Economic Development Plan
Fiscal Years 1995-1999, Republic of Palau

Volume II: Capital Infrastructure Projects
Acknowledgements

The preparation of the Economic Development Plan has been a national effort which many individuals contributed to.

All eight Cabinet Ministers supported the Plan preparation assisting by coordinating the contributions from the various Bureaus and Divisions under their responsibility. They are: the Honorable Tommy E. Remengesau (Vice President and Minister of Administration), the Honorable Salvador Ingerekii (Minister of Justice), the Honorable Billy G. Kuartei (Minister of Education), the Honorable Marcelino Melairei (Minister of Resources and Development), the Honorable George Ngirarsaol (Minister of Commerce and Trade), the Honorable Riosang Salvador (Minister of Community and Cultural Affairs), the Honorable Masao Ueda (Minister of Health), and the Honorable Andres Uherbelau (Minister of State).

A working group of key National Government employees representing a wide variety of disciplines helped coordinate the preparation of the Plan. The working group included: Mr. Theodore Aitaro (Special Assistant to the President); Ms. Jennifer Blackman (Assistant Attorney General assigned to Foreign Investment Board), Mr. Huan Hosei (Office of Planning and Statistics), Mr. Richard Mangham (CIP Design/Engineer & Special Assistant to the Minister of Resources & Development), Mr. Richard Minaker (Grants Coordinator), Mr. Ari Nathan (Legal Counsel for the President), Mr. Koichi L. Wong (National Planner); and Mr. Dennis Yamase (Legal Counsel for the Vice President).

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Plan was provided by Dr. Don Townsend, Team Leader for the Master Plan and a number of specialists working with him.

Mr. William Perryclear provided appropriate photographs on extremely short notice with efficiency and graciousness.

The hard work by the Olbiil Era Kelulau, particularly those members delegated to work with the Executive Branch on the Plan, to wit, the Honorable Elia Tulop, Vice Speaker of the House of Delegates; the Honorable Alan R. Seid, Chairman of the House Committee on Ways and Means; the Honorable Harry R. Fritz, Chairman of the Senate Committee on Ways and Means; the Honorable Hersey Kyota, Chairman of the Senate Committee on Infrastructure Development & State; and the Honorable Johnny Reklai, Chairman of the Senate Committee on Resources & Development, was critical to ensuring that the CIP prioritization was expeditiously and effectively agreed on.

Last, but certainly not least, was the energy, intelligence and dedication to preparing this Plan by Mary Wenty Adelbai whose hard work and commitment made it all possible.

Team work has enabled the group to review and interpret data, gather input from diverse backgrounds and analyze a range of viewpoints. The result is an economic development plan that we believe is realistic in both its scope and goals.
Preface

This Plan represents a major milestone in the Republic's development of economic self-sufficiency which is an essential element of nationhood. The Plan is designed to move Palau towards more balanced economic growth throughout the Republic by creating an infrastructure foundation upon which all States can build sustainable economies.

The expansion of the Republic's infrastructure will have the goal of ensuring such infrastructure as: healthy and safe drinking water and sanitation; reliable electrical and communications systems; and appropriate transportation and government facilities. These infrastructure facilities are necessary for the health and well-being of the Palauan people and are essential in order to create a base for private sector development which will lead to economic opportunities and benefits for the Palauan people.

Political autonomy and economic self-sufficiency are the two major components of independence. With the implementation of the Compact of Free Association between the Republic and the United States, Palau will, at long last, be an autonomous member of the international community of nations. With the adoption of an effective program for the use of Compact funds, Palau's goal of economic self-sufficiency is brought one important step closer.

The Republic anticipates implementing the Compact on October 1, 1994. The Compact covers 50 years and broadly defines the nature of political, economic and military relationships between the two nations. Under the relationship of free association, Palau will conduct its own domestic and foreign affairs. The U.S. is given responsibility for defense and security matters. The U.S. Government will also provide annual financial aid during the first 15 years of the Compact subject to certain requirements. Funding for Capital Infrastructure Projects ("CIP") is required to be in conformity with an agreed upon plan.

The legal requirements for the required plan are set forth in the Compact and related agreements. Section 231(a) of the Compact states that:

"The annual expenditure by the Government of Palau of the grant amounts specified in Article I of [Title Two] shall be in accordance with an official national development plan promulgated by the Government of Palau and concurred in by the Government of the United States prior to
the effective date of this Compact. This Plan may be amended from time­
to-time by the Government of Palau.

Article I of Title Two of the Compact describes the various monetary
grants to be provided to Palau by the United States. The Republic of Palau and the
United States have agreed that the "grant amounts" referred to are the adjusted
funds for "capital account purposes" in Section 212(b) of the Compact. A more
detailed outline of the plan is also found at Article VI, Section 461(j) of the
Compact of Free Association in which the required plan is described as:

"A documented program of annual development which identifies the
specific policy and project activities necessary to achieve a specified set
of economic goals and objectives during the period of free association.
Such a document should include an analysis of population trends,
manpower requirements, social needs, gross national product estimates,
resource utilization, infrastructure needs and expenditures, and the
specific private sector projects required to develop the local economy of
Palau."

Although the required plan is alternatively referred to as the "official
national development plan" and/or the "official economic development plan," its
requirements predominately are economic. Accordingly, we refer to the required
plan as the Economic Development Plan ("EDP").

Several years ago, in anticipation of implementation of the Compact, the
Republic promulgated a document known as the First National Development Plan,
or "existing plan" (the "First Plan"). The First Plan is used as an outline for this
EDP. This is in accordance with an agreement between the Republic and the U.S.
which stated that:

"(a) In respect of the National Development Plans promulgated by the
Government of Palau pursuant to Section 231 of the Compact and
paragraph 3 of Article III of the Fiscal Procedures Agreement, the
Government of Palau shall ensure the inclusion in such development
plans of the following information:

(i) current information, including such information adapting the
existing plan to the first 5-year period following the effective
date of the Compact; and

(ii) a list, in priority order, of all capital infrastructure projects, both
for the public and the private sectors, intended by the
Government of Palau to be financed with United States assistance, including all capital infrastructure projects for which obligations were in existence at the commencement of the plan period covered by the first National Development Plan."

(Agreement Concerning Special Programs, May 26, 1989 at Article V(2)(a)).

Two additional facts should be noted in connection with the First Plan. It is the Republic's understanding that the First Plan was approved by U.S. President Ronald Reagan upon its submission to the United States and that the Republic of the Marshall Islands and the Federated States of Micronesia submitted plans substantively similar to Palau's First Plan in structure, content and level of analysis. Those plans were approved by the United States thereby allowing those nations to effectively enter into a relationship of free association with the U.S.

Accordingly, consistent with the legal requirements described herein, Volume I of this EDP updates and revises the First Plan with current information and statistics and makes projections based thereon. A careful analysis is made of the current situation in a number of areas and future trends are projected. Based on the problems and issues identified, general policies and strategies are mapped out. Volume II then provides a prioritized list of Capital Infrastructure Projects which the Republic will use Section 212(b) funds for. Volume II specifically details and prioritizes those ten Capital Infrastructure Projects for which 212(b) funds, as adjusted, will be used and outlines another sixteen projects which such funds could be used for in the event that there are any remaining 212(b) funds after the completion of the first ten projects. The EDP's overall emphasis is on the rational allocation of scarce resources available to the Republic for a maximum sustainable social and economic development of Palau.

The Republic is also currently working with a private firm to draft another plan outlining future development generally known as the "Master Plan." The parameters of the Master Plan, relative to those of the EDP, are quite broad and encompassing. The Master Plan is to "set forth a strategy for the pursuit of economic, physical, and social development" of Palau. In addition to the Master Plan itself, legislation will be prepared to implement the Master Plan, including laws on zoning, building codes, environmental protection, etc. The Master Plan, with its broad scope and implementation process, is not anticipated to be completed until well after the projected date of Compact implementation. To effectuate the wishes of the people of both the Republic of Palau and the United States of America to enter into a relationship of free association as expeditiously as possible, and for the reasons stated above, the Republic has therefore prepared an EDP which satisfies
the requirements of Section 231(a) of the Compact with the understanding that the Master Plan and the EDP will join and work together as a cohesive whole to guide Palau into the twenty-first century.

There is one final, but perhaps most critical, point regarding the EDP. In essence, the EDP is to assure that CIP funds will be expended in a reasonable manner and lay a positive basis for Palau’s future development. Additional requirements for the EDP are merely to create a context which helps demonstrate that such expenditures are, in fact, reasonable. The various projects referred to in Volume II are all appropriate and reasonable projects. Many of these projects are actually extensions of ongoing work which the U.S. has already agreed is appropriate. The projects relate to basic infrastructure in such areas as healthy drinking water and sanitation, reliable electrical and communication and transportation systems, and government facilities. The need for such projects, and their relationship to the health, safety and well-being of the Palauan people, as well as their critical importance to Palau’s future economic development, should be essentially undisputed.

Date  May 12, 1994

Kuniwo Nakamura
President of the Republic of Palau
Economic Development Plan  
Fiscal Years 1995-1999

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This Chapter presents an outline of ongoing and intended Capital Infrastructure Projects (CIP). Section A is a list of ongoing CIP as of June 1, 1994. This helps to place the planned projects listed in the following sections within the context of existing projects. Projects which the Republic intends to fund under Section 212(b) of the Compact of Free Association are summarized in Section B. Additional CIP which are necessary but which will cost above the amount of Section 212(b) funding (approximately $51,885,000 as of October 1, 1994) are listed in a non-priority order in Section C. In the event that projects in Section B are financed from sources other than 212(b) funds, cost less than projected, etc., then "overflow" 212(b) funds will be used for projects listed in Section C.

Some of the prioritized projects require immediate attention due to either the severely deteriorated condition of a critical facility, or to the urgent need for a facility's construction for the public health and well-being. This is the case in projects such as the Koror Sewage Collection System Improvements in which public health is at stake. In the case of the Koror-Airai Road Repair Project, daily deterioration of the surface and sub-surface significantly effects repair costs. In the cases of the Rural Water Systems Projects or the National Power Plants Rehabilitation, lack of water systems adversely impacts the rural population while impending lack of electric power in the capital threatens economic growth as well as the general public welfare.

The project prioritization is in accordance with the terms of an agreement between the United States and the Republic. The prioritization is based on attention to both the benefit to the public well-being of a facility as well as the "time factor" for the replacement of existing facilities, which takes into consideration the useful life still left in that facility.

It should also be noted that Volume I contains some projects, such as docking facilities for a number of States, feasibility studies for various projects, etc. which are not more explicitly detailed in Volume II. This is because these are projects or studies which, although needed, have not as yet had specific funding sources positively identified and which we do not intend to use Compact 212(b) funds, or "overflow" 212(b) funds, for.
A. **ON-GOING CAPITAL INFRASTRUCTURE PROJECTS**  
*(as of June 1, 1994)*

On-going CIP Programs, managed by the Republic of Palau Bureau of Public Works are in different stages of completion, which include both design and construction of projects. Shown below are original project grant amounts, approximate amount of funds expended or obligated to date, and approximate amount of funds "available". Note that "available" funding is somewhat obligated since it is scheduled to be spent on project design or construction, virtually all of which will be in progress before the end of calendar year 1994.

<table>
<thead>
<tr>
<th>Project and Funding Grant Year(s)</th>
<th>Grant Amount</th>
<th>Funds Exp. or Oblig.</th>
<th>Funds Avail.</th>
</tr>
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<tbody>
<tr>
<td>1. Koror-Airai Road Repair Project Phase I (T-227) FY 90, 91</td>
<td>$1,269</td>
<td>$1,269</td>
<td>$0</td>
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<td>2. Palau Rural Water Systems Project (T-209), FY 84, 91, 92, 93</td>
<td>$9,985</td>
<td>$6,611</td>
<td>$3,374</td>
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Limited asphalt surface patching and pot-hole repair on roads in Koror/Airai capital center area. Also repair of airport access road failure and Koror causeway buttress wall. Project completed late 1993.

Design & construction of water systems in rural areas. 16 systems designed, 10 systems either built or under construction. Project for completion of Peleliu system system recently awarded. Bids for additions to Angaur system and new systems for Ngkeklaup and Chol in Ngaraad State to be advertised May/June 1994. Rainwater catchment tank systems to be built in the Southwest Islands of Sonsorol and Hatohobei and Kayangel in mid 1994. System in Ngiwal to be designed starting June 1994. Construction of systems in Ngchesar, Ngardmau, Ngiwal and Imeong, Ngaremlengui will still remain, though funding may allow one of these to be built. Construction on items, which will expend all funds before end of 1994.
Approximately $5 million required to complete project.

3. **Koror Sewage Treatment Plant (STP) Expansion (T-232) FY 93, 94**
   - Design contract to A/E to be awarded May 1994 for expansion of overloaded STP. $500,000 is earmarked for design, $3 million for construction. Design to take 4-6 months, construction to commence by end of calendar 1994. ROP originally requested $6.8 million, hence project will be phased until additional funds acquired.

4. **Koror Wastewater System Improvements (T-224) FY 91**
   - Includes up-date of Wastewater Facilities Plan for $350,000 plus construction of Echang hamlet sewer system to tie into Koror system, for $900,000. Construction bids on Echang opened in March 1994, and construction to start June 1994, Facilities Plan to be completed mid to late 1994.

5. **Koror Wastewater System Deficiencies Repair (T-225) FY 91**

6. **Koror-Babeldaob Bridge Repair (T-226) FY 90, 91, 94**
   - Design and construction repair to bridge that links capital of Koror to Babeldaob Island. 15 year old bridge has sagged considerably in middle. Design is complete and project to be bid May 1994.
Construction to commence about Sept. 1994 which will deplete all funds.

7. **Koror-Airai Water System Improvements (T-231) FY 93**

Design and construction of additional pumps for capital water distribution system as well as stand-by electric power generators. Bid for new pump set for May 1994, generators June/July 1994. Construction for all items underway before end of 1994, which will expend all funds.

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8. **Koror Wastewater System Pump Station Up-grade (T-233) FY 93**

Replacement of worn-out or undersized pumps in 30 "satellite" pump stations throughout Koror sewer system. Design underway, construction to start late 1994, which will use all project funding.

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<td>483</td>
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9. **Koror Electric Power System Improvements FY 93**

Funding to be used for power generation and distribution system up-grade. Project was on hold by TTP/DOI until ROP established a Public Utilities Commission (PUC). Anticipated funds to be released May 1994 due to PUC passage. Funds will be used for new engines for Malakal power plant by late 1994, fully expending all monies.

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10. **Babeldaob & Outer Island School Rehabilitation (T-230) FY 93**

Basic rehabilitation and repair to 17 rural schools. Project completed early 1994. Additional funds required for more, major repairs that are needed.

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11. Koror Jail Renovation Project
   (T-246) FY 91

   Renovation of existing Jail facilities in order to ease jail overcrowding and repair dilapidated structure. First phase; 2nd story to Police Station completed early 1994. Design now underway for complete renovation of prison interior. Design to be completed and project bid May/June 1994. Construction anticipated to commence Aug/Sept 1994, which will complete project and deplete all funds.

12. Palau Classroom Construction
    Project (T-228) FY 91

   Design and construction of two elementary school buildings; 2 story, 4 classroom at Harris and Koror Elementary Schools, and one high school building; 2 story, 8 classrooms at Palau High School, also one bathroom building at Meyuns Elementary School. Construction at Harris Elem., Koror Elem. and Meyuns to be complete May/June 1994. Construction started at Palau High School April 1994, completion set for late 1994. Remaining available project funds to be used for construction of facilities at Airai Elementary School starting May 1994.

13. Koror School Complex Roofing
    Project (T-229) FY 91

   Replacement of leaking roofs at 21 elementary, high school and college buildings within Koror, as identified in 1998 Berger CIP Deficiencies Report. $250,000 of project funds used for renovation of Airai Elementary School main building.

14. Palau International Airport Taxiway
    & Parking Apron Repair (FAA) FY 90

   $ 1,000 $  40 $  960
Design and construction of asphalt surface repair to airport's taxiway and apron. Project is 90% / 10% matching funds with FAA. Design underway, to be complete May 1994, construction to commence Sept 1994, complete in late 1994.

15. Malakal & M-Dock Sewer Extension Projects (EPA) FY 92


| TOTALS  | $26,918 | $12,287 | $14,631 |

Note:

Approximately 54% of the project grants listed in Section C above are listed as "Available Funding" this is somewhat misleading since it is anticipated that close to 100% of these funds will be either expended or obligated, by the award of construction contracts, by the end of calendar year 1994, or early 1995 at the latest.

The actual construction time period required per project is usually about one year, though some difficult projects such as the Sewer Treatment Expansion may require a year and a half. Therefore, since there is some outstanding design work on various projects, it is anticipated that all the projects listed herein as "On-Going CIP" should be complete within the next 2 years. Obviously some projects will be complete before others, though it is anticipated that all of the projects listed above, with current funding, should reach completion by the mid calendar year 1996.
B. **PRIORITIZED PROJECTS (in order of priority)**

1. **Koror Sewage Collection System Improvement**

Expansion and up-grade of wastewater collection system, including additional sewer piping and pump stations, to handle the overloaded Koror system, as well as some of the smaller hamlets within the capital not yet sewered. Wastewater "bottlenecks" will soon limit economic development in Koror, as well threaten public health, especially in the few remaining areas of the capital that are not hooked into the sewage collection system.

2. **Palau National Water Systems Improvement Project**

The project will involve both the construction of four remaining water systems in rural areas, which have been designed under earlier phases of the Rural Water Systems Project, as well as improvements to portions of the Koror-Airai water system which serves the capital center area of Palau.

Included for the rural areas are water systems that serve villages in Ngchesar State, Ngardmau State, Ngiwal State, and Ngaremlengui State. Twelve rural systems have already been built, are under construction, or will be under construction during 1994 as part of this on-going Project to bring safe, dependable potable water to Palau's rural areas.

Improvements for the Capital Center water system center on the up-grade of water quality within the capital, including pre-treatment of water at the treatment plant/pumping station.

3. **National Road Improvement/Repair Project and National Heavy Equipment Control Office and Asphalt Plant**

|$2,500,000$

|$5,000,000$

|$7,885,000$
The project will encompass improvement and/or repair to the National Road and Highway system including roads to be improved on Babylaob and other islands, as well as re-surfacing on the 20 miles of paved roads in the capital center area of Koror and Airai. Included in the improvements for the capital’s roads are correction of drainage and safety deficiencies, widening of traffic lanes and addition of turning lanes in heavy traffic areas. Many of these items proposed are identified in 1988 Berger CIP Deficiencies Report sponsored by DOI/TTPI.

Though part of the project will also involve the purchase of several additional pieces of heavy equipment for National Road construction, its main thrust will be for the establishment of a centralized control office, located on Babeldaob Island for the maintenance and repair of the National Government Road building and other heavy construction equipment.

A new hot-mix asphalt plant will be constructed in order for the Government to be able to carry out proper maintenance on National roads and highways in a timely and economical manner. This facility will serve to protect the huge investment in the transportation infrastructure which will be the backbone of Palau’s post Compact era economic development.

4. **Palau National Power Plants Rehabilitation**

Repair to Malakal Powerhouse and installation of two 4.2 MW generators for Koror area, and installation of new, matching 3.2 MW generator for Aimeliik Power Plant. The Babylaob (Aimeliik) Power Plant’s electricity is being used more for development on Babylaob. These improvements are critical to meeting not only Palau’s near term power needs but also keeping pace with immediate economic development of the Nation. These improvements should provide Palau’s power requirements
through the year 2000, and provide power for the other States on Babeldaob Island that do not have electric power at this writing. Other funding sources are currently paying for the design and construction of new distribution lines throughout Babeldaob Island so that power will be available to these outer States. The funding estimate for this project is considered a minimum amount necessary to adequately address Palau’s near term power requirement as mentioned above.

5. Palau National Gymnasium and Sports Facilities Project

Funding will be used for the construction of a National multi-sports and recreation facility that will also host community functions, such as meetings, graduations, etc. Currently there are no gymnasiums in Palau. This facility will also be critical to Palau’s hosting of the 1998 Micronesian Games. Funding will also be used for the improvement or construction of sports facilities, mainly multi-purpose courts and baseball fields, in several outer States of Palau.

6. New Airport Terminal Construction

The existing airport terminal was poorly constructed and is too expensive to maintain for the safety of tourists or workers. This new terminal will serve the needs of Palau’s tourist industry into the 21st century, with appropriate space and facilities to compliment Palau’s post Compact development. Included will also be several additional parking apron areas for jets and a parking lot for customer vehicles, as well as appropriate navigational aids and airport lighting. While it is the policy of the ROP Government to extend the airport runway in the near future, suitable for larger jets, this task is not included under this funding proposal.
7. **Palau National Education Facilities Renovation, Construction and Equipment Replacement**

Project will address Palau National Elementary Schools in Koror and Outer States, as well as Palau High School, the Ministry of Education main office and Palau Community College. Major renovations will be carried out at Palau Community College for student dormitories, cafeteria, trade shops, laundry, classrooms and administration building. Also, a new two story classroom building and staff housing facility will be built and old or obsolete equipment in the trade shops will be replaced. A new emphasis on creating expanded educational programs in the Tourism Industry, Marine Resources and Agriculture will be instituted. Related landscaping, parking facilities, fencing and outdoor lighting will also be included in order to bring Palau Community College up to a higher standard as an educational institution.

The National Ministry of Education Office complex will be renovated and supplied with new equipment in order to provide better support for outlying schools throughout Palau. New classroom buildings will be constructed at elementary schools in both Koror and outer States. Basketball courts will be built at several outer schools. Schools in Koror will be fenced and at Palau High School a kitchen/cafeteria will be constructed as well as a dormitory to house students from the outer States.

8. **National Health Facilities Improvement Project**

An apartment facility for temporary housing of visiting medical specialists will be constructed for the National Hospital in Koror as well as repair to the old pier behind the hospital in order to receive patients from outer States. A central Babeldaob clinic will be built and existing dispensaries around Babeldaob will be renovated and repaired. Expansion/remodeling work
will take place at the National Hospital for Hemodialysis, Physical Therapy and Mental Health areas.

9. **State Projects**

Each State of Palau has its own unique needs and special projects in which to improve the general living condition of its citizens. It is often most appropriate that the individual States undertake these specialized projects on their own. In most States these projects usually center on constructing piers and docks as well as community buildings for State functions. These projects will be on a scale to involve State-residents in project planning and providing employment opportunity.

10. **Palau National Capital Construction - Phase I**

As mandated in the Palau Constitution, the National Capital must relocate to Babeldaob Island in order to be centrally located and accessible to the population. Land for the National Capital has been designated in Melekeok State. At this time, $2.6 million is available for design of the Capital. This initial phase of the project will construct the basic facilities of the new capital, including offices for the Palau leadership, limited roads and water and wastewater facilities. The project will be on-going, with future funding from other sources to complete the remaining development of the National Capital.

| TOTAL | $51,885,000 |
### C. UNPRIORITIZED PROJECTS

1. Babeldaob & Outer Island School Rehabilitation/Construction $1,450,000
2. Intra-Babeldaob Roads Project $7,700,000
3. Outer Island Electric Power Systems $3,600,000
4. Koror-Airai Water Systems Improvements $3,750,000
5. Babeldaob Electric Power Transmission and Distribution Project $9,950,000
6. Palau National Capital Construction - Phase II $12,500,000
7. Palau National Museum and Library Complex $2,700,000
8. New Palau Prison Facility Project $2,500,000
9. Supreme Court Annex $1,400,000
10. Babeldaob & Outer Islands Police Substations Construction $900,000
11. Ship Purchase/Inter-Island Transportation $1,500,000
12. New Palau High School Construction Project $12,500,000
13. Palau Senior Citizens Center $1,500,000
14. Ministry of Administration Computer Center $2,500,000
15. Relocation and Expansion of Agriculture Station to Nekken, Aimeliik State $600,000
16. New Office Complex for Bureau of Natural Resources and Development, including Marine Resources Division, and Conservation/Entomology Office. $200,000

**TOTAL** $62,250,000

**GRAND TOTAL (Prioritized plus Unprioritized Projects)** $117,135,000
CHAPTER 2
KOROR WASTEWATER SYSTEM

I. PROJECT TITLE
Koror Sewer Collection System Improvement Project

II. LOCATION OF PROJECT
The project shall expand the service area of the Koror Sewer System which is located in Koror State, the governmental, residential, and commercial center of the Republic of Palau.

III. STATEMENT OF NEED
The Koror Sewer System is a public utility operated by the ROP Bureau of Public Works. The existing system consists of over 20 miles of gravity sewers and force mains and 37 sewage pump stations located on the islands of Koror, Arakebesang and Malakal. Wastewater collected by the system is pumped to the Malakal Sewage Treatment Plant (STP) where it is treated and discharged through an ocean outfall.

The system is currently being used by approximately 8,000 people living within the system's existing service area. Additional connections to the system are being made on an on-going basis through a house sewer connection program sponsored by the government.

Due to the topography of the service area, the majority of the system’s gravity sewers are arranged in 34 “satellite” or regional collection areas which empty into their own individual sewage pump stations. These satellite pump stations, and three major sewage pump stations, pump collected wastewater into the main trunk portion of the collection system which then conveys the wastewater to the Malakal STP.

Although the system presently provides service to most of the hamlets located within Koror State, additional satellite systems are needed to serve unsewered areas which have experienced rapid growth and development over the past several years. New satellite systems are needed for the hamlets of Echang, Lower Ngermid, Lower Ngerkesoal, Nigerias, Diberdii, and Ngesaol and the developing commercial areas of Malakal and M-Dock. Short extensions to existing satellite systems are also needed in a few places within Koror State. During the past year, water quality sampling by the Palau Environmental Quality Protection Board has shown coastal waters to be contaminated by raw sewage near several of these areas.
With the exception of the Echang, Malakal and M-Dock systems, funding is now required to complete these additional satellite systems and short extensions to existing systems. The Echang satellite system has been designed and will be constructed with FY-91 funds appropriated by the U.S. Congress/DOI, and supplemented with a portion of "High Priority Water and Sewer Improvement" funds from the FY-1992 CIP appropriation. The Echang sewer system project was advertised for competitive bidding in March 1994 with an anticipated construction start date of May 1994. The project will take approximately 9-12 months to construct.

The Malakal and the M-Dock satellite systems are currently being designed and will be constructed with an FY-1992 grant from the U.S. Environmental Protection Agency supplemented with a portion of the "High Priority Water and Sewer Improvement" funds from the FY-1993 CIP appropriation. Design completion is expected in May 1994, with competitive construction bidding to immediately follow. Construction should commence in July/August 1994, for a 9 month period.

IV. PROJECT DESCRIPTION

The proposed project will provide satellite sewer systems for the rapidly developing areas of Ngermid, Ngerkesoal, Nigerias, Diberdii, and Ngesaol. Short extensions to existing satellite systems in Koror will also be constructed as needed. In general, the work will entail the construction of approximately 15,600 feet of 8" and 10" gravity sewers, 12,150 feet of 2-1/2" to 8" force mains, 82 sewer manholes, 5 small grinder pump stations, 4 medium non-clog pump stations, and 1 large non-clog pump station.

For construction phasing purposes, the project will be broken down into 2 sub-projects as follows: 1) Satellite Sewer Systems Phase III which includes new systems for Lower Ngermid, Lower Ngerkesoal, Nigerias and Diberdii, and extensions to existing satellite systems; and 2) Ngesaol Sewer System.

The project scope includes the performance of project administration, engineering investigation, design, and construction and inspection work. The ROP Bureau of Public Works shall be responsible for the administration and inspection of the project. A major portion of the engineering investigation and design work for the project will be performed by a private architecture-engineering firm to be selected through a competitive negotiation process. However, relatively straightforward systems or system extensions may be designed in-house by the ROP Bureau of Public Works. Project construction will be competitively bid and awarded to local and/or off-island contractors experienced in wastewater facilities construction.
Each of the two phases of the project will take approximately one and a half to two years to complete from initial engineering investigation and design through construction and project acceptance. Both phases may commence concurrently.

V. PROJECT BENEFIT

The project will directly benefit the current and future residents and businesses of Lower Ngermid, Lower Ngerkesoal, Nigerias, Diberdii, and Ngesaol. It will also benefit those residents and businesses located adjacent to proposed extensions to existing satellite systems. Based on a national average of 6 persons per household in Palau, a total of approximately 750 people currently live in these areas. The following information on existing population, households, and businesses in each of these areas was obtained from a recent survey by the Koror State Government:

<table>
<thead>
<tr>
<th>System Location</th>
<th>Population</th>
<th>Households</th>
<th>Businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Ngermid</td>
<td>110</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>Lower Ngerkesoal</td>
<td>62</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Nigerias</td>
<td>68</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Diberdii</td>
<td>62</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Proposed Extensions</td>
<td>245</td>
<td>42</td>
<td>6</td>
</tr>
<tr>
<td>Ngesaol</td>
<td>208</td>
<td>34</td>
<td>3</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>755</strong></td>
<td><strong>126</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

Businesses reported for the residential hamlets of Lower Ngermid, Lower Ngerkesoal, Diberdii, Nigerias, and Ngesaol are primarily small retail outlets with the exception of one car repair shop in Nigerias and two in Ngesaol.

These areas are growing at a faster rate than the rest of Koror State because they are some of the last developable, open areas of land within the State. New construction is currently going on in each of these areas and is expected to continue for the next several years. Consequently, their population is expected to double before the end of the century.

The continued population growth and the resulting sanitary and environmental stresses in these areas have made the provision of satellite sewer systems a necessity. The long term benefits that will result from providing these systems include improved public health, a lessening of the risk of cholera or related epidemics, a reversal of environmental degradation, and a higher standard of living for people living in these areas. These benefits, in turn, will enhance the overall development of Koror State and the Republic of Palau.
Both of the phases of the project will take approximately one-and-a-half to two years to complete. The initial design phase of the project, including solicitation and selection of qualified A/E firms, contract award, design, and Government review is expected to take between 6 and 8 months. Thereafter, an additional 12 to 15 months will be needed to solicit bids, award the construction contract and complete construction and inspection for each project. Assuming commencement of the project by January 1995, both phases of the project should be complete by the end of calendar 1996 or early 1997.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in project administration, construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user's agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The preliminary, total estimated cost of the Koror Sewer Collection System Improvement project (including administration, design, construction, and inspection) is $2,500,000. Project administration and inspection amounts to approximately 6% of construction funding, while contingencies are set at 10% of the construction budget. The first phase of the project will total $1,300,000 for completion of the sewer systems mentioned in the description as "Satellite Sewer Systems - Phase III". The second phase funding requirement will total $1,200,000 for the completion of the "Ngesaol Sewer System". The cost breakdown is as follows:

A. Satellite Sewer Extension - Phase III - FY 1995 Funding

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>$40,000</td>
</tr>
<tr>
<td>Design</td>
<td>$80,000</td>
</tr>
<tr>
<td>Construction</td>
<td>$1,070,000</td>
</tr>
<tr>
<td>Lower Ngermid</td>
<td>$190,000</td>
</tr>
<tr>
<td>Lower Ngerkesoal</td>
<td>190,000</td>
</tr>
<tr>
<td>Ngerias</td>
<td>310,000</td>
</tr>
<tr>
<td>Diberdii</td>
<td>190,000</td>
</tr>
<tr>
<td>Extension of Exist. System</td>
<td>190,000</td>
</tr>
<tr>
<td>Inspection</td>
<td>10,000</td>
</tr>
<tr>
<td>Contingencies</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Project Total</strong></td>
<td><strong>$1,300,000</strong></td>
</tr>
</tbody>
</table>
B. Ngesaol Sewer System - FY 1995 Funding

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Sat. Sewer III</th>
<th>Ngesaol Syst.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>$ 40,000</td>
<td>$ 40,000</td>
<td>$ 80,000</td>
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<tr>
<td>Design</td>
<td>80,000</td>
<td>60,000</td>
<td>140,000</td>
</tr>
<tr>
<td>Construction</td>
<td>$1,070,000</td>
<td>$1,000,000</td>
<td>$2,070,000</td>
</tr>
<tr>
<td>Inspection</td>
<td>10,000</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Contingency</td>
<td>100,000</td>
<td>90,000</td>
<td>190,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$1,300,000</strong></td>
<td><strong>$1,200,000</strong></td>
<td><strong>$2,500,000</strong></td>
</tr>
</tbody>
</table>

**Koror Sewer Collection System Improvements Project**
CHAPTER 3

NATIONWIDE WATER SYSTEM

I. PROJECT TITLE

The Palau National Water Systems Improvement Project which includes continuation of the on-going Rural Water Systems Project (RWSP) and improvements to the Urban Center Water System which serves the Koror-Airai area.

II. LOCATION OF PROJECT

The RWSP project phase is located in the rural areas of Palau, which includes all of the States outside of the capital center area of Koror and Airai. This encompasses virtually all of the island of Babedaoab, as well as the island States of Peleliu, Angaur, Kayangel, Sonsorol and Hatohobei. The phase of the project which addresses the Urban Center Water System is located in the economic and government center of Palau—the States of Koror and Airai.

III. STATEMENT OF NEED

Rural Water Systems Project Phase

The Palau Rural Water Systems Project was tasked with the basic development of potable water systems for Palau's outlying areas. These rural areas include approximately 5,000 people, (1/3 of Palau's population) who are in desperate need of a basic, dependable, and safe water supply. The lack of such facilities retards economic development and threatens the general health and welfare of the citizens.

So far, the Palau RWSP has addressed these needs through the design of most of the rural water systems and the actual construction of over half of these systems. To date, four separate DOI CIP funding grants have contributed to the project. The original DOI FY-1984 project grant of $3.7 million was adequate for the design of 12 large, centralized water systems and several small rainwater catchment tank systems that can be used in smaller, remote villages. Four large central systems were built under the FY-1984 grant, while five villages received rainwater catchment tank systems. These systems were completed by 1990. Another DOI CIP grant in FY-1991, of $2.561 million, has funded the construction of an additional two large centralized village water systems to be completed in June 1994. The most recent CIP grants, $3.224 million in FY 1992 and $.5 million in FY 1993, will be sufficient for the construction of three or four more centralized systems and several rainwater catchment tank systems.
Some of these projects are scheduled to commence in May 1994. In order to complete the remaining systems, or system improvements in Palau's rural areas (some using identical/repetitive designs as other systems), it is estimated that an additional $4 million in funding is required including $3.82 million for construction and $0.18 million for project management, inspection, design and contingency funding.

Koror-Airai Urban Center Water System Project Phase

The Koror-Airai water system serves approximately 13,000 people living in the governmental/commercial center of Palau. Currently, about 3.8 million gallons (3.8 MGD) of water are treated and pumped into the system each day. The main components of the Koror-Airai water system were built between 1978-1990 under various CIP grants administered by the Department of the Interior through the Trust Territory of the Pacific Islands. While these projects have been of great benefit to the ROP, they have not completely addressed the need for a dependable water system infrastructure.

As Palau develops a greater demand upon water resources and water system infrastructure is created. Previous lack of funds for complete system construction has placed the Koror-Airai area in the position of failing to supply adequate, safe and dependable water to the populace. Several recent Japanese grant projects have installed additional main-line piping within the Koror-Airai area. Together with a portion of the funding (about $500,000) from the recent FY-1993 "High Priority Water and Sewer Improvements" DOI CIP grant, the Koror-Airai water system is no longer in the constant "crisis" situation it once was, plagued by "water hours" (periods when the water is off). Still, water quality is quite poor, with insufficient facilities for improvement.

The main problems of the system center around lack of quantity and quality. Near term growth will place a demand on the system that cannot be met at this time. An important factor in improving water quality, is to provide sufficient quantity. The second step in guaranteeing safe water is expanded treatment facilities.

At this time the Koror-Airai Water System has difficulty complying with U.S. Environmental Protection Agency water quality standards. This could result in regulatory action against the utility as well as threaten the health of the populace.

IV. PROJECT DESCRIPTION

Rural Water Systems Project Phase

Funds from the original FY-1984 $3.7 million project grant were not made available to the Republic of Palau to administer the project until a 1986 Project
Grant Agreement (PGA) with the Government of the Trust Territory of the Pacific Islands was executed. The project has continued under the ROP’s administration since that time. The additional FY-1991, FY-1992 and FY-1993 grants have brought the program total to $9.985 million, which has afforded additional project construction.

Initially, the project was divided into two areas; 1) those villages for which a central community water system was appropriate and 2) those villages for which single family rainwater catchment tanks were suitable. Funds were expended to hire an Architectural/Engineering firm to design 12 central village water systems, while the Palau Bureau of Public Works engineering staff initially designed rainwater catchment tank systems for several smaller, remote villages. The same rainwater catchment tank systems have since been designated for additional areas. The centralized water systems employ either surface sources (rivers), deep wells or shallow wells. An exploratory well drilling program was also executed to locate groundwater resources.

Over 200 rainwater catchment tanks have been built to date in five (5) villages. Several more villages have also been identified to receive similar tanks. Tank construction to date has cost about $400,000 which includes materials, transport to remote sites, and labor. The current FY-1992 and FY-1993 CIP grants will contribute to the construction of tanks in several additional remote villages on Babeldao Island as well as the States of Kayangel, Sonsorol and Hatohobei.

**Koror-Airai Urban Center Water System Project Phase**

The Republic of Palau proposes to alleviate the recurring problems in the existing system by expanding and constructing new components to meet current and future water demands.

The work will center on providing additional water sources for the Koror-Airai area, as well as the means to treat and transmit that water to customers. Additional raw water transmission, and treated water distribution lines, will be constructed. New wells and water treatment plant components are also needed.

As proposed in the *Palau Water Preliminary Engineering Report*, prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command, by Hawaii Architects & Engineers, Inc. in 1982, there are several phases of water system expansion that are recommended for the Koror-Airai Water System. The phase of this program was constructed in 1982-1983 under U.S. Navy OICC supervision. The remaining phases outlined in the program, set to take place through the period 1985-1995, have largely remained incomplete, due to lack of funding. The recommendations in this report form the basis of the improvements herein and include:
A. Construction of a new, 100,000 second clearwell at the Water Treatment Plant (WTP): The WTP is the treatment and main pumping station for the Koror-Airai water system. This expansion will double the quantity of water in the clearwell, which supplies water to the pumps, to approximately 200,000 gallons. This expansion also allows for maintenance on the existing clearwell without a shut down in WTP operation.

B. Replacement and up-grading of the chiorination units at the WTP: This will enable proper and dependable disinfection of the water supply.

C. Replacement and up-grading of the existing influent booster pumps at the WTP: Pumps are necessary to deliver raw water to the filters.

D. An additional rapid sand filtration unit at the WTP: This will afford the opportunity to treat a greater quantity of water, as well as allow for maintenance on the four existing filters.

E. New pump at the Gaden River Pump Station: A new pump will be required to replace one of the aging pumps now in operation at this major station.

F. Additional well drilling and development in Airai State: As more of the population expands into Airai State, the abundant groundwater resources of this area must be developed.

G. Additional distribution piping in Airai State is to serve the expanded residential population and business development.

The current working estimate for all proposed water improvements to the Koror-Airai Water System is $1,000,000.

V. PROJECT BENEFIT

The aim of the Palau Rural Water Systems phase of the project is to design and build potable water systems to serve the rural population of Palau, thus providing basic, safe, and dependable water service. This goal is in accordance with the development of the ROP's basic infrastructure as well as providing for the general health and welfare of its rural citizens.

As the Urban Center area of the Republic of Palau aims for increased economic and social development it is essential that basic utilities and infrastructure expand. It is difficult to proceed with development in tourism and light industry without a safe and dependable water system. Therefore, it is essential that this resource be utilized to aid Palau's growth, while maintaining the basic health and well-being of the citizenry.
VI. PROJECT SCHEDULE

Funding for the remaining rural village water systems is anticipated to be applied during a project period over two years, from early 1995 through early 1997. It is anticipated that each of the projects, which will proceed concurrently, will require about 2 years to complete, which includes design up-date (if necessary), competitive bidding, contract award, construction, inspection and final acceptance.

Funding for the construction of improvements to the Koror-Airai water system will be applied over a period of 18 - 24 months. It is anticipated that design of such improvements will commence in early 1995 and require 4-6 months to complete. Construction should start by mid 1995 for 12 - 18 months, which includes competitive bidding, contract award, construction, inspection and final acceptance. Project completion is expected in early 1997.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

All phases of the project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

Rural Water Systems Project Phase

Under the Palau Rural Water Systems phase of the project four central community water systems will be constructed. Work will take place on other systems or rainwater catchment tank systems as funding allows. The total cost of this phase of the project will be $4 million; $3.82 million in construction funds, $0.07 million in administrative and inspection monies, $0.01 million for design up-dates, and $0.10 million in contingency funds. As has been the practice throughout the previous construction, all phases of the project will be competitively bid out to qualified contractors and construction will be administered by the Palau Bureau of Public Works.
CONSTRUCTION COSTS OF REMAINING RURAL SYSTEMS

<table>
<thead>
<tr>
<th>State</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imeong, Ngaremlengui</td>
<td>$820,000</td>
</tr>
<tr>
<td>Ngardmau State</td>
<td>$825,000</td>
</tr>
<tr>
<td>Ngiwal State</td>
<td>$925,000</td>
</tr>
<tr>
<td>Ngchesar State</td>
<td>$1,250,000</td>
</tr>
</tbody>
</table>

Construction Funding Required $3,820,000

Since most of the project’s design work is complete, the design portion of project requires only slight modifications to existing construction plans in which conditions may have changed in the few years since designs were first complete. Administration and inspection amounts total about 2% of construction costs and Contingency is less than 5% of construction costs. The small Contingency amount is due to the repetitive nature of these rural systems which have already been built in several villages. Refer to cost chart below.

Koror-Airai Capital Center Water System Project Phase

Cost estimates from the 1982 Hawaii Architects & Engineers Water System Report form the basis of the following cost breakdown, including a 3% annual inflation rate. Construction costs of specific area improvements are estimated below. In the budget summary, costs for Administration and Inspection are roughly 5% of construction costs, design is about 3.5% of the Construction budget, and Contingencies at roughly 8% of Construction.

<table>
<thead>
<tr>
<th>WTP Improvements</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>New 100,000 gallon clearwell</td>
<td>200,000</td>
</tr>
<tr>
<td>New Chlorinator Units</td>
<td>20,000</td>
</tr>
<tr>
<td>New Influent Booster Pumps</td>
<td>30,000</td>
</tr>
<tr>
<td>New Rapid Sand Filter Unit</td>
<td>150,000</td>
</tr>
<tr>
<td>Gaden River Pump Station</td>
<td>100,000</td>
</tr>
<tr>
<td>New 1400 gpm pump</td>
<td>355,000</td>
</tr>
<tr>
<td>Water Development in Airai State</td>
<td>50,000</td>
</tr>
<tr>
<td>Well drilling in Airai</td>
<td>50,000</td>
</tr>
<tr>
<td>Well development</td>
<td>255,000</td>
</tr>
</tbody>
</table>

Construction Total $855,000

PALAU NATIONAL WATER SYSTEMS IMPROVEMENT PROJECT

<table>
<thead>
<tr>
<th>PROJECT PHASE</th>
<th>RURAL AREAS WATER SYSTEMS</th>
<th>CAPITAL CENTER WATER SYSTEM</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>$ 55,000</td>
<td>$ 35,000</td>
<td>$90,000</td>
</tr>
<tr>
<td>Design</td>
<td>10,000</td>
<td>30,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Construction</td>
<td>$3,820,000</td>
<td>855,000</td>
<td>4,675,000</td>
</tr>
<tr>
<td>Inspection</td>
<td>15,000</td>
<td>10,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Contingency</td>
<td>100,000</td>
<td>70,000</td>
<td>170,000</td>
</tr>
</tbody>
</table>

TOTAL $4,000,000 $1,000,000 $5,000,000
CHAPTER 4
ROAD PROJECT

I. PROJECT TITLE

National Road Improvements/Repair, National Heavy Equipment Control Office, and Asphalt Plant

II. LOCATION OF PROJECT

The Project shall address the improvement/repair of roads in Koror and Airai States, as well as in the rural areas of Babeldaob Island. The National Heavy Equipment Control Office and Asphalt Plant shall also be located on Babeldaob Island.

III. STATEMENT OF NEED

Koror-Airai Road Improvements/Repair

Previous road improvement projects in the Koror-Airai area, collectively called the Palau Roads Project Phases I-IV, were administered by the U.S. Navy Officer in Charge of Construction (OICC). They consisted of approximately 22 miles of asphalt paved primary and secondary roads. This four-phase projects was designed and implemented between 1978 and 1988. The Navy OICC discontinued operations in Palau in mid-1991 and the Republic of Palau has since undertaken the responsibility of administering all major road works.

Over the years, it has become apparent that design and construction related defects exist within the above mentioned 22 miles of roads. This situation was indicated in an October 1988 DOI/TTPI report which identified quality deficiencies in CIP Projects. These defects fall into several main categories: Inadequate Drainage Structures/System; Poor Roadbed Stabilization; Road Potholes; Premature Asphalitic Concrete Pavement Deterioration; Inadequate Roadway Safety Elements and; Inadequate Carrying Capacity.

These items are in need of prompt correction in order to prevent additional and more costly deterioration of the Koror-Airai road system.

Babeldaob Road Improvements/Repair

The continued development of the primary road system between the ten States on Babeldaob Island is one of the Republic of Palau’s most important infrastructure requirements. Such a road system is needed to connect the
States on Babeldaob to the major arterial roadway planned for the island and to each other. The need for both the major arterial road and an interconnecting road system between the States is stressed in the Palau Indicative Development Plan and several subsequent planning studies which state that such a road network is key to the economic development of Babeldaob and of Palau as a whole.

Completion of the primary access road system would facilitate the development of Babeldaob’s large land area and natural resources for housing, agriculture, forestry, hotels and other tourist related projects, commercial and industrial activities, bauxite mining, fisheries and mariculture projects.

National Heavy Equipment Control Office and Asphalt Plant

The Republic of Palau requires the establishment of a Heavy Equipment Control Office to support the road maintenance and construction program in the Koror-Airai area and on Babeldaob Island. This same Office will serve as a central repair/maintenance facility for the ROP’s heavy road construction equipment, which will include dump trucks, cranes, bull-dozers, back-hoes, loaders, graders and rollers. This Office will need to be supplied with the necessary spare parts, tools and maintenance equipment in order to carry out periodic repair services. It is anticipated that this Office will be located on Babeldaob so as to be close to those areas where road construction will be most intense.

A hot-mix asphalt plant of approximately 1 ton per batch capacity will also be constructed at the Control Office site. This facility will be used for both the construction of new paved road sections in Koror and Babeldaob, as well as the repair of existing paved roads throughout the same areas. It is anticipated that well trained Government Force Account Crews can carry out pot-hole repair in an economical and timely manner on National Government roads.

IV. PROJECT DESCRIPTION

Koror-Airai Roads

Inadequate Drainage Structures/System: The existing road storm drainage system is inadequate to carry storm runoff during typical downpours in Palau. This problem frequently results in hazardous flooding of roadways and intersections. This is especially true of the Main Road sections throughout central Koror.

Flooded areas drain slowly allowing water to seep under the pavement and weaken road foundations. Eventually, these drainage problems lead to potholes, settlement and even road failure.
New and or enlarged storm water inlets, catch basins, earthen and concrete drainage swales, gutters, storm drains and outlet structures need to be designed and constructed to correct roadway drainage problems in the Koror-Airai area. Construction of drainage swales runs about $20 per lineal foot, while construction of drainage culverts ranges from $100 to $150 per lineal foot depending on size, type and location. The cost to construct these improvements is estimated at approximately $100,000.

Poor Roadbed Stabilization: Major road damage due to landslides from beneath the roadbed have occurred in several areas. These problems frequently develop during the rainy season, often causing both lanes of the road surface to collapse several feet.

This type of structural failure should be corrected as soon as possible to facilitate safe and efficient traffic flow and to prevent further damage to the roadway in these areas. Repairs require new embankment and road foundation materials up to a depth of 6 feet, as well as embankment stabilization measures such as sheet piling or retaining walls, appropriate drainage structures, and reconstruction of road section. The cost of rebuilding these road sections, including slope reinforcement measures, is estimated at $100,000.

Road Pothole Repair: Further evidence of road stabilization problems such as cracking, minor-to-moderate road settlement, and potholes, can be seen in many different areas scattered throughout the primary road system. Many of these areas were addressed under a recent Palau Road Repairs Project, though many still remain. It will be necessary to saw cut and excavate these areas so that failed road foundations can be replaced. Sub-base and base material will have to be brought in and compacted and the road section repaved and remarked in order to complete the repairs. The cost of addressing these road repairs, which include about 40,000 sq. ft. of road repair, is roughly $200,000. This work must be completed before any resurfacing/overlay commences.

Premature Road Surface Deterioration: Several factors may have contributed to extremely premature deterioration (raveling, cracking and pot-holing) of the pavement surface. These potential factors include deficiencies in the asphalt mix; use of inappropriate aggregate; improper mix designs and/or inappropriate construction methods for local (extremely wet, tropical) conditions; and road drainage problems.

Resurfacing of the roads is required to protect the Koror-Airai road system from further deterioration. All cracks will need to be sealed and potholes patched prior to resurfacing the roads as mentioned above. Depending on the condition of a particular road segment, road resurfacing will involve either a
chip seal surface treatment or an overlay of approximately 1-1/2 inches of asphaltic concrete.

Construction plans and specifications for the correction of badly deteriorated areas and an overall resurfacing of Palau’s road system have already been prepared under the direction of the U.S. Navy/OICC, and are now held by the Palau Government. Estimated construction costs for the chip seal or overlay of the 5 miles of highest priority paved main roads is approximately $1,500,000, including pavement markings.

**Inadequate Roadway Safety Elements** Several sections of the primary road system need improvement in various roadway safety elements such as sight distance, horizontal and vertical alignment, lighting, signing, pavement markings, and roadside barriers (guardrail). In particular, the lack of some of these items has contributed to numerous accidents and excessive traffic fatalities since the completion of the road.

Guardrails are needed along the causeways and other dangerous slopes along the primary road system. The cost of constructing the guardrails and other safety elements is estimated at $250,000.

**Inadequate Carrying Capacity** In addition to the roadway structural deficiencies, it is evident from observation that the present traffic volume and queuing of vehicles during normal working day peak periods, exceeds the capacity of the section of the primary road through the Central Business District area between the Medalaii Intersection (to Meyuns) and the vicinity of the T-Dock intersection. Widening and/or remarking of this section of road for a two way left turn lane and delineating egress and ingress to the abutting properties will significantly improve the roadways effective carrying capacity as well as its safety aspect. The cost to implement these improvements is approximately $100,000.

**Babeldaob Roads**

In its entirety, the Intra-Babeldaob Access Roads phase of this project will eventually entail the design and construction of approximately 45 miles of two lane highway. Where funding is sufficient, it is desired that the road specifications meet FHA and AASHTO design criteria and construction standards based on an appropriate level of service requirements for the various individual road segments.

In most cases, the road alignments will follow the road system constructed by the Japanese before World War II. The funding herein covers improvements to the first 8-10 miles of the project. It is anticipated that this portion of the project will mainly focus on road widening, re-grading, re-capping with dredged coral and construction of drainage swales. The cost to implement
these improvements by the purchase of necessary road building heavy equipment and materials is estimated at $2,575,000.

**National Heavy Equipment Control Office and Asphalt Plant**

This phase of the project will focus on the construction of a National Heavy Equipment Control Office on Babeldaob Island. The purpose of this Office will be to establish a centralized office for the organization and assignment of road working equipment throughout Palau as well as a central area for the repair and maintenance of heavy equipment. The center will be stocked with appropriate tools, equipment and materials in order to maintain the heavy equipment.

The hot-mix asphalt plant that is proposed to be constructed adjacent to the Control Office will be of one ton per batch capacity (approximately 500 tons per day). This plant will support the repair of existing paved roads in Palau, (repair of pot-holes and worn surface courses) as well as the construction of new paved highway sections in the ROP. The plant will be staffed by ROP Government Force Account crews trained in its operation and it will be supplied with necessary equipment and dump trucks to support its functions.

**V. PROJECT BENEFIT**

**Koror-Airai Roads**

The Koror-Airai road system represents a significant financial investment and is critical to the continued social and economic development of the central commercial area of the Republic. The continued dependability of these thoroughfares are required for common transportation and commerce in the Koror-Airai area as well as for the development of the tourism industry that depends upon roads between the airport, hotels and various points of interest within Palau. It is critical that attention be paid to these road repairs in the near future before they deteriorate to levels requiring far greater investment to repair.

**Babeldaob Roads**

The potential development of Babeldaob is enormous. Areas on Babeldaob with the potential for housing, agriculture, cattle raising, aquaculture, forestry, mineral and aggregate mining, hotel resorts and related developments, and other economic activities which are presently inaccessible by land will become accessible upon the completion of the Babeldaob road system. Development of the road system will also facilitate the provision of education programs and health and police services to all the communities on Babeldaob. Furthermore,
fisherman and farmers on Babeldaob will be able to bring their products to the markets in Koror in a more efficient and cost effective manner.

The opening of Babeldaob by a modern road system will induce foreign investors to lease lands and invest in development projects in Palau. Such an influx of investments will serve to help develop the private sector of Palau which in turn will create jobs for the Palauan people and broaden the tax base, whereupon further development of the country can take place.

National Heavy Equipment Control Office and Asphalt Plant

It will be a positive benefit to the ROP to have one centralized office to address the organization, assignment and maintenance of road building equipment. This Office will be located on Babeldaob since it is anticipated that a good majority of the road building activities will take place on that island.

The hot-mix asphalt plant will allow the ROP to immediately address the repair and maintenance of existing asphalt roads so that damaged areas (pot-holes, worn surface course, etc.) do not enlarge and cause extensive damage to the road system, as is now often the case. The asphalt plant will also enable the ROP to commence its own paving of road segments that have been improved.

VI. PROJECT SCHEDULE

Koror-Airai Roads

Funding for the road improvements and rehabilitation mentioned herein is anticipated to be applied over a two year period from early 1995 into 1997. This period will include design, (modifications if necessary since much of the work is complete), competitive bidding, contract award, construction, inspection and final acceptance.

Babeldaob Roads

The ROP has already undertaken construction of sections of the planned road on Babeldaob through Government Force Account crews and Government heavy road working equipment. Since much of the planned Babeldaob roads will follow the old World War II era Japanese roads, limited design is required, and a portion of the design and construction monies will address road stabilization and erosion control. The funding under this phase of the project is expected to be applied over a period of approximately three years, from early 1995 into 1998. Design and/or engineering work will be accomplished by individual sections, hence construction will take place while other parts of the road engineering are still underway.
National Heavy Equipment Control Office and Asphalt Plant

The National Heavy Equipment Control Office and Asphalt Plant will be designed and constructed over a period of approximately 12 months. This will include the purchase of a hot-mix asphalt plant to be installed adjacent to the Heavy Equipment Control Office.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATES

Koror-Airai Roads

The estimated cost to complete the Koror-Airai Road Repairs Project in FY-1995 dollars is shown below. Cost percentages for Administration and Inspection are about 3% of construction cost, with Contingencies at approximately 5%. The small design costs is anticipated mainly as modifications to existing designs, in order to reflect current conditions.

<table>
<thead>
<tr>
<th></th>
<th>Administration</th>
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<th>Construction</th>
</tr>
</thead>
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<tr>
<td>Road Drainage Systems</td>
<td>$ 100,000</td>
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</tr>
<tr>
<td>Road Bed Stabilization</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Road Pothole Repair</td>
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<td></td>
</tr>
<tr>
<td>Road Surface Repair</td>
<td>1,500,000</td>
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<tr>
<td>Increase Vehicle Capac.</td>
<td>100,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road Safety Elements</td>
<td>250,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspection</td>
<td></td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>Contingency</td>
<td></td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,435,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Babeldaob Roads

The cost estimate for this phase of the project, which represents improvements to the first 8 - 10 miles of the roads to be addressed on Babeldaob is $2,575,000. Funding will be used to pay for road building equipment and materials, fuel for Government heavy equipment, Government...
Force Account workers salaries, project management, and design and inspection costs.

**National Heavy Equipment Control Office and Asphalt Plant**

This phase of the project will include the design and construction of the Heavy Equipment Control Office for approximately $275,000. Included in the expenditure of this Office will be the stocking of specialty repair parts, tools and equipment necessary for the heavy road working equipment that will be controlled and maintained at the facility.

A hot-mix asphalt plant of approximately 1 ton per batch capacity will be purchased and constructed at the Heavy Equipment Control Office. The cost of this equipment, including necessary incidental items and dump trucks to support the asphalt plant will be approximately $2,600,000.

<table>
<thead>
<tr>
<th>PROJECT PHASE</th>
<th>Koror-Airai Roads</th>
<th>Babeldaob Roads</th>
<th>Heavy Equip. Office and Asphalt Plant</th>
<th>TOTAL</th>
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<td>$ 45,000</td>
<td>$ 40,000</td>
<td>$ 135,000</td>
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<td>Design</td>
<td>20,000</td>
<td>60,000</td>
<td>20,000</td>
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<td>Constr.</td>
<td>2,250,000</td>
<td>2,250,000</td>
<td>2,750,000</td>
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<tr>
<td>Inspect.</td>
<td>15,000</td>
<td>20,000</td>
<td>15,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Conting.</td>
<td>100,000</td>
<td>200,000</td>
<td>50,000</td>
<td>350,000</td>
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<tr>
<td>TOTAL</td>
<td>$2,435,000</td>
<td>$2,575,000</td>
<td>$2,875,000</td>
<td>$7,885,000</td>
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</table>
CHAPTER 5

ELECTRICAL POWER PLANTS

I. PROJECT TITLE

Palau National Power Plants Rehabilitation

II. LOCATION OF PROJECT

The project is located at the existing Malakal Power Plant on Malakal Island, in the western part of Koror State and at the existing Aimeliik Power Plant in Aimeliik State in the southwestern area of Babeldaob.

III. STATEMENT OF NEED

The project is centered around rehabilitation/improvement to two separate power plants that serve the Republic of Palau. One of the Plants which is to be improved is the Malakal Power Plant in Koror where the installation of two new generators is planned. Two 4.2 Mega-Watt (MW) units are needed to supplement the existing power supply system as well as meet the near term power requirements of the Palau capital center area, through 1999. Power demand after that period will require additional measures to satisfy the demand growth associated with Palau's development.

The second power plant included in the project is the Aimeliik Power Plant on Babeldaob where the installation of one 3.2 MW generator is planned. This engine will be the fifth and final engine to be installed at the Aimeliik Plant and will satisfy its compliment of engines. Alternator, radiator and engine mounting foundation already exist for this engine. This fifth generator will allow the Aimeliik Plant to both supplement electricity to the Koror-Airai area as well as provide power to the rural States of Palau for which new transmission lines are being constructed.

The health, welfare, and progress of the Republic depends upon the availability of reliable electric power, in the Koror-Airai area, which is also the business/economic center of the Republic. Reliable electric power is also needed in the rural States where much of the ROP's post Compact development will take place. Lead time required to acquire generators and construct power plant improvements means that decisions need to be based on long-term forecasts of the future electric load. Timely implementation of these decisions is necessary so that sufficient electric generating capacity is available when it is required by the consumers.
Our power generation forecast takes into account population increases; trends in the residential, commercial and government use of electricity; and planned development projects. The forecast used in the planning of this project is based upon past trends in overall electric power consumption.

**Basis of Planning**

The first step in the forecast of power requirements is the identification of past trends through the analysis of power generation records for the last six years. Trends in average load demand growth, peak load growth, capacity factor, and load factor were identified. Clarification of terminology used in the analysis is outlined below.

**Peak Load**: The highest level of peak power, by kilowatts (KW), generated during the year.

**Peak Loan Demand**: All demands on the system for electric power in excess of the average load.

**Average Loan Demand**: The hourly average of all power generated during one year.

**Capacity Factor**: The ratio of the total amount of power actually produced for the year to the amount of power that could have been produced for the year if the power plant had operated continuously at maximum rated capacity.

**Load Factor**: The ratio of the total amount of power actually produced for the year to the amount of power that could have been produced if the power plant had operated continuously at the annual peak load. This is a rough indicator of the excess generating capacity that is required to serve peak loads. A low load factor indicates a larger need for excess generating capacity.

A review of the Republic’s electric power use trend over the last six years will indicate that the Peak Load grew at a rate of 11%. The Average Load grew at 12% over the same period, while the Capacity Factor increased from 29% to 51% and the Load Factor averaged 71%. (See Tables No. 1 and No. 2 on following pages).

Table No. 1 shows the percent growth in kilowatt hour production over the last six years, as well as the growth in Capacity Factor and Load Factor. Table No. 2 indicates the Peak Load growth for the same six year period.
### ELECTRIC POWER PRODUCTION DATA AND ANALYSIS

#### TABLE 1

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<td>JANUARY</td>
<td>2,764,570</td>
<td>3,124,720</td>
<td>3,275,940</td>
<td>3,775,410</td>
<td>4,128,490</td>
<td>4,434,960</td>
<td>5,083,044</td>
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<td>2,897,670</td>
<td>3,157,906</td>
<td>3,451,060</td>
<td>3,743,900</td>
<td>4,250,605</td>
<td>4,638,390</td>
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<td>MARCH</td>
<td>2,833,320</td>
<td>3,208,510</td>
<td>3,275,830</td>
<td>3,790,220</td>
<td>4,195,060</td>
<td>4,512,029</td>
<td>5,239,230</td>
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<tr>
<td>APRIL</td>
<td>2,297,820</td>
<td>3,179,800</td>
<td>3,336,000</td>
<td>3,859,650</td>
<td>4,410,140</td>
<td>4,575,060</td>
<td>5,237,680</td>
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<tr>
<td>MAY</td>
<td>2,283,110</td>
<td>3,237,780</td>
<td>3,408,431</td>
<td>4,070,560</td>
<td>4,477,220</td>
<td>4,747,290</td>
<td>5,645,670</td>
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<tr>
<td>JUNE</td>
<td>2,327,540</td>
<td>3,103,520</td>
<td>3,273,176</td>
<td>3,657,100</td>
<td>4,316,940</td>
<td>4,642,040</td>
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</tr>
<tr>
<td>JULY</td>
<td>2,455,900</td>
<td>3,220,980</td>
<td>3,357,350</td>
<td>3,923,120</td>
<td>4,341,730</td>
<td>4,837,990</td>
<td></td>
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<tr>
<td>AUGUST</td>
<td>2,735,770</td>
<td>3,320,420</td>
<td>3,508,320</td>
<td>4,076,290</td>
<td>4,395,186</td>
<td>4,965,270</td>
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<tr>
<td>SEPTEMBER</td>
<td>2,835,690</td>
<td>3,284,460</td>
<td>3,453,810</td>
<td>3,932,480</td>
<td>4,336,560</td>
<td>4,924,870</td>
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<td>OCTOBER</td>
<td>3,099,090</td>
<td>3,128,507</td>
<td>3,653,190</td>
<td>4,053,260</td>
<td>4,560,580</td>
<td>5,138,990</td>
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<td>NOVEMBER</td>
<td>3,049,530</td>
<td>3,198,430</td>
<td>3,609,200</td>
<td>3,439,970</td>
<td>4,440,190</td>
<td>5,127,040</td>
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</tr>
<tr>
<td>DECEMBER</td>
<td>3,185,470</td>
<td>3,163,900</td>
<td>3,663,320</td>
<td>4,179,550</td>
<td>4,529,920</td>
<td>5,315,310</td>
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<tr>
<td>TOTAL KWH</td>
<td>32,412,370</td>
<td>38,068,697</td>
<td>40,972,473</td>
<td>46,208,670</td>
<td>51,875,916</td>
<td>57,471,454</td>
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<tr>
<td>DAYS IN YEAR</td>
<td>365</td>
<td>366</td>
<td>365</td>
<td>365</td>
<td>365</td>
<td>366</td>
<td></td>
</tr>
<tr>
<td>HOURS IN YEAR</td>
<td>8760</td>
<td>8784</td>
<td>8760</td>
<td>8760</td>
<td>8760</td>
<td>8784</td>
<td></td>
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<tr>
<td>AVG KWH/DAY</td>
<td>88,801</td>
<td>104,013</td>
<td>112,253</td>
<td>126,599</td>
<td>142,126</td>
<td>157,026</td>
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<td>% GROWTH IN PRODUCTION</td>
<td>17%</td>
<td>8%</td>
<td>13%</td>
<td>12%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAPACITY FACTOR</td>
<td>29%</td>
<td>34%</td>
<td>37%</td>
<td>41%</td>
<td>46%</td>
<td>51%</td>
<td></td>
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<tr>
<td>LOAD FACTOR</td>
<td>65%</td>
<td>72%</td>
<td>78%</td>
<td>71%</td>
<td>73%</td>
<td>69%</td>
<td></td>
</tr>
</tbody>
</table>

| AVERAGE GROWTH IN PRODUCTION | 12% |
| AVERAGE LOAD FACTOR | 71% |
### Table 2

**Peak Load in Kilowatts**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>January</strong></td>
<td>4,900</td>
<td>5,520</td>
<td>6,200</td>
<td>6,530</td>
<td>7,200</td>
<td>7,930</td>
<td>9,050</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td>4,950</td>
<td>5,250</td>
<td>5,900</td>
<td>6,500</td>
<td>7,075</td>
<td>7,800</td>
<td>8,970</td>
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<tr>
<td><strong>March</strong></td>
<td>5,040</td>
<td>5,570</td>
<td>6,000</td>
<td>6,700</td>
<td>7,550</td>
<td>7,600</td>
<td>8,950</td>
</tr>
<tr>
<td><strong>April</strong></td>
<td>5,450</td>
<td>5,750</td>
<td>6,350</td>
<td>6,730</td>
<td>7,900</td>
<td>8,450</td>
<td>9,450</td>
</tr>
<tr>
<td><strong>May</strong></td>
<td>5,150</td>
<td>5,615</td>
<td>6,450</td>
<td>6,920</td>
<td>7,910</td>
<td>8,600</td>
<td>9,750</td>
</tr>
<tr>
<td><strong>June</strong></td>
<td>5,380</td>
<td>5,725</td>
<td>6,200</td>
<td>7,080</td>
<td>7,860</td>
<td>8,660</td>
<td>9,925</td>
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<tr>
<td><strong>July</strong></td>
<td>5,230</td>
<td>5,750</td>
<td>6,150</td>
<td>7,075</td>
<td>7,700</td>
<td>8,390</td>
<td>8,800</td>
</tr>
<tr>
<td><strong>August</strong></td>
<td>4,830</td>
<td>5,900</td>
<td>6,425</td>
<td>7,150</td>
<td>7,840</td>
<td>8,800</td>
<td>9,000</td>
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<tr>
<td><strong>September</strong></td>
<td>5,150</td>
<td>6,000</td>
<td>6,475</td>
<td>7,050</td>
<td>8,100</td>
<td>9,150</td>
<td>9,150</td>
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<tr>
<td><strong>October</strong></td>
<td>5,570</td>
<td>5,800</td>
<td>6,490</td>
<td>7,100</td>
<td>8,100</td>
<td>9,150</td>
<td>9,500</td>
</tr>
<tr>
<td><strong>November</strong></td>
<td>5,650</td>
<td>5,930</td>
<td>6,450</td>
<td>7,350</td>
<td>7,950</td>
<td>9,500</td>
<td>9,925</td>
</tr>
<tr>
<td><strong>December</strong></td>
<td>5,660</td>
<td>5,700</td>
<td>6,425</td>
<td>7,380</td>
<td>7,925</td>
<td>9,220</td>
<td>9,900</td>
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<tr>
<td><strong>Highest</strong></td>
<td>5,660</td>
<td>6,000</td>
<td>6,490</td>
<td>7,380</td>
<td>8,100</td>
<td>9,500</td>
<td>9,500</td>
</tr>
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</table>

**% Peak Load Growth**

- January: 6%
- February: 8%
- March: 14%
- April: 10%
- May: 17%
- Average: 11%
Present Trends

In electric power systems, Peak Load determines the required output capacity of the power plant. Peak Load Demand mandates that the system must be prepared to meet this level of the consumer's power requirements. Failure to do so results in power rationing or possible brown-outs. Therefore, the trend in peak load growth will be used as the basis for the power demand forecast in planning this project.

Understanding the mechanics of the growth in Peak Load is important since the Peak Load requirements dictate the output capacity of power plant that is required. By controlling or shifting electric power demands, the Peak Load can be reduced. Looking at load demand variations over a 24 hour period, it can be seen that from 8:00 a.m. to 10:00 p.m., power is consumed in excess of the Average Load Demand. From 10:00 p.m. to 8:00 a.m. power is consumed below the Average Demand Load. (See Figure No. 1 on following page).

Since 1988 the growth in Peak Load, over the previous year, has ranged from 6% to 17%. (see Table No. 2). This is a wide variation in annual Peak Load growth, but when averaged over the past six years, peak load growth is roughly 11%. In 1990, 1991, and 1992 the Peak Load growth was 14%, 10%, and 17% and Average Load growth was 13%, 12%, and 10% respectively. Over this most recent three year period, the Average Load growth was 12%, and the average annual Peak Load growth was over 13% (see Table No. 2). This recent trend of Peak Load growth was used as the basis for the Peak Load forecast to the year 2000.

Table No. 3 and Figure No. 2 indicate the ratio of Average Load growth versus Peak Load growth during the subject six year term.

IV. PROJECT DESCRIPTION

The improvements outlined herein are scheduled and designed to meet the Republic’s predicted future Peak Load Demands through about the year 1998 with a reliable electric power supply. The main improvements included herein are the installation of two 4.2 MW power generation units at the existing Malakal Power Plant, along with necessary improvements to the plant facility to house the generators, and the installation of one 3.2 MW power generation unit at the existing Aimeliik Power Plant. In Malakal, it is recommended that the new generators be placed at the existing Malakal Power Plant due to its proximity to the Koror area; the area where the power demand is greatest. In Aimeliik, an engine mounting foundation already exists in the powerhouse to receive this engine.
EXAMPLES OF SYSTEM LOAD DEMAND VARIATIONS OVER A 24 HOUR PERIOD

AVERAGE LOAD LINE 7050 KW
TABLE 3
AVERAGE KILOWATT LOAD

<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>JANUARY</td>
<td>3,716</td>
<td>4,200</td>
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<td>5,074</td>
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<td>MARCH</td>
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<td>6,381</td>
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<td>JUNE</td>
<td>3,233</td>
<td>4,310</td>
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<td>JULY</td>
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<td>AUGUST</td>
<td>3,677</td>
<td>4,463</td>
<td>4,715</td>
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<td>SEPTEMBER</td>
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<td>OCTOBER</td>
<td>4,165</td>
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<td>NOVEMBER</td>
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<td>DECEMBER</td>
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<td>AVG KW LOAD</td>
<td>3,700</td>
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<td>5,921</td>
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<tr>
<td>% LOAD GROWTH</td>
<td>17%</td>
<td>8%</td>
<td>13%</td>
<td>12%</td>
<td>10%</td>
<td></td>
<td></td>
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<tr>
<td>% PEAK &gt; AVERAGE</td>
<td>53%</td>
<td>38%</td>
<td>39%</td>
<td>40%</td>
<td>37%</td>
<td>45%</td>
<td>12%</td>
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</table>
V. PROJECT BENEFIT

Providing reliable electric power to the Republic’s governmental and business center and to developing rural areas is one of the highest priorities of the National Government. It is a necessary component of all future development and the foundation of all future economic growth. Reliable electric power is a requirement for water systems, health care systems, and telecommunications systems. It is critical to the construction industry which will build and maintain Palau’s transportation system. Providing a reliable electric power supply requires that reserve electric power generating capacity is maintained at all times. This reserve capacity is needed for unexpected loss of a generating unit; load growth exceeding the load demand forecast; delays in completion of generator installation or overhauls; and any other unforeseen circumstances. Failure to maintain this reserve electric power generating capacity will likely result in power rationing or possible brown-outs. Please refer to Figure No. 3 on the following page for Peak Load Demand Forecast.

VI. PROJECT SCHEDULE

The two phases of the project at the Malakal Plant and the Aimeliik Plant will take approximately 18-24 months to complete. The initial design phase of the project, including solicitation of technical proposals from qualified A/E firms, A/E selection, contract award, project design, and government review is expected to take about 9 - 12 months. Thereafter, an additional 9 - 12 months will be needed to solicit bids, award the construction contract and complete project construction and inspection.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works in conjunction with the Public Utilities Corporation (PUC). Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection in conjunction with the PUC. Responsibilities of the implementing agency also include any necessary land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.
ELECTRIC POWER PRODUCTION DATA AND ANALYSIS

Figure No. 2

AVERAGE LOAD GROWTH VS PEAK LOAD GROWTH

% PEAK LOAD HIGHER THAN AVERAGE LOAD

MEGAWATTS

YEAR


53 % 38 % 39 % 40 % 37 % 45 %

AVERAGE LOAD GROWTH PEAK LOAD GROWTH
Figure No. 3

PEAK LOAD DEMAND FORECAST

MEGAWATTS

1990 91 92 93 94 95 96 97 98 99 2000

YEAR
VIII. PROJECT COST ESTIMATE

The estimated cost of the Palau National Power Plants Rehabilitation Project, including administration, design, construction and inspection is $8.5 million. Estimated costs for administration, design and inspection are only 5% of the project construction costs, due to the fact that engines are to be installed at existing facilities/powerhouses (requiring modifications) rather than considering the construction of completely new facilities. Contingency funds are budgeted at about 7% of Construction monies, which should be sufficient to cover unforseen items during the project period.

<table>
<thead>
<tr>
<th>PROJECT PHASE</th>
<th>MALAKAL POWER PLANT</th>
<th>AIMELIUK POWER PLANT</th>
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<td>Design</td>
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<td>5,000,000</td>
<td>2,600,000</td>
<td>7,600,000</td>
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<td>Inspection</td>
<td>40,000</td>
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<td>90,000</td>
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<tr>
<td>Contingency</td>
<td>300,000</td>
<td>220,000</td>
<td>520,000</td>
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<td><strong>TOTAL</strong></td>
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<td><strong>$3,000,000</strong></td>
<td><strong>$8,500,000</strong></td>
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</tbody>
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PALAU NATIONAL POWER PLANTS REHABILITATION PROJECT
CHAPTER 6
SPORTS FACILITIES

I. PROJECT TITLE
Palau National Gymnasium and Sports Facilities Project

II. LOCATION OF PROJECT
Koror-Airai Capital Center, Republic of Palau

III. STATEMENT OF NEED
Currently, the Republic of Palau has no permanent complex for indoor athletic competition, related activities and large social or community functions. While outdoor basketball/volleyball courts exist throughout Palau, these are not always suitable for major sporting activities due to the frequent rainfall in Palau.

The establishment of a recreation/athletic program for the youth of Palau is seen as one of the National Government’s highest priorities. In order to establish such programs for Palau’s citizens, a suitable gymnasium is required. Such a facility is also needed for the Republic’s hosting of the next Micronesian Games in 1998.

In addition to meeting the requirements for an athletic facility, the ROP needs a large civic center type of building in which public meetings, high school graduations, cultural events and conventions may be held indoors protected from the weather.

The project will also include the construction of additional multi-purpose outdoor courts and ball fields in several of the States of Palau.

IV. PROJECT DESCRIPTION
The Republic of Palau proposes to provide improved cultural and recreational resources for its citizens by designing and constructing a multi-purpose complex to adequately house athletic events, and community, social and public meetings and other activities.

This athletic/civic center complex will be located in the urban center area and will be designed to feature traditional motifs and structures with appropriate...
modern technology and methods. The new center will serve as a focal point for community activities including multi-sports functions. This will be the first such facility in Palau and it is anticipated that virtually all the citizens of the Republic will be able to share in its use through participation in athletics or community/cultural activities. This facility will also be available for business/government conventions for groups throughout Micronesia, which raises the potential of increased tourist revenues in Palau's private sector.

As mentioned previously, several of the States will receive outdoor multi-purpose athletics courts and ball fields under this project in order to contribute to their youth recreation programs.

V. PROJECT BENEFIT

The Palau National Gymnasium and Sports Facilities Project will be of immense social and recreational benefit to all the citizens of Palau by providing a facility that can host athletic events as well as cultural/civic activities. While the main function of the facility will be to function as a centralized athletic center, it is anticipated that it will also host school graduations and community meetings. Also, the possibility for conventions to be held at the same facility raises the potential for additional tourist income to the Republic. Since such a multi-purpose facility does not yet exist in Palau, it is of great importance that this National Center be constructed.

VI. PROJECT SCHEDULE

It is anticipated that funding for the Palau National Gymnasium and Sport Facilities Project will be expended over a period of two years.

The project will take approximately 6-9 months for design/engineering. Another 12-18 months will be required to complete competitive bidding, contract award, materials procurement, construction, inspection and final acceptance. Assuming that project funding is obtained by early 1995, design/engineering work should be complete after mid 1995 when construction will immediately commence. Barring unforeseen delays construction should proceed through the remainder of 1995 and into 1996, with project completion realized by the end of calendar year 1996.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering
Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user's agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs based on FY 1995 dollars. The Administration and Inspection amounts total about 3% of Construction costs. Design is roughly 6% of the Construction budget and Contingencies are added at roughly 5% of the Construction amount.

<table>
<thead>
<tr>
<th>NATIONAL MUSEUM, ARCHIVES, AND LIBRARY COMPLEX CONSTRUCTION PROJECT</th>
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</thead>
<tbody>
<tr>
<td>PROJECT PHASE</td>
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<tr>
<td>----------------</td>
</tr>
<tr>
<td>Administration</td>
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<tr>
<td>Design</td>
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<tr>
<td>Contingency</td>
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<tr>
<td><strong>TOTAL</strong></td>
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CHAPTER 7
AIRPORT

I. PROJECT TITLE
New Airport Terminal Construction

II. LOCATION OF PROJECT
Palau International Airport, Airai State

III. STATEMENT OF NEED
The existing Palau International Airport Terminal does not meet the needs of the Republic. The terminal has had a number of structural problems and must be repaired on a constant basis.

The Republic has a thriving tourist industry that will continue to grow in the post-Compact era. New hotels are planned or are being constructed in the capital center and will soon appear in outlying areas. Projections of tourism growth indicate that this sector will be a driving force behind Palau's future revenues through tourist spending and private sector/facilities taxation. It is also predicted that at least one new airline will commence service to Palau in the future.

All these indicators point to the ROP's need of a structurally sound, economical to maintain and modern new International Airport Terminal. This new facility will serve Palau's international air transportation needs well into the 21st century with appropriate facilities for airline service and space rental for airport vendors.

IV. PROJECT DESCRIPTION
It is anticipated that the new airport terminal will be constructed across the parking lot from the old existing terminal. The new facility will be two stories, with approximately 30,000 square feet of area per floor; for a total area of 60,000 square feet. Included in the new building will be appropriate Government offices. Adequate space will be provided for airline services. Sufficient space will be provided for the aircraft that service the tuna fishing industry and the smaller ones that serve as commuter transportation within Palau. Rental space will be provided for restaurant and snack bar operations, car rental agencies, etc.
Construction of the airport terminal will take into account traditional designs and environmental concerns in order to best fit Palau's culture, location and climate. Appropriate modern technology will supplement the design and construction in order to complete a facility that will be of the greatest use and appreciation by the traveling public community.

As part of the expansion and construction of airport facilities, it will be necessary to construct at least two additional concrete pads to serve as parking aprons for large aircraft. The parking lot for airport customer vehicles will be re-configured, and appropriate navigational aids and runway lighting will be up-graded as required.

While it is the policy of the National Government to eventually extend the airport runway to accommodate wide-bodied aircraft utilized in international flights, this task is not included under this construction plan.

V. PROJECT BENEFIT

As the Republic moves into the post-Compact era, it is critical that national facilities exist and function in such a way as to contribute to the new nation's image as well as to its revenue base. The new airport terminal will be the focus of international travelers into Palau. Palau's spectacular environment and natural beauty already draw tens of thousands of visitors a year and this number will certainly grow.

The specific economic benefit that will be derived when the Republic constructs this new airport terminal to serve Palau's visitors will be based upon increased revenues from space rental at the terminal, fees paid by airlines that use the facility, tourist dollars spent on local businesses and taxation by the Government on this increased commerce.

VI. PROJECT SCHEDULE

Funding for the New Airport Terminal Construction Project will be expended over a period of 18-24 months. It is anticipated that the design portion of the project will take approximately 6-9 months and is scheduled to be completed by late 1995. This phase will include tasks performed by a qualified A/E firm, extensive field investigations, and the preparations of final plans and specifications. After the design portion is complete, the construction portion of the project is expected to continue for approximately 12 to 15 months. This phase of the project includes the competitive bidding and award of the project, actual construction, inspection and final acceptance. Construction should take place upon the completion of the design phase and will continue through to the end of 1996 and possibly into early 1997. After which airport operations will be transferred to the new
terminal facility and the old one will then be torn down making rooms for two additional aircraft parking aprons.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include any necessary land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user's agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The project cost estimate for the New Airport Terminal Construction Project is shown below. Administration and Inspection funds are budgeted at approximately 3% of the Construction amount, Design is scheduled at about 5% of the Construction allotment, and Contingencies are set at roughly 10% of the Construction budget.

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<tr>
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<tr>
<td>Design</td>
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<td>Construction</td>
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<td>Inspection</td>
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<td>Contingencies</td>
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CHAPTER 8
EDUCATION FACILITIES

I. PROJECT TITLE

Palau National Education Facilities Renovation, Construction and Equipment Replacement Project

II. LOCATION OF PROJECT

Palau Community College, Palau High School, and Elementary Schools in different States

III. STATEMENT OF NEED

This project will address many areas of the Palau National Education System which are in great need of attention. Included will be Palau National Elementary Schools in Koror and other States, as well as Palau High School, the Ministry of Education main office and Palau Community College. Major renovations are required at Palau Community College for student dormitories, cafeteria, trade shops, laundry, classrooms and administration building. This work must be done before these facilities deteriorate beyond usefulness. Also, a new two story classroom building and staff housing facility needs to be built and old or obsolete equipment in the trade shops must be replaced. A new emphasis on creating expanded educational programs in the Tourism Industry, Marine Resources and Agriculture with appropriate facilities is to be instituted to keep pace with Palau’s post-Compact development. Related landscaping, parking facilities, fencing and outdoor lighting must also be included in order to bring Palau Community College up to a higher standard as an educational institution.

The Ministry of Education Office complex is in desperate need of renovation if it is to continue to serve the schools throughout Palau. It must also be supplied with new equipment in order to provide better support for national education system. New classroom buildings must be constructed at elementary schools in both Koror and other States. Basketball courts need to be built at several outer schools. Schools in Koror will be fenced and at Palau High School a kitchen/cafeteria should be constructed as well as a dormitory to house students from the other States.
IV. PROJECT DESCRIPTION

Palau Community College Improvements

Renovation of Major Buildings/Facilities includes a Cafeteria, 4 Dormitories, 5 Industrial Shop Buildings, Business Education/Library Building, and 2 General Education Classrooms. Many of these buildings have leaking roofs and rusting or rotting structural components. Approximate cost is $750,000.

New Classroom Construction: a new 2-story, 10 classroom building is needed to provide additional classrooms, faculty offices and conference room. Approximate cost is $300,000.

Replacement of Equipment: new equipment are required in the industrial classrooms/shops, cafeteria and multi-media center. Approximate cost is $500,000.

New Laundry Facility: facility to serve student population, includes new building and equipped with laundry equipment. Approximate cost is $30,000.

Parking Facilities, Landscaping, Fencing and Lighting: these facilities are required to accommodate staff/student/visitor vehicles, improve the appearance of the campus, and provide security for students, staff, visitors and property. Approximate cost is $100,000.

New programs in Tourism, Marine Resources and Agriculture: these are new curriculum programs that will reflect the areas in which Micronesian students will have greater opportunity for future employment. Approximate cost is $1,000,000.

Staff Housing: housing/apartments are needed for instructors and other College employees. Approximate cost is $500,000.

Palau Community College sub-total is $3,180,000. This cost estimate includes project administration, design, construction, inspection and contingency amounts.

Palau Ministry of Education

Ministry of Education Office: the main Ministry of Education office is old and dilapidated with a leaking roof. Offices within the building are crowded. Major renovation of the office is required. Cost estimate is $300,000.

Classroom Construction: new 2-story, 4-classroom buildings are proposed for Harris Elementary School, Koror Elementary School and Aimeliik Elementary School, as well as renovation of one classroom building at Palau High School. Cost estimate is $750,000.
School Campus Fencing: fencing is planned to be installed at Palau High School, Koror Elementary School, Harris Elementary School and Meyuns Elementary School for security of students and property. Cost estimate is $150,000.

Sport Facilities: multi-purpose sports courts are planned at elementary schools in Kayangel, Angaur, Ngeremlengui and Aimeliik. Cost estimate is $120,000.

Palau High School Cafeteria and Dormitory: construction is planned for a kitchen/cafeteria at Palau High School to serve all students and for a dormitory to house students from Babeldaob and the other States. Cost estimate is $1,500,000.

Palau Ministry of Education sub-total is $2,820,000. This estimate includes costs for project administration, design, construction, inspection and contingencies.

V. PROJECT BENEFIT

In order that young Palauans may receive an appropriate education and learn useful skills in order to be able to participate in the development of a post-Compact era Palau, it is necessary that the Republic’s education system be brought up to a higher standard. The improvements included under this project will have a positive effect on the lives of students from elementary school, through high school and to the college level.

Funding spent on the improvement of educational facilities will influence the whole population of Palau for many future generations to come. These improvements will directly impact the higher education preparedness of those Palauan students that travel off-island to continue their education, as well as the employment opportunities open to every young Palauan as they complete their education.

VI. PROJECT SCHEDULE

The design portion of the project is scheduled for approximately 9 - 12 months, due to the large number of separate facilities to be designed throughout Palau. This phase will include tasks performed by a qualified A/E firm or Public Works Design/Engineering Staff including extensive field investigations, and the preparations of final plans and specifications. After the design work is complete, the construction portion of the project is expected to continue for approximately 18 to 24 months at the various locations in Koror, Babeldaob, Peleliu, Angaur, Kayangel and the Southwest Islands. This phase of the project includes the competitive bidding and
award of the project(s), actual construction work, inspection and final acceptance of the project(s).

Design should be complete by early 1996, when construction will commence at the various sites. Construction should take place throughout 1996 and 1997. Considering that construction will be on-going throughout the Republic, it is anticipated that projects at different locations will reach completion at different times through 1997. The overall project should be fully complete by early 1998.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The project cost estimate for the first phase of the Palau National Education Facilities Renovation, Construction and Equipment Replacement Project is shown below. Administration and Inspection funds are budgeted at approximately 3% of the Construction amount, Design is scheduled at about 5% of the Construction allotment, and Contingencies are set at roughly 10% of the Construction budget.

<table>
<thead>
<tr>
<th>PROJECT PHASE</th>
<th>FUNDING TOTAL</th>
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**PALAU NATIONAL EDUCATION FACILITIES RENOVATION, CONSTRUCTION AND EQUIPMENT REPLACEMENT PROJECT**
CHAPTER 9
HEALTH FACILITIES

I. PROJECT TITLE
National Health Facilities Improvement Project

II. LOCATION OF PROJECT
Palau National Hospital and Community Health Center in Koror and State Dispensaries in all the States of Palau

III. STATEMENT OF NEED
For many years the medical treatment and health care available to the citizens of Palau has been generally sub-standard. Thanks in large part to the completion in December 1992 of the new U.S. funded Belau National Hospital, health care has significantly improved.

However, there still remains a need for expanded health care and medical coverage of the population. This is especially true in the rural areas of Palau where there has been less improvement of medical facilities. It is often difficult for the rural population to travel or even relocate in Koror in order to receive emergency medical treatment and routine health care. In preparation for the growth and development planned for Palau’s post-Compact era, including the growth expected in the tourism industry, the need for additional health care facilities in both urban Koror and rural areas will be greater than before.

The Belau National Hospital, while a new facility, requires several modifications that are specific to the needs of a health care facility in Micronesian. Included with these modifications/improvements are the construction of apartments for temporary housing of visiting medical specialists, re-construction of the pier behind the Belau National Hospital to receive patients by boat from other States, and the remodeling/expansion of several areas within the Hospital which receive larger patient loads than originally anticipated.

IV. PROJECT DESCRIPTION
In order to address the general health and medical requirements of Palau’s population, as well as for the growing tourist industry, the following sub-projects are planned for construction in Koror and other States. These
projects will be administered and staffed by the Republic of Palau Ministry of Health upon completion.

Each sub-project will be administered by the Palau Bureau of Public Works Design/Engineering staff. Design will be either performed "in-house" by Government staff or contracted out to qualified A/E firms where appropriate. The sub-project cost estimates below include costs for project administration, design, construction, inspection and contingencies.

A. Central Babeldaob Medical Clinic: This centralized clinic, with approximately 15 beds, will serve the Babeldaob population, providing first medical aid to accident victims as well as preventive, primary and certain secondary health care services for patients in Babeldaob. It will be far easier and less costly for such patients to use this facility, closer to their homes. Approximate budget is $1,600,000.

B. Renovation/improvement of State Dispensaries (excluding Koror and Airai): Each State of Palau has a dispensary to handle basic medical treatment. Most of these dispensaries are in dilapidated condition requiring major repairs to the structure as well as needing new health care equipment. Cost estimate is $650,000.

C. Apartment facility of 4-6 units to serve as temporary housing for visiting medical specialists: Currently no available housing exists for visiting medical specialists: This facility will house such personnel for short, though critical, visits they make to Palau. Cost estimate is $300,000.

D. Reconstruction of the old pier behind the Belau National Hospital in order to receive patients by boat during all tide conditions: This pier is a Japanese World War II era facility which requires major reconstruction. It is critical in order to receive patients that arrive by boat from Babeldaob, Kayangel, Peleliu and Angaur as well as diving accident victims. Cost estimate is $350,000.

E. Expand treatment areas, at the National Hospital in Koror, for the Hemodialysis and the Physical Therapy units: Also, expand the area at the Community Health Center in Koror for additional clinic, diagnostic and administrative work space. Cost estimate is $300,000.

F. Remodel the Psychiatric Ward and the Behavioral Health areas at the National Hospital in Koror. Cost estimate is $200,000.
V. PROJECT BENEFIT

The benefit to be received by the population of Palau through the implementation of this project is the obvious improvement and expansion of health care facilities. This project will accord medical treatment and health care to more patients and will help to ensure that the health care provided is of good quality.

As Palau develops through the implementation of the Compact, health care delivery and medical treatment facilities continue to be improved. The expected influx of tourism during the post Compact era, especially those involved in SCUVA diving activities, requires that Palau be prepared to offer modern medical treatment to all visitors. Improvement of health care and medical treatment facilities are a sensible and critical foundation to the growth of any nation.

VI. PROJECT SCHEDULE

Project design should require approximately 9 - 12 months, due to the large number of separate facilities to be improved throughout Palau. This phase will include tasks performed by a qualified A/E firm or Public Works Design/Engineering Staff including extensive field investigations, and the preparation of final plans and specifications. After the design work is complete, the construction portion of the project is expected to continue for approximately 18 to 24 months at the various locations in Koror, Babeldaoob, Peleliu, Angaur, Kayangel, Hatoboei and Sonsorol. This phase of the project includes the competitive bidding and award of the project(s), actual construction work, inspection and final acceptance of the project(s).

Design should be complete by early 1996, at which time construction will commence at the various sites. Construction should take place throughout 1996 and 1997. Considering that construction will be on-going throughout the Republic, it is anticipated that projects at different locations will reach completion at different times through 1997. The overall project should be fully complete by early 1998.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of
appropriate personnel within the user's agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The project cost estimate for the National Health Facilities Improvements Project is shown below. Administration and Inspection funds are budgeted at approximately 3% of the Construction amount, Design is scheduled at about 4% of the Construction allotment, and Contingencies are set at roughly 10% of the Construction budget.

<table>
<thead>
<tr>
<th>PROJECT PHASE</th>
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CHAPTER 10

STATE PROJECTS

I. PROJECT TITLE

State Projects

II. LOCATION OF PROJECT

In each of the 16 individual States of the Republic of Palau

III. STATEMENT OF NEED

Each State of the Republic of Palau has its own unique needs, and special projects are to be designed to meet these needs and to ensure the improvement of the general living conditions of its citizens.

It is often most appropriate that the individual State undertake these specialized projects, essentially at their own initiative and direction, though with support and guidance from the National Government. The National Government will also be training individual State’s personnel to administer small scale infrastructure projects, from design management through construction inspection and final acceptance.

All of Palau’s States, (except Koror and Airai though they will still take part in the project), have limited and/or deteriorating infrastructure. Essential items which dramatically need improvement include docks and piers, State office buildings, community buildings, athletic facilities, and roads and water systems. Even though the National Government will still be responsible for major infrastructure projects within the States, it is hoped that through these projects the States will achieve a greater level of autonomy and self-sufficiency, thereby reducing their dependence on the National Government.

IV. PROJECT DESCRIPTION

The Republic of Palau proposes to provide improved infrastructure resources for its citizens by assisting the States of Palau in the design and construction of various facilities, based on the States’ priority. These projects will be focused on improving the social, economic, governmental, cultural and recreational aspect of the lives of each State’s citizens.

While it will be the decision of each State to determine its own priorities for this project, the National Government will assist and guide the States through this process to ensure that the funds will be spent in the most beneficial manner.
It is anticipated that most State projects will focus on small scale infrastructure items such as:

- New or improved docks and piers to allow fishing and boats access to the villages at low tide;
- State office buildings to house official functions;
- Community buildings for village meetings, cultural events and elementary school graduations;
- Athletic and recreation facilities such as multi-purpose courts and ball fields for youth programs;
- Secondary access roads between or within villages; and
- Village water system facilities such as the construction of individual household rainwater catchment and storage systems.

Each of the projects to be undertaken in the States will be on a scale which will involve State residents in project planning and implementation. It is also anticipated that significant employment opportunities will arise for State residents out of each State project.

While it is planned that each State should receive a basically equal share of the $4 million in project funding (about $250,000 apiece) consideration will be given to State populations as well as project priority and scope. It may, therefore, be appropriate for some projects, and States, to receive a somewhat larger share of the funding.

The facilities that will eventually be constructed under this project are anticipated to take into account traditional decision making processes as well as traditional designs and structures with appropriate modern technology and methods. Each project will serve as a focal point for community activities including the purposes outlined above. This will be the first time such a far reaching project has been coordinated in Palau and it is anticipated that virtually all the citizens of the Republic will be able to share in its use through participation in social events and community/cultural activities.

V. PROJECT BENEFIT

The State Projects included under this plan will be of great social and community benefit to all the citizens of Palau by providing facilities that will address basic concerns identified by the individual States. It is anticipated that this project will help strengthen the civic and cultural pride of each State
by allowing them to be part of the decision making and implementation process of their State’s development. Each project improvement that is designed and constructed will be the focal point of activity in that State and will set a precedent of the State’s drive toward self-sufficiency. The establishment of strong community programs in each of Palau’s States is a high priority of the National Government and will contribute toward the overall development of Palau through the construction of improvements in each of the States throughout the Republic.

VI. PROJECT SCHEDULE

It is anticipated that funding for the individual State Projects will be expended over a period of approximately 12-18 months. All projects should be complete by the end of calendar year 1996.

Once adequate funding is secured, then it is anticipated that the State projects will take approximately 4-6 months for design/engineering. Another 8-12 months will be required to complete competitive bidding, contract award, materials procurement, construction, inspection and final acceptance. It is also anticipated that most of the State projects, while following their own individual schedule, will proceed approximately concurrently.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the individual States will include land use acquisition prior to commencement of the project. Responsibility of the implementing agency will include training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs based on FY 1995 dollars. The Administration and Inspection amounts total about 10% of Construction costs. Design is roughly 5% of the Construction budget and Contingencies are added at 10% of the Construction amount.
## INDIVIDUAL STATE INFRASTRUCTURE PROJECTS

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CHAPTER 11
NATIONAL CAPITAL

I. PROJECT TITLE

Palau National Capital Construction - Phase I

II. LOCATION OF PROJECT

Melekeok State, Babeldaob, Republic of Palau

III. STATEMENT OF NEED

The Palau Constitution stipulates that Palau’s permanent capital shall be located on Babeldaob Island. Melekeok State was then designated by law as the future site of Palau’s permanent capital.

While initial studies have been conducted and a very preliminary plan submitted to the President and the Palau National Congress, much work still remains to be done. In depth plans, including Master Planning for facilities, Transition Plan for transfer of government facilities, as well as the formal design plans and specification for all infrastructure must now commence.

The United States Government has previously appropriated $2.6 million as a contribution to the new capital relocation. While this contribution was greatly appreciated, and should be sufficient for project design and preliminary site work at the capital, it is not sufficient to cover the start of construction for basic facilities and structures.

The new capital will require the installation of a complete and new infrastructure apparatus. Water, sewer, roads, buildings, communications and power systems must all be designed and constructed. Access roads to the site must also be built. This concept is similar to the new capital recently constructed on the Island of Pohnpei in the Federated States of Micronesia. While some of the infrastructure required at the site, such as road work and electric power supply, will be provided by other projects, this project will be responsible for the construction of basic facilities.

IV. PROJECT DESCRIPTION

The relocation of the capital involves many different and complicated steps in planning and implementation including the following:
A. In depth review and evaluation of recently completed studies and recommendation prepared by Capital Relocation Commission.

B. Completion of Architectural/Engineering design work to develop the final plans and specifications to implement capital relocation and prepare infrastructure/utilities requirements.

C. Development of a plan for the orderly and systematic transfer of government functions from Koror to Melekeok.

D. Actual commencement of construction of facilities. This includes water, sewer, power, communications, and roads systems, as well as all buildings.

It is anticipated that the $2.6 million grant that the Republic of Palau has already received from the U.S. Government will be used in the design of Phase I of the National Capital Construction as well as to fund the basic site work portion of project construction at the National Capital area in Melekeok.

The $5 million Phase I construction funds discussed herein will mainly be used for the construction of a water and wastewater system for the site, as well as construction of the first permanent buildings to house Government facilities. These will include structures for basic operation of all three branches of the National Government.

It is understood that the $5 million Phase I construction will establish the basic structure of the new Palau National Capital in Melekeok. Phase II, to be constructed at a future date as funds become available, will supplement this basic project with further and more complete construction of additional Government facilities.

V. PROJECT BENEFIT

A. Short Term Benefit

During the construction period of the permanent capital, economic benefits will be realized by those actually involved in the labor. A large work force will consist mainly of Palauan nationals. Benefit will also be gained by those indirectly involved with the project, such as merchants, farmers, fishermen and other support services. Such a large project as this will have countless spinoff benefits.
B. Long Term Benefit

In the long term, the whole of Palau will directly benefit from the new capital relocation. Koror state will be relieved of its population overcrowding, traffic congestion, and infrastructure stress. Koror State currently has limited land and water resources which are rapidly becoming overburdened. Koror State can, and will, remain Palau’s economic center.

The physical expansion of the government and capital in Melekeok State will easily be accommodated due to the sufficient land and water resources. Benefit to the neighboring states on Babeldaob Island will also now be possible due to the new roads and power systems.

VI. PROJECT SCHEDULE

It is anticipated that the design portion of the project, to be funded under the existing $2.6 million grant will take approximately 12 - 18 months to complete. This phase will include tasks performed by a qualified A/E firm, extensive field investigations, and the preparations of final plans and specifications. After the design portion is complete, the construction portion of the project under Phase I is expected to continue for approximately 2 to 2 1/2 years. This $5 million phase of the project includes the competitive bidding and award of the project, actual construction, inspection and final acceptance. Once construction is substantially complete, approximately 3 to 6 months will be required for Government transfer to the new capital site.

Assuming that funding for the project is obtained in early 1995, then design should be complete by mid 1996, when construction will commence. Construction should take place for the remainder of 1996 through the end of 1998. It is anticipated that Government transfer will then commence in late 1998 or early 1999.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.
VIII. PROJECT COST ESTIMATE

The project cost estimate for the first phase of the Palau National Capital Construction is shown below. Administration and Inspection funds are budgeted at approximately 3.5% of the Construction amount, while Contingencies are scheduled at roughly 10% of the Construction budget.

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<tr>
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<tr>
<td>Inspection</td>
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<td>Contingencies</td>
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</tr>
<tr>
<td>Total</td>
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</tr>
</tbody>
</table>

Note: The design portion of the project will be covered under the existing $2.6 million grant already received by the Republic of Palau. Therefore, no funds from the $5 million Phase I of the Palau National Capital Construction Project will be used for design services.
CHAPTER 12
NON-PRIORITIZED PROJECTS

As of October 1, 1994 approximately $51,885,000 in Section 212(b) Compact funds are expected to be available to the Republic for Capital Infrastructure Projects. Chapters 2-11 describe, in prioritized order, those projects which the Republic feels are the most critical for the health and well-being of the Palauan people and the future development of Palau given the amount of 212(b) funds available. The projects listed in Chapters 2-11 do not, of course, represent all of the Republic's CIP needs. This chapter contains, in non-prioritized order, a list of other vital projects which the Republic intends to use 212(b) funds for in the event that there are any such funds available pending the completion of the projects listed in Chapters 2-11. This could occur if sources other than 212(b) funds are used for the projects in Chapters 2-11 or if such projects cost less than originally projected. All of the projects listed in this chapter are important to the development of Palau, and it is the sincere hope of the Republic that they will ultimately be able to be funded.

A. SCHOOL REHABILITATION

I. PROJECT TITLE

Babeldaob and Outer Islands Schools Rehabilitation Project

II. LOCATION OF PROJECT

Village and statewide elementary schools located on the islands of Babeldaob, Kayangel, Peleliu, Angaur, Hatohobei, Pulo Anna, and Sonsorol in the Republic of Palau.

III. STATEMENT OF NEED

There are twenty (20) elementary schools located throughout the Republic of Palau's largest island, Babeldaob, and the smaller outer islands of Kayangel, Peleliu, Angaur, Hatohobei, Pulo Anna, and Sonsorol. In total, approximately 700 children attend these schools.

Most of the classroom and auxiliary buildings which comprise these schools are in a deteriorating state. The substandard condition of these buildings has a negative effect on the quality of education received by children at these schools.
The majority of buildings which comprise these schools were originally constructed in the mid-1960’s. Generally, the buildings are of simple wood frame or cement block and corrugated tin roof construction. Over the years, the elements, termites, age, corrosion, and usage have taken their toll on these buildings. Extensive repair or outright replacement of roofs, rain guttering, exterior walls, interior partitions, flooring, doors, windows, sills, frames, insect screen, and sanitary facilities is now needed to rehabilitate these structures.

IV. PROJECT DESCRIPTION

The project entails the rehabilitation of classroom and auxiliary buildings which comprise the twenty (20) elementary schools located throughout Babeldaoab, Kayangel, Peleliu, Angaur, Kayangel, Hatohobei, Pulo Anna, and Sonsorol. As mentioned above, this work shall involve the repair or outright replacement of roofs, rain guttering, exterior walls, interior partitions, flooring, doors, windows, sills, frames, insect screen, and sanitary facilities as required to rehabilitate each particular facility. Interior and exterior painting will also be needed on all of these structures.

It is anticipated that the Bureau of Public Works (BPW) will be responsible for all project administration, design and inspection work. Project construction will likely be performed by a combination of BPW force account and private contractor forces.

V. PROJECT BENEFIT

Rehabilitation of the deteriorated school buildings on Babeldaoab and the outer islands will have several socio-economic benefits. The most important of these is the provision of a safe, adequate learning environment for the children who are now and those who will be attending these schools in the future. Given their present state of disrepair, the buildings must be rehabilitated to prevent their total deterioration and abandonment. Renovation of these facilities now will minimize or prevent the need for more costly repairs in the future. Similarly, the project will help delay the need for large capital expenditures on new facilities by prolonging the service lives of the existing school buildings.

VI. PROJECT SCHEDULE

It is anticipated that all work under the project, including construction, will require about 12 months to complete. Due to the fairly straightforward tasks involved in the school rehabilitations, the project will require limited
design. Except for the difficulty in mobilizing materials and equipment to remote areas, the project should be completed relatively quickly.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The cost of the Babeldaob and Outer Island Schools rehabilitation Project is estimated at $1,450,000. Of this amount, approximately $1,250,000 will be used for construction, $55,000 (less than 5%) for project administration and inspection, $20,000 (2%) for design and roughly $125,000 (10%) will be reserved for contingencies.

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</tbody>
</table>
B. ACCESS ROADS

I. PROJECT TITLE

Intra-Babeldaob Access Roads Project - Phase I

II. PROJECT LOCATION

Babeldaob Island, Republic of Palau

III. STATEMENT OF NEED

The development of a primary road system between the ten States of Babeldaob is one of the Republic’s most important infrastructure requirements. Such a road system is needed to connect the States to the major arterial roadway planned for Babeldaob and to each other where appropriate. The need for both the major arterial roads and an inter-connecting road system between the States is stressed in the Palau Indicative Development Plan and several subsequent planning studies which state that such a road network is key to the economic development of Babeldaob and of Palau as a whole.

Completion of the primary access road system would link the States of Babeldaob with urban Koror and to each other. It would also facilitate the development of Babeldaob’s large land area and natural resources for housing, agriculture, forestry, hotels and tourism, commercial and industrial activities, rock quarrying/crushing for road construction, fisheries and mariculture projects.

IV. PROJECT DESCRIPTION

In its entirety, the Intra-Babeldaob Access Roads Project will entail the design and construction of approximately 45 miles of two lane highway. It is desired that the road specifications meet FHA and AASHTO design criteria and construction standards based on an appropriate level of service requirements for the various individual road segments. In most cases, the road alignments will follow the road system constructed by the Japanese before World War II. The funding plan herein covers Phase I, or the first 8-10 miles of the project. In order to facilitate funding availability, the project is broken down into two sub-phases for FY 1997 and FY 1998, each budgeted at $3.85 million.

V. PROJECT BENEFIT

The potential development of Babeldaob Island is enormous. Areas on Babeldaob with the potential for housing, agriculture, livestock raising,
aquaculture, forestry, road construction material development, hotel resorts and related developments, and other economic activities, presently inaccessible by land, will become accessible upon the completion of the Babeldaob road system. Development of the road system will also facilitate the provision of education programs and health and other emergency services to all the communities on Babeldaob. Furthermore, fisherman and farmers on Babeldaob will be able to bring their products to the markets in Koror in a more efficient and cost effective manner.

The opening of Babeldaob by a modern road system will induce foreign investors to lease lands and invest in development projects in Palau. Such an influx of investments will serve to help develop the private sector of Palau which in turn will create jobs for the Palauan people and broaden the tax base, whereupon further development of the nation can take place.

VI. PROJECT SCHEDULE

The ROP has already undertaken the construction of certain sections of the planned Intra-Babeldaob Access Road Project through Government Force Account initiative. Much of the planned Babeldaob roads will follow the old World War II era Japanese roads. A portion of the design and construction monies will, therefore, address road stabilization and erosion control. Each funding year phase of the project will take approximately one year to complete. Design and/or engineering work will be accomplished by individual sections, hence construction will be taking place while other parts of the road engineering are still underway.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The cost estimate for Phase I, which represents the first 8 - 10 miles of the project is as shown below. Funding will be used to purchase several pieces of additional heavy equipment to supplement to existing Government equipment now working on the roads. Funding will also be used for road building materials, fuel, workers salaries, and inspection.
## INTER-BABELDAOB ACCESS ROADS PROJECT - PHASE I

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C. OUTER ISLAND ELECTRIC POWER

I. PROJECT TITLE

Outer Island Electric Power Systems Project

II. LOCATION OF PROJECT

The project is located on the five major outlying islands of the Republic of Palau, which also constitute five of Palau’s 16 States. These include the States of Peleliu and Angaur (south of Koror), Kayangel (north of Babeldaob), Sonsorol and Hatohobei (southwest of Koror).

III. STATEMENT OF NEED

All of the outer islands of Palau have great potential for further development, especially in terms of their nearshore fisheries as well as their tourism industry. These economic activities cannot be further developed without reliable electric power systems. This in turn supports other infrastructure, such as water systems, upon which development could be supported. Presently, only Peleliu and Angaur have any type of centralized power system and both are in need of complete modification. The States of Kayangel, Sonsorol and Hatohobei have no central power systems. This situation is reflected in the lack of economic activity and development now experienced by those States.

Development of Palau’s ocean resources is necessary in Palau’s quest for greater self-sufficiency. Improvement of all the outer island electric power systems will greatly improve the general health and welfare of these island States and their citizens. These projects will enhance socio-economic activities such as inshore fishery, tourism, handicraft making, water pumping, private homes lighting, operations of communication systems, school, dispensary and local retail outlets.

IV. PROJECT DESCRIPTION

This project targets the outer island electrification program and specific electrical power system improvements proposed for the five islands. Design and construction of these systems is slated for a phased schedule which is described below. Phase I will encompass the design of all of the electric power system improvements, and the construction of the Peleliu State and Angaur State power systems. Phase II will focus on the construction of the Kayangel, Sonsorol and Hatohobei power systems, designed under Phase I. It is anticipated that the electric power systems for Peleliu and Angaur will
center around the modification and up-grading of their existing power plant structures, replacement of power generation equipment, and upgrading of power transmission/distribution systems. A similar, small scale system will be introduced to Kayangel State. The States of Sonsorol and Hatohobei will receive photo-voltaic systems which are most appropriate for those States.

V. PROJECT BENEFIT

Although none of Palau’s outer States have any major resort developments at this time, a significant number of tourists who come to Palau visit these States particularly Peleliu, Angaur and Kayangel. Several individual homes are presently operated as hostels to cater for the tourists who plan to spend a short time there. Reliable power is needed for these operations before larger developments can commence.

Most of these States also have one-ton capacity icemaking machines and a walk-in chillbox, but need a reliable source of power. These facilities are key to the enhancement of the inshore and offshore fisheries of the States. Fish is exported to Koror, Guam, Saipan, Hawaii and Japan.

A reliable source of power is also key to the social advancement of the States. The operation of schools, dispensaries, communication systems, water systems and the numerous retail outlets, small scale boat building operation and handicraft industries all depend on a reliable source of electric power.

VI. PROJECT SCHEDULE

Funding for the Outer Islands Electric Power Systems Project is scheduled for a two year period. In the first year of the project all of the design funds will be utilized. Construction funding has been split into two phases which address the most pressing areas in the first year, Phase I. The remaining year follows accordingly to complete the project goals in Phase II.

Each phase of the project will take approximately 12 to 18 months, including design tasks, bidding and construction periods.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works in conjunction with the Public Utilities Corporation (PUC). Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection in conjunction with the PUC. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the
project, as well as training of appropriate personnel within the user's agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

Below is a summary of the project budgets for the two fiscal years of the program. Budgets contain costs figured at approximately 5% - 10% of the construction amount to cover Design, Administration and Inspection. Contingency funding at roughly 10% of the construction budget is included for unforeseen items that would arise from construction in such remote areas. An annual inflation rate of 3% has been figured into the project costs for the yearly phases of the program.

OUTER ISLAND ELECTRIC POWER SYSTEMS PROJECT

PHASE I: Design of all 5 State Systems and Construction of Peleliu and Angaur State Power Systems

<table>
<thead>
<tr>
<th>Category</th>
<th>Budget Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROP Administration</td>
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<tr>
<td>Design</td>
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PHASE II: Construction of Kayangel, Sonsorol and Hatohobei State Power Systems

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OUTER ISLAND ELECTRIC POWER SYSTEMS PROJECT

<table>
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<tr>
<th>PROJECT PHASE</th>
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</table>
D. WATER SYSTEM

I. PROJECT TITLE

Koror-Airai Water System Improvements

II. LOCATION OF PROJECT

The project is located in the States of Koror and Airai, the primary center area of Palau.

III. STATEMENT OF NEED

The Koror-Airai water system serves approximately 13,000 people living in the governmental/commercial center of Palau. Currently, about 3.8 million gallons (3.8 MGD) of water are treated and pumped into the system each day. The main components of the Koror-Airai water system were built between 1978-1990 under various capital improvement project grants administered by the Department of the Interior through the Trust Territory of the Pacific Islands (TTPI). While these projects have been of great benefit to the ROP, they have not totally addressed the need for a complete and dependable water system infrastructure.

As the urban center area and the rest of Palau develops, there will be a greater demand upon the water resources and related infrastructure. Previous lack of funds for complete system construction has placed the Koror-Airai area in a position of failing to supply an adequate, safe and dependable water supply to the populace. Several recent Japanese grant projects have recently installed additional main-line piping within the Koror-Airai area. Together with a portion of the funding (about $500,000) from the recent FY-1993 "High Priority Water and Sewer Improvements" CIP grant, the Koror-Airai water system is no longer in a constant "crisis" situation, plagued by "water hours" (periods when the water is off). However, the water system still lacks the appropriate and necessary facilities for improving the water quality to acceptable standard.

The main areas for improvement of the system are focused on quantity and quality. The recent infrastructure improvements provided through a Japanese Government grant aid assistance have alleviated "water hours"; however, near term growth will place a demand on the system that cannot be met at this time. An important factor in improving quality, is to keep providing sufficient quantity. The second step in guaranteeing safe water is expanded treatment facilities, especially, for the Koror-Airai Water System, a "pre-treatment" unit.
At this time the Koror-Airai Water System has difficulty complying with U.S. Environmental Protection Agency water quality standards. This could result in regulatory action against the utility and threatens the general health of the populace. This funding plan is geared toward solving such problems through the improvement of the quality of the water produced.

IV. PROJECT DESCRIPTION

The Republic of Palau proposes to alleviate the recurring problems in the existing system by expanding and constructing new components to meet the quality requirements of current and near future water demands.

The work will center on providing better means of treating that water which is delivered to customers by the construction of water treatment plant components.

As proposed in the Palau Water Preliminary Engineering Report, prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command, by Hawaii Architects & Engineers, Inc. in 1982, there are several phases of water system expansion that are recommended for the Koror-Airai Water System. The first phase of this program was constructed in 1982-1983 under U.S. Navy OICC supervision. The remaining phases outlined in the program, set to take place through the period 1985-1995, have largely remained incomplete, due to lack of funding. The recommendations surrounding water quality improvement in this report form the basis of the improvements herein and include:

1. Construction of a 4.0 MGD pretreatment unit. This facility will enable complete treatment of the water which is not accomplished at this time due to the quantity of suspended particles present in the water after heavy rains. Currently, turbidity levels are raised to unacceptable levels after heavy rain. A chemical pretreatment unit will allow for removal of the smallest suspended matter and improve turbidity.

2. Installation of a laboratory/chemical building to support the chemical pretreatment unit.

The current working estimate for the proposed water quality improvements to the Koror-Airai Water System is $3,750,000.

V. PROJECT BENEFIT

As the Republic of Palau aims for increased economic and social development it is essential that basic utilities and infrastructure expand. It is difficult to proceed with developments in tourism and light industry without a safe and
dependable water system. Therefore, it is essential that this resource be utilized to aid Palau’s growth and the basic health and well being of the citizenry.

VI. PROJECT SCHEDULE

Funding for the Koror-Airai Water System Improvements Project is scheduled for a two year project period. It is anticipated that project design will require 6-9 months, after which the project will be bid for construction. The construction period is expected to last 12 - 18 months, including inspection and final acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau - Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

Cost estimates from the 1982 Hawaii Architects & Engineers Water System Report form the basis of the following cost breakdown, including a 3% annual inflation rate. Construction costs are estimated below. In the budget summary, costs for Administration and Inspection are figured at roughly 4% of construction costs, Design is about 7% of Construction, and Contingencies at roughly 10% of the construction budget.

### KOROR-AIRAI WATER SYSTEM IMPROVEMENTS PROJECT

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</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>$3,750,000</strong></td>
</tr>
</tbody>
</table>
E. BABELDAOB ELECTRIC POWER TRANSMISSION

I. PROJECT TITLE

Babeldaob Electric Power Transmission and Distribution Project

II. LOCATION OF PROJECT

Babeldaob Island, Republic of Palau

III. STATEMENT OF NEED

Presently, 24-hour electric power service is only provided to Koror State and portions of Airai State, Aimeliik State and Ngatpang State. Electric power is generated at the 12.8 MW Aimeliik Power Plant located on Babeldaob Island and distributed to these areas by 34.5 KV transmission lines and 13.8 KV distribution lines.

Approximately 4,000 people living on Babeldaob Island are essentially without dependable electric power service. In fact, most do not have electric power service at all. A few of the villages on Babeldaob have small, isolated State run electric power systems. However, these are capable of supplying only enough electricity for limited lighting purposes and are typified by 6:00 PM to 12:00 AM operation. Power lines are generally strung on trees. Due to their relative remoteness and small size, these systems are uneconomical and logistically difficult to operate and maintain.

In order to provide 24-hour electric power service to Babeldaob and to achieve better system operating economies, the ROP Government seeks to extend the national electric power transmission and distribution system to all residential areas on Babeldaob.

Palau’s First 5-Year National Development Plan identified the installation of necessary infrastructure (roads, electric power and communications systems, water supply and sewage collection, treatment and disposal systems, etc.) as a prerequisite for balanced regional development. Improved accessibility and availability of essential utility services will permit development of Babeldaob Island’s vast land area and natural resources.

IV. PROJECT DESCRIPTION

The Babeldaob Electric Power Transmission and Distribution Project consists of the following components:
1. **West Coast Transmission Lines**: From the existing terminus at Nekken Forestry Station, a 34.5 KV, 4-wire, 20.5 mile overhead electric transmission lines will be extended eastward until it crosses the Tabecheding River and then splits into two feeders. One feeder (West Coast Transmission Lines) is routed essentially northward following the alignment of the old Japanese road until it reaches Ngardmau State and then turns eastward until the east coast of Ngaraard State where it is terminated.

2. **East Coast Transmission Lines**: At a point near Tabecheding River, a 34.8 KV, 4-wire, overhead electric power transmission line will be extended for 11 miles on a northeasterly direction through Ngchesar State to Melekeok State and Ngiwal State where it will terminate. The States of Ngchesar, Melekeok and Ngiwal will derive their power source from the East Coast Power Transmission Lines.

3. **Primary Distribution**: From the 34.5 KV transmission lines, electrical power distribution lines will be routed to each State and/or community through a 34.5 KV/13.8 KV stepdown transformer substation which might vary in capacity from as little as 100 KVA up to as large as 1000 KVA, depending upon the power requirement of each State/community. Electric power will be distributed within each State through primary distribution lines of 13.8 KV, 4-wire overhead system hung on prestressed concrete poles. In this manner, the community of Ibobang and the States of Ngaremengui, Ngaraard and Ngarchelong will derive their electric power source from the West Coast Power Transmission Lines.

4. **Power Services**: From a 13.8 KV distribution system within each State, power service to each house and/or facility will be accomplished by providing for each group of three houses a 20 KVA, 13.8 KV/120 V pole mounted service transformer. Each house and/or facility must be provided with an appropriate electric power demand meter, properly installed.

Presently, the States of Ngaremengui and Melekeok have properly designed and constructed power distribution systems, and it would only be necessary to tie these systems to the main transmission lines with approximately sized and located step-down transformer substations. Other States not tied to the public power grid require complete power distribution systems. It is anticipated that a Japanese grant aid assistance will enable the extension of the public power grid to the States of Ngaremengui, Ngchesar and Melekeok by late 1996 or early 1997.
5. **Voltage Regulation**: As the proposed 34.5 KV power transmission lines are long, it may be necessary to install voltage regulation equipment in the system to compensate for any voltage drop. Other necessary electrical apparatus will be installed in the system as required.

The ROP Bureau of Public Works shall be responsible for the administration and inspection of the project. Engineering, investigations and design work for the project (part of the project outside the scope of the Japanese grant aid assistance) will be performed by a private A/E firm to be selected through the competitive negotiation process. The A/E firm will also assist the ROP Bureau of Public Works in reviewing contractor submittals for materials, equipment, and shop drawings during the construction phase of the project. Due to the complexity of the work, project construction will be competitively bid and awarded to a reputable contractor experienced in electric power transmission and distribution line construction.

V. **PROJECT BENEFIT**

Babeldaob is the second largest land mass in Micronesia. The island has great potential for the development of residential housing, agriculture, forestry, inshore and aquaculture/mauriculture fisheries, hotels and resorts, minerals including bauxite, clay for making bricks, rock sources for road and construction materials, water sources for irrigation and industrial use and land space for industrial site development.

Providing electric power service to existing residential areas on Babeldaob will dramatically improve the quality of life for approximately 4,000 people currently living on the part of the island that does not have electric power at this time. It will also facilitate the island’s development. Electric power is needed to develop Babeldaob’s abundant water resources. Coupled with the Government’s on-going Babeldaob road improvement program, the availability of water and electric power will make residential, agricultural and commercial development of Babeldaob practical. The availability of reliable electric power on Babeldaob will promote investor interest. Commercial developments will generate jobs for people as well as demand for leased land. The benefits to be gained by both the land owners and the investors by bringing electric power to Babeldaob will be extensive.

The Palau First 5-Year National Development Plan calls for relocation of the capital of Palau from Koror State to Babeldaob (Melekeok). Extending the electric power transmission lines to Babeldaob will enhance this objective. This in turn will help to alleviate congestion in Koror State as people move to Melekeok and surrounding areas of Babeldaob to seek employment. Overcrowding and related problems which presently burden Koror will thus decrease.
VI. PROJECT SCHEDULE

The project will take approximately three years to complete. The initial design phase of the project, including solicitation of technical proposals from qualified A/E firms, A/E selection, contract award, project design, and government review is expected to take approximately one year. Thereafter, an additional two years will be needed to solicit bids, award the construction contract and complete project construction and inspection.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works in conjunction with the PUC. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection in conjunction with the PUC. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The estimated cost of the project in FY-1995 dollars is approximately $9,950,000. A breakdown of this amount by funding year is provided below.

<table>
<thead>
<tr>
<th>BABELDAOB ELECTRIC POWER TRANSMISSION AND DISTRIBUTION PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT PHASE</td>
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<tr>
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<tr>
<td>Design</td>
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<tr>
<td>Construction</td>
</tr>
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</tr>
<tr>
<td>Contingency</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
</tr>
</tbody>
</table>
F. NATIONAL CAPITAL - PHASE II

I. PROJECT TITLE

Palau National Capital Construction - Phase II

II. LOCATION OF PROJECT

Melekeok State, Babeldaob, Republic of Palau

III. STATEMENT OF NEED

The Palau Constitution stipulates that Palau’s permanent capital shall be located on Babeldaob Island. Melekeok State was then designated by law as the future site of Palau’s permanent capital.

While initial studies have been conducted and a preliminary plan submitted to the President and the Palau National Congress, much work still remains to be done. In depth plans, including Master Planning for facilities, Transition Plan for transfer of government facilities, as well as the formal design plans and specification for all infrastructure must now commence.

The United States Government has previously appropriated $2.6 million as a contribution to the new capital relocation. While this contribution was greatly appreciated, and should be sufficient for project design and preliminary site work at the capital, it is not sufficient to cover the start of construction for basic facilities and structures. The Phase I construction, which will utilize $5 million in Compact funds will only fund basic construction as described below.

The new capital will require the installation of a complete and new infrastructure apparatus. Water, sewer, roads, buildings, communications and power systems must all be designed and constructed. Access roads to the site must also be built. This concept is similar to the new capital recently constructed on the Island of Pohnpei in the Federated States of Micronesia. While some of the infrastructure required at the site, such as road work and electric power supply, will be provided by other projects, this project will be responsible for the construction of basic facilities.

IV. PROJECT DESCRIPTION

The relocation of the capital involves many different and complicated steps in planning and implementation.
1. In depth review and evaluation of recently completed studies and recommendation prepared by Capital Relocation Commission.

2. Completion of Architectural/Engineering design work to develop the final plans and specifications to implement capital relocation and prepare infrastructure/utilities requirements.

3. Development of a plan for the orderly and systematic transfer of government functions from Koror to Melekeok.

4. Actual commencement of construction of facilities. This includes water, sewer, power, communications, and roads systems, as well as all buildings.

It is anticipated that the $2.6 million grant that the Republic of Palau has already received from the U.S. Government will be used in the design of Phase I of the National Capital Construction as well as to fund the basic site work portion of project construction at the National Capital area in Melekeok.

The $5 million Phase I construction funds will mainly be used for the construction of a water and wastewater system for the site, as well as construction of the first permanent buildings to house Government facilities. These will include structures for basic operation of all three branches of the National Government. The $12.5 million Phase II project will continue the work started under Phase I, by expanding Government facilities and infrastructure at the Capital site.

While it is understood that the $5 million Phase I construction will establish the basic structure of the new Palau National Capital in Melekeok, Phase II will supplement this basic project with further and more complete construction of additional Government facilities.

V. PROJECT BENEFIT

1. Short Term Benefit

During the construction period of the permanent capital, economic benefits will be realized by those actually involved in the labor. A large work force will consist mainly of Palauan nationals. Benefit will also be gained by those indirectly involved with the project, such as merchants, farmers, fishermen and other support services. Such a large project as this will have countless spinoff benefits.
2. Long Term Benefit

In the long term, the whole of Palau will directly benefit from the new capital relocation. Koror state will be relieved of its population overcrowding, traffic congestion and infrastructure stress. Koror State currently has limited land and water resources which are rapidly becoming overburdened. Koror State can, and will, remain Palau’s economic center.

The physical expansion of the government and capital in Melekeok State will easily be accommodated due to the sufficient land and water resources. Benefit to the neighboring states on Babeldao Island will also now be possible due to the new roads and power systems.

VI. PROJECT SCHEDULE

It is anticipated that the design portion of the project, to be funded under the original $2.6 million grant will take approximately 12 - 18 months to complete. This phase will include tasks performed by a qualified A/E firm, extensive field investigations, and the preparations of final plans and specifications. After the design portion is complete, the construction portion of the project under Phase I is expected to continue for approximately 2 to 2 1/2 years. That $5 million phase of the project includes the competitive bidding and award of the project, actual construction, inspection and final acceptance. Once construction is substantially complete, approximately 3 to 6 months will be required for Government transfer to the new capital site.

Design of Phase I should be complete by mid 1996, when construction will commence. Construction should take place for the remainder of 1996 through the end of 1998. It is anticipated that Government transfer of basic operations will then commence in late 1998 or early 1999.

Phase II construction, most of which will be designed under Phase I, will require approximately 2-3 years of additional work time. A small amount of design money has been retained under Phase II for possible design modifications that may be required.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of
appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The project cost estimate for the second phase of the Palau National Capital Construction is shown below. Administration and Inspection funds are budgeted at approximately 3% of the Construction amount, as is Design. Contingencies are scheduled at roughly 10% of the Construction budget.

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<thead>
<tr>
<th>PROJECT PHASE</th>
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<tbody>
<tr>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$12,500,000</strong></td>
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</table>

* Note: The design portion of the project was mainly covered under the original $2.6 million grant already received by the Republic of Palau. Therefore, only a small design budget, allowing for possible design modifications to the work, will be budgeted from the $12.5 million Phase II of the Palau National Capital Construction Project.
G. NATIONAL MUSEUM, ARCHIVES AND LIBRARY

I. PROJECT TITLE

National Museum, Archives and Library Complex Construction Project.

II. LOCATION OF PROJECT

Koror State, Republic of Palau

III. STATEMENT OF NEED

Currently, the Republic of Palau has no permanent complex for preserving, maintaining and displaying artifacts of the nation’s culture or for recording the development of recent impacts on Palau’s social changes. The current museum is a small, deteriorating pre-World War II building which cannot safely protect valuable items. The existing library is housed in a very small building which also serves as the elementary and high school library. This structure is not adequate for either purpose. The combination of preserving Palau’s past, recording its present, and providing for its citizens’ education make the construction of a new National Museum, Archives and Library an essential and important project.

IV. PROJECT DESCRIPTION

The Republic of Palau proposes to provide better cultural, historical and educational resources for its citizens by designing and constructing a complex to adequately house and protect museum archival and library properties.

The complex will be centrally located in urban Koror and will include traditional designs and structures with appropriate modern technology and methods. The new center will serve as a focal point for research, learning and cultural life within Palau. The facility will also serve as an attraction to tourists through its cultural collections and demonstrations.

V. PROJECT BENEFIT

The National Museum, Archives and Library Complex Project will be of immense benefit to all the citizens of Palau by providing a critical supplement to the nation’s cultural and educational foundation. Also, the complex will serve as an excellent tourist attraction, which will in turn generate renewed interest in cultural issues, as well as revenue. Such a facility will also enable Palau to solicit gifts, donations and loans from private citizens and institutions for display within the complex.
VI. PROJECT SCHEDULE

The project will take approximately 18-24 months to complete from initial engineering investigations and design through materials procurement, construction, inspection and acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design\Engineering Branch of Public Works which is experience in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The amount for Administration, Design and Inspection totals about 10% of Construction costs, and Contingencies are also budgeted at roughly 10% of the Construction amount.

<table>
<thead>
<tr>
<th>NATIONAL MUSEUM, ARCHIVES, AND LIBRARY COMPLEX CONSTRUCTION PROJECT</th>
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<tr>
<td>Contingency</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
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</table>
H. PRISON

I. PROJECT TITLE
New Palau Prison Facility Project

II. LOCATION OF PROJECT
Southern Babeldaob Island, Republic of Palau

III. STATEMENT OF NEED
The existing jail is located in the center of downtown Koror. This location is inappropriate for the detention of long term prisoners. The existing jail facility is being renovated, but it will not be able to service the projected prison population in the near future. The existing jail would still serve many important needs including, but not limited to, incarceration of high security prisoners, short-term prisoners, prisoners who need to be segregated from the general prison population, and prisoners who need to be in close proximity to the Courts or health facilities. It has, however, been determined that much of the inmate population should be relocated to a new facility in southern Babeldaob. This new facility would be of ample size and design to meet the requirements set forth in the Palauan Constitution, which includes preservation of basic human rights, as well as, separation of the various inmate populations. The facility would incorporate areas of agricultural production and animal husbandry.

IV. PROJECT DESCRIPTION
The Republic of Palau proposes to better provide for inmate care and rehabilitation by designing and constructing a new detention facility on the southern part of Babeldaob Island to adequately house and inmate population of 150, including males, females and juveniles.

The facility will be located in southern Babeldaob to provide ready access to Koror. It will be positioned in a rural atmosphere and will include farming capabilities. The structures will be of concrete and masonry construction, and although designed to prison security standards it will essentially be a low to medium level security facility that will be designed to blend into the natural environment. Inmates will be provided with arts/crafts areas, recreational facilities, a library, interview rooms and visiting areas.

V. PROJECT BENEFIT
The New Prison Facility in southern Babeldaob will ensure adequate and humane detention of convicted criminals. The new prison will provide an atmosphere conducive to rehabilitation for inmates and allow them to make

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the best use of their time in detention. Food will be grown at the facility not only to feed the inmate population, but to provide the inmates with additional sources of income.

The facility will be sized to meet the anticipate prison population of the year 2020. The new facility will allow the existing facility to be converted for use as a short term holding facility for certain sentenced prisoners and non-convicted holds.

VI. PROJECT SCHEDULE
The project will take approximately 24-30 months to complete from initial engineering investigations and design through materials procurement, construction, inspection and acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT
The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE
The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration, Design and Inspection amounts total about 12% of Construction costs, and Contingencies are also budgeted at roughly 10% of the Construction amount.

<table>
<thead>
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<th>PROJECT PHASE</th>
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</thead>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$2,500,000</strong></td>
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</tbody>
</table>
I. COURT ANNEX

I. PROJECT TITLE

Supreme Court Annex.

II. LOCATION OF PROJECT

Koror, Republic of Palau.

III. STATEMENT OF NEED

The current four Supreme Court Justices are utilizing make-shift, inappropriate and run down office space. They need to be provided with appropriate work area, with adequate auxiliary spaces for their clerical and legal support. Four new judges chambers consisting of an office for the judge, reception area, a clerk’s office and a small library. Each will be equipped with its own toilet facilities. Spaces will also be provided other judiciary personnel and functions.

IV. PROJECT DESCRIPTION

The Republic of Palau proposes to better provide for working space and environment for their Supreme Court Justices and staff. The new building will be an Annex to the existing Judiciary Building and will be a two story building of approximately 11,000 square feet. The building will be air conditioned and designed to provide security and privacy to the judges.

Office space in the new building will also be provided for the Administrative Director and the Senior Judge of the Court of Common Pleas.

The building will be constructed of concrete and masonry with a metal roof. The architectural will blend with and enhance the existing building. A breeze way will be designed and constructed to allow the judges to travel between their chambers and the courtrooms.

V. PROJECT BENEFIT

The Supreme Court Annex project will provide office space for the four Supreme Court Justices of the Republic of Palau. The project will also provides much needed space for the clerical and legal support staff require for the justices. The proper work environment will provide the justices with the security and privacy necessary to carry out their work.
VI. PROJECT SCHEDULE

The project will take approximately 15 -18 months to complete from initial engineering investigations and design through materials procurement, construction, inspection and acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration, Design and Inspection amounts total about 10% of Construction costs, and Contingencies are also budgeted at roughly 10% of the Construction amount.

<table>
<thead>
<tr>
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</table>
J. POLICE SUB-STATIONS

I. PROJECT TITLE

Babeldaob and Outer Island Public Safety (Police) Sub-stations

II. LOCATION OF PROJECT

The post Compact development and repopulation of Babeldaob and the States of Peleliu, Angaur and Kayangel create a need to provide police substations to promote and ensure the public safety. Palau’s Bureau of Public Safety is currently located in central Koror and provides police and fire protection to the people of the Republic. However, due to transportation constraints their principle efforts are focused on the Koror-Airai area. The shifting of population creates the need to establish additional police substations throughout Palau in order to temporarily detain violators as well as to serve a location for tourists to receive emergency assistance. Substations in all States should be constructed. These substations will be designed to provide a small office and reception space, lockable storage and a secured room for temporary confinement.

The offices will be designed with traditional elements making them inviting to tourists. These facilities will be supplied with radio communications to Koror and telephones where available.

IV. PROJECT DESCRIPTION

The Republic of Palau proposes to provide public safety substations in all of the States of Palau. These stations will vary from 500 to 1,000 square feet in area. They will be single story and constructed of both local and imported materials. The architecture will contain traditional elements including local materials, graphics and shapes. The substations will be located, when possible, adjacent to the national highway.

V. PROJECT BENEFIT

The Public Safety Substations will provide the people of Palau with emergency assistance and allow the temporary detention of suspects prior to transport to Koror. The stations will also provide a location for visitors to find emergency assistance and information.
VI. PROJECT SCHEDULE

The project will take approximately 18-24 months to complete from initial engineering investigations and design through contract award, materials procurement, construction, inspection and final acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion. Project materials will be purchased by the National Government and Force Account agreements for labor negotiated with the individual States where appropriate.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration, Design and Inspection amounts total about 7.5% of Construction costs, and Contingencies are budgeted at approximately 5% of the Construction amount.

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K. INTER-ISLAND VESSEL

I. PROJECT TITLE

Purchase of Inter-Island Vessel

II. LOCATION OF PROJECT

Republic of Palau

III. STATEMENT OF NEED

The Southwest Island States of Hatohobei and Sonsorol can only be reached by ocean going vessels. The lack of regularly scheduled transportation to these islands has caused a migration of their inhabitants to Koror. The need for a frequent and reliable means of transportation to these islands is needed for these citizens to repopulate their home islands. The islands are located in some of the Pacific Ocean’s most valuable fishing waters, and their habitation is vital to the surveillance and protection of this tremendous economic resource.

IV. PROJECT DESCRIPTION

The Republic of Palau plans to purchase and operate an ocean going vessel for the Southwest Island States of Hatohobei and Sonsorol. The ship will be able to transport people and supplies to these remote areas on a regular, scheduled basis. The vessel will be of a size, design and level of sophistication to allow safe comfortable and reliable transport even in heavy seas. The ship will be equipped with appropriate machinery to both off-load and on-load cargo at all sites. The ship will also be able to assist in marine patrol surveillance missions.

Space will also be provided to accommodate a modest number of visitors and tourists to these remote islands.

It is anticipated that operation and maintenance of the vessel will be contracted out to a private firm, with the vessel remaining the property of the Palau National Government.

V. PROJECT BENEFIT

An efficient and reliable transportation system between the Southwest Islands and Koror will promote the repopulation of these islands and is necessary to protect the Republic’s environmental and economic interests in the area.
VI. PROJECT SCHEDULE

The purchase, delivery, training of personnel and commencement of service of the vessels will take approximately 18 - 24 months.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the appropriate branch of the National Government. The actual operation and maintenance of the system may be contracted out through a competitive negotiation process. The vessel will remain the property of the Republic of Palau National Government.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration amount is about 2.4% of Purchase costs, and Contingencies are budgeted at roughly 10% of the Purchase amount.

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<tr>
<td>Transport of vessel to Palau</td>
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<tr>
<td>Contingency</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$ 1,500,000</strong></td>
</tr>
</tbody>
</table>
I. HIGH SCHOOL

I. PROJECT TITLE

Central Palau High School Construction Project.

II. LOCATION OF PROJECT

Central Babeldaob Island, Republic of Palau.

III. STATEMENT OF NEED

Currently, the only public high school in Palau is located in Koror. This forces families to send their high school age students to Koror to live with relatives and friends during their teenage years. The post Compact re-population of Babeldaob and the creation of the national highway system will allow these displaced youngsters to remain in their villages with their families provided that a new high school is available. Through this project, the over-crowded Palau High School could expect a drop in enrolment allowing it to move readily to meet its educational mission. It is estimated that the current student drop out-rate, which is especially high among young males, will be greatly reduced by the location of the new school closer to their homes.

The social and economic pressure placed on the families in the rural states, who now send their children to school in Koror, will be greatly reduced. The family and clan units which are integral to Palauan society will be preserved and children will be afforded a better education.

IV. PROJECT DESCRIPTION

The Central Babeldaob High School will be a modern school with the requisite facilities to provide a well rounded education. While designed to place emphasis on and promote education in the traditions and culture of Palau, it will also have the equipment and amenities to provide an education which will allow its graduates to continue their education on island or abroad. The school will have recreational, library, computer, science, and food service facilities to meet the needs of its students and the Republic well into the 21st century.

The campus will be modular in design allowing a separation of disciplines and a free and open environment for learning. Buildings will be one and two story. Some rooms will be climate controlled to allow the use of modern electronic devices, while other classes will be designed to take advantage of natural ventilation. Architectural design will reflect the traditional structures of Palau...
with the history and culture of the people of Palau evidenced in the design and treatment of the architecture.

An estimated 60,000 square feet of classroom, administrative and support space will be created. The construction will be masonry with pitched wooden roofs. The individual buildings will be connected with loggias of traditional design.

V. PROJECT BENEFIT

The socio-economic and cultural benefits from protecting the family unit in traditional regions such as Palau are well documented. This project will support this practice. The Palau of the 21st century will include a much larger population on Babeldaob. This population will have adequate primary education facilities but no secondary education facilities until this project is realized.

VI. PROJECT SCHEDULE

The project will take approximately 24-36 months to complete from initial engineering investigations and design through contract award, materials procurement, construction, inspection and final acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration, Design and Inspection amounts total about 14% of Construction costs, and Contingencies are budgeted at roughly 10% of the Construction amount.
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<td>Construction</td>
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<td>Inspection</td>
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<td><strong>TOTAL</strong></td>
<td><strong>$12,500,000</strong></td>
</tr>
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</table>
M. SENIOR CITIZEN’S CENTER

I. PROJECT TITLE

Palau Senior Citizens Center

II. LOCATION OF PROJECT

Koror State, Republic of Palau

III. STATEMENT OF NEED

The current Senior Citizen’s Center is inadequate to meet the needs of this vital segment of the population. A new facility that will provide ample space and facilities to allow various seniors of Palau to meet, discuss and promote the culture and traditions of Palau is greatly needed. The center needs to be located in Koror close to the National Hospital. The facility needs to contain short term living quarters with nursing capabilities for visiting seniors. A store and area to display handicrafts is also required.

New space needs to be provided where senior citizens can meet with and counsel the youth of Palau, in the same way as they have for centuries. The center will also act as a shelter in times of emergency, and must be designed to withstand typhoon and earthquake forces.

IV. PROJECT DESCRIPTION

The Republic of Palau proposes to better provide for the needs of its senior citizens by constructing a civic center specifically for their needs. The new facility will contain three buildings: a central meeting and cultural center with cooking facilities, a dormitory with semi-private rooms, and a store/gift shop. A total of 13,500 square feet of space will be developed.

All construction will be engineered to withstand earthquakes and typhoons. The basic structures will be of concrete and masonry construction covered with appropriate traditional finishes. The facilities will provide modern bathroom and shower areas.

Areas and office spaces will be provided for an administrator, staff members and a full time nurse. Emergency power and water supply will be provided.

V. PROJECT BENEFIT

By providing a center for the senior citizens of the Republic of Palau, the culture and traditions that have developed over centuries will be protected and
passed down for generations to come. The facility will provide for short term convalescence, thus reducing the burden on the National Hospital. The facility will also act as typhoon and emergency shelter.

VI. PROJECT SCHEDULE

The project will take approximately 15-18 months to complete from initial engineering investigations and design through contract award, materials procurement, construction, inspection and final acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency also include land use acquisition prior to commencement of the project, as well as training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration, Design and Inspection amounts total about 15% of Construction costs, and Contingencies are budgeted at 10% of the Construction amount.

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<td><strong>TOTAL</strong></td>
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</table>
N. ADMINISTRATION CENTER

I. PROJECT TITLE

Ministry of Administration (including Computer Center)

II. LOCATION OF PROJECT

Koror State, Republic of Palau

III. STATEMENT OF NEED

The existing Ministry of Administration facilities consist primarily of a maze of corridors in a pre-WW II building, connecting small poorly ventilated and constructed offices. These spaces are not appropriate for the use of modern computers and electronic equipment. Existing computer equipment is outdated and mismatched between departments. Some departments are still hand posting. A modern facilities designed specifically for the needs of the Ministry, with a new computer system and associated equipment is a requisite for the post Compact Government of Palau. The facility must be designed and equipped to meet the Republic’s accounting and administrative needs through the first decades of the 21st century.

New space needs to be climatic controlled, and protected from fire, and designed to withstand earthquake and typhoon forces.

IV. PROJECT DESCRIPTION

The Republic of Palau plans to build and equip a modern building to house all the functions and departments of the Ministry of Administration. The facilities will be fully air-conditioned and climate controlled, including dehumidification.

A new state-of-the-art computer system appropriate to the functions of the Ministry will be installed. The system will have a central main frame computer, in a secured and protected area with remote terminals to appropriate offices. One system will be use throughout the Ministry.

The building will be designed up to appropriate building and fire codes. The main computer room will be protected by a halon fire protection system. The new office space will utilize a landscape architectural approach with low level partitioning. A central reception and waiting area will be provided. The building will be two stories with a total developed area of 10,000 square feet.
V. PROJECT BENEFIT

A centralized administrative and accounting facility is vital to the operation of modern government. The new Ministry of Administration Computer Center will be such a facility. The use of a single computer system throughout the departments of the Ministry will promote efficiency and better cooperation within the Government. The building will be climatically controlled to protect valuable equipment.

VI. PROJECT SCHEDULE

Once adequate funding is secured, the project will take approximately 24-30 months to complete from initial engineering investigations and design through materials procurement, construction, inspection and acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency include training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration, Design and Inspection amounts total about 13% of Construction costs, and Contingencies are budgeted at roughly 10% of the Construction amount.

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<td>Contingency</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$2,500,000</strong></td>
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</table>
O. AGRICULTURAL STATION

I. PROJECT TITLE

Relocation and Expansion of National Government Agricultural Station

II. LOCATION OF PROJECT

Nekken Hamlet, Aimeliik State, Republic of Palau

III. STATEMENT OF NEED

The improved roads of the post-Compact era will open Babeldaob not only to tourism but also to agriculture. The fertile lands of Babeldaob, especially its central section, will become an important component of the national economy. The existing agricultural station located at the Ministry of Resources and Development Office in Koror provides support to local farmers and community in the way of fertilizers, tools, equipment and training. These functions will better serve a post Compact Palau if located at the existing Nekken Agricultural Center in Aimeliik State. This new center will also include a farmer’s market for sale of produce to both the people of Babeldaob and Koror.

IV. PROJECT DESCRIPTION

The Republic of Palau plans to relocate the existing Agricultural Center to Nekken, in Aimeliik State. The new center will included offices, a store and warehouse, a demonstration area, and a farmer’s market. Buildings will be single story and constructed of pre-manufactured metal type. The warehouse will be approximately 15,000 square feet, with 2,000 feet of air-conditioned space.

The farmer’s market and demonstration area will be open air and traditional in architecture. Spaces will be provided for rental to the farmers.

The facilities will be designed and constructed to provide an attractive destination for tourists as well as for citizens of Palau.

V. PROJECT BENEFIT

A relocated Agricultural center will provide better access to the farmers of Babeldaob. It will serve as a tourist destination and agriculture and livestock demonstration center.
A farmer’s market will be constructed to promote local small scale agriculture production.

VI. PROJECT SCHEDULE

The project will take approximately 12-18 months to complete from initial engineering investigations and design through materials procurement, construction, inspection and acceptance.

VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency include training of appropriate personnel within the user’s agency for the proper operation and maintenance of the project after completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The Administration, Design and Inspection amounts total about 10% of Construction costs, and Contingencies are also budgeted at roughly 10% of the Construction amount.

<table>
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<tr>
<th>MINISTRY OF ADMINISTRATION COMPUTER CENTER</th>
<th>CONSTRUCTION PROJECT</th>
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<tbody>
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</table>


P. **NATURAL RESOURCES AND DEVELOPMENT**

I. **PROJECT TITLE**

New Office Complex for the Bureau of Natural Resources and Development.

II. **LOCATION OF THE PROJECT**

Koror, Republic of Palau

III. **STATEMENT OF NEED**

The offices of the Bureau of Natural Resources and Development are spread throughout Koror making coordination and communication difficult. There is a need to centralize these offices into one new modern office complex. This complex will include the Divisions of Marine Resources and Conservation/Entomology. A central location of critical laboratory and computer equipment is needed.

IV. **PROJECT DESCRIPTION**

The Republic of Palau plans to consolidate the divisions of the Bureau of Natural Resources and Development into a building complex of approximately 3,000 square feet. Offices for each of the divisions will be provided. A large conference room with audio-visual aids will be incorporated into the design. The building will be single story, of concrete/masonry construction with a metal/wood roof. The offices will be air conditioned and a central restroom facility will be provided.

V. **PROJECT BENEFIT**

A centralized and efficiently planned office complex will promote better communication with the Divisions of the Bureau of Natural Resources and Development. The new complex will create a single point of contact for visiting scientists that frequent the Divisions of Marine Resources and Conservation/Entomology.

VI. **PROJECT SCHEDULE**

The project will take approximately 12-18 months to complete from initial engineering investigations and design through contract award, materials procurement, construction, inspection, and final acceptance.
VII. PROJECT IMPLEMENTING AGENCY AND MANAGEMENT

The project will be implemented and managed by the Palau Ministry of Resources and Development through the Bureau of Public Works. Actual project management will be the responsibility of the Design/Engineering Branch of Public Works which is experienced in construction management and inspection. Responsibilities of the implementing agency include training of appropriate personnel within the user’s agency for the proper operation and maintenance of the facility after project completion.

VIII. PROJECT COST ESTIMATE

The following table provides a summary breakdown of estimated project costs in FY 1995 dollars. The amount for Administration, Design and Inspection totals about 15% of Construction costs, and Contingencies are budgeted at roughly 10% of the Construction amount.

<table>
<thead>
<tr>
<th>NEW BUREAU OF NATURAL RESOURCES AND DEVELOPMENT</th>
<th>OFFICE COMPLEX CONSTRUCTION COMPLEX</th>
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<td>TOTAL</td>
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