evaluate existing peak demand forecasts and determine additional rehabilitation efforts and/or generating unit additions required to meet future generation requirements.

3 - RESULTS

(1) There are currently 11 diesel generating units installed (sets 1 through 9, 848 and 849). Sets 1 and 2 are not operable, are over 20 years old and are judged to be not economically repairable. Some of their parts have been used to keep set 3 operating.

(2) Set 3 has reached its useful life, is unreliable and uneconomical for further base load operation but should be kept operable until 1988 for emergency situations. This set is over 20 years old and has reached its useful life and can not be economically rehabilitated.

(3) ~~The comments for set 3 also apply to set 4.~~ The crankcase of set 4 broke on Nov. 23, 1985, as advised by GRENELEC. The unit is therefore no longer operable.

(4) Sets 5,6,8 and 9 are in the process of being fully rehabilitated. This effort will be completed by the end of 1985. They are then expected to be available for reliable base load generation. They should have a remaining life of 50,000 hours of operation for sets 5 & 6, and 90,000 hours for sets 8 & 9.

(5) Set 7 consists of a new diesel engine which is being coupled to an existing generator. This set will also be available for reliable base load generation.

(6) Sets 848 and 849 are high speed units and are not suitable for continuous base load operation. They are rental units. ~~and have a relatively high fuel consumption.~~

(7) The peak load in 1970 was 2.83 MW and increased erratically to 5.13 MW in 1984, with average growth rate of 4.3%. The erratic and relatively low growth in the past was due to social and political events which hindered an orderly growth during some of the years. The current peak demand is 5.~~2~~4 MW (estimated at end of 1985) which is expected to rise to ~~8.95~~ 9.31 MW by the end of 1995 with an average compound growth of 5.6% per year.

(8) Upon completion of rehabilitation of units 5,6,8 and 9, there is sufficient generating capacity to meet the end of 1985 peak demand. Upon returning the rental units 848 and 849 in 1986, there will be a shortfall of generation capacity, as shown in Exhibit 4.

(9) The rehabilitation effort now in progress is necessary, appropriate and sufficient. No additional rehabilitation is required since sets 1 through 4 have reached the end of their useful life and are judged not to be economically repairable.

(10) A new diesel generator set will be required by the end of 1986 to provide economical and reliable base load generation capacity. Additional units will be required in 1988 and 1992 to meet projected load growth. Additions of 1500 kW, 1800 kW and 2000 kW units have been examined. A 1500 kW unit size is ~~marginally~~ acceptable, but provides little room for changes in actual peak demands greater than forecast, considering also that unit 3 is not reliable ~~that the forecast used in this study is 5% lower than Grenlec's.~~ An 1800 kW unit is the most appropriate size. It matches the existing large (1820 kW) units 8 & 9 and provides for adequate capacity margins. A 2000 kW unit size is somewhat greater than needed to adequately meet Grenlec's generation capacity requirements.

4 - RECOMMENDATIONS

(1) A new diesel generator set should be installed and put in service by the end of 1986. This set should be a skid-mounted, self-contained unit suitable for future relocation to a new site. The recommended size is 1800 kW net output to match the existing large (1820 kW) units 8 & 9. Such a unit, completely installed, is estimated to cost $1,256,000. An invitation for bids should require a unit size in the range of 1700 kW to 2100 kW (750 rpm, 50 Hz) to allow the bidder to offer his standard size. Such a flexibility is expected to bring a cost advantage in that it permits an opportunistic purchase of an already fabricated, or partially fabricated unit.

(2) Additional generating capacity is required in 1988 and again in 1992. This additional capacity may be in the form of diesel, hydro or geothermal generation. Exact timing, size and type of future generation capacity addition should be determined through future studies.

(3) The existing set~~s~~ 3 ~~and 4~~ should be kept operable for emergency situations until 1988, that is, until future additional reliable capacity has been installed. ~~They~~ It should then be retired.

(4) The rental units 848 and 849 should be kept in place until a new set is fully operable at the end of 1986. They should then be removed and returned or otherwise utilized as Grenlec may determine.

(5) The Queens Park power plant area is restricted. Grenlec should investigate the use of an alternate site, preferably closer to the load center, for locating future additional generating units. This would alleviate the space problem and also reduce feeder losses.

(6) With firm, reliable base generation capacity in place from 1986 onward, the maintenace personnel will be available to, and should, perform regular scheduled maintenance. Grenlec should actively support this activity through supervision, training, scheduling and stocking of adequate spare parts. This continuous activity is essential to avoid future generation capacity degradation.

SECTION II - DISCUSSION

1 - INTRODUCTION

The Grenada Electric Company (Grenlec) system has been subject to frequent load-shedding during the past year due largely to serious equipment problems with existing diesel generating units. Also, the load demand is expected to increase significantly in the near term. Thus, the local mission of the United States Agency For International Development (U.S A.I.D.) has offered to assist Grenlec in resolving this situation by sponsoring a study by Ebasco Services Inc (Ebasco) to review the near term power generation needs and the condition of the existing power generation plant.

In this connection, a Diesel Specialist of Ebasco made a visit to the offices and power plant of Grenlec on October 22 through 24, 1985. Latest available information pertaining to the immediate and short term load forecast for the Grenlec system was obtained.

Also, the operating history and nature of the equipment problems experienced on the existing diesel generating units were reviewed at the Queens Park Power Plant. The data obtained and observations made during this field visit form the basis of this study, as discussed in the following sections.

2 - DIESEL GENERATION

The Grenlec system consists of only one generating station (Queens Park Power Plant located in St George) and all of the diesel generating units are being operated with No. 2 oil, which is delivered by ship.

2.1 Number and Rating of Existing Diesel Generating Units

There are a total of nine permanent and two temporary (portable) diesel generating units installed at Queens Park Power Plant, which have a design rating for site conditions as shown on Exhibit 1.

Also, there is a current (October 1985) base load capacity rating assigned to each set by the Grenlec staff, which takes into account various operating problems and engine component equipment failures experienced recently. Examples of the reported operating problems are excessive lube oil consumption and high cylinder exhaust temperatures, which may be corrected during future scheduled maintenance. Set No. 4 has experienced cracking of the tension bolts that extend from the cylinder heads through all engine sections to the base plate.

2.2 Operating History of Diesel Generating Units

Pertinent comments furnished by Grenlec staff regarding the operating history and present condition of the various sets of diesel generators at Queens Park Power Plant are summarized as follows:

Set No. 1 - This unit was forced out of service in June 1985 due to the bursting of the lube oil filter housing, which resulted in a total loss of lubrication while the diesel engine was running. This engine has not been opened up as yet to asses the extent of damages because of priority maintenance work required on other sets. But it is presumed that all of the bearings need to be replaced and the turbocharger also may have been damaged. It is not known whether the cylinders and/or crankshaft are scored. This set had logged a total of 82,846 service hours up to the time of failure. For utility applications, diesel generator sets commonly have an economic service life of 100,000 hours. Thus, it does not appear economically justifiable to make expensive repairs to restore Set No. 1 for base load duty.

Set No. 2 - This diesel generator was shut down in July 1984 due to a lube oil pump failure. All of the bearings were damaged but the cylinders are not scored. A significant number of engine parts and accessories (cyclinder heads, valves, pistons turbocharger, etc) were removed subsequently from Set No. 2 for installation on the same model Set No. 3. It would not be cost effective to rebuild this engine for further base load service such as explained above for Set No. 1.

Set No. 3 - This diesel generator set has more than 100,000 service hours to date and has been kept in operating condition by "canniballizing" a number of engine parts from identical Set No. 2. The current base load capacity is limited to 450 kW by Grenlec versus the design rating of 600 kW because of operating problems such as high cyclinder exhaust temperatures. It might be noted that Set No. 3 is the only engine that has a salt water cooling system, as compared to air-cooled radiators for all other sets at this power plant. There is a remote salt water cooling pump for Set No. 3, which requires keeping a third operator on each shift for periodic servicing. Otherwise, the plant could be operated with only two men per shift. In view of the large number of service hours and operating problems on Set No. 3, it would be better to assign it to peaking service only.

Set No. 4 - Base load capacity of this diesel generator set presently is being restricted by Grenlec to 1000 kW versus the design rating of 1450 kW because of operating problems such as excessive lube oil consumption and high cylinder exhaust temperatures. Also, there have been occasions of main tension bolts cracking, which raises concern as to the structural integrity if the set is operated at design output. The original salt water cooling system was converted to air-cooled radiators in 1971 and this set reportedly never achieved rated output afterward. In view of these problems, Set No. 4 can not be considered reliable enough for further base load service, but it should be maintained for emergency peaking duty.

Set No. 5 - This diesel engine suffered a crankshaft failure and is now in the process of being rebuilt. It was surmised that the crankshaft failure was due to foundation problems. Thus, the bedplate was removed and reinstalled with non-shrink type grouting material. The replacement crankshaft is in place inside the engine and a Ruston service engineer has been supervising the installation of new cylinder liners, pistons and connecting rods. All timing gears and the camshaft have been overhauled. The target date for returning

Set No. 5 to regular service is mid-December 1985, which is realistic. That this major rebuilding program on Set No. 5 should qualify it for at least another 50,000 hours of base load service.

Set No. 6 - This diesel engine suffered a crankshaft failure last year. A new one was installed in December 1984. At that time new liners, pistons, bearings and a replacement turbocharger were also installed. This set currently is being limited to a base load capacity of 1200 kW because of uncertainty regarding the cylinder exhaust temperature monitoring instrumentation. After this instrumentation problem is corrected, Set No. 6 should be capable of operating at the design rating of 1450 kW. The major rebuilding work done on Set No. 6 in 1984 should qualify it for at least another 50,000 hours of base load service.

Set No. 8 & 9 - Both of these diesel generator units were placed in service during the Summer of 1984. Shortly thereafter, both engines had a number of piston failures. English Electric investigated this problem and determined that an independent supplier had furnished pistons made from an improper material that was prone to burning of heads under full load operation. Therefore, all of the pistons in Sets No. 8 & 9 have been replaced by the manufacturer during the past year. These units should be available for regular, base load service with only scheduled maintenance during off-peak periods. Also, both of these units were installed on foundations that are supported by a number of deep piles.

Set No. 848 & 849 - These two package type diesel generator units have been rented from Woodlands Co. (England) since late 1983. These are compact, high-speed (1200 rpm) Caterpillar engines with a design fuel consumption of 0.355 lb per BHP hr which is significantly greater than the other existing medium-speed (750 rpm) type of diesel generator sets such as No. 8 and 9, which are rated at 0.340 lb per BHP hr. It was noted that the rental cost for these two sets for the year 1984 was E.C.

$532,933 (U.S. $205,000). The current price of diesel fuel delivered to the Grenlec power plant is E.C. $3.40 per imperial gallon, which is equivalent to U.S. $1.09 per U.S. gallon.

2.3 Current Status of Diesel Generating Units

Based on observations made during the field vist to Grenada on October 22-24, 1985 as reported herein, Ebasco believes it is realistic to expect that there will be adequate base load generating capacity available to meet the expected maximum load demand during the winter of 1985/6. Specifically, five permanent Sets No. 5, 6, 7, 8 and 9 should be available with a combined total design base load capacity of 7,750 kW. The two temporary, portable Sets No. 848 and 849 add 1,000 kW more of reliable generating capacity, but they have a higher fuel consumption and are not economic for base load service.

The two largest sets are No. 8 and 9 with a combined design capacity of 3,640 kW. In this case, a simultaneous outage of Sets 8 & 9 would leave a balance of 5,560 kW of generating capacity from permanent Sets 3, 4, 5, 6, 7 and the two portable Sets 848 & 849, as soon as the current servicing of Sets 5 & 7 is completed by the expected target date of December 5, 1985. Thus, it appears that the system load sheding crisis, experienced during this and the past year, will be alleviated.

Although they are not reliable for base load generation, it would be prudent to keep Set~~s~~ No. 3 ~~& 4~~ in operating condition for emergency peaking service, with the provision that no major maintenance expenses are incurred.

Review of Grenlec's records for the year 1984 shows a total expenditure of E.C. $1,195,753 (U.S. $459,805) for repairs and maintenance at this power plant. The total generation shown for 1984 is 22,988,431 kWh. Thus, the unit cost for maintenance and repairs only is calculated to be EC $0.052 per kWh (U.S. $0.02 per kWh), which is approximately four times greater than average diesel generator system maintenance costs.

As noted previously, there is an annual rental fee for the two portable diesel generator sets (No. 848 & 849) of E.C. $532,933 (U.S. $205,000), which is included in the above total expenditure for repairs and maintenance. Considering this annual retal expense for the two portable sets together with their higher design fuel rate would be a strong motivation for replacing them with one larger and more efficient diesel generating set as soon as possible. The recommended size and type for the replacement diesel generator unit is covered in Section 4, which covers a review of generation requirements as related to load forecasts.

3 - LOAD FORECAST

3.1 Introduction

This study deals primarily with the present and expected future peak demands and the required generation capacity to adequately meet this demand. The scope and time limitations do not permit a detailed study of socio-economic factors, population growth, load factors, kWh generation, sales and losses or pricing strategy of electric energy. Existing information in this respect has been reviewed only to discern unusual and/or unreasonable facts or assumptions. Given the sometimes disruptive socio-political events in Grenada in the last decade, which hindered orderly growth and development, it seems unreasonable to predict peak demands and energy sales by use of econometric models or trend analysis based on historical data alone. The method used therefore, was to review Grenlec's forecasts, which are partially based on physical load identification, and to adjust this forecast to the latest available actual peak demand.

3.2 Review of Existing Forecasts

3.2.1 In mid 1979 Shawinigan prepared a load forecast which resulted in a peak demand growth rate of 9.3% for the period from 1978 to 1983 and 7% for the period from 1983 to 1988.

3.2.2 In early 1982 Grenlec prepared a load forecast which shows a peak demand growth rate of 5% for the period from 1983 to 1988.

3.2.3 In November 1983 Grenlec prepared a peak demand forecast of 5.10 MW for 1983 and a subsequent growth rate of 3.5%.

3.2.4 In mid 1985 Grenlec developed a peak demand forecast of 5.46 MW for 1985, 6.69 MW for 1988 and a subsequent growth rate of 5% until 1995.

3.2.5 The peak demand forecasts are compared in Exhibit 2.

3.3 Forecast Used in this Study

The peak demand forecast for the purpose of this study is based on the expected actual peak demand of 5.4 MW at the end of 1985 and Grenlec's mid 1985 forecast growth rates. It therefore parallels Grenlec's latest forecast but is shifted down from Grenlec's forecast 5.46 MW in 1985 to the actually expected 5.4 MW.

With initial growth rates of 7.5% in 1986 and 1987, followed by 6% in 1988 and subsequent 5% per year until 1995, such a forecast seems to be realistic and adequate for the purpose of determining required generation capacity addition. The initial 7.5 and 6% growth rates are based on identified load additions, the subsequent 5% is judged to be a normal growth rate for Grenada. These are peak demand growth rates. The growth rate for electric power generation and sales are expected to be higher but not all will be coincident with peak load, thus resulting in a higher overall load factor.

The 1985-1995 average peak demand growth rate is 5.6%, which compares with 5.2% for the period from 1970 to 1985, if one were to disregard those 4 years in that time period in which the peak demand actually declined due to social and political disturbances.

4.1 Considering that only sets 5 through 9 will provide future reliable and relatively economical generation capacity, it becomes apparent from an examination of Exhibit 4 that additional generation capacity is needed from the end of 1986 onward. Exhibits 5 through 7 indicate the forecast peak demand, generation requirements and capacity margins for various unit size additions. Set 3 has been shown available ~~with 450 kW~~ until 1987 for calculation purposes. In practice it is assumed ~~that either~~ the set ~~3 or set 4~~ will be available to provide ~~a minimum of 450 kW~~ emergency capacity. The~~se~~ set~~s~~ ~~are~~ is not suitable to provide reliable base load capacity and ~~are~~ is less fuel efficient than the larger, newer units. The calculations are based on the assumption that the two largest units ~~(1.82 MW each)~~ are down, one for scheduled maintenance and one due to a forced outage. There is some conservatism in this assumption because in practice one would attempt to schedule maintenance of the largest unit in the months of lower peak demands, such as June and the forced outage of a second unit need not necessarily always be for the second ~~1.82 MW~~ largest unit. However, this conservatism is not taken into consideration because, given the past operating history, it is conceivable that the existing units, although now being fully reconditioned, may experience some derating in the future from their design ratings.

4.2 An examination of Exhibit 5 indicates that a 1500 kW unit size is ~~marginally~~ acceptable, but provides little room for changes in actual peak demands greater than forecast, considering also that ~~the forecast used in this study is 5% lower than Grenlec's '85 forecast~~ set No. is not reliable An 1800 kW unit is the most appropriate size. It matches the existing large (1820 kW) units 8 & 9 and provides for adequate capacity margins. A 2000 kW unit size is somewhat greater than needed to adequately meet Grenlec's generation capacity requirements.

Exhibit 10A shows a typical variation of monthly peak demands. Exhibit 10B shows that 90% of the maximum annual peak occurs 70% of the time. Scheduled maintenance should be performed during the months with lower peak demands so that one scheduled and one forced outage do not coincide with the maximum annual peak. For sizing and timing of additional generation units, it was assumed that the two largest units would be out of service when the peak demand is 90% of its annual maximum, as shown in Exhibits 5B, 6B and 7B. Energy generation and sales have been estimated and are shown in Exhibit 11.

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4.3 Proposed Installation of the New D/G Unit

The existing Queens Park Power Plant building is located in an area with restricted space. Extending the building, although feasable, would be costly. The noisy and hot ambient is a challenge to the operators and the maintenance staff. Removal of Sets 1 and 2 would theoretically provide the necessary space for installing a new unit. However, such an installation would cause partial plant operation interruptions and would require a building wall openening for set removal and installation. Access to the Sets 1 & 2 location is very difficult, if not impossible.

A new diesel generator unit should therefore be purchased and installed as a complete, self-contained, unit in a sound-insulated, weather-proof enclosure outside and adjacent to the existing building. The 11 kV switchgear and transformer would be installed at the existing respective area. (See Exhibit 9). The estimated cost of US $1,256,000 is shown in Exhibit 8.

Because of the restricted area available at the Queens Park Power Plant, it will be necessary to establish a second power plant site, preferable closer to the load center, in the future. Locating a new, self-contained diesel generator unit initially at the Queens Park Power Plant would minimize plant operation interruptions and initial cost and would permit a relatively easy ~~the~~ relocation of the new unit to a ~~new~~ second power plant site in the future.

EXHIBIT 1

SET NO.	MFR	DESIGN RATING FOR SITE kW	CURRENT BASE LOAD CAPACITY, kW	INITIAL SERVICE YEAR	TOTAL OF SERVICE HOURS & DATE	
1	Ruston	920	Out of Service	1965	82,846	12/31/84
2	Ruston	600	Out of Service	1962	85,044	12/31/84
3	Ruston	600	450	1962	97,059	12/31/84
4 (d)	Ruston	1450	1000	1968	79,300	12/31/84
*5(a)	Ruston	1240	Out of Service	1969	79,249	12/31/84
6	Ruston	1450	1200	1971	Rebuilt Engine 12/84	
*7(b)	Ruston	1420	Out of Service	1985	New Engine 12/85	
8	English Electric	1820	1800	1984	7,734	10/21/85
9	English Electric	1820	1800	1984	4,989	10/21/85
*848(c)	Caterp.	680	500	1983	Rental Unit	
*849(c)	Caterp.	680	500	1983	Rental Unit	

Notes: (a) Set No. 5 is being rebuilt at present with new major parts and overhauled systems under supervision of manufacturer's Service Engineer. Expected date of recommisioning is mid-December 1985.

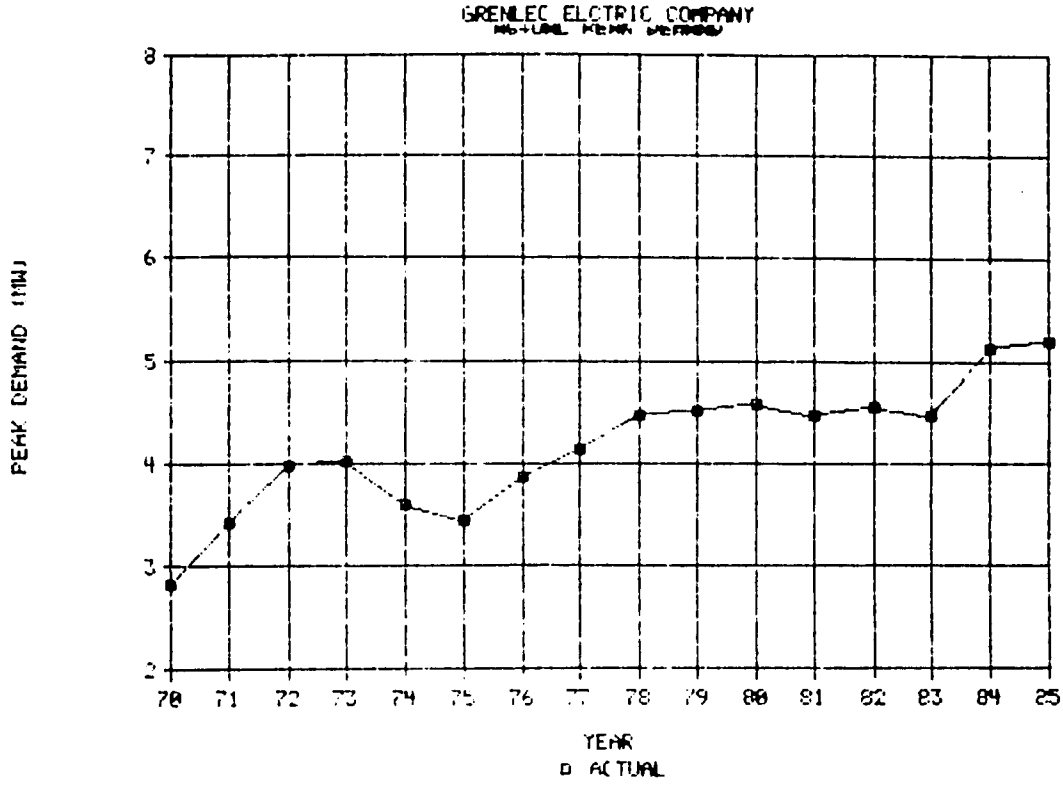
(b) Set No. 7 is being re-engined. A new model 12RKC diesel engine has been delivered to site, which has been derated (by lowering brake mean effective pressure) to match the output of the original, rehabilitated AC generator. The old engine has been removed and the new engine is in place inside the power plant. Final installation and connections are being carried out currently under supervision of Ruston's Installation Engineer. The generator also is being refurnished.

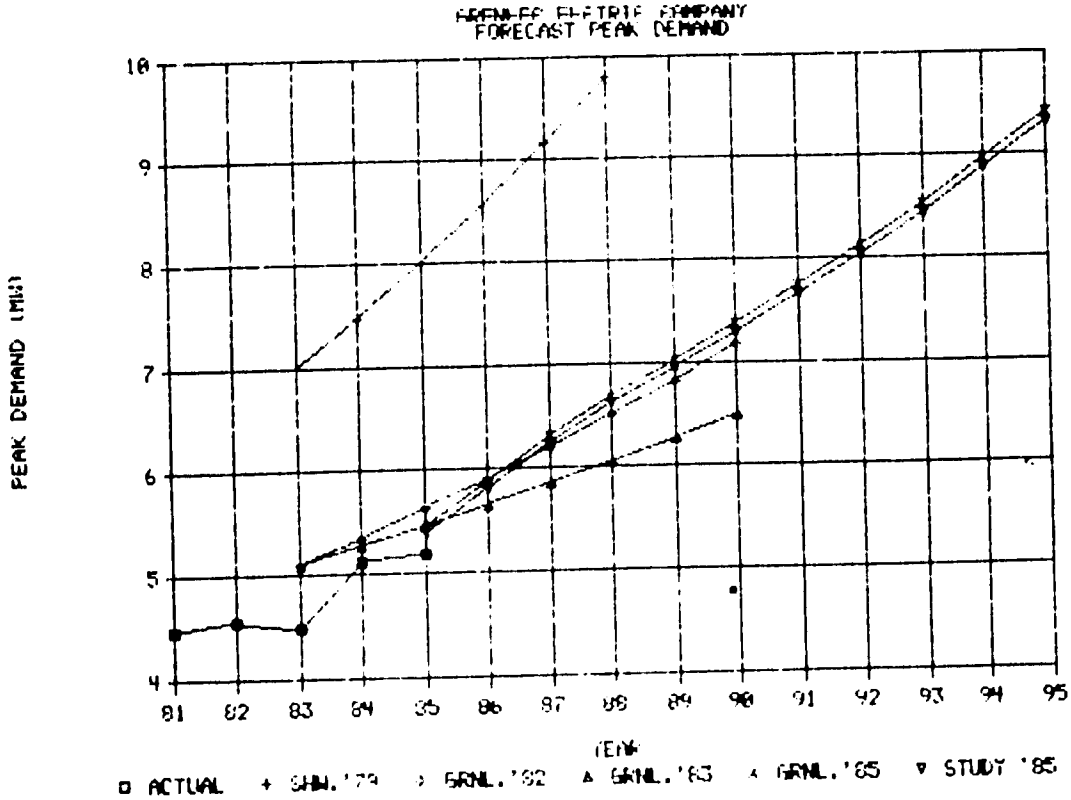
(c) Sets No. 848 and 849 are portable units, which have been rented from Woodland Company (England) since November 1983. These two sets are not expected to be returned until sets No. 5 and 7 have been restored to base load service and after additional capacity has been identified for commissioning in 1986.

(d) set No. 4 suffered a broken crankcase on Nov. 23, 1985 and is now fully out of service.

COMPARISON OF ACTUAL AND FORECAST PEAK DEMANDS

	ACTUAL [1]		SHW.'79 F'CST [2]		GRN.'82 F'CST [3]		GRN.'83 F'CST [4]		GRN.'85 F'CST [5]		STUDY '85 F'CST [6]	
Year	MW	GROWTH %	MW	GROWTH %	MW	GROWTH %	MW	GROWTH %	MW	GROWTH %	MW	GROWTH %
1970	2.83											
1971	3.43	21.2%										
1972	3.98	16.0%										
1973	4.02	1.0%										
1974	3.60	-10.4%										
1975	3.45	-4.2%										
1976	3.87	12.2%										
1977	4.13	6.7%										
1978	4.47	8.2%										
1979	4.51	0.9%										
1980	4.57	1.3%										
1981	4.47	-2.2%										
1982	4.55	1.8%										
1983	4.48	-1.5%	7.00		5.10		5.10	12.1%				
1984	5.13	14.5%	7.49	7.0%	5.36	5.0%	5.28	3.5%				
1985	5.20	1.4%	8.01	7.0%	5.62	5.0%	5.46	3.4%	5.46		5.40	
1986			8.57	7.0%	5.90	5.0%	5.65	3.5%	5.87	7.5%	5.81	7.5%
1987			9.16	7.0%	6.20	5.0%	5.85	3.5%	6.31	7.5%	6.24	7.5%
1988			9.80	7.0%	6.51	5.0%	6.06	3.6%	6.69	6.0%	6.61	6.0%
1989					6.83	5.0%	6.27	3.5%	7.02	4.9%	6.95	5.0%
1990					7.18	5.0%	6.50	3.7%	7.37	5.0%	7.29	5.0%
1991									7.74	5.0%	7.66	5.0%
1992									8.13	5.0%	8.04	5.0%
1993									8.53	4.9%	8.44	5.0%
1994									8.96	5.0%	8.86	5.0%
1995									9.41	5.0%	9.31	5.0%


GRENLEC ELCTRIC COMPANY
PEAK DEMAND (MW)
8
7
6
5
4
3
2
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85
YEAR
ACTUAL


FORECAST PEAK DEMAND
PEAK DEMAND (MW)
10
9
8
7
6
5
4
81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
YEAR
ACTUAL
GRNL.'82
GRNL.'83
GRNL.'85
STUDY '85

PEAK DEMAND

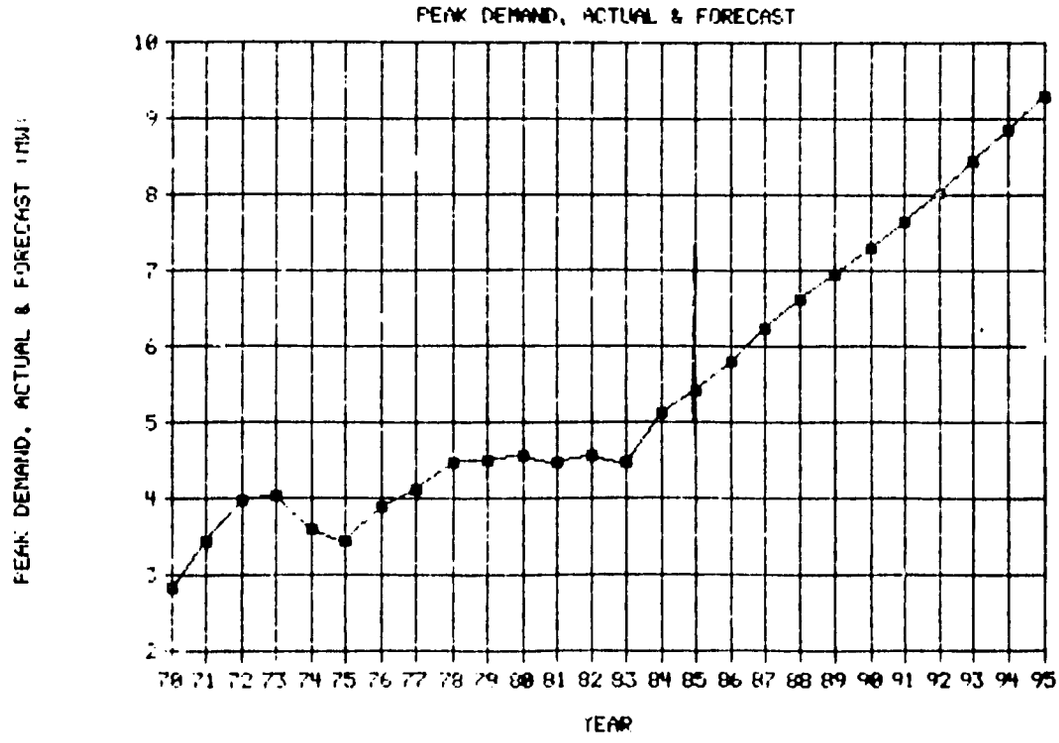
ACTUAL

Year	MW	GROWTH %
1970	2.83	
1971	3.43	21.2%
1972	3.98	16.0%
1973	4.02	1.0%
1974	3.60	-10.4%
1975	3.45	-4.2%
1976	3.87	12.2%
1977	4.13	6.7%
1978	4.47	8.2%
1979	4.51	0.9%
1980	4.57	1.3%
1981	4.47	-2.2%
1982	4.55	1.8%
1983	4.48	-1.5%
1984	5.13	14.5%
1985	5.40	5.3%
AVG. GROWTH:		4.7%

STUDY FORECAST

Year	MW	GROWTH %
1985	5.40	
1986	5.81	7.5%
1987	6.24	7.5%
1988	6.61	6.0%
1989	6.95	5.0%
1990	7.29	5.0%
1991	7.66	5.0%
1992	8.04	5.0%
1993	8.44	5.0%
1994	8.86	5.0%
1995	9.31	5.0%
AVG. GROWTH:		5.6%

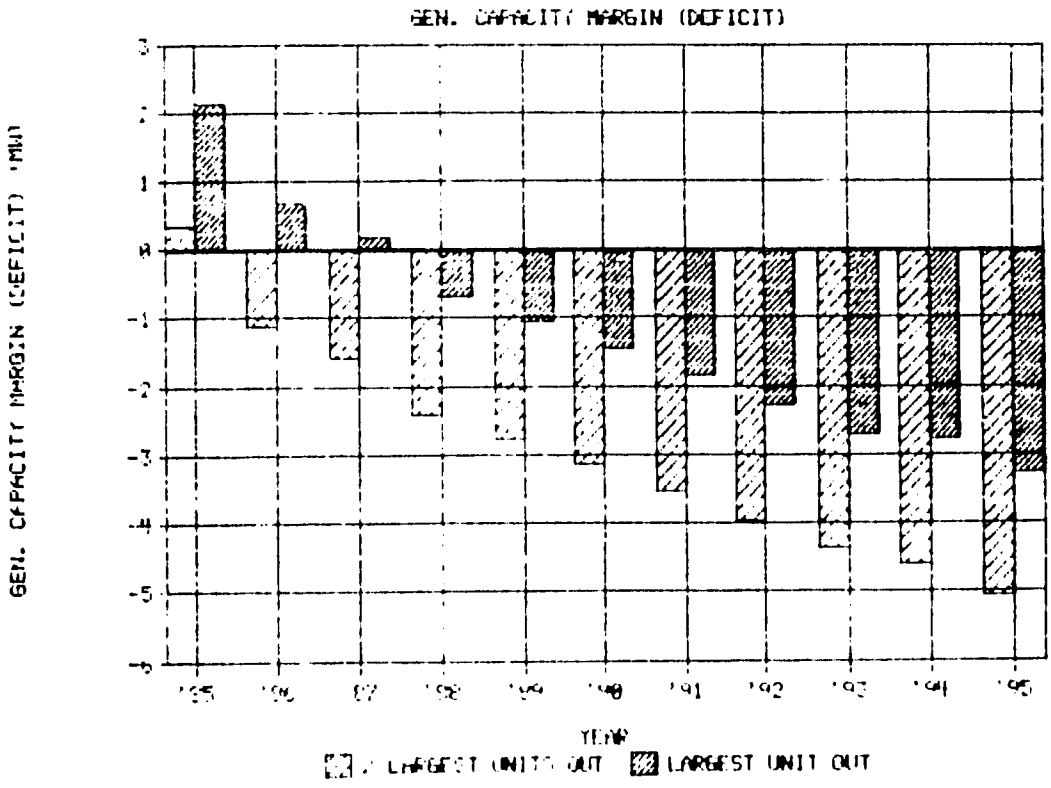
Note: 1985 peak estimated based on 5.34 MW peak in November 1985.



Ex 4. 4

GENERATION CAPACITY MARGINS WITHOUT ADDITIONS

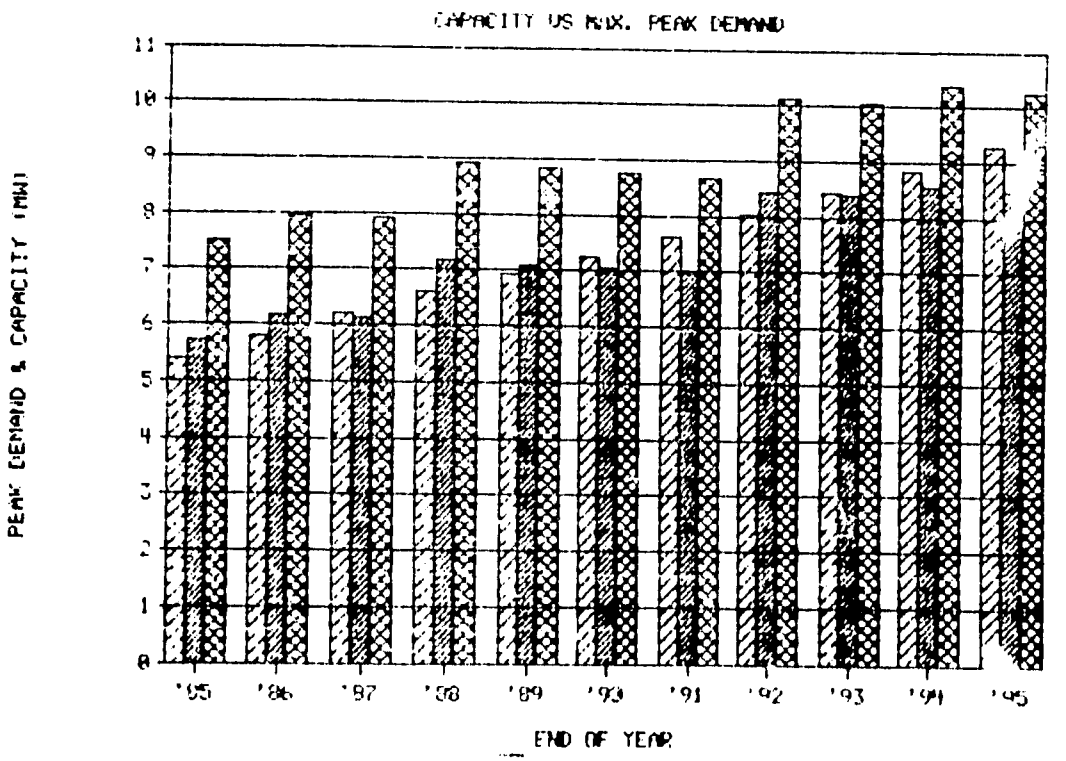
SET NO	DESIGN RATING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	920	-	-	-	-	-	-	-	-	-	-	-
2	600	-	-	-	-	-	-	-	-	-	-	-
3	600	450	437	423	-	-	-	-	-	-	-	-
4	1,450	-	-	-	-	-	-	-	-	-	-	-
5	1,240	1,240	1,228	1,215	1,203	1,191	1,179	1,167	1,156	1,144	1,240	1,228
6	1,450	1,450	1,436	1,421	1,407	1,393	1,379	1,365	1,351	1,338	1,450	1,436
7	1,420	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
8	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
9	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
848	600	500	-	-	-	-	-	-	-	-	-	-
849	600	500	-	-	-	-	-	-	-	-	-	-
TOTAL:	12,600	9,344	8,267	8,192	7,707	7,646	7,585	7,525	7,466	7,407	7,930	7,867
PEAK DEMAND (MW):		5.40	5.81	6.24	6.61	6.95	7.29	7.66	8.04	8.44	8.86	9.31
LARGEST UNIT OUT(MW):		-1.80	-1.78	-1.77	-1.75	-1.73	-1.71	-1.70	-1.68	-1.66	-1.82	-1.80
CAPACITY MARGIN (MW):		2.14	0.68	0.19	-0.66	-1.03	-1.42	-1.83	-2.25	-2.70	-2.75	-3.24
2ND LARGEST UNIT OUT:		-1.80	-1.78	-1.77	-1.75	-1.73	-1.71	-1.70	-1.68	-1.66	-1.82	-1.80
CAPACITY MARGIN (MW):		0.34	-1.11	-1.58	-2.40	-2.76	-3.13	-3.52	-3.93	-4.36	-4.57	-5.04



CASE 1A - PROJECTED DIESEL GENERATION CAPACITY W/ 1500 KW UNIT ADDITIONS

Max. annual peak with sched. maint. & forced outage of 2 largest units

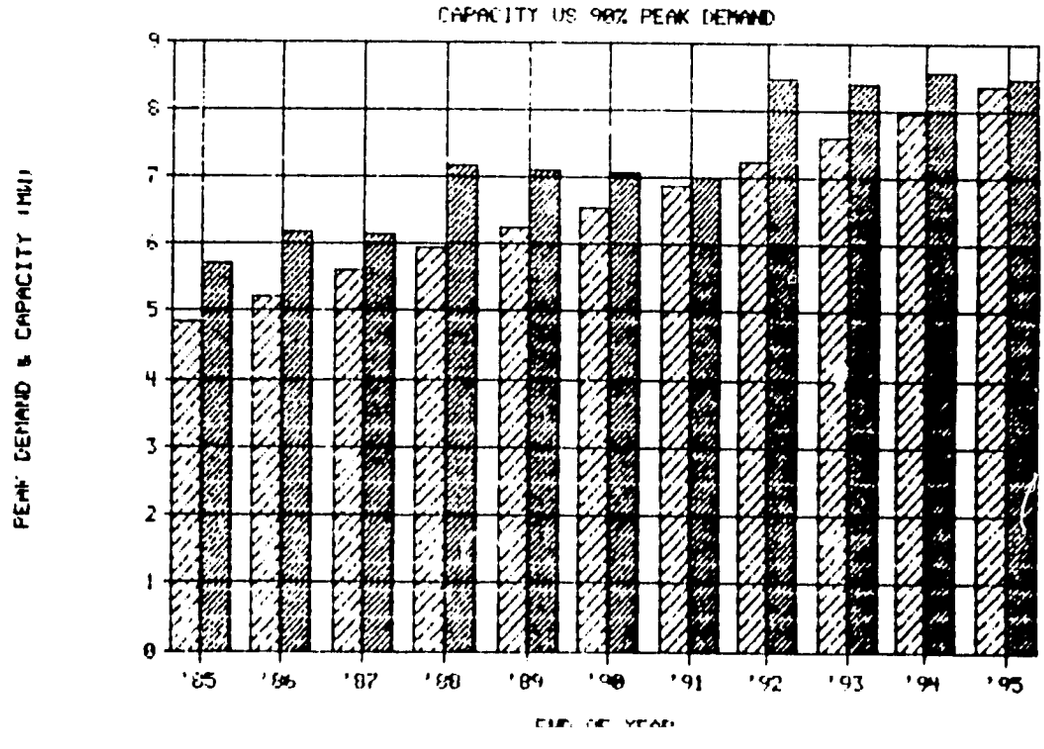
SET NO	DESIGN RATING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	920	-	-	-	-	-	-	-	-	-	-	-
2	600	-	-	-	-	-	-	-	-	-	-	-
3	600	450	437	423	-	-	-	-	-	-	-	-
4	1,450	-	-	-	-	-	-	-	-	-	-	-
5	1,240	1,240	1,228	1,215	1,203	1,191	1,179	1,167	1,156	1,144	1,240	1,228
6	1,450	1,450	1,436	1,421	1,407	1,393	1,379	1,365	1,351	1,338	1,450	1,436
7	1,420	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
8	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
9	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
848	600	500	-	-	-	-	-	-	-	-	-	-
849	500	500	-	-	-	-	-	-	-	-	-	-
0 (NEW)	1,500	-	1,500	1,485	1,470	1,455	1,441	1,426	1,412	1,398	1,384	1,370
1 (NEW)	1,500	-	-	-	1,500	1,485	1,470	1,455	1,441	1,426	1,412	1,398
3 (NEW)	1,500	-	-	-	-	-	-	-	1,500	1,485	1,470	1,455
TOTAL:	16,260	9,344	9,767	9,677	10,677	10,586	10,496	10,407	11,819	11,717	12,196	12,091
MAX PEAK DEMAND (MW):		5.40	5.81	6.24	6.61	6.95	7.29	7.66	8.04	8.44	8.86	9.31
LARGEST UNIT OUT(MW):		-1.80	-1.78	-1.77	-1.75	-1.73	-1.71	-1.70	-1.68	-1.66	-1.82	-1.80
CAPACITY (MW):		7.54	7.98	7.91	8.93	8.86	8.78	8.71	10.14	10.05	10.38	10.29
MARGIN (MW):		2.14	2.18	1.67	2.31	1.91	1.49	1.05	2.10	1.61	1.51	0.98
2ND LARGEST UNIT OUT:		-1.80	-1.78	-1.77	-1.75	-1.73	-1.71	-1.70	-1.68	-1.66	-1.82	-1.80
CAPACITY (MW):		5.74	6.20	6.14	7.18	7.12	7.07	7.01	8.46	8.39	8.56	8.49
MARGIN (MW):		0.34	0.39	-0.10	0.57	0.18	-0.22	-0.64	0.42	-0.05	-0.31	-0.82



CASE 1B - PROJECTED DIESEL GENERATION CAPACITY W/ 1500 KW UNIT ADDITIONS

90% annual peak with sched. maint. & forced outage of 2 largest units

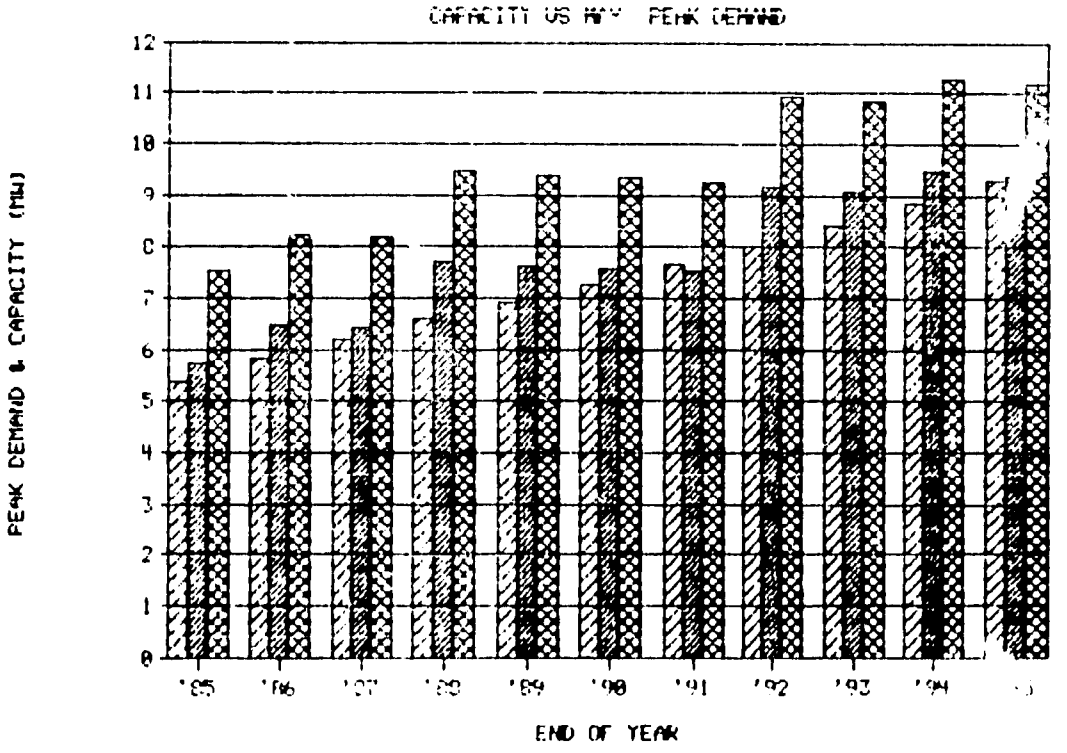
SET NO	DESIGN RATING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	920	-	-	-	-	-	-	-	-	-	-	-
2	600	-	-	-	-	-	-	-	-	-	-	-
3	600	450	437	423	-	-	-	-	-	-	-	-
4	1,450	-	-	-	-	-	-	-	-	-	-	-
5	1,240	1,240	1,228	1,215	1,203	1,191	1,179	1,167	1,156	1,144	1,240	1,228
6	1,450	1,450	1,436	1,421	1,407	1,393	1,379	1,365	1,351	1,338	1,450	1,436
7	1,420	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
8	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
9	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
848	680	500	-	-	-	-	-	-	-	-	-	-
849	680	500	-	-	-	-	-	-	-	-	-	-
10 (NEW)	1,500	-	1,500	1,485	1,470	1,455	1,441	1,426	1,412	1,398	1,384	1,370
11 (NEW)	1,500	-	-	-	1,500	1,485	1,470	1,455	1,441	1,426	1,412	1,398
13 (NEW)	1,500	-	-	-	-	-	-	-	1,500	1,485	1,470	1,455
TOTAL:	16,260	9,344	9,767	9,677	10,677	10,586	10,496	10,407	11,819	11,717	12,196	12,091
90% PEAK DEMAND (MW):		4.86	5.22	5.62	5.95	6.25	6.56	6.89	7.24	7.60	7.96	8.38
LARGEST UNIT OUT(MW):		-1.80	-1.78	-1.77	-1.75	-1.73	-1.71	-1.70	-1.68	-1.66	-1.82	-1.80
CAPACITY (MW):		7.54	7.98	7.91	8.93	8.86	8.78	8.71	10.14	10.05	10.38	10.29
MARGIN (MW):		2.68	2.76	2.29	2.98	2.60	2.22	1.82	2.90	2.46	2.40	1.91
2ND LARGEST UNIT OUT:		-1.80	-1.78	-1.77	-1.75	-1.73	-1.71	-1.70	-1.68	-1.66	-1.82	-1.80
CAPACITY (MW):		5.74	6.20	6.14	7.18	7.12	7.07	7.01	8.46	8.39	8.56	8.49
MARGIN (MW):		0.88	0.98	0.53	1.23	0.87	0.51	0.12	1.22	0.79	0.58	0.11



CASE 2A - PROJECTED DIESEL GENERATION CAPACITY W/ 1820 KW UNIT ADDITIONS

Max. annual peak with sched. maint. & forced outage of 2 largest units

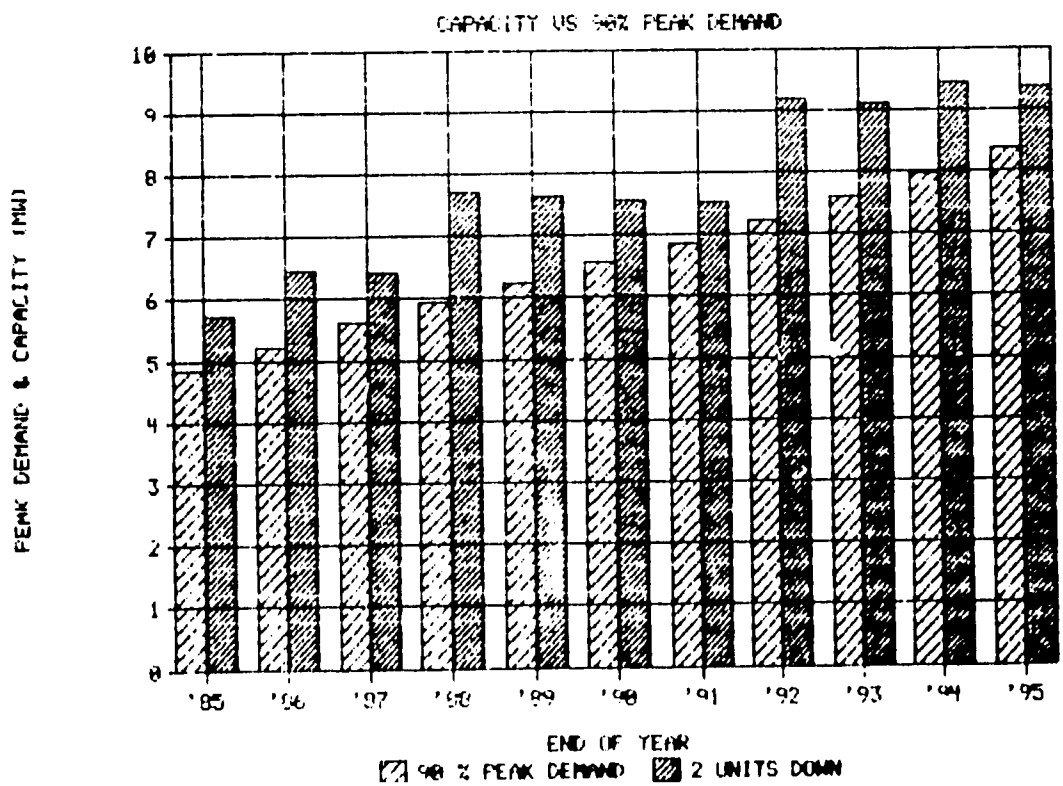
SET NO	DESIGN RATING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	920	-	-	-	-	-	-	-	-	-	-	-
2	600	-	-	-	-	-	-	-	-	-	-	-
3	600	450	437	423	-	-	-	-	-	-	-	-
4	1,450	-	-	-	-	-	-	-	-	-	-	-
5	1,240	1,240	1,228	1,215	1,203	1,191	1,179	1,167	1,156	1,144	1,240	1,228
6	1,450	1,450	1,436	1,421	1,407	1,393	1,379	1,365	1,351	1,338	1,450	1,436
7	1,420	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
8	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
9	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
848	680	500	-	-	-	-	-	-	-	-	-	-
849	680	500	-	-	-	-	-	-	-	-	-	-
0 (NEW)	1,820	-	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663
1 (NEW)	1,820	-	-	-	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696
3 (NEW)	1,820	-	-	-	-	-	-	-	1,820	1,802	1,784	1,766
TOTAL:	17,220	9,344	10,067	9,994	11,310	11,213	11,117	11,022	12,748	12,636	13,107	12,992
MAX PEAK DEMAND (MW):		5.40	5.81	6.24	6.61	6.95	7.29	7.66	8.04	8.44	8.86	9.31
LARGEST UNIT OUT(MW):		-1.80	-1.82	-1.80	-1.82	-1.80	-1.78	-1.77	-1.82	-1.80	-1.82	-1.80
CAPACITY (MW):		7.54	8.27	8.19	9.49	9.41	9.33	9.26	10.93	10.83	11.29	11.19
MARGIN (MW):		2.14	2.46	1.95	2.88	2.47	2.04	1.60	2.89	2.39	2.42	1.88
2ND LARGEST UNIT OUT:		-1.80	-1.78	-1.77	-1.78	-1.77	-1.75	-1.73	-1.75	-1.73	-1.82	-1.80
CAPACITY (MW):		5.74	6.48	6.43	7.71	7.65	7.59	7.53	9.18	9.10	9.47	9.39
MARGIN (MW):		0.34	0.68	0.19	1.09	0.70	0.29	-0.13	1.14	0.66	0.60	0.08



CASE 2B - PROJECTED DIESEL GENERATION CAPACITY W/ 1820 KW UNIT ADDITIONS

90% annual peak with sched. maint. & forced outage of 2 largest units

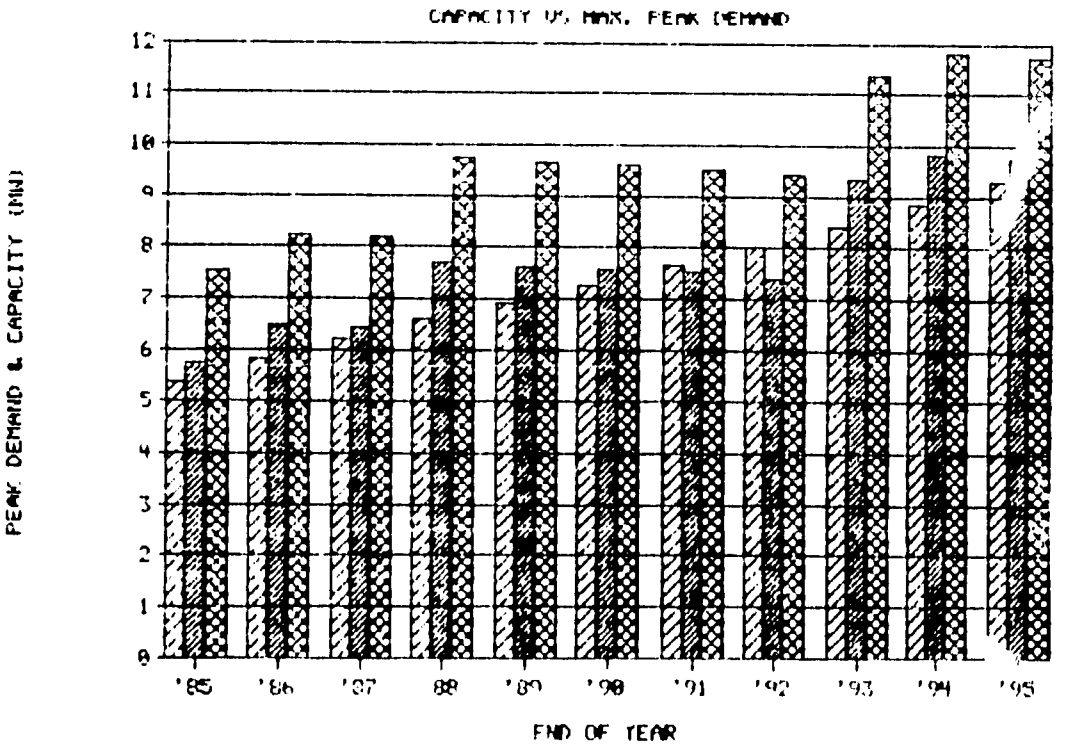
SET NO	DESIGN RATING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	920	-	-	-	-	-	-	-	-	-	-	-
2	600	-	-	-	-	-	-	-	-	-	-	-
3	600	450	437	423	-	-	-	-	-	-	-	-
4	1,450	-	-	-	-	-	-	-	-	-	-	-
5	1,240	1,240	1,228	1,215	1,203	1,191	1,179	1,167	1,156	1,144	1,240	1,228
6	1,450	1,450	1,436	1,421	1,407	1,393	1,379	1,365	1,351	1,338	1,450	1,436
7	1,420	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
8	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
9	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
848	680	500	-	-	-	-	-	-	-	-	-	-
849	680	500	-	-	-	-	-	-	-	-	-	-
10 (NEW)	1,820	-	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663
11 (NEW)	1,820	-	-	-	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696
13 (NEW)	1,820	-	-	-	-	-	-	-	1,820	1,802	1,784	1,766
TOTAL:	17,220	9,344	10,087	9,994	11,310	11,213	11,117	11,022	12,748	12,636	13,107	12,992
90% PEAK DEMAND (MW):		4.86	5.22	5.62	5.95	6.25	6.56	6.89	7.24	7.60	7.98	8.38
LARGEST UNIT OUT(MW):		-1.80	-1.82	-1.80	-1.82	-1.80	-1.78	-1.77	-1.82	-1.80	-1.82	-1.80
CAPACITY (MW):		7.54	8.27	8.19	9.49	9.41	9.33	9.26	10.93	10.83	11.29	11.19
MARGIN (MW):		2.68	3.04	2.58	3.54	3.16	2.77	2.36	3.69	3.24	3.31	2.81
2ND LARGEST UNIT OUT:		-1.80	-1.78	-1.77	-1.78	-1.77	-1.75	-1.73	-1.75	-1.73	-1.82	-1.80
CAPACITY (MW):		5.74	6.48	6.43	7.71	7.65	7.59	7.53	9.18	9.10	9.47	9.39
MARGIN (MW):		0.88	1.26	0.81	1.75	1.39	1.02	0.63	1.94	1.51	1.49	1.01



CASE 3A - PROJECTED DIESEL GENERATION CAPACITY W/ 2100 KW UNIT ADDITIONS

Max. annual peak with sched. maint. & forced outage of 2 largest units

SET NO	DESIGN RATING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	920	-	-	-	-	-	-	-	-	-	-	-
2	600	-	-	-	-	-	-	-	-	-	-	-
3	600	450	437	423	-	-	-	-	-	-	-	-
4	1,450	-	-	-	-	-	-	-	-	-	-	-
5	1,240	1,240	1,228	1,215	1,203	1,191	1,179	1,167	1,156	1,144	1,240	1,228
6	1,450	1,450	1,436	1,421	1,407	1,393	1,379	1,365	1,351	1,338	1,450	1,436
7	1,420	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
8	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
9	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
848	680	500	-	-	-	-	-	-	-	-	-	-
849	680	500	-	-	-	-	-	-	-	-	-	-
10 (NEW)	2,100	-	2,100	2,079	2,058	2,038	2,017	1,997	1,977	1,957	1,938	1,918
11 (NEW)	2,100	-	-	-	2,100	2,079	2,058	2,038	2,017	1,997	1,977	1,957
12 (NEW)	2,100	-	-	-	-	-	-	-	-	2,100	2,079	2,058
TOTAL:	18,900	9,344	10,367	10,271	11,665	11,762	11,661	11,560	11,460	13,462	13,924	13,801
MAX PEAK DEMAND (MW):		5.40	5.81	6.24	6.61	6.95	7.29	7.66	8.04	8.44	8.86	9.31
LARGEST UNIT OUT(MW):		-1.80	-2.10	-2.08	-2.10	-2.08	-2.06	-2.04	-2.04	-2.10	-2.10	-2.08
CAPACITY (MW):		7.54	8.27	8.19	9.76	9.68	9.60	9.52	9.42	11.36	11.82	11.72
MARGIN (MW):		2.14	2.46	1.95	3.15	2.74	2.31	1.86	1.38	2.92	2.96	2.41
2ND LARGEST UNIT OUT:		-1.80	-1.78	-1.77	-2.06	-2.04	-2.02	-2.00	-2.02	-2.00	-1.98	-1.96
CAPACITY (MW):		5.74	6.48	6.43	7.71	7.65	7.59	7.53	7.41	9.36	9.85	9.76
MARGIN (MW):		0.34	0.68	0.19	1.09	0.70	0.29	-0.13	-0.63	0.92	0.98	0.46



CASE 3B - PROJECTED DIESEL GENERATION CAPACITY W/ 2100 KW UNIT ADDITIONS

90% annual peak with sched. maint. & forced outage of 2 largest units

SET NO	DESIGN RATING	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	920	-	-	-	-	-	-	-	-	-	-	-
2	600	-	-	-	-	-	-	-	-	-	-	-
3	600	450	437	423	-	-	-	-	-	-	-	-
4	1,450	-	-	-	-	-	-	-	-	-	-	-
5	1,240	1,240	1,228	1,215	1,203	1,191	1,179	1,167	1,156	1,144	1,240	1,228
6	1,450	1,450	1,436	1,421	1,407	1,393	1,379	1,365	1,351	1,338	1,450	1,436
7	1,420	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
8	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
9	1,820	1,802	1,784	1,766	1,748	1,731	1,713	1,696	1,679	1,663	1,820	1,802
848	680	500	-	-	-	-	-	-	-	-	-	-
849	680	500	-	-	-	-	-	-	-	-	-	-
10 (NEW)	2,100	-	2,100	2,079	2,058	2,038	2,017	1,997	1,977	1,957	1,938	1,918
11 (NEW)	2,100	-	-	-	2,100	2,079	2,058	2,038	2,017	1,997	1,977	1,957
12 (NEW)	2,100	-	-	-	-	-	-	-	-	2,100	2,079	2,058
TOTAL:	18,980	9,344	10,367	10,271	11,865	11,762	11,661	11,560	11,460	13,462	13,924	13,801
90% PEAK DEMAND (MW):		4.86	5.22	5.62	5.95	6.25	6.56	6.89	7.24	7.60	7.98	8.38
LARGEST UNIT OUT (MW):		-1.80	-2.10	-2.08	-2.10	-2.08	-2.06	-2.04	-2.02	-2.10	-2.08	-2.06
CAPACITY (MW):		7.54	8.27	8.19	9.76	9.68	9.60	9.52	9.44	11.36	11.84	11.74
MARGIN (MW):		2.68	3.04	2.58	3.81	3.43	3.04	2.63	2.21	3.76	3.87	3.37
2ND LARGEST UNIT OUT:		-1.80	-1.78	-1.77	-2.06	-2.04	-2.02	-2.00	-2.0[illegible]	-2.00	-1.98	-1.96
CAPACITY (MW):		5.74	6.48	6.43	7.71	7.65	7.59	7.53	7.43	9.36	9.87	9.79
MARGIN (MW):		0.88	1.26	0.81	1.75	1.39	1.02	0.63	0.19	1.77	1.89	1.41

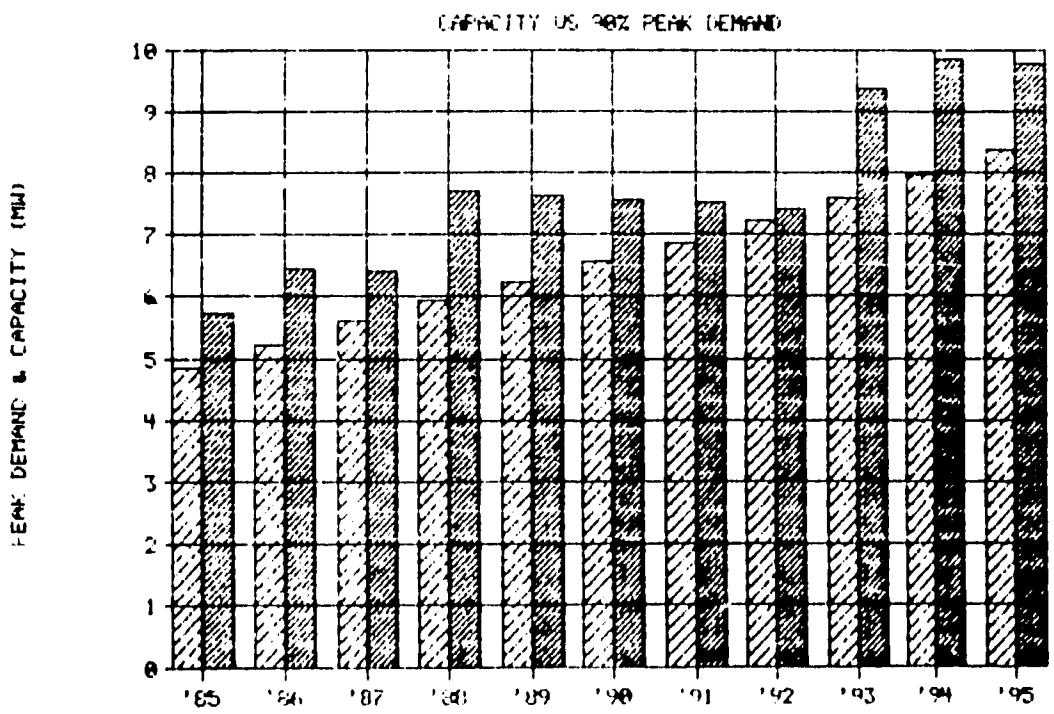


EXHIBIT 8

DIESEL GENERATOR COST ESTIMATE

ITEM	EXPENSE CATEGORY	PROJECT COST IN US $1000 US	LOCAL	TOTAL
1.00	MATERAL			
1.01	Diesel Generator Set	773		773
1.02	Electrical Equipment	130		130
1.03	Freight, Insurance	30		30
1.04	Port & Local Transp.		10	10
1.05	Local Material, Tools		18	18
2.00	INSTALLATION			
2.01	Constr. Equip. Rental		15	15
2.02	Labor, Supervision	44	20	64
2.03	Service Engr.	7		7
	Sub Total:	984	63	1,047
3.00	MISCELLANEOUS			
3.01	Contingency, Escalation Admin. Charges. (20%)	197	13	209
	Total:	1,181	76	1,256

Note: Estimate is for an end of 1986 in-service date, and is for an 1,800 kW, 750 rpm, 50 Hz unit.

EBASCO SERVICES INCORPORATED EXHIBIT 9

BY Jon Hawks DATE 11/18/85 SHEET ____ OF ____

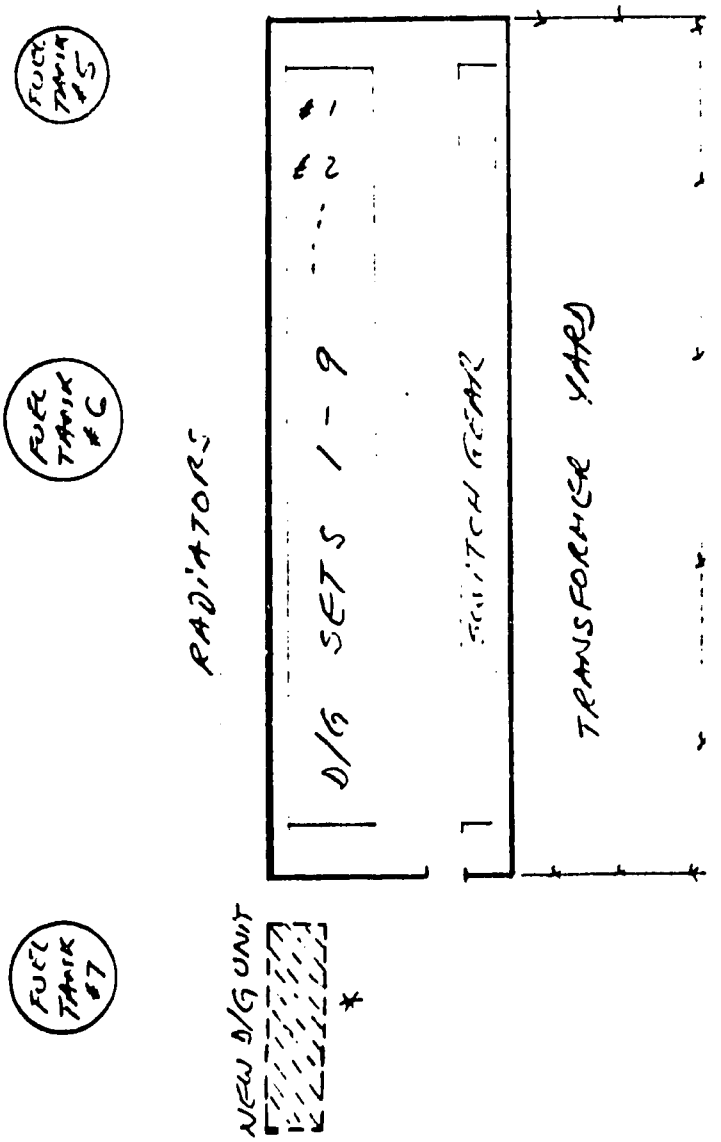
CHKD. BY ____ DATE ____ OFS NO. ____ DEPT. NO. ____

CLIENT GRENLEC

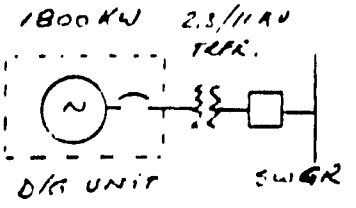
PROJECT

SUBJECT SCHEMATIC LOCATION OF NEW D/G UNIT

QUEENS PARK POWER STATION, GRENADA



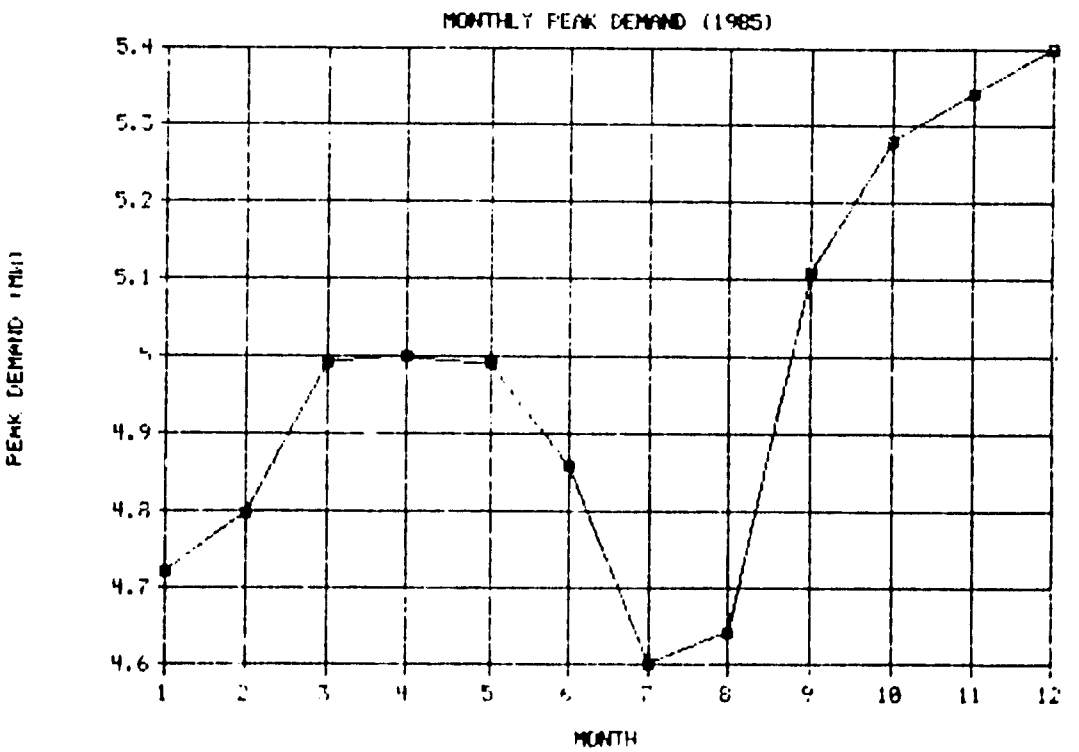
* SKID-MOUNTED D/G UNIT, HOUSED IN A SOUND-INSULATED, WEATHER-PROOF ENCLOSURE.

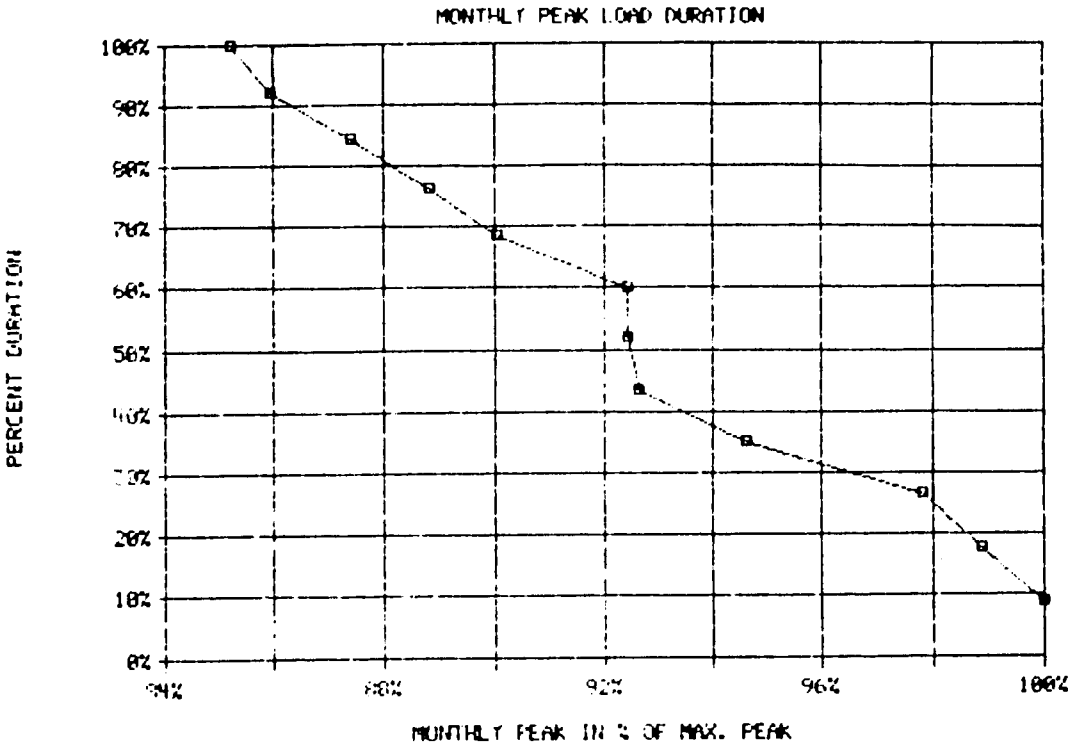


MONTHLY PEAK LOAD (1985)

MONTH	ACTUAL PEAK MW	EST. LOAD SHEDDING MW	EST. PEAK MW
1	4.720		4.720
2	4.696	0.100	4.796
3	4.890	0.100	4.990
4	4.900	0.100	5.000
5	4.890	0.100	4.990
6	4.760	0.100	4.860
7	4.500	0.100	4.600
8	4.530	0.110	4.640
9	5.010	0.100	5.110
10	5.180	0.100	5.280
11	5.340		5.340
12	5.400		5.400

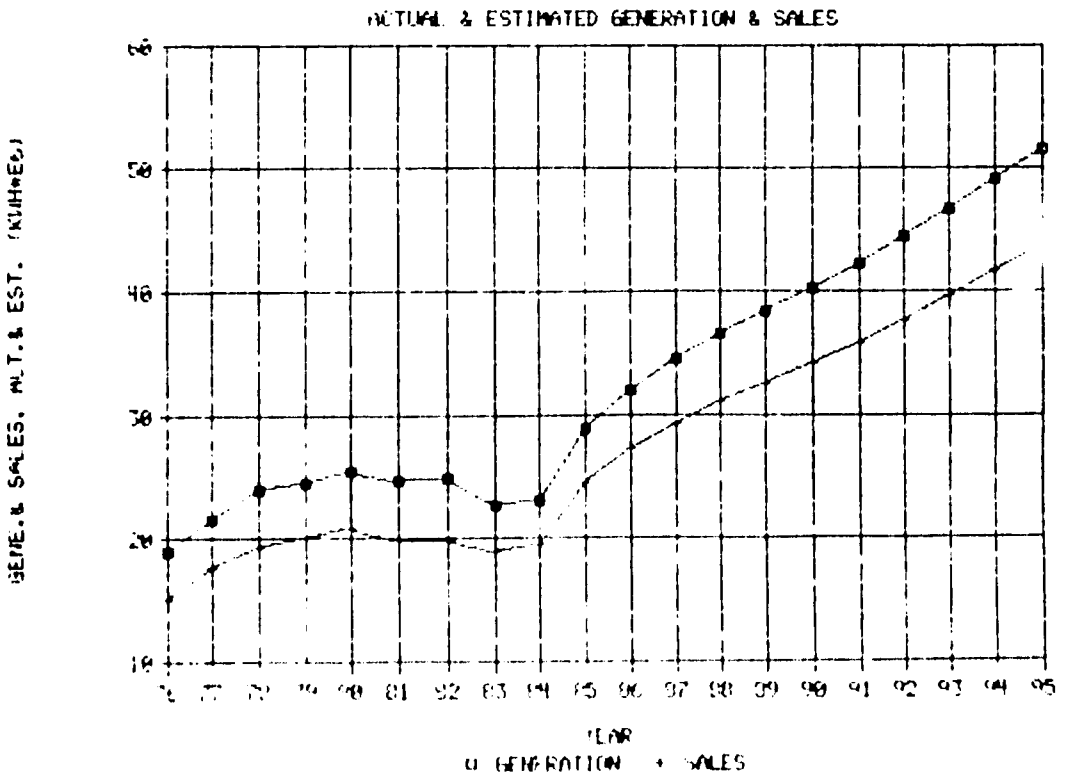
NOTE: ACTUAL PEAK LOADS HAVE BEEN ADJUSTED BECAUSE INSUFFICIENT GENERATING CAPACITY REQUIRED LOAD SHEDDING FROM FEB. TO SEPT.




MONTHLY PEAK LOAD DURATION
PERCENT DURATION
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
84%
88%
92%
96%
100%
MONTHLY PEAK IN % OF MAX. PEAK

KWH GENERATION AND SALES

YEAR	PEAK DEMAND KW	GENER. KWH*1000	LOAD FACTOR %	SALES KWH*1000	INTERNAL USE & LOSS KWH*1000	INTERNAL USE & LOSS %-GEN
			ACTUAL			
1976	3,870	18,947	55.9%	15,155	3,792	20.01%
1977	4,130	21,561	59.6%	17,740	3,821	17.72%
1978	4,470	24,007	61.3%	19,435	4,572	19.04%
1979	4,510	24,511	62.0%	20,099	4,412	18.00%
1980	4,570	25,479	63.6%	20,916	4,563	17.91%
1981	4,470	24,703	63.1%	19,972	4,731	19.15%
1982	4,550	24,921	62.5%	19,985	4,936	19.81%
1983	4,480	22,708	57.9%	19,096	3,612	15.91%
1984	5,130	22,988	51.2%	19,491	3,497	15.21%
			ESTIMATED			
1985	5,400	28,856	61.0%	24,441	4,415	15.30%
1986	5,805	32,138	63.2%	27,253	4,885	15.20%
1987	6,240	34,549	63.2%	29,297	5,251	15.20%
1988	6,615	36,622	63.2%	31,055	5,566	15.20%
1989	6,946	38,453	63.2%	32,646	5,806	15.10%
1990	7,293	40,375	63.2%	34,279	6,097	15.10%
1991	7,657	42,394	63.2%	35,993	6,402	15.10%
1992	8,040	44,514	63.2%	37,837	6,677	15.00%
1993	8,442	46,740	63.2%	39,729	7,011	15.00%
1994	8,864	49,076	63.2%	41,715	7,361	15.00%
1995	9,308	51,530	63.2%	43,852	7,678	14.90%



ANNEX II
EXHIBIT C

GRENADA

INDUSTRIAL FACILITIES DEVELOPMENT PROJECT

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Prepared by:

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1815 North Lynn Street Suite 200
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ANNEXES

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I. INTRODUCTION

Since 1983, a number of major improvements - including completion of Point Salines International Airport, road resurfacing, and construction of key transport arteries, and adoption of economic reforms by the Government of Grenada - have been implemented which are expected to enhance the country's economic performance during the next few years. In some sectors of the economy, particularly tourism, the effects of these measures are evident and should continue to pay dividends in the future.

The manufacturing sector, however, has suffered a negative real rate of growth since 1982 due to a number of factors, including: (i) the structure of the sector which favors import-substitution industries (in a very small internal market); (ii) restrictions imposed by members of CARICOM, particuarly Trinidad and Jamaica, (iii) the unavailability of credit on reasonable terms and conditions; (iv) poor foreign investor perceptions and (v) inadequate industrial infrastructure, including unreliable power and water supply, poor telecommunications and the lack of readily available factory space.

Recent steps taken by the Government indicate a strong commitment to revitalizing the manufacturing sector, particularly export-oriented industries. The Government has adopted a new Investment Code and begun divesting some of the publicly held companies. In response to these measures, a number of local entrepreneurs are restructuring operations or initiating new projects to produce goods at world competitive prices for the export market. Interest from foreign investors is also increasing, evidenced by the number of on-site visits undertaken in the last year. However, because of

the bottlenecks mentioned above, the majority of projects are still classified as "potential", rather than "actual" investment.

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At the request of the U.S. ~~Agency for International Development and the~~ Government of Grenada, Coopers & Lybrand through the USAID funded PIDAP program contracted the services of Free Zone Authority, Ltd., a non-profit corporation specializing in planning, finance, design, construction, operation and management of industrial free zones and industrial estates, to assist the Government of Grenada in the formulation of a comprehensive plan for the development of industrial facilities and to integrate this plan with Grenada's national industrial development strategy. (See Terms of Reference, Annex 1)

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II. BASIC CONCEPTS

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A. Definitions

Serviced land and buildings for industrial use can be provided in a number of different ways. In the absence of a land-use planning framework and enforced zoning regulations, an investor need only acquire a piece of land, put up a building, negotiate the supply of power, water, telecommunications, etc. from the public utility companies (or install such services at his own expense) and he is ready to begin business. Industrial growth based on such independant locational decisions by numerous entrepreneurs is always haphazard and generally inefficient, resulting in financial and economic penalties for both the private enterprise and the public sector suppliers of industrial services.

Disordered growth leads to the commingling of industrial, residential and commercial properties in an unplanned melange of congested infrastructure typical of urban centers worldwide. Ironically, under these conditions, land and building values and rentals tend to increase over time despite the deterioration of assets and environment. Small and medium-scale industries in particular often have no alternative but to bear the inefficiencies and financial burdens of inner city locations.

Largely in response to the problems mentioned above, the concept of grouped siting of factories in areas reserved for industrial activities has been widely applied in recent decades, first in the advanced countries and more recently in the developing world. A special terminology has evolved to identify and describe the various project modes available to developers of such industrial facilities. However, the terms and concepts are often used loosely and vary from country to country. Misconceptions then arise as to

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the characteristics and functions of a tract of land designated as an "industrial zone," for example, as opposed to an "industrial park (or estate)." While this is not a serious problem *per se*, it does lead to confusion and "wheel-spinning" when developers, technical assistance institutions and banks try to reach consensus on the type of industrial facilities needed and associated costs.

For purposes of conceptual clarity, in this report the terms will be used as defined below:

Industrial Zone

A delineated area set aside or "zoned" for industrial use, generally as part of a master land-use plan developed by a municipality or state authority, is commonly called an industrial zone. It may be left in the "raw" or undeveloped state or partially developed in advance by laying an access road and major internal roads. Services such as water, waste disposal, electric power, natural gas and telecommunications are often - but not always - available on short notice by connecting with nearby branches of public utility networks. Depending on the specific zoning ordinances, other permissible activities may include warehousing, commerce and business services. Firms interested in acquiring land within the zone negotiate prices and terms with the landowner, whether public or private, and arrange for utilities and other services directly with the suppliers. Historically, industrial zones have also been called "industrial districts" and "industrial areas" simply to denote that the area is dominated by industrial activity.

Industrial Estate

The modern industrial estate - or industrial park, the more common designation in the U.S. and a few other countries - emerged in the 1950s as a more advanced and efficient conceptual framework for providing industrial infrastructure. An industrial estate, essentially, is an industrial area under the proprietary control of a public agency or private corporation, planned, developed and managed as a business enterprise that promotes the sale or lease of land, buildings and services to industrial firms. A precise

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and comprehensive definition is difficult given the diversity of objectives, institutional structure, physical design, sectoral priorities, common facilities, financial policy and operational standards found at various locations. Nevertheless, a working defintion (adopted by the World Bank in 1977) suitable for the purposes of this report is given below:

> "An industrial estate is an area of land selected by and under the control of a development agency, to be subdivided and managed according to a comprehensive plan for the use of a community of industries. The estate can be of virtually any size and the development organization can be public or private. If factory buildings are included in the project, they can be wholly planned and built in advance of legally binding commitment by potential occupants; they can be partly built in advance, or they can be custom built to the specifications of the eventual occupant. Improved land and/or buildings can be rented, leased with option to purchase, or sold. Services can be of a wide variety, ranging from the basic infrastructure of roads, electric power, gas, water, sewage and telecommunications to canteens and restaurants, banking and postal facilities, repair and maintenance shops, vocational training schools, business and technical advisory services and others. The estate can be operated at a profit or with the aim of recovering costs."

Specialized forms of industrial estates have evolved over time in response to the needs of particular subgroupings, including *inter alia*:

Mini-Estate or Shop Cluster - provides simple low cost structures and utility services for small-scale enterprises, usually in an urban setting within or close to the intended market for the products and services offered by the estate occupants;

Ancillary Estate - estates designed to foster mutually beneficial subcontracting and other linkages between one or more large-scale primary manufacturers and groups of smaller upstream suppliers and downstream processors of the primary products;

Commercial Estate - designed for retail and wholesale trade and warehousing, often including craft and service industries;

High Technology Estate - facilities designed for the special needs of advanced technology firms, often located close to and associated with universities and/or large R & D operations.

Export-oriented estates are a rapidly spreading project form. When coupled with free zone legislation permitting duty-free in and out movement of goods and other regulatory and fiscal benefits aimed at attracting foreign investors, the estate becomes an Industrial Free

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Zone (IFZ) or Export Processing Zone (EPZ). The important characteristics of EPZ will be discussed in detail below.

Export Processing Zone

The Export Processing Zone (EPZ) is a relatively recent variant of the widely used Free Trade Zone (FTZ) — a designated area, usually in or next to a port area, to and from which unrestricted trade is permitted with the rest of the world. Merchandise may be moved in and out of FTZs free of customs, stored in warehouses for varying periods and repackaged as needed. Although goods imported from the FTZ into the host country pay the requisite duty; their prior storage in FTZ warehouses permits rapid delivery to order, meanwhile saving interest on customs payments.

EPZs, more specifically, also provide buildings and services for manufacturing, i.e., transformation of imported raw and intermediate materials into finished products, usually for export but sometimes partly for domestic sale subject to the normal duty. The EPZ is thus a specialized industrial estate located physically and/or administratively outside the customs barrier, oriented to export production. It serves as a showcase to attract investors and facilitate the initiation of their operations. In most cases, EPZs are developed in conjunction with other investment incentives.

Although an EPZ is an industrial estate it is distinguished from the general case by its specialized export-oriented operations and the framework or rules, regulations and incentives specifically geared to attract foreign investors. Stated in another way, the "hardware" of industrial estates and EPZs is similar, but the "software" differs in order to better serve the differing objectives linked to each project form.

An interesting development in recent years is the "hybrid" design in which a single site will encompass facilities for both domestic-market and export-oriented production. Such projects - often designated as IE/EPZs - appear to serve the needs of all segments of the industrial sector efficiently without engendering incremental problems. In fact, there are clear synergistic benefits and external economies in locating small, medium and large scale enterprises, domestic or export-market oriented, in close proximity. Customs

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supervision of the EPZ segment of the project is ensured as in any other site by effectively designing roads, fences and access points.

B. Physical Design Considerations

The design standards that have emerged over time in well-managed IEs and EPZs have had a strongly beneficial impact on the quality of industrial facilities. In the developing world, projects typically are financed by national and/or international institutions that, to reduce risk on long-term loans, often impose strict terms and conditions that will ensure sound planning and execution of the construction program. This translates into professionally qualified management and technical supervision in all phases of project implementation. The end product - developed land, factory structures and services - is generally built to higher standards than usual and, therefore, less expensive over the long term (although possibly, but not necessarily, more costly in terms of initial capital investment).

In developing countries, the introduction of the industrial estate concept, based on professional planning, design and management of the industrial facilities, is often met with skepticism or resistance by local entrepreneurs. Eventually, however, the long-term economies and other benefits become apparent. A well-planned industrial estate will offer all the locational and infrastructure elements necessary for the efficient manufacture of goods, including: adequate labor supply, access to markets, transport, communications, reliable power and water, ancillary services (medical, food, fire fighting, security) and so forth. When compared to earlier experiences with unplanned ad hoc locational decisions, the advantages of the industrial estate soon become apparent.

The factory premises per se are an important comparative advantage. While any structure providing protection from the elements can be used as a "factory," the standard and custom-designed factory buildings characteristic of well planned and professionally managed estates are generally far superior to the traditional product. Service requirements have been carefully assessed and designed in advance, with suitable margins of safety. Factory expansion as and when needed has been foreseen and can be implemented with minimum disruption to a "going business". Truck access and maneuvering areas are taken into consideration, a design element often disregarded by individual entrepreneurs until the problem becomes overwhelming and, sometimes, unsolvable. The "quality of life" for both workers and management has been taken into account in specifying insulation, ventilation, sanitary facilities, heating and/or air conditioning and lighting. Finally, because of economies of scale, an estate can provide common business services - e.g., telex, computers, document copiers, secretarial - that many individual enterprises would find it difficult or impossible to finance individually.

The undeniable advantages of estate sites and services are evident in those countries that have made such programs a major instrument of national industrial development policy. In Turkey, over 200 estates are currently operating. These facilites vary greatly; some house as many as 2000 enterprises ranging in size from small shops of 5 - 10 workers to large factories of 400 - 500 workers or more. Most are owned and operated by the estate enterprises as cooperatives, managed by hired professionals. Mexico has some 30 government sponsored estates along the border zone with the U.S., and elsewhere in the interior, and probably an equal number of privately

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owned projects. Barbados has 11 estates, operated as general purpose facilities for both domestic market and export-oriented manufacturers. Other well-known success stories are the long established and growing programs of Ireland, Singapore, Mauritius, Malaysia and Taiwan and the more recent activities undertaken by the People's Republic of China in the coastal Special Economic Zones.

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III. CURRENT STRATEGY FOR DEVELOPMENT OF INDUSTRIAL FACILITIES

A. Institutional Framework

Prior to 1985, there were no formally planned industrial estate projects in Grenada. Factories were financed, located and owned by individuals or corporations for their own purposes. On the government level, national planning and promotion of industrial development was assigned to the Department of Industrial Development (DID) under the portfolio of the Ministry of Agriculture, National Resources and Industrial Development. The DID was primarily responsible for processing inquiries and applications for incentives, but was not authorized to assume any liabilities. The Ministry of Agriculture was, and continues to be, the Government's legal arm for property controlled by the Crown.

Recognizing the importance of planned industrial infrastructure development as a stimulus to industrial growth and diversification, the Government approached the Caribbean Development Bank (CDB) in 1984 for finance of an industrial park. This project has been approved by the Board of the CDB, subject, of course, to certain terms and conditions. (See Chapter V) Project preparation is now underway, including qualification of contractors and detailed engineering work.

The Grenada Development Bank was chosen as the executing agency for the project referred to as the True Blue Industrial Estate, adjacent to the "old motor pool" at Frequente. (At the time, the GDB was the only entity capable of taking on this responsibility). Once built, under terms of the loan agreement, the GDB would undertake operational management including

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" . . . selection of tenants, leasing of factory space, collection of rent and repair and maintenance of factory shells and related works."/1

Since negotiation of the loan agreement, a new public sector agency was created - the Industrial Development Corporation (IDC) - to "stimulate, facilitate and undertake the establishment and development of industry in Grenada." The corporation is empowered to purchase, accept, hold, and dispose of land and other property of whatever kind, enter into contracts and to "do all things necessary for purposes of fulfilling this Act," in effect, duplicating the responsibilities given to the GDB.

More specifically, the IDC is responsible for investment promotion, reviewing investment applications, recommending actions to the IDC Board and entering into lease negotiations for factory space at Frequente. Current planning calls for the refurbishing of the existing structures and some infrastructure improvement. This property, however, has not been vested in the IDC and therefore the corporation cannot negotiate leases or any other arrangement with potential occupants. Currently, these functions would be discharged by the Ministry of Finance as agent for the Goverment.

To summarize, there are four agencies involved in the development of industrial facilities: (i) the Ministry of Finance, empowered in the general case to act as lessor on behalf of the Government; (ii) the Ministry of Agriculture, acting as agent, subject to Cabinet approval, for Crown Lands and other land acquired by the Government; (iii) the Grenada Development Bank, executing agency for the True Blue Industrial Estate; and (iv) the Industrial Development Corporation with general industrial investment

/1 Appraisal Report on Industrial Estate - Grenada, CDB, 1984.

promotion responsibilities - including land acquisition, development and lease - currently focusing its attention on the Frequente site.

In order to resolve the problems created by the overlapping layers of responsibility summarized above, it appears - based on discussions with the concerned agencies - that the Government intends to designate the IDC as the executing agency for all public sector industrial facilities. To date, however, action has not been completed to transfer the True Blue project to the IDC or to vest in the IDC ownership of the Frequente land which is now under development./1

Evidently, there are procedural difficulties inherent in the implementation of a government policy decision to effectively centralize management control that is presently spread among four government agencies. However, the sooner the necessary actions are taken, the sooner the national program of industrial development can reach the "take-off" stage.

B. Land-Use Planning and the Supply of Industrial Land

1. Land-Use Planning

There are no zoning or other legally enforced land-use restrictions in Grenada. /2 Industrial facilities are located throughout the island, with the majority of industry concentrated in the St. George's area. Within the private sector, entrepreneurs have generally constructed facilities on their own property and necessary services (whether adequate or inadequate) have

/1 According to the loan agreement, a formal request must be submitted to CDB before ownership or management responsibilities can be assumed by another party. To date, this has not been completed.

/2 The Planning Commission in Grenada is required to approve all building plans, but the consultants are unaware of any specific evaluation criteria.

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been negotiated directly with the public utility companies. Site selection for government facilities was generally chosen on the basis of the availablity of Crown Lands or on an ad hoc basis.

The manner in which industrial facilities have been developed in Grenada has had a negative effect on industrial development efforts. Factories have been constructed without adequate planning for services, such as electricity, water, sewage and storm water disposal and telecommunications. The inefficiency of this system has forced some entrepreneurs to finance their own infrastructure requirements (e.g. stand-by generators, supplementary water supply). Notwithstanding, it appears that the majority of industries in Grenada cannot, or are unwilling to, allocate scarce resources to services that the Government would normally supply. The result has been poor productivity, and in some extreme cases, cutbacks in the labor force. Operating costs, particularly for electricity and water supply, are also high, adversely affecting Grenada's ability to compete at world market prices for manufactured goods.

2. Supply of Industrial Land

In the near to medium term, the consultants believe that most of the growth in industrial activity will occur in the southern part of the island, particularly in the area between the airport and St. George's. (See Annex 2) Obviously, some industries will locate in other parts of the island convenient to agricultural resources and "pockets" of available labor or where an inexpensive parcel of land is available. However, the area between the airport and St. George's offers a number of comparative advantages:

a. Proximity to international transportion links at Point Saline International Airport and port facilities at St. George's;

b. A good quality road system to support container traffic;

c. Availability of labor in the St. George's area;

d. The (future) availabilty of electricity, including a new 11 kva transmission line adjacent to the airport road;

e. Proximity to services, such as banking, retail facilities, hotels and other business and social services;

f. Topographic features of the area which permit development of industrial facilities at a reasonable cost and space for expansion; and

g. Presence of existing industries in the area.

It is the consultants' opinion that the shortage of land suitable and available for industrial development in this area has been artifically induced by failure to plan effectively and in a timely manner, compounded by the land ownership problems inherited from the previous regime. Demand has been increasing while supply has contracted. The status of much of the area that would normally be negotiable as industrial property is "frozen", pending settlement of claims by former private owners against the Government. Even where Crown Land is undisputedly and legally owned by the Government, there are no policy guidelines governing its disposal and use so that even these parcels are effectively off the market. The end result is that private interests owning property can now demand an artificially high price, if they were willing to sell at all.

The problem is further complicated by the lack of accessible information. Within the Ministry of Agriculture, the Department of Lands and Surveys has been designated as the repository for all boundary surveys and cadastral maps. Due to the organization (or lack thereof) of the relevant information, determining ownership and property bounderies can take up to one year, if

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obtainable at all. This problem has discouraged numerous potential investors in the past. It is not uncommon for businessmen to comb the island seeking suitable sites, only to then spend frustrating days and weeks trying to ascertain legal ownership of the property. It is also not unusual to find that some parcels of land may be allocated to more than one industry.

By eliminating the ownership problems in acquiring land, the planned industrial parks could accelerate the process of industrialization while reducing costs significantly./1 A few large industries may have special requirements or other reasons to own their own tracts of land, but in the normal course of events, such development sites are likely to be located near the estate projects and would contribute to the marketability of the estates as evidenced in many locations worldwide.

In summary, the Government's current strategy seems to focus primarily on settling claims from the private sector for land acquired by the previous regime. This is fine as far as it goes. Certain parameters have been established, but the consultants are unaware of any guidelines which govern the priority of claims or the establishment of fair market values. The Government recognizes the need for a comprehensive resolution of all outstanding land title/ownership conflicts as a necessary precursor to rational land use planning and implementation (a land use plan prepared by the Organization of American States is presently under review) particularly in the southern part of the island. But, progress has been painfully slow because of a lack of effective planning, missing or inaccessible records,

/1 Assuming, of course, that the associated infrastructure is upgraded to serve the needs of industry.

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bureaucratic inertia, murky guidelines governing the determination of fair market values and the settlement of disputes by transfer of equivalent values (substituting an available alternative parcel in cases where the disputed parcel, for whatever reason cannot simply be returned to the previous owner).

C. Operating Procedures

1. Allocating Factory Space

The primary guideline governing the allocation of factory space has been "first come, first serve" with some attention paid to the employment potential of the proposed enterprise. Deposits have not been required nor have contractual obligations been established specifying when occupancy must be taken. The IDC has assumed the responsibility of allocating factory space for public sector facilities, but as noted earlier, lacks legal authority to enter into binding agreements with tenants. The Ministry of Agriculture, as the agent for Crown Lands, has also assumed some responsibility for allocating land and factory space, particularly at the Frequente site. In other instances, interested investors have been discussing rental agreements with potential developers of privately owned industrial parks.

Due to the shortage of factory space in Grenada, a number of companies, particularly local entrepreneurs, have requested factory space in advance of their actual needs to assure availability at a future time. Many of these projects are "on hold", awaiting the completion of building renovations and infrastructure development or have not reached a sufficient point in project development to begin production. At present, only one company is in production occupying 16,848 sq. ft. (See Annex 2, Status Report of Frequente)

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The present system of allocating factory space is clearly inefficient. The economic benefits of an industrial park project (of which job creation is the most visible) and the financial benefit, cannot be maximized if factory space is vacant for an extended period of time and manufacturers have no impetus to begin production in a timely manner. Effectively, the present system removes vacant factory space from a tight market and decreases the liklihood of attracting fast turnaround projects. In addition, the responsibility for allocating factory space (which is de facto shared between the IDC and the Ministry of Agriculture) can and has led to poor control over project implementation and unnecessary delays.

2. Pricing Policy

With the exception of the pricing guidelines established by the Caribbean Development Bank for the True Blue Industrial Estate, the Government of Grenada has not formally articulated or implementated a pricing strategy for industrial facilities. The present lease agreement for one structure at Frequente (Building No. 1) is US$1.48 per sq. ft. The Ministry of Finance as the Government executor of the lease agreement has not, to date, collected any rental income from the tenant./1

The need to develop a rational pricing policy, including the establishment of economic rental rates, collection procedures and recourse for failure to pay is critical to cost recovery. These measures can help to preserve the resources of the public sector and ensure a financial return on investment. The prices established for industrial facilities will also affect private sector development. If, for example, the government chooses a deliberate

/1 The consultants have no information regarding the lease arrangements made with Woodco.

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policy of subsidizing rental rates, or setting rental rates at less than current market value, development of private sector projects may not be feasible.

Based on discussions during the consultants' mission, it appears that the Government is aware of the issues involved in developing a sound pricing strategy. Assuming that a firm policy of unsubsidized pricing is adopted, it then becomes crucial to create an operating agency - IDC or other - capable of building and maintaining the facilities in such condition as to justify the the market prices asked of tenants.

D. Role of the Private Sector

Private sector involvement in developing industrial facilities can take many forms including:

- Private management of public sector projects under contract;
- Construction and/or ownership of individual factory sites; within the estate boundaries;
- Joint public/private ventures in industrial park development;
- Fully private projects, including private financing, provision and management of buildings and associated infrastructure such as telecommunications, power supply, etc.

The degree of private sector involvement will be influenced by a number of factors including overall demand for industrial space, the availability of long term finance, government actions, including pricing policy in competing locations and receptivity to the private sector. One of the key factors influencing private sector involvement is the availability of long-term finance. Through the USAID Infrastructure for Productive Investment Project (IPIP) this need has been addressed - the project provides long-term finance

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(up to 20 years) at concessional interest rates for the construction of industrial facilities and related infrastructure. This facility was established in 1984 and provides finance through the Eastern Caribbean Central Bank for on-lending to commercial banks operating in the region. A number of investors have expressed interest in using this funding source in Grenada, but project implementation, as already noted, will depend in large measure on the Government's rental policy and the overall supply/demand situation as well as the terms and conditions on which land can be made available to the private sector.

One very important benefit resulting from private sector development of industrial facilities is, essentially, the ability to assure that the supply of factory space can meet the demand. Rather than relying upon donor agencies, which tend to restrict speculative building and cause long delays in the construction process, the private sector has a "quick response" capability to construct facilities as needed responding rapidly to market forces. Also, private ownership and management is generally characterized by better maintenance and more businesslike operations overall.

Government's policy for private sector involvement in industrial park development is still undefined. During the past year, the government has entertained one proposal for development of a privately owned industrial park and has indicated a willingness to support the project through duty exemptions and tax concessions. However, the broader issues of pricing policy and overall supply of industrial space have not been addressed. As already noted, government planning of industrial facilities should outline a suitable role for the private sector (where private interest exists, as it

does in Grenada) and establish operating guidelines and criteria which permit both the public and private sector projects to achieve financial viability.

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IV. DEMAND FOR INDUSTRIAL FACILITIES

A. The Setting

Unlike several of the other islands in the Caribbean, the manufacturing sector in Grenada is relatively undeveloped. The sector's contribution to GDP is less than 3 percent and is comprised mainly of small scale industry producing for the local market. Not surprisingly - despite efforts to broaden the manufacturing base - new start-ups during the past 2 years were still small-scale industries producing for the local and/or regional market. In the past two years, only one foreign owned enterprise has begun production for the export market.

The factors influencing growth in the manufacturing sector in general and demand for industrial facilities in particular have been well documented in past studies. Evidently, industrial growth cannot be realized, regardless of external stimuli, if the basic factors of production - land, labor and capital - are unaccesible on competitive terms and basic infrastructure and general service delivery is unavailable. During the past two years, certain key constraints have been removed (e.g. air transport, internal road development) but other problems are likely to persist over the short to medium term. For example, only three to four ships call at St. George's each month and freight rates are high relative to other islands. This problem is compounded by the port's handling capacity which is limited to 20 foot containers. Other factors including the poor quality of telecommunications, water and electricity supply have tended to discourage investors in the past.

Certain impediments to growth, particularly the lack of industrial space and the absence of reliable utilities, can be addressed in the short to medium term which should improve Grenada's ability to attract export oriented

industries. Such facilities will not guarantee attracting new investment, but it is unlikely that significant growth will occur in the industrial sector in their absence.

B. Demand Projections

Forecasting demand is, at best, an inexact "science" and can be "calculated" in a number of different ways. The current practice in Grenada seems to be to list the applications in hand, summarize the space requirements and try to obtain finance for the projected factory areas to be built in one construction stage.

Such projections of potential demand cannot, realistically, be equated with effective demand, i.e., customers ready to sign leases a year or two in the future when the facilities actually become available. Lending institutions view the estimates with justifiable skepticism.

Notwithstanding the limitations of demand forecasting, some attempt must be made to provide a rational basis for planning purposes. A list of projected space requirements should be used, but considered as one factor among many. Other important influences to be evaluated relate to historical occupancy rates (which in this instance would yield zero demand), historical growth rates in the industrial sector, experience in comparative regional locations, changes in government policy and incentives, the impact of bilateral and multilateral trade and investment treaties, and others. Skilled market analysts will then integrate the data, "doctor" the results with adjustments based on judgement and intuition, and arrive at a conclusion. At best, the

forecasts are educated guesses. A prudent investor and/or lending institution will assume that the figure is an upper limit and plan accordingly.

In light of the limitations indicated, the demand projections in Table 3 are based on historical occupancy rates in competing locations (Annex 4) and takes into account, with adjustments, requests for factory space during the past two years. Projections separate local investor demand from that of foreign manufacturers; there are some differences in requirements resulting from the basic difference in market orientation. Local investors in Grenada, and throughout the region, generally require factory space of 1,500 - 6,000 sq. ft. with an average of 175 sq. ft. per worker./1 In contrast, foreign manufacturers generally require 10,000 - 15,000 sq. ft. with an average of 100 sq. ft. per worker. These projections assume that construction of fully serviced factory space commences in the first quarter of 1986, no major changes in the investment climate, the absence of a recession and no significant increase in protectionism in the industrialized countries, particularly the United States.

/1 FZA and Coopers & Lybrand data. Note that the calculation of square feet per worker is based on total area under roof (including storage areas, sanitary facilities, etc.) rather than productive space.

TABLE 1
DEMAND PROJECTIONS /1
(Thousands of sq. ft.)

	1986	1987	1988	1989	1990	Total
Foreign Investment						
New	15 /2	25	20	20	20	100
Expansion	0	0	10	10	10	30
Local Investment						
New /3	35	20	15	10	10	90
Expansion	0	10	10	8	8	36
TOTAL DEMAND	50	55	55	53	53	256

/1 Demand projections exclude consideration of requirements in Cariacou.
/2 Excludes consideration of the Dominion International Garden Center project.
/3 These figures represent local investment which would be likely to locate in an industrial park, rather than new investment or expansion which would occur on a manufacturer's site located elsewhere.

The best mechanism to assure that the supply of industrial facilities more or less parallels effective demand is to carry out the construction program in phases, each phase corresponding to a fraction of the potential demand so that investment does not get too far ahead of the market. This mechanism, however, is most effective when the executing agency (either public or private) is capable of reacting quickly to unexpected surges in demand.

Conversely, where factory construction can take up to 2 years or more, a reasonable amount of advance factory construction will be critical to facilitate growth in the industrial sector. The construction of one or two buildings (say, 10 - 20,000 sq. ft.) in advance of firm commitments (or signed lease agreements) by one or more occupants is a small financial risk when compared to the cost of developing the whole project, say 10 or 20 acres. Advance factory construction, within judicious limits, is recognized

worldwide as a powerful promotional tool. It can spell the difference between "capturing" one or two customers who are in a hurry for space or losing them to competitors offering immediate occupancy.

conception, the need to develop a fully planned and serviced industrial park, rather than the rehabilitation of individual units has become apparent. Not only would the former option be more cost effective, but would serve the needs of industry more comprehensively and efficiently (as dicussed in Chapter II, Basic Concepts). Specifically, the present program suffers from the following shortcomings:

1. Inadequate access road to accomodate vehicular and container traffic;

2. Inadequate storm water drainage system;

3. Inadequate internal road system causing, among other things, a poor land use ratio, difficult accesibility for some buildings, particularly buildings 1 and 2;

4. Lack of any provision for standby power facilities to alleviate current problems caused by disruptions in supply; similarly, for water, no provision for storage or fire-fighting;

5. Lack of any exterior landscaping, building standards, and provision for general site maintenance;

7. Inadequate building design which cannot either easily accomodate expansion (Building 3 & 4); or lacks sanitary facilities, adequate ventilation and systems for rain water run-off (9, 10, 11, 12); lack of manuvering areas for trucks in transit, loading and unloading, and lack of planned parking for cars.*

(*Note: See Annex 3 for a complete analysis of the existing infrastructure and superstructure at the Frequente site.)

While the Frequente site in its present state may provide an interim location for two or three industries, it does not adequately serve the aggregate needs of manufacturers nor act as an incentive to locate in Grenada. Without further planning and infrastructure development along the lines recommended, the full economic potential of the site will not be realized.

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2. True Blue Industrial Estate

The True Blue Industrial Estate, to be financed by the Caribbean Development Bank, is a five-acre site located on the eastern side of the main access road to Frequente, bounded on the south by the Airport Road. According to available information, this site is owned by the Government of Grenada. (However, legal documentation is unavailable.)

This project calls for the construction of 40,000 sq. ft. of factory space, in phases, site development and technical assistance to the executing agency and the IDC. Site development includes providing water, electricity and sanitary facilities to each building and the construction of access roads to the buildings, loading areas and parking. No provision has been made for stand-by generating facilities./1 According to CDB officials, the construction program is as follows:

TABLE 2
CONSTRUCTION SCHEDULE

Start Date	Sq. Ft.	Completion Date
March 1986	6,000	August 1986
March 1986	8,000	August 1986
March 1986	10,000	August 1986
June 1986	6,000	November 1986
June 1986	10,000	January 1987
Total	40,000	

However, the construction of the 16,000 sq. ft. scheduled to commence in June, 1986 may be contingent upon receipt of evidence indicated that the 24,000 sq. ft. has been pre-leased. The loan agreement clearly states that one of the conditions precedent for disbursal is "withdrawals may not be made in respect of any factory shells if at the date on which the withdrawal in

/1 Based on discussions with CDB officials, the project does not include upgrading the main access road to the estate. Note that this is the same main access road to Frequente.

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respect of such factory shell is requested there is already in existence an unoccupied factory shell managed by the the executing agency." Other conditions necessary for the disbursal of the first loan include establishment of clear title to the property and vesting the property in the borrower - the Grenada Development Bank.

The total project cost has been estimated at US$1,654,000 including a technical assistance component of US$130,000 for the recruitment of an industrial development expert to assist the borrower and the IDC in policy matters and strategies for the planning and promotion of industrial development in general, and industrial estates in particular. Finance is provided for a 20 year term, including a five year grace period on principal repayment at a fixed interest rate of 4 percent.

The CDB and the Government of Grenada have ostensibly adopted a pricing strategy based on cost recovery. The recommended rental rate is US$2.65/sq.ft./yr. for the first three years, increasing by 40 percent in year 4, 12 percent in year 5 and 6 percent thereafter. These rates have been established to cover all operating expenses, including maintenance and insurance which is the responsibility of the borrower. (Nevertheless, given the known capital cost of construction, it is doubtful that the rate of $2.65, plus escalation, will in fact achieve cost recovery.)

3. Private Sector Projects

Through the USAID Infrastructure for Productive Investment Project (IPIP), substantial interest has been demonstrated by the private sector for development of industrial parks or owner occupied facilities. A summary of initiatives to date in Grenada is presented on the following page:

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TABLE 3
PRIVATE SECTOR PROJECTS

Potential Borrower	Use	Sq. Ft.	Current Status
1. Local Entrepreneur	Garment Manufacturing	20,000	Project Identification
2. Local Entrepreneur	Optical Goods	10,000	Project Identification
3. Local Entrepreneur	Garments/Electronics	15,000	Project Identification
4. Foreign Investor	Electronics	30,000	Project Identification; may consider leased space if available
5. Foreign Investor	Medical Supplies & Leasing	20,000	Project Identification
6. Local Investor	Industrial Park Developer	90,000	Detailed engineering work completed for site owned by investor.

In general, local investors have expressed interest in IPIP because of their preference to own (and therefore establish collateral), rather than lease facilities. With one notable exception, the proposed projects are new ventures, rather than relocation or expansion of existing enterprises. Interest from foreign investors is, for the most part, due to the absence of any other available space for manufacturing.

The one project which could have an effect on the supply of factory space in the near to medium term is Item 6, a privately developed industrial park to be located in Tempe, approximately one mile from St. George's. This project has been under consideration for approximately one year and negotiations for financing are underway. The project calls for the development of approximately 90,000 sq. ft. of factory space in 20,000 sq. ft. modules phased in accordance with demand. The initial construction of 20,000 sq. ft. is in part preleased. The time frame for implementation will depend upon the

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government's action regarding the supply of factory space, pricing policy and the ability to negotiate suitable terms and conditions with the commercial bank through which IPIP funds are channelled.

4. Other Potential Projects

The mission has evaluated a number of locations throughout the island which have been suggested as suitable sites for industrial development. The most relevant to this discussion include (a) the buildings adjacent to Lance Aux Epines Road presently occupied by Morrison Knudson and USAID; and (b) the Sandino Complex./1

a. Lance Aux Epines Facilities

Two 12,000 sq. ft. structures, erected during the tenure of the previous regime, occupy approximately one acre of a 15-20 acre area, formerly part of the Grand Anse Estate. During the past year, the land, which was acquired without compensation, was returned to a private citizen. The buildings are now occupied by USAID and Morrison Knudson for the storage of materials and equipment and are expected to be vacated in the third quarter of 1986.

These facilities could be suitable for industrial purposes if some renovation work was conducted. Specifically, refurbishing the lighting fixtures, ventilation system, sanitary facilities, roofs and siding would have to be completed before manufacturing activities could commence. (Cleanup and landscaping would add to the appeal of this site.) The consultant's believe

/1 One other facility merits attention, namely the buildings behind "Hotel California." However, the mission has been advised that these facilities will be the future home of USAID and are not available.

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that the structural integrity of the buildings is sound and renovations would require a capital investment estimated at not more than US$250,000 - 300,000.

However, an outstanding claim for ownership of the buildings has been presented to the Government of Grenada which, until resolved, could prevent further development of the property. This site also offers no space for expansion, unless, of course, the owner of the property is willing to sell additional land and buildings for industrial development purposes.

b. Sandino Complex

This complex, located adjacent to the Lance Aux Espines Road opposite the Sugar Mill, was originally constructed to supply concrete blocks and wood based materials to the Point Salines Airport. Ownership of the site is under dispute within the Government (the Ministry of Works and the National Housing Authority) and there may be an outstanding claim from the private sector./1

Within the complex, there are five structures in varied stages of completion. Site infrastructure includes two overhead water tanks, one electric generating set (non-functioning at present), water, sewage and electricity lines and an unpaved internal road system. The buildings are unoccupied, with the exception of one structure which is presently used as residences by squatters. (See Annex __ for a description of the site and equipment.) A detailed topographic survey of the area is unavailable./2 Based on our inspection of the property, this site could be used for a variety of

/1 Despite repeated attempts to determine legal ownership, the Ministry of Lands and the Office of the Attorney General were unable to confirm ownership of the property.

/2 The consultants requested a detailed topographic map of the site, but due to the ownership dispute, no agency was able to obtain a copy.

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industrial purposes, including (i) concrete block plant; (ii) manufacture of wood based products with a lumber yard; or (iii) an industrial park. Other possible alternatives exist. One approach might be to mount a promotional effort to identify an investor(s) capable of and willing to take over the assets, put everything in working order and start up production (of the originally planned products). (This idea represents only an outside chance of realization. The installed equipment is of Eastern European origin; operational and maintenance problems, including the procurement of spare parts, may be more of a burden than a western firm would care to cope with.)

As an industrial park, the project would entail a capital investment of the magnitude of US$750,000 - US$1,000,000 for road construction, building rehabilitation (and some demolition work), storm water drainage system and the upgrading of utilities. This estimate excludes the construction of any new facilities.

C. Supply and Demand Prognosis

Our review of the existing national inventory of factory space indicates that approximately 13,122 sq. ft. is presently unoccupied at Frequente of which 7,992 has been allocated to local industry. Despite the infrastructure constraints outlined earlier, the available space could meet the minimum needs of one or two small manufacturers, but additional investment will be required in the near term to provide full services to these facilities.

Assuming no changes in the existing program, the buildings financed by the Caribbean Development Bank will be the first new factory space to be added to the existing inventory. Approximately 24,000 sq. ft. should be available for occupancy on or about August 1986, assuming the government completes the

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conditions precedent for loan dispersal. Development of the additional 16,000 sq. ft. will depend upon demand. These facilities will be fully serviced industrial space suitable for light manufacturing although the tenants will be required to provide their own stand-by generating facilities. Additionally, the access road to the site has not been considered as part of the loan finance. This will not prohibit vehicular movement, but could cause congestion and unnecessary delays.

Development of the private sector project at Tempe is somewhat uncertain and will depend upon a number of factors mentioned previously. If this project is implemented in the near term, an additional 20,000 sq. ft. (some of the space has been preleased) could come on stream, in the second or third quarter, 1986.

Assuming an optimistic scenario, supply of industrial facilities for the year 1986 can meet demand with a seven month lead time before additional capacity comes on stream. This scenario assumes that the private sector project is implemented and no unnecessary delays in construction of the CDB financed facilities. However, this program will not provide (i) an attractive and efficient working environment conducive to growth; (ii) the ability to meet unexpected surges in demand in 1986; (iii) flexibility to meet the needs for expansion of facilities in the public sector projects; (iv) centralized administration and customs control in the public sector projects; and (v) an adequate reduced financial and economic return from the USAID financed renovations of Frequente. Also, the present strategy for development cannot supply industrial space in accordance with demand beyond 1986.

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Applying conservative assumptions, i.e., delays in the CDB project or in the private sector industrial park the immediate need for factory space in 1986 will not be met. Additionally, the current program does not include the development of industrial facilities in Cariacou or other locations, such as Grenville.

Over the long term, it will be important to establish alternative industrial growth poles away from the "natural" center of activity at the southern end of the island in order to achieve a more balanced regional pattern of growth. The recommended program concentrates attention and resources in the St. George's — Point Saline development corridor in response to immediate and short-term (3-5 years) needs, consonant with available resources. This strategy is perfectly consistent with the planning of a long-term program of decentralization of industry. Whatever agency takes over responsibility for industrial facilities development should include in its workplan ongoing studies relevant to this objective. International institutions such as AID, World Bank, CDB, IDB and others are generally receptive to providing financial and technical assistance in support of such activities.

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TABLE 4
PROJECTED SUPPLY & DEMAND FOR FACTORY SPACE
(Thousands of sq. ft.)

	1986	1987	1988	1989	1990	Total
DEMAND						
Foreign Investors	15	25	30	30	30	130
Local Investors	35	30	25	18	18	126
Total Demand	50	55	55	53	53	256
SUPPLY						
Frequente	6					6
True Blue Industrial Estate	30 /1	10				40
Private Sector	12 /2	40	20			72
Total Supply	48	50	20	0	0	118

/1 Full development of the True Blue Industrial Park is contingent upon firm demand from tenants and assumes that no other industrial facilities managed by the executing agency will be available. However, assuming no major changes in the loan agreement, 24,000 sq. ft. of factory space should be built in 1986.

/2 Development of a privately owned industrial estate is contingent upon *inter alia*, development of an appropriate policy to foster private sector development.

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VI. DIAGNOSIS AND RECOMMENDATIONS

Government agencies and donor institutions recognize that lack of availability of fully-serviced factory buildings is one of the key constraints inhibiting growth in the industrial sector. While the construction of a few factory shells for urgent immediate needs is justifiable as a "quick fix" bricks and mortar response to the problem, it should be considered only a first step in a long-term comprehensive development plan.

As already discussed earlier in this report, industrial estates (used in the generic sense and including the concept of export processing zones) offer industry much more than factory shells. (See Chapter II, Basic Concepts.) The program recommended in this report is based on the development of industrial facilities in the form of professionally designed and managed estates at optimum (i.e. efficient) locations, with construction — and therefore, resource commitments — phased in accordance with expected effective demand.

A. Site Selection

Industrial estate locational decisions should be governed by factors such as proximity to a labor force, access to transportation, utilities, business services and social amenities, and land use patterns in surrounding areas. The inventory of industrial facilities in Grenada discussed in Chapter V indicates four possible alternatives for further development:

1. Frequente/True Blue Industrial Complex
2. Sandino Complex
3. Lance Aux Epine Facilities
4. Tempe

The <u>Frequente/True Blue Industrial Complex</u> presents the best alternative for

the initial development of industrial facilities due to (i) availability (assuming clear title is produced) of 25 acres of suitable land and strategic location for transportation services and social and business amenities; and (ii) the availability of finance for a portion of project development through the Caribbean Development Bank and possibly USAID. This recommendation does not preclude development of other sites throughout the island, (i.e. Tempe) but serves to focus attention and available public resources on one location in the short to medium term.

The limitations of the other alternatives reinforce this selection. The Sandino Complex offers little room for expansion above and beyond the existing development and ownership is currently disputed. Additionally, it would appear that the best use for the property is the re-opening of the original facility - a concrete block plant and lumber yard - assuming a profitable product mix and interested investors can be located. Ancillary activities, such as furniture manufacturing and retail shops, (i.e. a hardware concession), should also be explored. A prospectus should be prepared and circulated among potential investors, both foreign and local. (If clear title can be established for the property, auction of land and buildings is one mechanism for disposing of the property and earning additional revenue for industrial development.)

The Lance Aux Epine road facilities offer little scope for development unless the owner of the property is willing to refurbish the facilities and lease and/or sell the buildings to private investors and develop additional industrial property on the site. After the buildings are vacated by USAID in the third quarter of 1986, discussions could be held with the owner to ascertain his interest. This will ultimately depend upon the overall demand

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for factory space at the time and the owner's plans for developing the rest of the estate.

Lastly, it is recommended that development of the privately owned industrial park at Tempe should be encouraged. The site is located in an industrial area within one mile of St. George's and could be an attractive site for the location of new industry. The timing and other aspects of the recommended program have been designed to minimize potential conflict between the public and private initiatives. In other words, the objective is to coordinate the activities of both sectors in an integrated national effort which will utilize their combined resources efficiently and effectively.

B. Project Design

1. General Description

At this point in time, there is a tendency to segregate the potential USAID funded program at Frequente from the CDB financed True Blue project. Given the contiguous locations of these sites and the economies of scale in infrastructure development which can be realized by coordinating the overall development of the two projects, it is recommended that the entire area be renamed "True Blue Industrial Complex." The degree of coordination reached will depend upon the ownership structure adopted for the 19.81 acres of Frequente land and the policy of the CDB. The terms and conditions of the CDB loan may complicate the easy consolidation of the two sites under a single ownership/management entity. Nonetheless, the potential advantages in terms of rational timing of resource commitment and construction scheduling, lower cost and enhanced marketability support the recommendations.

2. Ownership

At the outset, it is recommended that legal confirmation of property ownership be established to the satisfaction of all interested parties. Assuming the land is Crown Property or has been acquired by Government under the Lands Acquisition Act, three options exist for ownership of the estate:

(a) Public Sector Ownership by IDC (or other acceptable institution). Facilities built by IDC would be leased to private firms or could be sold. Lease with option to purchase is often an attractive option. Note that selling or leasing with option to purchase are ways of recovering capital more rapidly for reallocation to further development as needed. Land for owner-built factories can be either leased long-term (20-30 years) or sold.

(b) Public/Private Joint Venture for park development could take a number of different forms, but the most common would be for the Government to contribute land as equity in a joint venture company, assessed at fair market value. In this instance, Government's contribution to the project would be land and buildings.

(c) 100 Percent Private Ownership and Development of the site would involve selling or leasing 19.81 acres of land and existing buildings to a private developer for the construction of additional factory buildings, associated infrastructure and commercial services./1 The developer could be a local and/or foreign investor, and long term finance could be accessed through the IPIP project. In the event of a takeover by a foreign developer, stock subscriptions by local interests should be encouraged.

/1 Sale of land, rather than a long term lease is the preferred option. Financial institutions generally prefer to use land as equity and collateral in a project of this nature.

It is recommended that alternatives for private sector ownership (either in the form of 100% private ownership or as a joint venture agreement) be explored through aggressive promotion efforts. The benefits of this approach have been elaborated elsewhere in this report, but briefly summarized include (i) immediate cash inflow; (ii) ability to meet the medium to long term financial needs for industrial facilities without tying up scarce public resources; (iii) flexible financial terms permitting lease and or sale of facilities; (iv) reduced lead time for construction; and (v) in general, the proven benefits of dedicated private management.

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3. Management

The management of the True Blue Industrial Complex will ultimately depend upon the ownership structure adopted. If, for example, a private investor(s) is located, the general practice is for the owner to manage the property or to subcontract this function to a third-party professional group. Under this scenario, the role of the public sector agency will still be very important in plannning and monitoring the multi-locational national program, market surveys and marketing and promotion activities, investment approvals and coordination with the owner to assure that the supply of industrial facilities meets demand.

If the property remains in the public sector, there is still a suitable role for private sector participation in the form of an operational management contract. Professional management by industrial real estate development corporations (or consultants) is generally advantageous in terms of growth rates and cost/benefit considerations.

4. Institutional Structure

Regardless of the ownership and management structure adopted, it is recommended that one organization be appointed as the Government's agent for overall industrial facilities development. This would imply vesting all the land at the True Blue Industrial Complex, including the portion allocated to the CDB-financed project in one organization as well as other projects that may arise. With regard to the CDB-financed portion, the terms and conditions of the loan agreement should be carefully reviewed to determine the procedural mechanism by which the property and corresponding financial obligations can be transferred to the selected institution. In a "worst

case" scenario, GDB could continue as owner of the CDB-financed buildings but would transfer operating responsibility to the agency managing the Complex.

The Government's intent appears to be to appoint the Industrial Development Corporation as the lead agency for industrial facilities development. Although this organization is relatively new and has had little experience with industrial park development, the staff is capable and willing to assume the responsibility. For purposes of institutional training and upgrading of staff skills, technical assistance and training should be planned in areas such as demand forecasting, site planning, national and international marketing and promotion, industrial estate and free zone operational management, and so forth. Visits to successful programs established in other countries can easily be arranged and are very useful in gaining understanding and insights into what does and does not work.

5. Detailed Project Description

a. Overview

Two Alternative Master Plans have been prepared for the True Blue Industrial Complex (Annex___):

Plan I — assuming that the Dominion International Garden Center is implemented;

Plan II — without the Garden Center.

These layouts define: basic building modular design and location; access road and internal roads; schematic indications of water connections and lines, power, storm water drainage and waste disposal. Also incorporated in the plan are a commercial/administrative sub-area and a customs/security post

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at the entrance. To the extent possible, existing infrastructure and buildings have been utilized./1 Specifically, the structural integrity of buildings 1, 2, 3, and 4 have remain unchanged. For buildings 9, 10, 11, and 12, it is recommended that the structure be upgraded in accordance with the existing tenant's specifications, or alternatively, restructured at a later phase in the project.

Under Plan 1, the estate could accommodate a total of 196,000 sq.ft. of factory space and approximately 10,000 sq.ft. of commercial space. For Plan 2, a total of 215,000 sq.ft. of factory space and 10,000 sq.ft. of commercial space can be accommodated./2

b. Infrastructure

A summary of the recommended infratructure requirements and changes is as follows:

1. Access Road. For customs and traffic control, it is recommended that one entry and exit point serve the entire complex. The main access road to the estate is located at the western boundary and has been designed at 26 feet of hardtop.

2. Internal Road System. The main "spine" road has been specified at 24 feet width to accommodate container traffic; secondary roads are 18 feet wide.

/1 In the event that the Dominion garden center project is not implemented, it is recommended that the existing structural steel frames on the site be removed. One structure, which was originally given to a tire retreader, has not been included in the design work. The presence of this structure would unnecessarily reduce the land use ratio and financial and economic viability of the project. In addition, this facility is an eyesore at a highly visable point on the estate. Regarding building number 13, a structure which is presently occupied by the Peace Keeping Force, it is recommended that a further evaluation of the structure be conducted to determine its usefulness for commercial purposes.

/2 The land use ratio — that is the ratio of under-rood space total land area — is approximately 22 percent for Plan 1 and 24 percent for Plan 2. This is well below the norm (which is generally 30-40 percent in well-designed projects) but it is necessary in this instance due to the topography of the site and the constraints of the existing structure.

3. Water. At full occupancy, the total water demand for light industrial and sanitary use is estimated, conservatively, at 156,000 gallons per day. /1 Due to drought conditions which sometimes affect the southern part of the island and the poor water distribution system, a time will be reached when it will be prudent to build an additional water tank as stand-by supply for at least one day.

4. Electricity. At full occupancy, it is conservatively estimated that the peak demand for power will be 2MW./2 To accommodate this demand, it is recommended that a main transformer substation be installed with the internal power network at factory use voltage. The first few factories, however, can be served by individual pole transformers at lower cost.

5. Storm Drainage. Rather than using an open swall system, which reduces the amount of available land and creates a poor physical appearance, it is recommended that a storm drainage system be implemented using concrete culverts and/or pipes, as shown in the drawings.

b. Superstructure

The factory shells, or superstructure, are of modular design — each module measuring 30 x 100 , or 3,000 sq.ft. — for maximum flexibility in meeting the needs of small- to mdeium-scale industries. Larger firms would normally require multiple module areas, up to 15,000-21,000 sq.ft. or more. At the smaller end, an area of 3,000 sq.ft. could be let and, if necessary, further subdivided into two areas of 1,500 sq.ft. (for the 5-10 man shops typical of local small enterprises). Adoption of modular design — which can be delivered as pre-engineered knock-down units (Butler-type buildings) for easy erection on site will also reduce engineering design and construction costs.

/1 These estimates (including requirements for the CDB facilities) are based on an average of 125 sq. ft. under roof per worker with a maximum demand of 80 gallons per day (40 gallons for sanitary use and 40 gallons for light industrial use per worker).

/2 Power requirements (including CDB facilities) have been estimated based on an average of 150 kw of power per acre of industrial land.

Basic plumbing connections are provided for easy completion of sanitary facilities in accordance with various use-patterns that may develop, i.e., mixtures of smaller and larger firms under one roof. Liquid waste disposal in the form of septic tanks and soakaways will handle all normal sanitary and non-aggressive industrial waste material. Aggressive waste — such as acid, alkali, high-organic residues, heavy metal salts, etc. — will require pretreatment at the point of origin by the factory before entering the system. Companies requiring uninterrupted power have the option of installing standby generators./1

The prepared plans also provide space for the development of commercial activities such as a bank, post office, telex facilities, etc., and could be constructed after a sufficient level of demand has been attained in the park. A cafeteria, outdoor eating area and centralized space for venders has also been provided. This area would also serve as the office and administrative center.

C. Project Implementation: Phase I

Final decisions as to ownership and management of this project could require several months. However, the need to develop adequate industrial facilities is immediate and finance from the CDB and USAID is presently available to assist in development efforts. Project development should not be stopped in the interim period. The basic elements of the Phase I infrastructure program are discussed on the following page.

/1 The power requirements for each facility will vary and for maintenance and financial considerations, a stand by facility serving each factory rather a central stand by unit serving multiple units is recommended.

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1. Infrastructure & Physical Planning

In order to provide adequate services to the existing structures and begin development of the infrastructure needs of the Complex, it is recommended that the following Phase I program be carried out:

a. Paving of the access road to a width of 24 feet; and

b. Construction of internal roads as demarcated in the plans;

c. Site clean-up, including the removal of all existing structures in the vicinity of buildings 1 & 2 & 13;

d. In the event that the Dominion Garden Center project is not implemented, remove structural steel frame of buildings 5, 6, 7, and 8 (best option, selling at auction);

e. Construction of a 4-inch water main, converted to public 10-inch main, as shown;

f. No common electricity facility in Phase I; pole transformers installed as needed;

g. Sewage and storm water drainage as shown;

h. Close access gates adjacent to the Airport Road as demarcated in the plans;

i. Implement a general landscaping plan within the estate boundaries adjacent to the main road and in front of building 1;

j. Install appropriate signage for the "True Blue Industrial Complex" to be located adjacent to the Airport Road (part of the marketing program);

k. Relocate Caribbean Peace Keeping Force personnel and equipment to an alternate site.

2. Superstructure

The demand analysis given in Chapter IV indictates that, under an optimistic scenario, the projected need for 50,000 sq. ft. of factory space in 1986 can be met. The assumptions supporting this conclusion are:

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	Project	Space	Estimated Availability
(a)	CDB buildings	40,000	August 1986 to January 1987
(b)	Private project	20,000	Late 1986 (8,000 sq.ft. preleased)
(c)	AID-financed building	20,000	Mid-to-late 1986
	TOTAL	80,000	

Obviously, even allowing for some slippage, if all three projects move forward, 50,000 sq. ft. or close to that figure will in fact be available in 1986.

A more conservative scenario may be defined, assuming that certain potential roadblocks appear. In the first place, the CDB loan document permits a delay in executing the balance (of 40,000 sq. ft.) if any unit of the first 24,000 sq. ft. planned for August availability is uncommitted (Chapter V). The early construction of the AID-financed 20,000 sq. ft. unit could contribute to a delay in completing the CDB 1986 program by syphoning off customers that otherwise would have occupied CDB buildings. Finally, the private developer, in the face of at least 44,000 sq. ft. of AID and CDB building combined, may delay or stretch out his program (unless, of course, effective demand were to far exceed our estimate —in which case the issues raised in this section become moot).

The foregoing discussion underlines the critical importance of closely coordinating all three initiatives, preferably under one central authority, as recommended. Construction scheduling, marketing and allocation of space could then be optimized so that available resources are used most

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efficiently. Judicious management of construction scheduling and space allocation by the Government lead agency might even avoid the temporary (or, possibly, permanent) unavailability of funding from one or two of the three sources (CDB, AID, and IPIP) —to the detriment of the national program. Specifically, AID construction could be delayed for 2 or 3 months or more in order to ensure that the full CDB 1986 program be executed and that the private developer not be discouraged from proceeding with his plans.

3. Capital Cost Estimate

The estimated capital cost for Phas I is US$385,000 (rounded). These estimates are based on cost data gathered in Grenada and are subject to confirmation. As indicated in the table on the following page, the major cost item is road works.

CAPITAL COST ESTIMATE
PHASE I INFRASTRUCTURE

Item	Unit Cost (US$)	Area	Total (US$)
Road Works:			
-Access road and main spine /1	9/sq. ft.	21,120 sq. ft.	190,080
-Secondary Roads /2	9/sq. ft.	8,640 sq. ft.	77,760
Storm Water Drainage /3	1/lin . ft.		30,000
Site Clean-Up			10,000
Landscaping & Signage			25,000
Four Inch Water Main			7,500
Total, Phase I Infrastructure			340,340
	Rounded		350,000
	Contigency at 10%		35,000
	Total		385,000

/1 The main spine road is 24 feet wide with cross section consisting of a 4 inch layer of aggregate on top of a compacted subgrade topped with 2 inches of asphalt.

/2 The secondary road is 18 feet wide with the same cross section indicated above.

/3 The storm water drainage system is the construction of culverts along side the main spine and secondary roads specified above.

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The construction of a 20,000 sq. ft. building (including the cost of bringing all utilities to the factory wall) would require an estimated US$480,000 in 1985 current prices.

4. Operating Procedures

The system of "allocating factory space" to tenants in advance of their actual needs will not maximize revenue and provide the economic benefits desired from this project. All existing buildings should be considered "available for rent" until such time as a deposit (usually equal to 3 months rent in advance) has been received from the potential tenant. Monthly payments should be collected each month from the date of occupancy. Undoubtedly, this will provide manufacturers with the incentive to begin production in a timely fashion, rather than utilizing factory space for unproductive purposes. Provision should be made for reallocation of the property in the event it is not occupied by a date given.

With regard to pricing policy, rental prices should be set at a level which is:

1. Competitive with other Caribbean locations; and
2. Provides a financial return on investment

Historically, most of the Eastern Caribbean islands have subsidized rental rates in order to attract investment. Given the fact that lease payments generally represent less than 4 percent of operating costs for an offshore manufacturer producing for the export market, the value of this concessional rental is questionable. The subsidization has not only resulted in a negative financial return, but has resulted in default by one of the Eastern Caribbean islands.

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Due to external pressure from lending agencies and the increase in private sector development of industrial parks in some of the islands, rental rates are beginning to approach market levels. Within the immediate region, the average rental rate for new factory construction is US$2.65 per sq. ft., with escalation clauses (usually established at 10%) effective after year 3 of project implementation.

Outside the Eastern Caribbean, rental rates are generally higher than those quoted above. For example, in Jamaica, current annual rental rates for new construction are US$3.50 per sq. ft., Barbados (US$4.25) and Mexico (US$2.00 - US$5.50) depending upon the location, and in the Bahamas, $4.25-4.50.

The second criteria for developing a pricing strategy is that the project should provide a financial return on investment. In order to acheive this objective, rental rates must be set at a level sufficient to cover all operating costs (including interest expense, maintenance, overhead, salaries, insurance, and promotion) and should provide a return on investment of approximately 12 - 14 percent in current terms (approximately the opportunity cost of capital).

This appendix discusses the methodology that yielded the results presented in the PP Amendment text section entitled "Economic Analysis." This appendix is divided into four sections, one for each major project component.

A. Roads

The three road projects proposed under this Project Amendment are discussed separately below. The methodology employed is identical to that used for road projects in the original PP, and the following assumes a familiarity with that methodology.

Basically, an internal rate of return is calculated for a discounted stream of net benefits ascribed to each road project. For each of the three roads, a financial analysis is followed by an economic analysis. To move from the former to the latter, two price adjustments are made: one reflects the opportunity cost of labor in Grenada and the other an estimate of the real EC$/US$ exchange rate. (All data are presented in US$.) Labor inputs to the project are deflated by 50 percent to arrive at an opportunity cost of labor that is half the nominal wage rate, a practice common in RDO/C project analyses. EC$-denominated costs (the original cost-saving calculations in the PP) are converted to US$ at the official exchange rate (EC$ 2.70 = US$ 1.00) in the financial analysis, but are converted at a different rate (EC$ 3.24 = US$ 1.00) in the economic analysis, to reflect the approximately 20-percent overvaluation of the EC$.

Project costs over a 15-year time period include initial road revitalization costs, annual maintenance costs, and resealing costs in year 10. Project benefits used in the calculation are the original PP's estimate of vehicle operating cost savings attributable to the project (a per vehicle per mile per day factor) multiplied by the miles of road, the number of vehicles, and 365 days. The revitalization cost figures are recent estimates; all other cost figures come from the 1984 PP, and are inflated by 5 percent to put them into 1985 prices.

It is important to note that neither all direct benefits nor any externalities have been included in the economic analysis. Data limitations preclude doing the latter. However, road improvements will almost certainly benefit all productive sectors, encouraging and facilitating further economic activity. Although we cannot hazard a guess at the magnitude of the improvement, economic cost-benefit rates of return will clearly be higher than the figures derived using our methodology.

1. St. George's-Grenville Road.

This road consists primarily of three segments, two of which were analysed in preparing the original PP. Those are the Beaulieu-Vendome segment and the Birch Grove-Grenville segment. Vehicle cost saving factors used on those two segments were only slightly different. For the sake of the analysis of the entire road, we reduced the mean of those two factors by 50 percent to account for the reduced traffic load since the airport at Point Salines opened. Costs of revitalizing the road are US$ 120,000 per mile, somewhat different from the costs presented in the PP. Road usage figures used for the two previously analyzed segments were also quite close, and we used below the mean of the two figures. Footnotes to the tables permit following the calculations from one column to the next, and the internal rate of return calculation was done by machine.

Table A.1 St. George's-Grenville Road Financial Analysis

IRR is 0.16

YEAR	(th US $) ROAD COST	(th US $) MAINT	(th US $) TOT COST	(veh's) VEHICLES	(US $) SAV/DAY	(th US $) TOT SAV	(th US $) NET BEN
1985	-1320.00		-1320.00	800.00		0.00	-1320.00
1986		-14.21	-14.21	832.00	622.84	227.34	213.13
1987		-14.21	-14.21	865.28	647.76	236.43	222.22
1988		-14.21	-14.21	899.89	673.67	245.89	231.68
1989		-14.21	-14.21	935.89	700.62	255.72	241.51
1990		-14.21	-14.21	973.32	728.64	265.95	251.74
1991		-14.21	-14.21	1012.26	757.79	276.59	262.38
1992		-14.21	-14.21	1052.75	788.10	287.66	273.44
1993		-14.21	-14.21	1094.86	819.62	299.16	284.95
1994	-358.52	-14.21	-372.73	1138.65	852.41	311.13	-61.60
1995		-14.21	-14.21	1184.20	886.50	323.57	309.36
1996		-14.21	-14.21	1231.56	921.96	336.52	322.30
1997		-14.21	-14.21	1280.83	958.84	349.98	335.76
1998		-14.21	-14.21	1332.06	997.19	363.98	349.76
1999		-14.21	-14.21	1385.34	1037.08	378.53	364.32

NOTES:

Column 1 ROAD COST is US$120,000 times 11 miles.

Column 2 MAINTenance is US$ 1290/mile times 11 miles.

Column 3: TOTal COST is sum of columns 1 and 2.

Column 4: VEHICLES is a baseline estimate of number of vehicles using road per day (800) extrapolated using a 4 percent increase per year.

Column 5: SAVings/DAY is actually savings per vehicle per mile per day, and is derived from the "vehicle operating cost savings" figure in the original PP, which averages about 17.5 cents EC. This figure is raised by 5 percent to account for inflation between 1984 and 1985. In this column, the EC$ is converted to US$ by dividing by 2.7. Then the number of cars in the preceding column is factored in, as are the number of miles of the road.

Column 6: TOTal SAVings is derived from the preceding column by multiplying by 365 days.

Column 7: NET BENefits are the undiscounted difference between columns 6 and 3.

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Table A.2 St. George's-Grenville Road Economic Analysis

IRR is 0.14

YEAR	(th US $) ROAD COST	(th US $) MAINT	(th US $) TOT COST	(veh's) VEHICLES	(US $) SAV/DAY	(th US $) TOT SAV	(th US $) NET BEN
1985	-1188.00		-1188.00	800.00		0.00	-1188.00
1986		-12.79	-12.79	832.00	519.04	189.45	176.66
1987		-12.79	-12.79	865.28	539.80	197.03	184.24
1988		-12.79	-12.79	899.89	561.39	204.91	192.12
1989		-12.79	-12.79	935.89	583.85	213.10	200.31
1990		-12.79	-12.79	973.32	607.20	221.63	208.84
1991		-12.79	-12.79	1012.26	631.49	230.49	217.70
1992		-12.79	-12.79	1052.75	656.75	239.71	226.92
1993		-12.79	-12.79	1094.86	683.02	249.30	236.51
1994	-322.67	-12.79	-335.46	1138.65	710.34	259.27	-76.18
1995		-12.79	-12.79	1184.20	738.75	269.64	256.85
1996		-12.79	-12.79	1231.56	768.30	280.43	267.64
1997		-12.79	-12.79	1280.83	799.03	291.65	278.86
1998		-12.79	-12.79	1332.06	831.00	303.31	290.52
1999		-12.79	-12.79	1385.34	864.23	315.45	302.65

NOTES:

Column 1 ROAD COST is US$108,000 times 11 miles. This adjustment to the nominal per-mile charge is made to reflect the estimate that the opportunity cost of labor in Grenada is only 50 percent of the nominal wage, and that 20 percent of the revitalization costs are labor costs.

Column 2 MAINTenance is US$ 1161/mile times 11 miles. As for column 1, an adjustment is made for the opportunity cost of labor; 20 percent of the maintenance costs are estimated to be labor costs.

Column 3: TOTal COST is sum of columns 1 and 2.

Column 4: VEHICLES is a baseline estimate of number of vehicles using road per day (800) extrapolated using a 4 percent increase per year.

Column 5: SAVings/DAY is actually savings per vehicle per mile per day, and is derived from the "vehicle operating cost savings" figure in the original PP, which averages about 17.5 cents EC. This figure is raised by 5 percent to account for inflation between 1984 and 1985. In this column, the EC$ is converted to US$ by dividing by 3.24, to reflect our estimate that the EC$/US$ exchange rate is 20 percent overvalued. Then the number of cars in the preceding column is factored in, as are the number of miles of the road.

Column 6: TOTal SAVings is derived from the preceding column by multiplying by 365 days.

Column 7: NET BENefits are the undiscounted difference between columns 6 and 3.

2. Morne Rouge Road.

This short segment of road, which will improve access to existing and contemplated tourist facilities, is similar to the segment known as Grand Anse-Woodland, analyzed during original PP perparation. Hence, in the following analysis, we use the cost-saving factor associated with Grand Anse-Woodland. Revitalization costs per mile are considerably less than those for the St. George's-Grenville road, and are US$ 75,000. Vehicle usage for this road has not been properly assessed, and the figures included in the following tables are highly conjectural, and are possibly biased upward. Footnotes to the following tables permit following the calculations from one column to the next, and the internal rate of return calculation was done by machine.

3. Lance aux Epines Road.

This 2.5-mile segment of road, which will improve access to existing and contemplated tourist facilities as well as to residential areas, is also similar to the segment known as Grand Anse-Woodland, analyzed during original PP perparation. Hence, in the following analysis, we again use the cost-saving factor associated with Grand Anse-Woodland. Revitalization costs per mile are also considerably less than those for the St. George's-Grenville road, and are US$ 75,000. Vehicle usage for this road has not been properly assessed, and the figures included in the following tables are highly conjectural, and are possibly biased upward. Footnotes to the following tables permit following the calculations from one column to the next, and the internal rate of return calculation was done by machine.

Table A.3 Morne Rouge Road Financial Analysis

IRR is 0.19

YEAR	(th US $) ROAD COST	(th US $) MAINT	(th US $) TOT COST	(veh's) VEHICLES	(US $) SAV/DAY	(th US $) TOT SAV	(th US $) NET BEN
1985	-37.50		-37.50	600.00		0.00	-37.50
1986		-0.65	-0.65	624.00	21.23	7.75	7.10
1987		-0.65	-0.65	648.96	22.08	8.06	7.41
1988		-0.65	-0.65	674.92	22.97	8.38	7.74
1989		-0.65	-0.65	701.92	23.88	8.72	8.07
1990		-0.65	-0.65	729.99	24.84	9.07	8.42
1991		-0.65	-0.65	759.19	25.83	9.43	8.78
1992		-0.65	-0.65	789.56	26.87	9.81	9.16
1993		-0.65	-0.65	821.14	27.94	10.20	9.55
1994	-16.30	-0.65	-16.94	853.99	29.06	10.61	-6.34
1995		-0.65	-0.65	888.15	30.22	11.03	10.38
1996		-0.65	-0.65	923.67	31.43	11.47	10.83
1997		-0.65	-0.65	960.62	32.69	11.93	11.29
1998		-0.65	-0.65	999.04	34.00	12.41	11.76
1999		-0.65	-0.65	1039.01	35.36	12.90	12.26

NOTES:

Column 1 ROAD COST is US$120,000 times 0.5 miles.

Column 2 MAINTenance is US$ 1290/mile times 0.5 miles.

Column 3: TOTal COST is sum of columns 1 and 2.

Column 4: VEHICLES is a baseline estimate of number of vehicles using road per day (600) extrapolated using a 4 percent increase per year.

Column 5: SAVings/DAY is actually savings per vehicle per mile per day, and is derived from the "vehicle operating cost savings" figure in the original PP, which averages about 17.5 cents EC. This figure is raised by 5 percent to account for inflation between 1984 and 1985. In this column, the EC$ is converted to US$ by dividing by 2.7. Then the number of cars in the preceding column is factored in, as are the number of miles of the road.

Column 6: TOTal SAVings is derived from the preceding column by multiplying by 365 days.

Column 7: NET BENefits are the undiscounted difference between columns 6 and 3.

Table A.4 Morne Rouge Road Economic Analysis

IRR is 0.14

YEAR	(th US $) ROAD COST	(th US $) MAINT	(th US $) TOT COST	(veh's) VEHICLES	(US $) SAV/DAY	(th US $) TOT SAV	(th US $) NET BEN
1985	-37.50		-37.50	600.00		0.00	-37.50
1986		-0.65	-0.65	624.00	17.69	6.46	5.81
1987		-0.65	-0.65	648.96	18.40	6.72	6.07
1988		-0.65	-0.65	674.92	19.14	6.99	6.34
1989		-0.65	-0.65	701.92	19.90	7.26	6.62
1990		-0.65	-0.65	729.99	20.70	7.56	6.91
1991		-0.65	-0.65	759.19	21.53	7.86	7.21
1992		-0.65	-0.65	789.56	22.39	8.17	7.53
1993		-0.65	-0.65	821.14	23.28	8.50	7.85
1994	-16.30	-0.65	-16.94	853.99	24.22	8.84	-8.10
1995		-0.65	-0.65	888.15	25.18	9.19	8.55
1996		-0.65	-0.65	923.67	26.19	9.56	8.91
1997		-0.65	-0.65	960.62	27.24	9.94	9.30
1998		-0.65	-0.65	999.04	28.33	10.34	9.69
1999		-0.65	-0.65	1039.01	29.46	10.75	10.11

NOTES:

Column 1 ROAD COST is US$108,000 times 0.5 miles. This adjustment to the nominal per-mile charge is made to reflect the estimate that the opportunity cost of labor in Grenada is only 50 percent of the nominal wage, and that 20 percent of the revitalization costs are labor costs.

Column 2 MAINTenance is US$ 1161/mile times 0.5 miles. As for column 1, an adjustment is made for the opportunity cost of labor; 20 percent of the maintenance costs are estimated to be labor costs.

Column 3: TOTal COST is sum of columns 1 and 2.

Column 4: VEHICLES is a baseline estimate of number of vehicles using road per day (600) extrapolated using a 4 percent increase per year.

Column 5: SAVings/DAY is actually savings per vehicle per mile per day, and is derived from the "vehicle operating cost savings" figure in the original PP, which averages about 17.5 cents EC. This figure is raised by 5 percent to account for inflation between 1984 and 1985. In this column, the EC$ is converted to US$ by dividing by 3.24, to reflect our estimate that the EC$/US$ exchange rate is 20 percent overvalued. Then the number of cars in the preceding column is factored in, as are the number of miles of the road.

Column 6: TOTal SAVings is derived from the preceding column by multiplying by 365 days.

Column 7: NET BENefits are the undiscounted difference between columns 6 and 3.

Table A.5 Lance aux Epines Road Financial Analysis

IRR is 0.19

YEAR	(th US $) ROAD COST	(th US $) MAINT	(th US $) TOT COST	(veh's) VEHICLES	(US $) SAV/DAY	(th US $) TOT SAV	(th US $) NET BEN
1985	-187.50		-187.50	600.00		0.00	-187.50
1986		-3.23	-3.23	624.00	106.17	38.75	35.52
1987		-3.23	-3.23	648.96	110.41	40.30	37.07
1988		-3.23	-3.23	674.92	114.83	41.91	38.68
1989		-3.23	-3.23	701.92	119.42	43.59	40.36
1990		-3.23	-3.23	729.99	124.20	45.33	42.10
1991		-3.23	-3.23	759.19	129.17	47.15	43.92
1992		-3.23	-3.23	789.56	134.33	49.03	45.80
1993		-3.23	-3.23	821.14	139.71	50.99	47.76
1994	-81.48	-3.23	-84.71	853.99	145.30	53.03	-31.68
1995		-3.23	-3.23	888.15	151.11	55.15	51.92
1996		-3.23	-3.23	923.67	157.15	57.36	54.13
1997		-3.23	-3.23	960.62	163.44	59.66	56.43
1998		-3.23	-3.23	999.04	169.98	62.04	58.81
1999		-3.23	-3.23	1039.01	176.78	64.52	61.29

NOTES:

Column 1 ROAD COST is US$120,000 times 2.5 miles.

Column 2 MAINTenance is US$ 1290/mile times 2.5 miles.

Column 3: TOTal COST is sum of columns 1 and 2.

Column 4: VEHICLES is a baseline estimate of number of vehicles using road per day (600) extrapolated using a 4 percent increase per year.

Column 5: SAVings/DAY is actually savings per vehicle per mile per day, and is derived from the "vehicle operating cost savings" figure in the original PP, which averages about 17.5 cents EC. This figure is raised by 5 percent to account for inflation between 1984 and 1985. In this column, the EC$ is converted to US$ by dividing by 2.7. Then the number of cars in the preceding column is factored in, as are the number of miles of the road.

Column 6: TOTal SAVings is derived from the preceding column by multiplying by 365 days.

Column 7: NET BENefits are the undiscounted difference between columns 6 and 3.

Table A.6 Lance aux Epines Road Economic Analysis

IRR is 0.14

YEAR	(th US $) ROAD COST	(th US $) MAINT	(th US $) TOT COST	(veh's) VEHICLES	(US $) SAV/DAY	(th US $) TOT SAV	(th US $) NET BEN
1985	-187.50		-187.50	600.00		0.00	-187.50
1986		-3.23	-3.23	624.00	88.47	32.29	29.06
1987		-3.23	-3.23	648.96	92.01	33.58	30.35
1988		-3.23	-3.23	674.92	95.69	34.93	31.70
1989		-3.23	-3.23	701.92	99.52	36.32	33.09
1990		-3.23	-3.23	729.99	103.50	37.78	34.55
1991		-3.23	-3.23	759.19	107.64	39.29	36.06
1992		-3.23	-3.23	789.56	111.95	40.86	37.63
1993		-3.23	-3.23	821.14	116.42	42.49	39.26
1994	-81.48	-3.23	-84.71	853.99	121.08	44.19	-40.52
1995		-3.23	-3.23	888.15	125.92	45.96	42.73
1996		-3.23	-3.23	923.67	130.96	47.80	44.57
1997		-3.23	-3.23	960.62	136.20	49.71	46.48
1998		-3.23	-3.23	999.04	141.65	51.70	48.47
1999		-3.23	-3.23	1039.01	147.31	53.77	50.54

NOTES:

Column 1 ROAD COST is US$108,000 times 2.5 miles. This adjustment to the nominal per-mile charge is made to reflect the estimate that the opportunity cost of labor in Grenada is only 50 percent of the nominal wage, and that 20 percent of the revitalization costs are labor costs.

Column 2 MAINTenance is US$ 1161/mile times 2.5 miles. As for column 1, an adjustment is made for the opportunity cost of labor; 20 percent of the maintenance costs are estimated to be labor costs.

Column 3: TOTal COST is sum of columns 1 and 2.

Column 4: VEHICLES is a baseline estimate of number of vehicles using road per day (600) extrapolated using a 4 percent increase per year.

Column 5: SAVings/DAY is actually savings per vehicle per mile per day, and is derived from the "vehicle operating cost savings" figure in the original PP, which averages about 17.5 cents EC. This figure is raised by 5 percent to account for inflation between 1984 and 1985. In this column, the EC$ is converted to US$ by dividing by 3.24, to reflect our estimate that the EC$/US$ exchange rate is 20 percent overvalued. Then the number of cars in the preceding column is factored in, as are the number of miles of the road.

Column 6: TOTal SAVings is derived from the preceding column by multiplying by 365 days.

Column 7: NET BENefits are the undiscounted difference between columns 6 and 3.

B. Electric Power Generator

An ideal economic analysis of the effects of adding generating capacity to the Grenlec system would examine the system as a whole, comparing costs and benefits without the additional capacity and with the new capacity. The economic analysis would flow from a financial analysis that made a similar comparison using actual prices of inputs (operating costs and amortization) and of outputs (power sale revenues) that Grenlec faces. The economic analysis would go beyond the financial analysis by (a) adjusting prices and (b) changing cost and benefit items. Prices would be adjusted to take account of economic prices because in many instances nominal prices will overstate or understate the opportunity cost of an item. (For example, legislated minimum wages usually overstate the opportunity cost of labor.) Cost and benefit elements would be added or deleted from the financial analysis to arrive at an economic analysis, because the economic analysis must consider effects on the economy as a whole. (For example, economic analysis would include economic benefits indirectly accruing to the project, even though these would not be of financial benefit to Grenlec.)

In the case of the economic analysis for this project, however, we have elected to first attempt a simpler (though theoretically less comprehensive) approach, in the interests of saving time. If this approach appears to justify the project in economic terms, we shall discuss how that justification might have been improved or made less acceptable if the ideal analysis had been carried out.

1. Economic Rate of Return

The economic rate of return on the discounted stream of net benefits (benefits less costs) associated with the project, over a twenty-year period, is estimated at 26 percent, and argues strongly in favor of the project. The benefits and costs include both direct ones (derived from the financial analysis, with some adjustments to arrive at opportunity costs) and indirect ones (discussed below.) The calculations are presented in Table A.7.

2. Costs

Costs calculated in Table A.7 include capital costs of the proposed generator, lubricating oil costs, maintenance costs, labor costs, and transmission and distribution costs. No fuel costs are included, because Grenlec's current practice is to charge consumers a fuel surcharge over and above the electricity tariff. That fuel surcharge is included on neither the cost nor the benefit side of the calculation.

a. Capital costs (which include delivery and installation) are first calculated as US$1.242 million, but must be adjusted to account for a labor input factor in installation. (The unadjusted figure is derived by adding 50 percent overhead, including transportation, to an estimated unit price of US$ 460 per kilowatt of generating capacity.) One percent of

that total cost is assumed to be local labor charges for installation, and these are halved to account for an opportunity cost of labor which RDO/C believes is only half of the nominal wage. The adjustment is minor, and reduces the "capital costs" to US$ 1.236 million.

b. Lubricating oil costs are assessed at 1.2 percent of fuel costs for operating the generator.

c. Maintenance costs are calculated as one percent of unadjusted capital costs.

d. Labor costs for operations and maintenance are adjusted downward, as were the "capital costs" above. 20 percent of the labor is estimated to be unskilled, and is assessed at 50 percent of its nominal cost to reflect a below-wage opportunity cost of unskilled labor. The estimated labor cost of $6,000 is accordingly adjusted.

e. Transmission and distribution costs are US$ 20 per megawatt-hour of electricity generated, based upon an analysis done in Dominica.

3. Benefits

Both direct and indirect benefits are attributed to the project. Direct benefits are derived from sales revenues, based upon the electricity tariff and the power actually generated by the proposed generator. An adjustment is made to reflect the overvaluation of the EC dollar. Indirect benefits are very important, but are difficult to quantify. First, the increased production activity permitted by the higher, more stable electrical generation capacity will stimulate further rounds of economic activity, particularly in the trade sector, the tourism sector, and other services that support sectors of production. Second, improved productive efficiency in the economy that arises from stability of power generation made possible by the new generator is not captured in the direct benefit calculation. Third, increased social cohesion that will result from the improved capability of Grenlec to deliver stable, increased power for social uses is also not reflected in the direct benefits. Studies of the relationship between direct and indirect benefits in other electrical projects suggest that indirect benefits are at least as great as direct benefits are, in general. To be conservative, we have assumed that these externalities are equivalent in magnitude to the project's direct benefits.

Table A.7 Electric Power Generator Economic Analysis

IRR is 0.26

YEAR	(th US$) CAP COST	(th US$) OIL COST	(th US$) MAINT COST	(th US$) LABOR COST	(th US$) T & D COST	(th US$) TOTAL COST
			COST ELEMENTS			
1985	1235.79					1235.79
1986		6.37	11.12	3.00	109.01	129.50
1987		6.85	11.12	3.00	117.19	138.16
1988		7.26	11.12	3.00	124.22	145.60
1989		7.63	11.12	3.00	130.59	152.34
1990		8.01	11.12	3.00	137.11	159.25
1991		8.41	11.12	3.00	143.97	166.50
1992		8.84	11.12	3.00	151.35	174.31
1993		9.28	11.12	3.00	158.92	182.32
1994		9.75	11.12	3.00	166.86	190.73
1995		10.25	11.12	3.00	175.41	199.78
1996		10.86	11.12	3.00	185.93	210.92
1997		11.51	11.12	3.00	197.09	222.72
1998		12.20	11.12	3.00	208.91	235.24
1999		12.94	11.12	3.00	221.45	248.51
2000		12.94	11.12	3.00	221.45	248.51
2001		12.94	11.12	3.00	221.45	248.51
2002		12.94	11.12	3.00	221.45	248.51
2003		12.94	11.12	3.00	221.45	248.51
2004		12.94	11.12	3.00	221.45	248.51
2005		12.94	11.12	3.00	221.45	248.51
2006		12.94	11.12	3.00	221.45	248.51
2007		12.94	11.12	3.00	221.45	248.51
2008		12.94	11.12	3.00	221.45	248.51
2009		12.94	11.12	3.00	221.45	248.51

Table 7 (continued)

		BENEFITS			
(th mWh)	(th mWh)	(th mWh)	(th US$)	(th US$)	(th US$)
TOTAL PWR GEN	TOTAL PWR SOLD	SOLD THIS GEN	REV THIS GEN	TOTAL BEN	NET BEN
28.86	24.44		0.00	0.00	-1235.79
32.14	27.25	5.45	386.93	386.93	257.42
34.55	29.30	5.86	415.95	415.95	277.79
36.62	31.06	6.21	440.91	440.91	295.31
38.45	32.65	6.53	463.50	463.50	311.16
40.38	34.28	6.86	486.67	486.67	327.42
42.39	35.99	7.20	511.00	511.00	344.50
44.51	37.84	7.57	537.19	537.19	362.88
46.74	39.73	7.95	564.05	564.05	381.73
49.08	41.71	8.34	592.24	592.24	401.52
51.53	43.85	8.77	622.59	622.59	422.81
54.62	46.48	9.30	659.95	659.95	449.03
57.90	49.27	9.85	699.54	699.54	476.82
61.37	52.23	10.45	741.52	741.52	506.28
65.06	55.36	11.07	786.01	786.01	537.50
68.96	58.68	11.07	786.01	786.01	537.50
73.10	62.20	11.07	786.01	786.01	537.50
77.48	65.94	11.07	786.01	786.01	537.50
82.13	69.89	11.07	786.01	786.01	537.50
87.06	74.09	11.07	786.01	786.01	537.50
92.28	78.53	11.07	786.01	786.01	537.50
97.82	83.24	11.07	786.01	786.01	537.50
103.69	88.24	11.07	786.01	786.01	537.50
109.91	93.53	11.07	786.01	786.01	537.50
116.50	99.15	11.07	786.01	786.01	537.50

NOTES:

Col 1: CAPital COST is 50 percent contingency added onto the price of a 1.8 mW generator, priced at US$460 per kW. One percent of that value is assumed to be labor for installation, and that is adjusted downward to reflect the estimation that the opportunity cost of labor is only half the nominal wage.

Col 2: OIL COST is calculated as 1.2 percent of fuel consumption costs for this generator. Fuel costs are determined by multiplying power generated by this generator (column 9 divided by 0.87 to account for 13 percent losses) times the inverse of unit fuel consumption (17 kWh per gallon) times the price of diesel fuel (US$1.44 per gallon).

Col 3: MAINTenance COST is calculated as 1 percent of the installed cost of the generator. Inasmuch as 20 percent of this is presumed to be labor, the figure is adjusted downward for this 20 percent to reflect the opportunity cost of labor.

Col 4: LABOR COST is a flat US$ 6,000 per year in financial terms, and this figure is adjusted downward to reflect the estimatation that the opportunity cost of labor is only half the nominal wage rate.

Col 5: Transmission & Distribution COST is estimated at US$ 20 per mWh; this column is derived from the numbers in column 9.

Col 6: TOTAL COST is the sum of the preceding five columns.

Col 7: TOTAL PoWeR GENerated through 1995 is taken from a recent EBASCO study, after which an average annual 6 percent increase is used.

Col 8: TOTAL PoWeR SOLD is taken from the same EBASCO study.

Col 9: SOLD THIS GENerator is 20 percent of "total power sold," because this generator adds about 20 percent to Grenlec's capacity. This approach is used through 1999; after that date the generator is being used at 70 percent of capacity, and no further increase is permitted.

Col 10: REVenue THIS GENerator is derived by multiplying the average tariff rate (EC$0.23) by column 9, then dividing the result by the exchange rate (EC$2.7=US$ 1.00), and finally by dividing the result by 1.2, to reflect the 20-percent overvaluation of the EC dollar.

Col 11: TOTAL BENefits is column 10.

Col 11: NET BENefits is the difference between total costs and total benefits.

C. Industrial Site Development

A frequently heard complaint about Grenada is the shortage of industrial sites sufficiently developed to attract investors. Although some construction and refurbishing activity is underway, more is needed to meet demand. To tie in with existing and planned facilities in the True Blue/Frequente area, A.I.D. proposes constructing 20,000 square feet of additional factory shell space at Frequente, and providing some additional supportive infrastructure. The latter will also improve facilities in existing factory shells.

The following analysis employs a methodology used by RDO/C in assessing the economic merits of the Infrastructure for Productive Investment project (IPIP) factory shell project. Inasmuch as the precise value of output of shell tenants is difficult to predict (given the range of possible types of productive facility), the methodology focuses on the benefits that will stay in Grenada. The likelihood is strong that the shells will be used to process imported materials for export, probably using externally funded equipment and using foreign management. Thus, returns to Grenadian labor employed in occupied shells are an obvious measure of benefits of the project to the economy.

As RDO/C did in assessing the feasibility of the IPIP shells, the following analysis converts the nominal wage to a "shadow price" to reflect the fact that the opportunity cost of this labor in the relatively underemployed Grenadian economy is less than the nominal wage rate. The difference between the opportunity cost and the actual wage paid may be considered a measure of the benefit to the economy of the project. It is the only element of the returns to production that is in excess of a cost of production and that remains in Grenada. Footnotes to Table A.8 permit following the calculations from one column to the next, and the internal rate of return calculation was done by machine.

Table A.8 Industrial Site Infrastructure Economic Analysis

IRR is 0.14

YEAR	(th US$) SHELL COST	(th US$) OTHER COST	(th US$) TOT COST	(th sqft) SHELL SPACE	(persons) EMP LABOR	(th US$) BENE-FITS	(th US$) NET B'FITS
1985	-365.00	-385.00	-750.00				-750.00
1986				16.59	165.91	124.31	124.31
1987				16.59	165.91	124.31	124.31
1988				16.59	165.91	124.31	124.31
1989				16.59	165.91	124.31	124.31
1990				16.59	165.91	124.31	124.31
1991				16.59	165.91	124.31	124.31
1992				16.59	165.91	124.31	124.31
1993				16.59	165.91	124.31	124.31
1994				16.59	165.91	124.31	124.31
1995				16.59	165.91	124.31	124.31
1996				16.59	165.91	124.31	124.31
1997				16.59	165.91	124.31	124.31
1998				16.59	165.91	124.31	124.31
1999				16.59	165.91	124.31	124.31

NOTES:

Col 1: SHELL COST is the cost of construction of the shell component of the project. Since the sum in column 2 is fixed and the total subproject cost (column 3) is also fixed, this figure is a residual.

Col 2: OTHER COST is given (see Col 1 note).

Col 3: TOTal COST is also given (see Col 1 note).

Col 4: SHELL SPACE is the amount of floorspace available in the constructed shells. Given a US$ 22 per-square-foot cost of shells, this figure is derived by dividing the figure in column 1 by US$ 22.

Col 5: EMPloyed LABOR is derived from estimates in the region that indicate that the average shell space producing for export requires 100 square feet of floorspace, on average, per worker.

Col 6: BENEFITS is a function of the return to labor employed (see text). The figure in column 5 is multiplied by 0.45 (to take account of the shell's contribution to the employment) and again by US$ 2,220 (the nominal wage paid workers in this type of employment) and again by a factor to express earnings in excess of the opportunity cost of labor.

Col 7: NET BENEFITS is the undiscounted difference between total costs and total benefits.

D. Asphalt Plant

In order to continue with the necessary road construction (such as that set forth above) in Grenada, as well as to enable the Government of Grenada to maintain its road system properly over the coming years, the current asphalt-producing facilities must be replaced. The following analysis presents the costs and benefits associated with the purchase of new asphalt-producing facilities and derives an internal rate of return. The analysis is essentially a financial analysis, following which some allowance is made for the difference between financial and economic prices for inputs and outputs.

1. Costs

Costs include capital costs for the equipment to be installed as well as production costs over the life of the project. The asphalt-producing equipment to be installed will cost $500,000. Non-labor operating costs (exclusive of rock and asphalt inputs) are calculated at $1750 per day in operation and include fuel and routine maintenance. Labor costs are $320 per day and the cost of a foreign supervisor is $8500 per month. The largest input costs are asphalt at $30 per ton and crushed rock at $15 per ton.

2. Benefits

The most readily measurable benefit is asphalt for road construction and maintenance. A.I.D. estimates firm production at 70,000 tons per year, at a unit price of $53 per ton.

3. Financial Returns

The financial returns to the asphalt plant appear to be quite good. At the quoted price, the rate of return using a ten-year project life is 20 percent.

4. Economic Returns

Abstracting from externalities for the moment, the financial analysis provides a basis for an economic analysis. First, two adjustments should be made to labor costs. Assuming that the EC$/US$ exchange rate is overvalued by 20 percent the $320 per day should be adjusted downward. In addition, the nominal wage exceeds the opportunity cost, and a second downward revision is made in the following table. Operating costs (primarily fuel) are already expressed in "border prices" and require no adjustment. Similarly, asphalt costs require no adjustment, because the product is procured abroad. On the cost side, finally, the cost of the crushed rock input must be adjusted downward to reflect the overvalued exchange rate. The result of these adjustments is to increase the rate of return above the rate of financial return to 77 percent. Given the highly positive financial returns, this increase only improves the viability of the project.

Table A.9. Financial analysis for asphalt plant

IRR is 0.20

YEAR	(th US$) CAP COST	(th US$) NON-LAB OP COSTS	(th US$) LABOR COSTS	(th US$) SPVSR COSTS	(th US$) ASPHALT COSTS
1985	500.00				
1986		255.21	83.20	102.00	2100.00
1987		255.21	83.20	102.00	2100.00
1988		255.21	83.20	102.00	2100.00
1989		255.21	83.20	102.00	2100.00
1990		255.21	83.20	102.00	2100.00
1991		255.21	83.20	102.00	2100.00
1992		255.21	83.20	102.00	2100.00
1993		255.21	83.20	102.00	2100.00
1994		255.21	83.20	102.00	2100.00
1995		255.21	83.20	102.00	2100.00

(th US$) ROCK COSTS	(th US$) TOTAL COSTS	(th tons) OUTPUT VOLUME	(th US$) OUTPUT REVENUE	(th US$) NET B'FITS
	500.00			-500.00
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59
1050.00	3590.41	70.00	3710.00	119.59

NOTES:

(1) CAPital COST: $500,000 for the asphalt plant equipment, installed.
(2) NON-LABor OPerating COSTS: $1750 per operating day, times the annual output, which is OUTPUT VOLUME divided by the product of the hourly production rate (60 tons) and hours per day (8).
(3) LABOR COSTS: $320 per day, times 260 days per year.
(4) SuPerViSoR COSTS: $8500 per month times 12 months.
(5) ASPHALT COSTS: $30 per ton.
(6) ROCK COSTS: $15 per ton.
(7) TOTAL COSTS: sum of preceding columns.
(8) OUTPUT VOLUME: fixed at 70,000 tons per year, probable demand.
(9) OUTPUT REVENUE: $53 per ton.
(10) NET BeneFITS: difference between OUTPUT REVENUE and TOTAL COSTS.

Table A.10 Economic analysis for the asphalt plant

IRR is 0.77

YEAR	(th US$) CAP COST	(th US$) NON-LAB OP COSTS	(th US$) LABOR COSTS	(th US$) SPVSR COSTS	(th US$) ASPHALT COSTS
1985	500.00				
1986		212.67	34.67	102.00	2100.00
1987		212.67	34.67	102.00	2100.00
1988		212.67	34.67	102.00	2100.00
1989		212.67	34.67	102.00	2100.00
1990		212.67	34.67	102.00	2100.00
1991		212.67	34.67	102.00	2100.00
1992		212.67	34.67	102.00	2100.00
1993		212.67	34.67	102.00	2100.00
1994		212.67	34.67	102.00	2100.00
1995		212.67	34.67	102.00	2100.00

(th US$) ROCK COSTS	(th US$) TOTAL COSTS	(th tons) OUTPUT VOLUME	(th US$) OUTPUT REVENUE	(th US$) NET B'FITS
	500.00			-500.00
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66
875.00	3324.34	70.00	3710.00	385.66

NOTES:

(1) CAPital COST: as in the financial analysis.
(2) NON-LABor OPerating COSTS: the figure derived in the financial analysis is adjusted to account for the overvalued exchange rate (by dividing by 120 percent).
(3) LABOR COSTS: the figure derived in the financial analysis above is first adjusted for the overvalued exchange rate (by dividing by 120 percent) and then further adjusted to reflect the opportunity cost of labor (by multiplying by 50 percent.
(4) SuPerViSoR COSTS: as in the financial analysis.
(5) ASPHALT COSTS: as in the financial analysis.
(6) ROCK COSTS: the figure in the financial analysis is adjusted to account for the overvalued exchange rate (by dividing by 120 percent).
(7) TOTAL COSTS: sum of preceding columns.
(8) OUTPUT VOLUME: fixed at 70,000 tons per year, probable demand.
(9) OUTPUT REVENUE: as in the financial analysis.
(10) NET BeneFITS: difference between OUTPUT REVENUE and TOTAL COSTS.

(6) AID-2 INFO CHARGE DCM ECON CHRON

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1. THIS CABLE IS THE FOLLOW-UP TO REFTEL TO DESCRIBE IN DETAIL THE PLANNED ACTIVITIES UNDER SUBJECT PROJECT; PROVIDE A SUMMARY PROCUREMENT PLAN; AND JUSTIFY THE URGENT NEED TO OBLIGATE IN NOVEMBER UP TO THE DOLS5 MILLION PROPOSED IN THE CN.

2. THE GRENADA CDSS AND THE FY86 ACTION PLAN PROPOSE TO PROMOTE GROWTH IN THE PRODUCTIVE SECTORS OF TOURISM, LIGHT MANUFACTURING AND AGRICULTURE BY CREATING AN ENVIRONMENT CONDUCIVE TO INVESTMENT AND PRODUCTIVE ENTERPRISE WHILE ACTIVELY SEEKING SUITABLE INVESTORS INTERESTED IN GRENADA-BASED OPERATIONS. SPECIFICALLY, MAJOR INPUTS ARE REQUIRED TO BRING BASIC PUBLIC INFRASTRUCTURE TO A LEVEL CAPABLE OF SUPPORTING BOTH EXISTING AND NEW INVESTMENT. RDO/C GRENADA HAS IDENTIFIED AS PRIORITIES THE PAVING OF SELECTED ROADS THAT SUPPORT PRODUCTIVE ENTERPRISE; THE UPGRADING OF GRENLEC'S GENERATING CAPABILITY TO MEET PEAK LOAD DEMAND; THE RAPID DEVELOPMENT OF AN INDUSTRIAL PARK WITH SITES AND SERVICES; AND THE SECURING OF A CAPABILITY TO PROVIDE AGGREGATE, ASPHALT AND CONCRETE REQUIRED FOR BOTH PUBLIC AND PRIVATE CONSTRUCTION. (OTHER AREAS OF CONCERN ARE THE SUPPLY AND DISTRIBUTION OF POTABLE WATER AND POWER, BUT BOTH SYSTEMS REQUIRE MORE STUDY BEFORE MAJOR INTERVENTIONS CAN BE CONSIDERED.)

3. THIS PROJECT WILL CONSIST OF THE FOLLOWING ELEMENTS WHICH ARE DISCUSSED IN MORE DETAIL BELOW:

- A. THE PROCUREMENT OF A PORTABLE ASPHALT PLANT CAPABLE OF SUPPORTING ALL ROAD PAVING PROJECTS CURRENTLY UNDERWAY AND PLANNED FOR THE FUTURE.

PARDON ..... DATE 11/12/85 ..... 4 NOV. ..... ED

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- B. THE PROCUREMENT OF A CONTRACT FOR TA TO INSTALL AND OPERATE THE ASPHALT PLANT AND A PORTABLE ROCK CRUSHER ALREADY ON ORDER; OPERATE THE SUPPORTING QUARRYING OPERATION; TRAIN GRENADIANS TO ASSUME OPERATION OF ALL FACILITIES; PAVE APPROXIMATELY 15 MILES OF ROADS IDENTIFIED AS BEING OF HIGH PRIORITY; AND CONSTRUCT FACTORY SHELLS AND SUPPORTING INFRASTRUCTURE AT THE FREQUENTE INDUSTRIAL PARK.

- C. PROCUREMENT AND INSTALLATION OF TWO (2) GENERATORS CAPABLE OF PRODUCING AN ADDITIONAL 2-3 MEGAWATTS OF POWER TO PERMIT GRENLEC TO MEET PRESENT AND PROJECTED PEAK LOAD DEMAND.

4. THE CURRENT SITUATION WITH REGARD TO THE SUPPLY OF CRUSHED AGGREGATE, CONCRETE AND ASPHALT IS CRITICAL. AT THIS TIME, THE ONLY SUPPLY OF AGGREGATE AND ASPHALT IS THE FACILITY OF MOUNT HARTMAN, IN THE SOUTH-WEST, WHICH IS BEING OPERATED BY MORRISON-KNUDSEN AS PART OF THE AIRPORT PROJECT. THAT FACILITY IS PRESENTLY SUPPLYING AGGREGATE TO THE AIRPORT PROJECT, THE EDF-FUNDED [illegible], CDB-FUNDED FEEDER ROADS, THE AID-FUNDED MENTAL HEALTH FACILITY, AID-FUNDED ROAD PAVING INCLUDED IN THE AIRPORT PROJECT, AND ALL PRIVATE CONSTRUCTION. THE MOUNT HARTMAN ASPHALT PLANT IS SUPPLYING THE HOT MIX FOR ALL ROAD PAVING FUNDED BY AID. BOTH THE ASPHALT PLANT AND THE ROCK CRUSHER ARE OF EAST-BLOC MANUFACTURE AND DUE TO THE ABSENCE OF SPARE PARTS AND ADVANCE AGE CANNOT BE EXPECTED TO OPERATE MUCH LONGER. THAT THEY ARE OPERATING AT ALL CAN BE ATTRIBUTED TO EXTRAORDINARY EFFORTS BY MR. AS THE AIRPORT PROJECT NEARS COMPLETION, MR WILL BEGIN, IN NOVEMBER, TO DEMOBILIZE THE PERSONNEL WHO ARE OPERATING MOUNT HARTMAN. ONCE THAT DEMOBILIZATION OCCURS, THE PRODUCTION OF AGGREGATE AND ASPHALT MAY COME TO A COMPLETE HALT AT ANY TIME. CONSTRUCTION OF ALL OF THE ABOVE MENTIONED PROJECTS WILL ALSO HALT UNTIL A NEW SOURCE OF SUPPLY CAN BE SECURED; PLANNED CONSTRUCTION OF THE RAMADA RENNAISANCE, CARIMEX AND AIR GRENADA HOTELS WILL BE DELAYED; AND PROPOSED FACTORY SHELL CONSTRUCTION WILL HAVE TO BE POSTPONED. RDO/C GRENADA IS IN THE PROCESS OF PROCURING A PORTABLE ROCK CRUSHER THAT IS CAPABLE OF

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SUPPLYING ALL OF GRENADA'S PUBLIC AND PRIVATE SECTOR REQUIREMENTS. HOWEVER, ONCE THAT ROCK CRUSHER IS INSTALLED, GRENADIANS WILL NEED TO BE TRAINED IN ITS OPERATION AS WELL AS THE QUARRYING OPERATIONS NECESSARY TO SUPPLY IT. THIS PROJECT PROPOSES TO AUGMENT THE NEW ROCK CRUSHER WITH A NEW PORTABLE ASPHALT PLANT AND THE TA TO OPERATE BOTH PLANTS AND THE QUARRYING OPERATION FOR UP TO TWO YEARS. DURING THIS PERIOD, GRENADIANS WOULD BE TRAINED IN ALL ASPECTS OF THE OPERATION AND THE EXPATRIATE PERSONNEL WOULD BE PHASED OUT.

5. THE ROAD PAVING THAT HAS BEEN COMPLETED AS PART OF THE AIRPORT PROJECT HAS BEEN ONE OF AID'S MOST VISIBLE AND SUCCESSFUL UNDERTAKINGS. THERE IS NO QUESTION THAT THE PRESENCE OF AN ADEQUATE ROAD NETWORK IS A PREREQUISITE FOR MANY INVESTMENTS AND A CONTRIBUTING FACTOR TO THE DEGREE OF CONFIDENCE THAT ANY POTENTIAL INVESTOR HAS IN THE ECONOMIC FUTURE OF GRENADA. THE NEED FOR GOOD ROADS IS COMMON TO THE TOURISM, MANUFACTURING AND AGRICULTURE SECTORS AND THIS POINT IS REPEATEDLY MADE BY POTENTIAL INVESTORS. RDO/C GRENADA BELIEVES THAT THE FIRST PRIORITY IS TO COMPLETE THE ROADS NETWORK IN THE SOUTHWEST QUADRANT. THIS AREA, WHICH EXTENDS FROM THE POINT SALINES AIRPORT TO ST. GEORGES INCLUDES MOST OF GRENADA'S HOTELS AND POTENTIAL HOTEL SITES, PRIME MANUFACTURING SITES AND IMPORT/EXPORT FACILITIES. THE NEXT PRIORITY IS THE UPGRADING AND PAVING OF THE ROAD FROM ST. GEORGE'S TO GRENVILLE, GRENADA'S OTHER PORT, SECOND LARGEST CITY, AND A POTENTIAL SITE FOR INDUSTRIAL AND TOURISM DEVELOPMENT. THIS ROAD PASSES THROUGH THE GRANDE ETANG FOREST (A TOURIST ATTRACTION) AND LINKS ST. GEORGE'S PORT FACILITIES AND MARKET WITH THE AGRICULTURAL AREA NORTH OF GRENVILLE. RDO/C GRENADA PROPOSES TO COMBINE THE TA SERVICES RELATED TO THE MOUNT HARTMAN OPERATION WITH CONSTRUCTION SERVICES AND TO PAVE THE FOLLOWING ROADS:

- A. LANCE AUX EPINES ROAD (2.5 MILES) --SUPPORTS MAJOR HOTELS, RESTAURANTS AND MARINE SERVICES.

- B. MOURNE ROUGE ROAD (.5 MILES)--SUPPORTS HOTELS AND OPENS MAJOR TOURISM DEVELOPMENT AREA.

- C. SELECTED ROADS IN ST. GEORGE'S (1.5 MILES) --SUPPORTS TOURISM AND PROVIDE ACCESS THROUGH ST. GEORGE'S IN SUPPORT OF TOURISM, AGRICULTURE AND MANUFACTURING.

- D. ST. GEORGE'S TO GRENVILLE (11 MILES)--PROVIDES ACCESS TO VENDOME, GRANDE ETANG AND GRENVILLE SUPPORTING ALL PRODUCTIVE SECTORS.

THE CONTRACTOR WOULD CONCENTRATE FIRST ON COMPLETION OF THE ROADS IN THE SOUTHWEST QUADRANT AND THEN FROM ST. GEORGE'S TO VENDOME AND AND GRANDE ETANG. AT THIS

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POINT, THE QUARRYING/CRUSHING/ASPHALT OPERATION WOULD BE MOVED TO THE TELESCOPE POINT QUARRY AND WOULD SUPPORT THE PAVING FROM GRENVILLE TO GRANDE ETANG, THE EDF-FUNDED EASTERN MAIN ROAD, THE FARM ROADS PROJECT FUNDED BY IBRD AND THE CDB-FIEDER ROADS PROJECT.

6. MISSION IS EXPECTING, MOMENTARILY, A PLAN FOR THE DEVELOPMENT OF THE FREQUENTE INDUSTRIAL PARK THAT IS BEING PREPARED BY FREE ZONE AUTHORITY. THE ABSENCE OF FACTORY SPACE HAS BEEN A CONTINUING CONSTRAINT TO INVESTMENTS IN MANUFACTURING AND THE FREE ZONE PLAN IS PERCEIVED AT THE MOST EXPEDITIOUS AND COST EFFECTIVE WAY TO OBTAIN SUITABLE FACTORY SITES. RDO/C GRENALA PLANS A CONCERTED EFFORT TO ASSIST THE GOG AND INDUSTRIAL DEVELOPMENT CORPORATION (IDC) TO DEVELOP THE FREQUENTE SITE AND A COMPLETE STARTER FACTORY SHELL WITHIN SIX (6) MONTHS. THIS PROJECT WILL FUND CONSTRUCTION SERVICES AND COMMODITIES TO INCLUDE ROADS WITHIN THE PARK, UTILITIES, LANDSCAPING AND AN ADMINISTRATION FACILITY. THE PAVING OF ROADS, SITE CLEARING, INSTALLATION OF UTILITIES, LANDSCAPING AND RELATED SITE DEVELOPMENT TASKS WILL BE INCLUDED AS

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CONSTRUCTION SERVICES IN THE ABOVE MENTIONED CONTRACT. CONSTRUCTION OF FACTORY SHELLS AND THE ADMINISTRATION BUILDING WOULD BE CONTRACTED FROM OTHER SOURCES.

7. REGARDING THE PROCUREMENT OF ADDITIONAL GENERATORS, GRENLEC RECENTLY CONTRACTED TRASCO (USING AID FUNDS) TO UNDERTAKE AN ANALYSIS OF ITS GENERATING CAPACITY. FIELD WORK FOR THAT ANALYSIS WAS COMPLETED AT THE END OF OCTOBER. BASED ON OUR DEBRIEFING WITH EBASCO, GRENLEC HAS AN IMMEDIATE REQUIREMENT FOR AN ADDITIONAL 2-3 MEGAWATTS OF GENERATING CAPACITY TO MEET PEAK LOAD DEMAND. THE ADDITIONAL CAPACITY WOULD ENSURE AGAINST LOAD SHEDDING AND WOULD IMPROVE THE INVESTMENT CLIMATE (PARTICULARLY FOR TOURISM AND MANUFACTURING).

8. PROCUREMENT: (A) SPECIFICATIONS FOR THE ASPHALT PLANT ARE BEING PREPARED AND WE INTEND TO CONTRACT WITH AN IQC PROCUREMENT SERVICES AGENT TO UNDERTAKE THE PROCUREMENT. THE PIO/C FOR THE PROCUREMENT WILL BE READY TO GO OUT IMMEDIATELY FOLLOWING OBLIGATION OF FUNDS. (B) THE CONTRACT FOR TECHNICAL ASSISTANCE FOR THE OPERATION OF THE MOUNT HARTMAN AND TELESCOPE QUARRY FACILITIES AND CONSTRUCTION SERVICES WILL BE PROCURED COMPETITIVELY UNDER AID HB 11 PROCEDURES. THE CONTRACT ALSO WOULD INCLUDE THE DEVELOPMENT OF THE FREQUENT INDUSTRIAL PARK SITE. TO ACCELERATE THIS COMPETITIVE PROCUREMENT AND HOPEFULLY HAVE THE CONTRACTOR MOBILIZED IN FEBRUARY, WE WILL BE REQUESTING AA/LAC TO APPROVE A WAIVER OF FORMAL ADVERTISING. TO ENSURE THAT THE MOUNT HARTMAN FACILITY CONTINUE TO OPERATE UNTIL THE NEW CONTRACTOR CAN BE MOBILIZED IN FEBRUARY, RDO/C GRENADA IS EXPLORING THE POSSIBILITY OF EXTENDING THE MOUNT HARTMAN PERSONNEL OF MA UNDER THE AIRPORT OR MENTAL HOSPITAL PROJECT. (C) THE GRENLEC GENERATORS ALSO WILL BE PROCURED COMPETITIVELY. BASED ON EARLIER CONVERSATIONS WITH LAC/DR (ROD MCDONALD) WE WILL BE REQUESTING YOUR ASSISTANCE IN FACILITATING THE PROCUREMENT.

9. COST ESTIMATES FOR THE ABOVE ACTIVITIES ARE FOLLOWS:

COMPONENT		DOLLARS 000
- A. ASPHALT PLANT		800
- B. TECHNICAL ASSISTANCE		
- - AND MATERIALS		2,400
- - (1) MT. HARTMAN QUARRY	(1,600)	
- - (2) TELESCOPE QUARRY	(800)	
- C. CONSTRUCTION SERVICES		2,500
- - (1) FREQUENTE INDUSTRIAL	(500)	
- - - PARK		
- - (2) ST. GEORGES-GRANVILLE		
- - - ROAD	(1,800)	
- - (3) LANCE AUX EPINES ROAD	(100)	

(4) MORNE ROUGE ROAD (44)
(5) ST. GEORGES-RELATED (1[illegible]4)
- ROAD SEGMENTS
(6) CONTINGENCY (15 PERCENT) (3[illegible])
- D. TOTAL 3,000

10. IT IS RDO/C GRENADA'S UNDERSTANDING THAT THE CN DID NOT GO FORWARD IN TIME TO PERMIT OBLIGATION OF AN INITIAL TRANCHE OF DOLS2 MILLION BY NOVEMBER 14. SINCE THE FULL DOLS3 MILLION IS REQUIRED URGENTLY, WE PROPOSE TO INCLUDE THE TOTAL DOLS3 MILLION IN THE SAME PP/AUTHORIZATION/PROAG. WHILE THE ROAD COMPONENT AND ASPHALT PLANT ELEMENTS WOULD HAVE BEEN DEFINED TO AN ACCEPTABLE LEVEL FOR AUTHORIZATION BY NOVEMBER 8, THE ADDITIONAL GENERATOR COMPONENT WILL REQUIRE ANOTHER ONE-TWO WEEKS WITH PP COMPLETION BY NLT NOVEMBER 22 AND OBLIGATION POSSIBLE NLT NOVEMBER 29. AFTER CAREFUL CONSIDERATION AND IN CONSULTATION WITH PIA CARTER, WE STRONGLY BELIEVE THAT THE ON-GOING INFRASTRUCTURE PROJECT IN GRENADA (543-0008) BE AMENDED RATHER THAN CREATE AN ENTIRELY NEW PROJECT. THE ACTIVITIES ARE REASONABLE AND LOGICAL EXTENSIONS OF ACTIVITIES UNDERWAY UNDER

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543-0008 AND WE SEE NO PURPOSE BEING SERVED BY DEVELOPING A NEW PP, AUTHORIZATION AND PROAG. WE WOULD APPRECIATE YOUR REASSESSMENT OF THIS ISSUE AND REQUEST CONCURRENCE TO PROCEED WITH THE ACTIVITIES AS A PROJECT AMENDMENT FUNDED UNDER A NEW PROJECT NUMBER (538-0128).

11. SUBJECT TO THE ADO/C ESF LEVEL THE BALANCE OF FY86 ASSISTANCE TO IMPROVE INFRASTRUCTURE IN GRENADA OF APPROXIMATELY DOLS5 MILLION WILL BE MADE AVAILABLE UNDER THE INFRASTRUCTURE EXPANSION AND MAINTENANCE SYSTEMS PROJECT (538-0138). ANDERSON
ST
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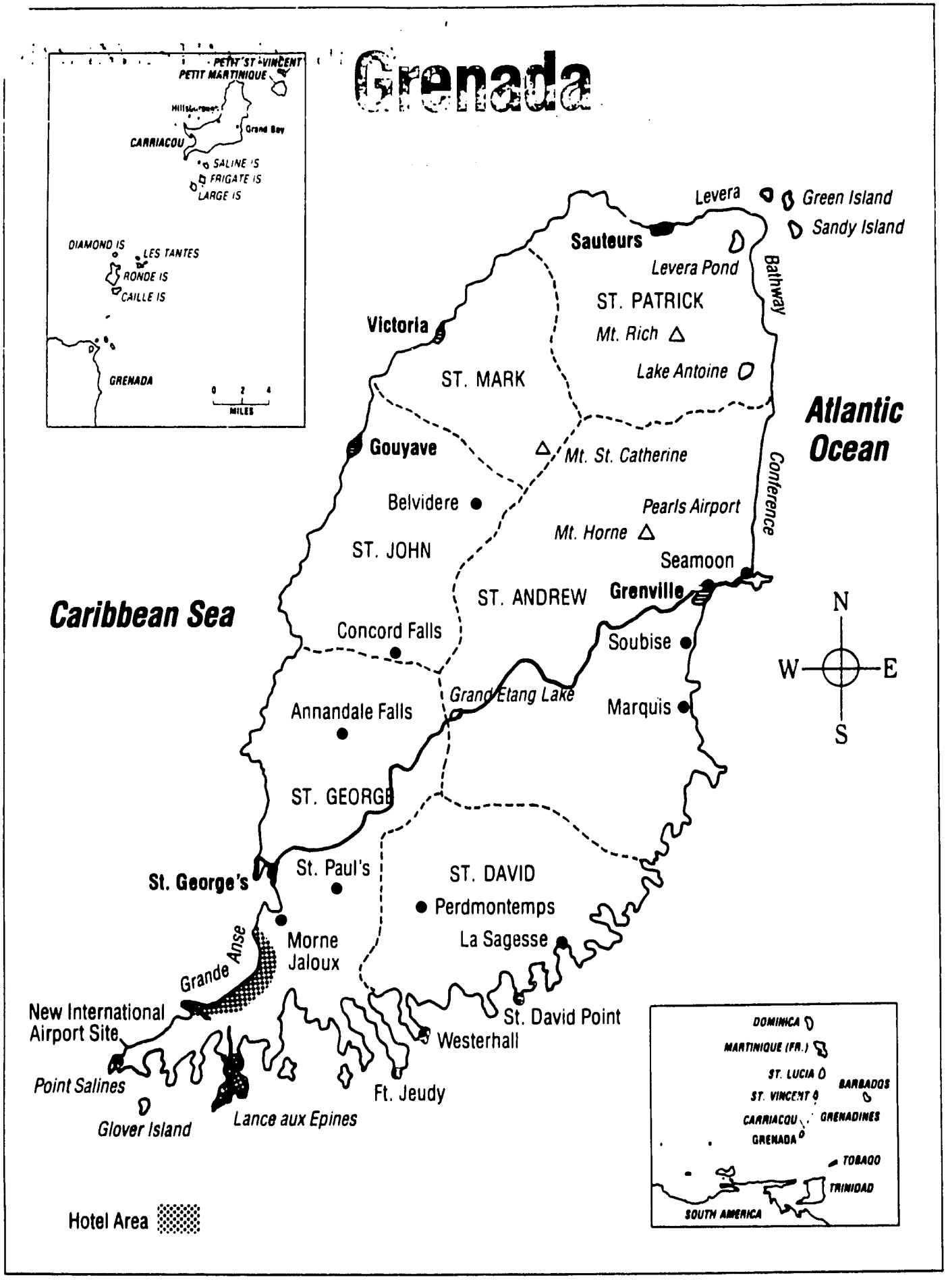
Grenada
PETIT ST. VINCENT
PETIT MARTINIQUE
Grand Bay
CARRIACOU
SALINE IS
FRIGATE IS
LARGE IS
DIAMOND IS
LES TANTES
RONDE IS
CAILLE IS
GRENADA
MILES
Levera
Green Island
Sandy Island
Sauteurs
Levera Pond
Bathway
ST. PATRICK
Mt. Rich
Lake Antoine
Victoria
ST. MARK
Atlantic Ocean
Gouyave
Mt. St. Catherine
Conference
Belvidere
Pearls Airport
Mt. Horne
ST. JOHN
Seamoon
ST. ANDREW
Grenville
Caribbean Sea
Concord Falls
Soubise
N
W
E
S
Grand Etang Lake
Annandale Falls
Marquis
ST. GEORGE
St. George's
St. Paul's
ST. DAVID
Perdmontemps
Morne Jaloux
La Sagesse
Grande Anse
New International Airport Site
St. David Point
Westerhall
Point Salines
Ft. Jeudy
Glover Island
Lance aux Epines
Hotel Area
DOMINICA
MARTINIQUE (FR.)
ST. LUCIA
BARBADOS
ST. VINCENT
CARRIACOU
GRENADINES
GRENADA
TOBAGO
TRINIDAD
SOUTH AMERICA